

Table of Contents

***** MASTER SUMMARY *****

Watershed..... Master Network Summary 1.01

***** DESIGN STORMS SUMMARY *****

Sedgwick24..... Design Storms 2.01

Sedgwick24..... 5y24h
Design Storms 2.03

***** POND VOLUMES *****

POND..... Vol: Elev-Area 3.01

RB POND..... Vol: Elev-Area 3.02

***** OUTLET STRUCTURES *****

POND OUT..... Outlet Input Data 4.01

RB WEIR..... Outlet Input Data 4.03

MASTER DESIGN STORM SUMMARY

Default Network Design Storm File, ID SEDGWICK.RN Sedgwick24

Return Event	Total Depth in	Rainfall Type	RNF File	RNF ID
5y24h	4.5000	Synthetic Curve	SCSTYPES	Type I 24hr
25y24h	6.1000	Synthetic Curve	SCS	SCSI
100y24	7.9000	Synthetic Curve	SCSTYPES	Type I 24hr
10y24h	5.3000	Synthetic Curve	SCSTYPES	Type I 24hr
2y24h	3.5000	Synthetic Curve	SCSTYPES	Type I 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversi on;)
(Trun= HYG Truncati on; Blank=None; L=Left; R=Rt; LR=Left&Rt)

Storage Node ID	Return Type Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond ac-ft
*13TH ST.	JCT 5	15.511		12.7500	23.34		
*13TH ST.	JCT 25	25.096		12.5500	38.95		
*13TH ST.	JCT 100	36.511		12.6000	73.52		
*13TH ST.	JCT 10	20.212		12.7000	33.86		
*13TH ST.	JCT 2	10.005		12.9000	12.32		
BLACKSTONE	AREA 5	8.290		12.0500	120.49		
BLACKSTONE	AREA 25	13.375		12.0000	88.02		
BLACKSTONE	AREA 100	19.435		12.0500	278.70		
BLACKSTONE	AREA 10	10.785		12.0500	156.72		
BLACKSTONE	AREA 2	5.365		12.0500	77.25		
POND	IN POND 5	8.290		12.0500	120.49		
POND	IN POND 25	13.375		12.0000	88.02		
POND	IN POND 100	19.435		12.0500	278.70		
POND	IN POND 10	10.785		12.0500	156.72		
POND	IN POND 2	5.365		12.0500	77.25		
POND	OUT POND 5	8.124		14.8000	5.02	1363.40	5.124
POND	OUT POND 25	13.170		14.2500	8.62	1364.21	8.206
POND	OUT POND 100	19.178		14.5000	10.92	1365.34	12.585
POND	OUT POND 10	10.599		14.2000	7.08	1363.80	6.632

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversi on;)
(Trun= HYG Truncati on; Bl ank=None; L=Left; R=Rt; LR=Left&Rt)

Storage Node ID	Return Type	Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond ac-ft
POND	OUT POND	2	5.228		16.1000	2.60	1362.94	3.434
RB BASIN	AREA	5	6.669		12.2000	67.99		
RB BASIN	AREA	25	10.759		12.0500	65.36		
RB BASIN	AREA	100	15.634		12.2000	159.36		
RB BASIN	AREA	10	8.676		12.2000	88.83		
RB BASIN	AREA	2	4.315		12.2000	43.22		
RB POND	IN POND	5	15.530		12.2000	73.13		
RB POND	IN POND	25	25.118		12.0000	77.83		
RB POND	IN POND	100	36.540		12.2000	173.89		
RB POND	IN POND	10	20.233		12.2000	96.47		
RB POND	IN POND	2	10.020		12.2000	45.93		
RB POND	OUT POND	5	15.511		12.7500	23.34	1360.61	3.131
RB POND	OUT POND	25	25.096		12.5500	38.95	1361.26	4.451
RB POND	OUT POND	100	36.511		12.6000	73.52	1362.47	6.936
RB POND	OUT POND	10	20.212		12.7000	33.86	1361.07	4.048
RB POND	OUT POND	2	10.005		12.9000	12.32	1360.05	2.024
SOUTH EAST BASIN	AREA	5	.737		11.9500	13.30		
SOUTH EAST BASIN	AREA	25	1.189		12.0000	8.10		
SOUTH EAST BASIN	AREA	100	1.727		11.9500	30.54		
SOUTH EAST BASIN	AREA	10	.959		11.9500	17.26		
SOUTH EAST BASIN	AREA	2	.477		11.9500	8.56		
SWS	JCT	5	8.861		11.9500	13.91		
SWS	JCT	25	14.359		12.0000	13.37		
SWS	JCT	100	20.906		11.9500	34.92		
SWS	JCT	10	11.558		11.9500	18.37		
SWS	JCT	2	5.705		11.9500	8.88		

Type... Design Storms
Name... Sedgwick24

File... C:\HAESTAD\PPKW\RAINFALL\SEDGWICK.RN0
Title...

JOB TITLE NOT SPECIFIED
Click Project Summary on the File Menu to enter title

DESIGN STORMS SUMMARY

Design Storm File, ID = SEDGWICK.RN0 Sedgwick24

Storm Tag Name = 5y24h
Description: Sedgwick County 5-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF Typell 24hr
Storm Frequency = 5 yr
Total Rainfall Depth= 4.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 25y24h
Description: Sedgwick County - 25 year - 24hour

Data Type, File, ID = Synthetic Storm SCS.RNF SCSII
Storm Frequency = 25 yr
Total Rainfall Depth= 6.1000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= 1.0000 hrs End= 24.0000 hrs

Storm Tag Name = 100y24
Description: Sedgwick County 100-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF Typell 24hr
Storm Frequency = 100 yr
Total Rainfall Depth= 7.9000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 10y24h
Description: Sedgwick County 10-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF Typell 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 5.3000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Type... Design Storms
Name... Sedgwick24

File... C:\HAESTAD\PPKW\RAINFALL\SEDGWICK.RNO
Title...

JOB TITLE NOT SPECIFIED
Click Project Summary on the File Menu to enter title

DESIGN STORMS SUMMARY

Design Storm File, ID = SEDGWICK.RNO Sedgwick24

Storm Tag Name = 2y24h
Description: Sedgwick County 2-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF Type1 24hr
Storm Frequency = 2 yr
Total Rainfall Depth= 3.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Type... Design Storms
Name... Sedgwick24
File... C:\HAESTAD\PPKW\RAI NFALL\SEDGWI CK. RNO
Storm... Typell 24hr Tag: 5y24h

Page 2.03
Event: 5 yr

DESIGN STORMS SUMMARY

Design Storm File, ID = SEDGWI CK. RNO Sedgwick24

Storm Tag Name = 5y24h
Description: Sedgwick County 5-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES. RNF Typell 24hr
Storm Frequency = 5 yr
Total Rainfall Depth= 4.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 25y24h
Description: Sedgwick County - 25 year - 24hour

Data Type, File, ID = Synthetic Storm SCS. RNF SCSII
Storm Frequency = 25 yr
Total Rainfall Depth= 6.1000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= 1.0000 hrs End= 24.0000 hrs

Storm Tag Name = 100y24
Description: Sedgwick County 100-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES. RNF Typell 24hr
Storm Frequency = 100 yr
Total Rainfall Depth= 7.9000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 10y24h
Description: Sedgwick County 10-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES. RNF Typell 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 5.3000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Type... Design Storms
Name... Sedgwick24
File... C:\HAESTAD\PPKW\RAINFALL\SEDGWICK.RNQ
Storm... Typell 24hr Tag: 5y24h

Page 2.04
Event: 5 yr

DESIGN STORMS SUMMARY

Design Storm File, ID = SEDGWICK.RNQ Sedgwick24

Storm Tag Name = 2y24h
Description: Sedgwick County 2-yr 24 hour Duration

Data Type, File, ID = Synthetic Storm SCSTYPES.RNF Typell 24hr
Storm Frequency = 2 yr
Total Rainfall Depth= 3.5000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

File. . . . F:\HYDRO\PROJECTS\BLACKSTONE\PONDPACK\DEVELOPED.PPW

Elevation (ft)	Planimeter (sq.in)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	Volume (ac-ft)	Volume Sum (ac-ft)
1362.00	-----	3.6000	.0000	.000	.000
1369.00	-----	4.3300	11.8782	27.716	27.716

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

$$\text{Volume} = (1/3) * (\text{EL2}-\text{EL1}) * (\text{Area1} + \text{Area2} + \text{sq. rt.}(\text{Area1}*\text{Area2}))$$

where: EL1, EL2 = Lower and upper elevations of the increment
 Area1, Area2 = Areas computed for EL1, EL2, respectively
 Volume = Incremental volume between EL1 and EL2

File. . . . F:\HYDRO\PROJECTS\BLACKSTONE\PONDPACK\DEVELOPED.PPW

Elevation (ft)	Planimeter (sq.in)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	Volume (ac-ft)	Volume Sum (ac-ft)
1359.00	-----	1.9000	.0000	.000	.000
1364.00	-----	2.2000	6.1445	10.241	10.241
1370.00	-----	2.2000	6.6000	13.200	23.441

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

$$\text{Volume} = (1/3) * (\text{EL2}-\text{EL1}) * (\text{Area1} + \text{Area2} + \text{sq. rt.}(\text{Area1}*\text{Area2}))$$

where: EL1, EL2 = Lower and upper elevations of the increment
 Area1, Area2 = Areas computed for EL1, EL2, respectively
 Volume = Incremental volume between EL1 and EL2

Type... Outlet Input Data
Name... POND OUT

File... F:\HYDRO\PROJECTS\BLACKSTONE\PONDPACK\DEVELOPED.PPW

REQUESTED POND WS ELEVATIONS:

Min. Elev. = 1362.00 ft
Increment = .50 ft
Max. Elev. = 1369.00 ft

OUTLET CONNECTIVITY

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.	Outfall	E1, ft	E2, ft
----- Culvert-Circular TW SETUP, DS Channel	CV	---> TW	1362.000	1369.000

File... F:\HYDRO\PROJECTS\BLACKSTONE\PONDPACK\DEVELOPED.PPW

OUTLET STRUCTURE INPUT DATA

Structure ID = CV
Structure Type = Culvert-Circular

No. Barrels = 1
Barrel Diameter = 2.0000 ft
Upstream Invert = 1362.00 ft
Dnstream Invert = 1361.00 ft
Horiz. Length = 1100.00 ft
Barrel Length = 1100.00 ft
Barrel Slope = .00091 ft/ft

OUTLET CONTROL DATA...

Mannings n = .0130
Ke = .5000 (forward entrance loss)
Kb = .012411 (per ft of full flow)
Kr = .5000 (reverse entrance loss)
HW Convergence = .001 +/- ft

INLET CONTROL DATA...

Equation form = 1
Inlet Control K = .0098
Inlet Control M = 2.0000
Inlet Control c = .03980
Inlet Control Y = .6700
T1 ratio (HW/D) = 1.160
T2 ratio (HW/D) = 1.306
Slope Factor = -.500

Use unsubmerged inlet control Form 1 equ. below T1 elev.
Use submerged inlet control Form 1 equ. above T2 elev.

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

At T1 Elev = 1364.32 ft ---> Flow = 15.55 cfs
At T2 Elev = 1364.61 ft ---> Flow = 17.77 cfs

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...

Maximum Iterations = 30
Min. TW tolerance = .01 ft
Max. TW tolerance = .01 ft
Min. HW tolerance = .01 ft
Max. HW tolerance = .01 ft
Min. Q tolerance = .10 cfs
Max. Q tolerance = .10 cfs

Type... Outlet Input Data
Name... RB WEIR

File... F:\HYDRO\PROJECTS\BLACKSTONE\PONDPACK\DEVELOPED.PPW

REQUESTED POND WS ELEVATIONS:

Min. Elev. = 1359.00 ft
Increment = .50 ft
Max. Elev. = 1370.00 ft

OUTLET CONNECTIVITY

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.	Outfall	E1, ft	E2, ft
----- User Defined Table TW SETUP, DS Channel	WR	---> TW	.000	1370.000

OUTLET STRUCTURE INPUT DATA

Structure ID = WR
Structure Type = User Defined Table

ELEV-FLOW RATING TABLE

Elev, ft	Flow, cfs
1359.00	.00
1359.50	4.00
1360.00	11.40
1360.50	20.90
1361.00	32.20
1361.50	45.00
1362.00	59.20
1362.50	74.60
1363.00	91.20
1363.50	108.80
1364.00	134.20
1370.00	437.00

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...
Maximum Iterations= 30
Min. TW tolerance = .01 ft
Max. TW tolerance = .01 ft
Min. HW tolerance = .01 ft
Max. HW tolerance = .01 ft
Min. Q tolerance = .10 cfs
Max. Q tolerance = .10 cfs

Index of Starting Page Numbers for ID Names

----- P -----

POND... 3.01

POND OUT... 4.01

----- R -----

RB POND... 3.02

RB WEIR... 4.03

----- S -----

Sedgwick24... 2.01, 2.03

----- W -----

Watershed... 1.01