



April 6, 2022

Mr. John Gislason  
DR Horton  
4220 Race Track Road  
St. Johns County, Florida 32259

ECS Project No. 35:31217-E

Reference: Report of Geotechnical Engineering Services  
**The Rookery Stormwater Ponds**  
Pearce Boulevard  
Clay County, Florida

Dear Mr. Gislason:

As requested, ECS Florida, LLC (ECS) has completed the requested geotechnical engineering analyses of the stormwater management facilities for the above-referenced project. This letter presents the field testing performed, presents the data obtained, our evaluation of the drawdown of the groundwater level in the adjacent wetlands that could occur due to the pond construction, our evaluation of the groundwater baseflow into the ponds, and the groundwater baseflow into the underdrains. Note ECS previously performed geotechnical explorations for the subject site (ECS Report Nos. 35:30682, 35:30682-A, 35:31217, 35:31217-C). The results of our previous explorations were utilized herein.

Our services were provided in accordance with our Proposal No. 35:20184-GPR, which includes our Terms and Conditions of Service, dated February 8, 2023, as authorized by Mr. John Gislason on February 13, 2023 and Change Order No. 1, dated April 3, 2023.

### **FIELD EXPLORATION AND RESULTS**

Our exploration procedures are explained in greater detail in Appendix B including the insert titled Subsurface Exploration Procedures. Our scope of work included drilling four Standard Penetration Test (SPT) borings and performing 30 field permeability tests. Our borings and permeability tests were located with a handheld GPS unit and their approximate locations are shown on the Field Exploration Diagram (Figure 2) in Appendix A. Our recent borings were extended deeper from previous borings from ESC Report Nos. 35:30682 and 35:30682-A and are presented in our borings logs in Appendix B.

We located and performed 30 field permeability tests adjacent to our previously performed boring locations within several proposed stormwater ponds. The field permeability tests were performed by installing a solid-walled, open-bottom PVC casing snugly fit into a 4-inch diameter, between 6 feet

and 30 feet deep auger boreholes. The solid-walled PVC casing was constructed with a 1.5-foot long section of PVC slotted screen, with 0.010-inch openings, attached to the bottom of the casing. The pipe was filled to the top with water. The tests were conducted as a "falling head" test in which the rate of water drop within the pipe was measured over a 24-hour period.

Relatively undisturbed Shelby tubes pushed horizontally below the ground surface were also collected and returned to our laboratory for permeability testing. The tube samples were collected on soils within the upper aquifer that were above the existing groundwater level at the time of our field exploration. The results of the permeability testing are presented in Table 1.

### **DRAWDOWN ANALYSES**

Drawdown analyses were performed for Ponds SWMF No. 4, 6, 7, 12, 14, 21, 31, 32, 33, and J1 to estimate the potential drawdown of the groundwater level within the wetlands adjacent the proposed ponds that could occur as a result of the ponds' construction. The primary variables affecting drawdown are: (1) the difference between the wetland seasonal high groundwater table and the pond control elevation (i.e., NWL), (2) the hydraulic conductivity of the soil, and (3) the size and geometry of the pond.

#### **Stormwater Ponds SWMF No. 4, 6, 7, 12, 14, 21, 31, 32, 33**

To simulate the pond conditions for Ponds SWMF No. 4, 6, 7, 12, 14, 21, 31, 32, 33, design parameters estimated from the subsurface soil information and the results of the field and laboratory permeability tests were used in the computer program "PONDS, Version 3.3" which utilizes the "MODFLOW" program to conduct background seepage analyses. The program model can be used to simulate actual loading conditions and predict the resultant drawdown and background water seepage during a specific time period.

The input parameters for this project included normal seasonal high groundwater levels at the wetland locations, and pond design NWL and pond dimensions as provided by Dunn & Associates, Inc. An estimated 1-foot seasonal water table fluctuation, a soil porosity of 25 percent, and a simulation period of 153 days (i.e., the length of wet season) were also used in our analyses. Average soil permeability values (horizontal hydraulic conductivity), calculated from results the laboratory permeability test for the ponds, were used for the surficial, unconfined aquifers (see Table 2 and the attached calculation sheet for pond-specific values). These values were used in the drawdown analyses modeled without the installation of a cut-off wall to determine the extent of the groundwater drawdown.

#### **Stormwater Pond SWMF J1**

To simulate the pond conditions of SWMF J1, design parameters estimated from the subsurface soil information and the results of the field and laboratory permeability tests were used in the computer program "Groundwater Modeling System (GMS), Version 10.6.6" which utilizes the "MODFLOW" program to conduct three-dimensional background seepage analysis. The program model can be used to simulate actual loading conditions and predict the resultant drawdown and background water seepage during a specific time period.

The input parameters for this project included the following:

- Pre-development estimated seasonal high groundwater levels established from the topographic information and wetland boundaries provided by Dunn & Associates, Inc. Boundary condition seasonal high groundwater levels were estimated using a combination of provided LIDAR data and the USDA Web Soil Survey. The seasonal high groundwater levels between our test locations and boundary conditions were estimated using interpolation tools within GMS.
- Pre-development and post-development ground surface topography was input for on-site grades using LIDAR data and proposed grading information provided by Dunn & Associates, Inc.
- The design NWL at the pond location. This parameter was also modeled using the Time Variant Specified Head (CHD) package, as it allows groundwater to be removed from the specified cells at the specified elevation.
- Pond design dimensions as provided by Dunn & Associates, Inc. The pond dimensions were modeled in a three-dimensional grid that has a total size of 3,400 feet x 3,200 feet x 58 feet. The grid was subdivided into cells with sizes varying between 25 feet and 100 feet. The grid refinement was focused on the pond areas. The pond geometry was modeled by assigning a high permeability soil value to the pond area.
- An estimated 1-foot seasonal water table fluctuation. This was modeled utilizing the Recharge (RCH) package. The model recharge was set to simulate 1-foot of water table fluctuation across 153 days (i.e., the length of wet season) in a soil that exhibits a porosity of 25 percent.
- Soil permeability values (horizontal hydraulic conductivity), calculated from results the laboratory and field permeability tests for the pond, were used for the surficial, unconfined aquifers. These values were used in the drawdown analyses modeled without the installation of a cut-off wall to determine the extent of the groundwater drawdown.

### **Drawdown Analysis Results**

Based on the results of our drawdown analysis, as presented in Table 1, it is our opinion that SWMF Nos. 7, 12, and 14 will not require cut-off walls to preclude impacts to the wetlands.

Also presented in Table 1, it is our opinion that SWMF Nos. 4, 6, 21, 31, 32, 33, and J1 will require a cut-off wall to preclude impacts to the wetlands. The cut-off walls should be constructed to the horizontal extents shown in Plates 1-8 and should be imbedded at least one foot into the restrictive layer. A recommended typical detail for cut-off wall construction is indicated on Plate 9. The estimated depths to the restrictive layers are presented on the table below.

Pond	Soil Boring	Depth of restrictive layer encountered in the boring (feet below existing ground surface)
SWMF No. 4	BB9	7
SWMF No. 6	B41	12
SWMF No. 21	PB1	6
SWMF No. 31	BB12	12
SWMF No. 32	BB14	10
SWMF No. 33	B36	4
SWMF J1	BB4	3

The recommended cut-off wall may be constructed of clayey soils compacted to obtain a permeability of  $1 \times 10^{-7}$  cm/sec or less, or 30-mil PVC or HDPE (or equivalent) material.

#### **GROUNDWATER BASEFLOW INTO THE STORMWATER PONDS**

Groundwater baseflow analyses were performed for SWMF No. 1 through SWMF No. 33 to estimate the amount of groundwater inflow to the stormwater ponds. The primary variables affecting drawdown are: (1) the difference between the seasonal high groundwater table and the pond control elevation (i.e., NWL), (2) the hydraulic conductivity of the soil, and (3) the size and geometry of the pond. To simulate the pond conditions, design parameters estimated from the subsurface soil information and the results of the field and laboratory permeability tests were used in the computer program "PONDS, Version 3.3" which utilizes the "MODFLOW" program to conduct background seepage analyses. The program model can be used to simulate actual loading conditions and estimate background water seepage during a specific time period.

The input parameters for this project included normal seasonal high groundwater levels adjacent to the ponds, pond design NWL, and pond dimensions as provided by Dunn & Associates, Inc. An estimated soil porosity of 25 percent, and a simulation period of 153 days (i.e., the length of wet season) were also used in our analyses. Average soil permeability values (horizontal hydraulic conductivity), calculated from results of the laboratory permeability tests for the ponds, were used for the surficial, unconfined aquifers (see Table 2). Note weighted permeability values of stormwater ponds where testing was not performed were estimated based on the results of nearby stormwater ponds. Average soil permeability values (horizontal hydraulic conductivity), calculated from results of the field permeability tests for the ponds and the standard permeability value of a cut-off wall, were used for the surficial, unconfined aquifers with a cut-off wall installed (see Table 3). These values were used in the baseflow analyses to estimate the rate of groundwater baseflow into the ponds during seasonal high groundwater conditions (see Table 4). Note, factors of safety were not applied to the calculated baseflow rates. We recommend an appropriate factor of safety be applied when designing the stormwater ponds.

The parameters and results of the baseflow analyses at the pond locations are presented in Table 4 (attached). Output sheets and Groundwater Baseflow curves generated by the "PONDS" program are also attached in Appendix A.

### **GROUNDWATER BASEFLOW INTO UNDERDRAINS**

Based on the underdrain locations shown in the *Paving and Drainage Plans* prepared by Dun & Associates, Inc. dated December 12, 2022, as well as the results of our previously performed borings, we performed a groundwater baseflow analysis to determine the groundwater flow rate into the roadway underdrains.

To simulate the underdrain conditions, design parameters estimated from the subsurface soil information and the results of the field and laboratory permeability tests were used in the computer program "PONDS, Version 3.3" which utilizes the "MODFLOW" program to conduct background seepage analyses. The program model can be used to simulate actual loading conditions and predict the background water seepage during a specific time period. Note the simulations were performed utilizing a 500 foot long pond. Therefore, the calculated baseflow was divided by 500 feet to provide a flow rate per linear foot of underdrain. Based on these results, we estimate the groundwater flow rate into the following underdrain systems will be approximately as shown in the table below during seasonal high groundwater conditions. The results of our evaluation are included in Appendix A.

<b>Roadway Name</b>	<b>Approximate Station</b>	<b>Estimated Groundwater Baseflow Per Linear Foot of Underdrain (gpm)</b>
White Ibis Lane	13+50 to 15+50	0.009
White Ibis Lane	17+50 to 20+00	0.006
Lark Sparrow Street	3+00 to 6+25	0.014
Lark Sparrow Street	9+00 to 9+75	0.009
Audubon Avenue	15+50 to 16+50	0.009
Little Heron Place	3+00 to 9+75	0.014
Pearce Boulevard	62+25 to 65+00	0.013

Factors of safety were not applied to the calculated baseflow rates. We recommend an appropriate factor of safety be applied when designing the stormwater ponds.

### **CLOSURE**


We appreciate this opportunity to be of service as your geotechnical consultant on this phase of the project. If you have any questions concerning this report, or if we may be of any further service, please contact us.

Respectfully Submitted,  
ECS Florida, LLC

  
Nathan D. Hildreth, E.I.  
Geotechnical Project Manager  
[NHildreth@ecslimited.com](mailto:NHildreth@ecslimited.com)

Christopher M. Egan, State of Florida Professional Engineer, License No. 79645  
This item has been digitally signed and sealed by Christopher Egan on the date indicated here.  
Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

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Chris M. Egan, P.E.  
Associate Principal Engineer  
Registered, Florida No. 79645  
[CEgan@ecslimited.com](mailto:CEgan@ecslimited.com)

#### TABLES

Table 1	Results of Drawdown Analyses
Table 2	Weighted Average Hydraulic Conductivity Calculation Sheet
Table 3	Weighted Average Hydraulic Conductivity With Cut-Off Walls
Table 4	Results of Baseflow Analyses

#### PLATES

Plates 1 - 6	Cut-Off Wall Location Plans
Plate 7	Pre-Development Groundwater Contours and Cut-Off Wall for SWMF J1
Plate 8	Post-Development Groundwater Contours and Cut-Off Wall for SWMF J1
Plate 9	Cut-Off Wall Detail Section

#### Appendix A – Drawings & Reports

- Figure 1 - Site Location Diagram
- Figure 2 - Field Exploration Diagram
- Figure 3 - Generalized Subsurface Profiles

#### Appendix B – Field Operations

- Reference Notes for Boring Logs
- Subsurface Exploration Procedure: Standard Penetration Testing (SPT)
- Boring Logs

#### Appendix C – PONDS Output

- Drawdown and Baseflow Analyses
- Underdrain Baseflow Analyses

## **TABLES**

Table 1	Results of Drawdown Analyses
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Table 3	Weighted Average Hydraulic Conductivity With Cut-Off Walls
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**TABLE 1**  
**RESULTS OF DRAWDOWN ANALYSES**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

Pond No.	Average Modeled Pond Dimension [L x W, ft]	Pond Design Normal Water Elevation <sup>(1)</sup> [ft]	Measured Horizontal Hydraulic Conductivities (k <sub>h</sub> )				Wetland Information <sup>(1)</sup>			Distance From NWL to a Drawdown of 0.01 feet	
			Test Number	Test Depth <sup>(2)</sup> [ft]	[cm/s]	[ft/day]	Wetland Direction	Shortest Distance from Pond NWL to Wetland [ft]	Estimated Seasonal High Groundwater Elevation <sup>(3)</sup> [ft]	Modeled Without a Cut-off Wall <sup>(4)</sup>	Modeled With a Cut-off Wall <sup>(5)</sup>
SWMF 4	226 X 77	29.00	BB9 LAB	1	2.96E-03	8.378	East	172	32.00	436	22
			BB9 A	8.5 - 10	1.21E-06	0.003					
			BB9 B	18.5 - 20	9.37E-07	0.003	Southeast	167	33.00	468	24
			Weighted Average Surficial Aquifer <sup>(4)</sup>			1.096					
			Weighted Average with Cut of wall			0.002	South	236	34.00	495	25
SWMF 6	504 X 122	29.00	B41 LAB	1	1.70E-03	4.822	North	43	32.00	396	29
			B41 A	6.5 - 8	4.78E-06	0.014					
			B41 B	13.5 - 15	2.06E-06	0.006	South	42	33.00	420	31
			Weighted Average Surficial Aquifer <sup>(4)</sup>			0.587					
			Weighted Average with Cut of wall			0.003					
SWMF 7	270 X 80	29.00	B43 LAB	1	3.16E-04	0.897	West	311	31.00	135	NR <sup>(6)</sup>
			B43 A	7 - 8.5	1.68E-05	0.048					
			B43 B	13.5-15	1.38E-06	0.004	Southwest	335	32.00	149	NR <sup>(6)</sup>
			Weighted Average Surficial Aquifer <sup>(4)</sup>			0.095					
			Weighted Average with Cut of wall			0.012					

(1) Based on the Master Grading Plans provided by Dunn & Associates, Inc.

(2) Feet below existing grade.

(3) Estimated from the Master Grading Plans provided by Dunn & Associates, Inc.

(4) The Weighted Average of the Measured Horizontal Hydraulic Conductivities (k<sub>h</sub>) was used for the surficial aquifer for each pond.

(5) Measured Horizontal Hydraulic Conductivity used for the pond model with a cut-off wall installed.

(6) NR Not Required, the Distance from NWL to Drawdown of 0.01 feet is less than the shortest distance from the pond NWL to Wetland.





**TABLE 1**  
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Pond No.	Average Modeled Pond Dimension [L x W, ft]	Pond Design Normal Water Elevation <sup>(1)</sup> [ft]	Measured Horizontal Hydraulic Conductivities (k <sub>h</sub> )				Wetland Information <sup>(1)</sup>			Distance From NWL to a Drawdown of 0.01 feet	
			Test Number	Test Depth <sup>(2)</sup> [ft]	[cm/s]	[ft/day]	Wetland Direction	Shortest Distance from Pond NWL to Wetland [ft]	Estimated Seasonal High Groundwater Elevation <sup>(3)</sup> [ft]	Modeled Without a Cut-off Wall <sup>(4)</sup>	Modeled With a Cut-off Wall <sup>(5)</sup>
SWMF 12	624 X 159	29.00	BB13 LAB	1	1.84E-05	0.052	Northwest	272	31.00	58	NR <sup>(6)</sup>
			BB13 A	6.5-8	3.72E-06	0.011					
			BB13 B	18.5-20	2.60E-06	0.007	West	330	32.00	63	NR <sup>(6)</sup>
			Weighted Average Surficial Aquifer <sup>(4)</sup>			0.011					
			Weighted Average with Cut of wall			0.008	Southwest	335	30.00	45	NR <sup>(6)</sup>
SWMF 14	292 X 155	29.00	BB16 LAB	1	5.04E-05	0.143	West	324	31.00	103	NR <sup>(6)</sup>
			BB16 A	4.5-6	1.16E-06	0.003					
			BB16 B	18.5-20	9.23E-06	0.026	Southwest	371	32.00	112	NR <sup>(6)</sup>
			Weighted Average Surficial Aquifer <sup>(4)</sup>			0.030					
			Weighted Average with Cut of wall			0.018					
SWMF 21	991 X 546	24.00	PB1 LAB	1	4.91E-03	13.922	North	261	24.58	401	27
			PB1 A	4.5 - 6	2.60E-06	0.007					
			PB1 B	28.5 - 30	2.10E-06	0.006	Northwest	252	25.43	635	43
			Weighted Average Surficial Aquifer <sup>(4)</sup>			1.216	West	243	26.00	692	47
			Weighted Average with Cut of wall			0.005	South	195	27.00	763	51

(1) Based on the Master Grading Plans provided by Dunn & Associates, Inc.

(2) Feet below existing grade.

(3) Estimated from the Master Grading Plans provided by Dunn & Associates, Inc.

(4) The Weighted Average of the Measured Horizontal Hydraulic Conductivities (k<sub>h</sub>) was used for the surficial aquifer for each pond.

(5) Measured Horizontal Hydraulic Conductivity used for the pond model with a cut-off wall installed.

(6) NR Not Required, the Distance from NWL to Drawdown of 0.01 feet is less than the shortest distance from the pond NWL to Wetland.



**TABLE 1**  
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**The Rookery Phase 1**  
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Pond No.	Average Modeled Pond Dimension [L x W, ft]	Pond Design Normal Water Elevation <sup>(1)</sup> [ft]	Measured Horizontal Hydraulic Conductivities (k <sub>h</sub> )				Wetland Information <sup>(1)</sup>			Distance From NWL to a Drawdown of 0.01 feet		
			Test Number	Test Depth <sup>(2)</sup> [ft]	[cm/s]	[ft/day]	Wetland Direction	Shortest Distance from Pond NWL to Wetland [ft]	Estimated Seasonal High Groundwater Elevation <sup>(3)</sup> [ft]	Modeled Without a Cut-off Wall <sup>(4)</sup>	Modeled With a Cut-off Wall <sup>(5)</sup>	
SWMF 31	363 X 110	33.00	BB12 LAB	1	4.09E-04	1.159	South	33	34.00	410	31	
			BB12 A	6.5-8	4.48E-04	1.271						
			BB12 B	18.5-20	2.65E-06	0.008						
			Weighted Average Surficial Aquifer <sup>(4)</sup>									0.460
			Weighted Average with Cut of wall									0.005
SWMF 32	456 X 119	33.00	BB14 LAB	1	2.29E-03	6.505	North	61	34.00	239	39	
			BB14 A	8.5-10	7.36E-06	0.021	Northwest	46	34.00	239	39	
			BB14 B	18.5-20	2.43E-06	0.007	West	47	35.00	309	41	
			Weighted Average Surficial Aquifer <sup>(4)</sup>				0.438	Southwest	47	36.00	340	45
								South-Southwest	110	37.00	365	58
			Weighted Average with Cut of wall				0.006	South	179	40.00	413	65
SWMF 33	353 X 136	33.00	B36 LAB	1	1.14E-03	3.235	South1	60	34.00	243	36	
			B36 A	6.5-8	8.14E-06	0.023						
			B36 B	18.5-20	4.89E-07	0.001	South2	257	35.00	312	46	
			Weighted Average Surficial Aquifer <sup>(4)</sup>				0.288	South 3	281	36.00	339	50
			Weighted Average with Cut of wall				0.006	South4	462	37.00	363	NR <sup>(6)</sup>

(1) Based on the Master Grading Plans provided by Dunn & Associates, Inc.

(2) Feet below existing grade.

(3) Estimated from the Master Grading Plans provided by Dunn & Associates, Inc.

(4) The Weighted Average of the Measured Horizontal Hydraulic Conductivities (k<sub>h</sub>) was used for the surficial aquifer for each pond.

(5) Measured Horizontal Hydraulic Conductivity used for the pond model with a cut-off wall installed.

(6) NR Not Required, the Distance from NWL to Drawdown of 0.01 feet is less than the shortest distance from the pond NWL to Wetland.



**TABLE 1**  
**RESULTS OF DRAWDOWN ANALYSES**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

Pond No.	Average Modeled Pond Dimension [L x W, ft]	Pond Design Normal Water Elevation <sup>(1)</sup> [ft]	Measured Horizontal Hydraulic Conductivities ( $k_h$ )				Wetland Information <sup>(1)</sup>			Distance From NWL to a Drawdown of 0.01 feet		
			Test Number	Test Depth <sup>(2)</sup> [ft]	[cm/s]	[ft/day]	Wetland Direction	Shortest Distance from Pond NWL to Wetland [ft]	Estimated Seasonal High Groundwater Elevation <sup>(3)</sup> [ft]	Modeled Without a Cut-off Wall <sup>(4)</sup>	Modeled With a Cut-off Wall <sup>(5)</sup>	
SWMF J1	997 X 997	29.00	BB4 LAB	1	5.57E-04	1.580	Northeast	39	30.00	Varies <sup>(7)</sup>	Varies <sup>(7)</sup>	
			BB4 A	8.5-10	1.73E-07	0.000						
			BB4 B	23.5-25	9.74E-06	0.028	East	23	31.00	Varies <sup>(7)</sup>	Varies <sup>(7)</sup>	
			Weighted Average Surficial Aquifer <sup>(4)</sup>									0.076
							0.022	Southwest	88	32.00	Varies <sup>(7)</sup>	Varies <sup>(7)</sup>
								West	127	33.00	Varies <sup>(7)</sup>	Varies <sup>(7)</sup>
			Weighted Average with Cut of wall					0.022	Northwest	69	34.00	Varies <sup>(7)</sup>

(1) Based on the plan provided by Almond Engineering  
(2) Feet below existing grade.  
(3) Estimated from Topographic Plan provided by Almond Engineering  
(4) The Weighted Average of the Measured Horizontal Hydraulic Conductivities ( $k_h$ ) was used for the surficial aquifer for each pond.  
(5) Measured Horizontal Hydraulic Conductivity used for the pond model with a cut-off wall installed.  
(6) NR Not Required, the Distance from NWL to Drawdown of 0.01 feet is less than the shortest distance from the pond NWL to Wetland.  
(7) Drawdown distance varies due to 3-dimensional modeling. See attached groundwater elevation contours on Plates 7 and 8 for graphical representation.



**TABLE 2**  
**Weighted Average Hydraulic Conductivity Calculation Sheet**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

SWMF 1							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	3	3	B71 LAB	8.26E-03	23.402	70.21	1.302
3	22	19	B71 A	4.84E-07	0.001	0.03	
22	54	32	B71 B	6.48E-07	0.002	0.06	
<b>Total</b>		<b>54.0</b>				<b>70.29</b>	

SWMF 4							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	3	3	BB9 LAB	2.96E-03	8.378	25.13	1.096
3	17	14	BB9 A	1.21E-06	0.003	0.05	
17	23	6	BB9 B	9.37E-07	0.003	0.02	
<b>Total</b>		<b>23.0</b>				<b>25.20</b>	

SWMF 6							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	3	3	B41 LAB	1.70E-03	4.822	14.47	0.587
3	12	9	B41 A	4.78E-06	0.014	0.12	
12	25	13	B41 B	2.06E-06	0.006	0.08	
<b>Total</b>		<b>25.0</b>				<b>14.66</b>	



**TABLE 2**  
**Weighted Average Hydraulic Conductivity Calculation Sheet**  
**The Rookery Phase 1**  
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SWMF 7							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness × Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	2	2	B43 LAB	3.16E-04	0.897	1.79	0.095
2	12	10	B43 A	1.68E-05	0.048	0.48	
12	24.5	12.5	B43 B	1.38E-06	0.004	0.05	
<b>Total</b>		<b>24.5</b>				<b>2.32</b>	

SWMF 10							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness × Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	3	3	B54 LAB	3.15E-03	8.920	26.76	1.033
3	12	9	B54 A	3.34E-06	0.009	0.09	
12	26	14	B54 B	1.22E-07	0.000	0.00	
<b>Total</b>		<b>26.0</b>				<b>26.85</b>	

SWMF 12							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness × Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	2	2	BB13 LAB	1.84E-05	0.052	0.10	0.011
2	12	10	BB13 A	3.72E-06	0.011	0.11	
12	33	21	BB13 B	2.60E-06	0.007	0.15	
<b>Total</b>		<b>33.0</b>				<b>0.36</b>	



**TABLE 2**  
**Weighted Average Hydraulic Conductivity Calculation Sheet**  
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**ECS Project No. 35:31217-E**

SWMF 14							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	3	3	BB16 LAB	5.04E-05	0.143	0.43	0.030
3	12	9	BB16 A	1.16E-06	0.003	0.03	
12	37	25	BB16 B	9.23E-06	0.026	0.65	
<b>Total</b>		<b>37.0</b>				<b>1.11</b>	

SWMF 17							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	3	3	B103 LAB	1.71E-03	4.837	14.51	0.384
3	20	17	B103 A	1.58E-06	0.004	0.08	
20	38	18	B103 B	3.74E-07	0.001	0.02	
<b>Total</b>		<b>38.0</b>				<b>14.61</b>	

SWMF 21							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	4	4	PB1 LAB	4.91E-03	13.922	55.69	1.216
4	12	8	PB1 A	2.60E-06	0.007	0.06	
12	46	34	PB1 B	2.10E-06	0.006	0.20	
<b>Total</b>		<b>46.0</b>				<b>55.95</b>	



**TABLE 2**  
**Weighted Average Hydraulic Conductivity Calculation Sheet**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

SWMF No. 26							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	3	3	BB18 LAB	5.58E-04	1.582	4.74	<b>0.167</b>
3	8	5	BB18 A	6.31E-06	0.018	0.09	
8	29	21	BB18 B	1.70E-07	0.000	0.01	
<b>Total</b>		<b>29.0</b>				<b>4.84</b>	

SWMF No. 30							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	2	2	BB23 LAB	2.88E-03	8.178	16.36	<b>0.685</b>
2	10	8	BB23 A	3.18E-06	0.009	0.07	
10	24	14	BB23 B	4.12E-07	0.001	0.02	
<b>Total</b>		<b>24.0</b>				<b>16.44</b>	

SWMF 31							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	2	2	BB12 LAB	4.09E-04	1.159	2.32	<b>0.460</b>
2	12	10	BB12 A	4.48E-04	1.271	12.71	
12	33	21	BB12 B	2.65E-06	0.008	0.16	
<b>Total</b>		<b>33.0</b>				<b>15.18</b>	



**TABLE 2**  
**Weighted Average Hydraulic Conductivity Calculation Sheet**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

SWMF 32							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	2	2	BB14 LAB	2.29E-03	6.505	13.01	<b>0.438</b>
2	12	10	BB14 A	7.36E-06	0.021	0.21	
12	30.5	18.5	BB14 B	2.43E-06	0.007	0.13	
<b>Total</b>		<b>30.5</b>				<b>13.35</b>	

SWMF 33							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	3	3	B36 LAB	1.14E-03	3.235	9.70	<b>0.288</b>
3	12	9	B36 A	8.14E-06	0.023	0.21	
12	34.5	22.5	B36 B	4.89E-07	0.001	0.03	
<b>Total</b>		<b>34.5</b>				<b>9.94</b>	





**TABLE 3**  
**Weighted Average Hydraulic Conductivity Calculation Sheet With Cut - Off Walls**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	7	7	N/A	1.00E-07	0.000	0.00	
7	17	10	BB9 A	1.21E-06	0.003	0.03	
17	23	6	BB9 B	9.37E-07	0.003	0.02	
<b>Total</b>		<b>23.0</b>				<b>0.05</b>	<b>0.002</b>

Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	12	12	N/A	1.00E-07	0.000	0.00	
12	12	0	B41 A	4.78E-06	0.014	0.00	
12	25	13	B41 B	2.06E-06	0.006	0.08	
<b>Total</b>		<b>25.0</b>				<b>0.08</b>	<b>0.003</b>

Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	7	7	N/A	1.00E-07	0.000	0.00	
7	12	5	B43 A	1.68E-05	0.048	0.24	
12	24.5	12.5	B43 B	1.38E-06	0.004	0.05	
<b>Total</b>		<b>24.5</b>				<b>0.29</b>	<b>0.012</b>



**TABLE 3**  
**Weighted Average Hydraulic Conductivity Calculation Sheet With Cut - Off Walls**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

SWMF 12							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	3	3	N/A	1.00E-07	0.000	0.00	<b>0.008</b>
3	12	9	BB13 A	3.72E-06	0.011	0.09	
12	33	21	BB13 B	2.60E-06	0.007	0.15	
<b>Total</b>		<b>33.0</b>				<b>0.25</b>	

SWMF 14							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	4	4	N/A	1.00E-07	0.000	0.00	<b>0.018</b>
4	12	8	BB16 A	1.16E-06	0.003	0.03	
12	37	25	BB16 B	9.23E-06	0.026	0.65	
<b>Total</b>		<b>37.0</b>				<b>0.68</b>	

SWMF 21							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	6	6	N/A	1.00E-07	0.000	0.00	<b>0.005</b>
6	12	6	PB1 A	2.60E-06	0.007	0.04	
12	46	34	PB1 B	2.10E-06	0.006	0.20	
<b>Total</b>		<b>46.0</b>				<b>0.25</b>	



**TABLE 3**  
**Weighted Average Hydraulic Conductivity Calculation Sheet With Cut - Off Walls**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

SWMF 31							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	12	12	N/A	1.00E-07	0.000	0.00	<b>0.005</b>
12	12	0	BB12 A	4.48E-04	1.271	0.00	
12	33	21	BB12 B	2.65E-06	0.008	0.16	
<b>Total</b>		<b>33.0</b>				<b>0.16</b>	

SWMF 32							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	10	10	N/A	1.00E-07	0.000	0.00	<b>0.006</b>
10	12	2	BB14 A	7.36E-06	0.021	0.04	
12	33	21	BB14 B	2.43E-06	0.007	0.14	
<b>Total</b>		<b>33.0</b>				<b>0.19</b>	

SWMF 33							
Depth [ft]		Layer Thickness	Test Number	Permeability [cm/sec]	Permeability [ft/day]	Layer Thickness x Permeability [ft <sup>2</sup> /day]	Weighted Average [ft/day]
0	4	4	N/A	1.00E-07	0.000	0.00	<b>0.006</b>
4	12	8	B36 A	8.14E-06	0.023	0.18	
12	34.5	22.5	B36 B	4.89E-07	0.001	0.03	
<b>Total</b>		<b>34.5</b>				<b>0.22</b>	



**TABLE 4**  
**RESULTS OF BASEFLOW ANALYSES**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

Pond No.	Average Modeled Pond Dimension [L x W, ft]	Pond Design Normal Water Elevation <sup>(1)</sup> [ft]	Measured Horizontal Hydraulic Conductivities ( $k_h$ )				Estimated Seasonal High Groundwater Elevation <sup>(3)</sup> [ft]	Groundwater Baseflow (gpm)
			Test Number	Test Depth <sup>(2)</sup> [ft]	[cm/s]	[ft/day]		
SWMF 1	730 X 285	29.00	B71 LAB	1	8.26E-03	23.402	29.50	-12.8 <sup>(6)</sup>
			B71 A	13.5-15	4.84E-07	0.001		
			B71 B	28.5-30	6.48E-07	0.002		
			Weighted Average Surficial Aquifer <sup>(4)</sup>				1.302	
SWMF 2	412 X 93	29.00	BB9 LAB	1	2.96E-03	8.378	29.00	-2.62 <sup>(6)</sup>
			BB9 A	6.5 - 8	1.21E-06	0.003		
			BB9 B	13.5 - 15	9.37E-07	0.003		
			Weighted Average Surficial Aquifer <sup>(4)</sup>				1.096	
SWMF 3	264 X 127	29.00	B71 LAB	1	8.26E-03	23.402	31.50	-2.8 <sup>(6)</sup>
			B71 A	13.5-15	4.84E-07	0.001		
			B71 B	28.5-30	6.48E-07	0.002		
			Weighted Average Surficial Aquifer <sup>(4)</sup>				1.302	

(1) Based on the Master Grading Plans provided by Dunn & Associates, Inc.

(2) Feet below existing grade.

(3) Estimated from the Master Grading Plans provided by Dunn & Associates, Inc.

(4) The Weighted Average of the Measured Horizontal Hydraulic Conductivities ( $k_h$ ) was calculated in Table 2 and used for the surficial aquifer for each pond.

(5) The Weighted Average of the Horizontal Hydraulic Conductivity with a cut-off wall installed; calculated in Table 3.

(6) Negative values indicate baseflow into the stormwater pond. Positive values indicate baseflow leaving the stormwater pond.



**TABLE 4**  
**RESULTS OF BASEFLOW ANALYSES**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

Pond No.	Average Modeled Pond Dimension [L x W, ft]	Pond Design Normal Water Elevation <sup>(1)</sup> [ft]	Measured Horizontal Hydraulic Conductivities (k <sub>h</sub> )				Estimated Seasonal High Groundwater Elevation <sup>(3)</sup> [ft]	Groundwater Baseflow (gpm)	
			Test Number	Test Depth <sup>(2)</sup> [ft]	[cm/s]	[ft/day]			
SWMF 4	226 X 77	29.00	BB9 LAB	1	2.96E-03	8.378	34.00	-0.08 <sup>(6)</sup>	
			BB9 A	8.5 - 10	1.21E-06	0.003			
			BB9 B	18.5 - 20	9.37E-07	0.003			
			Weighted Average Surficial Aquifer <sup>(4)</sup>						1.096
			Weighted Average with Cut of wall <sup>(5)</sup>						0.002
SWMF 5	214 X 69	29.00	B41 LAB	1	1.70E-03	4.822	29.50	-0.24 <sup>(6)</sup>	
			B41 A	6.5 - 8	4.78E-06	0.014			
			B41 B	13.5 - 15	2.06E-06	0.006			
			Weighted Average Surficial Aquifer <sup>(4)</sup>						0.587
SWMF 6	504 X 122	29.00	B41 LAB	1	1.70E-03	4.822	32.00	-1.13 <sup>(6)</sup>	
			B41 A	6.5 - 8	4.78E-06	0.014			
			B41 B	13.5 - 15	2.06E-06	0.006			
			Weighted Average Surficial Aquifer <sup>(4)</sup>						0.587
			Weighted Average with Cut of wall <sup>(5)</sup>						0.003

(1) Based on the Master Grading Plans provided by Dunn & Associates, Inc.

(2) Feet below existing grade.

(3) Estimated from the Master Grading Plans provided by Dunn & Associates, Inc.

(4) The Weighted Average of the Measured Horizontal Hydraulic Conductivities (k<sub>h</sub>) was calculated in Table 2 and used for the surficial aquifer for each pond.

(5) The Weighted Average of the Horizontal Hydraulic Conductivity with a cut-off wall installed; calculated in Table 3.

(6) Negative values indicate baseflow into the stormwater pond. Positive values indicate baseflow leaving the stormwater pond.



**TABLE 4**  
**RESULTS OF BASEFLOW ANALYSES**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

Pond No.	Average Modeled Pond Dimension [L x W, ft]	Pond Design Normal Water Elevation <sup>(1)</sup> [ft]	Measured Horizontal Hydraulic Conductivities ( $k_h$ )				Estimated Seasonal High Groundwater Elevation <sup>(3)</sup> [ft]	Groundwater Baseflow (gpm)
			Test Number	Test Depth <sup>(2)</sup> [ft]	[cm/s]	[ft/day]		
SWMF 7	270 X 80	29.00	B43 LAB	1	3.16E-04	0.897	28.80	0.04 <sup>(6)</sup>
			B43 A	7 - 8.5	1.68E-05	0.048		
			B43 B	13.5-15	1.38E-06	0.004		
			Weighted Average Surficial Aquifer <sup>(4)</sup>					
SWMF 8	400 X 83	29.00	B54 LAB	1	3.15E-03	8.920	25.13	-0.13 <sup>(6)</sup>
			B54 A	6.5-8	3.34E-06	0.009		
			B54 B	13.5-15	1.22E-07	0.000		
			Weighted Average Surficial Aquifer <sup>(4)</sup>				1.033	
SWMF 9	505 X 117	29.00	B54 LAB	1	3.15E-03	8.920	28.14	0.04 <sup>(6)</sup>
			B54 A	6.5-8	3.34E-06	0.009		
			B54 B	13.5-15	1.22E-07	0.000		
			Weighted Average Surficial Aquifer <sup>(4)</sup>					

(1) Based on the Master Grading Plans provided by Dunn & Associates, Inc.

(2) Feet below existing grade.

(3) Estimated from the Master Grading Plans provided by Dunn & Associates, Inc.

(4) The Weighted Average of the Measured Horizontal Hydraulic Conductivities ( $k_h$ ) was calculated in Table 2 and used for the surficial aquifer for each pond.

(5) The Weighted Average of the Horizontal Hydraulic Conductivity with a cut-off wall installed; calculated in Table 3.

(6) Negative values indicate baseflow into the stormwater pond. Positive values indicate baseflow leaving the stormwater pond.



**TABLE 4**  
**RESULTS OF BASEFLOW ANALYSES**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

Pond No.	Average Modeled Pond Dimension [L x W, ft]	Pond Design Normal Water Elevation <sup>(1)</sup> [ft]	Measured Horizontal Hydraulic Conductivities (k <sub>h</sub> )				Estimated Seasonal High Groundwater Elevation <sup>(3)</sup> [ft]	Groundwater Baseflow (gpm)
			Test Number	Test Depth <sup>(2)</sup> [ft]	[cm/s]	[ft/day]		
SWMF 10	302 X 85	29.00	B54 LAB	1	3.15E-03	8.920	30.00	-1.1 <sup>(6)</sup>
			B54 A	6.5-8	3.34E-06	0.009		
			B54 B	13.5-15	1.22E-07	0.000		
			Weighted Average Surficial Aquifer <sup>(4)</sup>					
SWMF 11	631 X 83	29.00	B43 LAB	1	3.16E-04	0.897	30.00	-0.4 <sup>(6)</sup>
			B43 A	7 - 8.5	1.68E-05	0.048		
			B43 B	13.5-15	1.38E-06	0.004		
			Weighted Average Surficial Aquifer <sup>(4)</sup>					
SWMF 12	624 X 159	29.00	BB13 LAB	1	1.84E-05	0.052	30.00	-0.2 <sup>(6)</sup>
			BB13 A	6.5-8	3.72E-06	0.011		
			BB13 B	18.5-20	2.60E-06	0.007		
			Weighted Average Surficial Aquifer <sup>(4)</sup>					

(1) Based on the Master Grading Plans provided by Dunn & Associates, Inc.

(2) Feet below existing grade.

(3) Estimated from the Master Grading Plans provided by Dunn & Associates, Inc.

(4) The Weighted Average of the Measured Horizontal Hydraulic Conductivities (k<sub>h</sub>) was calculated in Table 2 and used for the surficial aquifer for each pond.

(5) The Weighted Average of the Horizontal Hydraulic Conductivity with a cut-off wall installed; calculated in Table 3.

(6) Negative values indicate baseflow into the stormwater pond. Positive values indicate baseflow leaving the stormwater pond.



**TABLE 4**  
**RESULTS OF BASEFLOW ANALYSES**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

Pond No.	Average Modeled Pond Dimension [L x W, ft]	Pond Design Normal Water Elevation <sup>(1)</sup> [ft]	Measured Horizontal Hydraulic Conductivities ( $k_h$ )				Estimated Seasonal High Groundwater Elevation <sup>(3)</sup> [ft]	Groundwater Baseflow (gpm)
			Test Number	Test Depth <sup>(2)</sup> [ft]	[cm/s]	[ft/day]		
SWMF 13	463 X 72	29.00	BB16 LAB	1	5.04E-05	0.143	27.50	-0.05 <sup>(6)</sup>
			BB16 A	4.5-6	1.16E-06	0.003		
			BB16 B	18.5-20	9.23E-06	0.026		
			Weighted Average Surficial Aquifer <sup>(4)</sup>				0.030	
SWMF 14	292 X 155	29.00	BB16 LAB	1	5.04E-05	0.143	32.00	-0.49 <sup>(6)</sup>
			BB16 A	4.5-6	1.16E-06	0.003		
			BB16 B	18.5-20	9.23E-06	0.026		
			Weighted Average Surficial Aquifer <sup>(4)</sup>				0.030	
SWMF 15	314 X 118	24.00	B54 LAB	1	3.15E-03	8.920	27.30	-3.0 <sup>(6)</sup>
			B54 A	6.5-8	3.34E-06	0.009		
			B54 B	13.5-15	1.22E-07	0.000		
			Weighted Average Surficial Aquifer <sup>(4)</sup>				1.033	

(1) Based on the Master Grading Plans provided by Dunn & Associates, Inc.

(2) Feet below existing grade.

(3) Estimated from the Master Grading Plans provided by Dunn & Associates, Inc.

(4) The Weighted Average of the Measured Horizontal Hydraulic Conductivities ( $k_h$ ) was calculated in Table 2 and used for the surficial aquifer for each pond.

(5) The Weighted Average of the Horizontal Hydraulic Conductivity with a cut-off wall installed; calculated in Table 3.

(6) Negative values indicate baseflow into the stormwater pond. Positive values indicate baseflow leaving the stormwater pond.





**TABLE 4**  
**RESULTS OF BASEFLOW ANALYSES**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

Pond No.	Average Modeled Pond Dimension [L x W, ft]	Pond Design Normal Water Elevation <sup>(1)</sup> [ft]	Measured Horizontal Hydraulic Conductivities (k <sub>h</sub> )				Estimated Seasonal High Groundwater Elevation <sup>(3)</sup> [ft]	Groundwater Baseflow (gpm)
			Test Number	Test Depth <sup>(2)</sup> [ft]	[cm/s]	[ft/day]		
SWMF 16	429 X 150	24.00	B103 LAB	1	1.71E-03	4.837	27.50	-2.6 <sup>(6)</sup>
			B103 A	18.5 - 20	1.58E-06	0.004		
			B103 B	23.5 - 25	3.74E-07	0.001		
			Weighted Average Surficial Aquifer <sup>(4)</sup>					
SWMF 17	422 X 152	24.00	B103 LAB	1	1.71E-03	4.837	25.00	-2.3 <sup>(6)</sup>
			B103 A	18.5 - 20	1.58E-06	0.004		
			B103 B	23.5 - 25	3.74E-07	0.001		
			Weighted Average Surficial Aquifer <sup>(4)</sup>				0.384	
SWMF 18	723 X 140	24.00	B103 LAB	1	1.71E-03	4.837	23.50	-4.1 <sup>(6)</sup>
			B103 A	18.5 - 20	1.58E-06	0.004	27.50	
			B103 B	23.5 - 25	3.74E-07	0.001		
			Weighted Average Surficial Aquifer <sup>(4)</sup>				0.384	

(1) Based on the Master Grading Plans provided by Dunn & Associates, Inc.

(2) Feet below existing grade.

(3) Estimated from the Master Grading Plans provided by Dunn & Associates, Inc.

(4) The Weighted Average of the Measured Horizontal Hydraulic Conductivities (k<sub>h</sub>) was calculated in Table 2 and used for the surficial aquifer for each pond.

(5) The Weighted Average of the Horizontal Hydraulic Conductivity with a cut-off wall installed; calculated in Table 3.

(6) Negative values indicate baseflow into the stormwater pond. Positive values indicate baseflow leaving the stormwater pond.



**TABLE 4**  
**RESULTS OF BASEFLOW ANALYSES**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

Pond No.	Average Modeled Pond Dimension [L x W, ft]	Pond Design Normal Water Elevation <sup>(1)</sup> [ft]	Measured Horizontal Hydraulic Conductivities (k <sub>h</sub> )				Estimated Seasonal High Groundwater Elevation <sup>(3)</sup> [ft]	Groundwater Baseflow (gpm)
			Test Number	Test Depth <sup>(2)</sup> [ft]	[cm/s]	[ft/day]		
SWMF 19	424 X 97	24.00	B103 LAB	1	1.71E-03	4.837	26.50	-1.2 <sup>(6)</sup>
			B103 A	18.5 - 20	1.58E-06	0.004		
			B103 B	23.5 - 25	3.74E-07	0.001		
			Weighted Average Surficial Aquifer <sup>(4)</sup>			0.384		
SWMF 20	275 X 62	24.00	PB1 LAB	1	4.91E-03	13.922	24.50	-0.4 <sup>(6)</sup>
			PB1 A	4.5 - 6	2.60E-06	0.007		
			PB1 B	28.5 - 30	2.10E-06	0.006		
			Weighted Average Surficial Aquifer <sup>(4)</sup>			1.216		
SWMF 21	991 X 546	24.00	PB1 LAB	1	4.91E-03	13.922	24.25	-0.8 <sup>(6)</sup>
			PB1 A	4.5 - 6	2.60E-06	0.007		
			PB1 B	28.5 - 30	2.10E-06	0.006		
			Weighted Average Surficial Aquifer <sup>(4)</sup>			1.216	26.25	

(1) Based on the Master Grading Plans provided by Dunn & Associates, Inc.

(2) Feet below existing grade.

(3) Estimated from the Master Grading Plans provided by Dunn & Associates, Inc.

(4) The Weighted Average of the Measured Horizontal Hydraulic Conductivities (k<sub>h</sub>) was calculated in Table 2 and used for the surficial aquifer for each pond.

(5) The Weighted Average of the Horizontal Hydraulic Conductivity with a cut-off wall installed; calculated in Table 3.

(6) Negative values indicate baseflow into the stormwater pond. Positive values indicate baseflow leaving the stormwater pond.



**TABLE 4**  
**RESULTS OF BASEFLOW ANALYSES**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

Pond No.	Average Modeled Pond Dimension [L x W, ft]	Pond Design Normal Water Elevation <sup>(1)</sup> [ft]	Measured Horizontal Hydraulic Conductivities (k <sub>h</sub> )				Estimated Seasonal High Groundwater Elevation <sup>(3)</sup> [ft]	Groundwater Baseflow (gpm)
			Test Number	Test Depth <sup>(2)</sup> [ft]	[cm/s]	[ft/day]		
SWMF 22	476 X 83	24.00	B103 LAB	1	1.71E-03	4.837	25.50	-0.9 <sup>(6)</sup>
			B103 A	18.5 - 20	1.58E-06	0.004		
			B103 B	23.5 - 25	3.74E-07	0.001		
			Weighted Average Surficial Aquifer <sup>(4)</sup>					
SWMF 23	371 X 92	24.00	BB18 LAB	1	5.58E-04	1.582	25.70	-0.5 <sup>(6)</sup>
			BB18 A	6.5 - 8	6.31E-06	0.018		
			BB18 B	13.5 - 15	1.70E-07	0.000		
			Weighted Average Surficial Aquifer <sup>(4)</sup>					
SWMF 24	486 X 202	21.00	PB1 LAB	1	4.91E-03	13.922	23.30	-4.3 <sup>(6)</sup>
			PB1 A	4.5 - 6	2.60E-06	0.007		
			PB1 B	28.5 - 30	2.10E-06	0.006		
			Weighted Average Surficial Aquifer <sup>(4)</sup>					

(1) Based on the Master Grading Plans provided by Dunn & Associates, Inc.

(2) Feet below existing grade.

(3) Estimated from the Master Grading Plans provided by Dunn & Associates, Inc.

(4) The Weighted Average of the Measured Horizontal Hydraulic Conductivities (k<sub>h</sub>) was calculated in Table 2 and used for the surficial aquifer for each pond.

(5) The Weighted Average of the Horizontal Hydraulic Conductivity with a cut-off wall installed; calculated in Table 3.

(6) Negative values indicate baseflow into the stormwater pond. Positive values indicate baseflow leaving the stormwater pond.



**TABLE 4**  
**RESULTS OF BASEFLOW ANALYSES**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

Pond No.	Average Modeled Pond Dimension [L x W, ft]	Pond Design Normal Water Elevation <sup>(1)</sup> [ft]	Measured Horizontal Hydraulic Conductivities (k <sub>h</sub> )				Estimated Seasonal High Groundwater Elevation <sup>(3)</sup> [ft]	Groundwater Baseflow (gpm)
			Test Number	Test Depth <sup>(2)</sup> [ft]	[cm/s]	[ft/day]		
SWMF 25	286 X 61	24.00	BB18 LAB	1	5.58E-04	1.582	25.50	-0.4 <sup>(6)</sup>
			BB18 A	6.5 - 8	6.31E-06	0.018		
			BB18 B	13.5 - 15	1.70E-07	0.000		
			Weighted Average Surficial Aquifer <sup>(4)</sup>					
SWMF 26	541 X 128	24.00	BB18 LAB	1	5.58E-04	1.582	26.50	-1.5 <sup>(6)</sup>
			BB18 A	6.5 - 8	6.31E-06	0.018		
			BB18 B	13.5 - 15	1.70E-07	0.000		
			Weighted Average Surficial Aquifer <sup>(4)</sup>					
SWMF 27	744 X 115	24.00	BB18 LAB	1	5.58E-04	1.582	27.00	-1.8 <sup>(6)</sup>
			BB18 A	6.5 - 8	6.31E-06	0.018		
			BB18 B	13.5 - 15	1.70E-07	0.000		
			Weighted Average Surficial Aquifer <sup>(4)</sup>					

(1) Based on the Master Grading Plans provided by Dunn & Associates, Inc.

(2) Feet below existing grade.

(3) Estimated from the Master Grading Plans provided by Dunn & Associates, Inc.

(4) The Weighted Average of the Measured Horizontal Hydraulic Conductivities (k<sub>h</sub>) was calculated in Table 2 and used for the surficial aquifer for each pond.

(5) The Weighted Average of the Horizontal Hydraulic Conductivity with a cut-off wall installed; calculated in Table 3.

(6) Negative values indicate baseflow into the stormwater pond. Positive values indicate baseflow leaving the stormwater pond.



**TABLE 4**  
**RESULTS OF DRAWDOWN ANALYSES**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

Pond No.	Average Modeled Pond Dimension [L x W, ft]	Pond Design Normal Water Elevation <sup>(1)</sup> [ft]	Measured Horizontal Hydraulic Conductivities ( $k_h$ )				Estimated Seasonal High Groundwater Elevation <sup>(3)</sup> [ft]	Groundwater Baseflow (gpm)
			Test Number	Test Depth <sup>(2)</sup> [ft]	[cm/s]	[ft/day]		
SWMF 28	437 X 203	24.00	BB23 LAB	1	2.88E-03	8.178	26.80	-3.3 <sup>(6)</sup>
			BB23 A	8.5-10	3.18E-06	0.009		
			BB23 B	13.5-15	4.12E-07	0.001		
			Weighted Average Surficial Aquifer <sup>(4)</sup>					
SWMF 29	436 X 52	24.00	BB23 LAB	1	2.88E-03	8.178	27.30	-1.6 <sup>(6)</sup>
			BB23 A	8.5-10	3.18E-06	0.009		
			BB23 B	13.5-15	4.12E-07	0.001		
			Weighted Average Surficial Aquifer <sup>(4)</sup>					
SWMF 30	302 X 79	28.00	BB23 LAB	1	2.88E-03	8.178	27.00	0.03 <sup>(6)</sup>
			BB23 A	8.5-10	3.18E-06	0.009		
			BB23 B	13.5-15	4.12E-07	0.001		
			Weighted Average Surficial Aquifer <sup>(4)</sup>					

(1) Based on the Master Grading Plans provided by Dunn & Associates, Inc.

(2) Feet below existing grade.

(3) Estimated from the Master Grading Plans provided by Dunn & Associates, Inc.

(4) The Weighted Average of the Measured Horizontal Hydraulic Conductivities ( $k_h$ ) was calculated in Table 2 and used for the surficial aquifer for each pond.

(5) The Weighted Average of the Horizontal Hydraulic Conductivity with a cut-off wall installed; calculated in Table 3.

(6) Negative values indicate baseflow into the stormwater pond. Positive values indicate baseflow leaving the stormwater pond.



**TABLE 4**  
**RESULTS OF BASEFLOW ANALYSES**  
**The Rookery Phase 1**  
**ECS Project No. 35:31217-E**

Pond No.	Average Modeled Pond Dimension [L x W, ft]	Pond Design Normal Water Elevation <sup>(1)</sup> [ft]	Measured Horizontal Hydraulic Conductivities (k <sub>h</sub> )				Estimated Seasonal High Groundwater Elevation <sup>(3)</sup> [ft]	Groundwater Baseflow (gpm)
			Test Number	Test Depth <sup>(2)</sup> [ft]	[cm/s]	[ft/day]		
SWMF 31	363 X 110	33.00	BB12 LAB	1	4.09E-04	1.159	34.00	-0.8 <sup>(6)</sup>
			BB12 A	6.5-8	4.48E-04	1.271		
			BB12 B	18.5-20	2.65E-06	0.008		
			Weighted Average Surficial Aquifer <sup>(4)</sup>			0.460		
			Weighted Average with Cut of wall <sup>(5)</sup>			0.005		
SWMF 32	456 X 119	33.00	BB14 LAB	1	2.29E-03	6.505	34.00	-0.2 <sup>(6)</sup>
			BB14 A	8.5-10	7.36E-06	0.021		
			BB14 B	18.5-20	2.43E-06	0.007		
			Weighted Average Surficial Aquifer <sup>(4)</sup>			0.438	37.00	
			Weighted Average with Cut of wall <sup>(5)</sup>			0.006		
SWMF 33	353 X 136	33.00	B36 LAB	1	1.14E-03	3.235	32.00	0.02 <sup>(6)</sup>
			B36 A	6.5-8	8.14E-06	0.023		
			B36 B	18.5-20	4.89E-07	0.001		
			Weighted Average Surficial Aquifer <sup>(4)</sup>			0.288		
			Weighted Average with Cut of wall			0.006		

(1) Based on the Master Grading Plans provided by Dunn & Associates, Inc.

(2) Feet below existing grade.

(3) Estimated from the Master Grading Plans provided by Dunn & Associates, Inc.

(4) The Weighted Average of the Measured Horizontal Hydraulic Conductivities (k<sub>h</sub>) was calculated in Table 2 and used for the surficial aquifer for each pond.

(5) The Weighted Average of the Horizontal Hydraulic Conductivity with a cut-off wall installed; calculated in Table 3.

(6) Negative values indicate baseflow into the stormwater pond. Positive values indicate baseflow leaving the stormwater pond.



**TABLE 4**

**RESULTS OF BASEFLOW ANALYSES**

**The Rookery Phase 1**

**ECS Project No. 35:31217-E**

Pond No.	Average Modeled Pond Dimension [L x W, ft]	Pond Design Normal Water Elevation <sup>(1)</sup> [ft]	Measured Horizontal Hydraulic Conductivities ( $k_h$ )				Estimated Seasonal High Groundwater Elevation <sup>(3)</sup> [ft]	Groundwater Baseflow (gpm)
			Test Number	Test Depth <sup>(2)</sup> [ft]	[cm/s]	[ft/day]		
SWMF J1	997 X 997	29.00	BB4 LAB	1	5.57E-04	1.580	Varies <sup>(7)</sup>	-10.6 <sup>(6)</sup>
			BB4 A	8.5-10	1.73E-07	0.000		
			BB4 B	23.5-25	9.74E-06	0.028		
			Weighted Average Surficial Aquifer <sup>(4)</sup>			N/A		
			Weighted Average with Cut of wall <sup>(5)</sup>			N/A		

(1) Based on the Master Grading Plans provided by Dunn & Associates, Inc.

(2) Feet below existing grade.

(3) Estimated from the Master Grading Plans provided by Dunn & Associates, Inc.

(4) The Weighted Average of the Measured Horizontal Hydraulic Conductivities ( $k_h$ ) was calculated in Table 2 and used for the surficial aquifer for each pond.

(5) The Weighted Average of the Horizontal Hydraulic Conductivity with a cut-off wall installed; calculated in Table 3.

(6) Negative values indicate baseflow into the stormwater pond. Positive values indicate baseflow leaving the stormwater pond.

(7) ESHGW elevation varies due to 3-dimensional modeling. See attached groundwater elevation contours on Plates 7 and 8 for graphical representation.

## **PLATES**

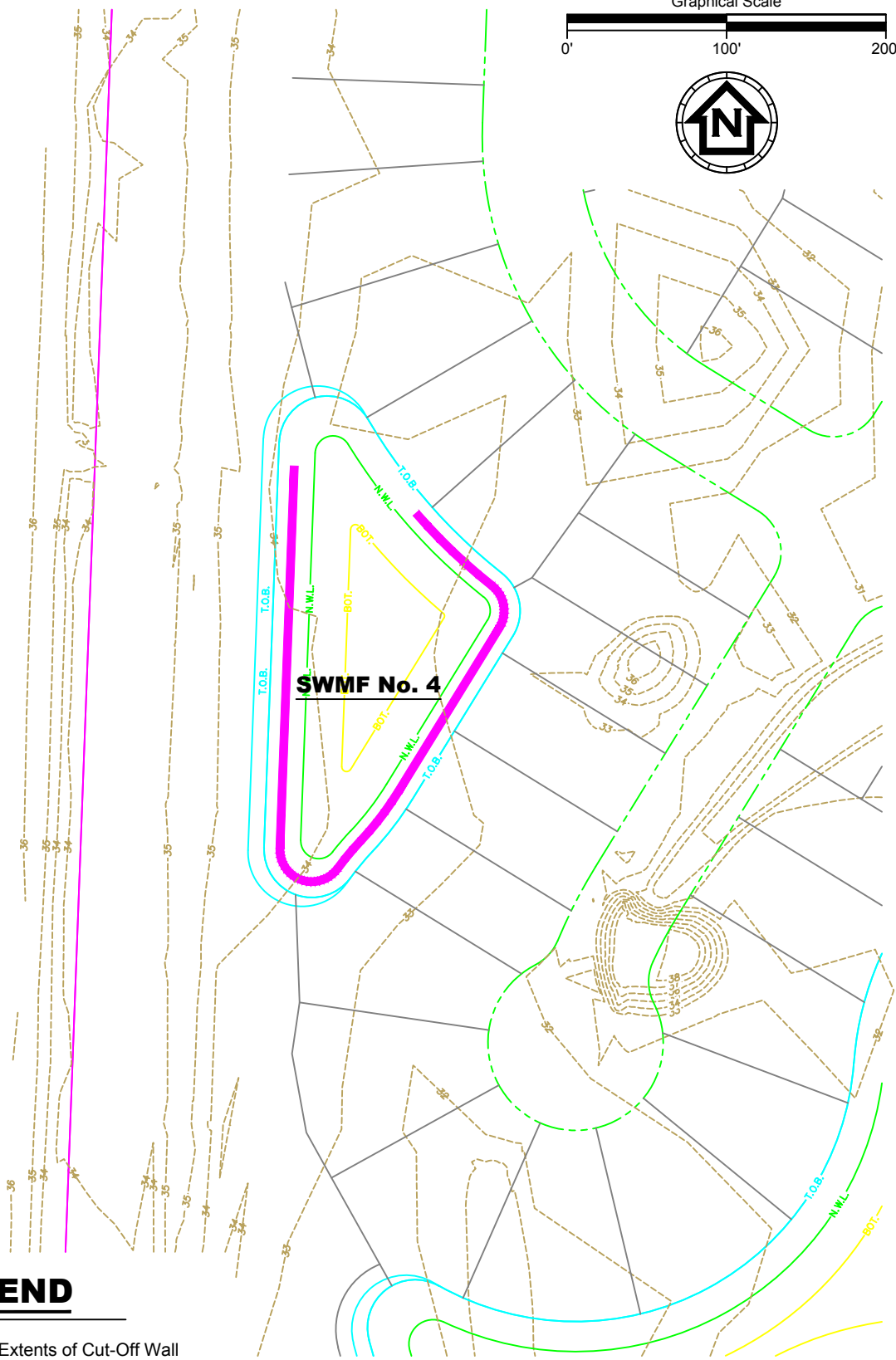
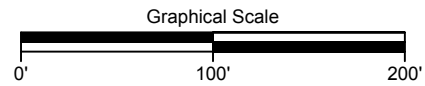
Plates 1-6 Cut-Off Wall Location Plans

Plate 7 Pre-Development Groundwater Contours for SWMF J1

Plate 8 Post-Development Groundwater Contours and Cut-Off Wall for  
SWMF J1

Plate 9 Cut-Off Wall Detail Section





**SWMF No. 4**

**LEGEND**

Approximate Extents of Cut-Off Wall

JAS - 35-31217-E



**ECS Florida, LLC**

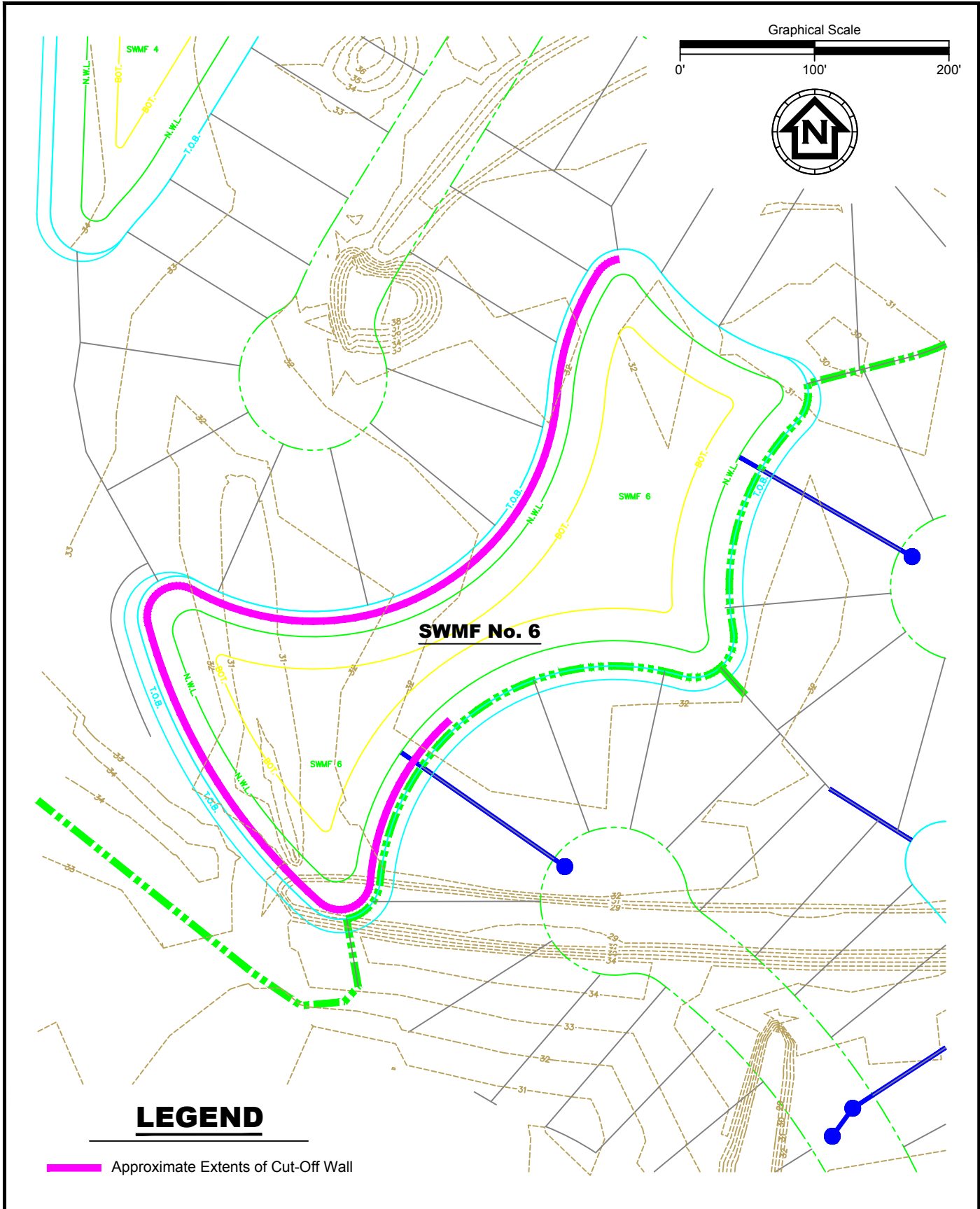
Geotechnical ■ Construction Materials ■ Environmental ■ Facilities  
 11554 Davis Creek Court, Jacksonville, FL 32256  
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Cut-Off Wall Location Plan (SWMF-4)  
**The Rookery Phase 1**  
 Clay County, Florida


Date: 03/29/23

Project No.: 35-31217-E

Plate 1



**LEGEND**

 Approximate Extents of Cut-Off Wall



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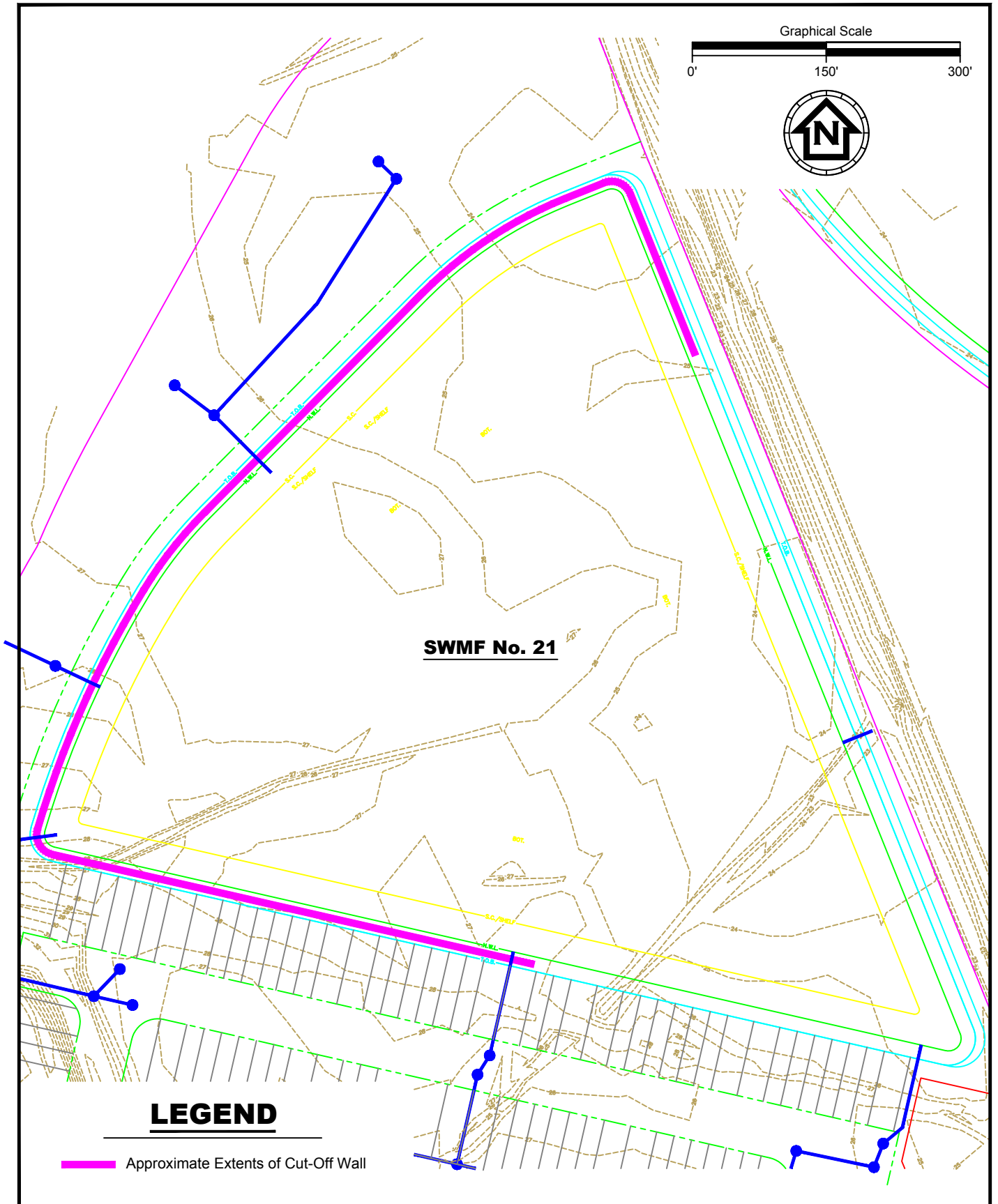
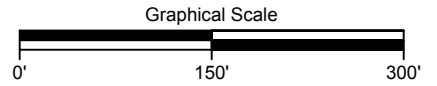
Cut-Off Wall Location Plan (SWMF-6)  
**The Rookery Phase 1**  
 Clay County, Florida

Date: 03/29/23

Project No.: 35-31217-E

Plate 2

JAS - 35-31217-E



**LEGEND**

Approximate Extents of Cut-Off Wall



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Cut-Off Wall Location Plan (SWMF-21)  
**The Rookery Phase 1**  
 Clay County, Florida

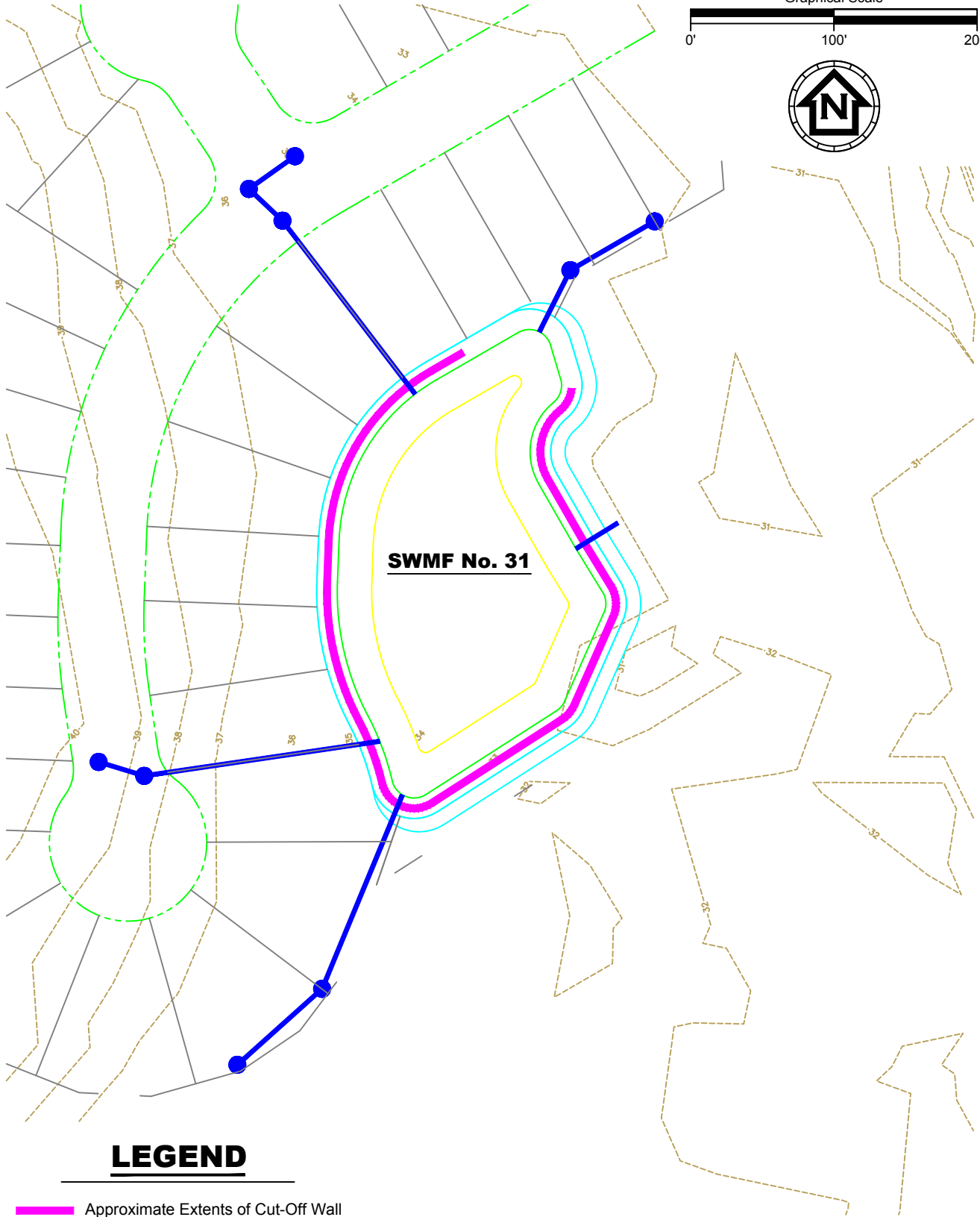
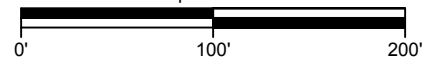
Date: 03/29/23

Project No.: 35-31217-E

Plate 3

JAS - 35-31217-E

Graphical Scale



**SWMF No. 31**

**LEGEND**

 Approximate Extents of Cut-Off Wall



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Cut-Off Wall Location Plan (SWMF-31)

**The Rookery Phase 1**

Clay County, Florida

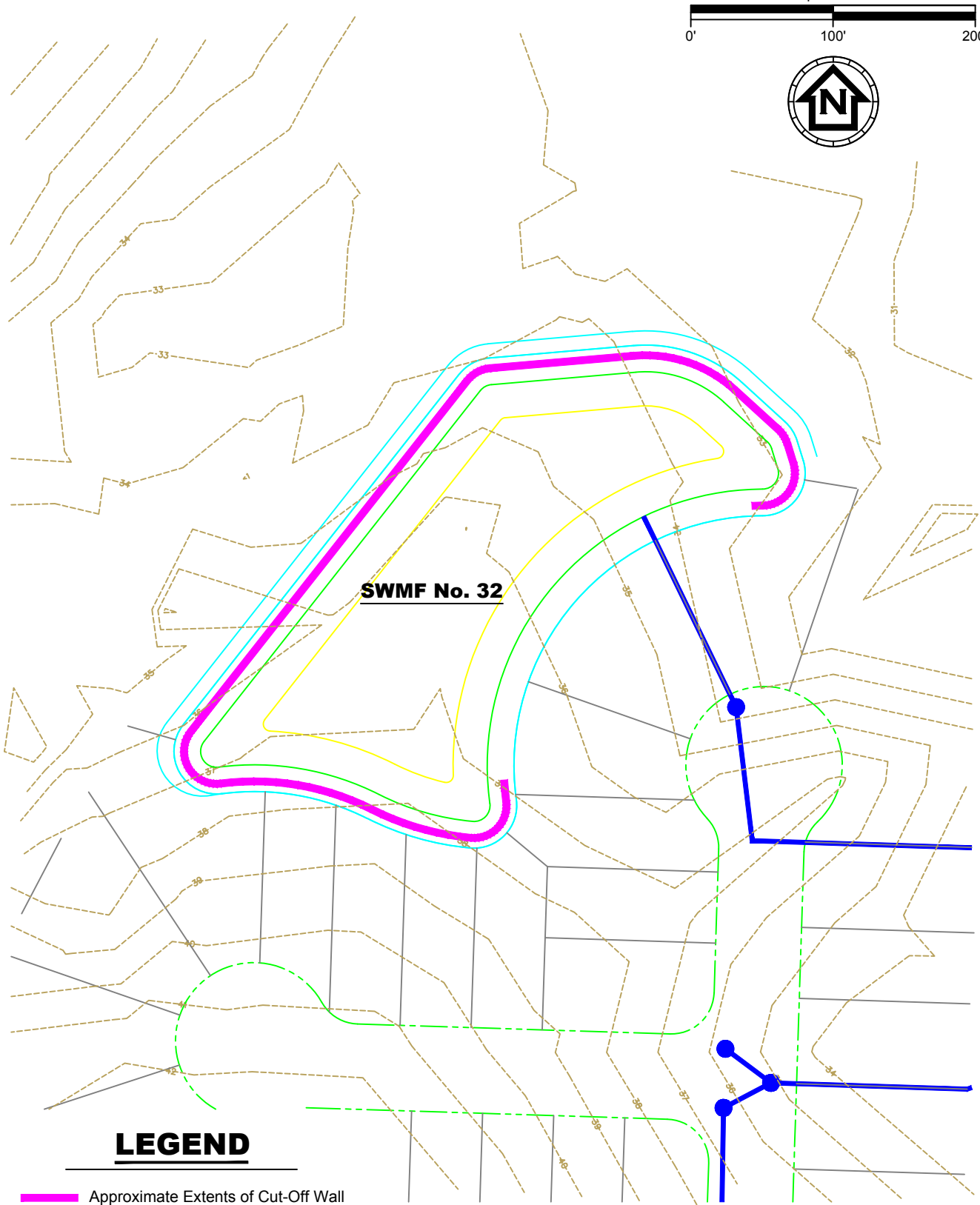
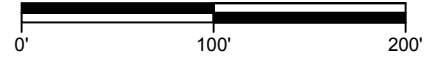
Date: 03/29/23

Project No.: 35-31217-E

Plate 4

JAS - 35-31217-E

Graphical Scale



**SWMF No. 32**

**LEGEND**

 Approximate Extents of Cut-Off Wall



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Cut-Off Wall Location Plan (SWMF-32)  
**The Rookery Phase 1**  
Clay County, Florida

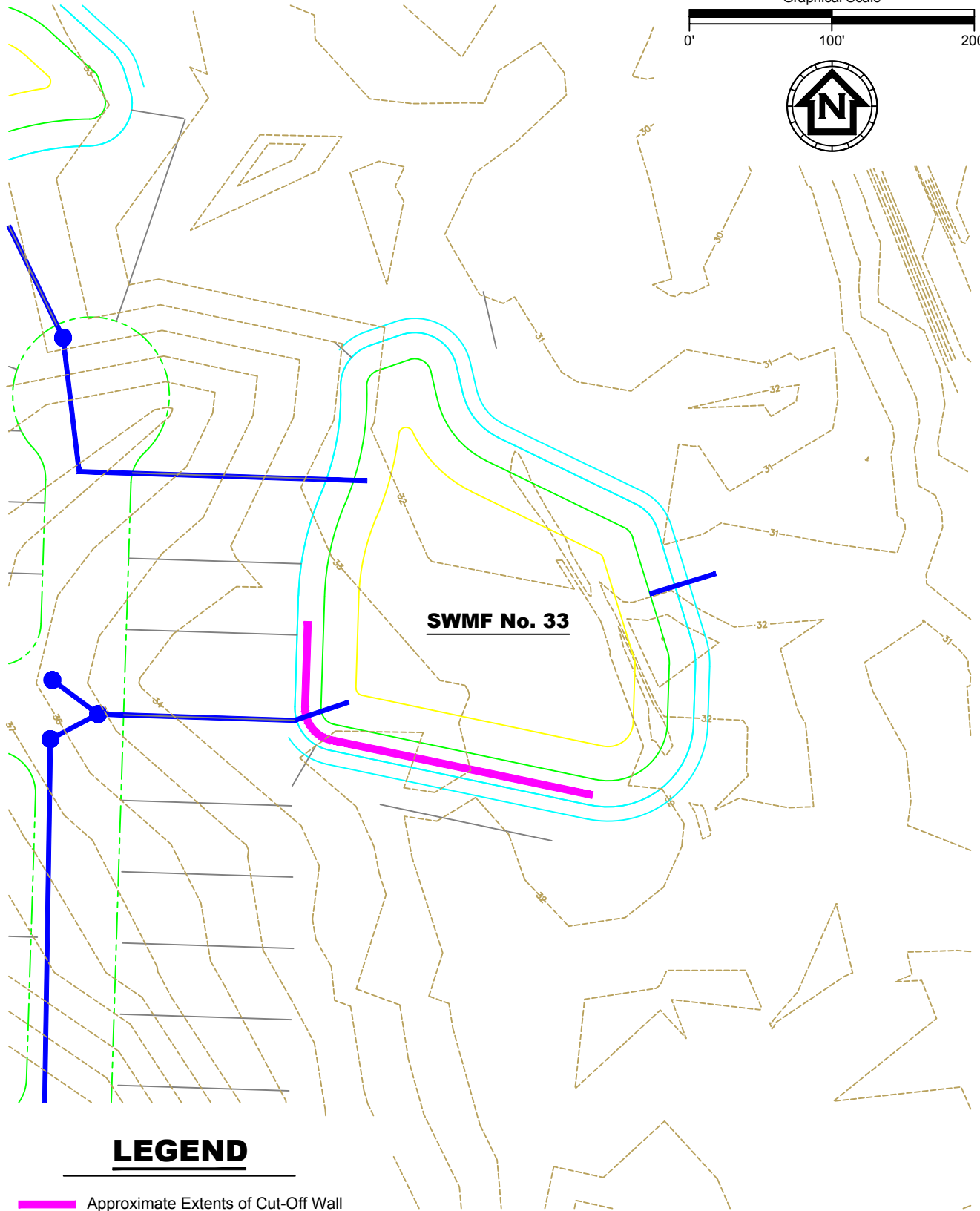
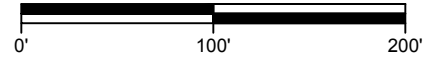
Date: 03/29/23

Project No.: 35-31217-E

Plate 5


JAS - 35-31217-E

Graphical Scale



**SWMF No. 33**

**LEGEND**

 Approximate Extents of Cut-Off Wall



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Cut-Off Wall and Pond Liner Location Plan (SWMF-33)

**The Rookery Phase 1**

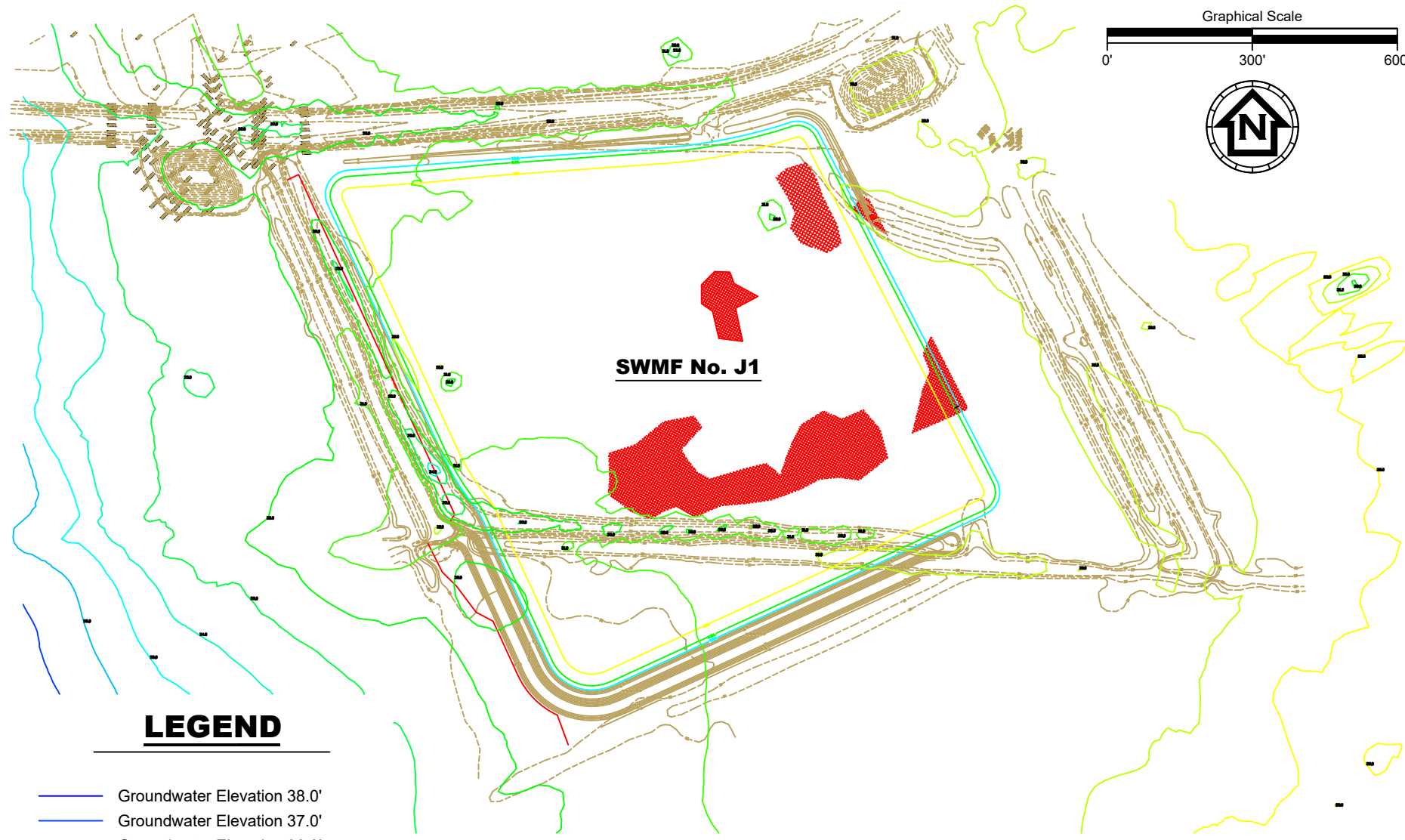
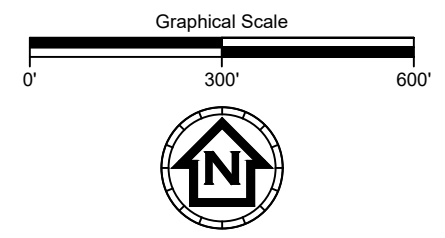
Clay County, Florida

Date: 03/29/23

Project No.: 35-31217-E

Plate 6

JAS - 35-31217-E



**SWMF No. J1**

**LEGEND**

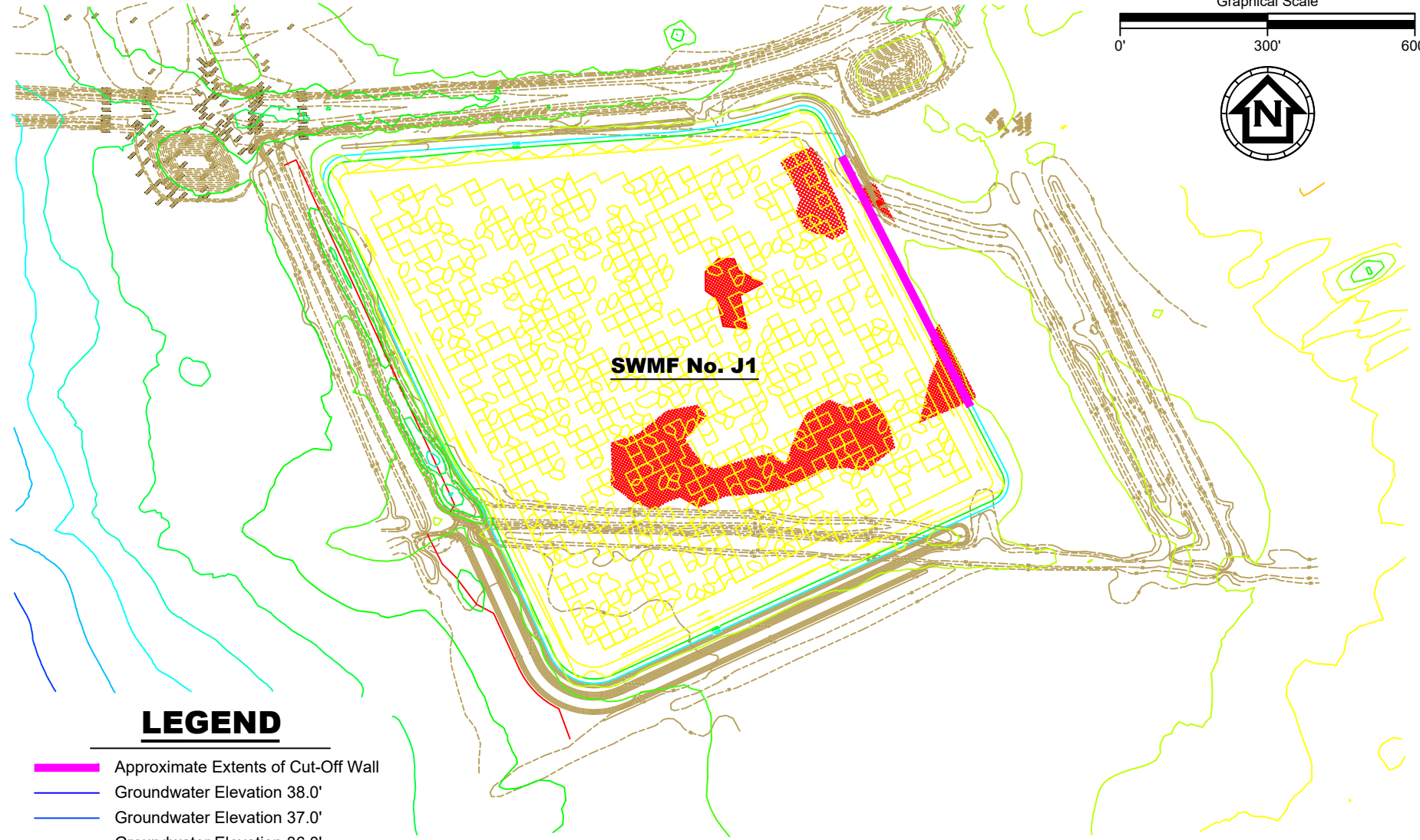
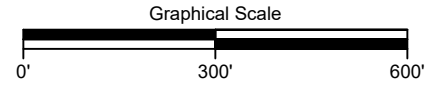
- Groundwater Elevation 38.0'
- Groundwater Elevation 37.0'
- Groundwater Elevation 36.0'
- Groundwater Elevation 35.0'
- Groundwater Elevation 34.0'
- Groundwater Elevation 33.0'
- Groundwater Elevation 32.0'
- Groundwater Elevation 31.0'
- Groundwater Elevation 30.0'
- Groundwater Elevation 29.0'

JAS - 35-31217-E

**ECS** ECS Florida, LLC  
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Pre-Development Groundwater Contours for (SWMF-J1)  
**The Rookery Phase 1**  
 Jacksonville, Florida

Date: 04/04/23	Project No.: 35-31217-E	Plate 7
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**SWMF No. J1**

**LEGEND**

- Approximate Extents of Cut-Off Wall
- Groundwater Elevation 38.0'
- Groundwater Elevation 37.0'
- Groundwater Elevation 36.0'
- Groundwater Elevation 35.0'
- Groundwater Elevation 34.0'
- Groundwater Elevation 33.0'
- Groundwater Elevation 32.0'
- Groundwater Elevation 31.0'
- Groundwater Elevation 30.0'
- Groundwater Elevation 29.0'

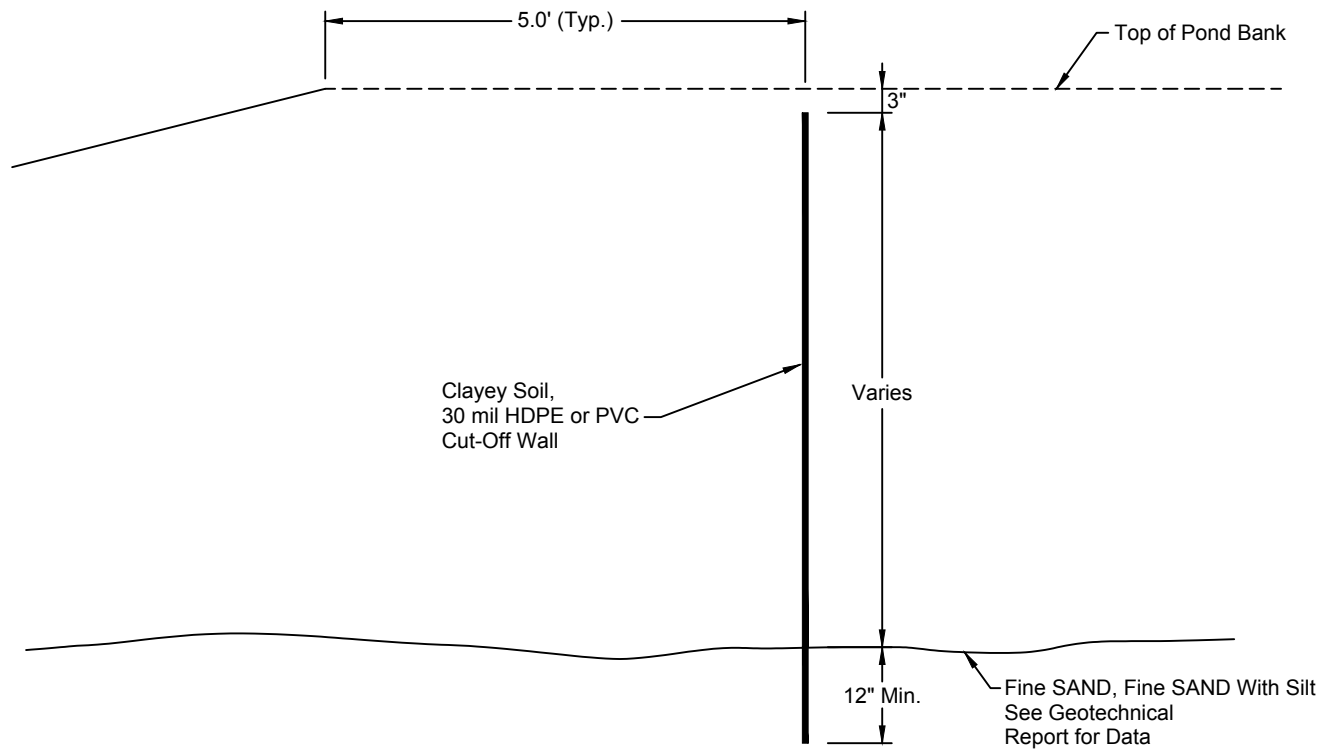
**ECS Florida, LLC**  
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Post-Development Groundwater Contours and Cut-Off Wall for (SWMF-J1)  
**The Rookery Phase 1**  
 Jacksonville, Florida

Date: 04/04/23	Project No.: 35-31217-E	Plate 8
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JAS - 35-31217-E





\* See Boring Profile and Report for Restrictive Layer Data

JAS - 35-31217-E



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Cut Off Wall Detail Section  
**The Rookery Phase 1**  
 Clay County, Florida

Date: 03/29/23

Project No.: 35-31217-E

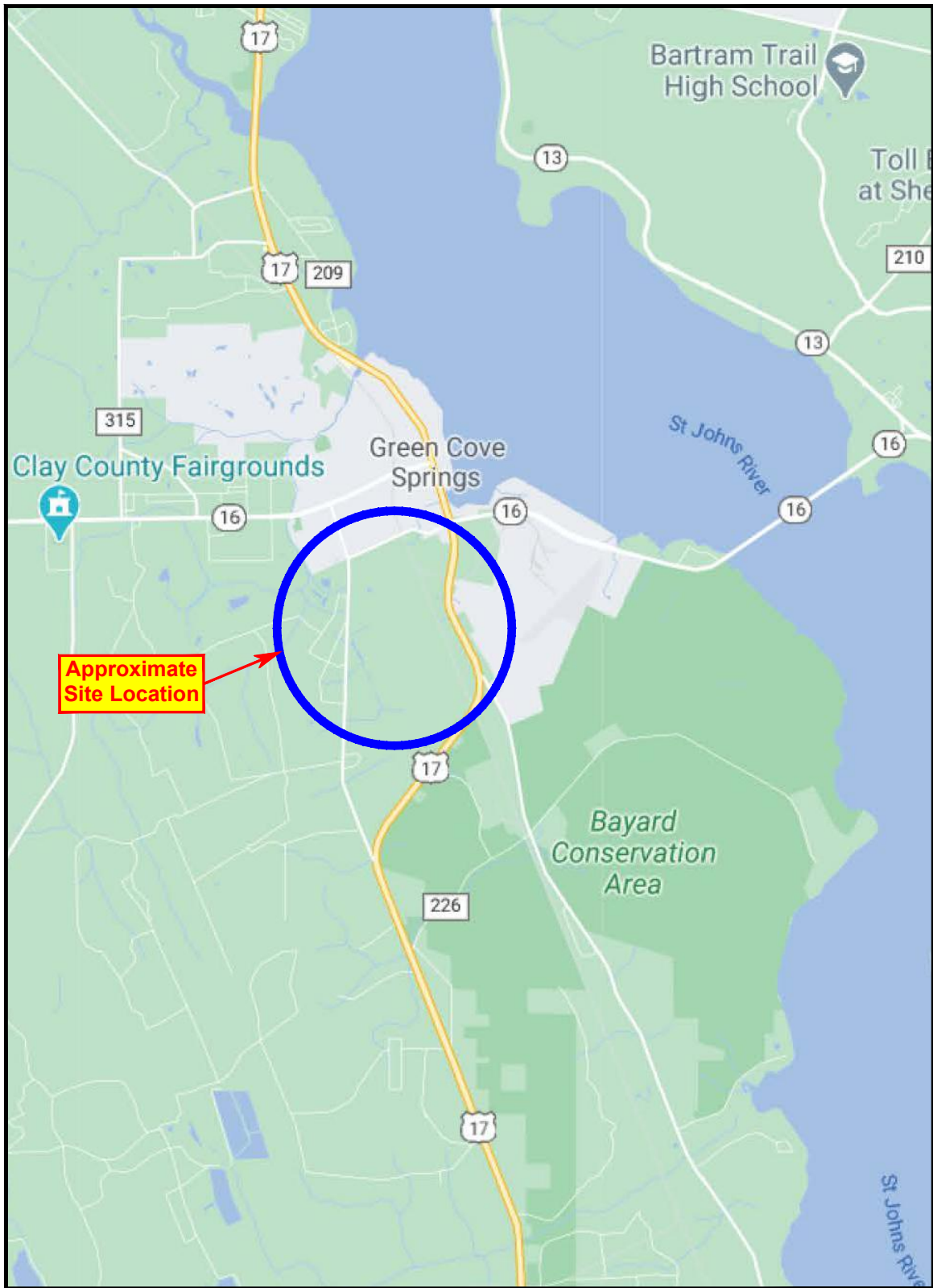
Plate 9

## **APPENDIX A – Drawings & Reports**

Figure 1 - Site Location Diagram

Figure 2 - Field Exploration Diagram

Figure 3 - Generalized Subsurface Profiles



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Site Location Diagram  
**The Rookery Phase 1**  
 Green Cove Springs, Florida

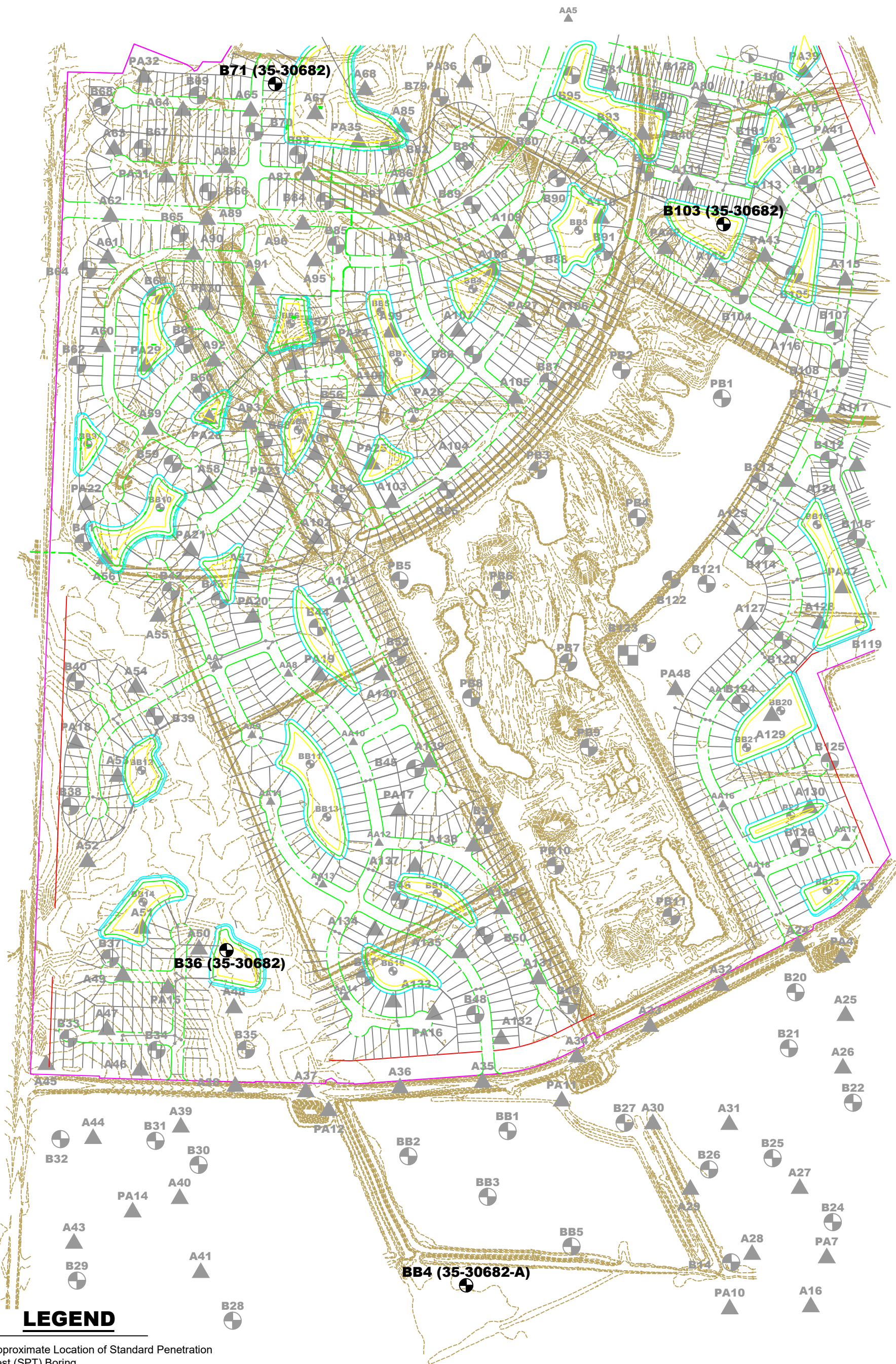


Date: 04/04/23

Project No.: 35-31217-E

Figure 1

JAS - 35-31217-E



**LEGEND**

- Approximate Location of Standard Penetration Test (SPT) Boring
- ▲ Approximate Location of Auger Boring

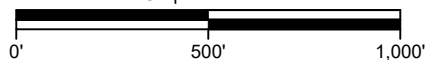


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Field Exploration Diagram  
**The Rookery Phase 1**  
 Green Cove Springs, Florida



Graphical Scale

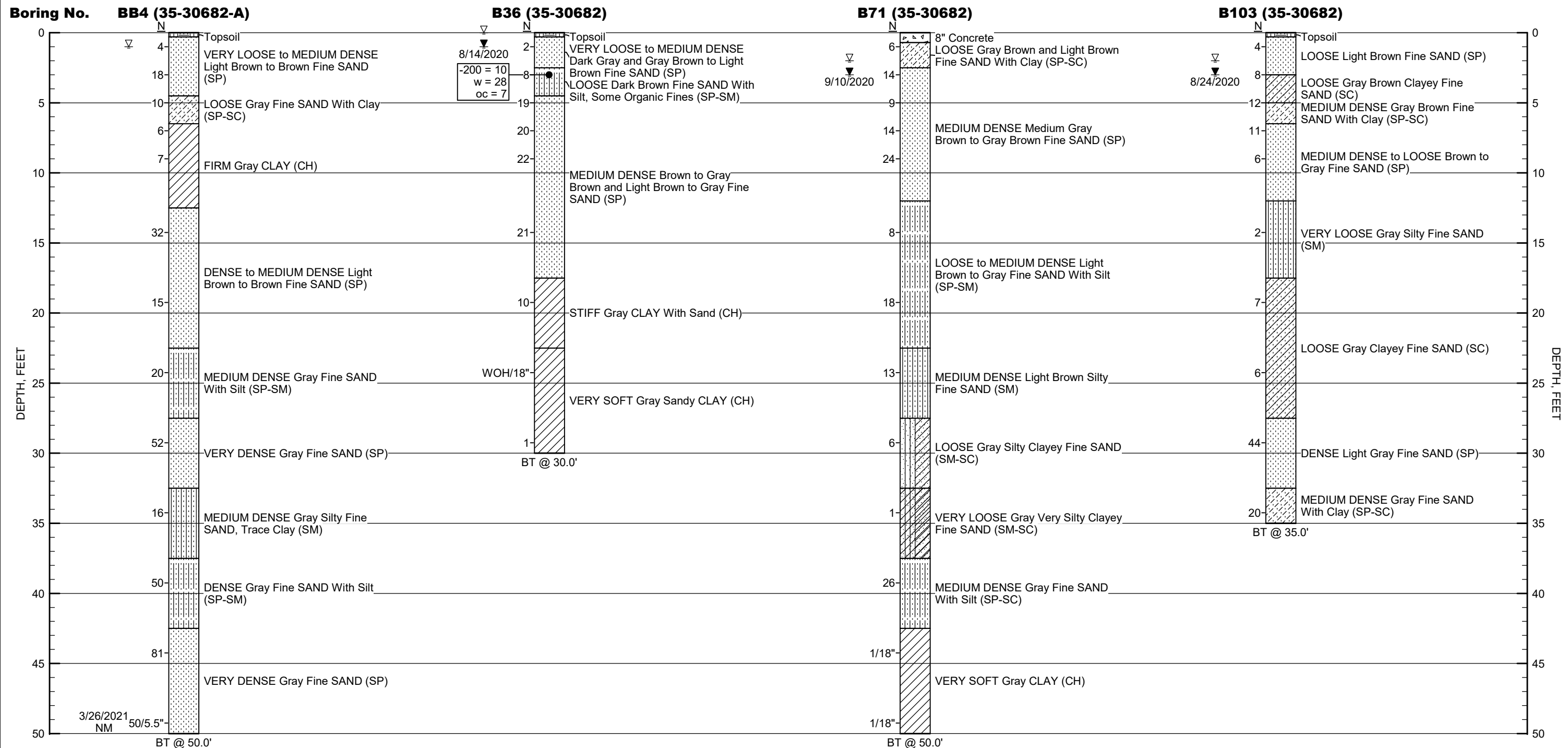


Date: 04/04/23

Project No.: 35-31217-E

Figure 2

JAS - 35-31217-E



**LEGEND**

- |                             |                             |  |   |   |
|-----------------------------|-----------------------------|--|---|---|
| Topsoil                     | Concrete                    | Standard Penetration Resistance, Blows/Foot      | 1/18" One Blow to Drive Split Spoon Sample Eighteen Inches  | -200 % Passing No. 200 U.S. Standard Sieve  |
| Fine SAND With Silt (SP-SM) | Fine SAND (SP)              | SP Unified Soil Classification System            | 50/5" Number of Blows to Drive Split Spoon Sample in Inches | w Natural Moisture Content (%)  |
| Silty Fine SAND (SM)        | Fine SAND With Clay (SP-SC) | Groundwater Level at Time of Drilling            | NM Groundwater Level Not Measured on Date Drilled           | oc Organic Content (%)  |
| CLAY (CH)                   | Clayey Fine SAND (SC)       | Estimated Normal Seasonal High Groundwater Level | BT Boring Terminated at Depth Below Grade                   | WOH Distance Split-Spoon Soil Sampler Dropped Under Weight of Drilling Tools and Hammer |
|                             | Silty Fine SAND With Clay   |  |   |   |

Generalized Subsurface Profiles

**The Rookery Phase 1**

Green Cove Springs, Florida

DATE: 04/04/23	PROJ. NO.: 35-31217-E	Figure 3
----------------	-----------------------	----------

## **APPENDIX B – Field Operations**

Reference Notes for Boring Logs

Subsurface Exploration Procedure: Standard Penetration Testing (SPT)

Boring Logs

# REFERENCE NOTES FOR BORING LOGS

MATERIAL <sup>1,2</sup>	
	<b>ASPHALT</b>
	<b>CONCRETE</b>
	<b>GRAVEL</b>
	<b>TOPSOIL</b>
	<b>VOID</b>
	<b>BRICK</b>
	<b>AGGREGATE BASE COURSE</b>
	<b>GW WELL-GRADED GRAVEL</b> gravel-sand mixtures, little or no fines
	<b>GP POORLY-GRADED GRAVEL</b> gravel-sand mixtures, little or no fines
	<b>GM SILTY GRAVEL</b> gravel-sand-silt mixtures
	<b>GC CLAYEY GRAVEL</b> gravel-sand-clay mixtures
	<b>SW WELL-GRADED SAND</b> gravelly sand, little or no fines
	<b>SP POORLY-GRADED SAND</b> gravelly sand, little or no fines
	<b>SM SILTY SAND</b> sand-silt mixtures
	<b>SC CLAYEY SAND</b> sand-clay mixtures
	<b>ML SILT</b> non-plastic to medium plasticity
	<b>MH ELASTIC SILT</b> high plasticity
	<b>CL LEAN CLAY</b> low to medium plasticity
	<b>CH FAT CLAY</b> high plasticity
	<b>OL ORGANIC SILT or CLAY</b> non-plastic to low plasticity
	<b>OH ORGANIC SILT or CLAY</b> high plasticity
	<b>PT PEAT</b> highly organic soils

DRILLING SAMPLING SYMBOLS & ABBREVIATIONS			
SS	Split Spoon Sampler	PM	Pressuremeter Test
ST	Shelby Tube Sampler	RD	Rock Bit Drilling
WS	Wash Sample	RC	Rock Core, NX, BX, AX
BS	Bulk Sample of Cuttings	REC	Rock Sample Recovery %
PA	Power Auger (no sample)	RQD	Rock Quality Designation %
HSA	Hollow Stem Auger		

PARTICLE SIZE IDENTIFICATION		
DESIGNATION	PARTICLE SIZES	
Boulders	12 inches (300 mm) or larger	
Cobbles	3 inches to 12 inches (75 mm to 300 mm)	
Gravel:	Coarse	¾ inch to 3 inches (19 mm to 75 mm)
	Fine	4.75 mm to 19 mm (No. 4 sieve to ¾ inch)
Sand:	Coarse	2.00 mm to 4.75 mm (No. 10 to No. 4 sieve)
	Medium	0.425 mm to 2.00 mm (No. 40 to No. 10 sieve)
	Fine	0.074 mm to 0.425 mm (No. 200 to No. 40 sieve)
Silt & Clay ("Fines")	<0.074 mm (smaller than a No. 200 sieve)	

COHESIVE SILTS & CLAYS		
UNCONFINED COMPRESSIVE STRENGTH, QP <sup>4</sup>	SPT <sup>5</sup> (BPF)	CONSISTENCY <sup>7</sup> (COHESIVE)
<0.25	<2	Very Soft
0.25 - <0.50	2 - 4	Soft
0.50 - <1.00	5 - 8	Firm
1.00 - <2.00	9 - 15	Stiff
2.00 - <4.00	16 - 30	Very Stiff
4.00 - 8.00	31 - 50	Hard
>8.00	>50	Very Hard

RELATIVE AMOUNT <sup>7</sup>	COARSE GRAINED (%) <sup>8</sup>	FINE GRAINED (%) <sup>8</sup>
Trace	≤5	≤5
With	10 - 20	10 - 25
Adjective (ex: "Silty")	25 - 45	30 - 45

GRAVELS, SANDS & NON-COHESIVE SILTS	
SPT <sup>5</sup>	DENSITY
<5	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
>50	Very Dense

WATER LEVELS <sup>6</sup>	
	WL (First Encountered)
	WL (Completion)
	WL (Seasonal High Water)
	WL (Stabilized)

FILL AND ROCK			
	<b>FILL</b>		<b>POSSIBLE FILL</b>
	<b>PROBABLE FILL</b>		<b>ROCK</b>

<sup>1</sup>Classifications and symbols per ASTM D 2488-17 (Visual-Manual Procedure) unless noted otherwise.

<sup>2</sup>To be consistent with general practice, "POORLY GRADED" has been removed from GP, GP-GM, GP-GC, SP, SP-SM, SP-SC soil types on the boring logs.

<sup>3</sup>Non-ASTM designations are included in soil descriptions and symbols along with ASTM symbol [Ex: (SM-FILL)].

<sup>4</sup>Typically estimated via pocket penetrometer or Torvane shear test and expressed in tons per square foot (tsf).

<sup>5</sup>Standard Penetration Test (SPT) refers to the number of hammer blows (blow count) of a 140 lb. hammer falling 30 inches on a 2 inch OD split spoon sampler required to drive the sampler 12 inches (ASTM D 1586). "N-value" is another term for "blow count" and is expressed in blows per foot (bpf). SPT correlations per 7.4.2 Method B and need to be corrected if using an auto hammer.

<sup>6</sup>The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in granular soils. In clay and cohesive silts, the determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally employed.

<sup>7</sup>Minor deviation from ASTM D 2488-17 Note 14.

<sup>8</sup>Percentages are estimated to the nearest 5% per ASTM D 2488-17.



## SUBSURFACE EXPLORATION PROCEDURE: STANDARD PENETRATION TESTING (SPT) ASTM D 1586 Split-Barrel Sampling

Standard Penetration Testing, or **SPT**, is the most frequently used subsurface exploration test performed worldwide. This test provides samples for identification purposes, as well as a measure of penetration resistance, or N-value. The N-Value, or blow counts, when corrected and correlated, can approximate engineering properties of soils used for geotechnical design and engineering purposes.

### SPT Procedure:

- Involves driving a hollow tube (split-spoon) into the ground by dropping a 140-lb hammer a height of 30-inches at desired depth
- Recording the number of hammer blows required to drive split-spoon a distance of 18-24 inches (in 3 or 4 Increments of 6 inches each)
- Auger is advanced\* and an additional SPT is performed
- One SPT typically performed for every two to five feet. An approximate 1.5 inch diameter soil sample is recovered.



*\*Drilling Methods May Vary*— The predominant drilling methods used for SPT are open hole fluid rotary drilling and hollow-stem auger drilling.





# LOG OF BORING

Project No.: 35-31217-E  
 Boring No.: BB4 (35-30682-A)  
 Sheet 1 of 2

Project: The Rookery Phase 1 Client: DR Horton  
 Drill Rig: 101A Driller: M. Foster  
 Boring Location: See Field Exploration Plan Drill Rod: AWJ Drill Mud: Super Gel-X  
 Casing Size: \_\_\_\_\_ Length of Casing: \_\_\_\_\_  
 Groundwater Depth: NM Time: Drilling Date: 3/26/21 Boring Begun: 3/26/21 Boring Completed: 3/20/23

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER 6 IN.	N Value	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE	PLASTIC LIMIT	MOISTURE CONTENT (%)	LIQUID LIMIT	SHEAR STRENGTH (ksf)	
											PLASTICITY INDEX	UNSATURATED SHEAR STRENGTH
	0		Topsoil	1								
1	0 - 1		VERY LOOSE Light Brown Fine SAND (SP)	1 1 3 4 7	4							
2	1 - 2		MEDIUM DENSE Brown Fine SAND (SP)	8 10 13 9	18							
3	2 - 3		LOOSE Gray Fine SAND With Clay (SP-SC)	5 5 4 3	10							
4	3 - 4		FIRM Gray CLAY (CH)	3 3 3 12 3 3	6							
5	4 - 5			3 3 4 4	7							
	5 - 10											
6	10 - 15		DENSE Light Brown Fine SAND (SP)	15 16 16	32							
	15 - 20											
7	20 - 21		MEDIUM DENSE Brown Fine SAND (SP)	4 7 8	15							
	21 - 25											
8	25 - 26		MEDIUM DENSE Gray Fine SAND With Silt (SP-SM)	7 8 12	20							

**Remarks** NM = Groundwater Level Not Measured at Time of Drilling.



# LOG OF BORING

Project No.: 35-31217-E  
 Boring No.: BB4 (35-30682-A)  
 Sheet 2 of 2

Project: The Rookery Phase 1 Client: DR Horton  
 Drill Rig: 101A Driller: M. Foster  
 Boring Location: See Field Exploration Plan Drill Rod: AWJ Drill Mud: Super Gel-X  
 Casing Size: \_\_\_\_\_ Length of Casing: \_\_\_\_\_  
 Groundwater Depth: NM Time: Drilling Date: 3/26/21 Boring Begun: 3/26/21 Boring Completed: 3/20/23

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER 6 IN.	N Value	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE	PLASTIC LIMIT	MOISTURE CONTENT (%)	LIQUID LIMIT	SHEAR STRENGTH (ksf)	
											○	◇
	25		MEDIUM DENSE Gray Fine SAND With Silt (SP-SM) (Continued)									
	9		VERY DENSE Gray Fine SAND (SP)	12 22 30	52							
	10		MEDIUM DENSE Gray Silty Fine SAND, Trace Clay (SM)	6 6 10	16							
	11		DENSE Gray Fine SAND With Silt (SP-SM)	23 24 26	50							
	12		VERY DENSE Gray Fine SAND (SP)	18 31 50	81							
	13			30								
Remarks				Boring Terminated @ 50 ft.								



# LOG OF BORING

Project No.: 35-31217-E  
 Boring No.: B36 (35-30682)  
 Sheet 1 of 2

Project: The Rookery Phase 1 Client: DR Horton  
 Boring Location: See Field Exploration Plan Drill Rig: 101A Driller: M. Foster  
 Groundwater Depth: 1 ft Time: Drilling Date: 8/14/20 Drill Rod: AWJ Drill Mud: Super Gel-X  
 Casing Size: \_\_\_\_\_ Length of Casing: \_\_\_\_\_  
 Boring Begun: 8/14/20 Boring Completed: 3/17/23

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER 6 IN.	N Value	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE	PLASTIC LIMIT	MOISTURE CONTENT (%)	LIQUID LIMIT	SHEAR STRENGTH (ksf)	
											○ Pocket Penetrometer Undisturbed Sample	● Pocket Penetrometer Disturbed Sample
	0		Topsoil	1								
1	0 - 1		VERY LOOSE Dark Gray Fine SAND (SP)	1	2							
2	1 - 3		LOOSE Dark Brown Fine SAND With Silt, Some Organic Fines (SP-SM)	3	8	7	10		+			
3	3 - 5		MEDIUM DENSE Brown to Gray Brown Fine SAND (SP)	6								
4	5 - 8		MEDIUM DENSE Light Brown Fine SAND (SP)	8								
5	8 - 10		MEDIUM DENSE Gray Fine SAND (SP)	11								
6	10 - 15		MEDIUM DENSE Gray Fine SAND (SP)	11								
7	15 - 20		STIFF Gray CLAY With Sand (CH)	10								
	20 - 21			10								
8	21 - 25		VERY SOFT Gray Sandy CLAY (CH)	11								
				4								
				3								
				7	10							
				WOH/18"								
				WOH/18"								

Remarks



# LOG OF BORING

Project No.: 35-31217-E  
 Boring No.: B36 (35-30682)  
 Sheet 2 of 2

Project: The Rookery Phase 1 Client: DR Horton  
 Boring Location: See Field Exploration Plan Drill Rig: 101A Driller: M. Foster  
 Groundwater Depth: 1 ft Time: Drilling Date: 8/14/20 Drill Rod: AWJ Drill Mud: Super Gel-X  
 Casing Size: \_\_\_\_\_ Length of Casing: \_\_\_\_\_  
 Boring Begun: 8/14/20 Boring Completed: 3/17/23

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER 6 IN.	N Value	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE	PLASTIC LIMIT	MOISTURE CONTENT (%)	LIQUID LIMIT	SHEAR STRENGTH (ksf)	
											<input type="checkbox"/> Pocket Penetrometer Undisturbed Sample <input checked="" type="checkbox"/> Pocket Penetrometer Disturbed Sample <input type="checkbox"/> Torvane <input type="checkbox"/> Unconfined Compression <input type="checkbox"/> Triaxial Compression	
9	25 30 35 40 45 50	[Hatched Box]	VERY SOFT Gray Sandy CLAY (CH) (Continued)  WOH/12"  Boring Terminated @ 30 ft.	1	1							

Remarks



# LOG OF BORING

Project No.: 35-31217-E  
 Boring No.: B71 (35-30682)  
 Sheet 1 of 2

Project: The Rookery Phase 1 Client: DR Horton  
 Boring Location: See Field Exploration Plan Drill Rig: 101A Driller: M. Foster  
 Groundwater Depth: 3 ft Time: Drilling Date: 9/10/20 Drill Rod: AWJ Drill Mud: Super Gel-X  
 Casing Size: \_\_\_\_\_ Length of Casing: \_\_\_\_\_  
 Boring Begun: 9/10/20 Boring Completed: 3/10/23

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER 6 IN.	N Value	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE	PLASTIC LIMIT	MOISTURE CONTENT (%)	LIQUID LIMIT	SHEAR STRENGTH (ksf)	
											○	◇
	0		8" Concrete									
1			LOOSE Gray Brown and Light Brown Fine SAND With Clay (SP-SC)	2 4 5 5	6							
2			MEDIUM DENSE Medium Gray Brown Fine SAND (SP)	7 7 5 4 4	14							
3	5		MEDIUM DENSE Gray Brown Fine SAND (SP)	5 5 5 6 8 8 8	9							
4			MEDIUM DENSE Gray Brown Fine SAND (SP)	12 12 14	24							
5	10		LOOSE Light Brown Fine SAND With Silt (SP-SM)	3 3 5	8							
6	15		MEDIUM DENSE Gray Fine SAND With Silt (SP-SM)	5 9 9	18							
7	20		MEDIUM DENSE Light Brown Silty Fine SAND (SM)	6 7 6	13							
8	25											

Remarks



# LOG OF BORING

Project No.: 35-31217-E  
 Boring No.: B71 (35-30682)  
 Sheet 2 of 2

Project: The Rookery Phase 1 Client: DR Horton  
 Boring Location: See Field Exploration Plan Drill Rig: 101A Driller: M. Foster  
 Groundwater Depth: 3 ft Time: Drilling Date: 9/10/20 Drill Rod: AWJ Drill Mud: Super Gel-X  
 Casing Size: \_\_\_\_\_ Length of Casing: \_\_\_\_\_  
 Boring Begun: 9/10/20 Boring Completed: 3/10/23

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER 6 IN.	N Value	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE	PLASTIC LIMIT	MOISTURE CONTENT (%)	LIQUID LIMIT	SHEAR STRENGTH (ksf)	
											PLASTICITY INDEX	UNSATURATED SHEAR STRENGTH
	25		MEDIUM DENSE Light Brown Silty Fine SAND (SM) (Continued)									
	30		LOOSE Gray Silty Clayey Fine SAND (SM-SC)	3 4 2	6							
	35		VERY LOOSE Gray Very Silty Clayey Fine SAND (SM-SC)	1/12"	1							
	40		MEDIUM DENSE Gray Fine SAND With Silt (SP-SC)	7 12 14	26							
	45		VERY SOFT Gray CLAY (CH)	1/18"	1/18"							
	50			1/18"	1/18"							
Boring Terminated @ 50 ft. Remarks												



# LOG OF BORING

Project No.: 35-31217-E  
 Boring No.: B103 (35-30682)  
 Sheet 1 of 2

Project: The Rookery Phase 1 Client: DR Horton  
 Drill Rig: 101A Driller: M. Foster  
 Boring Location: See Field Exploration Plan Drill Rod: AWJ Drill Mud: Super Gel-X  
 Casing Size: \_\_\_\_\_ Length of Casing: \_\_\_\_\_  
 Groundwater Depth: 3 ft Time: Drilling Date: 8/24/20 Boring Begun: 8/24/20 Boring Completed: 3/14/23

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER 6 IN.	N Value	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE	PLASTIC LIMIT	MOISTURE CONTENT (%)	LIQUID LIMIT	SHEAR STRENGTH (ksf)	
											Unconfined Compression	Triaxial Compression
	0		Topsoil	1								
1			LOOSE Light Brown Fine SAND (SP)	2	4							
				2								
				3								
2			LOOSE Gray Brown Clayey Fine SAND (SC)	5	8							
				3								
				5								
3	5		MEDIUM DENSE Gray Brown Fine SAND With Clay (SP-SC)	6	12							
				5								
				6								
4			MEDIUM DENSE Brown Fine SAND (SP)	6	11							
				5								
				5								
5			LOOSE Gray Fine SAND (SP)	3	6							
				3								
				3								
	10			3								
			VERY LOOSE Gray Silty Fine SAND (SM)									
6				1	2							
				1								
	15			1								
			LOOSE Gray Clayey Fine SAND (SC)									
7				2	7							
				3								
	20			4								
8				2	6							
				3								
	25			3								

Remarks



# LOG OF BORING

Project No.: 35-31217-E  
 Boring No.: B103 (35-30682)  
 Sheet 2 of 2

Project: The Rookery Phase 1 Client: DR Horton  
 Drill Rig: 101A Driller: M. Foster  
 Boring Location: See Field Exploration Plan Drill Rod: AWJ Drill Mud: Super Gel-X  
 Casing Size: \_\_\_\_\_ Length of Casing: \_\_\_\_\_  
 Groundwater Depth: 3 ft Time: Drilling Date: 8/24/20 Boring Begun: 8/24/20 Boring Completed: 3/14/23

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER 6 IN.	N Value	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE	PLASTIC LIMIT	MOISTURE CONTENT (%)	LIQUID LIMIT	SHEAR STRENGTH (ksf)	
											<input type="checkbox"/> Pocket Penetrometer Undisturbed Sample <input checked="" type="checkbox"/> Pocket Penetrometer Disturbed Sample <input type="checkbox"/> Torvane <input type="checkbox"/> Unconfined Compression <input type="checkbox"/> Triaxial Compression	
	25		LOOSE Gray Clayey Fine SAND (SC) <i>(Continued)</i>									
	9		DENSE Light Gray Fine SAND (SP)	15 20 24	44							
	10		MEDIUM DENSE Gray Fine SAND With Clay (SP-SC)	5 10 10	20							
	35		Boring Terminated @ 35 ft.									
	40											
	45											
	50											

Remarks



## **APPENDIX C – PONDS Output**

Drawdown and Baseflow Analyses  
Underdrain Baseflow Analyses

**PONDS Version 3.3.0278**  
**Retention Pond Recovery - Refined Method**  
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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.1, Southwest Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -22.00  
Water Table Elevation, [WT] (ft datum): 29.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.30  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 730.0  
Equivalent Pond Width, [W] (ft): 285.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
-17.00	3484.8
29.00	208216.8

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

**PONDS Version 3.3.0278**  
**Retention Pond Recovery - Refined Method**  
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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	28.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Retention Pond Recovery - Refined Method**  
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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 7:42:32

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

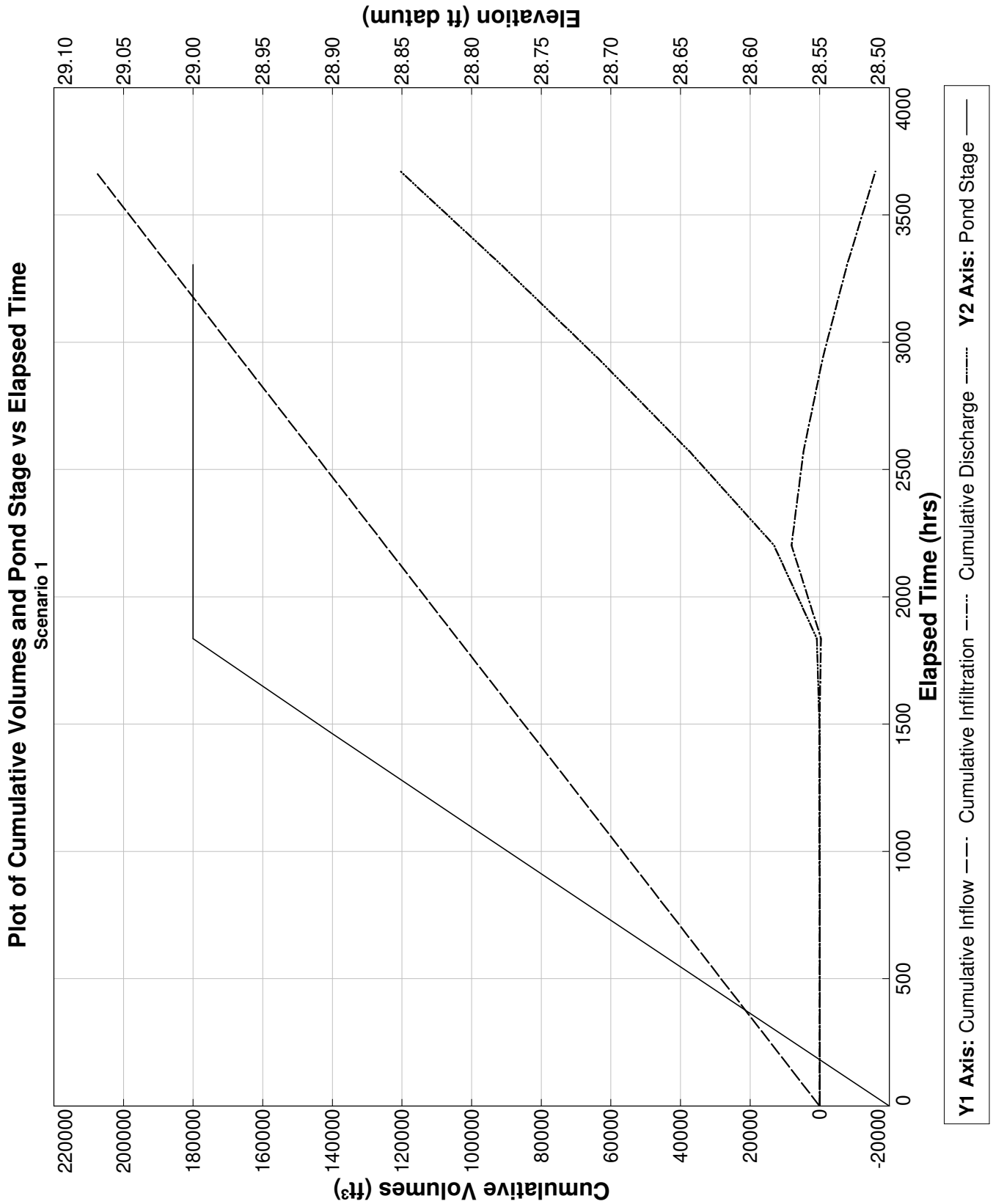
Baseflow hydrograph: Initial GWT (seasonal low) is 28.5 ft.

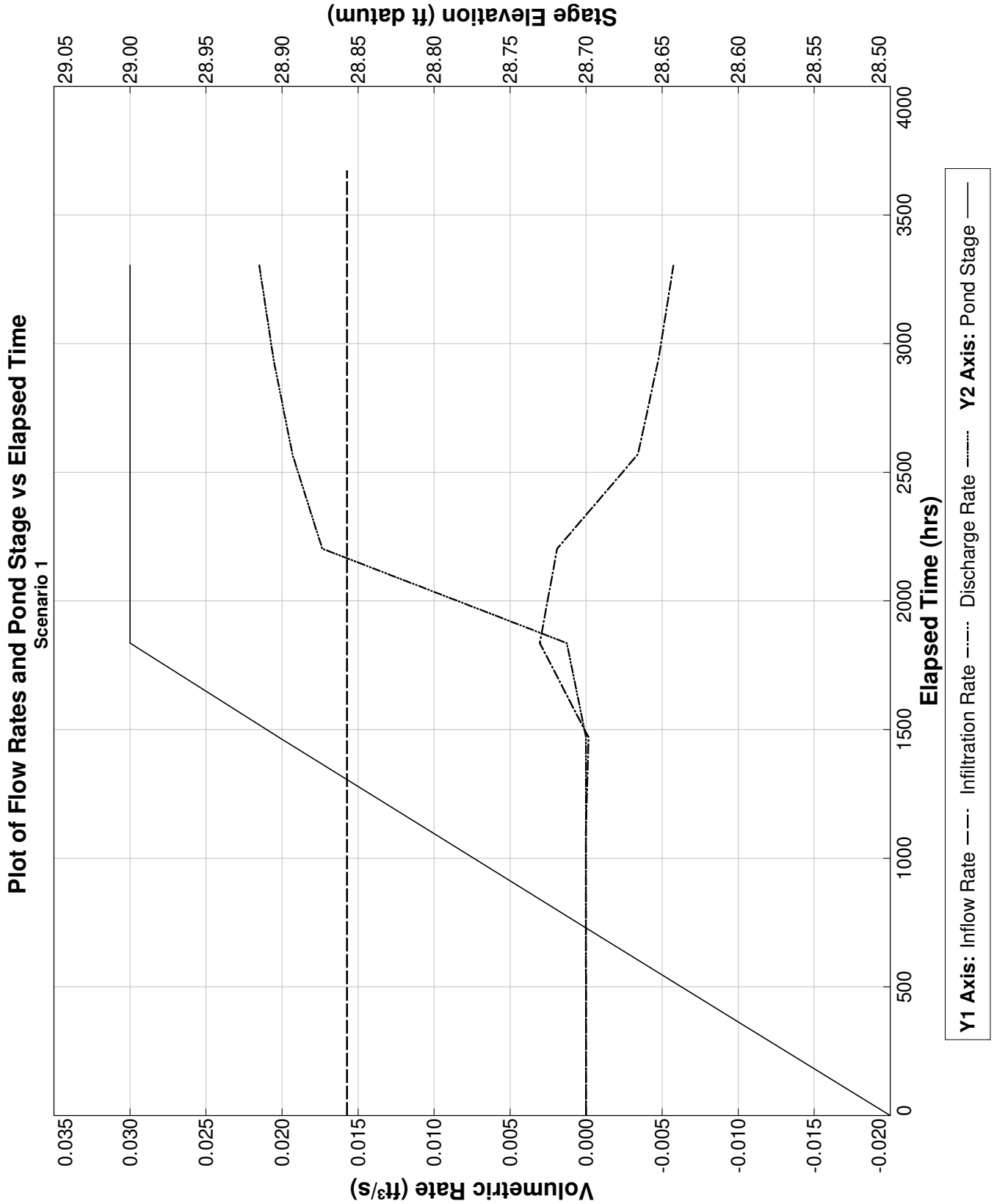
End Scenario 1 3/31/2023 7:42:33

**PONDS Version 3.3.0278**  
**Retention Pond Recovery - Refined Method**  
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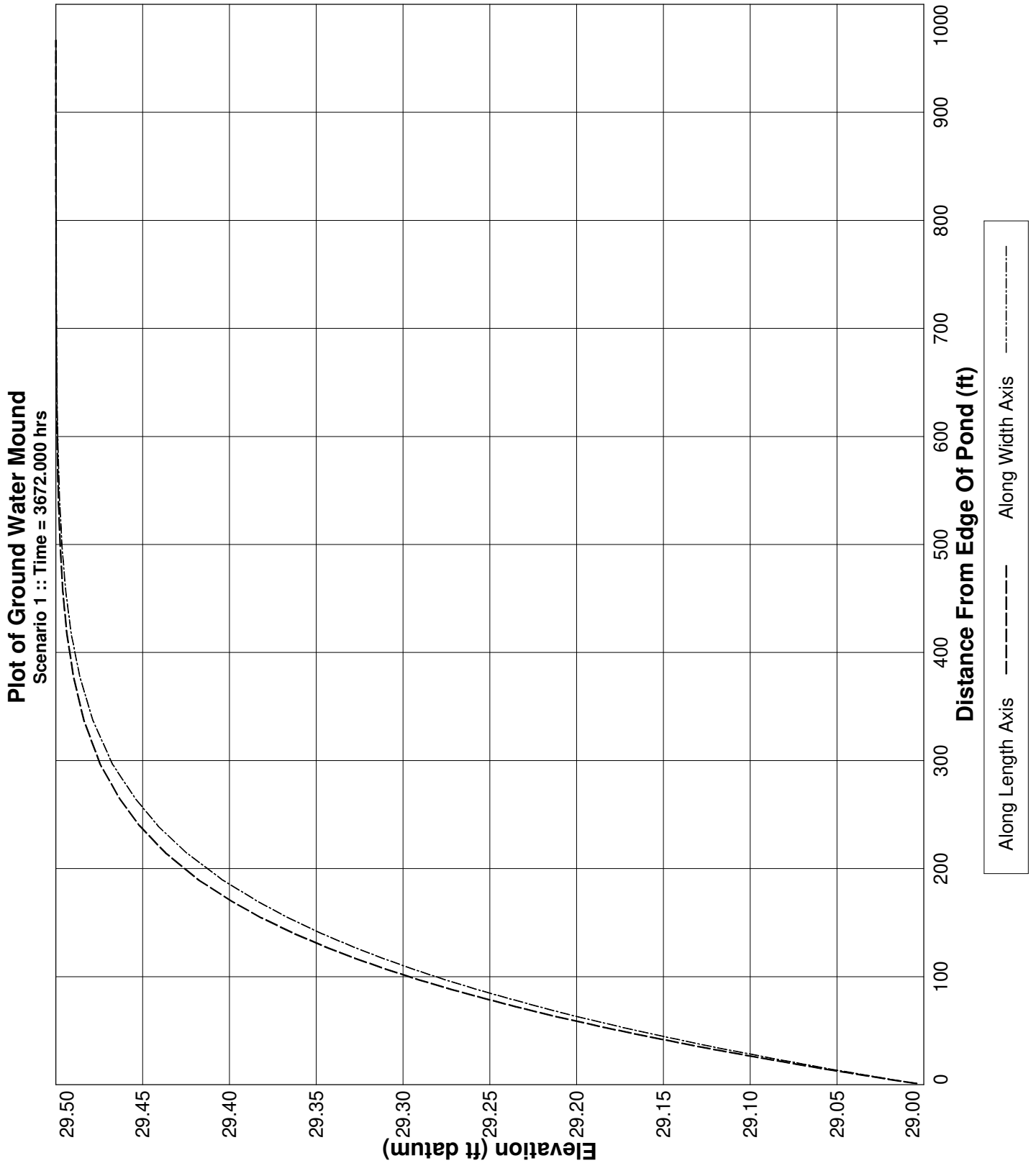
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0157	0.00163	28.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0157	0.00163	28.60082	0.00001	0	20805.000	14.4	0	S
734.400	0.0157	0.00163	28.70139	0.00002	0	41610.000	34.9	0	S
1101.600	0.0157	0.00163	28.80173	0.00002	0	62415.000	57.8	0	S
1468.800	0.0157	0.00163	28.90188	-0.00016	0	83220.000	76.6	0	S
1836.000	0.0157	0.00163	29.00000	0.00305	1.268357E-03	104025.000	-365.4	838.3335	S
2203.200	0.0157	0.00163	29.00000	0.00191	1.735639E-02	124830.000	8129.4	13148.55	S
2570.400	0.0157	0.00163	29.00000	-0.00340	1.932079E-02	145635.000	4692.2	37390.7	S
2937.600	0.0157	0.00163	29.00000	-0.00475	2.055878E-02	166440.000	-861.6	63749.49	S
3304.800	0.0157	0.00163	29.00000	-0.00573	2.150456E-02	187245.000	-7858.8	91551.67	S
3672.000	0.0157	0.00163	29.00000	----	----	208050.000	-16021.3	120519.2	N.A.









**PONDS Version 3.3.0278**  
**Retention Pond Recovery - Refined Method**  
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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.1, East Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -22.00  
Water Table Elevation, [WT] (ft datum): 33.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.30  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 730.0  
Equivalent Pond Width, [W] (ft): 285.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

Stage (ft datum)	Area (ft <sup>2</sup> )
-17.00	3484.8
29.00	208216.8

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

**PONDS Version 3.3.0278**  
**Retention Pond Recovery - Refined Method**  
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---

**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	32.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

**PONDS Version 3.3.0278**  
**Retention Pond Recovery - Refined Method**  
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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 7:46:40

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

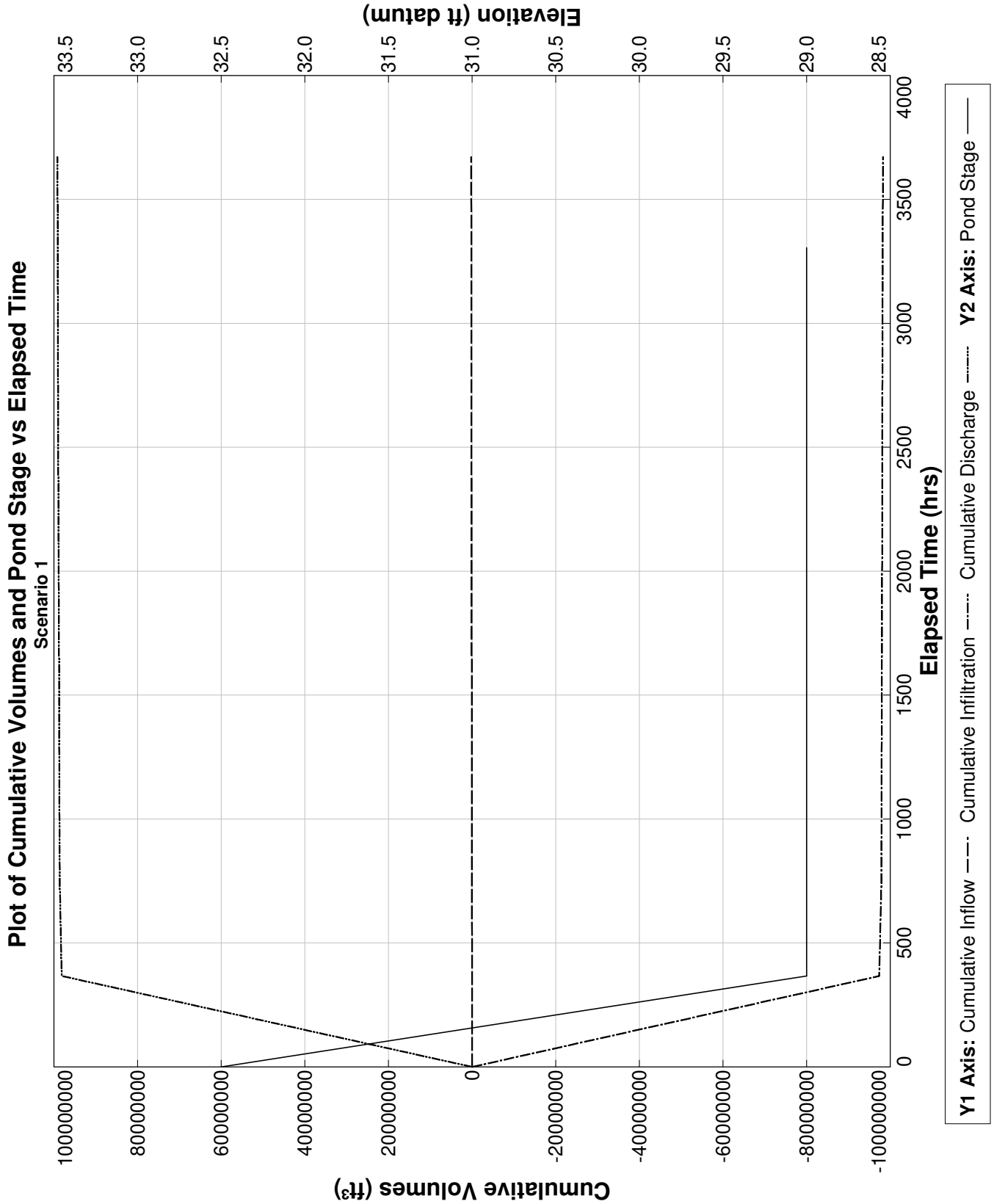
Baseflow hydrograph: Initial GWT (seasonal low) is 32.5 ft.

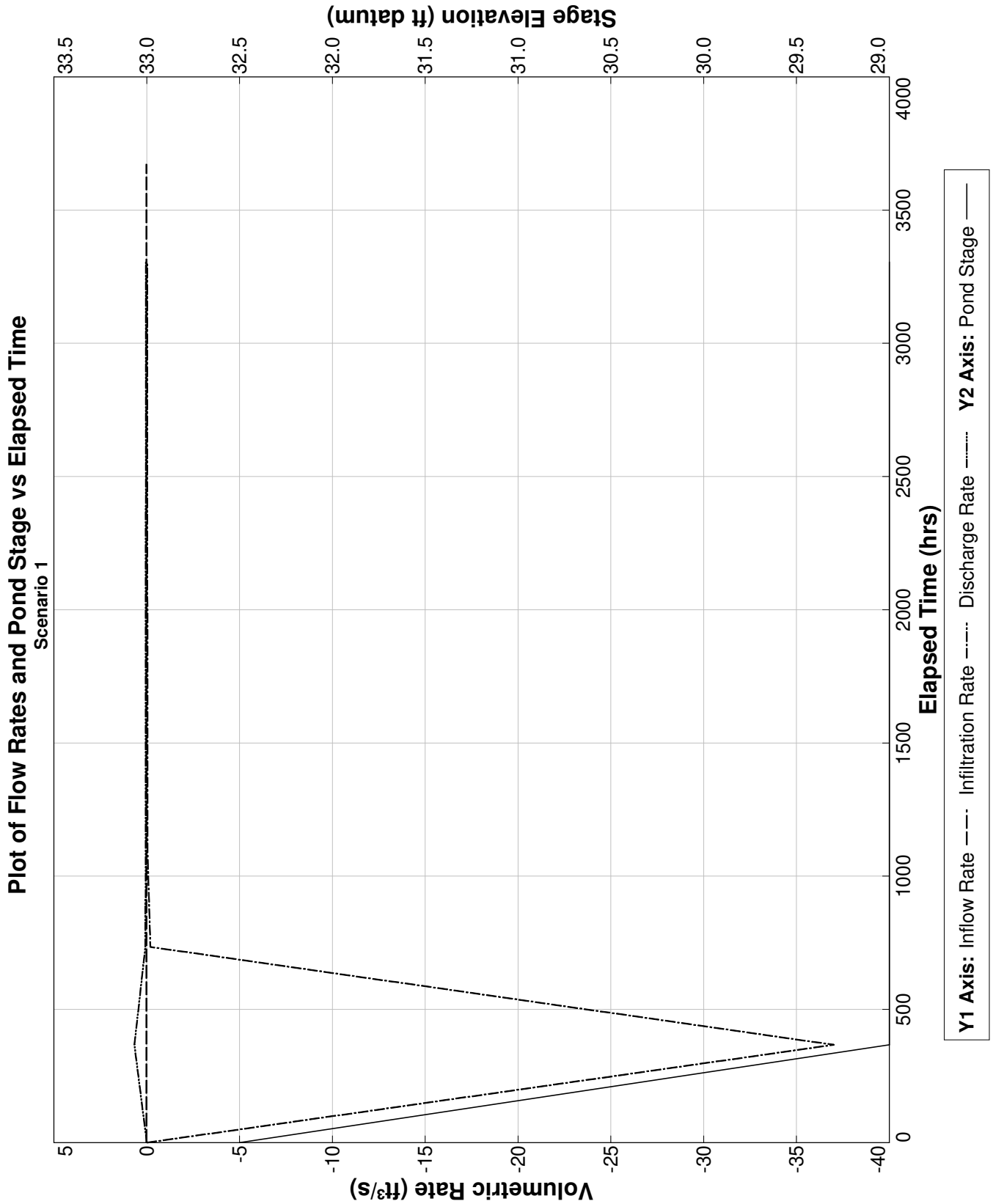
End Scenario 1 3/31/2023 7:46:40

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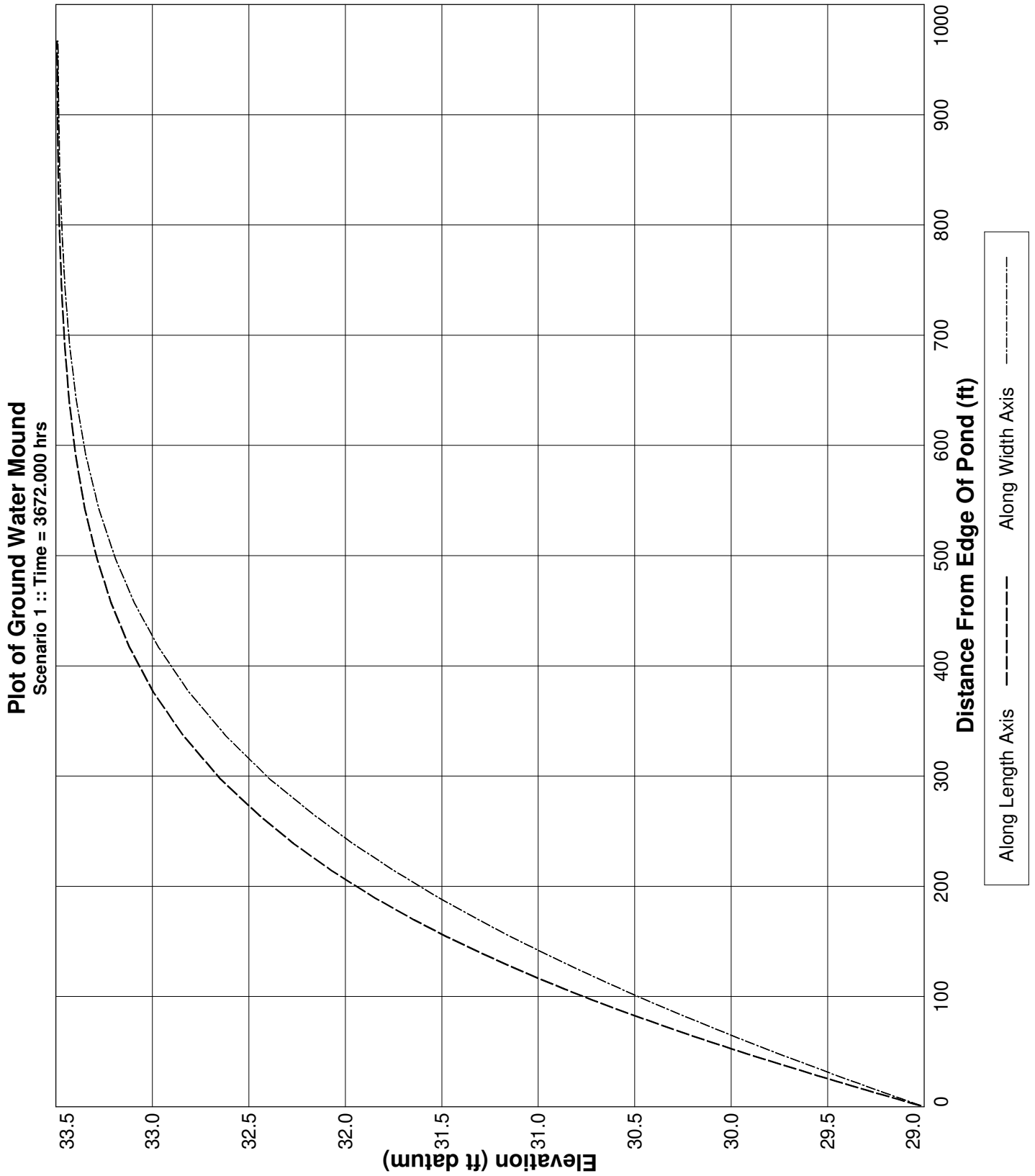
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0157	0.00163	32.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0157	0.00163	29.00007	-37.00671	.6632745	20805.000	-97375740.0	9.812529E+07	S
734.400	0.0157	0.00163	29.00000	-0.20043	7.035156E-02	41610.000	-97839820.0	9.861018E+07	S
1101.600	0.0157	0.00163	29.00000	-0.04628	6.072132E-02	62415.000	-97905650.0	9.869682E+07	S
1468.800	0.0157	0.00163	29.00000	-0.04100	5.628958E-02	83220.000	-97962180.0	9.877416E+07	S
1836.000	0.0157	0.00163	29.00000	-0.03820	5.367051E-02	104025.000	-98014060.0	9.884684E+07	S
2203.200	0.0157	0.00163	29.00000	-0.03652	5.213393E-02	124830.000	-98063180.0	9.891678E+07	S
2570.400	0.0157	0.00163	29.00000	-0.03543	5.108463E-02	145635.000	-98110600.0	9.898499E+07	S
2937.600	0.0157	0.00163	29.00000	-0.03465	5.035281E-02	166440.000	-98156840.0	9.905204E+07	S
3304.800	0.0157	0.00163	29.00000	-0.03409	.0497818	187245.000	-98202220.0	9.911822E+07	S
3672.000	0.0157	0.00163	29.00000	----	----	208050.000	-98246960.0	9.918377E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.2, Southeast, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 6.00  
Water Table Elevation, [WT] (ft datum): 29.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.10  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 412.0  
Equivalent Pond Width, [W] (ft): 93.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
11.00	435.6
29.00	38332.8

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	28.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 10:28:30

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

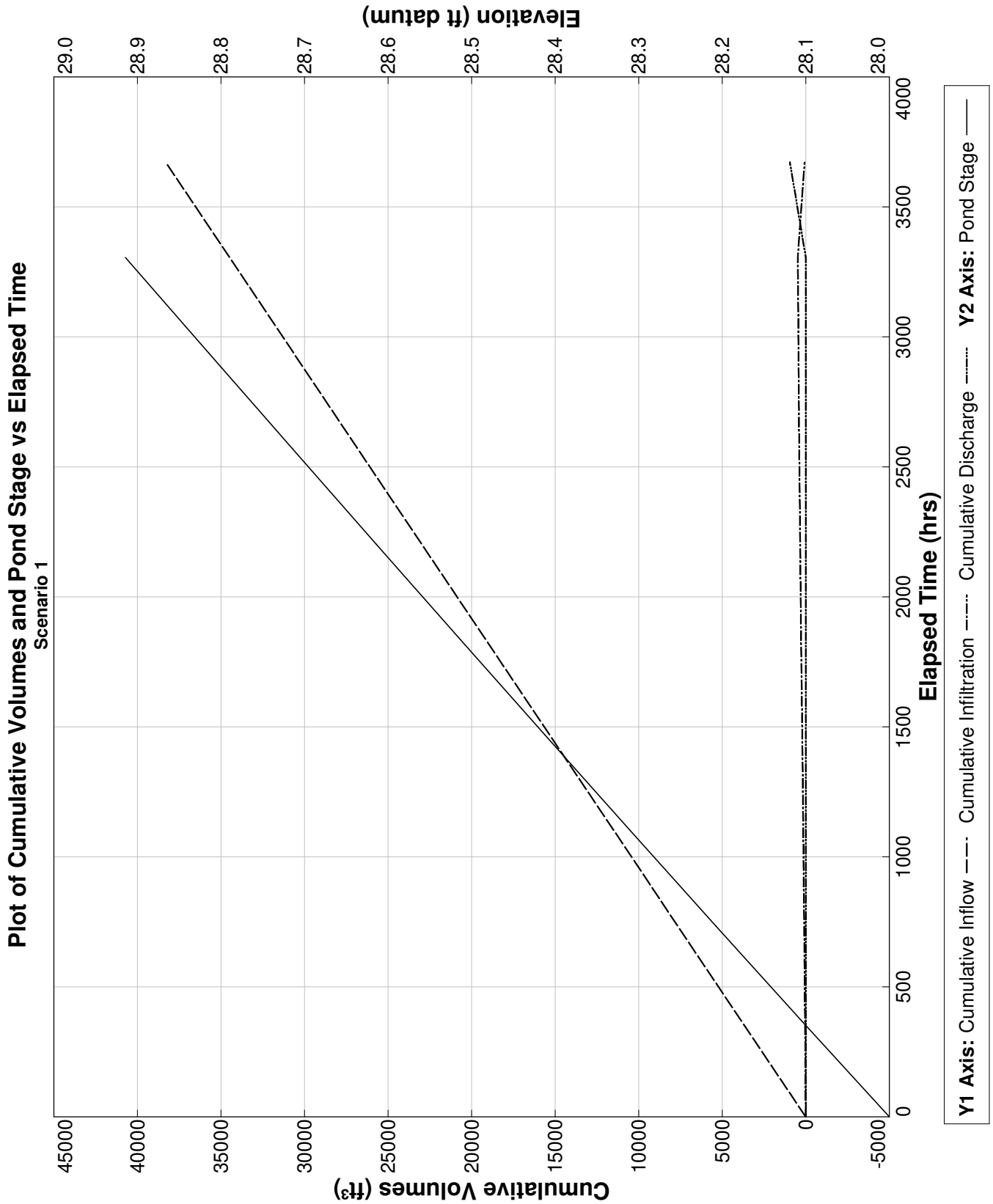
Baseflow hydrograph: Initial GWT (seasonal low) is 28.0 ft.

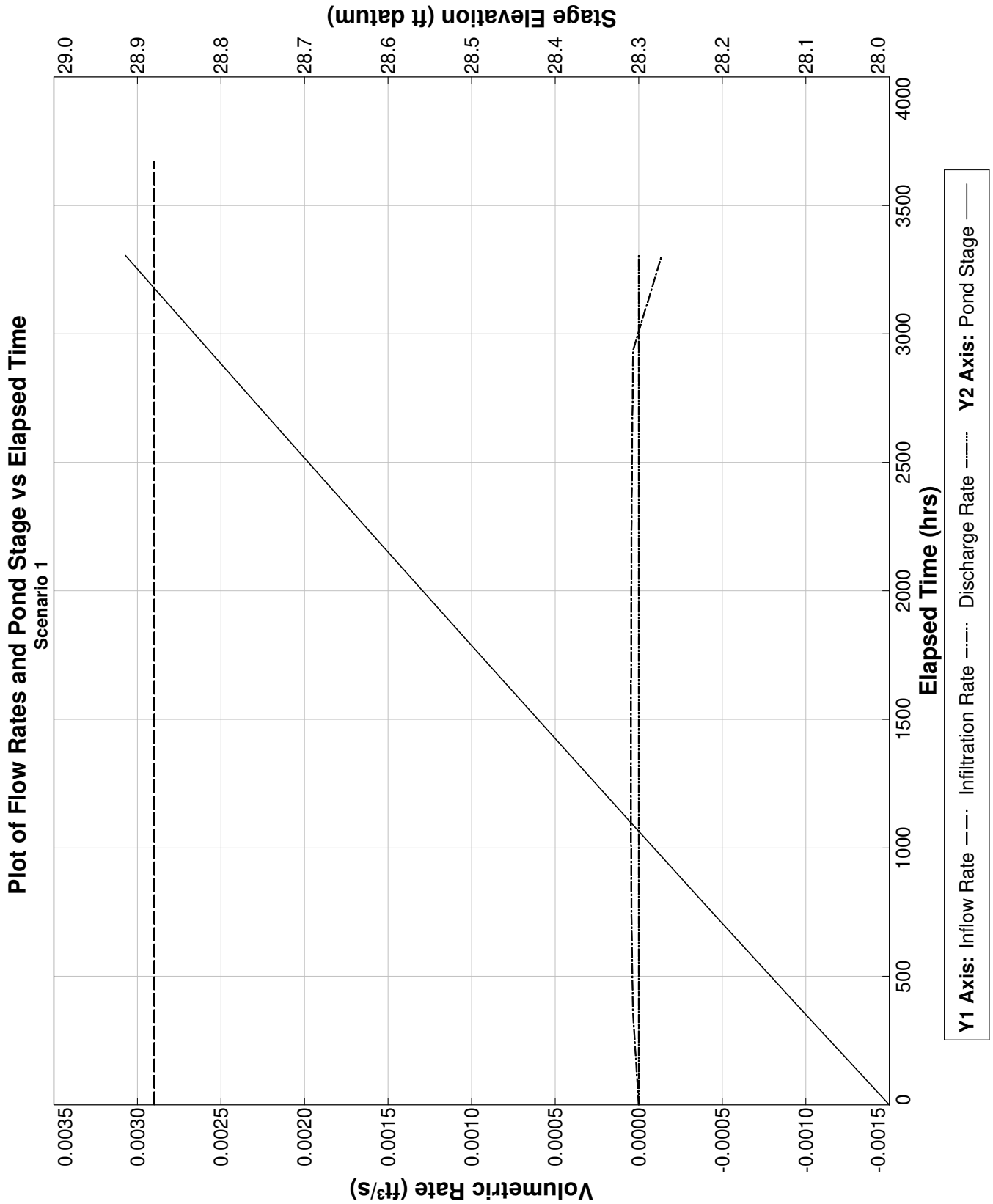
End Scenario 1 3/31/2023 10:28:30

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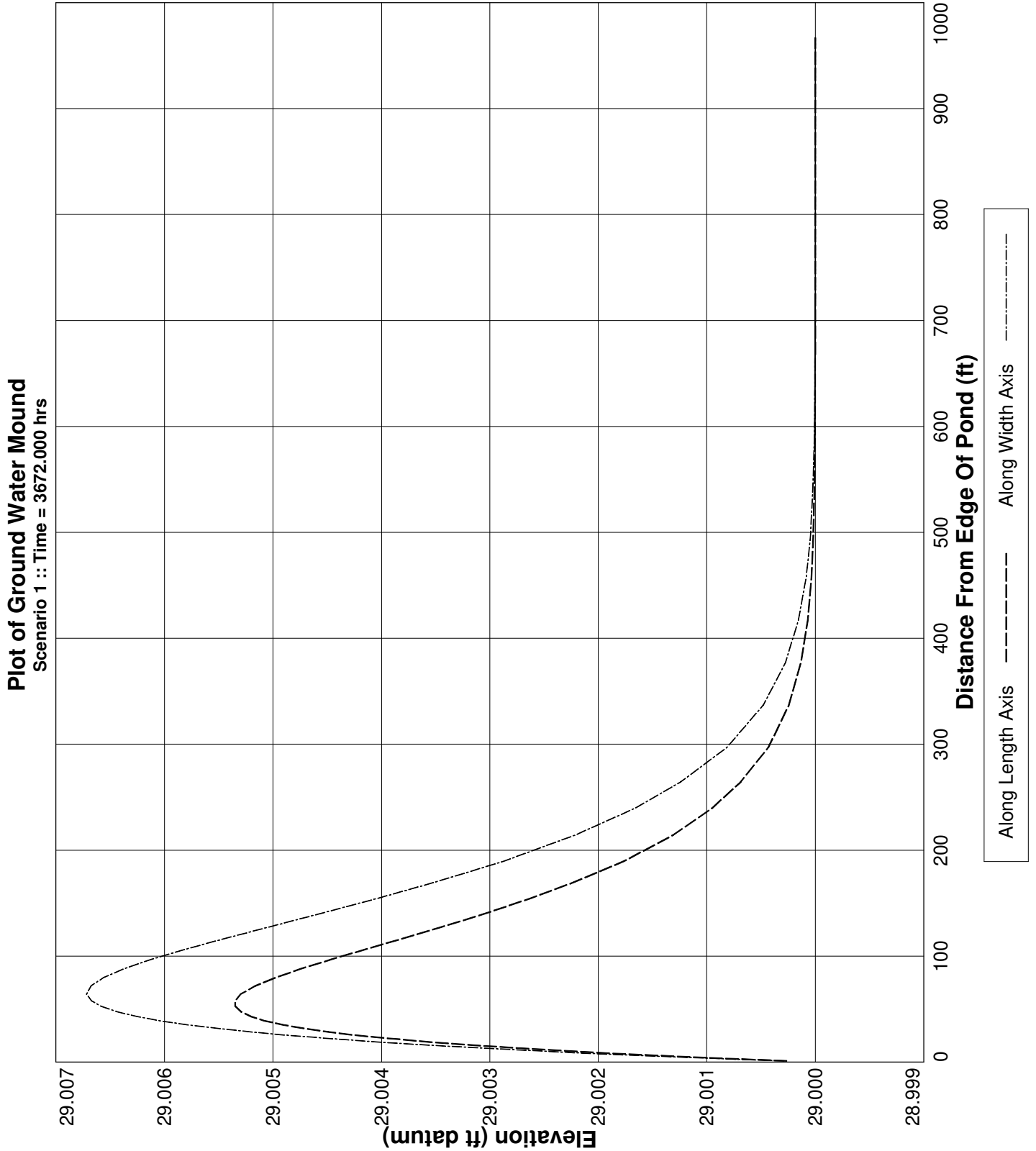
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0029	0.00163	28.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0029	0.00163	28.10439	0.00003	0	3831.600	38.5	0	S
734.400	0.0029	0.00163	28.20773	0.00004	0	7663.200	92.4	0	S
1101.600	0.0029	0.00163	28.31029	0.00005	0	11494.800	152.6	0	S
1468.800	0.0029	0.00163	28.41220	0.00005	0	15326.400	214.7	0	S
1836.000	0.0029	0.00163	28.51354	0.00005	0	19158.000	276.2	0	S
2203.200	0.0029	0.00163	28.61437	0.00004	0	22989.600	335.2	0	S
2570.400	0.0029	0.00163	28.71474	0.00004	0	26821.200	390.3	0	S
2937.600	0.0029	0.00163	28.81471	0.00003	0	30652.800	439.3	0	S
3304.800	0.0029	0.00163	28.91437	-0.00014	0	34484.400	478.9	0	S
3672.000	0.0029	0.00163	29.00000	----	----	38316.000	76.8	959.0929	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.2, North, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 6.00  
Water Table Elevation, [WT] (ft datum): 32.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.10  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 412.0  
Equivalent Pond Width, [W] (ft): 93.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
11.00	435.6
29.00	38332.8

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	31.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 10:29:51

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

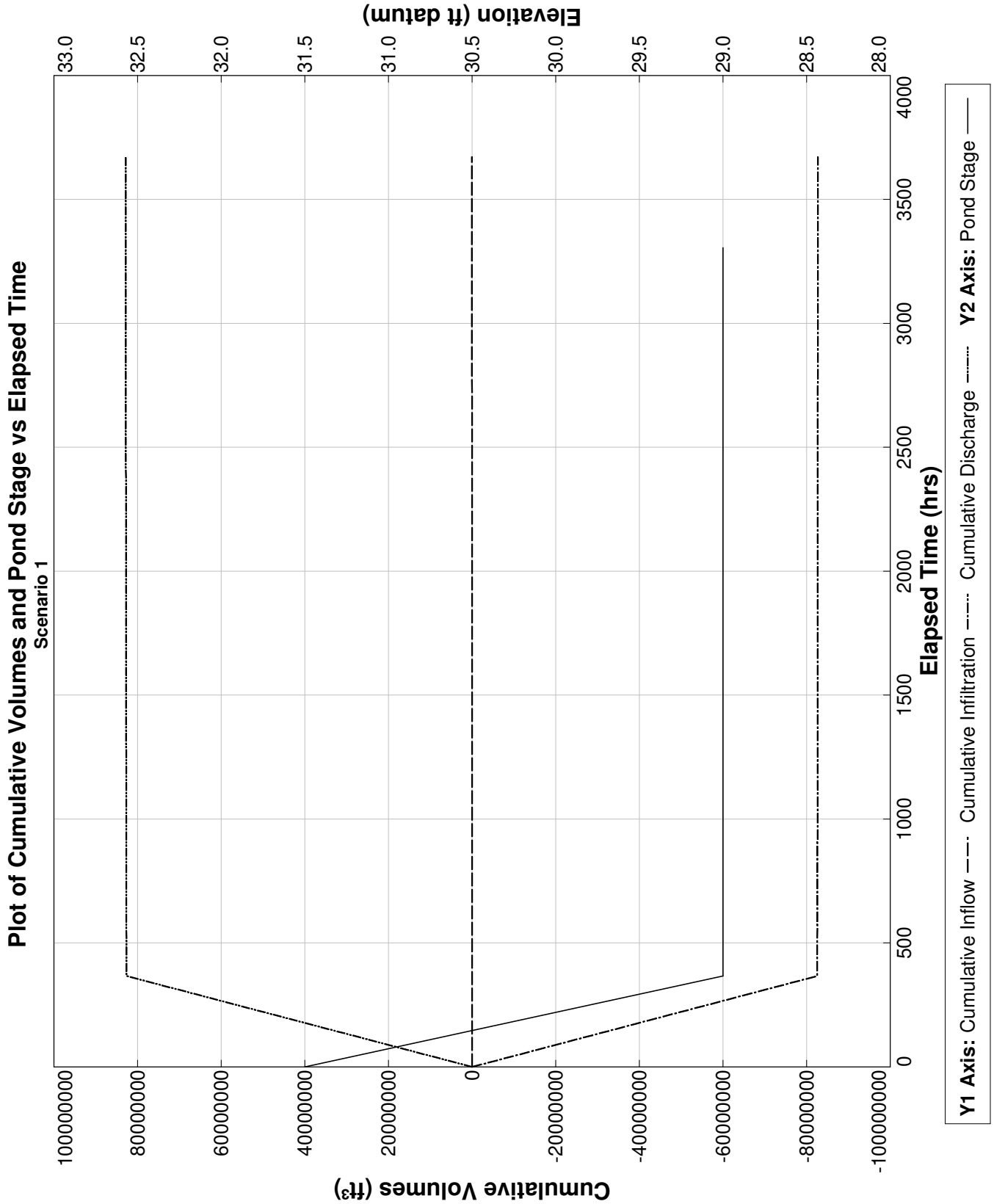
Baseflow hydrograph: Initial GWT (seasonal low) is 31.5 ft.

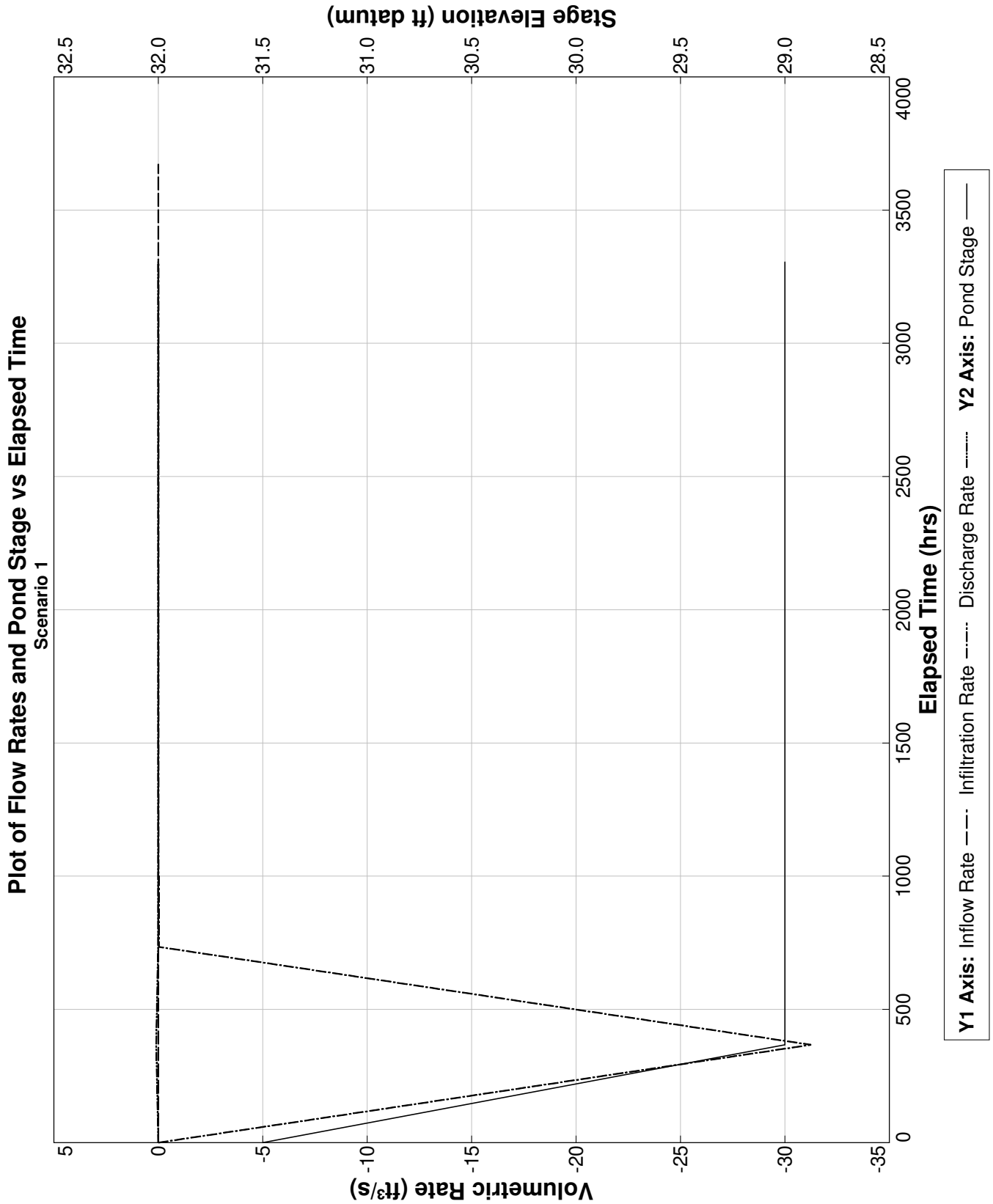
End Scenario 1 3/31/2023 10:29:51

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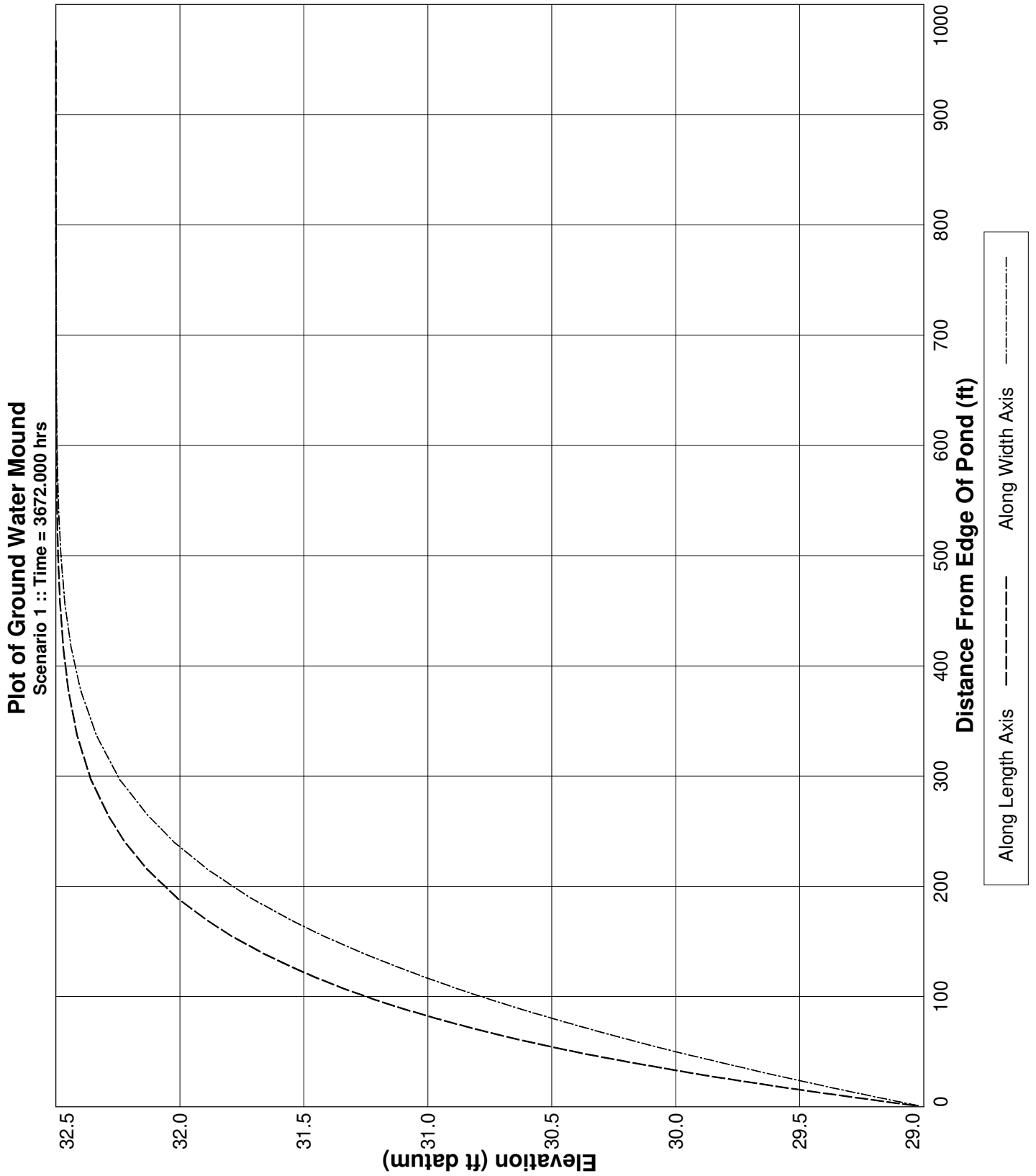
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0029	0.00163	31.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0029	0.00163	29.00000	-31.24147	9.807647E-02	3831.600	-82525660.0	8.262532E+07	S
734.400	0.0029	0.00163	29.00000	-0.03330	1.632565E-02	7663.200	-82597440.0	8.270094E+07	S
1101.600	0.0029	0.00163	29.00000	-0.01149	.0140684	11494.800	-82613700.0	8.272102E+07	S
1468.800	0.0029	0.00163	29.00000	-0.01030	.0130916	15326.400	-82627820.0	8.273898E+07	S
1836.000	0.0029	0.00163	29.00000	-0.00970	1.255807E-02	19158.000	-82640940.0	8.275593E+07	S
2203.200	0.0029	0.00163	29.00000	-0.00931	1.217844E-02	22989.600	-82653460.0	8.277228E+07	S
2570.400	0.0029	0.00163	29.00000	-0.00906	1.193775E-02	26821.200	-82665560.0	8.278822E+07	S
2937.600	0.0029	0.00163	29.00000	-0.00891	1.179313E-02	30652.800	-82677420.0	8.28039E+07	S
3304.800	0.0029	0.00163	29.00000	-0.00884	1.172578E-02	34484.400	-82689130.0	8.281945E+07	S
3672.000	0.0029	0.00163	29.00000	----	----	38316.000	-82700780.0	8.283493E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.3, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -3.00  
Water Table Elevation, [WT] (ft datum): 31.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.30  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 264.0  
Equivalent Pond Width, [W] (ft): 127.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
7.00	435.6
29.00	33541.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	30.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 10:50:1

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

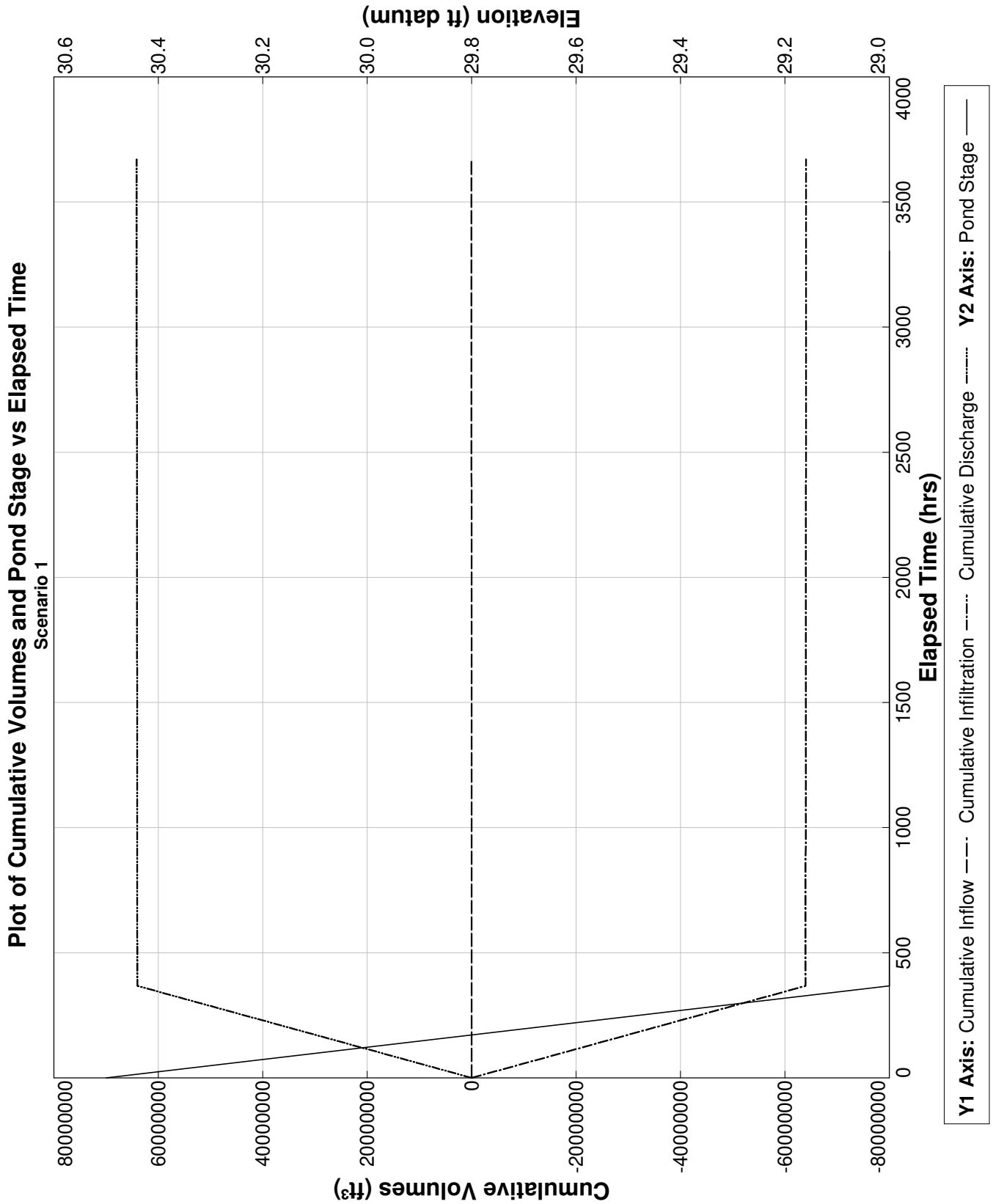
Baseflow hydrograph: Initial GWT (seasonal low) is 30.5 ft.

End Scenario 1 3/31/2023 10:50:1

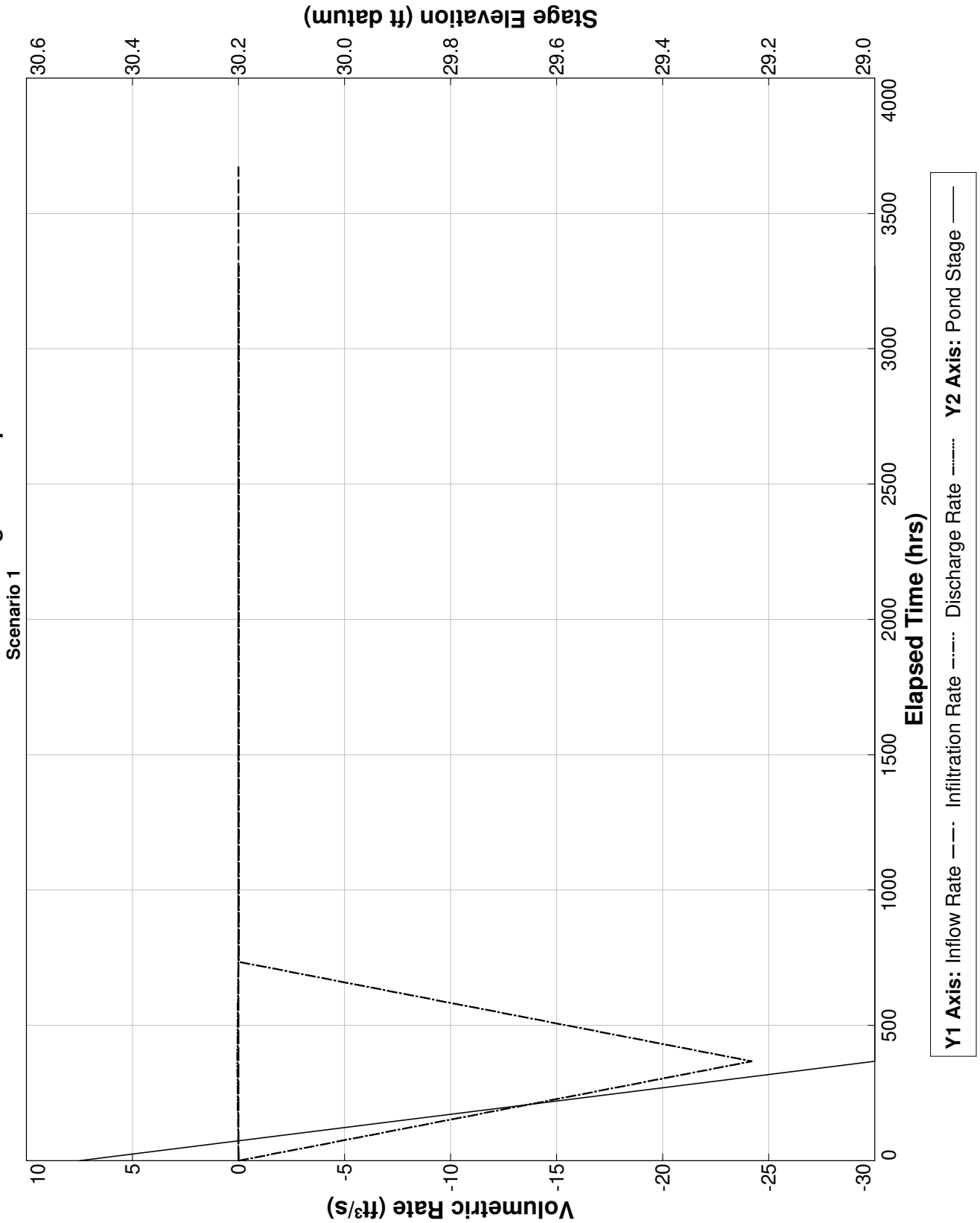
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**Detailed Results** :: Scenario 1 ::

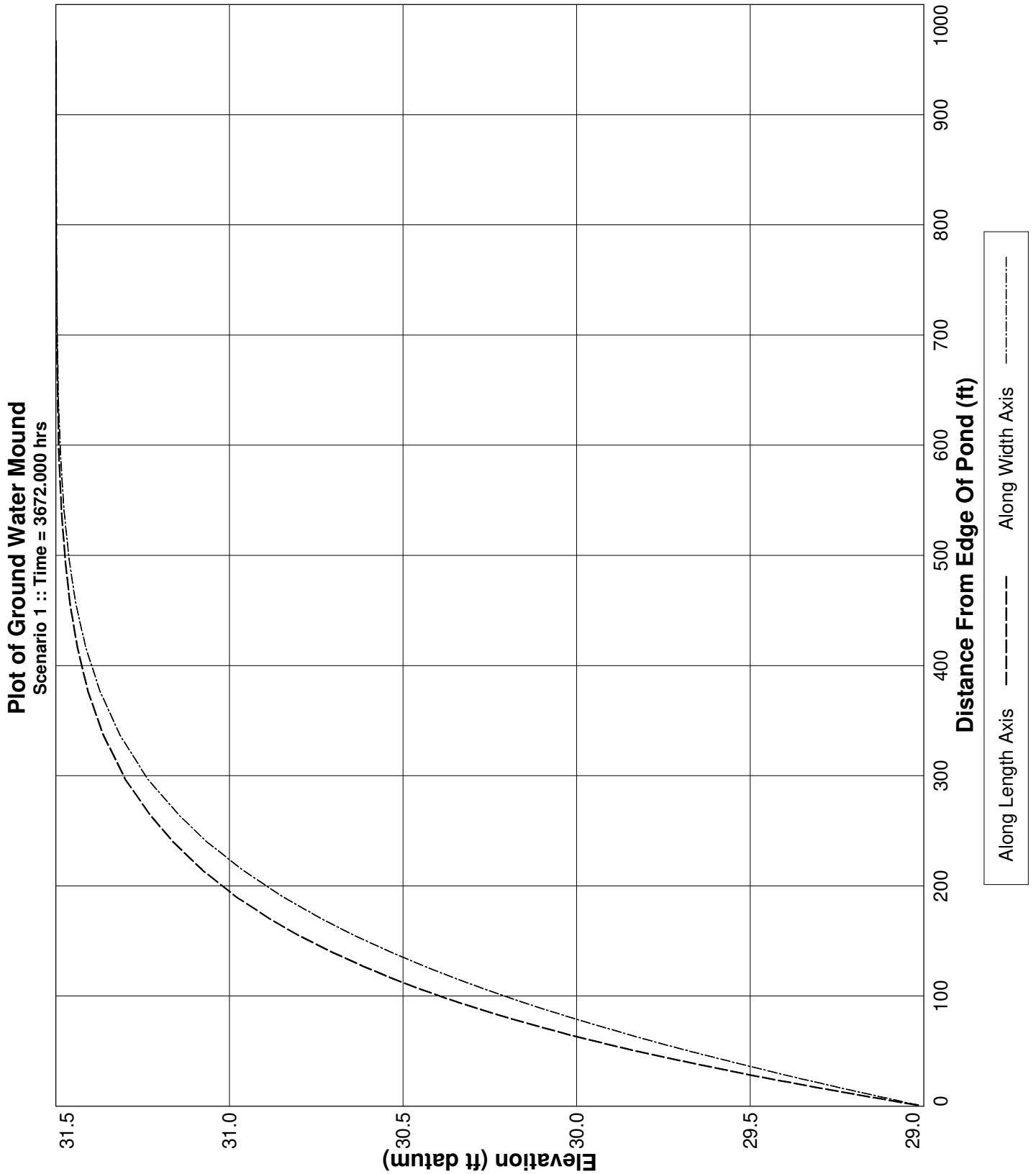
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0025	0.00163	30.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0025	0.00163	29.00000	-24.19798	5.561293E-02	3352.800	-63934180.0	6.398784E+07	S
734.400	0.0025	0.00163	29.00000	-0.02012	1.213441E-02	6705.600	-63975600.0	6.403262E+07	S
1101.600	0.0025	0.00163	29.00000	-0.00843	1.073705E-02	10058.400	-63987360.0	6.404774E+07	S
1468.800	0.0025	0.00163	29.00000	-0.00778	1.026227E-02	13411.200	-63997890.0	6.406162E+07	S
1836.000	0.0025	0.00163	29.00000	-0.00749	9.989082E-03	16764.000	-64007920.0	6.4075E+07	S
2203.200	0.0025	0.00163	29.00000	-0.00736	9.873464E-03	20116.800	-64017700.0	6.408813E+07	S
2570.400	0.0025	0.00163	29.00000	-0.00733	9.854909E-03	23469.600	-64027390.0	6.410117E+07	S
2937.600	0.0025	0.00163	29.00000	-0.00737	9.898793E-03	26822.400	-64037090.0	6.411422E+07	S
3304.800	0.0025	0.00163	29.00000	-0.00745	9.98312E-03	30175.200	-64046880.0	6.412737E+07	S
3672.000	0.0025	0.00163	29.00000	----	----	33528.000	-64056800.0	6.414064E+07	N.A.



Plot of Flow Rates and Pond Stage vs Elapsed Time







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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.4, Southeast Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-23-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 10.00  
Water Table Elevation, [WT] (ft datum): 33.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.10  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 226.0  
Equivalent Pond Width, [W] (ft): 77.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
15.00	435.6
29.00	17424.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	32.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/23/2023 15:4:57

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

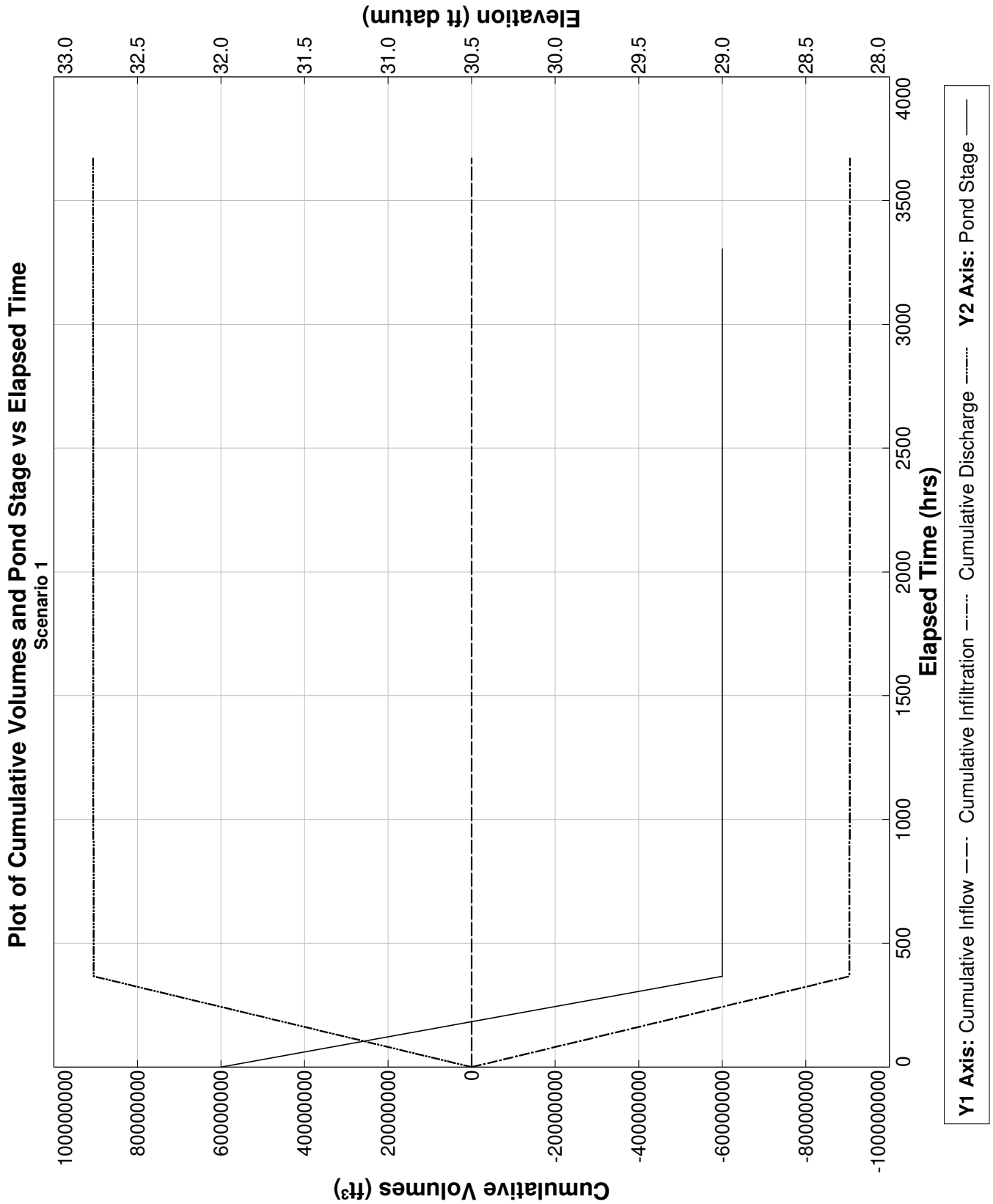
Baseflow hydrograph: Initial GWT (seasonal low) is 32.0 ft.

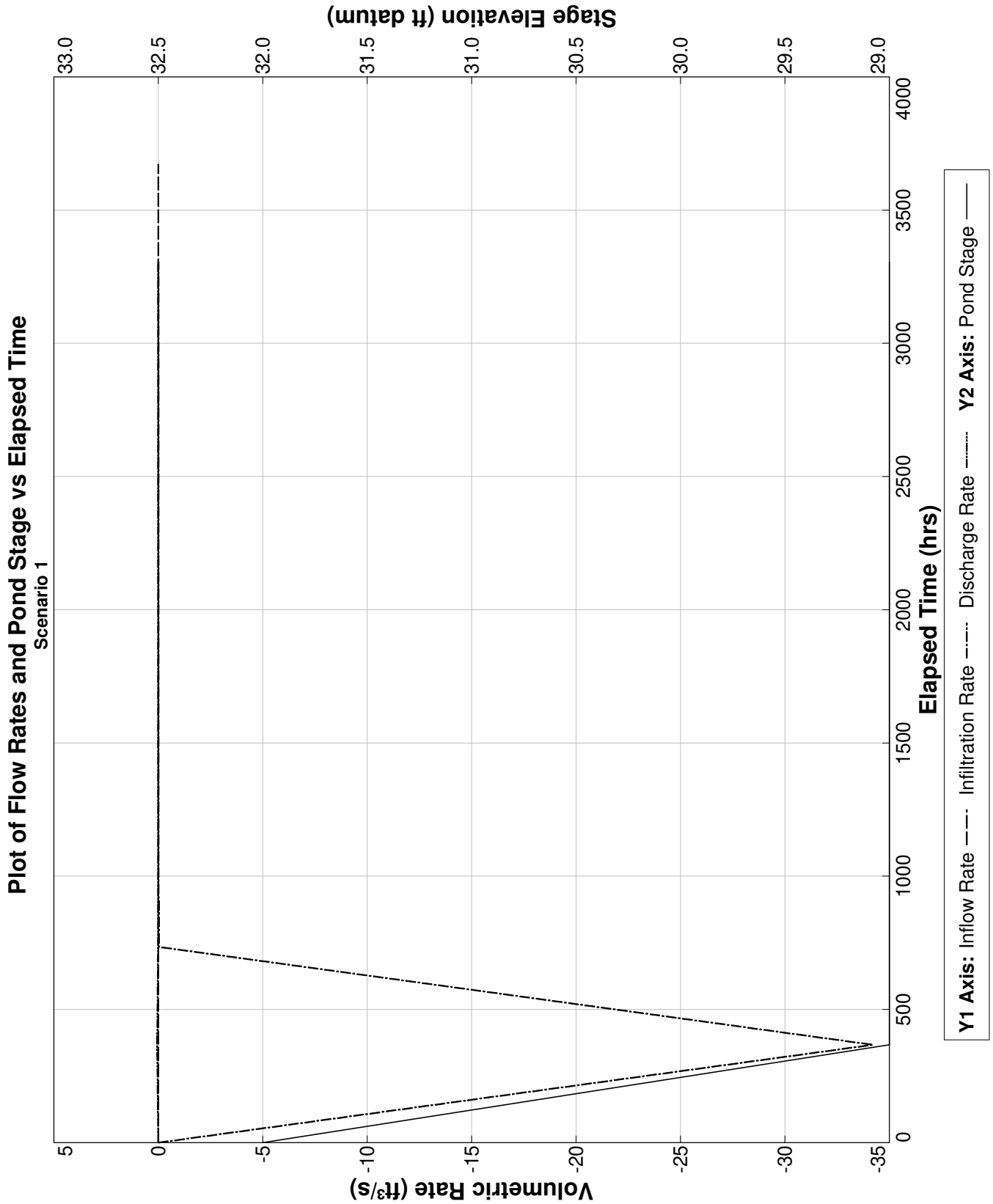
End Scenario 1 3/23/2023 15:4:57

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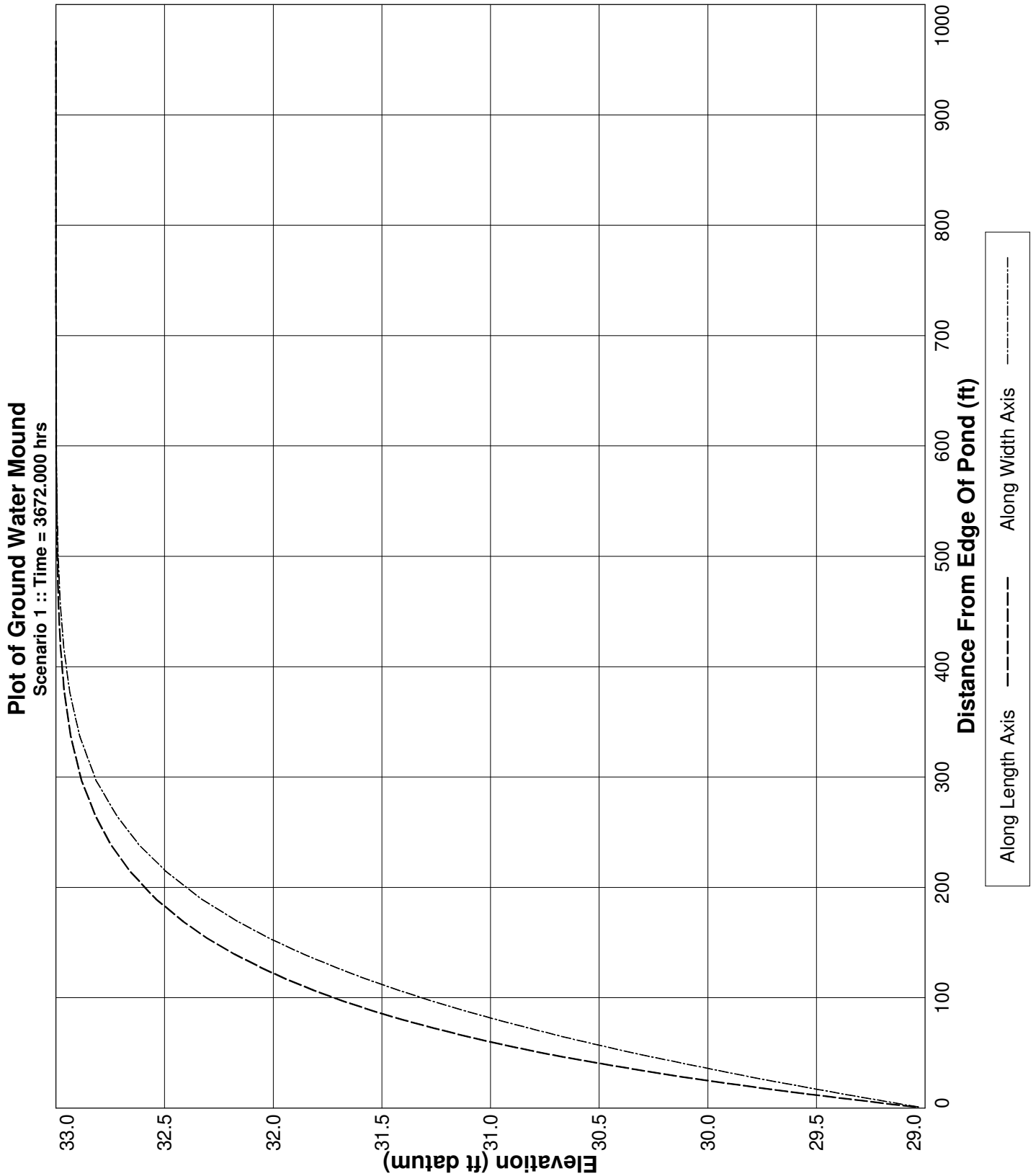
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0013	0.00163	32.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0013	0.00163	29.00000	-34.21801	5.668654E-02	1740.200	-90423940.0	9.047795E+07	S
734.400	0.0013	0.00163	29.00000	-0.02068	1.099973E-02	3480.400	-90466940.0	9.05227E+07	S
1101.600	0.0013	0.00163	29.00000	-0.00825	9.29005E-03	5220.600	-90478610.0	9.05361E+07	S
1468.800	0.0013	0.00163	29.00000	-0.00740	8.672373E-03	6960.800	-90488740.0	9.054798E+07	S
1836.000	0.0013	0.00163	29.00000	-0.00696	8.229739E-03	8701.000	-90498180.0	9.055915E+07	S
2203.200	0.0013	0.00163	29.00000	-0.00666	7.954339E-03	10441.200	-90507130.0	9.056985E+07	S
2570.400	0.0013	0.00163	29.00000	-0.00648	7.776973E-03	12181.400	-90515790.0	9.058024E+07	S
2937.600	0.0013	0.00163	29.00000	-0.00637	7.673342E-03	13921.600	-90524260.0	9.059046E+07	S
3304.800	0.0013	0.00163	29.00000	-0.00631	7.61438E-03	15661.800	-90532620.0	9.060056E+07	S
3672.000	0.0013	0.00163	29.00000	----	----	17402.000	-90540940.0	9.061062E+07	N.A.









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**Retention Pond Recovery - Refined Method**  
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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.4, Southeast Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-23-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 10.00  
Water Table Elevation, [WT] (ft datum): 33.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.00  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 226.0  
Equivalent Pond Width, [W] (ft): 77.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
15.00	435.6
29.00	17424.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	32.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/23/2023 15:12:29

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 32.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 6 of 10 saturated stress periods.

Maximum calculated water budget error is -4.16086925368649 percent, for saturated stress period 1.

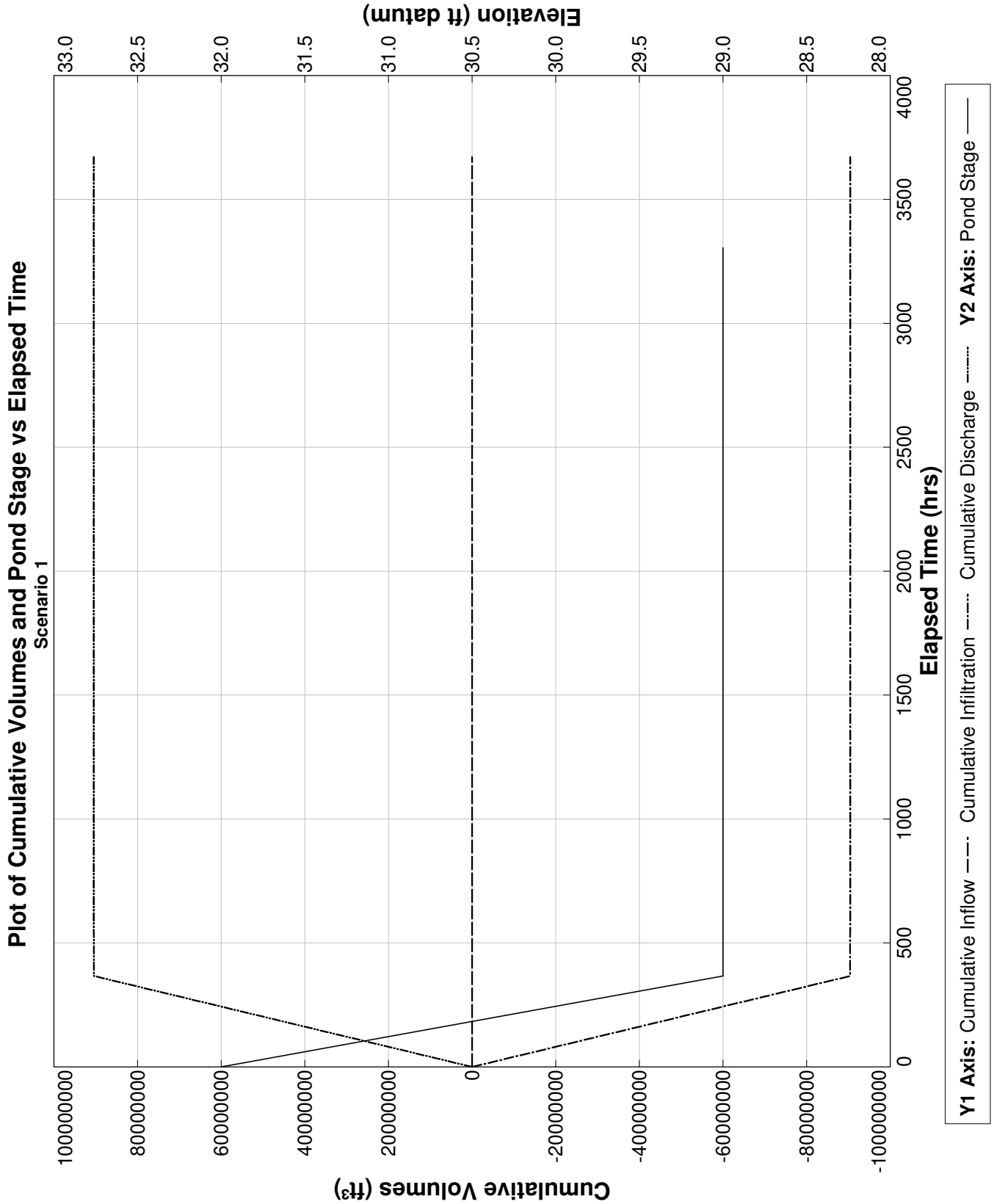
If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

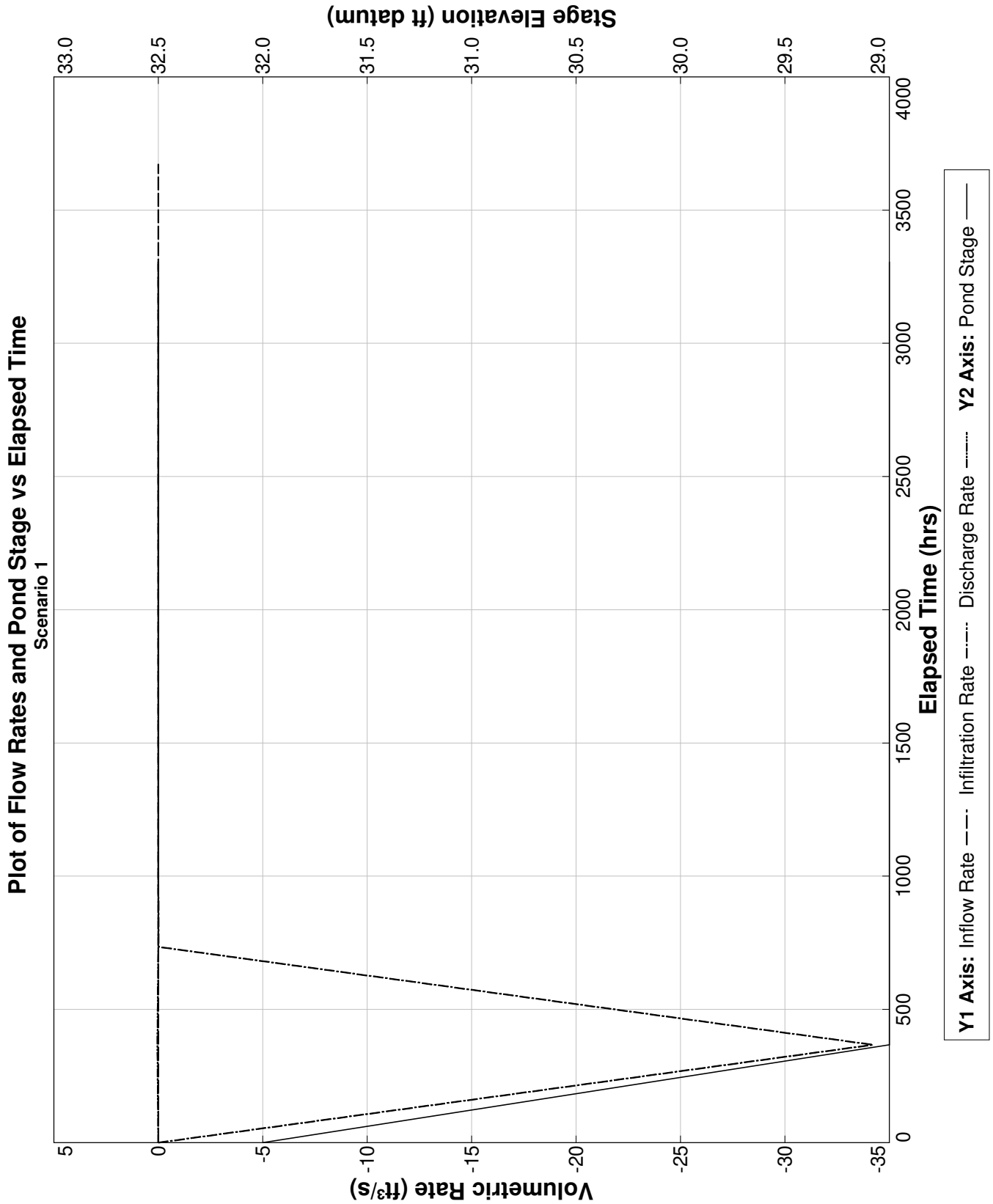
End Scenario 1 3/23/2023 15:12:29

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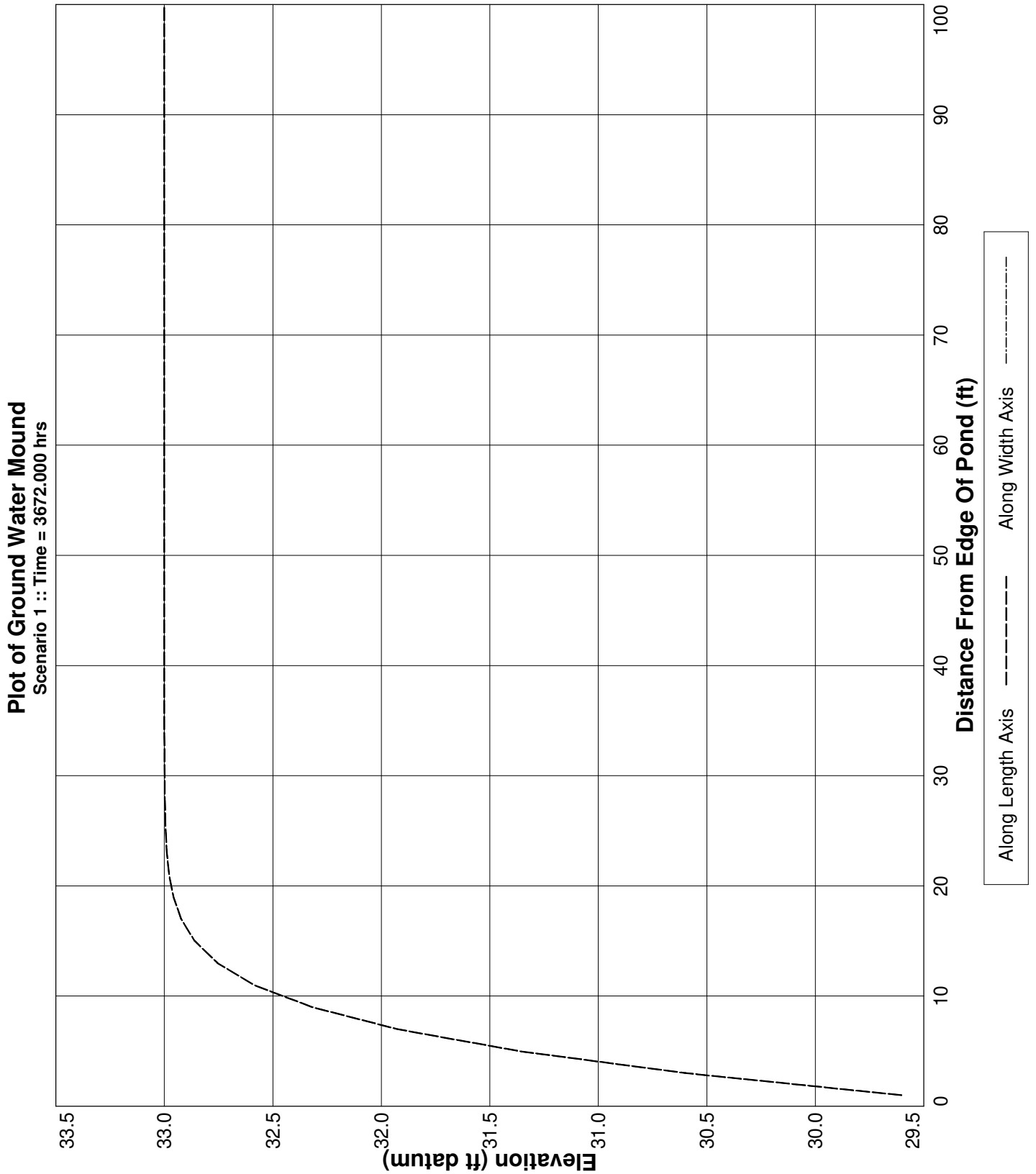
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0013	0.00163	32.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0013	0.00163	29.00000	-34.21093	.0467738	1740.200	-90417390.0	9.04714E+07	S
734.400	0.0013	0.00163	29.00000	-0.01205	2.509776E-03	3480.400	-90448220.0	9.050398E+07	S
1101.600	0.0013	0.00163	29.00000	-0.00053	1.666598E-03	5220.600	-90449250.0	9.050674E+07	S
1468.800	0.0013	0.00163	29.00000	-0.00026	1.551878E-03	6960.800	-90449630.0	9.050886E+07	S
1836.000	0.0013	0.00163	29.00000	-0.00021	1.520965E-03	8701.000	-90449920.0	9.05109E+07	S
2203.200	0.0013	0.00163	29.00000	-0.00019	1.506866E-03	10441.200	-90450180.0	9.05129E+07	S
2570.400	0.0013	0.00163	29.00000	-0.00018	1.498458E-03	12181.400	-90450430.0	9.051489E+07	S
2937.600	0.0013	0.00163	29.00000	-0.00018	1.492881E-03	13921.600	-90450660.0	9.051686E+07	S
3304.800	0.0013	0.00163	29.00000	-0.00017	1.489038E-03	15661.800	-90450900.0	9.051883E+07	S
3672.000	0.0013	0.00163	29.00000	----	----	17402.000	-90451130.0	9.05208E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.4, South Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-23-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 10.00  
Water Table Elevation, [WT] (ft datum): 34.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.10  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 226.0  
Equivalent Pond Width, [W] (ft): 77.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
15.00	435.6
29.00	17424.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	33.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/23/2023 15:16:37

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

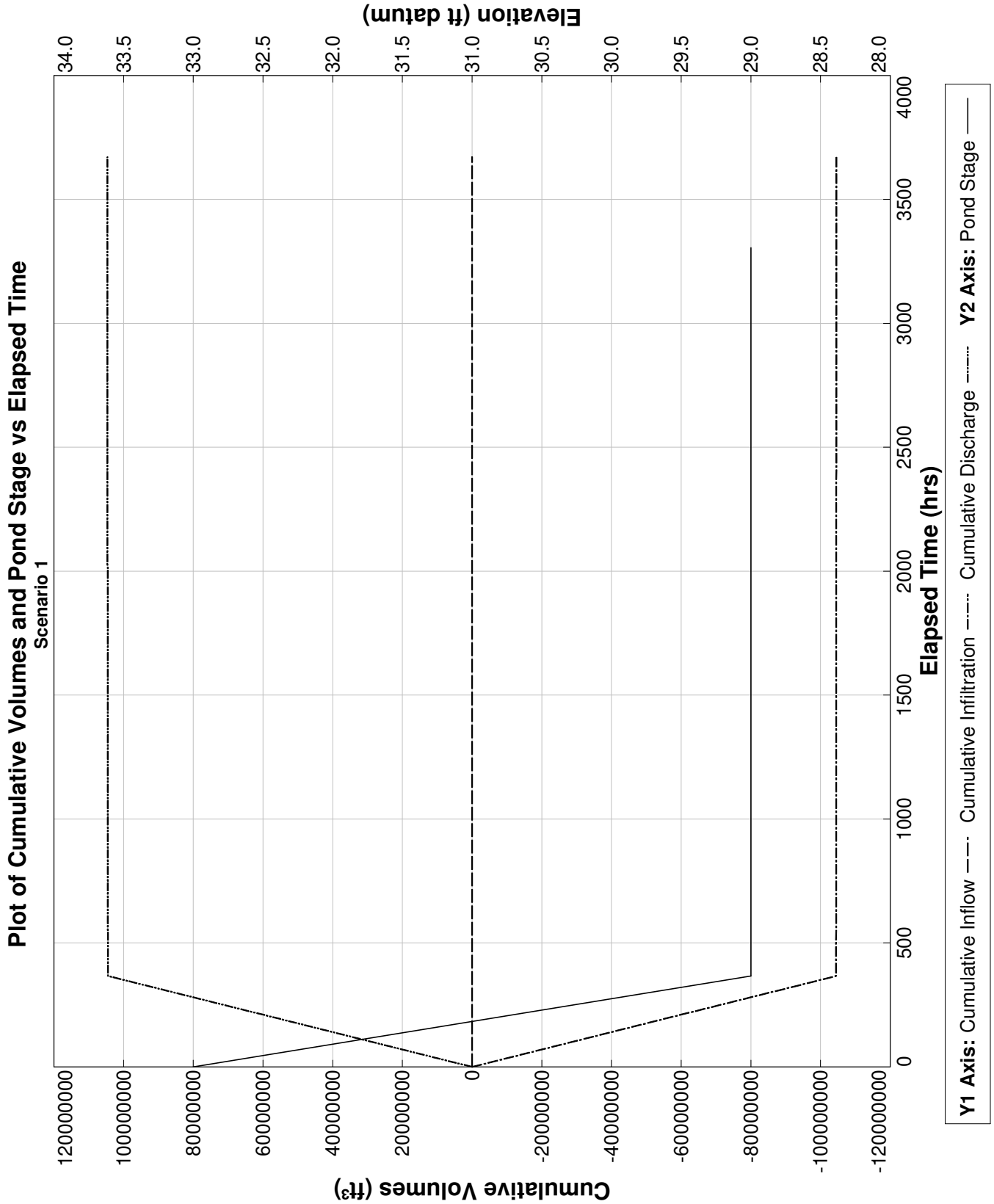
Baseflow hydrograph: Initial GWT (seasonal low) is 33.0 ft.

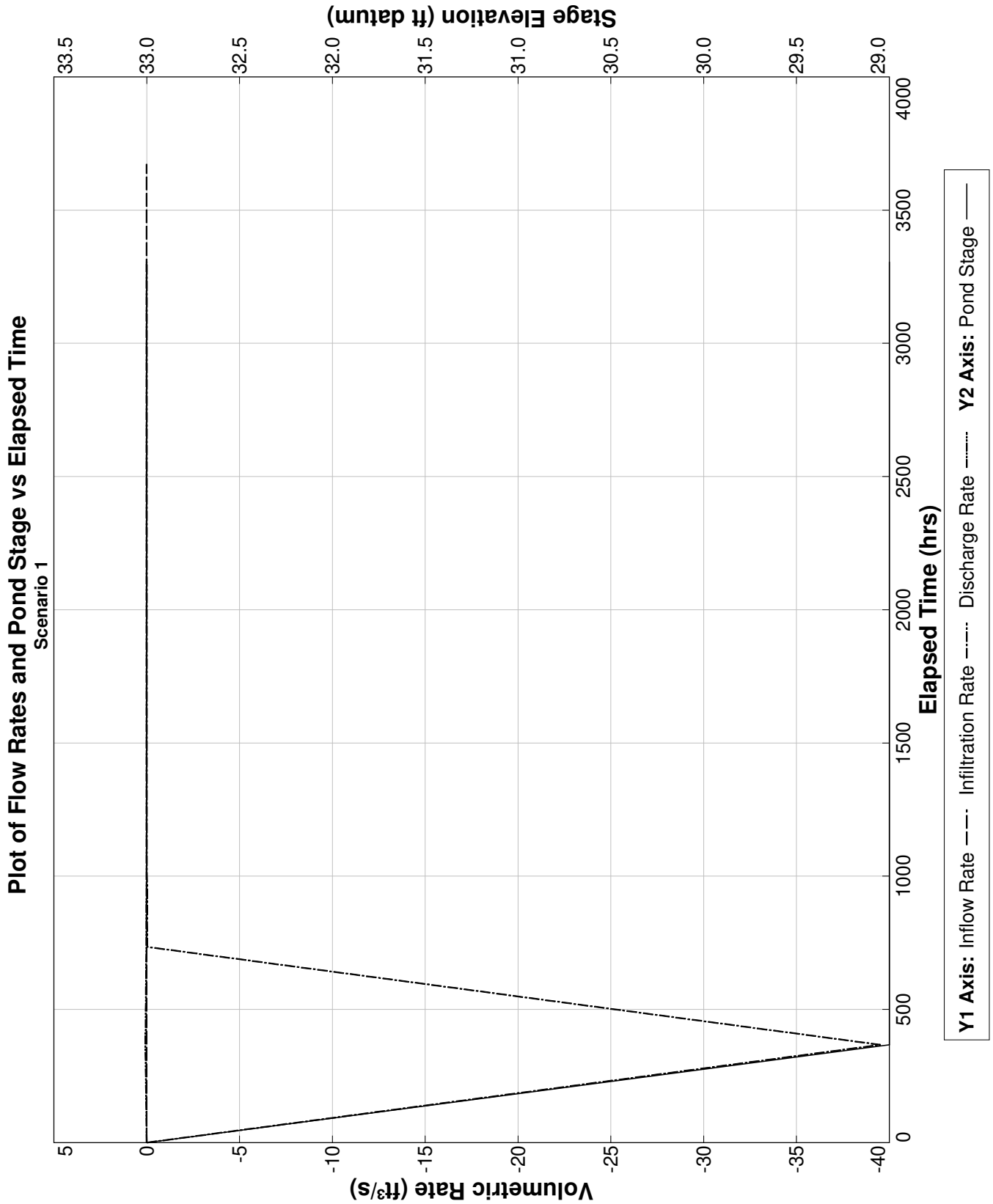
End Scenario 1 3/23/2023 15:16:37

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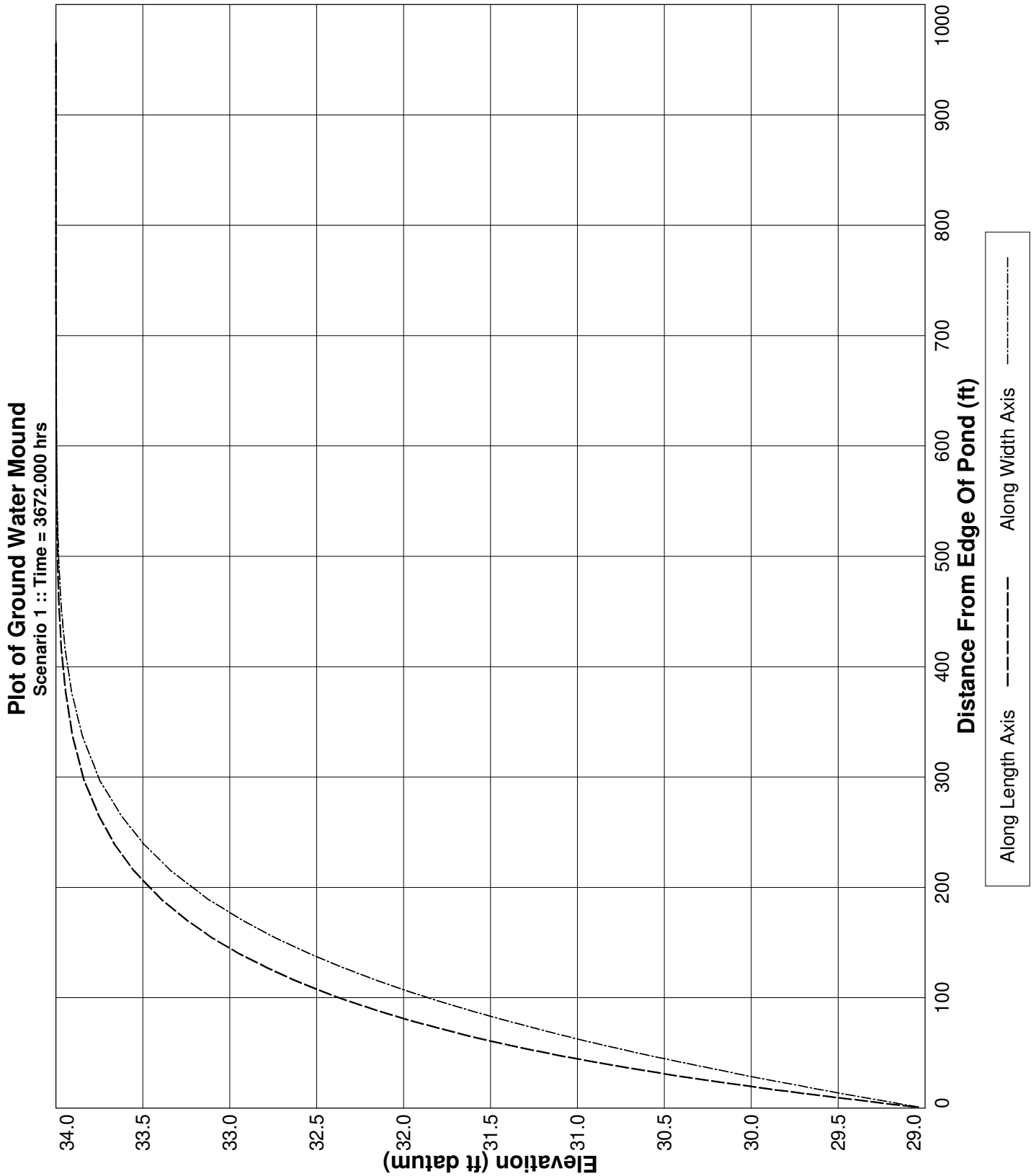
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0013	0.00163	33.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0013	0.00163	29.00000	-39.51318	7.480992E-02	1740.200	-104409700.0	1.044811E+08	S
734.400	0.0013	0.00163	29.00000	-0.02718	1.380068E-02	3480.400	-104466500.0	1.045397E+08	S
1101.600	0.0013	0.00163	29.00000	-0.01058	1.156677E-02	5220.600	-104481500.0	1.045565E+08	S
1468.800	0.0013	0.00163	29.00000	-0.00945	1.066991E-02	6960.800	-104494500.0	1.045712E+08	S
1836.000	0.0013	0.00163	29.00000	-0.00888	1.016275E-02	8701.000	-104506500.0	1.045849E+08	S
2203.200	0.0013	0.00163	29.00000	-0.00849	9.776313E-03	10441.200	-104518000.0	1.045981E+08	S
2570.400	0.0013	0.00163	29.00000	-0.00821	9.505099E-03	12181.400	-104529000.0	1.046108E+08	S
2937.600	0.0013	0.00163	29.00000	-0.00802	9.324382E-03	13921.600	-104539700.0	1.046233E+08	S
3304.800	0.0013	0.00163	29.00000	-0.00790	9.204417E-03	15661.800	-104550200.0	1.046355E+08	S
3672.000	0.0013	0.00163	29.00000	----	----	17402.000	-104560600.0	1.046477E+08	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.4, South Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-23-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 10.00  
Water Table Elevation, [WT] (ft datum): 34.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.00  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 226.0  
Equivalent Pond Width, [W] (ft): 77.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
15.00	435.6
29.00	17424.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	33.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/23/2023 15:20:9

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 33.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 7 of 10 saturated stress periods.

Maximum calculated water budget error is -4.89137656320380 percent, for saturated stress period 1.

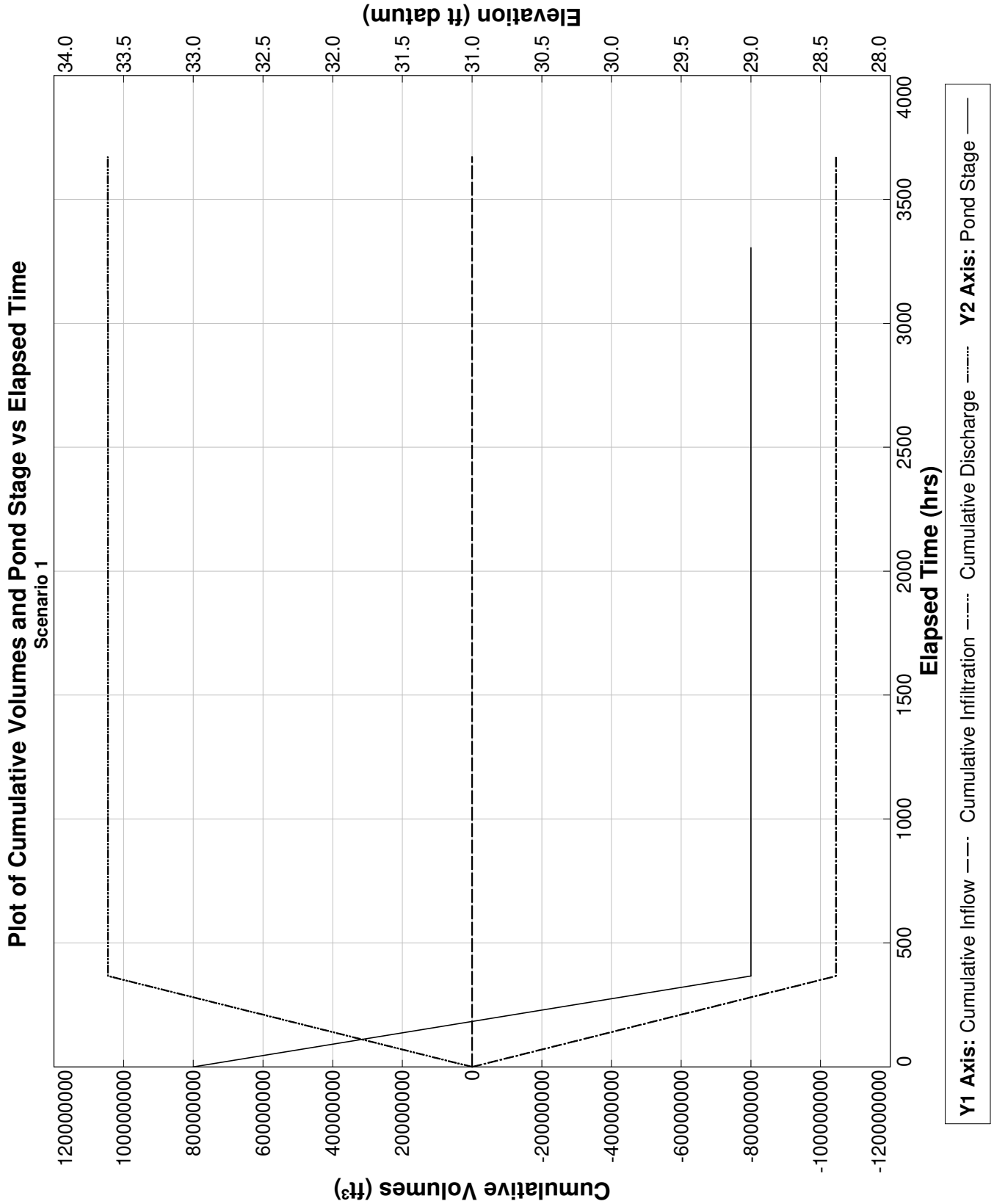
If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

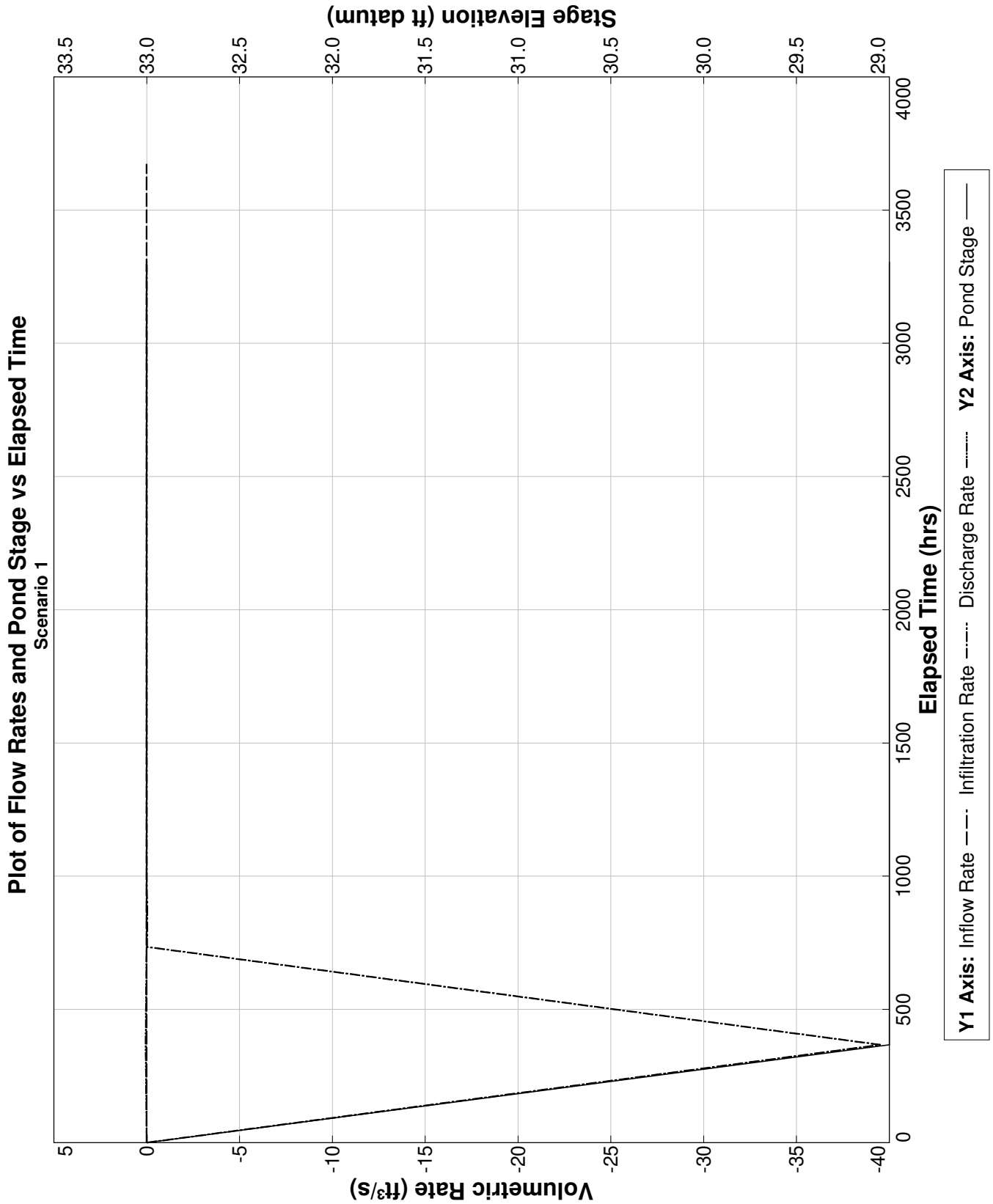
End Scenario 1 3/23/2023 15:20:9

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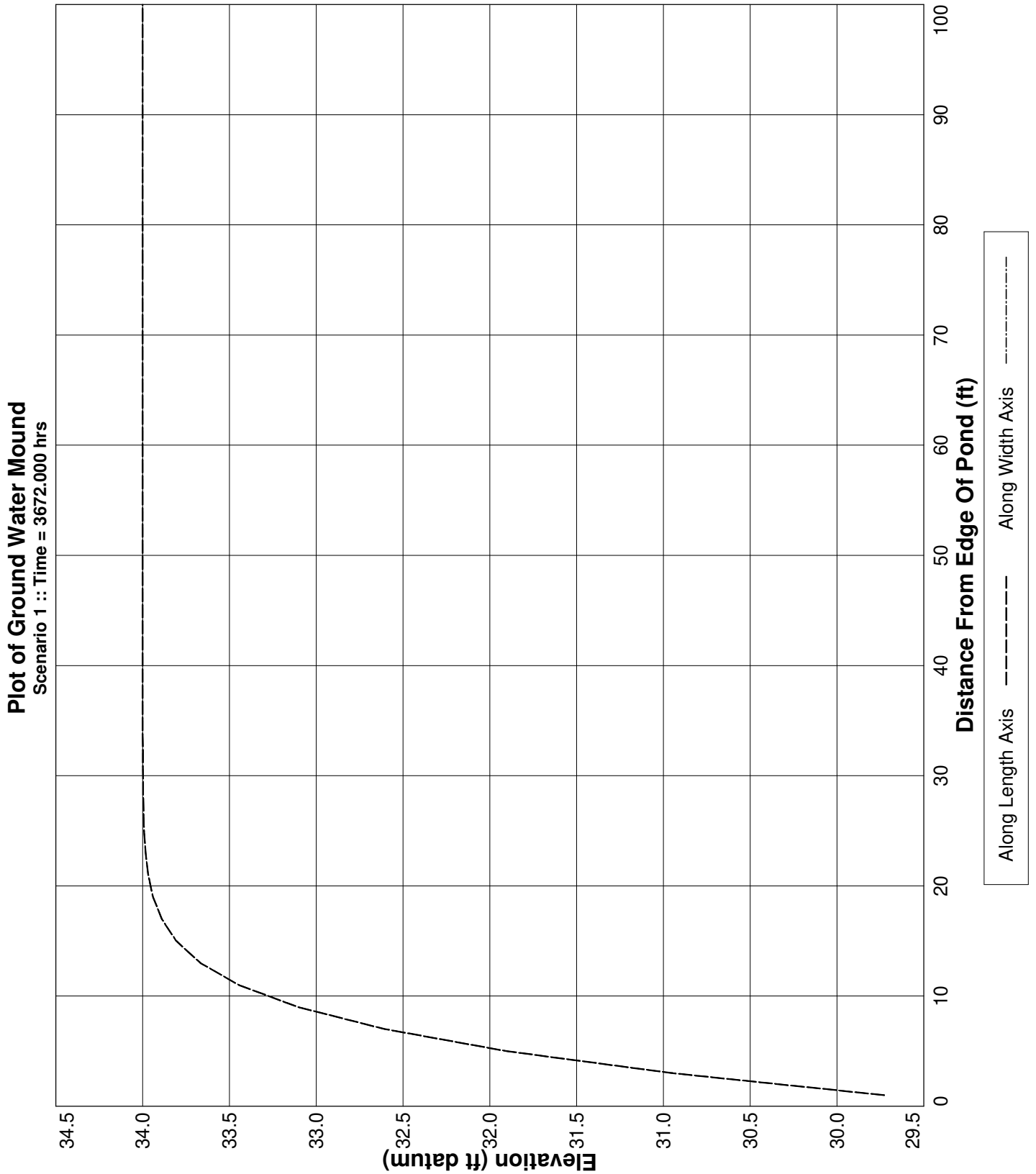
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0013	0.00163	33.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0013	0.00163	29.00000	-39.50375	6.176743E-02	1740.200	-104401100.0	1.044725E+08	S
734.400	0.0013	0.00163	29.00000	-0.01564	2.172346E-03	3480.400	-104441600.0	1.045148E+08	S
1101.600	0.0013	0.00163	29.00000	-0.00048	1.704339E-03	5220.600	-104442400.0	1.045173E+08	S
1468.800	0.0013	0.00163	29.00000	-0.00031	1.610873E-03	6960.800	-104442900.0	1.045195E+08	S
1836.000	0.0013	0.00163	29.00000	-0.00026	1.575546E-03	8701.000	-104443200.0	1.045216E+08	S
2203.200	0.0013	0.00163	29.00000	-0.00024	1.556129E-03	10441.200	-104443600.0	1.045237E+08	S
2570.400	0.0013	0.00163	29.00000	-0.00023	1.543547E-03	12181.400	-104443900.0	1.045257E+08	S
2937.600	0.0013	0.00163	29.00000	-0.00022	1.534749E-03	13921.600	-104444200.0	1.045278E+08	S
3304.800	0.0013	0.00163	29.00000	-0.00021	1.528332E-03	15661.800	-104444400.0	1.045298E+08	S
3672.000	0.0013	0.00163	29.00000	----	----	17402.000	-104444700.0	1.045318E+08	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.4, East Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-29-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 10.00  
Water Table Elevation, [WT] (ft datum): 32.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.10  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 226.0  
Equivalent Pond Width, [W] (ft): 77.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
15.00	435.6
29.00	17424.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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---

**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	31.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/29/2023 10:55:59

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

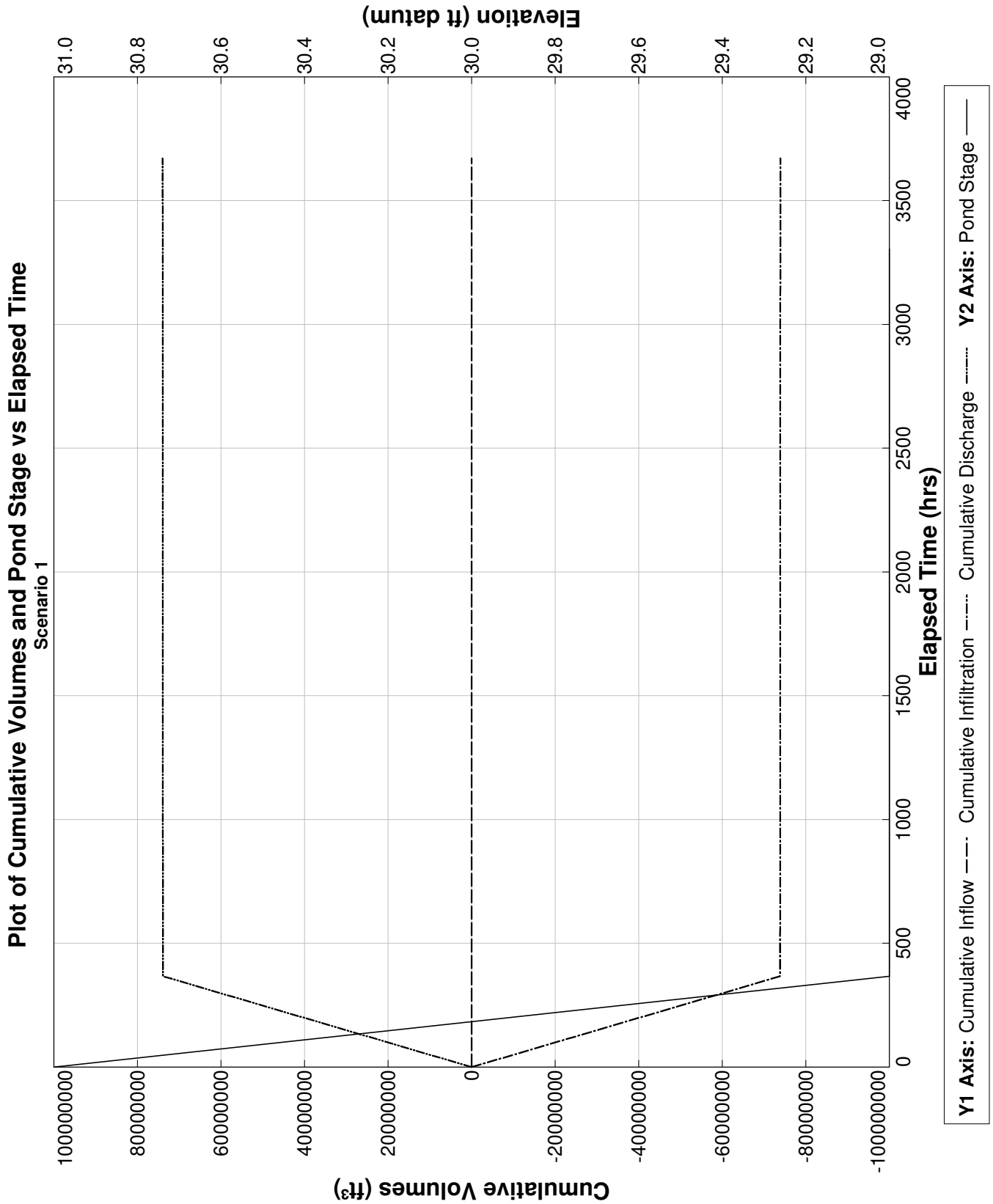
Baseflow hydrograph: Initial GWT (seasonal low) is 31.0 ft.

End Scenario 1 3/29/2023 10:55:59

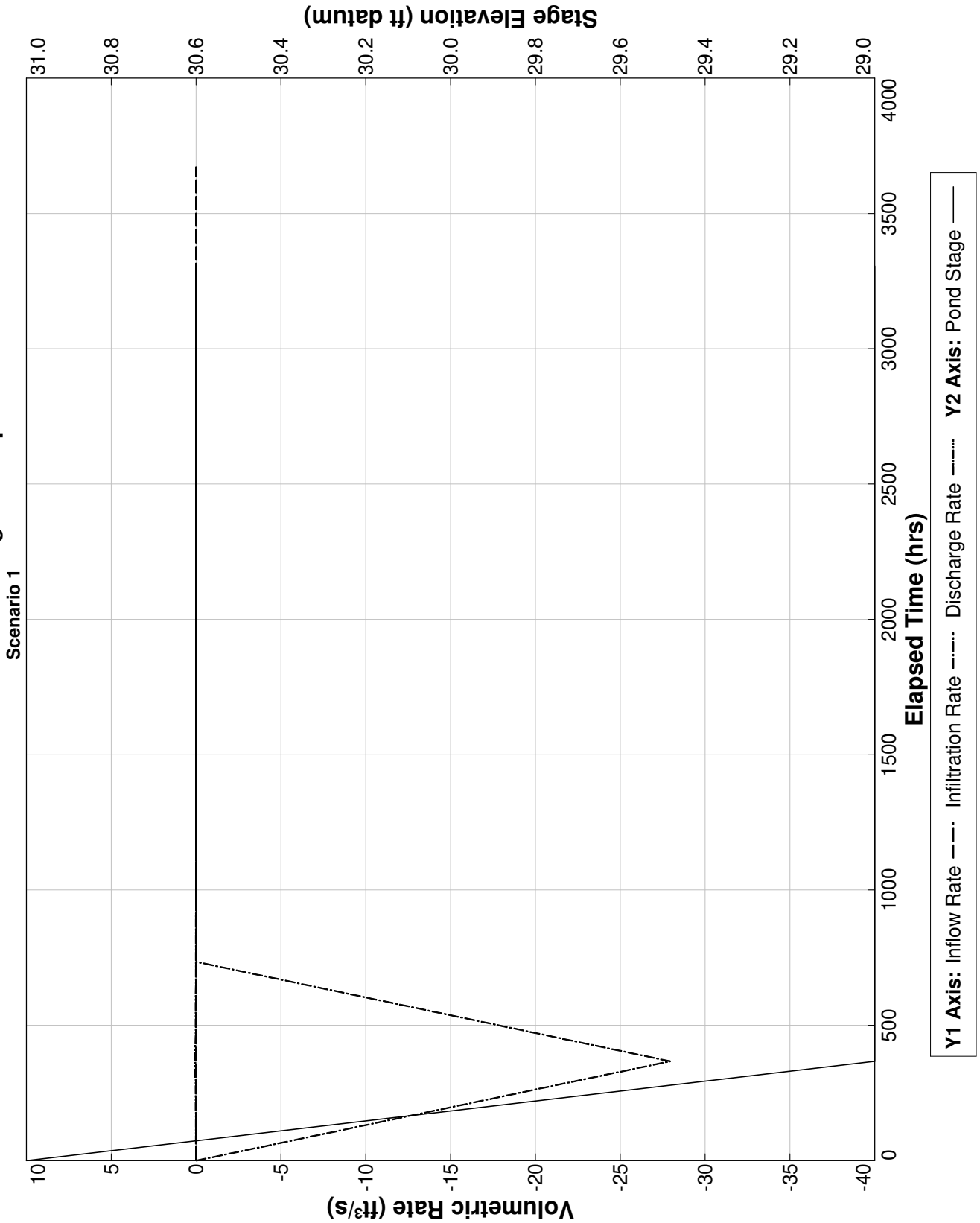
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**Detailed Results**    :: Scenario 1 ::

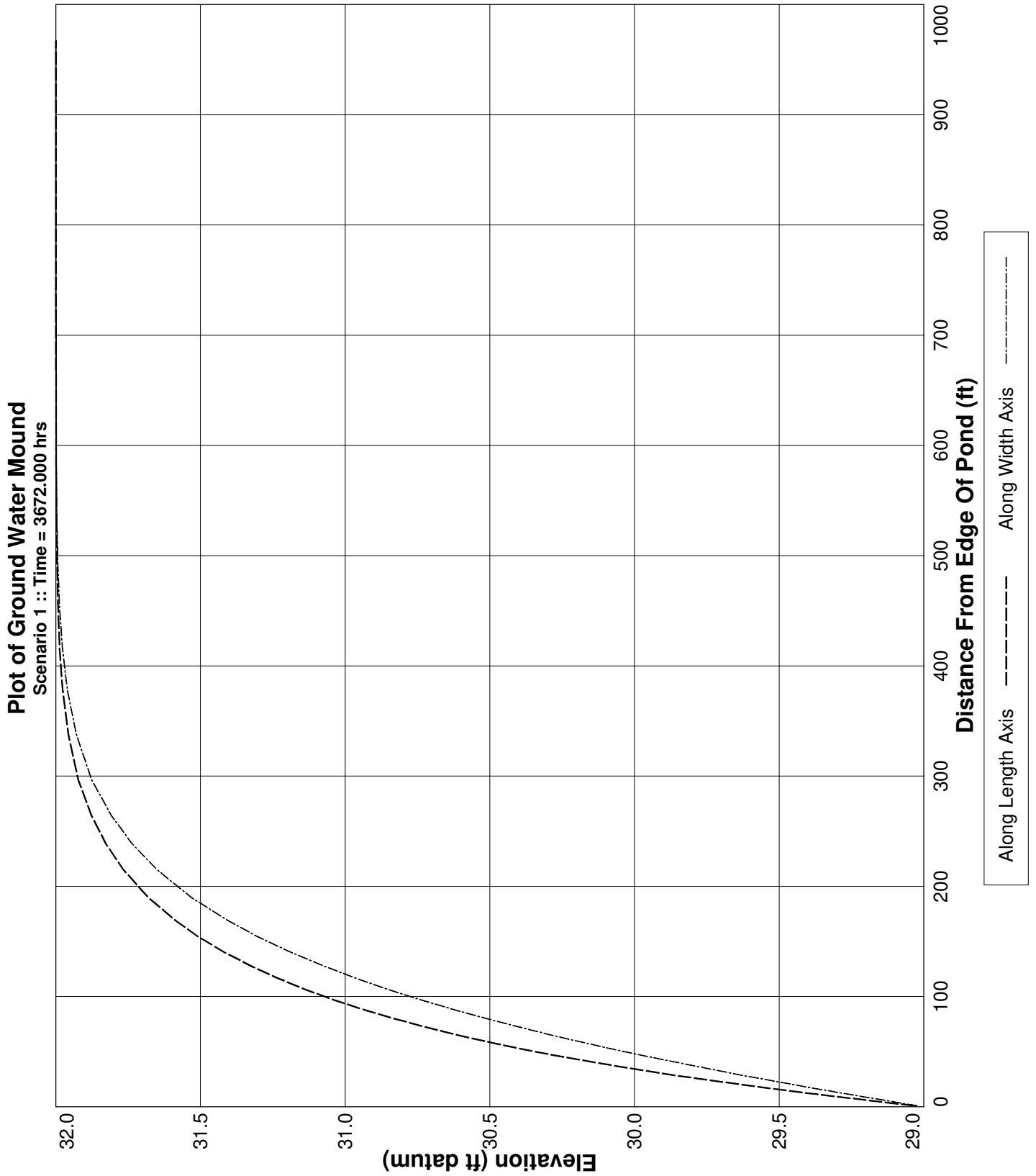
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0013	0.00163	31.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0013	0.00163	29.00000	-27.93756	3.869143E-02	1740.200	-73833340.0	7.386992E+07	S
734.400	0.0013	0.00163	29.00000	-0.01410	7.985432E-03	3480.400	-73862450.0	7.390078E+07	S
1101.600	0.0013	0.00163	29.00000	-0.00582	6.991711E-03	5220.600	-73870610.0	7.391067E+07	S
1468.800	0.0013	0.00163	29.00000	-0.00529	6.55897E-03	6960.800	-73877820.0	7.391963E+07	S
1836.000	0.0013	0.00163	29.00000	-0.00501	6.296993E-03	8701.000	-73884580.0	7.392813E+07	S
2203.200	0.0013	0.00163	29.00000	-0.00485	6.150014E-03	10441.200	-73891060.0	7.393635E+07	S
2570.400	0.0013	0.00163	29.00000	-0.00478	6.081242E-03	12181.400	-73897410.0	7.394444E+07	S
2937.600	0.0013	0.00163	29.00000	-0.00475	6.059277E-03	13921.600	-73903700.0	7.395246E+07	S
3304.800	0.0013	0.00163	29.00000	-0.00476	6.070987E-03	15661.800	-73909970.0	7.396048E+07	S
3672.000	0.0013	0.00163	29.00000	----	----	17402.000	-73916280.0	7.396853E+07	N.A.



Plot of Flow Rates and Pond Stage vs Elapsed Time







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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.4, East Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-29-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 10.00  
Water Table Elevation, [WT] (ft datum): 32.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.00  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 226.0  
Equivalent Pond Width, [W] (ft): 77.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
15.00	435.6
29.00	17424.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	31.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/29/2023 11:3:38

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 31.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 9 of 10 saturated stress periods.

Maximum calculated water budget error is -6.81537894075264 percent, for saturated stress period 1.

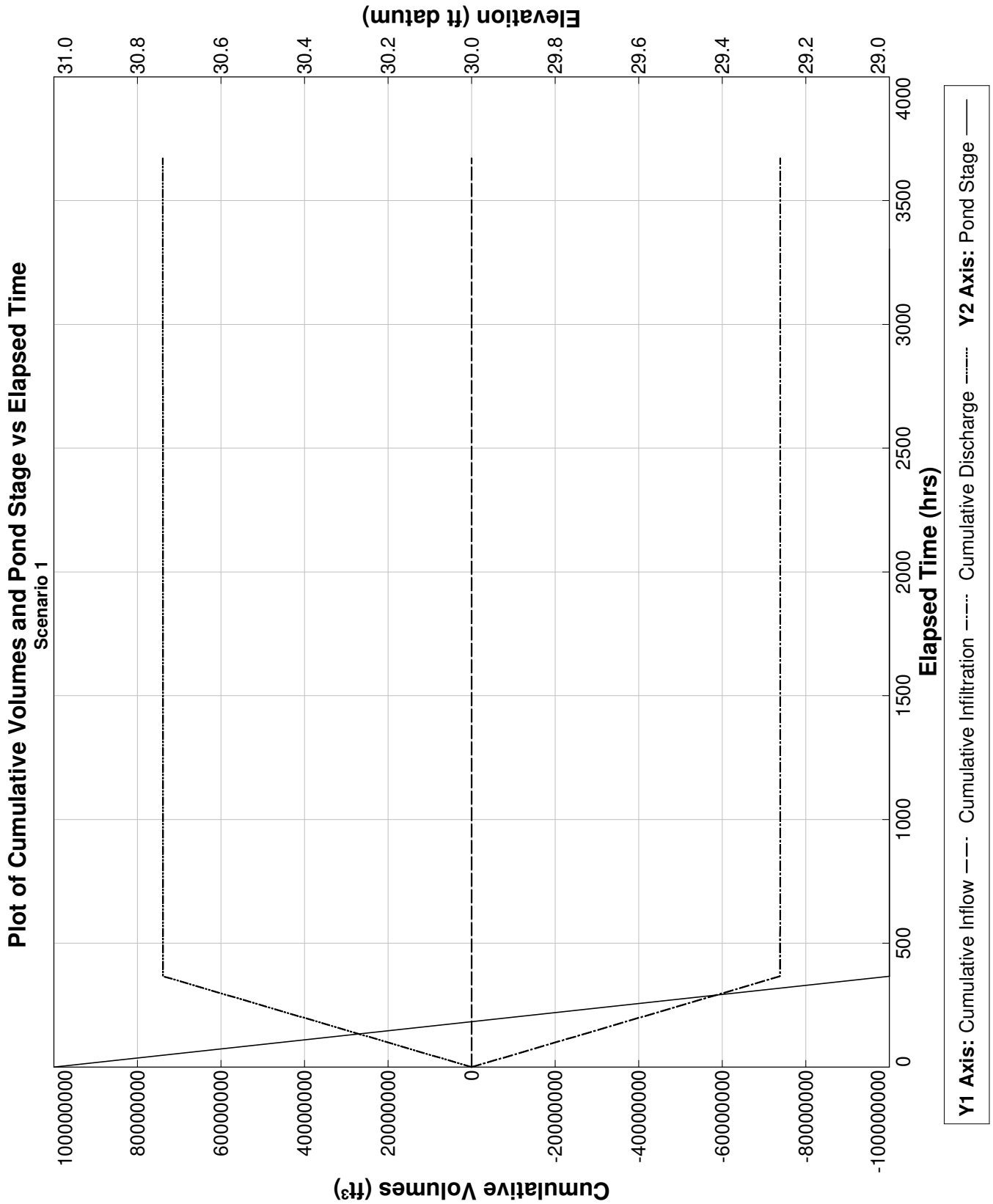
If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

End Scenario 1 3/29/2023 11:3:38

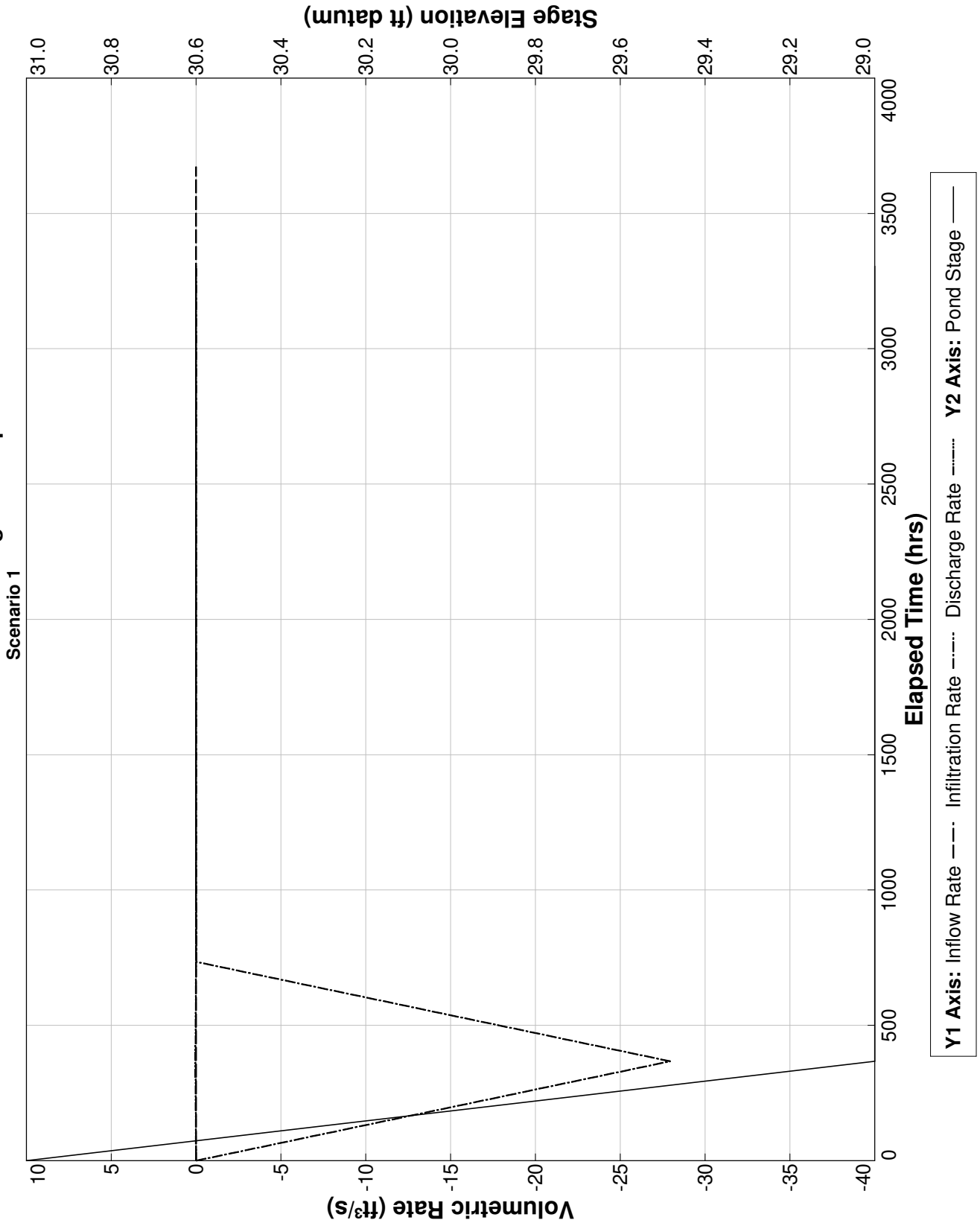
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**Detailed Results**    :: Scenario 1 ::

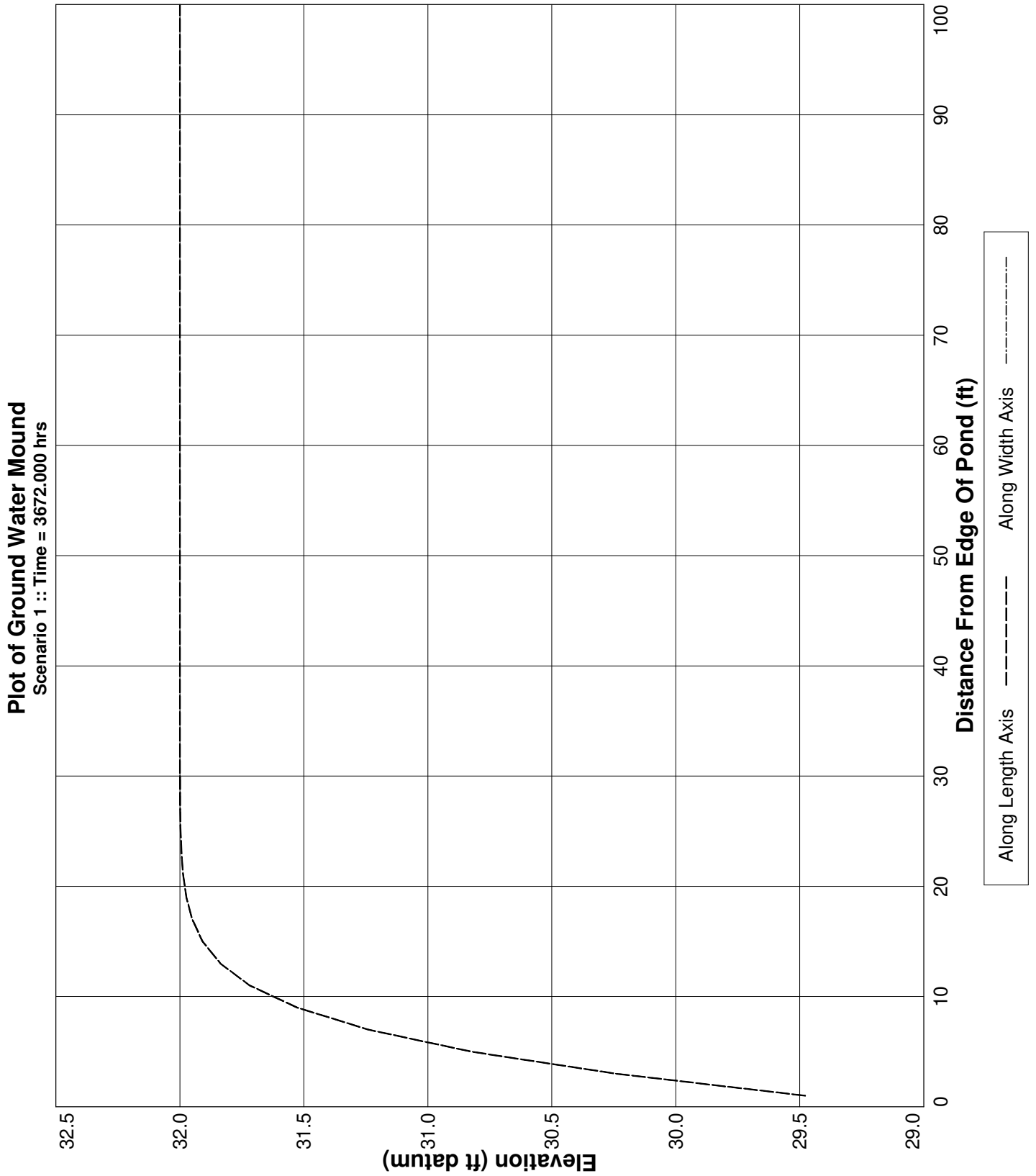
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0013	0.00163	31.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0013	0.00163	29.00000	-27.93484	3.608018E-02	1740.200	-73831610.0	7.38682E+07	S
734.400	0.0013	0.00163	29.00000	-0.00925	2.295132E-03	3480.400	-73855230.0	7.389356E+07	S
1101.600	0.0013	0.00163	29.00000	-0.00042	1.580494E-03	5220.600	-73856060.0	7.389612E+07	S
1468.800	0.0013	0.00163	29.00000	-0.00019	1.487857E-03	6960.800	-73856340.0	7.389815E+07	S
1836.000	0.0013	0.00163	29.00000	-0.00015	1.466433E-03	8701.000	-73856550.0	7.39001E+07	S
2203.200	0.0013	0.00163	29.00000	-0.00014	1.458238E-03	10441.200	-73856740.0	7.390204E+07	S
2570.400	0.0013	0.00163	29.00000	-0.00014	1.454018E-03	12181.400	-73856940.0	7.390396E+07	S
2937.600	0.0013	0.00163	29.00000	-0.00014	1.451641E-03	13921.600	-73857110.0	7.390588E+07	S
3304.800	0.0013	0.00163	29.00000	-0.00013	1.450335E-03	15661.800	-73857290.0	7.39078E+07	S
3672.000	0.0013	0.00163	29.00000	----	----	17402.000	-73857460.0	7.390972E+07	N.A.



Plot of Flow Rates and Pond Stage vs Elapsed Time







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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.5, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 10.00  
Water Table Elevation, [WT] (ft datum): 29.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.59  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 214.0  
Equivalent Pond Width, [W] (ft): 69.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
15.00	435.6
29.00	14810.4

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	28.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 11:15:54

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

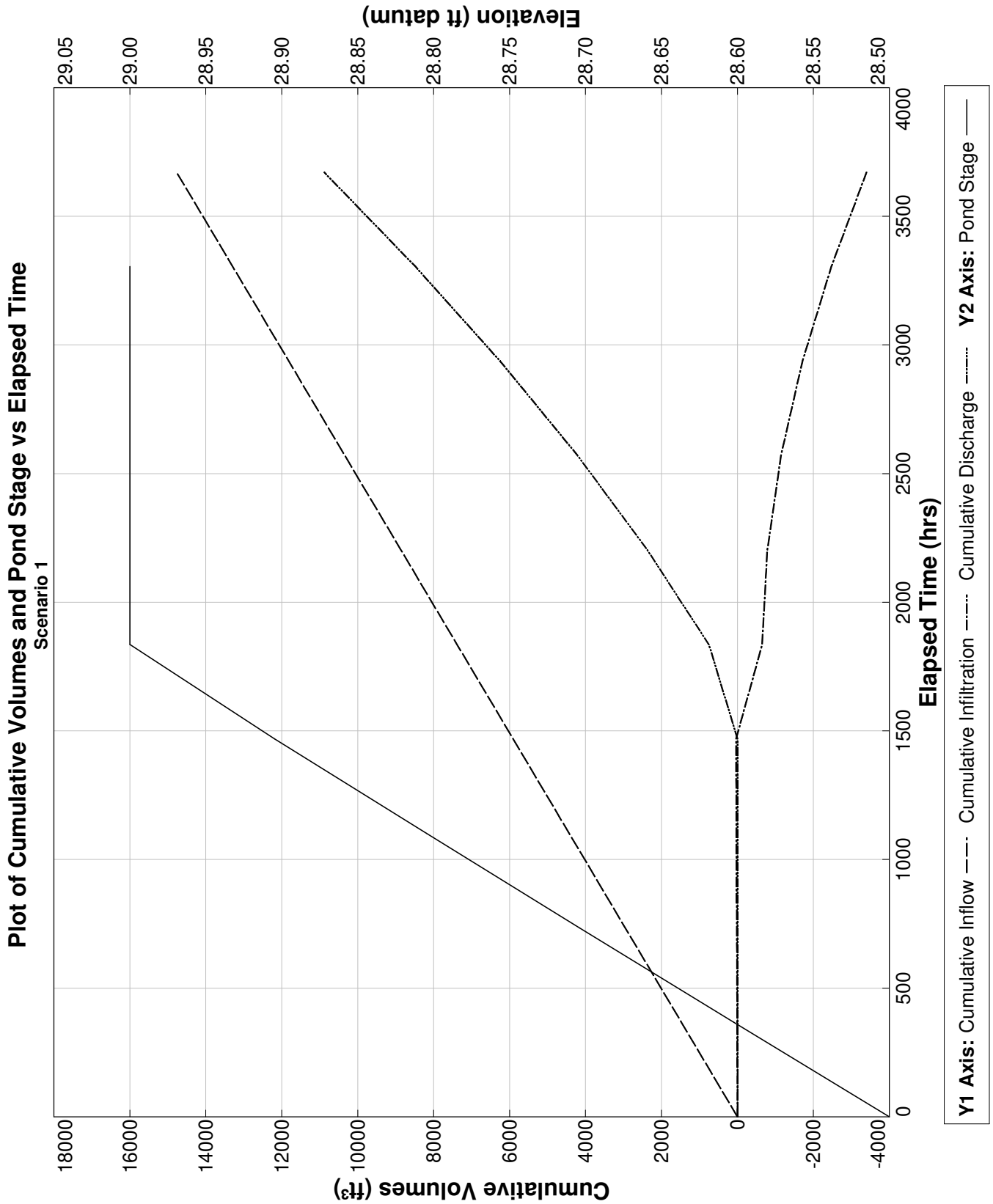
Baseflow hydrograph: Initial GWT (seasonal low) is 28.5 ft.

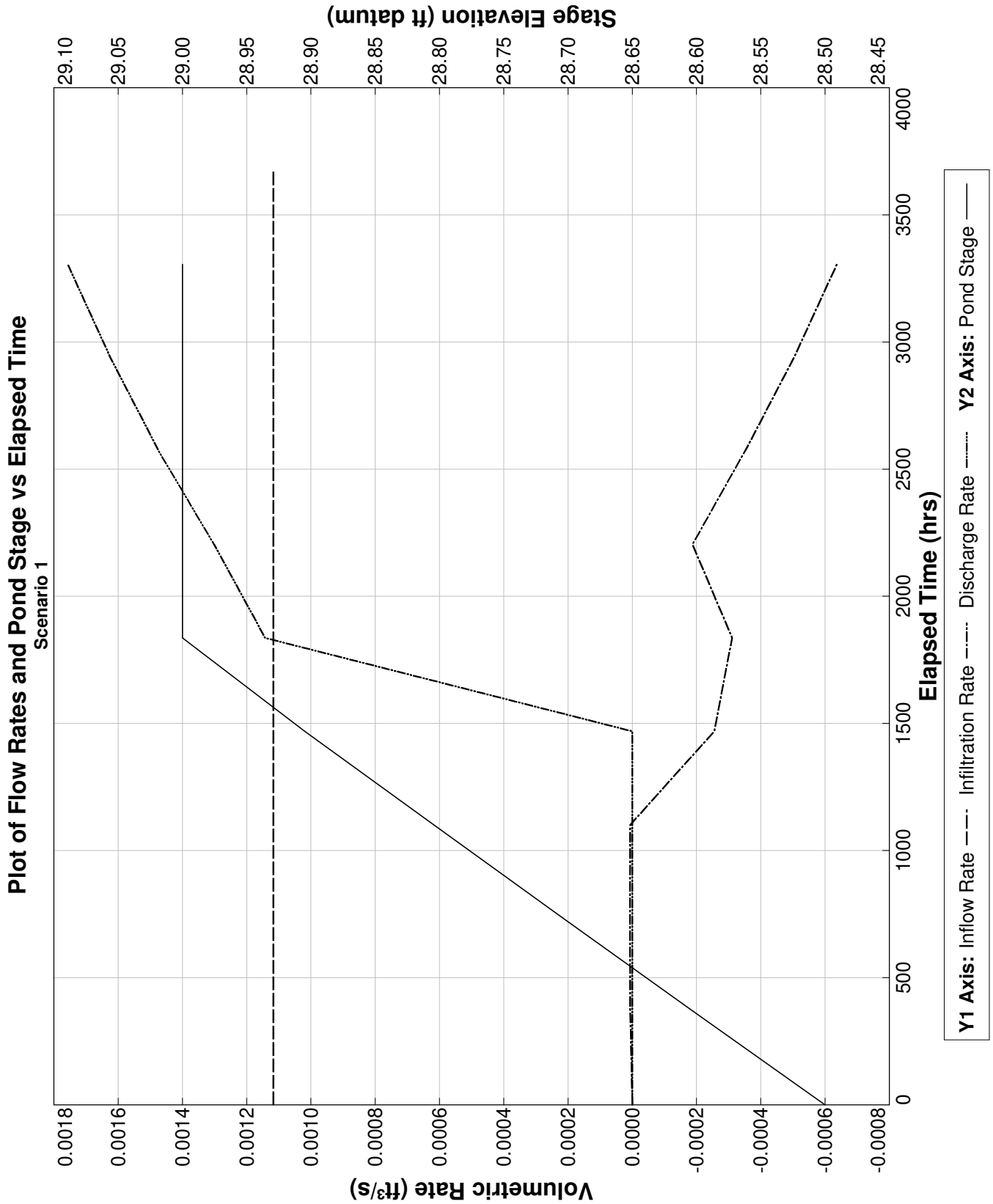
End Scenario 1 3/31/2023 11:15:54

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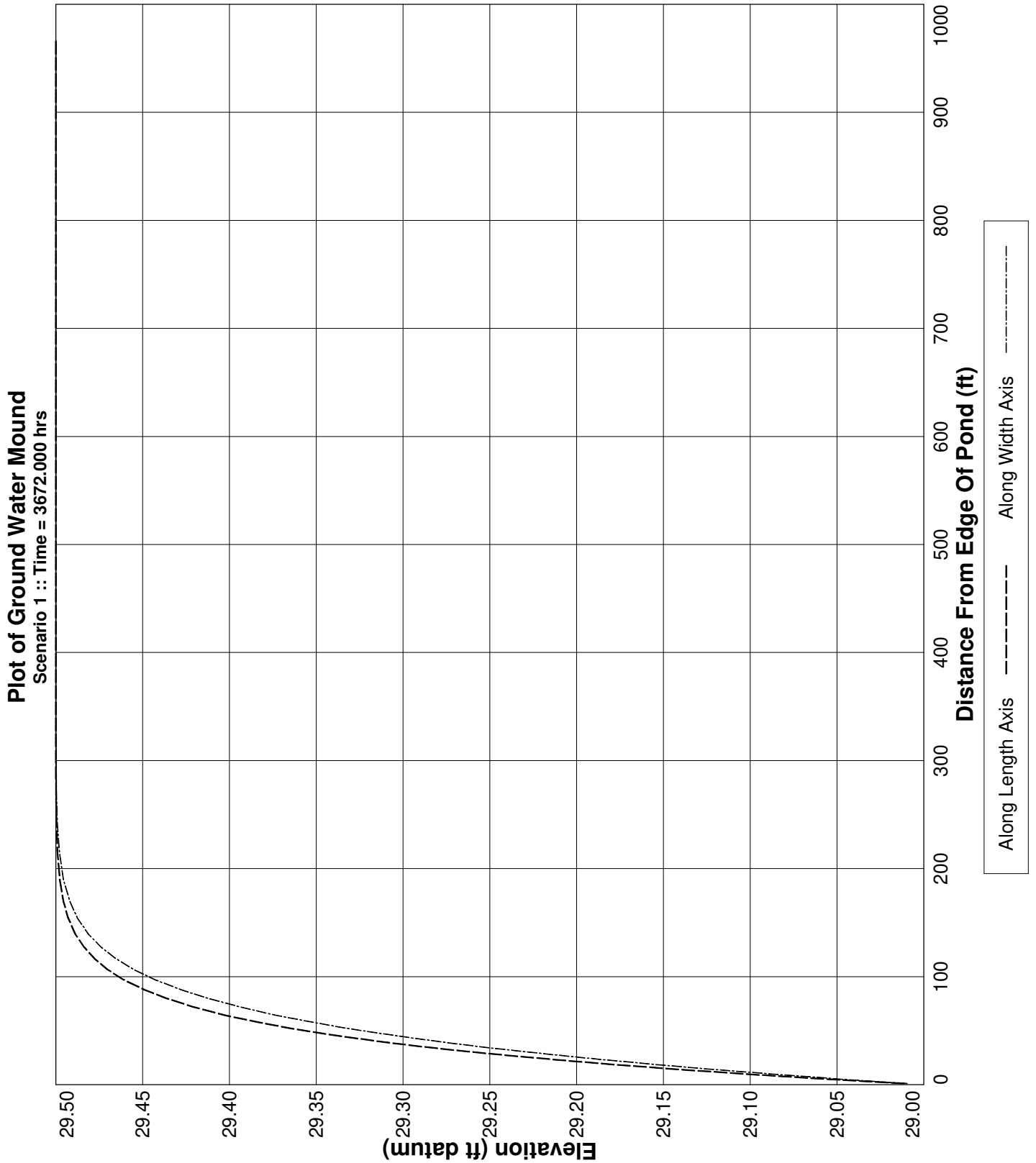
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0011	0.00163	28.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0011	0.00163	28.60239	0.00001	0	1476.600	7.3	0	S
734.400	0.0011	0.00163	28.70389	0.00001	0	2953.200	16.9	0	S
1101.600	0.0011	0.00163	28.80467	0.00001	0	4429.800	26.3	0	S
1468.800	0.0011	0.00163	28.90483	-0.00026	0	5906.400	34.4	0	S
1836.000	0.0011	0.00163	29.00000	-0.00031	1.142538E-03	7383.000	-649.0	755.1716	S
2203.200	0.0011	0.00163	29.00000	-0.00019	1.301027E-03	8859.600	-787.5	2370.27	S
2570.400	0.0011	0.00163	29.00000	-0.00035	1.473406E-03	10336.200	-1144.7	4204.06	S
2937.600	0.0011	0.00163	29.00000	-0.00050	1.62381E-03	11812.800	-1715.2	6251.195	S
3304.800	0.0011	0.00163	29.00000	-0.00064	1.757139E-03	13289.400	-2473.3	8485.867	S
3672.000	0.0011	0.00163	29.00000	----	----	14766.000	-3398.8	10887.9	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 6, North Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-29-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 7.00  
Water Table Elevation, [WT] (ft datum): 32.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.59  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 504.0  
Equivalent Pond Width, [W] (ft): 122.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
12.00	1306.8
29.00	61419.6

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	31.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/29/2023 11:32:41

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

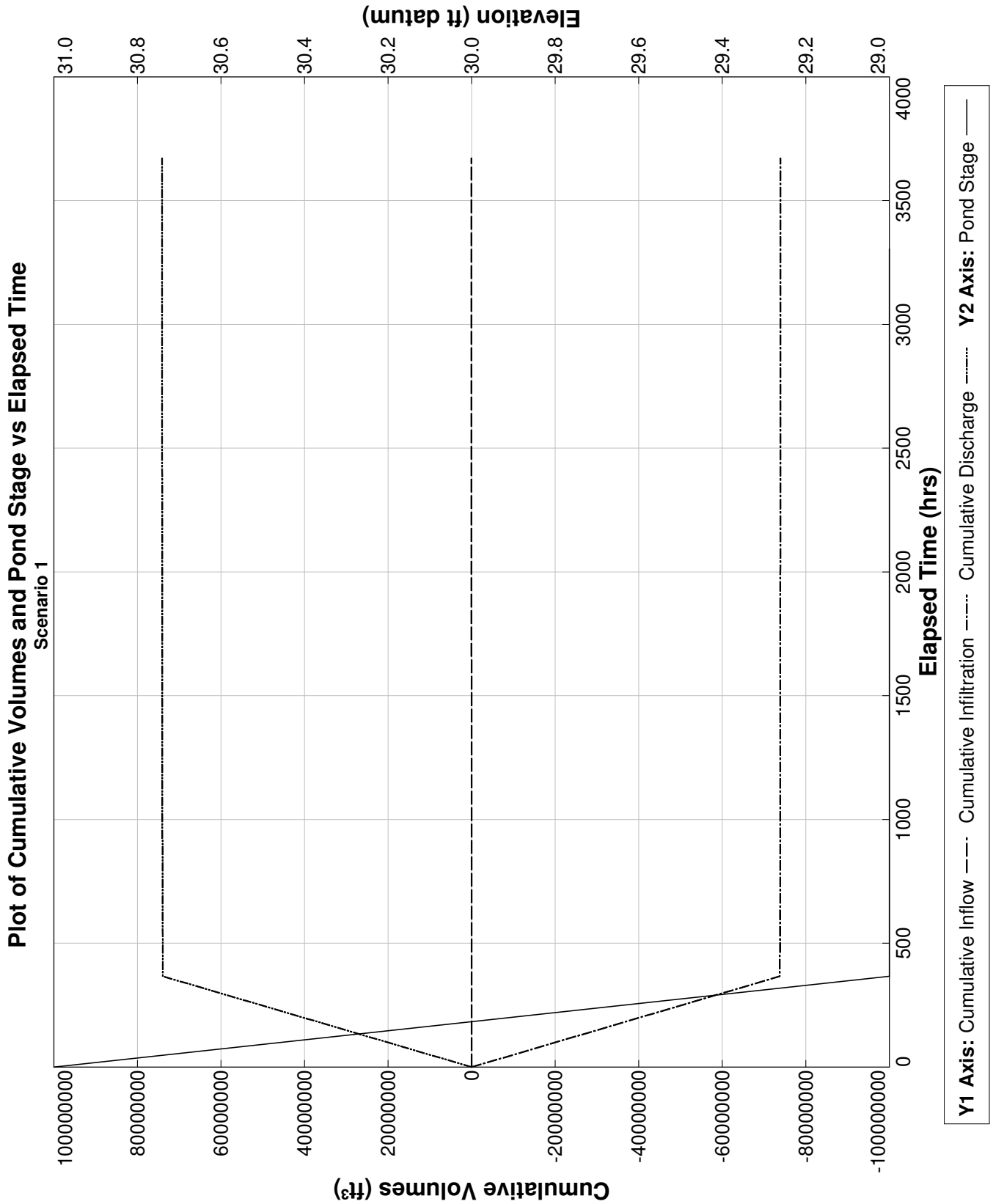
Baseflow hydrograph: Initial GWT (seasonal low) is 31.0 ft.

End Scenario 1 3/29/2023 11:32:41

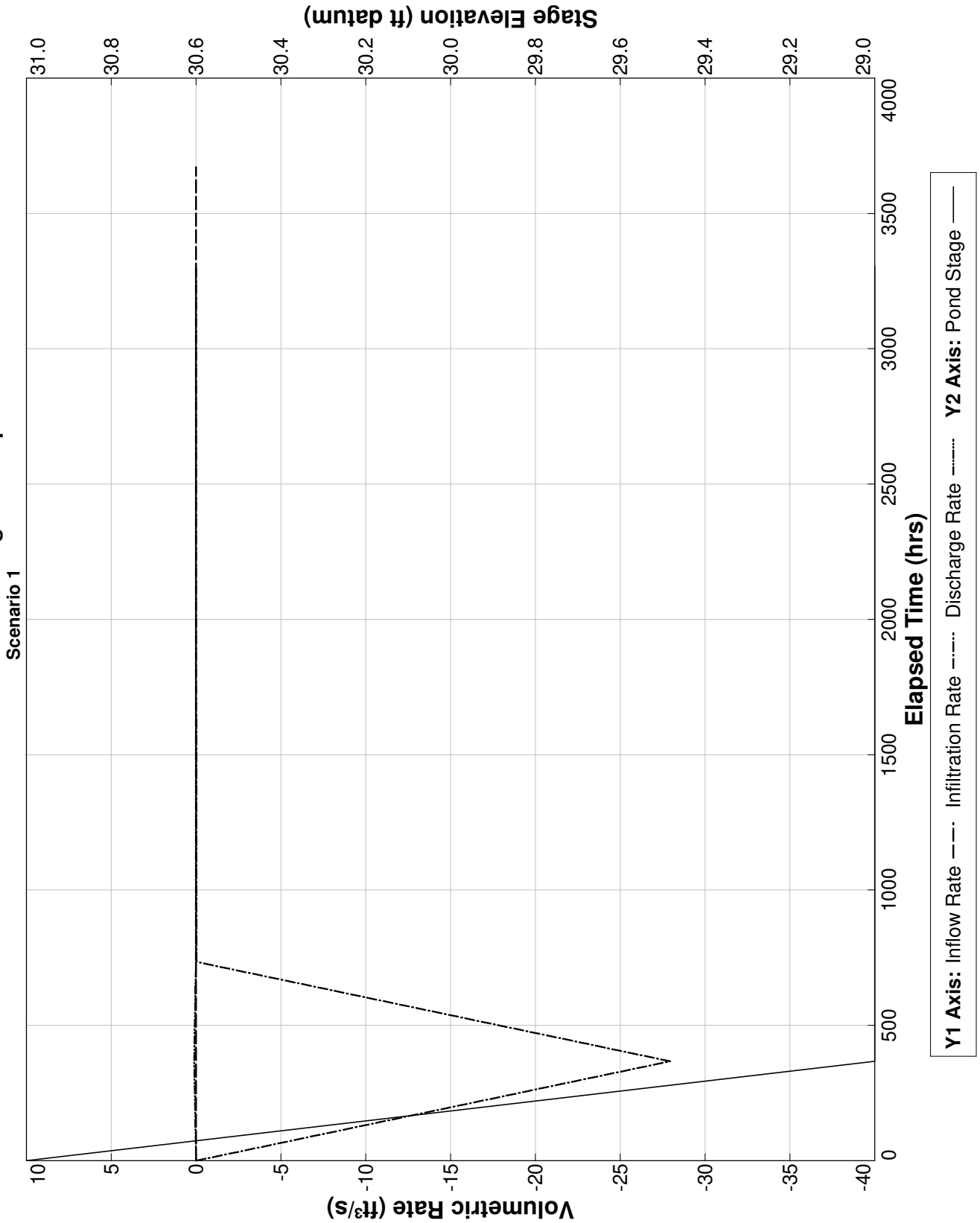
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**Detailed Results**    :: Scenario 1 ::

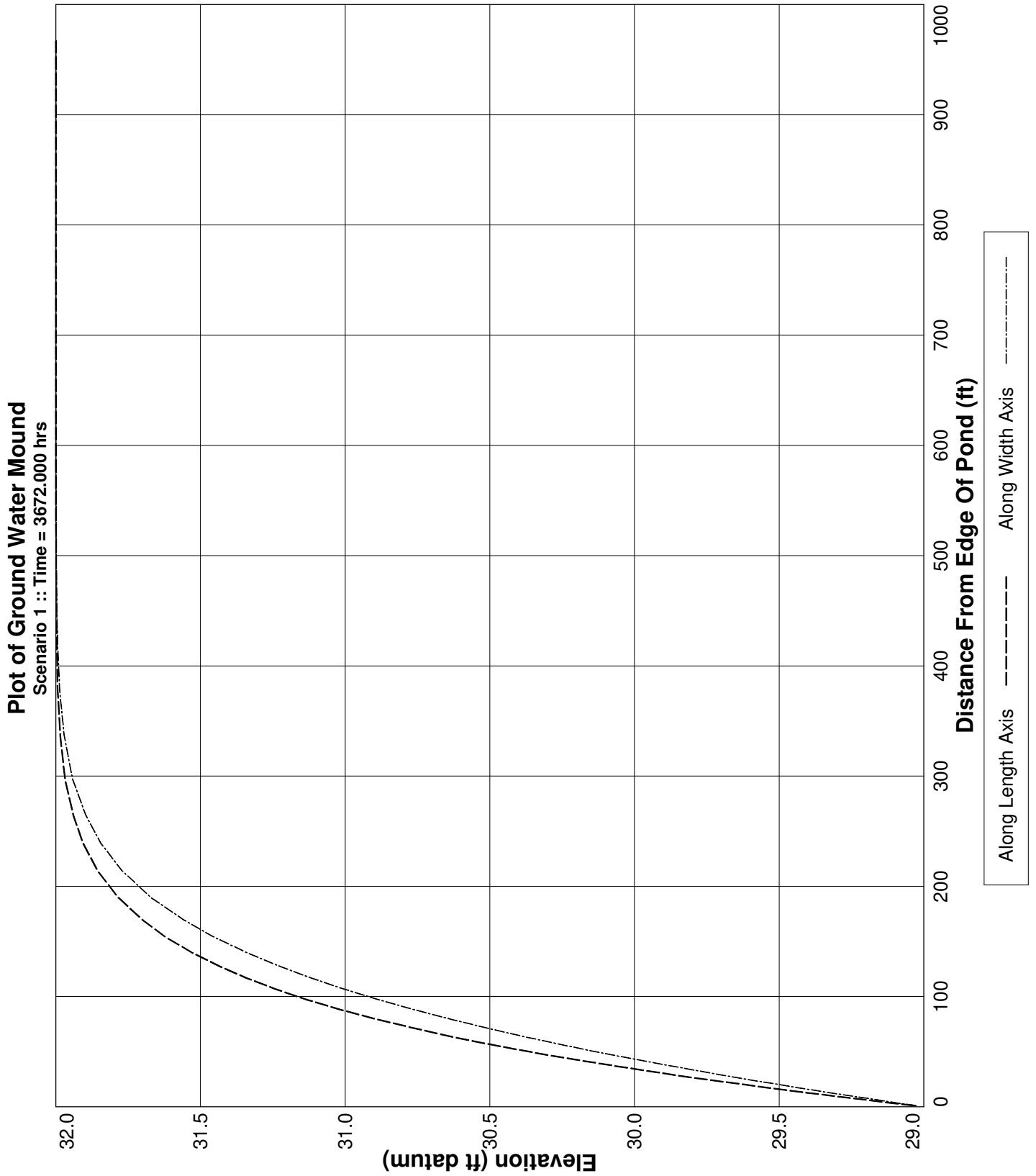
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0047	0.00163	31.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0047	0.00163	29.00000	-27.93980	.1133875	6148.800	-73790300.0	7.39193E+07	S
734.400	0.0047	0.00163	29.00000	-0.03376	1.400146E-02	12297.600	-73868350.0	7.40035E+07	S
1101.600	0.0047	0.00163	29.00000	-0.00788	.0122392	18446.400	-73879550.0	7.402084E+07	S
1468.800	0.0047	0.00163	29.00000	-0.00703	1.163748E-02	24595.200	-73889180.0	7.403662E+07	S
1836.000	0.0047	0.00163	29.00000	-0.00661	1.122375E-02	30744.000	-73898140.0	7.405173E+07	S
2203.200	0.0047	0.00163	29.00000	-0.00634	1.095871E-02	36892.800	-73906660.0	7.406639E+07	S
2570.400	0.0047	0.00163	29.00000	-0.00617	1.080731E-02	43041.600	-73914900.0	7.408078E+07	S
2937.600	0.0047	0.00163	29.00000	-0.00608	1.072181E-02	49190.400	-73922980.0	7.409501E+07	S
3304.800	0.0047	0.00163	29.00000	-0.00605	1.069088E-02	55339.200	-73930980.0	7.410916E+07	S
3672.000	0.0047	0.00163	29.00000	----	----	61488.000	-73938970.0	7.412329E+07	N.A.



Plot of Flow Rates and Pond Stage vs Elapsed Time







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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 6, North Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-29-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 7.00  
Water Table Elevation, [WT] (ft datum): 32.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.00  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 504.0  
Equivalent Pond Width, [W] (ft): 122.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
12.00	1306.8
29.00	61419.6

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	31.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/29/2023 11:33:26

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 31.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 6 of 10 saturated stress periods.

Maximum calculated water budget error is -2.70636823601526 percent, for saturated stress period 1.

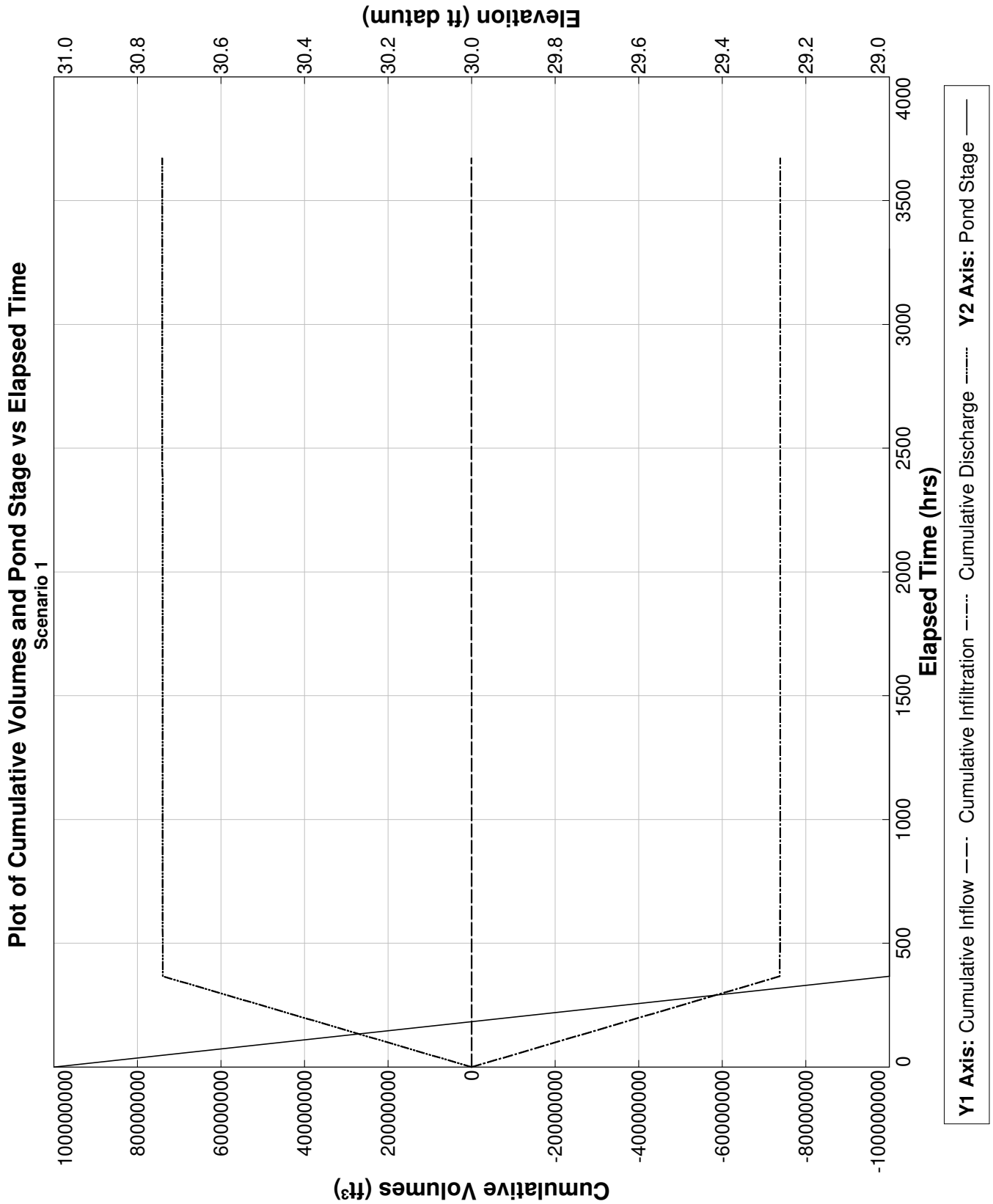
If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

End Scenario 1 3/29/2023 11:33:26

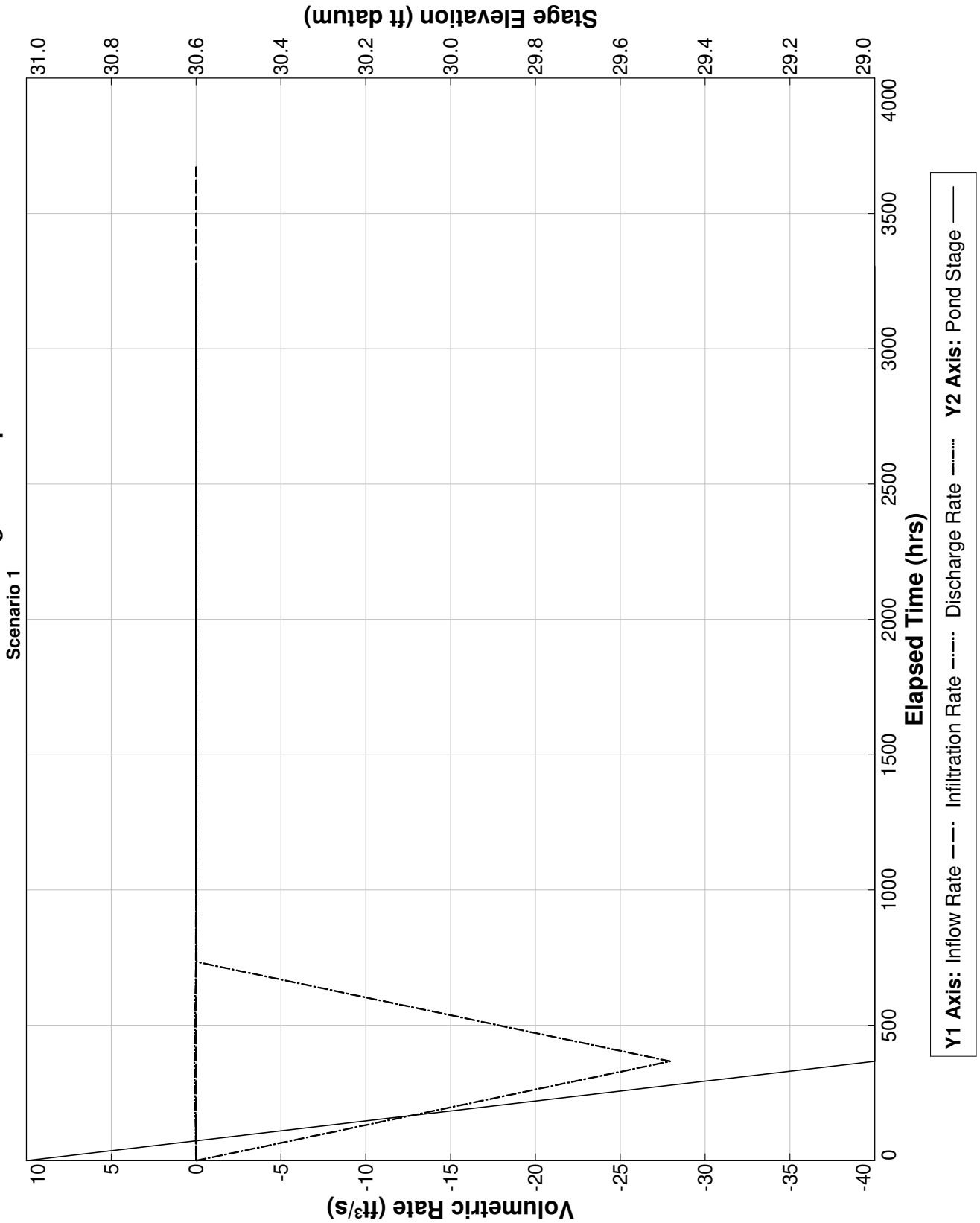
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**Detailed Results** :: Scenario 1 ::

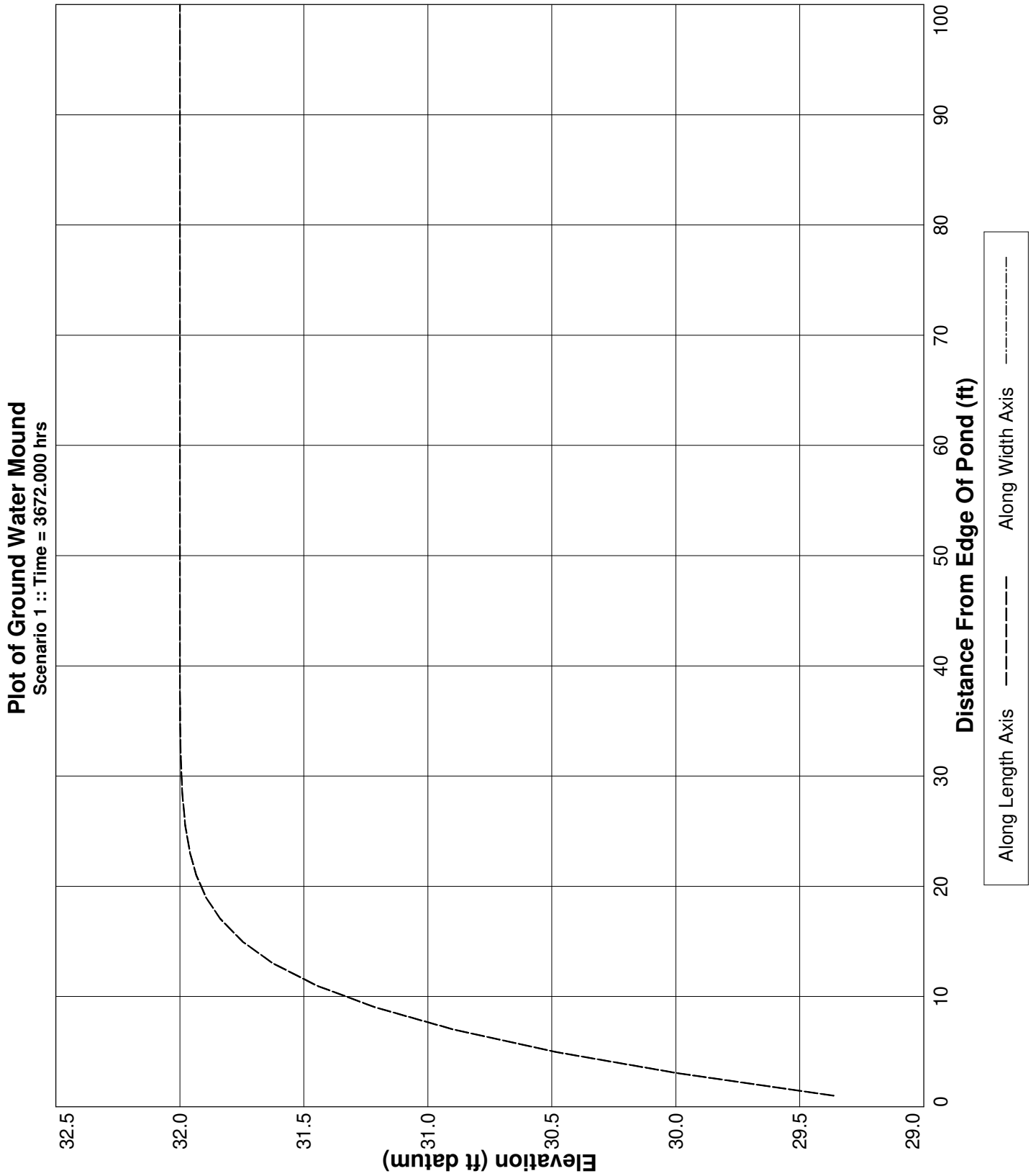
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0047	0.00163	31.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0047	0.00163	29.00000	-27.93346	.1039053	6148.800	-73784040.0	7.391302E+07	S
734.400	0.0047	0.00163	29.00000	-0.02649	7.620911E-03	12297.600	-73851600.0	7.398674E+07	S
1101.600	0.0047	0.00163	29.00000	-0.00124	5.412865E-03	18446.400	-73854070.0	7.399535E+07	S
1468.800	0.0047	0.00163	29.00000	-0.00053	5.119665E-03	24595.200	-73854880.0	7.400232E+07	S
1836.000	0.0047	0.00163	29.00000	-0.00041	5.055074E-03	30744.000	-73855460.0	7.400904E+07	S
2203.200	0.0047	0.00163	29.00000	-0.00038	5.032456E-03	36892.800	-73855980.0	7.401571E+07	S
2570.400	0.0047	0.00163	29.00000	-0.00037	5.021273E-03	43041.600	-73856470.0	7.402235E+07	S
2937.600	0.0047	0.00163	29.00000	-0.00036	5.014987E-03	49190.400	-73856960.0	7.402899E+07	S
3304.800	0.0047	0.00163	29.00000	-0.00036	5.011509E-03	55339.200	-73857440.0	7.403562E+07	S
3672.000	0.0047	0.00163	29.00000	----	----	61488.000	-73857910.0	7.404224E+07	N.A.



Plot of Flow Rates and Pond Stage vs Elapsed Time







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**Retention Pond Recovery - Refined Method**  
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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 6, South Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-29-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 7.00  
Water Table Elevation, [WT] (ft datum): 33.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.59  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 504.0  
Equivalent Pond Width, [W] (ft): 122.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
12.00	1306.8
29.00	61419.6

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	32.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/29/2023 11:34:29

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

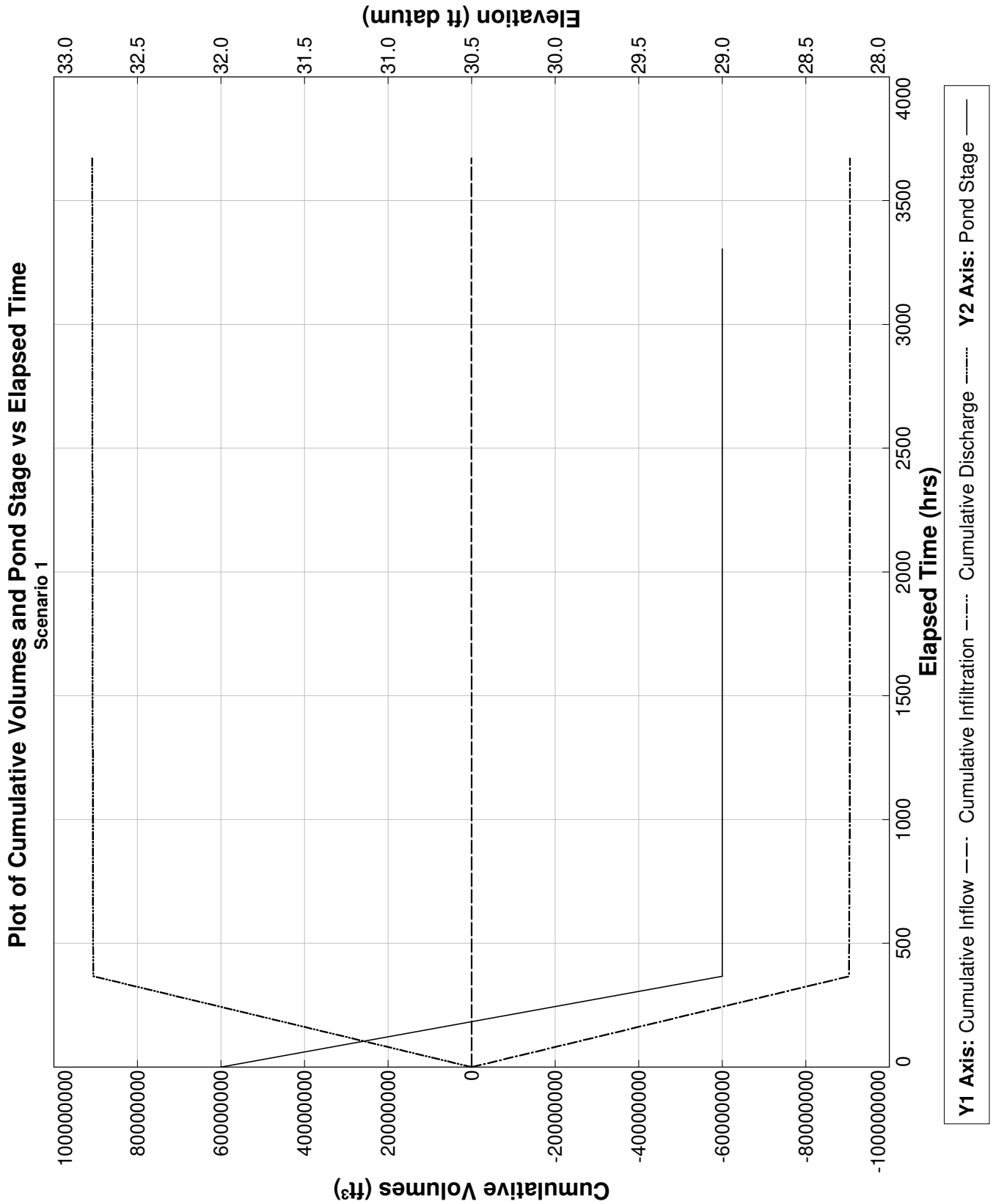
Baseflow hydrograph: Initial GWT (seasonal low) is 32.0 ft.

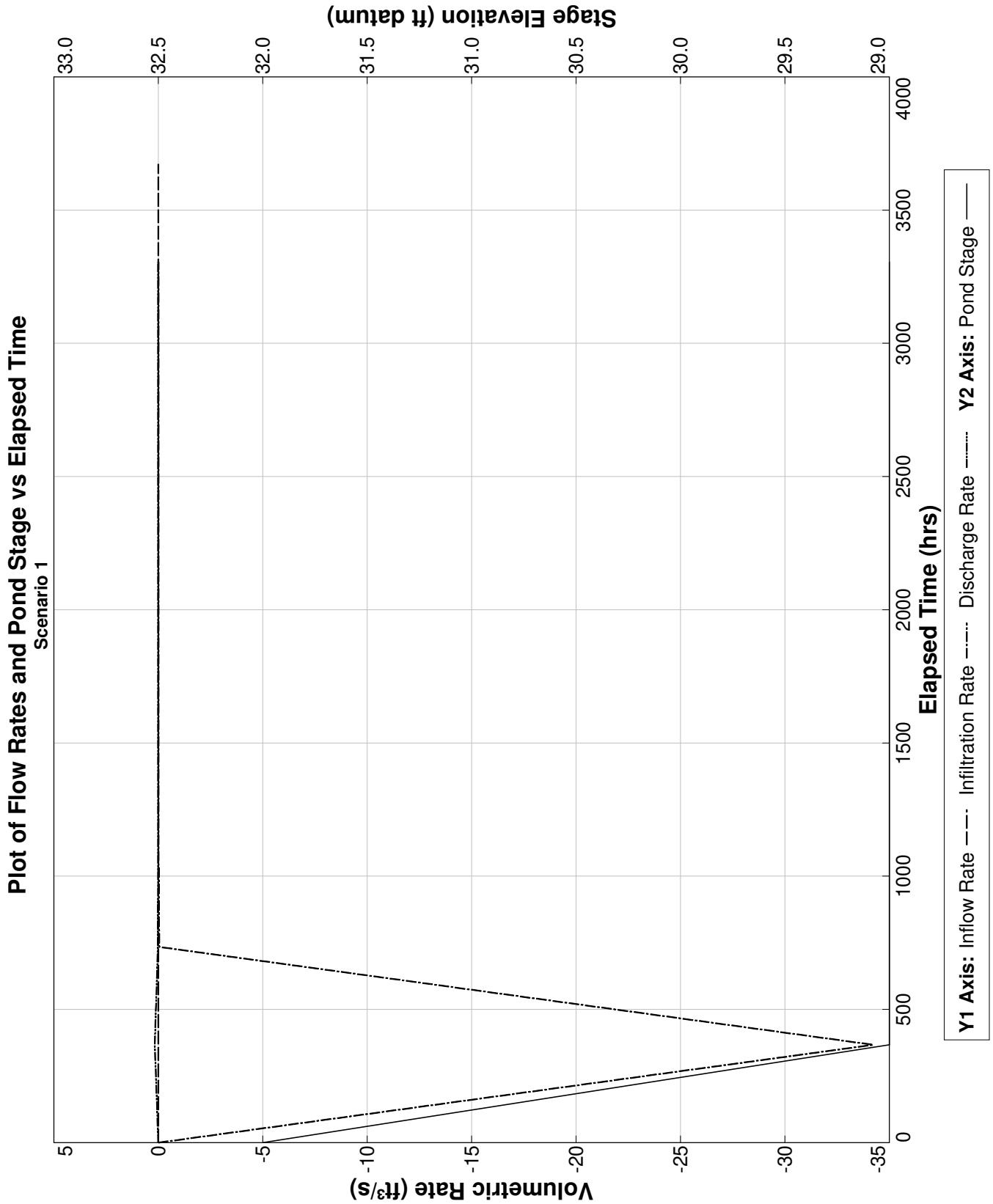
End Scenario 1 3/29/2023 11:34:29

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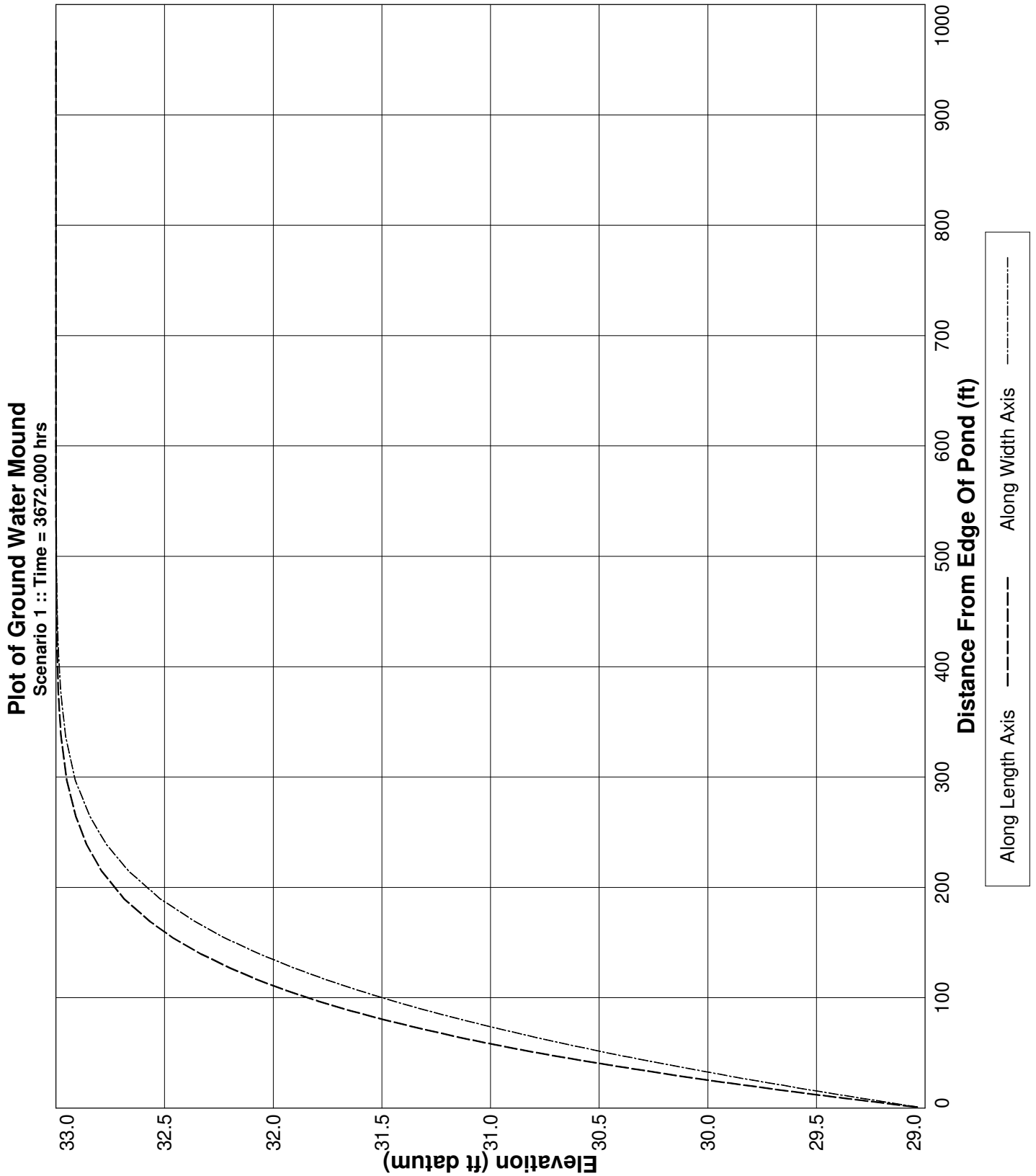
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0047	0.00163	32.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0047	0.00163	29.00001	-34.22164	.1670751	6148.800	-90360510.0	9.055092E+07	S
734.400	0.0047	0.00163	29.00000	-0.04985	1.778479E-02	12297.600	-90476540.0	9.06731E+07	S
1101.600	0.0047	0.00163	29.00000	-0.01104	1.537601E-02	18446.400	-90492310.0	9.069502E+07	S
1468.800	0.0047	0.00163	29.00000	-0.00972	1.423832E-02	24595.200	-90505740.0	9.071459E+07	S
1836.000	0.0047	0.00163	29.00000	-0.00903	1.364499E-02	30744.000	-90518020.0	9.073302E+07	S
2203.200	0.0047	0.00163	29.00000	-0.00859	1.320623E-02	36892.800	-90529620.0	9.075077E+07	S
2570.400	0.0047	0.00163	29.00000	-0.00827	1.289104E-02	43041.600	-90540720.0	9.076802E+07	S
2937.600	0.0047	0.00163	29.00000	-0.00805	.0126829	49190.400	-90551470.0	9.078493E+07	S
3304.800	0.0047	0.00163	29.00000	-0.00790	1.254019E-02	55339.200	-90562000.0	9.080159E+07	S
3672.000	0.0047	0.00163	29.00000	----	----	61488.000	-90572370.0	9.081812E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 6, South Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-29-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 7.00  
Water Table Elevation, [WT] (ft datum): 33.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.00  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 504.0  
Equivalent Pond Width, [W] (ft): 122.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
12.00	1306.8
29.00	61419.6

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	32.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/29/2023 11:36:55

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 32.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 5 of 10 saturated stress periods.

Maximum calculated water budget error is -1.90090188547680 percent, for saturated stress period 2.

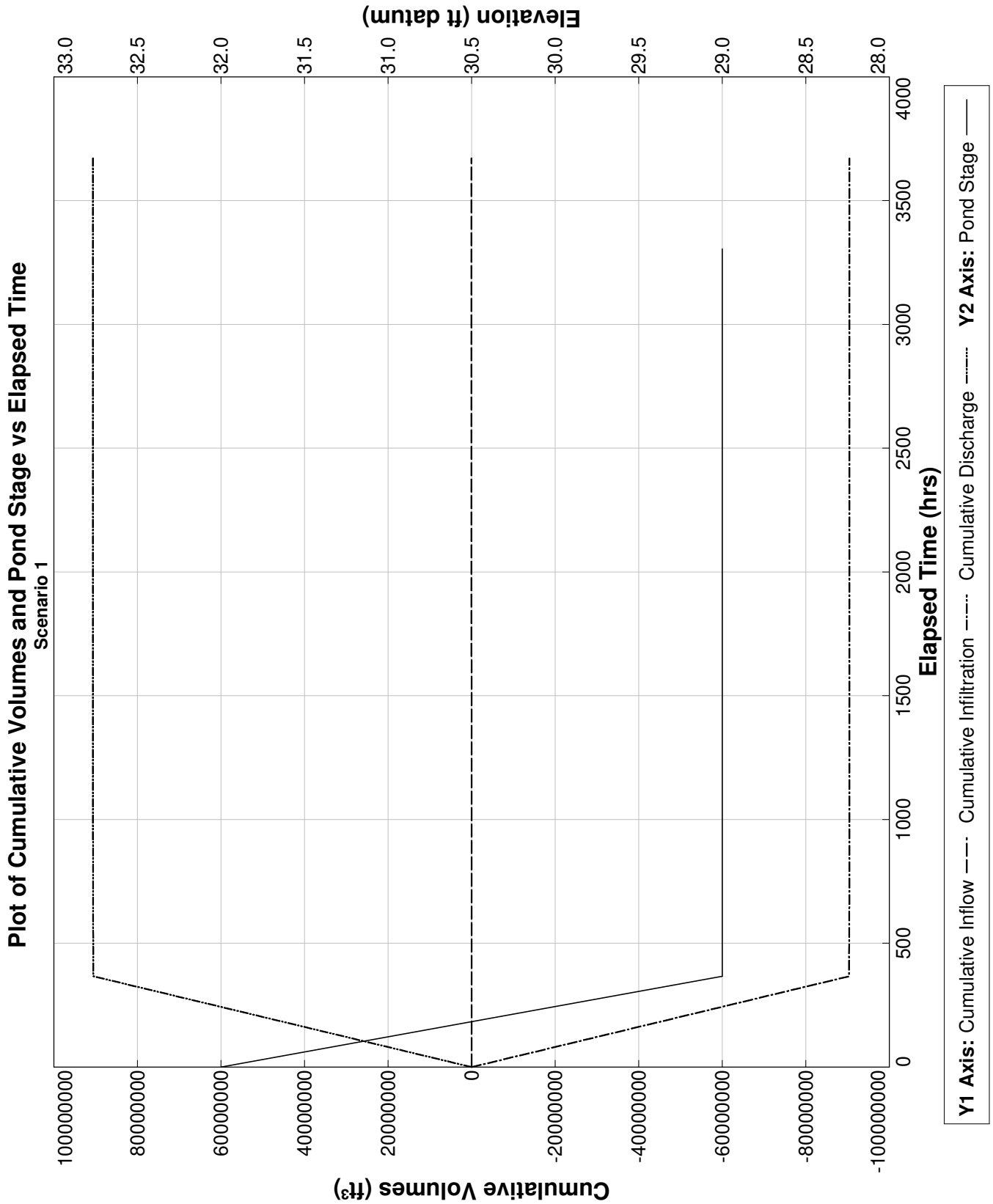
If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

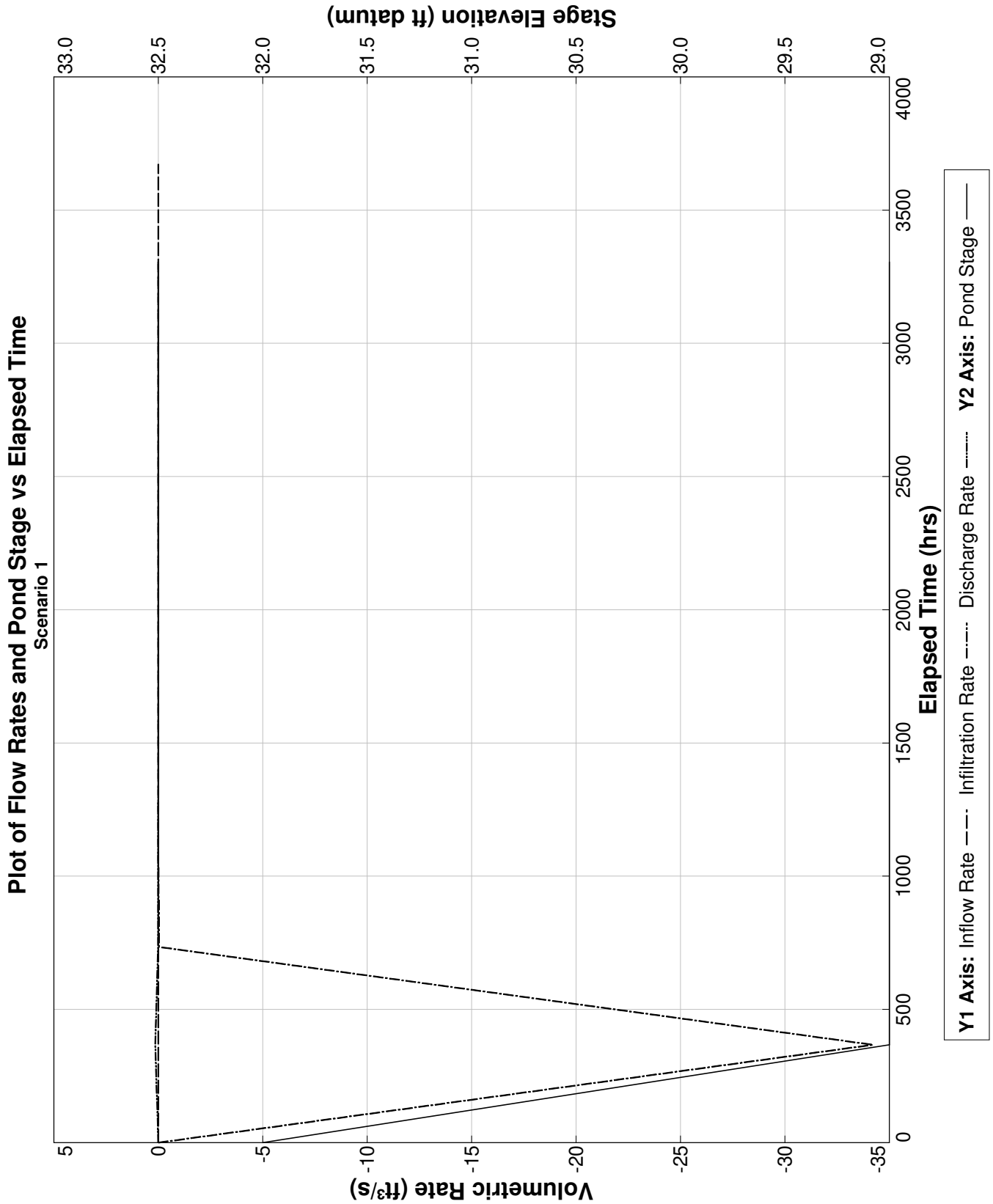
End Scenario 1 3/29/2023 11:36:55

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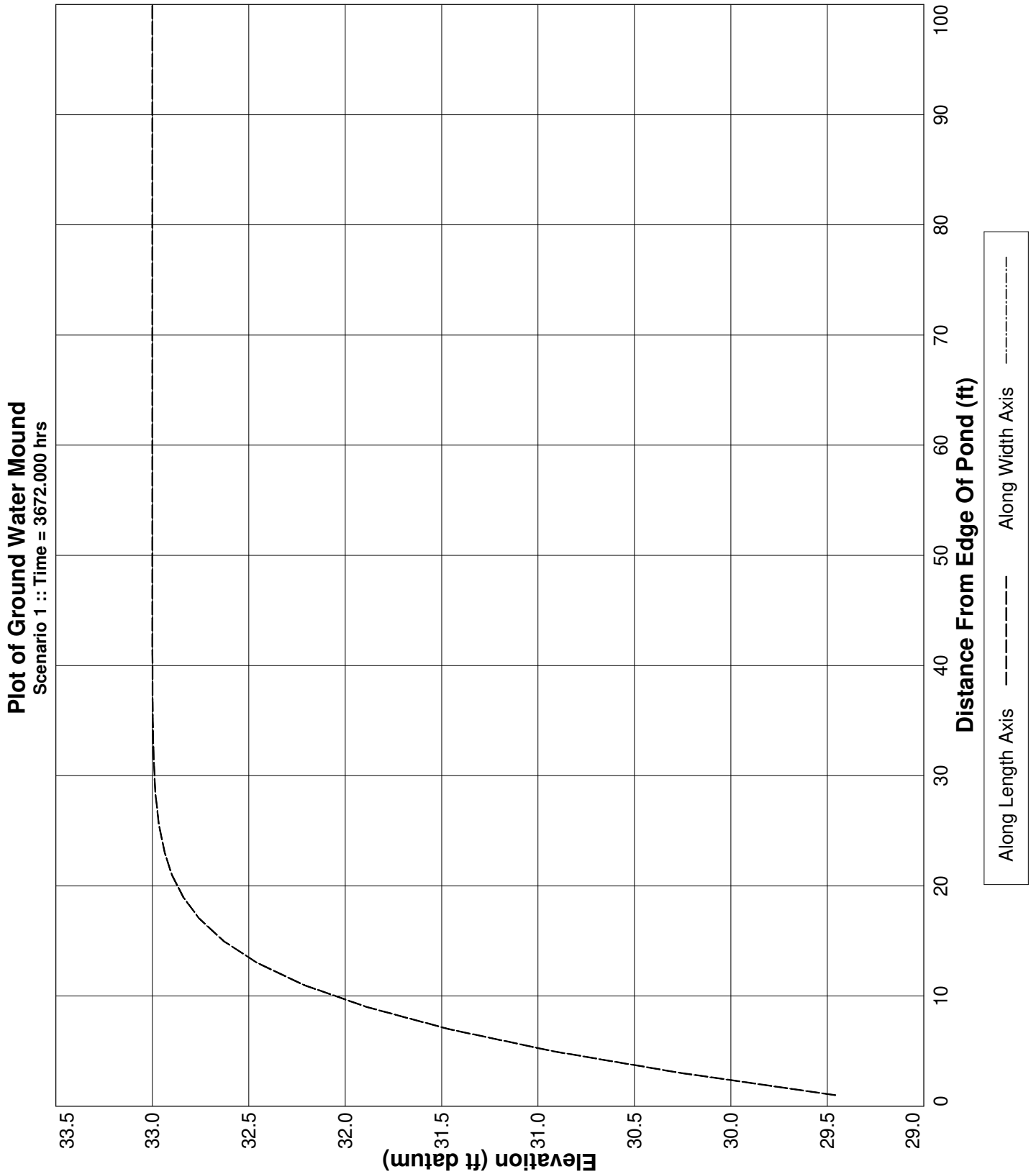
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0047	0.00163	32.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0047	0.00163	29.00000	-34.21038	.1492602	6148.800	-90348740.0	9.053914E+07	S
734.400	0.0047	0.00163	29.00000	-0.03825	8.345484E-03	12297.600	-90446760.0	9.064331E+07	S
1101.600	0.0047	0.00163	29.00000	-0.00159	5.660443E-03	18446.400	-90449860.0	9.065257E+07	S
1468.800	0.0047	0.00163	29.00000	-0.00071	5.291142E-03	24595.200	-90450950.0	9.065981E+07	S
1836.000	0.0047	0.00163	29.00000	-0.00056	5.199829E-03	30744.000	-90451740.0	9.066674E+07	S
2203.200	0.0047	0.00163	29.00000	-0.00051	5.16169E-03	36892.800	-90452440.0	9.067359E+07	S
2570.400	0.0047	0.00163	29.00000	-0.00049	5.139486E-03	43041.600	-90453100.0	9.06804E+07	S
2937.600	0.0047	0.00163	29.00000	-0.00047	5.124726E-03	49190.400	-90453740.0	9.068718E+07	S
3304.800	0.0047	0.00163	29.00000	-0.00046	5.114463E-03	55339.200	-90454350.0	9.069395E+07	S
3672.000	0.0047	0.00163	29.00000	----	----	61488.000	-90454960.0	9.070071E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.7, West Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-27-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 8.00  
Water Table Elevation, [WT] (ft datum): 31.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.10  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 270.0  
Equivalent Pond Width, [W] (ft): 80.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
13.00	435.6
29.00	17424.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	30.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/27/2023 8:39:53

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 30.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 6 of 10 saturated stress periods.

    Maximum calculated water budget error is -4.76583215699552 percent, for saturated stress period 1.

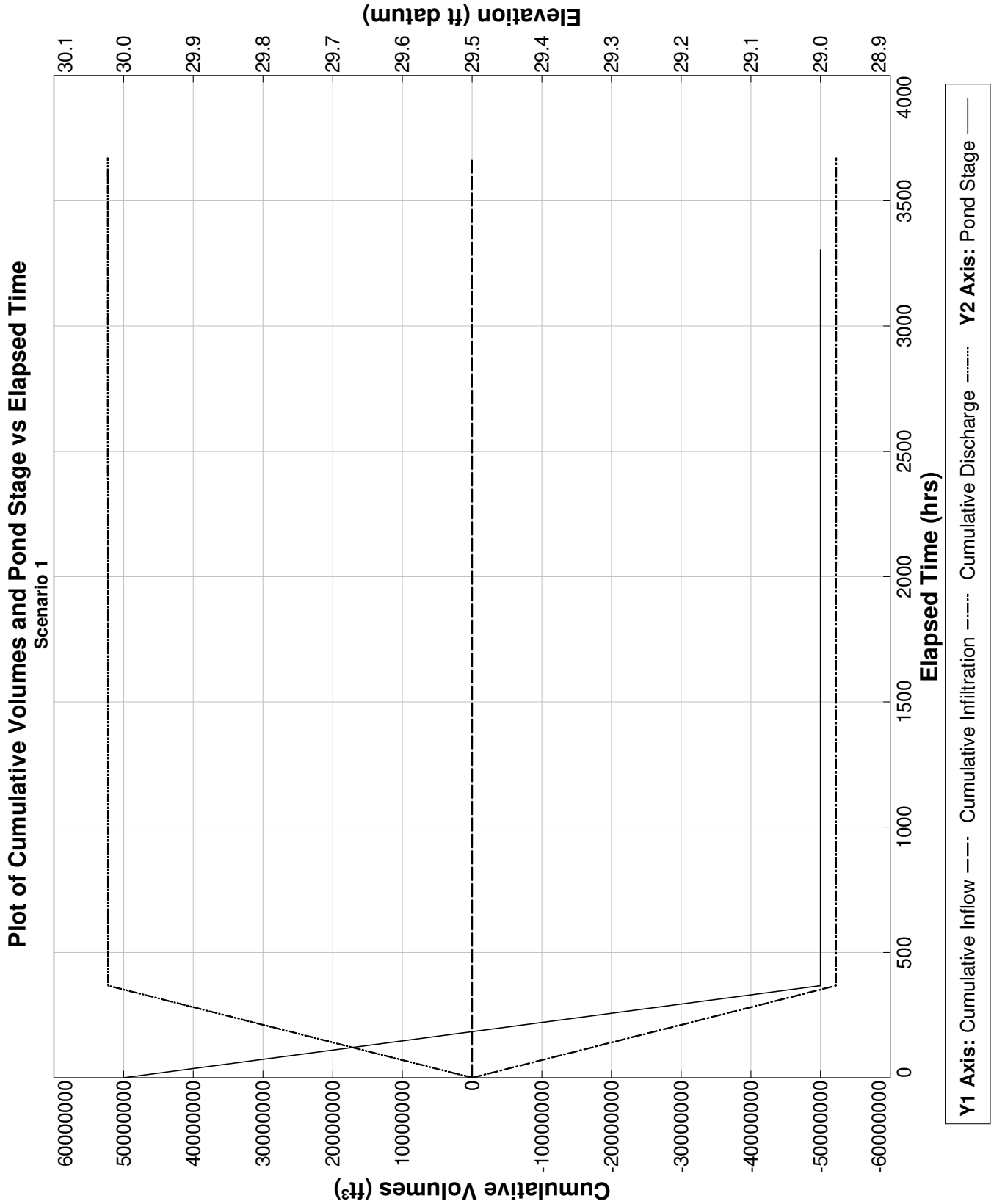
    If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

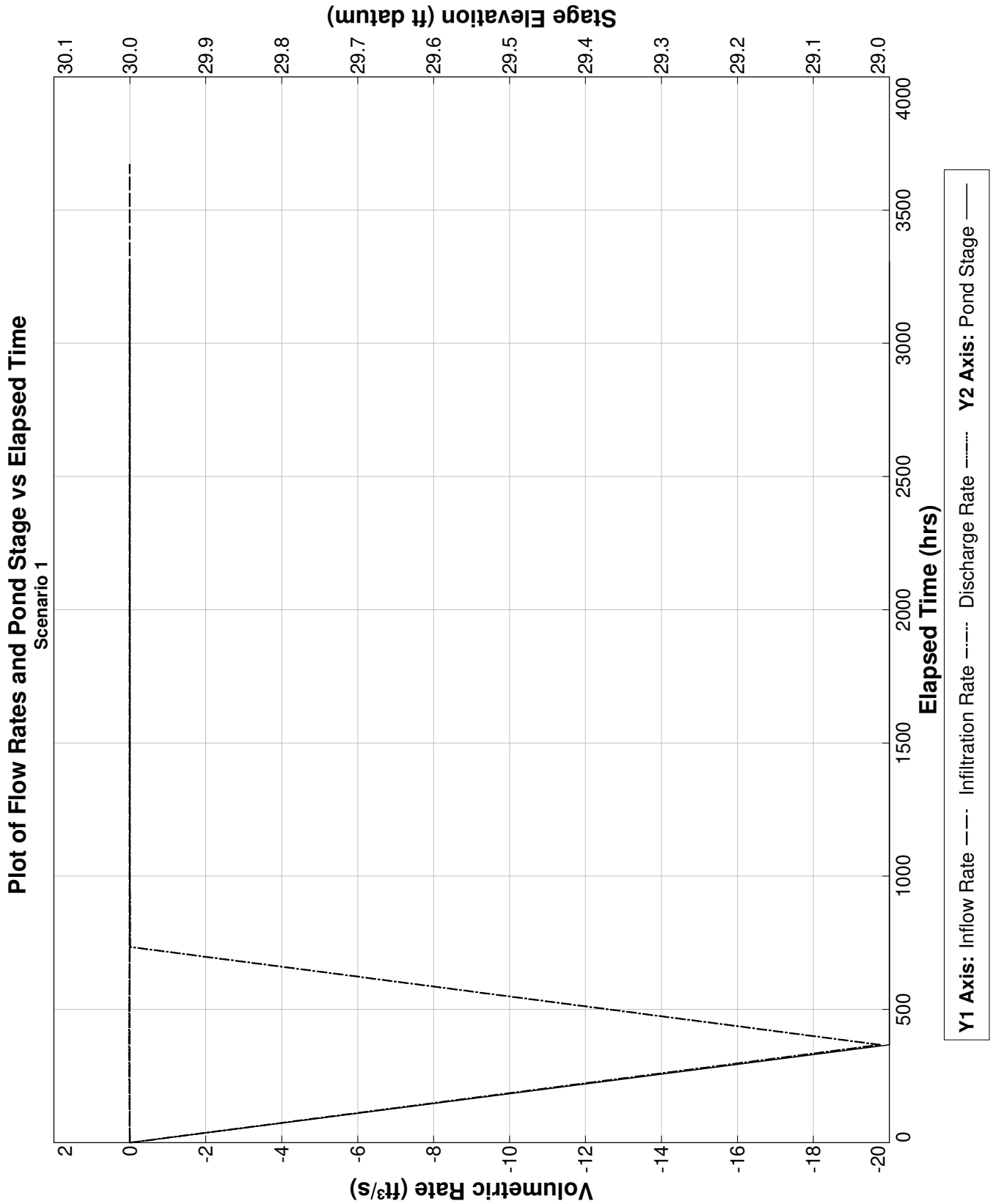
End Scenario 1 3/27/2023 8:39:53

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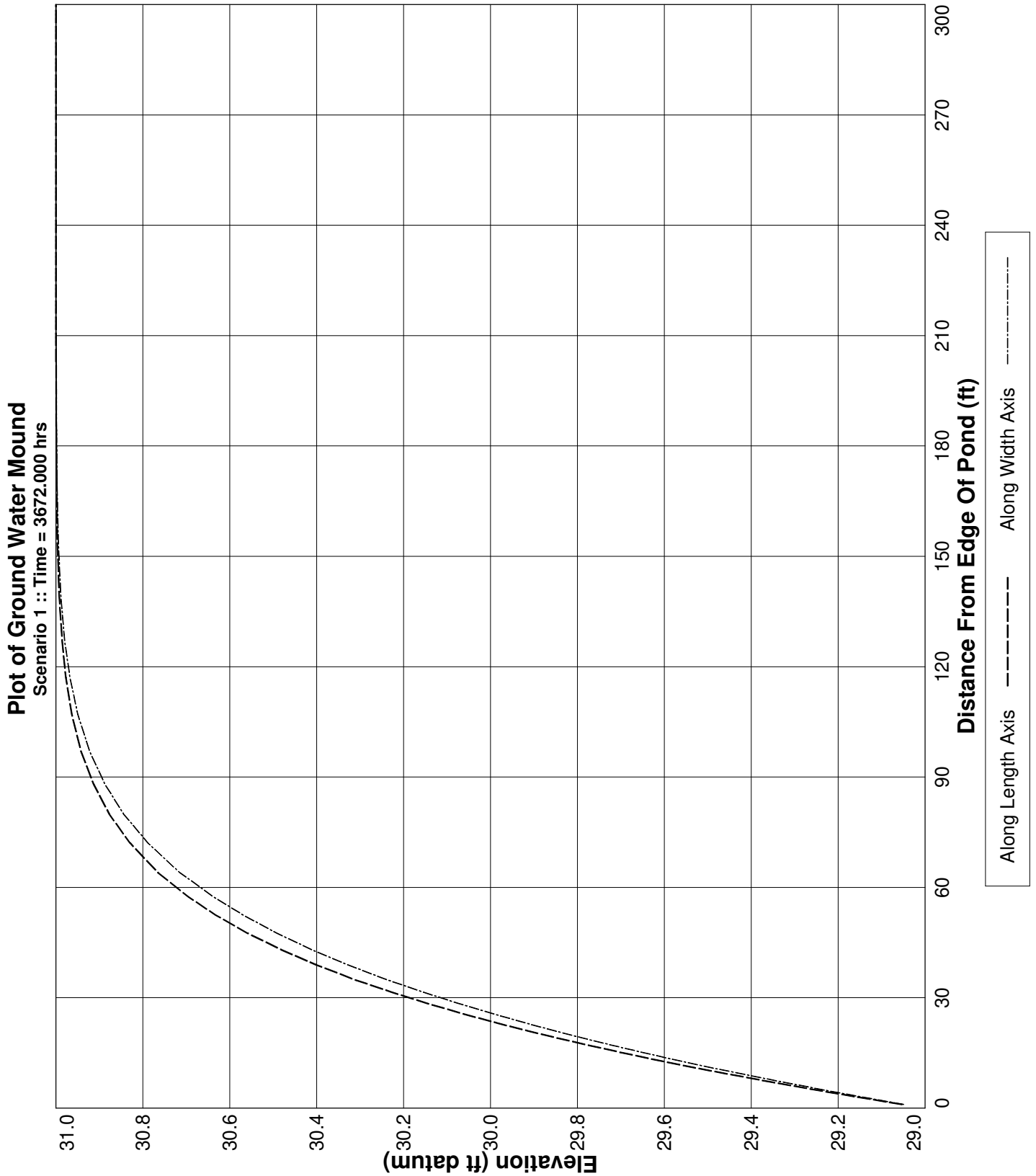
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0016	0.00163	30.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0016	0.00163	29.00000	-19.75345	2.158215E-02	2160.000	-52210520.0	5.22301E+07	S
734.400	0.0016	0.00163	29.00000	-0.00623	3.516015E-03	4320.000	-52224950.0	5.224669E+07	S
1101.600	0.0016	0.00163	29.00000	-0.00131	2.826862E-03	6480.000	-52226980.0	5.225089E+07	S
1468.800	0.0016	0.00163	29.00000	-0.00100	2.60152E-03	8640.000	-52228410.0	5.225448E+07	S
1836.000	0.0016	0.00163	29.00000	-0.00090	2.52343E-03	10800.000	-52229640.0	5.225786E+07	S
2203.200	0.0016	0.00163	29.00000	-0.00087	2.500037E-03	12960.000	-52230800.0	5.226118E+07	S
2570.400	0.0016	0.00163	29.00000	-0.00087	2.498853E-03	15120.000	-52231940.0	5.226448E+07	S
2937.600	0.0016	0.00163	29.00000	-0.00088	2.507743E-03	17280.000	-52233090.0	5.22678E+07	S
3304.800	0.0016	0.00163	29.00000	-0.00089	2.521733E-03	19440.000	-52234260.0	5.227112E+07	S
3672.000	0.0016	0.00163	29.00000	----	----	21600.000	-52235440.0	5.227446E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.7, Southwest Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-27-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 8.00  
Water Table Elevation, [WT] (ft datum): 32.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.10  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 270.0  
Equivalent Pond Width, [W] (ft): 80.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
13.00	435.6
29.00	17424.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	31.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/27/2023 8:42:56

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 31.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 10 of 10 saturated stress periods.

Maximum calculated water budget error is -7.41102954164981 percent, for saturated stress period 1.

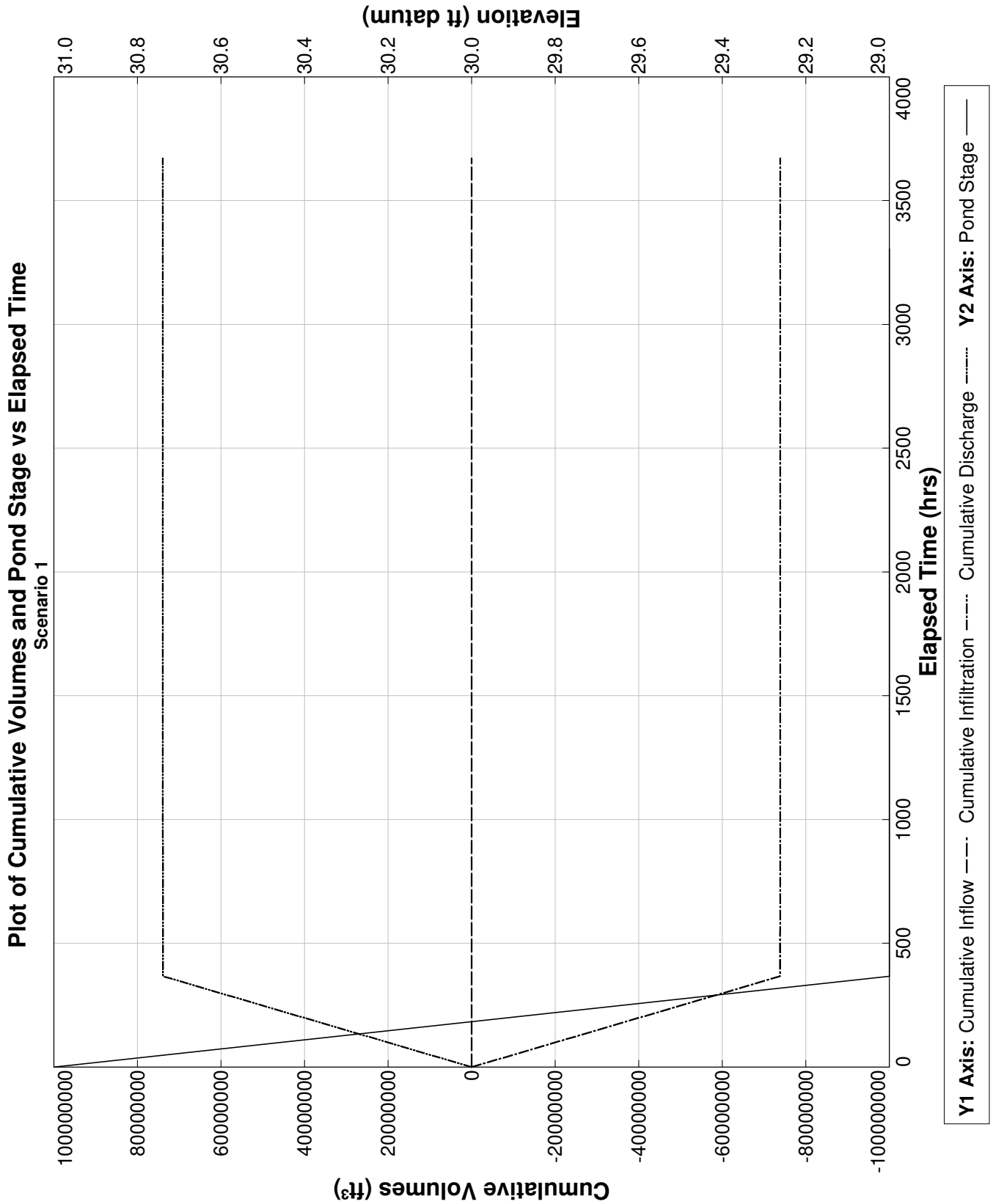
If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

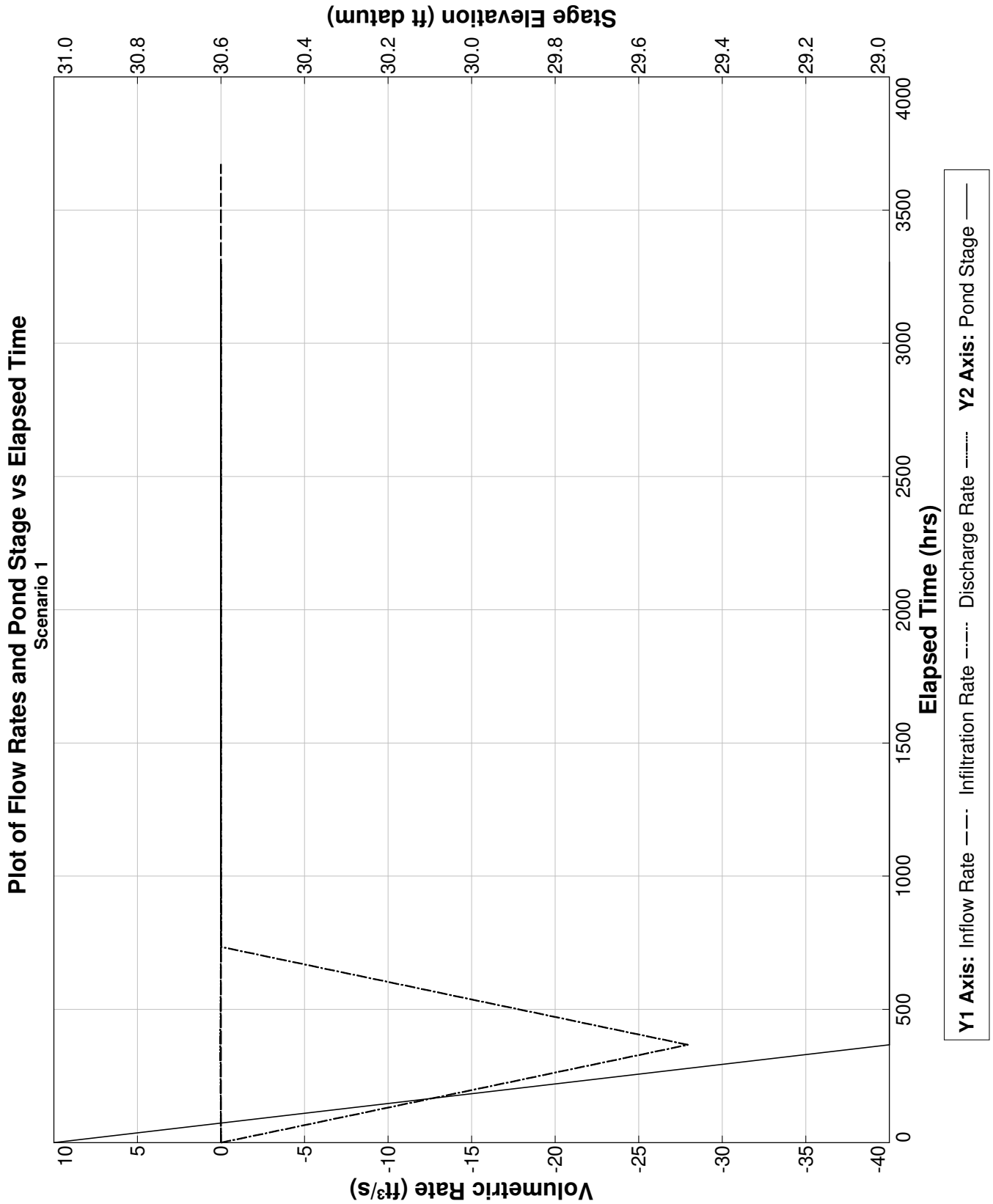
End Scenario 1 3/27/2023 8:42:56

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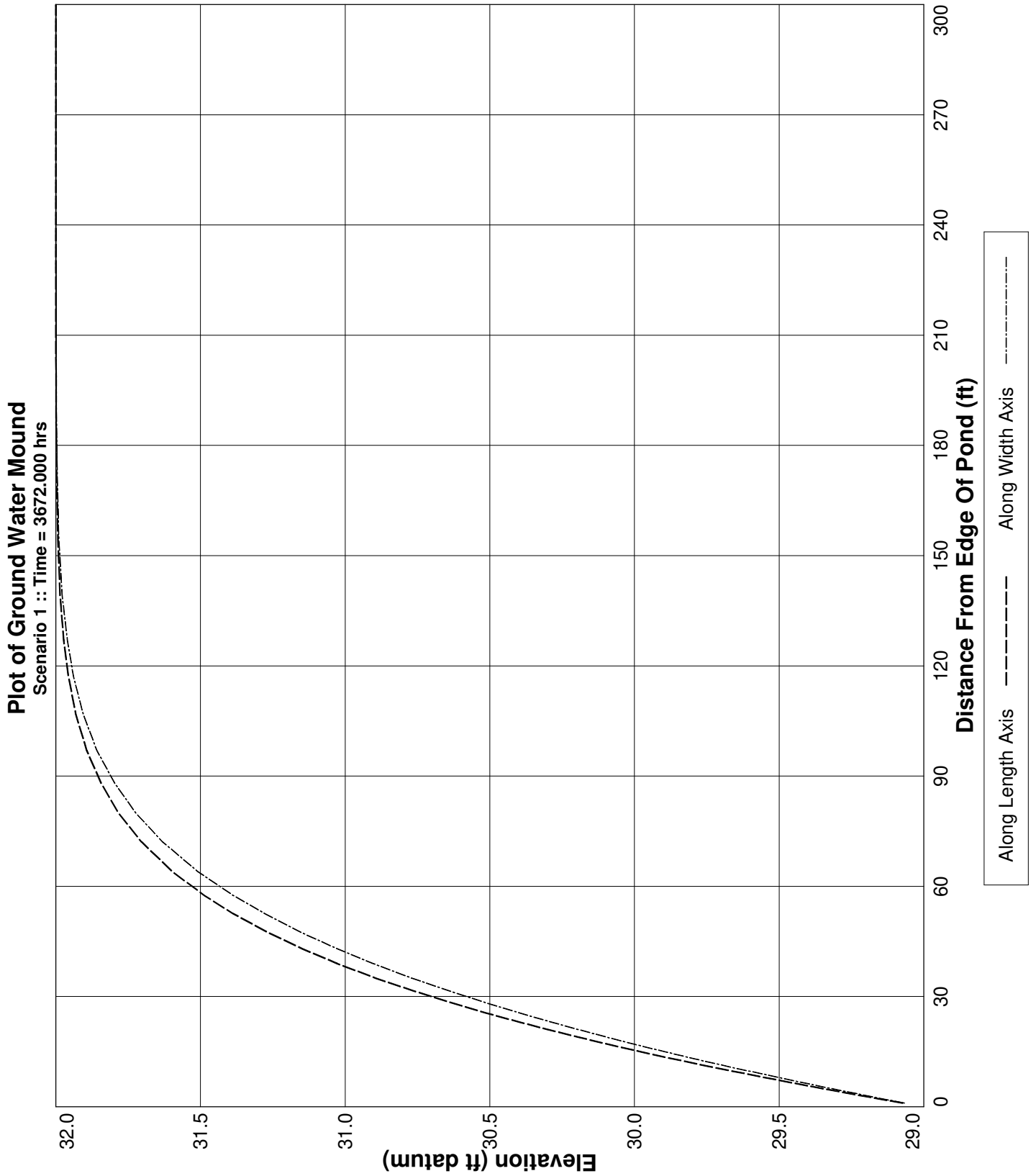
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0016	0.00163	31.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0016	0.00163	29.00000	-27.93717	4.037098E-02	2160.000	-73834020.0	7.387103E+07	S
734.400	0.0016	0.00163	29.00000	-0.01151	4.341021E-03	4320.000	-73861420.0	7.390058E+07	S
1101.600	0.0016	0.00163	29.00000	-0.00200	3.509925E-03	6480.000	-73864450.0	7.390578E+07	S
1468.800	0.0016	0.00163	29.00000	-0.00159	3.173725E-03	8640.000	-73866700.0	7.391019E+07	S
1836.000	0.0016	0.00163	29.00000	-0.00141	3.028797E-03	10800.000	-73868640.0	7.391429E+07	S
2203.200	0.0016	0.00163	29.00000	-0.00133	2.956884E-03	12960.000	-73870440.0	7.391825E+07	S
2570.400	0.0016	0.00163	29.00000	-0.00129	2.919653E-03	15120.000	-73872170.0	7.392214E+07	S
2937.600	0.0016	0.00163	29.00000	-0.00127	2.900876E-03	17280.000	-73873850.0	7.392598E+07	S
3304.800	0.0016	0.00163	29.00000	-0.00126	2.892913E-03	19440.000	-73875520.0	7.392981E+07	S
3672.000	0.0016	0.00163	29.00000	----	----	21600.000	-73877180.0	7.393363E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.7, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-29-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 8.00  
Water Table Elevation, [WT] (ft datum): 28.80  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.10  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 270.0  
Equivalent Pond Width, [W] (ft): 80.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
13.00	435.6
29.00	17424.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	27.8
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/29/2023 16:1:18

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

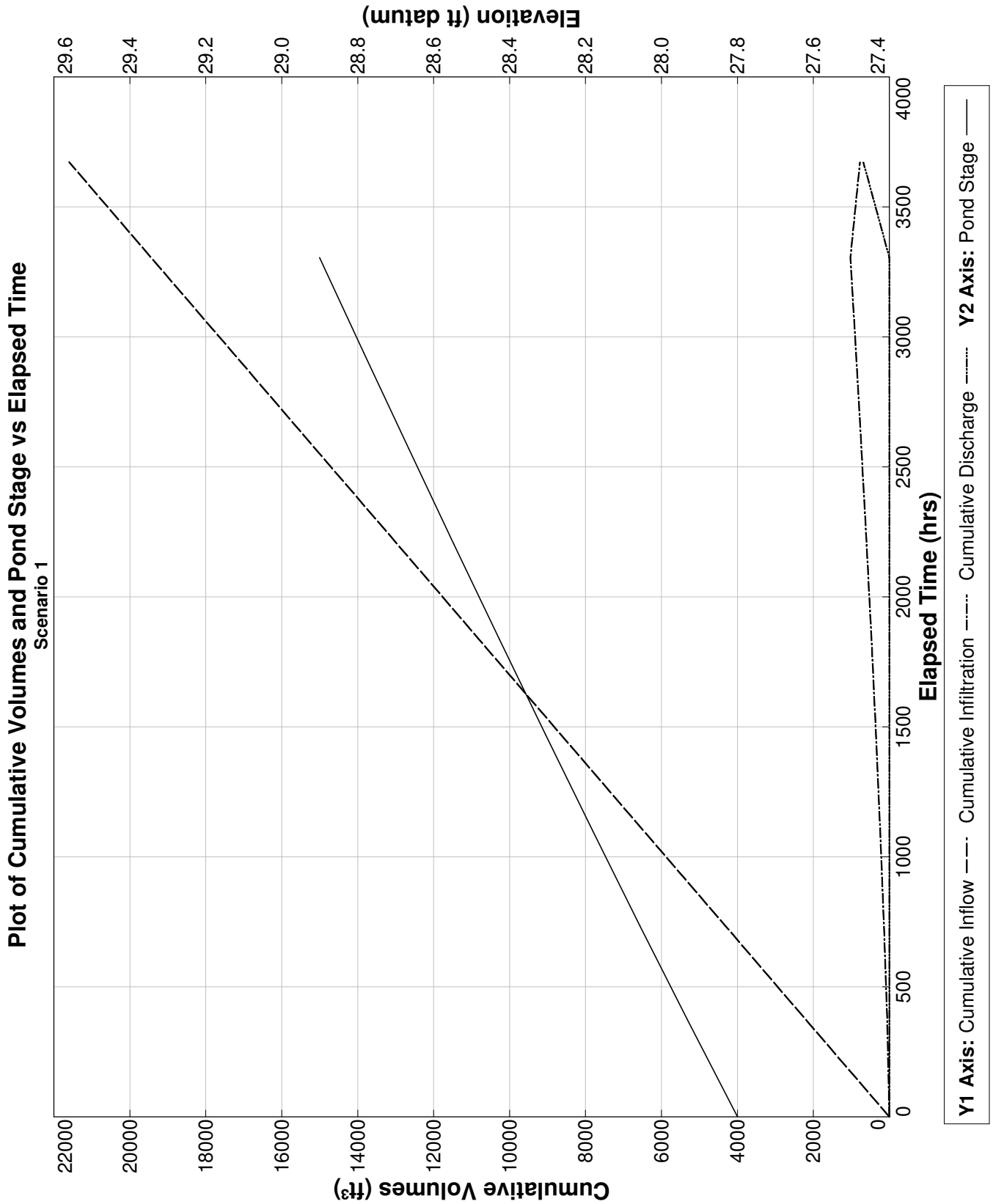
Baseflow hydrograph: Initial GWT (seasonal low) is 27.8 ft.

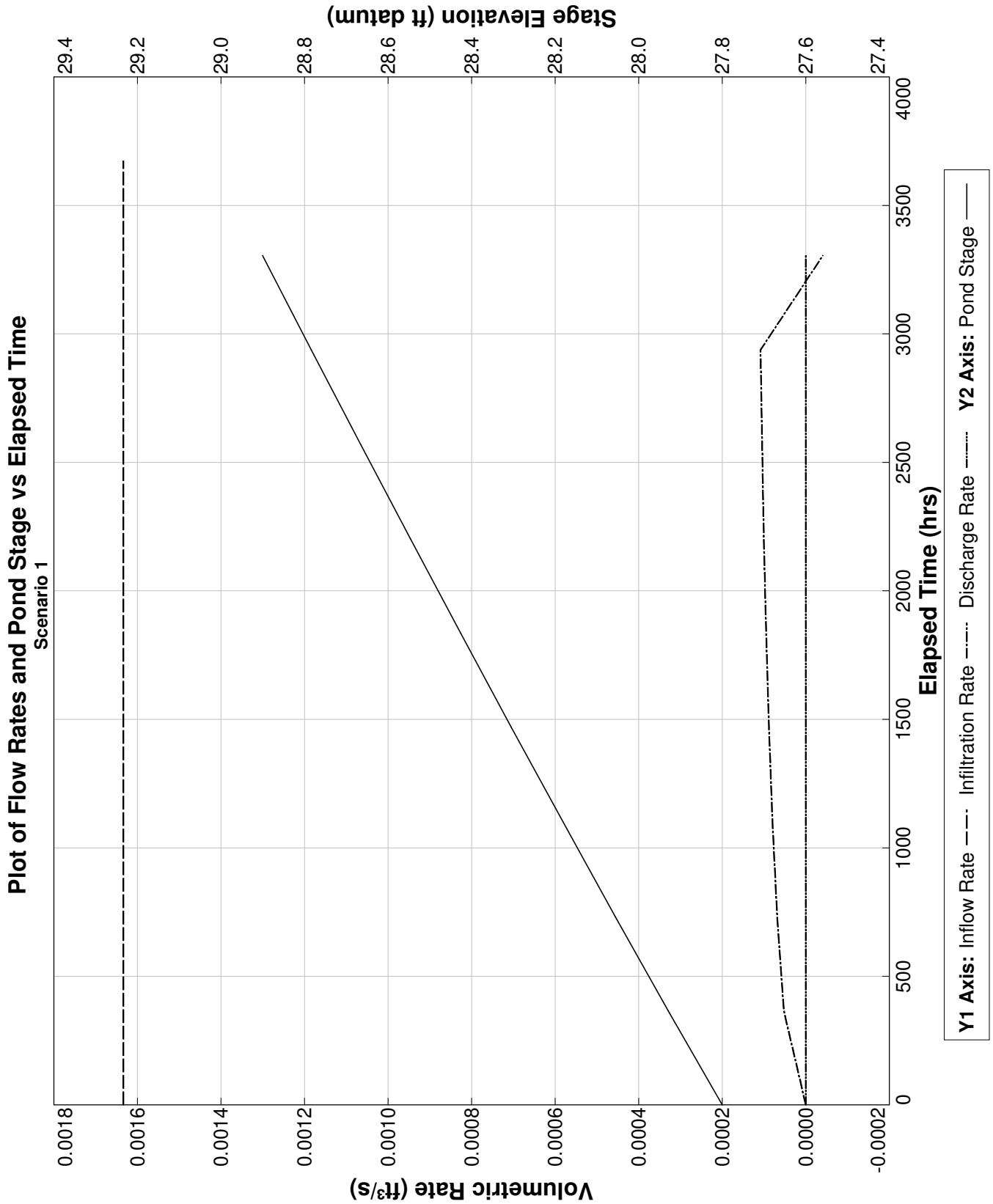
End Scenario 1 3/29/2023 16:1:18

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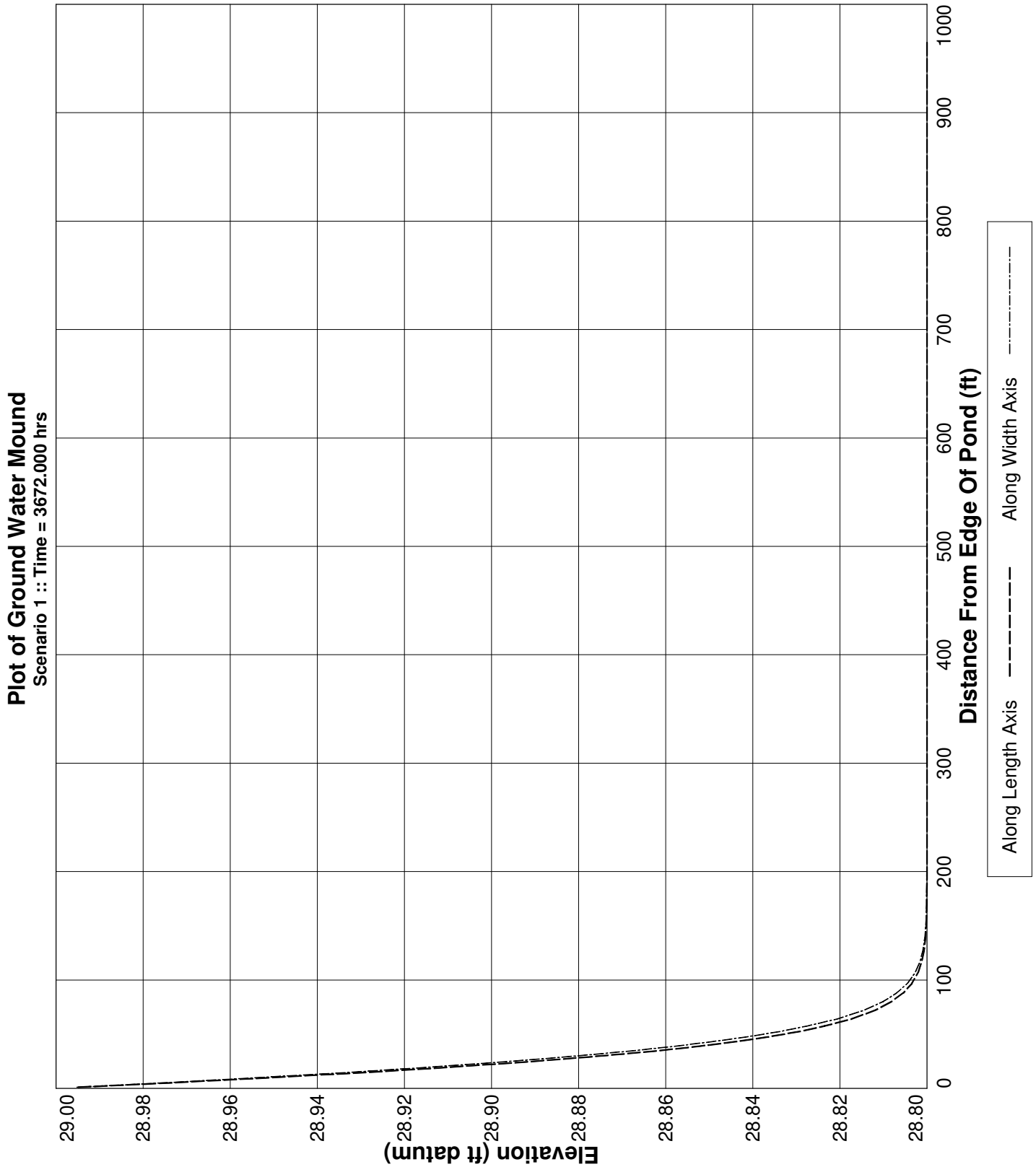
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0016	0.00163	27.80000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0016	0.00163	27.92964	0.00005	0	2160.000	57.4	0	S
734.400	0.0016	0.00163	28.05666	0.00007	0	4320.000	140.0	0	S
1101.600	0.0016	0.00163	28.18165	0.00008	0	6480.000	239.1	0	S
1468.800	0.0016	0.00163	28.30488	0.00009	0	8640.000	350.9	0	S
1836.000	0.0016	0.00163	28.42658	0.00009	0	10800.000	472.3	0	S
2203.200	0.0016	0.00163	28.54688	0.00010	0	12960.000	601.8	0	S
2570.400	0.0016	0.00163	28.66592	0.00010	0	15120.000	737.5	0	S
2937.600	0.0016	0.00163	28.78376	0.00011	0	17280.000	878.6	0	S
3304.800	0.0016	0.00163	28.90051	-0.00004	0	19440.000	1023.9	0	S
3672.000	0.0016	0.00163	29.00000	----	----	21600.000	770.4	685.2547	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.8, Northeast, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 9.00  
Water Table Elevation, [WT] (ft datum): 25.13  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.03  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 400.0  
Equivalent Pond Width, [W] (ft): 83.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
9.00	435.6
29.00	33105.6

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	24.13
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 11:37:56

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

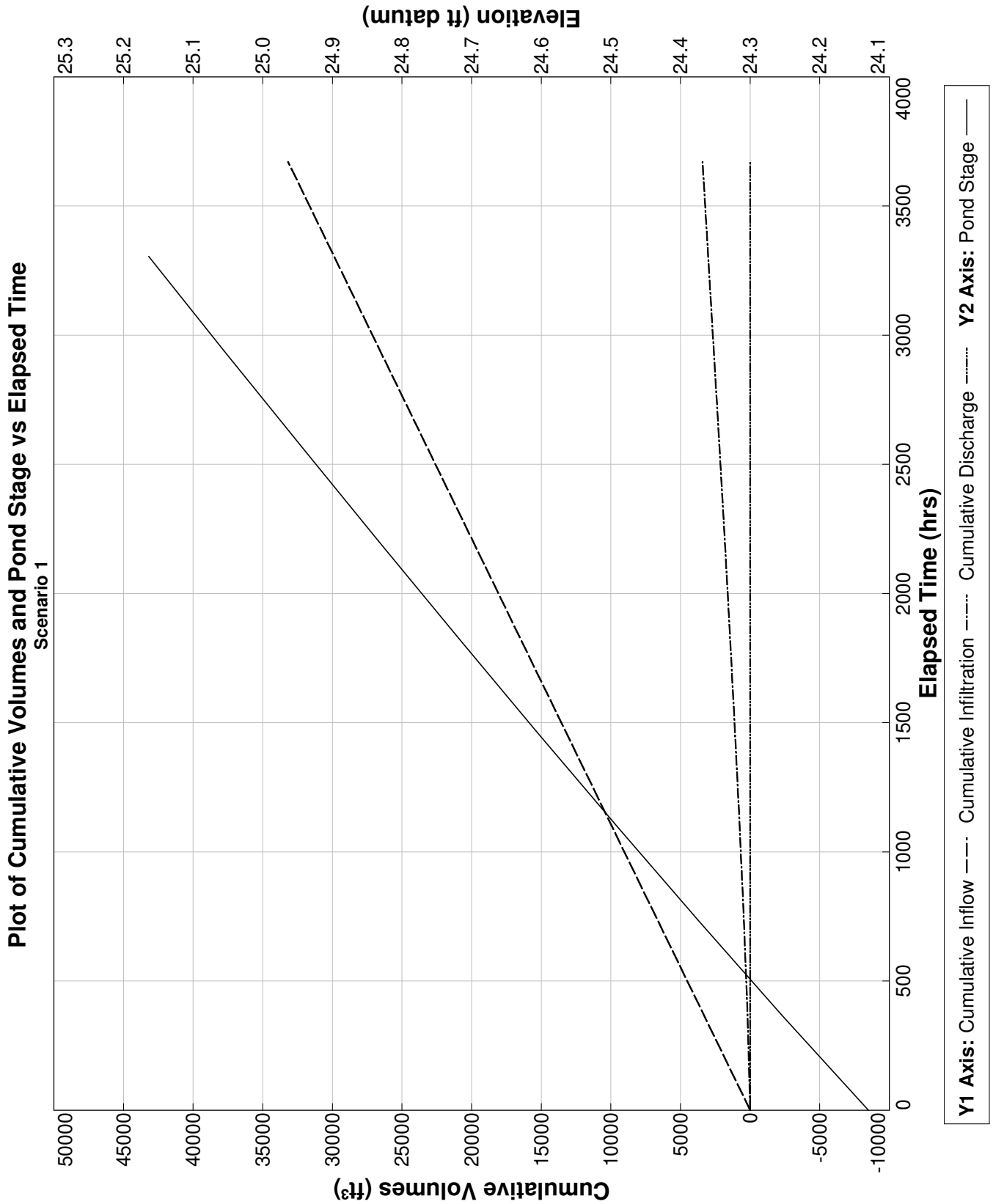
Baseflow hydrograph: Initial GWT (seasonal low) is 24.13 ft.

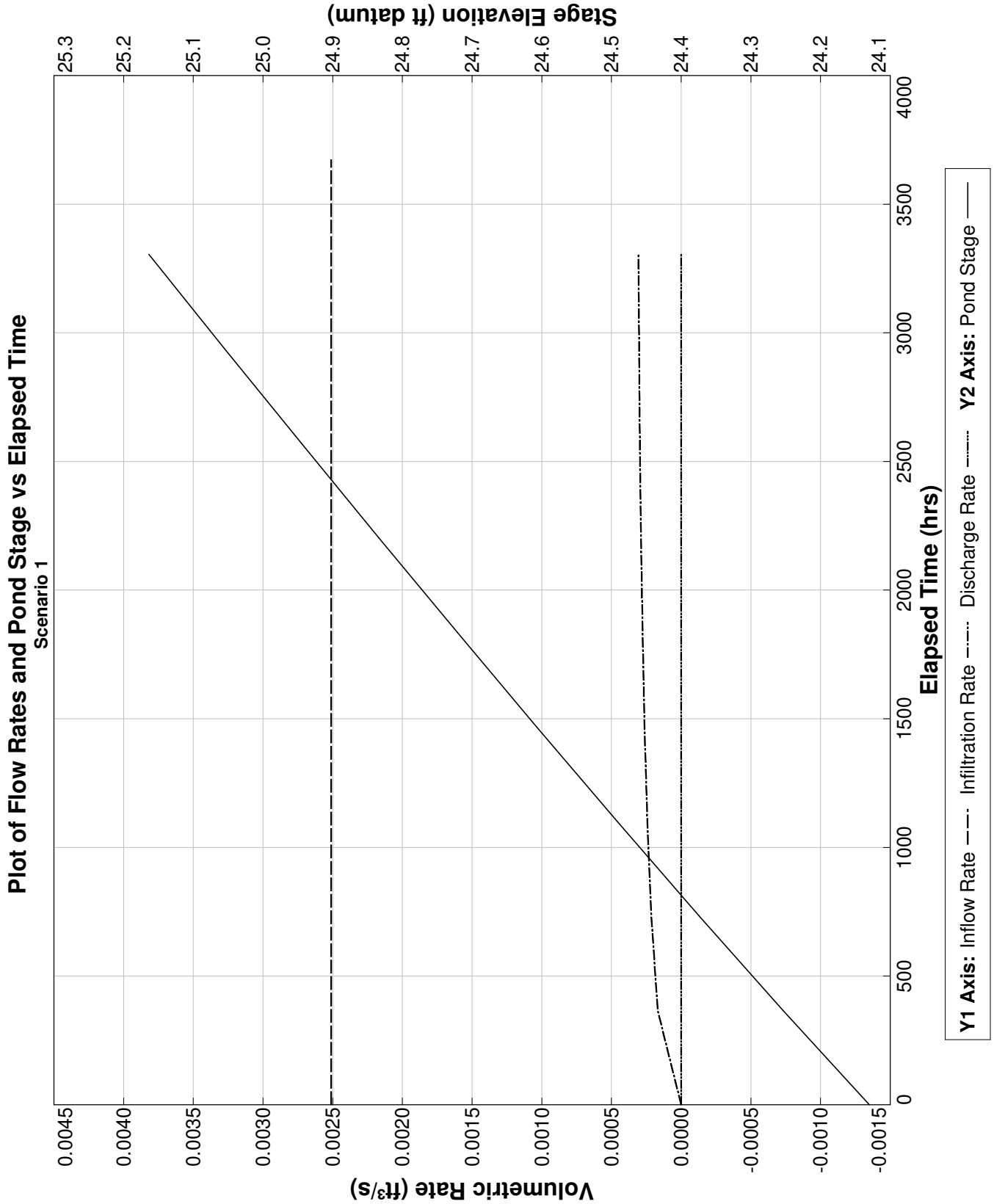
End Scenario 1 3/31/2023 11:37:57

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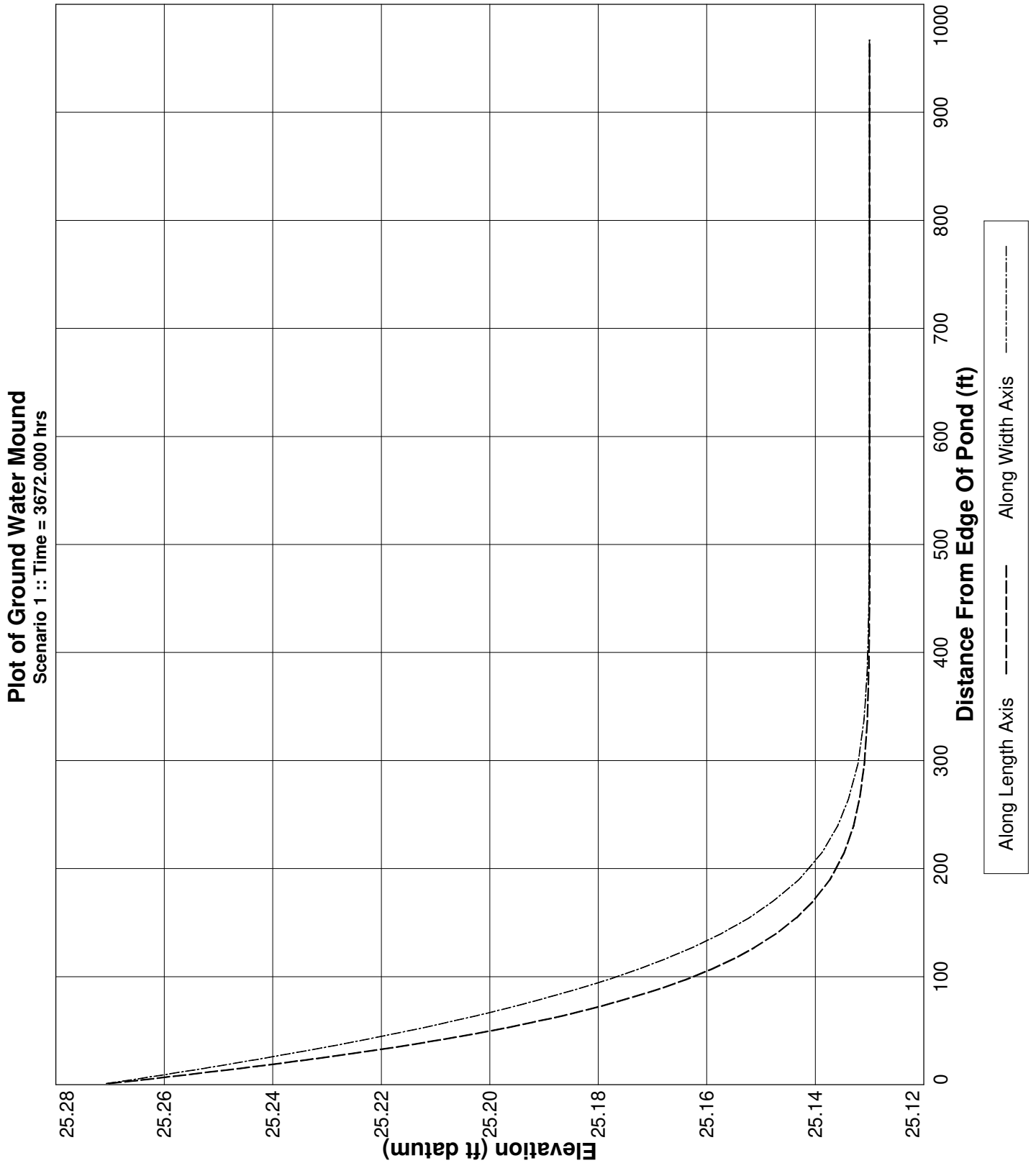
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0025	0.00163	24.13000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0025	0.00163	24.25416	0.00017	0	3320.000	184.8	0	S
734.400	0.0025	0.00163	24.37441	0.00021	0	6640.000	444.3	0	S
1101.600	0.0025	0.00163	24.49199	0.00024	0	9960.000	748.8	0	S
1468.800	0.0025	0.00163	24.60750	0.00026	0	13280.000	1084.5	0	S
1836.000	0.0025	0.00163	24.72131	0.00028	0	16600.000	1442.6	0	S
2203.200	0.0025	0.00163	24.83369	0.00029	0	19920.000	1817.4	0	S
2570.400	0.0025	0.00163	24.94482	0.00030	0	23240.000	2204.7	0	S
2937.600	0.0025	0.00163	25.05484	0.00030	0	26560.000	2601.1	0	S
3304.800	0.0025	0.00163	25.16389	0.00031	0	29880.000	3004.2	0	S
3672.000	0.0025	0.00163	25.27204	----	----	33200.000	3411.9	0	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.8, South, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 9.00  
Water Table Elevation, [WT] (ft datum): 31.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.03  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 400.0  
Equivalent Pond Width, [W] (ft): 83.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
9.00	435.6
29.00	33105.6

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	30.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head

Maximum iterations of outer loop: 150

Maximum iterations of inner loop: 60

Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)

Instantaneous storage coefficient: Volumetric balance

Default head closure tolerance: .01

Default residual closure tolerance: .5

Target water budget error: 1

On failure to converge: Rerun limiting inner loop to one iteration

> Maximum number of iterations of outer loop: 500

Running Average Porosity is active

> Starting on pass: 2

> When outer iteration reaches: 50

> Number of data points: 4

Running Average Pond Stage (for discharge structures with tailwater) is active

> Starting on pass: 2

> When outer iteration reaches: 50

> Number of data points: 4

Grid size: 1000 ft (from pond centerline)

Mound Output: all stress periods

Begin Scenario 1 3/31/2023 11:40:14

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

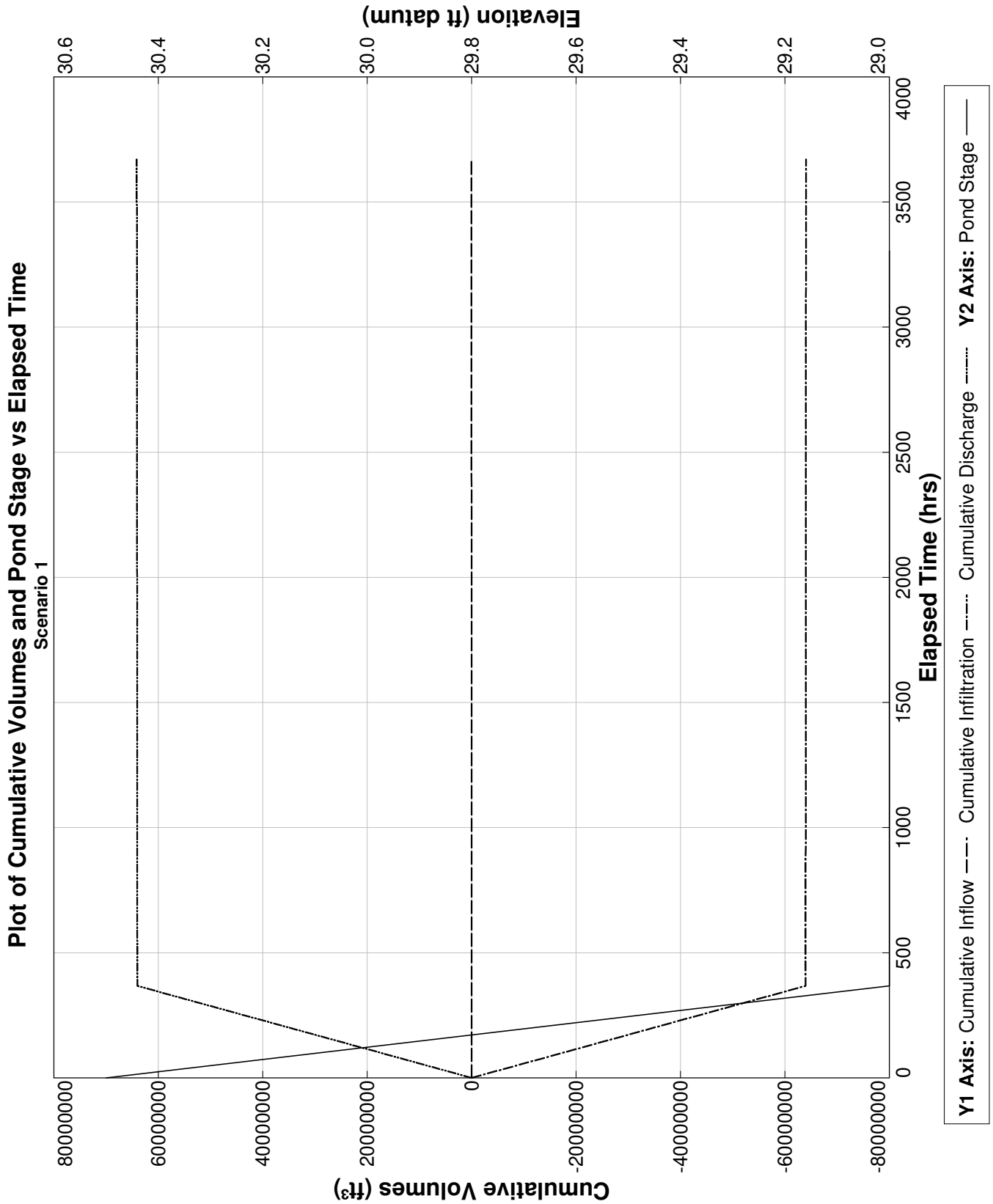
Baseflow hydrograph: Initial GWT (seasonal low) is 30.5 ft.

End Scenario 1 3/31/2023 11:40:14

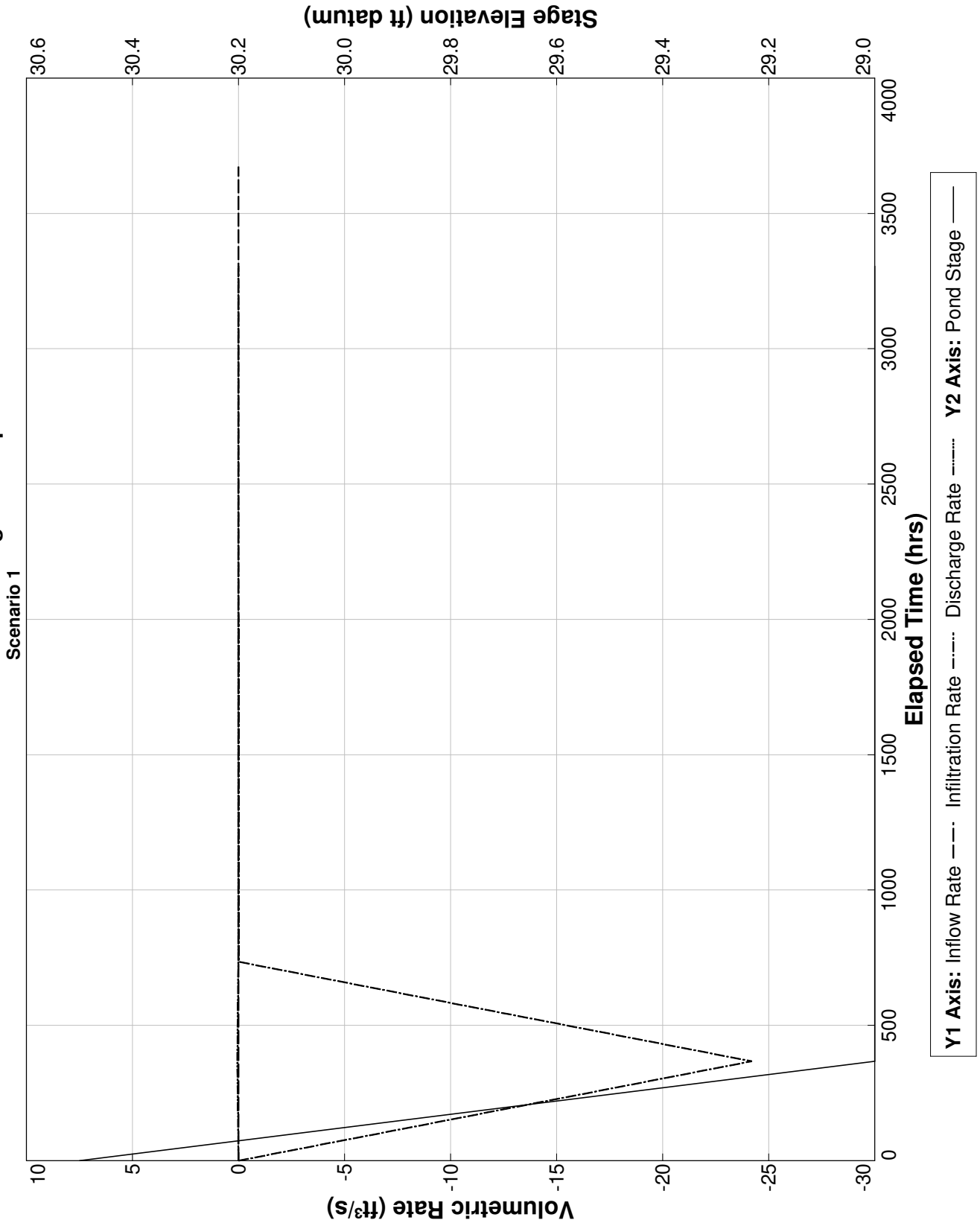
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**Detailed Results**    :: Scenario 1 ::

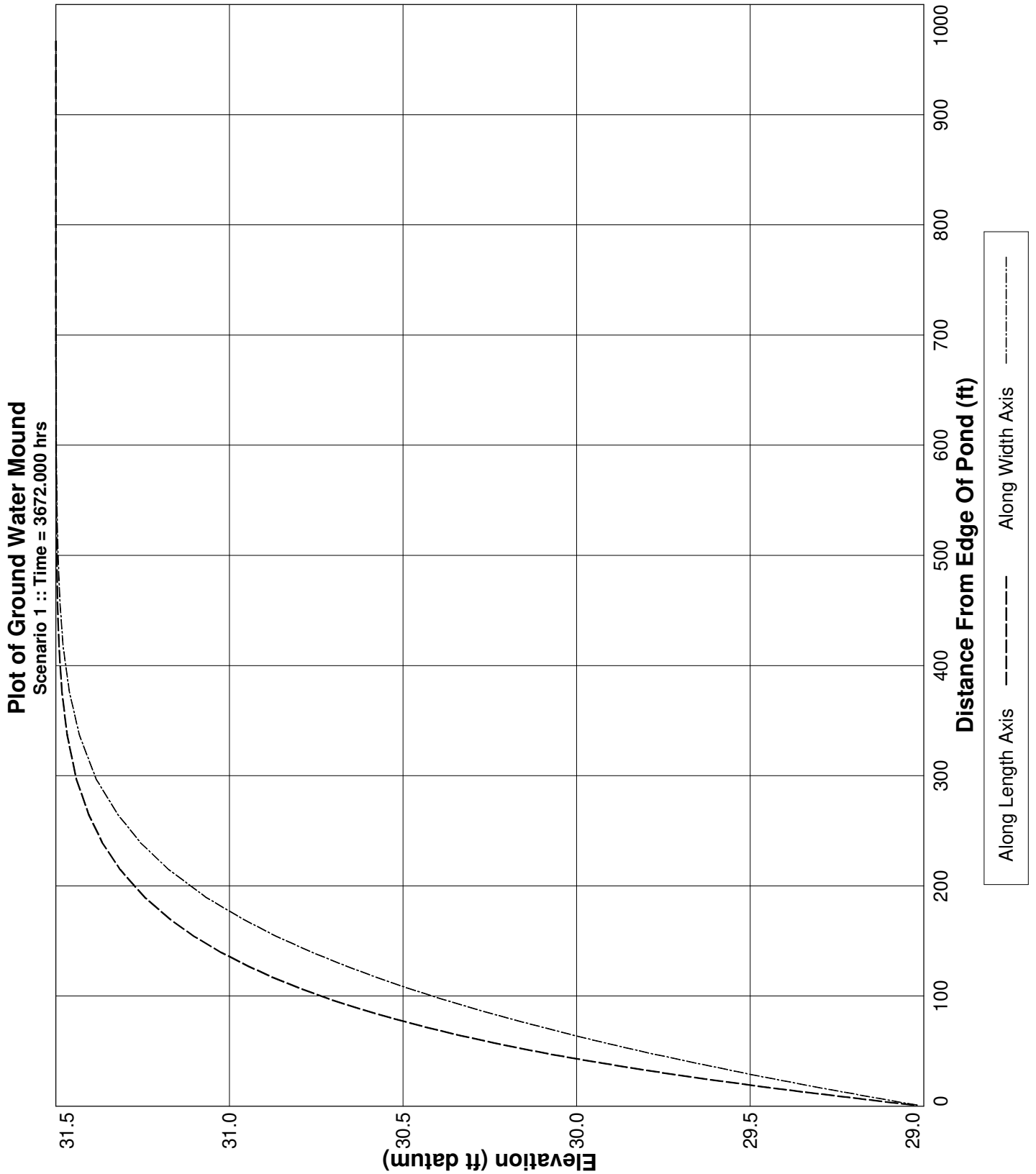
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0025	0.00163	30.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0025	0.00163	29.00000	-24.19611	5.231043E-02	3320.000	-63932680.0	6.398566E+07	S
734.400	0.0025	0.00163	29.00000	-0.01788	1.014582E-02	6640.000	-63970640.0	6.402694E+07	S
1101.600	0.0025	0.00163	29.00000	-0.00663	8.971822E-03	9960.000	-63979960.0	6.403958E+07	S
1468.800	0.0025	0.00163	29.00000	-0.00602	8.483474E-03	13280.000	-63988170.0	6.405111E+07	S
1836.000	0.0025	0.00163	29.00000	-0.00572	8.199172E-03	16600.000	-63995880.0	6.406214E+07	S
2203.200	0.0025	0.00163	29.00000	-0.00557	8.055432E-03	19920.000	-64003300.0	6.407288E+07	S
2570.400	0.0025	0.00163	29.00000	-0.00550	7.999144E-03	23240.000	-64010600.0	6.408349E+07	S
2937.600	0.0025	0.00163	29.00000	-0.00550	8.001815E-03	26560.000	-64017850.0	6.409407E+07	S
3304.800	0.0025	0.00163	29.00000	-0.00553	8.040222E-03	29880.000	-64025140.0	6.410467E+07	S
3672.000	0.0025	0.00163	29.00000	----	----	33200.000	-64032480.0	6.411534E+07	N.A.



Plot of Flow Rates and Pond Stage vs Elapsed Time







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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 9, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 0.00  
Water Table Elevation, [WT] (ft datum): 28.14  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.03  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 505.0  
Equivalent Pond Width, [W] (ft): 117.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
5.00	435.6
29.00	59241.6

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	27.14
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 11:55:57

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

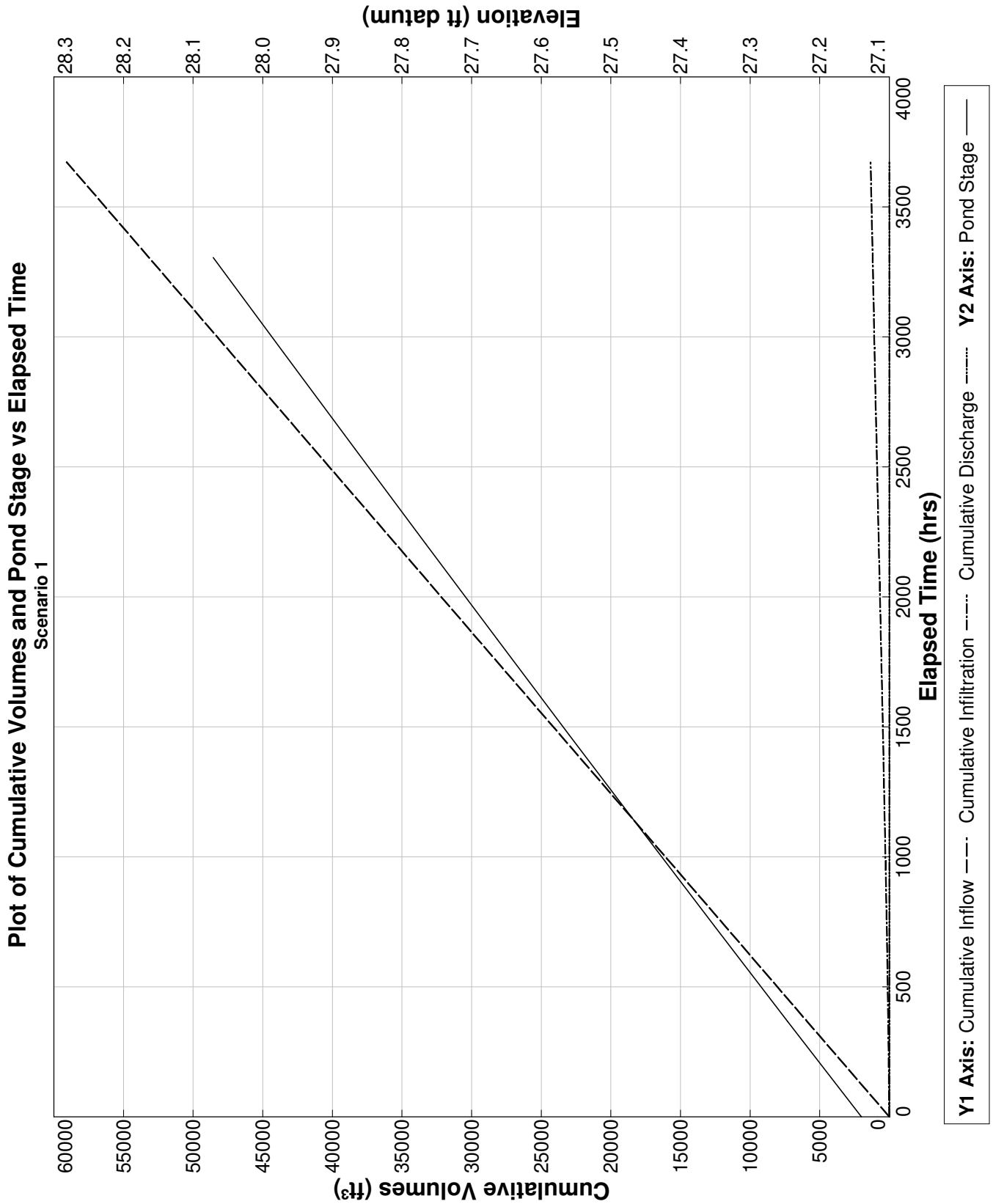
Baseflow hydrograph: Initial GWT (seasonal low) is 27.14 ft.

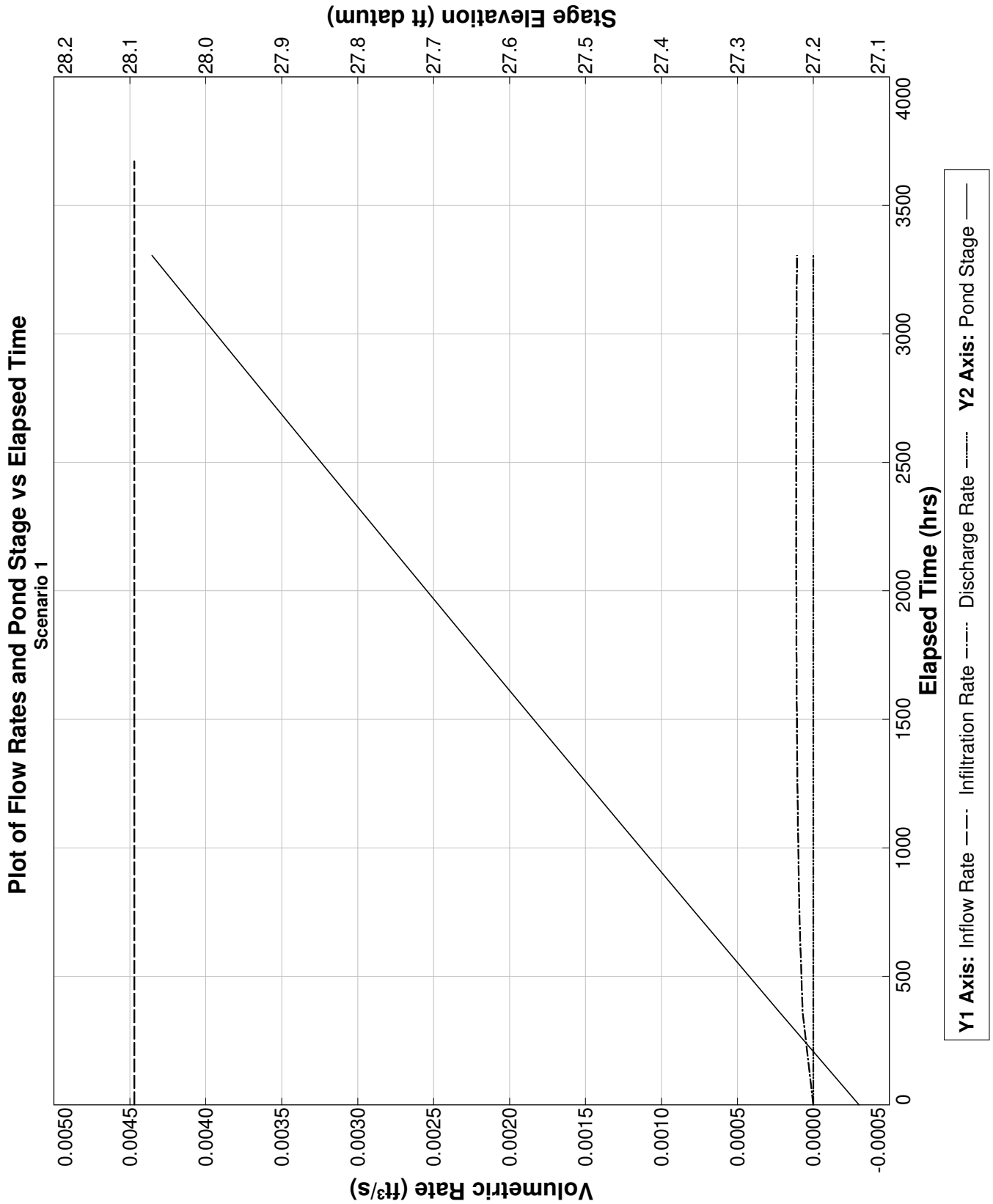
End Scenario 1 3/31/2023 11:55:57

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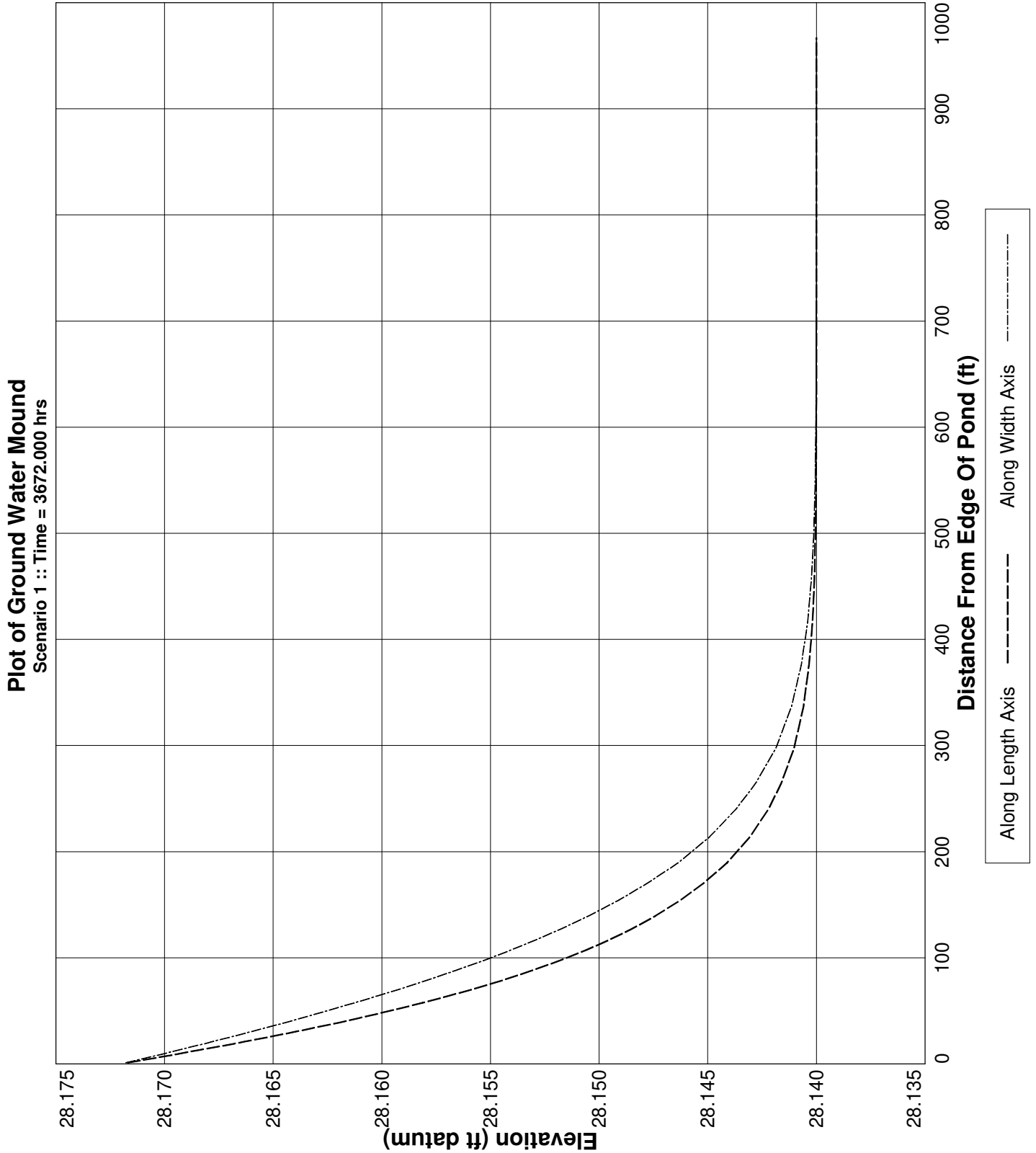
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0045	0.00163	27.14000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0045	0.00163	27.24636	0.00007	0	5908.500	78.2	0	S
734.400	0.0045	0.00163	27.35162	0.00009	0	11817.000	189.9	0	S
1101.600	0.0045	0.00163	27.45606	0.00010	0	17725.500	319.7	0	S
1468.800	0.0045	0.00163	27.55982	0.00011	0	23634.000	460.4	0	S
1836.000	0.0045	0.00163	27.66300	0.00011	0	29542.500	607.5	0	S
2203.200	0.0045	0.00163	27.76566	0.00011	0	35451.000	757.7	0	S
2570.400	0.0045	0.00163	27.86786	0.00011	0	41359.500	908.3	0	S
2937.600	0.0045	0.00163	27.96962	0.00011	0	47268.000	1057.7	0	S
3304.800	0.0045	0.00163	28.07099	0.00011	0	53176.500	1204.2	0	S
3672.000	0.0045	0.00163	28.17199	----	----	59085.000	1346.7	0	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.10, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-27-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 5.00  
Water Table Elevation, [WT] (ft datum): 30.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.03  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 302.0  
Equivalent Pond Width, [W] (ft): 85.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
5.00	435.6
29.00	25700.4

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	29.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/27/2023 12:41:17

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

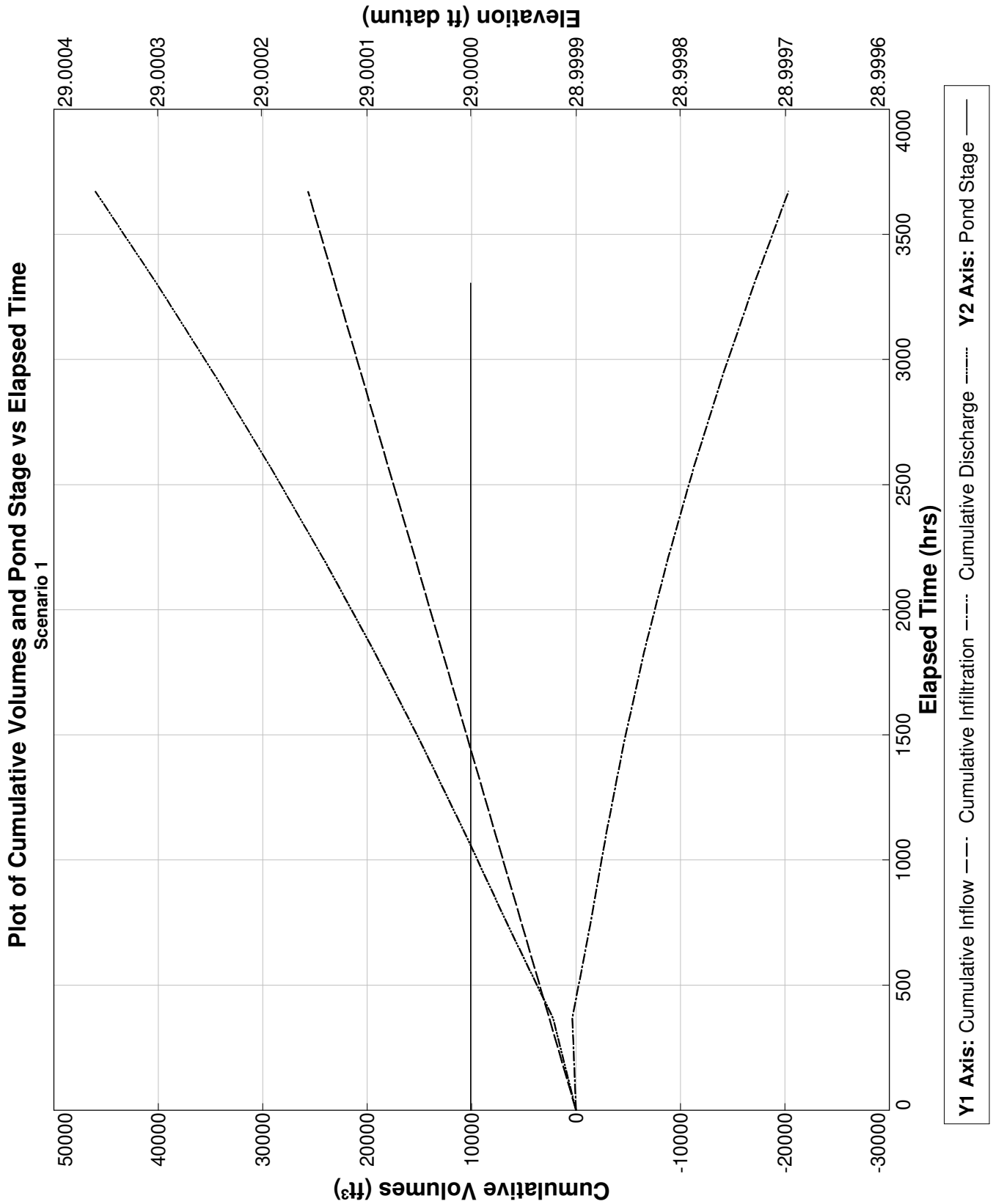
Baseflow hydrograph: Initial GWT (seasonal low) is 29.0 ft.

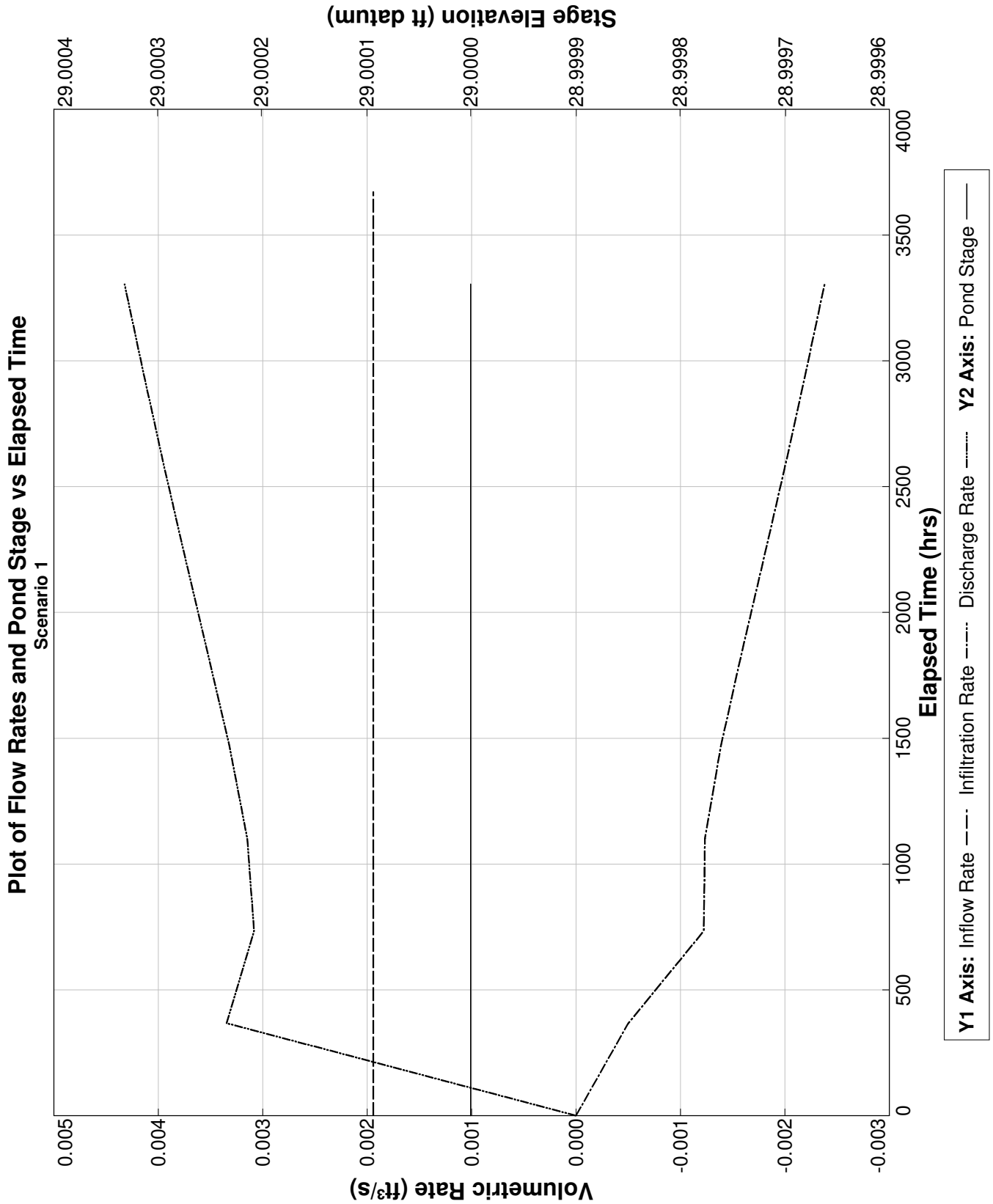
End Scenario 1 3/27/2023 12:41:17

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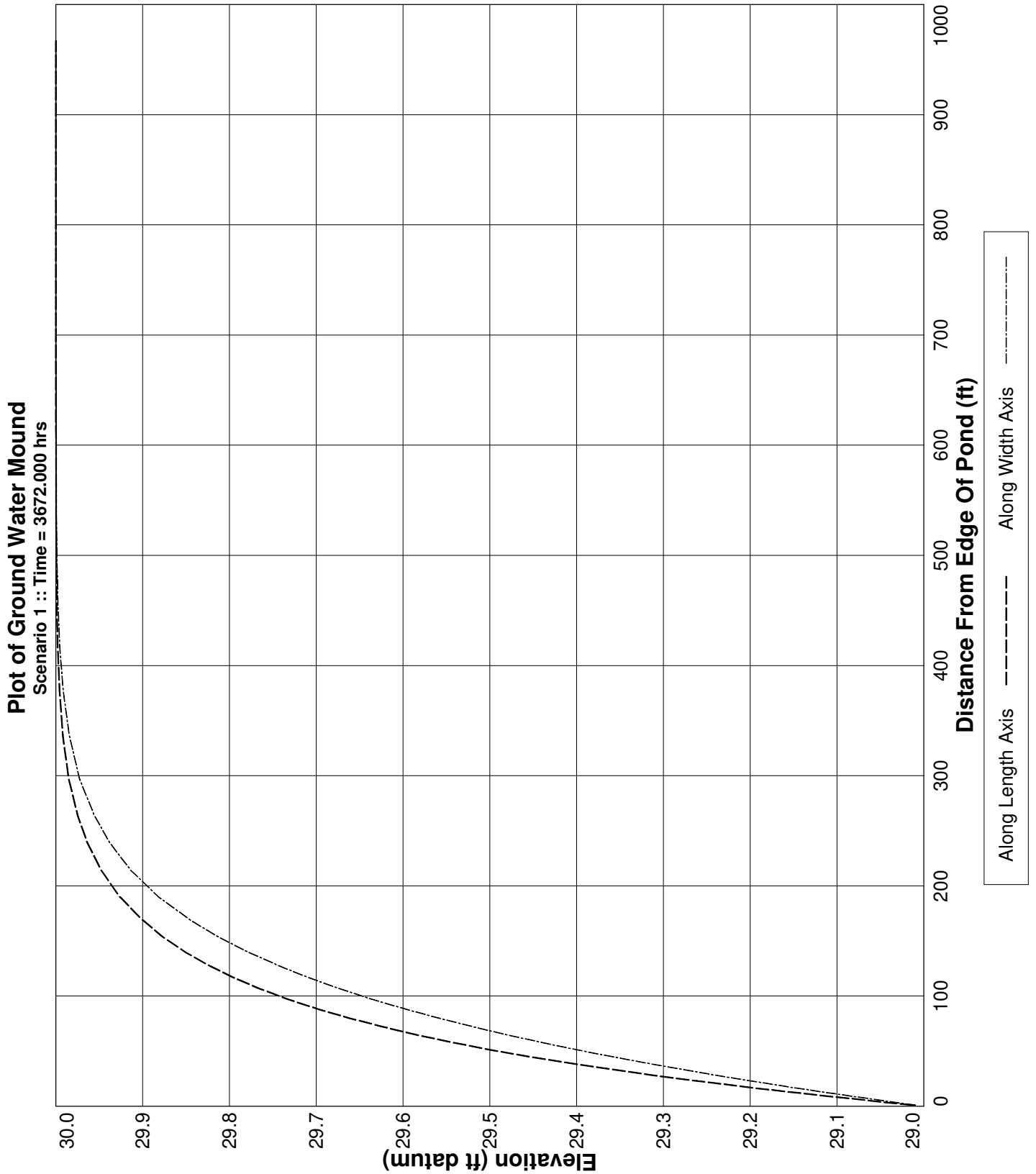
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0019	0.00163	29.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0019	0.00163	29.00000	-0.00050	3.345602E-03	2567.000	355.7	2211.309	S
734.400	0.0019	0.00163	29.00000	-0.00122	3.083899E-03	5134.000	-1327.0	6460.952	S
1101.600	0.0019	0.00163	29.00000	-0.00123	3.147738E-03	7701.000	-2878.8	10579.81	S
1468.800	0.0019	0.00163	29.00000	-0.00139	3.319449E-03	10268.000	-4586.4	14854.37	S
1836.000	0.0019	0.00163	29.00000	-0.00158	3.525825E-03	12835.000	-6543.8	19378.82	S
2203.200	0.0019	0.00163	29.00000	-0.00179	3.734258E-03	15402.000	-8775.4	24177.44	S
2570.400	0.0019	0.00163	29.00000	-0.00200	3.939554E-03	17969.000	-11280.5	29249.53	S
2937.600	0.0019	0.00163	29.00000	-0.00219	4.135125E-03	20536.000	-14050.6	34586.57	S
3304.800	0.0019	0.00163	29.00000	-0.00238	4.32465E-03	23103.000	-17075.1	40178.14	S
3672.000	0.0019	0.00163	29.00000	----	----	25670.000	-20342.3	46012.31	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 11, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 6.00  
Water Table Elevation, [WT] (ft datum): 30.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.10  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 631.0  
Equivalent Pond Width, [W] (ft): 83.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
11.00	435.6
29.00	52272.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	29.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 12:15:45

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

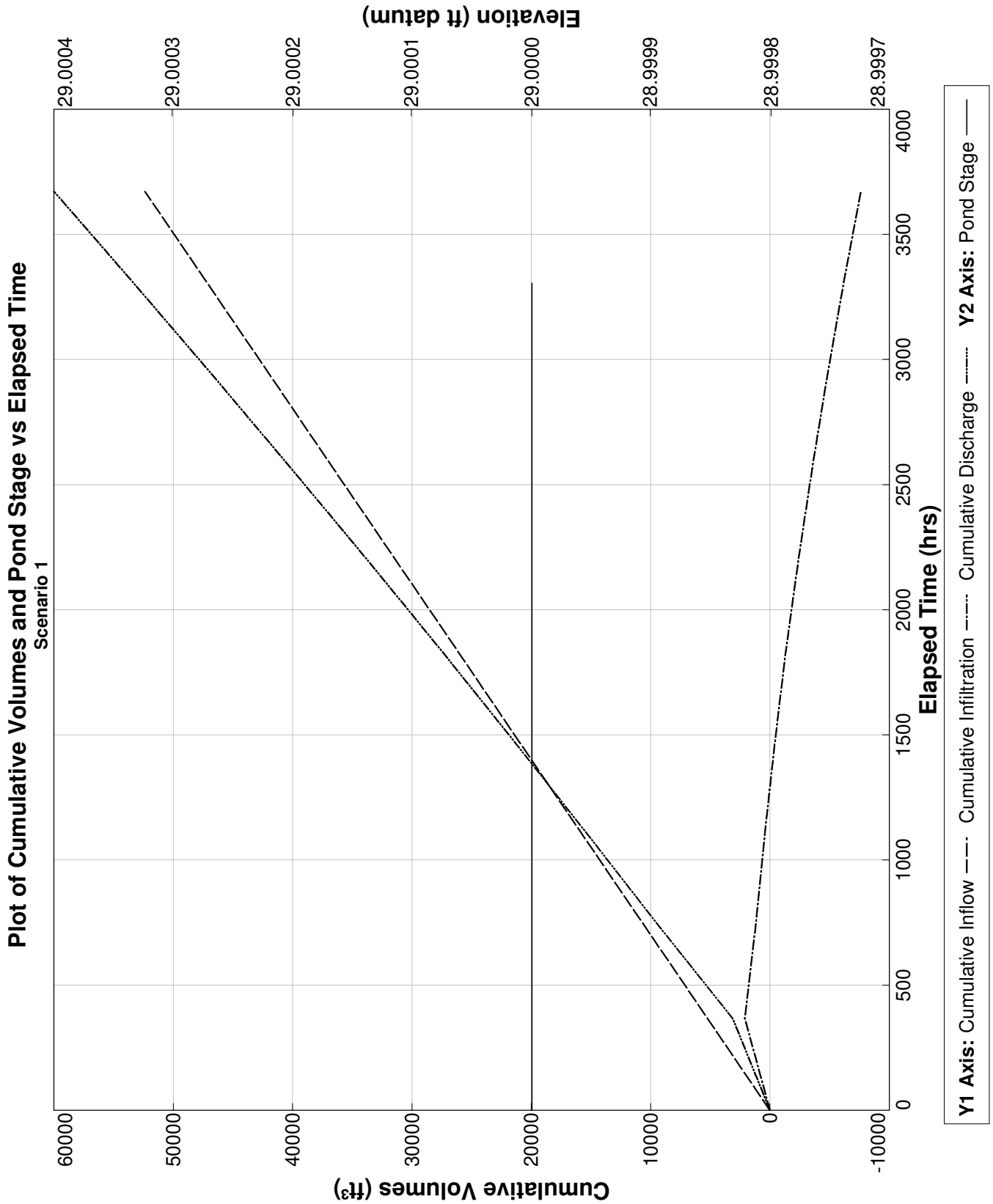
Baseflow hydrograph: Initial GWT (seasonal low) is 29.0 ft.

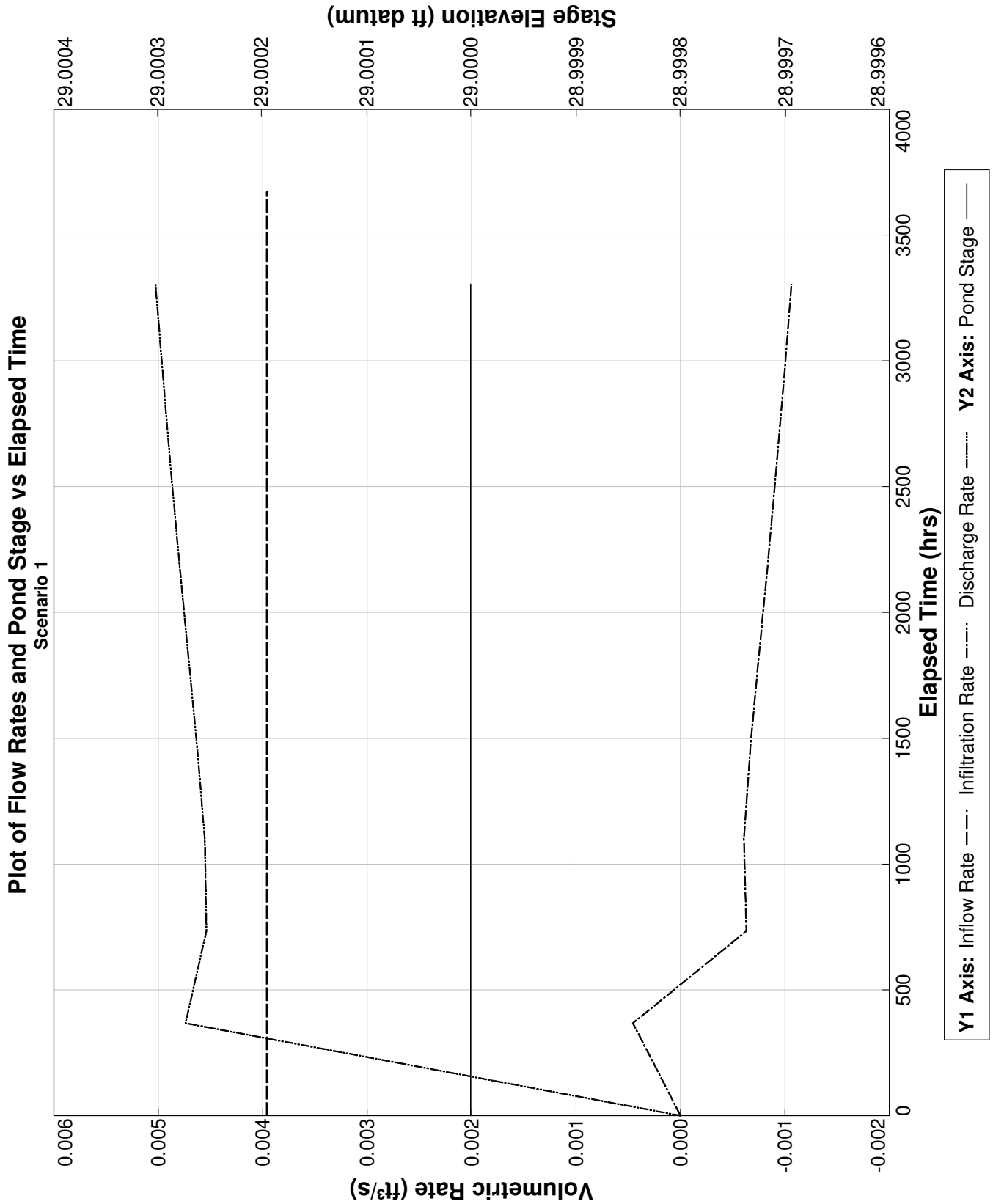
End Scenario 1 3/31/2023 12:15:45

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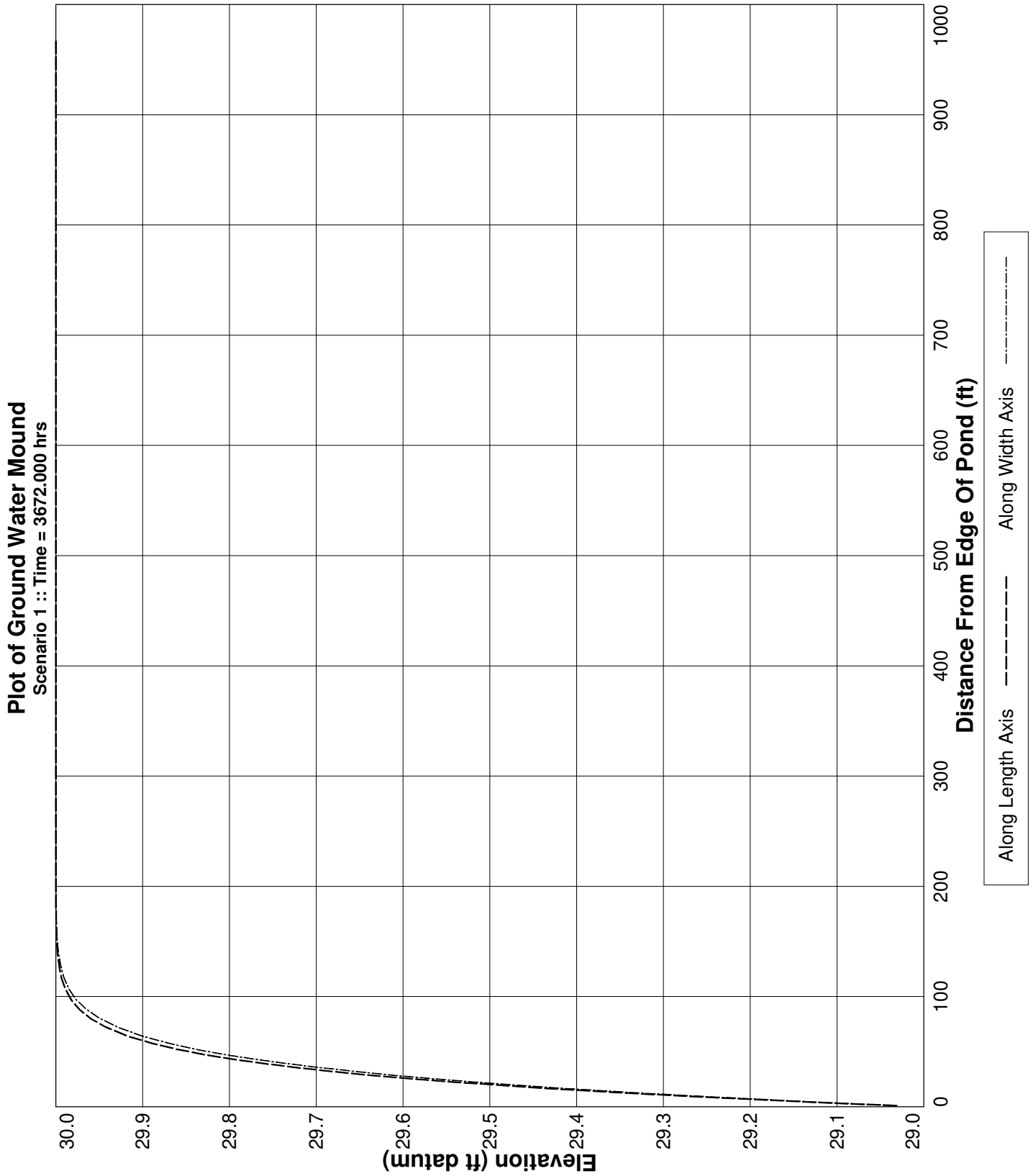
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0040	0.00163	29.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0040	0.00163	29.00000	0.00046	4.740395E-03	5237.300	2104.1	3133.211	S
734.400	0.0040	0.00163	29.00000	-0.00063	4.538212E-03	10474.600	1208.6	9266	S
1101.600	0.0040	0.00163	29.00000	-0.00061	4.55431E-03	15711.900	436.1	15275.79	S
1468.800	0.0040	0.00163	29.00000	-0.00067	4.628967E-03	20949.200	-396.4	21345.57	S
1836.000	0.0040	0.00163	29.00000	-0.00075	4.715512E-03	26186.500	-1335.4	27521.9	S
2203.200	0.0040	0.00163	29.00000	-0.00084	4.800458E-03	31423.800	-2387.8	33811.57	S
2570.400	0.0040	0.00163	29.00000	-0.00092	4.88062E-03	36661.100	-3549.3	40210.38	S
2937.600	0.0040	0.00163	29.00000	-0.00099	4.955844E-03	41898.400	-4813.5	46711.89	S
3304.800	0.0040	0.00163	29.00000	-0.00106	5.026721E-03	47135.700	-6174.3	53309.96	S
3672.000	0.0040	0.00163	29.00000	----	----	52373.000	-7626.3	59999.3	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 12, Northwest Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-28-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -1.00  
Water Table Elevation, [WT] (ft datum): 31.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 624.0  
Equivalent Pond Width, [W] (ft): 159.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
4.00	435.6
29.00	99316.8

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	30.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/28/2023 16:40:7

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 30.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 7 of 10 saturated stress periods.

Maximum calculated water budget error is -2.61376306669389 percent, for saturated stress period 2.

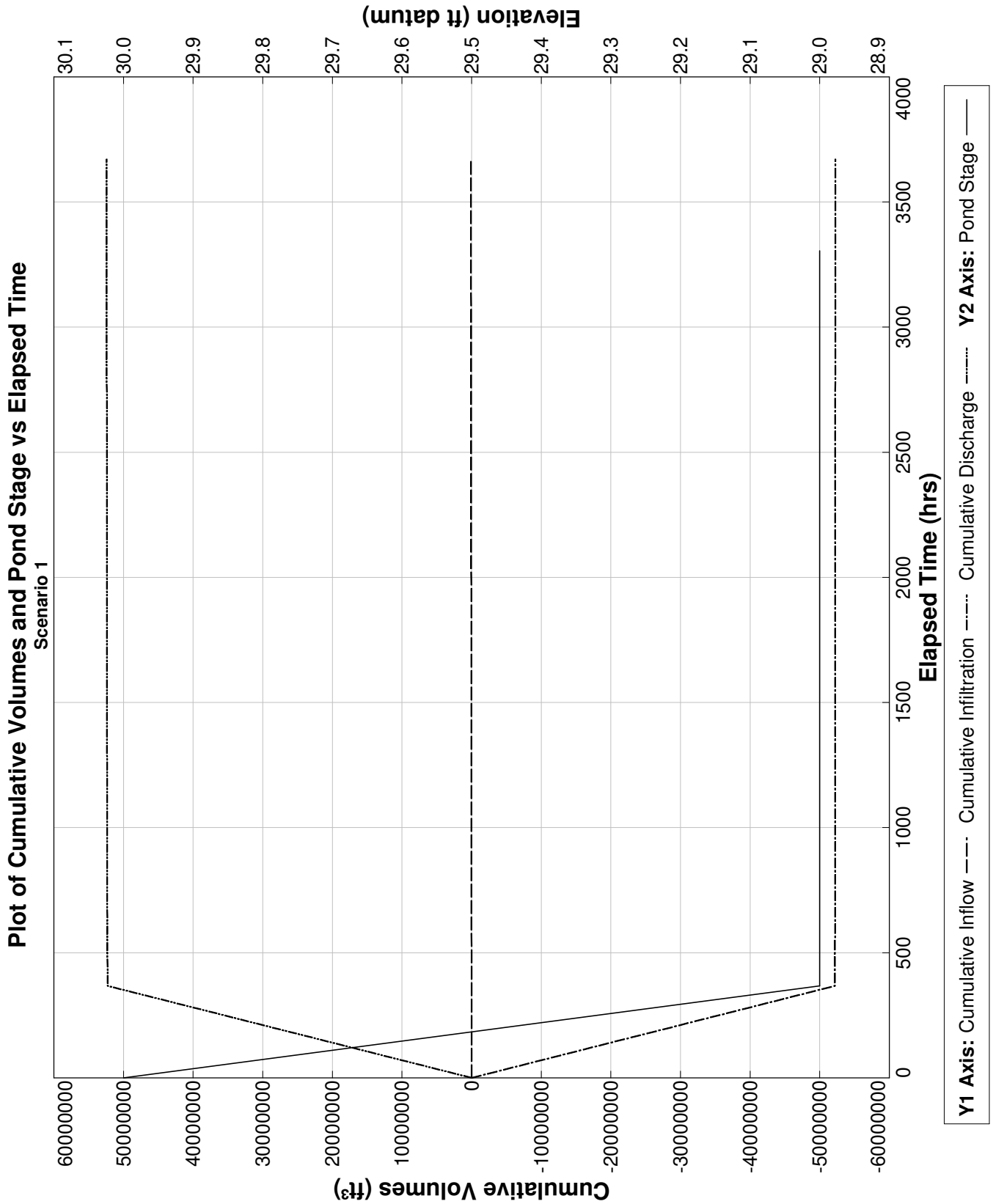
If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

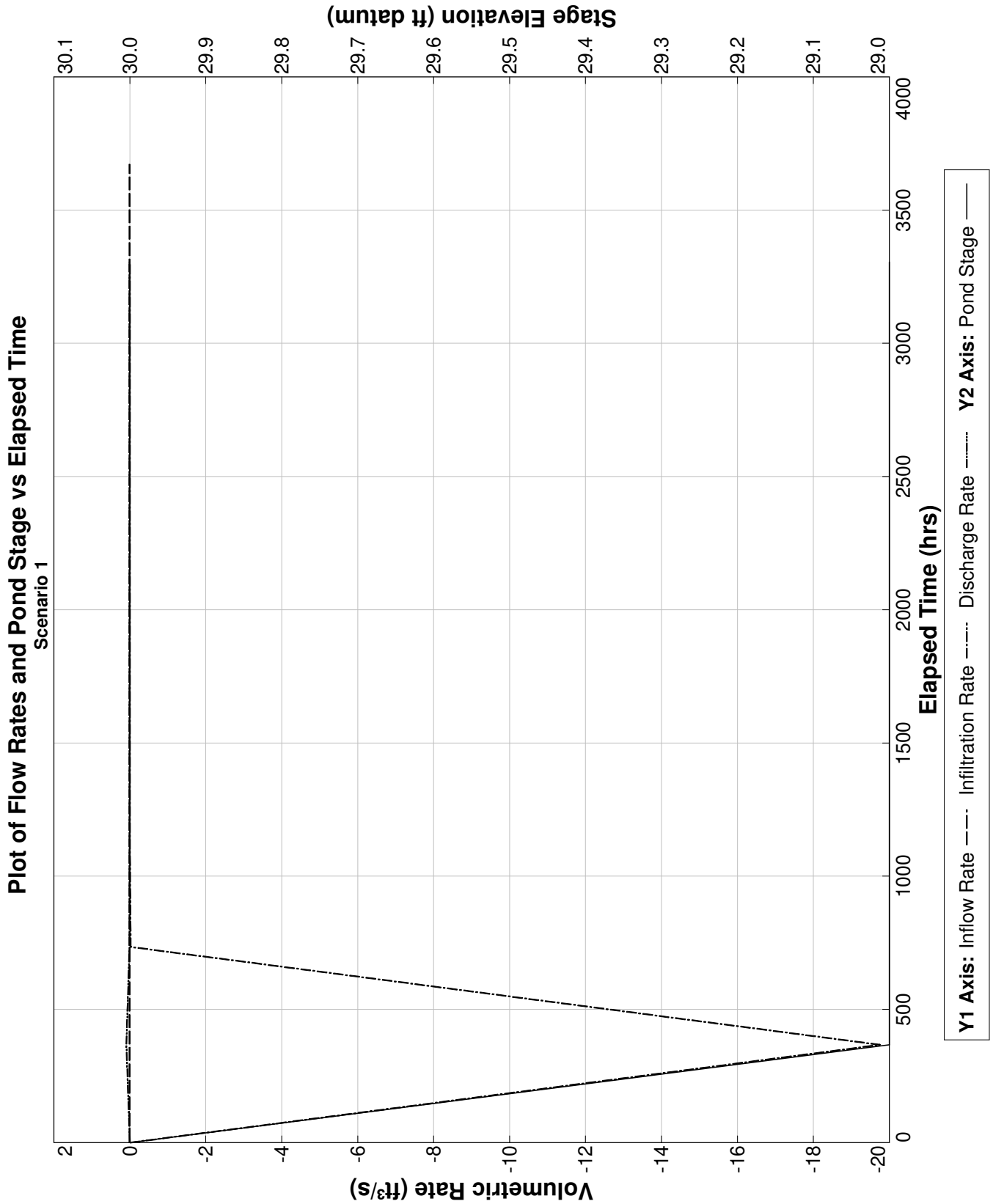
End Scenario 1 3/28/2023 16:40:8

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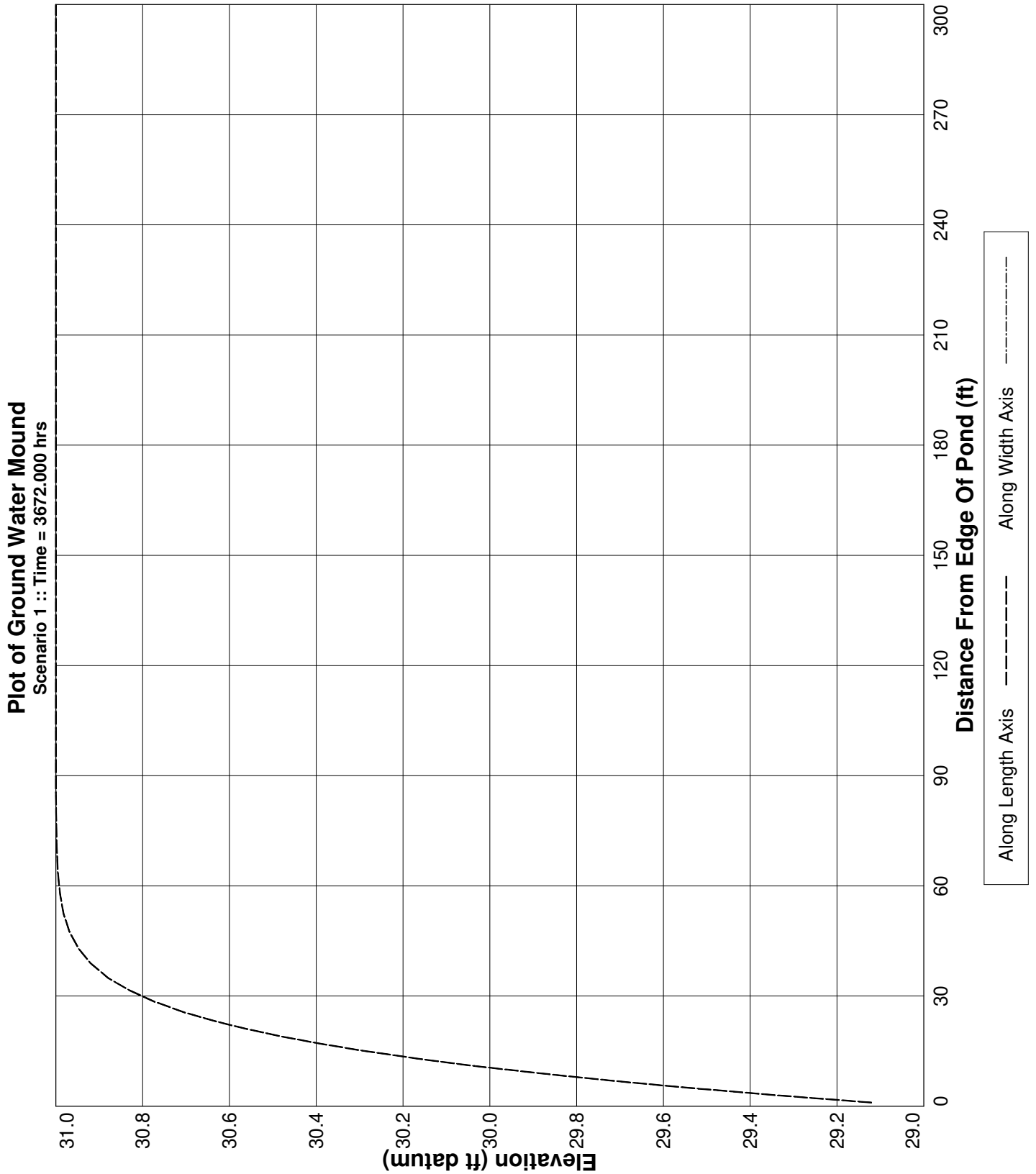
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0075	0.00163	30.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0075	0.00163	29.00000	-19.75219	8.858397E-02	9921.600	-52165150.0	5.227439E+07	S
734.400	0.0075	0.00163	29.00000	-0.02280	1.186784E-02	19843.200	-52221620.0	5.234078E+07	S
1101.600	0.0075	0.00163	29.00000	-0.00199	8.883448E-03	29764.800	-52225420.0	5.23545E+07	S
1468.800	0.0075	0.00163	29.00000	-0.00095	8.355952E-03	39686.400	-52226890.0	5.23659E+07	S
1836.000	0.0075	0.00163	29.00000	-0.00076	8.244227E-03	49608.000	-52227940.0	5.237687E+07	S
2203.200	0.0075	0.00163	29.00000	-0.00072	8.219917E-03	59529.600	-52228900.0	5.238775E+07	S
2570.400	0.0075	0.00163	29.00000	-0.00071	8.217948E-03	69451.200	-52229850.0	5.239862E+07	S
2937.600	0.0075	0.00163	29.00000	-0.00072	8.223579E-03	79372.800	-52230790.0	5.240948E+07	S
3304.800	0.0075	0.00163	29.00000	-0.00073	8.232679E-03	89294.400	-52231750.0	5.242036E+07	S
3672.000	0.0075	0.00163	29.00000	----	----	99216.000	-52232720.0	5.243125E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 12, West Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-28-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -1.00  
Water Table Elevation, [WT] (ft datum): 32.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 624.0  
Equivalent Pond Width, [W] (ft): 159.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
4.00	435.6
29.00	99316.8

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	31.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/28/2023 16:42:51

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

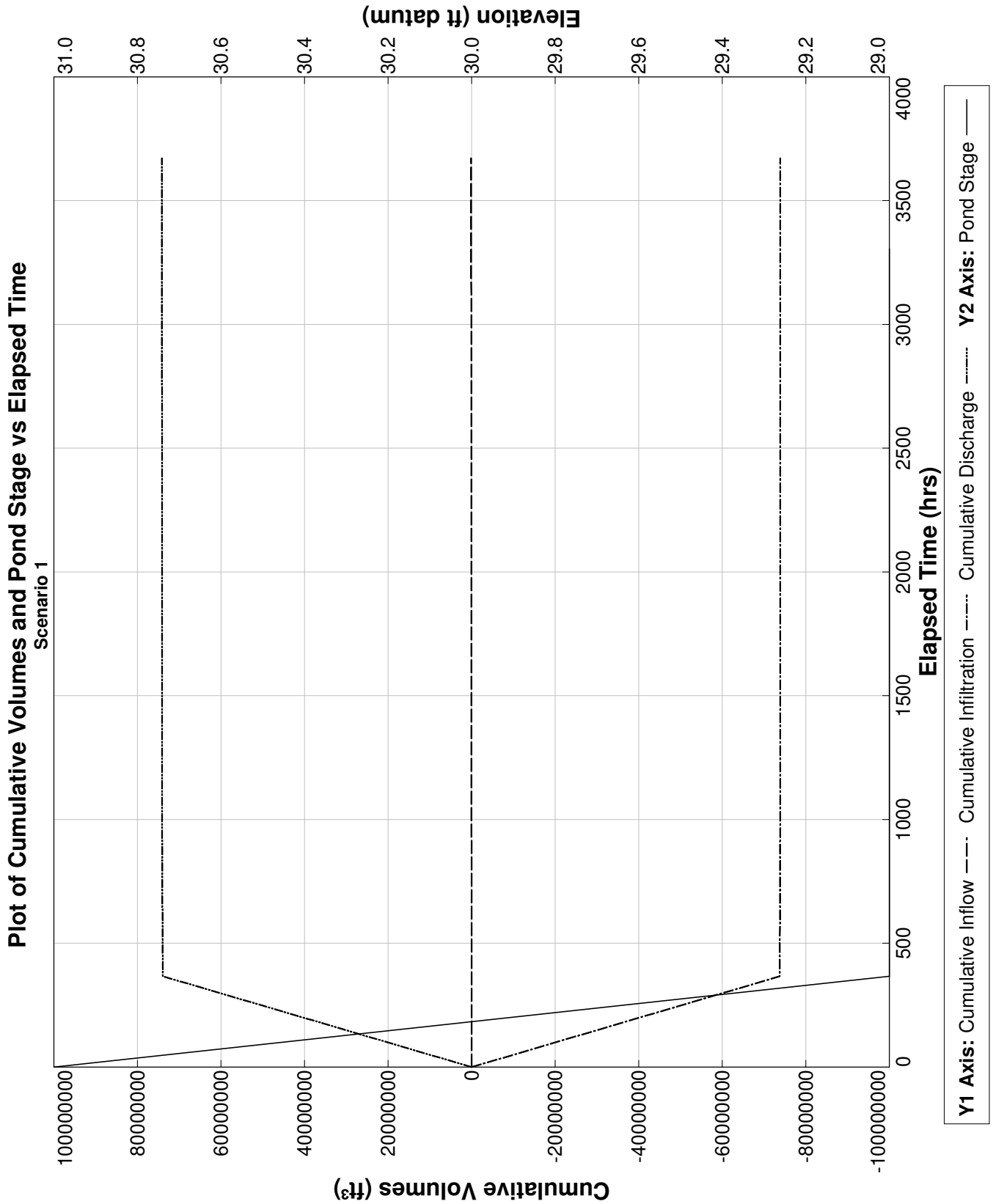
Baseflow hydrograph: Initial GWT (seasonal low) is 31.0 ft.

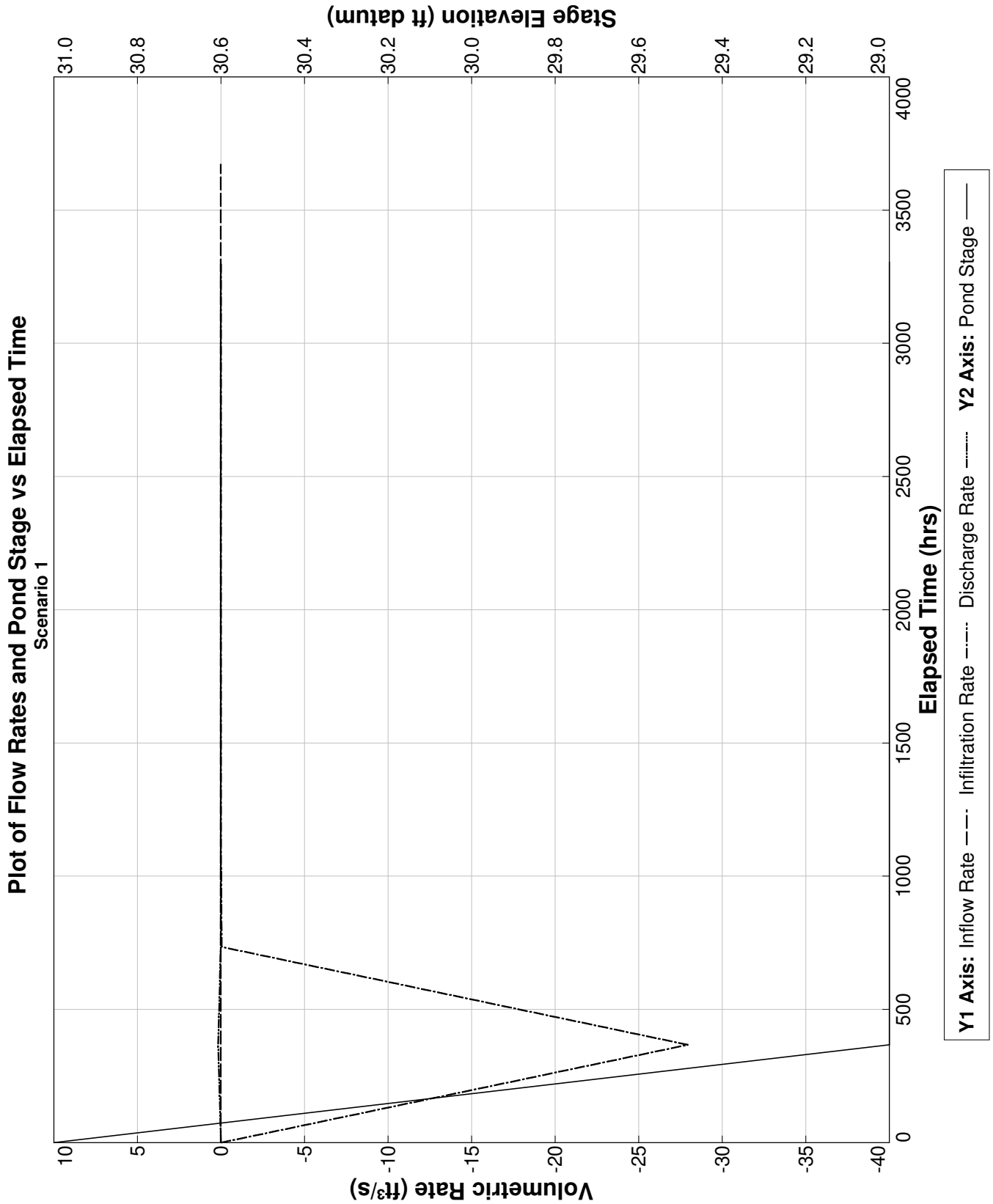
End Scenario 1 3/28/2023 16:42:51

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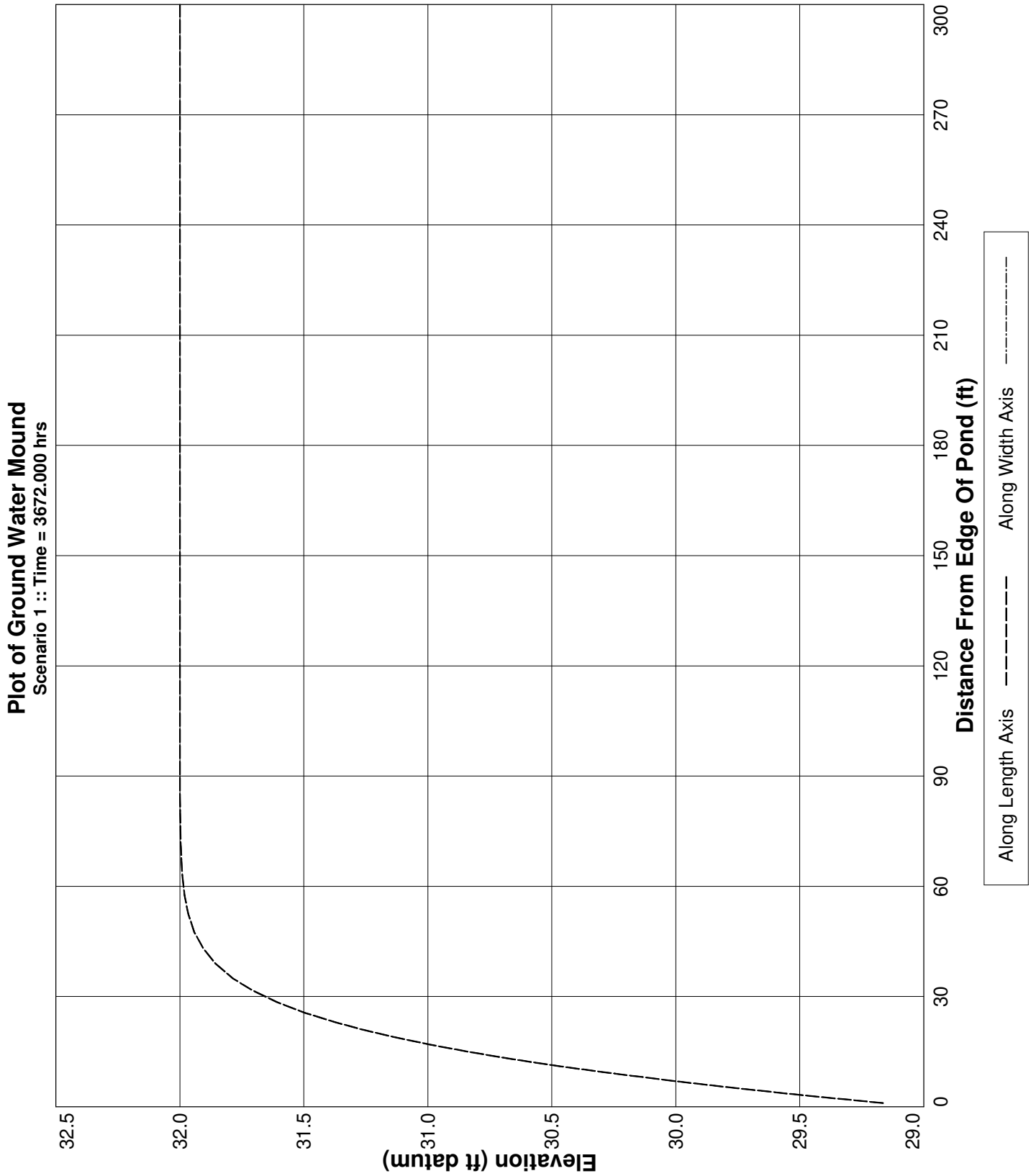
**Detailed Results** :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0075	0.00163	31.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0075	0.00163	29.00001	-27.93187	.1625711	9921.600	-73743250.0	7.39518E+07	S
734.400	0.0075	0.00163	29.00000	-0.04039	9.99731E-03	19843.200	-73847380.0	7.406586E+07	S
1101.600	0.0075	0.00163	29.00000	-0.00168	9.008654E-03	29764.800	-73850020.0	7.407842E+07	S
1468.800	0.0075	0.00163	29.00000	-0.00127	8.733992E-03	39686.400	-73851830.0	7.409015E+07	S
1836.000	0.0075	0.00163	29.00000	-0.00113	8.626942E-03	49608.000	-73853380.0	7.410162E+07	S
2203.200	0.0075	0.00163	29.00000	-0.00107	8.573778E-03	59529.600	-73854830.0	7.41113E+07	S
2570.400	0.0075	0.00163	29.00000	-0.00104	8.543964E-03	69451.200	-73856220.0	7.412431E+07	S
2937.600	0.0075	0.00163	29.00000	-0.00102	8.526739E-03	79372.800	-73857580.0	7.413559E+07	S
3304.800	0.0075	0.00163	29.00000	-0.00101	8.517257E-03	89294.400	-73858930.0	7.414686E+07	S
3672.000	0.0075	0.00163	29.00000	----	----	99216.000	-73860260.0	7.415811E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 12, Southwest Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-28-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -1.00  
Water Table Elevation, [WT] (ft datum): 30.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 624.0  
Equivalent Pond Width, [W] (ft): 159.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
4.00	435.6
29.00	99316.8

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Retention Pond Recovery - Refined Method**  
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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	29.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/28/2023 16:45:36

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 29.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 5 of 10 saturated stress periods.

Maximum calculated water budget error is -4.25636049663616 percent, for saturated stress period 1.

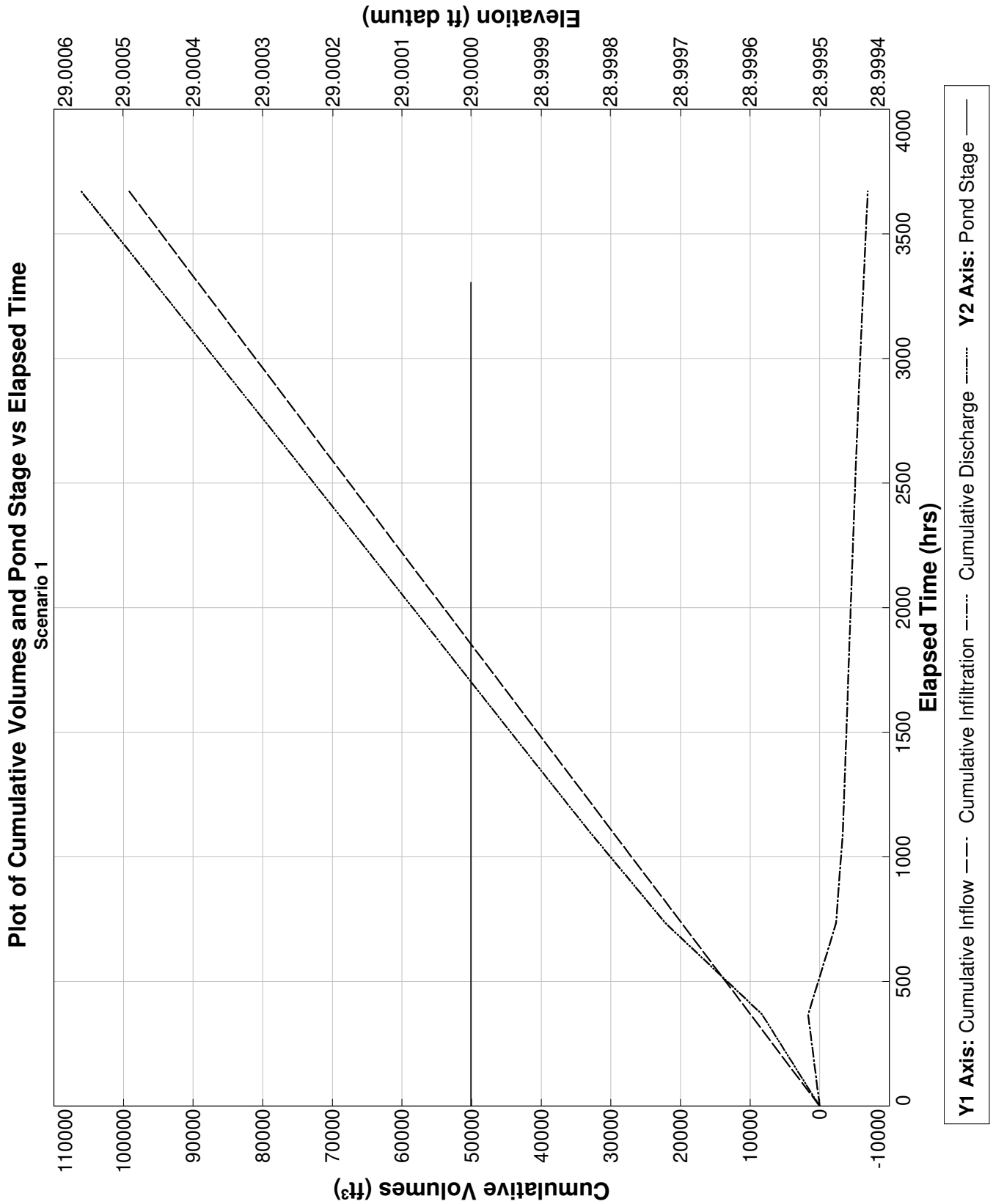
If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

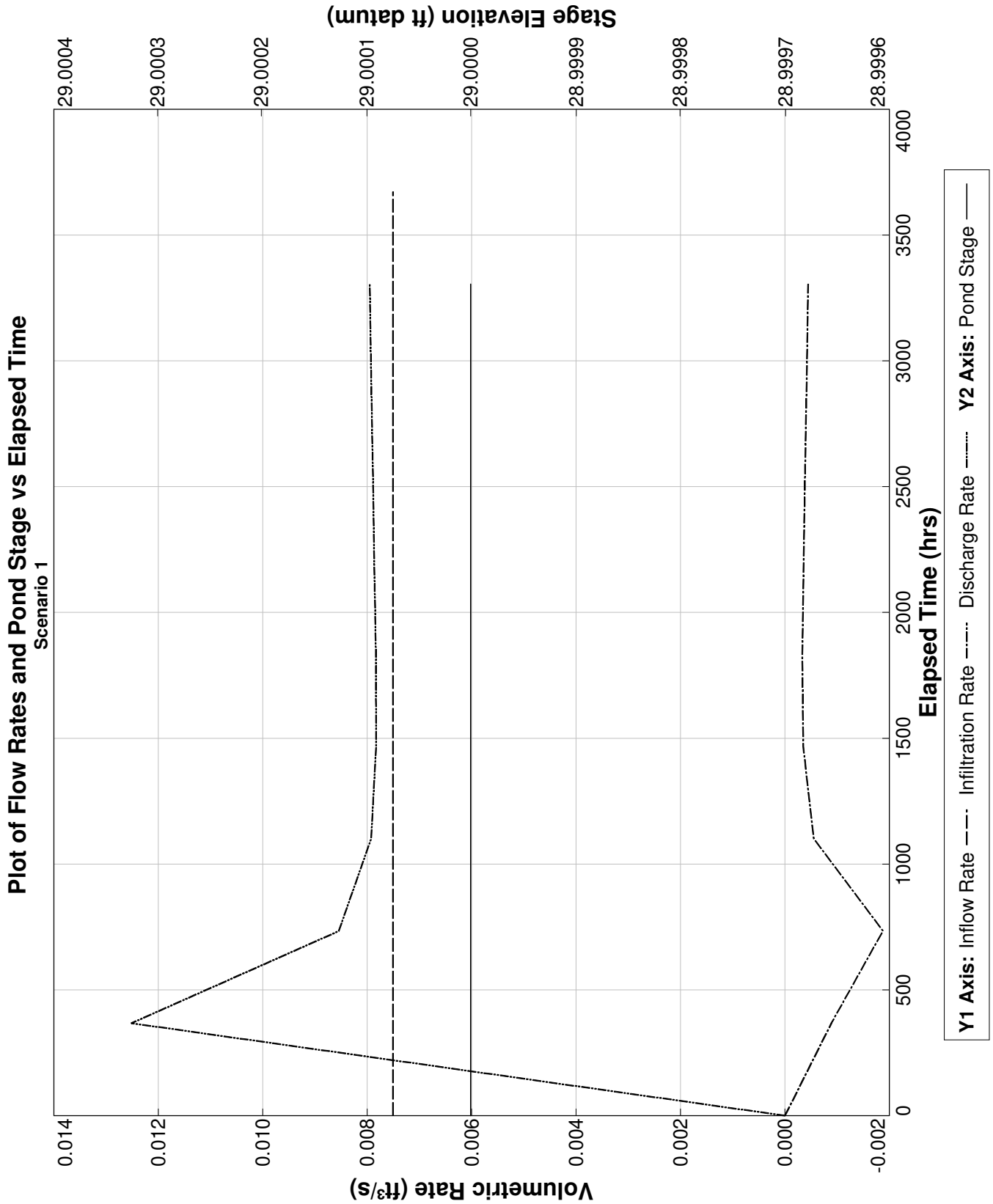
End Scenario 1 3/28/2023 16:45:37

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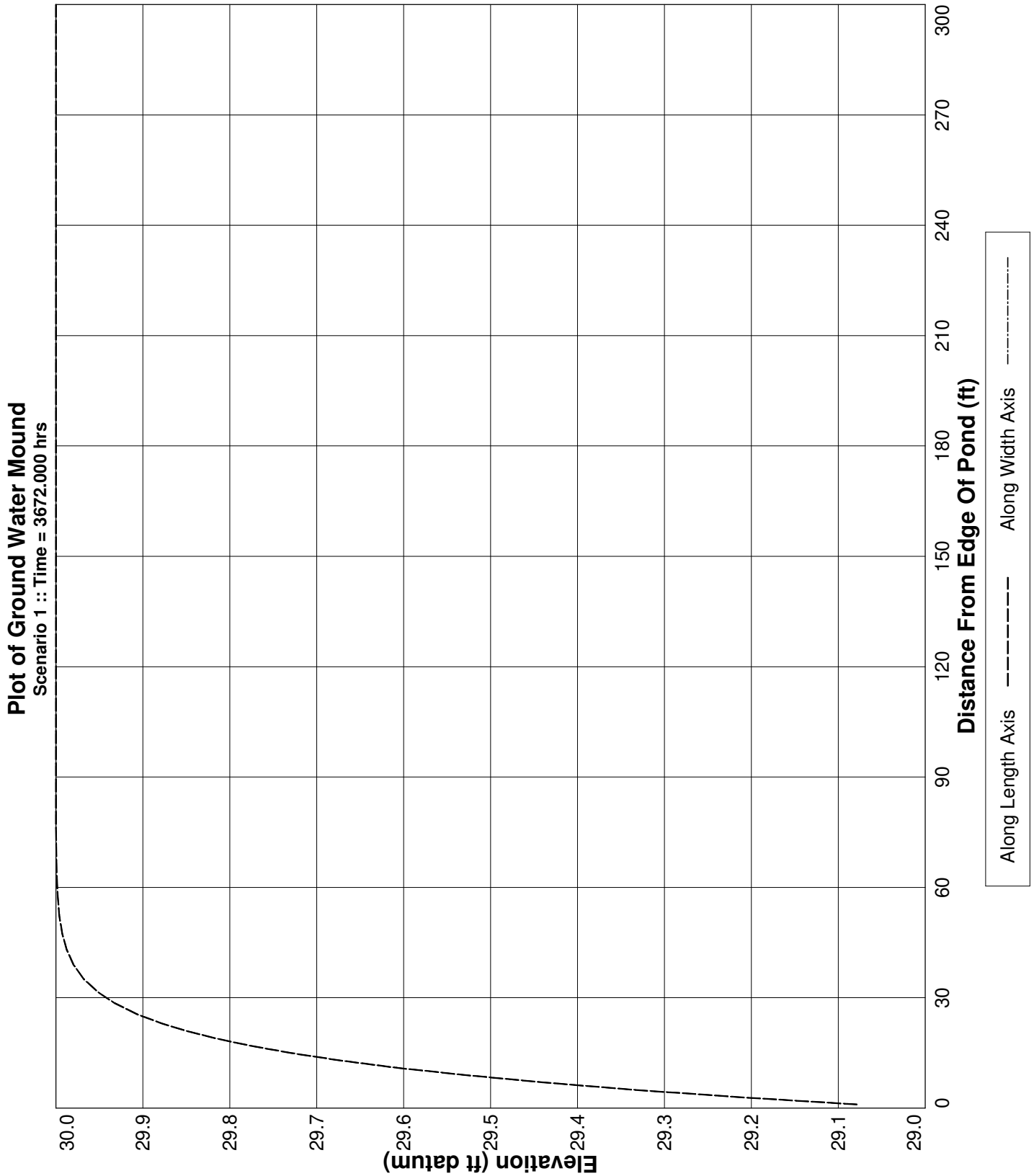
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0075	0.00163	29.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0075	0.00163	29.00000	-0.00089	1.251681E-02	9921.600	1648.5	8273.113	S
734.400	0.0075	0.00163	29.00000	-0.00188	8.545865E-03	19843.200	-2351.5	22194.7	S
1101.600	0.0075	0.00163	29.00000	-0.00055	7.925722E-03	29764.800	-3317.0	33081.76	S
1468.800	0.0075	0.00163	29.00000	-0.00035	7.827315E-03	39686.400	-3807.5	43493.89	S
1836.000	0.0075	0.00163	29.00000	-0.00033	7.834828E-03	49608.000	-4237.9	53845.94	S
2203.200	0.0075	0.00163	29.00000	-0.00036	7.862953E-03	59529.600	-4691.9	64221.54	S
2570.400	0.0075	0.00163	29.00000	-0.00039	7.893566E-03	69451.200	-5184.8	74635.98	S
2937.600	0.0075	0.00163	29.00000	-0.00042	7.923078E-03	79372.800	-5717.3	85090.14	S
3304.800	0.0075	0.00163	29.00000	-0.00045	7.950997E-03	89294.400	-6287.9	95582.27	S
3672.000	0.0075	0.00163	29.00000	----	----	99216.000	-6894.3	106110.3	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 13, North, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 6.00  
Water Table Elevation, [WT] (ft datum): 27.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.03  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 463.0  
Equivalent Pond Width, [W] (ft): 72.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
16.00	435.6
29.00	33541.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	26.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 12:43:2

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

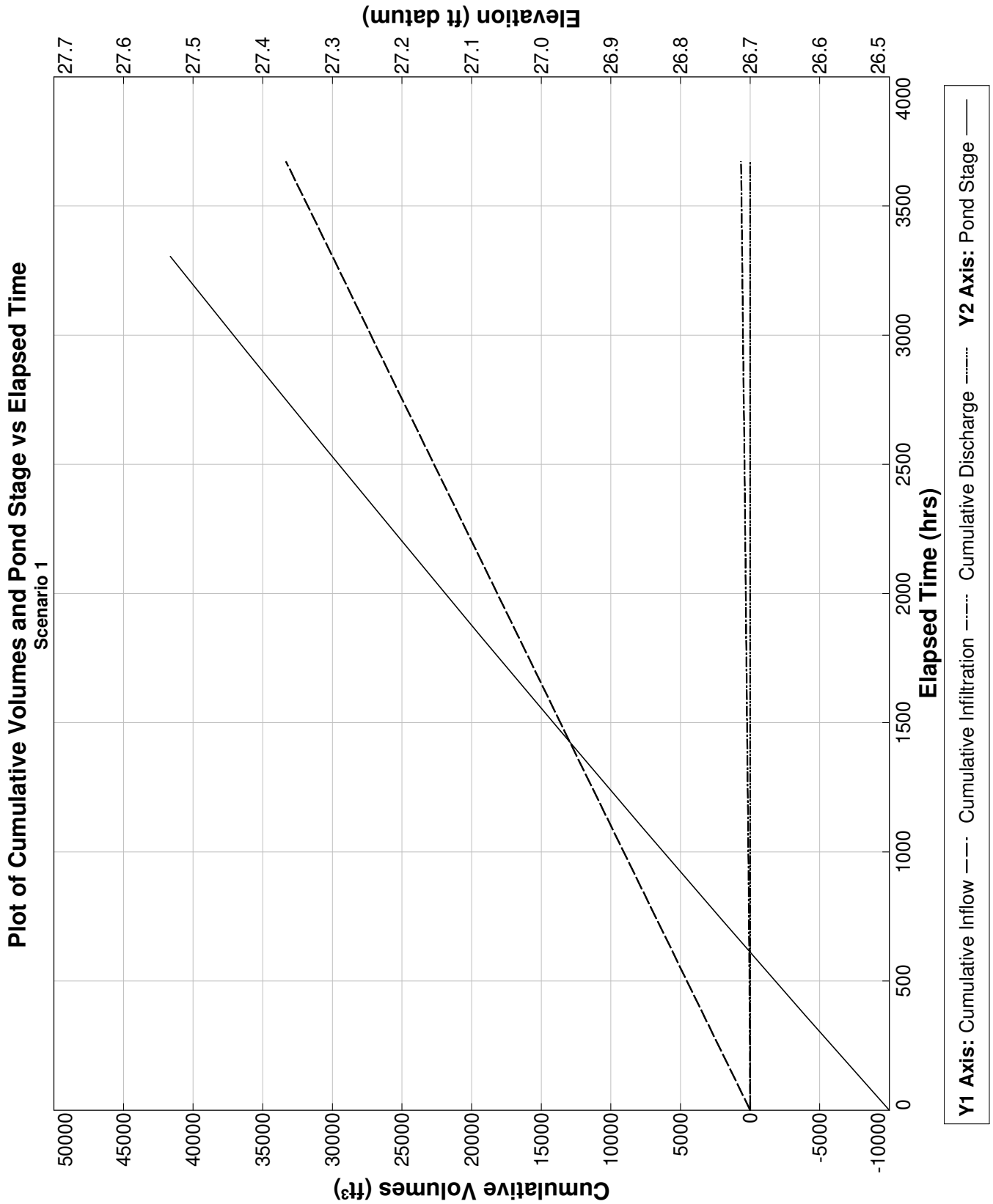
Baseflow hydrograph: Initial GWT (seasonal low) is 26.5 ft.

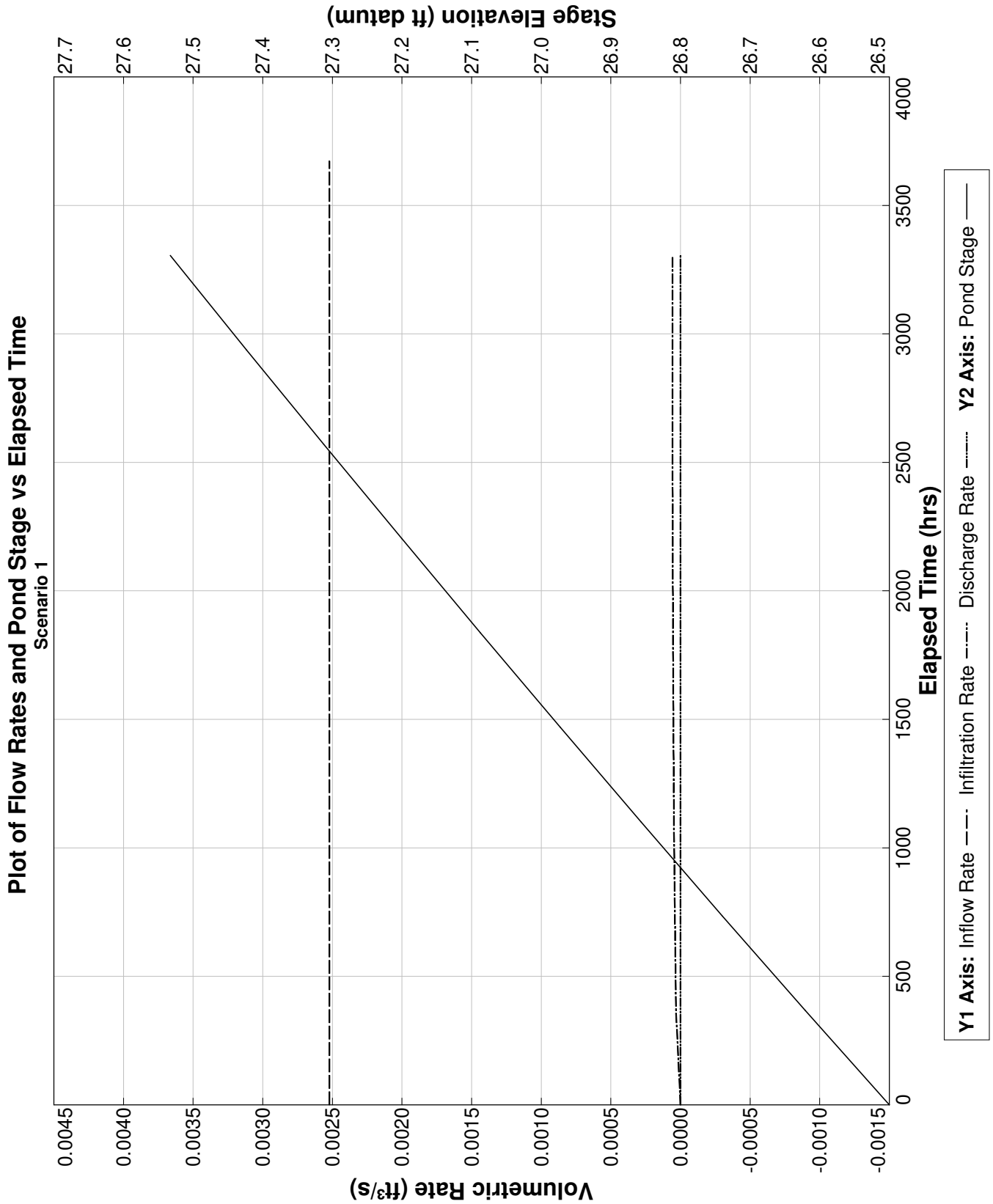
End Scenario 1 3/31/2023 12:43:2

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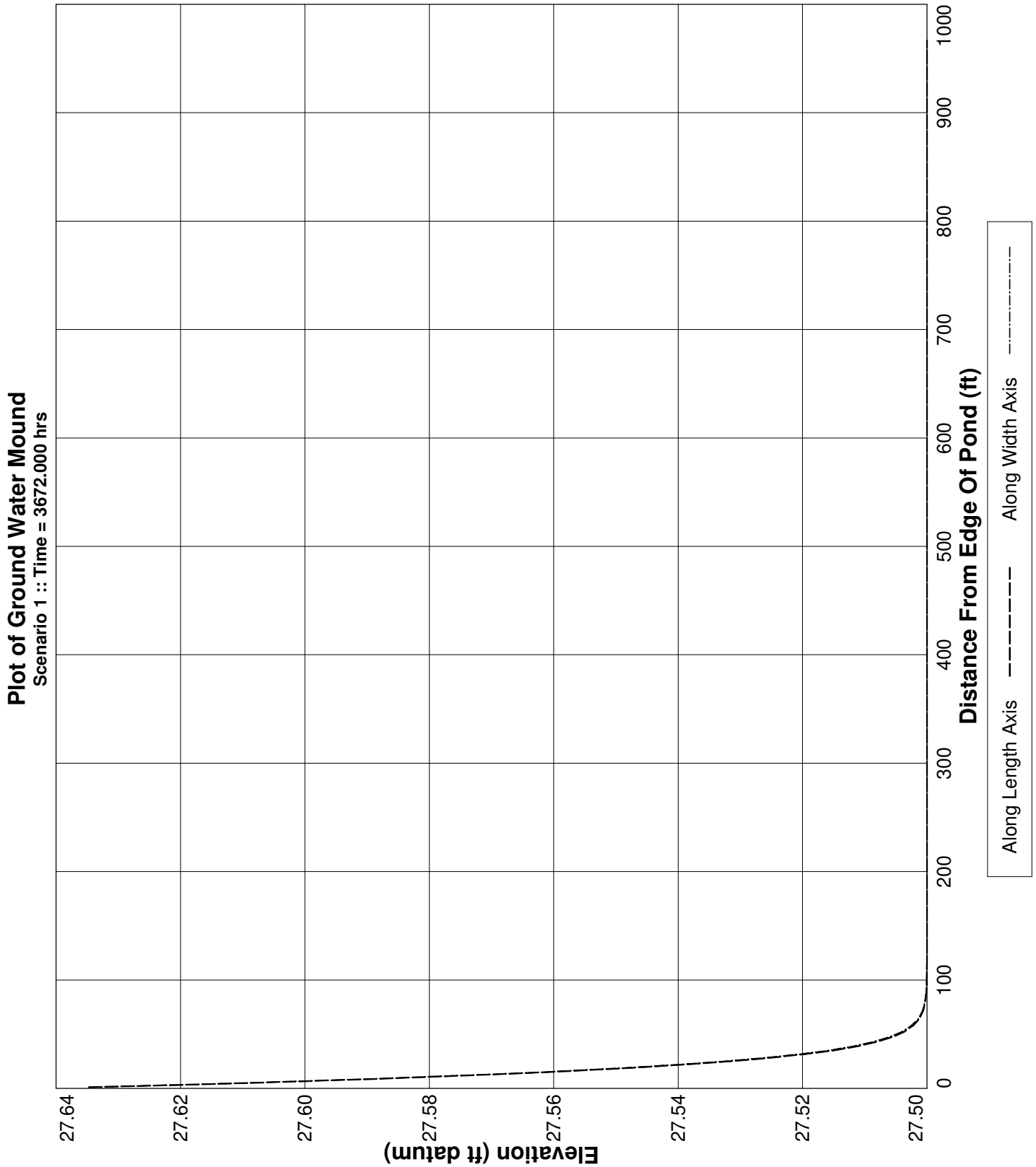
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0025	0.00163	26.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0025	0.00163	26.62074	0.00003	0	3333.600	34.1	0	S
734.400	0.0025	0.00163	26.73960	0.00004	0	6667.200	83.0	0	S
1101.600	0.0025	0.00163	26.85686	0.00005	0	10000.800	141.2	0	S
1468.800	0.0025	0.00163	26.97265	0.00005	0	13334.400	205.8	0	S
1836.000	0.0025	0.00163	27.08710	0.00005	0	16668.000	274.9	0	S
2203.200	0.0025	0.00163	27.20028	0.00006	0	20001.600	347.2	0	S
2570.400	0.0025	0.00163	27.31227	0.00006	0	23335.200	421.7	0	S
2937.600	0.0025	0.00163	27.42314	0.00006	0	26668.800	497.6	0	S
3304.800	0.0025	0.00163	27.53294	0.00006	0	30002.400	574.0	0	S
3672.000	0.0025	0.00163	27.64171	----	----	33336.000	650.6	0	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 13, South, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 6.00  
Water Table Elevation, [WT] (ft datum): 29.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.03  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 463.0  
Equivalent Pond Width, [W] (ft): 72.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
16.00	435.6
29.00	33541.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	28.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 12:44:17

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

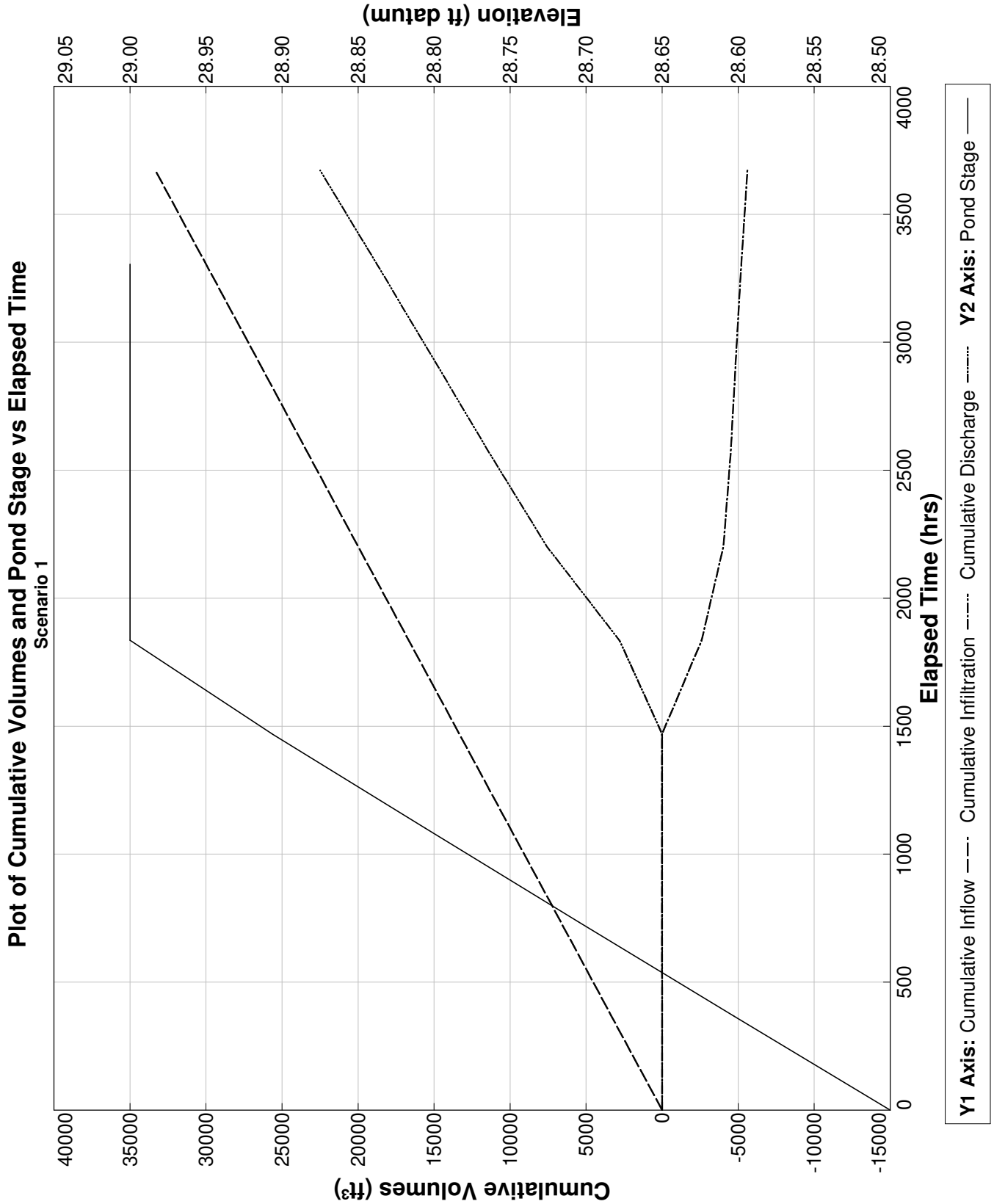
Baseflow hydrograph: Initial GWT (seasonal low) is 28.5 ft.

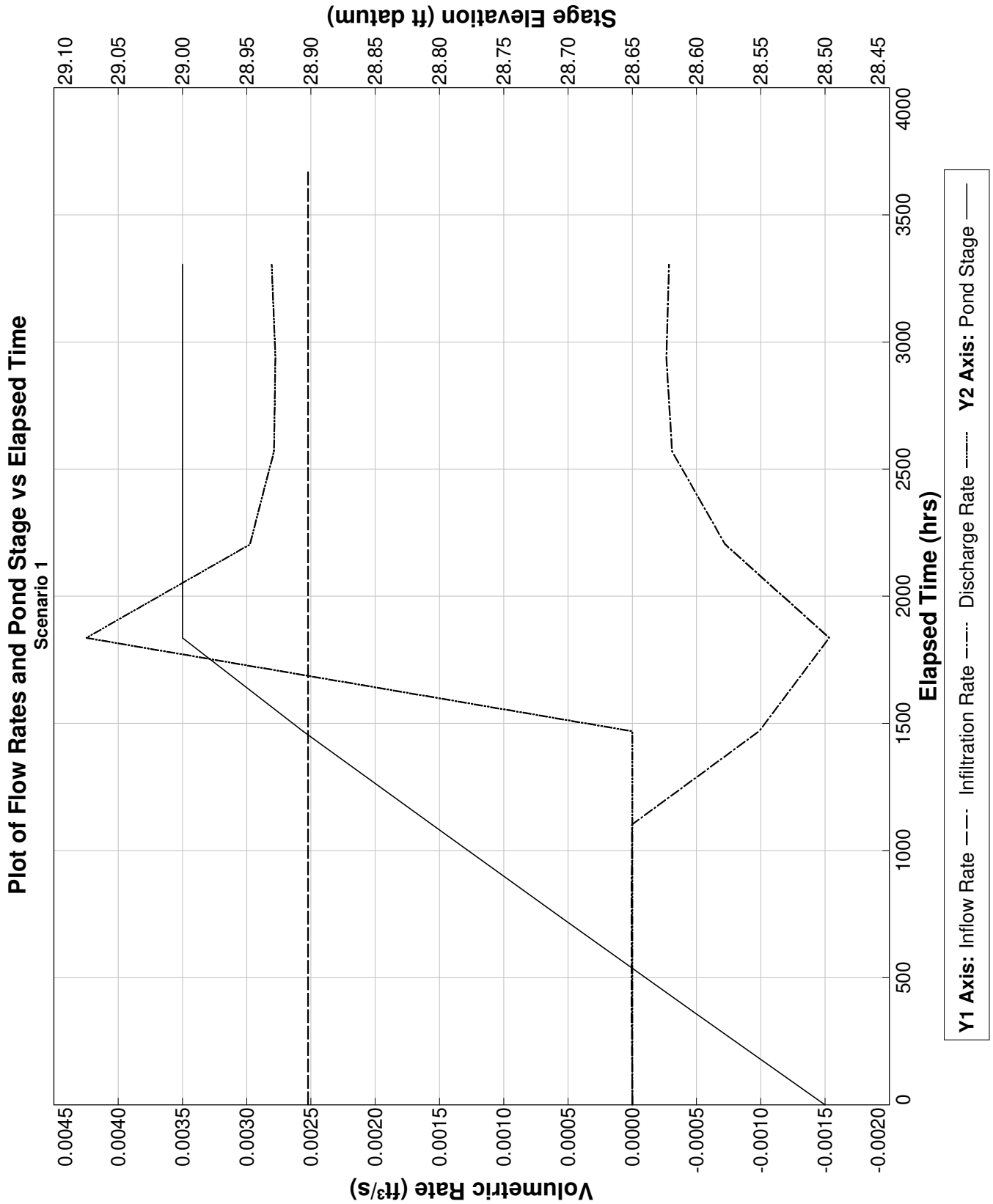
End Scenario 1 3/31/2023 12:44:17

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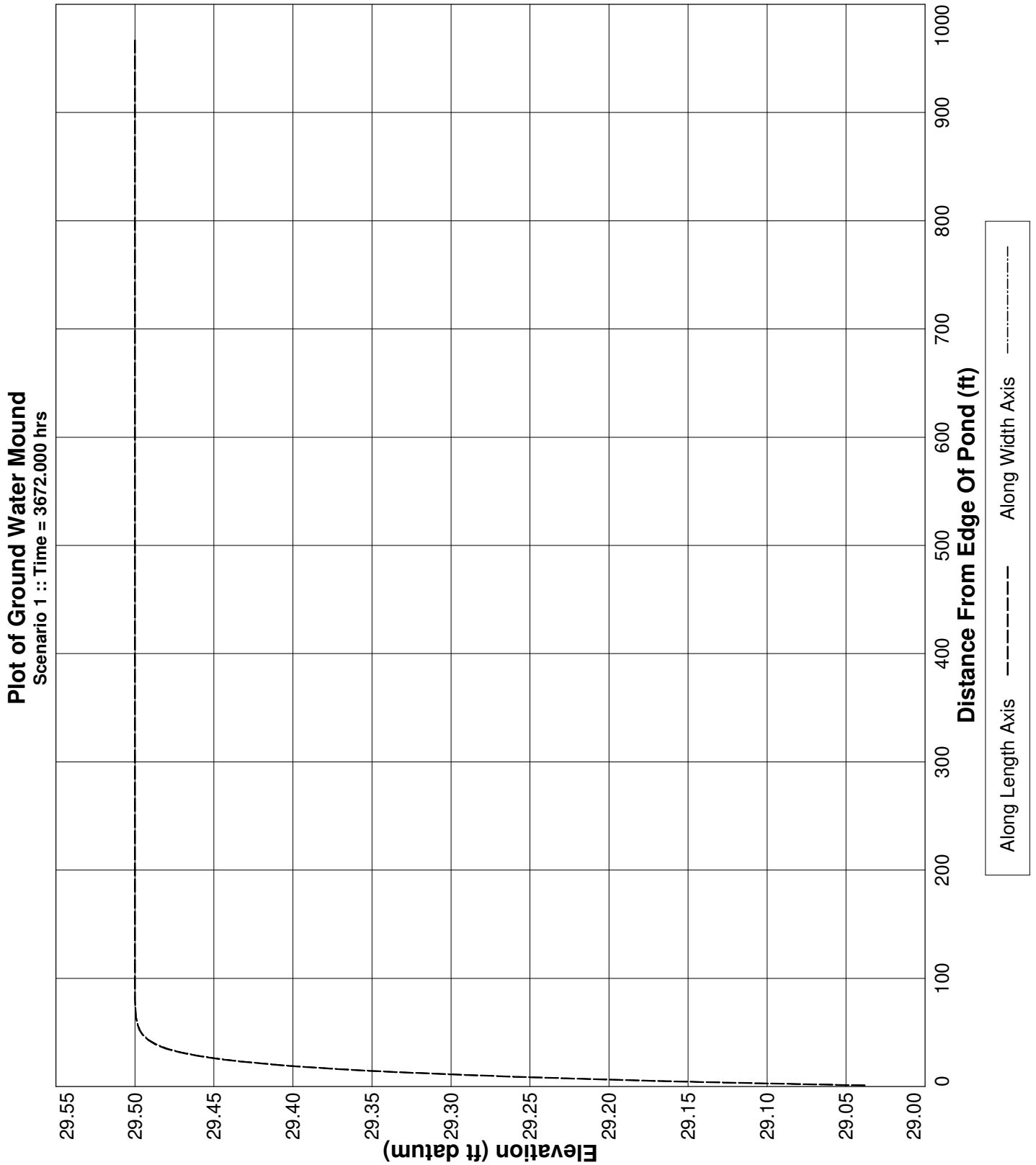
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0025	0.00163	28.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0025	0.00163	28.60275	0.00000	0	3333.600	4.8	0	S
734.400	0.0025	0.00163	28.70464	0.00000	0	6667.200	10.5	0	S
1101.600	0.0025	0.00163	28.80575	0.00000	0	10000.800	16.0	0	S
1468.800	0.0025	0.00163	28.90610	-0.00099	0	13334.400	20.5	0	S
1836.000	0.0025	0.00163	29.00000	-0.00153	4.248271E-03	16668.000	-2592.2	2807.937	S
2203.200	0.0025	0.00163	29.00000	-0.00072	2.975078E-03	20001.600	-4033.0	7582.282	S
2570.400	0.0025	0.00163	29.00000	-0.00031	2.786692E-03	23335.200	-4507.7	11390.58	S
2937.600	0.0025	0.00163	29.00000	-0.00027	2.777155E-03	26668.800	-4851.5	15068.06	S
3304.800	0.0025	0.00163	29.00000	-0.00029	.0028063	30002.400	-5208.4	18758.5	S
3672.000	0.0025	0.00163	29.00000	----	----	33336.000	-5608.1	22491.84	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.14, West Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-23-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -6.00  
Water Table Elevation, [WT] (ft datum): 31.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.03  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 292.0  
Equivalent Pond Width, [W] (ft): 155.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
4.00	435.6
29.00	45302.4

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	30.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/23/2023 16:48:46

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 30.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 5 of 10 saturated stress periods.

Maximum calculated water budget error is -3.68732921662173 percent, for saturated stress period 1.

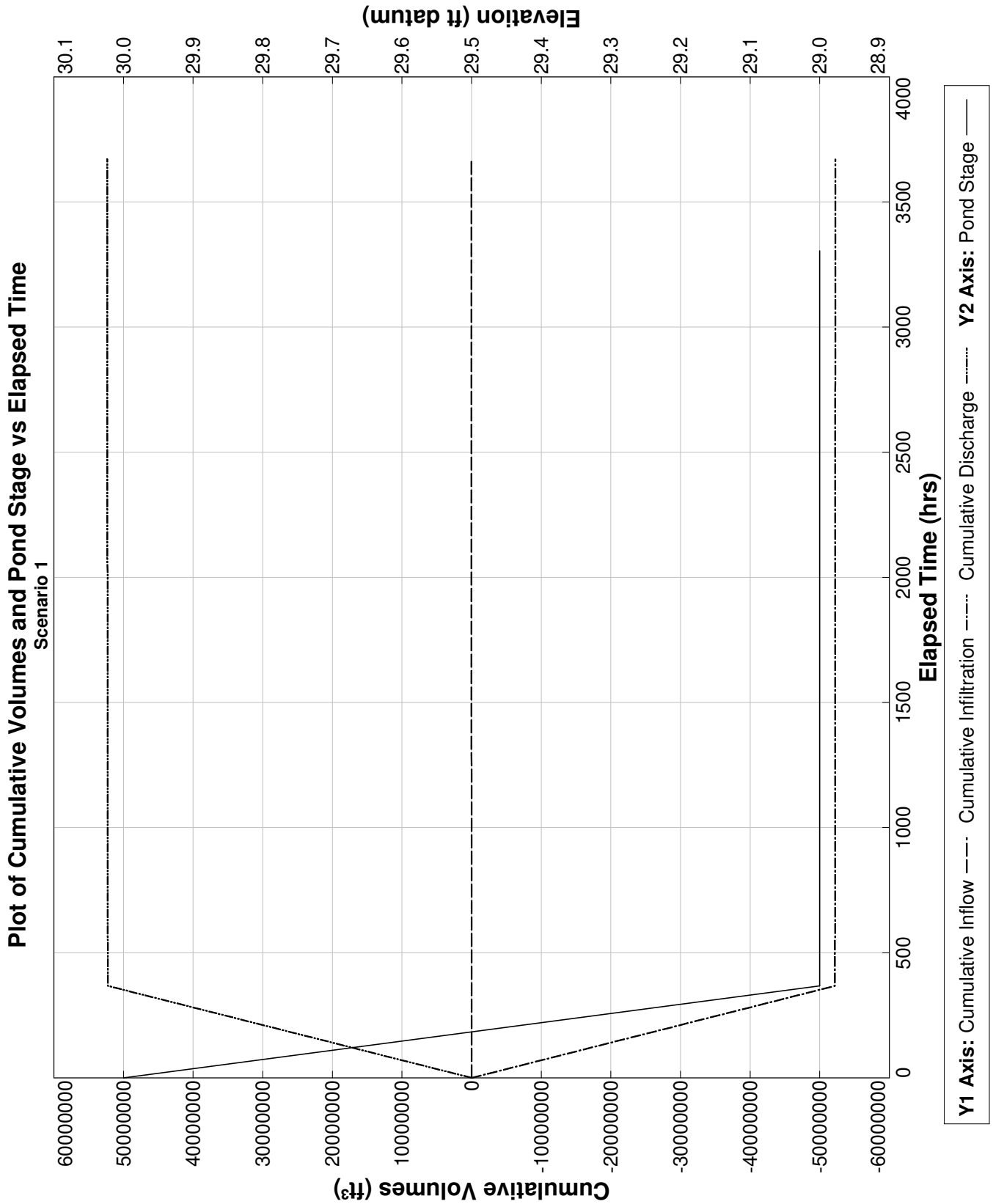
If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

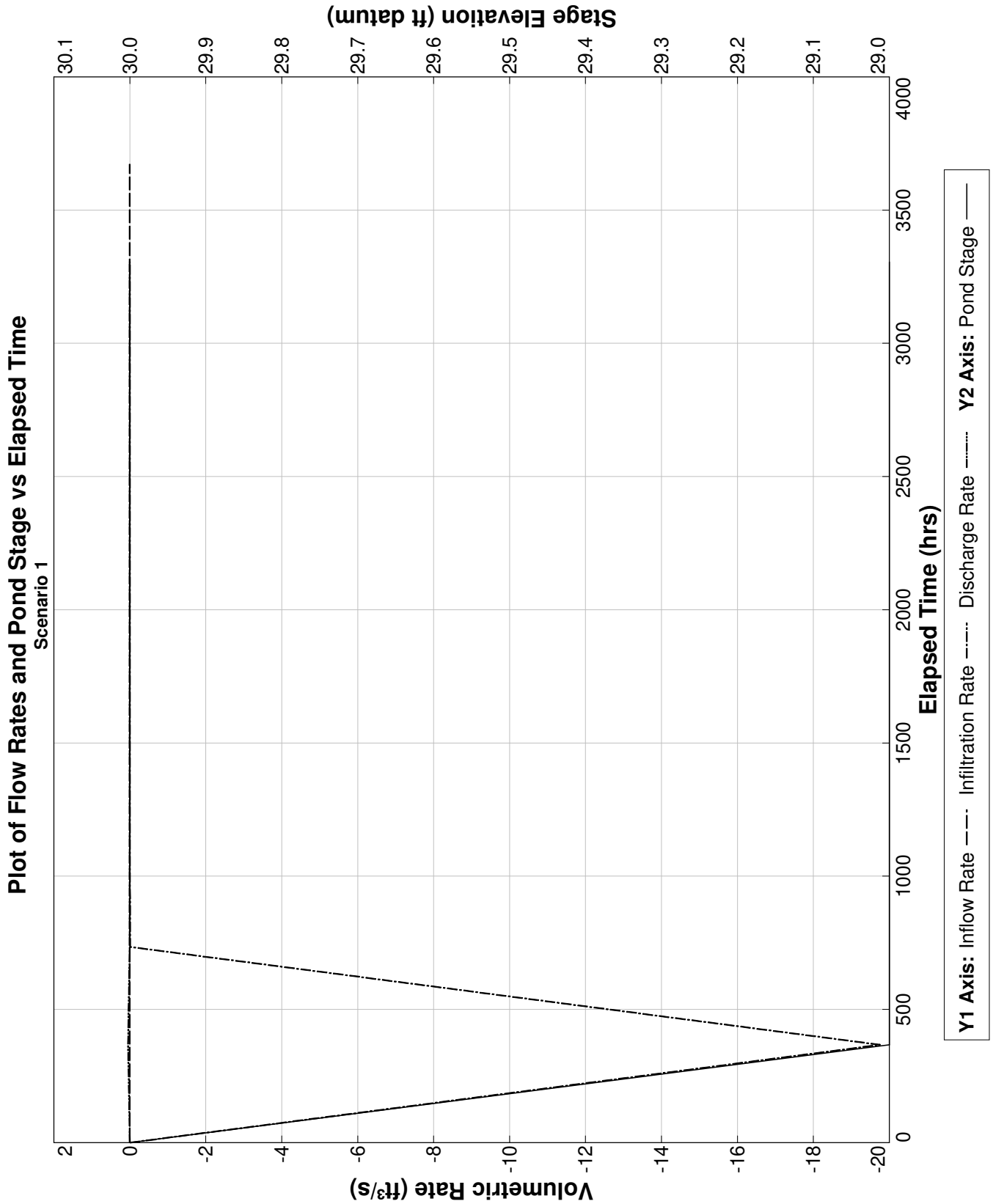
End Scenario 1 3/23/2023 16:48:46

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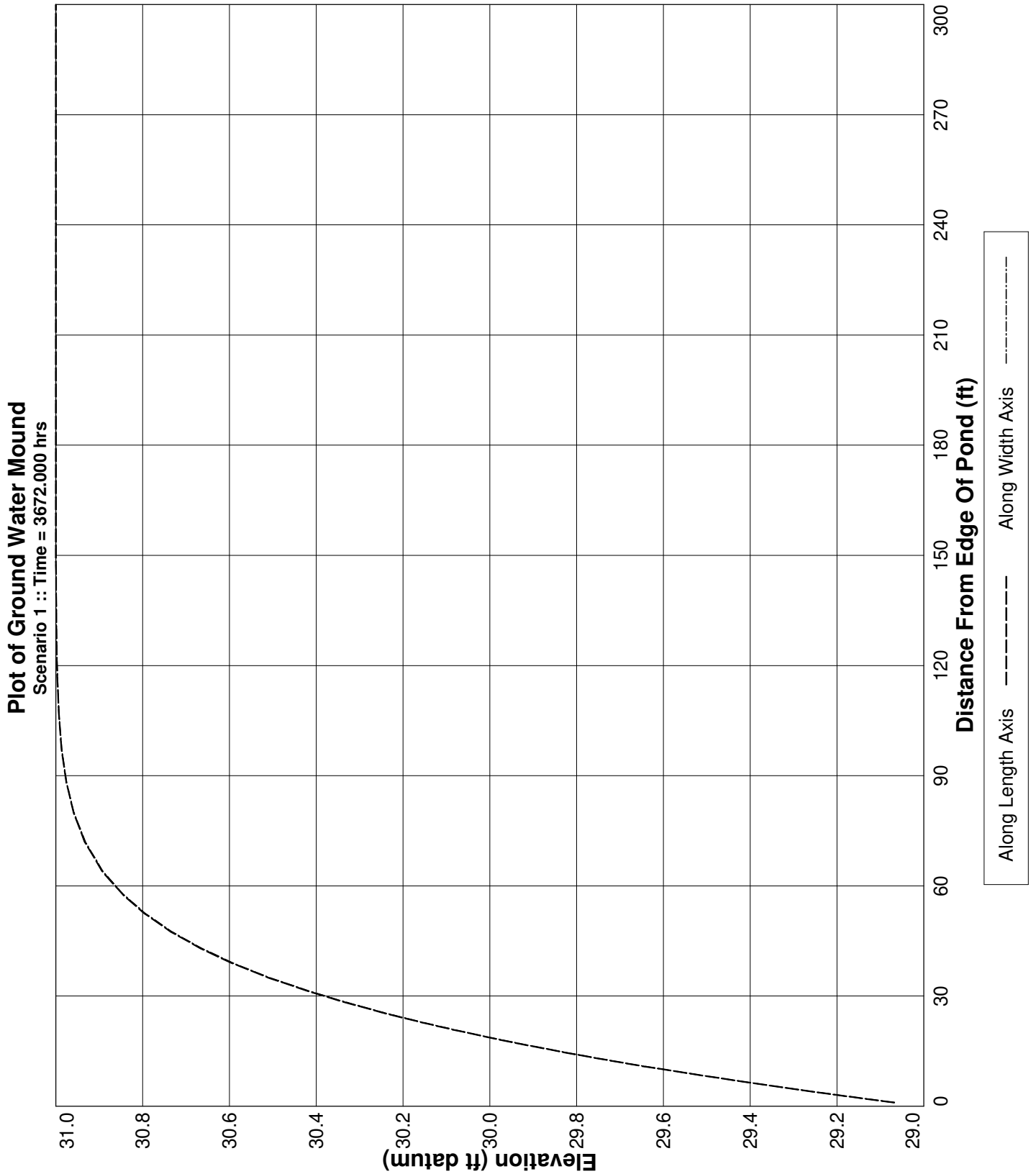
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0034	0.00163	30.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0034	0.00163	29.00000	-19.75278	4.412244E-02	4526.000	-52195180.0	5.2245E+07	S
734.400	0.0034	0.00163	29.00000	-0.01129	5.132435E-03	9052.000	-52223200.0	5.227756E+07	S
1101.600	0.0034	0.00163	29.00000	-0.00116	4.471675E-03	13578.000	-52225030.0	5.228391E+07	S
1468.800	0.0034	0.00163	29.00000	-0.00088	4.269728E-03	18104.000	-52226280.0	5.228968E+07	S
1836.000	0.0034	0.00163	29.00000	-0.00079	4.202647E-03	22630.000	-52227350.0	5.229528E+07	S
2203.200	0.0034	0.00163	29.00000	-0.00076	4.182655E-03	27156.000	-52228370.0	5.230083E+07	S
2570.400	0.0034	0.00163	29.00000	-0.00076	4.181533E-03	31682.000	-52229370.0	5.230636E+07	S
2937.600	0.0034	0.00163	29.00000	-0.00077	4.188455E-03	36208.000	-52230380.0	5.231189E+07	S
3304.800	0.0034	0.00163	29.00000	-0.00078	4.199152E-03	40734.000	-52231400.0	5.231743E+07	S
3672.000	0.0034	0.00163	29.00000	----	----	45260.000	-52232430.0	5.232299E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.14, Southeast Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-23-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -6.00  
Water Table Elevation, [WT] (ft datum): 32.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.03  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 292.0  
Equivalent Pond Width, [W] (ft): 155.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
4.00	435.6
29.00	45302.4

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 29  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	31.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/23/2023 16:51:18

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 31.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 5 of 10 saturated stress periods.

Maximum calculated water budget error is -2.59234314332015 percent, for saturated stress period 1.

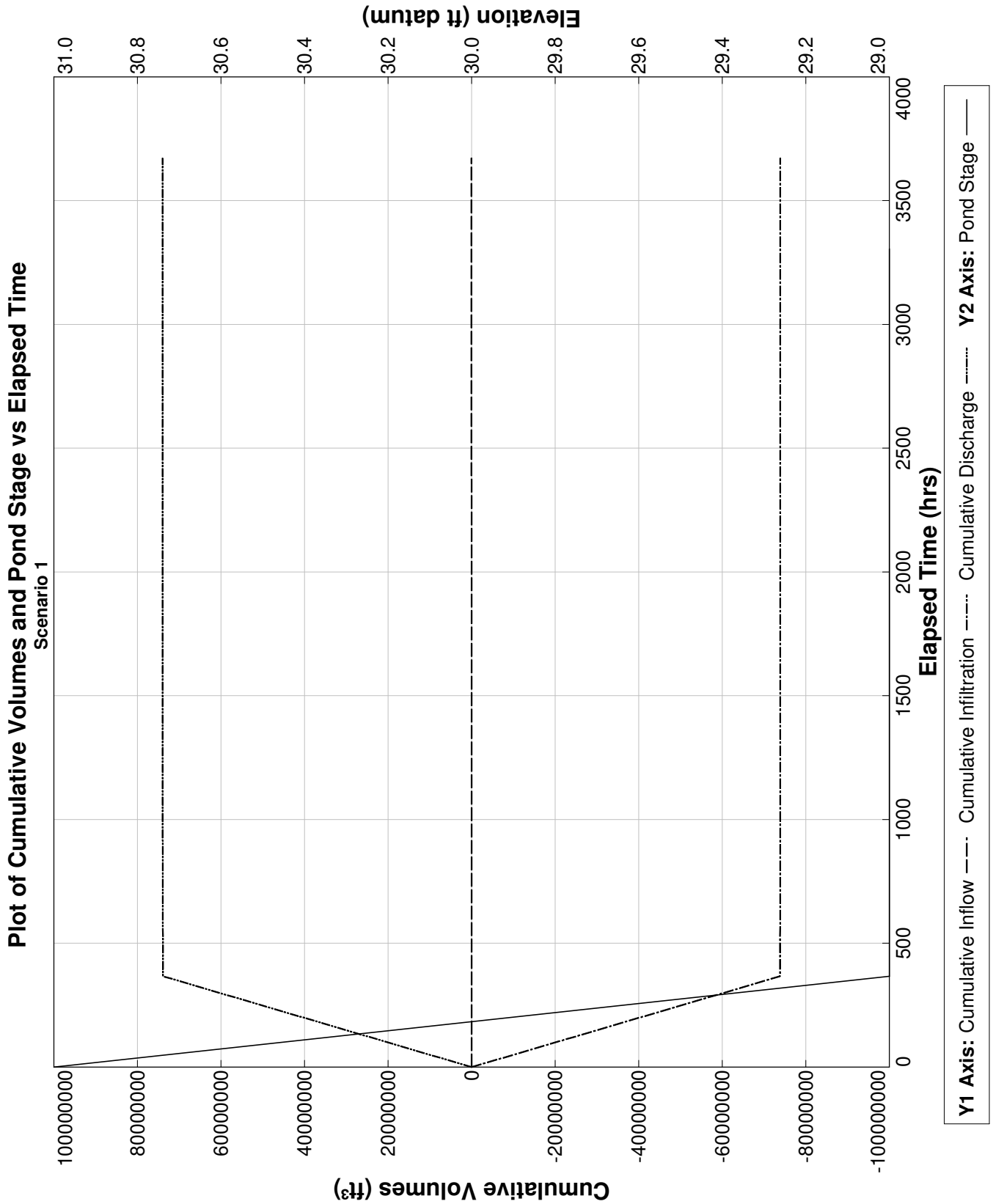
If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

End Scenario 1 3/23/2023 16:51:18

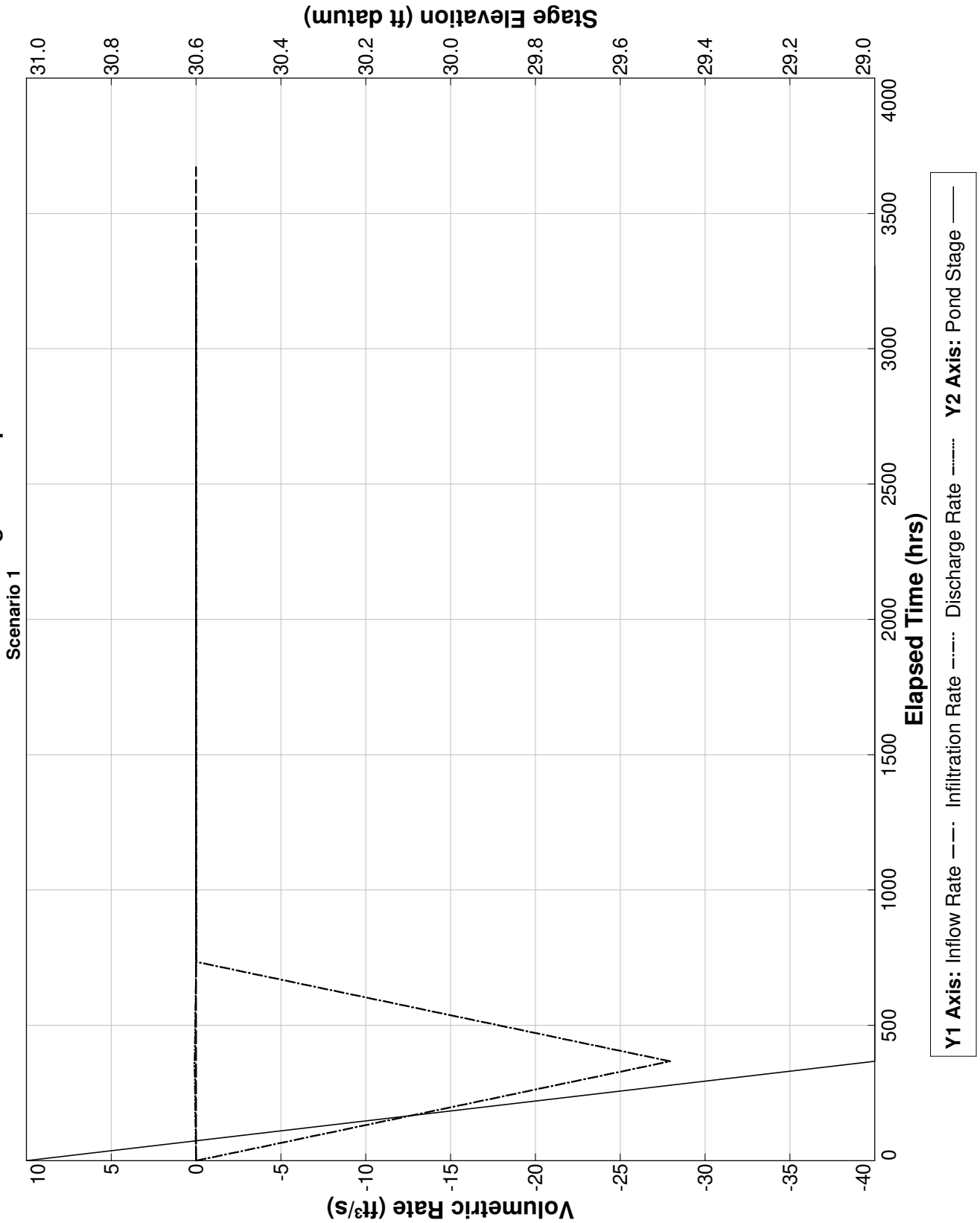
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**Detailed Results**    :: Scenario 1 ::

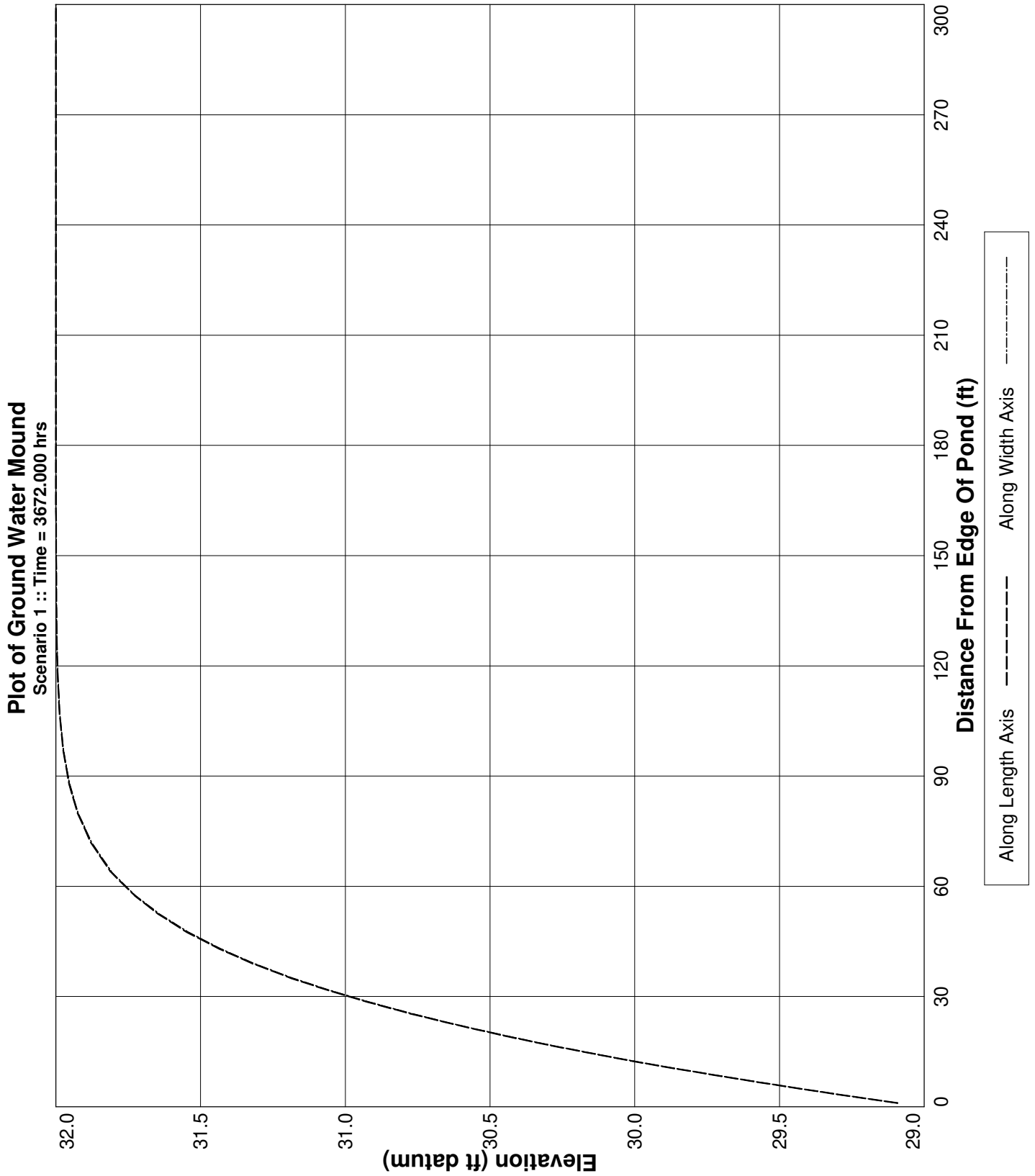
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0034	0.00163	31.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0034	0.00163	29.00000	-27.93421	7.924152E-02	4526.000	-73801590.0	7.389673E+07	S
734.400	0.0034	0.00163	29.00000	-0.02080	6.247943E-03	9052.000	-73853580.0	7.395323E+07	S
1101.600	0.0034	0.00163	29.00000	-0.00191	5.14339E-03	13578.000	-73856580.0	7.396076E+07	S
1468.800	0.0034	0.00163	29.00000	-0.00142	4.788038E-03	18104.000	-73858620.0	7.396732E+07	S
1836.000	0.0034	0.00163	29.00000	-0.00124	4.642711E-03	22630.000	-73860320.0	7.397356E+07	S
2203.200	0.0034	0.00163	29.00000	-0.00116	4.574121E-03	27156.000	-73861890.0	7.397965E+07	S
2570.400	0.0034	0.00163	29.00000	-0.00112	4.538903E-03	31682.000	-73863380.0	7.398567E+07	S
2937.600	0.0034	0.00163	29.00000	-0.00110	4.520325E-03	36208.000	-73864850.0	7.399166E+07	S
3304.800	0.0034	0.00163	29.00000	-0.00109	4.511034E-03	40734.000	-73866290.0	7.399763E+07	S
3672.000	0.0034	0.00163	29.00000	----	----	45260.000	-73867730.0	7.400359E+07	N.A.



Plot of Flow Rates and Pond Stage vs Elapsed Time







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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 15, North, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 5.00  
Water Table Elevation, [WT] (ft datum): 29.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.03  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 314.0  
Equivalent Pond Width, [W] (ft): 118.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
5.00	435.6
24.00	37026.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	28.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 13:46:13

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

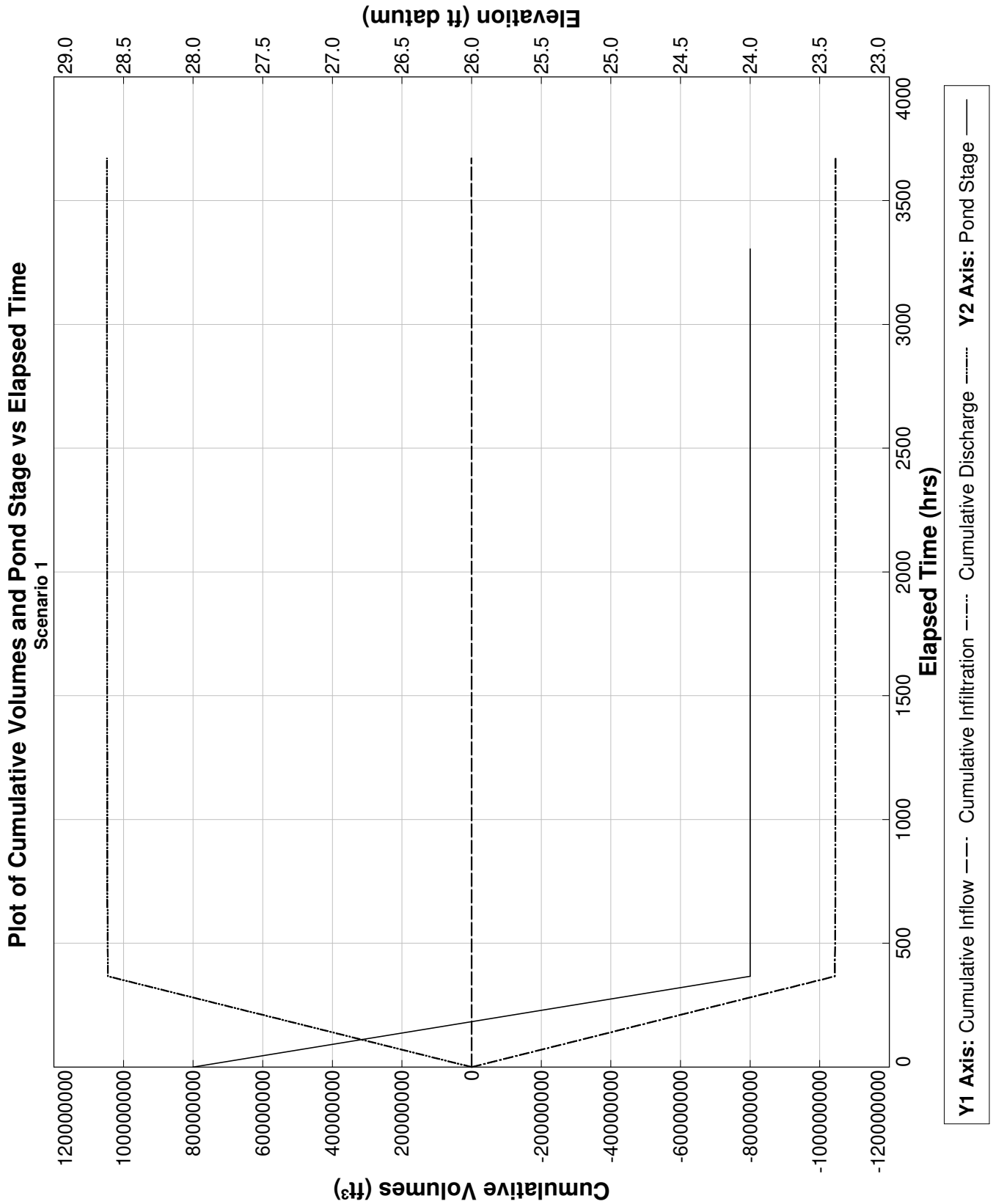
Baseflow hydrograph: Initial GWT (seasonal low) is 28.0 ft.

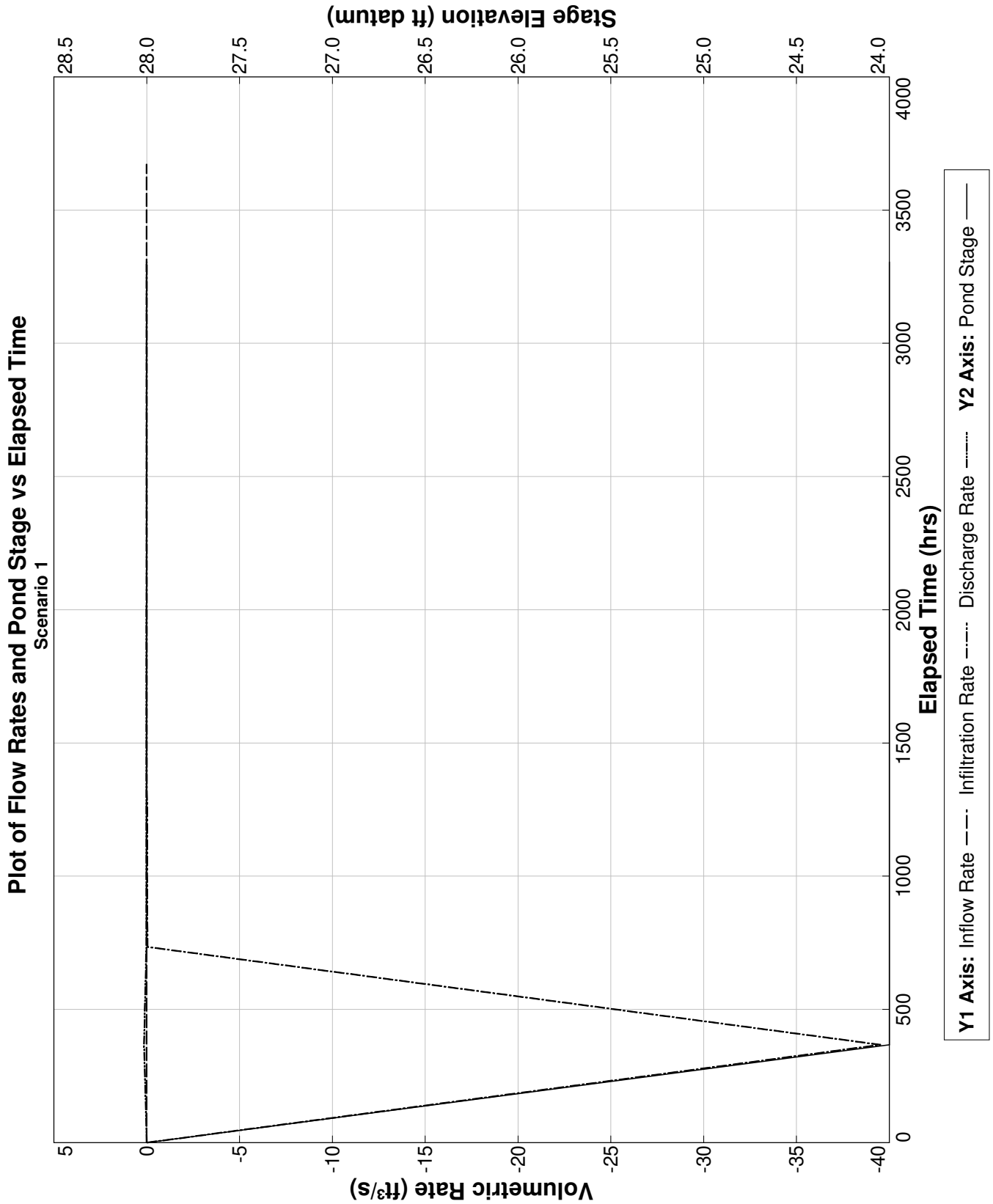
End Scenario 1 3/31/2023 13:46:13

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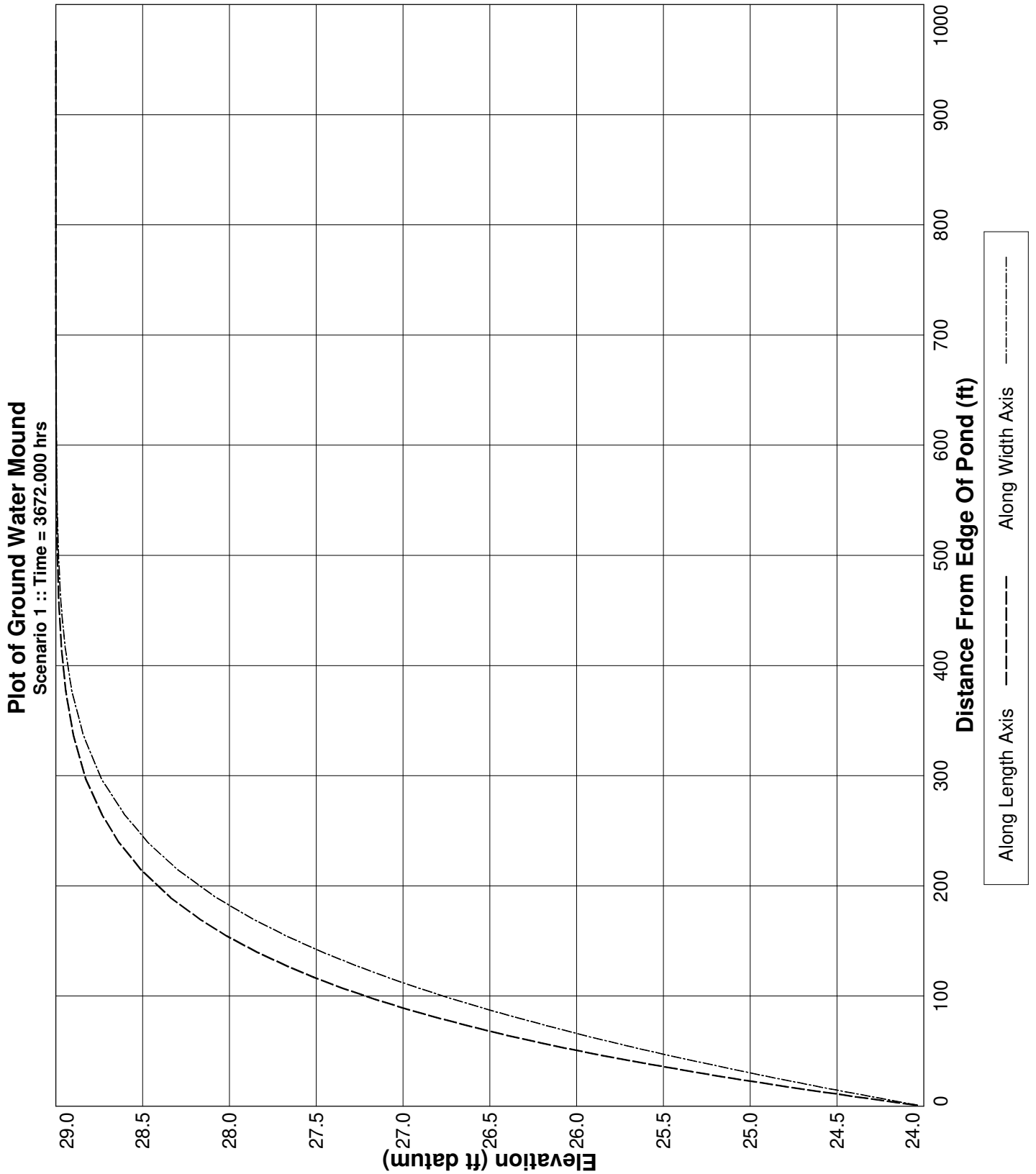
**Detailed Results** :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0028	0.00163	28.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0028	0.00163	24.00000	-39.51686	.1420591	3705.200	-104373800.0	1.045256E+08	S
734.400	0.0028	0.00163	24.00000	-0.04595	1.859785E-02	7410.400	-104476200.0	1.046318E+08	S
1101.600	0.0028	0.00163	24.00000	-0.01333	1.575038E-02	11115.600	-104495200.0	1.046545E+08	S
1468.800	0.0028	0.00163	24.00000	-0.01177	1.441977E-02	14820.800	-104511500.0	1.046744E+08	S
1836.000	0.0028	0.00163	24.00000	-0.01096	1.369283E-02	18526.000	-104526400.0	1.04693E+08	S
2203.200	0.0028	0.00163	24.00000	-0.01047	.0132531	22231.200	-104540500.0	1.047108E+08	S
2570.400	0.0028	0.00163	24.00000	-0.01012	1.289258E-02	25936.400	-104554000.0	1.047281E+08	S
2937.600	0.0028	0.00163	24.00000	-0.00985	1.263757E-02	29641.600	-104567200.0	1.04745E+08	S
3304.800	0.0028	0.00163	24.00000	-0.00966	1.245241E-02	33346.800	-104580100.0	1.047615E+08	S
3672.000	0.0028	0.00163	24.00000	----	----	37052.000	-104592800.0	1.047779E+08	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 15, South, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 5.00  
Water Table Elevation, [WT] (ft datum): 27.30  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.03  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 314.0  
Equivalent Pond Width, [W] (ft): 118.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
5.00	435.6
24.00	37026.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	26.3
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 13:52:3

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

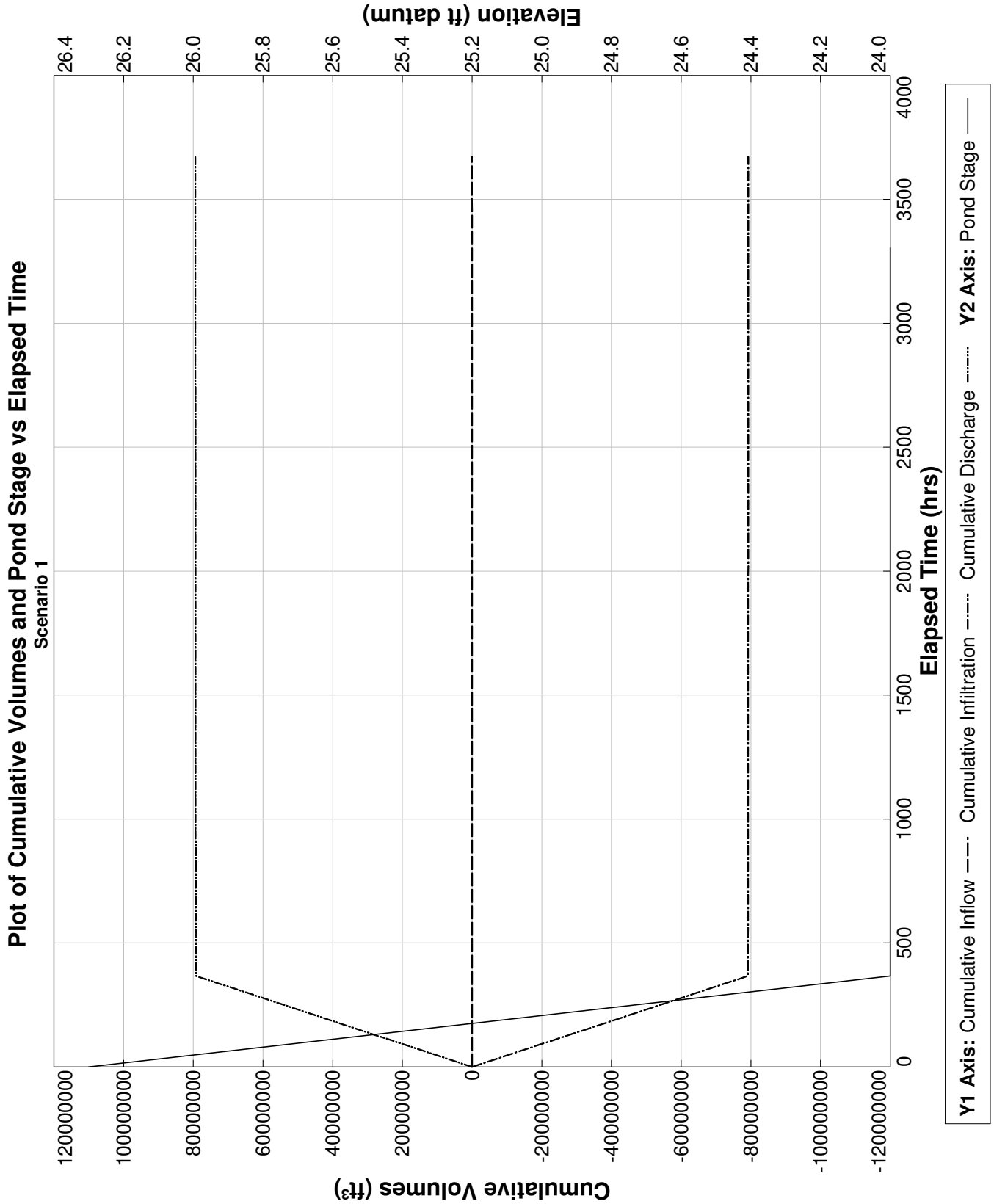
Baseflow hydrograph: Initial GWT (seasonal low) is 26.3 ft.

End Scenario 1 3/31/2023 13:52:3

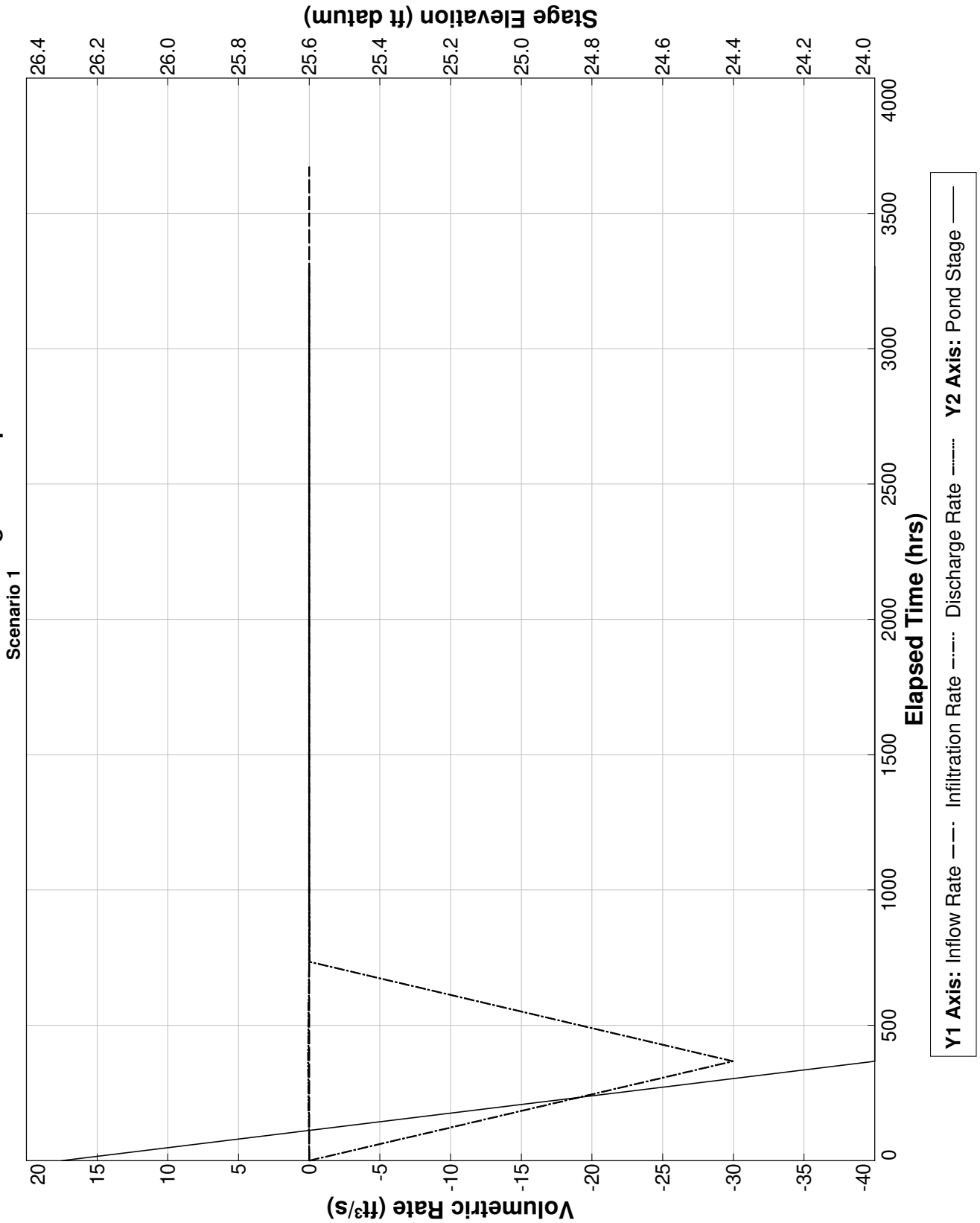
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**Detailed Results**    :: Scenario 1 ::

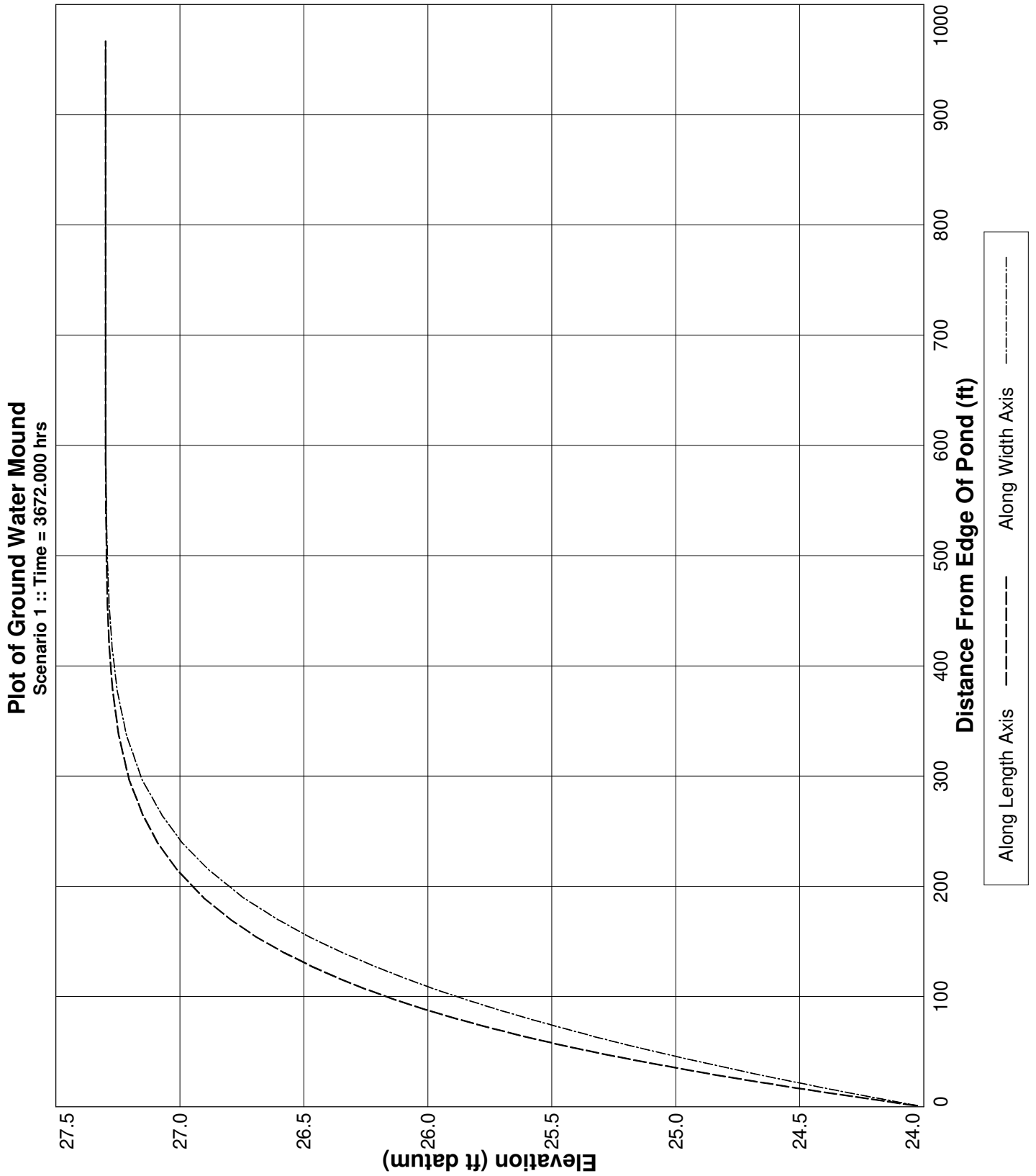
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0028	0.00163	26.30000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0028	0.00163	24.00000	-29.96218	8.344423E-02	3705.200	-79155530.0	7.924439E+07	S
734.400	0.0028	0.00163	24.00000	-0.02697	.0124337	7410.400	-79215200.0	7.930777E+07	S
1101.600	0.0028	0.00163	24.00000	-0.00822	1.078641E-02	11115.600	-79226840.0	7.932311E+07	S
1468.800	0.0028	0.00163	24.00000	-0.00737	1.008727E-02	14820.800	-79236930.0	7.933691E+07	S
1836.000	0.0028	0.00163	24.00000	-0.00695	9.727422E-03	18526.000	-79246320.0	7.935001E+07	S
2203.200	0.0028	0.00163	24.00000	-0.00670	9.482082E-03	22231.200	-79255310.0	7.93627E+07	S
2570.400	0.0028	0.00163	24.00000	-0.00655	9.334095E-03	25936.400	-79264050.0	7.937514E+07	S
2937.600	0.0028	0.00163	24.00000	-0.00647	9.256522E-03	29641.600	-79272620.0	7.938743E+07	S
3304.800	0.0028	0.00163	24.00000	-0.00643	9.226603E-03	33346.800	-79281140.0	7.939965E+07	S
3672.000	0.0028	0.00163	24.00000	----	----	37052.000	-79289630.0	7.941184E+07	N.A.



Plot of Flow Rates and Pond Stage vs Elapsed Time







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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 16, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -13.00  
Water Table Elevation, [WT] (ft datum): 27.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.38  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 429.0  
Equivalent Pond Width, [W] (ft): 150.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
-8.00	435.6
24.00	64468.8

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	26.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 14:59:48

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 26.5 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 4 of 10 saturated stress periods.

Maximum calculated water budget error is -1.76893368832567 percent, for saturated stress period 1.

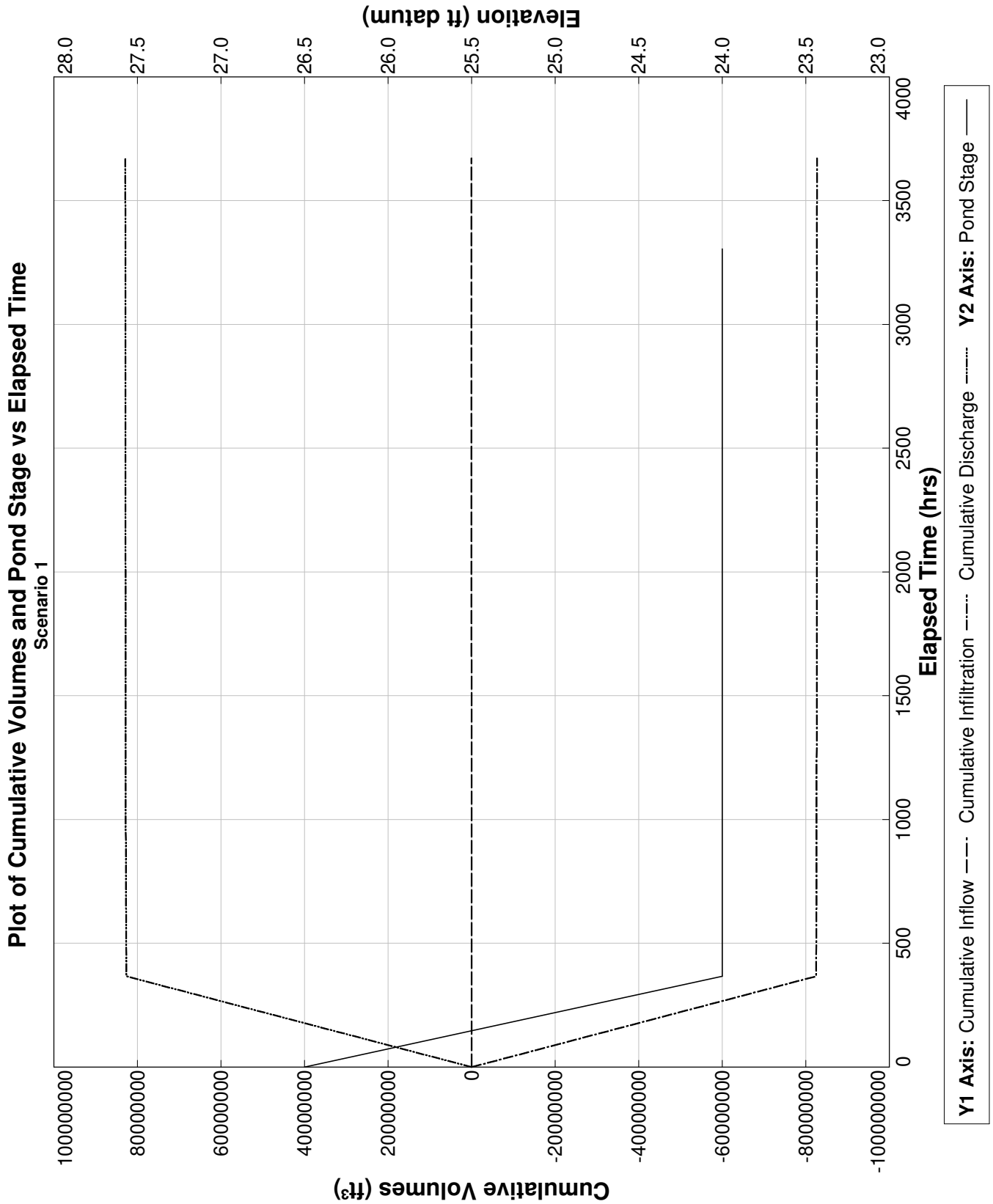
If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

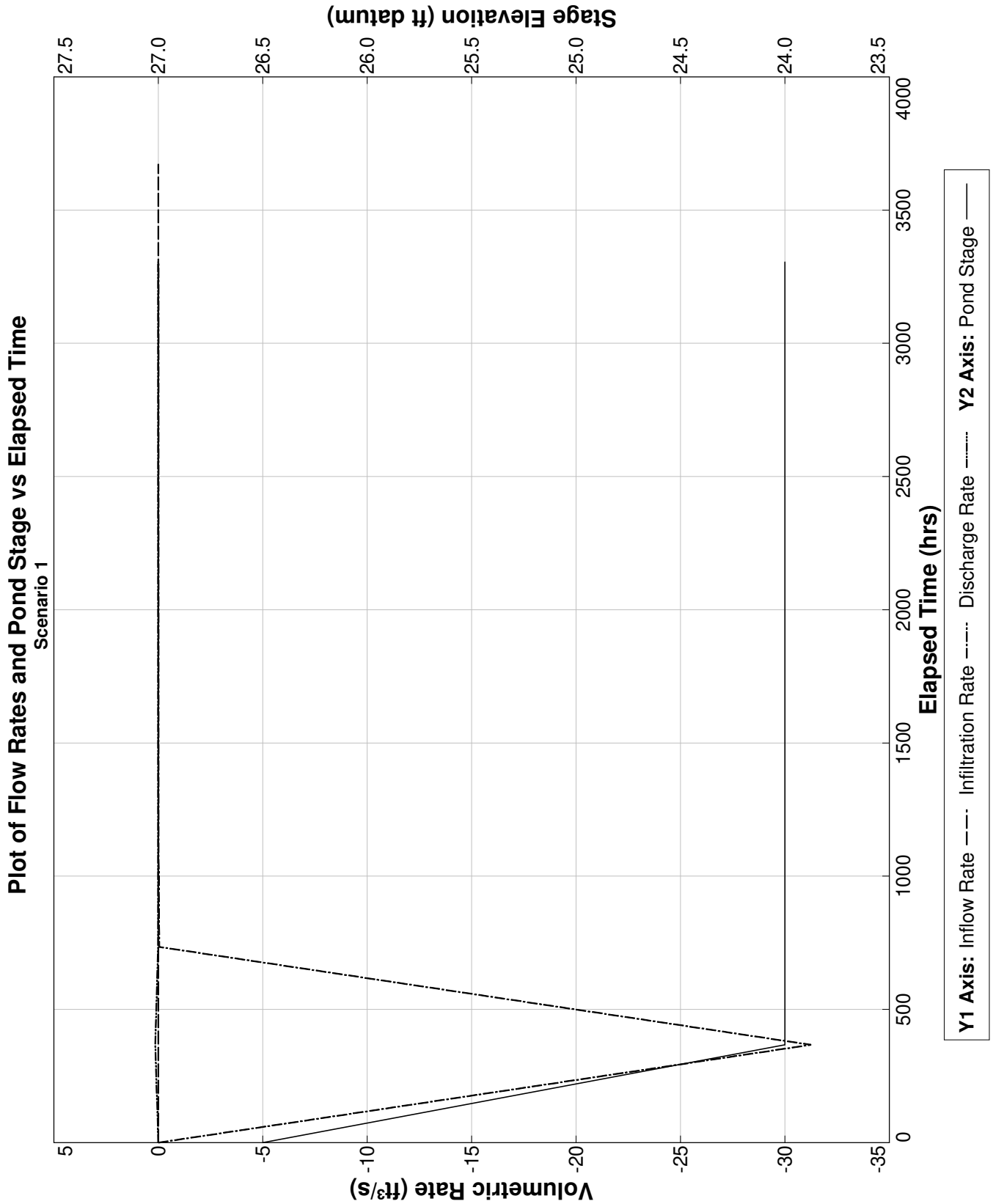
End Scenario 1 3/31/2023 14:59:48

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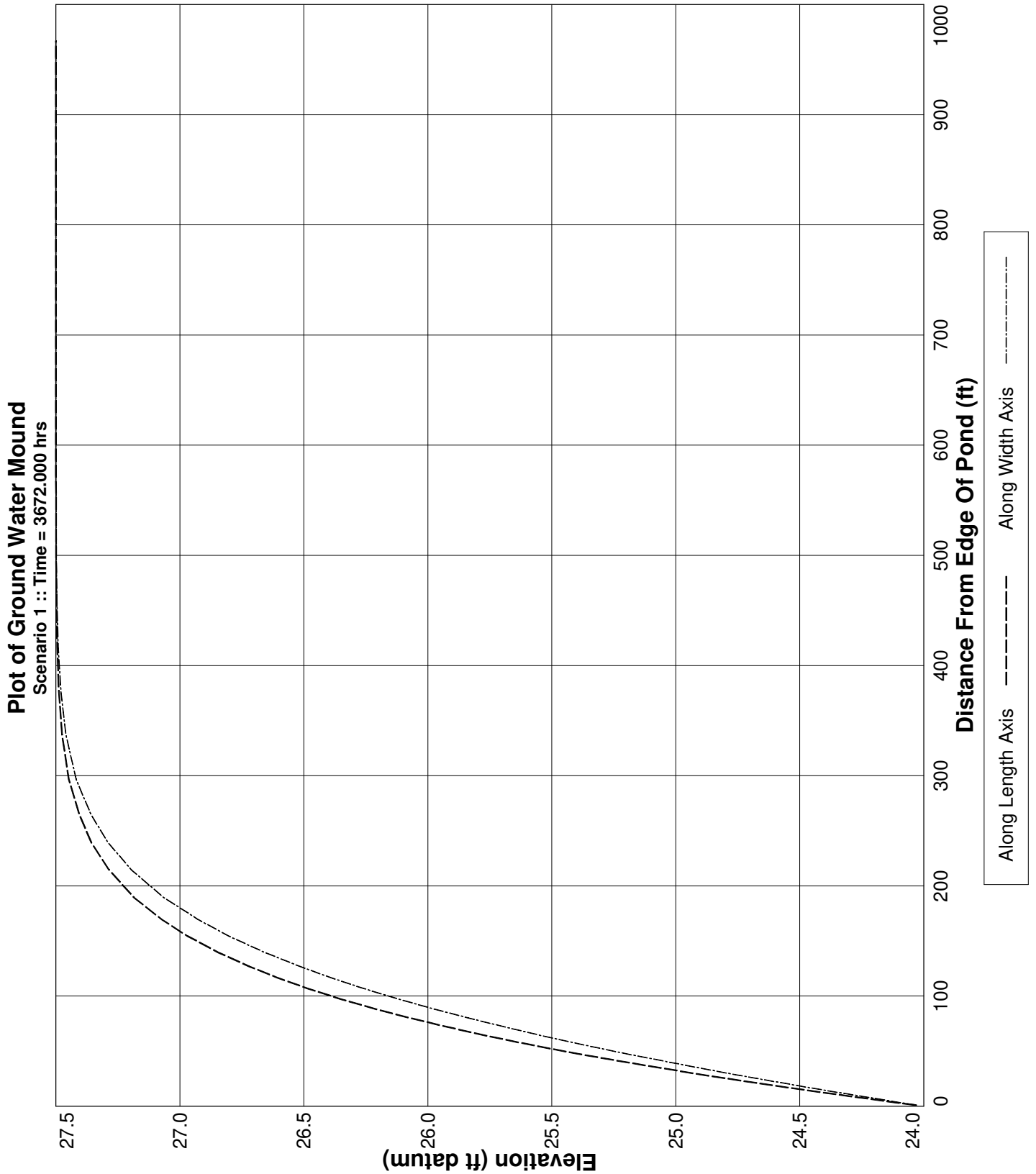
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0049	0.00163	26.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0049	0.00163	24.00000	-31.24014	.1490218	6435.000	-82491380.0	8.265899E+07	S
734.400	0.0049	0.00163	24.00000	-0.04378	1.586973E-02	12870.000	-82593940.0	8.276798E+07	S
1101.600	0.0049	0.00163	24.00000	-0.00924	1.381822E-02	19305.000	-82607120.0	8.27876E+07	S
1468.800	0.0049	0.00163	24.00000	-0.00817	1.293008E-02	25740.000	-82618370.0	8.280528E+07	S
1836.000	0.0049	0.00163	24.00000	-0.00763	1.246689E-02	32175.000	-82628720.0	8.282206E+07	S
2203.200	0.0049	0.00163	24.00000	-0.00730	1.213708E-02	38610.000	-82638540.0	8.283833E+07	S
2570.400	0.0049	0.00163	24.00000	-0.00707	1.191574E-02	45045.000	-82648010.0	8.285422E+07	S
2937.600	0.0049	0.00163	24.00000	-0.00692	1.178019E-02	51480.000	-82657230.0	8.286989E+07	S
3304.800	0.0049	0.00163	24.00000	-0.00684	1.169511E-02	57915.000	-82666320.0	8.28854E+07	S
3672.000	0.0049	0.00163	24.00000	----	----	64350.000	-82675320.0	8.290084E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.17, Northeast Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-27-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -11.00  
Water Table Elevation, [WT] (ft datum): 25.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.38  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 422.0  
Equivalent Pond Width, [W] (ft): 152.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
-6.00	435.6
24.00	64033.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	24.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/27/2023 13:14:52

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

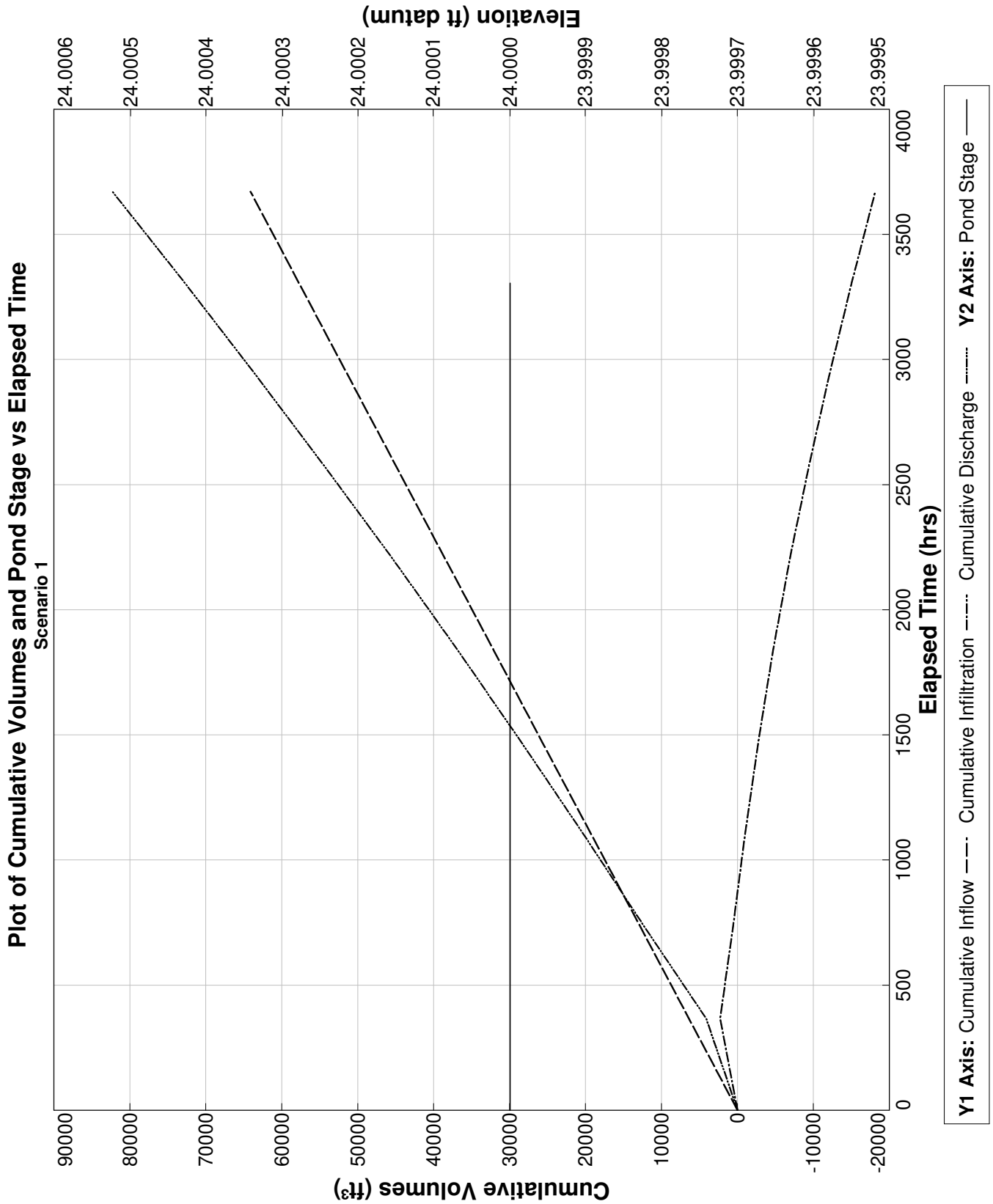
Baseflow hydrograph: Initial GWT (seasonal low) is 24.0 ft.

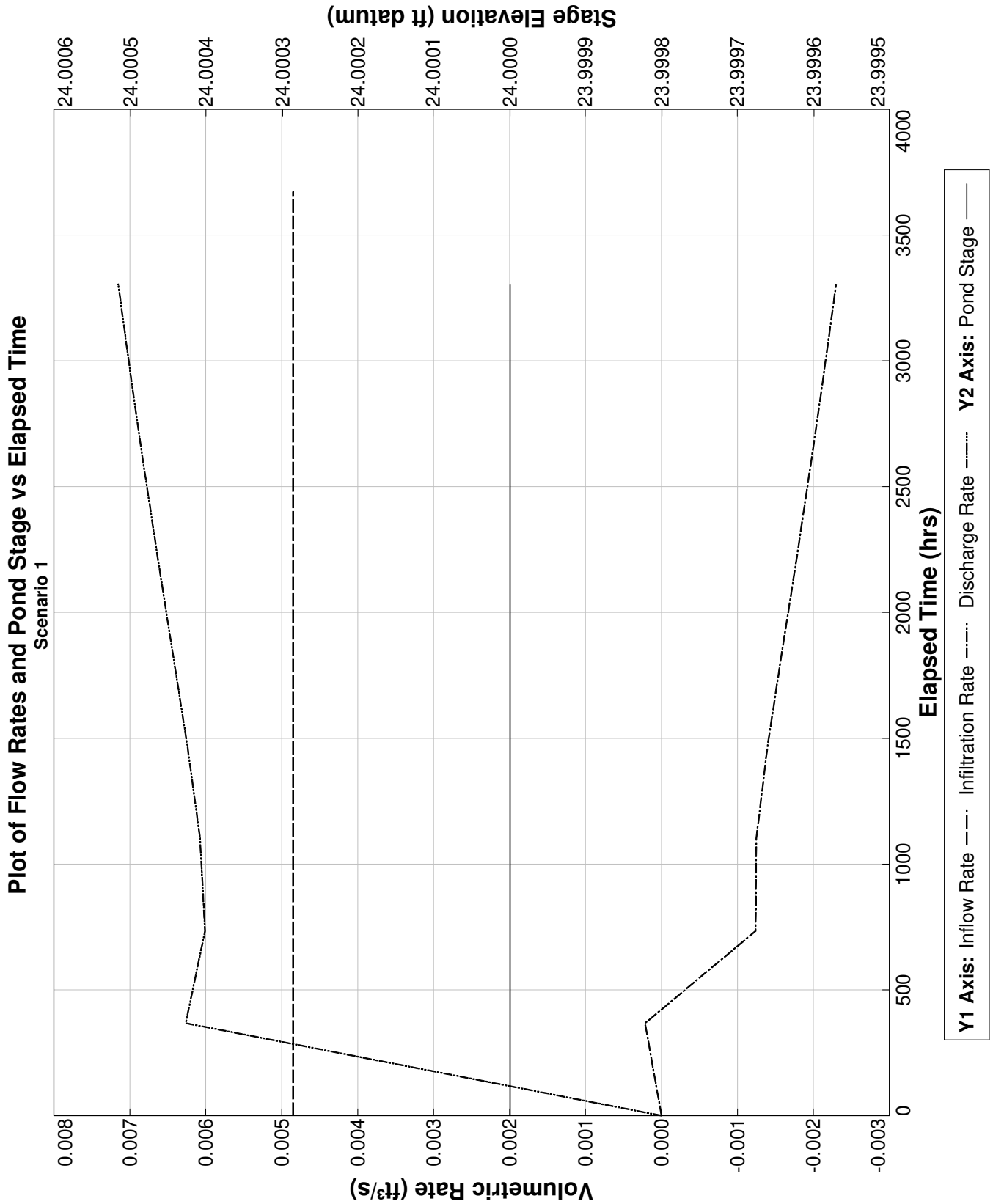
End Scenario 1 3/27/2023 13:14:52

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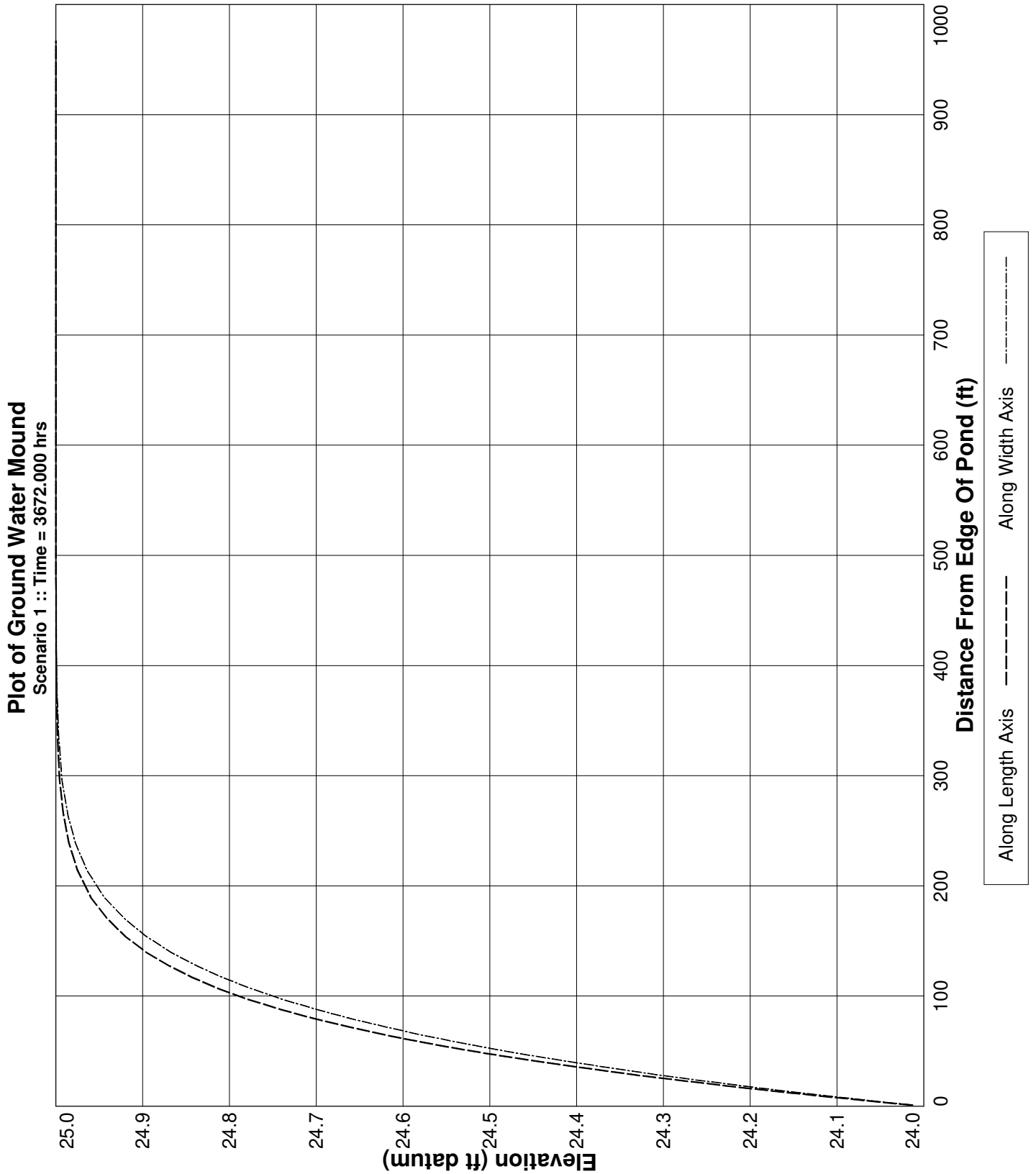
**Detailed Results** :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0049	0.00163	24.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0049	0.00163	24.00000	0.00022	6.264372E-03	6414.400	2273.9	4140.499	S
734.400	0.0049	0.00163	24.00000	-0.00124	6.010464E-03	12828.800	575.1	12253.67	S
1101.600	0.0049	0.00163	24.00000	-0.00125	6.074579E-03	19243.200	-998.2	20241.41	S
1468.800	0.0049	0.00163	24.00000	-0.00140	6.241537E-03	25657.600	-2724.3	28381.87	S
1836.000	0.0049	0.00163	24.00000	-0.00158	6.434317E-03	32072.000	-4688.1	36760.1	S
2203.200	0.0049	0.00163	24.00000	-0.00177	6.626397E-03	38486.400	-6906.3	45392.71	S
2570.400	0.0049	0.00163	24.00000	-0.00196	6.811638E-03	44900.800	-9373.9	54274.71	S
2937.600	0.0049	0.00163	24.00000	-0.00213	6.98632E-03	51315.200	-12079.4	63394.61	S
3304.800	0.0049	0.00163	24.00000	-0.00230	7.153268E-03	57729.600	-15010.7	72740.31	S
3672.000	0.0049	0.00163	24.00000	----	----	64144.000	-18158.2	82302.15	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.17, Southwest Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-27-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -11.00  
Water Table Elevation, [WT] (ft datum): 30.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.38  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 422.0  
Equivalent Pond Width, [W] (ft): 152.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
-6.00	435.6
24.00	64033.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	29.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/27/2023 13:18:8

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

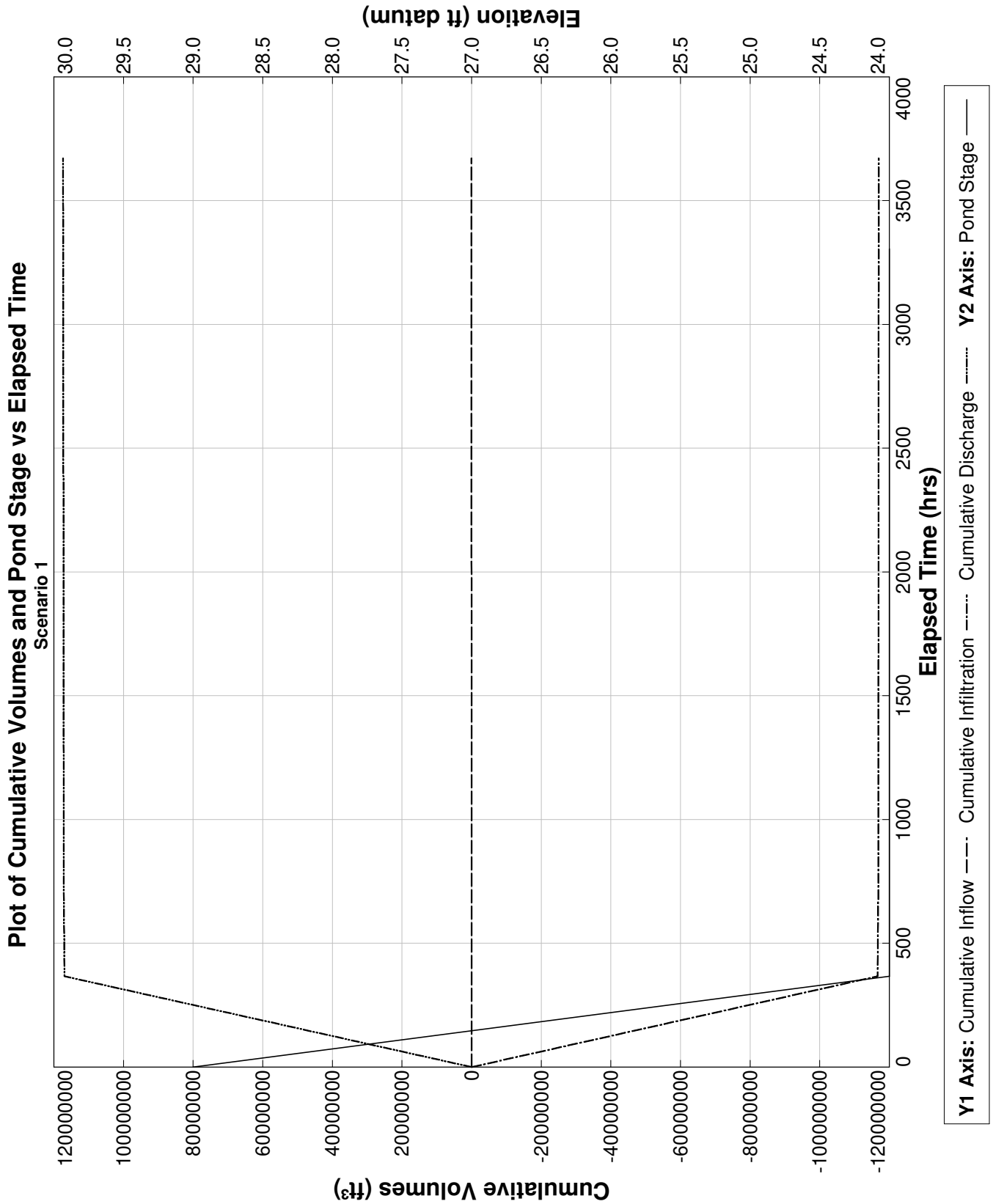
Baseflow hydrograph: Initial GWT (seasonal low) is 29.0 ft.

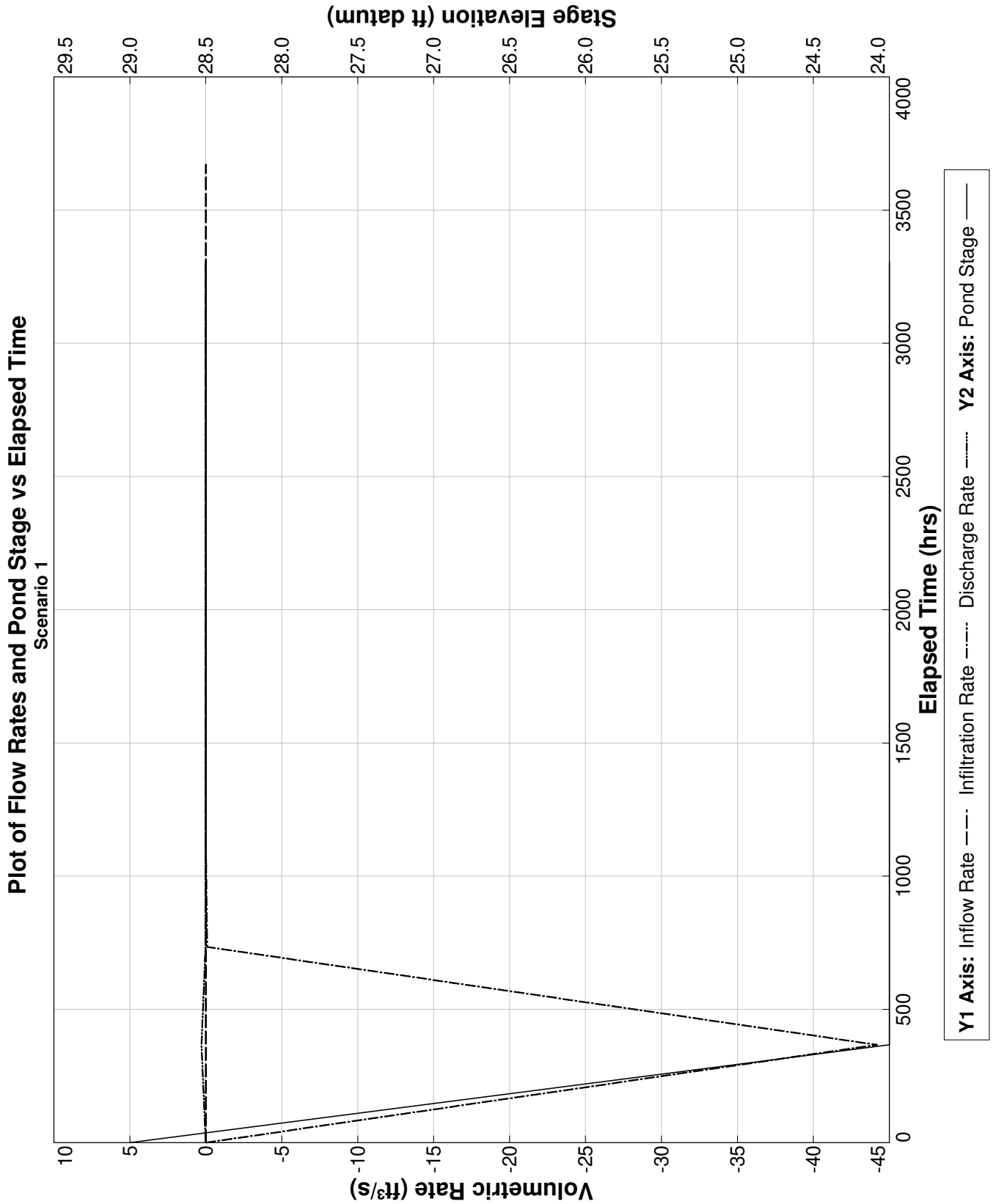
End Scenario 1 3/27/2023 13:18:8

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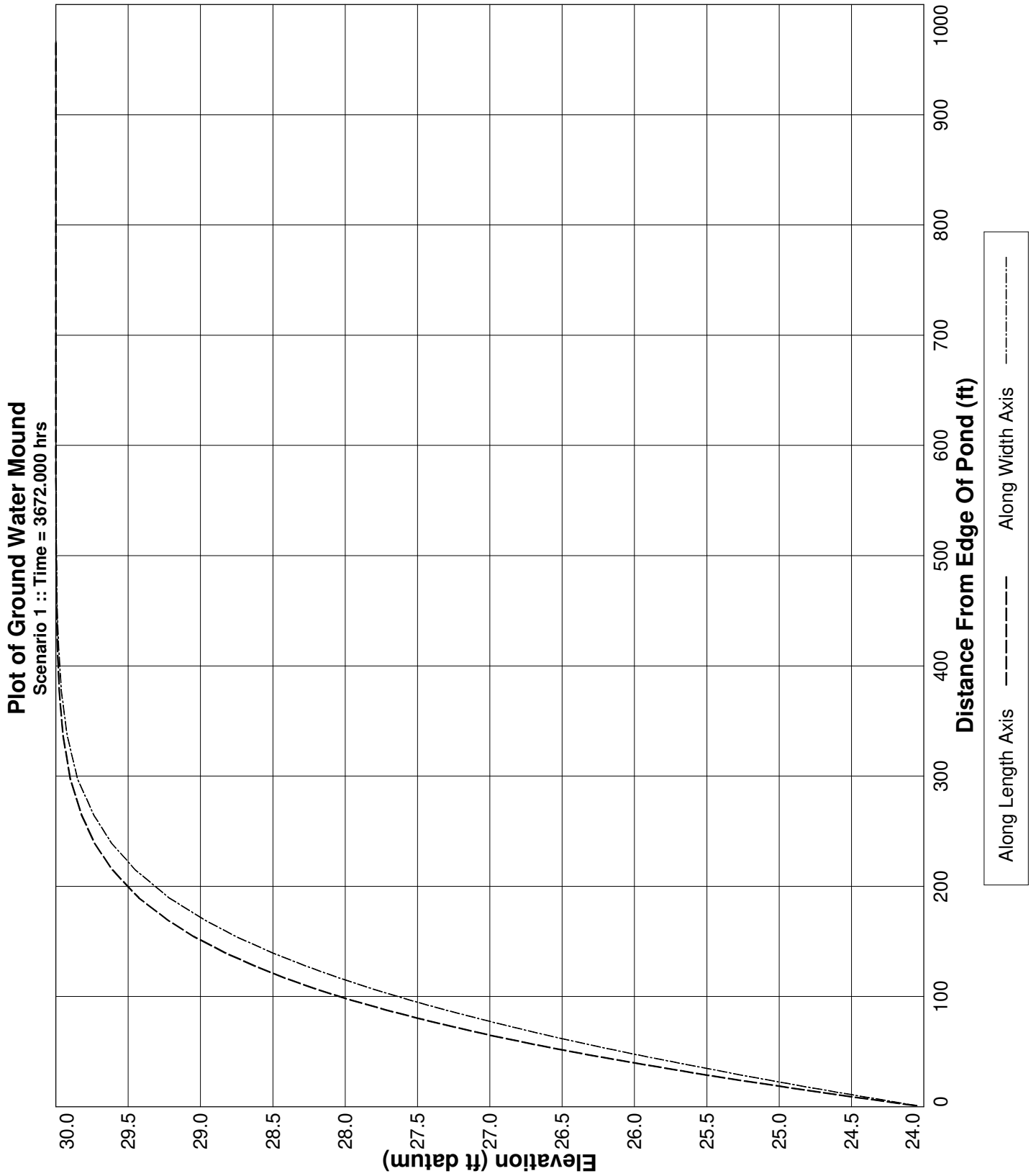
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0049	0.00163	29.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0049	0.00163	24.00001	-44.18513	.2851936	6414.400	-116620100.0	1.169467E+08	S
734.400	0.0049	0.00163	24.00000	-0.08389	2.456063E-02	12828.800	-116818400.0	1.171514E+08	S
1101.600	0.0049	0.00163	24.00000	-0.01632	2.067574E-02	19243.200	-116841900.0	1.171813E+08	S
1468.800	0.0049	0.00163	24.00000	-0.01415	1.879672E-02	25657.600	-116861600.0	1.172074E+08	S
1836.000	0.0049	0.00163	24.00000	-0.01300	1.774985E-02	32072.000	-116879300.0	1.172316E+08	S
2203.200	0.0049	0.00163	24.00000	-0.01227	.0170991	38486.400	-116895900.0	1.172546E+08	S
2570.400	0.0049	0.00163	24.00000	-0.01174	1.655909E-02	44900.800	-116911800.0	1.172768E+08	S
2937.600	0.0049	0.00163	24.00000	-0.01131	1.613526E-02	51315.200	-116927000.0	1.172984E+08	S
3304.800	0.0049	0.00163	24.00000	-0.01099	.0158216	57729.600	-116941700.0	1.173196E+08	S
3672.000	0.0049	0.00163	24.00000	----	----	64144.000	-116956000.0	1.173403E+08	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 18, North, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -7.00  
Water Table Elevation, [WT] (ft datum): 23.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.38  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 723.0  
Equivalent Pond Width, [W] (ft): 140.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
-2.00	435.6
24.00	101494.8

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	22.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 15:4:40

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

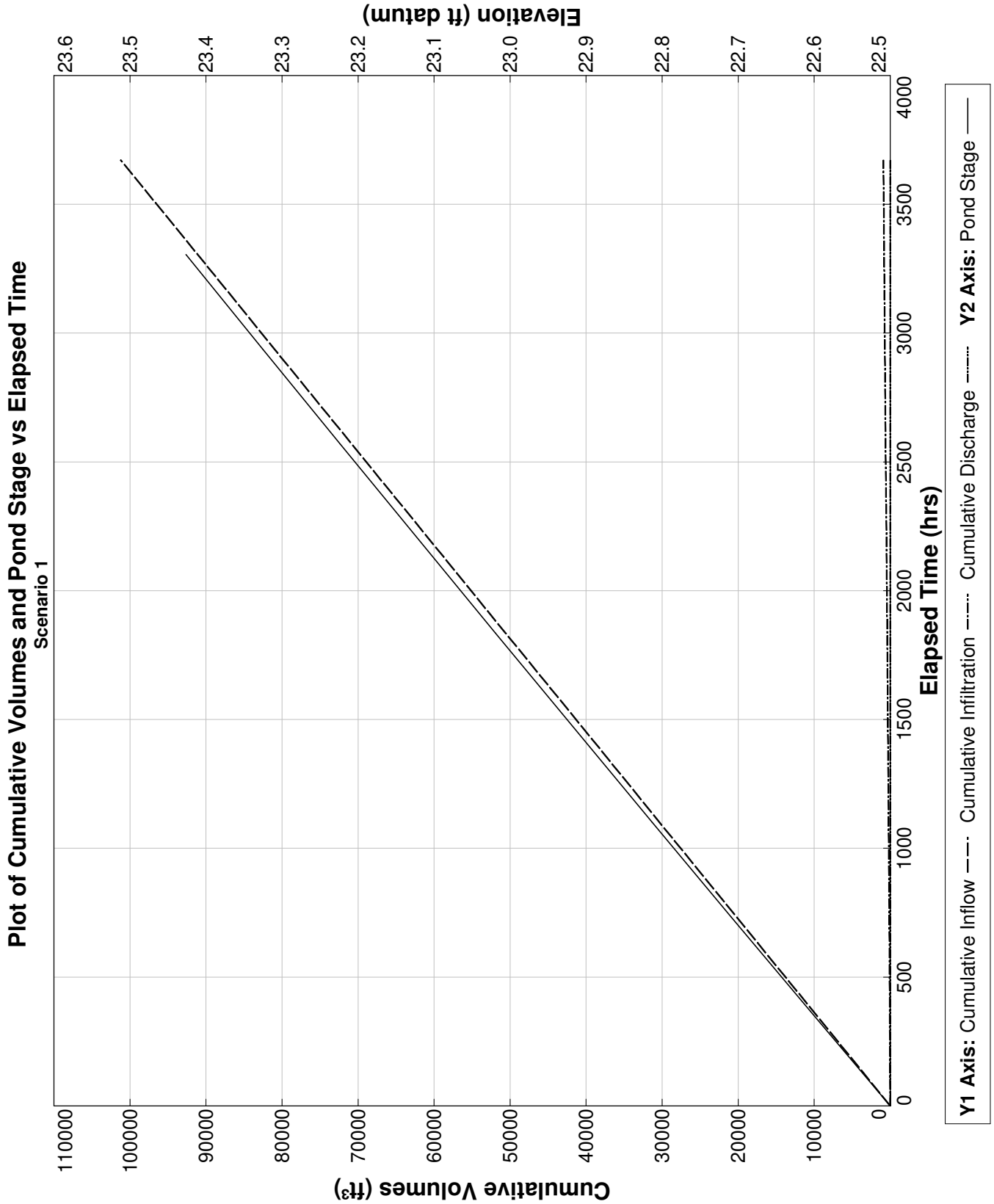
Baseflow hydrograph: Initial GWT (seasonal low) is 22.5 ft.

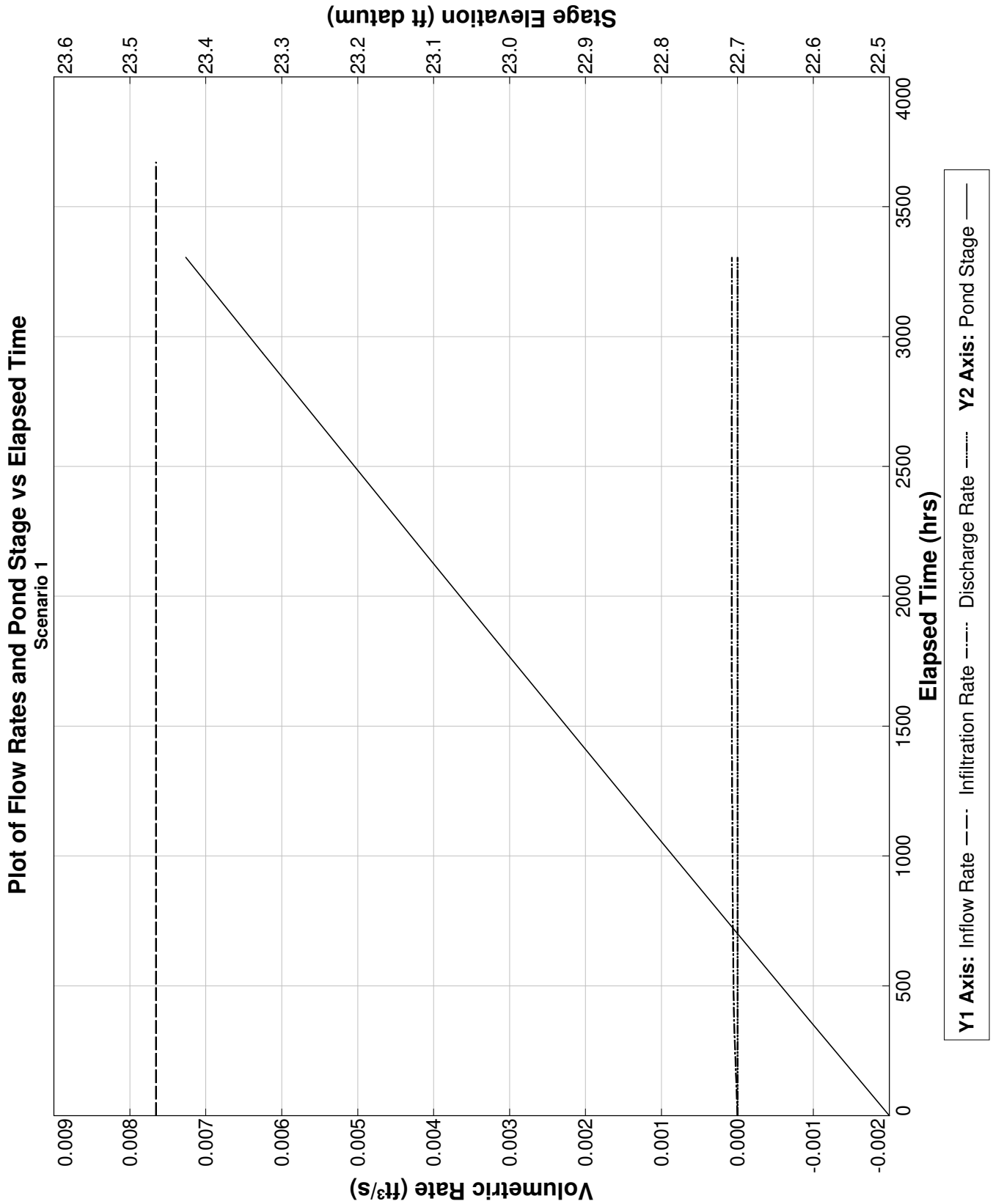
End Scenario 1 3/31/2023 15:4:41

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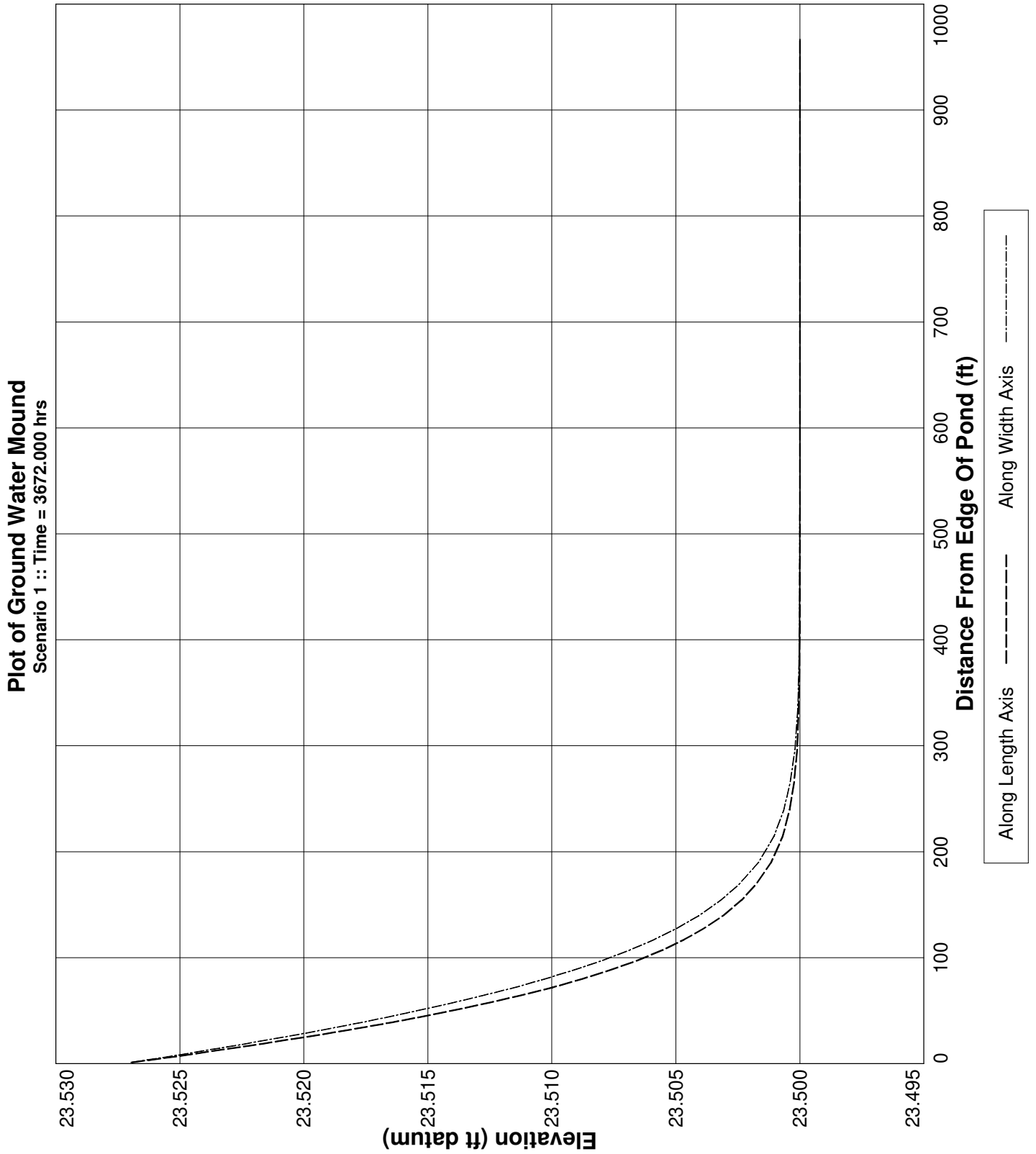
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0077	0.00163	22.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0077	0.00163	22.60507	0.00005	0	10122.000	49.3	0	S
734.400	0.0077	0.00163	22.70944	0.00006	0	20244.000	122.4	0	S
1101.600	0.0077	0.00163	22.81324	0.00007	0	30366.000	209.0	0	S
1468.800	0.0077	0.00163	22.91653	0.00007	0	40488.000	304.0	0	S
1836.000	0.0077	0.00163	23.01934	0.00008	0	50610.000	403.6	0	S
2203.200	0.0077	0.00163	23.12171	0.00008	0	60732.000	505.4	0	S
2570.400	0.0077	0.00163	23.22367	0.00008	0	70854.000	607.2	0	S
2937.600	0.0077	0.00163	23.32523	0.00007	0	80976.000	707.4	0	S
3304.800	0.0077	0.00163	23.42642	0.00007	0	91098.000	804.7	0	S
3672.000	0.0077	0.00163	23.52725	----	----	101220.000	897.9	0	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 18, Northeast, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -7.00  
Water Table Elevation, [WT] (ft datum): 27.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.38  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 723.0  
Equivalent Pond Width, [W] (ft): 140.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
-2.00	435.6
24.00	101494.8

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	26.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 15:6:24

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

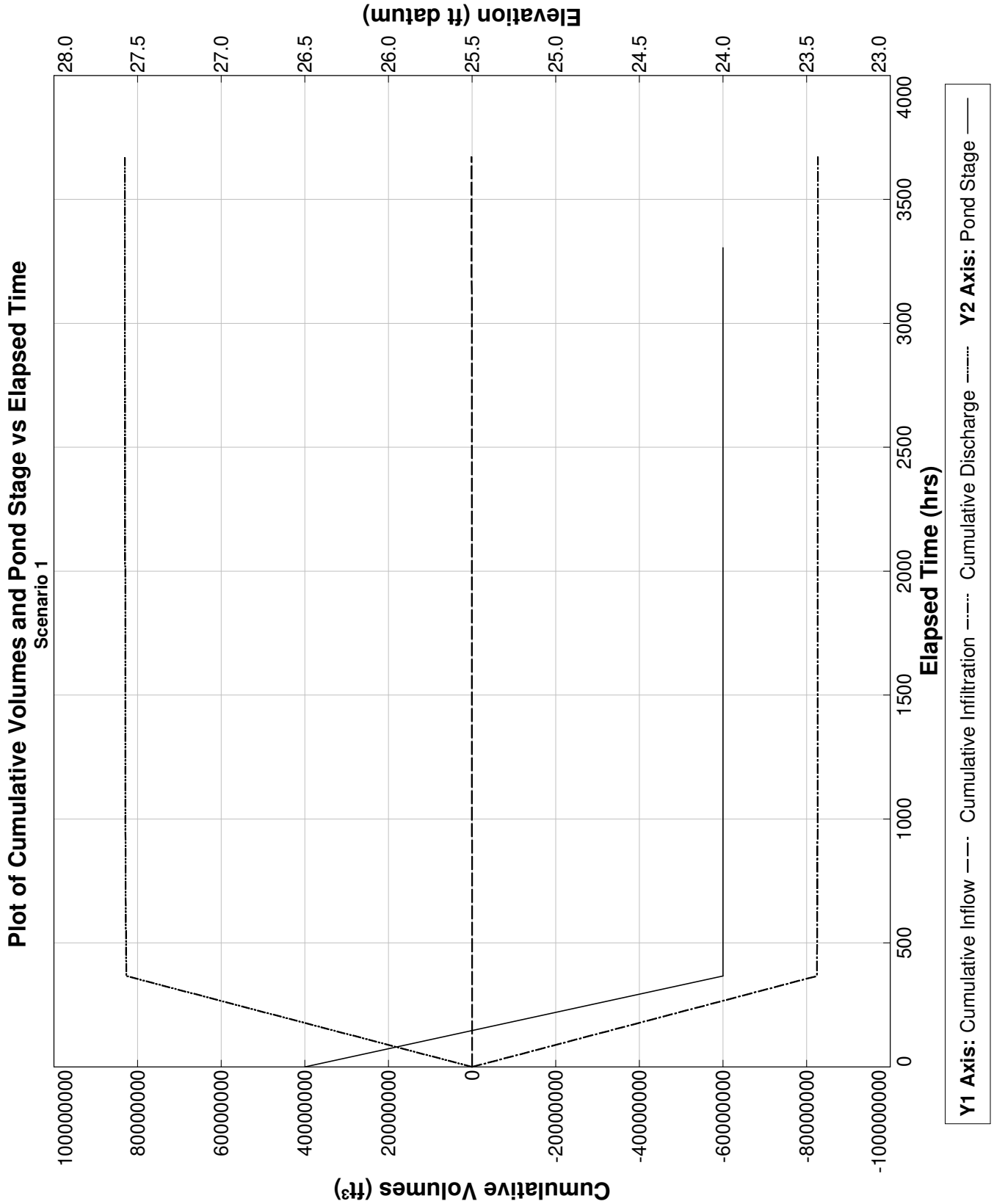
Baseflow hydrograph: Initial GWT (seasonal low) is 26.5 ft.

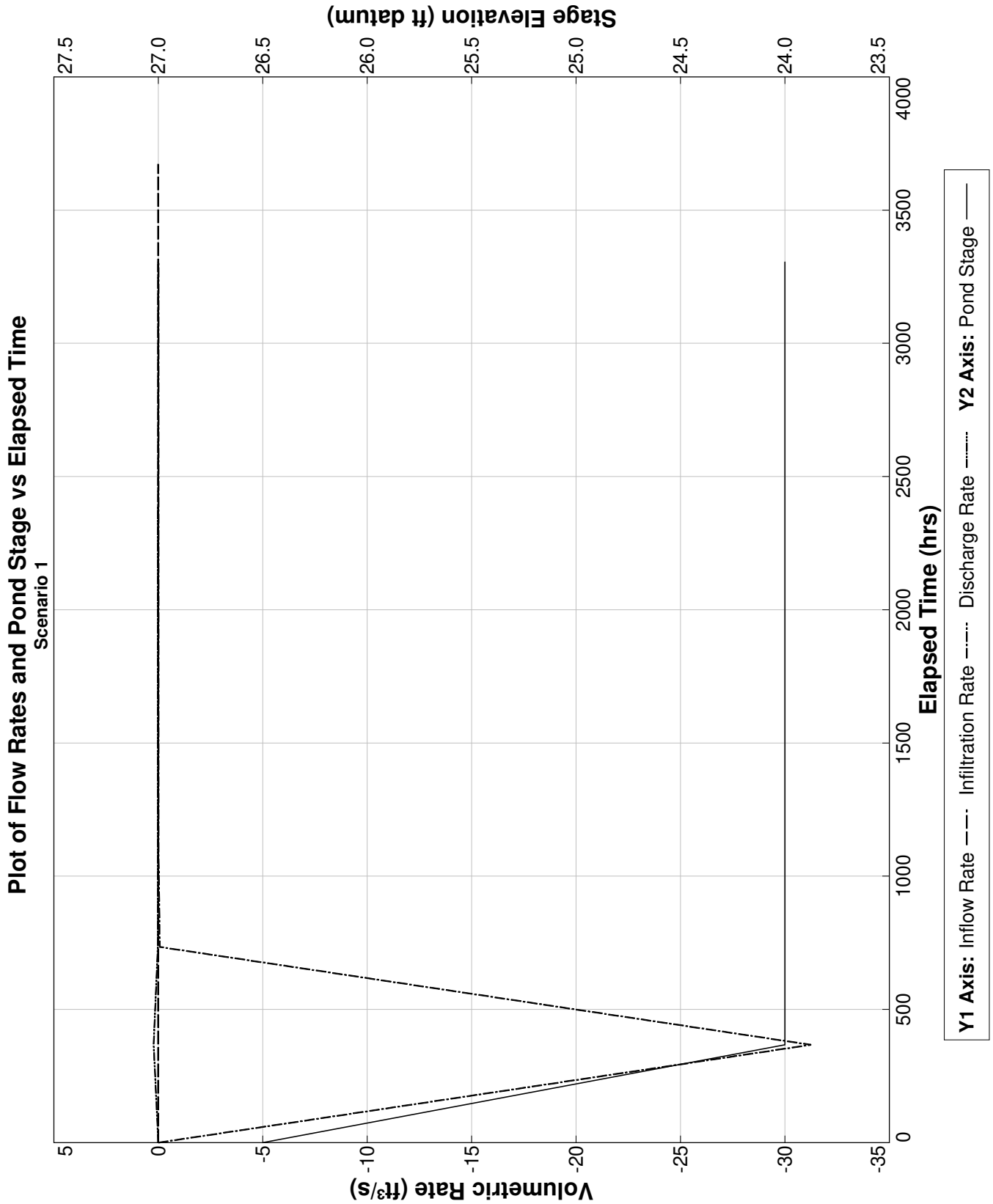
End Scenario 1 3/31/2023 15:6:24

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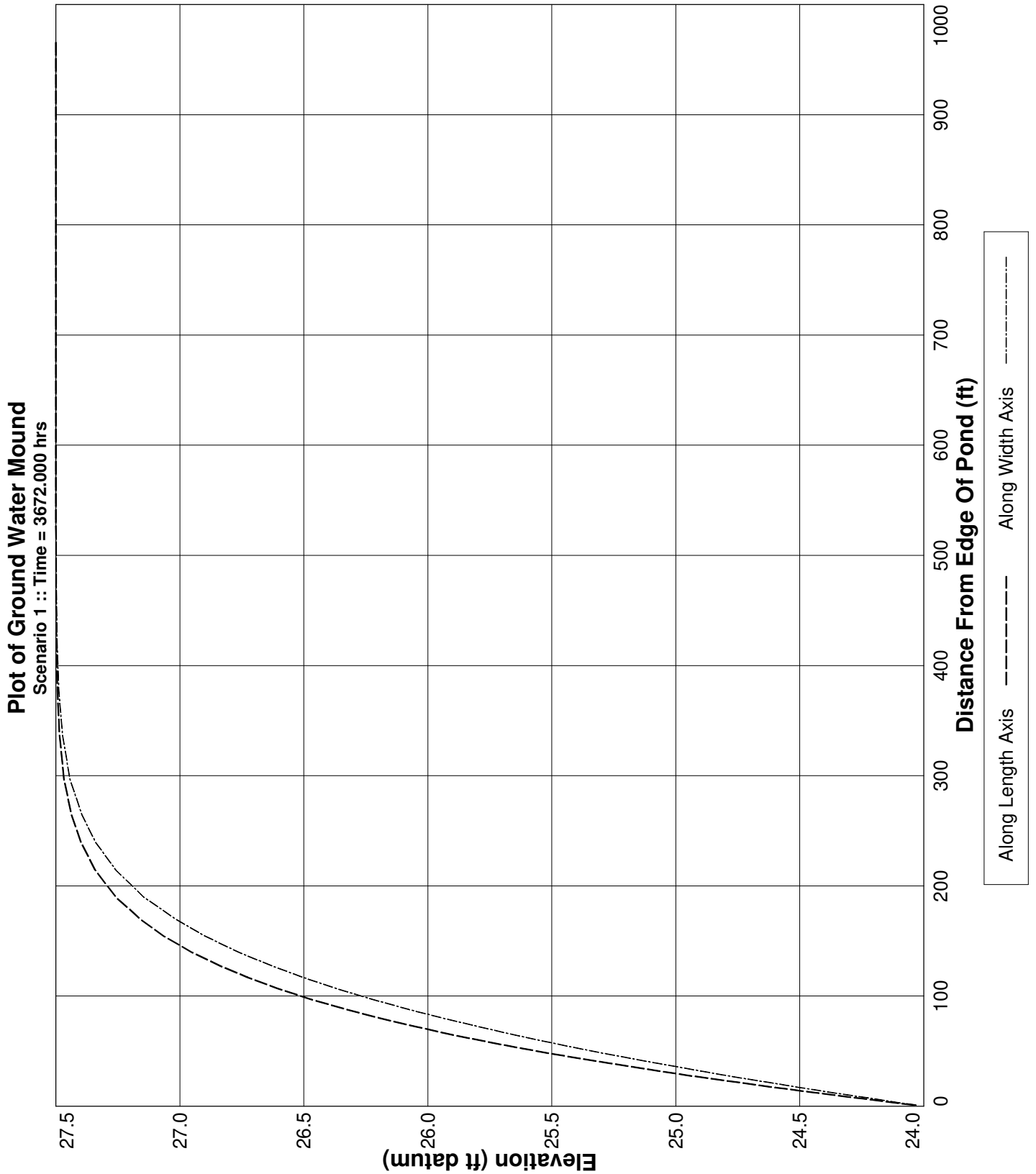
**Detailed Results** :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0077	0.00163	26.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0077	0.00163	24.00001	-31.24144	.2242173	10122.000	-82444830.0	8.270869E+07	S
734.400	0.0077	0.00163	24.00000	-0.06414	2.187982E-02	20244.000	-82597370.0	8.287135E+07	S
1101.600	0.0077	0.00163	24.00000	-0.01193	.019226	30366.000	-82614420.0	8.289852E+07	S
1468.800	0.0077	0.00163	24.00000	-0.01052	1.803513E-02	40488.000	-82628920.0	8.292315E+07	S
1836.000	0.0077	0.00163	24.00000	-0.00979	1.739979E-02	50610.000	-82642220.0	8.294657E+07	S
2203.200	0.0077	0.00163	24.00000	-0.00931	1.693595E-02	60732.000	-82654790.0	8.296926E+07	S
2570.400	0.0077	0.00163	24.00000	-0.00898	1.660481E-02	70854.000	-82666840.0	8.299143E+07	S
2937.600	0.0077	0.00163	24.00000	-0.00877	1.641082E-02	80976.000	-82678540.0	8.301326E+07	S
3304.800	0.0077	0.00163	24.00000	-0.00864	1.627942E-02	91098.000	-82690020.0	8.303486E+07	S
3672.000	0.0077	0.00163	24.00000	----	----	101220.000	-82701380.0	8.305634E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 18, South, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -7.00  
Water Table Elevation, [WT] (ft datum): 30.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.38  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 723.0  
Equivalent Pond Width, [W] (ft): 140.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
-2.00	435.6
24.00	101494.8

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	29.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 15:7:45

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

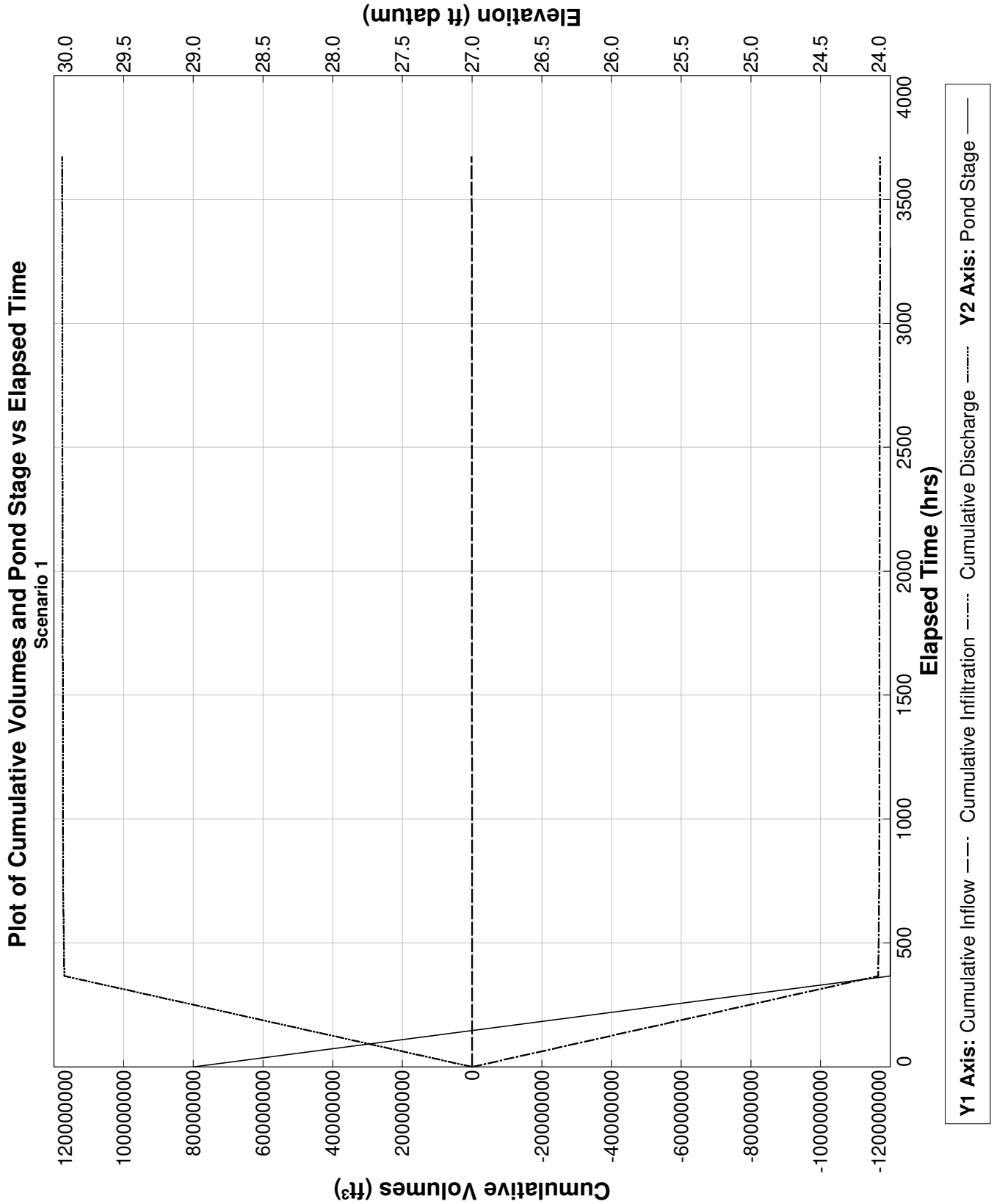
Baseflow hydrograph: Initial GWT (seasonal low) is 29.0 ft.

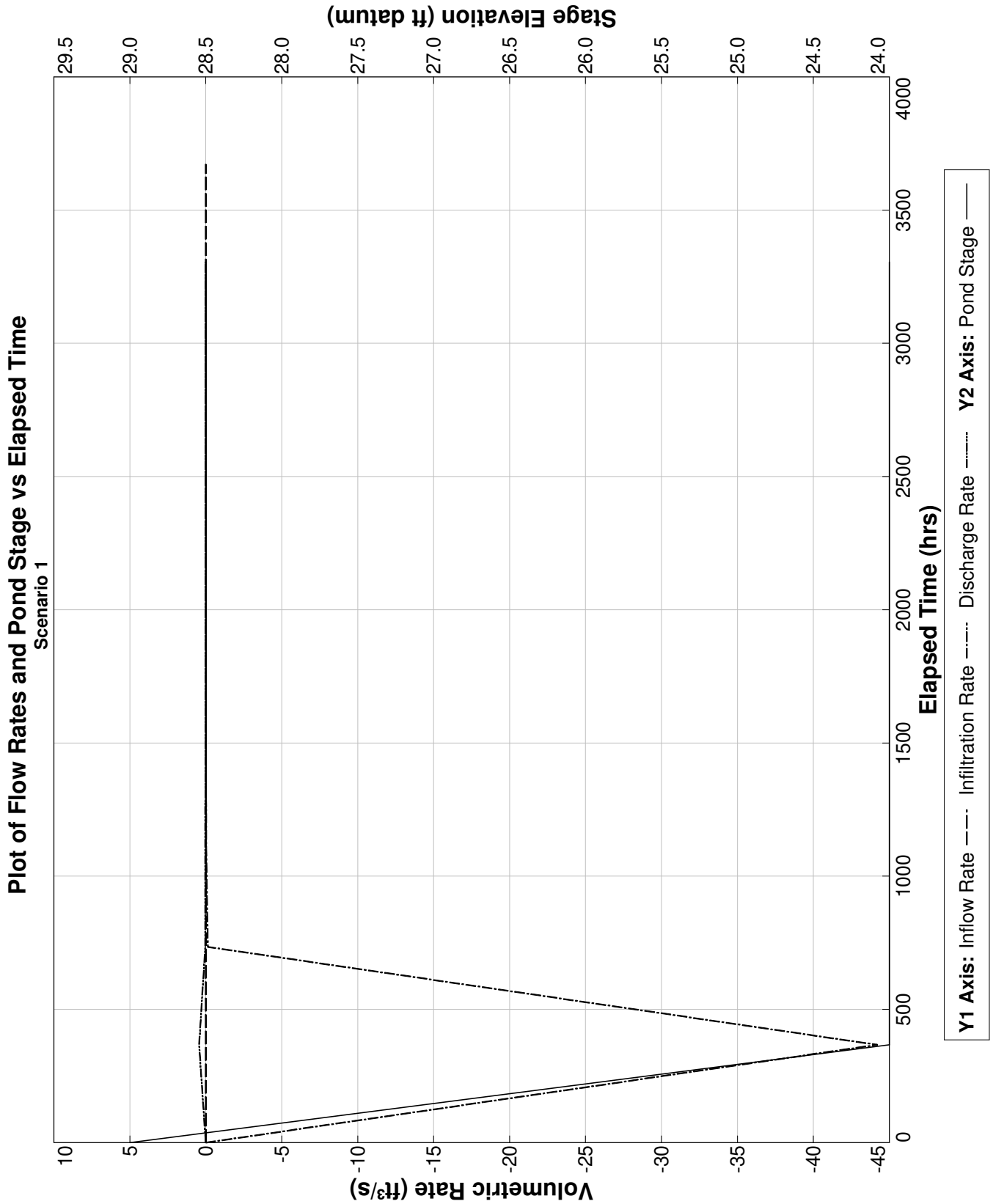
End Scenario 1 3/31/2023 15:7:45

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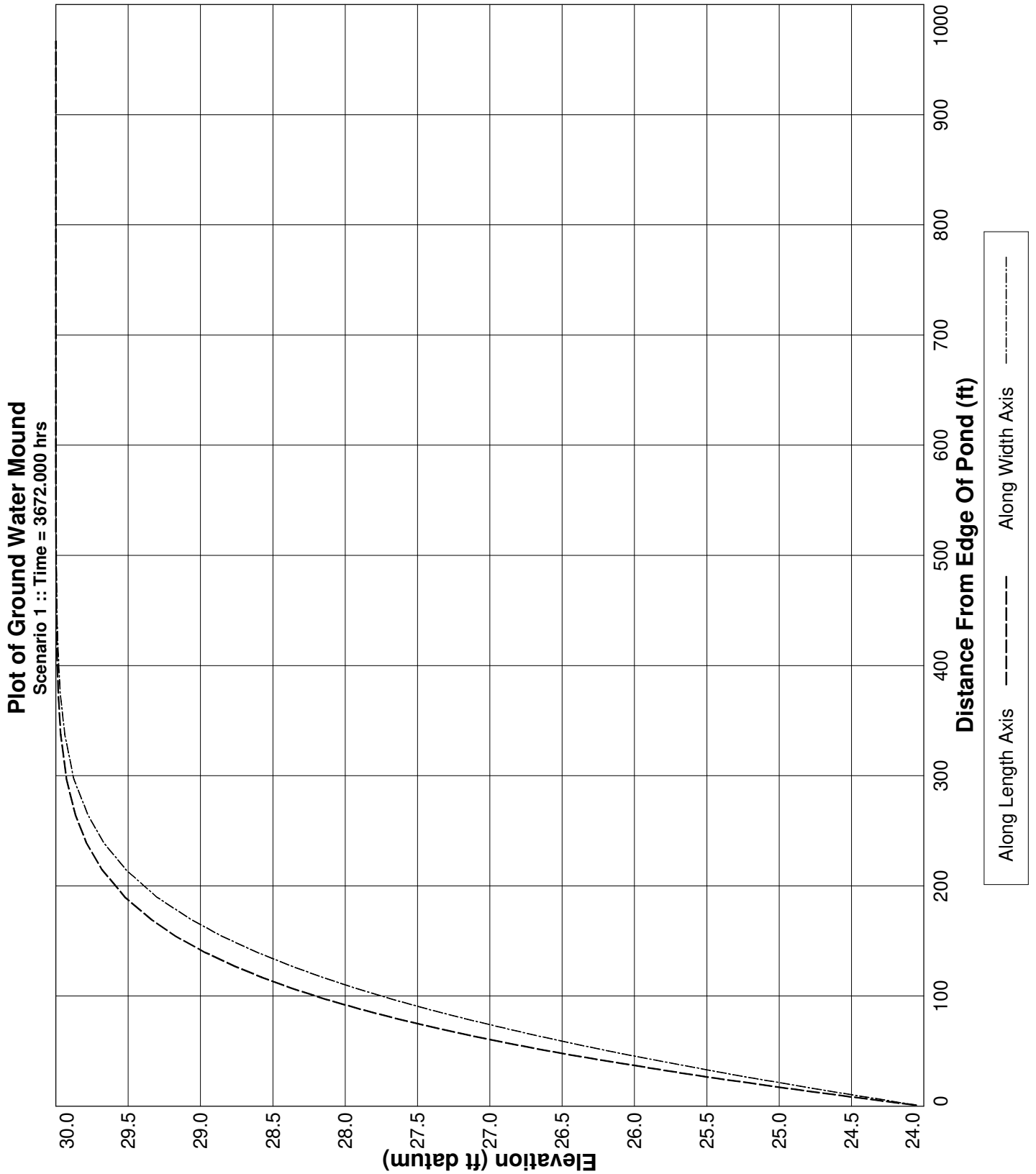
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0077	0.00163	29.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0077	0.00163	24.00003	-44.19249	.4422611	10122.000	-116532900.0	1.170505E+08	S
734.400	0.0077	0.00163	24.00000	-0.12739	.034479	20244.000	-116837900.0	1.173656E+08	S
1101.600	0.0077	0.00163	24.00000	-0.02201	2.896225E-02	30366.000	-116869700.0	1.174075E+08	S
1468.800	0.0077	0.00163	24.00000	-0.01891	.0262794	40488.000	-116896100.0	1.17444E+08	S
1836.000	0.0077	0.00163	24.00000	-0.01720	2.475027E-02	50610.000	-116919700.0	1.174778E+08	S
2203.200	0.0077	0.00163	24.00000	-0.01611	2.366514E-02	60732.000	-116941600.0	1.175098E+08	S
2570.400	0.0077	0.00163	24.00000	-0.01537	2.300315E-02	70854.000	-116962300.0	1.175406E+08	S
2937.600	0.0077	0.00163	24.00000	-0.01481	2.244309E-02	80976.000	-116982200.0	1.175706E+08	S
3304.800	0.0077	0.00163	24.00000	-0.01436	2.198535E-02	91098.000	-117001400.0	1.176E+08	S
3672.000	0.0077	0.00163	24.00000	----	----	101220.000	-117020200.0	1.176288E+08	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 19, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -2.00  
Water Table Elevation, [WT] (ft datum): 26.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.38  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 424.0  
Equivalent Pond Width, [W] (ft): 7.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
3.00	435.6
24.00	40946.4

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	25.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 16:1:5

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

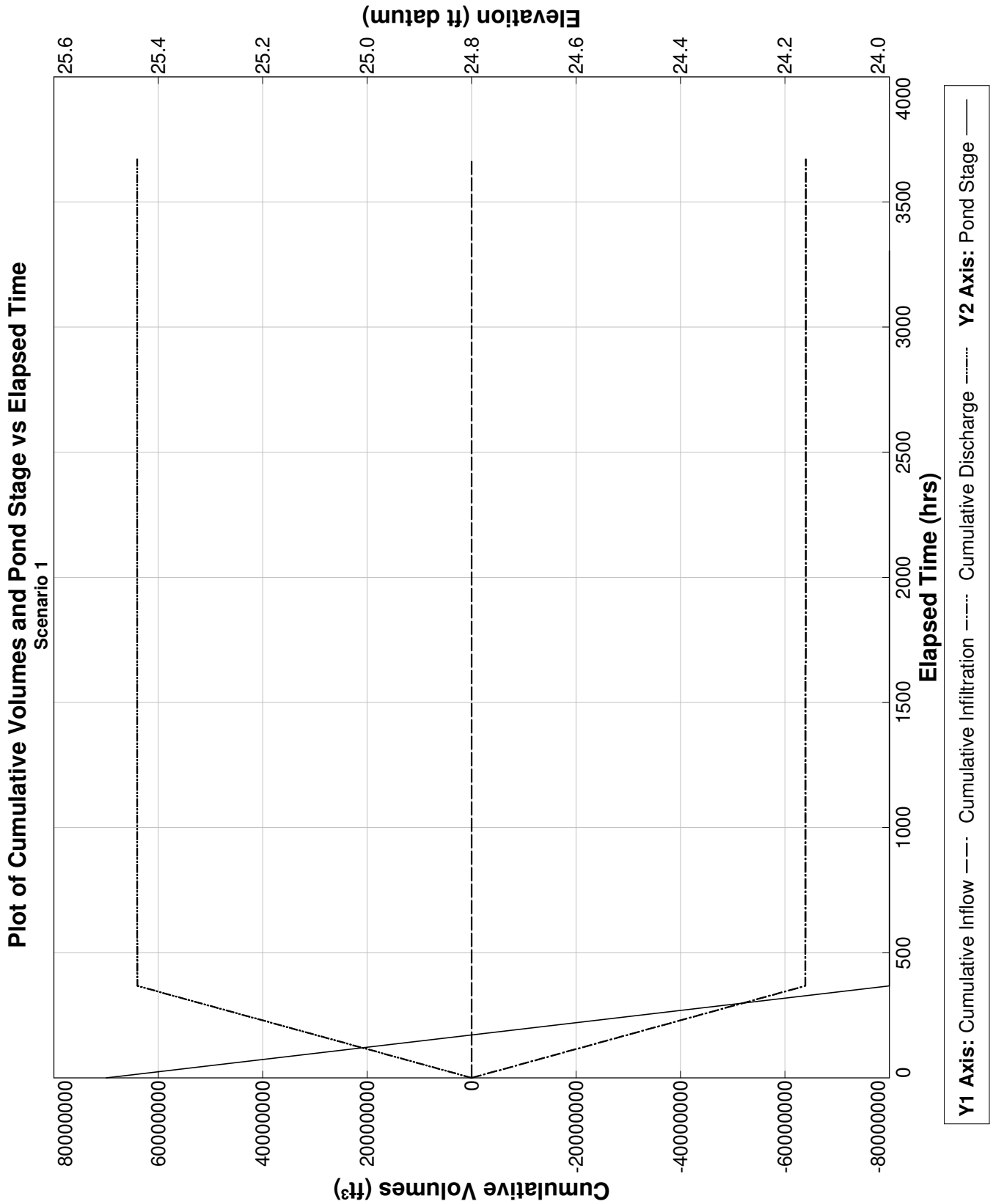
Baseflow hydrograph: Initial GWT (seasonal low) is 25.5 ft.

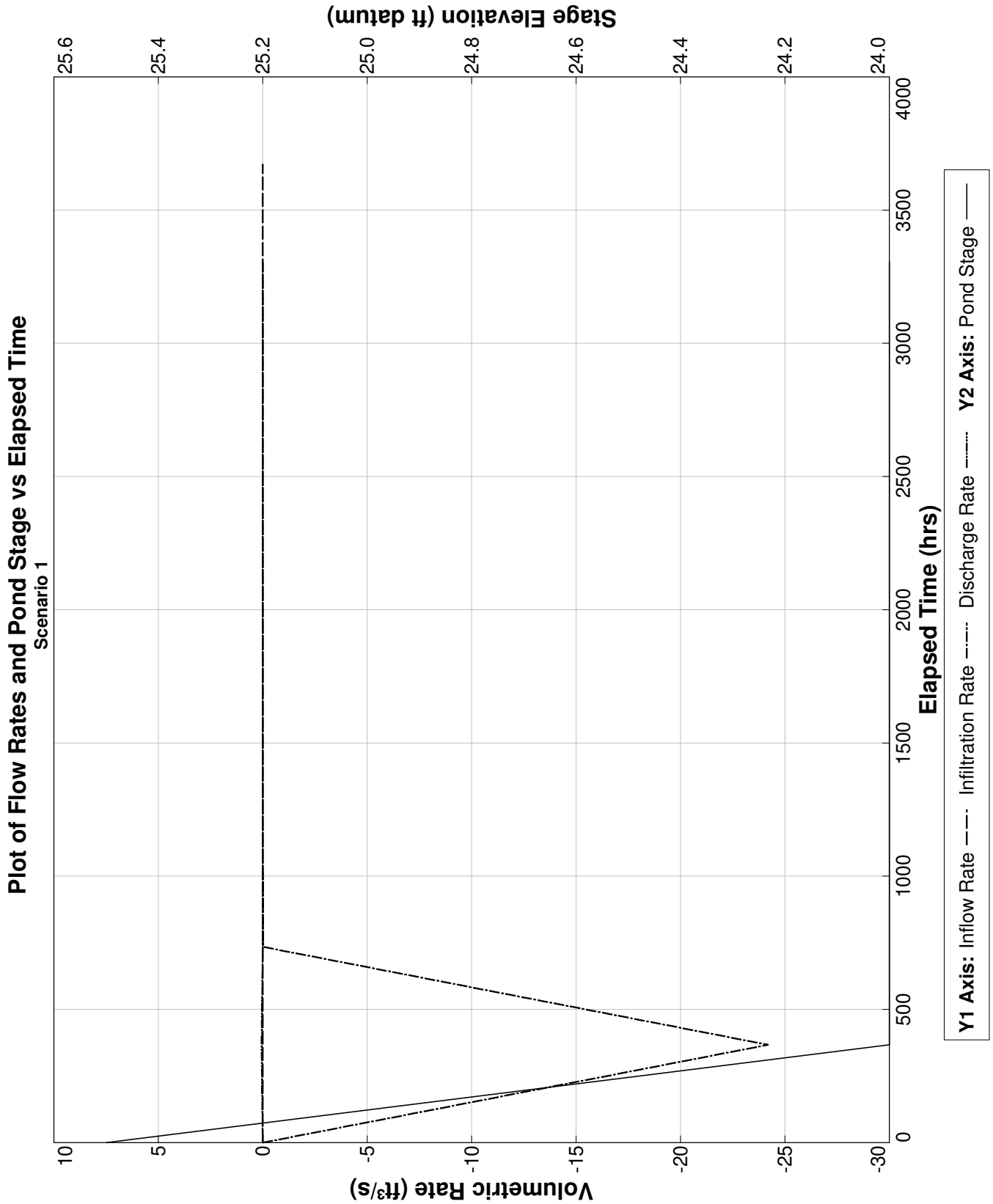
End Scenario 1 3/31/2023 16:1:5

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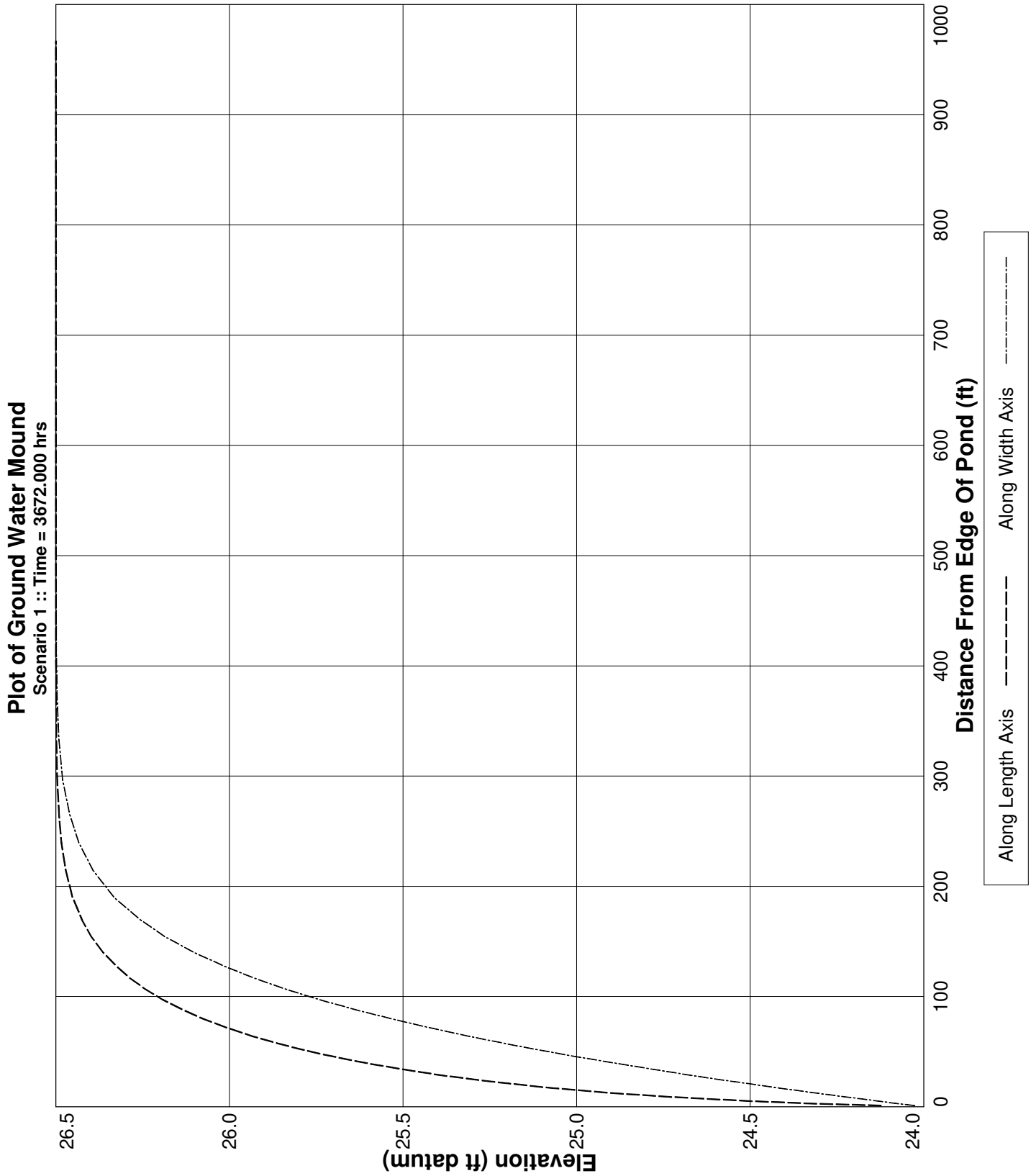
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0002	0.00163	25.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0002	0.00163	24.00000	-24.19381	5.455749E-02	296.800	-63925430.0	6.398714E+07	S
734.400	0.0002	0.00163	24.00000	-0.01704	5.113269E-03	593.600	-63964570.0	6.402658E+07	S
1101.600	0.0002	0.00163	24.00000	-0.00414	4.271904E-03	890.400	-63970480.0	6.403278E+07	S
1468.800	0.0002	0.00163	24.00000	-0.00364	3.804288E-03	1187.200	-63975520.0	6.403812E+07	S
1836.000	0.0002	0.00163	24.00000	-0.00337	3.562853E-03	1484.000	-63980090.0	6.404299E+07	S
2203.200	0.0002	0.00163	24.00000	-0.00323	3.43872E-03	1780.800	-63984420.0	6.404762E+07	S
2570.400	0.0002	0.00163	24.00000	-0.00317	3.385219E-03	2077.600	-63988640.0	6.405213E+07	S
2937.600	0.0002	0.00163	24.00000	-0.00315	3.370557E-03	2374.400	-63992800.0	6.40566E+07	S
3304.800	0.0002	0.00163	24.00000	-0.00316	3.379625E-03	2671.200	-63996970.0	6.406106E+07	S
3672.000	0.0002	0.00163	24.00000	----	----	2968.000	-64001160.0	6.406554E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 20, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 5.00  
Water Table Elevation, [WT] (ft datum): 24.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.22  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 275.0  
Equivalent Pond Width, [W] (ft): 62.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
10.00	435.6
24.00	16988.4

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	23.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 15:25:13

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

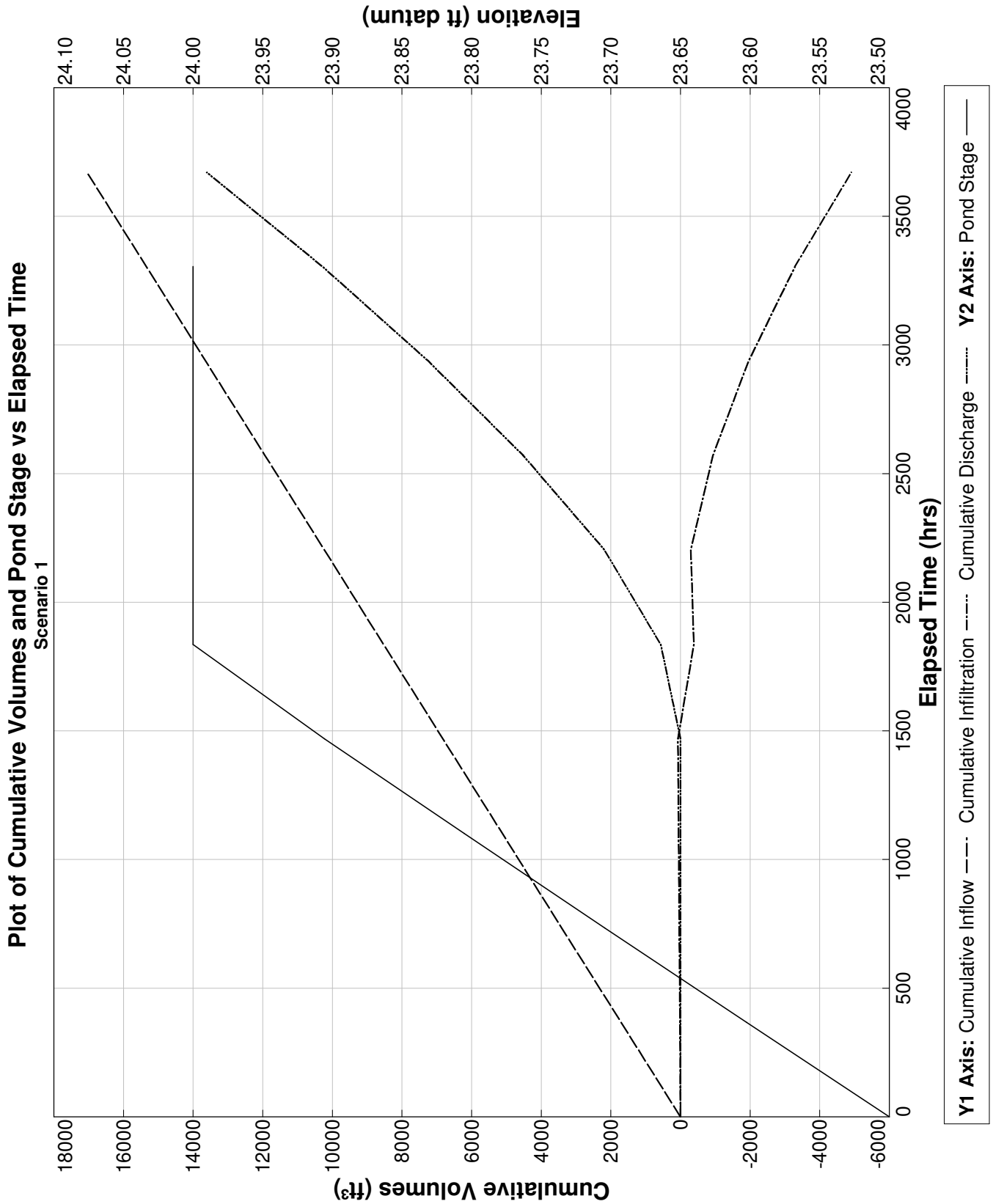
Baseflow hydrograph: Initial GWT (seasonal low) is 23.5 ft.

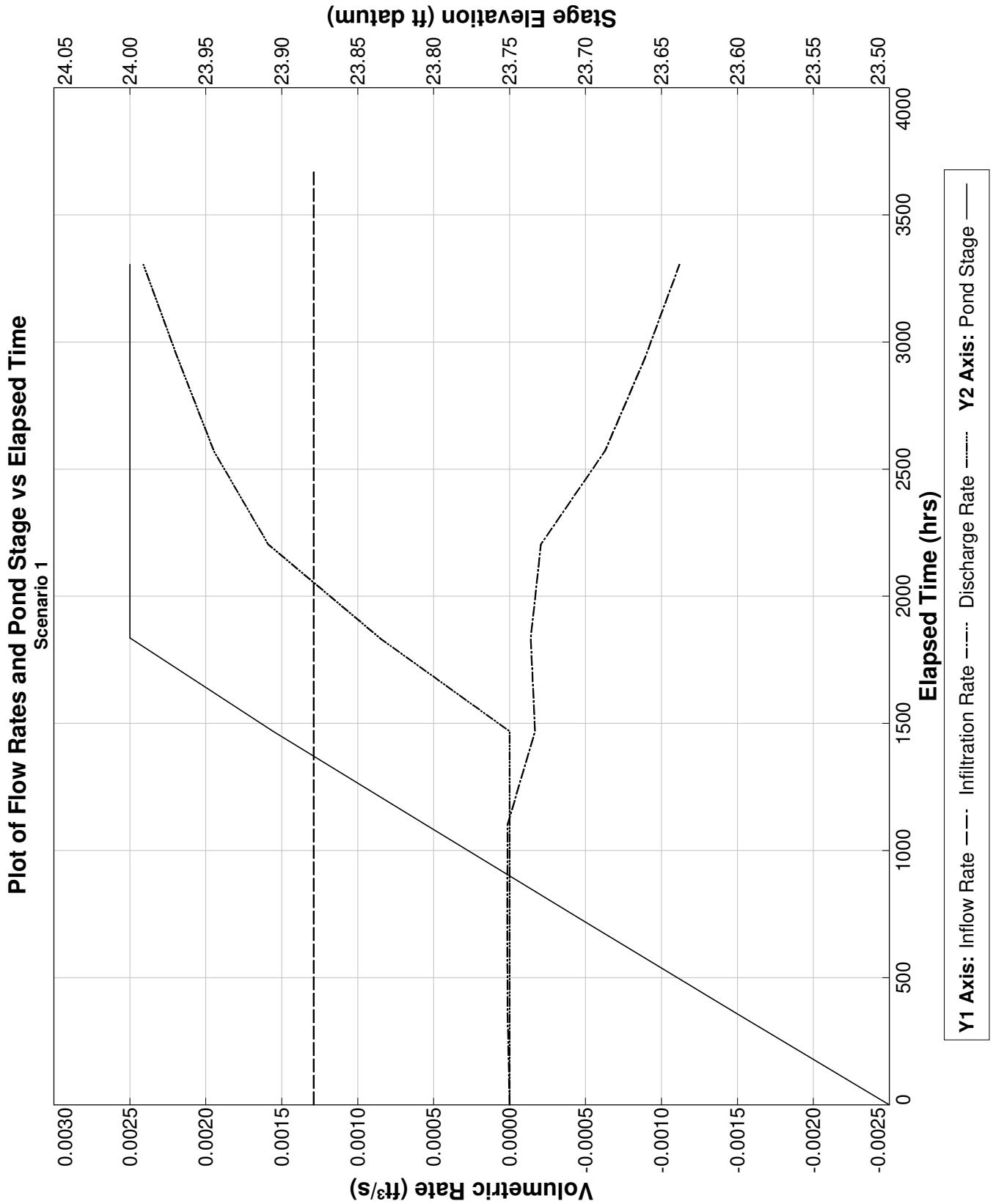
End Scenario 1 3/31/2023 15:25:13

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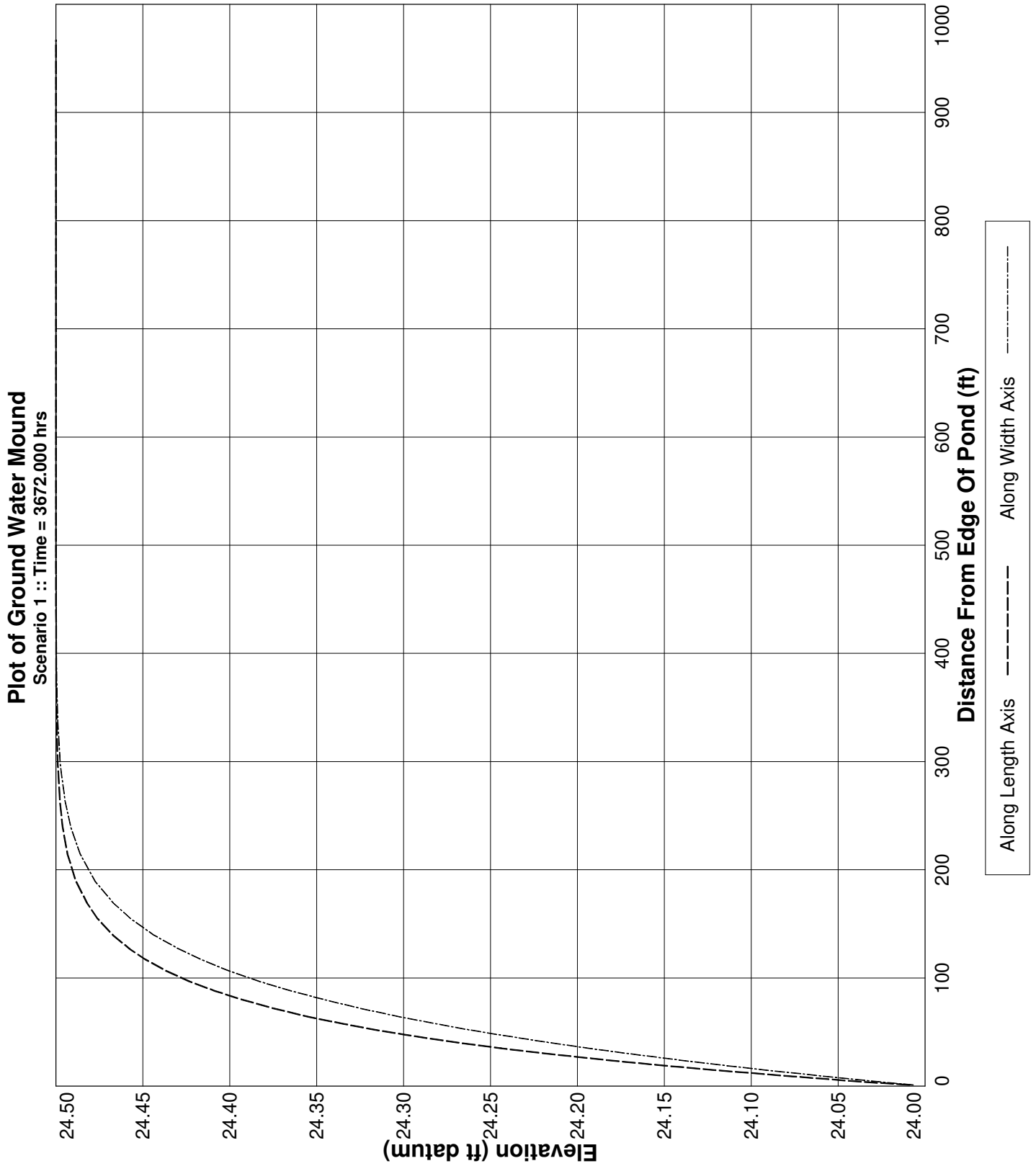
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0013	0.00163	23.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0013	0.00163	23.60269	0.00001	0	1705.000	14.9	0	S
734.400	0.0013	0.00163	23.70437	0.00001	0	3410.000	34.2	0	S
1101.600	0.0013	0.00163	23.80532	0.00001	0	5115.000	53.5	0	S
1468.800	0.0013	0.00163	23.90566	-0.00017	0	6820.000	71.0	0	S
1836.000	0.0013	0.00163	24.00000	-0.00014	8.561544E-04	8525.000	-387.3	565.8839	S
2203.200	0.0013	0.00163	24.00000	-0.00021	1.588584E-03	10230.000	-298.2	2181.758	S
2570.400	0.0013	0.00163	24.00000	-0.00063	1.946643E-03	11935.000	-929.8	4518.401	S
2937.600	0.0013	0.00163	24.00000	-0.00089	2.185157E-03	13640.000	-1955.8	7249.356	S
3304.800	0.0013	0.00163	24.00000	-0.00112	2.410858E-03	15345.000	-3288.5	10287.14	S
3672.000	0.0013	0.00163	24.00000	----	----	17050.000	-4912.7	13616.33	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.21, North Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-24-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -20.00  
Water Table Elevation, [WT] (ft datum): 24.58  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.22  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 991.0  
Equivalent Pond Width, [W] (ft): 546.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
-15.00	196020.0
24.00	541015.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	23.58
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/24/2023 7:28:29

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

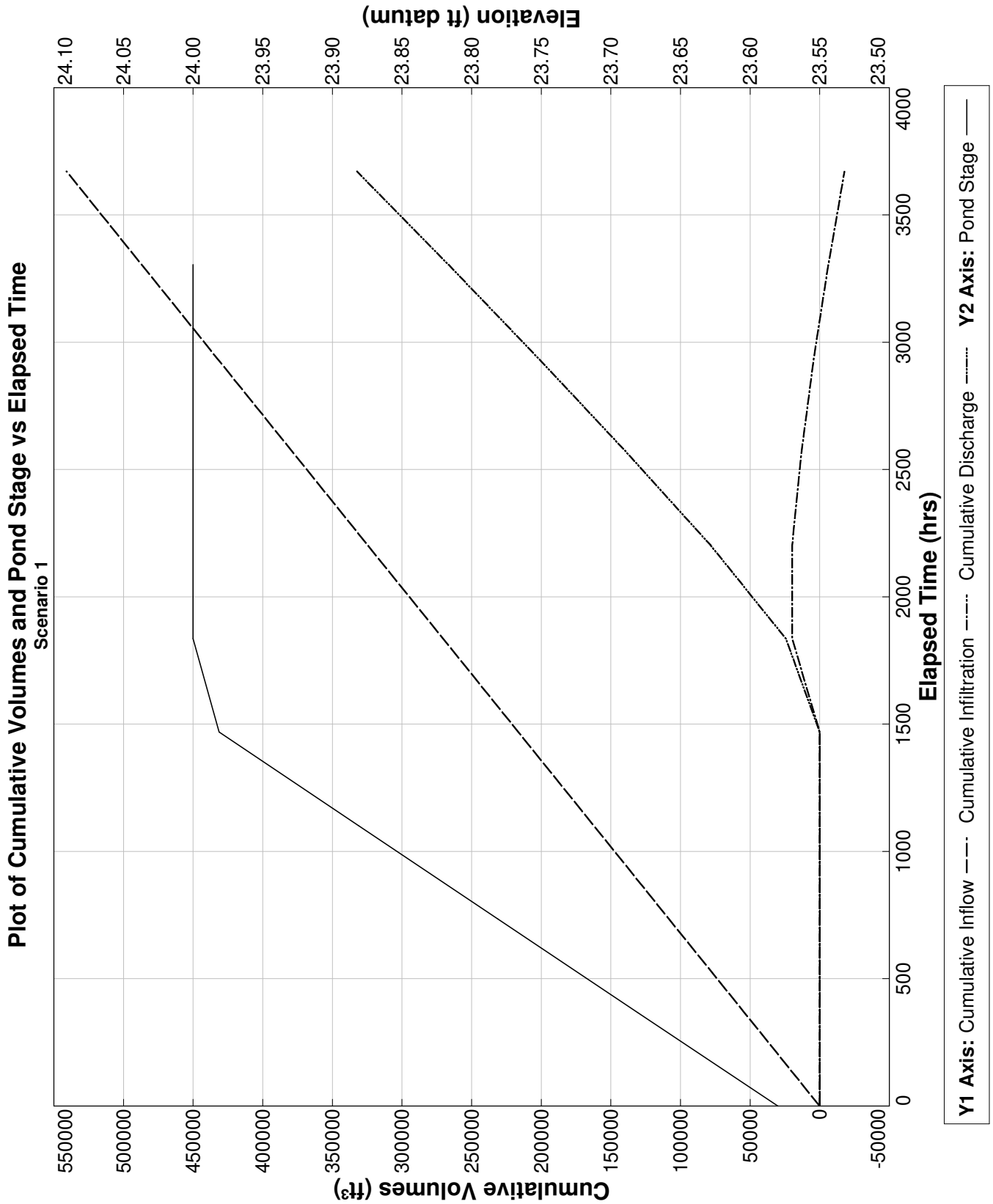
Baseflow hydrograph: Initial GWT (seasonal low) is 23.58 ft.

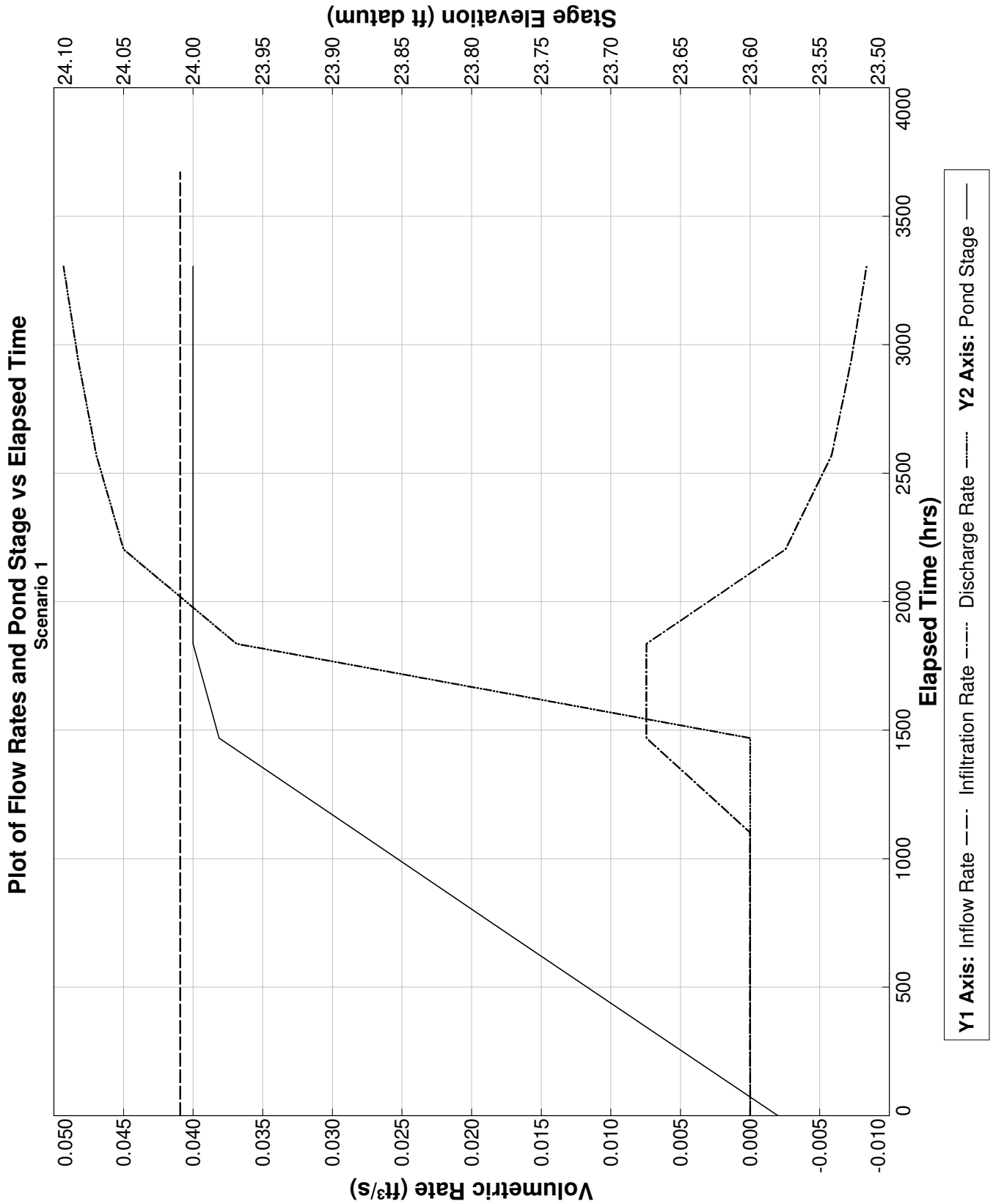
End Scenario 1 3/24/2023 7:28:29

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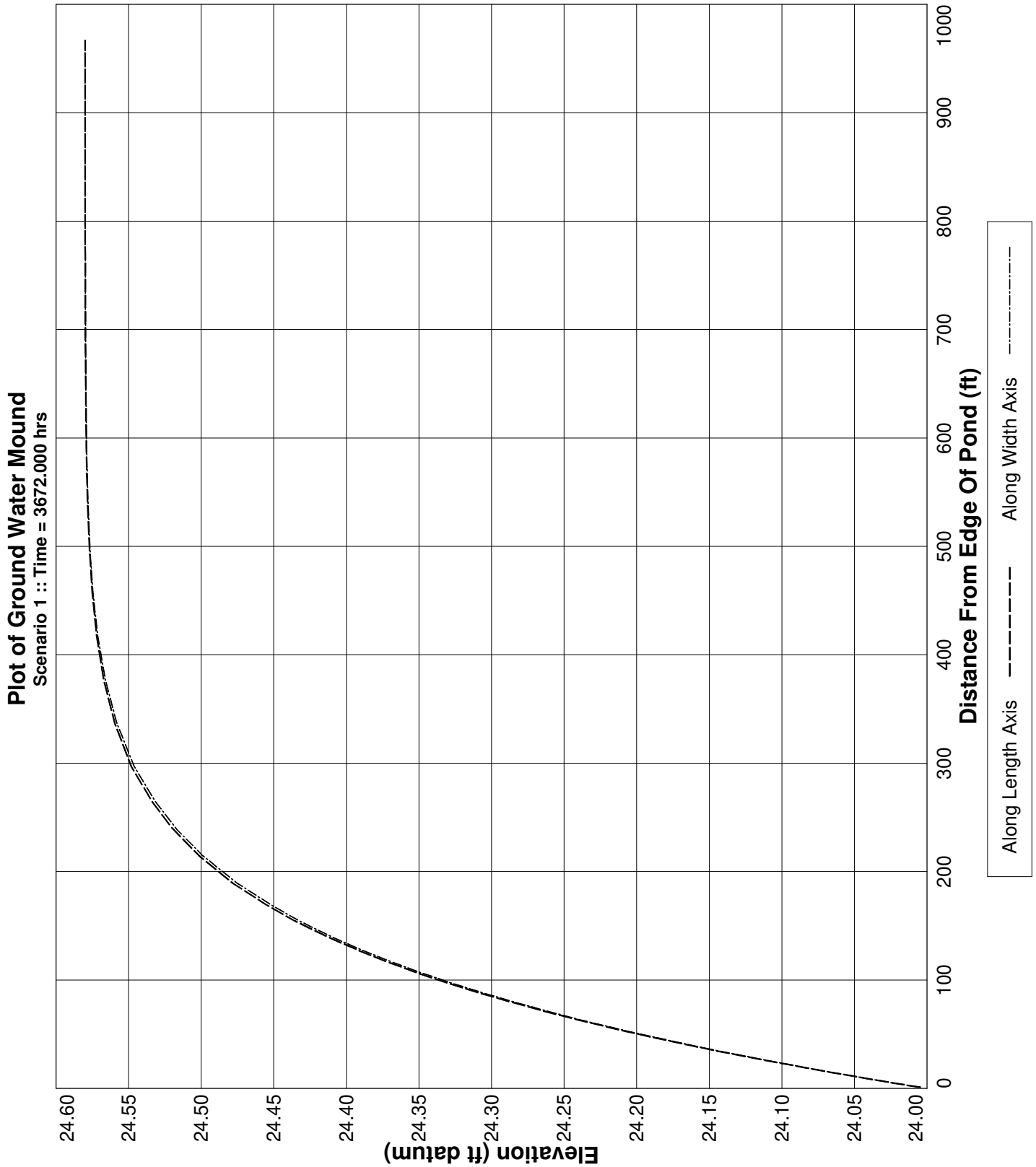
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0409	0.00163	23.58000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0409	0.00163	23.68060	0.00001	0	54108.600	11.4	0	S
734.400	0.0409	0.00163	23.78104	0.00001	0	108217.200	18.7	0	S
1101.600	0.0409	0.00163	23.88131	0.00001	0	162325.800	28.6	0	S
1468.800	0.0409	0.00163	23.98143	0.00745	0	216434.400	34.2	0	S
1836.000	0.0409	0.00163	24.00000	0.00744	3.688659E-02	270543.000	19716.1	24380.56	S
2203.200	0.0409	0.00163	24.00000	-0.00253	4.500166E-02	324651.600	19699.8	78505.41	S
2570.400	0.0409	0.00163	24.00000	-0.00585	4.694673E-02	378760.200	13034.2	139279.6	S
2937.600	0.0409	0.00163	24.00000	-0.00726	4.824956E-02	432868.800	4221.8	202200.6	S
3304.800	0.0409	0.00163	24.00000	-0.00836	4.930437E-02	486977.400	-6148.8	266679.8	S
3672.000	0.0409	0.00163	24.00000	----	----	541086.000	-17880.2	332519.8	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.21, North Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-24-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -20.00  
Water Table Elevation, [WT] (ft datum): 24.58  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 991.0  
Equivalent Pond Width, [W] (ft): 546.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
-15.00	196020.0
24.00	541015.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	23.58
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/24/2023 7:31:11

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

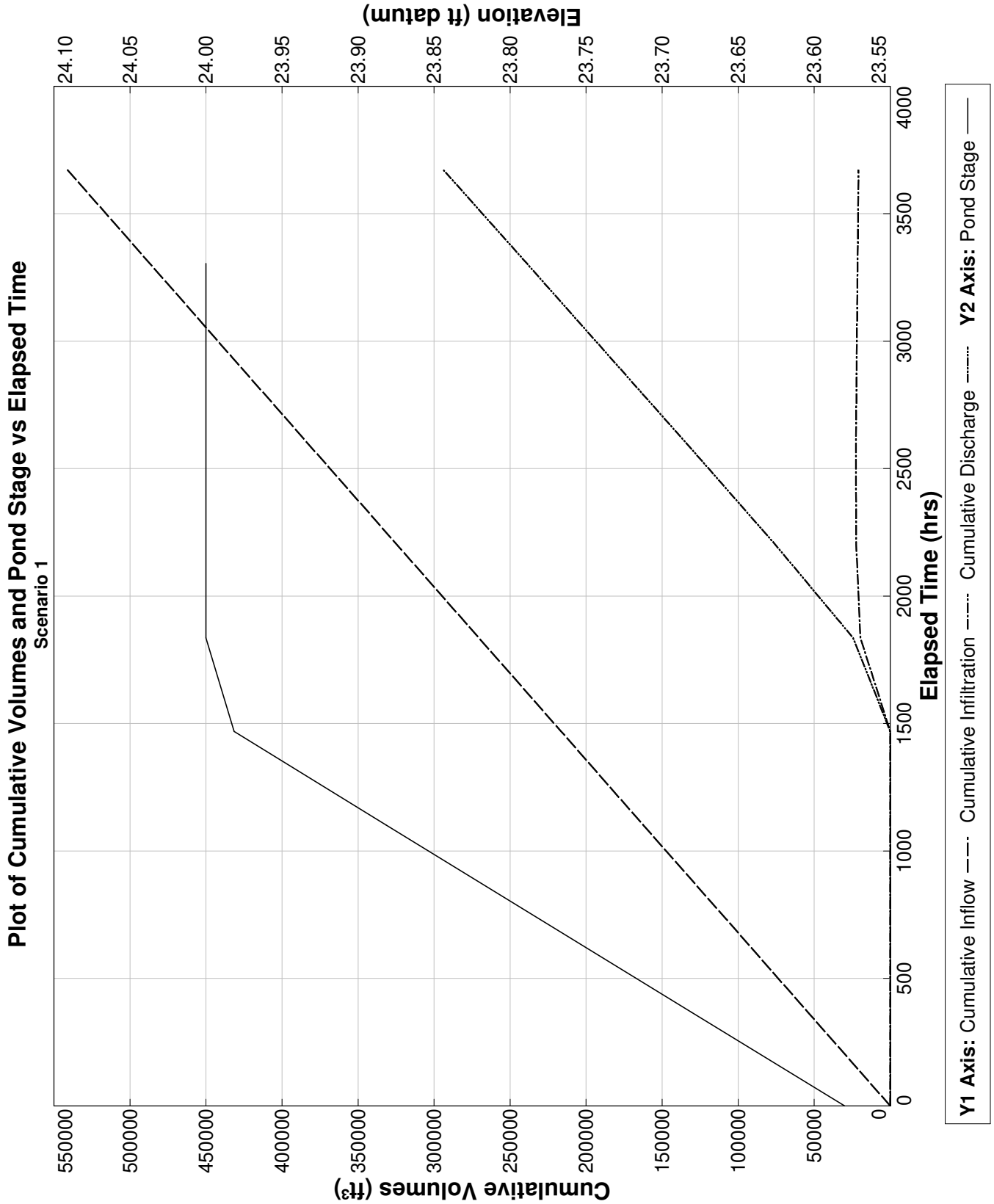
Baseflow hydrograph: Initial GWT (seasonal low) is 23.58 ft.

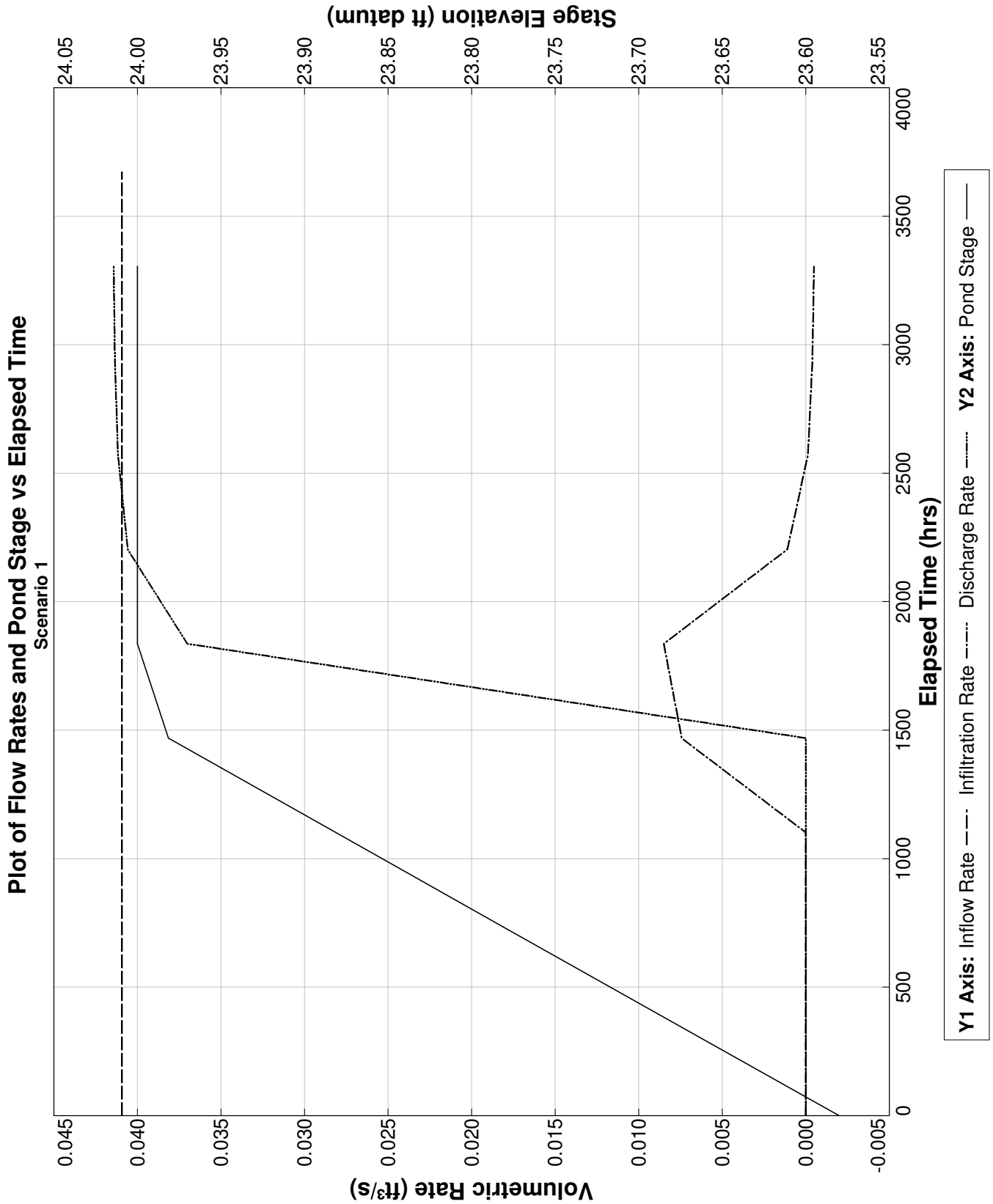
End Scenario 1 3/24/2023 7:31:11

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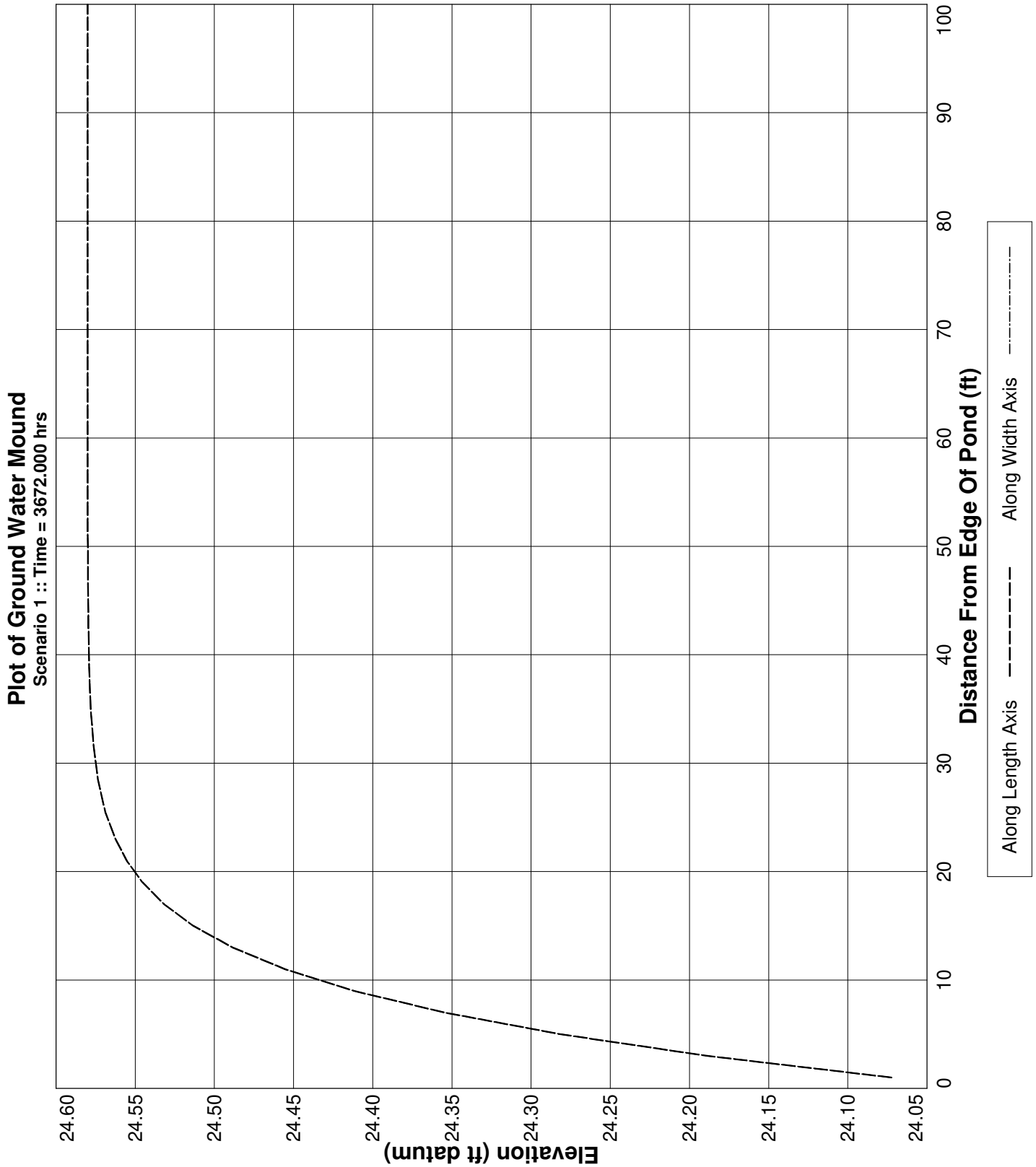
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0409	0.00163	23.58000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0409	0.00163	23.68062	0.00000	0	54108.600	1.7	0	S
734.400	0.0409	0.00163	23.78107	0.00000	0	108217.200	3.9	0	S
1101.600	0.0409	0.00163	23.88136	0.00000	0	162325.800	6.0	0	S
1468.800	0.0409	0.00163	23.98148	0.00743	0	216434.400	7.8	0	S
1836.000	0.0409	0.00163	24.00000	0.00850	3.700336E-02	270543.000	19638.9	24457.74	S
2203.200	0.0409	0.00163	24.00000	0.00110	4.056894E-02	324651.600	22475.3	75729.93	S
2570.400	0.0409	0.00163	24.00000	-0.00013	4.117129E-02	378760.200	22556.9	129757	S
2937.600	0.0409	0.00163	24.00000	-0.00039	4.134231E-02	432868.800	22127.3	184295.2	S
3304.800	0.0409	0.00163	24.00000	-0.00049	4.142555E-02	486977.400	21529.6	239001.4	S
3672.000	0.0409	0.00163	24.00000	----	----	541086.000	20837.0	293802.7	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.21, Northwest Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-24-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -20.00  
Water Table Elevation, [WT] (ft datum): 25.43  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.22  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 991.0  
Equivalent Pond Width, [W] (ft): 546.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
-15.00	196020.0
24.00	541015.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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---

**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	24.43
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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---

**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/24/2023 7:33:55

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

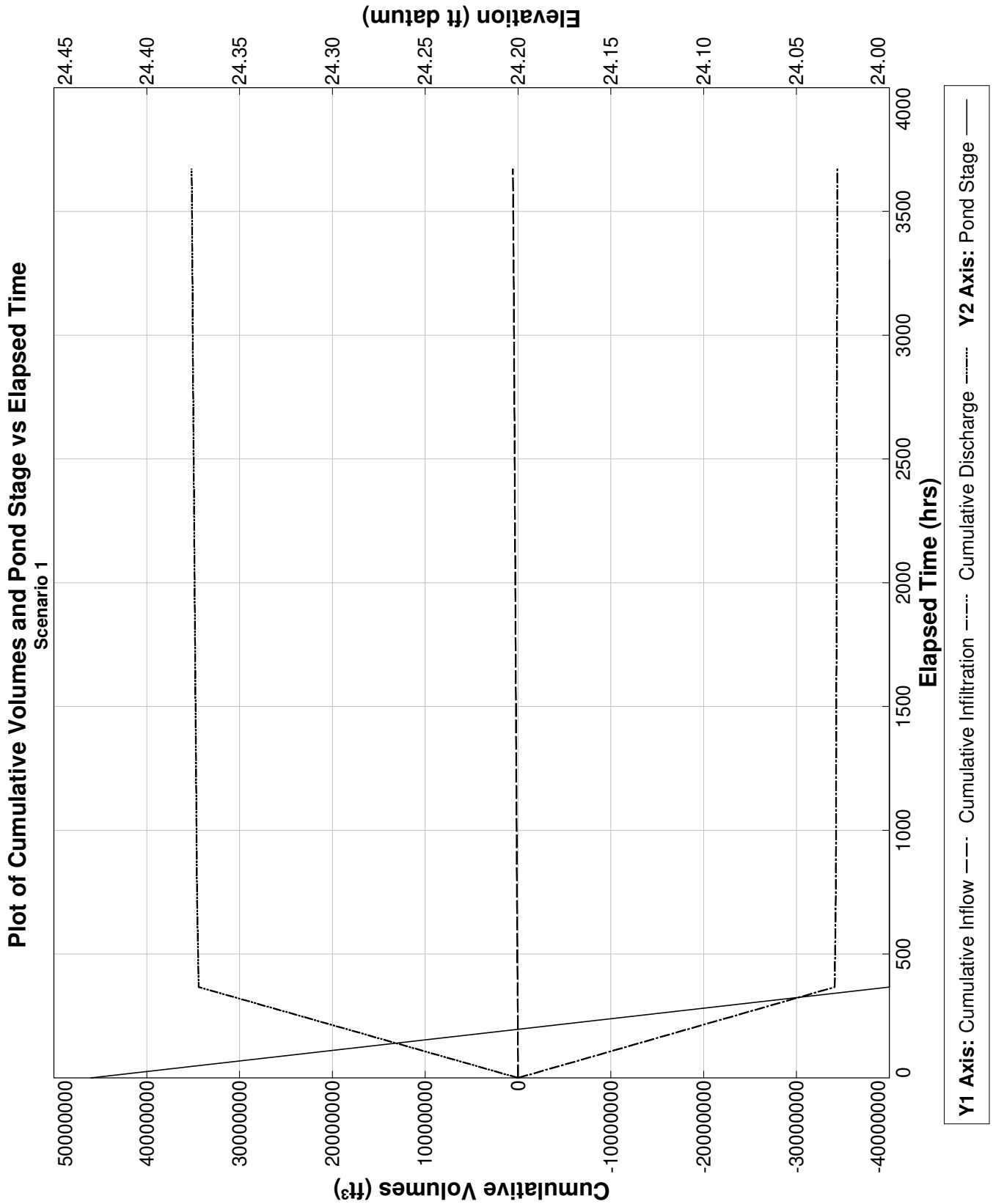
Baseflow hydrograph: Initial GWT (seasonal low) is 24.43 ft.

End Scenario 1 3/24/2023 7:33:55

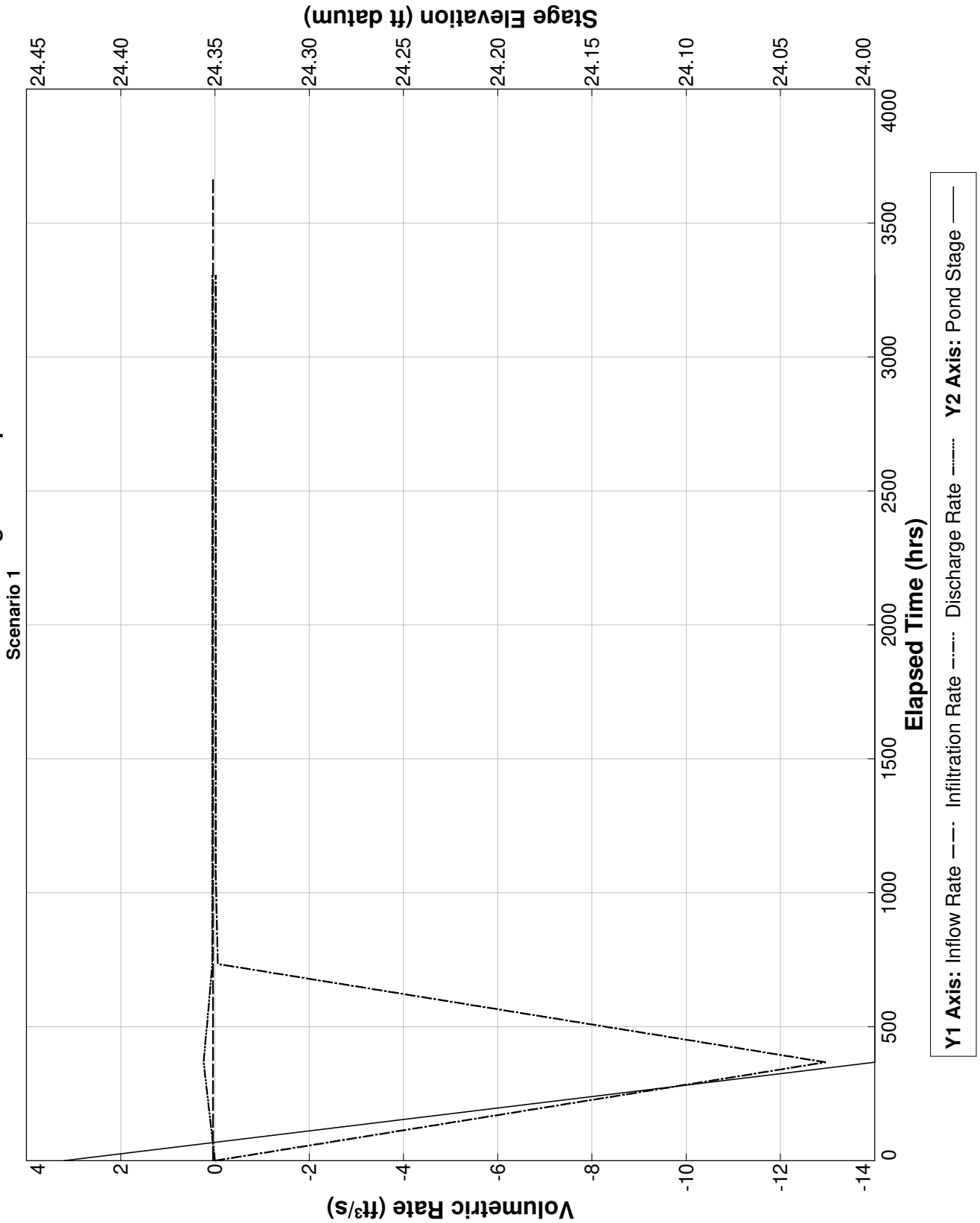
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**Detailed Results**    :: Scenario 1 ::

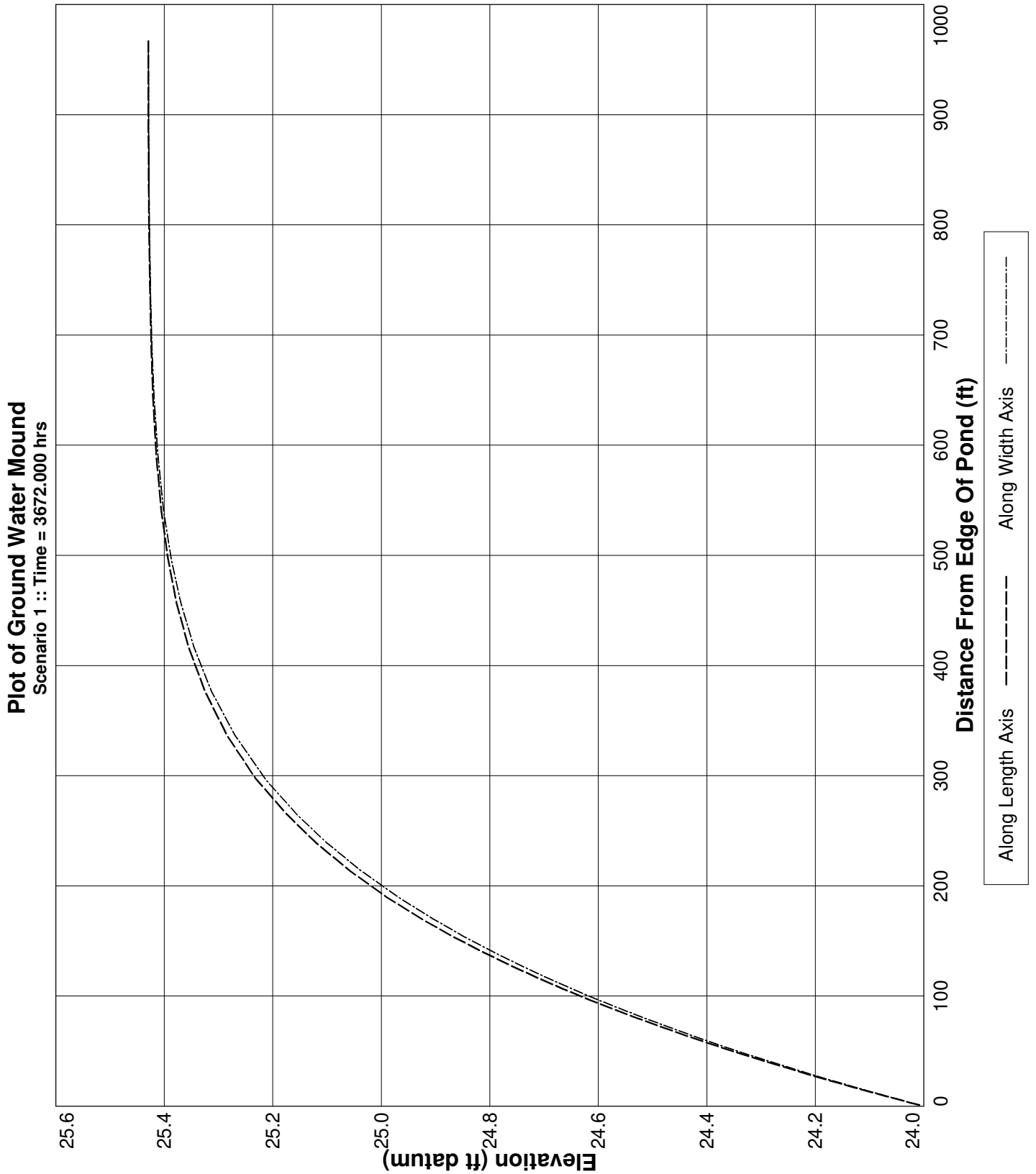
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0409	0.00163	24.43000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0409	0.00163	24.00001	-12.95376	.2359383	54108.600	-34109420.0	3.439616E+07	S
734.400	0.0409	0.00163	24.00000	-0.05915	5.508325E-02	108217.200	-34247660.0	3.458852E+07	S
1101.600	0.0409	0.00163	24.00000	-0.01346	5.422789E-02	162325.800	-34265800.0	3.466076E+07	S
1468.800	0.0409	0.00163	24.00000	-0.01320	.0540338	216434.400	-34283250.0	3.473232E+07	S
1836.000	0.0409	0.00163	24.00000	-0.01338	5.423898E-02	270543.000	-34300710.0	3.480389E+07	S
2203.200	0.0409	0.00163	24.00000	-0.01382	5.472725E-02	324651.600	-34318620.0	3.487591E+07	S
2570.400	0.0409	0.00163	24.00000	-0.01438	5.530401E-02	378760.200	-34337240.0	3.494864E+07	S
2937.600	0.0409	0.00163	24.00000	-0.01499	.0559148	432868.800	-34356640.0	3.502215E+07	S
3304.800	0.0409	0.00163	24.00000	-0.01560	5.653441E-02	486977.400	-34376860.0	3.509647E+07	S
3672.000	0.0409	0.00163	24.00000	----	----	541086.000	-34397890.0	3.517162E+07	N.A.



Plot of Flow Rates and Pond Stage vs Elapsed Time







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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.21, Northwest Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-24-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -20.00  
Water Table Elevation, [WT] (ft datum): 25.43  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 991.0  
Equivalent Pond Width, [W] (ft): 546.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
-15.00	196020.0
24.00	541015.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	24.43
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/24/2023 7:35:56

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 24.43 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 2 of 10 saturated stress periods.

Maximum calculated water budget error is -1.29296707442610 percent, for saturated stress period 2.

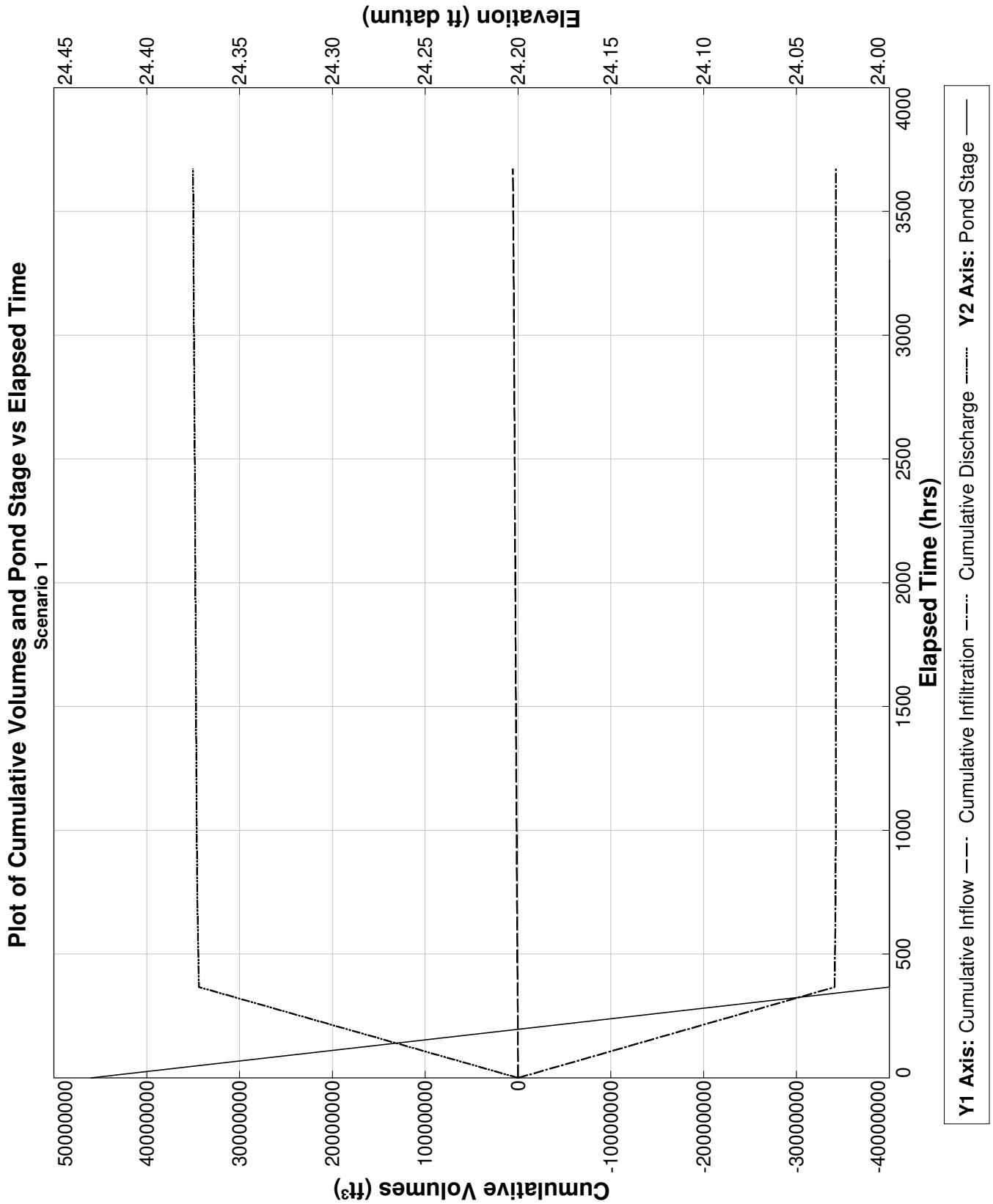
If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

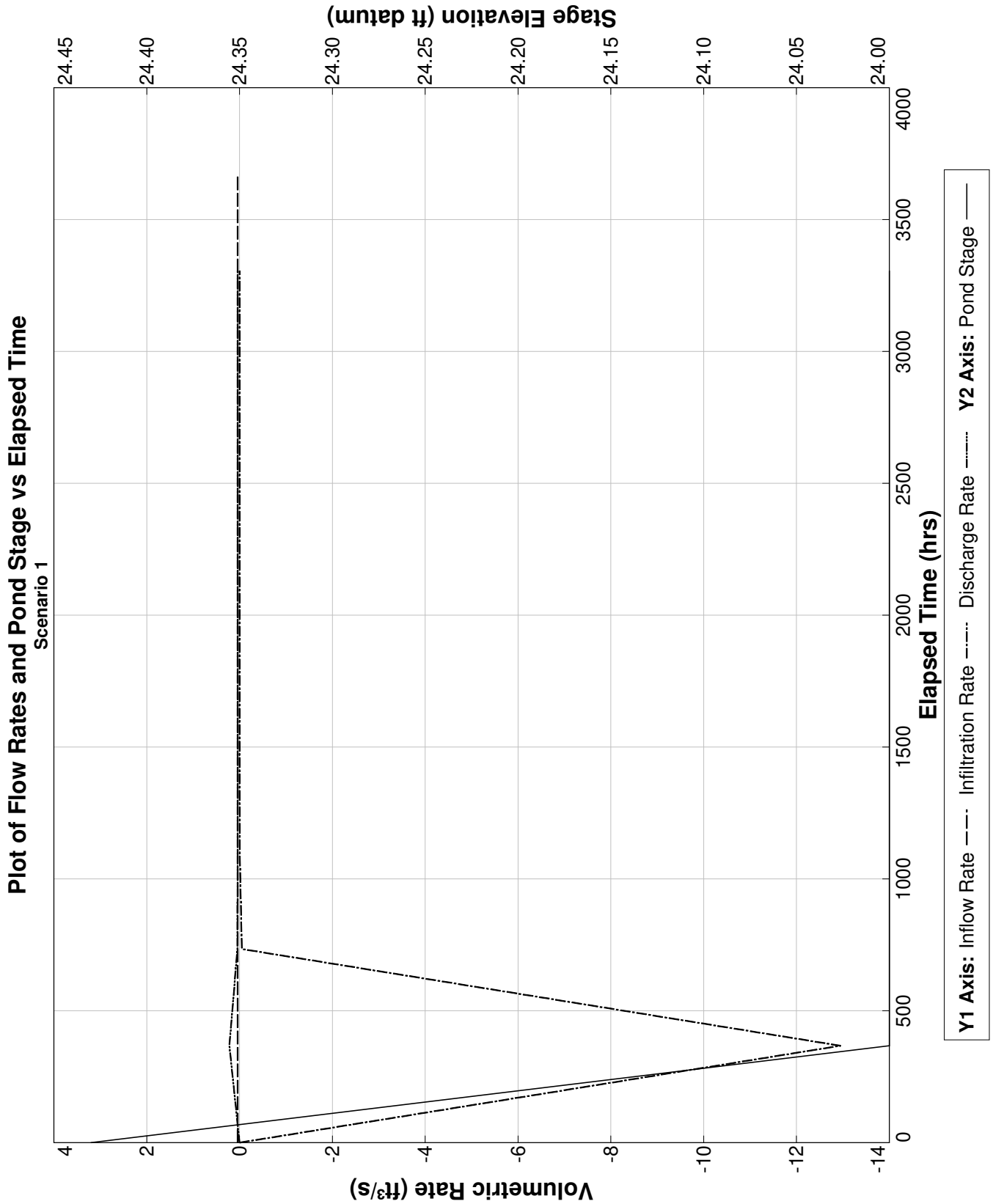
End Scenario 1 3/24/2023 7:35:56

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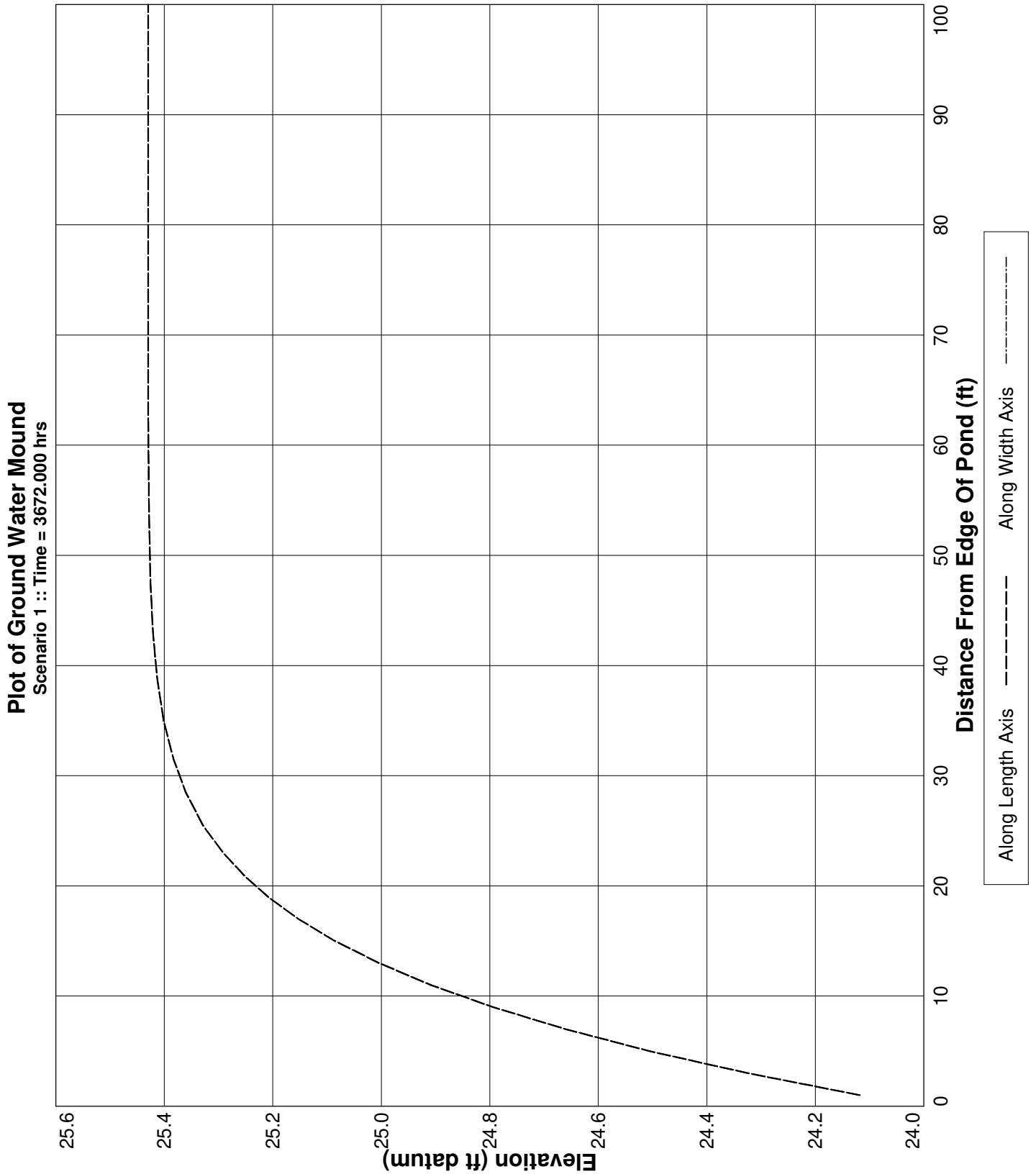
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0409	0.00163	24.43000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0409	0.00163	24.00001	-12.94374	.2203139	54108.600	-34099100.0	3.438584E+07	S
734.400	0.0409	0.00163	24.00000	-0.04787	4.625302E-02	108217.200	-34221170.0	3.456202E+07	S
1101.600	0.0409	0.00163	24.00000	-0.00228	4.238152E-02	162325.800	-34225650.0	3.462061E+07	S
1468.800	0.0409	0.00163	24.00000	-0.00101	4.182446E-02	216434.400	-34227200.0	3.467626E+07	S
1836.000	0.0409	0.00163	24.00000	-0.00083	4.173641E-02	270543.000	-34228320.0	3.47315E+07	S
2203.200	0.0409	0.00163	24.00000	-0.00081	4.174157E-02	324651.600	-34229380.0	3.478667E+07	S
2570.400	0.0409	0.00163	24.00000	-0.00084	4.176686E-02	378760.200	-34230470.0	3.484187E+07	S
2937.600	0.0409	0.00163	24.00000	-0.00087	4.179668E-02	432868.800	-34231600.0	3.48971E+07	S
3304.800	0.0409	0.00163	24.00000	-0.00090	4.182742E-02	486977.400	-34232760.0	3.495237E+07	S
3672.000	0.0409	0.00163	24.00000	----	----	541086.000	-34233960.0	3.500768E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.21, West Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-24-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -20.00  
Water Table Elevation, [WT] (ft datum): 26.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.22  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 991.0  
Equivalent Pond Width, [W] (ft): 546.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
-15.00	196020.0
24.00	541015.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	25.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/24/2023 8:8:22

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

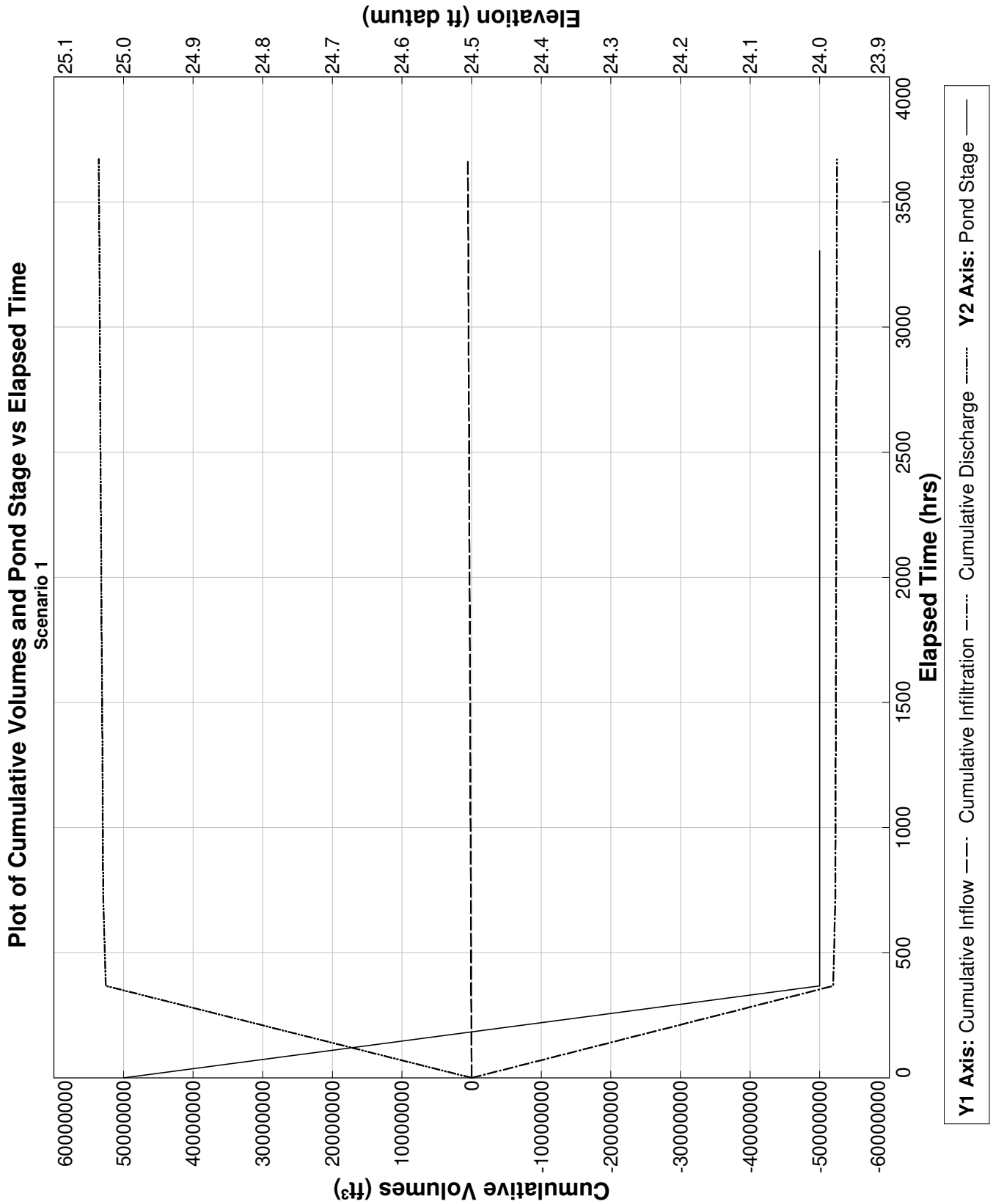
Baseflow hydrograph: Initial GWT (seasonal low) is 25.0 ft.

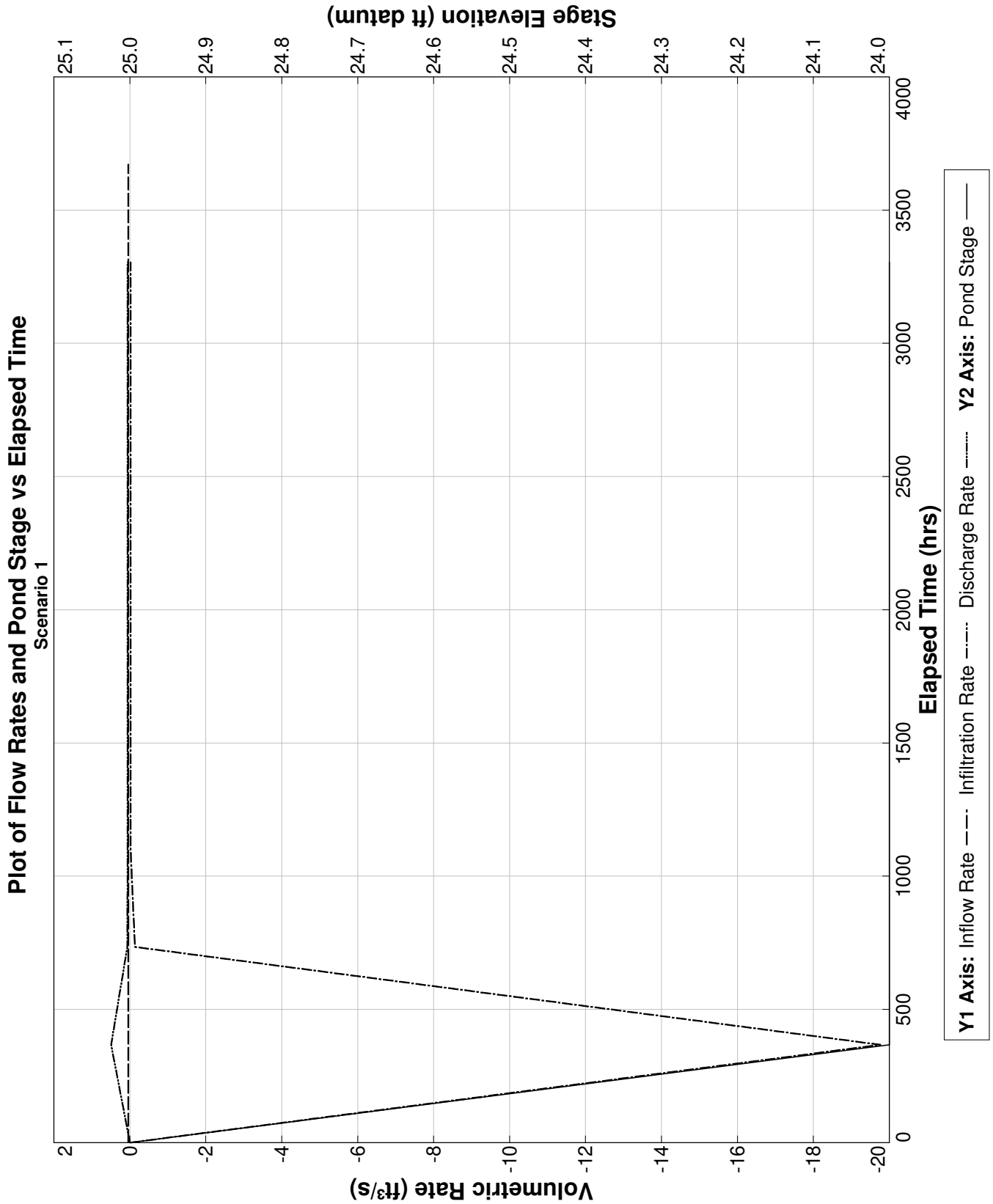
End Scenario 1 3/24/2023 8:8:22

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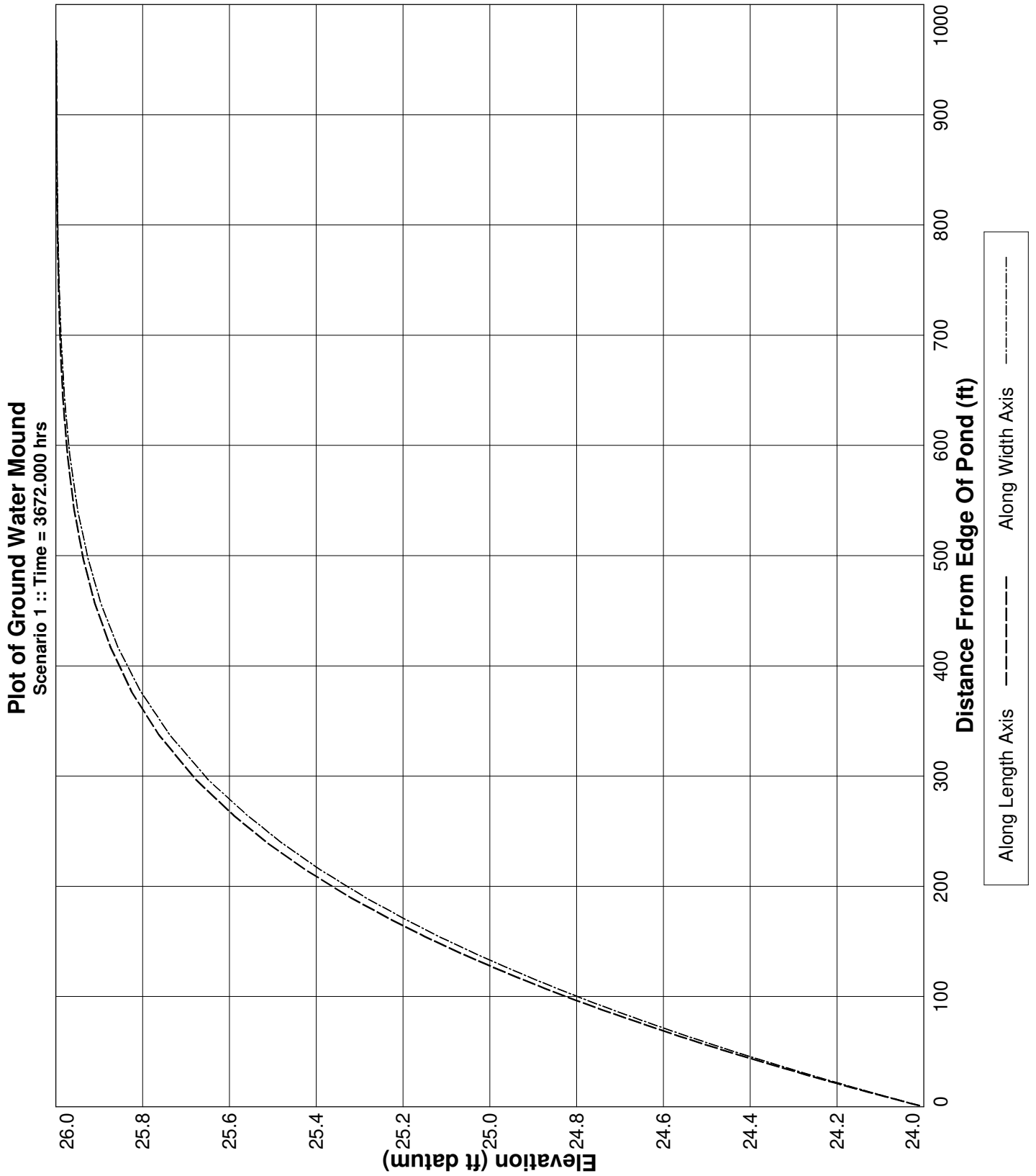
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0409	0.00163	25.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0409	0.00163	24.00004	-19.76531	.4890663	54108.600	-51943990.0	5.253909E+07	S
734.400	0.0409	0.00163	24.00000	-0.12960	6.536592E-02	108217.200	-52256320.0	5.290555E+07	S
1101.600	0.0409	0.00163	24.00000	-0.02189	6.235068E-02	162325.800	-52286620.0	5.298997E+07	S
1468.800	0.0409	0.00163	24.00000	-0.02046	.0612131	216434.400	-52314190.0	5.307164E+07	S
1836.000	0.0409	0.00163	24.00000	-0.01993	6.079696E-02	270543.000	-52340720.0	5.315228E+07	S
2203.200	0.0409	0.00163	24.00000	-0.01977	6.065019E-02	324651.600	-52366890.0	5.323255E+07	S
2570.400	0.0409	0.00163	24.00000	-0.01983	6.072201E-02	378760.200	-52393000.0	5.331278E+07	S
2937.600	0.0409	0.00163	24.00000	-0.02003	6.093873E-02	432868.800	-52419300.0	5.339319E+07	S
3304.800	0.0409	0.00163	24.00000	-0.02033	6.124605E-02	486977.400	-52445960.0	5.347395E+07	S
3672.000	0.0409	0.00163	24.00000	----	----	541086.000	-52473050.0	5.355515E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.21, West Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-24-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -20.00  
Water Table Elevation, [WT] (ft datum): 26.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 991.0  
Equivalent Pond Width, [W] (ft): 546.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
-15.00	196020.0
24.00	541015.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Retention Pond Recovery - Refined Method**  
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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	25.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/24/2023 8:10:40

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

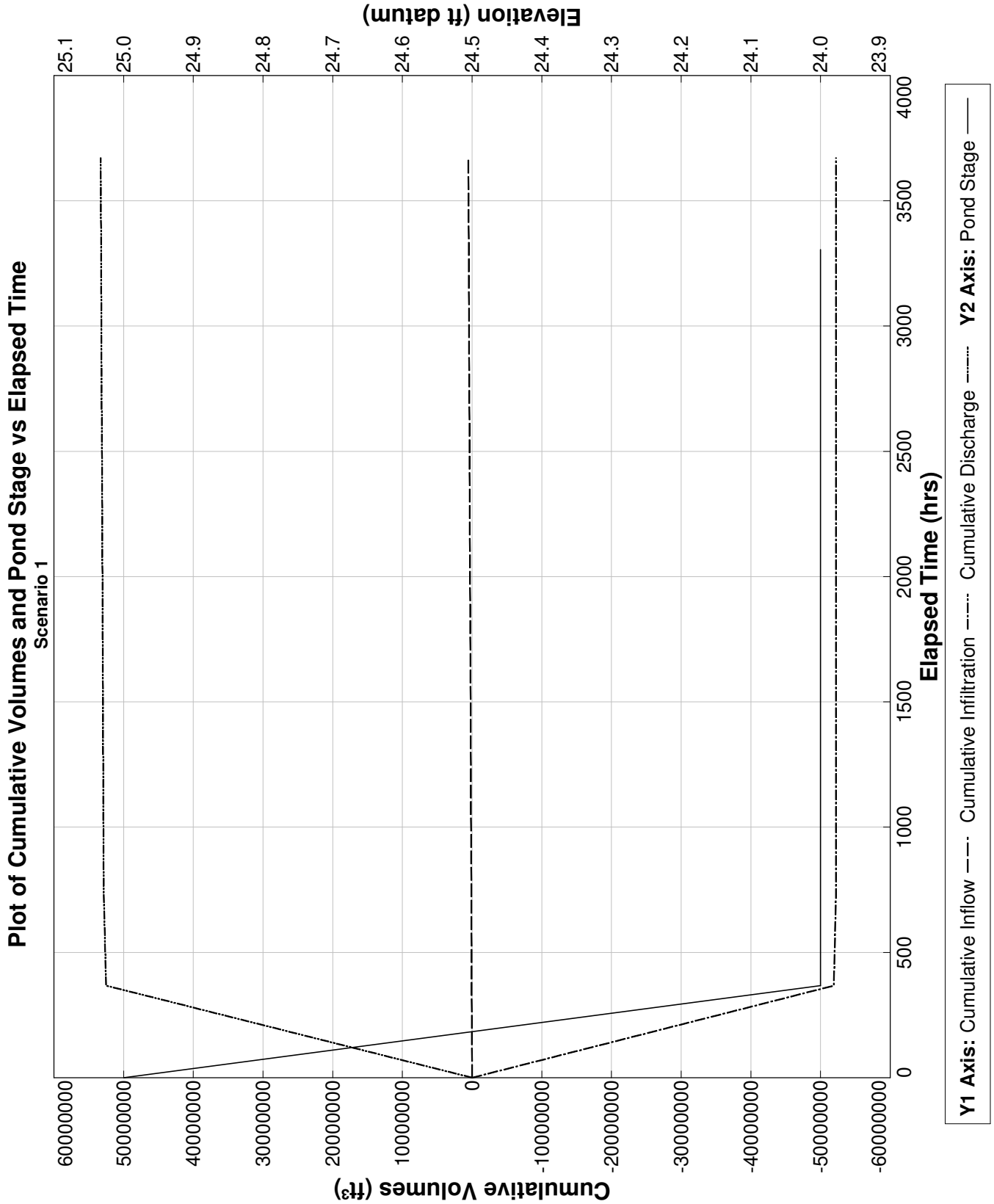
Baseflow hydrograph: Initial GWT (seasonal low) is 25.0 ft.

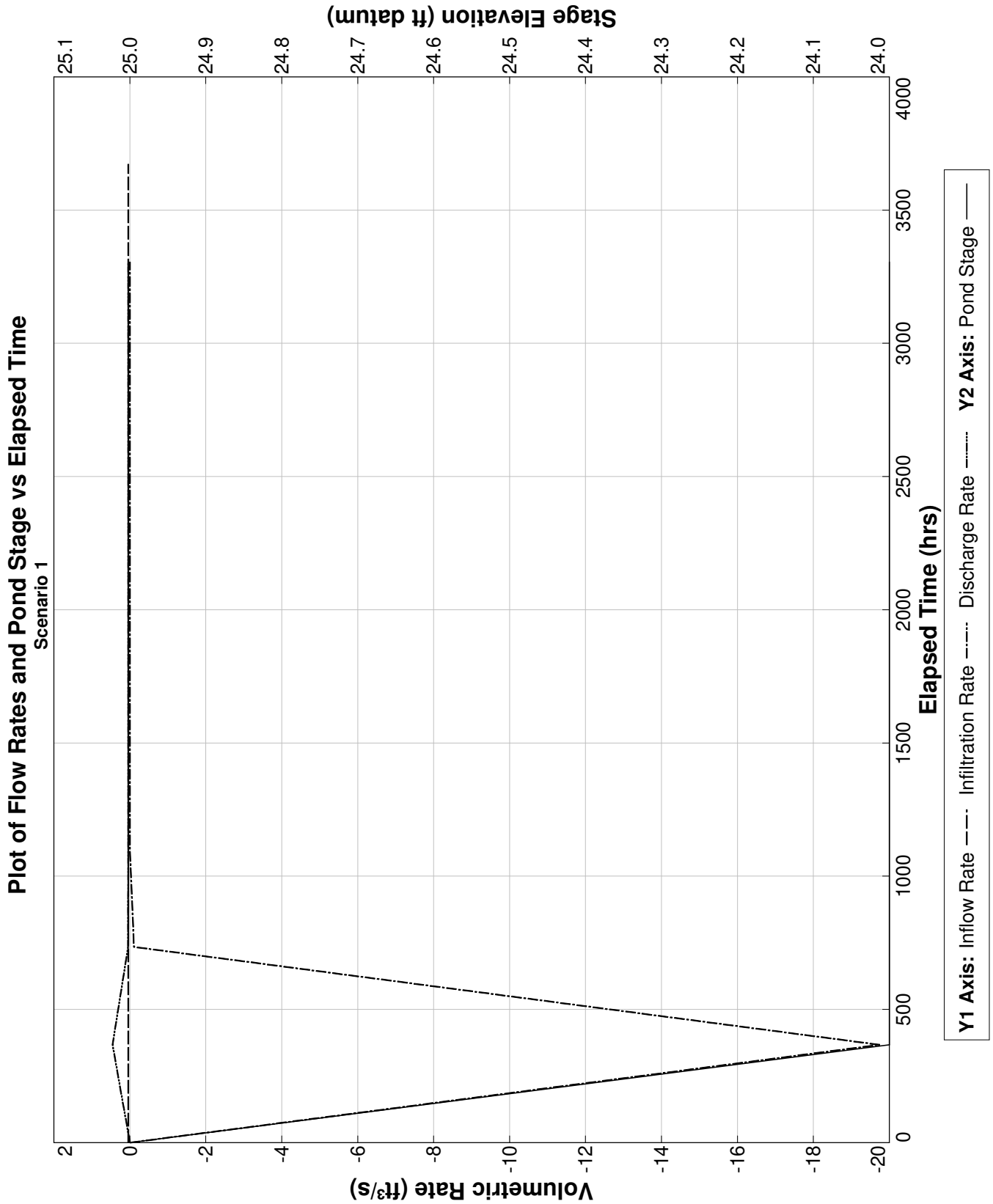
End Scenario 1 3/24/2023 8:10:41

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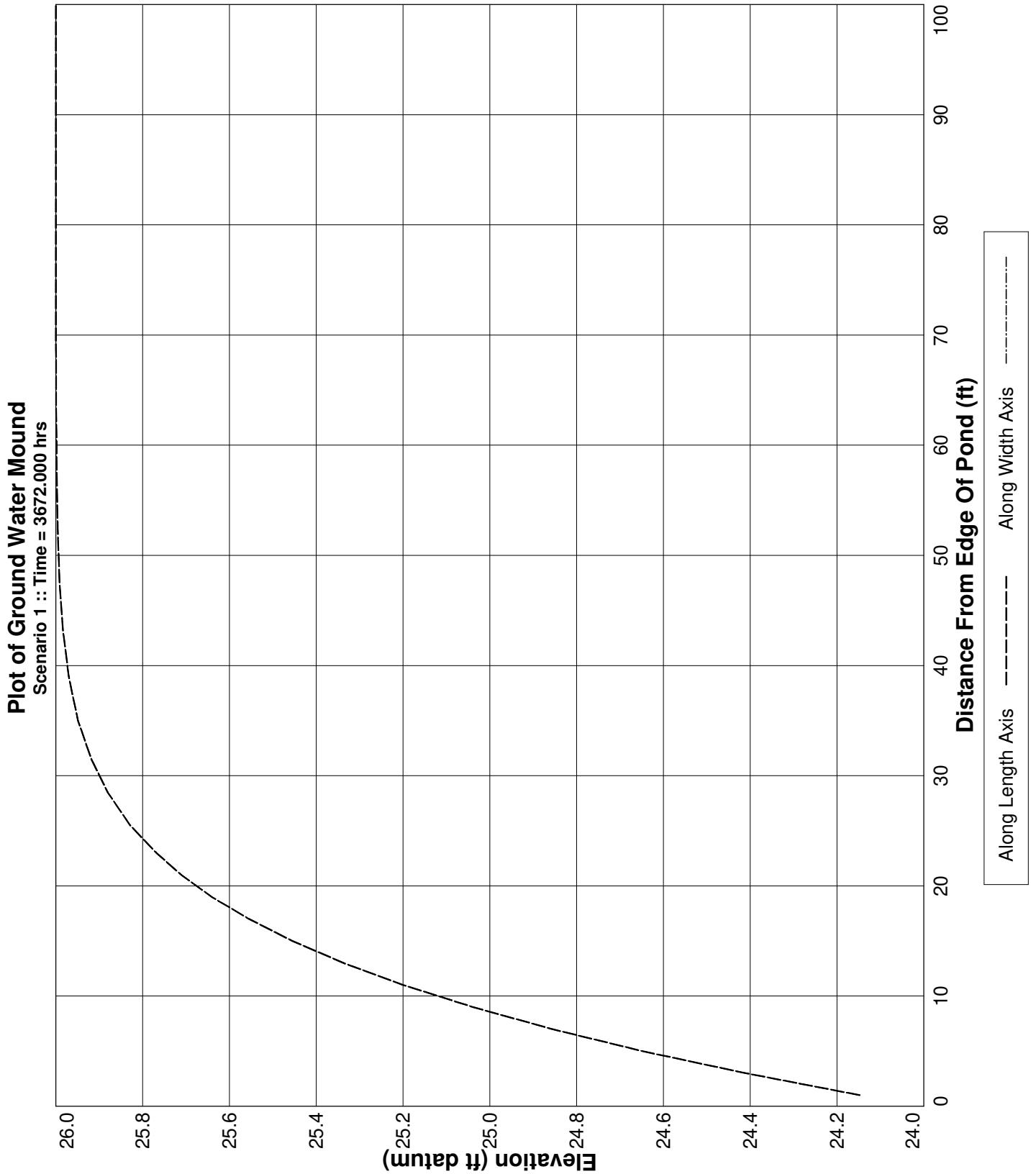
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0409	0.00163	25.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0409	0.00163	24.00004	-19.74320	.4547299	54108.600	-51921290.0	5.25164E+07	S
734.400	0.0409	0.00163	24.00000	-0.10621	4.558417E-02	108217.200	-52197850.0	5.284708E+07	S
1101.600	0.0409	0.00163	24.00000	-0.00237	4.271642E-02	162325.800	-52202110.0	5.290545E+07	S
1468.800	0.0409	0.00163	24.00000	-0.00137	4.219673E-02	216434.400	-52204120.0	5.296157E+07	S
1836.000	0.0409	0.00163	24.00000	-0.00117	4.208223E-02	270543.000	-52205720.0	5.301728E+07	S
2203.200	0.0409	0.00163	24.00000	-0.00113	.0420564	324651.600	-52207220.0	5.307289E+07	S
2570.400	0.0409	0.00163	24.00000	-0.00113	4.205551E-02	378760.200	-52208710.0	5.312848E+07	S
2937.600	0.0409	0.00163	24.00000	-0.00113	4.206432E-02	432868.800	-52210200.0	5.318408E+07	S
3304.800	0.0409	0.00163	24.00000	-0.00115	4.207805E-02	486977.400	-52211710.0	5.32397E+07	S
3672.000	0.0409	0.00163	24.00000	----	----	541086.000	-52213230.0	5.329534E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.21, South Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-24-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -20.00  
Water Table Elevation, [WT] (ft datum): 27.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.22  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 991.0  
Equivalent Pond Width, [W] (ft): 546.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
-15.00	196020.0
24.00	541015.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	26.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/24/2023 8:13:26

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

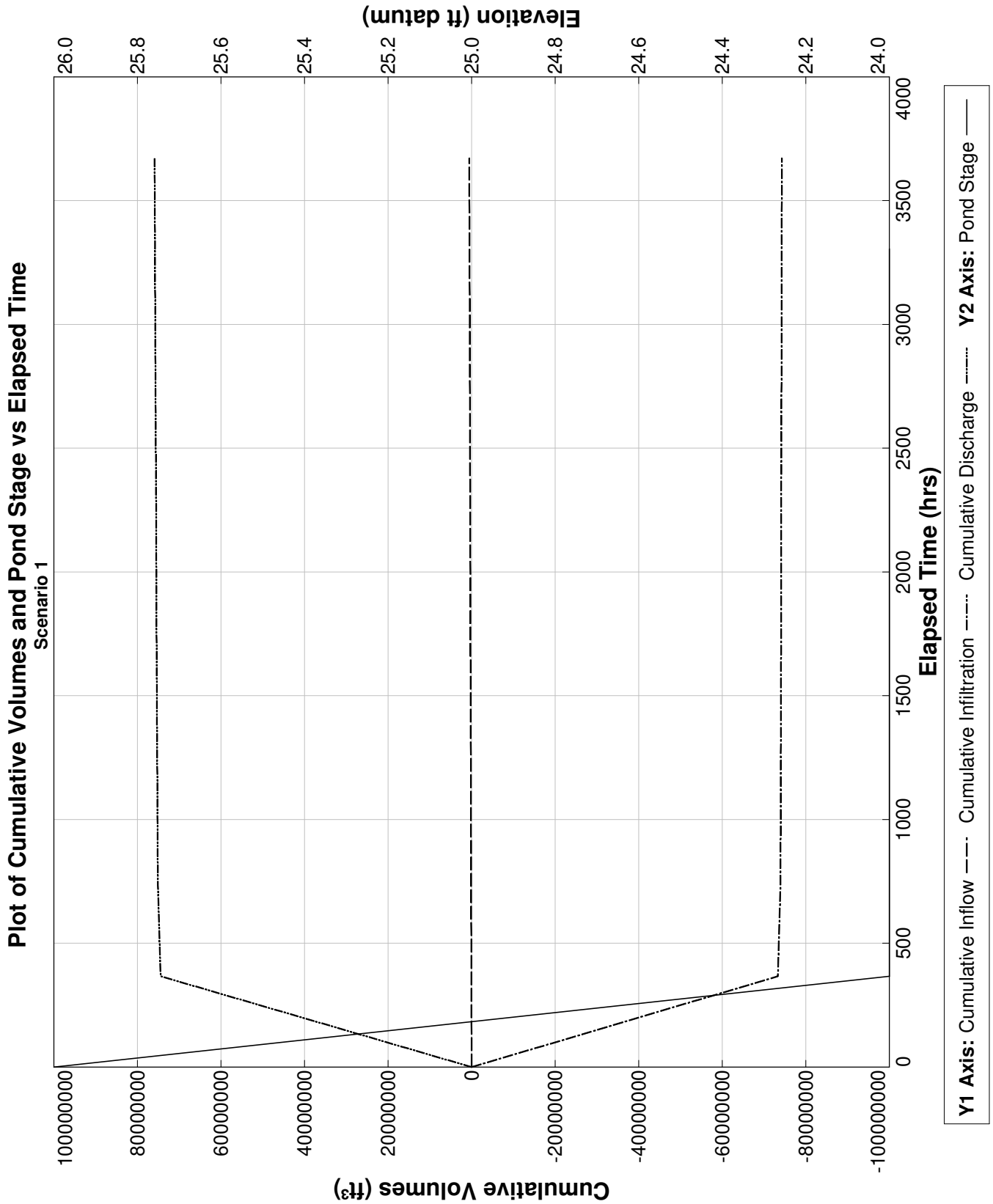
Baseflow hydrograph: Initial GWT (seasonal low) is 26.0 ft.

End Scenario 1 3/24/2023 8:13:26

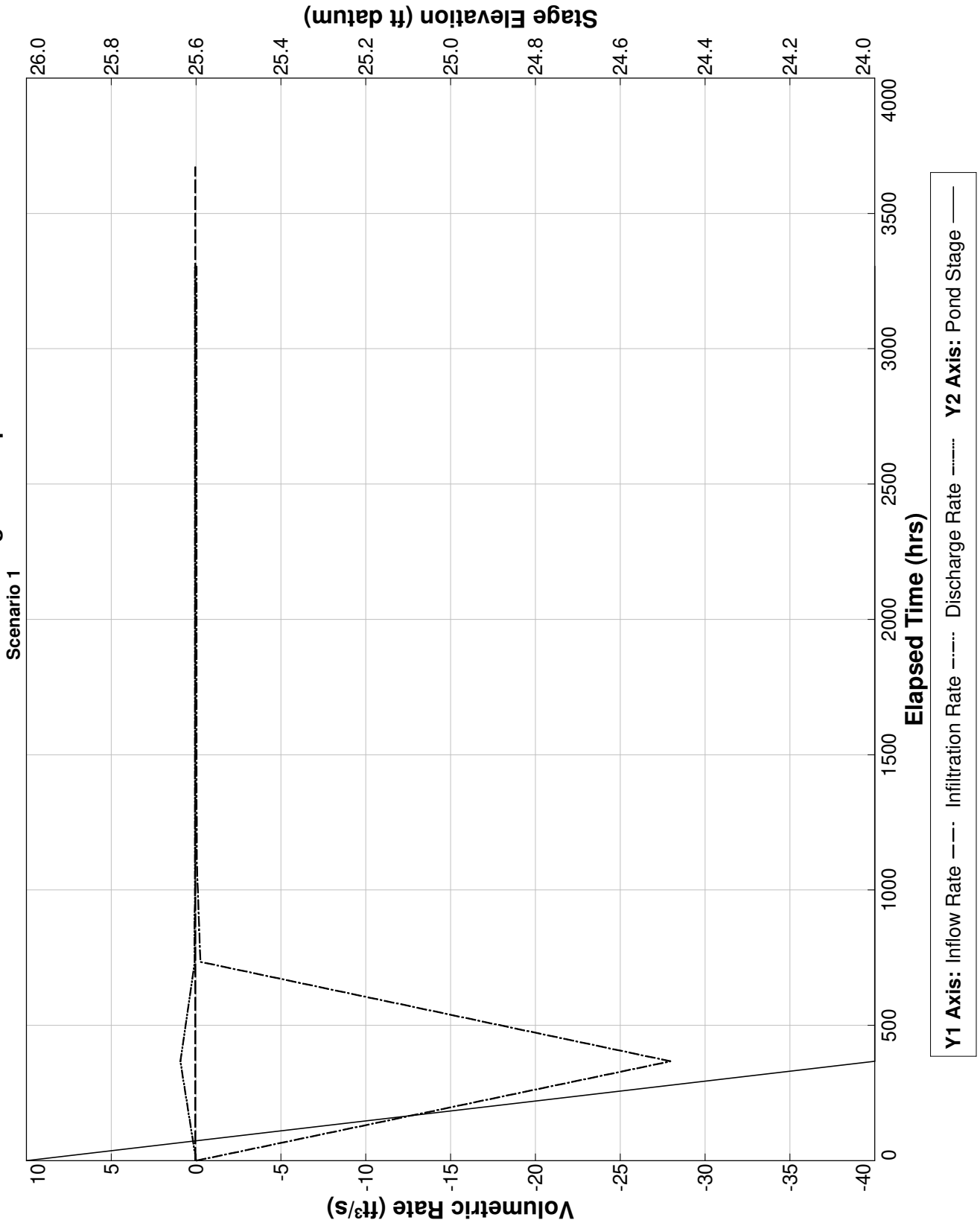
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**Detailed Results** :: Scenario 1 ::

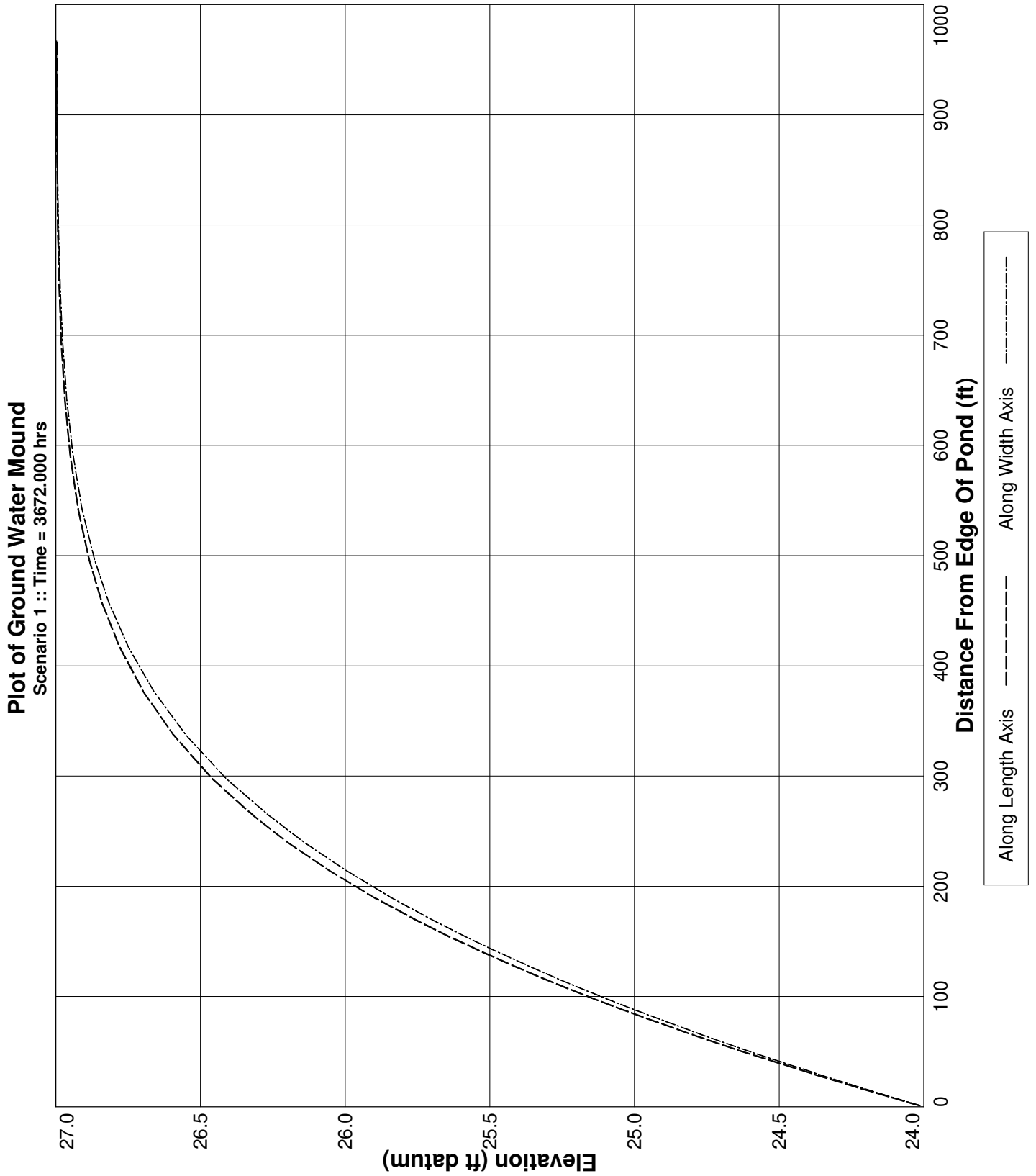
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0409	0.00163	26.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0409	0.00163	24.00014	-27.96815	.9334161	54108.600	-73325240.0	7.44613E+07	S
734.400	0.0409	0.00163	24.00000	-0.25336	8.366934E-02	108217.200	-73943300.0	7.513355E+07	S
1101.600	0.0409	0.00163	24.00000	-0.03664	7.654971E-02	162325.800	-73995100.0	7.523945E+07	S
1468.800	0.0409	0.00163	24.00000	-0.03295	7.352799E-02	216434.400	-74040180.0	7.533865E+07	S
1836.000	0.0409	0.00163	24.00000	-0.03118	7.193171E-02	270543.000	-74082220.0	7.543479E+07	S
2203.200	0.0409	0.00163	24.00000	-0.03019	7.106412E-02	324651.600	-74122620.0	7.55293E+07	S
2570.400	0.0409	0.00163	24.00000	-0.02955	7.041793E-02	378760.200	-74162020.0	7.562282E+07	S
2937.600	0.0409	0.00163	24.00000	-0.02915	7.003199E-02	432868.800	-74200750.0	7.571565E+07	S
3304.800	0.0409	0.00163	24.00000	-0.02894	6.982991E-02	486977.400	-74239090.0	7.58081E+07	S
3672.000	0.0409	0.00163	24.00000	----	----	541086.000	-74277260.0	7.590037E+07	N.A.



Plot of Flow Rates and Pond Stage vs Elapsed Time







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**Retention Pond Recovery - Refined Method**  
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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.21, South Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-24-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -20.00  
Water Table Elevation, [WT] (ft datum): 27.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 991.0  
Equivalent Pond Width, [W] (ft): 546.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
-15.00	196020.0
24.00	541015.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	26.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/24/2023 8:15:17

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

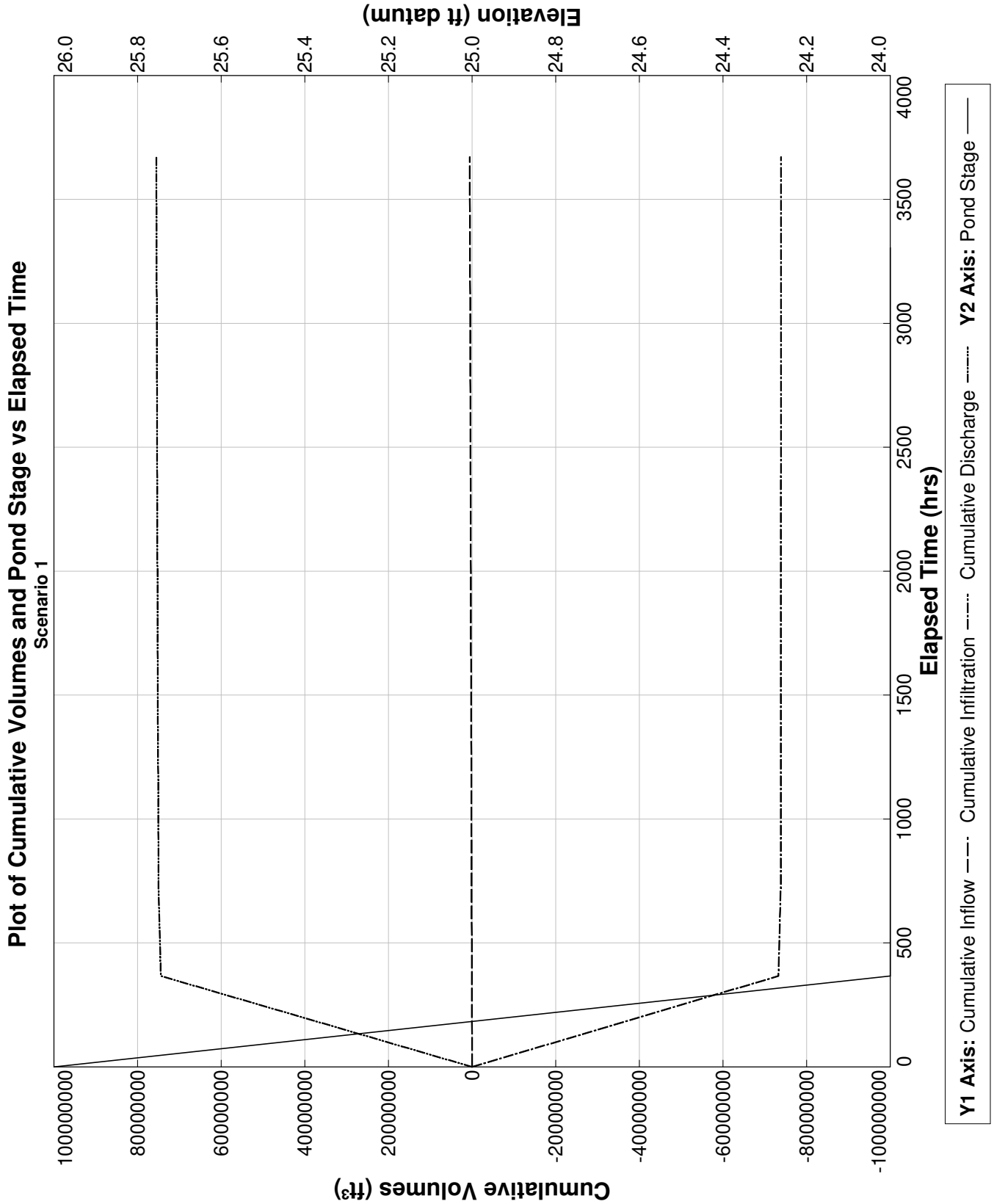
Baseflow hydrograph: Initial GWT (seasonal low) is 26.0 ft.

End Scenario 1 3/24/2023 8:15:17

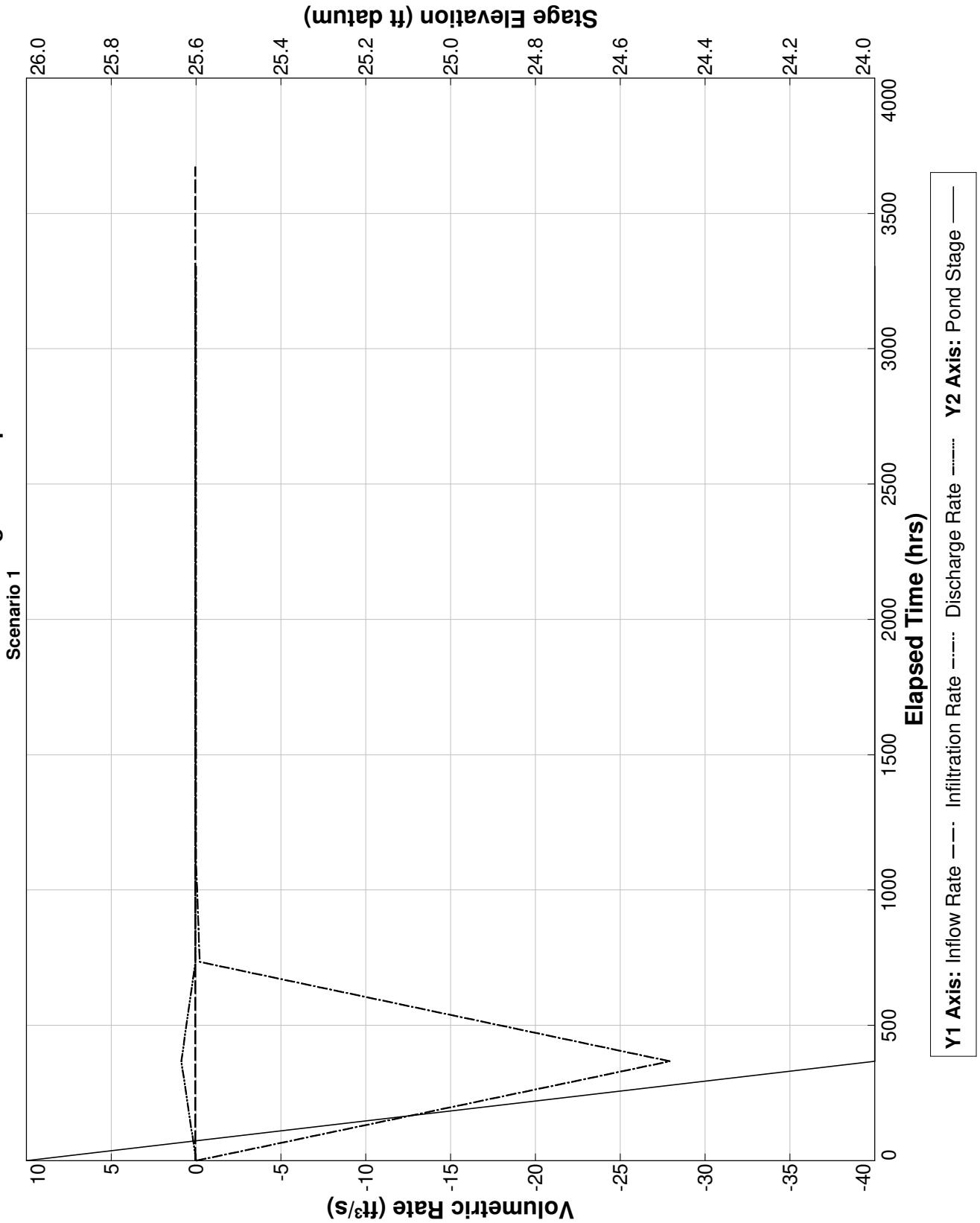
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**Detailed Results**    :: Scenario 1 ::

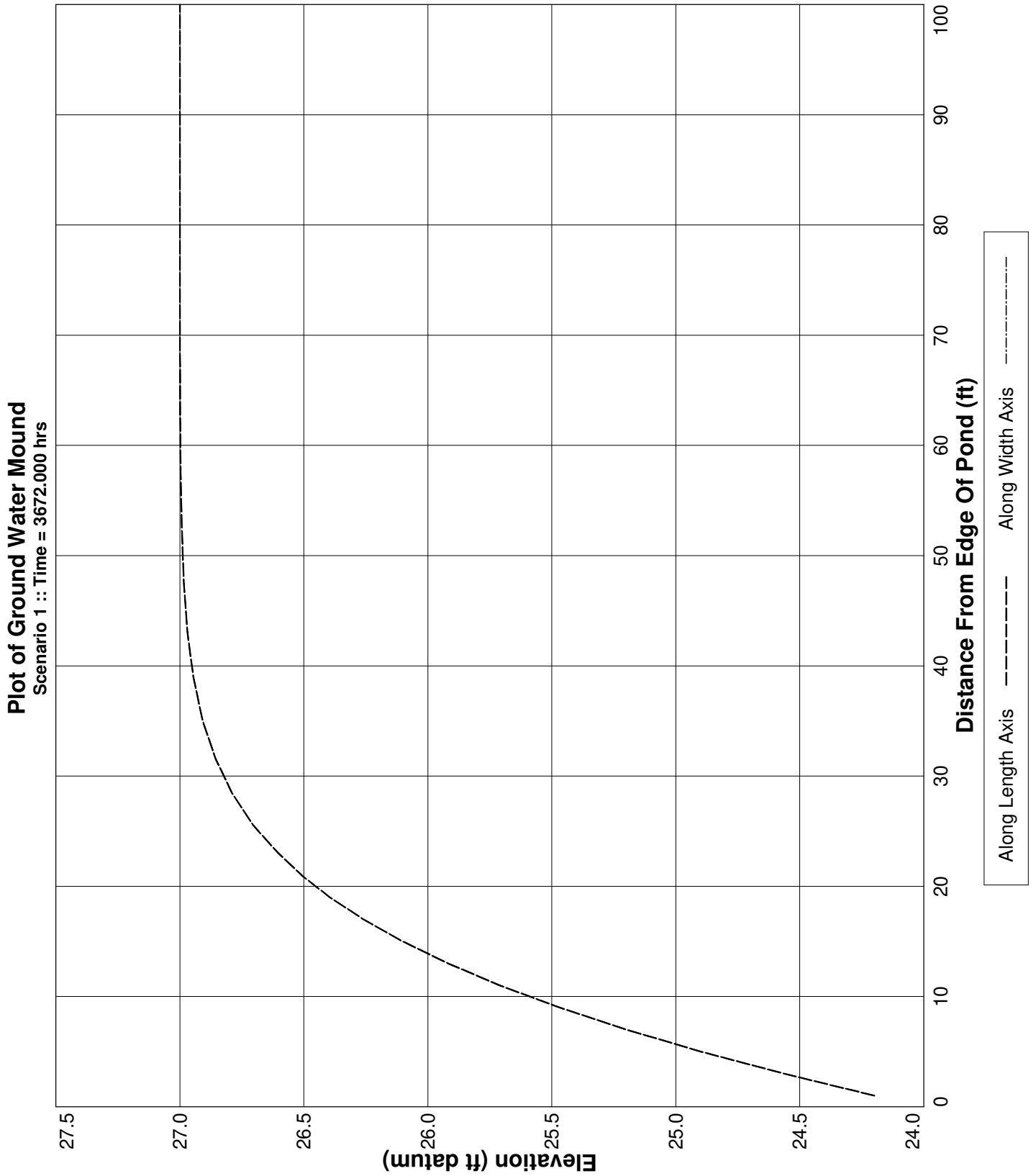
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0409	0.00163	26.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0409	0.00163	24.00013	-27.92639	.867875	54108.600	-73281910.0	7.441798E+07	S
734.400	0.0409	0.00163	24.00000	-0.21081	4.773509E-02	108217.200	-73832910.0	7.502316E+07	S
1101.600	0.0409	0.00163	24.00000	-0.00360	4.373162E-02	162325.800	-73839260.0	7.508362E+07	S
1468.800	0.0409	0.00163	24.00000	-0.00214	4.293222E-02	216434.400	-73842430.0	7.51409E+07	S
1836.000	0.0409	0.00163	24.00000	-0.00181	4.270587E-02	270543.000	-73844930.0	7.51975E+07	S
2203.200	0.0409	0.00163	24.00000	-0.00169	.0426128	324651.600	-73847220.0	7.52539E+07	S
2570.400	0.0409	0.00163	24.00000	-0.00164	4.256401E-02	378760.200	-73849400.0	7.531019E+07	S
2937.600	0.0409	0.00163	24.00000	-0.00161	4.253598E-02	432868.800	-73851540.0	7.536644E+07	S
3304.800	0.0409	0.00163	24.00000	-0.00159	4.252008E-02	486977.400	-73853650.0	7.542266E+07	S
3672.000	0.0409	0.00163	24.00000	----	----	541086.000	-73855740.0	7.547886E+07	N.A.



Plot of Flow Rates and Pond Stage vs Elapsed Time







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**Retention Pond Recovery - Refined Method**  
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**Project Data**

Project Name: The Rookery Phase 1, SWMF 21, SW, Baseflow, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-30-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 8.00  
Water Table Elevation, [WT] (ft datum): 24.25  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.12  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 991.0  
Equivalent Pond Width, [W] (ft): 546.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
13.00	435.6
24.00	21780.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Retention Pond Recovery - Refined Method**  
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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	23.25
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/30/2023 10:36:17

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

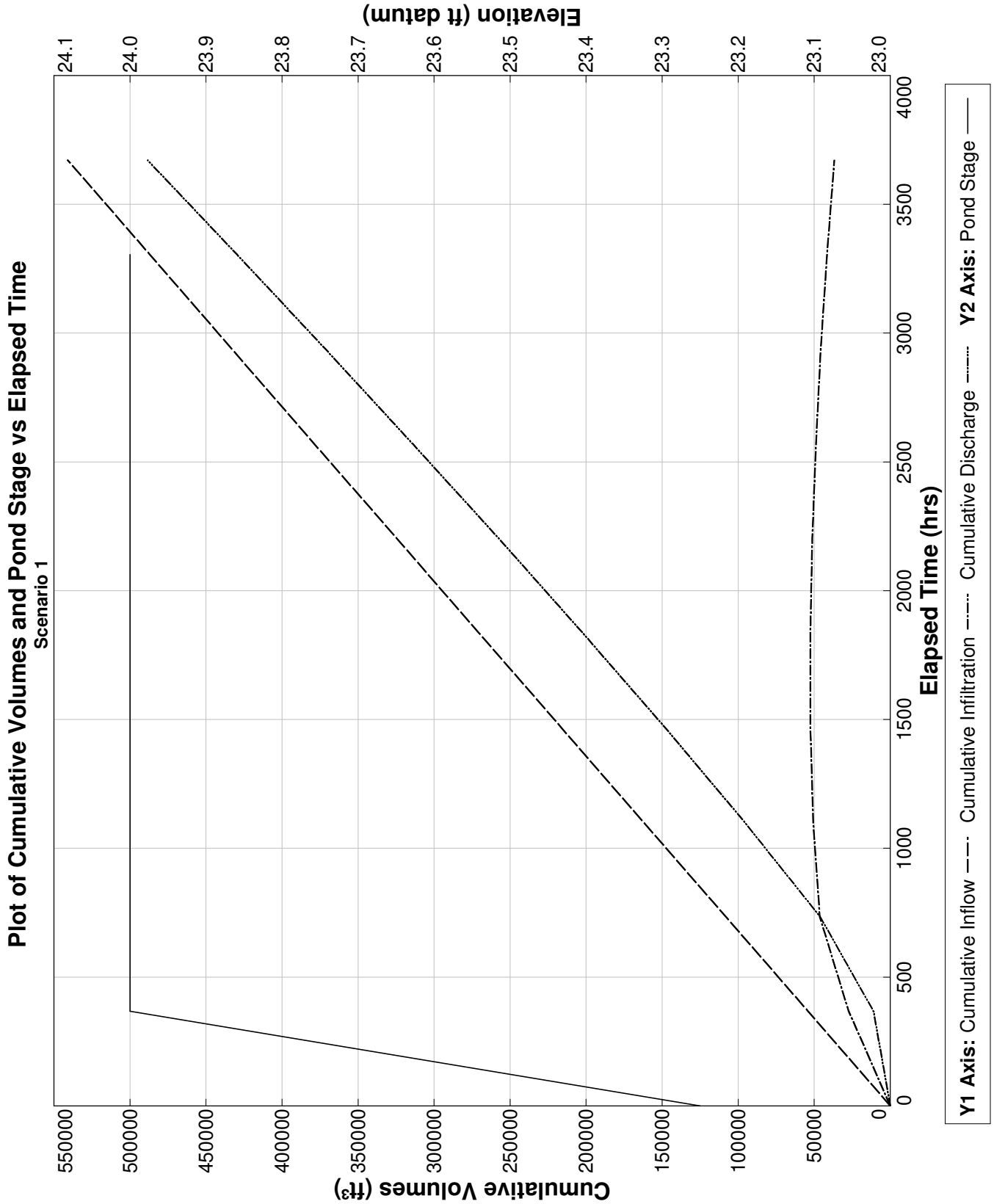
Baseflow hydrograph: Initial GWT (seasonal low) is 23.25 ft.

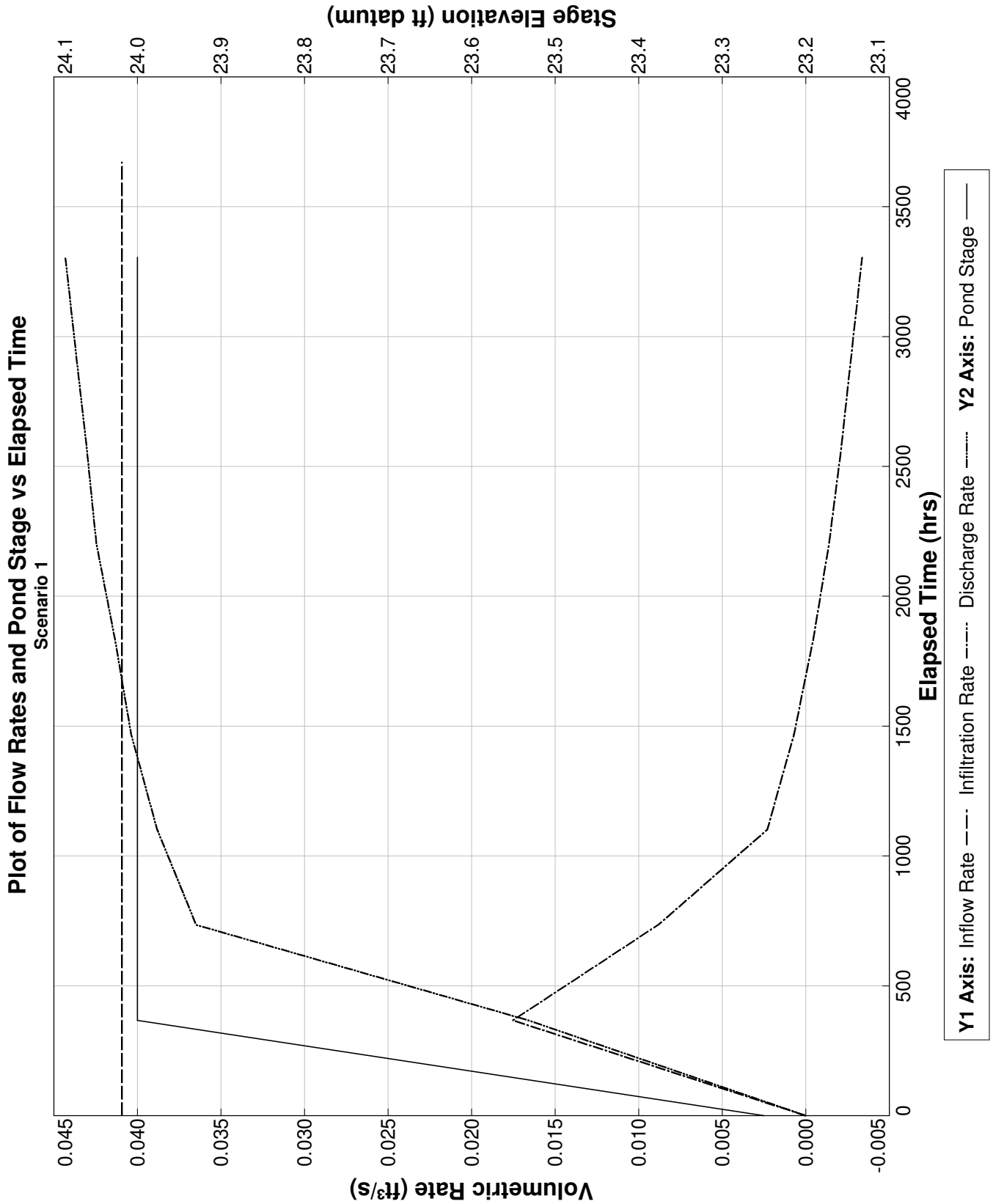
End Scenario 1 3/30/2023 10:36:17

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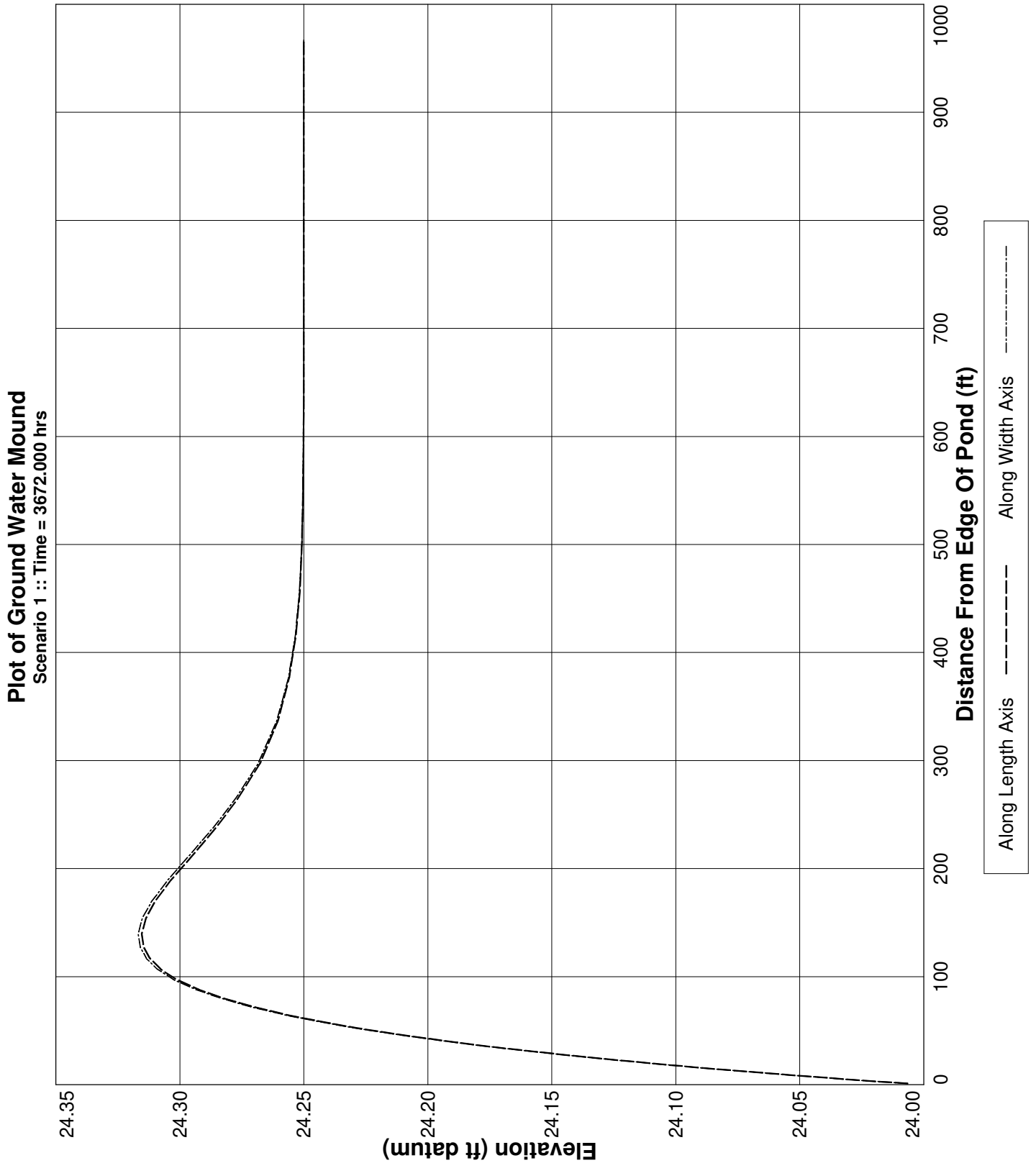
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0409	0.00163	23.25000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0409	0.00163	24.00000	0.01753	1.660622E-02	54108.600	27343.3	10976.05	S
734.400	0.0409	0.00163	24.00000	0.00883	3.648921E-02	108217.200	46357.9	46070	S
1101.600	0.0409	0.00163	24.00000	0.00231	3.881412E-02	162325.800	50694.0	95842.49	S
1468.800	0.0409	0.00163	24.00000	0.00070	4.038507E-02	216434.400	52455.1	148190	S
1836.000	0.0409	0.00163	24.00000	-0.00045	4.135233E-02	270543.000	52538.6	202215.1	S
2203.200	0.0409	0.00163	24.00000	-0.00139	4.245126E-02	324651.600	51256.4	257606	S
2570.400	0.0409	0.00163	24.00000	-0.00212	4.302899E-02	378760.200	48865.9	314105	S
2937.600	0.0409	0.00163	24.00000	-0.00274	4.368092E-02	432868.800	45662.8	371416.8	S
3304.800	0.0409	0.00163	24.00000	-0.00337	4.431501E-02	486977.400	41609.6	429578.6	S
3672.000	0.0409	0.00163	24.00000	----	----	541086.000	36748.9	488547.8	N.A.









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**Retention Pond Recovery - Refined Method**  
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**Project Data**

Project Name: The Rookery Phase 1, SWMF 21, SW, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-30-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 8.00  
Water Table Elevation, [WT] (ft datum): 24.25  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 991.0  
Equivalent Pond Width, [W] (ft): 546.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
13.00	435.6
24.00	21780.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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---

**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	23.25
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/30/2023 10:32:17

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 23.25 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 4 of 10 saturated stress periods.

Maximum calculated water budget error is -4.39925880082418 percent, for saturated stress period 1.

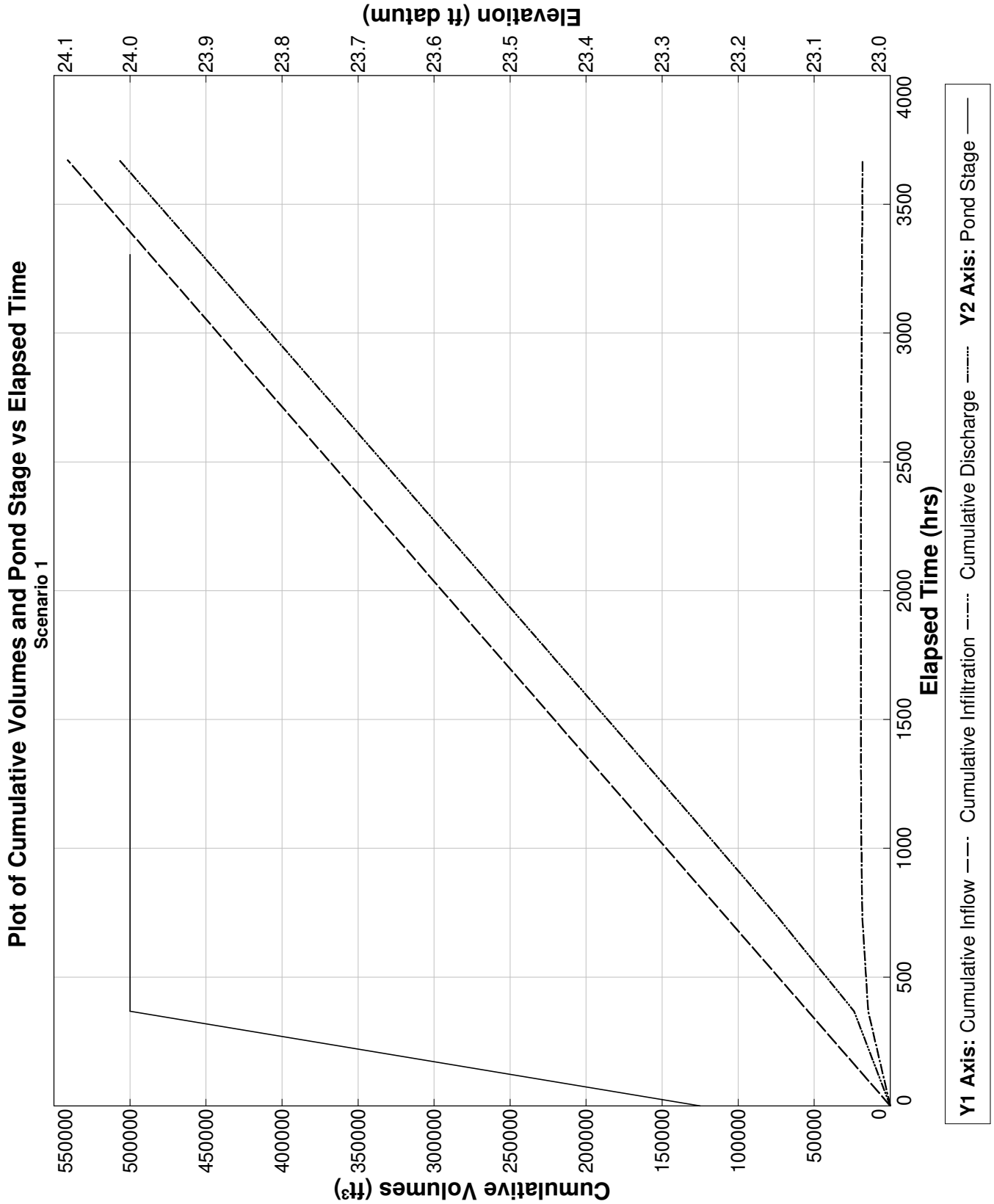
If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

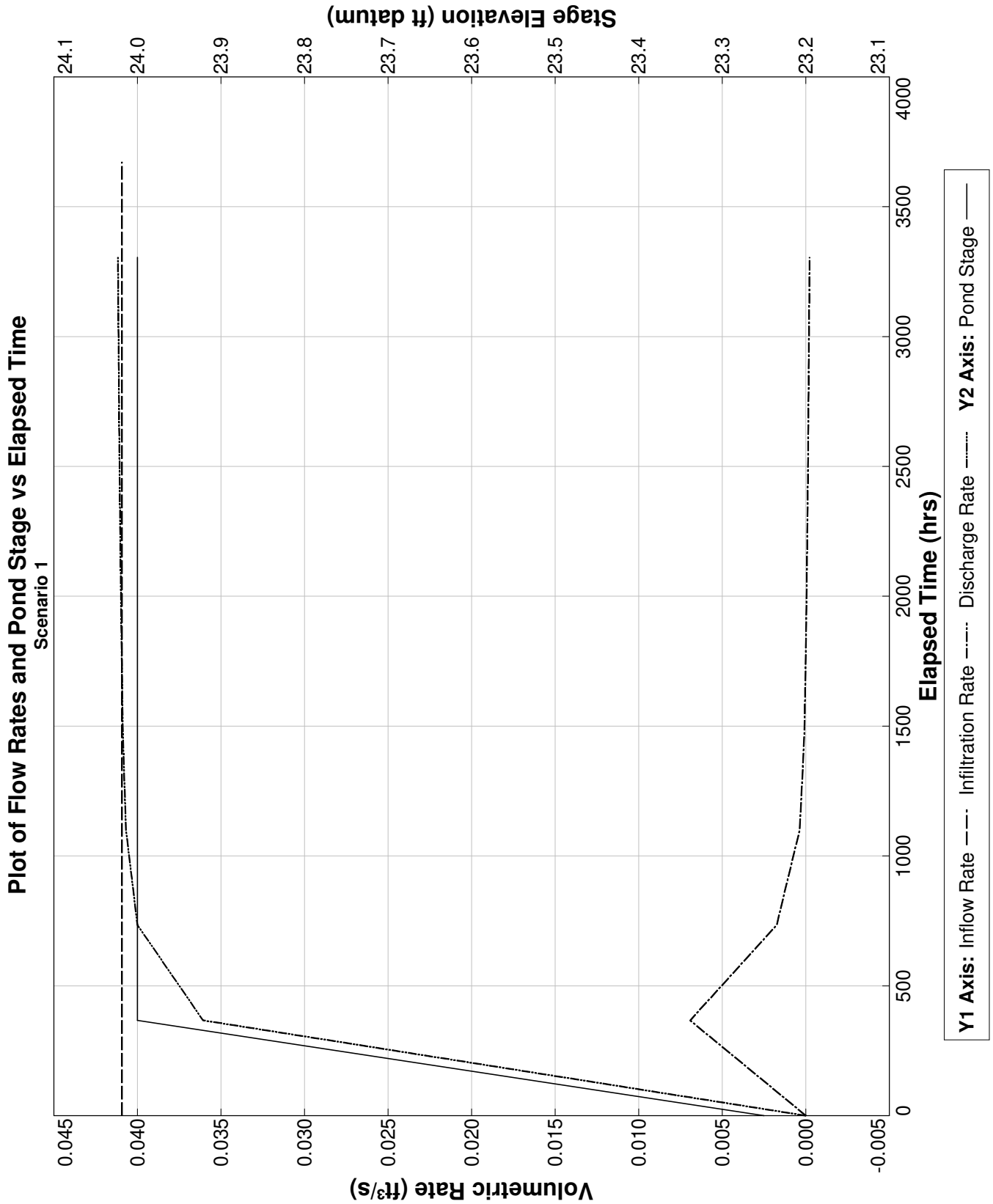
End Scenario 1 3/30/2023 10:32:17

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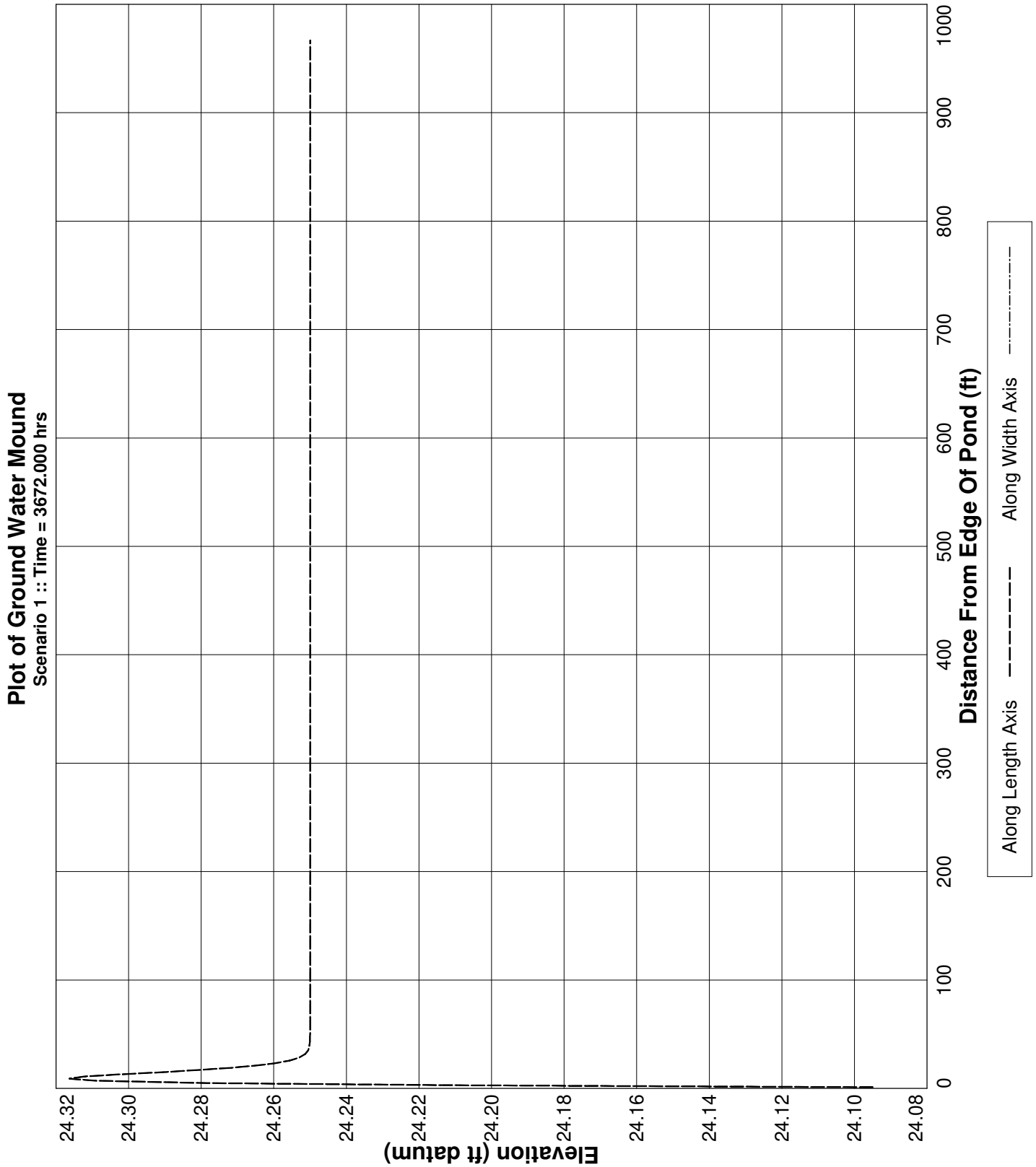
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0409	0.00163	23.25000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0409	0.00163	24.00000	0.00693	3.606441E-02	54108.600	14482.2	23837.13	S
734.400	0.0409	0.00163	24.00000	0.00174	4.000076E-02	108217.200	18314.8	74113.17	S
1101.600	0.0409	0.00163	24.00000	0.00037	.0406881	162325.800	19091.3	127445.3	S
1468.800	0.0409	0.00163	24.00000	0.00009	4.086834E-02	216434.400	19294.3	181350.8	S
1836.000	0.0409	0.00163	24.00000	-0.00002	4.095949E-02	270543.000	19318.0	235435.8	S
2203.200	0.0409	0.00163	24.00000	-0.00009	4.102408E-02	324651.600	19238.7	289623.6	S
2570.400	0.0409	0.00163	24.00000	-0.00014	4.107643E-02	378760.200	19082.2	343888.8	S
2937.600	0.0409	0.00163	24.00000	-0.00019	4.112139E-02	432868.800	18861.3	398218.3	S
3304.800	0.0409	0.00163	24.00000	-0.00023	4.116125E-02	486977.400	18584.4	452603.8	S
3672.000	0.0409	0.00163	24.00000	----	----	541086.000	18257.2	507039.5	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF 21, North, Baseflow, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-30-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 8.00  
Water Table Elevation, [WT] (ft datum): 26.25  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 991.0  
Equivalent Pond Width, [W] (ft): 546.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
13.00	435.6
24.00	21780.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	25.25
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/30/2023 10:38:42

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 25.25 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 5 of 10 saturated stress periods.

Maximum calculated water budget error is -3.68287443504082 percent, for saturated stress period 1.

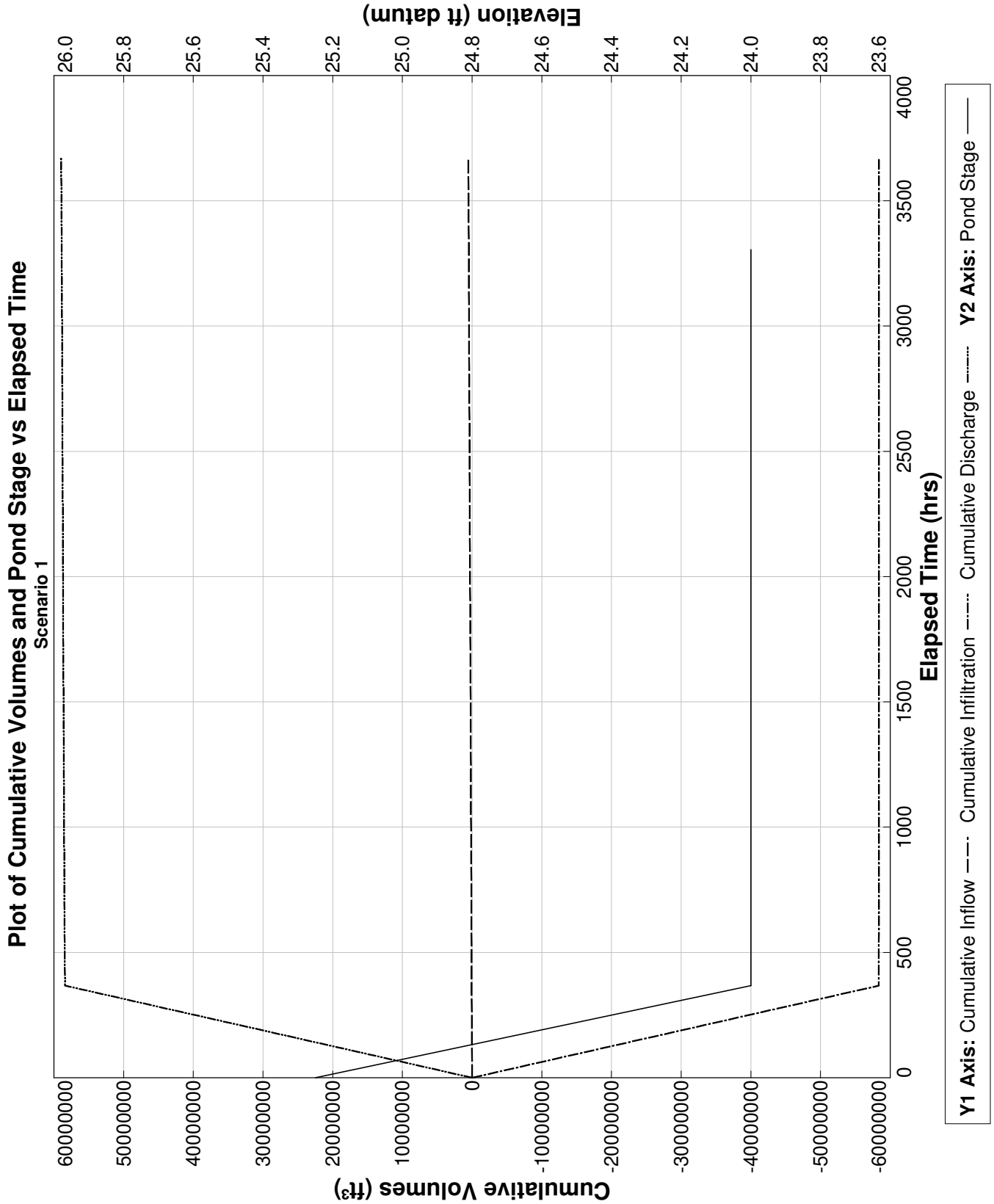
If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

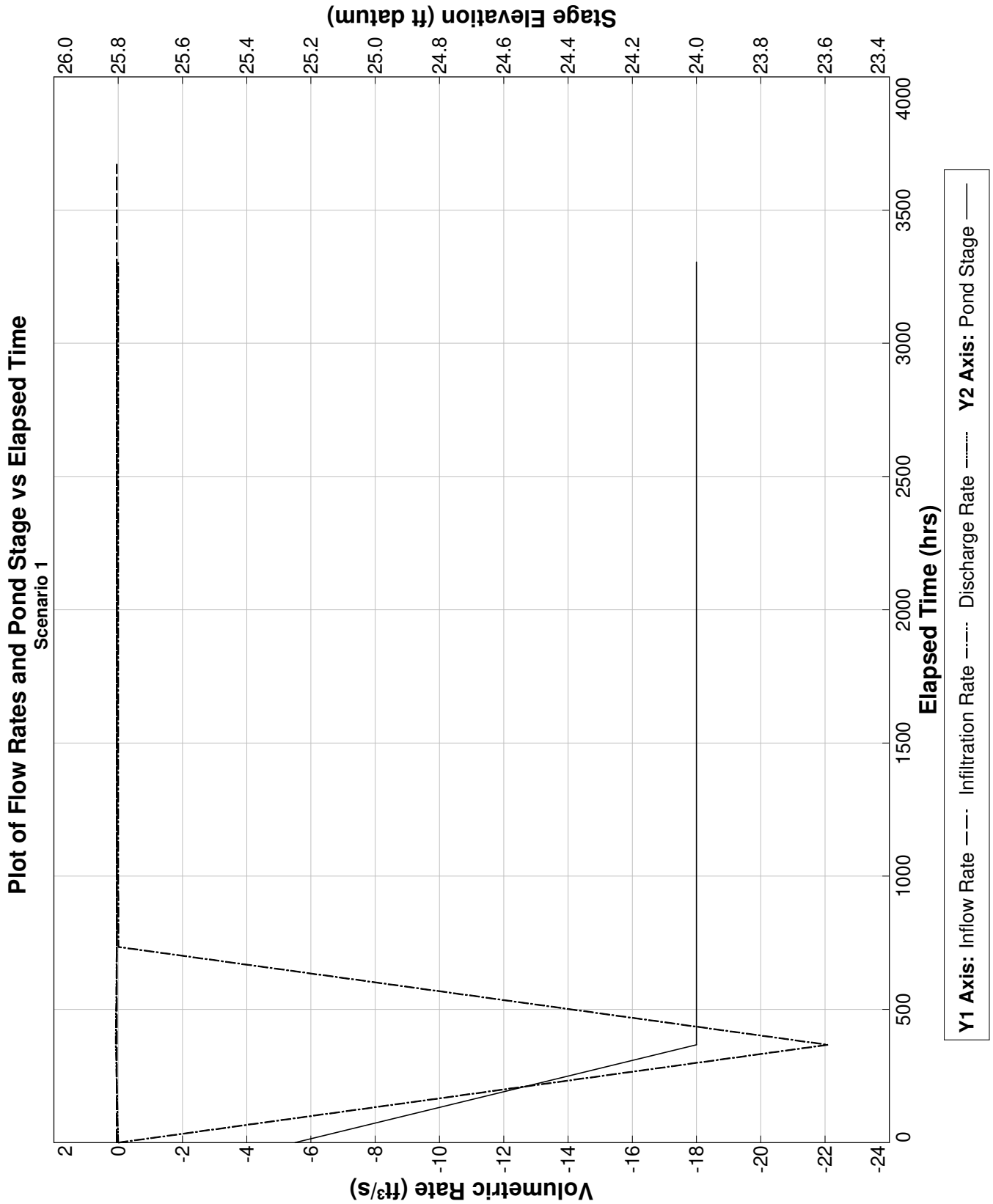
End Scenario 1 3/30/2023 10:38:43

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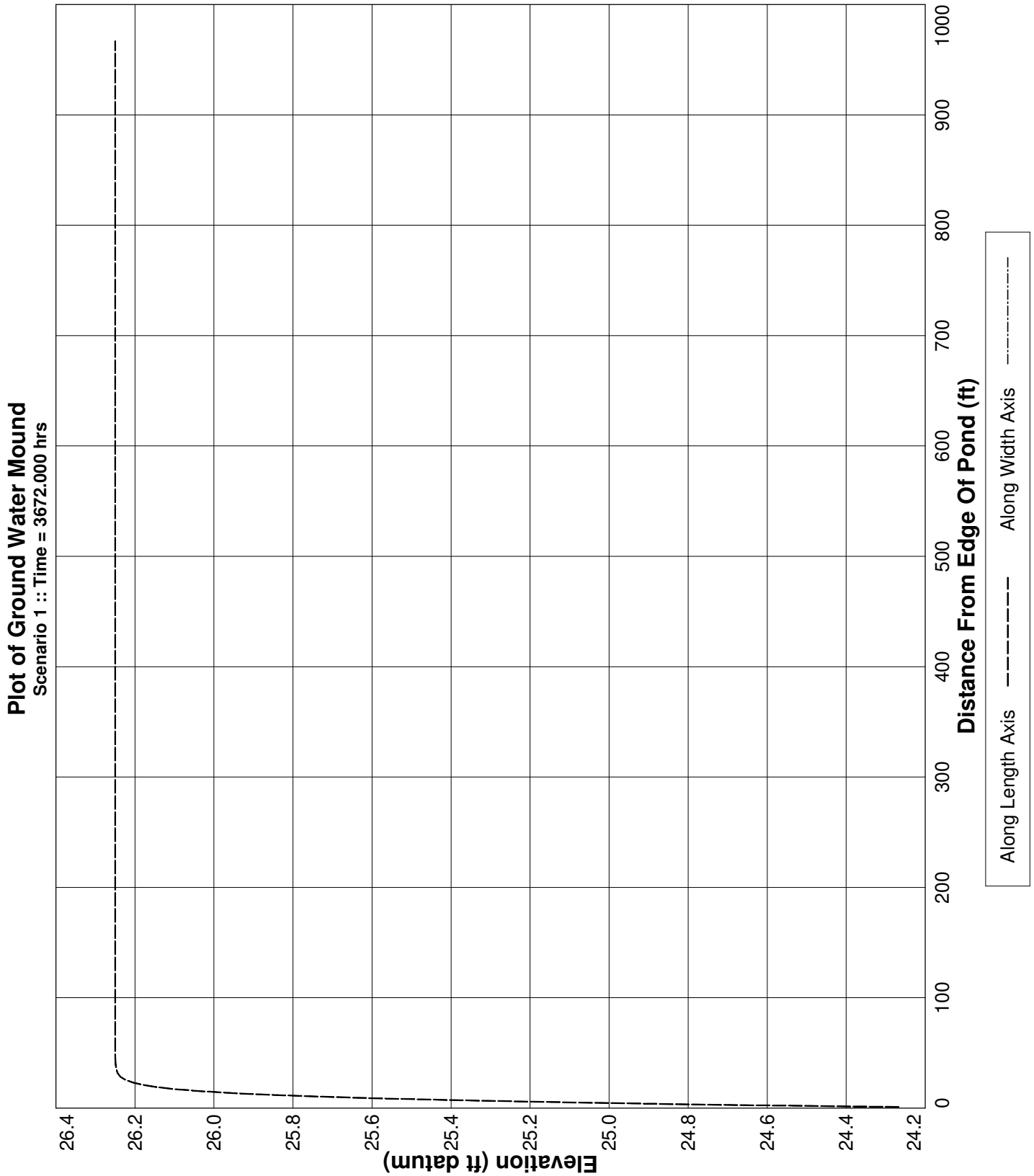
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0409	0.00163	25.25000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0409	0.00163	24.00000	-22.07639	7.049491E-02	54108.600	-58344340.0	5.842568E+07	S
734.400	0.0409	0.00163	24.00000	-0.00963	.0447859	108217.200	-58366430.0	5.850188E+07	S
1101.600	0.0409	0.00163	24.00000	-0.00180	4.217643E-02	162325.800	-58369800.0	5.855935E+07	S
1468.800	0.0409	0.00163	24.00000	-0.00094	4.180247E-02	216434.400	-58371200.0	5.861486E+07	S
1836.000	0.0409	0.00163	24.00000	-0.00081	4.172376E-02	270543.000	-58372300.0	5.867007E+07	S
2203.200	0.0409	0.00163	24.00000	-0.00077	4.170075E-02	324651.600	-58373330.0	5.872521E+07	S
2570.400	0.0409	0.00163	24.00000	-0.00076	4.169398E-02	378760.200	-58374340.0	5.878033E+07	S
2937.600	0.0409	0.00163	24.00000	-0.00076	4.169431E-02	432868.800	-58375350.0	5.883544E+07	S
3304.800	0.0409	0.00163	24.00000	-0.00077	4.169865E-02	486977.400	-58376360.0	5.889056E+07	S
3672.000	0.0409	0.00163	24.00000	----	----	541086.000	-58377380.0	5.894569E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 22, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 1.00  
Water Table Elevation, [WT] (ft datum): 25.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.38  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 476.0  
Equivalent Pond Width, [W] (ft): 83.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
5.00	435.6
24.00	39639.6

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	24.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 16:23:52

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

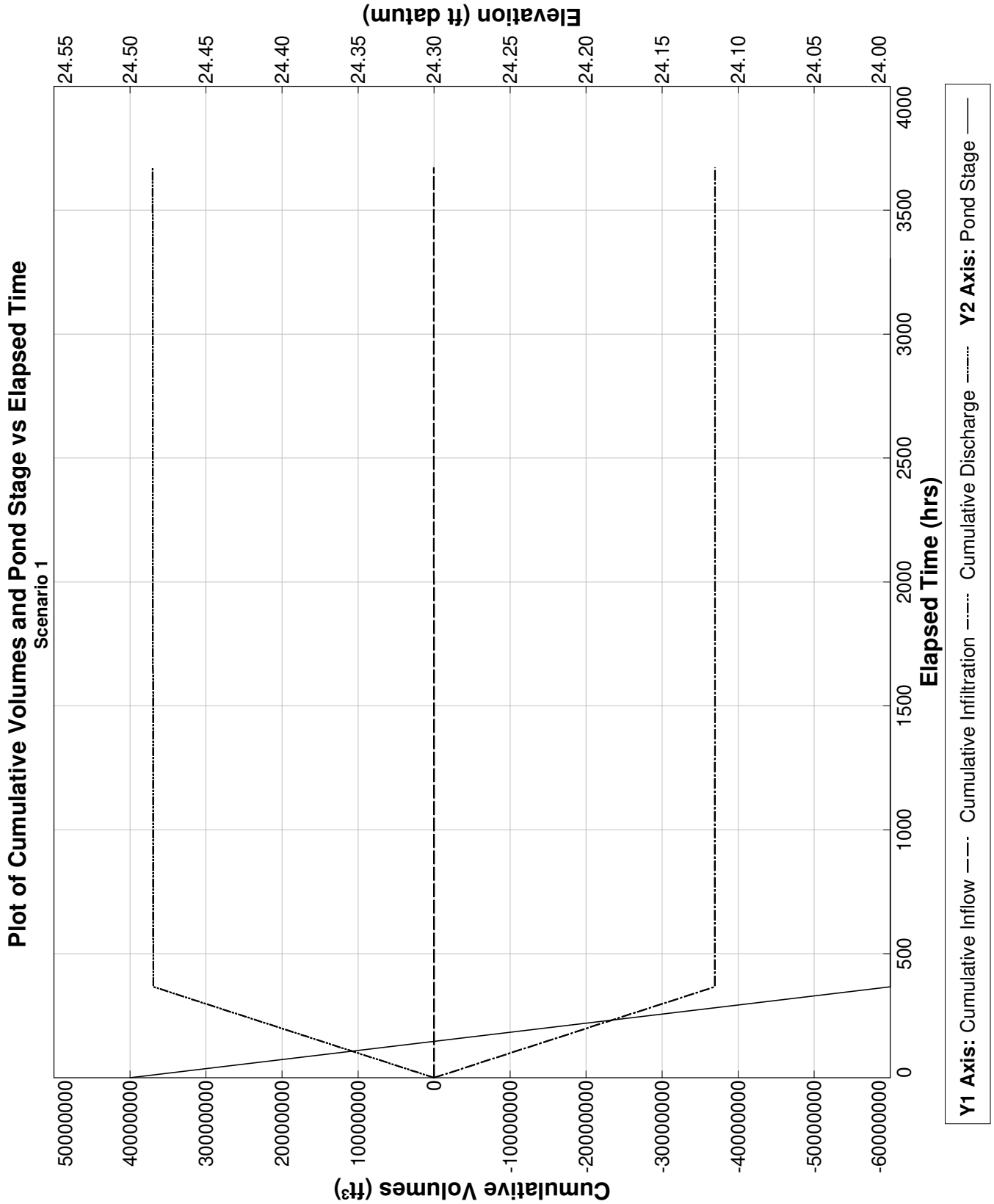
Baseflow hydrograph: Initial GWT (seasonal low) is 24.5 ft.

End Scenario 1 3/31/2023 16:23:52

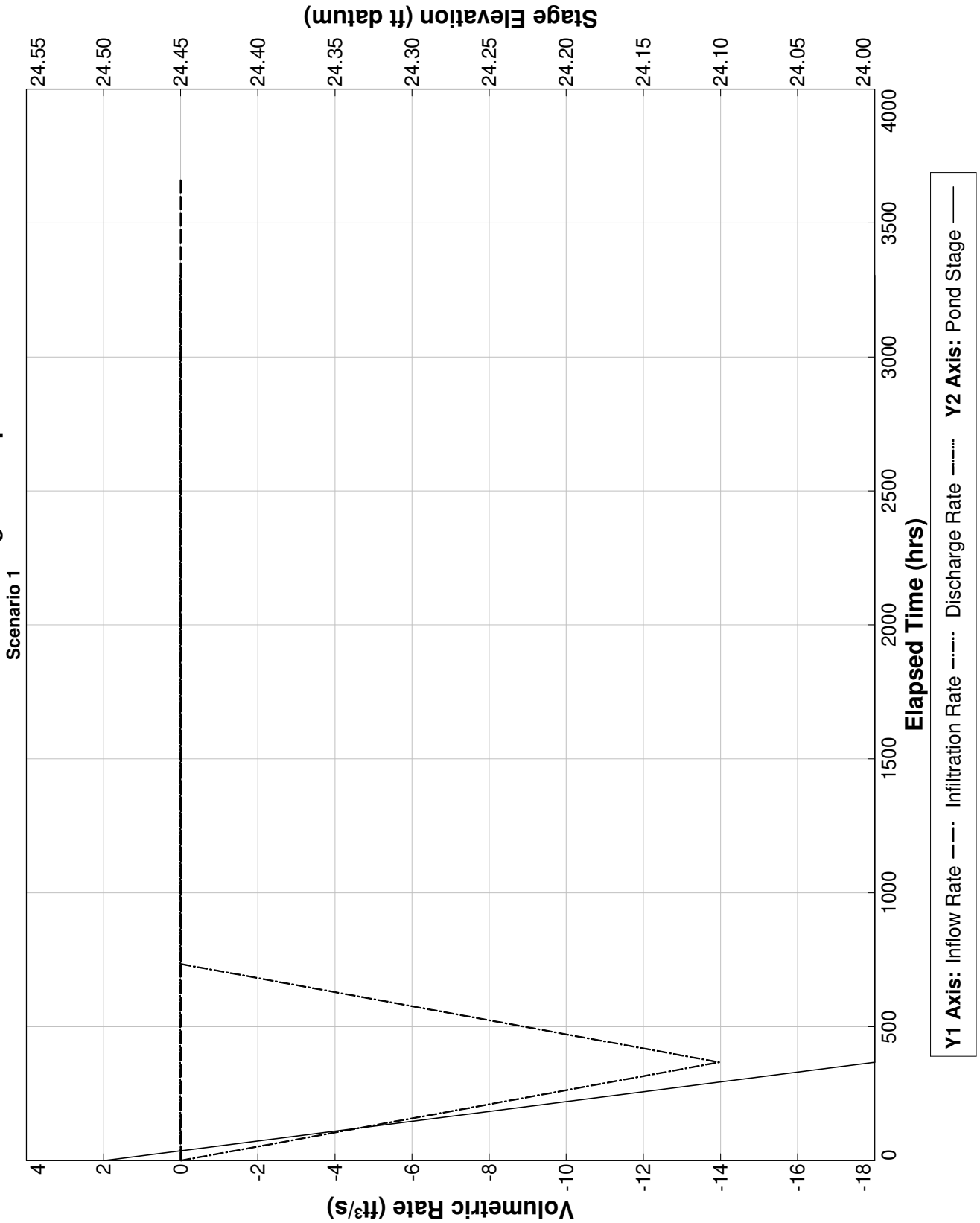
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**Detailed Results**    :: Scenario 1 ::

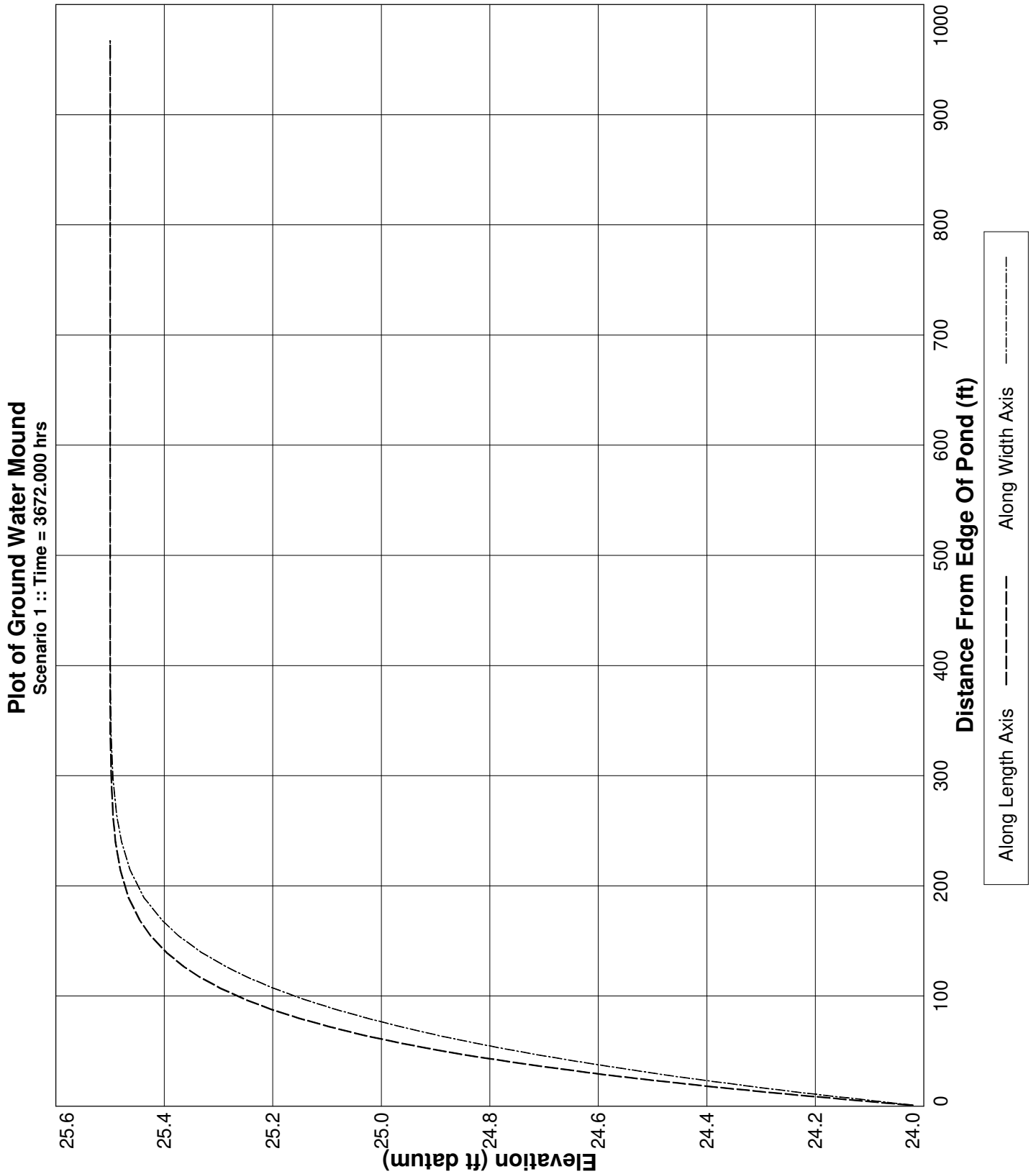
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0030	0.00163	24.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0030	0.00163	24.00000	-13.96739	2.208493E-02	3950.800	-36913000.0	3.693677E+07	S
734.400	0.0030	0.00163	24.00000	-0.00683	5.915789E-03	7901.600	-36927560.0	3.695528E+07	S
1101.600	0.0030	0.00163	24.00000	-0.00246	5.348713E-03	11852.400	-36931050.0	3.696272E+07	S
1468.800	0.0030	0.00163	24.00000	-0.00222	5.168676E-03	15803.200	-36934050.0	3.696968E+07	S
1836.000	0.0030	0.00163	24.00000	-0.00217	5.140661E-03	19754.000	-36936920.0	3.697649E+07	S
2203.200	0.0030	0.00163	24.00000	-0.00220	5.179018E-03	23704.800	-36939790.0	3.698331E+07	S
2570.400	0.0030	0.00163	24.00000	-0.00226	5.247192E-03	27655.600	-36942730.0	3.69902E+07	S
2937.600	0.0030	0.00163	24.00000	-0.00234	5.328834E-03	31606.400	-36945770.0	3.699719E+07	S
3304.800	0.0030	0.00163	24.00000	-0.00243	5.416472E-03	35557.200	-36948920.0	3.70043E+07	S
3672.000	0.0030	0.00163	24.00000	----	----	39508.000	-36952190.0	3.701152E+07	N.A.



Plot of Flow Rates and Pond Stage vs Elapsed Time







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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 23, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 1.00  
Water Table Elevation, [WT] (ft datum): 25.70  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.17  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 371.0  
Equivalent Pond Width, [W] (ft): 92.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
3.00	435.6
24.00	33976.8

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	24.7
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 16:41:28

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

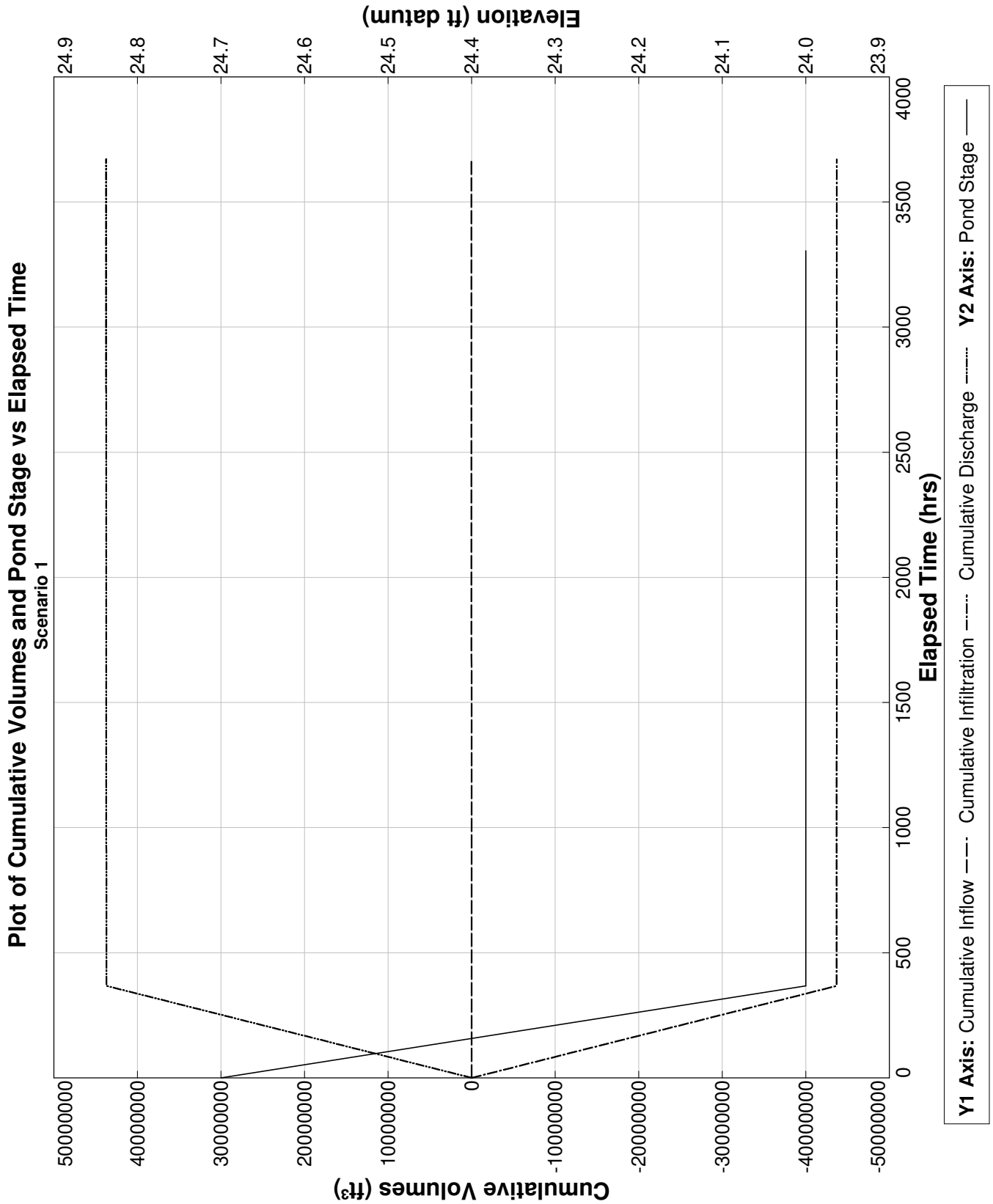
Baseflow hydrograph: Initial GWT (seasonal low) is 24.7 ft.

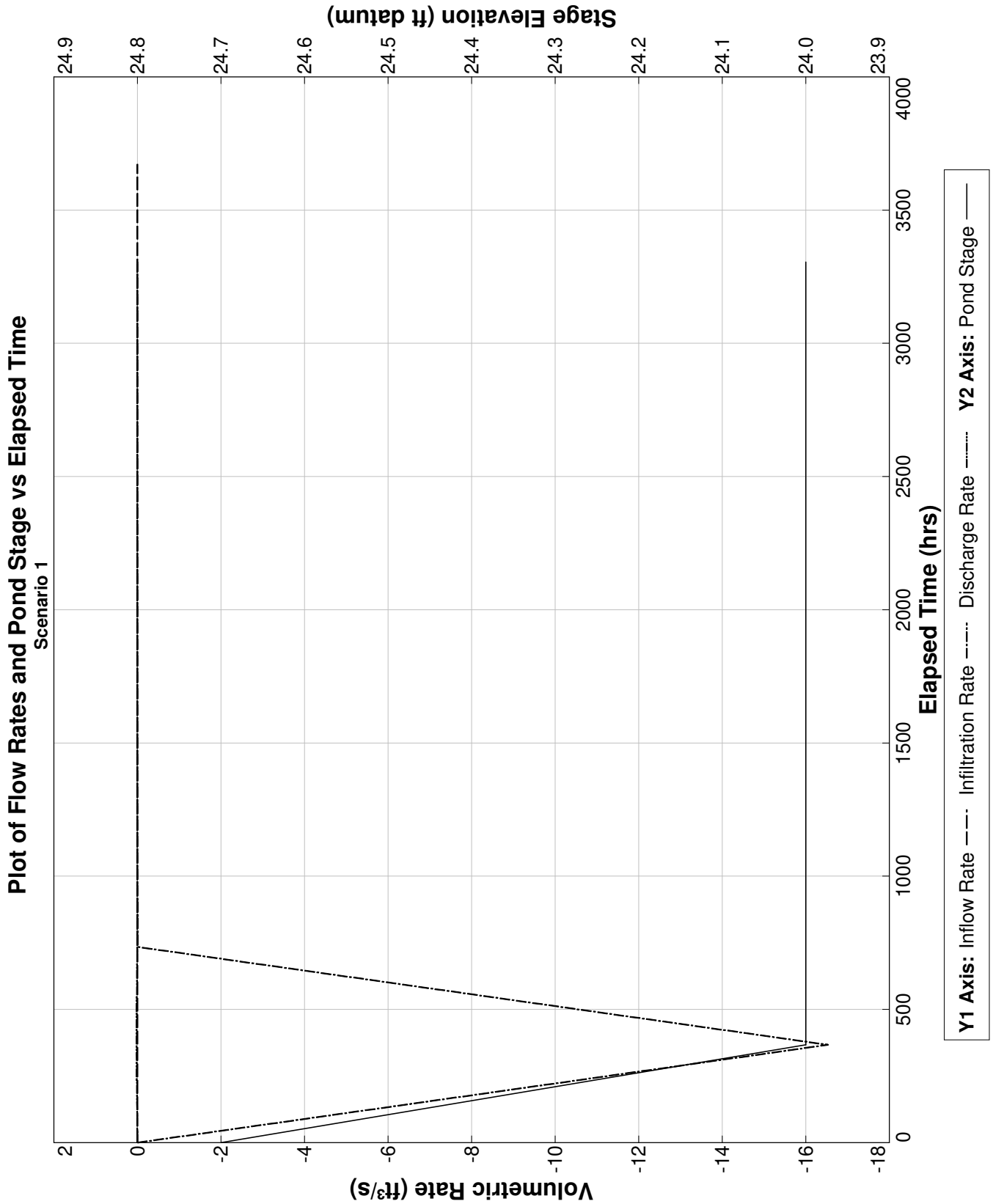
End Scenario 1 3/31/2023 16:41:28

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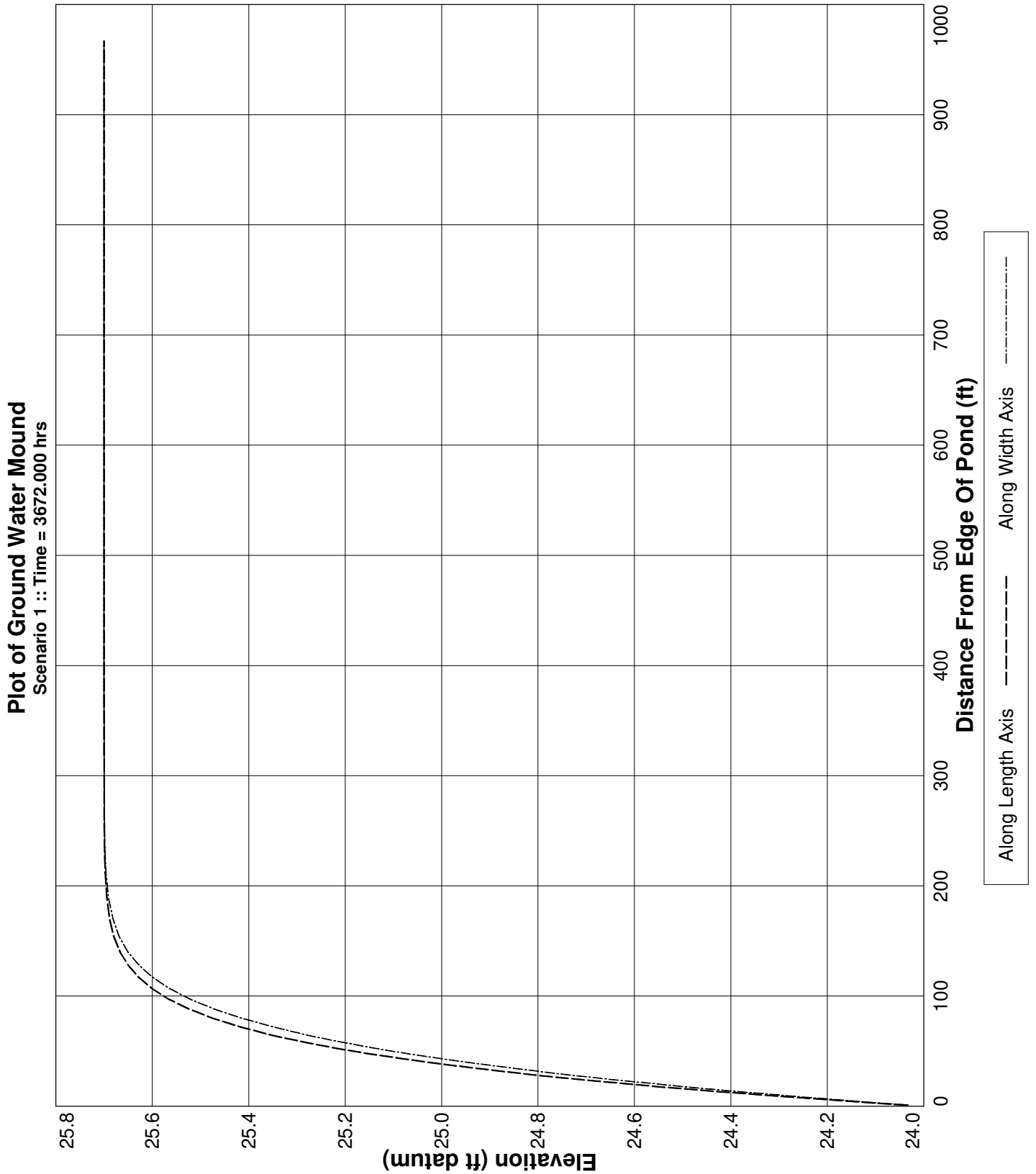
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0026	0.00163	24.70000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0026	0.00163	24.00000	-16.52557	2.391021E-02	3413.200	-43675510.0	4.370271E+07	S
734.400	0.0026	0.00163	24.00000	-0.00675	4.626543E-03	6826.400	-43690960.0	4.372157E+07	S
1101.600	0.0026	0.00163	24.00000	-0.00164	4.145148E-03	10239.600	-43693340.0	4.372737E+07	S
1468.800	0.0026	0.00163	24.00000	-0.00142	3.973704E-03	13652.800	-43695300.0	4.373274E+07	S
1836.000	0.0026	0.00163	24.00000	-0.00135	3.921841E-03	17066.000	-43697100.0	4.373796E+07	S
2203.200	0.0026	0.00163	24.00000	-0.00134	3.920607E-03	20479.200	-43698880.0	4.374314E+07	S
2570.400	0.0026	0.00163	24.00000	-0.00136	3.942114E-03	23892.400	-43700660.0	4.374834E+07	S
2937.600	0.0026	0.00163	24.00000	-0.00139	3.974331E-03	27305.600	-43702480.0	4.375357E+07	S
3304.800	0.0026	0.00163	24.00000	-0.00143	4.01182E-03	30718.800	-43704340.0	4.375884E+07	S
3672.000	0.0026	0.00163	24.00000	----	----	34132.000	-43706260.0	4.376418E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.24, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 04-06-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -20.00  
Water Table Elevation, [WT] (ft datum): 23.30  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.22  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 486.0  
Equivalent Pond Width, [W] (ft): 202.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
-15.00	196020.0
21.00	98010.0

**Ditch Data**

Ditch (or interceptor trench) parallel to length axis is inactive  
Ditch (or interceptor trench) parallel to width axis is inactive

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES

Weir elevation, (ft datum):	21
Weir coefficient:	7.9
Weir length, (ft):	10
Weir exponent:	0.5

Tailwater - disabled, free discharge

**Discharge Structure #2 is inactive**

**Discharge Structure #3 is inactive**

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**Scenario Input Data**

*Scenario 1 ::*

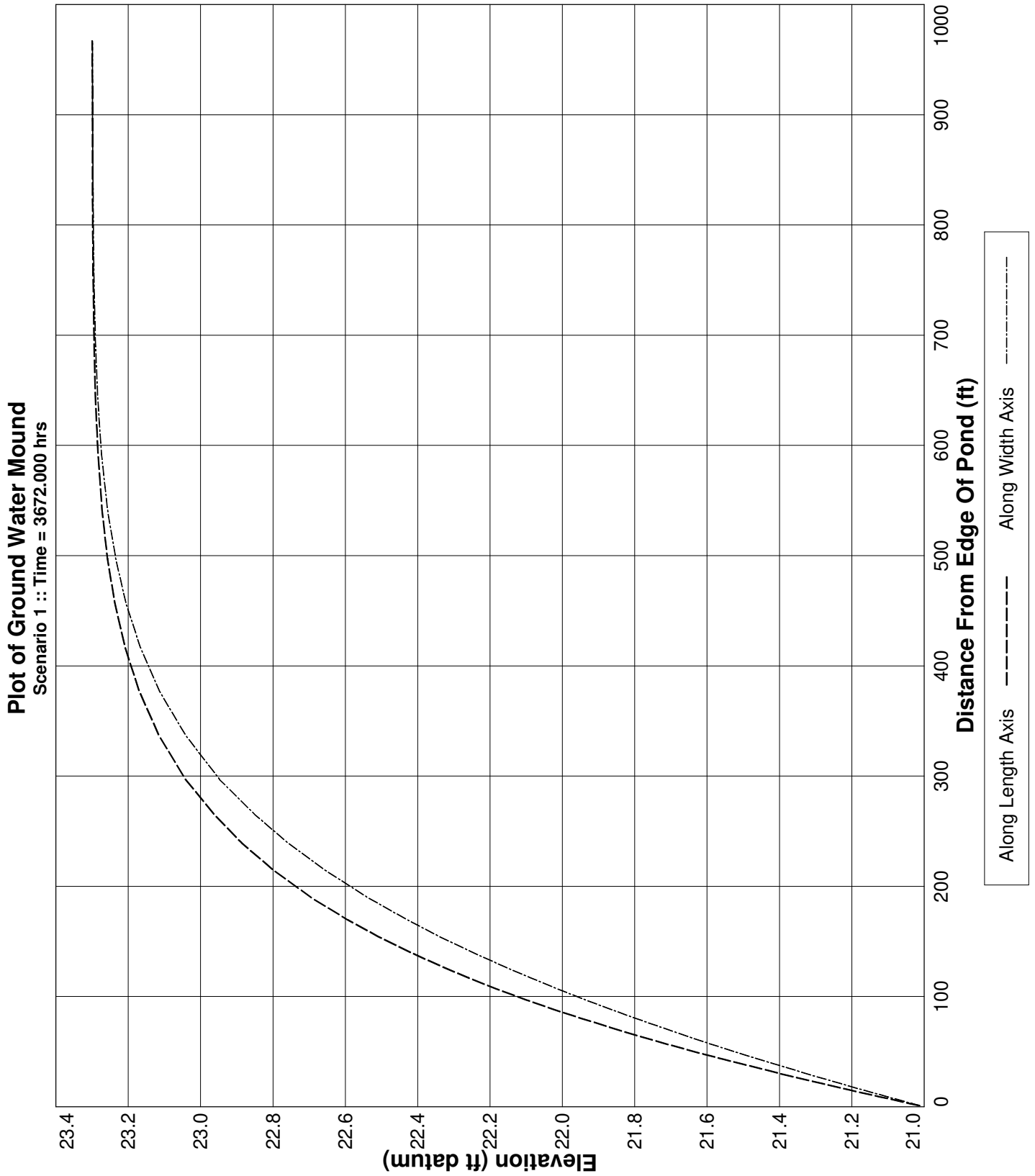
Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	22.3
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0074	0.00163	22.30000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0074	0.00163	21.00000	-22.53154	.1265114	9817.200	-59481610.0	5.961884E+07	S
734.400	0.0074	0.00163	21.00000	-0.04007	2.175922E-02	19634.400	-59569790.0	5.971684E+07	S
1101.600	0.0074	0.00163	21.00000	-0.01281	1.993839E-02	29451.600	-59587530.0	5.974444E+07	S
1468.800	0.0074	0.00163	21.00000	-0.01193	1.929601E-02	39268.800	-59603650.0	5.977033E+07	S
1836.000	0.0074	0.00163	21.00000	-0.01153	1.889502E-02	49086.000	-59619080.0	5.979557E+07	S
2203.200	0.0074	0.00163	21.00000	-0.01134	1.872508E-02	58903.200	-59634120.0	5.982044E+07	S
2570.400	0.0074	0.00163	21.00000	-0.01130	.0187035	68720.400	-59649040.0	5.984518E+07	S
2937.600	0.0074	0.00163	21.00000	-0.01136	.0187731	78537.600	-59664000.0	5.986995E+07	S
3304.800	0.0074	0.00163	21.00000	-0.01149	1.890796E-02	88354.800	-59679080.0	5.989485E+07	S
3672.000	0.0074	0.00163	21.00000	----	----	98172.000	-59694380.0	5.991996E+07	N.A.



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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 25, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 4.00  
Water Table Elevation, [WT] (ft datum): 25.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.17  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 286.0  
Equivalent Pond Width, [W] (ft): 61.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
9.00	435.6
24.00	17424.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive



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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	24.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 16:48:0

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

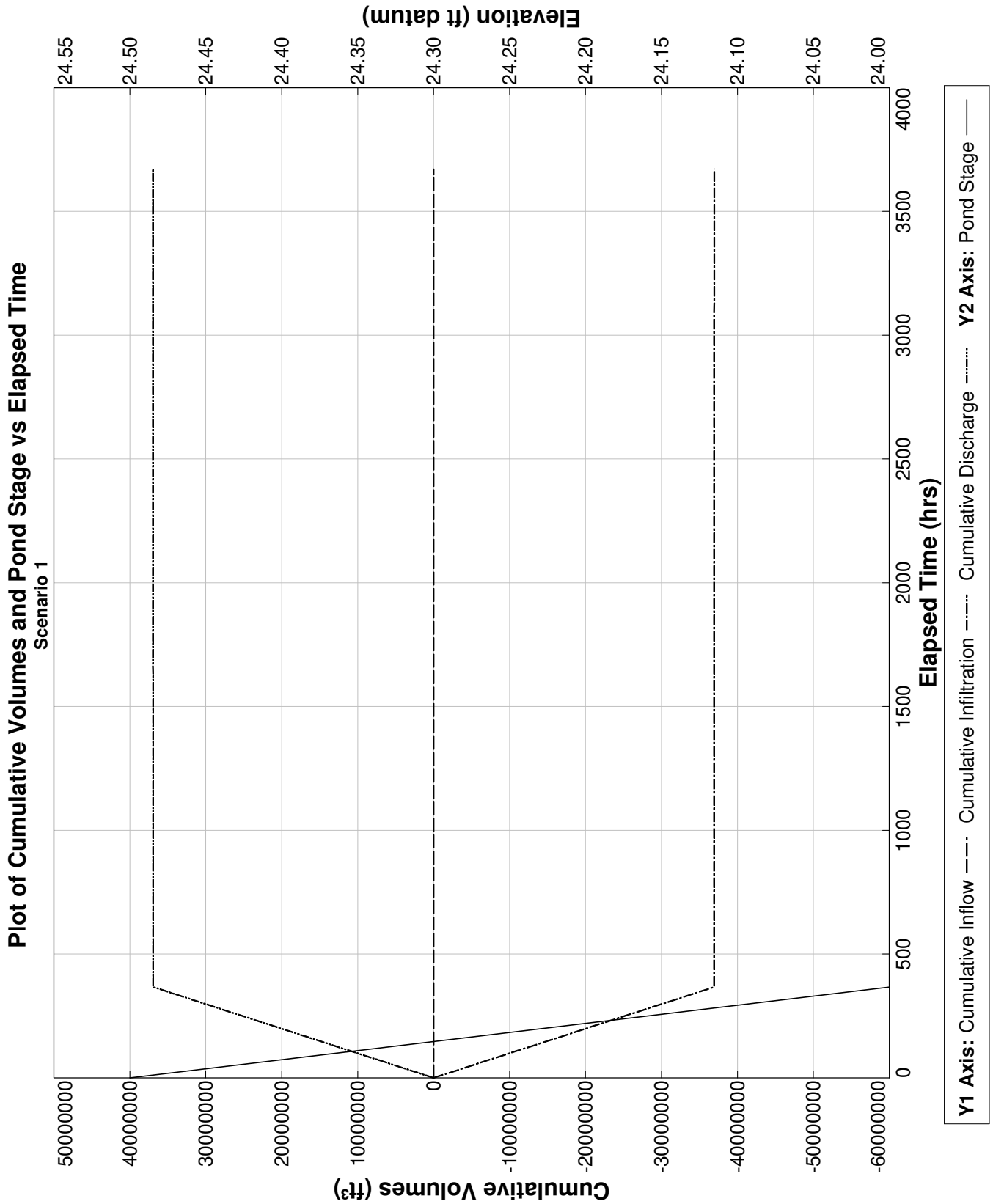
Baseflow hydrograph: Initial GWT (seasonal low) is 24.5 ft.

End Scenario 1 3/31/2023 16:48:0

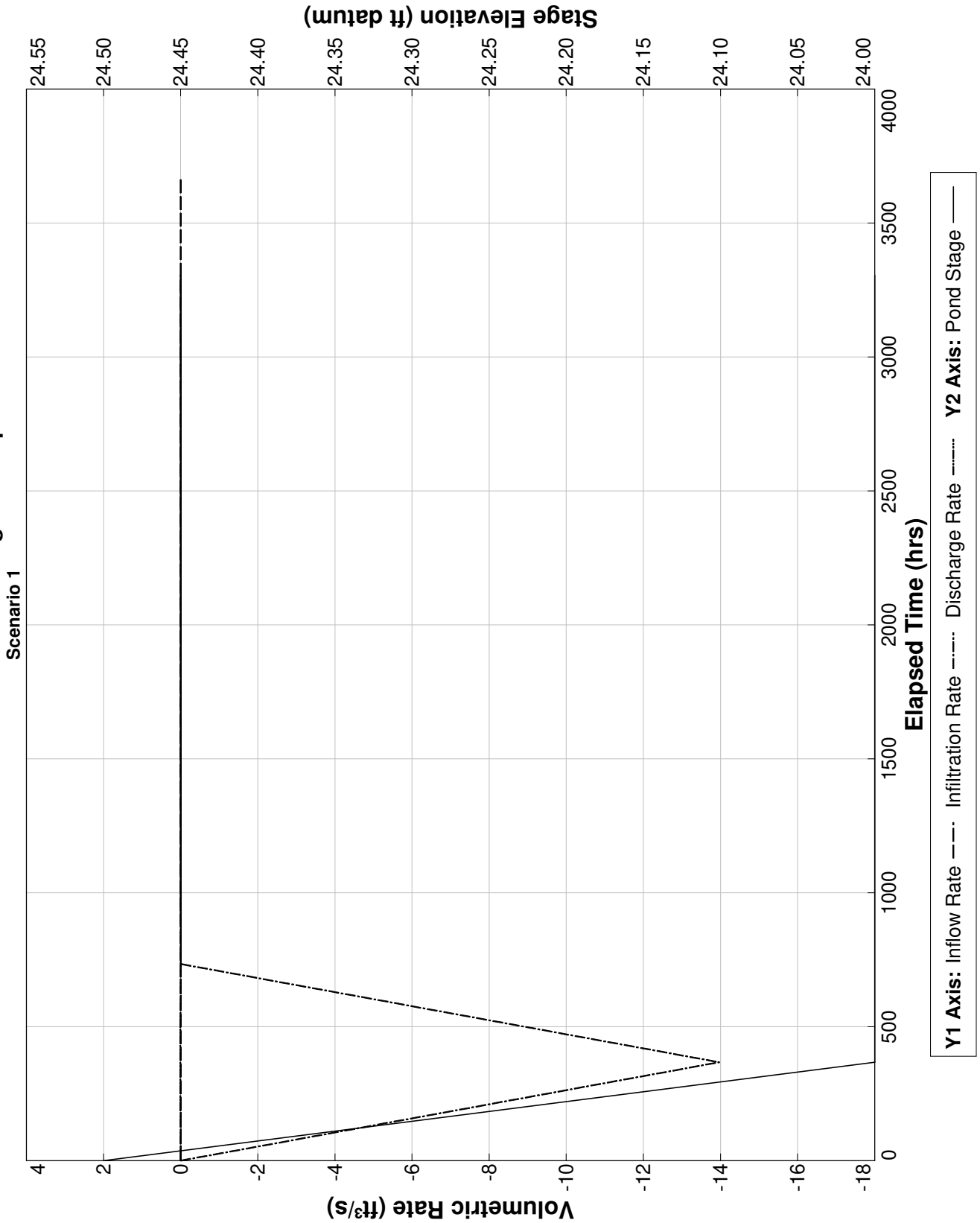
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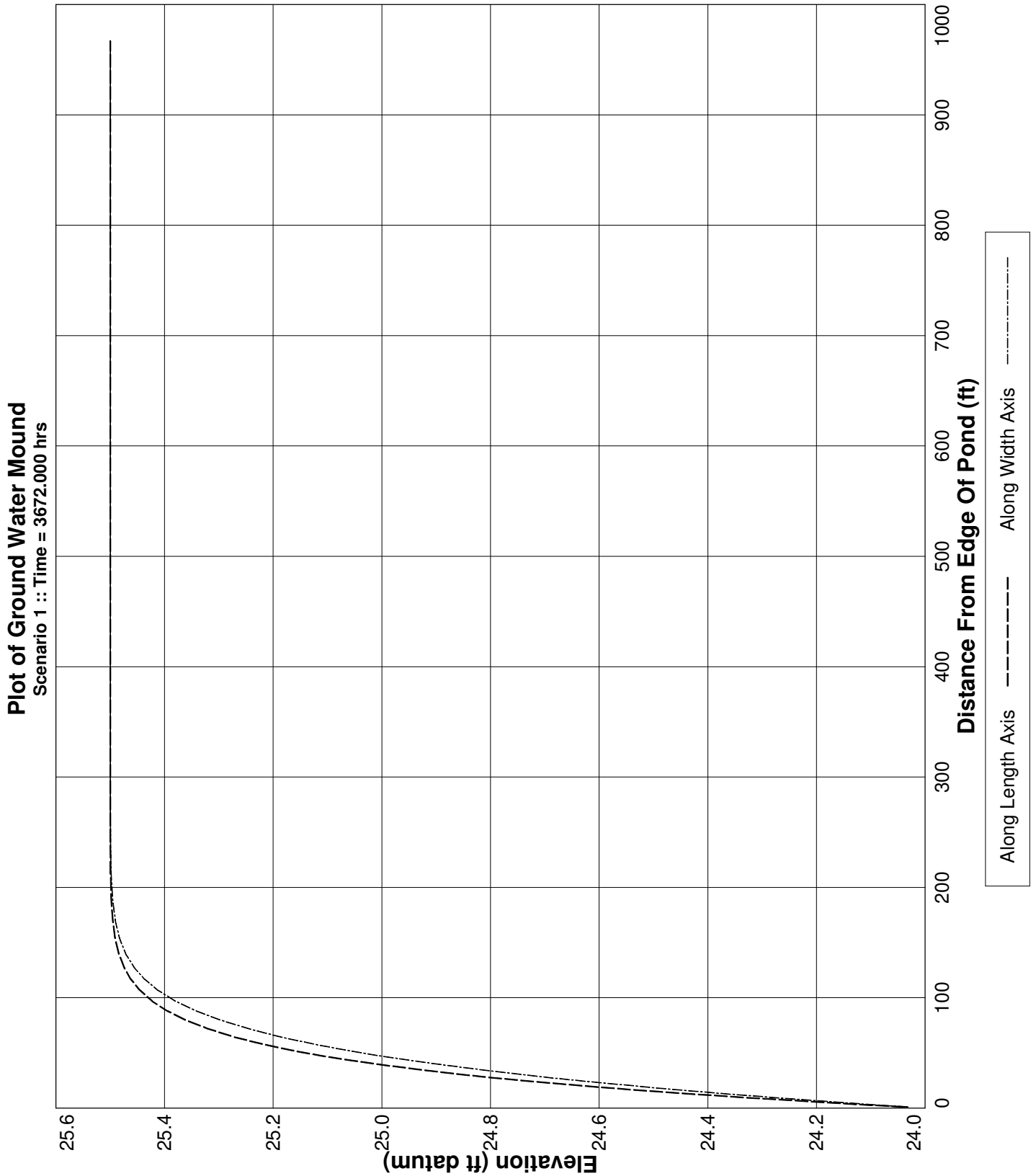
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0013	0.00163	24.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0013	0.00163	24.00000	-13.96647	9.902963E-03	1744.600	-36918260.0	3.692872E+07	S
734.400	0.0013	0.00163	24.00000	-0.00329	3.083654E-03	3489.200	-36925100.0	3.69373E+07	S
1101.600	0.0013	0.00163	24.00000	-0.00119	2.385807E-03	5233.800	-36926970.0	3.694092E+07	S
1468.800	0.0013	0.00163	24.00000	-0.00092	2.200062E-03	6978.400	-36928260.0	3.694395E+07	S
1836.000	0.0013	0.00163	24.00000	-0.00085	2.157617E-03	8723.000	-36929400.0	3.694683E+07	S
2203.200	0.0013	0.00163	24.00000	-0.00085	2.163194E-03	10467.600	-36930510.0	3.694968E+07	S
2570.400	0.0013	0.00163	24.00000	-0.00087	2.186756E-03	12212.200	-36931640.0	3.695256E+07	S
2937.600	0.0013	0.00163	24.00000	-0.00090	2.217444E-03	13956.800	-36932800.0	3.695547E+07	S
3304.800	0.0013	0.00163	24.00000	-0.00093	2.250981E-03	15701.400	-36934010.0	3.695842E+07	S
3672.000	0.0013	0.00163	24.00000	----	----	17446.000	-36935270.0	3.696142E+07	N.A.



Plot of Flow Rates and Pond Stage vs Elapsed Time





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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.26, Baseflow, revised  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 04-06-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -11.00  
Water Table Elevation, [WT] (ft datum): 26.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.17  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 541.0  
Equivalent Pond Width, [W] (ft): 128.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
4.00	435.6
24.00	69260.4

**Ditch Data**

Ditch (or interceptor trench) parallel to length axis is inactive  
Ditch (or interceptor trench) parallel to width axis is inactive

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES

Weir elevation, (ft datum):	24
Weir coefficient:	7.9
Weir length, (ft):	10
Weir exponent:	0.5

Tailwater - disabled, free discharge

**Discharge Structure #2 is inactive**

**Discharge Structure #3 is inactive**



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**Scenario Input Data**

*Scenario 1 ::*

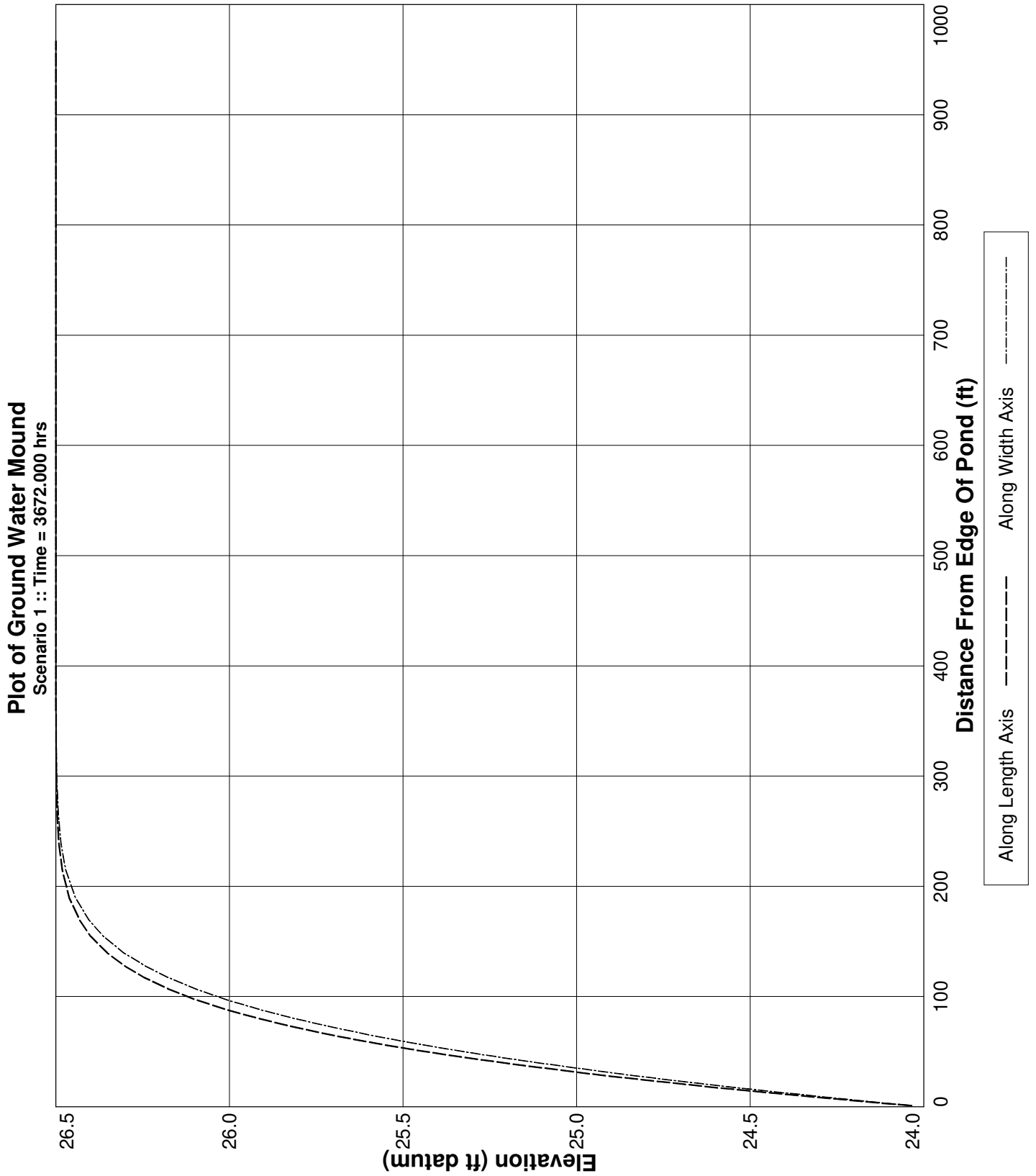
Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	25.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Detailed Results** :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0052	0.00163	25.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0052	0.00163	24.00000	-24.19534	9.692141E-02	6924.800	-63904330.0	6.401514E+07	S
734.400	0.0052	0.00163	24.00000	-0.02683	1.081686E-02	13849.600	-63968610.0	6.408636E+07	S
1101.600	0.0052	0.00163	24.00000	-0.00463	9.734863E-03	20774.400	-63975270.0	6.409994E+07	S
1468.800	0.0052	0.00163	24.00000	-0.00401	9.174484E-03	27699.200	-63980850.0	6.411244E+07	S
1836.000	0.0052	0.00163	24.00000	-0.00369	8.893592E-03	34624.000	-63985860.0	6.412438E+07	S
2203.200	0.0052	0.00163	24.00000	-0.00353	8.751402E-03	41548.800	-63990600.0	6.413604E+07	S
2570.400	0.0052	0.00163	24.00000	-0.00346	8.686858E-03	48473.600	-63995200.0	6.414757E+07	S
2937.600	0.0052	0.00163	24.00000	-0.00343	8.664525E-03	55398.400	-63999750.0	6.415904E+07	S
3304.800	0.0052	0.00163	24.00000	-0.00343	8.667946E-03	62323.200	-64004280.0	6.417049E+07	S
3672.000	0.0052	0.00163	24.00000	----	----	69248.000	-64008820.0	6.418196E+07	N.A.



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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 27, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -8.00  
Water Table Elevation, [WT] (ft datum): 27.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.17  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 744.0  
Equivalent Pond Width, [W] (ft): 115.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
-3.00	435.6
24.00	85813.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	26.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 17:3:25

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 26.0 ft.

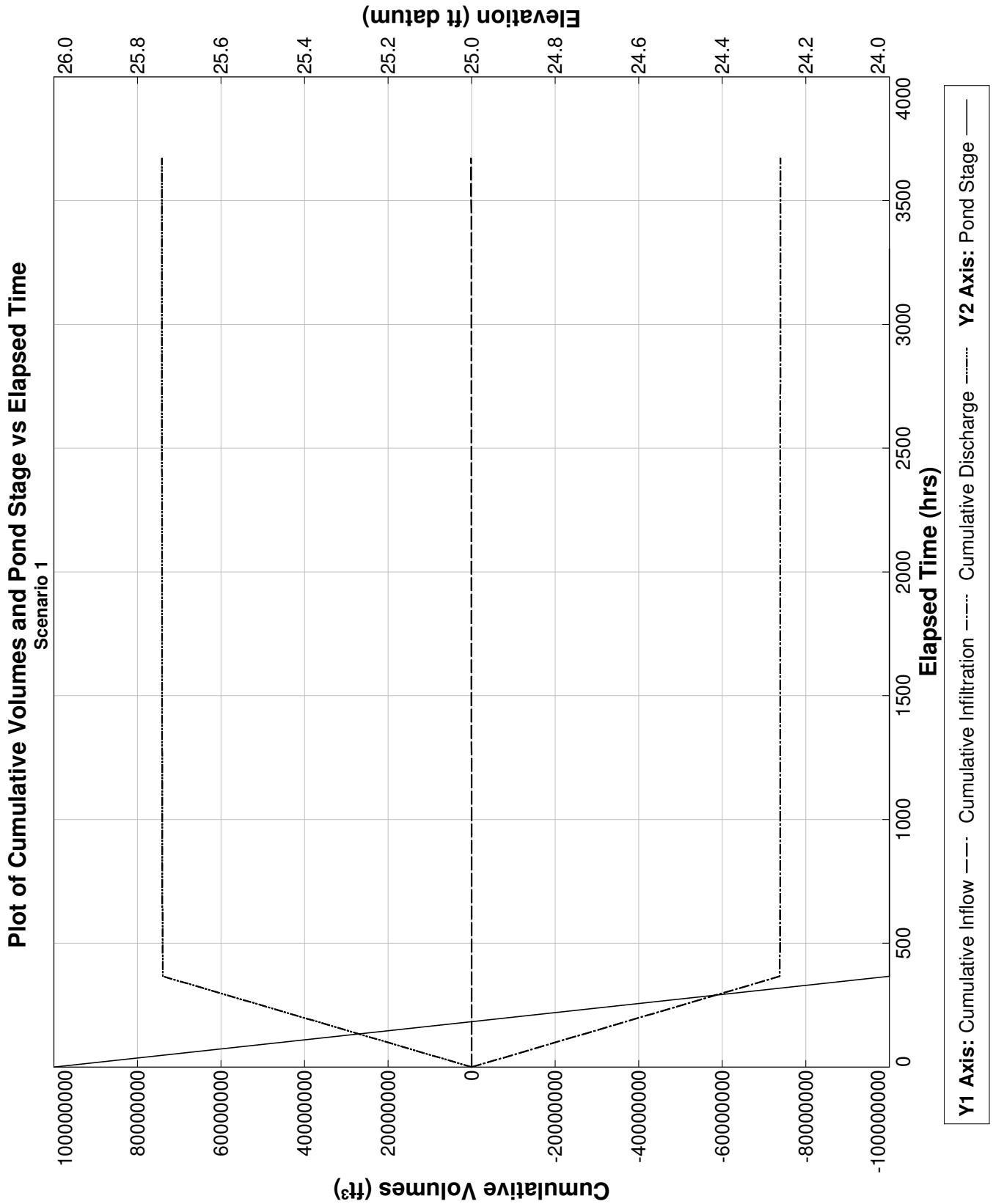
End Scenario 1 3/31/2023 17:3:25

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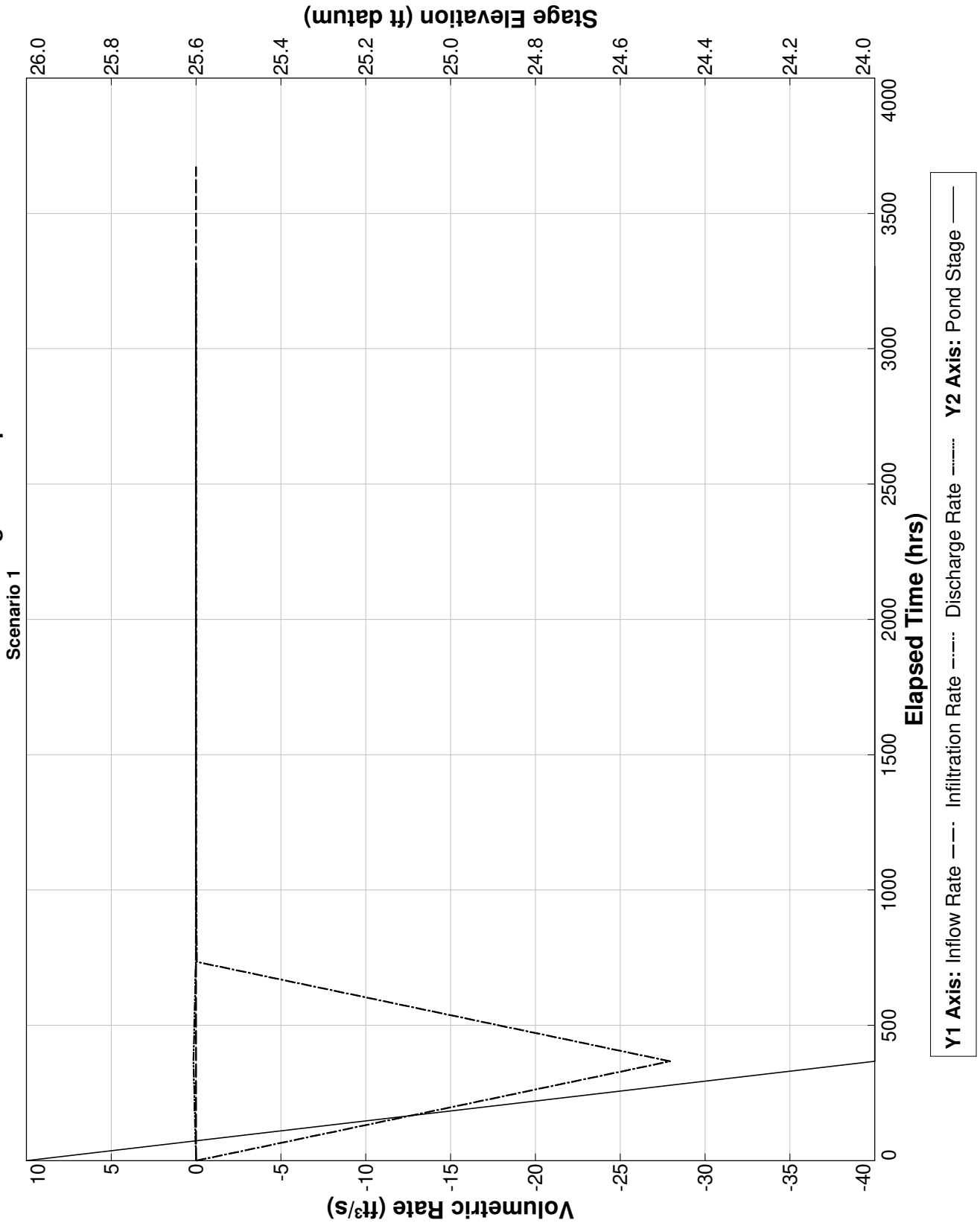
**Detailed Results**    :: Scenario 1 ::

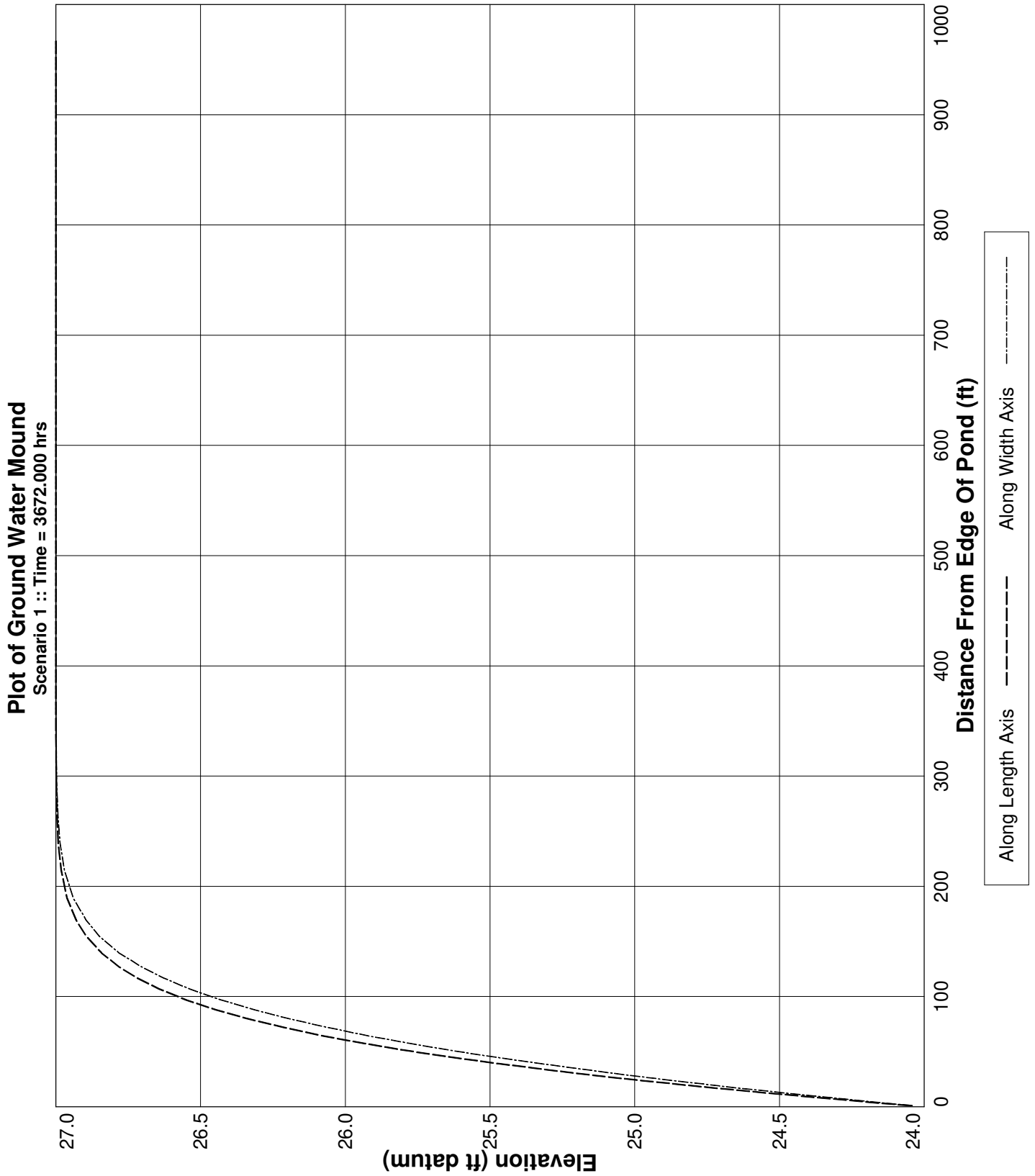
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0065	0.00163	26.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0065	0.00163	24.00000	-27.93779	.1498244	8556.000	-73763190.0	7.394338E+07	S
734.400	0.0065	0.00163	24.00000	-0.04131	1.418319E-02	17112.000	-73863040.0	7.405178E+07	S
1101.600	0.0065	0.00163	24.00000	-0.00661	1.295572E-02	25668.000	-73872420.0	7.406972E+07	S
1468.800	0.0065	0.00163	24.00000	-0.00583	1.223336E-02	34224.000	-73880510.0	7.408637E+07	S
1836.000	0.0065	0.00163	24.00000	-0.00537	1.180145E-02	42780.000	-73887850.0	7.410226E+07	S
2203.200	0.0065	0.00163	24.00000	-0.00510	1.154776E-02	51336.000	-73894720.0	7.411769E+07	S
2570.400	0.0065	0.00163	24.00000	-0.00494	1.139549E-02	59892.000	-73901330.0	7.413285E+07	S
2937.600	0.0065	0.00163	24.00000	-0.00485	1.130976E-02	68448.000	-73907780.0	7.414786E+07	S
3304.800	0.0065	0.00163	24.00000	-0.00480	1.126467E-02	77004.000	-73914140.0	7.416278E+07	S
3672.000	0.0065	0.00163	24.00000	----	----	85560.000	-73920470.0	7.417766E+07	N.A.





Plot of Flow Rates and Pond Stage vs Elapsed Time





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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 28, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -14.00  
Water Table Elevation, [WT] (ft datum): 26.80  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.69  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 437.0  
Equivalent Pond Width, [W] (ft): 203.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
-9.00	2613.6
24.00	88862.4

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	25.8
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 17:12:38

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 25.8 ft.

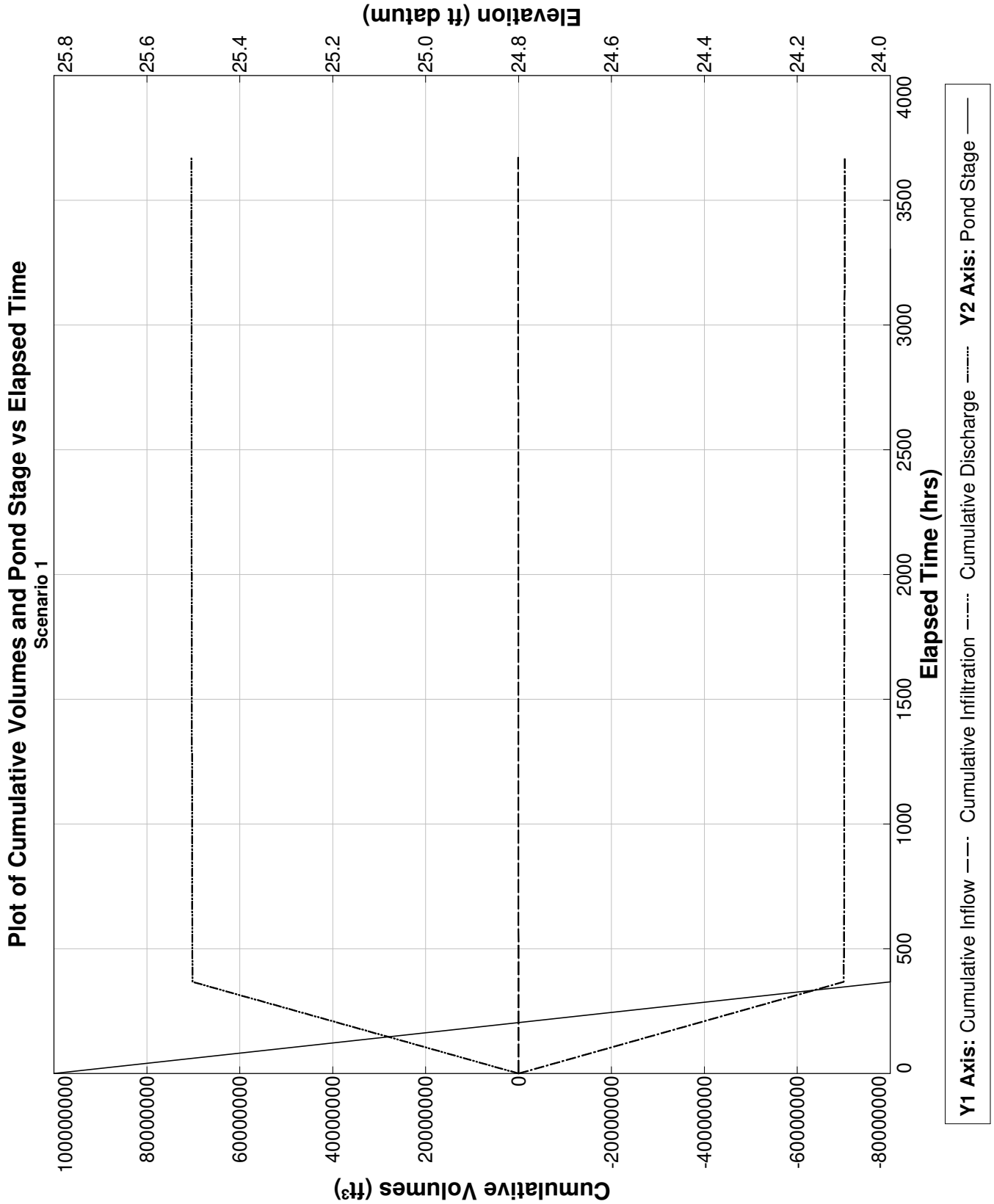
End Scenario 1 3/31/2023 17:12:38

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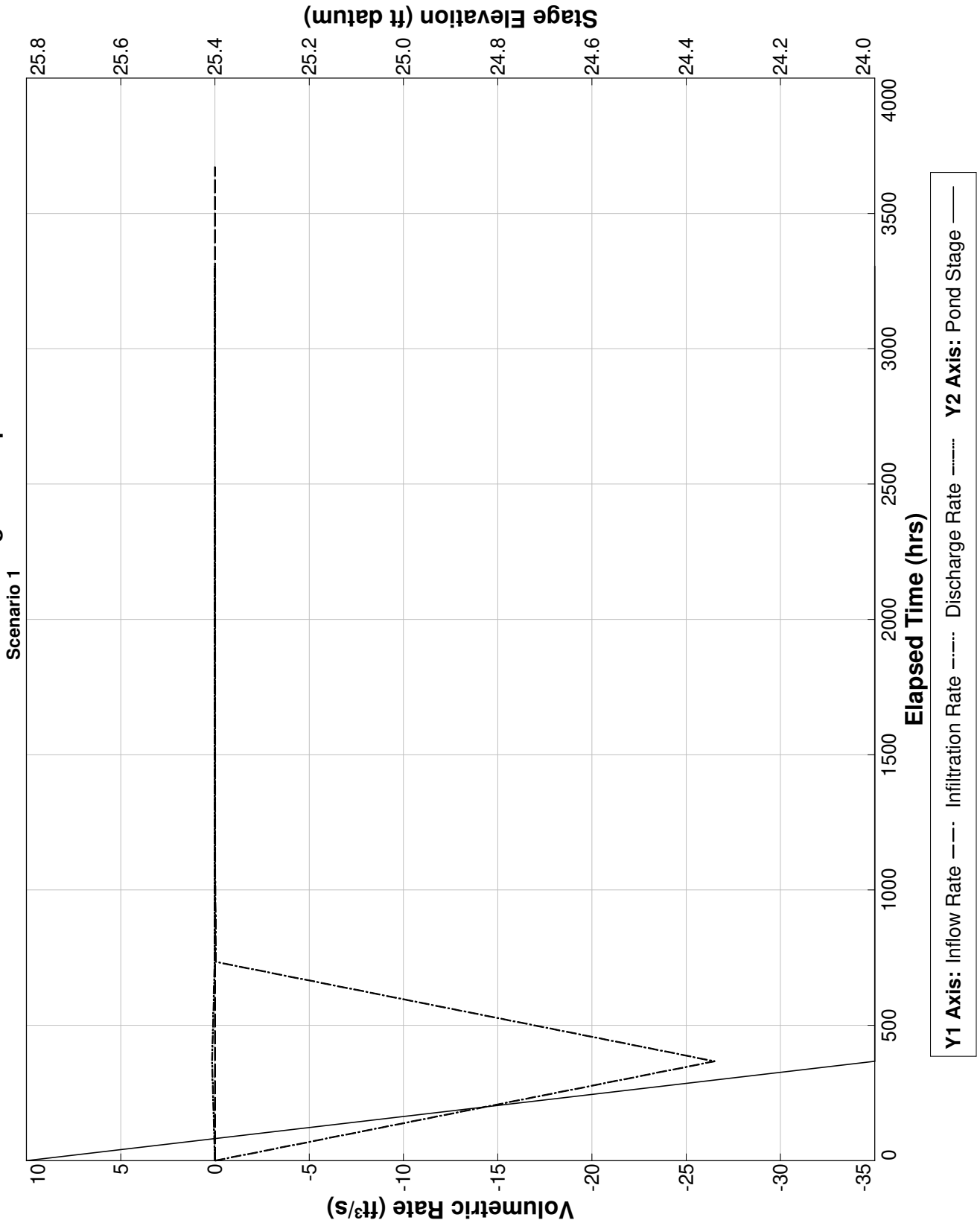
**Detailed Results** :: Scenario 1 ::

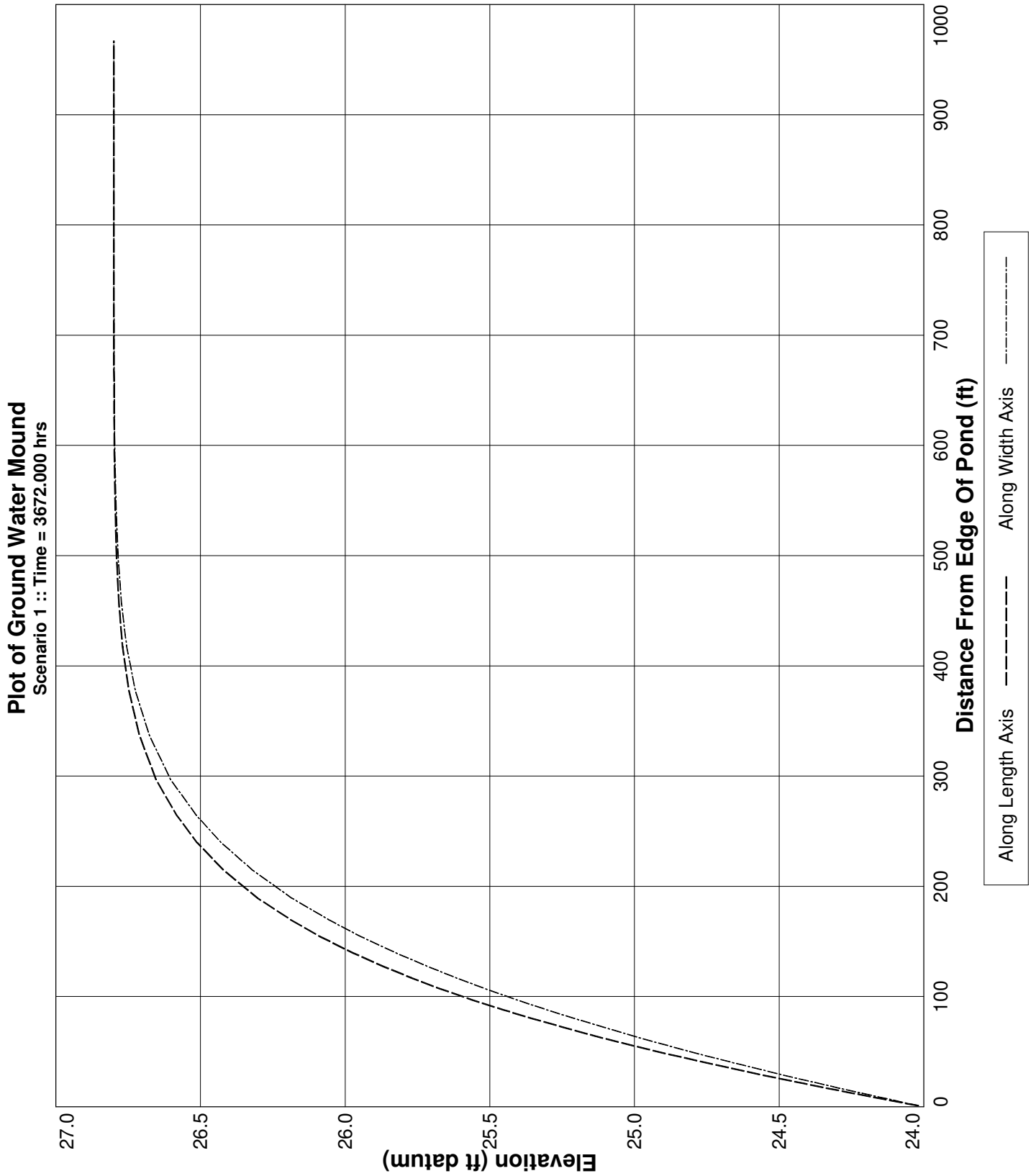
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0067	0.00163	25.80000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0067	0.00163	24.00000	-26.50919	.1483564	8871.100	-69984140.0	7.015296E+07	S
734.400	0.0067	0.00163	24.00000	-0.04430	.019259	17742.200	-70086050.0	7.026374E+07	S
1101.600	0.0067	0.00163	24.00000	-0.01076	1.715996E-02	26613.300	-70101250.0	7.028782E+07	S
1468.800	0.0067	0.00163	24.00000	-0.00971	1.631786E-02	35484.400	-70114500.0	7.030994E+07	S
1836.000	0.0067	0.00163	24.00000	-0.00922	1.589099E-02	44355.500	-70126930.0	7.033123E+07	S
2203.200	0.0067	0.00163	24.00000	-0.00893	1.561263E-02	53226.600	-70138880.0	7.035206E+07	S
2570.400	0.0067	0.00163	24.00000	-0.00878	1.546643E-02	62097.700	-70150540.0	7.03726E+07	S
2937.600	0.0067	0.00163	24.00000	-0.00871	1.540638E-02	70968.800	-70162080.0	7.0393E+07	S
3304.800	0.0067	0.00163	24.00000	-0.00870	1.540573E-02	79839.900	-70173580.0	7.041337E+07	S
3672.000	0.0067	0.00163	24.00000	----	----	88711.000	-70185100.0	7.043376E+07	N.A.





Plot of Flow Rates and Pond Stage vs Elapsed Time





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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 29, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-31-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 11.00  
Water Table Elevation, [WT] (ft datum): 27.30  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.69  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 436.0  
Equivalent Pond Width, [W] (ft): 52.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
16.00	435.6
24.00	22651.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 24  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	26.3
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/31/2023 17:23:34

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 26.3 ft.

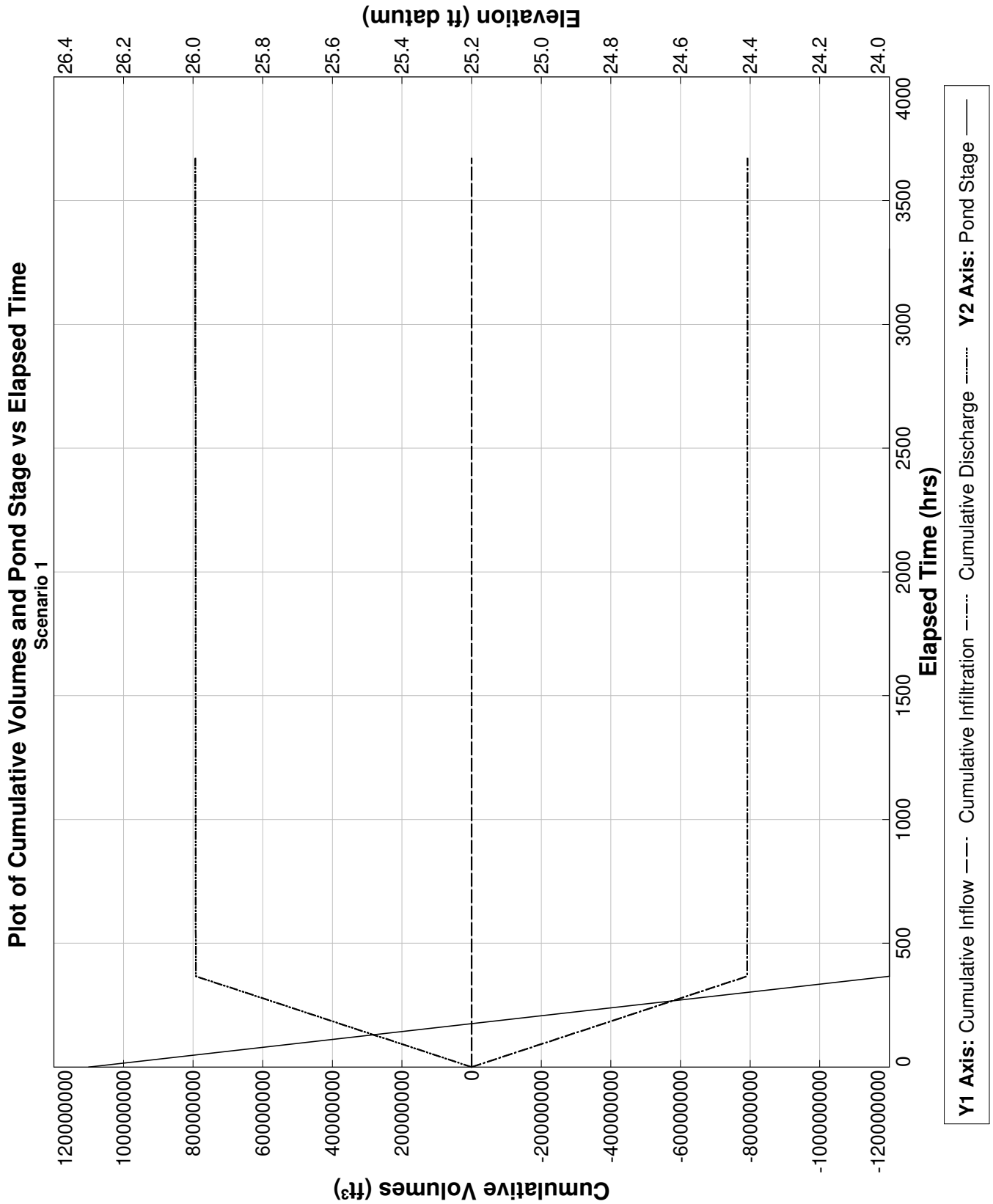
End Scenario 1 3/31/2023 17:23:35

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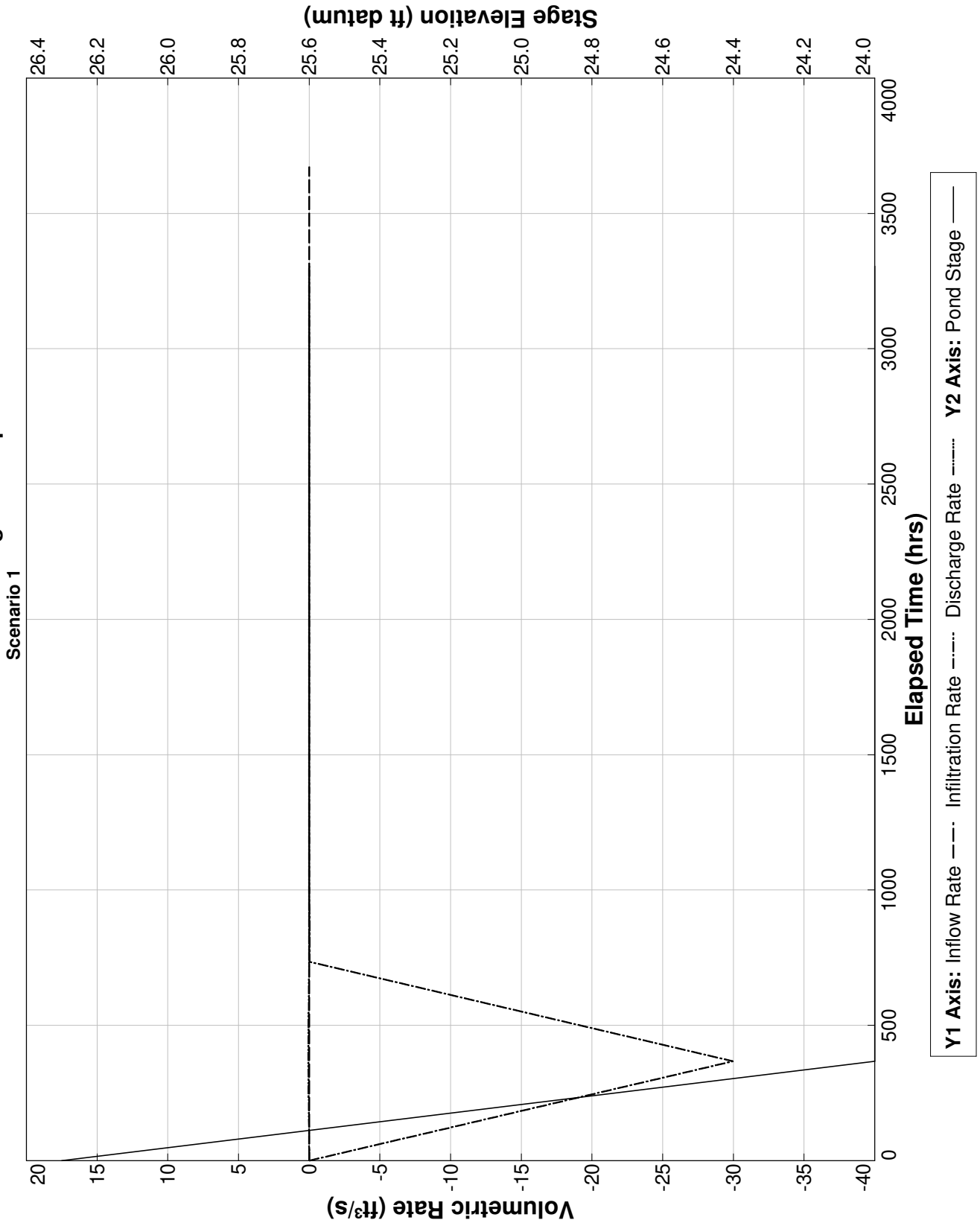
**Detailed Results**    :: Scenario 1 ::

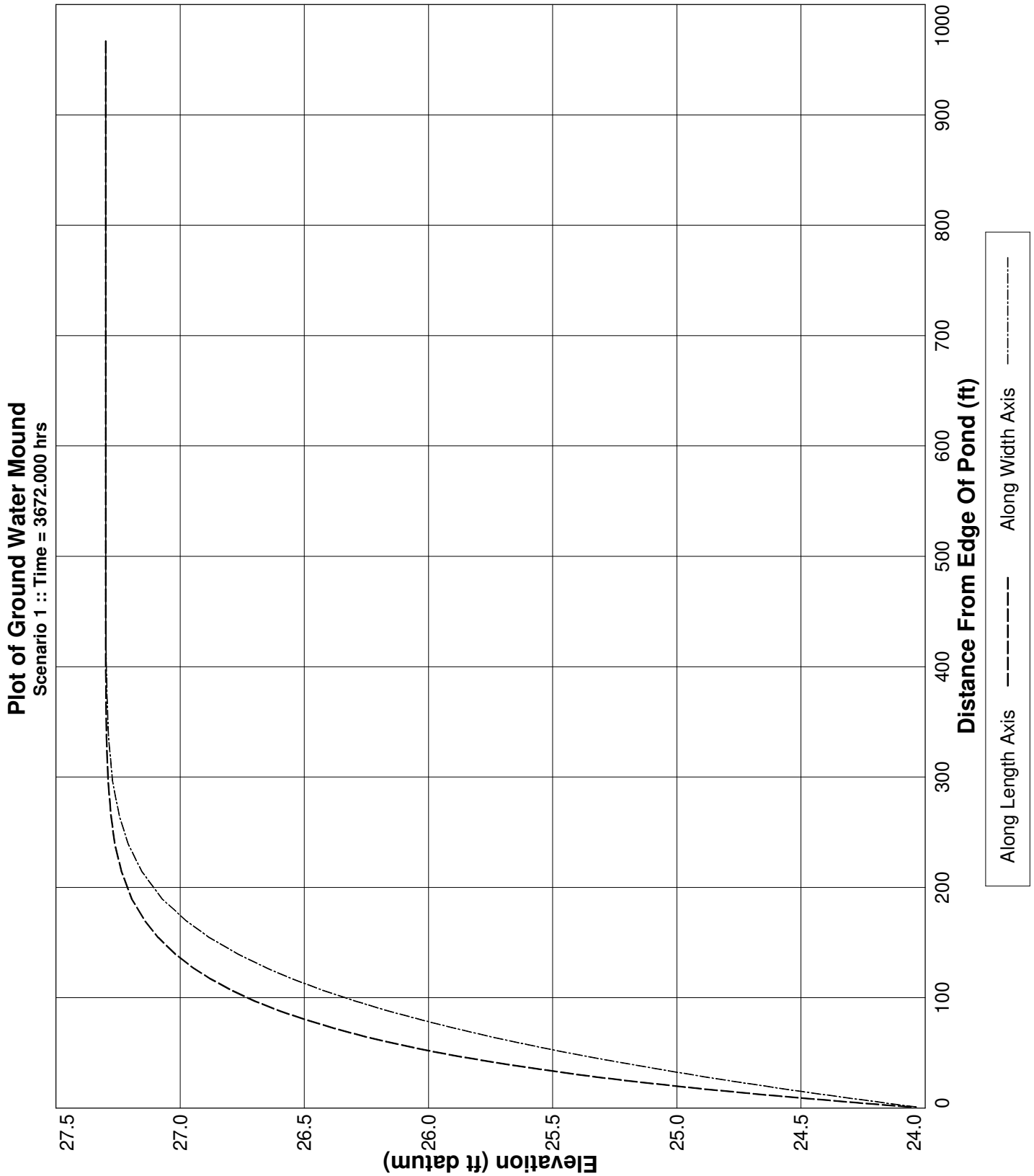
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0017	0.00163	26.30000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0017	0.00163	24.00000	-29.95983	5.339636E-02	2267.200	-79170170.0	7.922454E+07	S
734.400	0.0017	0.00163	24.00000	-0.01788	8.757223E-03	4534.400	-79208980.0	7.926562E+07	S
1101.600	0.0017	0.00163	24.00000	-0.00594	7.46257E-03	6801.600	-79217440.0	7.927634E+07	S
1468.800	0.0017	0.00163	24.00000	-0.00526	6.930464E-03	9068.800	-79224680.0	7.928585E+07	S
1836.000	0.0017	0.00163	24.00000	-0.00489	6.578005E-03	11336.000	-79231340.0	7.929478E+07	S
2203.200	0.0017	0.00163	24.00000	-0.00466	6.347908E-03	13603.200	-79237620.0	7.930332E+07	S
2570.400	0.0017	0.00163	24.00000	-0.00452	6.218017E-03	15870.400	-79243660.0	7.931162E+07	S
2937.600	0.0017	0.00163	24.00000	-0.00443	6.139801E-03	18137.600	-79249560.0	7.931979E+07	S
3304.800	0.0017	0.00163	24.00000	-0.00439	6.102621E-03	20404.800	-79255380.0	7.932789E+07	S
3672.000	0.0017	0.00163	24.00000	----	----	22672.000	-79261180.0	7.933594E+07	N.A.





Plot of Flow Rates and Pond Stage vs Elapsed Time





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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.30, Baseflow  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-27-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 6.00  
Water Table Elevation, [WT] (ft datum): 27.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.69  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 302.0  
Equivalent Pond Width, [W] (ft): 79.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
6.00	435.6
28.00	23958.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 28  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	26.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/27/2023 14:23:49

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 26.0 ft.

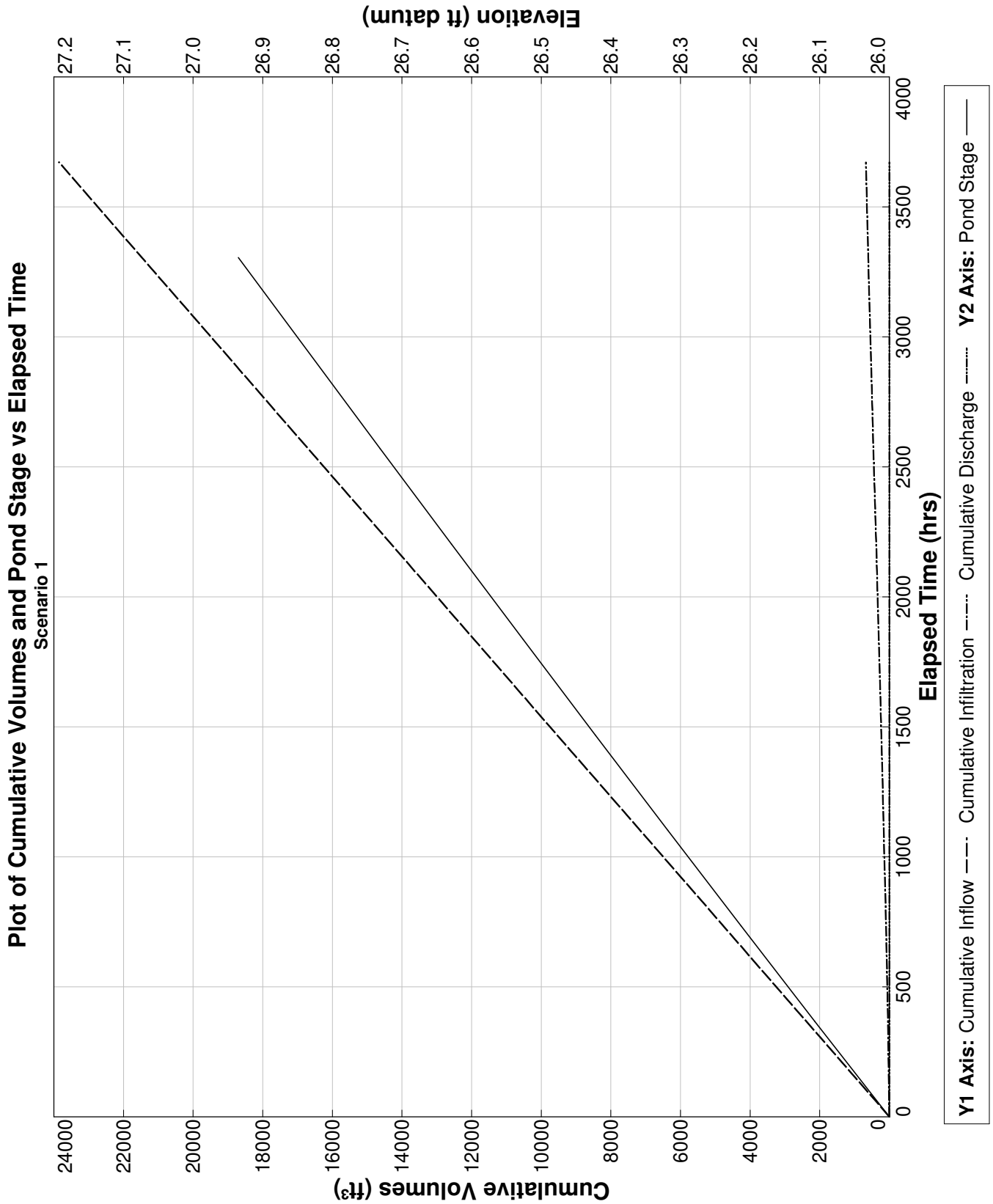
End Scenario 1 3/27/2023 14:23:49

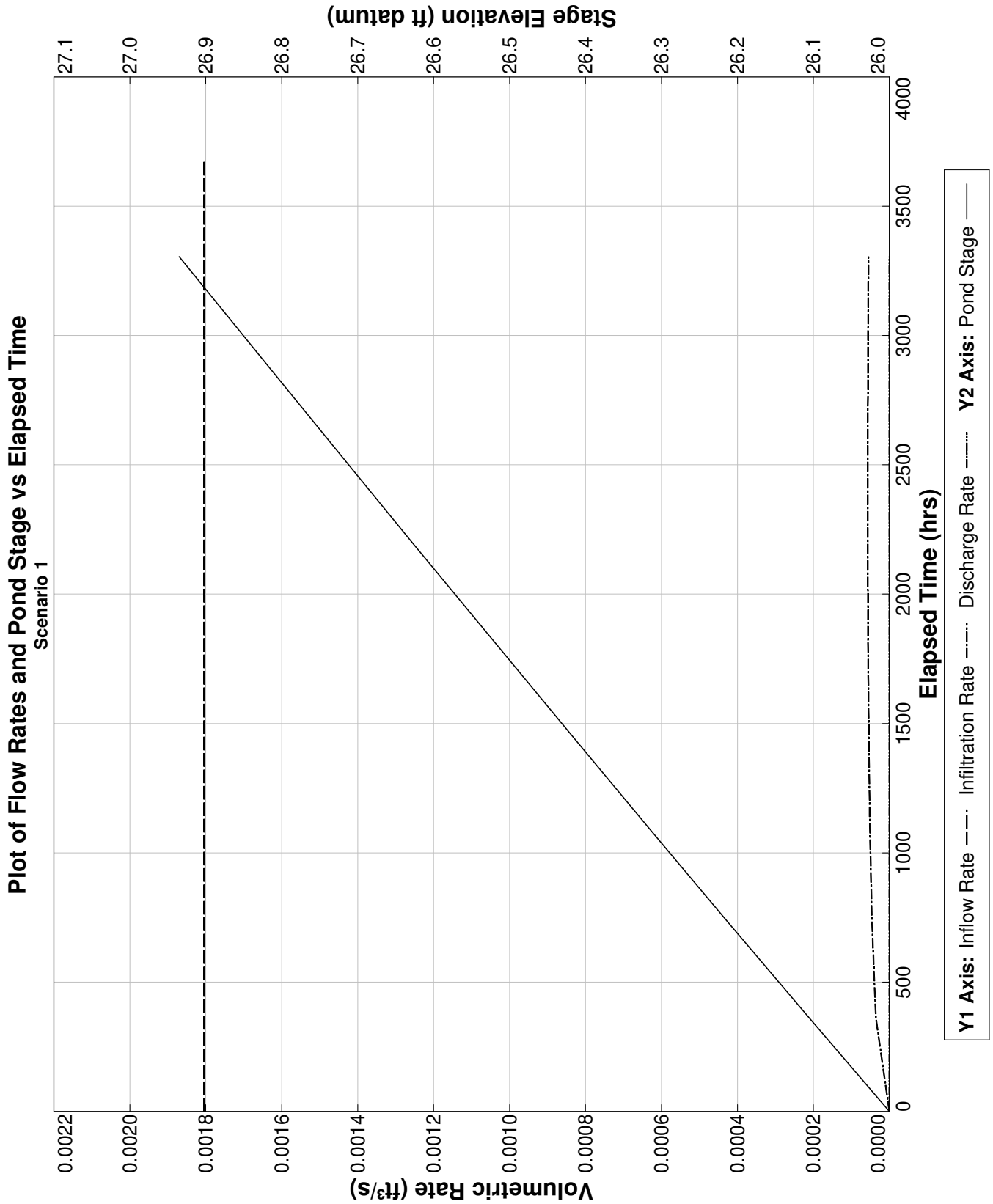
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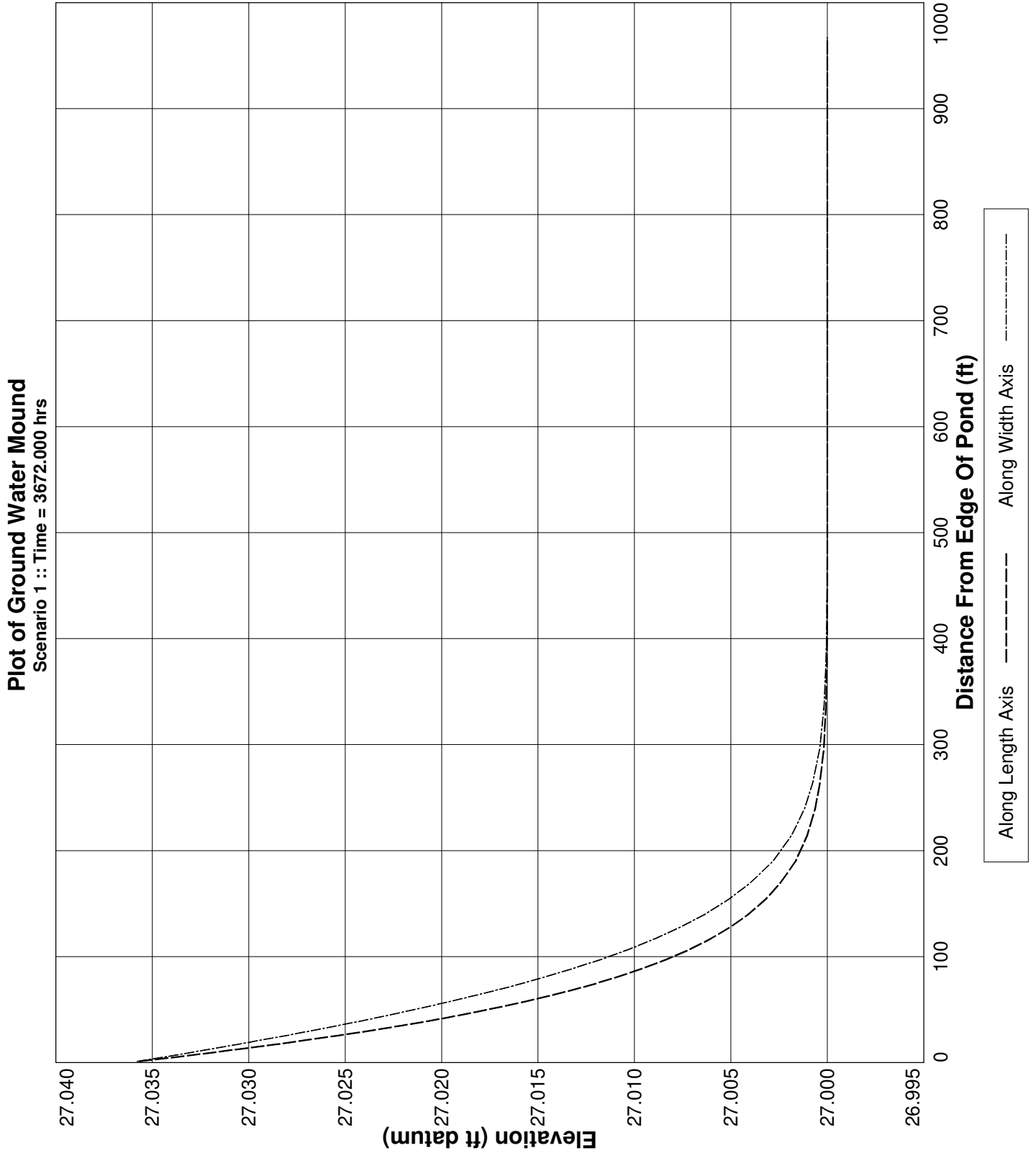
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0018	0.00163	26.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0018	0.00163	26.10725	0.00004	0	2385.800	39.5	0	S
734.400	0.0018	0.00163	26.21320	0.00005	0	4771.600	95.4	0	S
1101.600	0.0018	0.00163	26.31820	0.00005	0	7157.400	160.3	0	S
1468.800	0.0018	0.00163	26.42242	0.00005	0	9543.200	230.7	0	S
1836.000	0.0018	0.00163	26.52598	0.00006	0	11929.000	304.3	0	S
2203.200	0.0018	0.00163	26.62896	0.00006	0	14314.800	379.6	0	S
2570.400	0.0018	0.00163	26.73142	0.00006	0	16700.600	455.3	0	S
2937.600	0.0018	0.00163	26.83341	0.00006	0	19086.400	530.4	0	S
3304.800	0.0018	0.00163	26.93497	0.00006	0	21472.200	604.3	0	S
3672.000	0.0018	0.00163	27.03613	----	----	23858.000	676.2	0	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.31, South Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-24-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 2.00  
Water Table Elevation, [WT] (ft datum): 34.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 1.27  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 363.0  
Equivalent Pond Width, [W] (ft): 110.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
-15.00	435.6
33.00	541015.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	33.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/24/2023 9:42:51

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 33.0 ft.

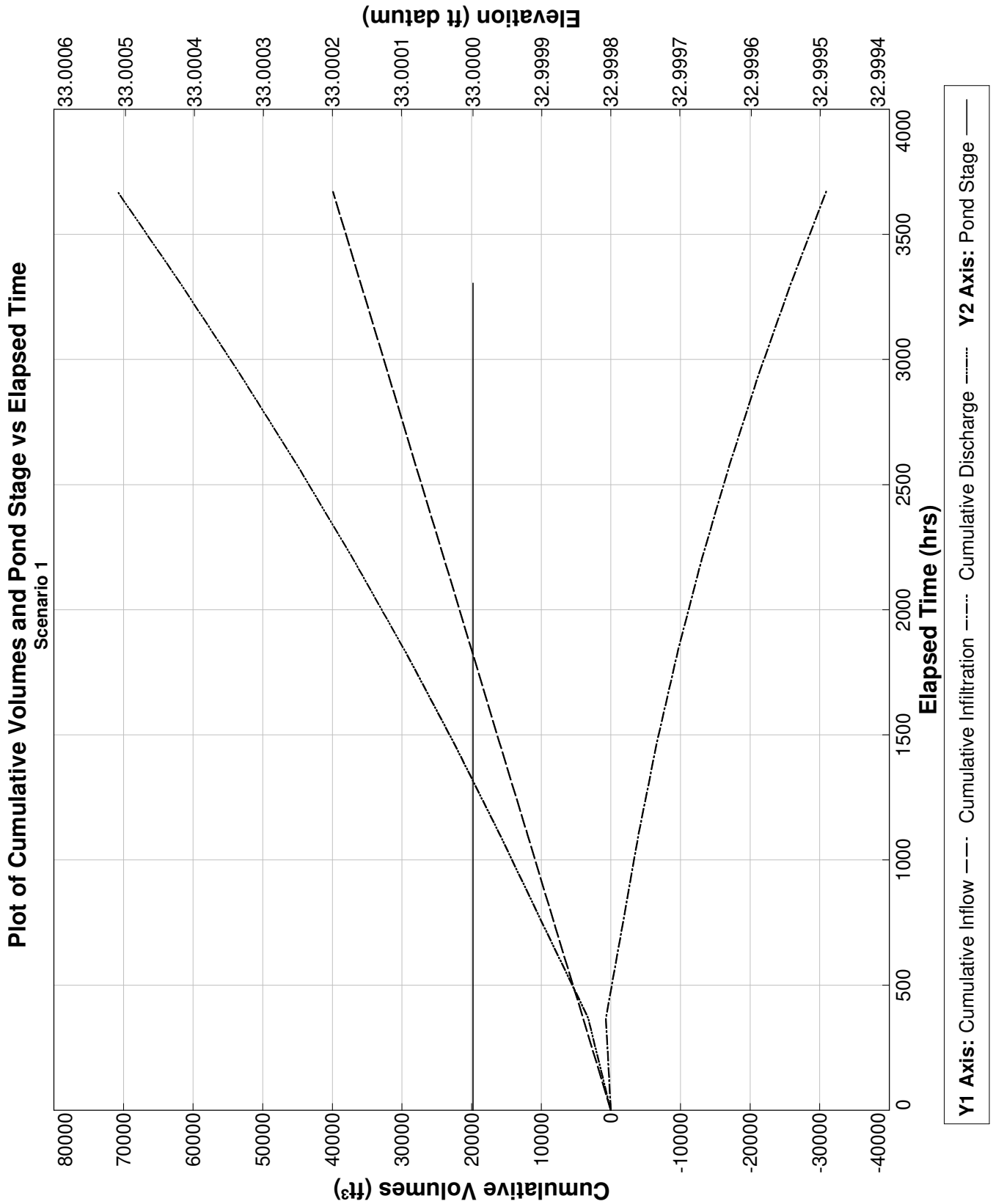
End Scenario 1 3/24/2023 9:42:51

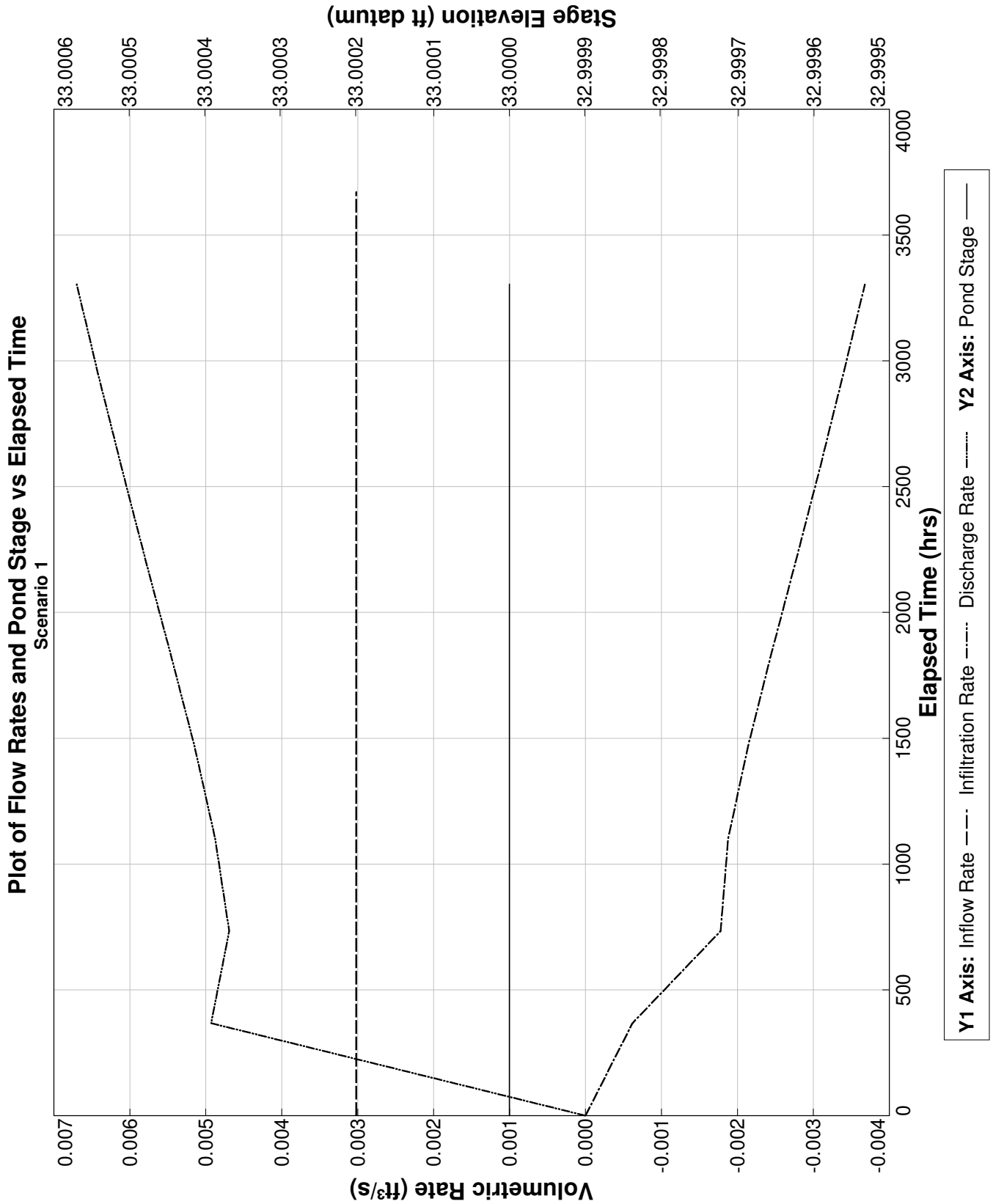
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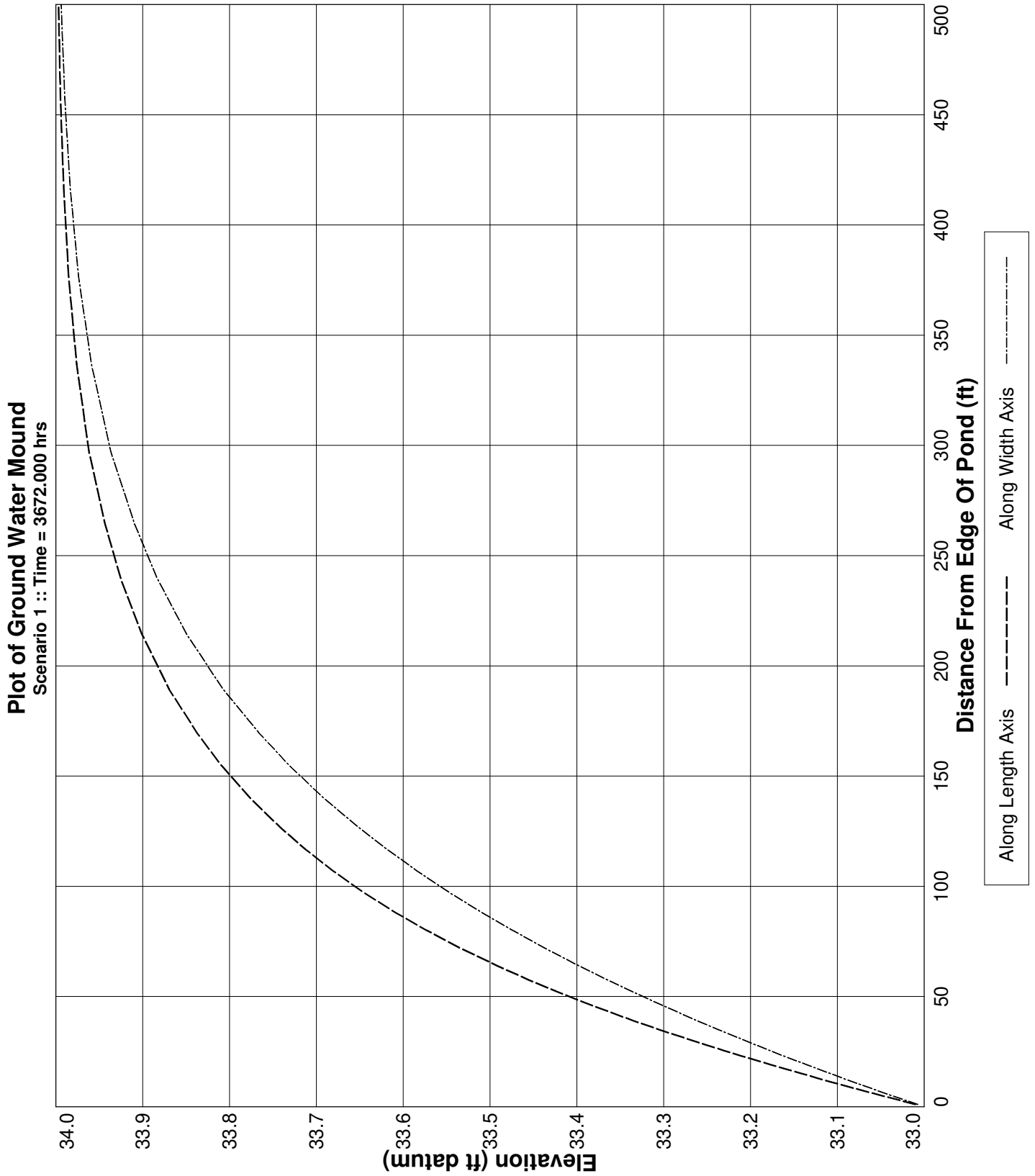
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0030	0.00163	33.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0030	0.00163	33.00000	-0.00062	4.931005E-03	3993.000	733.8	3259.197	S
734.400	0.0030	0.00163	33.00000	-0.00178	4.691044E-03	7986.000	-1633.0	9618.986	S
1101.600	0.0030	0.00163	33.00000	-0.00188	4.876826E-03	11979.000	-3964.0	15942.97	S
1468.800	0.0030	0.00163	33.00000	-0.00214	5.147957E-03	15972.000	-6596.9	22568.95	S
1836.000	0.0030	0.00163	33.00000	-0.00245	5.46381E-03	19965.000	-9617.9	29582.9	S
2203.200	0.0030	0.00163	33.00000	-0.00277	5.789357E-03	23958.000	-13062.8	37020.79	S
2570.400	0.0030	0.00163	33.00000	-0.00308	6.103339E-03	27951.000	-16930.4	44881.39	S
2937.600	0.0030	0.00163	33.00000	-0.00339	6.409447E-03	31944.000	-21207.8	53151.84	S
3304.800	0.0030	0.00163	33.00000	-0.00368	6.700269E-03	35937.000	-25879.8	61816.84	S
3672.000	0.0030	0.00163	33.00000	----	----	39930.000	-30931.6	70861.59	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No.31, South Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-24-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 2.00  
Water Table Elevation, [WT] (ft datum): 34.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 363.0  
Equivalent Pond Width, [W] (ft): 110.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
-15.00	435.6
33.00	541015.2

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	33.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/24/2023 9:48:6

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 33.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 2 of 10 saturated stress periods.

Maximum calculated water budget error is -1.89607762539623 percent, for saturated stress period 1.

If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

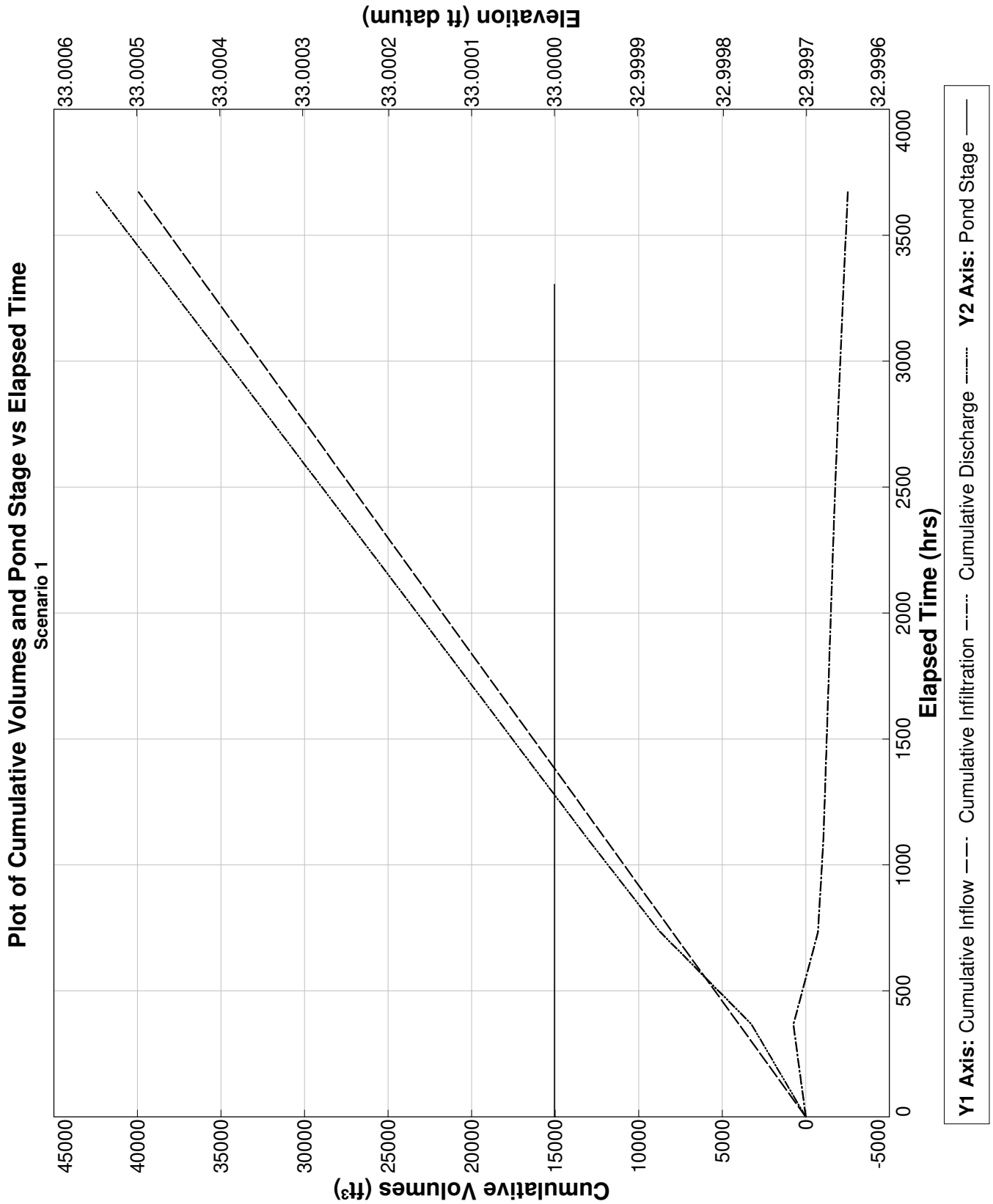
End Scenario 1 3/24/2023 9:48:6

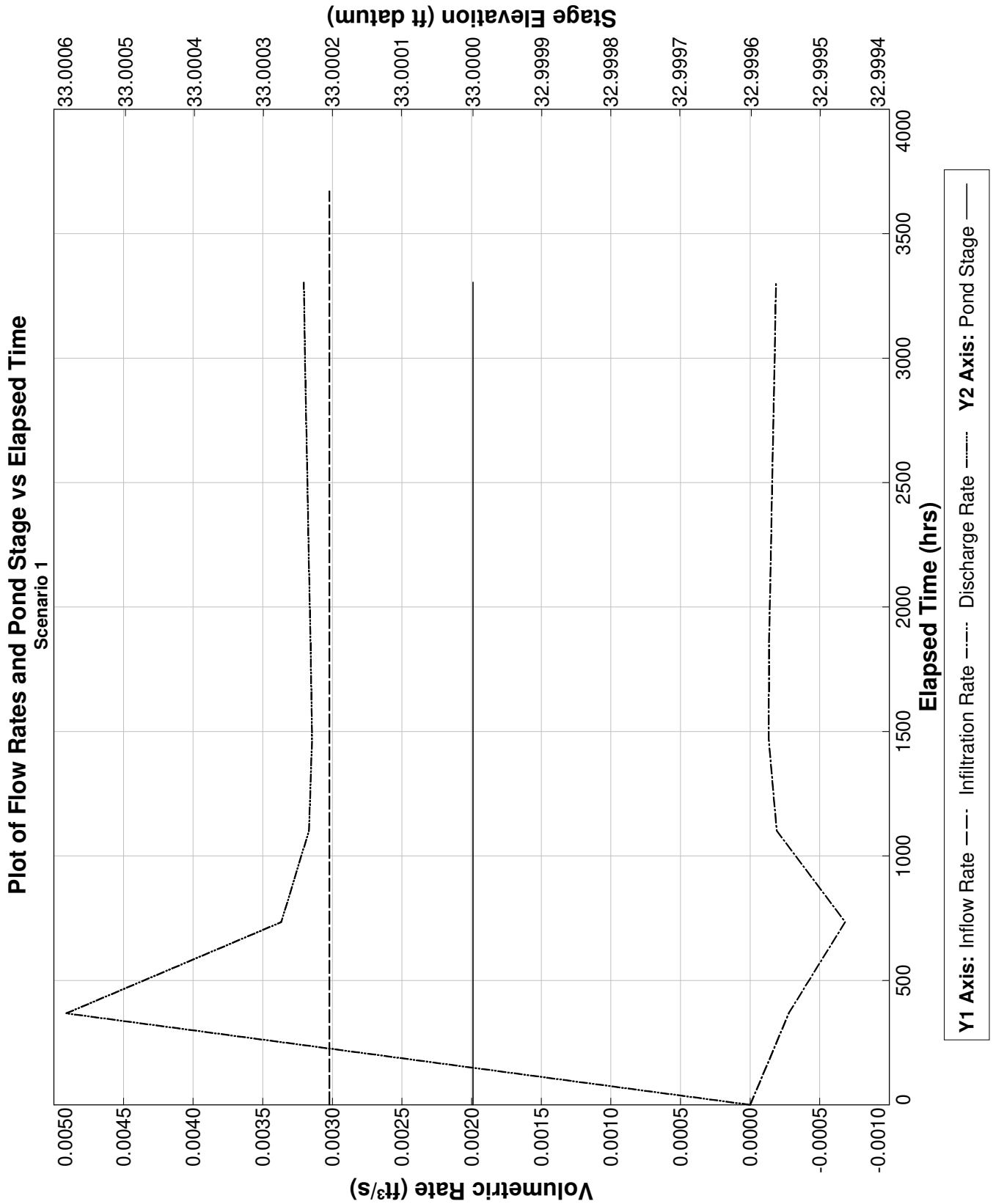
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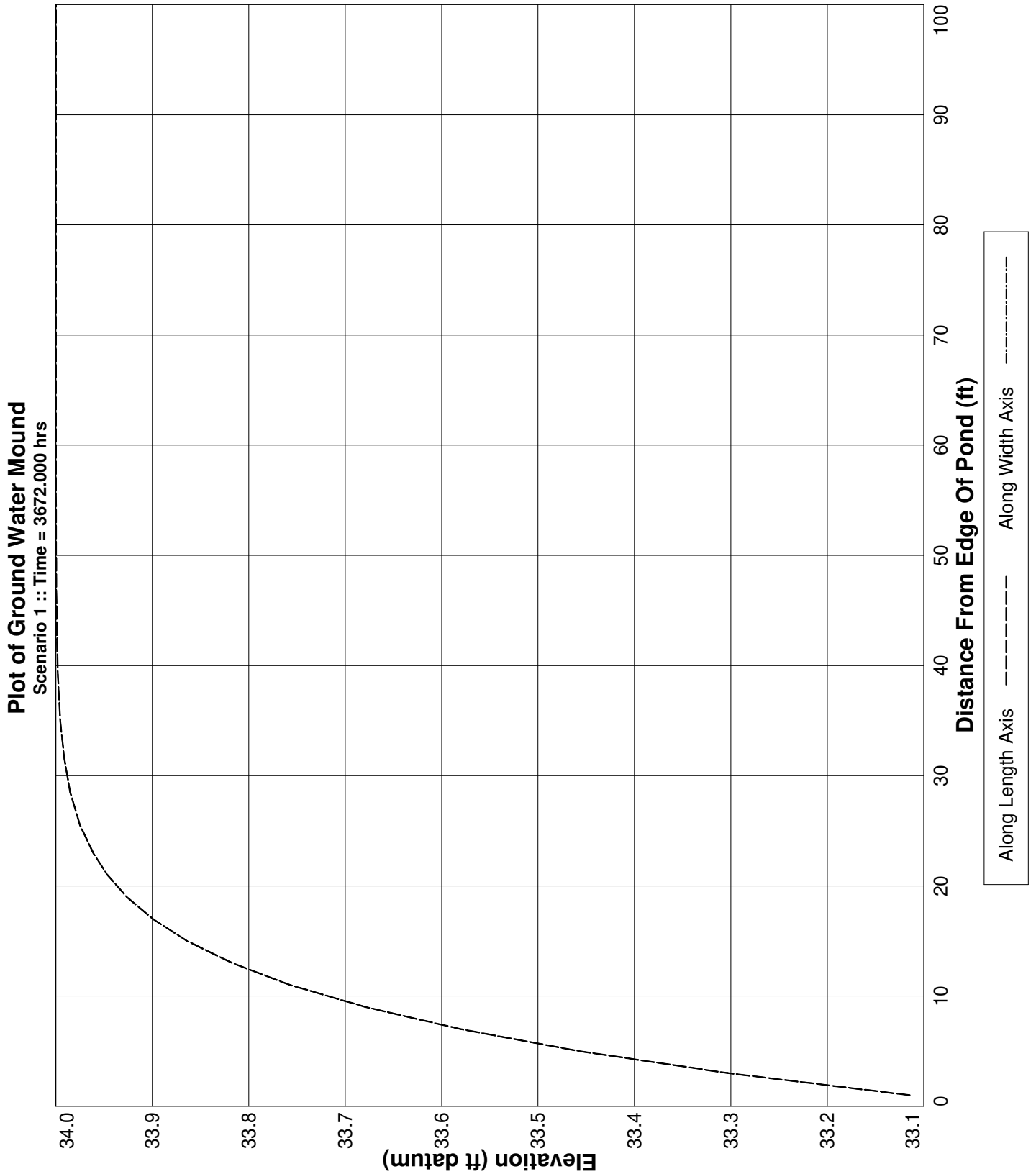
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0030	0.00163	33.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0030	0.00163	33.00000	-0.00028	4.911997E-03	3993.000	746.4	3246.634	S
734.400	0.0030	0.00163	33.00000	-0.00068	3.367567E-03	7986.000	-733.1	8719.095	S
1101.600	0.0030	0.00163	33.00000	-0.00019	3.167182E-03	11979.000	-1059.3	13038.3	S
1468.800	0.0030	0.00163	33.00000	-0.00013	3.146484E-03	15972.000	-1239.4	17211.38	S
1836.000	0.0030	0.00163	33.00000	-0.00014	3.155574E-03	19965.000	-1411.8	21376.79	S
2203.200	0.0030	0.00163	33.00000	-0.00015	3.168848E-03	23958.000	-1599.0	25556.98	S
2570.400	0.0030	0.00163	33.00000	-0.00016	3.18195E-03	27951.000	-1803.6	29754.61	S
2937.600	0.0030	0.00163	33.00000	-0.00017	3.194284E-03	31944.000	-2025.0	33969.04	S
3304.800	0.0030	0.00163	33.00000	-0.00019	3.205885E-03	35937.000	-2262.3	38199.3	S
3672.000	0.0030	0.00163	33.00000	----	----	39930.000	-2514.5	42444.48	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 32, North Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-28-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 6.00  
Water Table Elevation, [WT] (ft datum): 34.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.44  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 456.0  
Equivalent Pond Width, [W] (ft): 119.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
11.00	435.6
33.00	54450.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	33.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/28/2023 9:14:20

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 33.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 1 of 10 saturated stress periods.

Maximum calculated water budget error is -1.12675274031798 percent, for saturated stress period 1.

If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

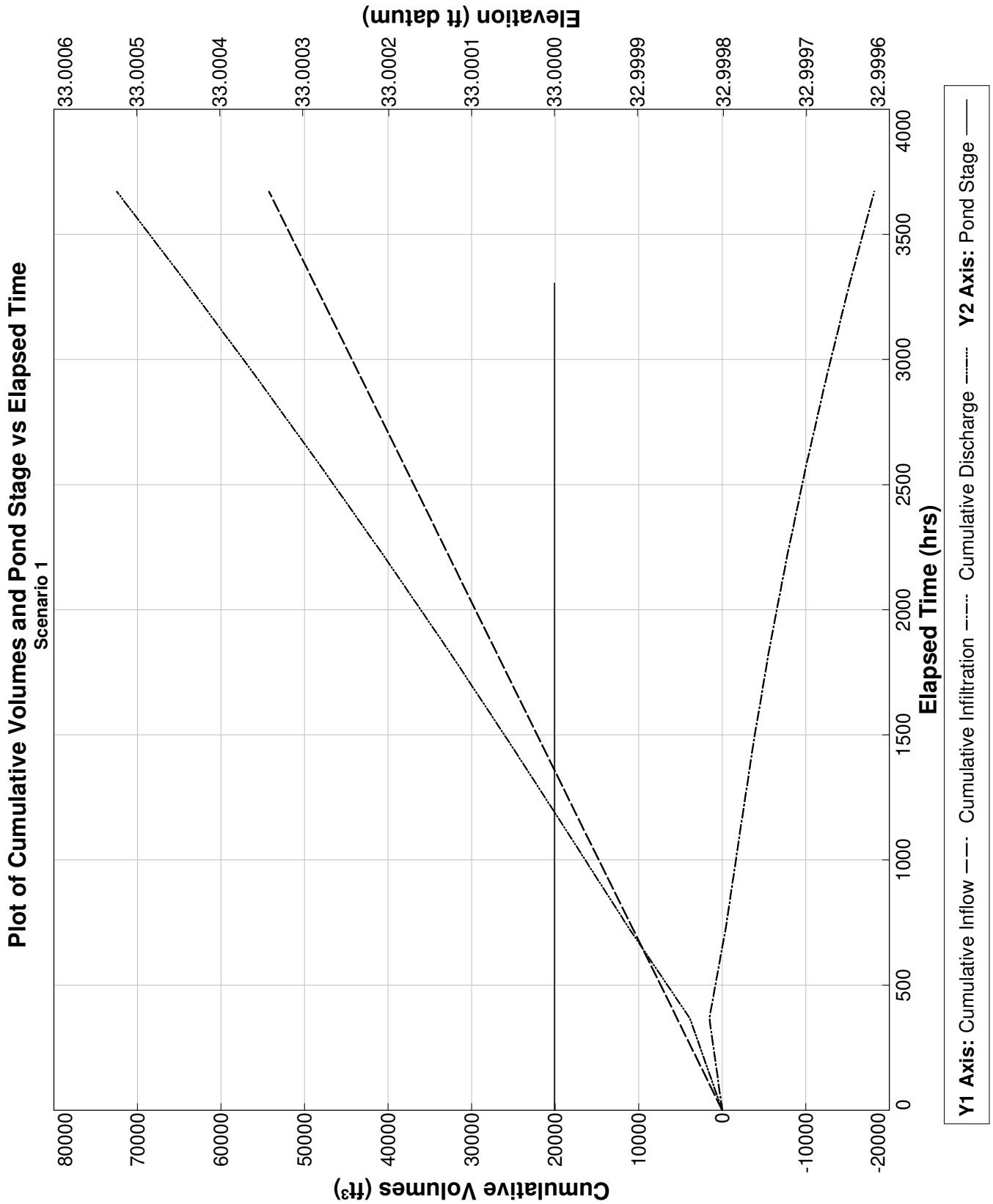
End Scenario 1 3/28/2023 9:14:20

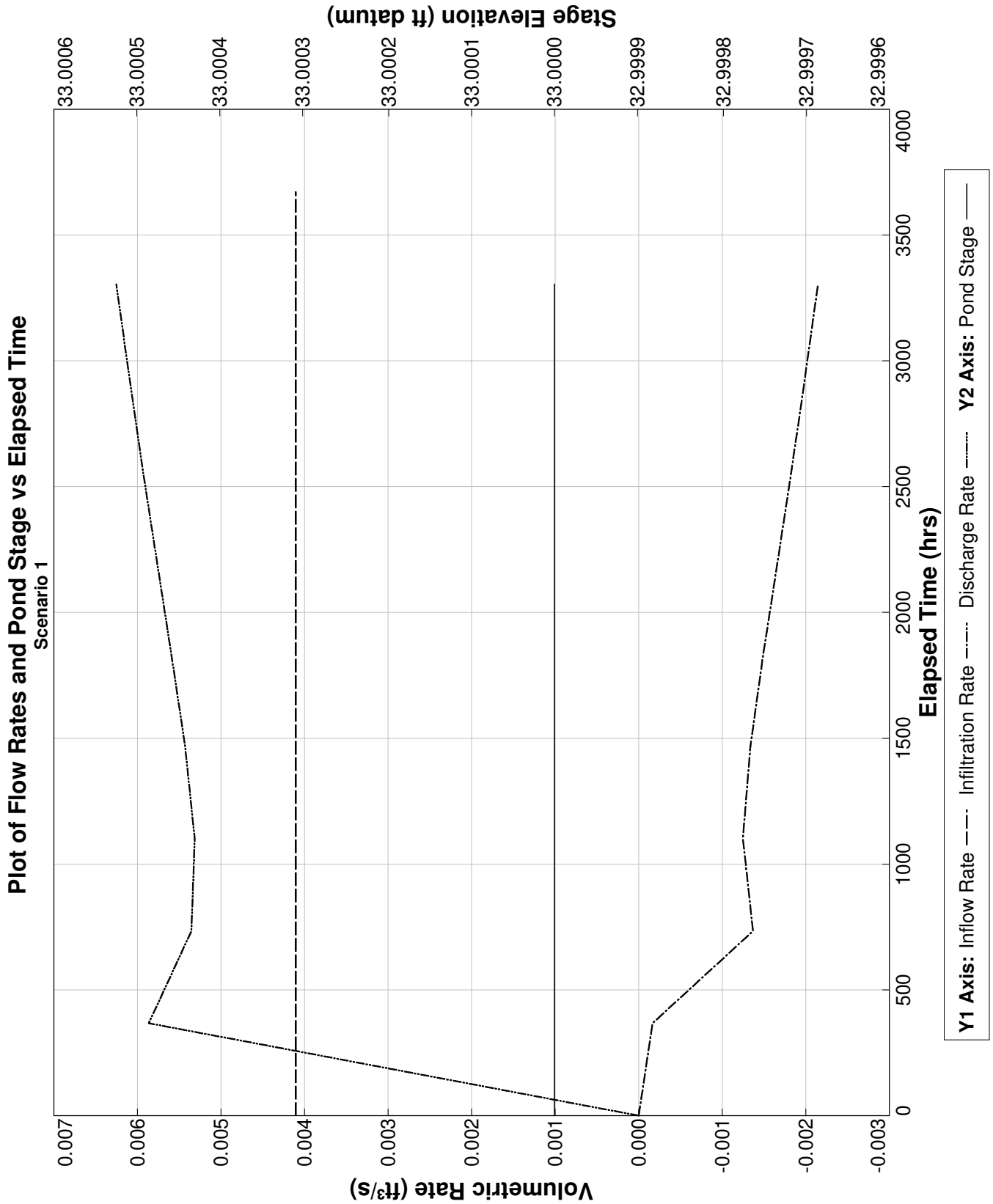
**PONDS Version 3.3.0278**  
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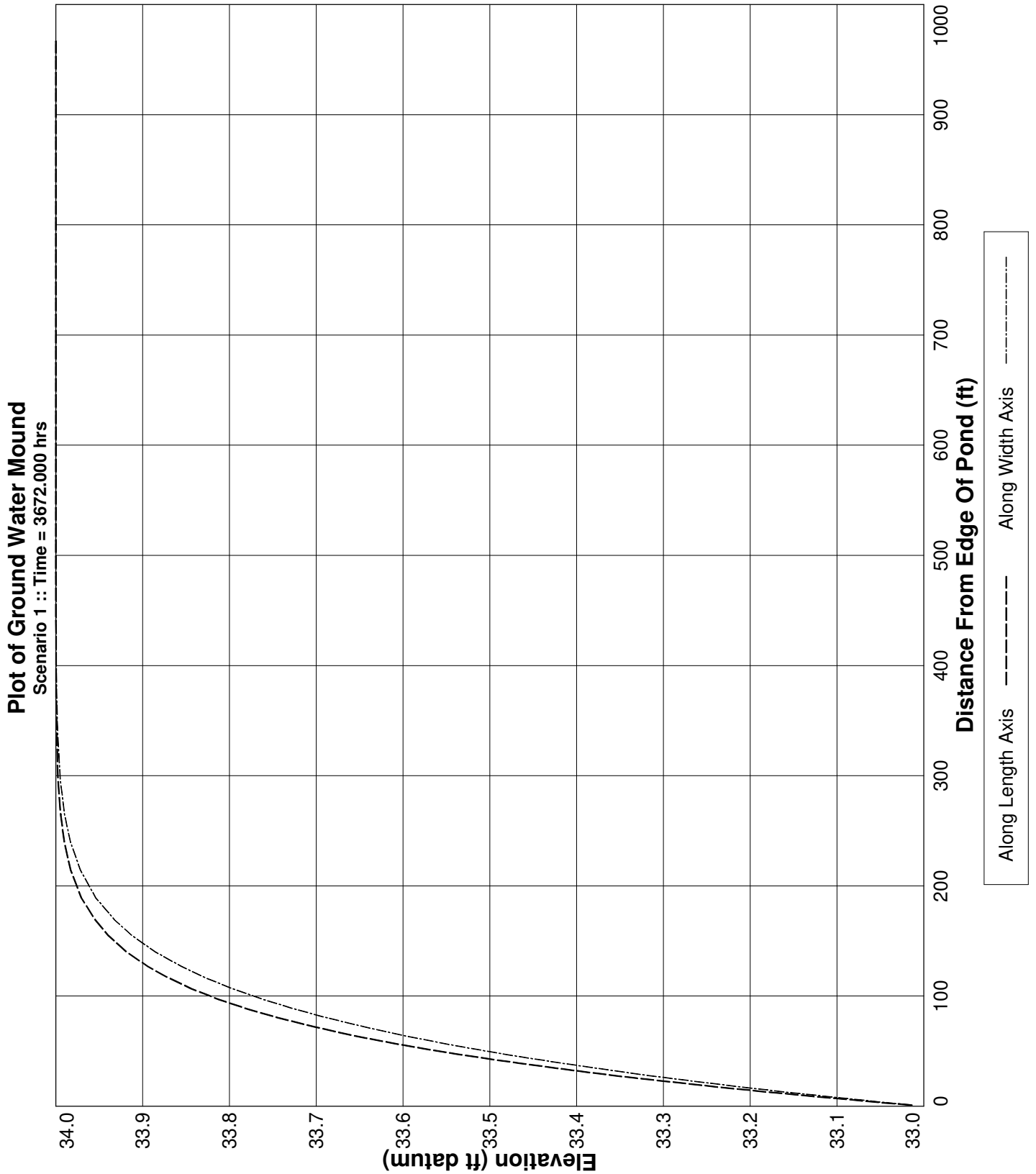
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0041	0.00163	33.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0041	0.00163	33.00000	-0.00017	5.865236E-03	5426.400	1549.7	3876.687	S
734.400	0.0041	0.00163	33.00000	-0.00137	5.355244E-03	10852.800	-440.2	11292.97	S
1101.600	0.0041	0.00163	33.00000	-0.00125	5.313811E-03	16279.200	-2065.6	18344.79	S
1468.800	0.0041	0.00163	33.00000	-0.00134	5.429359E-03	21705.600	-3740.0	25445.6	S
1836.000	0.0041	0.00163	33.00000	-0.00149	5.594548E-03	27132.000	-5600.0	32731.96	S
2203.200	0.0041	0.00163	33.00000	-0.00166	5.767871E-03	32558.400	-7683.7	40242.07	S
2570.400	0.0041	0.00163	33.00000	-0.00183	5.937036E-03	37984.800	-9993.7	47978.54	S
2937.600	0.0041	0.00163	33.00000	-0.00199	6.099064E-03	43411.200	-12522.7	55933.92	S
3304.800	0.0041	0.00163	33.00000	-0.00215	6.253129E-03	48837.600	-15260.6	64098.23	S
3672.000	0.0041	0.00163	33.00000	----	----	54264.000	-18198.2	72462.15	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 32, North Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-28-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 6.00  
Water Table Elevation, [WT] (ft datum): 34.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 456.0  
Equivalent Pond Width, [W] (ft): 119.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
11.00	435.6
33.00	54450.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	33.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/28/2023 9:20:38

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 33.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 3 of 10 saturated stress periods.

Maximum calculated water budget error is -2.85790076413589 percent, for saturated stress period 1.

If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

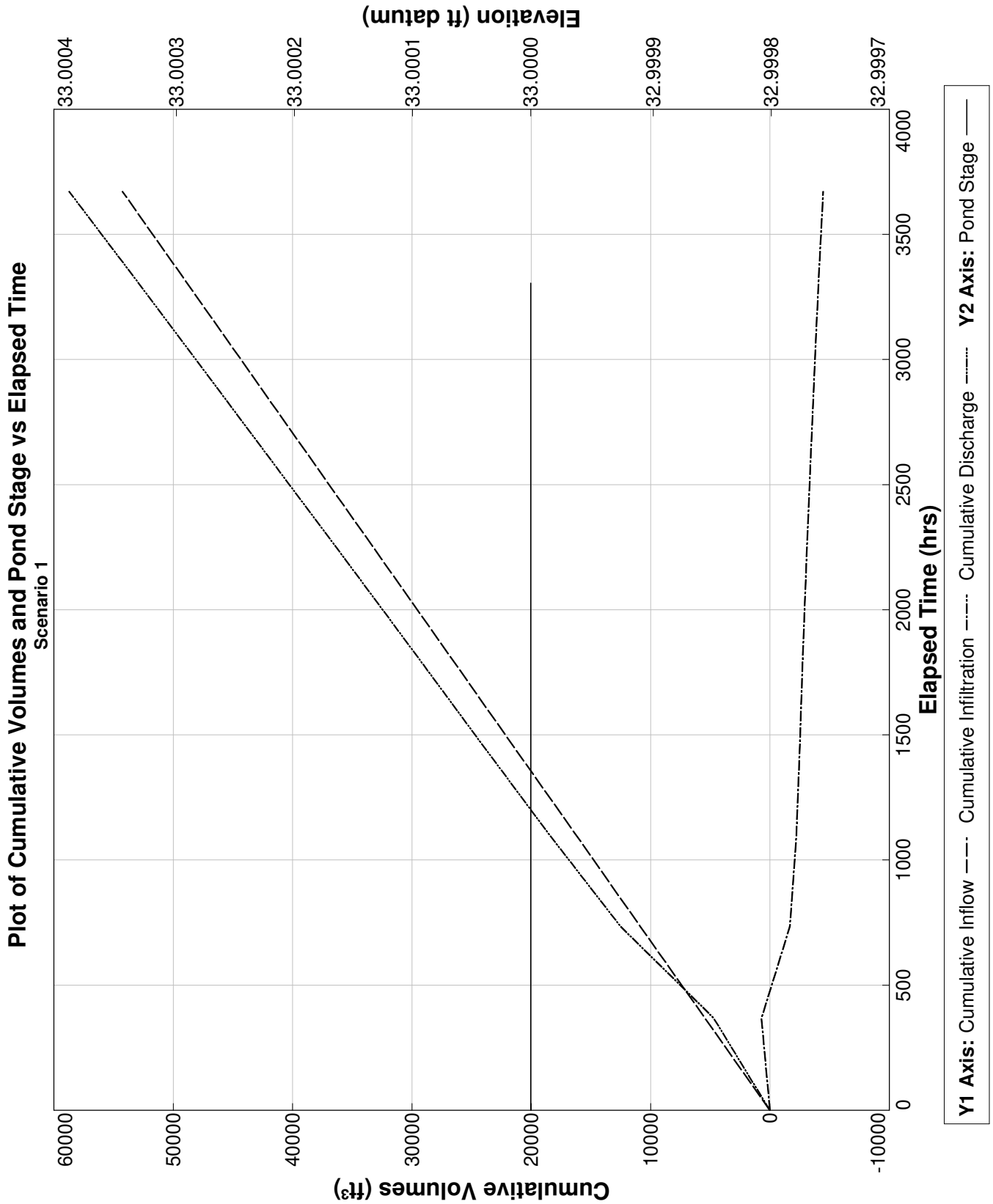
End Scenario 1 3/28/2023 9:20:38

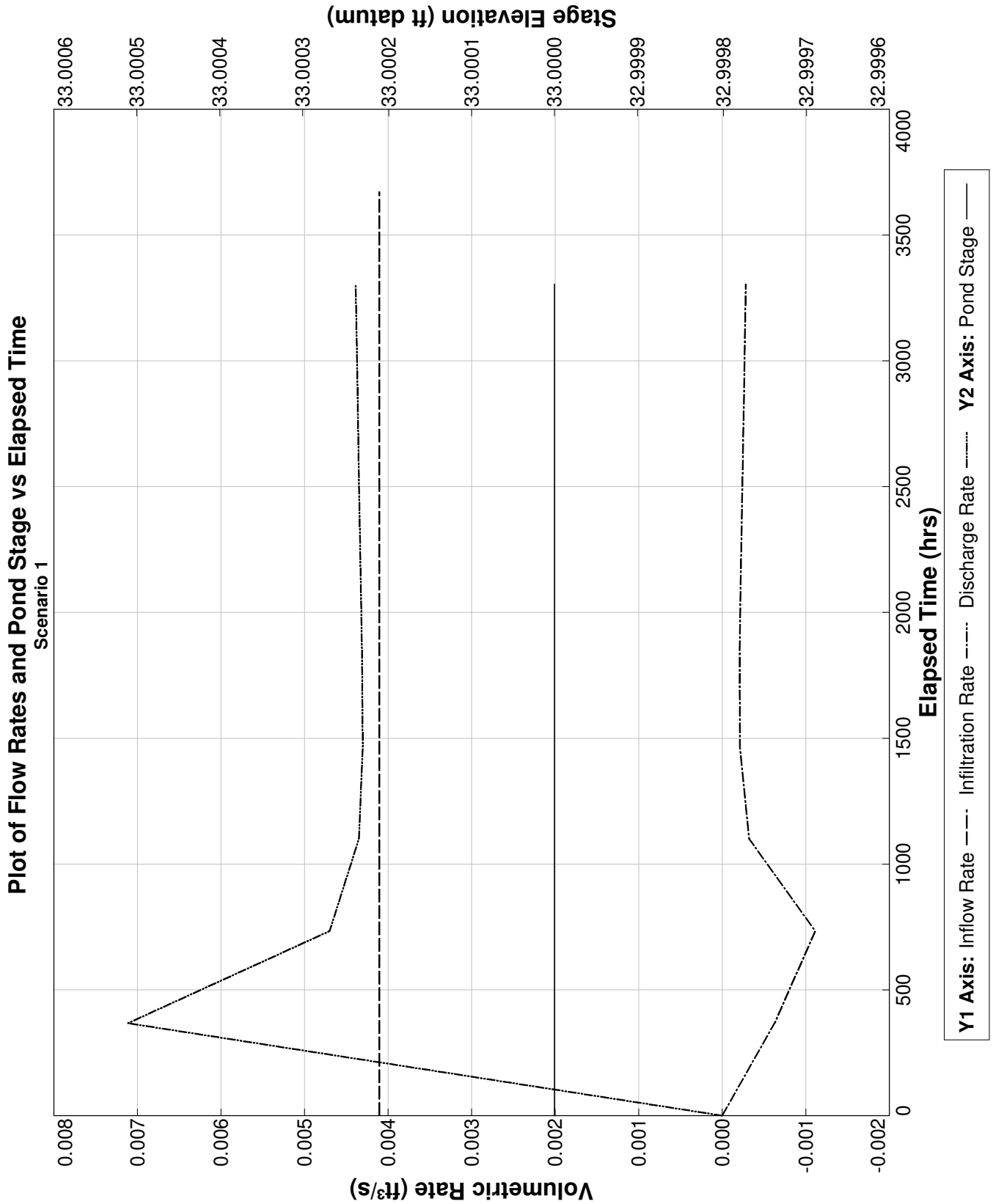
**PONDS Version 3.3.0278**  
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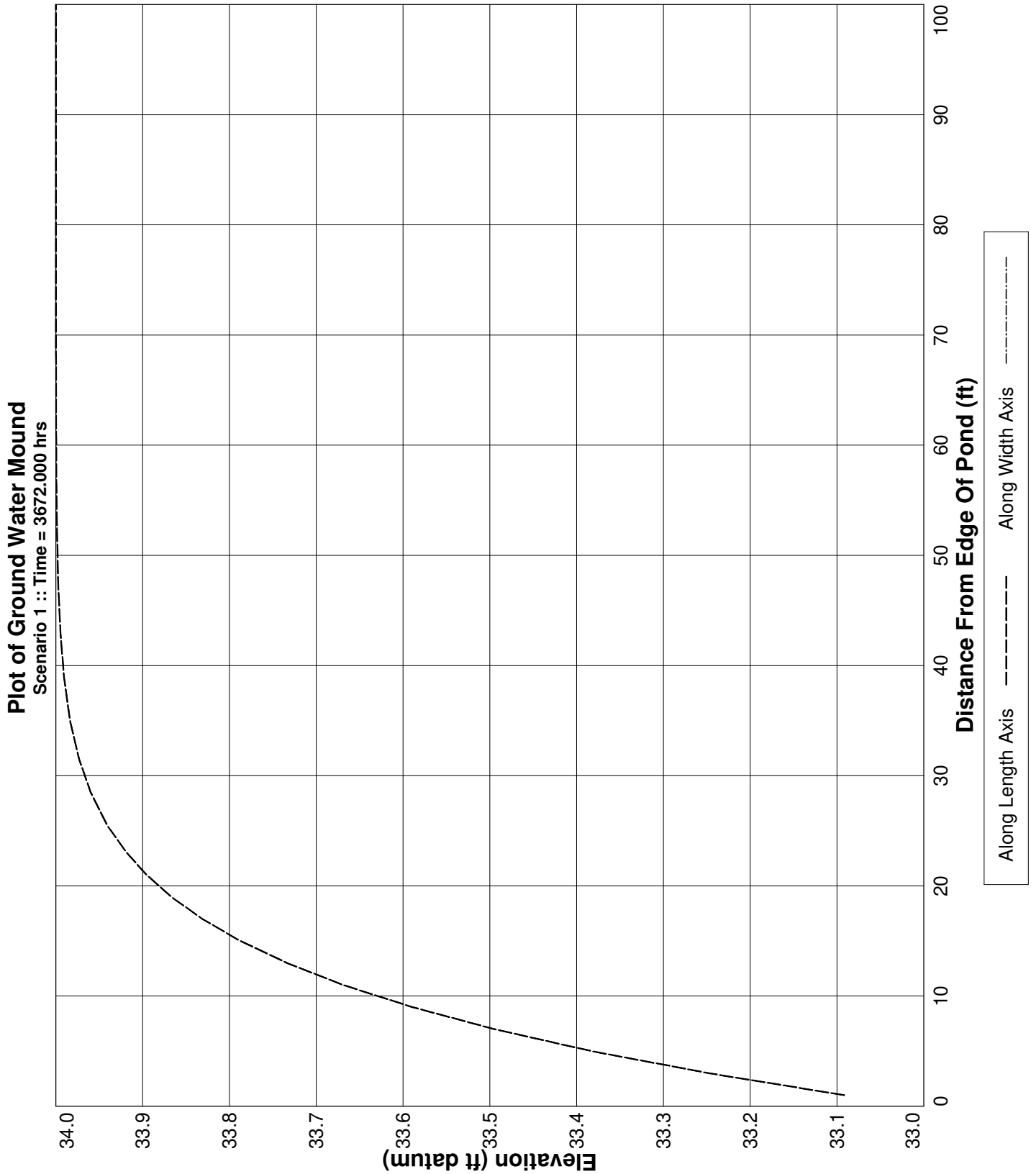
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0041	0.00163	33.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0041	0.00163	33.00000	-0.00063	7.114515E-03	5426.400	724.0	4702.41	S
734.400	0.0041	0.00163	33.00000	-0.00111	4.700172E-03	10852.800	-1658.6	12511.45	S
1101.600	0.0041	0.00163	33.00000	-0.00032	4.349123E-03	16279.200	-2213.5	18492.67	S
1468.800	0.0041	0.00163	33.00000	-0.00021	4.302193E-03	21705.600	-2505.2	24210.84	S
1836.000	0.0041	0.00163	33.00000	-0.00021	4.311694E-03	27132.000	-2772.3	29904.28	S
2203.200	0.0041	0.00163	33.00000	-0.00023	4.330833E-03	32558.400	-3058.2	35616.64	S
2570.400	0.0041	0.00163	33.00000	-0.00025	4.350571E-03	37984.800	-3369.9	41354.7	S
2937.600	0.0041	0.00163	33.00000	-0.00026	4.369354E-03	43411.200	-3707.0	47118.22	S
3304.800	0.0041	0.00163	33.00000	-0.00028	4.387078E-03	48837.600	-4068.3	52905.88	S
3672.000	0.0041	0.00163	33.00000	----	----	54264.000	-4452.3	58716.34	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 32, West Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-28-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 6.00  
Water Table Elevation, [WT] (ft datum): 35.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.44  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 456.0  
Equivalent Pond Width, [W] (ft): 119.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
11.00	435.6
33.00	54450.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	34.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/28/2023 9:23:2

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 34.0 ft.

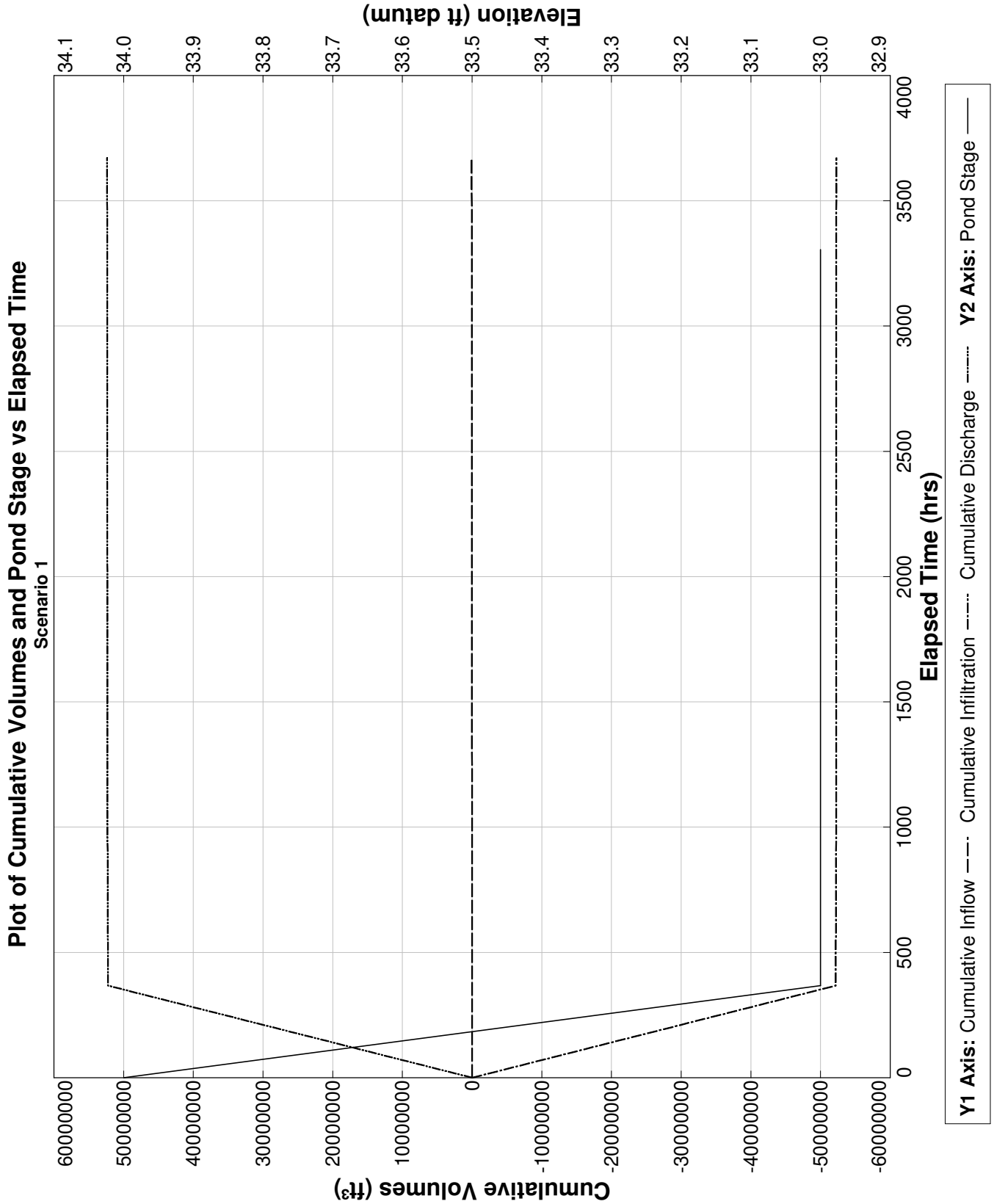
End Scenario 1 3/28/2023 9:23:2

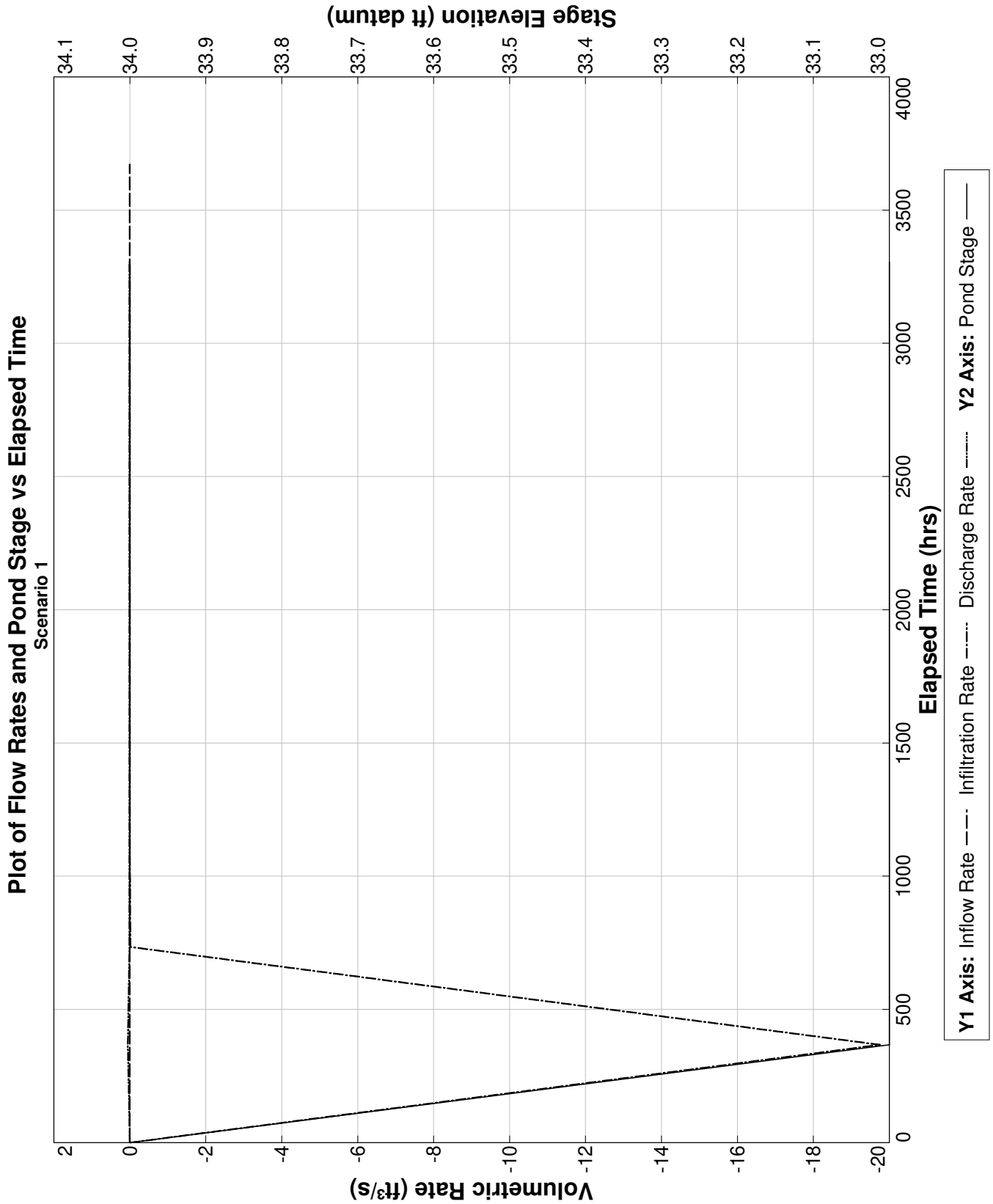
**PONDS Version 3.3.0278**  
**Retention Pond Recovery - Refined Method**  
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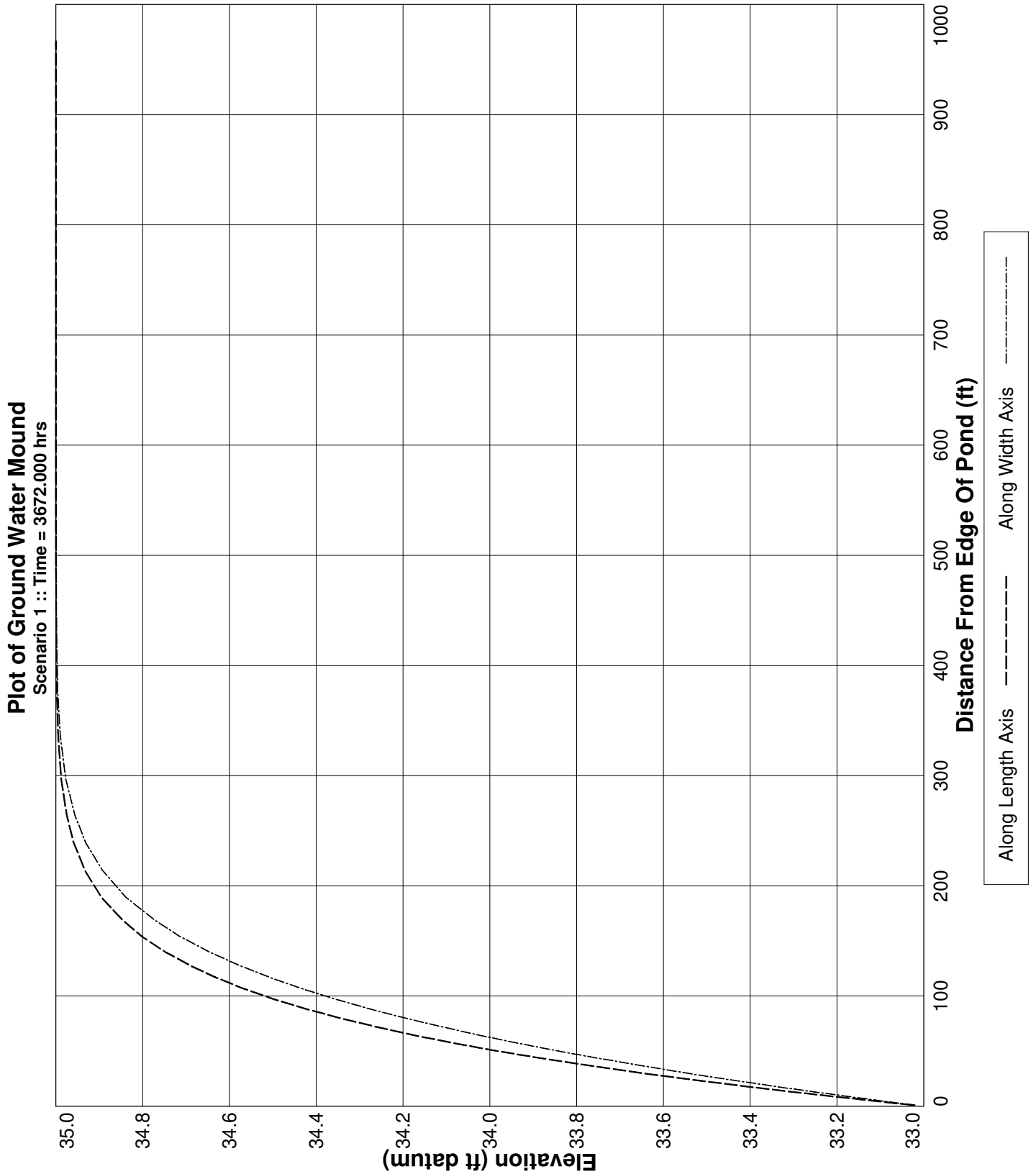
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0041	0.00163	34.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0041	0.00163	33.00000	-19.75394	5.279588E-02	5426.400	-52190860.0	5.225074E+07	S
734.400	0.0041	0.00163	33.00000	-0.01565	8.981509E-03	10852.800	-52226260.0	5.229157E+07	S
1101.600	0.0041	0.00163	33.00000	-0.00426	8.277752E-03	16279.200	-52232250.0	5.230298E+07	S
1468.800	0.0041	0.00163	33.00000	-0.00386	7.921159E-03	21705.600	-52237530.0	5.231368E+07	S
1836.000	0.0041	0.00163	33.00000	-0.00368	7.757494E-03	27132.000	-52242460.0	5.232404E+07	S
2203.200	0.0041	0.00163	33.00000	-0.00362	7.712131E-03	32558.400	-52247260.0	5.233427E+07	S
2570.400	0.0041	0.00163	33.00000	-0.00363	7.723187E-03	37984.800	-52252040.0	5.234447E+07	S
2937.600	0.0041	0.00163	33.00000	-0.00367	7.766151E-03	43411.200	-52256850.0	5.235471E+07	S
3304.800	0.0041	0.00163	33.00000	-0.00373	7.828619E-03	48837.600	-52261730.0	5.236502E+07	S
3672.000	0.0041	0.00163	33.00000	----	----	54264.000	-52266700.0	5.237542E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 32, West Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-28-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 6.00  
Water Table Elevation, [WT] (ft datum): 35.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 456.0  
Equivalent Pond Width, [W] (ft): 119.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
11.00	435.6
33.00	54450.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	34.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/28/2023 11:3:19

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 34.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 7 of 10 saturated stress periods.

Maximum calculated water budget error is -3.79212104079059 percent, for saturated stress period 1.

If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

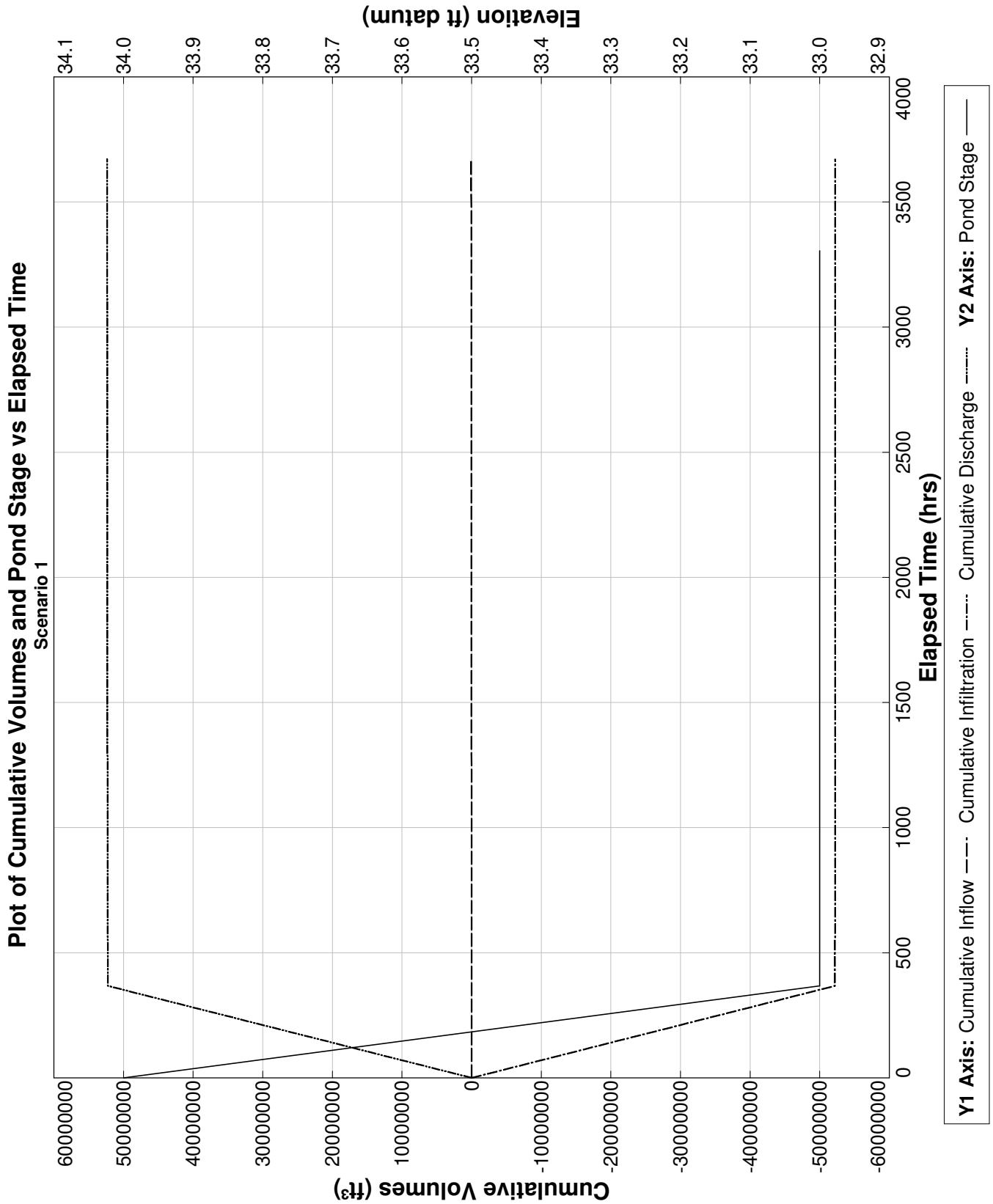
End Scenario 1 3/28/2023 11:3:19

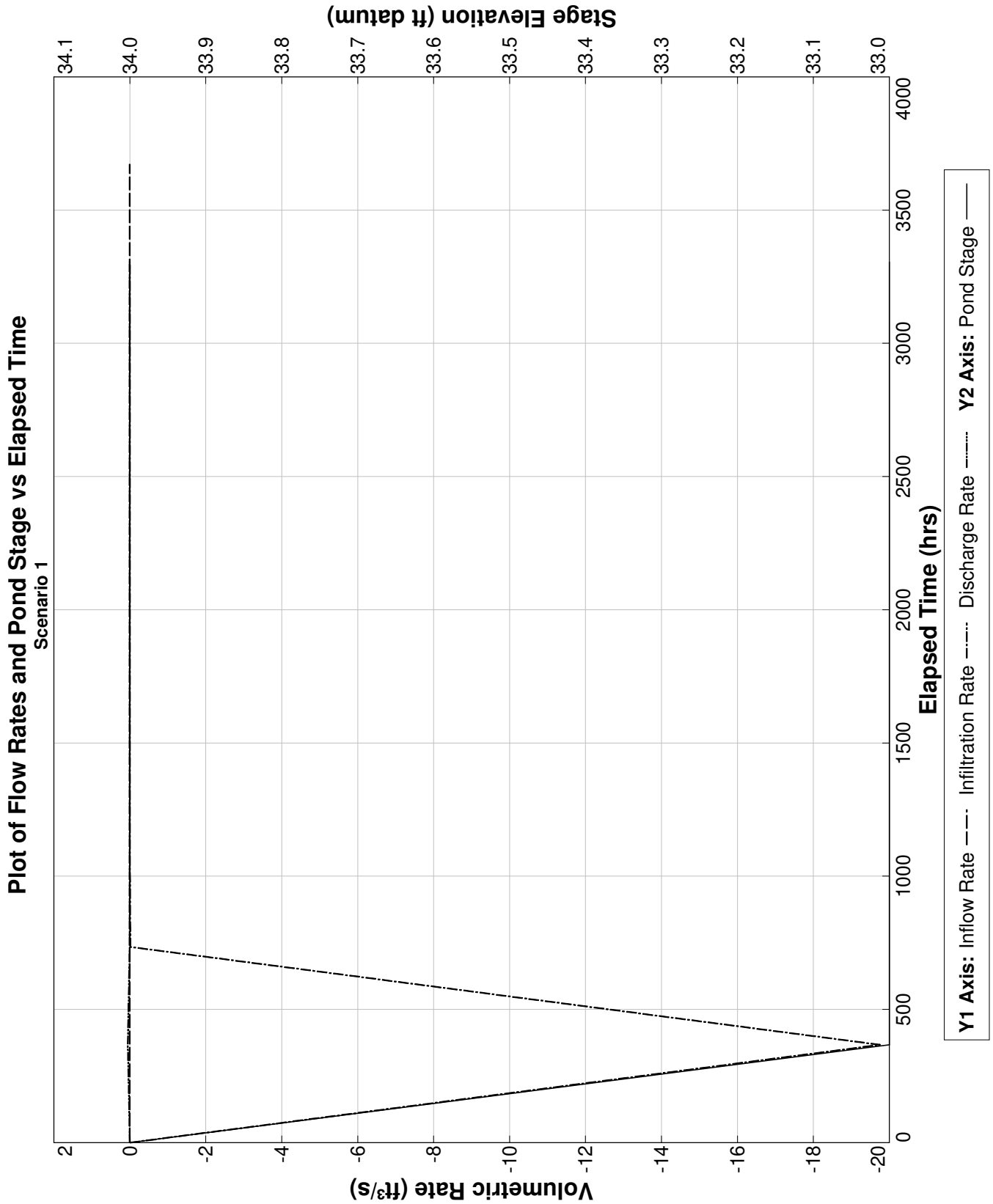
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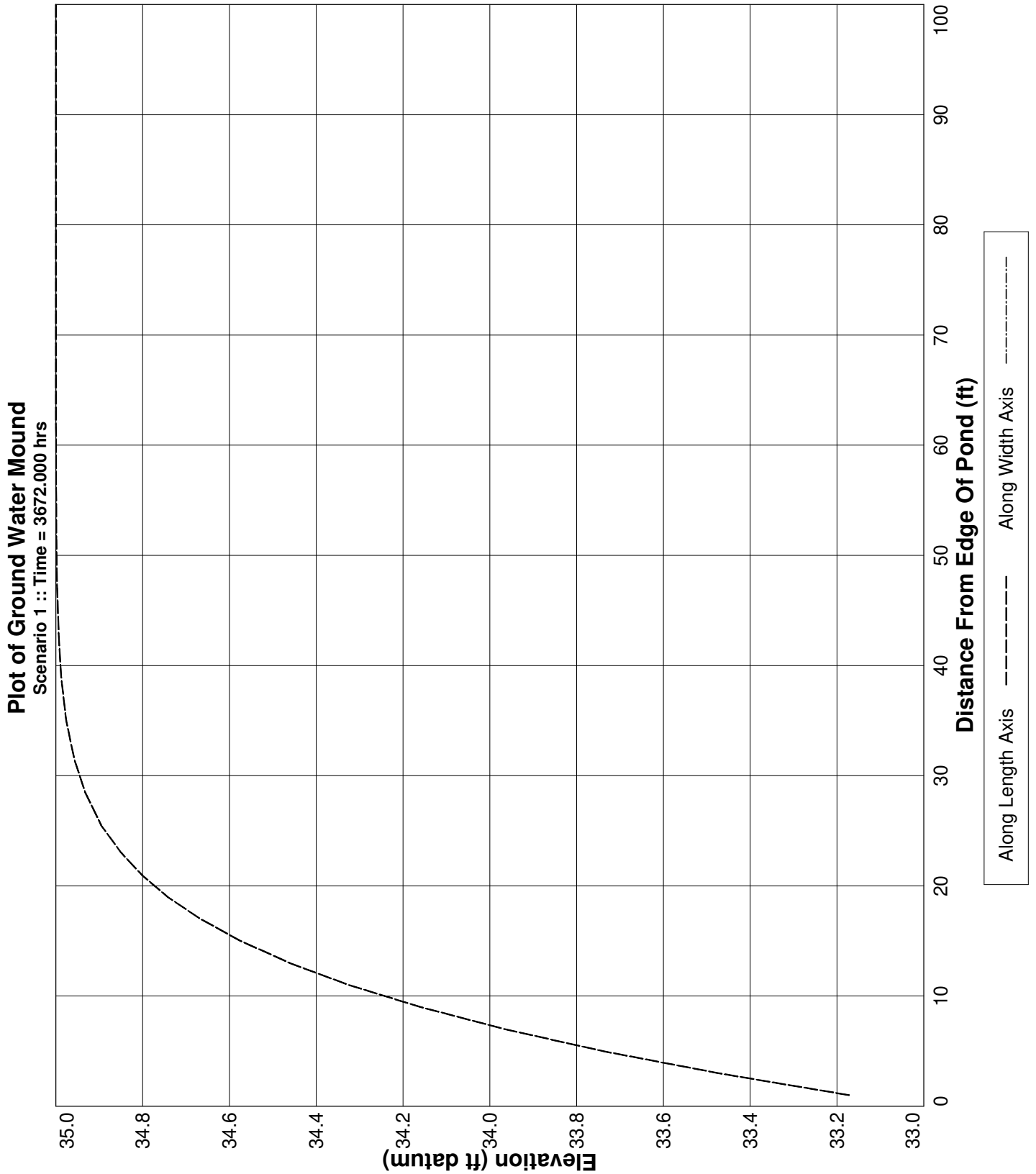
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0041	0.00163	34.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0041	0.00163	33.00000	-19.75276	5.153746E-02	5426.400	-52190030.0	5.22499E+07	S
734.400	0.0041	0.00163	33.00000	-0.01337	6.765052E-03	10852.800	-52223140.0	5.228844E+07	S
1101.600	0.0041	0.00163	33.00000	-0.00114	4.829682E-03	16279.200	-52225380.0	5.22961E+07	S
1468.800	0.0041	0.00163	33.00000	-0.00049	4.537245E-03	21705.600	-52226140.0	5.23023E+07	S
1836.000	0.0041	0.00163	33.00000	-0.00039	4.482262E-03	27132.000	-52226680.0	5.230826E+07	S
2203.200	0.0041	0.00163	33.00000	-0.00037	4.471636E-03	32558.400	-52227160.0	5.231418E+07	S
2570.400	0.0041	0.00163	33.00000	-0.00037	4.471398E-03	37984.800	-52227650.0	5.232008E+07	S
2937.600	0.0041	0.00163	33.00000	-0.00037	4.474607E-03	43411.200	-52228140.0	5.2326E+07	S
3304.800	0.0041	0.00163	33.00000	-0.00037	4.47943E-03	48837.600	-52228630.0	5.233192E+07	S
3672.000	0.0041	0.00163	33.00000	----	----	54264.000	-52229130.0	5.233784E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 32, Southwest Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-28-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 6.00  
Water Table Elevation, [WT] (ft datum): 36.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.44  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 456.0  
Equivalent Pond Width, [W] (ft): 119.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
11.00	435.6
33.00	54450.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	35.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/28/2023 10:30:55

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 35.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 6 of 10 saturated stress periods.

Maximum calculated water budget error is -2.98018746101624 percent, for saturated stress period 1.

If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

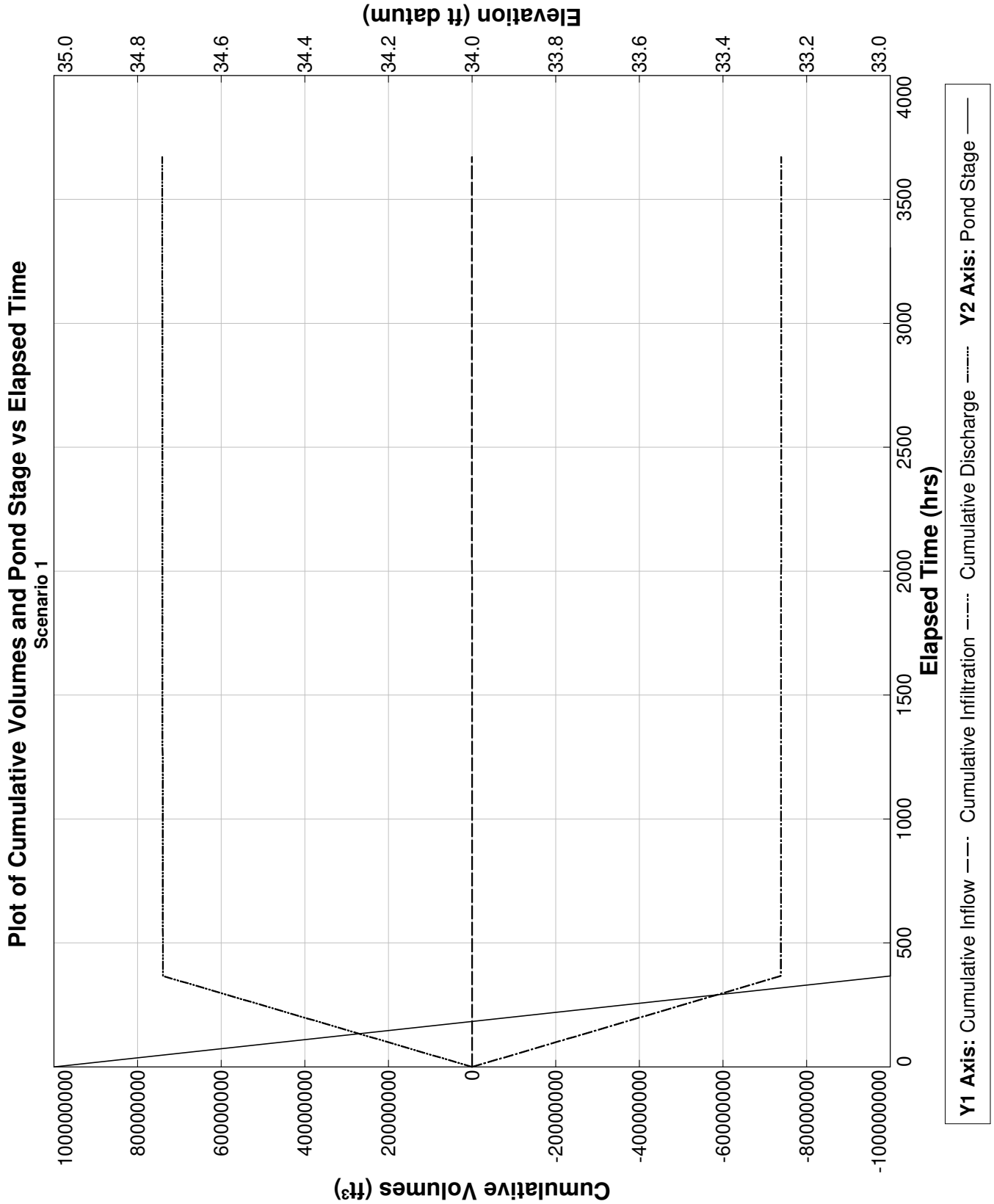
End Scenario 1 3/28/2023 10:30:55

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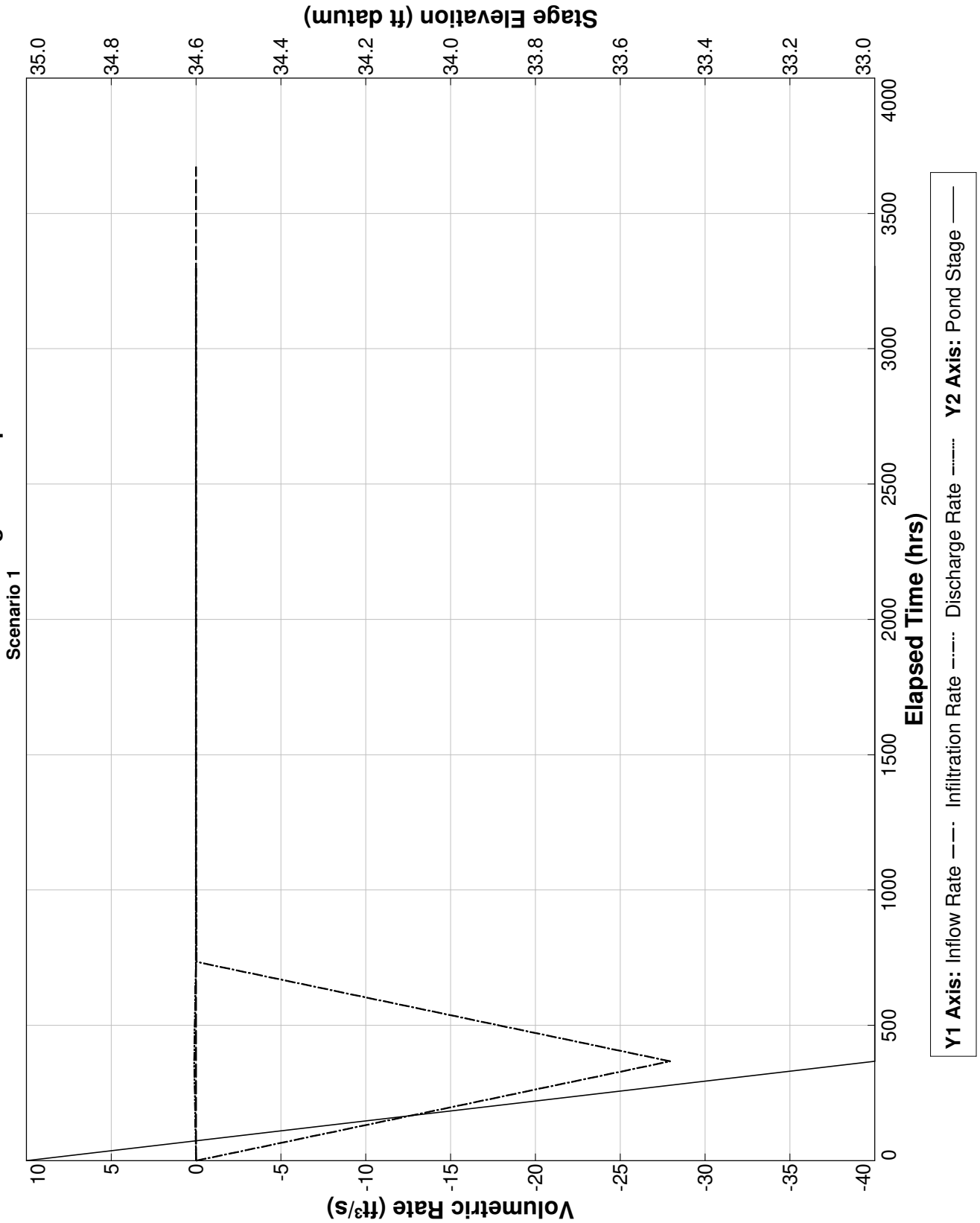
**Detailed Results**    :: Scenario 1 ::

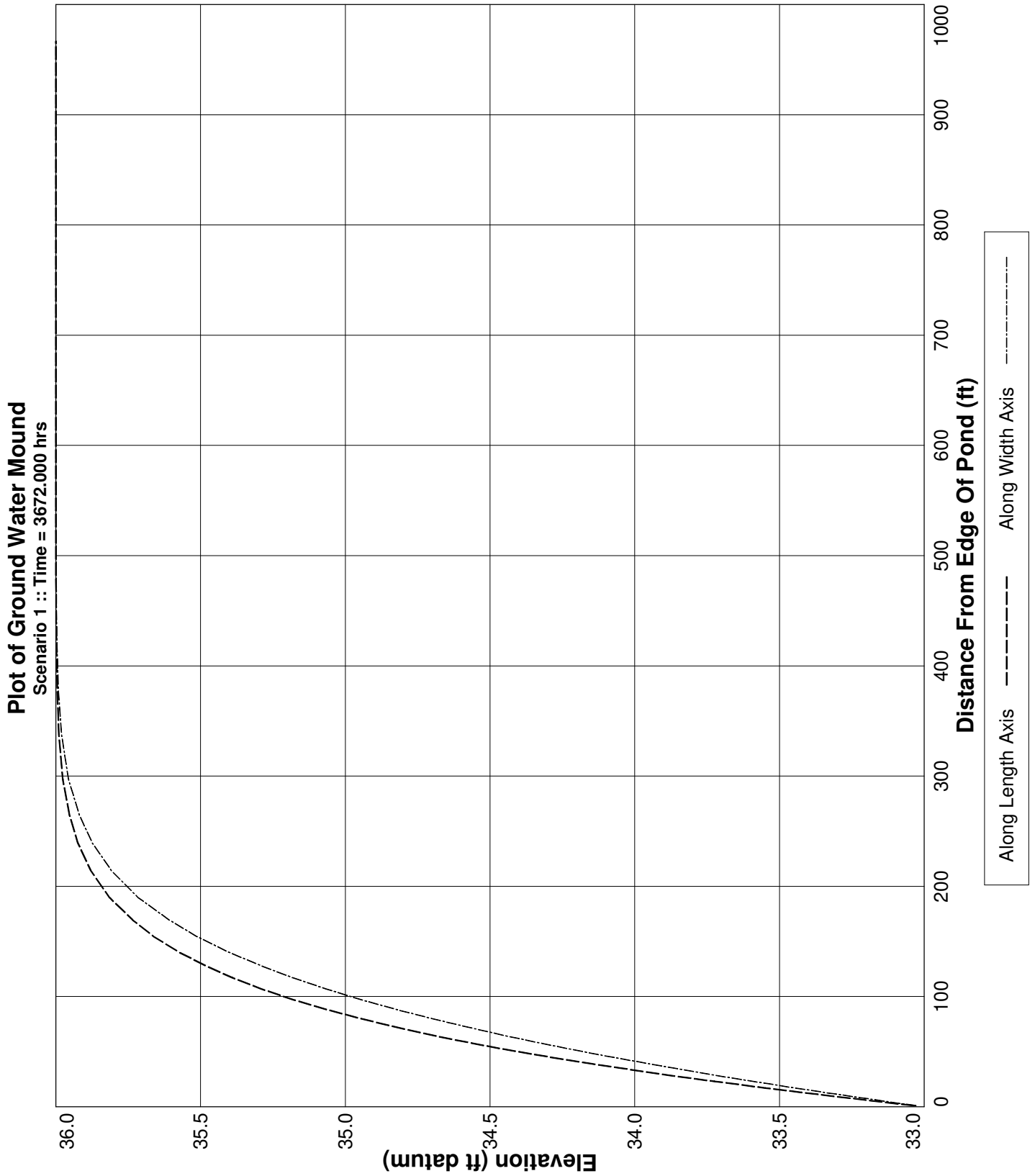
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0041	0.00163	35.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0041	0.00163	33.00000	-27.94123	.1054516	5426.400	-73799720.0	7.391405E+07	S
734.400	0.0041	0.00163	33.00000	-0.03115	1.231988E-02	10852.800	-73872140.0	7.399189E+07	S
1101.600	0.0041	0.00163	33.00000	-0.00701	1.092262E-02	16279.200	-73882070.0	7.400726E+07	S
1468.800	0.0041	0.00163	33.00000	-0.00625	1.030224E-02	21705.600	-73890680.0	7.402128E+07	S
1836.000	0.0041	0.00163	33.00000	-0.00584	9.907397E-03	27132.000	-73898610.0	7.403464E+07	S
2203.200	0.0041	0.00163	33.00000	-0.00559	9.66357E-03	32558.400	-73906120.0	7.404758E+07	S
2570.400	0.0041	0.00163	33.00000	-0.00544	9.527525E-03	37984.800	-73913380.0	7.406026E+07	S
2937.600	0.0041	0.00163	33.00000	-0.00536	9.452945E-03	43411.200	-73920500.0	7.407281E+07	S
3304.800	0.0041	0.00163	33.00000	-0.00533	9.425886E-03	48837.600	-73927540.0	7.408528E+07	S
3672.000	0.0041	0.00163	33.00000	----	----	54264.000	-73934580.0	7.409774E+07	N.A.





Plot of Flow Rates and Pond Stage vs Elapsed Time





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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 32, Southwest Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-28-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 6.00  
Water Table Elevation, [WT] (ft datum): 36.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 456.0  
Equivalent Pond Width, [W] (ft): 119.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
11.00	435.6
33.00	54450.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	35.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/28/2023 10:36:9

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 35.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 6 of 10 saturated stress periods.

Maximum calculated water budget error is -2.63398628519534 percent, for saturated stress period 1.

If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

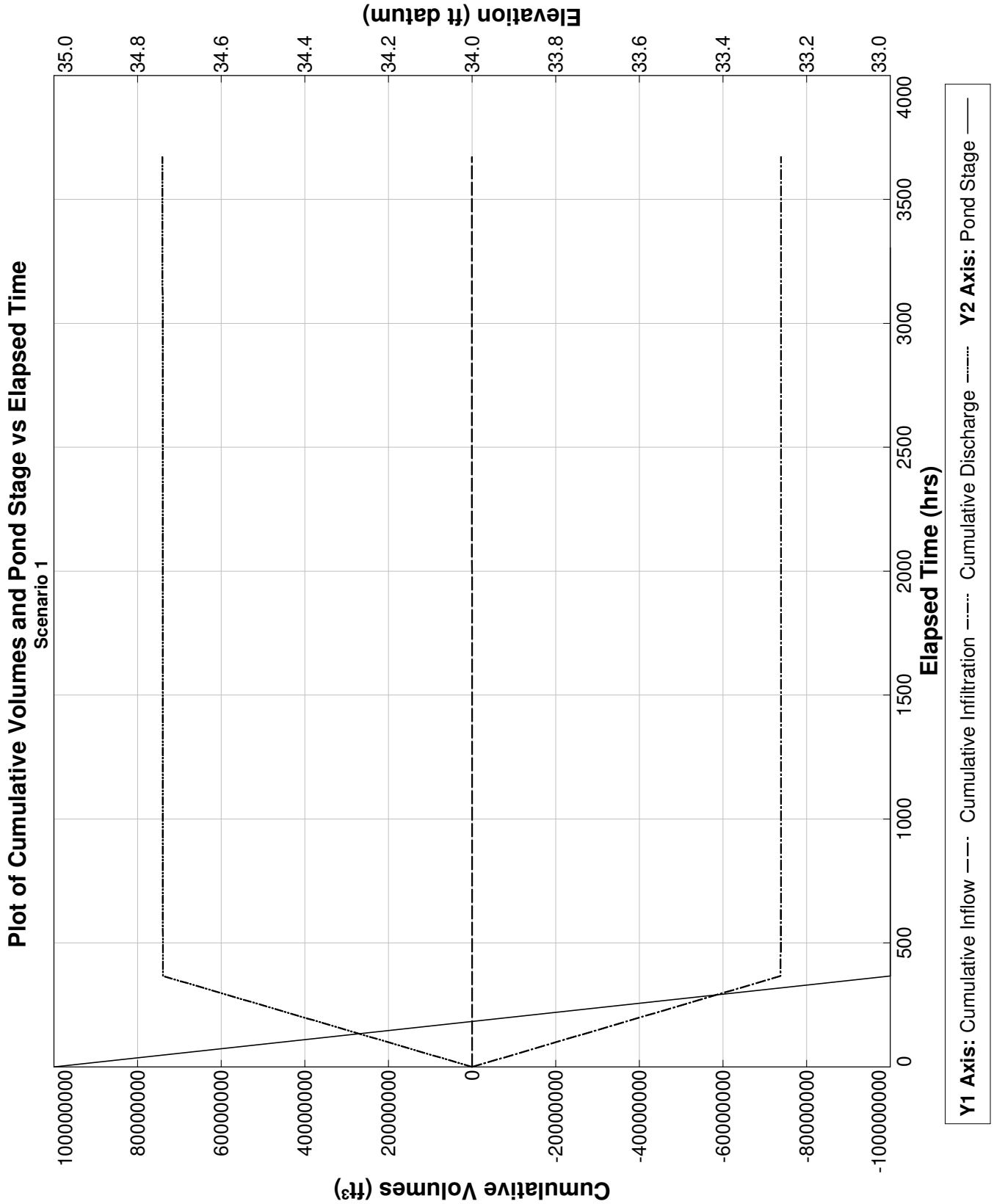
End Scenario 1 3/28/2023 10:36:9

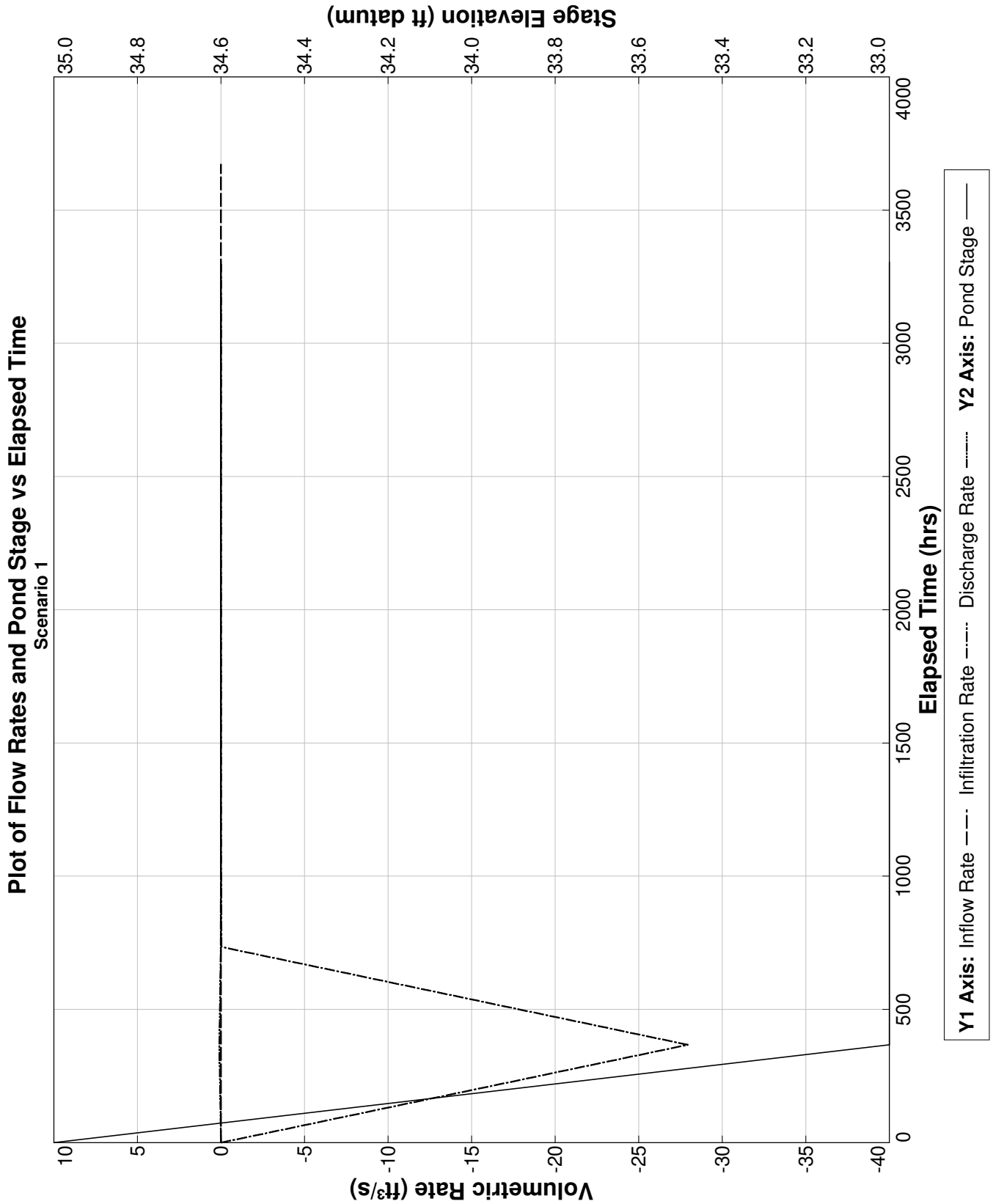
**PONDS Version 3.3.0278**  
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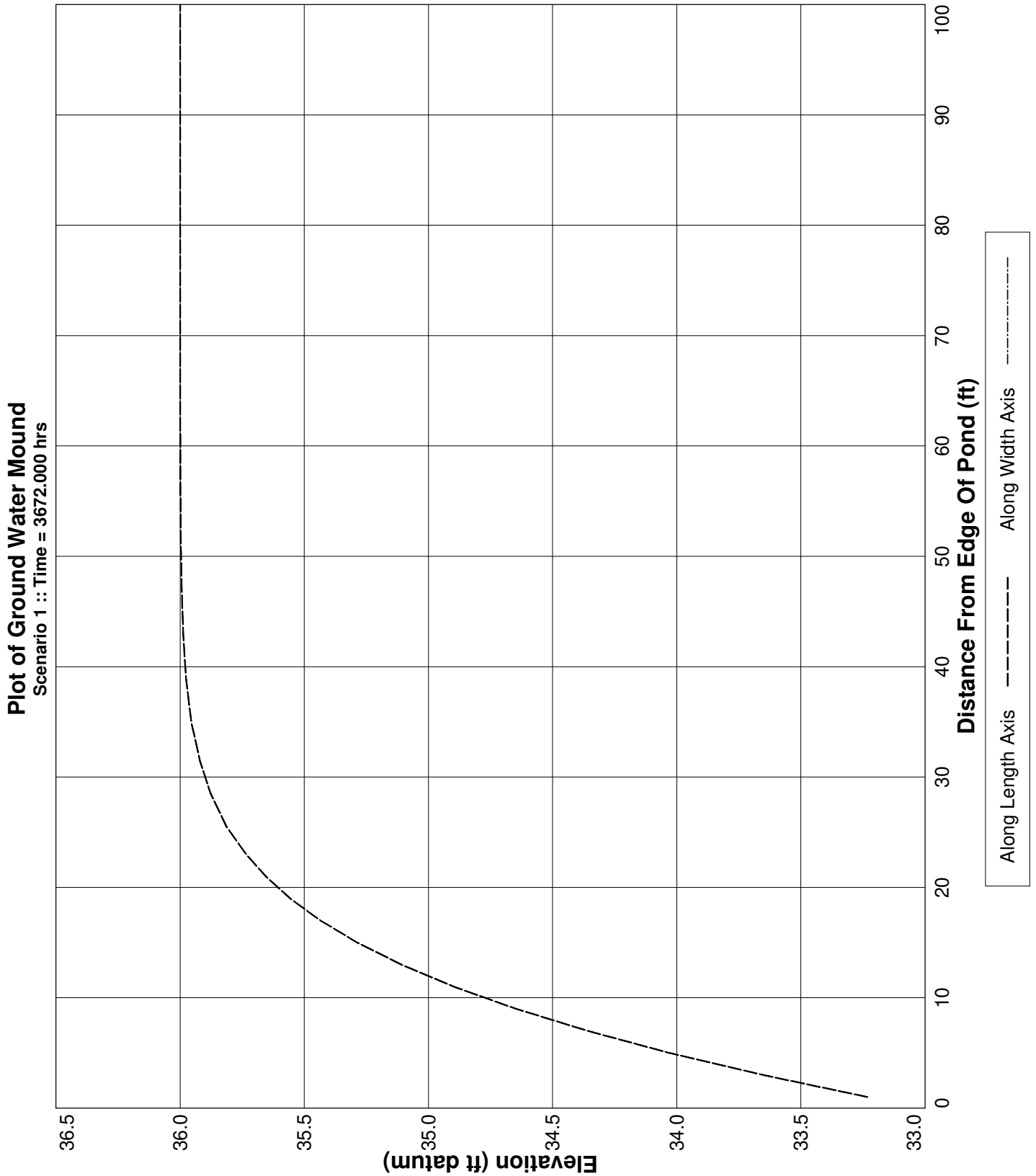
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0041	0.00163	35.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0041	0.00163	33.00000	-27.93365	9.281014E-02	5426.400	-73791370.0	7.39057E+07	S
734.400	0.0041	0.00163	33.00000	-0.02402	7.284111E-03	10852.800	-73852100.0	7.397185E+07	S
1101.600	0.0041	0.00163	33.00000	-0.00147	5.125309E-03	16279.200	-73854870.0	7.398006E+07	S
1468.800	0.0041	0.00163	33.00000	-0.00073	4.772652E-03	21705.600	-73855990.0	7.398659E+07	S
1836.000	0.0041	0.00163	33.00000	-0.00060	4.686614E-03	27132.000	-73856820.0	7.399285E+07	S
2203.200	0.0041	0.00163	33.00000	-0.00055	4.654986E-03	32558.400	-73857560.0	7.399902E+07	S
2570.400	0.0041	0.00163	33.00000	-0.00054	4.639319E-03	37984.800	-73858280.0	7.400517E+07	S
2937.600	0.0041	0.00163	33.00000	-0.00053	4.630611E-03	43411.200	-73858980.0	7.40113E+07	S
3304.800	0.0041	0.00163	33.00000	-0.00052	4.625884E-03	48837.600	-73859670.0	7.401741E+07	S
3672.000	0.0041	0.00163	33.00000	----	----	54264.000	-73860360.0	7.402353E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 32, South-Southwest Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-28-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 6.00  
Water Table Elevation, [WT] (ft datum): 37.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.44  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 456.0  
Equivalent Pond Width, [W] (ft): 119.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
11.00	435.6
33.00	54450.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	36.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/28/2023 10:38:48

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 36.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 4 of 10 saturated stress periods.

Maximum calculated water budget error is -1.80276582231360 percent, for saturated stress period 1.

If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

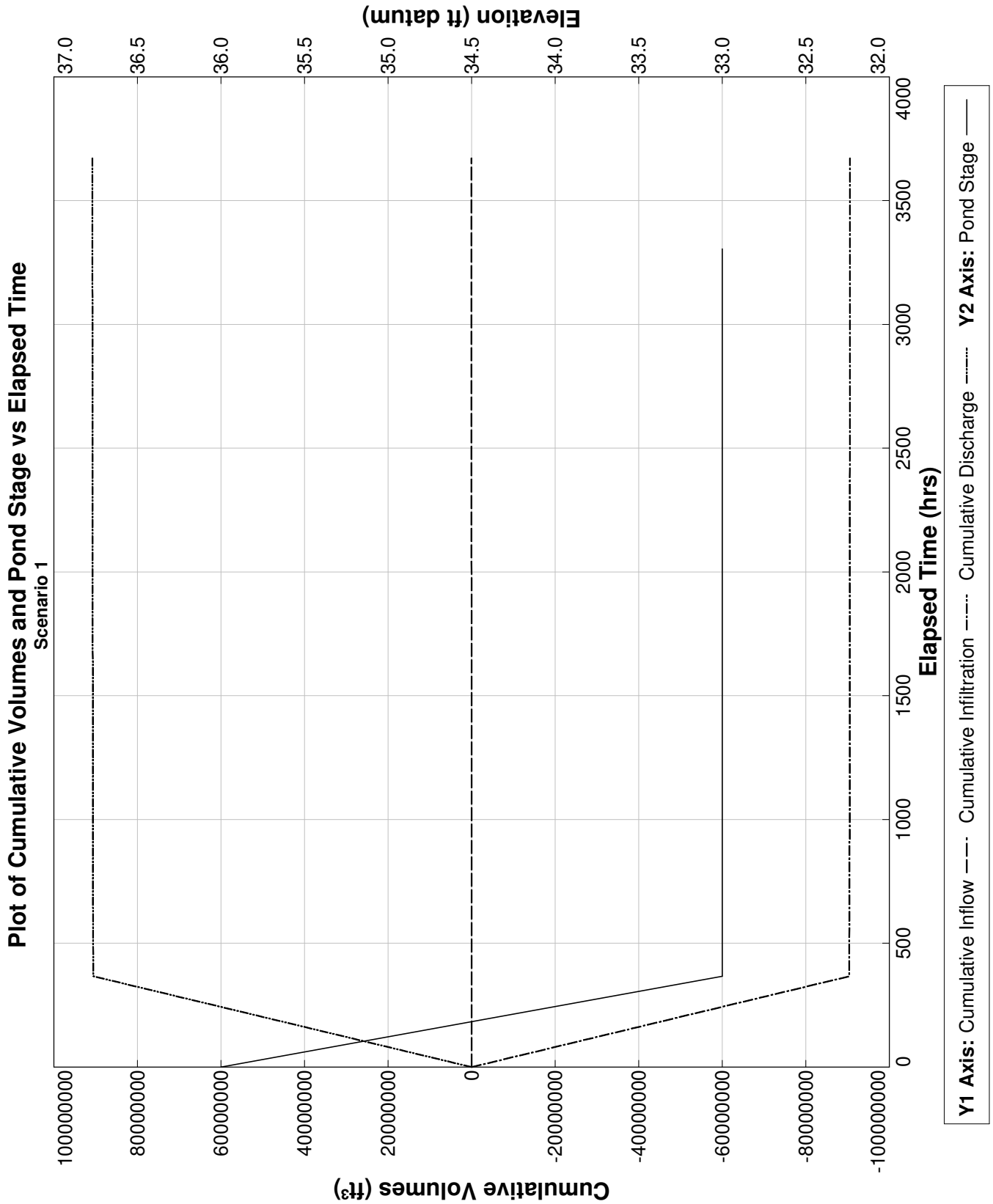
End Scenario 1 3/28/2023 10:38:48

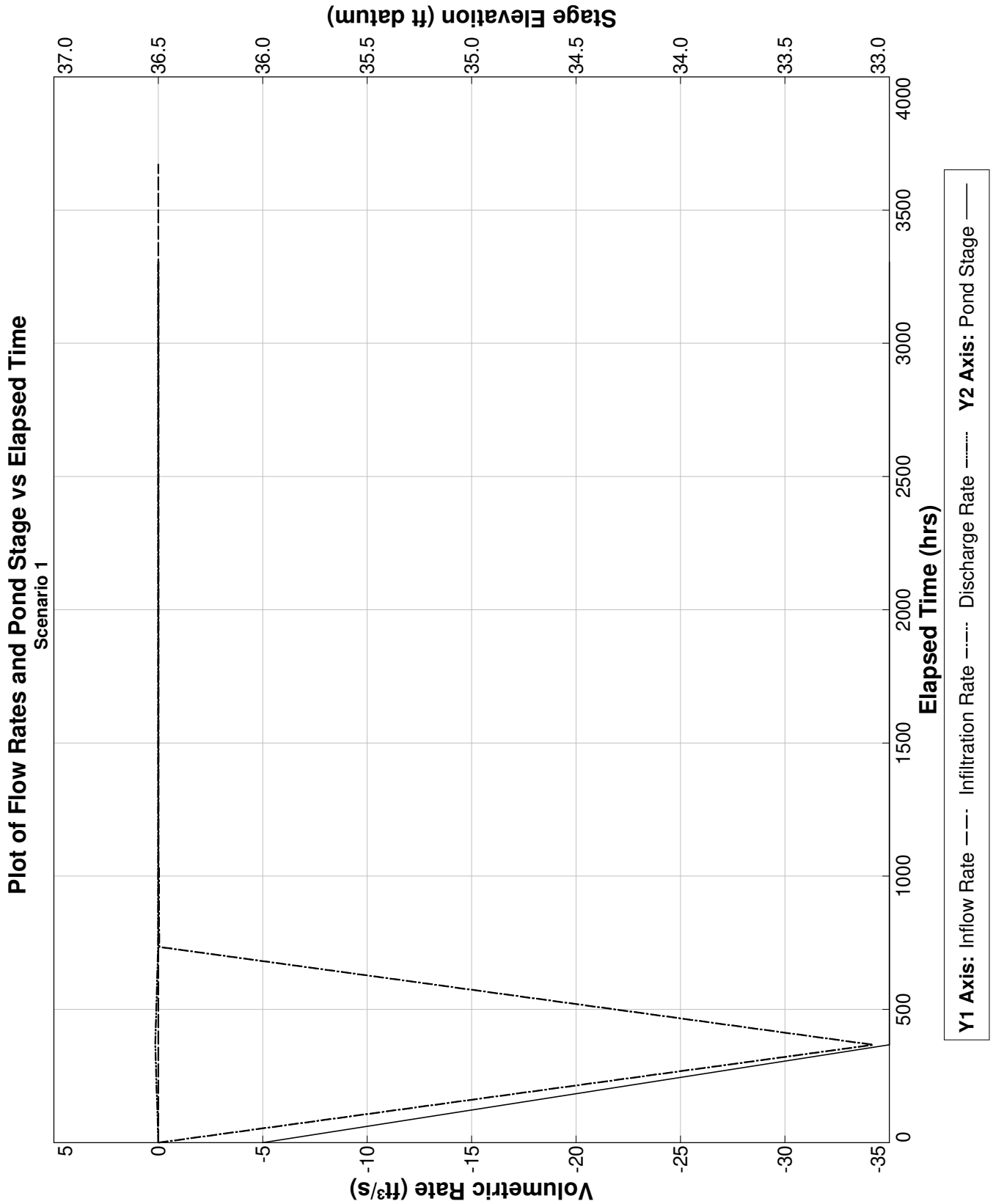
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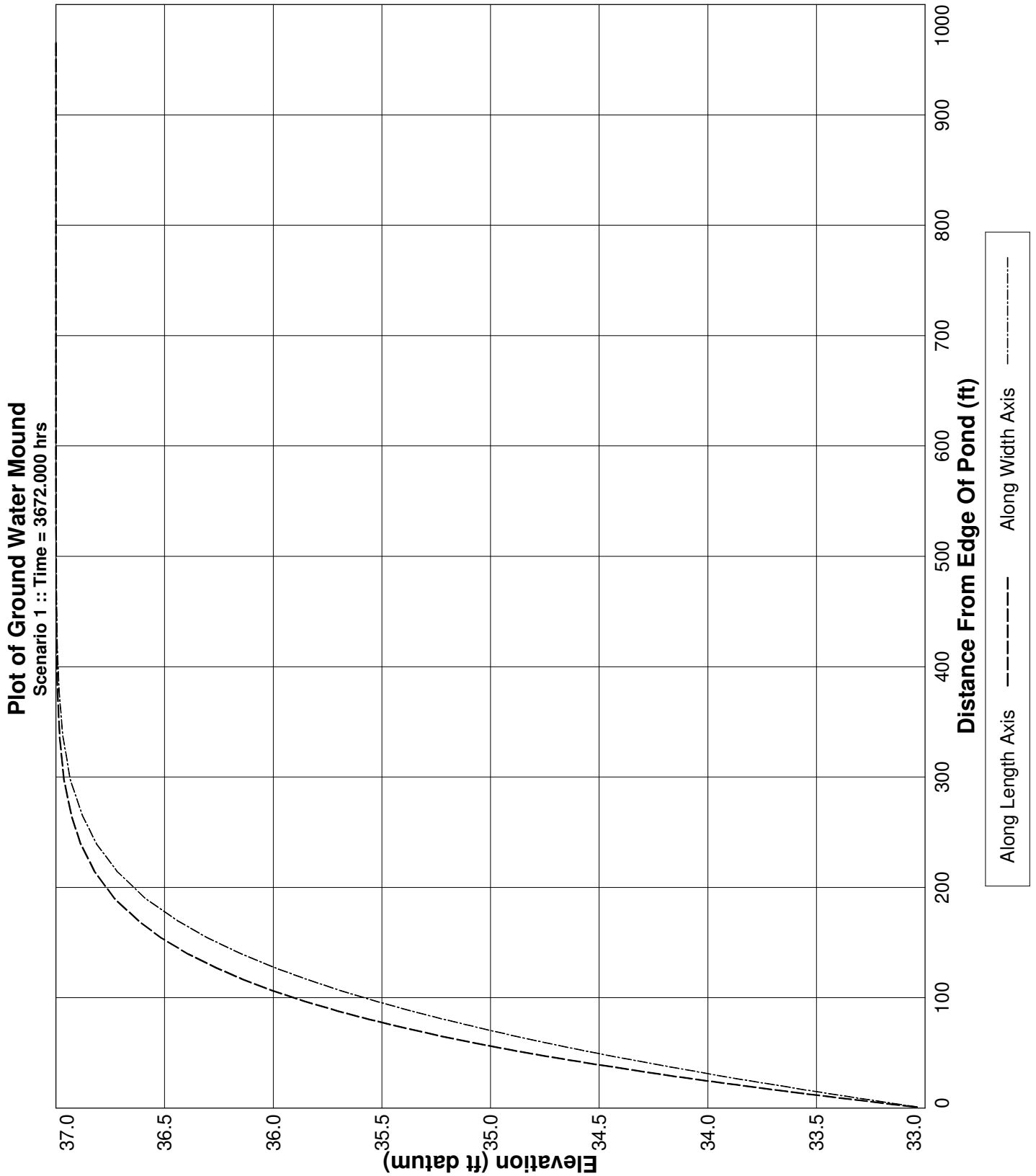
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0041	0.00163	36.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0041	0.00163	33.00000	-34.22189	.1515354	5426.400	-90371870.0	9.054065E+07	S
734.400	0.0041	0.00163	33.00000	-0.04518	.0160132	10852.800	-90477180.0	9.065139E+07	S
1101.600	0.0041	0.00163	33.00000	-0.00982	1.358145E-02	16279.200	-90491320.0	9.067095E+07	S
1468.800	0.0041	0.00163	33.00000	-0.00856	1.254146E-02	21705.600	-90503160.0	9.068822E+07	S
1836.000	0.0041	0.00163	33.00000	-0.00794	.0120125	27132.000	-90513960.0	9.070445E+07	S
2203.200	0.0041	0.00163	33.00000	-0.00755	1.162506E-02	32558.400	-90524160.0	9.072007E+07	S
2570.400	0.0041	0.00163	33.00000	-0.00727	1.134988E-02	37984.800	-90533920.0	9.073526E+07	S
2937.600	0.0041	0.00163	33.00000	-0.00708	1.116884E-02	43411.200	-90543380.0	9.075014E+07	S
3304.800	0.0041	0.00163	33.00000	-0.00695	1.104445E-02	48837.600	-90552630.0	9.076482E+07	S
3672.000	0.0041	0.00163	33.00000	----	----	54264.000	-90561760.0	9.077938E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 32, South-Southwest Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-28-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 6.00  
Water Table Elevation, [WT] (ft datum): 37.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 456.0  
Equivalent Pond Width, [W] (ft): 119.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
11.00	435.6
33.00	54450.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	36.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/28/2023 10:40:20

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 36.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 2 of 10 saturated stress periods.

    Maximum calculated water budget error is -1.53780024356589 percent, for saturated stress period 1.

    If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

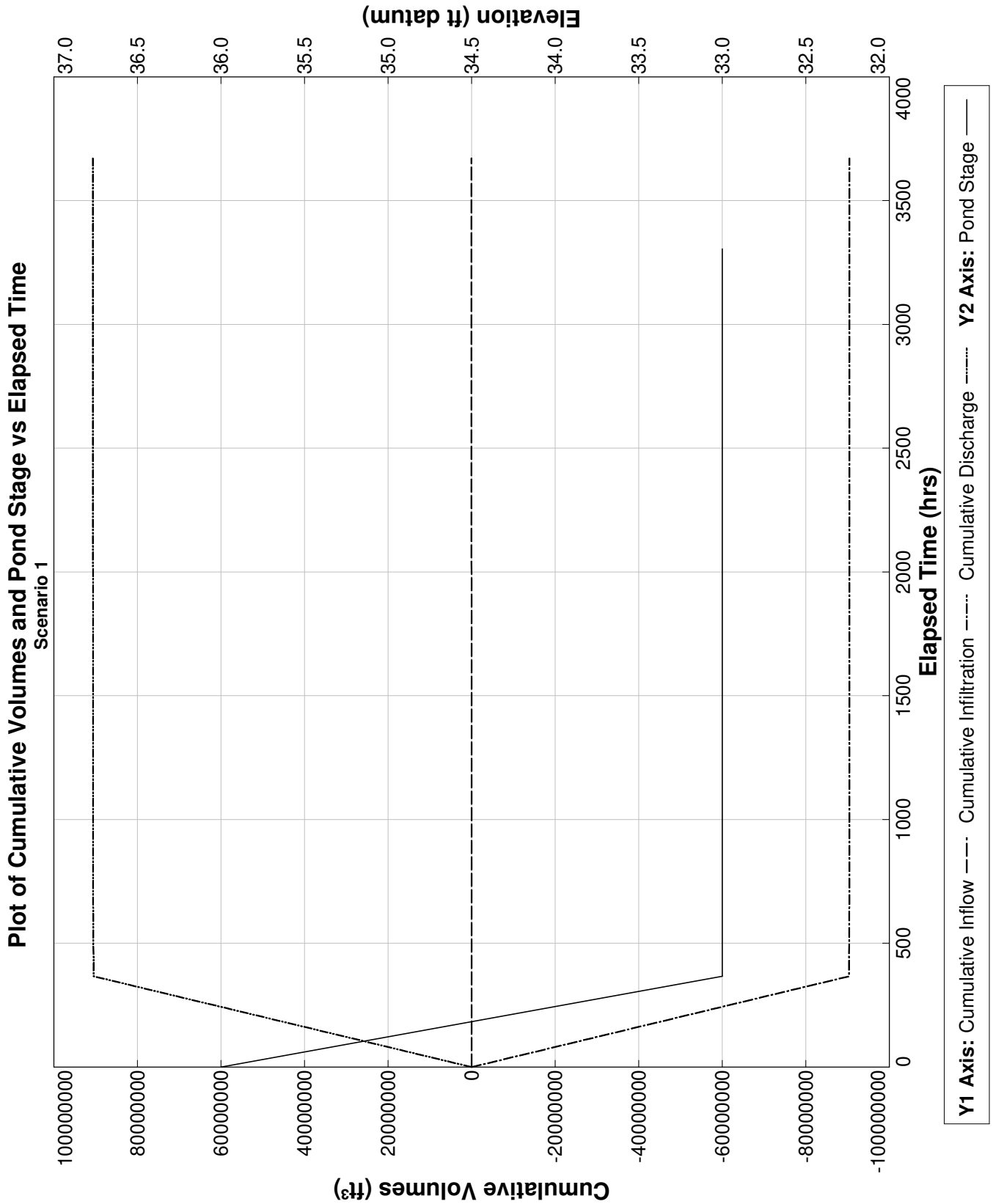
End Scenario 1 3/28/2023 10:40:20

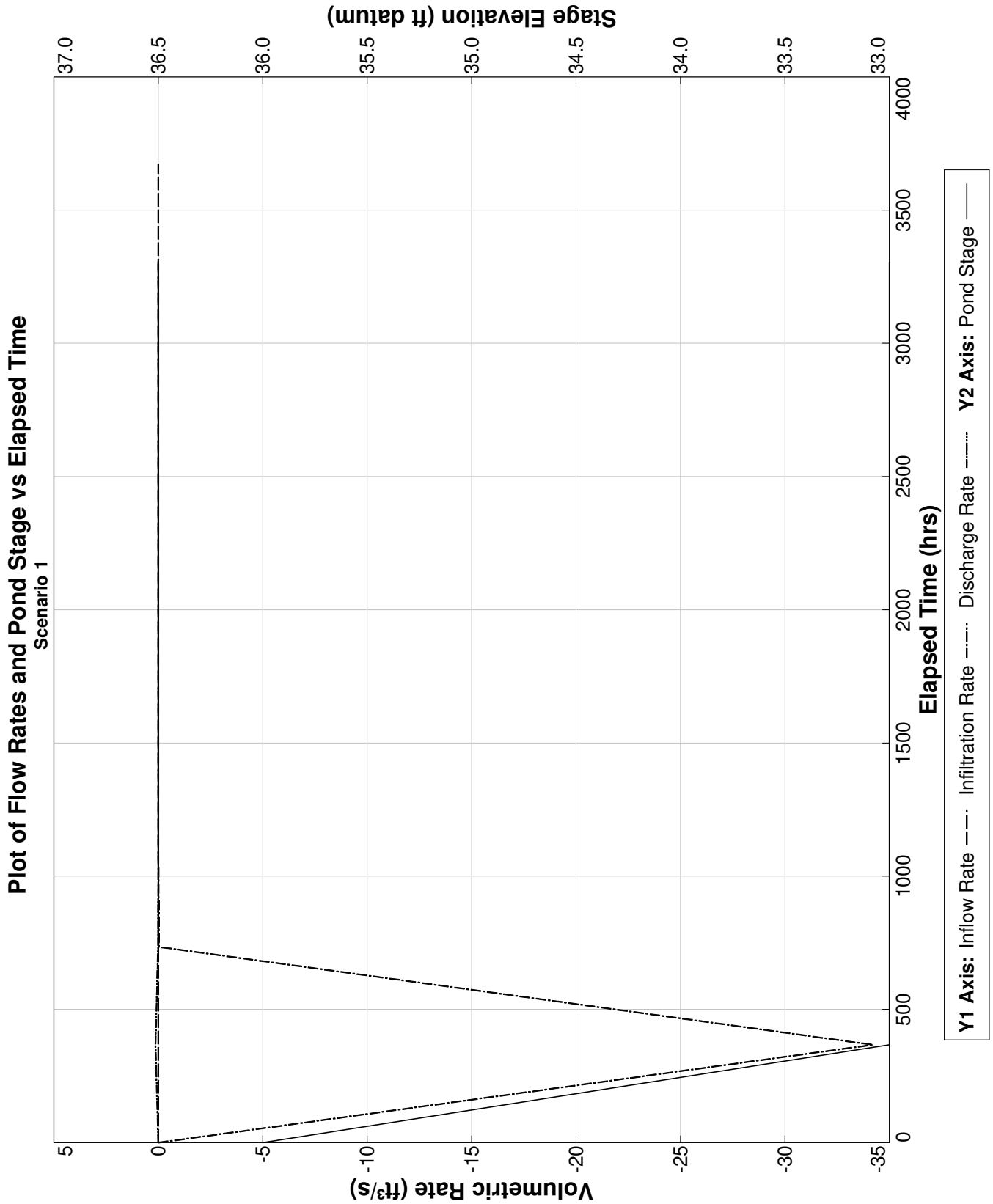
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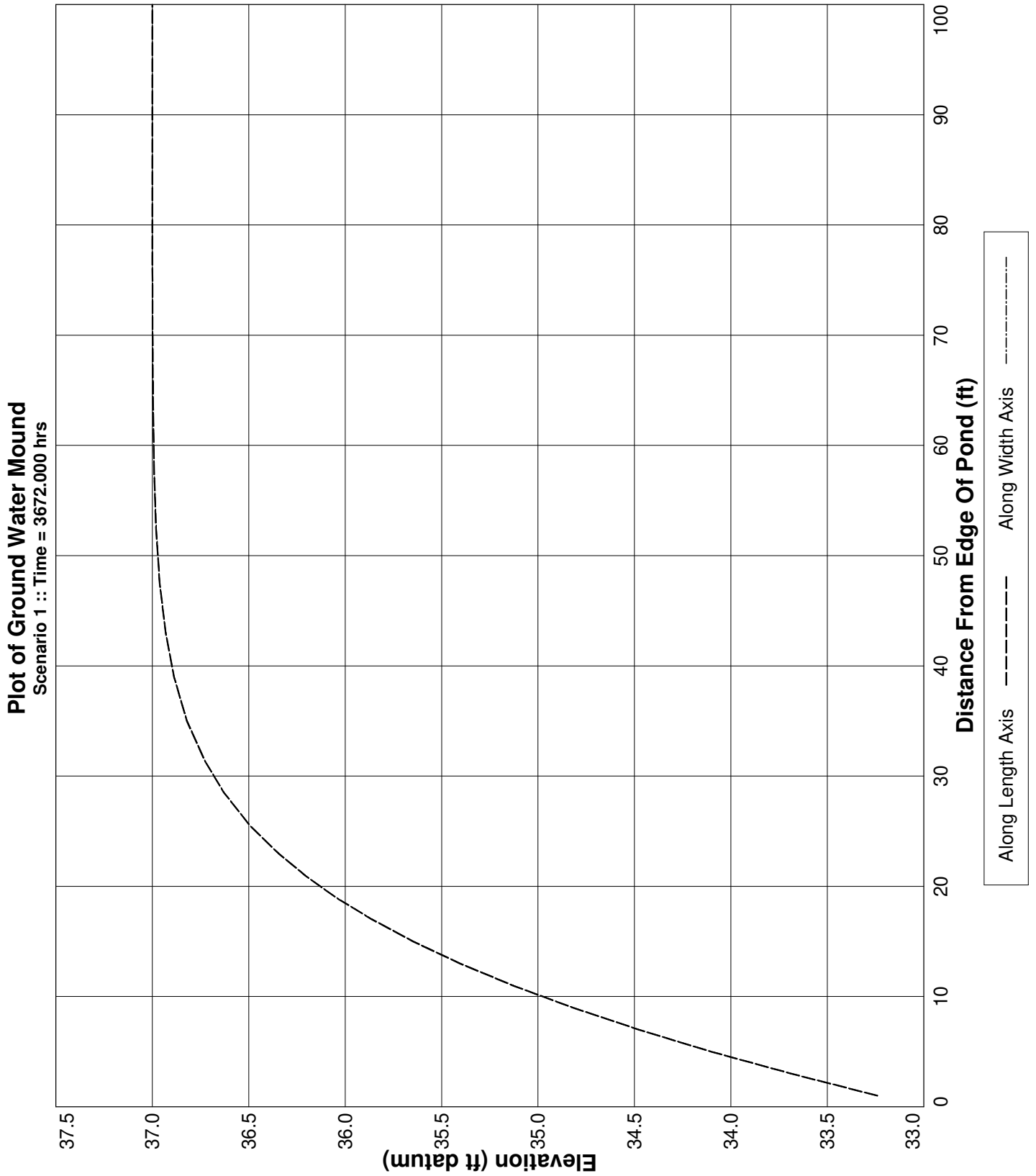
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0041	0.00163	36.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0041	0.00163	33.00000	-34.21055	.1337813	5426.400	-90360140.0	9.052891E+07	S
734.400	0.0041	0.00163	33.00000	-0.03378	6.177781E-03	10852.800	-90447220.0	9.062142E+07	S
1101.600	0.0041	0.00163	33.00000	-0.00144	5.412074E-03	16279.200	-90449450.0	9.062908E+07	S
1468.800	0.0041	0.00163	33.00000	-0.00110	5.17464E-03	21705.600	-90451020.0	9.063608E+07	S
1836.000	0.0041	0.00163	33.00000	-0.00098	5.069389E-03	27132.000	-90452370.0	9.064285E+07	S
2203.200	0.0041	0.00163	33.00000	-0.00091	5.010329E-03	32558.400	-90453600.0	9.064951E+07	S
2570.400	0.0041	0.00163	33.00000	-0.00087	4.972763E-03	37984.800	-90454780.0	9.065611E+07	S
2937.600	0.0041	0.00163	33.00000	-0.00084	4.947358E-03	43411.200	-90455900.0	9.066266E+07	S
3304.800	0.0041	0.00163	33.00000	-0.00083	4.929699E-03	48837.600	-90457010.0	9.066919E+07	S
3672.000	0.0041	0.00163	33.00000	----	----	54264.000	-90458090.0	9.06757E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 32, South Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-28-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 6.00  
Water Table Elevation, [WT] (ft datum): 40.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.44  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 456.0  
Equivalent Pond Width, [W] (ft): 119.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
11.00	435.6
33.00	54450.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	39.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/28/2023 10:48:24

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 39.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 1 of 10 saturated stress periods.

Maximum calculated water budget error is -1.05245588648235 percent, for saturated stress period 1.

If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

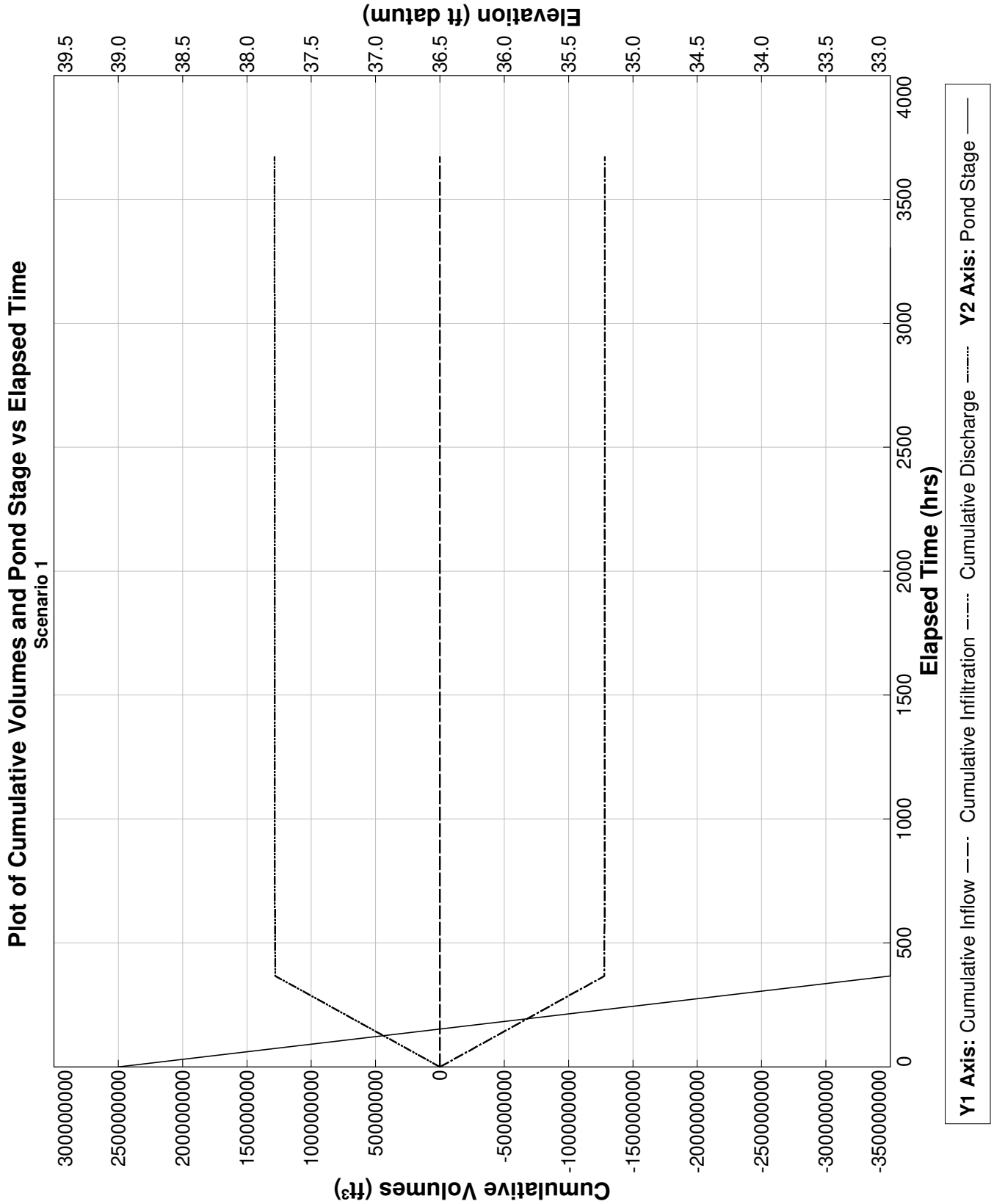
End Scenario 1 3/28/2023 10:48:24

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**Retention Pond Recovery - Refined Method**  
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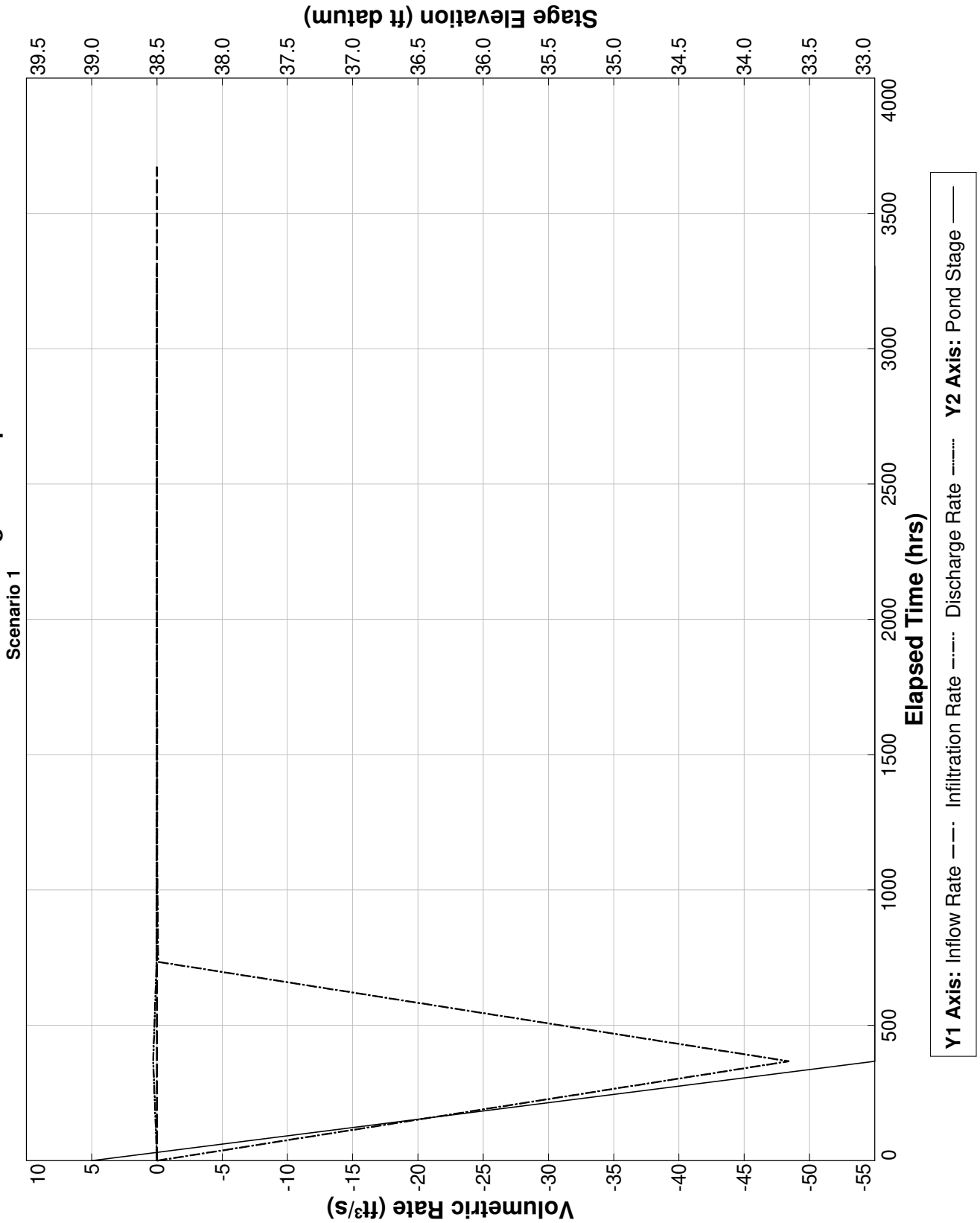
**Detailed Results**    :: Scenario 1 ::

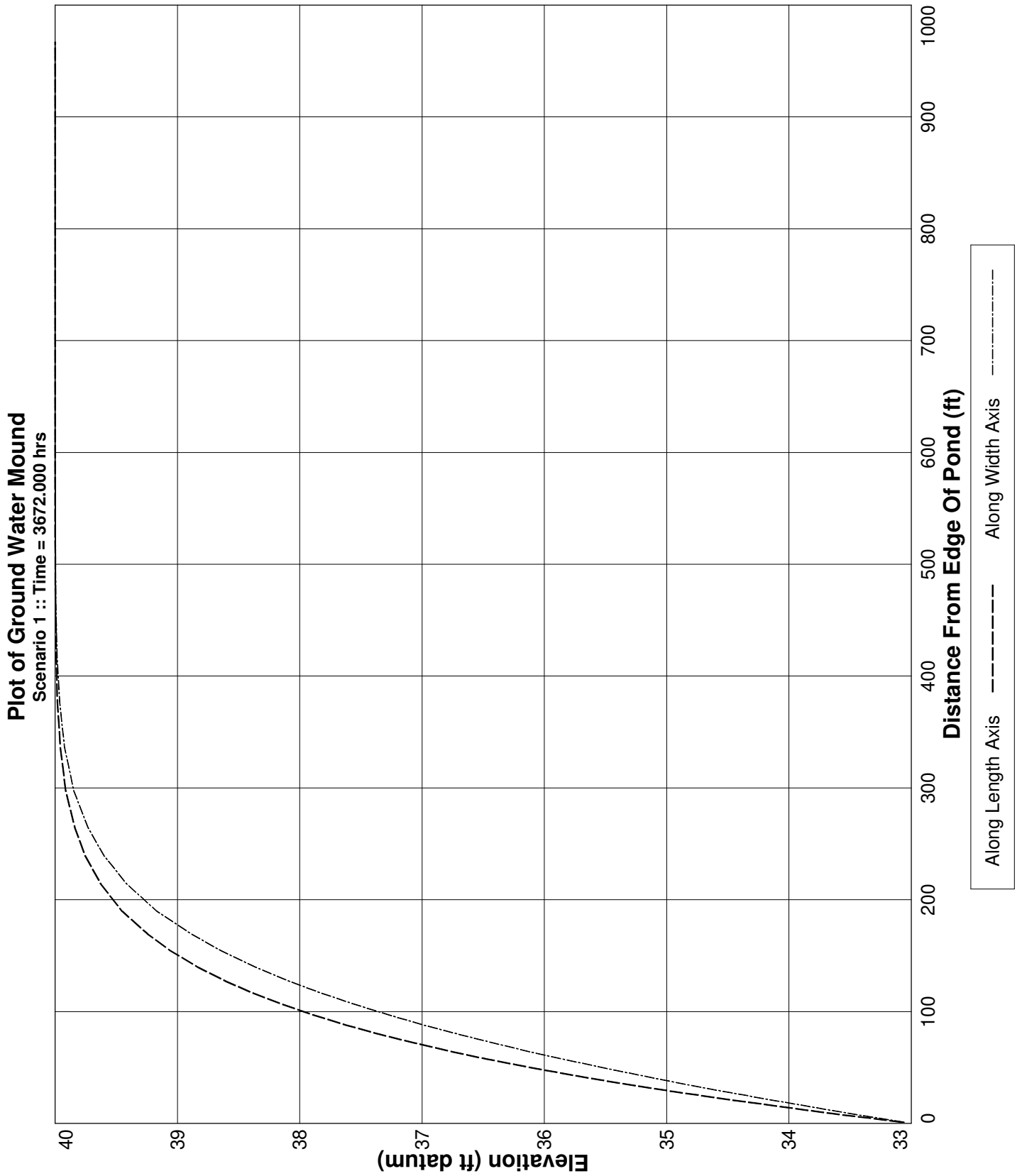
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0041	0.00163	39.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0041	0.00163	33.00002	-48.40351	.2943762	5426.400	-127764600.0	1.280967E+08	S
734.400	0.0041	0.00163	33.00000	-0.08808	2.628087E-02	10852.800	-127971100.0	1.283087E+08	S
1101.600	0.0041	0.00163	33.00000	-0.01828	2.181208E-02	16279.200	-127997500.0	1.283405E+08	S
1468.800	0.0041	0.00163	33.00000	-0.01575	1.962283E-02	21705.600	-128019400.0	1.283678E+08	S
1836.000	0.0041	0.00163	33.00000	-0.01439	1.836452E-02	27132.000	-128039100.0	1.28393E+08	S
2203.200	0.0041	0.00163	33.00000	-0.01354	1.761212E-02	32558.400	-128057500.0	1.284167E+08	S
2570.400	0.0041	0.00163	33.00000	-0.01290	.0169779	37984.800	-128074900.0	1.284396E+08	S
2937.600	0.0041	0.00163	33.00000	-0.01239	1.646093E-02	43411.200	-128091600.0	1.284617E+08	S
3304.800	0.0041	0.00163	33.00000	-0.01199	.0160746	48837.600	-128107700.0	1.284832E+08	S
3672.000	0.0041	0.00163	33.00000	----	----	54264.000	-128123300.0	1.285043E+08	N.A.





Plot of Flow Rates and Pond Stage vs Elapsed Time





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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 32, South Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-28-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 6.00  
Water Table Elevation, [WT] (ft datum): 40.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 456.0  
Equivalent Pond Width, [W] (ft): 119.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
11.00	435.6
33.00	54450.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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---

**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	39.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/28/2023 10:50:9

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 39.0 ft.

End Scenario 1 3/28/2023 10:50:9

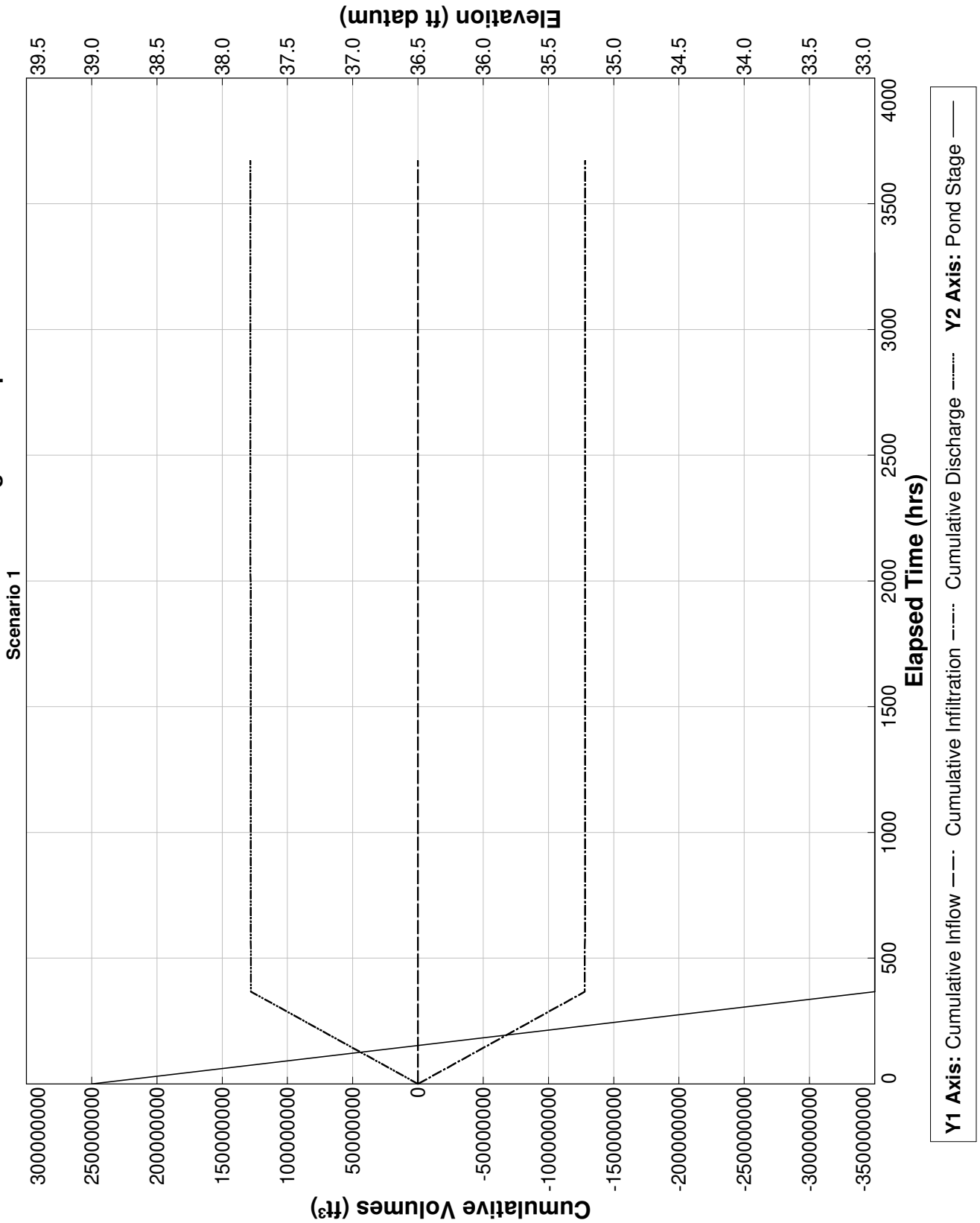
**PONDS Version 3.3.0278**  
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**Detailed Results** :: Scenario 1 ::

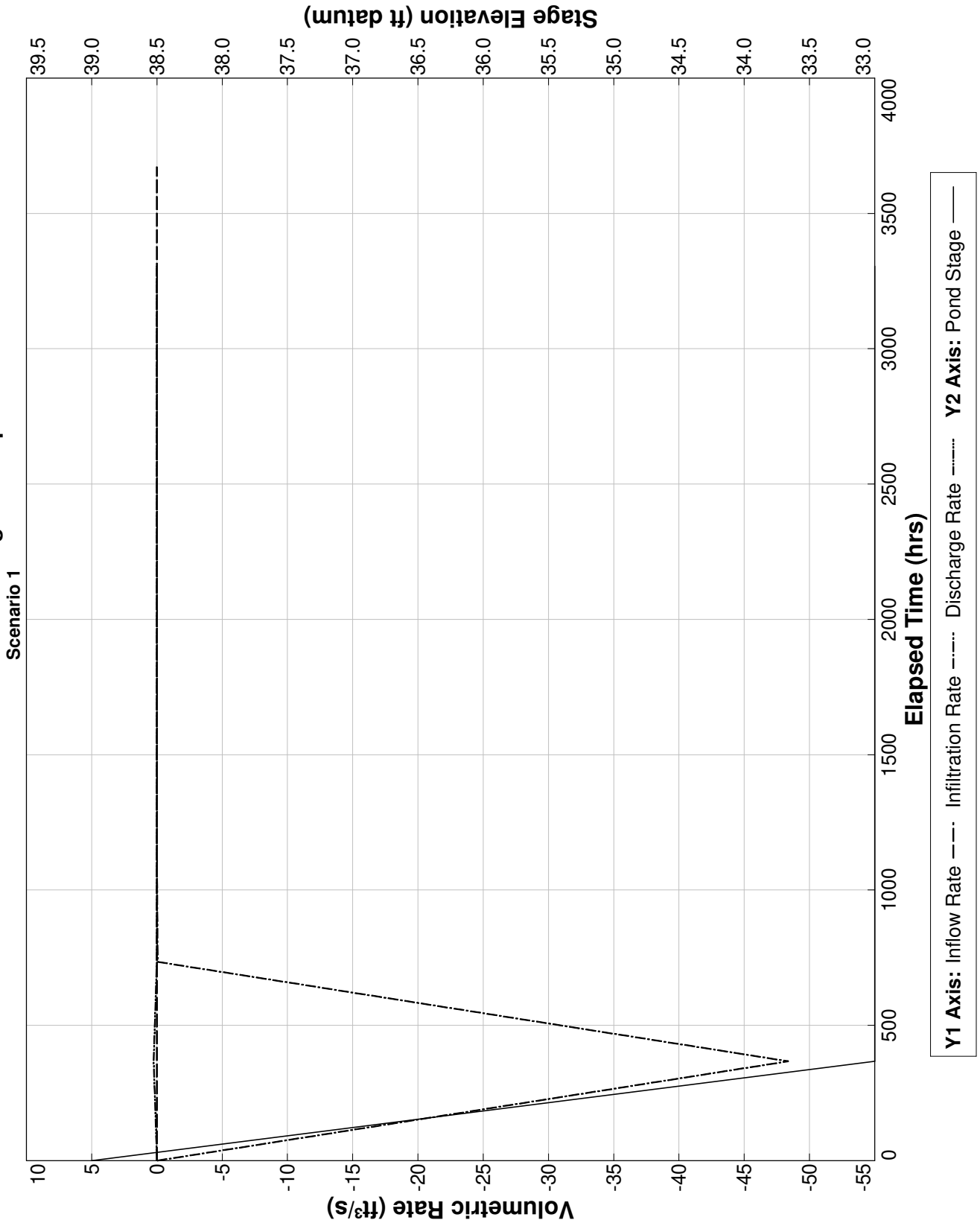
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0041	0.00163	39.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0041	0.00163	33.00001	-48.38107	.2580979	5426.400	-127740600.0	1.280728E+08	S
734.400	0.0041	0.00163	33.00000	-0.06664	9.087767E-03	10852.800	-127911800.0	1.282494E+08	S
1101.600	0.0041	0.00163	33.00000	-0.00305	6.712123E-03	16279.200	-127916800.0	1.282598E+08	S
1468.800	0.0041	0.00163	33.00000	-0.00209	6.110587E-03	21705.600	-127919900.0	1.282683E+08	S
1836.000	0.0041	0.00163	33.00000	-0.00178	5.858169E-03	27132.000	-127922400.0	1.282762E+08	S
2203.200	0.0041	0.00163	33.00000	-0.00162	5.713855E-03	32558.400	-127924600.0	1.282838E+08	S
2570.400	0.0041	0.00163	33.00000	-0.00152	5.618033E-03	37984.800	-127926600.0	1.282913E+08	S
2937.600	0.0041	0.00163	33.00000	-0.00145	5.547165E-03	43411.200	-127928600.0	1.282987E+08	S
3304.800	0.0041	0.00163	33.00000	-0.00139	5.492967E-03	48837.600	-127930500.0	1.28306E+08	S
3672.000	0.0041	0.00163	33.00000	----	----	54264.000	-127932300.0	1.283132E+08	N.A.

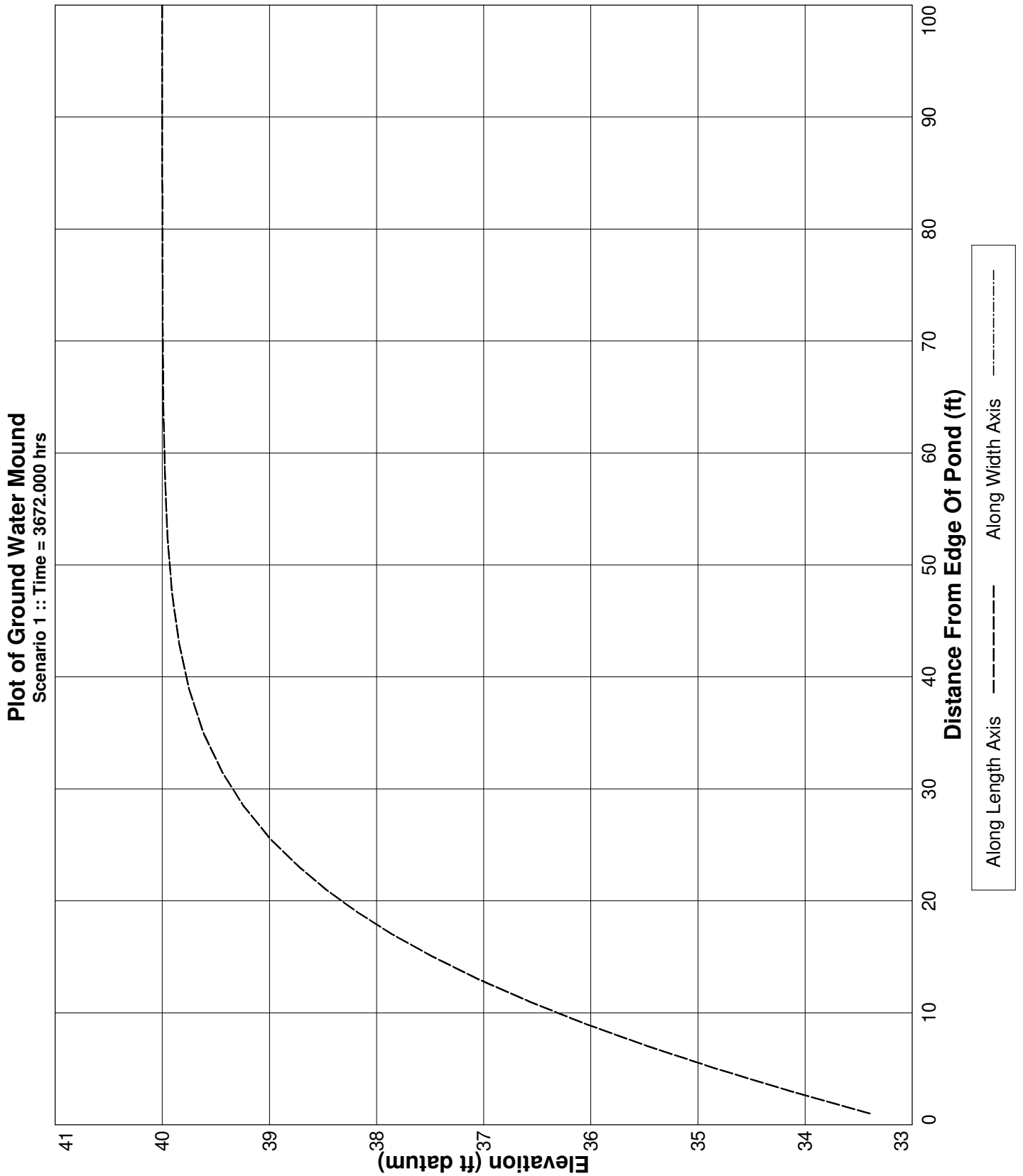


Plot of Cumulative Volumes and Pond Stage vs Elapsed Time



Plot of Flow Rates and Pond Stage vs Elapsed Time





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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 33, South1 Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-29-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -2.00  
Water Table Elevation, [WT] (ft datum): 34.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.29  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 353.0  
Equivalent Pond Width, [W] (ft): 136.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
3.00	435.6
33.00	47916.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	33.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/29/2023 9:55:36

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 33.0 ft.

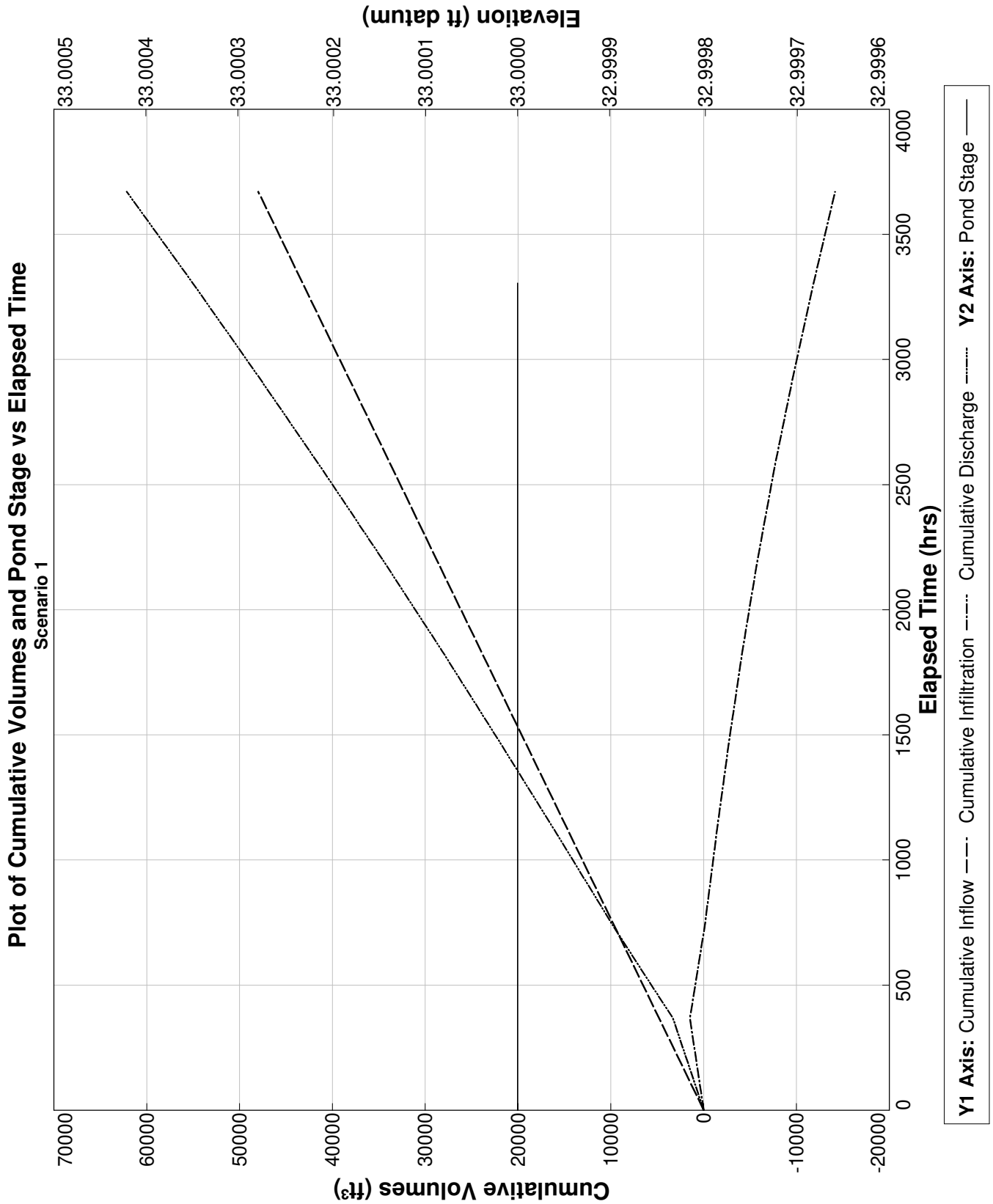
End Scenario 1 3/29/2023 9:55:36

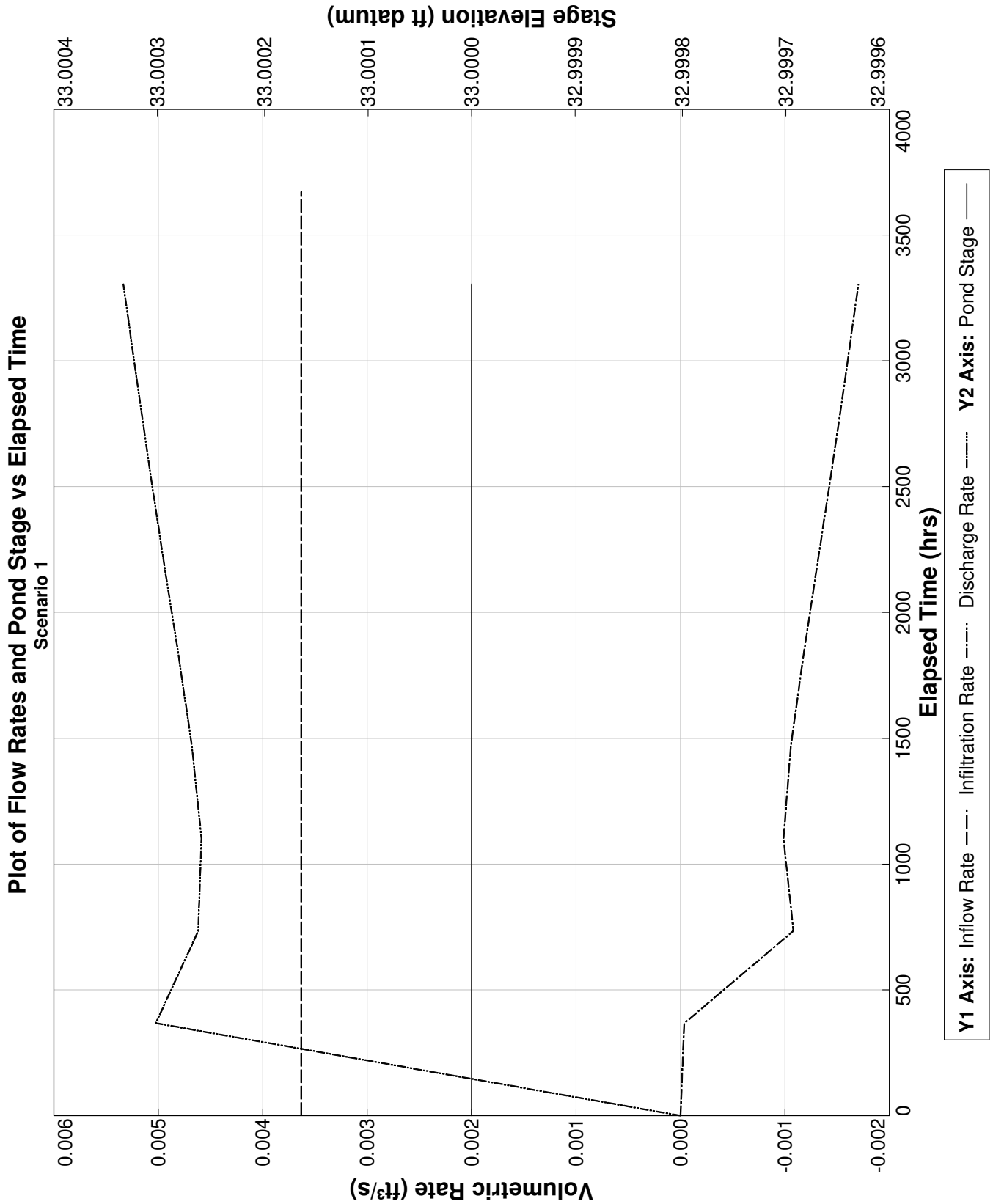
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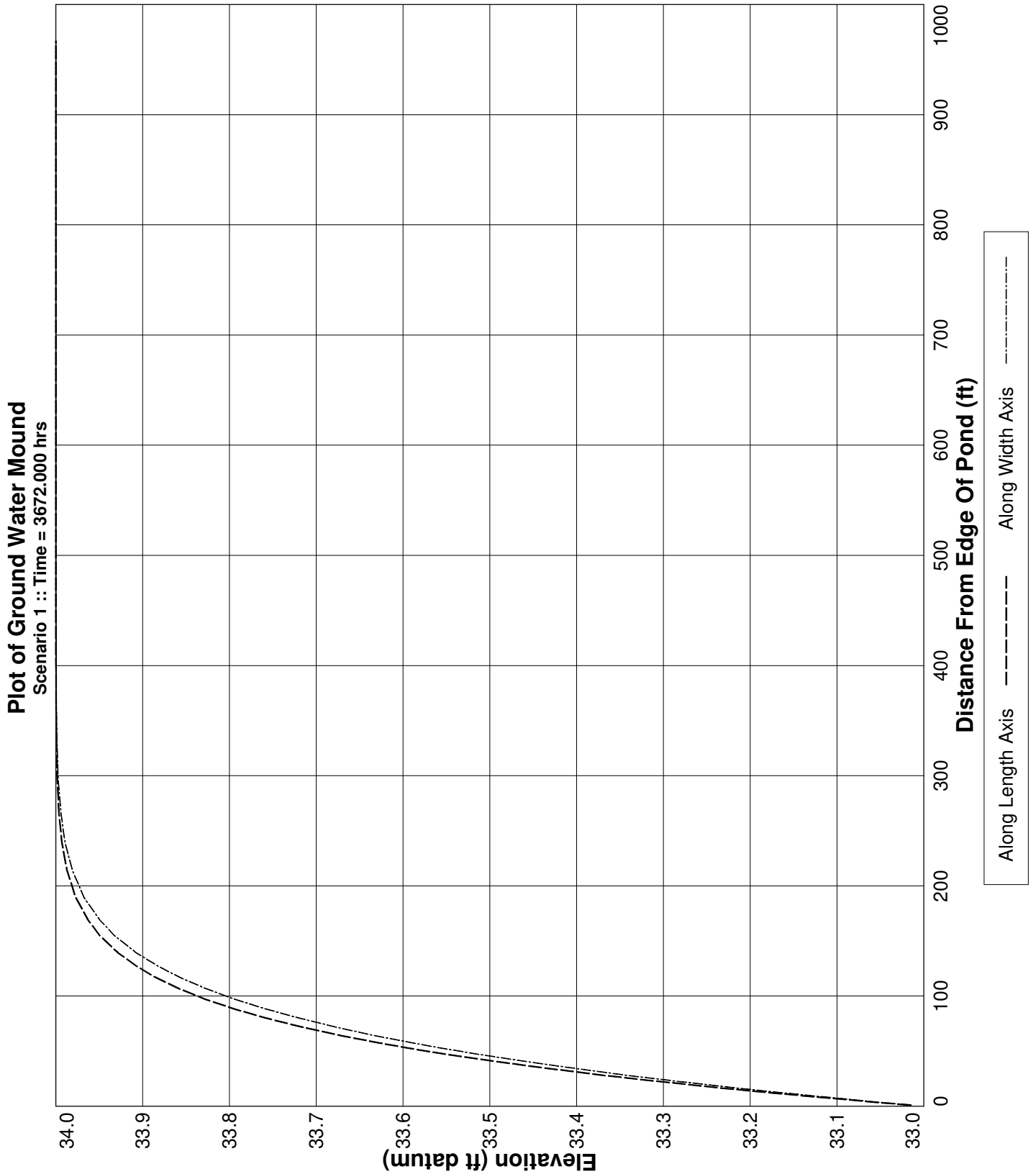
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0036	0.00163	33.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0036	0.00163	33.00000	-0.00004	5.025056E-03	4800.800	1479.4	3321.361	S
734.400	0.0036	0.00163	33.00000	-0.00108	4.618254E-03	9601.600	-93.6	9695.204	S
1101.600	0.0036	0.00163	33.00000	-0.00099	4.586328E-03	14402.400	-1376.7	15779.07	S
1468.800	0.0036	0.00163	33.00000	-0.00106	4.679671E-03	19203.200	-2700.3	21903.52	S
1836.000	0.0036	0.00163	33.00000	-0.00118	4.80955E-03	24004.000	-4171.5	28175.52	S
2203.200	0.0036	0.00163	33.00000	-0.00131	4.947248E-03	28804.800	-5819.6	34624.37	S
2570.400	0.0036	0.00163	33.00000	-0.00145	5.08241E-03	33605.600	-7648.0	41253.57	S
2937.600	0.0036	0.00163	33.00000	-0.00158	5.212074E-03	38406.400	-9651.4	48057.81	S
3304.800	0.0036	0.00163	33.00000	-0.00170	5.335898E-03	43207.200	-11822.4	55029.6	S
3672.000	0.0036	0.00163	33.00000	----	----	48008.000	-14153.6	62161.55	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 33, South1 Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-29-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -2.00  
Water Table Elevation, [WT] (ft datum): 34.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 353.0  
Equivalent Pond Width, [W] (ft): 136.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
3.00	435.6
33.00	47916.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	33.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/29/2023 9:57:31

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 33.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 3 of 10 saturated stress periods.

Maximum calculated water budget error is -2.67323896121806 percent, for saturated stress period 1.

If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

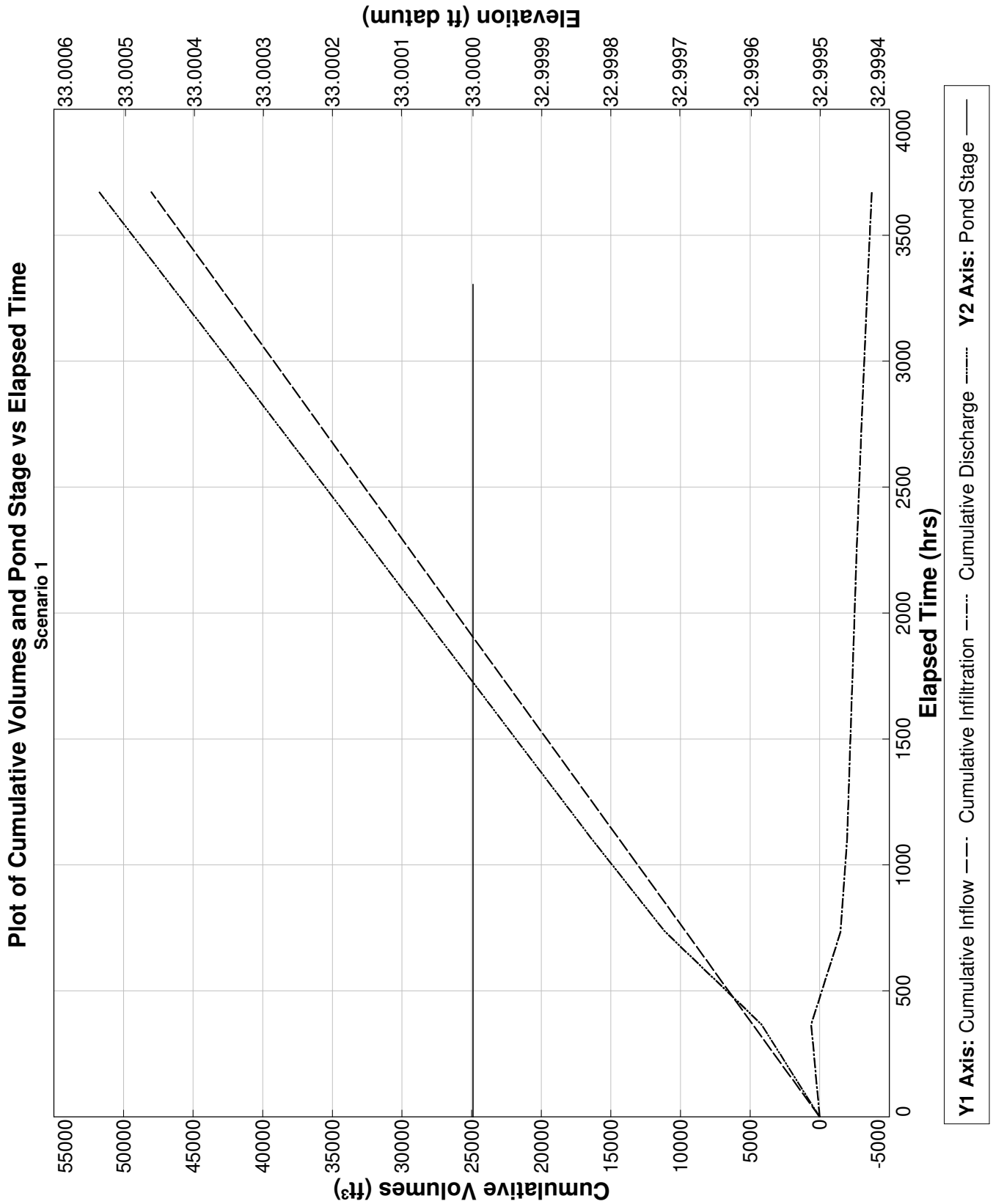
End Scenario 1 3/29/2023 9:57:31

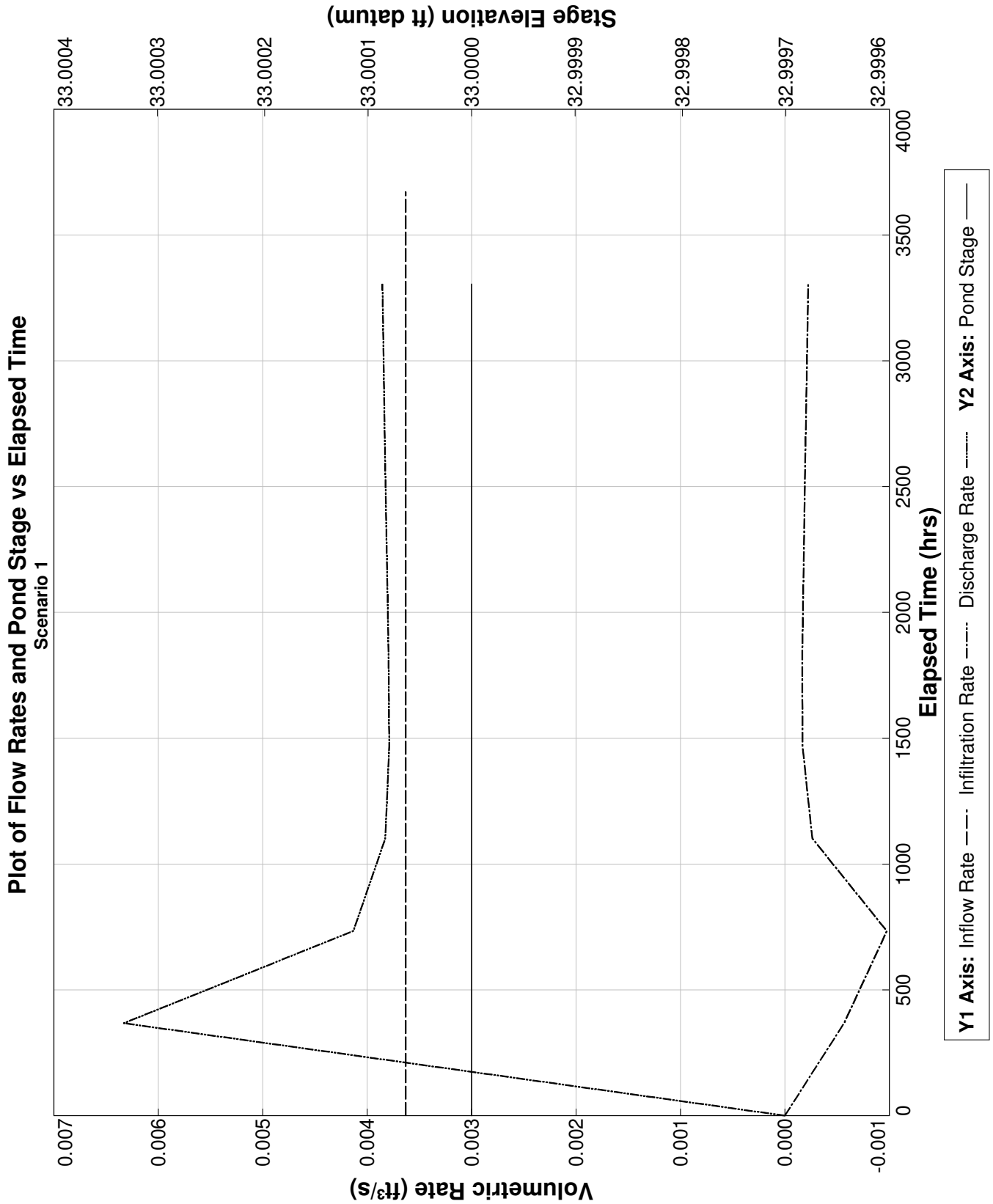
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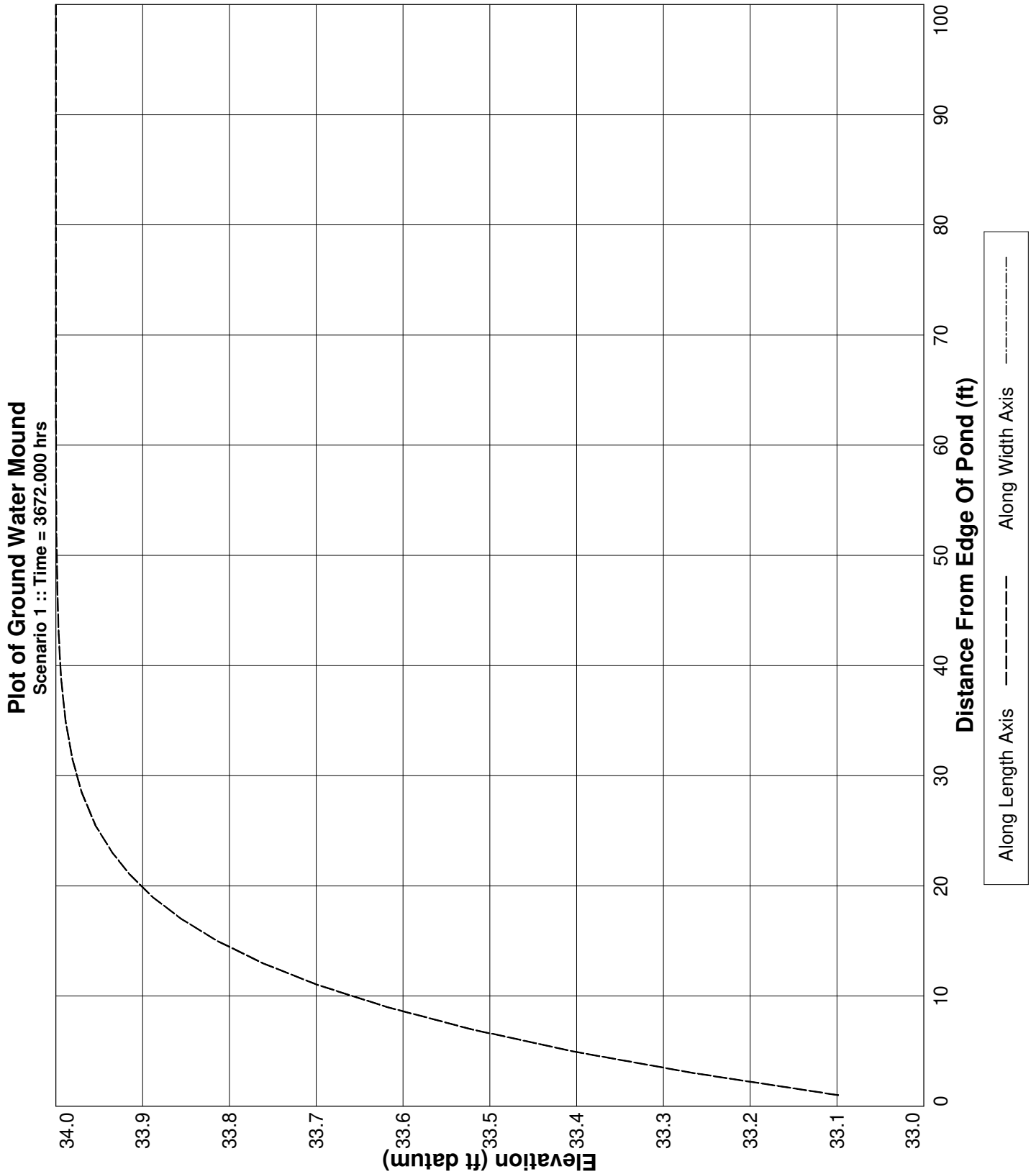
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0036	0.00163	33.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0036	0.00163	33.00000	-0.00057	6.331408E-03	4800.800	616.0	4184.808	S
734.400	0.0036	0.00163	33.00000	-0.00097	4.132154E-03	9601.600	-1499.2	11100.8	S
1101.600	0.0036	0.00163	33.00000	-0.00026	3.828082E-03	14402.400	-1959.8	16362.2	S
1468.800	0.0036	0.00163	33.00000	-0.00017	3.78795E-03	19203.200	-2192.9	21396.09	S
1836.000	0.0036	0.00163	33.00000	-0.00017	3.795247E-03	24004.000	-2404.3	26408.28	S
2203.200	0.0036	0.00163	33.00000	-0.00018	3.810406E-03	28804.800	-2630.5	31435.32	S
2570.400	0.0036	0.00163	33.00000	-0.00019	3.826022E-03	33605.600	-2877.1	36482.69	S
2937.600	0.0036	0.00163	33.00000	-0.00021	3.840875E-03	38406.400	-3143.8	41550.2	S
3304.800	0.0036	0.00163	33.00000	-0.00022	3.854877E-03	43207.200	-3429.6	46636.79	S
3672.000	0.0036	0.00163	33.00000	----	----	48008.000	-3733.4	51741.39	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 33, South2 Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-29-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -2.00  
Water Table Elevation, [WT] (ft datum): 35.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.29  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 353.0  
Equivalent Pond Width, [W] (ft): 136.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
3.00	435.6
33.00	47916.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	34.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/29/2023 9:58:54

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 34.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 7 of 10 saturated stress periods.

Maximum calculated water budget error is -4.25255377325517 percent, for saturated stress period 1.

If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

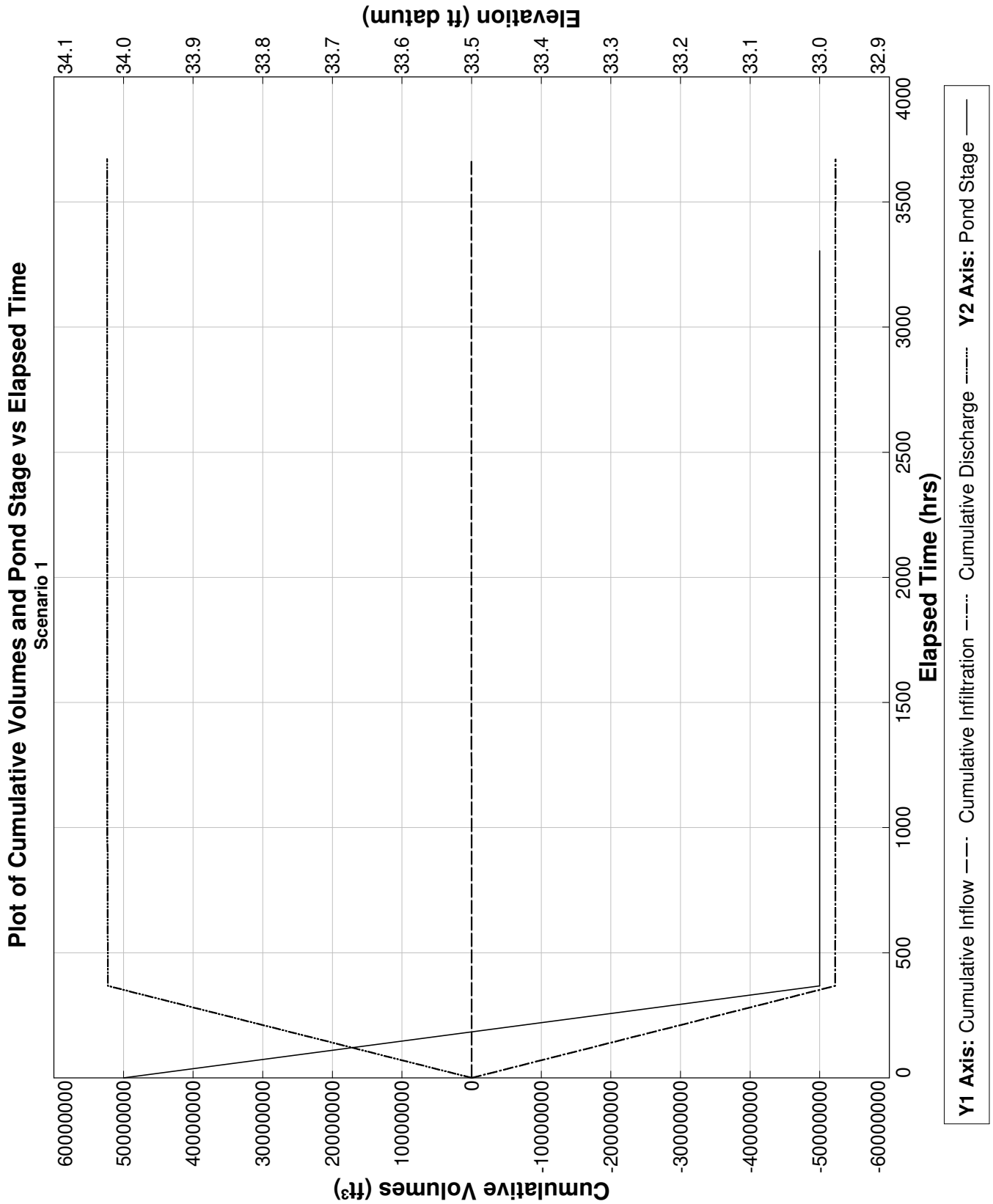
End Scenario 1 3/29/2023 9:58:54

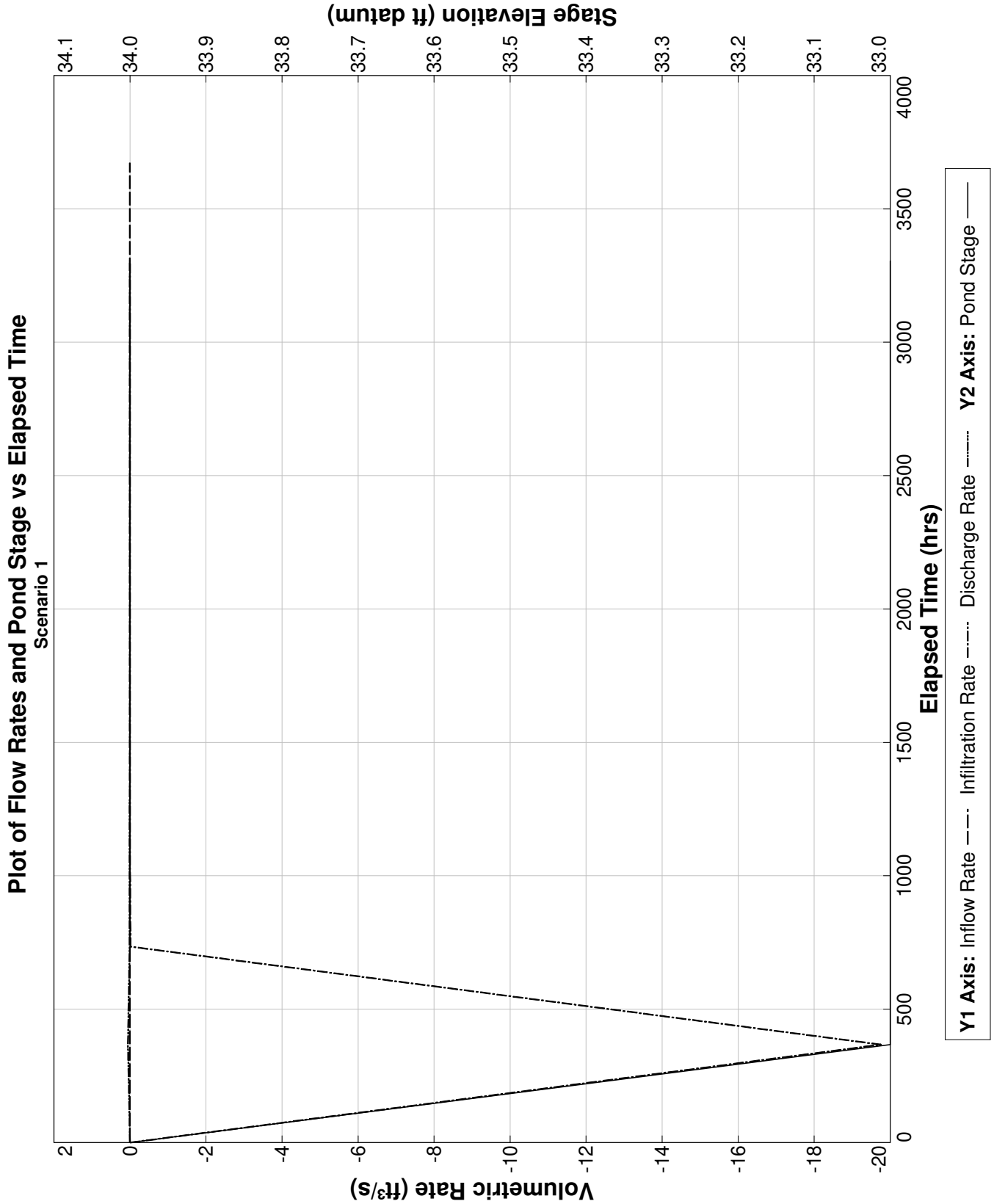
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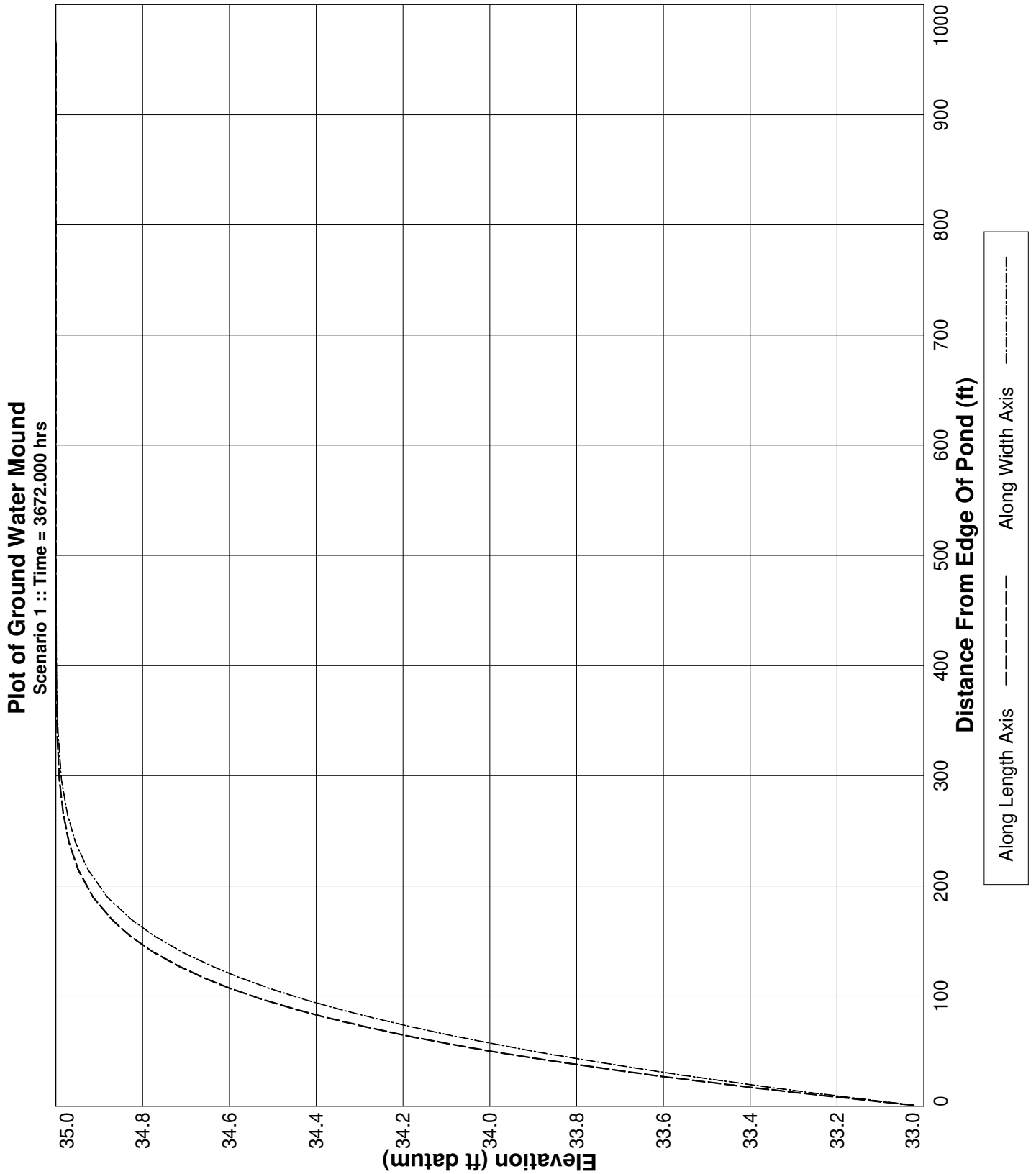
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0036	0.00163	34.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0036	0.00163	33.00000	-19.75586	5.120443E-02	4800.800	-52196970.0	5.224968E+07	S
734.400	0.0036	0.00163	33.00000	-0.01498	8.057119E-03	9601.600	-52231340.0	5.228885E+07	S
1101.600	0.0036	0.00163	33.00000	-0.00363	7.132507E-03	14402.400	-52236580.0	5.229889E+07	S
1468.800	0.0036	0.00163	33.00000	-0.00315	6.723204E-03	19203.200	-52240930.0	5.230805E+07	S
1836.000	0.0036	0.00163	33.00000	-0.00295	6.552208E-03	24004.000	-52244900.0	5.231682E+07	S
2203.200	0.0036	0.00163	33.00000	-0.00288	6.50198E-03	28804.800	-52248730.0	5.232546E+07	S
2570.400	0.0036	0.00163	33.00000	-0.00288	6.506438E-03	33605.600	-52252530.0	5.233405E+07	S
2937.600	0.0036	0.00163	33.00000	-0.00291	6.539988E-03	38406.400	-52256350.0	5.234268E+07	S
3304.800	0.0036	0.00163	33.00000	-0.00296	6.590115E-03	43207.200	-52260230.0	5.235135E+07	S
3672.000	0.0036	0.00163	33.00000	----	----	48008.000	-52264180.0	5.23601E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 33, South2 Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-29-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -2.00  
Water Table Elevation, [WT] (ft datum): 35.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 353.0  
Equivalent Pond Width, [W] (ft): 136.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
3.00	435.6
33.00	47916.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	34.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Retention Pond Recovery - Refined Method**  
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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/29/2023 10:0:30

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 34.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 5 of 10 saturated stress periods.

Maximum calculated water budget error is -3.64920326206818 percent, for saturated stress period 1.

If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

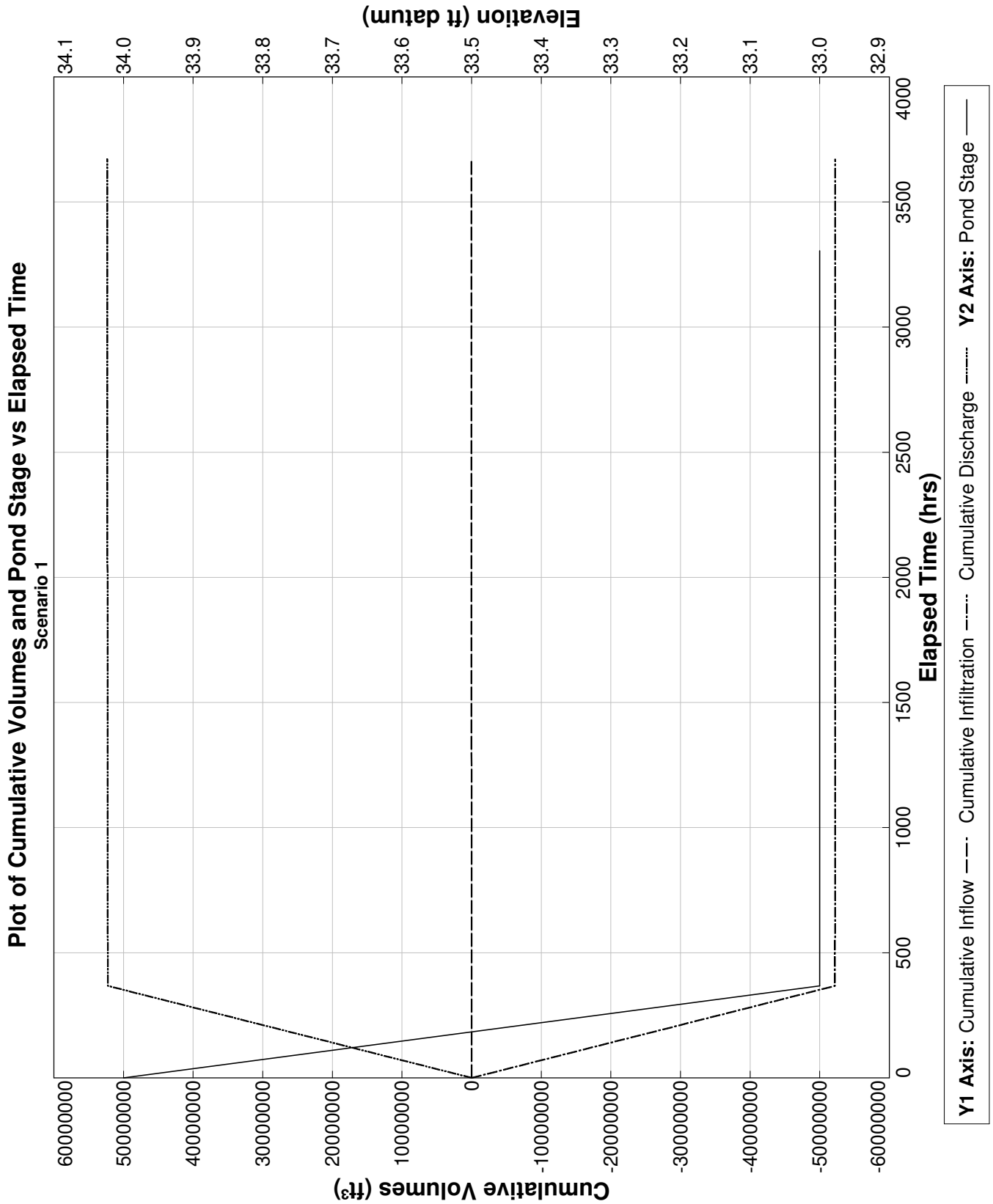
End Scenario 1 3/29/2023 10:0:30

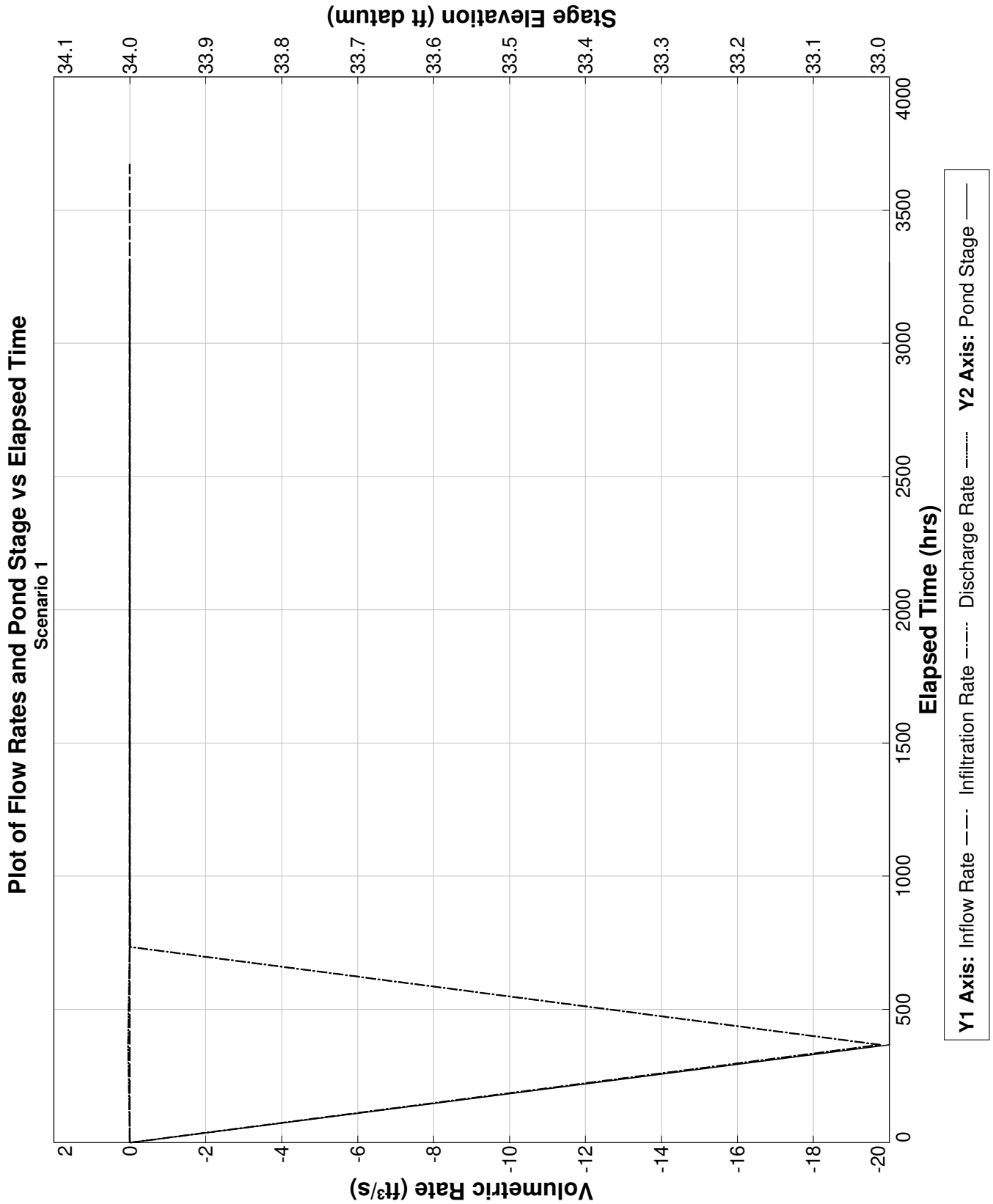
**PONDS Version 3.3.0278**  
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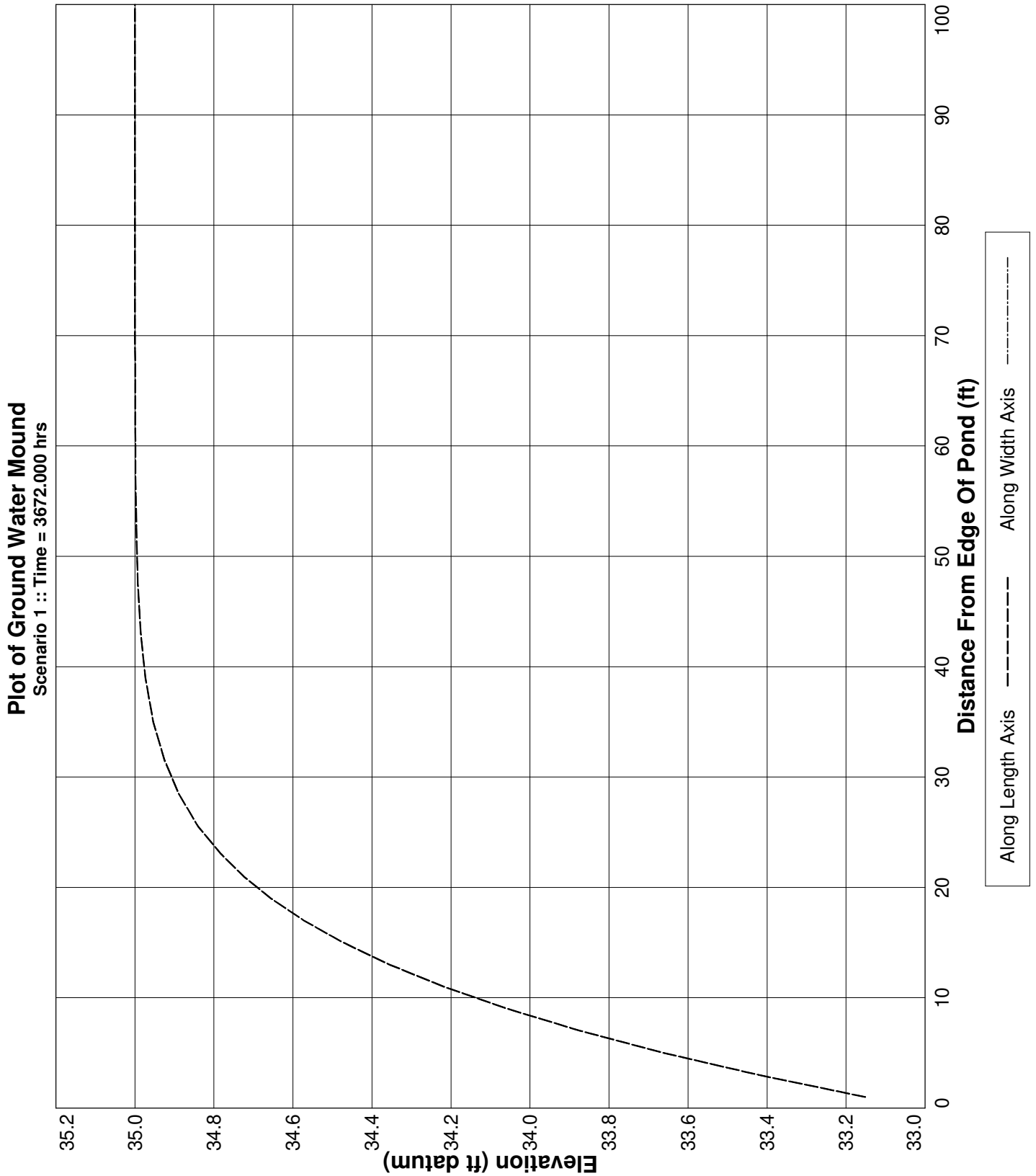
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0036	0.00163	34.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0036	0.00163	33.00000	-19.75214	4.557149E-02	4800.800	-52193240.0	5.224596E+07	S
734.400	0.0036	0.00163	33.00000	-0.01101	4.446375E-03	9601.600	-52221500.0	5.227902E+07	S
1101.600	0.0036	0.00163	33.00000	-0.00053	4.091781E-03	14402.400	-52222340.0	5.228466E+07	S
1468.800	0.0036	0.00163	33.00000	-0.00040	4.012174E-03	19203.200	-52222900.0	5.229002E+07	S
1836.000	0.0036	0.00163	33.00000	-0.00036	3.991759E-03	24004.000	-52223390.0	5.229531E+07	S
2203.200	0.0036	0.00163	33.00000	-0.00036	3.987002E-03	28804.800	-52223860.0	5.230058E+07	S
2570.400	0.0036	0.00163	33.00000	-0.00036	3.987743E-03	33605.600	-52224330.0	5.230586E+07	S
2937.600	0.0036	0.00163	33.00000	-0.00036	3.991058E-03	38406.400	-52224810.0	5.231113E+07	S
3304.800	0.0036	0.00163	33.00000	-0.00036	3.995808E-03	43207.200	-52225280.0	5.231641E+07	S
3672.000	0.0036	0.00163	33.00000	----	----	48008.000	-52225770.0	5.232169E+07	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 33, South3 Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-29-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -2.00  
Water Table Elevation, [WT] (ft datum): 36.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.29  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 353.0  
Equivalent Pond Width, [W] (ft): 136.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

Stage (ft datum)	Area (ft <sup>2</sup> )
3.00	435.6
33.00	47916.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	35.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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---

**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/29/2023 10:18:4

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 35.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 6 of 10 saturated stress periods.

Maximum calculated water budget error is -2.95208508494048 percent, for saturated stress period 1.

If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

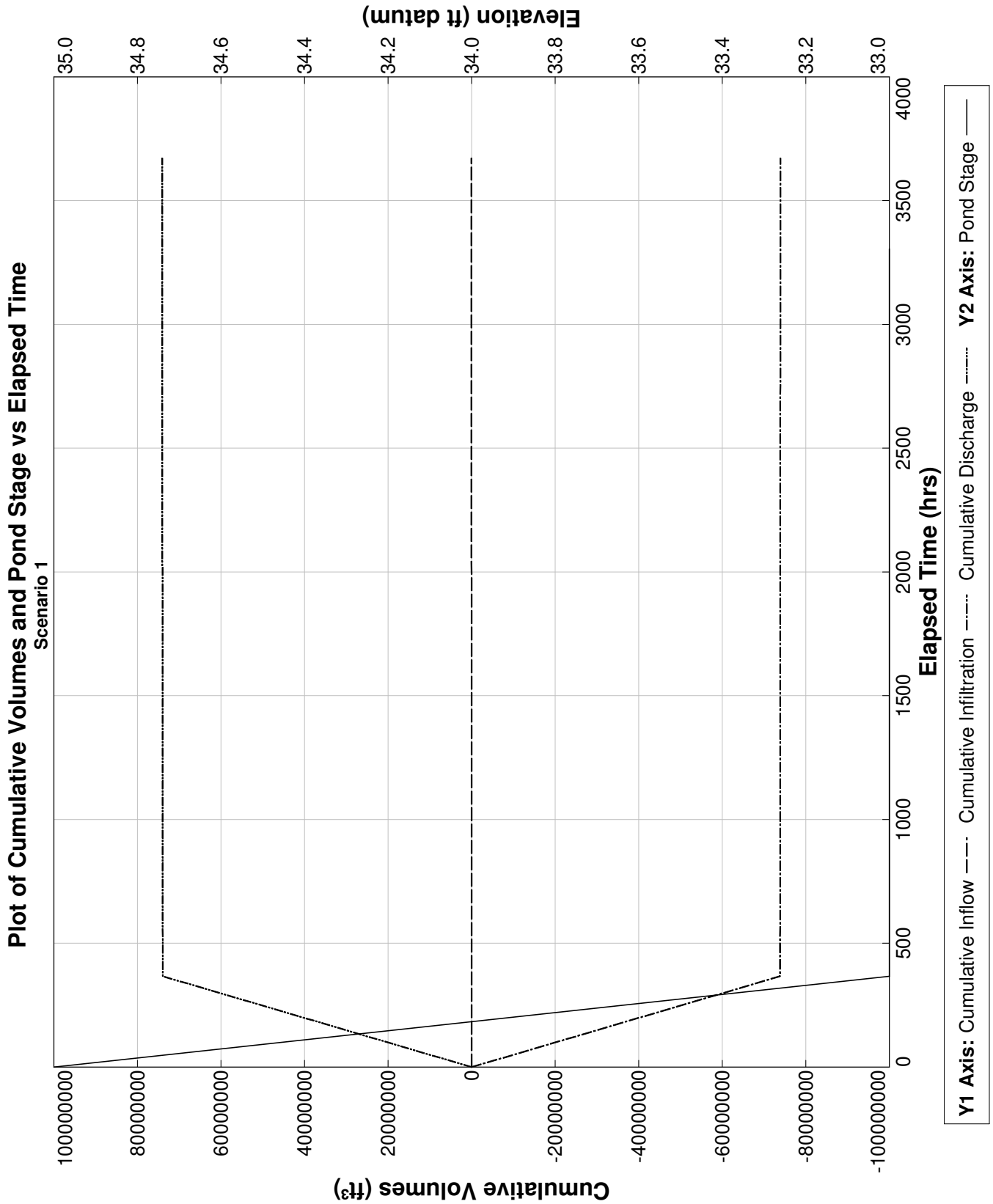
End Scenario 1 3/29/2023 10:18:4

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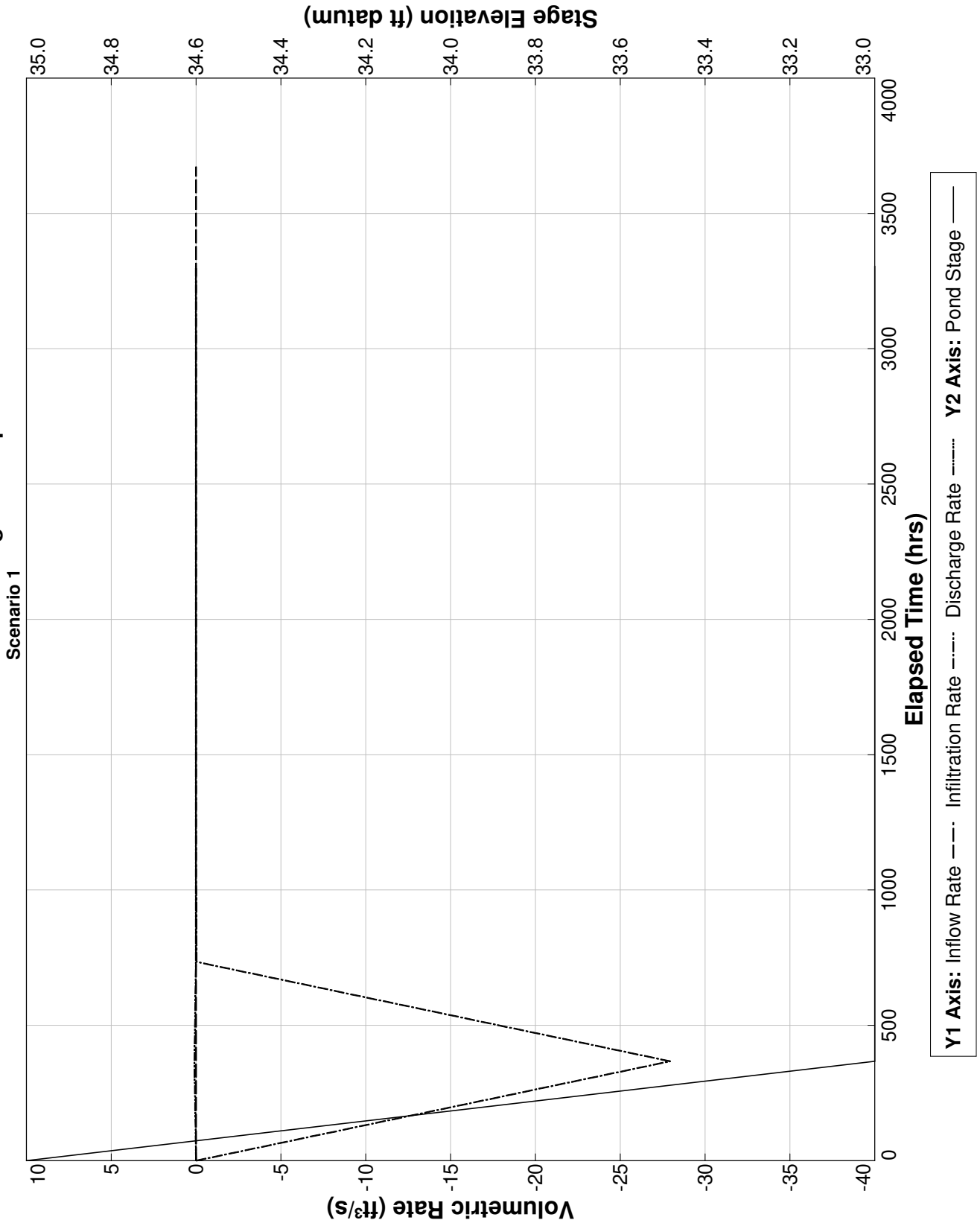
**Detailed Results** :: Scenario 1 ::

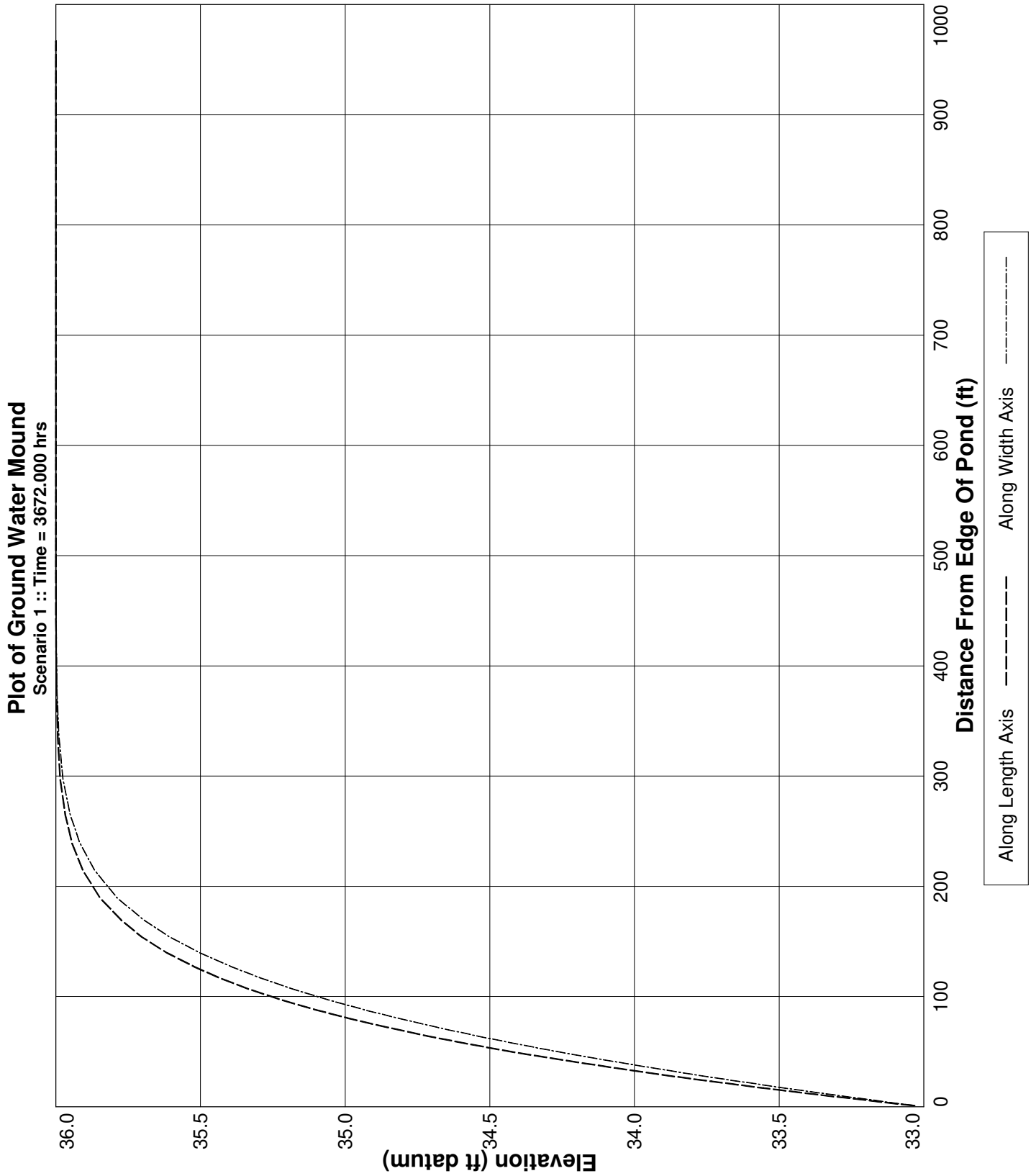
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0036	0.00163	35.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0036	0.00163	33.00000	-27.93932	.0917597	4800.800	-73804370.0	7.3905E+07	S
734.400	0.0036	0.00163	33.00000	-0.02678	1.040914E-02	9601.600	-73867100.0	7.397253E+07	S
1101.600	0.0036	0.00163	33.00000	-0.00565	9.079081E-03	14402.400	-73875180.0	7.398541E+07	S
1468.800	0.0036	0.00163	33.00000	-0.00497	8.550795E-03	19203.200	-73882020.0	7.399706E+07	S
1836.000	0.0036	0.00163	33.00000	-0.00463	8.227891E-03	24004.000	-73888310.0	7.400815E+07	S
2203.200	0.0036	0.00163	33.00000	-0.00442	8.031721E-03	28804.800	-73894260.0	7.40189E+07	S
2570.400	0.0036	0.00163	33.00000	-0.00431	7.929358E-03	33605.600	-73900010.0	7.402945E+07	S
2937.600	0.0036	0.00163	33.00000	-0.00425	7.873986E-03	38406.400	-73905660.0	7.40399E+07	S
3304.800	0.0036	0.00163	33.00000	-0.00423	7.854899E-03	43207.200	-73911250.0	7.405029E+07	S
3672.000	0.0036	0.00163	33.00000	----	----	48008.000	-73916830.0	7.406067E+07	N.A.





Plot of Flow Rates and Pond Stage vs Elapsed Time





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---

**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 33, South3 Wetland, with wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-29-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -2.00  
Water Table Elevation, [WT] (ft datum): 36.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 353.0  
Equivalent Pond Width, [W] (ft): 136.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
3.00	435.6
33.00	47916.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	35.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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---

**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/29/2023 10:20:32

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 35.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 6 of 10 saturated stress periods.

Maximum calculated water budget error is -2.56855887746159 percent, for saturated stress period 1.

If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

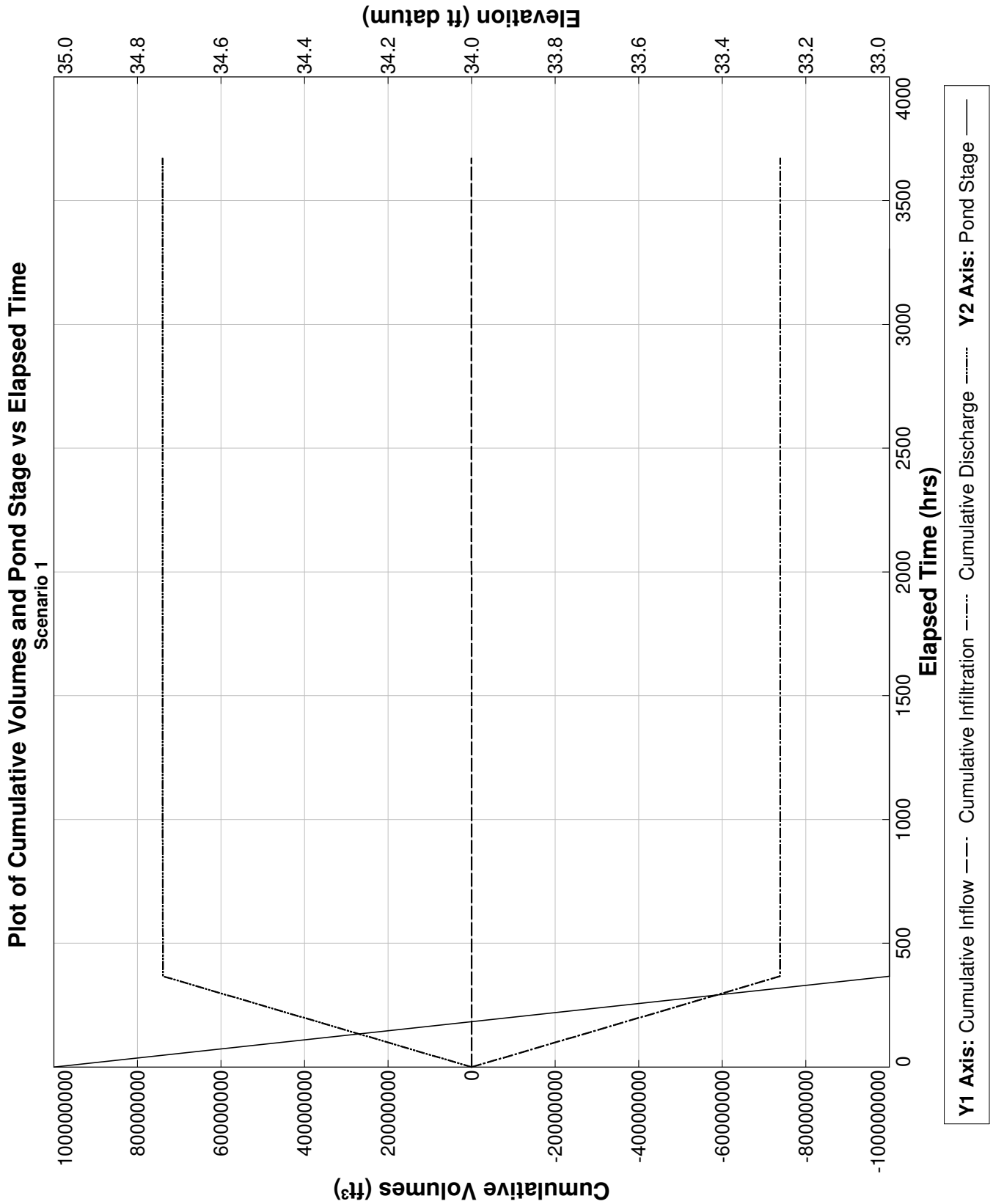
End Scenario 1 3/29/2023 10:20:32

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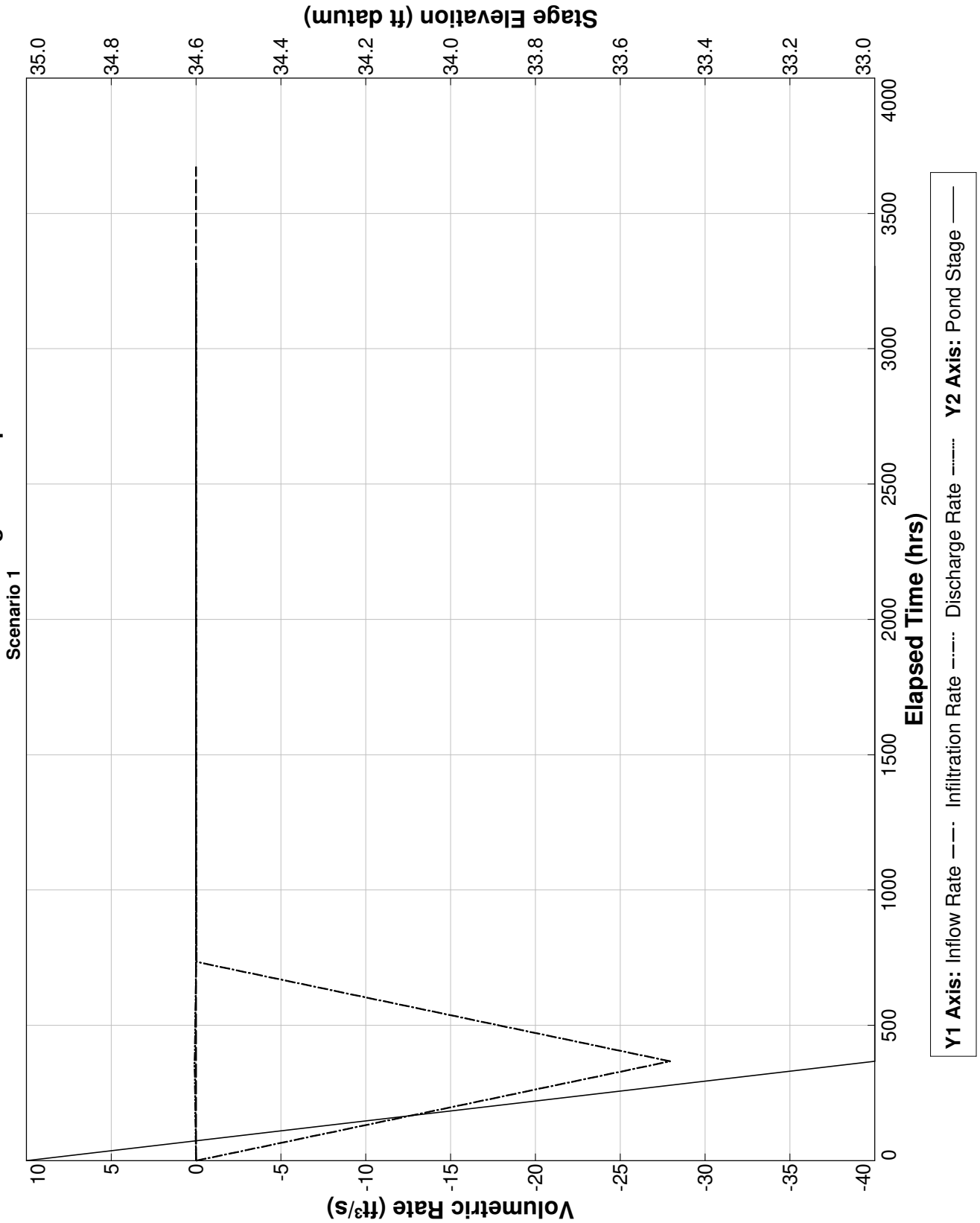
**Detailed Results**    :: Scenario 1 ::

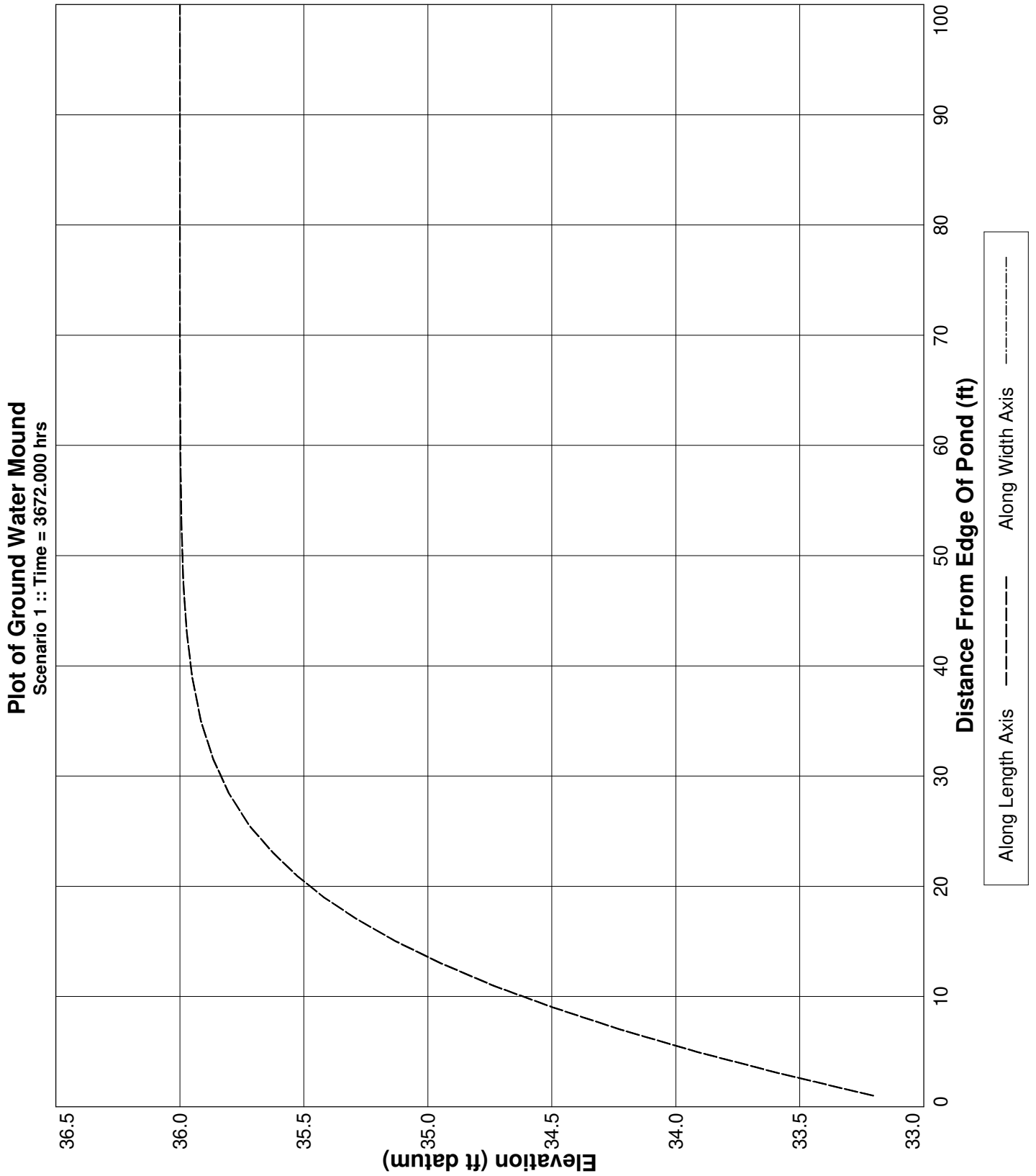
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0036	0.00163	35.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0036	0.00163	33.00000	-27.93353	8.193903E-02	4800.800	-73797870.0	7.38985E+07	S
734.400	0.0036	0.00163	33.00000	-0.02145	6.872972E-03	9601.600	-73851780.0	7.395721E+07	S
1101.600	0.0036	0.00163	33.00000	-0.00148	4.64939E-03	14402.400	-73854590.0	7.396482E+07	S
1468.800	0.0036	0.00163	33.00000	-0.00072	4.287737E-03	19203.200	-73855700.0	7.397073E+07	S
1836.000	0.0036	0.00163	33.00000	-0.00058	4.198724E-03	24004.000	-73856500.0	7.397634E+07	S
2203.200	0.0036	0.00163	33.00000	-0.00054	4.166571E-03	28804.800	-73857230.0	7.398187E+07	S
2570.400	0.0036	0.00163	33.00000	-0.00052	4.151054E-03	33605.600	-73857930.0	7.398737E+07	S
2937.600	0.0036	0.00163	33.00000	-0.00051	4.142582E-03	38406.400	-73858610.0	7.399285E+07	S
3304.800	0.0036	0.00163	33.00000	-0.00051	4.13804E-03	43207.200	-73859280.0	7.399832E+07	S
3672.000	0.0036	0.00163	33.00000	----	----	48008.000	-73859950.0	7.400379E+07	N.A.





Plot of Flow Rates and Pond Stage vs Elapsed Time





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**Retention Pond Recovery - Refined Method**  
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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 33, South4 Wetland, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-29-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -2.00  
Water Table Elevation, [WT] (ft datum): 37.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.29  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 353.0  
Equivalent Pond Width, [W] (ft): 136.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
3.00	435.6
33.00	47916.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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---

**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	36.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
> Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
> Starting on pass: 2  
> When outer iteration reaches: 50  
> Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/29/2023 10:26:32

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 36.0 ft.

#WARNING: The calculated water budget error exceeded the target water budget error for 4 of 10 saturated stress periods.

Maximum calculated water budget error is -1.70563707915584 percent, for saturated stress period 1.

If convergence is not a problem, it is recommended to reduce the Modflow convergence tolerances to attempt to decrease the water budget error to within the target level.

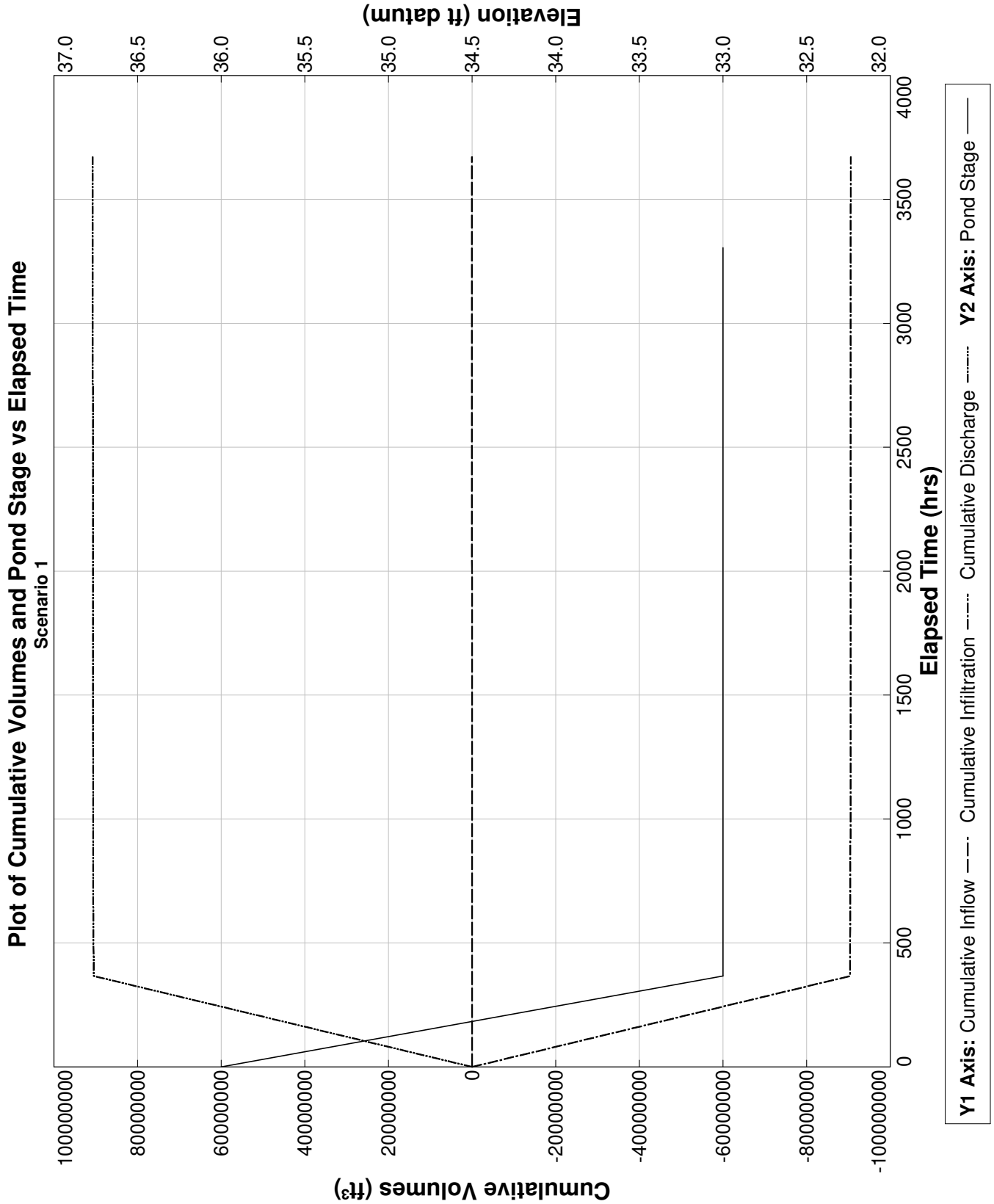
End Scenario 1 3/29/2023 10:26:32

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**Retention Pond Recovery - Refined Method**  
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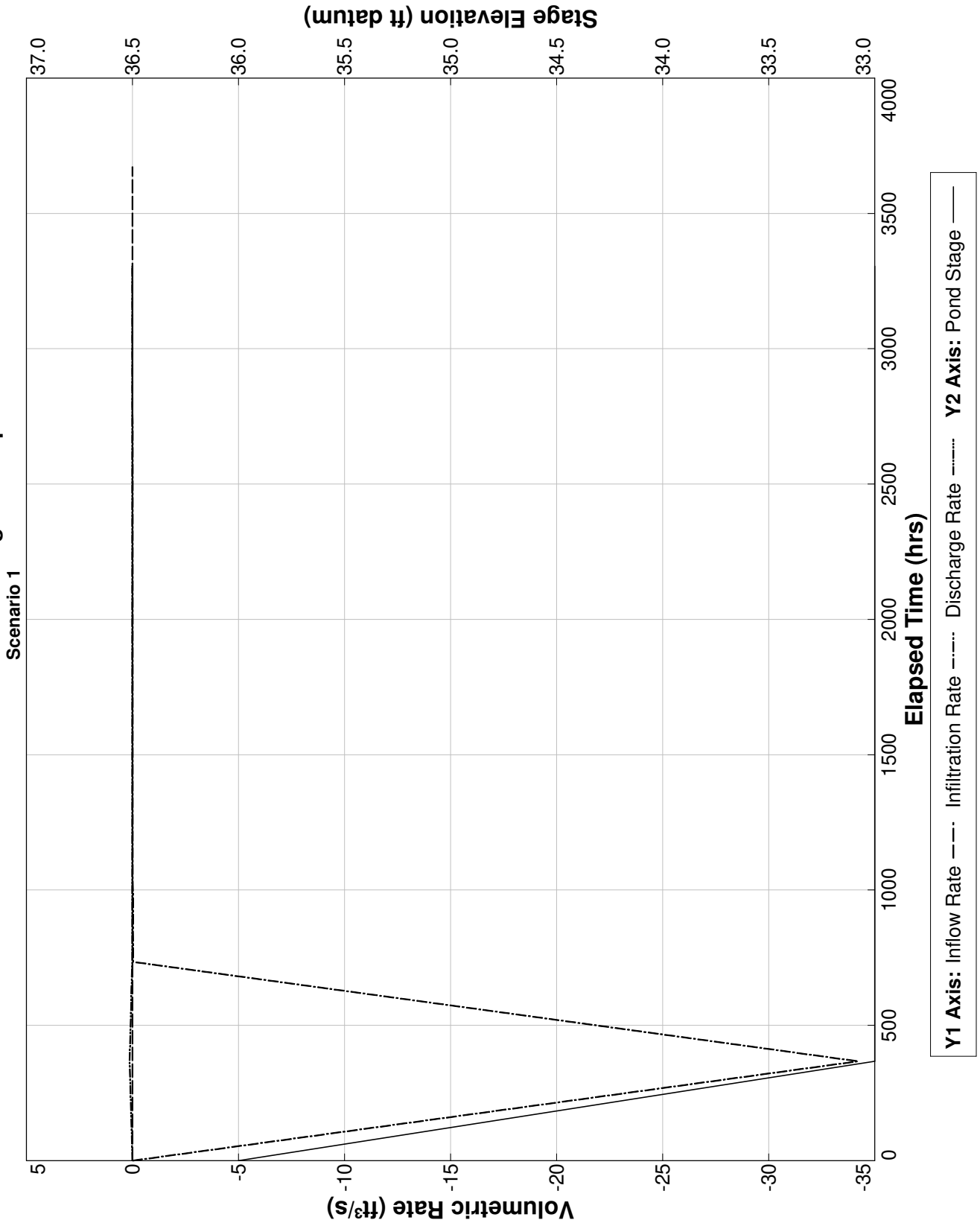
**Detailed Results**    :: Scenario 1 ::

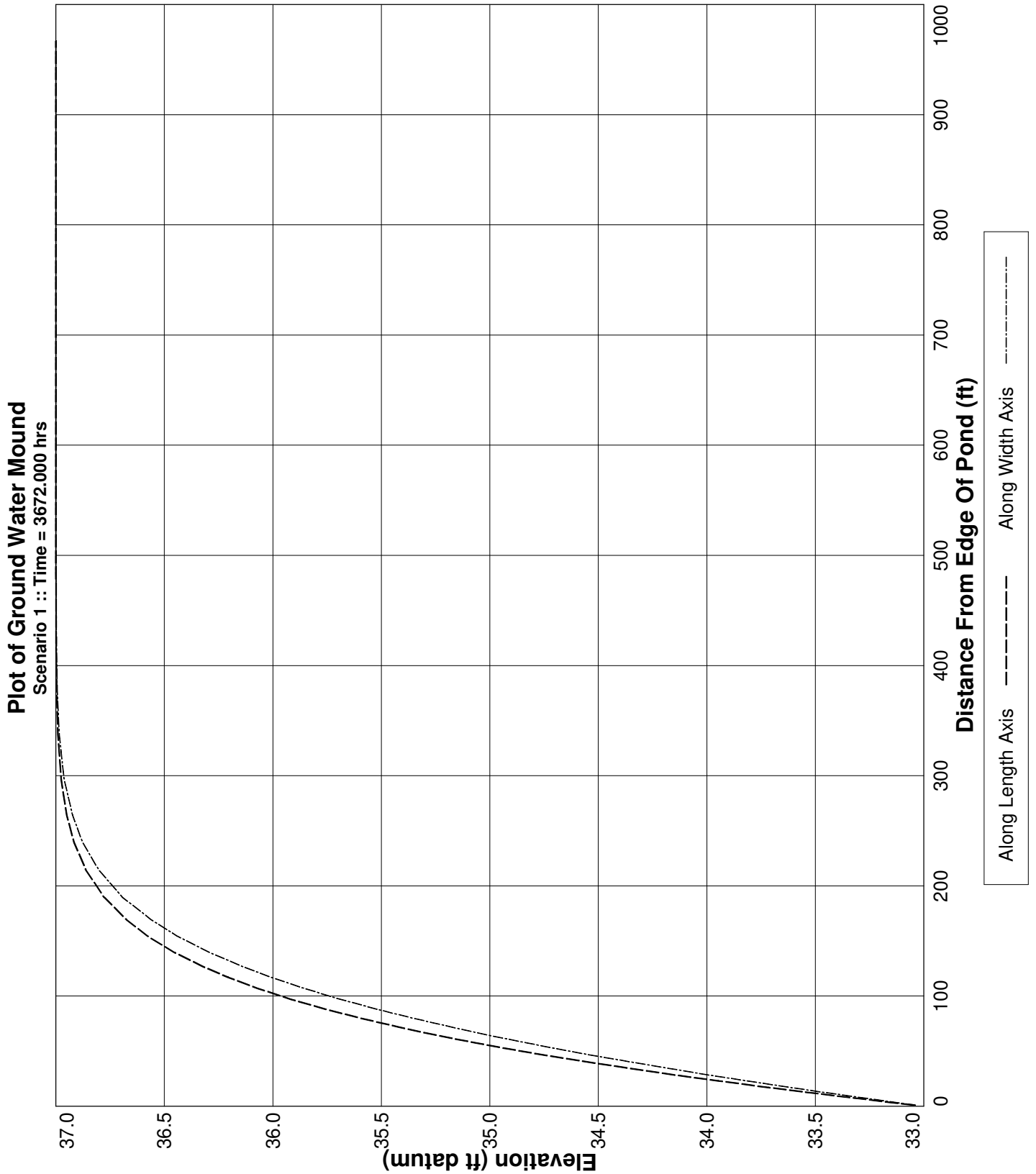
Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0036	0.00163	36.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0036	0.00163	33.00000	-34.21902	.131429	4800.800	-90378810.0	9.052736E+07	S
734.400	0.0036	0.00163	33.00000	-0.03862	1.322206E-02	9601.600	-90469620.0	9.062297E+07	S
1101.600	0.0036	0.00163	33.00000	-0.00784	1.112875E-02	14402.400	-90480910.0	9.063906E+07	S
1468.800	0.0036	0.00163	33.00000	-0.00684	1.042445E-02	19203.200	-90490350.0	9.06533E+07	S
1836.000	0.0036	0.00163	33.00000	-0.00633	9.921722E-03	24004.000	-90499000.0	9.066675E+07	S
2203.200	0.0036	0.00163	33.00000	-0.00599	9.593583E-03	28804.800	-90507100.0	9.067966E+07	S
2570.400	0.0036	0.00163	33.00000	-0.00576	9.371595E-03	33605.600	-90514830.0	9.069219E+07	S
2937.600	0.0036	0.00163	33.00000	-0.00561	9.23023E-03	38406.400	-90522330.0	9.070448E+07	S
3304.800	0.0036	0.00163	33.00000	-0.00551	9.13437E-03	43207.200	-90529660.0	9.071662E+07	S
3672.000	0.0036	0.00163	33.00000	----	----	48008.000	-90536900.0	9.072866E+07	N.A.





Plot of Flow Rates and Pond Stage vs Elapsed Time





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**Retention Pond Recovery - Refined Method**  
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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 33, EL 32 Baseflow, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-30-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -2.00  
Water Table Elevation, [WT] (ft datum): 32.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.29  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 353.0  
Equivalent Pond Width, [W] (ft): 136.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
3.00	435.6
33.00	47916.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Retention Pond Recovery - Refined Method**  
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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	31.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/30/2023 15:6:53

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 31.0 ft.

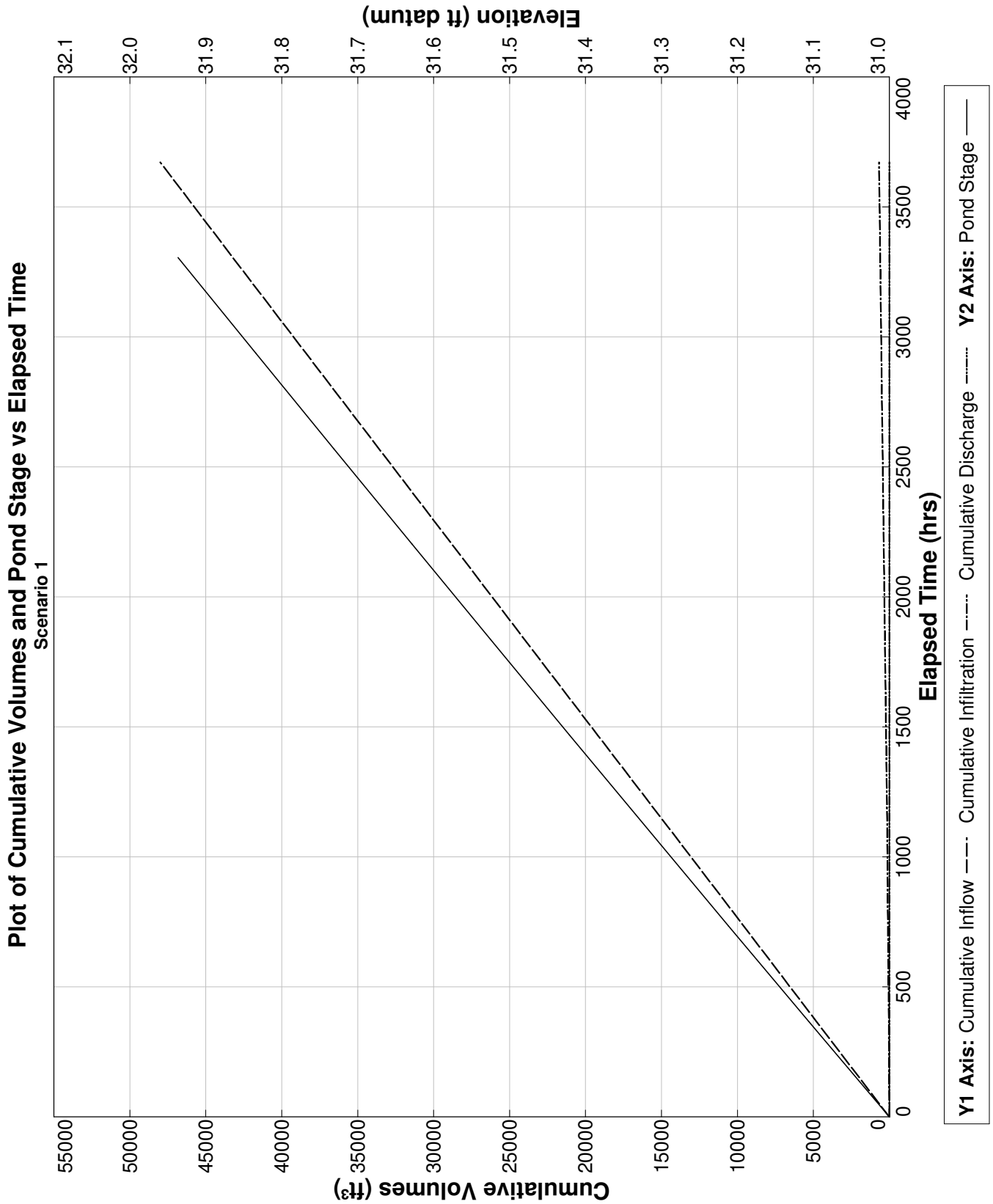
End Scenario 1 3/30/2023 15:6:53

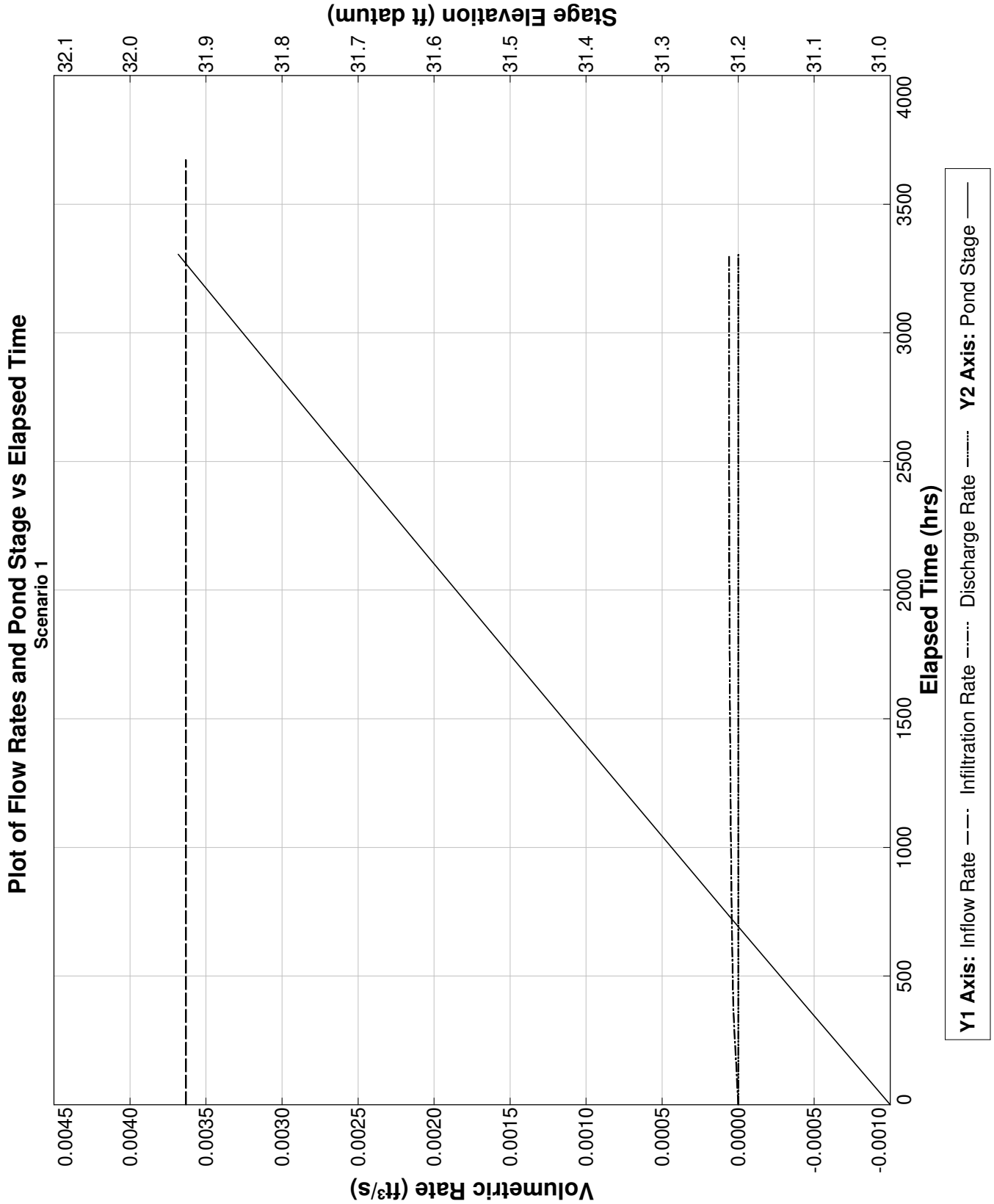
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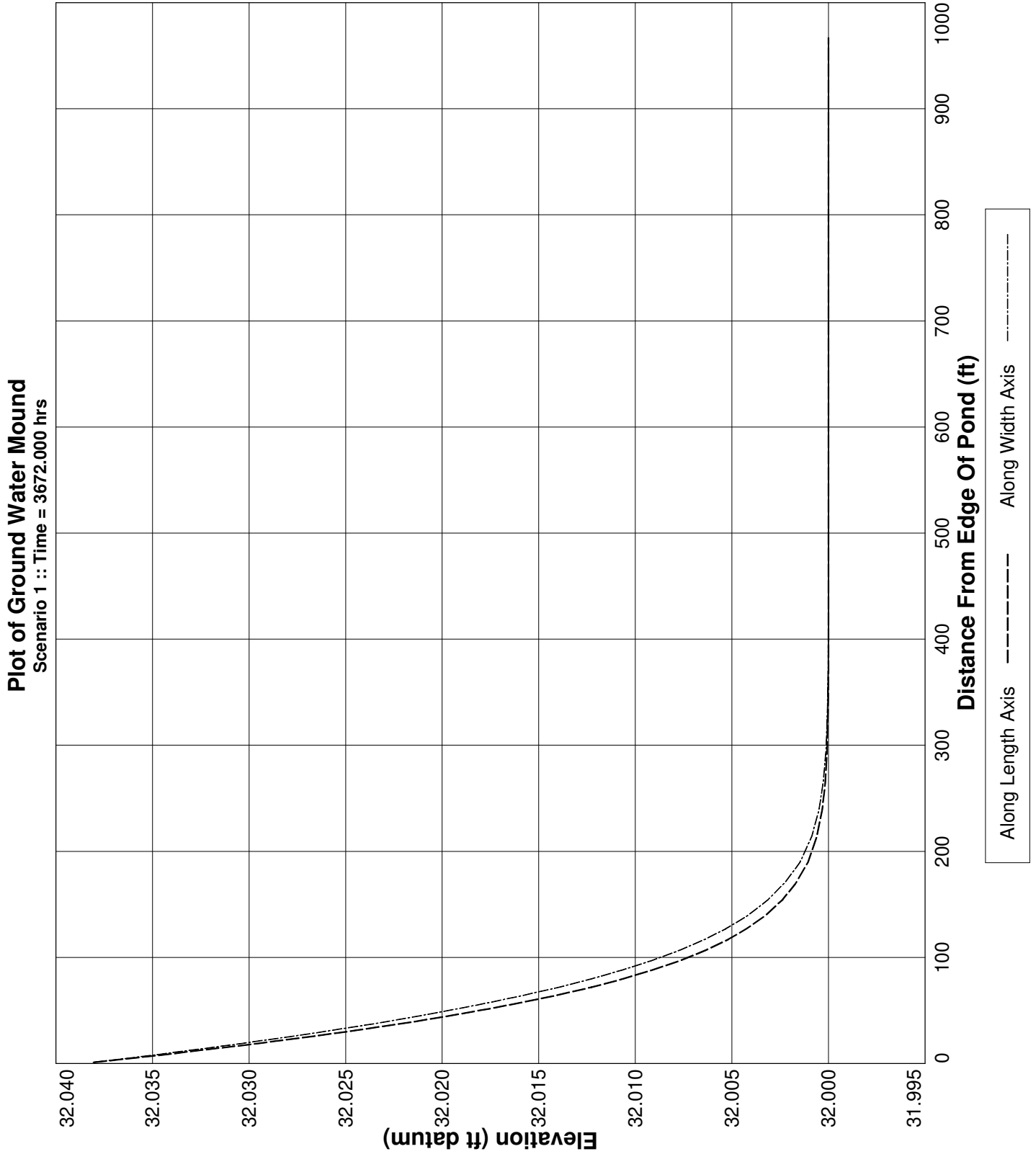
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0036	0.00163	31.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0036	0.00163	31.10631	0.00003	0	4800.800	34.4	0	S
734.400	0.0036	0.00163	31.21185	0.00004	0	9601.600	85.5	0	S
1101.600	0.0036	0.00163	31.31679	0.00005	0	14402.400	146.5	0	S
1468.800	0.0036	0.00163	31.42118	0.00005	0	19203.200	214.6	0	S
1836.000	0.0036	0.00163	31.52510	0.00006	0	24004.000	287.4	0	S
2203.200	0.0036	0.00163	31.62857	0.00006	0	28804.800	363.4	0	S
2570.400	0.0036	0.00163	31.73162	0.00006	0	33605.600	441.5	0	S
2937.600	0.0036	0.00163	31.83429	0.00006	0	38406.400	520.6	0	S
3304.800	0.0036	0.00163	31.93659	0.00006	0	43207.200	599.9	0	S
3672.000	0.0036	0.00163	32.03855	----	----	48008.000	678.8	0	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, SWMF No. 33, EL 32 Baseflow, without wall  
Simulation Description: background seepage  
Project Number: 35:31217-E  
Engineer : Nathan Hildreth, E.I.  
Supervising Engineer: Chris Egan, P.E.  
Date: 03-30-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): -2.00  
Water Table Elevation, [WT] (ft datum): 32.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 0.01  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 353.0  
Equivalent Pond Width, [W] (ft): 136.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage (ft datum)</u>	<u>Area (ft<sup>2</sup>)</u>
3.00	435.6
33.00	47916.0

**Discharge Structures**

**Discharge Structure #1 is active as weir**

Structure Parameters

Description: MES  
Weir elevation, (ft datum): 33  
Weir coefficient: 7.9  
Weir length, (ft): 10  
Weir exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.0
Initial (seasonal low) ground water level (ft datum)	31.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: all stress periods

Begin Scenario 1 3/30/2023 15:9:12

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 31.0 ft.

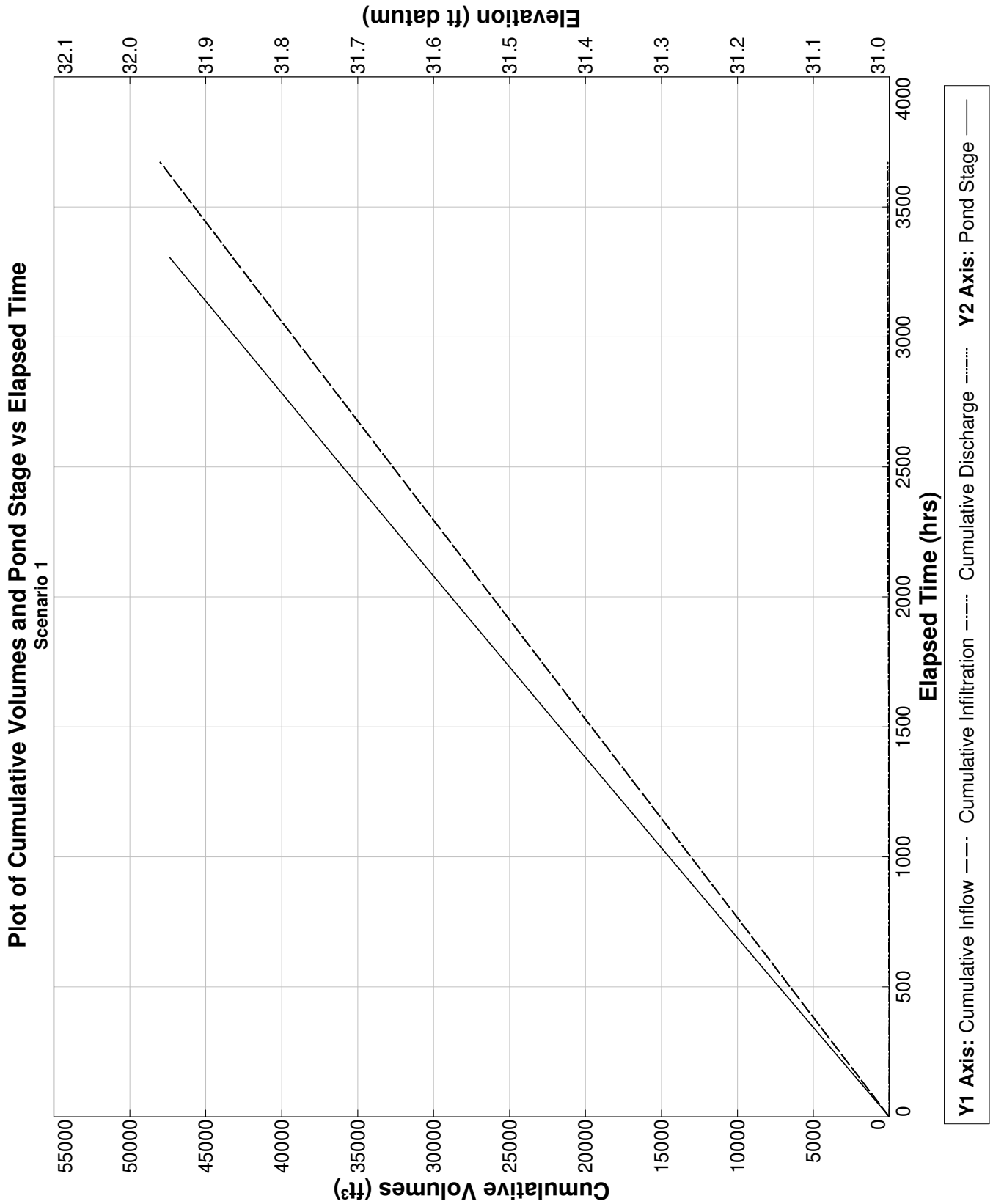
End Scenario 1 3/30/2023 15:9:12

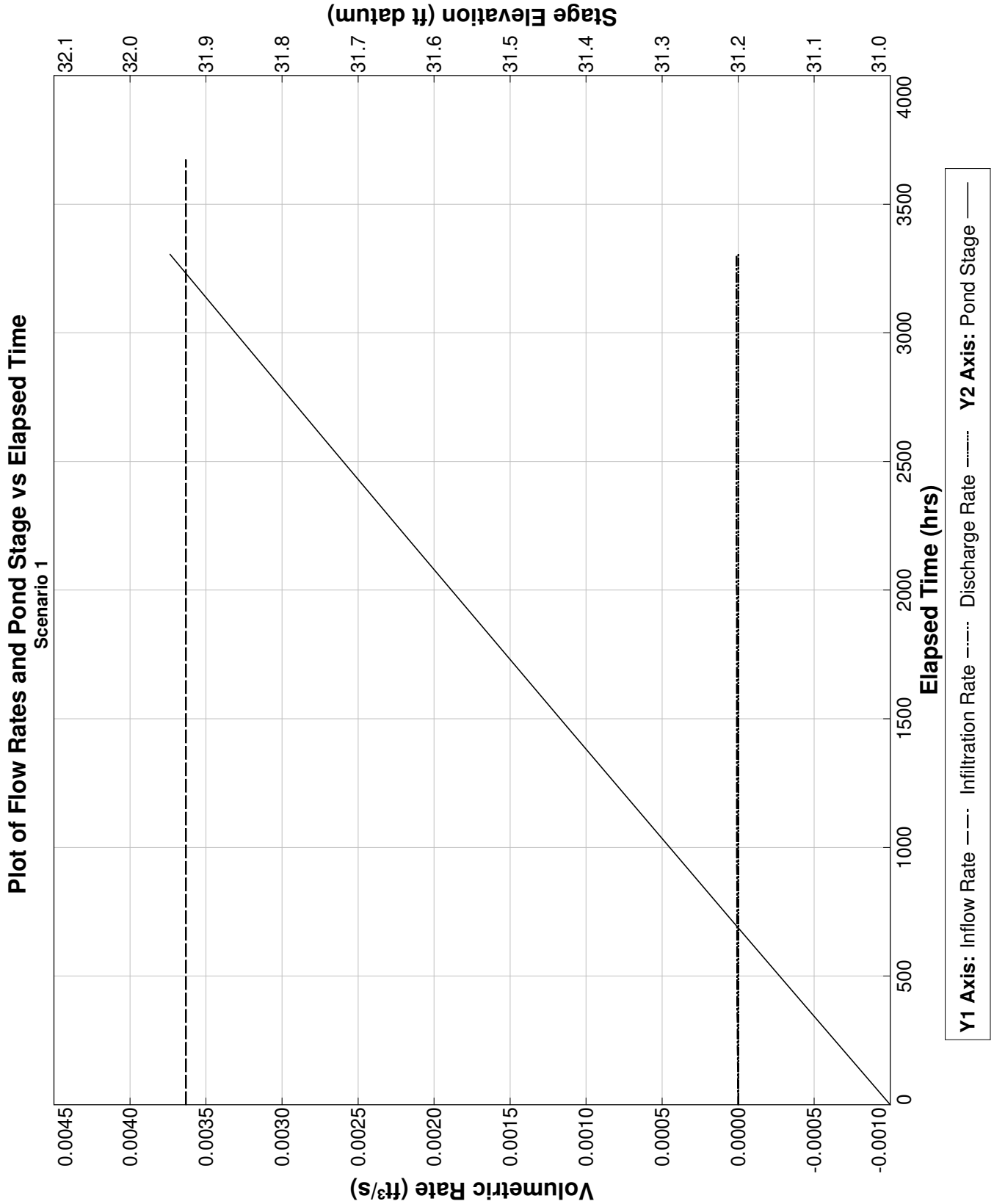
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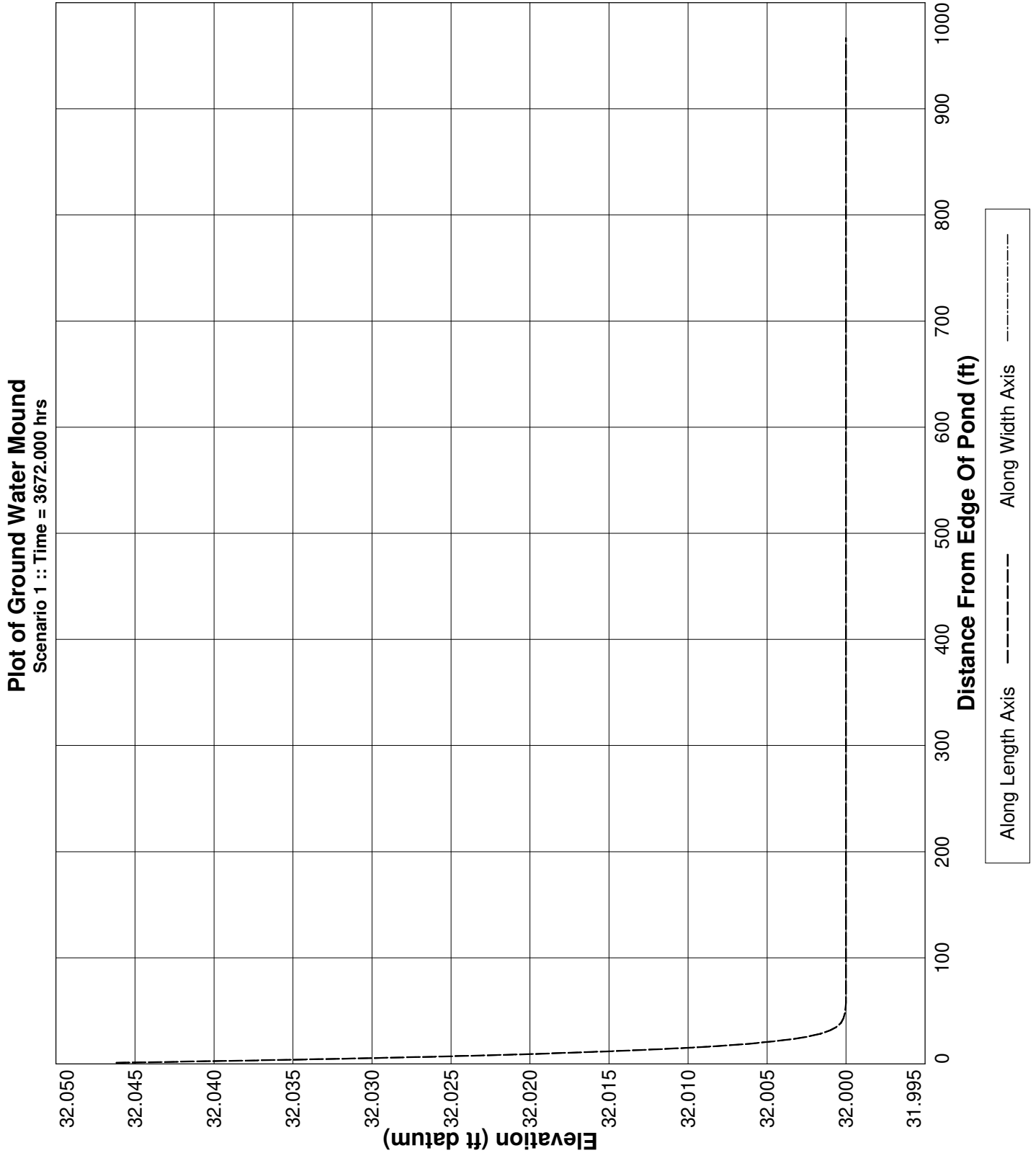
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0036	0.00163	31.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0036	0.00163	31.10695	0.00001	0	4800.800	5.7	0	S
734.400	0.0036	0.00163	31.21343	0.00001	0	9601.600	14.2	0	S
1101.600	0.0036	0.00163	31.31948	0.00001	0	14402.400	24.4	0	S
1468.800	0.0036	0.00163	31.42512	0.00001	0	19203.200	35.9	0	S
1836.000	0.0036	0.00163	31.53034	0.00001	0	24004.000	48.2	0	S
2203.200	0.0036	0.00163	31.63517	0.00001	0	28804.800	61.2	0	S
2570.400	0.0036	0.00163	31.73961	0.00001	0	33605.600	74.7	0	S
2937.600	0.0036	0.00163	31.84367	0.00001	0	38406.400	88.4	0	S
3304.800	0.0036	0.00163	31.94735	0.00001	0	43207.200	102.4	0	S
3672.000	0.0036	0.00163	32.05067	----	----	48008.000	116.4	0	N.A.









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**Project Data**

Project Name: The Rookery Phase 1, Underdrain Baseflow, White Ibis Lane, 13+50 to 15+50  
Simulation Description:  
Project Number: 35:31217-E  
Engineer : Nathan D. Hildreth, E.I.  
Supervising Engineer: Chris M. Egan, P.E.  
Date: 04-03-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 25.75  
Water Table Elevation, [WT] (ft datum): 32.25  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 15.90  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 500.0  
Equivalent Pond Width, [W] (ft): 2.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
30.00	400.0
31.00	550.0
32.00	400.0

**Discharge Structures**

**Discharge Structure #1 is active as orifice**

Structure Parameters

Description:

Orifice elevation, (ft datum): 30.5  
Orifice coefficient: 7.9  
Orifice area, (ft<sup>2</sup>): 0.196  
Orifice exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.5
Initial (seasonal low) ground water level (ft datum)	30.75
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: none

Begin Scenario 1 4/3/2023 9:12:35

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 30.75 ft.

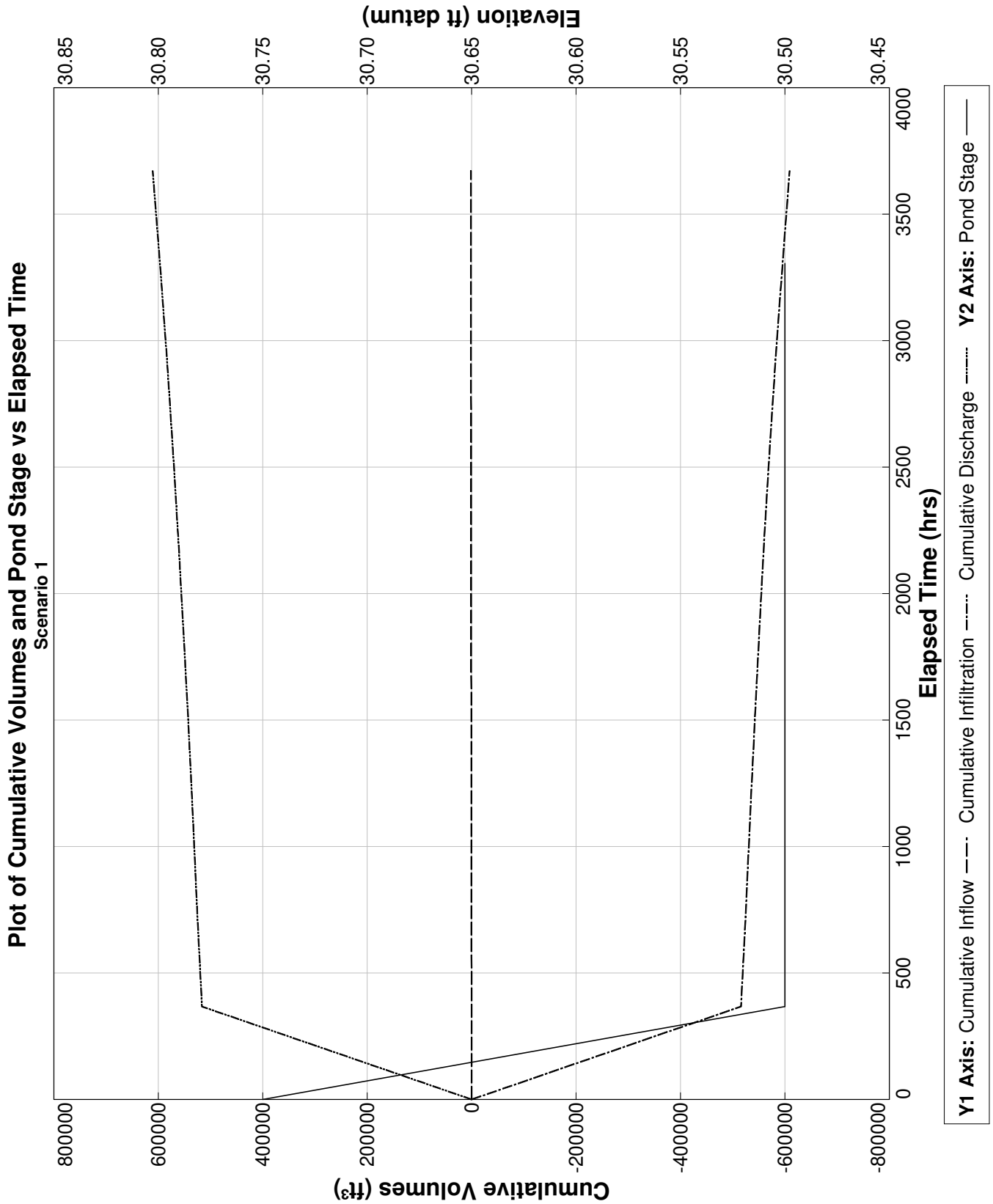
End Scenario 1 4/3/2023 9:12:35

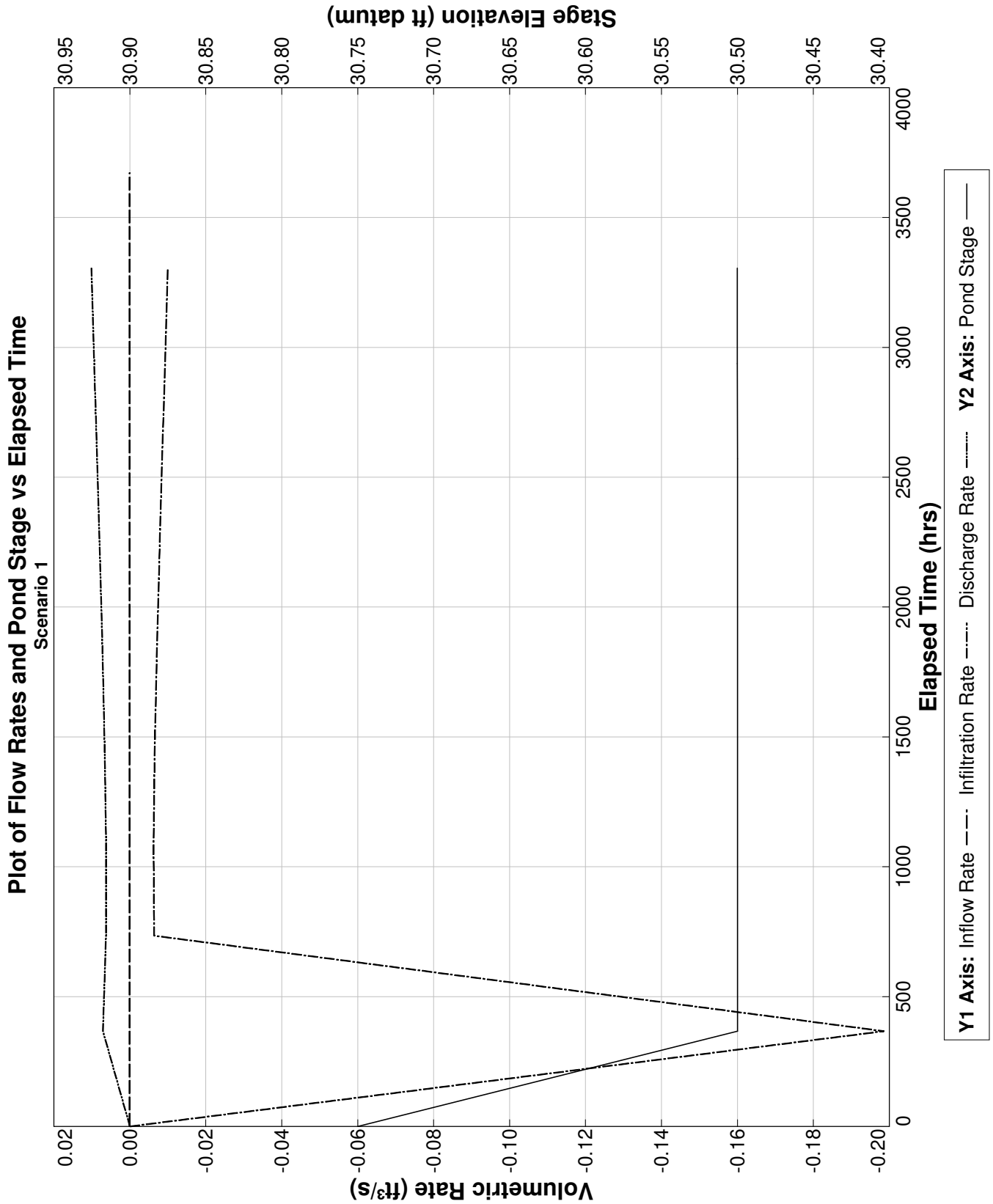
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**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0001	0.00245	30.75000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0001	0.00245	30.50002	-0.19850	7.076213E-03	150.000	-516118.9	516392.3	S
734.400	0.0001	0.00245	30.50002	-0.00637	6.284151E-03	300.000	-524799.6	525223	S
1101.600	0.0001	0.00245	30.50002	-0.00626	6.281816E-03	450.000	-532955.2	533528.6	S
1468.800	0.0001	0.00245	30.50002	-0.00659	6.651563E-03	600.000	-541353.6	542077.1	S
1836.000	0.0001	0.00245	30.50002	-0.00712	7.211088E-03	750.000	-550366.3	551239.7	S
2203.200	0.0001	0.00245	30.50003	-0.00778	7.860122E-03	900.000	-560177.8	561201.2	S
2570.400	0.0001	0.00245	30.50003	-0.00851	8.635697E-03	1050.000	-570930.8	572104.3	S
2937.600	0.0001	0.00245	30.50004	-0.00926	9.380862E-03	1200.000	-582689.1	584012.4	S
3304.800	0.0001	0.00245	30.50005	-0.00998	1.011396E-02	1350.000	-595424.4	596897.8	S
3672.000	0.0001	0.00245	30.50005	----	----	1500.000	-609083.4	610706.8	N.A.







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**Project Data**

Project Name: The Rookery Phase 1, Underdrain Baseflow, White Ibis Lane, 17+50 to 20+00  
Simulation Description:  
Project Number: 35:31217-E  
Engineer : Nathan D. Hildreth, E.I.  
Supervising Engineer: Chris M. Egan, P.E.  
Date: 04-03-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 25.75  
Water Table Elevation, [WT] (ft datum): 32.25  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 8.40  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 500.0  
Equivalent Pond Width, [W] (ft): 2.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
30.00	400.0
31.00	550.0
32.00	400.0

**Discharge Structures**

**Discharge Structure #1 is active as orifice**

Structure Parameters

Description:

Orifice elevation, (ft datum): 30.5  
Orifice coefficient: 7.9  
Orifice area, (ft<sup>2</sup>): 0.196  
Orifice exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.5
Initial (seasonal low) ground water level (ft datum)	30.75
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: none

Begin Scenario 1 4/3/2023 9:14:17

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

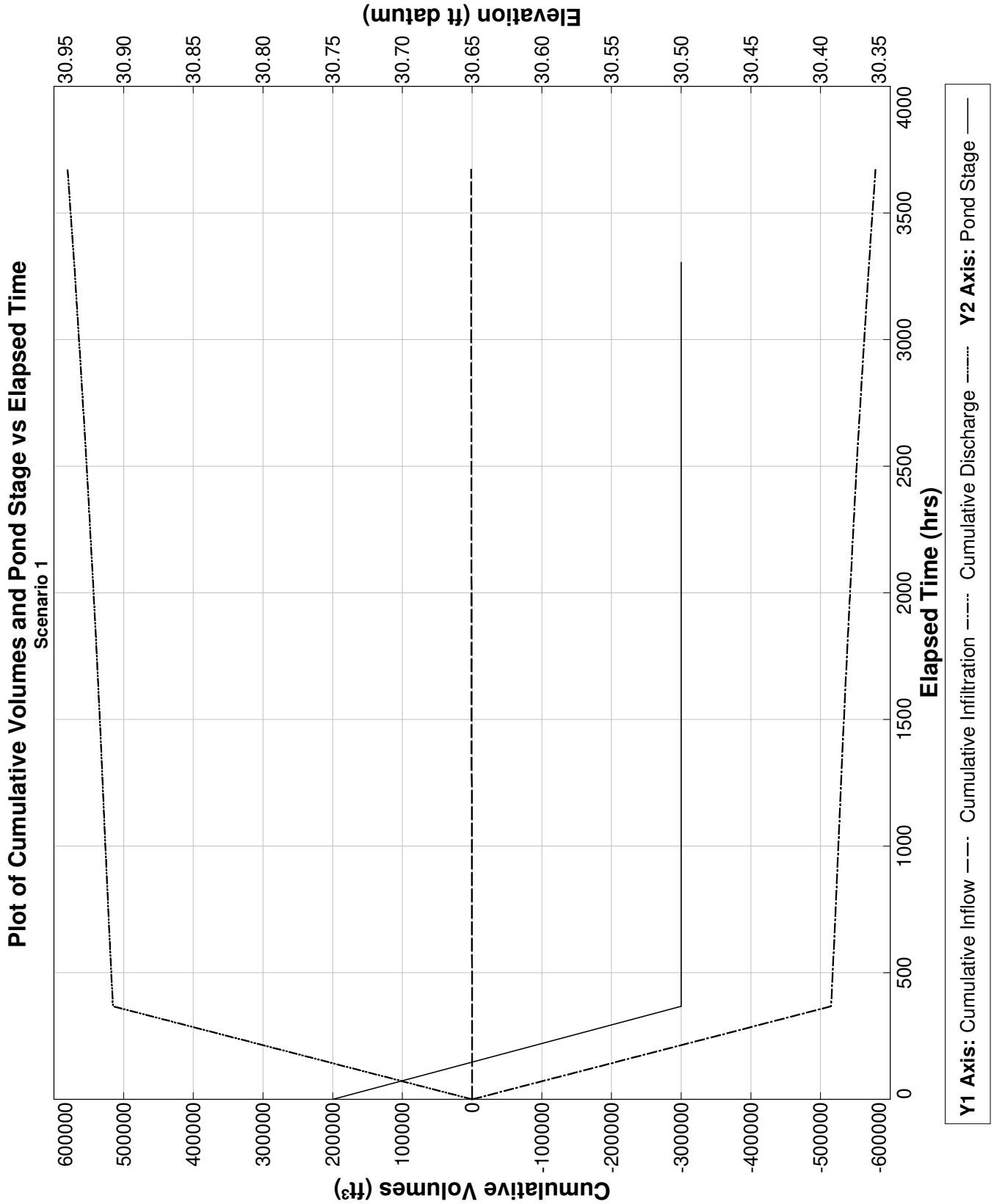
Baseflow hydrograph: Initial GWT (seasonal low) is 30.75 ft.

End Scenario 1 4/3/2023 9:14:17

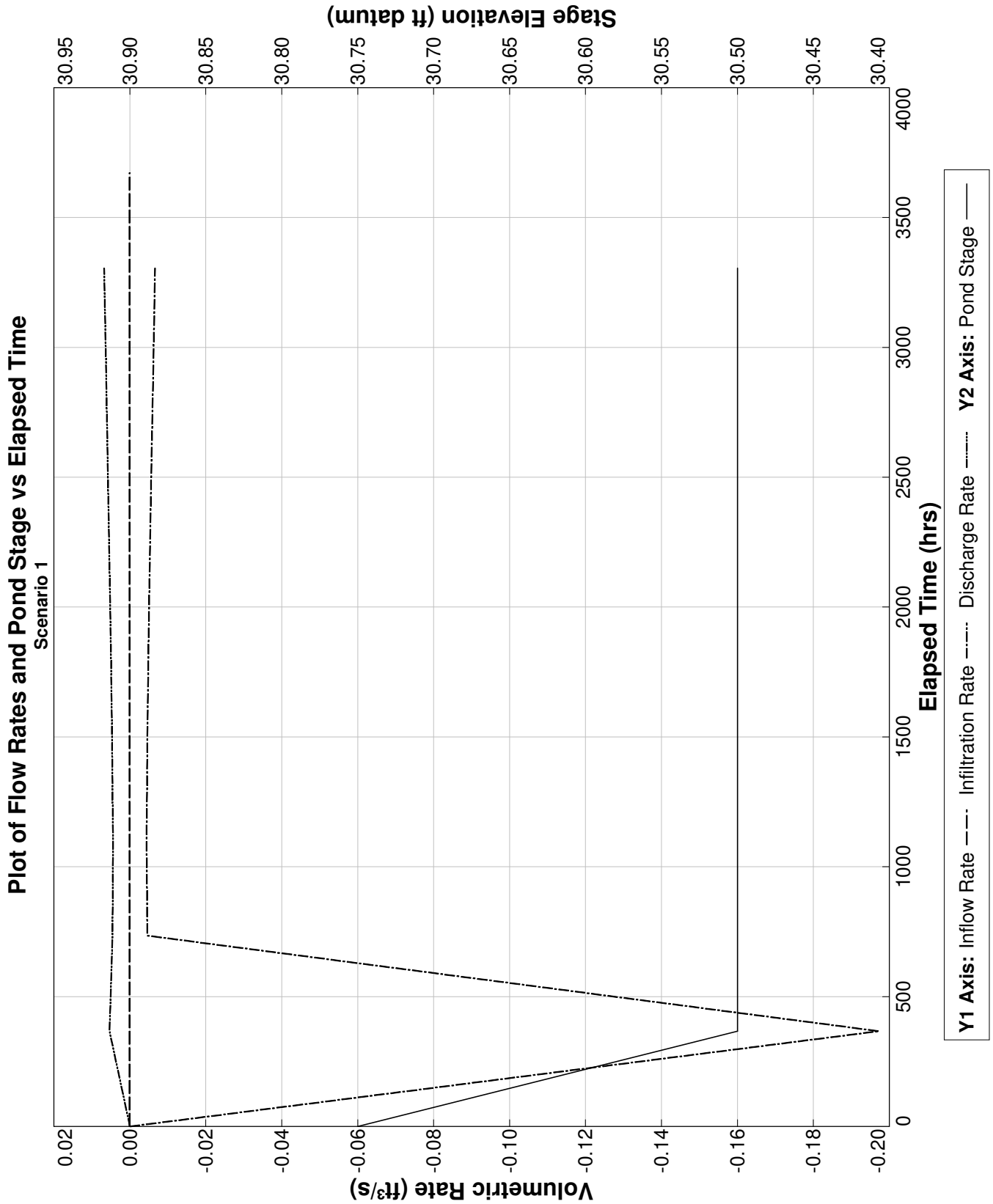
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**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0001	0.00245	30.75000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0001	0.00245	30.50001	-0.19720	5.338122E-03	150.000	-514970.1	515243.5	S
734.400	0.0001	0.00245	30.50001	-0.00461	4.550872E-03	300.000	-521356.3	521779.8	S
1101.600	0.0001	0.00245	30.50001	-0.00441	4.442844E-03	450.000	-527150.8	527724.3	S
1468.800	0.0001	0.00245	30.50001	-0.00457	4.643731E-03	600.000	-533006.7	533730.1	S
1836.000	0.0001	0.00245	30.50001	-0.00489	4.989509E-03	750.000	-539223.9	540097.3	S
2203.200	0.0001	0.00245	30.50001	-0.00530	5.402388E-03	900.000	-545942.5	546965.9	S
2570.400	0.0001	0.00245	30.50002	-0.00574	5.846986E-03	1050.000	-553227.9	554401.3	S
2937.600	0.0001	0.00245	30.50002	-0.00619	6.303002E-03	1200.000	-561108.5	562431.9	S
3304.800	0.0001	0.00245	30.50002	-0.00665	6.763057E-03	1350.000	-569594.7	571068.1	S
3672.000	0.0001	0.00245	30.50002	----	----	1500.000	-578688.3	580311.8	N.A.







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**Project Data**

Project Name: The Rookery Phase 1, Underdrain Baseflow, Lark Sparrow Street, 3+00 to 6+25  
Simulation Description:  
Project Number: 35:31217-E  
Engineer : Nathan D. Hildreth, E.I.  
Supervising Engineer: Chris M. Egan, P.E.  
Date: 04-03-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 30.95  
Water Table Elevation, [WT] (ft datum): 35.95  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 23.40  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 500.0  
Equivalent Pond Width, [W] (ft): 2.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
31.75	400.0
32.75	550.0
33.75	400.0

**Discharge Structures**

**Discharge Structure #1 is active as orifice**

Structure Parameters

Description:

Orifice elevation, (ft datum): 32.25  
Orifice coefficient: 7.9  
Orifice area, (ft<sup>2</sup>): 0.196  
Orifice exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.5
Initial (seasonal low) ground water level (ft datum)	34.45
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: none

Begin Scenario 1 4/3/2023 9:20:49

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

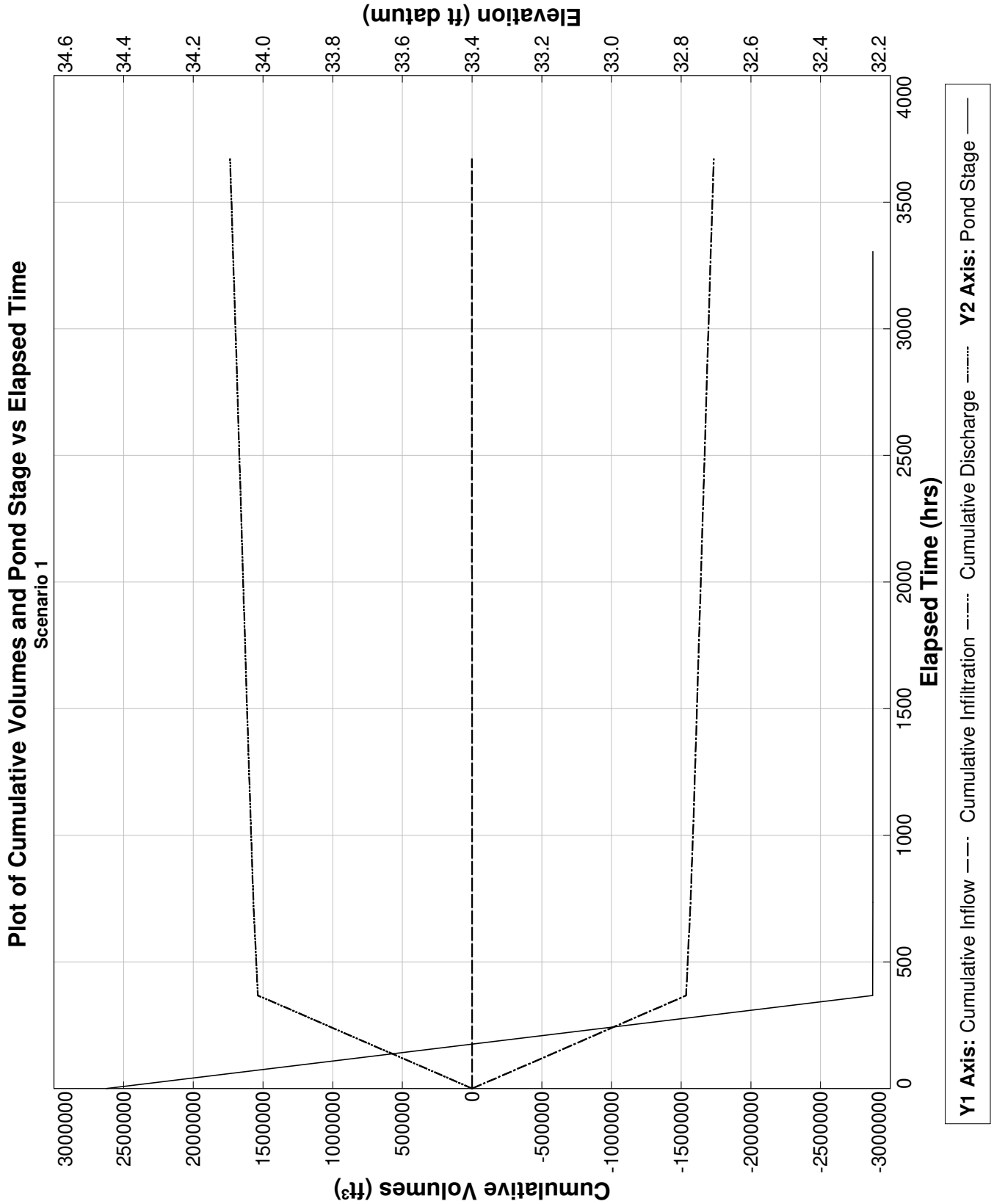
Baseflow hydrograph: Initial GWT (seasonal low) is 34.45 ft.

End Scenario 1 4/3/2023 9:20:49

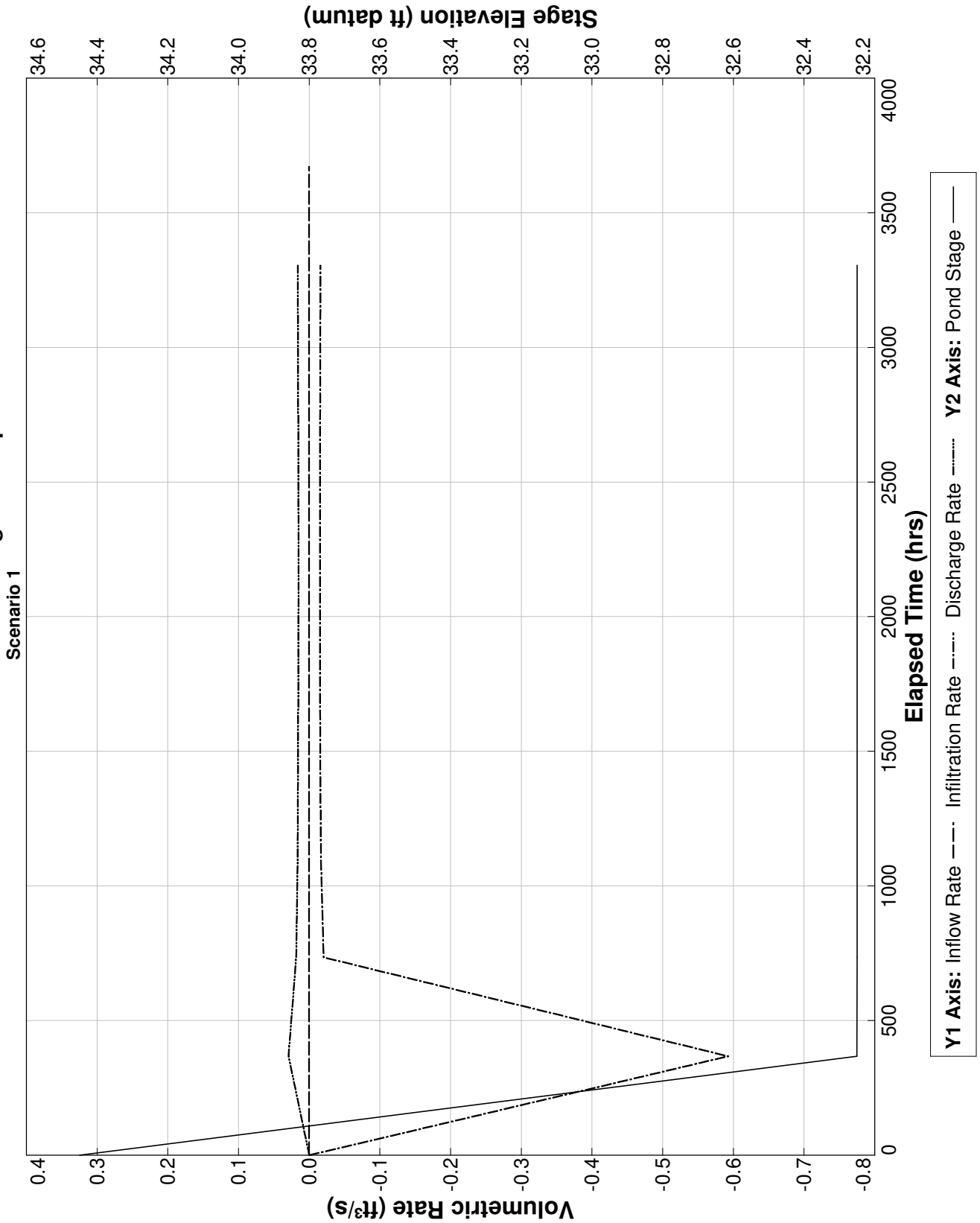
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**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0001	0.00245	34.45000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0001	0.00245	32.25039	-0.59282	2.909864E-02	150.000	-1536065.0	1537226	S
734.400	0.0001	0.00245	32.25015	-0.02048	1.841487E-02	300.000	-1567319.0	1568630	S
1101.600	0.0001	0.00245	32.25012	-0.01664	1.643117E-02	450.000	-1590201.0	1591662	S
1468.800	0.0001	0.00245	32.25011	-0.01568	1.571849E-02	600.000	-1611301.0	1612912	S
1836.000	0.0001	0.00245	32.25011	-0.01528	1.531819E-02	750.000	-1631665.0	1633426	S
2203.200	0.0001	0.00245	32.25010	-0.01515	1.520409E-02	900.000	-1651689.0	1653600	S
2570.400	0.0001	0.00245	32.25011	-0.01524	1.530951E-02	1050.000	-1671707.0	1673768	S
2937.600	0.0001	0.00245	32.25011	-0.01549	1.557228E-02	1200.000	-1691968.0	1694180	S
3304.800	0.0001	0.00245	32.25011	-0.01586	1.594811E-02	1350.000	-1712652.0	1715013	S
3672.000	0.0001	0.00245	32.25012	----	----	1500.000	-1733892.0	1736403	N.A.



Plot of Flow Rates and Pond Stage vs Elapsed Time





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**Retention Pond Recovery - Refined Method**  
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**Project Data**

Project Name: The Rookery Phase 1, Underdrain Baseflow, Lark Sparrow Street, 9+00 to 9+75  
Simulation Description:  
Project Number: 35:31217-E  
Engineer : Nathan D. Hildreth, E.I.  
Supervising Engineer: Chris M. Egan, P.E.  
Date: 04-03-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 27.50  
Water Table Elevation, [WT] (ft datum): 32.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 23.40  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 500.0  
Equivalent Pond Width, [W] (ft): 2.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
30.30	400.0
31.30	550.0
32.30	400.0

**Discharge Structures**

**Discharge Structure #1 is active as orifice**

Structure Parameters

Description:

Orifice elevation, (ft datum): 30.8  
Orifice coefficient: 7.9  
Orifice area, (ft<sup>2</sup>): 0.196  
Orifice exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.5
Initial (seasonal low) ground water level (ft datum)	31.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: none

Begin Scenario 1 4/3/2023 9:23:26

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

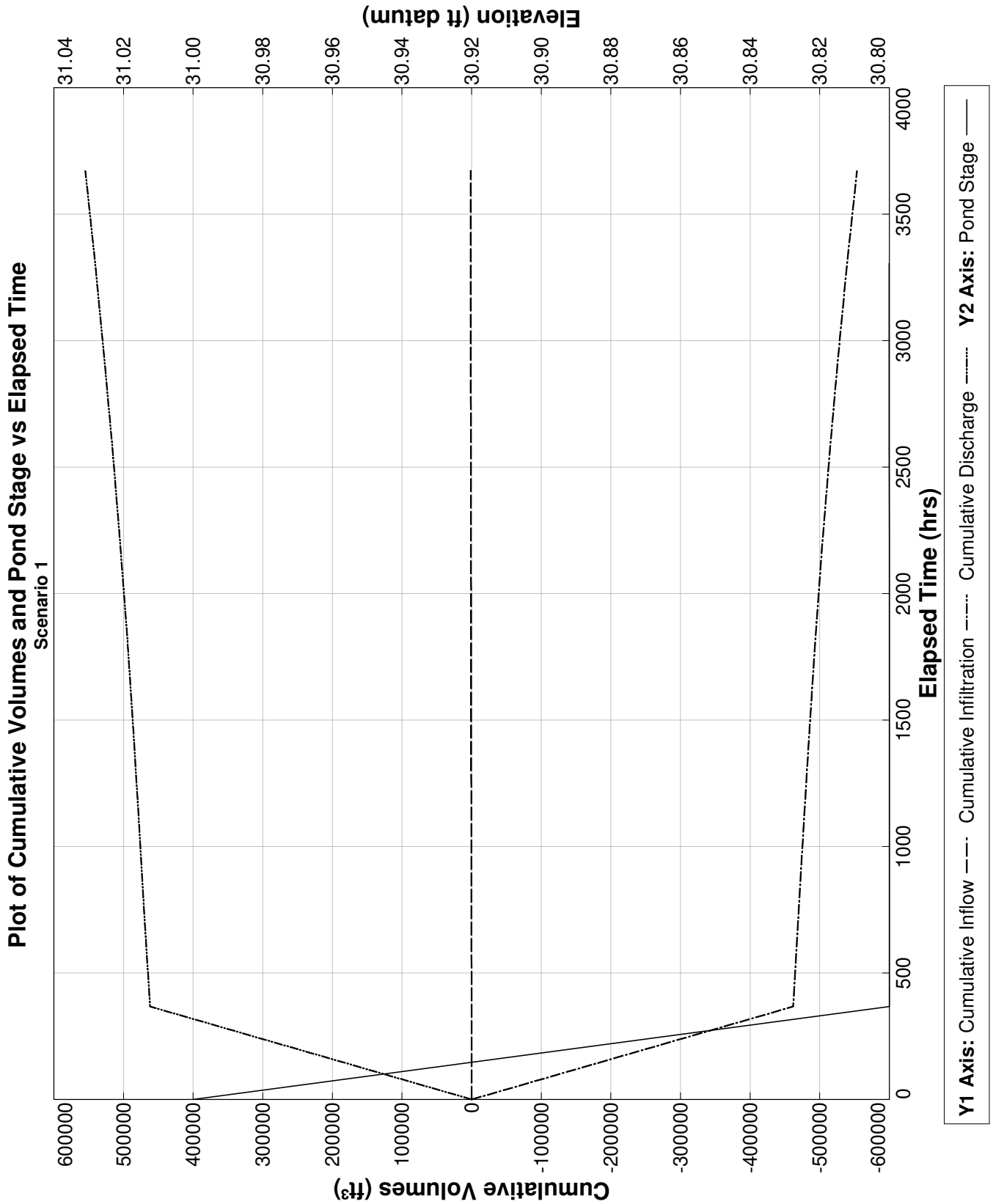
Baseflow hydrograph: Initial GWT (seasonal low) is 31.0 ft.

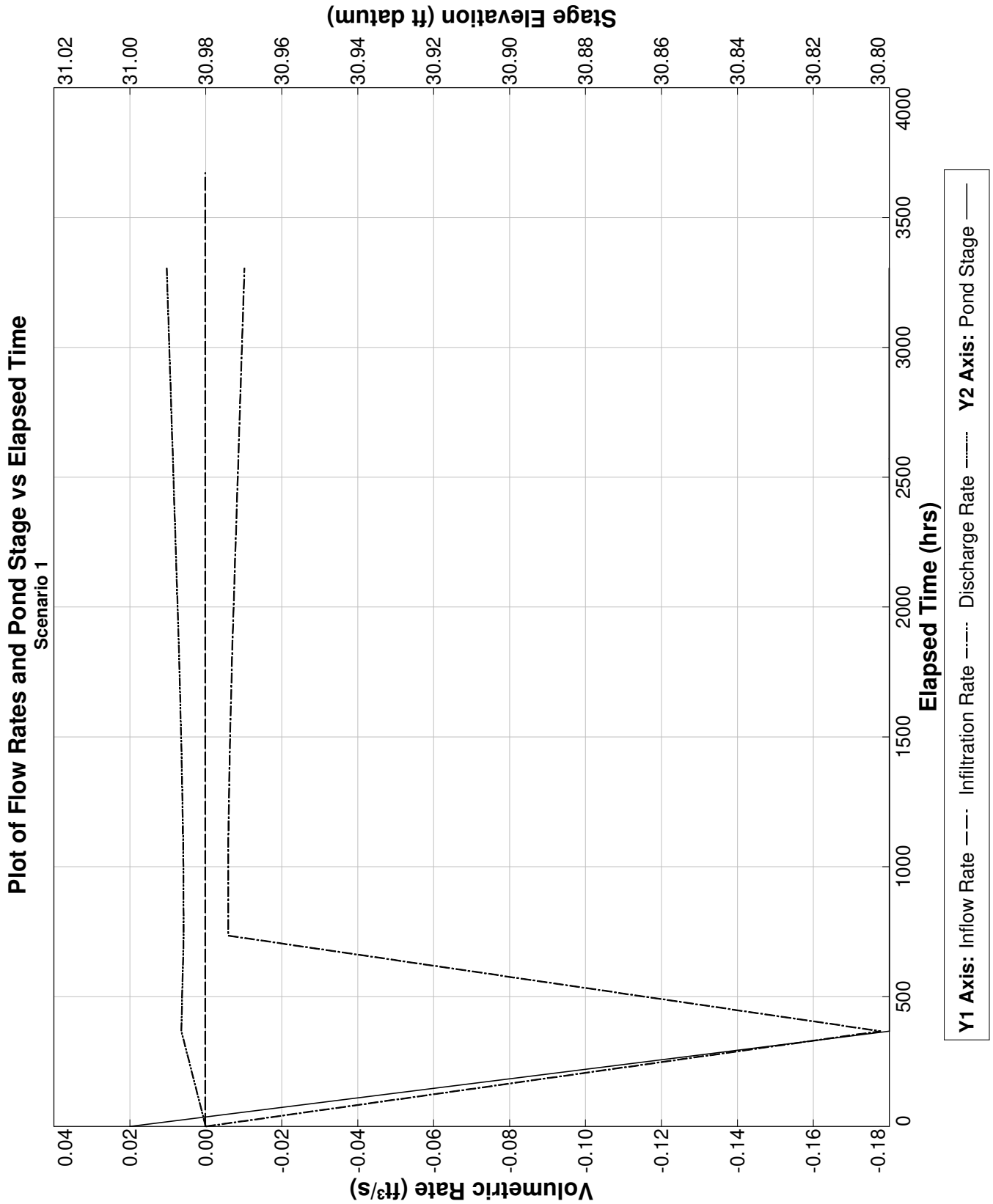
End Scenario 1 4/3/2023 9:23:26

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**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0001	0.00245	31.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0001	0.00245	30.80002	-0.17765	6.458915E-03	150.000	-461713.1	461961.1	S
734.400	0.0001	0.00245	30.80002	-0.00591	5.835381E-03	300.000	-469689.2	470087.1	S
1101.600	0.0001	0.00245	30.80002	-0.00593	5.953063E-03	450.000	-477330.8	477878.8	S
1468.800	0.0001	0.00245	30.80002	-0.00635	6.420363E-03	600.000	-485359.2	486057.2	S
1836.000	0.0001	0.00245	30.80002	-0.00699	7.062843E-03	750.000	-494121.0	494969	S
2203.200	0.0001	0.00245	30.80003	-0.00775	7.868098E-03	900.000	-503839.8	504837.8	S
2570.400	0.0001	0.00245	30.80003	-0.00856	8.674745E-03	1050.000	-514624.0	515771.9	S
2937.600	0.0001	0.00245	30.80004	-0.00936	9.471245E-03	1200.000	-526467.8	527765.7	S
3304.800	0.0001	0.00245	30.80005	-0.01016	1.027533E-02	1350.000	-539369.4	540817.4	S
3672.000	0.0001	0.00245	30.80005	----	----	1500.000	-553330.9	554928.8	N.A.





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**Project Data**

Project Name: The Rookery Phase 1, Underdrain Baseflow, Audubon Avenue, 15+50 to 16+50  
Simulation Description:  
Project Number: 35:31217-E  
Engineer : Nathan D. Hildreth, E.I.  
Supervising Engineer: Chris M. Egan, P.E.  
Date: 04-03-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 27.50  
Water Table Elevation, [WT] (ft datum): 32.50  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 23.40  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 500.0  
Equivalent Pond Width, [W] (ft): 2.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
30.30	400.0
31.30	550.0
32.30	400.0

**Discharge Structures**

**Discharge Structure #1 is active as orifice**

Structure Parameters

Description:

Orifice elevation, (ft datum): 30.8  
Orifice coefficient: 7.9  
Orifice area, (ft<sup>2</sup>): 0.196  
Orifice exponent: 0.5

Tailwater - disabled, free discharge



**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.5
Initial (seasonal low) ground water level (ft datum)	31.0
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: none

Begin Scenario 1 4/3/2023 9:25:25

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

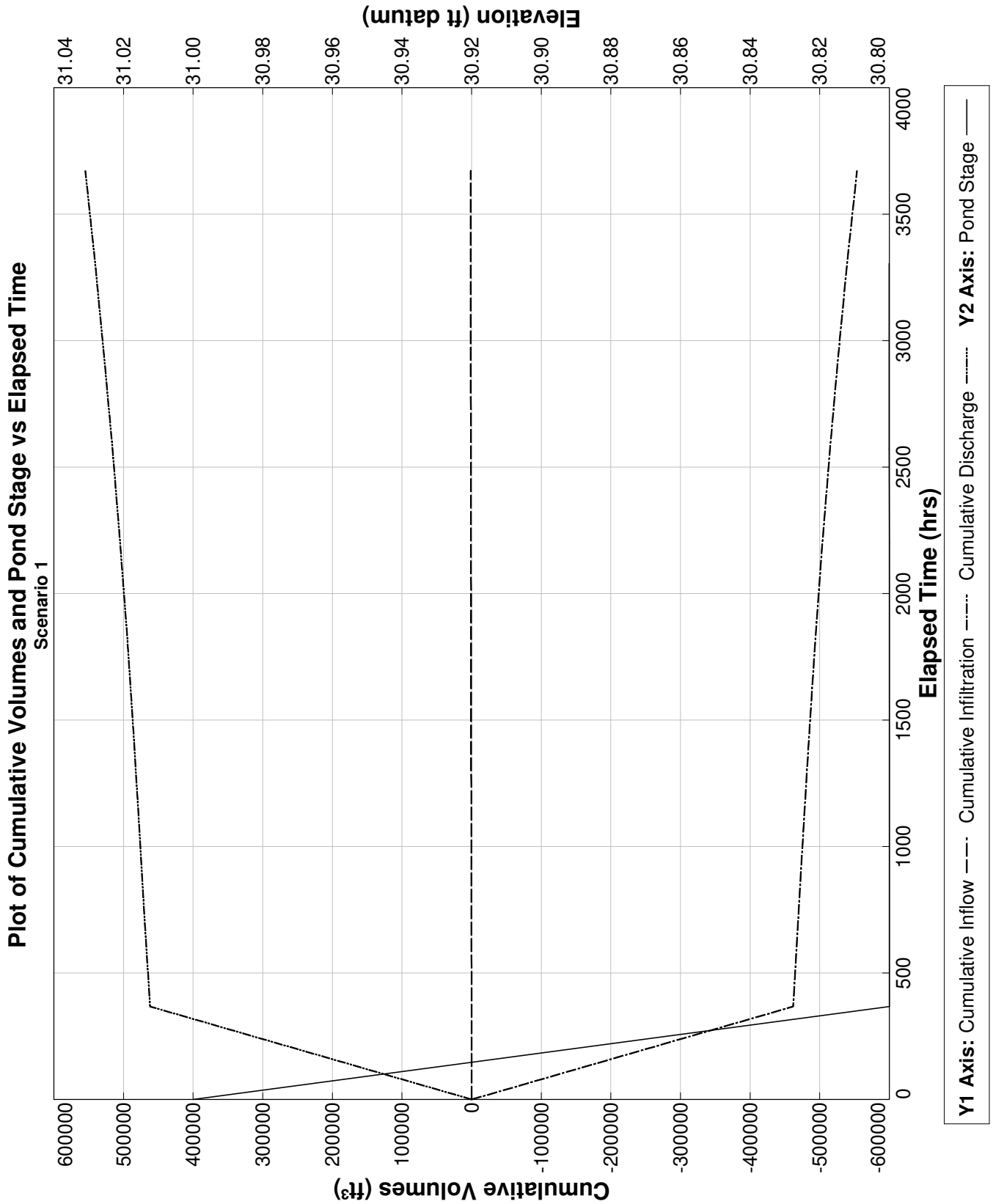
Baseflow hydrograph: Initial GWT (seasonal low) is 31.0 ft.

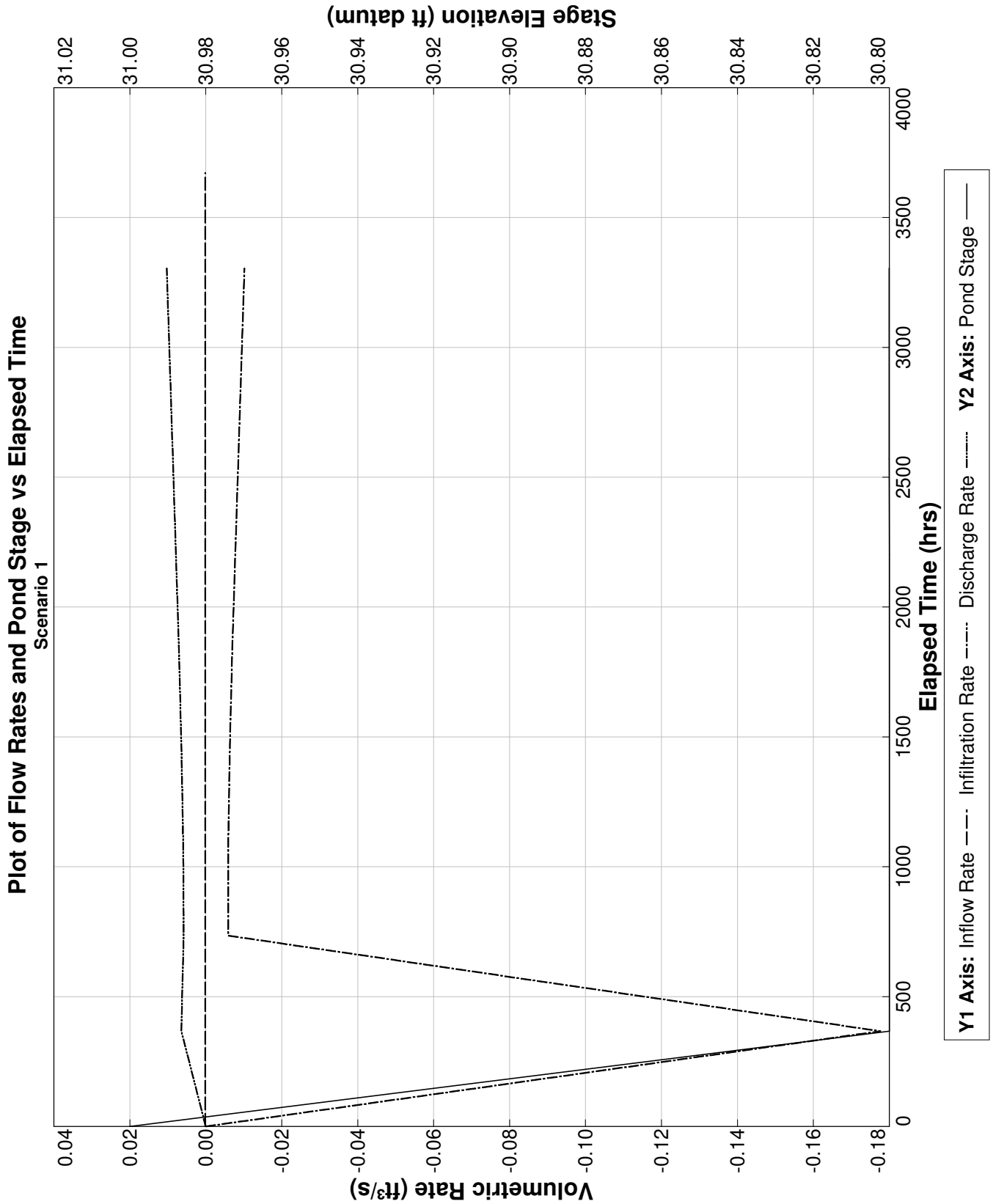
End Scenario 1 4/3/2023 9:25:25

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**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0001	0.00245	31.00000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0001	0.00245	30.80002	-0.17765	6.458915E-03	150.000	-461713.1	461961.1	S
734.400	0.0001	0.00245	30.80002	-0.00591	5.835381E-03	300.000	-469689.2	470087.1	S
1101.600	0.0001	0.00245	30.80002	-0.00593	5.953063E-03	450.000	-477330.8	477878.8	S
1468.800	0.0001	0.00245	30.80002	-0.00635	6.420363E-03	600.000	-485359.2	486057.2	S
1836.000	0.0001	0.00245	30.80002	-0.00699	7.062843E-03	750.000	-494121.0	494969	S
2203.200	0.0001	0.00245	30.80003	-0.00775	7.868098E-03	900.000	-503839.8	504837.8	S
2570.400	0.0001	0.00245	30.80003	-0.00856	8.674745E-03	1050.000	-514624.0	515771.9	S
2937.600	0.0001	0.00245	30.80004	-0.00936	9.471245E-03	1200.000	-526467.8	527765.7	S
3304.800	0.0001	0.00245	30.80005	-0.01016	1.027533E-02	1350.000	-539369.4	540817.4	S
3672.000	0.0001	0.00245	30.80005	----	----	1500.000	-553330.9	554928.8	N.A.





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**Project Data**

Project Name: The Rookery Phase 1, Underdrain Baseflow, Little Heron Place, 3+00 to 9+75  
Simulation Description:  
Project Number: 35:31217-E  
Engineer : Nathan D. Hildreth, E.I.  
Supervising Engineer: Chris M. Egan, P.E.  
Date: 04-03-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 30.75  
Water Table Elevation, [WT] (ft datum): 35.75  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 23.40  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 500.0  
Equivalent Pond Width, [W] (ft): 2.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
31.40	400.0
32.40	550.0
33.40	400.0

**Discharge Structures**

**Discharge Structure #1 is active as orifice**

Structure Parameters

Description:

Orifice elevation, (ft datum): 31.9  
Orifice coefficient: 7.9  
Orifice area, (ft<sup>2</sup>): 0.196  
Orifice exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive



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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.5
Initial (seasonal low) ground water level (ft datum)	34.25
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.

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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: none

Begin Scenario 1 4/3/2023 9:8:18

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 34.25 ft.

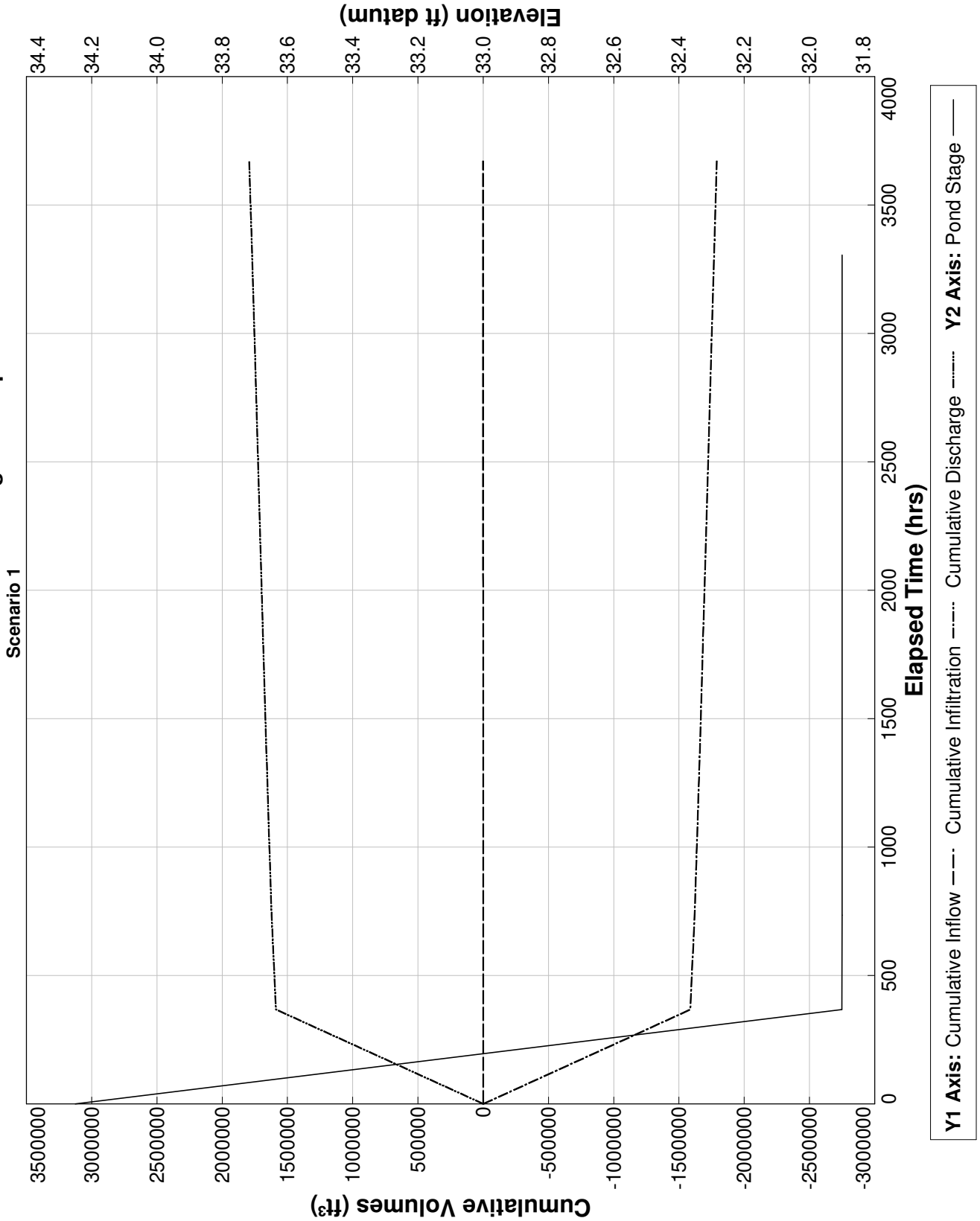
End Scenario 1 4/3/2023 9:8:18

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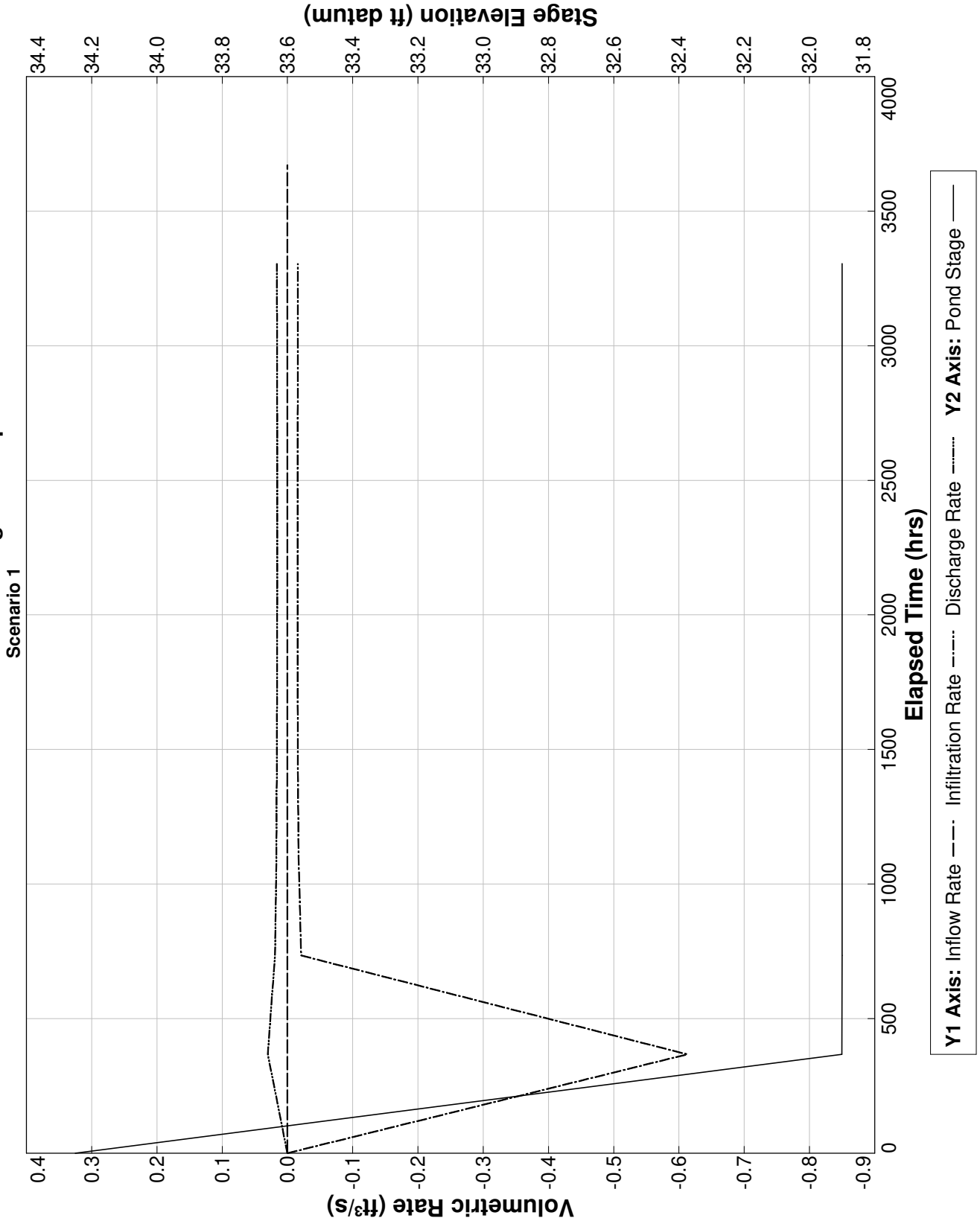
**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0001	0.00245	34.25000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0001	0.00245	31.90042	-0.61276	3.021623E-02	150.000	-1587640.0	1588861	S
734.400	0.0001	0.00245	31.90016	-0.02116	1.902423E-02	300.000	-1620036.0	1621407	S
1101.600	0.0001	0.00245	31.90013	-0.01709	1.684401E-02	450.000	-1643593.0	1645114	S
1468.800	0.0001	0.00245	31.90012	-0.01608	1.611945E-02	600.000	-1665231.0	1666902	S
1836.000	0.0001	0.00245	31.90011	-0.01563	1.567237E-02	750.000	-1686094.0	1687915	S
2203.200	0.0001	0.00245	31.90011	-0.01546	1.552075E-02	900.000	-1706561.0	1708532	S
2570.400	0.0001	0.00245	31.90011	-0.01552	1.559442E-02	1050.000	-1726977.0	1729098	S
2937.600	0.0001	0.00245	31.90011	-0.01575	1.583401E-02	1200.000	-1747600.0	1749871	S
3304.800	0.0001	0.00245	31.90012	-0.01609	.0161853	1350.000	-1768614.0	1771035	S
3672.000	0.0001	0.00245	31.90012	----	----	1500.000	-1790152.0	1792723	N.A.

Plot of Cumulative Volumes and Pond Stage vs Elapsed Time



Plot of Flow Rates and Pond Stage vs Elapsed Time



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**Retention Pond Recovery - Refined Method**  
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**Project Data**

Project Name: The Rookery Phase 1, Underdrain Baseflow, Pearce Boulevard, 62+25 to 65+00  
Simulation Description:  
Project Number: 35:31217-E  
Engineer : Nathan D. Hildreth, E.I.  
Supervising Engineer: Chris M. Egan, P.E.  
Date: 04-03-2023

**Aquifer Data**

Base Of Aquifer Elevation, [B] (ft datum): 28.00  
Water Table Elevation, [WT] (ft datum): 33.00  
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 23.40  
Fillable Porosity, [n] (%): 25.00  
Vertical infiltration was not considered.

**Geometry Data**

Equivalent Pond Length, [L] (ft): 500.0  
Equivalent Pond Width, [W] (ft): 2.0  
Ground water mound is expected to intersect the pond bottom

**Stage vs Area Data**

<u>Stage</u> (ft datum)	<u>Area</u> (ft <sup>2</sup> )
29.40	400.0
30.40	550.0
31.40	400.0

**Discharge Structures**

**Discharge Structure #1 is active as orifice**

Structure Parameters

Description:

Orifice elevation, (ft datum): 29.9  
Orifice coefficient: 7.9  
Orifice area, (ft<sup>2</sup>): 0.196  
Orifice exponent: 0.5

Tailwater - disabled, free discharge

**Discharge Structures (cont'd.)**

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

**PONDS Version 3.3.0278**  
**Retention Pond Recovery - Refined Method**  
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**Scenario Input Data**

*Scenario 1 ::*

Hydrograph Type:	Baseflow
Modflow Routing:	Routed with infiltration
Analysis Type	Wet Season Water Table Rise
Duration of Wet Season Water Table Rise (days)	153.0
Total Number of Time Increments In Simulation	10
Seasonal Water Table Fluctuation (ft)	1.5
Initial (seasonal low) ground water level (ft datum)	31.5
Recharge is applied inside pond (in addition to outside pond)?	Yes

Note: when this option is selected, water will be added to the pond to synchronize the rise in the pond level with the rise in the groundwater. Otherwise, no water will be added directly to the pond, and the pond water level will rise as a result of infiltration only.



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**Modflow Log**

MODFLOW CONTROL PARAMETERS

Perimeter boundary condition: constant head  
Maximum iterations of outer loop: 150  
Maximum iterations of inner loop: 60  
Horizontal conductivity within pond: 1000000 (if ground water mound is expected to intersect pond bottom)  
Instantaneous storage coefficient: Volumetric balance  
Default head closure tolerance: .01  
Default residual closure tolerance: .5  
Target water budget error: 1  
On failure to converge: Rerun limiting inner loop to one iteration  
    > Maximum number of iterations of outer loop: 500  
Running Average Porosity is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Running Average Pond Stage (for discharge structures with tailwater) is active  
    > Starting on pass: 2  
    > When outer iteration reaches: 50  
    > Number of data points: 4  
Grid size: 1000 ft (from pond centerline)  
Mound Output: none

Begin Scenario 1 4/3/2023 9:32:54

Baseflow hydrograph: Default perimeter boundary condition has been overridden. Using no-flow.

Baseflow hydrograph: Initial GWT (seasonal low) is 31.5 ft.

End Scenario 1 4/3/2023 9:32:54

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**Detailed Results**    :: Scenario 1 ::

Elapsed Time (hours)	Instantaneous Inflow Rate (ft <sup>3</sup> /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft <sup>3</sup> /s)	Combined Instantaneous Discharge Rate (ft <sup>3</sup> /s)	Cumulative Inflow Volume (ft <sup>3</sup> )	Cumulative Infiltration Volume (ft <sup>3</sup> )	Combined Cumulative Discharge (ft <sup>3</sup> )	Flow Type
0.000	0.0001	0.00245	31.50000	0.00000	0	0.000	0.0	0	N.A.
367.200	0.0001	0.00245	29.90026	-0.50512	2.390026E-02	150.000	-1309425.0	1310346	S
734.400	0.0001	0.00245	29.90011	-0.01731	1.572921E-02	300.000	-1335468.0	1336539	S
1101.600	0.0001	0.00245	29.90009	-0.01444	1.435087E-02	450.000	-1355200.0	1356421	S
1468.800	0.0001	0.00245	29.90009	-0.01374	1.376296E-02	600.000	-1373632.0	1375003	S
1836.000	0.0001	0.00245	29.90008	-0.01350	1.354516E-02	750.000	-1391531.0	1393053	S
2203.200	0.0001	0.00245	29.90008	-0.01354	1.360271E-02	900.000	-1409325.0	1410996	S
2570.400	0.0001	0.00245	29.90009	-0.01378	1.385722E-02	1050.000	-1427325.0	1429146	S
2937.600	0.0001	0.00245	29.90009	-0.01415	1.424274E-02	1200.000	-1445748.0	1447719	S
3304.800	0.0001	0.00245	29.90010	-0.01462	1.471795E-02	1350.000	-1464740.0	1466861	S
3672.000	0.0001	0.00245	29.90010	----	----	1500.000	-1484398.0	1486669	N.A.

