Drainage Report for:

Johnson County Animal Shelter
2160 N. Graham Road
Franklin, Indiana

Date: February 12, 2008
REV.: March 13, 2008
REV.: July 3, 2008

RECEIVED
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CITY OF FRANKLIN
DEPT. OF PLANNING

FILE COPY

Prepared for:

Johnson County Board of Commissioners
86 W. Court Street, Courthouse Annex
Franklin, IN 46131

5930.002

Schneider

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DRAINAGE NARRATIVE

Introduction:

This report contains the drainage calculations for the proposed Johnson County Animal Shelter in Franklin, Indiana. The scope of this project includes the construction of the animal shelter, a parking lot, and a detention pond. The proposed drainage design is based on guidelines set forth in the City of Franklin Subdivision Control Ordinance.

Site Location:

The proposed Johnson County Animal Shelter site is located in Section 2, Township 12 North, Range 4 East in the Town of Franklin, Johnson County, Indiana. The site is located on the west side of Graham Road, north of Commerce Drive. Adjoining land uses are as follows:

North – Agricultural field
South – Agricultural field
East – Graham Road
West – Agricultural field & single family residence

Soil Types:

Soils maps from the National Resources Conservation Service identify Brookston Silty Clay Loam (Br), Crosby Silt Loam (CrA), and Fox complex (FxC2) on the proposed site. Brookston and Fox soils are part of hydrologic soil group B, while Crosby soils are part of hydrologic soil group C. See Appendix A for a soils map.

Overall Watershed:

The overall watershed is Young's Creek – Brewer's/Canary Ditches. The 14-digit Hydrologic Unit Code is 05120204090030. The site is marked Zone X (unshaded) on FEMA Map #18081C0143D for Johnson County, Indiana, dated August 2, 2007. This FEMA Flood Map can be found in Appendix A.

Existing Drainage Conditions:

The proposed site is currently an agricultural field. Stormwater runoff leaves the site as shallow concentrated flow in three locations: two localized depressions on the southern property line and one on the western property line. The site accepts some offsite flow from the north that leaves the site at the easternmost localized depression along the southern property line. All runoff eventually reaches Canary Ditch.

The existing conditions were modeled with Interconnected Channel and Pond Routing Software (ICPR). This model analyzed the contributing drainage area to the proposed detention pond,

which includes both onsite and offsite flows. Because the proposed detention facility will detain the offsite runoff, the allowable release rate will be based on the entire contributing drainage area. SCS Type II rainfall distributions were used with storm durations of 1,2,3,6,12, and 24 hours. Rainfall depths were obtained from Intensity-Duration-Depth Tables for Indianapolis, IN. The time of concentration for each basin was computed using the TR-55 method. According to the City of Franklin Subdivision Control Ordinance, the pre-developed runoff rates for any existing farm ground shall be computed based on pasture cover type in good hydrologic condition. The composite curve number for each basin was computed accordingly.

The peak discharge rates are reported below in Table 1. Basin "Overall" refers to the entire contributing drainage area to the proposed detention pond, and the peak discharge rates represent the superimposed hydrographs for basins EX-West, EX-South-W, and EX-South-E. See Appendix B for basin maps, calculations, rainfall information and ICPR data.

TABLE 1: EXISTING DRAINAGE BASIN PEAK DISCHARGE RATES

	Peak Discharge		
Drainage Basin	**2-yr (ft^3/s)**	**10-yr (ft^3/s)**	**100-yr (ft^3/s)**
Overall	1.56	8.95	22.85

Overall Proposed Drainage Design:

A series of swales will collect runoff from the developed site and convey it to a wet detention pond located on the western half of the site. This pond discharges west via a 12" RCP to Canary Creek. Because the outlet pipe crosses two properties, an easement is being obtained. The detention pond will accept offsite flow from a 5.7-acre (±) area to the north via an 18" RCP. Runoff from this offsite area *will be detained* in the detention pond. This more than compensates for any direct runoff from the animal shelter site. The proposed detention pond has adequate volume to detain at least 20% of runoff resulting from 0.5 inches of direct runoff from the contributing watershed for at least 24 hours after the peak runoff occurs. This is the critical water quality criterion.

Storm Sewer Design:

The storm sewers for this site were designed using the Rational Method for peak runoff rates and Manning's Equation for pipe sizing. The time of concentration for each drainage basin was computed using the TR-55 Method. A roughness coefficient of 0.013 was used for all reinforced concrete pipes. Runoff coefficients were chosen based on recommendations found in the HERPICC County Storm Drainage Manual. The swales were evaluated to determine that the depth of flow in a 10-year storm does not result in overtopping the banks. Basin maps and calculations may be found in Appendix C.

Detention Storage Design:

The proposed conditions require detention storage which will be provided by a wet detention pond on the western half of the property. The City of Franklin Subdivision Control Ordinance states that detention facilities shall outlet stormwater at a 2-year pre-development rainfall event rate for a 10-year post-development storm, and shall outlet at a 10-year pre-development rainfall event rate for a 100-year post-development storm. The Ordinance requires that detention facilities be modeled using SCS hydrographs for the following storm durations: 1 hour, 2 hours, 3 hours, 6 hours, 12 hours, and 24 hours.

The proposed detention pond was modeled with ICPR using SCS Type II rainfall distributions and rainfall amounts obtained from Intensity-Duration-Depth Tables for Indianapolis, IN. As previously mentioned, this pond detains both onsite and offsite flows. The allowable and proposed release rates from the pond are shown below in Table 2. The pond has adequate volume to meet the allowable release rates for all storm events.

TABLE 2: PROPOSED RELEASE RATES FROM DETENTION POND

Storm Event	Allowable Discharge (ft^3/s)	Proposed Peak Discharge (ft^3/s)	Maximum Stage (ft.)
2-year	1.56	0.28	751.25
10-year	8.95	0.51	752.37
100-year	22.85	1.57	753.53

Se Appendix D for detention storage computations and ICPR data.

The Franklin Subdivision Control Ordinance requires that emergency spillways be capable of passing 1.25 times the peak discharge and peak flow velocity resulting from the 100-year return period storm from the entire contributing watershed. According to the ICPR model for the proposed conditions, the 100-year peak discharge from the contributing watershed is 36.9 ft^3/s. North American Green Software was used to determine the depth of flow over the spillway and the stability against erosion. For the 60-ft wide spillway chosen, the normal depth of flow is 0.55 ft. The spillway is stable against erosion with a factor of safety of 7.19. See Appendix D for emergency spillway computations.

BMP/Water Quality Design:

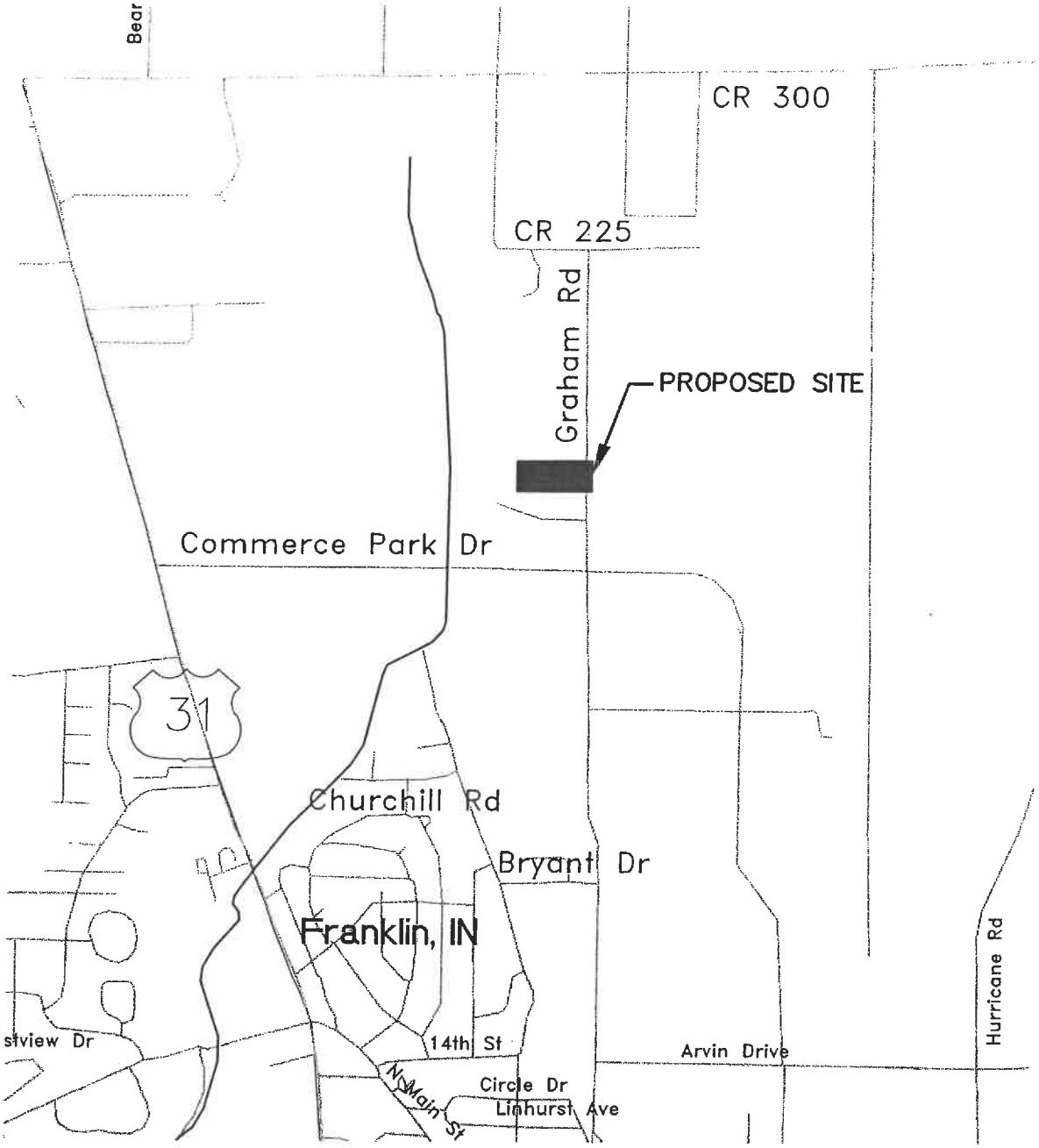
The Franklin Subdivision Control Ordinance states that the detention facility shall be designed to detain, for over 24 hours after the peak runoff from a 24-hour storm, at least 20% of the runoff from either a 1.25 inch storm or 0.50 inches of direct runoff, whichever is greater. Using the SCS Curve Number Method, it was determined that the 1.25 inch storm resulted in less than 0.5 inches of runoff. A 2.3-inch storm is needed to generate 0.5 inches of direct runoff in this particular watershed. The detention pond was modeled using ICPR to appropriately size the outlet control orifice. Using a 4-inch diameter orifice, 22% of the runoff from the 2.3–inch storm is still stored 24 hours after the peak inflow. See Appendix E for computations and ICPR results.

REFERENCES:

Design and data methods are based on the following references:

1. HERPICC County Storm Drainage Manual
2. Natural Resources Conservation Service Soil Maps
3. ICPR Computer pond routing program
4. 210-VI-TR-55, Second Ed., June 1986
5. SCS National Engineering Handbook, Section 4
6. City of Franklin Subdivision Control Ordinance
7. Indiana GIS Atlas
8. North American Green modeling software

SITE MAPS



NOT TO SCALE

AREA MAP

Johnson County Animal Shelter
Franklin, IN 46131

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February 1, 2008

S:\5k\5930\002\drainage\Area Map 5930.002.dwg

IMAGE COURTESY OF INDIANA GIS ATLAS

NOT TO SCALE

AERIAL MAP

Johnson County Animal Shelter
Franklin, IN 46131

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February 1, 2008

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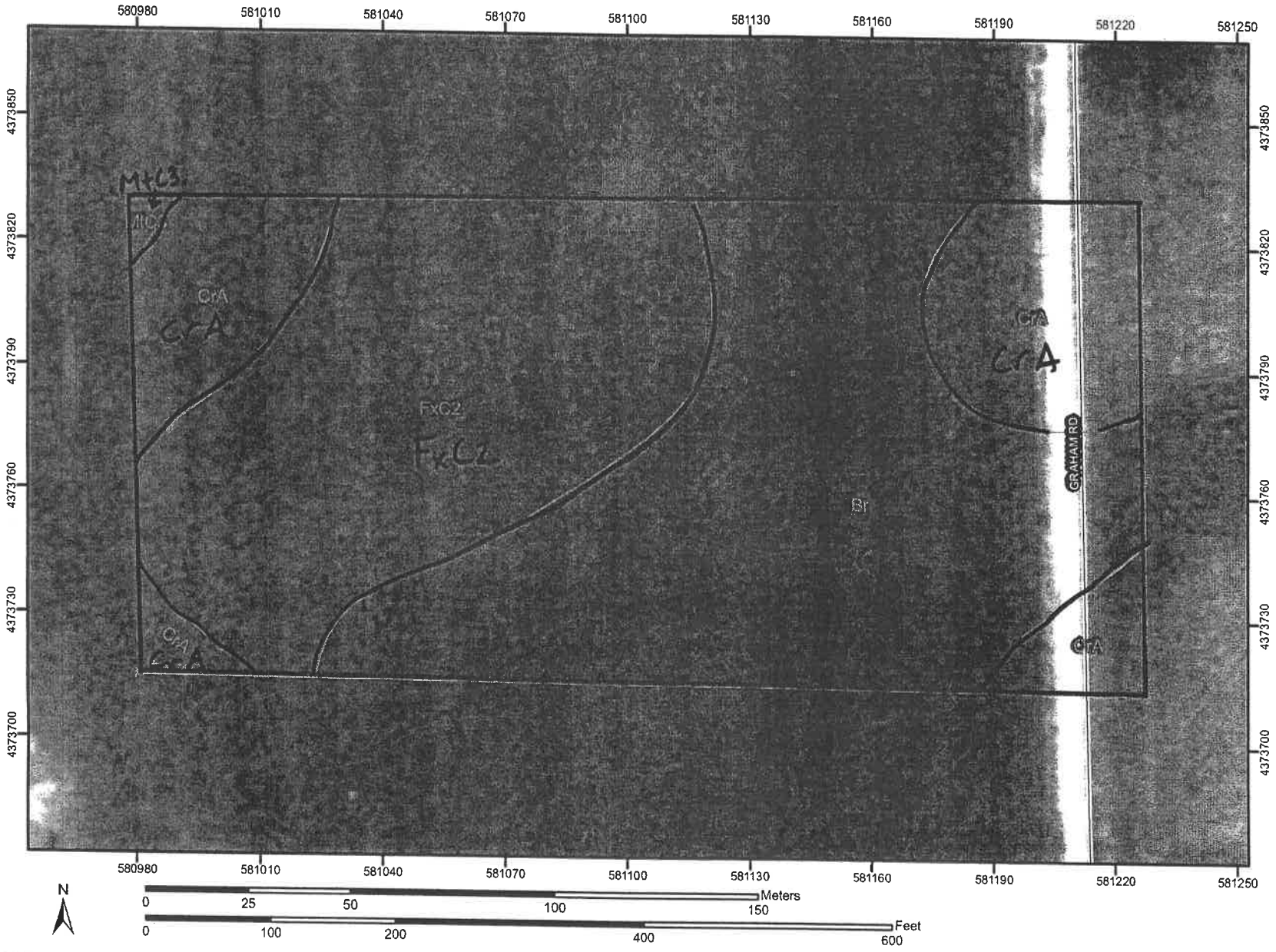
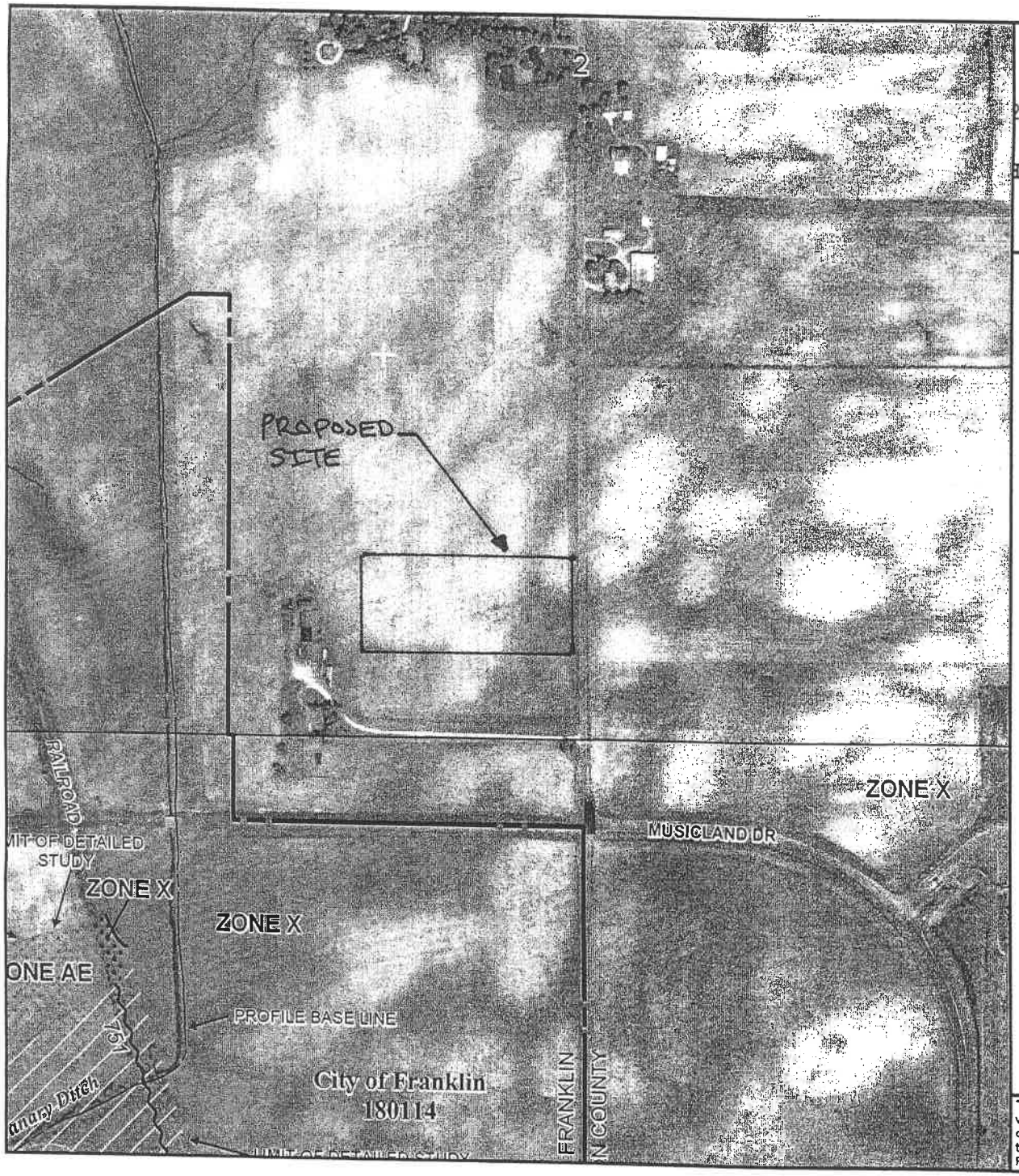
Soil Map–Johnson County, Indiana
(Johnson County Animal Shelter)



USDA Natural Resources Conservation Service

Web Soil Survey 2.0
National Cooperative Soil Survey



MAP SCALE 1 " = 500 '

250 0 500 1000 FEET

0 150 300 METE

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0143D

FIRM

FLOOD INSURANCE RATE MAP

JOHNSON COUNTY, INDIANA

AND INCORPORATED AREAS

PANEL 143 OF 352

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
FRANKLIN, CITY OF	180114	0143	D
JOHNSON COUNTY	180111	0143	D

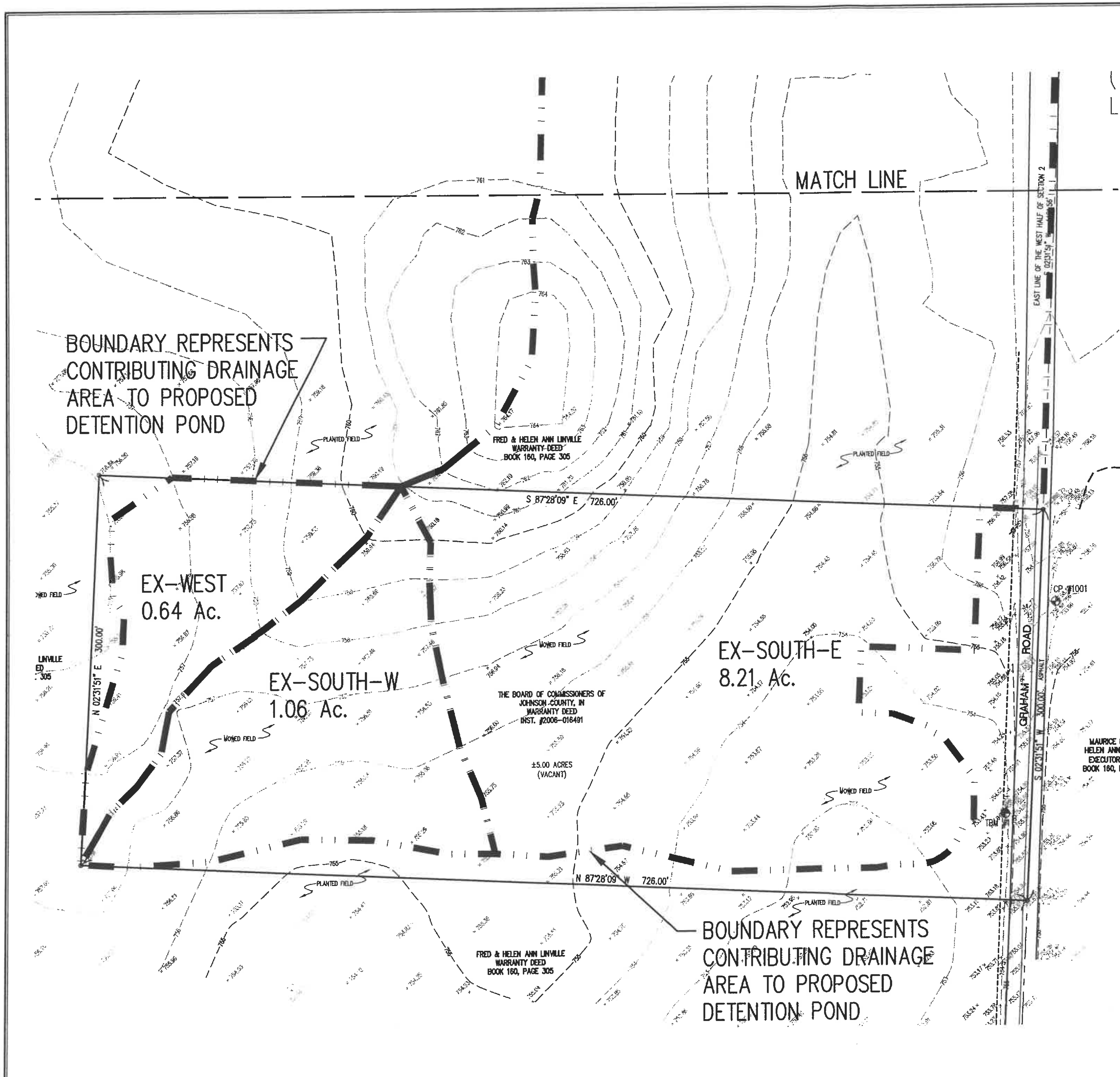
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
18081C0143D
EFFECTIVE DATE
AUGUST 2, 2007

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

EXISTING CONDITIONS



ASSUMED NORTH
SCALE: 1"=80'

80 0 40 80 160
GRAPHIC SCALE

NOTES:

1. THIS MAP IS FOR THE DELINIATION OF DRAINAGE AREAS ONLY.

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JOHNSON COUNTY
ANIMAL SHELTER
FRANKLIN, INDIANA

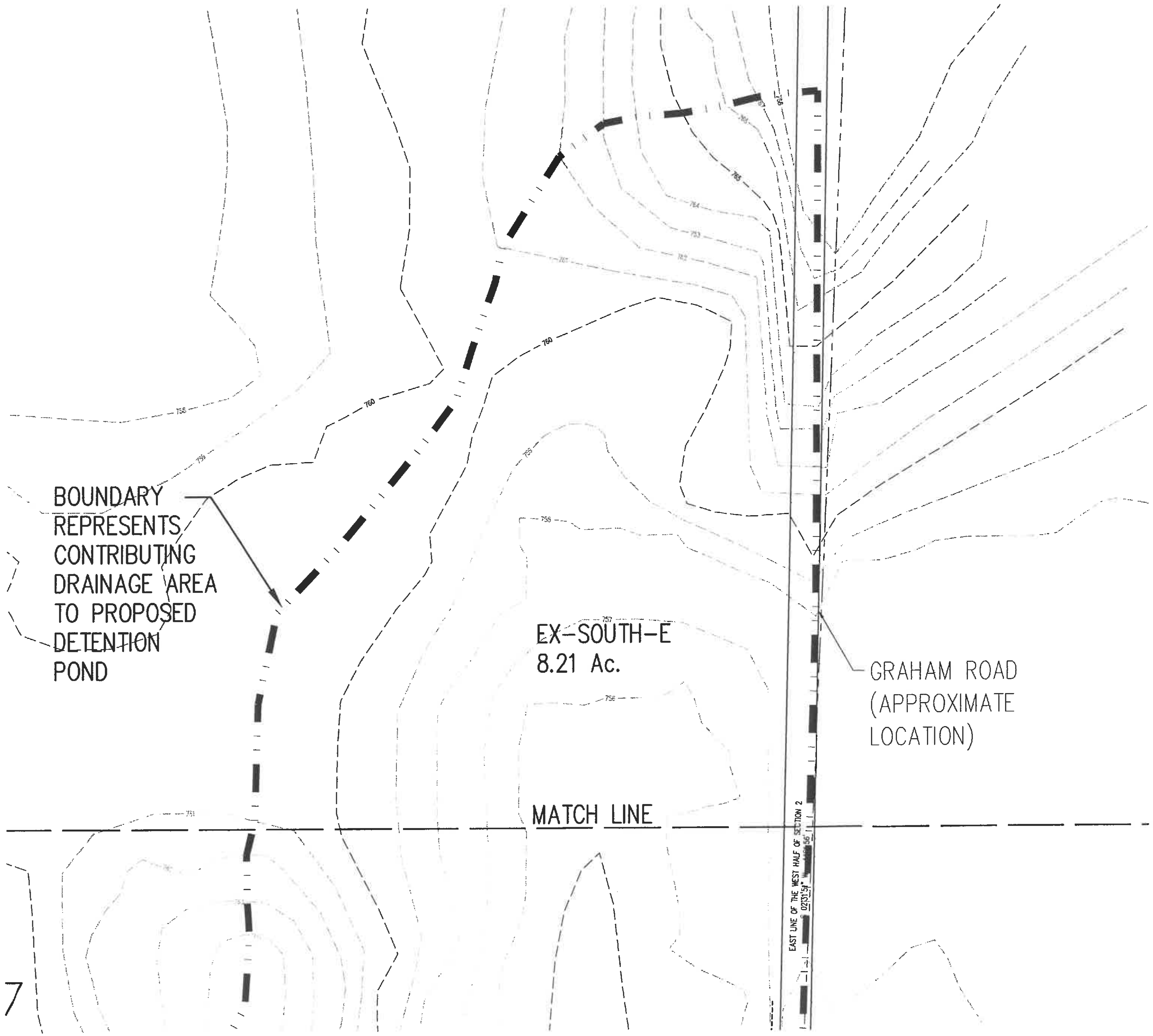
JOHNSON COUNTY COMMISSIONERS
FRANKLIN, INDIANA 46131

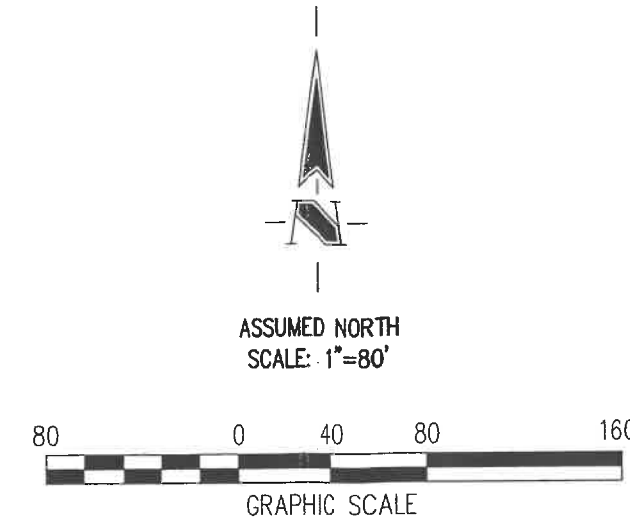
DATE: 02/12/08	PROJECT NO.: 5930.002
DRAWN BY: AJF	CHECKED BY: ALF

SHEET TITLE: EXISTING DRAINAGE BASINS

DRAWING FILES:

SHEET NO.: B1





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JOHNSON COUNTY
ANIMAL SHELTER
FRANKLIN, INDIANA

JOHNSON COUNTY COMMISSIONERS
FRANKLIN, INDIANA 46131

DATE: 02/12/08	PROJECT NO.: 5930.002
DRAWN BY: AJF	CHECKED BY: ALF
SHEET TITLE: EXISTING DRAINAGE BASINS	

SHEET NO.: B2

JOHNSON COUNTY ANIMAL SHELTER

EXISTING DRAINAGE BASINS

Basin	Soil Group % B	C	D	Cover Type & condition	Percent of this cover	CN B	C	D	
EX-WEST	85%	15%		Pasture	100%	61	74	80	63
									0
								weighted CN =	63

Basin	Soil Group % B	C	D	Cover Type & condition	Percent of this cover	CN B	C	D	
EX-SOUTH-W	100%			Pasture	100%	61	74	80	61
								weighted CN =	61

Basin	Soil Group % B	C	D	Cover Type & condition	Percent of this cover	CN B	C	D	
EX-SOUTH-E	95%	5%		Pasture	100%	61	74	80	62
									0
								weighted CN =	62

Time of Concentration Worksheet
Based on TR-55

PROJECT: Johnson County Animal Shelter
JOB #: 5930.002 *Date: 2/12/08*

Typical values for Manning's n			
Overland Flow		Channel Flow	
short grass	0.15	grass	0.03
farm, > 20% cover	0.17	concrete	0.015
dense grass	0.24	rip-rap	0.035
pavement	0.011		

2 year, 24 hour rainfall = 2.64 inches
minimum T_c = 5.00 minutes

S:\5k\5930\002\drainage\[5930.002-ST.xls]Time of Conc

Basin name	Overland flow sec. 1				Overland flow sec. 2				Shallow Concentrated Flow					Channel Flow								T_c
	Length (ft)	S %	n	T_t (min)	Length (ft)	S %	n	T_t (min)	Length (ft)	S %	Paved/Un (P or U)	Vel. (ft/s)	T_t (min)	Length (ft)	a (s.f.)	Pw (ft)	r (ft)	S %	n	Vel. (ft/s)	T_t (min)	(min)
EX-WEST	100	2.30	0.15	10					86	1.80	U	2.16	1									11
EX-SOUTH-W	100	2.70	0.15	10					157	1.30	U	1.84	1									11
EX-SOUTH-E	100	4.50	0.15	8					994	0.95	U	1.57	11									18

Hours	Minutes	Return Period - Rainfall Intensity (in/hr)					
		2	5	10	25	50	100
0.08	5	4.75	6.14	6.99	8.08	8.83	9.69
0.17	10	3.63	4.75	5.48	6.40	7.07	7.77
0.25	15	2.97	3.92	4.55	5.34	5.94	6.53
0.5	30	1.98	2.64	3.09	3.65	4.10	4.50
1	60	1.25	1.67	1.96	2.31	2.62	2.88
2	120	0.76	1.02	1.20	1.40	1.59	1.75
3	180	0.56	0.75	0.88	1.03	1.17	1.29
6	360	0.33	0.44	0.52	0.60	0.68	0.75
12	720	0.20	0.26	0.30	0.35	0.39	0.43
24	1440	0.11	0.15	0.17	0.20	0.22	0.25

Hours	Minutes	Return Period - Rainfall Depth (in)					
		2	5	10	25	50	100
0.08	5	0.40	0.51	0.58	0.67	0.74	0.81
0.17	10	0.61	0.79	0.91	1.07	1.18	1.30
0.25	15	0.74	0.98	1.14	1.34	1.49	1.63
0.5	30	0.99	1.32	1.55	1.83	2.05	2.25
1	60	1.25	1.67	1.96	2.31	2.62	2.88
2	120	1.52	2.04	2.40	2.80	3.18	3.50
3	180	1.68	2.25	2.64	3.09	3.51	3.87
6	360	1.98	2.64	3.12	3.60	4.08	4.50
12	720	2.40	3.12	3.60	4.20	4.68	5.16
24	1440	2.64	3.60	4.08	4.80	5.28	6.00

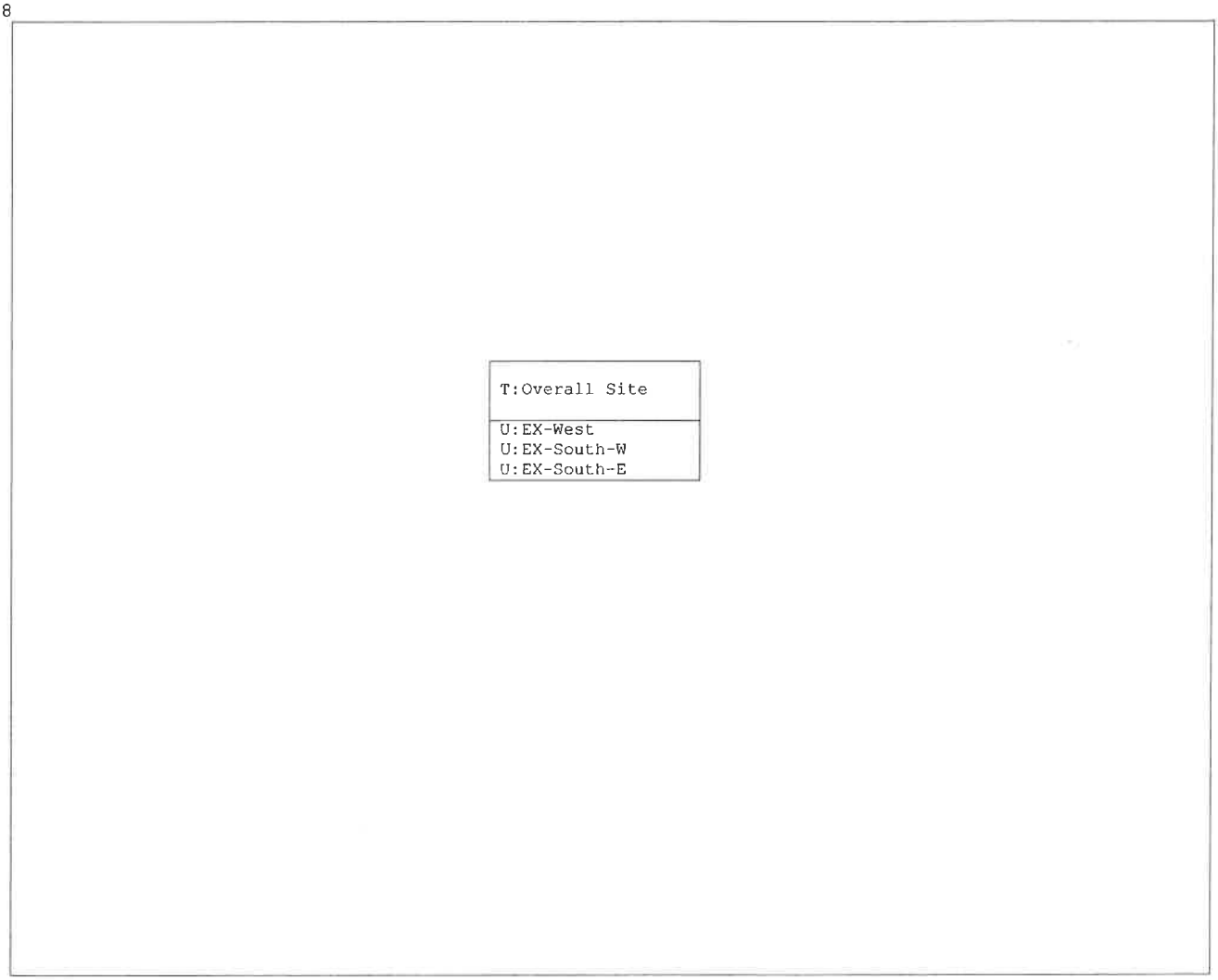
TABLE 202-2: IDF and IDD Tables for Indianapolis, IN

Johnson County Animal Shelter
Existing Conditions
July 2, 2008
REV. March 13, 2008

Nodes
A Stage/Area
V Stage/Volume
T Time/Stage
M Manhole

Basins
O Overland Flow
U SCS Unit Hydro
S Santa Barbara

Links
P Pipe
W Weir
C Channel
D Drop Structure
B Bridge
R Rating Curve
H Breach



Johnson County Animal Shelter
Existing Conditions
July 2, 2008
REV. March 13, 2008

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Overall Site	BASE	002yr-12hr	0.00	1.000	2.000	0.0000	0	6.17	1.128	0.00	0.000
Overall Site	BASE	002yr-1hr	0.00	1.000	2.000	0.0000	0	1.08	0.004	0.00	0.000
Overall Site	BASE	002yr-24hr	0.00	1.000	2.000	0.0000	0	12.17	1.558	0.00	0.000
Overall Site	BASE	002yr-2hr	0.00	1.000	2.000	0.0000	0	2.00	0.170	0.00	0.000
Overall Site	BASE	002yr-3hr	0.00	1.000	2.000	0.0000	0	2.25	0.239	0.00	0.000
Overall Site	BASE	002yr-6hr	0.00	1.000	2.000	0.0000	0	3.42	0.465	0.00	0.000
Overall Site	BASE	010yr-12hr	0.00	1.000	2.000	0.0000	0	6.17	7.462	0.00	0.000
Overall Site	BASE	010yr-1hr	0.00	1.000	2.000	0.0000	0	0.83	1.489	0.00	0.000
Overall Site	BASE	010yr-24hr	0.00	1.000	2.000	0.0000	0	12.08	8.952	0.00	0.000
Overall Site	BASE	010yr-2hr	0.00	1.000	2.000	0.0000	0	1.25	2.781	0.00	0.000
Overall Site	BASE	010yr-3hr	0.00	1.000	2.000	0.0000	0	1.75	3.622	0.00	0.000
Overall Site	BASE	010yr-6hr	0.00	1.000	2.000	0.0000	0	3.17	5.434	0.00	0.000
Overall Site	BASE	100yr-12hr	0.00	1.000	2.000	0.0000	0	6.10	20.102	0.00	0.000
Overall Site	BASE	100yr-1hr	0.00	1.000	2.000	0.0000	0	0.75	7.710	0.00	0.000
Overall Site	BASE	100yr-24hr	0.00	1.000	2.000	0.0000	0	12.08	22.845	0.00	0.000
Overall Site	BASE	100yr-2hr	0.00	1.000	2.000	0.0000	0	1.17	11.303	0.00	0.000
Overall Site	BASE	100yr-3hr	0.00	1.000	2.000	0.0000	0	1.67	13.807	0.00	0.000
Overall Site	BASE	100yr-6hr	0.00	1.000	2.000	0.0000	0	3.17	17.827	0.00	0.000

NOTED: MAXIMUM EXISTING 2-YEAR, 10-YEAR, AND 100-YEAR DISCHARGES ARE NOTED.

==========
==== Basins ====
==========

Name: EX-South-E Node: Overall Site Status: Onsite
Group: BASE Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484 Peaking Factor: 484.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 18.00
Area(ac): 8.210 Time Shift(hrs): 0.00
Curve Number: 62.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: EX-South-W Node: Overall Site Status: Onsite
Group: BASE Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484 Peaking Factor: 484.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 11.00
Area(ac): 1.060 Time Shift(hrs): 0.00
Curve Number: 61.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: EX-West Node: Overall Site Status: Onsite
Group: BASE Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484 Peaking Factor: 484.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 11.00
Area(ac): 0.640 Time Shift(hrs): 0.00
Curve Number: 63.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

==========
==== Nodes ====
==========

Name: Overall Site Base Flow(cfs): 0.000 Init Stage(ft): 1.000
Group: BASE Warn Stage(ft): 2.000
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	1.000
999.00	1.000

==========
==== Hydrology Simulations ====
==========

Name: 002yr-12hr
Filename: S:\5k\5930\002\drainage\002yr-12hr.R32

Override Defaults: Yes
Storm Duration(hrs): 12.00
Rainfall File: Scsii-24
Rainfall Amount(in): 2.40

Time(hrs) Print Inc(min)

24.000	5.00

Name: 002yr-1hr
Filename: S:\5k\5930\002\drainage\002yr-1hr.R32

Override Defaults: Yes
Storm Duration(hrs): 1.00
Rainfall File: Scsii-24
Rainfall Amount(in): 1.25

Time(hrs)	Print Inc(min)
2.000	5.00

Name: 002yr-24hr
Filename: S:\5k\5930\002\drainage\002yr-24hr.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scsii-24
Rainfall Amount(in): 2.64

Time(hrs)	Print Inc(min)
48.000	5.00

Name: 002yr-2hr
Filename: S:\5k\5930\002\drainage\002yr-2hr.R32

Override Defaults: Yes
Storm Duration(hrs): 2.00
Rainfall File: Scsii-24
Rainfall Amount(in): 1.52

Time(hrs)	Print Inc(min)
4.000	5.00

Name: 002yr-3hr
Filename: S:\5k\5930\002\drainage\002yr-3hr.R32

Override Defaults: Yes
Storm Duration(hrs): 3.00
Rainfall File: Scsii-24
Rainfall Amount(in): 1.68

Time(hrs)	Print Inc(min)
6.000	5.00

Name: 002yr-6hr
Filename: S:\5k\5930\002\drainage\002yr-6hr.R32

Override Defaults: Yes
Storm Duration(hrs): 6.00
Rainfall File: Scsii-24
Rainfall Amount(in): 1.98

Time(hrs)	Print Inc(min)
12.000	5.00

Name: 010yr-12hr
Filename: S:\5k\5930\002\drainage\010yr-12hr.R32

```
      Override Defaults: Yes
    Storm Duration(hrs): 12.00
          Rainfall File: Scsii-24
    Rainfall Amount(in): 3.60

Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          5.00

-------------------------------------------------------------------------------------------------------
         Name: 010yr-1hr
     Filename: S:\5k\5930\002\drainage\010yr-1hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 1.00
          Rainfall File: Scsii-24
    Rainfall Amount(in): 1.96

Time(hrs)       Print Inc(min)
--------------- ---------------
2.000           5.00

-------------------------------------------------------------------------------------------------------
         Name: 010yr-24hr
     Filename: S:\5k\5930\002\drainage\010yr-24hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Scsii-24
    Rainfall Amount(in): 4.08

Time(hrs)       Print Inc(min)
--------------- ---------------
48.000          5.00

-------------------------------------------------------------------------------------------------------
         Name: 010yr-2hr
     Filename: S:\5k\5930\002\drainage\010yr-2hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 2.00
          Rainfall File: Scsii-24
    Rainfall Amount(in): 2.40

Time(hrs)       Print Inc(min)
--------------- ---------------
4.000           5.00

-------------------------------------------------------------------------------------------------------
         Name: 010yr-3hr
     Filename: S:\5k\5930\002\drainage\010yr-3hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 3.00
          Rainfall File: Scsii-24
    Rainfall Amount(in): 2.64

Time(hrs)       Print Inc(min)
--------------- ---------------
6.000           5.00

-------------------------------------------------------------------------------------------------------
         Name: 010yr-6hr
     Filename: S:\5k\5930\002\drainage\010yr-6hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 6.00
          Rainfall File: Scsii-24
    Rainfall Amount(in): 3.12
```

Time(hrs)	Print Inc(min)
12.000	5.00

Name: 100yr-12hr
Filename: S:\5k\5930\002\drainage\100yr-12hr.R32

Override Defaults: Yes
Storm Duration(hrs): 12.00
Rainfall File: Scsii-24
Rainfall Amount(in): 5.16

Time(hrs)	Print Inc(min)
24.000	5.00

Name: 100yr-1hr
Filename: S:\5k\5930\002\drainage\100yr-1hr.R32

Override Defaults: Yes
Storm Duration(hrs): 1.00
Rainfall File: Scsii-24
Rainfall Amount(in): 2.88

Time(hrs)	Print Inc(min)
2.000	5.00

Name: 100yr-24hr
Filename: S:\5k\5930\002\drainage\100yr-24hr.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scsii-24
Rainfall Amount(in): 6.00

Time(hrs)	Print Inc(min)
48.000	5.00

Name: 100yr-2hr
Filename: S:\5k\5930\002\drainage\100yr-2hr.R32

Override Defaults: Yes
Storm Duration(hrs): 2.00
Rainfall File: Scsii-24
Rainfall Amount(in): 3.50

Time(hrs)	Print Inc(min)
4.000	5.00

Name: 100yr-3hr
Filename: S:\5k\5930\002\drainage\100yr-3hr.R32

Override Defaults: Yes
Storm Duration(hrs): 3.00
Rainfall File: Scsii-24
Rainfall Amount(in): 3.87

Time(hrs)	Print Inc(min)
6.000	5.00

Name: 100yr-6hr

```
     Filename: S:\5k\5930\002\drainage\100yr-6hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 6.00
          Rainfall File: Scsii-24
   Rainfall Amount(in): 4.50

Time(hrs)       Print Inc(min)
--------------- ---------------
12.000          5.00

================================================================================
==== Routing Simulations ======================================================
================================================================================

         Name: 002yr-12hr          Hydrology Sim: 002yr-12hr
     Filename: S:\5k\5930\002\drainage\002yr-12hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 24.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          5.000

Group           Run
--------------- -----
BASE            Yes

--------------------------------------------------------------------------------
         Name: 002yr-1hr           Hydrology Sim: 002yr-1hr
     Filename: S:\5k\5930\002\drainage\002yr-1hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 2.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
2.000           5.000

Group           Run
--------------- -----
BASE            Yes

--------------------------------------------------------------------------------
         Name: 002yr-24hr          Hydrology Sim: 002yr-24hr
     Filename: S:\5k\5930\002\drainage\002yr-24hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
```

```
        Start Time(hrs): 0.000                    End Time(hrs): 48.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
48.000          5.000

Group           Run
--------------- -----
BASE            Yes

-------------------------------------------------------------------------------------------------------
         Name: 002yr-2hr           Hydrology Sim: 002yr-2hr
     Filename: S:\5k\5930\002\drainage\002yr-2hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 4.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
4.000           5.000

Group           Run
--------------- -----
BASE            Yes

-------------------------------------------------------------------------------------------------------
         Name: 002yr-3hr           Hydrology Sim: 002yr-3hr
     Filename: S:\5k\5930\002\drainage\002yr-3hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 6.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
6.000           5.000

Group           Run
--------------- -----
BASE            Yes

-------------------------------------------------------------------------------------------------------
         Name: 002yr-6hr           Hydrology Sim: 002yr-6hr
     Filename: S:\5k\5930\002\drainage\002yr-6hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
```

```
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                  End Time(hrs): 12.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                        Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
12.000          5.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------------
         Name: 010yr-12hr          Hydrology Sim: 010yr-12hr
     Filename: S:\5k\5930\002\drainage\010yr-12hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                  End Time(hrs): 24.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                        Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          5.000

Group           Run
--------------- -----
BASE            Yes

-------------------------------------------------------------------------------------------------------
         Name: 010yr-1hr           Hydrology Sim: 010yr-1hr
     Filename: S:\5k\5930\002\drainage\010yr-1hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                  End Time(hrs): 2.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                        Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
2.000           5.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------------
         Name: 010yr-24hr          Hydrology Sim: 010yr-24hr
     Filename: S:\5k\5930\002\drainage\010yr-24hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No
```

```
       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 48.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
48.000          5.000

Group           Run
--------------- -----
BASE            Yes

-------------------------------------------------------------------------------------------------------
        Name: 010yr-2hr           Hydrology Sim: 010yr-2hr
    Filename: S:\5k\5930\002\drainage\010yr-2hr.I32

     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 4.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
4.000           5.000

Group           Run
--------------- -----
BASE            Yes

-------------------------------------------------------------------------------------------------------
        Name: 010yr-3hr           Hydrology Sim: 010yr-3hr
    Filename: S:\5k\5930\002\drainage\010yr-3hr.I32

     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 6.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
6.000           5.000

Group           Run
--------------- -----
BASE            Yes

-------------------------------------------------------------------------------------------------------
        Name: 010yr-6hr           Hydrology Sim: 010yr-6hr
    Filename: S:\5k\5930\002\drainage\010yr-6hr.I32

     Execute: Yes         Restart: No            Patch: No
 Alternative: No
```

```
       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 12.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
12.000          5.000

Group           Run
--------------- -----
BASE            Yes
```

```
        Name: 100yr-12hr          Hydrology Sim: 100yr-12hr
    Filename: S:\5k\5930\002\drainage\100yr-12hr.I32

     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 24.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          5.000

Group           Run
--------------- -----
BASE            Yes
```

```
        Name: 100yr-1hr           Hydrology Sim: 100yr-1hr
    Filename: S:\5k\5930\002\drainage\100yr-1hr.I32

     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 2.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
2.000           5.000

Group           Run
--------------- -----
BASE            Yes
```

```
        Name: 100yr-24hr          Hydrology Sim: 100yr-24hr
    Filename: S:\5k\5930\002\drainage\100yr-24hr.I32

     Execute: Yes         Restart: No            Patch: No
```

Alternative: No

Max Delta Z(ft):	1.00	Delta Z Factor:	0.00500
Time Step Optimizer:	10.000		
Start Time(hrs):	0.000	End Time(hrs):	48.00
Min Calc Time(sec):	0.5000	Max Calc Time(sec):	60.0000
Boundary Stages:		Boundary Flows:	

Time(hrs)	Print Inc(min)
48.000	5.000

Group	Run
BASE	Yes

Name: 100yr-2hr Hydrology Sim: 100yr-2hr
Filename: S:\5k\5930\002\drainage\100yr-2hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft):	1.00	Delta Z Factor:	0.00500
Time Step Optimizer:	10.000		
Start Time(hrs):	0.000	End Time(hrs):	4.00
Min Calc Time(sec):	0.5000	Max Calc Time(sec):	60.0000
Boundary Stages:		Boundary Flows:	

Time(hrs)	Print Inc(min)
4.000	5.000

Group	Run
BASE	Yes

Name: 100yr-3hr Hydrology Sim: 100yr-3hr
Filename: S:\5k\5930\002\drainage\100yr-3hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft):	1.00	Delta Z Factor:	0.00500
Time Step Optimizer:	10.000		
Start Time(hrs):	0.000	End Time(hrs):	6.00
Min Calc Time(sec):	0.5000	Max Calc Time(sec):	60.0000
Boundary Stages:		Boundary Flows:	

Time(hrs)	Print Inc(min)
6.000	5.000

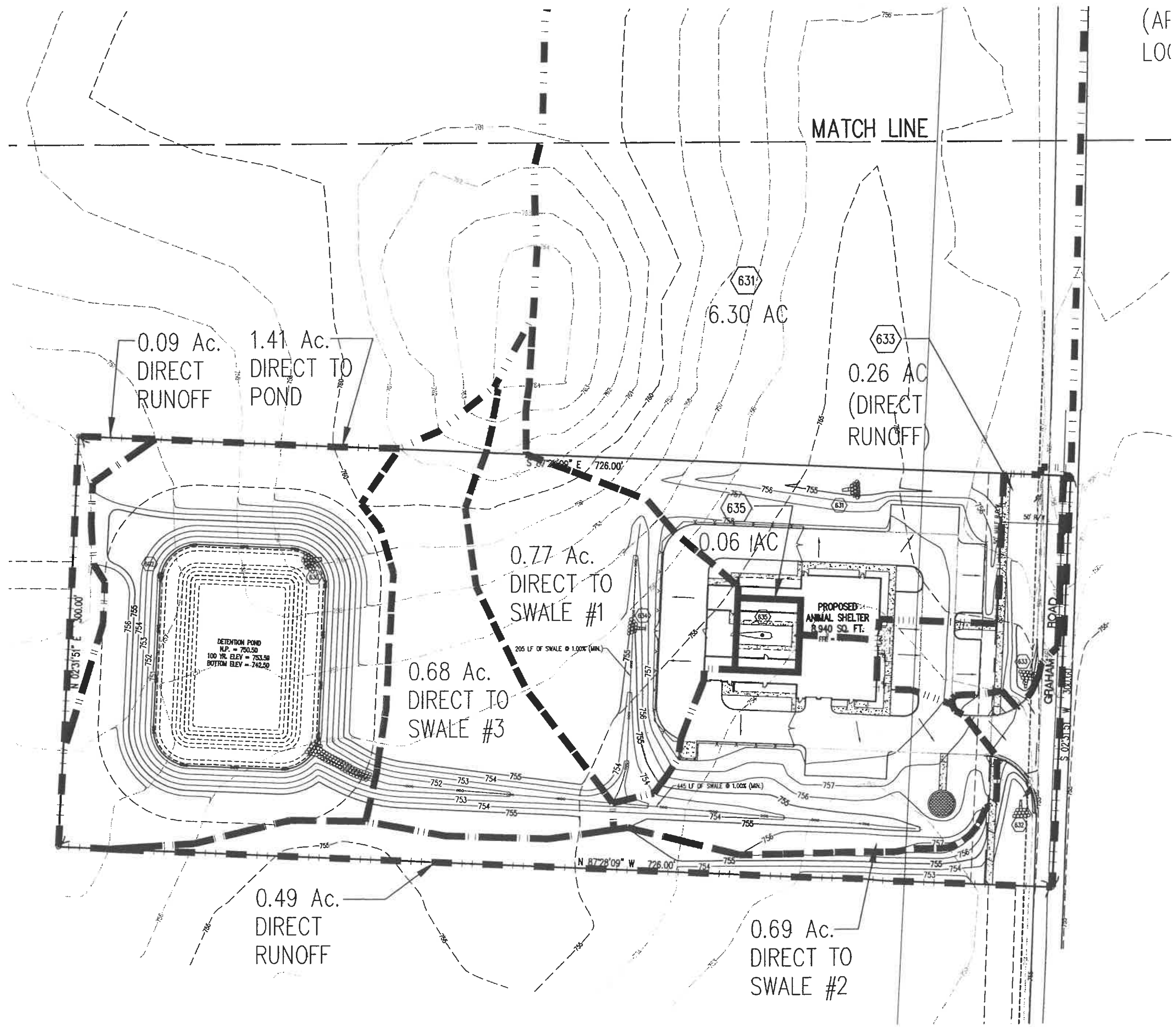
Group	Run
BASE	Yes

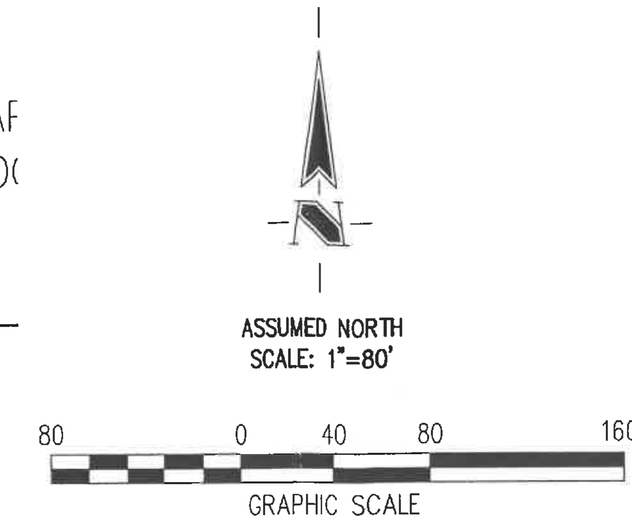
Name: 100yr-6hr Hydrology Sim: 100yr-6hr
Filename: S:\5k\5930\002\drainage\100yr-6hr.I32

```
     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
   Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 12.00
    Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
       Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
12.000          5.000

Group           Run
--------------- -----
BASE            Yes

================================================================================
==== Boundary Conditions ======================================================
================================================================================
```

PROPOSED CONDITIONS – STORM SEWER DESIGN

APPENDIX C





NOTES:

1. THIS MAP IS FOR THE DELINIATION OF DRAINAGE AREAS ONLY.
2. TOPOGRAPHIC INFOMRATION BEYOND THE SCOPE OF SCHNEIDER'S SURVEY IS SHOWN PER JOHNSON COUNTY'S GIS WEBSITE. THE SCHNEIDER CORPORATION IS NOT LIABLE FOR THE ACCURACY OF THIS INFORMATION AS IT PERTAINS TO ACUTAL SITE CONDITIONS.
3. TOTAL CONTRIBUTING DRAINAGE AREA TO THE POND IS 9.91 ACRES.

REVISIONS:
1. REVISED PER REVIEW COMMENTS FROM THE CITY OF FRANKLIN - AJF - 031308

DATE:

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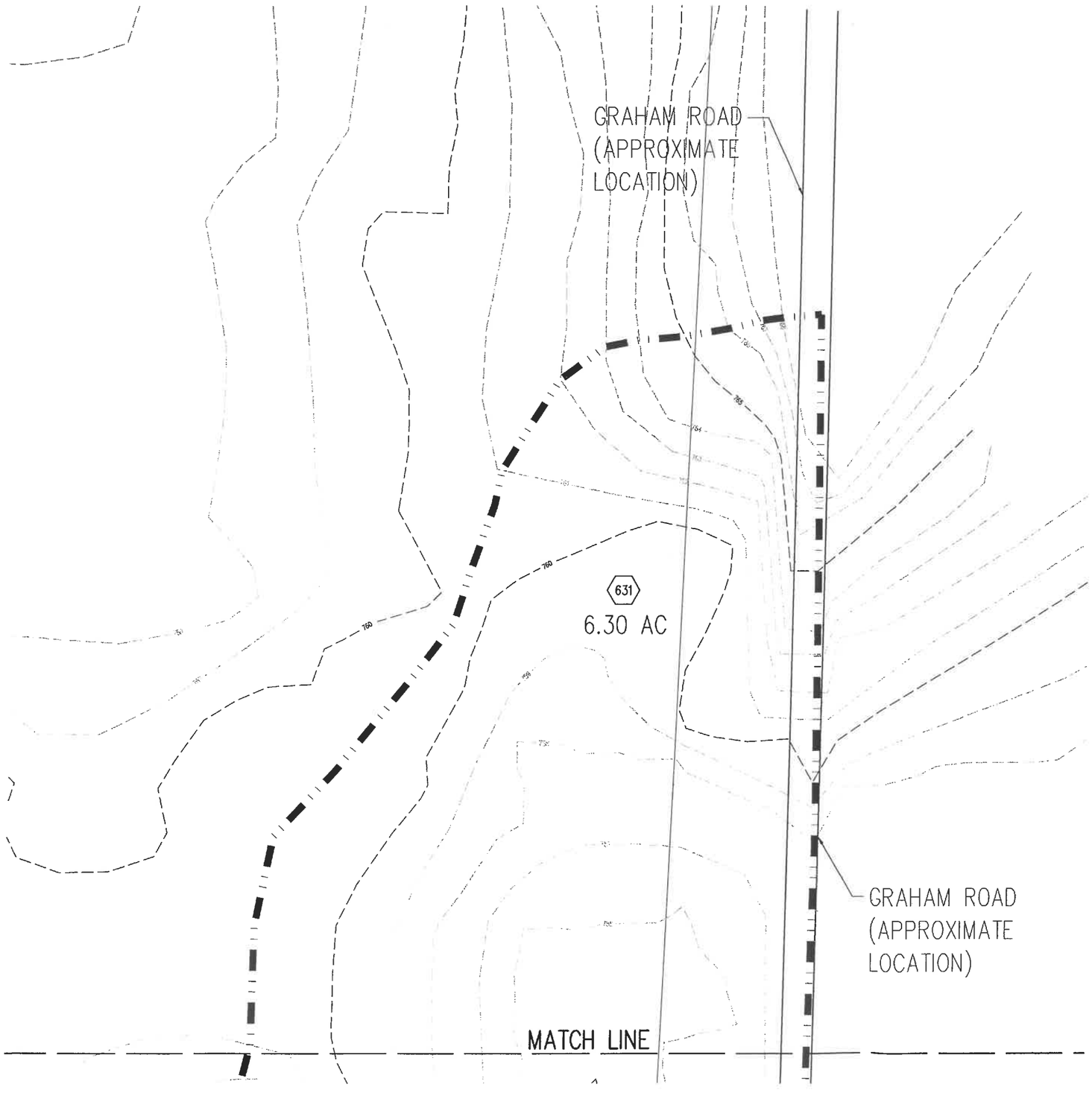
Landscape Architecture
Transportation Engineering

JOHNSON COUNTY ANIMAL SHELTER
FRANKLIN, INDIANA

JOHNSON COUNTY COMMISSIONERS
FRANKLIN, INDIANA 46131

DATE: 02/12/08	PROJECT NO.: 5930.002
DRAWN BY: AJF	CHECKED BY: ALF
SHEET TITLE: PROPOSED DRAINAGE BASINS	
SHEET NO.: B3	



ASSUMED NORTH
SCALE: 1"=80'

80 0 40 80 160

GRAPHIC SCALE

NOTES:

1. THIS MAP IS FOR THE DELINIATION OF DRAINAGE AREAS ONLY.
2. TOPOGRAPHIC INFOMRATION BEYOND THE SCOPE OF SCHNEIDER'S SURVEY IS SHOWN PER JOHNSON COUNTY'S GIS WEBSITE. THE SCHNEIDER CORPORATION IS NOT LIABLE FOR THE ACCURACY OF THIS INFORMATION AS IT PERTAINS TO ACUTAL SITE CONDITIONS.
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JOHNSON COUNTY ANIMAL SHELTER
FRANKLIN, INDIANA

JOHNSON COUNTY COMMISSIONERS
FRANKLIN, INDIANA 46131

DATE: 02/12/08	PROJECT NO.: 5930.002
DRAWN BY: ALF	CHECKED BY: ALF

SHEET TITLE:
PROPOSED DRAINAGE BASINS

SHEET NO.:
B4

JOHNSON COUNTY ANIMAL SHELTER

PROPOSED DRAINAGE BASINS

Basin	Cover Type & condition	Percent of this cover	c
631	Cultivated Land	95%	0.30
	Impervious	5%	0.90
			0.33

Basin	Cover Type & condition	Percent of this cover	c
633	Grass/Lawn	45%	0.30
	Impervious	55%	0.90
			0.63

Basin	Cover Type & condition	Percent of this cover	c
635	Impervious	100%	0.90
			0.90

Time of Concentration Worksheet

Based on TR-55

PROJECT: Johnson County Animal Shelter

JOB #: 5930.002 *Date: 7/3/08*

Typical values for Manning's n			
Overland Flow		Channel Flow	
short grass	0.15	grass	0.03
farm, > 20% cover	0.17	concrete	0.015
dense grass	0.24	rip-rap	0.035
pavement	0.011		

2 year, 24 hour rainfall = 2.64 inches

minimum T_c = 5.00 minutes

S:\5k\5930\002\drainage\[5930.002-ST.xls]Time of Conc

Basin name	Overland flow seg. 1 Length (ft)	S %	n	T_t (min)	Overland flow seg. 2 Length (ft)	S %	n	T_t (min)	Shallow Concentrated Flow Length (ft)	S %	Paved/Un (P or U)	Vel. (ft/s)	T_t (min)	Channel Flow Length (ft)	a (s.f.)	Pw (ft)	r (ft)	S %	n	Vel. (ft/s)	T_t (min)	T_c (min)
631	100	4.50	0.15	8					694	1.20	U	1.77	7									**14**
633	1	1.00	0.15	0																		**5**
635	1	1.00	0.15	0																		**5**
SWALE	100	4.30	0.15	8					183	2.30	U	2.45	1									**9**
DIRECT	1	4.30	0.15	0																		**5**

STORM SEWER DESIGN CALCULATIONS
-RATIONAL METHOD-

PROJECT:	*Johnson County Animal Shelter*	*STORM:*	*10 Year*
JOB #:	*5930.002*	*COMPUTED BY:*	*AJF*
DATE:	*7/3/08*	*SHEET NO.:*	

S:\5k\5930\002\drainage\[5930.002-ST.xls]Rational

STRUCTURE		BASINS							COMPOSITE BASINS				TRAVEL
FROM	TO	BASIN #	c	A (acres)	c*A	Tc (min)	I (in/hr)	Q (cfs)	SUM (c*A)	Tc (min)	I (in/hr)	Q (cfs)	TIME (min)
631	630	631	0.33	6.30	2.08	14	4.71	9.78	2.08	14	4.71	9.78	2.18
633	632	633	0.63	0.26	0.16	5	6.98	1.14	0.16	5	6.98	1.14	1.91
635	634	635	0.90	0.06	0.05	5	6.98	0.38	0.05	5	6.98	0.38	0.00
602	601	602	0.00	0.00	0.00	0	0.00	0.00	0.00	0	9.93	1.60	1.91
601	600	601	0.00	0.00	0.00	0	0.00	0.00	0.00	2	8.46	1.60	2.22

STORM SEWER DESIGN CALCULATIONS
-PIPE DESIGN-

PROJECT:	*Johnson County Animal Shelter*	*STORM:*	*10*
JOB #:	*5930.002*	*COMPUTED BY:*	*AJF*
DATE:	*7/3/08*	*SHEET NO.:*	

S:\5k\5930\002\drainage\[5930.002-ST.xls]Pipe Design

STRUCTURE FROM	STRUCTURE TO	DESIGN Q (cfs)	L (ft)	DIA. (in)	SLOPE %	CAP. Q (cfs)	CAP. VEL. (ft/s)	RIM ELEV. UP	RIM ELEV. DOWN	INVERT ELEV. UP	INVERT ELEV. DOWN	COVER (ft) UP	COVER (ft) DOWN
631	630	9.78	392	18	0.99	10.54	5.96	N/A	N/A	754.40	750.50		#VALUE!
633	632	1.14	90	12	0.33	2.06	2.62	N/A	N/A	753.60	753.30		#VALUE!
635	634	0.38	90	6	1.00	0.56	2.87	758.80	N/A	755.90	755.00		#VALUE!
602	601	1.60	344	12	0.50	2.53	3.23	753.59	751.95	750.50	748.78	1.92	2.00
601	600	1.60	400	12	0.30	1.96	2.50	751.95	N/A	748.68	747.48	2.10	#VALUE!

SCHNEIDER ENG.
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNING

Date _____

Sheet of

JOHNSON CO. ANIMAL SHELTER
SWALE CAPACITY CALCULATIONS
JULY 3, 2008
NOTE: REFER TO BASINS MAP "B3" FOR BASIN DELINIATION; ALSO REFER TO NORTH AMERICAN GREEN MODELS THAT FOLLOW

- SWALE #1 - WEST OF ANIMAL SHELTER

$A = 0.77\,AC + 0.06\,AC = 0.83\,AC$

$$C = \frac{(0.18\,AC)(0.9) + (0.65\,AC)(0.3)}{0.83\,AC} = 0.43$$

$t_c = 10$ min (assumed) $\rightarrow i_{10} = 5.48$ in/hr

$Q_{10} = CiA = (0.43)(5.48)(0.83) = 1.96\ ft^3/s$
$Q_{10} = 1.96\ ft^3/s$

- SWALE #2 - SOUTH OF ANIMAL SHELTER

$A = 0.64\,AC$

$$C = \frac{(0.30\,AC)(0.9) + (0.39\,AC)(0.3)}{0.69\,AC} = 0.56$$

$t_c = 5$ min (assumed) $\rightarrow i_{10} = 6.98$ in/hr

$Q_{10} = CiA = (0.56)(6.98)(0.69) = 2.70\ ft^3/s$
$Q_{10} = 2.70\ ft^3/s$

- SWALE #3 - CONFLUENCE OF SWALE #1 AND SWALE #2

$A = 0.68\,AC + 0.77\,AC + 0.69\,AC + 0.06\,AC = 2.20\,AC$

$$C = \frac{(0.48)(0.9) + (1.72)(0.3)}{2.20} = 0.43$$

$t_c = 12$ min (assumed) $\rightarrow i = 5.06$ in/hr

$Q_{10} = CiA = (0.43)(5.06)(2.20) = 4.79\ ft^3/s$
$Q_{10} = 4.79\ ft^3/s$

Job # _____

SWALE CAPACITY CALCULATIONS
SWALE #1

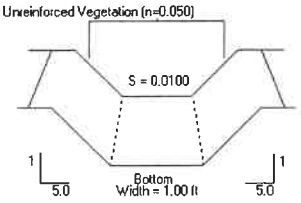
North American Green - ECMDS Version 4.3 | 7/3/2008 | 04:05 PM | COMPUTED BY: AJF

PROJECT NAME: Johnson County Animal Shelter | PROJECT NO.: 5930.002

FROM STATION/REACH: | TO STATION/REACH: | DRAINAGE AREA: | DESIGN FREQUENCY:

HYDRAULIC RESULTS

Discharge (cfs)	Peak Flow Period (hrs)	Velocity (fps)	Area (sq.ft)	Hydraulic Radius(ft)	Normal Depth (ft)
2.0	1.0	1.25	1.60	0.27	0.47



Not to Scale

LINER RESULTS

Reach	Matting Type / Staple Pattern	Stability Analysis	Vegetation Characteristics: Phase	Class	Type	Density	Permissible Shear Stress (psf)	Calculated Shear Stress (psf)	Safety Factor	Remarks
Straight	Unreinforced	Vegetation		D	Sod	50-75%	3.33	0.30	11.26	STABLE
		Soil	Silt Loam				0.035	0.009	4.05	STABLE

$Q_{10} = 1.96\ ft^3/s$

Normal Depth = 0.47 ft

TOP OF BANK ≥ ____ ft higher than flowline

∴ SWALE HAS ADEQUATE CAPACITY

Back to Input Screen

SWALE CAPACITY CALCULATIONS
SWALE #2

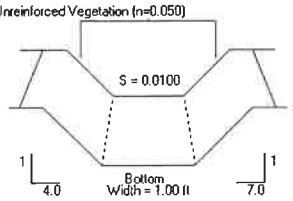
North American Green - ECMDS Version 4.3 | 7/3/2008 | 04:09 PM | COMPUTED BY: AJF

PROJECT NAME: Johnson County Animal Shelter | PROJECT NO.: 5930.002

FROM STATION/REACH: | TO STATION/REACH: | DRAINAGE AREA: | DESIGN FREQUENCY:

HYDRAULIC RESULTS

Discharge (cfs)	Peak Flow Period (hrs)	Velocity (fps)	Area (sq.ft)	Hydraulic Radius(ft)	Normal Depth (ft)
2.7	1.0	1.32	2.04	0.30	0.53



Not to Scale

LINER RESULTS

Reach	Matting Type / Staple Pattern	Stability Analysis	Vegetation Characteristics: Phase	Class	Type	Density	Permissible Shear Stress (psf)	Calculated Shear Stress (psf)	Safety Factor	Remarks
Straight	Unreinforced	Vegetation		D	Sod	50-75%	3.33	0.33	10.16	STABLE
		Soil	Silt Loam				0.035	0.010	3.66	STABLE

$Q_{10} = 2.70 \text{ ft}^3/\text{s}$

Normal Depth = 0.53 ft

Top of bank ≈ 1.5 ft higher than flowline.

∴ Swale has adequate capacity.

Back to Input Screen

SWALE CAPACITY CALCULATIONS
SWALE #3

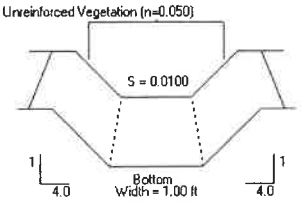
North American Green - ECMDS Version 4.3 | 7/3/2008 | 04:13 PM | COMPUTED BY: AJF

PROJECT NAME: Johnson County Animal Shelter | PROJECT NO.: 5930.002

FROM STATION/REACH: | TO STATION/REACH: | DRAINAGE AREA: | DESIGN FREQUENCY:

HYDRAULIC RESULTS

Discharge (cfs)	Peak Flow Period (hrs)	Velocity (fps)	Area (sq.ft)	Hydraulic Radius(ft)	Normal Depth (ft)
4.8	1.0	1.64	2.92	0.41	0.74



Not to Scale

LINER RESULTS

Reach	Matting Type / Staple Pattern	Stability Analysis	Vegetation Characteristics: Phase	Class	Type	Density	Permissible Shear Stress (psf)	Calculated Shear Stress (psf)	Safety Factor	Remarks
Straight	Unreinforced	Vegetation		D	Sod	50-75%	3.33	0.46	7.23	STABLE
		Soil	Silt Loam				0.035	0.013	2.60	STABLE

$Q_{10} = 4.79\ ft^3/s$

NORMAL DEPTH = 0.74 ft

TOP OF BANK ≈ 3.5ft above flowline

∴ SWALE HAS ADEQUATE CAPACITY

Back to Input Screen

PROPOSED CONDITIONS – DETENTION DESIGN

JOHNSON COUNTY ANIMAL SHELTER

OVERALL PROPOSED SITE -- DETENTION DESIGN

Basin	Area (Ac.)	Soil Group % B	C	D	Cover Type & condition	Percent of this cover	CN B	C	D	
631	6.30	95%	5%		Cultivated Field	85%	71	78	81	71
		90%	10%		Impervious	10%	98	98	98	98
		90%	10%		Grassed/Landscaped	5%	61	74	80	62
									weighted CN =	74

Basin	Area (Ac.)	Soil Group % B	C	D	Cover Type & condition	Percent of this cover	CN B	C	D	
Swale	2.21	100%	0%		Cultivated Field	5%	71	78	81	71
		100%	0%		Impervious	25%	98	98	98	98
		100%	0%		Grassed/Landscaped	70%	61	74	80	61
									weighted CN =	71

Basin	Area (Ac.)	Soil Group % B	C	D	Cover Type & condition	Percent of this cover	CN B	C	D	
Direct	1.41	90%	10%		Cultivated Field	0%	71	78	81	72
		90%	10%		Impervious	45%	98	98	98	98
		90%	10%		Grassed/Landscaped	55%	61	74	80	62
									weighted CN =	78

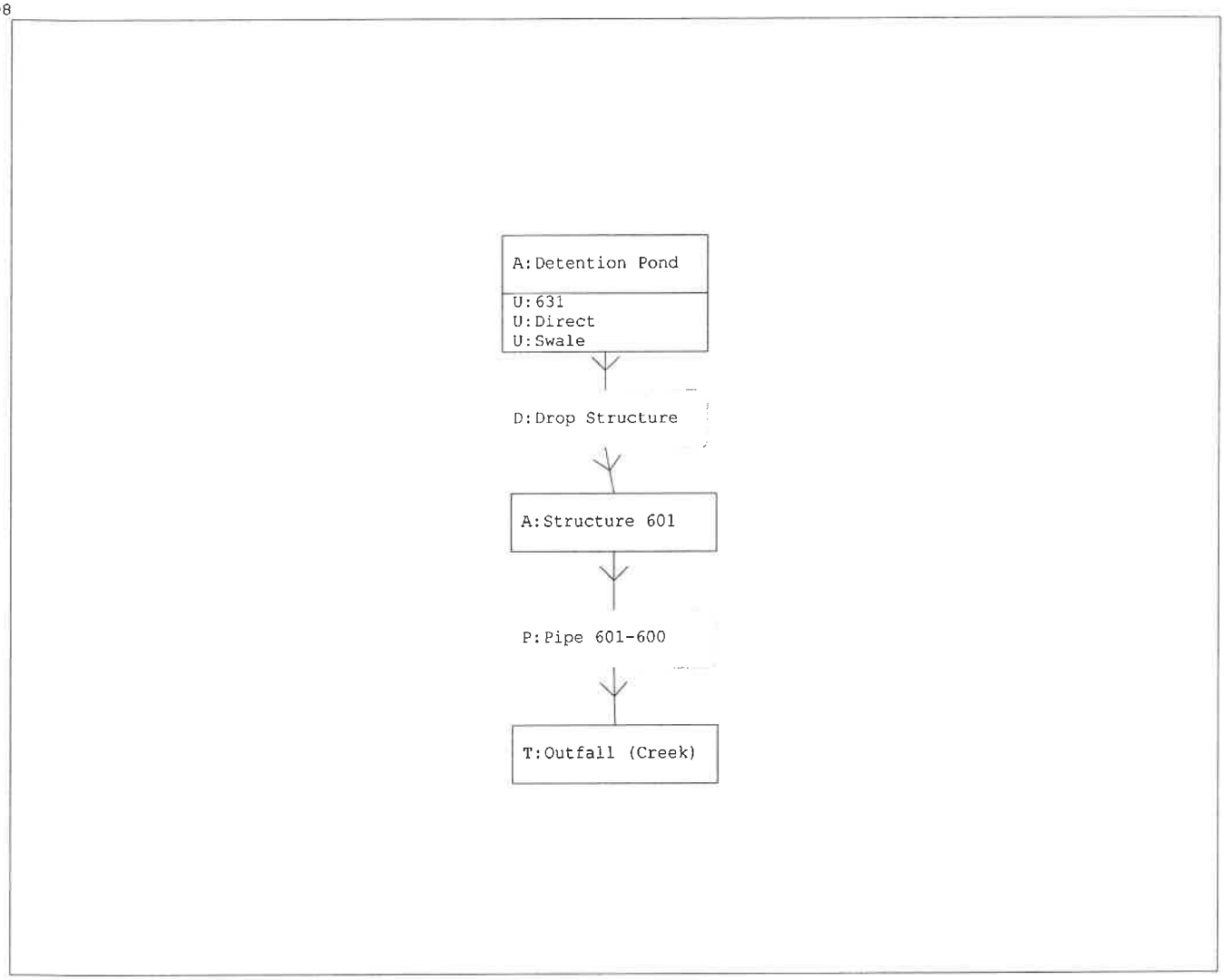
NOTE: The pond receives runoff from three (3) sources. The basins above represent these three sources.
**Basin 631 represents runoff received via pipe 631-630. The time of concentration for this basin is the addition of the travel time to Structure 631 and the travel time to the pond in the pipe.*
**Basin "Swale" represents runoff received via the swale that discharges at the southeast corner of the pond.*
**Basin "Direct" represents runoff that enters the pond directly by sheet flow.*
Please refer to Basins Maps B3 and B4.

Johnson County Animal Shelter
Proposed Conditions
July 3, 2008
REV. March 13, 2008

Nodes
A Stage/Area
V Stage/Volume
T Time/Stage
M Manhole

Basins
O Overland Flow
U SCS Unit Hydro
S Santa Barbara

Links
P Pipe
W Weir
C Channel
D Drop Structure
B Bridge
R Rating Curve
L Breach



Johnson County Animal Shelter
Proposed Conditions
July 3, 2008
REV. March 13, 2008

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Detention Pond	BASE	002yr-12hr	11.97	751.226	754.000	0.0050	20726	6.08	7.235	11.97	0.277
Detention Pond	BASE	002yr-1hr	1.43	750.638	754.000	0.0047	19090	0.75	1.487	1.43	0.030
Detention Pond	BASE	002yr-24hr	17.67	751.246	754.000	0.0050	20788	12.00	7.158	17.67	0.282
Detention Pond	BASE	002yr-2hr	2.29	750.772	754.000	0.0050	19443	1.17	2.522	2.27	0.095
Detention Pond	BASE	002yr-3hr	3.23	750.863	754.000	0.0050	19678	1.67	3.200	3.23	0.145
Detention Pond	BASE	002yr-6hr	6.12	751.027	754.000	0.0050	20119	3.09	4.562	6.12	0.218
Detention Pond	BASE	010yr-12hr	12.01	752.236	754.000	0.0050	24113	6.08	19.480	12.01	0.487
Detention Pond	BASE	010yr-1hr	1.34	751.071	754.000	0.0050	20255	0.67	7.830	1.34	0.232
Detention Pond	BASE	010yr-24hr	17.95	752.373	754.000	0.0050	24713	12.00	18.845	17.95	0.509
Detention Pond	BASE	010yr-2hr	2.25	751.416	754.000	0.0050	21306	1.16	11.310	2.25	0.325
Detention Pond	BASE	010yr-3hr	3.22	751.610	754.000	0.0050	21897	1.58	13.134	3.22	0.369
Detention Pond	BASE	010yr-6hr	6.12	751.979	754.000	0.0050	23024	3.08	17.398	6.12	0.442
Detention Pond	BASE	100yr-12hr	9.11	753.265	754.000	0.0050	29061	6.08	38.330	9.13	1.390
Detention Pond	BASE	100yr-1hr	1.34	751.862	754.000	0.0050	22667	0.58	21.232	1.34	0.420
Detention Pond	BASE	100yr-24hr	14.53	753.534	754.000	0.0050	30698	12.00	36.901	14.53	1.565
Detention Pond	BASE	100yr-2hr	2.27	752.431	754.000	0.0050	24964	1.08	28.604	2.27	0.526
Detention Pond	BASE	100yr-3hr	3.18	752.741	754.000	0.0050	26315	1.58	32.650	3.18	0.832
Detention Pond	BASE	100yr-6hr	6.04	753.095	754.000	0.0050	28020	3.08	37.774	6.04	1.262
Detention Pond	BASE	WQ Storm	17.67	751.029	754.000	0.0050	20125	12.00	4.836	17.69	0.219

NOTE: MAX. DISCHARGES UNDERLINED

MAX 100-YR INFLOW FROM CONTRIBUTING WATERSHED
$1.25\,Q_{peak} = 46.1\ ft^3/s$

==========
==== Basins ====
==========

Name: 631 Node: Detention Pond Status: Onsite
Group: BASE Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484 Peaking Factor: 484.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 16.00
Area(ac): 6.300 Time Shift(hrs): 0.00
Curve Number: 74.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: Direct Node: Detention Pond Status: Onsite
Group: BASE Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484 Peaking Factor: 484.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 5.00
Area(ac): 1.410 Time Shift(hrs): 0.00
Curve Number: 78.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: Swale Node: Detention Pond Status: Onsite
Group: BASE Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484 Peaking Factor: 484.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 9.00
Area(ac): 2.210 Time Shift(hrs): 0.00
Curve Number: 71.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

==========
==== Nodes ====
==========

Name: Detention Pond Base Flow(cfs): 0.000 Init Stage(ft): 750.500
Group: BASE Warn Stage(ft): 754.000
Type: Stage/Area

Stage(ft)	Area(ac)
750.500	0.4300
751.000	0.4600
752.000	0.5300
753.000	0.6300
754.000	0.7700

Name: Outfall (Creek) Base Flow(cfs): 0.000 Init Stage(ft): 747.480
Group: BASE Warn Stage(ft): 749.000
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	747.480
999.00	747.480

Name: Structure 601 Base Flow(cfs): 0.000 Init Stage(ft): 748.680
Group: BASE Warn Stage(ft): 751.950
Type: Stage/Area

Stage(ft)	Area(ac)

==== Pipes ====

```
        Name: Pipe 601-600        From Node: Structure 601      Length(ft): 400.00
       Group: BASE                  To Node: Outfall (Creek)         Count: 1
                                                 Friction Equation: Average Conveyance
              UPSTREAM       DOWNSTREAM      Solution Algorithm: Automatic
    Geometry: Circular       Circular                      Flow: Both
    Span(in): 12.00          12.00           Entrance Loss Coef: 0.00
    Rise(in): 12.00          12.00               Exit Loss Coef: 0.00
  Invert(ft): 748.680        747.480             Bend Loss Coef: 0.00
Manning's N: 0.013000        0.013000          Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000          0.000               Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000          0.000            Stabilizer Option: None
```

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

==== Drop Structures ====

```
        Name: Drop Structure      From Node: Detention Pond     Length(ft): 344.00
       Group: BASE                  To Node: Structure 601          Count: 1

              UPSTREAM       DOWNSTREAM      Friction Equation: Average Conveyance
    Geometry: Circular       Circular        Solution Algorithm: Automatic
    Span(in): 12.00          12.00                         Flow: Both
    Rise(in): 12.00          12.00           Entrance Loss Coef: 0.000
  Invert(ft): 750.500        748.780             Exit Loss Coef: 0.000
Manning's N: 0.013000        0.013000          Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000          0.000               Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000          0.000                 Solution Incs: 10
```

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 2 for Drop Structure Drop Structure ***

TABLE

```
           Count: 1                    Bottom Clip(in): 0.000
            Type: Vertical: Mavis         Top Clip(in): 0.000
            Flow: Both                  Weir Disc Coef: 3.200
        Geometry: Circular          Orifice Disc Coef: 0.600

        Span(in): 4.00                      Invert(ft): 750.500
        Rise(in): 4.00                Control Elev(ft): 750.500
```

*** Weir 2 of 2 for Drop Structure Drop Structure ***

TABLE

```
           Count: 1                    Bottom Clip(in): 0.000
            Type: Vertical: Mavis         Top Clip(in): 0.000
            Flow: Both                  Weir Disc Coef: 3.200
        Geometry: Circular          Orifice Disc Coef: 0.600

        Span(in): 6.00                      Invert(ft): 752.370
        Rise(in): 6.00                Control Elev(ft): 752.370
```

==== Hydrology Simulations ====

```
        Name: 002yr-12hr
    Filename: S:\5k\5930\002\drainage\002yr-12hr.R32

   Override Defaults: Yes
Storm Duration(hrs): 12.00
     Rainfall File: Scsii-24
```

Rainfall Amount(in): 2.40

Time(hrs)	Print Inc(min)
24.000	5.00

Name: 002yr-1hr
Filename: S:\5k\5930\002\drainage\002yr-1hr.R32

Override Defaults: Yes
Storm Duration(hrs): 1.00
Rainfall File: Scsii-24
Rainfall Amount(in): 1.25

Time(hrs)	Print Inc(min)
2.000	5.00

Name: 002yr-24hr
Filename: S:\5k\5930\002\drainage\002yr-24hr.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scsii-24
Rainfall Amount(in): 2.64

Time(hrs)	Print Inc(min)
48.000	5.00

Name: 002yr-2hr
Filename: S:\5k\5930\002\drainage\002yr-2hr.R32

Override Defaults: Yes
Storm Duration(hrs): 2.00
Rainfall File: Scsii-24
Rainfall Amount(in): 1.52

Time(hrs)	Print Inc(min)
4.000	5.00

Name: 002yr-3hr
Filename: S:\5k\5930\002\drainage\002yr-3hr.R32

Override Defaults: Yes
Storm Duration(hrs): 3.00
Rainfall File: Scsii-24
Rainfall Amount(in): 1.68

Time(hrs)	Print Inc(min)
6.000	5.00

Name: 002yr-6hr
Filename: S:\5k\5930\002\drainage\002yr-6hr.R32

Override Defaults: Yes
Storm Duration(hrs): 6.00
Rainfall File: Scsii-24
Rainfall Amount(in): 1.98

Time(hrs)	Print Inc(min)
12.000	5.00

Name: 010yr-12hr
Filename: S:\5k\5930\002\drainage\010yr-12hr.R32

Override Defaults: Yes
Storm Duration(hrs): 12.00
Rainfall File: Scsii-24
Rainfall Amount(in): 3.60

Time(hrs)	Print Inc(min)

24.000 5.00

Name: 010yr-1hr
Filename: S:\5k\5930\002\drainage\010yr-1hr.R32

Override Defaults: Yes
Storm Duration(hrs): 1.00
Rainfall File: Scsii-24
Rainfall Amount(in): 1.96

Time(hrs)	Print Inc(min)
2.000	5.00

Name: 010yr-24hr
Filename: S:\5k\5930\002\drainage\010yr-24hr.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scsii-24
Rainfall Amount(in): 4.08

Time(hrs)	Print Inc(min)
48.000	5.00

Name: 010yr-2hr
Filename: S:\5k\5930\002\drainage\010yr-2hr.R32

Override Defaults: Yes
Storm Duration(hrs): 2.00
Rainfall File: Scsii-24
Rainfall Amount(in): 2.40

Time(hrs)	Print Inc(min)
4.000	5.00

Name: 010yr-3hr
Filename: S:\5k\5930\002\drainage\010yr-3hr.R32

Override Defaults: Yes
Storm Duration(hrs): 3.00
Rainfall File: Scsii-24
Rainfall Amount(in): 2.64

Time(hrs)	Print Inc(min)
6.000	5.00

Name: 010yr-6hr
Filename: S:\5k\5930\002\drainage\010yr-6hr.R32

Override Defaults: Yes
Storm Duration(hrs): 6.00
Rainfall File: Scsii-24
Rainfall Amount(in): 3.12

Time(hrs)	Print Inc(min)
12.000	5.00

Name: 100yr-12hr
Filename: S:\5k\5930\002\drainage\100yr-12hr.R32

Override Defaults: Yes
Storm Duration(hrs): 12.00
Rainfall File: Scsii-24
Rainfall Amount(in): 5.16

Time(hrs)	Print Inc(min)
24.000	5.00

Name: 100yr-1hr

```
     Filename: S:\5k\5930\002\drainage\100yr-1hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 1.00
          Rainfall File: Scsii-24
    Rainfall Amount(in): 2.88

Time(hrs)       Print Inc(min)
--------------- ---------------
2.000           5.00

--------------------------------------------------------------------------------------------------------
         Name: 100yr-24hr
     Filename: S:\5k\5930\002\drainage\100yr-24hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Scsii-24
    Rainfall Amount(in): 6.00

Time(hrs)       Print Inc(min)
--------------- ---------------
48.000          5.00

--------------------------------------------------------------------------------------------------------
         Name: 100yr-2hr
     Filename: S:\5k\5930\002\drainage\100yr-2hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 2.00
          Rainfall File: Scsii-24
    Rainfall Amount(in): 3.50

Time(hrs)       Print Inc(min)
--------------- ---------------
4.000           5.00

--------------------------------------------------------------------------------------------------------
         Name: 100yr-3hr
     Filename: S:\5k\5930\002\drainage\100yr-3hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 3.00
          Rainfall File: Scsii-24
    Rainfall Amount(in): 3.87

Time(hrs)       Print Inc(min)
--------------- ---------------
6.000           5.00

--------------------------------------------------------------------------------------------------------
         Name: 100yr-6hr
     Filename: S:\5k\5930\002\drainage\100yr-6hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 6.00
          Rainfall File: Scsii-24
    Rainfall Amount(in): 4.50

Time(hrs)       Print Inc(min)
--------------- ---------------
12.000          5.00

--------------------------------------------------------------------------------------------------------
         Name: WQ Storm
     Filename: S:\5k\5930\002\drainage\WQ Storm.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Scsii-24
    Rainfall Amount(in): 2.30

Time(hrs)       Print Inc(min)
--------------- ---------------
60.000          5.00

================================================================================
==== Routing Simulations ======================================================
================================================================================

         Name: 002yr-12hr          Hydrology Sim: 002yr-12hr
     Filename: S:\5k\5930\002\drainage\002yr-12hr.I32
```

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 24.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
24.000	5.000

Group	Run
BASE	Yes

Name: 002yr-1hr Hydrology Sim: 002yr-1hr
Filename: S:\5k\5930\002\drainage\002yr-1hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 2.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
2.000	5.000

Group	Run
BASE	Yes

Name: 002yr-24hr Hydrology Sim: 002yr-24hr
Filename: S:\5k\5930\002\drainage\002yr-24hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 48.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
48.000	5.000

Group	Run
BASE	Yes

Name: 002yr-2hr Hydrology Sim: 002yr-2hr
Filename: S:\5k\5930\002\drainage\002yr-2hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 4.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
4.000	5.000

Group	Run
BASE	Yes

Name: 002yr-3hr Hydrology Sim: 002yr-3hr
Filename: S:\5k\5930\002\drainage\002yr-3hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 6.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
6.000	5.000

Group	Run
BASE	Yes

Name: 002yr-6hr Hydrology Sim: 002yr-6hr
Filename: S:\5k\5930\002\drainage\002yr-6hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 12.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
12.000	5.000

Group	Run
BASE	Yes

Name: 010yr-12hr Hydrology Sim: 010yr-12hr
Filename: S:\5k\5930\002\drainage\010yr-12hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 24.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
24.000	5.000

Group	Run
BASE	Yes

Name: 010yr-1hr Hydrology Sim: 010yr-1hr
Filename: S:\5k\5930\002\drainage\010yr-1hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 2.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
2.000	5.000

Group	Run
BASE	Yes

Name: 010yr-24hr Hydrology Sim: 010yr-24hr
Filename: S:\5k\5930\002\drainage\010yr-24hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 48.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
48.000	5.000

Group	Run
BASE	Yes

Name: 010yr-2hr Hydrology Sim: 010yr-2hr
Filename: S:\5k\5930\002\drainage\010yr-2hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 4.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
4.000	5.000

Group	Run
BASE	Yes

Name: 010yr-3hr Hydrology Sim: 010yr-3hr
Filename: S:\5k\5930\002\drainage\010yr-3hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000

```
        Start Time(hrs): 0.000                    End Time(hrs): 6.00
     Min Calc Time(sec): 0.5000                Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
6.000           5.000

Group           Run
--------------- -----
BASE            Yes
```

```
         Name: 010yr-6hr           Hydrology Sim: 010yr-6hr
     Filename: S:\5k\5930\002\drainage\010yr-6hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 12.00
     Min Calc Time(sec): 0.5000                Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
12.000          5.000

Group           Run
--------------- -----
BASE            Yes
```

```
         Name: 100yr-12hr          Hydrology Sim: 100yr-12hr
     Filename: S:\5k\5930\002\drainage\100yr-12hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 24.00
     Min Calc Time(sec): 0.5000                Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          5.000

Group           Run
--------------- -----
BASE            Yes
```

```
         Name: 100yr-1hr           Hydrology Sim: 100yr-1hr
     Filename: S:\5k\5930\002\drainage\100yr-1hr.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 2.00
     Min Calc Time(sec): 0.5000                Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
2.000           5.000
```

Group	Run
BASE	Yes

Name: 100yr-24hr Hydrology Sim: 100yr-24hr
Filename: S:\5k\5930\002\drainage\100yr-24hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 48.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
48.000	5.000

Group	Run
BASE	Yes

Name: 100yr-2hr Hydrology Sim: 100yr-2hr
Filename: S:\5k\5930\002\drainage\100yr-2hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 4.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
4.000	5.000

Group	Run
BASE	Yes

Name: 100yr-3hr Hydrology Sim: 100yr-3hr
Filename: S:\5k\5930\002\drainage\100yr-3hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 6.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
6.000	5.000

Group	Run
BASE	Yes

Name: 100yr-6hr Hydrology Sim: 100yr-6hr
Filename: S:\5k\5930\002\drainage\100yr-6hr.I32

Execute: Yes Restart: No Patch: No

Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 12.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
12.000	5.000

Group	Run
BASE	Yes

Name: WQ Storm Hydrology Sim: WQ Storm
Filename: S:\5k\5930\002\drainage\WQ Storm.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 60.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
60.000	5.000

Group	Run
BASE	Yes

==== Boundary Conditions ====

EMERGENCY SPILLWAY COMPUTATIONS

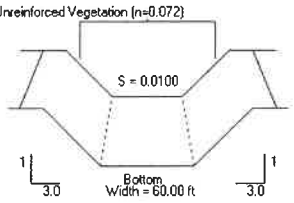
North American Green - ECMDS Version 4.3		7/3/2008 03:39 PM	COMPUTED BY: AJF
PROJECT NAME: Johnson County Animal Shelter		PROJECT NO.: 5930.002	
FROM STATION/REACH:	TO STATION/REACH:	DRAINAGE AREA:	DESIGN FREQUENCY:

HYDRAULIC RESULTS

Discharge (cfs)	Peak Flow Period (hrs)	Velocity (fps)	Area (sq.ft)	Hydraulic Radius(ft)	Normal Depth (ft)
46.1	1.0	1.36	33.81	0.53	0.55

NORMAL DEPTH OF FLOW

MAX 100-YR CONTRIBUTING INFLOW X 1.25



Not to Scale

LINER RESULTS

Reach	Matting Type / Staple Pattern	Stability Analysis	Vegetation Characteristics: Phase	Class	Type	Density	Permissible Shear Stress (psf)	Calculated Shear Stress (psf)	Safety Factor	Remarks
Straight	Unreinforced	Vegetation		D	Sod	50-75%	3.33	0.34	9.73	STABLE
		Soil	Silt Loam				0.035	0.005	7.19	STABLE

← STABLE AGAINST EROSION

Back to Input Screen

WATER QUALITY DESIGN

APPENDIX E

WATER QUALITY COMPUTATIONS

* DETERMINE IF THE 1 1/4" STORM OR 1/2" OF DIRECT RUNOFF IS GREATER

1 1/4" STORM

$$R(t) = \frac{(P(t) - 0.2S)^2}{P(t) + 0.8S} \qquad S = \frac{1000}{CN} - 10$$

$$S = \frac{1000}{74} - 10 = 3.51$$

$$R(t) = \frac{[1.25 - (0.2)(3.51)]^2}{1.25 + (0.8)(3.51)} = 0.07 \text{ in}$$

$R(t) = 0.07$ in

∴ USE 1/2" OF DIRECT RUNOFF FOR WATER QUALITY COMPUTATIONS

* DETERMINE PRECIPITATION THAT RESULTS IN 1/2" OF DIRECT RUNOFF

$$R(t) = \frac{[P(t) - 0.2S]^2}{P(t) + 0.8S}$$

$R(t) = 0.5 \quad S = 3.51 \longrightarrow P(t) = 2.3$ in

∴ THE 2.3 in, 24-hr storm will be used for water quality computations.

WATER QUALITY COMPUTATIONS CONT.

TOTAL VOLUME OF RUNOFF INTO POND = 0.413 AC-FT
TOTAL VOLUME DISCHARGED AT $t = 36.10$ hr = 0.322 AC-FT

$V_{in} - V_{out}$ = STORAGE = 0.091 AC-FT

$$\frac{0.091 \text{ AC-FT}}{0.413 \text{ AC-FT}} = 0.22 \rightarrow 22\ \%$$

∴ AT LEAST 20 % OF THE RUNOFF IS STORED AT LEAST 24 HOURS AFTER THE PEAK RUNOFF OCCURS. REFER TO THE ATTACHED ICPR PRINTOUT.

PLEASE REFER TO "PROPOSED CONDITIONS" FOR A SCHEMATIC AND ICPR DATA

SIMULATION = WQ STORM (P=2-3 in)

Johnson County Animal Shelter
Proposed Conditions
July 3, 2008
REV. March 13, 2008

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
WQ Storm	Detention Pond	BASE	0.00	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	0.08	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	0.18	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	0.26	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	0.34	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	0.42	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	0.50	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	0.60	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	0.68	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	0.77	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	0.85	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	0.93	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	1.02	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	1.10	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	1.18	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	1.27	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	1.35	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	1.43	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	1.52	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	1.60	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	1.68	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	1.77	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	1.85	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	1.93	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	2.02	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	2.10	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	2.18	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	2.27	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	2.35	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	2.43	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	2.52	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	2.60	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	2.68	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	2.77	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	2.85	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	2.93	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	3.02	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	3.10	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	3.18	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	3.27	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	3.35	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	3.43	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	3.52	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	3.60	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	3.68	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	3.77	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	3.85	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	3.93	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	4.02	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	4.10	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	4.18	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	4.27	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	4.35	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	4.43	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	4.52	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	4.60	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	4.68	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	4.77	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	4.85	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	4.93	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	5.02	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	5.10	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	5.18	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	5.27	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	5.35	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	5.43	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	5.52	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	5.60	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	5.68	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	5.77	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	5.85	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	5.93	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	6.02	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	6.10	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	6.18	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	6.27	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	6.35	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	6.43	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	6.52	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm	Detention Pond	BASE	6.60	750.500	754.000	18731	0.000	0.000	0.000	0.000

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
WQ Storm Detention Pond		BASE	6.68	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	6.77	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	6.85	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	6.93	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	7.02	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	7.10	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	7.18	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	7.27	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	7.35	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	7.43	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	7.52	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	7.60	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	7.68	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	7.77	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	7.85	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	7.93	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	8.02	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	8.10	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	8.18	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	8.27	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	8.35	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	8.43	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	8.52	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	8.60	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	8.68	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	8.77	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	8.85	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	8.93	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	9.02	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	9.10	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	9.18	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	9.27	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	9.35	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	9.43	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	9.52	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	9.60	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	9.68	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	9.77	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	9.85	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	9.93	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	10.02	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	10.10	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	10.18	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	10.27	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	10.35	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	10.43	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	10.52	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	10.60	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	10.68	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	10.77	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	10.85	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	10.93	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	11.02	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	11.10	750.500	754.000	18731	0.000	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	11.18	750.500	754.000	18731	0.001	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	11.27	750.500	754.000	18731	0.003	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	11.35	750.500	754.000	18731	0.008	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	11.43	750.500	754.000	18732	0.013	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	11.52	750.501	754.000	18732	0.031	0.000	0.000	0.000
WQ Storm Detention Pond		BASE	11.60	750.502	754.000	18735	0.102	0.000	0.001	0.000
WQ Storm Detention Pond		BASE	11.68	750.504	754.000	18741	0.199	0.000	0.002	0.000
WQ Storm Detention Pond		BASE	11.77	750.509	754.000	18753	0.480	0.000	0.004	0.000
WQ Storm Detention Pond		BASE	11.85	750.523	754.000	18791	1.471	0.001	0.011	0.000
WQ Storm Detention Pond		BASE	11.92	750.554	754.000	18872	2.970	0.005	0.024	0.000
WQ Storm Detention Pond		BASE	12.00	750.613	754.000	19027	4.836	0.021	0.050	0.000
WQ Storm Detention Pond		BASE	12.08	750.687	754.000	19219	4.757	0.053	0.082	0.000
WQ Storm Detention Pond		BASE	12.17	750.753	754.000	19391	3.471	0.084	0.112	0.001
WQ Storm Detention Pond		BASE	12.25	750.796	754.000	19505	2.464	0.108	0.132	0.001
WQ Storm Detention Pond		BASE	12.34	750.827	754.000	19585	1.761	0.120	0.147	0.002
WQ Storm Detention Pond		BASE	12.42	750.849	754.000	19642	1.345	0.134	0.158	0.003
WQ Storm Detention Pond		BASE	12.50	750.865	754.000	19685	1.124	0.148	0.166	0.004
WQ Storm Detention Pond		BASE	12.59	750.879	754.000	19722	1.000	0.158	0.174	0.005
WQ Storm Detention Pond		BASE	12.67	750.891	754.000	19753	0.931	0.167	0.180	0.006
WQ Storm Detention Pond		BASE	12.75	750.902	754.000	19782	0.893	0.175	0.186	0.007
WQ Storm Detention Pond		BASE	12.84	750.913	754.000	19809	0.814	0.179	0.192	0.009
WQ Storm Detention Pond		BASE	12.92	750.922	754.000	19833	0.735	0.182	0.197	0.010
WQ Storm Detention Pond		BASE	13.00	750.929	754.000	19853	0.684	0.185	0.202	0.011
WQ Storm Detention Pond		BASE	13.09	750.937	754.000	19872	0.651	0.188	0.207	0.012
WQ Storm Detention Pond		BASE	13.17	750.944	754.000	19890	0.627	0.190	0.211	0.014
WQ Storm Detention Pond		BASE	13.25	750.950	754.000	19907	0.612	0.192	0.216	0.015

PEAK RUNOFF

t=12hr

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
WQ Storm Detention	Pond	BASE	13.34	750.956	754.000	19923	0.574	0.194	0.220	0.016
WQ Storm Detention	Pond	BASE	13.42	750.961	754.000	19937	0.532	0.196	0.223	0.018
WQ Storm Detention	Pond	BASE	13.50	750.966	754.000	19949	0.506	0.198	0.227	0.019
WQ Storm Detention	Pond	BASE	13.59	750.971	754.000	19961	0.487	0.200	0.230	0.021
WQ Storm Detention	Pond	BASE	13.67	750.975	754.000	19972	0.472	0.201	0.234	0.022
WQ Storm Detention	Pond	BASE	13.75	750.979	754.000	19983	0.464	0.202	0.237	0.023
WQ Storm Detention	Pond	BASE	13.84	750.983	754.000	19992	0.450	0.204	0.240	0.025
WQ Storm Detention	Pond	BASE	13.92	750.986	754.000	20002	0.436	0.205	0.243	0.026
WQ Storm Detention	Pond	BASE	14.00	750.990	754.000	20011	0.427	0.206	0.246	0.027
WQ Storm Detention	Pond	BASE	14.09	750.993	754.000	20019	0.402	0.207	0.249	0.029
WQ Storm Detention	Pond	BASE	14.17	750.996	754.000	20026	0.377	0.208	0.252	0.030
WQ Storm Detention	Pond	BASE	14.25	750.998	754.000	20032	0.361	0.209	0.254	0.032
WQ Storm Detention	Pond	BASE	14.34	751.000	754.000	20038	0.353	0.209	0.257	0.033
WQ Storm Detention	Pond	BASE	14.42	751.002	754.000	20045	0.348	0.210	0.259	0.035
WQ Storm Detention	Pond	BASE	14.50	751.004	754.000	20051	0.345	0.211	0.261	0.036
WQ Storm Detention	Pond	BASE	14.59	751.006	754.000	20056	0.325	0.211	0.264	0.038
WQ Storm Detention	Pond	BASE	14.67	751.008	754.000	20061	0.303	0.212	0.266	0.039
WQ Storm Detention	Pond	BASE	14.75	751.009	754.000	20065	0.289	0.212	0.268	0.040
WQ Storm Detention	Pond	BASE	14.84	751.010	754.000	20068	0.288	0.213	0.270	0.042
WQ Storm Detention	Pond	BASE	14.92	751.011	754.000	20072	0.295	0.213	0.272	0.043
WQ Storm Detention	Pond	BASE	15.00	751.013	754.000	20076	0.300	0.214	0.274	0.045
WQ Storm Detention	Pond	BASE	15.09	751.014	754.000	20080	0.304	0.214	0.276	0.046
WQ Storm Detention	Pond	BASE	15.17	751.015	754.000	20084	0.306	0.214	0.278	0.048
WQ Storm Detention	Pond	BASE	15.25	751.017	754.000	20088	0.306	0.215	0.280	0.049
WQ Storm Detention	Pond	BASE	15.34	751.018	754.000	20092	0.287	0.215	0.282	0.051
WQ Storm Detention	Pond	BASE	15.42	751.019	754.000	20095	0.267	0.216	0.284	0.052
WQ Storm Detention	Pond	BASE	15.50	751.019	754.000	20097	0.254	0.216	0.286	0.054
WQ Storm Detention	Pond	BASE	15.59	751.020	754.000	20098	0.253	0.216	0.288	0.055
WQ Storm Detention	Pond	BASE	15.67	751.021	754.000	20100	0.259	0.216	0.290	0.057
WQ Storm Detention	Pond	BASE	15.75	751.021	754.000	20102	0.263	0.216	0.291	0.058
WQ Storm Detention	Pond	BASE	15.84	751.022	754.000	20104	0.259	0.217	0.293	0.060
WQ Storm Detention	Pond	BASE	15.92	751.022	754.000	20106	0.253	0.217	0.295	0.061
WQ Storm Detention	Pond	BASE	16.00	751.023	754.000	20108	0.249	0.217	0.297	0.063
WQ Storm Detention	Pond	BASE	16.09	751.023	754.000	20109	0.253	0.217	0.298	0.064
WQ Storm Detention	Pond	BASE	16.17	751.024	754.000	20111	0.260	0.217	0.300	0.066
WQ Storm Detention	Pond	BASE	16.25	751.025	754.000	20113	0.266	0.218	0.302	0.067
WQ Storm Detention	Pond	BASE	16.34	751.025	754.000	20115	0.263	0.218	0.304	0.069
WQ Storm Detention	Pond	BASE	16.42	751.026	754.000	20117	0.256	0.218	0.306	0.070
WQ Storm Detention	Pond	BASE	16.50	751.027	754.000	20119	0.252	0.218	0.307	0.072
WQ Storm Detention	Pond	BASE	16.59	751.027	754.000	20120	0.246	0.218	0.309	0.073
WQ Storm Detention	Pond	BASE	16.67	751.027	754.000	20121	0.238	0.218	0.311	0.075
WQ Storm Detention	Pond	BASE	16.75	751.028	754.000	20122	0.233	0.219	0.312	0.076
WQ Storm Detention	Pond	BASE	16.84	751.028	754.000	20122	0.231	0.219	0.314	0.078
WQ Storm Detention	Pond	BASE	16.92	751.028	754.000	20123	0.230	0.219	0.315	0.079
WQ Storm Detention	Pond	BASE	17.00	751.028	754.000	20123	0.230	0.219	0.317	0.081
WQ Storm Detention	Pond	BASE	17.09	751.028	754.000	20124	0.224	0.219	0.319	0.082
WQ Storm Detention	Pond	BASE	17.17	751.028	754.000	20124	0.218	0.219	0.320	0.084
WQ Storm Detention	Pond	BASE	17.25	751.028	754.000	20124	0.214	0.219	0.322	0.085
WQ Storm Detention	Pond	BASE	17.34	751.028	754.000	20124	0.217	0.219	0.323	0.087
WQ Storm Detention	Pond	BASE	17.42	751.028	754.000	20124	0.223	0.219	0.325	0.088
WQ Storm Detention	Pond	BASE	17.50	751.028	754.000	20124	0.228	0.219	0.326	0.090
WQ Storm Detention	Pond	BASE	17.59	751.028	754.000	20124	0.225	0.219	0.328	0.091
WQ Storm Detention	Pond	BASE	17.67	751.029	754.000	20125	0.219	0.219	0.329	0.093
WQ Storm Detention	Pond	BASE	17.75	751.028	754.000	20124	0.215	0.219	0.331	0.094
WQ Storm Detention	Pond	BASE	17.84	751.028	754.000	20124	0.208	0.219	0.332	0.096
WQ Storm Detention	Pond	BASE	17.92	751.028	754.000	20123	0.199	0.219	0.334	0.097
WQ Storm Detention	Pond	BASE	18.00	751.028	754.000	20122	0.193	0.219	0.335	0.099
WQ Storm Detention	Pond	BASE	18.09	751.027	754.000	20121	0.190	0.219	0.336	0.100
WQ Storm Detention	Pond	BASE	18.17	751.027	754.000	20120	0.189	0.218	0.338	0.102
WQ Storm Detention	Pond	BASE	18.25	751.027	754.000	20119	0.188	0.218	0.339	0.103
WQ Storm Detention	Pond	BASE	18.34	751.026	754.000	20117	0.183	0.218	0.340	0.105
WQ Storm Detention	Pond	BASE	18.42	751.025	754.000	20115	0.178	0.218	0.341	0.106
WQ Storm Detention	Pond	BASE	18.50	751.025	754.000	20113	0.175	0.218	0.343	0.108
WQ Storm Detention	Pond	BASE	18.59	751.024	754.000	20112	0.177	0.217	0.344	0.109
WQ Storm Detention	Pond	BASE	18.67	751.024	754.000	20110	0.183	0.217	0.345	0.111
WQ Storm Detention	Pond	BASE	18.75	751.023	754.000	20108	0.186	0.217	0.346	0.112
WQ Storm Detention	Pond	BASE	18.84	751.023	754.000	20107	0.183	0.217	0.348	0.114
WQ Storm Detention	Pond	BASE	18.92	751.022	754.000	20105	0.179	0.217	0.349	0.115
WQ Storm Detention	Pond	BASE	19.00	751.022	754.000	20103	0.176	0.217	0.350	0.117
WQ Storm Detention	Pond	BASE	19.09	751.021	754.000	20102	0.178	0.216	0.351	0.118
WQ Storm Detention	Pond	BASE	19.17	751.020	754.000	20100	0.184	0.216	0.353	0.120
WQ Storm Detention	Pond	BASE	19.25	751.020	754.000	20099	0.187	0.216	0.354	0.121
WQ Storm Detention	Pond	BASE	19.34	751.020	754.000	20097	0.185	0.216	0.355	0.123
WQ Storm Detention	Pond	BASE	19.42	751.019	754.000	20096	0.180	0.216	0.356	0.124
WQ Storm Detention	Pond	BASE	19.50	751.019	754.000	20094	0.177	0.216	0.358	0.126
WQ Storm Detention	Pond	BASE	19.59	751.018	754.000	20092	0.179	0.215	0.359	0.127
WQ Storm Detention	Pond	BASE	19.67	751.017	754.000	20091	0.185	0.215	0.360	0.129
WQ Storm Detention	Pond	BASE	19.75	751.017	754.000	20090	0.188	0.215	0.361	0.130
WQ Storm Detention	Pond	BASE	19.84	751.017	754.000	20088	0.179	0.215	0.363	0.132
WQ Storm Detention	Pond	BASE	19.92	751.016	754.000	20086	0.164	0.215	0.364	0.133

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
WQ Storm	Detention Pond	BASE	20.00	751.015	754.000	20084	0.154	0.214	0.365	0.135
WQ Storm	Detention Pond	BASE	20.09	751.014	754.000	20081	0.145	0.214	0.366	0.136
WQ Storm	Detention Pond	BASE	20.17	751.013	754.000	20077	0.139	0.214	0.367	0.138
WQ Storm	Detention Pond	BASE	20.25	751.012	754.000	20074	0.135	0.213	0.368	0.139
WQ Storm	Detention Pond	BASE	20.34	751.011	754.000	20070	0.137	0.213	0.369	0.141
WQ Storm	Detention Pond	BASE	20.42	751.010	754.000	20067	0.140	0.213	0.370	0.142
WQ Storm	Detention Pond	BASE	20.50	751.009	754.000	20064	0.143	0.212	0.371	0.143
WQ Storm	Detention Pond	BASE	20.59	751.008	754.000	20061	0.141	0.212	0.372	0.145
WQ Storm	Detention Pond	BASE	20.67	751.006	754.000	20057	0.137	0.212	0.373	0.146
WQ Storm	Detention Pond	BASE	20.75	751.005	754.000	20054	0.135	0.211	0.374	0.148
WQ Storm	Detention Pond	BASE	20.84	751.004	754.000	20050	0.137	0.211	0.375	0.149
WQ Storm	Detention Pond	BASE	20.92	751.003	754.000	20047	0.141	0.210	0.376	0.151
WQ Storm	Detention Pond	BASE	21.00	751.002	754.000	20044	0.144	0.210	0.376	0.152
WQ Storm	Detention Pond	BASE	21.09	751.001	754.000	20041	0.145	0.210	0.377	0.154
WQ Storm	Detention Pond	BASE	21.17	751.000	754.000	20038	0.146	0.209	0.378	0.155
WQ Storm	Detention Pond	BASE	21.25	750.999	754.000	20036	0.146	0.209	0.379	0.156
WQ Storm	Detention Pond	BASE	21.34	750.998	754.000	20033	0.143	0.209	0.380	0.158
WQ Storm	Detention Pond	BASE	21.42	750.997	754.000	20030	0.139	0.209	0.381	0.159
WQ Storm	Detention Pond	BASE	21.50	750.996	754.000	20028	0.136	0.208	0.382	0.161
WQ Storm	Detention Pond	BASE	21.59	750.995	754.000	20025	0.138	0.208	0.383	0.162
WQ Storm	Detention Pond	BASE	21.67	750.994	754.000	20022	0.142	0.207	0.384	0.164
WQ Storm	Detention Pond	BASE	21.75	750.993	754.000	20020	0.145	0.207	0.385	0.165
WQ Storm	Detention Pond	BASE	21.84	750.992	754.000	20017	0.143	0.207	0.386	0.167
WQ Storm	Detention Pond	BASE	21.92	750.991	754.000	20015	0.139	0.207	0.387	0.168
WQ Storm	Detention Pond	BASE	22.00	750.990	754.000	20012	0.137	0.206	0.388	0.169
WQ Storm	Detention Pond	BASE	22.09	750.989	754.000	20009	0.139	0.206	0.389	0.171
WQ Storm	Detention Pond	BASE	22.17	750.988	754.000	20007	0.143	0.205	0.390	0.172
WQ Storm	Detention Pond	BASE	22.25	750.987	754.000	20004	0.145	0.205	0.391	0.174
WQ Storm	Detention Pond	BASE	22.34	750.986	754.000	20002	0.144	0.205	0.392	0.175
WQ Storm	Detention Pond	BASE	22.42	750.985	754.000	19999	0.140	0.205	0.393	0.176
WQ Storm	Detention Pond	BASE	22.50	750.984	754.000	19997	0.137	0.204	0.394	0.178
WQ Storm	Detention Pond	BASE	22.59	750.983	754.000	19994	0.139	0.204	0.395	0.179
WQ Storm	Detention Pond	BASE	22.67	750.982	754.000	19992	0.143	0.204	0.396	0.181
WQ Storm	Detention Pond	BASE	22.75	750.982	754.000	19990	0.146	0.203	0.397	0.182
WQ Storm	Detention Pond	BASE	22.84	750.981	754.000	19987	0.148	0.203	0.398	0.183
WQ Storm	Detention Pond	BASE	22.92	750.980	754.000	19985	0.149	0.203	0.399	0.185
WQ Storm	Detention Pond	BASE	23.00	750.979	754.000	19983	0.149	0.202	0.400	0.186
WQ Storm	Detention Pond	BASE	23.09	750.978	754.000	19981	0.145	0.202	0.401	0.188
WQ Storm	Detention Pond	BASE	23.17	750.977	754.000	19979	0.141	0.202	0.402	0.189
WQ Storm	Detention Pond	BASE	23.25	750.977	754.000	19976	0.139	0.202	0.403	0.190
WQ Storm	Detention Pond	BASE	23.34	750.976	754.000	19974	0.140	0.201	0.404	0.192
WQ Storm	Detention Pond	BASE	23.42	750.975	754.000	19971	0.145	0.201	0.405	0.193
WQ Storm	Detention Pond	BASE	23.50	750.974	754.000	19969	0.147	0.201	0.406	0.195
WQ Storm	Detention Pond	BASE	23.59	750.973	754.000	19967	0.145	0.200	0.407	0.196
WQ Storm	Detention Pond	BASE	23.67	750.972	754.000	19965	0.142	0.200	0.408	0.197
WQ Storm	Detention Pond	BASE	23.75	750.971	754.000	19963	0.139	0.200	0.409	0.199
WQ Storm	Detention Pond	BASE	23.84	750.970	754.000	19960	0.130	0.199	0.410	0.200
WQ Storm	Detention Pond	BASE	23.92	750.969	754.000	19957	0.117	0.199	0.411	0.201
WQ Storm	Detention Pond	BASE	24.00	750.968	754.000	19954	0.108	0.199	0.411	0.203
WQ Storm	Detention Pond	BASE	24.09	750.966	754.000	19950	0.078	0.198	0.412	0.204
WQ Storm	Detention Pond	BASE	24.17	750.964	754.000	19944	0.043	0.197	0.412	0.206
WQ Storm	Detention Pond	BASE	24.25	750.962	754.000	19938	0.020	0.196	0.413	0.207
WQ Storm	Detention Pond	BASE	24.34	750.959	754.000	19930	0.009	0.196	0.413	0.208
WQ Storm	Detention Pond	BASE	24.42	750.956	754.000	19923	0.004	0.195	0.413	0.210
WQ Storm	Detention Pond	BASE	24.50	750.953	754.000	19915	0.002	0.194	0.413	0.211
WQ Storm	Detention Pond	BASE	24.59	750.950	754.000	19908	0.001	0.192	0.413	0.212
WQ Storm	Detention Pond	BASE	24.67	750.947	754.000	19900	0.000	0.191	0.413	0.214
WQ Storm	Detention Pond	BASE	24.75	750.945	754.000	19893	0.000	0.190	0.413	0.215
WQ Storm	Detention Pond	BASE	24.84	750.942	754.000	19885	0.000	0.189	0.413	0.216
WQ Storm	Detention Pond	BASE	24.92	750.939	754.000	19878	0.000	0.188	0.413	0.218
WQ Storm	Detention Pond	BASE	25.00	750.936	754.000	19870	0.000	0.187	0.413	0.219
WQ Storm	Detention Pond	BASE	25.09	750.933	754.000	19863	0.000	0.186	0.413	0.220
WQ Storm	Detention Pond	BASE	25.17	750.930	754.000	19856	0.000	0.185	0.413	0.221
WQ Storm	Detention Pond	BASE	25.25	750.928	754.000	19848	0.000	0.184	0.413	0.223
WQ Storm	Detention Pond	BASE	25.34	750.925	754.000	19841	0.000	0.183	0.413	0.224
WQ Storm	Detention Pond	BASE	25.42	750.922	754.000	19834	0.000	0.182	0.413	0.225
WQ Storm	Detention Pond	BASE	25.50	750.919	754.000	19827	0.000	0.181	0.413	0.226
WQ Storm	Detention Pond	BASE	25.59	750.917	754.000	19820	0.000	0.180	0.413	0.228
WQ Storm	Detention Pond	BASE	25.67	750.914	754.000	19813	0.000	0.179	0.413	0.229
WQ Storm	Detention Pond	BASE	25.75	750.911	754.000	19805	0.000	0.178	0.413	0.230
WQ Storm	Detention Pond	BASE	25.84	750.908	754.000	19798	0.000	0.177	0.413	0.231
WQ Storm	Detention Pond	BASE	25.92	750.906	754.000	19791	0.000	0.176	0.413	0.233
WQ Storm	Detention Pond	BASE	26.00	750.903	754.000	19784	0.000	0.175	0.413	0.234
WQ Storm	Detention Pond	BASE	26.09	750.900	754.000	19777	0.000	0.174	0.413	0.235
WQ Storm	Detention Pond	BASE	26.17	750.898	754.000	19771	0.000	0.173	0.413	0.236
WQ Storm	Detention Pond	BASE	26.25	750.895	754.000	19764	0.000	0.171	0.413	0.237
WQ Storm	Detention Pond	BASE	26.34	750.893	754.000	19757	0.000	0.169	0.413	0.239
WQ Storm	Detention Pond	BASE	26.42	750.890	754.000	19750	0.000	0.167	0.413	0.240
WQ Storm	Detention Pond	BASE	26.50	750.888	754.000	19744	0.000	0.165	0.413	0.241
WQ Storm	Detention Pond	BASE	26.59	750.885	754.000	19737	0.000	0.163	0.413	0.242

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
WQ Storm Detention	Pond	BASE	26.67	750.883	754.000	19731	0.000	0.161	0.413	0.243
WQ Storm Detention	Pond	BASE	26.75	750.880	754.000	19724	0.000	0.159	0.413	0.244
WQ Storm Detention	Pond	BASE	26.84	750.878	754.000	19718	0.000	0.157	0.413	0.245
WQ Storm Detention	Pond	BASE	26.92	750.875	754.000	19712	0.000	0.155	0.413	0.246
WQ Storm Detention	Pond	BASE	27.00	750.873	754.000	19706	0.000	0.154	0.413	0.247
WQ Storm Detention	Pond	BASE	27.09	750.871	754.000	19700	0.000	0.152	0.413	0.248
WQ Storm Detention	Pond	BASE	27.17	750.868	754.000	19694	0.000	0.150	0.413	0.250
WQ Storm Detention	Pond	BASE	27.25	750.866	754.000	19688	0.000	0.148	0.413	0.251
WQ Storm Detention	Pond	BASE	27.34	750.864	754.000	19682	0.000	0.147	0.413	0.252
WQ Storm Detention	Pond	BASE	27.42	750.862	754.000	19676	0.000	0.145	0.413	0.253
WQ Storm Detention	Pond	BASE	27.50	750.859	754.000	19670	0.000	0.143	0.413	0.254
WQ Storm Detention	Pond	BASE	27.59	750.857	754.000	19665	0.000	0.141	0.413	0.255
WQ Storm Detention	Pond	BASE	27.67	750.855	754.000	19659	0.000	0.140	0.413	0.255
WQ Storm Detention	Pond	BASE	27.75	750.853	754.000	19654	0.000	0.138	0.413	0.256
WQ Storm Detention	Pond	BASE	27.84	750.851	754.000	19648	0.000	0.136	0.413	0.257
WQ Storm Detention	Pond	BASE	27.92	750.849	754.000	19643	0.000	0.135	0.413	0.258
WQ Storm Detention	Pond	BASE	28.00	750.847	754.000	19637	0.000	0.133	0.413	0.259
WQ Storm Detention	Pond	BASE	28.09	750.845	754.000	19632	0.000	0.131	0.413	0.260
WQ Storm Detention	Pond	BASE	28.17	750.843	754.000	19627	0.000	0.130	0.413	0.261
WQ Storm Detention	Pond	BASE	28.25	750.841	754.000	19622	0.000	0.128	0.413	0.262
WQ Storm Detention	Pond	BASE	28.34	750.839	754.000	19617	0.000	0.126	0.413	0.263
WQ Storm Detention	Pond	BASE	28.42	750.837	754.000	19612	0.000	0.125	0.413	0.264
WQ Storm Detention	Pond	BASE	28.50	750.835	754.000	19607	0.000	0.123	0.413	0.265
WQ Storm Detention	Pond	BASE	28.59	750.833	754.000	19602	0.000	0.122	0.413	0.265
WQ Storm Detention	Pond	BASE	28.67	750.831	754.000	19597	0.000	0.121	0.413	0.266
WQ Storm Detention	Pond	BASE	28.75	750.829	754.000	19592	0.000	0.121	0.413	0.267
WQ Storm Detention	Pond	BASE	28.84	750.828	754.000	19587	0.000	0.121	0.413	0.268
WQ Storm Detention	Pond	BASE	28.92	750.826	754.000	19582	0.000	0.120	0.413	0.269
WQ Storm Detention	Pond	BASE	29.00	750.824	754.000	19578	0.000	0.120	0.413	0.270
WQ Storm Detention	Pond	BASE	29.09	750.822	754.000	19573	0.000	0.119	0.413	0.270
WQ Storm Detention	Pond	BASE	29.17	750.820	754.000	19568	0.000	0.118	0.413	0.271
WQ Storm Detention	Pond	BASE	29.25	750.819	754.000	19563	0.000	0.117	0.413	0.272
WQ Storm Detention	Pond	BASE	29.34	750.817	754.000	19559	0.000	0.117	0.413	0.273
WQ Storm Detention	Pond	BASE	29.42	750.815	754.000	19554	0.000	0.116	0.413	0.274
WQ Storm Detention	Pond	BASE	29.50	750.813	754.000	19549	0.000	0.115	0.413	0.274
WQ Storm Detention	Pond	BASE	29.59	750.811	754.000	19545	0.000	0.114	0.413	0.275
WQ Storm Detention	Pond	BASE	29.67	750.810	754.000	19540	0.000	0.114	0.413	0.276
WQ Storm Detention	Pond	BASE	29.75	750.808	754.000	19536	0.000	0.113	0.413	0.277
WQ Storm Detention	Pond	BASE	29.84	750.806	754.000	19531	0.000	0.112	0.413	0.278
WQ Storm Detention	Pond	BASE	29.92	750.804	754.000	19527	0.000	0.111	0.413	0.278
WQ Storm Detention	Pond	BASE	30.00	750.803	754.000	19522	0.000	0.111	0.413	0.279
WQ Storm Detention	Pond	BASE	30.09	750.801	754.000	19518	0.000	0.110	0.413	0.280
WQ Storm Detention	Pond	BASE	30.17	750.799	754.000	19513	0.000	0.111	0.413	0.281
WQ Storm Detention	Pond	BASE	30.25	750.798	754.000	19509	0.000	0.110	0.413	0.281
WQ Storm Detention	Pond	BASE	30.34	750.796	754.000	19504	0.000	0.108	0.413	0.282
WQ Storm Detention	Pond	BASE	30.42	750.794	754.000	19500	0.000	0.107	0.413	0.283
WQ Storm Detention	Pond	BASE	30.50	750.793	754.000	19496	0.000	0.106	0.413	0.284
WQ Storm Detention	Pond	BASE	30.59	750.791	754.000	19491	0.000	0.105	0.413	0.284
WQ Storm Detention	Pond	BASE	30.67	750.789	754.000	19487	0.000	0.104	0.413	0.285
WQ Storm Detention	Pond	BASE	30.75	750.788	754.000	19483	0.000	0.103	0.413	0.286
WQ Storm Detention	Pond	BASE	30.84	750.786	754.000	19479	0.000	0.102	0.413	0.286
WQ Storm Detention	Pond	BASE	30.92	750.785	754.000	19475	0.000	0.102	0.413	0.287
WQ Storm Detention	Pond	BASE	31.00	750.783	754.000	19471	0.000	0.101	0.413	0.288
WQ Storm Detention	Pond	BASE	31.09	750.782	754.000	19467	0.000	0.100	0.413	0.289
WQ Storm Detention	Pond	BASE	31.17	750.780	754.000	19463	0.000	0.099	0.413	0.289
WQ Storm Detention	Pond	BASE	31.25	750.779	754.000	19459	0.000	0.098	0.413	0.290
WQ Storm Detention	Pond	BASE	31.34	750.777	754.000	19455	0.000	0.098	0.413	0.291
WQ Storm Detention	Pond	BASE	31.42	750.776	754.000	19451	0.000	0.097	0.413	0.291
WQ Storm Detention	Pond	BASE	31.50	750.774	754.000	19447	0.000	0.096	0.413	0.292
WQ Storm Detention	Pond	BASE	31.59	750.773	754.000	19443	0.000	0.095	0.413	0.293
WQ Storm Detention	Pond	BASE	31.67	750.771	754.000	19439	0.000	0.094	0.413	0.293
WQ Storm Detention	Pond	BASE	31.75	750.770	754.000	19436	0.000	0.094	0.413	0.294
WQ Storm Detention	Pond	BASE	31.84	750.768	754.000	19432	0.000	0.093	0.413	0.295
WQ Storm Detention	Pond	BASE	31.92	750.767	754.000	19428	0.000	0.092	0.413	0.295
WQ Storm Detention	Pond	BASE	32.00	750.765	754.000	19424	0.000	0.091	0.413	0.296
WQ Storm Detention	Pond	BASE	32.09	750.764	754.000	19421	0.000	0.091	0.413	0.296
WQ Storm Detention	Pond	BASE	32.17	750.763	754.000	19417	0.000	0.090	0.413	0.297
WQ Storm Detention	Pond	BASE	32.25	750.761	754.000	19413	0.000	0.089	0.413	0.298
WQ Storm Detention	Pond	BASE	32.34	750.760	754.000	19410	0.000	0.088	0.413	0.298
WQ Storm Detention	Pond	BASE	32.42	750.758	754.000	19406	0.000	0.088	0.413	0.299
WQ Storm Detention	Pond	BASE	32.50	750.757	754.000	19403	0.000	0.087	0.413	0.299
WQ Storm Detention	Pond	BASE	32.59	750.756	754.000	19399	0.000	0.086	0.413	0.300
WQ Storm Detention	Pond	BASE	32.67	750.754	754.000	19396	0.000	0.085	0.413	0.301
WQ Storm Detention	Pond	BASE	32.75	750.753	754.000	19392	0.000	0.085	0.413	0.301
WQ Storm Detention	Pond	BASE	32.84	750.752	754.000	19389	0.000	0.084	0.413	0.302
WQ Storm Detention	Pond	BASE	32.92	750.750	754.000	19385	0.000	0.089	0.413	0.302
WQ Storm Detention	Pond	BASE	33.00	750.749	754.000	19382	0.000	0.088	0.413	0.303
WQ Storm Detention	Pond	BASE	33.09	750.748	754.000	19378	0.000	0.087	0.413	0.304
WQ Storm Detention	Pond	BASE	33.17	750.746	754.000	19375	0.000	0.086	0.413	0.304
WQ Storm Detention	Pond	BASE	33.25	750.745	754.000	19371	0.000	0.085	0.413	0.305

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
WQ Storm	Detention Pond	BASE	33.34	750.744	754.000	19368	0.000	0.085	0.413	0.305
WQ Storm	Detention Pond	BASE	33.42	750.742	754.000	19365	0.000	0.084	0.413	0.306
WQ Storm	Detention Pond	BASE	33.50	750.741	754.000	19361	0.000	0.083	0.413	0.307
WQ Storm	Detention Pond	BASE	33.59	750.740	754.000	19358	0.000	0.082	0.413	0.307
WQ Storm	Detention Pond	BASE	33.67	750.739	754.000	19354	0.000	0.082	0.413	0.308
WQ Storm	Detention Pond	BASE	33.75	750.737	754.000	19351	0.000	0.081	0.413	0.308
WQ Storm	Detention Pond	BASE	33.84	750.736	754.000	19348	0.000	0.080	0.413	0.309
WQ Storm	Detention Pond	BASE	33.92	750.735	754.000	19345	0.000	0.080	0.413	0.309
WQ Storm	Detention Pond	BASE	34.00	750.734	754.000	19341	0.000	0.079	0.413	0.310
WQ Storm	Detention Pond	BASE	34.09	750.732	754.000	19338	0.000	0.078	0.413	0.310
WQ Storm	Detention Pond	BASE	34.17	750.731	754.000	19335	0.000	0.077	0.413	0.311
WQ Storm	Detention Pond	BASE	34.25	750.730	754.000	19332	0.000	0.077	0.413	0.311
WQ Storm	Detention Pond	BASE	34.34	750.729	754.000	19329	0.000	0.076	0.413	0.312
WQ Storm	Detention Pond	BASE	34.42	750.728	754.000	19326	0.000	0.075	0.413	0.313
WQ Storm	Detention Pond	BASE	34.50	750.726	754.000	19323	0.000	0.075	0.413	0.313
WQ Storm	Detention Pond	BASE	34.59	750.725	754.000	19320	0.000	0.074	0.413	0.314
WQ Storm	Detention Pond	BASE	34.67	750.724	754.000	19317	0.000	0.073	0.413	0.314
WQ Storm	Detention Pond	BASE	34.75	750.723	754.000	19314	0.000	0.073	0.413	0.315
WQ Storm	Detention Pond	BASE	34.84	750.722	754.000	19311	0.000	0.072	0.413	0.315
WQ Storm	Detention Pond	BASE	34.92	750.721	754.000	19308	0.000	0.071	0.413	0.316
WQ Storm	Detention Pond	BASE	35.00	750.720	754.000	19305	0.000	0.071	0.413	0.316
WQ Storm	Detention Pond	BASE	35.09	750.719	754.000	19302	0.000	0.070	0.413	0.317
WQ Storm	Detention Pond	BASE	35.17	750.718	754.000	19299	0.000	0.070	0.413	0.317
WQ Storm	Detention Pond	BASE	35.25	750.716	754.000	19296	0.000	0.069	0.413	0.318
WQ Storm	Detention Pond	BASE	35.34	750.715	754.000	19294	0.000	0.068	0.413	0.318
WQ Storm	Detention Pond	BASE	35.42	750.714	754.000	19291	0.000	0.068	0.413	0.318
WQ Storm	Detention Pond	BASE	35.50	750.713	754.000	19288	0.000	0.067	0.413	0.319
WQ Storm	Detention Pond	BASE	35.59	750.712	754.000	19285	0.000	0.067	0.413	0.319
WQ Storm	Detention Pond	BASE	35.67	750.711	754.000	19283	0.000	0.066	0.413	0.320
WQ Storm	Detention Pond	BASE	35.75	750.710	754.000	19280	0.000	0.065	0.413	0.320
WQ Storm	Detention Pond	BASE	35.84	750.709	754.000	19277	0.000	0.065	0.413	0.321
WQ Storm	Detention Pond	BASE	35.92	750.708	754.000	19275	0.000	0.064	0.413	0.321
WQ Storm	Detention Pond	BASE	36.00	750.707	754.000	19272	0.000	0.064	0.413	0.322
WQ Storm	Detention Pond	BASE	36.09	750.706	754.000	19270	0.000	0.063	0.413	0.322
WQ Storm	Detention Pond	BASE	36.17	750.705	754.000	19267	0.000	0.063	0.413	0.322
WQ Storm	Detention Pond	BASE	36.25	750.704	754.000	19265	0.000	0.062	0.413	0.323
WQ Storm	Detention Pond	BASE	36.34	750.703	754.000	19262	0.000	0.062	0.413	0.323
WQ Storm	Detention Pond	BASE	36.42	750.702	754.000	19260	0.000	0.061	0.413	0.324
WQ Storm	Detention Pond	BASE	36.50	750.701	754.000	19257	0.000	0.061	0.413	0.324
WQ Storm	Detention Pond	BASE	36.59	750.700	754.000	19255	0.000	0.060	0.413	0.325
WQ Storm	Detention Pond	BASE	36.67	750.699	754.000	19252	0.000	0.060	0.413	0.325
WQ Storm	Detention Pond	BASE	36.75	750.699	754.000	19250	0.000	0.059	0.413	0.325
WQ Storm	Detention Pond	BASE	36.84	750.698	754.000	19247	0.000	0.059	0.413	0.326
WQ Storm	Detention Pond	BASE	36.92	750.697	754.000	19245	0.000	0.058	0.413	0.326
WQ Storm	Detention Pond	BASE	37.00	750.696	754.000	19243	0.000	0.058	0.413	0.327
WQ Storm	Detention Pond	BASE	37.09	750.695	754.000	19240	0.000	0.057	0.413	0.327
WQ Storm	Detention Pond	BASE	37.17	750.694	754.000	19238	0.000	0.057	0.413	0.327
WQ Storm	Detention Pond	BASE	37.25	750.693	754.000	19236	0.000	0.056	0.413	0.328
WQ Storm	Detention Pond	BASE	37.34	750.692	754.000	19233	0.000	0.056	0.413	0.328
WQ Storm	Detention Pond	BASE	37.42	750.691	754.000	19231	0.000	0.055	0.413	0.329
WQ Storm	Detention Pond	BASE	37.50	750.691	754.000	19229	0.000	0.055	0.413	0.329
WQ Storm	Detention Pond	BASE	37.59	750.690	754.000	19227	0.000	0.054	0.413	0.329
WQ Storm	Detention Pond	BASE	37.67	750.689	754.000	19224	0.000	0.054	0.413	0.330
WQ Storm	Detention Pond	BASE	37.75	750.688	754.000	19222	0.000	0.053	0.413	0.330
WQ Storm	Detention Pond	BASE	37.84	750.687	754.000	19220	0.000	0.053	0.413	0.330
WQ Storm	Detention Pond	BASE	37.92	750.686	754.000	19218	0.000	0.053	0.413	0.331
WQ Storm	Detention Pond	BASE	38.00	750.686	754.000	19216	0.000	0.052	0.413	0.331
WQ Storm	Detention Pond	BASE	38.09	750.685	754.000	19214	0.000	0.052	0.413	0.332
WQ Storm	Detention Pond	BASE	38.17	750.684	754.000	19212	0.000	0.051	0.413	0.332
WQ Storm	Detention Pond	BASE	38.25	750.683	754.000	19209	0.000	0.051	0.413	0.332
WQ Storm	Detention Pond	BASE	38.34	750.682	754.000	19207	0.000	0.051	0.413	0.333
WQ Storm	Detention Pond	BASE	38.42	750.682	754.000	19205	0.000	0.050	0.413	0.333
WQ Storm	Detention Pond	BASE	38.50	750.681	754.000	19203	0.000	0.050	0.413	0.333
WQ Storm	Detention Pond	BASE	38.59	750.680	754.000	19201	0.000	0.049	0.413	0.334
WQ Storm	Detention Pond	BASE	38.67	750.679	754.000	19199	0.000	0.049	0.413	0.334
WQ Storm	Detention Pond	BASE	38.75	750.678	754.000	19197	0.000	0.049	0.413	0.334
WQ Storm	Detention Pond	BASE	38.84	750.678	754.000	19195	0.000	0.048	0.413	0.335
WQ Storm	Detention Pond	BASE	38.92	750.677	754.000	19193	0.000	0.048	0.413	0.335
WQ Storm	Detention Pond	BASE	39.00	750.676	754.000	19191	0.000	0.047	0.413	0.335
WQ Storm	Detention Pond	BASE	39.09	750.675	754.000	19189	0.000	0.047	0.413	0.336
WQ Storm	Detention Pond	BASE	39.17	750.675	754.000	19188	0.000	0.047	0.413	0.336
WQ Storm	Detention Pond	BASE	39.25	750.674	754.000	19186	0.000	0.046	0.413	0.336
WQ Storm	Detention Pond	BASE	39.34	750.673	754.000	19184	0.000	0.046	0.413	0.337
WQ Storm	Detention Pond	BASE	39.42	750.673	754.000	19182	0.000	0.046	0.413	0.337
WQ Storm	Detention Pond	BASE	39.50	750.672	754.000	19180	0.000	0.045	0.413	0.337
WQ Storm	Detention Pond	BASE	39.59	750.671	754.000	19178	0.000	0.045	0.413	0.337
WQ Storm	Detention Pond	BASE	39.67	750.670	754.000	19176	0.000	0.045	0.413	0.338
WQ Storm	Detention Pond	BASE	39.75	750.670	754.000	19175	0.000	0.044	0.413	0.338
WQ Storm	Detention Pond	BASE	39.84	750.669	754.000	19173	0.000	0.044	0.413	0.338
WQ Storm	Detention Pond	BASE	39.92	750.668	754.000	19171	0.000	0.044	0.413	0.339

24 hrs After Peak Inflow t=36hr

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
WQ Storm	Detention Pond	BASE	40.00	750.668	754.000	19169	0.000	0.043	0.413	0.339
WQ Storm	Detention Pond	BASE	40.09	750.667	754.000	19167	0.000	0.043	0.413	0.339
WQ Storm	Detention Pond	BASE	40.17	750.666	754.000	19166	0.000	0.043	0.413	0.340
WQ Storm	Detention Pond	BASE	40.25	750.666	754.000	19164	0.000	0.042	0.413	0.340
WQ Storm	Detention Pond	BASE	40.34	750.665	754.000	19162	0.000	0.042	0.413	0.340
WQ Storm	Detention Pond	BASE	40.42	750.664	754.000	19160	0.000	0.042	0.413	0.340
WQ Storm	Detention Pond	BASE	40.50	750.664	754.000	19159	0.000	0.041	0.413	0.341
WQ Storm	Detention Pond	BASE	40.59	750.663	754.000	19157	0.000	0.041	0.413	0.341
WQ Storm	Detention Pond	BASE	40.67	750.662	754.000	19155	0.000	0.041	0.413	0.341
WQ Storm	Detention Pond	BASE	40.75	750.662	754.000	19154	0.000	0.040	0.413	0.342
WQ Storm	Detention Pond	BASE	40.84	750.661	754.000	19152	0.000	0.040	0.413	0.342
WQ Storm	Detention Pond	BASE	40.92	750.661	754.000	19150	0.000	0.040	0.413	0.342
WQ Storm	Detention Pond	BASE	41.00	750.660	754.000	19149	0.000	0.040	0.413	0.342
WQ Storm	Detention Pond	BASE	41.09	750.659	754.000	19147	0.000	0.039	0.413	0.343
WQ Storm	Detention Pond	BASE	41.17	750.659	754.000	19146	0.000	0.039	0.413	0.343
WQ Storm	Detention Pond	BASE	41.25	750.658	754.000	19144	0.000	0.039	0.413	0.343
WQ Storm	Detention Pond	BASE	41.34	750.658	754.000	19142	0.000	0.038	0.413	0.343
WQ Storm	Detention Pond	BASE	41.42	750.657	754.000	19141	0.000	0.038	0.413	0.344
WQ Storm	Detention Pond	BASE	41.50	750.656	754.000	19139	0.000	0.038	0.413	0.344
WQ Storm	Detention Pond	BASE	41.59	750.656	754.000	19138	0.000	0.038	0.413	0.344
WQ Storm	Detention Pond	BASE	41.67	750.655	754.000	19136	0.000	0.037	0.413	0.345
WQ Storm	Detention Pond	BASE	41.75	750.655	754.000	19135	0.000	0.037	0.413	0.345
WQ Storm	Detention Pond	BASE	41.84	750.654	754.000	19133	0.000	0.037	0.413	0.345
WQ Storm	Detention Pond	BASE	41.92	750.653	754.000	19132	0.000	0.037	0.413	0.345
WQ Storm	Detention Pond	BASE	42.00	750.653	754.000	19130	0.000	0.036	0.413	0.346
WQ Storm	Detention Pond	BASE	42.09	750.652	754.000	19129	0.000	0.036	0.413	0.346
WQ Storm	Detention Pond	BASE	42.17	750.652	754.000	19127	0.000	0.036	0.413	0.346
WQ Storm	Detention Pond	BASE	42.25	750.651	754.000	19126	0.000	0.035	0.413	0.346
WQ Storm	Detention Pond	BASE	42.34	750.651	754.000	19124	0.000	0.035	0.413	0.347
WQ Storm	Detention Pond	BASE	42.42	750.650	754.000	19123	0.000	0.035	0.413	0.347
WQ Storm	Detention Pond	BASE	42.50	750.649	754.000	19122	0.000	0.035	0.413	0.347
WQ Storm	Detention Pond	BASE	42.59	750.649	754.000	19120	0.000	0.035	0.413	0.347
WQ Storm	Detention Pond	BASE	42.67	750.648	754.000	19119	0.000	0.034	0.413	0.347
WQ Storm	Detention Pond	BASE	42.75	750.648	754.000	19117	0.000	0.034	0.413	0.348
WQ Storm	Detention Pond	BASE	42.84	750.647	754.000	19116	0.000	0.034	0.413	0.348
WQ Storm	Detention Pond	BASE	42.92	750.647	754.000	19115	0.000	0.034	0.413	0.348
WQ Storm	Detention Pond	BASE	43.00	750.646	754.000	19113	0.000	0.033	0.413	0.348
WQ Storm	Detention Pond	BASE	43.09	750.646	754.000	19112	0.000	0.033	0.413	0.349
WQ Storm	Detention Pond	BASE	43.17	750.645	754.000	19110	0.000	0.033	0.413	0.349
WQ Storm	Detention Pond	BASE	43.25	750.645	754.000	19109	0.000	0.033	0.413	0.349
WQ Storm	Detention Pond	BASE	43.34	750.644	754.000	19108	0.000	0.032	0.413	0.349
WQ Storm	Detention Pond	BASE	43.42	750.644	754.000	19106	0.000	0.032	0.413	0.350
WQ Storm	Detention Pond	BASE	43.50	750.643	754.000	19105	0.000	0.032	0.413	0.350
WQ Storm	Detention Pond	BASE	43.59	750.643	754.000	19104	0.000	0.032	0.413	0.350
WQ Storm	Detention Pond	BASE	43.67	750.642	754.000	19102	0.000	0.032	0.413	0.350
WQ Storm	Detention Pond	BASE	43.75	750.642	754.000	19101	0.000	0.031	0.413	0.350
WQ Storm	Detention Pond	BASE	43.84	750.641	754.000	19100	0.000	0.031	0.413	0.351
WQ Storm	Detention Pond	BASE	43.92	750.641	754.000	19099	0.000	0.031	0.413	0.351
WQ Storm	Detention Pond	BASE	44.00	750.640	754.000	19097	0.000	0.031	0.413	0.351
WQ Storm	Detention Pond	BASE	44.09	750.640	754.000	19096	0.000	0.031	0.413	0.351
WQ Storm	Detention Pond	BASE	44.17	750.639	754.000	19095	0.000	0.030	0.413	0.351
WQ Storm	Detention Pond	BASE	44.25	750.639	754.000	19094	0.000	0.030	0.413	0.352
WQ Storm	Detention Pond	BASE	44.34	750.638	754.000	19092	0.000	0.030	0.413	0.352
WQ Storm	Detention Pond	BASE	44.42	750.638	754.000	19091	0.000	0.030	0.413	0.352
WQ Storm	Detention Pond	BASE	44.50	750.637	754.000	19090	0.000	0.030	0.413	0.352
WQ Storm	Detention Pond	BASE	44.59	750.637	754.000	19089	0.000	0.029	0.413	0.353
WQ Storm	Detention Pond	BASE	44.67	750.636	754.000	19088	0.000	0.029	0.413	0.353
WQ Storm	Detention Pond	BASE	44.75	750.636	754.000	19086	0.000	0.029	0.413	0.353
WQ Storm	Detention Pond	BASE	44.84	750.636	754.000	19085	0.000	0.029	0.413	0.353
WQ Storm	Detention Pond	BASE	44.92	750.635	754.000	19084	0.000	0.029	0.413	0.353
WQ Storm	Detention Pond	BASE	45.00	750.635	754.000	19083	0.000	0.028	0.413	0.354
WQ Storm	Detention Pond	BASE	45.09	750.634	754.000	19082	0.000	0.028	0.413	0.354
WQ Storm	Detention Pond	BASE	45.17	750.634	754.000	19080	0.000	0.028	0.413	0.354
WQ Storm	Detention Pond	BASE	45.25	750.633	754.000	19079	0.000	0.028	0.413	0.354
WQ Storm	Detention Pond	BASE	45.34	750.633	754.000	19078	0.000	0.028	0.413	0.354
WQ Storm	Detention Pond	BASE	45.42	750.632	754.000	19077	0.000	0.028	0.413	0.354
WQ Storm	Detention Pond	BASE	45.50	750.632	754.000	19076	0.000	0.027	0.413	0.355
WQ Storm	Detention Pond	BASE	45.59	750.632	754.000	19075	0.000	0.027	0.413	0.355
WQ Storm	Detention Pond	BASE	45.67	750.631	754.000	19074	0.000	0.027	0.413	0.355
WQ Storm	Detention Pond	BASE	45.75	750.631	754.000	19073	0.000	0.027	0.413	0.355
WQ Storm	Detention Pond	BASE	45.84	750.630	754.000	19071	0.000	0.027	0.413	0.355
WQ Storm	Detention Pond	BASE	45.92	750.630	754.000	19070	0.000	0.027	0.413	0.356
WQ Storm	Detention Pond	BASE	46.00	750.630	754.000	19069	0.000	0.026	0.413	0.356
WQ Storm	Detention Pond	BASE	46.09	750.629	754.000	19068	0.000	0.026	0.413	0.356
WQ Storm	Detention Pond	BASE	46.17	750.629	754.000	19067	0.000	0.026	0.413	0.356
WQ Storm	Detention Pond	BASE	46.25	750.628	754.000	19066	0.000	0.026	0.413	0.356
WQ Storm	Detention Pond	BASE	46.34	750.628	754.000	19065	0.000	0.026	0.413	0.357
WQ Storm	Detention Pond	BASE	46.42	750.627	754.000	19064	0.000	0.026	0.413	0.357
WQ Storm	Detention Pond	BASE	46.50	750.627	754.000	19063	0.000	0.026	0.413	0.357
WQ Storm	Detention Pond	BASE	46.59	750.627	754.000	19062	0.000	0.025	0.413	0.357

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
WQ Storm	Detention Pond	BASE	46.67	750.626	754.000	19061	0.000	0.025	0.413	0.357
WQ Storm	Detention Pond	BASE	46.75	750.626	754.000	19060	0.000	0.025	0.413	0.357
WQ Storm	Detention Pond	BASE	46.84	750.625	754.000	19059	0.000	0.025	0.413	0.358
WQ Storm	Detention Pond	BASE	46.92	750.625	754.000	19058	0.000	0.025	0.413	0.358
WQ Storm	Detention Pond	BASE	47.00	750.625	754.000	19057	0.000	0.025	0.413	0.358
WQ Storm	Detention Pond	BASE	47.09	750.624	754.000	19056	0.000	0.024	0.413	0.358
WQ Storm	Detention Pond	BASE	47.17	750.624	754.000	19055	0.000	0.024	0.413	0.358
WQ Storm	Detention Pond	BASE	47.25	750.624	754.000	19054	0.000	0.024	0.413	0.358
WQ Storm	Detention Pond	BASE	47.34	750.623	754.000	19053	0.000	0.024	0.413	0.359
WQ Storm	Detention Pond	BASE	47.42	750.623	754.000	19052	0.000	0.024	0.413	0.359
WQ Storm	Detention Pond	BASE	47.50	750.622	754.000	19051	0.000	0.024	0.413	0.359
WQ Storm	Detention Pond	BASE	47.59	750.622	754.000	19050	0.000	0.024	0.413	0.359
WQ Storm	Detention Pond	BASE	47.67	750.622	754.000	19049	0.000	0.024	0.413	0.359
WQ Storm	Detention Pond	BASE	47.75	750.621	754.000	19048	0.000	0.023	0.413	0.359
WQ Storm	Detention Pond	BASE	47.84	750.621	754.000	19047	0.000	0.023	0.413	0.360
WQ Storm	Detention Pond	BASE	47.92	750.621	754.000	19046	0.000	0.023	0.413	0.360
WQ Storm	Detention Pond	BASE	48.00	750.620	754.000	19045	0.000	0.023	0.413	0.360
WQ Storm	Detention Pond	BASE	48.09	750.620	754.000	19044	0.000	0.023	0.413	0.360
WQ Storm	Detention Pond	BASE	48.17	750.619	754.000	19043	0.000	0.023	0.413	0.360
WQ Storm	Detention Pond	BASE	48.25	750.619	754.000	19042	0.000	0.023	0.413	0.360
WQ Storm	Detention Pond	BASE	48.34	750.619	754.000	19041	0.000	0.022	0.413	0.360
WQ Storm	Detention Pond	BASE	48.42	750.618	754.000	19040	0.000	0.022	0.413	0.361
WQ Storm	Detention Pond	BASE	48.50	750.618	754.000	19039	0.000	0.022	0.413	0.361
WQ Storm	Detention Pond	BASE	48.59	750.618	754.000	19038	0.000	0.022	0.413	0.361
WQ Storm	Detention Pond	BASE	48.67	750.617	754.000	19037	0.000	0.022	0.413	0.361
WQ Storm	Detention Pond	BASE	48.75	750.617	754.000	19037	0.000	0.022	0.413	0.361
WQ Storm	Detention Pond	BASE	48.84	750.617	754.000	19036	0.000	0.022	0.413	0.361
WQ Storm	Detention Pond	BASE	48.92	750.616	754.000	19035	0.000	0.022	0.413	0.362
WQ Storm	Detention Pond	BASE	49.00	750.616	754.000	19034	0.000	0.021	0.413	0.362
WQ Storm	Detention Pond	BASE	49.09	750.616	754.000	19033	0.000	0.021	0.413	0.362
WQ Storm	Detention Pond	BASE	49.17	750.615	754.000	19032	0.000	0.021	0.413	0.362
WQ Storm	Detention Pond	BASE	49.25	750.615	754.000	19031	0.000	0.021	0.413	0.362
WQ Storm	Detention Pond	BASE	49.34	750.615	754.000	19030	0.000	0.021	0.413	0.362
WQ Storm	Detention Pond	BASE	49.42	750.614	754.000	19030	0.000	0.021	0.413	0.362
WQ Storm	Detention Pond	BASE	49.50	750.614	754.000	19029	0.000	0.021	0.413	0.363
WQ Storm	Detention Pond	BASE	49.59	750.614	754.000	19028	0.000	0.021	0.413	0.363
WQ Storm	Detention Pond	BASE	49.67	750.613	754.000	19027	0.000	0.021	0.413	0.363
WQ Storm	Detention Pond	BASE	49.75	750.613	754.000	19026	0.000	0.020	0.413	0.363
WQ Storm	Detention Pond	BASE	49.84	750.613	754.000	19025	0.000	0.020	0.413	0.363
WQ Storm	Detention Pond	BASE	49.92	750.612	754.000	19024	0.000	0.020	0.413	0.363
WQ Storm	Detention Pond	BASE	50.00	750.612	754.000	19024	0.000	0.020	0.413	0.363
WQ Storm	Detention Pond	BASE	50.09	750.612	754.000	19023	0.000	0.020	0.413	0.364
WQ Storm	Detention Pond	BASE	50.17	750.611	754.000	19022	0.000	0.020	0.413	0.364
WQ Storm	Detention Pond	BASE	50.25	750.611	754.000	19021	0.000	0.020	0.413	0.364
WQ Storm	Detention Pond	BASE	50.34	750.611	754.000	19020	0.000	0.020	0.413	0.364
WQ Storm	Detention Pond	BASE	50.42	750.610	754.000	19020	0.000	0.020	0.413	0.364
WQ Storm	Detention Pond	BASE	50.50	750.610	754.000	19019	0.000	0.019	0.413	0.364
WQ Storm	Detention Pond	BASE	50.59	750.610	754.000	19018	0.000	0.019	0.413	0.364
WQ Storm	Detention Pond	BASE	50.67	750.610	754.000	19017	0.000	0.019	0.413	0.365
WQ Storm	Detention Pond	BASE	50.75	750.609	754.000	19016	0.000	0.019	0.413	0.365
WQ Storm	Detention Pond	BASE	50.84	750.609	754.000	19016	0.000	0.019	0.413	0.365
WQ Storm	Detention Pond	BASE	50.92	750.609	754.000	19015	0.000	0.019	0.413	0.365
WQ Storm	Detention Pond	BASE	51.00	750.608	754.000	19014	0.000	0.019	0.413	0.365
WQ Storm	Detention Pond	BASE	51.09	750.608	754.000	19013	0.000	0.019	0.413	0.365
WQ Storm	Detention Pond	BASE	51.17	750.608	754.000	19012	0.000	0.019	0.413	0.365
WQ Storm	Detention Pond	BASE	51.25	750.607	754.000	19012	0.000	0.019	0.413	0.365
WQ Storm	Detention Pond	BASE	51.34	750.607	754.000	19011	0.000	0.018	0.413	0.366
WQ Storm	Detention Pond	BASE	51.42	750.607	754.000	19010	0.000	0.018	0.413	0.366
WQ Storm	Detention Pond	BASE	51.50	750.607	754.000	19009	0.000	0.018	0.413	0.366
WQ Storm	Detention Pond	BASE	51.59	750.606	754.000	19009	0.000	0.018	0.413	0.366
WQ Storm	Detention Pond	BASE	51.67	750.606	754.000	19008	0.000	0.018	0.413	0.366
WQ Storm	Detention Pond	BASE	51.75	750.606	754.000	19007	0.000	0.018	0.413	0.366
WQ Storm	Detention Pond	BASE	51.84	750.605	754.000	19006	0.000	0.018	0.413	0.366
WQ Storm	Detention Pond	BASE	51.92	750.605	754.000	19006	0.000	0.018	0.413	0.366
WQ Storm	Detention Pond	BASE	52.00	750.605	754.000	19005	0.000	0.018	0.413	0.367
WQ Storm	Detention Pond	BASE	52.09	750.605	754.000	19004	0.000	0.018	0.413	0.367
WQ Storm	Detention Pond	BASE	52.17	750.604	754.000	19003	0.000	0.018	0.413	0.367
WQ Storm	Detention Pond	BASE	52.25	750.604	754.000	19003	0.000	0.017	0.413	0.367
WQ Storm	Detention Pond	BASE	52.34	750.604	754.000	19002	0.000	0.017	0.413	0.367
WQ Storm	Detention Pond	BASE	52.42	750.604	754.000	19001	0.000	0.017	0.413	0.367
WQ Storm	Detention Pond	BASE	52.50	750.603	754.000	19001	0.000	0.017	0.413	0.367
WQ Storm	Detention Pond	BASE	52.59	750.603	754.000	19000	0.000	0.017	0.413	0.367
WQ Storm	Detention Pond	BASE	52.67	750.603	754.000	18999	0.000	0.017	0.413	0.367
WQ Storm	Detention Pond	BASE	52.75	750.602	754.000	18999	0.000	0.017	0.413	0.368
WQ Storm	Detention Pond	BASE	52.84	750.602	754.000	18998	0.000	0.017	0.413	0.368
WQ Storm	Detention Pond	BASE	52.92	750.602	754.000	18997	0.000	0.017	0.413	0.368
WQ Storm	Detention Pond	BASE	53.00	750.602	754.000	18996	0.000	0.017	0.413	0.368
WQ Storm	Detention Pond	BASE	53.09	750.601	754.000	18996	0.000	0.017	0.413	0.368
WQ Storm	Detention Pond	BASE	53.17	750.601	754.000	18995	0.000	0.016	0.413	0.368
WQ Storm	Detention Pond	BASE	53.25	750.601	754.000	18994	0.000	0.016	0.413	0.368

Simulation	Node	Group	Time	Stage	Warning Stage	Surface Area	Total Inflow	Total Outflow	Total Vol In	Total Vol Out
			hrs	ft	ft	ft2	cfs	cfs	af	af
WQ Storm	Detention Pond	BASE	53.34	750.601	754.000	18994	0.000	0.016	0.413	0.368
WQ Storm	Detention Pond	BASE	53.42	750.600	754.000	18993	0.000	0.016	0.413	0.369
WQ Storm	Detention Pond	BASE	53.50	750.600	754.000	18992	0.000	0.016	0.413	0.369
WQ Storm	Detention Pond	BASE	53.59	750.600	754.000	18992	0.000	0.016	0.413	0.369
WQ Storm	Detention Pond	BASE	53.67	750.600	754.000	18991	0.000	0.016	0.413	0.369
WQ Storm	Detention Pond	BASE	53.75	750.599	754.000	18990	0.000	0.016	0.413	0.369
WQ Storm	Detention Pond	BASE	53.84	750.599	754.000	18990	0.000	0.016	0.413	0.369
WQ Storm	Detention Pond	BASE	53.92	750.599	754.000	18989	0.000	0.016	0.413	0.369
WQ Storm	Detention Pond	BASE	54.00	750.599	754.000	18988	0.000	0.016	0.413	0.369
WQ Storm	Detention Pond	BASE	54.09	750.598	754.000	18988	0.000	0.016	0.413	0.369
WQ Storm	Detention Pond	BASE	54.17	750.598	754.000	18987	0.000	0.015	0.413	0.370
WQ Storm	Detention Pond	BASE	54.25	750.598	754.000	18987	0.000	0.015	0.413	0.370
WQ Storm	Detention Pond	BASE	54.34	750.598	754.000	18986	0.000	0.015	0.413	0.370
WQ Storm	Detention Pond	BASE	54.42	750.597	754.000	18985	0.000	0.015	0.413	0.370
WQ Storm	Detention Pond	BASE	54.50	750.597	754.000	18985	0.000	0.015	0.413	0.370
WQ Storm	Detention Pond	BASE	54.59	750.597	754.000	18984	0.000	0.015	0.413	0.370
WQ Storm	Detention Pond	BASE	54.67	750.597	754.000	18983	0.000	0.015	0.413	0.370
WQ Storm	Detention Pond	BASE	54.75	750.596	754.000	18983	0.000	0.015	0.413	0.370
WQ Storm	Detention Pond	BASE	54.84	750.596	754.000	18982	0.000	0.015	0.413	0.370
WQ Storm	Detention Pond	BASE	54.92	750.596	754.000	18982	0.000	0.015	0.413	0.370
WQ Storm	Detention Pond	BASE	55.00	750.596	754.000	18981	0.000	0.015	0.413	0.371
WQ Storm	Detention Pond	BASE	55.09	750.595	754.000	18980	0.000	0.015	0.413	0.371
WQ Storm	Detention Pond	BASE	55.17	750.595	754.000	18980	0.000	0.015	0.413	0.371
WQ Storm	Detention Pond	BASE	55.25	750.595	754.000	18979	0.000	0.014	0.413	0.371
WQ Storm	Detention Pond	BASE	55.34	750.595	754.000	18979	0.000	0.014	0.413	0.371
WQ Storm	Detention Pond	BASE	55.42	750.595	754.000	18978	0.000	0.014	0.413	0.371
WQ Storm	Detention Pond	BASE	55.50	750.594	754.000	18977	0.000	0.014	0.413	0.371
WQ Storm	Detention Pond	BASE	55.59	750.594	754.000	18977	0.000	0.014	0.413	0.371
WQ Storm	Detention Pond	BASE	55.67	750.594	754.000	18976	0.000	0.014	0.413	0.371
WQ Storm	Detention Pond	BASE	55.75	750.594	754.000	18976	0.000	0.014	0.413	0.371
WQ Storm	Detention Pond	BASE	55.84	750.593	754.000	18975	0.000	0.014	0.413	0.372
WQ Storm	Detention Pond	BASE	55.92	750.593	754.000	18974	0.000	0.014	0.413	0.372
WQ Storm	Detention Pond	BASE	56.00	750.593	754.000	18974	0.000	0.014	0.413	0.372
WQ Storm	Detention Pond	BASE	56.09	750.593	754.000	18973	0.000	0.014	0.413	0.372
WQ Storm	Detention Pond	BASE	56.17	750.593	754.000	18973	0.000	0.014	0.413	0.372
WQ Storm	Detention Pond	BASE	56.25	750.592	754.000	18972	0.000	0.014	0.413	0.372
WQ Storm	Detention Pond	BASE	56.34	750.592	754.000	18972	0.000	0.014	0.413	0.372
WQ Storm	Detention Pond	BASE	56.42	750.592	754.000	18971	0.000	0.014	0.413	0.372
WQ Storm	Detention Pond	BASE	56.50	750.592	754.000	18970	0.000	0.013	0.413	0.372
WQ Storm	Detention Pond	BASE	56.59	750.591	754.000	18970	0.000	0.013	0.413	0.372
WQ Storm	Detention Pond	BASE	56.67	750.591	754.000	18969	0.000	0.013	0.413	0.372
WQ Storm	Detention Pond	BASE	56.75	750.591	754.000	18969	0.000	0.013	0.413	0.373
WQ Storm	Detention Pond	BASE	56.84	750.591	754.000	18968	0.000	0.013	0.413	0.373
WQ Storm	Detention Pond	BASE	56.92	750.591	754.000	18968	0.000	0.013	0.413	0.373
WQ Storm	Detention Pond	BASE	57.00	750.590	754.000	18967	0.000	0.013	0.413	0.373
WQ Storm	Detention Pond	BASE	57.09	750.590	754.000	18967	0.000	0.013	0.413	0.373
WQ Storm	Detention Pond	BASE	57.17	750.590	754.000	18966	0.000	0.013	0.413	0.373
WQ Storm	Detention Pond	BASE	57.25	750.590	754.000	18966	0.000	0.013	0.413	0.373
WQ Storm	Detention Pond	BASE	57.34	750.590	754.000	18965	0.000	0.013	0.413	0.373
WQ Storm	Detention Pond	BASE	57.42	750.589	754.000	18964	0.000	0.013	0.413	0.373
WQ Storm	Detention Pond	BASE	57.50	750.589	754.000	18964	0.000	0.013	0.413	0.373
WQ Storm	Detention Pond	BASE	57.59	750.589	754.000	18963	0.000	0.013	0.413	0.373
WQ Storm	Detention Pond	BASE	57.67	750.589	754.000	18963	0.000	0.013	0.413	0.374
WQ Storm	Detention Pond	BASE	57.75	750.589	754.000	18962	0.000	0.013	0.413	0.374
WQ Storm	Detention Pond	BASE	57.84	750.588	754.000	18962	0.000	0.012	0.413	0.374
WQ Storm	Detention Pond	BASE	57.92	750.588	754.000	18961	0.000	0.012	0.413	0.374
WQ Storm	Detention Pond	BASE	58.00	750.588	754.000	18961	0.000	0.012	0.413	0.374
WQ Storm	Detention Pond	BASE	58.09	750.588	754.000	18960	0.000	0.012	0.413	0.374
WQ Storm	Detention Pond	BASE	58.17	750.588	754.000	18960	0.000	0.012	0.413	0.374
WQ Storm	Detention Pond	BASE	58.25	750.587	754.000	18959	0.000	0.012	0.413	0.374
WQ Storm	Detention Pond	BASE	58.34	750.587	754.000	18959	0.000	0.012	0.413	0.374
WQ Storm	Detention Pond	BASE	58.42	750.587	754.000	18958	0.000	0.012	0.413	0.374
WQ Storm	Detention Pond	BASE	58.50	750.587	754.000	18958	0.000	0.012	0.413	0.374
WQ Storm	Detention Pond	BASE	58.59	750.587	754.000	18957	0.000	0.012	0.413	0.374
WQ Storm	Detention Pond	BASE	58.67	750.586	754.000	18957	0.000	0.012	0.413	0.375
WQ Storm	Detention Pond	BASE	58.75	750.586	754.000	18956	0.000	0.012	0.413	0.375
WQ Storm	Detention Pond	BASE	58.84	750.586	754.000	18956	0.000	0.012	0.413	0.375
WQ Storm	Detention Pond	BASE	58.92	750.586	754.000	18955	0.000	0.012	0.413	0.375
WQ Storm	Detention Pond	BASE	59.00	750.586	754.000	18955	0.000	0.012	0.413	0.375
WQ Storm	Detention Pond	BASE	59.09	750.586	754.000	18954	0.000	0.012	0.413	0.375
WQ Storm	Detention Pond	BASE	59.17	750.585	754.000	18954	0.000	0.012	0.413	0.375
WQ Storm	Detention Pond	BASE	59.25	750.585	754.000	18953	0.000	0.012	0.413	0.375
WQ Storm	Detention Pond	BASE	59.34	750.585	754.000	18953	0.000	0.011	0.413	0.375
WQ Storm	Detention Pond	BASE	59.42	750.585	754.000	18952	0.000	0.011	0.413	0.375
WQ Storm	Detention Pond	BASE	59.50	750.585	754.000	18952	0.000	0.011	0.413	0.375
WQ Storm	Detention Pond	BASE	59.59	750.584	754.000	18952	0.000	0.011	0.413	0.375
WQ Storm	Detention Pond	BASE	59.67	750.584	754.000	18951	0.000	0.011	0.413	0.376
WQ Storm	Detention Pond	BASE	59.75	750.584	754.000	18951	0.000	0.011	0.413	0.376
WQ Storm	Detention Pond	BASE	59.84	750.584	754.000	18950	0.000	0.011	0.413	0.376
WQ Storm	Detention Pond	BASE	59.92	750.584	754.000	18950	0.000	0.011	0.413	0.376

Simulation	Node	Group	Time hrs	Stage ft	Warning Stage ft	Surface Area ft2	Total Inflow cfs	Total Outflow cfs	Total Vol In af	Total Vol Out af
WQ Storm Detention Pond		BASE	60.00	750.584	754.000	18949	0.000	0.011	0.413	0.376
WQ Storm Detention Pond		BASE	60.01	750.584	754.000	18949	0.000	0.011	0.413	0.376