

APPENDIX 3.2 - Lower Mill Ponds Evaluation Hydrology Summary - Proposed Conditions

By: JEF
Chkd. By: VVCBDate: 08/16/18
Date: 9/14/18Subject: Lower Mill Ponds
Pond Capacity EvaluationSheet No.: 1 of 13
Proj. No.: 152596C

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POND CAPACITY EVALUATION - PROPOSED CONDITIONS
LOWER MILL PONDS
SPECIALTY GRANULES LLC
ADAMS COUNTY, PENNSYLVANIA

PURPOSE

The purpose of these calculations is to evaluate the existing sediment pond capacity for flooding with the 100-year storm event for the Lower Mill Ponds at Specialty Granules LLC Charmian Site located in Adams County, Pennsylvania during the development of the proposed Northern Tract quarry. The site was modeled using Autodesk Storm and Sanitary Analysis.

RAINFALL DEPTHS

SCS Storms: Storm routing for all storm events other will be performed using the Technical Release No. 55 (TR-55) SCS method with a 24-hour, Type II rainfall distribution. The following depths were obtained from the NOAA Point Precipitation Frequency Estimates for the site (Attachment 1):

Storm Frequency	Depth (Inches)
2-yr	3.25
5-yr	4.05
10-yr	4.75
25-yr	5.85
50-yr	6.85
100-yr	8.03



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WATERSHED CHARACTERISTICS

The following watershed areas are tributary to the Lower Mill Ponds. Watersheds that are pumped to the Lower Mill Ponds following a storm event are excluded from the presented totals.

Total Tributary Area = 226 Acres <-- See Watershed Plan
Disturbed Watershed Area = 75 Acres (Conservative Assumption)

REQUIRED SEDIMENT POND CAPACITY

Lower Mill Ponds 2 and 3 are the sediment control structures for the Lower Mill Facility as well as the West Ridge permit area. The ponds are required to meet the criteria in the PADEP Engineering Mining Manual as well as the Erosion and Sediment Pollution Control Program Manual.

Required sediment storage is 2,000 cf/ac of disturbed area

Required settling storage is 5,000 cf/ac of tributary area

Required Sediment Volume = 150,000 CF
Required Settling Volume = 1,130,000 CF

AVAILABLE SEDIMENT POND VOLUME

The existing stage-storage volumes of Pond 2 and Pond 3 were provided in a report by the previous engineering firm for SGI. (Attachment #4)

Sediment Volume		Elevation	Volume (cf)
Pond 2		932.50	1,046,412
Pond 3		931.78	748,501
Total			1,794,913

Settling Volume		Elevation	Volume (cf)
Pond 2		941.47	938,548
Pond 3		940.93	832,197
Total			1,770,745

Total Volume to Principal Spillway Crest		Elevation	Volume (cf)
Pond 2		941.47	1,984,960
Pond 3		940.93	1,580,697
Total			3,565,657



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WATERSHED AREAS AND CURVE NUMBERS

The curve numbers and watershed areas for the site are presented in the following tables based on the TR-55 (Ref #4). Web Soil Survey was used to determine the hydrologic soil group (HSG) ratings of the site soils. HSG ratings for soils that were covered by fill or disturbed for construction were assumed to become HSG B since the majority of the site is rated HSG B and any fill used during construction will most likely consist of HSG B material. Composite curve numbers were determined for each watershed as shown below. Refer to Attachment #2 for the soil survey map. Refer to the watershed map drawing which graphically depicts the location of the various soil types outlined in the web soil survey.

Mill Pond 1 Subbasin

Soil Group		Area (Acres)	HSG Rating	Weighted CN
Cover Type	CN			
Woods, Fair	60	11.35	B	43.1
Paved Roads	89	1.18		6.6
Gravel Roads	85	2.97		16.0
Water	100	0.31		2.0
		15.81		67.65

Mill Pond 2 Subbasin

Soil Group		Area (Acres)	HSG Rating	Weighted CN
Cover Type	CN			
Woods, Fair	60	12.94	B	38.5
Parking Lot & Waynesboro Road	89	0.98		4.3
Gravel Roads	85	1.93		8.1
Grass, Fair	69	2.22		7.6
Water	100	2.09		10.4
		20.16		68.94

Mill Pond 3 Subbasin

Soil Group		Area (Acres)	HSG Rating	Weighted CN
Cover Type	CN			
Woods, Fair	60	3.28	B	31.5
Paved Roads	89	0.11		1.6
Grass, Fair	69	1.14		12.6
Water	100	1.72		27.5
		6.25		73.16

Old Waynesboro Road Culvert Subbasin

Soil Group		Area (Acres)	HSG Rating	Weighted CN
Cover Type	CN			
Woods, Fair	60	17.63	B	28.7
Disturbed Areas	86	15.05		35.1
Grass, Fair	69	2.43		4.6
Buildings/Rooftops	100	1.74		4.7
		36.85		73.10

CC-5 Culvert Subbasin

Soil Group		Area (Acres)	HSG Rating	Weighted CN
Cover Type	CN			
Woods & Grass Combination, Fair	65	12.58	B	47.2
Disturbed Areas	86	4.75		23.6
		17.33		70.76



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Blue Mountain Pond Subbasin

Soil Group	CN	Area (Acres)	HSG Rating	Weighted CN
Woods & Grass Combination, Fair	65	7.14	B	43.1
Disturbed Areas	86	3.64		29.0
		10.78		72.09

Railroad Culvert Subbasin

Soil Group	CN	Area (Acres)	HSG Rating	Weighted CN
Pasture, Grassland, Fair	69	26.67	B	56.7
Disturbed Areas	86	5.79		15.3
		32.46		72.03

Inlet I-12 Subbasin

Soil Group	CN	Area (Acres)	HSG Rating	Weighted CN
Woods & Grass Combination, Fair	65	24.44	B	28.4
Disturbed Areas	86	31.50		48.4
		55.94		76.82

Inlet I-10 Subbasin

Soil Group	CN	Area (Acres)	HSG Rating	Weighted CN
Pasture, Grassland, Fair	69	1.47	B	49.2
Disturbed Areas	86	0.59		24.6
		2.06		73.87

Inlet I-11 Subbasin

Soil Group	CN	Area (Acres)	HSG Rating	Weighted CN
Pasture, Grassland, Fair	69	5.66	B	41.1
Disturbed Areas	86	3.84		34.8
		9.50		75.87

Inlet I-6 Subbasin

Soil Group	CN	Area (Acres)	HSG Rating	Weighted CN
Woods, Fair	36	6.87	A	13.3
Woods, Fair	60	9.96	B	32.1
Disturbed Areas	86	1.76		8.1
		18.59		53.59



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Sediment Traps ST-1E and 2E Subbasin

Soil Group		Area (Acres)	HSG Rating	Weighted CN
Cover Type	CN			
Woods, Fair	60	6.00	B	37.6
Disturbed Areas	86	3.57		32.1
		9.57		69.70

Pitts Pond 1 Subbasin

Soil Group		Area (Acres)	HSG Rating	Weighted CN
Cover Type	CN			
Disturbed Areas	86	49.29	B	44.9
Meadow, non-grazed	58	2.00		1.2
Woods, Fair	60	34.14		21.7
Water	100	1.40		1.5
Woods, Fair	36	7.51	A	2.9
		94.34		72.22

Pitts Pond 2 Subbasin

Soil Group		Area (Acres)	HSG Rating	Weighted CN
Cover Type	CN			
Woods, Fair	60	14.87	B	55.9
Water	100	1.10		6.9
		15.97		62.76

Pitts Quarry Subbasin

Soil Group		Area (Acres)	HSG Rating	Weighted CN
Cover Type	CN			
Woods, Fair	60	5.45	B	2.8
Disturbed Areas	86	113.16		82.0
		118.61		84.81



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HYDRAULIC PATHS

Times of concentration were evaluated for the subbasins using methodology presented in TR-55 (Ref #4). A summary of each subbasin is provided below; complete calculations generated from AutoDesk Storm and Sanitary Analysis are presented Attachment 3.

Mill Pond 1 Subbasin

Section	Length (ft)	Slope (ft/ft)	Flow Type	Mannings n	Surface Cover	Est. Velocity (fps)	Flow Time (min)	Total TOC (min)
AB	100	0.053	Sheet	0.40	Woods L.U.	-	14.43	27.63
BC	573.3	0.153	Shallow Concentrated	-	Woodland	1.96	4.88	
CD	156.3	0.096	Shallow Concentrated	-	Paved	6.30	0.41	
DE	1129.5	0.226	Shallow Concentrated	-	Woodland	2.38	7.91	

Mill Pond 2 Subbasin

Section	Length (ft)	Slope (ft/ft)	Flow Type	Mannings n	Surface Cover	Est. Velocity (fps)	Flow Time (min)	Total TOC (min)
AB	100	0.044	Sheet	0.40	Woods L.U.	-	15.54	31.16
BC	673	0.142	Shallow Concentrated	-	Woodland	1.88	5.97	
CD	191.7	0.052	Shallow Concentrated	-	Short Grass	1.60	2.00	
DE	1105.5	0.233	Shallow Concentrated	-	Woodland	2.41	7.65	

Mill Pond 3 Subbasin

Section	Length (ft)	Slope (ft/ft)	Flow Type	Mannings n	Surface Cover	Est. Velocity (fps)	Flow Time (min)	Total TOC (min)
AB	100	0.370	Sheet	0.40	Woods L.U.	-	6.63	10.28
BC	319.7	0.247	Shallow Concentrated	-	Woodland	2.48	2.15	
CD	196.5	0.097	Shallow Concentrated	-	Short Grass	2.18	1.50	

Old Waynesboro Road Subbasin

Section	Length (ft)	Slope (ft/ft)	Flow Type	Mannings n	Surface Cover	Est. Velocity (fps)	Flow Time (min)	Total TOC (min)
AB	100	0.010	Sheet	0.10	Roads	-	9.27	22.91
BC	457	0.013	Shallow Concentrated	-	Nearly bare	1.14	6.68	
CD	548	0.285	Shallow Concentrated	-	Short Grass	3.74	2.44	
DE	431	0.032	Shallow Concentrated	-	Nearly bare	1.79	4.01	
EF	157	0.395	Channel	0.040	-	-	0.12	
FG	424	0.045	Channel	0.035	-	-	0.39	

Blue Mountain Pond Subbasin

Section	Length (ft)	Slope (ft/ft)	Flow Type	Mannings n	Surface Cover	Est. Velocity (fps)	Flow Time (min)	Total TOC (min)
AB	100	0.020	Sheet	0.40	Woods L.U.	-	21.31	26.19
BC	488.5	0.268	Shallow Concentrated	-	Woodland	2.59	3.14	
CD	185.6	0.065	Shallow Concentrated	-	Woodland	1.78	1.74	



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CC-5 Culvert Subbasin

Section	Length (ft)	Slope (ft/ft)	Flow Type	Mannings n	Surface Cover	Est. Velocity (fps)	Flow Time (min)	Total TOC (min)
AB	100	0.022	Sheet	0.40	Woods L.U.	-	20.51	23.70
BC	490	0.262	Shallow Concentrated	-	Woodland	2.56	3.19	

Railroad Culvert Subbasin

Section	Length (ft)	Slope (ft/ft)	Flow Type	Mannings n	Surface Cover	Est. Velocity (fps)	Flow Time (min)	Total TOC (min)
AB	100	0.017	Sheet	0.40	Woods L.U.	-	22.63	28.33
BC	308	0.298	Shallow Concentrated	-	Woodland	2.73	1.88	
CD	495	0.068	Shallow Concentrated	-	Short Grass	2.61	3.16	
EF	446	0.226	Channel Flow	0.033	-	-	0.25	
FG	443	0.111	Channel Flow	0.033	-	-	0.41	

Inlet I-10 Subbasin

Section	Length (ft)	Slope (ft/ft)	Flow Type	Mannings n	Surface Cover	Est. Velocity (fps)	Flow Time (min)	Total TOC (min)
AB	100	0.185	Sheet	0.30	Disturbed	-	6.95	7.84
BC	100.8	0.342	Shallow Concentrated	-	Short Grass	4.09	0.41	
CD	76.5	0.072	Shallow Concentrated	-	Nearly Bare	2.68	0.48	

Inlet I-11 Subbasin

Section	Length (ft)	Slope (ft/ft)	Flow Type	Mannings n	Surface Cover	Est. Velocity (fps)	Flow Time (min)	Total TOC (min)
AB	100	0.076	Sheet	0.02	Gravel	-	1.14	2.80
BC	172.4	0.214	Shallow Concentrated	-	Nearly Bare	4.63	0.62	
CD	205.3	0.273	Shallow Concentrated	-	Short Grass	3.66	0.93	
DE	97.1	0.093	Channel Flow	0.033	-	-	0.11	

Inlet I-12 Subbasin

Section	Length (ft)	Slope (ft/ft)	Flow Type	Mannings n	Surface Cover	Est. Velocity (fps)	Flow Time (min)	Total TOC (min)
AB	100	0.015	Sheet	0.30	Disturbed	-	18.99	33.12
BC	712	0.024	Shallow Concentrated	-	Nearly Bare	1.56	7.61	
CD	766	0.123	Shallow Concentrated	-	Nearly Bare	3.50	3.66	
DE	383	0.050	Shallow Concentrated	-	Nearly Bare	2.23	2.86	



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Inlet I-6 Subbasin

Section	Length (ft)	Slope (ft/ft)	Flow Type	Mannings n	Surface Cover	Est. Velocity (fps)	Flow Time (min)	Total TOC (min)
AB	100	0.105	Sheet	0.40	Woods L.U.	-	10.98	24.80
BC	1488.5	0.197	Shallow Concentrated	-	Woodland	2.22	11.17	
CD	605	0.145	Shallow Concentrated	-	Nearly Bare	3.81	2.65	

Sediment Traps ST-1E and 2E Subbasin

Section	Length (ft)	Slope (ft/ft)	Flow Type	Mannings n	Surface Cover	Est. Velocity (fps)	Flow Time (min)	Total TOC (min)
AB	100	0.011	Sheet	0.10	Roads	-	8.93	11.83
BC	189.5	0.011	Shallow Concentrated	-	Unpaved	1.69	1.87	
CD	29.8	0.616	Shallow Concentrated	-	Unpaved	12.66	0.04	
DE	74.6	0.458	Shallow Concentrated	-	Unpaved	10.92	0.11	
EF	500	0.105	Channel Flow	0.033	-	-	0.67	
FG	264	0.300	Channel Flow	0.033	-	-	0.21	

Pitts Pond 1 Subbasin

Section	Length (ft)	Slope (ft/ft)	Flow Type	Mannings n	Surface Cover	Est. Velocity (fps)	Flow Time (min)	Total TOC (min)
AB	100	0.010	Sheet	0.30	Disturbed	-	22.34	36.75
BC	727	0.010	Shallow Concentrated	-	Unpaved	1.61	7.53	
CD	1154	0.080	Shallow Concentrated	-	Unpaved	4.56	4.22	
DE	412	0.200	Shallow Concentrated	-	Unpaved	7.22	0.95	
EF	1479	0.130	Channel Flow	0.033	-	-	1.71	

Pitts Pond 2 Subbasin

Section	Length (ft)	Slope (ft/ft)	Flow Type	Mannings n	Surface Cover	Est. Velocity (fps)	Flow Time (min)	Total TOC (min)
AB	54	0.443	Sheet	0.40	Woods L.U.	-	3.77	14.35
BC	46	0.122	Sheet	0.40	Woods L.U.	-	5.55	
CD	478.2	0.219	Shallow Concentrated	-	Unpaved	7.55	1.06	
DE	688.6	0.032	Shallow Concentrated	-	Unpaved	2.89	3.97	

Pitts Quarry Subbasin

Section	Length (ft)	Slope (ft/ft)	Flow Type	Mannings n	Surface Cover	Est. Velocity (fps)	Flow Time (min)	Total TOC (min)
AB	100	0.010	Sheet	0.30	Disturbed	-	22.34	33.77
BC	2677	0.075	Shallow Concentrated	-	Unpaved	4.42	10.09	
CD	343	0.075	Shallow Concentrated	-	Unpaved	4.42	1.29	
DE	43	0.849	Shallow Concentrated	-	Unpaved	14.87	0.05	



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SEDIMENTATION POND PROPERTIES

The following is a summary of the major components of the sedimentation ponds:

	Mill Pond 1	Mill Pond 2	Mill Pond 3	Pitts Pond 1	Pitts Pond 2
Minimum Embankment Crest El.	951.0	946.0	946.0	1121.0	1121.0
Upstream Toe of Embankment El.	945.0	913.0	911.0	1110.0	1106.0
Downstream Toe of Embankment El.	920.0	934.0	894.0	1117.0	1096.0
Embankment Top Width	20 ft	45 ft	25 ft	16 ft	15 ft
Principal Spillway:					
Crest Elevation	946.7	941.6	931.6	1116.0	1115.0
Riser	N/A	8" CMP	N/A	18" HDPE	18" HDPE
Barrel Pipe	24" CMP	18" CMP	8" CMP	36" CPEP	36" CPEP
Auxiliary Spillway:					
Crest Elevation	948.50	942.50	942.50	1119.25	1117.25
Bottom Width or Diameter	18 in & 20x28 in pipes	217 ft	78.5 ft	90 ft	25 ft
Shape	Circular	Trapezoidal	Trapezoidal	Trapezoidal	Trapezoidal
Lining	CMP	Riprap	Riprap	Riprap	Riprap

Note: The auxiliary spillways were analysed as a broad crested weir with a discharge coefficient of 2.63, consistent with Table 5-3 of Reference #11.



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DEWATERING TIME

Per the PADEP Erosion and Sediment Pollution Control Program Manual, the sediment ponds must dewater the storage volume contained between the sediment cleanout elevation and the principal spillway crest elevation in 2 to 7 days. The storage volumes were obtained from the reported stage-storage curves and the stage-discharge rates were calculated using Autodesk Storm and Sanitary Analysis 2018. Pond 2 will dewater through four 8 inch diameter risers with 9 rows of 1 inch orifices drilled into each riser. Pond 3 will dewater through one 8 inch diameter culvert and a CD160M Dri-Prime diesel powered pump (see pump curve in Attachment #5). All calculations were performed using Autodesk Storm and Sanitary Analysis 2018.

Lower Mill Pond 2

Elevation	Storage		Discharge (cfs)	Volume (cf)	Avg. Discharge (cfs)	Time	
	(ac-ft)	(cf)				(s)	(days)
932.6	24.2	1055728.0	0.10				
934.0	27.3	1188948.5	1.09	133,221	0.60	223,900	2.6
936.0	31.9	1388156.5	2.58	199,208	1.84	108,560	1.3
938.0	36.7	1597276.0	3.00	209,120	2.79	74,953	0.9
940.0	41.7	1816594.0	2.90	219,318	2.95	74,345	0.9
941.4	45.3	1971251.0	1.25	154,657	2.08	74,533	0.9
						Total	6.4

Lower Mill Pond 3

Elevation	Storage		Discharge (cfs)	Volume (cf)	Avg. Discharge (cfs)	Time	
	(ac-ft)	(cf)				(s)	(days)
931.6	16.9	738011.0	4.49				
932.0	17.6	768333.0	5.29	30,322	4.89	6,201	0.1
934.0	21.2	924815.0	5.84	156,482	5.57	28,119	0.3
936.0	24.9	1085292.0	5.92	160,477	5.88	27,292	0.3
938.0	29.5	1283987.0	6.15	198,695	6.04	32,924	0.4
940.0	33.9	1474890.0	6.36	190,903	6.26	30,520	0.4
941.0	36.5	1588661.0	6.40	113,771	6.16	18,469	0.2
						Total	1.7

Note: The dewatering time for Lower Mill Pond 3 was determined considering the contribution of a manually operated pump. The pump discharge can be operated to achieve a dewatering time between 2 and 7 days per the above calculation.



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PERFORATION SCHEDULE

Pond 2 has four perforated risers that discharge water into Pond 3, P-20, P-22, P-23, and P-25.

Orifice ID	Orifices	Diameter	Crest Elev.
P-20a	8	1	933.00
P-20b	8	1	933.92
P-20c	8	1	934.92
P-20d	8	1	935.92
P-20e	8	1	936.92
P-20f	8	1	937.92
P-20g	8	1	938.92
P-20h	8	1	939.92
P-20i	8	1	940.50

Orifice ID	Orifices	Diameter	Crest Elev.
P-22a	8	1	932.70
P-22b	8	1	933.63
P-22c	8	1	934.63
P-22d	8	1	935.63
P-22e	8	1	936.63
P-22f	8	1	937.63
P-22g	8	1	938.63
P-22h	8	1	939.60
P-22i	8	1	940.50

Orifice ID	Orifices per Row	Diameter (in.)	Crest Elev. (ft.)
P-23a	8	1	932.60
P-23b	8	1	933.48
P-23c	8	1	934.48
P-23d	8	1	935.48
P-23e	8	1	936.48
P-23f	8	1	937.48
P-23g	8	1	938.48
P-23h	8	1	939.48
P-23i	8	1	940.50

Orifice ID	Orifices per Row	Diameter (in.)	Crest Elev. (ft.)
P-25a	8	1	933.00
P-25b	8	1	933.93
P-25c	8	1	934.93
P-25d	8	1	935.93
P-25e	8	1	936.93
P-25f	8	1	937.93
P-25g	8	1	938.93
P-25h	8	1	939.93
P-25i	8	1	940.50

CULVERT DETAILS

Lower Mill Ponds 2 and 3 have several culverts that discharge water in addition to the primary spillways. Pond 2 has two 18 inch CMP culverts (P-21 and P-24) that discharge water into Pond 3. Pond 3 has two 18 inch CMP culverts (P-26 and P-28) that discharge water into the Miney Branch watershed.

Orifice ID	Diameter (in.)	Length (ft.)	Inlet Elev. (ft.)	Outlet Elev. (ft.)
P-21	18	44.60	941.58	940.48
P-24	18	43.00	941.47	940.88
P-26	18	41.81	940.98	940.31
P-28	18	40.65	941.07	940.35

By: JEF
Chkd. By: MGJDate: 08/16/18
Date: 9/14/18Subject: Lower Mill Ponds
Pond Capacity EvaluationSheet No.: 12 of 13
Proj. No.: 152596C

N:\2015\152596 1 - SGI - Stormwater Conveyance\SSA Models\Lower Mill Ponds Evaluation\Lower Mill Ponds Evaluation Hydrology Summary.xlsx\Proposed N. Tract

HYDROLOGIC SUMMARY

The pertinent results of the hydrologic analysis performed in SSA are summarized below. Refer to Attachment 3 for the complete SSA output report.

Subbasin Summary

Subbasin	Area (ac)	100-year Runoff (cf)	100-year Peak Discharge (cfs)
Mill Pond 1	15.81	242,252	61.8
Mill Pond 2	20.16	319,724	76.1
Mill Pond 3	6.25	110,216	41.6
Old Waynesboro Road	36.85	648,446	183.2
CC-5 Culvert	17.33	287,891	80.0
Blue Mountain Pond	10.78	185,108	48.8
Railroad Culvert	32.46	556,576	140.2
Inlet I-10	2.06	36,941	14.8
Inlet I-11	9.50	178,235	74.9
Inlet I-12	55.94	1,072,462	245.7
Inlet I-6	18.59	178,924	46.0
Pitts Pond 1	94.34	1,625,901	348.5
Pitts Pond 2	15.97	212,390	73.7
Pitts Quarry	118.61	2,678,466	593.4
ST-1E and 2E	9.57	154,763	56.8

STORM ROUTING SUMMARY

The pertinent results of the storm routing analyses performed in SSA are summarized below. Refer to Attachment 3 for the complete SSA output report.

100-Year Storm

Pond	Peak Flow (cfs)		Pool Elevation (ft)		Freeboard at Peak Pool El.	Pump Rate
	Inflow	Outflow	Normal	Peak	(ft)	(gpm)
Mill Pond 1	351.7	209.6	946.7	950.0	1.01	-
Mill Pond 2	414.7	245.9	933.0	943.3	2.75	-
Mill Pond 3	249.1	182.0	934.0	943.2	2.79	2000
Pitts Pond 1	348.5	101.2	1105.6	1119.7	1.29	800-3200
Pitts Pond 2	73.7	3.6	1105.0	1113.3	7.66	1600
Pitts Quarry	600.5	1.8	992.0	1036.5	-	780

Notes:

1. Mill Pond normal pool elevations were set according to as-built outlet elevations or an assumed elevation. Mill Pond 1 was set at the primary dewatering pipe. Mill Pond 2 was set 0.4 feet above the lowest dewatering orifice for a slightly conservative elevation. Mill Pond 3 was assigned a conservative water elevation to account for the additional water that has been observed in the pond by D'Appolonia personnel during site visits.



By: JEF

Date: 08/16/18

Subject: Lower Mill Ponds

Sheet No.: 13 OF 13

Chkd. By: WLBDate: 9/14/18

Pond Capacity Evaluation

Proj. No.: 152596C

N:\2015\152596 1 - SGI - Stormwater Conveyance\SSA Models\Lower Mill Ponds Evaluation\[Lower Mill Ponds Evaluation Hydrology Summary.xlsx]References

REFERENCES

- 1) Erosion and Sediment Pollution Control Program Manual, Pennsylvania Department of Environmental Protection, Office of Water Management, March 2012.
- 2) Engineering Manual for Mining Operations, Pennsylvania Department of Environmental Protection, Bureaus of Mining and Reclamation and District Mining Operations, January 1999.
- 3) Urban Hydrology for Small Watersheds, Technical Release Number 55 (TR-55), United States Department of Agriculture, Soil Conservation Service, 2nd Edition, June 1986.
- 4) Applied Hydrology and Sedimentology for Disturbed Areas, Third Printing 1985, B.J. Barfield, R.C. Warner, and C.T. Hann, Published by Oklahoma Technical Press, 1981.
- 5) Web Soil Survey, Natural Resources Conservation Service, Retrieved from <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm> .
- 6) Handbook of Hydraulics - Sixth Edition, Brater and King, McGraw-Hill Book Company, 1976.

ATTACHMENT 1

NOAA Point Precipitation Frequency Estimates



NOAA Atlas 14, Volume 2, Version 3
Location name: Fairfield, Pennsylvania, US*
Latitude: 39.7678°, Longitude: -77.4403°
Elevation: 1240 ft*
 * source: Google Maps



POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerals](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.356 (0.319-0.398)	0.427 (0.382-0.477)	0.512 (0.457-0.571)	0.578 (0.516-0.644)	0.670 (0.594-0.745)	0.741 (0.654-0.822)	0.818 (0.717-0.906)	0.899 (0.784-0.996)	1.01 (0.875-1.12)	1.11 (0.948-1.23)
10-min	0.555 (0.498-0.621)	0.670 (0.599-0.748)	0.799 (0.714-0.892)	0.897 (0.801-0.999)	1.03 (0.914-1.14)	1.13 (1.00-1.26)	1.24 (1.09-1.38)	1.35 (1.18-1.50)	1.51 (1.30-1.67)	1.63 (1.40-1.81)
15-min	0.682 (0.612-0.763)	0.822 (0.735-0.918)	0.987 (0.882-1.10)	1.11 (0.990-1.24)	1.28 (1.13-1.42)	1.41 (1.24-1.56)	1.55 (1.36-1.72)	1.69 (1.47-1.87)	1.89 (1.63-2.09)	2.04 (1.75-2.26)
30-min	0.907 (0.814-1.01)	1.10 (0.988-1.23)	1.36 (1.21-1.52)	1.55 (1.38-1.73)	1.82 (1.61-2.02)	2.03 (1.79-2.25)	2.25 (1.98-2.50)	2.49 (2.17-2.75)	2.83 (2.44-3.13)	3.10 (2.65-3.43)
60-min	1.11 (0.998-1.24)	1.36 (1.22-1.52)	1.71 (1.53-1.91)	1.98 (1.77-2.21)	2.37 (2.10-2.63)	2.69 (2.37-2.98)	3.03 (2.66-3.36)	3.39 (2.96-3.76)	3.93 (3.39-4.35)	4.38 (3.75-4.84)
2-hr	1.29 (1.16-1.46)	1.58 (1.41-1.77)	2.00 (1.78-2.24)	2.34 (2.08-2.62)	2.85 (2.52-3.18)	3.29 (2.89-3.67)	3.79 (3.30-4.21)	4.35 (3.76-4.83)	5.23 (4.47-5.79)	6.00 (5.09-6.65)
3-hr	1.44 (1.29-1.64)	1.75 (1.56-1.99)	2.20 (1.96-2.50)	2.57 (2.28-2.91)	3.13 (2.76-3.54)	3.62 (3.17-4.08)	4.18 (3.63-4.69)	4.81 (4.14-5.39)	5.79 (4.93-6.48)	6.66 (5.61-7.46)
6-hr	1.84 (1.65-2.10)	2.23 (1.99-2.54)	2.78 (2.48-3.17)	3.25 (2.88-3.69)	3.95 (3.47-4.47)	4.57 (3.99-5.16)	5.29 (4.58-5.95)	6.10 (5.24-6.86)	7.37 (6.24-8.27)	8.51 (7.13-9.55)
12-hr	2.31 (2.05-2.64)	2.80 (2.48-3.19)	3.48 (3.08-3.96)	4.07 (3.58-4.63)	4.98 (4.35-5.63)	5.80 (5.03-6.55)	6.75 (5.79-7.59)	7.85 (6.66-8.81)	9.59 (8.01-10.7)	11.2 (9.21-12.5)
24-hr	2.71 (2.47-3.00)	3.25 (2.96-3.61)	4.05 (3.68-4.49)	4.75 (4.30-5.26)	5.85 (5.25-6.44)	6.85 (6.11-7.52)	8.03 (7.09-8.77)	9.41 (8.23-10.2)	11.6 (10.0-12.6)	13.7 (11.6-14.8)
2-day	3.14 (2.85-3.51)	3.77 (3.42-4.22)	4.68 (4.24-5.24)	5.49 (4.95-6.12)	6.75 (6.04-7.50)	7.90 (7.02-8.75)	9.25 (8.16-10.2)	10.8 (9.46-11.9)	13.4 (11.5-14.7)	15.7 (13.3-17.3)
3-day	3.34 (3.04-3.73)	4.01 (3.65-4.47)	4.96 (4.50-5.53)	5.80 (5.23-6.45)	7.10 (6.37-7.87)	8.29 (7.38-9.16)	9.66 (8.54-10.7)	11.3 (9.88-12.4)	13.9 (12.0-15.2)	16.3 (13.8-17.8)
4-day	3.55 (3.23-3.95)	4.25 (3.87-4.73)	5.24 (4.76-5.83)	6.10 (5.52-6.77)	7.45 (6.69-8.24)	8.67 (7.74-9.56)	10.1 (8.93-11.1)	11.7 (10.3-12.9)	14.4 (12.4-15.8)	16.8 (14.3-18.4)
7-day	4.13 (3.79-4.55)	4.93 (4.52-5.44)	6.03 (5.52-6.65)	6.98 (6.37-7.68)	8.44 (7.65-9.27)	9.75 (8.79-10.7)	11.3 (10.1-12.3)	13.0 (11.5-14.2)	15.7 (13.8-17.2)	18.2 (15.7-19.9)
10-day	4.73 (4.36-5.20)	5.64 (5.19-6.19)	6.81 (6.25-7.47)	7.81 (7.15-8.55)	9.32 (8.49-10.2)	10.7 (9.66-11.6)	12.2 (11.0-13.3)	13.9 (12.4-15.1)	16.5 (14.6-18.0)	18.9 (16.5-20.6)
20-day	6.38 (5.97-6.87)	7.54 (7.04-8.10)	8.85 (8.26-9.51)	9.94 (9.26-10.7)	11.5 (10.7-12.4)	12.9 (11.9-13.8)	14.4 (13.3-15.4)	16.1 (14.7-17.2)	18.6 (16.9-20.0)	20.8 (18.7-22.3)
30-day	7.88 (7.43-8.41)	9.26 (8.72-9.87)	10.7 (10.1-11.4)	11.9 (11.2-12.6)	13.6 (12.7-14.5)	15.0 (14.1-16.0)	16.6 (15.4-17.6)	18.3 (16.9-19.4)	20.8 (19.1-22.1)	22.9 (20.9-24.4)
45-day	9.87 (9.32-10.5)	11.5 (10.9-12.2)	13.1 (12.4-13.9)	14.4 (13.6-15.3)	16.2 (15.3-17.2)	17.7 (16.7-18.8)	19.3 (18.1-20.4)	21.0 (19.6-22.3)	23.4 (21.8-24.9)	25.4 (23.5-27.0)
60-day	11.7 (11.1-12.4)	13.7 (13.0-14.5)	15.4 (14.6-16.3)	16.8 (16.0-17.8)	18.8 (17.8-19.9)	20.4 (19.3-21.6)	22.1 (20.8-23.4)	24.0 (22.5-25.3)	26.5 (24.7-28.0)	28.6 (26.6-30.3)

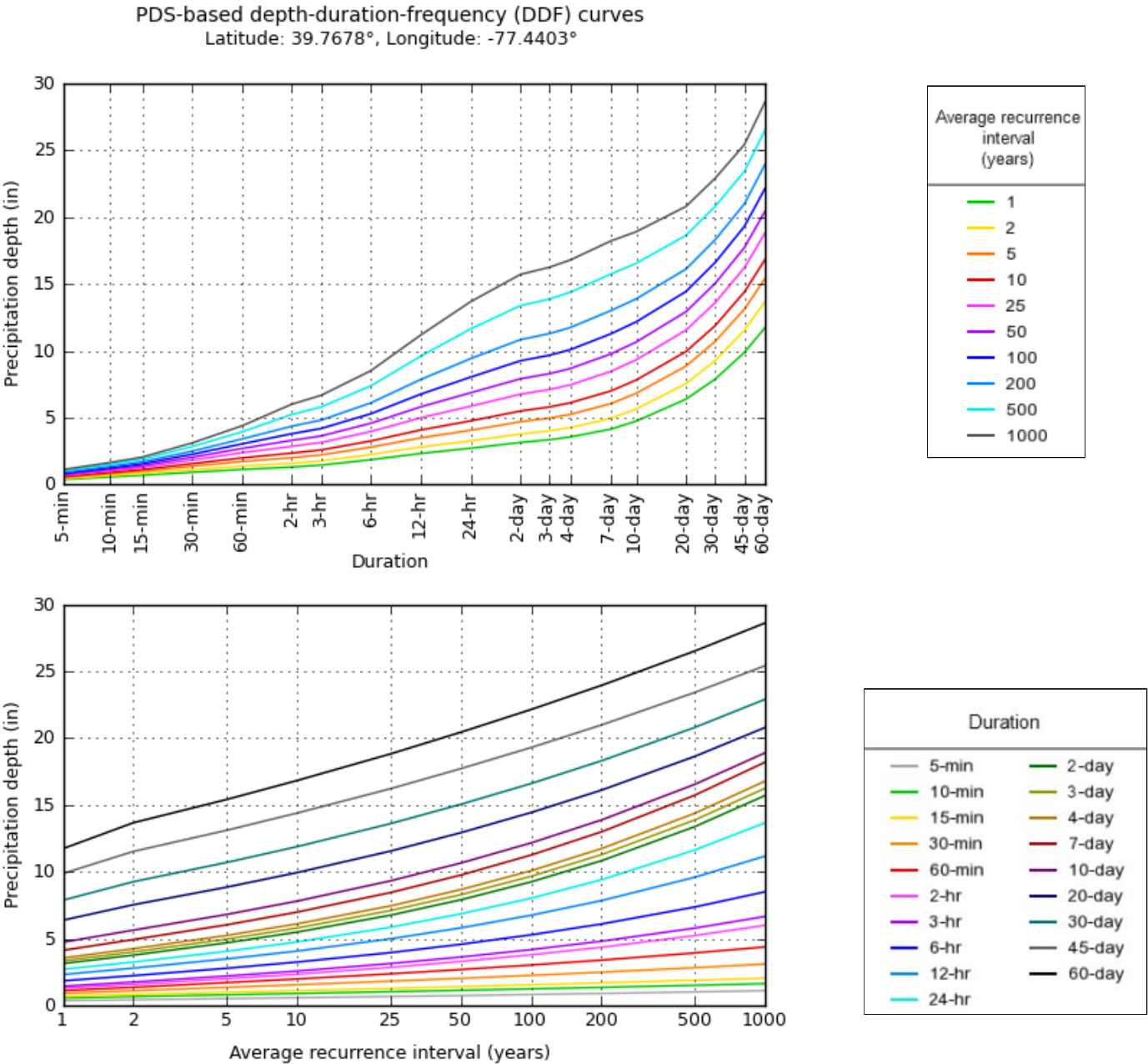
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical



NOAA Atlas 14, Volume 2, Version 3

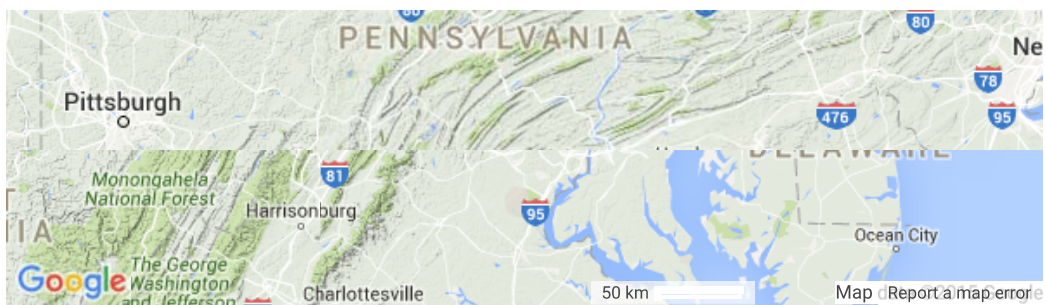
Created (GMT): Wed Dec 16 18:57:04 2015

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Maps & aerials

Small scale terrain



**Large scale terrain****Large scale map****Large scale aerial**



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Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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ATTACHMENT 2

Natural Resources Conservation Service

Soil Map—Adams County, Pennsylvania, and Franklin County, Pennsylvania
(Specialty Granules Inc - Lower Mill Ponds Evaluation)



Soil Map—Adams County, Pennsylvania, and Franklin County, Pennsylvania
(Specialty Granules Inc - Lower Mill Ponds Evaluation)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Adams County, Pennsylvania

Survey Area Data: Version 13, Oct 3, 2017

Soil Survey Area: Franklin County, Pennsylvania

Survey Area Data: Version 10, Oct 4, 2017

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 14, 2011—Nov 6, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
EeB	Edgemont channery loam, 0 to 8 percent slopes, very stony	6.6	0.8%
EeD	Edgemont channery loam, 8 to 25 percent slopes, very stony	7.1	0.9%
EeF	Edgemont channery loam, 25 to 70 percent slopes, very stony	25.7	3.1%
Hc	Hatboro silt loam	0.3	0.0%
HgB	Highfield channery silt loam, 3 to 8 percent slopes	4.2	0.5%
HgC	Highfield channery silt loam, 8 to 15 percent slopes	23.0	2.8%
HKB	Highfield, Catoctin, and Myersville soils, 0 to 8 percent slopes, very stony	24.8	3.0%
HKD	Highfield, Catoctin, and Myersville soils, 8 to 25 percent slopes, very stony	91.7	11.2%
HMF	Highfield and Catoctin channery silt loams, 25 to 70 percent slopes, very stony	121.2	14.8%
MtB	Mt. Zion gravelly silt loam, 3 to 8 percent slopes	1.8	0.2%
MtC	Mt. Zion gravelly silt loam, 8 to 15 percent slopes	4.0	0.5%
MyB	Myersville silt loam, 3 to 8 percent slopes	7.7	0.9%
MyD	Myersville silt loam, 15 to 25 percent slopes	10.5	1.3%
Pt	Pits, quarry	195.0	23.8%
RcC	Ravenrock-Highfield-Rock outcrop complex, 8 to 15 percent slopes	8.3	1.0%
RcD	Ravenrock-Highfield-Rock outcrop complex, 15 to 25 percent slopes	205.6	25.1%
RoB	Rohrersville silt loam, 3 to 8 percent slopes	0.5	0.1%
RsB	Rohrersville silt loam, 0 to 15 percent slopes, very stony	44.8	5.5%
W	Water	3.8	0.5%
Subtotals for Soil Survey Area		786.5	96.0%
Totals for Area of Interest		819.3	100.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HTB	Highfield and Catoctin channery silt loams, 0 to 8 percent slopes, extremely stony	0.2	0.0%
HTD	Highfield and Catoctin channery silt loams, 8 to 25 percent slopes, extremely stony	24.4	3.0%
HTF	Highfield and Catoctin channery silt loams, 25 to 50 percent slopes, extremely stony	0.7	0.1%
MyB	Myersville silt loam, 3 to 8 percent slopes	3.1	0.4%
Q	Quarries	4.1	0.5%
RcB	Rohrersville silt loam, 0 to 15 percent slopes, very stony	0.3	0.0%
Subtotals for Soil Survey Area		32.8	4.0%
Totals for Area of Interest		819.3	100.0%

ATTACHMENT 3

Autodesk Storm and Sanitary Analysis Calculations

100-Year Storm

Project Description

File Name	Stormwater System - Existing with Proposed N. Tract as of 2018-08-03.SPF
Description	R:\2015\152596 - SGI Disposal Embankment\Xrefs\Watersheds.dwg

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	SCS TR-55
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	Dec 01, 2015	00:00:00
End Analysis On	Dec 09, 2015	00:00:00
Start Reporting On	Dec 01, 2015	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:00:30	days hh:mm:ss
Routing Time Step	15	seconds

Number of Elements

	Qty
Rain Gages	1
Subbasins.....	15
Nodes.....	52
<i>Junctions</i>	35
<i>Outfalls</i>	3
<i>Flow Diversions</i>	0
<i>Inlets</i>	0
<i>Storage Nodes</i>	14
Links.....	123
<i>Channels</i>	15
<i>Pipes</i>	51
<i>Pumps</i>	7
<i>Orifices</i>	43
<i>Weirs</i>	7
<i>Outlets</i>	0
Pollutants	0
Land Uses	0

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1	Rain Gage-07	Time Series	100-yr	Cumulative	inches	Pennsylvania	Adams	100	8.03	SCS Type II 24-hr

Subbasin Summary

SN Subbasin ID	Area	Weighted Curve Number	Total Rainfall	Total Runoff	Total Runoff Volume	Peak Runoff	Time of Concentration
	(ac)		(in)	(in)	(ac-in)	(cfs)	(days hh:mm:ss)
1 BLUE_MOUNTAIN_POND	10.78	72.09	8.03	4.73	51.00	48.84	0 00:26:11
2 CC-5_CULVERT	17.33	70.75	8.03	4.58	79.32	80.00	0 00:23:42
3 INLET I-11	9.50	75.87	8.03	5.17	49.12	75.04	0 00:06:00
4 INLET I-12	55.94	76.82	8.03	5.28	295.41	245.70	0 00:33:06
5 INLET I-6	18.59	53.59	8.03	2.65	49.30	46.06	0 00:24:48
6 INLET I-10	2.06	73.87	8.03	4.94	10.17	14.80	0 00:07:50
7 MILL POND 1	15.81	67.65	8.03	4.22	66.73	61.78	0 00:27:37
8 MILL POND 2	20.16	68.94	8.03	4.37	88.07	76.17	0 00:31:09
9 MILL POND 3	6.26	73.17	8.03	4.86	30.38	41.63	0 00:10:16
10 OLD WAYNESBORO RD	36.85	73.10	8.03	4.85	178.65	183.33	0 00:22:55
11 Pitts Pond 1 Subbasin	94.34	72.22	8.03	4.75	447.74	348.73	0 00:36:44
12 Pitts Pond 2 Subbasin	15.97	62.76	8.03	3.67	58.53	73.72	0 00:14:21
13 Pitts Quarry	118.61	84.81	8.03	6.22	737.75	593.41	0 00:33:46
14 RAILROAD CULVERT	32.46	72.03	8.03	4.72	153.34	140.34	0 00:28:19
15 ST-1E & 2E Subbasin	9.57	69.70	8.03	4.46	42.64	56.89	0 00:11:49

Node Summary

SN	Element ID	Element Type	Invert Elevation	Ground/Rim (Max) Elevation	Initial Water Elevation	Surcharge Elevation	Ponded Area	Peak Inflow	Max HGL Elevation Attained	Max Surcharge Depth Attained	Min Freeboard Attained	Time of Peak Flooding Occurrence	Total Flooded Volume	Total Time Flooded
			(ft)	(ft)	(ft)	(ft)	(ft²)	(cfs)	(ft)	(ft)	(ft)	(days hh:mm)	(ac-in)	(min)
1	30CMPout	Junction	1194.43	1199.43	1194.43	1199.43	1000.00	47.52	1203.20	3.77	0.00	0 12:26	7.73	110.00
2	36CPEPout	Junction	1188.32	1191.32	1188.32	1191.32	1000.00	205.82	1203.87	10.87	0.00	0 12:08	21.39	135.00
3	72RCPin	Junction	1038.72	1047.97	1038.72	1047.97	100.00	163.48	1043.90	0.00	5.10	0 00:00	0.00	0.00
4	72RCPout	Junction	1030.64	1036.64	1030.64	1036.64	1000.00	163.46	1031.66	0.00	4.98	0 00:00	0.00	0.00
5	CC-4_Start	Junction	1070.00	1079.00	1070.00	1079.00	100.00	163.48	1071.63	0.00	7.37	0 00:00	0.00	0.00
6	CC-5_Start	Junction	1167.21	1200.00	1167.21	1200.00	100.00	196.03	1203.19	3.19	0.00	0 12:29	13.49	105.00
7	CC-7_Start	Junction	1230.00	1240.93	1230.00	1240.93	1000.00	138.58	1231.11	0.00	9.82	0 00:00	0.00	0.00
8	11	Junction	1101.51	1105.65	1101.51	1105.65	50.00	309.08	1122.22	15.57	0.00	0 12:23	20.16	170.00
9	110	Junction	1241.67	1245.67	1241.67	1245.67	100.00	14.78	1243.89	0.00	1.78	0 00:00	0.00	0.00
10	111	Junction	1269.21	1275.80	1269.21	1275.80	1556.00	146.02	1293.13	17.33	0.00	0 11:53	12.10	111.00
11	112	Junction	1358.50	1365.50	1358.50	1365.50	2500.00	194.35	1390.44	24.94	0.00	0 12:12	19.06	81.00
12	12	Junction	1114.80	1119.16	1114.80	1119.16	50.00	289.78	1128.65	8.49	0.00	0 12:19	8.36	45.00
13	13	Junction	1126.59	1130.90	1126.59	1130.90	50.00	269.84	1138.98	7.08	0.00	0 12:17	10.42	147.00
14	14	Junction	1137.91	1142.20	1137.91	1142.20	50.00	260.43	1149.27	6.07	0.00	0 12:14	5.84	63.00
15	15	Junction	1199.25	1203.66	1199.25	1203.66	100.00	47.47	1204.12	0.46	0.00	0 12:10	0.06	10.00
16	16	Junction	1202.80	1206.00	1202.80	1206.00	1000.00	46.02	1207.66	1.66	0.00	0 12:07	0.52	18.00
17	17	Junction	1194.24	1200.52	1194.24	1200.52	100.00	203.24	1213.02	12.50	0.00	0 11:06	6.40	185.00
18	19	Junction	1199.23	1205.30	1199.23	1205.30	100.00	203.68	1215.44	10.14	0.00	0 11:58	3.16	127.00
19	Jun-60	Junction	971.00	975.00	971.00	975.00	100.00	163.45	972.54	0.00	3.46	0 00:00	0.00	0.00
20	Jun-71	Junction	1090.00	2500.00	1090.00	2500.00	0.00	7.13	1090.08	0.00	1409.92	0 00:00	0.00	0.00
21	Jun-72	Junction	1115.00	1125.00	1115.00	1125.00	0.00	116.41	1115.45	0.00	24.55	0 00:00	0.00	0.00
22	Junction1	Junction	1350.00	1359.00	1350.00	1359.00	100.00	150.62	1372.26	13.26	0.00	0 12:12	2.34	51.00
23	Junction2	Junction	1201.50	1204.50	1201.50	1204.50	100.00	208.66	1216.44	11.94	0.00	0 11:56	4.64	135.00
24	Junction3	Junction	1196.50	1199.50	1196.50	1199.50	100.00	203.23	1214.12	14.62	0.00	0 11:05	8.15	200.00
25	Junction4	Junction	1148.00	1151.00	1148.00	1151.00	100.00	270.83	1159.66	8.66	0.00	0 12:13	2.19	24.00
26	Junction5	Junction	1132.20	1135.20	1132.20	1135.20	100.00	235.32	1143.80	8.60	0.00	0 12:15	4.29	114.00
27	Junction6	Junction	1120.50	1123.50	1120.50	1123.50	100.00	253.11	1132.54	9.04	0.00	0 12:18	3.21	33.00
28	Junction7	Junction	1108.50	1111.50	1108.50	1111.50	100.00	271.78	1125.53	14.03	0.00	0 12:21	5.82	142.00
29	Out-01	Junction	905.00	950.00	905.00	950.00	1.00	181.95	932.18	0.00	17.82	0 00:00	0.00	0.00
30	P-20	Junction	932.92	950.00	932.92	950.00	10.00	3.85	943.25	0.00	17.25	0 00:00	0.00	0.00
31	P-22	Junction	932.63	950.00	932.63	950.00	10.00	2.16	943.25	0.00	16.97	0 00:00	0.00	0.00
32	P-23	Junction	932.48	950.00	932.48	950.00	10.00	2.15	943.25	0.00	16.81	0 00:00	0.00	0.00
33	P-25	Junction	932.93	950.00	932.93	950.00	10.00	2.17	943.25	0.00	17.27	0 00:00	0.00	0.00
34	P-27	Junction	929.31	950.00	929.31	950.00	10.00	2.67	941.85	0.00	8.15	0 00:00	0.00	0.00
35	WaynesboroCulvert	Junction	951.00	959.00	951.00	965.00	5000.00	291.44	954.78	0.00	4.22	0 00:00	0.00	0.00
36	Out-03	Outfall	900.00					181.95	900.00					
37	Out-06	Outfall	1112.00					128.91	1112.36					
38	Out-07	Outfall	0.00					52.29	0.00					
39	BlueMtPond	Storage Node	1073.00	1083.00	1073.00		39071.00	216.71	1085.98				33.25	168.00
40	CC-5_End	Storage Node	1153.00	1159.00	1153.00		1662.00	235.03	1173.46				37.09	195.00
41	CC-7_End	Storage Node	1203.75	1211.13	1203.75		2600.00	272.99	1222.50				40.56	120.00
42	I11PondedArea	Storage Node	1275.80	1278.40	1275.80		1556.00	74.88	1293.66				6.54	95.00
43	I12PondedArea	Storage Node	1365.50	1371.00	1365.50		2500.00	245.65	1395.74				16.97	63.00
44	MillPond1	Storage Node	945.00	951.00	946.70		103660.00	351.67	949.99				0.00	0.00
45	MillPond2	Storage Node	913.00	946.00	933.00		0.00	414.69	943.25				0.00	0.00
46	MillPond3	Storage Node	911.00	946.00	934.00		0.00	249.13	943.21				0.00	0.00
47	N. Tract Pond 1	Storage Node	1045.00	1060.00	1057.50		0.00	0.00	1057.64				0.00	0.00
48	N.Tract Pond 2	Storage Node	995.00	1010.00	1006.80		0.00	0.00	1006.88				0.00	0.00
49	Pitts Pond 1	Storage Node	1102.00	1121.00	1105.60		0.00	348.45	1119.78				0.00	0.00
50	Pitts Pond 2	Storage Node	1102.00	1121.00	1105.00		0.00	73.65	1113.36				0.00	0.00
51	Pitts Quarry Storage	Storage Node	992.00	1090.00	992.00		0.00	600.51	1036.53				0.00	0.00
52	ST-1E & 2E	Storage Node	1208.00	1214.00	1210.50		0.00	56.84	1213.71				0.00	0.00

Link Summary

SN Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/Total Depth Ratio	Total Time Surcharged	
				(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1	72RCP	Pipe	72RCPin	72RCPout	488.00	1038.72	1030.64	1.6600	72.000	0.0110	163.46	644.03	0.25	11.09	3.10	0.52	0.00
2	BlueMtCulvertOut	Pipe	BlueMtPond	CC-4_Start	40.00	1077.00	1076.00	2.5000	36.000	0.0240	163.48	114.25	1.43	11.70	2.89	0.96	0.00
3	CC-5_Inlet4A	Pipe	CC-5_End	Junction4	46.00	1153.00	1148.00	10.8700	36.000	0.0110	270.83	259.88	1.04	38.31	3.00	1.00	24.00
4	CC-5_Inlet4B	Pipe	Junction4	I4	100.00	1148.00	1137.90	10.1000	36.000	0.0110	260.43	250.39	1.04	36.84	3.00	1.00	24.00
5	CC-7_Inlet9A	Pipe	CC-7_End	Junction2	20.50	1203.75	1201.50	10.9800	36.000	0.0110	208.66	261.14	0.80	29.52	3.00	1.00	134.00
6	CC-7_Inlet9B	Pipe	Junction2	I9	20.50	1201.50	1199.43	10.1000	36.000	0.0110	203.68	250.48	0.81	28.82	3.00	1.00	135.00
7	Inlet10_CC-7	Pipe	I10	CC-7_Start	213.00	1241.67	1230.00	5.4800	24.000	0.0120	14.83	57.36	0.26	5.69	1.55	0.78	0.00
8	Inlet11_CC-7	Pipe	I11	CC-7_Start	341.00	1269.21	1237.93	9.1700	36.000	0.0240	137.33	109.42	1.26	19.43	3.00	1.00	88.00
9	Inlet12_Inlet11A	Pipe	I12	Junction1	100.00	1358.50	1350.00	8.5000	36.000	0.0240	150.62	105.33	1.43	22.98	3.00	1.00	58.00
10	Inlet12_Inlet11B	Pipe	Junction1	I11	520.00	1350.00	1269.34	15.5100	36.000	0.0240	139.66	142.29	0.98	19.76	3.00	1.00	58.00
11	Inlet1-BlueMtPond	Pipe	I1	BlueMtPond	262.00	1101.51	1083.76	6.7700	36.000	0.0120	153.63	188.07	0.82	24.15	2.61	0.87	0.00
12	Inlet2_Inlet1A	Pipe	I2	Junction7	55.00	1114.80	1108.50	11.4500	36.000	0.0120	271.78	244.55	1.11	38.45	3.00	1.00	141.00
13	Inlet2_Inlet1B	Pipe	Junction7	I1	60.00	1108.50	1101.51	11.6500	36.000	0.0120	253.93	246.63	1.03	35.92	3.00	1.00	142.00
14	Inlet3_Inlet2A	Pipe	I3	Junction6	60.00	1126.59	1120.50	10.1500	36.000	0.0120	253.11	230.20	1.10	35.81	3.00	1.00	32.00
15	Inlet3_Inlet2B	Pipe	Junction6	I2	56.00	1120.50	1114.80	10.1800	36.000	0.0120	237.80	230.53	1.03	33.64	3.00	1.00	33.00
16	Inlet4_Inlet3A	Pipe	I4	Junction5	58.00	1137.90	1132.20	9.8300	36.000	0.0120	235.32	226.72	1.04	33.29	3.00	1.00	113.00
17	Inlet4_Inlet3B	Pipe	Junction5	I3	58.00	1132.20	1126.59	9.6700	36.000	0.0120	221.11	224.72	0.98	31.28	3.00	1.00	114.00
18	Inlet5_CC-5	Pipe	I5	30CMPout	80.60	1199.25	1194.43	5.9800	30.000	0.0240	47.52	54.33	0.87	13.77	2.50	1.00	78.00
19	Inlet6_Inlet5	Pipe	I6	I5	62.00	1202.80	1199.66	5.0600	30.000	0.0240	47.47	50.00	0.95	9.67	2.50	1.00	17.00
20	Inlet7_CC-5	Pipe	I7	36CPEPout	97.00	1194.24	1188.32	6.1000	36.000	0.0120	205.82	178.51	1.15	29.12	3.00	1.00	132.00
21	Inlet9_Inlet7A	Pipe	I9	Junction3	27.00	1199.23	1196.50	10.1100	36.000	0.0110	203.23	250.65	0.81	28.75	3.00	1.00	188.00
22	Inlet9_Inlet7B	Pipe	Junction3	I7	23.00	1196.50	1194.24	9.8300	36.000	0.0110	203.24	247.09	0.82	28.75	3.00	1.00	200.00
23	Mill Pond 1 Crest 18s	Pipe	MillPond1	MillPond2	50.30	948.30	947.30	1.9900	18.000	0.0240	24.10	24.07	1.00	4.94	1.30	0.87	0.00
24	Mill Pond 1 Crest 20x28s	Pipe	MillPond1	MillPond2	49.90	948.50	947.10	2.8100	20.000	0.0150	165.42	485.57	0.34	6.13	1.08	0.65	0.00
25	P-01	Pipe	WaynesboroCulvert	MillPond1	130.00	951.00	947.00	3.0800	48.000	0.0120	289.89	1767.23	0.16	5.77	3.37	0.84	0.00
26	P-03	Pipe	MillPond1	MillPond2	67.47	946.68	944.30	3.5300	24.000	0.0240	20.09	23.01	0.87	6.98	1.72	0.86	0.00
27	P-04	Pipe	MillPond1	MillPond2	47.00	948.18	947.08	2.3400	18.000	0.0240	0.00	8.70	0.00	0.43	0.75	0.50	0.00
28	P-05	Pipe	MillPond1	MillPond2	47.00	948.30	947.25	2.2300	20.000	0.0240	0.00	17.83	0.00	0.18	0.83	0.50	0.00
29	P-06	Pipe	MillPond1	MillPond2	47.79	948.18	947.20	2.0500	20.000	0.0240	13.25	17.08	0.78	4.80	1.34	0.81	0.00
30	P-07	Pipe	MillPond1	MillPond2	49.91	948.26	947.29	1.9400	20.000	0.0240	12.64	16.63	0.76	4.60	1.34	0.80	0.00
31	P-08	Pipe	MillPond1	MillPond2	47.86	948.43	947.33	2.3000	20.000	0.0240	11.32	18.08	0.63	4.45	1.22	0.73	0.00
32	P-09	Pipe	MillPond1	MillPond2	48.81	948.66	946.72	3.9700	18.000	0.0240	7.92	17.10	0.46	4.44	0.99	0.66	0.00
33	P-10	Pipe	MillPond1	MillPond2	50.30	948.39	947.24	2.2900	20.000	0.0240	11.67	18.03	0.65	4.49	1.25	0.75	0.00
34	P-11	Pipe	MillPond1	MillPond2	50.34	948.30	947.91	0.7700	18.000	0.0240	6.43	5.01	1.28	4.11	1.24	0.83	0.00
35	P-12	Pipe	MillPond1	MillPond2	50.13	948.72	947.59	2.2500	20.000	0.0240	8.51	17.91	0.48	4.17	1.00	0.60	0.00
36	P-13	Pipe	MillPond1	MillPond2	49.85	948.84	947.03	3.6300	20.000	0.0240	7.50	22.73	0.33	4.47	0.86	0.52	0.00
37	P-14	Pipe	MillPond1	MillPond2	50.20	948.68	947.51	2.3300	20.000	0.0240	8.89	18.21	0.49	4.19	1.02	0.61	0.00
38	P-15	Pipe	MillPond1	MillPond2	50.62	947.98	946.93	2.0700	20.000	0.0240	14.77	17.18	0.86	5.22	1.39	0.83	0.00
39	P-16	Pipe	MillPond1	MillPond2	50.23	948.60	946.51	4.1600	20.000	0.0240	9.95	24.33	0.41	4.60	1.02	0.61	0.00
40	P-17	Pipe	MillPond1	MillPond2	51.25	948.77	946.91	3.6300	20.000	0.0240	8.15	22.72	0.36	4.48	0.91	0.55	0.00
41	P-18	Pipe	MillPond1	MillPond2	50.25	948.78	946.79	3.9600	20.000	0.0240	8.09	23.74	0.34	4.53	0.90	0.54	0.00
42	P-19	Pipe	MillPond1	MillPond2	50.20	948.33	946.96	2.7300	18.000	0.0240	6.35	9.40	0.68	4.18	1.20	0.80	0.00
43	P-20	Pipe	P-20	MillPond3	82.71	932.92	929.95	3.5900	8.000	0.0110	3.80	2.71	1.40	10.88	0.67	1.00	10556.00
44	P-21	Pipe	MillPond2	MillPond3	49.70	941.58	940.21	2.7600	18.000	0.0240	5.62	9.45	0.60	4.04	1.50	1.00	110.00
45	P-22	Pipe	P-22	MillPond3	80.32	932.63	930.34	2.8500	8.000	0.0240	2.00	1.11	1.81	5.74	0.67	1.00	9339.00
46	P-23	Pipe	P-23	MillPond3	80.25	932.48	931.36	1.4000	8.000	0.0240	2.01	0.77	2.60	5.76	0.67	1.00	9851.00
47	P-24	Pipe	MillPond2	MillPond3	49.59	941.47	940.30	2.3600	18.000	0.0240	6.22	8.74	0.71	4.07	1.50	1.00	128.00
48	P-25	Pipe	P-25	MillPond3	78.74	932.93	930.60	2.9600	8.000	0.0240	2.03	1.13	1.80	5.81	0.67	1.00	8044.00
49	P-26	Pipe	MillPond3	Out-01	41.81	940.98	940.31	1.6000	18.000	0.0240	9.26	7.20	1.29	5.56	1.34	0.89	0.00
50	P-27	Pipe	P-27	Out-01	98.09	929.31	922.86	6.5800	8.000	0.0240	2.10	1.68	1.25	6.01	0.67	1.00	11519.00
51	P-28	Pipe	MillPond3	Out-01	40.65	941.07	940.35	1.7700	18.000	0.0240	9.23	7.57	1.22	5.55	1.34	0.89	0.00
52	72 inch Culvert Bypass	Channel	72RCPin	72RCPout	489.00	1046.00	1030.64	3.1400	36.000	0.0330	0.00	2471.78	0.00	0.00	0.51	0.17	0.00
53	CC-1	Channel	Jun-60	WaynesboroCulvert	425.00	971.00	951.00	4.7100	60.000	0.0330	163.45	1686.60	0.10	7.00	2.51	0.50	0.00
54	CC-3	Channel	72RCPout	Jun-60	160.00	1030.64	971.00	37.2800	48.000	0.0330	163.45	2470.63	0.07	16.88	1.28	0.32	0.00
55	CC-4	Channel	CC-4_Start	72RCPin	333.00	1070.00	1038.72	9.3900	36.000	0.0400	163.48	554.32	0.29	7.33	2.32	0.77	0.00
56	CC-5	Channel	CC-5_Start	CC-5_End	481.26	1167.21	1153.00	2.9500	24.000	0.0400	155.05	155.05	1.00	7.75	2.00	1.00	154.00
57	CC-7	Channel	CC-7_Start	CC-7_End	220.00	1230.00	1203.75	11.9300	120.000	0.0350	138.53	7678.55	0.02	3.98	5.55	0.56	0.00
58	CMP_CC5	Channel	30CMPout	CC-5_Start	50.00	1194.43	1167.21	54.4400	36.000	0.0400	72.48	1334.46	0.05	3.10	3.00	1.00	115.00

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Link Summary

SN Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged
				(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)
59 CPEP_CC5	Channel	36CPEPout	CC-5_Start	50.00	1190.00	1167.21	45.5800	36.000	0.0400	174.87	1221.05	0.14	12.24	3.00	1.00	135.00
60 Inlet1_Bypass	Channel	I1	BlueMtPond	262.00	1105.65	1089.61	6.1200	12.000	0.0320	51.54	43.95	1.17	10.31	1.00	1.00	132.00
61 Inlet2_Bypass	Channel	I2	I1	115.00	1119.16	1105.65	11.7500	12.000	0.0320	60.88	60.88	1.00	12.18	1.00	1.00	45.00
62 Inlet3_Bypass	Channel	I3	I2	116.00	1130.90	1119.16	10.1200	12.000	0.0320	60.96	56.51	1.08	12.19	1.00	1.00	122.00
63 Inlet4_Bypass	Channel	I4	I3	116.00	1142.20	1130.90	9.7400	12.000	0.0320	55.44	55.44	1.00	11.09	1.00	1.00	50.00
64 Link-170	Channel	Jun-71	Pitts Quarry Storage	75.00	1090.00	1088.00	2.6700	300.000	0.0110	7.13	317822.46	0.00	3.42	0.11	0.00	0.00
65 Link-172	Channel	Jun-72	Out-06	135.57	1115.00	1112.00	2.2100	300.000	0.0110	128.91	289520.32	0.00	9.25	0.40	0.02	0.00
66 Outlet	Channel	Out-01	Out-03	16.48	930.00	929.00	6.0700	120.000	0.0320	181.95	2552.56	0.07	9.99	1.82	0.18	0.00
67 Inlet-11	Orifice	I11PondedArea	I11		1275.80	1269.21		36.000		59.21						
68 Inlet-12	Orifice	I12PondedArea	I12		1365.50	1358.50		50.000		128.61						
69 P-20a	Orifice	MillPond2	P-20		913.00	932.92		1.000		0.29						
70 P-20b	Orifice	MillPond2	P-20		913.00	932.92		1.000		0.29						
71 P-20c	Orifice	MillPond2	P-20		913.00	932.92		1.000		0.29						
72 P-20d	Orifice	MillPond2	P-20		913.00	932.92		1.000		0.29						
73 P-20e	Orifice	MillPond2	P-20		913.00	932.92		1.000		0.29						
74 P-20f	Orifice	MillPond2	P-20		913.00	932.92		1.000		0.28						
75 P-20g	Orifice	MillPond2	P-20		913.00	932.92		1.000		0.27						
76 P-20h	Orifice	MillPond2	P-20		913.00	932.92		1.000		0.26						
77 P-20i	Orifice	MillPond2	P-20		913.00	932.92		1.000		0.23						
78 P-20j	Orifice	MillPond2	P-20		913.00	932.92		8.000		1.49						
79 P-22a	Orifice	MillPond2	P-20		913.00	932.92		1.000		0.29						
80 P-22b	Orifice	MillPond2	P-22		913.00	932.63		1.000		0.30						
81 P-22c	Orifice	MillPond2	P-22		913.00	932.63		1.000		0.29						
82 P-22d	Orifice	MillPond2	P-22		913.00	932.63		1.000		0.28						
83 P-22e	Orifice	MillPond2	P-22		913.00	932.63		1.000		0.27						
84 P-22f	Orifice	MillPond2	P-22		913.00	932.63		1.000		0.27						
85 P-22g	Orifice	MillPond2	P-22		913.00	932.63		1.000		0.27						
86 P-22h	Orifice	MillPond2	P-20		913.00	932.92		1.000		0.26						
87 P-22i	Orifice	MillPond2	P-22		913.00	932.63		1.000		0.21						
88 P-22j	Orifice	MillPond2	P-22		913.00	932.63		8.000		1.10						
89 P-23a	Orifice	MillPond2	P-20		913.00	932.92		1.000		0.29						
90 P-23b	Orifice	MillPond2	P-23		913.00	932.48		1.000		0.31						
91 P-23c	Orifice	MillPond2	P-23		913.00	932.48		1.000		0.29						
92 P-23d	Orifice	MillPond2	P-23		913.00	932.48		1.000		0.28						
93 P-23e	Orifice	MillPond2	P-23		913.00	932.48		1.000		0.27						
94 P-23f	Orifice	MillPond2	P-23		913.00	932.48		1.000		0.25						
95 P-23g	Orifice	MillPond2	P-23		913.00	932.48		1.000		0.24						
96 P-23h	Orifice	MillPond2	P-23		913.00	932.48		1.000		0.23						
97 P-23i	Orifice	MillPond2	P-23		913.00	932.48		1.000		0.23						
98 P-23j	Orifice	MillPond2	P-23		913.00	932.48		8.000		1.04						
99 P-25a	Orifice	MillPond2	P-20		913.00	932.92		1.000		0.29						
100 P-25b	Orifice	MillPond2	P-25		913.00	932.93		1.000		0.31						
101 P-25c	Orifice	MillPond2	P-25		913.00	932.93		1.000		0.30						
102 P-25d	Orifice	MillPond2	P-25		913.00	932.93		1.000		0.30						
103 P-25e	Orifice	MillPond2	P-25		913.00	932.93		1.000		0.28						
104 P-25f	Orifice	MillPond2	P-25		913.00	932.93		1.000		0.27						
105 P-25g	Orifice	MillPond2	P-25		913.00	932.93		1.000		0.25						
106 P-25h	Orifice	MillPond2	P-25		913.00	932.93		1.000		0.23						
107 P-25i	Orifice	MillPond2	P-25		913.00	932.93		1.000		0.21						
108 P-25j	Orifice	MillPond2	P-25		913.00	932.93		8.000		1.05						
109 P-27 Orifice	Orifice	MillPond3	P-27		911.00	929.31		8.000		2.67						
110 Inlet-12-Weir	Weir	I12PondedArea	I12		1365.50	1358.50				63.51						
111 Pitts Pond 1 E. Spillway	Weir	Pitts Pond 1	Jun-72		1102.00	1115.00				116.41						
112 Pitts Pond 2 E. Spillway	Weir	Pitts Pond 2	Jun-72		1102.00	1115.00				0.00						
113 Pond 1 E. Spillway	Weir	MillPond1	MillPond2		945.00	913.00				0.00						
114 Pond 2 E. Spillway As-Built	Weir	MillPond2	MillPond3		913.00	911.00				223.74						
115 Pond 3 E. Spillway As-Built	Weir	MillPond3	Out-01		911.00	905.00				156.99						
116 Weir-28	Weir	ST-1E & 2E	Out-07		1208.00	0.00				52.29						

Reported
Condition

Link Summary

SN Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged
				(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)
117 NT 1 to J-Stand	Pump	N. Tract Pond 1	I12		1045.00	1358.50				2.23						
118 NT 2 to J-Stand	Pump	N.Tract Pond 2	I12		995.00	1358.50				1.78						
119 Pitts Pond 1 to Quarry	Pump	Pitts Pond 1	Jun-71		1102.00	1090.00				7.13						
120 Pitts Pond 2 to Quarry	Pump	Pitts Pond 2	Pitts Pond 1		1102.00	1102.00				3.60						
121 Pitts Quarry to Mill Ponds	Pump	Pitts Quarry Storage	I12		992.00	1358.50				1.75						
122 Pond 3 Dewater Pump	Pump	MillPond3	Out-01		911.00	905.00				4.47						
123 Sed Traps to Lower Mill Ponds	Pump	ST-1E & 2E	I12		1208.00	1358.50				2.23						

Reported
Condition

Subbasin Hydrology

Subbasin : BLUE_MOUNTAIN_POND

Input Data

Area (ac) 10.78
Weighted Curve Number 72.09
Rain Gage ID Rain Gage-07

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Newly graded area	3.64	B	86.00
Woods & grass combination, Fair	7.14	B	65.00
Composite Area & Weighted CN	10.78		72.09

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

$$T_c = (0.007 * ((n * L_f)^{0.8})) / ((P^{0.5}) * (S_f^{0.4}))$$

Where :

T_c = Time of Concentration (hr)
 n = Manning's roughness
 L_f = Flow Length (ft)
 P = 2 yr, 24 hr Rainfall (inches)
 S_f = Slope (ft/ft)

Shallow Concentrated Flow Equation :

$V = 16.1345 * (S_f^{0.5})$ (unpaved surface)
 $V = 20.3282 * (S_f^{0.5})$ (paved surface)
 $V = 15.0 * (S_f^{0.5})$ (grassed waterway surface)
 $V = 10.0 * (S_f^{0.5})$ (nearly bare & untilled surface)
 $V = 9.0 * (S_f^{0.5})$ (cultivated straight rows surface)
 $V = 7.0 * (S_f^{0.5})$ (short grass pasture surface)
 $V = 5.0 * (S_f^{0.5})$ (woodland surface)
 $V = 2.5 * (S_f^{0.5})$ (forest w/heavy litter surface)
 $T_c = (L_f / V) / (3600 \text{ sec/hr})$

Where:

T_c = Time of Concentration (hr)
 L_f = Flow Length (ft)
 V = Velocity (ft/sec)
 S_f = Slope (ft/ft)

Channel Flow Equation :

$V = (1.49 * (R^{2/3}) * (S_f^{0.5})) / n$
 $R = A_q / W_p$
 $T_c = (L_f / V) / (3600 \text{ sec/hr})$

Where :

T_c = Time of Concentration (hr)
 L_f = Flow Length (ft)
 R = Hydraulic Radius (ft)
 A_q = Flow Area (ft²)
 W_p = Wetted Perimeter (ft)
 V = Velocity (ft/sec)
 S_f = Slope (ft/ft)
 n = Manning's roughness

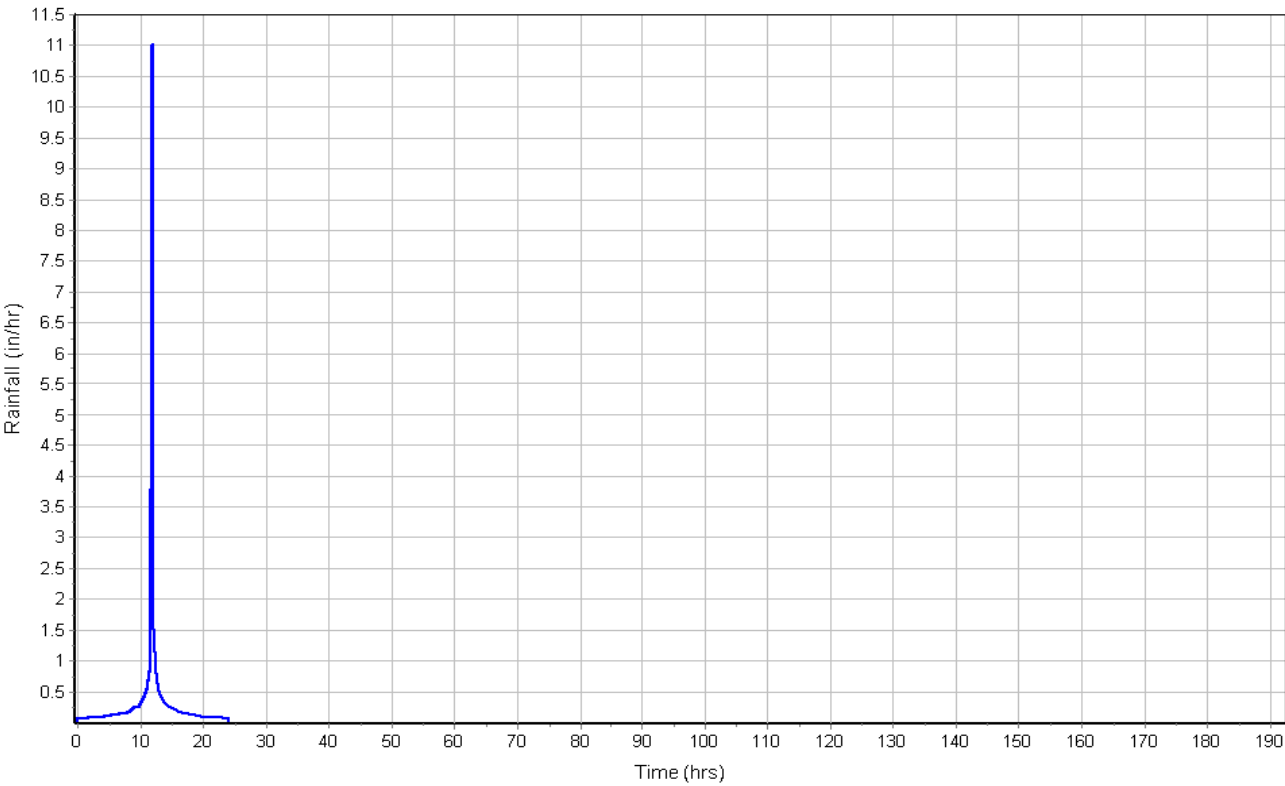
Sheet Flow Computations	Subarea	Subarea	Subarea
	A	B	C
Manning's Roughness :	0.40	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	3.25	0.00	0.00
Velocity (ft/sec) :	0.08	0.00	0.00
Computed Flow Time (min) :	21.31	0.00	0.00
Shallow Concentrated Flow Computations	Subarea	Subarea	Subarea
	A	B	C
Flow Length (ft) :	488.5	185.6	0.00
Slope (%) :	26.8	6.5	0.00
Surface Type :	Woodland		Bare & untilled
Velocity (ft/sec) :	2.59	1.78	0.00
Computed Flow Time (min) :	3.14	1.74	0.00
Total TOC (min)	26.19		

Subbasin Runoff Results

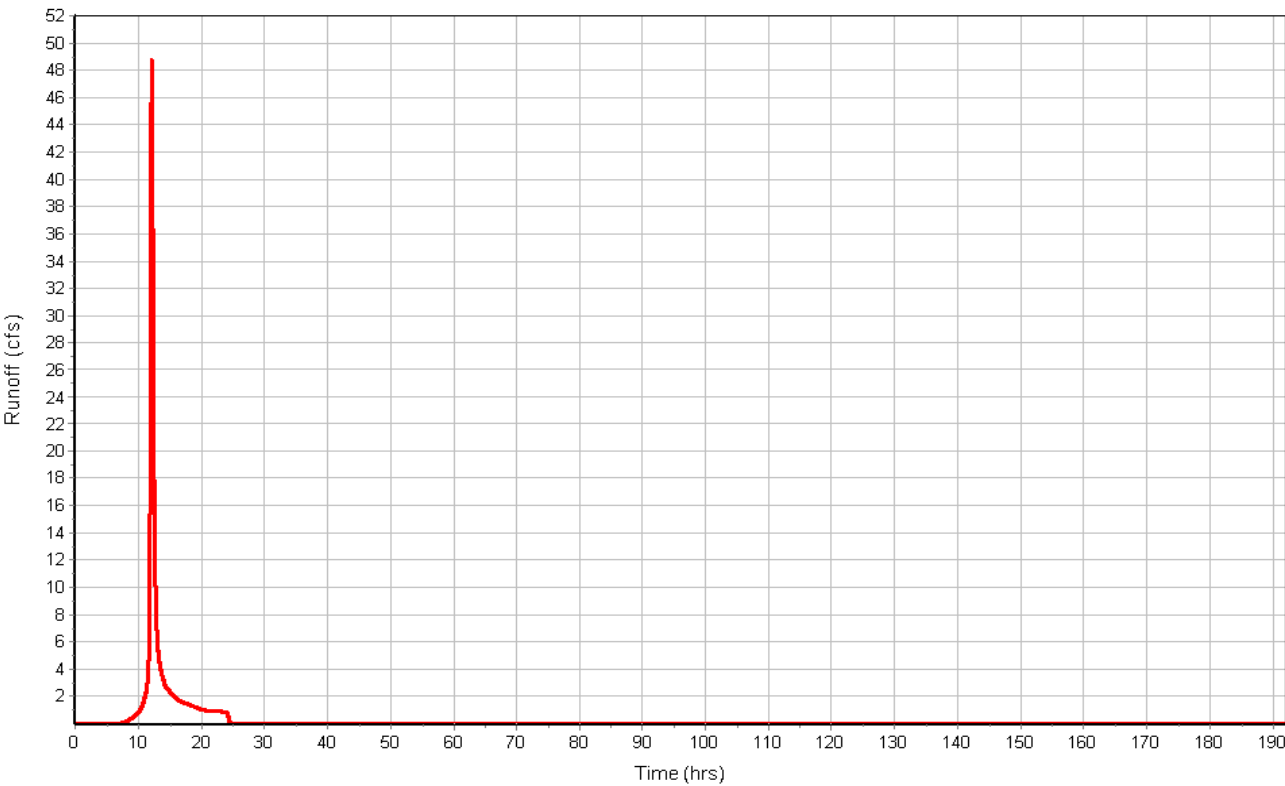
Total Rainfall (in)	8.03
Total Runoff (in)	4.73
Peak Runoff (cfs)	48.84
Weighted Curve Number	72.09
Time of Concentration (days hh:mm:ss)	0 00:26:11

Subbasin : BLUE_MOUNTAIN_POND

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : CC-5_CULVERT

Input Data

Area (ac) 17.33
Weighted Curve Number 70.75
Rain Gage ID Rain Gage-07

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Newly graded area	4.75	B	86.00
Woods & grass combination, Fair	12.58	B	65.00
Composite Area & Weighted CN	17.33		70.75

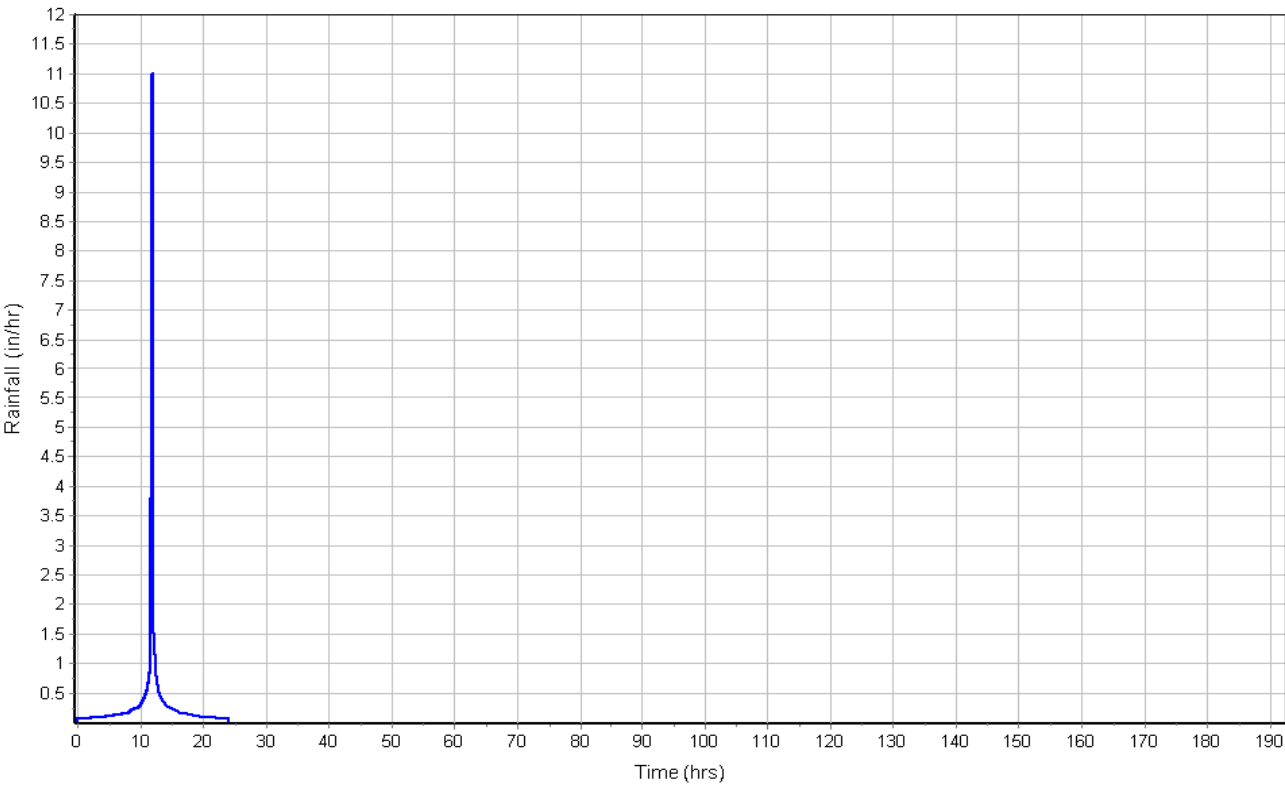
Time of Concentration

	Subarea A	Subarea B	Subarea C
Sheet Flow Computations			
Manning's Roughness :	0.40	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	2.2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	3.25	0.00	0.00
Velocity (ft/sec) :	0.08	0.00	0.00
Computed Flow Time (min) :	20.51	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	490	0.00	0.00
Slope (%) :	26.2	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	2.56	0.00	0.00
Computed Flow Time (min) :	3.19	0.00	0.00
Total TOC (min)	23.70		

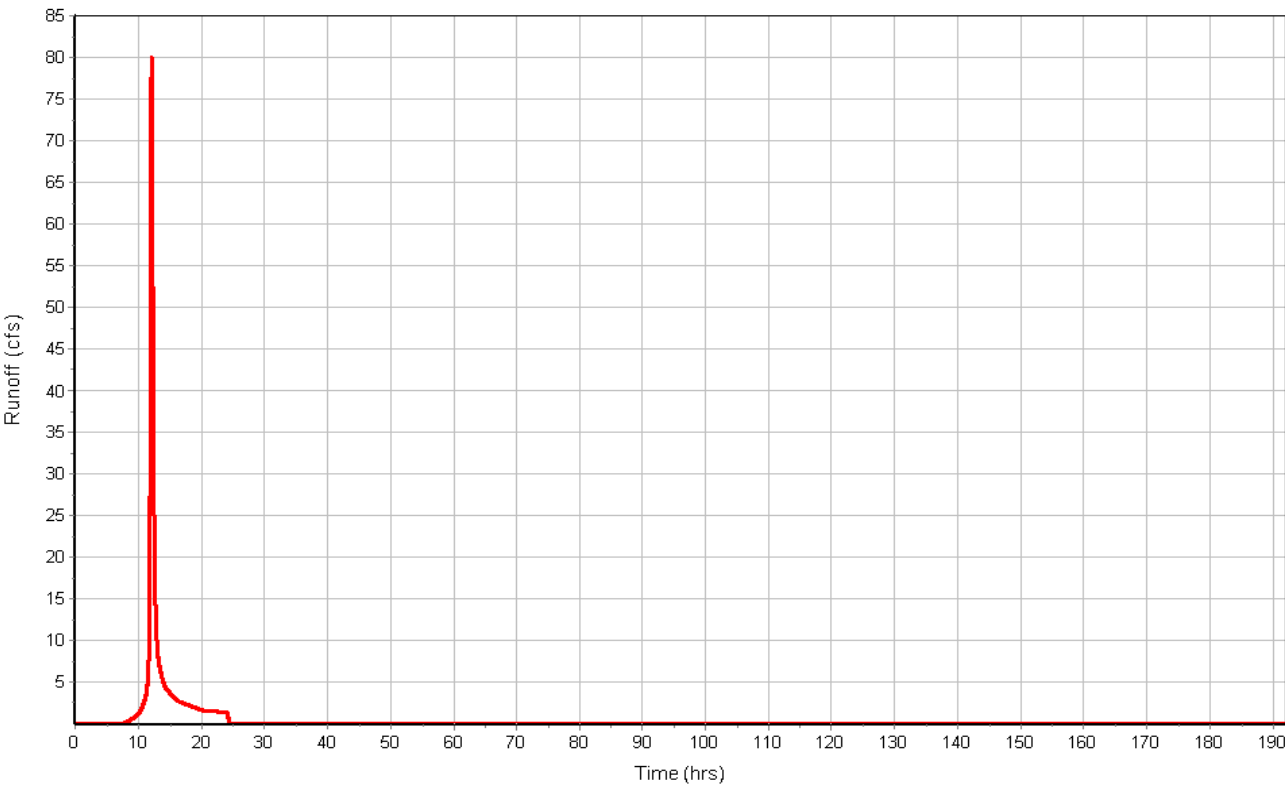
Subbasin Runoff Results

Total Rainfall (in) 8.03
Total Runoff (in) 4.58
Peak Runoff (cfs) 80.00
Weighted Curve Number 70.75
Time of Concentration (days hh:mm:ss) 0 00:23:42

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : INLET I-11

Input Data

Area (ac) 9.50
Weighted Curve Number 75.87
Rain Gage ID Rain Gage-07

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Newly graded area	3.84	B	86.00
Pasture, grassland, or range, Fair	5.66	B	69.00
Composite Area & Weighted CN	9.50		75.87

Time of Concentration

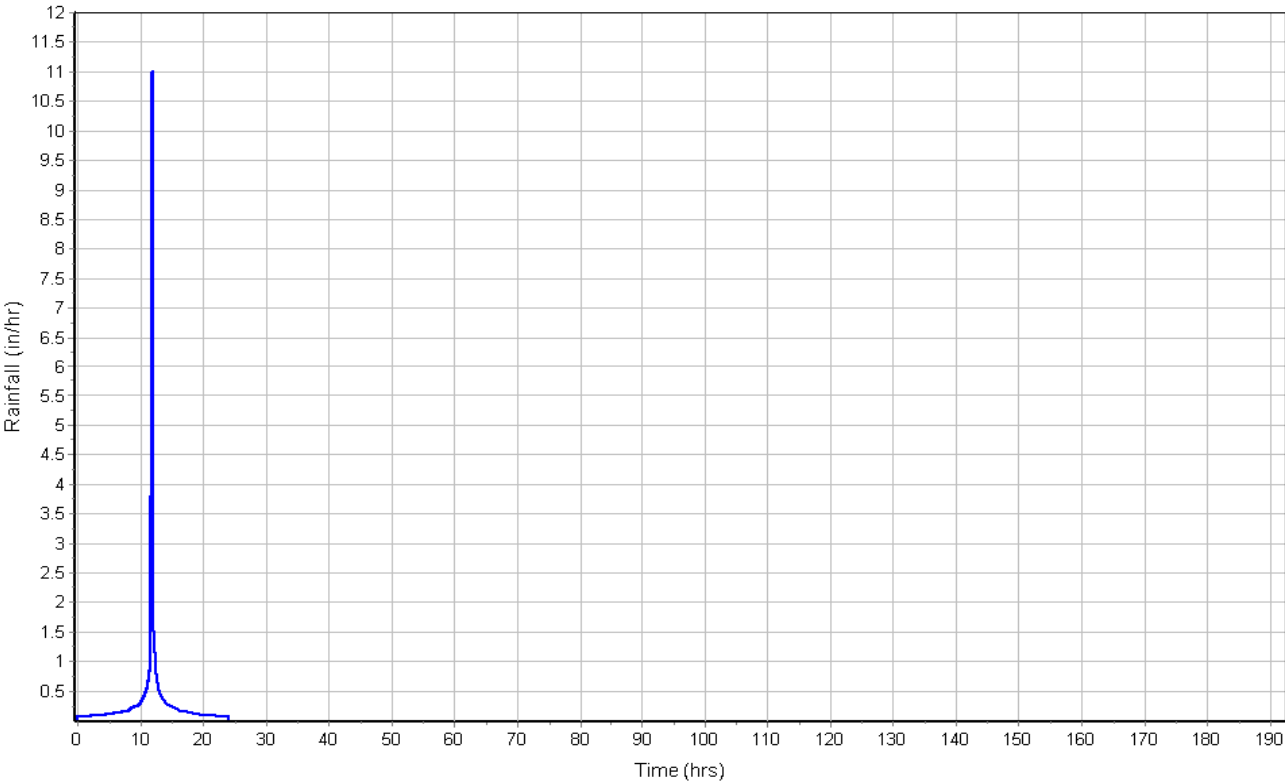
	Subarea A	Subarea B	Subarea C
Sheet Flow Computations			
Manning's Roughness :	.02	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	7.6	0.00	0.00
2 yr, 24 hr Rainfall (in) :	3.25	0.00	0.00
Velocity (ft/sec) :	1.47	0.00	0.00
Computed Flow Time (min) :	1.14	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	172.4	205.3	0.00
Slope (%) :	21.4	27.3	0.00
Surface Type :	Bare & untilled		Unpaved
Velocity (ft/sec) :	4.63	3.66	0.00
Computed Flow Time (min) :	0.62	0.93	0.00
Channel Flow Computations			
Manning's Roughness :	.033	0.00	0.00
Flow Length (ft) :	97.1	0.00	0.00
Channel Slope (%) :	9.3	0.00	0.00
Cross Section Area (ft ²) :	32.4	0.00	0.00
Wetted Perimeter (ft) :	28.4	0.00	0.00
Velocity (ft/sec) :	15.03	0.00	0.00
Computed Flow Time (min) :	0.11	0.00	0.00
Total TOC (min)2.80			

Subbasin Runoff Results

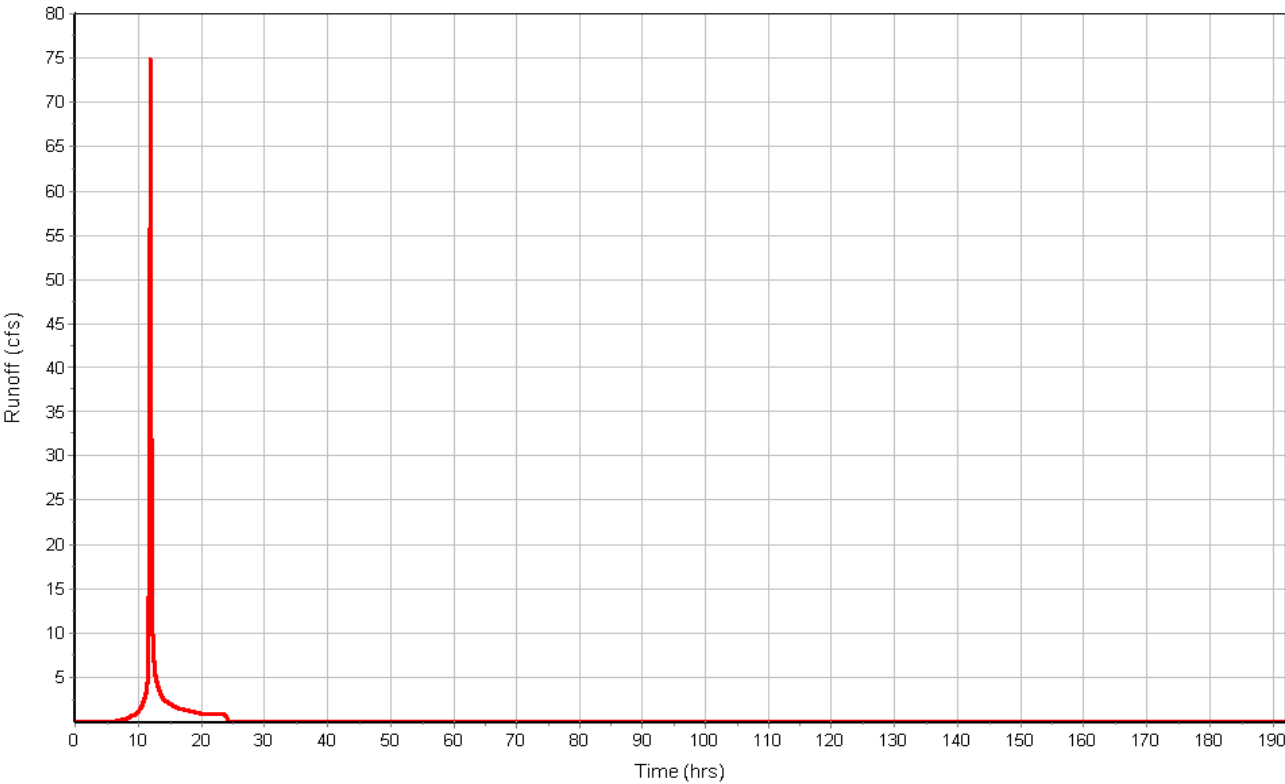
Total Rainfall (in) 8.03
Total Runoff (in) 5.17
Peak Runoff (cfs) 75.04
Weighted Curve Number 75.87
Time of Concentration (days hh:mm:ss) 0 00:02:48

Subbasin : INLET I-11

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : INLET I-12

Input Data

Area (ac) 55.94
Weighted Curve Number 76.82
Rain Gage ID Rain Gage-07

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Newly graded area	31.50	B	86.00
Woods & grass combination, Fair	24.44	B	65.00
Composite Area & Weighted CN	55.94		76.82

Time of Concentration

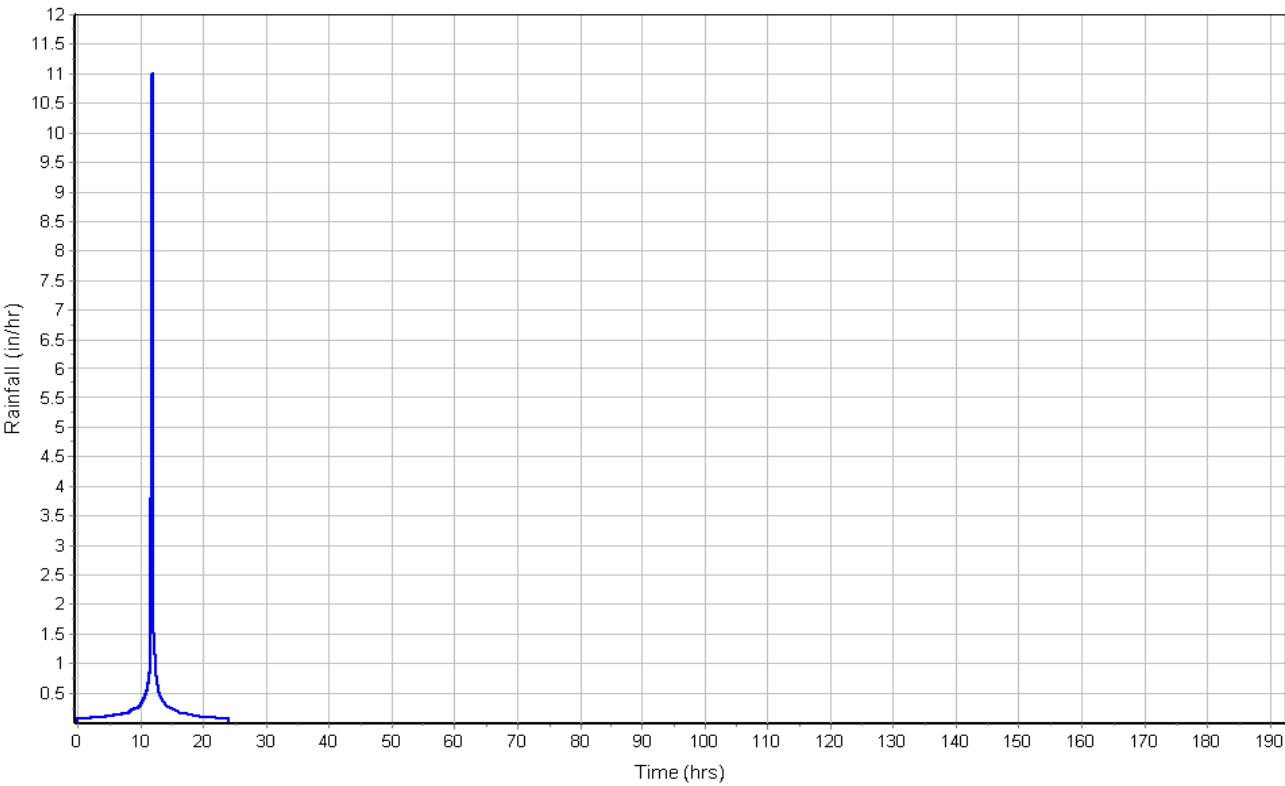
	Subarea A	Subarea B	Subarea C
Sheet Flow Computations			
Manning's Roughness :	.3	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	1.5	0.00	0.00
2 yr, 24 hr Rainfall (in) :	3.25	0.00	0.00
Velocity (ft/sec) :	0.09	0.00	0.00
Computed Flow Time (min) :	18.99	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	712	768	382
Slope (%) :	2.43	12.28	4.97
Surface Type :	Bare & untilled	re & untill	Bare & untilled
Velocity (ft/sec) :	1.56	3.50	2.23
Computed Flow Time (min) :	7.61	3.66	2.86
Total TOC (min)	33.11		

Subbasin Runoff Results

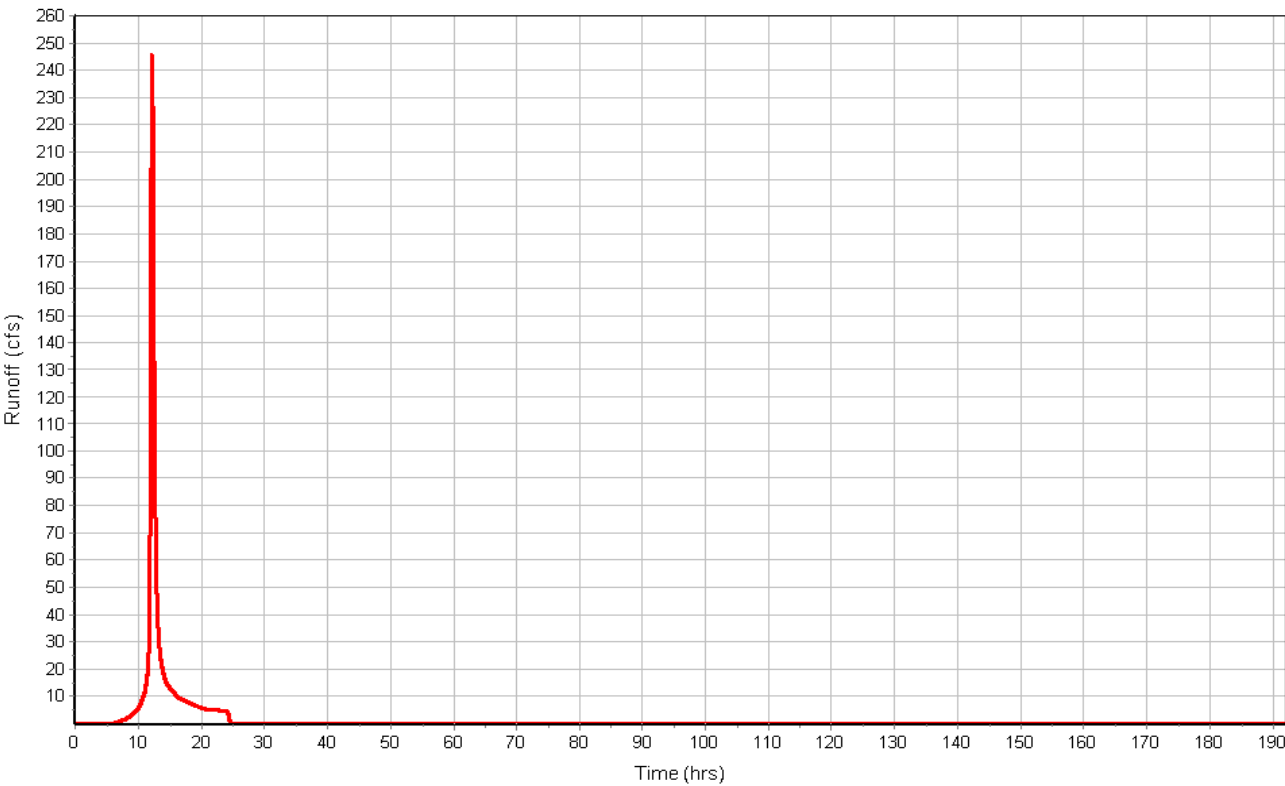
Total Rainfall (in) 8.03
Total Runoff (in) 5.28
Peak Runoff (cfs) 245.70
Weighted Curve Number 76.82
Time of Concentration (days hh:mm:ss) 0 00:33:07

Subbasin : INLET I-12

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : INLET I-6

Input Data

Area (ac) 18.59
Weighted Curve Number 53.59
Rain Gage ID Rain Gage-07

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Newly graded area	1.76	B	86.00
Woods, Fair	9.96	B	60.00
Woods, Fair	6.87	A	36.00
Composite Area & Weighted CN	18.59		53.59

Time of Concentration

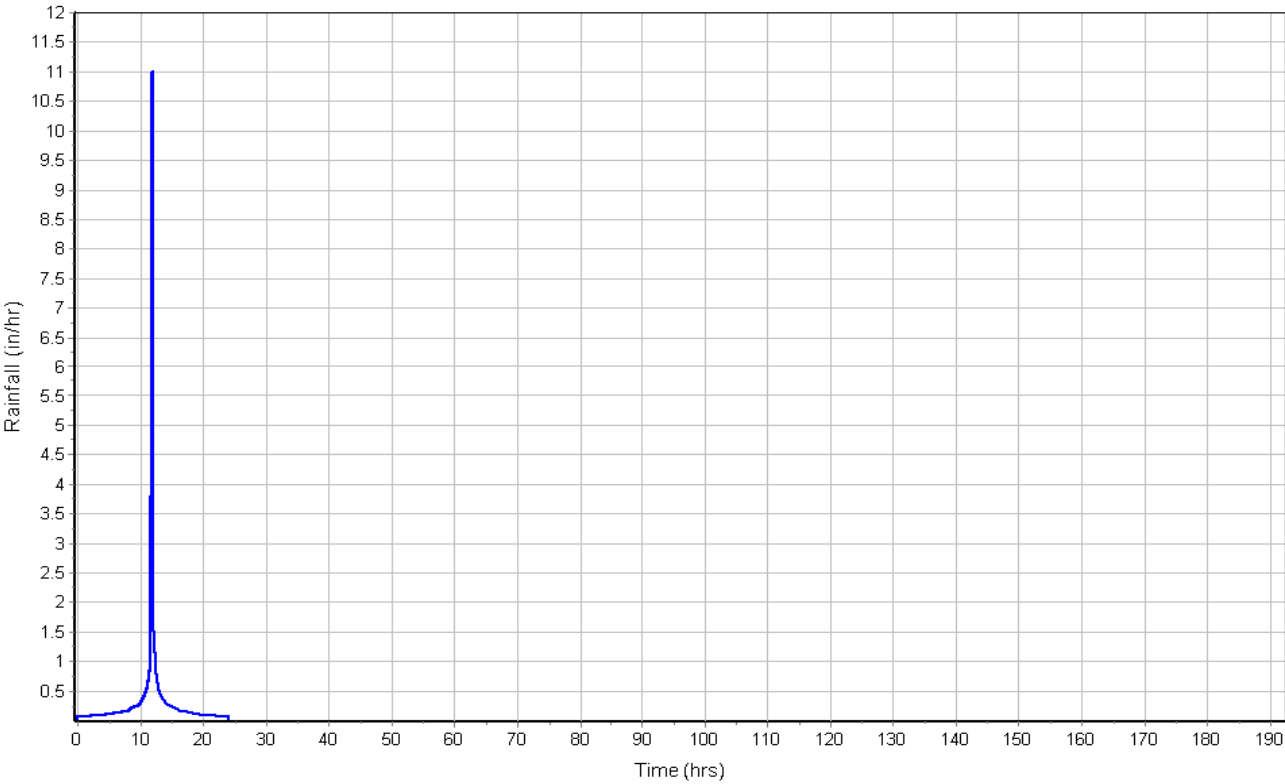
	Subarea A	Subarea B	Subarea C
Sheet Flow Computations			
Manning's Roughness :	.4	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	10.5	0.00	0.00
2 yr, 24 hr Rainfall (in) :	3.25	0.00	0.00
Velocity (ft/sec) :	0.15	0.00	0.00
Computed Flow Time (min) :	10.98	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	1488.5	605	0.00
Slope (%) :	19.7	14.5	0.00
Surface Type :	Woodland	ire & untill	Unpaved
Velocity (ft/sec) :	2.22	3.81	0.00
Computed Flow Time (min) :	11.17	2.65	0.00
Total TOC (min)	24.80		

Subbasin Runoff Results

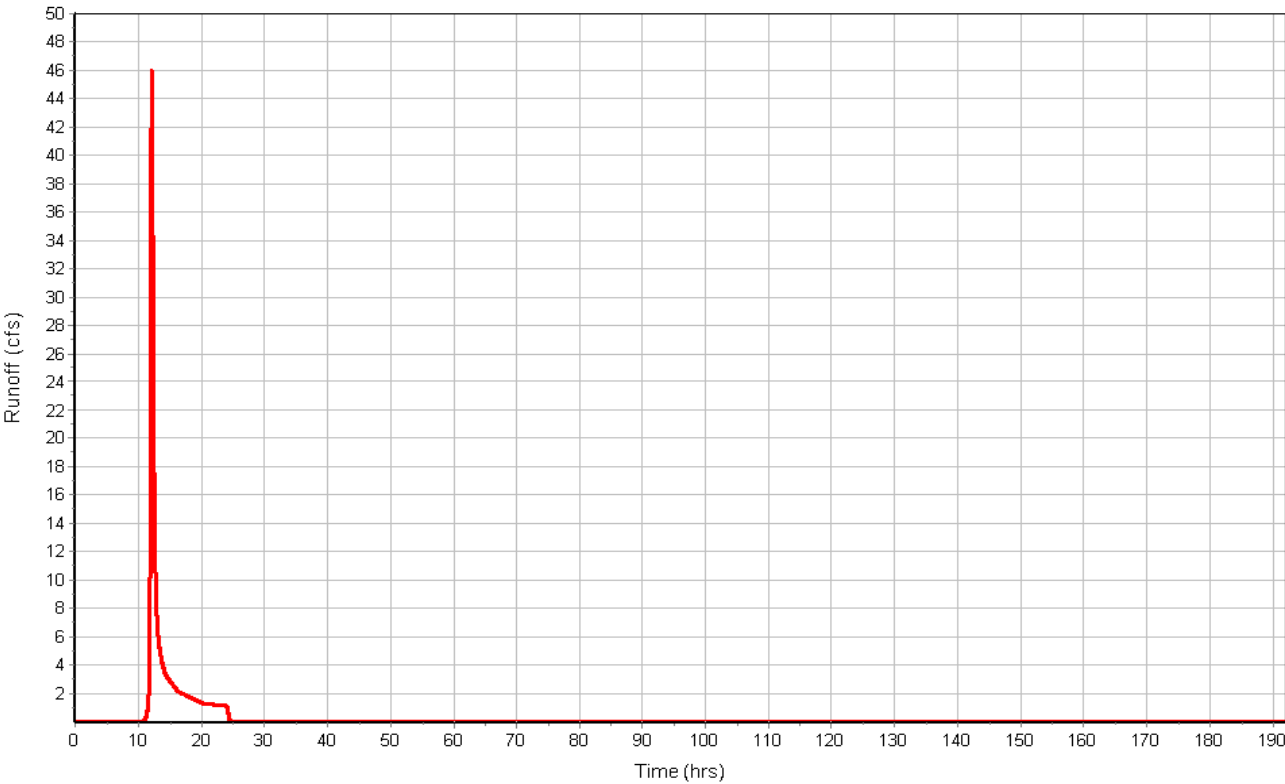
Total Rainfall (in) 8.03
Total Runoff (in) 2.65
Peak Runoff (cfs) 46.06
Weighted Curve Number 53.59
Time of Concentration (days hh:mm:ss) 0 00:24:48

Subbasin : INLET I-6

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : INLET1-10

Input Data

Area (ac) 2.06
Weighted Curve Number 73.87
Rain Gage ID Rain Gage-07

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Newly graded area	0.59	B	86.00
Pasture, grassland, or range, Fair	1.47	B	69.00
Composite Area & Weighted CN	2.06		73.87

Time of Concentration

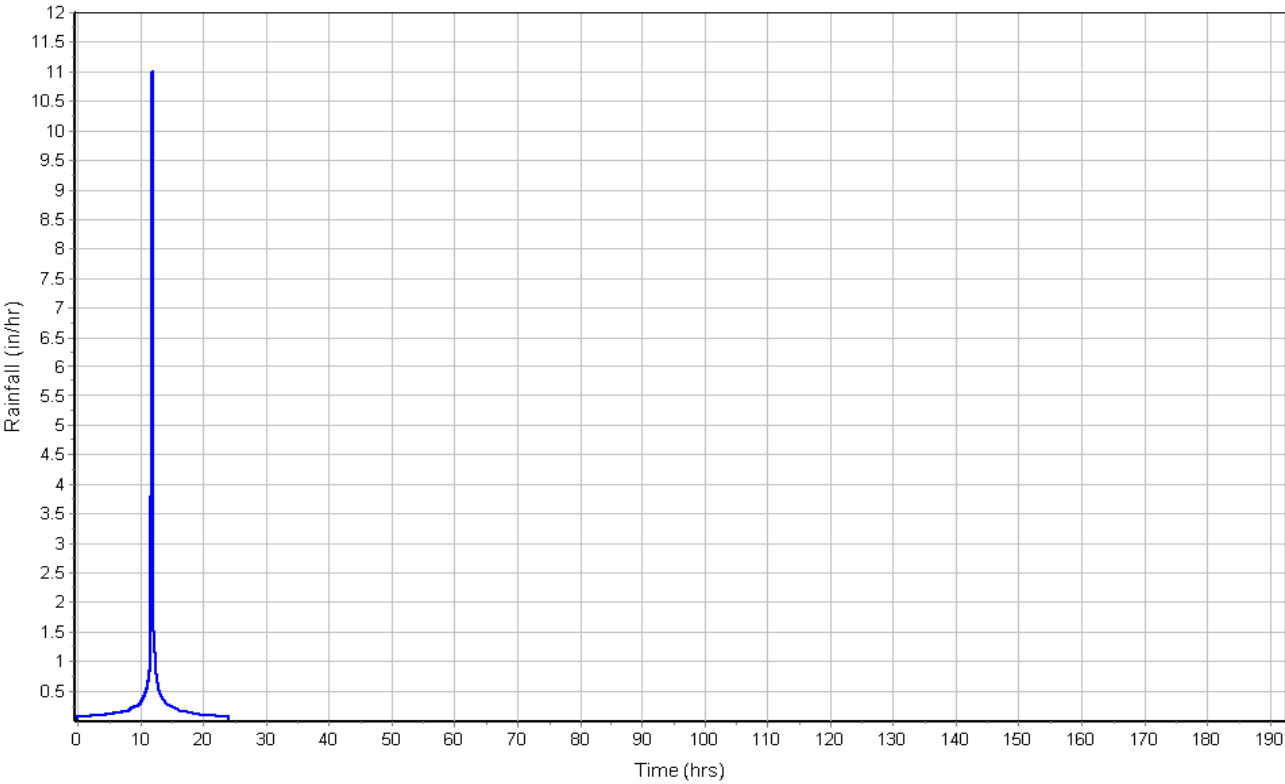
	Subarea A	Subarea B	Subarea C
Sheet Flow Computations			
Manning's Roughness :	0.3	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	18.5	0.00	0.00
2 yr, 24 hr Rainfall (in) :	3.25	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	6.95	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	100.8	76.5	0.00
Slope (%) :	34.2	7.2	0.00
Surface Type :		Bare & untill	Unpaved
Velocity (ft/sec) :	4.09	2.68	0.00
Computed Flow Time (min) :	0.41	0.48	0.00
Total TOC (min)7.84			

Subbasin Runoff Results

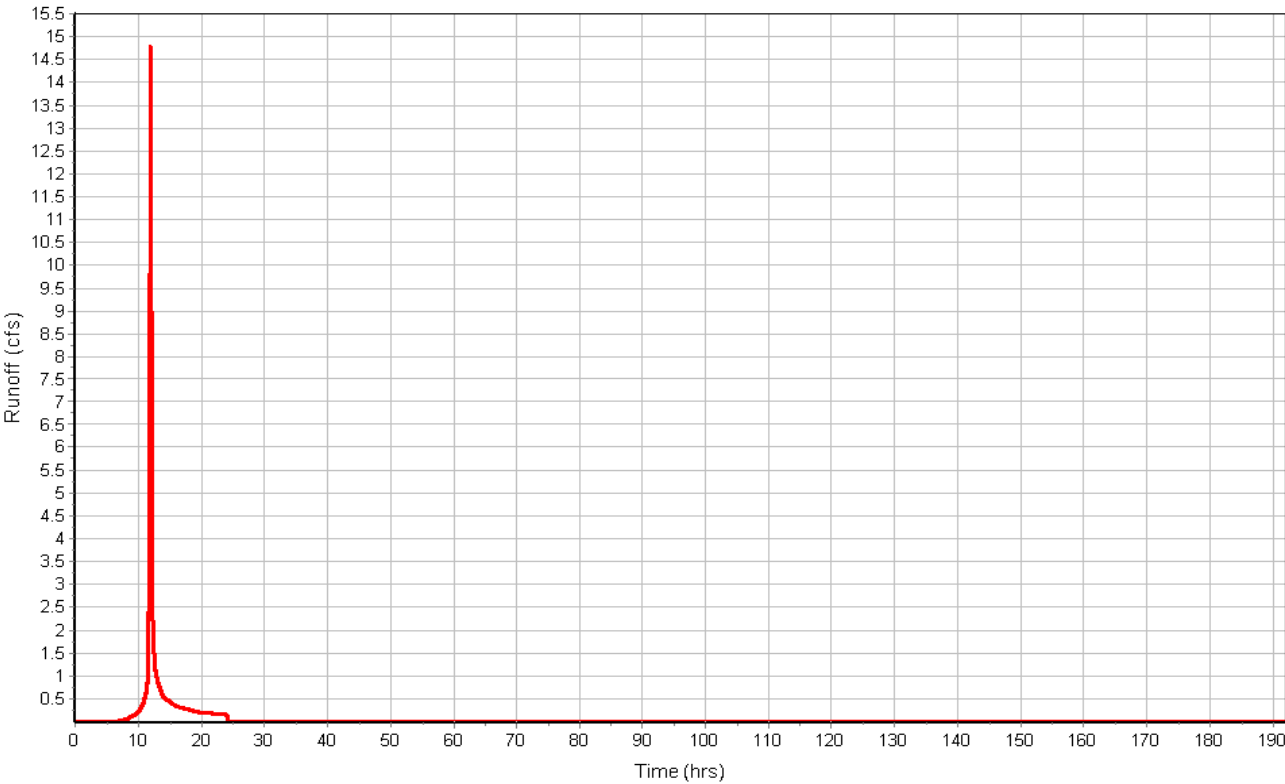
Total Rainfall (in) 8.03
Total Runoff (in) 4.94
Peak Runoff (cfs) 14.80
Weighted Curve Number 73.87
Time of Concentration (days hh:mm:ss) 0 00:07:50

Subbasin : INLET1-10

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : MILL POND 1

Input Data

Area (ac) 15.81
Weighted Curve Number 67.65
Rain Gage ID Rain Gage-07

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Paved roads with open ditches, 50% imp	1.18	B	89.00
Woods, Fair	11.35	B	60.00
Gravel roads	2.97	B	85.00
Water	0.31	-	100.00
Composite Area & Weighted CN	15.81		67.65

Time of Concentration

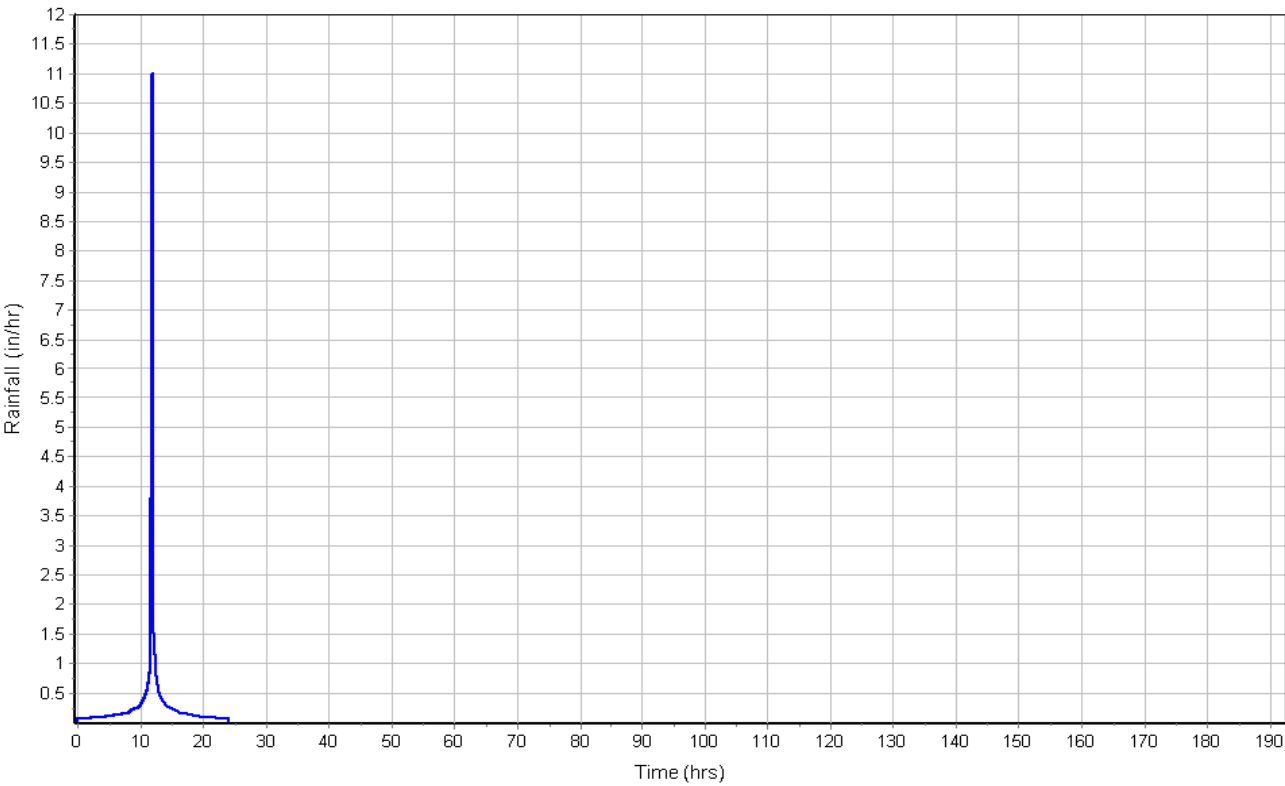
	Subarea A	Subarea B	Subarea C
Sheet Flow Computations			
Manning's Roughness :	.4	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	5.3	0.00	0.00
2 yr, 24 hr Rainfall (in) :	3.25	0.00	0.00
Velocity (ft/sec) :	0.12	0.00	0.00
Computed Flow Time (min) :	14.43	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	573.3	156.3	1129.5
Slope (%) :	15.3	9.6	22.6
Surface Type :	Woodland	Paved	Woodland
Velocity (ft/sec) :	1.96	6.30	2.38
Computed Flow Time (min) :	4.88	0.41	7.91
Total TOC (min)	27.63		

Subbasin Runoff Results

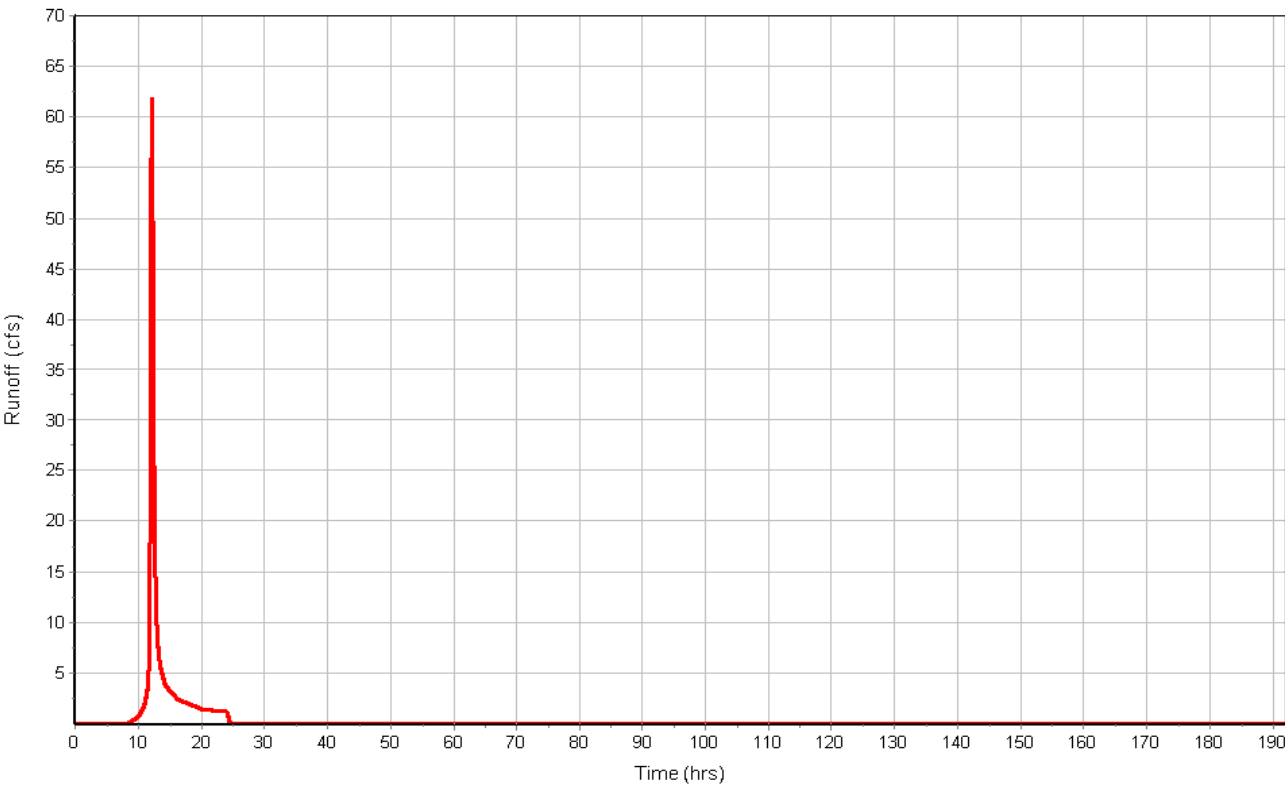
Total Rainfall (in) 8.03
Total Runoff (in) 4.22
Peak Runoff (cfs) 61.78
Weighted Curve Number 67.65
Time of Concentration (days hh:mm:ss) 0 00:27:38

Subbasin : MILL POND 1

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : MILL POND 2

Input Data

Area (ac) 20.16
Weighted Curve Number 68.94
Rain Gage ID Rain Gage-07

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Paved roads with open ditches, 50% imp	0.98	B	89.00
Water	2.09	-	100.00
Gravel roads	1.93	B	85.00
Woods, Fair	12.94	B	60.00
Pasture, grassland, or range, Fair	2.22	B	69.00
Composite Area & Weighted CN	20.16		68.94

Time of Concentration

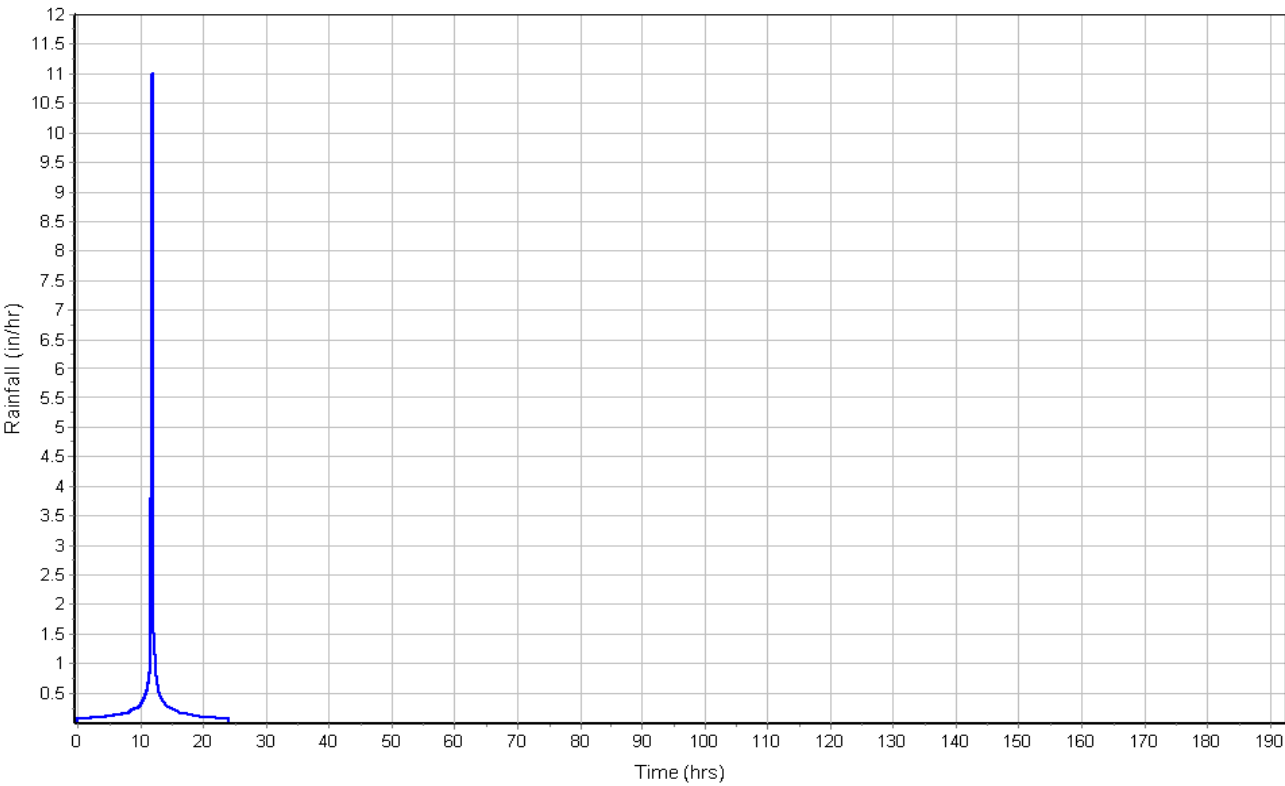
	Subarea A	Subarea B	Subarea C
Sheet Flow Computations			
Manning's Roughness :	.4	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	4.4	0.00	0.00
2 yr, 24 hr Rainfall (in) :	3.25	0.00	0.00
Velocity (ft/sec) :	0.11	0.00	0.00
Computed Flow Time (min) :	15.54	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	673	191.7	1105.5
Slope (%) :	14.2	5.2	23.3
Surface Type :	Woodland	grass pastu	Woodland
Velocity (ft/sec) :	1.88	1.60	2.41
Computed Flow Time (min) :	5.97	2.00	7.65
Total TOC (min)	31.15		

Subbasin Runoff Results

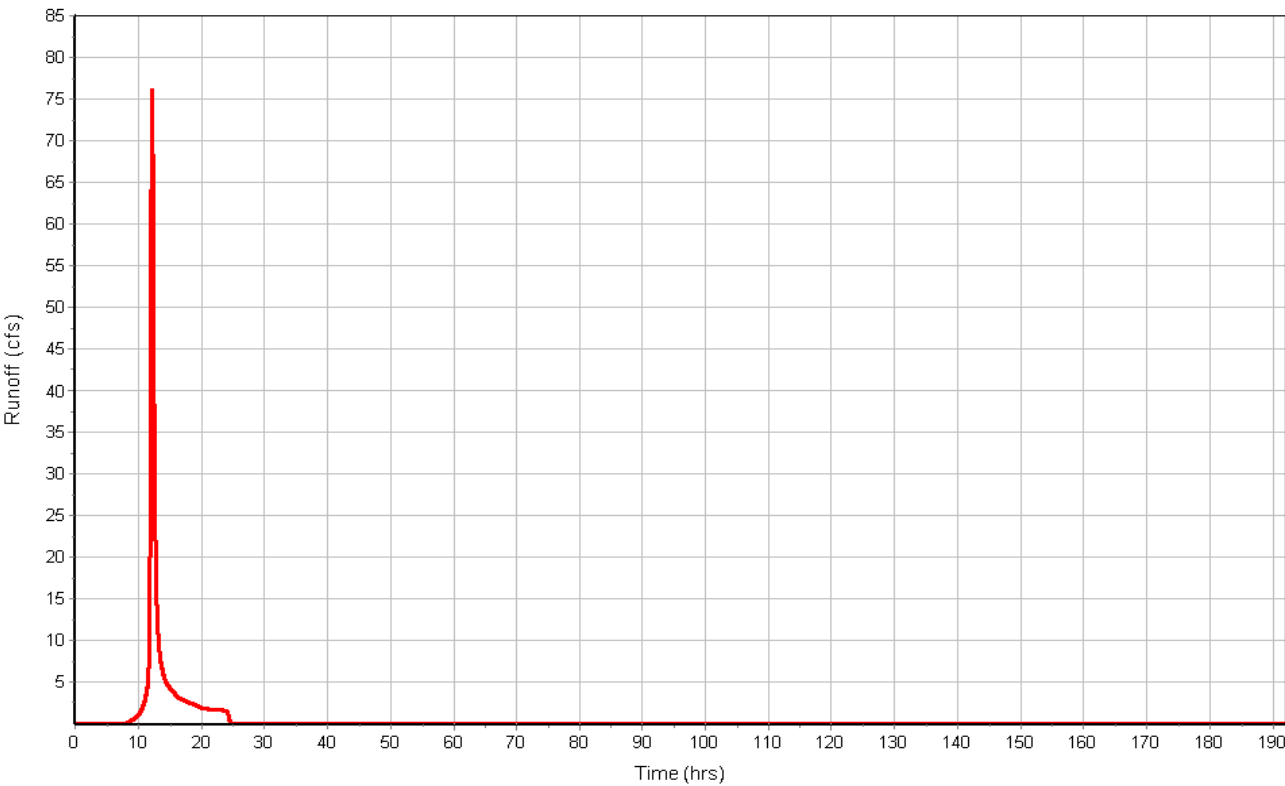
Total Rainfall (in) 8.03
Total Runoff (in) 4.37
Peak Runoff (cfs) 76.17
Weighted Curve Number 68.94
Time of Concentration (days hh:mm:ss) 0 00:31:09

Subbasin : MILL POND 2

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : MILL POND 3

Input Data

Area (ac) 6.26
Weighted Curve Number 73.17
Rain Gage ID Rain Gage-07

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Water	1.72	-	100.00
Paved roads with open ditches, 50% imp	0.12	B	89.00
Woods, Fair	3.28	B	60.00
Pasture, grassland, or range, Fair	1.14	B	69.00
Composite Area & Weighted CN	6.26		73.17

Time of Concentration

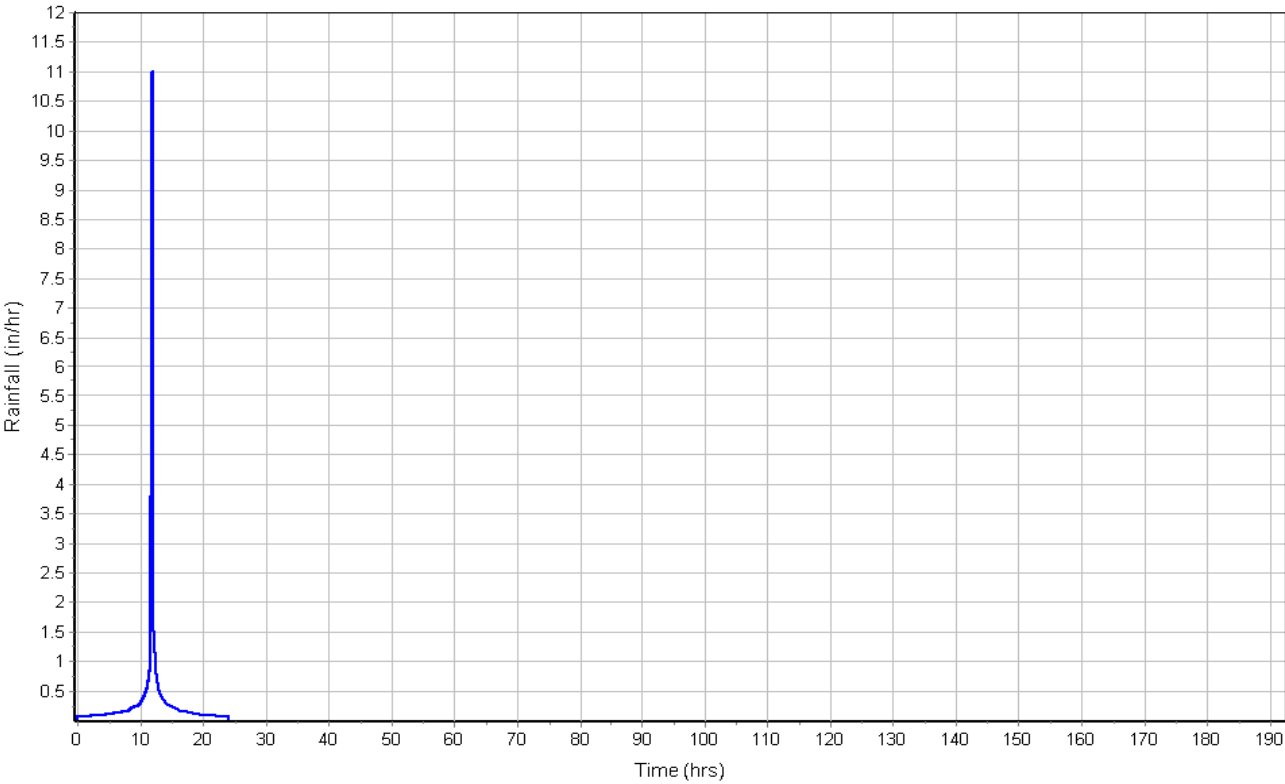
	Subarea A	Subarea B	Subarea C
Sheet Flow Computations			
Manning's Roughness :	.4	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	37	0.00	0.00
2 yr, 24 hr Rainfall (in) :	3.25	0.00	0.00
Velocity (ft/sec) :	0.25	0.00	0.00
Computed Flow Time (min) :	6.63	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	319.7	196.5	0.00
Slope (%) :	24.7	9.7	0.00
Surface Type :	Woodland	grass pastu	Unpaved
Velocity (ft/sec) :	2.48	2.18	0.00
Computed Flow Time (min) :	2.15	1.50	0.00
Total TOC (min)	10.28		

Subbasin Runoff Results

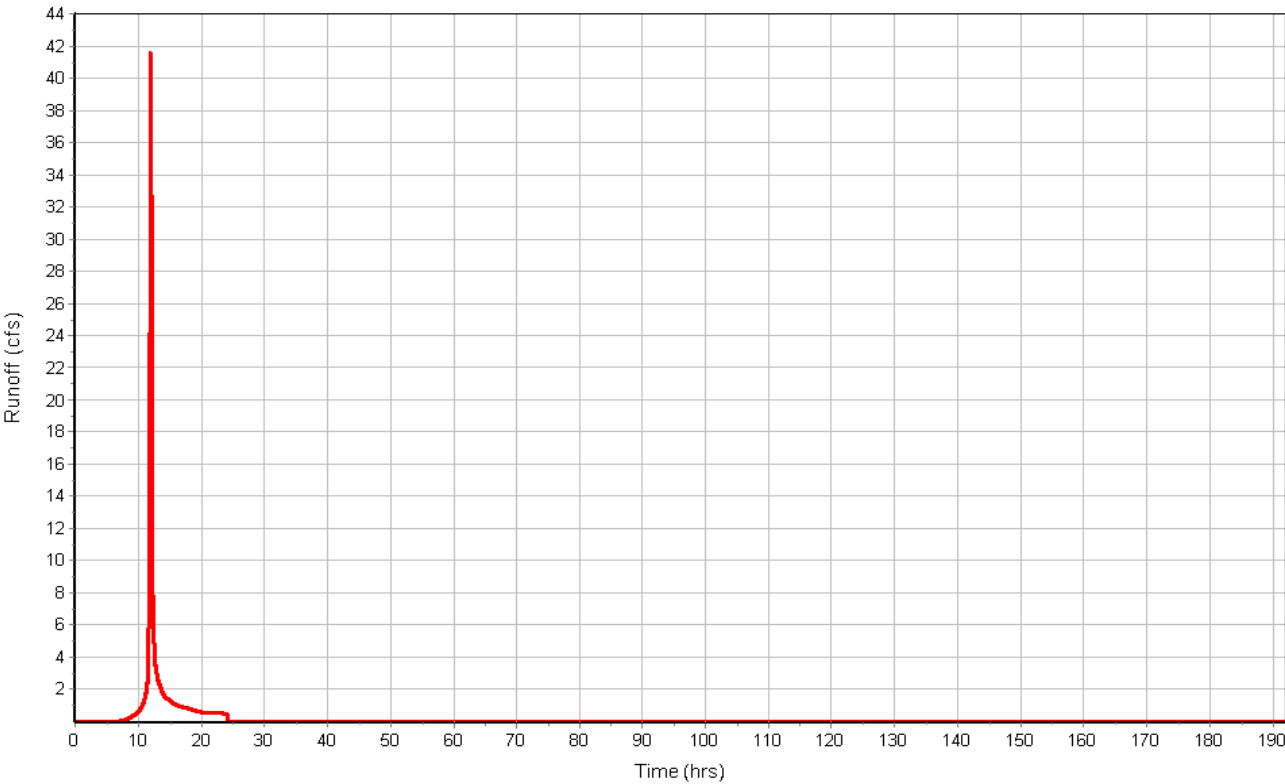
Total Rainfall (in) 8.03
Total Runoff (in) 4.86
Peak Runoff (cfs) 41.63
Weighted Curve Number 73.17
Time of Concentration (days hh:mm:ss) 0 00:10:17

Subbasin : MILL POND 3

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : OLD WAYNESBORO RD

Input Data

Area (ac) 36.85
Weighted Curve Number 73.10
Rain Gage ID Rain Gage-07

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Newly graded area	15.05	B	86.00
Buildings/Rooftops	1.74	-	100.00
Woods, Fair	17.63	B	60.00
Pasture, grassland, or range, Fair	2.43	B	69.00
Composite Area & Weighted CN	36.85		73.10

Time of Concentration

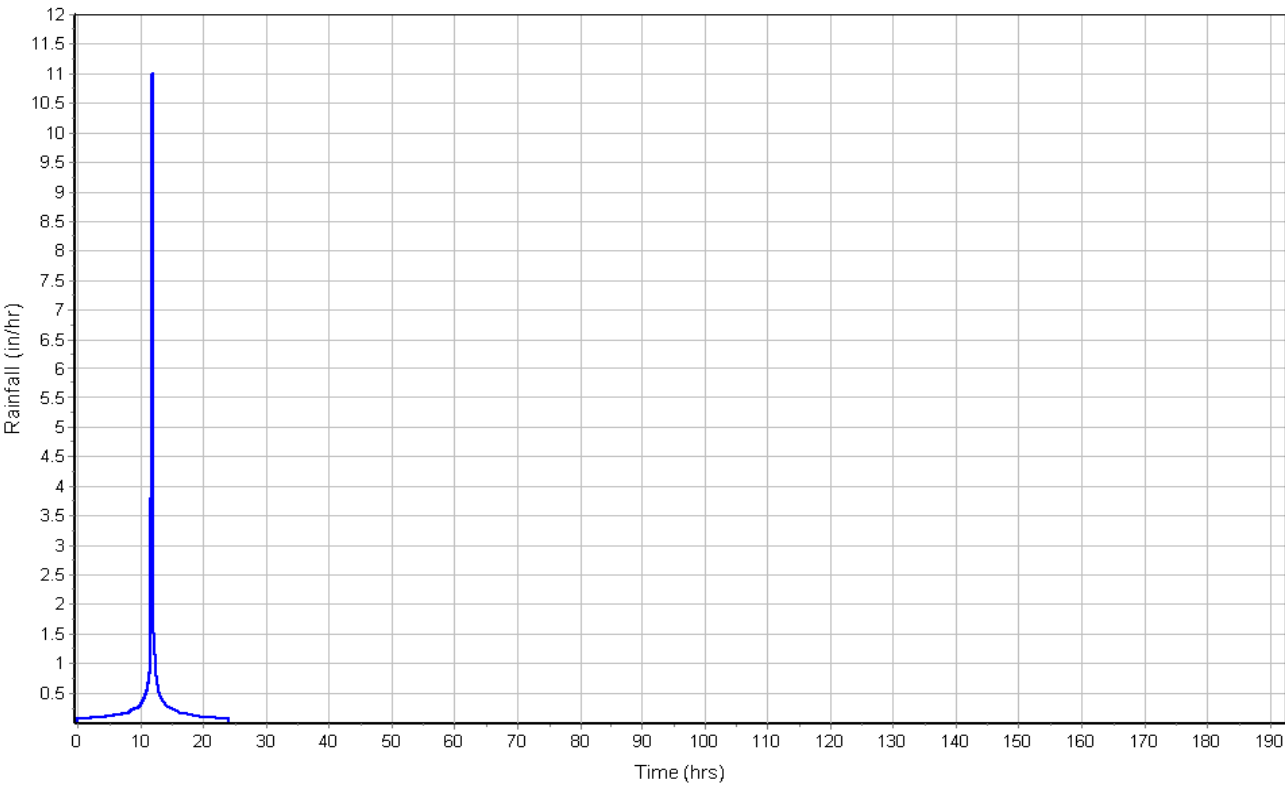
Sheet Flow Computations	Subarea A	Subarea B	Subarea C
	A	B	C
Manning's Roughness :	0.10	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	1.0	0.00	0.00
2 yr, 24 hr Rainfall (in) :	3.25	0.00	0.00
Velocity (ft/sec) :	0.18	0.00	0.00
Computed Flow Time (min) :	9.27	0.00	0.00
Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
	A	B	C
Flow Length (ft) :	457	548	431
Slope (%) :	1.3	28.5	3.2
Surface Type :	Bare & untilled grass pasture	Bare & untilled	Bare & untilled
Velocity (ft/sec) :	1.14	3.74	1.79
Computed Flow Time (min) :	6.68	2.44	4.01
Channel Flow Computations	Subarea A	Subarea B	Subarea C
	A	B	C
Manning's Roughness :	0.04	0.035	0.00
Flow Length (ft) :	157	424	0.00
Channel Slope (%) :	39.5	4.5	0.00
Cross Section Area (ft ²) :	9	86	0.00
Wetted Perimeter (ft) :	10.5	30.4	0.00
Velocity (ft/sec) :	21.12	18.06	0.00
Computed Flow Time (min) :	0.12	0.39	0.00
Total TOC (min)	22.93		

Subbasin Runoff Results

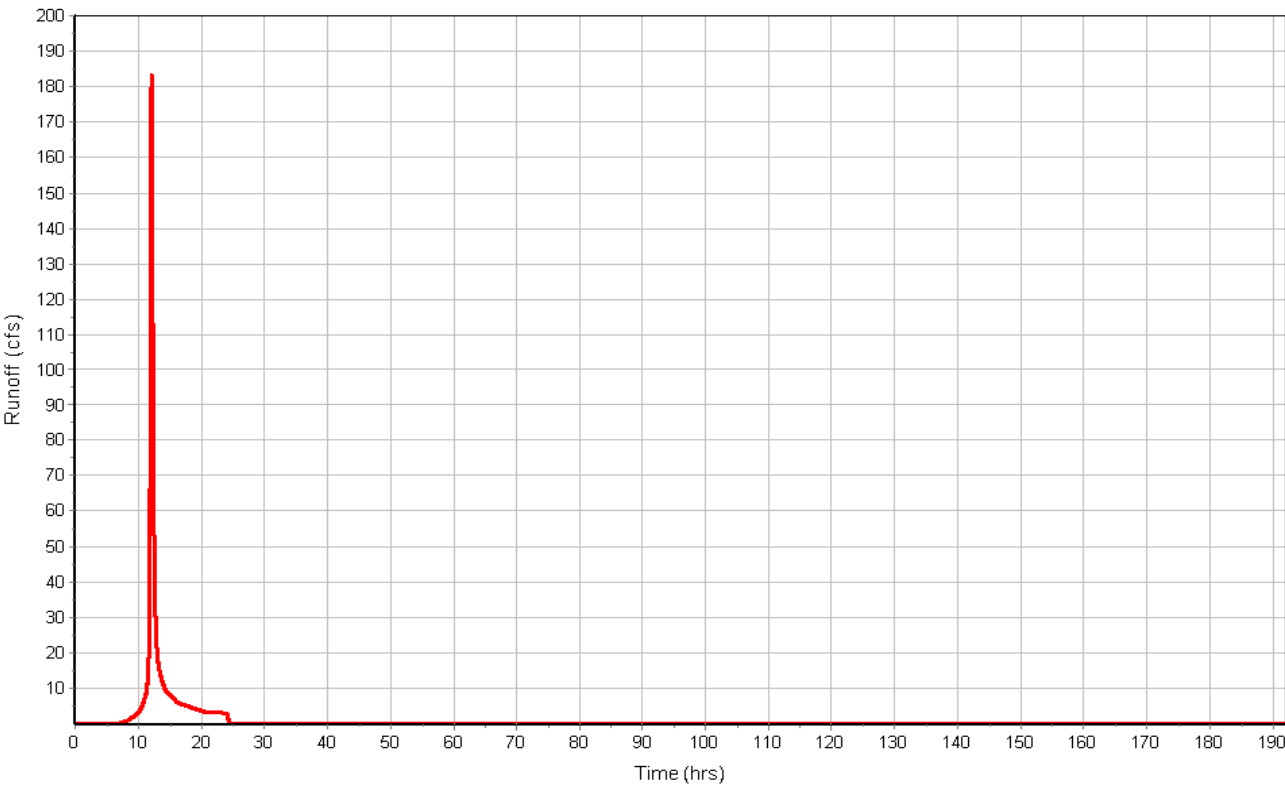
Total Rainfall (in) 8.03
Total Runoff (in) 4.85
Peak Runoff (cfs) 183.33
Weighted Curve Number 73.10
Time of Concentration (days hh:mm:ss) 0 00:22:56

Subbasin : OLD WAYNESBORO RD

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Pitts Pond 1 Subbasin

Input Data

Area (ac) 94.34
Weighted Curve Number 72.22
Rain Gage ID Rain Gage-07

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Newly graded area	49.29	B	86.00
Meadow, non-grazed	2.00	B	58.00
Woods, Fair	34.14	B	60.00
Water	1.40	-	100.00
Woods, Fair	7.51	A	36.00
Composite Area & Weighted CN	94.34		72.22

Time of Concentration

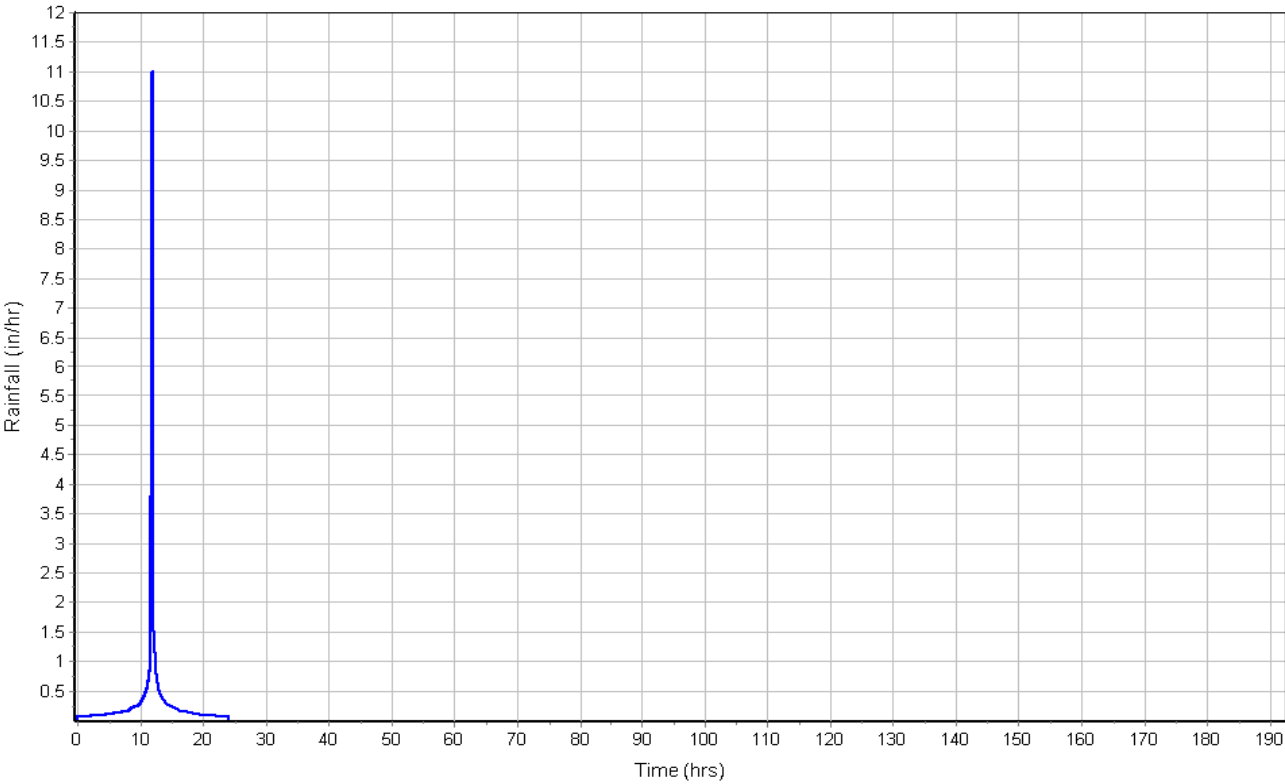
	Subarea A	Subarea B	Subarea C
Sheet Flow Computations			
Manning's Roughness :	0.3	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	1	0.00	0.00
2 yr, 24 hr Rainfall (in) :	3.25	0.00	0.00
Velocity (ft/sec) :	0.07	0.00	0.00
Computed Flow Time (min) :	22.34	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	727	1154	412
Slope (%) :	1.0	8.0	20.0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	1.61	4.56	7.22
Computed Flow Time (min) :	7.53	4.22	0.95
Channel Flow Computations			
Manning's Roughness :	0.033	0.00	0.00
Flow Length (ft) :	1479	0.00	0.00
Channel Slope (%) :	13.0	0.00	0.00
Cross Section Area (ft ²) :	5.6	0.00	0.00
Wetted Perimeter (ft) :	6.7	0.00	0.00
Velocity (ft/sec) :	14.45	0.00	0.00
Computed Flow Time (min) :	1.71	0.00	0.00
Total TOC (min)	36.74		

Subbasin Runoff Results

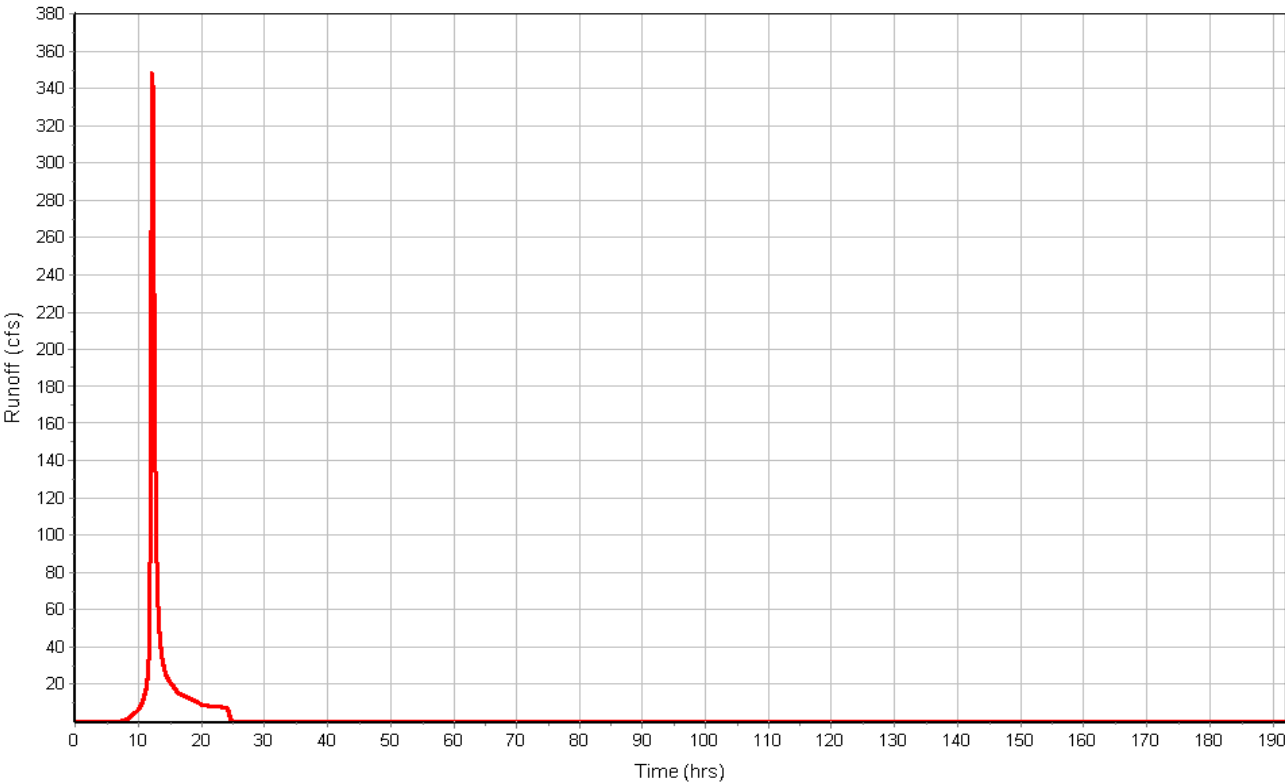
Total Rainfall (in) 8.03
Total Runoff (in) 4.75
Peak Runoff (cfs) 348.73
Weighted Curve Number 72.22
Time of Concentration (days hh:mm:ss) 0 00:36:44

Subbasin : Pitts Pond 1 Subbasin

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Pitts Pond 2 Subbasin

Input Data

Area (ac) 15.97
Weighted Curve Number 62.76
Rain Gage ID Rain Gage-07

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	14.87	B	60.00
Water	1.10	-	100.00
Composite Area & Weighted CN	15.97		62.76

Time of Concentration

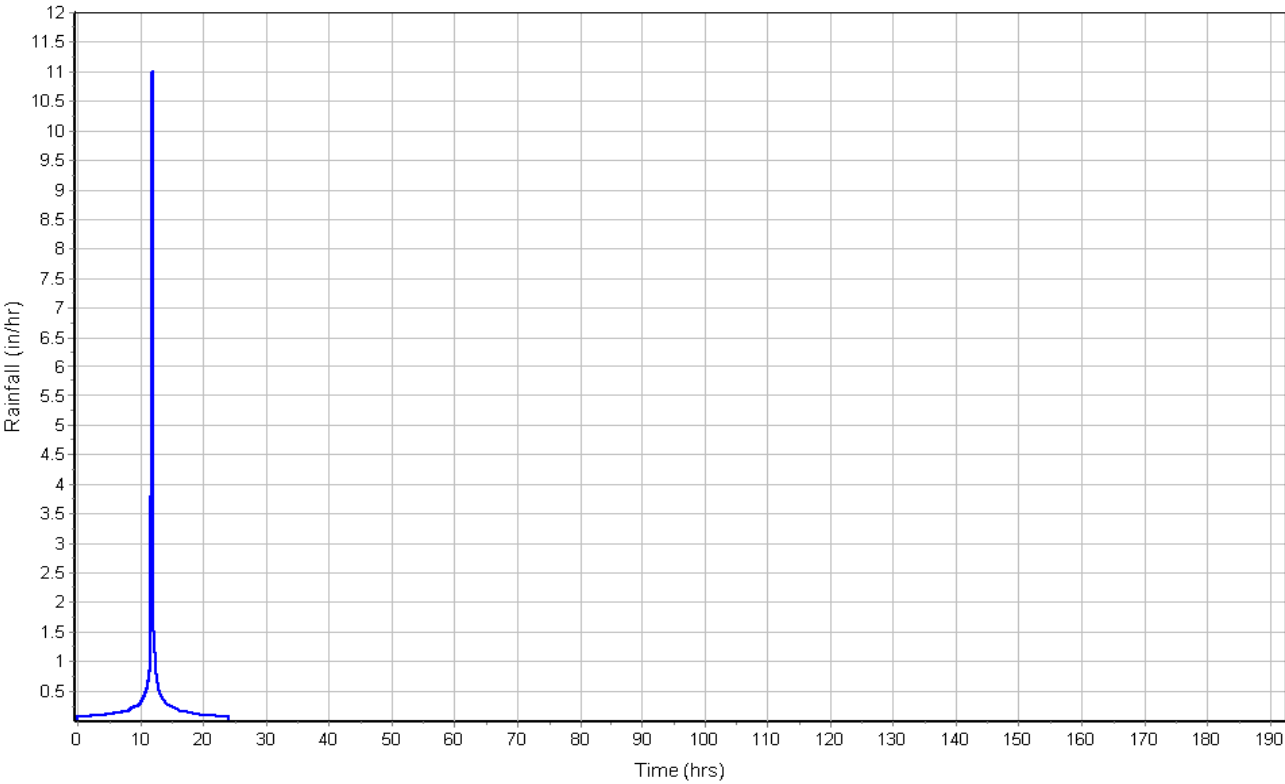
	Subarea A	Subarea B	Subarea C
Sheet Flow Computations			
Manning's Roughness :	0.4	0.4	0.00
Flow Length (ft) :	54	46	0.00
Slope (%) :	44.3	12.2	0.00
2 yr, 24 hr Rainfall (in) :	3.25	3.25	0.00
Velocity (ft/sec) :	0.24	0.14	0.00
Computed Flow Time (min) :	3.77	5.55	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	478.2	688.6	0.00
Slope (%) :	21.9	3.2	0.00
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	7.55	2.89	0.00
Computed Flow Time (min) :	1.06	3.97	0.00
Total TOC (min)	14.35		

Subbasin Runoff Results

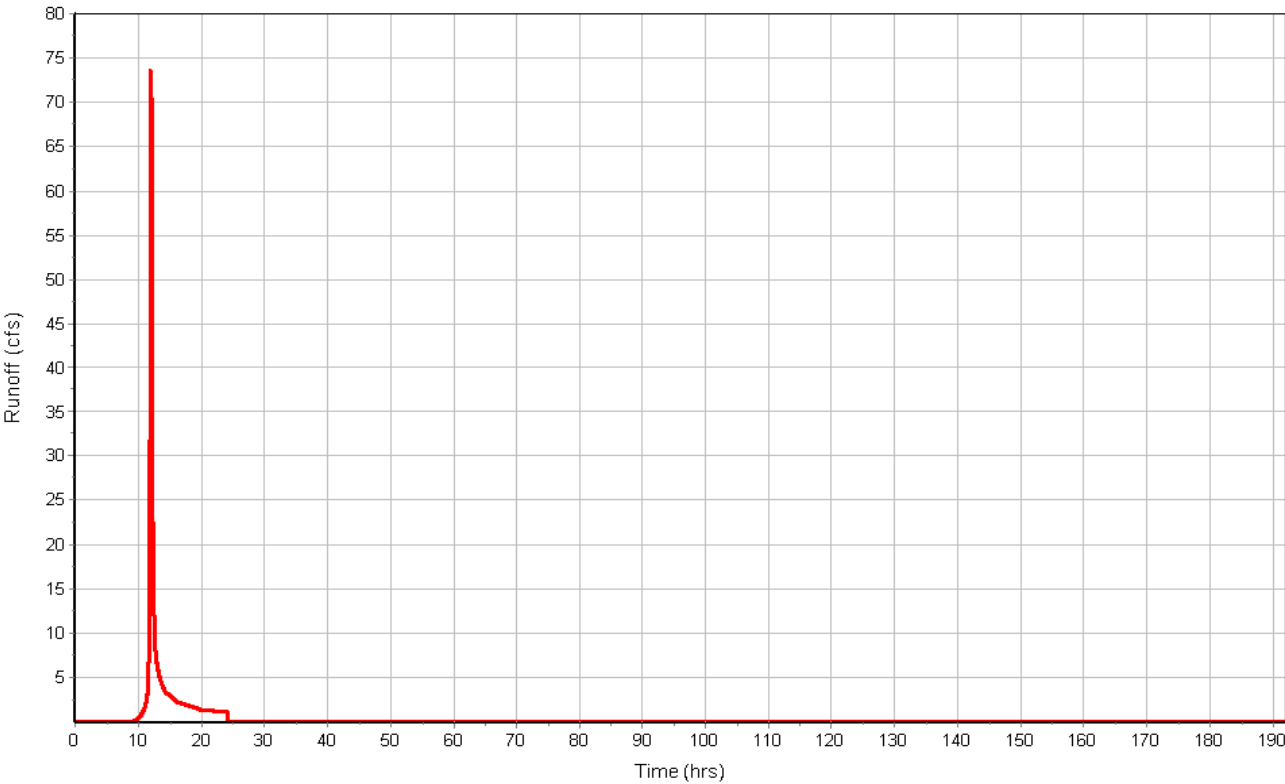
Total Rainfall (in) 8.03
Total Runoff (in) 3.67
Peak Runoff (cfs) 73.72
Weighted Curve Number 62.76
Time of Concentration (days hh:mm:ss) 0 00:14:21

Subbasin : Pitts Pond 2 Subbasin

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : Pitts Quarry

Input Data

Area (ac) 118.61
Weighted Curve Number 84.81
Rain Gage ID Rain Gage-07

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Newly graded area	113.16	B	86.00
Woods, Fair	5.45	B	60.00
Composite Area & Weighted CN	118.61		84.81

Time of Concentration

	Subarea A	Subarea B	Subarea C
Sheet Flow Computations			
Manning's Roughness :	0.3	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	1	0.00	0.00
2 yr, 24 hr Rainfall (in) :	3.25	0.00	0.00
Velocity (ft/sec) :	0.07	0.00	0.00
Computed Flow Time (min) :	22.34	0.00	0.00

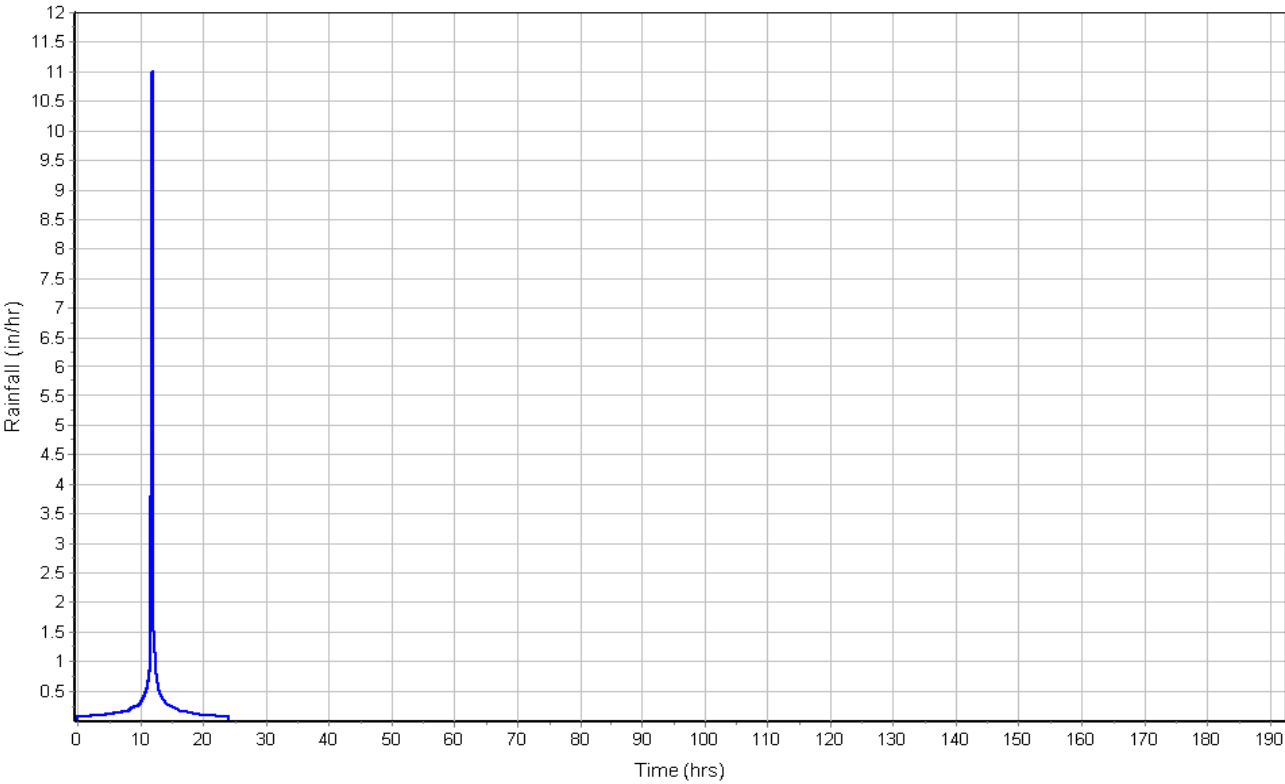
	Subarea A	Subarea B	Subarea C
Shallow Concentrated Flow Computations			
Flow Length (ft) :	2677	343	43
Slope (%) :	7.5	7.5	84.9
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	4.42	4.42	14.87
Computed Flow Time (min) :	10.09	1.29	0.05
Total TOC (min)33.77			

Subbasin Runoff Results

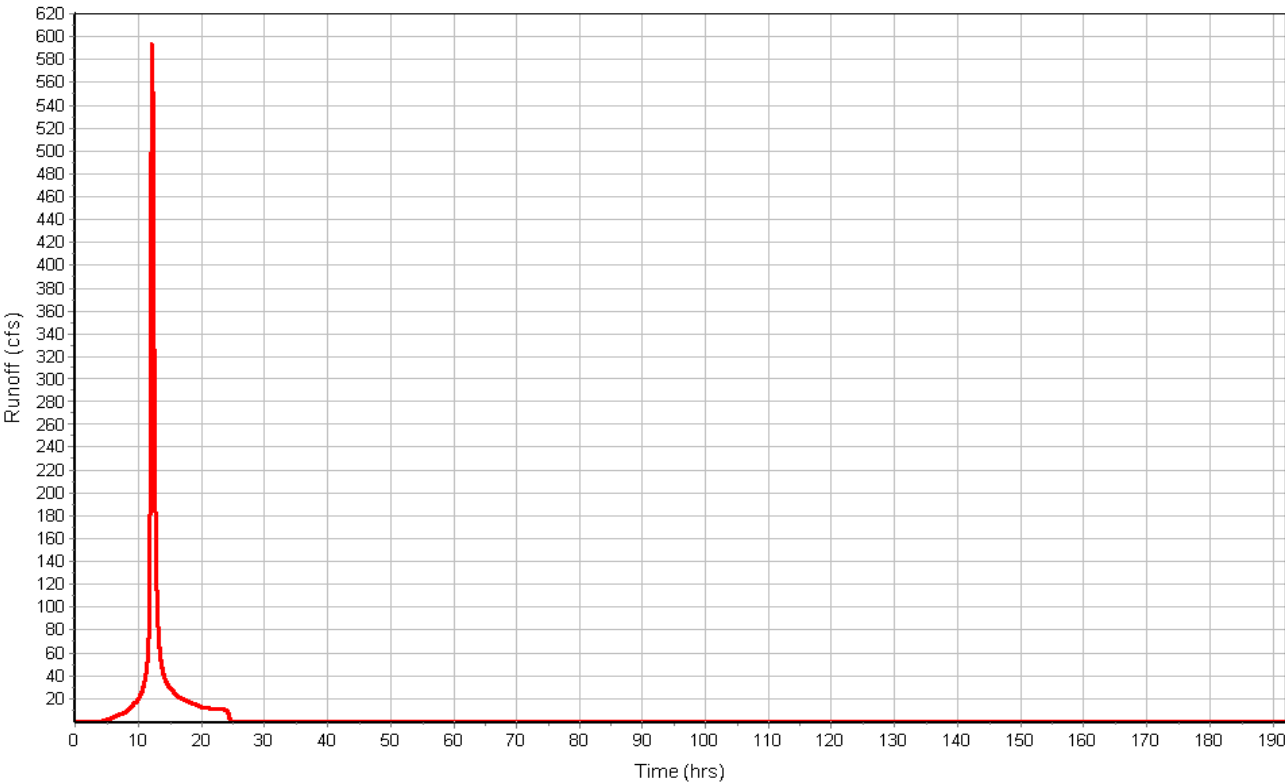
Total Rainfall (in) 8.03
Total Runoff (in) 6.22
Peak Runoff (cfs) 593.41
Weighted Curve Number 84.81
Time of Concentration (days hh:mm:ss) 0 00:33:46

Subbasin : Pitts Quarry

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : RAILROAD CULVERT

Input Data

Area (ac) 32.46
Weighted Curve Number 72.03
Rain Gage ID Rain Gage-07

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Newly graded area	5.79	B	86.00
Pasture, grassland, or range, Fair	26.67	B	69.00
Composite Area & Weighted CN	32.46		72.03

Time of Concentration

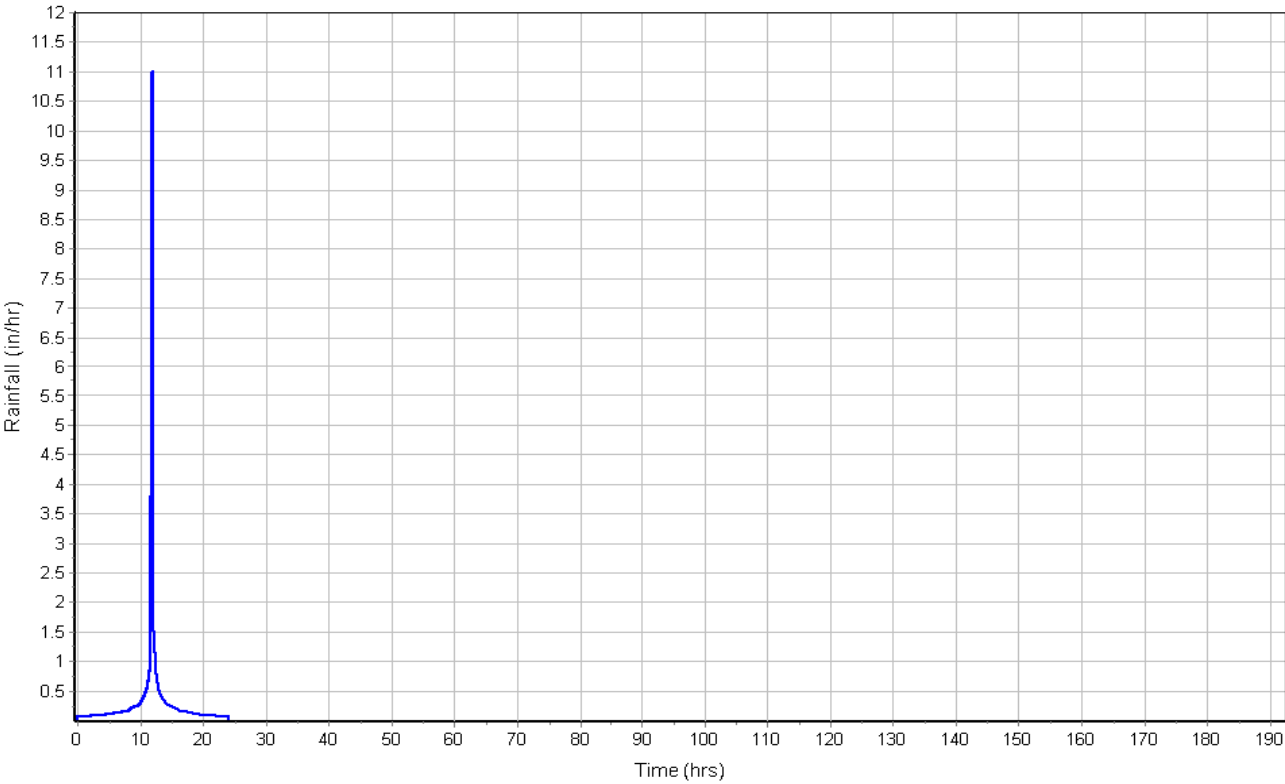
	Subarea A	Subarea B	Subarea C
Sheet Flow Computations			
Manning's Roughness :	0.40	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	1.72	0.00	0.00
2 yr, 24 hr Rainfall (in) :	3.25	0.00	0.00
Velocity (ft/sec) :	0.07	0.00	0.00
Computed Flow Time (min) :	22.63	0.00	0.00
Shallow Concentrated Flow Computations			
Flow Length (ft) :	308	495	0.00
Slope (%) :	29.8	6.8	0.00
Surface Type :	Woodland	ure & untill	Bare & untilled
Velocity (ft/sec) :	2.73	2.61	0.00
Computed Flow Time (min) :	1.88	3.16	0.00
Channel Flow Computations			
Manning's Roughness :	.033	.033	0.00
Flow Length (ft) :	446	443	0.00
Channel Slope (%) :	22.6	11.1	0.00
Cross Section Area (ft ²) :	29.3	18.0	0.00
Wetted Perimeter (ft) :	17.5	13.9	0.00
Velocity (ft/sec) :	30.27	17.87	0.00
Computed Flow Time (min) :	0.25	0.41	0.00
Total TOC (min)	28.33		

Subbasin Runoff Results

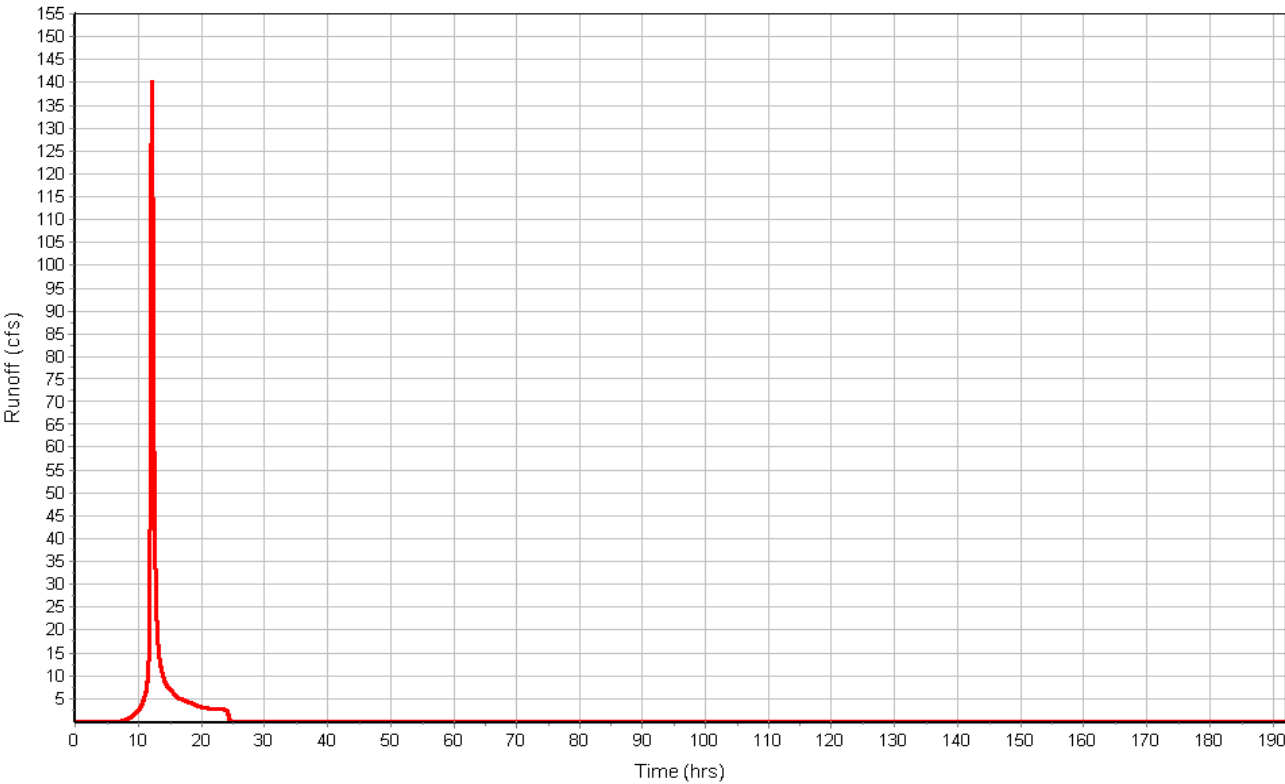
Total Rainfall (in) 8.03
Total Runoff (in) 4.72
Peak Runoff (cfs) 140.34
Weighted Curve Number 72.03
Time of Concentration (days hh:mm:ss) 0 00:28:20

Subbasin : RAILROAD CULVERT

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : ST-1E & 2E Subbasin

Input Data

Area (ac) 9.57
Weighted Curve Number 69.70
Rain Gage ID Rain Gage-07

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Newly graded area	3.57	B	86.00
Woods, Fair	6.00	B	60.00
Composite Area & Weighted CN	9.57		69.70

Time of Concentration

	Subarea A	Subarea B	Subarea C
Sheet Flow Computations			
Manning's Roughness :	0.1	0.00	0.00
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	1.1	0.00	0.00
2 yr, 24 hr Rainfall (in) :	3.25	0.00	0.00
Velocity (ft/sec) :	0.19	0.00	0.00
Computed Flow Time (min) :	8.93	0.00	0.00

	Subarea A	Subarea B	Subarea C
Shallow Concentrated Flow Computations			
Flow Length (ft) :	189.5	29.8	74.6
Slope (%) :	1.1	61.6	45.8
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	1.69	12.66	10.92
Computed Flow Time (min) :	1.87	0.04	0.11

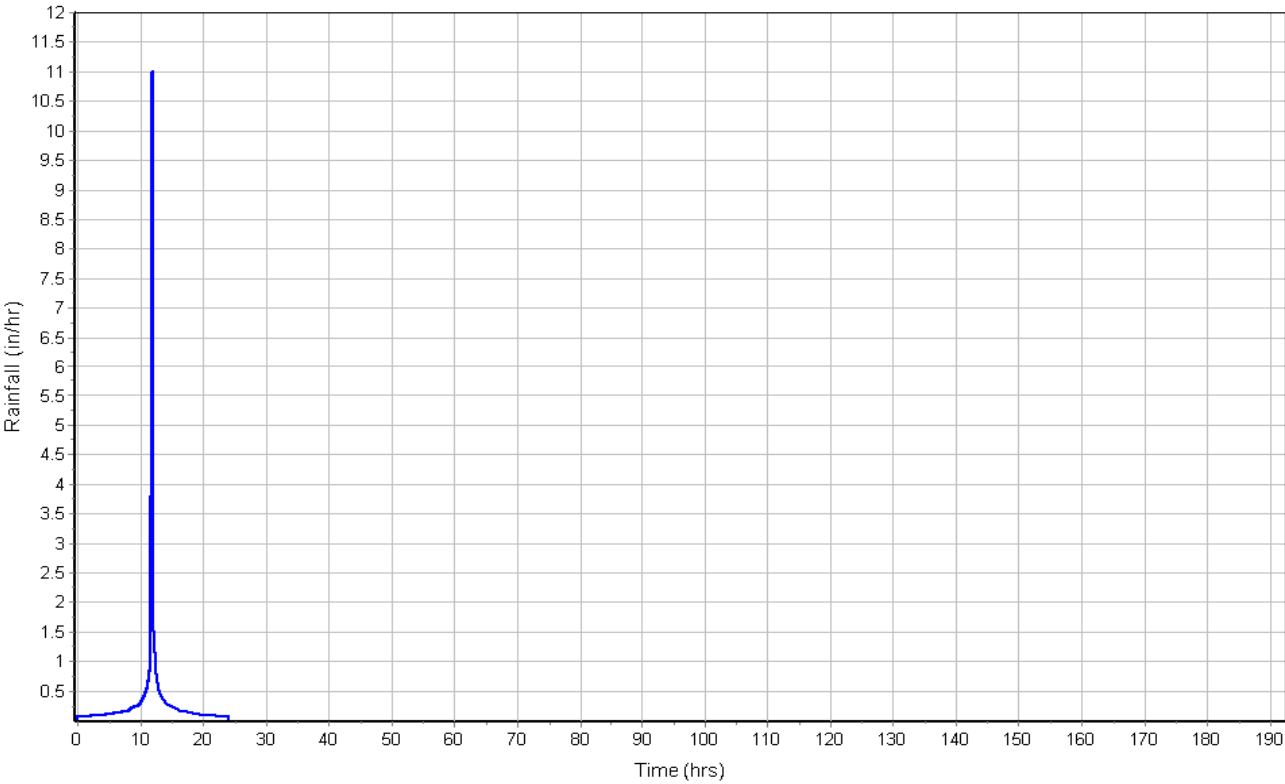
	Subarea A	Subarea B	Subarea C
Channel Flow Computations			
Manning's Roughness :	0.033	0.033	0.00
Flow Length (ft) :	500	264	0.00
Channel Slope (%) :	10.5	30.0	0.00
Cross Section Area (ft ²) :	5.0	5.0	0.00
Wetted Perimeter (ft) :	6.4	6.4	0.00
Velocity (ft/sec) :	12.41	20.98	0.00
Computed Flow Time (min) :	0.67	0.21	0.00
Total TOC (min)11.83			

Subbasin Runoff Results

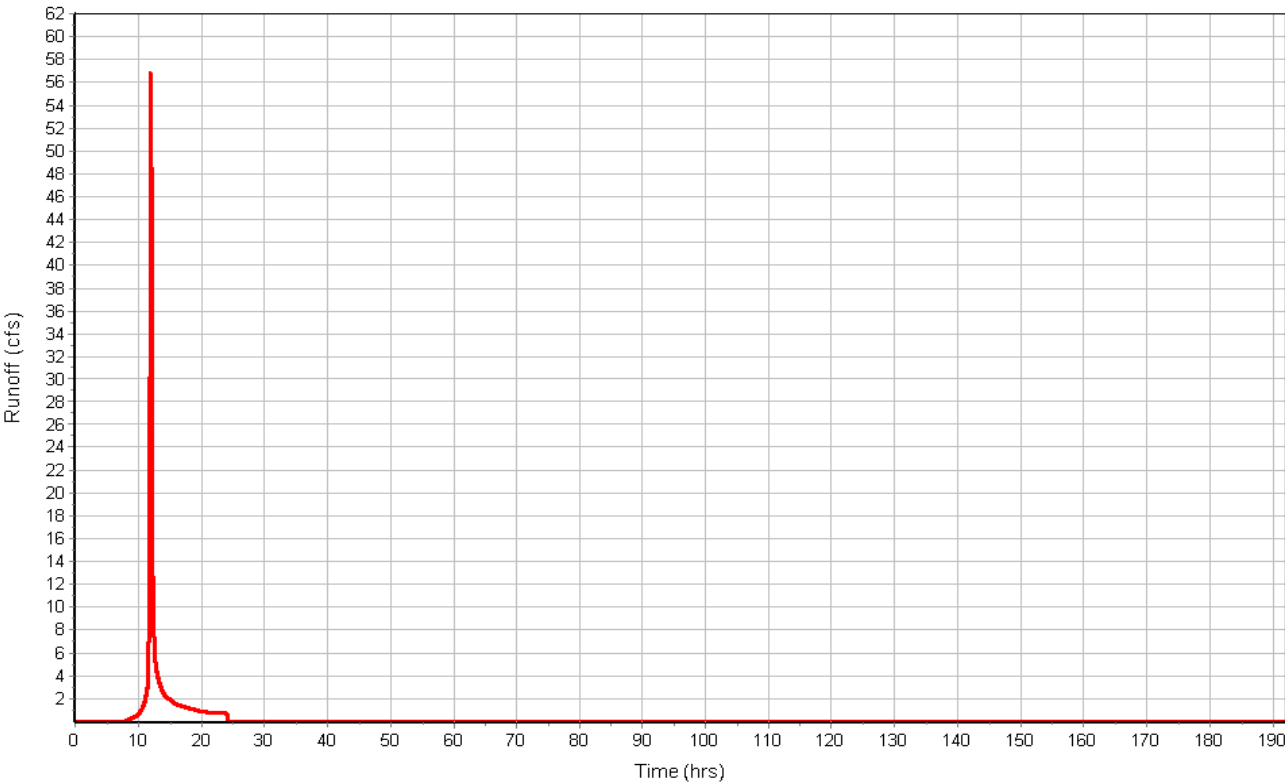
Total Rainfall (in) 8.03
Total Runoff (in) 4.46
Peak Runoff (cfs) 56.89
Weighted Curve Number 69.70
Time of Concentration (days hh:mm:ss) 0 00:11:50

Subbasin : ST-1E & 2E Subbasin

Rainfall Intensity Graph



Runoff Hydrograph



Junction Input

SN	Element ID	Invert Elevation	Ground/Rim (Max) Elevation	Ground/Rim (Max) Offset	Initial Water Elevation	Initial Water Depth	Surcharge Elevation	Surcharge Depth	Ponded Area	Minimum Pipe Cover
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft²)	(in)
1	30CMPout	1194.43	1199.43	5.00	1194.43	0.00	1199.43	0.00	1000.00	0.00
2	36CPEPout	1188.32	1191.32	3.00	1188.32	0.00	1191.32	0.00	1000.00	0.00
3	72RCPin	1038.72	1047.97	9.25	1038.72	0.00	1047.97	0.00	100.00	0.00
4	72RCPout	1030.64	1036.64	6.00	1030.64	0.00	1036.64	0.00	1000.00	0.00
5	CC-4_Start	1070.00	1079.00	9.00	1070.00	0.00	1079.00	0.00	100.00	0.00
6	CC-5_Start	1167.21	1200.00	32.79	1167.21	0.00	1200.00	0.00	100.00	0.00
7	CC-7_Start	1230.00	1240.93	10.93	1230.00	0.00	1240.93	0.00	1000.00	0.00
8	I1	1101.51	1105.65	4.14	1101.51	0.00	1105.65	0.00	50.00	0.00
9	I10	1241.67	1245.67	4.00	1241.67	0.00	1245.67	0.00	100.00	0.00
10	I11	1269.21	1275.80	6.59	1269.21	0.00	1275.80	0.00	1556.00	0.00
11	I12	1358.50	1365.50	7.00	1358.50	0.00	1365.50	0.00	2500.00	0.00
12	I2	1114.80	1119.16	4.36	1114.80	0.00	1119.16	0.00	50.00	0.00
13	I3	1126.59	1130.90	4.31	1126.59	0.00	1130.90	0.00	50.00	0.00
14	I4	1137.91	1142.20	4.29	1137.91	0.00	1142.20	0.00	50.00	0.00
15	I5	1199.25	1203.66	4.41	1199.25	0.00	1203.66	0.00	100.00	0.00
16	I6	1202.80	1206.00	3.20	1202.80	0.00	1206.00	0.00	1000.00	0.00
17	I7	1194.24	1200.52	6.28	1194.24	0.00	1200.52	0.00	100.00	0.00
18	I9	1199.23	1205.30	6.07	1199.23	0.00	1205.30	0.00	100.00	0.00
19	Jun-60	971.00	975.00	4.00	971.00	0.00	975.00	0.00	100.00	0.00
20	Jun-71	1090.00	2500.00	1410.00	1090.00	0.00	2500.00	0.00	0.00	0.00
21	Jun-72	1115.00	1125.00	10.00	1115.00	0.00	1125.00	0.00	0.00	0.00
22	Junction1	1350.00	1359.00	9.00	1350.00	0.00	1359.00	0.00	100.00	0.00
23	Junction2	1201.50	1204.50	3.00	1201.50	0.00	1204.50	0.00	100.00	0.00
24	Junction3	1196.50	1199.50	3.00	1196.50	0.00	1199.50	0.00	100.00	0.00
25	Junction4	1148.00	1151.00	3.00	1148.00	0.00	1151.00	0.00	100.00	0.00
26	Junction5	1132.20	1135.20	3.00	1132.20	0.00	1135.20	0.00	100.00	0.00
27	Junction6	1120.50	1123.50	3.00	1120.50	0.00	1123.50	0.00	100.00	0.00
28	Junction7	1108.50	1111.50	3.00	1108.50	0.00	1111.50	0.00	100.00	0.00
29	Out-01	905.00	950.00	45.00	905.00	0.00	950.00	0.00	1.00	0.00
30	P-20	932.92	950.00	17.08	932.92	0.00	950.00	0.00	10.00	0.00
31	P-22	932.63	950.00	17.37	932.63	0.00	950.00	0.00	10.00	0.00
32	P-23	932.48	950.00	17.52	932.48	0.00	950.00	0.00	10.00	0.00
33	P-25	932.93	950.00	17.07	932.93	0.00	950.00	0.00	10.00	0.00
34	P-27	929.31	950.00	20.69	929.31	0.00	950.00	0.00	10.00	0.00
35	WaynesboroCulvert	951.00	959.00	8.00	951.00	0.00	965.00	6.00	5000.00	0.00

Junction Results

SN Element ID	Peak Inflow	Peak Lateral Inflow	Max HGL Elevation Attained	Max HGL Depth Attained	Max Surcharge Depth Attained	Min Freeboard Attained	Average HGL Elevation Attained	Average HGL Depth Attained	Time of Max HGL Occurrence	Time of Peak Flooding Occurrence	Total Flooded Volume	Total Time Flooded
	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(days hh:mm)	(days hh:mm)	(ac-in)	(min)
1 30CMPout	47.52	0.00	1203.20	8.77	3.77	0.00	1194.51	0.08	0 13:32	0 12:26	7.73	110.00
2 36CPEPout	205.82	0.00	1203.87	15.55	10.87	0.00	1190.15	1.83	0 13:28	0 12:08	21.39	135.00
3 72RCPin	163.48	0.00	1043.90	5.18	0.00	5.10	1039.21	0.49	0 13:04	0 00:00	0.00	0.00
4 72RCPout	163.46	0.00	1031.66	1.02	0.00	4.98	1030.73	0.09	0 13:05	0 00:00	0.00	0.00
5 CC-4_Start	163.48	0.00	1071.63	1.63	0.00	7.37	1070.15	0.15	0 13:02	0 00:00	0.00	0.00
6 CC-5_Start	196.03	0.00	1203.19	35.98	3.19	0.00	1167.77	0.56	0 13:32	0 12:29	13.49	105.00
7 CC-7_Start	138.58	0.00	1231.11	1.11	0.00	9.82	1230.09	0.09	0 12:03	0 00:00	0.00	0.00
8 I1	309.08	0.00	1122.22	20.71	15.57	0.00	1102.23	0.72	0 12:41	0 12:23	20.16	170.00
9 I10	14.78	14.78	1243.89	2.22	0.00	1.78	1241.70	0.03	0 11:57	0 00:00	0.00	0.00
10 I11	146.02	0.00	1293.13	23.92	17.33	0.00	1269.89	0.68	0 12:52	0 11:53	12.10	111.00
11 I12	194.35	0.00	1390.44	31.94	24.94	0.00	1359.15	0.65	0 12:31	0 12:12	19.06	81.00
12 I2	289.78	0.00	1128.65	13.85	8.49	0.00	1115.30	0.50	0 12:38	0 12:19	8.36	45.00
13 I3	269.84	0.00	1138.98	12.39	7.08	0.00	1127.23	0.64	0 12:18	0 12:17	10.42	147.00
14 I4	260.43	0.00	1149.27	11.36	6.07	0.00	1138.51	0.60	0 12:15	0 12:14	5.84	63.00
15 I5	47.47	0.00	1204.12	4.87	0.46	0.00	1199.32	0.07	0 12:11	0 12:10	0.06	10.00
16 I6	46.02	46.02	1207.66	4.86	1.66	0.00	1202.85	0.05	0 12:12	0 12:07	0.52	18.00
17 I7	203.24	0.00	1213.02	18.78	12.50	0.00	1194.99	0.75	0 12:53	0 11:06	6.40	185.00
18 I9	203.68	0.00	1215.44	16.21	10.14	0.00	1199.89	0.66	0 12:47	0 11:58	3.16	127.00
19 Jun-60	163.45	0.00	972.54	1.54	0.00	3.46	971.14	0.14	0 13:05	0 00:00	0.00	0.00
20 Jun-71	7.13	0.00	1090.08	0.08	0.00	1409.92	1090.02	0.02	0 09:42	0 00:00	0.00	0.00
21 Jun-72	116.41	0.00	1115.45	0.45	0.00	24.55	1115.00	0.00	0 12:45	0 00:00	0.00	0.00
22 Junction1	150.62	0.00	1372.26	22.26	13.26	0.00	1350.29	0.29	0 12:34	0 12:12	2.34	51.00
23 Junction2	208.66	0.00	1216.44	14.94	11.94	0.00	1201.80	0.30	0 12:43	0 11:56	4.64	135.00
24 Junction3	203.23	0.00	1214.12	17.62	14.62	0.00	1196.86	0.36	0 12:52	0 11:05	8.15	200.00
25 Junction4	270.83	0.00	1159.66	11.66	8.66	0.00	1148.20	0.20	0 12:15	0 12:13	2.19	24.00
26 Junction5	235.32	0.00	1143.80	11.60	8.60	0.00	1132.45	0.25	0 12:16	0 12:15	4.29	114.00
27 Junction6	253.11	0.00	1132.54	12.04	9.04	0.00	1120.71	0.21	0 12:19	0 12:18	3.21	33.00
28 Junction7	271.78	0.00	1125.53	17.03	14.03	0.00	1108.78	0.28	0 12:39	0 12:21	5.82	142.00
29 Out-01	181.95	0.00	932.18	27.18	0.00	17.82	930.17	25.17	0 14:28	0 00:00	0.00	0.00
30 P-20	3.85	0.00	943.25	10.33	0.00	17.25	936.38	3.46	0 14:25	0 00:00	0.00	0.00
31 P-22	2.16	0.00	943.25	10.62	0.00	16.97	936.19	3.56	0 14:30	0 00:00	0.00	0.00
32 P-23	2.15	0.00	943.25	10.77	0.00	16.81	936.21	3.73	0 14:23	0 00:00	0.00	0.00
33 P-25	2.17	0.00	943.25	10.32	0.00	17.27	936.18	3.25	0 14:15	0 00:00	0.00	0.00
34 P-27	2.67	0.00	941.85	12.54	0.00	8.15	934.93	5.62	0 14:29	0 00:00	0.00	0.00
35 WaynesboroCulvert	291.44	183.24	954.78	3.78	0.00	4.22	951.15	0.15	0 12:09	0 00:00	0.00	0.00

Channel Input

SN Element ID	Length	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Shape	Height (ft)	Width (ft)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flap Flow Gate (cfs)
1 72 inch Culvert Bypass	489.00	1046.00	7.28	1030.64	0.00	15.36	3.1400	Trapezoidal	3.000	56.000	0.0330	0.0000	0.0000	0.0000	0.00 No
2 CC-1	425.00	971.00	0.00	951.00	0.00	20.00	4.7100	Trapezoidal	5.000	27.000	0.0330	0.5000	0.5000	0.0000	0.00 No
3 CC-3	160.00	1030.64	0.00	971.00	0.00	59.64	37.2800	Trapezoidal	4.000	21.000	0.0330	0.5000	0.5000	0.0000	0.00 No
4 CC-4	333.00	1070.00	0.00	1038.72	0.00	31.28	9.3900	Trapezoidal	3.000	17.000	0.0400	0.5000	0.5000	0.0000	0.00 No
5 CC-5	481.26	1167.21	0.00	1153.00	0.00	14.21	2.9500	Trapezoidal	2.000	14.000	0.0400	0.0000	0.5000	0.0000	0.00 No
6 CC-7	220.00	1230.00	0.00	1203.75	0.00	26.25	11.9300	Trapezoidal	10.000	28.000	0.0350	0.5000	0.5000	0.0000	0.00 No
7 CMP_CC5	50.00	1194.43	0.00	1167.21	0.00	27.22	54.4400	Trapezoidal	3.000	17.000	0.0400	0.5000	0.5000	0.0000	0.00 No
8 CPEP_CC5	50.00	1190.00	1.68	1167.21	0.00	22.79	45.5800	Trapezoidal	3.000	17.000	0.0400	0.5000	0.5000	0.0000	0.00 No
9 Inlet1_Bypass	262.00	1105.65	4.14	1089.61	16.61	16.04	6.1200	Trapezoidal	1.000	7.000	0.0320	0.5000	0.5000	0.0000	0.00 No
10 Inlet2_Bypass	115.00	1119.16	4.36	1105.65	4.14	13.51	11.7500	Trapezoidal	1.000	7.000	0.0320	0.5000	0.5000	0.0000	0.00 No
11 Inlet3_Bypass	116.00	1130.90	4.31	1119.16	4.36	11.74	10.1200	Trapezoidal	1.000	7.000	0.0320	0.5000	0.5000	0.0000	0.00 No
12 Inlet4_Bypass	116.00	1142.20	4.29	1130.90	4.31	11.30	9.7400	Trapezoidal	1.000	7.000	0.0320	0.5000	0.5000	0.0000	0.00 No
13 Link-170	75.00	1090.00	0.00	1088.00	96.00	2.00	2.6700	Trapezoidal	25.000	160.000	0.0110	0.0000	0.0000	0.0000	0.00 No
14 Link-172	135.57	1115.00	0.00	1112.00	0.00	3.00	2.2100	Trapezoidal	25.000	160.000	0.0110	0.5000	0.5000	0.0000	0.00 No
15 Outlet	16.48	930.00	25.00	929.00	29.00	1.00	6.0700	Rectangular	10.000	10.000	0.0320	0.5000	0.5000	0.0000	0.00 No

Channel Results

SN Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
	(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)		
1 72 inch Culvert Bypass	0.00	0 00:00	2471.78	0.00	0.00		0.51	0.17	0.00		
2 CC-1	163.45	0 13:05	1686.60	0.10	7.00	1.01	2.51	0.50	0.00		
3 CC-3	163.45	0 13:05	2470.63	0.07	16.88	0.16	1.28	0.32	0.00		
4 CC-4	163.48	0 13:02	554.32	0.29	7.33	0.76	2.32	0.77	0.00		
5 CC-5	155.05	0 12:03	155.05	1.00	7.75	1.03	2.00	1.00	154.00		
6 CC-7	138.53	0 12:03	7678.55	0.02	3.98	0.92	5.55	0.56	0.00		
7 CMP_CC5	72.48	0 14:12	1334.46	0.05	3.10	0.27	3.00	1.00	115.00		
8 CPEP_CC5	174.87	0 12:34	1221.05	0.14	12.24	0.07	3.00	1.00	135.00		
9 Inlet1_Bypass	51.54	0 12:41	43.95	1.17	10.31	0.42	1.00	1.00	132.00		
10 Inlet2_Bypass	60.88	0 12:19	60.88	1.00	12.18	0.16	1.00	1.00	45.00		
11 Inlet3_Bypass	60.96	0 13:10	56.51	1.08	12.19	0.16	1.00	1.00	122.00		
12 Inlet4_Bypass	55.44	0 12:11	55.44	1.00	11.09	0.17	1.00	1.00	50.00		
13 Link-170	7.13	0 09:42	317822.46	0.00	3.42	0.37	0.11	0.00	0.00		
14 Link-172	128.91	0 12:47	289520.32	0.00	9.25	0.24	0.40	0.02	0.00		
15 Outlet	181.95	0 14:29	2552.56	0.07	9.99	0.03	1.82	0.18	0.00		

Pipe Input

SN	Element ID	Length	Inlet Invert Elevation	Inlet Invert Offset	Outlet Invert Elevation	Outlet Invert Offset	Total Drop	Average Pipe Slope	Pipe Shape	Pipe Diameter or Height	Pipe Width	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(%)		(in)	(in)				
1	72RCP	488.00	1038.72	0.00	1030.64	0.00	8.08	1.6600	CIRCULAR	72.000	72.000	0.0110	0.5000	0.5000	0.0000
2	BlueMtCulvertOut	40.00	1077.00	4.00	1076.00	6.00	1.00	2.5000	CIRCULAR	36.000	36.000	0.0240	0.5000	0.5000	0.0000
3	CC-5_Inlet4A	46.00	1153.00	0.00	1148.00	0.00	5.00	10.8700	CIRCULAR	36.000	36.000	0.0110	0.5000	0.0000	0.0000
4	CC-5_Inlet4B	100.00	1148.00	0.00	1137.90	-0.01	10.10	10.1000	CIRCULAR	36.000	36.000	0.0110	0.0000	0.0000	0.0000
5	CC-7_Inlet9A	20.50	1203.75	0.00	1201.50	0.00	2.25	10.9800	CIRCULAR	36.000	36.000	0.0110	0.5000	0.0000	0.0000
6	CC-7_Inlet9B	20.50	1201.50	0.00	1199.43	0.20	2.07	10.1000	CIRCULAR	36.000	36.000	0.0110	0.0000	0.0000	0.0000
7	Inlet10_CC-7	213.00	1241.67	0.00	1230.00	0.00	11.67	5.4800	CIRCULAR	24.000	24.000	0.0120	0.5000	0.5000	0.0000
8	Inlet11_CC-7	341.00	1269.21	0.00	1237.93	7.93	31.28	9.1700	CIRCULAR	36.000	36.000	0.0240	0.5000	0.0000	0.0000
9	Inlet12_Inlet11A	100.00	1358.50	0.00	1350.00	0.00	8.50	8.5000	CIRCULAR	36.000	36.000	0.0240	0.5000	0.0000	0.0000
10	Inlet12_Inlet11B	520.00	1350.00	0.00	1269.34	0.13	80.66	15.5100	CIRCULAR	36.000	36.000	0.0240	0.0000	0.5000	0.0000
11	Inlet1-BlueMtPond	262.00	1101.51	0.00	1083.76	10.76	17.75	6.7700	CIRCULAR	36.000	36.000	0.0120	0.0000	0.5000	0.0000
12	Inlet2_Inlet1A	55.00	1114.80	0.00	1108.50	0.00	6.30	11.4500	CIRCULAR	36.000	36.000	0.0120	0.0000	0.0000	0.0000
13	Inlet2_Inlet1B	60.00	1108.50	0.00	1101.51	0.00	6.99	11.6500	CIRCULAR	36.000	36.000	0.0120	0.0000	0.0000	0.0000
14	Inlet3_Inlet2A	60.00	1126.59	0.00	1120.50	0.00	6.09	10.1500	CIRCULAR	36.000	36.000	0.0120	0.0000	0.0000	0.0000
15	Inlet3_Inlet2B	56.00	1120.50	0.00	1114.80	0.00	5.70	10.1800	CIRCULAR	36.000	36.000	0.0120	0.0000	0.0000	0.0000
16	Inlet4_Inlet3A	58.00	1137.90	-0.01	1132.20	0.00	5.70	9.8300	CIRCULAR	36.000	36.000	0.0120	0.0000	0.0000	0.0000
17	Inlet4_Inlet3B	58.00	1132.20	0.00	1126.59	0.00	5.61	9.6700	CIRCULAR	36.000	36.000	0.0120	0.0000	0.0000	0.0000
18	Inlet5_CC-5	80.60	1199.25	0.00	1194.43	0.00	4.82	5.9800	CIRCULAR	30.000	30.000	0.0240	0.5000	0.5000	0.0000
19	Inlet6_Inlet5	62.00	1202.80	0.00	1199.66	0.41	3.14	5.0600	CIRCULAR	30.000	30.000	0.0240	0.5000	0.5000	0.0000
20	Inlet7_CC-5	97.00	1194.24	0.00	1188.32	0.00	5.92	6.1000	CIRCULAR	36.000	36.000	0.0120	0.0000	0.5000	0.0000
21	Inlet9_Inlet7A	27.00	1199.23	0.00	1196.50	0.00	2.73	10.1100	CIRCULAR	36.000	36.000	0.0110	0.0000	0.0000	0.0000
22	Inlet9_Inlet7B	23.00	1196.50	0.00	1194.24	0.00	2.26	9.8300	CIRCULAR	36.000	36.000	0.0110	0.0000	0.0000	0.0000
23	Mill Pond 1 Crest 18s	50.30	948.30	3.30	947.30	34.30	1.00	1.9900	CIRCULAR	18.000	18.000	0.0240	0.9000	0.5000	0.0000
24	Mill Pond 1 Crest 20x28s	49.90	948.50	3.50	947.10	34.10	1.40	2.8100	Horizontal Ellipse	20.040	27.960	0.0150	0.9000	0.5000	0.0000
25	P-01	130.00	951.00	0.00	947.00	2.00	4.00	3.0800	Rectangular	48.000	180.000	0.0120	0.5000	0.5000	0.0000
26	P-03	67.47	946.68	1.68	944.30	31.30	2.38	3.5300	CIRCULAR	24.000	24.000	0.0240	0.5000	0.5000	0.0000
27	P-04	47.00	948.18	3.18	947.08	34.08	1.10	2.3400	CIRCULAR	18.000	18.000	0.0240	0.5000	0.5000	0.0000
28	P-05	47.00	948.30	3.30	947.25	34.25	1.05	2.2300	Arch	20.040	27.960	0.0240	0.5000	0.5000	0.0000
29	P-06	47.79	948.18	3.18	947.20	34.20	0.98	2.0500	Arch	20.040	27.960	0.0240	0.5000	0.5000	0.0000
30	P-07	49.91	948.26	3.26	947.29	34.29	0.97	1.9400	Arch	20.040	27.960	0.0240	0.5000	0.5000	0.0000
31	P-08	47.86	948.43	3.43	947.33	34.33	1.10	2.3000	Arch	20.040	27.960	0.0240	0.5000	0.5000	0.0000
32	P-09	48.81	948.66	3.66	946.72	33.72	1.94	3.9700	Arch	18.000	24.000	0.0240	0.5000	0.5000	0.0000
33	P-10	50.30	948.39	3.39	947.24	34.24	1.15	2.2900	Arch	20.040	27.960	0.0240	0.5000	0.5000	0.0000
34	P-11	50.34	948.30	3.30	947.91	34.91	0.39	0.7700	CIRCULAR	18.000	18.000	0.0240	0.5000	0.5000	0.0000
35	P-12	50.13	948.72	3.72	947.59	34.59	1.13	2.2500	Arch	20.040	27.960	0.0240	0.5000	0.5000	0.0000
36	P-13	49.85	948.84	3.84	947.03	34.03	1.81	3.6300	Arch	20.040	27.960	0.0240	0.5000	0.5000	0.0000
37	P-14	50.20	948.68	3.68	947.51	34.51	1.17	2.3300	Arch	20.040	27.960	0.0240	0.5000	0.5000	0.0000
38	P-15	50.62	947.98	2.98	946.93	33.93	1.05	2.0700	Arch	20.040	27.960	0.0240	0.5000	0.5000	0.0000
39	P-16	50.23	948.60	3.60	946.51	33.51	2.09	4.1600	Arch	20.040	27.960	0.0240	0.5000	0.5000	0.0000
40	P-17	51.25	948.77	3.77	946.91	33.91	1.86	3.6300	Arch	20.040	27.960	0.0240	0.5000	0.5000	0.0000
41	P-18	50.25	948.78	3.78	946.79	33.79	1.99	3.9600	Arch	20.040	27.960	0.0240	0.5000	0.5000	0.0000
42	P-19	50.20	948.33	3.33	946.96	33.96	1.37	2.7300	CIRCULAR	18.000	18.000	0.0240	0.5000	0.5000	0.0000
43	P-20	82.71	932.92	0.00	929.95	18.95	2.97	3.5900	CIRCULAR	8.040	8.040	0.0110	0.5000	0.5000	0.0000
44	P-21	49.70	941.58	28.58	940.21	29.21	1.37	2.7600	CIRCULAR	18.000	18.000	0.0240	0.9000	0.5000	0.0000
45	P-22	80.32	932.63	0.00	930.34	19.34	2.29	2.8500	CIRCULAR	8.040	8.040	0.0240	0.5000	0.5000	0.0000
46	P-23	80.25	932.48	0.00	931.36	20.36	1.12	1.4000	CIRCULAR	8.040	8.040	0.0240	0.5000	0.5000	0.0000
47	P-24	49.59	941.47	28.47	940.30	29.30	1.17	2.3600	CIRCULAR	18.000	18.000	0.0240	0.9000	0.5000	0.0000
48	P-25	78.74	932.93	0.00	930.60	19.60	2.33	2.9600	CIRCULAR	8.040	8.040	0.0240	0.5000	0.5000	0.0000
49	P-26	41.81	940.98	29.98	940.31	35.31	0.67	1.6000	CIRCULAR	18.000	18.000	0.0240	0.9000	0.5000	0.0000
50	P-27	98.09	929.31	0.00	922.86	17.86	6.45	6.5800	CIRCULAR	8.040	8.040	0.0240	0.5000	0.5000	0.0000
51	P-28	40.65	941.07	30.07	940.35	35.35	0.72	1.7700	CIRCULAR	18.000	18.000	0.0240	0.9000	0.5000	0.0000

[illegible]

Pipe Results

SN Element ID	Peak Flow	Time of Peak Flow Occurrence	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Travel Time	Peak Flow Depth	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged	Froude Number	Reported Condition
	(cfs)	(days hh:mm)	(cfs)		(ft/sec)	(min)	(ft)		(min)		
1 72RCP	163.46	0 13:04	644.03	0.25	11.09	0.73	3.10	0.52	0.00		Calculated
2 BlueMtCulvertOut	163.48	0 13:02	114.25	1.43	11.70	0.06	2.89	0.96	0.00		> CAPACITY
3 CC-5_Inlet4A	270.83	0 12:14	259.88	1.04	38.31	0.02	3.00	1.00	24.00		SURCHARGED
4 CC-5_Inlet4B	260.43	0 12:16	250.39	1.04	36.84	0.05	3.00	1.00	24.00		SURCHARGED
5 CC-7_Inlet9A	208.66	0 12:12	261.14	0.80	29.52	0.01	3.00	1.00	134.00		SURCHARGED
6 CC-7_Inlet9B	203.68	0 12:10	250.48	0.81	28.82	0.01	3.00	1.00	135.00		SURCHARGED
7 Inlet10_CC-7	14.83	0 11:57	57.36	0.26	5.69	0.62	1.55	0.78	0.00		Calculated
8 Inlet11_CC-7	137.33	0 12:52	109.42	1.26	19.43	0.29	3.00	1.00	88.00		SURCHARGED
9 Inlet12_Inlet11A	150.62	0 12:11	105.33	1.43	22.98	0.07	3.00	1.00	58.00		SURCHARGED
10 Inlet12_Inlet11B	139.66	0 12:31	142.29	0.98	19.76	0.44	3.00	1.00	58.00		SURCHARGED
11 Inlet1-BlueMtPond	153.63	0 12:41	188.07	0.82	24.15	0.18	2.61	0.87	0.00		Calculated
12 Inlet2_Inlet1A	271.78	0 12:22	244.55	1.11	38.45	0.02	3.00	1.00	141.00		SURCHARGED
13 Inlet2_Inlet1B	253.93	0 12:23	246.63	1.03	35.92	0.03	3.00	1.00	142.00		SURCHARGED
14 Inlet3_Inlet2A	253.11	0 12:18	230.20	1.10	35.81	0.03	3.00	1.00	32.00		SURCHARGED
15 Inlet3_Inlet2B	237.80	0 12:20	230.53	1.03	33.64	0.03	3.00	1.00	33.00		SURCHARGED
16 Inlet4_Inlet3A	235.32	0 12:15	226.72	1.04	33.29	0.03	3.00	1.00	113.00		SURCHARGED
17 Inlet4_Inlet3B	221.11	0 12:17	224.72	0.98	31.28	0.03	3.00	1.00	114.00		SURCHARGED
18 Inlet5_CC-5	47.52	0 12:18	54.33	0.87	13.77	0.10	2.50	1.00	78.00		SURCHARGED
19 Inlet6_Inlet5	47.47	0 12:18	50.00	0.95	9.67	0.11	2.50	1.00	17.00		SURCHARGED
20 Inlet7_CC-5	205.82	0 12:06	178.51	1.15	29.12	0.06	3.00	1.00	132.00		SURCHARGED
21 Inlet9_Inlet7A	203.23	0 12:09	250.65	0.81	28.75	0.02	3.00	1.00	188.00		SURCHARGED
22 Inlet9_Inlet7B	203.24	0 12:08	247.09	0.82	28.75	0.01	3.00	1.00	200.00		SURCHARGED
23 Mill Pond 1 Crest 18s	24.10	0 12:13	24.07	1.00	4.94	0.17	1.30	0.87	0.00		> CAPACITY
24 Mill Pond 1 Crest 20x28s	165.42	0 12:03	485.57	0.34	6.13	0.14	1.08	0.65	0.00		Calculated
25 P-01	289.89	0 12:09	1767.23	0.16	5.77	0.38	3.37	0.84	0.00		Calculated
26 P-03	20.09	0 12:13	23.01	0.87	6.98	0.16	1.72	0.86	0.00		Calculated
27 P-04	0.00	0 09:49	8.70	0.00	0.43	1.82	0.75	0.50	0.00		Calculated
28 P-05	0.00	0 09:54	17.83	0.00	0.18	4.35	0.83	0.50	0.00		Calculated
29 P-06	13.25	0 12:13	17.08	0.78	4.80	0.17	1.34	0.81	0.00		Calculated
30 P-07	12.64	0 12:13	16.63	0.76	4.60	0.18	1.34	0.80	0.00		Calculated
31 P-08	11.32	0 12:13	18.08	0.63	4.45	0.18	1.22	0.73	0.00		Calculated
32 P-09	7.92	0 12:13	17.10	0.46	4.44	0.18	0.99	0.66	0.00		Calculated
33 P-10	11.67	0 12:13	18.03	0.65	4.49	0.19	1.25	0.75	0.00		Calculated
34 P-11	6.43	0 12:13	5.01	1.28	4.11	0.20	1.24	0.83	0.00		> CAPACITY
35 P-12	8.51	0 12:13	17.91	0.48	4.17	0.20	1.00	0.60	0.00		Calculated
36 P-13	7.50	0 12:13	22.73	0.33	4.47	0.19	0.86	0.52	0.00		Calculated
37 P-14	8.89	0 12:13	18.21	0.49	4.19	0.20	1.02	0.61	0.00		Calculated
38 P-15	14.77	0 12:13	17.18	0.86	5.22	0.16	1.39	0.83	0.00		Calculated
39 P-16	9.95	0 12:13	24.33	0.41	4.60	0.18	1.02	0.61	0.00		Calculated
40 P-17	8.15	0 12:13	22.72	0.36	4.48	0.19	0.91	0.55	0.00		Calculated
41 P-18	8.09	0 12:13	23.74	0.34	4.53	0.18	0.90	0.54	0.00		Calculated
42 P-19	6.35	0 12:13	9.40	0.68	4.18	0.20	1.20	0.80	0.00		Calculated
43 P-20	3.80	0 12:26	2.71	1.40	10.88	0.13	0.67	1.00	10556.00		SURCHARGED
44 P-21	5.62	0 12:37	9.45	0.60	4.04	0.21	1.50	1.00	110.00		SURCHARGED
45 P-22	2.00	0 12:26	1.11	1.81	5.74	0.23	0.67	1.00	9339.00		SURCHARGED
46 P-23	2.01	0 12:26	0.77	2.60	5.76	0.23	0.67	1.00	9851.00		SURCHARGED
47 P-24	6.22	0 12:33	8.74	0.71	4.07	0.20	1.50	1.00	128.00		SURCHARGED
48 P-25	2.03	0 12:26	1.13	1.80	5.81	0.23	0.67	1.00	8044.00		SURCHARGED
49 P-26	9.26	0 14:28	7.20	1.29	5.56	0.13	1.34	0.89	0.00		> CAPACITY
50 P-27	2.10	0 13:32	1.68	1.25	6.01	0.27	0.67	1.00	11519.00		SURCHARGED
51 P-28	9.23	0 14:28	7.57	1.22	5.55	0.12	1.34	0.89	0.00		> CAPACITY

Storage Nodes

Storage Node : BlueMtPond

Input Data

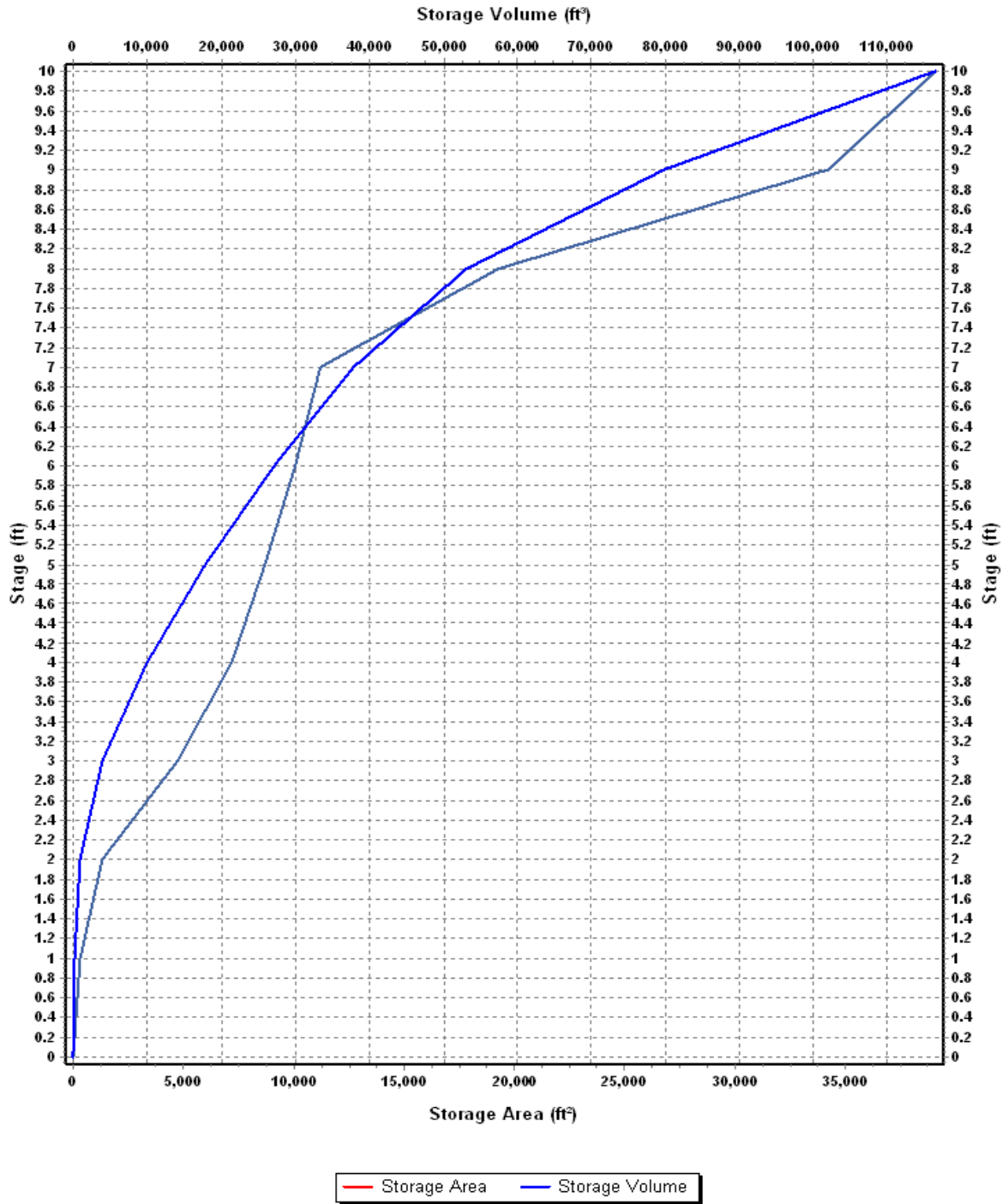
Invert Elevation (ft)	1073.00
Max (Rim) Elevation (ft)	1083.00
Max (Rim) Offset (ft)	10.00
Initial Water Elevation (ft)	1073.00
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	39071.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Blue Mountain Pond

Stage	Storage Area	Storage Volume
(ft)	(ft²)	(ft³)
0	15	0.000
1	337	176.00
2	1317	1003.00
3	4704	4013.50
4	7164	9947.50
5	8665	17862.00
6	10079	27234.00
7	11180	37863.50
8	19290	53098.50
9	34201	79844.00
10	39071	116480.00

Storage Area Volume Curves



Storage Node : BlueMtPond (continued)

Output Summary Results

Peak Inflow (cfs)	216.71
Peak Lateral Inflow (cfs)	48.79
Peak Outflow (cfs)	163.48
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	1085.98
Max HGL Depth Attained (ft)	12.98
Average HGL Elevation Attained (ft)	1077.37
Average HGL Depth Attained (ft)	4.37
Time of Max HGL Occurrence (days hh:mm)	0 13:03
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	33.25
Total Time Flooded (min)	168
Total Retention Time (sec)	0.00

Storage Node : CC-5_End

Input Data

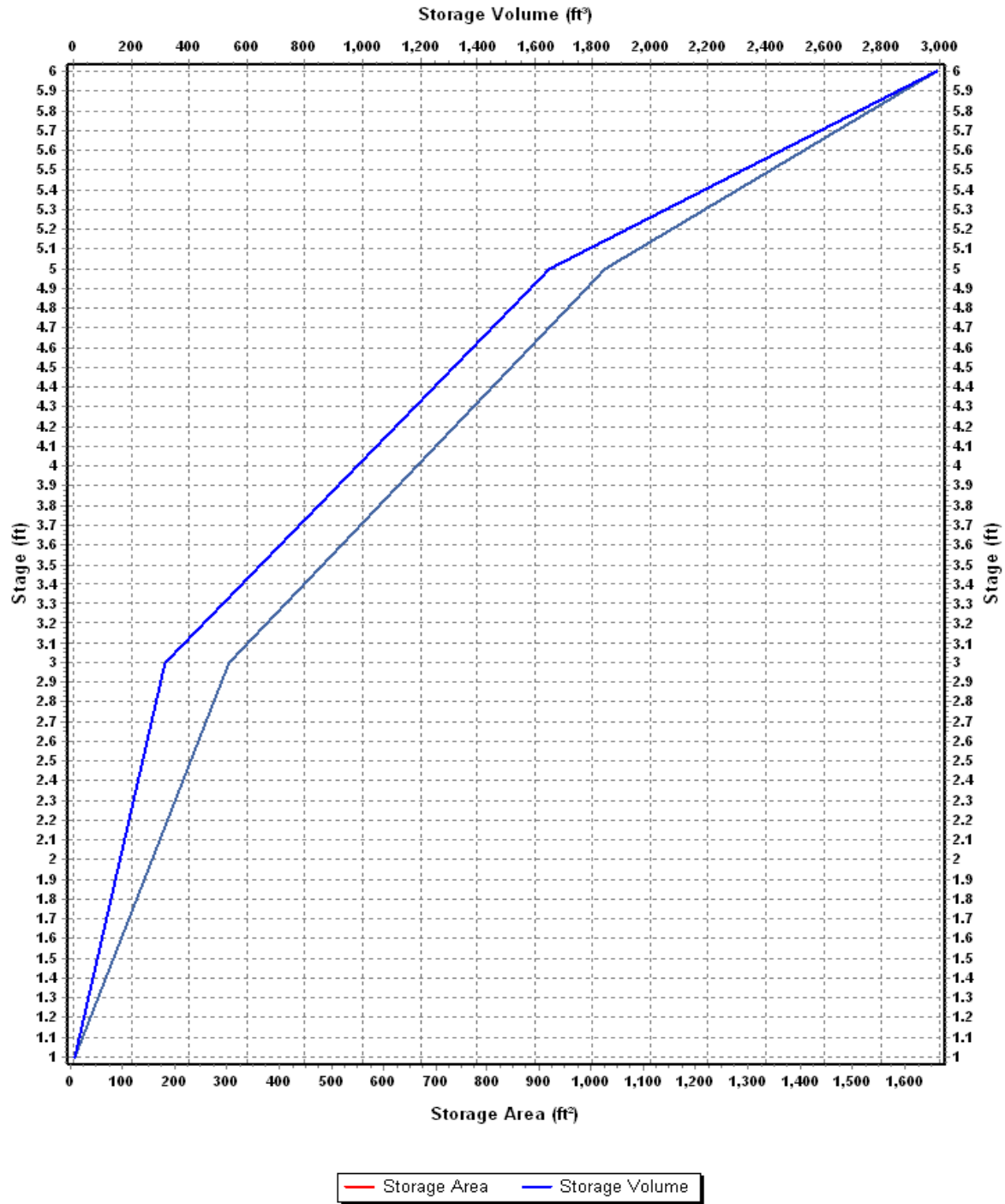
Invert Elevation (ft)	1153.00
Max (Rim) Elevation (ft)	1159.00
Max (Rim) Offset (ft)	6.00
Initial Water Elevation (ft)	1153.00
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	1662.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : CC-5 Culvert

Stage	Storage Area	Storage Volume
(ft)	(ft²)	(ft³)
1	8.5	4.250
3	305	317.75
5	1025	1647.75
6	1662	2991.25

Storage Area Volume Curves



Storage Node : CC-5_End (continued)

Output Summary Results

Peak Inflow (cfs)	235.03
Peak Lateral Inflow (cfs)	79.98
Peak Outflow (cfs)	270.83
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	1173.46
Max HGL Depth Attained (ft)	20.46
Average HGL Elevation Attained (ft)	1153.75
Average HGL Depth Attained (ft)	0.75
Time of Max HGL Occurrence (days hh:mm)	0 12:13
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	37.09
Total Time Flooded (min)	195
Total Retention Time (sec)	0.00

Storage Node : CC-7_End

Input Data

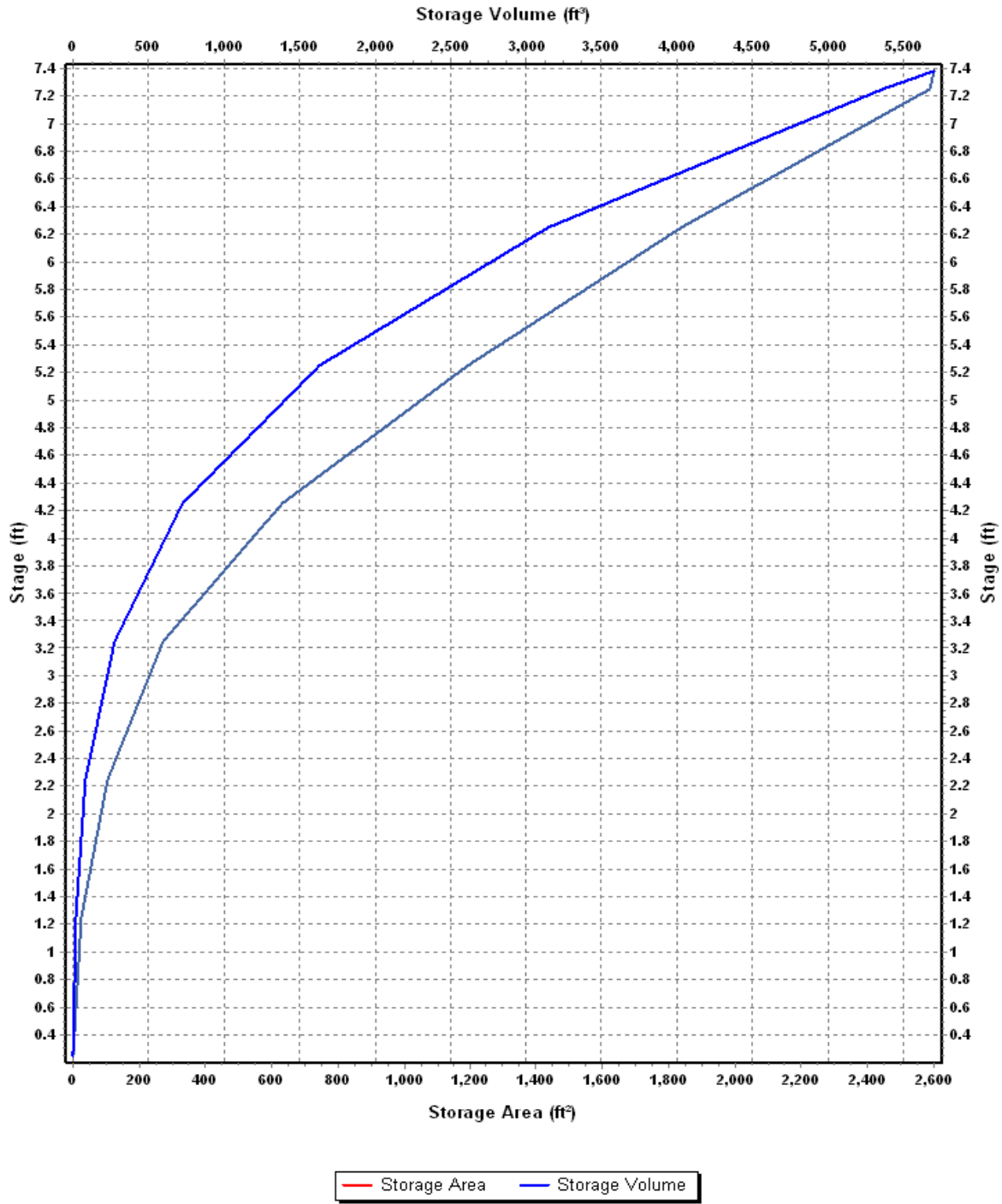
Invert Elevation (ft)	1203.75
Max (Rim) Elevation (ft)	1211.13
Max (Rim) Offset (ft)	7.38
Initial Water Elevation (ft)	1203.75
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	2600.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : CC-7_End

Stage	Storage Area	Storage Volume
(ft)	(ft²)	(ft³)
0.25	1	0.125
1.25	28	14.63
2.25	105	81.13
3.25	275	271.13
4.25	631	724.13
5.25	1194	1636.63
6.25	1837	3152.13
7.25	2589	5365.13
7.38	2600	5702.42

Storage Area Volume Curves



Storage Node : CC-7_End (continued)

Output Summary Results

Peak Inflow (cfs)	272.99
Peak Lateral Inflow (cfs)	140.19
Peak Outflow (cfs)	208.66
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	1222.50
Max HGL Depth Attained (ft)	18.75
Average HGL Elevation Attained (ft)	1204.42
Average HGL Depth Attained (ft)	0.67
Time of Max HGL Occurrence (days hh:mm)	0 12:37
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	40.56
Total Time Flooded (min)	120
Total Retention Time (sec)	0.00

Storage Node : I11PondedArea

Input Data

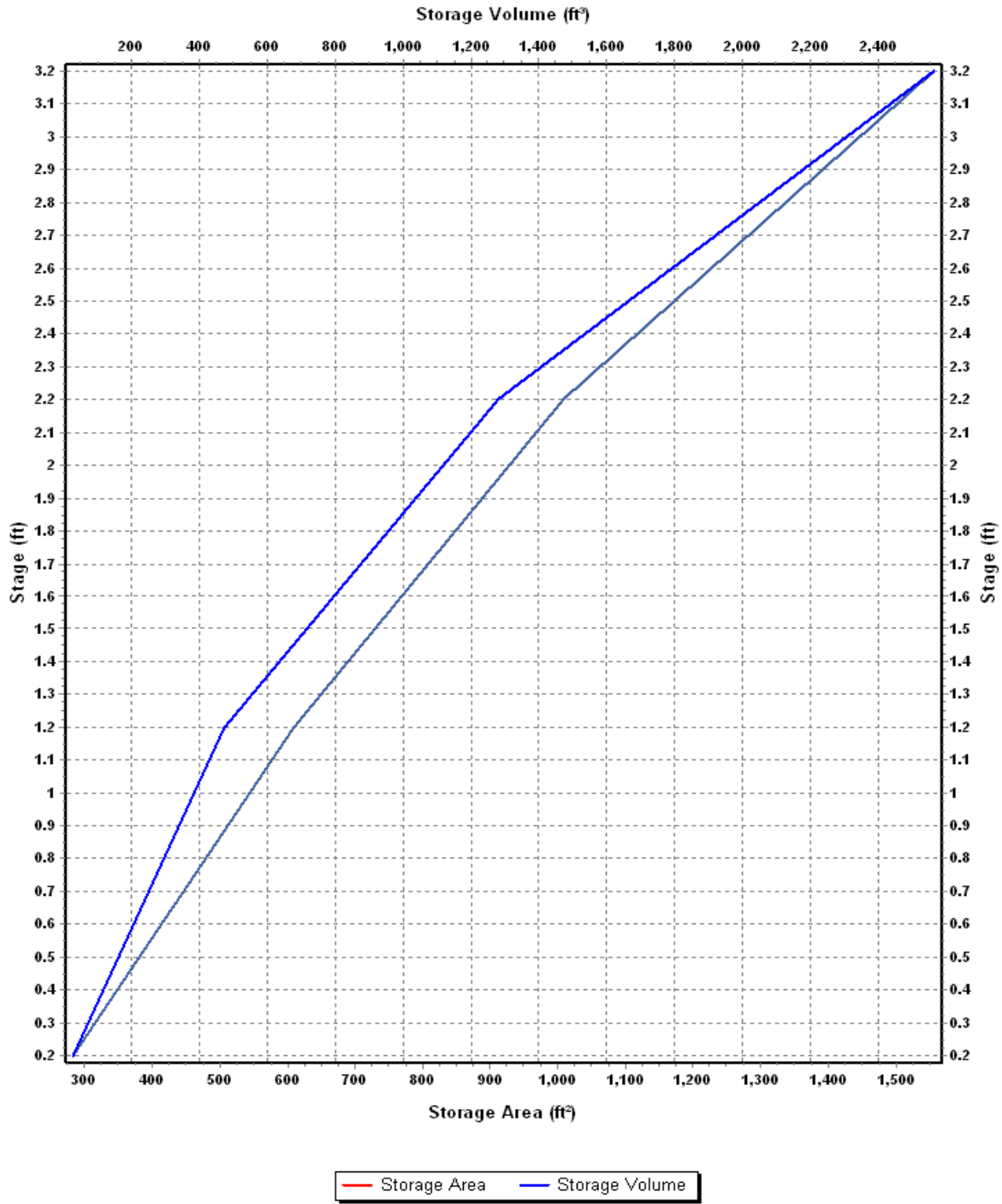
Invert Elevation (ft)	1275.80
Max (Rim) Elevation (ft)	1278.40
Max (Rim) Offset (ft)	2.60
Initial Water Elevation (ft)	1275.80
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	1556.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : I-11 Ponded Area

Stage	Storage Area	Storage Volume
(ft)	(ft²)	(ft³)
0.2	283	28.300
1.2	608	473.80
2.2	1008	1281.80
3.2	1556	2563.80

Storage Area Volume Curves



Storage Node : I11PondedArea (continued)

Outflow Orifices

SN Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1 Inlet-11	Bottom	Rectangular	No		36.00	36.00	1275.80	0.62

Output Summary Results

Peak Inflow (cfs)	74.88
Peak Lateral Inflow (cfs)	74.88
Peak Outflow (cfs)	59.21
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	1293.66
Max HGL Depth Attained (ft)	17.86
Average HGL Elevation Attained (ft)	1275.91
Average HGL Depth Attained (ft)	0.11
Time of Max HGL Occurrence (days hh:mm)	0 12:53
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	6.54
Total Time Flooded (min)	95
Total Retention Time (sec)	0.00

Storage Node : I12PondedArea

Input Data

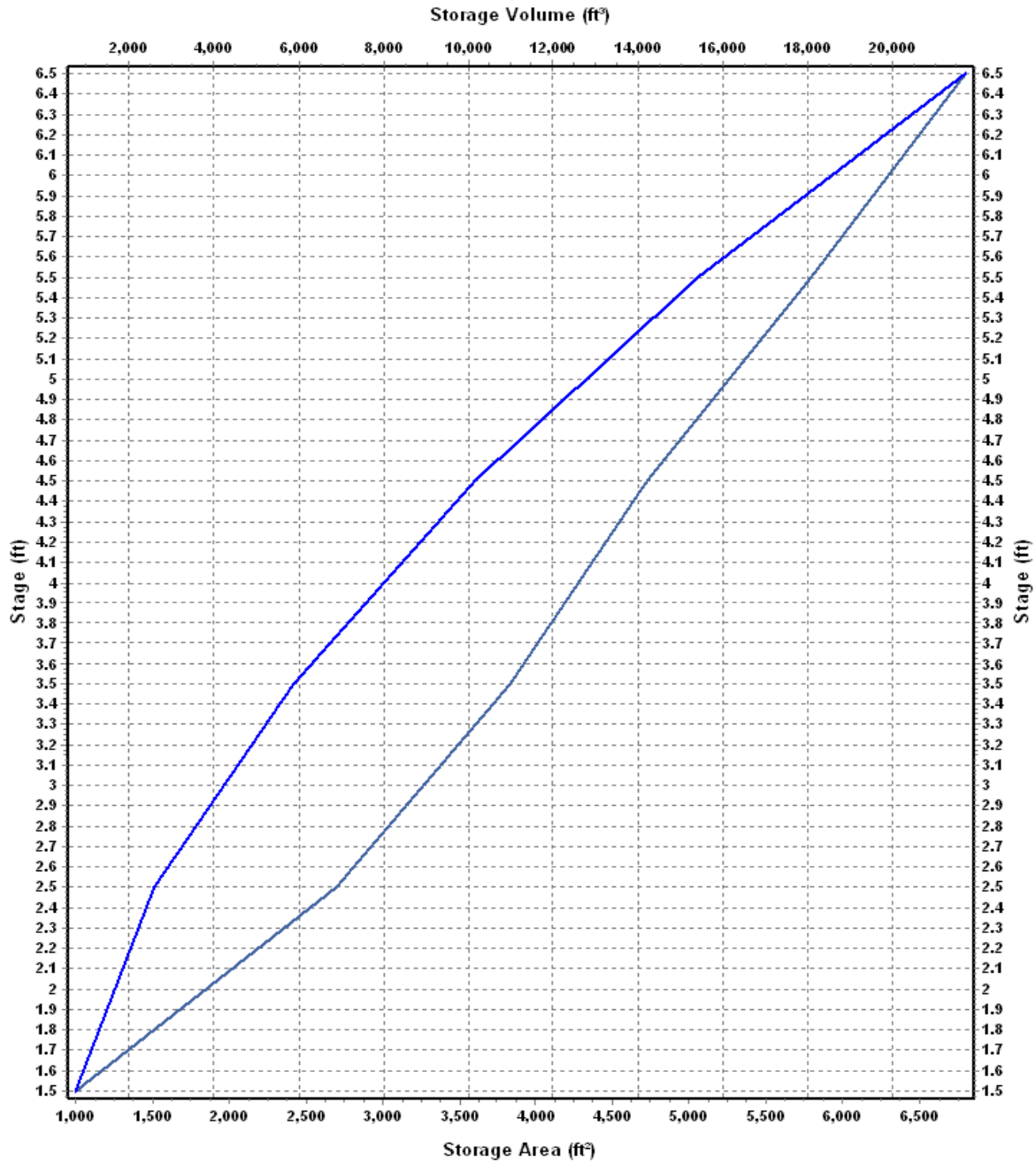
Invert Elevation (ft)	1365.50
Max (Rim) Elevation (ft)	1371.00
Max (Rim) Offset (ft)	5.50
Initial Water Elevation (ft)	1365.50
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	2500.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : I-12 Ponded Area

Stage	Storage Area	Storage Volume
(ft)	(ft²)	(ft³)
1.5	1000	750.000
2.5	2703	2601.50
3.5	3835	5870.50
4.5	4728	10152.00
5.5	5793	15412.50
6.5	6802	21710.00

Storage Area Volume Curves



— Storage Area — Storage Volume

Storage Node : I12PondedArea (continued)

Outflow Weirs

SN Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1 Inlet-12-Weir	Rectangular	No	1364.50	-1.00	3.00	1.50	3.33

Outflow Orifices

SN Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1 Inlet-12	Bottom	Rectangular	No		50.00	50.00	1365.50	0.31

Output Summary Results

Peak Inflow (cfs)	245.65
Peak Lateral Inflow (cfs)	245.65
Peak Outflow (cfs)	192.12
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	1395.74
Max HGL Depth Attained (ft)	30.24
Average HGL Elevation Attained (ft)	1365.63
Average HGL Depth Attained (ft)	0.13
Time of Max HGL Occurrence (days hh:mm)	0 12:27
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	16.97
Total Time Flooded (min)	63
Total Retention Time (sec)	0.00

Storage Node : MillPond1

Input Data

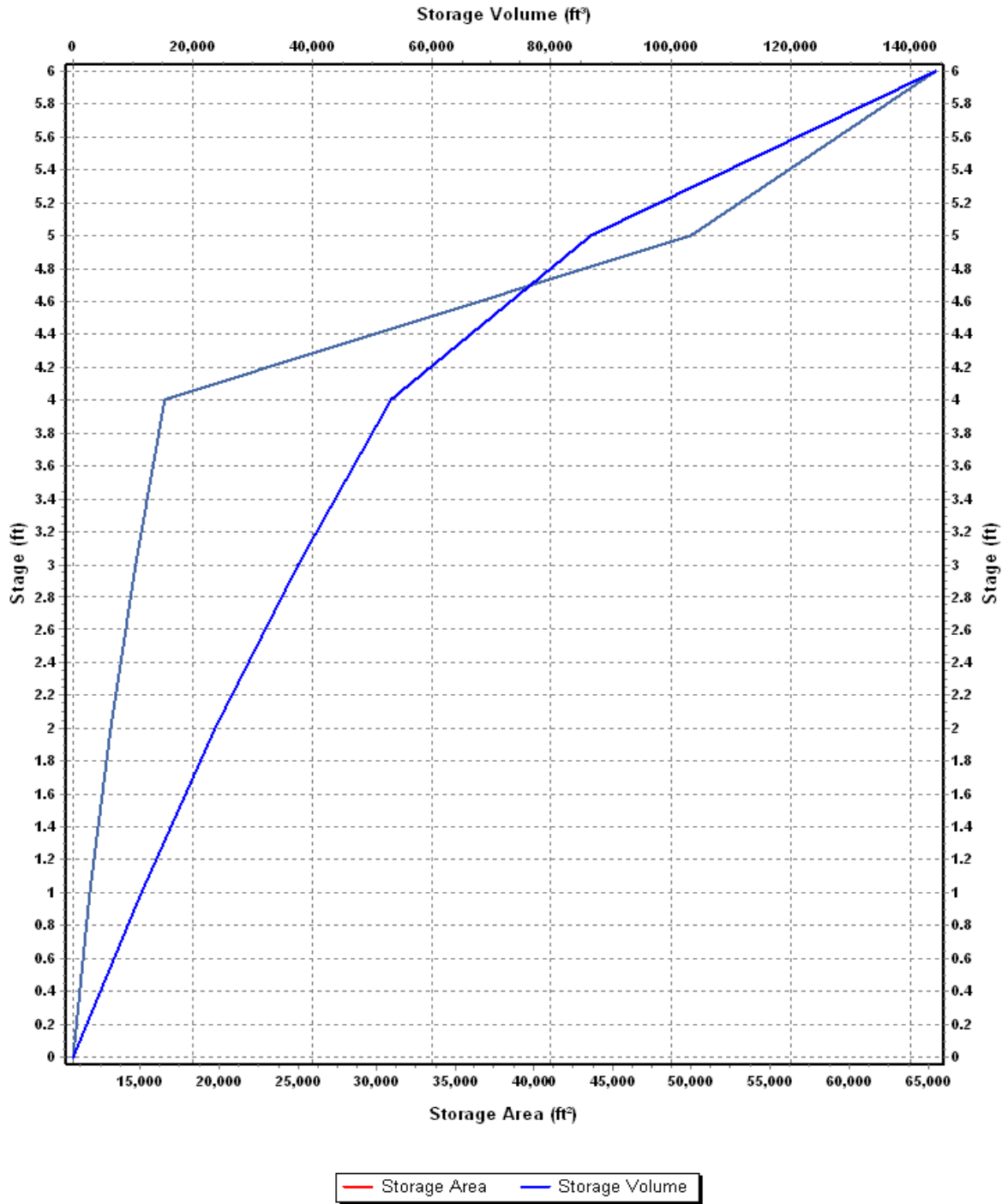
Invert Elevation (ft)	945.00
Max (Rim) Elevation (ft)	951.00
Max (Rim) Offset (ft)	6.00
Initial Water Elevation (ft)	946.70
Initial Water Depth (ft)	1.70
Ponded Area (ft²)	103660.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Mill Pond 1

Stage	Storage Area	Storage Volume
(ft)	(ft²)	(ft³)
0	10763	0.000
1	11811	11287.00
2	13125	23755.00
3	14704	37669.50
4	16548	53295.50
5	49934	86536.50
6	65472	144239.50

Storage Area Volume Curves



Storage Node : MillPond1 (continued)

Outflow Weirs

SN Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1 Pond 1 E. Spillway	Trapezoidal	No	950.50	5.50	200.00	1.50	3.33

Output Summary Results

Peak Inflow (cfs)	351.67
Peak Lateral Inflow (cfs)	61.78
Peak Outflow (cfs)	338.96
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	949.99
Max HGL Depth Attained (ft)	4.99
Average HGL Elevation Attained (ft)	947.22
Average HGL Depth Attained (ft)	2.22
Time of Max HGL Occurrence (days hh:mm)	0 12:13
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : MillPond2

Input Data

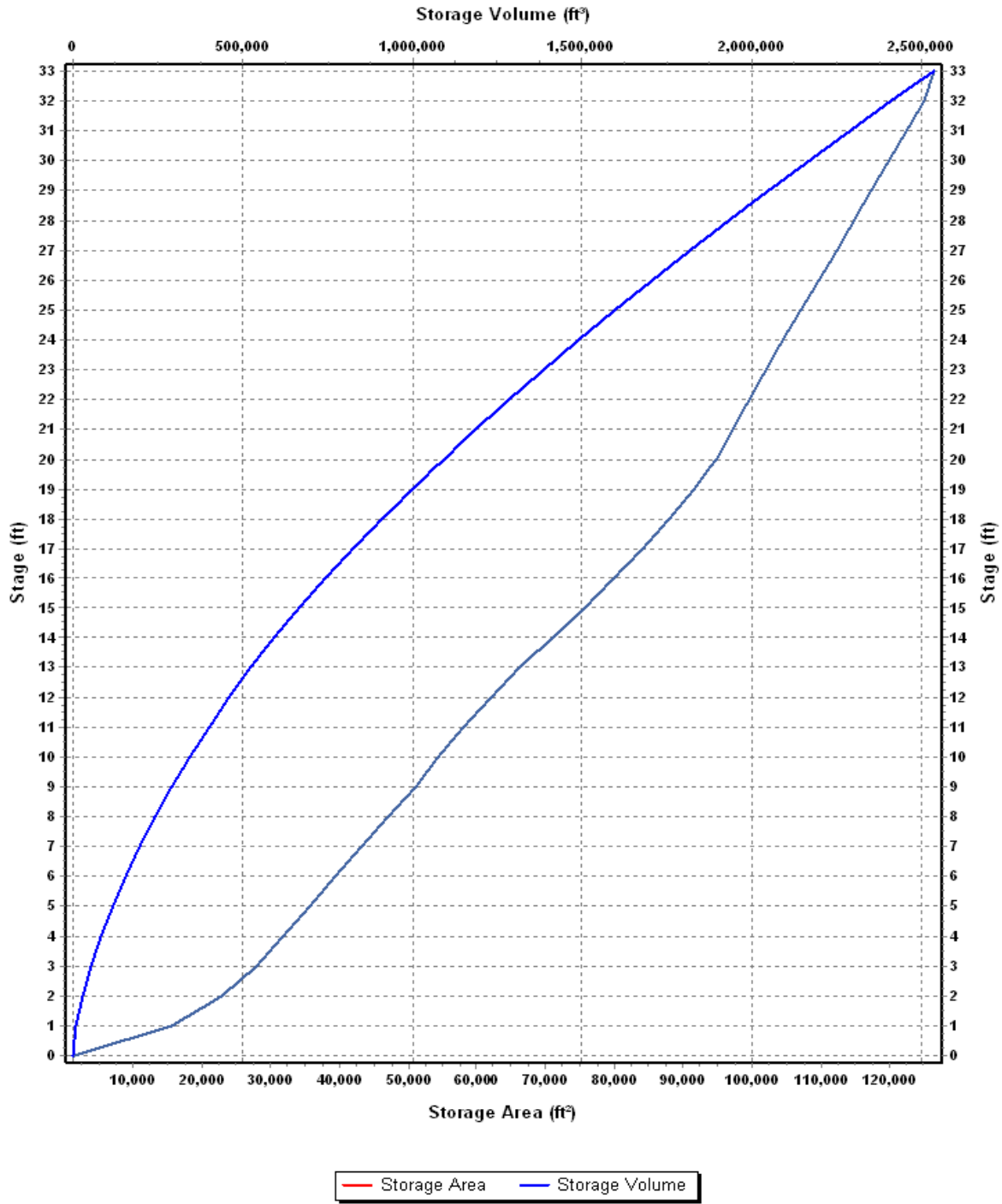
Invert Elevation (ft)	913.00
Max (Rim) Elevation (ft)	946.00
Max (Rim) Offset (ft)	33.00
Initial Water Elevation (ft)	933.00
Initial Water Depth (ft)	20.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Mill Pond 2

Stage	Storage Area	Storage Volume
(ft)	(ft²)	(ft³)
0	1317	0.000
1	15525	8421.00
2	22827	27597.00
3	28006	53013.50
4	31725	82879.00
5	35680	116581.50
6	39456	154149.50
7	43118	195436.50
8	47102	240546.50
9	51008	289601.50
10	54386	342298.50
11	57945	398464.00
12	61875	458374.00
13	66220	522421.50
14	70925	590994.00
15	75702	664307.50
16	79901	742109.00
17	84059	824089.00
18	87907	910072.00
19	91616	999833.50
19.75	93926	1069411.75
20	94696	1092989.50
20.4	95725	1131073.70
21	97191	1188948.50
22	99591	1287339.50
23	102043	1388156.50
24	104551	1491453.50
25	107094	1597276.00
27	112224	1816594.00
28.65	116279	2005108.98
32	125017	2409279.78
33	126410	2534993.28

Storage Area Volume Curves



Storage Node : MillPond2 (continued)

Outflow Weirs

SN Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1 Pond 2 E. Spillway As-Built	Trapezoidal	No	942.50	29.50	217.00	3.50	3.33

Outflow Orifices

SN Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1 P-20a	Side	CIRCULAR	No	1.00			933.00	4.80
2 P-20b	Side	CIRCULAR	No	1.00			933.92	4.80
3 P-20c	Side	CIRCULAR	No	1.00			934.92	4.80
4 P-20d	Side	CIRCULAR	No	1.00			935.92	4.80
5 P-20e	Side	CIRCULAR	No	1.00			936.92	4.80
6 P-20f	Side	CIRCULAR	No	1.00			937.92	4.80
7 P-20g	Side	CIRCULAR	No	1.00			938.92	4.80
8 P-20h	Side	CIRCULAR	No	1.00			939.92	4.80
9 P-20i	Side	CIRCULAR	No	1.00			940.50	4.80
10 P-20j	Bottom	CIRCULAR	No	8.00			941.53	0.61
11 P-22a	Side	CIRCULAR	No	1.00			932.70	4.80
12 P-22b	Side	CIRCULAR	No	1.00			933.63	4.80
13 P-22c	Side	CIRCULAR	No	1.00			934.63	4.80
14 P-22d	Side	CIRCULAR	No	1.00			935.63	4.80
15 P-22e	Side	CIRCULAR	No	1.00			936.63	4.80
16 P-22f	Side	CIRCULAR	No	1.00			937.63	4.80
17 P-22g	Side	CIRCULAR	No	1.00			938.63	4.80
18 P-22h	Side	CIRCULAR	No	1.00			939.60	4.80
19 P-22i	Side	CIRCULAR	No	1.00			940.50	4.80
20 P-22j	Bottom	CIRCULAR	No	8.00			941.37	0.61
21 P-23a	Side	CIRCULAR	No	1.00			932.60	4.80
22 P-23b	Side	CIRCULAR	No	1.00			933.48	4.80
23 P-23c	Side	CIRCULAR	No	1.00			934.48	4.80
24 P-23d	Side	CIRCULAR	No	1.00			935.48	4.80
25 P-23e	Side	CIRCULAR	No	1.00			936.48	4.80
26 P-23f	Side	CIRCULAR	No	1.00			937.48	4.80
27 P-23g	Side	CIRCULAR	No	1.00			938.48	4.80
28 P-23h	Side	CIRCULAR	No	1.00			939.48	4.80
29 P-23i	Side	CIRCULAR	No	1.00			940.50	4.80
30 P-23j	Bottom	CIRCULAR	No	8.00			941.88	0.61
31 P-25a	Side	CIRCULAR	No	1.00			933.00	4.80
32 P-25b	Side	CIRCULAR	No	1.00			933.93	4.80
33 P-25c	Side	CIRCULAR	No	1.00			934.93	4.80
34 P-25d	Side	CIRCULAR	No	1.00			935.93	4.80
35 P-25e	Side	CIRCULAR	No	1.00			936.93	4.80
36 P-25f	Side	CIRCULAR	No	1.00			937.93	4.80
37 P-25g	Side	CIRCULAR	No	1.00			938.93	4.80
38 P-25h	Side	CIRCULAR	No	1.00			939.93	4.80
39 P-25i	Side	CIRCULAR	No	1.00			940.50	4.80
40 P-25j	Bottom	CIRCULAR	No	8.00			941.46	0.61

Output Summary Results

Peak Inflow (cfs)	414.69
Peak Lateral Inflow (cfs)	76.09
Peak Outflow (cfs)	244.68
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	943.25
Max HGL Depth Attained (ft)	30.25
Average HGL Elevation Attained (ft)	937.08
Average HGL Depth Attained (ft)	24.08
Time of Max HGL Occurrence (days hh:mm)	0 14:27
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : MillPond3

Input Data

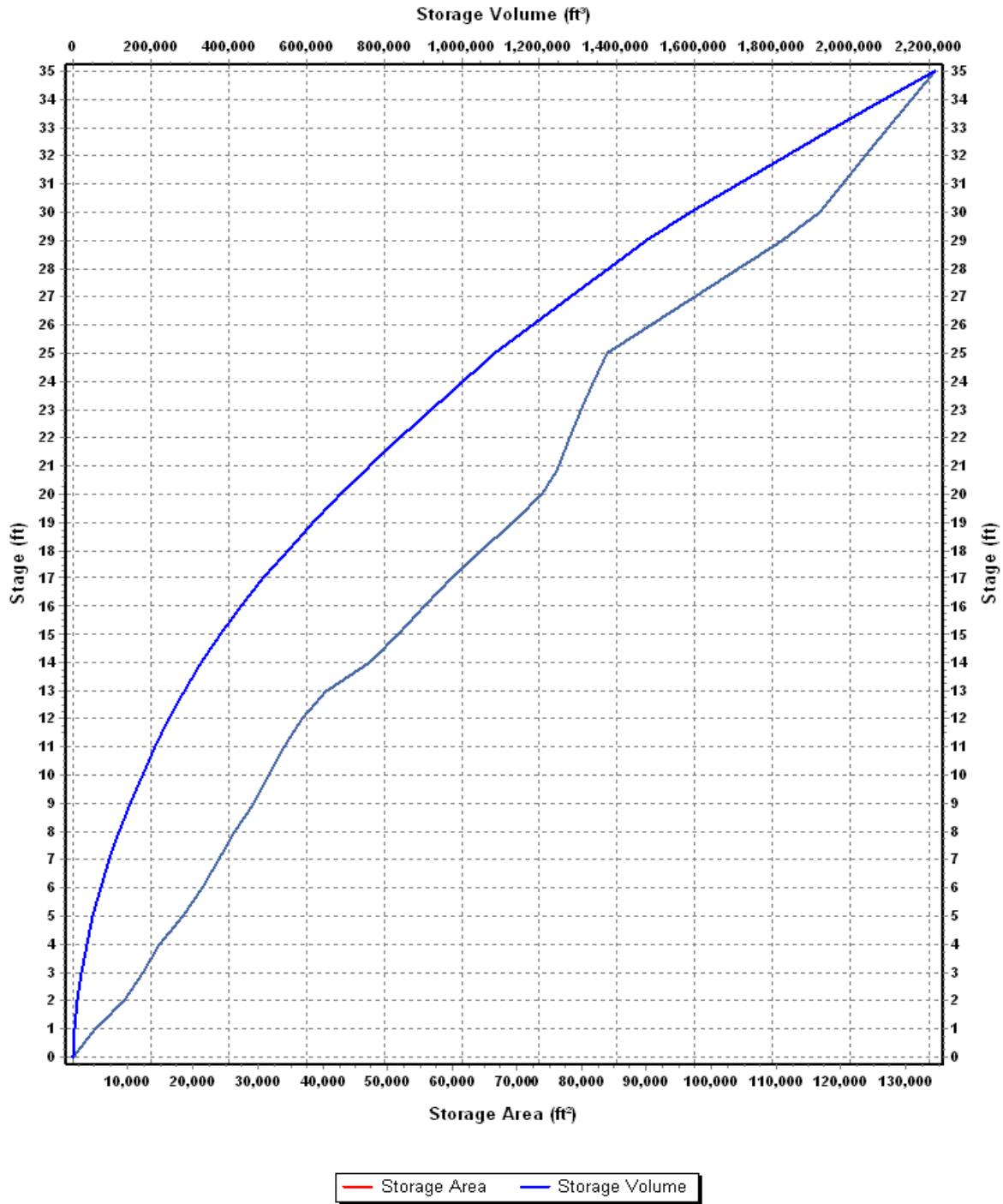
Invert Elevation (ft)	911.00
Max (Rim) Elevation (ft)	946.00
Max (Rim) Offset (ft)	35.00
Initial Water Elevation (ft)	934.00
Initial Water Depth (ft)	23.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Mill Pond 3

Stage (ft)	Storage Area (ft²)	Storage Volume (ft³)
0	1560	0.000
1	4949	3254.50
2	9391	10424.50
3	12217	21228.50
4	14810	34742.00
5	18459	51376.50
6	21365	71288.50
7	23943	93942.50
8	26470	119149.00
9	29283	147025.50
10	31714	177524.00
11	34077	210419.50
12	36801	245858.50
13	40489	284503.50
14	47189	328342.50
15	51664	377769.00
16	55766	431484.00
17	59960	489347.00
18	64411	551532.50
19	69409	618442.50
20	73824	690059.00
20.8	76027	749999.40
21	76399	765242.00
22	78168	842525.50
23	79942	921580.50
24	81770	1002436.50
25	83941	1085292.00
29	110858	1474890.00
30	116685	1588661.50
33	127157	1954424.50
34	130800	2083403.00
35	134466	2216036.00

Storage Area Volume Curves



Storage Node : MillPond3 (continued)

Outflow Weirs

SN Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1 Pond 3 E. Spillway As-Built	Trapezoidal	No	942.50	31.50	78.50	3.50	3.33

Outflow Orifices

SN Element ID	Orifice Type	Orifice Shape	Flap Gate	Circular Orifice Diameter (in)	Rectangular Orifice Height (in)	Rectangular Orifice Width (in)	Orifice Invert Elevation (ft)	Orifice Coefficient
1 P-27 Orifice	Bottom	CIRCULAR	No	8.00			931.59	0.61

Output Summary Results

Peak Inflow (cfs)	249.13
Peak Lateral Inflow (cfs)	41.60
Peak Outflow (cfs)	181.95
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	943.21
Max HGL Depth Attained (ft)	32.21
Average HGL Elevation Attained (ft)	935.63
Average HGL Depth Attained (ft)	24.63
Time of Max HGL Occurrence (days hh:mm)	0 14:28
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : N. Tract Pond 1

Input Data

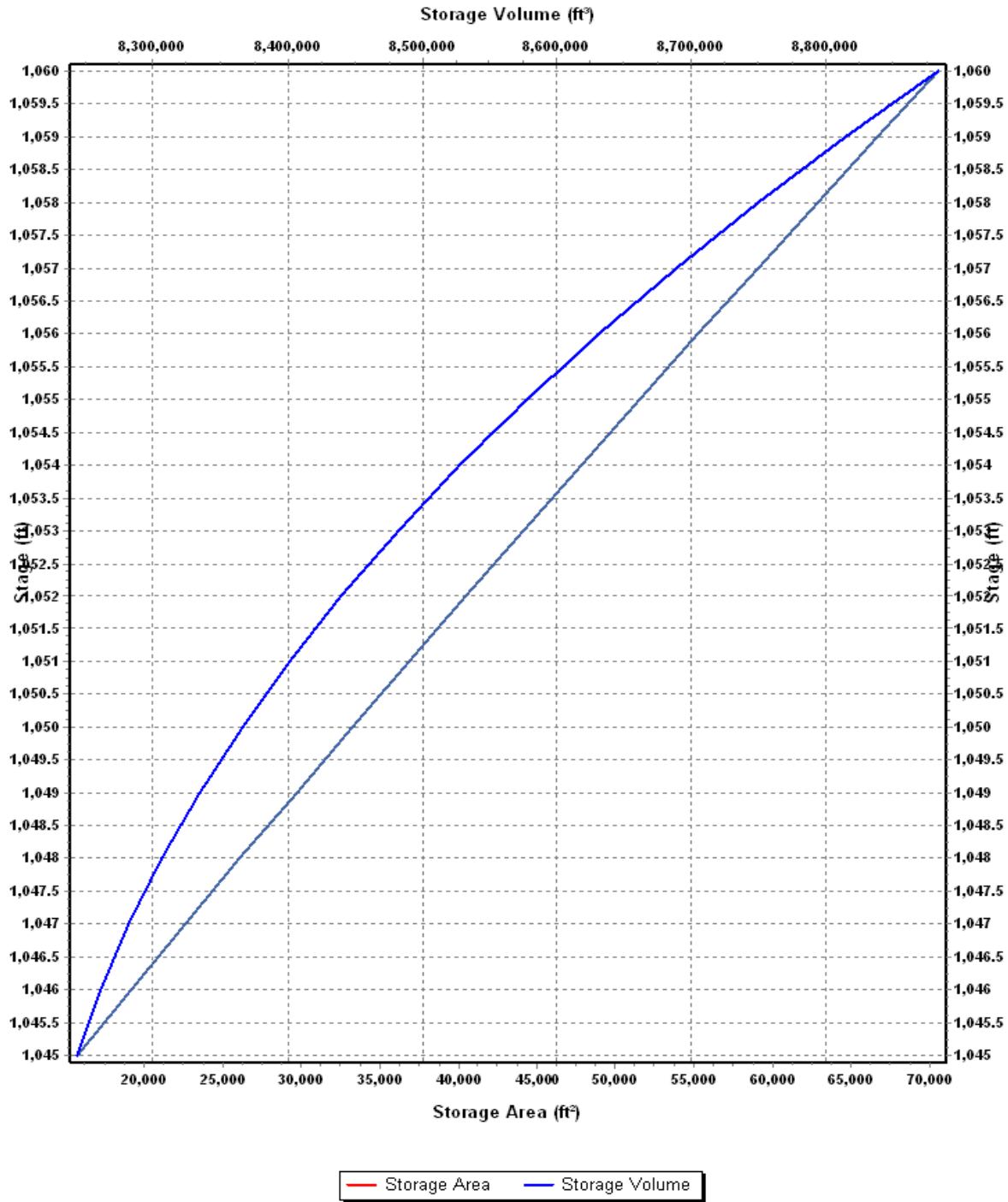
Invert Elevation (ft)	1045.00
Max (Rim) Elevation (ft)	1060.00
Max (Rim) Offset (ft)	15.00
Initial Water Elevation (ft)	1057.50
Initial Water Depth (ft)	12.50
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : NT Pond 1

Stage	Storage Area	Storage Volume
(ft)	(ft²)	(ft³)
1045	15778	8244005.000
1046	19187	8261487.50
1047	22639	8282400.50
1048	26132	8306786.00
1049	29667	8334685.50
1050	33247	8366142.50
1051	36856	8401194.00
1052	40491	8439867.50
1053	44154	8482190.00
1054	47845	8528189.50
1055	51560	8577892.00
1056	55300	8631322.00
1057	59067	8688505.50
1058	62858	8749468.00
1059	66654	8814224.00
1060	70514	8882808.00

Storage Area Volume Curves



Storage Node : N. Tract Pond 1 (continued)

Output Summary Results

Peak Inflow (cfs)	0.00
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	2.23
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	1057.64
Max HGL Depth Attained (ft)	12.64
Average HGL Elevation Attained (ft)	1050.69
Average HGL Depth Attained (ft)	5.69
Time of Max HGL Occurrence (days hh:mm)	3 00:00
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : N.Tract Pond 2

Input Data

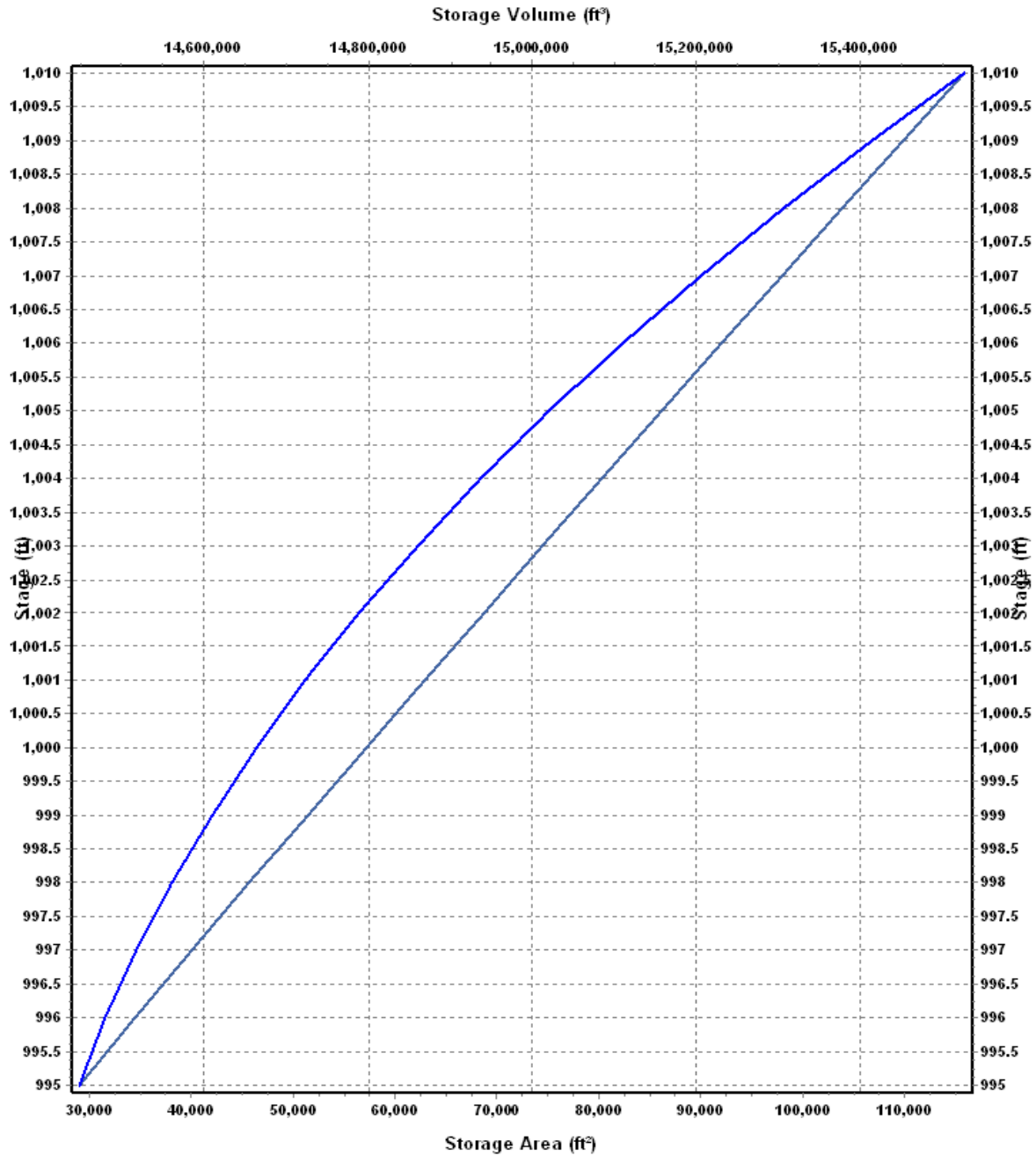
Invert Elevation (ft)	995.00
Max (Rim) Elevation (ft)	1010.00
Max (Rim) Offset (ft)	15.00
Initial Water Elevation (ft)	1006.80
Initial Water Depth (ft)	11.80
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : NT Pond 2

Stage	Storage Area	Storage Volume
(ft)	(ft²)	(ft³)
995	29042	14448395.000
996	34548	14480190.00
997	40109	14517518.50
998	45726	14560436.00
999	51398	14608998.00
1000	57130	14663262.00
1001	62894	14723274.00
1002	68680	14789061.00
1003	74488	14860645.00
1004	80341	14938059.50
1005	86191	15021325.50
1006	92062	15110452.00
1007	97956	15205461.00
1008	103874	15306376.00
1009	109802	15413214.00
1010	115850	15526040.00

Storage Area Volume Curves



Storage Area Storage Volume

Storage Node : N.Tract Pond 2 (continued)

Output Summary Results

Peak Inflow (cfs)	0.00
Peak Lateral Inflow (cfs)	0.00
Peak Outflow (cfs)	1.78
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	1006.88
Max HGL Depth Attained (ft)	11.88
Average HGL Elevation Attained (ft)	1000.70
Average HGL Depth Attained (ft)	5.7
Time of Max HGL Occurrence (days hh:mm)	2 23:59
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : Pitts Pond 1

Input Data

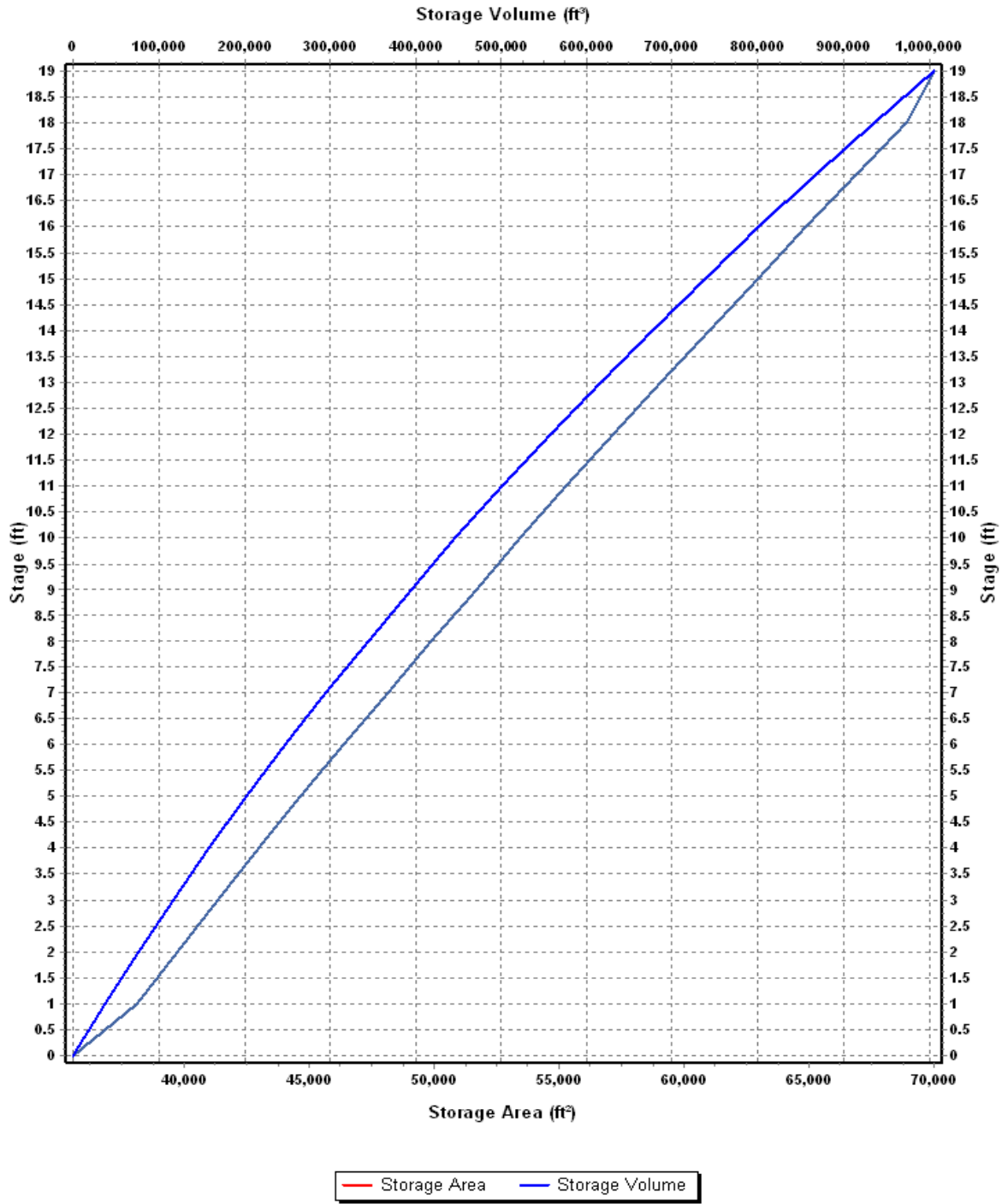
Invert Elevation (ft)	1102.00
Max (Rim) Elevation (ft)	1121.00
Max (Rim) Offset (ft)	19.00
Initial Water Elevation (ft)	1105.60
Initial Water Depth (ft)	3.60
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Pitts Pond 1

Stage	Storage Area	Storage Volume
(ft)	(ft²)	(ft³)
0	35556	0.000
1	38105	36830.50
2	39708	75737.00
3	41338	116260.00
4	42995	158426.50
5	44678	202263.00
6	46387	247795.50
7	48123	295050.50
8	49886	344055.00
9	51674	394835.00
10	53487	447415.50
11	55326	501822.00
12	57189	558079.50
13	59078	616213.00
14	60992	676248.00
15	62931	738209.50
16	64895	802122.50
17	66884	868012.00
18	68898	935903.00
19	70000	1005352.00

Storage Area Volume Curves



Storage Node : Pitts Pond 1 (continued)

Outflow Weirs

SN Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1 Pitts Pond 1 E.Spillway	Trapezoidal	No	1119.25	17.25	90.00	1.05	3.33

Output Summary Results

Peak Inflow (cfs)	348.45
Peak Lateral Inflow (cfs)	348.45
Peak Outflow (cfs)	123.54
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	1119.78
Max HGL Depth Attained (ft)	17.78
Average HGL Elevation Attained (ft)	1108.12
Average HGL Depth Attained (ft)	6.12
Time of Max HGL Occurrence (days hh:mm)	0 12:46
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : Pitts Pond 2

Input Data

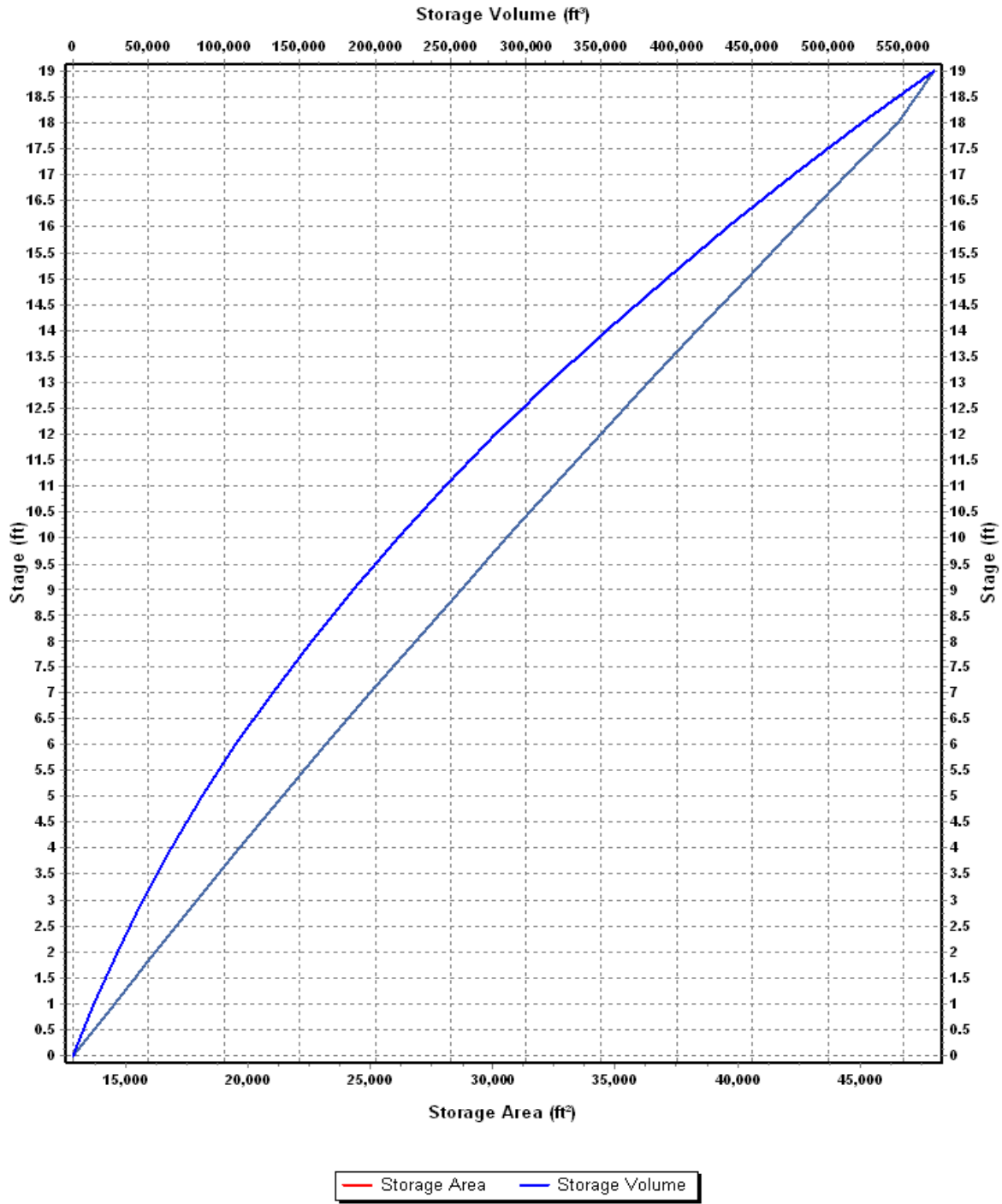
Invert Elevation (ft)	1102.00
Max (Rim) Elevation (ft)	1121.00
Max (Rim) Offset (ft)	19.00
Initial Water Elevation (ft)	1105.00
Initial Water Depth (ft)	3.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Pitts Pond 2

Stage	Storage Area	Storage Volume
(ft)	(ft²)	(ft³)
0	12876	0.000
1	14545	13710.50
2	16224	29095.00
3	17929	46171.50
4	19659	64965.50
5	21415	85502.50
6	23196	107808.00
7	25002	131907.00
8	26833	157824.50
9	28690	185586.00
10	30572	215217.00
11	32478	246742.00
12	34410	280186.00
13	36367	315574.50
14	38350	352933.00
15	40357	392286.50
16	42390	433660.00
17	44447	477078.50
18	46530	522567.00
19	48000	569832.00

Storage Area Volume Curves



Storage Node : Pitts Pond 2 (continued)

Outflow Weirs

SN Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1 Pitts Pond 2 E.Spillway	Trapezoidal	No	1117.25	15.25	25.00	2.75	3.33

Output Summary Results

Peak Inflow (cfs)	73.65
Peak Lateral Inflow (cfs)	73.65
Peak Outflow (cfs)	3.60
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	1113.36
Max HGL Depth Attained (ft)	11.36
Average HGL Elevation Attained (ft)	1105.86
Average HGL Depth Attained (ft)	3.86
Time of Max HGL Occurrence (days hh:mm)	1 00:26
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : Pitts Quarry Storage

Input Data

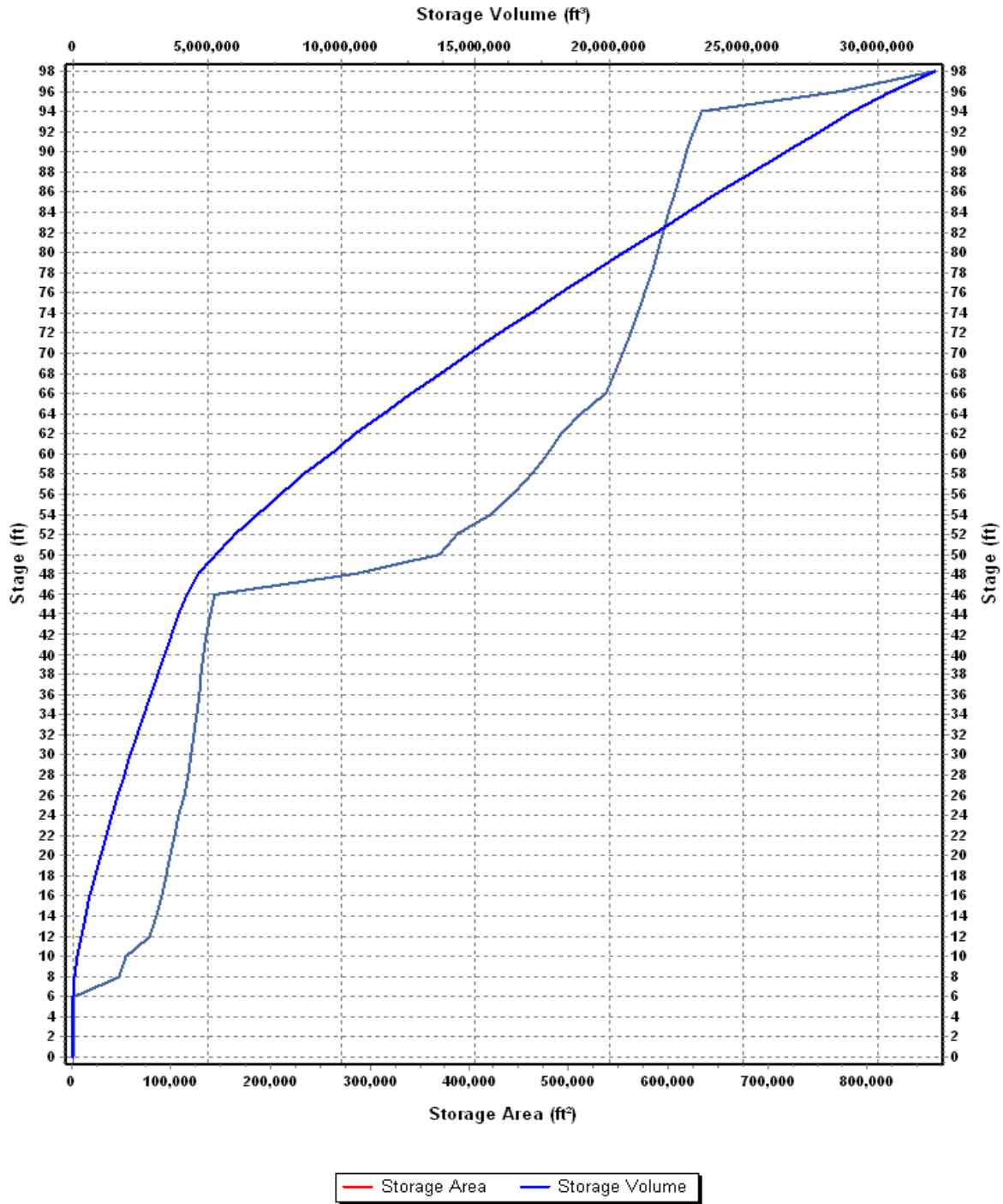
Invert Elevation (ft)	992.00
Max (Rim) Elevation (ft)	1090.00
Max (Rim) Offset (ft)	98.00
Initial Water Elevation (ft)	992.00
Initial Water Depth (ft)	0.00
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : Pitts Quarry Storage Chamber

Stage (ft)	Storage Area (ft²)	Storage Volume (ft³)
0	1786	0.000
2	2488	4274.00
4	2957	9719.00
6	3440	16116.00
8	47562	67118.00
10	55309	169989.00
12	79202	304500.00
14	85834	469536.00
16	90958	646328.00
18	95014	832300.00
20	99333	1026647.00
22	103330	1229310.00
24	107916	1440556.00
26	113748	1662220.00
28	117767	1893735.00
30	120963	2132465.00
32	123297	2376725.00
34	125826	2625848.00
36	128074	2879748.00
38	130416	3138238.00
40	133196	3401850.00
42	136084	3671130.00
44	139728	3946942.00
46	144102	4230772.00
48	284316	4659190.00
50	370667	5314173.00
52	387816	6072656.00
54	421214	6881686.00
56	443589	7746489.00
58	464142	8654220.00
60	478848	9597210.00
62	492885	10568943.00
64	512137	11573965.00
66	537415	12623517.00
68	546371	13707303.00
70	554510	14808184.00
72	561908	15924602.00
74	569688	17056198.00
76	576616	18202502.00
78	583077	19362195.00
80	589005	20534277.00
82	594974	21718256.00
84	600819	22914049.00
86	606850	24121718.00
88	612993	25341561.00
90	619065	26573619.00
92	625594	27818278.00
94	633794	29077666.00
96	770793	30482253.00
98	868076	32121122.00

Storage Area Volume Curves



Storage Node : Pitts Quarry Storage (continued)

Output Summary Results

Peak Inflow (cfs)	600.51
Peak Lateral Inflow (cfs)	593.38
Peak Outflow (cfs)	1.75
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	1036.53
Max HGL Depth Attained (ft)	44.53
Average HGL Elevation Attained (ft)	1030.75
Average HGL Depth Attained (ft)	38.75
Time of Max HGL Occurrence (days hh:mm)	2 19:21
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

Storage Node : ST-1E & 2E

Input Data

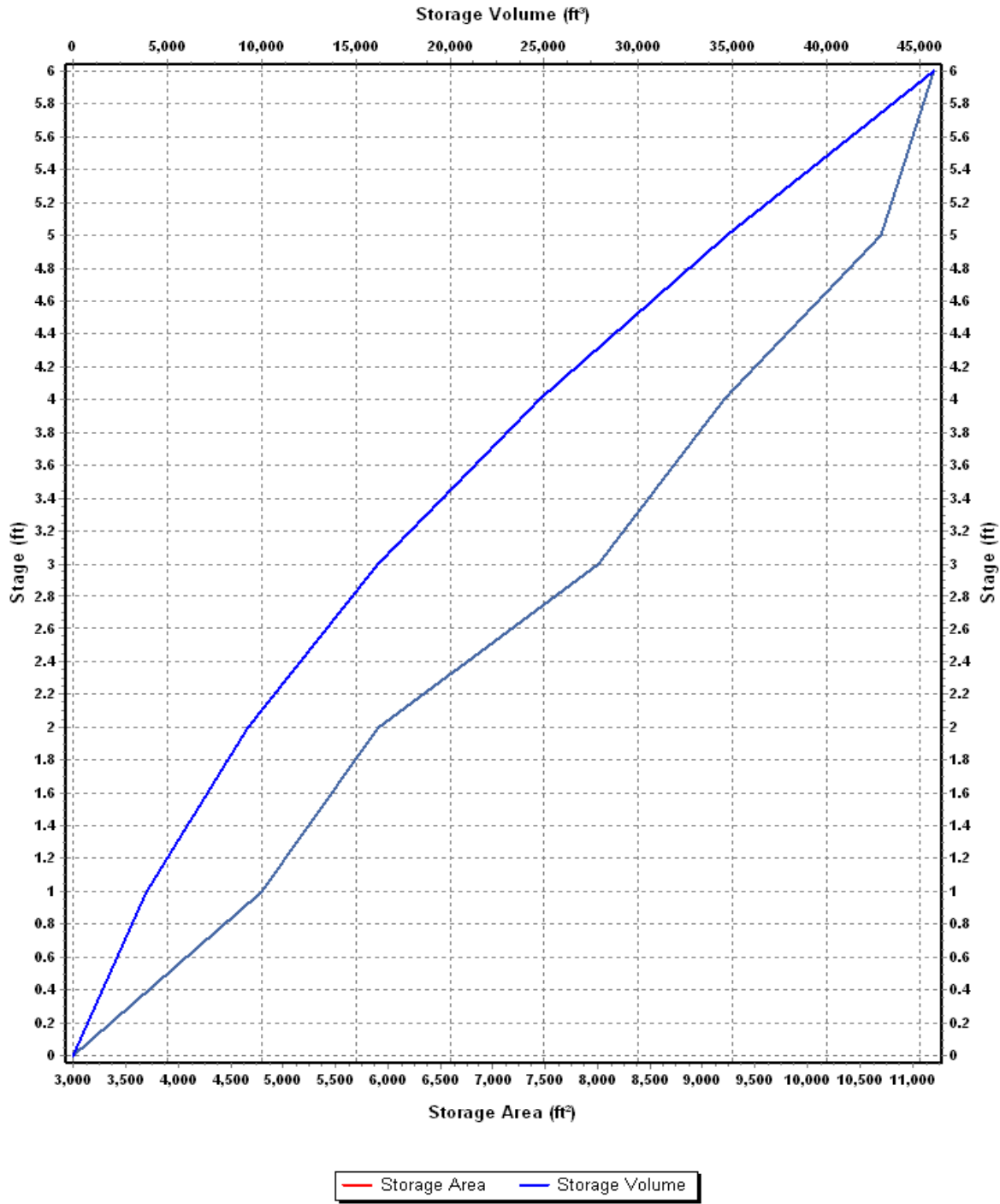
Invert Elevation (ft)	1208.00
Max (Rim) Elevation (ft)	1214.00
Max (Rim) Offset (ft)	6.00
Initial Water Elevation (ft)	1210.50
Initial Water Depth (ft)	2.50
Ponded Area (ft²)	0.00
Evaporation Loss	0.00

Storage Area Volume Curves

Storage Curve : ST-1E & 2E

Stage (ft)	Storage Area (ft²)	Storage Volume (ft³)
0	3000	0.000
1	4800	3900.00
2	5900	9250.00
3	8000	16200.00
4	9200	24800.00
5	10700	34750.00
6	11200	45700.00

Storage Area Volume Curves



Storage Node : ST-1E & 2E (continued)

Outflow Weirs

SN Element ID	Weir Type	Flap Gate	Crest Elevation (ft)	Crest Offset (ft)	Length (ft)	Weir Total Height (ft)	Discharge Coefficient
1 Weir-28	Trapezoidal	No	1213.00	5.00	25.00	1.00	3.33

Output Summary Results

Peak Inflow (cfs)	56.84
Peak Lateral Inflow (cfs)	56.84
Peak Outflow (cfs)	54.52
Peak Exfiltration Flow Rate (cfm)	0.00
Max HGL Elevation Attained (ft)	1213.71
Max HGL Depth Attained (ft)	5.71
Average HGL Elevation Attained (ft)	1210.93
Average HGL Depth Attained (ft)	2.93
Time of Max HGL Occurrence (days hh:mm)	0 12:03
Total Exfiltration Volume (1000-ft³)	0.000
Total Flooded Volume (ac-in)	0
Total Time Flooded (min)	0
Total Retention Time (sec)	0.00

ATTACHMENT 4

Lower Mill Ponds NPDES Report



October 26, 2012

Pennsylvania Department of Environmental Protection
Bureau of District Mining Operations
286 Industrial Park Road
Ebensburg, PA 15931-4119
Attention: Michael Timcik, P.G.
Hydrogeologist

Subject: NPDES Permit Renewal
SMP No. 6477SM5
Hamilton & Washington Townships
Adams and Franklin Counties

Dear Mr. Timcik:

On behalf of Specialty Granules Inc (SGI), URS is responding to the Pennsylvania Department of Environmental Protection, (PADEP) comment letter dated July 13, 2012 concerning the NPDES Permit Renewal for the above referenced subject. This letter provides URS' response to PADEP's July 13, 2012 comment letter. The attached NPDES Permit No. PA0009059 Application Final Addendum Report dated October 25 is considered comprehensive and complete to address all of PADEP's comments on this matter, including the original PADEP comment letter dated April 25, 2012. The attached report replaces URS' prior response submittal dated May 24, 2012, as some calculations and conclusions have been revised to reflect the entire scope of comments received from PADEP.

To assist in your review, PADEP comments from the July 13, 2012 comment letter are presented in bold *italic* type with URS corresponding responses in plain type text.

Section 2 – Project Description

- 1.) Please provide the flow rates of the discharges for the Lower Mill system, pond # 3. Presently you are showing the 8" CMP discharges. However, with the water surface elevation of 931.8 and the top of the riser to be 931.78 the 8" CMP should have a continuous discharge, but no flow rates were provided.***

There is no continuous discharge through the 8-inch CMP vertical riser. The 931.78 elevation represents the top of the intake riser for the primary discharge pipe, which is not perfectly horizontal. The water surface elevation is rounded to 931.80. Please refer to the NPDES Permit No. PA0009059 Application Addendum Report included with this submission.

- 2.) Please provide the flow rates from the seeps.***

URS Corporation
4507 North Front Street, Suite 200
Harrisburg, PA 17110
Phone 717-635-7901
Fax 717-635-7902

Seep flow rates have not been accurately measured, but will be monitored regularly (see Section 4 of attached report) once monitoring flumes are installed. Preliminary and initial field estimates of flow from these seeps during field observation in August 2012 ranged from approximately 2 to 10 gallons per minute depending on the location. We will provide measured flow rates once approval is received of the proposed seep monitoring plan.

Section 3 – Computations

- 1.) Please clarify how the Lower Mill Pond System qualifies for a dam permit waiver as provided for a Chapter 105, Section 12 – Waiver of Permit Requirements under Paragraph 6. Does the Lower Mill Pond System meet all the requirements of Chapter 102 as it relates to erosion and sediment control? Does the Lower Mill Pond System have a design emergency spillway that meets the Chapter 102 requirements? Do the ponds have dewatering pipes to lower the pond elevation to the sediment storage level to allow sufficient storage volume? If the ponds are always full at the elevations noted on the As-Built Plan for Sediment Ponds 2 and 3 – June 2011, then the ponds do not meet the required storage volume of 5,000 cubic feet per acre. Are the ponds certified by a professional engineer or registered land surveyor? Please provide this information to justify the Lower Mill Pond System meets all Chapter 102 requirements.***

The Lower Mill Pond System qualifies for a waiver under subsection “(6) A water obstruction or encroachment located in, along, across or projecting into a stormwater management facility or an erosion and sedimentation pollution control facility which meets the requirements in Chapter 102 (relating to erosion and sediment control), if the facility was constructed and continues to be maintained for the designated purpose.”

The existing three (3) pond system has been operating as a sediment control facility for over 30 years at the Charmian Facility. The system will be upgraded to meet the criteria as contained in the current Chapter 102 requirements for design and operation of a sediment control facility with the minor modifications summarized below. A more detailed description is contained in the NPDES Application Addendum Report attached hereto.

- Pond 2 will be improved to include a spillway that can convey the Chapter 102-required 391-cfs (2cfs x Inflow Drainage Area) with 2-ft of freeboard. The freeboard is measured from the provided discharge water surface elevation to the top of bank. Pond 3 will be improved to include installation of a 75-ft spillway at an elevation of 942. With the proposed modifications to Ponds 2 & 3, the required discharge capacity will be met and the existing embankments will not have to be raised. Please reference the Addendum Report included with this submission for the design calculations and details.
- The Ponds have more storage volume than 5,000 cf per acre. The maximum drainage area to Ponds 2 & 3 is 195.5-acres. The natural drainage area to Ponds 2 and 3 is 190.5-acres. The additional 5.0-acres are added to account for the pumping of Pitts Pond, Sediment Traps 6 and 7, and Pitts Quarry to Ponds 2 and 3. (The maximum combined pumping rate from Pitts Pond, Sediment Traps 6 and 7, and Pitts Quarry is 4,100-GPM. The total 4,100-GPM equates to 9.14-cfs. Using the Chapter 102 requirements for discharge capacity of 2-cfs per drainage acre, the additional 9.14-cfs equates to 5.0 additional acres.)

In accordance with the Chapter 102 sediment basin design requirements, a total settling storage volume of 5,000 cubic feet, (cf) per acre and sediment storage volume of 1,000 cf per disturbed acre need to be provided. Therefore for the 195.5 acre drainage area, 977,500-cf of settling volume and 195,500-cf of sediment storage volume must be provided. However, SGI has designed sediment storage volume at five times larger than the requirements of Chapter 102. Therefore, the minimum sediment storage volume multiplied by five is 977,500-cf. resulting in a total storage volume of **1,955,000-cf**. The three-pond system with proposed improvements provides a total storage volume of **1,985,175-cf** which meets and exceeds the Chapter 102 requirements. Please reference the Addendum Report included with this submission for the design calculations and details.

- Also, a dewatering device will be installed in Pond 2 capable of dewatering Pond 2 to the sediment storage elevation within 4 to 7 days after a rainfall event. Please reference the Addendum Report included with this submission for the design calculations and details.
- Pond 3 has not been used in calculations to meet the storage requirements of the Chapter 102 regulations since Pond 2 provides sufficient total storage volumes. Pond 3 will be used as a final treatment/"polishing" pond. Please reference the Addendum Report included with this submission for the design calculations and details.
- Upon construction of the proposed improvements, the "As-Built" Plans will be certified by a professional engineer or registered land surveyor and provided to PADEP.

Section 4 – Conclusions

- 1.) Until weirs are constructed downstream of Sediment Basin # 3 outfalls and dates and flow rates provided it is hard to determine the average monthly discharge rate required for the NPDES permit.***

SGI plans to construct measurement flumes at three locations downstream of Pond No. 3 to monitor flow discharges. Figure 3 in the attached report is a plan view and construction details of the proposed weir locations for review.

- 2.) Please clarify how SGI personnel will know what flow rate they will pump to the Lower Mill Pond System. Do you have a flow gauge on the pumps to determine the correct flow rates? Please provide the pump models, horsepower and pumping curves to show the correct flow rates at which these pumps will perform. Please show all pipeline losses and sizes for the flow designs.***

SGI has provided the most relevant of the requested pump data information in the attached design report, assuming pumps can operate at capacity to provide the maximum discharge rate for O.D. facilities proposed to be pumped to the Lower Mill pond system. Flow meters will be installed for each pumped discharge to measure and report actual pumped flow rates as required by the NPDES permit monitoring requirements.

We trust that these responses adequately address your comments.

If you have any questions concerning our responses, please let us know.



Sincerely,

URS Corporation

A handwritten signature in black ink, reading "Mark D. Pennell".

Mark D. Pennell

Vice President, Office Manager

NPDES PERMIT NO. PA0009059 APPLICATION FINAL ADDENDUM REPORT

**Charmian Facility
Hamiltonban Township,
Adams County, Pennsylvania**

Prepared for:

SPECIALTY GRANULES INC.

13424 Pennsylvania Avenue
Suite 303
Hagerstown, MD 21742



Prepared by:

URS

4507 North Front Street
Suite 200
Harrisburg, Pennsylvania 17110

URS Project No. 20498083

October 26, 2012

Mark D. Pennell, Vice President

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1.1 BACKGROUND AND EXISTING CONDITIONS

Specialty Granules Inc. (SGI) (formerly ISP Minerals Inc.) operates a non-coal surface mine to obtain metabasalt for manufacturing roofing granules at its Charmian Facility located in Hamiltonban Township, Adams County (Figure 1). The Charmian operation is located here due to the unique underlying bedrock geology that occurs in a regionally narrow southwest to northeast band in this area.

Surface water runoff from the site is controlled through a series of stormwater and sedimentation management features including drainage swales and pipeline conveyance systems that pass through multiple sedimentation pond/clarifier systems. The site discharge is permitted with three outfalls under the National Pollutant Discharge Elimination System (NPDES) as part of the quarry's Noncoal Surface Mining Permits, Pennsylvania Department of Environmental Protection (PADEP) Permit Surface Mining Permit No. 01930302 (Pitts Quarry) and 6477SM5 (West Ridge Quarry).

Two NPDES permitted outfalls (Outfall 001 and 002 at Pitts Pond) discharge under NPDES Permit No. PA0223239 to an unnamed tributary to Toms Creek in the northern portion of the property. The third permitted outfall (Outfall 001 at the Lower Mill three-pond system) discharges under NPDES Permit No. PA0009059 (presented in Appendix A) to Miney Branch, which is subsequently a tributary to Toms Creek approximately 4.5-miles east/southeast of the facility.

The major natural drainage areas included in each NPDES permit are identified on Figure 2 as "Lower Mill Natural Drainage Area" and "Drainage Area to Pitts Pond". These major drainage areas include sub-drainage areas, identified and comprising the identified drainage areas, in acres, as follows. Figure 2 shows the natural drainage area boundaries for each sub-drainage area within the limits of the mining and NPDES permits. Each sub-drainage area is currently routed to the outfalls for each respective NPDES permit as described below. It is important to note that although the natural drainage area to Pitts Quarry is in the Pitts Pond natural drainage, stormwater captured in Pitts Quarry and Pitts Pond has always been permitted to be pumped to the Lower Mill three-pond system as an "Other Drainage (O.D.) facility:

- A. Drainage to Lower Mill three-pond system (NPDES PA0009059) = 190.5 acres + pumped discharge from Pitts Quarry O.D.
 - 1. Lower Mill Natural Drainage Area = 190.5 acres
 - 2. Pitts Quarry = 70.2 acres (OD discharge limited by pump and conveyance line capacities)
- B. Proposed Pumped Drainage Areas to Lower Mill System = 106.5 acres
 - 1. Pitts Pond = 38.0 acres
 - 2. Advance Area = 47.6 acres
 - 3. Sediment Trap 6 & 7 = 20.9 acres
- C. West Flank Permit Application under Development = 25.7 acres, (maximum)

The runoff from the Lower Mill area (190.5 acres) is managed through a three-pond system which is permitted under Chapter 102 as a permanent Erosion and Sediment Pollution Control

Facility. SGI regularly withdraws water from Pond 3 of the three-pond system for use in their production process. Currently, runoff from Pitts Quarry (70.2 acres) is managed through an Erosion and Sediment Pollution Control Facility and is periodically pumped as necessary to the Lower Mill three-pond system as provided in the current NPDES permit. Runoff from Pitts Pond (38.0 acres) and the Advance Area (47.6 acres) is collected at the permanent Pitts Pond and periodically pumped to the Lower Mill three-pond system as necessary to limit discharge to the un-named tributary to Toms Creek. Runoff from Sediment Traps 6 and 7 (20.9 acres) will be directly pumped to the Lower Mill three-pond system.

Currently, approximately half of the drainage area referred to as West Flank (25.7 acres) is not part of the stormwater management system in the Pitts Pond drainage area, but is being considered for future development and will be incorporated into that stormwater management system, which will ultimately be pumped to the Lower Mill three-pond system.

1.2 NPDES PERMIT RENEWAL AND COMMUNICATIONS WITH PADEP

In August 2011, SGI submitted an application for renewal of its NPDES permit No. PA0009059 to PADEP. On September 8, 2011, SGI received a letter response from PADEP stating that at certain times of the year the discharge water flow rate at the Lower Mill three-pond system is exceeding the maximum monthly average discharge flow rate under the permit. This conclusion was based upon the monthly reports submitted by SGI based upon instantaneous flow measurement results. The September response from PADEP requested that SGI submit a request to revise the current permit to account for higher potential discharge flow rates. For clarification, the referenced discharge rate of 0.1 MGD only applies to pumped discharges from “other discharges” (proposed pumping from drainage areas “B” and “C”) it is not a total cap on the site discharge water flow rate.

The PADEP response also requested that SGI provide a thorough evaluation of the design for the current system in order to establish that it is capable of handling higher discharge flow rates while at the same time consistently maintaining water quality that is compliant with the permitted effluent limits. A copy of the September 8, 2011 PADEP letter to SGI is provided in Appendix A.

SGI and URS met with PADEP on September 27, 2011 to determine the necessary considerations to be included in this submittal to support an increase in the permitted other discharge flow rate. It was also requested by PADEP that SGI include additional information to confirm that sufficient capacity exists in the Lower Mill three-pond system to effectively handle additional stormwater to be pumped to the Lower Mill system from adjacent permitted area SMP No. 01930302 (“Pitts Drainage”) from the Pitts Pond and Pitts Quarry. SGI historically pumps stormwater from the active Pitts Quarry and Pitts Pond to the Lower Mill system, and is proposing to continue to periodically pump additional stormwater from Sediment Traps 6 and 7 to the Lower Mill system.

It is important to note that a review of reported water quality indicates that historically water quality discharge limits as specified in the existing NPDES have not been exceeded.

In response to the PADEP comment letter dated September 8, 2011, URS prepared a response, including supporting calculations and design report that was submitted on January 5, 2012 to PADEP to address the September 8, 2011 comments.

PADEP issued a follow-up comment letter dated April 25, 2012 that is also included in Appendix A that requested further clarification regarding the Lower Mill ponds. The response included in this report and accompanying response letter addresses all PADEP comments and is considered a complete and stand-alone response to address all PADEP comments from both of their comment letters. As such, the previous report submitted January 5, 2012 is superseded by this submittal.

1.3 PURPOSE OF THIS REPORT

This addendum report addresses a required revision to the pumped discharge limit from OD to Outfall 001 of NPDES Permit No. PA0009059, verifies sufficient storage capacity for sediment and stormwater to support the proposed change to the OD discharge limit, demonstrates compliance of the system with Chapter 102 requirements (based upon minor improvements recommended in this report), and provides additional and improved monitoring.

Currently the NPDES permit has a monthly average discharge rate of 0.1 million gallons per day (MGD) that applies to pumped discharge “other discharges (OD)”. The current discharge rate was established in 1981 and, as site development and operations have evolved since that time, this addendum report addresses a necessary change to the limit for potential pump discharge from “OD” at the facility.

Currently, the existing NPDES permit includes monthly monitoring of water quality of water discharged from outfall 001, which is comprised of two 8-inch diameter discharge pipes (referred to as eastern and western discharge pipes) as originally designed and approved under the permit. Water quality limits in the NPDES permit include; maximum concentration of total suspended solids (TSS) not to exceed 35 mg/l as the average during the month, 70 mg/l as the maximum daily average, 90 mg/l as the maximum instantaneous concentration, and pH in the range of 6.0 to 9.0 standard units (s.u.) at all times.

During discharges due to precipitation events up to the expected 10-year, 24-hour precipitation (4.80-inches), the discharge limit at outfall 001 is 0.5 ml/l for total settleable solids. SGI is not requesting any modifications to these monitoring requirements.

SGI also historically reports discharge rates from Outfall 001 based upon grab samples and has recently installed a continuous recording flow meter at the western discharge pipe, and is in the process of adding the same discharge measurement capability at the eastern discharge pipe that comprise total discharge for outfall 001. The current NPDES discharge rate limit of 0.1 MGD applies to only the pumped discharge from OD facilities. There is no discharge rate limit for Outfall 001 in the current NPDES Permit. In addition, SGI is adding three monitoring flumes (F-1, F-2, and F-3) to monitor discharge from the gravel drainage layer underlying the embankment of Pond 3. With the additional flow meters and monitoring flumes, SGI will be able to monitor all discharge from Pond 3.

SGI, through this permit renewal is requesting to update the pumped discharge rate from “OD”, and to improve NPDES monitoring and reporting.

The analysis contained in this addendum report considered the ability of the existing three pond system to effectively manage higher discharge flow rates, while maintaining existing permit discharge limits for water quality. As specified in the current NPDES permit, the pumped discharge rate from “OD” to the Lower Mill Erosion and Sediment Pollution Control Facility is permitted for an average monthly discharge flow rate of 0.1 MGD. This flow rate requires modification to reflect the actual maximum pumping rates of 5.9 MGD to be included in this NPDES renewal.

The two key components presented in this report to respond to PADEP comments and support the requested NPDES revisions are:

- a.) Performance of Lower Mill Erosion and Sediment Pollution Control Facility including the proposed pumped discharge under PADEP Chapter 102 regulations.
- b.) Subsequent system improvements and monitoring to support the changes under the NPDES Permit.

2.1 EXISTING CONDITIONS

Site runoff from the Lower Mill drainage area consists mainly of sheet flow that is collected in a series of channels, sediment traps and pipeline systems throughout the drainage area. The drainage area is a combination of quarry, wooded areas, brush, and some limited impervious areas that ultimately enters an existing interconnected three-pond sedimentation system through existing 48-inch and 36-inch diameter reinforced concrete pipelines (RCPs). The influent stormwater contains generally fine-grained sediment including some colloidal size crushed rock and other natural materials in suspension.

The Lower Mill three-pond system is designed to retain heavier, coarse-grained solids in Pond 1. In order to improve settlement of the suspended materials, coagulants and flocculants are added within a conveyance channel between Ponds 1 and 2 to the influent flow into Pond No. 2. Nalco 7192 is the primary flocculant that is used in tandem with coagulant, Nalco 8157. These amendments are applied at target rates of 7 parts per million (ppm) and 15 ppm, respectively. The application rates are adjusted by SGI personnel in order to improve performance based upon field testing and visual observation for floating solids or visible foam in other than trace amounts. Information from the manufacturer regarding these additions is provided in Appendix B.

Stormwater is then discharged from Pond 2 to Pond 3, currently via four 8-inch riser pipes, for the final solids settling stage. Discharge from Pond 3 is a passive controlled discharge through two 8-inch outfall pipes (Outfall 001) to Miney Branch.

The current NPDES permit requires the discharge from Outfall 001 to be no greater than 35 mg/L for TSS as an average monthly concentration, 70 mg/L maximum daily concentration, 90 mg/L instantaneous maximum concentration, and a pH in the 6 to 9 standard unit (s.u.) range at all times.

For discharges of surface runoff not subject to mechanical control that are a result of a precipitation event that occur within 24 hours of said precipitation event up to the 10-yr, 24-hour storm, the discharge limit is a maximum of 0.5 ml/l total settleable solids. For storm events exceeding the 10-year 24-hour storm, there are no discharge limits. A copy of the existing NPDES permit is included in Appendix A.

2.2 PROPOSED IMPROVEMENTS UNDER CHAPTER 102

SGI is planning to upgrade the existing Ponds 2 and 3 spillways to provide required storage volumes and emergency spillway requirements to meet the 2-cfs/acres discharge requirement under Chapter 102. Pond 2 will be improved to include a spillway that can convey 391-cfs (2cfs x Inflow Drainage Area) with 2-ft of freeboard. The freeboard is measured from the provided discharge water surface elevation to the top of bank. Pond 3 will be improved to include installation of a 75-ft spillway at an elevation of 942 ft amsl. With the proposed modifications to Ponds 2 and 3, the required discharge capacity will be met and the existing embankments will not have to be raised. Also, a dewatering device will be installed in Pond 2 capable of dewatering Pond 2 to the sediment storage elevation within 4 to 7 days after a rainfall event.

The following sections of this application addendum provide data and supporting calculations to confirm the stormwater discharge quantities managed by SGI at the facility, evaluate the capacity of the existing stormwater management system, and analyze the ability to manage stormwater through the existing three-pond Lower Mill system under the existing water quality discharge limits.

The evaluation presented in the next several sections of this report demonstrate that sufficient capacity is available within the Lower Mill three-pond system following modification of the spillway to meet the requirements of PADEP Chapter 102, to effectively manage stormwater from both the Lower Mill and Pitts drainage areas based upon the revised pumped discharge limits.

There is no proposed change to the current water quality limits in the existing NPDES permit. Included, however, is a proposed plan to improve monitoring and reporting related to discharges from the three-pond Lower Mill outfall and the drainage blanket that underlies a portion of the embankment at Pond 3. The average discharge rate from “O.D.” facilities is proposed to be modified to meet current and future operational needs. A discussion of the proposed discharge rate of 5.9-MGD is described in Section 3.3.

3.1 DRAINAGE AREAS

URS determined the existing tributary drainage area to the Lower Mill three-pond system and the drainage area from the adjacent NPDES Permit No. PA0223239 Pitts drainage area. The calculated drainage areas are previously summarized in Section 1, and the calculations are provided in Appendix C. The drainage from the Pitts drainage area collected in the Pitts Pond or Pitts Quarry will continue to be pumped into the Lower Mill Pond collection/conveyance system so there is very limited discharge of stormwater directly to Toms Creek. Mapping from an aerial survey conducted in 2011 was used to delineate each sub-drainage area and the total drainage area as shown on Figure 2.

Runoff calculations were performed utilizing the National Resources Conservation Service (NRCS), TR-55 methods in accordance with Hamiltonban Township, Section 1003, Standards for Storm Water Management. Calculations were then completed using HydroCAD software for the 10-year 24-hour storm event for the Natural Drainage, Pitts Drainage, and the Lower Mill Drainage areas. A time of concentration was calculated from the most remote point in the watershed to the influent to Pond No. 1. Runoff Curve Numbers (CN) were obtained from Technical Release (TR55) based upon surface conditions. A composite "CN" was calculated for use in determining the total runoff depth quantity. Copies of the drainage area, stormwater runoff, composite CN, and time of concentration calculations are included in Appendix C.

3.2 STORMWATER DISCHARGE

The design basis for the discharge evaluation is based upon calculation of the depth of runoff that can be expected to occur for a 10-year, 24-hour storm within the drainage basin. From the Hamiltonban Township, Stormwater Management Ordinance, a 10-year, 24-hour storm event produces 4.8 inches of runoff.

The 10-year, 24-hour storm discharge rate for the Natural Drainage Area (190.5-acres) is 776.08-cfs. The maximum discharge rate associated with the maximum pumped discharge from the Pitts Area is 9.14-cfs (4,100-GPM). Therefore, the total inflow to Ponds 2 and 3 is 785.22-cfs.

The existing conditions 10-year, 24-hour storm discharge rate from Pond 3 is 16.74-cfs at an elevation of 942.62. The proposed conditions 10-year, 24-hour storm discharge rate from Pond 3 following the modifications proposed in this letter is 29.94-cfs at an elevation of 942.62.

For conservative design criteria the calculations are based upon the Lower Mill Pond capacity discussed in Section 3.4, it is proposed that the Pitts drainage area will be pumped to the Lower Mill Pond system as described in Section 3.3 so that all site drainage is discharged through Outfall 001 of NPDES Permit No. PA0009059, and meets all Chapter 102 requirements. Under certain conditions, SGI will continue to discharge under the requirements of NPDES Permit PA 0223239.

3.3 PUMPED DISCHARGE

The drainage from the Pitts drainage area currently is collected either in the active Pitts Quarry, drainage to Pitts Pond, and drainage to Sediment Traps 6 and 7. The portion of the stormwater collected in the Pitts Quarry, Pitts Pond, and Sediment Traps 6 and 7 is then pumped to the Lower Mill Pond System. It is proposed that as necessary all drainage from the Pitts Drainage area will be pumped to the Lower Mill Pond System and discharged through Outfall 001 in

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accordance with the revised discharge limit for O.D. facilities. Pumping from the adjacent Pitts Quarry and Pitts Pond will be performed when necessary by SGI personnel as summarized below:

3.3.1 Pitts Pond

The Pitts Pond pumping system consists of a new electric pump system comprised of two pumps rated at 800-GPM each with a dedicated 12-inch diameter discharge line, and an existing electric/genset pump system comprised of one pump rated at 500-GPM with a dedicated 6-inch diameter discharge line.

The planned normal operation for pumping discharge from Pitts Pond to the Lower Mill system is to use the two new electric pumps at a maximum discharge rate of 1,600-GPM. The existing electric/genset pump system will remain in-place and will be used as a back-up so that both pumping systems could be operated in tandem for total maximum discharge capacity of 2,100-GPM from Pitts Pond, if needed. The hydrologic model was developed using 2,100-GPM for the Pitts Pond pumping rate.

3.3.2 Pitts Quarry Sump

The Pitts Quarry pumping system consists of a new electric pump system comprised of two pumps rated at 500-GPM, each with a dedicated 12-inch diameter discharge line, and an existing portable diesel backup pump rated at 950-GPM. The diesel pump is for backup only and will not be operated simultaneously.

The planned normal operation for pumping discharge from Pitts Quarry to the Lower Mill system will be to use the two new electric pumps at a maximum discharge rate of 1,000-GPM. The hydrologic model was developed using 1,000-GPM for the Pitts Quarry pumping rate.

3.3.3 Sediment Traps 6 and 7

Traps 6 and 7 will utilize a pump system rated for 1,000-GPM. The pump system will convey the discharge indirectly through existing drainage channels to Ponds 2 and 3. The hydrologic model included 1,000-GPM pumping capacity indirectly through existing drainage channels from Sediment Traps 6 and 7 to the Lower Mill.

3.3.4 Summary of Pumped Discharge

The planned normal operation of the three combined pumping systems provides a total pumping capacity of 4,100-GPM (9.14-cfs). This pumping rate of 4,100-GPM (5.9 MGD) from O.D. facilities represents the requested revision to the daily average discharge rate from O.D. facilities in the NPDES Permit. The hydrologic model was developed assuming that pumping from these three areas to the Lower Mill system will occur continuously even during the peak discharge from the Lower Mill drainage area.

The next section of this document discusses the storage and discharge capacities of the Lower Mill system.

3.4 LOWER MILL POND SYSTEM CAPACITY

The capacity of existing Ponds 2 and 3 was determined based upon a survey of the ponds completed in September 2011 by Brindle Associates, Inc. Calculations to determine the existing basin volumes are included in Appendix C. In order to model and evaluate the system capacity, the 10-year, 24-hour storm event was routed into the existing ponds with the proposed

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modifications presented below using HydroCAD software. Copies of the pond routing are included in Appendix C.

The volume calculations for sizing of sediment basins were completed in accordance with the PADEP criteria for sediment basin design as provided in the draft “Erosion and Sediment Control BMP Manual”, Technical Guidance No. 363-2134-008, 2010. Specifically, sediment basins are required to be sized for a dewatering zone of 5,000 cubic feet, (c.f.) for each acre tributary to the basin. An additional sediment storage zone of 1,000 c.f. per disturbed acre tributary to the basin is required. Pond 1 provides primary settling and as such, the stormwater storage capacity is limited and fluctuates depending upon the amount of sediment captured. Conservatively, with regard to stormwater retention, URS eliminated Pond 1 from its evaluation of the stormwater storage calculations under the 10-year, 24-hour storm event.

The existing three (3) pond system has been operating as a sediment control facility for over 30-years at the Charmian Facility. The three (3) pond system will meet the current requirements of the PADEP Chapter 102 with the minor modifications to Ponds 2 and 3 presented below, consisting of spillway upgrades and installation of a dewatering device in Pond 2. The following is an outlined summary of the proposed modifications to Ponds 2 and 3, PADEP Chapter 102 requirements, and PADEP Chapter 102 capacities. Figures 3 and 4 illustrate the existing and proposed conditions.

3.4.1 Proposed Modifications to Ponds 2 and 3

Pond 2 modifications include the following:

- Installation of 25-ft, 80-ft, and 50-ft spillways at an elevation of 942.50 (Top of Bank is 946.00) in the embankment between Ponds 2 and 3.
- Maintain the existing location and elevations of the existing two (2) 18-inch CMP culverts.
- Install Perforated Risers on the existing four (4) 8-inch CMP culverts to provide 4 to 7 day dewatering time.
- Restore any low points within the embankment to maintain a minimum elevation of 946.00. The design height of the embankment between Ponds 2 and 3 is not being modified.

Pond 3 modifications include the following:

- Installation of a 75-ft spillway at an elevation of 942.50 (Top of Bank is 946.00) in the southwest corner of the embankment associated with Pond 3.
- Maintain the existing location and elevations of the two (2) 8-inch CMP culverts and two (2) 18-inch CMP Culverts.
- Restore any low points within the embankment to maintain a minimum elevation of 946.00. The design height of the embankment for Pond 3 is not being modified.

3.4.2 PADEP Chapter 102 Requirements

The following provides a summary of the Chapter 102 requirements, calculations, and results (in bold type) of the modeling completed with the proposed modifications and change to pumped discharge rates from OD facilities.

The equation for determining the total required storage volume under PA Chapter 102 is:

$$\text{Total Required Storage Volume (C.)} = \text{Settling Volume (A.)} + \text{5-year Sediment Volume (B.)}$$

The calculations for the requirements and capacities for each component of the equation follow:

A. Settling Volume = 977,500-cf (summarized below)

- Natural Drainage Area = 190.5-acres
- Pumped Discharge = 9.14-cfs (4,100-GPM) (Equates to 5.0-acres using Chapter 102: 2cfs/acre)
 - 2,100-GPM Pump Rate from Pitts Pond
 - 1,000-GPM Pump Rate from Pitts Quarry
 - 1,000-GPM Pump Rate from Ponds 6 & 7
- Revised Total Drainage Area to include pumped discharge = 195.5-acres
- Settling Volume = 5,000-cf per Drainage Acre
 - $(195.5\text{-acres} * 5,000\text{-cf}) = 977,500\text{-cf}$

The total settling volume provided in Pond 2 (from model) with modifications equals 985,175-cf, and is greater than the Chapter 102-required settling volume of 977, 500-cf.

B. Total 5-year Sediment Storage Volume = 977,500-cf

- Sediment Volume = 1,000-cf per Drainage Acre
 - $(195.5\text{-acres} * 1,000\text{-cf}) = 195,500\text{-cf}$
- 5-year Volume = $(5 * 195,500\text{-cf}) = 977,500\text{-cf}$
- Assuming 100% disturbed (conservative)

The total 5-year sediment storage volume provided in Pond 2 (from model) with modifications equals 1,000,000-cf, which is greater than the Chapter 102-required 5-year sediment storage volume of 977, 500-cf.

C. Total Required Storage Volume = 1,955,500-cf

The total storage volume provided in Pond 2 (from model) with modifications equals 1,985,175-cf, which is greater than the Chapter 102-required total storage volume of 1,955,500-cf.

Finally, the following summarizes the revised discharge capacity of the revised spillways based upon the proposed modifications.

D. Total Discharge Capacity = 391-cfs

Total Discharge Capacity = 2-cfs per Drainage Acre

- $(2\text{-cfs} * 195.5\text{-acres}) = 391\text{-cfs}$

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- Minimum 24-inches of Freeboard between Top of Bank and 2-cfs/acre Discharge W.S.E.

The discharge capacity provided with the emergency spillway modifications equals 775.73-cfs, which is greater than the Chapter 102-required discharge capacity of 391-cfs.

3.4.3 Calculated Capacities Compared to Chapter 102 Requirements

The following summary of the modeled results demonstrates that Proposed Pond 2 (not including Pond 3) meets PADEP Chapter 102 Requirements for total storage (sediment and settling) and discharge capacity:

- Sediment Storage Elevation = 932.50 (surveyed)
 - Lowest surveyed 8-inch CMP Culvert w/Perforated Riser @ 932.50
 - Pond 2 Elevation 932.50 **Provides 1,000,000-cf > 977,500-cf; OK**
- Total Storage Elevation = 941.47 (surveyed)
 - Lowest surveyed 18-inch CMP Culvert @ 941.47
 - Pond 2 Elevation 941.47 **Provides 1,985,175-cf > 1,955,000-cf; OK**
 - Pond 2 Elevation 941.47 **Provides 14,849,109-gallons > 14,623,400-gallons; OK**
- Total Discharge Capacity = 775.73-cfs
 - At Elevation 944.00 (2-ft Below Top of Bank) the proposed 25-ft, 80-ft, and 50-ft spillways and (2) 18-inch CMP Culverts **can convey 775.73-cfs > 391-cfs; OK**

The table below depicts the existing and proposed peak water-surface elevations (W.S.E.) for a 10-year 24-hour storm event in Ponds 2 and 3:

Pond	Existing 10-yr W.S.E (ft @ msl)	Proposed 10-yr W.S.E (ft @ msl)	Embankment Elevation (ft @ msl)	Spillway Invert Elevation (ft @ msl)
2	945.98	943.77	946.00	942.50
3	942.62	942.62	946.00	942.50

Note: 24-inches of freeboard is required for the peak water-surface elevation associated with the 10-year storm event. Therefore, the peak W.S.E. must be at or below an elevation of 944.00

The supporting calculations associated with the requirements of PADEP Chapter 102 and pond models are provided in Appendix C. Figures 3 and 4 depict the proposed improvements associated with Ponds 2 and 3. Tables 1 and 2 on Figure 4 depict the PADEP Chapter 102 requirements and peak water surface elevations for various design storms.

The routing indicates that the three-pond system can safely pass a 10-year (4.8 inches), 24-hour storm event for the Lower Mill and the Pitts drainage areas without overtopping the pond embankment and the increased discharge capacity provides necessary freeboard to meet Chapter 102 requirements.

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The results of this evaluation indicate that with the proposed modifications, Ponds 2 and 3 meet all Chapter 102 requirements and that the discharge rate for pumped discharged from O.D. facilities from Pitts Quarry, Pitts Pond, and Sediment Traps 6 and 7 to the Lower Mill Pond system can be increased to 5.9 MGD from its current 0.10 MGD permit value and comply with the Chapter 102 requirements as currently required by the NPDES permit.

4.1 EXISTING NPDES MONITORING

Currently, the existing NPDES permit includes monthly monitoring of water quality of water discharged from outfall 001, which is comprised of two 8-inch diameter discharge pipes (referred to as eastern and western discharge pipes) as originally designed and approved under the permit. Water quality limits in the NPDES permit include; maximum concentration of total suspended solids (TSS) not to exceed 35 mg/l as the average during the month, 70 mg/l as the maximum daily average, 90 mg/l as the maximum instantaneous concentration, and pH in the range of 6.0 to 9.0 standard units (s.u.) at all times.

During discharges due to precipitation events up to the expected 10-year, 24-hour precipitation (4.80-inches), the discharge limit at outfall 001 is 0.5 ml/l for total settleable solids. SGI is not requesting any modifications to these monitoring requirements.

SGI also historically reports discharge rates from Outfall 001 based upon grab samples and has recently installed a continuous recording flow meter at the western discharge pipe, and is in the process of adding the same discharge measurement capability at the eastern discharge pipe that comprise total discharge for outfall 001. For discharges of surface runoff not subject to mechanical control that are a result of a precipitation event that occur within 24 hours of said precipitation event there is no discharge rate limit for outfall 001 in the current NPDES Permit. By adding the additional flow meters and monitoring flumes, SGI will be able to monitor all discharge from Pond 3.

4.2 PROPOSED NPDES MONITORING

As part of the Lower Mill pond embankment improvements made in 1981, a gravel drainage layer was installed at the base of the embankment for Pond 3 to allow for seepage to alleviate potential buildup of pore pressure in the embankment. This is a standard design practice for this type of feature (see URS' letter to PADEP dated September 26, 2012 in Appendix A).

SGI proposes to install three flumes, the locations of which are shown on Figure 4. The monitoring flumes (F-1 through F-3) will be constructed as shown on Figure 5, and will be sized according to maximum expected flow. These locations were chosen based upon observed discharge from the drainage layer through multiple site inspections conducted between July 2012 and October 2012 representing variable runoff conditions. Flume locations F-1 through F-3 will effectively measure the discharge from this drainage layer. Discharge will be measured daily and tracked for trends over time as a measure of determining the effectiveness of the drainage layer.

In addition, SGI proposes additional flow monitoring to measure the pump discharge from O.D. facilities by installing flow meters on each separate pumped discharge prior to its discharge to the Lower Mill Ponds. These flow measurements will be made for each month and the total discharge will be divided by the number of days in the month to provide a daily flow rate for comparison to the revised limit of 5.9-MGD.

Based upon the modeling and proposed modifications for the contributing Lower Mill and Pitts drainage areas, there is sufficient storage volume to ensure that the Lower Mill Pond System meets Chapter 102 requirements.

Worst case modeling of the 10-year, 24-hour storm also indicates that the Lower Mill system has sufficient capacity to manage stormwater effectively under the 10-year, 24-hour scenario, where

drainage from the Pitts drainage is pumped at the maximum pumping rate of 4,100-GPM continuously before, during, and after the peak of the storm from the Lower Mill drainage, without any risk of overtopping the Pond 2 or Pond 3 embankments. Based upon that model, there is also significant additional storage capacity at the modeled rates.

Typically, SGI personnel will initiate pumping up to the maximum normal pumping rate of 4,100-GPM. Once pumping is initiated by SGI personnel, SGI will closely monitor the levels in the three-pond system and adjust pumping rates as necessary to ensure the pond is not overtopped. In order to comply with the water quality discharge requirements, SGI will monitor, sample and field test the discharge to ensure that proper detention time for chemical amendments is being achieved and water quality limitations are in compliance with the NPDES permit. SGI will adjust pumping and/or chemical feed rates as necessary for compliance with the NPDES permit.

In accordance with the NPDES Permit, any discharges from a precipitation event exceeding the 10-year, 24-hour event shall not be subject to the discharge limitations, and calculation of the monthly total will not include discharges during storm events greater than the 10-year, 24-hour precipitation.

SGI therefore requests the NPDES permit be corrected to reflect an average daily pumped discharge rate of 5,900,000 gallons per day (5.9-MGD) from the O.D. facilities at the Charmian operation. Revision of this discharge rate does not adversely affect the performance of the Lower Mill three pond system provided the proposed modifications are completed, and meets all requirements of Chapter 102.

Hamiltonban Township, Adams County, PA. Stormwater Management Ordinance

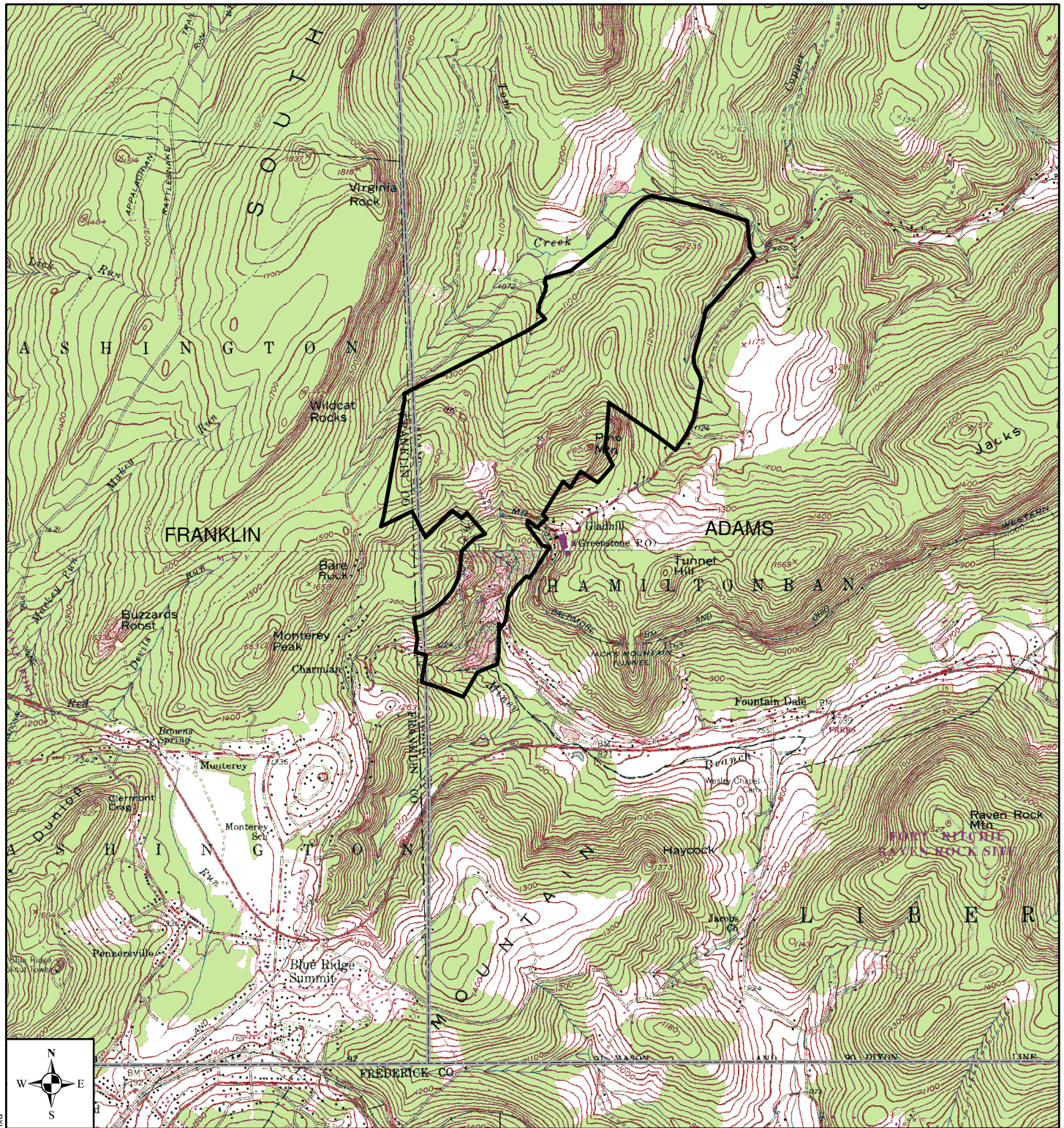
Pennsylvania Department of Transportation, PennDOT Drainage Manual, Publication 584, 2010 Edition.

Urban Hydrology for Small Watersheds, Technical Release 55

HydroCAD Software

Dames and Moore- Appendix D Hydrologic and Hydraulic Analyses (1981)

Figures



0 3,000 6,000 9,000 Feet

 Existing SGI Property

REFERENCE:

BASEMAP OF USGS 7.5 MINUTE TOPOGRAPHIC MAPS; BLUE RIDGE SUMMIT QUADRANGLE, PENNSYLVANIA-MARYLAND 1953, PHOTOREVISED 1985; AND IRON SPRINGS QUADRANGLE, PENNSYLVANIA 1953, PHOTOREVISED 1968 AND 1973, PHOTOINSPECTED 1984

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

TITLE

PROJECT LOCATION MAP

PROJECT

**SPECIALTY GRANULES INC.
BLUE RIDGE SUMMIT, PA
ADAMS COUNTY, PENNSYLVANIA**



4507 NORTH FRONT STREET, SUITE 200
HARRISBURG, PENNSYLVANIA 17110
TEL (717) 635-7901 FAX (717) 635-7902
www.urscorp.com

SCALE

1" = 3000'

DATE

10/24/12

DWN. BY

BAS

APPR. BY

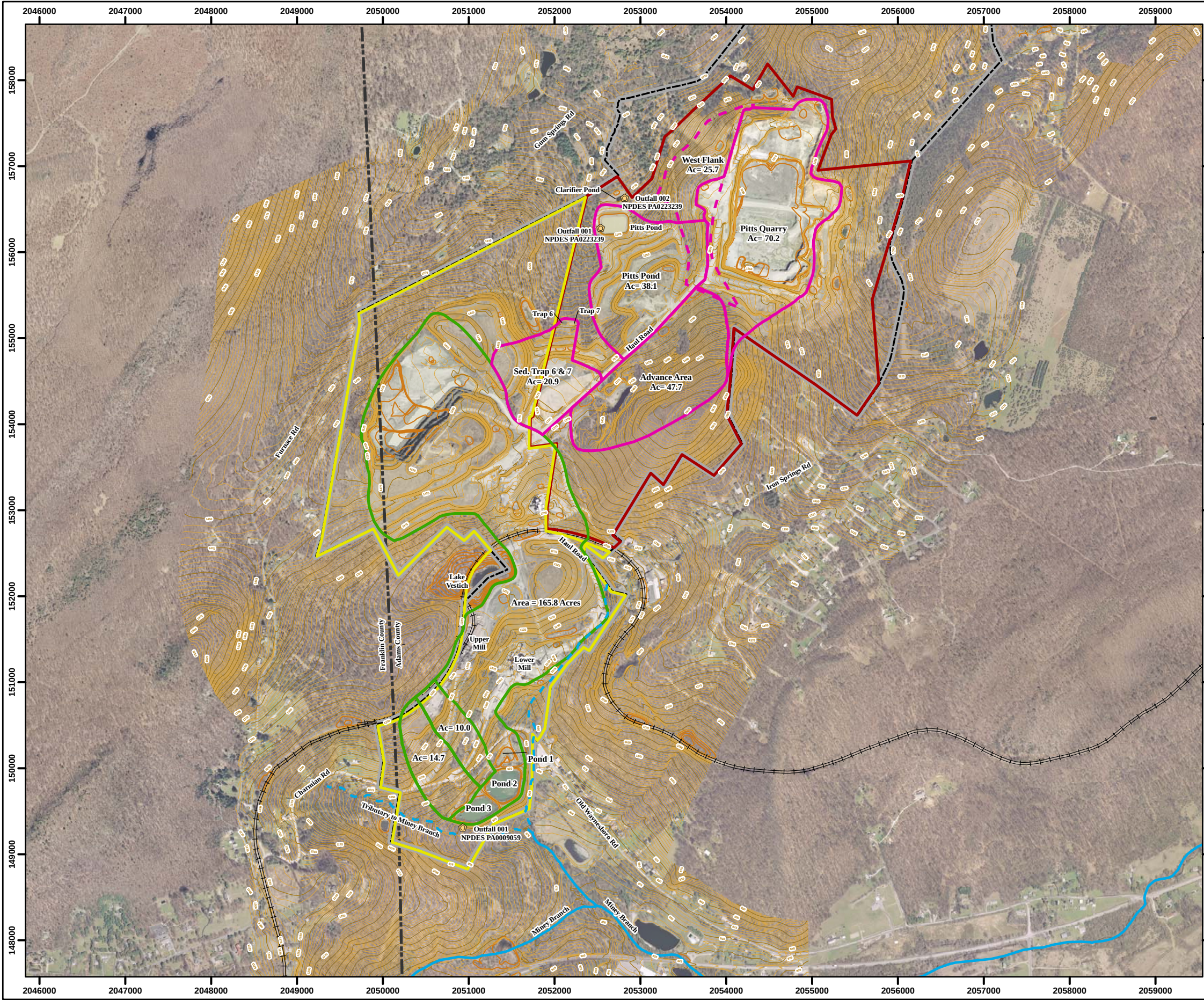
MDP

JOB NO.

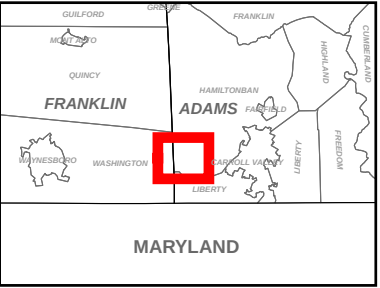
20498083

FIG NO.

1



- Legend**
- SGI Property Line
 - Drainage Area to Pitts Pond and Pitts Quarry
 - Lower Mill Pond Natural Drainage Area
 - Existing SMP Boundary (1930302); NPDES Permit No. PA0223239
 - Existing SMP Boundary (6477SM5); NPDES Permit No. PA0009059
 - Franklin/Adams County Line
 - Tributary to Miney Branch
 - Miney Branch
 - West Flank Proposed Expansion



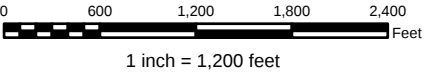
Key Map
Not to Scale



NAD_1983_StatePlane_Pennsylvania_South_FIPS_3702_Feet
Projection: Lambert_Conformal_Conic
False_Easting: 1968500.000000
False_Northing: 0.000000
Central_Meridian: -77.750000
Standard_Parallel_1: 39.933333
Standard_Parallel_2: 40.966667
Latitude_Of_Origin: 39.333333
Linear Unit: Foot_US

GCS_North_American_1983
Datum: D_North_American_1983

REFERENCE:
PAMAP PROGRAM CYCLE 2 HIGH RESOLUTION ORTHOIMAGE 2007 - 2008, PAMAP PROGRAM, PA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES, BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY



NPDES PERMIT NO. PA0009059
APPLICATION ADDENDUM REPORT
**LOWER MILL PONDS DRAINAGE AREAS
NPDES PERMIT STUDY**

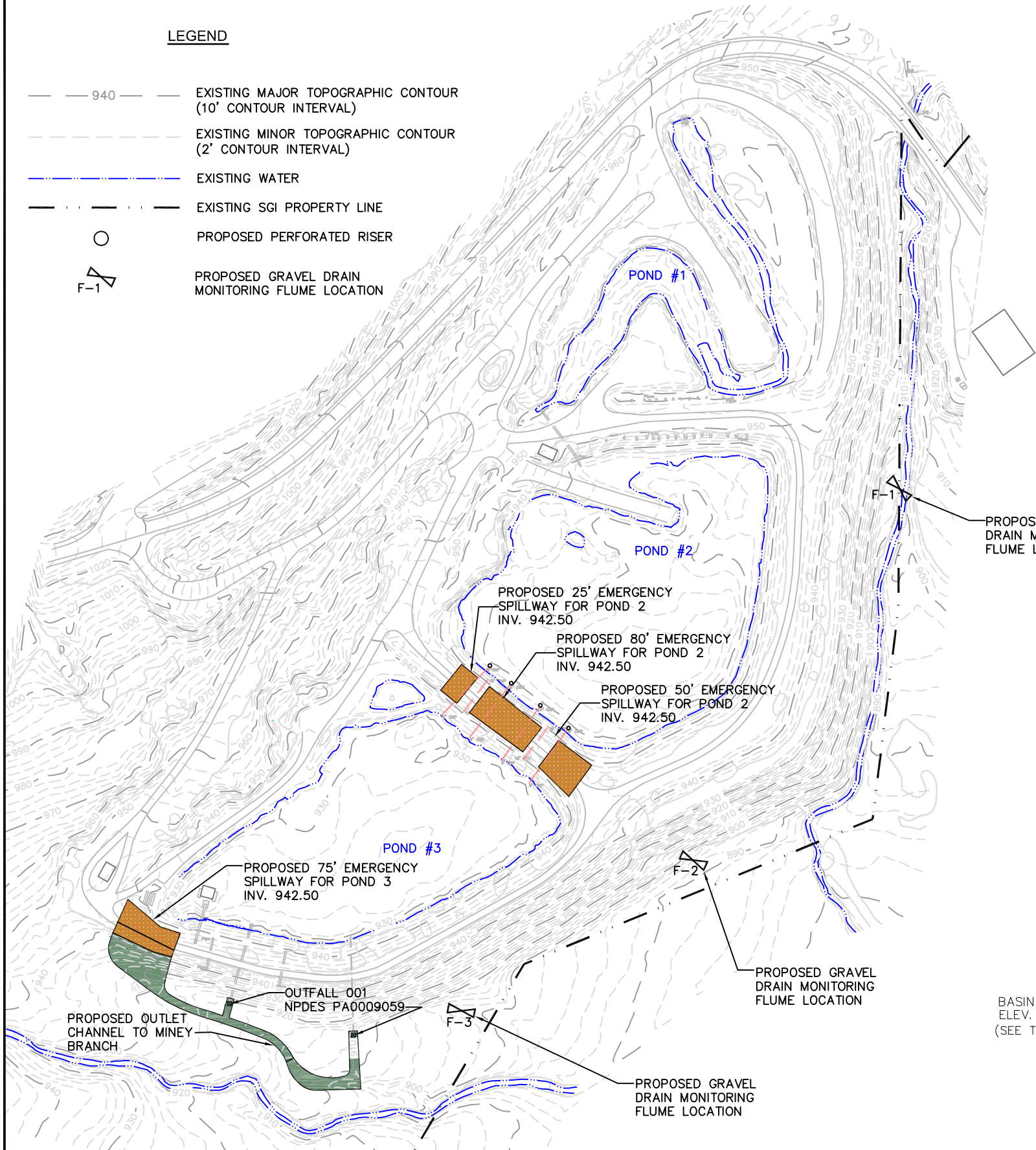
FIGURE 2
SPECIALTY GRANULES INC.
BLUE RIDGE SUMMIT, PA
ADAMS COUNTY, PENNSYLVANIA

Prepared By:	BAS	Checked By:	MDP
Job:	20498083	Date:	11/09/11

File: X:\Projects\Acad\ISP\Project Drawings\Lower Ponds\Proposed Spillways\PropPondImp.dwg Layout: 11X17 User: Jeffrey_Keeney Oct 15, 2012 - 4:18pm

LEGEND

- 940 — EXISTING MAJOR TOPOGRAPHIC CONTOUR (10' CONTOUR INTERVAL)
- - - - - EXISTING MINOR TOPOGRAPHIC CONTOUR (2' CONTOUR INTERVAL)
- — — — — EXISTING WATER
- . - . - . EXISTING SGI PROPERTY LINE
- PROPOSED PERFORATED RISER
- △ F-1 PROPOSED GRAVEL DRAIN MONITORING FLUME LOCATION



POND 2 & 3
EMERGENCY SPILLWAY
N.T.S.

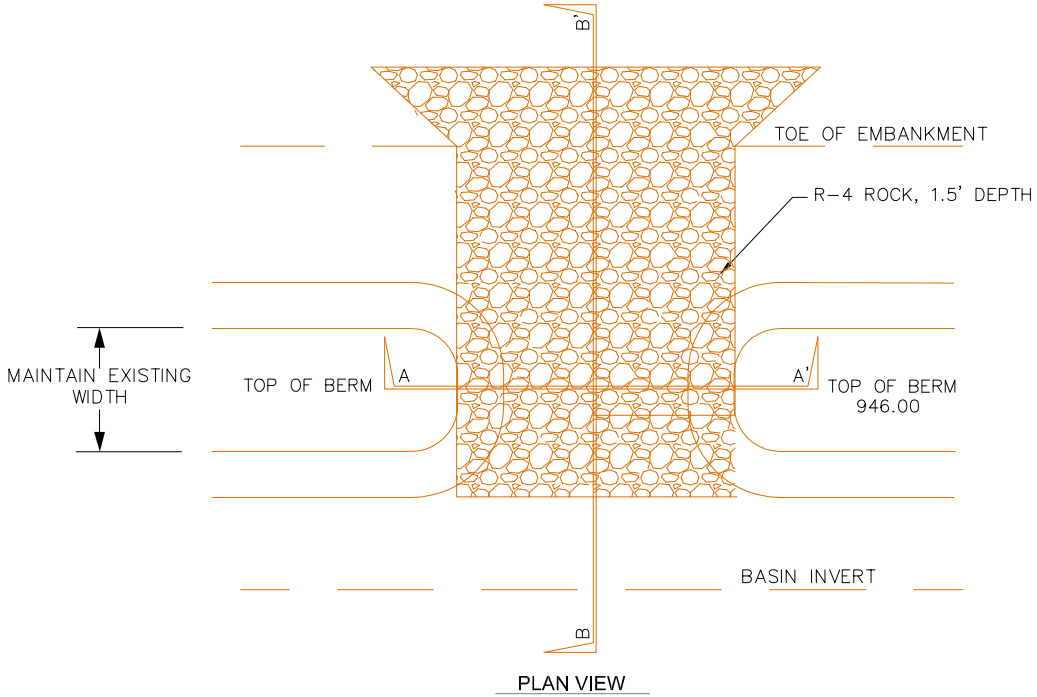
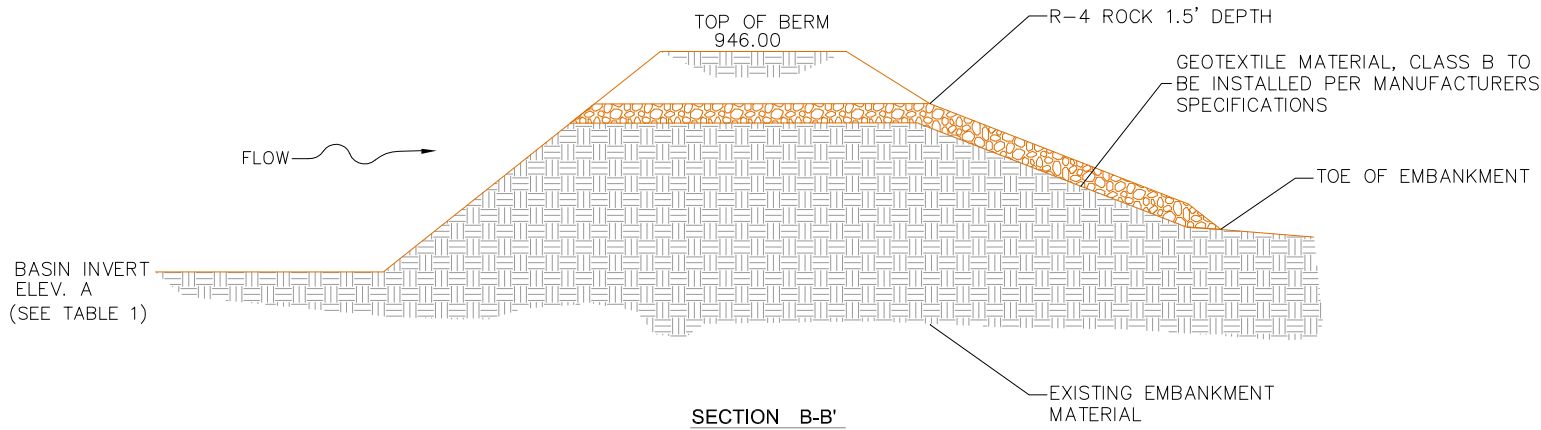
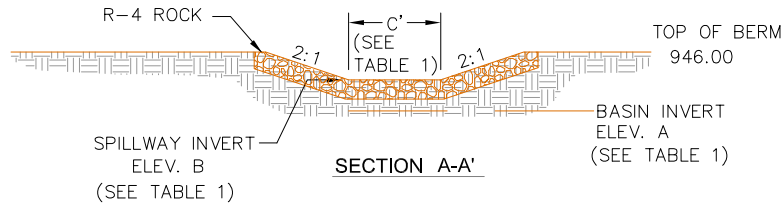


TABLE 1

POND	ELEV. A	ELEV. B	WIDTH C
2	913.00	942.50	25', 80', 50'
3	911.00	942.50	75'



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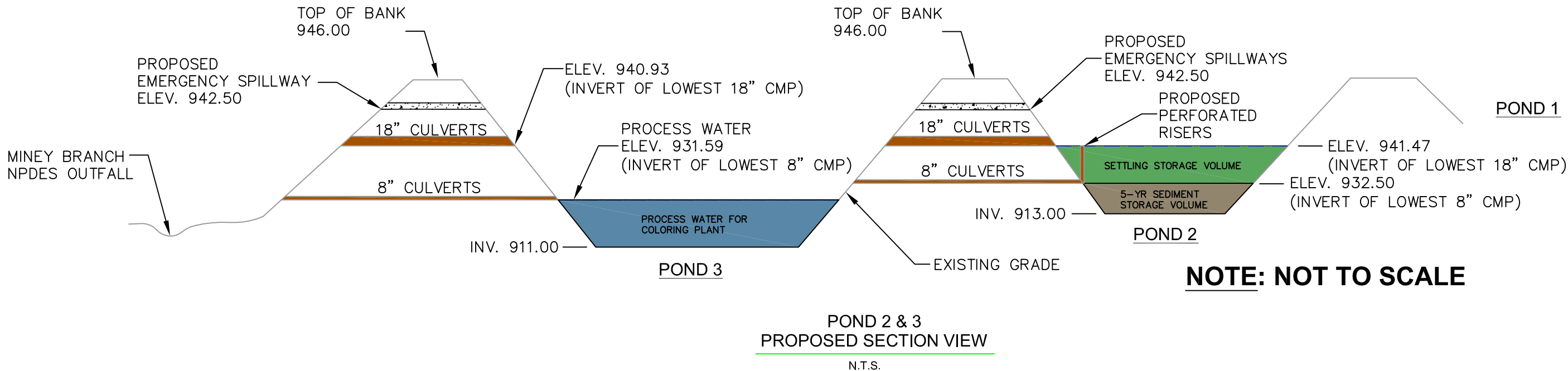
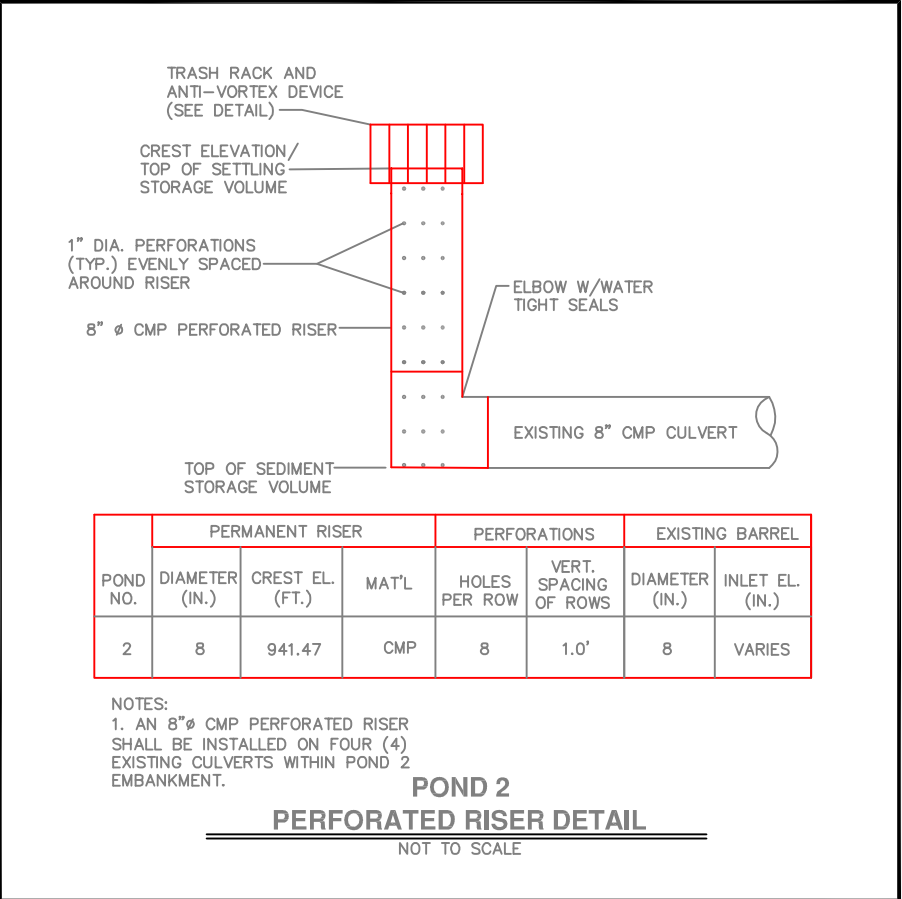
SPECIALTY GRANULES INC.
BLUE RIDGE SUMMIT, PA
PROPOSED POND IMPROVEMENTS

JOB NO.: 20498083	SCALE: 1"=150'
SHEET:	DATE: 9/24/12
FIGURE 3	REV.:

File: X:\Projects\Acad\ISP\Project Drawings\Lower Ponds\Proposed Spillways\ProPondImp.dwg Layout: 11X17 Section User: Jeffrey_Keeney Oct 15, 2012 - 4:17pm

TABLE 1. POND 2- PADEP CHAPTER 102 REQUIREMENTS				
		REQUIRED	PROVIDED	@ ELEVATION
5-YEAR SEDIMENT STORAGE VOLUME	(CUBIC FEET)	977,500	1,000,000	932.50
SETTLING VOLUME	(CUBIC FEET)	977,500	985,175	941.47-932.50
	(GALLONS)	7,311,700	7,369,109	
TOTAL STORAGE VOLUME (SETTLING & SEDIMENT)	(CUBIC FEET)	1,955,000	1,985,175	941.47
	(GALLONS)	14,623,400	14,849,109	
DISCHARGE CAPACITY	(CFS)	391.00	775.73	944.00
DEWATER TIME	(DAYS)	2 TO 7	4.3	N/A

TABLE 2. PEAK WATER SURFACE ELEVATIONS								
POND	PEAK 2-YR	PEAK 2-YR	PEAK 10-YR	PEAK 10-YR	PEAK 25-YR	PEAK 25-YR	PEAK 100-YR	PEAK 100-YR
	W.S.E.	OUTFLOW	W.S.E.	OUTFLOW	W.S.E.	OUTFLOW	W.S.E.	OUTFLOW
	(FT)	(CFS)	(FT)	(CFS)	(FT)	(CFS)	(FT)	(CFS)
2	942.63	33.09	943.77	612.18	943.92	715.25	944.37	1,070.21
3	941.12	8.16	942.62	29.94	942.70	40.27	943.38	188.29
NOTES: 1. 24" FREEBOARD REQUIRED FOR A 10-YR PEAK STORM EVENT. 2. 12" FREEBOARD REQUIRED FOR A 100-YR PEAK STORM EVENT. 3. TOP OF BANK FOR PONDS 2 & 3 IS 946.00								



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www.urscorp.com

SPECIALTY GRANULES INC.
BLUE RIDGE SUMMIT, PA

POND 2 AND 3 PROPOSED SECTION VIEW

JOB NO.: 20498083	SCALE: N.T.S.
SHEET:	DATE: 9/24/12
FIGURE 4	REV.:

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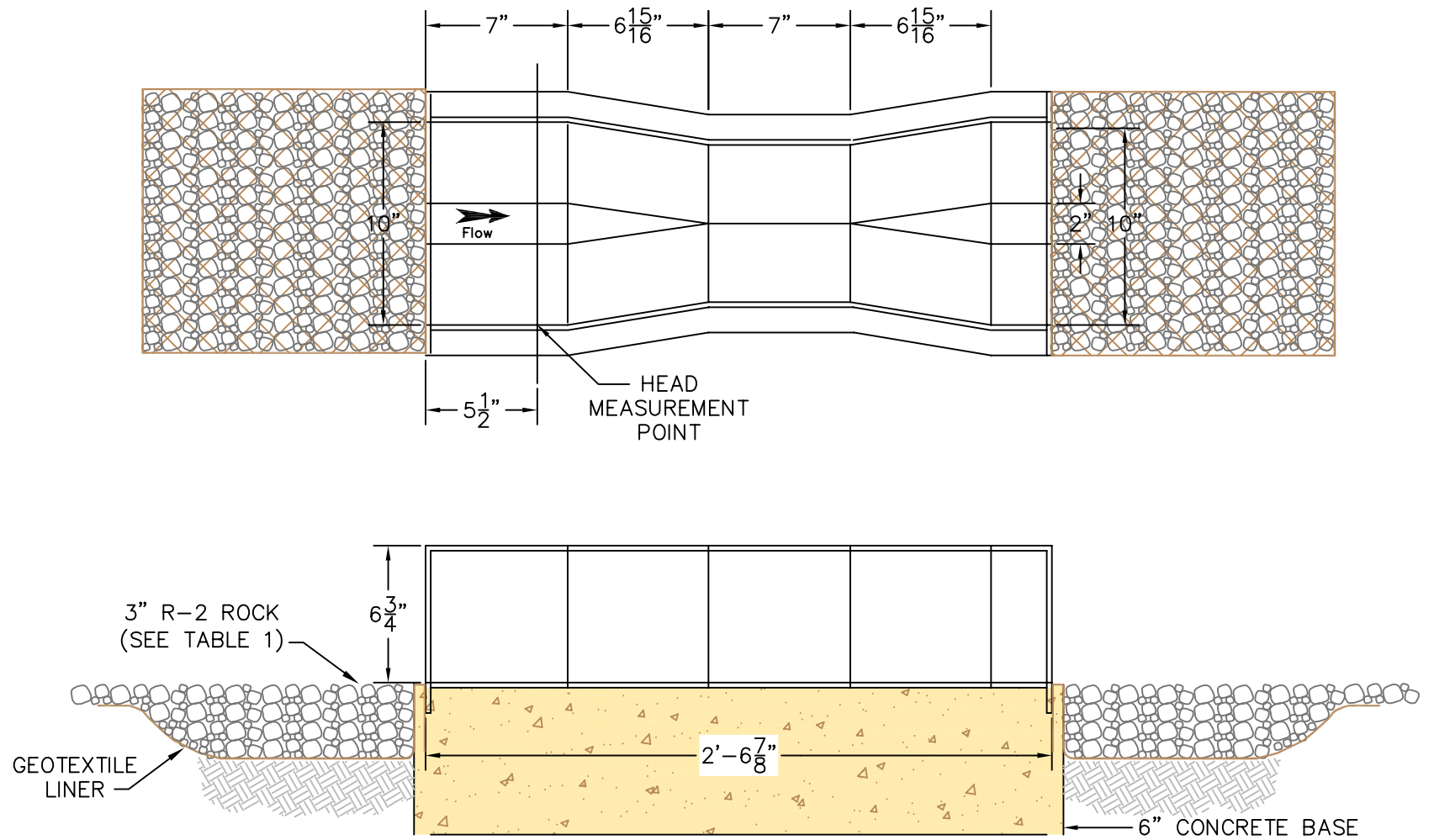
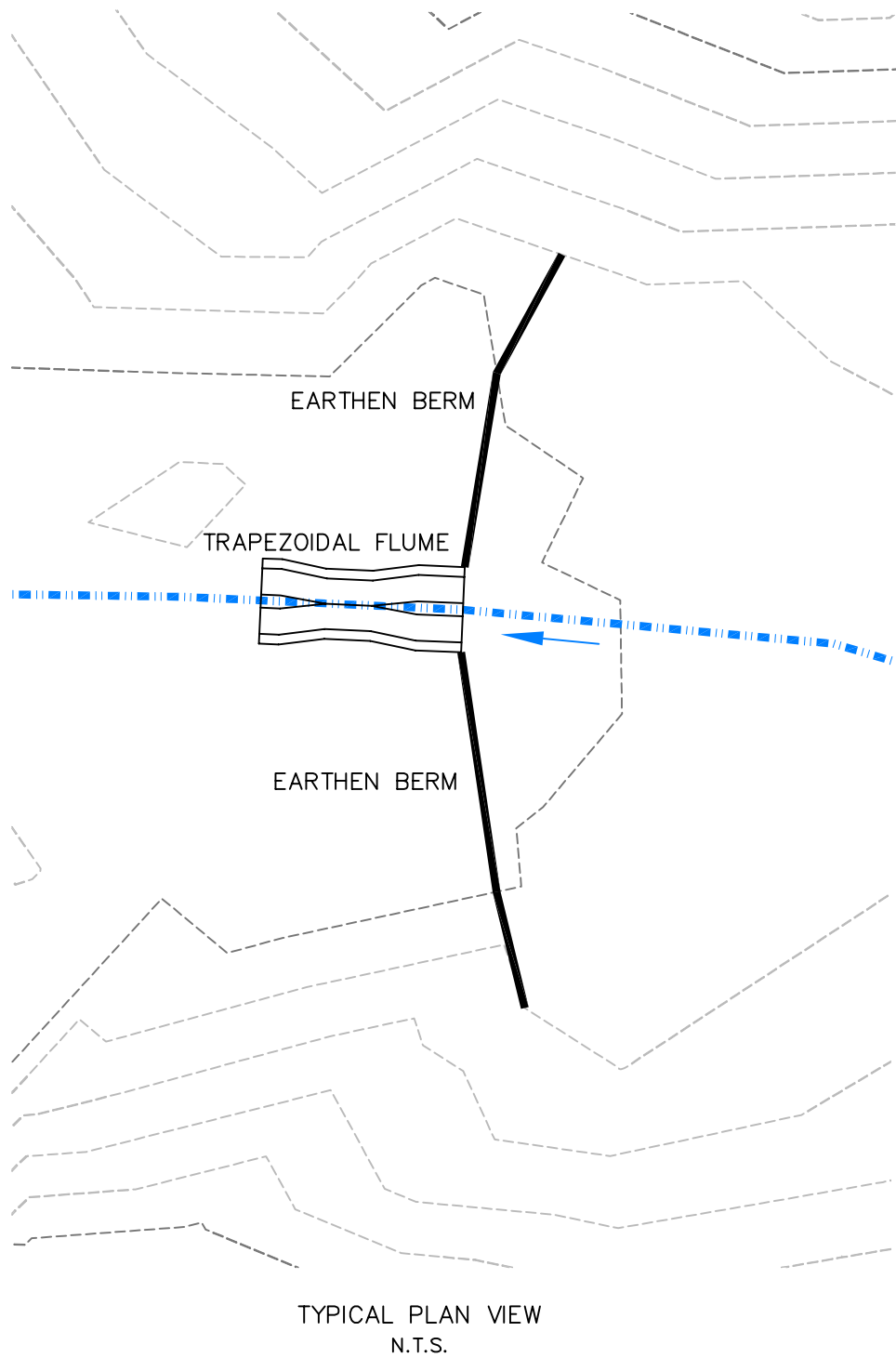
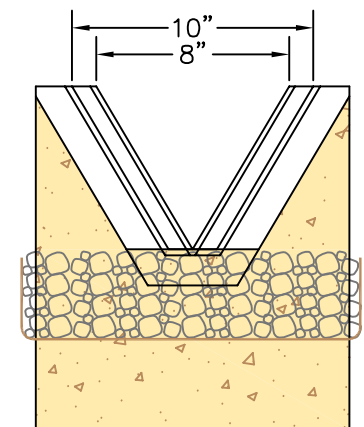


TABLE 1

GRADED ROCK SIZE (INCHES)			
ROCK SIZE	MAXIMUM	D50	MINIMUM
R-2	3	1.5	1

NOTES:
STAFF GAUGE GRADUATED TO 0.01-FOOT TO
BE INSTALLED AT FLUME TO MONITOR FLOW



TYPICAL TRAPEZOIDAL FLUME DETAIL
N.T.S.

REVISIONS				
NO.	BY	CHKD	DATE	DESCRIPTION
△				
△				
△				
△				

URS

DRAFT

(Signature) (Date)

PA. P.E. Certification No.

DESIGNED BY:	BAS	DATE	9/19/12
DRAWN BY:	JAK		9/19/12
CHECKED BY:	BAS		9/19/12
APPROVED BY:	MDP		9/19/12
CLIENT APPROVED BY:			
FILE:			



SPECIALTY GRANULES INC.
BLUE RIDGE SUMMIT, PA

TYPICAL DETAILS FOR MONITORING FLUMES F-1 THROUGH F-3

JOB NO.: 20498083	SCALE: N.T.S.
SHEET: 9/24/12	REV.:
DRAWING NO.:	FIGURE 5

Appendix A
NPDES Permit No. PA0009059 and PADEP Comment
Letters



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

CAMBRIA DISTRICT MINING OFFICE

September 8, 2011

I.S.P. Minerals, Inc.
P. O. Box O
Blue Ridge Summit, PA 17214

Re: NPDES Permit Renewal
"Charmian Plant"
Permit No. 6477SM5
Hamiltonban & Washington Townships, Adams & Franklin Counties

Ladies and Gentlemen:

In conjunction with the Department's review of the NPDES Permit Renewal Application for the above-referenced surface mining permit the following comment is provided:

1. In evaluating the monitoring data it appears that at certain times of the year the discharge rate for the permitted outfall (001), designated DP0001 under the Department's sample information system, is exceeding the maximum discharge rate under the permit. The operator must submit a request to revise the current permit to account for these higher discharge rates. In support of this request, the operator must provide a thorough evaluation of the design for the current system in order to establish that it is capable of handling these higher discharge rates while at the same time consistently maintaining water quality that is compliant with the permitted effluent limits. This evaluation must include an evaluation of the all related aspects and impacts relative to water pumped to this system from the adjacent SMP No. 01930302.

If you have any questions, please contact me at the above number.

Sincerely,

Tim Kania, P.G., Chief
Technical Services Section

cc: Daniel Sammarco, P.E., Acting District Mining Manager
John Wilk, Mine Inspector Supervisor
Jack Thornton, Mine Conservation Inspector
Mike Timcik, P.G., Hydrogeologist
File (6477SM5)
2011 NPDES Renewal (6477SM5)

'bk



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF MINING AND RECLAMATION

DEP USE ONLY

Date Received

NPDES PERMIT RENEWAL APPLICATION FOR NONCOAL MINING

Before completing this form, read the step-by-step instructions provided with this Permit Application Package.

SECTION A. APPLICANT INFORMATION

Applicant Name ISP MINERALS INC.		Applicant Type ☐ Individual (INDIV) ☐ PA Corporation (PACOR) ☒ Non-PA Corporation (NPACO) ☐ General Partnership (PARTG) ☐ Limited Partnership (PARTL) ☐ Municipality (MUNI) ☐ Sole Proprietorship (SOLEP) ☐ Other (OTHER)	
Mailing Address P.O. BOX 0 _____ (Street # and Name or P.O. Box)			
Blue Ridge Summit _____ (City)	PA _____ (State)		17214 _____ (Zip Code + Four)
7177942184 _____ (Telephone #)	Ext. _____ 7177945248 _____ (FAX #)		Mining Operator's License # 6982

Applicant Contact			
Crumbacker _____ (Last Name)	Douglas _____ (First Name)	R _____ (MI)	
Sr. Plant Engineer _____ (Title)			
Mailing Address P.O. BOX 0 _____ (Street # and Name or P.O. Box)			
Blue Ridge Summit _____ (City)	PA _____ (State)	17214 _____ (Zip Code + Four)	
Dcrumbacker@ISPCORP.com _____ (Email Address)	(717) 7943310 _____ (Telephone #)	Ext. _____ 7177945248 _____ (FAX #)	

SECTION B. DESCRIPTION OF ACTIVITY

Type of Mining Activity(ies)

☒ Surface Mining
 ☐ Underground Mining (Includes Surface Effects of Underground Mining)
 ☐ Incidental Coal Extraction
 ☐ Other (specify) _____

SECTION C. SITE INFORMATION

Operation/Site Name Charmian Plant	
Operation/Site Location	
County(ies) Adams _____ Franklin _____	Municipality(ies) Hamiltonban _____ Washington _____

NPDES Permit No. PA0009059	Permit Issuance Date 11/6/1981	Permit Expiration Date 11/6/2011
Mining Permit No. or Mine Drainage Permit No. 6477SM5T2		

SECTION D. CONSULTANT

N/A		
_____	_____	_____
(Last Name)	(First Name)	(MI)

(Title)	(Name of Consulting Firm)	

Mailing Address

(Street # and Name or P.O. Box)		
_____	_____	_____
(City)	(State)	(Zip Code + Four)
_____	()	()
(E-mail Address)	(Telephone #)	(Fax #)

SECTION E. NPDES INFORMATION

Identify each point of discharge, the receiving stream and the corresponding latitude and longitude. The labeling of discharge points must correspond with the labels used on the mining permit maps.

Discharge Point (e.g. TF 01, TF 02 etc. SP 01, SP 02 etc.)	Source of Discharge (i.e., treatment facility (TF), sedimentation pond, (SP) etc.)	Description of Discharge		Name of Receiving Stream	Latitude	Longitude
		Average Rate (mgd)	Frequency of Discharge			
1	SP / OD	0.10	Daily	Miney Branch to Toms Creek	39° 44' 30"	77° 27' 30"
					° ' "	° ' "
					° ' "	° ' "
					° ' "	° ' "
					° ' "	° ' "
					° ' "	° ' "
					° ' "	° ' "
					° ' "	° ' "
					° ' "	° ' "
					° ' "	° ' "
					° ' "	° ' "
					° ' "	° ' "
					° ' "	° ' "

Describe Treatment or Other Control Technology A series of

three sedimentation ponds are in use to control direct run off

and precipitation collected within the quarry and pond #6.

This discharge occasionally includes water pumped from

adjacent SMP01930302, also permitted and operated by ISP

Minerals Inc.

The information on the NPDES form must be certified correct by one of the following, as applicable.

- a) In the case of corporations, by principal executive officer of at least the level of vice president, or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the NPDES form originates.
- b) In the case of a partnership, by a general partner.
- c) In the case of a sole proprietorship, by the proprietor.
- d) In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

I certify that I am familiar with the information contained in the above table, and that to the best of my knowledge and belief such information is true, complete, and accurate.

William Hudak

Printed Name of Person Signing

Site manager

Title

Date

Signature

18 U.S.C Section 1001 provides that:

Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact, or makes or uses any false, fictitious, or fraudulent statements or representations; or makes or uses any false writing or document knowing same to contain any false, fictitious, or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than 5 years, or both.

Application Date: _____

SECTION F. AFFIDAVIT

Commonwealth of Pennsylvania, County of Adams

I, William Hudak being duly sworn, according to law, depose

and say that I (am the applicant) (am an officer or official of the applicant) (have the authority to make this application) and that the plans, reports and documents submitted as part of the application are true and correct to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (cross out inapplicable portions in parenthesis)

Sworn and Subscribed to Before Me This

Day of

(month)

(year)

Signature of Applicant or Responsible Official

Notary Public

Name (Typed)

Title and Seal

Address

NPDES PERMIT RENEWAL
SUPPLEMENTAL INFORMATION

Permittee: ISP Minerals Inc. NCSMP # 6477SM5
Address: P.O. Box 0 NPDES #PA 0009059
1455 Old Waynesboro Road Municipality(s): Hamiltonban, Washington
Blue Ridge Summit, PA. Townships
17214 County(s) Adams and Franklin
Operation Name: Charmian Plant Phone # 717-794-2184

- I. Current PA Code, Title 25, Chapter 93 Stream Classification for each watercourse receiving a direct, point-source discharge (listed in the above NPDES Permit) from this site:

<u>Outfall No.</u>	<u>Stream Name</u>	<u>Stream Zone</u>	<u>Classification</u>
001	4-Miney Branch to Toms Creek	Basins	CWF

- II. List all current public (community and non-community) surface water supplies that have intakes on the receiving stream within 10 miles (16 km) downstream of each outfall.

<u>Facility Name/Address</u>	<u>Approximate Distance Downstream</u>
None	

I hereby attest that I (am applicant)(am officer or official of the applicant)(have the authority to make this application) and that the report and documents submitted as part of the application are true and correct to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

NPDES PERMIT RENEWAL

PART A

NONCOAL SURFACE MINING PERMIT NO. 6477SM5T2
NPDES PERMIT NO. PA0009059

PERMITTEE NAME ISP Minerals, Inc. ISSUANCE DATE November 6, 1981
AND ADDRESS PO Box O RENEWAL DATES 8/2/96; 7/31/01 & 5/4/06
Blue Ridge Summit, PA 17214 REISSUANCE DATES 4/26/94; 4/30/97 & 12/23/97
TRANSFER DATES 4/26/94 & 9/27/04
EXPIRATION DATE November 6, 2011
NAME OF OPERATION ISP Charmain Quarry
LOCATION OF OPERATION:
MUNICIPALITIES Hamiltonban & Washington Townships COUNTIES Adams & Franklin

TYPE OF OPERATION

- ☒ Noncoal Surface Mine
☐ Surface Activity Connected With Underground Mining (Noncoal)
☐ Other _____

DISCHARGE TO (RECEIVING WATERS) Miney Branch to Tom's Creek

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. TYPE OF DISCHARGE FACILITY

(M.D.T.) Mine Drainage Treatment Facilities
(E&S) Erosion and Sediment Control Facilities
(O.D.) Other discharge facilities

Outfall Numbers	Type of Discharge Facility (Key to a.)	Latitude	Longitude
001	E&S*/O.D.**	39° 44' 30"	77° 27' 30"
		° ' "	° ' "
		° ' "	° ' "
		° ' "	° ' "

*Includes direct runoff and precipitation collected within the quarry and Pond 6.

** Water discharged at this point occasionally includes water pumped from adjacent SMP #01930302 also permitted and operated by ISP Minerals, Inc. O.D. limits shall apply during periods when water is pumped into the ponds associated with Outfall 001.

- B. The permittee is authorized to discharge during the period from November 6, 1981 through November 6, 2011.
- C. Based on the hydrologic data and anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or revisions, the following effluent limitations and monitoring requirements apply to the above listed outfall numbers.

NPDES PERMIT RENEWAL

Type of Discharge Facility	Discharge Parameter	DISCHARGE LIMITATIONS *			MONITORING REQUIREMENTS	
		Average Monthly	Maximum Daily	Instantaneous Maximum	Measurement Frequency	Sample Type
E & S	Total Suspended Solids (or Total Settleable Solids as in Part A.1.D.1 below)	35.0	70.0	90.0	Monthly	Grab
M.D.T. or O.D.	Total Suspended Solids	35.0	70.0	90.0	Monthly	Grab
	Average Discharge Rate	0.10 MGD	---	---	Daily	Measured Flow

Note: The discharge limitations designated above for M.D.T. or O.D. facilities shall apply to all NPDES Point-Source discharges of groundwater or other discharges that are subject to mechanical control (i.e. pumping) at any point prior to the discharge.

pH not less than 6.0 standard units nor greater than 9.0 standard units at all times.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Unless otherwise indicated, discharge limitations are concentrations expressed in mg/l, and the total (dissolved plus suspended fraction) is applicable for each parameter.

Samples taken in compliance with the monitoring requirements specified above shall be taken during a discharge at the following location(s):

At the outlet of all major erosion and sediment pollution control facilities, whether NPDES point-source discharges as listed above or non-point-source discharges and all other NPDES point-source discharges (if any).

- D. Any discharge of water, whether listed under Part A, Section 1.a. or not, from areas within this surface mining permit disturbed by surface mining and reclamation operations must meet the Discharge Limitations listed in Part A, Section 1.c. except as described below.
- Discharges of surface runoff (not subject to mechanical control), from major erosion and sediment pollution controls (i.e. sediment basins), that are a result of a precipitation event and occur within 24 hours of said precipitation event shall not be subject to the total suspended solids limitations listed in Part A, Section 1.c. above. Discharges described by this condition shall meet a maximum total settleable solids limit of 0.5 ml/l.
 - Other discharges of surface runoff from minor erosion and sediment pollution controls (sheet flow from minor areas, outcrops, berms, etc.) shall meet the Department's standards for temporary control of sediment and timely stabilization of disturbed areas (Best Management Practices).
 - Any discharges resulting from a precipitation event exceeding the expected 10-year, 24-hour precipitation shall not be subject to the limitations of Part A, Section 1.c.

cc: Fish & Boat Commission
SMCI File
File
PA0009059

By 
Roger J. Homberger
Title District Mining Manager

NPDES PERMIT RENEWAL
SUPPLEMENTAL INFORMATION

Permittee: ISP Minerals Inc. NOSMP # 6477SM5
Address: P.O. Box 0 NPDES #PA 0009059
1455 Old Waynesboro Road Municipality(s): Hamiltonban, Washington
Blue Ridge Summit, PA. Townships
17214 County(s) Adams and Franklin
Operation Name: Charmian Plant Phone # 717-794-2184

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<u>Outfall No.</u>	<u>Stream Name</u>	<u>Stream Zone</u>	<u>Classification</u>
001	4-Miney Branch to Toms Creek	Basins	CWF

- II. List all current public (community and non-community) surface water supplies that have intakes on the receiving stream within 10 miles (16 km) downstream of each outfall.

<u>Facility Name/Address</u>	<u>Approximate Distance Downstream</u>
None	

I hereby attest that I (am applicant)(am officer or official of the applicant)(have the authority to make this application) and that the report and documents submitted as part of the application are true and correct to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

001 0000
MP29A-NPDES

Michael E. Hunt
Signature



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF MINING AND RECLAMATION

op.

DEP USE ONLY
Date Received
6477SM52

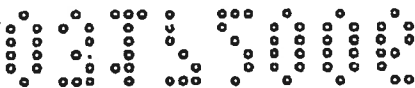
NPDES PERMIT RENEWAL APPLICATION FOR NONCOAL MINING

Before completing this form, read the step-by-step instructions provided with this Permit Application Package.

SECTION A. APPLICANT INFORMATION			
Applicant Name ISP MINERALS INC		Applicant Type ☐ Individual (INDIV) ☐ PA Corporation (PACOR) ☒ Non-PA Corporation (NPACO) ☐ General Partnership (PARTG) ☐ Limited Partnership (PARTL) ☐ Municipality (MUNI) ☐ Sole Proprietorship (SOLEP) ☐ Other (OTHER)	
Mailing Address P.O. Box 0 _____ (Street # and Name or P.O. Box)			
Blue Ridge Summit _____ (City)	PA _____ (State)	17214 _____ (Zip Code + Four)	
7177942184 _____ (Telephone #)	Ext. _____ (Telephone #)	7177945248 _____ (FAX #)	Mining Operator's License # 8882
Applicant Contact Crumbacker _____ (Last Name)			
Douglas _____ (First Name)			
R. _____ (MI)			
Plant Engineer _____ (Title)			
Mailing Address P.O. Box 0 _____ (Street # and Name or P.O. Box)			
Blue Ridge Summit _____ (City)	PA _____ (State)	17268 _____ (Zip Code + Four)	
Dcrumbacker@ISPCORP.com _____ (Email Address)	(717) 7942184 _____ (Telephone #)	Ext. 210 _____ (Telephone #)	7177943338 _____ (FAX #)
SECTION B. DESCRIPTION OF ACTIVITY			
Type of Mining Activity(ies) ☒ Surface Mining ☐ Underground Mining (includes Surface Effects of Underground Mining) ☐ Incidental Coal Extraction ☐ Other (specify) _____			
SECTION C. SITE INFORMATION			
Operation/Site Name Charmian Plant			
Operation/Site Location			
Adams _____ Franklin		Hamiltonban _____ Washington	
_____ _____		_____ _____	
NPDES Permit No. PA0008059 Permit Issuance Date 11/8/1981 Permit Expiration Date 11/8/2006			
Mining Permit No. or Mine Drainage Permit No. 6477SM52			

SECTION D. CONSULTANT *N/A*

(Last Name)	(First Name)	(MI)
(Title)	(Name of Consulting Firm)	
Mailing Address		
(Street # and Name or P.O. Box)		
(City)	(State)	(Zip Code + Four)
(E-mail Address)	(Telephone #)	(Fax #)



SECTION E. NPDES INFORMATION

Identify each point of discharge, the receiving stream and the corresponding latitude and longitude. The labeling of discharge points must correspond with the labels used on the mining permit maps.

Discharge Point (e.g. TF 01, TF 02 etc. SP 01, SP 02 etc.)	Source of Discharge (i.e., treatment facility (TF), sedimentation pond, (SP) etc.)	Description of Discharge		Name of Receiving Stream	Latitude	Longitude
		Average Rate (mgd)	Frequency of Discharge			
1	SP / OD	.072 <i>0.10</i> <i>5-2-06</i>	Daily	Miney Branch to Toms Creek	39° 44' 30"	77° 27' 30"
					" " "	" " "
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Describe Treatment or Other Control Technology A series of

3 sedimentation ponds are in use to control direct run off and precipitation collected within the quarry and pond 6.

This discharge occasionally includes water pumped from adjacent SMP01930302, also permitted and operated by ISP Minerals Inc.

The information on the NPDES form must be certified correct by one of the following, as applicable.

- In the case of corporations, by principal executive officer of at least the level of vice president, or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the NPDES form originates.
- In the case of a partnership, by a general partner.
- In the case of a sole proprietorship, by the proprietor.
- In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

I certify that I am familiar with the information contained in the above table, and that to the best of my knowledge and belief such information is true, complete, and accurate.

Michael E. Shelbert

Printed Name of Person Signing

3-21-06

Date

Plant Manager - Chalmian Plant

Title

Michael E. Shelbert

Signature

18 U.S.C Section 1001 provides that:

Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly, and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact, or makes or uses any false, fictitious, or fraudulent statements or representations; or makes or uses any false writing or document knowing same to contain any false, fictitious, or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than 5 years, or both.

Application Date: _____

SECTION F. AFFIDAVIT

Commonwealth of Pennsylvania, County of

Adams

I, Michael E. Shelbert

being duly sworn, according to law, depose

and say that I (~~am the applicant~~) (am an officer or official of the applicant) (have the authority to make this application) and that the plans, reports and documents submitted as part of the application are true and correct to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment (cross out inapplicable portions in parenthesis).

Sworn and Subscribed to Before Me This

21st Day of March 2006
(Month) (Year)

Michael E. Shelbert
Signature of Applicant or Responsible Official

Judith A. Hay
Notary Public
Notary Public
Title and Seal

Michael E. Shelbert

Name (Typed)

1455 Old Waynesboro Road, Blue Ridge Summit, PA. 17214

Address

COMMONWEALTH OF PA

Notarial Seal
Judith A. Hay, Notary Public
Fairfield Borough, Adams County
My Commission Expires June 12, 2008





Pennsylvania Department of Environmental Protection

5 West Laurel Boulevard
Pottsville, PA 17901-2454
May 4, 2006

570-621-3118
FAX #570-621-3110

Pottsville District Office

NOTICE OF PERMIT CORRECTION

ISP Minerals, Inc.
P.O. Box 0
Blue Ridge Summit, PA 17214

Re: Application No. 6477SM5C2
Charmain Plant Operation
Hamiltonban and Washington Townships
Adams and Franklin Counties

Ladies & Gentlemen:

Existing permit #6477SM5T2 is hereby corrected per the above-referenced application dated March 14, 2006. The purpose of this correction is to renew NPDES Permit No. PA0009059.

The enclosed information shall be considered an addendum to the original permit issued on November 6, 1981 and any subsequent revisions or corrections. This information is to be filed with your copy of the original permit and, in case of any conflicts with the original permit, shall take precedence over the original permit information.

Any person aggrieved by this action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 PA C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, PO Box 8457, Harrisburg, PA 17105-8457, (717) 787-3483. TDD users may contact the Board through the Pennsylvania Relay Service, (800) 654-5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in braille or on audiotape from the Secretary to the Board at (717) 787-3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law. If you want to challenge this action, your appeal must reach the Board within 30 days. You do not need a lawyer to file an appeal with the Board. Important legal rights are at stake, however, so you should show this document to a lawyer at once. If you cannot afford a lawyer, you may qualify for free pro bono representation. Call the secretary to the Board (717) 787-3483 for more information.

Should you have any questions, please contact Keith A. Laslow, P.G., Pottsville District Office.

Sincerely,


Roger J. Hornberger
District Mining Manager
District Mining Operations

Enclosures

cc: Keith A. Laslow
SMCIS, Thomas N. Flannery
SMCI File
PA Fish & Boat Commission
Municipalities of Hamiltonban & Washington Twps.
Counties of Adams and Franklin
File
MS1-lsp (3/06)

RJH:JSB:gk

cc: SHEBERT
KUYKENDALL





pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

CAMBRIA DISTRICT MINING OFFICE

April 25, 2012

Specialty Granules, Inc.
1455 Old Waynesboro Road
Blue Ridge Summit, PA 17214

Re: NPDES Permit Renewal
"Charmian Plant"
SMP No. 6477SM5
Hamiltonban & Washington Townships
Adams & Franklin Counties

Ladies and Gentlemen:

The Department has completed its review of the package of revisions submitted as part of the NPDES Permit Renewal Application for the above referenced surface mining permit. This package was submitted under cover letter dated January 5 and received at the Cambria Office on January 6. The following comments are provided:

Section 1 – Introduction

- 1.) On page 1, please clarify the drainage area for the Pitts Quarry. The 70.2 acres noted on Figure 2, Lower Mill Ponds Drainage Areas NPDES Permit Study, is smaller than the drainage area outlined on the Figure 2 Map.

Section 2 – Project Description

- 1.) Please clarify the number of discharges for the Lower Mill system. Presently the Dames & Moore July 31, 1980 Report noted two 8-inch steel pipes installed at elevation 930.0 as operating outlets from Settling Basin No. 3. These outlet pipes will be at least 100 feet apart in order to distribute the flow across Basin No. 3 and prevent channeling. The two 8-inch steel pipes will have sufficient capacity to accumulate the 10 year, 24-hour storm flow. The 25-year, 24-hour storm will be discharged into Miney Branch through two 18-inch diameter corrugated metal pipes installed at elevation 940.0 near the northwest end of the perimeter embankment of Basin No. 3. Finally, there is a gravel drainage blanket constructed in the Basin No. 3 embankment and Dames & Moore noted a seepage measurement weir would be constructed to monitor the flow. However, this weir was not constructed. All discharges from the Settling Basin No. 3 need to be measured to find the total discharge from the Lower Mill system.

Section 3 – Computations

- 1.) As part of Section 3.4 (Lower Mill Pond System Capacity), please clarify how much drainage area is going to each sediment pond. Chapter 105 notes if a pond drainage area is over 100 acres then a dam permit is required. In addition, please provide the maximum storage value in acre-feet for each pond.

Appendix C – Stormwater Runoff and Capacity Calculations

- 1.) Please revise Standard Worksheet #12, Sediment Basin Capacity Requirements for ponds 2 & 3 as follows:
 - a.) The required sediment storage volume is not correct as shown on the worksheet. The correct sediment storage volume is 1,000 cubic feet per acre times 392.9 acres equals 392,900 cubic feet.
 - b.) The total required storage volume needs to be corrected since the sediment storage volume is not correct.
 - c.) Please provide as built drawings and pond certifications for ponds #2 and #3 since there is some discrepancy from the Dames & Moore, July 1980 Report on Sedimentation Studies for the Charmian Plant. The Dames & Moore study noted the total capacity of ponds #2 and #3 to be 2,280,000 cubic feet and now the total pond volume for ponds #2 and #3 is 3,291,484 cubic feet.
- 2.) Please clarify on the Standard Worksheet #14 for both Sediment Ponds #2 and #3 the following:
 - a.) Please label the storage volume at the inlet to the principal spillway, the emergency spillway and the top of the pond embankment for each pond. The pond depths do not agree with the Dames & Moore Study of the pond depth calculations. Presently Standard Worksheet #14 is showing the total depth of Basin #2 to be 27 feet and the total depth of Basin #3 is 29 feet to the top of the pond at the storage volume of 3.3 million cubic feet. Chapter 105 requires a Dam Safety Permit if the impoundment has the greatest depth of water measured by the upstream toe of the dam at maximum elevation (top of embankment) exceeds 15 feet.

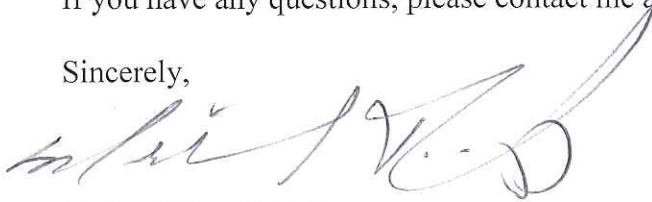
Section 4 – Conclusions

- 1.) Please construct weirs downstream of the Sediment Basin #3 outfalls. The one weir can help in the calibration of the proposed flow meter for Sediment Pond #3. The weir can provide a second check for the flow meter. However, if there is more than one discharge location for Sediment Basin #3 then all the discharges must be measured for the total outfall for Sediment Basin #3.
- 2.) Please clarify how long SGI personnel will have to wait to pump from the Pitts Quarry and Pitts Pond, after the peak flow has occurred at the Lower Mill natural drainage area. The Master Design Storm Summary, page 1.01 notes as the peak hours, 54.9, for the water to exit Pond 3. Is this the time that the SGI personnel will have to wait until they can pump from the other drainage areas?

Please address these comments within 30 days.

If you have any questions, please contact me at the above number.

Sincerely,



Michael Timcik, P.G.
Hydrogeologist

cc: Dan Sammarco, P.E., District Mining Manager
Tim Kania, P.G., Chief, Technical Services Section
John Wilk, Mine Inspector Supervisor
Jack Thornton, Mine Conservation Inspector
Mike Timcik, P.G., Hydrogeologist
2011 NPDES Renewal (6477SM5)
File (6477SM5)

'da



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

CAMBRIA DISTRICT MINING OFFICE

July 13, 2012

Specialty Granules, Inc.
1455 Old Waynesboro Road
Blue Ridge Summit, PA 17214

Re: NPDES Permit Renewal
"Charmian Plant"
Permit No. 6477SM5
Hamiltonban and Washington Townships, Adams and Franklin Counties

Ladies and Gentlemen:

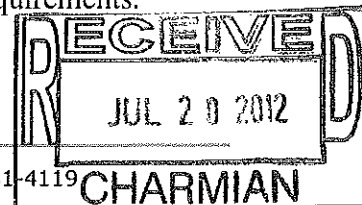
The Department has completed its review of the package of revisions submitted under cover letter dated May 24 relative to the NPDES Permit Renewal Application for the above-referenced surface mining permit. The following comments are provided:

Section 2 – Project Description

1. Please provide the flow rates of the discharges for the Lower Mill system, pond #3. Presently you are showing the 8" CMP discharges. However, with the surface water elevation of 931.8 and the top of the riser pipe to be 931.78 the 8" CMP should have a continuous discharge, but no flow rates were provided.
2. Please provide the flow rates from the seeps.

Section 3 – Computations

1. Please clarify how the Lower Mill Pond System qualifies for a dam permit waiver as provided for a Chapter 105, Section 12 – Waiver of Permit Requirements, under Paragraph 6. Does the Lower Mill Pond System meet all requirements of Chapter 102 as it relates to erosion and sediment control? Does the Lower Mill Pond System have a design emergency spillway that meets the Chapter 102 requirements? Do the ponds have dewatering pipes to lower the pond elevation to the sediment storage level to allow sufficient storage volume? If the ponds are always full at the elevations noted on the **As-Built Plan for Sediment Ponds 2 and 3 – June 2011**, then the ponds do not meet the required storage volume of 5,000 cubic feet per acre. Are the ponds certified by a professional engineer or registered land surveyor? Please provide this information to justify that the Lower Mill Pond System meets all Chapter 102 requirements.



Bureau of District Mining Operations, 286 Industrial Park Road, Ebensburg, PA 15931-4119

Section 4 – Conclusions

1. Until weirs are constructed downstream of Sediment Basin #3 outfalls and dates and flow rates provided it is hard to determine the average monthly discharge rate required for the NPDES permit.

2. Please clarify how SGI personnel will know what flow rate they will pump to the Lower Mill Pond System. Do you have a flow gauge on the pumps to determine the correct flow rates? Please provide the pump models, horsepower and pumping curves to show the correct flow rates at which these pumps will perform. Please show all pipeline losses and sizes for the flow designs.

Please note that the Department must re-publish in the PA Bulletin to revise the permitted discharge rate. This can only be completed when information is submitted to arrive at an acceptable discharge rate for the permit.

Please respond to these comments within thirty (30) days.

If you have any questions, please contact me at the above number.

Sincerely,



Michael Timcik, P.G.
Hydrogeologist

cc: Daniel Sammarco, P.E., District Mining Manager
Tim Kania, P.G., Chief, Technical Services Section
John Wilk, Mine Inspector Supervisor
Jack Thornton, Mine Conservation Inspector
Mike Timcik, P.G., Hydrogeologist
2011 NPDES Renewal (6477SM5)
File (6477SM5)

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September 26, 2012

Pennsylvania Department of the Environmental Protection
Bureau of District Mining Operations
286 Industrial Park Road
Ebensburg, PA 15931-4119

Attention: Michael Timcik, P.G.
Hydrogeologist

Re: Purpose of Gravel Drainage Blanket in Water Retaining Structures

Dear Mr. Timcik:

It is my understanding that the subject of gravel drainage blankets was discussed during an August 21, 2012 meeting between SGI, URS and PADEP regarding the sediment ponds on the SGI property in Blue Ridge Summit, Pennsylvania. During this conversation, the PADEP mentioned that the gravel drainage blanket is something that they believed was not common with embankments and questioned its purpose. It is believed that this discussion was based upon a figure (Section "C") in the December 1979 Dames & Moore report that shows a gravel drainage blanket below a new barren rock fill.

The text of the 1979 Dames & Moore report indicates that the buttress berm must be designed to allow seepage water to drain safely. Therefore, the bottom of the buttress berm should be constructed of coarse fill, including sand, gravel, and small rock. The fill should include no more than 10 percent particles passing the No. 200 sieve." The cross-section in the Dames & Moore 1980 report indicates the recommended thickness of this layer was to be 3 feet.

The use of internal drainage, such as a blanket drain, is considered good protection in the design and construction of water retaining structures because control of seepage through the dam decreases the amount of water held in the downstream slope, which decreases the driving forces. Keeping the downstream shell unsaturated also increases the strength of the material, which increases the resisting forces. Therefore, overall, use of effective internal drainage will generally increase the stability of the downstream embankment slope. Another purpose of properly designed internal system drainage is to collect seepage and serve as a filter to prevent piping of foundation and embankment soils.

Discussions of the use of drainage blankets can also be found in the engineering manuals prepared by the US Army Corps of Engineer, Bureau of Reclamation, and the NRCS.

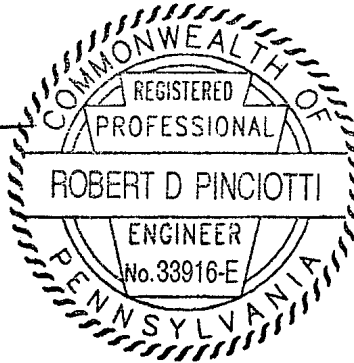
Should you have any further questions regarding the use of gravel drainage blankets in the design and construction of water retaining structures, please do not hesitate to contact me.

Sincerely,

URS Corporation



Robert Pinciotti, PE
Principal Geotechnical Engineer



cc: Tom Nalisnick, PE – PADEP
Tim Kania, PE – PADEP
Ken Walton - SGI
Mark Pennell, PE - URS
Joseph Kula, PE - URS

Appendix B

Manufacturer's Flocculant and Coagulant Product Information

**SAFETY DATA SHEET****PRODUCT****ULTRION® 8157****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION****PRODUCT NAME :** ULTRION® 8157**APPLICATION :** CLARIFICATION AID**COMPANY IDENTIFICATION :** Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198**EMERGENCY TELEPHONE NUMBER(S) :** (800) 424-9300 (24 Hours) CHEMTREC**NFPA 704M/HMIS RATING****HEALTH :** 1 / 2 **FLAMMABILITY :** 1 / 1 **INSTABILITY :** 0 / 0 **OTHER :**
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme * = Chronic Health Hazard**2. COMPOSITION/INFORMATION ON INGREDIENTS**

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Aluminum Hydroxychloride	1327-41-9	10.0 - 30.0
Aluminum Phosphate	13530-50-2	1.0 - 5.0
Calcium Chloride	10043-52-4	10.0 - 30.0

3. HAZARDS IDENTIFICATION****EMERGENCY OVERVIEW******WARNING**

Irritating to eyes.

Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water.

Wear suitable protective clothing.

May evolve oxides of nitrogen (NOx) under fire conditions. May evolve oxides of carbon (COx) under fire conditions.

May evolve oxides of phosphorus (POx) under fire conditions. May evolve HCl under fire conditions.

PRIMARY ROUTES OF EXPOSURE :

Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :**EYE CONTACT :**

Can cause moderate irritation.

Nalco Company 1601 W. Diehl Road • Naperville, Illinois 60563-1198 • (630)305-1000For additional copies of an MSDS visit www.nalco.com and request access



SAFETY DATA SHEET

PRODUCT

ULTRION® 8157

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

SKIN CONTACT :

Can cause moderate irritation.

INGESTION :

Not a likely route of exposure. No adverse effects expected.

INHALATION :

Not a likely route of exposure. Aerosols or product mist may irritate the upper respiratory tract.

SYMPTOMS OF EXPOSURE :

Acute :

A review of available data does not identify any symptoms from exposure not previously mentioned.

Chronic :

A review of available data does not identify any symptoms from exposure not previously mentioned.

AGGRAVATION OF EXISTING CONDITIONS :

A review of available data does not identify any worsening of existing conditions.

HUMAN HEALTH HAZARDS - CHRONIC :

No adverse effects expected other than those mentioned above.

4. FIRST AID MEASURES

EYE CONTACT :

Immediately flush eye with water for at least 15 minutes while holding eyelids open. If irritation persists, repeat flushing. Get immediate medical attention.

SKIN CONTACT :

Immediately flush with plenty of water for at least 15 minutes. If symptoms persist, call a physician.

INGESTION :

Do not induce vomiting without medical advice. If conscious, washout mouth and give water to drink. Get medical attention.

INHALATION :

Remove to fresh air, treat symptomatically. Get medical attention.

NOTE TO PHYSICIAN :

Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT :

None



SAFETY DATA SHEET

PRODUCT

ULTRION® 8157

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

EXTINGUISHING MEDIA :

This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Keep containers cool by spraying with water. Use extinguishing media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARD :

May evolve oxides of nitrogen (NOx) under fire conditions. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of phosphorus (POx) under fire conditions. May evolve HCl under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :

Restrict access to area as appropriate until clean-up operations are complete. Ensure clean-up is conducted by trained personnel only. Ventilate spill area if possible. Do not touch spilled material. Stop or reduce any leaks if it is safe to do so. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP :

SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. **LARGE SPILLS:** Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Wash site of spillage thoroughly with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :

This product is toxic to fish and other water organisms. Do not discharge directly into lakes, ponds, streams, waterways or public water supplies.

7. HANDLING AND STORAGE

HANDLING :

Do not take internally. Do not get in eyes, on skin, on clothing. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labeled. Keep the containers closed when not in use. Use with adequate ventilation.

STORAGE CONDITIONS :

Store the containers tightly closed. Store in suitable labeled containers.

SUITABLE CONSTRUCTION MATERIAL :

Compatibility with Plastic Materials can vary; we therefore recommend that compatibility is tested prior to use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :

Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

**SAFETY DATA SHEET****PRODUCT****ULTRION® 8157****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC**

Country/Source	Substance(s)	Category:	ppm	mg/m3
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ENGINEERING MEASURES :

General ventilation is recommended.

RESPIRATORY PROTECTION :

Respiratory protection is not normally needed. If significant mists, vapors or aerosols are generated an approved respirator is recommended. Where concentrations in air may exceed the limits given in this section, the use of a full face filter mask or air supplied breathing apparatus is recommended. A suitable filter material depends on the amount and type of chemicals being handled. Consider the use of filter type: Multi-contaminant cartridge. with a Particulate pre-filter. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used.

HAND PROTECTION :

Neoprene gloves Nitrile gloves Butyl gloves PVC gloves

SKIN PROTECTION :

Wear standard protective clothing.

EYE PROTECTION :

Wear chemical splash goggles.

HYGIENE RECOMMENDATIONS :

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse. Keep an eye wash fountain available. Keep a safety shower available.

HUMAN EXPOSURE CHARACTERIZATION :

Based on our recommended product application and personal protective equipment, the potential human exposure is:
Low

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Greenish Brown
ODOR	Slight
SPECIFIC GRAVITY	1.27 @ 72 °F / 22 °C
DENSITY	10.6 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	2.7
VISCOSITY	14 cps @ 72 °F / 22 °C
FREEZING POINT	-23 °F / -31 °C
BOILING POINT	225 °F / 107 °C
VOC CONTENT	0.00 % EPA Method 24



SAFETY DATA SHEET

PRODUCT

ULTRION® 8157

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY

STABILITY :

Stable under normal conditions.

HAZARDOUS POLYMERIZATION :

Hazardous polymerization will not occur.

CONDITIONS TO AVOID :

Extremes of temperature

MATERIALS TO AVOID :

Metals

HAZARDOUS DECOMPOSITION PRODUCTS :

Under fire conditions: Oxides of carbon, Oxides of nitrogen

11. TOXICOLOGICAL INFORMATION

No toxicity studies have been conducted on this product.

SENSITIZATION :

This product is not expected to be a sensitizer.

CARCINOGENICITY :

None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :

Based on our hazard characterization, the potential human hazard is: Moderate

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

The tests for (products or similar products) were performed in clean water as set forth by USEPA (EPA/600/4-90/027). In order to evaluate the potential toxicity mitigation, the tests for (representative polymers) were performed in environmentally relevant water with dissolved organic carbon (DOC: 4.5 mg/l). The toxicity of this product is due to an external mode of action, e.g., suffocation or immobilization. In the presence of suspended material, e.g., DOC, the polymers are bound to suspended material and the bioavailability is substantially reduced. As a result, the toxicity is expected to be lower. Under normal use and discharge conditions, the LC50 values of the representative polymers tested in the presence of DOC are expected to apply to this product. However, for large spills, the clean water data is more applicable.

**SAFETY DATA SHEET****PRODUCT****ULTRION® 8157****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****ACUTE FISH RESULTS :**

Species	Exposure	LC50	Test Descriptor
Rainbow Trout	96 hrs	6.8 mg/l	Product tested in clean water
Fathead Minnow	96 hrs	18 mg/l	Product tested in clean water
Zebra Danio	96 hrs	10 - 100 mg/l	Representative polymer tested in water with DOC

ADDITIONAL ECOLOGICAL DATA

NOEC on earthworm: > 1000 mg/l (representative polymer) Product contains organic halogens, may contribute to AOX.

PERSISTENCY AND DEGRADATION :

Chemical Oxygen Demand (COD) : 18,100 mg/l

Biological Oxygen Demand (BOD) :

Incubation Period	Value	Test Descriptor
5 d	0 mg/l	Product

Greater than 95% of this product consists of inorganic substances for which a biodegradation value is not applicable.

MOBILITY :

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	30 - 50%	30 - 50%

The portion in water is expected to be soluble or dispersible.

BIOACCUMULATION POTENTIAL

This preparation or material is not expected to bioaccumulate.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION

Based on our hazard characterization, the potential environmental hazard is: Moderate

Based on our recommended product application and the product's characteristics, the potential environmental exposure is: Low

OTHER INFORMATION

The hazard characterization is based on the tests or potential hazard in the clean water.

If released into the environment, see CERCLA/SUPERFUND in Section 15.



SAFETY DATA SHEET

PRODUCT

ULTRION® 8157

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous waste, it is not subject to federal regulation. Consult state or local regulation for any additional handling, treatment or disposal requirements. For disposal, contact a properly licensed waste treatment, storage, disposal or recycling facility.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

LAND TRANSPORT :

Proper Shipping Name :

PRODUCT IS NOT REGULATED DURING
TRANSPORTATION

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :

PRODUCT IS NOT REGULATED DURING
TRANSPORTATION

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name :

PRODUCT IS NOT REGULATED DURING
TRANSPORTATION

15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :

Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Aluminum Hydroxychloride : Exposure Limit - Compound Class, Eye irritant

Aluminum Phosphate : Eye irritant

Calcium Chloride : Eye irritant

CERCLA/SUPERFUND, 40 CFR 117, 302 :

Notification of spills of this product is not required.



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SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :

This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :

Our hazard evaluation has found this product to be hazardous. The product should be reported under the following indicated EPA hazard categories:

- | | |
|---|-----------------------------------|
| X | Immediate (Acute) Health Hazard |
| - | Delayed (Chronic) Health Hazard |
| - | Fire Hazard |
| - | Sudden Release of Pressure Hazard |
| - | Reactive Hazard |

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :

This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :

When use situations necessitate compliance with FDA regulations, this product is acceptable under : 21 CFR 176.170 Components of paper and paperboard in contact with aqueous and fatty foods and 21 CFR 176.180 Components of paper and paperboard in contact with dry foods.

The following limitations apply: 1) For use as a retention aid employed prior to the sheet-forming operation and used at a level not to exceed that necessary to accomplish the intended technical effect. 2) At the size press at a level not to exceed 0.3% by weight (as product) of the finished paper or paperboard.

NSF INTERNATIONAL :

This product has received NSF/International certification under NSF/ANSI Standard 60 in the coagulation and flocculation category. The official name is "Polymer Blends." Maximum product application dosage is : 102 mg/l.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

CLEAN AIR ACT, Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.



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CALIFORNIA PROPOSITION 65 :

Substances known to the State of California to cause cancer are present as an impurity or residue.

MICHIGAN CRITICAL MATERIALS :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

STATE RIGHT TO KNOW LAWS :

The following substances are disclosed for compliance with State Right to Know Laws:

Aluminum Hydroxychloride	1327-41-9
Polyquaternary Amine Chloride	Proprietary
Aluminum Phosphate	13530-50-2
Calcium Chloride	10043-52-4
Water	7732-18-5

NATIONAL REGULATIONS, CANADA :

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS CLASSIFICATION :

D2B - Materials Causing Other Toxic Effects - Toxic Material

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

AUSTRALIA

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on the Inventory of Existing Chemical Substances China (IECSC).

EUROPE

The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

KOREA

All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

PHILIPPINES

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).



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16. OTHER INFORMATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

* The human risk is: Low

* The environmental risk is: Low

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight CD-ROM Version), Ariel Research Corp., Bethesda, MD.



SAFETY DATA SHEET

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EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS CD-ROM Version),
Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department

Date issued : 07/31/2009

Version Number : 1.13



Product Bulletin

OPTIMER[®] 7192 PLUS

Cationic Flocculant

PRODUCT BENEFITS

OPTIMER 7192 PLUS cationic emulsion flocculant is designed for industrial sludge dewatering, sludge thickening and wastewater clarification. This product functions well with all types of equipment including twin-belt presses, screw presses, dissolved air flotation/induced air flotation, plate-and-frame presses, vacuum filter presses, as well as high shear applications.

PRINCIPAL USES

GENERAL DESCRIPTION

Form:	Liquid
Color:	Colorless, light yellow
Odor:	Hydrocarbon
Specific Gravity @ 77°F (25°C):	1.01 - 1.04
Density:	8.4 - 8.7 lb/gal
Solubility in Water:	Emulsifiable
pH (100%):	5
Viscosity @ 77°F (25°C):	300 - 800 cp
Freeze Point:	-1°F (30°C)
Freeze-Thaw Recoverable:	Complete
VOC Content:	28%

ACTIVE CONSTITUENTS

Acrylamide co-polymer, medium-low cationic charge.

REGULATORY APPROVALS

Please refer to the Material Safety Data Sheet (MSDS) for the most recent approval information.

MATERIALS OF COMPATIBILITY

Compatible
Hasteloy C-276
Inconel 625

Not Compatible
Stainless Steel 304 and 316
Polyethylene tubing

Viton
Teflon
Polyethylene (rigid)
Polypropylene (rigid)
CPVC (rigid)
Plasite 4300 (vinyl ester resin)
Plasite 7122 (epoxy phenolic)

Brass
Neoprene
Buna-N Rubber
Natural Rubber
Polyurethane
Hypalon
EPDM
Mild Steel
Galvanized Steel

NOTE: Feed Systems Acceptable Materials

Utilize plastic piping and fittings where possible on neat polymer feed lines. Where strength is needed, 316 SS pumps, valves, etc. can be used. However, these components, especially pump internals, will have a reduced life span. Be sure to routinely inspect all 316 SS components for signs of corrosion and to utilize check valves with Teflon or epoxy coated springs.

DOSAGE AND FEEDING

OPTIMER 7192 PLUS should be fed via a closed feed system. A closed feed system is defined as a system in which fluid is moved from a closed storage vessel into a treated media without exposure to the atmosphere (except through normal venting or pressure devices).

Emulsion flocculants must be fed following proper makeup procedures. Suitable inversion systems should be utilized to allow for adequate inversion and feeding control. The quality of water used to invert the polymer is important. Avoid using plant recycle water or other water sources high in suspended solids, mineral salts and iron, and with a pH either below 6.5 or above 7.8. A dilution aging tank is highly recommended, with a minimum of 30 minutes aging in order to gain full product activity. Inverting the emulsion flocculant below a concentration of 0.2%, or above a concentration of 1.0%, is not recommended. A positive displacement pump is recommended for feeding the inverted material to the treatment system.

In some cases, continuous dilution of pre-inverted flocculant will enhance activity and generate more cost-effective results. Improved performance using dilution water is site specific. To determine if post-dilution is advantageous, feed inverted product through a standard mixing tee to an active dilution water line. The water temperature should be close to ambient and low on suspended solids, mineral salts and iron.

In most cases, inverted flocculant should be fed on the discharge side of the feed pump. There may be isolated cases where the additional mixing rendered by distributing the polymer on the suction side of the pump will yield better program results.

ENVIRONMENTAL AND TOXICITY DATA

Refer to the Material Safety Data Sheet, SECTIONS 11 and 12, for the most current data.

SAFETY AND HANDLING

As with any chemical, OPTIMER 7192 PLUS should be handled with responsible care. When considering the use of OPTIMER 7192 PLUS in a particular application, the Material Safety Data Sheet must be reviewed to assure that the intended use can be accomplished safely. All precautions described in the MSDS should be strictly followed when handling OPTIMER 7192 PLUS. In case of small liquid spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Smaller spills can be effectively cleaned up with NALCO POLYCLEAN 7.

STORAGE

Keep containers closed and protect from frost and moisture. Low temperatures should be avoided since viscosity increases and pumping problems can occur. When frozen, warm the product slowly to ambient temperature and agitate with a low (<200) RPM mixer. After warming up to 46 - 50°F (8 -10°C) and re-homogenization by gentle agitation for about 2 hrs, the product can be re-used without loss in efficiency. Nevertheless freezing should be avoided. When the product has been exposed to heat, the product should be gently agitated while its temperature is allowed to lower to room temperature. After the product is back to room temperature, about 2 hrs of gentle agitation should be sufficient to make the product ready for use. While product performance should not be affected if the product freezes or warms up, some loss in physical stability should be expected. If the product is to be stored for longer than two weeks, i.e., bulk tank storage, periodic agitation of the product will help keep the product fully homogenized and ensure consistent performance.

SHIPPING

REMARKS

If you need assistance or information, please call your nearest Ondeo Nalco Representative, or our Naperville office at (630) 305-1000. For more news about Ondeo Nalco, visit our website at www.ondeo-nalco.com.

For Medical and Transportation Emergencies involving Ondeo Nalco products, call (24-hour response): 1-800-424-9300.

ADDITIONAL INFORMATION

Product Viscosity vs. Temperature

Viscosity (cp)	Temperature
6000	-5°C (23°F)
1300	11°C (51.8°F)
500	24°C (75.2°F)

Product Viscosity vs. Concentration

% Solution	Viscosity (cp)
1.5	600
1.0	340
0.5	220

Appendix C
PADEP Chapter 102 Requirements & Stormwater
Runoff/Capacity Calculations

STANDARD WORKSHEET # 12

Sediment Basin Capacity Requirements

PROJECT NAME: Specialty Granules, Inc.

LOCATION: Pond 2 and 3

PREPARED BY: TWS

DATE: 09/23/2011

REVISED BY: RKF

DATE: 9/5/12

CHECKED BY: DM

9/6/12

BASIN NUMBER	Pond 2 & 3	
(A) MAXIMUM TOTAL DRAINAGE AREA (AC) *****	195,500	
(I) INITIAL REQ'D SETTLING VOLUME (5000 x A) (CF)	977,500	
(T) REDUCTION FOR TOP DEWATERING (-700 x A) (CF)	0	
(P) REDUCTION FOR PERMANENT POOL (-700 x A) (CF)	0	
(L) RED. FOR 4:1 FLOW LENGTH:WIDTH (-350 x A) (CF)	0	
(D) RED. FOR 4 TO 7 DAY DEWATERING (-350 x A) (CF)	0	
*** (Sv) REQUIRED SETTLING VOLUME [I- (T+P+L+D)] (CF)	977,500	
(Sd) REQ'D SEDIMENT STORAGE VOLUME (1000 x A) ¹ (CF)	977,500	<= 5-year Volume
(St) TOTAL REQ'D STORAGE VOLUME (Sv + Sd) (CF)	1,955,000	
**** TOTAL STORAGE VOLUME PROVIDED (CF)	1,985,175	
REQUIRED DISCHARGE CAPACITY (2 x A) (cfs)	391.0	
PRINCIPAL SPILLWAY CAPACITY (@ ELEV 5) (cfs)	25.40	
EMERGENCY SPILLWAY CAPACITY (@ ELEV 5) (cfs)	750.32	
EMERGENCY SPILLWAY PROTECTIVE LINING	Rip Rap	

* Provide supporting computations.

** If grass lining is proposed, spillway must be constructed in original ground

*** 5000 cubic feet per acre settling volume is required for basins located in Special protection (HQ & EV) watersheds. In other watersheds, the basin settling volume may be reduced per the Department's "Erosion and Sediment Pollution Control Manual," No. 363-2134-008 (January 1996), as amended and updated. The minimum settling volume for such basins is (3600 X A).

**** Total Storage Volume provided at riser crest.

***** Since 9.14-cfs (4,100GPM, max.) is being proposed to be pumped from Sed.Traps 6 & 7, Pitts Pond and Pitts Quarry, using 2-cfs x drainage acre for storage calculations then, 5.0 additional acres are added to the 190.5-acre "Natural Drainage Area"

STANDARD WORKSHEET # 14
Sediment Basin Storage Data - POND #2

PROJECT NAME: Specialty Granules, Inc.
 LOCATION: Proposed Pond 2
 PREPARED BY: TWS
 REVISED BY: RKF
 CHECKED BY: DM
 CHECKED BY: _____

DATE: 09/23/11
 DATE: 9/5/12
 DATE: 9/6/12
 DATE: _____

WATER SURFACE ELEVATION (FEET)	AREA (SQ. FT.)	AVERAGE AREA (SQ. FT.)	DIFFERENCE IN ELEVATION (FEET)	STORAGE VOLUME (CUBIC FEET)		REMARKS
				INCREMENTAL	TOTAL	
913.00	1,317				0	
		8,421	1.00	8,421		
914.00	15,525				8,421	
		19,176	1.00	19,176		
915.00	22,827				27,597	
		25,417	1.00	25,417		
916.00	28,006				53,014	
		29,866	1.00	29,866		
917.00	31,725				82,879	
		33,703	1.00	33,703		
918.00	35,680				116,582	
		37,568	1.00	37,568		
919.00	39,456				154,150	
		41,287	1.00	41,287		
920.00	43,118				195,437	
		45,110	1.00	45,110		
921.00	47,102				240,547	
		49,055	1.00	49,055		
922.00	51,008				289,602	
		52,697	1.00	52,697		
923.00	54,386				342,299	
		56,166	1.00	56,166		
924.00	57,945				398,464	
		59,910	1.00	59,910		
925.00	61,875				458,374	
		64,048	1.00	64,048		
926.00	66,220				522,422	
		68,573	1.00	68,573		
927.00	70,925				590,994	
		73,314	1.00	73,314		
928.00	75,702				664,308	
		77,802	1.00	77,802		
929.00	79,901				742,109	
		81,980	1.00	81,980		
930.00	84,059				824,089	
		85,983	1.00	85,983		
931.00	87,907				910,072	
		89,762	1.00	89,762		
932.00	91,616				999,834	
		93,156	0.75	69,867		Sediment Level
932.75	93,926				1,069,701	
		94,826	0.25	23,706		
933.00	94,696				1,093,407	
		95,211	0.40	38,084		
933.40	95,725				1,131,491	
		96,458	0.60	57,875		
934.00	97,191				1,189,366	
		98,391	1.00	98,391		
935.00	99,591				1,287,757	
		100,817	1.00	100,817		
936.00	102,043				1,388,574	
		103,297	1.00	103,297		
937.00	104,551				1,491,871	
		105,823	1.00	105,823		
938.00	107,094				1,597,693	
		109,659	2.00	219,318		
940.00	112,224				1,817,011	
		114,252	1.65	188,515		
941.65	116,279				2,005,526	Approximate Elevation of Lowest Outfall
		120,648	3.35	404,171		
945.00	125,017				2,409,697	
		125,714	1.00	125,714		
946.00	126,410				2,535,411	

STANDARD WORKSHEET # 14
Sediment Basin Storage Data - POND #3

PROJECT NAME: Specialty Granules, Inc.
 LOCATION: Proposed Pond 3
 PREPARED BY: TWS
 REVISED BY: RKF
 CHECKED BY: DM
 CHECKED BY:

DATE: 09/23/11
 DATE: 9/5/12
 DATE: 9/6/12
 DATE:

WATER SURFACE ELEVATION (FEET)	AREA (SQ. FT.)	AVERAGE AREA (SQ. FT.)	DIFFERENCE IN ELEVATION (FEET)	STORAGE VOLUME (CUBIC FEET)		REMARKS
				INCREMENTAL	TOTAL	
911.00	1,560				0	
		3,255	1.00	3,255	3,255	
912.00	4,949	7,170	1.00	7,170	10,425	
913.00	9,391	10,804	1.00	10,804	21,229	
914.00	12,217	13,514	1.00	13,514	34,742	
915.00	14,810	16,635	1.00	16,635	51,377	
916.00	18,459	19,912	1.00	19,912	71,289	
917.00	21,365	22,654	1.00	22,654	93,943	
918.00	23,943	25,207	1.00	25,207	119,149	
919.00	26,470	27,877	1.00	27,877	147,026	
920.00	29,283	30,499	1.00	30,499	177,524	
921.00	31,714	32,896	1.00	32,896	210,420	
922.00	34,077	35,439	1.00	35,439	245,859	
923.00	36,801	38,645	1.00	38,645	284,504	
924.00	40,489	43,839	1.00	43,839	328,343	
925.00	47,189	49,427	1.00	49,427	377,769	
926.00	51,664	53,715	1.00	53,715	431,484	
927.00	55,766	57,863	1.00	57,863	489,347	
928.00	59,960	62,186	1.00	62,186	551,533	
929.00	64,411	66,910	1.00	66,910	618,443	
930.00	69,409	71,617	1.00	71,617	690,059	
931.00	73,824	74,926	0.80	59,940	749,999	
931.80	76,027	76,213	0.20	15,243	765,242	
932.00	76,399	77,284	1.00	77,284	842,526	
933.00	78,168	79,055	1.00	79,055	921,581	
934.00	79,942	80,856	1.00	80,856	1,002,437	
935.00	81,770	82,856	1.00	82,856	1,085,292	
936.00	83,941	97,400	4.00	389,598	1,474,890	
940.00	110,858	113,771	1.00	113,771	1,588,661	
941.00	116,685	121,921	3.00	365,762	1,954,424	
944.00	127,157	128,979	1.00	128,979	2,083,402	
945.00	130,800	132,633	1.00	132,633	2,216,035	
946.00	134,466					

WORKSHEET # 15

Sediment Basin Dewatering Discharge Data

PROJECT NAME: Specialty Granules, Inc.

LOCATION: Pond 2

PREPARED BY: RKF

CHECKED BY: ARZ

DATE: 9/27/12

DATE: 9/28/12

REV'D.: _____

PERFORATION DISCHARGE (TOP OF RISER TO SEDIMENT CLEAN OUT ELEVATION)

WATER SURFACE ELEVATION 1	RISER ORIFICE ROW ELEVATION 2									TOTAL DISCHARGE (CFS) 3
	ROW 1	ROW 2	ROW 3	ROW 4	ROW 5	ROW 6	ROW 7	ROW 8	ROW 9	
941.47	0.629	0.593	0.555	0.513	0.468	0.419	0.362	0.295	0.207	4.0
938.00	0.493	0.446	0.393	0.332	0.257	0.149				2.1
937.00	0.446	0.393	0.332	0.257	0.149					1.6
936.00	0.393	0.332	0.257	0.149						1.1
935.00	0.332	0.257	0.149							0.7
934.00	0.257	0.149								0.4
932.50	0.000									0.0

1 FROM WORKSHEET #14: TOP ELEVATION IS TOP OF DEWATERING ZONE (ELEV. 3 ON WORKSHEET #13), AND BOTTOM ELEVATION IS TOP OF SEDIMENT STORAGE ZONE (ELEVATION 2 ON WORKSHEET #13).

2 ALL PERFORATIONS SHOULD BE THE SAME SIZE. ONE INCH DIAMETER PERFORATIONS ARE PREFERRED.
SPECIFY SIZE OF PERFORATIONS 1 INCH DIAMETER.
EACH ORIFICE ROW SHOULD HAVE APPROXIMATELY THE SAME NUMBER OF PERFORATIONS AND THE ORIFICE ROWS SHOULD BE EQUALLY SPACED VERTICALLY.
SPECIFY THE NUMBER OF PERFORATIONS IN EACH ROW. 8

3 INSERT VALUE INTO COLUMN 4 OF STANDARD WORKSHEET #16

NOTE: WHERE FAIRCLOTH STYLE SKIMMERS ARE USED, FIGURE 7.2, WITH BASIN DEWATERING VOLUME AND SKIMMER ORIFICE SIZE PLOTTED, SHOULD BE SUBMITTED IN LIEU OF STANDARD WORKSHEETS #15 & 16.

Orifice Flow $Q = CA(2gh)^{1/2}$

Area per Row = 0.04363 S.F.

Orifice Coeff. = 0.6

WORKSHEET # 16

Sediment Basin Dewatering Time Data

PROJECT NAME: Specialty Granules, Inc.

LOCATION: Pond 2

PREPARED BY: RKF

CHECKED BY: ARZ

DATE: 9/27/12

DATE: 9/28/12

REV'D.: _____

WATER SURFACE ELEVATION 1	STORAGE VOLUME (CU. FT.) 2	INCREMENTAL STORAGE VOLUME (CU. FT.)	DISCHARGE (CFS) 3	AVERAGE DISCHARGE (CFS)	TIME (HRS.)	ACCUMULATED TIME (HRS.)
941.47	1,985,175		4.041			0.00
		387,482		3.06	35.23	
938.00	1,597,693		2.069			35.23
		105,822		1.82	16.12	
937.00	1,491,871		1.577			51.35
		103,297		1.35	21.19	
936.00	1,388,574		1.131			72.54
		100,817		0.93	29.97	
935.00	1,287,757		0.738			102.51
		98,391		0.57	47.78	
934.00	1,189,366		0.406			150.29
		189,366		0.20	259.21	
932.50	1,000,000		0.000			409.50

Dewatering Time 409 Hours = 17.1 Days

1 From Worksheet #15, first column

of Risers= 4

2 From Worksheet #14, sixth column

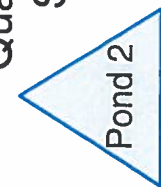
Final Dewatering Time= 4.3 Days

3 From Worksheet #15, last column

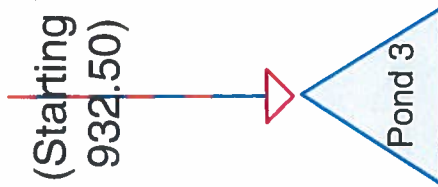
Pond 2 Includes
9.14-cfs of Inflow from
Pitts Pond
(2,100-GPM), Pitts
Quarry (1,000-GPM) &
Sed.Traps 6 & 7
(1,000-GPM)



Natural Drainage Area



Pond 2 (Starting W.S.E.
932.50)



Pond 3 (Starting W.S.E.
931.59)



Routing Diagram for Pond 2 & 3 Model_Proposed Conditions
Prepared by URS Corp., Printed 10/26/2012
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Pond 2 & 3 Model_Proposed Conditions*Type II 24-hr 10-yr Rainfall=4.80"*

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Page 1

Summary for Subcatchment Natural DA: Natural Drainage Area

Runoff = 776.08 cfs @ 12.07 hrs, Volume= 50.538 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.80"

Area (ac)	CN	Description
61.270	70	Woods, Good, HSG C
* 90.980	89	Mining Support Area
* 38.240	98	Imperv., Buildings, & Ponds
190.490	85	Weighted Average
152.250		79.93% Pervious Area
38.240		20.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

Pond 2 & 3 Model_Proposed Conditions

Type II 24-hr 10-yr Rainfall=4.80"

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Summary for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50)

Additional 9.14-cfs Inflow from Pitts Pond (2,100GPM), Pitts Quarry (1,000GPM), & Sed.Traps 6 & 7 (1,000GPM) Is Included

Inflow Area = 190.490 ac, 20.07% Impervious, Inflow Depth > 6.61" for 10-yr event
Inflow = 785.22 cfs @ 12.07 hrs, Volume= 104.933 af, Incl. 9.14 cfs Base Flow
Outflow = 612.18 cfs @ 12.16 hrs, Volume= 80.867 af, Atten= 22%, Lag= 5.2 min
Primary = 23.78 cfs @ 12.16 hrs, Volume= 42.856 af
Secondary = 588.39 cfs @ 12.16 hrs, Volume= 38.012 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Starting Elev= 932.50' Surf.Area= 0 sf Storage= 1,046,412 cf

Peak Elev= 943.77' @ 12.16 hrs Surf.Area= 0 sf Storage= 2,261,776 cf (1,215,364 cf above start)

Plug-Flow detention time= 1,548.6 min calculated for 56.841 af (54% of inflow)

Center-of-Mass det. time= 292.2 min (1,804.1 - 1,511.9)

Volume	Invert	Avail.Storage	Storage Description
#1	913.00'	2,535,411 cf	Custom Stage Data Listed below

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

Type II 24-hr 10-yr Rainfall=4.80"

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Elevation (feet)	Cum.Store (cubic-feet)
913.00	0
914.00	8,421
915.00	27,597
916.00	53,014
917.00	82,879
918.00	116,582
919.00	154,150
920.00	195,437
921.00	240,547
922.00	289,602
923.00	342,299
924.00	398,464
925.00	458,374
926.00	522,422
927.00	590,994
928.00	664,308
929.00	742,109
930.00	824,089
931.00	910,072
932.00	999,834
932.75	1,069,701
933.00	1,093,407
933.40	1,131,491
934.00	1,189,366
935.00	1,287,757
936.00	1,388,574
937.00	1,491,871
938.00	1,597,693
940.00	1,817,011
941.65	2,005,526
945.00	2,409,697
946.00	2,535,411

Device	Routing	Invert	Outlet Devices
#1	Primary	941.47'	8.0" Round Top of 8" Perf. Riser L= 82.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 930.18' S= 0.1377 ' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Primary	941.47'	8.0" Round Top of 8" Perf. Riser L= 80.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 930.47' S= 0.1375 ' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#3	Primary	941.47'	8.0" Round Top of 8" Perf. Riser L= 80.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 931.42' S= 0.1256 ' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#4	Primary	941.47'	8.0" Round Top of 8" Perf. Riser L= 80.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 930.70' S= 0.1346 ' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

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#5	Primary	941.47'	18.0" Round 18" Culvert L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 940.28' S= 0.0238 '/ Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#6	Primary	941.62'	18.0" Round 18" Culvert L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.62' / 940.20' S= 0.0284 '/ Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#7	Secondary	942.50'	80.0' long x 40.0' breadth 80' Emergency Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#8	Secondary	942.50'	25.0' long x 40.0' breadth 25' Emergency Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#9	Secondary	942.50'	50.0' long x 40.0' breadth 50' Emergency Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=23.78 cfs @ 12.16 hrs HW=943.77' TW=933.80' (Dynamic Tailwater)

- 1=Top of 8" Perf. Riser (Inlet Controls 1.86 cfs @ 5.33 fps)
- 2=Top of 8" Perf. Riser (Inlet Controls 1.86 cfs @ 5.33 fps)
- 3=Top of 8" Perf. Riser (Inlet Controls 1.86 cfs @ 5.33 fps)
- 4=Top of 8" Perf. Riser (Inlet Controls 1.86 cfs @ 5.33 fps)
- 5=18" Culvert (Inlet Controls 8.37 cfs @ 4.74 fps)
- 6=18" Culvert (Inlet Controls 7.96 cfs @ 4.50 fps)

Secondary OutFlow Max=587.64 cfs @ 12.16 hrs HW=943.77' TW=933.80' (Dynamic Tailwater)

- 7=80' Emergency Spillway (Weir Controls 303.30 cfs @ 2.98 fps)
- 8=25' Emergency Spillway (Weir Controls 94.78 cfs @ 2.98 fps)
- 9=50' Emergency Spillway (Weir Controls 189.56 cfs @ 2.98 fps)

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

Type II 24-hr 10-yr Rainfall=4.80"

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Hydrograph for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	9.14	1,046,577	932.50	0.00	0.00	0.00
0.20	9.14	1,053,157	932.57	0.00	0.00	0.00
0.40	9.14	1,059,738	932.64	0.00	0.00	0.00
0.60	9.14	1,066,319	932.71	0.00	0.00	0.00
0.80	9.14	1,072,900	932.78	0.00	0.00	0.00
1.00	9.14	1,079,481	932.85	0.00	0.00	0.00
1.20	9.14	1,086,061	932.92	0.00	0.00	0.00
1.40	9.14	1,092,642	932.99	0.00	0.00	0.00
1.60	9.14	1,099,223	933.06	0.00	0.00	0.00
1.80	9.14	1,105,804	933.13	0.00	0.00	0.00
2.00	9.14	1,112,385	933.20	0.00	0.00	0.00
2.20	9.14	1,118,965	933.27	0.00	0.00	0.00
2.40	9.14	1,125,546	933.34	0.00	0.00	0.00
2.60	9.14	1,132,127	933.41	0.00	0.00	0.00
2.80	9.14	1,138,708	933.47	0.00	0.00	0.00
3.00	9.14	1,145,289	933.54	0.00	0.00	0.00
3.20	9.14	1,151,869	933.61	0.00	0.00	0.00
3.40	9.14	1,158,450	933.68	0.00	0.00	0.00
3.60	9.14	1,165,031	933.75	0.00	0.00	0.00
3.80	9.14	1,171,612	933.82	0.00	0.00	0.00
4.00	9.14	1,178,193	933.88	0.00	0.00	0.00
4.20	9.14	1,184,773	933.95	0.00	0.00	0.00
4.40	9.14	1,191,354	934.02	0.00	0.00	0.00
4.60	9.14	1,197,935	934.09	0.00	0.00	0.00
4.80	9.14	1,204,516	934.15	0.00	0.00	0.00
5.00	9.14	1,211,097	934.22	0.00	0.00	0.00
5.20	9.14	1,217,677	934.29	0.00	0.00	0.00
5.40	9.14	1,224,258	934.35	0.00	0.00	0.00
5.60	9.14	1,230,839	934.42	0.00	0.00	0.00
5.80	9.16	1,237,422	934.49	0.00	0.00	0.00
6.00	9.36	1,244,079	934.56	0.00	0.00	0.00
6.20	9.66	1,250,925	934.63	0.00	0.00	0.00
6.40	9.98	1,257,997	934.70	0.00	0.00	0.00
6.60	10.32	1,265,307	934.77	0.00	0.00	0.00
6.80	10.67	1,272,862	934.85	0.00	0.00	0.00
7.00	11.03	1,280,672	934.93	0.00	0.00	0.00
7.20	11.39	1,288,742	935.01	0.00	0.00	0.00
7.40	11.77	1,297,082	935.09	0.00	0.00	0.00
7.60	12.16	1,305,696	935.18	0.00	0.00	0.00
7.80	12.55	1,314,592	935.27	0.00	0.00	0.00
8.00	12.96	1,323,777	935.36	0.00	0.00	0.00
8.20	13.41	1,333,261	935.45	0.00	0.00	0.00
8.40	14.10	1,343,155	935.55	0.00	0.00	0.00
8.60	14.93	1,353,603	935.65	0.00	0.00	0.00
8.80	15.86	1,364,686	935.76	0.00	0.00	0.00
9.00	16.87	1,376,468	935.88	0.00	0.00	0.00
9.20	17.90	1,389,001	936.00	0.00	0.00	0.00
9.40	18.61	1,402,164	936.13	0.00	0.00	0.00
9.60	19.20	1,415,781	936.26	0.00	0.00	0.00
9.80	20.22	1,429,925	936.40	0.00	0.00	0.00
10.00	21.82	1,445,048	936.55	0.00	0.00	0.00
10.20	23.72	1,461,425	936.71	0.00	0.00	0.00

Pond 2 & 3 Model_Proposed Conditions

Type II 24-hr 10-yr Rainfall=4.80"

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Hydrograph for Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
10.40	26.18	1,479,369	936.88	0.00	0.00	0.00
10.60	29.01	1,499,227	937.07	0.00	0.00	0.00
10.80	32.69	1,521,365	937.28	0.00	0.00	0.00
11.00	37.40	1,546,569	937.52	0.00	0.00	0.00
11.20	43.35	1,575,472	937.79	0.00	0.00	0.00
11.40	53.46	1,610,126	938.11	0.00	0.00	0.00
11.60	67.97	1,653,183	938.51	0.00	0.00	0.00
11.80	203.88	1,737,091	939.27	0.00	0.00	0.00
12.00	670.79	2,023,776	941.80	1.66	1.66	0.00
12.20	472.93	2,253,333	943.70	563.84	23.26	540.58
12.40	180.68	2,187,738	943.16	241.71	18.67	223.05
12.60	108.82	2,159,766	942.93	133.73	16.35	117.38
12.80	79.33	2,146,846	942.82	91.07	15.06	76.01
13.00	68.55	2,141,141	942.77	74.21	14.45	59.76
13.20	60.49	2,137,684	942.75	64.65	14.07	50.59
13.40	55.09	2,135,182	942.72	58.06	13.79	44.28
13.60	50.52	2,133,224	942.71	53.12	13.57	39.55
13.80	46.60	2,131,482	942.69	48.78	13.29	35.49
14.00	43.27	2,130,105	942.68	45.05	12.64	32.41
14.20	40.31	2,128,902	942.67	41.82	12.03	29.79
14.40	38.67	2,128,208	942.67	39.11	10.79	28.32
14.60	37.49	2,128,096	942.67	37.49	9.41	28.08
14.80	36.37	2,128,156	942.67	36.25	8.05	28.21
15.00	35.25	2,128,272	942.67	35.07	6.62	28.45
15.20	34.12	2,128,693	942.67	32.77	5.22	27.55
15.40	33.00	2,129,888	942.68	31.37	4.49	26.88
15.60	31.86	2,130,822	942.69	30.96	4.17	26.79
15.80	30.72	2,131,209	942.69	30.55	4.00	26.54
16.00	29.58	2,131,143	942.69	29.94	3.91	26.03
16.20	28.53	2,130,764	942.69	29.19	3.85	25.34
16.40	27.95	2,130,301	942.68	28.58	3.84	24.74
16.60	27.52	2,129,868	942.68	28.11	3.85	24.27
16.80	27.12	2,129,457	942.68	27.69	3.86	23.83
17.00	26.71	2,129,059	942.67	27.27	3.87	23.40
17.20	26.31	2,128,668	942.67	26.86	3.88	22.98
17.40	25.90	2,128,281	942.67	26.45	3.89	22.56
17.60	25.50	2,127,895	942.66	26.04	3.90	22.14
17.80	25.09	2,127,508	942.66	25.64	3.92	21.72
18.00	24.68	2,127,120	942.66	25.23	3.93	21.30
18.20	24.27	2,126,731	942.65	24.82	3.95	20.88
18.40	23.86	2,126,339	942.65	24.42	3.96	20.45
18.60	23.45	2,125,945	942.65	24.01	3.98	20.03
18.80	23.04	2,125,550	942.64	23.60	4.00	19.60
19.00	22.63	2,125,151	942.64	23.19	4.02	19.17
19.20	22.22	2,124,751	942.64	22.78	4.05	18.73
19.40	21.80	2,124,348	942.63	22.37	4.08	18.30
19.60	21.39	2,123,944	942.63	21.96	4.11	17.85
19.80	20.97	2,123,537	942.63	21.55	4.14	17.41
20.00	20.56	2,123,128	942.62	21.13	4.18	16.96
20.20	20.19	2,122,723	942.62	20.73	4.22	16.51
20.40	20.02	2,122,381	942.62	20.44	4.27	16.16
20.60	19.93	2,122,122	942.62	20.25	4.34	15.92

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

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Hydrograph for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
20.80	19.85	2,121,916	942.61	20.12	4.40	15.72
21.00	19.77	2,121,742	942.61	20.00	4.45	15.55
21.20	19.69	2,121,590	942.61	19.89	4.50	15.39
21.40	19.61	2,121,455	942.61	19.79	4.55	15.24
21.60	19.53	2,121,334	942.61	19.69	4.59	15.10
21.80	19.45	2,121,224	942.61	19.60	4.64	14.96
22.00	19.37	2,121,131	942.61	19.48	4.70	14.78
22.20	19.29	2,121,049	942.61	19.41	4.76	14.65
22.40	19.20	2,120,964	942.61	19.33	4.83	14.50
22.60	19.12	2,120,876	942.61	19.25	4.90	14.35
22.80	19.04	2,120,786	942.61	19.17	4.97	14.20
23.00	18.96	2,120,693	942.60	19.10	5.05	14.05
23.20	18.88	2,120,598	942.60	19.02	5.13	13.89
23.40	18.80	2,120,501	942.60	18.94	5.21	13.73
23.60	18.72	2,120,403	942.60	18.86	5.29	13.56
23.80	18.63	2,120,303	942.60	18.78	5.38	13.40
24.00	18.55	2,120,202	942.60	18.70	5.47	13.23
24.20	14.29	2,119,439	942.59	17.45	5.45	12.01
24.40	9.87	2,116,683	942.57	13.28	5.36	7.91
24.60	9.23	2,114,802	942.56	11.19	5.72	5.47
24.80	9.14	2,113,677	942.55	10.41	6.25	4.15
25.00	9.14	2,112,892	942.54	10.10	6.78	3.31
25.20	9.14	2,112,262	942.53	9.95	7.27	2.68
25.40	9.14	2,111,710	942.53	9.87	7.70	2.17
25.60	9.14	2,111,206	942.53	9.82	8.08	1.74
25.80	9.14	2,110,734	942.52	9.78	8.42	1.36
26.00	9.14	2,110,285	942.52	9.75	8.72	1.03
26.20	9.14	2,109,852	942.51	9.73	8.99	0.74
26.40	9.14	2,109,429	942.51	9.72	9.23	0.49
26.60	9.14	2,109,006	942.51	9.74	9.44	0.30
26.80	9.14	2,108,571	942.50	9.75	9.63	0.12
27.00	9.14	2,108,127	942.50	9.76	9.76	0.01
27.20	9.14	2,107,650	942.50	9.84	9.84	0.00
27.40	9.14	2,107,130	942.49	9.87	9.87	0.00
27.60	9.14	2,106,603	942.49	9.87	9.87	0.00
27.80	9.14	2,106,074	942.48	9.88	9.88	0.00
28.00	9.14	2,105,544	942.48	9.88	9.88	0.00
28.20	9.14	2,105,015	942.47	9.87	9.87	0.00
28.40	9.14	2,104,490	942.47	9.86	9.86	0.00
28.60	9.14	2,103,974	942.47	9.85	9.85	0.00
28.80	9.14	2,103,468	942.46	9.84	9.84	0.00
29.00	9.14	2,102,972	942.46	9.82	9.82	0.00
29.20	9.14	2,102,488	942.45	9.80	9.80	0.00
29.40	9.14	2,102,015	942.45	9.79	9.79	0.00
29.60	9.14	2,101,556	942.45	9.77	9.77	0.00
29.80	9.14	2,101,108	942.44	9.75	9.75	0.00
30.00	9.14	2,100,674	942.44	9.73	9.73	0.00
30.20	9.14	2,100,252	942.44	9.72	9.72	0.00
30.40	9.14	2,099,845	942.43	9.69	9.69	0.00
30.60	9.14	2,099,457	942.43	9.66	9.66	0.00
30.80	9.14	2,099,091	942.43	9.63	9.63	0.00
31.00	9.14	2,098,748	942.42	9.60	9.60	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

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Hydrograph for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
31.20	9.14	2,098,428	942.42	9.57	9.57	0.00
31.40	9.14	2,098,132	942.42	9.53	9.53	0.00
31.60	9.14	2,097,860	942.42	9.50	9.50	0.00
31.80	9.14	2,097,609	942.41	9.47	9.47	0.00
32.00	9.14	2,097,378	942.41	9.45	9.45	0.00
32.20	9.14	2,097,165	942.41	9.42	9.42	0.00
32.40	9.14	2,096,970	942.41	9.40	9.40	0.00
32.60	9.14	2,096,789	942.41	9.38	9.38	0.00
32.80	9.14	2,096,623	942.41	9.36	9.36	0.00
33.00	9.14	2,096,471	942.40	9.34	9.34	0.00
33.20	9.14	2,096,330	942.40	9.33	9.33	0.00
33.40	9.14	2,096,201	942.40	9.31	9.31	0.00
33.60	9.14	2,096,082	942.40	9.30	9.30	0.00
33.80	9.14	2,095,972	942.40	9.29	9.29	0.00
34.00	9.14	2,095,871	942.40	9.27	9.27	0.00
34.20	9.14	2,095,778	942.40	9.26	9.26	0.00
34.40	9.14	2,095,692	942.40	9.25	9.25	0.00
34.60	9.14	2,095,613	942.40	9.25	9.25	0.00
34.80	9.14	2,095,541	942.40	9.24	9.24	0.00
35.00	9.14	2,095,474	942.40	9.23	9.23	0.00
35.20	9.14	2,095,412	942.40	9.22	9.22	0.00
35.40	9.14	2,095,356	942.39	9.22	9.22	0.00
35.60	9.14	2,095,304	942.39	9.21	9.21	0.00
35.80	9.14	2,095,256	942.39	9.20	9.20	0.00
36.00	9.14	2,095,211	942.39	9.20	9.20	0.00
36.20	9.14	2,095,171	942.39	9.19	9.19	0.00
36.40	9.14	2,095,133	942.39	9.19	9.19	0.00
36.60	9.14	2,095,099	942.39	9.19	9.19	0.00
36.80	9.14	2,095,067	942.39	9.18	9.18	0.00
37.00	9.14	2,095,038	942.39	9.18	9.18	0.00
37.20	9.14	2,095,011	942.39	9.18	9.18	0.00
37.40	9.14	2,094,986	942.39	9.17	9.17	0.00
37.60	9.14	2,094,963	942.39	9.17	9.17	0.00
37.80	9.14	2,094,942	942.39	9.17	9.17	0.00
38.00	9.14	2,094,923	942.39	9.17	9.17	0.00
38.20	9.14	2,094,905	942.39	9.16	9.16	0.00
38.40	9.14	2,094,889	942.39	9.16	9.16	0.00
38.60	9.14	2,094,874	942.39	9.16	9.16	0.00
38.80	9.14	2,094,860	942.39	9.16	9.16	0.00
39.00	9.14	2,094,847	942.39	9.16	9.16	0.00
39.20	9.14	2,094,835	942.39	9.16	9.16	0.00
39.40	9.14	2,094,824	942.39	9.15	9.15	0.00
39.60	9.14	2,094,814	942.39	9.15	9.15	0.00
39.80	9.14	2,094,805	942.39	9.15	9.15	0.00
40.00	9.14	2,094,797	942.39	9.15	9.15	0.00
40.20	9.14	2,094,789	942.39	9.15	9.15	0.00
40.40	9.14	2,094,782	942.39	9.15	9.15	0.00
40.60	9.14	2,094,775	942.39	9.15	9.15	0.00
40.80	9.14	2,094,769	942.39	9.15	9.15	0.00
41.00	9.14	2,094,764	942.39	9.15	9.15	0.00
41.20	9.14	2,094,758	942.39	9.15	9.15	0.00
41.40	9.14	2,094,754	942.39	9.15	9.15	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Hydrograph for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
41.60	9.14	2,094,749	942.39	9.15	9.15	0.00
41.80	9.14	2,094,745	942.39	9.15	9.15	0.00
42.00	9.14	2,094,742	942.39	9.14	9.14	0.00
42.20	9.14	2,094,738	942.39	9.14	9.14	0.00
42.40	9.14	2,094,735	942.39	9.14	9.14	0.00
42.60	9.14	2,094,732	942.39	9.14	9.14	0.00
42.80	9.14	2,094,730	942.39	9.14	9.14	0.00
43.00	9.14	2,094,727	942.39	9.14	9.14	0.00
43.20	9.14	2,094,725	942.39	9.14	9.14	0.00
43.40	9.14	2,094,723	942.39	9.14	9.14	0.00
43.60	9.14	2,094,721	942.39	9.14	9.14	0.00
43.80	9.14	2,094,719	942.39	9.14	9.14	0.00
44.00	9.14	2,094,717	942.39	9.14	9.14	0.00
44.20	9.14	2,094,716	942.39	9.14	9.14	0.00
44.40	9.14	2,094,715	942.39	9.14	9.14	0.00
44.60	9.14	2,094,713	942.39	9.14	9.14	0.00
44.80	9.14	2,094,712	942.39	9.14	9.14	0.00
45.00	9.14	2,094,711	942.39	9.14	9.14	0.00
45.20	9.14	2,094,710	942.39	9.14	9.14	0.00
45.40	9.14	2,094,709	942.39	9.14	9.14	0.00
45.60	9.14	2,094,708	942.39	9.14	9.14	0.00
45.80	9.14	2,094,708	942.39	9.14	9.14	0.00
46.00	9.14	2,094,707	942.39	9.14	9.14	0.00
46.20	9.14	2,094,706	942.39	9.14	9.14	0.00
46.40	9.14	2,094,706	942.39	9.14	9.14	0.00
46.60	9.14	2,094,705	942.39	9.14	9.14	0.00
46.80	9.14	2,094,705	942.39	9.14	9.14	0.00
47.00	9.14	2,094,704	942.39	9.14	9.14	0.00
47.20	9.14	2,094,704	942.39	9.14	9.14	0.00
47.40	9.14	2,094,703	942.39	9.14	9.14	0.00
47.60	9.14	2,094,703	942.39	9.14	9.14	0.00
47.80	9.14	2,094,703	942.39	9.14	9.14	0.00
48.00	9.14	2,094,702	942.39	9.14	9.14	0.00
48.20	9.14	2,094,702	942.39	9.14	9.14	0.00
48.40	9.14	2,094,702	942.39	9.14	9.14	0.00
48.60	9.14	2,094,701	942.39	9.14	9.14	0.00
48.80	9.14	2,094,701	942.39	9.14	9.14	0.00
49.00	9.14	2,094,701	942.39	9.14	9.14	0.00
49.20	9.14	2,094,701	942.39	9.14	9.14	0.00
49.40	9.14	2,094,701	942.39	9.14	9.14	0.00
49.60	9.14	2,094,701	942.39	9.14	9.14	0.00
49.80	9.14	2,094,700	942.39	9.14	9.14	0.00
50.00	9.14	2,094,700	942.39	9.14	9.14	0.00
50.20	9.14	2,094,700	942.39	9.14	9.14	0.00
50.40	9.14	2,094,700	942.39	9.14	9.14	0.00
50.60	9.14	2,094,700	942.39	9.14	9.14	0.00
50.80	9.14	2,094,700	942.39	9.14	9.14	0.00
51.00	9.14	2,094,700	942.39	9.14	9.14	0.00
51.20	9.14	2,094,700	942.39	9.14	9.14	0.00
51.40	9.14	2,094,700	942.39	9.14	9.14	0.00
51.60	9.14	2,094,699	942.39	9.14	9.14	0.00
51.80	9.14	2,094,699	942.39	9.14	9.14	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Hydrograph for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
52.00	9.14	2,094,699	942.39	9.14	9.14	0.00
52.20	9.14	2,094,699	942.39	9.14	9.14	0.00
52.40	9.14	2,094,699	942.39	9.14	9.14	0.00
52.60	9.14	2,094,699	942.39	9.14	9.14	0.00
52.80	9.14	2,094,699	942.39	9.14	9.14	0.00
53.00	9.14	2,094,699	942.39	9.14	9.14	0.00
53.20	9.14	2,094,699	942.39	9.14	9.14	0.00
53.40	9.14	2,094,699	942.39	9.14	9.14	0.00
53.60	9.14	2,094,699	942.39	9.14	9.14	0.00
53.80	9.14	2,094,699	942.39	9.14	9.14	0.00
54.00	9.14	2,094,699	942.39	9.14	9.14	0.00
54.20	9.14	2,094,699	942.39	9.14	9.14	0.00
54.40	9.14	2,094,699	942.39	9.14	9.14	0.00
54.60	9.14	2,094,699	942.39	9.14	9.14	0.00
54.80	9.14	2,094,699	942.39	9.14	9.14	0.00
55.00	9.14	2,094,699	942.39	9.14	9.14	0.00
55.20	9.14	2,094,699	942.39	9.14	9.14	0.00
55.40	9.14	2,094,699	942.39	9.14	9.14	0.00
55.60	9.14	2,094,699	942.39	9.14	9.14	0.00
55.80	9.14	2,094,699	942.39	9.14	9.14	0.00
56.00	9.14	2,094,699	942.39	9.14	9.14	0.00
56.20	9.14	2,094,699	942.39	9.14	9.14	0.00
56.40	9.14	2,094,699	942.39	9.14	9.14	0.00
56.60	9.14	2,094,699	942.39	9.14	9.14	0.00
56.80	9.14	2,094,699	942.39	9.14	9.14	0.00
57.00	9.14	2,094,699	942.39	9.14	9.14	0.00
57.20	9.14	2,094,699	942.39	9.14	9.14	0.00
57.40	9.14	2,094,699	942.39	9.14	9.14	0.00
57.60	9.14	2,094,699	942.39	9.14	9.14	0.00
57.80	9.14	2,094,699	942.39	9.14	9.14	0.00
58.00	9.14	2,094,699	942.39	9.14	9.14	0.00
58.20	9.14	2,094,699	942.39	9.14	9.14	0.00
58.40	9.14	2,094,699	942.39	9.14	9.14	0.00
58.60	9.14	2,094,699	942.39	9.14	9.14	0.00
58.80	9.14	2,094,699	942.39	9.14	9.14	0.00
59.00	9.14	2,094,699	942.39	9.14	9.14	0.00
59.20	9.14	2,094,699	942.39	9.14	9.14	0.00
59.40	9.14	2,094,699	942.39	9.14	9.14	0.00
59.60	9.14	2,094,699	942.39	9.14	9.14	0.00
59.80	9.14	2,094,699	942.39	9.14	9.14	0.00
60.00	9.14	2,094,699	942.39	9.14	9.14	0.00
60.20	9.14	2,094,699	942.39	9.14	9.14	0.00
60.40	9.14	2,094,699	942.39	9.14	9.14	0.00
60.60	9.14	2,094,699	942.39	9.14	9.14	0.00
60.80	9.14	2,094,699	942.39	9.14	9.14	0.00
61.00	9.14	2,094,699	942.39	9.14	9.14	0.00
61.20	9.14	2,094,699	942.39	9.14	9.14	0.00
61.40	9.14	2,094,699	942.39	9.14	9.14	0.00
61.60	9.14	2,094,699	942.39	9.14	9.14	0.00
61.80	9.14	2,094,699	942.39	9.14	9.14	0.00
62.00	9.14	2,094,699	942.39	9.14	9.14	0.00
62.20	9.14	2,094,699	942.39	9.14	9.14	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

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Hydrograph for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
62.40	9.14	2,094,699	942.39	9.14	9.14	0.00
62.60	9.14	2,094,699	942.39	9.14	9.14	0.00
62.80	9.14	2,094,699	942.39	9.14	9.14	0.00
63.00	9.14	2,094,699	942.39	9.14	9.14	0.00
63.20	9.14	2,094,699	942.39	9.14	9.14	0.00
63.40	9.14	2,094,699	942.39	9.14	9.14	0.00
63.60	9.14	2,094,699	942.39	9.14	9.14	0.00
63.80	9.14	2,094,699	942.39	9.14	9.14	0.00
64.00	9.14	2,094,699	942.39	9.14	9.14	0.00
64.20	9.14	2,094,699	942.39	9.14	9.14	0.00
64.40	9.14	2,094,699	942.39	9.14	9.14	0.00
64.60	9.14	2,094,699	942.39	9.14	9.14	0.00
64.80	9.14	2,094,699	942.39	9.14	9.14	0.00
65.00	9.14	2,094,699	942.39	9.14	9.14	0.00
65.20	9.14	2,094,699	942.39	9.14	9.14	0.00
65.40	9.14	2,094,699	942.39	9.14	9.14	0.00
65.60	9.14	2,094,699	942.39	9.14	9.14	0.00
65.80	9.14	2,094,699	942.39	9.14	9.14	0.00
66.00	9.14	2,094,699	942.39	9.14	9.14	0.00
66.20	9.14	2,094,699	942.39	9.14	9.14	0.00
66.40	9.14	2,094,699	942.39	9.14	9.14	0.00
66.60	9.14	2,094,699	942.39	9.14	9.14	0.00
66.80	9.14	2,094,699	942.39	9.14	9.14	0.00
67.00	9.14	2,094,699	942.39	9.14	9.14	0.00
67.20	9.14	2,094,699	942.39	9.14	9.14	0.00
67.40	9.14	2,094,699	942.39	9.14	9.14	0.00
67.60	9.14	2,094,699	942.39	9.14	9.14	0.00
67.80	9.14	2,094,699	942.39	9.14	9.14	0.00
68.00	9.14	2,094,699	942.39	9.14	9.14	0.00
68.20	9.14	2,094,699	942.39	9.14	9.14	0.00
68.40	9.14	2,094,699	942.39	9.14	9.14	0.00
68.60	9.14	2,094,699	942.39	9.14	9.14	0.00
68.80	9.14	2,094,699	942.39	9.14	9.14	0.00
69.00	9.14	2,094,699	942.39	9.14	9.14	0.00
69.20	9.14	2,094,699	942.39	9.14	9.14	0.00
69.40	9.14	2,094,699	942.39	9.14	9.14	0.00
69.60	9.14	2,094,699	942.39	9.14	9.14	0.00
69.80	9.14	2,094,699	942.39	9.14	9.14	0.00
70.00	9.14	2,094,699	942.39	9.14	9.14	0.00
70.20	9.14	2,094,699	942.39	9.14	9.14	0.00
70.40	9.14	2,094,699	942.39	9.14	9.14	0.00
70.60	9.14	2,094,699	942.39	9.14	9.14	0.00
70.80	9.14	2,094,699	942.39	9.14	9.14	0.00
71.00	9.14	2,094,699	942.39	9.14	9.14	0.00
71.20	9.14	2,094,699	942.39	9.14	9.14	0.00
71.40	9.14	2,094,699	942.39	9.14	9.14	0.00
71.60	9.14	2,094,699	942.39	9.14	9.14	0.00
71.80	9.14	2,094,699	942.39	9.14	9.14	0.00
72.00	9.14	2,094,699	942.39	9.14	9.14	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

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Stage-Discharge for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
913.00	0.00	0.00	0.00	916.64	0.00	0.00	0.00
913.07	0.00	0.00	0.00	916.71	0.00	0.00	0.00
913.14	0.00	0.00	0.00	916.78	0.00	0.00	0.00
913.21	0.00	0.00	0.00	916.85	0.00	0.00	0.00
913.28	0.00	0.00	0.00	916.92	0.00	0.00	0.00
913.35	0.00	0.00	0.00	916.99	0.00	0.00	0.00
913.42	0.00	0.00	0.00	917.06	0.00	0.00	0.00
913.49	0.00	0.00	0.00	917.13	0.00	0.00	0.00
913.56	0.00	0.00	0.00	917.20	0.00	0.00	0.00
913.63	0.00	0.00	0.00	917.27	0.00	0.00	0.00
913.70	0.00	0.00	0.00	917.34	0.00	0.00	0.00
913.77	0.00	0.00	0.00	917.41	0.00	0.00	0.00
913.84	0.00	0.00	0.00	917.48	0.00	0.00	0.00
913.91	0.00	0.00	0.00	917.55	0.00	0.00	0.00
913.98	0.00	0.00	0.00	917.62	0.00	0.00	0.00
914.05	0.00	0.00	0.00	917.69	0.00	0.00	0.00
914.12	0.00	0.00	0.00	917.76	0.00	0.00	0.00
914.19	0.00	0.00	0.00	917.83	0.00	0.00	0.00
914.26	0.00	0.00	0.00	917.90	0.00	0.00	0.00
914.33	0.00	0.00	0.00	917.97	0.00	0.00	0.00
914.40	0.00	0.00	0.00	918.04	0.00	0.00	0.00
914.47	0.00	0.00	0.00	918.11	0.00	0.00	0.00
914.54	0.00	0.00	0.00	918.18	0.00	0.00	0.00
914.61	0.00	0.00	0.00	918.25	0.00	0.00	0.00
914.68	0.00	0.00	0.00	918.32	0.00	0.00	0.00
914.75	0.00	0.00	0.00	918.39	0.00	0.00	0.00
914.82	0.00	0.00	0.00	918.46	0.00	0.00	0.00
914.89	0.00	0.00	0.00	918.53	0.00	0.00	0.00
914.96	0.00	0.00	0.00	918.60	0.00	0.00	0.00
915.03	0.00	0.00	0.00	918.67	0.00	0.00	0.00
915.10	0.00	0.00	0.00	918.74	0.00	0.00	0.00
915.17	0.00	0.00	0.00	918.81	0.00	0.00	0.00
915.24	0.00	0.00	0.00	918.88	0.00	0.00	0.00
915.31	0.00	0.00	0.00	918.95	0.00	0.00	0.00
915.38	0.00	0.00	0.00	919.02	0.00	0.00	0.00
915.45	0.00	0.00	0.00	919.09	0.00	0.00	0.00
915.52	0.00	0.00	0.00	919.16	0.00	0.00	0.00
915.59	0.00	0.00	0.00	919.23	0.00	0.00	0.00
915.66	0.00	0.00	0.00	919.30	0.00	0.00	0.00
915.73	0.00	0.00	0.00	919.37	0.00	0.00	0.00
915.80	0.00	0.00	0.00	919.44	0.00	0.00	0.00
915.87	0.00	0.00	0.00	919.51	0.00	0.00	0.00
915.94	0.00	0.00	0.00	919.58	0.00	0.00	0.00
916.01	0.00	0.00	0.00	919.65	0.00	0.00	0.00
916.08	0.00	0.00	0.00	919.72	0.00	0.00	0.00
916.15	0.00	0.00	0.00	919.79	0.00	0.00	0.00
916.22	0.00	0.00	0.00	919.86	0.00	0.00	0.00
916.29	0.00	0.00	0.00	919.93	0.00	0.00	0.00
916.36	0.00	0.00	0.00	920.00	0.00	0.00	0.00
916.43	0.00	0.00	0.00	920.07	0.00	0.00	0.00
916.50	0.00	0.00	0.00	920.14	0.00	0.00	0.00
916.57	0.00	0.00	0.00	920.21	0.00	0.00	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

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Stage-Discharge for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
920.28	0.00	0.00	0.00	923.92	0.00	0.00	0.00
920.35	0.00	0.00	0.00	923.99	0.00	0.00	0.00
920.42	0.00	0.00	0.00	924.06	0.00	0.00	0.00
920.49	0.00	0.00	0.00	924.13	0.00	0.00	0.00
920.56	0.00	0.00	0.00	924.20	0.00	0.00	0.00
920.63	0.00	0.00	0.00	924.27	0.00	0.00	0.00
920.70	0.00	0.00	0.00	924.34	0.00	0.00	0.00
920.77	0.00	0.00	0.00	924.41	0.00	0.00	0.00
920.84	0.00	0.00	0.00	924.48	0.00	0.00	0.00
920.91	0.00	0.00	0.00	924.55	0.00	0.00	0.00
920.98	0.00	0.00	0.00	924.62	0.00	0.00	0.00
921.05	0.00	0.00	0.00	924.69	0.00	0.00	0.00
921.12	0.00	0.00	0.00	924.76	0.00	0.00	0.00
921.19	0.00	0.00	0.00	924.83	0.00	0.00	0.00
921.26	0.00	0.00	0.00	924.90	0.00	0.00	0.00
921.33	0.00	0.00	0.00	924.97	0.00	0.00	0.00
921.40	0.00	0.00	0.00	925.04	0.00	0.00	0.00
921.47	0.00	0.00	0.00	925.11	0.00	0.00	0.00
921.54	0.00	0.00	0.00	925.18	0.00	0.00	0.00
921.61	0.00	0.00	0.00	925.25	0.00	0.00	0.00
921.68	0.00	0.00	0.00	925.32	0.00	0.00	0.00
921.75	0.00	0.00	0.00	925.39	0.00	0.00	0.00
921.82	0.00	0.00	0.00	925.46	0.00	0.00	0.00
921.89	0.00	0.00	0.00	925.53	0.00	0.00	0.00
921.96	0.00	0.00	0.00	925.60	0.00	0.00	0.00
922.03	0.00	0.00	0.00	925.67	0.00	0.00	0.00
922.10	0.00	0.00	0.00	925.74	0.00	0.00	0.00
922.17	0.00	0.00	0.00	925.81	0.00	0.00	0.00
922.24	0.00	0.00	0.00	925.88	0.00	0.00	0.00
922.31	0.00	0.00	0.00	925.95	0.00	0.00	0.00
922.38	0.00	0.00	0.00	926.02	0.00	0.00	0.00
922.45	0.00	0.00	0.00	926.09	0.00	0.00	0.00
922.52	0.00	0.00	0.00	926.16	0.00	0.00	0.00
922.59	0.00	0.00	0.00	926.23	0.00	0.00	0.00
922.66	0.00	0.00	0.00	926.30	0.00	0.00	0.00
922.73	0.00	0.00	0.00	926.37	0.00	0.00	0.00
922.80	0.00	0.00	0.00	926.44	0.00	0.00	0.00
922.87	0.00	0.00	0.00	926.51	0.00	0.00	0.00
922.94	0.00	0.00	0.00	926.58	0.00	0.00	0.00
923.01	0.00	0.00	0.00	926.65	0.00	0.00	0.00
923.08	0.00	0.00	0.00	926.72	0.00	0.00	0.00
923.15	0.00	0.00	0.00	926.79	0.00	0.00	0.00
923.22	0.00	0.00	0.00	926.86	0.00	0.00	0.00
923.29	0.00	0.00	0.00	926.93	0.00	0.00	0.00
923.36	0.00	0.00	0.00	927.00	0.00	0.00	0.00
923.43	0.00	0.00	0.00	927.07	0.00	0.00	0.00
923.50	0.00	0.00	0.00	927.14	0.00	0.00	0.00
923.57	0.00	0.00	0.00	927.21	0.00	0.00	0.00
923.64	0.00	0.00	0.00	927.28	0.00	0.00	0.00
923.71	0.00	0.00	0.00	927.35	0.00	0.00	0.00
923.78	0.00	0.00	0.00	927.42	0.00	0.00	0.00
923.85	0.00	0.00	0.00	927.49	0.00	0.00	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

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Stage-Discharge for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
927.56	0.00	0.00	0.00	931.20	0.00	0.00	0.00
927.63	0.00	0.00	0.00	931.27	0.00	0.00	0.00
927.70	0.00	0.00	0.00	931.34	0.00	0.00	0.00
927.77	0.00	0.00	0.00	931.41	0.00	0.00	0.00
927.84	0.00	0.00	0.00	931.48	0.00	0.00	0.00
927.91	0.00	0.00	0.00	931.55	0.00	0.00	0.00
927.98	0.00	0.00	0.00	931.62	0.00	0.00	0.00
928.05	0.00	0.00	0.00	931.69	0.00	0.00	0.00
928.12	0.00	0.00	0.00	931.76	0.00	0.00	0.00
928.19	0.00	0.00	0.00	931.83	0.00	0.00	0.00
928.26	0.00	0.00	0.00	931.90	0.00	0.00	0.00
928.33	0.00	0.00	0.00	931.97	0.00	0.00	0.00
928.40	0.00	0.00	0.00	932.04	0.00	0.00	0.00
928.47	0.00	0.00	0.00	932.11	0.00	0.00	0.00
928.54	0.00	0.00	0.00	932.18	0.00	0.00	0.00
928.61	0.00	0.00	0.00	932.25	0.00	0.00	0.00
928.68	0.00	0.00	0.00	932.32	0.00	0.00	0.00
928.75	0.00	0.00	0.00	932.39	0.00	0.00	0.00
928.82	0.00	0.00	0.00	932.46	0.00	0.00	0.00
928.89	0.00	0.00	0.00	932.53	0.00	0.00	0.00
928.96	0.00	0.00	0.00	932.60	0.00	0.00	0.00
929.03	0.00	0.00	0.00	932.67	0.00	0.00	0.00
929.10	0.00	0.00	0.00	932.74	0.00	0.00	0.00
929.17	0.00	0.00	0.00	932.81	0.00	0.00	0.00
929.24	0.00	0.00	0.00	932.88	0.00	0.00	0.00
929.31	0.00	0.00	0.00	932.95	0.00	0.00	0.00
929.38	0.00	0.00	0.00	933.02	0.00	0.00	0.00
929.45	0.00	0.00	0.00	933.09	0.00	0.00	0.00
929.52	0.00	0.00	0.00	933.16	0.00	0.00	0.00
929.59	0.00	0.00	0.00	933.23	0.00	0.00	0.00
929.66	0.00	0.00	0.00	933.30	0.00	0.00	0.00
929.73	0.00	0.00	0.00	933.37	0.00	0.00	0.00
929.80	0.00	0.00	0.00	933.44	0.00	0.00	0.00
929.87	0.00	0.00	0.00	933.51	0.00	0.00	0.00
929.94	0.00	0.00	0.00	933.58	0.00	0.00	0.00
930.01	0.00	0.00	0.00	933.65	0.00	0.00	0.00
930.08	0.00	0.00	0.00	933.72	0.00	0.00	0.00
930.15	0.00	0.00	0.00	933.79	0.00	0.00	0.00
930.22	0.00	0.00	0.00	933.86	0.00	0.00	0.00
930.29	0.00	0.00	0.00	933.93	0.00	0.00	0.00
930.36	0.00	0.00	0.00	934.00	0.00	0.00	0.00
930.43	0.00	0.00	0.00	934.07	0.00	0.00	0.00
930.50	0.00	0.00	0.00	934.14	0.00	0.00	0.00
930.57	0.00	0.00	0.00	934.21	0.00	0.00	0.00
930.64	0.00	0.00	0.00	934.28	0.00	0.00	0.00
930.71	0.00	0.00	0.00	934.35	0.00	0.00	0.00
930.78	0.00	0.00	0.00	934.42	0.00	0.00	0.00
930.85	0.00	0.00	0.00	934.49	0.00	0.00	0.00
930.92	0.00	0.00	0.00	934.56	0.00	0.00	0.00
930.99	0.00	0.00	0.00	934.63	0.00	0.00	0.00
931.06	0.00	0.00	0.00	934.70	0.00	0.00	0.00
931.13	0.00	0.00	0.00	934.77	0.00	0.00	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

Type II 24-hr 10-yr Rainfall=4.80"

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Stage-Discharge for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
934.84	0.00	0.00	0.00	938.48	0.00	0.00	0.00
934.91	0.00	0.00	0.00	938.55	0.00	0.00	0.00
934.98	0.00	0.00	0.00	938.62	0.00	0.00	0.00
935.05	0.00	0.00	0.00	938.69	0.00	0.00	0.00
935.12	0.00	0.00	0.00	938.76	0.00	0.00	0.00
935.19	0.00	0.00	0.00	938.83	0.00	0.00	0.00
935.26	0.00	0.00	0.00	938.90	0.00	0.00	0.00
935.33	0.00	0.00	0.00	938.97	0.00	0.00	0.00
935.40	0.00	0.00	0.00	939.04	0.00	0.00	0.00
935.47	0.00	0.00	0.00	939.11	0.00	0.00	0.00
935.54	0.00	0.00	0.00	939.18	0.00	0.00	0.00
935.61	0.00	0.00	0.00	939.25	0.00	0.00	0.00
935.68	0.00	0.00	0.00	939.32	0.00	0.00	0.00
935.75	0.00	0.00	0.00	939.39	0.00	0.00	0.00
935.82	0.00	0.00	0.00	939.46	0.00	0.00	0.00
935.89	0.00	0.00	0.00	939.53	0.00	0.00	0.00
935.96	0.00	0.00	0.00	939.60	0.00	0.00	0.00
936.03	0.00	0.00	0.00	939.67	0.00	0.00	0.00
936.10	0.00	0.00	0.00	939.74	0.00	0.00	0.00
936.17	0.00	0.00	0.00	939.81	0.00	0.00	0.00
936.24	0.00	0.00	0.00	939.88	0.00	0.00	0.00
936.31	0.00	0.00	0.00	939.95	0.00	0.00	0.00
936.38	0.00	0.00	0.00	940.02	0.00	0.00	0.00
936.45	0.00	0.00	0.00	940.09	0.00	0.00	0.00
936.52	0.00	0.00	0.00	940.16	0.00	0.00	0.00
936.59	0.00	0.00	0.00	940.23	0.00	0.00	0.00
936.66	0.00	0.00	0.00	940.30	0.00	0.00	0.00
936.73	0.00	0.00	0.00	940.37	0.00	0.00	0.00
936.80	0.00	0.00	0.00	940.44	0.00	0.00	0.00
936.87	0.00	0.00	0.00	940.51	0.00	0.00	0.00
936.94	0.00	0.00	0.00	940.58	0.00	0.00	0.00
937.01	0.00	0.00	0.00	940.65	0.00	0.00	0.00
937.08	0.00	0.00	0.00	940.72	0.00	0.00	0.00
937.15	0.00	0.00	0.00	940.79	0.00	0.00	0.00
937.22	0.00	0.00	0.00	940.86	0.00	0.00	0.00
937.29	0.00	0.00	0.00	940.93	0.00	0.00	0.00
937.36	0.00	0.00	0.00	941.00	0.00	0.00	0.00
937.43	0.00	0.00	0.00	941.07	0.00	0.00	0.00
937.50	0.00	0.00	0.00	941.14	0.00	0.00	0.00
937.57	0.00	0.00	0.00	941.21	0.00	0.00	0.00
937.64	0.00	0.00	0.00	941.28	0.00	0.00	0.00
937.71	0.00	0.00	0.00	941.35	0.00	0.00	0.00
937.78	0.00	0.00	0.00	941.42	0.00	0.00	0.00
937.85	0.00	0.00	0.00	941.49	0.01	0.01	0.00
937.92	0.00	0.00	0.00	941.56	0.13	0.13	0.00
937.99	0.00	0.00	0.00	941.63	0.39	0.39	0.00
938.06	0.00	0.00	0.00	941.70	0.80	0.80	0.00
938.13	0.00	0.00	0.00	941.77	1.36	1.36	0.00
938.20	0.00	0.00	0.00	941.84	2.06	2.06	0.00
938.27	0.00	0.00	0.00	941.91	2.86	2.86	0.00
938.34	0.00	0.00	0.00	941.98	3.74	3.74	0.00
938.41	0.00	0.00	0.00	942.05	4.67	4.67	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

Type II 24-hr 10-yr Rainfall=4.80"

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Stage-Discharge for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
942.12	5.58	5.58	0.00	945.76	2,435.03	35.56	2,399.46
942.19	6.46	6.46	0.00	945.83	2,513.07	35.91	2,477.16
942.26	7.39	7.39	0.00	945.90	2,591.93	36.25	2,555.68
942.33	8.33	8.33	0.00	945.97	2,671.59	36.59	2,635.01
942.40	9.29	9.29	0.00				
942.47	10.26	10.26	0.00				
942.54	14.56	11.23	3.32				
942.61	27.37	12.21	15.15				
942.68	44.90	13.18	31.72				
942.75	66.15	14.13	52.02				
942.82	90.58	15.05	75.53				
942.89	117.80	15.91	101.89				
942.96	147.25	16.68	130.57				
943.03	178.90	17.43	161.48				
943.10	212.61	18.11	194.50				
943.17	246.49	18.76	227.73				
943.24	281.67	19.41	262.26				
943.31	318.29	20.04	298.25				
943.38	357.94	20.65	337.29				
943.45	399.06	21.24	377.82				
943.52	441.92	21.82	420.10				
943.59	487.07	22.38	464.70				
943.66	533.77	22.92	510.85				
943.73	581.66	23.46	558.20				
943.80	630.50	23.98	606.53				
943.87	680.66	24.49	656.17				
943.94	731.55	24.99	706.56				
944.01	783.17	25.47	757.70				
944.08	835.87	25.95	809.91				
944.15	890.42	26.43	864.00				
944.22	946.45	26.89	919.56				
944.29	1,003.61	27.34	976.26				
944.36	1,061.88	27.79	1,034.09				
944.43	1,121.24	28.23	1,093.01				
944.50	1,181.67	28.66	1,153.01				
944.57	1,243.16	29.09	1,214.07				
944.64	1,305.68	29.51	1,276.17				
944.71	1,369.22	29.92	1,339.29				
944.78	1,433.76	30.33	1,403.43				
944.85	1,499.29	30.74	1,468.55				
944.92	1,565.79	31.13	1,534.65				
944.99	1,633.25	31.53	1,601.72				
945.06	1,701.65	31.92	1,669.73				
945.13	1,770.99	32.30	1,738.69				
945.20	1,841.24	32.68	1,808.56				
945.27	1,912.40	33.05	1,879.35				
945.34	1,984.46	33.42	1,951.03				
945.41	2,057.40	33.79	2,023.61				
945.48	2,131.22	34.15	2,097.06				
945.55	2,205.90	34.51	2,171.39				
945.62	2,281.43	34.87	2,246.57				
945.69	2,357.81	35.22	2,322.59				

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

Type II 24-hr 10-yr Rainfall=4.80"

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Stage-Area-Storage for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
913.00	0	916.64	72,128	920.28	208,068
913.07	589	916.71	74,218	920.35	211,226
913.14	1,179	916.78	76,309	920.42	214,383
913.21	1,768	916.85	78,399	920.49	217,541
913.28	2,358	916.92	80,490	920.56	220,699
913.35	2,947	916.99	82,580	920.63	223,856
913.42	3,537	917.06	84,901	920.70	227,014
913.49	4,126	917.13	87,260	920.77	230,172
913.56	4,716	917.20	89,620	920.84	233,329
913.63	5,305	917.27	91,979	920.91	236,487
913.70	5,895	917.34	94,338	920.98	239,645
913.77	6,484	917.41	96,697	921.05	243,000
913.84	7,074	917.48	99,056	921.12	246,434
913.91	7,663	917.55	101,416	921.19	249,867
913.98	8,253	917.62	103,775	921.26	253,301
914.05	9,380	917.69	106,134	921.33	256,735
914.12	10,722	917.76	108,493	921.40	260,169
914.19	12,064	917.83	110,852	921.47	263,603
914.26	13,407	917.90	113,212	921.54	267,037
914.33	14,749	917.97	115,571	921.61	270,471
914.40	16,091	918.04	118,085	921.68	273,904
914.47	17,434	918.11	120,714	921.75	277,338
914.54	18,776	918.18	123,344	921.82	280,772
914.61	20,118	918.25	125,974	921.89	284,206
914.68	21,461	918.32	128,604	921.96	287,640
914.75	22,803	918.39	131,234	922.03	291,183
914.82	24,145	918.46	133,863	922.10	294,872
914.89	25,488	918.53	136,493	922.17	298,560
914.96	26,830	918.60	139,123	922.24	302,249
915.03	28,360	918.67	141,753	922.31	305,938
915.10	30,139	918.74	144,382	922.38	309,627
915.17	31,918	918.81	147,012	922.45	313,316
915.24	33,697	918.88	149,642	922.52	317,004
915.31	35,476	918.95	152,272	922.59	320,693
915.38	37,255	919.02	154,976	922.66	324,382
915.45	39,035	919.09	157,866	922.73	328,071
915.52	40,814	919.16	160,756	922.80	331,760
915.59	42,593	919.23	163,646	922.87	335,448
915.66	44,372	919.30	166,536	922.94	339,137
915.73	46,151	919.37	169,426	923.01	342,861
915.80	47,931	919.44	172,316	923.08	346,792
915.87	49,710	919.51	175,206	923.15	350,724
915.94	51,489	919.58	178,096	923.22	354,655
916.01	53,313	919.65	180,987	923.29	358,587
916.08	55,403	919.72	183,877	923.36	362,518
916.15	57,494	919.79	186,767	923.43	366,450
916.22	59,584	919.86	189,657	923.50	370,382
916.29	61,675	919.93	192,547	923.57	374,313
916.36	63,765	920.00	195,437	923.64	378,245
916.43	65,856	920.07	198,595	923.71	382,176
916.50	67,947	920.14	201,752	923.78	386,108
916.57	70,037	920.21	204,910	923.85	390,039

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

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Stage-Area-Storage for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
923.92	393,971	927.56	632,050	931.20	928,024
923.99	397,902	927.63	637,182	931.27	934,308
924.06	402,059	927.70	642,314	931.34	940,591
924.13	406,252	927.77	647,446	931.41	946,874
924.20	410,446	927.84	652,578	931.48	953,158
924.27	414,640	927.91	657,710	931.55	959,441
924.34	418,833	927.98	662,842	931.62	965,724
924.41	423,027	928.05	668,198	931.69	972,008
924.48	427,221	928.12	673,644	931.76	978,291
924.55	431,414	928.19	679,090	931.83	984,574
924.62	435,608	928.26	684,536	931.90	990,858
924.69	439,802	928.33	689,982	931.97	997,141
924.76	443,996	928.40	695,428	932.04	1,003,560
924.83	448,189	928.47	700,874	932.11	1,010,081
924.90	452,383	928.54	706,321	932.18	1,016,602
924.97	456,577	928.61	711,767	932.25	1,023,123
925.04	460,936	928.68	717,213	932.32	1,029,644
925.11	465,419	928.75	722,659	932.39	1,036,165
925.18	469,903	928.82	728,105	932.46	1,042,686
925.25	474,386	928.89	733,551	932.53	1,049,207
925.32	478,869	928.96	738,997	932.60	1,055,728
925.39	483,353	929.03	744,568	932.67	1,062,249
925.46	487,836	929.10	750,307	932.74	1,068,769
925.53	492,319	929.17	756,046	932.81	1,075,390
925.60	496,803	929.24	761,784	932.88	1,082,028
925.67	501,286	929.31	767,523	932.95	1,088,666
925.74	505,770	929.38	773,261	933.02	1,095,311
925.81	510,253	929.45	779,000	933.09	1,101,976
925.88	514,736	929.52	784,739	933.16	1,108,641
925.95	519,220	929.59	790,477	933.23	1,115,305
926.02	523,793	929.66	796,216	933.30	1,121,970
926.09	528,593	929.73	801,954	933.37	1,128,635
926.16	533,394	929.80	807,693	933.44	1,135,349
926.23	538,194	929.87	813,432	933.51	1,142,101
926.30	542,994	929.94	819,170	933.58	1,148,854
926.37	547,794	930.01	824,949	933.65	1,155,606
926.44	552,594	930.08	830,968	933.72	1,162,358
926.51	557,394	930.15	836,986	933.79	1,169,110
926.58	562,194	930.22	843,005	933.86	1,175,862
926.65	566,994	930.29	849,024	933.93	1,182,614
926.72	571,794	930.36	855,043	934.00	1,189,366
926.79	576,594	930.43	861,062	934.07	1,196,253
926.86	581,394	930.50	867,081	934.14	1,203,141
926.93	586,194	930.57	873,099	934.21	1,210,028
927.00	590,994	930.64	879,118	934.28	1,216,915
927.07	596,126	930.71	885,137	934.35	1,223,803
927.14	601,258	930.78	891,156	934.42	1,230,690
927.21	606,390	930.85	897,175	934.49	1,237,578
927.28	611,522	930.92	903,193	934.56	1,244,465
927.35	616,654	930.99	909,212	934.63	1,251,352
927.42	621,786	931.06	915,458	934.70	1,258,240
927.49	626,918	931.13	921,741	934.77	1,265,127

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

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Stage-Area-Storage for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
934.84	1,272,014	938.48	1,650,329	942.12	2,062,231
934.91	1,278,902	938.55	1,658,005	942.19	2,070,676
934.98	1,285,789	938.62	1,665,682	942.26	2,079,121
935.05	1,292,798	938.69	1,673,358	942.33	2,087,567
935.12	1,299,855	938.76	1,681,034	942.40	2,096,012
935.19	1,306,912	938.83	1,688,710	942.47	2,104,457
935.26	1,313,969	938.90	1,696,386	942.54	2,112,903
935.33	1,321,027	938.97	1,704,062	942.61	2,121,348
935.40	1,328,084	939.04	1,711,738	942.68	2,129,794
935.47	1,335,141	939.11	1,719,414	942.75	2,138,239
935.54	1,342,198	939.18	1,727,091	942.82	2,146,684
935.61	1,349,255	939.25	1,734,767	942.89	2,155,130
935.68	1,356,313	939.32	1,742,443	942.96	2,163,575
935.75	1,363,370	939.39	1,750,119	943.03	2,172,020
935.82	1,370,427	939.46	1,757,795	943.10	2,180,466
935.89	1,377,484	939.53	1,765,471	943.17	2,188,911
935.96	1,384,541	939.60	1,773,147	943.24	2,197,356
936.03	1,391,673	939.67	1,780,824	943.31	2,205,802
936.10	1,398,904	939.74	1,788,500	943.38	2,214,247
936.17	1,406,134	939.81	1,796,176	943.45	2,222,693
936.24	1,413,365	939.88	1,803,852	943.52	2,231,138
936.31	1,420,596	939.95	1,811,528	943.59	2,239,583
936.38	1,427,827	940.02	1,819,296	943.66	2,248,029
936.45	1,435,058	940.09	1,827,294	943.73	2,256,474
936.52	1,442,288	940.16	1,835,291	943.80	2,264,919
936.59	1,449,519	940.23	1,843,289	943.87	2,273,365
936.66	1,456,750	940.30	1,851,286	943.94	2,281,810
936.73	1,463,981	940.37	1,859,284	944.01	2,290,255
936.80	1,471,212	940.44	1,867,282	944.08	2,298,701
936.87	1,478,442	940.51	1,875,279	944.15	2,307,146
936.94	1,485,673	940.58	1,883,277	944.22	2,315,592
937.01	1,492,929	940.65	1,891,274	944.29	2,324,037
937.08	1,500,337	940.72	1,899,272	944.36	2,332,482
937.15	1,507,744	940.79	1,907,270	944.43	2,340,928
937.22	1,515,152	940.86	1,915,267	944.50	2,349,373
937.29	1,522,559	940.93	1,923,265	944.57	2,357,818
937.36	1,529,967	941.00	1,931,263	944.64	2,366,264
937.43	1,537,374	941.07	1,939,260	944.71	2,374,709
937.50	1,544,782	941.14	1,947,258	944.78	2,383,154
937.57	1,552,190	941.21	1,955,255	944.85	2,391,600
937.64	1,559,597	941.28	1,963,253	944.92	2,400,045
937.71	1,567,005	941.35	1,971,251	944.99	2,408,491
937.78	1,574,412	941.42	1,979,248	945.06	2,417,240
937.85	1,581,820	941.49	1,987,246	945.13	2,426,040
937.92	1,589,227	941.56	1,995,243	945.20	2,434,840
937.99	1,596,635	941.63	2,003,241	945.27	2,443,640
938.06	1,604,273	941.70	2,011,558	945.34	2,452,440
938.13	1,611,949	941.77	2,020,004	945.41	2,461,240
938.20	1,619,625	941.84	2,028,449	945.48	2,470,040
938.27	1,627,301	941.91	2,036,894	945.55	2,478,840
938.34	1,634,977	941.98	2,045,340	945.62	2,487,640
938.41	1,642,653	942.05	2,053,785	945.69	2,496,440

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

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Stage-Area-Storage for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Elevation (feet)	Storage (cubic-feet)
945.76	2,505,240
945.83	2,514,040
945.90	2,522,840
945.97	2,531,640

Pond 2 & 3 Model_Proposed Conditions

Type II 24-hr 10-yr Rainfall=4.80"

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Summary for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59)

Inflow Area = 190.490 ac, 20.07% Impervious, Inflow Depth > 5.09" for 10-yr event
 Inflow = 612.18 cfs @ 12.16 hrs, Volume= 80.867 af
 Outflow = 29.94 cfs @ 16.00 hrs, Volume= 60.240 af, Atten= 95%, Lag= 230.6 min
 Primary = 21.08 cfs @ 16.00 hrs, Volume= 57.967 af
 Secondary = 8.85 cfs @ 16.00 hrs, Volume= 2.273 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Starting Elev= 931.59' Surf.Area= 0 sf Storage= 734,265 cf

Peak Elev= 942.62' @ 16.00 hrs Surf.Area= 0 sf Storage= 1,786,750 cf (1,052,485 cf above start)

Plug-Flow detention time= 1,751.7 min calculated for 43.384 af (54% of inflow)

Center-of-Mass det. time= 409.4 min (2,213.4 - 1,804.1)

Volume	Invert	Avail.Storage	Storage Description
#1	911.00'	2,216,035 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
911.00	0
912.00	3,255
913.00	10,425
914.00	21,229
915.00	34,742
916.00	51,377
917.00	71,289
918.00	93,943
919.00	119,149
920.00	147,026
921.00	177,524
922.00	210,420
923.00	245,859
924.00	284,504
925.00	328,343
926.00	377,769
927.00	431,484
928.00	489,347
929.00	551,533
930.00	618,443
931.00	690,059
931.80	749,999
932.00	765,242
933.00	842,526
934.00	921,581
935.00	1,002,437
936.00	1,085,292
940.00	1,474,890
941.00	1,588,661
944.00	1,954,424
945.00	2,083,402
946.00	2,216,035

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

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Device	Routing	Invert	Outlet Devices
#1	Primary	931.59'	8.0" Round 8" Culvert L= 98.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 931.59' / 924.79' S= 0.0692 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Primary	931.78'	8.0" Round 8" Culvert L= 120.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 931.78' / 908.82' S= 0.1913 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#3	Primary	940.93'	18.0" Round 18" Culvert L= 40.7' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 940.93' / 940.27' S= 0.0162 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#4	Primary	941.10'	18.0" Round 18" Culvert L= 40.4' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.10' / 940.25' S= 0.0210 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#5	Secondary	942.50'	75.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=21.08 cfs @ 16.00 hrs HW=942.62' (Free Discharge)

- ↑ **1=8" Culvert** (Inlet Controls 4.34 cfs @ 12.44 fps)
- ↑ **2=8" Culvert** (Inlet Controls 4.30 cfs @ 12.32 fps)
- ↑ **3=18" Culvert** (Inlet Controls 6.53 cfs @ 3.69 fps)
- ↑ **4=18" Culvert** (Inlet Controls 5.91 cfs @ 3.35 fps)

Secondary OutFlow Max=8.85 cfs @ 16.00 hrs HW=942.62' (Free Discharge)

- ↑ **5=Broad-Crested Rectangular Weir** (Weir Controls 8.85 cfs @ 0.95 fps)

Pond 2 & 3 Model_Proposed Conditions

Type II 24-hr 10-yr Rainfall=4.80"

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Hydrograph for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	734,265	931.59	0.00	0.00	0.00
0.20	0.00	734,265	931.59	0.00	0.00	0.00
0.40	0.00	734,265	931.59	0.00	0.00	0.00
0.60	0.00	734,265	931.59	0.00	0.00	0.00
0.80	0.00	734,265	931.59	0.00	0.00	0.00
1.00	0.00	734,265	931.59	0.00	0.00	0.00
1.20	0.00	734,265	931.59	0.00	0.00	0.00
1.40	0.00	734,265	931.59	0.00	0.00	0.00
1.60	0.00	734,265	931.59	0.00	0.00	0.00
1.80	0.00	734,265	931.59	0.00	0.00	0.00
2.00	0.00	734,265	931.59	0.00	0.00	0.00
2.20	0.00	734,265	931.59	0.00	0.00	0.00
2.40	0.00	734,265	931.59	0.00	0.00	0.00
2.60	0.00	734,265	931.59	0.00	0.00	0.00
2.80	0.00	734,265	931.59	0.00	0.00	0.00
3.00	0.00	734,265	931.59	0.00	0.00	0.00
3.20	0.00	734,265	931.59	0.00	0.00	0.00
3.40	0.00	734,265	931.59	0.00	0.00	0.00
3.60	0.00	734,265	931.59	0.00	0.00	0.00
3.80	0.00	734,265	931.59	0.00	0.00	0.00
4.00	0.00	734,265	931.59	0.00	0.00	0.00
4.20	0.00	734,265	931.59	0.00	0.00	0.00
4.40	0.00	734,265	931.59	0.00	0.00	0.00
4.60	0.00	734,265	931.59	0.00	0.00	0.00
4.80	0.00	734,265	931.59	0.00	0.00	0.00
5.00	0.00	734,265	931.59	0.00	0.00	0.00
5.20	0.00	734,265	931.59	0.00	0.00	0.00
5.40	0.00	734,265	931.59	0.00	0.00	0.00
5.60	0.00	734,265	931.59	0.00	0.00	0.00
5.80	0.00	734,265	931.59	0.00	0.00	0.00
6.00	0.00	734,265	931.59	0.00	0.00	0.00
6.20	0.00	734,265	931.59	0.00	0.00	0.00
6.40	0.00	734,265	931.59	0.00	0.00	0.00
6.60	0.00	734,265	931.59	0.00	0.00	0.00
6.80	0.00	734,265	931.59	0.00	0.00	0.00
7.00	0.00	734,265	931.59	0.00	0.00	0.00
7.20	0.00	734,265	931.59	0.00	0.00	0.00
7.40	0.00	734,265	931.59	0.00	0.00	0.00
7.60	0.00	734,265	931.59	0.00	0.00	0.00
7.80	0.00	734,265	931.59	0.00	0.00	0.00
8.00	0.00	734,265	931.59	0.00	0.00	0.00
8.20	0.00	734,265	931.59	0.00	0.00	0.00
8.40	0.00	734,265	931.59	0.00	0.00	0.00
8.60	0.00	734,265	931.59	0.00	0.00	0.00
8.80	0.00	734,265	931.59	0.00	0.00	0.00
9.00	0.00	734,265	931.59	0.00	0.00	0.00
9.20	0.00	734,265	931.59	0.00	0.00	0.00
9.40	0.00	734,265	931.59	0.00	0.00	0.00
9.60	0.00	734,265	931.59	0.00	0.00	0.00
9.80	0.00	734,265	931.59	0.00	0.00	0.00
10.00	0.00	734,265	931.59	0.00	0.00	0.00
10.20	0.00	734,265	931.59	0.00	0.00	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

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Hydrograph for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
10.40	0.00	734,265	931.59	0.00	0.00	0.00
10.60	0.00	734,265	931.59	0.00	0.00	0.00
10.80	0.00	734,265	931.59	0.00	0.00	0.00
11.00	0.00	734,265	931.59	0.00	0.00	0.00
11.20	0.00	734,265	931.59	0.00	0.00	0.00
11.40	0.00	734,265	931.59	0.00	0.00	0.00
11.60	0.00	734,265	931.59	0.00	0.00	0.00
11.80	0.00	734,265	931.59	0.00	0.00	0.00
12.00	1.66	734,304	931.59	0.00	0.00	0.00
12.20	563.84	1,000,110	934.97	4.56	4.56	0.00
12.40	241.71	1,268,866	937.88	6.43	6.43	0.00
12.60	133.73	1,392,247	939.15	7.09	7.09	0.00
12.80	91.07	1,465,745	939.91	7.45	7.45	0.00
13.00	74.21	1,518,965	940.39	7.68	7.68	0.00
13.20	64.65	1,563,167	940.78	7.85	7.85	0.00
13.40	58.06	1,601,460	941.10	8.14	8.14	0.00
13.60	53.12	1,635,242	941.38	9.26	9.26	0.00
13.80	48.78	1,664,603	941.62	11.08	11.08	0.00
14.00	45.05	1,689,640	941.83	13.10	13.10	0.00
14.20	41.82	1,710,776	942.00	14.97	14.97	0.00
14.40	39.11	1,728,462	942.15	16.62	16.62	0.00
14.60	37.49	1,743,526	942.27	17.98	17.98	0.00
14.80	36.25	1,756,710	942.38	19.07	19.07	0.00
15.00	35.07	1,768,348	942.47	19.91	19.91	0.00
15.20	32.77	1,777,810	942.55	22.89	20.55	2.34
15.40	31.37	1,782,886	942.59	26.55	20.85	5.70
15.60	30.96	1,785,354	942.61	28.66	21.00	7.66
15.80	30.55	1,786,457	942.62	29.67	21.07	8.60
16.00	29.94	1,786,750	942.62	29.94	21.08	8.85
16.20	29.19	1,786,533	942.62	29.74	21.07	8.67
16.40	28.58	1,786,058	942.62	29.30	21.04	8.26
16.60	28.11	1,785,540	942.61	28.83	21.01	7.82
16.80	27.69	1,785,035	942.61	28.38	20.98	7.40
17.00	27.27	1,784,545	942.61	27.95	20.94	7.00
17.20	26.86	1,784,061	942.60	27.53	20.91	6.61
17.40	26.45	1,783,579	942.60	27.12	20.89	6.24
17.60	26.04	1,783,093	942.59	26.72	20.86	5.86
17.80	25.64	1,782,601	942.59	26.32	20.83	5.49
18.00	25.23	1,782,102	942.59	25.93	20.81	5.12
18.20	24.82	1,781,594	942.58	25.54	20.78	4.76
18.40	24.42	1,781,076	942.58	25.14	20.75	4.40
18.60	24.01	1,780,547	942.57	24.75	20.72	4.03
18.80	23.60	1,780,006	942.57	24.36	20.68	3.68
19.00	23.19	1,779,451	942.56	23.97	20.65	3.32
19.20	22.78	1,778,880	942.56	23.58	20.62	2.97
19.40	22.37	1,778,293	942.56	23.20	20.58	2.62
19.60	21.96	1,777,686	942.55	22.82	20.54	2.27
19.80	21.55	1,777,058	942.55	22.44	20.50	1.93
20.00	21.13	1,776,404	942.54	22.06	20.46	1.60
20.20	20.73	1,775,722	942.53	21.69	20.42	1.28
20.40	20.44	1,775,041	942.53	21.35	20.37	0.98
20.60	20.25	1,774,423	942.52	21.06	20.33	0.73

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

Type II 24-hr 10-yr Rainfall=4.80"

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Hydrograph for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
20.80	20.12	1,773,878	942.52	20.83	20.29	0.53
21.00	20.00	1,773,386	942.52	20.65	20.26	0.39
21.20	19.89	1,772,937	942.51	20.49	20.23	0.26
21.40	19.79	1,772,520	942.51	20.36	20.20	0.16
21.60	19.69	1,772,119	942.50	20.25	20.17	0.07
21.80	19.60	1,771,719	942.50	20.16	20.15	0.01
22.00	19.48	1,771,292	942.50	20.11	20.11	0.00
22.20	19.41	1,770,825	942.49	20.08	20.08	0.00
22.40	19.33	1,770,331	942.49	20.04	20.04	0.00
22.60	19.25	1,769,810	942.49	20.01	20.01	0.00
22.80	19.17	1,769,249	942.48	19.97	19.97	0.00
23.00	19.10	1,768,661	942.48	19.93	19.93	0.00
23.20	19.02	1,768,048	942.47	19.89	19.89	0.00
23.40	18.94	1,767,410	942.47	19.84	19.84	0.00
23.60	18.86	1,766,749	942.46	19.79	19.79	0.00
23.80	18.78	1,766,066	942.46	19.74	19.74	0.00
24.00	18.70	1,765,362	942.45	19.69	19.69	0.00
24.20	17.45	1,764,460	942.44	19.62	19.62	0.00
24.40	13.28	1,761,399	942.42	19.41	19.41	0.00
24.60	11.19	1,756,239	942.37	19.04	19.04	0.00
24.80	10.41	1,750,428	942.33	18.57	18.57	0.00
25.00	10.10	1,744,599	942.28	18.08	18.08	0.00
25.20	9.95	1,738,975	942.23	17.58	17.58	0.00
25.40	9.87	1,733,627	942.19	17.09	17.09	0.00
25.60	9.82	1,728,575	942.15	16.63	16.63	0.00
25.80	9.78	1,723,812	942.11	16.20	16.20	0.00
26.00	9.75	1,719,331	942.07	15.77	15.77	0.00
26.20	9.73	1,715,133	942.04	15.38	15.38	0.00
26.40	9.72	1,711,197	942.01	15.01	15.01	0.00
26.60	9.74	1,707,514	941.97	14.67	14.67	0.00
26.80	9.75	1,704,079	941.95	14.36	14.36	0.00
27.00	9.76	1,700,871	941.92	14.07	14.07	0.00
27.20	9.84	1,697,896	941.90	13.80	13.80	0.00
27.40	9.87	1,695,148	941.87	13.56	13.56	0.00
27.60	9.87	1,692,576	941.85	13.33	13.33	0.00
27.80	9.88	1,690,163	941.83	13.12	13.12	0.00
28.00	9.88	1,687,889	941.81	12.94	12.94	0.00
28.20	9.87	1,685,754	941.80	12.75	12.75	0.00
28.40	9.86	1,683,740	941.78	12.58	12.58	0.00
28.60	9.85	1,681,840	941.76	12.42	12.42	0.00
28.80	9.84	1,680,040	941.75	12.27	12.27	0.00
29.00	9.82	1,678,333	941.74	12.13	12.13	0.00
29.20	9.80	1,676,711	941.72	12.00	12.00	0.00
29.40	9.79	1,675,168	941.71	11.88	11.88	0.00
29.60	9.77	1,673,698	941.70	11.76	11.76	0.00
29.80	9.75	1,672,297	941.69	11.65	11.65	0.00
30.00	9.73	1,670,960	941.68	11.55	11.55	0.00
30.20	9.72	1,669,681	941.66	11.45	11.45	0.00
30.40	9.69	1,668,457	941.65	11.36	11.36	0.00
30.60	9.66	1,667,278	941.64	11.27	11.27	0.00
30.80	9.63	1,666,140	941.64	11.19	11.19	0.00
31.00	9.60	1,665,038	941.63	11.11	11.11	0.00

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

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Hydrograph for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
31.20	9.57	1,663,970	941.62	11.03	11.03	0.00
31.40	9.53	1,662,933	941.61	10.95	10.95	0.00
31.60	9.50	1,661,924	941.60	10.88	10.88	0.00
31.80	9.47	1,660,945	941.59	10.81	10.81	0.00
32.00	9.45	1,659,995	941.59	10.75	10.75	0.00
32.20	9.42	1,659,073	941.58	10.68	10.68	0.00
32.40	9.40	1,658,180	941.57	10.62	10.62	0.00
32.60	9.38	1,657,314	941.56	10.56	10.56	0.00
32.80	9.36	1,656,475	941.56	10.51	10.51	0.00
33.00	9.34	1,655,663	941.55	10.45	10.45	0.00
33.20	9.33	1,654,878	941.54	10.40	10.40	0.00
33.40	9.31	1,654,117	941.54	10.35	10.35	0.00
33.60	9.30	1,653,382	941.53	10.30	10.30	0.00
33.80	9.29	1,652,671	941.53	10.26	10.26	0.00
34.00	9.27	1,651,983	941.52	10.21	10.21	0.00
34.20	9.26	1,651,318	941.51	10.17	10.17	0.00
34.40	9.25	1,650,676	941.51	10.13	10.13	0.00
34.60	9.25	1,650,056	941.50	10.09	10.09	0.00
34.80	9.24	1,649,456	941.50	10.05	10.05	0.00
35.00	9.23	1,648,877	941.49	10.02	10.02	0.00
35.20	9.22	1,648,318	941.49	9.99	9.99	0.00
35.40	9.22	1,647,778	941.48	9.95	9.95	0.00
35.60	9.21	1,647,256	941.48	9.92	9.92	0.00
35.80	9.20	1,646,753	941.48	9.89	9.89	0.00
36.00	9.20	1,646,267	941.47	9.86	9.86	0.00
36.20	9.19	1,645,798	941.47	9.83	9.83	0.00
36.40	9.19	1,645,345	941.46	9.81	9.81	0.00
36.60	9.19	1,644,908	941.46	9.78	9.78	0.00
36.80	9.18	1,644,478	941.46	9.77	9.77	0.00
37.00	9.18	1,644,063	941.45	9.74	9.74	0.00
37.20	9.18	1,643,667	941.45	9.71	9.71	0.00
37.40	9.17	1,643,288	941.45	9.69	9.69	0.00
37.60	9.17	1,642,916	941.45	9.68	9.68	0.00
37.80	9.17	1,642,554	941.44	9.65	9.65	0.00
38.00	9.17	1,642,215	941.44	9.63	9.63	0.00
38.20	9.16	1,641,887	941.44	9.61	9.61	0.00
38.40	9.16	1,641,571	941.43	9.59	9.59	0.00
38.60	9.16	1,641,266	941.43	9.58	9.58	0.00
38.80	9.16	1,640,972	941.43	9.56	9.56	0.00
39.00	9.16	1,640,687	941.43	9.54	9.54	0.00
39.20	9.16	1,640,413	941.42	9.53	9.53	0.00
39.40	9.15	1,640,149	941.42	9.52	9.52	0.00
39.60	9.15	1,639,893	941.42	9.50	9.50	0.00
39.80	9.15	1,639,647	941.42	9.49	9.49	0.00
40.00	9.15	1,639,409	941.42	9.48	9.48	0.00
40.20	9.15	1,639,180	941.41	9.46	9.46	0.00
40.40	9.15	1,638,959	941.41	9.45	9.45	0.00
40.60	9.15	1,638,745	941.41	9.44	9.44	0.00
40.80	9.15	1,638,539	941.41	9.43	9.43	0.00
41.00	9.15	1,638,340	941.41	9.42	9.42	0.00
41.20	9.15	1,638,148	941.41	9.41	9.41	0.00
41.40	9.15	1,637,963	941.40	9.40	9.40	0.00

Pond 2 & 3 Model_Proposed Conditions

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Hydrograph for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
41.60	9.15	1,637,784	941.40	9.39	9.39	0.00
41.80	9.15	1,637,611	941.40	9.38	9.38	0.00
42.00	9.14	1,637,445	941.40	9.37	9.37	0.00
42.20	9.14	1,637,284	941.40	9.36	9.36	0.00
42.40	9.14	1,637,129	941.40	9.36	9.36	0.00
42.60	9.14	1,636,979	941.40	9.35	9.35	0.00
42.80	9.14	1,636,834	941.40	9.34	9.34	0.00
43.00	9.14	1,636,695	941.39	9.33	9.33	0.00
43.20	9.14	1,636,560	941.39	9.33	9.33	0.00
43.40	9.14	1,636,430	941.39	9.32	9.32	0.00
43.60	9.14	1,636,305	941.39	9.31	9.31	0.00
43.80	9.14	1,636,183	941.39	9.31	9.31	0.00
44.00	9.14	1,636,067	941.39	9.30	9.30	0.00
44.20	9.14	1,635,954	941.39	9.30	9.30	0.00
44.40	9.14	1,635,845	941.39	9.29	9.29	0.00
44.60	9.14	1,635,740	941.39	9.29	9.29	0.00
44.80	9.14	1,635,638	941.39	9.28	9.28	0.00
45.00	9.14	1,635,540	941.38	9.28	9.28	0.00
45.20	9.14	1,635,445	941.38	9.27	9.27	0.00
45.40	9.14	1,635,354	941.38	9.27	9.27	0.00
45.60	9.14	1,635,266	941.38	9.26	9.26	0.00
45.80	9.14	1,635,181	941.38	9.26	9.26	0.00
46.00	9.14	1,635,098	941.38	9.25	9.25	0.00
46.20	9.14	1,635,019	941.38	9.25	9.25	0.00
46.40	9.14	1,634,942	941.38	9.25	9.25	0.00
46.60	9.14	1,634,868	941.38	9.24	9.24	0.00
46.80	9.14	1,634,797	941.38	9.24	9.24	0.00
47.00	9.14	1,634,728	941.38	9.23	9.23	0.00
47.20	9.14	1,634,661	941.38	9.23	9.23	0.00
47.40	9.14	1,634,597	941.38	9.23	9.23	0.00
47.60	9.14	1,634,535	941.38	9.23	9.23	0.00
47.80	9.14	1,634,475	941.38	9.22	9.22	0.00
48.00	9.14	1,634,417	941.38	9.22	9.22	0.00
48.20	9.14	1,634,361	941.37	9.22	9.22	0.00
48.40	9.14	1,634,307	941.37	9.21	9.21	0.00
48.60	9.14	1,634,254	941.37	9.21	9.21	0.00
48.80	9.14	1,634,204	941.37	9.21	9.21	0.00
49.00	9.14	1,634,155	941.37	9.21	9.21	0.00
49.20	9.14	1,634,108	941.37	9.20	9.20	0.00
49.40	9.14	1,634,063	941.37	9.20	9.20	0.00
49.60	9.14	1,634,019	941.37	9.20	9.20	0.00
49.80	9.14	1,633,977	941.37	9.20	9.20	0.00
50.00	9.14	1,633,936	941.37	9.20	9.20	0.00
50.20	9.14	1,633,896	941.37	9.19	9.19	0.00
50.40	9.14	1,633,858	941.37	9.19	9.19	0.00
50.60	9.14	1,633,821	941.37	9.19	9.19	0.00
50.80	9.14	1,633,786	941.37	9.19	9.19	0.00
51.00	9.14	1,633,751	941.37	9.19	9.19	0.00
51.20	9.14	1,633,718	941.37	9.19	9.19	0.00
51.40	9.14	1,633,686	941.37	9.18	9.18	0.00
51.60	9.14	1,633,655	941.37	9.18	9.18	0.00
51.80	9.14	1,633,625	941.37	9.18	9.18	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

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Hydrograph for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
52.00	9.14	1,633,596	941.37	9.18	9.18	0.00
52.20	9.14	1,633,568	941.37	9.18	9.18	0.00
52.40	9.14	1,633,541	941.37	9.18	9.18	0.00
52.60	9.14	1,633,515	941.37	9.18	9.18	0.00
52.80	9.14	1,633,490	941.37	9.17	9.17	0.00
53.00	9.14	1,633,466	941.37	9.17	9.17	0.00
53.20	9.14	1,633,442	941.37	9.17	9.17	0.00
53.40	9.14	1,633,420	941.37	9.17	9.17	0.00
53.60	9.14	1,633,398	941.37	9.17	9.17	0.00
53.80	9.14	1,633,377	941.37	9.17	9.17	0.00
54.00	9.14	1,633,356	941.37	9.17	9.17	0.00
54.20	9.14	1,633,336	941.37	9.17	9.17	0.00
54.40	9.14	1,633,317	941.37	9.17	9.17	0.00
54.60	9.14	1,633,299	941.37	9.17	9.17	0.00
54.80	9.14	1,633,281	941.37	9.16	9.16	0.00
55.00	9.14	1,633,264	941.37	9.16	9.16	0.00
55.20	9.14	1,633,247	941.37	9.16	9.16	0.00
55.40	9.14	1,633,231	941.37	9.16	9.16	0.00
55.60	9.14	1,633,216	941.37	9.16	9.16	0.00
55.80	9.14	1,633,201	941.37	9.16	9.16	0.00
56.00	9.14	1,633,186	941.37	9.16	9.16	0.00
56.20	9.14	1,633,172	941.37	9.16	9.16	0.00
56.40	9.14	1,633,159	941.36	9.16	9.16	0.00
56.60	9.14	1,633,146	941.36	9.16	9.16	0.00
56.80	9.14	1,633,133	941.36	9.16	9.16	0.00
57.00	9.14	1,633,121	941.36	9.16	9.16	0.00
57.20	9.14	1,633,109	941.36	9.16	9.16	0.00
57.40	9.14	1,633,098	941.36	9.16	9.16	0.00
57.60	9.14	1,633,087	941.36	9.16	9.16	0.00
57.80	9.14	1,633,076	941.36	9.15	9.15	0.00
58.00	9.14	1,633,066	941.36	9.15	9.15	0.00
58.20	9.14	1,633,056	941.36	9.15	9.15	0.00
58.40	9.14	1,633,046	941.36	9.15	9.15	0.00
58.60	9.14	1,633,037	941.36	9.15	9.15	0.00
58.80	9.14	1,633,028	941.36	9.15	9.15	0.00
59.00	9.14	1,633,019	941.36	9.15	9.15	0.00
59.20	9.14	1,633,011	941.36	9.15	9.15	0.00
59.40	9.14	1,633,003	941.36	9.15	9.15	0.00
59.60	9.14	1,632,995	941.36	9.15	9.15	0.00
59.80	9.14	1,632,988	941.36	9.15	9.15	0.00
60.00	9.14	1,632,980	941.36	9.15	9.15	0.00
60.20	9.14	1,632,973	941.36	9.15	9.15	0.00
60.40	9.14	1,632,967	941.36	9.15	9.15	0.00
60.60	9.14	1,632,960	941.36	9.15	9.15	0.00
60.80	9.14	1,632,954	941.36	9.15	9.15	0.00
61.00	9.14	1,632,947	941.36	9.15	9.15	0.00
61.20	9.14	1,632,942	941.36	9.15	9.15	0.00
61.40	9.14	1,632,936	941.36	9.15	9.15	0.00
61.60	9.14	1,632,930	941.36	9.15	9.15	0.00
61.80	9.14	1,632,925	941.36	9.15	9.15	0.00
62.00	9.14	1,632,920	941.36	9.15	9.15	0.00
62.20	9.14	1,632,915	941.36	9.15	9.15	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

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Hydrograph for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
62.40	9.14	1,632,910	941.36	9.15	9.15	0.00
62.60	9.14	1,632,905	941.36	9.15	9.15	0.00
62.80	9.14	1,632,901	941.36	9.15	9.15	0.00
63.00	9.14	1,632,897	941.36	9.15	9.15	0.00
63.20	9.14	1,632,892	941.36	9.15	9.15	0.00
63.40	9.14	1,632,888	941.36	9.15	9.15	0.00
63.60	9.14	1,632,884	941.36	9.15	9.15	0.00
63.80	9.14	1,632,881	941.36	9.15	9.15	0.00
64.00	9.14	1,632,877	941.36	9.14	9.14	0.00
64.20	9.14	1,632,873	941.36	9.14	9.14	0.00
64.40	9.14	1,632,870	941.36	9.14	9.14	0.00
64.60	9.14	1,632,867	941.36	9.14	9.14	0.00
64.80	9.14	1,632,863	941.36	9.14	9.14	0.00
65.00	9.14	1,632,860	941.36	9.14	9.14	0.00
65.20	9.14	1,632,857	941.36	9.14	9.14	0.00
65.40	9.14	1,632,855	941.36	9.14	9.14	0.00
65.60	9.14	1,632,852	941.36	9.14	9.14	0.00
65.80	9.14	1,632,849	941.36	9.14	9.14	0.00
66.00	9.14	1,632,846	941.36	9.14	9.14	0.00
66.20	9.14	1,632,844	941.36	9.14	9.14	0.00
66.40	9.14	1,632,842	941.36	9.14	9.14	0.00
66.60	9.14	1,632,839	941.36	9.14	9.14	0.00
66.80	9.14	1,632,837	941.36	9.14	9.14	0.00
67.00	9.14	1,632,835	941.36	9.14	9.14	0.00
67.20	9.14	1,632,833	941.36	9.14	9.14	0.00
67.40	9.14	1,632,831	941.36	9.14	9.14	0.00
67.60	9.14	1,632,829	941.36	9.14	9.14	0.00
67.80	9.14	1,632,827	941.36	9.14	9.14	0.00
68.00	9.14	1,632,825	941.36	9.14	9.14	0.00
68.20	9.14	1,632,823	941.36	9.14	9.14	0.00
68.40	9.14	1,632,821	941.36	9.14	9.14	0.00
68.60	9.14	1,632,820	941.36	9.14	9.14	0.00
68.80	9.14	1,632,818	941.36	9.14	9.14	0.00
69.00	9.14	1,632,817	941.36	9.14	9.14	0.00
69.20	9.14	1,632,815	941.36	9.14	9.14	0.00
69.40	9.14	1,632,814	941.36	9.14	9.14	0.00
69.60	9.14	1,632,812	941.36	9.14	9.14	0.00
69.80	9.14	1,632,811	941.36	9.14	9.14	0.00
70.00	9.14	1,632,810	941.36	9.14	9.14	0.00
70.20	9.14	1,632,808	941.36	9.14	9.14	0.00
70.40	9.14	1,632,807	941.36	9.14	9.14	0.00
70.60	9.14	1,632,806	941.36	9.14	9.14	0.00
70.80	9.14	1,632,805	941.36	9.14	9.14	0.00
71.00	9.14	1,632,804	941.36	9.14	9.14	0.00
71.20	9.14	1,632,803	941.36	9.14	9.14	0.00
71.40	9.14	1,632,802	941.36	9.14	9.14	0.00
71.60	9.14	1,632,801	941.36	9.14	9.14	0.00
71.80	9.14	1,632,800	941.36	9.14	9.14	0.00
72.00	9.14	1,632,799	941.36	9.14	9.14	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

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Stage-Discharge for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
911.00	0.00	0.00	0.00	915.16	0.00	0.00	0.00
911.08	0.00	0.00	0.00	915.24	0.00	0.00	0.00
911.16	0.00	0.00	0.00	915.32	0.00	0.00	0.00
911.24	0.00	0.00	0.00	915.40	0.00	0.00	0.00
911.32	0.00	0.00	0.00	915.48	0.00	0.00	0.00
911.40	0.00	0.00	0.00	915.56	0.00	0.00	0.00
911.48	0.00	0.00	0.00	915.64	0.00	0.00	0.00
911.56	0.00	0.00	0.00	915.72	0.00	0.00	0.00
911.64	0.00	0.00	0.00	915.80	0.00	0.00	0.00
911.72	0.00	0.00	0.00	915.88	0.00	0.00	0.00
911.80	0.00	0.00	0.00	915.96	0.00	0.00	0.00
911.88	0.00	0.00	0.00	916.04	0.00	0.00	0.00
911.96	0.00	0.00	0.00	916.12	0.00	0.00	0.00
912.04	0.00	0.00	0.00	916.20	0.00	0.00	0.00
912.12	0.00	0.00	0.00	916.28	0.00	0.00	0.00
912.20	0.00	0.00	0.00	916.36	0.00	0.00	0.00
912.28	0.00	0.00	0.00	916.44	0.00	0.00	0.00
912.36	0.00	0.00	0.00	916.52	0.00	0.00	0.00
912.44	0.00	0.00	0.00	916.60	0.00	0.00	0.00
912.52	0.00	0.00	0.00	916.68	0.00	0.00	0.00
912.60	0.00	0.00	0.00	916.76	0.00	0.00	0.00
912.68	0.00	0.00	0.00	916.84	0.00	0.00	0.00
912.76	0.00	0.00	0.00	916.92	0.00	0.00	0.00
912.84	0.00	0.00	0.00	917.00	0.00	0.00	0.00
912.92	0.00	0.00	0.00	917.08	0.00	0.00	0.00
913.00	0.00	0.00	0.00	917.16	0.00	0.00	0.00
913.08	0.00	0.00	0.00	917.24	0.00	0.00	0.00
913.16	0.00	0.00	0.00	917.32	0.00	0.00	0.00
913.24	0.00	0.00	0.00	917.40	0.00	0.00	0.00
913.32	0.00	0.00	0.00	917.48	0.00	0.00	0.00
913.40	0.00	0.00	0.00	917.56	0.00	0.00	0.00
913.48	0.00	0.00	0.00	917.64	0.00	0.00	0.00
913.56	0.00	0.00	0.00	917.72	0.00	0.00	0.00
913.64	0.00	0.00	0.00	917.80	0.00	0.00	0.00
913.72	0.00	0.00	0.00	917.88	0.00	0.00	0.00
913.80	0.00	0.00	0.00	917.96	0.00	0.00	0.00
913.88	0.00	0.00	0.00	918.04	0.00	0.00	0.00
913.96	0.00	0.00	0.00	918.12	0.00	0.00	0.00
914.04	0.00	0.00	0.00	918.20	0.00	0.00	0.00
914.12	0.00	0.00	0.00	918.28	0.00	0.00	0.00
914.20	0.00	0.00	0.00	918.36	0.00	0.00	0.00
914.28	0.00	0.00	0.00	918.44	0.00	0.00	0.00
914.36	0.00	0.00	0.00	918.52	0.00	0.00	0.00
914.44	0.00	0.00	0.00	918.60	0.00	0.00	0.00
914.52	0.00	0.00	0.00	918.68	0.00	0.00	0.00
914.60	0.00	0.00	0.00	918.76	0.00	0.00	0.00
914.68	0.00	0.00	0.00	918.84	0.00	0.00	0.00
914.76	0.00	0.00	0.00	918.92	0.00	0.00	0.00
914.84	0.00	0.00	0.00	919.00	0.00	0.00	0.00
914.92	0.00	0.00	0.00	919.08	0.00	0.00	0.00
915.00	0.00	0.00	0.00	919.16	0.00	0.00	0.00
915.08	0.00	0.00	0.00	919.24	0.00	0.00	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

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Stage-Discharge for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
919.32	0.00	0.00	0.00	923.48	0.00	0.00	0.00
919.40	0.00	0.00	0.00	923.56	0.00	0.00	0.00
919.48	0.00	0.00	0.00	923.64	0.00	0.00	0.00
919.56	0.00	0.00	0.00	923.72	0.00	0.00	0.00
919.64	0.00	0.00	0.00	923.80	0.00	0.00	0.00
919.72	0.00	0.00	0.00	923.88	0.00	0.00	0.00
919.80	0.00	0.00	0.00	923.96	0.00	0.00	0.00
919.88	0.00	0.00	0.00	924.04	0.00	0.00	0.00
919.96	0.00	0.00	0.00	924.12	0.00	0.00	0.00
920.04	0.00	0.00	0.00	924.20	0.00	0.00	0.00
920.12	0.00	0.00	0.00	924.28	0.00	0.00	0.00
920.20	0.00	0.00	0.00	924.36	0.00	0.00	0.00
920.28	0.00	0.00	0.00	924.44	0.00	0.00	0.00
920.36	0.00	0.00	0.00	924.52	0.00	0.00	0.00
920.44	0.00	0.00	0.00	924.60	0.00	0.00	0.00
920.52	0.00	0.00	0.00	924.68	0.00	0.00	0.00
920.60	0.00	0.00	0.00	924.76	0.00	0.00	0.00
920.68	0.00	0.00	0.00	924.84	0.00	0.00	0.00
920.76	0.00	0.00	0.00	924.92	0.00	0.00	0.00
920.84	0.00	0.00	0.00	925.00	0.00	0.00	0.00
920.92	0.00	0.00	0.00	925.08	0.00	0.00	0.00
921.00	0.00	0.00	0.00	925.16	0.00	0.00	0.00
921.08	0.00	0.00	0.00	925.24	0.00	0.00	0.00
921.16	0.00	0.00	0.00	925.32	0.00	0.00	0.00
921.24	0.00	0.00	0.00	925.40	0.00	0.00	0.00
921.32	0.00	0.00	0.00	925.48	0.00	0.00	0.00
921.40	0.00	0.00	0.00	925.56	0.00	0.00	0.00
921.48	0.00	0.00	0.00	925.64	0.00	0.00	0.00
921.56	0.00	0.00	0.00	925.72	0.00	0.00	0.00
921.64	0.00	0.00	0.00	925.80	0.00	0.00	0.00
921.72	0.00	0.00	0.00	925.88	0.00	0.00	0.00
921.80	0.00	0.00	0.00	925.96	0.00	0.00	0.00
921.88	0.00	0.00	0.00	926.04	0.00	0.00	0.00
921.96	0.00	0.00	0.00	926.12	0.00	0.00	0.00
922.04	0.00	0.00	0.00	926.20	0.00	0.00	0.00
922.12	0.00	0.00	0.00	926.28	0.00	0.00	0.00
922.20	0.00	0.00	0.00	926.36	0.00	0.00	0.00
922.28	0.00	0.00	0.00	926.44	0.00	0.00	0.00
922.36	0.00	0.00	0.00	926.52	0.00	0.00	0.00
922.44	0.00	0.00	0.00	926.60	0.00	0.00	0.00
922.52	0.00	0.00	0.00	926.68	0.00	0.00	0.00
922.60	0.00	0.00	0.00	926.76	0.00	0.00	0.00
922.68	0.00	0.00	0.00	926.84	0.00	0.00	0.00
922.76	0.00	0.00	0.00	926.92	0.00	0.00	0.00
922.84	0.00	0.00	0.00	927.00	0.00	0.00	0.00
922.92	0.00	0.00	0.00	927.08	0.00	0.00	0.00
923.00	0.00	0.00	0.00	927.16	0.00	0.00	0.00
923.08	0.00	0.00	0.00	927.24	0.00	0.00	0.00
923.16	0.00	0.00	0.00	927.32	0.00	0.00	0.00
923.24	0.00	0.00	0.00	927.40	0.00	0.00	0.00
923.32	0.00	0.00	0.00	927.48	0.00	0.00	0.00
923.40	0.00	0.00	0.00	927.56	0.00	0.00	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Stage-Discharge for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
927.64	0.00	0.00	0.00	931.80	0.12	0.12	0.00
927.72	0.00	0.00	0.00	931.88	0.24	0.24	0.00
927.80	0.00	0.00	0.00	931.96	0.41	0.41	0.00
927.88	0.00	0.00	0.00	932.04	0.62	0.62	0.00
927.96	0.00	0.00	0.00	932.12	0.86	0.86	0.00
928.04	0.00	0.00	0.00	932.20	1.11	1.11	0.00
928.12	0.00	0.00	0.00	932.28	1.33	1.33	0.00
928.20	0.00	0.00	0.00	932.36	1.54	1.54	0.00
928.28	0.00	0.00	0.00	932.44	1.71	1.71	0.00
928.36	0.00	0.00	0.00	932.52	1.87	1.87	0.00
928.44	0.00	0.00	0.00	932.60	2.02	2.02	0.00
928.52	0.00	0.00	0.00	932.68	2.15	2.15	0.00
928.60	0.00	0.00	0.00	932.76	2.28	2.28	0.00
928.68	0.00	0.00	0.00	932.84	2.40	2.40	0.00
928.76	0.00	0.00	0.00	932.92	2.52	2.52	0.00
928.84	0.00	0.00	0.00	933.00	2.63	2.63	0.00
928.92	0.00	0.00	0.00	933.08	2.73	2.73	0.00
929.00	0.00	0.00	0.00	933.16	2.83	2.83	0.00
929.08	0.00	0.00	0.00	933.24	2.93	2.93	0.00
929.16	0.00	0.00	0.00	933.32	3.03	3.03	0.00
929.24	0.00	0.00	0.00	933.40	3.12	3.12	0.00
929.32	0.00	0.00	0.00	933.48	3.21	3.21	0.00
929.40	0.00	0.00	0.00	933.56	3.29	3.29	0.00
929.48	0.00	0.00	0.00	933.64	3.38	3.38	0.00
929.56	0.00	0.00	0.00	933.72	3.46	3.46	0.00
929.64	0.00	0.00	0.00	933.80	3.54	3.54	0.00
929.72	0.00	0.00	0.00	933.88	3.62	3.62	0.00
929.80	0.00	0.00	0.00	933.96	3.70	3.70	0.00
929.88	0.00	0.00	0.00	934.04	3.77	3.77	0.00
929.96	0.00	0.00	0.00	934.12	3.85	3.85	0.00
930.04	0.00	0.00	0.00	934.20	3.92	3.92	0.00
930.12	0.00	0.00	0.00	934.28	3.99	3.99	0.00
930.20	0.00	0.00	0.00	934.36	4.06	4.06	0.00
930.28	0.00	0.00	0.00	934.44	4.13	4.13	0.00
930.36	0.00	0.00	0.00	934.52	4.20	4.20	0.00
930.44	0.00	0.00	0.00	934.60	4.26	4.26	0.00
930.52	0.00	0.00	0.00	934.68	4.33	4.33	0.00
930.60	0.00	0.00	0.00	934.76	4.39	4.39	0.00
930.68	0.00	0.00	0.00	934.84	4.46	4.46	0.00
930.76	0.00	0.00	0.00	934.92	4.52	4.52	0.00
930.84	0.00	0.00	0.00	935.00	4.58	4.58	0.00
930.92	0.00	0.00	0.00	935.08	4.64	4.64	0.00
931.00	0.00	0.00	0.00	935.16	4.70	4.70	0.00
931.08	0.00	0.00	0.00	935.24	4.76	4.76	0.00
931.16	0.00	0.00	0.00	935.32	4.82	4.82	0.00
931.24	0.00	0.00	0.00	935.40	4.88	4.88	0.00
931.32	0.00	0.00	0.00	935.48	4.94	4.94	0.00
931.40	0.00	0.00	0.00	935.56	4.99	4.99	0.00
931.48	0.00	0.00	0.00	935.64	5.05	5.05	0.00
931.56	0.00	0.00	0.00	935.72	5.11	5.11	0.00
931.64	0.01	0.01	0.00	935.80	5.16	5.16	0.00
931.72	0.05	0.05	0.00	935.88	5.21	5.21	0.00

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Stage-Discharge for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
935.96	5.27	5.27	0.00	940.12	7.55	7.55	0.00
936.04	5.32	5.32	0.00	940.20	7.59	7.59	0.00
936.12	5.37	5.37	0.00	940.28	7.63	7.63	0.00
936.20	5.43	5.43	0.00	940.36	7.66	7.66	0.00
936.28	5.48	5.48	0.00	940.44	7.70	7.70	0.00
936.36	5.53	5.53	0.00	940.52	7.74	7.74	0.00
936.44	5.58	5.58	0.00	940.60	7.77	7.77	0.00
936.52	5.63	5.63	0.00	940.68	7.81	7.81	0.00
936.60	5.68	5.68	0.00	940.76	7.85	7.85	0.00
936.68	5.73	5.73	0.00	940.84	7.88	7.88	0.00
936.76	5.78	5.78	0.00	940.92	7.92	7.92	0.00
936.84	5.83	5.83	0.00	941.00	7.97	7.97	0.00
936.92	5.88	5.88	0.00	941.08	8.08	8.08	0.00
937.00	5.92	5.92	0.00	941.16	8.26	8.26	0.00
937.08	5.97	5.97	0.00	941.24	8.54	8.54	0.00
937.16	6.02	6.02	0.00	941.32	8.91	8.91	0.00
937.24	6.06	6.06	0.00	941.40	9.37	9.37	0.00
937.32	6.11	6.11	0.00	941.48	9.92	9.92	0.00
937.40	6.16	6.16	0.00	941.56	10.54	10.54	0.00
937.48	6.20	6.20	0.00	941.64	11.23	11.23	0.00
937.56	6.25	6.25	0.00	941.72	11.98	11.98	0.00
937.64	6.29	6.29	0.00	941.80	12.78	12.78	0.00
937.72	6.34	6.34	0.00	941.88	13.63	13.63	0.00
937.80	6.38	6.38	0.00	941.96	14.51	14.51	0.00
937.88	6.42	6.42	0.00	942.04	15.41	15.41	0.00
937.96	6.47	6.47	0.00	942.12	16.32	16.32	0.00
938.04	6.51	6.51	0.00	942.20	17.22	17.22	0.00
938.12	6.56	6.56	0.00	942.28	18.09	18.09	0.00
938.20	6.60	6.60	0.00	942.36	18.90	18.90	0.00
938.28	6.64	6.64	0.00	942.44	19.61	19.61	0.00
938.36	6.68	6.68	0.00	942.52	20.87	20.30	0.57
938.44	6.72	6.72	0.00	942.60	27.25	20.89	6.36
938.52	6.77	6.77	0.00	942.68	36.85	21.50	15.35
938.60	6.81	6.81	0.00	942.76	48.79	22.09	26.71
938.68	6.85	6.85	0.00	942.84	62.71	22.65	40.06
938.76	6.89	6.89	0.00	942.92	78.31	23.19	55.12
938.84	6.93	6.93	0.00	943.00	95.31	23.72	71.59
938.92	6.97	6.97	0.00	943.08	113.67	24.22	89.45
939.00	7.01	7.01	0.00	943.16	132.57	24.72	107.85
939.08	7.05	7.05	0.00	943.24	152.10	25.20	126.90
939.16	7.09	7.09	0.00	943.32	172.64	25.67	146.97
939.24	7.13	7.13	0.00	943.40	194.86	26.13	168.74
939.32	7.17	7.17	0.00	943.48	218.01	26.57	191.43
939.40	7.21	7.21	0.00	943.56	242.52	27.01	215.51
939.48	7.25	7.25	0.00	943.64	268.17	27.44	240.73
939.56	7.29	7.29	0.00	943.72	294.67	27.86	266.81
939.64	7.33	7.33	0.00	943.80	321.75	28.27	293.48
939.72	7.36	7.36	0.00	943.88	349.66	28.67	320.98
939.80	7.40	7.40	0.00	943.96	377.97	29.07	348.90
939.88	7.44	7.44	0.00	944.04	406.85	29.46	377.39
939.96	7.48	7.48	0.00	944.12	436.56	29.85	406.71
940.04	7.52	7.52	0.00	944.20	467.43	30.22	437.21

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

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Stage-Discharge for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
944.28	499.03	30.60	468.43
944.36	531.33	30.96	500.36
944.44	564.31	31.32	532.99
944.52	597.98	31.68	566.30
944.60	632.30	32.03	600.27
944.68	667.27	32.38	634.89
944.76	702.88	32.72	670.16
944.84	739.12	33.06	706.06
944.92	775.97	33.39	742.57
945.00	813.42	33.72	779.70
945.08	851.47	34.05	817.42
945.16	890.11	34.37	855.74
945.24	929.32	34.69	894.63
945.32	969.10	35.01	934.09
945.40	1,009.44	35.32	974.12
945.48	1,050.34	35.63	1,014.71
945.56	1,091.78	35.94	1,055.84
945.64	1,133.76	36.24	1,097.52
945.72	1,176.27	36.54	1,139.73
945.80	1,219.30	36.84	1,182.46
945.88	1,262.85	37.13	1,225.72
945.96	1,306.92	37.42	1,269.50

Pond 2 & 3 Model_Proposed Conditions

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Stage-Area-Storage for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
911.00	0	915.16	37,404	919.32	128,070
911.08	260	915.24	38,734	919.40	130,300
911.16	521	915.32	40,065	919.48	132,530
911.24	781	915.40	41,396	919.56	134,760
911.32	1,042	915.48	42,727	919.64	136,990
911.40	1,302	915.56	44,058	919.72	139,220
911.48	1,562	915.64	45,388	919.80	141,451
911.56	1,823	915.72	46,719	919.88	143,681
911.64	2,083	915.80	48,050	919.96	145,911
911.72	2,344	915.88	49,381	920.04	148,246
911.80	2,604	915.96	50,712	920.12	150,686
911.88	2,864	916.04	52,173	920.20	153,126
911.96	3,125	916.12	53,766	920.28	155,565
912.04	3,542	916.20	55,359	920.36	158,005
912.12	4,115	916.28	56,952	920.44	160,445
912.20	4,689	916.36	58,545	920.52	162,885
912.28	5,263	916.44	60,138	920.60	165,325
912.36	5,836	916.52	61,731	920.68	167,765
912.44	6,410	916.60	63,324	920.76	170,204
912.52	6,983	916.68	64,917	920.84	172,644
912.60	7,557	916.76	66,510	920.92	175,084
912.68	8,131	916.84	68,103	921.00	177,524
912.76	8,704	916.92	69,696	921.08	180,156
912.84	9,278	917.00	71,289	921.16	182,787
912.92	9,851	917.08	73,101	921.24	185,419
913.00	10,425	917.16	74,914	921.32	188,051
913.08	11,289	917.24	76,726	921.40	190,682
913.16	12,154	917.32	78,538	921.48	193,314
913.24	13,018	917.40	80,351	921.56	195,946
913.32	13,882	917.48	82,163	921.64	198,577
913.40	14,747	917.56	83,975	921.72	201,209
913.48	15,611	917.64	85,788	921.80	203,841
913.56	16,475	917.72	87,600	921.88	206,472
913.64	17,340	917.80	89,412	921.96	209,104
913.72	18,204	917.88	91,225	922.04	211,838
913.80	19,068	917.96	93,037	922.12	214,673
913.88	19,933	918.04	94,951	922.20	217,508
913.96	20,797	918.12	96,968	922.28	220,343
914.04	21,770	918.20	98,984	922.36	223,178
914.12	22,851	918.28	101,001	922.44	226,013
914.20	23,932	918.36	103,017	922.52	228,848
914.28	25,013	918.44	105,034	922.60	231,683
914.36	26,094	918.52	107,050	922.68	234,519
914.44	27,175	918.60	109,067	922.76	237,354
914.52	28,256	918.68	111,083	922.84	240,189
914.60	29,337	918.76	113,100	922.92	243,024
914.68	30,418	918.84	115,116	923.00	245,859
914.76	31,499	918.92	117,133	923.08	248,951
914.84	32,580	919.00	119,149	923.16	252,042
914.92	33,661	919.08	121,379	923.24	255,134
915.00	34,742	919.16	123,609	923.32	258,225
915.08	36,073	919.24	125,839	923.40	261,317

Pond 2 & 3 Model_Proposed Conditions

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Stage-Area-Storage for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
923.48	264,409	927.64	468,516	931.80	749,999
923.56	267,500	927.72	473,145	931.88	756,096
923.64	270,592	927.80	477,774	931.96	762,193
923.72	273,683	927.88	482,403	932.04	768,333
923.80	276,775	927.96	487,032	932.12	774,516
923.88	279,867	928.04	491,834	932.20	780,699
923.96	282,958	928.12	496,809	932.28	786,882
924.04	286,258	928.20	501,784	932.36	793,064
924.12	289,765	928.28	506,759	932.44	799,247
924.20	293,272	928.36	511,734	932.52	805,430
924.28	296,779	928.44	516,709	932.60	811,612
924.36	300,286	928.52	521,684	932.68	817,795
924.44	303,793	928.60	526,659	932.76	823,978
924.52	307,300	928.68	531,633	932.84	830,161
924.60	310,807	928.76	536,608	932.92	836,343
924.68	314,315	928.84	541,583	933.00	842,526
924.76	317,822	928.92	546,558	933.08	848,850
924.84	321,329	929.00	551,533	933.16	855,175
924.92	324,836	929.08	556,886	933.24	861,499
925.00	328,343	929.16	562,239	933.32	867,824
925.08	332,297	929.24	567,591	933.40	874,148
925.16	336,251	929.32	572,944	933.48	880,472
925.24	340,205	929.40	578,297	933.56	886,797
925.32	344,159	929.48	583,650	933.64	893,121
925.40	348,113	929.56	589,003	933.72	899,446
925.48	352,067	929.64	594,355	933.80	905,770
925.56	356,022	929.72	599,708	933.88	912,094
925.64	359,976	929.80	605,061	933.96	918,419
925.72	363,930	929.88	610,414	934.04	924,815
925.80	367,884	929.96	615,767	934.12	931,284
925.88	371,838	930.04	621,308	934.20	937,752
925.96	375,792	930.12	627,037	934.28	944,221
926.04	379,918	930.20	632,766	934.36	950,689
926.12	384,215	930.28	638,495	934.44	957,158
926.20	388,512	930.36	644,225	934.52	963,626
926.28	392,809	930.44	649,954	934.60	970,095
926.36	397,106	930.52	655,683	934.68	976,563
926.44	401,404	930.60	661,413	934.76	983,032
926.52	405,701	930.68	667,142	934.84	989,500
926.60	409,998	930.76	672,871	934.92	995,969
926.68	414,295	930.84	678,600	935.00	1,002,437
926.76	418,592	930.92	684,330	935.08	1,009,065
926.84	422,890	931.00	690,059	935.16	1,015,694
926.92	427,187	931.08	696,053	935.24	1,022,322
927.00	431,484	931.16	702,047	935.32	1,028,951
927.08	436,113	931.24	708,041	935.40	1,035,579
927.16	440,742	931.32	714,035	935.48	1,042,207
927.24	445,371	931.40	720,029	935.56	1,048,836
927.32	450,000	931.48	726,023	935.64	1,055,464
927.40	454,629	931.56	732,017	935.72	1,062,093
927.48	459,258	931.64	738,011	935.80	1,068,721
927.56	463,887	931.72	744,005	935.88	1,075,349

Pond 2 & 3 Model_Proposed Conditions

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Stage-Area-Storage for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
935.96	1,081,978	940.12	1,488,543	944.28	1,990,538
936.04	1,089,188	940.20	1,497,644	944.36	2,000,856
936.12	1,096,980	940.28	1,506,746	944.44	2,011,174
936.20	1,104,772	940.36	1,515,848	944.52	2,021,493
936.28	1,112,564	940.44	1,524,949	944.60	2,031,811
936.36	1,120,356	940.52	1,534,051	944.68	2,042,129
936.44	1,128,148	940.60	1,543,153	944.76	2,052,447
936.52	1,135,940	940.68	1,552,254	944.84	2,062,766
936.60	1,143,732	940.76	1,561,356	944.92	2,073,084
936.68	1,151,524	940.84	1,570,458	945.00	2,083,402
936.76	1,159,316	940.92	1,579,559	945.08	2,094,013
936.84	1,167,108	941.00	1,588,661	945.16	2,104,623
936.92	1,174,900	941.08	1,598,415	945.24	2,115,234
937.00	1,182,692	941.16	1,608,168	945.32	2,125,845
937.08	1,190,483	941.24	1,617,922	945.40	2,136,455
937.16	1,198,275	941.32	1,627,676	945.48	2,147,066
937.24	1,206,067	941.40	1,637,429	945.56	2,157,676
937.32	1,213,859	941.48	1,647,183	945.64	2,168,287
937.40	1,221,651	941.56	1,656,937	945.72	2,178,898
937.48	1,229,443	941.64	1,666,690	945.80	2,189,508
937.56	1,237,235	941.72	1,676,444	945.88	2,200,119
937.64	1,245,027	941.80	1,686,198	945.96	2,210,730
937.72	1,252,819	941.88	1,695,951		
937.80	1,260,611	941.96	1,705,705		
937.88	1,268,403	942.04	1,715,459		
937.96	1,276,195	942.12	1,725,213		
938.04	1,283,987	942.20	1,734,966		
938.12	1,291,779	942.28	1,744,720		
938.20	1,299,571	942.36	1,754,474		
938.28	1,307,363	942.44	1,764,227		
938.36	1,315,155	942.52	1,773,981		
938.44	1,322,947	942.60	1,783,735		
938.52	1,330,739	942.68	1,793,488		
938.60	1,338,531	942.76	1,803,242		
938.68	1,346,323	942.84	1,812,996		
938.76	1,354,115	942.92	1,822,749		
938.84	1,361,907	943.00	1,832,503		
938.92	1,369,699	943.08	1,842,257		
939.00	1,377,491	943.16	1,852,010		
939.08	1,385,282	943.24	1,861,764		
939.16	1,393,074	943.32	1,871,518		
939.24	1,400,866	943.40	1,881,271		
939.32	1,408,658	943.48	1,891,025		
939.40	1,416,450	943.56	1,900,779		
939.48	1,424,242	943.64	1,910,532		
939.56	1,432,034	943.72	1,920,286		
939.64	1,439,826	943.80	1,930,040		
939.72	1,447,618	943.88	1,939,793		
939.80	1,455,410	943.96	1,949,547		
939.88	1,463,202	944.04	1,959,583		
939.96	1,470,994	944.12	1,969,901		
940.04	1,479,441	944.20	1,980,220		

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

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Summary for Pond Pond 2 Discharge Cap.: Pond 2 Discharge Capacity

Additional 6.9-cfs Inflow from Pitts Pond (2,100GPM), Pitts Quarry (1,000GPM), & Sed.Traps 6 & 7 (1,000GPM) Is Included

Inflow	=	9.14 cfs @	0.00 hrs,	Volume=	54.394 af,	Incl. 9.14 cfs Base Flow
Outflow	=	9.14 cfs @	0.01 hrs,	Volume=	54.394 af,	Atten= 0%, Lag= 0.6 min
Primary	=	0.32 cfs @	0.01 hrs,	Volume=	1.912 af	
Secondary	=	8.82 cfs @	0.01 hrs,	Volume=	52.482 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Starting Elev= 932.50' Surf.Area= 0 sf Storage= 0 cf

Peak Elev= 943.90' @ 0.00 hrs Surf.Area= 100 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 0.0 min (2,160.0 - 2,160.0)

Volume	Invert	Avail.Storage	Storage Description
#1	943.90'	15 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
943.90	100	0	0
944.00	200	15	15

Device	Routing	Invert	Outlet Devices
#1	Primary	941.47'	8.0" Round Top of 8" Perf. Riser L= 82.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 930.18' S= 0.1377 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Primary	941.47'	8.0" Round Top of 8" Perf. Riser L= 80.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 930.47' S= 0.1375 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#3	Primary	941.47'	8.0" Round Top of 8" Perf. Riser L= 80.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 931.42' S= 0.1256 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#4	Primary	941.47'	8.0" Round Top of 8" Perf. Riser L= 80.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 930.70' S= 0.1346 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#5	Primary	941.47'	18.0" Round 18" Culvert L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 940.28' S= 0.0238 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#6	Primary	941.62'	18.0" Round 18" Culvert L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.62' / 940.20' S= 0.0284 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#7	Secondary	942.50'	80.0' long x 40.0' breadth 80' Emergency Spillway

Pond 2 & 3 Model_Proposed Conditions

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#8	Secondary	942.50'	Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60
			Coef. (English)	2.68	2.70	2.70	2.64	2.63	2.64	2.64	2.63
			25.0' long x 40.0' breadth 25' Emergency Spillway								
#9	Secondary	942.50'	Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60
			Coef. (English)	2.68	2.70	2.70	2.64	2.63	2.64	2.64	2.63
			50.0' long x 40.0' breadth 50' Emergency Spillway								
			Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60
			Coef. (English)	2.68	2.70	2.70	2.64	2.63	2.64	2.64	2.63

Primary OutFlow Max=0.00 cfs @ 0.01 hrs HW=943.90' (Free Discharge)

- 1=Top of 8" Perf. Riser (Passes 0.00 cfs of 1.92 cfs potential flow)
- 2=Top of 8" Perf. Riser (Passes 0.00 cfs of 1.92 cfs potential flow)
- 3=Top of 8" Perf. Riser (Passes 0.00 cfs of 1.92 cfs potential flow)
- 4=Top of 8" Perf. Riser (Passes 0.00 cfs of 1.92 cfs potential flow)
- 5=18" Culvert (Passes 0.00 cfs of 8.71 cfs potential flow)
- 6=18" Culvert (Passes 0.00 cfs of 8.31 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=943.90' (Free Discharge)

- 7=80' Emergency Spillway (Passes 0.00 cfs of 349.85 cfs potential flow)
- 8=25' Emergency Spillway (Passes 0.00 cfs of 109.33 cfs potential flow)
- 9=50' Emergency Spillway (Passes 0.00 cfs of 218.66 cfs potential flow)

Pond 2 & 3 Model_Proposed Conditions*Type II 24-hr 10-yr Rainfall=4.80"*

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Stage-Discharge for Pond Pond 2 Discharge Cap.: Pond 2 Discharge Capacity

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
943.90	0.00	0.00	0.00
943.91	709.76	24.77	684.99
943.92	717.00	24.84	692.16
943.93	724.26	24.91	699.35
943.94	731.55	24.99	706.56
943.95	738.85	25.06	713.80
943.96	746.19	25.13	721.06
943.97	753.54	25.20	728.34
943.98	760.91	25.27	735.65
943.99	768.31	25.34	742.97
944.00	775.73	25.40	750.32

ATTACHMENT 5

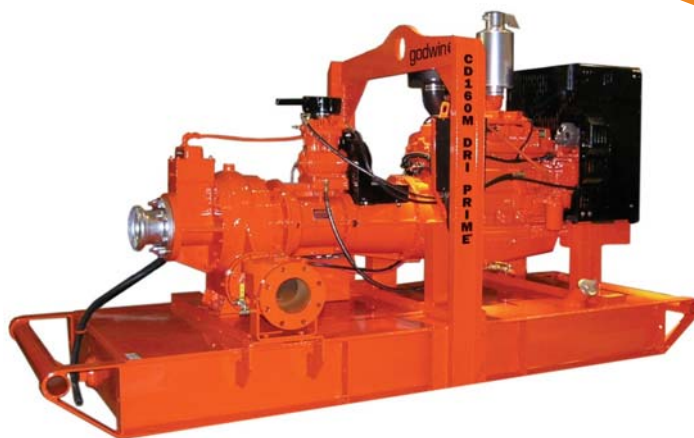
CD160M Dri-Prime Pump Curve

CD160M Dri-Prime® Pump

The Godwin Dri-Prime CD160M pump offers flow rates to 1880 USGPM and has the capability of handling solids up to 3.0" in diameter.

The CD160M is able to automatically prime to 28' of suction lift from dry. Automatic or manual starting/stopping available through integral mounted control panel or optional wireless-remote access.

Indefinite dry-running is no problem due to the unique Godwin liquid bath mechanical seal design. Solids handling, dry-running, and portability make the CD160M the perfect choice for dewatering and bypass applications.



Features and Benefits

- Simple maintenance normally limited to checking fluid levels and filters.
- Dri-Prime (continuously operated Venturi air ejector priming device) requiring no periodic adjustment. Optional compressor clutch available.
- Extensive application flexibility handling sewage, slurries, and liquids with solids up to 3.0" in diameter.
- Dry-running high pressure liquid bath mechanical seal with high abrasion resistant solid silicon carbide faces.
- Close-coupled centrifugal pump with Dri-Prime system coupled to a diesel engine or electric motor.
- All cast iron construction (stainless steel construction option available) with cast steel impeller.
- Also available in a critically silenced unit which reduces noise levels to less than 70 dBA at 30'.
- Standard engine John Deere 6068HF285 (T3 Flex). Also available with John Deere 6068HC93 (IT4).

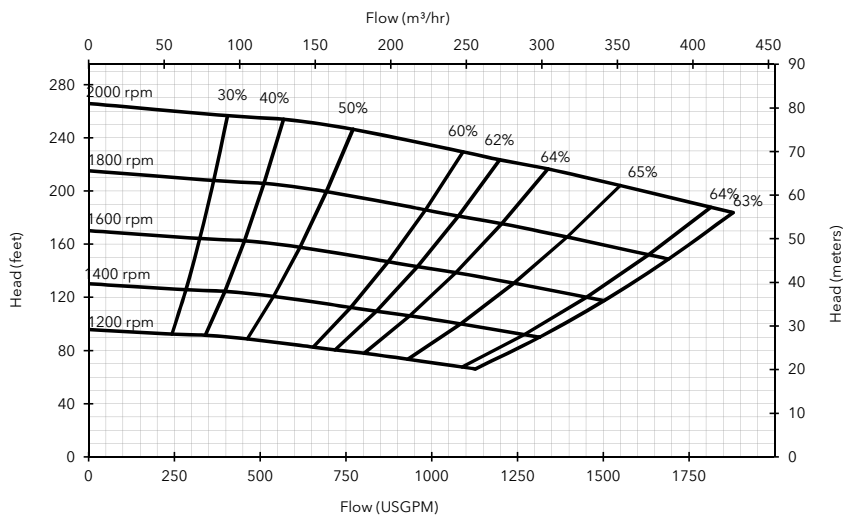
Specifications

Suction connection	6" 150# ANSI B16.5
Delivery connection	6" 150# ANSI B16.5
Max capacity	1880 USGPM †
Max solids handling	3.0"
Max impeller diameter	14.0"
Max operating temp	176°F*
Max pressure	115 psi
Max suction pressure	73 psi
Max casing pressure	173 psi
Max operating speed	2000 rpm

* Please contact our office for applications in excess of 176°F.

† Larger diameter pipes may be required for maximum flows.

Performance Curve



Engine option 1

John Deere 6068HF285 (T3 Flex), 149 HP @ 2000 rpm

Impeller diameter 14.0"

Pump speed 2000 rpm

Suction Lift Table

Total Suction Head (feet)	Total Delivery Head (feet)				
	144	185	201	221	245
	Output (USGPM)				
10	2006	1712	1468	1027	489
15	2006	1614	1370	734	367
20	2006	1517	1223	612	-
25	1614	1223	1076	489	-

Fuel capacity: 180 US Gal

Max Fuel consumption @ 2000 rpm: 8.0 US Gal/hr

Max Fuel consumption @ 1600 rpm: 7.0 US Gal/hr

Weight (Dry): 5,610 lbs

Weight (Wet): 6,910 lbs

Dim.: (L) 147" x (W) 56" x (H) 84"

Performance data provided in tables is based on water tests at sea level and 20°C ambient. All information is approximate and for general guidance only. Please contact the factory or office for further details.

Materials

Pump casing & suction cover	Cast iron BS EN 1561 - 1997
Wearplates	Cast iron BS EN 1561 - 1997
Pump Shaft	Carbon steel BS 970 - 1991 817M40T
Impeller	Cast Steel BS3100 A5 Hardness to 200 HB Brinell
Non-return valve body	Cast iron BS EN 1561 - 1997
Mechanical seal	Silicon carbide face; Viton elastomers; Stainless steel body

Engine option 2

John Deere 6068HC93 (IT4), 156 HP @ 2000 rpm

Impeller diameter 14.0"

Pump speed 2000 rpm

Suction Lift Table

Total Suction Head (feet)	Total Delivery Head (feet)				
	144	185	201	221	245
	Output (USGPM)				
10	2006	1712	1468	1027	489
15	2006	1614	1370	734	367
20	2006	1517	1223	612	-
25	1614	1223	1076	489	-

Fuel capacity: 180 US Gal

Max Fuel consumption @ 2000 rpm: 7.9 US Gal/hr

Max Fuel consumption @ 1600 rpm: 6.8 US Gal/hr

Weight (Dry): 6,270 lbs

Weight (Wet): 7,570 lbs

Dim.: (L) 147" x (W) 56" x (H) 84"

Performance data provided in tables is based on water tests at sea level and 20°C ambient. All information is approximate and for general guidance only. Please contact the factory or office for further details.

