Drainage Report

Lake Manawa Centre – Lot 10

Council Bluffs, IA

FSE #: 025.001

February 8, 2021

Revised

Preliminary Submittal – 2021.02.09



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Andrew L Rech — 02/09/2021

Signature — Date

Printed or typed name: Andrew L. Rech
My license renewal date is December 31, 2022
Page or sheets covered by this seal:

DRAINAGE REPORT

Civil Engineer

Contents

1	Introduction	3
2	Project Narrative	3
3	Existing Development Conditions	3
4	Proposed Development Conditions	4
5	Drainage Summary	6
5.1	Runoff Rate Control	7
5.2	Water Quality and Rate Control Treatment Requirements	7
5.3	HydroCAD Peak Flow Results Summary	7
5.4	Water Quality Treatment Facilities	7

List of Tables

Table 1 – Existing Land Use 4

Table 2 – Existing Conditions Basins & Peak Flows (HydroCAD) 4

Table 3 – Proposed Land Use 5

Table 4 – Proposed Conditions Basins & Peak Flows (HydroCAD) 5

Table 5 – Routing Results for Basin P1 (HydroCAD) 5

Table 6 – Routing Results for Basin P2 (HydroCAD) 5

Table 7 – Routing Results for Basin P3 (HydroCAD) 6

Table 8 – Routing Results for Basin P4 (HydroCAD) 6

Table 9 – Routing Results for Basin P5 (HydroCAD) 6

Table 10 – Peak Flows 7

Table 11 – Water Quality Treatment Facilities 7

List of Appendices

Appendix A Existing Site Calculations

Appendix B Proposed Site Calculations

Appendix C Existing / Proposed Site Plans

Drainage Report

Lake Manawa Centre – Lot 10

1 Introduction

The Lake Manawa Centre – Lot 10 development includes approximately 14 +/- acres, which is located on the southeast corner of Power Drive and 35th Ave in Pottawattamie County, Iowa. The information provided within this drainage report includes a summary of existing and proposed development conditions of the site.

2 Project Narrative

The proposed development will plat 2 lots, one for a carwash facility and the other for a multifamily residential development. Proposed drainage patterns will remain consistent with existing drainage patterns. Runoff will be treated and detained onsite using dry detention basins, to meet the requirements of the City of Council Bluffs, IA.

3 Existing Development Conditions

The existing site consists of alfalfa with a section of existing public street in the north east corner of the site. This site was originally developed in the 1990s with Lake Manawa Centre, with Lot 10 being undeveloped since. Commercial development is located on the north and west sides of the site. Per documents and discussions with the City of Council Bluffs, a city owned stormwater detention basin is located on the south and east sides of the site. The NRCS Web Soil Survey website identifies that the site is a mix of Blencoe silty clay in the south west corner of the site, Cooper silty clay loam on the west half of the site, and Lakeport silty clay loam in the north west corner of the site. These all have a Hydrologic Soil Group of D, with Lakeport sitly caly loam at a C/D.

All areas of the existing site flow into the detention basin surrounding the property, the existing site is shown as subcatchment “EWS_1”. There is a small section of land off site that flows through the site before entering the surrounding basin, this is shown as subcatchment “OWS_1”.

Appendix C identifies the locations of each existing subcatchment, along with drainage patterns and discharge points in which the stormwater exits the site prior to any modifications to the site. Table 1 shows the existing land use, Table 2 shows the drainage area, curve number, concentration time, and flow rate for the existing watersheds. See appendix A for existing site calculations, including runoff, time of concentration, and Curve Number.

Table 1 – Existing Land Use

Land Use	Existing Conditions (acres)	Percent of Total Existing Area
Legumes, Straight Rows	13.67	97%
Paved Roads	0.19	1%
Brush	0.27	2%
Total	14.13	100.00%

Table 2 – Existing Conditions Basins & Peak Flows (HydroCAD)

Basin	Area (acres)	TC (min)	2-Year Flow (cfs)	5-Year Flow (cfs)	100-Year Flow (cfs)
EWS_1	13.85	64.7	15.2	20.3	48.8
OWS_1	0.27	2.1	0.7	1.0	2.9
Total	14.12		15.9	21.3	51.7

4 Proposed Development Conditions

The proposed site consists of extending Power Drive along the west side of the site within a proposed 66 foot right-of-way. The site will also split the existing lot 10 into two lots, one of which will have a carwash facility in the north west corner of the site, the remainder of the site will be a multifamily apartment complex with a club house.

Proposed subcatchment PWS_1 stormwater runoff sheet flows to a proposed drainage area which is pond P1. This then flows into basin P2 through a proposed storm sewer pipe. Proposed subcatchment PWS_2 flows through proposed parking and drives and into basin P2. Basin P2 then flows east through a storm sewer pipe and into basin P3. Proposed subcatchment PWS_3 flows through parking and drives and into basin P3 located in the north east corner of the site. This then flows through a storm sewer pipe to the south and into basin P4. Proposed subcatchment PWS_4 is the southeast corner of the site and flows through parking and drives into basin P4. Basin P4 outfalls through storm sewer pipe and to the south, matching existing discharge locations. Proposed subcatchment PWS_5 begins in the north west corner of the site and flows south with the proposed Power drive pavement, this is then picked up, along with flows from parking and drive areas, by storm sewer inlets and routed to basin P5 on the south side of the site. Basin P5 outfalls through storm sewer pipe and to the south, matching existing discharge locations. Subcatchent PWS_6 is all undetained flow from the site, and all sheet flows into the existing basin that surrounds the site.

Appendix C identifies the locations of each proposed subcatchment, along with drainage patterns and discharge points in which the stormwater exits the site. Table 3 shows the proposed land use, Table 4 shows the drainage area, concentration time, and flow rate for the proposed watersheds.

Tables 5-9 show the proposed detention pond routing results. See Appendix B for proposed site calculations, including runoff, time of concentration, Curve Number, and pond routing.

Table 3 – Proposed Land Use

Land Use	Proposed Conditions (acres)	Percent of Total Proposed Area
>75% Grass Cover	5.62	40%
Brush	0.27	2%
Paved parking	5.14	36%
Paved Roads	0.75	5%
Roofs	2.35	17%
Total	14.13	100.00%

Table 4 – Proposed Conditions Basins & Peak Flows (HydroCAD)

Basin	Area (acres)	TC (min)	2-Year Flow (cfs)	5-Year Flow (cfs)	100-Year Flow (cfs)
OWS_1	0.08	2.1	0.2	0.3	0.8
PWS_1	0.55	8.1	1.6	2.1	5.4
OWS_2	0.19	2.1	0.5	0.7	2.0
PWS_2	3.68	15.7	9.9	12.9	29.7
PWS_3	3.58	9.1	12.9	16.6	36.6
PWS_4	1.21	5.6	4.5	5.9	13.8
PWS_5	3.27	7.4	12.7	16.2	35.8
PWS_6	1.55	5.8	4.4	6.2	16.2
Total	14.12		46.7	60.9	140.3

Table 5 – Routing Results for Basin P1 (HydroCAD)

Period	Inflow (cfs)	Outflow (cfs)	Water Surface Elevation (ft)	Volume (cubic feet)
2-Year	1.62	0.08	974.55	2,455
5-Year	2.23	0.09	974.81	3,718
100-Year	5.71	0.11	976.12	11,395

Table 6 – Routing Results for Basin P2 (HydroCAD)

Period	Inflow (cfs)	Outflow (cfs)	Water Surface Elevation (ft)	Volume (cubic feet)
2-Year	10.10	2.51	974.43	13,330
5-Year	13.18	2.50	974.78	18,980
100-Year	30.23	2.15	975.86	59,878

Table 7 – Routing Results for Basin P3 (HydroCAD)

Period	Inflow (cfs)	Outflow (cfs)	Water Surface Elevation (ft)	Volume (cubic feet)
2-Year	14.41	5.49	973.57	12,314
5-Year	18.36	6.37	973.97	15,943
100-Year	37.54	6.87	975.56	40,948

Table 8 – Routing Results for Basin P4 (HydroCAD)

Period	Inflow (cfs)	Outflow (cfs)	Water Surface Elevation (ft)	Volume (cubic feet)
2-Year	8.35	1.15	973.18	33,749
5-Year	10.64	1.25	973.75	41,724
100-Year	20.23	1.52	975.49	71,946

Table 9 – Routing Results for Basin P5 (HydroCAD)

Period	Inflow (cfs)	Outflow (cfs)	Water Surface Elevation (ft)	Volume (cubic feet)
2-Year	12.69	2.44	972.35	11,362
5-Year	16.24	2.76	972.93	15,302
100-Year	35.79	3.87	975.55	39,918

5 Drainage Summary

5.1 Runoff Rate Control

HydroCAD Version 10.0 modeling software was utilized in the analysis, using the SCS TR-20 method to analyze the peak runoff rate control requirement for the existing and proposed development conditions. Modeling results for both conditions are shown in Appendix A & B.

5.2 Water Quality and Rate Control Treatment Requirements

Per City requirements, the stormwater system has been designed to cause "no adverse impact" compared to the existing conditions, with post development 100 year flow matching the pre development conditions 5 year flow. This is accomplished by constructing dry detention basins to account for the added runoff from the increase in impervious area.

5.3 HydroCAD Peak Flow Results Summary

The following tables will summarize the modeling results which reflect the total peak flow (cfs) leaving the site for the existing development conditions, and the proposed development conditions after detention. The peak flows have included the offsite drainage that flows through the site. The post development conditions are a summation of undetained subbasin PWS_6, basin P5, and basin, P4.

Table 10 – Peak Flows

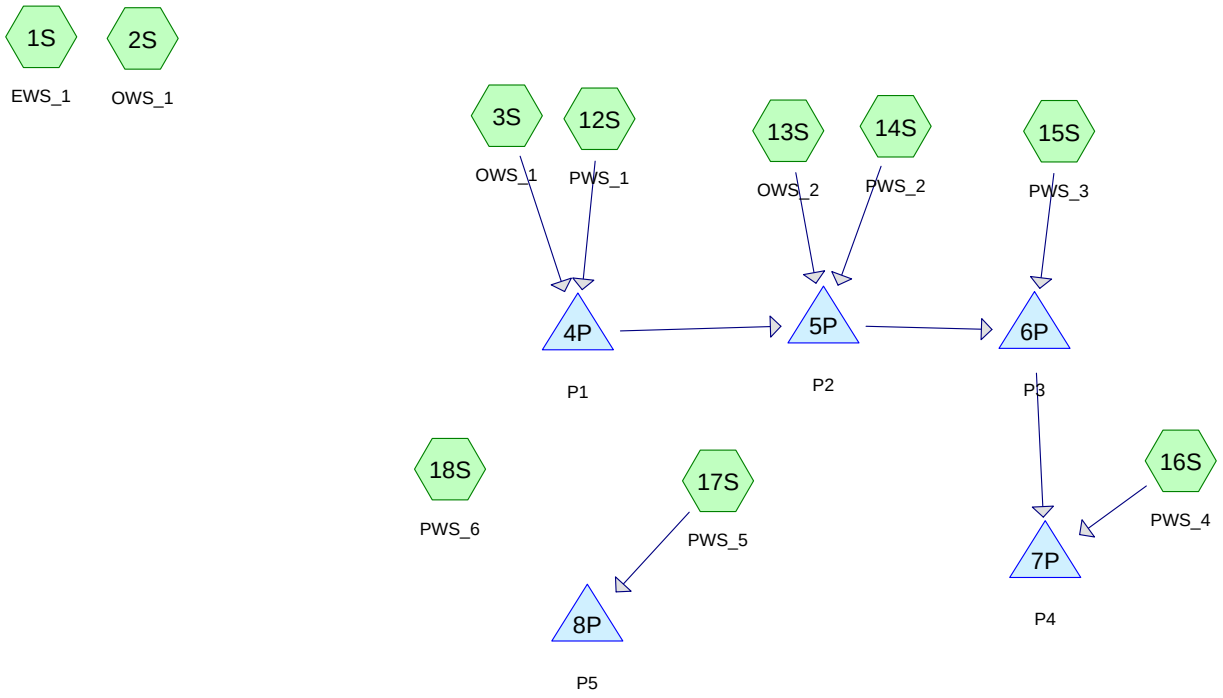
Period	Existing Conditions (cfs)	Proposed Development Conditions (cfs)
2-Year Event	15.9	8.0
5-Year Event	21.3	10.2
100-Year Event	51.7	21.6

5.4 Water Quality Treatment Facilities

Lake Manawa Centre – Lot 10 will utilize dry detention basins to achieve the required water quality treatment and rate control. The calculations are based on the requirement to treat a 1.25" rainfall event. The drawdown time for Basin P1 is 35 hours with a 2" outlet orifice. The drawdown time for Basin P2 is 30 hours with a 10" outlet orifice. The drawdown time for Basin P3 is 29 hours with a 14" outlet orifice. The drawdown time for Basin P4 is 37 hours with a 5" outlet orifice. The drawdown time for Basin P5 is 25 hours with an 8" orifice.

Table 11 – Water Quality Treatment Facilities

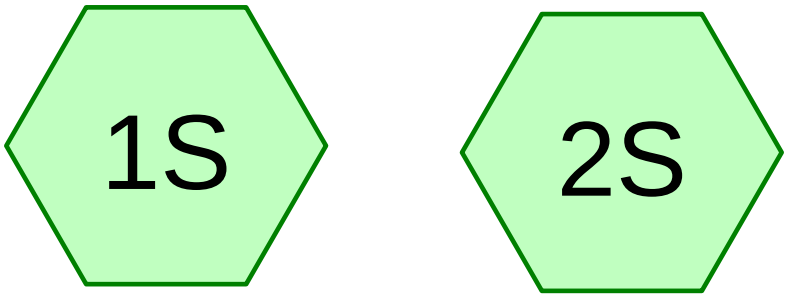
Basin area	Drawdown Time (hours)	Peak Storage (cu ft)
P1	35	331
P2	30	2,973
P3	29	3,437
P4	37	7,187
P5	25	2,727
Total		**16,665**



Subcat Reach Pond Link

Routing Diagram for Lake Manawa Lot 10
Prepared by FoleyShald Engineering, LLC, Printed 2/9/2021
HydroCAD® 10.00-26 s/n 11038 © 2020 HydroCAD Software Solutions LLC

APPENDIX A



Subcat Reach Pond Link

Routing Diagram for Lake Manawa Lot 10
Prepared by FoleyShald Engineering, LLC, Printed 2/8/2021
HydroCAD® 10.00-26 s/n 11038 © 2020 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.268	77	Brush, Fair, HSG D (2S)
13.667	89	Legumes, straight row, Poor, HSG D (1S)
0.188	98	Paved roads w/curbs & sewers, HSG D (1S)
14.123	**89**	**TOTAL AREA**

Time span=2.00-48.00 hrs, dt=0.01 hrs, 4601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: EWS_1 Runoff Area=13.855 ac 1.36% Impervious Runoff Depth=1.98"
Flow Length=945' Tc=64.7 min CN=89 Runoff=15.18 cfs 2.288 af

Subcatchment 2S: OWS_1 Runoff Area=0.268 ac 0.00% Impervious Runoff Depth=1.13"
Flow Length=20' Slope=0.1000 '/' Tc=2.1 min CN=77 Runoff=0.68 cfs 0.025 af

Total Runoff Area = 14.123 ac Runoff Volume = 2.313 af Average Runoff Depth = 1.97"
98.67% Pervious = 13.935 ac 1.33% Impervious = 0.188 ac

Time span=2.00-48.00 hrs, dt=0.01 hrs, 4601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: EWS_1 Runoff Area=13.855 ac 1.36% Impervious Runoff Depth=2.65"
Flow Length=945' Tc=64.7 min CN=89 Runoff=20.26 cfs 3.065 af

Subcatchment 2S: OWS_1 Runoff Area=0.268 ac 0.00% Impervious Runoff Depth=1.67"
Flow Length=20' Slope=0.1000 '/' Tc=2.1 min CN=77 Runoff=0.98 cfs 0.037 af

Total Runoff Area = 14.123 ac Runoff Volume = 3.102 af Average Runoff Depth = 2.64"
98.67% Pervious = 13.935 ac 1.33% Impervious = 0.188 ac

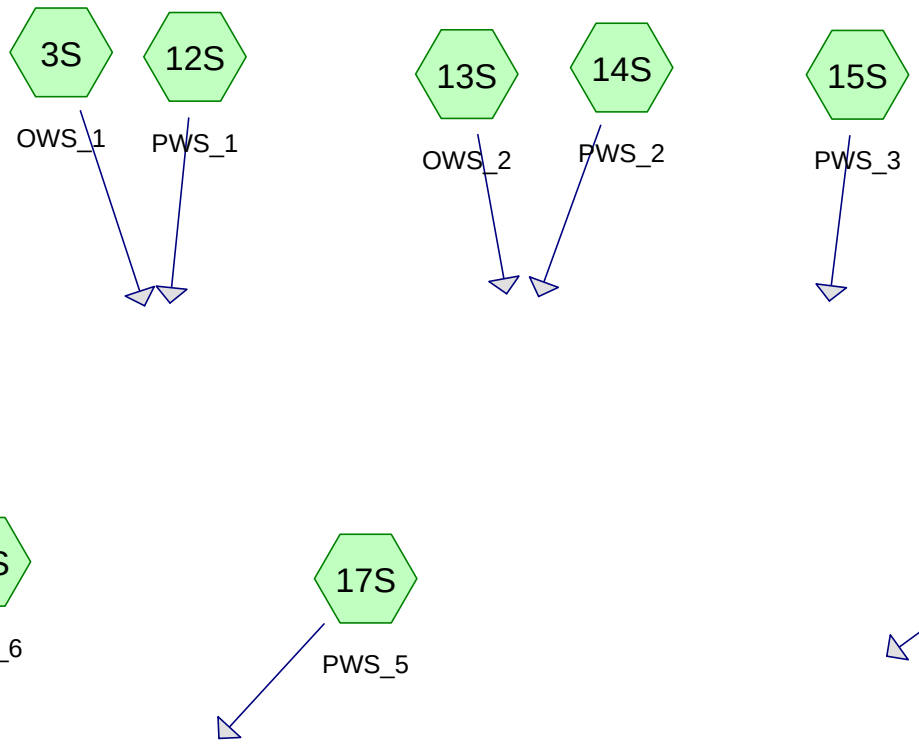
Time span=2.00-48.00 hrs, dt=0.01 hrs, 4601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: EWS_1 Runoff Area=13.855 ac 1.36% Impervious Runoff Depth=6.60"
Flow Length=945' Tc=64.7 min CN=89 Runoff=48.82 cfs 7.619 af

Subcatchment 2S: OWS_1 Runoff Area=0.268 ac 0.00% Impervious Runoff Depth=5.19"
Flow Length=20' Slope=0.1000 '/' Tc=2.1 min CN=77 Runoff=2.86 cfs 0.116 af

Total Runoff Area = 14.123 ac Runoff Volume = 7.734 af Average Runoff Depth = 6.57"
98.67% Pervious = 13.935 ac 1.33% Impervious = 0.188 ac

APPENDIX B



Subcat Reach Pond Link

Routing Diagram for Lake Manawa Lot 10
Prepared by FoleyShald Engineering, LLC, Printed 2/8/2021
HydroCAD® 10.00-26 s/n 11038 © 2020 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.620	80	>75% Grass cover, Good, HSG D (12S, 14S, 15S, 16S, 17S, 18S)
0.268	77	Brush, Fair, HSG D (3S, 13S)
5.137	98	Paved parking, HSG D (14S, 15S, 16S, 17S)
0.745	98	Paved roads w/curbs & sewers, HSG D (17S, 18S)
2.354	98	Roofs, HSG D (12S, 14S, 15S, 16S, 17S)
14.124	**90**	**TOTAL AREA**

Time span=2.00-48.00 hrs, dt=0.01 hrs, 4601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: OWS_1 Runoff Area=0.077 ac 0.00% Impervious Runoff Depth=1.13"
Flow Length=20' Slope=0.1000 '/' Tc=2.1 min CN=77 Runoff=0.19 cfs 0.007 af

Subcatchment 12S: PWS_1 Runoff Area=0.550 ac 27.09% Impervious Runoff Depth=1.66"
Flow Length=195' Tc=8.1 min CN=85 Runoff=1.55 cfs 0.076 af

Subcatchment 13S: OWS_2 Runoff Area=0.191 ac 0.00% Impervious Runoff Depth=1.13"
Flow Length=20' Slope=0.1000 '/' Tc=2.1 min CN=77 Runoff=0.48 cfs 0.018 af

Subcatchment 14S: PWS_2 Runoff Area=3.684 ac 61.86% Impervious Runoff Depth=2.16"
Flow Length=770' Slope=0.0050 '/' Tc=15.7 min CN=91 Runoff=9.91 cfs 0.662 af

Subcatchment 15S: PWS_3 Runoff Area=3.583 ac 74.18% Impervious Runoff Depth=2.34"
Flow Length=665' Slope=0.0050 '/' Tc=9.1 min CN=93 Runoff=12.93 cfs 0.699 af

Subcatchment 16S: PWS_4 Runoff Area=1.214 ac 48.85% Impervious Runoff Depth=1.98"
Flow Length=400' Slope=0.0050 '/' Tc=5.6 min CN=89 Runoff=4.45 cfs 0.200 af

Subcatchment 17S: PWS_5 Runoff Area=3.274 ac 71.38% Impervious Runoff Depth=2.34"
Flow Length=1,025' Tc=7.4 min CN=93 Runoff=12.69 cfs 0.638 af

Subcatchment 18S: PWS_6 Runoff Area=1.551 ac 14.18% Impervious Runoff Depth=1.52"
Flow Length=280' Tc=5.8 min CN=83 Runoff=4.44 cfs 0.196 af

Total Runoff Area = 14.124 ac Runoff Volume = 2.497 af Average Runoff Depth = 2.12"
41.69% Pervious = 5.888 ac 58.31% Impervious = 8.236 ac

Time span=2.00-48.00 hrs, dt=0.01 hrs, 4601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: OWS_1 Runoff Area=0.077 ac 0.00% Impervious Runoff Depth=1.67"
Flow Length=20' Slope=0.1000 '/' Tc=2.1 min CN=77 Runoff=0.28 cfs 0.011 af

Subcatchment 12S: PWS_1 Runoff Area=0.550 ac 27.09% Impervious Runoff Depth=2.30"
Flow Length=195' Tc=8.1 min CN=85 Runoff=2.12 cfs 0.105 af

Subcatchment 13S: OWS_2 Runoff Area=0.191 ac 0.00% Impervious Runoff Depth=1.67"
Flow Length=20' Slope=0.1000 '/' Tc=2.1 min CN=77 Runoff=0.70 cfs 0.027 af

Subcatchment 14S: PWS_2 Runoff Area=3.684 ac 61.86% Impervious Runoff Depth=2.85"
Flow Length=770' Slope=0.0050 '/' Tc=15.7 min CN=91 Runoff=12.94 cfs 0.874 af

Subcatchment 15S: PWS_3 Runoff Area=3.583 ac 74.18% Impervious Runoff Depth=3.04"
Flow Length=665' Slope=0.0050 '/' Tc=9.1 min CN=93 Runoff=16.56 cfs 0.909 af

Subcatchment 16S: PWS_4 Runoff Area=1.214 ac 48.85% Impervious Runoff Depth=2.65"
Flow Length=400' Slope=0.0050 '/' Tc=5.6 min CN=89 Runoff=5.87 cfs 0.269 af

Subcatchment 17S: PWS_5 Runoff Area=3.274 ac 71.38% Impervious Runoff Depth=3.04"
Flow Length=1,025' Tc=7.4 min CN=93 Runoff=16.24 cfs 0.831 af

Subcatchment 18S: PWS_6 Runoff Area=1.551 ac 14.18% Impervious Runoff Depth=2.13"
Flow Length=280' Tc=5.8 min CN=83 Runoff=6.17 cfs 0.275 af

Total Runoff Area = 14.124 ac Runoff Volume = 3.300 af Average Runoff Depth = 2.80"
41.69% Pervious = 5.888 ac 58.31% Impervious = 8.236 ac

Time span=2.00-48.00 hrs, dt=0.01 hrs, 4601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 3S: OWS_1 Runoff Area=0.077 ac 0.00% Impervious Runoff Depth=5.19"
Flow Length=20' Slope=0.1000 '/' Tc=2.1 min CN=77 Runoff=0.82 cfs 0.033 af

Subcatchment 12S: PWS_1 Runoff Area=0.550 ac 27.09% Impervious Runoff Depth=6.13"
Flow Length=195' Tc=8.1 min CN=85 Runoff=5.38 cfs 0.281 af

Subcatchment 13S: OWS_2 Runoff Area=0.191 ac 0.00% Impervious Runoff Depth=5.19"
Flow Length=20' Slope=0.1000 '/' Tc=2.1 min CN=77 Runoff=2.04 cfs 0.083 af

Subcatchment 14S: PWS_2 Runoff Area=3.684 ac 61.86% Impervious Runoff Depth=6.84"
Flow Length=770' Slope=0.0050 '/' Tc=15.7 min CN=91 Runoff=29.66 cfs 2.099 af

Subcatchment 15S: PWS_3 Runoff Area=3.583 ac 74.18% Impervious Runoff Depth=7.07"
Flow Length=665' Slope=0.0050 '/' Tc=9.1 min CN=93 Runoff=36.55 cfs 2.112 af

Subcatchment 16S: PWS_4 Runoff Area=1.214 ac 48.85% Impervious Runoff Depth=6.60"
Flow Length=400' Slope=0.0050 '/' Tc=5.6 min CN=89 Runoff=13.77 cfs 0.668 af

Subcatchment 17S: PWS_5 Runoff Area=3.274 ac 71.38% Impervious Runoff Depth=7.07"
Flow Length=1,025' Tc=7.4 min CN=93 Runoff=35.79 cfs 1.930 af

Subcatchment 18S: PWS_6 Runoff Area=1.551 ac 14.18% Impervious Runoff Depth=5.89"
Flow Length=280' Tc=5.8 min CN=83 Runoff=16.24 cfs 0.761 af

Total Runoff Area = 14.124 ac Runoff Volume = 7.966 af Average Runoff Depth = 6.77"
41.69% Pervious = 5.888 ac 58.31% Impervious = 8.236 ac

Summary for Pond 4P: P1

Inflow Area = 0.627 ac, 23.76% Impervious, Inflow Depth = 1.60" for 2-Year event
Inflow = 1.62 cfs @ 12.15 hrs, Volume= 0.084 af
Outflow = 0.08 cfs @ 13.75 hrs, Volume= 0.084 af, Atten= 95%, Lag= 95.9 min
Primary = 0.08 cfs @ 13.75 hrs, Volume= 0.084 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 974.55' @ 13.63 hrs Surf.Area= 4,669 sf Storage= 2,455 cf

Plug-Flow detention time= 443.6 min calculated for 0.084 af (100% of inflow)
Center-of-Mass det. time= 443.4 min (1,250.1 - 806.8)

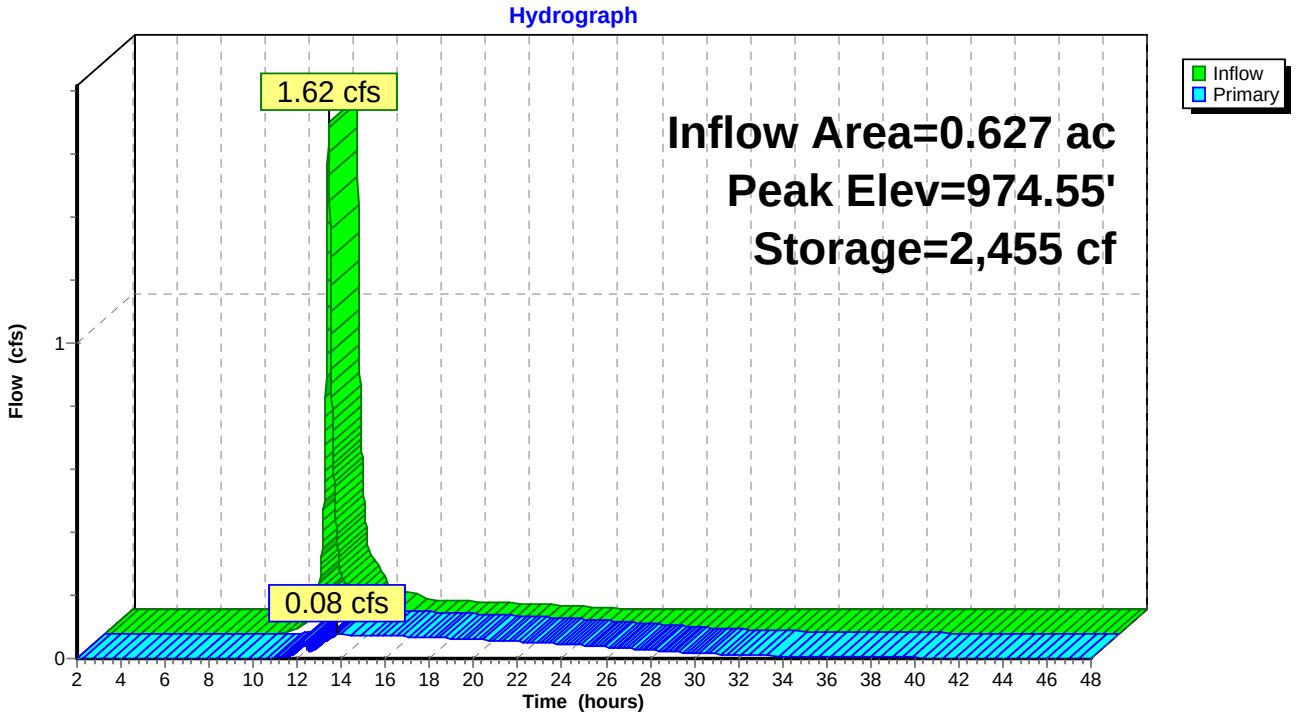
Volume	Invert	Avail.Storage	Storage Description
#1	973.95'	17,964 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
973.95	5	12.0	0	0	5
974.00	3,990	305.0	69	69	7,396
975.00	5,260	330.0	4,610	4,679	8,699
976.00	6,630	355.0	5,932	10,611	10,104
977.00	8,100	380.0	7,353	17,964	11,612

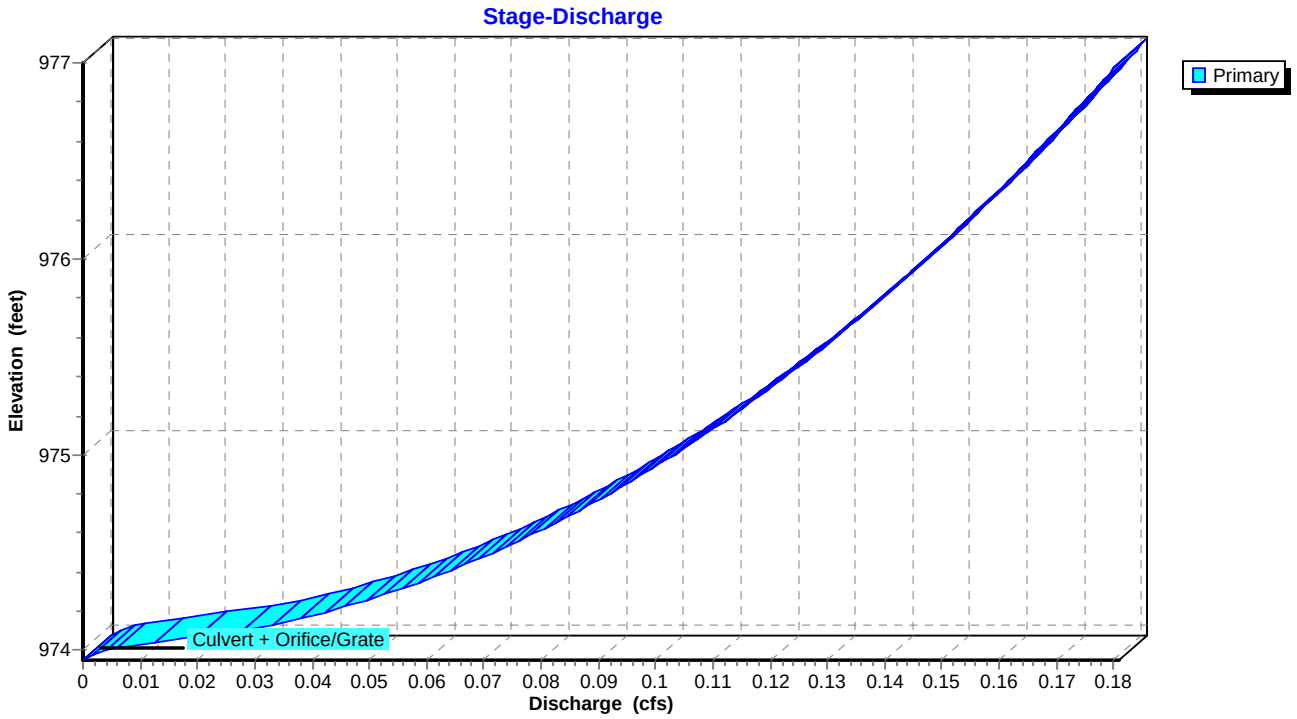
Device	Routing	Invert	Outlet Devices
#1	Primary	973.95'	**12.0" Round Culvert** L= 180.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 973.95' / 973.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	973.95'	**2.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.08 cfs @ 13.75 hrs HW=974.55' TW=974.02' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.08 cfs of 0.72 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 0.08 cfs @ 3.46 fps)

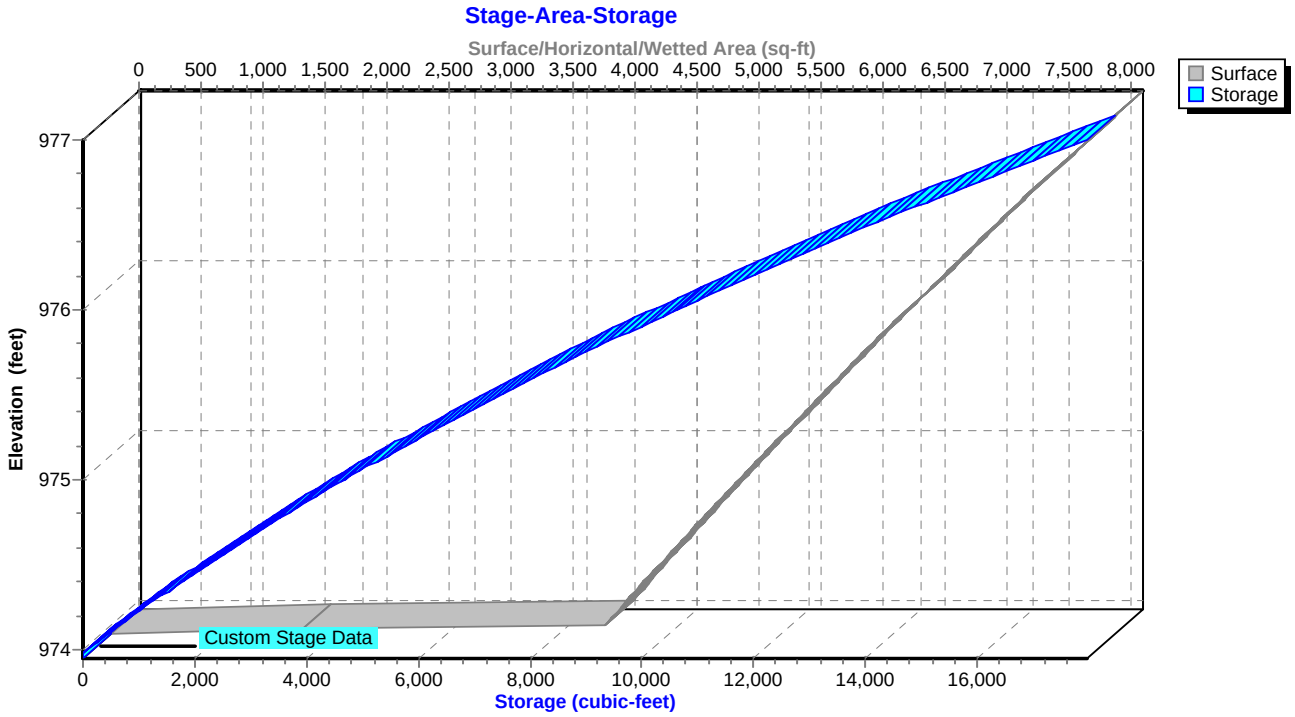
Pond 4P: P1



Pond 4P: P1



Pond 4P: P1


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0 500 1,000 1,500 2,000 2,500 3,000 3,500 4,000 4,500 5,000 5,500 6,000 6,500 7,000 7,500 8,000
Surface
Storage
977
976
975
974
Elevation (feet)
Custom Stage Data
0 2,000 4,000 6,000 8,000 10,000 12,000 14,000 16,000
Storage (cubic-feet)

Stage-Discharge for Pond 4P: P1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
973.95	0.00	975.01	0.10	976.07	0.15
973.97	0.00	975.03	0.10	976.09	0.15
973.99	0.00	975.05	0.11	976.11	0.15
974.01	0.01	975.07	0.11	976.13	0.15
974.03	0.01	975.09	0.11	976.15	0.15
974.05	0.01	975.11	0.11	976.17	0.15
974.07	0.02	975.13	0.11	976.19	0.15
974.09	0.02	975.15	0.11	976.21	0.15
974.11	0.03	975.17	0.11	976.23	0.16
974.13	0.03	975.19	0.11	976.25	0.16
974.15	0.04	975.21	0.11	976.27	0.16
974.17	0.04	975.23	0.11	976.29	0.16
974.19	0.04	975.25	0.12	976.31	0.16
974.21	0.04	975.27	0.12	976.33	0.16
974.23	0.05	975.29	0.12	976.35	0.16
974.25	0.05	975.31	0.12	976.37	0.16
974.27	0.05	975.33	0.12	976.39	0.16
974.29	0.05	975.35	0.12	976.41	0.16
974.31	0.06	975.37	0.12	976.43	0.16
974.33	0.06	975.39	0.12	976.45	0.16
974.35	0.06	975.41	0.12	976.47	0.16
974.37	0.06	975.43	0.12	976.49	0.16
974.39	0.06	975.45	0.13	976.51	0.17
974.41	0.06	975.47	0.13	976.53	0.17
974.43	0.07	975.49	0.13	976.55	0.17
974.45	0.07	975.51	0.13	976.57	0.17
974.47	0.07	975.53	0.13	976.59	0.17
974.49	0.07	975.55	0.13	976.61	0.17
974.51	0.07	975.57	0.13	976.63	0.17
974.53	0.07	975.59	0.13	976.65	0.17
974.55	0.08	975.61	0.13	976.67	0.17
974.57	0.08	975.63	0.13	976.69	0.17
974.59	0.08	975.65	0.13	976.71	0.17
974.61	0.08	975.67	0.13	976.73	0.17
974.63	0.08	975.69	0.14	976.75	0.17
974.65	0.08	975.71	0.14	976.77	0.17
974.67	0.08	975.73	0.14	976.79	0.17
974.69	0.09	975.75	0.14	976.81	0.18
974.71	0.09	975.77	0.14	976.83	0.18
974.73	0.09	975.79	0.14	976.85	0.18
974.75	0.09	975.81	0.14	976.87	0.18
974.77	0.09	975.83	0.14	976.89	0.18
974.79	0.09	975.85	0.14	976.91	0.18
974.81	0.09	975.87	0.14	976.93	0.18
974.83	0.09	975.89	0.14	976.95	0.18
974.85	0.09	975.91	0.14	976.97	0.18
974.87	0.10	975.93	0.14	976.99	**0.18**
974.89	0.10	975.95	0.15		
974.91	0.10	975.97	0.15		
974.93	0.10	975.99	0.15		
974.95	0.10	976.01	0.15		
974.97	0.10	976.03	0.15		
974.99	0.10	976.05	0.15		

Stage-Area-Storage for Pond 4P: P1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
973.95	5	0
974.00	3,990	69
974.05	4,049	270
974.10	4,109	474
974.15	4,169	681
974.20	4,230	891
974.25	4,291	1,104
974.30	4,353	1,320
974.35	4,415	1,539
974.40	4,477	1,761
974.45	4,540	1,987
974.50	4,603	2,215
974.55	4,667	2,447
974.60	4,731	2,682
974.65	4,796	2,920
974.70	4,861	3,162
974.75	4,926	3,406
974.80	4,992	3,654
974.85	5,058	3,906
974.90	5,125	4,160
974.95	5,192	4,418
975.00	5,260	4,679
975.05	5,325	4,944
975.10	5,390	5,212
975.15	5,455	5,483
975.20	5,521	5,757
975.25	5,588	6,035
975.30	5,654	6,316
975.35	5,721	6,601
975.40	5,789	6,888
975.45	5,857	7,179
975.50	5,925	7,474
975.55	5,994	7,772
975.60	6,063	8,073
975.65	6,132	8,378
975.70	6,202	8,687
975.75	6,273	8,999
975.80	6,343	9,314
975.85	6,414	9,633
975.90	6,486	9,955
975.95	6,558	10,281
976.00	6,630	10,611
976.05	6,700	10,944
976.10	6,770	11,281
976.15	6,841	11,621
976.20	6,912	11,965
976.25	6,984	12,313
976.30	7,056	12,664
976.35	7,128	13,018
976.40	7,200	13,376
976.45	7,273	13,738
976.50	7,347	14,104
976.55	7,420	14,473
976.60	7,494	14,846
976.65	7,569	15,222
976.70	7,644	15,603
976.75	7,719	15,987
976.80	7,794	16,375
976.85	7,870	16,766
976.90	7,946	17,162
976.95	8,023	17,561
977.00	**8,100**	**17,964**

Summary for Pond 5P: P2

Inflow Area = 4.502 ac, 53.93% Impervious, Inflow Depth = 2.03" for 2-Year event
Inflow = 10.10 cfs @ 12.23 hrs, Volume= 0.763 af
Outflow = 2.51 cfs @ 13.13 hrs, Volume= 0.763 af, Atten= 75%, Lag= 53.8 min
Primary = 2.51 cfs @ 13.13 hrs, Volume= 0.763 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 974.43' @ 12.67 hrs Surf.Area= 14,403 sf Storage= 13,330 cf

Plug-Flow detention time= 92.2 min calculated for 0.763 af (100% of inflow)
Center-of-Mass det. time= 92.1 min (938.3 - 846.1)

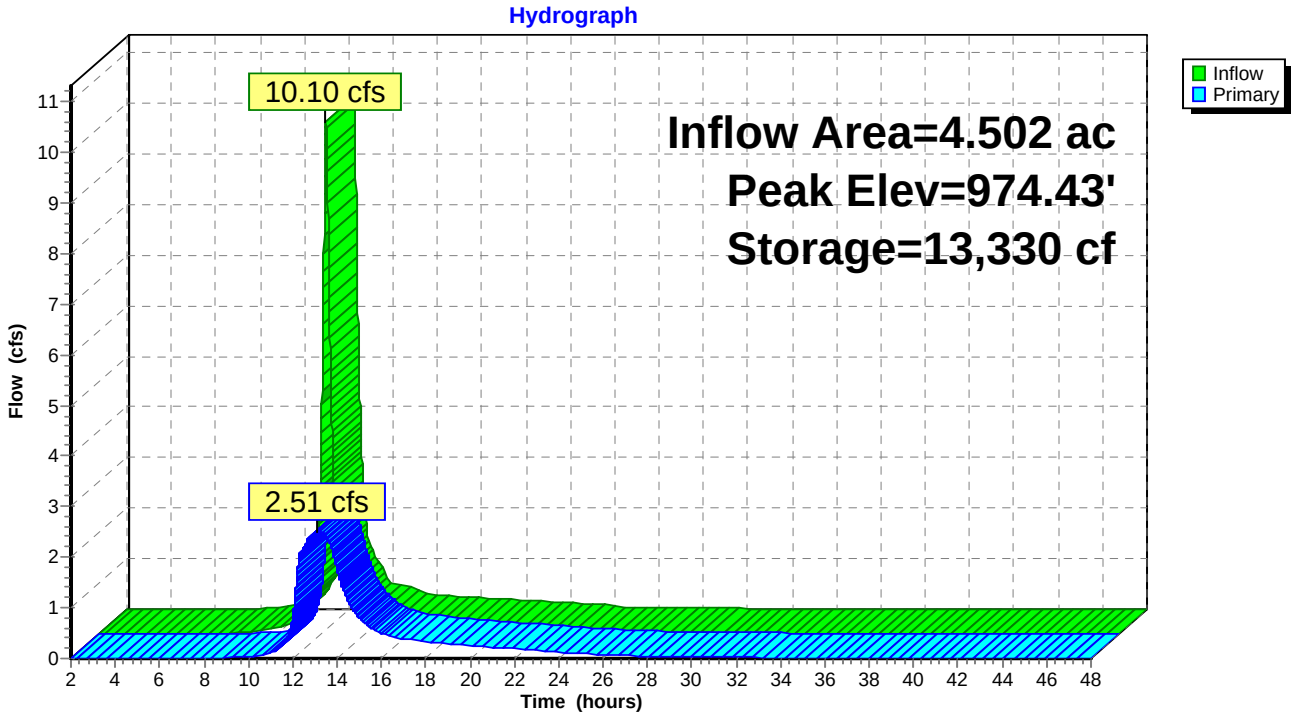
Volume	Invert	Avail.Storage	Storage Description
#1	972.90'	69,780 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
972.90	5	12.0	0	0	5
973.00	6,040	510.0	207	207	20,692
974.00	9,910	760.0	7,896	8,103	45,965
975.00	21,570	1,415.0	15,367	23,470	159,339
976.00	76,690	1,830.0	46,311	69,780	266,516

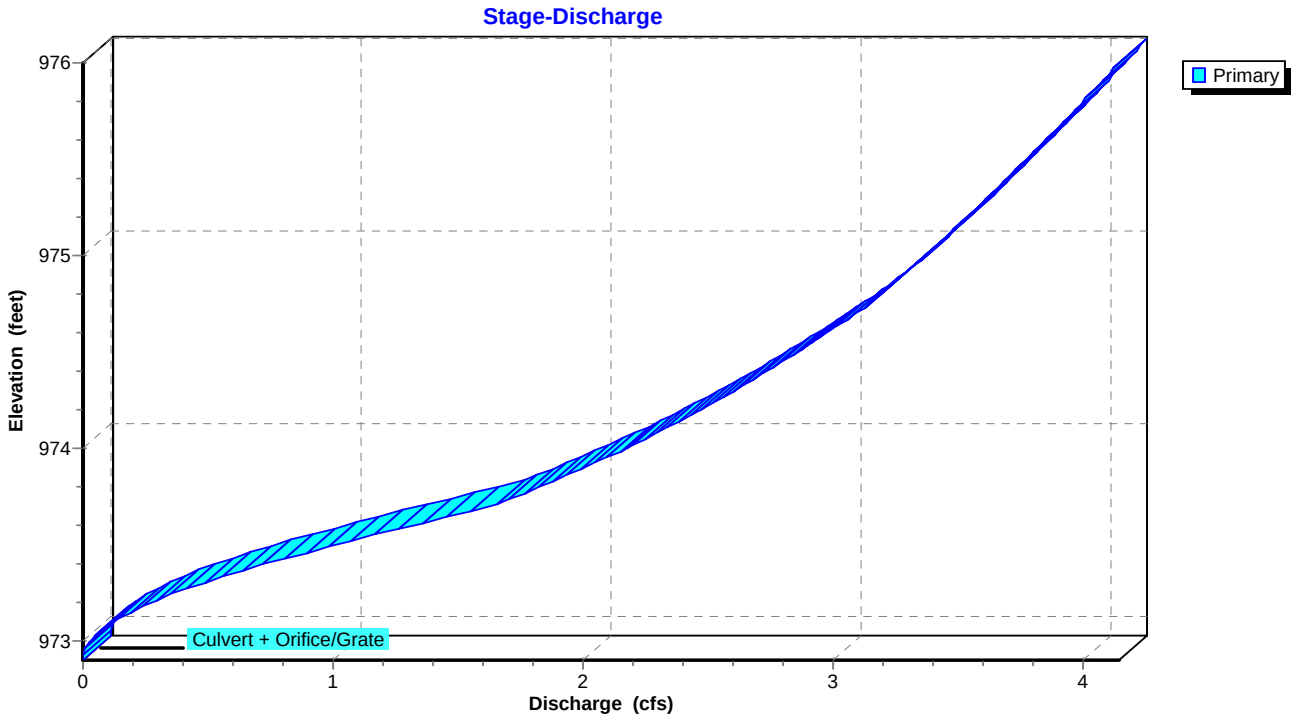
Device	Routing	Invert	Outlet Devices
#1	Primary	972.90'	**12.0" Round Culvert** L= 170.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 972.90' / 972.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	972.90'	**10.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.51 cfs @ 13.13 hrs HW=974.32' TW=973.23' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 2.51 cfs @ 3.20 fps)
↑**2=Orifice/Grate** (Passes 2.51 cfs of 2.63 cfs potential flow)

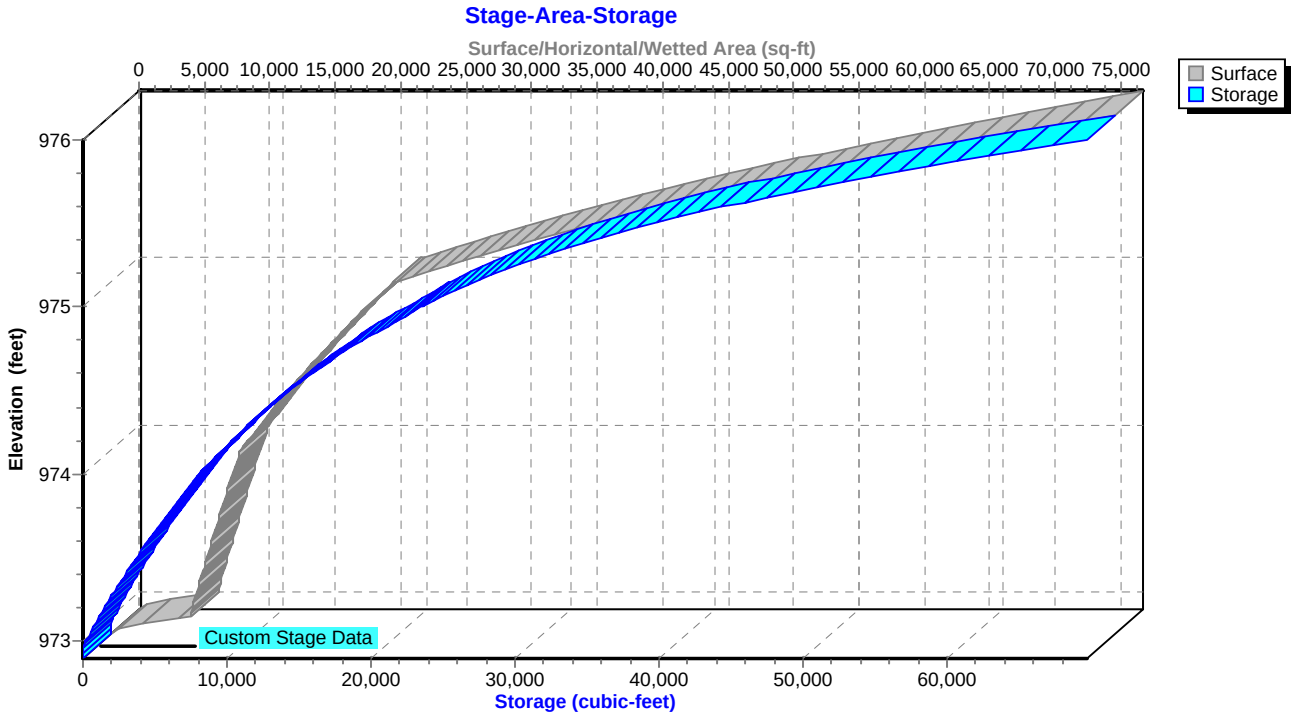
Pond 5P: P2



Pond 5P: P2



Pond 5P: P2


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0 5,000 10,000 15,000 20,000 25,000 30,000 35,000 40,000 45,000 50,000 55,000 60,000 65,000 70,000 75,000
Surface
Storage
976
975
974
973
Elevation (feet)
Custom Stage Data
0 10,000 20,000 30,000 40,000 50,000 60,000
Storage (cubic-feet)

Stage-Discharge for Pond 5P: P2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
972.90	0.00	973.96	2.11	975.02	3.38
972.92	0.00	973.98	2.14	975.04	3.40
972.94	0.00	974.00	2.17	975.06	3.42
972.96	0.01	974.02	2.20	975.08	3.43
972.98	0.02	974.04	2.23	975.10	3.45
973.00	0.03	974.06	2.26	975.12	3.47
973.02	0.04	974.08	2.29	975.14	3.48
973.04	0.06	974.10	2.32	975.16	3.50
973.06	0.08	974.12	2.35	975.18	3.52
973.08	0.10	974.14	2.38	975.20	3.53
973.10	0.12	974.16	2.41	975.22	3.55
973.12	0.15	974.18	2.44	975.24	3.57
973.14	0.18	974.20	2.47	975.26	3.58
973.16	0.21	974.22	2.50	975.28	3.60
973.18	0.24	974.24	2.52	975.30	3.62
973.20	0.28	974.26	2.55	975.32	3.63
973.22	0.31	974.28	2.58	975.34	3.65
973.24	0.35	974.30	2.60	975.36	3.66
973.26	0.39	974.32	2.63	975.38	3.68
973.28	0.44	974.34	2.66	975.40	3.70
973.30	0.48	974.36	2.68	975.42	3.71
973.32	0.53	974.38	2.71	975.44	3.73
973.34	0.58	974.40	2.73	975.46	3.74
973.36	0.63	974.42	2.76	975.48	3.76
973.38	0.68	974.44	2.78	975.50	3.77
973.40	0.73	974.46	2.81	975.52	3.79
973.42	0.79	974.48	2.83	975.54	3.80
973.44	0.84	974.50	2.86	975.56	3.82
973.46	0.90	974.52	2.88	975.58	3.83
973.48	0.96	974.54	2.90	975.60	3.85
973.50	1.01	974.56	2.93	975.62	3.86
973.52	1.07	974.58	2.95	975.64	3.88
973.54	1.13	974.60	2.98	975.66	3.89
973.56	1.19	974.62	3.00	975.68	3.91
973.58	1.26	974.64	3.02	975.70	3.92
973.60	1.32	974.66	3.04	975.72	3.94
973.62	1.38	974.68	3.07	975.74	3.95
973.64	1.44	974.70	3.09	975.76	3.97
973.66	1.51	974.72	3.11	975.78	3.98
973.68	1.57	974.74	3.13	975.80	4.00
973.70	1.63	974.76	3.15	975.82	4.01
973.72	1.68	974.78	3.17	975.84	4.03
973.74	1.71	974.80	3.19	975.86	4.04
973.76	1.75	974.82	3.21	975.88	4.05
973.78	1.79	974.84	3.22	975.90	4.07
973.80	1.83	974.86	3.24	975.92	4.08
973.82	1.86	974.88	3.26	975.94	4.10
973.84	1.90	974.90	3.28	975.96	4.11
973.86	1.94	974.92	3.30	975.98	4.13
973.88	1.97	974.94	3.31	976.00	**4.14**
973.90	2.01	974.96	3.33		
973.92	2.04	974.98	3.35		
973.94	2.07	975.00	3.37		

Stage-Area-Storage for Pond 5P: P2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
972.90	5	0
972.95	1,598	28
973.00	6,040	207
973.05	6,211	514
973.10	6,384	828
973.15	6,560	1,152
973.20	6,738	1,484
973.25	6,918	1,826
973.30	7,101	2,176
973.35	7,286	2,536
973.40	7,474	2,905
973.45	7,664	3,283
973.50	7,856	3,671
973.55	8,051	4,069
973.60	8,248	4,476
973.65	8,447	4,894
973.70	8,649	5,321
973.75	8,853	5,759
973.80	9,060	6,207
973.85	9,269	6,665
973.90	9,480	7,133
973.95	9,694	7,613
974.00	9,910	8,103
974.05	10,387	8,610
974.10	10,874	9,142
974.15	11,374	9,698
974.20	11,884	10,279
974.25	12,405	10,886
974.30	12,938	11,520
974.35	13,482	12,180
974.40	14,037	12,868
974.45	14,603	13,584
974.50	15,180	14,329
974.55	15,769	15,102
974.60	16,369	15,906
974.65	16,980	16,740
974.70	17,602	17,604
974.75	18,235	18,500
974.80	18,880	19,428
974.85	19,536	20,388
974.90	20,202	21,381
974.95	20,881	22,408
975.00	21,570	23,470
975.05	23,522	24,597
975.10	25,560	25,823
975.15	27,681	27,154
975.20	29,887	28,593
975.25	32,178	30,144
975.30	34,554	31,812
975.35	37,014	33,601
975.40	39,558	35,515
975.45	42,187	37,558
975.50	44,901	39,735
975.55	47,699	42,050
975.60	50,582	44,506
975.65	53,550	47,109
975.70	56,602	49,863
975.75	59,738	52,771
975.80	62,959	55,838
975.85	66,265	59,068
975.90	69,656	62,466
975.95	73,130	66,035
976.00	**76,690**	**69,780**

Summary for Pond 6P: P3

Inflow Area = 8.085 ac, 62.91% Impervious, Inflow Depth = 2.17" for 2-Year event
Inflow = 14.41 cfs @ 12.16 hrs, Volume= 1.462 af
Outflow = 5.49 cfs @ 12.43 hrs, Volume= 1.462 af, Atten= 62%, Lag= 15.8 min
Primary = 5.49 cfs @ 12.43 hrs, Volume= 1.462 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 973.57' @ 12.43 hrs Surf.Area= 8,832 sf Storage= 12,314 cf

Plug-Flow detention time= 87.9 min calculated for 1.462 af (100% of inflow)
Center-of-Mass det. time= 87.8 min (951.8 - 863.9)

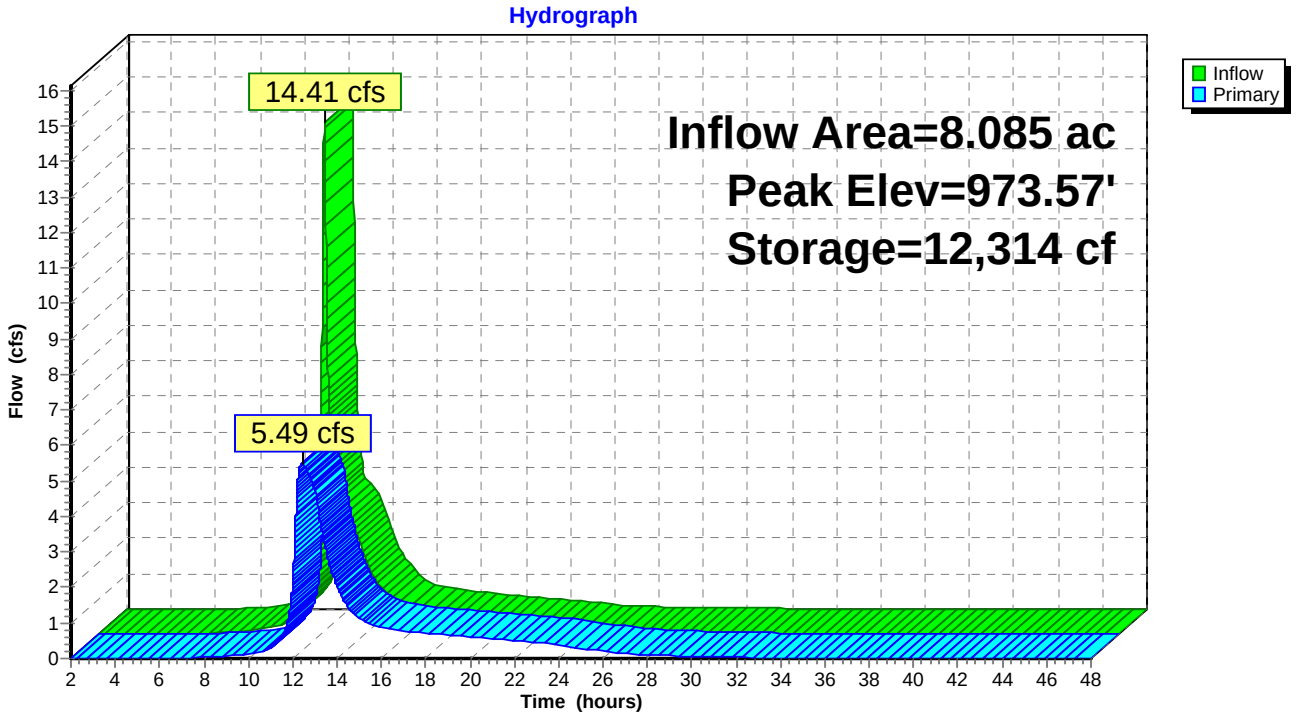
Volume	Invert	Avail.Storage	Storage Description
#1	971.85'	52,405 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
971.85	5	12.0	0	0	5
972.00	6,485	355.0	334	334	10,022
973.00	7,950	380.0	7,205	7,539	11,530
974.00	9,530	410.0	8,728	16,267	13,457
975.00	17,380	930.0	13,260	29,527	68,911
976.00	28,860	1,080.0	22,879	52,405	92,924

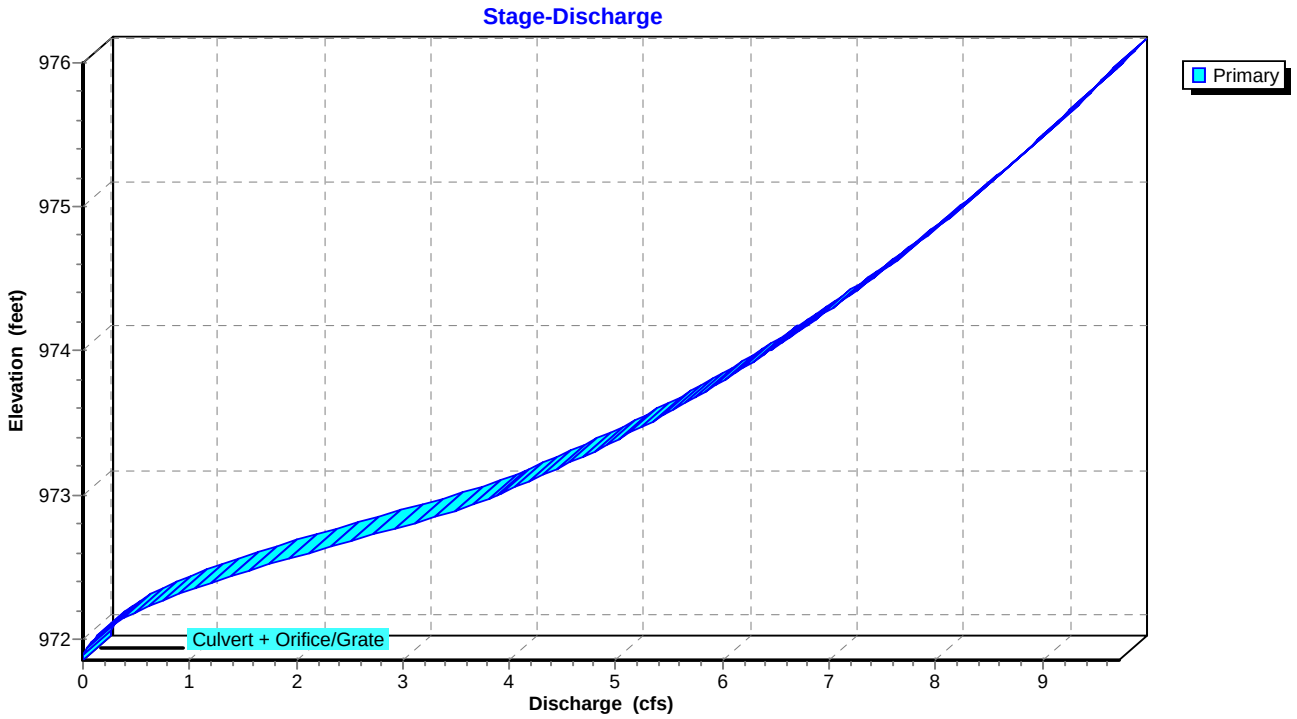
Device	Routing	Invert	Outlet Devices
#1	Primary	971.85'	**15.0" Round Culvert X 2.00** L= 350.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 971.85' / 970.10' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	971.85'	**14.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=5.49 cfs @ 12.43 hrs HW=973.57' TW=971.51' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 5.49 cfs of 9.10 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 5.49 cfs @ 5.13 fps)

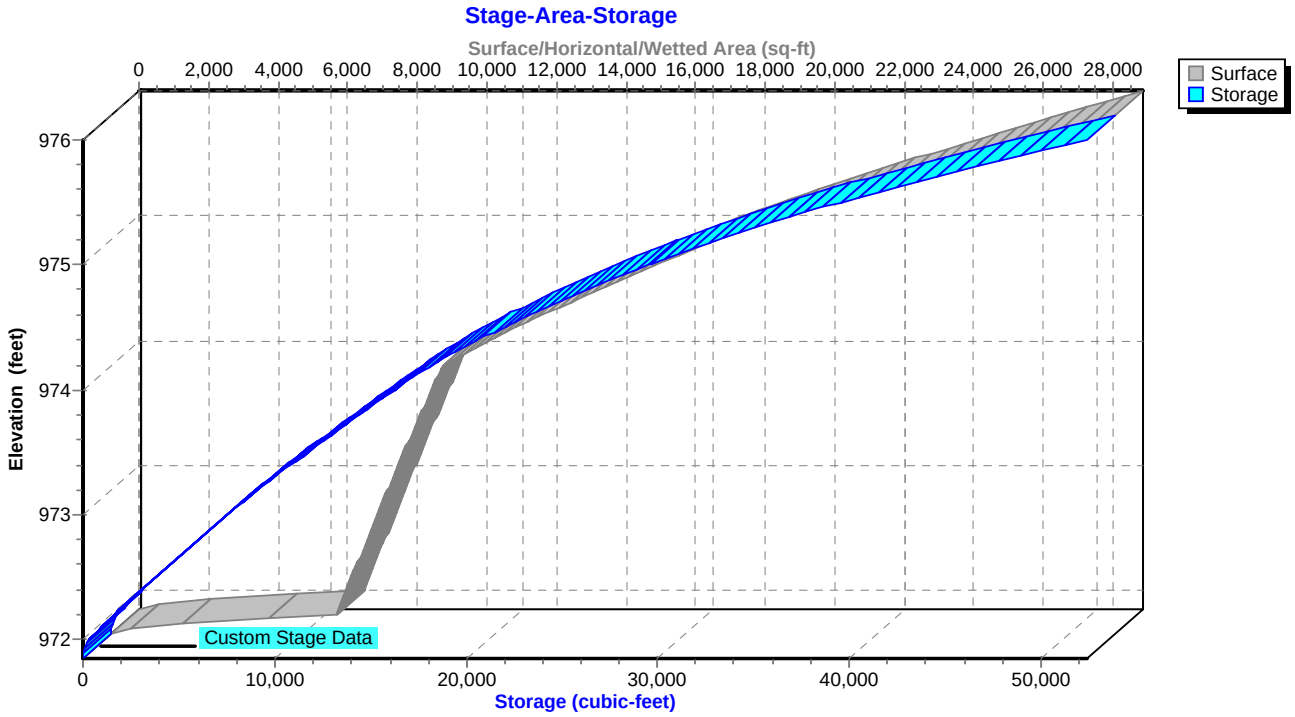
Pond 6P: P3



Pond 6P: P3



Pond 6P: P3


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0 2,000 4,000 6,000 8,000 10,000 12,000 14,000 16,000 18,000 20,000 22,000 24,000 26,000 28,000
Surface
Storage
976
975
974
973
972
Elevation (feet)
Custom Stage Data
0 10,000 20,000 30,000 40,000 50,000
Storage (cubic-feet)

Stage-Discharge for Pond 6P: P3

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
971.85	0.00	972.91	3.58	973.97	6.38	975.03	8.29
971.87	0.00	972.93	3.66	973.99	6.42	975.05	8.33
971.89	0.01	972.95	3.73	974.01	6.46	975.07	8.36
971.91	0.02	972.97	3.80	974.03	6.50	975.09	8.39
971.93	0.03	972.99	3.86	974.05	6.54	975.11	8.42
971.95	0.05	973.01	3.92	974.07	6.59	975.13	8.45
971.97	0.07	973.03	3.98	974.09	6.63	975.15	8.48
971.99	0.09	973.05	4.04	974.11	6.67	975.17	8.52
972.01	0.12	973.07	4.11	974.13	6.70	975.19	8.55
972.03	0.15	973.09	4.17	974.15	6.74	975.21	8.58
972.05	0.19	973.11	4.23	974.17	6.78	975.23	8.61
972.07	0.22	973.13	4.30	974.19	6.82	975.25	8.64
972.09	0.26	973.15	4.36	974.21	6.86	975.27	8.67
972.11	0.31	973.17	4.42	974.23	6.90	975.29	8.70
972.13	0.36	973.19	4.48	974.25	6.94	975.31	8.73
972.15	0.41	973.21	4.54	974.27	6.98	975.33	8.76
972.17	0.46	973.23	4.59	974.29	7.01	975.35	8.79
972.19	0.51	973.25	4.65	974.31	7.05	975.37	8.82
972.21	0.57	973.27	4.71	974.33	7.09	975.39	8.85
972.23	0.63	973.29	4.76	974.35	7.13	975.41	8.88
972.25	0.70	973.31	4.82	974.37	7.16	975.43	8.91
972.27	0.76	973.33	4.87	974.39	7.20	975.45	8.94
972.29	0.83	973.35	4.93	974.41	7.24	975.47	8.97
972.31	0.90	973.37	4.98	974.43	7.27	975.49	9.00
972.33	0.98	973.39	5.03	974.45	7.31	975.51	9.03
972.35	1.05	973.41	5.09	974.47	7.35	975.53	9.06
972.37	1.13	973.43	5.14	974.49	7.38	975.55	9.09
972.39	1.21	973.45	5.19	974.51	7.42	975.57	9.12
972.41	1.29	973.47	5.24	974.53	7.45	975.59	9.15
972.43	1.38	973.49	5.29	974.55	7.49	975.61	9.17
972.45	1.46	973.51	5.34	974.57	7.52	975.63	9.20
972.47	1.55	973.53	5.39	974.59	7.56	975.65	9.23
972.49	1.64	973.55	5.44	974.61	7.59	975.67	9.26
972.51	1.73	973.57	5.49	974.63	7.63	975.69	9.29
972.53	1.82	973.59	5.54	974.65	7.66	975.71	9.32
972.55	1.91	973.61	5.58	974.67	7.70	975.73	9.35
972.57	2.00	973.63	5.63	974.69	7.73	975.75	9.37
972.59	2.09	973.65	5.68	974.71	7.77	975.77	9.40
972.61	2.19	973.67	5.72	974.73	7.80	975.79	9.43
972.63	2.28	973.69	5.77	974.75	7.83	975.81	9.46
972.65	2.38	973.71	5.82	974.77	7.87	975.83	9.49
972.67	2.48	973.73	5.86	974.79	7.90	975.85	9.51
972.69	2.57	973.75	5.91	974.81	7.94	975.87	9.54
972.71	2.67	973.77	5.95	974.83	7.97	975.89	9.57
972.73	2.76	973.79	6.00	974.85	8.00	975.91	9.60
972.75	2.86	973.81	6.04	974.87	8.03	975.93	9.63
972.77	2.95	973.83	6.08	974.89	8.07	975.95	9.65
972.79	3.05	973.85	6.13	974.91	8.10	975.97	9.68
972.81	3.14	973.87	6.17	974.93	8.13	975.99	**9.71**
972.83	3.23	973.89	6.21	974.95	8.17		
972.85	3.32	973.91	6.25	974.97	8.20		
972.87	3.41	973.93	6.30	974.99	8.23		
972.89	3.49	973.95	6.34	975.01	8.26		

Stage-Area-Storage for Pond 6P: P3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
971.85	5	0
971.90	803	15
971.95	2,963	103
972.00	6,485	334
972.05	6,555	659
972.10	6,625	989
972.15	6,695	1,322
972.20	6,766	1,659
972.25	6,837	1,999
972.30	6,909	2,342
972.35	6,981	2,689
972.40	7,053	3,040
972.45	7,126	3,395
972.50	7,199	3,753
972.55	7,272	4,115
972.60	7,346	4,480
972.65	7,420	4,849
972.70	7,495	5,222
972.75	7,570	5,599
972.80	7,645	5,979
972.85	7,721	6,363
972.90	7,797	6,751
972.95	7,873	7,143
973.00	7,950	7,539
973.05	8,026	7,938
973.10	8,102	8,341
973.15	8,178	8,748
973.20	8,255	9,159
973.25	8,332	9,574
973.30	8,409	9,992
973.35	8,487	10,414
973.40	8,565	10,841
973.45	8,643	11,271
973.50	8,722	11,705
973.55	8,801	12,143
973.60	8,881	12,585
973.65	8,961	13,031
973.70	9,041	13,481
973.75	9,122	13,935
973.80	9,203	14,393
973.85	9,284	14,856
973.90	9,366	15,322
973.95	9,448	15,792
974.00	9,530	16,267
974.05	9,867	16,752
974.10	10,210	17,253
974.15	10,558	17,773
974.20	10,913	18,309
974.25	11,273	18,864
974.30	11,639	19,437
974.35	12,011	20,028
974.40	12,389	20,638
974.45	12,773	21,267
974.50	13,162	21,915
974.55	13,558	22,583
974.60	13,959	23,271
974.65	14,366	23,979
974.70	14,779	24,708
974.75	15,198	25,457
974.80	15,623	26,228
974.85	16,053	27,020
974.90	16,490	27,833
974.95	16,932	28,669
975.00	17,380	29,527
975.05	17,885	30,408
975.10	18,398	31,315
975.15	18,917	32,248
975.20	19,444	33,207
975.25	19,979	34,193
975.30	20,520	35,205
975.35	21,069	36,245
975.40	21,625	37,312
975.45	22,188	38,407
975.50	22,758	39,531
975.55	23,336	40,683
975.60	23,921	41,865
975.65	24,513	43,075
975.70	25,112	44,316
975.75	25,719	45,587
975.80	26,332	46,888
975.85	26,953	48,220
975.90	27,582	49,583
975.95	28,217	50,978
976.00	**28,860**	**52,405**

Summary for Pond 7P: P4

Inflow Area = 9.299 ac, 61.07% Impervious, Inflow Depth = 2.15" for 2-Year event
Inflow = 8.35 cfs @ 12.14 hrs, Volume= 1.662 af
Outflow = 1.15 cfs @ 15.17 hrs, Volume= 1.662 af, Atten= 86%, Lag= 181.7 min
Primary = 1.15 cfs @ 15.17 hrs, Volume= 1.662 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 973.18' @ 15.17 hrs Surf.Area= 13,516 sf Storage= 33,749 cf

Plug-Flow detention time= 374.6 min calculated for 1.662 af (100% of inflow)
Center-of-Mass det. time= 374.4 min (1,307.0 - 932.6)

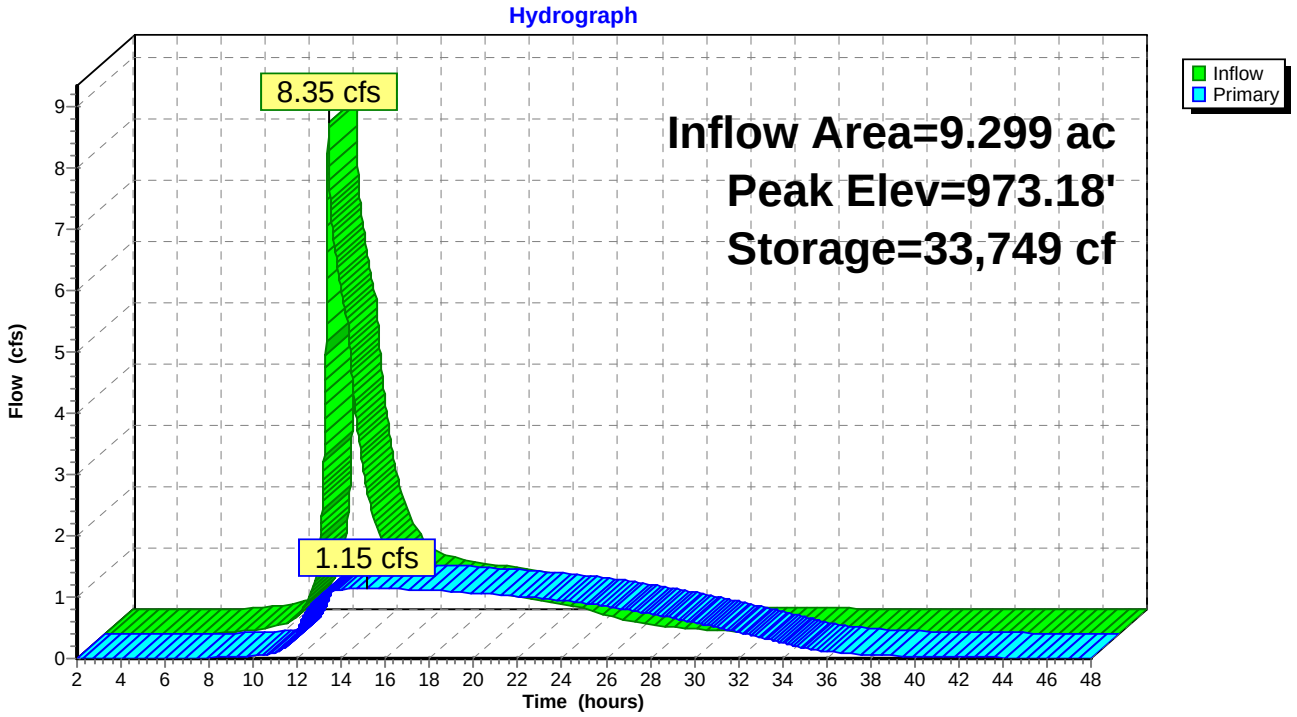
Volume	Invert	Avail.Storage	Storage Description
#1	969.90'	85,438 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
969.90	5	12.0	0	0	5
970.00	7,890	380.0	270	270	11,485
971.00	9,460	405.0	8,663	8,933	13,095
972.00	11,135	435.0	10,286	19,219	15,144
973.00	13,155	473.0	12,131	31,350	17,927
974.00	15,225	510.0	14,177	45,527	20,862
975.00	17,805	560.0	16,498	62,026	25,153
976.00	29,510	955.0	23,412	85,438	72,781

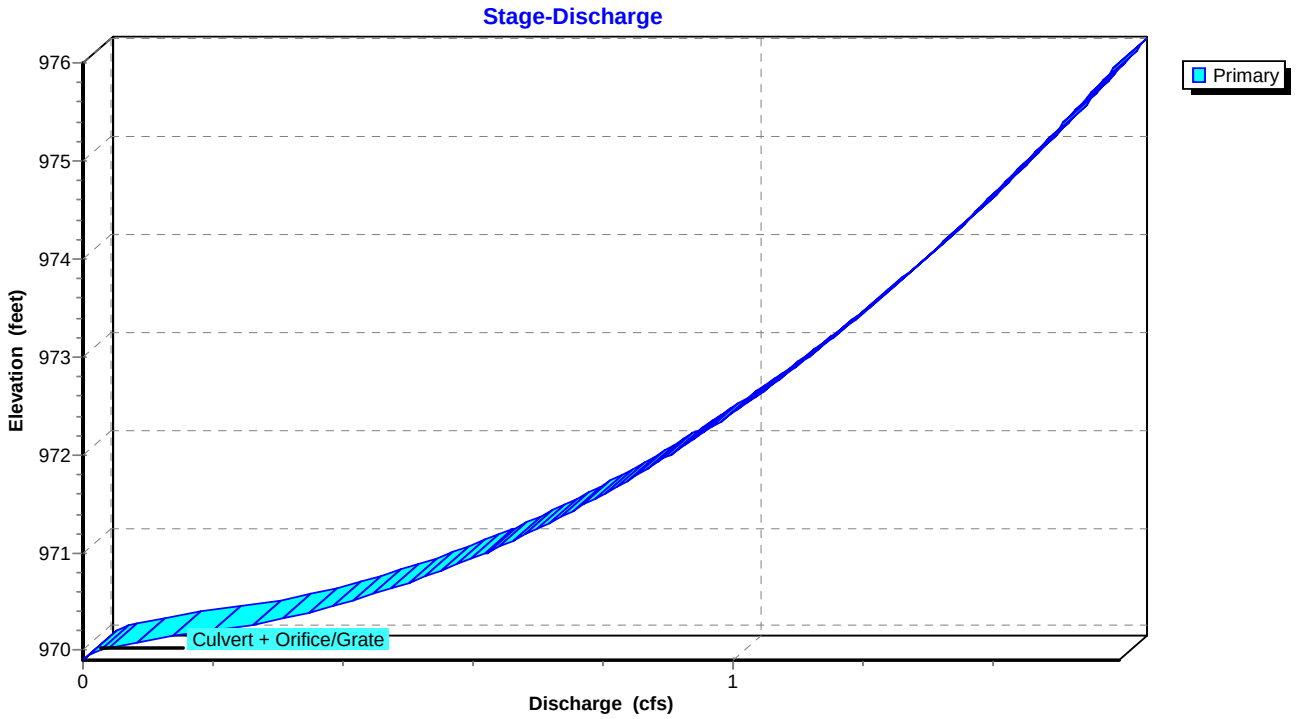
Device	Routing	Invert	Outlet Devices
#1	Primary	969.90'	**15.0" Round Culvert** L= 35.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 969.90' / 969.73' S= 0.0049 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Device 1	969.90'	**5.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.15 cfs @ 15.17 hrs HW=973.18' (Free Discharge)
↑—**1=Culvert** (Passes 1.15 cfs of 9.63 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 1.15 cfs @ 8.44 fps)

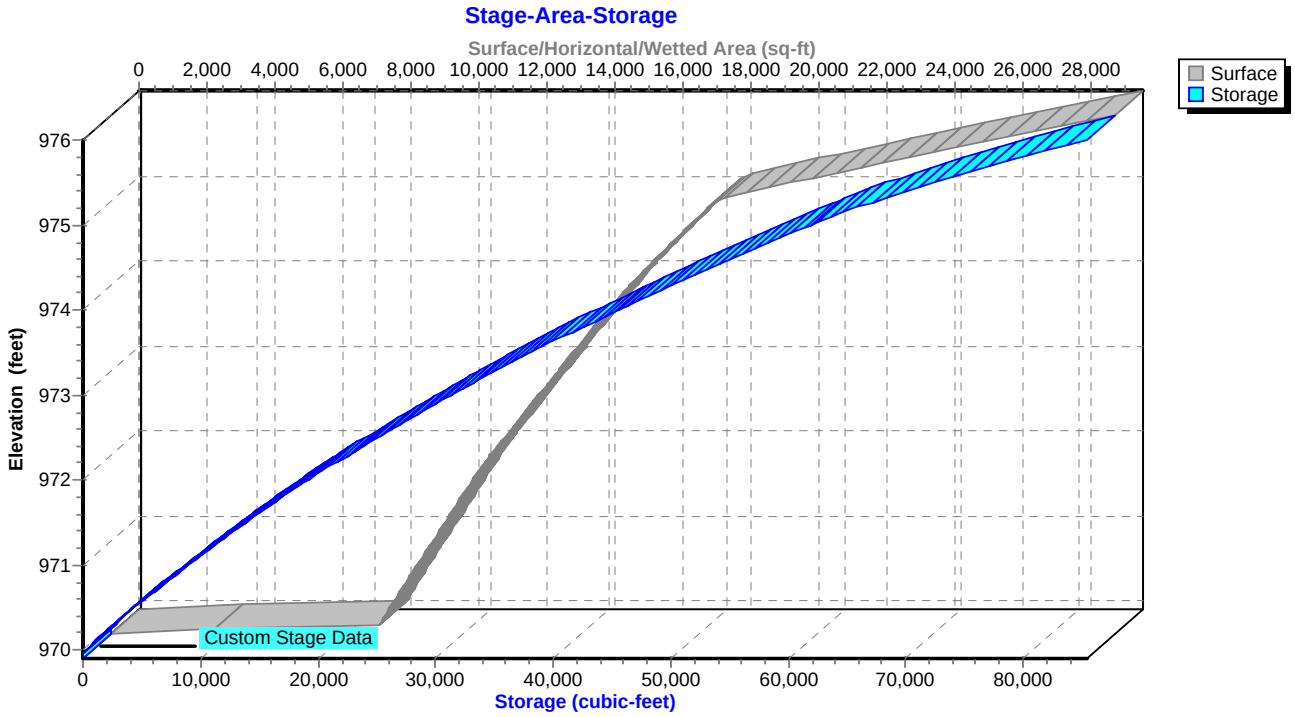
Pond 7P: P4



Pond 7P: P4



Pond 7P: P4


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0 2,000 4,000 6,000 8,000 10,000 12,000 14,000 16,000 18,000 20,000 22,000 24,000 26,000 28,000
Surface
Storage
976
975
974
973
972
971
970
Elevation (feet)
Custom Stage Data
0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000
Storage (cubic-feet)

Stage-Discharge for Pond 7P: P4

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
969.90	0.00	972.02	0.91	974.14	1.32
969.94	0.00	972.06	0.92	974.18	1.32
969.98	0.02	972.10	0.93	974.22	1.33
970.02	0.04	972.14	0.94	974.26	1.34
970.06	0.07	972.18	0.94	974.30	1.34
970.10	0.10	972.22	0.95	974.34	1.35
970.14	0.14	972.26	0.96	974.38	1.36
970.18	0.18	972.30	0.97	974.42	1.36
970.22	0.22	972.34	0.98	974.46	1.37
970.26	0.26	972.38	0.99	974.50	1.38
970.30	0.29	972.42	1.00	974.54	1.38
970.34	0.32	972.46	1.01	974.58	1.39
970.38	0.34	972.50	1.02	974.62	1.39
970.42	0.37	972.54	1.02	974.66	1.40
970.46	0.39	972.58	1.03	974.70	1.41
970.50	0.41	972.62	1.04	974.74	1.41
970.54	0.43	972.66	1.05	974.78	1.42
970.58	0.45	972.70	1.06	974.82	1.43
970.62	0.47	972.74	1.07	974.86	1.43
970.66	0.49	972.78	1.07	974.90	1.44
970.70	0.51	972.82	1.08	974.94	1.44
970.74	0.52	972.86	1.09	974.98	1.45
970.78	0.54	972.90	1.10	975.02	1.46
970.82	0.55	972.94	1.10	975.06	1.46
970.86	0.57	972.98	1.11	975.10	1.47
970.90	0.58	973.02	1.12	975.14	1.47
970.94	0.60	973.06	1.13	975.18	1.48
970.98	0.61	973.10	1.14	975.22	1.48
971.02	0.63	973.14	1.14	975.26	1.49
971.06	0.64	973.18	1.15	975.30	1.50
971.10	0.65	973.22	1.16	975.34	1.50
971.14	0.67	973.26	1.17	975.38	1.51
971.18	0.68	973.30	1.17	975.42	1.51
971.22	0.69	973.34	1.18	975.46	1.52
971.26	0.70	973.38	1.19	975.50	1.52
971.30	0.72	973.42	1.19	975.54	1.53
971.34	0.73	973.46	1.20	975.58	1.54
971.38	0.74	973.50	1.21	975.62	1.54
971.42	0.75	973.54	1.22	975.66	1.55
971.46	0.76	973.58	1.22	975.70	1.55
971.50	0.77	973.62	1.23	975.74	1.56
971.54	0.79	973.66	1.24	975.78	1.56
971.58	0.80	973.70	1.24	975.82	1.57
971.62	0.81	973.74	1.25	975.86	1.57
971.66	0.82	973.78	1.26	975.90	1.58
971.70	0.83	973.82	1.26	975.94	1.59
971.74	0.84	973.86	1.27	975.98	**1.59**
971.78	0.85	973.90	1.28		
971.82	0.86	973.94	1.29		
971.86	0.87	973.98	1.29		
971.90	0.88	974.02	1.30		
971.94	0.89	974.06	1.31		
971.98	0.90	974.10	1.31		

Stage-Area-Storage for Pond 7P: P4

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
969.90	5	0
970.00	7,890	270
970.10	8,041	1,066
970.20	8,193	1,878
970.30	8,346	2,705
970.40	8,501	3,547
970.50	8,657	4,405
970.60	8,815	5,279
970.70	8,974	6,168
970.80	9,135	7,074
970.90	9,297	7,995
971.00	9,460	8,933
971.10	9,621	9,887
971.20	9,784	10,857
971.30	9,948	11,844
971.40	10,114	12,847
971.50	10,280	13,867
971.60	10,449	14,903
971.70	10,618	15,956
971.80	10,789	17,027
971.90	10,961	18,114
972.00	11,135	19,219
972.10	11,329	20,342
972.20	11,526	21,485
972.30	11,723	22,647
972.40	11,923	23,830
972.50	12,124	25,032
972.60	12,327	26,255
972.70	12,531	27,497
972.80	12,738	28,761
972.90	12,945	30,045
973.00	13,155	31,350
973.10	13,355	32,676
973.20	13,557	34,021
973.30	13,760	35,387
973.40	13,965	36,773
973.50	14,171	38,180
973.60	14,379	39,607
973.70	14,588	41,056
973.80	14,799	42,525
973.90	15,011	44,016
974.00	15,225	45,527
974.10	15,474	47,062
974.20	15,725	48,622
974.30	15,978	50,207
974.40	16,233	51,818
974.50	16,490	53,454
974.60	16,749	55,116
974.70	17,010	56,804
974.80	17,273	58,518
974.90	17,538	60,258
975.00	17,805	62,026
975.10	18,843	63,858
975.20	19,911	65,795
975.30	21,008	67,841
975.40	22,134	69,998
975.50	23,290	72,269
975.60	24,475	74,657
975.70	25,690	77,165
975.80	26,934	79,796
975.90	28,207	82,552
976.00	**29,510**	**85,438**

Summary for Pond 8P: P5

Inflow Area = 3.274 ac, 71.38% Impervious, Inflow Depth = 2.34" for 2-Year event
Inflow = 12.69 cfs @ 12.15 hrs, Volume= 0.638 af
Outflow = 2.44 cfs @ 12.46 hrs, Volume= 0.639 af, Atten= 81%, Lag= 18.8 min
Primary = 2.44 cfs @ 12.46 hrs, Volume= 0.639 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 972.35' @ 12.46 hrs Surf.Area= 6,306 sf Storage= 11,362 cf

Plug-Flow detention time= 57.6 min calculated for 0.638 af (100% of inflow)
Center-of-Mass det. time= 57.6 min (838.7 - 781.1)

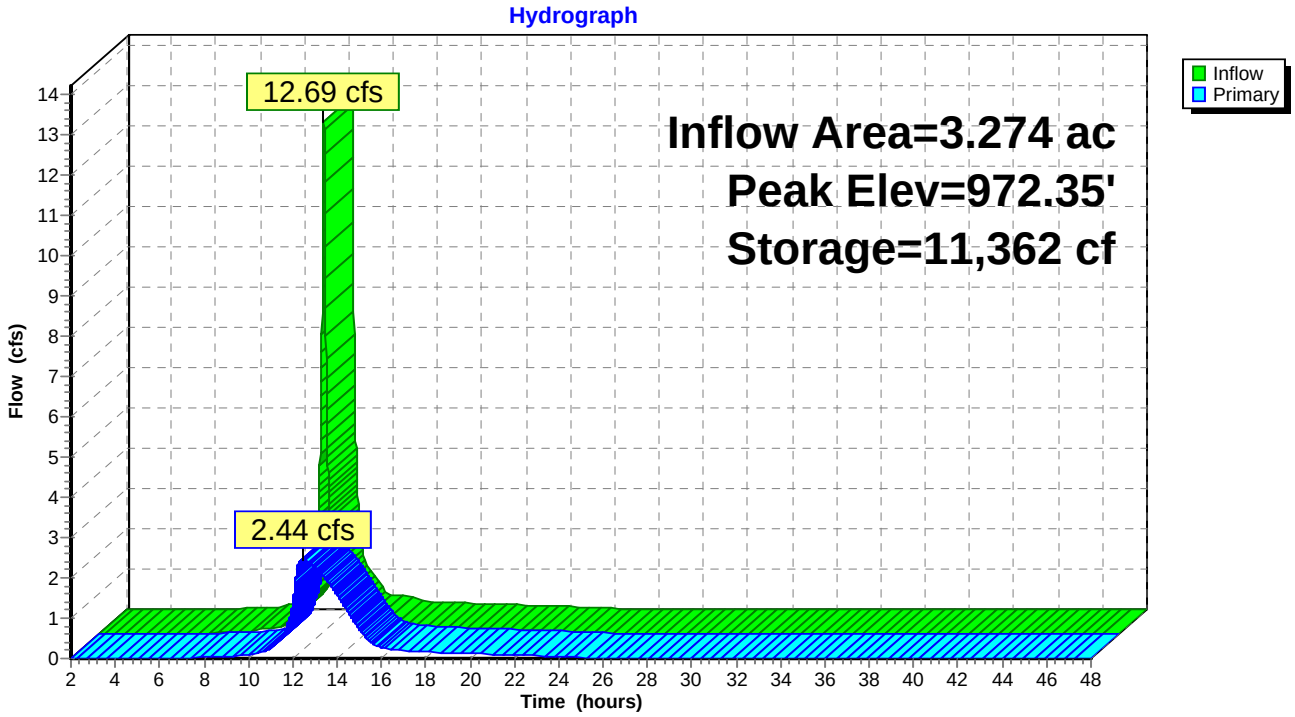
Volume	Invert	Avail.Storage	Storage Description
#1	969.90'	45,413 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
969.90	5	12.0	0	0	5
970.00	3,410	270.0	118	118	5,795
971.00	4,555	300.0	3,969	4,087	7,185
972.00	5,795	325.0	5,163	9,249	8,467
973.00	7,315	360.0	6,540	15,790	10,405
974.00	8,965	400.0	8,126	23,916	12,854
975.00	10,760	435.0	9,849	33,765	15,217
976.00	12,560	460.0	11,648	45,413	17,053

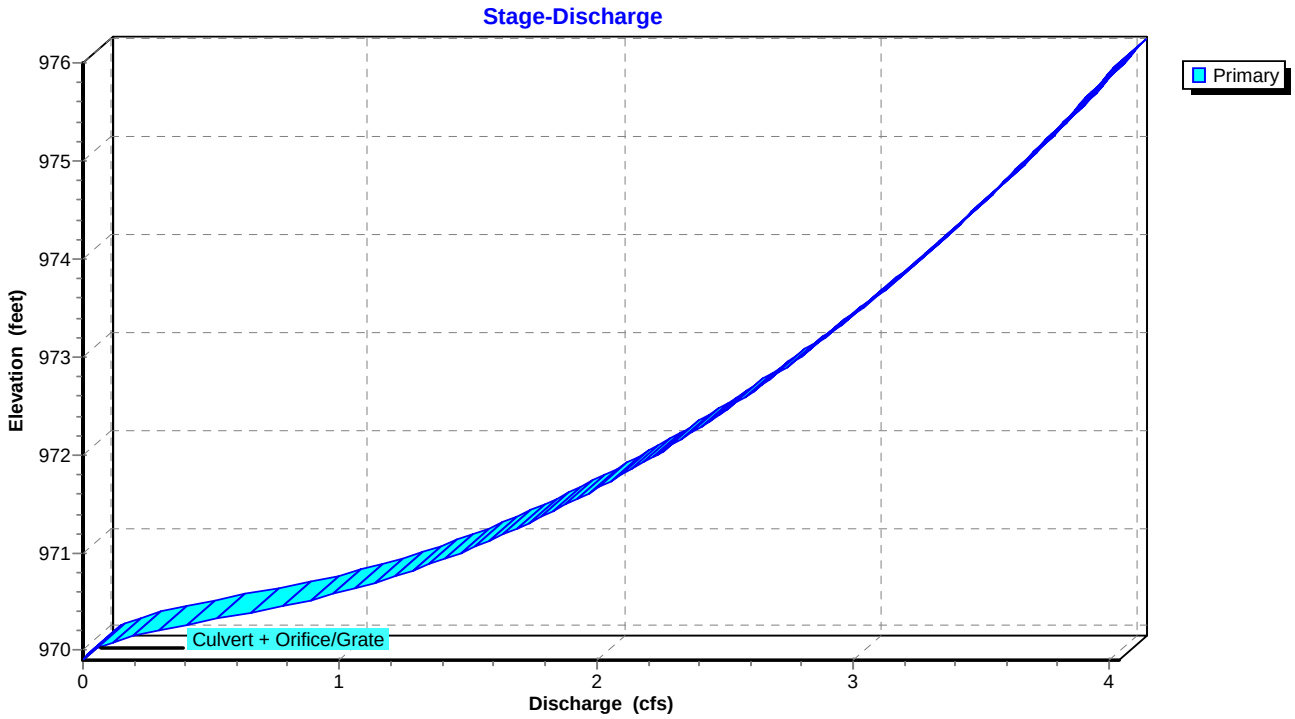
Device	Routing	Invert	Outlet Devices
#1	Primary	969.90'	**15.0" Round Culvert** L= 30.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 969.90' / 969.75' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Device 1	969.90'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.44 cfs @ 12.46 hrs HW=972.35' (Free Discharge)
↑—**1=Culvert** (Passes 2.44 cfs of 7.98 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 2.44 cfs @ 7.00 fps)

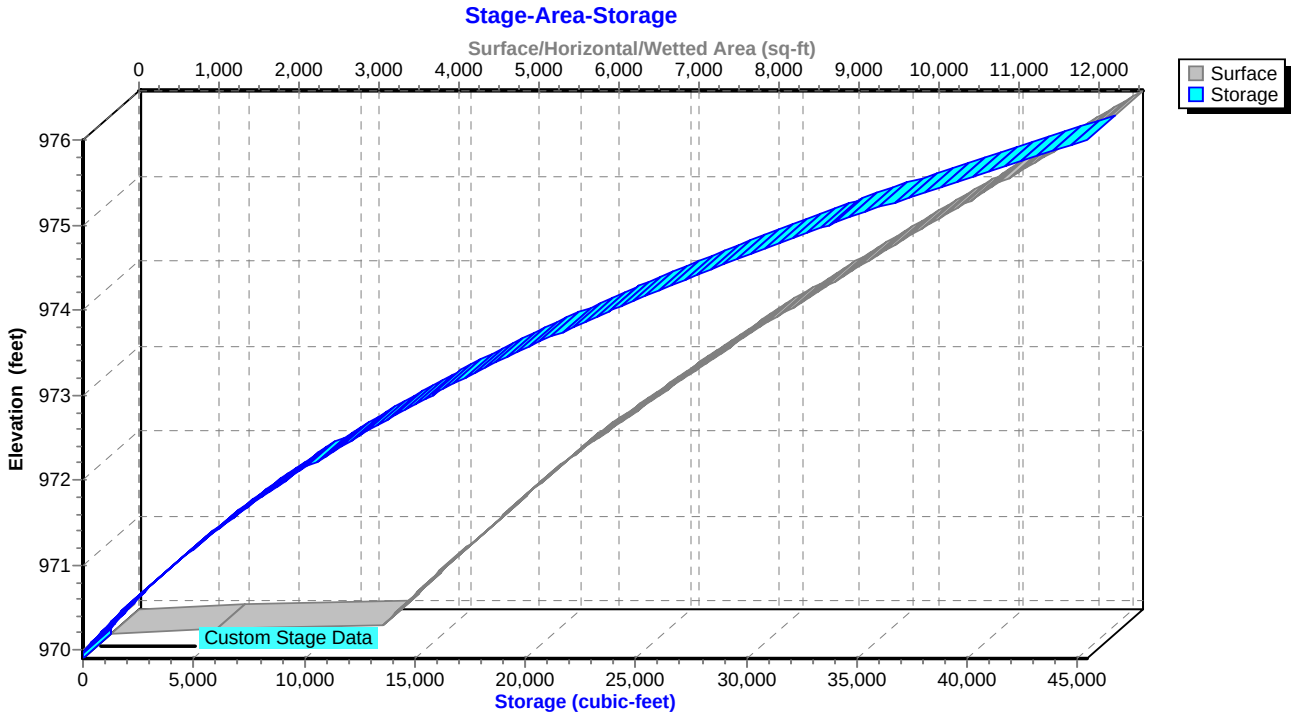
Pond 8P: P5



Pond 8P: P5



Pond 8P: P5


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
Surface
Storage
976
975
974
973
972
971
970
Elevation (feet)
Custom Stage Data
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
Storage (cubic-feet)

Stage-Discharge for Pond 8P: P5

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
969.90	0.00	972.02	2.25	974.14	3.32
969.94	0.01	972.06	2.27	974.18	3.34
969.98	0.02	972.10	2.30	974.22	3.36
970.02	0.05	972.14	2.32	974.26	3.37
970.06	0.09	972.18	2.35	974.30	3.39
970.10	0.13	972.22	2.37	974.34	3.41
970.14	0.19	972.26	2.39	974.38	3.42
970.18	0.25	972.30	2.42	974.42	3.44
970.22	0.32	972.34	2.44	974.46	3.46
970.26	0.39	972.38	2.46	974.50	3.47
970.30	0.47	972.42	2.49	974.54	3.49
970.34	0.55	972.46	2.51	974.58	3.50
970.38	0.63	972.50	2.53	974.62	3.52
970.42	0.72	972.54	2.55	974.66	3.54
970.46	0.80	972.58	2.57	974.70	3.55
970.50	0.87	972.62	2.60	974.74	3.57
970.54	0.94	972.66	2.62	974.78	3.58
970.58	0.99	972.70	2.64	974.82	3.60
970.62	1.05	972.74	2.66	974.86	3.62
970.66	1.10	972.78	2.68	974.90	3.63
970.70	1.15	972.82	2.70	974.94	3.65
970.74	1.20	972.86	2.72	974.98	3.66
970.78	1.24	972.90	2.74	975.02	3.68
970.82	1.29	972.94	2.77	975.06	3.69
970.86	1.33	972.98	2.79	975.10	3.71
970.90	1.37	973.02	2.81	975.14	3.72
970.94	1.41	973.06	2.83	975.18	3.74
970.98	1.45	973.10	2.85	975.22	3.75
971.02	1.49	973.14	2.87	975.26	3.77
971.06	1.53	973.18	2.89	975.30	3.78
971.10	1.56	973.22	2.90	975.34	3.80
971.14	1.60	973.26	2.92	975.38	3.81
971.18	1.64	973.30	2.94	975.42	3.83
971.22	1.67	973.34	2.96	975.46	3.84
971.26	1.70	973.38	2.98	975.50	3.86
971.30	1.74	973.42	3.00	975.54	3.87
971.34	1.77	973.46	3.02	975.58	3.89
971.38	1.80	973.50	3.04	975.62	3.90
971.42	1.83	973.54	3.06	975.66	3.92
971.46	1.86	973.58	3.07	975.70	3.93
971.50	1.89	973.62	3.09	975.74	3.94
971.54	1.92	973.66	3.11	975.78	3.96
971.58	1.95	973.70	3.13	975.82	3.97
971.62	1.98	973.74	3.15	975.86	3.99
971.66	2.01	973.78	3.17	975.90	4.00
971.70	2.04	973.82	3.18	975.94	4.02
971.74	2.06	973.86	3.20	975.98	**4.03**
971.78	2.09	973.90	3.22		
971.82	2.12	973.94	3.24		
971.86	2.14	973.98	3.25		
971.90	2.17	974.02	3.27		
971.94	2.20	974.06	3.29		
971.98	2.22	974.10	3.30		

Stage-Area-Storage for Pond 8P: P5

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
969.90	5	0
970.00	3,410	118
970.10	3,517	465
970.20	3,626	822
970.30	3,736	1,190
970.40	3,848	1,569
970.50	3,962	1,959
970.60	4,077	2,361
970.70	4,194	2,775
970.80	4,313	3,200
970.90	4,433	3,638
971.00	4,555	4,087
971.10	4,672	4,548
971.20	4,791	5,021
971.30	4,911	5,507
971.40	5,033	6,004
971.50	5,156	6,513
971.60	5,281	7,035
971.70	5,407	7,569
971.80	5,535	8,117
971.90	5,664	8,677
972.00	5,795	9,249
972.10	5,939	9,836
972.20	6,085	10,437
972.30	6,232	11,053
972.40	6,382	11,684
972.50	6,533	12,330
972.60	6,686	12,991
972.70	6,840	13,667
972.80	6,997	14,359
972.90	7,155	15,066
973.00	7,315	15,790
973.10	7,472	16,529
973.20	7,632	17,284
973.30	7,792	18,055
973.40	7,955	18,843
973.50	8,119	19,647
973.60	8,285	20,467
973.70	8,452	21,304
973.80	8,622	22,157
973.90	8,792	23,028
974.00	8,965	23,916
974.10	9,137	24,821
974.20	9,311	25,743
974.30	9,486	26,683
974.40	9,663	27,641
974.50	9,842	28,616
974.60	10,022	29,609
974.70	10,204	30,620
974.80	10,388	31,650
974.90	10,573	32,698
975.00	10,760	33,765
975.10	10,934	34,849
975.20	11,109	35,951
975.30	11,285	37,071
975.40	11,463	38,209
975.50	11,643	39,364
975.60	11,823	40,537
975.70	12,005	41,729
975.80	12,189	42,938
975.90	12,374	44,166
976.00	**12,560**	**45,413**

Summary for Pond 4P: P1

Inflow Area = 0.627 ac, 23.76% Impervious, Inflow Depth = 2.22" for 5-Year event
Inflow = 2.23 cfs @ 12.15 hrs, Volume= 0.116 af
Outflow = 0.09 cfs @ 15.32 hrs, Volume= 0.116 af, Atten= 96%, Lag= 190.2 min
Primary = 0.09 cfs @ 15.32 hrs, Volume= 0.116 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 974.81' @ 14.33 hrs Surf.Area= 5,009 sf Storage= 3,718 cf

Plug-Flow detention time= 555.1 min calculated for 0.116 af (100% of inflow)
Center-of-Mass det. time= 553.7 min (1,353.9 - 800.2)

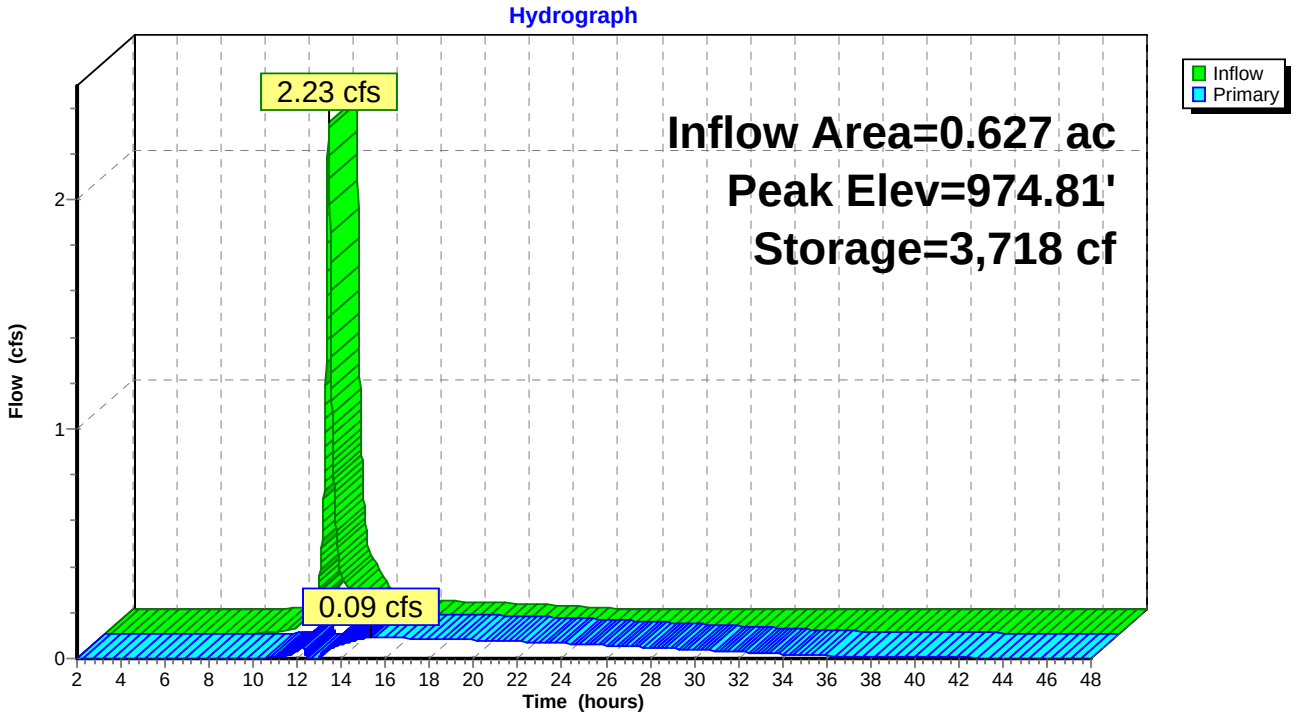
Volume	Invert	Avail.Storage	Storage Description
#1	973.95'	17,964 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
973.95	5	12.0	0	0	5
974.00	3,990	305.0	69	69	7,396
975.00	5,260	330.0	4,610	4,679	8,699
976.00	6,630	355.0	5,932	10,611	10,104
977.00	8,100	380.0	7,353	17,964	11,612

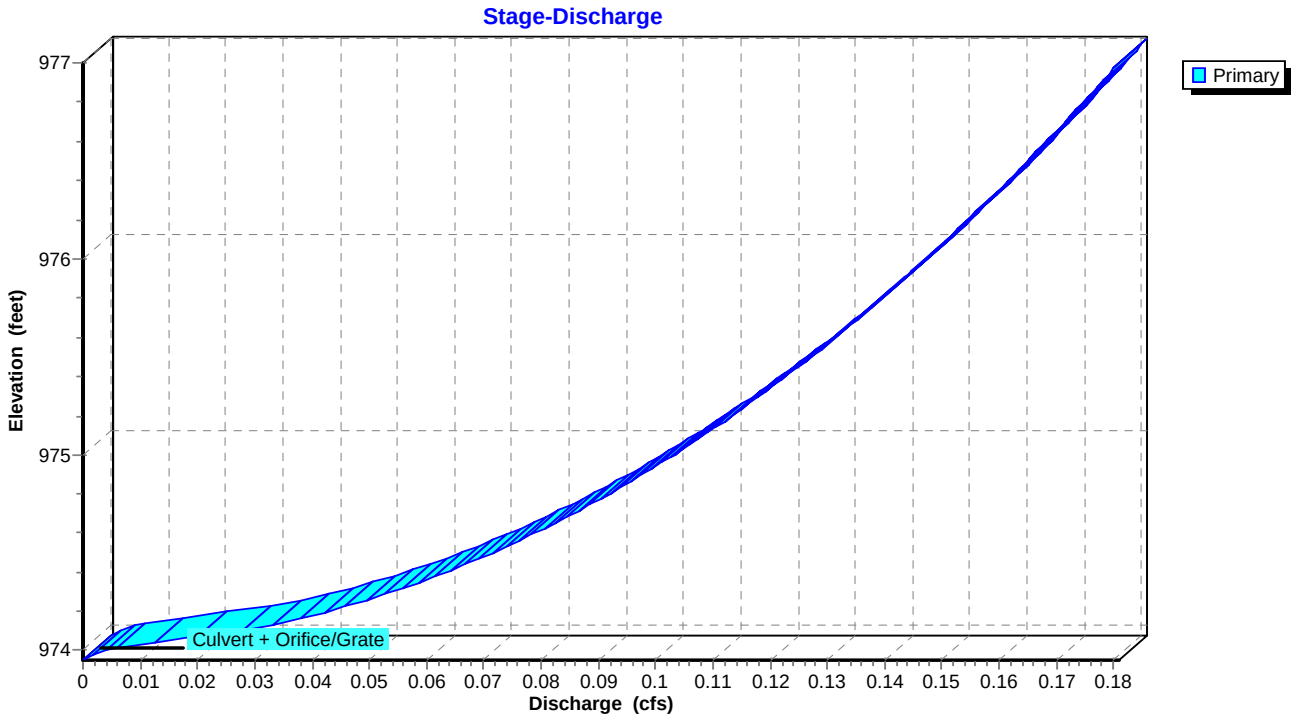
Device	Routing	Invert	Outlet Devices
#1	Primary	973.95'	**12.0" Round Culvert** L= 180.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 973.95' / 973.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	973.95'	**2.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.09 cfs @ 15.32 hrs HW=974.80' TW=974.03' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.09 cfs of 1.49 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 0.09 cfs @ 4.21 fps)

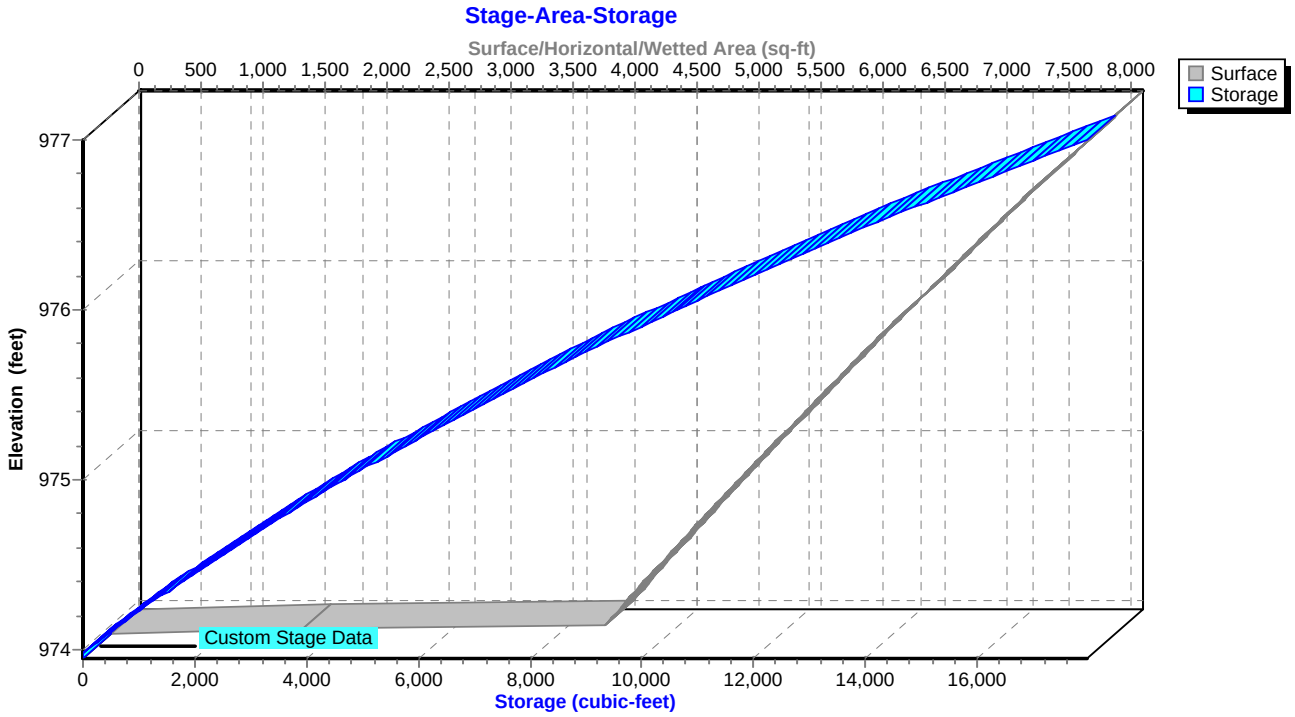
Pond 4P: P1



Pond 4P: P1



Pond 4P: P1


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0 500 1,000 1,500 2,000 2,500 3,000 3,500 4,000 4,500 5,000 5,500 6,000 6,500 7,000 7,500 8,000
Surface
Storage
977
976
975
974
Elevation (feet)
Custom Stage Data
0 2,000 4,000 6,000 8,000 10,000 12,000 14,000 16,000
Storage (cubic-feet)

Stage-Discharge for Pond 4P: P1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
973.95	0.00	975.01	0.10	976.07	0.15
973.97	0.00	975.03	0.10	976.09	0.15
973.99	0.00	975.05	0.11	976.11	0.15
974.01	0.01	975.07	0.11	976.13	0.15
974.03	0.01	975.09	0.11	976.15	0.15
974.05	0.01	975.11	0.11	976.17	0.15
974.07	0.02	975.13	0.11	976.19	0.15
974.09	0.02	975.15	0.11	976.21	0.15
974.11	0.03	975.17	0.11	976.23	0.16
974.13	0.03	975.19	0.11	976.25	0.16
974.15	0.04	975.21	0.11	976.27	0.16
974.17	0.04	975.23	0.11	976.29	0.16
974.19	0.04	975.25	0.12	976.31	0.16
974.21	0.04	975.27	0.12	976.33	0.16
974.23	0.05	975.29	0.12	976.35	0.16
974.25	0.05	975.31	0.12	976.37	0.16
974.27	0.05	975.33	0.12	976.39	0.16
974.29	0.05	975.35	0.12	976.41	0.16
974.31	0.06	975.37	0.12	976.43	0.16
974.33	0.06	975.39	0.12	976.45	0.16
974.35	0.06	975.41	0.12	976.47	0.16
974.37	0.06	975.43	0.12	976.49	0.16
974.39	0.06	975.45	0.13	976.51	0.17
974.41	0.06	975.47	0.13	976.53	0.17
974.43	0.07	975.49	0.13	976.55	0.17
974.45	0.07	975.51	0.13	976.57	0.17
974.47	0.07	975.53	0.13	976.59	0.17
974.49	0.07	975.55	0.13	976.61	0.17
974.51	0.07	975.57	0.13	976.63	0.17
974.53	0.07	975.59	0.13	976.65	0.17
974.55	0.08	975.61	0.13	976.67	0.17
974.57	0.08	975.63	0.13	976.69	0.17
974.59	0.08	975.65	0.13	976.71	0.17
974.61	0.08	975.67	0.13	976.73	0.17
974.63	0.08	975.69	0.14	976.75	0.17
974.65	0.08	975.71	0.14	976.77	0.17
974.67	0.08	975.73	0.14	976.79	0.17
974.69	0.09	975.75	0.14	976.81	0.18
974.71	0.09	975.77	0.14	976.83	0.18
974.73	0.09	975.79	0.14	976.85	0.18
974.75	0.09	975.81	0.14	976.87	0.18
974.77	0.09	975.83	0.14	976.89	0.18
974.79	0.09	975.85	0.14	976.91	0.18
974.81	0.09	975.87	0.14	976.93	0.18
974.83	0.09	975.89	0.14	976.95	0.18
974.85	0.09	975.91	0.14	976.97	0.18
974.87	0.10	975.93	0.14	976.99	**0.18**
974.89	0.10	975.95	0.15		
974.91	0.10	975.97	0.15		
974.93	0.10	975.99	0.15		
974.95	0.10	976.01	0.15		
974.97	0.10	976.03	0.15		
974.99	0.10	976.05	0.15		

Stage-Area-Storage for Pond 4P: P1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
973.95	5	0
974.00	3,990	69
974.05	4,049	270
974.10	4,109	474
974.15	4,169	681
974.20	4,230	891
974.25	4,291	1,104
974.30	4,353	1,320
974.35	4,415	1,539
974.40	4,477	1,761
974.45	4,540	1,987
974.50	4,603	2,215
974.55	4,667	2,447
974.60	4,731	2,682
974.65	4,796	2,920
974.70	4,861	3,162
974.75	4,926	3,406
974.80	4,992	3,654
974.85	5,058	3,906
974.90	5,125	4,160
974.95	5,192	4,418
975.00	5,260	4,679
975.05	5,325	4,944
975.10	5,390	5,212
975.15	5,455	5,483
975.20	5,521	5,757
975.25	5,588	6,035
975.30	5,654	6,316
975.35	5,721	6,601
975.40	5,789	6,888
975.45	5,857	7,179
975.50	5,925	7,474
975.55	5,994	7,772
975.60	6,063	8,073
975.65	6,132	8,378
975.70	6,202	8,687
975.75	6,273	8,999
975.80	6,343	9,314
975.85	6,414	9,633
975.90	6,486	9,955
975.95	6,558	10,281
976.00	6,630	10,611
976.05	6,700	10,944
976.10	6,770	11,281
976.15	6,841	11,621
976.20	6,912	11,965
976.25	6,984	12,313
976.30	7,056	12,664
976.35	7,128	13,018
976.40	7,200	13,376
976.45	7,273	13,738
976.50	7,347	14,104
976.55	7,420	14,473
976.60	7,494	14,846
976.65	7,569	15,222
976.70	7,644	15,603
976.75	7,719	15,987
976.80	7,794	16,375
976.85	7,870	16,766
976.90	7,946	17,162
976.95	8,023	17,561
977.00	**8,100**	**17,964**

Summary for Pond 5P: P2

[80] Warning: Exceeded Pond 4P by 0.08' @ 12.63 hrs (0.03 cfs 0.001 af)

Inflow Area = 4.502 ac, 53.93% Impervious, Inflow Depth > 2.71" for 5-Year event
Inflow = 13.18 cfs @ 12.23 hrs, Volume= 1.016 af
Outflow = 2.50 cfs @ 13.09 hrs, Volume= 1.016 af, Atten= 81%, Lag= 51.3 min
Primary = 2.50 cfs @ 13.09 hrs, Volume= 1.016 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 974.78' @ 12.74 hrs Surf.Area= 18,570 sf Storage= 18,980 cf

Plug-Flow detention time= 132.7 min calculated for 1.016 af (100% of inflow)
Center-of-Mass det. time= 132.4 min (987.5 - 855.1)

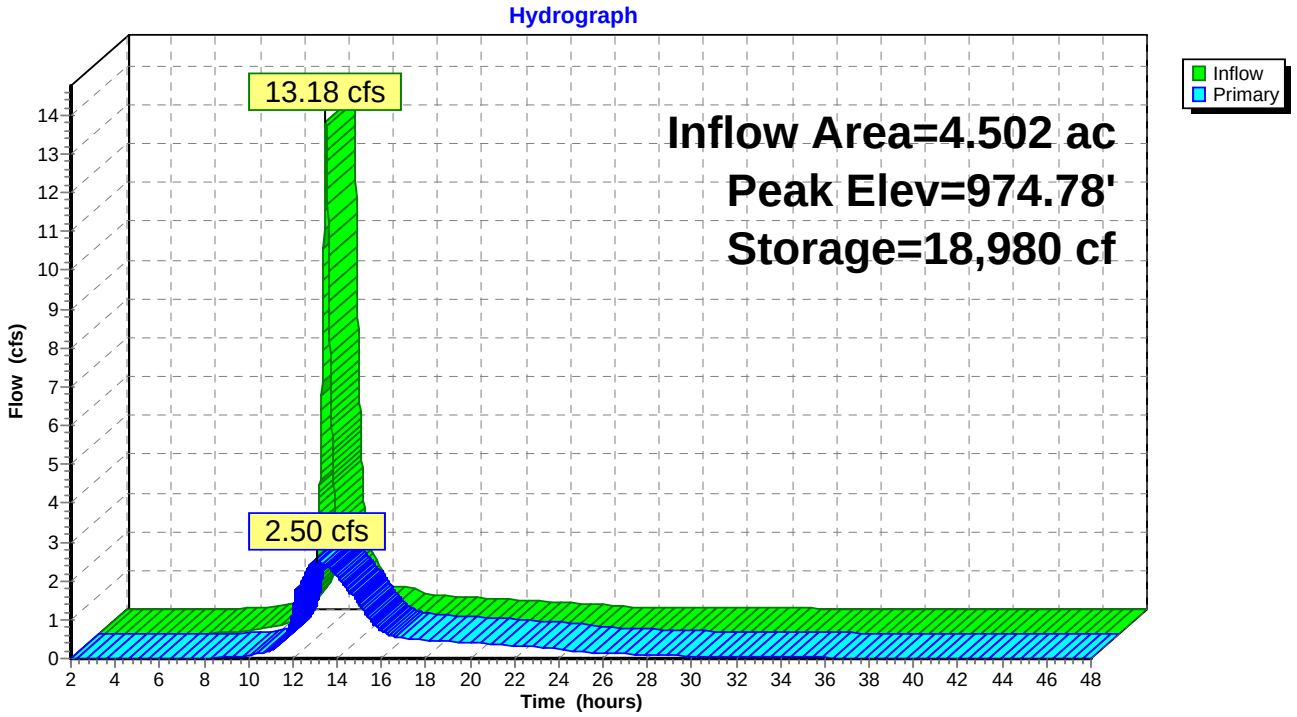
Volume	Invert	Avail.Storage	Storage Description
#1	972.90'	69,780 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
972.90	5	12.0	0	0	5
973.00	6,040	510.0	207	207	20,692
974.00	9,910	760.0	7,896	8,103	45,965
975.00	21,570	1,415.0	15,367	23,470	159,339
976.00	76,690	1,830.0	46,311	69,780	266,516

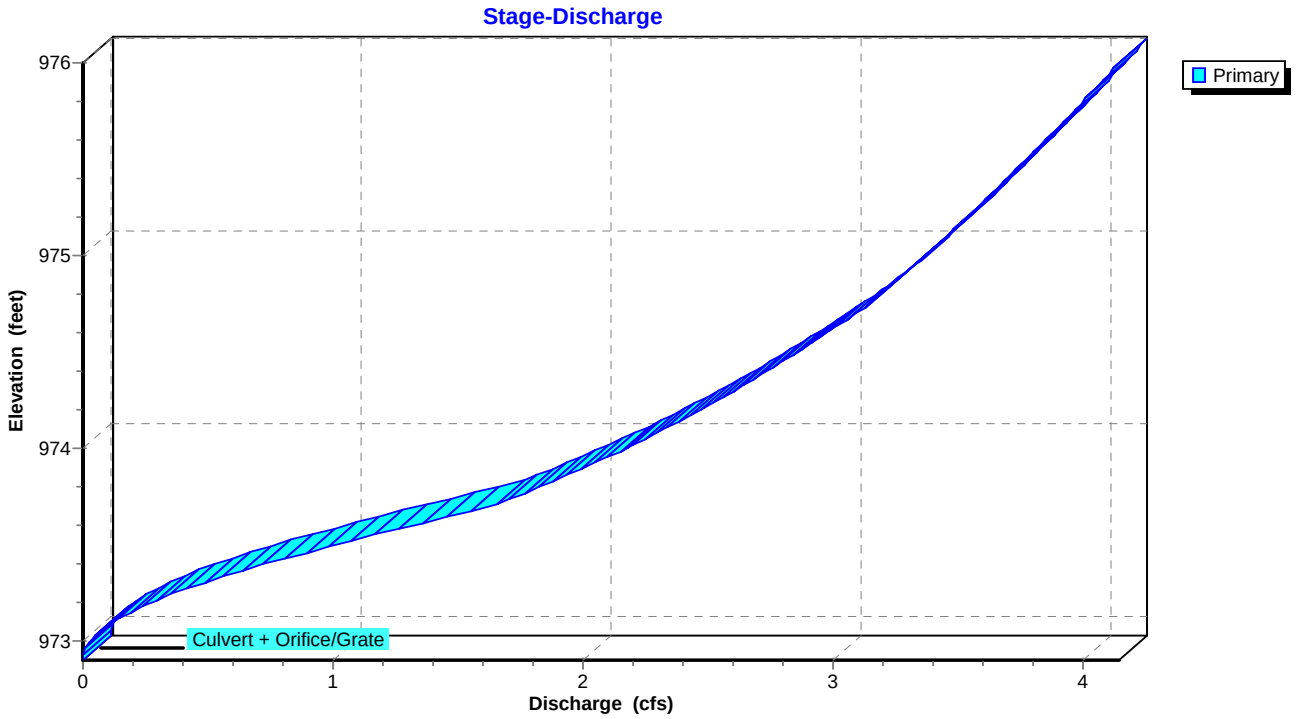
Device	Routing	Invert	Outlet Devices
#1	Primary	972.90'	**12.0" Round Culvert** L= 170.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 972.90' / 972.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	972.90'	**10.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.50 cfs @ 13.09 hrs HW=974.73' TW=973.65' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 2.50 cfs @ 3.19 fps)
↑**2=Orifice/Grate** (Passes 2.50 cfs of 2.73 cfs potential flow)

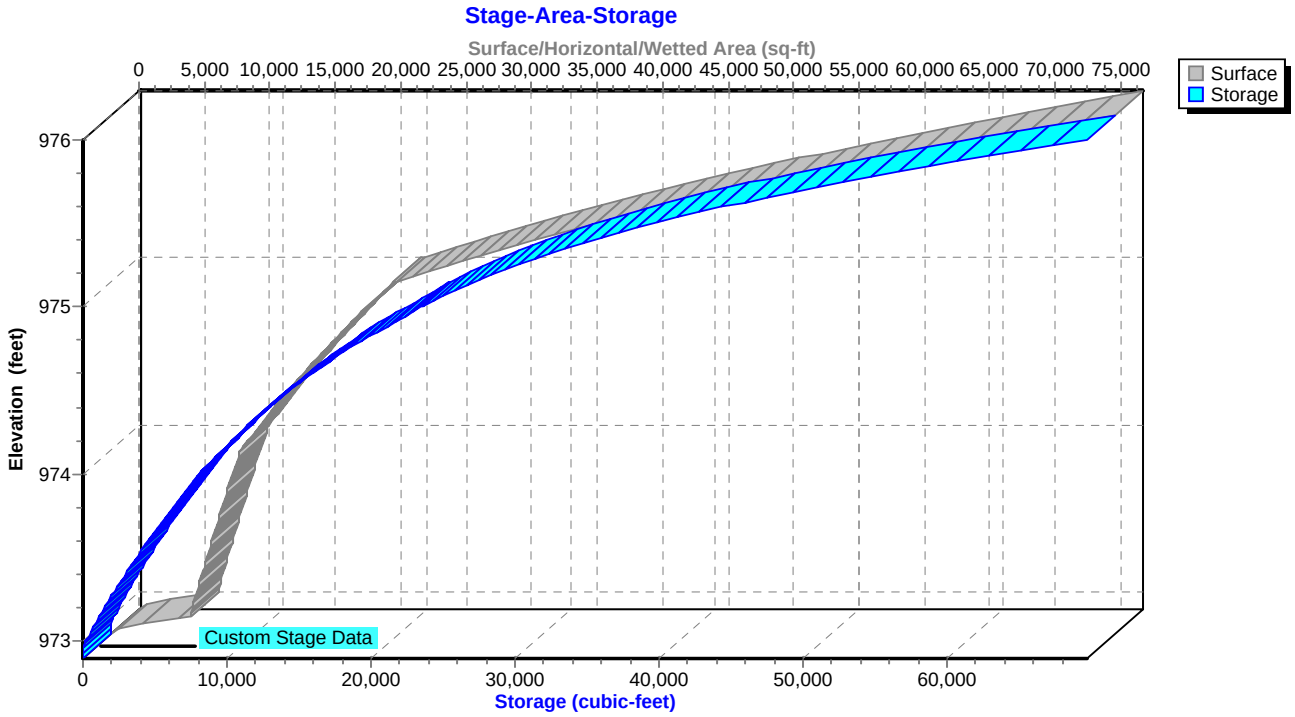
Pond 5P: P2



Pond 5P: P2



Pond 5P: P2


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0 5,000 10,000 15,000 20,000 25,000 30,000 35,000 40,000 45,000 50,000 55,000 60,000 65,000 70,000 75,000
Surface
Storage
976
975
974
973
Elevation (feet)
Custom Stage Data
0 10,000 20,000 30,000 40,000 50,000 60,000
Storage (cubic-feet)

Stage-Discharge for Pond 5P: P2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
972.90	0.00	973.96	2.11	975.02	3.38
972.92	0.00	973.98	2.14	975.04	3.40
972.94	0.00	974.00	2.17	975.06	3.42
972.96	0.01	974.02	2.20	975.08	3.43
972.98	0.02	974.04	2.23	975.10	3.45
973.00	0.03	974.06	2.26	975.12	3.47
973.02	0.04	974.08	2.29	975.14	3.48
973.04	0.06	974.10	2.32	975.16	3.50
973.06	0.08	974.12	2.35	975.18	3.52
973.08	0.10	974.14	2.38	975.20	3.53
973.10	0.12	974.16	2.41	975.22	3.55
973.12	0.15	974.18	2.44	975.24	3.57
973.14	0.18	974.20	2.47	975.26	3.58
973.16	0.21	974.22	2.50	975.28	3.60
973.18	0.24	974.24	2.52	975.30	3.62
973.20	0.28	974.26	2.55	975.32	3.63
973.22	0.31	974.28	2.58	975.34	3.65
973.24	0.35	974.30	2.60	975.36	3.66
973.26	0.39	974.32	2.63	975.38	3.68
973.28	0.44	974.34	2.66	975.40	3.70
973.30	0.48	974.36	2.68	975.42	3.71
973.32	0.53	974.38	2.71	975.44	3.73
973.34	0.58	974.40	2.73	975.46	3.74
973.36	0.63	974.42	2.76	975.48	3.76
973.38	0.68	974.44	2.78	975.50	3.77
973.40	0.73	974.46	2.81	975.52	3.79
973.42	0.79	974.48	2.83	975.54	3.80
973.44	0.84	974.50	2.86	975.56	3.82
973.46	0.90	974.52	2.88	975.58	3.83
973.48	0.96	974.54	2.90	975.60	3.85
973.50	1.01	974.56	2.93	975.62	3.86
973.52	1.07	974.58	2.95	975.64	3.88
973.54	1.13	974.60	2.98	975.66	3.89
973.56	1.19	974.62	3.00	975.68	3.91
973.58	1.26	974.64	3.02	975.70	3.92
973.60	1.32	974.66	3.04	975.72	3.94
973.62	1.38	974.68	3.07	975.74	3.95
973.64	1.44	974.70	3.09	975.76	3.97
973.66	1.51	974.72	3.11	975.78	3.98
973.68	1.57	974.74	3.13	975.80	4.00
973.70	1.63	974.76	3.15	975.82	4.01
973.72	1.68	974.78	3.17	975.84	4.03
973.74	1.71	974.80	3.19	975.86	4.04
973.76	1.75	974.82	3.21	975.88	4.05
973.78	1.79	974.84	3.22	975.90	4.07
973.80	1.83	974.86	3.24	975.92	4.08
973.82	1.86	974.88	3.26	975.94	4.10
973.84	1.90	974.90	3.28	975.96	4.11
973.86	1.94	974.92	3.30	975.98	4.13
973.88	1.97	974.94	3.31	976.00	**4.14**
973.90	2.01	974.96	3.33		
973.92	2.04	974.98	3.35		
973.94	2.07	975.00	3.37		

Stage-Area-Storage for Pond 5P: P2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
972.90	5	0
972.95	1,598	28
973.00	6,040	207
973.05	6,211	514
973.10	6,384	828
973.15	6,560	1,152
973.20	6,738	1,484
973.25	6,918	1,826
973.30	7,101	2,176
973.35	7,286	2,536
973.40	7,474	2,905
973.45	7,664	3,283
973.50	7,856	3,671
973.55	8,051	4,069
973.60	8,248	4,476
973.65	8,447	4,894
973.70	8,649	5,321
973.75	8,853	5,759
973.80	9,060	6,207
973.85	9,269	6,665
973.90	9,480	7,133
973.95	9,694	7,613
974.00	9,910	8,103
974.05	10,387	8,610
974.10	10,874	9,142
974.15	11,374	9,698
974.20	11,884	10,279
974.25	12,405	10,886
974.30	12,938	11,520
974.35	13,482	12,180
974.40	14,037	12,868
974.45	14,603	13,584
974.50	15,180	14,329
974.55	15,769	15,102
974.60	16,369	15,906
974.65	16,980	16,740
974.70	17,602	17,604
974.75	18,235	18,500
974.80	18,880	19,428
974.85	19,536	20,388
974.90	20,202	21,381
974.95	20,881	22,408
975.00	21,570	23,470
975.05	23,522	24,597
975.10	25,560	25,823
975.15	27,681	27,154
975.20	29,887	28,593
975.25	32,178	30,144
975.30	34,554	31,812
975.35	37,014	33,601
975.40	39,558	35,515
975.45	42,187	37,558
975.50	44,901	39,735
975.55	47,699	42,050
975.60	50,582	44,506
975.65	53,550	47,109
975.70	56,602	49,863
975.75	59,738	52,771
975.80	62,959	55,838
975.85	66,265	59,068
975.90	69,656	62,466
975.95	73,130	66,035
976.00	**76,690**	**69,780**

Summary for Pond 6P: P3

Inflow Area = 8.085 ac, 62.91% Impervious, Inflow Depth = 2.86" for 5-Year event
Inflow = 18.36 cfs @ 12.16 hrs, Volume= 1.925 af
Outflow = 6.37 cfs @ 12.42 hrs, Volume= 1.925 af, Atten= 65%, Lag= 15.4 min
Primary = 6.37 cfs @ 12.42 hrs, Volume= 1.925 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 973.97' @ 12.42 hrs Surf.Area= 9,474 sf Storage= 15,943 cf

Plug-Flow detention time= 127.2 min calculated for 1.925 af (100% of inflow)
Center-of-Mass det. time= 127.2 min (1,015.5 - 888.3)

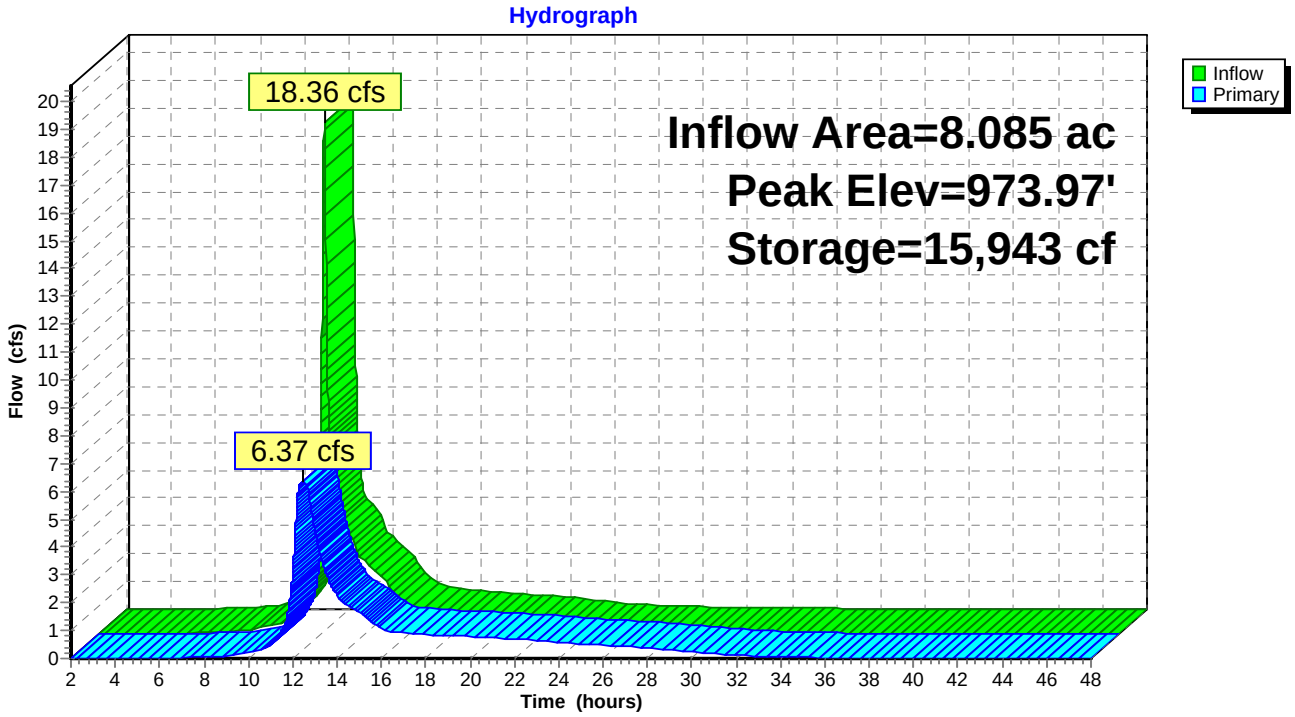
Volume	Invert	Avail.Storage	Storage Description
#1	971.85'	52,405 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
971.85	5	12.0	0	0	5
972.00	6,485	355.0	334	334	10,022
973.00	7,950	380.0	7,205	7,539	11,530
974.00	9,530	410.0	8,728	16,267	13,457
975.00	17,380	930.0	13,260	29,527	68,911
976.00	28,860	1,080.0	22,879	52,405	92,924

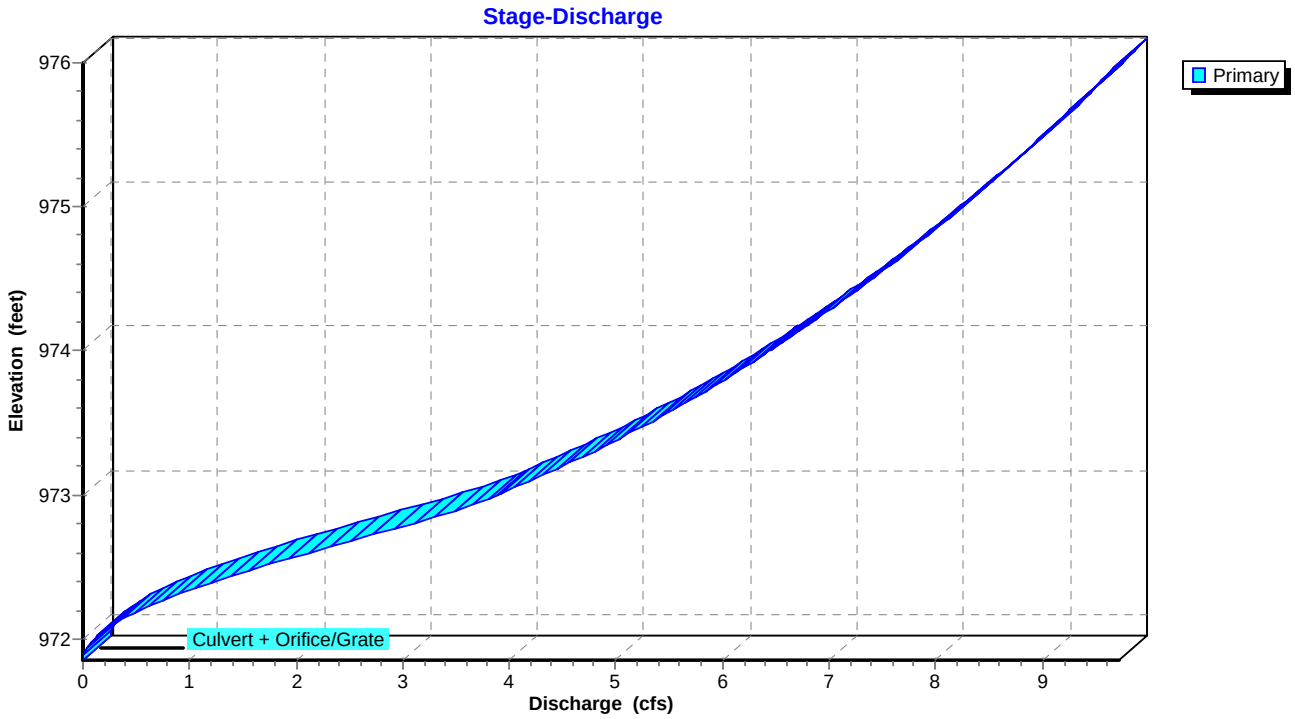
Device	Routing	Invert	Outlet Devices
#1	Primary	971.85'	**15.0" Round Culvert X 2.00** L= 350.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 971.85' / 970.10' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	971.85'	**14.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=6.37 cfs @ 12.42 hrs HW=973.97' TW=971.95' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 6.37 cfs of 9.00 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 6.37 cfs @ 5.96 fps)

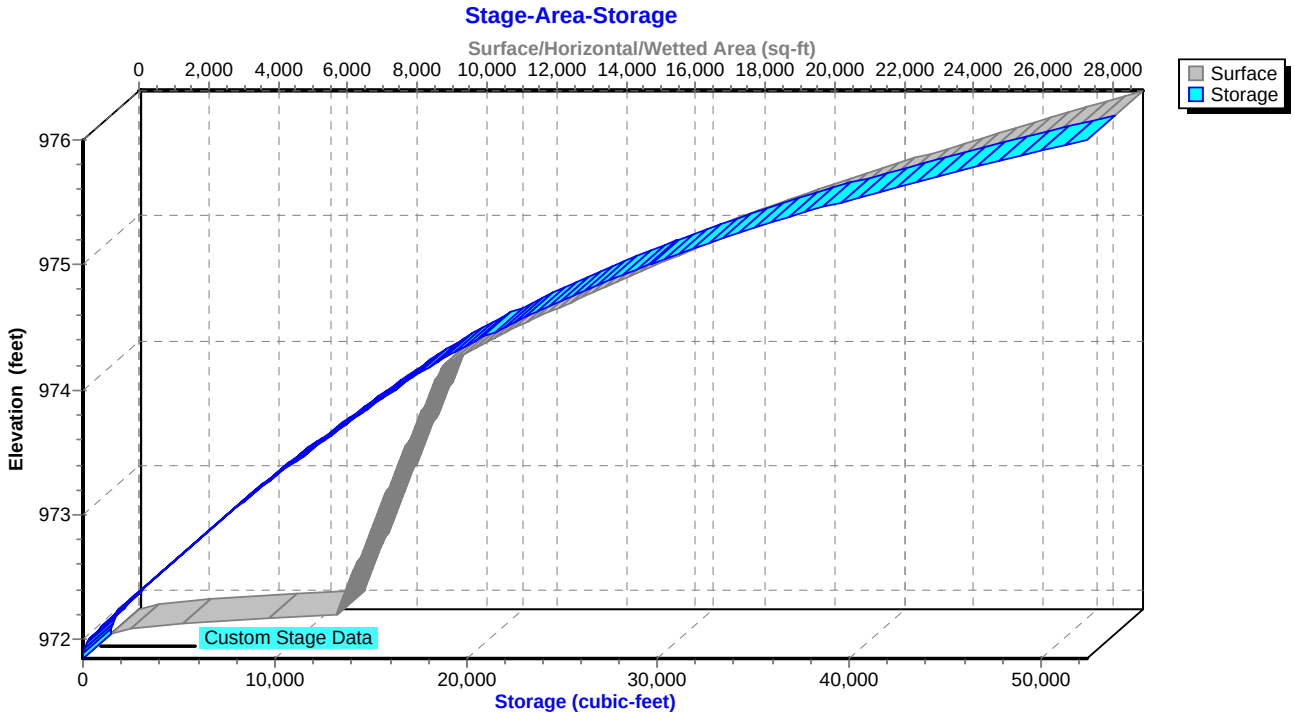
Pond 6P: P3



Pond 6P: P3



Pond 6P: P3


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0 2,000 4,000 6,000 8,000 10,000 12,000 14,000 16,000 18,000 20,000 22,000 24,000 26,000 28,000
Surface
Storage
976
975
974
973
972
Elevation (feet)
Custom Stage Data
0 10,000 20,000 30,000 40,000 50,000
Storage (cubic-feet)

Stage-Discharge for Pond 6P: P3

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
971.85	0.00	972.91	3.58	973.97	6.38	975.03	8.29
971.87	0.00	972.93	3.66	973.99	6.42	975.05	8.33
971.89	0.01	972.95	3.73	974.01	6.46	975.07	8.36
971.91	0.02	972.97	3.80	974.03	6.50	975.09	8.39
971.93	0.03	972.99	3.86	974.05	6.54	975.11	8.42
971.95	0.05	973.01	3.92	974.07	6.59	975.13	8.45
971.97	0.07	973.03	3.98	974.09	6.63	975.15	8.48
971.99	0.09	973.05	4.04	974.11	6.67	975.17	8.52
972.01	0.12	973.07	4.11	974.13	6.70	975.19	8.55
972.03	0.15	973.09	4.17	974.15	6.74	975.21	8.58
972.05	0.19	973.11	4.23	974.17	6.78	975.23	8.61
972.07	0.22	973.13	4.30	974.19	6.82	975.25	8.64
972.09	0.26	973.15	4.36	974.21	6.86	975.27	8.67
972.11	0.31	973.17	4.42	974.23	6.90	975.29	8.70
972.13	0.36	973.19	4.48	974.25	6.94	975.31	8.73
972.15	0.41	973.21	4.54	974.27	6.98	975.33	8.76
972.17	0.46	973.23	4.59	974.29	7.01	975.35	8.79
972.19	0.51	973.25	4.65	974.31	7.05	975.37	8.82
972.21	0.57	973.27	4.71	974.33	7.09	975.39	8.85
972.23	0.63	973.29	4.76	974.35	7.13	975.41	8.88
972.25	0.70	973.31	4.82	974.37	7.16	975.43	8.91
972.27	0.76	973.33	4.87	974.39	7.20	975.45	8.94
972.29	0.83	973.35	4.93	974.41	7.24	975.47	8.97
972.31	0.90	973.37	4.98	974.43	7.27	975.49	9.00
972.33	0.98	973.39	5.03	974.45	7.31	975.51	9.03
972.35	1.05	973.41	5.09	974.47	7.35	975.53	9.06
972.37	1.13	973.43	5.14	974.49	7.38	975.55	9.09
972.39	1.21	973.45	5.19	974.51	7.42	975.57	9.12
972.41	1.29	973.47	5.24	974.53	7.45	975.59	9.15
972.43	1.38	973.49	5.29	974.55	7.49	975.61	9.17
972.45	1.46	973.51	5.34	974.57	7.52	975.63	9.20
972.47	1.55	973.53	5.39	974.59	7.56	975.65	9.23
972.49	1.64	973.55	5.44	974.61	7.59	975.67	9.26
972.51	1.73	973.57	5.49	974.63	7.63	975.69	9.29
972.53	1.82	973.59	5.54	974.65	7.66	975.71	9.32
972.55	1.91	973.61	5.58	974.67	7.70	975.73	9.35
972.57	2.00	973.63	5.63	974.69	7.73	975.75	9.37
972.59	2.09	973.65	5.68	974.71	7.77	975.77	9.40
972.61	2.19	973.67	5.72	974.73	7.80	975.79	9.43
972.63	2.28	973.69	5.77	974.75	7.83	975.81	9.46
972.65	2.38	973.71	5.82	974.77	7.87	975.83	9.49
972.67	2.48	973.73	5.86	974.79	7.90	975.85	9.51
972.69	2.57	973.75	5.91	974.81	7.94	975.87	9.54
972.71	2.67	973.77	5.95	974.83	7.97	975.89	9.57
972.73	2.76	973.79	6.00	974.85	8.00	975.91	9.60
972.75	2.86	973.81	6.04	974.87	8.03	975.93	9.63
972.77	2.95	973.83	6.08	974.89	8.07	975.95	9.65
972.79	3.05	973.85	6.13	974.91	8.10	975.97	9.68
972.81	3.14	973.87	6.17	974.93	8.13	975.99	**9.71**
972.83	3.23	973.89	6.21	974.95	8.17		
972.85	3.32	973.91	6.25	974.97	8.20		
972.87	3.41	973.93	6.30	974.99	8.23		
972.89	3.49	973.95	6.34	975.01	8.26		

Stage-Area-Storage for Pond 6P: P3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
971.85	5	0
971.90	803	15
971.95	2,963	103
972.00	6,485	334
972.05	6,555	659
972.10	6,625	989
972.15	6,695	1,322
972.20	6,766	1,659
972.25	6,837	1,999
972.30	6,909	2,342
972.35	6,981	2,689
972.40	7,053	3,040
972.45	7,126	3,395
972.50	7,199	3,753
972.55	7,272	4,115
972.60	7,346	4,480
972.65	7,420	4,849
972.70	7,495	5,222
972.75	7,570	5,599
972.80	7,645	5,979
972.85	7,721	6,363
972.90	7,797	6,751
972.95	7,873	7,143
973.00	7,950	7,539
973.05	8,026	7,938
973.10	8,102	8,341
973.15	8,178	8,748
973.20	8,255	9,159
973.25	8,332	9,574
973.30	8,409	9,992
973.35	8,487	10,414
973.40	8,565	10,841
973.45	8,643	11,271
973.50	8,722	11,705
973.55	8,801	12,143
973.60	8,881	12,585
973.65	8,961	13,031
973.70	9,041	13,481
973.75	9,122	13,935
973.80	9,203	14,393
973.85	9,284	14,856
973.90	9,366	15,322
973.95	9,448	15,792
974.00	9,530	16,267
974.05	9,867	16,752
974.10	10,210	17,253
974.15	10,558	17,773
974.20	10,913	18,309
974.25	11,273	18,864
974.30	11,639	19,437
974.35	12,011	20,028
974.40	12,389	20,638
974.45	12,773	21,267
974.50	13,162	21,915
974.55	13,558	22,583
974.60	13,959	23,271
974.65	14,366	23,979
974.70	14,779	24,708
974.75	15,198	25,457
974.80	15,623	26,228
974.85	16,053	27,020
974.90	16,490	27,833
974.95	16,932	28,669
975.00	17,380	29,527
975.05	17,885	30,408
975.10	18,398	31,315
975.15	18,917	32,248
975.20	19,444	33,207
975.25	19,979	34,193
975.30	20,520	35,205
975.35	21,069	36,245
975.40	21,625	37,312
975.45	22,188	38,407
975.50	22,758	39,531
975.55	23,336	40,683
975.60	23,921	41,865
975.65	24,513	43,075
975.70	25,112	44,316
975.75	25,719	45,587
975.80	26,332	46,888
975.85	26,953	48,220
975.90	27,582	49,583
975.95	28,217	50,978
976.00	**28,860**	**52,405**

Summary for Pond 7P: P4

Inflow Area = 9.299 ac, 61.07% Impervious, Inflow Depth > 2.83" for 5-Year event
Inflow = 10.64 cfs @ 12.14 hrs, Volume= 2.193 af
Outflow = 1.25 cfs @ 15.76 hrs, Volume= 2.191 af, Atten= 88%, Lag= 217.4 min
Primary = 1.25 cfs @ 15.76 hrs, Volume= 2.191 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 973.75' @ 15.76 hrs Surf.Area= 14,684 sf Storage= 41,724 cf

Plug-Flow detention time= 424.0 min calculated for 2.191 af (100% of inflow)
Center-of-Mass det. time= 422.0 min (1,409.6 - 987.5)

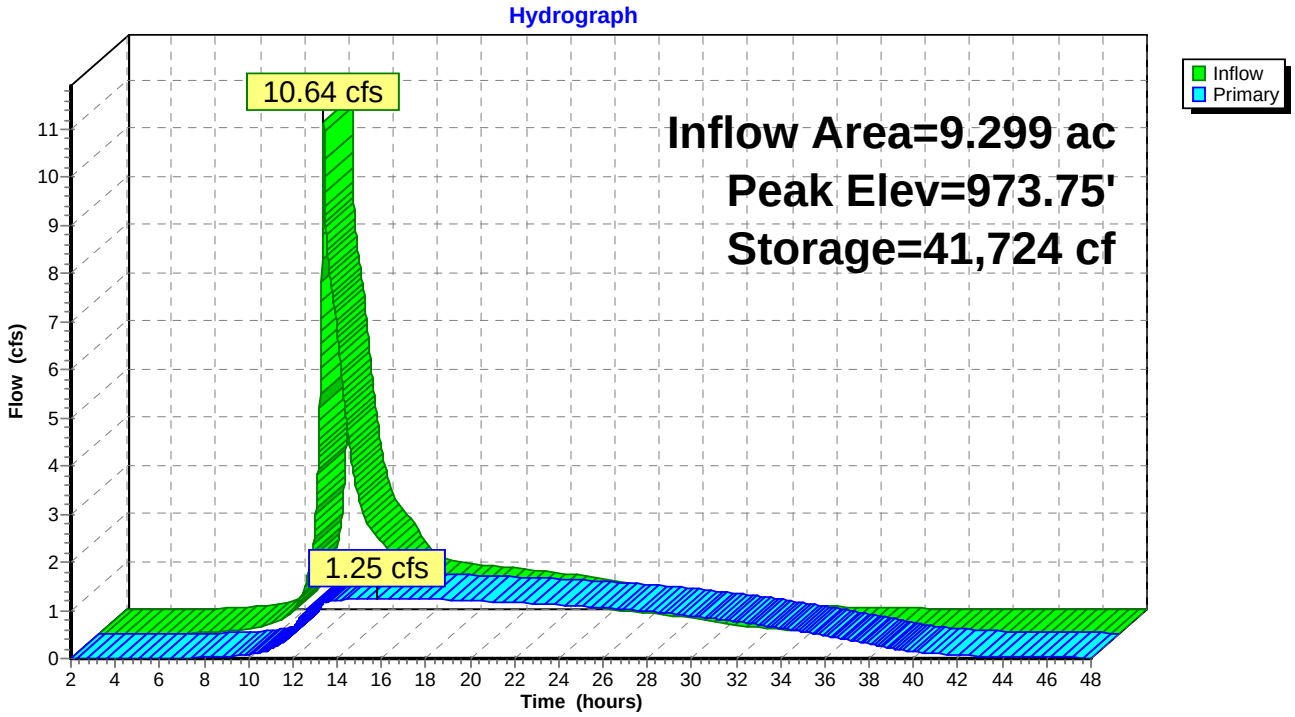
Volume	Invert	Avail.Storage	Storage Description
#1	969.90'	85,438 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
969.90	5	12.0	0	0	5
970.00	7,890	380.0	270	270	11,485
971.00	9,460	405.0	8,663	8,933	13,095
972.00	11,135	435.0	10,286	19,219	15,144
973.00	13,155	473.0	12,131	31,350	17,927
974.00	15,225	510.0	14,177	45,527	20,862
975.00	17,805	560.0	16,498	62,026	25,153
976.00	29,510	955.0	23,412	85,438	72,781

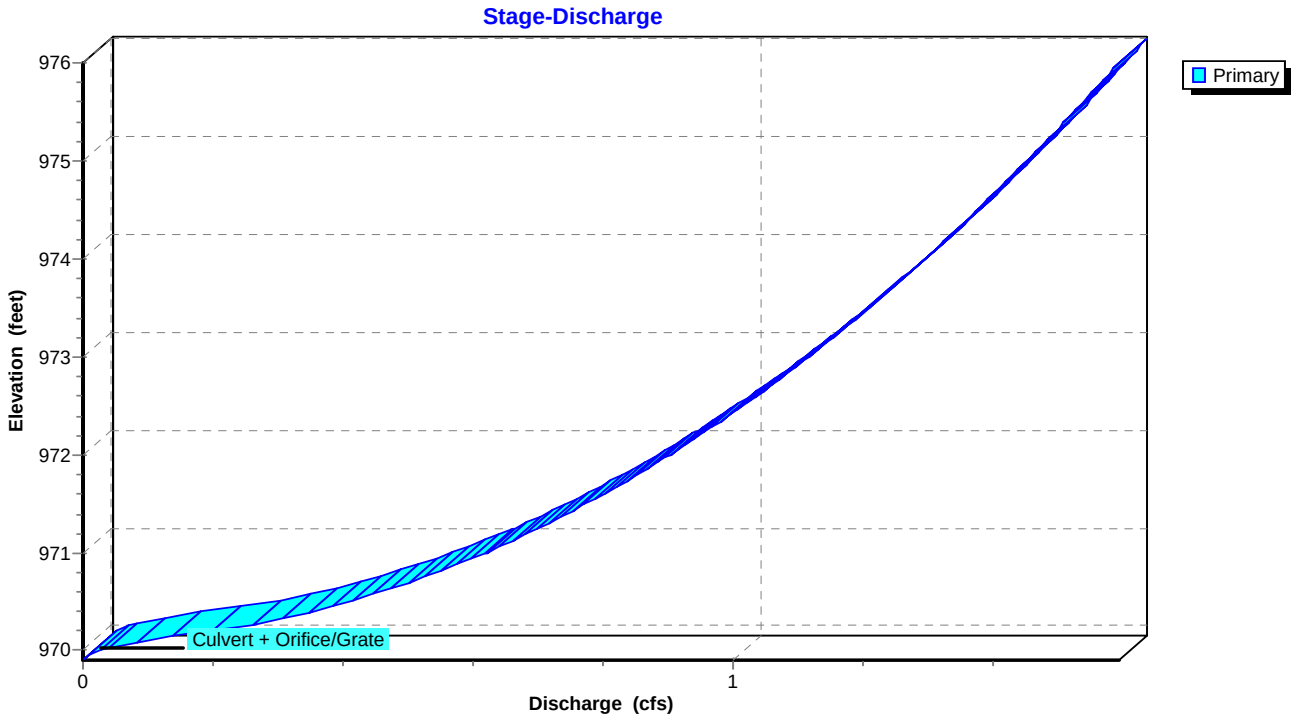
Device	Routing	Invert	Outlet Devices
#1	Primary	969.90'	**15.0" Round Culvert** L= 35.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 969.90' / 969.73' S= 0.0049 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Device 1	969.90'	**5.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.25 cfs @ 15.76 hrs HW=973.75' (Free Discharge)
↑—**1=Culvert** (Passes 1.25 cfs of 10.60 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 1.25 cfs @ 9.18 fps)

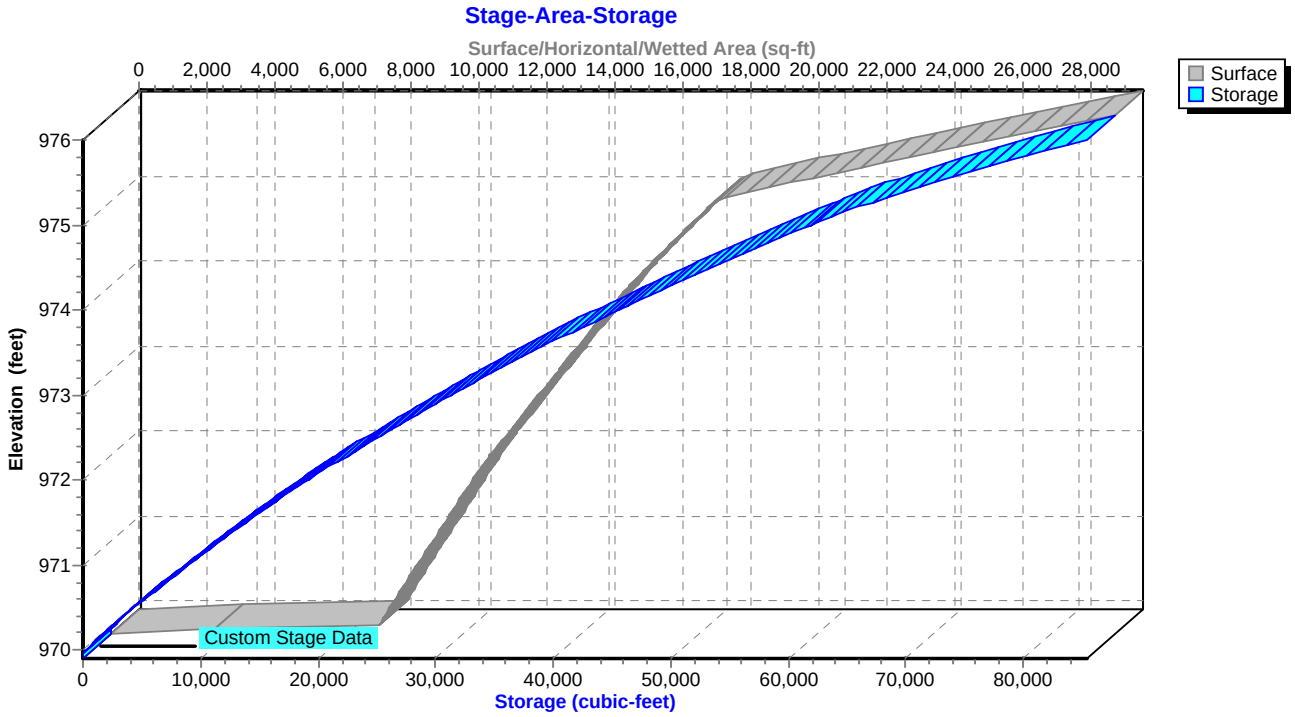
Pond 7P: P4



Pond 7P: P4



Pond 7P: P4


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0 2,000 4,000 6,000 8,000 10,000 12,000 14,000 16,000 18,000 20,000 22,000 24,000 26,000 28,000
Surface
Storage
976
975
974
973
972
971
970
Elevation (feet)
Custom Stage Data
0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000
Storage (cubic-feet)

Stage-Discharge for Pond 7P: P4

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
969.90	0.00	972.02	0.91	974.14	1.32
969.94	0.00	972.06	0.92	974.18	1.32
969.98	0.02	972.10	0.93	974.22	1.33
970.02	0.04	972.14	0.94	974.26	1.34
970.06	0.07	972.18	0.94	974.30	1.34
970.10	0.10	972.22	0.95	974.34	1.35
970.14	0.14	972.26	0.96	974.38	1.36
970.18	0.18	972.30	0.97	974.42	1.36
970.22	0.22	972.34	0.98	974.46	1.37
970.26	0.26	972.38	0.99	974.50	1.38
970.30	0.29	972.42	1.00	974.54	1.38
970.34	0.32	972.46	1.01	974.58	1.39
970.38	0.34	972.50	1.02	974.62	1.39
970.42	0.37	972.54	1.02	974.66	1.40
970.46	0.39	972.58	1.03	974.70	1.41
970.50	0.41	972.62	1.04	974.74	1.41
970.54	0.43	972.66	1.05	974.78	1.42
970.58	0.45	972.70	1.06	974.82	1.43
970.62	0.47	972.74	1.07	974.86	1.43
970.66	0.49	972.78	1.07	974.90	1.44
970.70	0.51	972.82	1.08	974.94	1.44
970.74	0.52	972.86	1.09	974.98	1.45
970.78	0.54	972.90	1.10	975.02	1.46
970.82	0.55	972.94	1.10	975.06	1.46
970.86	0.57	972.98	1.11	975.10	1.47
970.90	0.58	973.02	1.12	975.14	1.47
970.94	0.60	973.06	1.13	975.18	1.48
970.98	0.61	973.10	1.14	975.22	1.48
971.02	0.63	973.14	1.14	975.26	1.49
971.06	0.64	973.18	1.15	975.30	1.50
971.10	0.65	973.22	1.16	975.34	1.50
971.14	0.67	973.26	1.17	975.38	1.51
971.18	0.68	973.30	1.17	975.42	1.51
971.22	0.69	973.34	1.18	975.46	1.52
971.26	0.70	973.38	1.19	975.50	1.52
971.30	0.72	973.42	1.19	975.54	1.53
971.34	0.73	973.46	1.20	975.58	1.54
971.38	0.74	973.50	1.21	975.62	1.54
971.42	0.75	973.54	1.22	975.66	1.55
971.46	0.76	973.58	1.22	975.70	1.55
971.50	0.77	973.62	1.23	975.74	1.56
971.54	0.79	973.66	1.24	975.78	1.56
971.58	0.80	973.70	1.24	975.82	1.57
971.62	0.81	973.74	1.25	975.86	1.57
971.66	0.82	973.78	1.26	975.90	1.58
971.70	0.83	973.82	1.26	975.94	1.59
971.74	0.84	973.86	1.27	975.98	**1.59**
971.78	0.85	973.90	1.28		
971.82	0.86	973.94	1.29		
971.86	0.87	973.98	1.29		
971.90	0.88	974.02	1.30		
971.94	0.89	974.06	1.31		
971.98	0.90	974.10	1.31		

Stage-Area-Storage for Pond 7P: P4

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
969.90	5	0
970.00	7,890	270
970.10	8,041	1,066
970.20	8,193	1,878
970.30	8,346	2,705
970.40	8,501	3,547
970.50	8,657	4,405
970.60	8,815	5,279
970.70	8,974	6,168
970.80	9,135	7,074
970.90	9,297	7,995
971.00	9,460	8,933
971.10	9,621	9,887
971.20	9,784	10,857
971.30	9,948	11,844
971.40	10,114	12,847
971.50	10,280	13,867
971.60	10,449	14,903
971.70	10,618	15,956
971.80	10,789	17,027
971.90	10,961	18,114
972.00	11,135	19,219
972.10	11,329	20,342
972.20	11,526	21,485
972.30	11,723	22,647
972.40	11,923	23,830
972.50	12,124	25,032
972.60	12,327	26,255
972.70	12,531	27,497
972.80	12,738	28,761
972.90	12,945	30,045
973.00	13,155	31,350
973.10	13,355	32,676
973.20	13,557	34,021
973.30	13,760	35,387
973.40	13,965	36,773
973.50	14,171	38,180
973.60	14,379	39,607
973.70	14,588	41,056
973.80	14,799	42,525
973.90	15,011	44,016
974.00	15,225	45,527
974.10	15,474	47,062
974.20	15,725	48,622
974.30	15,978	50,207
974.40	16,233	51,818
974.50	16,490	53,454
974.60	16,749	55,116
974.70	17,010	56,804
974.80	17,273	58,518
974.90	17,538	60,258
975.00	17,805	62,026
975.10	18,843	63,858
975.20	19,911	65,795
975.30	21,008	67,841
975.40	22,134	69,998
975.50	23,290	72,269
975.60	24,475	74,657
975.70	25,690	77,165
975.80	26,934	79,796
975.90	28,207	82,552
976.00	**29,510**	**85,438**

Summary for Pond 8P: P5

Inflow Area = 3.274 ac, 71.38% Impervious, Inflow Depth = 3.04" for 5-Year event
Inflow = 16.24 cfs @ 12.14 hrs, Volume= 0.831 af
Outflow = 2.76 cfs @ 12.49 hrs, Volume= 0.831 af, Atten= 83%, Lag= 20.8 min
Primary = 2.76 cfs @ 12.49 hrs, Volume= 0.831 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 972.93' @ 12.49 hrs Surf.Area= 7,207 sf Storage= 15,302 cf

Plug-Flow detention time= 64.2 min calculated for 0.831 af (100% of inflow)
Center-of-Mass det. time= 64.3 min (840.2 - 775.9)

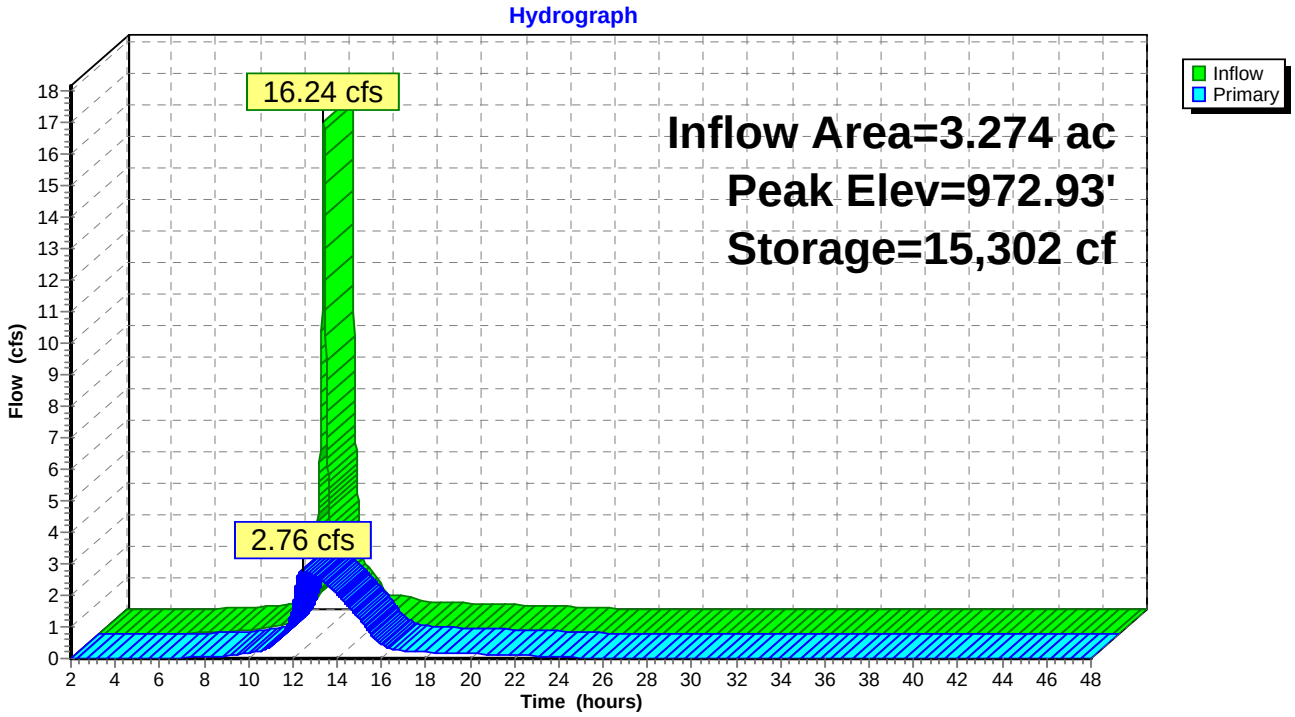
Volume	Invert	Avail.Storage	Storage Description
#1	969.90'	45,413 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
969.90	5	12.0	0	0	5
970.00	3,410	270.0	118	118	5,795
971.00	4,555	300.0	3,969	4,087	7,185
972.00	5,795	325.0	5,163	9,249	8,467
973.00	7,315	360.0	6,540	15,790	10,405
974.00	8,965	400.0	8,126	23,916	12,854
975.00	10,760	435.0	9,849	33,765	15,217
976.00	12,560	460.0	11,648	45,413	17,053

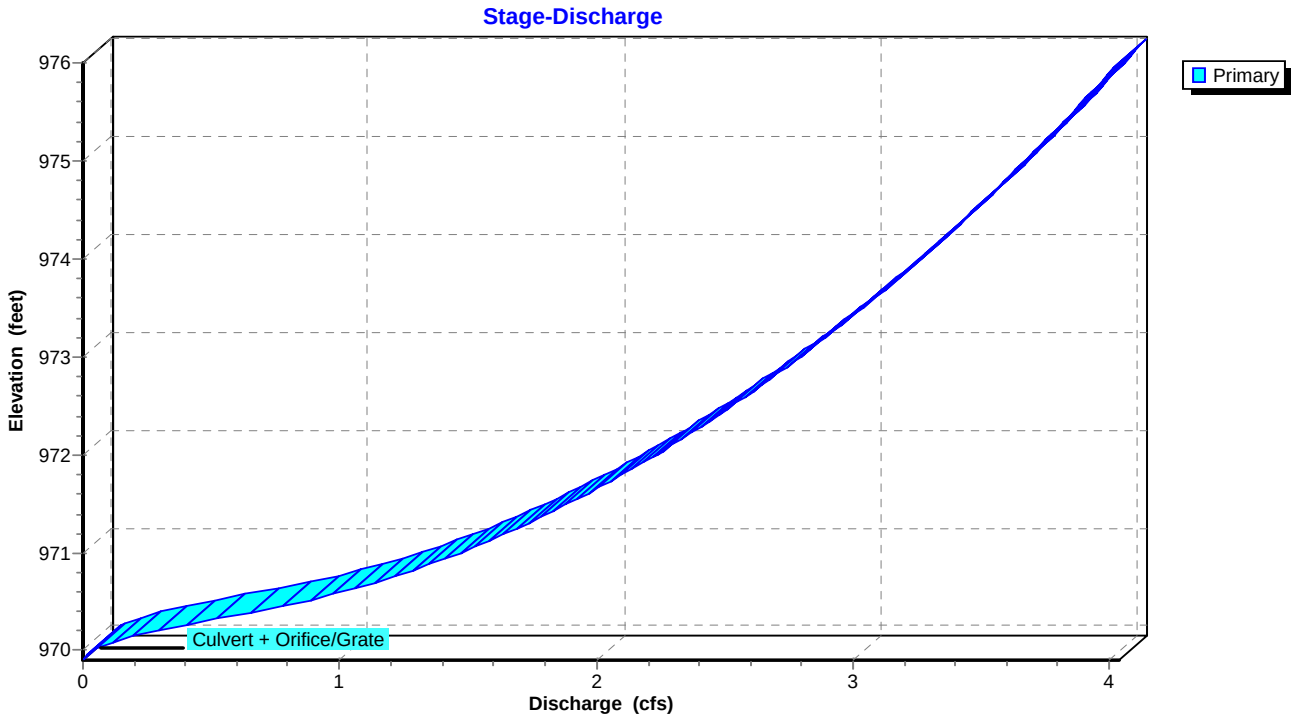
Device	Routing	Invert	Outlet Devices
#1	Primary	969.90'	**15.0" Round Culvert** L= 30.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 969.90' / 969.75' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Device 1	969.90'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.76 cfs @ 12.49 hrs HW=972.93' (Free Discharge)
↑—**1=Culvert** (Passes 2.76 cfs of 9.17 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 2.76 cfs @ 7.91 fps)

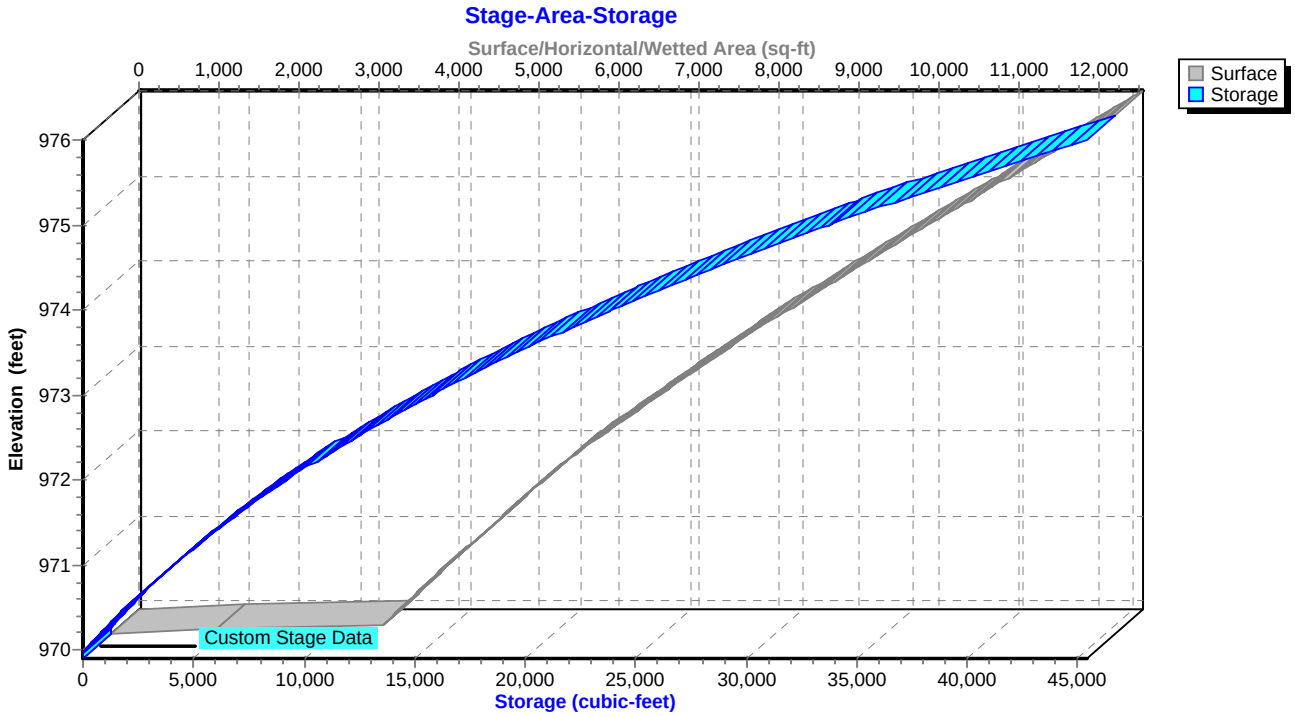
Pond 8P: P5



Pond 8P: P5



Pond 8P: P5


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
Surface
Storage
976
975
974
973
972
971
970
Elevation (feet)
Custom Stage Data
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
Storage (cubic-feet)

Stage-Discharge for Pond 8P: P5

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
969.90	0.00	972.02	2.25	974.14	3.32
969.94	0.01	972.06	2.27	974.18	3.34
969.98	0.02	972.10	2.30	974.22	3.36
970.02	0.05	972.14	2.32	974.26	3.37
970.06	0.09	972.18	2.35	974.30	3.39
970.10	0.13	972.22	2.37	974.34	3.41
970.14	0.19	972.26	2.39	974.38	3.42
970.18	0.25	972.30	2.42	974.42	3.44
970.22	0.32	972.34	2.44	974.46	3.46
970.26	0.39	972.38	2.46	974.50	3.47
970.30	0.47	972.42	2.49	974.54	3.49
970.34	0.55	972.46	2.51	974.58	3.50
970.38	0.63	972.50	2.53	974.62	3.52
970.42	0.72	972.54	2.55	974.66	3.54
970.46	0.80	972.58	2.57	974.70	3.55
970.50	0.87	972.62	2.60	974.74	3.57
970.54	0.94	972.66	2.62	974.78	3.58
970.58	0.99	972.70	2.64	974.82	3.60
970.62	1.05	972.74	2.66	974.86	3.62
970.66	1.10	972.78	2.68	974.90	3.63
970.70	1.15	972.82	2.70	974.94	3.65
970.74	1.20	972.86	2.72	974.98	3.66
970.78	1.24	972.90	2.74	975.02	3.68
970.82	1.29	972.94	2.77	975.06	3.69
970.86	1.33	972.98	2.79	975.10	3.71
970.90	1.37	973.02	2.81	975.14	3.72
970.94	1.41	973.06	2.83	975.18	3.74
970.98	1.45	973.10	2.85	975.22	3.75
971.02	1.49	973.14	2.87	975.26	3.77
971.06	1.53	973.18	2.89	975.30	3.78
971.10	1.56	973.22	2.90	975.34	3.80
971.14	1.60	973.26	2.92	975.38	3.81
971.18	1.64	973.30	2.94	975.42	3.83
971.22	1.67	973.34	2.96	975.46	3.84
971.26	1.70	973.38	2.98	975.50	3.86
971.30	1.74	973.42	3.00	975.54	3.87
971.34	1.77	973.46	3.02	975.58	3.89
971.38	1.80	973.50	3.04	975.62	3.90
971.42	1.83	973.54	3.06	975.66	3.92
971.46	1.86	973.58	3.07	975.70	3.93
971.50	1.89	973.62	3.09	975.74	3.94
971.54	1.92	973.66	3.11	975.78	3.96
971.58	1.95	973.70	3.13	975.82	3.97
971.62	1.98	973.74	3.15	975.86	3.99
971.66	2.01	973.78	3.17	975.90	4.00
971.70	2.04	973.82	3.18	975.94	4.02
971.74	2.06	973.86	3.20	975.98	**4.03**
971.78	2.09	973.90	3.22		
971.82	2.12	973.94	3.24		
971.86	2.14	973.98	3.25		
971.90	2.17	974.02	3.27		
971.94	2.20	974.06	3.29		
971.98	2.22	974.10	3.30		

Stage-Area-Storage for Pond 8P: P5

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
969.90	5	0
970.00	3,410	118
970.10	3,517	465
970.20	3,626	822
970.30	3,736	1,190
970.40	3,848	1,569
970.50	3,962	1,959
970.60	4,077	2,361
970.70	4,194	2,775
970.80	4,313	3,200
970.90	4,433	3,638
971.00	4,555	4,087
971.10	4,672	4,548
971.20	4,791	5,021
971.30	4,911	5,507
971.40	5,033	6,004
971.50	5,156	6,513
971.60	5,281	7,035
971.70	5,407	7,569
971.80	5,535	8,117
971.90	5,664	8,677
972.00	5,795	9,249
972.10	5,939	9,836
972.20	6,085	10,437
972.30	6,232	11,053
972.40	6,382	11,684
972.50	6,533	12,330
972.60	6,686	12,991
972.70	6,840	13,667
972.80	6,997	14,359
972.90	7,155	15,066
973.00	7,315	15,790
973.10	7,472	16,529
973.20	7,632	17,284
973.30	7,792	18,055
973.40	7,955	18,843
973.50	8,119	19,647
973.60	8,285	20,467
973.70	8,452	21,304
973.80	8,622	22,157
973.90	8,792	23,028
974.00	8,965	23,916
974.10	9,137	24,821
974.20	9,311	25,743
974.30	9,486	26,683
974.40	9,663	27,641
974.50	9,842	28,616
974.60	10,022	29,609
974.70	10,204	30,620
974.80	10,388	31,650
974.90	10,573	32,698
975.00	10,760	33,765
975.10	10,934	34,849
975.20	11,109	35,951
975.30	11,285	37,071
975.40	11,463	38,209
975.50	11,643	39,364
975.60	11,823	40,537
975.70	12,005	41,729
975.80	12,189	42,938
975.90	12,374	44,166
976.00	**12,560**	**45,413**

Summary for Pond 4P: P1

Inflow Area = 0.627 ac, 23.76% Impervious, Inflow Depth = 6.01" for 100-Year event
Inflow = 5.71 cfs @ 12.14 hrs, Volume= 0.314 af
Outflow = 0.11 cfs @ 40.23 hrs, Volume= 0.251 af, Atten= 98%, Lag= 1,685.5 min
Primary = 0.11 cfs @ 40.23 hrs, Volume= 0.251 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 976.12' @ 18.46 hrs Surf.Area= 6,794 sf Storage= 11,395 cf

Plug-Flow detention time= 1,167.9 min calculated for 0.251 af (80% of inflow)
Center-of-Mass det. time= 1,108.0 min (1,888.4 - 780.5)

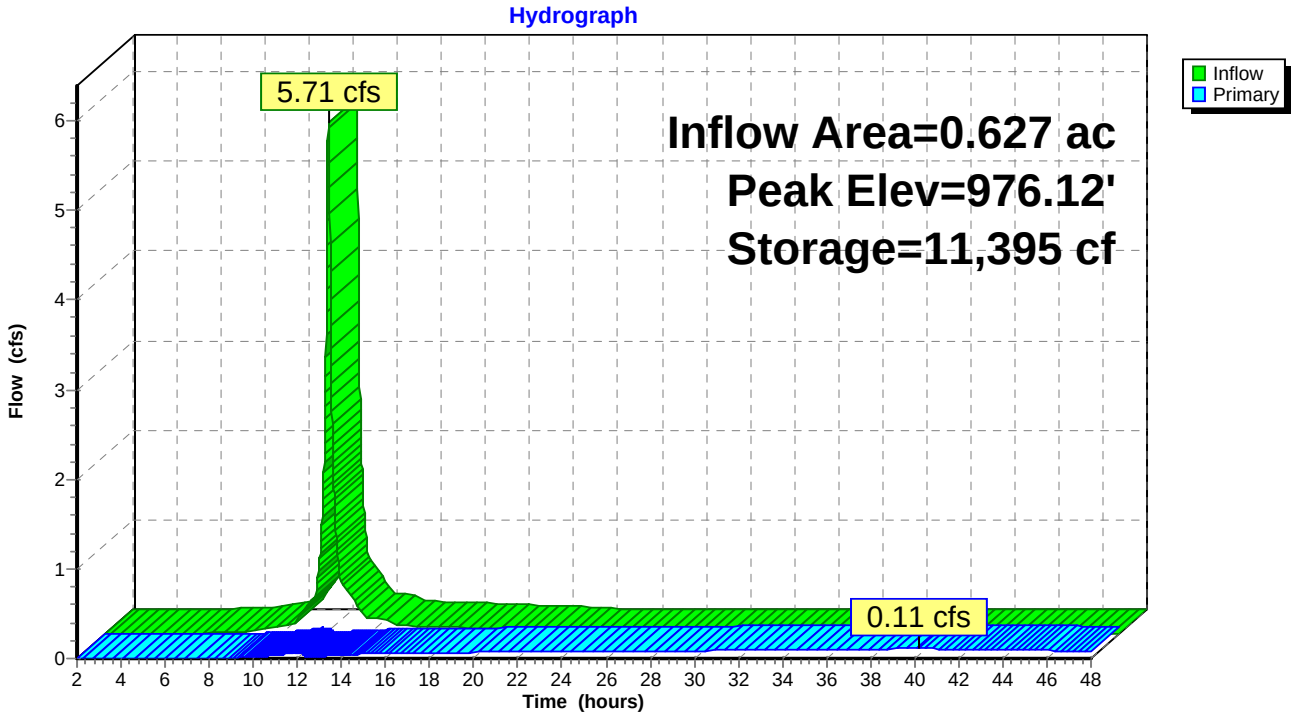
Volume	Invert	Avail.Storage	Storage Description
#1	973.95'	17,964 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
973.95	5	12.0	0	0	5
974.00	3,990	305.0	69	69	7,396
975.00	5,260	330.0	4,610	4,679	8,699
976.00	6,630	355.0	5,932	10,611	10,104
977.00	8,100	380.0	7,353	17,964	11,612

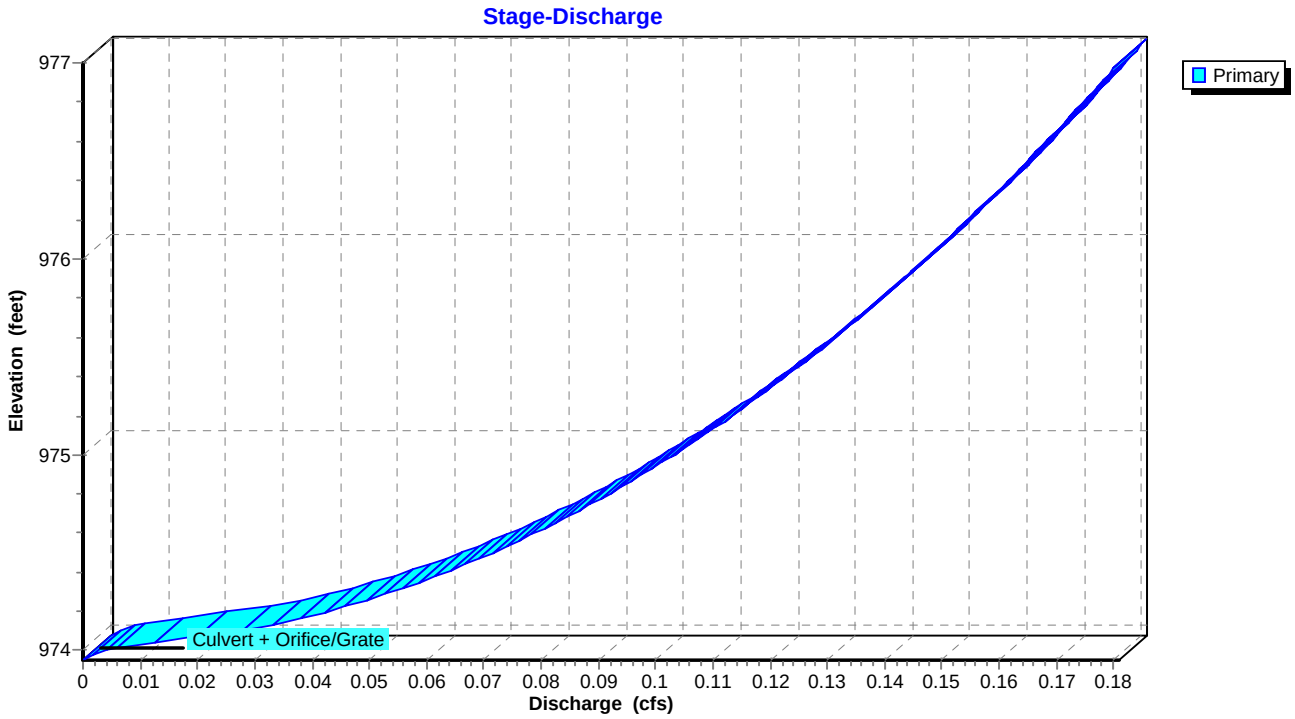
Device	Routing	Invert	Outlet Devices
#1	Primary	973.95'	**12.0" Round Culvert** L= 180.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 973.95' / 973.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	973.95'	**2.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.11 cfs @ 40.23 hrs HW=975.14' TW=974.03' (Dynamic Tailwater)
1=Culvert (Passes 0.11 cfs of 2.57 cfs potential flow)
2=Orifice/Grate (Orifice Controls 0.11 cfs @ 5.07 fps)

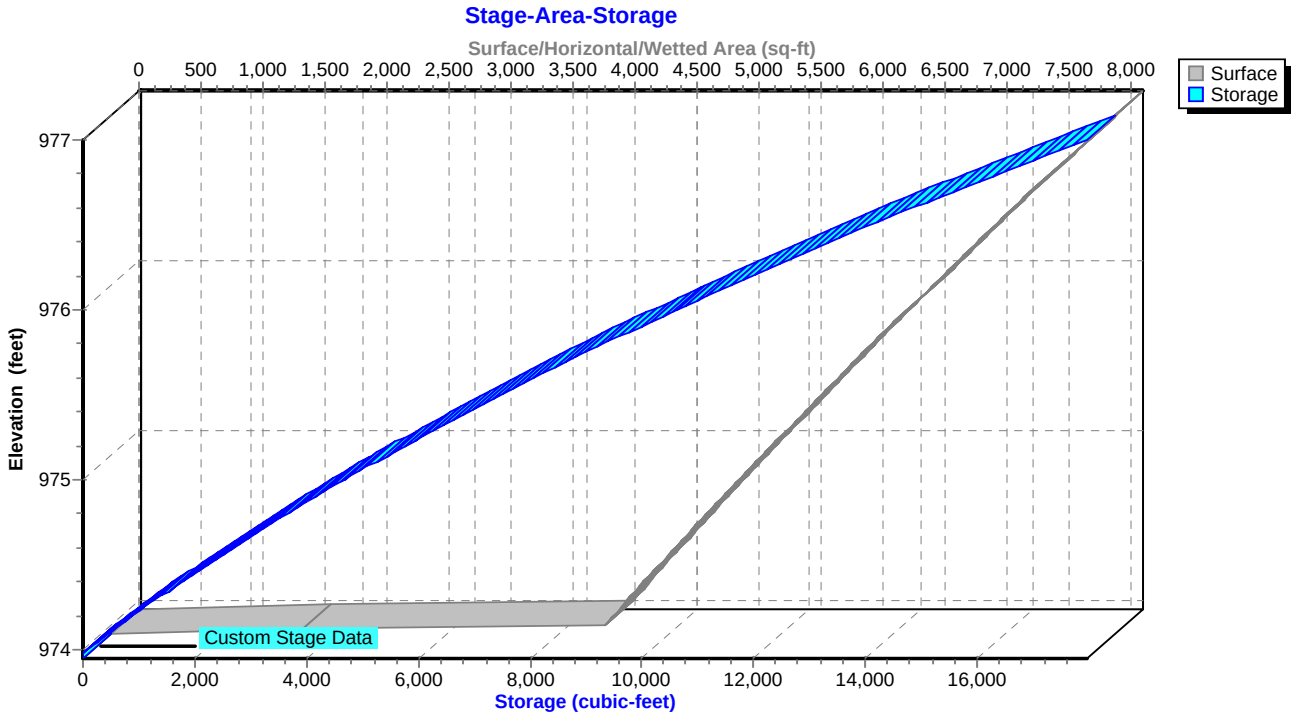
Pond 4P: P1



Pond 4P: P1



Pond 4P: P1


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0 500 1,000 1,500 2,000 2,500 3,000 3,500 4,000 4,500 5,000 5,500 6,000 6,500 7,000 7,500 8,000
Surface
Storage
977
976
975
974
Elevation (feet)
Custom Stage Data
0 2,000 4,000 6,000 8,000 10,000 12,000 14,000 16,000
Storage (cubic-feet)

Stage-Discharge for Pond 4P: P1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
973.95	0.00	975.01	0.10	976.07	0.15
973.97	0.00	975.03	0.10	976.09	0.15
973.99	0.00	975.05	0.11	976.11	0.15
974.01	0.01	975.07	0.11	976.13	0.15
974.03	0.01	975.09	0.11	976.15	0.15
974.05	0.01	975.11	0.11	976.17	0.15
974.07	0.02	975.13	0.11	976.19	0.15
974.09	0.02	975.15	0.11	976.21	0.15
974.11	0.03	975.17	0.11	976.23	0.16
974.13	0.03	975.19	0.11	976.25	0.16
974.15	0.04	975.21	0.11	976.27	0.16
974.17	0.04	975.23	0.11	976.29	0.16
974.19	0.04	975.25	0.12	976.31	0.16
974.21	0.04	975.27	0.12	976.33	0.16
974.23	0.05	975.29	0.12	976.35	0.16
974.25	0.05	975.31	0.12	976.37	0.16
974.27	0.05	975.33	0.12	976.39	0.16
974.29	0.05	975.35	0.12	976.41	0.16
974.31	0.06	975.37	0.12	976.43	0.16
974.33	0.06	975.39	0.12	976.45	0.16
974.35	0.06	975.41	0.12	976.47	0.16
974.37	0.06	975.43	0.12	976.49	0.16
974.39	0.06	975.45	0.13	976.51	0.17
974.41	0.06	975.47	0.13	976.53	0.17
974.43	0.07	975.49	0.13	976.55	0.17
974.45	0.07	975.51	0.13	976.57	0.17
974.47	0.07	975.53	0.13	976.59	0.17
974.49	0.07	975.55	0.13	976.61	0.17
974.51	0.07	975.57	0.13	976.63	0.17
974.53	0.07	975.59	0.13	976.65	0.17
974.55	0.08	975.61	0.13	976.67	0.17
974.57	0.08	975.63	0.13	976.69	0.17
974.59	0.08	975.65	0.13	976.71	0.17
974.61	0.08	975.67	0.13	976.73	0.17
974.63	0.08	975.69	0.14	976.75	0.17
974.65	0.08	975.71	0.14	976.77	0.17
974.67	0.08	975.73	0.14	976.79	0.17
974.69	0.09	975.75	0.14	976.81	0.18
974.71	0.09	975.77	0.14	976.83	0.18
974.73	0.09	975.79	0.14	976.85	0.18
974.75	0.09	975.81	0.14	976.87	0.18
974.77	0.09	975.83	0.14	976.89	0.18
974.79	0.09	975.85	0.14	976.91	0.18
974.81	0.09	975.87	0.14	976.93	0.18
974.83	0.09	975.89	0.14	976.95	0.18
974.85	0.09	975.91	0.14	976.97	0.18
974.87	0.10	975.93	0.14	976.99	**0.18**
974.89	0.10	975.95	0.15		
974.91	0.10	975.97	0.15		
974.93	0.10	975.99	0.15		
974.95	0.10	976.01	0.15		
974.97	0.10	976.03	0.15		
974.99	0.10	976.05	0.15		

Stage-Area-Storage for Pond 4P: P1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
973.95	5	0
974.00	3,990	69
974.05	4,049	270
974.10	4,109	474
974.15	4,169	681
974.20	4,230	891
974.25	4,291	1,104
974.30	4,353	1,320
974.35	4,415	1,539
974.40	4,477	1,761
974.45	4,540	1,987
974.50	4,603	2,215
974.55	4,667	2,447
974.60	4,731	2,682
974.65	4,796	2,920
974.70	4,861	3,162
974.75	4,926	3,406
974.80	4,992	3,654
974.85	5,058	3,906
974.90	5,125	4,160
974.95	5,192	4,418
975.00	5,260	4,679
975.05	5,325	4,944
975.10	5,390	5,212
975.15	5,455	5,483
975.20	5,521	5,757
975.25	5,588	6,035
975.30	5,654	6,316
975.35	5,721	6,601
975.40	5,789	6,888
975.45	5,857	7,179
975.50	5,925	7,474
975.55	5,994	7,772
975.60	6,063	8,073
975.65	6,132	8,378
975.70	6,202	8,687
975.75	6,273	8,999
975.80	6,343	9,314
975.85	6,414	9,633
975.90	6,486	9,955
975.95	6,558	10,281
976.00	6,630	10,611
976.05	6,700	10,944
976.10	6,770	11,281
976.15	6,841	11,621
976.20	6,912	11,965
976.25	6,984	12,313
976.30	7,056	12,664
976.35	7,128	13,018
976.40	7,200	13,376
976.45	7,273	13,738
976.50	7,347	14,104
976.55	7,420	14,473
976.60	7,494	14,846
976.65	7,569	15,222
976.70	7,644	15,603
976.75	7,719	15,987
976.80	7,794	16,375
976.85	7,870	16,766
976.90	7,946	17,162
976.95	8,023	17,561
977.00	**8,100**	**17,964**

Summary for Pond 5P: P2

Inflow Area = 4.502 ac, 53.93% Impervious, Inflow Depth > 6.48" for 100-Year event
Inflow = 30.23 cfs @ 12.23 hrs, Volume= 2.432 af
Outflow = 2.15 cfs @ 11.89 hrs, Volume= 2.393 af, Atten= 93%, Lag= 0.0 min
Primary = 2.15 cfs @ 11.89 hrs, Volume= 2.393 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 975.86' @ 13.73 hrs Surf.Area= 67,081 sf Storage= 59,878 cf

Plug-Flow detention time= 584.5 min calculated for 2.393 af (98% of inflow)
Center-of-Mass det. time= 554.5 min (1,443.4 - 888.9)

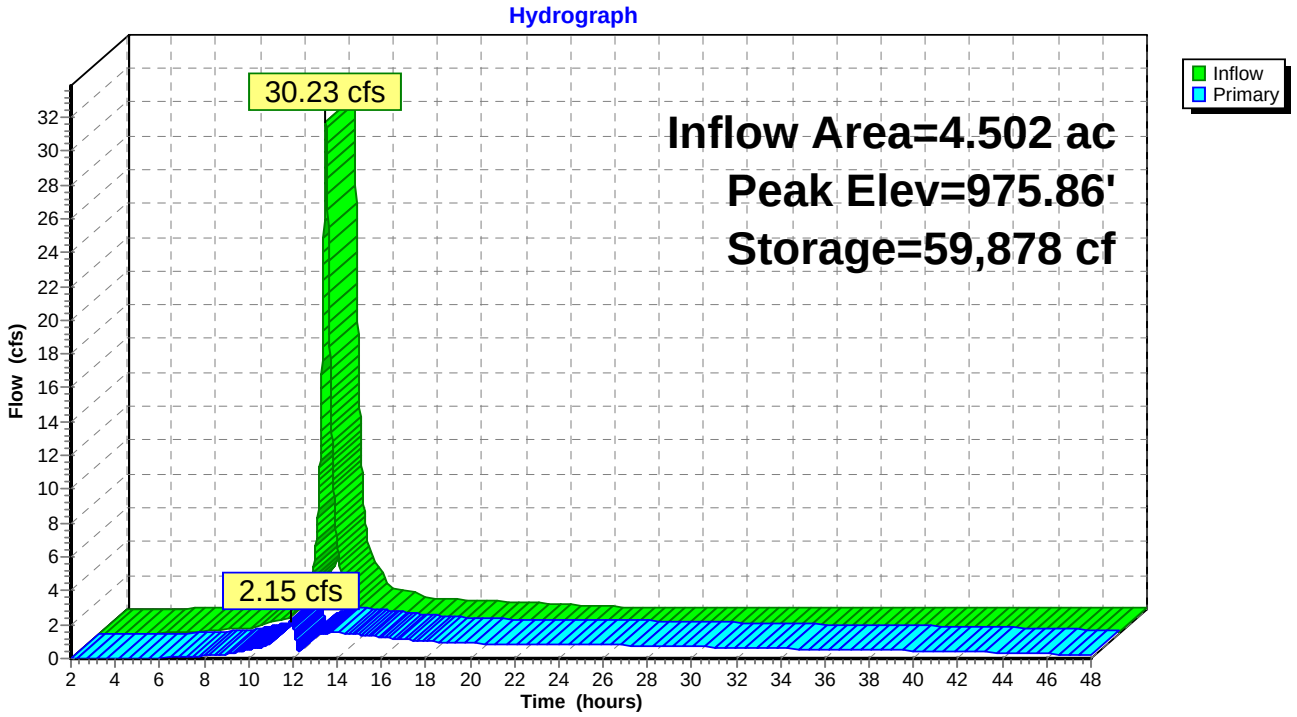
Volume	Invert	Avail.Storage	Storage Description
#1	972.90'	69,780 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
972.90	5	12.0	0	0	5
973.00	6,040	510.0	207	207	20,692
974.00	9,910	760.0	7,896	8,103	45,965
975.00	21,570	1,415.0	15,367	23,470	159,339
976.00	76,690	1,830.0	46,311	69,780	266,516

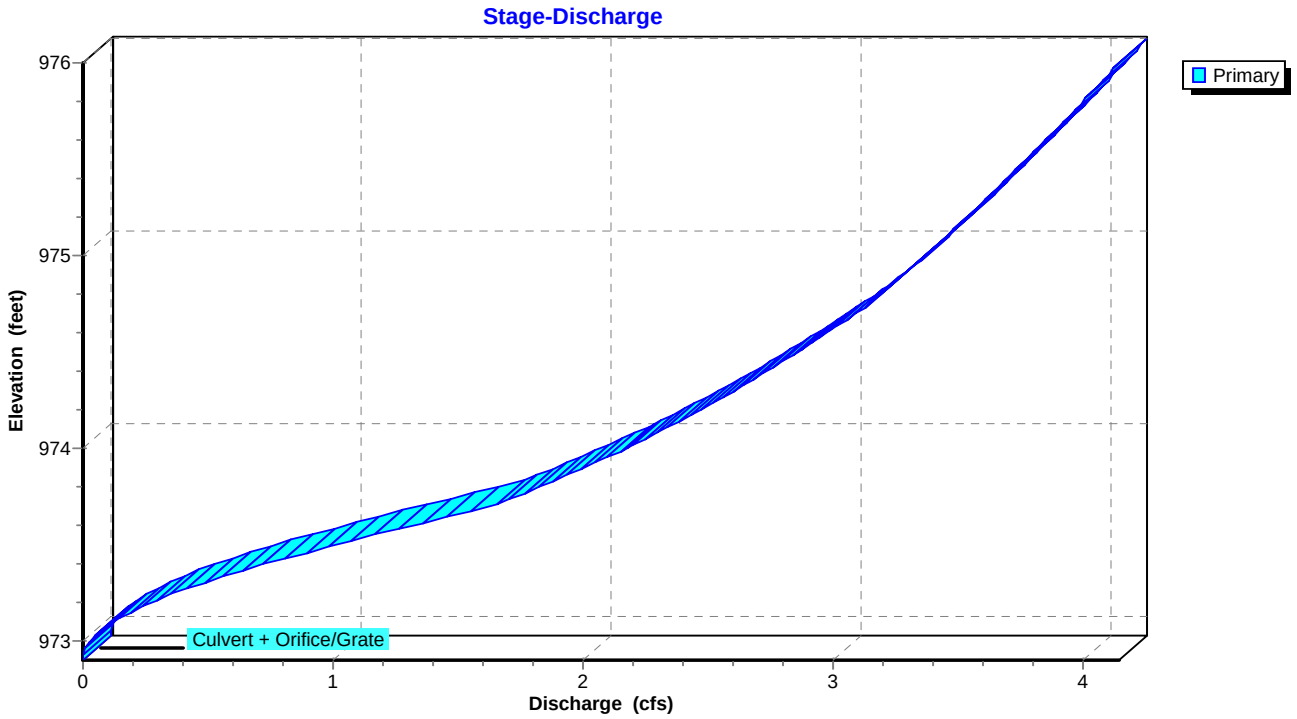
Device	Routing	Invert	Outlet Devices
#1	Primary	972.90'	**12.0" Round Culvert** L= 170.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 972.90' / 972.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	972.90'	**10.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.11 cfs @ 11.89 hrs HW=974.11' TW=973.41' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 2.11 cfs @ 2.81 fps)
↑**2=Orifice/Grate** (Passes 2.11 cfs of 2.21 cfs potential flow)

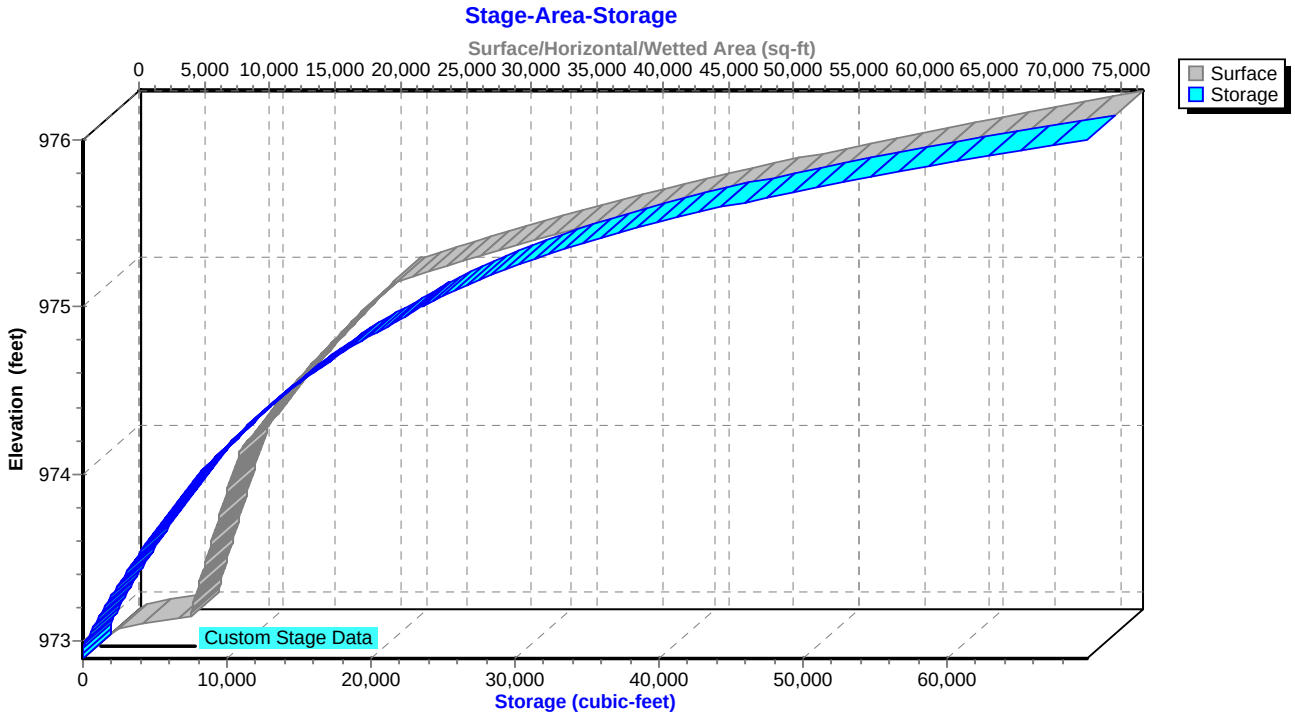
Pond 5P: P2



Pond 5P: P2



Pond 5P: P2


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0 5,000 10,000 15,000 20,000 25,000 30,000 35,000 40,000 45,000 50,000 55,000 60,000 65,000 70,000 75,000
Surface
Storage
976
975
974
973
Elevation (feet)
Custom Stage Data
0 10,000 20,000 30,000 40,000 50,000 60,000
Storage (cubic-feet)

Stage-Discharge for Pond 5P: P2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
972.90	0.00	973.96	2.11	975.02	3.38
972.92	0.00	973.98	2.14	975.04	3.40
972.94	0.00	974.00	2.17	975.06	3.42
972.96	0.01	974.02	2.20	975.08	3.43
972.98	0.02	974.04	2.23	975.10	3.45
973.00	0.03	974.06	2.26	975.12	3.47
973.02	0.04	974.08	2.29	975.14	3.48
973.04	0.06	974.10	2.32	975.16	3.50
973.06	0.08	974.12	2.35	975.18	3.52
973.08	0.10	974.14	2.38	975.20	3.53
973.10	0.12	974.16	2.41	975.22	3.55
973.12	0.15	974.18	2.44	975.24	3.57
973.14	0.18	974.20	2.47	975.26	3.58
973.16	0.21	974.22	2.50	975.28	3.60
973.18	0.24	974.24	2.52	975.30	3.62
973.20	0.28	974.26	2.55	975.32	3.63
973.22	0.31	974.28	2.58	975.34	3.65
973.24	0.35	974.30	2.60	975.36	3.66
973.26	0.39	974.32	2.63	975.38	3.68
973.28	0.44	974.34	2.66	975.40	3.70
973.30	0.48	974.36	2.68	975.42	3.71
973.32	0.53	974.38	2.71	975.44	3.73
973.34	0.58	974.40	2.73	975.46	3.74
973.36	0.63	974.42	2.76	975.48	3.76
973.38	0.68	974.44	2.78	975.50	3.77
973.40	0.73	974.46	2.81	975.52	3.79
973.42	0.79	974.48	2.83	975.54	3.80
973.44	0.84	974.50	2.86	975.56	3.82
973.46	0.90	974.52	2.88	975.58	3.83
973.48	0.96	974.54	2.90	975.60	3.85
973.50	1.01	974.56	2.93	975.62	3.86
973.52	1.07	974.58	2.95	975.64	3.88
973.54	1.13	974.60	2.98	975.66	3.89
973.56	1.19	974.62	3.00	975.68	3.91
973.58	1.26	974.64	3.02	975.70	3.92
973.60	1.32	974.66	3.04	975.72	3.94
973.62	1.38	974.68	3.07	975.74	3.95
973.64	1.44	974.70	3.09	975.76	3.97
973.66	1.51	974.72	3.11	975.78	3.98
973.68	1.57	974.74	3.13	975.80	4.00
973.70	1.63	974.76	3.15	975.82	4.01
973.72	1.68	974.78	3.17	975.84	4.03
973.74	1.71	974.80	3.19	975.86	4.04
973.76	1.75	974.82	3.21	975.88	4.05
973.78	1.79	974.84	3.22	975.90	4.07
973.80	1.83	974.86	3.24	975.92	4.08
973.82	1.86	974.88	3.26	975.94	4.10
973.84	1.90	974.90	3.28	975.96	4.11
973.86	1.94	974.92	3.30	975.98	4.13
973.88	1.97	974.94	3.31	976.00	**4.14**
973.90	2.01	974.96	3.33		
973.92	2.04	974.98	3.35		
973.94	2.07	975.00	3.37		

Stage-Area-Storage for Pond 5P: P2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
972.90	5	0
972.95	1,598	28
973.00	6,040	207
973.05	6,211	514
973.10	6,384	828
973.15	6,560	1,152
973.20	6,738	1,484
973.25	6,918	1,826
973.30	7,101	2,176
973.35	7,286	2,536
973.40	7,474	2,905
973.45	7,664	3,283
973.50	7,856	3,671
973.55	8,051	4,069
973.60	8,248	4,476
973.65	8,447	4,894
973.70	8,649	5,321
973.75	8,853	5,759
973.80	9,060	6,207
973.85	9,269	6,665
973.90	9,480	7,133
973.95	9,694	7,613
974.00	9,910	8,103
974.05	10,387	8,610
974.10	10,874	9,142
974.15	11,374	9,698
974.20	11,884	10,279
974.25	12,405	10,886
974.30	12,938	11,520
974.35	13,482	12,180
974.40	14,037	12,868
974.45	14,603	13,584
974.50	15,180	14,329
974.55	15,769	15,102
974.60	16,369	15,906
974.65	16,980	16,740
974.70	17,602	17,604
974.75	18,235	18,500
974.80	18,880	19,428
974.85	19,536	20,388
974.90	20,202	21,381
974.95	20,881	22,408
975.00	21,570	23,470
975.05	23,522	24,597
975.10	25,560	25,823
975.15	27,681	27,154
975.20	29,887	28,593
975.25	32,178	30,144
975.30	34,554	31,812
975.35	37,014	33,601
975.40	39,558	35,515
975.45	42,187	37,558
975.50	44,901	39,735
975.55	47,699	42,050
975.60	50,582	44,506
975.65	53,550	47,109
975.70	56,602	49,863
975.75	59,738	52,771
975.80	62,959	55,838
975.85	66,265	59,068
975.90	69,656	62,466
975.95	73,130	66,035
976.00	**76,690**	**69,780**

Summary for Pond 6P: P3

Inflow Area = 8.085 ac, 62.91% Impervious, Inflow Depth > 6.69" for 100-Year event
Inflow = 37.54 cfs @ 12.16 hrs, Volume= 4.505 af
Outflow = 6.87 cfs @ 12.26 hrs, Volume= 4.345 af, Atten= 82%, Lag= 6.0 min
Primary = 6.87 cfs @ 12.26 hrs, Volume= 4.345 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 975.56' @ 18.04 hrs Surf.Area= 23,468 sf Storage= 40,948 cf

Plug-Flow detention time= 313.7 min calculated for 4.344 af (96% of inflow)
Center-of-Mass det. time= 257.0 min (1,380.8 - 1,123.9)

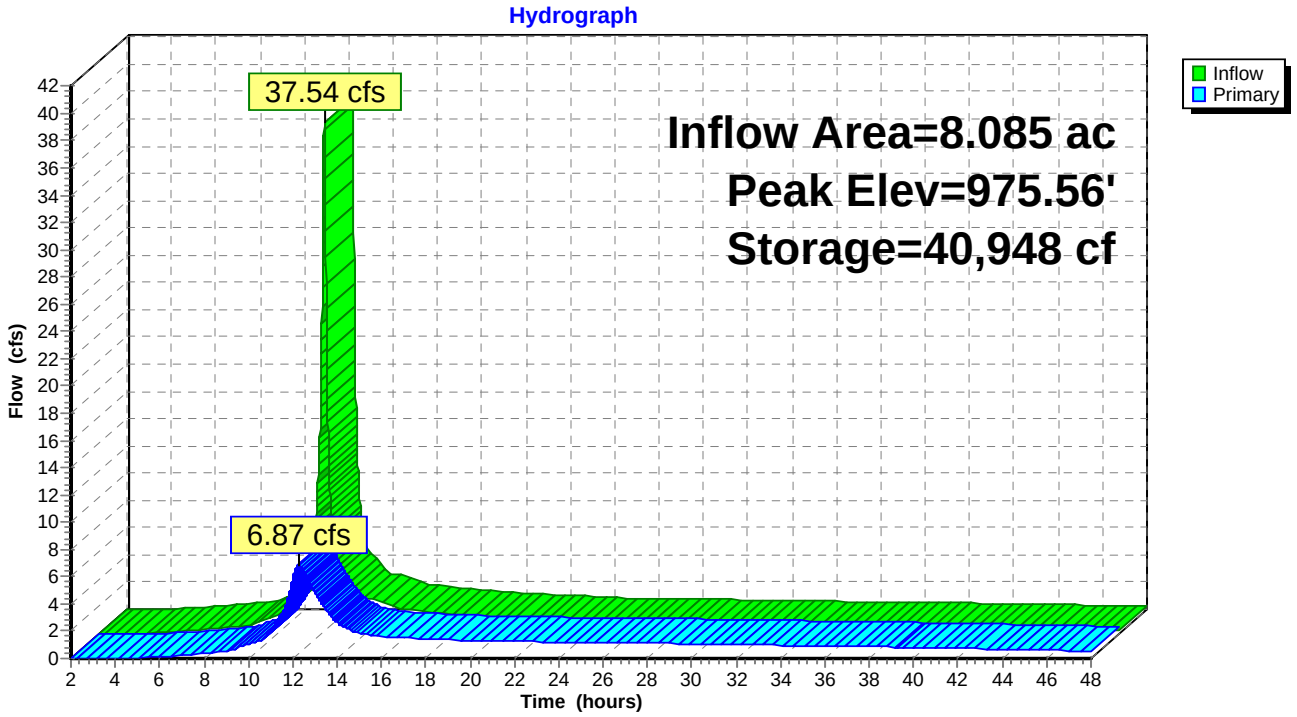
Volume	Invert	Avail.Storage	Storage Description
#1	971.85'	52,405 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
971.85	5	12.0	0	0	5
972.00	6,485	355.0	334	334	10,022
973.00	7,950	380.0	7,205	7,539	11,530
974.00	9,530	410.0	8,728	16,267	13,457
975.00	17,380	930.0	13,260	29,527	68,911
976.00	28,860	1,080.0	22,879	52,405	92,924

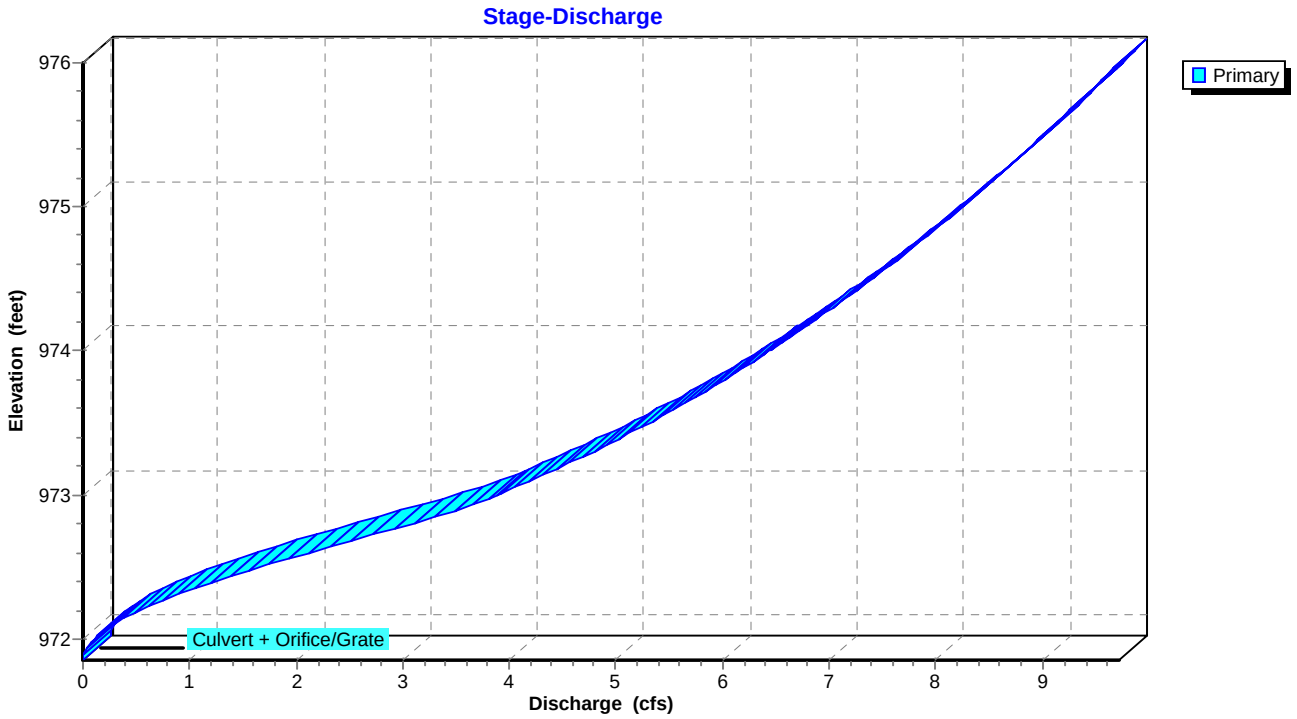
Device	Routing	Invert	Outlet Devices
#1	Primary	971.85'	**15.0" Round Culvert X 2.00** L= 350.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 971.85' / 970.10' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	971.85'	**14.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=6.81 cfs @ 12.26 hrs HW=975.30' TW=973.54' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 6.81 cfs of 8.39 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 6.81 cfs @ 6.37 fps)

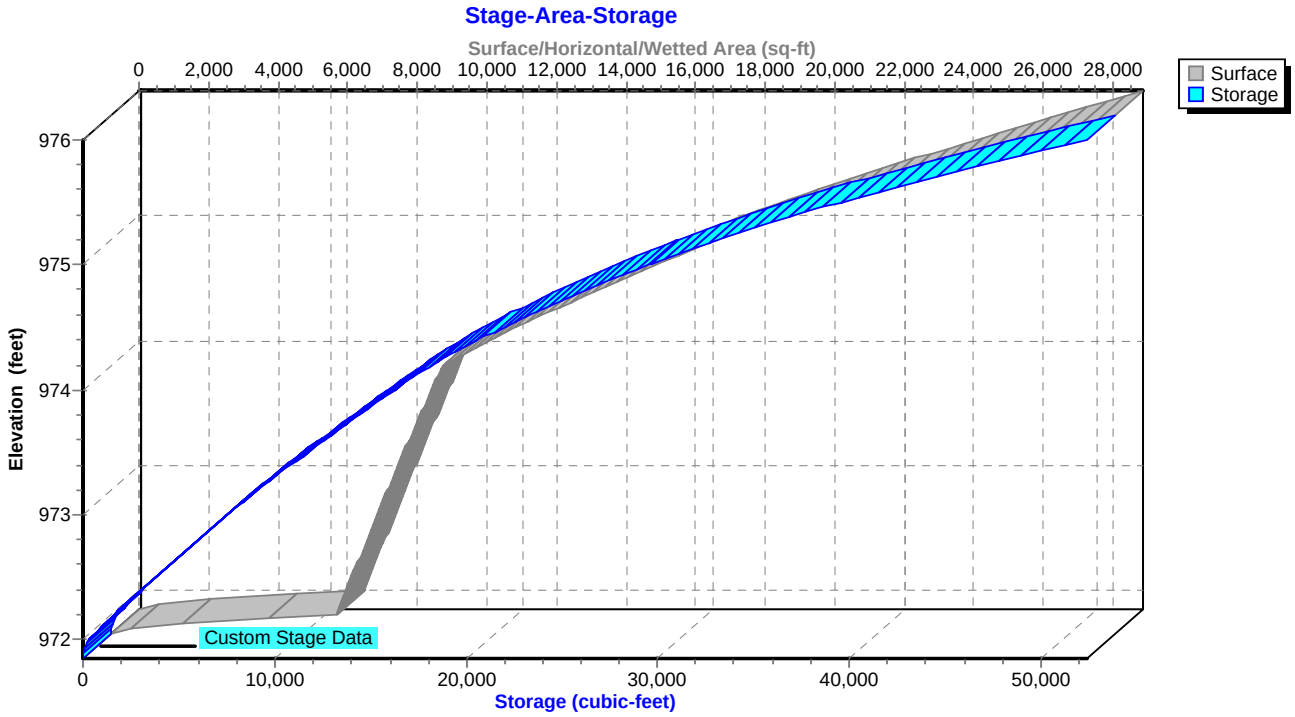
Pond 6P: P3



Pond 6P: P3



Pond 6P: P3


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0 2,000 4,000 6,000 8,000 10,000 12,000 14,000 16,000 18,000 20,000 22,000 24,000 26,000 28,000
Surface
Storage
Elevation (feet)
976
975
974
973
972
Custom Stage Data
0 10,000 20,000 30,000 40,000 50,000
Storage (cubic-feet)

Stage-Discharge for Pond 6P: P3

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
971.85	0.00	972.91	3.58	973.97	6.38	975.03	8.29
971.87	0.00	972.93	3.66	973.99	6.42	975.05	8.33
971.89	0.01	972.95	3.73	974.01	6.46	975.07	8.36
971.91	0.02	972.97	3.80	974.03	6.50	975.09	8.39
971.93	0.03	972.99	3.86	974.05	6.54	975.11	8.42
971.95	0.05	973.01	3.92	974.07	6.59	975.13	8.45
971.97	0.07	973.03	3.98	974.09	6.63	975.15	8.48
971.99	0.09	973.05	4.04	974.11	6.67	975.17	8.52
972.01	0.12	973.07	4.11	974.13	6.70	975.19	8.55
972.03	0.15	973.09	4.17	974.15	6.74	975.21	8.58
972.05	0.19	973.11	4.23	974.17	6.78	975.23	8.61
972.07	0.22	973.13	4.30	974.19	6.82	975.25	8.64
972.09	0.26	973.15	4.36	974.21	6.86	975.27	8.67
972.11	0.31	973.17	4.42	974.23	6.90	975.29	8.70
972.13	0.36	973.19	4.48	974.25	6.94	975.31	8.73
972.15	0.41	973.21	4.54	974.27	6.98	975.33	8.76
972.17	0.46	973.23	4.59	974.29	7.01	975.35	8.79
972.19	0.51	973.25	4.65	974.31	7.05	975.37	8.82
972.21	0.57	973.27	4.71	974.33	7.09	975.39	8.85
972.23	0.63	973.29	4.76	974.35	7.13	975.41	8.88
972.25	0.70	973.31	4.82	974.37	7.16	975.43	8.91
972.27	0.76	973.33	4.87	974.39	7.20	975.45	8.94
972.29	0.83	973.35	4.93	974.41	7.24	975.47	8.97
972.31	0.90	973.37	4.98	974.43	7.27	975.49	9.00
972.33	0.98	973.39	5.03	974.45	7.31	975.51	9.03
972.35	1.05	973.41	5.09	974.47	7.35	975.53	9.06
972.37	1.13	973.43	5.14	974.49	7.38	975.55	9.09
972.39	1.21	973.45	5.19	974.51	7.42	975.57	9.12
972.41	1.29	973.47	5.24	974.53	7.45	975.59	9.15
972.43	1.38	973.49	5.29	974.55	7.49	975.61	9.17
972.45	1.46	973.51	5.34	974.57	7.52	975.63	9.20
972.47	1.55	973.53	5.39	974.59	7.56	975.65	9.23
972.49	1.64	973.55	5.44	974.61	7.59	975.67	9.26
972.51	1.73	973.57	5.49	974.63	7.63	975.69	9.29
972.53	1.82	973.59	5.54	974.65	7.66	975.71	9.32
972.55	1.91	973.61	5.58	974.67	7.70	975.73	9.35
972.57	2.00	973.63	5.63	974.69	7.73	975.75	9.37
972.59	2.09	973.65	5.68	974.71	7.77	975.77	9.40
972.61	2.19	973.67	5.72	974.73	7.80	975.79	9.43
972.63	2.28	973.69	5.77	974.75	7.83	975.81	9.46
972.65	2.38	973.71	5.82	974.77	7.87	975.83	9.49
972.67	2.48	973.73	5.86	974.79	7.90	975.85	9.51
972.69	2.57	973.75	5.91	974.81	7.94	975.87	9.54
972.71	2.67	973.77	5.95	974.83	7.97	975.89	9.57
972.73	2.76	973.79	6.00	974.85	8.00	975.91	9.60
972.75	2.86	973.81	6.04	974.87	8.03	975.93	9.63
972.77	2.95	973.83	6.08	974.89	8.07	975.95	9.65
972.79	3.05	973.85	6.13	974.91	8.10	975.97	9.68
972.81	3.14	973.87	6.17	974.93	8.13	975.99	**9.71**
972.83	3.23	973.89	6.21	974.95	8.17		
972.85	3.32	973.91	6.25	974.97	8.20		
972.87	3.41	973.93	6.30	974.99	8.23		
972.89	3.49	973.95	6.34	975.01	8.26		

Stage-Area-Storage for Pond 6P: P3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
971.85	5	0
971.90	803	15
971.95	2,963	103
972.00	6,485	334
972.05	6,555	659
972.10	6,625	989
972.15	6,695	1,322
972.20	6,766	1,659
972.25	6,837	1,999
972.30	6,909	2,342
972.35	6,981	2,689
972.40	7,053	3,040
972.45	7,126	3,395
972.50	7,199	3,753
972.55	7,272	4,115
972.60	7,346	4,480
972.65	7,420	4,849
972.70	7,495	5,222
972.75	7,570	5,599
972.80	7,645	5,979
972.85	7,721	6,363
972.90	7,797	6,751
972.95	7,873	7,143
973.00	7,950	7,539
973.05	8,026	7,938
973.10	8,102	8,341
973.15	8,178	8,748
973.20	8,255	9,159
973.25	8,332	9,574
973.30	8,409	9,992
973.35	8,487	10,414
973.40	8,565	10,841
973.45	8,643	11,271
973.50	8,722	11,705
973.55	8,801	12,143
973.60	8,881	12,585
973.65	8,961	13,031
973.70	9,041	13,481
973.75	9,122	13,935
973.80	9,203	14,393
973.85	9,284	14,856
973.90	9,366	15,322
973.95	9,448	15,792
974.00	9,530	16,267
974.05	9,867	16,752
974.10	10,210	17,253
974.15	10,558	17,773
974.20	10,913	18,309
974.25	11,273	18,864
974.30	11,639	19,437
974.35	12,011	20,028
974.40	12,389	20,638
974.45	12,773	21,267
974.50	13,162	21,915
974.55	13,558	22,583
974.60	13,959	23,271
974.65	14,366	23,979
974.70	14,779	24,708
974.75	15,198	25,457
974.80	15,623	26,228
974.85	16,053	27,020
974.90	16,490	27,833
974.95	16,932	28,669
975.00	17,380	29,527
975.05	17,885	30,408
975.10	18,398	31,315
975.15	18,917	32,248
975.20	19,444	33,207
975.25	19,979	34,193
975.30	20,520	35,205
975.35	21,069	36,245
975.40	21,625	37,312
975.45	22,188	38,407
975.50	22,758	39,531
975.55	23,336	40,683
975.60	23,921	41,865
975.65	24,513	43,075
975.70	25,112	44,316
975.75	25,719	45,587
975.80	26,332	46,888
975.85	26,953	48,220
975.90	27,582	49,583
975.95	28,217	50,978
976.00	**28,860**	**52,405**

Summary for Pond 7P: P4

Inflow Area = 9.299 ac, 61.07% Impervious, Inflow Depth > 6.47" for 100-Year event
Inflow = 20.23 cfs @ 12.13 hrs, Volume= 5.013 af
Outflow = 1.52 cfs @ 18.60 hrs, Volume= 4.320 af, Atten= 92%, Lag= 388.4 min
Primary = 1.52 cfs @ 18.60 hrs, Volume= 4.320 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 975.49' @ 18.60 hrs Surf.Area= 23,127 sf Storage= 71,946 cf

Plug-Flow detention time= 601.7 min calculated for 4.320 af (86% of inflow)
Center-of-Mass det. time= 408.4 min (1,707.7 - 1,299.3)

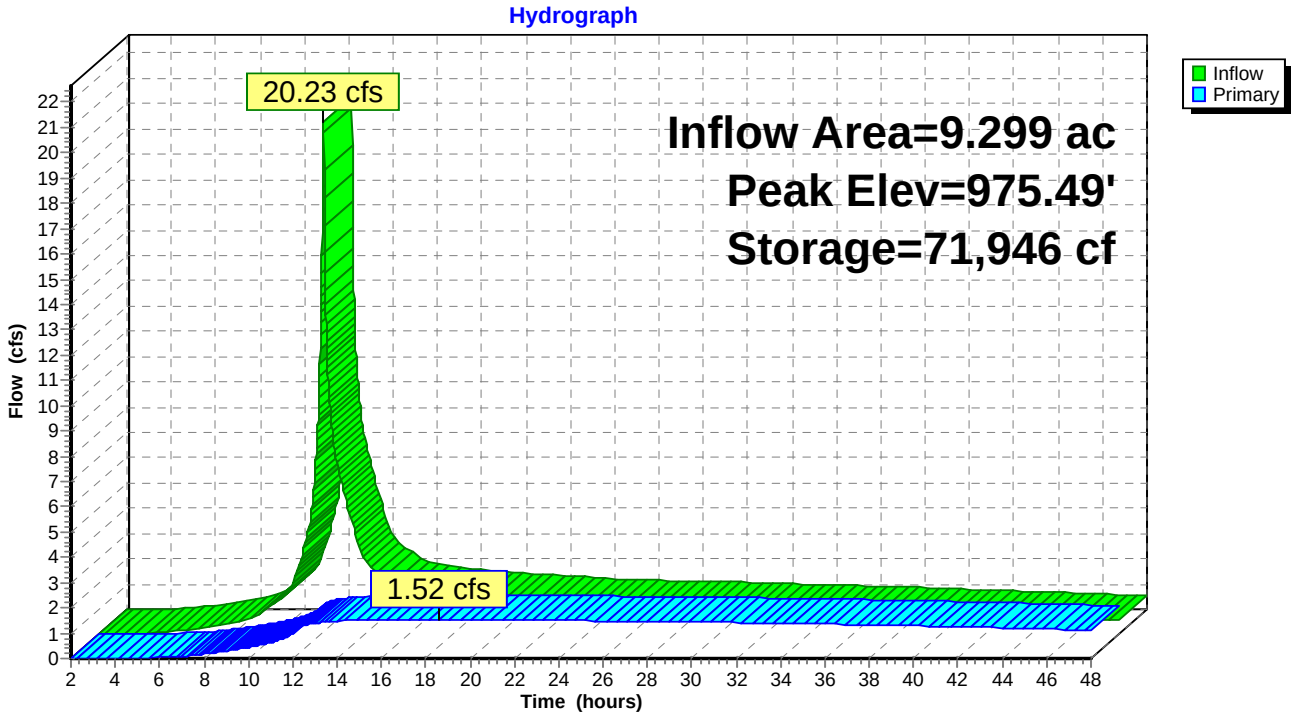
Volume	Invert	Avail.Storage	Storage Description
#1	969.90'	85,438 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
969.90	5	12.0	0	0	5
970.00	7,890	380.0	270	270	11,485
971.00	9,460	405.0	8,663	8,933	13,095
972.00	11,135	435.0	10,286	19,219	15,144
973.00	13,155	473.0	12,131	31,350	17,927
974.00	15,225	510.0	14,177	45,527	20,862
975.00	17,805	560.0	16,498	62,026	25,153
976.00	29,510	955.0	23,412	85,438	72,781

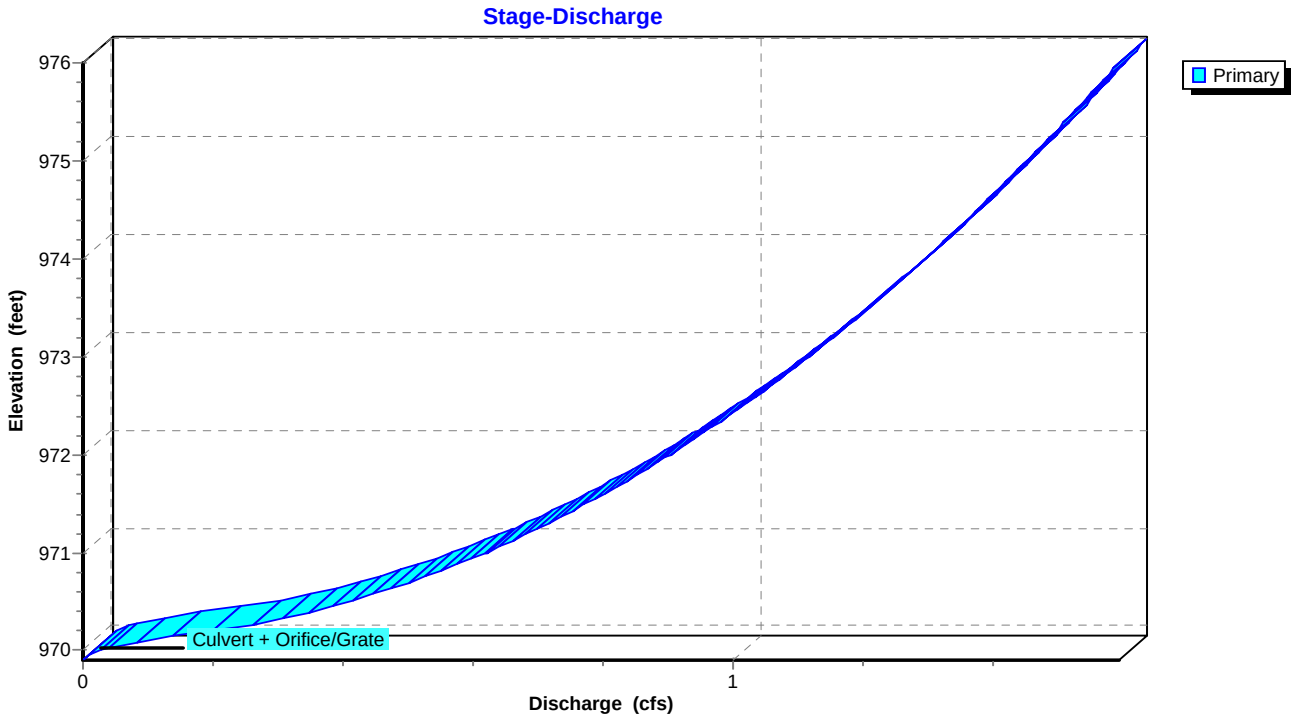
Device	Routing	Invert	Outlet Devices
#1	Primary	969.90'	**15.0" Round Culvert** L= 35.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 969.90' / 969.73' S= 0.0049 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Device 1	969.90'	**5.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.52 cfs @ 18.60 hrs HW=975.49' (Free Discharge)
↑—**1=Culvert** (Passes 1.52 cfs of 13.16 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 1.52 cfs @ 11.17 fps)

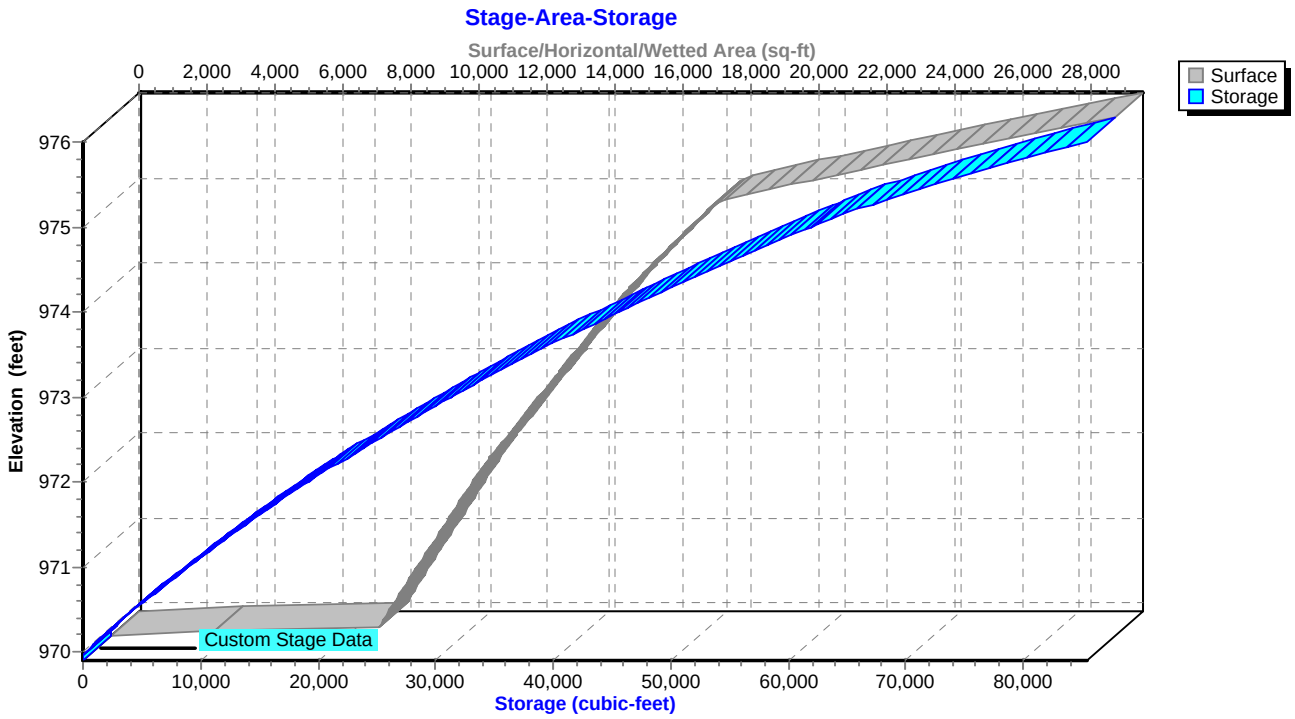
Pond 7P: P4



Pond 7P: P4



Pond 7P: P4


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0 2,000 4,000 6,000 8,000 10,000 12,000 14,000 16,000 18,000 20,000 22,000 24,000 26,000 28,000
Surface
Storage
976
975
974
973
972
971
970
Elevation (feet)
Custom Stage Data
0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000
Storage (cubic-feet)

Stage-Discharge for Pond 7P: P4

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
969.90	0.00	972.02	0.91	974.14	1.32
969.94	0.00	972.06	0.92	974.18	1.32
969.98	0.02	972.10	0.93	974.22	1.33
970.02	0.04	972.14	0.94	974.26	1.34
970.06	0.07	972.18	0.94	974.30	1.34
970.10	0.10	972.22	0.95	974.34	1.35
970.14	0.14	972.26	0.96	974.38	1.36
970.18	0.18	972.30	0.97	974.42	1.36
970.22	0.22	972.34	0.98	974.46	1.37
970.26	0.26	972.38	0.99	974.50	1.38
970.30	0.29	972.42	1.00	974.54	1.38
970.34	0.32	972.46	1.01	974.58	1.39
970.38	0.34	972.50	1.02	974.62	1.39
970.42	0.37	972.54	1.02	974.66	1.40
970.46	0.39	972.58	1.03	974.70	1.41
970.50	0.41	972.62	1.04	974.74	1.41
970.54	0.43	972.66	1.05	974.78	1.42
970.58	0.45	972.70	1.06	974.82	1.43
970.62	0.47	972.74	1.07	974.86	1.43
970.66	0.49	972.78	1.07	974.90	1.44
970.70	0.51	972.82	1.08	974.94	1.44
970.74	0.52	972.86	1.09	974.98	1.45
970.78	0.54	972.90	1.10	975.02	1.46
970.82	0.55	972.94	1.10	975.06	1.46
970.86	0.57	972.98	1.11	975.10	1.47
970.90	0.58	973.02	1.12	975.14	1.47
970.94	0.60	973.06	1.13	975.18	1.48
970.98	0.61	973.10	1.14	975.22	1.48
971.02	0.63	973.14	1.14	975.26	1.49
971.06	0.64	973.18	1.15	975.30	1.50
971.10	0.65	973.22	1.16	975.34	1.50
971.14	0.67	973.26	1.17	975.38	1.51
971.18	0.68	973.30	1.17	975.42	1.51
971.22	0.69	973.34	1.18	975.46	1.52
971.26	0.70	973.38	1.19	975.50	1.52
971.30	0.72	973.42	1.19	975.54	1.53
971.34	0.73	973.46	1.20	975.58	1.54
971.38	0.74	973.50	1.21	975.62	1.54
971.42	0.75	973.54	1.22	975.66	1.55
971.46	0.76	973.58	1.22	975.70	1.55
971.50	0.77	973.62	1.23	975.74	1.56
971.54	0.79	973.66	1.24	975.78	1.56
971.58	0.80	973.70	1.24	975.82	1.57
971.62	0.81	973.74	1.25	975.86	1.57
971.66	0.82	973.78	1.26	975.90	1.58
971.70	0.83	973.82	1.26	975.94	1.59
971.74	0.84	973.86	1.27	975.98	**1.59**
971.78	0.85	973.90	1.28		
971.82	0.86	973.94	1.29		
971.86	0.87	973.98	1.29		
971.90	0.88	974.02	1.30		
971.94	0.89	974.06	1.31		
971.98	0.90	974.10	1.31		

Stage-Area-Storage for Pond 7P: P4

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
969.90	5	0
970.00	7,890	270
970.10	8,041	1,066
970.20	8,193	1,878
970.30	8,346	2,705
970.40	8,501	3,547
970.50	8,657	4,405
970.60	8,815	5,279
970.70	8,974	6,168
970.80	9,135	7,074
970.90	9,297	7,995
971.00	9,460	8,933
971.10	9,621	9,887
971.20	9,784	10,857
971.30	9,948	11,844
971.40	10,114	12,847
971.50	10,280	13,867
971.60	10,449	14,903
971.70	10,618	15,956
971.80	10,789	17,027
971.90	10,961	18,114
972.00	11,135	19,219
972.10	11,329	20,342
972.20	11,526	21,485
972.30	11,723	22,647
972.40	11,923	23,830
972.50	12,124	25,032
972.60	12,327	26,255
972.70	12,531	27,497
972.80	12,738	28,761
972.90	12,945	30,045
973.00	13,155	31,350
973.10	13,355	32,676
973.20	13,557	34,021
973.30	13,760	35,387
973.40	13,965	36,773
973.50	14,171	38,180
973.60	14,379	39,607
973.70	14,588	41,056
973.80	14,799	42,525
973.90	15,011	44,016
974.00	15,225	45,527
974.10	15,474	47,062
974.20	15,725	48,622
974.30	15,978	50,207
974.40	16,233	51,818
974.50	16,490	53,454
974.60	16,749	55,116
974.70	17,010	56,804
974.80	17,273	58,518
974.90	17,538	60,258
975.00	17,805	62,026
975.10	18,843	63,858
975.20	19,911	65,795
975.30	21,008	67,841
975.40	22,134	69,998
975.50	23,290	72,269
975.60	24,475	74,657
975.70	25,690	77,165
975.80	26,934	79,796
975.90	28,207	82,552
976.00	**29,510**	**85,438**

Summary for Pond 8P: P5

Inflow Area = 3.274 ac, 71.38% Impervious, Inflow Depth = 7.07" for 100-Year event
Inflow = 35.79 cfs @ 12.14 hrs, Volume= 1.930 af
Outflow = 3.87 cfs @ 12.62 hrs, Volume= 1.930 af, Atten= 89%, Lag= 28.7 min
Primary = 3.87 cfs @ 12.62 hrs, Volume= 1.930 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 975.55' @ 12.62 hrs Surf.Area= 11,728 sf Storage= 39,918 cf

Plug-Flow detention time= 104.3 min calculated for 1.929 af (100% of inflow)
Center-of-Mass det. time= 104.3 min (864.6 - 760.3)

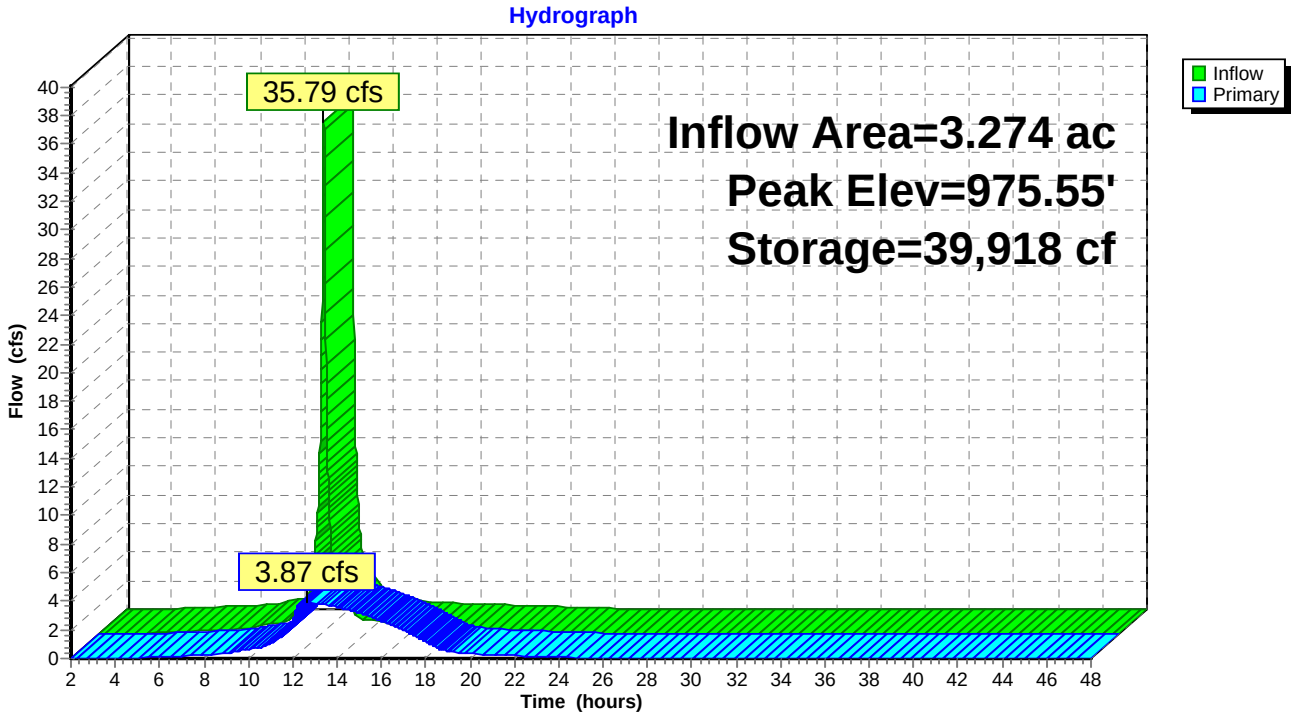
Volume	Invert	Avail.Storage	Storage Description
#1	969.90'	45,413 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
969.90	5	12.0	0	0	5
970.00	3,410	270.0	118	118	5,795
971.00	4,555	300.0	3,969	4,087	7,185
972.00	5,795	325.0	5,163	9,249	8,467
973.00	7,315	360.0	6,540	15,790	10,405
974.00	8,965	400.0	8,126	23,916	12,854
975.00	10,760	435.0	9,849	33,765	15,217
976.00	12,560	460.0	11,648	45,413	17,053

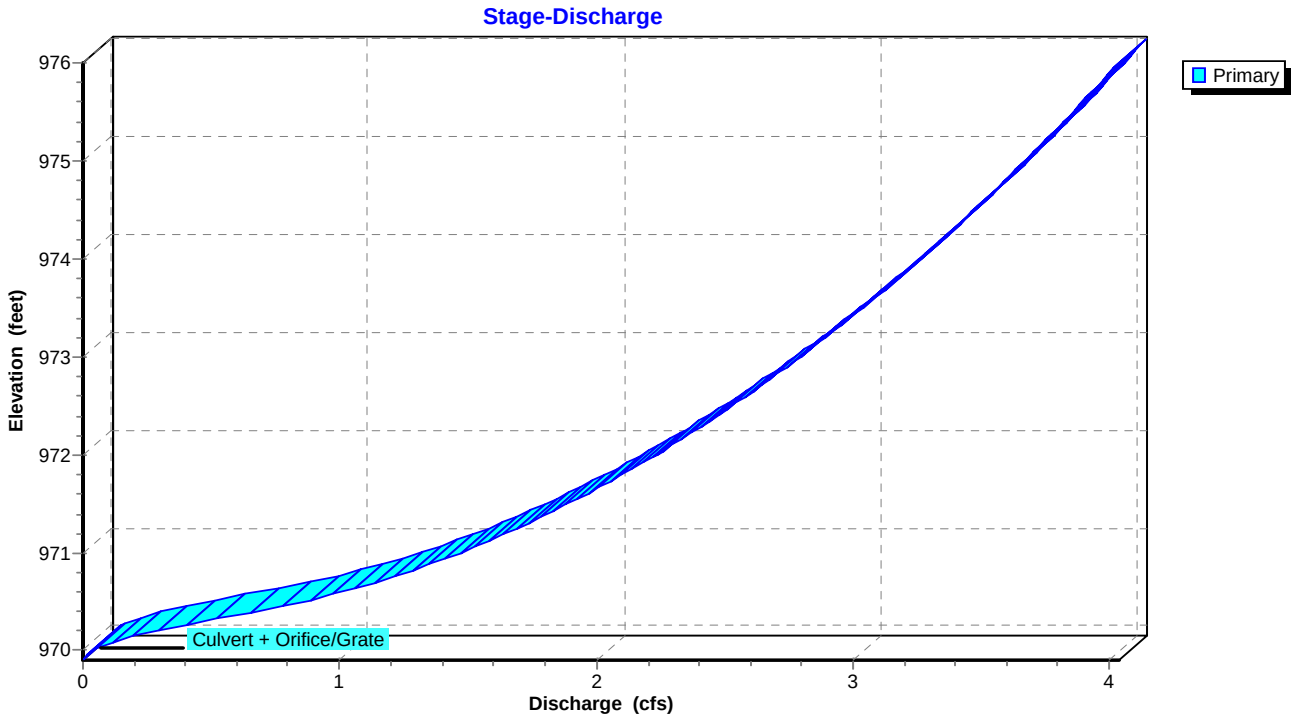
Device	Routing	Invert	Outlet Devices
#1	Primary	969.90'	**15.0" Round Culvert** L= 30.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 969.90' / 969.75' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Device 1	969.90'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=3.87 cfs @ 12.62 hrs HW=975.55' (Free Discharge)
↑—**1=Culvert** (Passes 3.87 cfs of 13.24 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 3.87 cfs @ 11.10 fps)

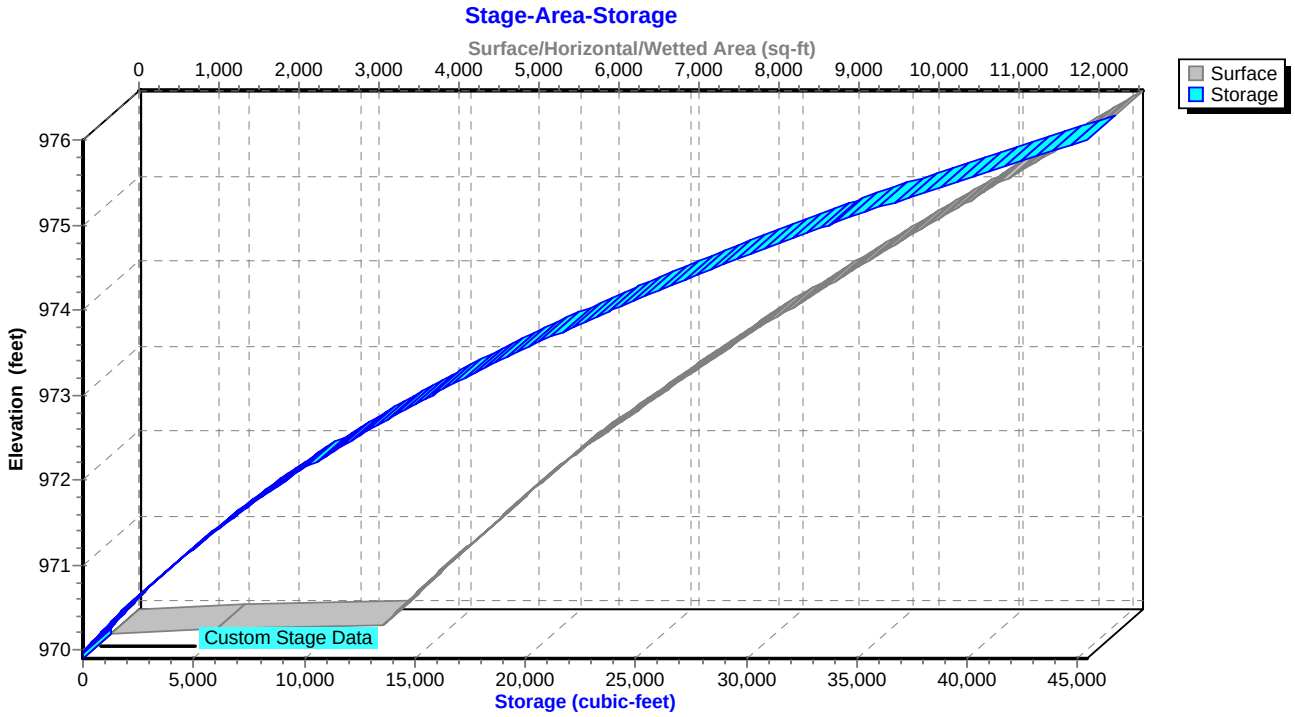
Pond 8P: P5



Pond 8P: P5



Pond 8P: P5


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
Surface
Storage
976
975
974
973
972
971
970
Elevation (feet)
Custom Stage Data
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
Storage (cubic-feet)

Stage-Discharge for Pond 8P: P5

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
969.90	0.00	972.02	2.25	974.14	3.32
969.94	0.01	972.06	2.27	974.18	3.34
969.98	0.02	972.10	2.30	974.22	3.36
970.02	0.05	972.14	2.32	974.26	3.37
970.06	0.09	972.18	2.35	974.30	3.39
970.10	0.13	972.22	2.37	974.34	3.41
970.14	0.19	972.26	2.39	974.38	3.42
970.18	0.25	972.30	2.42	974.42	3.44
970.22	0.32	972.34	2.44	974.46	3.46
970.26	0.39	972.38	2.46	974.50	3.47
970.30	0.47	972.42	2.49	974.54	3.49
970.34	0.55	972.46	2.51	974.58	3.50
970.38	0.63	972.50	2.53	974.62	3.52
970.42	0.72	972.54	2.55	974.66	3.54
970.46	0.80	972.58	2.57	974.70	3.55
970.50	0.87	972.62	2.60	974.74	3.57
970.54	0.94	972.66	2.62	974.78	3.58
970.58	0.99	972.70	2.64	974.82	3.60
970.62	1.05	972.74	2.66	974.86	3.62
970.66	1.10	972.78	2.68	974.90	3.63
970.70	1.15	972.82	2.70	974.94	3.65
970.74	1.20	972.86	2.72	974.98	3.66
970.78	1.24	972.90	2.74	975.02	3.68
970.82	1.29	972.94	2.77	975.06	3.69
970.86	1.33	972.98	2.79	975.10	3.71
970.90	1.37	973.02	2.81	975.14	3.72
970.94	1.41	973.06	2.83	975.18	3.74
970.98	1.45	973.10	2.85	975.22	3.75
971.02	1.49	973.14	2.87	975.26	3.77
971.06	1.53	973.18	2.89	975.30	3.78
971.10	1.56	973.22	2.90	975.34	3.80
971.14	1.60	973.26	2.92	975.38	3.81
971.18	1.64	973.30	2.94	975.42	3.83
971.22	1.67	973.34	2.96	975.46	3.84
971.26	1.70	973.38	2.98	975.50	3.86
971.30	1.74	973.42	3.00	975.54	3.87
971.34	1.77	973.46	3.02	975.58	3.89
971.38	1.80	973.50	3.04	975.62	3.90
971.42	1.83	973.54	3.06	975.66	3.92
971.46	1.86	973.58	3.07	975.70	3.93
971.50	1.89	973.62	3.09	975.74	3.94
971.54	1.92	973.66	3.11	975.78	3.96
971.58	1.95	973.70	3.13	975.82	3.97
971.62	1.98	973.74	3.15	975.86	3.99
971.66	2.01	973.78	3.17	975.90	4.00
971.70	2.04	973.82	3.18	975.94	4.02
971.74	2.06	973.86	3.20	975.98	**4.03**
971.78	2.09	973.90	3.22		
971.82	2.12	973.94	3.24		
971.86	2.14	973.98	3.25		
971.90	2.17	974.02	3.27		
971.94	2.20	974.06	3.29		
971.98	2.22	974.10	3.30		

Stage-Area-Storage for Pond 8P: P5

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
969.90	5	0
970.00	3,410	118
970.10	3,517	465
970.20	3,626	822
970.30	3,736	1,190
970.40	3,848	1,569
970.50	3,962	1,959
970.60	4,077	2,361
970.70	4,194	2,775
970.80	4,313	3,200
970.90	4,433	3,638
971.00	4,555	4,087
971.10	4,672	4,548
971.20	4,791	5,021
971.30	4,911	5,507
971.40	5,033	6,004
971.50	5,156	6,513
971.60	5,281	7,035
971.70	5,407	7,569
971.80	5,535	8,117
971.90	5,664	8,677
972.00	5,795	9,249
972.10	5,939	9,836
972.20	6,085	10,437
972.30	6,232	11,053
972.40	6,382	11,684
972.50	6,533	12,330
972.60	6,686	12,991
972.70	6,840	13,667
972.80	6,997	14,359
972.90	7,155	15,066
973.00	7,315	15,790
973.10	7,472	16,529
973.20	7,632	17,284
973.30	7,792	18,055
973.40	7,955	18,843
973.50	8,119	19,647
973.60	8,285	20,467
973.70	8,452	21,304
973.80	8,622	22,157
973.90	8,792	23,028
974.00	8,965	23,916
974.10	9,137	24,821
974.20	9,311	25,743
974.30	9,486	26,683
974.40	9,663	27,641
974.50	9,842	28,616
974.60	10,022	29,609
974.70	10,204	30,620
974.80	10,388	31,650
974.90	10,573	32,698
975.00	10,760	33,765
975.10	10,934	34,849
975.20	11,109	35,951
975.30	11,285	37,071
975.40	11,463	38,209
975.50	11,643	39,364
975.60	11,823	40,537
975.70	12,005	41,729
975.80	12,189	42,938
975.90	12,374	44,166
976.00	**12,560**	**45,413**

Summary for Pond 4P: P1

Inflow Area = 0.627 ac, 23.76% Impervious, Inflow Depth = 0.28" for WQ event
Inflow = 0.27 cfs @ 12.16 hrs, Volume= 0.015 af
Outflow = 0.02 cfs @ 13.60 hrs, Volume= 0.015 af, Atten= 93%, Lag= 85.9 min
Primary = 0.02 cfs @ 13.60 hrs, Volume= 0.015 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 974.06' @ 13.60 hrs Surf.Area= 4,067 sf Storage= 331 cf

Plug-Flow detention time= 295.3 min calculated for 0.015 af (100% of inflow)
Center-of-Mass det. time= 299.3 min (1,145.2 - 845.9)

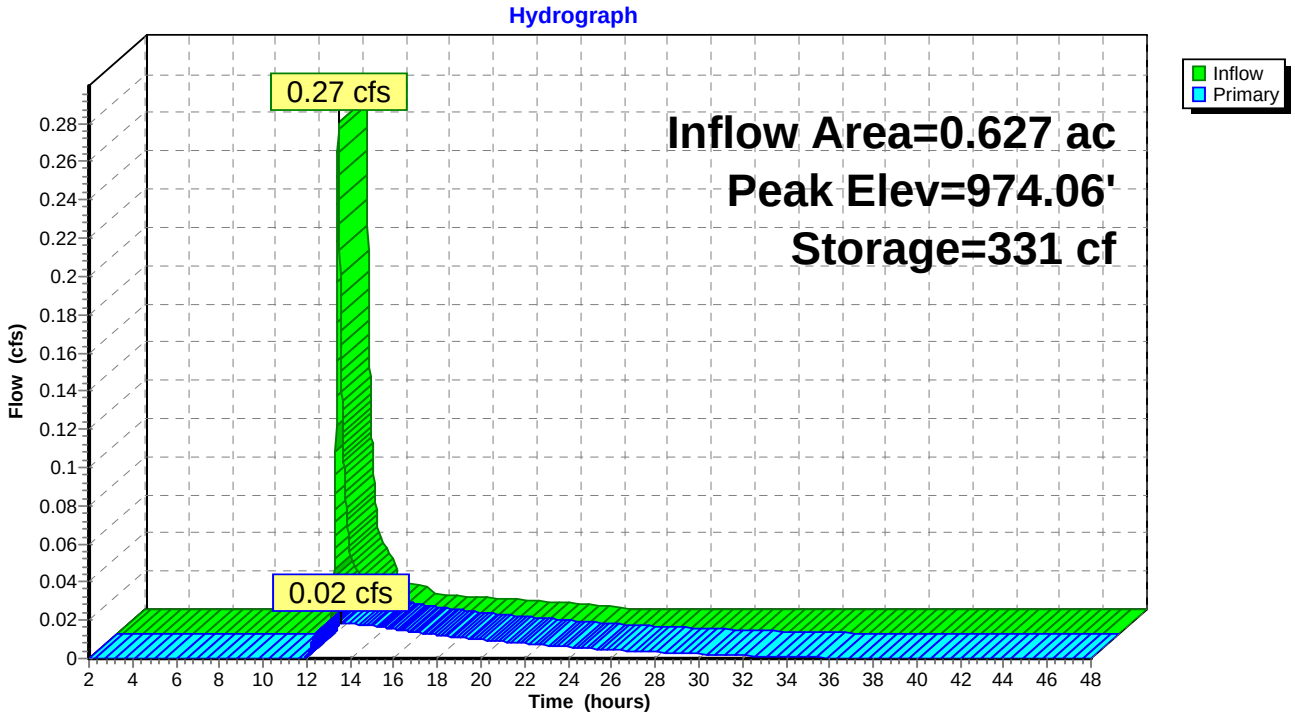
Volume	Invert	Avail.Storage	Storage Description
#1	973.95'	17,964 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
973.95	5	12.0	0	0	5
974.00	3,990	305.0	69	69	7,396
975.00	5,260	330.0	4,610	4,679	8,699
976.00	6,630	355.0	5,932	10,611	10,104
977.00	8,100	380.0	7,353	17,964	11,612

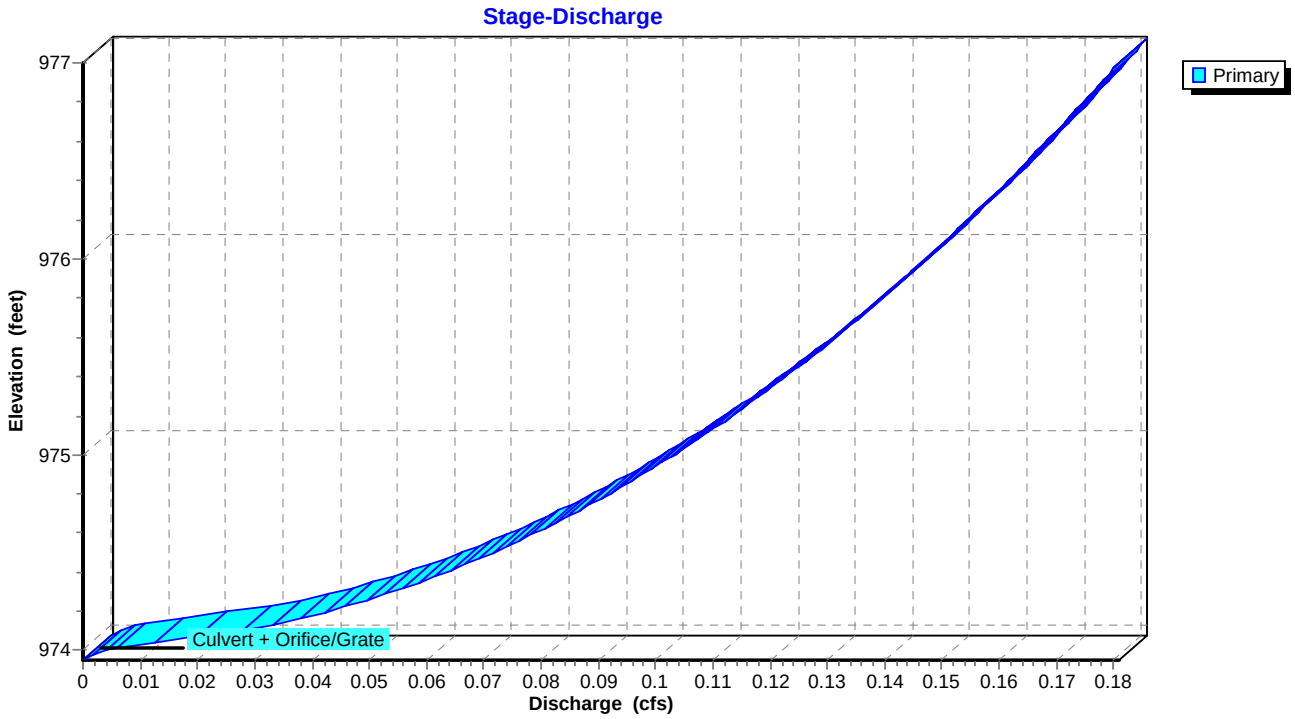
Device	Routing	Invert	Outlet Devices
#1	Primary	973.95'	**12.0" Round Culvert** L= 180.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 973.95' / 973.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	973.95'	**2.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.02 cfs @ 13.60 hrs HW=974.06' TW=973.30' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.02 cfs of 0.03 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 1.15 fps)

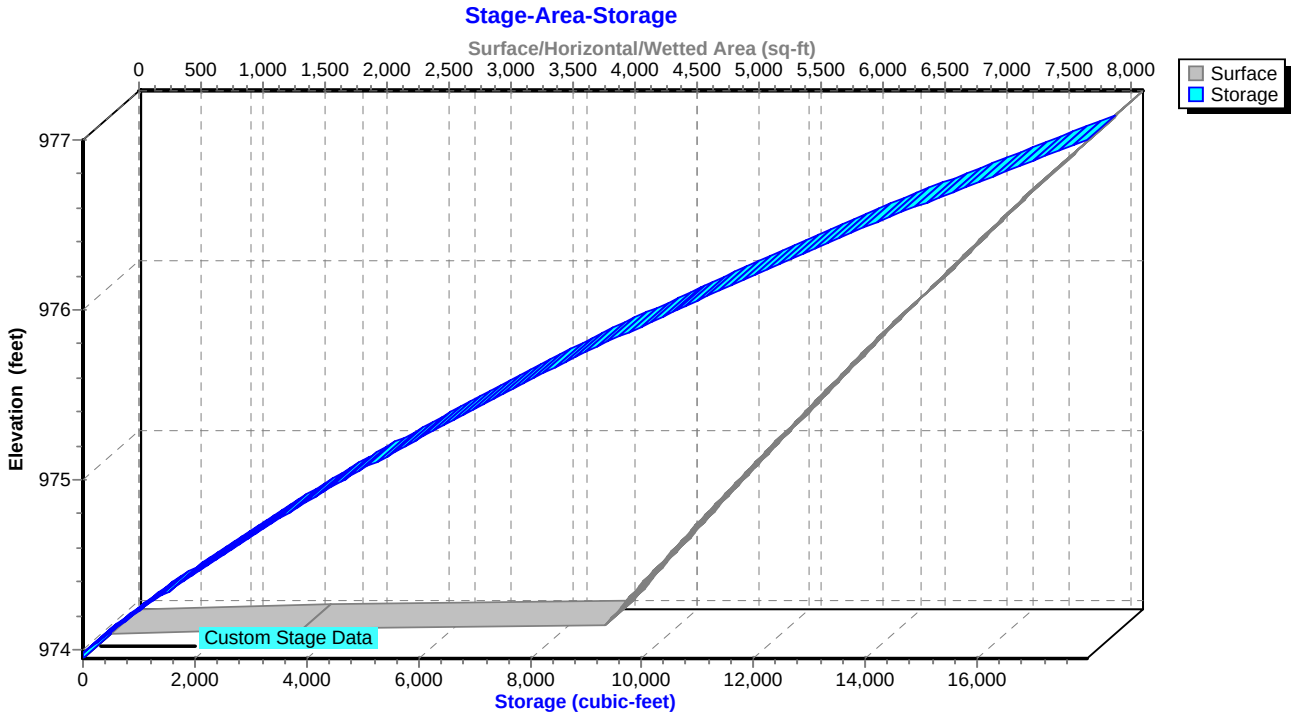
Pond 4P: P1



Pond 4P: P1



Pond 4P: P1


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0 500 1,000 1,500 2,000 2,500 3,000 3,500 4,000 4,500 5,000 5,500 6,000 6,500 7,000 7,500 8,000
Surface
Storage
977
976
975
974
Elevation (feet)
Custom Stage Data
0 2,000 4,000 6,000 8,000 10,000 12,000 14,000 16,000
Storage (cubic-feet)

Stage-Discharge for Pond 4P: P1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
973.95	0.00	975.01	0.10	976.07	0.15
973.97	0.00	975.03	0.10	976.09	0.15
973.99	0.00	975.05	0.11	976.11	0.15
974.01	0.01	975.07	0.11	976.13	0.15
974.03	0.01	975.09	0.11	976.15	0.15
974.05	0.01	975.11	0.11	976.17	0.15
974.07	0.02	975.13	0.11	976.19	0.15
974.09	0.02	975.15	0.11	976.21	0.15
974.11	0.03	975.17	0.11	976.23	0.16
974.13	0.03	975.19	0.11	976.25	0.16
974.15	0.04	975.21	0.11	976.27	0.16
974.17	0.04	975.23	0.11	976.29	0.16
974.19	0.04	975.25	0.12	976.31	0.16
974.21	0.04	975.27	0.12	976.33	0.16
974.23	0.05	975.29	0.12	976.35	0.16
974.25	0.05	975.31	0.12	976.37	0.16
974.27	0.05	975.33	0.12	976.39	0.16
974.29	0.05	975.35	0.12	976.41	0.16
974.31	0.06	975.37	0.12	976.43	0.16
974.33	0.06	975.39	0.12	976.45	0.16
974.35	0.06	975.41	0.12	976.47	0.16
974.37	0.06	975.43	0.12	976.49	0.16
974.39	0.06	975.45	0.13	976.51	0.17
974.41	0.06	975.47	0.13	976.53	0.17
974.43	0.07	975.49	0.13	976.55	0.17
974.45	0.07	975.51	0.13	976.57	0.17
974.47	0.07	975.53	0.13	976.59	0.17
974.49	0.07	975.55	0.13	976.61	0.17
974.51	0.07	975.57	0.13	976.63	0.17
974.53	0.07	975.59	0.13	976.65	0.17
974.55	0.08	975.61	0.13	976.67	0.17
974.57	0.08	975.63	0.13	976.69	0.17
974.59	0.08	975.65	0.13	976.71	0.17
974.61	0.08	975.67	0.13	976.73	0.17
974.63	0.08	975.69	0.14	976.75	0.17
974.65	0.08	975.71	0.14	976.77	0.17
974.67	0.08	975.73	0.14	976.79	0.17
974.69	0.09	975.75	0.14	976.81	0.18
974.71	0.09	975.77	0.14	976.83	0.18
974.73	0.09	975.79	0.14	976.85	0.18
974.75	0.09	975.81	0.14	976.87	0.18
974.77	0.09	975.83	0.14	976.89	0.18
974.79	0.09	975.85	0.14	976.91	0.18
974.81	0.09	975.87	0.14	976.93	0.18
974.83	0.09	975.89	0.14	976.95	0.18
974.85	0.09	975.91	0.14	976.97	0.18
974.87	0.10	975.93	0.14	976.99	**0.18**
974.89	0.10	975.95	0.15		
974.91	0.10	975.97	0.15		
974.93	0.10	975.99	0.15		
974.95	0.10	976.01	0.15		
974.97	0.10	976.03	0.15		
974.99	0.10	976.05	0.15		

Stage-Area-Storage for Pond 4P: P1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
973.95	5	0
974.00	3,990	69
974.05	4,049	270
974.10	4,109	474
974.15	4,169	681
974.20	4,230	891
974.25	4,291	1,104
974.30	4,353	1,320
974.35	4,415	1,539
974.40	4,477	1,761
974.45	4,540	1,987
974.50	4,603	2,215
974.55	4,667	2,447
974.60	4,731	2,682
974.65	4,796	2,920
974.70	4,861	3,162
974.75	4,926	3,406
974.80	4,992	3,654
974.85	5,058	3,906
974.90	5,125	4,160
974.95	5,192	4,418
975.00	5,260	4,679
975.05	5,325	4,944
975.10	5,390	5,212
975.15	5,455	5,483
975.20	5,521	5,757
975.25	5,588	6,035
975.30	5,654	6,316
975.35	5,721	6,601
975.40	5,789	6,888
975.45	5,857	7,179
975.50	5,925	7,474
975.55	5,994	7,772
975.60	6,063	8,073
975.65	6,132	8,378
975.70	6,202	8,687
975.75	6,273	8,999
975.80	6,343	9,314
975.85	6,414	9,633
975.90	6,486	9,955
975.95	6,558	10,281
976.00	6,630	10,611
976.05	6,700	10,944
976.10	6,770	11,281
976.15	6,841	11,621
976.20	6,912	11,965
976.25	6,984	12,313
976.30	7,056	12,664
976.35	7,128	13,018
976.40	7,200	13,376
976.45	7,273	13,738
976.50	7,347	14,104
976.55	7,420	14,473
976.60	7,494	14,846
976.65	7,569	15,222
976.70	7,644	15,603
976.75	7,719	15,987
976.80	7,794	16,375
976.85	7,870	16,766
976.90	7,946	17,162
976.95	8,023	17,561
977.00	**8,100**	**17,964**

Summary for Pond 5P: P2

Inflow Area = 4.502 ac, 53.93% Impervious, Inflow Depth = 0.49" for WQ event
Inflow = 2.54 cfs @ 12.25 hrs, Volume= 0.183 af
Outflow = 0.75 cfs @ 12.65 hrs, Volume= 0.183 af, Atten= 71%, Lag= 24.2 min
Primary = 0.75 cfs @ 12.65 hrs, Volume= 0.183 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 973.41' @ 12.64 hrs Surf.Area= 7,508 sf Storage= 2,973 cf

Plug-Flow detention time= 91.8 min calculated for 0.183 af (100% of inflow)
Center-of-Mass det. time= 91.9 min (942.0 - 850.1)

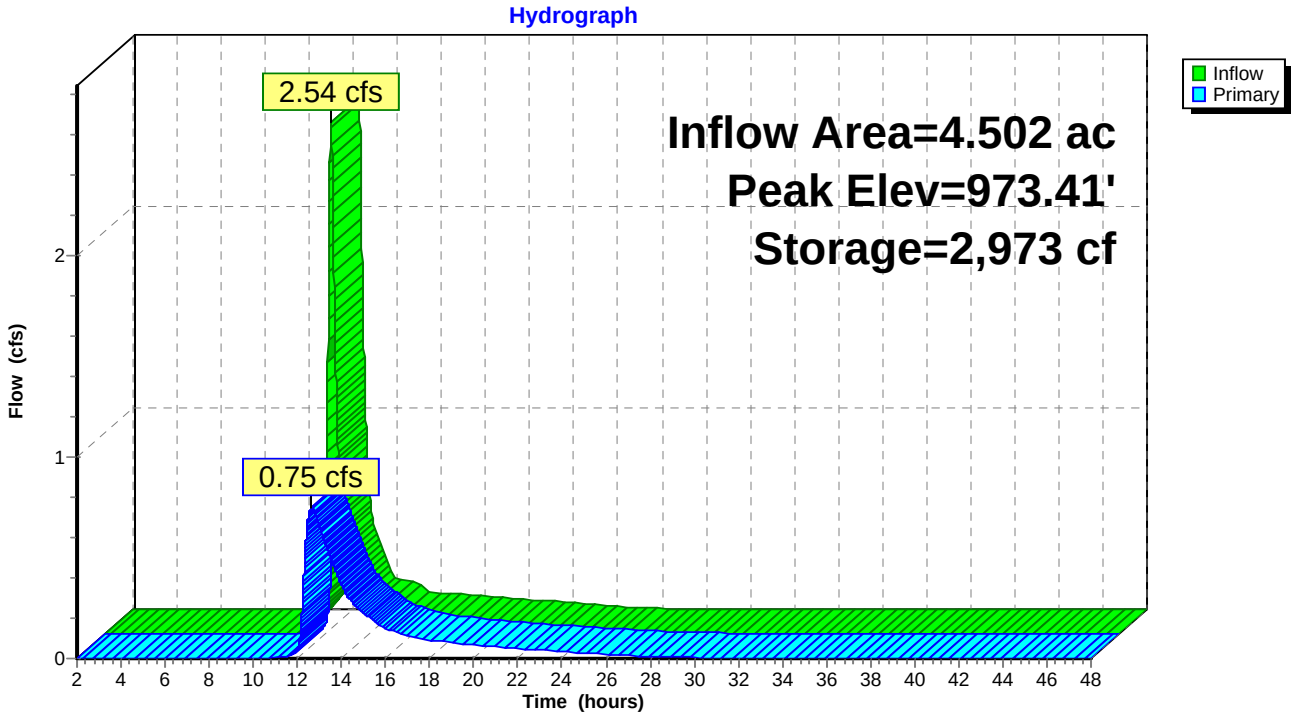
Volume	Invert	Avail.Storage	Storage Description
#1	972.90'	69,780 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
972.90	5	12.0	0	0	5
973.00	6,040	510.0	207	207	20,692
974.00	9,910	760.0	7,896	8,103	45,965
975.00	21,570	1,415.0	15,367	23,470	159,339
976.00	76,690	1,830.0	46,311	69,780	266,516

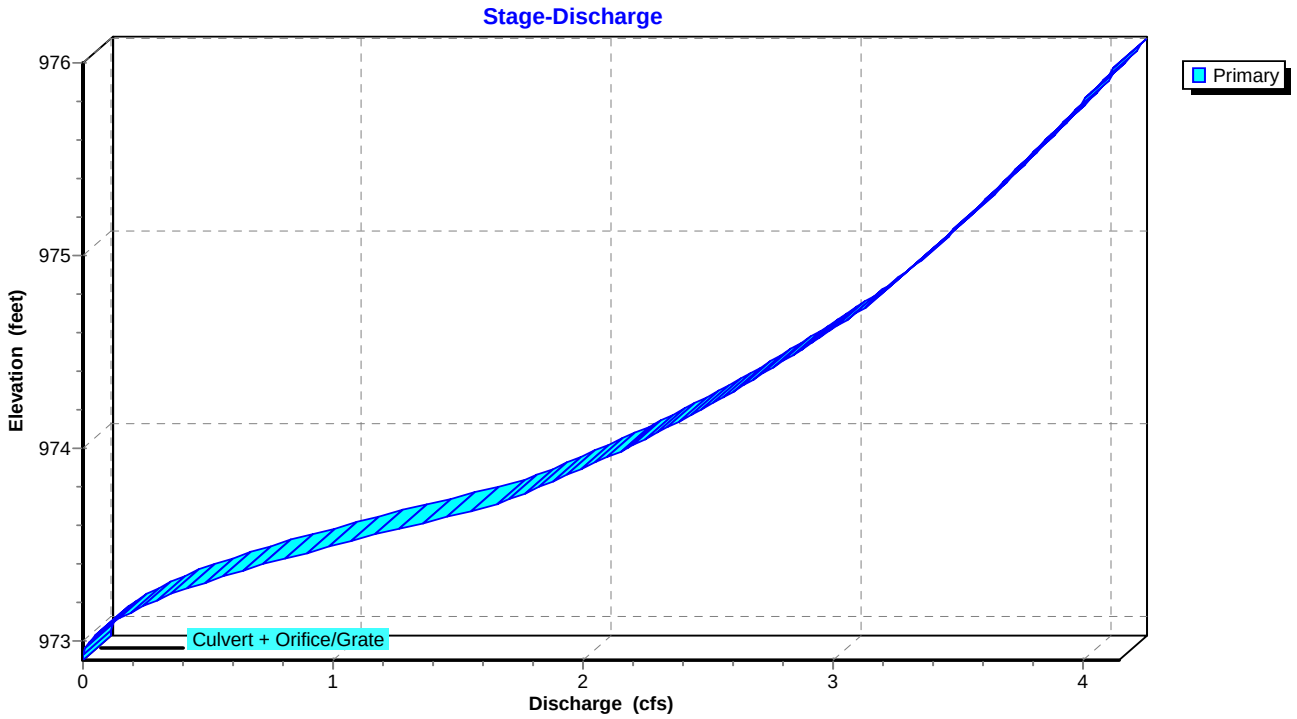
Device	Routing	Invert	Outlet Devices
#1	Primary	972.90'	**12.0" Round Culvert** L= 170.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 972.90' / 972.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	972.90'	**10.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.75 cfs @ 12.65 hrs HW=973.41' TW=972.45' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 0.75 cfs @ 2.72 fps)
↑**2=Orifice/Grate** (Passes 0.75 cfs of 0.85 cfs potential flow)

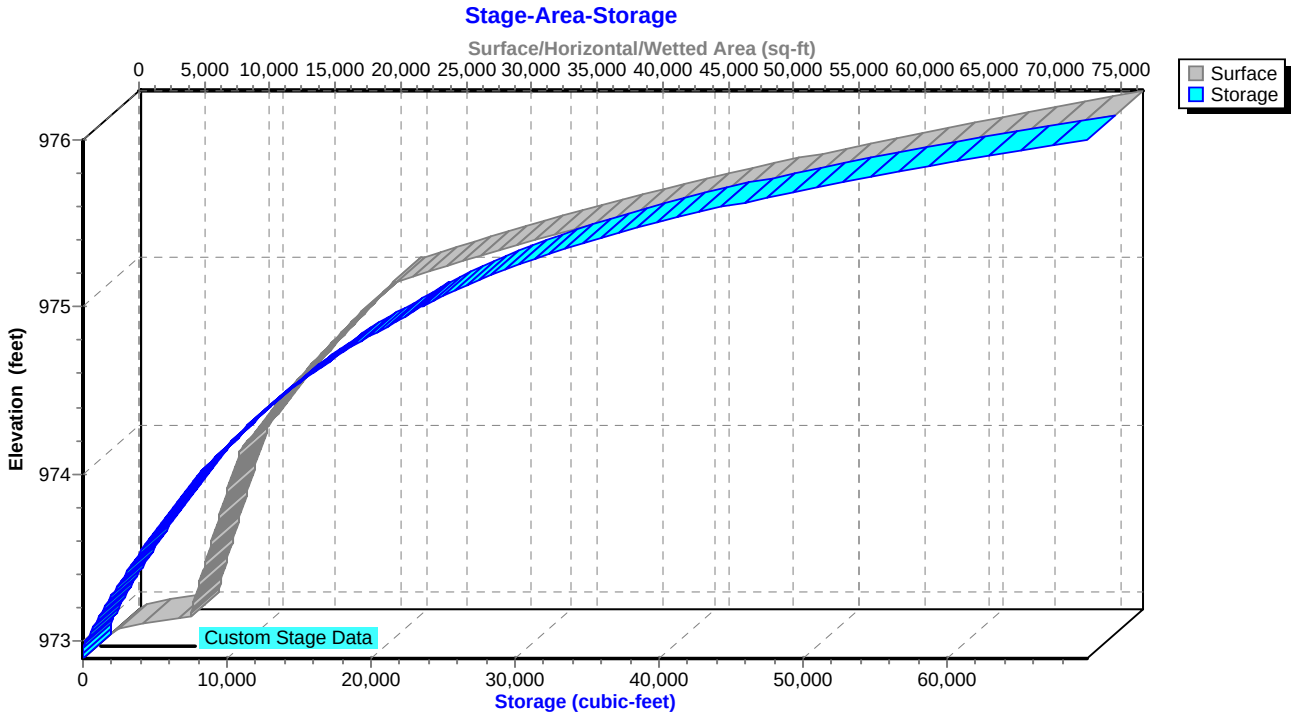
Pond 5P: P2



Pond 5P: P2



Pond 5P: P2


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0 5,000 10,000 15,000 20,000 25,000 30,000 35,000 40,000 45,000 50,000 55,000 60,000 65,000 70,000 75,000
Surface
Storage
976
975
974
973
Elevation (feet)
Custom Stage Data
0 10,000 20,000 30,000 40,000 50,000 60,000
Storage (cubic-feet)

Stage-Discharge for Pond 5P: P2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
972.90	0.00	973.96	2.11	975.02	3.38
972.92	0.00	973.98	2.14	975.04	3.40
972.94	0.00	974.00	2.17	975.06	3.42
972.96	0.01	974.02	2.20	975.08	3.43
972.98	0.02	974.04	2.23	975.10	3.45
973.00	0.03	974.06	2.26	975.12	3.47
973.02	0.04	974.08	2.29	975.14	3.48
973.04	0.06	974.10	2.32	975.16	3.50
973.06	0.08	974.12	2.35	975.18	3.52
973.08	0.10	974.14	2.38	975.20	3.53
973.10	0.12	974.16	2.41	975.22	3.55
973.12	0.15	974.18	2.44	975.24	3.57
973.14	0.18	974.20	2.47	975.26	3.58
973.16	0.21	974.22	2.50	975.28	3.60
973.18	0.24	974.24	2.52	975.30	3.62
973.20	0.28	974.26	2.55	975.32	3.63
973.22	0.31	974.28	2.58	975.34	3.65
973.24	0.35	974.30	2.60	975.36	3.66
973.26	0.39	974.32	2.63	975.38	3.68
973.28	0.44	974.34	2.66	975.40	3.70
973.30	0.48	974.36	2.68	975.42	3.71
973.32	0.53	974.38	2.71	975.44	3.73
973.34	0.58	974.40	2.73	975.46	3.74
973.36	0.63	974.42	2.76	975.48	3.76
973.38	0.68	974.44	2.78	975.50	3.77
973.40	0.73	974.46	2.81	975.52	3.79
973.42	0.79	974.48	2.83	975.54	3.80
973.44	0.84	974.50	2.86	975.56	3.82
973.46	0.90	974.52	2.88	975.58	3.83
973.48	0.96	974.54	2.90	975.60	3.85
973.50	1.01	974.56	2.93	975.62	3.86
973.52	1.07	974.58	2.95	975.64	3.88
973.54	1.13	974.60	2.98	975.66	3.89
973.56	1.19	974.62	3.00	975.68	3.91
973.58	1.26	974.64	3.02	975.70	3.92
973.60	1.32	974.66	3.04	975.72	3.94
973.62	1.38	974.68	3.07	975.74	3.95
973.64	1.44	974.70	3.09	975.76	3.97
973.66	1.51	974.72	3.11	975.78	3.98
973.68	1.57	974.74	3.13	975.80	4.00
973.70	1.63	974.76	3.15	975.82	4.01
973.72	1.68	974.78	3.17	975.84	4.03
973.74	1.71	974.80	3.19	975.86	4.04
973.76	1.75	974.82	3.21	975.88	4.05
973.78	1.79	974.84	3.22	975.90	4.07
973.80	1.83	974.86	3.24	975.92	4.08
973.82	1.86	974.88	3.26	975.94	4.10
973.84	1.90	974.90	3.28	975.96	4.11
973.86	1.94	974.92	3.30	975.98	4.13
973.88	1.97	974.94	3.31	976.00	**4.14**
973.90	2.01	974.96	3.33		
973.92	2.04	974.98	3.35		
973.94	2.07	975.00	3.37		

Stage-Area-Storage for Pond 5P: P2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
972.90	5	0
972.95	1,598	28
973.00	6,040	207
973.05	6,211	514
973.10	6,384	828
973.15	6,560	1,152
973.20	6,738	1,484
973.25	6,918	1,826
973.30	7,101	2,176
973.35	7,286	2,536
973.40	7,474	2,905
973.45	7,664	3,283
973.50	7,856	3,671
973.55	8,051	4,069
973.60	8,248	4,476
973.65	8,447	4,894
973.70	8,649	5,321
973.75	8,853	5,759
973.80	9,060	6,207
973.85	9,269	6,665
973.90	9,480	7,133
973.95	9,694	7,613
974.00	9,910	8,103
974.05	10,387	8,610
974.10	10,874	9,142
974.15	11,374	9,698
974.20	11,884	10,279
974.25	12,405	10,886
974.30	12,938	11,520
974.35	13,482	12,180
974.40	14,037	12,868
974.45	14,603	13,584
974.50	15,180	14,329
974.55	15,769	15,102
974.60	16,369	15,906
974.65	16,980	16,740
974.70	17,602	17,604
974.75	18,235	18,500
974.80	18,880	19,428
974.85	19,536	20,388
974.90	20,202	21,381
974.95	20,881	22,408
975.00	21,570	23,470
975.05	23,522	24,597
975.10	25,560	25,823
975.15	27,681	27,154
975.20	29,887	28,593
975.25	32,178	30,144
975.30	34,554	31,812
975.35	37,014	33,601
975.40	39,558	35,515
975.45	42,187	37,558
975.50	44,901	39,735
975.55	47,699	42,050
975.60	50,582	44,506
975.65	53,550	47,109
975.70	56,602	49,863
975.75	59,738	52,771
975.80	62,959	55,838
975.85	66,265	59,068
975.90	69,656	62,466
975.95	73,130	66,035
976.00	**76,690**	**69,780**

Summary for Pond 6P: P3

Inflow Area = 8.085 ac, 62.91% Impervious, Inflow Depth = 0.56" for WQ event
Inflow = 3.94 cfs @ 12.17 hrs, Volume= 0.378 af
Outflow = 1.49 cfs @ 12.53 hrs, Volume= 0.378 af, Atten= 62%, Lag= 21.8 min
Primary = 1.49 cfs @ 12.53 hrs, Volume= 0.378 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 972.46' @ 12.53 hrs Surf.Area= 7,134 sf Storage= 3,437 cf

Plug-Flow detention time= 46.9 min calculated for 0.378 af (100% of inflow)
Center-of-Mass det. time= 47.0 min (920.0 - 873.0)

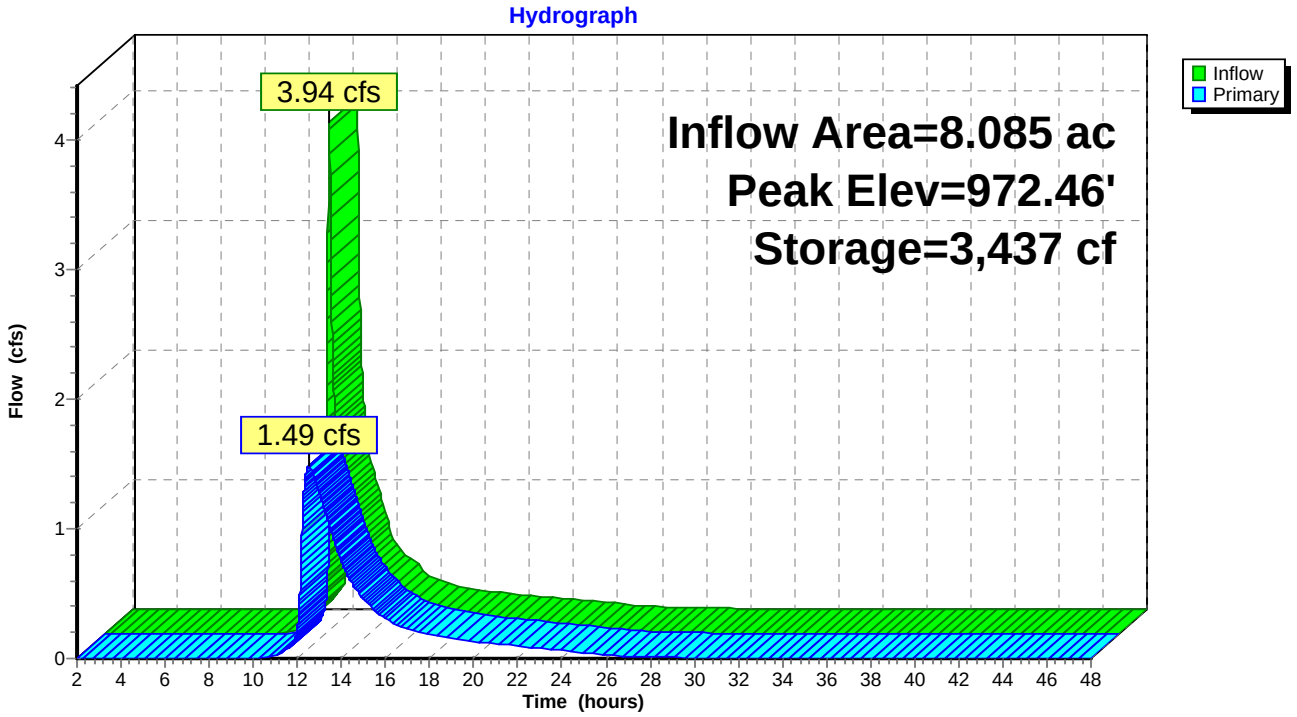
Volume	Invert	Avail.Storage	Storage Description
#1	971.85'	52,405 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
971.85	5	12.0	0	0	5
972.00	6,485	355.0	334	334	10,022
973.00	7,950	380.0	7,205	7,539	11,530
974.00	9,530	410.0	8,728	16,267	13,457
975.00	17,380	930.0	13,260	29,527	68,911
976.00	28,860	1,080.0	22,879	52,405	92,924

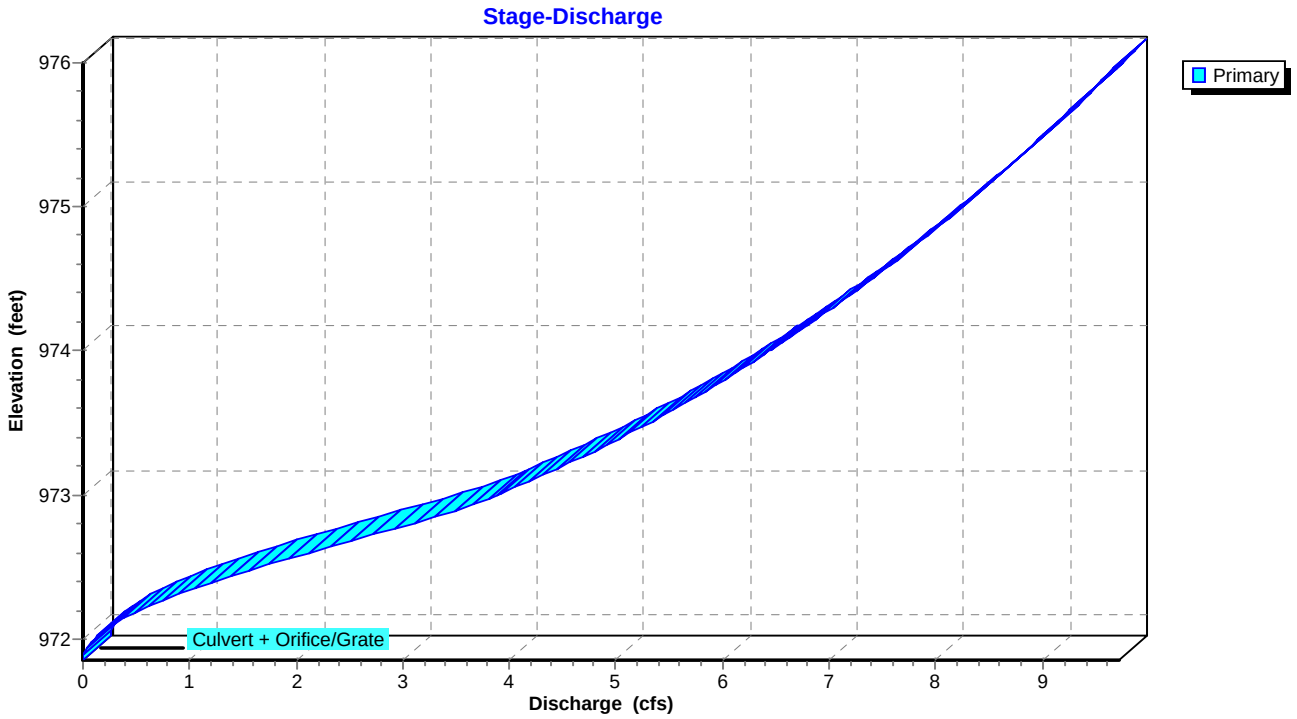
Device	Routing	Invert	Outlet Devices
#1	Primary	971.85'	**15.0" Round Culvert X 2.00** L= 350.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 971.85' / 970.10' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	971.85'	**14.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.49 cfs @ 12.53 hrs HW=972.46' TW=970.33' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 1.49 cfs of 2.52 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 1.49 cfs @ 2.65 fps)

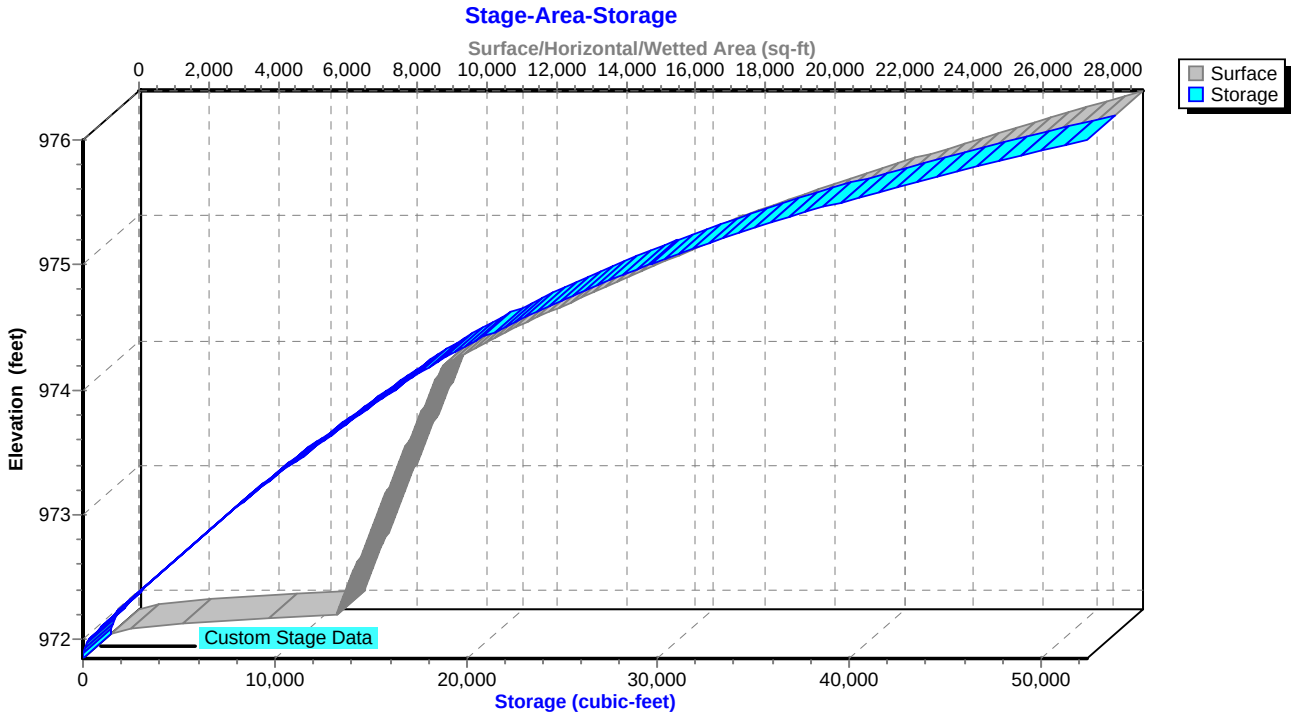
Pond 6P: P3



Pond 6P: P3



Pond 6P: P3


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
16,000
18,000
20,000
22,000
24,000
26,000
28,000
Surface
Storage
976
975
974
973
972
Elevation (feet)
Custom Stage Data
0
10,000
20,000
30,000
40,000
50,000
Storage (cubic-feet)

Stage-Discharge for Pond 6P: P3

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
971.85	0.00	972.91	3.58	973.97	6.38	975.03	8.29
971.87	0.00	972.93	3.66	973.99	6.42	975.05	8.33
971.89	0.01	972.95	3.73	974.01	6.46	975.07	8.36
971.91	0.02	972.97	3.80	974.03	6.50	975.09	8.39
971.93	0.03	972.99	3.86	974.05	6.54	975.11	8.42
971.95	0.05	973.01	3.92	974.07	6.59	975.13	8.45
971.97	0.07	973.03	3.98	974.09	6.63	975.15	8.48
971.99	0.09	973.05	4.04	974.11	6.67	975.17	8.52
972.01	0.12	973.07	4.11	974.13	6.70	975.19	8.55
972.03	0.15	973.09	4.17	974.15	6.74	975.21	8.58
972.05	0.19	973.11	4.23	974.17	6.78	975.23	8.61
972.07	0.22	973.13	4.30	974.19	6.82	975.25	8.64
972.09	0.26	973.15	4.36	974.21	6.86	975.27	8.67
972.11	0.31	973.17	4.42	974.23	6.90	975.29	8.70
972.13	0.36	973.19	4.48	974.25	6.94	975.31	8.73
972.15	0.41	973.21	4.54	974.27	6.98	975.33	8.76
972.17	0.46	973.23	4.59	974.29	7.01	975.35	8.79
972.19	0.51	973.25	4.65	974.31	7.05	975.37	8.82
972.21	0.57	973.27	4.71	974.33	7.09	975.39	8.85
972.23	0.63	973.29	4.76	974.35	7.13	975.41	8.88
972.25	0.70	973.31	4.82	974.37	7.16	975.43	8.91
972.27	0.76	973.33	4.87	974.39	7.20	975.45	8.94
972.29	0.83	973.35	4.93	974.41	7.24	975.47	8.97
972.31	0.90	973.37	4.98	974.43	7.27	975.49	9.00
972.33	0.98	973.39	5.03	974.45	7.31	975.51	9.03
972.35	1.05	973.41	5.09	974.47	7.35	975.53	9.06
972.37	1.13	973.43	5.14	974.49	7.38	975.55	9.09
972.39	1.21	973.45	5.19	974.51	7.42	975.57	9.12
972.41	1.29	973.47	5.24	974.53	7.45	975.59	9.15
972.43	1.38	973.49	5.29	974.55	7.49	975.61	9.17
972.45	1.46	973.51	5.34	974.57	7.52	975.63	9.20
972.47	1.55	973.53	5.39	974.59	7.56	975.65	9.23
972.49	1.64	973.55	5.44	974.61	7.59	975.67	9.26
972.51	1.73	973.57	5.49	974.63	7.63	975.69	9.29
972.53	1.82	973.59	5.54	974.65	7.66	975.71	9.32
972.55	1.91	973.61	5.58	974.67	7.70	975.73	9.35
972.57	2.00	973.63	5.63	974.69	7.73	975.75	9.37
972.59	2.09	973.65	5.68	974.71	7.77	975.77	9.40
972.61	2.19	973.67	5.72	974.73	7.80	975.79	9.43
972.63	2.28	973.69	5.77	974.75	7.83	975.81	9.46
972.65	2.38	973.71	5.82	974.77	7.87	975.83	9.49
972.67	2.48	973.73	5.86	974.79	7.90	975.85	9.51
972.69	2.57	973.75	5.91	974.81	7.94	975.87	9.54
972.71	2.67	973.77	5.95	974.83	7.97	975.89	9.57
972.73	2.76	973.79	6.00	974.85	8.00	975.91	9.60
972.75	2.86	973.81	6.04	974.87	8.03	975.93	9.63
972.77	2.95	973.83	6.08	974.89	8.07	975.95	9.65
972.79	3.05	973.85	6.13	974.91	8.10	975.97	9.68
972.81	3.14	973.87	6.17	974.93	8.13	975.99	**9.71**
972.83	3.23	973.89	6.21	974.95	8.17		
972.85	3.32	973.91	6.25	974.97	8.20		
972.87	3.41	973.93	6.30	974.99	8.23		
972.89	3.49	973.95	6.34	975.01	8.26		

Stage-Area-Storage for Pond 6P: P3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
971.85	5	0
971.90	803	15
971.95	2,963	103
972.00	6,485	334
972.05	6,555	659
972.10	6,625	989
972.15	6,695	1,322
972.20	6,766	1,659
972.25	6,837	1,999
972.30	6,909	2,342
972.35	6,981	2,689
972.40	7,053	3,040
972.45	7,126	3,395
972.50	7,199	3,753
972.55	7,272	4,115
972.60	7,346	4,480
972.65	7,420	4,849
972.70	7,495	5,222
972.75	7,570	5,599
972.80	7,645	5,979
972.85	7,721	6,363
972.90	7,797	6,751
972.95	7,873	7,143
973.00	7,950	7,539
973.05	8,026	7,938
973.10	8,102	8,341
973.15	8,178	8,748
973.20	8,255	9,159
973.25	8,332	9,574
973.30	8,409	9,992
973.35	8,487	10,414
973.40	8,565	10,841
973.45	8,643	11,271
973.50	8,722	11,705
973.55	8,801	12,143
973.60	8,881	12,585
973.65	8,961	13,031
973.70	9,041	13,481
973.75	9,122	13,935
973.80	9,203	14,393
973.85	9,284	14,856
973.90	9,366	15,322
973.95	9,448	15,792
974.00	9,530	16,267
974.05	9,867	16,752
974.10	10,210	17,253
974.15	10,558	17,773
974.20	10,913	18,309
974.25	11,273	18,864
974.30	11,639	19,437
974.35	12,011	20,028
974.40	12,389	20,638
974.45	12,773	21,267
974.50	13,162	21,915
974.55	13,558	22,583
974.60	13,959	23,271
974.65	14,366	23,979
974.70	14,779	24,708
974.75	15,198	25,457
974.80	15,623	26,228
974.85	16,053	27,020
974.90	16,490	27,833
974.95	16,932	28,669
975.00	17,380	29,527
975.05	17,885	30,408
975.10	18,398	31,315
975.15	18,917	32,248
975.20	19,444	33,207
975.25	19,979	34,193
975.30	20,520	35,205
975.35	21,069	36,245
975.40	21,625	37,312
975.45	22,188	38,407
975.50	22,758	39,531
975.55	23,336	40,683
975.60	23,921	41,865
975.65	24,513	43,075
975.70	25,112	44,316
975.75	25,719	45,587
975.80	26,332	46,888
975.85	26,953	48,220
975.90	27,582	49,583
975.95	28,217	50,978
976.00	**28,860**	**52,405**

Summary for Pond 7P: P4

Inflow Area = 9.299 ac, 61.07% Impervious, Inflow Depth = 0.55" for WQ event
Inflow = 1.68 cfs @ 12.44 hrs, Volume= 0.423 af
Outflow = 0.55 cfs @ 14.73 hrs, Volume= 0.424 af, Atten= 67%, Lag= 137.7 min
Primary = 0.55 cfs @ 14.73 hrs, Volume= 0.424 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 970.81' @ 14.73 hrs Surf.Area= 9,155 sf Storage= 7,187 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 187.9 min (1,097.5 - 909.6)

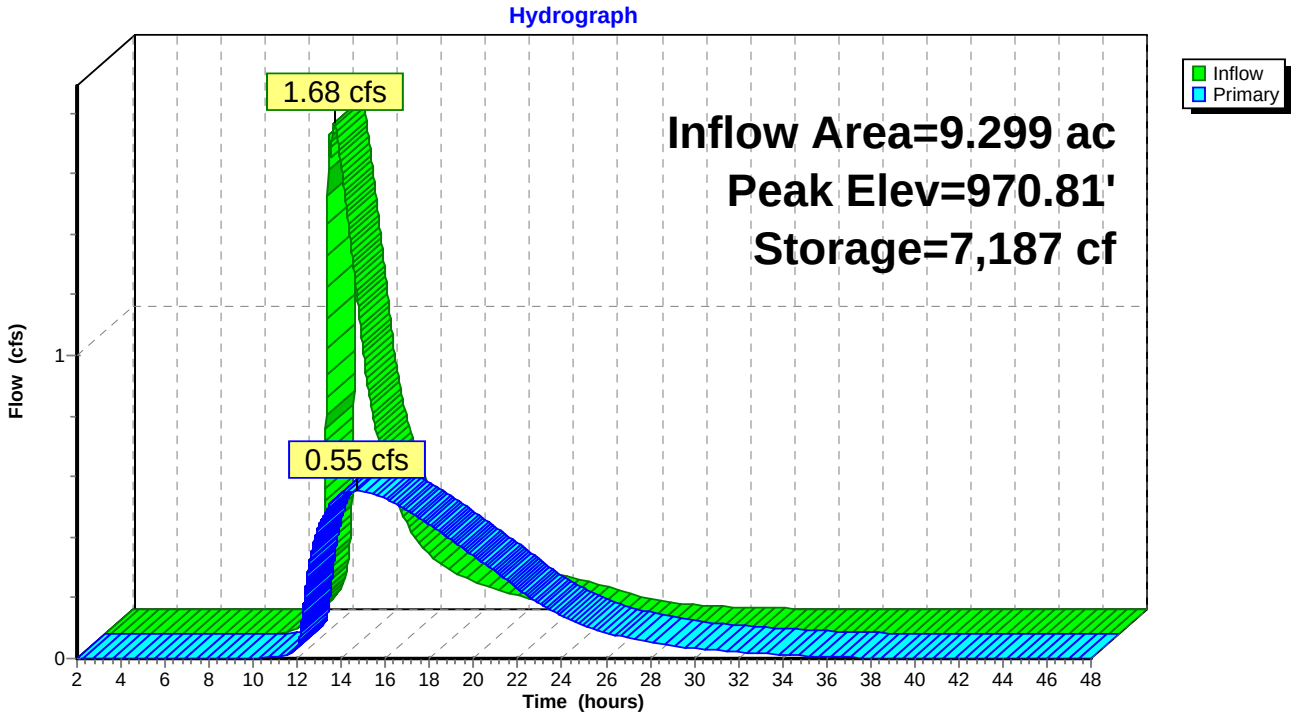
Volume	Invert	Avail.Storage	Storage Description
#1	969.90'	85,438 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
969.90	5	12.0	0	0	5
970.00	7,890	380.0	270	270	11,485
971.00	9,460	405.0	8,663	8,933	13,095
972.00	11,135	435.0	10,286	19,219	15,144
973.00	13,155	473.0	12,131	31,350	17,927
974.00	15,225	510.0	14,177	45,527	20,862
975.00	17,805	560.0	16,498	62,026	25,153
976.00	29,510	955.0	23,412	85,438	72,781

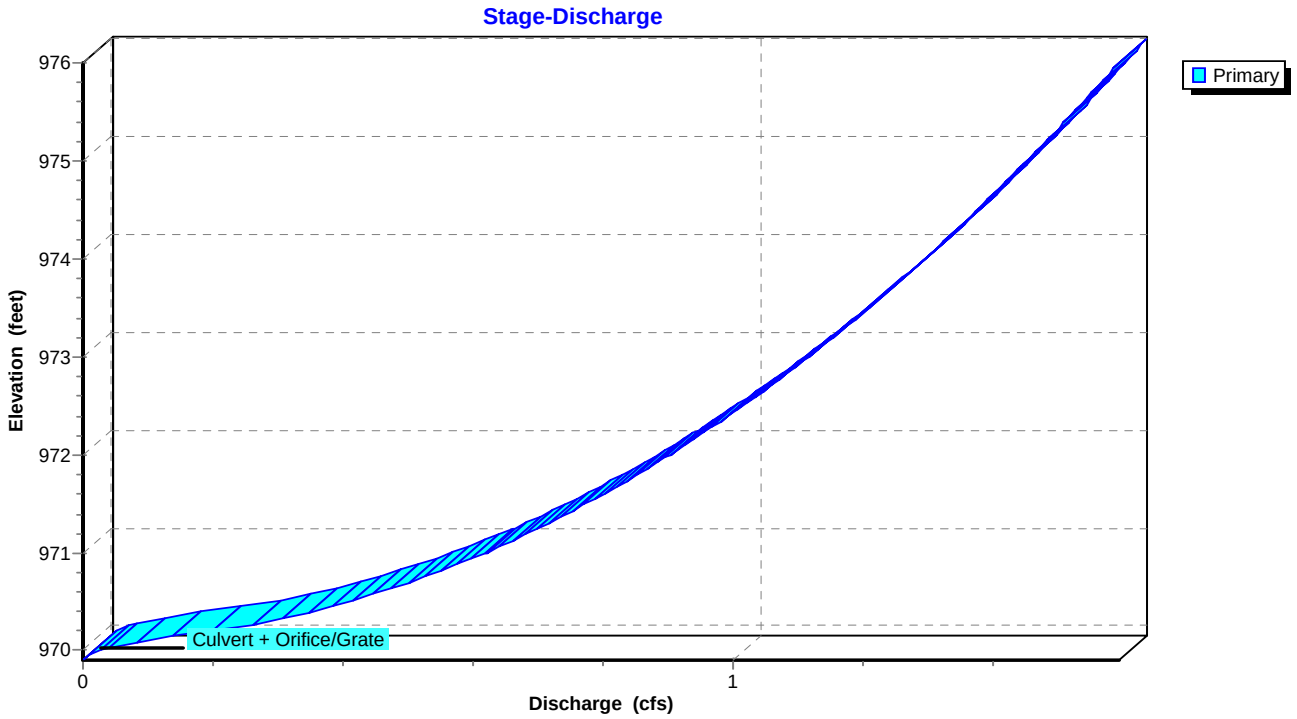
Device	Routing	Invert	Outlet Devices
#1	Primary	969.90'	**15.0" Round Culvert** L= 35.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 969.90' / 969.73' S= 0.0049 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Device 1	969.90'	**5.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.55 cfs @ 14.73 hrs HW=970.81' (Free Discharge)
↑—**1=Culvert** (Passes 0.55 cfs of 2.38 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 0.55 cfs @ 4.04 fps)

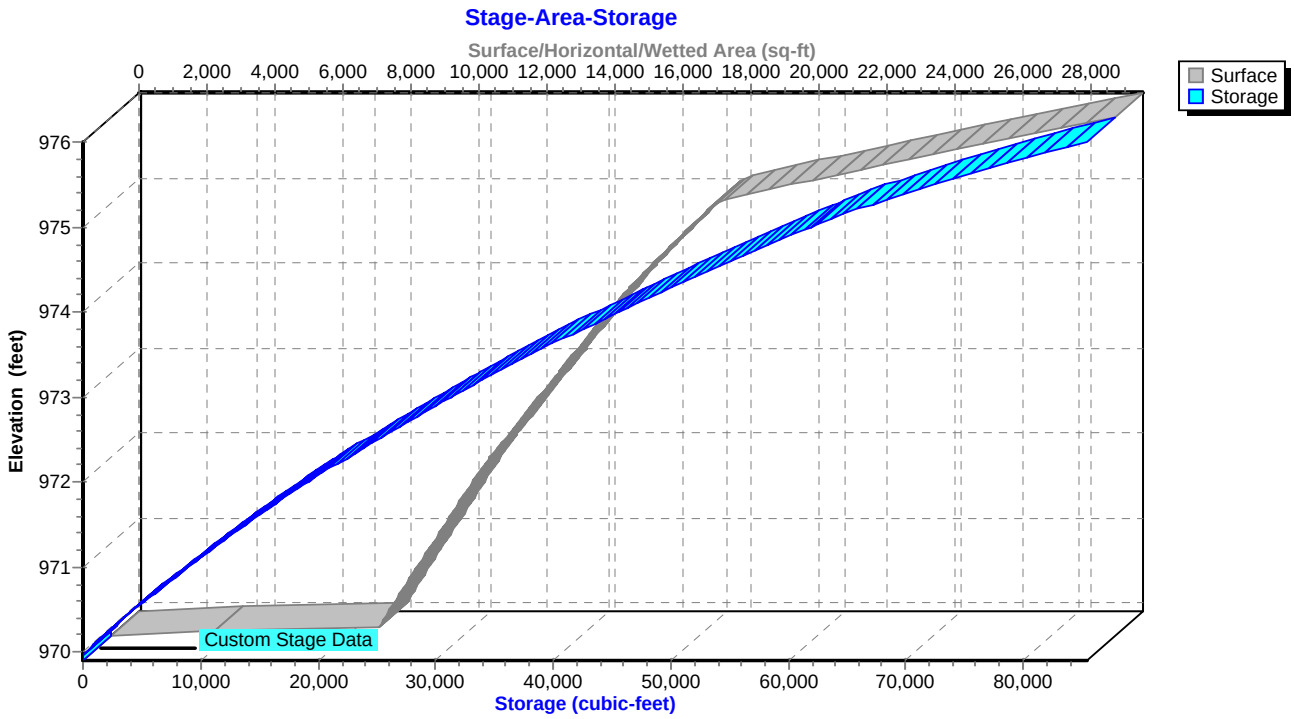
Pond 7P: P4



Pond 7P: P4



Pond 7P: P4


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0 2,000 4,000 6,000 8,000 10,000 12,000 14,000 16,000 18,000 20,000 22,000 24,000 26,000 28,000
Surface
Storage
Elevation (feet)
976
975
974
973
972
971
970
Custom Stage Data
0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000
Storage (cubic-feet)

Stage-Discharge for Pond 7P: P4

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
969.90	0.00	972.02	0.91	974.14	1.32
969.94	0.00	972.06	0.92	974.18	1.32
969.98	0.02	972.10	0.93	974.22	1.33
970.02	0.04	972.14	0.94	974.26	1.34
970.06	0.07	972.18	0.94	974.30	1.34
970.10	0.10	972.22	0.95	974.34	1.35
970.14	0.14	972.26	0.96	974.38	1.36
970.18	0.18	972.30	0.97	974.42	1.36
970.22	0.22	972.34	0.98	974.46	1.37
970.26	0.26	972.38	0.99	974.50	1.38
970.30	0.29	972.42	1.00	974.54	1.38
970.34	0.32	972.46	1.01	974.58	1.39
970.38	0.34	972.50	1.02	974.62	1.39
970.42	0.37	972.54	1.02	974.66	1.40
970.46	0.39	972.58	1.03	974.70	1.41
970.50	0.41	972.62	1.04	974.74	1.41
970.54	0.43	972.66	1.05	974.78	1.42
970.58	0.45	972.70	1.06	974.82	1.43
970.62	0.47	972.74	1.07	974.86	1.43
970.66	0.49	972.78	1.07	974.90	1.44
970.70	0.51	972.82	1.08	974.94	1.44
970.74	0.52	972.86	1.09	974.98	1.45
970.78	0.54	972.90	1.10	975.02	1.46
970.82	0.55	972.94	1.10	975.06	1.46
970.86	0.57	972.98	1.11	975.10	1.47
970.90	0.58	973.02	1.12	975.14	1.47
970.94	0.60	973.06	1.13	975.18	1.48
970.98	0.61	973.10	1.14	975.22	1.48
971.02	0.63	973.14	1.14	975.26	1.49
971.06	0.64	973.18	1.15	975.30	1.50
971.10	0.65	973.22	1.16	975.34	1.50
971.14	0.67	973.26	1.17	975.38	1.51
971.18	0.68	973.30	1.17	975.42	1.51
971.22	0.69	973.34	1.18	975.46	1.52
971.26	0.70	973.38	1.19	975.50	1.52
971.30	0.72	973.42	1.19	975.54	1.53
971.34	0.73	973.46	1.20	975.58	1.54
971.38	0.74	973.50	1.21	975.62	1.54
971.42	0.75	973.54	1.22	975.66	1.55
971.46	0.76	973.58	1.22	975.70	1.55
971.50	0.77	973.62	1.23	975.74	1.56
971.54	0.79	973.66	1.24	975.78	1.56
971.58	0.80	973.70	1.24	975.82	1.57
971.62	0.81	973.74	1.25	975.86	1.57
971.66	0.82	973.78	1.26	975.90	1.58
971.70	0.83	973.82	1.26	975.94	1.59
971.74	0.84	973.86	1.27	975.98	**1.59**
971.78	0.85	973.90	1.28		
971.82	0.86	973.94	1.29		
971.86	0.87	973.98	1.29		
971.90	0.88	974.02	1.30		
971.94	0.89	974.06	1.31		
971.98	0.90	974.10	1.31		

Stage-Area-Storage for Pond 7P: P4

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
969.90	5	0
970.00	7,890	270
970.10	8,041	1,066
970.20	8,193	1,878
970.30	8,346	2,705
970.40	8,501	3,547
970.50	8,657	4,405
970.60	8,815	5,279
970.70	8,974	6,168
970.80	9,135	7,074
970.90	9,297	7,995
971.00	9,460	8,933
971.10	9,621	9,887
971.20	9,784	10,857
971.30	9,948	11,844
971.40	10,114	12,847
971.50	10,280	13,867
971.60	10,449	14,903
971.70	10,618	15,956
971.80	10,789	17,027
971.90	10,961	18,114
972.00	11,135	19,219
972.10	11,329	20,342
972.20	11,526	21,485
972.30	11,723	22,647
972.40	11,923	23,830
972.50	12,124	25,032
972.60	12,327	26,255
972.70	12,531	27,497
972.80	12,738	28,761
972.90	12,945	30,045
973.00	13,155	31,350
973.10	13,355	32,676
973.20	13,557	34,021
973.30	13,760	35,387
973.40	13,965	36,773
973.50	14,171	38,180
973.60	14,379	39,607
973.70	14,588	41,056
973.80	14,799	42,525
973.90	15,011	44,016
974.00	15,225	45,527
974.10	15,474	47,062
974.20	15,725	48,622
974.30	15,978	50,207
974.40	16,233	51,818
974.50	16,490	53,454
974.60	16,749	55,116
974.70	17,010	56,804
974.80	17,273	58,518
974.90	17,538	60,258
975.00	17,805	62,026
975.10	18,843	63,858
975.20	19,911	65,795
975.30	21,008	67,841
975.40	22,134	69,998
975.50	23,290	72,269
975.60	24,475	74,657
975.70	25,690	77,165
975.80	26,934	79,796
975.90	28,207	82,552
976.00	**29,510**	**85,438**

Summary for Pond 8P: P5

Inflow Area = 3.274 ac, 71.38% Impervious, Inflow Depth = 0.65" for WQ event
Inflow = 3.73 cfs @ 12.15 hrs, Volume= 0.178 af
Outflow = 1.13 cfs @ 12.36 hrs, Volume= 0.178 af, Atten= 70%, Lag= 12.6 min
Primary = 1.13 cfs @ 12.36 hrs, Volume= 0.178 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 970.69' @ 12.36 hrs Surf.Area= 4,181 sf Storage= 2,727 cf

Plug-Flow detention time= 46.0 min calculated for 0.178 af (100% of inflow)
Center-of-Mass det. time= 46.1 min (852.8 - 806.6)

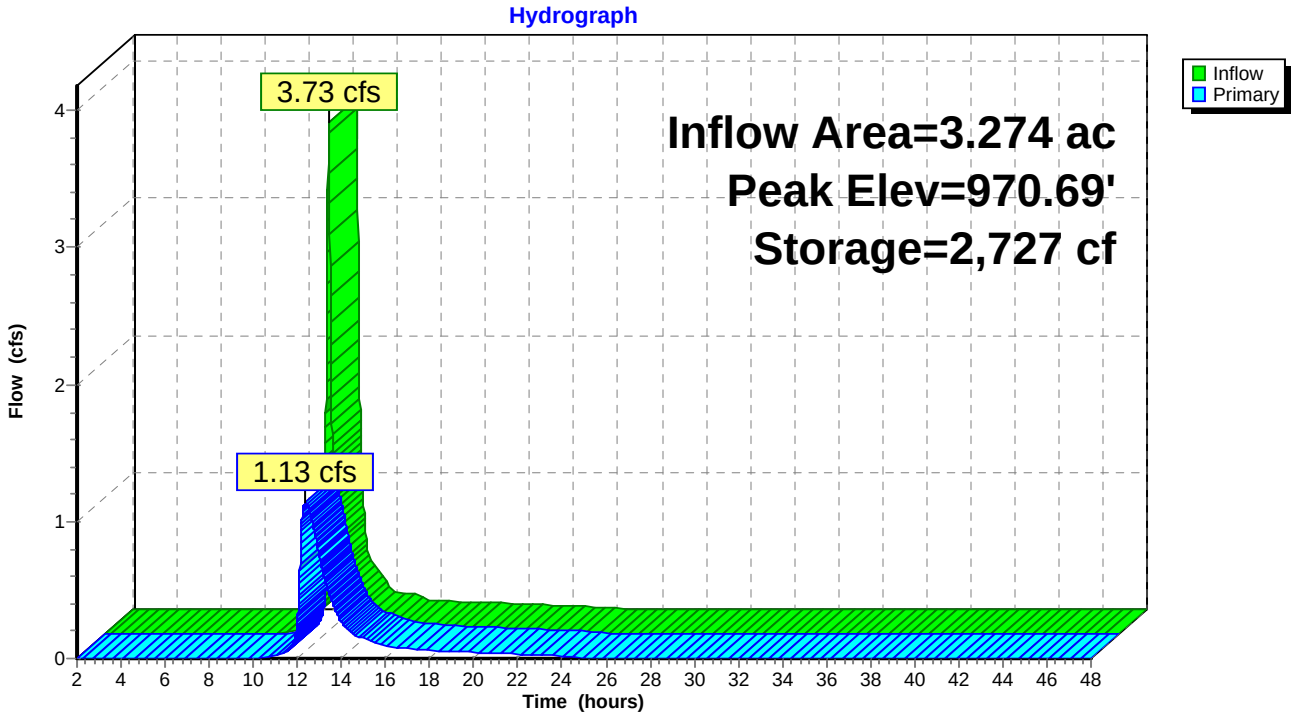
Volume	Invert	Avail.Storage	Storage Description
#1	969.90'	45,413 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
969.90	5	12.0	0	0	5
970.00	3,410	270.0	118	118	5,795
971.00	4,555	300.0	3,969	4,087	7,185
972.00	5,795	325.0	5,163	9,249	8,467
973.00	7,315	360.0	6,540	15,790	10,405
974.00	8,965	400.0	8,126	23,916	12,854
975.00	10,760	435.0	9,849	33,765	15,217
976.00	12,560	460.0	11,648	45,413	17,053

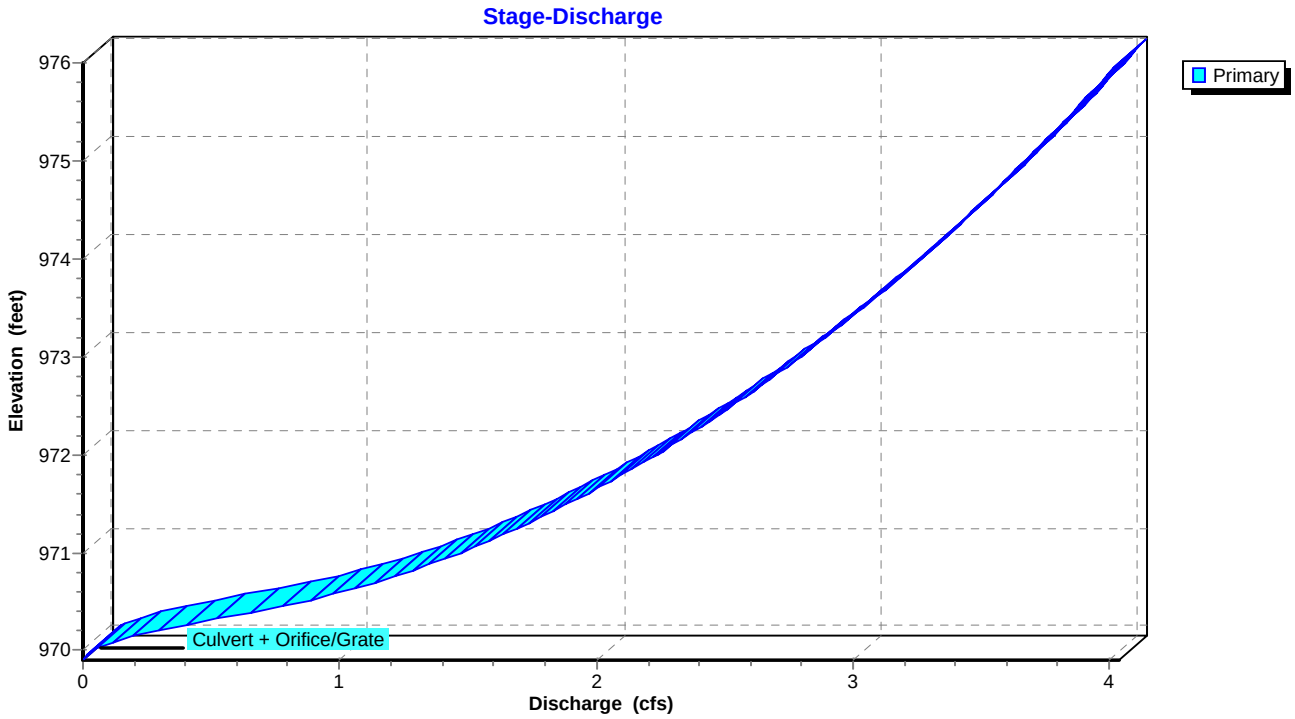
Device	Routing	Invert	Outlet Devices
#1	Primary	969.90'	**15.0" Round Culvert** L= 30.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 969.90' / 969.75' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Device 1	969.90'	**8.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.13 cfs @ 12.36 hrs HW=970.69' (Free Discharge)
↑—**1=Culvert** (Passes 1.13 cfs of 1.90 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 1.13 cfs @ 3.25 fps)

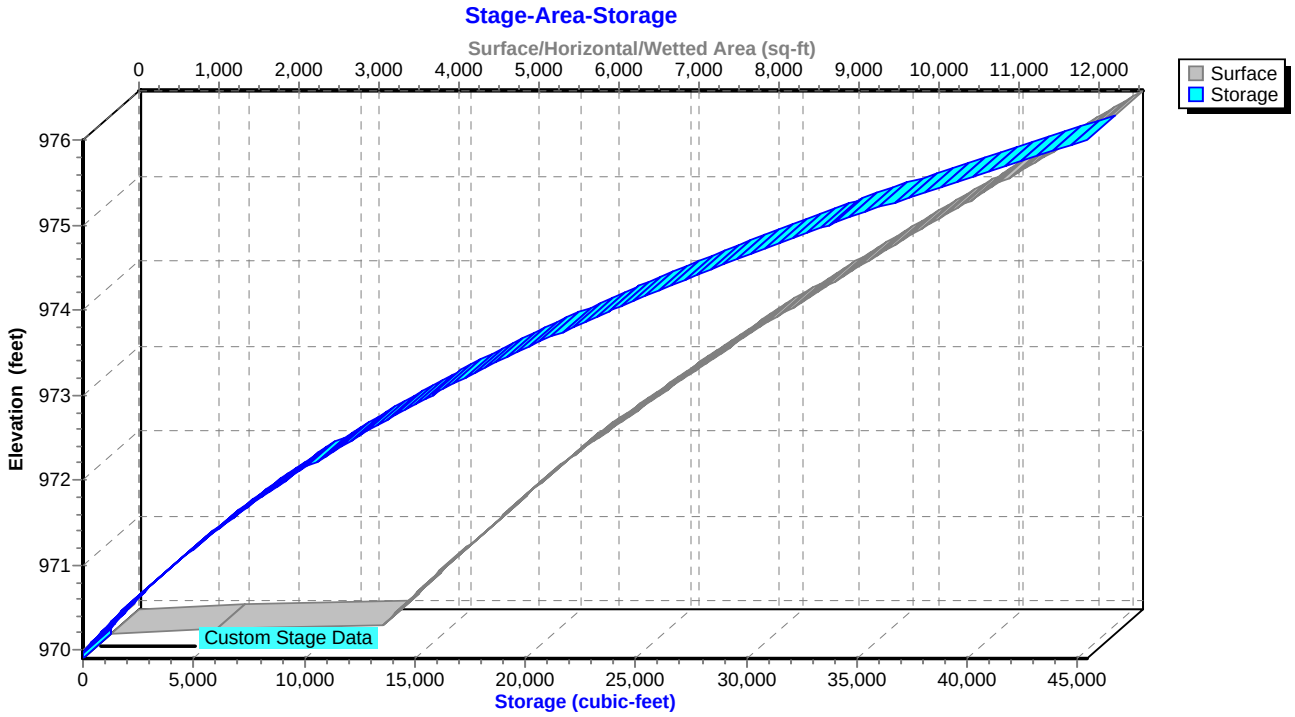
Pond 8P: P5



Pond 8P: P5



Pond 8P: P5


Stage-Area-Storage
Surface/Horizontal/Wetted Area (sq-ft)
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
Surface
Storage
976
975
974
973
972
971
970
Elevation (feet)
Custom Stage Data
0
5,000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
Storage (cubic-feet)

Stage-Discharge for Pond 8P: P5

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
969.90	0.00	972.02	2.25	974.14	3.32
969.94	0.01	972.06	2.27	974.18	3.34
969.98	0.02	972.10	2.30	974.22	3.36
970.02	0.05	972.14	2.32	974.26	3.37
970.06	0.09	972.18	2.35	974.30	3.39
970.10	0.13	972.22	2.37	974.34	3.41
970.14	0.19	972.26	2.39	974.38	3.42
970.18	0.25	972.30	2.42	974.42	3.44
970.22	0.32	972.34	2.44	974.46	3.46
970.26	0.39	972.38	2.46	974.50	3.47
970.30	0.47	972.42	2.49	974.54	3.49
970.34	0.55	972.46	2.51	974.58	3.50
970.38	0.63	972.50	2.53	974.62	3.52
970.42	0.72	972.54	2.55	974.66	3.54
970.46	0.80	972.58	2.57	974.70	3.55
970.50	0.87	972.62	2.60	974.74	3.57
970.54	0.94	972.66	2.62	974.78	3.58
970.58	0.99	972.70	2.64	974.82	3.60
970.62	1.05	972.74	2.66	974.86	3.62
970.66	1.10	972.78	2.68	974.90	3.63
970.70	1.15	972.82	2.70	974.94	3.65
970.74	1.20	972.86	2.72	974.98	3.66
970.78	1.24	972.90	2.74	975.02	3.68
970.82	1.29	972.94	2.77	975.06	3.69
970.86	1.33	972.98	2.79	975.10	3.71
970.90	1.37	973.02	2.81	975.14	3.72
970.94	1.41	973.06	2.83	975.18	3.74
970.98	1.45	973.10	2.85	975.22	3.75
971.02	1.49	973.14	2.87	975.26	3.77
971.06	1.53	973.18	2.89	975.30	3.78
971.10	1.56	973.22	2.90	975.34	3.80
971.14	1.60	973.26	2.92	975.38	3.81
971.18	1.64	973.30	2.94	975.42	3.83
971.22	1.67	973.34	2.96	975.46	3.84
971.26	1.70	973.38	2.98	975.50	3.86
971.30	1.74	973.42	3.00	975.54	3.87
971.34	1.77	973.46	3.02	975.58	3.89
971.38	1.80	973.50	3.04	975.62	3.90
971.42	1.83	973.54	3.06	975.66	3.92
971.46	1.86	973.58	3.07	975.70	3.93
971.50	1.89	973.62	3.09	975.74	3.94
971.54	1.92	973.66	3.11	975.78	3.96
971.58	1.95	973.70	3.13	975.82	3.97
971.62	1.98	973.74	3.15	975.86	3.99
971.66	2.01	973.78	3.17	975.90	4.00
971.70	2.04	973.82	3.18	975.94	4.02
971.74	2.06	973.86	3.20	975.98	**4.03**
971.78	2.09	973.90	3.22		
971.82	2.12	973.94	3.24		
971.86	2.14	973.98	3.25		
971.90	2.17	974.02	3.27		
971.94	2.20	974.06	3.29		
971.98	2.22	974.10	3.30		

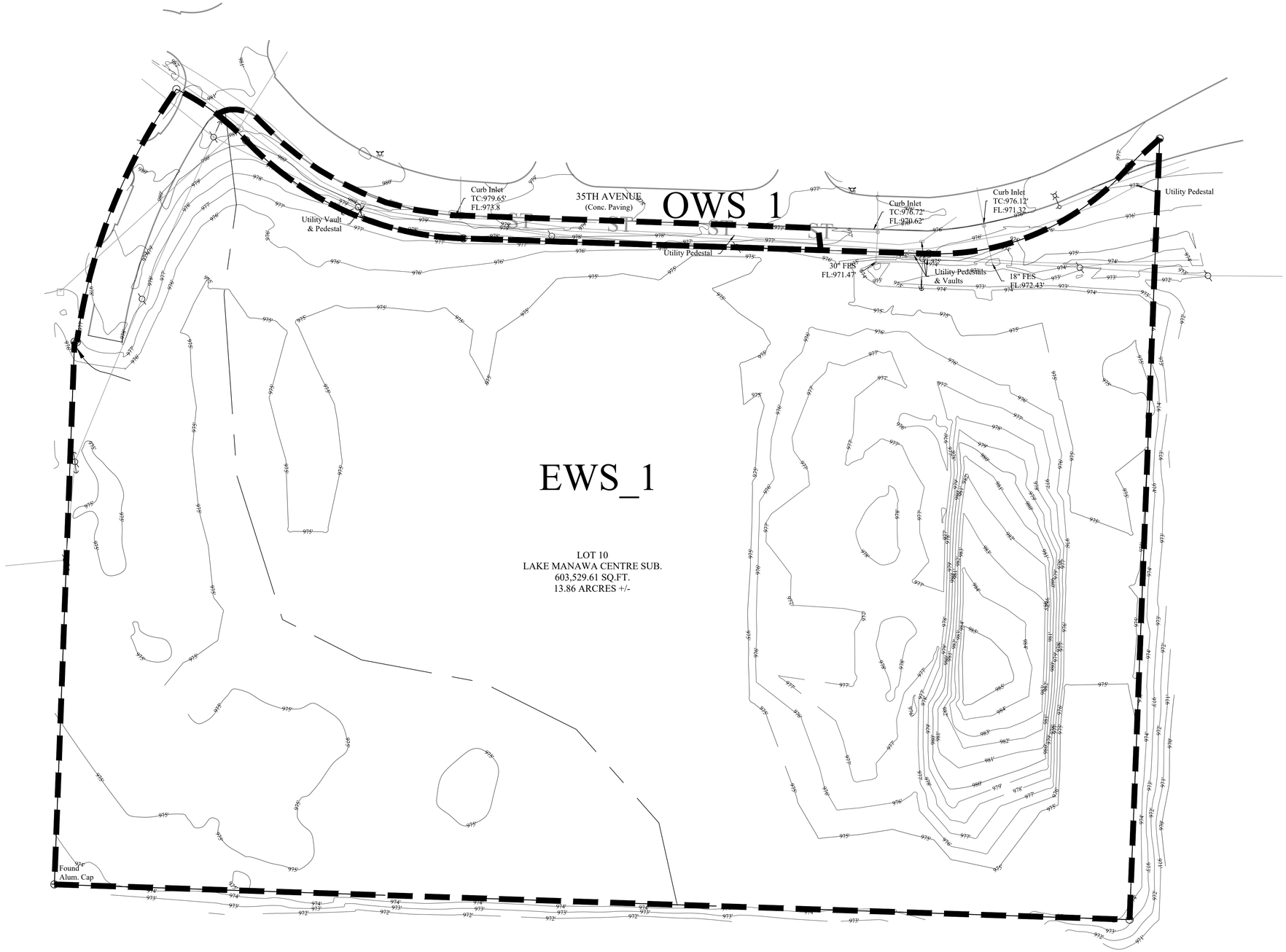
Stage-Area-Storage for Pond 8P: P5

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
969.90	5	0
970.00	3,410	118
970.10	3,517	465
970.20	3,626	822
970.30	3,736	1,190
970.40	3,848	1,569
970.50	3,962	1,959
970.60	4,077	2,361
970.70	4,194	2,775
970.80	4,313	3,200
970.90	4,433	3,638
971.00	4,555	4,087
971.10	4,672	4,548
971.20	4,791	5,021
971.30	4,911	5,507
971.40	5,033	6,004
971.50	5,156	6,513
971.60	5,281	7,035
971.70	5,407	7,569
971.80	5,535	8,117
971.90	5,664	8,677
972.00	5,795	9,249
972.10	5,939	9,836
972.20	6,085	10,437
972.30	6,232	11,053
972.40	6,382	11,684
972.50	6,533	12,330
972.60	6,686	12,991
972.70	6,840	13,667
972.80	6,997	14,359
972.90	7,155	15,066
973.00	7,315	15,790
973.10	7,472	16,529
973.20	7,632	17,284
973.30	7,792	18,055
973.40	7,955	18,843
973.50	8,119	19,647
973.60	8,285	20,467
973.70	8,452	21,304
973.80	8,622	22,157
973.90	8,792	23,028
974.00	8,965	23,916
974.10	9,137	24,821
974.20	9,311	25,743
974.30	9,486	26,683
974.40	9,663	27,641
974.50	9,842	28,616
974.60	10,022	29,609
974.70	10,204	30,620
974.80	10,388	31,650
974.90	10,573	32,698
975.00	10,760	33,765
975.10	10,934	34,849
975.20	11,109	35,951
975.30	11,285	37,071
975.40	11,463	38,209
975.50	11,643	39,364
975.60	11,823	40,537
975.70	12,005	41,729
975.80	12,189	42,938
975.90	12,374	44,166
976.00	**12,560**	**45,413**

APPENDIX C

LAKE MANAWA CENTRE, LOT 10

PRELIMINARY PLAN



N
W E
S

50 0 50 100
scale 25 feet

FoleyShald
ENGINEERING
3803 N 153RD STREET, SUITE 203 | OMAHA, NE 68116

REVISIONS

NUMBER	DATE	DESCRIPTION

Lake Manawa Centre, Lot 10

Council Bluffs, Iowa

FSE #: 025.001

February 9, 2021

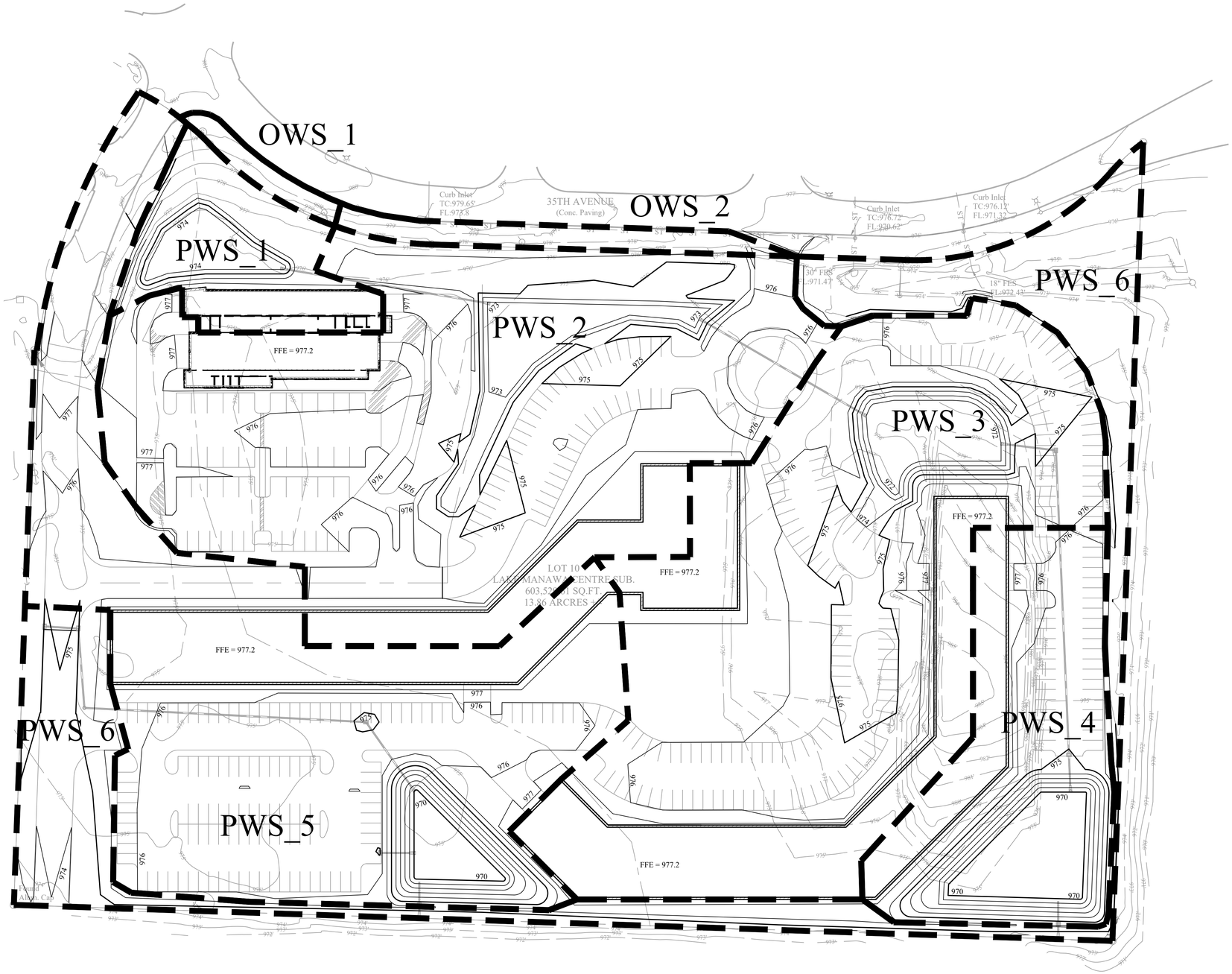
PRELIMINARY
NOT FOR CONSTRUCTION

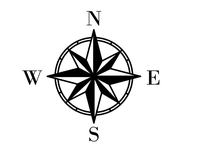
Existing Conditions

Exhibit A

LAKE MANAWA CENTRE, LOT 10

PRELIMINARY PLAN







FoleyShald ENGINEERING
3803 N 153RD STREET, SUITE 203 | OMAHA, NE 68116

REVISIONS

NUMBER	DATE	DESCRIPTION

Lake Manawa Centre, Lot 10

Council Bluffs, Iowa

FSE #: 025.001

February 9, 2021

PRELIMINARY

NOT FOR CONSTRUCTION

Grading & Drainage Plan

Exhibit B