ENVIRONMENTAL
MANAGEMENT SERVICES, INC.

October 12, 2016

Mr. Brian Hocutt
South Mississippi Electric Power Association
P.O. Box 15849
Hattiesburg, MS 39402

Re: CCR Surface Impoundments Initial Inflow Design Flood Control System Plan
R.D. Morrow, Sr. Generating Station
Purvis, Lamar County, Mississippi

Dear Mr. Hocutt:

South Mississippi Electric Power Association (SMEPA) retained Environmental Management Services, Inc. (EMS) to develop an "Initial Inflow Design Flood Control System Plan" (Plan) for the R.D. Morrow, Sr. Generating Station Emergency Scrubber Surge Pond and Scrubber Supply Pond (surface impoundments) located as shown on Figure 1 in Attachment 1 to this Plan. The purpose of this Plan is to ensure that the design of the surface impoundments is sufficient to perform as designed in the case of maximum operating conditions and the appropriate storm event chosen on the basis of the Hazard Classification for the impoundments per Coal Combustion Residuals (CCR) regulations found in 40 CFR Part 257.82.

Site Information

The R.D. Morrow, Sr. Generating Station is located near Purvis in Lamar County, Mississippi just north of Old Okahola School (Okahola) Road. The subject surface impoundments are located just south of the main power block (see Figure 2, Attachment 1) and are located such that discharges or overflows would be conveyed by overflow piping to the Coal Pile Runoff Collection Area immediately down gradient (to the south) from the CCR impoundments. Discharge or overflow from the Coal Pile Runoff Collection Area is conveyed via culvert to Pond 4A which is separated from the Coal Pile Runoff Collection Area by a large railroad spur embankment. The railroad spur is owned by SMEPA and serves to allow storage/routing of rail cars used to deliver coal to the facility. Downstream of Pond 4A is Okahola Road which is a county-maintained paved public road. Excess water from Pond 4A is routed via culvert underneath Okahola Road to the Cooling Tower Blowdown Pond, from where it is eventually discharged under the provisions of a NPDES permit.

Regulatory Background

Regulated surface impoundments that are used to contain and store CCR must meet the following capacity requirements as set forth in 40 CFR Part 257:

§ 257.82 – Hydrologic and hydraulic capacity requirements for CCR surface impoundments.

(a) The owner or operator of an existing or new CCR surface impoundment or any lateral expansion of a CCR surface impoundment must design, construct, operate, and maintain an inflow design flood control system as specified in paragraphs (a)(1) and (2) of this section.

> *(1) The inflow design flood control system must adequately manage flow into the CCR unit during and following the peak discharge of the inflow design flood specified in paragraph (a)(3) of this section.*
>
> *(2) The inflow design flood control system must adequately manage flow from the CCR unit to collect and control the peak discharge resulting from the inflow design flood specified in paragraph (a)(3) of this section.*
>
> *(3) The inflow design flood is:*
>
> > *(i) For a high hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the probable maximum flood;*
> >
> > *(ii) For a significant hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the 1,000-year flood;*
> >
> > *(iii) For a low hazard potential CCR surface impoundment, as determined under § 257.73(a)(2) or § 257.74(a)(2), the 100-year flood; or*
> >
> > *(iv) For an incised CCR surface impoundment, the 25-year flood.*

The hazard potential classification for a dam (i.e., impoundment) is intended to rank dams in terms of potential losses to downstream interests if the dam should fail for any reason. The classification is based on the incremental adverse consequences (pre vs. post event) of failure or mis-operation of the dam, and has no relationship to the current structural integrity, operational status, flood routing capability, or safety condition of the dam or its appurtenances. The hazard potential classification is based on potential adverse impacts/losses in four categories: environmental, infrastructure, economic, and/or human life. As detailed in the "Hazard Potential Classification Assessment" performed by EMS in October 2016, the impoundments are both classified as Low Hazard Potential. As such, the storm event that must be used for design inflow is the 100-year flood.

(b) Discharge from the CCR unit must be handled in accordance with the surface water requirements under § 257.3-3.

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Any discharges from the Emergency Scrubber Surge Pond or the Scrubber Supply Pond are routed through various collection areas prior to introduction to the Cooling Tower Blowdown Pond. The discharge from the Cooling Tower Blowdown Pond is regulated under an NPDES permit and is sampled and reported accordingly.

(c) Inflow design flood control system plan –

(1) Content of the plan. The owner or operator must prepare initial and periodic inflow design flood control system plans for the CCR unit according to the timeframes specified in paragraphs (c)(3) and (4) of this section. These plans must document how the inflow design flood control system has been designed and constructed to meet the requirements of this section. Each plan must be supported by appropriate engineering calculations. The owner or operator of the CCR unit has completed the inflow design flood control system plan when the plan has been placed in the facility's operating record as required by § 257.105(g)(4).

(2) Amendment of the plan. The owner or operator of the CCR unit may amend the written inflow design flood control system plan at any time provided the revised plan is placed in the facility's operating record as required by § 257.105(g)(4). The owner or operator must amend the written inflow design flood control system plan whenever there is a change in conditions that would substantially affect the written plan in effect.

(3) Timeframes for preparing the initial plan – (i) Existing CCR surface impoundments. The owner or operator of the CCR unit must prepare the initial inflow design flood control system plan no later than October 17, 2016.

(ii) New CCR surface impoundments and any lateral expansion of a CCR surface impoundment. The owner or operator must prepare the initial inflow design flood control system plan no later than the date of initial receipt of CCR in the CCR unit.

(4) Frequency for revising the plan. The owner or operator must prepare periodic inflow design flood control system plans required by paragraph (c)(1) of this section every five years. The date of completing the initial plan is the basis for establishing the deadline to complete the first periodic plan. The owner or operator may complete any required plan prior to the required deadline provided the owner or operator places the completed plan into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing a subsequent plan is based on the date of completing the previous plan. For purposes of this paragraph (c)(4), the owner or operator has completed an inflow design flood control system plan when the plan has been placed in the facility's operating record as required by § 257.105(g)(4).

(5) The owner or operator must obtain a certification from a qualified professional engineer stating that the initial and periodic inflow design flood control system plans meet the requirements of this section.

(d) The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(g), the notification requirements specified in § 257.106(g), and the internet requirements specified in § 257.107(g).

The following narrative and supporting figures and calculations constitute the ***Initial Inflow Design Flood Control System Plan*** and have been developed to address the requirements as stated in the regulatory reference above.

Emergency Scrubber Surge Pond

The Emergency Scrubber Surge Pond is a small impoundment used to capture overflow from the thickener unit. The pond has a surface area of 18,600 sq. ft. (0.43 acres) at the normal pool elevation of 264 feet, and has an approximate capacity of 728,000 gallons (2.23 acre-feet). Freeboard at normal pool is 2 feet with the crest of the impoundment at an elevation of approximately 267 feet. Due to the design of the pond and surrounding topography, very little run-on is directed into the impoundment. Normal operational flow from the thickener and rain water falling directly on the impoundment and immediate surroundings constitute the only inflows to the pond during storm events. The average daily operational overflow from the thickener unit to the Emergency Scrubber Surge Pond is 376 gallons per minute (gpm). Calculations for this ponds behavior during the 100-year storm event for this locality are included in Attachment 2 to this correspondence.

Scrubber Supply Pond

The Scrubber Supply Pond is a small impoundment used for supplying water to the facility scrubber system. The pond has a surface area of approximately 45,400 sq. ft. (1.04 acres) at the normal pool elevation of 264 feet, and has an approximate capacity of 3,200,500 gallons (9.82 acre-feet). Freeboard at normal pool is 3 feet with the crest of the impoundment at an elevation of approximately 267 feet. Due to the design of the pond and surrounding topography, very little run-on is directed into the impoundment. Normal operational flow and rain water falling directly on the impoundment and immediate surroundings constitute the only inflows to the pond during storm events. The average daily operational input to the pond is 130.1 gpm from plant drains and 376.1 gpm from the thickener unit overflow (via the emergency scrubber surge pond). Calculations for this ponds behavior during the 100-year storm event for this locality are included in Attachment 2.

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Results

The hydrologic and hydraulic model included in Attachment 2 has been developed based on the current configuration and piping arrangement observed at the facility in October, 2016. Operational assumptions have been made in order to create the model, and a conservative case has been chosen to demonstrate that the impoundments and hydraulic design can perform adequately during a 100-year, 24-hour storm event. This model assumes that no operational flows are entering or exiting the pond, which is a conservative assumption. If the facility is operating, impoundment withdrawals would be slightly greater than operational inputs and would therefore result in a net reduction in fluid volume in the system without makeup input.

The inputs to the model include: the 100-year, 24-hour storm event (design storm) for the plant area which enters the Scrubber Supply Pond via a sump pump arrangement through a 12-inch diameter HDPE pipe, and the design storm for the Emergency Scrubber Surge Pond and the Scrubber Supply Pond. Based on these inputs, both impoundments are designed and constructed to operate with sufficient freeboard to prevent overtopping their dams. Additional safeguards are in place for preventing dam overtopping including a 6-inch diameter high-level gravity overflow and a 6-inch diameter hose in place to serve as discharge piping for a portable pump should the need arise. The inflow flood control system to the CCR impoundments at this facility is adequate and will preserve the structural integrity of the impoundments during the design case.

Certification

I hereby certify, as a Professional Engineer in the State of Mississippi, that the information in this document was assembled under my direct personal charge. This report is not intended or represented to be suitable for reuse by South Mississippi Electric Power Association or others without specific verification or adaptation by the Engineer. This Inflow Design Flood Control System Plan was developed in accordance with the requirements of 40 CFR Part 257 §82.

CHRISTOPHER T. JOHNSON
LICENSED PROFESSIONAL ENGINEER AND SURVEYOR
10/12/2016
PE-15761
PS-3129
STATE OF MISSISSIPPI

Christopher Taylor Johnson, P.E. MS #15761

Qualified Professional Engineer

Date: 10/12/2016

Should you have any questions regarding this document please contact the undersigned at (601) 544-3674. We appreciate the opportunity to assist SMEPA in achieving compliance with CCR regulations.

Sincerely,

Environmental Management Services, Inc.

Chris T. Johnson, P.E., P.S.

Attachments

EMS Project No. SOU2-16-002

ATTACHMENT 1

FIGURES

REVISIONS		
REV	DATE	REMARKS

SCALE 1 INCH = 1500 FEET

375 750 1500

0 375 750 1500 3000

GRAPHIC SCALE

LEGEND

— - — SMEPA PROPERTY BOUNDARY

—— CAP BOUNDARY

REFERENCE: 7.5 MIN. SERIES TOPOGRAPHIC MAP PURVIS, MISSISSIPPI

ENVIRONMENTAL MANAGEMENT SERVICES, INC.

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PREPARED FOR

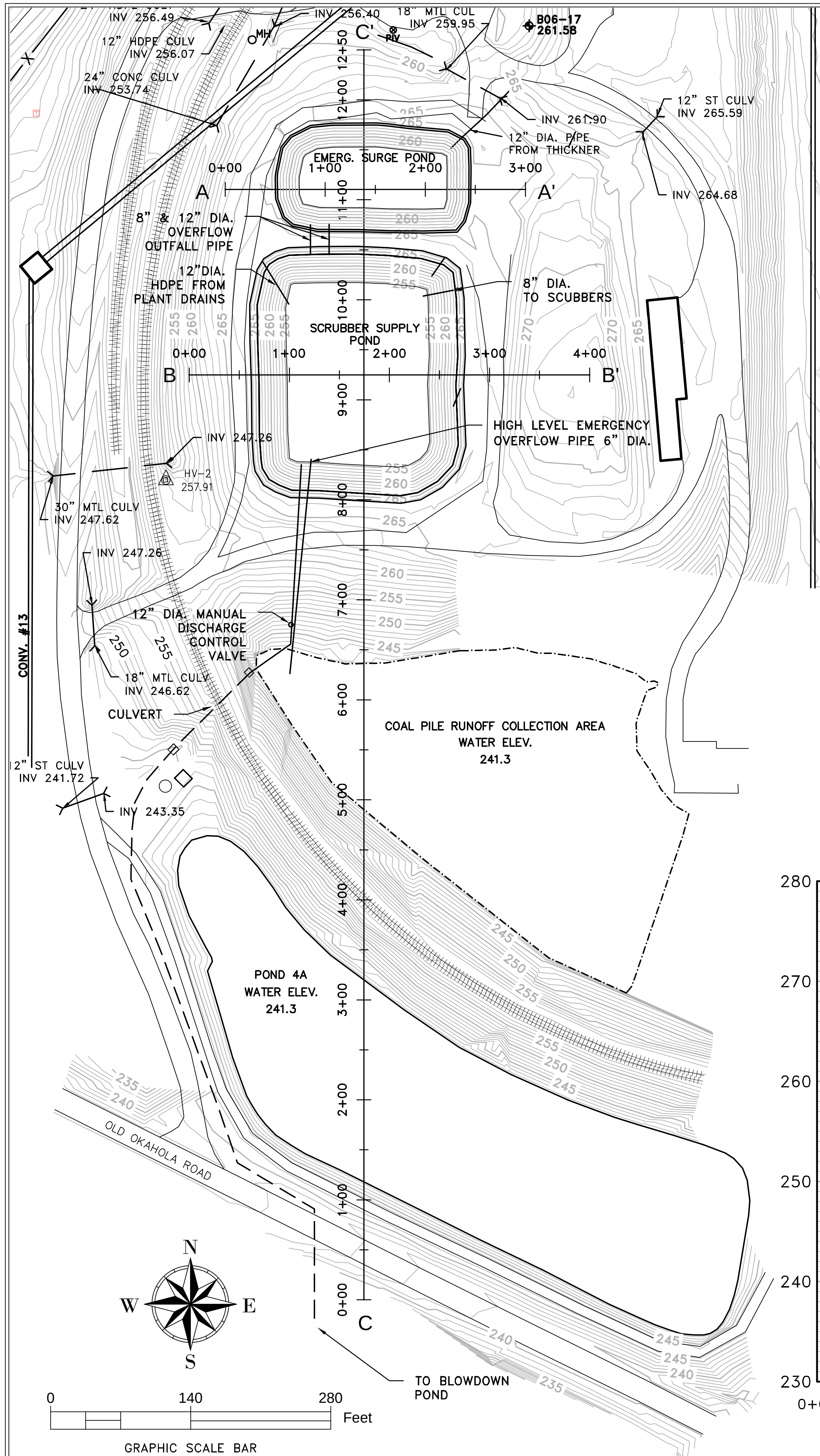
SOUTH MISSISSIPPI ELECTRIC POWER ASSOCIATION
P.O. BOX 15849
HATTIESBURG, MS 39404-5849

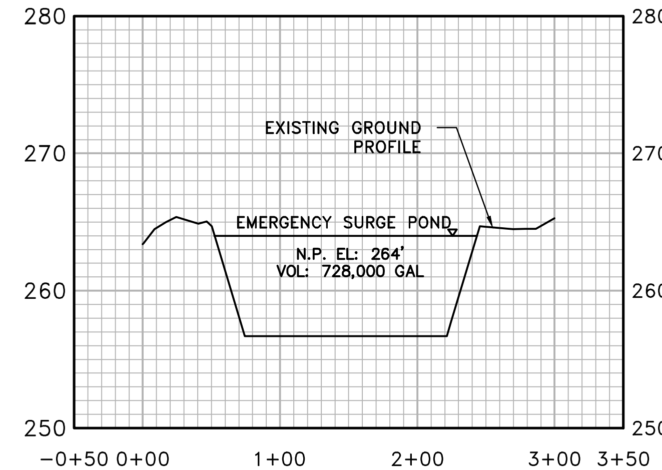
SHEET TITLE

SITE LOCATION

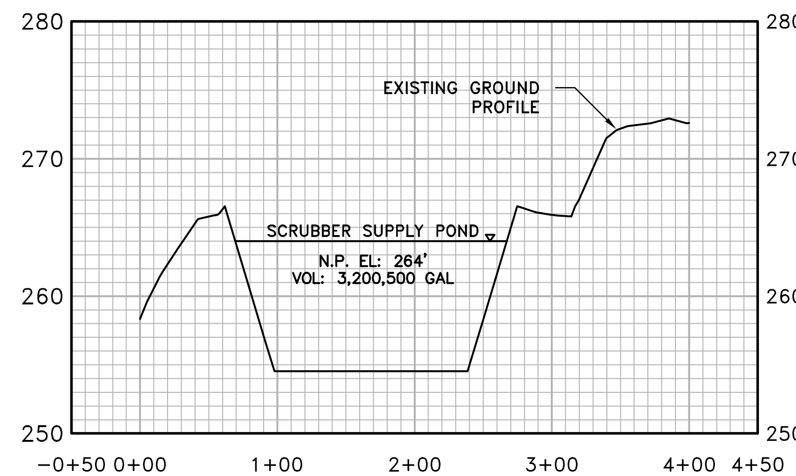
R.D. MORROW SR. GENERATING STATION
PURVIS, MISSISSIPPI

DATE	10/11/2016
SCALE	1" = 1500'
DRAWN BY	PDM
PROJECT NO.	SOU2-16-002
SHEET NO.	1

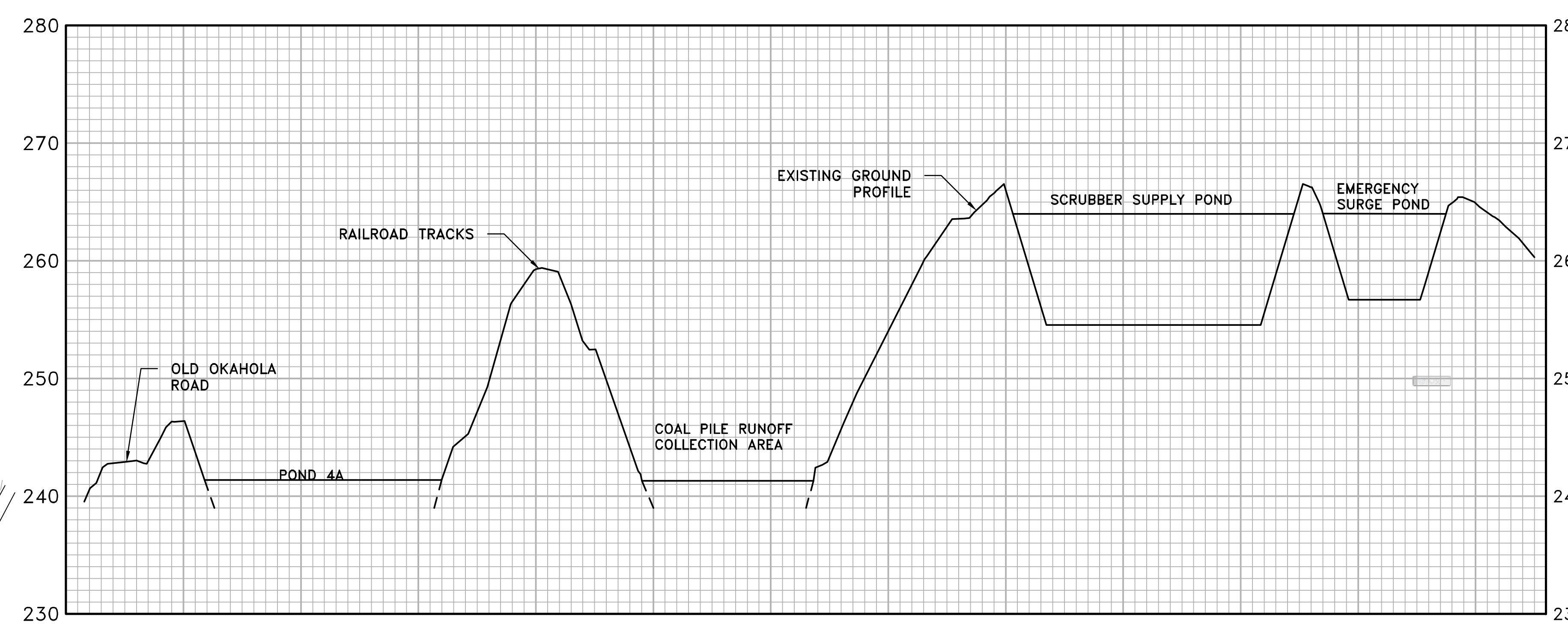




SECTION A - A'



SECTION B - B'



SECTION C - C'

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SHEET TITLE

CCR IMPOUNDMENT PLAN-PROFILE

R.D. MORROW SR. GENERATING STATION

DATE	10-06-2016
SCALE	AS SHOWN
SHEET NO.	2
PROJECT NO.	SOU2-16-002

ATTACHMENT 2
HYDROLOGIC & HYDRAULIC
MODEL/RESULTS

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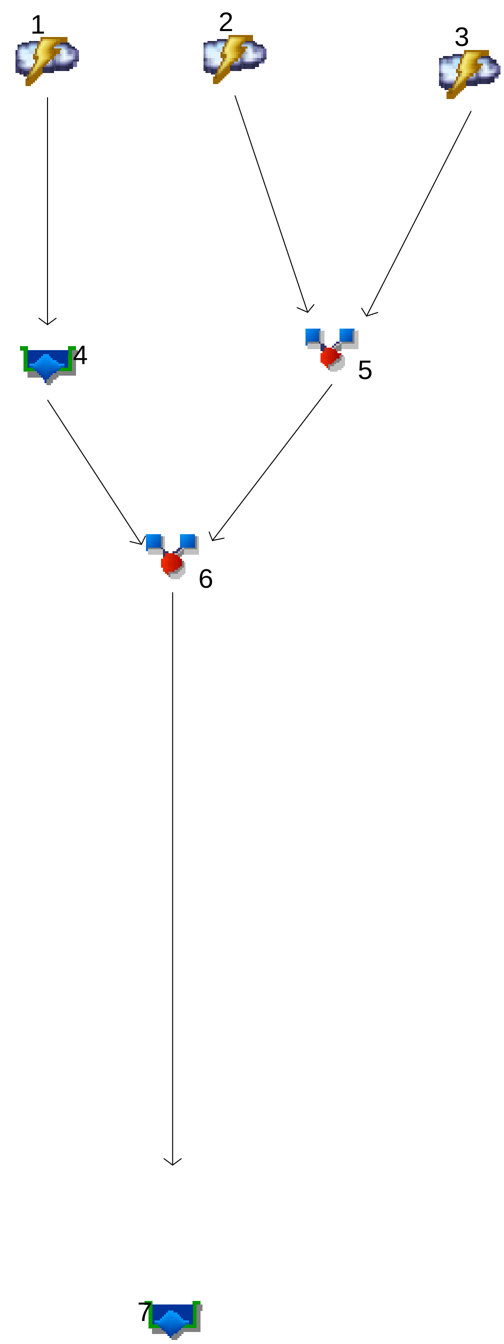
Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3



Legend

Hyd.	Origin	Description
1	Rational	Surge Pond Basin
2	Rational	Scrubber Supply Basin
3	Rational	Plant Drains
4	Reservoir	Route to Surge Pond
5	Combine	Combined Flow to Supply Pond
6	Combine	Total Flow to Supply Pond
7	Reservoir	Scrubber Supply Pond

Project: CCR Impoundments Final (10-12-2016).gpw | Wednesday, 10 / 12 / 2016

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Rational	------	-------	-------	-------	-------	-------	-------	-------	15.04	Surge Pond Basin
2	Rational	------	-------	-------	-------	-------	-------	-------	-------	30.90	Scrubber Supply Basin
3	Rational	------	-------	-------	-------	-------	-------	-------	-------	115.15	Plant Drains
4	Reservoir	1	-------	-------	-------	-------	-------	-------	-------	0.038	Route to Surge Pond
5	Combine	2, 3,	-------	-------	-------	-------	-------	-------	-------	115.15	Combined Flow to Supply Pond
6	Combine	4, 5	-------	-------	-------	-------	-------	-------	-------	115.19	Total Flow to Supply Pond
7	Reservoir	6	-------	-------	-------	-------	-------	-------	-------	2.303	Scrubber Supply Pond

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	15.04	1	1	903	------	------	------	Surge Pond Basin
2	Rational	30.90	1	1	1,854	------	------	------	Scrubber Supply Basin
3	Rational	115.15	1	6	41,453	------	------	------	Plant Drains
4	Reservoir	0.038	1	2	879	1	264.04	101,280	Route to Surge Pond
5	Combine	115.15	1	6	43,307	2, 3,	------	------	Combined Flow to Supply Pond
6	Combine	115.19	1	6	44,186	4, 5	------	------	Total Flow to Supply Pond
7	Reservoir	2.303	1	12	38,744	6	262.87	317,513	Scrubber Supply Pond

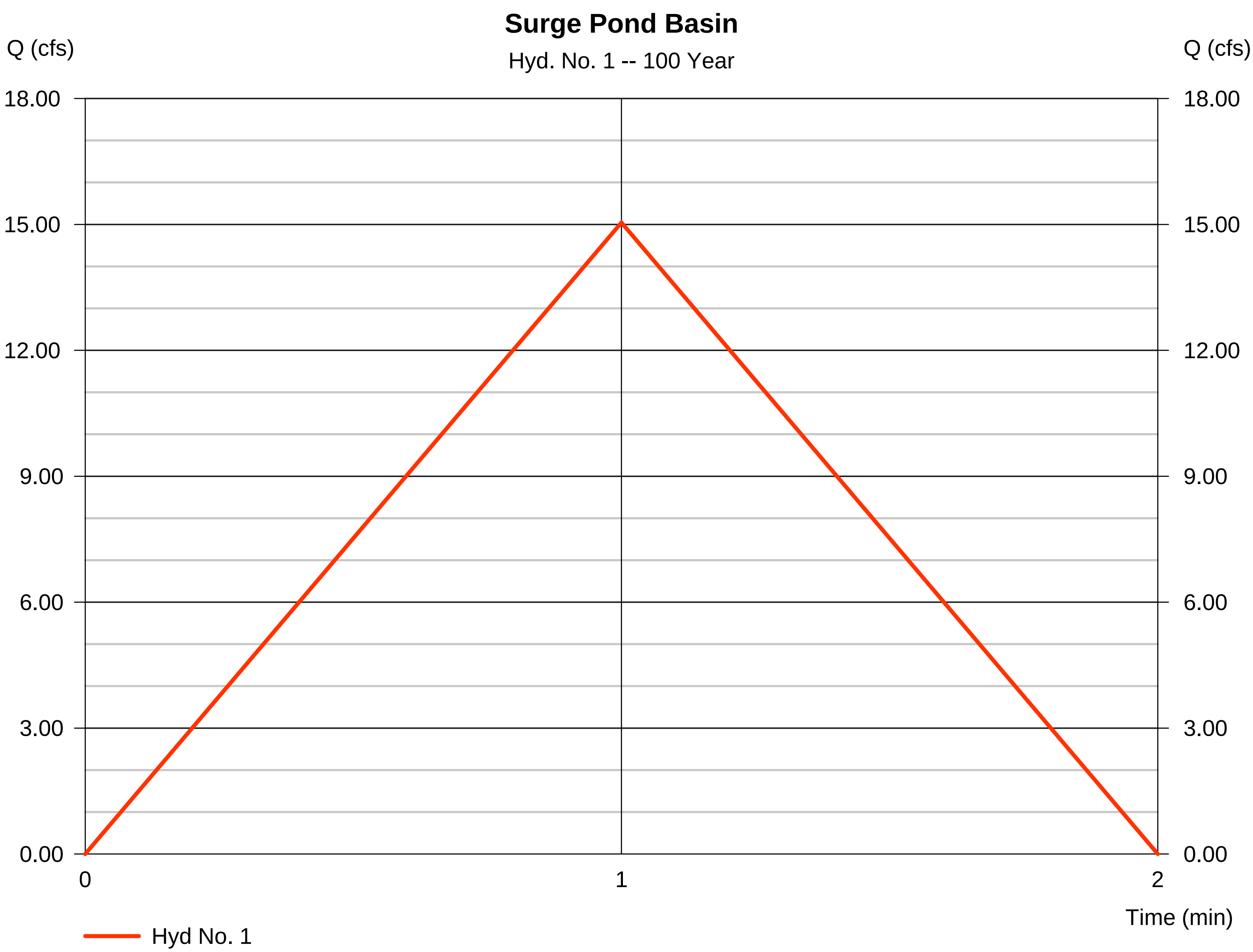
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3 — Wednesday, 10 / 12 / 2016

Hyd. No. 1

Surge Pond Basin

Hydrograph type	= Rational	Peak discharge	= 15.04 cfs
Storm frequency	= 100 yrs	Time to peak	= 1 min
Time interval	= 1 min	Hyd. volume	= 903 cuft
Drainage area	= 0.740 ac	Runoff coeff.	= 0.99
Intensity	= 20.533 in/hr	Tc by User	= 1.00 min
IDF Curve	= Hattiesburg Lamar IDF Curves	Asc/Rec limb fact	= 1/1



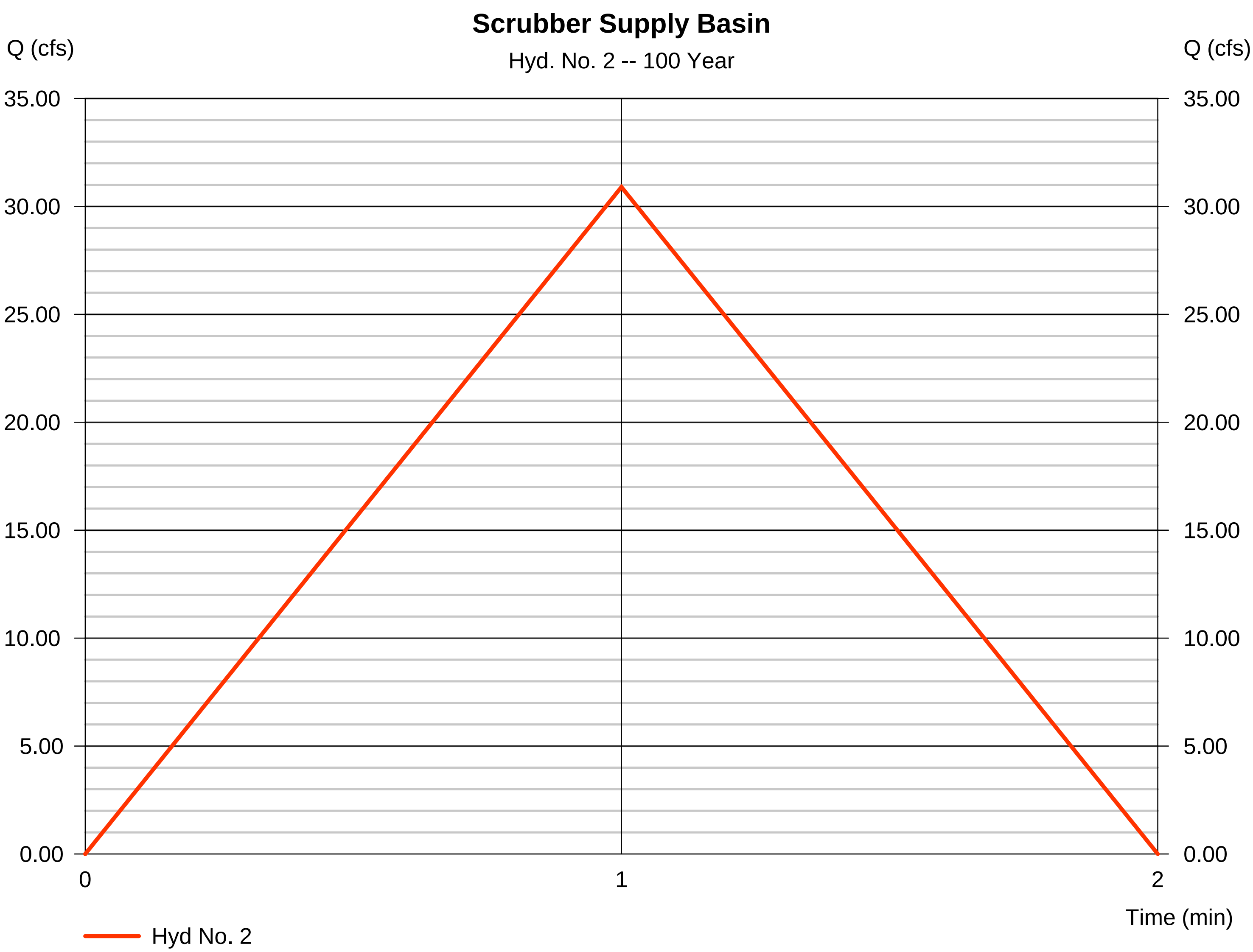
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3 Wednesday, 10 / 12 / 2016

Hyd. No. 2

Scrubber Supply Basin

Hydrograph type	= Rational	Peak discharge	= 30.90 cfs
Storm frequency	= 100 yrs	Time to peak	= 1 min
Time interval	= 1 min	Hyd. volume	= 1,854 cuft
Drainage area	= 1.520 ac	Runoff coeff.	= 0.99
Intensity	= 20.533 in/hr	Tc by User	= 1.00 min
IDF Curve	= Hattiesburg Lamar IDF Curves.IDF	Asc/Rec limb fact	= 1/1



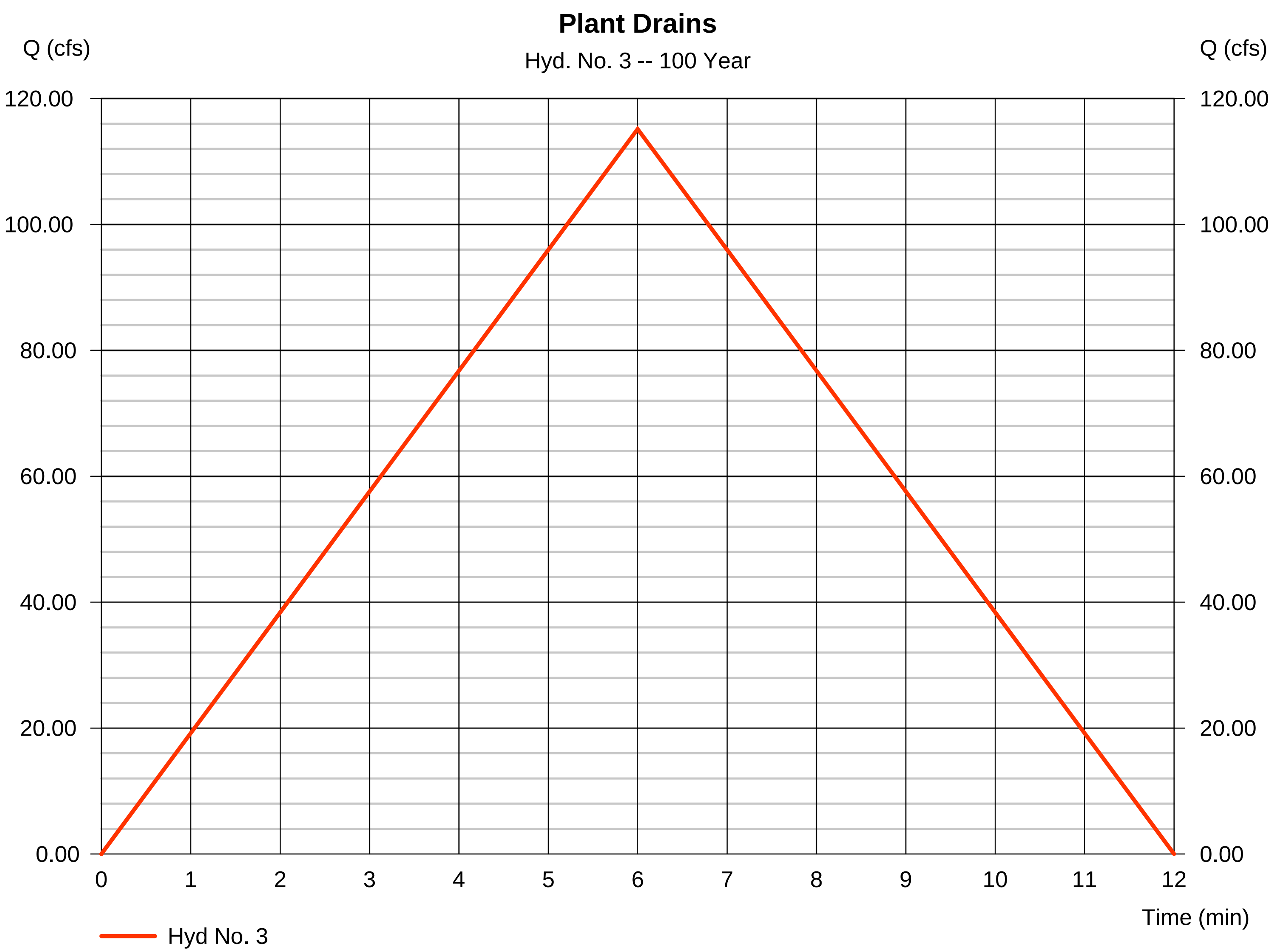
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3 Wednesday, 10 / 12 / 2016

Hyd. No. 3

Plant Drains

Hydrograph type	= Rational	Peak discharge	= 115.15 cfs
Storm frequency	= 100 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 41,453 cuft
Drainage area	= 10.000 ac	Runoff coeff.	= 0.9
Intensity	= 12.794 in/hr	Tc by User	= 6.00 min
IDF Curve	= Hattiesburg Lamar IDF Curves.IDF	Asc/Rec limb fact	= 1/1



Hydrograph Report

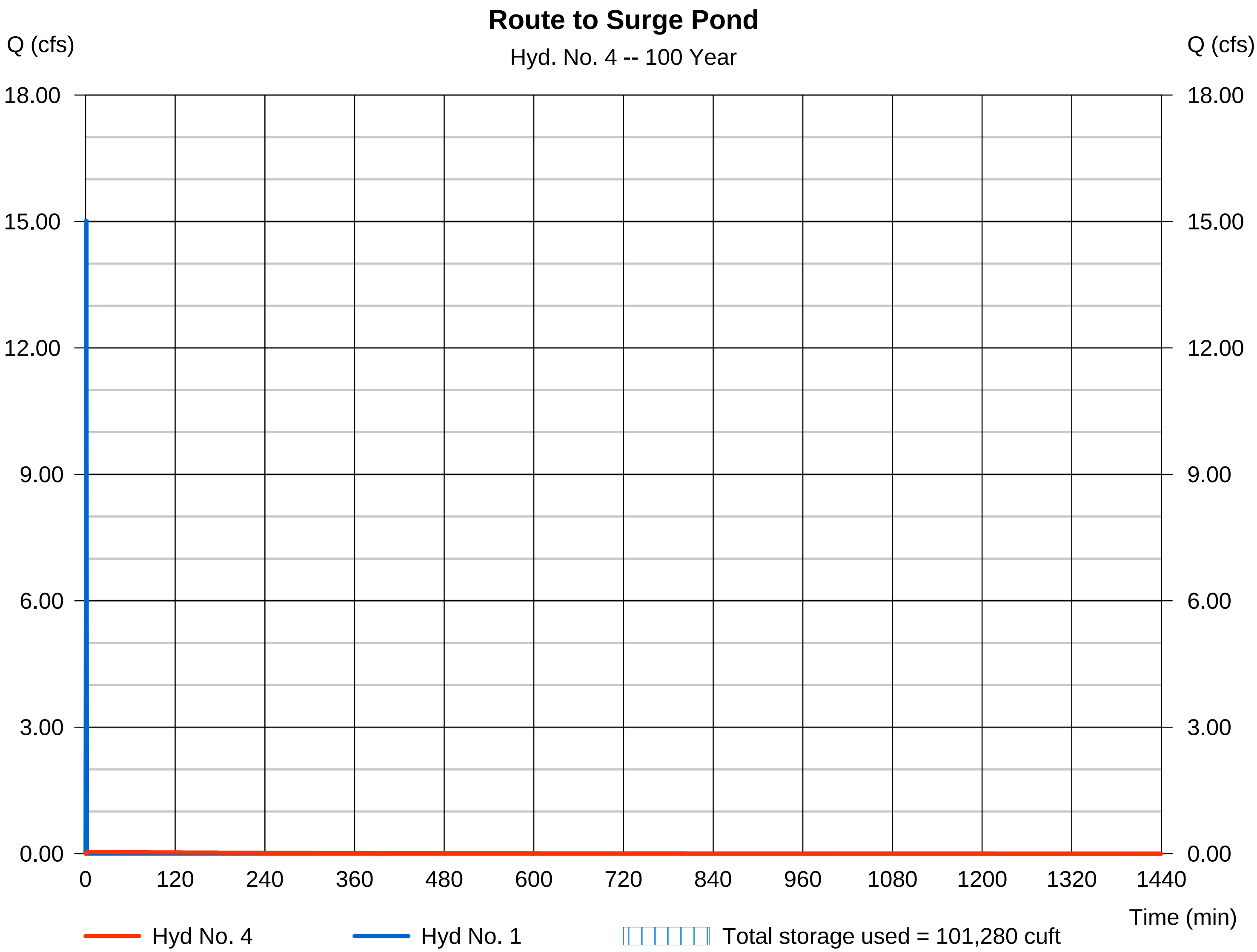
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3 Wednesday, 10 / 12 / 2016

Hyd. No. 4

Route to Surge Pond

Hydrograph type	= Reservoir	Peak discharge	= 0.038 cfs
Storm frequency	= 100 yrs	Time to peak	= 2 min
Time interval	= 1 min	Hyd. volume	= 879 cuft
Inflow hyd. No.	= 1 - Surge Pond Basin	Max. Elevation	= 264.04 ft
Reservoir name	= Em Surge Pond	Max. Storage	= 101,280 cuft

Storage Indication method used. Wet pond routing start elevation = 264.00 ft.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3 Wednesday, 10 / 12 / 2016

Pond No. 1 - Em Surge Pond

Pond Data

Trapezoid -Bottom L x W = 150.0 x 62.0 ft, Side slope = 3.00:1, Bottom elev. = 257.00 ft, Depth = 10.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	257.00	9,300	0	0
1.00	258.00	10,608	9,948	9,948
2.00	259.00	11,988	11,292	21,240
3.00	260.00	13,440	12,708	33,948
4.00	261.00	14,964	14,196	48,144
5.00	262.00	16,560	15,756	63,900
6.00	263.00	18,228	17,388	81,288
7.00	264.00	19,968	19,092	100,380
8.00	265.00	21,780	20,868	121,248
9.00	266.00	23,664	22,716	143,964
10.00	267.00	25,620	24,636	168,600

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	0.00	0.00	0.00
Span (in)	= 12.00	0.00	0.00	0.00
No. Barrels	= 2	0	0	0
Invert El. (ft)	= 264.00	0.00	0.00	0.00
Length (ft)	= 26.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	257.00	0.00	---	---	---	---	---	---	---	---	---	0.000
0.10	995	257.10	0.00	---	---	---	---	---	---	---	---	---	0.000
0.20	1,990	257.20	0.00	---	---	---	---	---	---	---	---	---	0.000
0.30	2,984	257.30	0.00	---	---	---	---	---	---	---	---	---	0.000
0.40	3,979	257.40	0.00	---	---	---	---	---	---	---	---	---	0.000
0.50	4,974	257.50	0.00	---	---	---	---	---	---	---	---	---	0.000
0.60	5,969	257.60	0.00	---	---	---	---	---	---	---	---	---	0.000
0.70	6,964	257.70	0.00	---	---	---	---	---	---	---	---	---	0.000
0.80	7,958	257.80	0.00	---	---	---	---	---	---	---	---	---	0.000
0.90	8,953	257.90	0.00	---	---	---	---	---	---	---	---	---	0.000
1.00	9,948	258.00	0.00	---	---	---	---	---	---	---	---	---	0.000
1.10	11,077	258.10	0.00	---	---	---	---	---	---	---	---	---	0.000
1.20	12,206	258.20	0.00	---	---	---	---	---	---	---	---	---	0.000
1.30	13,336	258.30	0.00	---	---	---	---	---	---	---	---	---	0.000
1.40	14,465	258.40	0.00	---	---	---	---	---	---	---	---	---	0.000
1.50	15,594	258.50	0.00	---	---	---	---	---	---	---	---	---	0.000
1.60	16,723	258.60	0.00	---	---	---	---	---	---	---	---	---	0.000
1.70	17,852	258.70	0.00	---	---	---	---	---	---	---	---	---	0.000
1.80	18,982	258.80	0.00	---	---	---	---	---	---	---	---	---	0.000
1.90	20,111	258.90	0.00	---	---	---	---	---	---	---	---	---	0.000
2.00	21,240	259.00	0.00	---	---	---	---	---	---	---	---	---	0.000
2.10	22,511	259.10	0.00	---	---	---	---	---	---	---	---	---	0.000
2.20	23,782	259.20	0.00	---	---	---	---	---	---	---	---	---	0.000
2.30	25,052	259.30	0.00	---	---	---	---	---	---	---	---	---	0.000
2.40	26,323	259.40	0.00	---	---	---	---	---	---	---	---	---	0.000
2.50	27,594	259.50	0.00	---	---	---	---	---	---	---	---	---	0.000
2.60	28,865	259.60	0.00	---	---	---	---	---	---	---	---	---	0.000
2.70	30,136	259.70	0.00	---	---	---	---	---	---	---	---	---	0.000
2.80	31,406	259.80	0.00	---	---	---	---	---	---	---	---	---	0.000
2.90	32,677	259.90	0.00	---	---	---	---	---	---	---	---	---	0.000
3.00	33,948	260.00	0.00	---	---	---	---	---	---	---	---	---	0.000
3.10	35,368	260.10	0.00	---	---	---	---	---	---	---	---	---	0.000

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Em Surge Pond
Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.20	36,787	260.20	0.00	---	---	---	---	---	---	---	---	---	0.000
3.30	38,207	260.30	0.00	---	---	---	---	---	---	---	---	---	0.000
3.40	39,626	260.40	0.00	---	---	---	---	---	---	---	---	---	0.000
3.50	41,046	260.50	0.00	---	---	---	---	---	---	---	---	---	0.000
3.60	42,466	260.60	0.00	---	---	---	---	---	---	---	---	---	0.000
3.70	43,885	260.70	0.00	---	---	---	---	---	---	---	---	---	0.000
3.80	45,305	260.80	0.00	---	---	---	---	---	---	---	---	---	0.000
3.90	46,724	260.90	0.00	---	---	---	---	---	---	---	---	---	0.000
4.00	48,144	261.00	0.00	---	---	---	---	---	---	---	---	---	0.000
4.10	49,720	261.10	0.00	---	---	---	---	---	---	---	---	---	0.000
4.20	51,295	261.20	0.00	---	---	---	---	---	---	---	---	---	0.000
4.30	52,871	261.30	0.00	---	---	---	---	---	---	---	---	---	0.000
4.40	54,446	261.40	0.00	---	---	---	---	---	---	---	---	---	0.000
4.50	56,022	261.50	0.00	---	---	---	---	---	---	---	---	---	0.000
4.60	57,598	261.60	0.00	---	---	---	---	---	---	---	---	---	0.000
4.70	59,173	261.70	0.00	---	---	---	---	---	---	---	---	---	0.000
4.80	60,749	261.80	0.00	---	---	---	---	---	---	---	---	---	0.000
4.90	62,324	261.90	0.00	---	---	---	---	---	---	---	---	---	0.000
5.00	63,900	262.00	0.00	---	---	---	---	---	---	---	---	---	0.000
5.10	65,639	262.10	0.00	---	---	---	---	---	---	---	---	---	0.000
5.20	67,378	262.20	0.00	---	---	---	---	---	---	---	---	---	0.000
5.30	69,116	262.30	0.00	---	---	---	---	---	---	---	---	---	0.000
5.40	70,855	262.40	0.00	---	---	---	---	---	---	---	---	---	0.000
5.50	72,594	262.50	0.00	---	---	---	---	---	---	---	---	---	0.000
5.60	74,333	262.60	0.00	---	---	---	---	---	---	---	---	---	0.000
5.70	76,072	262.70	0.00	---	---	---	---	---	---	---	---	---	0.000
5.80	77,810	262.80	0.00	---	---	---	---	---	---	---	---	---	0.000
5.90	79,549	262.90	0.00	---	---	---	---	---	---	---	---	---	0.000
6.00	81,288	263.00	0.00	---	---	---	---	---	---	---	---	---	0.000
6.10	83,197	263.10	0.00	---	---	---	---	---	---	---	---	---	0.000
6.20	85,106	263.20	0.00	---	---	---	---	---	---	---	---	---	0.000
6.30	87,016	263.30	0.00	---	---	---	---	---	---	---	---	---	0.000
6.40	88,925	263.40	0.00	---	---	---	---	---	---	---	---	---	0.000
6.50	90,834	263.50	0.00	---	---	---	---	---	---	---	---	---	0.000
6.60	92,743	263.60	0.00	---	---	---	---	---	---	---	---	---	0.000
6.70	94,652	263.70	0.00	---	---	---	---	---	---	---	---	---	0.000
6.80	96,562	263.80	0.00	---	---	---	---	---	---	---	---	---	0.000
6.90	98,471	263.90	0.00	---	---	---	---	---	---	---	---	---	0.000
7.00	100,380	264.00	0.00	---	---	---	---	---	---	---	---	---	0.000
7.10	102,467	264.10	0.09 ic	---	---	---	---	---	---	---	---	---	0.088
7.20	104,554	264.20	0.34 ic	---	---	---	---	---	---	---	---	---	0.342
7.30	106,640	264.30	0.74 ic	---	---	---	---	---	---	---	---	---	0.742
7.40	108,727	264.40	1.26 ic	---	---	---	---	---	---	---	---	---	1.264
7.50	110,814	264.50	1.89 ic	---	---	---	---	---	---	---	---	---	1.895
7.60	112,901	264.60	2.60 ic	---	---	---	---	---	---	---	---	---	2.599
7.70	114,988	264.70	3.29 oc	---	---	---	---	---	---	---	---	---	3.287
7.80	117,074	264.80	3.79 oc	---	---	---	---	---	---	---	---	---	3.787
7.90	119,161	264.90	4.17 oc	---	---	---	---	---	---	---	---	---	4.169
8.00	121,248	265.00	4.23 oc	---	---	---	---	---	---	---	---	---	4.233
8.10	123,519	265.10	4.98 oc	---	---	---	---	---	---	---	---	---	4.981
8.20	125,791	265.20	5.63 oc	---	---	---	---	---	---	---	---	---	5.630
8.30	128,063	265.30	6.21 oc	---	---	---	---	---	---	---	---	---	6.212
8.40	130,334	265.40	6.74 oc	---	---	---	---	---	---	---	---	---	6.744
8.50	132,606	265.50	7.24 oc	---	---	---	---	---	---	---	---	---	7.237
8.60	134,877	265.60	7.70 oc	---	---	---	---	---	---	---	---	---	7.698
8.70	137,149	265.70	8.13 oc	---	---	---	---	---	---	---	---	---	8.133
8.80	139,421	265.80	8.55 oc	---	---	---	---	---	---	---	---	---	8.547
8.90	141,692	265.90	8.94 oc	---	---	---	---	---	---	---	---	---	8.941
9.00	143,964	266.00	9.26 ic	---	---	---	---	---	---	---	---	---	9.262
9.10	146,427	266.10	9.57 ic	---	---	---	---	---	---	---	---	---	9.566
9.20	148,891	266.20	9.86 ic	---	---	---	---	---	---	---	---	---	9.860
9.30	151,355	266.30	10.15 ic	---	---	---	---	---	---	---	---	---	10.15
9.40	153,818	266.40	10.42 ic	---	---	---	---	---	---	---	---	---	10.42
9.50	156,282	266.50	10.69 ic	---	---	---	---	---	---	---	---	---	10.69
9.60	158,745	266.60	10.96 ic	---	---	---	---	---	---	---	---	---	10.96
9.70	161,209	266.70	11.22 ic	---	---	---	---	---	---	---	---	---	11.22
9.80	163,673	266.80	11.47 ic	---	---	---	---	---	---	---	---	---	11.47
9.90	166,136	266.90	11.72 ic	---	---	---	---	---	---	---	---	---	11.72
10.00	168,600	267.00	11.96 ic	---	---	---	---	---	---	---	---	---	11.96

...End

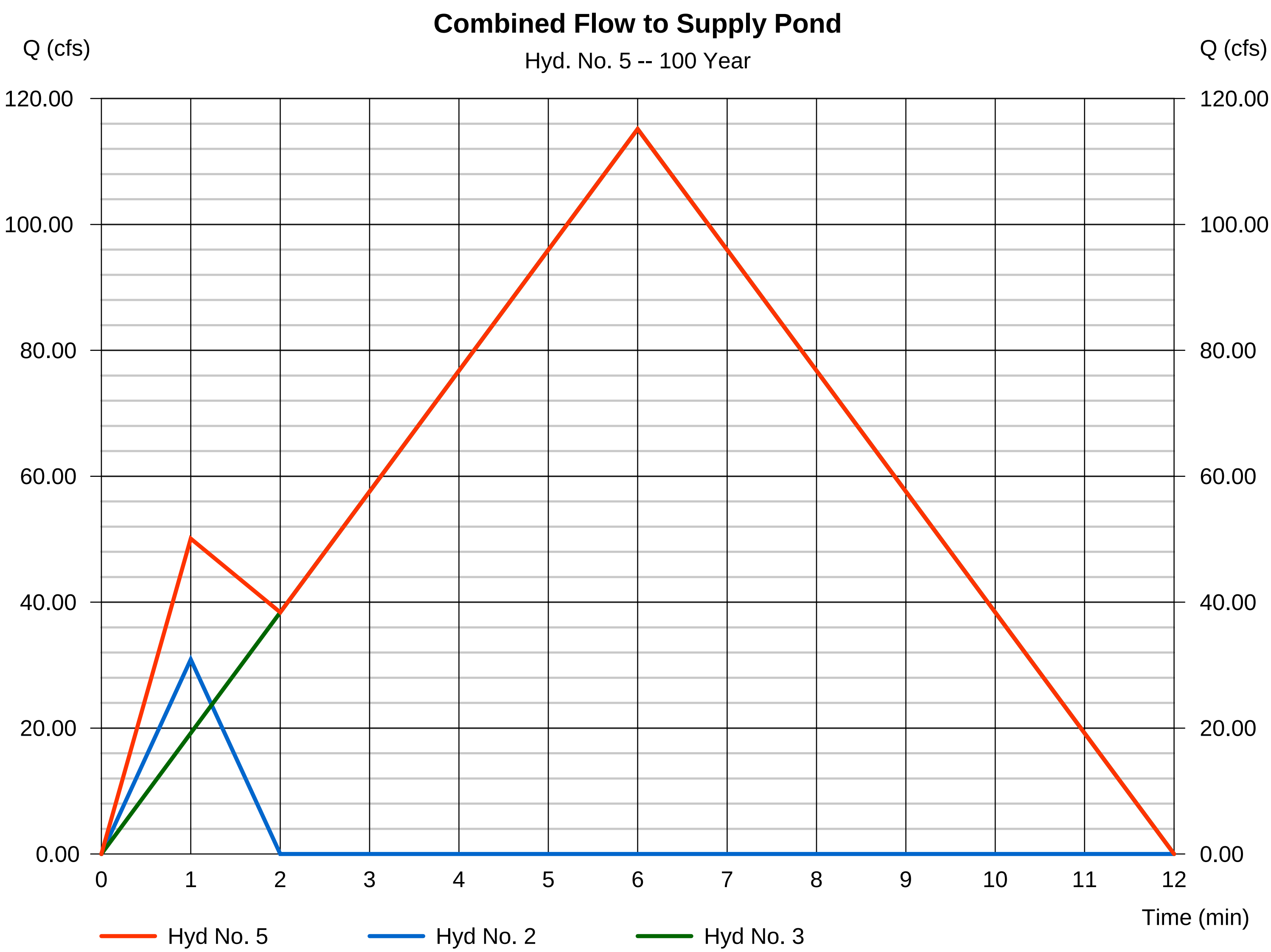
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3 Wednesday, 10 / 12 / 2016

Hyd. No. 5

Combined Flow to Supply Pond

Hydrograph type	= Combine	Peak discharge	= 115.15 cfs
Storm frequency	= 100 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 43,307 cuft
Inflow hyds.	= 2, 3	Contrib. drain. area	= 11.520 ac



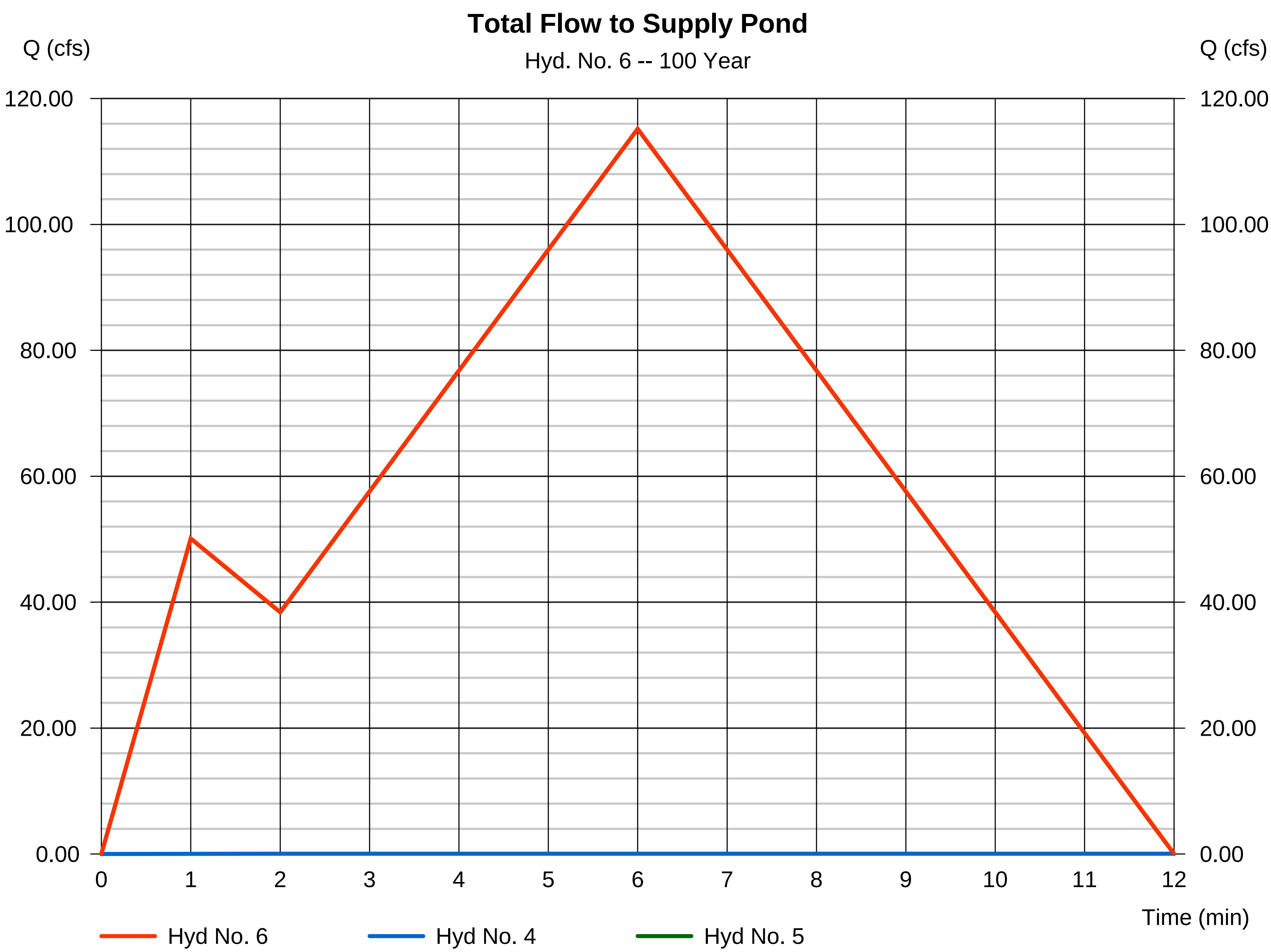
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3 Wednesday, 10 / 12 / 2016

Hyd. No. 6

Total Flow to Supply Pond

Hydrograph type	= Combine	Peak discharge	= 115.19 cfs
Storm frequency	= 100 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 44,186 cuft
Inflow hyds.	= 4, 5	Contrib. drain. area	= 0.000 ac



Hydrograph Report

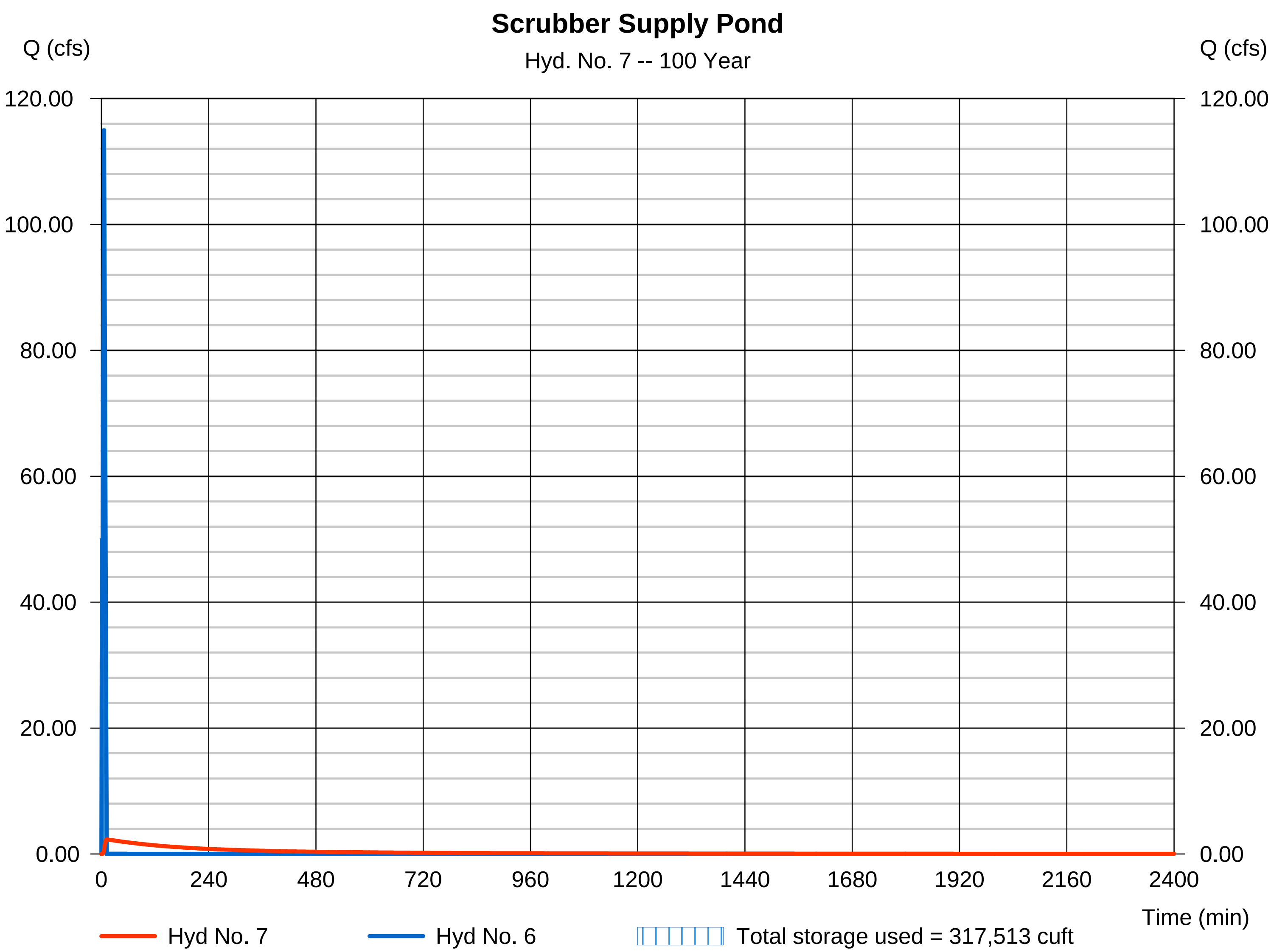
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3 Wednesday, 10 / 12 / 2016

Hyd. No. 7

Scrubber Supply Pond

Hydrograph type	= Reservoir	Peak discharge	= 2.303 cfs
Storm frequency	= 100 yrs	Time to peak	= 12 min
Time interval	= 1 min	Hyd. volume	= 38,744 cuft
Inflow hyd. No.	= 6 - Total Flow to Supply Pond	Max. Elevation	= 262.87 ft
Reservoir name	= Scrubber Supply Pond	Max. Storage	= 317,513 cuft

Storage Indication method used. Wet pond routing start elevation = 261.93 ft.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3 Wednesday, 10 / 12 / 2016

Pond No. 2 - Scrubber Supply Pond

Pond Data

Trapezoid -Bottom L x W = 184.0 x 142.0 ft, Side slope = 3.00:1, Bottom elev. = 254.00 ft, Depth = 13.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	254.00	26,128	0	0
1.30	255.30	28,732	35,646	35,646
2.60	256.60	31,457	39,109	74,755
3.90	257.90	34,304	42,731	117,486
5.20	259.20	37,273	46,512	163,998
6.50	260.50	40,363	50,450	214,448
7.80	261.80	43,575	54,547	268,994
9.10	263.10	46,909	58,801	327,796
10.40	264.40	50,364	63,214	391,010
11.70	265.70	53,941	67,785	458,795
13.00	267.00	57,640	72,514	531,309

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	0.00	0.00	0.00
Span (in)	= 12.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 262.00	0.00	0.00	0.00
Length (ft)	= 100.00	0.00	0.00	0.00
Slope (%)	= 4.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	254.00	0.00	---	---	---	---	---	---	---	---	---	0.000
0.13	3,565	254.13	0.00	---	---	---	---	---	---	---	---	---	0.000
0.26	7,129	254.26	0.00	---	---	---	---	---	---	---	---	---	0.000
0.39	10,694	254.39	0.00	---	---	---	---	---	---	---	---	---	0.000
0.52	14,258	254.52	0.00	---	---	---	---	---	---	---	---	---	0.000
0.65	17,823	254.65	0.00	---	---	---	---	---	---	---	---	---	0.000
0.78	21,387	254.78	0.00	---	---	---	---	---	---	---	---	---	0.000
0.91	24,952	254.91	0.00	---	---	---	---	---	---	---	---	---	0.000
1.04	28,516	255.04	0.00	---	---	---	---	---	---	---	---	---	0.000
1.17	32,081	255.17	0.00	---	---	---	---	---	---	---	---	---	0.000
1.30	35,646	255.30	0.00	---	---	---	---	---	---	---	---	---	0.000
1.43	39,557	255.43	0.00	---	---	---	---	---	---	---	---	---	0.000
1.56	43,467	255.56	0.00	---	---	---	---	---	---	---	---	---	0.000
1.69	47,378	255.69	0.00	---	---	---	---	---	---	---	---	---	0.000
1.82	51,289	255.82	0.00	---	---	---	---	---	---	---	---	---	0.000
1.95	55,200	255.95	0.00	---	---	---	---	---	---	---	---	---	0.000
2.08	59,111	256.08	0.00	---	---	---	---	---	---	---	---	---	0.000
2.21	63,022	256.21	0.00	---	---	---	---	---	---	---	---	---	0.000
2.34	66,933	256.34	0.00	---	---	---	---	---	---	---	---	---	0.000
2.47	70,844	256.47	0.00	---	---	---	---	---	---	---	---	---	0.000
2.60	74,755	256.60	0.00	---	---	---	---	---	---	---	---	---	0.000
2.73	79,028	256.73	0.00	---	---	---	---	---	---	---	---	---	0.000
2.86	83,301	256.86	0.00	---	---	---	---	---	---	---	---	---	0.000
2.99	87,574	256.99	0.00	---	---	---	---	---	---	---	---	---	0.000
3.12	91,848	257.12	0.00	---	---	---	---	---	---	---	---	---	0.000
3.25	96,121	257.25	0.00	---	---	---	---	---	---	---	---	---	0.000
3.38	100,394	257.38	0.00	---	---	---	---	---	---	---	---	---	0.000
3.51	104,667	257.51	0.00	---	---	---	---	---	---	---	---	---	0.000
3.64	108,940	257.64	0.00	---	---	---	---	---	---	---	---	---	0.000
3.77	113,213	257.77	0.00	---	---	---	---	---	---	---	---	---	0.000
3.90	117,486	257.90	0.00	---	---	---	---	---	---	---	---	---	0.000
4.03	122,138	258.03	0.00	---	---	---	---	---	---	---	---	---	0.000

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Scrubber Supply Pond

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
4.16	126,789	258.16	0.00	---	---	---	---	---	---	---	---	---	0.000
4.29	131,440	258.29	0.00	---	---	---	---	---	---	---	---	---	0.000
4.42	136,091	258.42	0.00	---	---	---	---	---	---	---	---	---	0.000
4.55	140,742	258.55	0.00	---	---	---	---	---	---	---	---	---	0.000
4.68	145,393	258.68	0.00	---	---	---	---	---	---	---	---	---	0.000
4.81	150,045	258.81	0.00	---	---	---	---	---	---	---	---	---	0.000
4.94	154,696	258.94	0.00	---	---	---	---	---	---	---	---	---	0.000
5.07	159,347	259.07	0.00	---	---	---	---	---	---	---	---	---	0.000
5.20	163,998	259.20	0.00	---	---	---	---	---	---	---	---	---	0.000
5.33	169,043	259.33	0.00	---	---	---	---	---	---	---	---	---	0.000
5.46	174,088	259.46	0.00	---	---	---	---	---	---	---	---	---	0.000
5.59	179,133	259.59	0.00	---	---	---	---	---	---	---	---	---	0.000
5.72	184,178	259.72	0.00	---	---	---	---	---	---	---	---	---	0.000
5.85	189,223	259.85	0.00	---	---	---	---	---	---	---	---	---	0.000
5.98	194,268	259.98	0.00	---	---	---	---	---	---	---	---	---	0.000
6.11	199,313	260.11	0.00	---	---	---	---	---	---	---	---	---	0.000
6.24	204,358	260.24	0.00	---	---	---	---	---	---	---	---	---	0.000
6.37	209,403	260.37	0.00	---	---	---	---	---	---	---	---	---	0.000
6.50	214,448	260.50	0.00	---	---	---	---	---	---	---	---	---	0.000
6.63	219,903	260.63	0.00	---	---	---	---	---	---	---	---	---	0.000
6.76	225,357	260.76	0.00	---	---	---	---	---	---	---	---	---	0.000
6.89	230,812	260.89	0.00	---	---	---	---	---	---	---	---	---	0.000
7.02	236,267	261.02	0.00	---	---	---	---	---	---	---	---	---	0.000
7.15	241,721	261.15	0.00	---	---	---	---	---	---	---	---	---	0.000
7.28	247,176	261.28	0.00	---	---	---	---	---	---	---	---	---	0.000
7.41	252,630	261.41	0.00	---	---	---	---	---	---	---	---	---	0.000
7.54	258,085	261.54	0.00	---	---	---	---	---	---	---	---	---	0.000
7.67	263,540	261.67	0.00	---	---	---	---	---	---	---	---	---	0.000
7.80	268,994	261.80	0.00	---	---	---	---	---	---	---	---	---	0.000
7.93	274,875	261.93	0.00	---	---	---	---	---	---	---	---	---	0.000
8.06	280,755	262.06	0.02 ic	---	---	---	---	---	---	---	---	---	0.016
8.19	286,635	262.19	0.15 ic	---	---	---	---	---	---	---	---	---	0.155
8.32	292,515	262.32	0.42 ic	---	---	---	---	---	---	---	---	---	0.418
8.45	298,395	262.45	0.78 ic	---	---	---	---	---	---	---	---	---	0.784
8.58	304,275	262.58	1.23 ic	---	---	---	---	---	---	---	---	---	1.226
8.71	310,155	262.71	1.71 ic	---	---	---	---	---	---	---	---	---	1.711
8.84	316,035	262.84	2.20 ic	---	---	---	---	---	---	---	---	---	2.199
8.97	321,916	262.97	2.61 ic	---	---	---	---	---	---	---	---	---	2.611
9.10	327,796	263.10	2.93 ic	---	---	---	---	---	---	---	---	---	2.929
9.23	334,117	263.23	3.23 ic	---	---	---	---	---	---	---	---	---	3.231
9.36	340,438	263.36	3.51 ic	---	---	---	---	---	---	---	---	---	3.507
9.49	346,760	263.49	3.76 ic	---	---	---	---	---	---	---	---	---	3.762
9.62	353,081	263.62	4.00 ic	---	---	---	---	---	---	---	---	---	4.002
9.75	359,403	263.75	4.23 ic	---	---	---	---	---	---	---	---	---	4.228
9.88	365,724	263.88	4.44 ic	---	---	---	---	---	---	---	---	---	4.442
10.01	372,045	264.01	4.65 ic	---	---	---	---	---	---	---	---	---	4.646
10.14	378,367	264.14	4.84 ic	---	---	---	---	---	---	---	---	---	4.842
10.27	384,688	264.27	5.03 ic	---	---	---	---	---	---	---	---	---	5.031
10.40	391,010	264.40	5.21 ic	---	---	---	---	---	---	---	---	---	5.212
10.53	397,788	264.53	5.39 ic	---	---	---	---	---	---	---	---	---	5.387
10.66	404,567	264.66	5.56 ic	---	---	---	---	---	---	---	---	---	5.557
10.79	411,345	264.79	5.72 ic	---	---	---	---	---	---	---	---	---	5.722
10.92	418,124	264.92	5.88 ic	---	---	---	---	---	---	---	---	---	5.882
11.05	424,902	265.05	6.04 ic	---	---	---	---	---	---	---	---	---	6.038
11.18	431,681	265.18	6.19 ic	---	---	---	---	---	---	---	---	---	6.190
11.31	438,459	265.31	6.34 ic	---	---	---	---	---	---	---	---	---	6.338
11.44	445,238	265.44	6.48 ic	---	---	---	---	---	---	---	---	---	6.483
11.57	452,017	265.57	6.63 ic	---	---	---	---	---	---	---	---	---	6.625
11.70	458,795	265.70	6.76 ic	---	---	---	---	---	---	---	---	---	6.764
11.83	466,046	265.83	6.90 ic	---	---	---	---	---	---	---	---	---	6.900
11.96	473,298	265.96	7.03 ic	---	---	---	---	---	---	---	---	---	7.033
12.09	480,549	266.09	7.16 ic	---	---	---	---	---	---	---	---	---	7.164
12.22	487,801	266.22	7.29 ic	---	---	---	---	---	---	---	---	---	7.293
12.35	495,052	266.35	7.42 ic	---	---	---	---	---	---	---	---	---	7.419
12.48	502,304	266.48	7.54 ic	---	---	---	---	---	---	---	---	---	7.544
12.61	509,555	266.61	7.67 ic	---	---	---	---	---	---	---	---	---	7.666
12.74	516,806	266.74	7.79 ic	---	---	---	---	---	---	---	---	---	7.786
12.87	524,058	266.87	7.90 ic	---	---	---	---	---	---	---	---	---	7.904
13.00	531,309	267.00	8.02 ic	---	---	---	---	---	---	---	---	---	8.021

...End

Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2014 by Autodesk, Inc. v10.3 Wednesday, 10 / 12 / 2016

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	30.4792	5.5000	0.6739	--------
2	35.6490	5.7000	0.6778	--------
3	68.4227	10.8000	0.8016	--------
5	40.9922	5.5000	0.6641	--------
10	43.7048	5.1000	0.6472	--------
25	44.3576	4.2000	0.6129	--------
50	44.6596	3.7000	0.5888	--------
100	42.3463	2.7000	0.5533	--------

File name: Hattiesburg Lamar IDF Curves.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	6.25	4.81	3.98	3.44	3.05	2.75	2.52	2.33	2.17	2.03	1.92	1.82
2	7.15	5.51	4.57	3.95	3.50	3.16	2.89	2.67	2.49	2.34	2.21	2.09
3	7.49	6.01	5.05	4.38	3.89	3.50	3.19	2.94	2.72	2.54	2.39	2.25
5	8.60	6.64	5.52	4.77	4.24	3.83	3.51	3.25	3.03	2.85	2.69	2.55
10	9.79	7.54	6.27	5.43	4.83	4.37	4.01	3.72	3.47	3.26	3.09	2.93
25	11.38	8.72	7.25	6.29	5.61	5.09	4.68	4.35	4.07	3.84	3.64	3.46
50	12.50	9.56	7.96	6.93	6.19	5.63	5.19	4.83	4.53	4.28	4.06	3.87
100	13.69	10.38	8.64	7.53	6.74	6.15	5.68	5.31	4.99	4.72	4.49	4.29

Tc = time in minutes. Values may exceed 60.

iance Support\20 Hydrologic & Hydraulic Capacity Requirments\Inflow Control Plan\Lamar Co Precipitation Curves.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	4.86	0.00	3.30	7.05	8.55	6.80	11.10
SCS 6-Hr	0.00	3.50	0.00	0.00	5.04	6.11	0.00	7.95
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10