

0614-012



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Architectural and Engineering Services

LETTER OF TRANSMITTAL

TO: Ohio Department of Natural Resources
Division of Water
Dam Safety Engineering Program
2045 Morse Road, Building B-2
Columbus, Ohio 43229-6693

DATE: July 12, 2012
PROJECT: Sippo Creek Reservoir Dam
JOB NO.: 13814498 (ODNR #0614-012)
PROJ. MGR. Mike Damian
RE: ODNR Comment Response Letter

ATTN: Keith Banachowski, PE, Program Manager

Ladies / Gentlemen:

We are sending you Attached Under Separate Cover the following items:
 Shop Drawings Drawings (Prints) Proposal Request Copy of Letters
 Product Data Project Manual Change Order Computer Media
 Samples Tracings Technical Spec Other

NO. OF COPIES	DRAWING NUMBER	DATE	DESCRIPTION	DISP.
1		June. '12	ODNR Comment Response Letter	1, 2
1		June. '12	Attachments	1, 2

These are transmitted for the following disposition:

- 1. For Your Approval
- 2. For Your Use/Information
- 3. As Requested
- 4. For Review and Comment
- 5. For Bidding
- 6. For Construction
- 7. Conforms As Is
- 8. Conforms As Noted
- 9. Does Not Conform
- 10. Other

REMARKS: Keith, attached is our response and attachments to the ODNR Comment Letter for your files. Please review these responses so we can obtain approval of the H&H Study. I still need to finalize a Feasibility Report for the City. Let me know if you have any questions or comments. Thank you.

COPIES: Keith Dylewski, PE, City of Massillon Engineer
Mike Damian, CPG, URS Project Manager
File 13814498

RECEIVED

JUL 19 2012

ODNR/Div. Of Water
Dam Safety Program

SIGNED: Michael Shore



June 21, 2012

Ohio Department of Natural Resources
Division of Water
c/o Mr. Keith Banachowski, P.E.
Dam Safety Engineering Program
2045 Morse Road, Building B-2
Columbus, OH 43229-6693

RECEIVED

JUL 19 2012

ODNR/Div. Of Water
Dam Safety Program

**RE: Sippo Creek Reservoir Dam
City of Massillon, Stark County
Hydrologic and Hydraulic Report Comments Response
File Number 0614-012**

Dear Mr. Banachowski:

URS Corporation (URS) is pleased to submit the following responses to the ODNR comments regarding the Hydrologic and Hydraulic Report for the Sippo Creek Reservoir Dam for the City of Massillon. This submittal reflects the responses to the H&H comments provided to the City of Massillon on April 4, 2012. URS is providing these services to develop a design discharge for the dam and to bring the dam into compliance with ODNR regulations.

Hydrology and Hydraulics for Sippo Creek Reservoir Watershed and Dam

1. The Dam Safety Engineering Program is in agreement with the methods used in the analysis and results of URS's report.

No response required.

2. Table "A", Breach Input Parameters, showed the normal pool storage to be 61 acre-feet. The normal pool storage based on the conic volume formula for a depth of 15 feet and a surface area of 7.1 acres is 36 acre-feet. The difference in volume is the result of elevation/area data below the normal pool level. Please explain how the elevation/area data below the normal pool level was developed.

Response:

The elevation/area data below the normal pool level was developed from approximated bathymetric contours. The contours were based on a proposed dredge plan to remove sediment accumulated in the reservoir, in an attempt to return the lake to its original depth. The invert of the lake near the dam was estimated to be at the same elevation as the surveyed downstream channel elevation. Interpolated bathymetry was developed to approximate the wetted perimeter and area at each elevation below the normal pool. HydroCAD determined the irregular shape's stage/storage relationship from the area and perimeter data. This method provides more accurate storage calculations than does the conic volume equation.

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3. The State of Ohio has hired a consultant to perform a study to update the Probable Maximum Precipitation (PMP) values for the state. The preliminary results indicate that PMP values will reduce by approximately 25%. This would reduce the Probable Maximum Flood, the design flood for the dam, by a similar percentage.

Response:

Based on the estimated 25% reduction in PMP values, the current 6-hr PMP depth of 26.15 inches will be decreased to an approximate depth of 19.61 inches. Accordingly, the reduction in the PMP depth will result in lowering the existing PMF of 31,970 cfs to 21,087 cfs, which should be accepted as the dam's regulatory design discharge. The lowest acceptable critical flood is the 40-percent PMF, which has been determined to be 5, 227 cfs.

Lincoln Way Flood Routing Analysis

1. The Dam Safety Engineering Program is in agreement with the methods used in the analysis and results of URS's report.

No response required.

2. Page 2-15 states that the maximum capacity of the culvert is approximately 3500 cubic feet per second. Review of the energy grade line for cross section 5409 just upstream of the culvert indicates that the maximum capacity of the culvert is 3000 cubic feet per second. Please address this inconsistency.

Response:

The top of the Lincoln Way Road is at an approximate elevation of 1108.0. In the URS HEC-RAS model, a large entrance loss ($Ke=0.9$) was used to determine the maximum head expected upstream of the embankment, and the minimum capacity of the culvert. The actual entrance loss for the culvert is estimated to be between 0.2-0.4, as shown on the attached Lincoln Way Culvert Comparison Chart. The culvert is an arch box, with 30-75° wingwalls, and square crown. The crown has become rounded by spalling. The actual entrance loss into the culvert is a best estimate. In the HydroCAD model, a much lower entrance loss (0.2) was used to minimize storage behind the embankment, to remain conservative. Using the higher entrance loss in the HEC-RAS model determines worst-case upstream flooding depths. Using a lower entrance loss in the HydroCAD model prevents increased storage from lowering the discharge downstream. Using a conservative Ke value of 0.5 for the culvert, in the HEC-RAS model, shows it has a capacity of approximately 3,350 cfs (see attached Lincoln Way Culvert Comparison Chart). Using an entrance loss value of 0.2 in the HydroCAD model indicates that the capacity of the culvert is approximately 3,480 cfs as shown in the Lincoln Way Culvert Comparison Chart. Using an entrance loss this low in the HEC-RAS model overestimates the capacity of the culvert.



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There are several important similarities in the two models. The URS and the FIS geometries both used a 1:24,000 topographic contour map, with a 2-foot contour interval. The area has not changed much since the 1982 FIS was performed, although the FIS used a 1970 topographic map, and the URS map was dated 2001. The cross section data should be similar for both models and the 100-year flood area of inundation for both models are similar (albeit the URS model shows lower water surface elevations). The slope of the channel along the Tremont Avenue SE reach in the FIS model appears to be consistent with that of the URS model. However, the inverts of several of the cross sections in the FIS model are lower than those used in the URS model. In addition, the Sippo Creek Pressure Conduit is included in both models, but the FIS model appears to over-estimate the pipe's capacity.

It is the opinion of URS that the FIS Manning's' roughness coefficients for the channel and overbank are slightly over-estimated, which yields higher water surface elevations. The FIS model tends to be more conservative than the URS model, which also results in higher water surface elevations. The URS model is more detailed and is likely to have more accurate results than does the Flood Insurance Rate Map shown in the Flood Insurance Study. Neither model is calibrated to actual flood data.

Results and Conclusions

1. The classification of the dam must consider failure of the dam during minor and major flood events. Based on the flood profiles in the FEMA FIS, failure of the dam with a base flow of 800 cubic feet per second (slightly less than the 10-year flood) would have the potential to increase the water surface elevation of East Sippo Creek downstream of Lincoln Way by over three feet. This would likely have significant impact to low-lying homes along Tremont Avenue Southeast. Until the comments provided in this letter have been addressed, this conclusion appears to be valid and the classification of Class I is appropriate.

Response: Based on a dam failure during a discharge approximating the 10-year flood, flows downstream of Tremont Avenue SE would increase from 1,100 cfs to 2,426 cfs as shown on the attached SippoCreek-TremontAve_ComparisonChart. The increased flow would raise flooding depths an additional 1.5 to 2.5 feet through the majority of the reach. However, since the capacity of the Sippo Creek Pressure Conduit would be exceeded during this event, the increased depth of flooding near the conduit would be significantly more in this area.

It is agreed that a dam failure during lesser floods would increase flooding downstream of Lincoln Way. This increase would cause flooding to the houses along Tremont Avenue SE, and could possibly cause a loss of life in the area. Therefore, the appropriate Hazard Classification of the dam is a Class I.

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2. Based on the submitted analysis and using either the URS or the FEMA flood profiles for East Sippo Creek, it appears that failure of the dam for base floods in excess of 3,000 cubic feet per second would have minimal impact on homes downstream of Lincoln Way.

Response: Agreed. Although the design flood for a Class I dam is the PMF, and the lowest critical flood allowed is 40-percent PMF, this structure has a unique situation in which a failure during a base flood of over 3,000 cfs would have minimal impact on the homes downstream of Lincoln Way. The 40-percent PMF can be proven to be a critical flood as shown on the attached SippoCreek-TremontAve_ComparisonChart. Floods larger than this are also critical floods. There is a flood between the 10-year and the 40-percent PMF that will cause additional flooding downstream of Tremont Avenue SE that would not pass the critical flood criteria. The 10-year flood does not pass the critical flood criteria, and cannot be considered a critical flood. However, it should be considered reasonable to use a design storm of no more than 4,000 cfs for this dam.

3. The submitted analysis considered the existing uneven crest profile of the dam. Any modification of the dam must address leveling the crest. Therefore, the final analysis must provide a proposed uniform crest elevation. Please be aware that the selection of the crest elevation could affect some of the results and conclusions of the submitted analysis.

Response: The feasibility study will address the uneven crest of the dam. All proposed alternative will have a level crest at roughly its current elevation. Based on the H&H analysis, it would appear that the depth of flooding over the dam during extreme floods would preclude using any other method to pass the design flood, other than overtopping protection for the entire dam crest.

URS has provided these responses, which will be incorporated into the URS feasibility study, based on the design discharge once it is approved. There is no tentative start of construction date.

- The current inflow design discharge is the Probable Maximum Flood, which has been determined by URS to be 21,087 cfs, based on a 75 percent reduction in PMP depths.
- Based on the URS revised analyses, the current High Hazard Classification I appears to be the appropriate classification.
- It is the opinion of URS that a critical flood exists, which is smaller than the allowable 40-percent PMF critical flood for a High Hazard Class I dam. The revised 40-percent PMF discharge has been determined to be 5,227 cfs.
- URS requests that the 0.4 PMF smallest critical flood be used as the design flood for the Dam since it is classified as a High Hazard Class Dam.

→ This was not performed.



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ATTACHMENTS

The items listed below are attached to and made a part of this submittal. They contain the revised hydraulic modeling, FIS Data, modeling output, and analyses.

Tremont Avenue SE Cross Section Comparison Chart

Lincoln Way Culvert Rating Curve Comparison Chart

HydroCAD Output

HEC-RAS Output

FIRM Panel FM39151C0192E

2012 FIS Floodway Data and Flood Profile

10-year Flood - Dam Failure Spreadsheet

40-percent PMF - Dam Failure Spreadsheet

NGVD 29 to NAVD88 Conversion Sheet

Sippo Creek - Tremont Avenue SE Cross Section Comparison Chart - FIS Calibrated Model

FIS XS	10-year Dam Failure Comparison										Critical Flood Check					
	FIS XS Invert Elevation ¹	100-yr FIS WSE ¹	FIS Flow Depth	Nearest HEC-RAS XS	HEC-RAS XS Invert Elevation	100-yr HEC RAS WSE	100-yr HEC RAS Flow Depth	Invert Difference (URS minus FIS)	100-yr WSE Difference (URS minus FIS)	10-yr Failure Depth ²	10-yr HEC-RAS Flow Depth	10-yr HEC-RAS WSE	10-yr Flood Dam Failure WSE ²	Incremental Depth = 10-yr Depth minus Failure Depth	10-yr Average Velocity	10-yr Ave V * WSE Difference
A	942.40	948.2	5.80	1526	942.35	952.89	10.54	-0.05	4.69	12.65	5.38	947.73	955.00	7.27	3.67	26.68
B	946.50	958.7	12.20	1863	946.35	953.62	7.27	-0.15	-5.08	8.83	5.22	951.57	955.18	3.61	8.50	30.69
C	950.70	960.4	9.70	2316	951.80	957.99	6.19	1.10	-2.41	6.88	4.50	956.30	958.68	2.38	5.66	13.47
D	958.50	966.5	8.00	2954	960.00	965.11	5.11	1.50	-1.39	5.48	4.13	964.13	965.48	1.35	4.35	5.87
E	964.00	971.4	7.40	3765	965.45	970.23	4.78	1.45	-1.17	5.23	3.55	969.00	970.68	1.68	8.62	14.48

FIS XS	40-percent PMF Dam Failure Comparison										Critical Flood Check					
	FIS XS Invert Elevation ¹	500-yr FIS WSE ¹	FIS Flow Depth	Nearest HEC-RAS XS	HEC-RAS XS Invert Elevation	500-yr HEC RAS WSE	HEC-RAS Flow Depth	Invert Difference (URS minus FIS)	500-yr WSE Difference (URS minus FIS)	40% PMF Failure Depth ²	40% PMF HEC-RAS Flow Depth	40% PMF HEC-RAS WSE	40% PMF Dam Failure WSE ²	Incremental Depth = 40% PMF Depth minus Failure Depth	40% PMF Average Velocity	40% PMF Ave V * WSE Difference
A	942.40	956.5	14.10	1526	942.35	955.56	13.21	-0.05	-0.94	17.03	16.61	959.29	959.70	0.41	14.43	5.92
B	946.50	960.0	13.50	1863	946.35	956.34	9.99	-0.15	-3.66	12.26	12.17	958.94	959.04	0.10	5.40	0.54
C	950.70	962.0	11.30	2316	951.80	959.02	7.22	1.10	-2.98	10.32	10.20	962.05	962.17	0.12	5.66	0.68
D	958.50	967.5	9.00	2954	960.00	965.69	5.69	1.50	-1.81	7.63	7.55	967.57	967.65	0.08	6.83	0.55
E	964.00	972.8	8.75	3765	965.45	970.95	5.50	1.45	-1.80	6.32	6.30	971.80	971.82	0.02	3.33	0.07

¹ - Values taken from 2012 FIS Floodway Data Sheet & Flood Profile - (NAVD88)

²-Water surface elevation based on Breach Equations Spreadsheet and HydroCAD output

FIS 10-yr discharge = 1,100 cfs

10-yr dam failure discharge = 5,056 cfs (Downstream of Dam)

10-yr dam failure discharge = 2,426 cfs (Downstream of Lincoln Way)

FIS 100-yr discharge = 1,980 cfs

FIS 500-yr discharge = 2,650 cfs

40-percent PMF discharge = 5,227 cfs

40-percent PMF dam failure discharge = 5,300 cfs (Downstream of Dam)

40-percent PMF dam failure discharge = 5,346 cfs (Downstream of Lincoln Way)

Critical flood must have an incremental depth < 2-feet and the product of the incremental depth times the average velocity < 7 ft²/s

Average Channel Slope Check

FIS			HEC-RAS		
FIS Channel Station	FIS Channel Slope	Invert	Station	Stream Length	Invert
3,334	0.0105	942.40	3334	390	942.35
3,724	0.0093	946.50	3724	450	946.35
4,174	0.0115	950.70	4174	680	951.80
4,854	0.0073	958.50	4854	750	960.00
5,604		964.00	5604		965.45
		21.60	2270	0.0095	23.10
		Total Reach Length		Average Slope	
		2270		0.0103	

Ave. Elev. Difference

Average Slope

Total Reach Length

Average Slope

Lincoln Way Culvert Comparison Chart

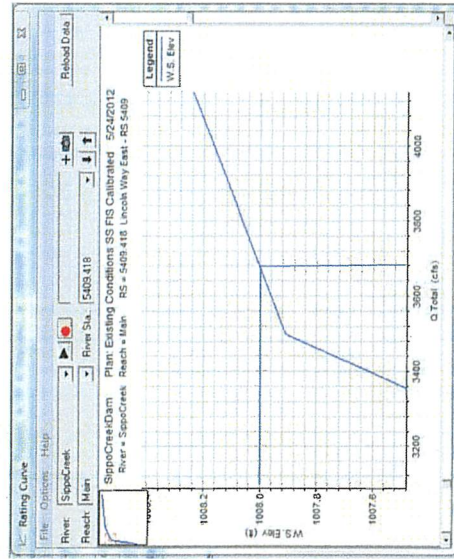
HydroCAD Output
Lincoln Way Culvert Rating Curve (Ke=0.2)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
1,007.52	3,449.72	3,449.72	0
1,007.60	3,455.22	3,455.22	0
1,007.68	3,460.71	3,460.71	0
1,007.76	3,466.19	3,466.19	0
1,007.84	3,471.66	3,471.66	0
1,007.92	3,477.13	3,477.13	0
1,008.00	3,482.58	3,482.58	0
1,008.08	3,505.69	3,488.03	17.67
1,008.16	3,544.37	3,493.47	50.91
1,008.24	3,594.15	3,498.90	95.26
1,008.32	3,653.64	3,504.32	149.32
1,008.40	3,722.14	3,509.73	212.41

Ke Entrance Type

- 0.5 Box, headwall w/3 square edges
- 0.2 Box, headwall w/3 rounded edges
- 0.4 Box, 30-75° wingwalls, square crown
- 0.2 Box, 30-75° wingwalls, rounded crown
- 0.5 Box, 10-30° wingwalls, square crown
- 0.7 Box, 0° wingwalls, square crown edge

HEC-RAS Output
Lincoln Way Culvert Rating Curve (Ke=0.2)

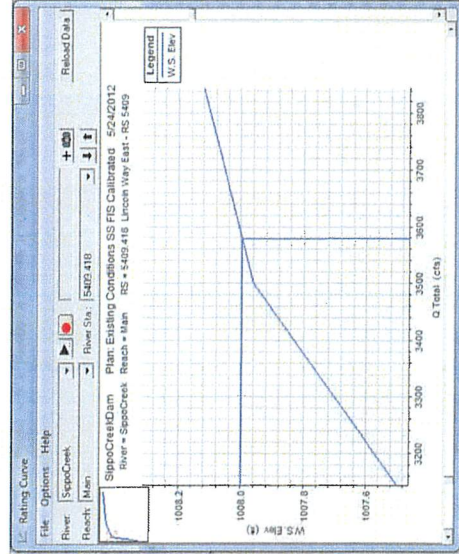


Overtopping at approximately 3,680 cfs

HydroCAD Output
Lincoln Way Culvert Rating Curve (Ke=0.3)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
1,007.84	3,204.61	3,204.61	0
1,007.92	3,209.66	3,209.66	0
1,008.00	3,214.69	3,214.69	0
1,008.08	3,237.38	3,219.72	17.67
1,008.16	3,275.65	3,224.74	50.91
1,008.24	3,325.01	3,229.75	95.26
1,008.32	3,384.08	3,234.75	149.32
1,008.40	3,452.16	3,239.75	212.41
1,008.48	3,528.86	3,244.74	284.12
1,008.56	3,613.92	3,249.72	364.12
1,008.64	3,707.20	3,254.69	452.51
1,008.72	3,808.61	3,259.66	548.95

HEC-RAS Output
Lincoln Way Culvert Rating Curve (Ke=0.3)

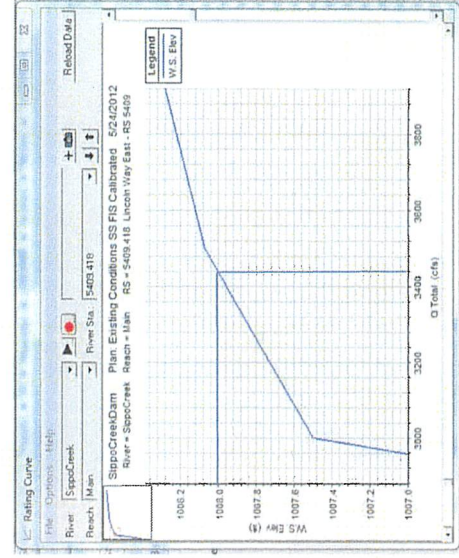


Overtopping at approximately 3,580 cfs

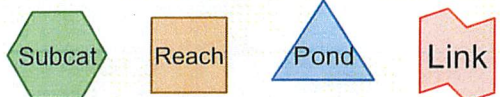
HydroCAD Output
Lincoln Way Culvert Rating Curve (Ke=0.4)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
1,007.32	2,825.87	2,825.87	0
1,007.58	2,841.36	2,841.36	0
1,007.83	2,855.93	2,855.93	0
1,008.06	2,882.35	2,869.68	12.67
1,008.28	3,002.19	2,881.90	120.3
1,008.47	3,160.83	2,889.76	271.07
1,008.63	3,331.29	2,894.57	436.71
1,008.77	3,504.81	2,897.71	607.1
1,008.89	3,673.97	2,899.66	774.31
1,008.99	3,838.44	2,900.92	937.53
1,009.09	3,999.24	2,901.75	1,097.49
1,009.18	4,157.55	2,902.33	1,255.22

HEC-RAS Output
Lincoln Way Culvert Rating Curve (Ke=0.4)



Overtopping at approximately 3,440 cfs



Drainage Diagram for Existing Conditions Sippo Reservoir-URS-Final-R
 Prepared by URS Corporation, Printed 6/5/2012
 HydroCAD® 9.10 s/n 04378 © 2010 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1,427.200	67	(HYD11, HYD9)
1,075.200	68	1 acre lots, 20% imp, HSG B (HYD 4)
1,068.800	69	Pasture/grassland/range, Fair, HSG B (HYD6)
1,401.600	70	1/2 acre lots, 25% imp, HSG B (HYD 3)
838.400	74	>75% Grass cover, Good, HSG C (HYD 1, HYD12)
2,969.600	75	1/4 acre lots, 38% imp, HSG B (HYD 2, HYD13, HYD8)
678.400	80	1/2 acre lots, 25% imp, HSG C (HYD14)
9,459.200	72	TOTAL AREA

Existing Conditions Sippo Reservoir-URS-Final-R

Prepared by URS Corporation

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
6,515.200	HSG B	HYD 2, HYD 3, HYD 4, HYD13, HYD6, HYD8
1,516.800	HSG C	HYD 1, HYD12, HYD14
0.000	HSG D	
1,427.200	Other	HYD11, HYD9
9,459.200		TOTAL AREA

Existing Conditions Sippo Reservoir-URS-Final-R

Prepared by URS Corporation

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Printed 6/5/2012

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Pipe Listing (all nodes)

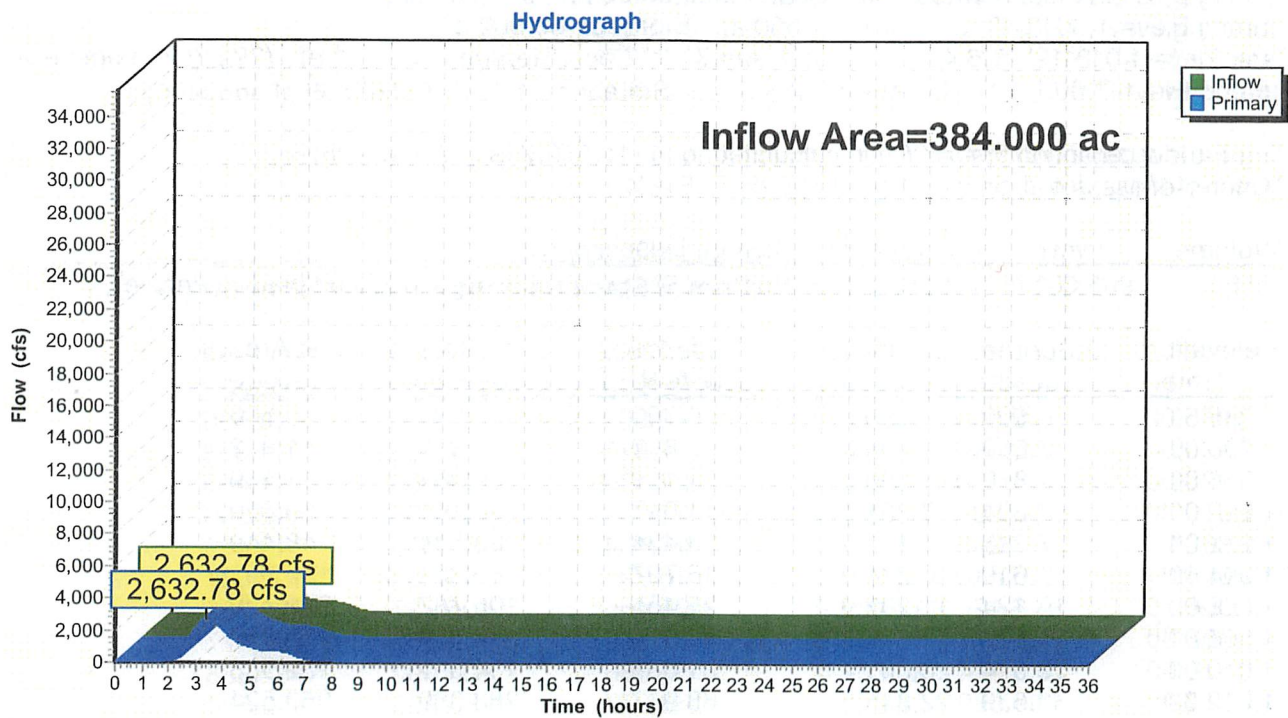
Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Fill (inches)
1	3P	1,088.00	1,076.00	450.0	0.0267	0.012	36.0	0.0	0.0
2	8P	1,018.00	1,017.00	60.0	0.0167	0.025	48.0	0.0	0.0
3	16P	978.25	978.13	121.8	0.0010	0.015	168.0	98.0	0.0

Summary for Pond 1C: CONF 1 Combined O'Springs and Eric

Inflow Area = 384.000 ac, 26.60% Impervious, Inflow Depth = 16.06" for 6 hr PMF Rev. TR-60 event
 Inflow = 2,632.78 cfs @ 3.40 hrs, Volume= 513.782 af
 Primary = 2,632.78 cfs @ 3.41 hrs, Volume= 513.782 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 1C: CONF 1 Combined O'Springs and Eric



Summary for Pond 1P: Sippo Creek Reservoir - Existing Conditions

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 15.19" for 6 hr PMF Rev. TR-60 event
 Inflow = 21,086.51 cfs @ 6.23 hrs, Volume= 11,977.693 af
 Outflow = 21,029.65 cfs @ 6.39 hrs, Volume= 11,963.980 af, Atten= 0%, Lag= 9.5 min
 Primary = 4,527.37 cfs @ 6.39 hrs, Volume= 3,911.893 af
 Secondary = 13,958.80 cfs @ 6.39 hrs, Volume= 7,012.238 af
 Tertiary = 2,543.50 cfs @ 6.40 hrs, Volume= 1,039.849 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Starting Elev= 1,001.64' Surf.Area= 7.050 ac Storage= 60.962 af
 Peak Elev= 1,015.19' @ 6.41 hrs Surf.Area= 71.772 ac Storage= 453.715 af (392.753 af above start)
 Flood Elev= 1,005.00' Surf.Area= 12.657 ac Storage= 91.431 af (30.469 af above start)

Plug-Flow detention time= 25.7 min calculated for 11,899.713 af (99% of inflow)
 Center-of-Mass det. time= 14.0 min (527.4 - 513.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	985.00'	1,292.544 af	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
985.00	0.500	500.0	0.000	0.000	0.500
990.00	3.000	1,000.0	7.875	7.875	1.873
998.00	4.870	2,500.0	31.179	39.054	11.469
1,000.00	6.204	3,251.0	11.047	50.101	19.360
1,002.00	7.243	5,147.0	13.434	63.535	48.449
1,004.00	9.610	10,274.0	16.797	80.332	192.887
1,006.00	16.124	11,202.9	25.455	105.787	229.335
1,008.00	21.577	15,736.9	37.569	143.356	452.477
1,010.00	29.674	20,301.4	51.036	194.392	752.988
1,012.00	39.539	22,845.5	68.977	263.369	953.524
1,014.00	68.669	34,370.5	106.876	370.246	2,158.174
1,025.00	100.000	50,000.0	922.298	1,292.544	4,567.204

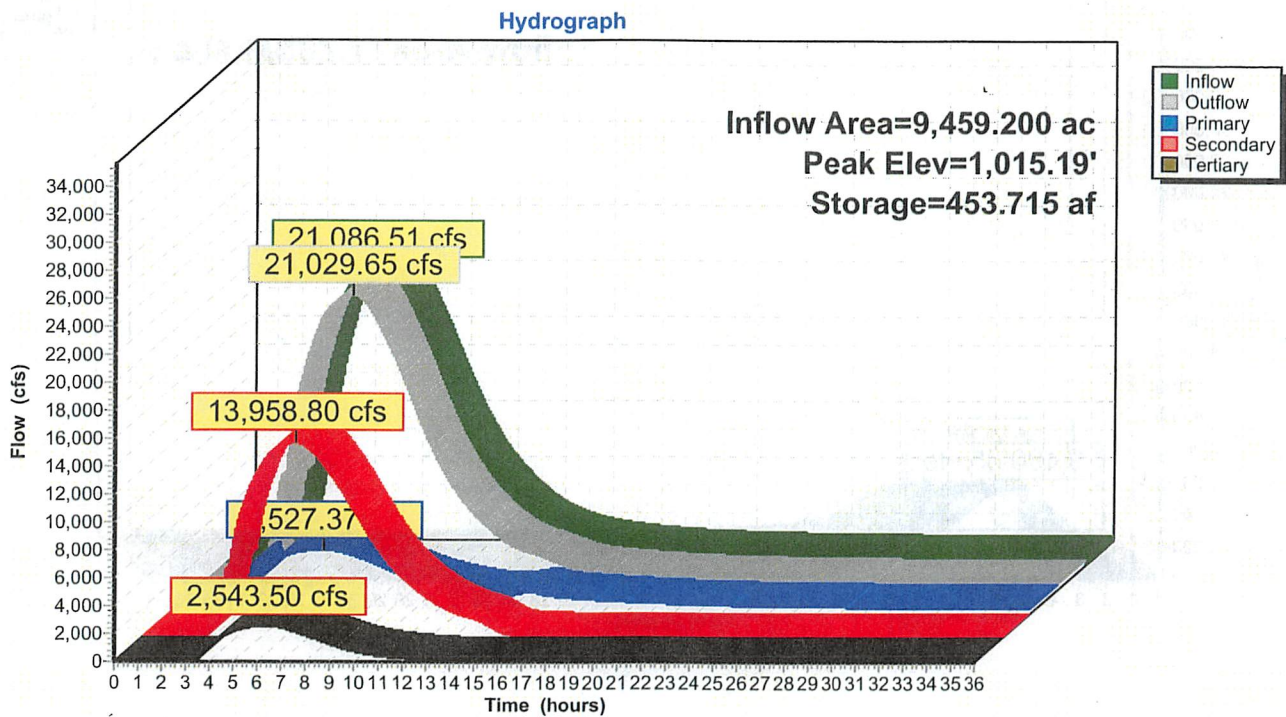
Device	Routing	Invert	Outlet Devices
#1	Primary	1,001.64'	50.0' long x 2.9' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.45 2.58 2.66 2.66 2.65 2.64 2.65 2.69 2.69 2.73 2.83 2.95 3.01 3.12 3.32
#2	Secondary	1,005.00'	Right Embankment Weir - Building side, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 1.60 20.00 Width (feet) 17.00 23.00 77.00 77.00
#3	Secondary	1,004.20'	Left Embankment Weir - Playground side, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 1.80 3.80 5.80 15.80 Width (feet) 10.00 22.00 45.00 130.00 180.00 205.00
#4	Tertiary	1,008.00'	Weir Flow around Bldg. X 0.50, Cv= 2.62 (C= 3.28) Head (feet) 0.00 2.00 4.00 6.00 8.00 10.00 12.00 Width (feet) 50.00 90.00 122.00 166.00 240.00 334.00 420.00

Primary OutFlow Max=4,527.18 cfs @ 6.39 hrs HW=1,015.19' TW=1,013.23' (Dynamic Tailwater)
 ↳1=Broad-Crested Rectangular Weir (Weir Controls 4,527.18 cfs @ 6.68 fps)

Secondary OutFlow Max=13,958.22 cfs @ 6.39 hrs HW=1,015.19' TW=1,013.23' (Dynamic Tailwater)
 ↳2=Right Embankment Weir - Building side (Weir Controls 4,542.11 cfs @ 6.39 fps)
 ↳3=Left Embankment Weir - Playground side (Weir Controls 9,416.10 cfs @ 6.30 fps)

Tertiary OutFlow Max=2,543.43 cfs @ 6.40 hrs HW=1,015.19' TW=1,013.23' (Dynamic Tailwater)
 ↳4=Weir Flow around Bldg. (Weir Controls 2,543.43 cfs @ 2.95 fps)

Pond 1P: Sippo Creek Reservoir - Existing Conditions

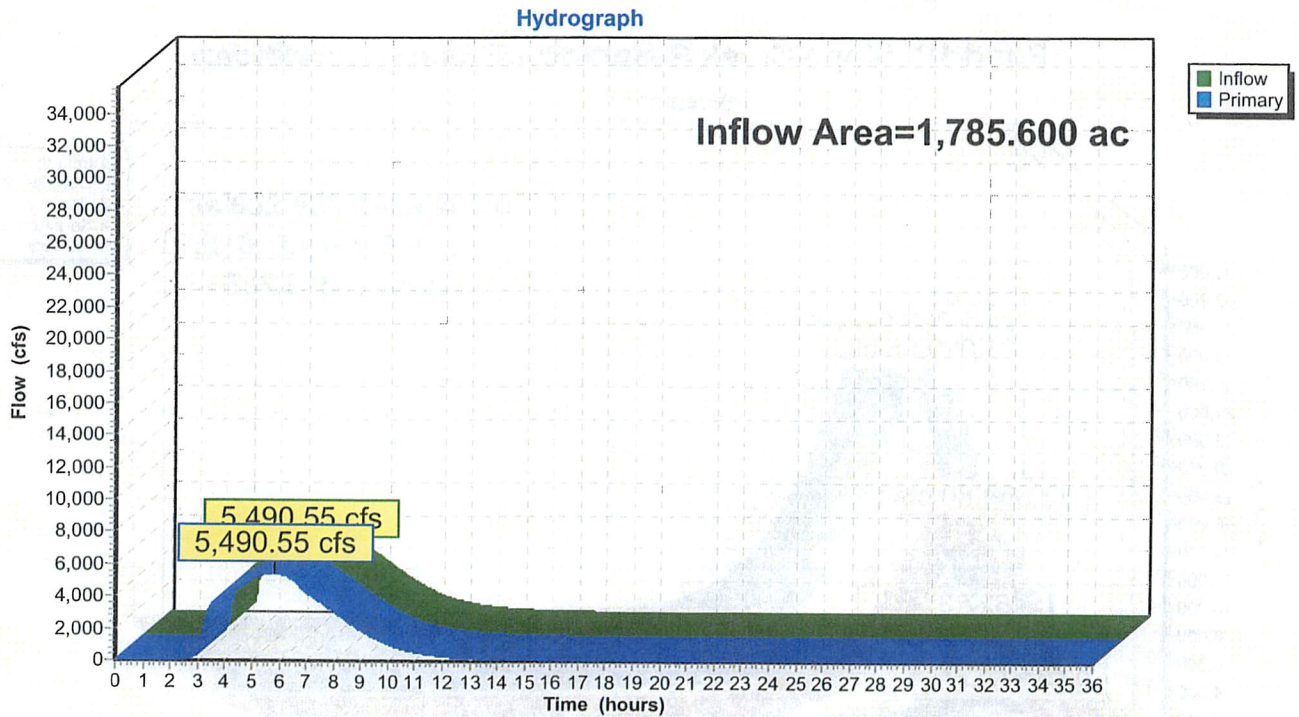


Summary for Pond 2C: CONF 2 Combined Cable and O'Springs

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 15.43" for 6 hr PMF Rev. TR-60 event
 Inflow = 5,490.55 cfs @ 5.78 hrs, Volume= 2,296.069 af
 Primary = 5,490.55 cfs @ 5.79 hrs, Volume= 2,296.069 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 2C: CONF 2 Combined Cable and O'Springs



Summary for Pond 3P: Lake Cable

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 15.43" for 6 hr PMF Rev. TR-60 event
 Inflow = 5,490.55 cfs @ 5.79 hrs, Volume= 2,296.068 af
 Outflow = 4,355.55 cfs @ 6.97 hrs, Volume= 2,380.573 af, Atten= 21%, Lag= 70.9 min
 Primary = 988.86 cfs @ 6.97 hrs, Volume= 1,343.595 af
 Secondary = 3,366.69 cfs @ 6.97 hrs, Volume= 1,036.978 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Starting Elev= 1,097.40' Surf.Area= 220.000 ac Storage= 1,914.000 af
 Peak Elev= 1,100.63' @ 6.97 hrs Surf.Area= 335.265 ac Storage= 2,814.586 af (900.586 af above start)
 Flood Elev= 1,099.50' Surf.Area= 296.000 ac Storage= 2,455.800 af (541.800 af above start)

Plug-Flow detention time= 1,258.8 min calculated for 466.444 af (20% of inflow)
 Center-of-Mass det. time= 316.4 min (709.6 - 393.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,080.00'	4,144.025 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,080.00	0.000	0.000	0.000
1,097.40	220.000	1,914.000	1,914.000
1,099.50	296.000	541.800	2,455.800
1,100.00	316.700	153.175	2,608.975
1,103.00	405.000	1,082.550	3,691.525
1,104.00	500.000	452.500	4,144.025

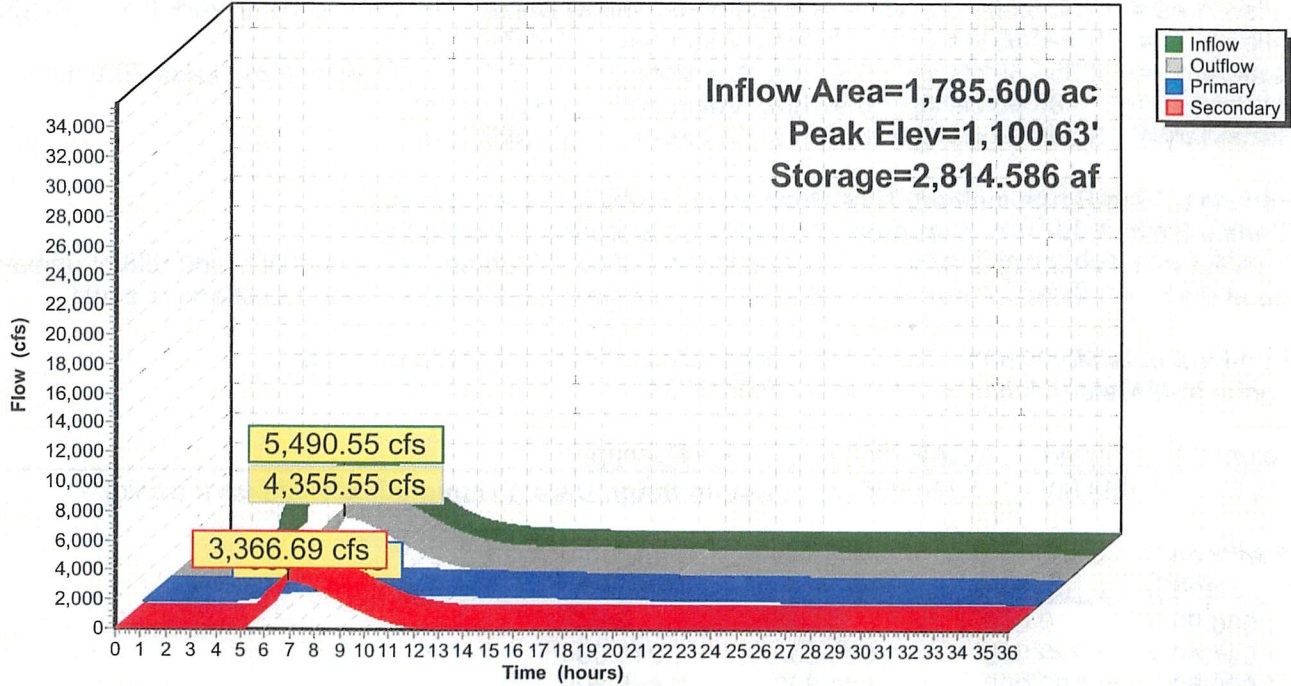
Device	Routing	Invert	Outlet Devices
#1	Primary	1,088.00'	36.0" Round Culvert-RCP L= 450.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 1,088.00' / 1,076.00' S= 0.0267 ' ' Cc= 0.900 n= 0.012 Concrete pipe, finished
#2	Primary	1,096.40'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 3.10 6.00 Width (feet) 30.00 30.00 30.00
#3	Secondary	1,099.50'	Custom Weir/Orifice, Cv= 2.24 (C= 2.80) Head (feet) 0.00 3.00 Width (feet) 1,000.00 1,000.00

Primary OutFlow Max=988.86 cfs @ 6.97 hrs HW=1,100.63' TW=1,077.22' (Dynamic Tailwater)
 1=Culvert-RCP (Barrel Controls 133.88 cfs @ 18.94 fps)
 2=Custom Weir/Orifice (Weir Controls 854.98 cfs @ 6.74 fps)

Secondary OutFlow Max=3,366.67 cfs @ 6.97 hrs HW=1,100.63' TW=1,077.22' (Dynamic Tailwater)
 3=Custom Weir/Orifice (Weir Controls 3,366.67 cfs @ 2.98 fps)

Pond 3P: Lake Cable

Hydrograph



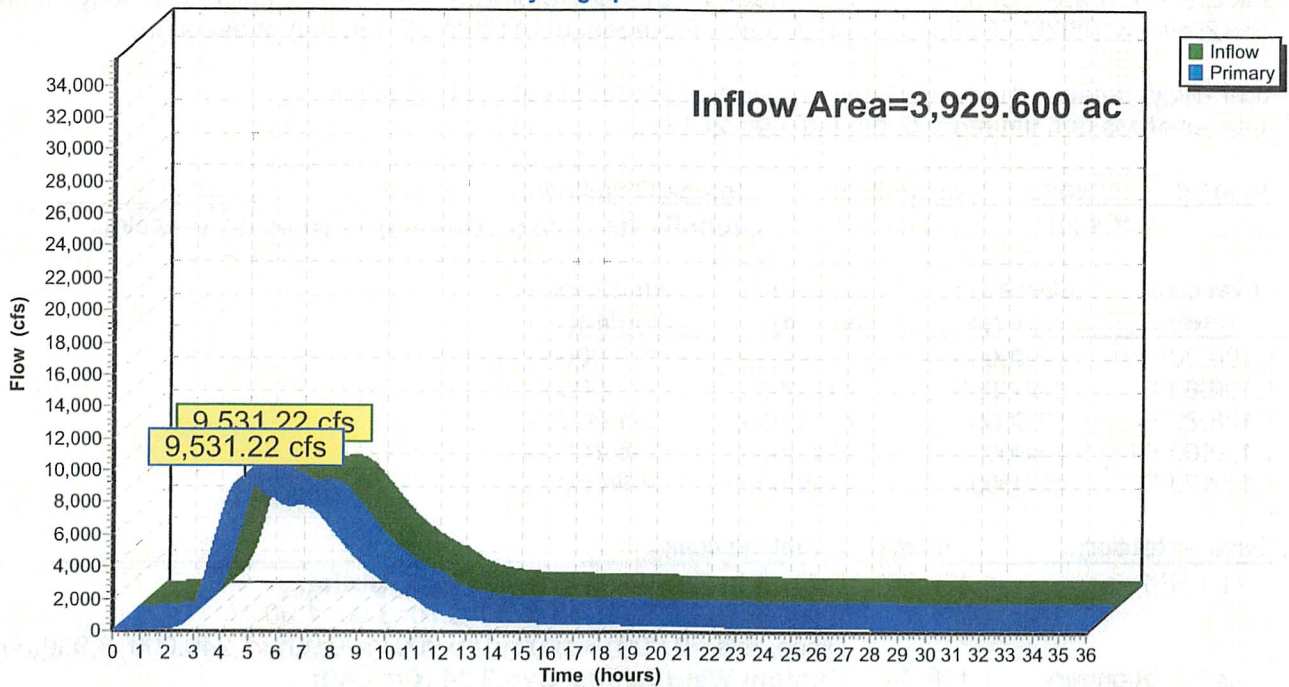
Summary for Pond 4C: Confluence 4

Inflow Area = 3,929.600 ac, 16.99% Impervious, Inflow Depth > 15.40" for 6 hr PMF Rev. TR-60 event
 Inflow = 9,531.22 cfs @ 4.84 hrs, Volume= 5,041.762 af
 Primary = 9,531.22 cfs @ 4.85 hrs, Volume= 5,041.762 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 4C: Confluence 4

Hydrograph



Summary for Pond 4P: Lake O'Springs

Inflow Area = 384.000 ac, 26.60% Impervious, Inflow Depth = 16.06" for 6 hr PMF Rev. TR-60 event
 Inflow = 2,632.78 cfs @ 3.41 hrs, Volume= 513.782 af
 Outflow = 2,556.73 cfs @ 3.61 hrs, Volume= 513.190 af, Atten= 3%, Lag= 12.1 min
 Primary = 2,311.61 cfs @ 3.61 hrs, Volume= 487.022 af
 Secondary = 245.12 cfs @ 3.61 hrs, Volume= 26.168 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Starting Elev= 1,106.00' Surf.Area= 27.000 ac Storage= 24.300 af
 Peak Elev= 1,109.40' @ 3.61 hrs Surf.Area= 35.372 ac Storage= 124.077 af (99.777 af above start)
 Flood Elev= 1,108.70' Surf.Area= 30.000 ac Storage= 101.250 af (76.950 af above start)

Plug-Flow detention time= 112.6 min calculated for 488.890 af (95% of inflow)
 Center-of-Mass det. time= 89.6 min (351.4 - 261.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,104.20'	268.550 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,104.20	0.000	0.000	0.000
1,106.00	27.000	24.300	24.300
1,108.70	30.000	76.950	101.250
1,110.00	40.000	45.500	146.750
1,112.90	44.000	121.800	268.550

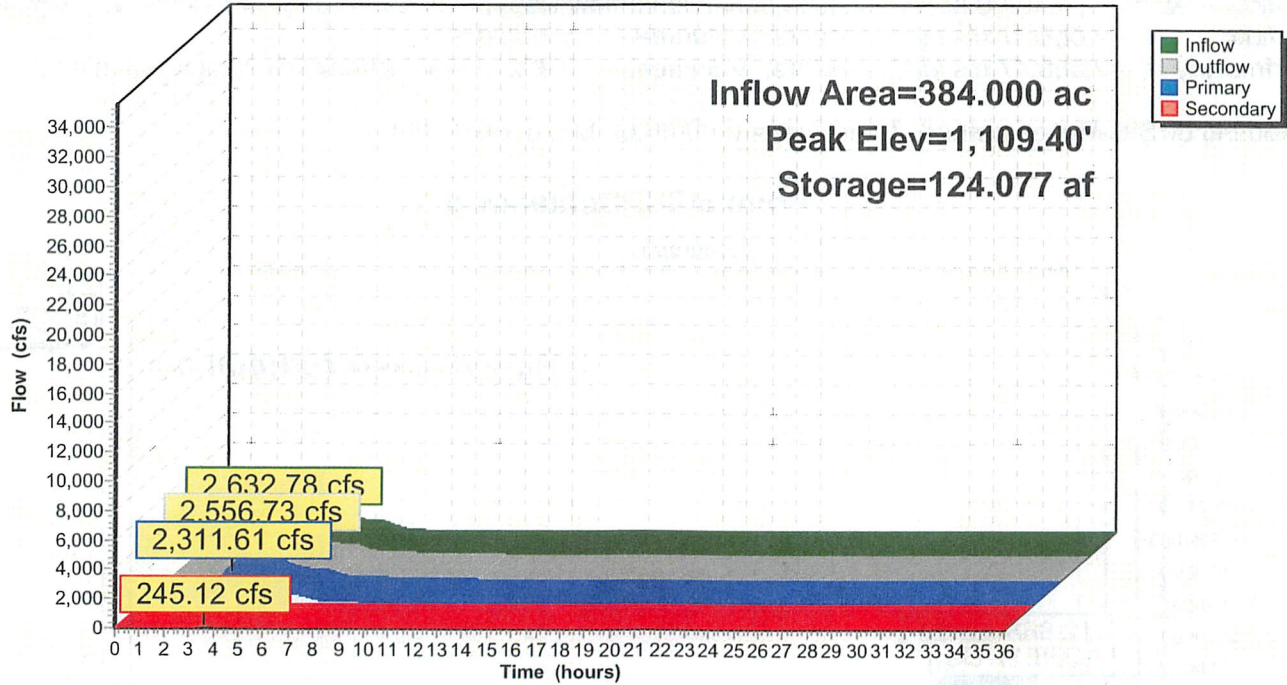
Device	Routing	Invert	Outlet Devices
#1	Primary	1,106.00'	Lake Eric Special & User-Defined Outlet Head (feet) 0.00 1.00 2.00 2.70 3.00 4.00 Disch. (cfs) 0.000 60.000 180.000 300.000 1,240.000 3,930.000
#2	Secondary	1,108.70'	Custom Weir/Orifice, Cv= 2.24 (C= 2.80) Head (feet) 0.00 1.30 Width (feet) 150.00 150.00

Primary OutFlow Max=2,311.57 cfs @ 3.61 hrs HW=1,109.40' TW=0.00' (Dynamic Tailwater)
 ↳1=Lake Eric Special & User-Defined Outlet(Custom Controls 2,311.57 cfs)

Secondary OutFlow Max=245.11 cfs @ 3.61 hrs HW=1,109.40' TW=0.00' (Dynamic Tailwater)
 ↳2=Custom Weir/Orifice (Weir Controls 245.11 cfs @ 2.34 fps)

Pond 4P: Lake O'Springs

Hydrograph

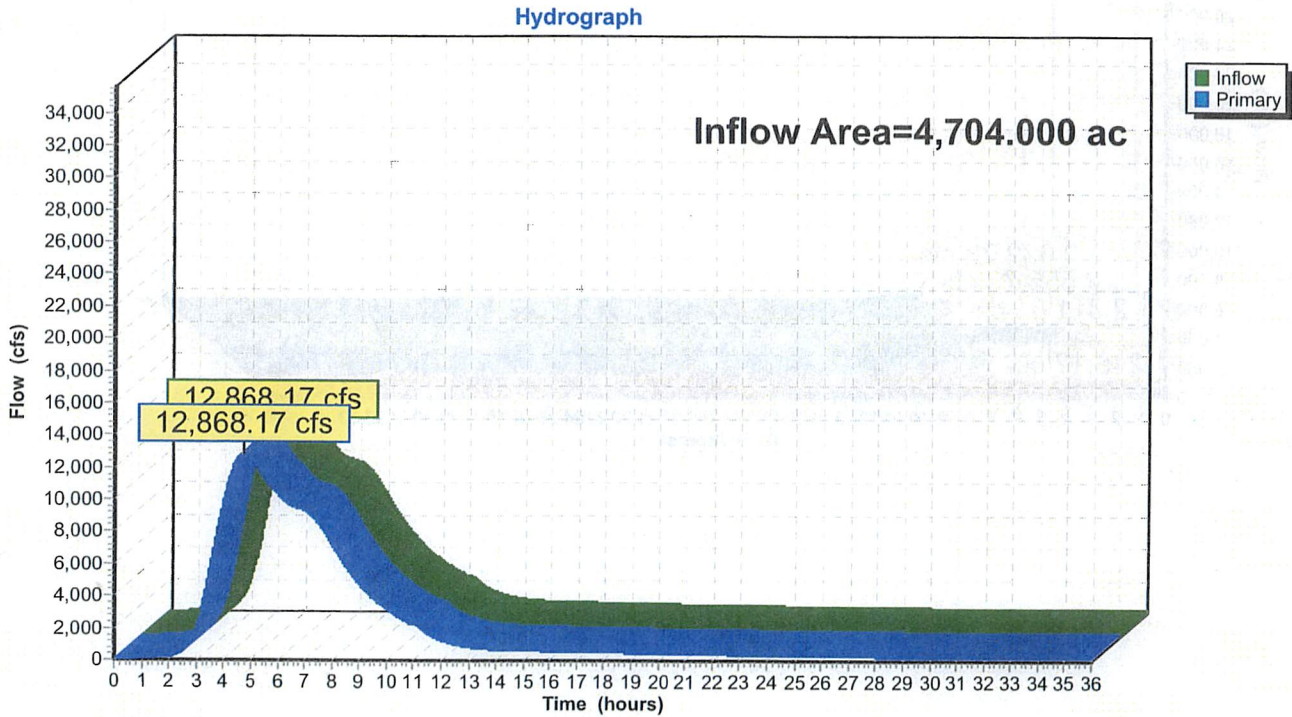


Summary for Pond 5C: Confluence 5

Inflow Area = 4,704.000 ac, 14.19% Impervious, Inflow Depth > 15.29" for 6 hr PMF Rev. TR-60 event
Inflow = 12,868.17 cfs @ 4.73 hrs, Volume= 5,992.169 af
Primary = 12,868.17 cfs @ 4.74 hrs, Volume= 5,992.169 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 5C: Confluence 5



Summary for Pond 5P: Lake Eric (Slagle)

Inflow Area = 115.200 ac, 0.00% Impervious, Inflow Depth = 15.94" for 6 hr PMF Rev. TR-60 event
 Inflow = 860.60 cfs @ 3.18 hrs, Volume= 153.066 af
 Outflow = 857.34 cfs @ 3.24 hrs, Volume= 152.946 af, Atten= 0%, Lag= 3.4 min
 Primary = 524.10 cfs @ 3.24 hrs, Volume= 111.748 af
 Secondary = 333.24 cfs @ 3.24 hrs, Volume= 41.198 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Starting Elev= 1,116.50' Surf.Area= 3.700 ac Storage= 13.690 af
 Peak Elev= 1,120.86' @ 3.24 hrs Surf.Area= 4.534 ac Storage= 31.233 af (17.543 af above start)
 Flood Elev= 1,120.00' Surf.Area= 4.200 ac Storage= 27.490 af (13.800 af above start)

Plug-Flow detention time= 73.8 min calculated for 139.217 af (91% of inflow)
 Center-of-Mass det. time= 48.6 min (282.1 - 233.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,109.10'	88.990 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,109.10	0.000	0.000	0.000
1,116.50	3.700	13.690	13.690
1,118.00	3.900	5.700	19.390
1,120.00	4.200	8.100	27.490
1,130.00	8.100	61.500	88.990

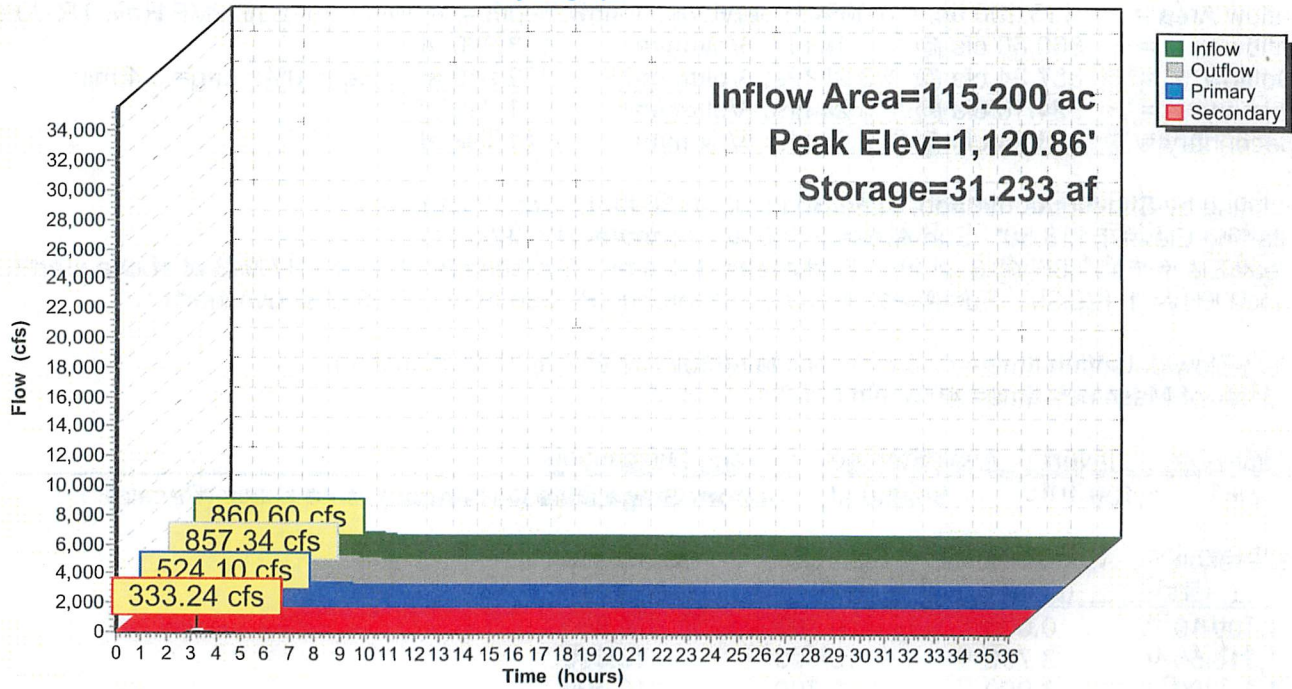
Device	Routing	Invert	Outlet Devices
#1	Primary	1,116.50'	Special & User-Defined Head (feet) 0.00 0.50 1.50 2.50 3.50 4.50 5.00 Disch. (cfs) 0.000 3.000 17.000 40.000 69.000 600.000 1,130.000
#2	Secondary	1,120.00'	Custom Weir/Orifice, Cv= 2.24 (C= 2.80) Head (feet) 0.00 10.00 Width (feet) 150.00 150.00

Primary OutFlow Max=524.09 cfs @ 3.24 hrs HW=1,120.86' TW=0.00' (Dynamic Tailwater)
 ↳1=Special & User-Defined (Custom Controls 524.09 cfs)

Secondary OutFlow Max=333.23 cfs @ 3.24 hrs HW=1,120.86' TW=0.00' (Dynamic Tailwater)
 ↳2=Custom Weir/Orifice (Weir Controls 333.23 cfs @ 2.59 fps)

Pond 5P: Lake Eric (Slagle)

Hydrograph

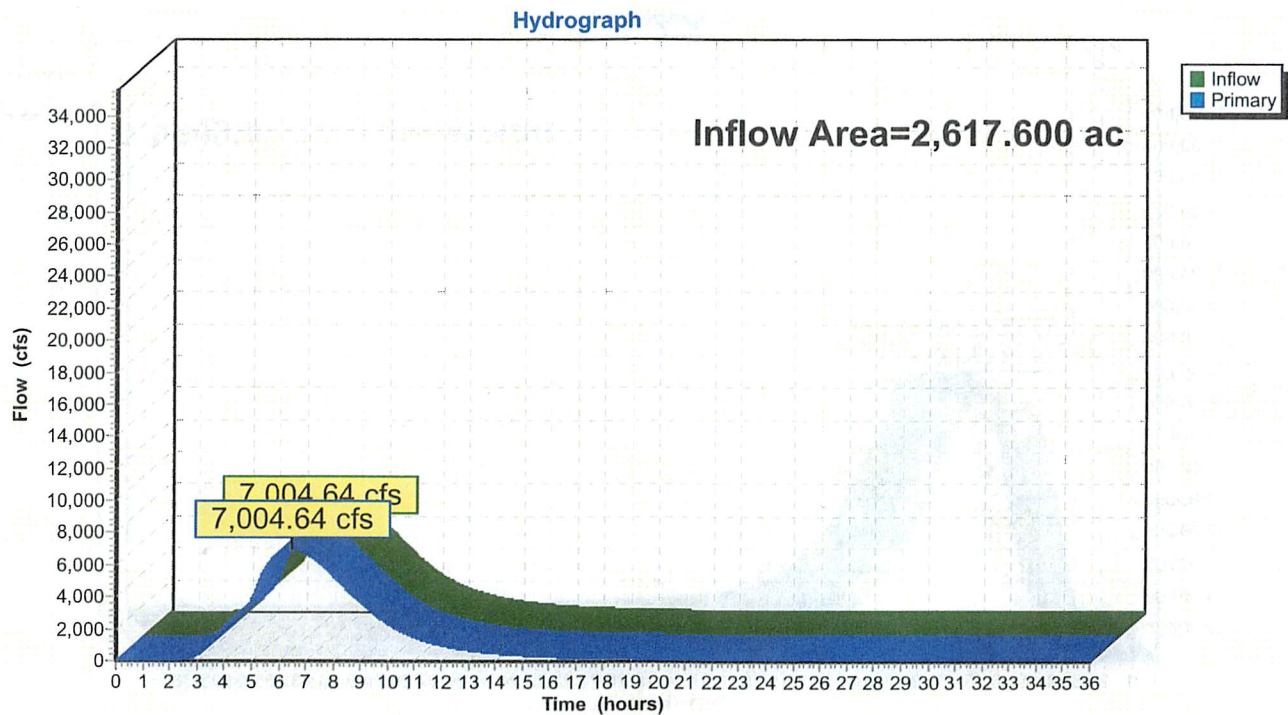


Summary for Pond 6C: Confluence 6

Inflow Area = 2,617.600 ac, 28.52% Impervious, Inflow Depth > 14.53" for 6 hr PMF Rev. TR-60 event
Inflow = 7,004.64 cfs @ 6.45 hrs, Volume= 3,169.204 af
Primary = 7,004.64 cfs @ 6.46 hrs, Volume= 3,169.204 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 6C: Confluence 6

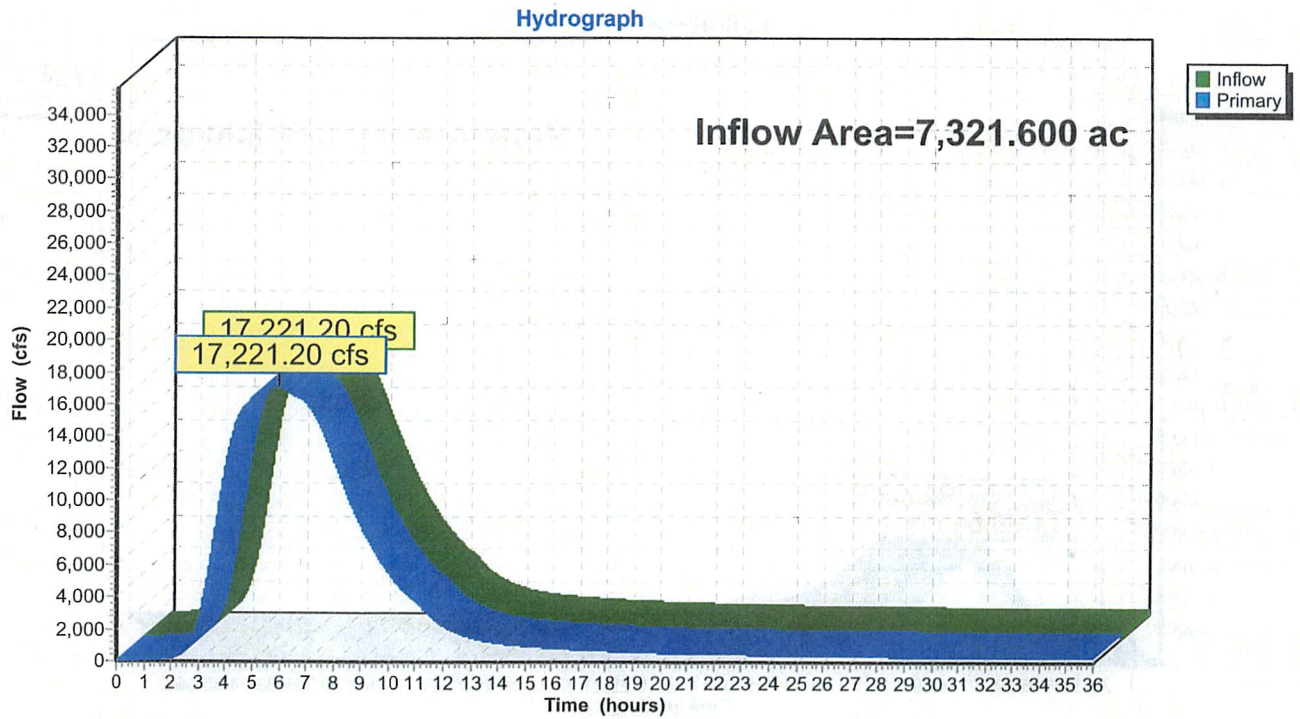


Summary for Pond 7C: Confluence 7 - Combined North Watershed and Sippo Lake

Inflow Area = 7,321.600 ac, 19.32% Impervious, Inflow Depth > 15.01" for 6 hr PMF Rev. TR-60 event
Inflow = 17,221.20 cfs @ 5.96 hrs, Volume= 9,161.142 af
Primary = 17,221.20 cfs @ 5.97 hrs, Volume= 9,161.142 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 7C: Confluence 7 - Combined North Watershed and Sippo Lake



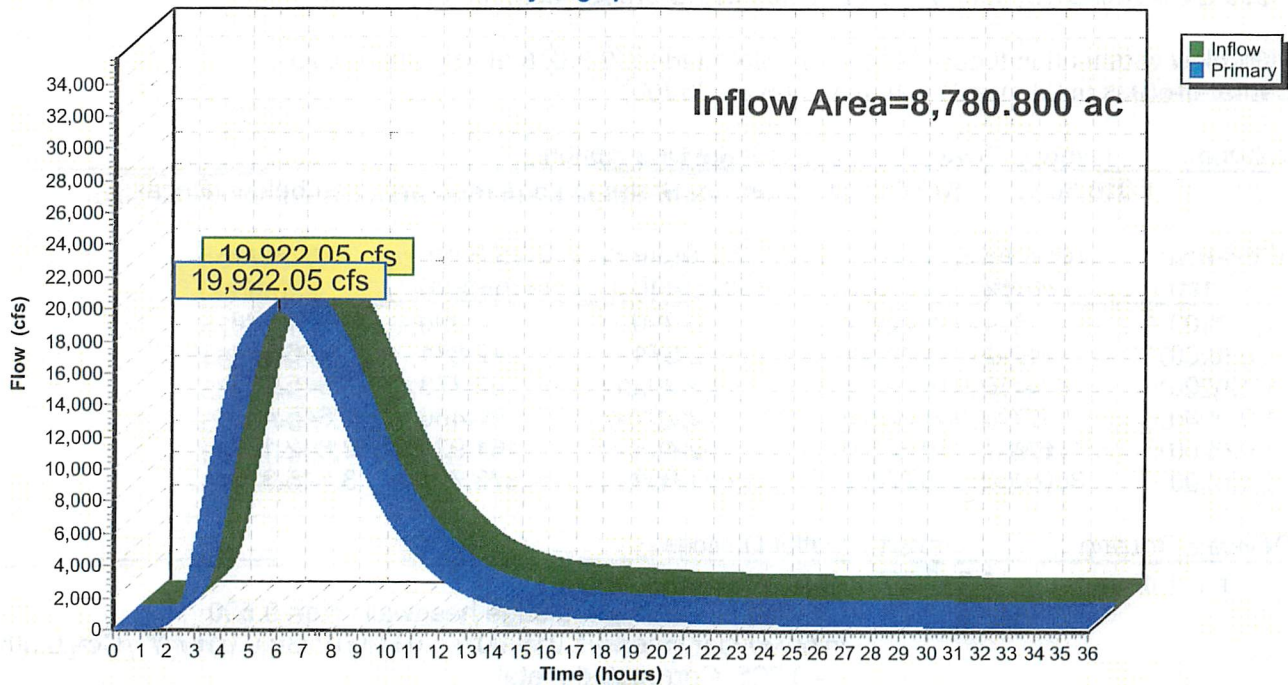
Summary for Pond 8C: Confluence 8

Inflow Area = 8,780.800 ac, 19.29% Impervious, Inflow Depth > 15.12" for 6 hr PMF Rev. TR-60 event
Inflow = 19,922.05 cfs @ 6.05 hrs, Volume= 11,067.337 af
Primary = 19,922.05 cfs @ 6.06 hrs, Volume= 11,067.337 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 8C: Confluence 8

Hydrograph



Summary for Pond 8P: Storage Area Genoa Rd

Inflow Area = 1,964.800 ac, 38.00% Impervious, Inflow Depth > 15.54" for 6 hr PMF Rev. TR-60 event
 Inflow = 8,621.37 cfs @ 5.03 hrs, Volume= 2,544.620 af
 Outflow = 5,407.55 cfs @ 6.68 hrs, Volume= 2,368.878 af, Atten= 37%, Lag= 99.0 min
 Primary = 129.89 cfs @ 4.55 hrs, Volume= 290.307 af
 Secondary = 5,310.93 cfs @ 6.68 hrs, Volume= 2,078.571 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,028.86' @ 6.69 hrs Surf.Area= 231.005 ac Storage= 1,041.766 af
 Flood Elev= 1,028.00' Surf.Area= 213.745 ac Storage= 851.153 af

Plug-Flow detention time= 227.2 min calculated for 2,368.878 af (93% of inflow)
 Center-of-Mass det. time= 204.6 min (585.3 - 380.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,018.00'	1,873.781 af	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
1,018.00	1.828	9,236.2	0.000	0.000	1.828
1,020.00	12.667	15,179.0	12.871	12.871	266.894
1,022.00	44.456	16,532.1	53.902	66.773	345.285
1,024.00	91.000	31,384.9	132.707	199.480	1,645.455
1,026.00	176.087	39,123.0	262.448	461.929	2,642.179
1,032.00	300.000	45,000.0	1,411.853	1,873.781	3,545.375

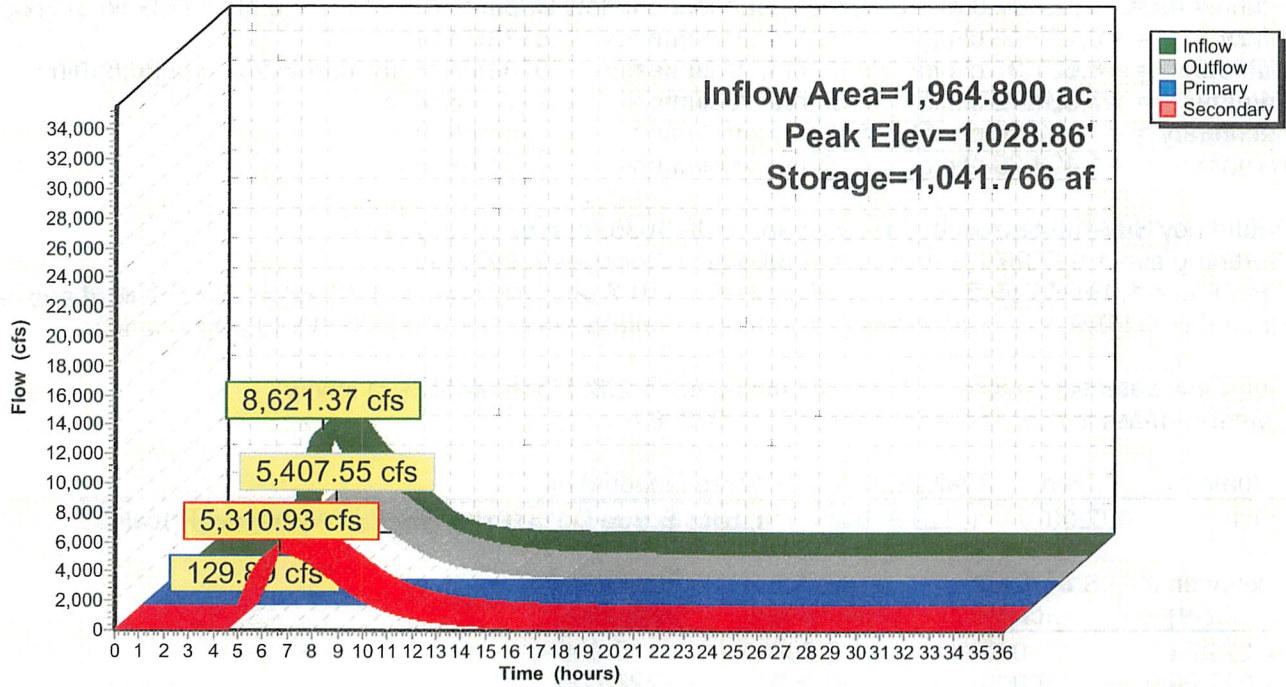
Device	Routing	Invert	Outlet Devices
#1	Primary	1,018.00'	48.0" Round Culvert L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,018.00' / 1,017.00' S= 0.0167 ' Cc= 0.900 n= 0.025 Corrugated metal
#2	Secondary	1,025.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 3.00 5.00 Width (feet) 125.00 192.00 308.00 415.00

Primary OutFlow Max=128.66 cfs @ 4.55 hrs HW=1,025.31' TW=1,020.79' (Dynamic Tailwater)
 ↳1=Culvert (Inlet Controls 128.66 cfs @ 10.24 fps)

Secondary OutFlow Max=5,310.80 cfs @ 6.68 hrs HW=1,028.86' TW=1,026.31' (Dynamic Tailwater)
 ↳2=Custom Weir/Orifice (Weir Controls 5,310.80 cfs @ 5.64 fps)

Pond 8P: Storage Area Genoa Rd

Hydrograph



Summary for Pond 9P: Sippo Lake

Inflow Area = 1,964.800 ac, 38.00% Impervious, Inflow Depth = 16.11" for 6 hr PMF Rev. TR-60 event
 Inflow = 8,779.02 cfs @ 4.69 hrs, Volume= 2,637.544 af
 Outflow = 8,621.37 cfs @ 5.03 hrs, Volume= 2,544.621 af, Atten= 2%, Lag= 20.5 min
 Primary = 7,024.12 cfs @ 5.03 hrs, Volume= 2,277.176 af
 Secondary = 193.96 cfs @ 5.03 hrs, Volume= 44.338 af
 Tertiary = 1,403.29 cfs @ 5.03 hrs, Volume= 223.107 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Starting Elev= 1,027.00' Surf.Area= 88.000 ac Storage= 220.000 af
 Peak Elev= 1,030.88' @ 5.03 hrs Surf.Area= 110.702 ac Storage= 613.788 af (393.788 af above start)
 Flood Elev= 1,029.30' Surf.Area= 106.000 ac Storage= 443.100 af (223.100 af above start)

Plug-Flow detention time= 81.2 min calculated for 2,323.975 af (88% of inflow)
 Center-of-Mass det. time= 44.0 min (380.7 - 336.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,022.00'	1,220.300 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,022.00	0.000	0.000	0.000
1,027.00	88.000	220.000	220.000
1,029.30	106.000	223.100	443.100
1,036.00	126.000	777.200	1,220.300

Device	Routing	Invert	Outlet Devices
#1	Primary	1,028.00'	300.0' long x 30.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	1,028.50'	330.0' long x 30.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Secondary	1,029.30'	30.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#4	Tertiary	1,030.00'	650.0' long x 50.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

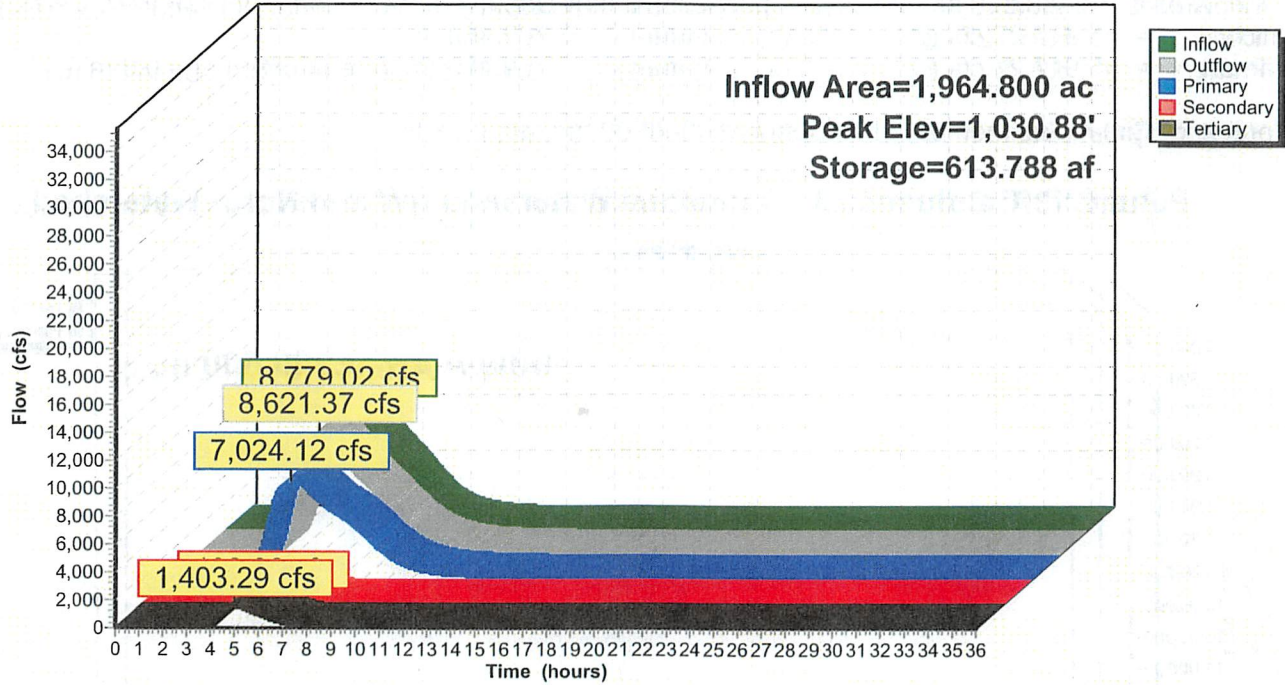
Primary OutFlow Max=7,024.10 cfs @ 5.03 hrs HW=1,030.88' TW=1,027.01' (Dynamic Tailwater)
 1=Broad-Crested Rectangular Weir (Weir Controls 3,846.85 cfs @ 4.46 fps)
 2=Broad-Crested Rectangular Weir (Weir Controls 3,177.25 cfs @ 4.05 fps)

Secondary OutFlow Max=193.96 cfs @ 5.03 hrs HW=1,030.88' TW=1,027.01' (Dynamic Tailwater)
 3=Sharp-Crested Rectangular Weir (Weir Controls 193.96 cfs @ 4.10 fps)

Tertiary OutFlow Max=1,403.28 cfs @ 5.03 hrs HW=1,030.88' TW=1,027.01' (Dynamic Tailwater)
 4=Broad-Crested Rectangular Weir (Weir Controls 1,403.28 cfs @ 2.47 fps)

Pond 9P: Sippo Lake

Hydrograph

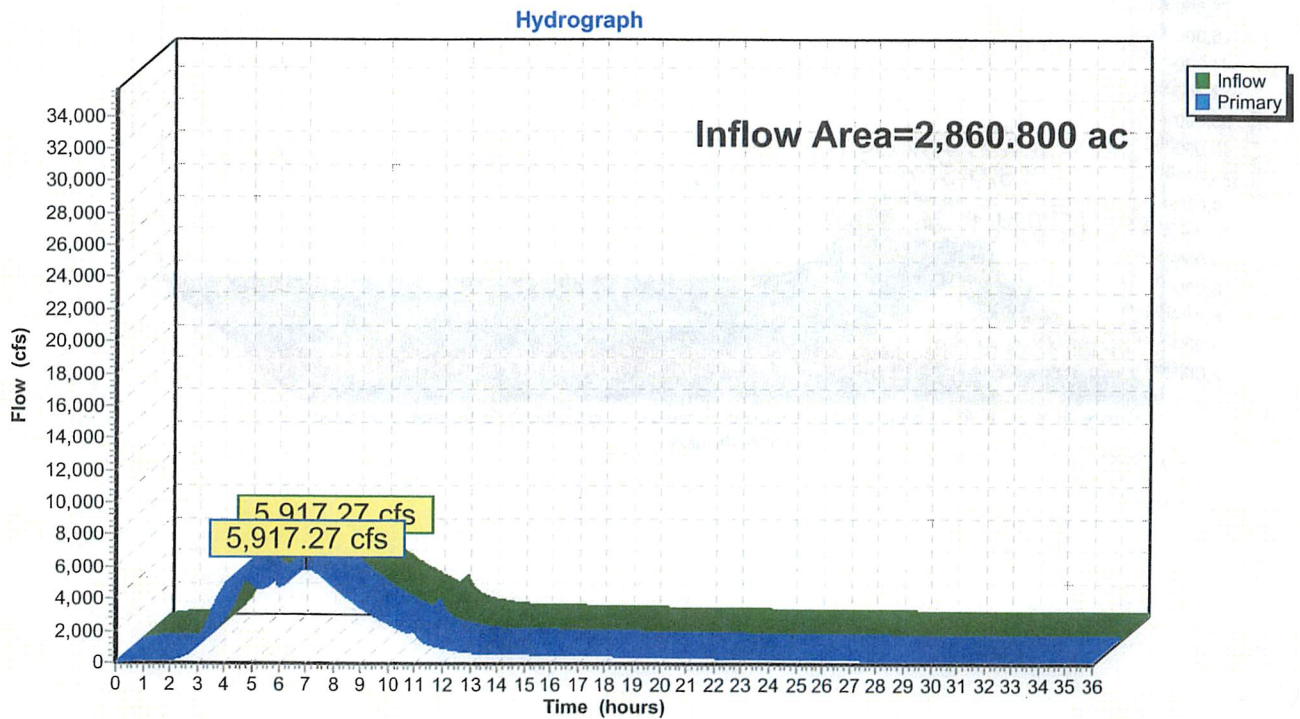


Summary for Pond 13P: Confluence 3 - Combined Watershed NW and North Watershed

Inflow Area = 2,860.800 ac, 23.34% Impervious, Inflow Depth > 15.56" for 6 hr PMF Rev. TR-60 event
Inflow = 5,917.27 cfs @ 7.00 hrs, Volume= 3,709.460 af
Primary = 5,917.27 cfs @ 7.01 hrs, Volume= 3,709.460 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 13P: Confluence 3 - Combined Watershed NW and North Watershed



Summary for Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 15.18" for 6 hr PMF Rev. TR-60 event
 Inflow = 21,029.65 cfs @ 6.39 hrs, Volume= 11,963.717 af
 Outflow = 21,028.50 cfs @ 6.42 hrs, Volume= 11,962.360 af, Atten= 0%, Lag= 1.9 min
 Primary = 2,921.65 cfs @ 3.61 hrs, Volume= 4,028.826 af
 Secondary = 18,260.31 cfs @ 6.42 hrs, Volume= 7,933.534 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,013.23' @ 6.42 hrs Surf.Area= 16.817 ac Storage= 274.766 af
 Flood Elev= 1,008.00' Surf.Area= 13.465 ac Storage= 197.028 af

Plug-Flow detention time= 15.3 min calculated for 11,959.038 af (100% of inflow)
 Center-of-Mass det. time= 15.1 min (542.4 - 527.3)

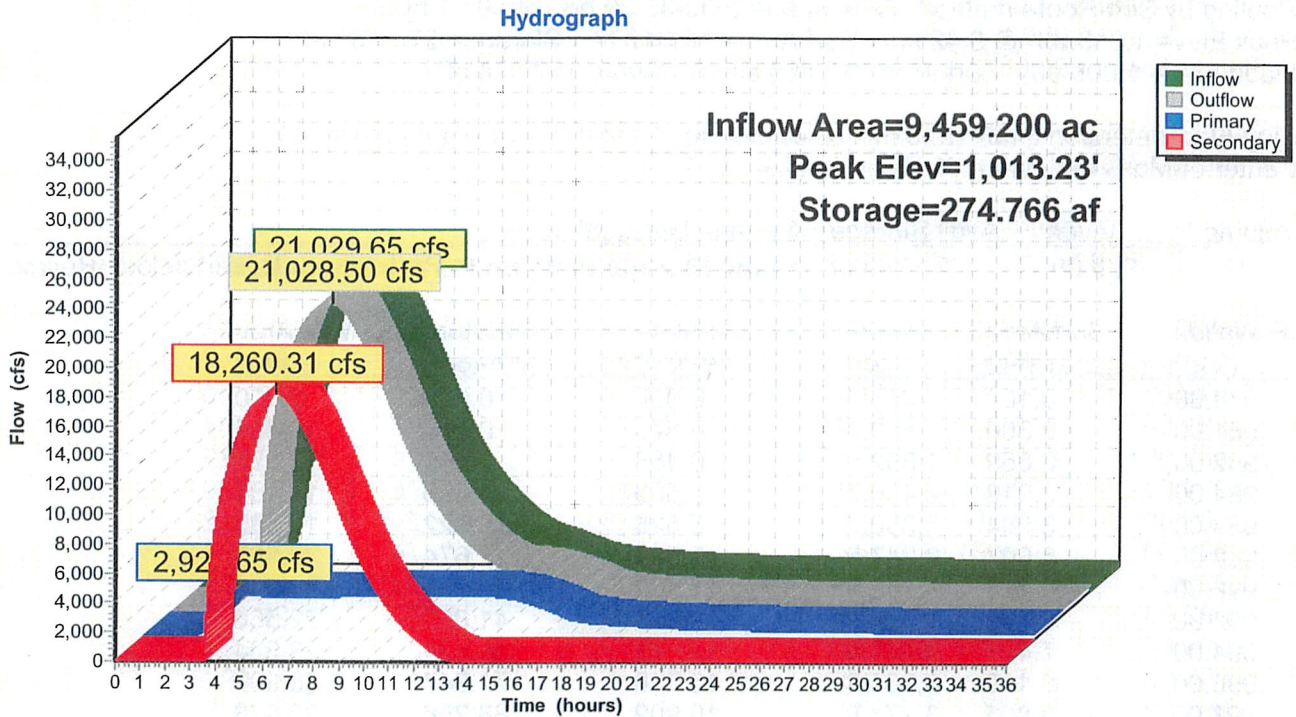
Volume	Invert	Avail.Storage	Storage Description		
#1	978.00'	371.368 af	Stage Storage in Sippo Park (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
978.00	0.100	200.0	0.000	0.000	0.100
981.00	0.300	500.0	0.573	0.573	0.484
982.00	0.659	1,392.9	0.468	1.041	3.572
984.00	2.018	2,470.7	2.553	3.595	11.180
986.00	3.584	3,300.7	5.528	9.122	19.932
988.00	5.007	3,247.5	8.551	17.674	20.586
990.00	6.111	3,143.9	11.100	28.773	21.805
992.00	6.773	3,217.1	12.878	41.652	22.668
994.00	7.411	3,271.9	14.179	55.831	23.334
996.00	8.110	3,253.8	15.516	71.347	23.597
998.00	8.804	3,273.8	16.909	88.256	23.878
1,000.00	9.441	3,318.6	18.241	106.497	24.439
1,002.00	10.181	3,437.0	19.617	126.114	25.908
1,004.00	11.109	3,548.6	21.283	147.398	27.341
1,006.00	12.538	3,553.4	23.633	171.030	27.516
1,008.00	13.465	3,829.8	25.997	197.028	31.248
1,010.00	14.326	4,085.3	27.787	224.814	34.947
1,012.00	15.633	4,329.5	29.949	254.764	38.706
1,014.00	17.576	4,742.6	33.190	287.954	45.555
1,016.00	20.521	5,940.5	38.059	326.013	68.935
1,018.00	24.905	6,310.6	45.355	371.368	77.223

Device	Routing	Invert	Outlet Devices
#1	Primary	978.25'	168.0" W x 98.0" H Box Box Culvert L= 121.8' Ke= 0.400 Inlet / Outlet Invert= 978.25' / 978.13' S= 0.0010 '/' Cc= 0.900 n= 0.015 Brickwork
#2	Secondary	1,008.00'	Linclon Way (172), Cv= 2.63 (C= 3.29) Head (feet) 0.00 1.00 2.00 4.00 6.00 8.00 10.00 Width (feet) 233.00 373.00 475.00 630.00 790.00 940.00 1,090.00

Primary OutFlow Max=2,910.23 cfs @ 3.61 hrs HW=1,009.33' TW=984.83' (Dynamic Tailwater)
 ↳1=Box Culvert (Inlet Controls 2,910.23 cfs @ 25.45 fps)

Secondary OutFlow Max=18,260.27 cfs @ 6.42 hrs HW=1,013.23' TW=991.21' (Dynamic Tailwater)
 ↳2=Linclon Way (172) (Weir Controls 18,260.27 cfs @ 6.84 fps)

Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-

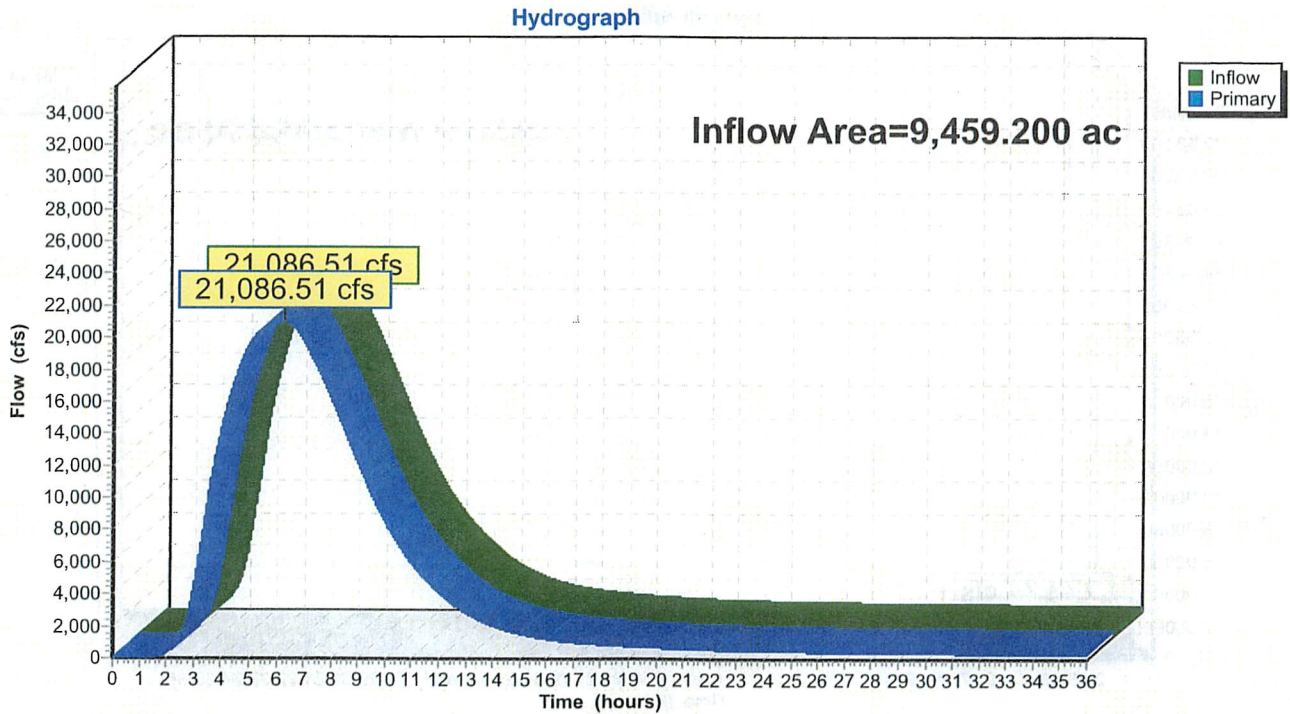


Summary for Pond 19C: Confluence 19

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 15.20" for 6 hr PMF Rev. TR-60 event
Inflow = 21,086.51 cfs @ 6.22 hrs, Volume= 11,977.953 af
Primary = 21,086.51 cfs @ 6.23 hrs, Volume= 11,977.953 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 19C: Confluence 19



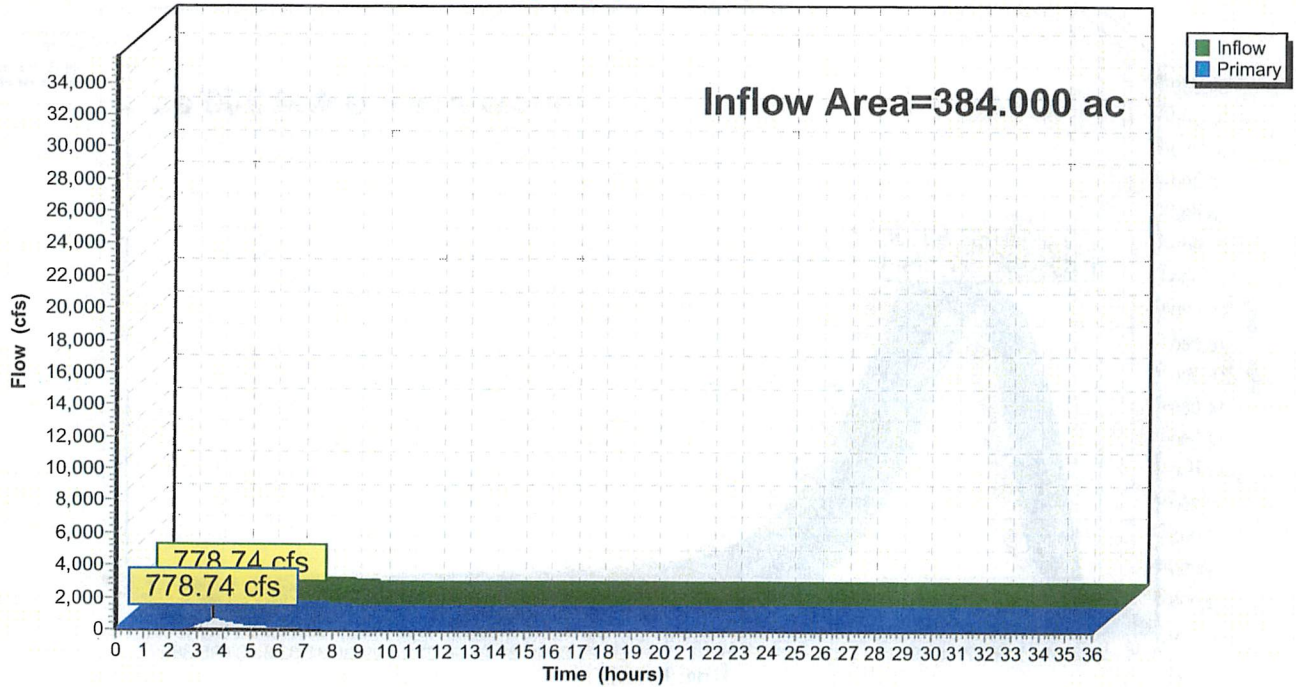
Summary for Pond 1C: CONF 1 Combined O'Springs and Eric

Inflow Area = 384.000 ac, 26.60% Impervious, Inflow Depth > 4.87" for 6-HR 0.4 Rev PMF event
Inflow = 778.74 cfs @ 3.63 hrs, Volume= 155.792 af
Primary = 778.74 cfs @ 3.64 hrs, Volume= 155.792 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 1C: CONF 1 Combined O'Springs and Eric

Hydrograph



Summary for Pond 1P: Sippo Creek Reservoir - Existing Conditions

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 4.31" for 6-HR 0.4 Rev PMF event
 Inflow = 5,227.19 cfs @ 6.14 hrs, Volume= 3,400.480 af
 Outflow = 5,171.73 cfs @ 6.37 hrs, Volume= 3,388.495 af, Atten= 1%, Lag= 14.0 min
 Primary = 2,520.51 cfs @ 4.65 hrs, Volume= 2,150.605 af
 Secondary = 3,181.94 cfs @ 6.38 hrs, Volume= 1,179.811 af
 Tertiary = 269.54 cfs @ 6.40 hrs, Volume= 58.079 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Starting Elev= 1,001.64' Surf.Area= 7.050 ac Storage= 60.962 af
 Peak Elev= 1,010.24' @ 6.43 hrs Surf.Area= 30.768 ac Storage= 201.546 af (140.584 af above start)
 Flood Elev= 1,005.00' Surf.Area= 12.657 ac Storage= 91.431 af (30.469 af above start)

Plug-Flow detention time= 56.5 min calculated for 3,326.609 af (98% of inflow)
 Center-of-Mass det. time= 17.0 min (672.7 - 655.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	985.00'	1,292.544 af	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
985.00	0.500	500.0	0.000	0.000	0.500
990.00	3.000	1,000.0	7.875	7.875	1.873
998.00	4.870	2,500.0	31.179	39.054	11.469
1,000.00	6.204	3,251.0	11.047	50.101	19.360
1,002.00	7.243	5,147.0	13.434	63.535	48.449
1,004.00	9.610	10,274.0	16.797	80.332	192.887
1,006.00	16.124	11,202.9	25.455	105.787	229.335
1,008.00	21.577	15,736.9	37.569	143.356	452.477
1,010.00	29.674	20,301.4	51.036	194.392	752.988
1,012.00	39.539	22,845.5	68.977	263.369	953.524
1,014.00	68.669	34,370.5	106.876	370.246	2,158.174
1,025.00	100.000	50,000.0	922.298	1,292.544	4,567.204

Device	Routing	Invert	Outlet Devices
#1	Primary	1,001.64'	50.0' long x 2.9' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.45 2.58 2.66 2.66 2.65 2.64 2.65 2.69 2.69 2.73 2.83 2.95 3.01 3.12 3.32
#2	Secondary	1,005.00'	Right Embankment Weir - Building side, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 1.60 20.00 Width (feet) 17.00 23.00 77.00 77.00
#3	Secondary	1,004.20'	Left Embankment Weir - Playground side, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 1.80 3.80 5.80 15.80 Width (feet) 10.00 22.00 45.00 130.00 180.00 205.00
#4	Tertiary	1,008.00'	Weir Flow around Bldg. X 0.50, Cv= 2.62 (C= 3.28) Head (feet) 0.00 2.00 4.00 6.00 8.00 10.00 12.00 Width (feet) 50.00 90.00 122.00 166.00 240.00 334.00 420.00

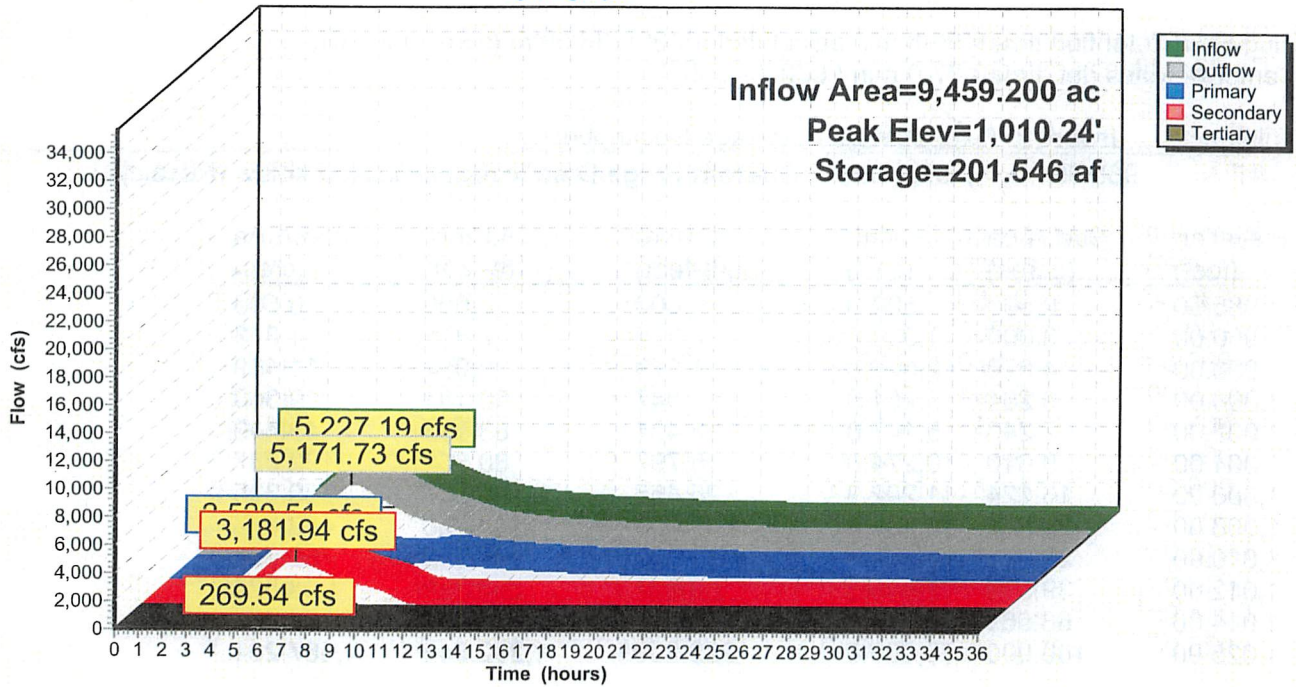
Primary OutFlow Max=2,514.81 cfs @ 4.65 hrs HW=1,007.78' TW=1,001.91' (Dynamic Tailwater)
 1=Broad-Crested Rectangular Weir (Weir Controls 2,514.81 cfs @ 8.20 fps)

Secondary OutFlow Max=3,180.49 cfs @ 6.38 hrs HW=1,010.24' TW=1,009.66' (Dynamic Tailwater)
 2=Right Embankment Weir - Building side (Weir Controls 1,177.94 cfs @ 3.57 fps)
 3=Left Embankment Weir - Playground side (Weir Controls 2,002.54 cfs @ 3.51 fps)

Tertiary OutFlow Max=269.47 cfs @ 6.40 hrs HW=1,010.24' TW=1,009.66' (Dynamic Tailwater)
 4=Weir Flow around Bldg. (Weir Controls 269.47 cfs @ 1.67 fps)

Pond 1P: Sippo Creek Reservoir - Existing Conditions

Hydrograph

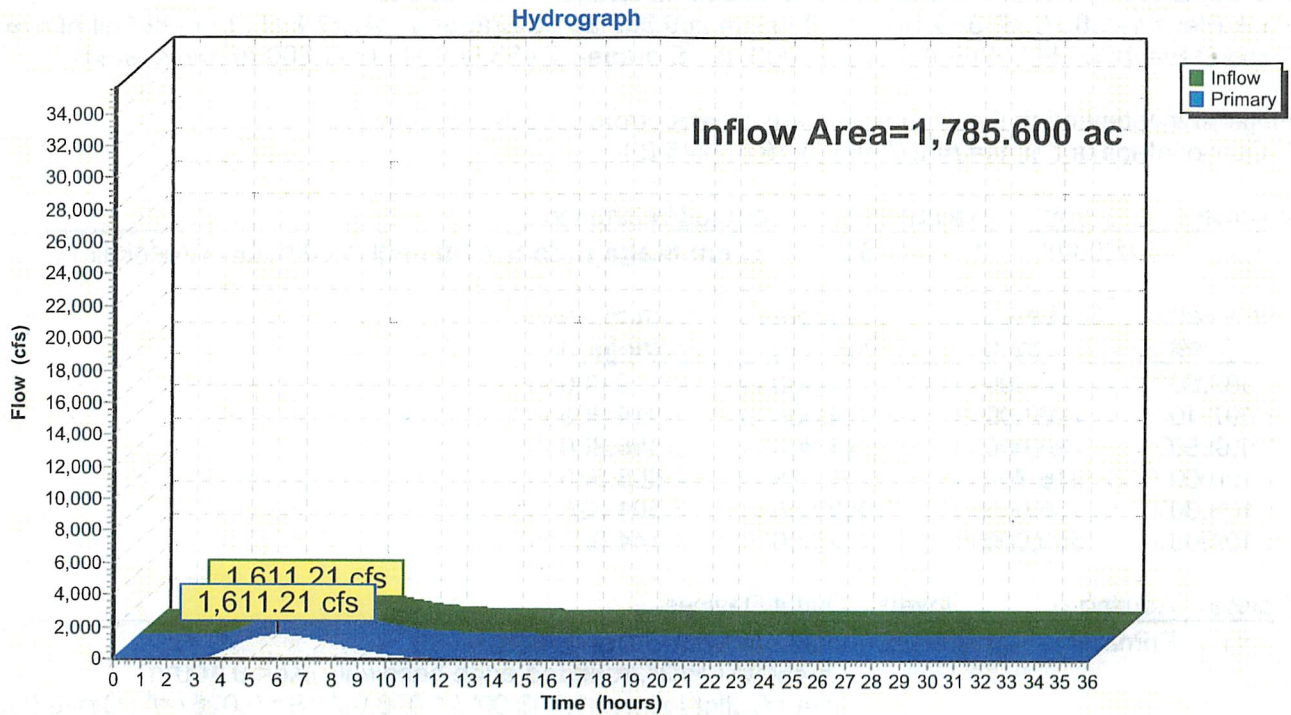


Summary for Pond 2C: CONF 2 Combined Cable and O'Springs

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 4.45" for 6-HR 0.4 Rev PMF event
Inflow = 1,611.21 cfs @ 6.03 hrs, Volume= 661.646 af
Primary = 1,611.21 cfs @ 6.04 hrs, Volume= 661.646 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 2C: CONF 2 Combined Cable and O'Springs



Summary for Pond 3P: Lake Cable

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 4.45" for 6-HR 0.4 Rev PMF event
 Inflow = 1,611.21 cfs @ 6.04 hrs, Volume= 661.645 af
 Outflow = 485.20 cfs @ 9.72 hrs, Volume= 821.634 af, Atten= 70%, Lag= 220.3 min
 Primary = 485.20 cfs @ 9.72 hrs, Volume= 821.634 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Starting Elev= 1,097.40' Surf.Area= 220.000 ac Storage= 1,914.000 af
 Peak Elev= 1,098.76' @ 9.72 hrs Surf.Area= 269.382 ac Storage= 2,247.881 af (333.881 af above start)
 Flood Elev= 1,099.50' Surf.Area= 296.000 ac Storage= 2,455.800 af (541.800 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= 502.7 min (948.6 - 445.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,080.00'	4,144.025 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,080.00	0.000	0.000	0.000
1,097.40	220.000	1,914.000	1,914.000
1,099.50	296.000	541.800	2,455.800
1,100.00	316.700	153.175	2,608.975
1,103.00	405.000	1,082.550	3,691.525
1,104.00	500.000	452.500	4,144.025

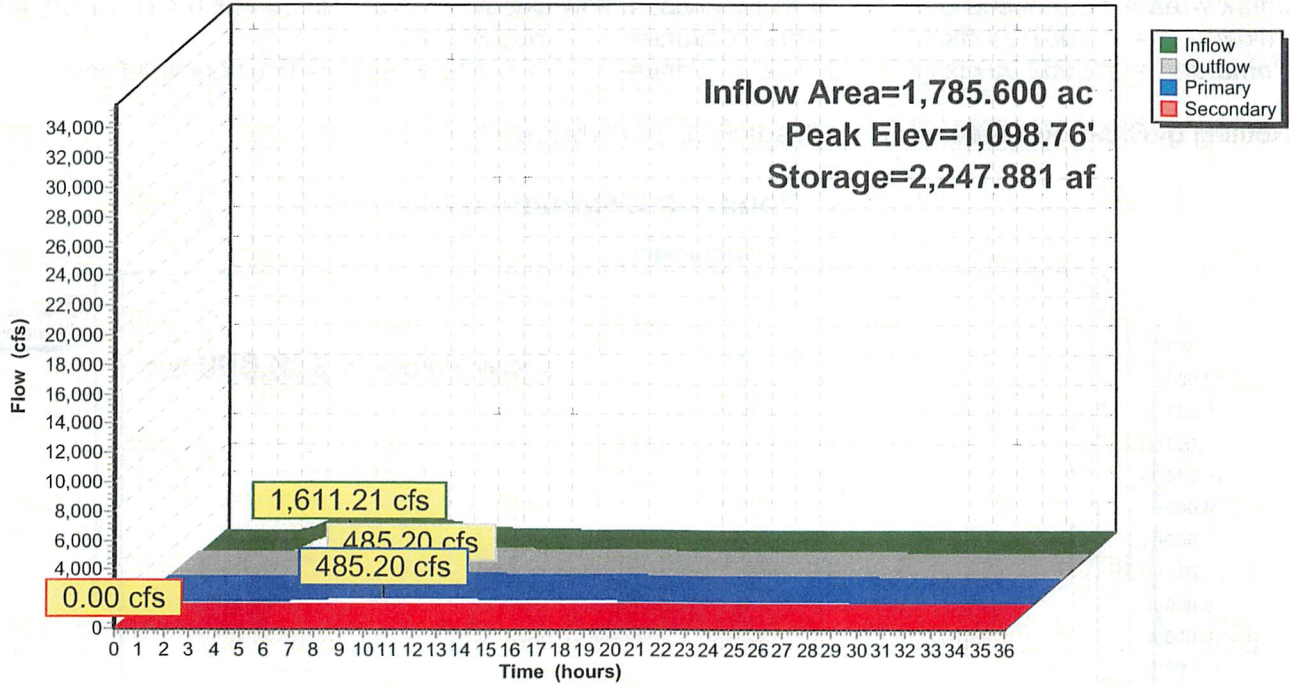
Device	Routing	Invert	Outlet Devices
#1	Primary	1,088.00'	36.0" Round Culvert-RCP L= 450.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 1,088.00' / 1,076.00' S= 0.0267 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished
#2	Primary	1,096.40'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 3.10 6.00 Width (feet) 30.00 30.00 30.00
#3	Secondary	1,099.50'	Custom Weir/Orifice, Cv= 2.24 (C= 2.80) Head (feet) 0.00 3.00 Width (feet) 1,000.00 1,000.00

Primary OutFlow Max=485.19 cfs @ 9.72 hrs HW=1,098.76' TW=1,072.53' (Dynamic Tailwater)
 1=Culvert-RCP (Barrel Controls 127.97 cfs @ 18.10 fps)
 2=Custom Weir/Orifice (Weir Controls 357.22 cfs @ 5.04 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,097.40' TW=1,069.00' (Dynamic Tailwater)
 3=Custom Weir/Orifice (Controls 0.00 cfs)

Pond 3P: Lake Cable

Hydrograph



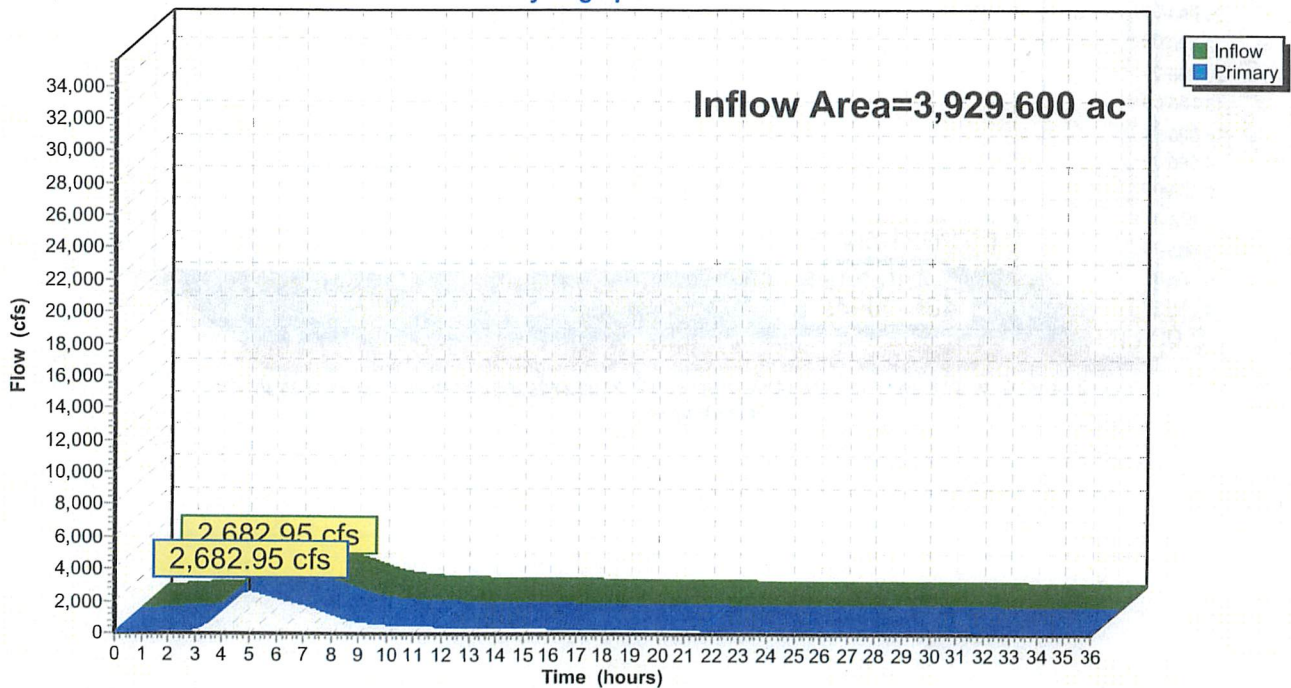
Summary for Pond 4C: Confluence 4

Inflow Area = 3,929.600 ac, 16.99% Impervious, Inflow Depth > 4.73" for 6-HR 0.4 Rev PMF event
Inflow = 2,682.95 cfs @ 5.00 hrs, Volume= 1,550.378 af
Primary = 2,682.95 cfs @ 5.01 hrs, Volume= 1,550.378 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 4C: Confluence 4

Hydrograph



Summary for Pond 4P: Lake O'Springs

Inflow Area = 384.000 ac, 26.60% Impervious, Inflow Depth > 4.87" for 6-HR 0.4 Rev PMF event
 Inflow = 778.74 cfs @ 3.64 hrs, Volume= 155.792 af
 Outflow = 285.17 cfs @ 5.44 hrs, Volume= 155.242 af, Atten= 63%, Lag= 108.5 min
 Primary = 285.17 cfs @ 5.44 hrs, Volume= 155.242 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Starting Elev= 1,106.00' Surf.Area= 27.000 ac Storage= 24.300 af
 Peak Elev= 1,108.61' @ 5.44 hrs Surf.Area= 29.904 ac Storage= 98.658 af (74.358 af above start)
 Flood Elev= 1,108.70' Surf.Area= 30.000 ac Storage= 101.250 af (76.950 af above start)

Plug-Flow detention time= 329.5 min calculated for 130.942 af (84% of inflow)
 Center-of-Mass det. time= 233.8 min (533.6 - 299.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,104.20'	268.550 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,104.20	0.000	0.000	0.000
1,106.00	27.000	24.300	24.300
1,108.70	30.000	76.950	101.250
1,110.00	40.000	45.500	146.750
1,112.90	44.000	121.800	268.550

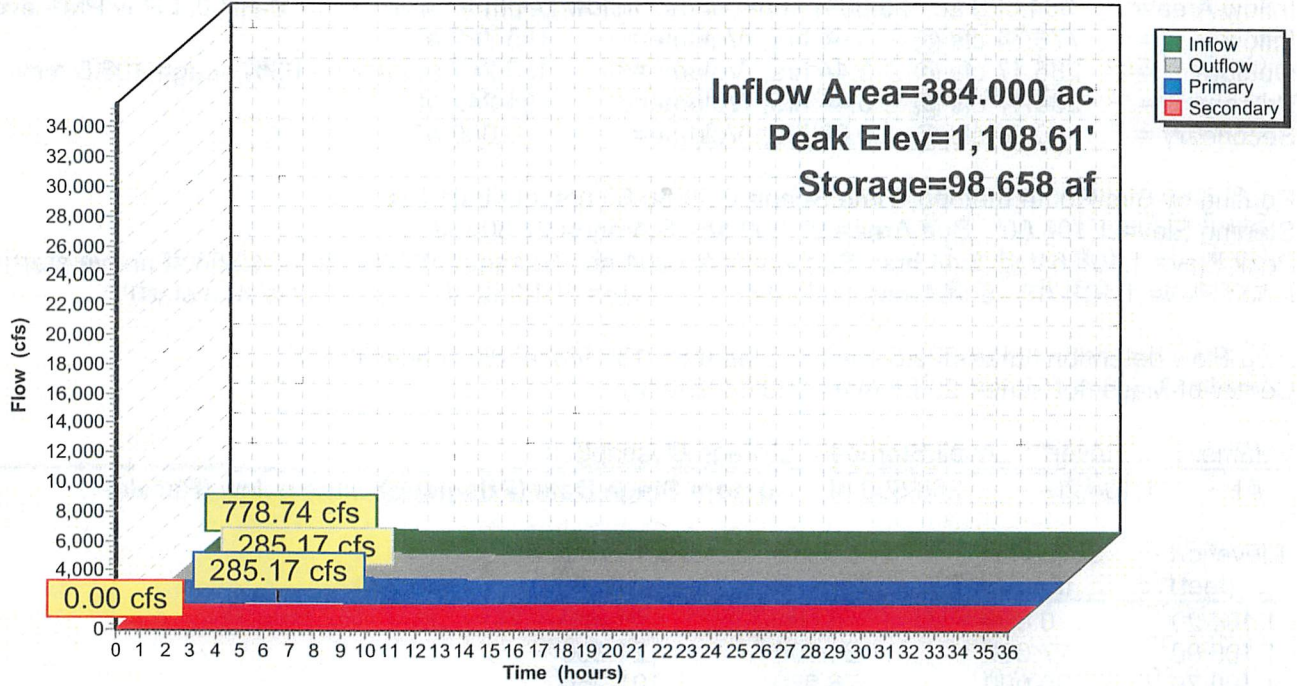
Device	Routing	Invert	Outlet Devices
#1	Primary	1,106.00'	Lake Eric Special & User-Defined Outlet Head (feet) 0.00 1.00 2.00 2.70 3.00 4.00 Disch. (cfs) 0.000 60.000 180.000 300.000 1,240.000 3,930.000
#2	Secondary	1,108.70'	Custom Weir/Orifice, Cv= 2.24 (C= 2.80) Head (feet) 0.00 1.30 Width (feet) 150.00 150.00

Primary OutFlow Max=285.17 cfs @ 5.44 hrs HW=1,108.61' TW=0.00' (Dynamic Tailwater)
 ↳1=Lake Eric Special & User-Defined Outlet(Custom Controls 285.17 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,106.00' TW=0.00' (Dynamic Tailwater)
 ↳2=Custom Weir/Orifice (Controls 0.00 cfs)

Pond 4P: Lake O'Springs

Hydrograph



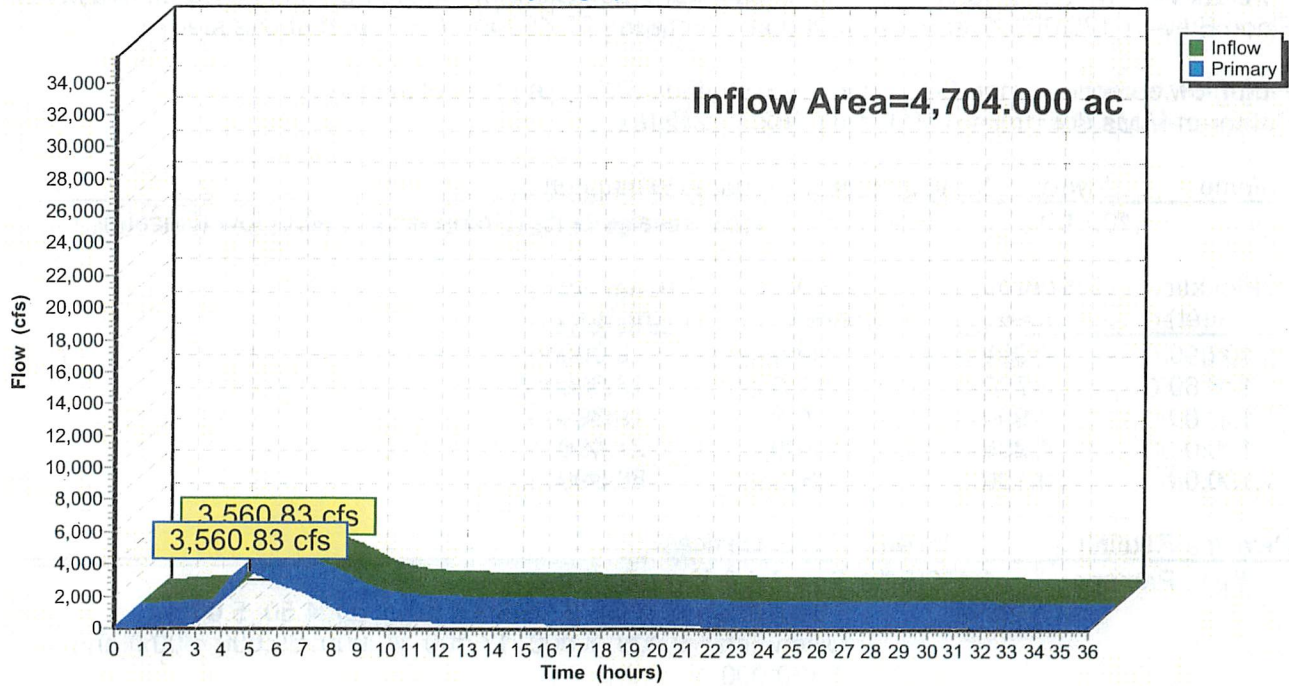
Summary for Pond 5C: Confluence 5

Inflow Area = 4,704.000 ac, 14.19% Impervious, Inflow Depth > 4.61" for 6-HR 0.4 Rev PMF event
 Inflow = 3,560.83 cfs @ 4.97 hrs, Volume= 1,808.211 af
 Primary = 3,560.83 cfs @ 4.98 hrs, Volume= 1,808.211 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 5C: Confluence 5

Hydrograph



Summary for Pond 5P: Lake Eric (Slagle)

Inflow Area = 115.200 ac, 0.00% Impervious, Inflow Depth = 4.79" for 6-HR 0.4 Rev PMF event
 Inflow = 255.72 cfs @ 3.28 hrs, Volume= 46.001 af
 Outflow = 231.20 cfs @ 3.63 hrs, Volume= 45.886 af, Atten= 10%, Lag= 21.0 min
 Primary = 187.13 cfs @ 3.63 hrs, Volume= 43.300 af
 Secondary = 44.07 cfs @ 3.63 hrs, Volume= 2.586 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Starting Elev= 1,116.50' Surf.Area= 3.700 ac Storage= 13.690 af
 Peak Elev= 1,120.22' @ 3.63 hrs Surf.Area= 4.287 ac Storage= 28.434 af (14.744 af above start)
 Flood Elev= 1,120.00' Surf.Area= 4.200 ac Storage= 27.490 af (13.800 af above start)

Plug-Flow detention time= 242.1 min calculated for 32.196 af (70% of inflow)
 Center-of-Mass det. time= 136.1 min (382.1 - 246.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,109.10'	88.990 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,109.10	0.000	0.000	0.000
1,116.50	3.700	13.690	13.690
1,118.00	3.900	5.700	19.390
1,120.00	4.200	8.100	27.490
1,130.00	8.100	61.500	88.990

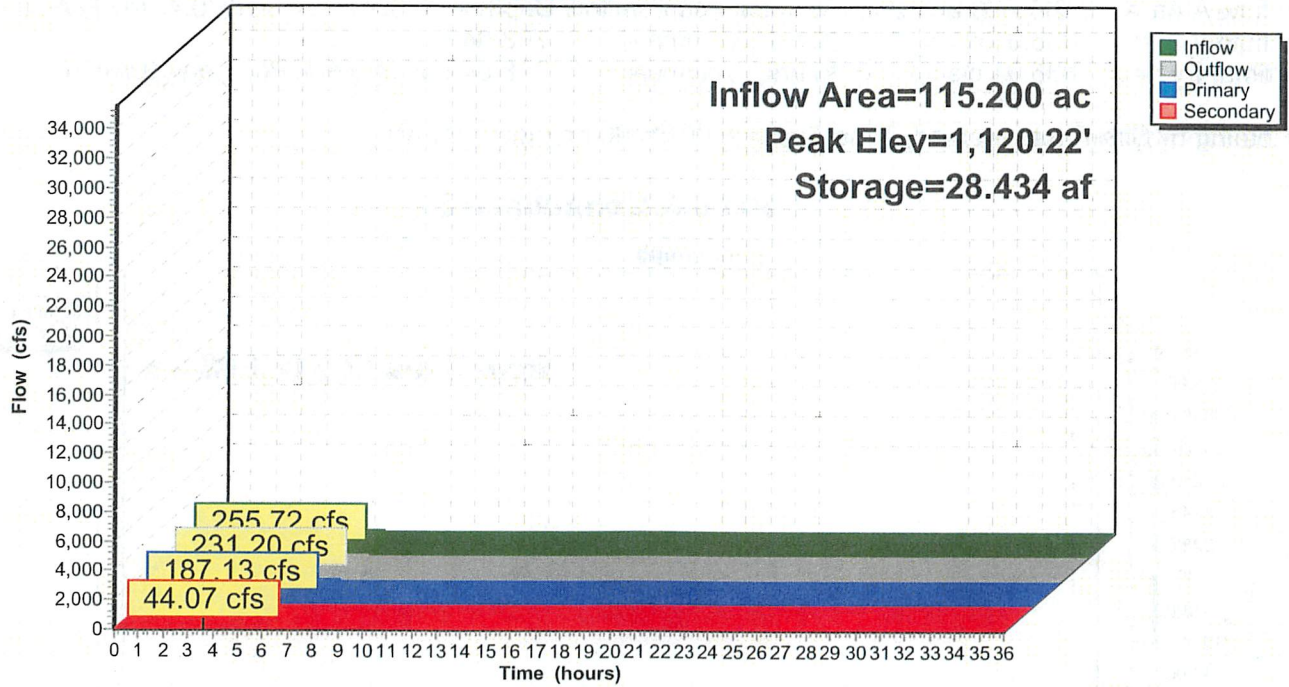
Device	Routing	Invert	Outlet Devices
#1	Primary	1,116.50'	Special & User-Defined Head (feet) 0.00 0.50 1.50 2.50 3.50 4.50 5.00 Disch. (cfs) 0.000 3.000 17.000 40.000 69.000 600.000 1,130.000
#2	Secondary	1,120.00'	Custom Weir/Orifice, Cv= 2.24 (C= 2.80) Head (feet) 0.00 10.00 Width (feet) 150.00 150.00

Primary OutFlow Max=187.11 cfs @ 3.63 hrs HW=1,120.22' TW=0.00' (Dynamic Tailwater)
 ↳1=Special & User-Defined (Custom Controls 187.11 cfs)

Secondary OutFlow Max=44.06 cfs @ 3.63 hrs HW=1,120.22' TW=0.00' (Dynamic Tailwater)
 ↳2=Custom Weir/Orifice (Weir Controls 44.06 cfs @ 1.32 fps)

Pond 5P: Lake Eric (Slagle)

Hydrograph



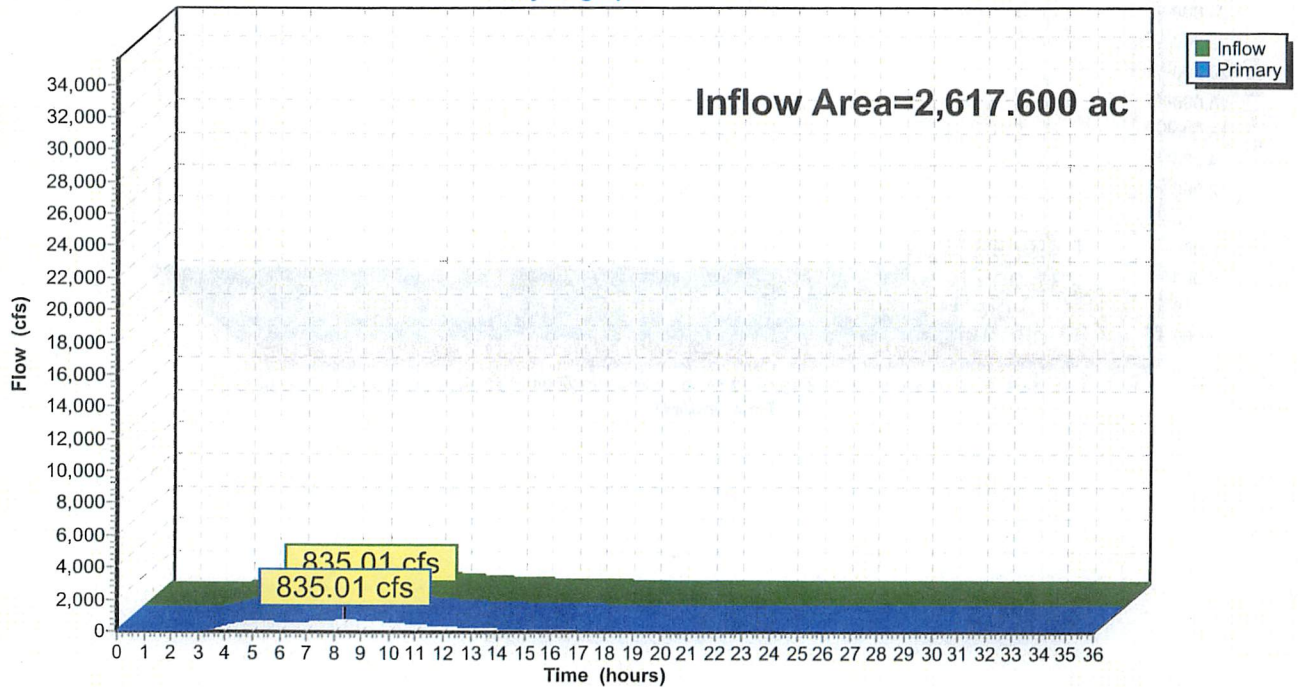
Summary for Pond 6C: Confluence 6

Inflow Area = 2,617.600 ac, 28.52% Impervious, Inflow Depth > 3.52" for 6-HR 0.4 Rev PMF event
Inflow = 835.01 cfs @ 8.35 hrs, Volume= 768.042 af
Primary = 835.01 cfs @ 8.36 hrs, Volume= 768.042 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 6C: Confluence 6

Hydrograph

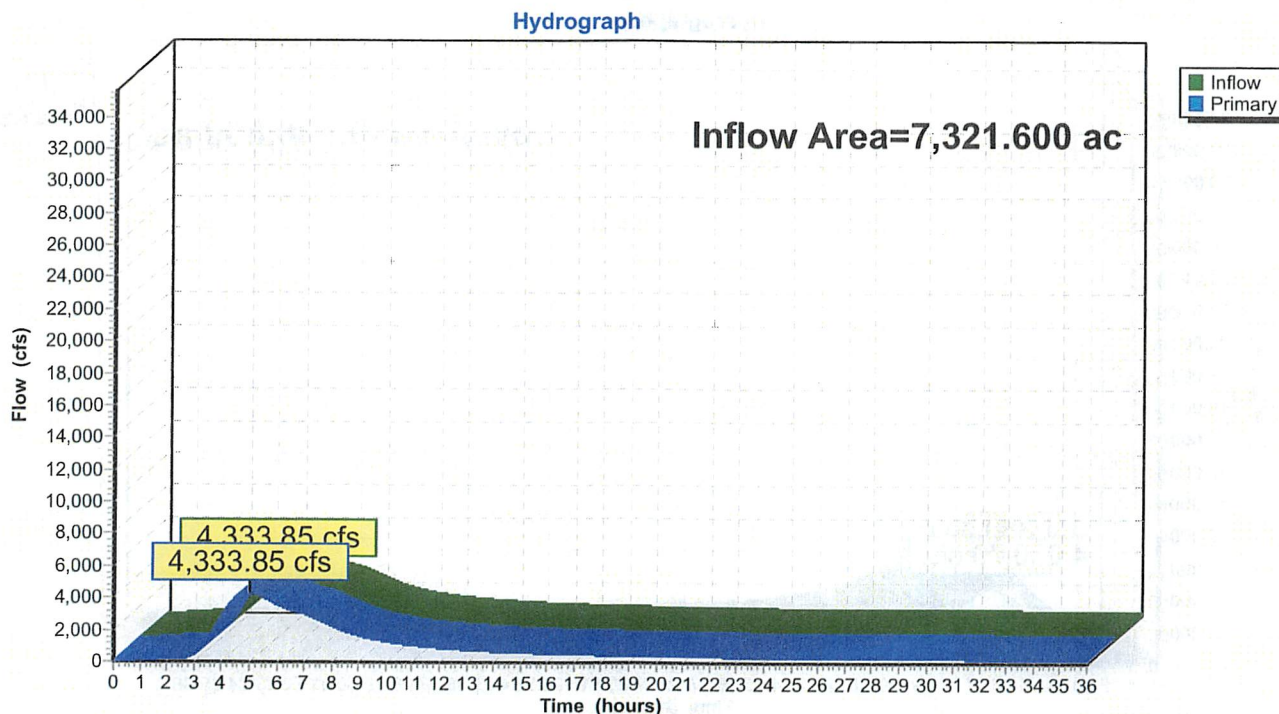


Summary for Pond 7C: Confluence 7 - Combined North Watershed and Sippo Lake

Inflow Area = 7,321.600 ac, 19.32% Impervious, Inflow Depth > 4.22" for 6-HR 0.4 Rev PMF event
Inflow = 4,333.85 cfs @ 5.01 hrs, Volume= 2,576.056 af
Primary = 4,333.85 cfs @ 5.02 hrs, Volume= 2,576.056 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 7C: Confluence 7 - Combined North Watershed and Sippo Lake

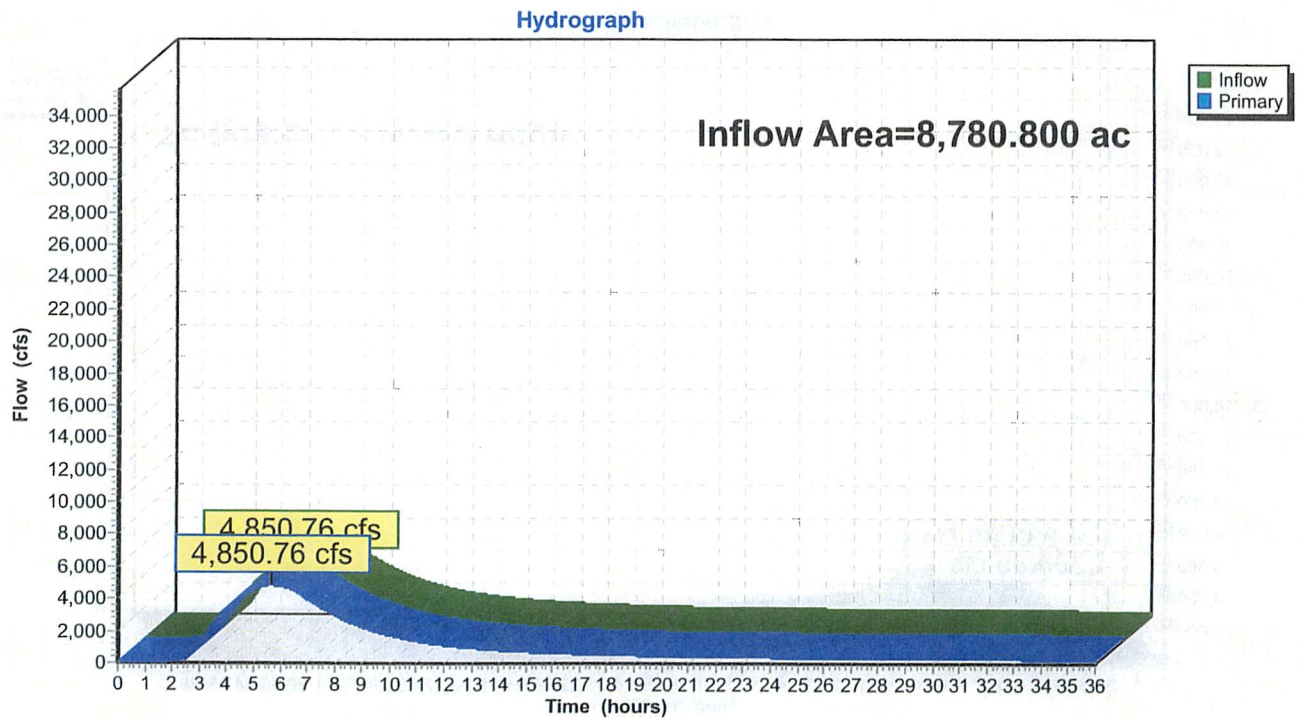


Summary for Pond 8C: Confluence 8

Inflow Area = 8,780.800 ac, 19.29% Impervious, Inflow Depth > 4.28" for 6-HR 0.4 Rev PMF event
 Inflow = 4,850.76 cfs @ 5.68 hrs, Volume= 3,129.942 af
 Primary = 4,850.76 cfs @ 5.69 hrs, Volume= 3,129.942 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 8C: Confluence 8



Summary for Pond 8P: Storage Area Genoa Rd

Inflow Area = 1,964.800 ac, 38.00% Impervious, Inflow Depth > 4.34" for 6-HR 0.4 Rev PMF event
 Inflow = 2,291.87 cfs @ 5.70 hrs, Volume= 710.504 af
 Outflow = 719.13 cfs @ 8.87 hrs, Volume= 551.538 af, Atten= 69%, Lag= 190.3 min
 Primary = 127.72 cfs @ 6.64 hrs, Volume= 286.933 af
 Secondary = 625.18 cfs @ 8.88 hrs, Volume= 264.604 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,026.15' @ 8.88 hrs Surf.Area= 178.706 ac Storage= 487.763 af
 Flood Elev= 1,028.00' Surf.Area= 213.745 ac Storage= 851.153 af

Plug-Flow detention time= 567.3 min calculated for 551.538 af (78% of inflow)
 Center-of-Mass det. time= 509.4 min (943.6 - 434.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	1,018.00'	1,873.781 af	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
1,018.00	1.828	9,236.2	0.000	0.000	1.828
1,020.00	12.667	15,179.0	12.871	12.871	266.894
1,022.00	44.456	16,532.1	53.902	66.773	345.285
1,024.00	91.000	31,384.9	132.707	199.480	1,645.455
1,026.00	176.087	39,123.0	262.448	461.929	2,642.179
1,032.00	300.000	45,000.0	1,411.853	1,873.781	3,545.375

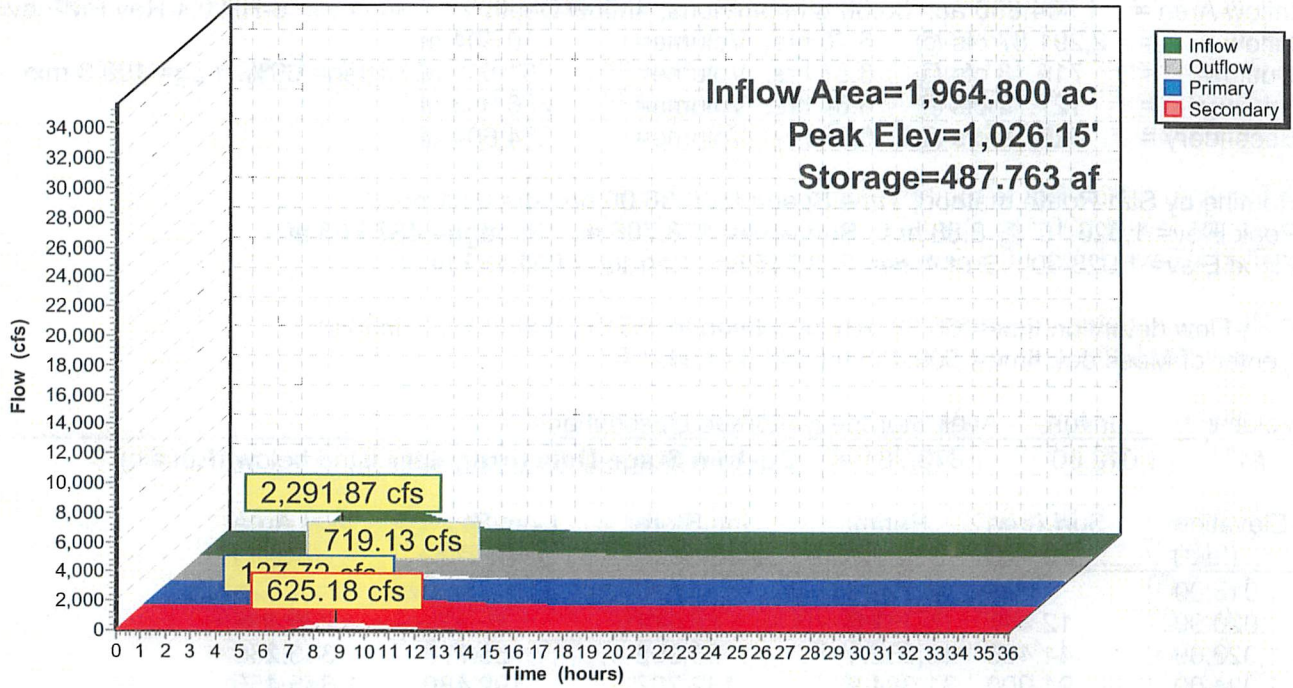
Device	Routing	Invert	Outlet Devices
#1	Primary	1,018.00'	48.0" Round Culvert L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,018.00' / 1,017.00' S= 0.0167 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Secondary	1,025.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 3.00 5.00 Width (feet) 125.00 192.00 308.00 415.00

Primary OutFlow Max=127.36 cfs @ 6.64 hrs HW=1,025.17' TW=1,020.74' (Dynamic Tailwater)
 ↳1=Culvert (Inlet Controls 127.36 cfs @ 10.13 fps)

Secondary OutFlow Max=625.18 cfs @ 8.88 hrs HW=1,026.15' TW=1,023.74' (Dynamic Tailwater)
 ↳2=Custom Weir/Orifice (Weir Controls 625.18 cfs @ 3.34 fps)

Pond 8P: Storage Area Genoa Rd

Hydrograph



Summary for Pond 9P: Sippo Lake

Inflow Area = 1,964.800 ac, 38.00% Impervious, Inflow Depth = 4.91" for 6-HR 0.4 Rev PMF event
 Inflow = 2,637.72 cfs @ 5.02 hrs, Volume= 803.362 af
 Outflow = 2,291.87 cfs @ 5.70 hrs, Volume= 710.505 af, Atten= 13%, Lag= 41.0 min
 Primary = 2,283.97 cfs @ 5.70 hrs, Volume= 709.810 af
 Secondary = 7.91 cfs @ 5.70 hrs, Volume= 0.695 af
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Starting Elev= 1,027.00' Surf.Area= 88.000 ac Storage= 220.000 af
 Peak Elev= 1,029.49' @ 5.70 hrs Surf.Area= 106.557 ac Storage= 462.933 af (242.933 af above start)
 Flood Elev= 1,029.30' Surf.Area= 106.000 ac Storage= 443.100 af (223.100 af above start)

Plug-Flow detention time= 199.7 min calculated for 490.505 af (61% of inflow)
 Center-of-Mass det. time= 85.2 min (434.2 - 349.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,022.00'	1,220.300 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,022.00	0.000	0.000	0.000
1,027.00	88.000	220.000	220.000
1,029.30	106.000	223.100	443.100
1,036.00	126.000	777.200	1,220.300

Device	Routing	Invert	Outlet Devices
#1	Primary	1,028.00'	300.0' long x 30.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	1,028.50'	330.0' long x 30.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Secondary	1,029.30'	30.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s)
#4	Tertiary	1,030.00'	650.0' long x 50.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

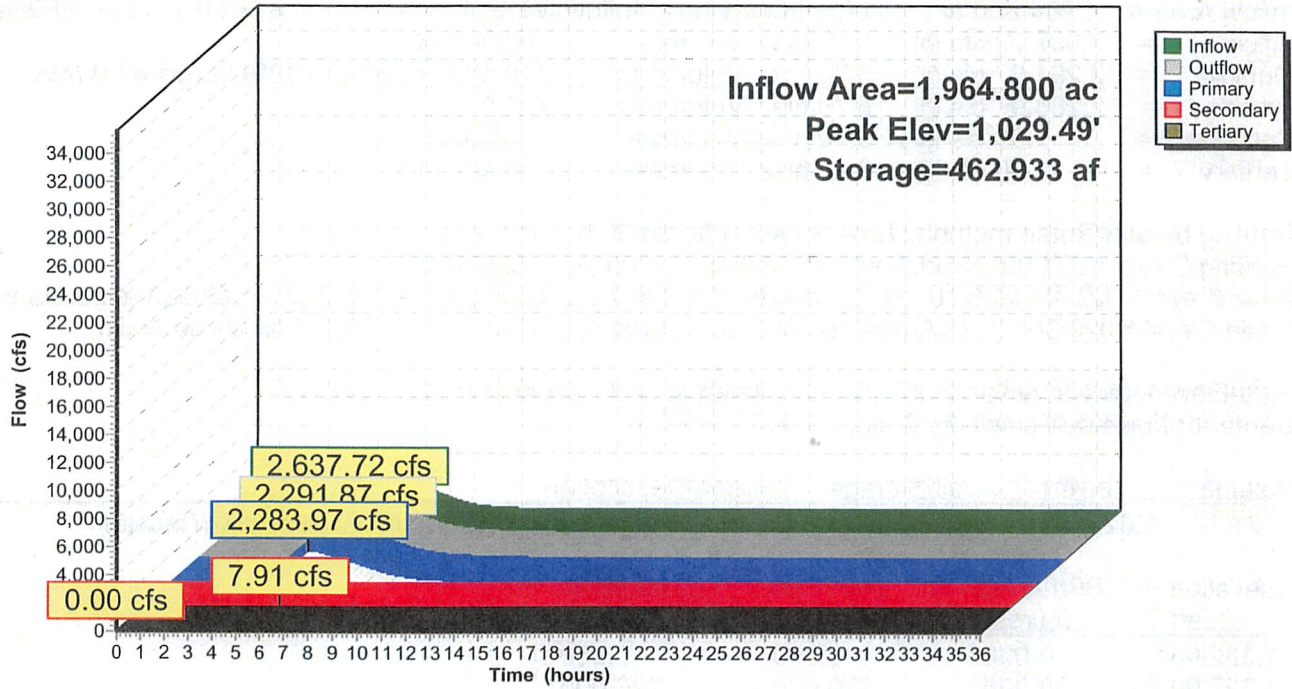
Primary OutFlow Max=2,283.96 cfs @ 5.70 hrs HW=1,029.49' TW=1,023.70' (Dynamic Tailwater)
 ↳1=**Broad-Crested Rectangular Weir** (Weir Controls 1,433.21 cfs @ 3.21 fps)
 ↳2=**Broad-Crested Rectangular Weir** (Weir Controls 850.75 cfs @ 2.61 fps)

Secondary OutFlow Max=7.91 cfs @ 5.70 hrs HW=1,029.49' TW=1,023.70' (Dynamic Tailwater)
 ↳3=**Sharp-Crested Rectangular Weir** (Weir Controls 7.91 cfs @ 1.41 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,027.00' TW=1,018.00' (Dynamic Tailwater)
 ↳4=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 9P: Sippo Lake

Hydrograph

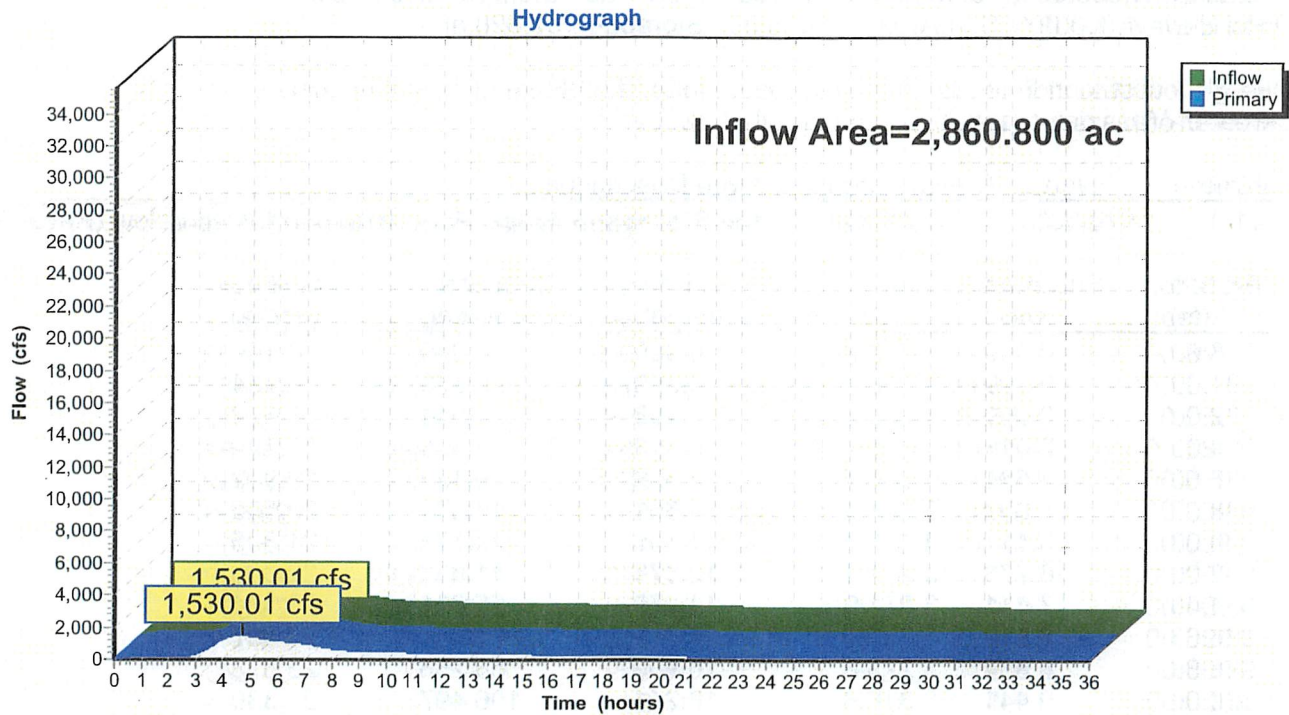


Summary for Pond 13P: Confluence 3 - Combined Watershed NW and North Watershed

Inflow Area = 2,860.800 ac, 23.34% Impervious, Inflow Depth > 4.97" for 6-HR 0.4 Rev PMF event
 Inflow = 1,530.01 cfs @ 4.69 hrs, Volume= 1,183.920 af
 Primary = 1,530.01 cfs @ 4.70 hrs, Volume= 1,183.920 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 13P: Confluence 3 - Combined Watershed NW and North Watershed



Summary for Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 4.30" for 6-HR 0.4 Rev PMF event
 Inflow = 5,171.73 cfs @ 6.37 hrs, Volume= 3,388.276 af
 Outflow = 5,167.54 cfs @ 6.45 hrs, Volume= 3,387.327 af, Atten= 0%, Lag= 4.5 min
 Primary = 2,899.76 cfs @ 5.66 hrs, Volume= 2,964.986 af
 Secondary = 2,270.36 cfs @ 6.45 hrs, Volume= 422.340 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,009.66' @ 6.45 hrs Surf.Area= 14.177 ac Storage= 219.946 af
 Flood Elev= 1,008.00' Surf.Area= 13.465 ac Storage= 197.028 af

Plug-Flow detention time= 28.2 min calculated for 3,386.386 af (100% of inflow)
 Center-of-Mass det. time= 27.7 min (700.4 - 672.6)

Volume	Invert	Avail.Storage	Storage Description
#1	978.00'	371.368 af	Stage Storage in Sippo Park (Irregular) Listed below (Recalc)

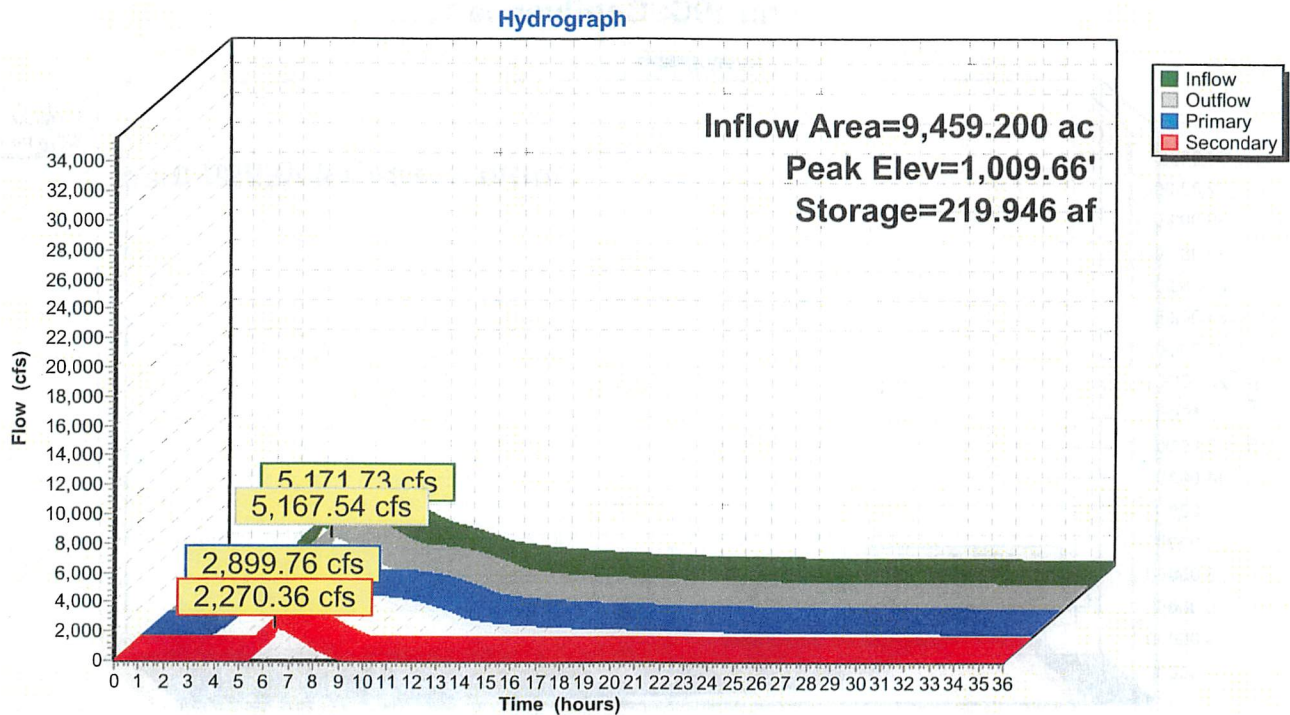
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
978.00	0.100	200.0	0.000	0.000	0.100
981.00	0.300	500.0	0.573	0.573	0.484
982.00	0.659	1,392.9	0.468	1.041	3.572
984.00	2.018	2,470.7	2.553	3.595	11.180
986.00	3.584	3,300.7	5.528	9.122	19.932
988.00	5.007	3,247.5	8.551	17.674	20.586
990.00	6.111	3,143.9	11.100	28.773	21.805
992.00	6.773	3,217.1	12.878	41.652	22.668
994.00	7.411	3,271.9	14.179	55.831	23.334
996.00	8.110	3,253.8	15.516	71.347	23.597
998.00	8.804	3,273.8	16.909	88.256	23.878
1,000.00	9.441	3,318.6	18.241	106.497	24.439
1,002.00	10.181	3,437.0	19.617	126.114	25.908
1,004.00	11.109	3,548.6	21.283	147.398	27.341
1,006.00	12.538	3,553.4	23.633	171.030	27.516
1,008.00	13.465	3,829.8	25.997	197.028	31.248
1,010.00	14.326	4,085.3	27.787	224.814	34.947
1,012.00	15.633	4,329.5	29.949	254.764	38.706
1,014.00	17.576	4,742.6	33.190	287.954	45.555
1,016.00	20.521	5,940.5	38.059	326.013	68.935
1,018.00	24.905	6,310.6	45.355	371.368	77.223

Device	Routing	Invert	Outlet Devices
#1	Primary	978.25'	168.0" W x 98.0" H Box Box Culvert L= 121.8' Ke= 0.400 Inlet / Outlet Invert= 978.25' / 978.13' S= 0.0010 '/' Cc= 0.900 n= 0.015 Brickwork
#2	Secondary	1,008.00'	Linclon Way (172), Cv= 2.63 (C= 3.29) Head (feet) 0.00 1.00 2.00 4.00 6.00 8.00 10.00 Width (feet) 233.00 373.00 475.00 630.00 790.00 940.00 1,090.00

Primary OutFlow Max=2,898.88 cfs @ 5.66 hrs HW=1,009.27' TW=984.99' (Dynamic Tailwater)
 ↳1=Box Culvert (Inlet Controls 2,898.88 cfs @ 25.35 fps)

Secondary OutFlow Max=2,270.35 cfs @ 6.45 hrs HW=1,009.66' TW=985.48' (Dynamic Tailwater)
 ↳2=Linclon Way (172) (Weir Controls 2,270.35 cfs @ 3.98 fps)

Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-

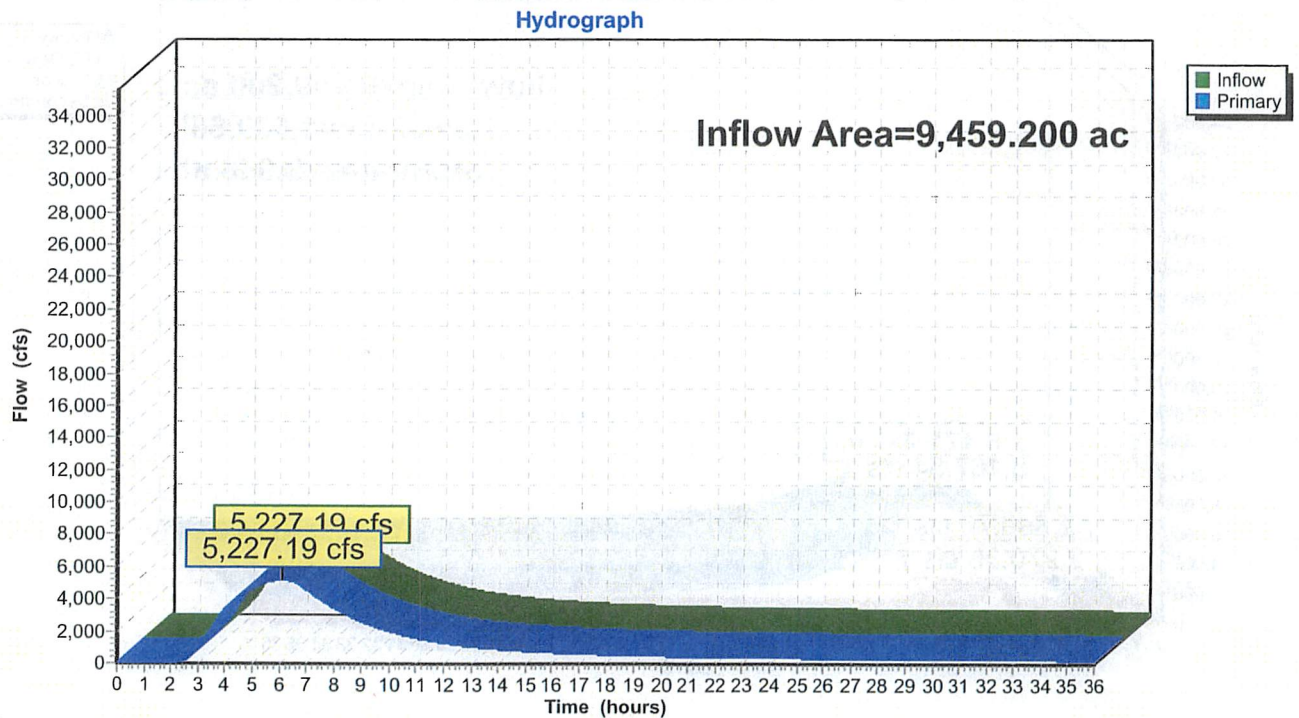


Summary for Pond 19C: Confluence 19

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 4.31" for 6-HR 0.4 Rev PMF event
Inflow = 5,227.19 cfs @ 6.13 hrs, Volume= 3,400.696 af
Primary = 5,227.19 cfs @ 6.14 hrs, Volume= 3,400.696 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 19C: Confluence 19

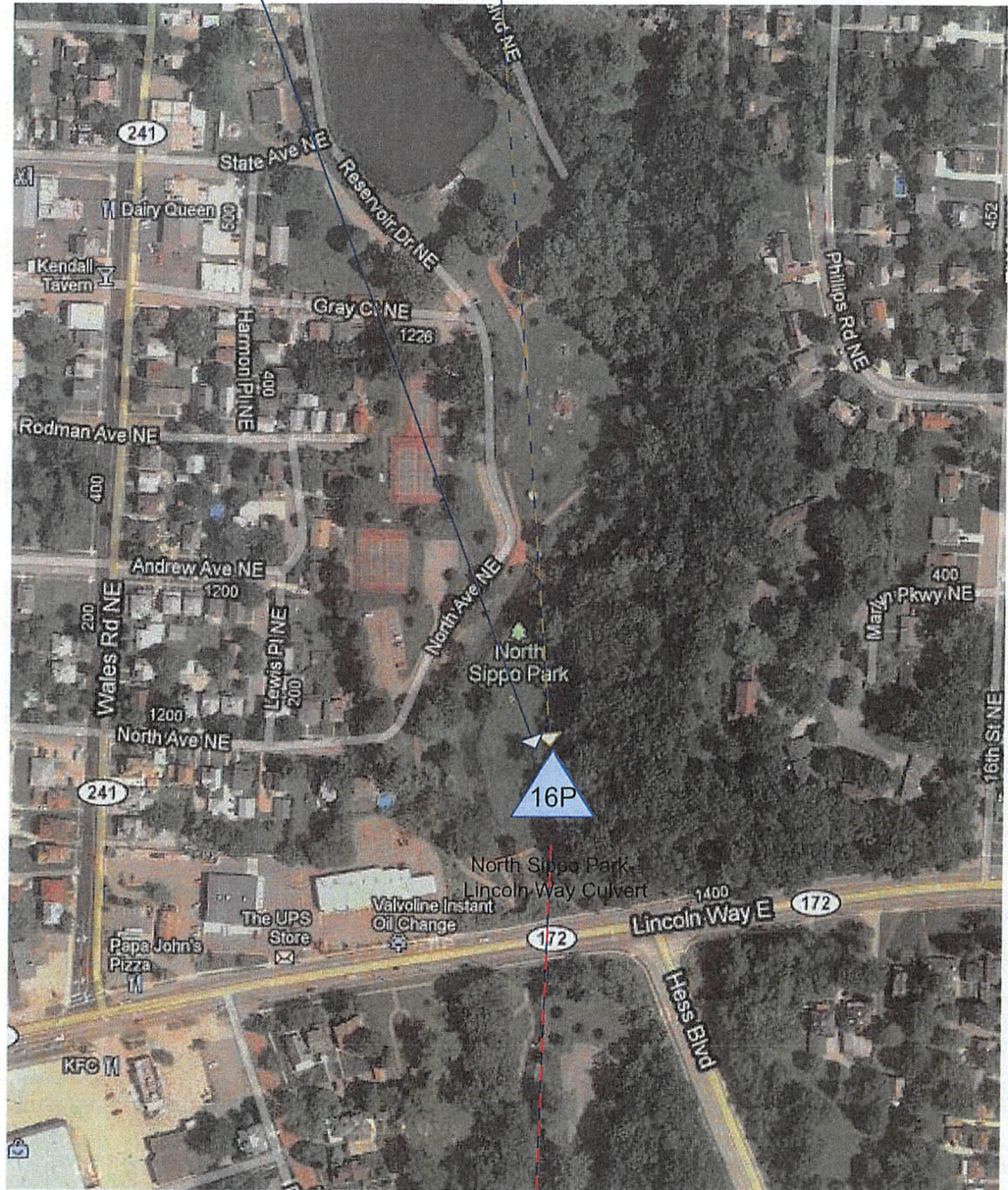




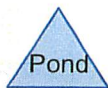
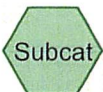
Constant inflow - 0.40 PMF



Sippo Reservoir - Existing Conditions - 0.40 PMF DBA



Sippo Creek Channel Downstream of Lincoln Way



Drainage Diagram for Existing Conditions Sippo Reservoir-URS-DBA-40PMF
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Existing Conditions Sippo Reservoir-URS-DBA-40PMF

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.000	0	TOTAL AREA

Existing Conditions Sippo Reservoir-URS-DBA-40PMF

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Page 3

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.000		TOTAL AREA

Existing Conditions Sippo Reservoir-URS-DBA-40PMF

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Fill (inches)
1	16P	978.25	978.13	121.8	0.0010	0.015	168.0	98.0	0.0

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Reach 18R: Sippo Creek Avg. Flow Depth=7.41' Max Vel=10.05 fps Inflow=5,346.03 cfs 20,746.774 af
L=450.0' S=0.0084 ' Capacity=200,707.82 cfs Outflow=5,280.34 cfs 20,745.712 af

Pond 1P: Sippo Reservoir - Existing Peak Elev=1,010.24' Storage=201.646 af Inflow=0.00 cfs 0.000 af
Outflow=70.27 cfs 16.269 af

Pond 16P: North Sippo Park- Peak Elev=1,009.71' Storage=220.660 af Inflow=5,296.37 cfs 20,747.155 af
Primary=3,080.47 cfs 11,495.613 af Secondary=2,383.35 cfs 9,255.482 af Outflow=5,346.03 cfs 20,751.094 af

Pond 32P: Constant inflow - 0.40 PMF Peak Elev=1,009.84' Inflow=5,227.00 cfs 20,735.207 af
Outflow=5,227.00 cfs 20,735.207 af

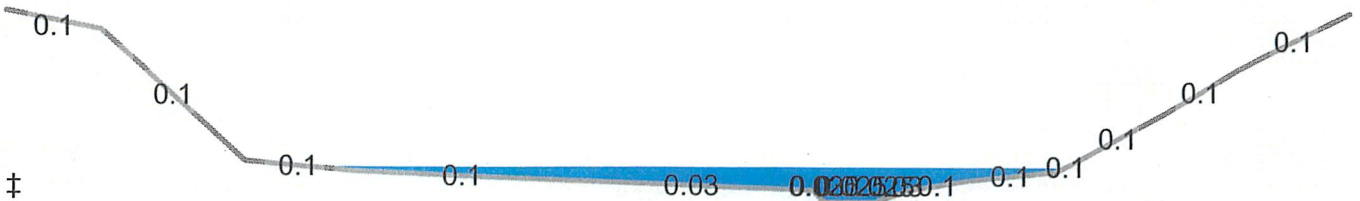
Summary for Reach 18R: Sippo Creek Channel Downstream of Lincoln Way

Inflow = 5,346.03 cfs @ 0.00 hrs, Volume= 20,746.774 af
 Outflow = 5,280.34 cfs @ 0.52 hrs, Volume= 20,745.712 af, Atten= 1%, Lag= 30.9 min

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Max. Velocity= 10.05 fps, Min. Travel Time= 0.7 min
 Avg. Velocity = 10.03 fps, Avg. Travel Time= 0.7 min

Peak Storage= 236,545 cf @ 0.52 hrs
 Average Depth at Peak Storage= 7.41'
 Defined Flood Depth= 15.00', Capacity at Flood Depth= 28,360.41 cfs
 Bank-Full Depth= 40.50', Capacity at Bank-Full= 200,707.82 cfs

Custom cross-section, Length= 450.0' Slope= 0.0084 '/' (1006 Elevation Intervals)
 Flow calculated by Manning's Subdivision method
 Inlet Invert= 978.13', Outlet Invert= 974.35'

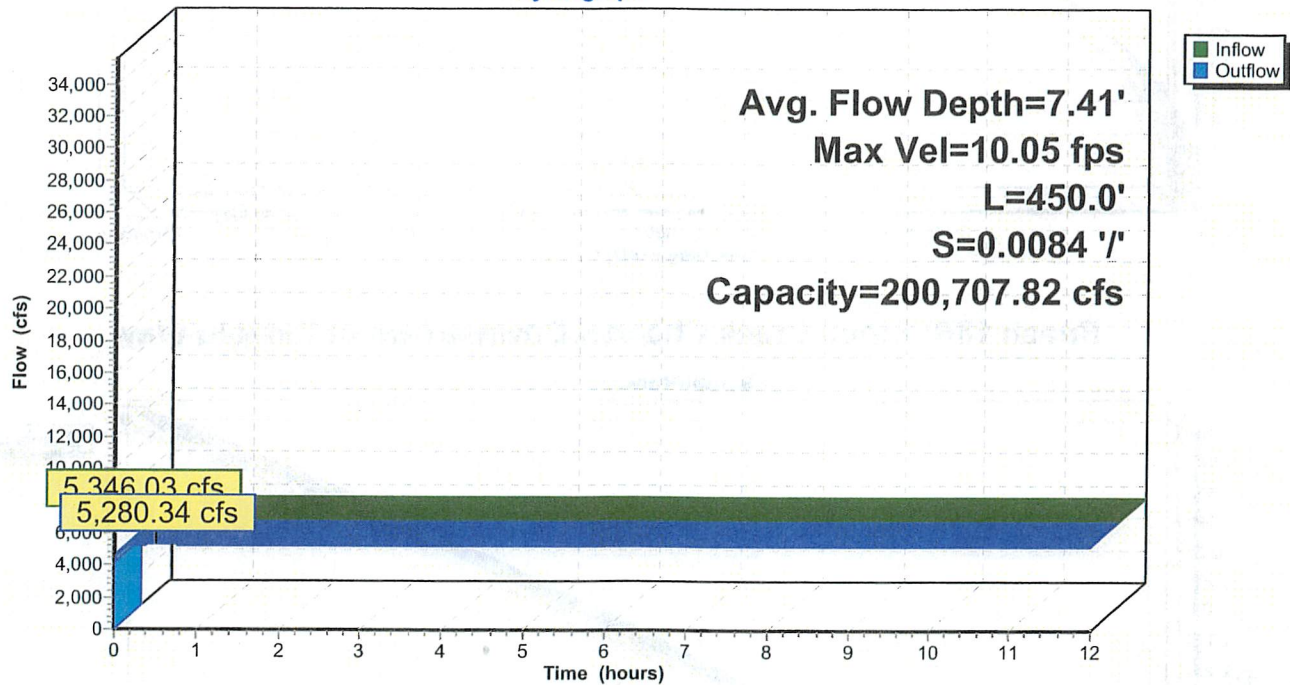


Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,012.00	0.00		
20.00	1,008.00	4.00	0.100	Heavy timber, flow below branches
51.00	980.00	32.00	0.100	Heavy timber, flow below branches
74.00	978.00	34.00	0.100	Heavy timber, flow below branches
121.00	976.00	36.00	0.100	Heavy timber, flow below branches
173.00	974.00	38.00	0.030	Short grass
175.00	972.00	40.00	0.030	Short grass
176.00	971.50	40.50	0.025	Stream, clean & straight
187.00	971.50	40.50	0.025	Stream, clean & straight
188.00	972.00	40.00	0.025	Stream, clean & straight
194.00	974.00	38.00	0.030	Short grass
206.00	976.00	36.00	0.100	Heavy timber, flow below branches
225.50	978.00	34.00	0.100	Heavy timber, flow below branches
229.50	980.00	32.00	0.100	Heavy timber, flow below branches
248.00	990.00	22.00	0.100	Heavy timber, flow below branches
265.00	1,000.00	12.00	0.100	Heavy timber, flow below branches
289.00	1,012.00	0.00	0.100	Heavy timber, flow below branches

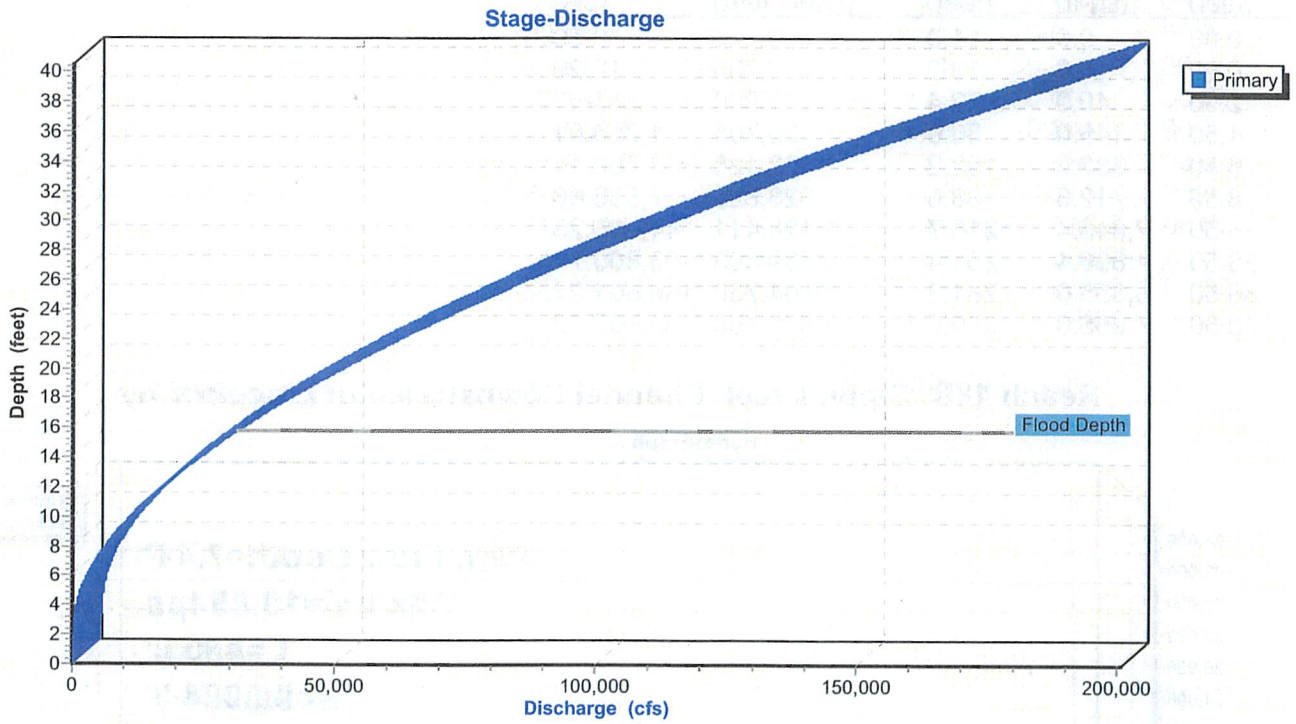
Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	11.0	0	0.00
0.50	6.0	13.2	2,700	19.29
2.50	40.0	22.4	18,000	347.53
4.50	146.0	86.6	65,701	1,300.01
6.50	382.5	153.2	172,125	3,703.14
8.50	712.5	180.8	320,625	7,536.06
18.50	2,645.4	216.7	1,190,411	44,005.23
28.50	4,866.4	251.4	2,189,893	103,800.74
36.50	6,855.0	281.2	3,084,750	166,501.22
40.50	7,955.0	310.6	3,579,750	200,707.82

Reach 18R: Sippo Creek Channel Downstream of Lincoln Way

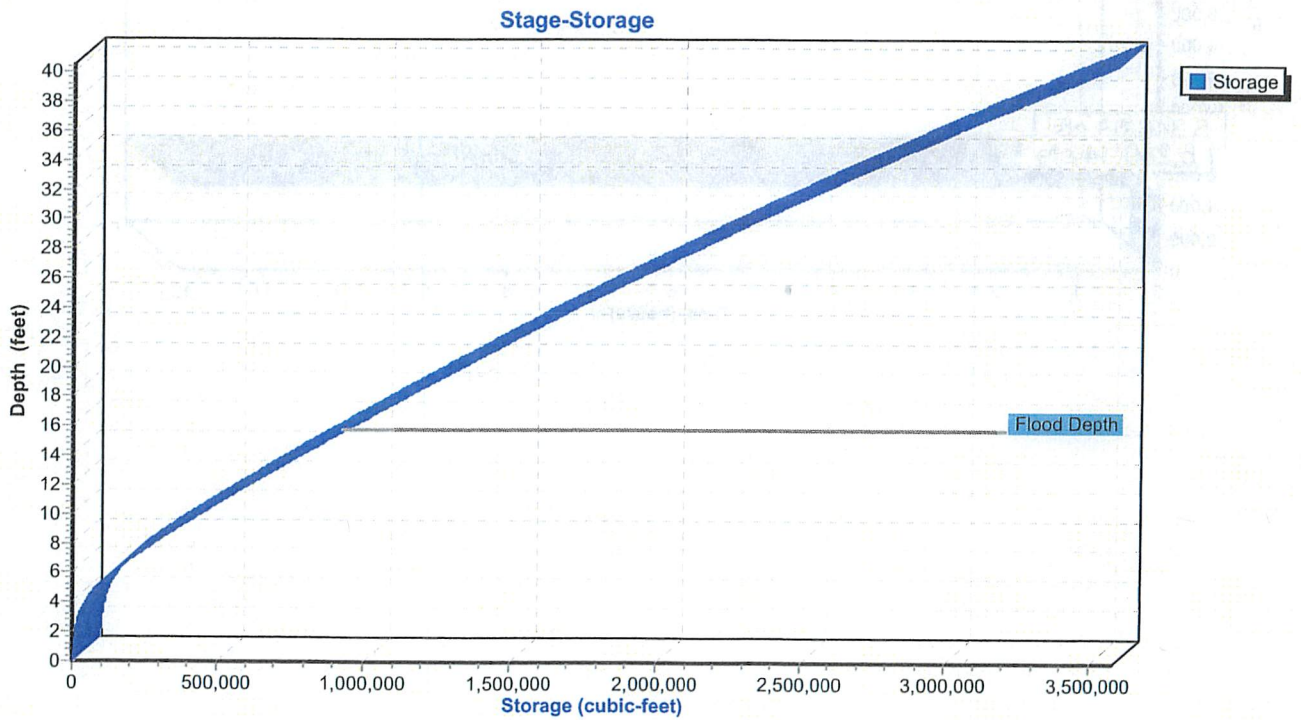
Hydrograph



Reach 18R: Sippo Creek Channel Downstream of Lincoln Way



Reach 18R: Sippo Creek Channel Downstream of Lincoln Way



Hydrograph for Reach 18R: Sippo Creek Channel Downstream of Lincoln Way

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	5,346.03	0	978.13	0.00
0.05	4,804.22	214,457	985.23	4,722.35
0.10	5,050.70	225,906	985.39	5,009.52
0.15	5,173.05	231,570	985.47	5,153.24
0.20	5,231.32	234,265	985.51	5,222.00
0.25	5,258.61	235,529	985.52	5,254.30
0.30	5,271.15	236,110	985.53	5,269.19
0.35	5,276.78	236,372	985.54	5,275.91
0.40	5,279.19	236,486	985.54	5,278.83
0.45	5,280.11	236,531	985.54	5,279.99
0.50	5,280.34	236,544	985.54	5,280.32
0.55	5,280.24	236,543	985.54	5,280.28
0.60	5,280.00	236,534	985.54	5,280.06
0.65	5,279.69	236,522	985.54	5,279.76
0.70	5,279.35	236,509	985.54	5,279.43
0.75	5,279.00	236,496	985.54	5,279.08
0.80	5,278.63	236,481	985.54	5,278.71
0.85	5,278.27	236,467	985.54	5,278.35
0.90	5,277.90	236,453	985.54	5,277.98
0.95	5,277.53	236,439	985.54	5,277.61
1.00	5,277.16	236,424	985.54	5,277.24
1.05	5,276.79	236,410	985.54	5,276.87
1.10	5,276.43	236,395	985.54	5,276.51
1.15	5,276.06	236,381	985.54	5,276.14
1.20	5,275.69	236,367	985.54	5,275.77
1.25	5,275.32	236,352	985.54	5,275.40
1.30	5,274.94	236,338	985.54	5,275.03
1.35	5,274.57	236,323	985.54	5,274.65
1.40	5,274.20	236,309	985.53	5,274.28
1.45	5,273.83	236,294	985.53	5,273.91
1.50	5,273.46	236,280	985.53	5,273.54
1.55	5,273.09	236,265	985.53	5,273.17
1.60	5,272.71	236,251	985.53	5,272.79
1.65	5,272.34	236,236	985.53	5,272.42
1.70	5,271.97	236,222	985.53	5,272.05
1.75	5,271.59	236,207	985.53	5,271.67
1.80	5,271.21	236,192	985.53	5,271.29
1.85	5,270.82	236,177	985.53	5,270.91
1.90	5,270.44	236,162	985.53	5,270.52
1.95	5,270.05	236,147	985.53	5,270.13
2.00	5,269.66	236,132	985.53	5,269.75
2.05	5,269.27	236,117	985.53	5,269.36
2.10	5,268.88	236,101	985.53	5,268.97
2.15	5,268.49	236,086	985.53	5,268.58
2.20	5,268.10	236,071	985.53	5,268.19
2.25	5,267.71	236,056	985.53	5,267.79
2.30	5,267.31	236,040	985.53	5,267.40
2.35	5,266.92	236,025	985.53	5,267.01
2.40	5,266.52	236,009	985.53	5,266.61
2.45	5,266.13	235,994	985.53	5,266.21
2.50	5,265.73	235,979	985.53	5,265.82
2.55	5,265.33	235,963	985.53	5,265.42
2.60	5,264.93	235,947	985.53	5,265.02

Hydrograph for Reach 18R: Sippo Creek Channel Downstream of Lincoln Way (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
2.65	5,264.53	235,932	985.53	5,264.62
2.70	5,264.13	235,916	985.53	5,264.22
2.75	5,263.73	235,900	985.53	5,263.82
2.80	5,263.32	235,885	985.53	5,263.41
2.85	5,262.92	235,869	985.53	5,263.01
2.90	5,262.51	235,853	985.53	5,262.60
2.95	5,262.10	235,837	985.53	5,262.19
3.00	5,261.69	235,821	985.53	5,261.78
3.05	5,261.28	235,805	985.53	5,261.37
3.10	5,260.87	235,789	985.53	5,260.96
3.15	5,260.46	235,773	985.53	5,260.55
3.20	5,260.04	235,757	985.53	5,260.13
3.25	5,259.62	235,740	985.53	5,259.71
3.30	5,259.20	235,724	985.53	5,259.29
3.35	5,258.78	235,707	985.53	5,258.87
3.40	5,258.36	235,691	985.53	5,258.45
3.45	5,257.93	235,674	985.53	5,258.02
3.50	5,257.50	235,658	985.53	5,257.60
3.55	5,257.07	235,641	985.53	5,257.17
3.60	5,256.64	235,624	985.53	5,256.73
3.65	5,256.20	235,607	985.53	5,256.30
3.70	5,255.76	235,590	985.53	5,255.86
3.75	5,255.30	235,572	985.52	5,255.40
3.80	5,254.84	235,554	985.52	5,254.94
3.85	5,254.38	235,536	985.52	5,254.48
3.90	5,253.91	235,518	985.52	5,254.01
3.95	5,253.44	235,499	985.52	5,253.54
4.00	5,252.96	235,481	985.52	5,253.07
4.05	5,252.48	235,462	985.52	5,252.59
4.10	5,252.00	235,443	985.52	5,252.11
4.15	5,251.51	235,424	985.52	5,251.62
4.20	5,251.02	235,405	985.52	5,251.13
4.25	5,250.53	235,386	985.52	5,250.64
4.30	5,250.03	235,366	985.52	5,250.14
4.35	5,249.52	235,347	985.52	5,249.63
4.40	5,249.01	235,327	985.52	5,249.13
4.45	5,248.50	235,307	985.52	5,248.61
4.50	5,247.98	235,286	985.52	5,248.09
4.55	5,247.46	235,266	985.52	5,247.57
4.60	5,246.93	235,245	985.52	5,247.04
4.65	5,246.39	235,224	985.52	5,246.51
4.70	5,245.85	235,203	985.52	5,245.97
4.75	5,245.30	235,182	985.52	5,245.42
4.80	5,244.74	235,160	985.52	5,244.86
4.85	5,244.18	235,138	985.52	5,244.30
4.90	5,243.60	235,116	985.52	5,243.73
4.95	5,243.02	235,093	985.52	5,243.15
5.00	5,242.43	235,070	985.52	5,242.56
5.05	5,241.84	235,047	985.52	5,241.97
5.10	5,241.23	235,023	985.52	5,241.36
5.15	5,240.61	234,999	985.52	5,240.74
5.20	5,239.98	234,974	985.52	5,240.12
5.25	5,239.34	234,949	985.52	5,239.48

Hydrograph for Reach 18R: Sippo Creek Channel Downstream of Lincoln Way (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.30	5,238.68	234,924	985.52	5,238.83
5.35	5,238.02	234,898	985.52	5,238.16
5.40	5,237.34	234,872	985.52	5,237.49
5.45	5,236.64	234,844	985.52	5,236.79
5.50	5,235.93	234,817	985.51	5,236.09
5.55	5,235.21	234,789	985.51	5,235.37
5.60	5,234.47	234,760	985.51	5,234.63
5.65	5,233.73	234,731	985.51	5,233.89
5.70	5,232.97	234,701	985.51	5,233.14
5.75	5,232.22	234,672	985.51	5,232.38
5.80	5,231.48	234,643	985.51	5,231.64
5.85	5,230.77	234,615	985.51	5,230.92
5.90	5,230.12	234,589	985.51	5,230.26
5.95	5,229.55	234,566	985.51	5,229.67
6.00	5,229.07	234,546	985.51	5,229.17
6.05	5,228.66	234,529	985.51	5,228.74
6.10	5,228.33	234,516	985.51	5,228.40
6.15	5,228.06	234,505	985.51	5,228.11
6.20	5,227.84	234,496	985.51	5,227.89
6.25	5,227.67	234,489	985.51	5,227.70
6.30	5,227.51	234,483	985.51	5,227.56
6.35	5,227.44	234,477	985.51	5,227.41
6.40	5,227.27	234,474	985.51	5,227.32
6.45	5,227.27	234,474	985.51	5,227.32
6.50	5,227.24	234,472	985.51	5,227.27
6.55	5,227.23	234,466	985.51	5,227.13
6.60	5,227.11	234,466	985.51	5,227.12
6.65	5,227.10	234,466	985.51	5,227.12
6.70	5,227.13	234,463	985.51	5,227.06
6.75	5,227.06	234,464	985.51	5,227.07
6.80	5,227.03	234,462	985.51	5,227.03
6.85	5,227.05	234,463	985.51	5,227.05
6.90	5,227.02	234,462	985.51	5,227.03
6.95	5,227.01	234,462	985.51	5,227.01
7.00	5,227.00	234,461	985.51	5,227.01
7.05	5,227.01	234,462	985.51	5,227.02
7.10	5,227.01	234,461	985.51	5,227.01
7.15	5,227.00	234,461	985.51	5,227.00
7.20	5,227.00	234,461	985.51	5,227.00
7.25	5,227.00	234,461	985.51	5,227.00
7.30	5,227.00	234,461	985.51	5,227.00
7.35	5,227.00	234,461	985.51	5,227.00
7.40	5,227.00	234,461	985.51	5,227.00
7.45	5,227.00	234,461	985.51	5,227.00
7.50	5,227.00	234,461	985.51	5,227.00
7.55	5,227.00	234,461	985.51	5,227.00
7.60	5,227.00	234,461	985.51	5,227.00
7.65	5,227.00	234,461	985.51	5,227.00
7.70	5,227.00	234,461	985.51	5,227.00
7.75	5,227.00	234,461	985.51	5,227.00
7.80	5,227.00	234,461	985.51	5,227.00
7.85	5,227.00	234,461	985.51	5,227.00
7.90	5,227.00	234,461	985.51	5,227.00

Hydrograph for Reach 18R: Sippo Creek Channel Downstream of Lincoln Way (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
7.95	5,227.00	234,461	985.51	5,227.00
8.00	5,227.00	234,461	985.51	5,227.00
8.05	5,227.00	234,461	985.51	5,227.00
8.10	5,227.00	234,461	985.51	5,227.00
8.15	5,227.00	234,461	985.51	5,227.00
8.20	5,227.00	234,461	985.51	5,227.00
8.25	5,227.00	234,461	985.51	5,227.00
8.30	5,227.00	234,461	985.51	5,227.00
8.35	5,227.00	234,461	985.51	5,227.00
8.40	5,227.00	234,461	985.51	5,227.00
8.45	5,227.00	234,461	985.51	5,227.00
8.50	5,227.00	234,461	985.51	5,227.00
8.55	5,227.00	234,461	985.51	5,227.00
8.60	5,227.00	234,461	985.51	5,227.00
8.65	5,227.00	234,461	985.51	5,227.00
8.70	5,227.00	234,461	985.51	5,227.00
8.75	5,227.00	234,461	985.51	5,227.00
8.80	5,227.00	234,461	985.51	5,227.00
8.85	5,227.00	234,461	985.51	5,227.00
8.90	5,227.00	234,461	985.51	5,227.00
8.95	5,227.00	234,461	985.51	5,227.00
9.00	5,227.00	234,461	985.51	5,227.00
9.05	5,227.00	234,461	985.51	5,227.00
9.10	5,227.00	234,461	985.51	5,227.00
9.15	5,227.00	234,461	985.51	5,227.00
9.20	5,227.00	234,461	985.51	5,227.00
9.25	5,227.00	234,461	985.51	5,227.00
9.30	5,227.00	234,461	985.51	5,227.00
9.35	5,227.00	234,461	985.51	5,227.00
9.40	5,227.00	234,461	985.51	5,227.00
9.45	5,227.00	234,461	985.51	5,227.00
9.50	5,227.00	234,461	985.51	5,227.00
9.55	5,227.00	234,461	985.51	5,227.00
9.60	5,227.00	234,461	985.51	5,227.00
9.65	5,227.00	234,461	985.51	5,227.00
9.70	5,227.00	234,461	985.51	5,227.00
9.75	5,227.00	234,461	985.51	5,227.00
9.80	5,227.00	234,461	985.51	5,227.00
9.85	5,227.00	234,461	985.51	5,227.00
9.90	5,227.00	234,461	985.51	5,227.00
9.95	5,227.00	234,461	985.51	5,227.00
10.00	5,227.00	234,461	985.51	5,227.00
10.05	5,227.00	234,461	985.51	5,227.00
10.10	5,227.00	234,461	985.51	5,227.00
10.15	5,227.00	234,461	985.51	5,227.00
10.20	5,227.00	234,461	985.51	5,227.00
10.25	5,227.00	234,461	985.51	5,227.00
10.30	5,227.00	234,461	985.51	5,227.00
10.35	5,227.00	234,461	985.51	5,227.00
10.40	5,227.00	234,461	985.51	5,227.00
10.45	5,227.00	234,461	985.51	5,227.00
10.50	5,227.00	234,461	985.51	5,227.00
10.55	5,227.00	234,461	985.51	5,227.00

Hydrograph for Reach 18R: Sippo Creek Channel Downstream of Lincoln Way (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
10.60	5,227.00	234,461	985.51	5,227.00
10.65	5,227.00	234,461	985.51	5,227.00
10.70	5,227.00	234,461	985.51	5,227.00
10.75	5,227.00	234,461	985.51	5,227.00
10.80	5,227.00	234,461	985.51	5,227.00
10.85	5,227.00	234,461	985.51	5,227.00
10.90	5,227.00	234,461	985.51	5,227.00
10.95	5,227.00	234,461	985.51	5,227.00
11.00	5,227.00	234,461	985.51	5,227.00
11.05	5,227.00	234,461	985.51	5,227.00
11.10	5,227.00	234,461	985.51	5,227.00
11.15	5,227.00	234,461	985.51	5,227.00
11.20	5,227.00	234,461	985.51	5,227.00
11.25	5,227.00	234,461	985.51	5,227.00
11.30	5,227.00	234,461	985.51	5,227.00
11.35	5,227.00	234,461	985.51	5,227.00
11.40	5,227.00	234,461	985.51	5,227.00
11.45	5,227.00	234,461	985.51	5,227.00
11.50	5,227.00	234,461	985.51	5,227.00
11.55	5,227.00	234,461	985.51	5,227.00
11.60	5,227.00	234,461	985.51	5,227.00
11.65	5,227.00	234,461	985.51	5,227.00
11.70	5,227.00	234,461	985.51	5,227.00
11.75	5,227.00	234,461	985.51	5,227.00
11.80	5,227.00	234,461	985.51	5,227.00
11.85	5,227.00	234,461	985.51	5,227.00
11.90	5,227.00	234,461	985.51	5,227.00
11.95	5,227.00	234,461	985.51	5,227.00
12.00	5,227.00	234,461	985.51	5,227.00

Summary for Pond 1P: Sippo Reservoir - Existing Conditions - 0.40 PMF DBA

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 70.27 cfs @ 0.02 hrs, Volume= 16.269 af, Atten= 0%, Lag= 1.4 min
 Primary = 70.27 cfs @ 0.02 hrs, Volume= 16.269 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Starting Elev= 1,010.24' Surf.Area= 30.783 ac Storage= 201.646 af
 Peak Elev= 1,010.24' @ 0.00 hrs Surf.Area= 30.783 ac Storage= 201.646 af
 Flood Elev= 1,008.00' Surf.Area= 21.577 ac Storage= 143.356 af

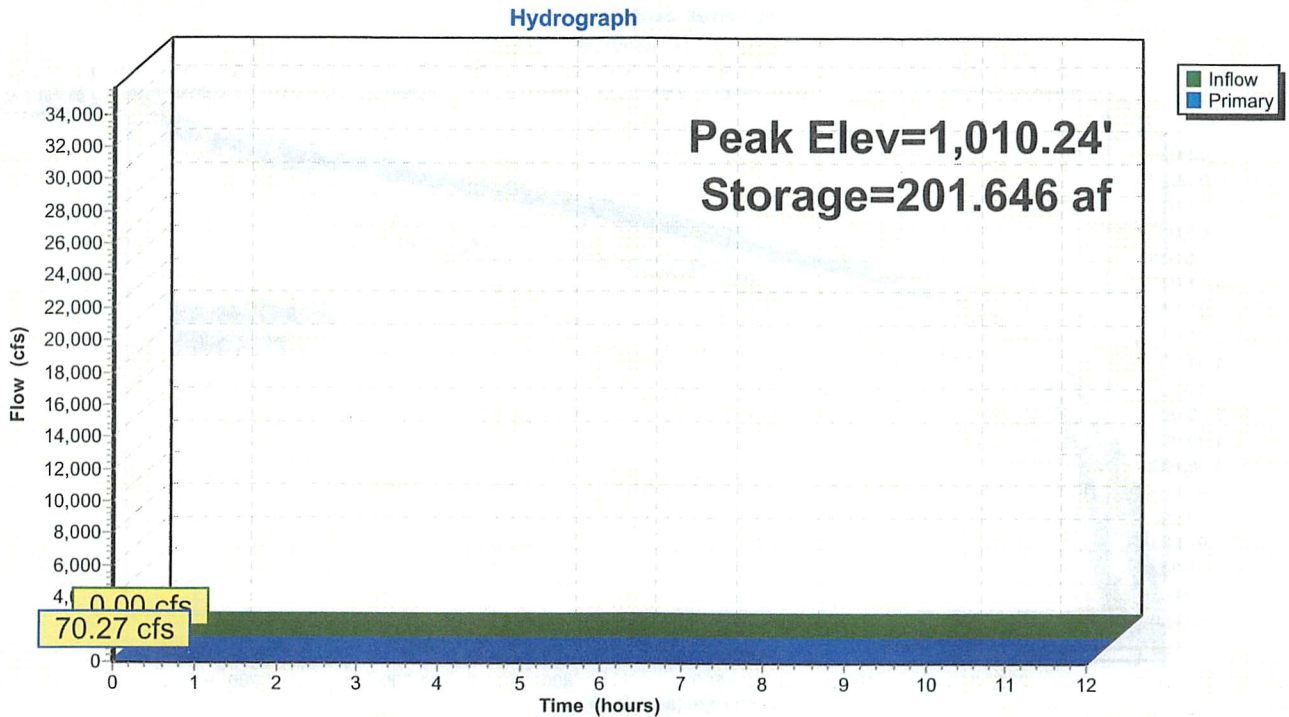
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description			
#1	985.00'	1,292.544 af	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)	
985.00	0.500	500.0	0.000	0.000	0.500	
990.00	3.000	1,000.0	7.875	7.875	1.873	
998.00	4.870	2,500.0	31.179	39.054	11.469	
1,000.00	6.204	3,251.0	11.047	50.101	19.360	
1,002.00	7.243	5,147.0	13.434	63.535	48.449	
1,004.00	9.610	10,274.0	16.797	80.332	192.887	
1,006.00	16.124	11,202.9	25.455	105.787	229.335	
1,008.00	21.577	15,736.9	37.569	143.356	452.477	
1,010.00	29.674	20,301.4	51.036	194.392	752.988	
1,012.00	39.539	22,845.5	68.977	263.369	953.524	
1,014.00	68.669	34,370.5	106.876	370.246	2,158.174	
1,025.00	100.000	50,000.0	922.298	1,292.544	4,567.204	

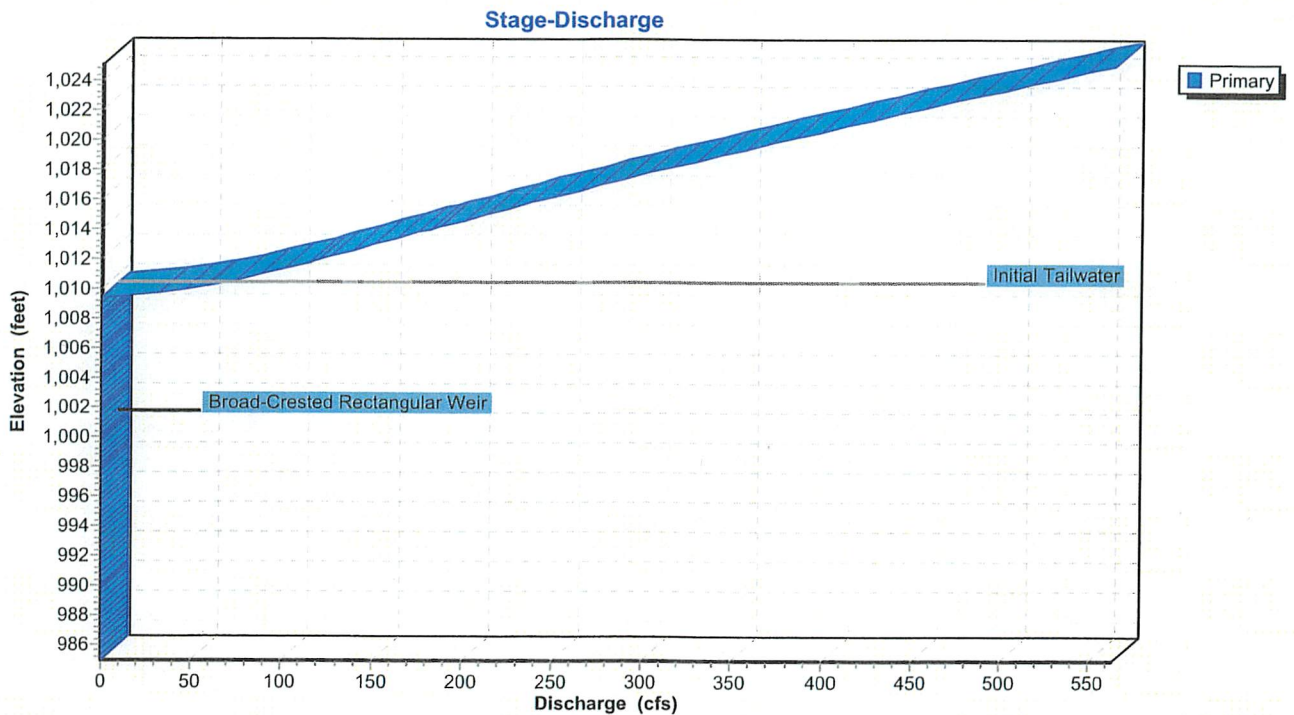
Device	Routing	Invert	Outlet Devices									
#1	Primary	1,001.00'	2.0' long x 50.0' breadth Broad-Crested Rectangular Weir									
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 20.00									
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63 2.63									

Primary OutFlow Max=67.70 cfs @ 0.02 hrs HW=1,010.24' TW=1,009.40' (Dynamic Tailwater)
 ↳ **1=Broad-Crested Rectangular Weir** (Weir Controls 67.70 cfs @ 3.67 fps)

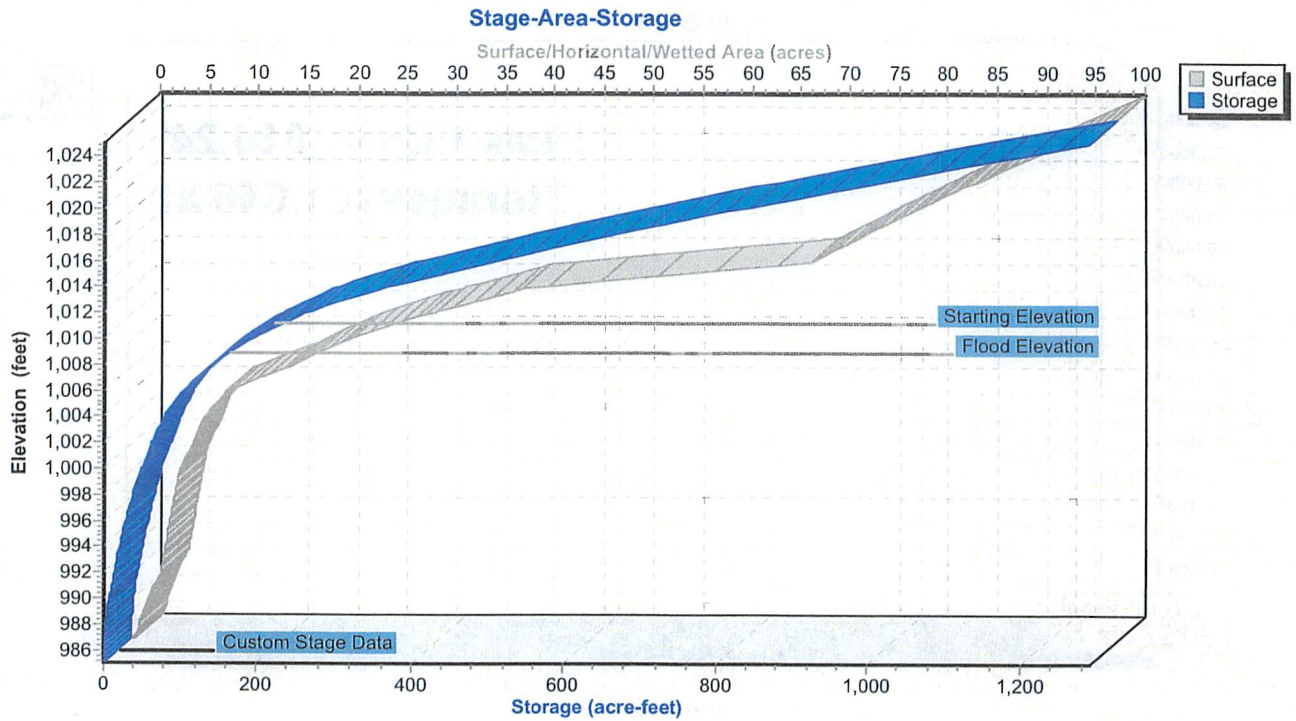
Pond 1P: Sippo Reservoir - Existing Conditions - 0.40 PMF DBA



Pond 1P: Sippo Reservoir - Existing Conditions - 0.40 PMF DBA



Pond 1P: Sippo Reservoir - Existing Conditions - 0.40 PMF DBA



Hydrograph for Pond 1P: Sippo Reservoir - Existing Conditions - 0.40 PMF DBA

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	201.646	1,010.24	59.12
0.05	0.00	201.380	1,010.23	65.50
0.10	0.00	201.118	1,010.22	60.78
0.15	0.00	200.872	1,010.21	58.11
0.20	0.00	200.634	1,010.21	56.59
0.25	0.00	200.402	1,010.20	55.67
0.30	0.00	200.173	1,010.19	55.04
0.35	0.00	199.947	1,010.18	54.54
0.40	0.00	199.722	1,010.18	54.12
0.45	0.00	199.499	1,010.17	53.72
0.50	0.00	199.278	1,010.16	53.34
0.55	0.00	199.058	1,010.15	52.97
0.60	0.00	198.840	1,010.15	52.59
0.65	0.00	198.623	1,010.14	52.22
0.70	0.00	198.408	1,010.13	51.86
0.75	0.00	198.194	1,010.13	51.49
0.80	0.00	197.982	1,010.12	51.12
0.85	0.00	197.771	1,010.11	50.75
0.90	0.00	197.562	1,010.11	50.38
0.95	0.00	197.355	1,010.10	50.01
1.00	0.00	197.149	1,010.09	49.64
1.05	0.00	196.944	1,010.08	49.27
1.10	0.00	196.741	1,010.08	48.90
1.15	0.00	196.540	1,010.07	48.53
1.20	0.00	196.340	1,010.06	48.16
1.25	0.00	196.141	1,010.06	47.79
1.30	0.00	195.944	1,010.05	47.42
1.35	0.00	195.749	1,010.05	47.05
1.40	0.00	195.555	1,010.04	46.68
1.45	0.00	195.363	1,010.03	46.30
1.50	0.00	195.172	1,010.03	45.93
1.55	0.00	194.983	1,010.02	45.56
1.60	0.00	194.795	1,010.01	45.19
1.65	0.00	194.609	1,010.01	44.81
1.70	0.00	194.425	1,010.00	44.44
1.75	0.00	194.242	1,009.99	44.05
1.80	0.00	194.060	1,009.99	43.67
1.85	0.00	193.881	1,009.98	43.28
1.90	0.00	193.702	1,009.98	42.89
1.95	0.00	193.526	1,009.97	42.50
2.00	0.00	193.351	1,009.96	42.11
2.05	0.00	193.177	1,009.96	41.72
2.10	0.00	193.006	1,009.95	41.33
2.15	0.00	192.836	1,009.95	40.94
2.20	0.00	192.667	1,009.94	40.54
2.25	0.00	192.500	1,009.94	40.15
2.30	0.00	192.335	1,009.93	39.76
2.35	0.00	192.171	1,009.92	39.36
2.40	0.00	192.009	1,009.92	38.96
2.45	0.00	191.849	1,009.91	38.57
2.50	0.00	191.690	1,009.91	38.17
2.55	0.00	191.533	1,009.90	37.77
2.60	0.00	191.378	1,009.90	37.37

Hydrograph for Pond 1P: Sippo Reservoir - Existing Conditions - 0.40 PMF DBA (continued)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
2.65	0.00	191.224	1,009.89	36.96
2.70	0.00	191.072	1,009.89	36.56
2.75	0.00	190.922	1,009.88	36.16
2.80	0.00	190.773	1,009.88	35.75
2.85	0.00	190.626	1,009.87	35.34
2.90	0.00	190.480	1,009.87	34.93
2.95	0.00	190.337	1,009.86	34.52
3.00	0.00	190.195	1,009.86	34.11
3.05	0.00	190.055	1,009.85	33.70
3.10	0.00	189.916	1,009.85	33.28
3.15	0.00	189.779	1,009.84	32.86
3.20	0.00	189.644	1,009.84	32.45
3.25	0.00	189.511	1,009.83	32.03
3.30	0.00	189.379	1,009.83	31.60
3.35	0.00	189.249	1,009.82	31.18
3.40	0.00	189.121	1,009.82	30.75
3.45	0.00	188.995	1,009.82	30.32
3.50	0.00	188.870	1,009.81	29.89
3.55	0.00	188.747	1,009.81	29.46
3.60	0.00	188.626	1,009.80	29.02
3.65	0.00	188.507	1,009.80	28.58
3.70	0.00	188.390	1,009.79	28.12
3.75	0.00	188.274	1,009.79	27.65
3.80	0.00	188.161	1,009.79	27.18
3.85	0.00	188.049	1,009.78	26.71
3.90	0.00	187.940	1,009.78	26.24
3.95	0.00	187.832	1,009.77	25.76
4.00	0.00	187.726	1,009.77	25.28
4.05	0.00	187.623	1,009.77	24.80
4.10	0.00	187.521	1,009.76	24.31
4.15	0.00	187.421	1,009.76	23.82
4.20	0.00	187.324	1,009.76	23.32
4.25	0.00	187.228	1,009.75	22.82
4.30	0.00	187.135	1,009.75	22.31
4.35	0.00	187.043	1,009.75	21.80
4.40	0.00	186.954	1,009.74	21.29
4.45	0.00	186.867	1,009.74	20.76
4.50	0.00	186.782	1,009.74	20.24
4.55	0.00	186.699	1,009.73	19.70
4.60	0.00	186.619	1,009.73	19.17
4.65	0.00	186.540	1,009.73	18.62
4.70	0.00	186.464	1,009.73	18.07
4.75	0.00	186.391	1,009.72	17.51
4.80	0.00	186.319	1,009.72	16.94
4.85	0.00	186.250	1,009.72	16.37
4.90	0.00	186.184	1,009.72	15.78
4.95	0.00	186.119	1,009.71	15.19
5.00	0.00	186.058	1,009.71	14.59
5.05	0.00	185.998	1,009.71	13.97
5.10	0.00	185.942	1,009.71	13.35
5.15	0.00	185.887	1,009.70	12.72
5.20	0.00	185.836	1,009.70	12.07
5.25	0.00	185.787	1,009.70	11.41

Hydrograph for Pond 1P: Sippo Reservoir - Existing Conditions - 0.40 PMF DBA (continued)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
5.30	0.00	185.741	1,009.70	10.74
5.35	0.00	185.698	1,009.70	10.05
5.40	0.00	185.657	1,009.70	9.35
5.45	0.00	185.620	1,009.70	8.64
5.50	0.00	185.586	1,009.69	7.91
5.55	0.00	185.554	1,009.69	7.17
5.60	0.00	185.526	1,009.69	6.41
5.65	0.00	185.500	1,009.69	5.65
5.70	0.00	185.478	1,009.69	4.89
5.75	0.00	185.459	1,009.69	4.15
5.80	0.00	185.443	1,009.69	3.44
5.85	0.00	185.430	1,009.69	2.81
5.90	0.00	185.420	1,009.69	2.26
5.95	0.00	185.411	1,009.69	1.81
6.00	0.00	185.404	1,009.69	1.44
6.05	0.00	185.399	1,009.69	1.15
6.10	0.00	185.394	1,009.69	0.91
6.15	0.00	185.391	1,009.69	0.72
6.20	0.00	185.388	1,009.69	0.57
6.25	0.00	185.386	1,009.69	0.45
6.30	0.00	185.385	1,009.69	0.51
6.35	0.00	185.383	1,009.69	0.92
6.40	0.00	185.382	1,009.69	1.08
6.45	0.00	185.381	1,009.69	0.00
6.50	0.00	185.380	1,009.69	0.00
6.55	0.00	185.379	1,009.69	0.00
6.60	0.00	185.379	1,009.69	0.00
6.65	0.00	185.379	1,009.69	0.00
6.70	0.00	185.378	1,009.69	0.00
6.75	0.00	185.378	1,009.69	0.00
6.80	0.00	185.378	1,009.69	0.43
6.85	0.00	185.378	1,009.69	0.00
6.90	0.00	185.378	1,009.69	0.00
6.95	0.00	185.378	1,009.69	0.00
7.00	0.00	185.378	1,009.69	0.14
7.05	0.00	185.378	1,009.69	0.00
7.10	0.00	185.378	1,009.69	0.00
7.15	0.00	185.378	1,009.69	0.00
7.20	0.00	185.378	1,009.69	0.00
7.25	0.00	185.378	1,009.69	0.00
7.30	0.00	185.378	1,009.69	0.00
7.35	0.00	185.378	1,009.69	0.00
7.40	0.00	185.378	1,009.69	0.00
7.45	0.00	185.378	1,009.69	0.00
7.50	0.00	185.378	1,009.69	0.00
7.55	0.00	185.378	1,009.69	0.00
7.60	0.00	185.378	1,009.69	0.00
7.65	0.00	185.378	1,009.69	0.00
7.70	0.00	185.378	1,009.69	0.00
7.75	0.00	185.378	1,009.69	0.00
7.80	0.00	185.378	1,009.69	0.00
7.85	0.00	185.378	1,009.69	0.00
7.90	0.00	185.378	1,009.69	0.00

Hydrograph for Pond 1P: Sippo Reservoir - Existing Conditions - 0.40 PMF DBA (continued)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
7.95	0.00	185.378	1,009.69	0.00
8.00	0.00	185.378	1,009.69	0.00
8.05	0.00	185.378	1,009.69	0.00
8.10	0.00	185.378	1,009.69	0.00
8.15	0.00	185.378	1,009.69	0.00
8.20	0.00	185.378	1,009.69	0.00
8.25	0.00	185.378	1,009.69	0.00
8.30	0.00	185.378	1,009.69	0.00
8.35	0.00	185.378	1,009.69	0.00
8.40	0.00	185.378	1,009.69	0.00
8.45	0.00	185.378	1,009.69	0.00
8.50	0.00	185.378	1,009.69	0.00
8.55	0.00	185.378	1,009.69	0.00
8.60	0.00	185.378	1,009.69	0.00
8.65	0.00	185.378	1,009.69	0.00
8.70	0.00	185.378	1,009.69	0.00
8.75	0.00	185.378	1,009.69	0.00
8.80	0.00	185.378	1,009.69	0.00
8.85	0.00	185.378	1,009.69	0.00
8.90	0.00	185.378	1,009.69	0.00
8.95	0.00	185.378	1,009.69	0.00
9.00	0.00	185.378	1,009.69	0.00
9.05	0.00	185.378	1,009.69	0.00
9.10	0.00	185.378	1,009.69	0.00
9.15	0.00	185.378	1,009.69	0.00
9.20	0.00	185.378	1,009.69	0.00
9.25	0.00	185.378	1,009.69	0.00
9.30	0.00	185.378	1,009.69	0.00
9.35	0.00	185.378	1,009.69	0.00
9.40	0.00	185.378	1,009.69	0.00
9.45	0.00	185.378	1,009.69	0.00
9.50	0.00	185.378	1,009.69	0.00
9.55	0.00	185.378	1,009.69	0.00
9.60	0.00	185.378	1,009.69	0.00
9.65	0.00	185.378	1,009.69	0.00
9.70	0.00	185.378	1,009.69	0.00
9.75	0.00	185.378	1,009.69	0.00
9.80	0.00	185.378	1,009.69	0.00
9.85	0.00	185.378	1,009.69	0.00
9.90	0.00	185.378	1,009.69	0.00
9.95	0.00	185.378	1,009.69	0.00
10.00	0.00	185.378	1,009.69	0.00
10.05	0.00	185.378	1,009.69	0.00
10.10	0.00	185.378	1,009.69	0.00
10.15	0.00	185.378	1,009.69	0.00
10.20	0.00	185.378	1,009.69	0.00
10.25	0.00	185.378	1,009.69	0.00
10.30	0.00	185.378	1,009.69	0.00
10.35	0.00	185.378	1,009.69	0.00
10.40	0.00	185.378	1,009.69	0.00
10.45	0.00	185.378	1,009.69	0.00
10.50	0.00	185.378	1,009.69	0.00
10.55	0.00	185.378	1,009.69	0.00

Hydrograph for Pond 1P: Sippo Reservoir - Existing Conditions - 0.40 PMF DBA (continued)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
10.60	0.00	185.378	1,009.69	0.00
10.65	0.00	185.378	1,009.69	0.00
10.70	0.00	185.378	1,009.69	0.00
10.75	0.00	185.378	1,009.69	0.00
10.80	0.00	185.378	1,009.69	0.00
10.85	0.00	185.378	1,009.69	0.00
10.90	0.00	185.378	1,009.69	0.00
10.95	0.00	185.378	1,009.69	0.00
11.00	0.00	185.378	1,009.69	0.00
11.05	0.00	185.378	1,009.69	0.00
11.10	0.00	185.378	1,009.69	0.00
11.15	0.00	185.378	1,009.69	0.00
11.20	0.00	185.378	1,009.69	0.00
11.25	0.00	185.378	1,009.69	0.00
11.30	0.00	185.378	1,009.69	0.00
11.35	0.00	185.378	1,009.69	0.00
11.40	0.00	185.378	1,009.69	0.00
11.45	0.00	185.378	1,009.69	0.00
11.50	0.00	185.378	1,009.69	0.00
11.55	0.00	185.378	1,009.69	0.00
11.60	0.00	185.378	1,009.69	0.00
11.65	0.00	185.378	1,009.69	0.00
11.70	0.00	185.378	1,009.69	0.00
11.75	0.00	185.378	1,009.69	0.00
11.80	0.00	185.378	1,009.69	0.00
11.85	0.00	185.378	1,009.69	0.00
11.90	0.00	185.378	1,009.69	0.00
11.95	0.00	185.378	1,009.69	0.00
12.00	0.00	185.378	1,009.69	0.00

Summary for Pond 16P: North Sippo Park- Lincoln Way Culvert

Inflow = 5,296.37 cfs @ 0.02 hrs, Volume= 20,747.155 af
 Outflow = 5,346.03 cfs @ 0.00 hrs, Volume= 20,751.094 af, Atten= 0%, Lag= 0.0 min
 Primary = 3,080.47 cfs @ 0.00 hrs, Volume= 11,495.613 af
 Secondary = 2,383.35 cfs @ 0.51 hrs, Volume= 9,255.482 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Starting Elev= 1,009.66' Surf.Area= 14.178 ac Storage= 219.969 af
 Peak Elev= 1,009.71' @ 0.51 hrs Surf.Area= 14.199 ac Storage= 220.660 af (0.691 af above start)
 Flood Elev= 1,008.00' Surf.Area= 13.465 ac Storage= 197.028 af

Plug-Flow detention time= 30.6 min calculated for 20,531.126 af (99% of inflow)
 Center-of-Mass det. time= 0.3 min (1,439.3 - 1,439.0)

Volume	Invert	Avail.Storage	Storage Description
#1	978.00'	371.368 af	Stage Storage in Sippo Park (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
978.00	0.100	200.0	0.000	0.000	0.100
981.00	0.300	500.0	0.573	0.573	0.484
982.00	0.659	1,392.9	0.468	1.041	3.572
984.00	2.018	2,470.7	2.553	3.595	11.180
986.00	3.584	3,300.7	5.528	9.122	19.932
988.00	5.007	3,247.5	8.551	17.674	20.586
990.00	6.111	3,143.9	11.100	28.773	21.805
992.00	6.773	3,217.1	12.878	41.652	22.668
994.00	7.411	3,271.9	14.179	55.831	23.334
996.00	8.110	3,253.8	15.516	71.347	23.597
998.00	8.804	3,273.8	16.909	88.256	23.878
1,000.00	9.441	3,318.6	18.241	106.497	24.439
1,002.00	10.181	3,437.0	19.617	126.114	25.908
1,004.00	11.109	3,548.6	21.283	147.398	27.341
1,006.00	12.538	3,553.4	23.633	171.030	27.516
1,008.00	13.465	3,829.8	25.997	197.028	31.248
1,010.00	14.326	4,085.3	27.787	224.814	34.947
1,012.00	15.633	4,329.5	29.949	254.764	38.706
1,014.00	17.576	4,742.6	33.190	287.954	45.555
1,016.00	20.521	5,940.5	38.059	326.013	68.935
1,018.00	24.905	6,310.6	45.355	371.368	77.223

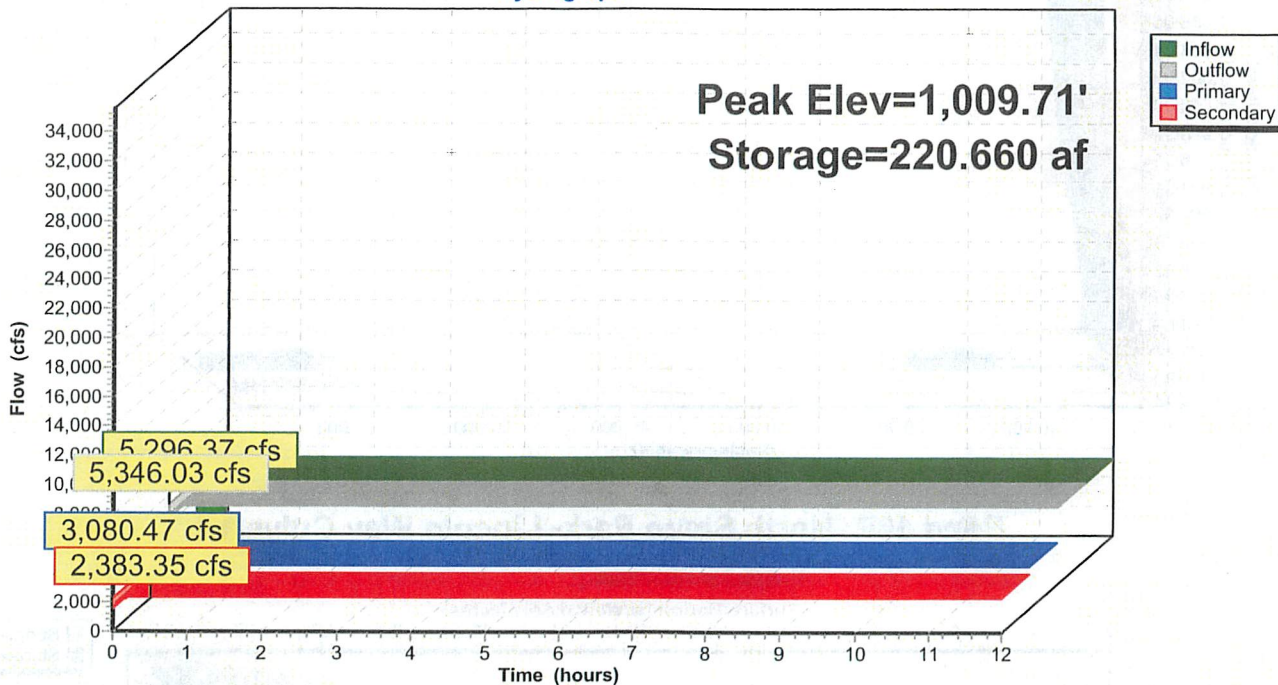
Device	Routing	Invert	Outlet Devices
#1	Primary	978.25'	168.0" W x 98.0" H Box Box Culvert L= 121.8' Box, 30-75° wingwalls, square crown, Ke= 0.400 Inlet / Outlet Invert= 978.25' / 978.13' S= 0.0010 ' /' Cc= 0.900 n= 0.015 Brickwork
#2	Secondary	1,008.00'	Linclon Way (172), Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 2.00 4.00 6.00 8.00 10.00 Width (feet) 233.00 373.00 475.00 630.00 790.00 940.00 1,090.00

Primary OutFlow Max=3,080.47 cfs @ 0.00 hrs HW=1,009.66' TW=978.13' (Dynamic Tailwater)
 ↳1=Box Culvert (Inlet Controls 3,080.47 cfs @ 26.94 fps)

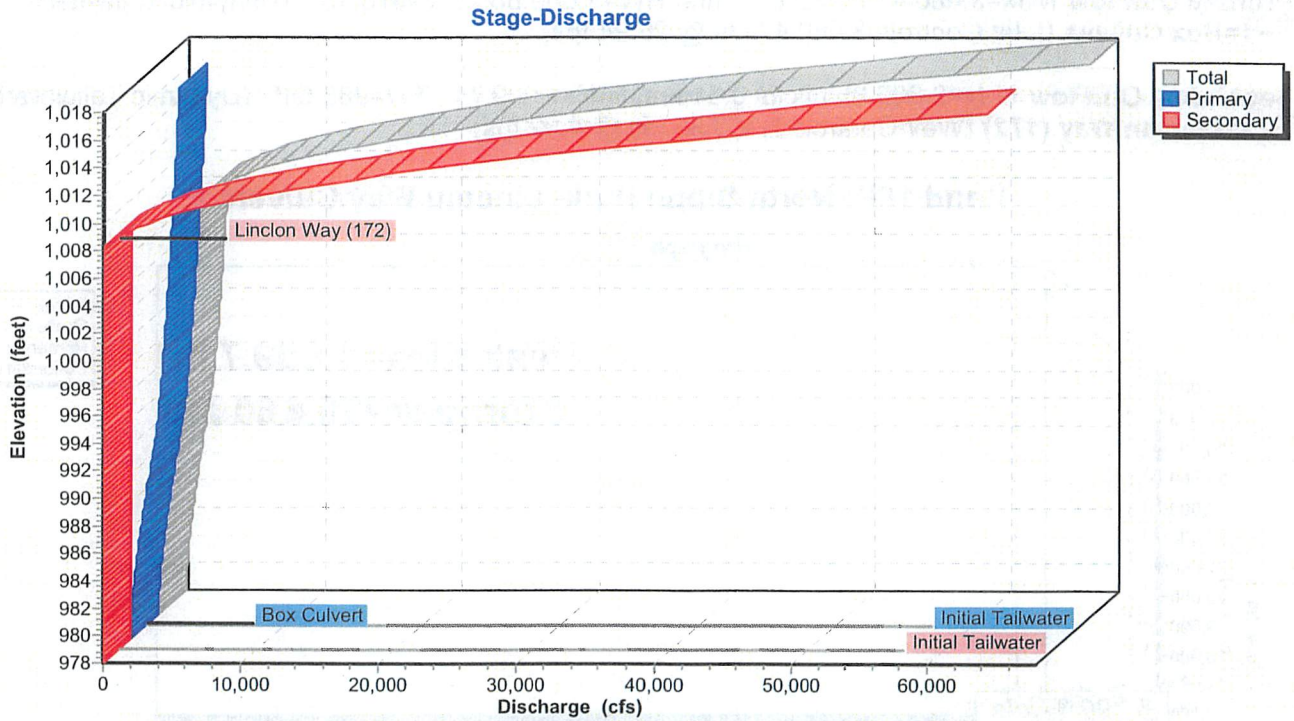
Secondary OutFlow Max=2,383.35 cfs @ 0.51 hrs HW=1,009.71' TW=985.54' (Dynamic Tailwater)
 ↳2=Lincoln Way (172) (Weir Controls 2,383.35 cfs @ 4.02 fps)

Pond 16P: North Sippo Park- Lincoln Way Culvert

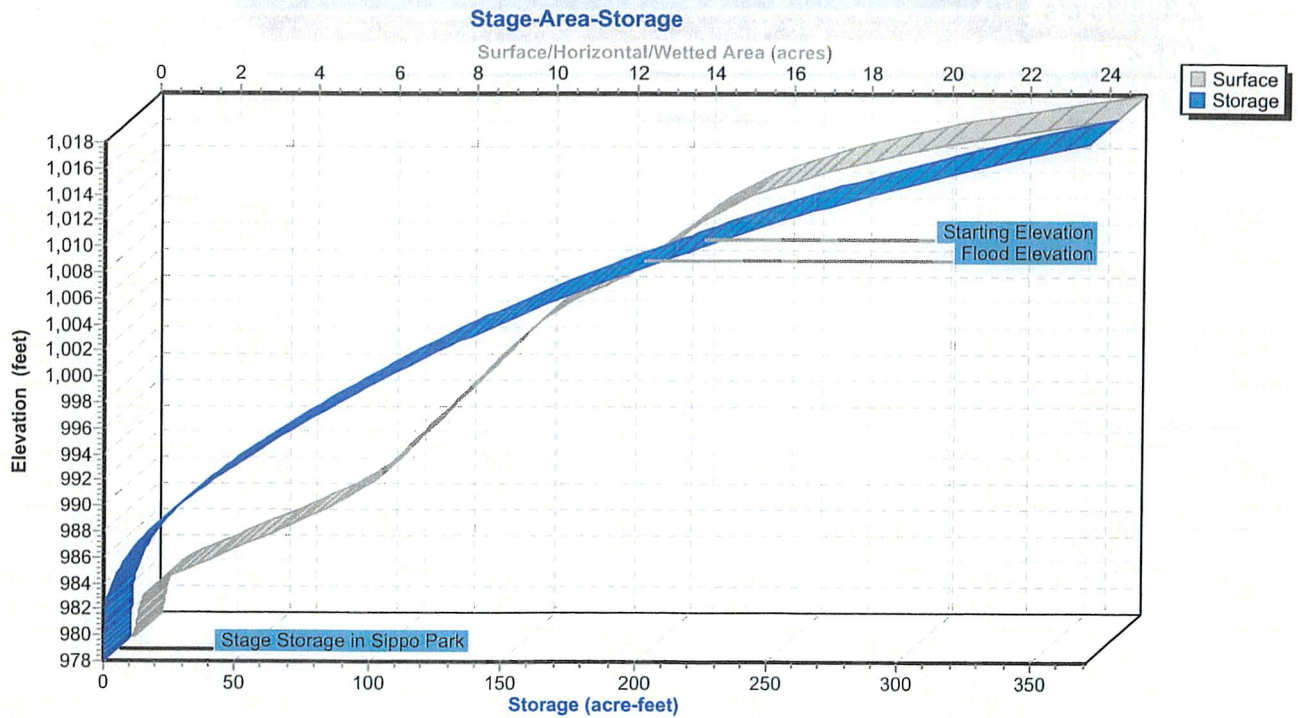
Hydrograph



Pond 16P: North Sippo Park- Lincoln Way Culvert



Pond 16P: North Sippo Park- Lincoln Way Culvert



Hydrograph for Pond 16P: North Sippo Park- Lincoln Way Culvert

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	59.12	219.969	1,009.66	5,346.03	3,080.47	2,265.55
0.05	5,292.50	217.731	1,009.50	4,804.22	2,902.81	1,901.40
0.10	5,287.78	219.279	1,009.61	5,050.70	2,900.07	2,150.63
0.15	5,285.11	220.022	1,009.66	5,173.05	2,898.49	2,274.56
0.20	5,283.59	220.372	1,009.69	5,231.32	2,897.70	2,333.63
0.25	5,282.67	220.534	1,009.70	5,258.61	2,897.31	2,361.30
0.30	5,282.04	220.609	1,009.70	5,271.15	2,897.13	2,374.02
0.35	5,281.54	220.642	1,009.71	5,276.78	2,897.05	2,379.73
0.40	5,281.12	220.656	1,009.71	5,279.19	2,897.01	2,382.18
0.45	5,280.72	220.662	1,009.71	5,280.11	2,896.99	2,383.12
0.50	5,280.34	220.663	1,009.71	5,280.34	2,896.99	2,383.35
0.55	5,279.97	220.663	1,009.71	5,280.24	2,896.98	2,383.26
0.60	5,279.59	220.661	1,009.71	5,280.00	2,896.98	2,383.02
0.65	5,279.22	220.659	1,009.71	5,279.69	2,896.98	2,382.71
0.70	5,278.86	220.657	1,009.71	5,279.35	2,896.99	2,382.37
0.75	5,278.49	220.655	1,009.71	5,279.00	2,896.99	2,382.01
0.80	5,278.12	220.653	1,009.71	5,278.63	2,896.99	2,381.65
0.85	5,277.75	220.651	1,009.71	5,278.27	2,896.99	2,381.28
0.90	5,277.38	220.649	1,009.71	5,277.90	2,896.99	2,380.91
0.95	5,277.01	220.647	1,009.71	5,277.53	2,896.99	2,380.54
1.00	5,276.64	220.645	1,009.71	5,277.16	2,896.99	2,380.17
1.05	5,276.27	220.643	1,009.71	5,276.79	2,896.99	2,379.80
1.10	5,275.90	220.640	1,009.71	5,276.43	2,897.00	2,379.43
1.15	5,275.53	220.638	1,009.71	5,276.06	2,897.00	2,379.06
1.20	5,275.16	220.636	1,009.71	5,275.69	2,897.00	2,378.69
1.25	5,274.79	220.634	1,009.71	5,275.32	2,897.00	2,378.32
1.30	5,274.42	220.632	1,009.71	5,274.94	2,897.00	2,377.94
1.35	5,274.05	220.630	1,009.71	5,274.57	2,897.00	2,377.57
1.40	5,273.68	220.627	1,009.71	5,274.20	2,897.00	2,377.20
1.45	5,273.30	220.625	1,009.71	5,273.83	2,897.01	2,376.83
1.50	5,272.93	220.623	1,009.71	5,273.46	2,897.01	2,376.45
1.55	5,272.56	220.621	1,009.71	5,273.09	2,897.01	2,376.08
1.60	5,272.19	220.619	1,009.71	5,272.71	2,897.01	2,375.70
1.65	5,271.81	220.616	1,009.71	5,272.34	2,897.01	2,375.33
1.70	5,271.44	220.614	1,009.71	5,271.97	2,897.01	2,374.95
1.75	5,271.05	220.612	1,009.71	5,271.59	2,897.01	2,374.58
1.80	5,270.67	220.610	1,009.70	5,271.21	2,897.02	2,374.19
1.85	5,270.28	220.608	1,009.70	5,270.82	2,897.02	2,373.81
1.90	5,269.89	220.605	1,009.70	5,270.44	2,897.02	2,373.42
1.95	5,269.50	220.603	1,009.70	5,270.05	2,897.02	2,373.03
2.00	5,269.11	220.601	1,009.70	5,269.66	2,897.02	2,372.64
2.05	5,268.72	220.598	1,009.70	5,269.27	2,897.02	2,372.25
2.10	5,268.33	220.596	1,009.70	5,268.88	2,897.02	2,371.86
2.15	5,267.94	220.594	1,009.70	5,268.49	2,897.02	2,371.47
2.20	5,267.54	220.592	1,009.70	5,268.10	2,897.03	2,371.07
2.25	5,267.15	220.589	1,009.70	5,267.71	2,897.03	2,370.68
2.30	5,266.76	220.587	1,009.70	5,267.31	2,897.03	2,370.29
2.35	5,266.36	220.585	1,009.70	5,266.92	2,897.03	2,369.89
2.40	5,265.96	220.582	1,009.70	5,266.52	2,897.03	2,369.49
2.45	5,265.57	220.580	1,009.70	5,266.13	2,897.03	2,369.10
2.50	5,265.17	220.578	1,009.70	5,265.73	2,897.03	2,368.70
2.55	5,264.77	220.575	1,009.70	5,265.33	2,897.04	2,368.30
2.60	5,264.37	220.573	1,009.70	5,264.93	2,897.04	2,367.90

Hydrograph for Pond 16P: North Sippo Park- Lincoln Way Culvert (continued)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
2.65	5,263.96	220.571	1,009.70	5,264.53	2,897.04	2,367.49
2.70	5,263.56	220.568	1,009.70	5,264.13	2,897.04	2,367.09
2.75	5,263.16	220.566	1,009.70	5,263.73	2,897.04	2,366.69
2.80	5,262.75	220.564	1,009.70	5,263.32	2,897.04	2,366.28
2.85	5,262.34	220.561	1,009.70	5,262.92	2,897.05	2,365.87
2.90	5,261.93	220.559	1,009.70	5,262.51	2,897.05	2,365.47
2.95	5,261.52	220.556	1,009.70	5,262.10	2,897.05	2,365.06
3.00	5,261.11	220.554	1,009.70	5,261.69	2,897.05	2,364.64
3.05	5,260.70	220.552	1,009.70	5,261.28	2,897.05	2,364.23
3.10	5,260.28	220.549	1,009.70	5,260.87	2,897.05	2,363.82
3.15	5,259.86	220.547	1,009.70	5,260.46	2,897.05	2,363.40
3.20	5,259.45	220.544	1,009.70	5,260.04	2,897.06	2,362.98
3.25	5,259.03	220.542	1,009.70	5,259.62	2,897.06	2,362.56
3.30	5,258.60	220.539	1,009.70	5,259.20	2,897.06	2,362.14
3.35	5,258.18	220.537	1,009.70	5,258.78	2,897.06	2,361.72
3.40	5,257.75	220.534	1,009.70	5,258.36	2,897.06	2,361.29
3.45	5,257.32	220.532	1,009.70	5,257.93	2,897.06	2,360.87
3.50	5,256.89	220.529	1,009.70	5,257.50	2,897.06	2,360.44
3.55	5,256.46	220.527	1,009.70	5,257.07	2,897.07	2,360.01
3.60	5,256.02	220.524	1,009.70	5,256.64	2,897.07	2,359.57
3.65	5,255.58	220.522	1,009.70	5,256.20	2,897.07	2,359.14
3.70	5,255.12	220.519	1,009.70	5,255.76	2,897.07	2,358.69
3.75	5,254.65	220.516	1,009.70	5,255.30	2,897.07	2,358.23
3.80	5,254.18	220.514	1,009.70	5,254.84	2,897.07	2,357.77
3.85	5,253.71	220.511	1,009.70	5,254.38	2,897.08	2,357.30
3.90	5,253.24	220.508	1,009.70	5,253.91	2,897.08	2,356.83
3.95	5,252.76	220.506	1,009.70	5,253.44	2,897.08	2,356.36
4.00	5,252.28	220.503	1,009.70	5,252.96	2,897.08	2,355.88
4.05	5,251.80	220.500	1,009.70	5,252.48	2,897.08	2,355.40
4.10	5,251.31	220.497	1,009.70	5,252.00	2,897.08	2,354.92
4.15	5,250.82	220.494	1,009.70	5,251.51	2,897.09	2,354.43
4.20	5,250.32	220.491	1,009.70	5,251.02	2,897.09	2,353.94
4.25	5,249.82	220.488	1,009.70	5,250.53	2,897.09	2,353.44
4.30	5,249.31	220.485	1,009.70	5,250.03	2,897.09	2,352.94
4.35	5,248.80	220.482	1,009.70	5,249.52	2,897.09	2,352.43
4.40	5,248.29	220.480	1,009.70	5,249.01	2,897.09	2,351.92
4.45	5,247.76	220.476	1,009.70	5,248.50	2,897.10	2,351.41
4.50	5,247.24	220.473	1,009.70	5,247.98	2,897.10	2,350.88
4.55	5,246.70	220.470	1,009.70	5,247.46	2,897.10	2,350.36
4.60	5,246.17	220.467	1,009.69	5,246.93	2,897.10	2,349.83
4.65	5,245.62	220.464	1,009.69	5,246.39	2,897.10	2,349.29
4.70	5,245.07	220.461	1,009.69	5,245.85	2,897.10	2,348.74
4.75	5,244.51	220.458	1,009.69	5,245.30	2,897.11	2,348.19
4.80	5,243.94	220.454	1,009.69	5,244.74	2,897.11	2,347.63
4.85	5,243.37	220.451	1,009.69	5,244.18	2,897.11	2,347.07
4.90	5,242.78	220.448	1,009.69	5,243.60	2,897.11	2,346.49
4.95	5,242.19	220.444	1,009.69	5,243.02	2,897.11	2,345.91
5.00	5,241.59	220.441	1,009.69	5,242.43	2,897.12	2,345.32
5.05	5,240.97	220.437	1,009.69	5,241.84	2,897.12	2,344.72
5.10	5,240.35	220.434	1,009.69	5,241.23	2,897.12	2,344.11
5.15	5,239.72	220.430	1,009.69	5,240.61	2,897.12	2,343.49
5.20	5,239.07	220.426	1,009.69	5,239.98	2,897.12	2,342.85
5.25	5,238.41	220.423	1,009.69	5,239.34	2,897.13	2,342.21

Hydrograph for Pond 16P: North Sippo Park- Lincoln Way Culvert (continued)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.30	5,237.74	220.419	1,009.69	5,238.68	2,897.13	2,341.55
5.35	5,237.05	220.415	1,009.69	5,238.02	2,897.13	2,340.89
5.40	5,236.35	220.411	1,009.69	5,237.34	2,897.13	2,340.20
5.45	5,235.64	220.407	1,009.69	5,236.64	2,897.14	2,339.51
5.50	5,234.91	220.402	1,009.69	5,235.93	2,897.14	2,338.79
5.55	5,234.17	220.398	1,009.69	5,235.21	2,897.14	2,338.07
5.60	5,233.41	220.394	1,009.69	5,234.47	2,897.14	2,337.33
5.65	5,232.65	220.389	1,009.69	5,233.73	2,897.15	2,336.58
5.70	5,231.89	220.385	1,009.69	5,232.97	2,897.15	2,335.82
5.75	5,231.15	220.381	1,009.69	5,232.22	2,897.15	2,335.07
5.80	5,230.44	220.376	1,009.69	5,231.48	2,897.15	2,334.32
5.85	5,229.81	220.372	1,009.69	5,230.77	2,897.16	2,333.62
5.90	5,229.26	220.368	1,009.69	5,230.12	2,897.16	2,332.97
5.95	5,228.81	220.365	1,009.69	5,229.55	2,897.16	2,332.39
6.00	5,228.44	220.362	1,009.69	5,229.07	2,897.16	2,331.90
6.05	5,228.15	220.359	1,009.69	5,228.66	2,897.17	2,331.49
6.10	5,227.91	220.358	1,009.69	5,228.33	2,897.17	2,331.16
6.15	5,227.72	220.356	1,009.69	5,228.06	2,897.17	2,330.89
6.20	5,227.57	220.355	1,009.69	5,227.84	2,897.17	2,330.67
6.25	5,227.45	220.354	1,009.69	5,227.67	2,897.17	2,330.50
6.30	5,227.51	220.353	1,009.69	5,227.51	2,897.17	2,330.34
6.35	5,227.92	220.352	1,009.69	5,227.44	2,897.17	2,330.26
6.40	5,228.08	220.351	1,009.69	5,227.27	2,897.17	2,330.10
6.45	5,227.00	220.351	1,009.69	5,227.27	2,897.17	2,330.10
6.50	5,227.00	220.351	1,009.69	5,227.24	2,897.18	2,330.06
6.55	5,227.00	220.351	1,009.69	5,227.23	2,897.18	2,330.05
6.60	5,227.00	220.350	1,009.69	5,227.11	2,897.18	2,329.93
6.65	5,227.00	220.350	1,009.69	5,227.10	2,897.18	2,329.93
6.70	5,227.00	220.350	1,009.69	5,227.13	2,897.18	2,329.95
6.75	5,227.00	220.350	1,009.69	5,227.06	2,897.18	2,329.88
6.80	5,227.43	220.350	1,009.69	5,227.03	2,897.18	2,329.85
6.85	5,227.00	220.350	1,009.69	5,227.05	2,897.18	2,329.87
6.90	5,227.00	220.350	1,009.69	5,227.02	2,897.18	2,329.84
6.95	5,227.00	220.350	1,009.69	5,227.01	2,897.18	2,329.83
7.00	5,227.14	220.350	1,009.69	5,227.00	2,897.18	2,329.83
7.05	5,227.00	220.350	1,009.69	5,227.01	2,897.18	2,329.84
7.10	5,227.00	220.350	1,009.69	5,227.01	2,897.18	2,329.83
7.15	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.83
7.20	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
7.25	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
7.30	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
7.35	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
7.40	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
7.45	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
7.50	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
7.55	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
7.60	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
7.65	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
7.70	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
7.75	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
7.80	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
7.85	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
7.90	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82

Hydrograph for Pond 16P: North Sippo Park- Lincoln Way Culvert (continued)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
7.95	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.00	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.05	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.10	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.15	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.20	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.25	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.30	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.35	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.40	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.45	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.50	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.55	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.60	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.65	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.70	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.75	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.80	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.85	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.90	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
8.95	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.00	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.05	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.10	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.15	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.20	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.25	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.30	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.35	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.40	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.45	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.50	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.55	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.60	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.65	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.70	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.75	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.80	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.85	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.90	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
9.95	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.00	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.05	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.10	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.15	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.20	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.25	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.30	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.35	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.40	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.45	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.50	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.55	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82

Hydrograph for Pond 16P: North Sippo Park- Lincoln Way Culvert (continued)

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
10.60	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.65	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.70	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.75	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.80	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.85	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.90	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
10.95	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.00	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.05	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.10	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.15	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.20	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.25	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.30	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.35	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.40	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.45	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.50	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.55	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.60	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.65	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.70	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.75	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.80	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.85	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.90	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
11.95	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82
12.00	5,227.00	220.350	1,009.69	5,227.00	2,897.18	2,329.82

Summary for Pond 32P: Constant inflow - 0.40 PMF

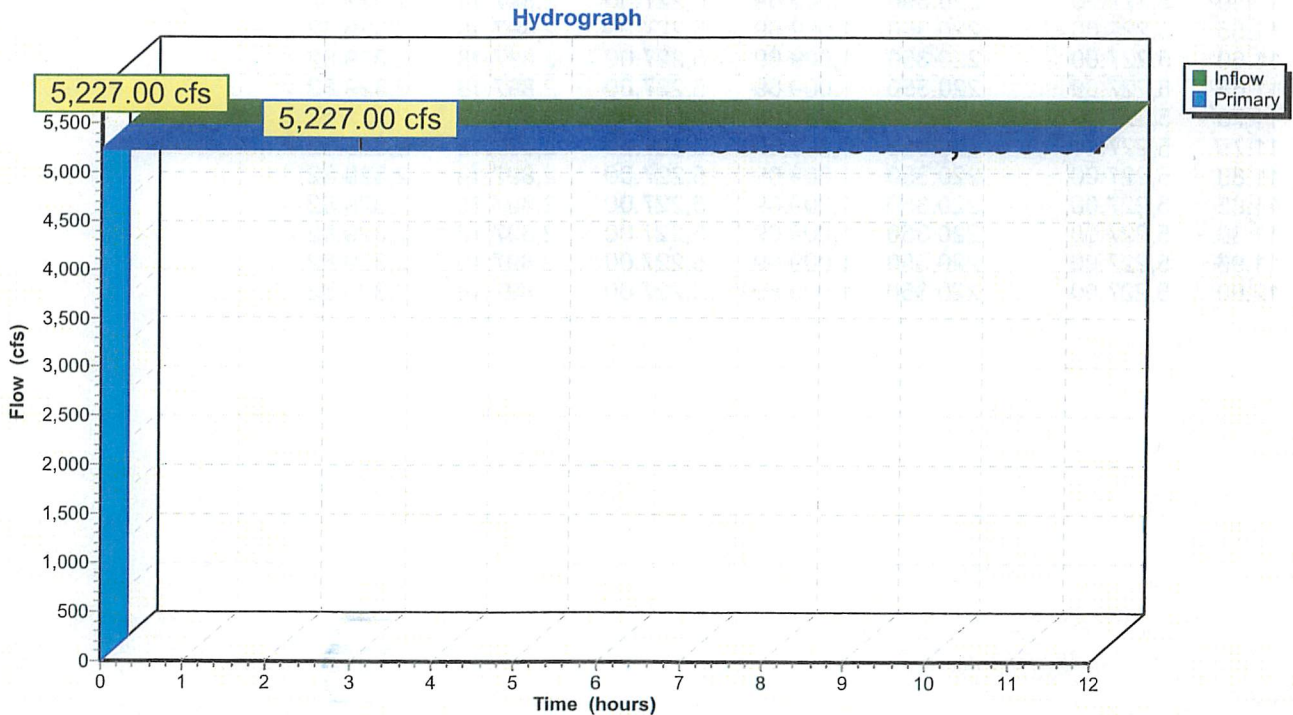
Inflow = 5,227.00 cfs @ 0.00 hrs, Volume= 20,735.207 af, Incl. 5,227.00 cfs Base Flow
 Outflow = 5,227.00 cfs @ 3.10 hrs, Volume= 20,735.207 af, Atten= 0%, Lag= 186.2 min
 Primary = 5,227.00 cfs @ 3.10 hrs, Volume= 20,735.207 af

Routing by Sim-Route method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
 Peak Elev= 1,009.84' @ 0.52 hrs

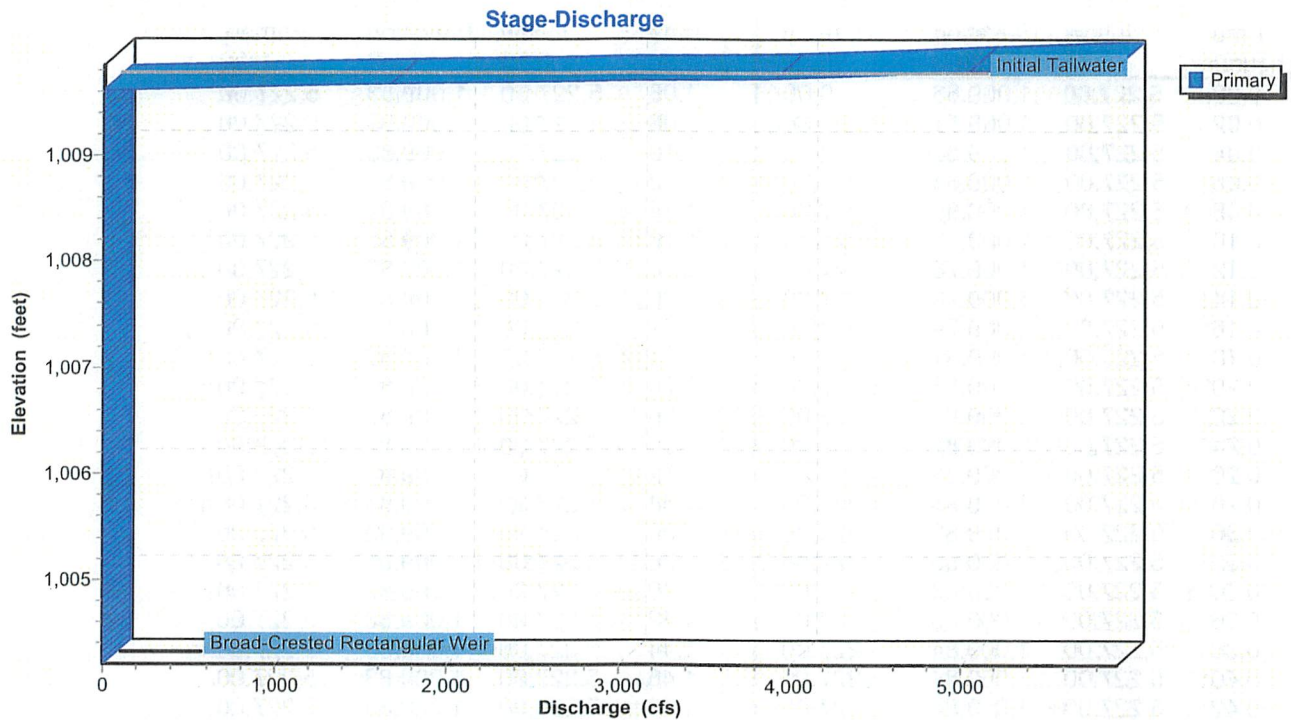
Device	Routing	Invert	Outlet Devices
#1	Primary	1,004.20'	500.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=5,227.53 cfs @ 3.10 hrs HW=1,009.83' TW=1,009.70' (Dynamic Tailwater)
 ←1=Broad-Crested Rectangular Weir (Weir Controls 5,227.53 cfs @ 1.86 fps)

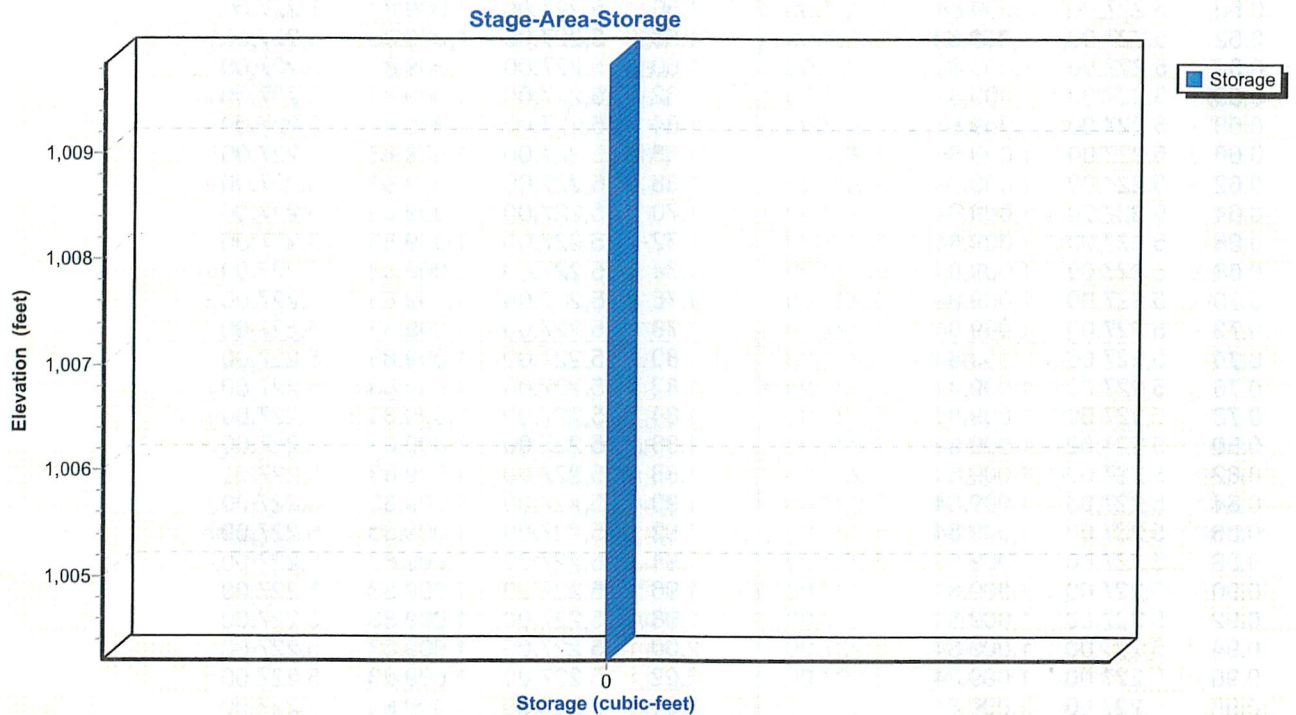
Pond 32P: Constant inflow - 0.40 PMF



Pond 32P: Constant inflow - 0.40 PMF



Pond 32P: Constant inflow - 0.40 PMF



Hydrograph for Pond 32P: Constant inflow - 0.40 PMF

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	5,227.00	1,009.66	0.00	1.06	5,227.00	1,009.83	5,227.00
0.02	5,227.00	1,009.51	5,227.00	1.08	5,227.00	1,009.83	5,227.00
0.04	5,227.00	1,009.58	5,227.00	1.10	5,227.00	1,009.83	5,227.00
0.06	5,227.00	1,009.64	5,227.00	1.12	5,227.00	1,009.83	5,227.00
0.08	5,227.00	1,009.69	5,227.00	1.14	5,227.00	1,009.83	5,227.00
0.10	5,227.00	1,009.73	5,227.00	1.16	5,227.00	1,009.83	5,227.00
0.12	5,227.00	1,009.76	5,227.00	1.18	5,227.00	1,009.83	5,227.00
0.14	5,227.00	1,009.78	5,227.00	1.20	5,227.00	1,009.83	5,227.00
0.16	5,227.00	1,009.79	5,227.00	1.22	5,227.00	1,009.83	5,227.00
0.18	5,227.00	1,009.81	5,227.00	1.24	5,227.00	1,009.83	5,227.00
0.20	5,227.00	1,009.81	5,227.00	1.26	5,227.00	1,009.83	5,227.00
0.22	5,227.00	1,009.82	5,227.00	1.28	5,227.00	1,009.83	5,227.00
0.24	5,227.00	1,009.82	5,227.00	1.30	5,227.00	1,009.83	5,227.00
0.26	5,227.00	1,009.83	5,227.00	1.32	5,227.00	1,009.83	5,227.00
0.28	5,227.00	1,009.83	5,227.00	1.34	5,227.00	1,009.83	5,227.00
0.30	5,227.00	1,009.83	5,227.00	1.36	5,227.00	1,009.83	5,227.00
0.32	5,227.00	1,009.83	5,227.00	1.38	5,227.00	1,009.83	5,227.00
0.34	5,227.00	1,009.83	5,227.00	1.40	5,227.00	1,009.83	5,227.00
0.36	5,227.00	1,009.83	5,227.00	1.42	5,227.00	1,009.83	5,227.00
0.38	5,227.00	1,009.84	5,227.00	1.44	5,227.00	1,009.83	5,227.00
0.40	5,227.00	1,009.84	5,227.00	1.46	5,227.00	1,009.83	5,227.00
0.42	5,227.00	1,009.84	5,227.00	1.48	5,227.00	1,009.83	5,227.00
0.44	5,227.00	1,009.84	5,227.00	1.50	5,227.00	1,009.83	5,227.00
0.46	5,227.00	1,009.84	5,227.00	1.52	5,227.00	1,009.83	5,227.00
0.48	5,227.00	1,009.84	5,227.00	1.54	5,227.00	1,009.83	5,227.00
0.50	5,227.00	1,009.84	5,227.00	1.56	5,227.00	1,009.83	5,227.00
0.52	5,227.00	1,009.84	5,227.00	1.58	5,227.00	1,009.83	5,227.00
0.54	5,227.00	1,009.84	5,227.00	1.60	5,227.00	1,009.83	5,227.00
0.56	5,227.00	1,009.84	5,227.00	1.62	5,227.00	1,009.83	5,227.00
0.58	5,227.00	1,009.84	5,227.00	1.64	5,227.00	1,009.83	5,227.00
0.60	5,227.00	1,009.84	5,227.00	1.66	5,227.00	1,009.83	5,227.00
0.62	5,227.00	1,009.84	5,227.00	1.68	5,227.00	1,009.83	5,227.00
0.64	5,227.00	1,009.84	5,227.00	1.70	5,227.00	1,009.83	5,227.00
0.66	5,227.00	1,009.84	5,227.00	1.72	5,227.00	1,009.83	5,227.00
0.68	5,227.00	1,009.84	5,227.00	1.74	5,227.00	1,009.83	5,227.00
0.70	5,227.00	1,009.84	5,227.00	1.76	5,227.00	1,009.83	5,227.00
0.72	5,227.00	1,009.84	5,227.00	1.78	5,227.00	1,009.83	5,227.00
0.74	5,227.00	1,009.84	5,227.00	1.80	5,227.00	1,009.83	5,227.00
0.76	5,227.00	1,009.84	5,227.00	1.82	5,227.00	1,009.83	5,227.00
0.78	5,227.00	1,009.84	5,227.00	1.84	5,227.00	1,009.83	5,227.00
0.80	5,227.00	1,009.84	5,227.00	1.86	5,227.00	1,009.83	5,227.00
0.82	5,227.00	1,009.84	5,227.00	1.88	5,227.00	1,009.83	5,227.00
0.84	5,227.00	1,009.84	5,227.00	1.90	5,227.00	1,009.83	5,227.00
0.86	5,227.00	1,009.84	5,227.00	1.92	5,227.00	1,009.83	5,227.00
0.88	5,227.00	1,009.84	5,227.00	1.94	5,227.00	1,009.83	5,227.00
0.90	5,227.00	1,009.84	5,227.00	1.96	5,227.00	1,009.83	5,227.00
0.92	5,227.00	1,009.84	5,227.00	1.98	5,227.00	1,009.83	5,227.00
0.94	5,227.00	1,009.84	5,227.00	2.00	5,227.00	1,009.83	5,227.00
0.96	5,227.00	1,009.84	5,227.00	2.02	5,227.00	1,009.83	5,227.00
0.98	5,227.00	1,009.84	5,227.00	2.04	5,227.00	1,009.83	5,227.00
1.00	5,227.00	1,009.84	5,227.00	2.06	5,227.00	1,009.83	5,227.00
1.02	5,227.00	1,009.84	5,227.00	2.08	5,227.00	1,009.83	5,227.00
1.04	5,227.00	1,009.83	5,227.00	2.10	5,227.00	1,009.83	5,227.00

Hydrograph for Pond 32P: Constant inflow - 0.40 PMF (continued)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
2.12	5,227.00	1,009.83	5,227.00	3.18	5,227.00	1,009.83	5,227.00
2.14	5,227.00	1,009.83	5,227.00	3.20	5,227.00	1,009.83	5,227.00
2.16	5,227.00	1,009.83	5,227.00	3.22	5,227.00	1,009.83	5,227.00
2.18	5,227.00	1,009.83	5,227.00	3.24	5,227.00	1,009.83	5,227.00
2.20	5,227.00	1,009.83	5,227.00	3.26	5,227.00	1,009.83	5,227.00
2.22	5,227.00	1,009.83	5,227.00	3.28	5,227.00	1,009.83	5,227.00
2.24	5,227.00	1,009.83	5,227.00	3.30	5,227.00	1,009.83	5,227.00
2.26	5,227.00	1,009.83	5,227.00	3.32	5,227.00	1,009.83	5,227.00
2.28	5,227.00	1,009.83	5,227.00	3.34	5,227.00	1,009.83	5,227.00
2.30	5,227.00	1,009.83	5,227.00	3.36	5,227.00	1,009.83	5,227.00
2.32	5,227.00	1,009.83	5,227.00	3.38	5,227.00	1,009.83	5,227.00
2.34	5,227.00	1,009.83	5,227.00	3.40	5,227.00	1,009.83	5,227.00
2.36	5,227.00	1,009.83	5,227.00	3.42	5,227.00	1,009.83	5,227.00
2.38	5,227.00	1,009.83	5,227.00	3.44	5,227.00	1,009.83	5,227.00
2.40	5,227.00	1,009.83	5,227.00	3.46	5,227.00	1,009.83	5,227.00
2.42	5,227.00	1,009.83	5,227.00	3.48	5,227.00	1,009.83	5,227.00
2.44	5,227.00	1,009.83	5,227.00	3.50	5,227.00	1,009.83	5,227.00
2.46	5,227.00	1,009.83	5,227.00	3.52	5,227.00	1,009.83	5,227.00
2.48	5,227.00	1,009.83	5,227.00	3.54	5,227.00	1,009.83	5,227.00
2.50	5,227.00	1,009.83	5,227.00	3.56	5,227.00	1,009.83	5,227.00
2.52	5,227.00	1,009.83	5,227.00	3.58	5,227.00	1,009.83	5,227.00
2.54	5,227.00	1,009.83	5,227.00	3.60	5,227.00	1,009.83	5,227.00
2.56	5,227.00	1,009.83	5,227.00	3.62	5,227.00	1,009.83	5,227.00
2.58	5,227.00	1,009.83	5,227.00	3.64	5,227.00	1,009.83	5,227.00
2.60	5,227.00	1,009.83	5,227.00	3.66	5,227.00	1,009.83	5,227.00
2.62	5,227.00	1,009.83	5,227.00	3.68	5,227.00	1,009.83	5,227.00
2.64	5,227.00	1,009.83	5,227.00	3.70	5,227.00	1,009.83	5,227.00
2.66	5,227.00	1,009.83	5,227.00	3.72	5,227.00	1,009.83	5,227.00
2.68	5,227.00	1,009.83	5,227.00	3.74	5,227.00	1,009.83	5,227.00
2.70	5,227.00	1,009.83	5,227.00	3.76	5,227.00	1,009.83	5,227.00
2.72	5,227.00	1,009.83	5,227.00	3.78	5,227.00	1,009.83	5,227.00
2.74	5,227.00	1,009.83	5,227.00	3.80	5,227.00	1,009.83	5,227.00
2.76	5,227.00	1,009.83	5,227.00	3.82	5,227.00	1,009.83	5,227.00
2.78	5,227.00	1,009.83	5,227.00	3.84	5,227.00	1,009.83	5,227.00
2.80	5,227.00	1,009.83	5,227.00	3.86	5,227.00	1,009.83	5,227.00
2.82	5,227.00	1,009.83	5,227.00	3.88	5,227.00	1,009.83	5,227.00
2.84	5,227.00	1,009.83	5,227.00	3.90	5,227.00	1,009.83	5,227.00
2.86	5,227.00	1,009.83	5,227.00	3.92	5,227.00	1,009.83	5,227.00
2.88	5,227.00	1,009.83	5,227.00	3.94	5,227.00	1,009.83	5,227.00
2.90	5,227.00	1,009.83	5,227.00	3.96	5,227.00	1,009.83	5,227.00
2.92	5,227.00	1,009.83	5,227.00	3.98	5,227.00	1,009.83	5,227.00
2.94	5,227.00	1,009.83	5,227.00	4.00	5,227.00	1,009.83	5,227.00
2.96	5,227.00	1,009.83	5,227.00	4.02	5,227.00	1,009.83	5,227.00
2.98	5,227.00	1,009.83	5,227.00	4.04	5,227.00	1,009.83	5,227.00
3.00	5,227.00	1,009.83	5,227.00	4.06	5,227.00	1,009.83	5,227.00
3.02	5,227.00	1,009.83	5,227.00	4.08	5,227.00	1,009.83	5,227.00
3.04	5,227.00	1,009.83	5,227.00	4.10	5,227.00	1,009.83	5,227.00
3.06	5,227.00	1,009.83	5,227.00	4.12	5,227.00	1,009.83	5,227.00
3.08	5,227.00	1,009.83	5,227.00	4.14	5,227.00	1,009.83	5,227.00
3.10	5,227.00	1,009.83	5,227.00	4.16	5,227.00	1,009.83	5,227.00
3.12	5,227.00	1,009.83	5,227.00	4.18	5,227.00	1,009.83	5,227.00
3.14	5,227.00	1,009.83	5,227.00	4.20	5,227.00	1,009.83	5,227.00
3.16	5,227.00	1,009.83	5,227.00	4.22	5,227.00	1,009.82	5,227.00

Hydrograph for Pond 32P: Constant inflow - 0.40 PMF (continued)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
4.24	5,227.00	1,009.82	5,227.00	5.30	5,227.00	1,009.82	5,227.00
4.26	5,227.00	1,009.82	5,227.00	5.32	5,227.00	1,009.82	5,227.00
4.28	5,227.00	1,009.82	5,227.00	5.34	5,227.00	1,009.82	5,227.00
4.30	5,227.00	1,009.82	5,227.00	5.36	5,227.00	1,009.82	5,227.00
4.32	5,227.00	1,009.82	5,227.00	5.38	5,227.00	1,009.82	5,227.00
4.34	5,227.00	1,009.82	5,227.00	5.40	5,227.00	1,009.82	5,227.00
4.36	5,227.00	1,009.82	5,227.00	5.42	5,227.00	1,009.82	5,227.00
4.38	5,227.00	1,009.82	5,227.00	5.44	5,227.00	1,009.82	5,227.00
4.40	5,227.00	1,009.82	5,227.00	5.46	5,227.00	1,009.82	5,227.00
4.42	5,227.00	1,009.82	5,227.00	5.48	5,227.00	1,009.82	5,227.00
4.44	5,227.00	1,009.82	5,227.00	5.50	5,227.00	1,009.82	5,227.00
4.46	5,227.00	1,009.82	5,227.00	5.52	5,227.00	1,009.82	5,227.00
4.48	5,227.00	1,009.82	5,227.00	5.54	5,227.00	1,009.82	5,227.00
4.50	5,227.00	1,009.82	5,227.00	5.56	5,227.00	1,009.82	5,227.00
4.52	5,227.00	1,009.82	5,227.00	5.58	5,227.00	1,009.82	5,227.00
4.54	5,227.00	1,009.82	5,227.00	5.60	5,227.00	1,009.82	5,227.00
4.56	5,227.00	1,009.82	5,227.00	5.62	5,227.00	1,009.82	5,227.00
4.58	5,227.00	1,009.82	5,227.00	5.64	5,227.00	1,009.82	5,227.00
4.60	5,227.00	1,009.82	5,227.00	5.66	5,227.00	1,009.82	5,227.00
4.62	5,227.00	1,009.82	5,227.00	5.68	5,227.00	1,009.82	5,227.00
4.64	5,227.00	1,009.82	5,227.00	5.70	5,227.00	1,009.82	5,227.00
4.66	5,227.00	1,009.82	5,227.00	5.72	5,227.00	1,009.82	5,227.00
4.68	5,227.00	1,009.82	5,227.00	5.74	5,227.00	1,009.82	5,227.00
4.70	5,227.00	1,009.82	5,227.00	5.76	5,227.00	1,009.82	5,227.00
4.72	5,227.00	1,009.82	5,227.00	5.78	5,227.00	1,009.82	5,227.00
4.74	5,227.00	1,009.82	5,227.00	5.80	5,227.00	1,009.82	5,227.00
4.76	5,227.00	1,009.82	5,227.00	5.82	5,227.00	1,009.82	5,227.00
4.78	5,227.00	1,009.82	5,227.00	5.84	5,227.00	1,009.82	5,227.00
4.80	5,227.00	1,009.82	5,227.00	5.86	5,227.00	1,009.82	5,227.00
4.82	5,227.00	1,009.82	5,227.00	5.88	5,227.00	1,009.82	5,227.00
4.84	5,227.00	1,009.82	5,227.00	5.90	5,227.00	1,009.82	5,227.00
4.86	5,227.00	1,009.82	5,227.00	5.92	5,227.00	1,009.82	5,227.00
4.88	5,227.00	1,009.82	5,227.00	5.94	5,227.00	1,009.82	5,227.00
4.90	5,227.00	1,009.82	5,227.00	5.96	5,227.00	1,009.82	5,227.00
4.92	5,227.00	1,009.82	5,227.00	5.98	5,227.00	1,009.82	5,227.00
4.94	5,227.00	1,009.82	5,227.00	6.00	5,227.00	1,009.82	5,227.00
4.96	5,227.00	1,009.82	5,227.00	6.02	5,227.00	1,009.82	5,227.00
4.98	5,227.00	1,009.82	5,227.00	6.04	5,227.00	1,009.82	5,227.00
5.00	5,227.00	1,009.82	5,227.00	6.06	5,227.00	1,009.82	5,227.00
5.02	5,227.00	1,009.82	5,227.00	6.08	5,227.00	1,009.82	5,227.00
5.04	5,227.00	1,009.82	5,227.00	6.10	5,227.00	1,009.82	5,227.00
5.06	5,227.00	1,009.82	5,227.00	6.12	5,227.00	1,009.82	5,227.00
5.08	5,227.00	1,009.82	5,227.00	6.14	5,227.00	1,009.82	5,227.00
5.10	5,227.00	1,009.82	5,227.00	6.16	5,227.00	1,009.82	5,227.00
5.12	5,227.00	1,009.82	5,227.00	6.18	5,227.00	1,009.82	5,227.00
5.14	5,227.00	1,009.82	5,227.00	6.20	5,227.00	1,009.82	5,227.00
5.16	5,227.00	1,009.82	5,227.00	6.22	5,227.00	1,009.82	5,227.00
5.18	5,227.00	1,009.82	5,227.00	6.24	5,227.00	1,009.82	5,227.00
5.20	5,227.00	1,009.82	5,227.00	6.26	5,227.00	1,009.82	5,227.00
5.22	5,227.00	1,009.82	5,227.00	6.28	5,227.00	1,009.82	5,227.00
5.24	5,227.00	1,009.82	5,227.00	6.30	5,227.00	1,009.82	5,227.00
5.26	5,227.00	1,009.82	5,227.00	6.32	5,227.00	1,009.82	5,227.00
5.28	5,227.00	1,009.82	5,227.00	6.34	5,227.00	1,009.82	5,227.00

Hydrograph for Pond 32P: Constant inflow - 0.40 PMF (continued)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
6.36	5,227.00	1,009.82	5,227.00	7.42	5,227.00	1,009.82	5,227.00
6.38	5,227.00	1,009.82	5,227.00	7.44	5,227.00	1,009.82	5,227.00
6.40	5,227.00	1,009.82	5,227.00	7.46	5,227.00	1,009.82	5,227.00
6.42	5,227.00	1,009.82	5,227.00	7.48	5,227.00	1,009.82	5,227.00
6.44	5,227.00	1,009.82	5,227.00	7.50	5,227.00	1,009.82	5,227.00
6.46	5,227.00	1,009.82	5,227.00	7.52	5,227.00	1,009.82	5,227.00
6.48	5,227.00	1,009.82	5,227.00	7.54	5,227.00	1,009.82	5,227.00
6.50	5,227.00	1,009.82	5,227.00	7.56	5,227.00	1,009.82	5,227.00
6.52	5,227.00	1,009.82	5,227.00	7.58	5,227.00	1,009.82	5,227.00
6.54	5,227.00	1,009.82	5,227.00	7.60	5,227.00	1,009.82	5,227.00
6.56	5,227.00	1,009.82	5,227.00	7.62	5,227.00	1,009.82	5,227.00
6.58	5,227.00	1,009.82	5,227.00	7.64	5,227.00	1,009.82	5,227.00
6.60	5,227.00	1,009.82	5,227.00	7.66	5,227.00	1,009.82	5,227.00
6.62	5,227.00	1,009.82	5,227.00	7.68	5,227.00	1,009.82	5,227.00
6.64	5,227.00	1,009.82	5,227.00	7.70	5,227.00	1,009.82	5,227.00
6.66	5,227.00	1,009.82	5,227.00	7.72	5,227.00	1,009.82	5,227.00
6.68	5,227.00	1,009.82	5,227.00	7.74	5,227.00	1,009.82	5,227.00
6.70	5,227.00	1,009.82	5,227.00	7.76	5,227.00	1,009.82	5,227.00
6.72	5,227.00	1,009.82	5,227.00	7.78	5,227.00	1,009.82	5,227.00
6.74	5,227.00	1,009.82	5,227.00	7.80	5,227.00	1,009.82	5,227.00
6.76	5,227.00	1,009.82	5,227.00	7.82	5,227.00	1,009.82	5,227.00
6.78	5,227.00	1,009.82	5,227.00	7.84	5,227.00	1,009.82	5,227.00
6.80	5,227.00	1,009.82	5,227.00	7.86	5,227.00	1,009.82	5,227.00
6.82	5,227.00	1,009.82	5,227.00	7.88	5,227.00	1,009.82	5,227.00
6.84	5,227.00	1,009.82	5,227.00	7.90	5,227.00	1,009.82	5,227.00
6.86	5,227.00	1,009.82	5,227.00	7.92	5,227.00	1,009.82	5,227.00
6.88	5,227.00	1,009.82	5,227.00	7.94	5,227.00	1,009.82	5,227.00
6.90	5,227.00	1,009.82	5,227.00	7.96	5,227.00	1,009.82	5,227.00
6.92	5,227.00	1,009.82	5,227.00	7.98	5,227.00	1,009.82	5,227.00
6.94	5,227.00	1,009.82	5,227.00	8.00	5,227.00	1,009.82	5,227.00
6.96	5,227.00	1,009.82	5,227.00	8.02	5,227.00	1,009.82	5,227.00
6.98	5,227.00	1,009.82	5,227.00	8.04	5,227.00	1,009.82	5,227.00
7.00	5,227.00	1,009.82	5,227.00	8.06	5,227.00	1,009.82	5,227.00
7.02	5,227.00	1,009.82	5,227.00	8.08	5,227.00	1,009.82	5,227.00
7.04	5,227.00	1,009.82	5,227.00	8.10	5,227.00	1,009.82	5,227.00
7.06	5,227.00	1,009.82	5,227.00	8.12	5,227.00	1,009.82	5,227.00
7.08	5,227.00	1,009.82	5,227.00	8.14	5,227.00	1,009.82	5,227.00
7.10	5,227.00	1,009.82	5,227.00	8.16	5,227.00	1,009.82	5,227.00
7.12	5,227.00	1,009.82	5,227.00	8.18	5,227.00	1,009.82	5,227.00
7.14	5,227.00	1,009.82	5,227.00	8.20	5,227.00	1,009.82	5,227.00
7.16	5,227.00	1,009.82	5,227.00	8.22	5,227.00	1,009.82	5,227.00
7.18	5,227.00	1,009.82	5,227.00	8.24	5,227.00	1,009.82	5,227.00
7.20	5,227.00	1,009.82	5,227.00	8.26	5,227.00	1,009.82	5,227.00
7.22	5,227.00	1,009.82	5,227.00	8.28	5,227.00	1,009.82	5,227.00
7.24	5,227.00	1,009.82	5,227.00	8.30	5,227.00	1,009.82	5,227.00
7.26	5,227.00	1,009.82	5,227.00	8.32	5,227.00	1,009.82	5,227.00
7.28	5,227.00	1,009.82	5,227.00	8.34	5,227.00	1,009.82	5,227.00
7.30	5,227.00	1,009.82	5,227.00	8.36	5,227.00	1,009.82	5,227.00
7.32	5,227.00	1,009.82	5,227.00	8.38	5,227.00	1,009.82	5,227.00
7.34	5,227.00	1,009.82	5,227.00	8.40	5,227.00	1,009.82	5,227.00
7.36	5,227.00	1,009.82	5,227.00	8.42	5,227.00	1,009.82	5,227.00
7.38	5,227.00	1,009.82	5,227.00	8.44	5,227.00	1,009.82	5,227.00
7.40	5,227.00	1,009.82	5,227.00	8.46	5,227.00	1,009.82	5,227.00

Hydrograph for Pond 32P: Constant inflow - 0.40 PMF (continued)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
8.48	5,227.00	1,009.82	5,227.00	9.54	5,227.00	1,009.82	5,227.00
8.50	5,227.00	1,009.82	5,227.00	9.56	5,227.00	1,009.82	5,227.00
8.52	5,227.00	1,009.82	5,227.00	9.58	5,227.00	1,009.82	5,227.00
8.54	5,227.00	1,009.82	5,227.00	9.60	5,227.00	1,009.82	5,227.00
8.56	5,227.00	1,009.82	5,227.00	9.62	5,227.00	1,009.82	5,227.00
8.58	5,227.00	1,009.82	5,227.00	9.64	5,227.00	1,009.82	5,227.00
8.60	5,227.00	1,009.82	5,227.00	9.66	5,227.00	1,009.82	5,227.00
8.62	5,227.00	1,009.82	5,227.00	9.68	5,227.00	1,009.82	5,227.00
8.64	5,227.00	1,009.82	5,227.00	9.70	5,227.00	1,009.82	5,227.00
8.66	5,227.00	1,009.82	5,227.00	9.72	5,227.00	1,009.82	5,227.00
8.68	5,227.00	1,009.82	5,227.00	9.74	5,227.00	1,009.82	5,227.00
8.70	5,227.00	1,009.82	5,227.00	9.76	5,227.00	1,009.82	5,227.00
8.72	5,227.00	1,009.82	5,227.00	9.78	5,227.00	1,009.82	5,227.00
8.74	5,227.00	1,009.82	5,227.00	9.80	5,227.00	1,009.82	5,227.00
8.76	5,227.00	1,009.82	5,227.00	9.82	5,227.00	1,009.82	5,227.00
8.78	5,227.00	1,009.82	5,227.00	9.84	5,227.00	1,009.82	5,227.00
8.80	5,227.00	1,009.82	5,227.00	9.86	5,227.00	1,009.82	5,227.00
8.82	5,227.00	1,009.82	5,227.00	9.88	5,227.00	1,009.82	5,227.00
8.84	5,227.00	1,009.82	5,227.00	9.90	5,227.00	1,009.82	5,227.00
8.86	5,227.00	1,009.82	5,227.00	9.92	5,227.00	1,009.82	5,227.00
8.88	5,227.00	1,009.82	5,227.00	9.94	5,227.00	1,009.82	5,227.00
8.90	5,227.00	1,009.82	5,227.00	9.96	5,227.00	1,009.82	5,227.00
8.92	5,227.00	1,009.82	5,227.00	9.98	5,227.00	1,009.82	5,227.00
8.94	5,227.00	1,009.82	5,227.00	10.00	5,227.00	1,009.82	5,227.00
8.96	5,227.00	1,009.82	5,227.00	10.02	5,227.00	1,009.82	5,227.00
8.98	5,227.00	1,009.82	5,227.00	10.04	5,227.00	1,009.82	5,227.00
9.00	5,227.00	1,009.82	5,227.00	10.06	5,227.00	1,009.82	5,227.00
9.02	5,227.00	1,009.82	5,227.00	10.08	5,227.00	1,009.82	5,227.00
9.04	5,227.00	1,009.82	5,227.00	10.10	5,227.00	1,009.82	5,227.00
9.06	5,227.00	1,009.82	5,227.00	10.12	5,227.00	1,009.82	5,227.00
9.08	5,227.00	1,009.82	5,227.00	10.14	5,227.00	1,009.82	5,227.00
9.10	5,227.00	1,009.82	5,227.00	10.16	5,227.00	1,009.82	5,227.00
9.12	5,227.00	1,009.82	5,227.00	10.18	5,227.00	1,009.82	5,227.00
9.14	5,227.00	1,009.82	5,227.00	10.20	5,227.00	1,009.82	5,227.00
9.16	5,227.00	1,009.82	5,227.00	10.22	5,227.00	1,009.82	5,227.00
9.18	5,227.00	1,009.82	5,227.00	10.24	5,227.00	1,009.82	5,227.00
9.20	5,227.00	1,009.82	5,227.00	10.26	5,227.00	1,009.82	5,227.00
9.22	5,227.00	1,009.82	5,227.00	10.28	5,227.00	1,009.82	5,227.00
9.24	5,227.00	1,009.82	5,227.00	10.30	5,227.00	1,009.82	5,227.00
9.26	5,227.00	1,009.82	5,227.00	10.32	5,227.00	1,009.82	5,227.00
9.28	5,227.00	1,009.82	5,227.00	10.34	5,227.00	1,009.82	5,227.00
9.30	5,227.00	1,009.82	5,227.00	10.36	5,227.00	1,009.82	5,227.00
9.32	5,227.00	1,009.82	5,227.00	10.38	5,227.00	1,009.82	5,227.00
9.34	5,227.00	1,009.82	5,227.00	10.40	5,227.00	1,009.82	5,227.00
9.36	5,227.00	1,009.82	5,227.00	10.42	5,227.00	1,009.82	5,227.00
9.38	5,227.00	1,009.82	5,227.00	10.44	5,227.00	1,009.82	5,227.00
9.40	5,227.00	1,009.82	5,227.00	10.46	5,227.00	1,009.82	5,227.00
9.42	5,227.00	1,009.82	5,227.00	10.48	5,227.00	1,009.82	5,227.00
9.44	5,227.00	1,009.82	5,227.00	10.50	5,227.00	1,009.82	5,227.00
9.46	5,227.00	1,009.82	5,227.00	10.52	5,227.00	1,009.82	5,227.00
9.48	5,227.00	1,009.82	5,227.00	10.54	5,227.00	1,009.82	5,227.00
9.50	5,227.00	1,009.82	5,227.00	10.56	5,227.00	1,009.82	5,227.00
9.52	5,227.00	1,009.82	5,227.00	10.58	5,227.00	1,009.82	5,227.00

Hydrograph for Pond 32P: Constant inflow - 0.40 PMF (continued)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
10.60	5,227.00	1,009.82	5,227.00	11.66	5,227.00	1,009.82	5,227.00
10.62	5,227.00	1,009.82	5,227.00	11.68	5,227.00	1,009.82	5,227.00
10.64	5,227.00	1,009.82	5,227.00	11.70	5,227.00	1,009.82	5,227.00
10.66	5,227.00	1,009.82	5,227.00	11.72	5,227.00	1,009.82	5,227.00
10.68	5,227.00	1,009.82	5,227.00	11.74	5,227.00	1,009.82	5,227.00
10.70	5,227.00	1,009.82	5,227.00	11.76	5,227.00	1,009.82	5,227.00
10.72	5,227.00	1,009.82	5,227.00	11.78	5,227.00	1,009.82	5,227.00
10.74	5,227.00	1,009.82	5,227.00	11.80	5,227.00	1,009.82	5,227.00
10.76	5,227.00	1,009.82	5,227.00	11.82	5,227.00	1,009.82	5,227.00
10.78	5,227.00	1,009.82	5,227.00	11.84	5,227.00	1,009.82	5,227.00
10.80	5,227.00	1,009.82	5,227.00	11.86	5,227.00	1,009.82	5,227.00
10.82	5,227.00	1,009.82	5,227.00	11.88	5,227.00	1,009.82	5,227.00
10.84	5,227.00	1,009.82	5,227.00	11.90	5,227.00	1,009.82	5,227.00
10.86	5,227.00	1,009.82	5,227.00	11.92	5,227.00	1,009.82	5,227.00
10.88	5,227.00	1,009.82	5,227.00	11.94	5,227.00	1,009.82	5,227.00
10.90	5,227.00	1,009.82	5,227.00	11.96	5,227.00	1,009.82	5,227.00
10.92	5,227.00	1,009.82	5,227.00	11.98	5,227.00	1,009.82	5,227.00
10.94	5,227.00	1,009.82	5,227.00	12.00	5,227.00	1,009.82	5,227.00
10.96	5,227.00	1,009.82	5,227.00				
10.98	5,227.00	1,009.82	5,227.00				
11.00	5,227.00	1,009.82	5,227.00				
11.02	5,227.00	1,009.82	5,227.00				
11.04	5,227.00	1,009.82	5,227.00				
11.06	5,227.00	1,009.82	5,227.00				
11.08	5,227.00	1,009.82	5,227.00				
11.10	5,227.00	1,009.82	5,227.00				
11.12	5,227.00	1,009.82	5,227.00				
11.14	5,227.00	1,009.82	5,227.00				
11.16	5,227.00	1,009.82	5,227.00				
11.18	5,227.00	1,009.82	5,227.00				
11.20	5,227.00	1,009.82	5,227.00				
11.22	5,227.00	1,009.82	5,227.00				
11.24	5,227.00	1,009.82	5,227.00				
11.26	5,227.00	1,009.82	5,227.00				
11.28	5,227.00	1,009.82	5,227.00				
11.30	5,227.00	1,009.82	5,227.00				
11.32	5,227.00	1,009.82	5,227.00				
11.34	5,227.00	1,009.82	5,227.00				
11.36	5,227.00	1,009.82	5,227.00				
11.38	5,227.00	1,009.82	5,227.00				
11.40	5,227.00	1,009.82	5,227.00				
11.42	5,227.00	1,009.82	5,227.00				
11.44	5,227.00	1,009.82	5,227.00				
11.46	5,227.00	1,009.82	5,227.00				
11.48	5,227.00	1,009.82	5,227.00				
11.50	5,227.00	1,009.82	5,227.00				
11.52	5,227.00	1,009.82	5,227.00				
11.54	5,227.00	1,009.82	5,227.00				
11.56	5,227.00	1,009.82	5,227.00				
11.58	5,227.00	1,009.82	5,227.00				
11.60	5,227.00	1,009.82	5,227.00				
11.62	5,227.00	1,009.82	5,227.00				
11.64	5,227.00	1,009.82	5,227.00				

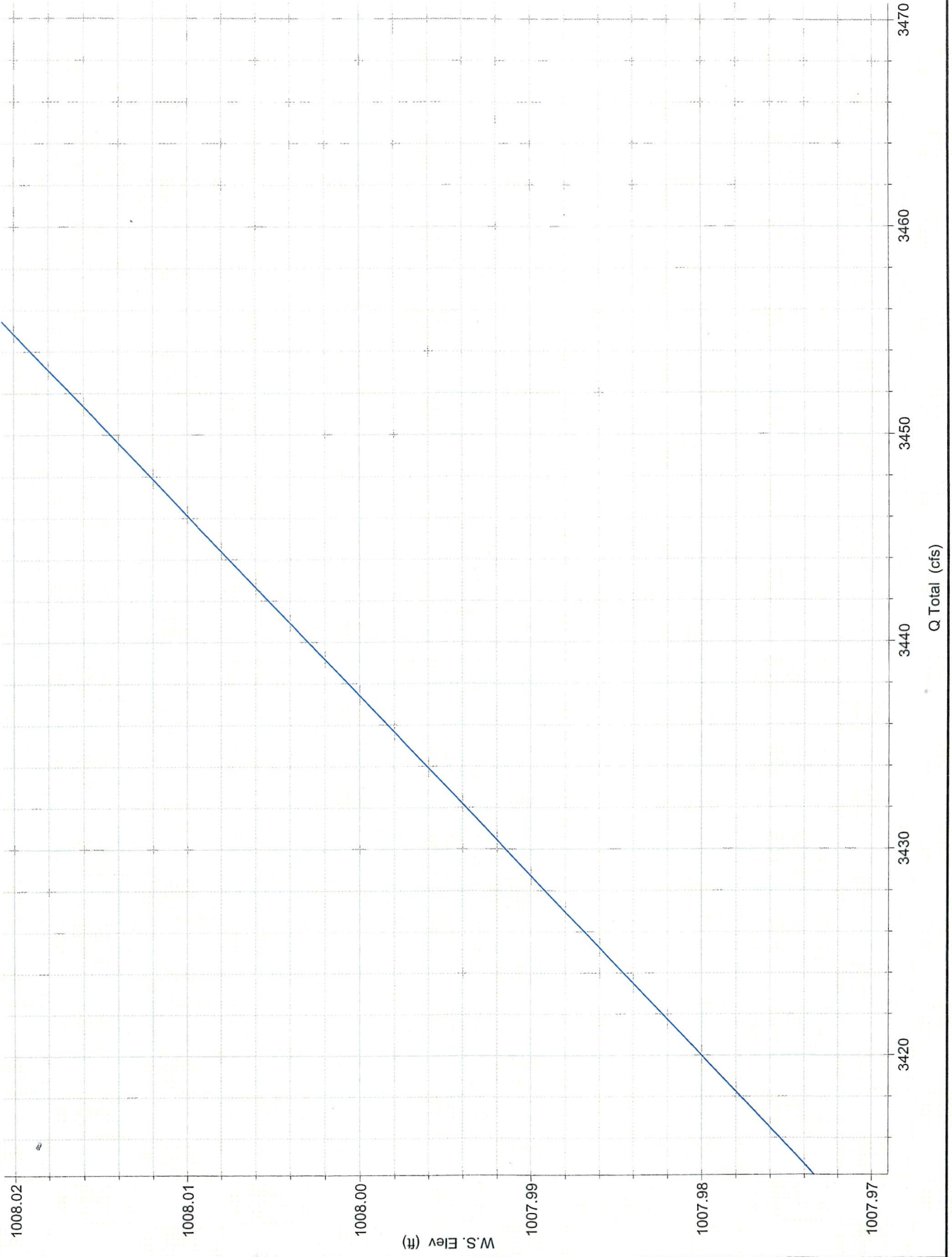
River	Reach	River Sta	Profile	Q Total (cfs)	Q Channel (cfs)	Q Left (cfs)	Q Right (cfs)	Hydr Depth C (ft)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	Frcn Slope (ft/ft)	Vel Total (ft/s)	Vel Chml (ft/s)	Vel Left (ft/s)	Vel Right (ft/s)	Froutde # Chl
SippoCreek	Main	3765.976	900 cfs	900.00	627.80	208.24	63.96	3.29	965.45	968.79	968.57	969.75	0.010518	6.29	9.08	3.78	3.85	0.88
SippoCreek	Main	3765.976	Q10 1100 cfs	1100.00	750.50	266.14	83.36	3.50	969.00	969.00	970.23	970.19	0.010418	7.01	10.20	4.31	3.98	0.96
SippoCreek	Main	3765.976	Q100 1980 cfs	1980.00	1217.26	569.63	193.11	4.73	965.45	970.23	970.23	971.83	0.008851	8.11	12.26	5.43	4.84	0.99
SippoCreek	Main	3765.976	2400 cfs	2400.00	1427.92	722.78	249.30	5.18	965.45	970.68	970.68	972.48	0.008450	8.62	13.13	5.92	5.24	1.02
SippoCreek	Main	3765.976	Q500 2650 cfs	2650.00	1548.70	816.57	284.72	5.45	970.95	970.95	972.84	972.84	0.008213	8.84	13.53	6.15	5.42	1.02
SippoCreek	Main	3765.976	3000 cfs	3000.00	1715.16	948.91	335.93	5.81	965.45	971.32	971.32	973.33	0.007916	9.12	14.05	6.44	5.66	1.03
SippoCreek	Main	3765.976	3500 cfs	3500.00	1949.64	1138.47	411.90	6.28	965.45	971.78	971.78	973.97	0.007641	9.53	14.79	6.83	6.00	1.04
SippoCreek	Main	3765.976	5227 cfs	5227.00	2908.45	1702.15	616.41	6.30	975.65	971.80	971.80	976.15	0.009094	14.17	21.98	10.16	8.92	1.54
SippoCreek	Main	3765.976	5346 cfs	5346.00	2971.73	1742.67	631.61	6.32	965.45	971.82	971.82	976.84	0.009131	14.43	22.40	10.36	9.09	1.57
SippoCreek	Main	3765.976	0.5 PMF 11457 cf	11457.00	4460.53	3959.03	1139	12.49	965.45	976.90	976.90	978.56	0.005334	10.66	18.64	8.77	6.31	0.97
SippoCreek	Main	3765.976	15000 cfs	15000.00	5393.36	4590.66	5015.98	12.49	965.45	977.99	977.99	981.09	0.005319	10.68	20.57	9.62	7.55	1.03
SippoCreek	Main	3765.976	0.75 PMF 21100 c	21100.00	6801.74	6182.81	8105.45	14.32	965.45	979.82	979.82	983.38	0.005640	11.83	23.62	10.51	9.06	1.05
SippoCreek	Main	3765.976	PMF 31970 cfs	31970.00	8740.09	9402.79	13827.12	17.73	965.45	983.23	982.17	986.88	0.005744	12.59	23.48	11.43	10.28	0.98
SippoCreek	Main	2954.488	900 cfs	900.00	395.66	335.69	168.65	3.82	960.00	963.84	963.84	964.18	0.002750	3.57	5.97	2.25	4.59	0.54
SippoCreek	Main	2954.488	Q10 1100 cfs	1100.00	431.64	479.08	189.28	4.11	960.00	964.13	964.13	964.46	0.002736	3.63	6.06	2.51	4.99	0.52
SippoCreek	Main	2954.488	Q100 1980 cfs	1980.00	593.90	1120.59	275.51	5.08	965.46	965.46	965.46	966.11	0.002870	4.11	6.62	3.31	4.99	0.53
SippoCreek	Main	2954.488	2400 cfs	2400.00	653.74	1431.03	315.23	5.46	960.00	965.48	964.56	965.86	0.002963	4.35	6.91	3.61	5.17	0.52
SippoCreek	Main	2954.488	Q500 2650 cfs	2650.00	693.64	1618.11	338.26	5.87	960.00	965.69	964.87	966.08	0.002996	4.47	7.06	3.76	5.26	0.52
SippoCreek	Main	2954.488	3000 cfs	3000.00	747.96	1882.12	369.92	5.95	960.00	966.39	966.39	966.39	0.003025	4.63	7.24	3.96	5.37	0.52
SippoCreek	Main	2954.488	3500 cfs	3500.00	822.81	2262.89	414.29	6.34	960.00	966.37	965.10	966.80	0.003044	4.83	7.48	4.20	5.49	0.52
SippoCreek	Main	2954.488	5227 cfs	5227.00	1068.13	3596.10	562.78	7.55	960.00	967.57	965.78	968.09	0.003062	5.37	8.15	4.82	5.83	0.52
SippoCreek	Main	2954.488	5346 cfs	5346.00	1084.48	3688.70	572.81	7.63	960.00	967.65	965.83	968.17	0.003064	5.37	8.20	4.85	5.85	0.52
SippoCreek	Main	2954.488	0.5 PMF 11457 cf	11457.00	1858.41	8530.99	1067.80	10.82	960.00	970.95	971.69	971.69	0.003044	6.62	9.81	6.20	6.45	0.52
SippoCreek	Main	2954.488	15000 cfs	15000.00	2323.25	11399.50	1347.25	12.90	960.00	972.93	973.71	973.71	0.002605	6.82	10.07	6.46	6.32	0.49
SippoCreek	Main	2954.488	0.75 PMF 21100 c	21100.00	2920.93	16342.60	1836.48	15.86	960.00	975.88	975.88	976.75	0.002264	7.17	10.62	6.88	6.26	0.47
SippoCreek	Main	2954.488	PMF 31970 cfs	31970.00	4016.91	25238.05	2715.05	20.87	960.00	980.90	980.90	981.83	0.001766	7.43	11.09	7.24	5.98	0.43
SippoCreek	Main	2316.257	900 cfs	900.00	624.83	87.42	187.75	4.05	951.80	955.90	954.87	956.56	0.007554	5.02	7.61	3.36	2.64	0.67
SippoCreek	Main	2316.257	Q10 1100 cfs	1100.00	772.49	83.71	243.80	4.45	951.80	956.30	955.28	957.14	0.007526	5.37	8.55	2.65	2.94	0.71
SippoCreek	Main	2316.257	Q100 1980 cfs	1980.00	1234.46	280.40	465.14	6.14	951.80	957.99	957.14	959.01	0.004688	5.67	9.91	3.30	3.33	0.70
SippoCreek	Main	2316.257	2400 cfs	2400.00	1420.74	410.07	569.19	6.83	951.80	958.68	957.64	959.72	0.003846	5.66	10.25	3.45	3.42	0.69
SippoCreek	Main	2316.257	Q500 2650 cfs	2650.00	1529.31	490.12	630.57	7.17	951.80	959.02	957.95	960.09	0.003653	5.71	10.52	3.54	3.49	0.69
SippoCreek	Main	2316.257	3000 cfs	3000.00	1654.24	628.58	717.18	7.78	951.80	959.63	958.34	960.85	0.003138	5.52	10.48	3.53	3.46	0.66
SippoCreek	Main	2316.257	3500 cfs	3500.00	1851.87	807.79	840.34	8.31	951.80	960.16	958.85	961.25	0.003108	5.66	10.98	3.72	3.62	0.67
SippoCreek	Main	2316.257	5227 cfs	5227.00	2371.54	1605.01	1250.46	10.20	951.80	962.05	960.37	963.11	0.002893	5.67	11.46	4.13	3.83	0.63
SippoCreek	Main	2316.257	5346 cfs	5346.00	2398.73	1671.45	1275.82	10.32	951.80	962.17	960.41	963.22	0.002866	5.66	11.46	4.15	3.83	0.63
SippoCreek	Main	2316.257	0.5 PMF 11457 cf	11457.00	3510.26	5453.07	2493.68	16.09	951.80	967.94	967.94	968.71	0.001377	5.38	10.75	4.89	3.63	0.47
SippoCreek	Main	2316.257	15000 cfs	15000.00	4177.47	7551.34	3271.19	18.85	951.80	970.70	971.46	971.46	0.001141	5.45	10.92	5.09	3.69	0.44
SippoCreek	Main	2316.257	0.75 PMF 21100 c	21100.00	5542.85	10821.75	4735.41	21.97	951.80	973.82	974.75	974.75	0.001161	5.95	12.43	5.50	4.17	0.47
SippoCreek	Main	2316.257	PMF 31970 cfs	31970.00	7395.98	17420.21	7153.81	27.30	951.80	979.15	979.15	980.16	0.001035	6.30	13.35	6.01	4.42	0.45
SippoCreek	Main	1862.561	900 cfs	900.00	852.13	26.81	21.06	4.26	946.35	951.04	950.75	952.66	0.010407	9.03	10.48	3.31	2.06	0.89
SippoCreek	Main	1862.561	Q10 1100 cfs	1100.00	1034.49	36.22	29.29	4.79	946.35	951.57	951.31	953.45	0.010549	9.59	11.32	3.56	2.22	0.91
SippoCreek	Main	1862.561	Q100 1980 cfs	1980.00	1813.21	88.13	78.67	6.85	946.35	953.62	953.62	956.38	0.008748	10.71	13.88	3.59	2.65	0.93
SippoCreek	Main	1862.561	2400 cfs	2400.00	2105.06	174.08	120.86	8.40	946.35	955.18	955.18	957.54	0.007161	8.50	13.14	2.37	2.47	0.80
SippoCreek	Main	1862.561	Q500 2650 cfs	2650.00	2105.77	396.60	147.63	9.56	946.35	956.34	956.34	958.00	0.006035	6.62	11.55	2.64	2.18	0.66
SippoCreek	Main	1862.561	3000 cfs	3000.00	2083.70	731.43	184.87	11.06	946.35	957.84	958.40	958.92	0.004240	5.32	9.88	2.86	1.90	0.52
SippoCreek	Main	1862.561	3500 cfs	3500.00	2627.31	669.45	203.24	10.16	946.35	958.94	958.94	959.12	0.004191	7.53	13.55	3.49	2.58	0.75
SippoCreek	Main	1862.561	5227 cfs	5227.00	3169.49	1729.87	327.64	12.17	946.35	958.94	958.94	960.80	0.002754	6.83	13.66	4.22	2.66	0.69
SippoCreek	Main	1862.561	5346 cfs	5346.00	3200.12	1811.02	334.87	12.26	946.35	959.04	959.04	960.88	0.002440	6.83	13.68	4.28	2.66	0.69
SippoCreek	Main	1862.561	0.5 PMF 11457 cf	11457.00	3320.67	7389.91	746.42	20.44	946.35	967.21	967.21	967.74	0.000627	4.63	8.52	4.43	1.78	0.33
SippoCreek	Main	1862.561	15000 cfs	15000.00	3843.01	10138.21	1018.78	23.34	946.35	970.12	970.12	970.65	0.000548	4.76	8.63	4.74	1.80	0.31
SippoCreek	Main	1862.561	0.75 PMF 21100 c	21100.00	4896.13	14695.50	1518.37	28.48	946.35	973.26	973.26	973.93	0.000590	5.37	9.69	5.51	2.01	0.33
SippoCreek	Main	1862.561	PMF 31970 cfs	31970.00	6566.19	22736.90	2666.91	31.80	946.35	978.58	978.58	979.40	0.000583	5.99	10.83	6.33	2.34	0.34
SippoCreek	Main	1528.039	900 cfs	900.00	873.51	5.66	20.83	4.44	942.35	947.12	947.12	949.21	0.000851	10.96	11.77	2.03	4.03	0.98
SippoCreek	Main	1528.039	Q10 1100 cfs	1100.00	1061.36	6.68	28.96	5.05	942.35	947.73	947.73	950.11	0.000802	11.51	12.57	2.24	4.12	0.99
SippoCreek	Main	1528.039	Q100 1980 cfs	1980.00	1635.65	23.41	110.94	10.21	942.35	950.09	950.09	954.08	0.000506	6.06	9.59	2.04	2.66	0.53
SippoCreek	Main	1528.039	2400 cfs	2400.00	1349.26	954.43	96.30	12.32	942.35	955.00	955.00	955.41	0.000337	3.67	6.56	2.57	1.27	0.33
SippoCreek	Main	1528.039	Q500 2650 cfs	2650.00	1356.36	1182.69	110.95	12.88	942.35	955.56	955.56	955.92	0.000329	3.49	6.30	2.65	1.12	0.31

River	Reach	River Sta	Profile	Q Total (cfs)	Q Channel (cfs)	Q Left (cfs)	Q Right (cfs)	Hydr Depth C (ft)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	Frctn Slope (ft/ft)	Vel Total (ft/s)	Vel Chnl (ft/s)	Vel Left (ft/s)	Vel Right (ft/s)	Froude # Ch1
SippoCreek	Main	1526.039	3000 cfs	3000.00	1263.83	1568.17	188.01	14.17	942.35	956.85		957.09	0.000248	2.92	5.34	2.54	0.96	0.25
SippoCreek	Main	1526.039	3600 cfs	3500.00	1362.86	1915.55	221.59	14.77	942.35	957.45		957.70	0.000273	3.02	5.52	2.75	1.04	0.25
SippoCreek	Main	1526.039	5227 cfs	5227.00	1668.98	3127.28	430.74	16.61	942.35	959.29		959.57	0.000334	3.33	6.02	3.29	1.25	0.26
SippoCreek	Main	1526.039	5346 cfs	5346.00	1644.64	3241.09	460.26	17.03	942.35	959.70		959.96	0.000303	3.21	5.78	3.22	1.23	0.25
SippoCreek	Main	1526.039	0.5 PMF 11457 cf	11457.00	2285.93	7593.86	1577.21	24.52	942.35	967.19		967.43	0.000215	3.20	5.58	3.61	1.47	0.20
SippoCreek	Main	1526.039	16000 cfs	15000.00	2715.08	10013.93	2270.99	27.40	942.35	970.08		970.34	0.000219	3.42	5.93	3.93	1.64	0.20
SippoCreek	Main	1526.039	0.75 PMF 21100 c	21100.00	3514.40	14131.46	3454.13	30.52	942.35	973.55		973.55	0.000269	3.98	6.89	4.64	1.99	0.22
SippoCreek	Main	1526.039	PMF 31970 cfs	31970.00	4789.27	21427.30	5753.44	35.81	942.35	976.48		976.48	0.000308	4.83	8.01	5.45	2.42	0.24

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
SippoCreek	Main	5409.418	Q10 1100 cfs	1100.00	978.25	987.25	984.00	988.43	0.002665	8.73	125.96	142.46	0.51
SippoCreek	Main	5409.418	Q100 1980 cfs	1980.00	978.25	994.71	986.76	995.86	0.001153	8.59	230.44	228.47	0.37
SippoCreek	Main	5409.418	Q500 2650 cfs	2650.00	978.25	1004.18	988.61	1005.00	0.000454	7.30	362.95	325.06	0.25
SippoCreek	Main	5409.418	3000 cfs	3000.00	978.25	1007.65	989.47	1008.47	0.000383	7.29	411.55	367.94	0.24
SippoCreek	Main	5409.418	3500 cfs	3500.00	978.25	1008.16	990.71	1009.23	0.000783	8.32	475.56	379.40	0.32
SippoCreek	Main	5409.418	4188 cfs	4188.00	978.25	1008.48	992.29	1009.89	0.001032	9.64	597.73	383.25	0.37
SippoCreek	Main	5409.418	0.5 PMF 11457 cf	11457.00	978.25	1013.42	1012.08	1014.70	0.001215	12.03	2667.16	488.40	0.41
SippoCreek	Main	5409.418	15000 cfs	15000.00	978.25	1014.21	1013.07	1015.79	.0001566	13.93	3051.14	496.69	0.47
SippoCreek	Main	5409.418	0.75 PMF 21100 c	21100.00	978.25	1014.66	1014.66	1017.28	0.002648	18.31	3276.49	511.49	0.62
SippoCreek	Main	5409.418	PMF 31970 cfs	31970.00	978.25	1016.84	1016.84	1019.41	0.002855	20.01	4529.22	646.33	0.65

SippoCreekDam Plan: Existing Conditions SS FIS Calibrated 5/30/2012
River = SippoCreek Reach = Main RS = 5409.418 Lincoln Way East - RS 5409 Ke=0.4

Legend
W.S. Elev



FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD)		
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE (FEET)
East Sippo Creek								
A	3,334	24	142	13.9	948.2	948.2	948.2	0.0
B	3,724	46	300	6.6	958.7	958.7	959.1	0.4
C	4,174	45	288	6.9	960.4	960.4	961.3	0.9
D	4,854	59	276	7.2	966.5	966.5	967.4	0.9
E	5,604	40	288	6.9	971.4	971.4	972.3	0.9

¹ Stream distance in feet above mouth

FEDERAL EMERGENCY MANAGEMENT AGENCY
 STARK COUNTY, OHIO
 AND INCORPORATED AREAS

FLOODWAY DATA

East Sippo Creek

Table 11

Sippo Creek Reservoir 10-YR Dam Breach Parameters (with Tailwater conditions)

Input Parameters	
Water Height (ft)	H= 13.63 ft
Crest Width (ft)	C= 15 ft
Storage Volume (ac-ft)	V _s = 104.1 ac-ft
Upstream slope (Z ₁ :1)	Z ₁ = 3
Downstream slope (Z ₂ :1)	Z ₂ = 2.5
Breach Subslope	Z ₃ = 1
Surface Area of Reservoir	S _a = 14.27 acres

Peak Discharge	
MacDonald & Langridge-Monopolis ²	Check w/ Max C
Q _p = 3.1B _u H ^{1.5}	4,410 cfs
C = 23.4(S _u /B _u) = 11.73	4,379 cfs
Froelich ³	
Q _p = 0.607V _s ^{0.295} H _u ^{1.24}	114.16 cms
B _u = 9.5K _c (V _s H _u) ^{0.23}	58.31 ft
T _r = 0.59(V _s ^{0.47})H _u ^{0.91}	0.486 hrs
	0.340 hrs

Peak Discharge	
National Weather Service (NWS) ²	check w/ Min C
Q _p = 0.9*3.1B _u (C/(T+C(H ^{0.5}))) ³	5,115 cfs
Q _p = 1100 cfs	7,034 cfs
B _u = 58.31 ft ²	11.73
C = 23.4(S _u /B _u) =	
T _r = 0.486 hrs	
Natural Resource Conservation Service (NRCS) ²	
Q _p = 3.2H ^{2.5} =	2,195 cfs

MacDonald & Langridge-Monopolis ²	
Breach Formation Factor = BFF = V _m (H)	1418.883
Volume of Eroded Material = V _m = 2.50 (BFF) ^{0.77}	668 yds ³
Breach Base Width =	14.84 ft
W _b = 27V _m ^{-0.17} (CZ ₂ + HZ ₂ Z ₃) / (C + HZ ₂ Z ₃)	
Z ₃ = Z ₁ + Z ₂ =	5.5
Breach Top Width =	42.10 ft
Average Breach Width =	28.47 ft
Breach Development Time =	0.44 hrs
T = 0.42 V _m ^{0.36}	Piping 0.306 hrs

Von Thun and Gillette ¹	
Breach Base Width =	40.48 ft
Average Breach Width =	16.89 m
B _u = 2.5H + C ₃	C ₃ is based on vol = 6.1 Page 15
Breach Development Time =	0.99 hrs
*Erosion Resistant	0.52 hrs
T _r = 0.020H + 0.25	T _r = B _u / 4H
Breach Development Time =	0.21 hrs
*Highly erodible	0.20 hrs
T _r = 0.015H	T _r = B _a / 4H + 61.0

Min C	6.17 Von Thun	with Min C			
C =	5.73 Froelich	3.1 B _u = 180.747			
		C/(H ^{0.5}) = 3.177	1.551	North	East
		T _r C/(H ^{0.5}) = 3.663	2.037	South	West
				18	ft
				T = 1.03	hrs
				B _u = 86.4	ft
				V _m = 1475	1475
				S _u = 75	75
				Q _p = 15k-25.5k	12.5k-23.3 cfs

Minimum Time to Failure	
T _r =	0.11 hrs
	6.815 min

1 - Prediction of Embankment Dam Breach Parameters - DSO-98-004 by Tony L. Wahl
 2 - Dam Safety Guidelines - Dam Break inundation Analysis and Downstream Hazard Classification - Technical Note 1 - Washington State Dept. of Ecology
 3 - NWS Simple Dam Break Analysis Equation (1995)

Questions concerning the VERTCON process may be mailed to NGS

Latitude: 40.797584

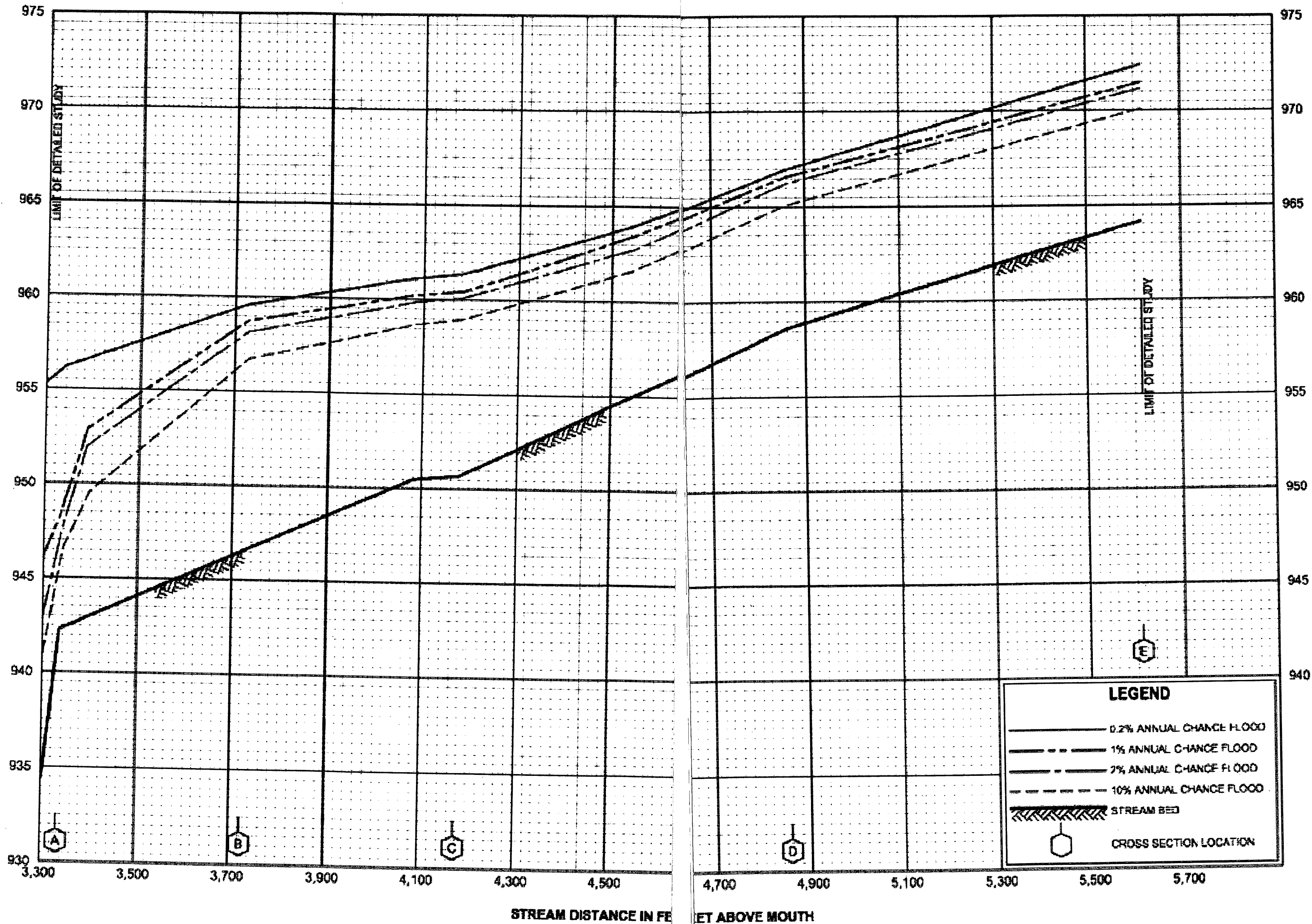
Longitude: 081.51937

NGVD 29 height: 950.00 FT

Datum shift (NAVD 88 minus NGVD 29): -0.646 feet

Converted to NAVD 88 height: 949.354 feet

ELEVATION IN FEET (NAVD88)



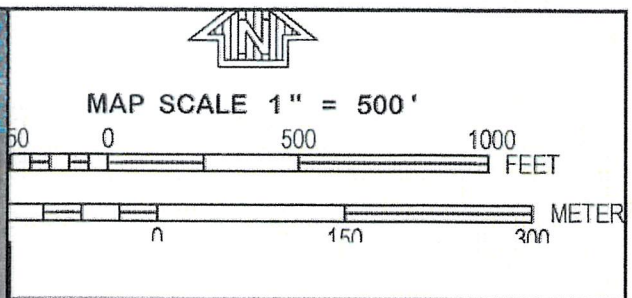
FLOOD PROFILES

EAST SIPPO CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

STARK COUNTY, OHIO

AND INCORPORATED AREAS



PANEL 0192E

FIRM
FLOOD INSURANCE RATE MAP
STARK COUNTY,
OHIO
AND INCORPORATED AREAS

PANEL 192 OF 428

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MASSILLON CITY OF	390517	0192	E
STARK COUNTY	390780	0192	E

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
39151C0192E
EFFECTIVE DATE
SEPTEMBER 29, 2011

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