MEMORANDUM

October 14, 2016

CEC Project 144-189.6204

Subject: Run-On and Run-Off Control System Plan: Version 1
Carter Hollow Landfill
Dayton Power and Light Company
J.M. Stuart Electric Generating Station
Sprigg Township, Adams County, Ohio

Dayton Power & Light Company (DP&L) operates the coal-fired J.M. Stuart Electric Generating Station (JMSS) located in Sprigg Township, Adams County, Ohio. The Carter Hollow Landfill (CHLF) is a Class III residual waste landfill currently under construction which will operate in compliance with the approved Permit to Install (PTI) No. 06-08445 issued by the Ohio Environmental Protection Agency (Ohio EPA). CHLF is a Coal Combustion Residuals (CCR) Unit by definition of the United States Environmental Protection Agency (USEPA) CCR Rule which has been published in the Federal Register (FR) on April 17, 2015 and is an extension of the current Code of Federal Rules (CFR) Title 40, Part 257 (§257).

At the request of DP&L, CEC has prepared this Run-On and Run-Off Control System Plan (Plan) for the CHLF to satisfy the requirements of §257.81 (run-on and run-off controls for CCR landfills). The application for the CHLF approved PTI included designs, plans, and associated supporting calculations for the various run-on and run-off control features for the CHLF, and although designed previously, still meet the requirements of §257.81. Therefore, this Plan summarizes the run-on and run-off control features contained within the approved PTI and includes supporting calculations and figures.

The applicable sections of the subject CCR rule are provided below in italicized text followed by DP&L's response demonstrating compliance with the rule.

§257.81(a): The owner or operator of an existing or new CCR landfill or any lateral expansion of a CCR landfill must design, construct, operate, and maintain:

§257.81(a)(1): A run on control system to prevent flow onto the active portion of the CCR unit during the peak discharge from a 24-hour, 25-year storm.

The run-on controls at the CHLF consist of temporary and permanent surface water control structures and an underdrain system. The surface water control structures for the CHLF have

been designed in accordance with the Ohio Administrative Code (OAC) 3745-30-07(C)(4), which require these structures to accommodate anticipated flows from a 24-hour, 25-year storm event. Therefore, the existing design of these structures meet the requirements of §257.81(a)(1). The underdrain system will not be subjected to stormwater flows, but ultimately will create a surface water discharge, and has thus been included in this discussion. Below is a description of the run-on controls for the CHLF.

The run-on controls have been designed to: collect, route, and retain surface water run-on, and sediment discharge from the CHLF. The run-on controls generally consist of the following:

- Surface water diversion berms;
- Downchute channels;
- Perimeter surface water channels;
- Drainage culverts;
- Stormwater ponds; and
- Temporary erosion controls.

CHLF has been subdivided into numbered phases (Phases 1A through 4) reflecting the order in which each partial area of the landfill will be constructed and filled. As the landfill operations progress, a subsequent phase of the landfill is prepared and constructed. Stormwater ponds and other associated run-on controls (cover, diversion berms, channels, ditches, etc.) are then constructed as part of the phase development.

Surface water diversion berms are designed to collect precipitation on the intermediate and final cover slopes. The berms are typically spaced at 25-feet vertical intervals. The berms are approximately 2 feet tall with 3H:1V exterior slopes. The berms are grass lined and are sloped at 2 percent toward downchute channels.

Surface water downchute channels are trapezoidal channels. These channels are lined to reduce erosion. The downchutes discharge into channels, which are used to convey collected surface water to the stormwater ponds.

Areas of potential high erosion are lined with riprap or other acceptable erosion control materials. These areas include locations where downchutes enter the perimeter channels, at the inlets and outlets of culverts, where the perimeter channels enter the sedimentation pond, and at the outlet of the sedimentation ponds.

CHLF PTI Drawings (specifically: Detail A on Drawing 7A; Detail OO on Drawing 7F; and, Details DDD, EEE, and FFF on Drawing 7G) illustrate the segregation of run-on and run-off at the landfill interim and permanent perimeters. The final outboard channel surrounding the

landfill perimeter will direct stormwater to Ponds C through G prior to discharge to the Carter Hollow "stream".

Surface water run-on, in final capped conditions, and from areas outside the waste limits will be directed to Ponds C through G at the locations presented on CHLF PTI Drawing 4F. Ponds C, F, and G, shown on PTI Drawings 6A through 6E, will serve as stormwater ponds during construction and operation of the landfill. These stormwater ponds were designed to satisfy OAC 3745-30-07(C)(4) which requires the following:

- Pass the 10-year/24-hour storm through the principal spillway;
- Route the 25-year/24-hour storm through the principal spillway and below the emergency spillway;
- Discharge the 100-year/24-hour storm through the combination of the principal and emergency spillways; and
- Provide a freeboard of at least 1-foot above the 100-year/24-hour storm pool elevation.

The stormwater pond structures include principal/emergency spillways and riprap-lined aprons. The principal spillway for Ponds D, E, and F consist of an outlet pipe. The principal spillway for Pond C consists of a vertical riser with two dewatering windows (square perforations). The principal spillway for Pond G consists of a vertical riser with floating skimmer-dewatering device. The emergency spillways for Ponds C, D, E, F, and G are trapezoidal channels. Riprap-lined aprons are designed where concentrated flow enters/exits the ponds. Riprap or other acceptable erosion control materials will act to dissipate water flow energy and to prevent scour in channels and aprons associated with the stormwater pond structures.

Design calculations for the run-on control features are included in Appendix A, Section 1 of this Plan. A plan view of the surface water management system is presented on CHLF PTI Drawing 4F, phase development plans are shown on PTI Drawings 6A through 6E and details of the surface water control structures are presented on PTI Drawings 7A through 7G. Referenced CHLF PTI Drawings are included in Appendix B.

CHLF has three underdrain systems to collect and transport groundwater from water producing zones and seeps that are encountered during construction and operation of CHLF. The underdrain system will also be used to collect groundwater from existing intermittent streams located on the north and west perimeters of CHLF that will be within the landfill construction limits. The underdrain system, which will convey groundwater by means of gravity flow, includes one system to convey groundwater that originates from areas outside the horizontal waste limits, another system to convey groundwater that originates from within the horizontal waste limits, and another system to convey groundwater, which originates south of the Phase 3 construction limits. The separation of these groundwater sources is necessary because the

underdrain outlet, which will discharge groundwater that originates from within the waste limits of the landfill, will serve as a sampling location for the groundwater monitoring program.

Approximate underdrain locations are shown on CHLF PTI Drawing 3A and details are provided on PTI Drawings 7B and 7F included in Appendix B.

§257.81(a)(2): A run-off control system from the active portion of the CCR unit to collect and control at least the water volume resulting from a 24-hour, 25-year storm.

The run-off controls at the CHLF consist of components included in the leachate management system. The run-off controls for the CHLF are designed to satisfy OAC 3745-30-07(C)(3), which require 7 days of leachate storage volume under final conditions. The run-off controls also provide leachate storage volume for a 24-hour, 25-year storm, and thus meet the requirements of §257.81(a)(2). A description of the run-off controls for the CHLF are as follows:

Generally, the working surface of the active landfill will remain relatively level with the active fill area being sloped towards the interior of the landfill, such that the successive waste fill lifts increase the elevation within the active phase. Containment berms will be constructed at the planned exterior limits of the interim or final slope of the active phase, followed by the placement of successive waste lifts within the phase until the approximate top of the containment berm is reached. This process is continued by shifting the outside edge of each subsequent containment berm until the design grade of the phase is reached. These containment berms serve the purpose to separate run-off from flowing outside of the waste placement area and run-on from outside the phase limits from flowing into the waste placement area. Run-off from within the active phase areas will be collected as part of the leachate collection system via the vertical chimney drains and the base liner leachate collection layer. Chimney drains will be constructed throughout the floor area of CHLF and will be extended vertically through the waste mass incrementally as waste placement progresses. The run-off and landfill leachate is then conveyed from the interim or final low-point of the landfill leachate collection system to the leachate pond at the southern end of the facility via gravity flow through a pipe. The Leachate Pond, lined with a flexible membrane liner and compacted clay liner, provides temporary storage and equalization capacity to allow transport of the collected leachate to flow to JMSS via gravity flow through a pipe for final treatment. The Leachate Pond capacity provides a minimum one week of leachate storage (i.e., much greater than the 24-hour, 25-year storm event) following installation of the complete final cap system.

Calculations for the run-off control features are included in Appendix A, Section 2 of this Plan. CHLF PTI Drawing 4D provides a plan view of the leachate management system components,

including the grading plan for the 12-inch thick granular leachate collection layer, chimney drain locations and the leachate collection piping layout. PTI Drawings 7A, 7F, and 7G provide details of the liner and leachate management system. Referenced CHLF PTI Drawings are included in Appendix B.

§257.81(b): Run-off from the active portion of the CCR unit must be handled in accordance with the surface water requirement under §257.3-3.

> *§257.3-3(a): For purposes of section 4004(a) of the Act, a facility shall not cause a discharge of pollutants into waters of the United States that is in violation of the requirements of the National Pollutant Discharge Elimination System (NDPES) under section 402 of the Clean Water Act, as amended.*
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> *§257.3-3(b): For purposes of section 4004(a) of the Act, a facility shall not cause a discharge of dredged material or fill material to water for the United States that is in violation of the requirements under section 404 of the Clean Water Act, as amended.*
>
> *§257.3-3(c): A facility or practice shall not cause non-point source pollution of waters of the United States that violates applicable legal requirements implementing an area wide or Statewide water quality management plan that has been approved by the Administrator under section 208 of the Clean Water Act, as amended.*

As described in the response to §257.81(a)(1), run-on controls for the CHLF facility include surface water control structures which collect and route non-contact stormwater around the landfill via perimeter diversion ditches, channels and culverts to stormwater ponds. The stormwater ponds serve as sedimentation basins to treat the stormwater prior to discharge into the natural stream channel of Carter Hollow. Also, groundwater from beneath the landfill is collected by the underdrain system and discharged into Carter Hollow "stream".

As described in the response to §257.81(a)(2), run-off controls for the CHLF facility include the leachate management system which collects and routes leachate from the active waste placement areas within CHLF to the Leachate Pond. Discharge from the Leachate Pond is routed by gravity flow to JMSS retention pond for treatment.

Both run-on and run-off controls were described in previously approved permit applications or alterations for the CHLF PTI (Permit No. 06-08445), the sites National Pollutant Discharge Elimination System (NPDES) Permit (Permit No. OIB00049*MD), and the PTI Permit for the leachate conveyance line between the Leachate Pond and the discharge point at the JMSS (Application No. 813706). Approval of these permits demonstrate adherence to the Clean Water Act as required in §257.3-3.

§257.81(c): Run-on and run-off control system plan

§257.81(c)(1): Contents of plan. The owner or operator must prepare initial or periodic run-on and run-off 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 run-on and run-off control systems have been designed and constructed to meet the applicable requirements of this section. Each plan must be supported by appropriate engineering calculations. The owner or operator has completed the initial run-on and run-off control system plan when the plan has been placed in the facility's operating record as required by §257.105(g)(3).

This document and all attachments serve as the initial Run-on and Run-off Control System Plan. In accordance with §257.81, this Plan shall be reviewed every five years or whenever there is a change in conditions affecting this plan.

§257.81(c)(2): Amendment of the plan. The owner or operator may amend the written run-on and run-off control system plan at any time provided the revised plan is placed in the facility's operating record as required by §257.105(g)(3). The owner or operator must amend the written run-on and run-off control system plan whenever there is a change in conditions that would substantially affect the written plan in effect.

The written Run-on and Run-off Control System Plan will be amended at least 60 days prior to a planned change in the operation of CHLF, or no later than 60 days after an unanticipated event requires the need to revise the Plan. If the written Plan needs to be revised after closure activities have commenced, the Plan will be revised no later than 30 days following the triggering event.

Any amendments to this Plan will include written certification from a qualified Professional Engineer stating that the initial and any amendments to the Plan meet the requirements of the CCR Rule. The latest version of the Run-on and Run-off Control System Plan will be noted on the first sheet of the Plan and the amendments to the plan will be tracked via the following table.

Version	Date	Description of Changes Made
1	October 14, 2016	Initial Issue

§257.81(c)(3): Timeframes for preparing the initial plan

§257.81(c)(3)(i): Existing CCR landfills. The owner or operator of the CCR unit must prepare an initial run-on and run-off control system plan no later than October 17, 2016.

This Run-on and Run-off Control System Plan is for an existing CCR landfill; therefore, CHLF complies with this requirement.

§257.81(c)(3)(ii): New CCR Landfills and any lateral expansion of a CCR landfill. The owner or operator must prepare the initial run-on and run-off control system plan no later than the date of initial receipt of CCR in the CCR unit.

The CHLF is a not a new CCR landfill; therefore, not applicable to this requirement.

§257.81(c)(4): Frequency of revising the plan. The owner or operator of a CCR unit must prepare periodic run-on and run-off 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 subsequent 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 a periodic run-on and run-off control system plan when the plan has been placed in the facility's operating record as required by §257.105(g)(3).

This Plan will be assessed and amended as needed, at a minimum, once every five years. The Plan will also be reviewed and updated whenever there is a change in operation of the CHLF substantially affecting the Run-on and Run-off Control System features or when unanticipated events necessitate a revision of the Plan as described above in response to §257.81(c)(2).

§257.81(c)(5): The owner or operator must obtain a certification from a qualified professional engineer stating that the initial and periodic run-on and run-off control system plans meet the requirements of this section.

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I verify that the contents of this Run-On and Run-Off Control System Plan for the Carter Hollow Landfill at the J.M. Stuart Electric Generating Station meets the USEPA's Final CCR Rule requirements of §257.81.

Signed: _____
(Consulting Engineer)

Print Name: Anthony Amicon

Ohio License No.: E-58805

Title: Principal

Company: Civil & Environmental Consultants, Inc.

Professional Engineer's Seal:

TDM:APA
Attachments

APPENDIX A

SUPPORTING CALCULATIONS

APPENDIX A; SECTION 1

RUN-ON CONTROL FEATURE SUPPORTING CALCULATIONS

STORMWATER DESIGN SUMMARY

(Taken from the existing PTI Permit Application for the Carter Hollow Landfill)

CALCULATION BRIEF

CARTER HOLLOW LANDFILL
PERMIT MODIFICATION - 2016 DESIGN CHANGES
(C)(6)(k)&(l) STORMWATER DESIGN SUMMARY

OBJECTIVE:

Determine the runoff discharge rates, flow depths, and peak discharge volumes for the stormwater management system at the Carter Hollow Landfill. This summary outlines the design methods and assumptions used throughout the design of the stormwater management system.

METHOD:

Use HydroCAD 10.0 Reference No. (Ref. No.) 1 to route the design storm through proposed channels, downchutes, culverts, catch basins, sediment traps, and sediment basins based on the proposed site conditions as depicted in the Permit Drawings. Use the North American Green (NAG) Erosion Control Materials Design Software (ECMDS) to determine appropriate channel linings for the design storm.

REFERENCES:

1. "HydroCAD 10.0," HydroCAD Software Solutions LLC, 2013.

2. Carter Hollow Landfill, Class III Residual Waste Landfill Permit Application, Revised February 2011.

3. United States Department of Agriculture, Natural Resources Conservation Service, Web Soil Survey, Accessed April 5, 2016.

4. "Erosion Control Material Design Software Version 5.0," North American Green, Tensar International Corporation, 2011.

5. Authorization for Storm Water Discharges Associated with Construction Activity Under the National Pollutant Discharge Elimination System, Ohio EPA Permit No. OHC000004, Effective Date April 21, 2013.

ANALYSIS:

This permit application for the Carter Hollow Landfill includes a revised footprint for the Phase 1 development area, resulting in modification of various stormwater controls. The stormwater features are being designed based on the worst-case peak flow conditions, which occur either during site development or under final conditions. Each feature was evaluated to determine the controlling scenario.

The stormwater management system has been designed using the 10-year, 25-year, and 100-year, 24-hour design storm events, as required by OAC 3745-30-07(C)(4). These rainfall values were obtained from Ref. No. 2.

STORM FREQUENCY	24-HOUR RAINFALL (INCHES)
10-YEAR	4.16
25-YEAR	4.97
100-YEAR	6.37

Using these rainfall depths, the Type II Storm event was modeled, which is conservative in that it represents the most intense short duration rainfall used to model most regions of the United States.

DRAINAGE AREA HYDROLOGY

The Soil Conservation Service (SCS) Technical Release No. 20 (TR-20) methodology within the HydroCAD computer program was used to determine the peak surface water runoff rates from the 25-year, 24-hour storm event. The rate of runoff is based on the relationships between the amount of rainfall, soil type, infiltration, land cover, slope, travel time, and the size of the drainage area. From Ref. No. 3, Carter Hollow Landfill is primarily located in an area of hydrologic soil group D, and it is assumed that on-site soils from this soil group will be used for earthwork activities. The curve numbers assumed for the various land cover conditions are summarized as follows:

CN DATA	
Description	**CN**
Brush/Weed/Grass Mix (Undisturbed Areas)	77
Woods (Undisturbed Areas)	77
Woods/Grass Combination (Undisturbed Areas)	79
Grass Cover 50 - 75% (Revegetated Areas)	84
Gravel Access Roads	91
Newly Graded Areas	94

The SCS TR-55 approach was used to calculate the time of concentration and peak discharge in each delineated drainage area. Figures showing the drainage areas and corresponding time of concentration paths are attached to each calculation brief. The HydroCAD computer software program was used to hydraulically route the 25-year, 24-hour storm event through the proposed stormwater controls. Sedimentation ponds were also evaluated for the 100-year, 24-hour storm event.

CHANNEL ANALYSIS

The channels will collect surface water runoff and convey the stormwater to the proposed sediment basins. The channels were designed assuming Manning's roughness coefficients (n-values) specific to the proposed lining for each channel. The invert elevations and lengths of each channel segment were measured from the permit drawings to determine channel slopes. Channel sections were then evaluated using Ref. No. 4 to determine adequate lining materials. Results of the NAG channel analyses are provided with their respective calculation briefs.

Design summary tables provided in Attachment 1 present the lengths, slope, and inlet and outlet elevations of the perimeter channels as well as the peak flow, maximum velocity, flow depths and lining materials.

CULVERT ANALYSIS

The culverts will collect surface water runoff from channels and convey the runoff to channels or basins, as appropriate. The culverts were designed using n-values appropriate to the specific culvert material. At the culvert outlets, riprap erosion protection was designed as needed based on the calculated discharge from each culvert. The riprap erosion protection will include riprap with an underlying geotextile.

Design summary tables provided in Attachment 1 present the culvert diameter, lengths, slopes, and inlet and outlet elevations of the culverts as well as the peak flow, peak elevation, adjacent road elevations, and culvert quantity.

CATCH BASINS

In certain conditions, catch basins will be designed to collect surface water runoff from channels and convey flow into culverts. Catch basins will be designed based on calculated flow rates from upgradient surface water controls and the required depth of cover above the top of the culverts.

Design summary tables provided in Attachment 1 present the catch basin dimensions, invert elevations, and peak elevation.

SEDIMENT BASIN ANAYLSIS

The sediment basins were designed using the 25-year and 100-year, 24-hour storm events. The sediment basins will provide a minimum 2 feet of freeboard during the 25-year, 24-hour storm event, and a minimum 1-foot of freeboard with an emergency spillway capable of conveying the peak flow during the 100-year, 24-hour storm event.

The sediment basins have been designed in accordance with Ref. No. 5, which requires the following:

1. A sediment storage zone of 1,000 cubic feet per disturbed acre.
2. A dewatering zone of 1,800 cubic feet for each acre contributing drainage. The maximum depth of the dewatering zone is 5 feet.
3. Dewatering time of at least 2 days.
4. A flow length to width ratio of at least 2:1. A ratio of 4:1 is recommended.

The design calculations and HydroCAD outputs for each sediment basin are provided in separate basin calculation briefs.

RIPRAP APRONS

Riprap aprons shall be design using the current Ohio Department of Transportation (ODOT) design methodologies or engineer approved equivalent at the time of construction.

ANTI-SEEP COLLARS

Anti-Seep collars were designed for the principal spillway outlet barrels in the sediment basins. As an alternative, Filter Diaphragms may be used.

CONCLUSIONS

The HydroCAD models and supporting calculations for the stormwater management system are provided in the subsequent calculation briefs. Calculation summary tables for the channels, culverts, and catch basins are provided in Attachment 1. Drainage area delineation figures have been developed for each stormwater management control associated with each sediment basin and sediment traps and are provided with their respective calculation briefs.

The proposed channels, culverts, catch basins, and sediment basins and traps are designed for the 25-year, 24-hour storm event. Sediment basins have been designed to manage runoff from the 25-year, 24-hour storm event and can safely manage the 100-year, 24-hour storm event through the emergency

spillway. The proposed channels will provide a minimum 0.5 feet of freeboard during the 25-year, 24-hour storm event, and the sediment basins will provide a minimum of 1-foot of freeboard with an emergency spillway during the 100-year, 24-hour storm event. Design calculations associated with each channel, culvert, catch basin, sediment basin and sediment trap are provided in their respective calculation briefs.

The proposed surface water management system is adequate, since each feature has been designed to manage stormwater runoff from the appropriate storm event.

ATTACHMENT 1

DESIGN SUMMARY TABLES

TABLE 1
CHANNEL SUMMARY

Channel ID	Bottom Width (ft)	Depth (ft)	Left Side Slope H:V	Right Side Slope H:V	Channel Length (ft)	Channel Slope (ft/ft)	Channel Lining	RipRap D_{50} (in.)	RipRap D_{MAX} (in.)
1A	4	3.5	2:1	2:1	917	0.0076	ODOT Type D Riprap / Flexamat (see Note 1)	6	12
1B	4	3.5	2:1	2:1	834	0.0084	ODOT Type D Riprap / Flexamat (see Note 1)	6	12
1C	4	3.5	2:1	2:1	1,090	0.0248	ODOT Type D Riprap / Flexamat (see Note 1)	6	12
1D	4	4	1.75:1	1.75:1	586	0.3379	NAG P550 Reinforced Vegetation	--	--
2A	4	3.5	2:1	2:1	1,585	0.0322	ODOT Type B Riprap / Flexamat (see Note 1)	18	24
2B	4	3.5	2:1	2:1	997	0.0281	ODOT Type D Riprap / Flexamat (see Note 1)	6	12
2C	4	3.5	2:1	2:1	1,179	0.0297	ODOT Type D Riprap / Flexamat (see Note 1)	6	12
2D	4	3.5	2:1	2:1	614	0.2036	ODOT Type B Riprap / Flexamat (see Note 1)	18	24
3	4	3.5	2:1	2:1	1,170	0.0274	ODOT Type C Riprap / Flexamat (see Note 1)	12	18
4	4	3	2:1	2:1	825	0.0109	ODOT Type D Riprap / Flexamat (see Note 1)	6	12
5	4	2	3:1	3:1	50	0.1800	NAG P550 Reinforced Vegetation	--	--
6	4	3.5	2:1	2:1	580	0.0293	ODOT Type D Riprap / Flexamat (see Note 1)	6	12
7	5	1.5	2.5:1	2.5:1	410	0.2829	NAG P300 Reinforced Vegetation	--	--
8	5	3	4:1	4:1	1,018	0.0462	NAG P300 Reinforced Vegetation	--	--
9A	5	1.5	4:1	4:1	300	0.0867	NAG P300 Reinforced Vegetation	--	--
9B	5	2.5	4:1	4:1	340	0.0765	NAG P300 Reinforced Vegetation	--	--
9C	5	3	4:1	4:1	420	0.0119	NAG P300 Reinforced Vegetation	--	--
11B	2	3	2:1	2:1	462	0.0779	NAG C350 Reinforced Vegetation	--	--
11C	2	3.5	2:1	2:1	254	0.0394	NAG C350 Reinforced Vegetation	--	--
12	0	2	2:1	2:1	370	0.2865	Flexamat Erosion Control Mat	--	--
13A	4	3	1:1	3:1	534	0.0300	ODOT Type D Riprap / Flexamat (see Note 1)	6	12
13B	4	3	1:1	3:1	395	0.0608	ODOT Type D Riprap / Flexamat (see Note 1)	6	12

Notes:

1. Channel linings may be the riprap type identified or Flexamat

TABLE 2
CULVERT SUMMARY

Culvert ID	Diameter (in)	No. of Barrels	Length (ft)	Inlet Elevation	Outlet Elevation	Slope (ft/ft)	Culvert Material
1	42	1	47	865.50	862.00	0.0745	Corrugated Metal Gauge 12
2	48	1	120	863.50	862.00	0.0125	Corrugated Metal Gauge 12
3	24	1	259	858.42	857.13	0.0050	Reinforced Concrete Class III
4	36	3	80	689.50	687.00	0.0313	Corrugated Polyethylene, Smooth Wall Interior
6	24	1	105	714.00	705.00	0.0857	Corrugated Polyethylene, Smooth Wall Interior
11	48	1	185	662.00	656.88	0.0278	Reinforced Concrete Class III
12	24	1	137	696.00	673.00	0.1679	Reinforced Concrete Class III
13	42	3	206	666.00	665.00	0.0049	Reinforced Concrete Class III
14	42	3	135	644.00	626.00	0.1333	Corrugated Polyethylene, Smooth Wall Interior

Notes:

1. Corrugated metal pipe shall consist of Contech ULTRA FLO or equivalent.
2. Polyethylene pipe shall consist of Standard Dimension Ratio (SDR) 11 high density polyethylene or equivalent

TABLE 3

DROP INLET SUMMARY

Drop Inlet ID	Rim/Grate Elevation	Culvert Outlet Elevation	Length and Width	Depth (ft)
1	865.0	863.5	4 ft x 4 ft	5
2	693.0	689.5	4 ft x 12.5 ft	3.5
3	700.0	696.0	3 ft x 3 ft	4
4	648.0	644.0	4 ft x 12.5 ft	4

PERMANENT SURFACE WATER CONTROL STRUCTURES

(Taken from the existing PTI Permit Application for the Carter Hollow Landfill)

OBJECTIVE:

To design the proposed surface water control structures for Drainage Area C which divert all stormwater runoff to the proposed Sedimentation Pond C. All calculations for Sedimentation Pond C can be found in the calculation entitled **"OAC 3745-30-05 (C)(6)(l) – Sediment Pond C Design Calculations"**. The calculations for all surface water control structures satisfy the following regulations for residual waste landfills:

OAC 3745-30-07(C)(4)(a)-(c)

(a) Any permanent surface water control structures shall be designed to accommodate, by non-mechanical means, the peak flow from the twenty-five-year/twenty-four-hour storm event.

(b) Any temporary surface water control structures shall be designed to accommodate the peak flow from the twenty-five-year/twenty-four-hour storm event.

(c) Surface water control structures shall be designed to minimize silting and scouring.

The design is based upon accepted engineering design equations, methodologies and assumptions. Where applicable, design references have been made. Calculations have been performed using the software package, HydroCAD Version 9.10, Copyright 2009.

METHOD:

Peak flows have been estimated with SCS TR-55 by calculating the time of concentration (Tc) of each channel reach, the composite runoff curve number describing the reach's watershed and the total area of the reach's watershed. A computer software package entitled "HydroCAD" Version 9.10, Copyright 2009, was utilized to perform the SCS TR-55 calculations.

Per the TR-55 methods, times of concentration will be estimated as the sum of sheet flow, shallow concentrated flow and channel flow. Sheet flow calculations use an average surface consisting of short grass, utilizing a Manning's Number of 0.150. Typical maximum sheet flow lengths are 100 ft. Shallow concentrated flow times of concentration will be estimated depending on the condition of the flow path. Channel flow times of concentration will be

estimated as part of the channel cross section design, utilizing actual flow depth and velocity information.

This site is located in an area of hydrologic soil group C. Based on the existing and proposed site conditions the following runoff coefficients have been determined and will be utilized.

CN DATA	
Description	**CN**
Existing (Woods Grass Combination, Fair)	76
Landfill (50-75% Grass Cover, Fair)	79

As mentioned above, all channels have been designed utilizing the 25-year, 24-hour storm event. The rainfall values for this site were referenced from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14[(1)], and are listed below and accompany "OAC 3745-30-05 (C)(6)(k) Permanent Surface Water Control Structures A Design Calculations".

RAINFALL DATA		
Frequency	**Duration**	**Depth (in)**
10 yr	24 hr	4.16
25 yr	24 hr	4.97
100 yr	24 hr	6.37

Utilizing a series of diversion berms, downchutes, perimeter channels, and pipe culverts, all stormwater runoff from Drainage Area C is directed to Sedimentation Pond C. Diversion berms on the landfill cap, which are typically v-shaped channels, collect smaller drainage areas and direct the runoff to the trapezoidal downchutes. The perimeter channel collects all runoff around the toe of the landfill. The perimeter channel and downchute then convey all runoff from within the drainage area to the sedimentation pond via a pipe culvert. The locations of the channels, as well as drainage areas, are shown on the attached "Pond C Tributary Map" shown in Figure C.

CALCULATIONS:

With the peak discharge known for each channel, the channel cross section is sized and a channel lining material is selected (from the channel lining design options, included below).

Flow properties within the channels are estimates from the HydroCAD output and hydrographs utilizing Manning's Equation (EQ. 1):

$$V = \frac{Q}{A} = 1.49\frac{R^{2/3}\sqrt{S_f}}{n} = 1.49\frac{\left[\frac{A}{WP}\right]^{2/3}\sqrt{S_f}}{n}$$

Where:

V = Velocity, fps

Q = Flowrate, cfs

A = Cross – Sectional area of flow, sf

R = Hydraulic Radius, ft

WP = Wetted Perimeter, ft

S_f = Slope of channel, ft / ft

n = Manning's roughness coefficient

See Figure A for the drainage areas utilized and the longest Tc path for each drainage area. The tables below show the drainage watershed identification, length, inlet and outlet invert elevations, contributing area, and peak flow for each channel based on the 25-year/24-hour storm event:

Surface Water Diversion Berm:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Max. Velocity (fps)	Lining
		Inlet	Outlet						
DB-C1	C-1	1002.1	997.0	254	0.020	0.74	3.0	3.6	Grass
DB-C2	C-2	1003.5	997.0	336	0.020	1.04	4.2	3.9	Grass
DB-C3	C-3	977.3	970.3	346	0.020	0.66	3.5	3.8	Grass
DB-C4	C-4	980.9	970.3	541	0.020	1.70	7.1	4.4	Grass
DB-C5	C-5	952.7	943.9	433	0.020	0.86	4.6	4.0	Grass
DB-C6	C-6	954.5	943.9	544	0.020	1.31	7.0	4.4	Grass
DB-C7	C-7	927.8	917.0	530	0.020	1.10	5.8	4.3	Grass
DB-C8	C-8	927.7	917.0	547	0.020	1.34	7.1	4.4	Grass
DB-C9	C-9	903.1	890.1	623	0.021	1.31	7.0	4.5	Grass
DB-C10	C-10	901.0	890.1	550	0.020	1.34	7.1	4.4	Grass

Downchute Channel:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Peak Velocity (fps)	Lining
		Inlet	Outlet						
DC-C1	C-1,C-2	997.0	970.3	107	0.250	1.78	7.1	6.4	Riprap
DC-C2	C-1,C-2,C-3,C-4	970.3	943.9	106	0.250	4.14	15.9	8.3	Riprap
DC-C3	C-1,C-2,C-3,C-4,C-5,C-6	943.9	917.0	108	0.250	6.31	25.3	9.6	Riprap
DC-C4	C-1,C-2,C-3,C-4,C-5,C-6,C-7,C-8	917.0	890.1	107	0.252	8.75	37.1	10.8	Riprap
DC-C5	C-1,C-2,C-3,C-4,C-5,C-6,C-7,C-8,C-9,C-10	890.1	870.6	74	0.262	11.40	50.1	12.0	Riprap

Inboard Perimeter Channel:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Peak Velocity (fps)	Lining
		Inlet	Outlet						
IPC-C	C-11	894.04	870.62	791	0.030	1.39	7.7	3.2	Riprap

Pipe Culvert:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Peak Velocity (fps)	Lining
		Inlet	Outlet						
~~DC-C6~~	~~C-1,C-2,C-3,C-4,C-5,C-6,C-7,C-8,C-9,C-10,C-11~~	~~865.50~~	~~820.00~~	~~209~~	~~0.22~~	~~12.79~~	~~56.6~~	~~5.8~~	~~RCP~~
DC-C6 ~~(alt.)~~	C-1,C-2,C-3,C-4,C-5,C-6,C-7,C-8,C-9,C-10,C-11	865.50	864.50	209	.005	12.79	52.2	7.0	RCP

For channel and berm details and schedule, see LINER AND SURFACE WATER CONTROL STRUCTURES DETAILS, Sheet 7A of the PERMIT Permit to Install application drawing set.

The maximum peak flow in any of the channels will occur in Pipe Culvert DC-C6, which combines drainage areas C-1, C-2, C-3, C-4, C-5, C-6, C-7, C-8, C-9, C-10 and C-11. These areas encompass approximately 12.79 total acres and provide a peak flow of 56.6 cfs during the 25-year, 24-hour storm event. See the **OAC 3745-30-05 (C)(6)(l) – Sediment Pond C Design Calculations** for the HydroCAD output and hydrograph files of the design of all surface water control structures.

Grass or riprap was chosen, dependent upon the velocity for lining of the channels. Channel lining maximum allowable velocity values are provided in the following table:

CHANNEL LININGS		
Material	**n**	**Vmax (fps)**
Grass	0.037	5.0
Riprap[(i)]	0.049-0.065	11.5

(i)The Riprap (stone) size used in the analysis is R-5 riprap gradation aggregate or equivalent.

CONCLUSIONS:

All surface water control structures were designed based on the drainage area, flow rate, channel slope, and channel lining based on the peak flows resulting from the 25-year, 24-hour storm event. Utilizing a series of surface water diversion berms, downchutes, perimeter channels, and pipe culverts, all stormwater runoff from Drainage Area C will be directed to Sedimentation Pond C in order to control sediment-laden runoff as well as meet applicable regulations. All surface water channels will either be lined with grass or riprap depending on flow velocity. See Drawing 7A for the channel schedules and details. The Surface Water Channel Design HydroCAD output and hydrograph files are attached.

REFERENCES:

1. National Climatic Data Center, *Precipitation Frequency Estimates*, Point Precipitation Frequency Estimate From NOAA Atlas 14 Ohio 38.65 N 83.65 W 800 feet, Viewed 19 May 2009,< http://hdsc.nws.noaa.gov/hdsc/pfds/index.html>.

2. National Resources Conservation Service, PART 630 HYDROLOGY NATIONAL ENGINEERING HANDBOOK, July 2004.

3. Ven Te Chow, OPEN CHANNEL HYDRAULICS, Mc-Graw Hill Book Company, 1959.

4. Goldman, Jackson and Bursztynsky, EROSION AND SEDIMENT CONTROL HANDBOOK, Mc-Graw Hill Book Company, 1986.

5. Soil Conservation Service, WATER MANAGEMENT AND SEDIMENT CONTROL FOR URBANIZING AREAS, distributed by Ohio Soil and Water Conservation Service.

6. HydroCAD Software Solutions LLC, HYDROCAD, Version 9.10, 2009, Computer Software Program.

Civil & Environmental Consultants, Inc.

SUBJECT	OAC 3745-30-05 (C)(6)(k) Permanent Surface Water Control Structures C Design Calculations					PROJECT NO.	071-644		
PROJECT	Dayton Power and Light – Carter Hollow Landfill Sprigg Township, Adams County, Ohio					PAGE	9	OF	9
	MADE BY	IIJ	DATE	03/03/10	CHECKED BY	JMP	DATE	03/04/10	

FIGURE C
DRAINAGE AREA AND SURFACE WATER CONTROL STRUCTURES

OBJECTIVE:

To design the proposed surface water control structures for Drainage Area D which divert all stormwater runoff to the proposed Sedimentation Pond D. All calculations for Sedimentation Pond D can be found in the calculation entitled **"OAC 3745-30-05 (C)(6)(l) – Sediment Pond D Design Calculations"**. The calculations for all surface water control structures satisfy the following regulations for residual waste landfills:

OAC 3745-30-07(C)(4)(a)-(c)

(a) Any permanent surface water control structures shall be designed to accommodate, by non-mechanical means, the peak flow from the twenty-five-year/twenty-four-hour storm event.

(b) Any temporary surface water control structures shall be designed to accommodate the peak flow from the twenty-five-year/twenty-four-hour storm event.

(c) Surface water control structures shall be designed to minimize silting and scouring.

The design is based upon accepted engineering design equations, methodologies and assumptions. Where applicable, design references have been made. Calculations have been performed using the software package, HydroCAD Version 9.10, Copyright 2009.

METHOD:

Peak flows have been estimated with SCS TR-55 by calculating the time of concentration (Tc) of each channel reach, the composite runoff curve number describing the reach's watershed and the total area of the reach's watershed. A computer software package entitled "HydroCAD" Version 9.10, Copyright 2009, was utilized to perform the SCS TR-55 calculations.

Per the TR-55 methods, times of concentration will be estimated as the sum of sheet flow, shallow concentrated flow and channel flow. Sheet flow calculations use an average surface consisting of short grass, utilizing a Manning's Number of 0.150. Typical maximum sheet flow lengths are 100 ft. Shallow concentrated flow times of concentration will be estimated depending on the condition of the flow path. Channel flow times of concentration will be

estimated as part of the channel cross section design, utilizing actual flow depth and velocity information.

This site is located in an area of hydrologic soil group C. Based on the existing and proposed site conditions the following runoff coefficients have been determined and will be utilized.

CN DATA	
Description	**CN**
Existing (Woods Grass Combination, Fair)	76
Landfill (50-75% Grass Cover, Fair)	79

As mentioned above, all channels have been designed utilizing the 25-year, 24-hour storm event. The rainfall values for this site were referenced from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14[(1)], and are listed below and accompany "OAC 3745-30-05 (C)(6)(k) Permanent Surface Water Control Structures A Design Calculations".

RAINFALL DATA		
Frequency	**Duration**	**Depth (in)**
10 yr	24 hr	4.16
25 yr	24 hr	4.97
100 yr	24 hr	6.37

Utilizing a series of diversion berms, downchutes, perimeter channels, and pipe culverts, all stormwater runoff from Drainage Area D is directed to Sedimentation Pond D. Diversion berms on the landfill cap, which are typically v-shaped channels, collect smaller drainage areas and direct the runoff to the trapezoidal downchutes. The perimeter channel collects all runoff around the toe of the landfill. The perimeter channel and downchute then convey all runoff from within the drainage area to the sedimentation pond via a pipe culvert. The locations of the channels, as well as drainage areas, are shown on the attached "Pond D Tributary Map" shown in Figure D.

CALCULATIONS:

With the peak discharge known for each channel, the channel cross section is sized and a channel lining material is selected (from the channel lining design options, included below).

Flow properties within the channels are estimates from the HydroCAD output and hydrographs utilizing Manning's Equation (EQ. 1):

$$V = \frac{Q}{A} = 1.49\frac{R^{2/3}\sqrt{S_f}}{n} = 1.49\frac{\left[\frac{A}{WP}\right]^{2/3}\sqrt{S_f}}{n}$$

Where:

V = Velocity, fps

Q = Flowrate, cfs

A = Cross – Sectional area of flow, sf

R = Hydraulic Radius, ft

WP = Wetted Perimeter, ft

S_f = Slope of channel, ft / ft

n = Manning's roughness coefficient

See Figure D for the drainage areas utilized and the longest Tc path for each drainage area. The tables below show the drainage watershed identification, length, inlet and outlet invert elevations, contributing area, and peak flow for each channel based on the 25-year/24-hour storm event:

Surface Water Diversion Berm:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Max. Velocity (fps)	Lining
		Inlet	Outlet						
DB-D1	D-1	981.1	976.7	223	0.020	0.60	2.6	3.5	Grass
DB-D2	D-2	987.5	976.7	543	0.020	2.61	10.5	4.9	Grass
DB-D3	D-3	960.3	954.6	285	0.020	0.51	2.8	3.5	Grass
DB-D4	D-4	965.4	954.6	543	0.020	1.10	5.9	4.2	Grass
DB-D5	D-5	938.4	932.5	310	0.019	0.60	3.3	3.6	Grass
DB-D6	D-6	943.3	932.5	543	0.020	1.10	5.9	4.2	Grass
DB-D8	D-8	921.2	910.4	545	0.020	1.07	5.8	4.2	Grass

Downchute Channel:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Peak Velocity (fps)	Lining
		Inlet	Outlet						
DC-D1	D-1,D-2	976.7	954.6	88	0.250	3.21	12.7	7.8	Riprap
DC-D2	D-1,D-2,D-3,D-4	954.6	932.5	88	0.250	4.83	18.2	8.7	Riprap
DC-D3	D-1,D-2,D-3,D-4,D-5,D-6	932.5	910.4	84	0.263	6.53	26.2	9.9	Riprap

Inboard Perimeter Channel:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Peak Velocity (fps)	Lining
		Inlet	Outlet						
IPC-D1	D-7	916.9	910.4	863	0.008	2.50	13.4	3.6	Riprap

Pipe Culvert:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Peak Velocity (fps)	Lining
		Inlet	Outlet						
DC-D4	D-1,D-2,D-3,D-4,D-5,D-6,D-7,D-8	906.85	906.00	83	.010	10.10	43.2	6.9	N/A

For channel and berm details and schedule, see LINER AND SURFACE WATER CONTROL STRUCTURES DETAILS, Sheet 7A of the Permit to Install application drawing set.

The maximum peak flow in any of the channels will occur in Pipe Culvert DC-D4, which combines drainage areas D-1, D-2, D-3, D-4, D-5, D-6, D-7, and D-8. These areas encompass approximately 10.10 total acres and provide a peak flow of 43.2 cfs during the 25-year, 24-hour storm event. See the **OAC 3745-30-05 (C)(6)(l) – Sediment Pond D Design Calculations** for the HydroCAD output and hydrograph files of the design of all surface water control structures.

Grass or riprap was chosen, dependent upon the velocity for lining of the channels. Channel lining maximum allowable velocity values are provided in the following table:

CHANNEL LININGS		
Material	**n**	**Vmax (fps)**
Grass	0.037	5.0
Riprap[(i)]	0.049-0.065	11.5

(i)The Riprap (stone) size used in the analysis is R-5 riprap gradation aggregate or equivalent.

CONCLUSIONS:

All surface water control structures were designed based on the drainage area, flow rate, channel slope, and channel lining based on the peak flows resulting from the 25-year, 24-hour storm event. Utilizing a series of surface water diversion berms, downchutes, perimeter channels, and pipe culverts, all stormwater runoff from Drainage Area D will be directed to Sedimentation Pond D in order to control sediment-laden runoff as well as meet applicable regulations. All surface water channels will either be lined with grass or riprap depending on flow velocity. See Drawing 7A for the channel schedules and details. The Surface Water Channel Design HydroCAD output and hydrograph files are attached.

REFERENCES:

1. National Climatic Data Center, *Precipitation Frequency Estimates*, Point Precipitation Frequency Estimate From NOAA Atlas 14 Ohio 38.65 N 83.65 W 800 feet, Viewed 19 May 2009,< http://hdsc.nws.noaa.gov/hdsc/pfds/index.html>.

2. National Resources Conservation Service, PART 630 HYDROLOGY NATIONAL ENGINEERING HANDBOOK, July 2004.

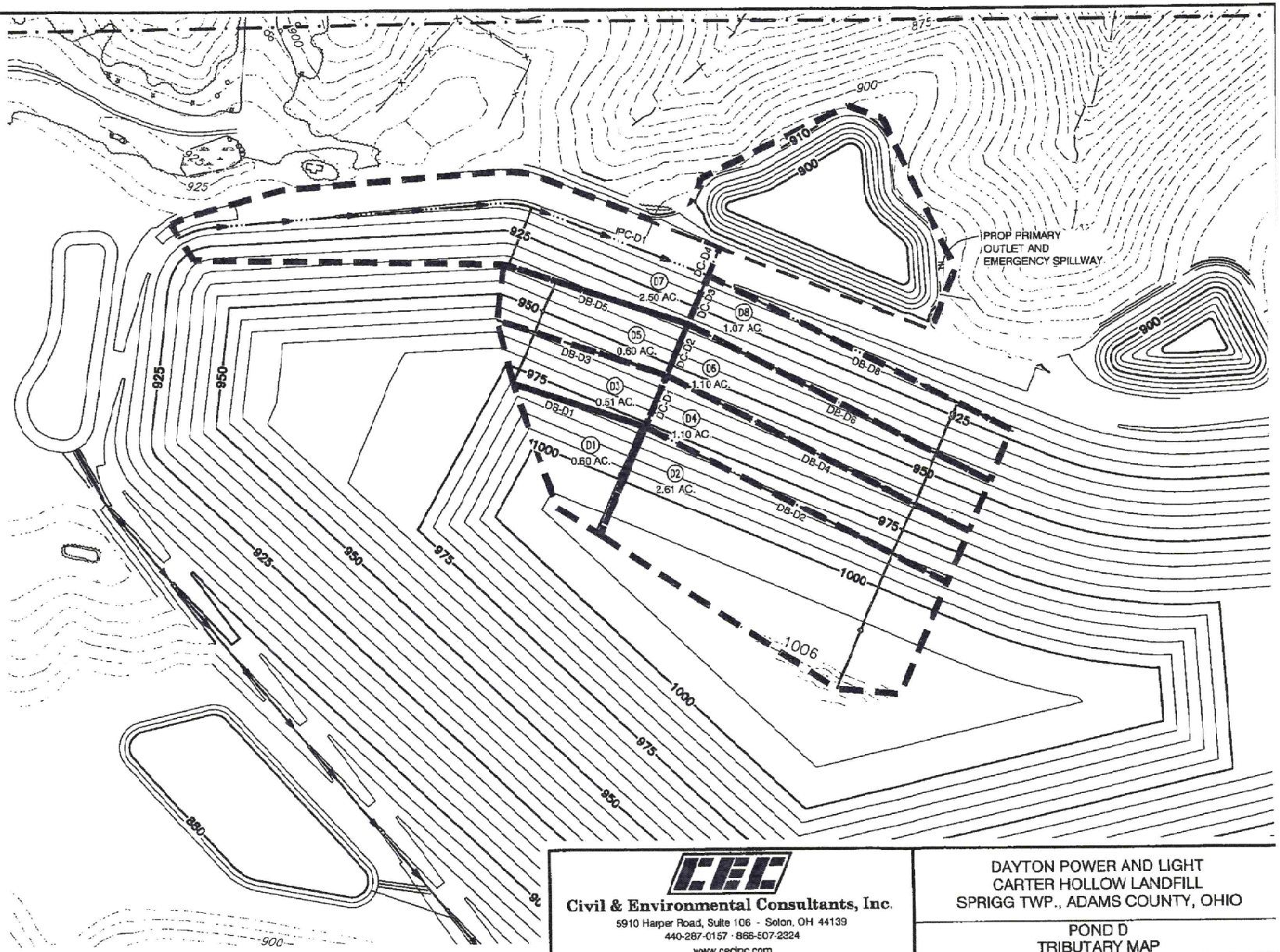
3. Ven Te Chow, OPEN CHANNEL HYDRAULICS, Mc-Graw Hill Book Company, 1959.

4. Goldman, Jackson and Bursztynsky, EROSION AND SEDIMENT CONTROL HANDBOOK, Mc-Graw Hill Book Company, 1986.

5. Soil Conservation Service, WATER MANAGEMENT AND SEDIMENT CONTROL FOR URBANIZING AREAS, distributed by Ohio Soil and Water Conservation Service.

6. HydroCAD Software Solutions LLC, HYDROCAD, Version 9.10, 2009, Computer Software Program.

FIGURE D
DRAINAGE AREA AND SURFACE WATER CONTROL STRUCTURES



LEGEND:

Tc PATH	
DRAINAGE AREA	
DRAINAGE BERM /CHANNEL	
DRAINAGE AREA NAME	(D1)
DIVERSION BERM	DB-D3
DOWNCHUTE	DC-D1
INBOARD PERIMETER CHANNEL	IPC-D

NOTE

1. REFER TO HYDROCAD OUTPUT FOR DETAILED INFORMATION REGARDING TIME OF CONCENTRATIONS, FLOW LENGTHS AND CN NUMBERS.

2. POND SIZING AND DESIGN CAN BE FOUND IN THE CALCULATION ENTITILED "OAC 3745-30-05 (C)(6)(L) – SEDIMENT POND D DESIGN CALCULATIONS"

SCALE IN FEET

0 150 300

DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

Civil & Environmental Consultants, Inc.
5910 Harper Road, Suite 106 - Solon, OH 44139
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www.cecinc.com

DAYTON POWER AND LIGHT
CARTER HOLLOW LANDFILL
SPRIGG TWP., ADAMS COUNTY, OHIO

POND D
TRIBUTARY MAP

DRAWN BY:	IJ	CHECKED BY:	JMP	APPROVED BY:	PCC	FIGURE NO.:	D
DATE:	MARCH 2010	DWG SCALE:	AS SHOWN	PROJECT NO:	071-644		

G:\PROJECTS\2007\071-644\PERMIT\DWG\HYDRO\071-644_SWM TRIB.DWG|POND D| (DPOKORNY) – MAR 26 2010 – 19:29:18

OBJECTIVE:

To design the proposed surface water control structures for Drainage Area E which divert all stormwater runoff to the proposed Sedimentation Pond E. All calculations for Sedimentation Pond E can be found in the calculation entitled **"OAC 3745-30-05 (C)(6)(l) – Sediment Pond E Design Calculations"**. The calculations for all surface water control structures satisfy the following regulations for residual waste landfills:

OAC 3745-30-07(C)(4)(a)-(c)

(a) Any permanent surface water control structures shall be designed to accommodate, by non-mechanical means, the peak flow from the twenty-five-year/twenty-four-hour storm event.

(b) Any temporary surface water control structures shall be designed to accommodate the peak flow from the twenty-five-year/twenty-four-hour storm event.

(c) Surface water control structures shall be designed to minimize silting and scouring.

The design is based upon accepted engineering design equations, methodologies and assumptions. Where applicable, design references have been made. Calculations have been performed using the software package, HydroCAD Version 9.10, Copyright 2009.

METHOD:

Peak flows have been estimated with SCS TR-55 by calculating the time of concentration (Tc) of each channel reach, the composite runoff curve number describing the reach's watershed and the total area of the reach's watershed. A computer software package entitled "HydroCAD" Version 9.10, Copyright 2009, was utilized to perform the SCS TR-55 calculations.

Per the TR-55 methods, times of concentration will be estimated as the sum of sheet flow, shallow concentrated flow and channel flow. Sheet flow calculations use an average surface consisting of short grass, utilizing a Manning's Number of 0.150. Typical maximum sheet flow lengths are 100 ft. Shallow concentrated flow times of concentration will be estimated depending on the condition of the flow path. Channel flow times of concentration will be

estimated as part of the channel cross section design, utilizing actual flow depth and velocity information.

This site is located in an area of hydrologic soil group C. Based on the existing and proposed site conditions the following runoff coefficients have been determined and will be utilized.

CN DATA	
Description	**CN**
Existing (Woods Grass Combination, Fair)	76
Landfill (50-75% Grass Cover, Fair)	79

As mentioned above, all channels have been designed utilizing the 25-year, 24-hour storm event. The rainfall values for this site were referenced from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14[(1)], and are listed below and accompany "OAC 3745-30-05 (C)(6)(k) Permanent Surface Water Control Structures A Design Calculations".

RAINFALL DATA		
Frequency	**Duration**	**Depth (in)**
10 yr	24 hr	4.16
25 yr	24 hr	4.97
100 yr	24 hr	6.37

Utilizing a series of diversion berms, downchutes, perimeter channels, and pipe culverts, all stormwater runoff from Drainage Area E is directed to Sedimentation Pond E. Diversion berms on the landfill cap, which are typically v-shaped channels, collect smaller drainage areas and direct the runoff to the trapezoidal downchutes. The perimeter channel collects all runoff around the toe of the landfill. The perimeter channel and downchute then convey all runoff from within the drainage area to the sedimentation pond via a pipe culvert. The locations of the channels, as well as drainage areas, are shown on the attached "Pond E Tributary Map" shown in Figure E.

CALCULATIONS:

With the peak discharge known for each channel, the channel cross section is sized and a channel lining material is selected (from the channel lining design options, included below).

Flow properties within the channels are estimates from the HydroCAD output and hydrographs utilizing Manning's Equation (EQ. 1):

$$V = \frac{Q}{A} = 1.49\frac{R^{2/3}\sqrt{S_f}}{n} = 1.49\frac{\left[\frac{A}{WP}\right]^{2/3}\sqrt{S_f}}{n}$$

Where:

V = Velocity, fps

Q = Flowrate, cfs

A = Cross – Sectional area of flow, sf

R = Hydraulic Radius, ft

WP = Wetted Perimeter, ft

S_f = Slope of channel, ft / ft

n = Manning's roughness coefficient

See Figure E for the drainage areas utilized and the longest Tc path for each drainage area. The tables below show the drainage watershed identification, length, inlet and outlet invert elevations, contributing area, and peak flow for each channel based on the 25-year/24-hour storm event:

Surface Water Diversion Berm:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Max. Velocity (fps)	Lining
		Inlet	Outlet						
DB-E1	E-1	987.5	975.0	419	0.030	1.35	5.6	4.9	Grass
DB-E2	E-2	993.4	975.0	189	0.097	0.24	1.1	5.1	Grass
DB-E3	E-3	965.4	958.4	395	0.018	0.78	4.2	3.7	Grass
DB-E4	E-4	965.5	958.4	363	0.020	1.75	9.7	4.8	Grass
DB-E5	E-5	943.3	936.4	354	0.020	0.75	4.1	3.8	Grass
DB-E6	E-6	947.6	936.4	572	0.020	1.05	5.7	4.2	Grass
DB-E7	E-7	921.2	914.7	314	0.021	0.67	3.6	3.8	Grass
DB-E8	E-8	927.6	914.7	651	0.020	1.21	6.6	4.3	Grass

Downchute Channel:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Peak Velocity (fps)	Lining
		Inlet	Outlet						
DC-E1	E-1,E-2	975	958.4	66	0.251	1.59	6.4	6.2	Riprap
DC-E2	E-1,E-2,E-3,E-4	958.4	936.4	88	0.250	4.12	18.0	8.7	Riprap
DC-E3	E-1,E-2,E-3,E-4,E-5,E-6	936.4	914.8	86	0.251	5.93	27.2	9.9	Riprap
DC-E4	E-1,E-2,E-3,E-4,E-5,E-6,E-7,E-8	914.8	903.9	39	0.281	7.80	36.8	11.2	Riprap

Inboard Perimeter Channel:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Peak Velocity (fps)	Lining
		Inlet	Outlet						
IPC-E1	E-9	910.4	903.9	833	0.008	1.60	8.9	3.2	Riprap

Pipe Culvert:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Peak Velocity (fps)	Lining
		Inlet	Outlet						
DC-E5	E-1,E-2,E-3,E-4,E-5,E-6,E-7,E-8,E-9	899.92	899.30	59	0.011	9.40	44.3	7.2	N/A

For channel and berm details and schedule, see LINER AND SURFACE WATER CONTROL STRUCTURES DETAILS, Sheet 7A of the Permit to Install application drawing set.

The maximum peak flow in any of the channels will occur in Pipe Culvert DC-E-5, which combines drainage areas E-1, E-2, E-3, E-4, E-5, E-6, E-7, E-8, and E-9. These areas encompass approximately 9.40 total acres and provide a peak flow of 44.3 cfs during the 25-year, 24-hour storm event. See the **OAC 3745-30-05 (C)(6)(l) – Sediment Pond E Design Calculations** for the HydroCAD output and hydrograph files of the design of all surface water control structures.

Grass or riprap was chosen, dependent upon the velocity for lining of the channels. Channel lining maximum allowable velocity values are provided in the following table:

CHANNEL LININGS		
Material	**n**	**Vmax (fps)**
Grass	0.037	5.0
Riprap[(i)]	0.049-0.065	11.5

(i)The Riprap (stone) size used in the analysis is R-5 riprap gradation aggregate or equivalent.

CONCLUSIONS:

All surface water control structures were designed based on the drainage area, flow rate, channel slope, and channel lining based on the peak flows resulting from the 25-year, 24-hour storm event. Utilizing a series of surface water diversion berms, downchutes, perimeter channels, and pipe culverts, all stormwater runoff from Drainage Area E will be directed to Sedimentation Pond E in order to control sediment-laden runoff as well as meet applicable regulations. All surface water channels will either be lined with grass or riprap depending on flow velocity. See Drawing 7A for the channel schedules and details. The Surface Water Channel Design HydroCAD output and hydrograph files are attached.

REFERENCES:

1. National Climatic Data Center, *Precipitation Frequency Estimates*, Point Precipitation Frequency Estimate From NOAA Atlas 14 Ohio 38.65 N 83.65 W 800 feet, Viewed 19 May 2009,< http://hdsc.nws.noaa.gov/hdsc/pfds/index.html>.

2. National Resources Conservation Service, PART 630 HYDROLOGY NATIONAL ENGINEERING HANDBOOK, July 2004.

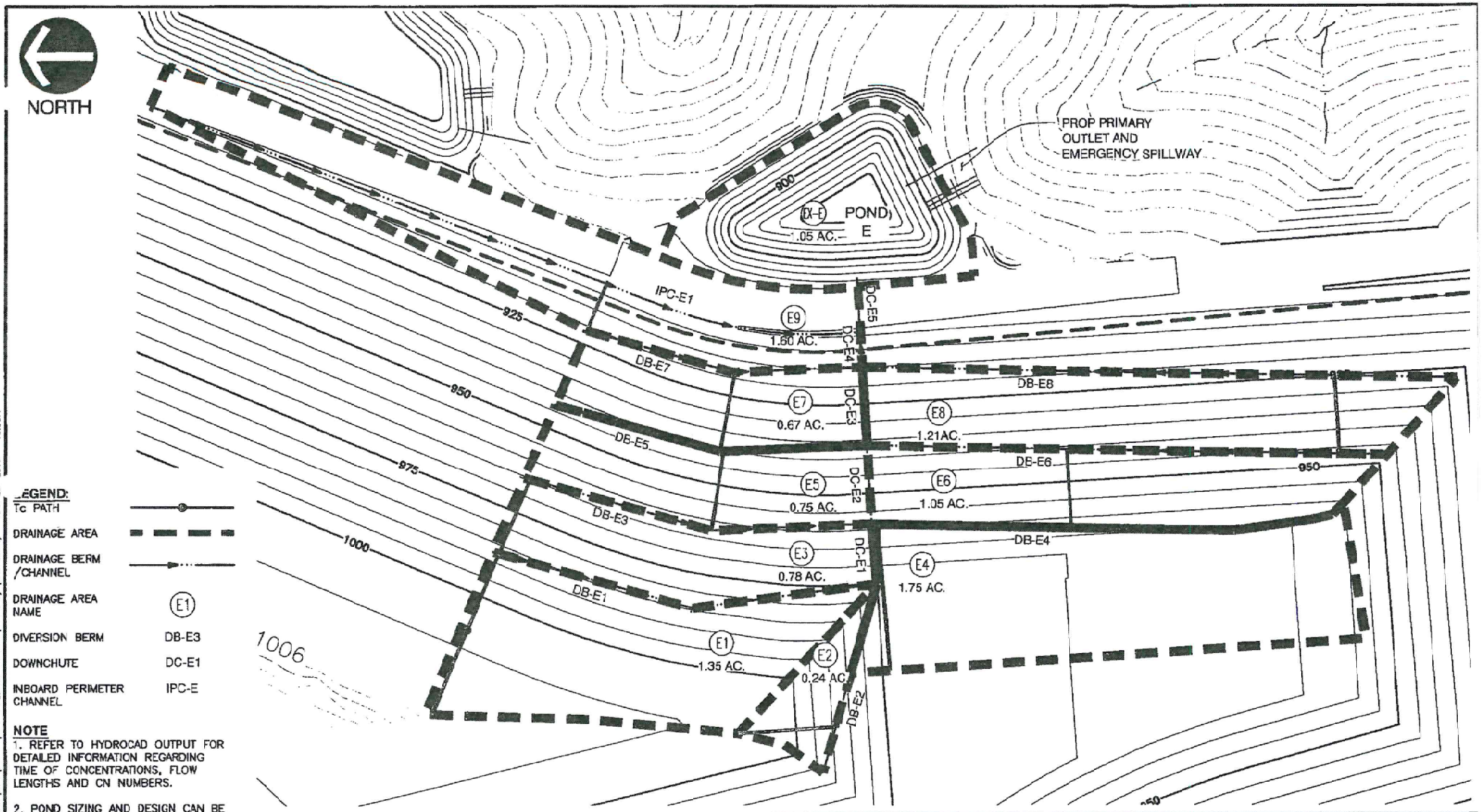
3. Ven Te Chow, OPEN CHANNEL HYDRAULICS, Mc-Graw Hill Book Company, 1959.

4. Goldman, Jackson and Bursztynsky, EROSION AND SEDIMENT CONTROL HANDBOOK, Mc-Graw Hill Book Company, 1986.

5. Soil Conservation Service, WATER MANAGEMENT AND SEDIMENT CONTROL FOR URBANIZING AREAS, distributed by Ohio Soil and Water Conservation Service.

6. HydroCAD Software Solutions LLC, HYDROCAD, Version 9.10, 2009, Computer Software Program.

FIGURE E
DRAINAGE AREA AND SURFACE WATER CONTROL STRUCTURES



LEGEND:

Tc PATH	
DRAINAGE AREA	
DRAINAGE BERM /CHANNEL	
DRAINAGE AREA NAME	(E1)
DIVERSION BERM	DB-E3
DOWNCHUTE	DC-E1
INBOARD PERIMETER CHANNEL	IPC-E

NOTE

1. REFER TO HYDROCAD OUTPUT FOR DETAILED INFORMATION REGARDING TIME OF CONCENTRATIONS, FLOW LENGTHS AND CN NUMBERS.

2. POND SIZING AND DESIGN CAN BE FOUND IN THE CALCULATION ENTITLED "OAC 3745-30-05 (C)(6)(.) – SEDIMENT POND E DESIGN CALCULATIONS"

SCALE IN FEET

0 100 200

DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

Civil & Environmental Consultants, Inc.
5910 Harper Road, Suite 106 - Solon OH 44139
440-287-0157 - 866-507-2324
www.cecinc.com

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CARTER HOLLOW LANDFILL
SPRIGG TWP., ADAMS COUNTY, OHIO

POND E
TRIBUTARY MAP

DRAWN BY:	IIJ	CHECKED BY:	JMP	APPROVED BY:	PCC	FIGURE NO.:	E
DATE:	MARCH 2010	DWG SCALE:	AS SHOWN	PROJECT NO:	071-644		

G:\PROJECTS\2007\071-644\PERMIT\DWG\HYDRO\071-644_SWM TRIB.DWG[POND E] (JPOKORNY) – MAR 26, 2010 – 19:30:4

OBJECTIVE:

To design the proposed surface water control structures for Drainage Area F which divert all stormwater runoff to the proposed Sedimentation Pond F. All calculations for Sedimentation Pond F can be found in the calculation entitled **"OAC 3745-30-05 (C)(6)(I) – Sediment Pond F Design Calculations"**. The calculations for all surface water control structures satisfy the following regulations for residual waste landfills:

OAC 3745-30-07(C)(4)(a)-(c)

(a) Any permanent surface water control structures shall be designed to accommodate, by non-mechanical means, the peak flow from the twenty-five-year/twenty-four-hour storm event.

(b) Any temporary surface water control structures shall be designed to accommodate the peak flow from the twenty-five-year/twenty-four-hour storm event.

(c) Surface water control structures shall be designed to minimize silting and scouring.

The design is based upon accepted engineering design equations, methodologies and assumptions. Where applicable, design references have been made. Calculations have been performed using the software package, HydroCAD Version 9.10, Copyright 2009.

METHOD:

Peak flows have been estimated with SCS TR-55 by calculating the time of concentration (Tc) of each channel reach, the composite runoff curve number describing the reach's watershed and the total area of the reach's watershed. A computer software package entitled "HydroCAD" Version 9.10, Copyright 2009, was utilized to perform the SCS TR-55 calculations.

Per the TR-55 methods, times of concentration will be estimated as the sum of sheet flow, shallow concentrated flow and channel flow. Sheet flow calculations use an average surface consisting of short grass, utilizing a Manning's Number of 0.150. Typical maximum sheet flow lengths are 100 ft. · Shallow concentrated flow times of concentration will be estimated depending on the condition of the flow path. Channel flow times of concentration will be

estimated as part of the channel cross section design, utilizing actual flow depth and velocity information.

This site is located in an area of hydrologic soil group C. Based on the existing and proposed site conditions the following runoff coefficients have been determined and will be utilized.

CN DATA	
Description	**CN**
Existing (Woods Grass Combination, Fair)	76
Landfill (50-75% Grass Cover, Fair)	79

As mentioned above, all channels have been designed utilizing the 25-year, 24-hour storm event. The rainfall values for this site were referenced from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14[(1)], and are listed below and accompany "OAC 3745-30-05 (C)(6)(k) Permanent Surface Water Control Structures A Design Calculations".

RAINFALL DATA		
Frequency	**Duration**	**Depth (in)**
10 yr	24 hr	4.16
25 yr	24 hr	4.97
100 yr	24 hr	6.37

Utilizing a series of diversion berms, downchutes, perimeter channels, and pipe culverts, all stormwater runoff from Drainage Area F is directed to Sedimentation Pond F. Diversion berms on the landfill cap, which are typically v-shaped channels, collect smaller drainage areas and direct the runoff to the trapezoidal downchutes. The perimeter channel collects all runoff around the toe of the landfill. The perimeter channel and downchute then convey all runoff from within the drainage area to the sedimentation basin via a pipe culvert. The locations of the channels, as well as drainage areas, are shown on the attached "Pond F Tributary Map" shown in Figure F.

CALCULATIONS:

With the peak discharge known for each channel, the channel cross section is sized and a channel lining material is selected (from the channel lining design options, included below).

Flow properties within the channels are estimates from the HydroCAD output and hydrographs utilizing Manning's Equation (EQ. 1):

$$V = \frac{Q}{A} = 1.49\frac{R^{2/3}\sqrt{S_f}}{n} = 1.49\frac{\left[\frac{A}{WP}\right]^{2/3}\sqrt{S_f}}{n}$$

Where:

V = Velocity, fps

Q = Flowrate, cfs

A = Cross – Sectional area of flow, sf

R = Hydraulic Radius, ft

WP = Wetted Perimeter, ft

S_f = Slope of channel, ft / ft

n = Manning's roughness coefficient

See Figure F for the drainage areas utilized and the longest Tc path for each drainage area. The tables below show the drainage watershed identification, length, inlet and outlet invert elevations, contributing area, and peak flow for each channel based on the 25-year/24-hour storm event:

Surface Water Diversion Berm:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Max. Velocity (fps)	Lining
		Inlet	Outlet						
DB-F1	F-1	972.8	970.3	164	0.015	0.55	2.9	3.2	Grass
DB-F2	F-2	1002.1	995.3	343	0.020	0.60	2.5	3.4	Grass
DB-F3	F-3	958.6	945.4	653	0.020	2.03	10.8	4.9	Grass
DB-F4	F-4	977.3	970.3	354	0.020	0.82	4.4	3.9	Grass
DB-F5	F-5	935.6	920.4	738	0.021	1.58	8.4	4.7	Grass
DB-F6	F-6	952.7	945.4	369	0.020	0.85	4.6	4.0	Grass
DB-F7	F-7	912.6	895.4	824	0.021	1.78	9.5	4.8	Grass
DB-F8	F-8	927.8	920.4	376	0.020	0.87	4.6	4.0	Grass
DB-F9	F-9	909.5	870.5	910	0.021	1.97	10.5	4.9	Grass
DB-F10	F-10	903.1	895.4	387	0.020	0.89	4.8	4.0	Grass
DB-F11	F-11	865.6	845.5	996	0.020	2.18	11.6	5.0	Grass
DB-F12	F-12	878.3	870.5	398	0.020	0.92	4.9	4.0	Grass
DB-F13	F-13	853.1	845.5	409	0.019	0.94	5.0	4.0	Grass
DB-F14	F-14	878.3	863.0	465	0.033	0.94	5.0	4.9	Grass

Downchute Channel:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Peak Velocity (fps)	Lining
		Inlet	Outlet						
DC-F1	F-1,F-2	995.3	970.3	100	0.250	0.60	2.4	4.4	Riprap
DC-F2	F-1,F-2,F-3,F-4	970.3	945.4	100	0.250	1.97	8.8	6.9	Riprap
DC-F3	F-1,F-2,F-3,F-4,F-5,F-6	945.4	920.4	100	0.250	4.85	23.4	9.4	Riprap
DC-F4	F-1,F-2,F-3,F-4,F-5,F-6,F-7,F-8	920.4	895.4	100	0.250	7.30	35.6	10.7	Riprap
DC-F5	F-1,F-2,F-3,F-4,F-5,F-6,F-7,F-8,F-9,F-10	895.4	870.5	100	0.250	9.97	48.8	11.7	Riprap
DC-F6	F-1,F-2,F-3,F-4,F-5,F-6,F-7,F-8,F-9,F-10,F-11,F-12	870.5	845.5	100	0.249	12.86	62.9	12.6	Riprap
DC-F7	F-1,F-2,F-3,F-4,F-5,F-6,F-7,F-8,F-9,F-10,F-11,F-12,F-13,F-14	845.5	837.8	26	0.294	16.00	78.0	14.2	Riprap

Inboard Perimeter Channel:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Peak Velocity (fps)	Lining
		Inlet	Outlet						
IPC-F1	F-16	870.6	863.0	262	0.029	0.69	3.7	2.6	Riprap
IPC-F2	F-15,F-16,F-17	863.0	837.8	867	0.029	2.94	15.2	4.0	Riprap

Pipe Culvert:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Peak Velocity (fps)	Lining
		Inlet	Outlet						
DC-F8	F-1,F-2,F-3,F-4,F-5,F-6,F-7,F-8,F-9,F-10,F-11,F-12,F-13,F-14,F-15,F-16,F-17	833.33	832.00	121	0.011	18.92	91.4	6.5	N/A

For channel and berm details and schedule, see LINER AND SURFACE WATER CONTROL STRUCTURES DETAILS, Sheet 7A of the Permit to Install application drawing set.

The maximum peak flow in any of the channels will occur in Pipe Culvert DC-F8, which combines drainage areas F-1, F-2, F-3, F-4, F-5, F-6, F-7, F-8, F-9, F-10, F-11, F-12, F-13, F-14, F-15, F-16, and F-17. These areas encompass approximately 18.9 total acres and provide a peak flow of 91.4 cfs during the 25-year, 24-hour storm event. See the **OAC 3745-30-05 (C)(6)(I) – Sediment Pond F Design Calculations** for the HydroCAD output and hydrograph files of the design of all surface water control structures.

Grass or riprap was chosen, dependent upon the velocity for lining of the channels. Channel lining maximum allowable velocity values are provided in the following table:

CHANNEL LININGS		
Material	**n**	**Vmax (fps)**
Grass	0.037	5.0
Riprap[(i)]	0.049-0.065	11.5

(i)The Riprap (stone) size used in the analysis is R-5 riprap gradation aggregate or equivalent.

CONCLUSIONS:

All surface water control structures were designed based on the drainage area, flow rate, channel slope, and channel lining based on the peak flows resulting from the 25-year, 24-hour storm event. Utilizing a series of surface water diversion berms, downchutes, perimeter channels, and pipe culverts, all stormwater runoff from Drainage Area F will be directed to Sedimentation Pond F in order to control sediment-laden runoff as well as meet applicable regulations. All surface water channels will either be lined with grass or riprap depending on flow velocity. See Drawing 7A for the channel schedules and details. The Surface Water Channel Design HydroCAD output and hydrograph files are attached.

REFERENCES:

1. National Climatic Data Center, *Precipitation Frequency Estimates*, Point Precipitation Frequency Estimate From NOAA Atlas 14 Ohio 38.65 N 83.65 W 800 feet, Viewed 19 May 2009,< http://hdsc.nws.noaa.gov/hdsc/pfds/index.html>.

2. National Resources Conservation Service, PART 630 HYDROLOGY NATIONAL ENGINEERING HANDBOOK, July 2004.

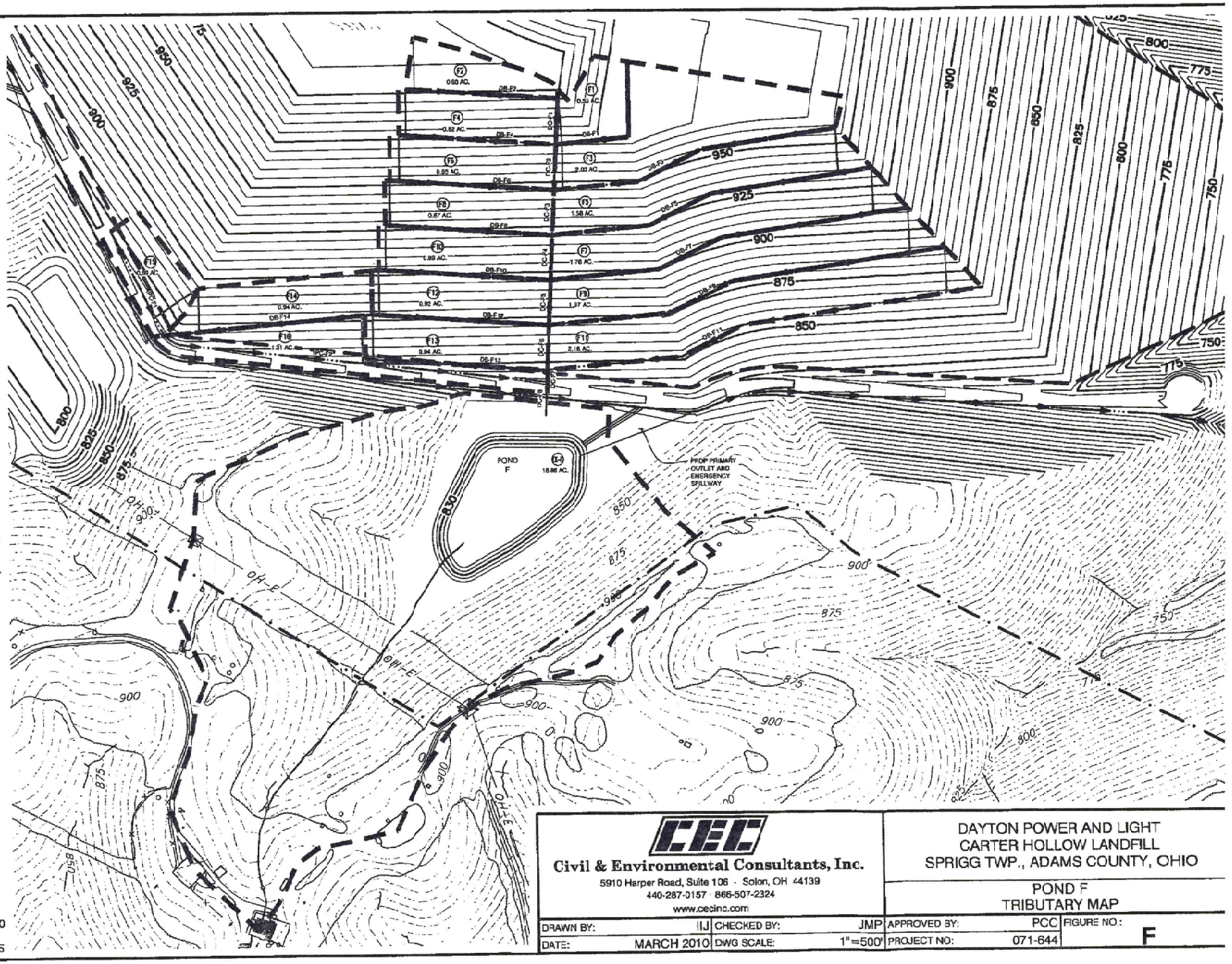
3. Ven Te Chow, OPEN CHANNEL HYDRAULICS, Mc-Graw Hill Book Company, 1959.

4. Goldman, Jackson and Bursztynsky, EROSION AND SEDIMENT CONTROL HANDBOOK, Mc-Graw Hill Book Company, 1986.

5. Soil Conservation Service, WATER MANAGEMENT AND SEDIMENT CONTROL FOR URBANIZING AREAS, distributed by Ohio Soil and Water Conservation Service.

6. HydroCAD Software Solutions LLC, HYDROCAD, Version 9.10, 2009, Computer Software Program.

FIGURE F
DRAINAGE AREA AND SURFACE WATER CONTROL STRUCTURES


NORTH
LEGEND:
Tc PATH
DRAINAGE AREA
DRAINAGE BERM /CHANNEL
DRAINAGE AREA NAME
F1
DIVERSION BERM
DB-F3
DOWNCHUTE
DC-F1
INBOARD PERIMETER CHANNEL
IPC-F
NOTE
1. REFER TO HYDROCAD OUTPUT FOR DETAILED INFORMATION REGARDING TIME OF CONCENTRATIONS, FLOW LENGTHS AND CN NUMBERS.
2. POND SIZING AND DESIGN CAN BE FOUND IN THE CALCULATION ENTITLED "OAC 3745-30-05 (C)(5)(L) - SEDIMENT POND F DESIGN CALCULATIONS"
SCALE IN FEET
0
200
400
DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES
POND F
PROP PRIMARY OUTLET AND EMERGENCY SPILLWAY
OH-E
OH-F
F1 0.53 AC.
F2 0.60 AC.
F3 1.58 AC.
F4 0.82 AC.
F5 0.85 AC.
F6 2.03 AC.
F7 1.76 AC.
F8 0.67 AC.
F9 1.37 AC.
F10 1.89 AC.
F11 2.18 AC.
F12 0.92 AC.
F13 0.94 AC.
F14 0.94 AC.
F15 1.31 AC.
F16 0.58 AC.
F17 0.88 AC.
DB-F1
DB-F2
DB-F3
DB-F4
DB-F5
DB-F6
DB-F7
DB-F8
DB-F9
DB-F10
DB-F11
DB-F12
DB-F13
DB-F14
DC-F1
DC-F2
DC-F3
DC-F4
DC-F5
DC-F6
IPC-F
Civil & Environmental Consultants, Inc.
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440-287-0157 · 866-507-2324
www.cecinc.com
DAYTON POWER AND LIGHT
CARTER HOLLOW LANDFILL
SPRIGG TWP., ADAMS COUNTY, OHIO
POND F
TRIBUTARY MAP
DRAWN BY: IJ
CHECKED BY: JMP
APPROVED BY: PCC
FIGURE NO: F
DATE: MARCH 2010
DWG SCALE: 1"=500'
PROJECT NO: 071-644
G:\PROJECTS\2007\071-644\PERMIT\DWG\HYDRO\071-644_SWM TRIB.DWG\POND F1 (JPOKORNY) - MAR 26 2010 - 19:32:25

OBJECTIVE:

To design the proposed surface water control structures for Drainage Area G which divert all stormwater runoff to the proposed Sedimentation Pond G. All calculations for Sedimentation Pond G can be found in the calculation entitled **"OAC 3745-30-05 (C)(6)(l) – Sediment Pond G Design Calculations"**. The calculations for all surface water control structures satisfy the following regulations for residual waste landfills:

OAC 3745-30-07(C)(4)(a)-(c)

(a) Any permanent surface water control structures shall be designed to accommodate, by non-mechanical means, the peak flow from the twenty-five-year/twenty-four-hour storm event.

(b) Any temporary surface water control structures shall be designed to accommodate the peak flow from the twenty-five-year/twenty-four-hour storm event.

(c) Surface water control structures shall be designed to minimize silting and scouring.

The design is based upon accepted engineering design equations, methodologies and assumptions. Where applicable, design references have been made. Calculations have been performed using the software package, HydroCAD Version 9.10, Copyright 2009.

METHOD:

Peak flows have been estimated with SCS TR-55 by calculating the time of concentration (Tc) of each channel reach, the composite runoff curve number describing the reach's watershed and the total area of the reach's watershed. A computer software package entitled "HydroCAD" Version 9.10, Copyright 2009, was utilized to perform the SCS TR-55 calculations.

Per the TR-55 methods, times of concentration will be estimated as the sum of sheet flow, shallow concentrated flow and channel flow. Sheet flow calculations use an average surface consisting of short grass, utilizing a Manning's Number of 0.150. Typical maximum sheet flow lengths are 100 ft. Shallow concentrated flow times of concentration will be estimated depending on the condition of the flow path. Channel flow times of concentration will be

estimated as part of the channel cross section design, utilizing actual flow depth and velocity information.

This site is located in an area of hydrologic soil group C. Based on the existing and proposed site conditions the following runoff coefficients have been determined and will be utilized.

CN DATA	
Description	**CN**
Existing (Woods Grass Combination, Fair)	76
Landfill (50-75% Grass Cover, Fair)	79

As mentioned above, all channels have been designed utilizing the 25-year, 24-hour storm event. The rainfall values for this site were referenced from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14[(1)], and are listed below and accompany "OAC 3745-30-05 (C)(6)(k) Permanent Surface Water Control Structures A Design Calculations".

RAINFALL DATA		
Frequency	**Duration**	**Depth (in)**
10 yr	24 hr	4.16
25 yr	24 hr	4.97
100 yr	24 hr	6.37

Utilizing a series of diversion berms, downchutes, perimeter channels, and pipe culverts, all stormwater runoff from Drainage Area G is directed to Sedimentation Pond G. Diversion berms on the landfill cap, which are typically v-shaped channels, collect smaller drainage areas and direct the runoff to the trapezoidal downchutes. The perimeter channel collects all runoff around the toe of the landfill. The perimeter channel and downchute then convey all runoff from within the drainage area to the sedimentation pond via a pipe culvert. The locations of the channels, as well as drainage areas, are shown on the attached "Pond G Tributary Map" shown in Figure G.

CALCULATIONS:

With the peak discharge known for each channel, the channel cross section is sized and a channel lining material is selected (from the channel lining design options, included below).

Flow properties within the channels are estimates from the HydroCAD output and hydrographs utilizing Manning's Equation (EQ. 1):

$$V = \frac{Q}{A} = 1.49\frac{R^{2/3}\sqrt{S_f}}{n} = 1.49\frac{\left[\frac{A}{WP}\right]^{2/3}\sqrt{S_f}}{n}$$

Where:

V = Velocity, fps

Q = Flowrate, cfs

A = Cross – Sectional area of flow, sf

R = Hydraulic Radius, ft

WP = Wetted Perimeter, ft

S_f = Slope of channel, ft / ft

n = Manning's roughness coefficient

See Figure G for the drainage areas utilized and the longest Tc path for each drainage area. The tables below show the drainage watershed identification, length, inlet and outlet invert elevations, contributing area, and peak flow for each channel based on the 25-year/24-hour storm event:

Surface Water Diversion Berm:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Max. Velocity (fps)	Lining
		Inlet	Outlet						
DB-G1	G-1	947.6	932.4	212	0.072	0.33	1.8	5.1	Grass
DB-G2	G-2	935.6	932.9	144	0.019	0.25	1.3	2.9	Grass
DB-G3	G-3	927.6	907.4	295	0.069	0.57	3.0	5.7	Grass
DB-G4	G-4	912.6	907.4	218	0.024	0.41	2.2	3.6	Grass
DB-G5	G-5	889.3	882.4	352	0.020	1.05	5.6	4.2	Grass
DB-G6	G-6	889.4	882.4	291	0.024	0.58	3.1	3.9	Grass
DB-G7	G-7	863.4	857.4	306	0.020	0.75	4.0	3.8	Grass
DB-G8	G-8	865.6	857.4	366	0.022	0.76	4.0	4.0	Grass
DB-G9	G-9	837.5	832.4	260	0.020	0.65	3.5	3.7	Grass
DB-G10	G-10	841.3	832.4	444	0.020	0.95	5.0	4.1	Grass
DB-G11	G-11	811.6	807.4	214	0.020	0.54	2.9	3.6	Grass
DB-G12	G-12	817.8	807.4	519	0.020	1.10	5.9	4.2	Grass
DB-G13	G-13	785.7	782.4	167	0.020	0.44	2.3	3.4	Grass
DB-G14	G-14	792.5	782.4	502	0.020	1.21	6.5	4.3	Grass
DB-G15	G-15	759.8	757.4	121	0.019	0.33	1.8	3.1	Grass
DB-G16	G-16	765.5	757.4	431	0.019	1.07	5.7	4.1	Grass
DB-G17	G-17	733.9	732.4	75	0.019	0.22	1.2	2.8	Grass
DB-G18	G-18	739.1	732.4	356	0.019	0.90	4.8	4.0	Grass
DB-G19	G-19	708.0	707.4	29	0.018	0.19	0.6	2.3	Grass
DB-G20	G-20	713.1	707.4	281	0.020	0.73	3.9	3.9	Grass
DB-G24	G-24	841.3	828.2	537	0.024	1.21	6.4	4.7	Grass
DB-G25	G-25	817.8	814.3	145	0.025	.26	1.4	3.2	Grass

Downchute Channel:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Peak Velocity (fps)	Lining
		Inlet	Outlet						
DC-G1	G-1,G-2	932.4	907.4	100	0.250	0.57	3.0	3.5	Riprap
DC-G2	G-1,G-2,G-3,G-4	907.4	882.4	100	0.250	1.55	8.2	5.1	Riprap
DC-G3	G-1,G-2,G-3,G-4,G-5,G-6	882.4	857.4	100	0.250	3.19	16.6	6.7	Riprap
DC-G4	G-1,G-2,G-3,G-4,G-5,G-6,G-7,G-8	857.4	832.4	100	0.250	4.70	24.3	7.7	Riprap
DC-G5	G-1,G-2,G-3,G-4,G-5,G-6,G-7,G-8,G-9,G-10	832.4	807.4	100	0.2500	6.29	32.5	8.5	Riprap
DC-G6	G-1,G-2,G-3,G-4,G-5,G-6,G-7,G-8,G-9,G-10,G-11,G-12	807.4	782.4	100	0.250	7.93	40.8	9.3	Riprap
DC-G7	G-1,G-2,G-3,G-4,G-5,G-6,G-7,G-8,G-9,G-10,G-11,G-12,G-13,G-14	782.4	757.4	100	0.250	9.57	49.2	9.9	Riprap

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Peak Velocity (fps)	Lining
		Inlet	Outlet						
DC-G8	G-1,G-2,G-3,G-4,G-5,G-6,G-7,G-8,G-9,G-10,G-11,G-12,G-13,G-14,G-15,G-16	757.4	732.4	100	0.250	10.97	56.3	10.4	Riprap
DC-G9	G-1,G-2,G-3,G-4,G-5,G-6,G-7,G-8,G-9,G-10,G-11,G-12,G-13,G-14,G-15,G-16,G-17,G-18	732.4	707.4	100	0.250	12.01	62.0	10.7	Riprap
DC-G10	G-1,G-2,G-3,G-4,G-5,G-6,G-7,G-8,G-9,G-10,G-11,G-12,G-13,G-14,G-15,G-16,G-17,G-18,G-19,G-20	707.4	681.0	104.0	0.255	12.95	66.4	11.1	Riprap
DC-G12	G-24	828.2	822.1	20	0.308	1.21	6.1	6.5	Riprap
DC-G13	G-25	814.3	808.1	20	0.309	0.26	1.4	3.8	Riprap

Inboard Perimeter Channel:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Peak Velocity (fps)	Lining
		Inlet	Outlet						
IPC-G1	G-21	903.9	898.3	741.7	0.008	2.10	12.0	1.8	Riprap
IPC-G2	G-21,G-23	898.3	681.0	975.4	0.223	6.62	31.6	8.2	Riprap
IPC-G3	G-26	837.8	822.1	534.2	0.030	1.25	6.8	3.1	Riprap
IPC-G4	G-24, G-26,G-27	822.3	808.1	470.3	0.030	3.47	17.5	4.3	Riprap
IPC-G5	G-24, G-26,G-27, G-25, G-28	808.1	803.0	174.4	0.029	3.97	19.2	4.4	Riprap
IPC-G6	G-24, G-26,G-27, G-25, G-28, G-29	803.0	678.5	589.9	0.211	5.40	25.5	9.5	Riprap

Pipe Culvert:

Channel	Drainage Area ID	Invert Elevations Inlet	Invert Elevations Outlet	Length (ft)	Slope (ft/ft)	Drainage Area (acres)	Peak Flow (cfs)	Peak Velocity (fps)	Lining
DC-G11	G-1,G-2,G-3,G-4,G-5,G-6,G-7,G-8,G-9,G-10,G-11,G-12,G-13,G-14,G-15,G-16,G-17,G-18,G-19,G-20,G-21,G-22,G-23,G-24,G-25	675.0	665.0	71	0.170	20.37	100.5	7.1	N/A

For channel and berm details and schedule, see LINER AND SURFACE WATER CONTROL STRUCTURES DETAILS, Sheet 7A of the Permit to Install application drawing set.

The maximum peak flow in any of the channels will occur in Pipe Culvert DC-G12, which combines drainage areas G-1, G-2, G-3, G-4, G-5, G-6, G-7, G-8, G-9, G-10, G-11, G-12, G-13, G-14, G-15, G-16, G-17, G-18, G-19, G-20, G-21, G-22, G-23, G-24, and G-25. These areas encompass approximately 20.37 total acres and provide a peak flow of 100.5 cfs during the 25-year, 24-hour storm event. See the **OAC 3745-30-05 (C)(6)(l) – Sediment Pond G Design Calculations** for the HydroCAD output and hydrograph files of the design of all surface water control structures.

Grass or riprap was chosen, dependent upon the velocity for lining of the channels. Channel lining maximum allowable velocity values are provided in the following table:

CHANNEL LININGS		
Material	**n**	**Vmax (fps)**
Grass	0.037	5.0
Riprap[(i)]	0.049-0.065	11.5

(i)The Riprap (stone) size used in the analysis is R-5 riprap gradation aggregate or equivalent.

CONCLUSIONS:

All surface water control structures were designed based on the drainage area, flow rate, channel slope, and channel lining based on the peak flows resulting from the 25-year, 24-hour storm event. Utilizing a series of surface water diversion berms, downchutes, perimeter channels, and pipe culverts, all stormwater runoff from Drainage Area G will be directed to Sedimentation Pond G in order to control sediment-laden runoff as well as meet applicable regulations. All surface water channels will either be lined with grass or riprap depending on flow velocity. See Drawing 7A for the channel schedules and details. The Surface Water Channel Design HydroCAD output and hydrograph files are attached.

REFERENCES:

1. National Climatic Data Center, *Precipitation Frequency Estimates*, Point Precipitation Frequency Estimate From NOAA Atlas 14 Ohio 38.65 N 83.65 W 800 feet, Viewed 19 May 2009,< http://hdsc.nws.noaa.gov/hdsc/pfds/index.html>.

2. National Resources Conservation Service, PART 630 HYDROLOGY NATIONAL ENGINEERING HANDBOOK, July 2004.

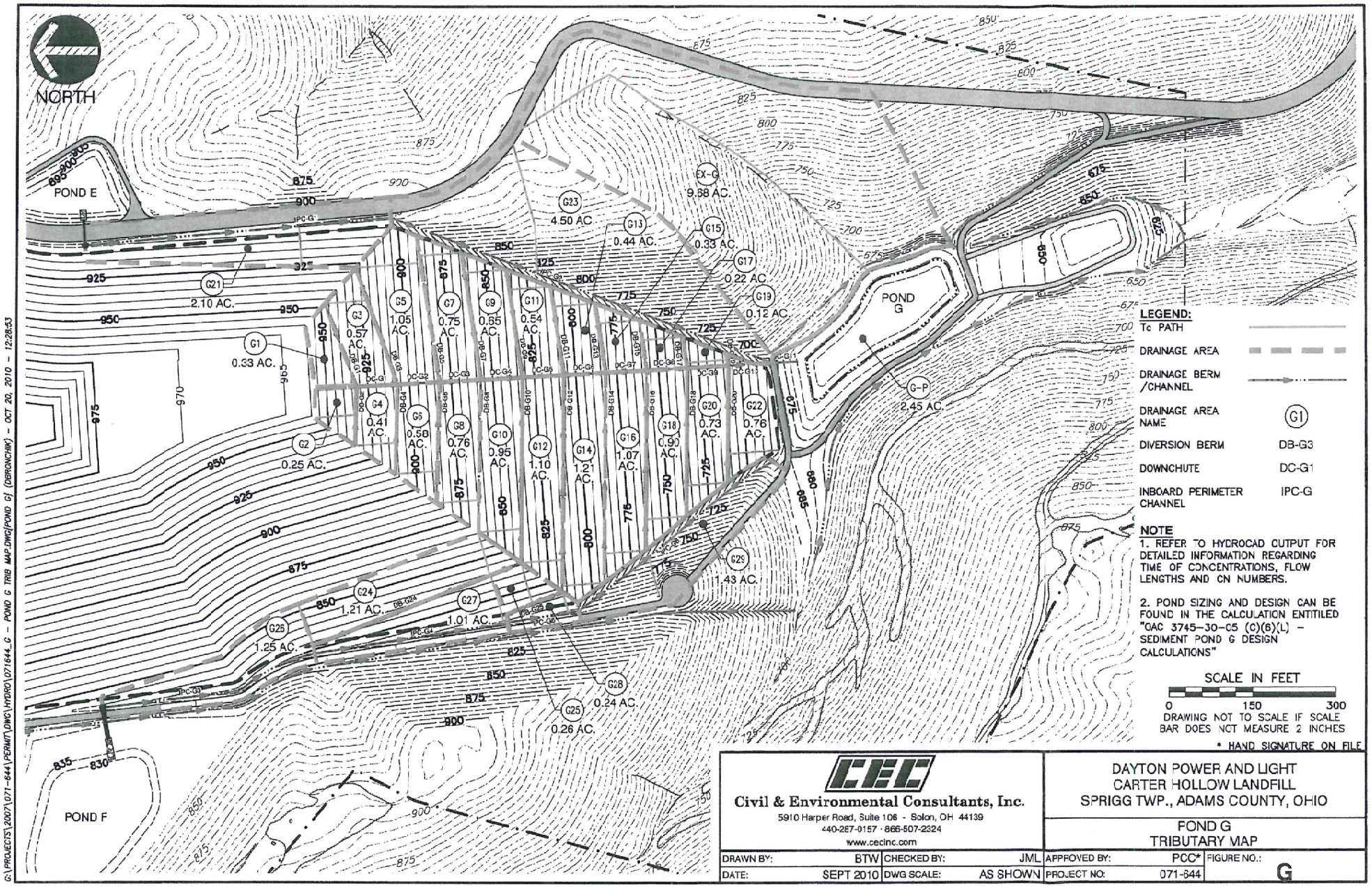
3. Ven Te Chow, OPEN CHANNEL HYDRAULICS, Mc-Graw Hill Book Company, 1959.

4. Goldman, Jackson and Bursztynsky, EROSION AND SEDIMENT CONTROL HANDBOOK, Mc-Graw Hill Book Company, 1986.

5. Soil Conservation Service, WATER MANAGEMENT AND SEDIMENT CONTROL FOR URBANIZING AREAS, distributed by Ohio Soil and Water Conservation Service.

6. HydroCAD Software Solutions LLC, HYDROCAD, Version 9.10, 2009, Computer Software Program.

FIGURE G
DRAINAGE AREA AND SURFACE WATER CONTROL STRUCTURES



LEGEND:

To PATH	
DRAINAGE AREA	
DRAINAGE BERM /CHANNEL	
DRAINAGE AREA NAME	(G1)
DIVERSION BERM	DB-G3
DOWNCHUTE	DC-G1
INBOARD PERIMETER CHANNEL	IPC-G

NOTE

1. REFER TO HYDROCAD OUTPUT FOR DETAILED INFORMATION REGARDING TIME OF CONCENTRATIONS, FLOW LENGTHS AND CN NUMBERS.

2. POND SIZING AND DESIGN CAN BE FOUND IN THE CALCULATION ENTITILED "OAC 3745-30-05 (C)(6)(L) - SEDIMENT POND G DESIGN CALCULATIONS"

SCALE IN FEET

0 150 300

DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

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SPRIGG TWP., ADAMS COUNTY, OHIO

FOND G
TRIBUTARY MAP

DRAWN BY:	BTW	CHECKED BY:	JML	APPROVED BY:	PCC*	FIGURE NO.:	G
DATE:	SEPT 2010	DWG SCALE:	AS SHOWN	PROJECT NO:	071-644		

G:\PROJECTS\2007\071-644\PERMIT\DWG\HYDRO\071644_G - POND G TRIB MAP.DWG[POND G] (DBRONCHIK) - OCT 20, 2010 - 12:28:53

OBJECTIVE:

To design the proposed surface water control structures for the ~~Alternative~~ Outboard Perimeter Channel which divert all stormwater runoff from the proposed Sedimentation Pond A, B, C, F, and G. All calculations for Sedimentation Pond A, B, C, F, and G can be found in the calculation entitled **"OAC 3745-30-05 (C)(6)(l) – Sedimentation Pond Design Calculations"**. The calculations for all surface water control structures satisfy the following regulations for residual waste landfills as follows:

OAC 3745-30-07(C)(4)(a)-(c)

(a) Any permanent surface water control structures shall be designed to accommodate, by non-mechanical means, the peak flow from the twenty-five-year/twenty-four-hour storm event.

(b) Any temporary surface water control structures shall be designed to accommodate the peak flow from the twenty-five-year/twenty-four-hour storm event.

(c) Surface water control structures shall be designed to minimize silting and scouring.

The design is based upon accepted engineering design equations, methodologies and assumptions. Where applicable, design references have been made. Calculations have been performed using the software package, HydroCAD Version 9.10, Copyright 2009.

METHOD:

Peak flows have been estimated with SCS TR-55 by calculating the time of concentration (Tc) of each channel reach, the composite runoff curve number describing the reach's watershed and the total area of the reach's watershed. Tc was not determined for watersheds with a pond, because each pond's outlet controls flow from the pond, and the outflow hydrograph for each pond is accounted for in the model. A computer software package entitled "HydroCAD" Version 9.10, Copyright 2009, was utilized to perform the SCS TR-55 calculations.

Per the TR-55 methods, times of concentration will be estimated as the sum of sheet flow, shallow concentrated flow and channel flow. Sheet flow calculations use an average surface consisting of short grass, utilizing a Manning's Number of 0.150. Typical maximum sheet flow

lengths are 100 ft. Shallow concentrated flow times of concentration will be estimated depending on the condition of the flow path. Channel flow times of concentration will be estimated as part of the channel cross section design, utilizing actual flow depth and velocity information.

This site is located in an area of hydrologic soil group C. Based on the existing and proposed site conditions the following runoff coefficients have been determined and will be utilized.

CN DATA	
Description	**CN**
Existing (Woods Grass Combination, Fair)	76
Landfill (50-75% Grass Cover, Fair)	79

As mentioned above, all channels have been designed utilizing the 25-year, 24-hour storm event. The rainfall values for this site were referenced from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14[(1)], and are listed below and accompanies the "Permanent Surface Water Control Structures A Design Calculation".

RAINFALL DATA		
Frequency	**Duration**	**Depth (in)**
10 yr	24 hr	4.16
25 yr	24 hr	4.97
100 yr	24 hr	6.37

Utilizing a series of diversion berms, downchutes, perimeter channels, pipe culverts, and basins all stormwater runoff from Drainage Area of Pond A, B, C, F, and G is directed to the Perimeter Channel. Diversion berms on the landfill cap, which are typically v-shaped channels, collect smaller drainage areas and direct the runoff to the trapezoidal downchutes. The perimeter channel collects all runoff around the toe of the landfill. The perimeter channel and downchute then convey all runoff from within the drainage area to the sedimentation pond via a pipe culvert. The locations of the channels, as well as drainage areas, are shown on the attached "Outboard Perimeter Channel Tributary Map" shown in Figure OPC.

CALCULATIONS:

With the peak discharge known for each channel, the channel cross section is sized and a channel lining material is selected (from the channel lining design options, included below). Flow properties within the channels are estimates from the HydroCAD output and hydrographs utilizing Manning's Equation (EQ. 1):

$$V = \frac{Q}{A} = 1.49\frac{R^{2/3}\sqrt{S_f}}{n} = 1.49\frac{\left[\frac{A}{WP}\right]^{2/3}\sqrt{S_f}}{n}$$

Where:

V = Velocity, fps

Q = Flowrate, cfs

A = Cross – Sectional area of flow, sf

R = Hydraulic Radius, ft

WP = Wetted Perimeter, ft

S_f = Slope of channel, ft / ft

n = Manning's roughness coefficient

See Figure OPC for the drainage areas utilized and the longest Tc path for each drainage area. The tables below show the drainage watershed identification, length, inlet and outlet invert elevations, contributing area (the channel carries the flow from its own drainage area, and all drainage areas above it), and peak flow for each channel based on the 25-year/24-hour storm event:

Outboard Perimeter Channel:

Channel	Drainage Area ID	Invert Elevations		Length (ft)	Slope (ft/ft)	Cumul. Drainage Area (acres)	Peak Flow (cfs)	Max. Velocity (fps)	Lining
		Inlet	Outlet						
OPC-1	7S, Pond A	905.0	879.7	862	0.029	12.10	8.2	3.4	Riprap
OPC-2	8S, Pond B	879.7	860.0	719	0.027	33.66	18.4	4.3	Riprap
OPC-3	6S, Pond C	860.0	830.8	982	0.030	76.87	49.7	5.6	Riprap
OPC-4	9S, Pond F	830.8	827.1	162	0.023	78.17	50.4	4.9	Riprap
OPC-5	10S, Pond F	827.1	799.1	1009	0.028	121.04	81.2	6.1	Riprap
OPC-6	5S	799.1	687.9	319	0.348	154.18	213.5	18.8	Riprap
OPC-7	13S	687.9	665.0	749	0.031	164.08	254.1	8.6	Riprap
OPC-8	11S, Pond G	665.0	~~615.0~~ 610.0	~~459~~ 663	~~0.109~~ 0.083	~~169.17~~ 171.53	~~269.2~~ 272.6	~~13.7~~ 12.48	Riprap

For channel details and schedule, see LINER AND SURFACE WATER CONTROL STRUCTURES DETAILS, Sheet 7A of the Permit to Install application drawing set.

The maximum peak flow in any of the channels will occur in OPC-8, which combines the drainage areas of Pond A, Pond B, Pond C, Pond F, Pond G and the existing drainage areas. These areas encompass approximately 187.75 total acres and provide a peak flow of 196.21 cfs during the 25-year, 24-hour storm event. See the **OAC 3745-30-05 (C)(6)(l) – Sediment Pond A, B, C, F, and G Design Calculations** for the HydroCAD output and hydrograph files of the design of all surface water control structures.

Grass or riprap was chosen, dependent upon the velocity for lining of the channels. Channel lining maximum allowable velocity values are provided in the following table:

CHANNEL LININGS		
Material	**n**	**Vmax (fps)**
Grass	0.037	5.0
Riprap[(i)]	0.049-0.065	11.5

(i)The Riprap (stone) size used in the analysis is R-5 riprap gradation aggregate or equivalent.

CONCLUSIONS:

All surface water control structures were designed based on the drainage area, flow rate, channel slope, and channel lining based on the peak flows resulting from the 25-year, 24-hour storm event. Utilizing a series of surface water diversion berms, downchutes, perimeter channels, pipe culverts, and ponds all stormwater runoff from Drainage Area of Pond A, B, C, F, and G will be directed to the Outboard Perimeter Channel in order to control runoff as well as meet applicable regulations. All surface water channels will either be lined with grass or riprap depending on flow velocity. See Drawing 7A for the channel schedules and details. The Surface Water Channel Design HydroCAD output and hydrograph files are attached.

REFERENCES:

1. National Climatic Data Center, *Precipitation Frequency Estimates*, Point Precipitation Frequency Estimate From NOAA Atlas 14 Ohio 38.65 N 83.65 W 800 feet, Viewed 19 May 2009,< http://hdsc.nws.noaa.gov/hdsc/pfds/index.html>.

2. National Resources Conservation Service, PART 630 HYDROLOGY NATIONAL ENGINEERING HANDBOOK, July 2004.

3. Ven Te Chow, OPEN CHANNEL HYDRAULICS, Mc-Graw Hill Book Company, 1959.

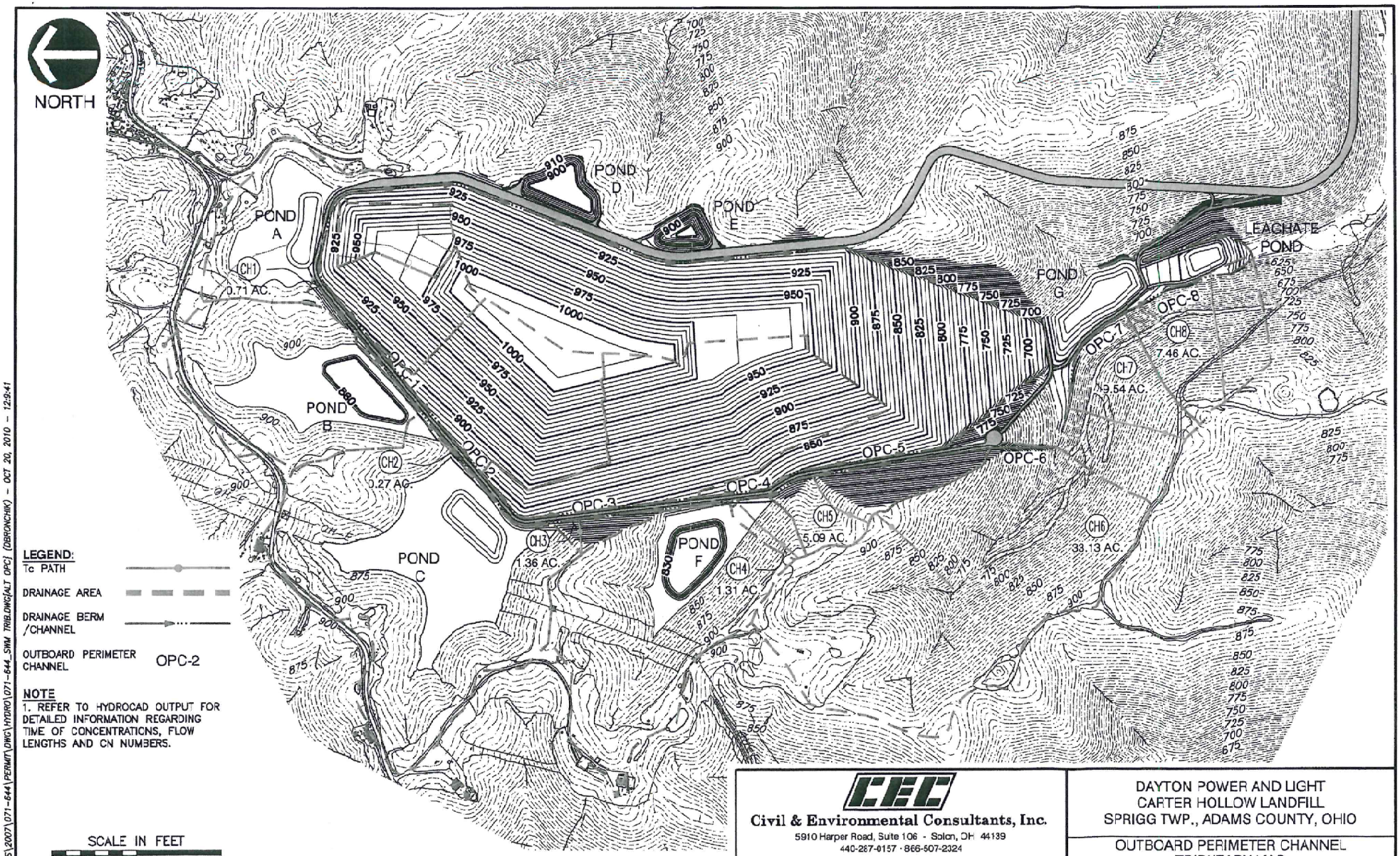
4. Goldman, Jackson and Bursztynsky, EROSION AND SEDIMENT CONTROL HANDBOOK, Mc-Graw Hill Book Company, 1986.

5. Soil Conservation Service, WATER MANAGEMENT AND SEDIMENT CONTROL FOR URBANIZING AREAS, distributed by Ohio Soil and Water Conservation Service.

6. HydroCAD Software Solutions LLC, HYDROCAD, Version 9.10, 2009, Computer Software Program.

SUBJECT	OAC 3745-30-05 (C)(6)(k) Permanent Surface Water Control Structures ~~Alternative~~ Outboard Perimeter Channel Design Calculations					PROJECT NO.	071-644		
PROJECT	Dayton Power and Light – Carter Hollow Landfill Sprigg Township, Adams County, Ohio					PAGE	7	OF	8
	MADE BY	~~IIJJML~~	DATE	~~03/04/10~~ 10/20/10	CHECKED BY	~~JMP~~ PCC	DATE	~~03/05/10~~ 10/20/10	

FIGURE OPC
DRAINAGE AREA AND SURFACE WATER CONTROL STRUCTURES



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SPRIGG TWP., ADAMS COUNTY, OHIO

OUTBOARD PERIMETER CHANNEL TRIBUTARY MAP

DRAWN BY:	DFB	CHECKED BY:	JVL	APPROVED BY:	PCC*	FIGURE NO.:	OPC
DATE:	OCTOBER 2010	DWG SCALE:	AS SHOWN	PROJECT NO:	071-644		

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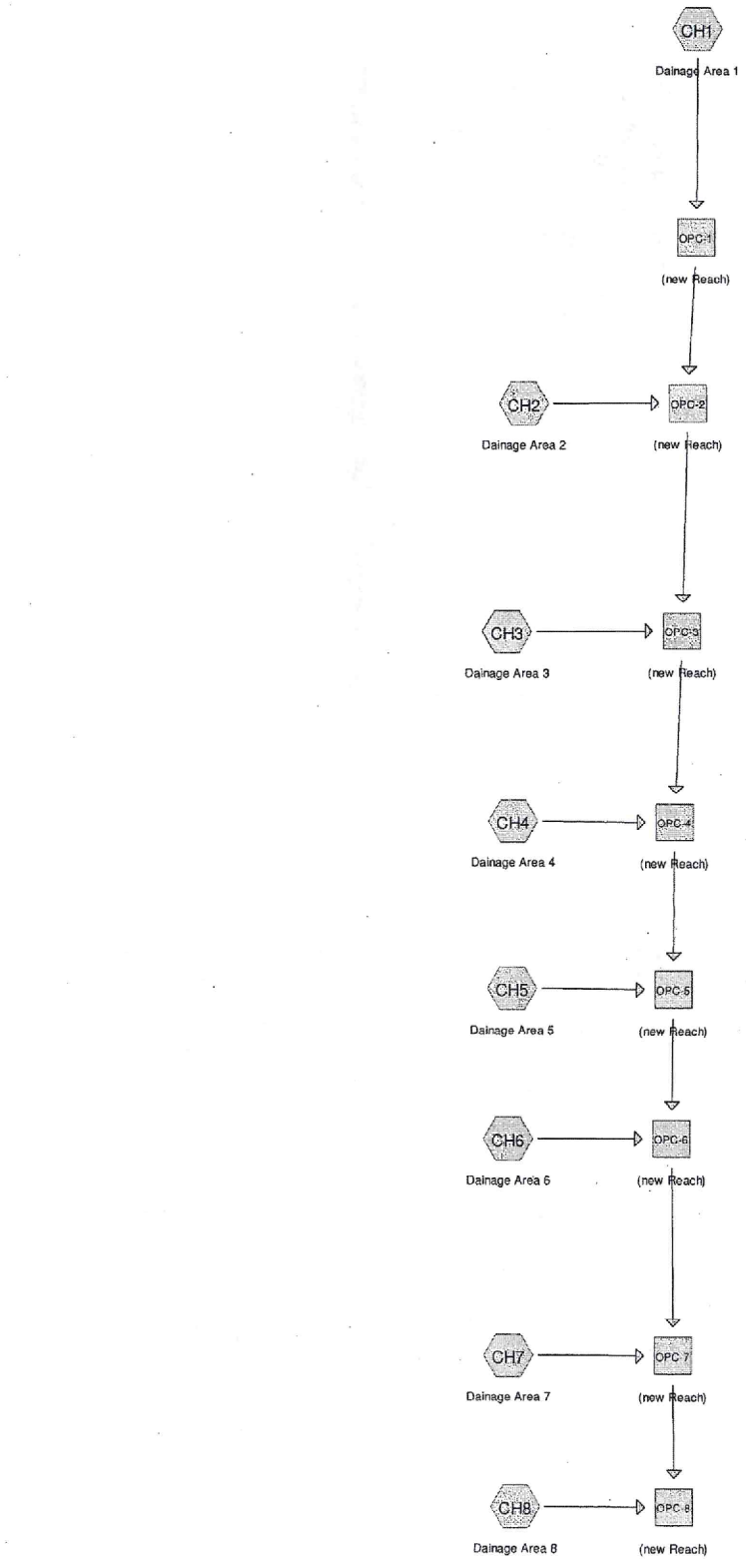
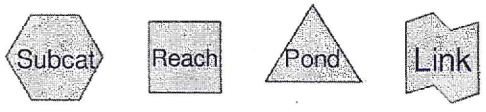
SURFACE WATER CHANNEL DESIGN HYDROCAD OUTPUT AND HYDROGRAPH FILES





Drainage Diagram for 071-644_SWM OPC

Prepared by Civil & Environmental Consultants, Inc., Printed 10/20/2010

HydroCAD® 9.10 s/n 05876 © 2009 HydroCAD Software Solutions LLC

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

Subcatchment CH1: Dainage Area 1 Runoff Area=0.701 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=100' Slope=0.1972 '/' Tc=4.1 min CN=79 Runoff=2.81 cfs 0.122 af

Subcatchment CH2: Dainage Area 2 Runoff Area=0.272 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=11' Slope=0.5000 '/' Tc=0.5 min CN=79 Runoff=1.23 cfs 0.047 af

Subcatchment CH3: Dainage Area 3 Runoff Area=1.355 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=159' Slope=0.3500 '/' Tc=3.5 min CN=79 Runoff=5.55 cfs 0.236 af

Subcatchment CH4: Dainage Area 4 Runoff Area=1.306 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=368' Tc=5.3 min CN=79 Runoff=5.01 cfs 0.228 af

Subcatchment CH5: Dainage Area 5 Runoff Area=5.093 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=359' Tc=5.6 min CN=79 Runoff=19.33 cfs 0.889 af

Subcatchment CH6: Dainage Area 6 Runoff Area=33.130 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=504' Tc=9.4 min CN=79 Runoff=109.32 cfs 5.782 af

Subcatchment CH7: Dainage Area 7 Runoff Area=9.540 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=574' Tc=6.0 min CN=79 Runoff=35.68 cfs 1.665 af

Subcatchment CH8: Dainage Area 8 Runoff Area=7.460 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=652' Tc=5.9 min CN=79 Runoff=27.99 cfs 1.302 af

Reach OPC-1: (new Reach) Avg. Flow Depth=0.40' Max Vel=3.05 fps Inflow=5.92 cfs 1.928 af
n=0.040 L=862.3' S=0.0293 '/' Capacity=117.22 cfs Outflow=5.89 cfs 1.927 af

Reach OPC-2: (new Reach) Avg. Flow Depth=0.62' Max Vel=3.77 fps Inflow=12.23 cfs 5.270 af
n=0.040 L=718.6' S=0.0274 '/' Capacity=113.29 cfs Outflow=12.22 cfs 5.268 af

Reach OPC-3: (new Reach) Avg. Flow Depth=0.77' Max Vel=4.64 fps Inflow=27.03 cfs 12.150 af
n=0.040 L=981.6' S=0.0298 '/' Capacity=155.65 cfs Outflow=27.00 cfs 12.147 af

Reach OPC-4: (new Reach) Avg. Flow Depth=0.72' Max Vel=4.03 fps Inflow=27.45 cfs 12.375 af
n=0.040 L=161.7' S=0.0229 '/' Capacity=170.10 cfs Outflow=27.45 cfs 12.374 af

Reach OPC-5: (new Reach) Avg. Flow Depth=0.82' Max Vel=4.89 fps Inflow=47.09 cfs 19.358 af
n=0.040 L=1,008.9' S=0.0278 '/' Capacity=224.97 cfs Outflow=47.01 cfs 19.352 af

Reach OPC-6: (new Reach) Avg. Flow Depth=0.78' Max Vel=16.75 fps Inflow=151.05 cfs 25.133 af
n=0.040 L=319.4' S=0.3481 '/' Capacity=796.28 cfs Outflow=150.88 cfs 25.132 af

Reach OPC-7: (new Reach) Avg. Flow Depth=1.71' Max Vel=7.74 fps Inflow=181.05 cfs 26.797 af
n=0.040 L=749.3' S=0.0305 '/' Capacity=502.93 cfs Outflow=177.52 cfs 26.792 af

Reach OPC-8: (new Reach) Avg. Flow Depth=1.37' Max Vel=11.30 fps Inflow=199.43 cfs 28.094 af
n=0.040 L=663.0' S=0.0830 '/' Capacity=828.78 cfs Outflow=198.03 cfs 28.092 af

Summary for Subcatchment CH1: Dainage Area 1

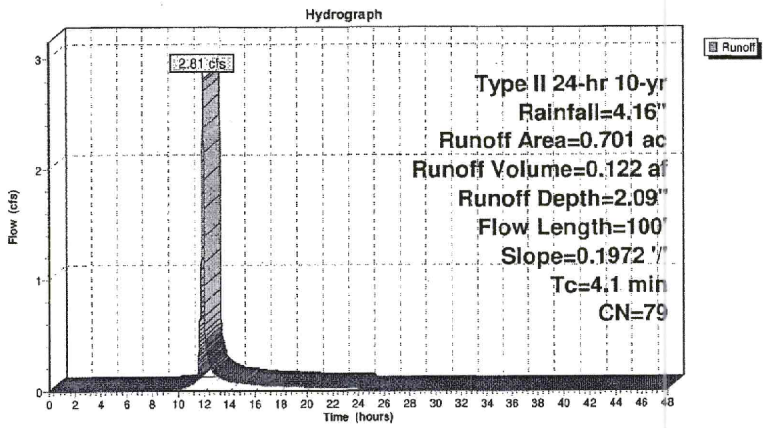
Runoff = 2.81 cfs @ 11.95 hrs, Volume= 0.122 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.701	79	50-75% Grass cover, Fair, HSG C
0.701		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	100	0.1972	0.41		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment CH1: Dainage Area 1



Summary for Subcatchment CH2: Dainage Area 2

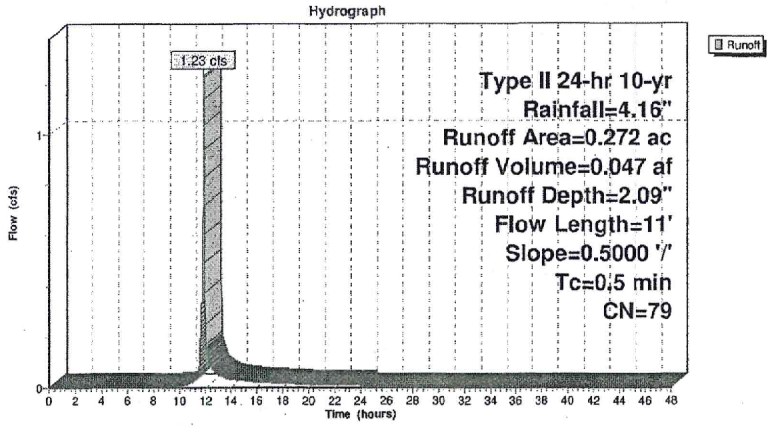
Runoff = 1.23 cfs @ 11.91 hrs, Volume= 0.047 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.272	79	50-75% Grass cover, Fair, HSG C
0.272		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	11	0.5000	0.38		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Subcatchment CH2: Dainage Area 2



Summary for Subcatchment CH3: Dainage Area 3

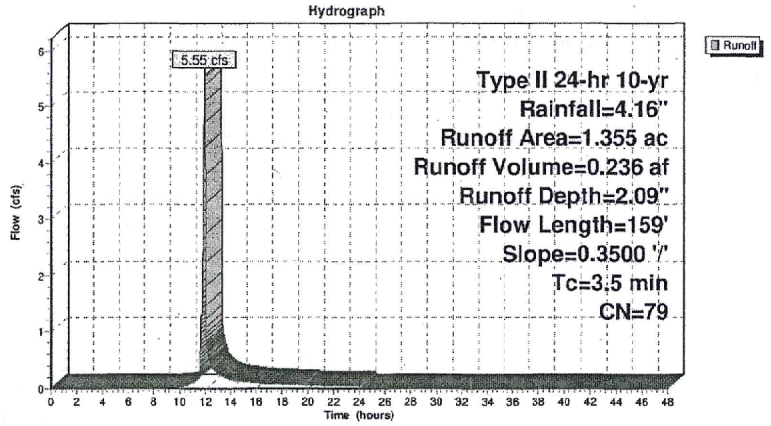
Runoff = 5.55 cfs @ 11.94 hrs, Volume= 0.236 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.355	79	50-75% Grass cover, Fair, HSG C
1.355		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	100	0.3500	0.51		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
0.2	59	0.3500	4.14		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.5	159	Total			

Subcatchment CH3: Dainage Area 3



Summary for Subcatchment CH4: Dainage Area 4

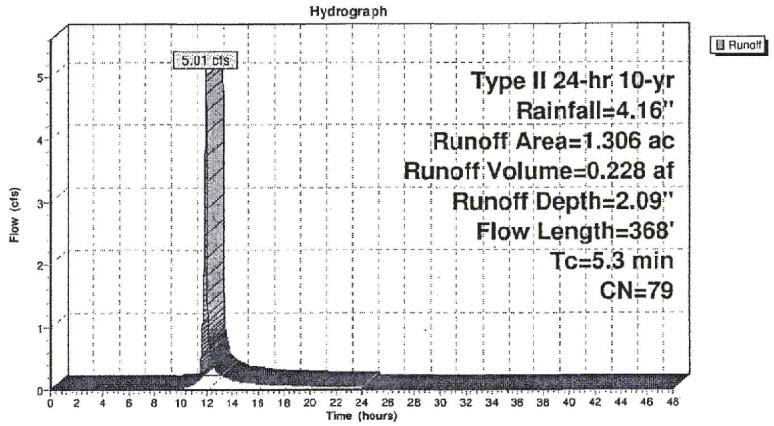
Runoff = 5.01 cfs @ 11.97 hrs, Volume= 0.228 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.306	79	50-75% Grass cover, Fair, HSG C
1.306		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.1840	0.39		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
1.1	268	0.3610	4.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.3	368	Total			

Subcatchment CH4: Dainage Area 4



Summary for Subcatchment CH5: Dainage Area 5

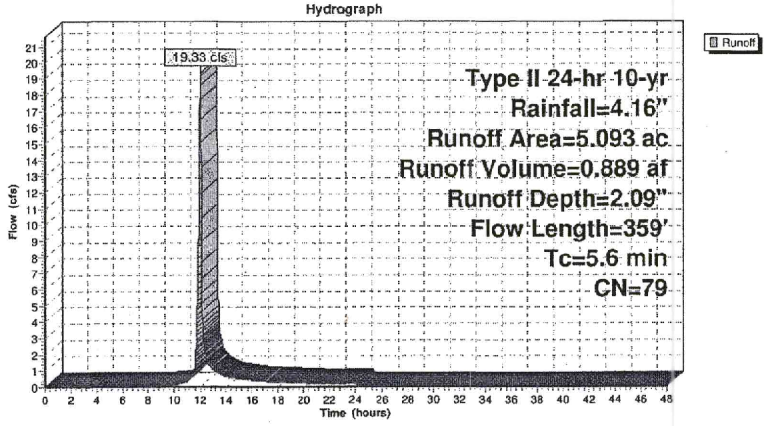
Runoff = 19.33 cfs @ 11.97 hrs, Volume= 0.889 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
5.093	79	50-75% Grass cover, Fair, HSG C
5.093		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	100	0.1590	0.37		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
1.1	259	0.3100	3.90		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.6	359	Total			

Subcatchment CH5: Dainage Area 5



Summary for Subcatchment CH6: Dainage Area 6

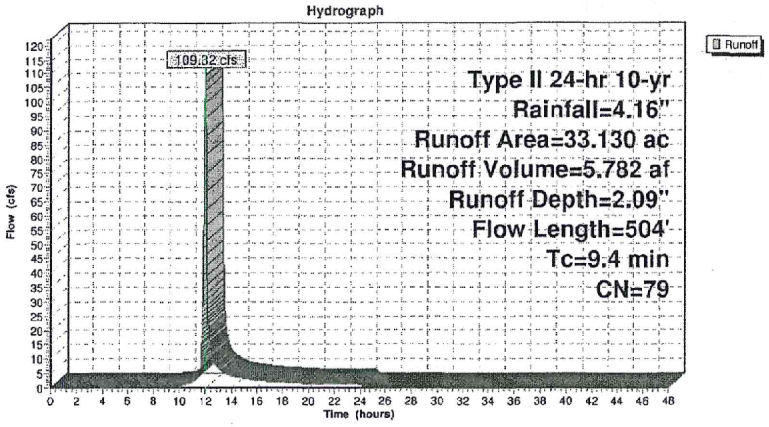
Runoff = 109.32 cfs @ 12.01 hrs, Volume= 5.782 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
33.130	79	50-75% Grass cover, Fair, HSG C
33.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0410	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
1.7	404	0.3280	4.01		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.4	504	Total			

Subcatchment CH6: Dainage Area 6



Summary for Subcatchment CH7: Dainage Area 7

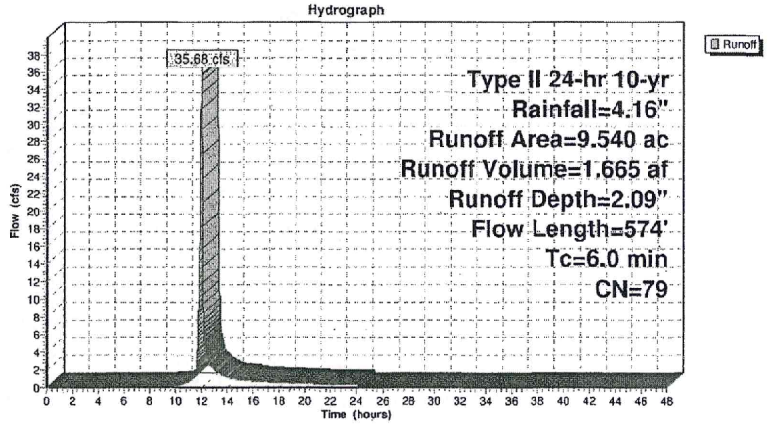
Runoff = 35.68 cfs @ 11.97 hrs, Volume= 1.665 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
9.540	79	50-75% Grass cover, Fair, HSG C
9.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.1850	0.39		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
1.8	474	0.4120	4.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.0	574	Total			

Subcatchment CH7: Dainage Area 7



Summary for Subcatchment CH8: Dainage Area 8

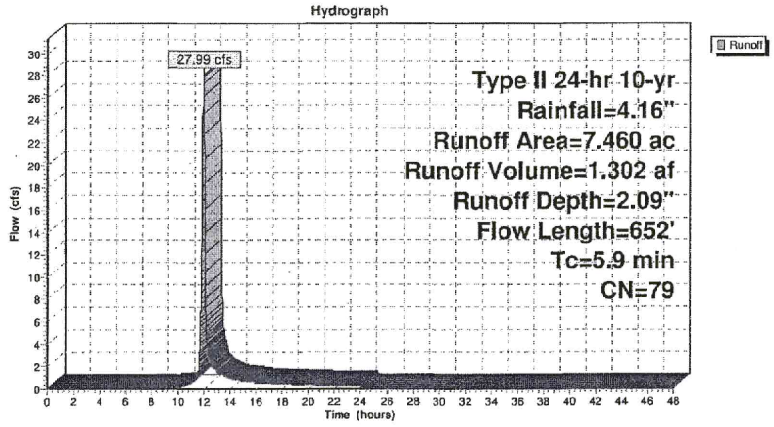
Runoff = 27.99 cfs @ 11.97 hrs, Volume= 1.302 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
7.460	79	50-75% Grass cover, Fair, HSG C
7.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	100	0.2300	0.43		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
2.0	552	0.4250	4.56		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.9	652	Total			

Subcatchment CH8: Dainage Area 8



Summary for Reach OPC-1: (new Reach)

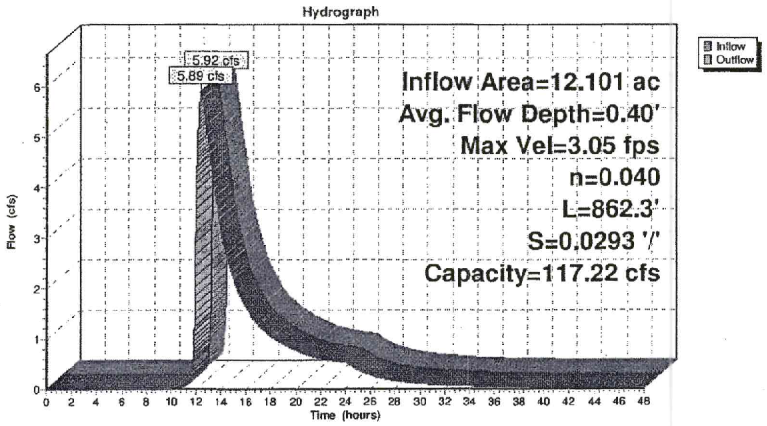
Inflow Area = 12.101 ac, 0.00% Impervious, Inflow Depth > 1.91" for 10-yr event
Inflow = 5.92 cfs @ 12.30 hrs, Volume= 1.928 af
Outflow = 5.89 cfs @ 12.37 hrs, Volume= 1.927 af, Atten= 1%, Lag= 4.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.05 fps, Min. Travel Time= 4.7 min
Avg. Velocity = 0.99 fps, Avg. Travel Time= 14.5 min

Peak Storage= 1,662 cf @ 12.37 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 117.22 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 862.3' Slope= 0.0293 '/'
Inlet Invert= 904.96', Outlet Invert= 879.68'

Reach OPC-1: (new Reach)



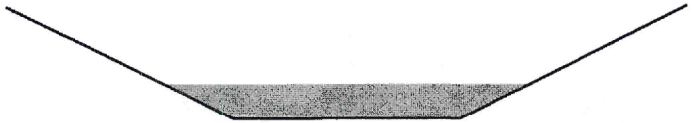
Summary for Reach OPC-2: (new Reach)

Inflow Area = 33.664 ac, 0.00% Impervious, Inflow Depth > 1.88" for 10-yr event
Inflow = 12.23 cfs @ 12.43 hrs, Volume= 5.270 af
Outflow = 12.22 cfs @ 12.47 hrs, Volume= 5.268 af, Atten= 0%, Lag= 2.5 min

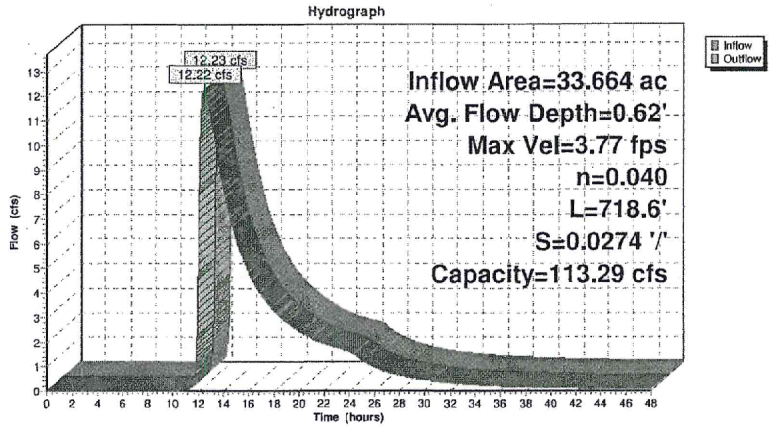
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.77 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 1.44 fps, Avg. Travel Time= 8.3 min

Peak Storage= 2,332 cf @ 12.47 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 113.29 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 718.6' Slope= 0.0274 '/'
Inlet Invert= 879.68', Outlet Invert= 860.00'



Reach OPC-2: (new Reach)



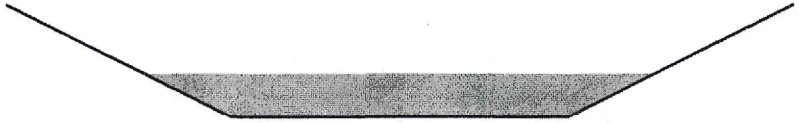
Summary for Reach OPC-3: (new Reach)

Inflow Area = 76.866 ac, 0.00% Impervious, Inflow Depth > 1.90" for 10-yr event
Inflow = 27.03 cfs @ 12.44 hrs, Volume= 12.150 af
Outflow = 27.00 cfs @ 12.49 hrs, Volume= 12.147 af, Atten= 0%, Lag= 2.7 min

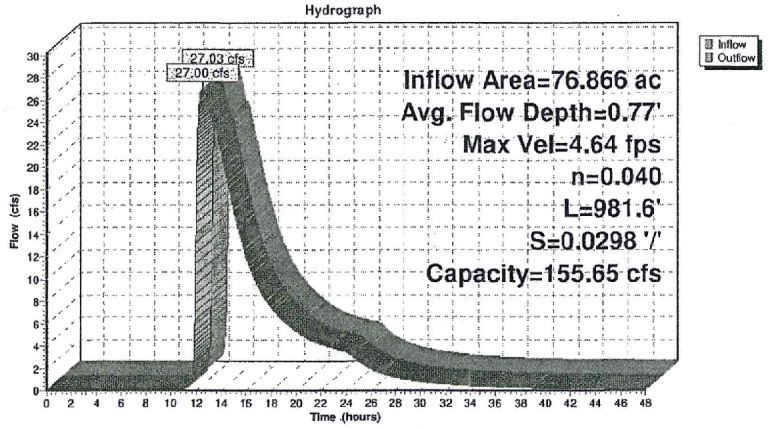
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.64 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 1.71 fps, Avg. Travel Time= 9.6 min

Peak Storage= 5,714 cf @ 12.49 hrs
Average Depth at Peak Storage= 0.77'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 155.65 cfs

6.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 981.6' Slope= 0.0298 '/'
Inlet Invert= 860.00', Outlet Invert= 830.79'



Reach OPC-3: (new Reach)



Summary for Reach OPC-4: (new Reach)

Inflow Area = 78.172 ac, 0.00% Impervious, Inflow Depth > 1.90" for 10-yr event
Inflow = 27.45 cfs @ 12.46 hrs, Volume= 12.375 af
Outflow = 27.45 cfs @ 12.47 hrs, Volume= 12.374 af, Atten= 0%, Lag= 0.5 min

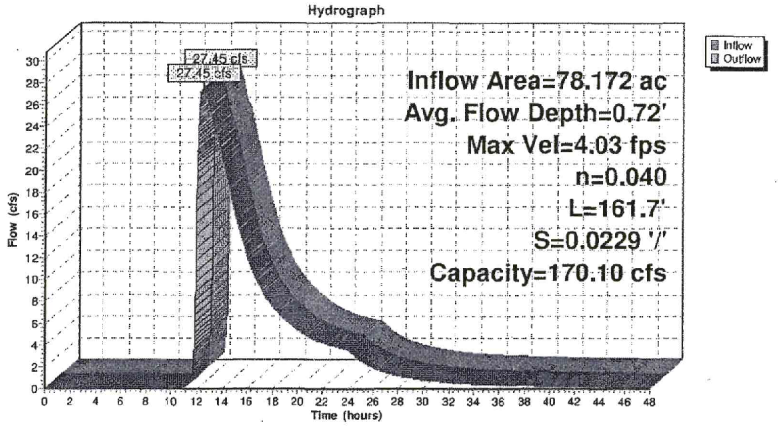
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.03 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.45 fps, Avg. Travel Time= 1.9 min

Peak Storage= 1,102 cf @ 12.47 hrs
Average Depth at Peak Storage= 0.72'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 170.10 cfs

8.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 161.7' Slope= 0.0229 '/'
Inlet Invert= 830.79', Outlet Invert= 827.09'

‡

Reach OPC-4: (new Reach)



Summary for Reach OPC-5: (new Reach)

Inflow Area = 121.045 ac, 0.00% Impervious, Inflow Depth > 1.92" for 10-yr event
Inflow = 47.09 cfs @ 12.37 hrs, Volume= 19.358 af
Outflow = 47.01 cfs @ 12.42 hrs, Volume= 19.352 af, Atten= 0%, Lag= 2.6 min

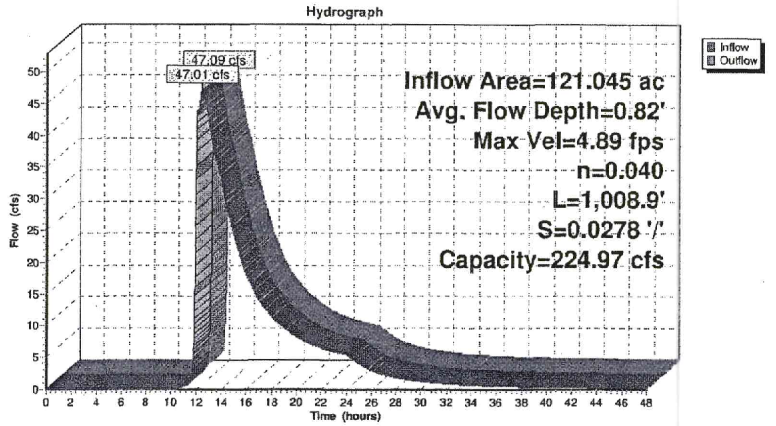
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.89 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 1.69 fps, Avg. Travel Time= 9.9 min

Peak Storage= 9,697 cf @ 12.42 hrs
Average Depth at Peak Storage= 0.82'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 224.97 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,008.9' Slope= 0.0278 '/'
Inlet Invert= 827.09', Outlet Invert= 799.06'

‡

Reach OPC-5: (new Reach)



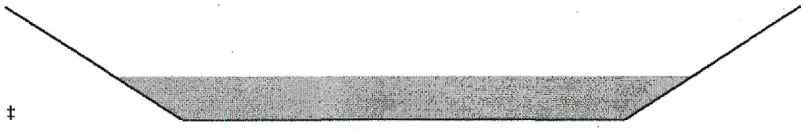
Summary for Reach OPC-6: (new Reach)

Inflow Area = 154.175 ac, 0.00% Impervious, Inflow Depth > 1.96" for 10-yr event
Inflow = 151.05 cfs @ 12.02 hrs, Volume= 25.133 af
Outflow = 150.88 cfs @ 12.02 hrs, Volume= 25.132 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 16.75 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 4.06 fps, Avg. Travel Time= 1.3 min

Peak Storage= 2,877 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.78'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 796.28 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 319.4' Slope= 0.3481 '/'
Inlet Invert= 799.06', Outlet Invert= 687.89'



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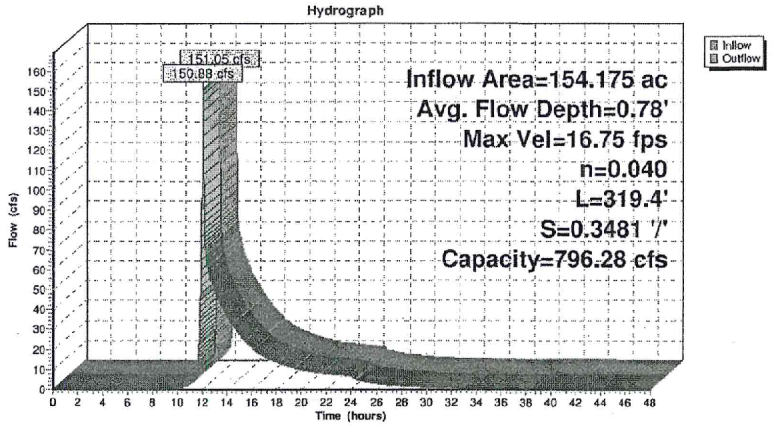
Reach OPC-6: (new Reach)



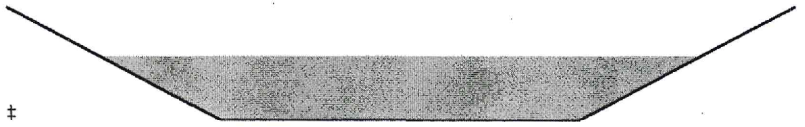
Summary for Reach OPC-7: (new Reach)

Inflow Area = 163.715 ac, 0.00% Impervious, Inflow Depth > 1.96" for 10-yr event
Inflow = 181.05 cfs @ 12.01 hrs, Volume= 26.797 af
Outflow = 177.52 cfs @ 12.03 hrs, Volume= 26.792 af, Atten= 2%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.74 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.91 fps, Avg. Travel Time= 6.5 min

Peak Storage= 17,195 cf @ 12.03 hrs
Average Depth at Peak Storage= 1.71'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 502.93 cfs

10.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 22.00'
Length= 749.3' Slope= 0.0305 '/'
Inlet Invert= 687.89', Outlet Invert= 665.00'



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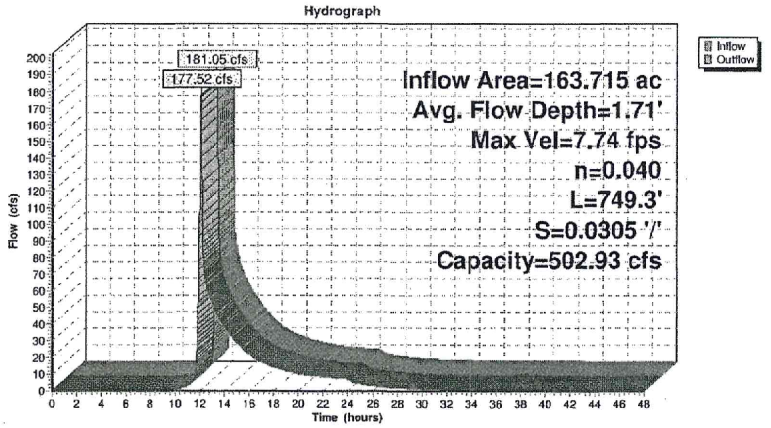
Reach OPC-7: (new Reach)



Summary for Reach OPC-8: (new Reach)

Inflow Area = 171.175 ac, 0.00% Impervious, Inflow Depth > 1.97" for 10-yr event
Inflow = 199.43 cfs @ 12.02 hrs, Volume= 28.094 af
Outflow = 198.03 cfs @ 12.03 hrs, Volume= 28.092 af, Atten= 1%, Lag= 0.7 min

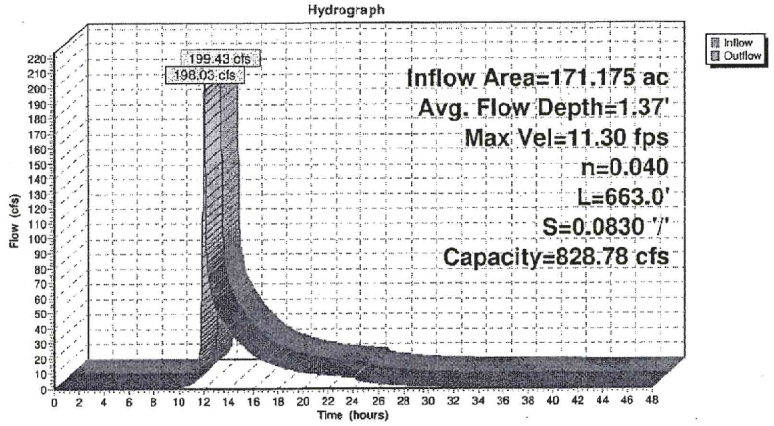
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.30 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 2.67 fps, Avg. Travel Time= 4.1 min

Peak Storage= 11,619 cf @ 12.03 hrs
Average Depth at Peak Storage= 1.37'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 828.78 cfs

10.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 22.00'
Length= 663.0' Slope= 0.0830 '/'
Inlet Invert= 665.00', Outlet Invert= 610.00'

‡

Reach OPC-8: (new Reach)



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

Subcatchment CH1: Dainage Area 1 Runoff Area=0.701 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=100' Slope=0.1972 '/' Tc=4.1 min CN=79 Runoff=3.69 cfs 0.162 af

Subcatchment CH2: Dainage Area 2 Runoff Area=0.272 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=11' Slope=0.5000 '/' Tc=0.5 min CN=79 Runoff=1.61 cfs 0.063 af

Subcatchment CH3: Dainage Area 3 Runoff Area=1.355 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=159' Slope=0.3500 '/' Tc=3.5 min CN=79 Runoff=7.29 cfs 0.313 af

Subcatchment CH4: Dainage Area 4 Runoff Area=1.306 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=368' Tc=5.3 min CN=79 Runoff=6.59 cfs 0.302 af

Subcatchment CH5: Dainage Area 5 Runoff Area=5.093 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=359' Tc=5.6 min CN=79 Runoff=25.42 cfs 1.178 af

Subcatchment CH6: Dainage Area 6 Runoff Area=33.130 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=504' Tc=9.4 min CN=79 Runoff=144.25 cfs 7.664 af

Subcatchment CH7: Dainage Area 7 Runoff Area=9.540 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=574' Tc=6.0 min CN=79 Runoff=46.94 cfs 2.207 af

Subcatchment CH8: Dainage Area 8 Runoff Area=7.460 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=652' Tc=5.9 min CN=79 Runoff=36.83 cfs 1.726 af

Reach OPC-1: (new Reach) Avg. Flow Depth=0.49' Max Vel=3.40 fps Inflow=8.22 cfs 2.593 af
n=0.040 L=862.3' S=0.0293 '/' Capacity=117.22 cfs Outflow=8.20 cfs 2.592 af

Reach OPC-2: (new Reach) Avg. Flow Depth=0.78' Max Vel=4.26 fps Inflow=18.41 cfs 7.116 af
n=0.040 L=718.6' S=0.0274 '/' Capacity=113.29 cfs Outflow=18.39 cfs 7.115 af

Reach OPC-3: (new Reach) Avg. Flow Depth=0.92' Max Vel=5.10 fps Inflow=36.58 cfs 16.370 af
n=0.040 L=981.6' S=0.0298 '/' Capacity=155.65 cfs Outflow=36.55 cfs 16.366 af

Reach OPC-4: (new Reach) Avg. Flow Depth=0.86' Max Vel=4.45 fps Inflow=37.18 cfs 16.668 af
n=0.040 L=161.7' S=0.0229 '/' Capacity=170.10 cfs Outflow=37.18 cfs 16.667 af

Reach OPC-5: (new Reach) Avg. Flow Depth=1.02' Max Vel=5.52 fps Inflow=70.23 cfs 26.033 af
n=0.040 L=1,008.9' S=0.0278 '/' Capacity=224.97 cfs Outflow=67.64 cfs 26.026 af

Reach OPC-6: (new Reach) Avg. Flow Depth=0.94' Max Vel=18.69 fps Inflow=209.21 cfs 33.690 af
n=0.040 L=319.4' S=0.3481 '/' Capacity=796.28 cfs Outflow=209.03 cfs 33.689 af

Reach OPC-7: (new Reach) Avg. Flow Depth=2.04' Max Vel=8.52 fps Inflow=248.96 cfs 35.896 af
n=0.040 L=749.3' S=0.0305 '/' Capacity=502.93 cfs Outflow=244.91 cfs 35.891 af

Reach OPC-8: (new Reach) Avg. Flow Depth=1.64' Max Vel=12.48 fps Inflow=274.23 cfs 37.616 af
n=0.040 L=663.0' S=0.0830 '/' Capacity=828.78 cfs Outflow=272.63 cfs 37.614 af

Summary for Subcatchment CH1: Dainage Area 1

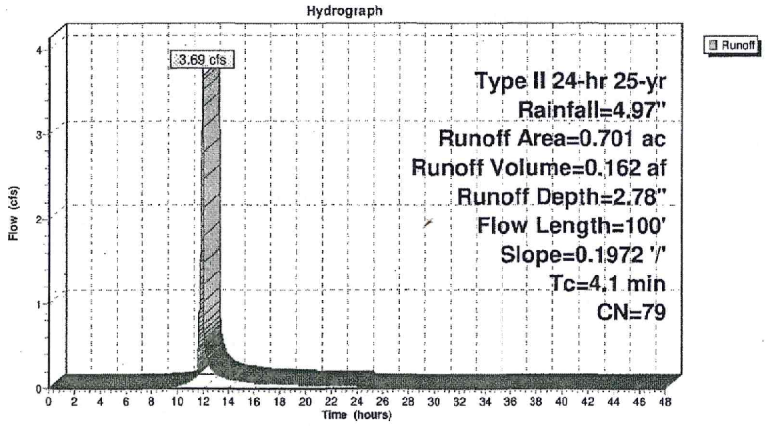
Runoff = 3.69 cfs @ 11.95 hrs, Volume= 0.162 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.701	79	50-75% Grass cover, Fair, HSG C
0.701		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	100	0.1972	0.41		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Subcatchment CH1: Dainage Area 1



Summary for Subcatchment CH2: Dainage Area 2

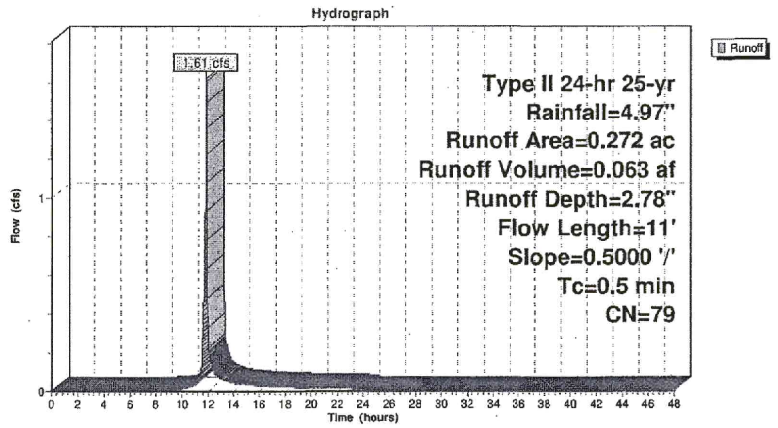
Runoff = 1.61 cfs @ 11.91 hrs, Volume= 0.063 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.272	79	50-75% Grass cover, Fair, HSG C
0.272		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	11	0.5000	0.38		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Subcatchment CH2: Dainage Area 2



Summary for Subcatchment CH3: Dainage Area 3

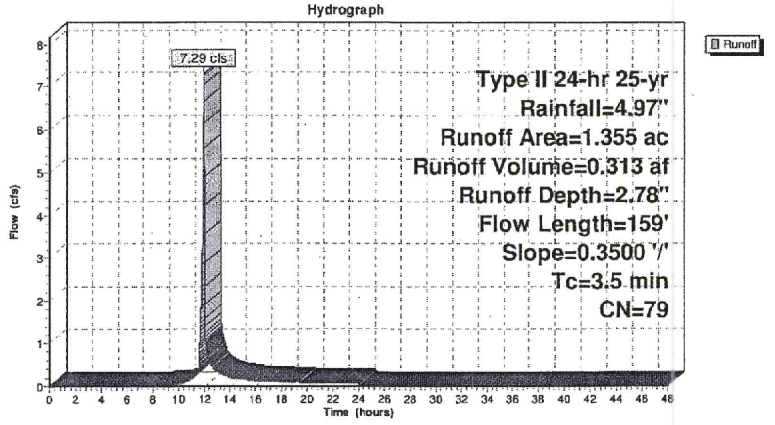
Runoff = 7.29 cfs @ 11.94 hrs, Volume= 0.313 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.355	79	50-75% Grass cover, Fair, HSG C
1.355		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	100	0.3500	0.51		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
0.2	59	0.3500	4.14		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.5	159	Total			

Subcatchment CH3: Dainage Area 3



Summary for Subcatchment CH4: Dainage Area 4

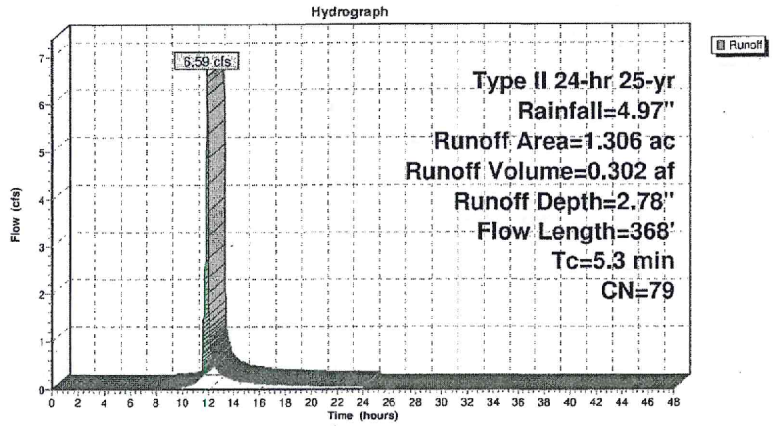
Runoff = 6.59 cfs @ 11.96 hrs, Volume= 0.302 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.306	79	50-75% Grass cover, Fair, HSG C
1.306		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.1840	0.39		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
1.1	263	0.3610	4.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.3	368	Total			

Subcatchment CH4: Dainage Area 4



Summary for Subcatchment CH5: Dainage Area 5

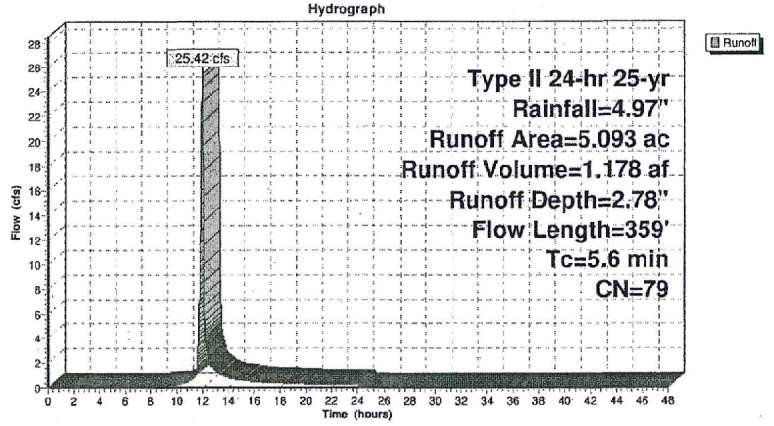
Runoff = 25.42 cfs @ 11.97 hrs, Volume= 1.178 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
5.093	79	50-75% Grass cover, Fair, HSG C
5.093		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	100	0.1590	0.37		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
1.1	259	0.3100	3.90		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.6	359	Total			

Subcatchment CH5: Dainage Area 5



Summary for Subcatchment CH6: Dainage Area 6

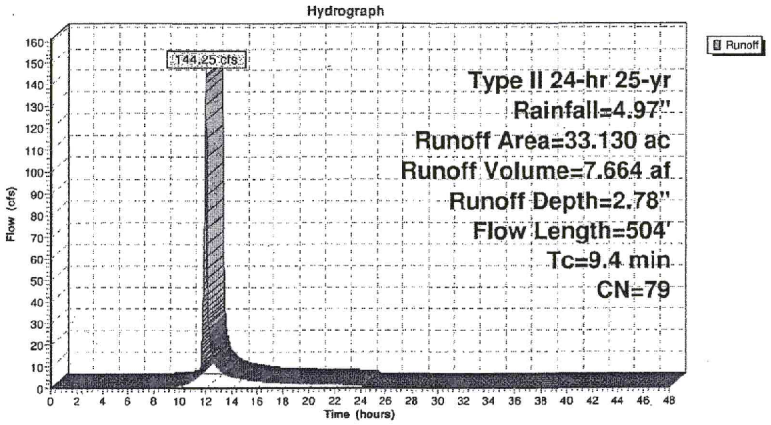
Runoff = 144.25 cfs @ 12.01 hrs, Volume= 7.664 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
33.130	79	50-75% Grass cover, Fair, HSG C
33.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0410	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
1.7	404	0.3280	4.01		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.4	504	Total			

Subcatchment CH6: Dainage Area 6



Summary for Subcatchment CH7: Dainage Area 7

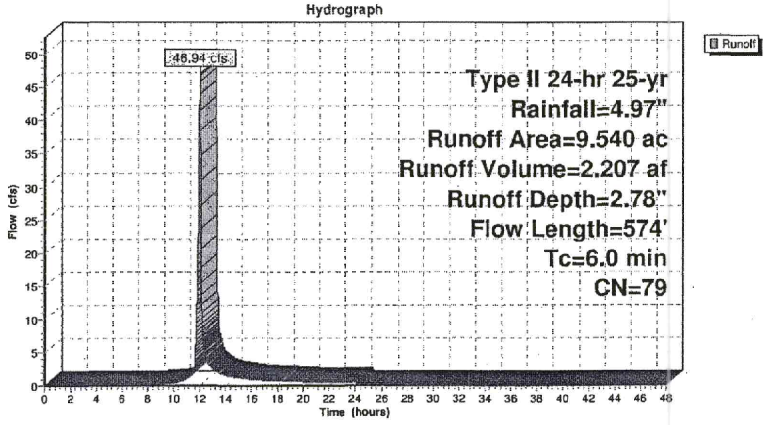
Runoff = 46.94 cfs @ 11.97 hrs, Volume= 2.207 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
9.540	79	50-75% Grass cover, Fair, HSG C
9.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.1850	0.39		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
1.8	474	0.4120	4.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.0	574	Total			

Subcatchment CH7: Dainage Area 7



Summary for Subcatchment CH8: Dainage Area 8

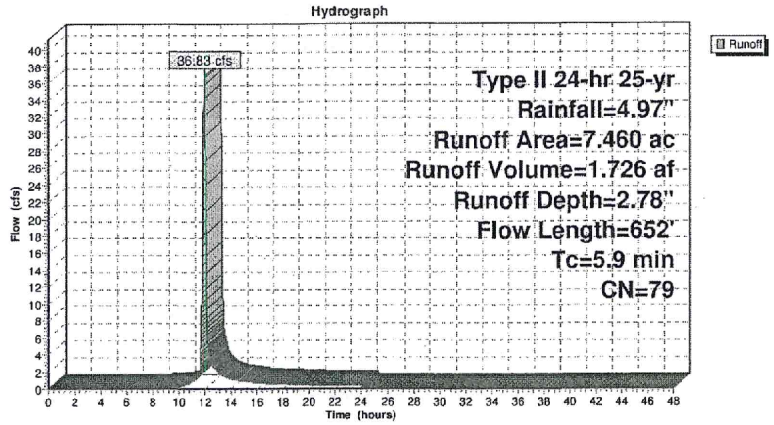
Runoff = 36.83 cfs @ 11.97 hrs, Volume= 1.726 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
7.460	79	50-75% Grass cover, Fair, HSG C
7.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	100	0.2300	0.43		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
2.0	552	0.4250	4.56		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.9	652	Total			

Subcatchment CH8: Dainage Area 8



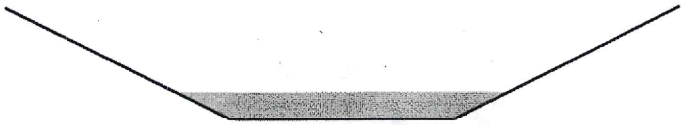
Summary for Reach OPC-1: (new Reach)

Inflow Area = 12.101 ac, 0.00% Impervious, Inflow Depth > 2.57" for 25-yr event
Inflow = 8.22 cfs @ 12.26 hrs, Volume= 2.593 af
Outflow = 8.20 cfs @ 12.32 hrs, Volume= 2.592 af, Atten= 0%, Lag= 3.6 min

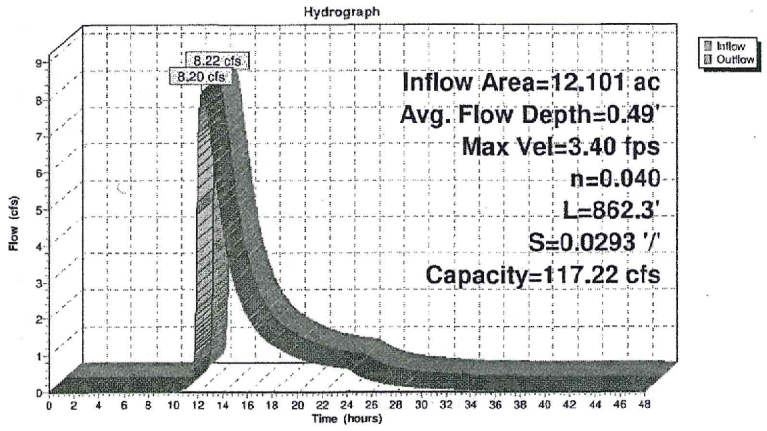
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.40 fps, Min. Travel Time= 4.2 min
Avg. Velocity = 1.06 fps, Avg. Travel Time= 13.6 min

Peak Storage= 2,079 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 117.22 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 862.3' Slope= 0.0293 '/'
Inlet Invert= 904.96', Outlet Invert= 879.68'



Reach OPC-1: (new Reach)



Summary for Reach OPC-2: (new Reach)

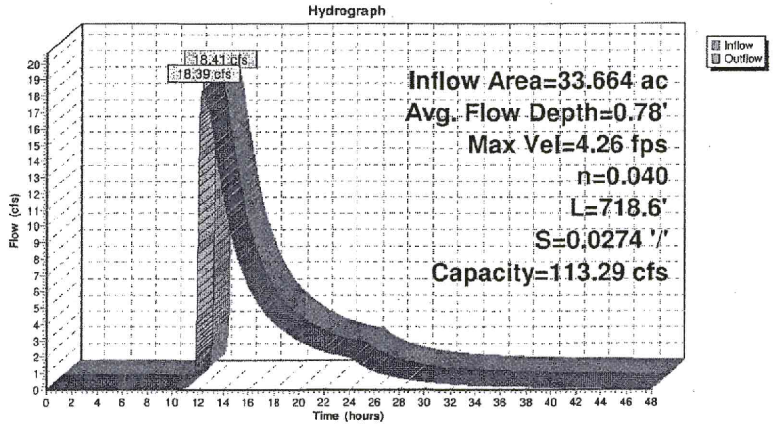
Inflow Area = 33.664 ac, 0.00% Impervious, Inflow Depth > 2.54" for 25-yr event
Inflow = 18.41 cfs @ 12.37 hrs, Volume= 7.116 af
Outflow = 18.39 cfs @ 12.41 hrs, Volume= 7.115 af, Atten= 0%, Lag= 2.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.26 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 7.8 min

Peak Storage= 3,101 cf @ 12.41 hrs
Average Depth at Peak Storage= 0.78'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 113.29 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 718.6' Slope= 0.0274 '/'
Inlet Invert= 879.68', Outlet Invert= 860.00'

Reach OPC-2: (new Reach)



Summary for Reach OPC-3: (new Reach)

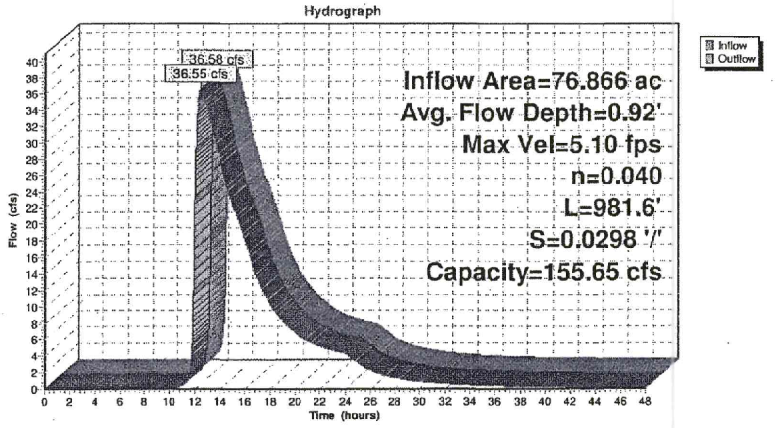
Inflow Area = 76.866 ac, 0.00% Impervious, Inflow Depth > 2.56" for 25-yr event
Inflow = 36.58 cfs @ 12.40 hrs, Volume= 16.370 af
Outflow = 36.55 cfs @ 12.44 hrs, Volume= 16.366 af, Atten= 0%, Lag= 2.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.10 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 1.83 fps, Avg. Travel Time= 9.0 min

Peak Storage= 7,034 cf @ 12.44 hrs
Average Depth at Peak Storage= 0.92'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 155.65 cfs

6.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 981.6' Slope= 0.0298 '/'
Inlet Invert= 860.00', Outlet Invert= 830.79'

Reach OPC-3: (new Reach)



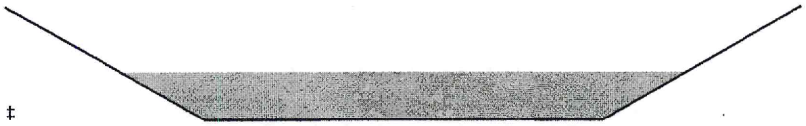
Summary for Reach OPC-4: (new Reach)

Inflow Area = 78.172 ac, 0.00% Impervious, Inflow Depth > 2.56" for 25-yr event
Inflow = 37.18 cfs @ 12.41 hrs, Volume= 16.668 af
Outflow = 37.18 cfs @ 12.42 hrs, Volume= 16.667 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.45 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 1.7 min

Peak Storage= 1,350 cf @ 12.42 hrs
Average Depth at Peak Storage= 0.86'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 170.10 cfs

8.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 161.7' Slope= 0.0229 '/'
Inlet Invert= 830.79', Outlet Invert= 827.09'



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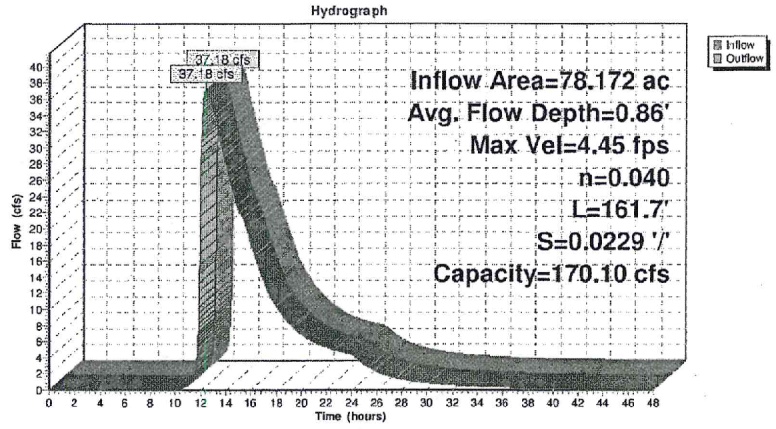
Reach OPC-4: (new Reach)



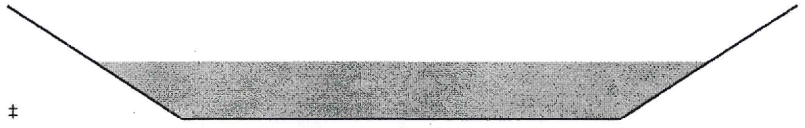
Summary for Reach OPC-5: (new Reach)

Inflow Area = 121.045 ac, 0.00% Impervious, Inflow Depth > 2.58" for 25-yr event
Inflow = 70.23 cfs @ 12.01 hrs, Volume= 26.033 af
Outflow = 67.64 cfs @ 12.34 hrs, Volume= 26.026 af, Atten= 4%, Lag= 20.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.52 fps, Min. Travel Time= 3.0 min
Avg. Velocity = 1.81 fps, Avg. Travel Time= 9.3 min

Peak Storage= 12,361 cf @ 12.34 hrs
Average Depth at Peak Storage= 1.02'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 224.97 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,008.9' Slope= 0.0278 '/'
Inlet Invert= 827.09', Outlet Invert= 799.06'



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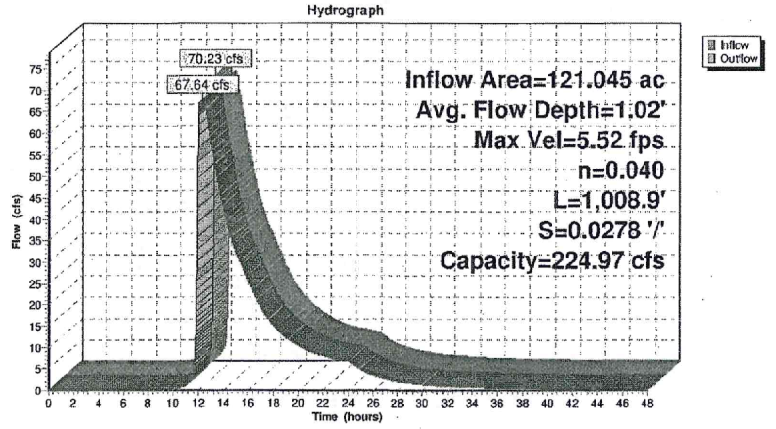
Reach OPC-5: (new Reach)



Summary for Reach OPC-6: (new Reach)

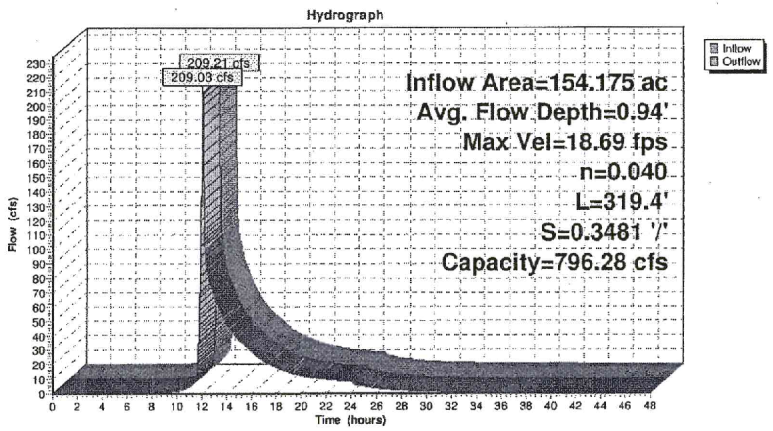
Inflow Area = 154.175 ac, 0.00% Impervious, Inflow Depth > 2.62" for 25-yr event
Inflow = 209.21 cfs @ 12.02 hrs, Volume= 33.690 af
Outflow = 209.03 cfs @ 12.02 hrs, Volume= 33.689 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 18.69 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 4.38 fps, Avg. Travel Time= 1.2 min

Peak Storage= 3,573 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.94'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 796.28 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 319.4' Slope= 0.3481 '/'
Inlet Invert= 799.06', Outlet Invert= 687.89'

Reach OPC-6: (new Reach)



Summary for Reach OPC-7: (new Reach)

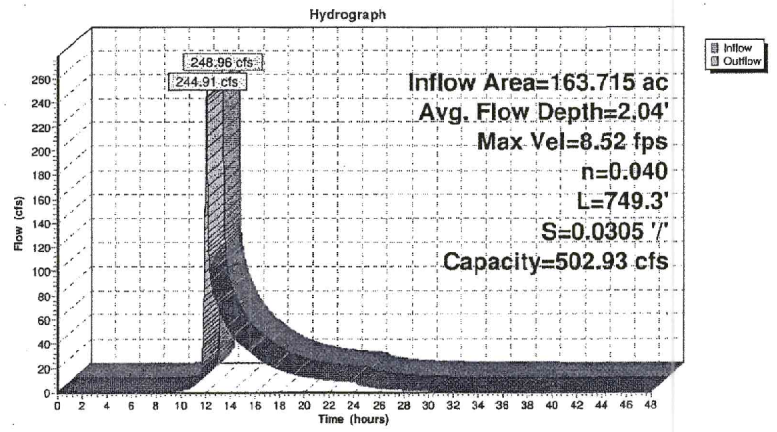
Inflow Area = 163.715 ac, 0.00% Impervious, Inflow Depth > 2.63" for 25-yr event
Inflow = 248.96 cfs @ 12.01 hrs, Volume= 35.896 af
Outflow = 244.91 cfs @ 12.03 hrs, Volume= 35.891 af, Atten= 2%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.52 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 2.06 fps, Avg. Travel Time= 6.1 min

Peak Storage= 21,541 cf @ 12.03 hrs
Average Depth at Peak Storage= 2.04'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 502.93 cfs

10.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 22.00'
Length= 749.3' Slope= 0.0305 '/'
Inlet Invert= 687.89', Outlet Invert= 665.00'

Reach OPC-7: (new Reach)



Summary for Reach OPC-8: (new Reach)

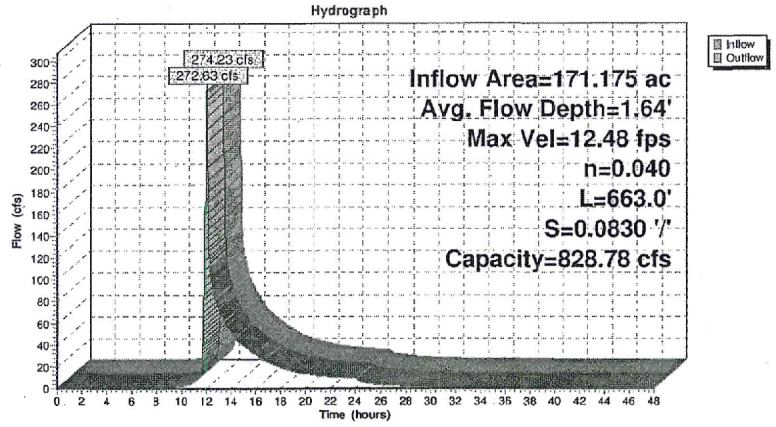
Inflow Area = 171.175 ac, 0.00% Impervious, Inflow Depth > 2.64" for 25-yr event
Inflow = 274.23 cfs @ 12.02 hrs, Volume= 37.616 af
Outflow = 272.63 cfs @ 12.03 hrs, Volume= 37.614 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 12.48 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.88 fps, Avg. Travel Time= 3.8 min

Peak Storage= 14,487 cf @ 12.03 hrs
Average Depth at Peak Storage= 1.64'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 828.78 cfs

10.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 22.00'
Length= 663.0' Slope= 0.0830 '/'
Inlet Invert= 665.00', Outlet Invert= 610.00'

Reach OPC-8: (new Reach)



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

Subcatchment CH1: Dainage Area 1 Runoff Area=0.701 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=100' Slope=0.1972 '/' Tc=4.1 min CN=79 Runoff=5.25 cfs 0.234 af

Subcatchment CH2: Dainage Area 2 Runoff Area=0.272 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=11' Slope=0.5000 '/' Tc=0.5 min CN=79 Runoff=2.29 cfs 0.091 af

Subcatchment CH3: Dainage Area 3 Runoff Area=1.355 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=159' Slope=0.3500 '/' Tc=3.5 min CN=79 Runoff=10.36 cfs 0.453 af

Subcatchment CH4: Dainage Area 4 Runoff Area=1.306 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=368' Tc=5.3 min CN=79 Runoff=9.38 cfs 0.437 af

Subcatchment CH5: Dainage Area 5 Runoff Area=5.093 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=359' Tc=5.6 min CN=79 Runoff=36.19 cfs 1.703 af

Subcatchment CH6: Dainage Area 6 Runoff Area=33.130 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=504' Tc=9.4 min CN=79 Runoff=206.17 cfs 11.076 af

Subcatchment CH7: Dainage Area 7 Runoff Area=9.540 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=574' Tc=6.0 min CN=79 Runoff=66.87 cfs 3.189 af

Subcatchment CH8: Dainage Area 8 Runoff Area=7.460 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=652' Tc=5.9 min CN=79 Runoff=52.45 cfs 2.494 af

Reach OPC-1: (new Reach) Avg. Flow Depth=0.75' Max Vel=4.34 fps Inflow=18.39 cfs 3.809 af
n=0.040 L=862.3' S=0.0293 '/' Capacity=117.22 cfs Outflow=18.04 cfs 3.808 af

Reach OPC-2: (new Reach) Avg. Flow Depth=1.23' Max Vel=5.45 fps Inflow=43.49 cfs 10.493 af
n=0.040 L=718.6' S=0.0274 '/' Capacity=113.29 cfs Outflow=43.25 cfs 10.491 af

Reach OPC-3: (new Reach) Avg. Flow Depth=1.78' Max Vel=7.31 fps Inflow=126.88 cfs 24.084 af
n=0.040 L=981.6' S=0.0298 '/' Capacity=155.65 cfs Outflow=124.44 cfs 24.080 af

Reach OPC-4: (new Reach) Avg. Flow Depth=1.83' Max Vel=6.76 fps Inflow=144.17 cfs 25.220 af
n=0.040 L=161.7' S=0.0229 '/' Capacity=170.10 cfs Outflow=144.12 cfs 25.219 af

Reach OPC-5: (new Reach) Avg. Flow Depth=1.82' Max Vel=7.63 fps Inflow=191.34 cfs 38.223 af
n=0.040 L=1,008.9' S=0.0278 '/' Capacity=224.97 cfs Outflow=189.10 cfs 38.216 af

Reach OPC-6: (new Reach) Avg. Flow Depth=1.19' Max Vel=21.35 fps Inflow=314.61 cfs 49.292 af
n=0.040 L=319.4' S=0.3481 '/' Capacity=796.28 cfs Outflow=314.41 cfs 49.291 af

Reach OPC-7: (new Reach) Avg. Flow Depth=2.54' Max Vel=9.58 fps Inflow=371.54 cfs 52.480 af
n=0.040 L=749.3' S=0.0305 '/' Capacity=502.93 cfs Outflow=367.02 cfs 52.475 af

Reach OPC-8: (new Reach) Avg. Flow Depth=2.05' Max Vel=14.08 fps Inflow=409.65 cfs 54.969 af
n=0.040 L=663.0' S=0.0830 '/' Capacity=828.78 cfs Outflow=407.84 cfs 54.966 af

Summary for Subcatchment CH1: Dainage Area 1

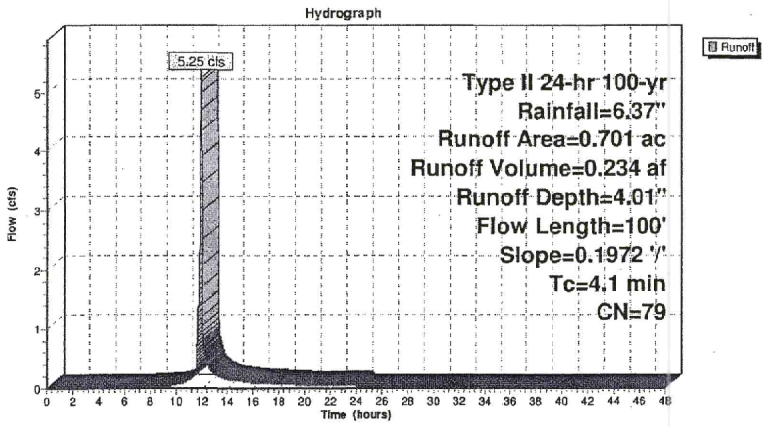
Runoff = 5.25 cfs @ 11.95 hrs, Volume= 0.234 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.701	79	50-75% Grass cover, Fair, HSG C
0.701		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	100	0.1972	0.41		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Subcatchment CH1: Dainage Area 1



Summary for Subcatchment CH2: Dainage Area 2

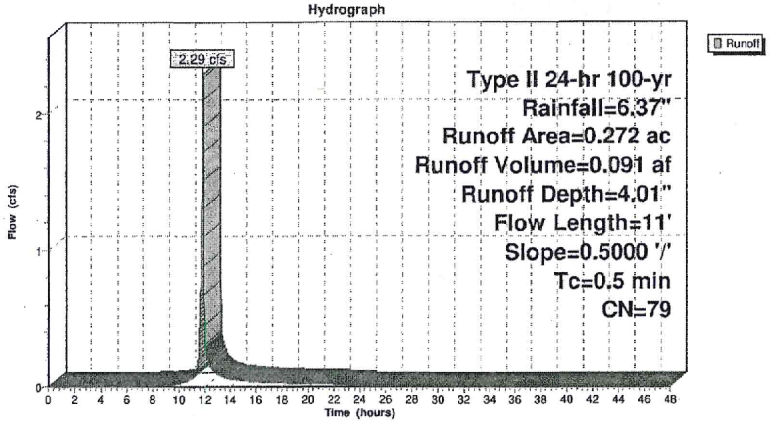
Runoff = 2.29 cfs @ 11.91 hrs, Volume= 0.091 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.272	79	50-75% Grass cover, Fair, HSG C
0.272		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	11	0.5000	0.38		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Subcatchment CH2: Dainage Area 2



Summary for Subcatchment CH3: Dainage Area 3

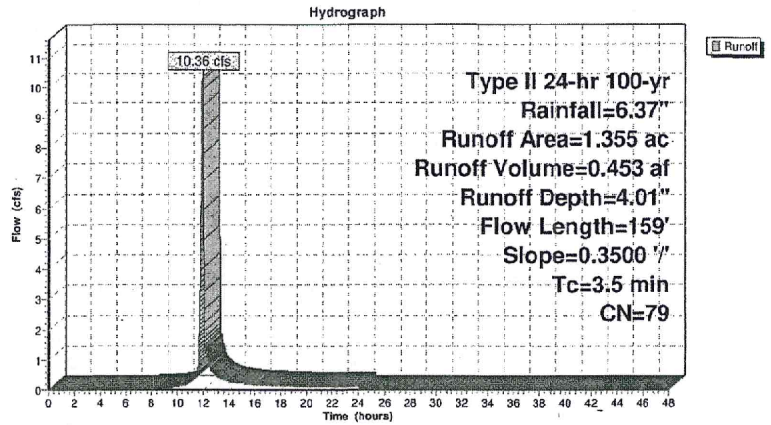
Runoff = 10.36 cfs @ 11.94 hrs, Volume= 0.453 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.355	79	50-75% Grass cover, Fair, HSG C
1.355		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	100	0.3500	0.51		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
0.2	59	0.3500	4.14		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.5	159	Total			

Subcatchment CH3: Dainage Area 3



Summary for Subcatchment CH4: Dainage Area 4

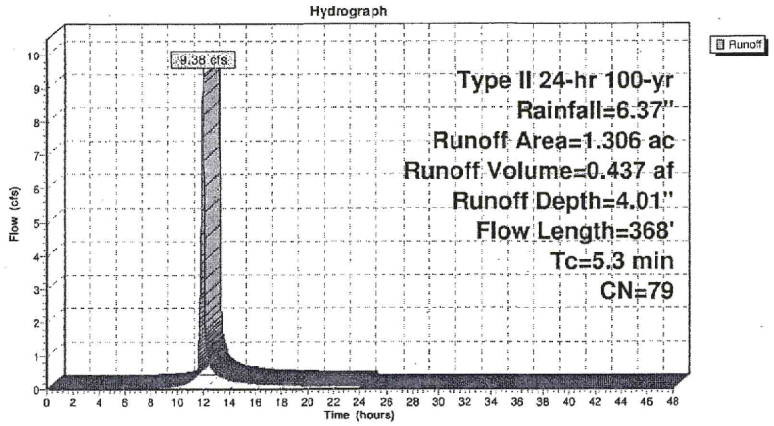
Runoff = 9.38 cfs @ 11.96 hrs, Volume= 0.437 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.306	79	50-75% Grass cover, Fair, HSG C
1.306		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.1840	0.39		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
1.1	268	0.3610	4.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.3	368	Total			

Subcatchment CH4: Dainage Area 4



Summary for Subcatchment CH5: Dainage Area 5

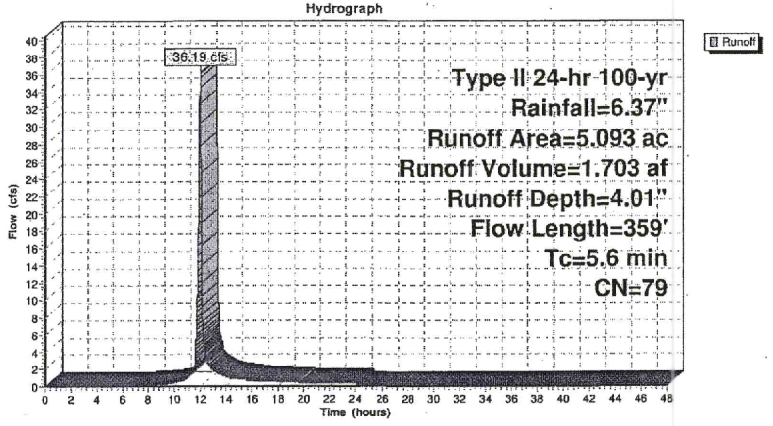
Runoff = 36.19 cfs @ 11.97 hrs, Volume= 1.703 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
5.093	79	50-75% Grass cover, Fair, HSG C
5.093		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	100	0.1590	0.37		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
1.1	259	0.3100	3.90		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.6	359	Total			

Subcatchment CH5: Dainage Area 5



Summary for Subcatchment CH6: Dainage Area 6

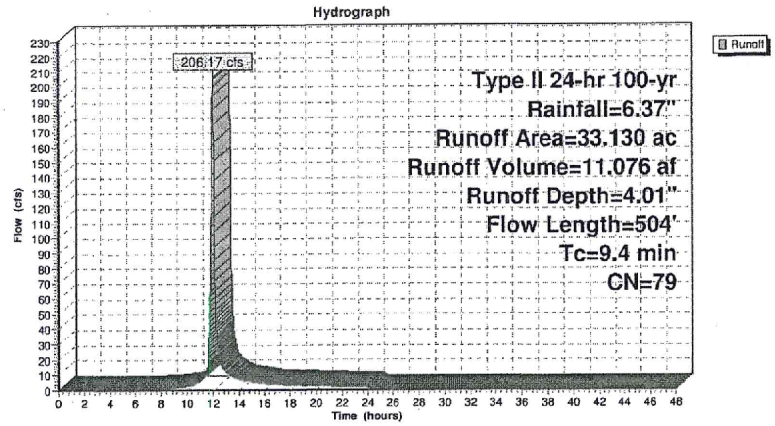
Runoff = 206.17 cfs @ 12.01 hrs, Volume= 11.076 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
33.130	79	50-75% Grass cover, Fair, HSG C
33.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0410	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
1.7	404	0.3280	4.01		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.4	504	Total			

Subcatchment CH6: Dainage Area 6



Summary for Subcatchment CH7: Dainage Area 7

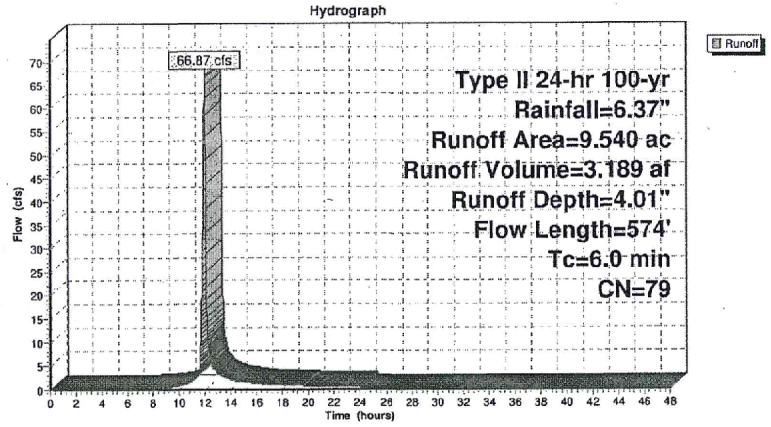
Runoff = 66.87 cfs @ 11.97 hrs, Volume= 3.189 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
9.540	79	50-75% Grass cover, Fair, HSG C
9.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	100	0.1850	0.39		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
1.8	474	0.4120	4.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.0	574	Total			

Subcatchment CH7: Dainage Area 7



Summary for Subcatchment CH8: Dainage Area 8

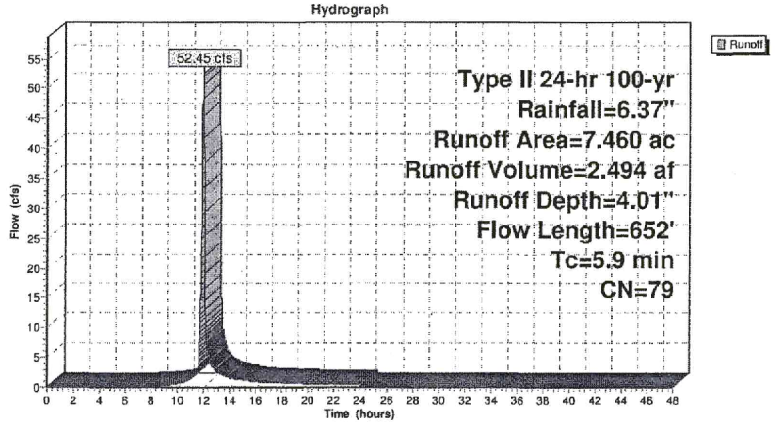
Runoff = 52.45 cfs @ 11.97 hrs, Volume= 2.494 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
7.460	79	50-75% Grass cover, Fair, HSG C
7.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	100	0.2300	0.43		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
2.0	552	0.4250	4.56		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.9	652	Total			

Subcatchment CH8: Dainage Area 8



Summary for Reach OPC-1: (new Reach)

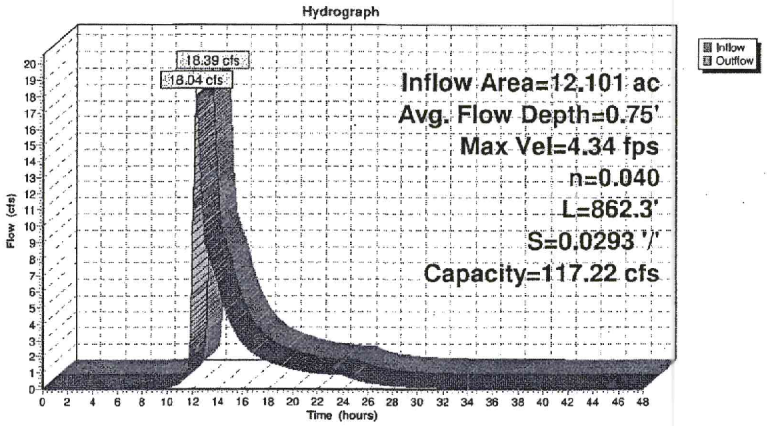
Inflow Area = 12.101 ac, 0.00% Impervious, Inflow Depth > 3.78" for 100-yr event
Inflow = 18.39 cfs @ 12.19 hrs, Volume= 3.809 af
Outflow = 18.04 cfs @ 12.24 hrs, Volume= 3.808 af, Atten= 2%, Lag= 2.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.34 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.15 fps, Avg. Travel Time= 12.5 min

Peak Storage= 3,585 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.75'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 117.22 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 862.3' Slope= 0.0293 '/'
Inlet Invert= 904.96', Outlet Invert= 879.68'

Reach OPC-1: (new Reach)



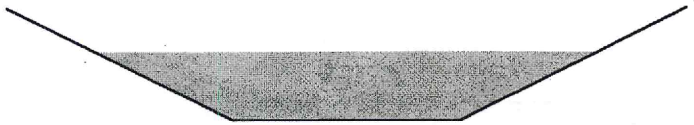
Summary for Reach OPC-2: (new Reach)

Inflow Area = 33.664 ac, 0.00% Impervious, Inflow Depth > 3.74" for 100-yr event
Inflow = 43.49 cfs @ 12.23 hrs, Volume= 10.493 af
Outflow = 43.25 cfs @ 12.26 hrs, Volume= 10.491 af, Atten= 1%, Lag= 1.9 min

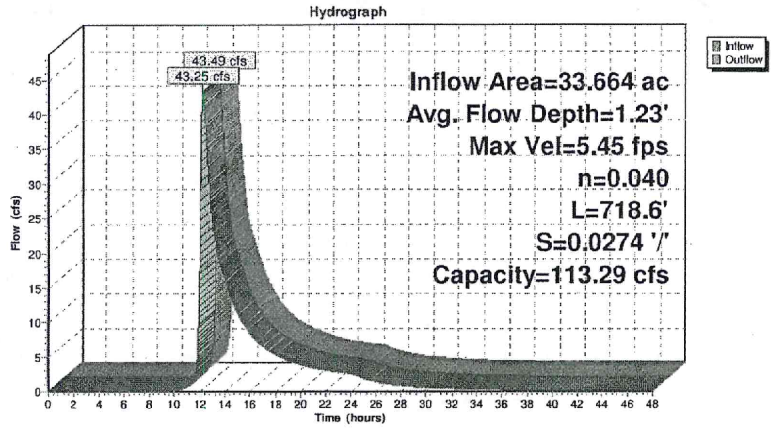
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.45 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.65 fps, Avg. Travel Time= 7.3 min

Peak Storage= 5,699 cf @ 12.26 hrs
Average Depth at Peak Storage= 1.23'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 113.29 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 718.6' Slope= 0.0274 '/'
Inlet Invert= 879.68', Outlet Invert= 860.00'



Reach OPC-2: (new Reach)



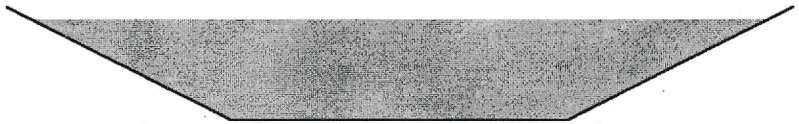
Summary for Reach OPC-3: (new Reach)

Inflow Area = 76.866 ac, 0.00% Impervious, Inflow Depth > 3.76" for 100-yr event
Inflow = 126.88 cfs @ 12.16 hrs, Volume= 24.084 af
Outflow = 124.44 cfs @ 12.19 hrs, Volume= 24.080 af, Atten= 2%, Lag= 2.1 min

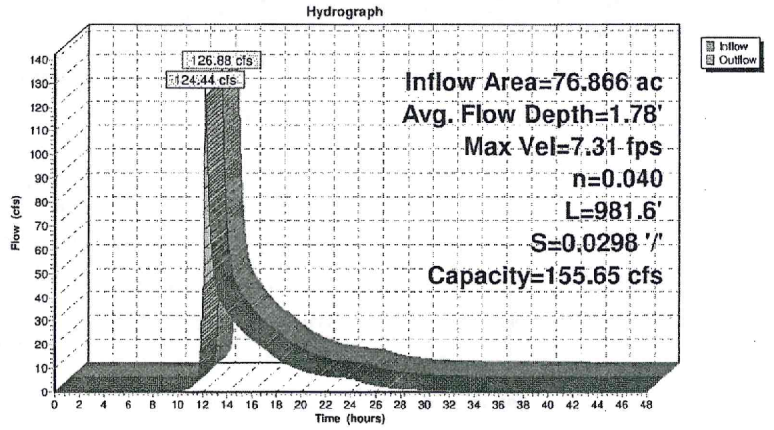
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.31 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.98 fps, Avg. Travel Time= 8.3 min

Peak Storage= 16,704 cf @ 12.19 hrs
Average Depth at Peak Storage= 1.78'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 155.65 cfs

6.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 981.6' Slope= 0.0298 '/'
Inlet Invert= 860.00', Outlet Invert= 830.79'



Reach OPC-3: (new Reach)



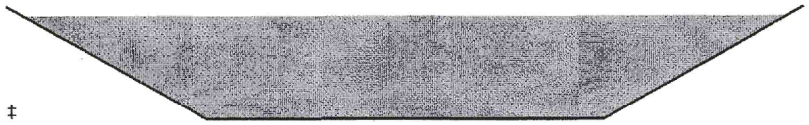
Summary for Reach OPC-4: (new Reach)

Inflow Area = 78.172 ac, 0.00% Impervious, Inflow Depth > 3.87" for 100-yr event
Inflow = 144.17 cfs @ 12.19 hrs, Volume= 25.220 af
Outflow = 144.12 cfs @ 12.19 hrs, Volume= 25.219 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.76 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.70 fps, Avg. Travel Time= 1.6 min

Peak Storage= 3,449 cf @ 12.19 hrs
Average Depth at Peak Storage= 1.83'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 170.10 cfs

8.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 161.7' Slope= 0.0229 '/'
Inlet Invert= 830.79', Outlet Invert= 827.09'



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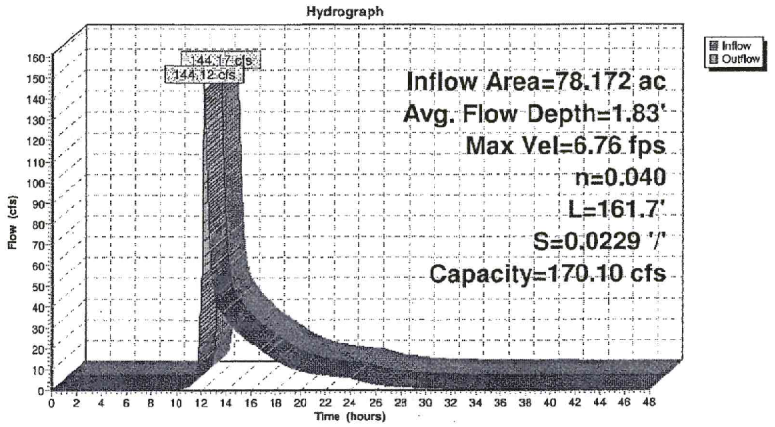
Reach OPC-4: (new Reach)



Summary for Reach OPC-5: (new Reach)

Inflow Area = 121.045 ac, 0.00% Impervious, Inflow Depth > 3.79" for 100-yr event
Inflow = 191.34 cfs @ 12.19 hrs, Volume= 38.223 af
Outflow = 189.10 cfs @ 12.22 hrs, Volume= 38.216 af, Atten= 1%, Lag= 1.9 min

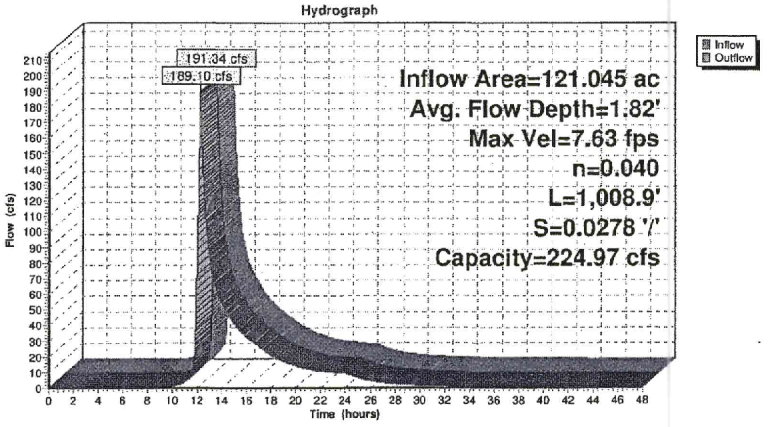
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.63 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.97 fps, Avg. Travel Time= 8.5 min

Peak Storage= 25,010 cf @ 12.22 hrs
Average Depth at Peak Storage= 1.82'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 224.97 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,008.9' Slope= 0.0278 '/'
Inlet Invert= 827.09', Outlet Invert= 799.06'

‡

Reach OPC-5: (new Reach)



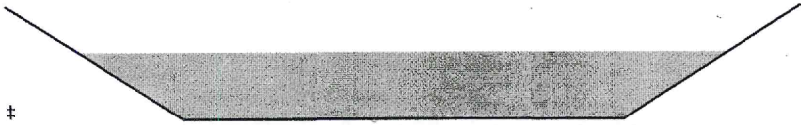
Summary for Reach OPC-6: (new Reach)

Inflow Area = 154.175 ac, 0.00% Impervious, Inflow Depth > 3.84" for 100-yr event
Inflow = 314.61 cfs @ 12.02 hrs, Volume= 49.292 af
Outflow = 314.41 cfs @ 12.02 hrs, Volume= 49.291 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 21.35 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 4.80 fps, Avg. Travel Time= 1.1 min

Peak Storage= 4,704 cf @ 12.02 hrs
Average Depth at Peak Storage= 1.19'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 796.28 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 319.4' Slope= 0.3481 '/'
Inlet Invert= 799.06', Outlet Invert= 687.89'



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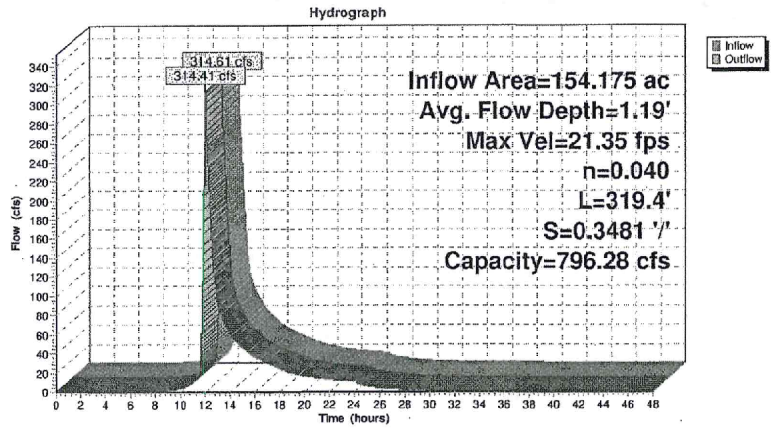
Reach OPC-6: (new Reach)



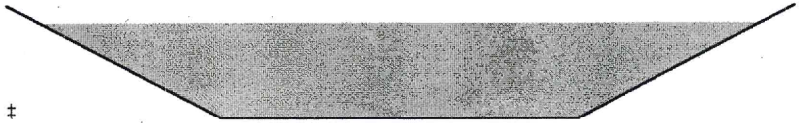
Summary for Reach OPC-7: (new Reach)

Inflow Area = 163.715 ac, 0.00% Impervious, Inflow Depth > 3.85" for 100-yr event
Inflow = 371.54 cfs @ 12.01 hrs, Volume= 52.480 af
Outflow = 367.02 cfs @ 12.02 hrs, Volume= 52.475 af, Atten= 1%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.58 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 2.25 fps, Avg. Travel Time= 5.5 min

Peak Storage= 28,695 cf @ 12.02 hrs
Average Depth at Peak Storage= 2.54'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 502.93 cfs

10.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 22.00'
Length= 749.3' Slope= 0.0305 '/'
Inlet Invert= 687.89', Outlet Invert= 665.00'



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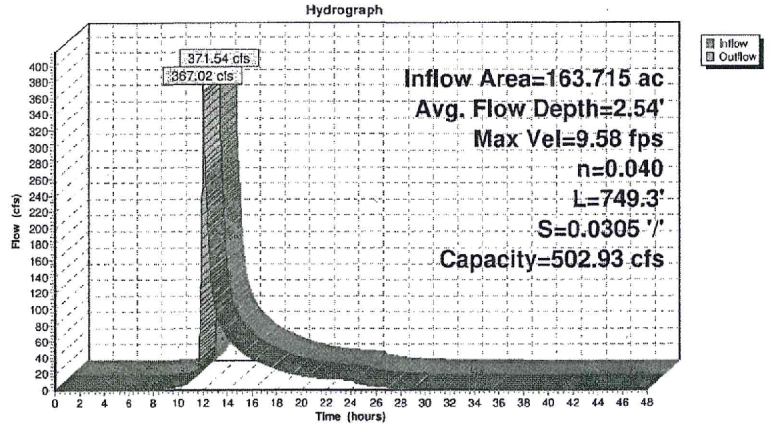
Reach OPC-7: (new Reach)



Summary for Reach OPC-8: (new Reach)

Inflow Area = 171.175 ac, 0.00% Impervious, Inflow Depth > 3.85" for 100-yr event
Inflow = 409.65 cfs @ 12.01 hrs, Volume= 54.969 af
Outflow = 407.84 cfs @ 12.02 hrs, Volume= 54.966 af, Atten= 0%, Lag= 0.6 min

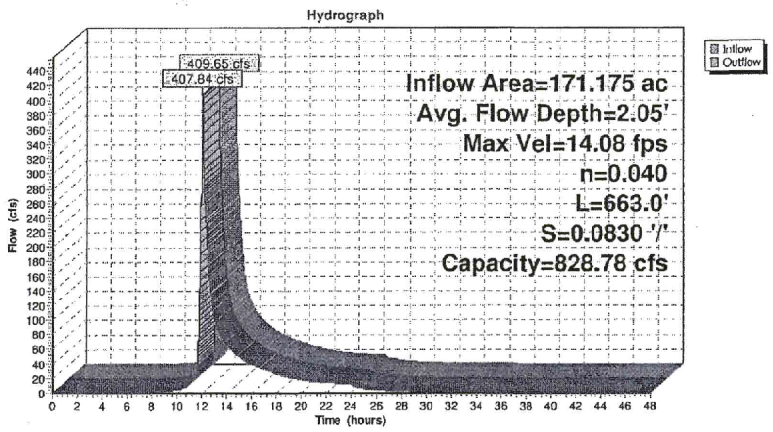
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 14.08 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 3.15 fps, Avg. Travel Time= 3.5 min

Peak Storage= 19,201 cf @ 12.02 hrs
Average Depth at Peak Storage= 2.05'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 828.78 cfs

10.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 22.00'
Length= 663.0' Slope= 0.0830 '/'
Inlet Invert= 665.00', Outlet Invert= 610.00'

‡

Reach OPC-8: (new Reach)



STORMWATER POND CALCULATIONS

(Taken from the existing PTI Permit Application for the Carter Hollow Landfill)

CALCULATION BRIEF

CARTER HOLLOW LANDFILL
PERMIT MODIFICATION - 2016 DESIGN CHANGES
(C)(6)(k)&(i) POND C DESIGN AND CAPACITY CALCULATIONS

OBJECTIVE:

This calculation involves the design of the channels, culverts, and catch basins that are being used to convey stormwater to Pond C. Note that as part of the Proposed 2016 Design Changes, Pond C receives flow from areas previously routed to Stormwater ponds A and B. Pond C was designed for final conditions. The stormwater controls were designed using the methodology and assumptions presented in the Stormwater Design Summary. The channels, culverts, and catch basins were designed for final conditions using the 25-year, 24-hour storm event. The sediment basin was designed using the 10-year, 25-year, and 100-year, 24-hour storm events as required by OAC 3745-30-07(C)(4).

DRAINAGE AREA:

The drainage areas to Pond C during final conditions were delineated using the proposed top of final cover grades shown on the Permit Drawings. The following drainage areas were delineated and input in HydroCAD for Pond C:

Drainage Area ID	Drainage Area (acres)	Curve Number
DAC1	2.29	84
	4.02	77
DAC2	0.04	91
	4.31	77
DAC3	11.40	84
DAC4	0.40	91
	1.96	84
	20.90	77
DA2A	0.58	91
	10.50	84
DA3	1.43	77
	5.74	84
DA4	2.41	77
	6.53	84
DA5	0.53	84

The outlet channel for Pond C also receives additional drainage area, as summarized below:

Drainage Area ID	Drainage Area (acres)	Curve Number
DA6	0.88	77
	1.25	84

CHANNEL CALCULATIONS:

Table 1, which is attached to the Stormwater Design Summary, provides the channel ID, length, slope, inlet and outlet elevation, peak flow, flow depth, freeboard, maximum velocity, and channel lining for Channels 2A, 3, 4, 5, and 6. The results of the North American Green (NAG) channel calculations are included as Attachment 2. These channels are described below.

- Channel 2A will convey drainage from the disposal area interior perimeter to Drop Inlet 1.
- Channel 3 will convey flow from the soil processing area to Sediment Trap C.
- Channel 4 will convey flow from the soil processing area to Sediment Trap C.
- Channel 5 will convey flow from Sediment Trap C to Culvert 1.
- Channel 6 will convey discharge from Pond C to Channel 7.

CULVERT CALCULATIONS:

Table 2, which is attached to the Stormwater Design Summary, provides the culvert ID, culvert diameter, length, slope, inlet and outlet elevation, peak flow, peak elevation, and culvert quantity.

Culvert 1 will convey flow from Channel 5 to the Pond C Forebay. This culvert will be corrugated metal, with a length of approximately 47 feet and slope of 7.45 percent. Culvert 2 will convey flow from Drop Inlet 1 to the Pond C Forebay. This culvert will be corrugated metal, with a length of approximately 120 feet and slope of 1.25 percent. Culvert 3 will serve as the outlet barrel for Pond C. This culvert will be reinforced concrete, with a length of approximately 259 feet and slope of 0.5 percent.

CATCH BASIN CALCULATIONS:

Table 3, which is attached to the Stormwater Design Summary, provides the catch basin dimensions, invert elevations, and peak elevations.

Drop Inlet 1 collects drainage from the disposal area interior perimeter channel and conveys the flow through Culvert 2 into the Pond C Forebay. The inlet will measure 4 feet in both length and width, with a depth of 5 feet.

POND C CALCULATIONS:

As stated in the Stormwater Design Summary, sediment ponds have been designed in accordance with the facility's National Pollutant Discharge Elimination System (NPDES) Permit, which requires the following for a basin:

Requirement 1: A sediment storage zone of 1,000 cubic feet per disturbed acre.

The stage storage curve was generated using the proposed embankment contours. The stage storage curve for Pond C was estimated from elevation 854 to elevation 864. The following stage storage curve was generated:

Elevation	Area (sf)	Cumulative Volume (cf)
854.0	129,407	0
856.0	139,654	269,061
858.0	150,147	558,862
860.0	160,886	869,895
862.0	171,871	1,202,652
864.0	183,120	1,557,643

The sediment storage zone was calculated assuming that 39.23 acres of the total 72.30 acre drainage area is disturbed. Approximately 39,230 cf (1,000 cf * 39.23 acres) of volume is required for permanent sediment storage. The required sediment storage is met at approximately elevation 854.31. However, the permanent pool was set at elevation 859.0 to provide additional water storage capacity for onsite construction operations.

Requirement 2: A dewatering zone of 1,800 cubic feet for each acre contributing drainage. The maximum depth of the dewatering zone is 5 feet.

The dewatering zone has been determined as a permanent zone located above the sediment storage zone. Approximately 130,140 cf (1,800 cf * 72.30 acres) of volume is required for the dewatering zone. The dewatering zone extends from the top of the sediment storage zone (elevation 859.0) to elevation 861.5 (crest of riser) and provides approximately 405,709 cf of dewatering zone. The depth of the dewatering zone is approximately 2.5 feet which is less than the maximum 5-foot depth. However, as shown, the dewatering zone provided is much greater than the dewatering zone required. Therefore, the dewatering zone design should be adequate..

Requirement 3: Dewatering time of at least 2 days.

Dewatering notches routed through the principal spillway riser are proposed to dewater the sediment basin. For the 25-year/24-hour rainfall event, using two 6-inch by 24-inch notches in combination with a 27.5-inch by 27.5-inch vertical riser, the calculated dewatering time is 84 hours, or approximately 3.5 days.

Requirement 4: A flow length to width ratio of at least 2:1. A ratio of 4:1 is recommended.

Due to the irregular shape of Pond C, a typical length to width ratio cannot be defined. However, the minimum flow length from the Forebay to the Pond C principal spillway measures approximately 450 linear feet. This flow length, combined with the fact that the pond has been greatly oversized relative to the required volume, will provide adequate sediment removal prior to discharge from the pond.

Principal Spillway Design

Item	Value
Riser Type	27.5” x 27.5” Concrete
Riser Quantity	1
Notch Size	6” x 24”
Number of Notches	2
Dewatering Orifice Elevation	859.00
Maximum Sediment Cleanout Elevation	859.00
Principal Spillway Riser Inlet Elevation	861.50
Sediment Basin Crest Elevation	864.00
Maximum Pool Elevation (25-year, 24-hour storm event)	861.64
Freeboard for 25-year, 24-hour storm event	2.36
Outlet Barrel Type	24” diameter RCP

The principal spillway can safely discharge the 25-year 24-hour storm event while maintaining approximately 2.36 feet of freeboard which is greater than the required 2-foot freeboard.

Emergency Spillway Design

Item	Value
Spillway Type	Trapezoidal Riprap Outlet
Emergency Spillway Dimensions	33-ft bottom width, 1.5-ft depth, 3H:1V side slopes
Emergency Spillway Inlet Elevation	862.50

Sediment Basin Crest Elevation	864.00
Maximum Pool Elevation (100-year, 24-hour storm event)	862.67
Maximum Pool Elevation (100-year, 24-hour storm event) with Principal Spillway removed	862.99

The principal and emergency spillways can safely discharge the 100-year 24-hour storm event while maintaining approximately 1.33 feet of freeboard which is greater than the required 1-foot freeboard. Assuming the principal spillway becomes clogged, the emergency spillway can also safely discharge the 100-year 24-hour storm event while maintaining approximately 1.01 feet of freeboard.

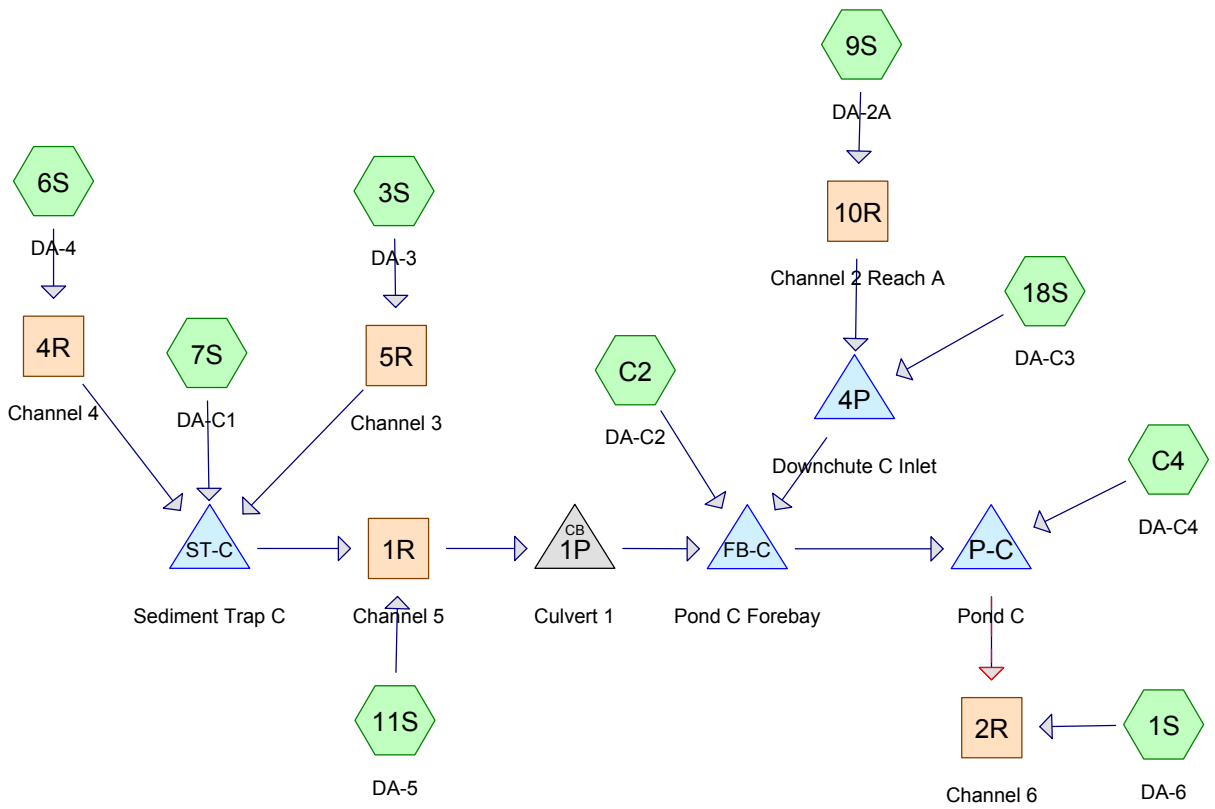
CONCLUSIONS;

The channels, culverts, and catch basins were designed using the 25-year 24-hour storm event. The sediment basin was designed using the 25-year, and 100-year, 24-hour storm events as required in accordance the methodology and assumptions presented in the Stormwater Design Summary.

ATTACHMENT 1

HYDROCAD ANALYSIS OUTPUT
POND C

POND C
10-YEAR, 24-HOUR STORM EVENT



Subcat Reach Pond Link

Routing Diagram for 144-189 Pond C
Prepared by CEC, Inc., Printed 5/23/2016
HydroCAD® 10.00 s/n 03447 © 2013 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
40.100	84	50-75% Grass cover, Fair, HSG D (1S, 3S, 6S, 7S, 9S, 11S, 18S, C4)
33.950	77	Brush, Fair, HSG D (1S, 3S, 6S, 7S, C2, C4)
1.020	91	Gravel roads, HSG D (9S, C2, C4)
75.070	**81**	**TOTAL AREA**

Summary for Subcatchment 1S: DA-6

Runoff = 8.49 cfs @ 11.97 hrs, Volume= 0.401 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 10 YR Rainfall=4.16"

Area (ac)	CN	Description
1.250	84	50-75% Grass cover, Fair, HSG D
0.880	77	Brush, Fair, HSG D
2.130	81	Weighted Average
2.130		100.00% Pervious Area

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

Hydrograph for Subcatchment 1S: DA-6

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.14	0.00	0.00
6.00	0.33	0.00	0.00
9.00	0.61	0.01	**0.03**
12.00	2.76	1.13	**7.95**
15.00	3.55	1.75	0.22
18.00	3.83	1.98	0.14
21.00	4.01	2.13	0.09
24.00	**4.16**	**2.26**	0.08
27.00	4.16	2.26	0.00
30.00	4.16	2.26	0.00
33.00	4.16	2.26	0.00
36.00	4.16	2.26	0.00
39.00	4.16	2.26	0.00
42.00	4.16	2.26	0.00
45.00	4.16	2.26	0.00
48.00	4.16	2.26	0.00
51.00	4.16	2.26	0.00
54.00	4.16	2.26	0.00
57.00	4.16	2.26	0.00
60.00	4.16	2.26	0.00
63.00	4.16	2.26	0.00
66.00	4.16	2.26	0.00
69.00	4.16	2.26	0.00
72.00	4.16	2.26	0.00
75.00	4.16	2.26	0.00
78.00	4.16	2.26	0.00
81.00	4.16	2.26	0.00
84.00	4.16	2.26	0.00
87.00	4.16	2.26	0.00
90.00	4.16	2.26	0.00
93.00	4.16	2.26	0.00
96.00	4.16	2.26	0.00
99.00	4.16	2.26	0.00
102.00	4.16	2.26	0.00
105.00	4.16	2.26	0.00
108.00	4.16	2.26	0.00
111.00	4.16	2.26	0.00
114.00	4.16	2.26	0.00
117.00	4.16	2.26	0.00
120.00	4.16	2.26	0.00
123.00	4.16	2.26	0.00
126.00	4.16	2.26	0.00
129.00	4.16	2.26	0.00
132.00	4.16	2.26	0.00
135.00	4.16	2.26	0.00
138.00	4.16	2.26	0.00
141.00	4.16	2.26	0.00
144.00	4.16	2.26	0.00
147.00	4.16	2.26	0.00
150.00	4.16	2.26	0.00
153.00	4.16	2.26	0.00
156.00	4.16	2.26	0.00
159.00	4.16	2.26	0.00
162.00	4.16	2.26	0.00
165.00	4.16	2.26	0.00
168.00	4.16	2.26	0.00
171.00	4.16	2.26	0.00
174.00	4.16	2.26	0.00
177.00	4.16	2.26	0.00
180.00	4.16	2.26	0.00
183.00	4.16	2.26	0.00
186.00	4.16	2.26	0.00
189.00	4.16	2.26	0.00
192.00	4.16	2.26	0.00

Summary for Subcatchment 3S: DA-3

Runoff = 25.63 cfs @ 12.03 hrs, Volume= 1.449 af, Depth= 2.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 10 YR Rainfall=4.16"

Area (ac)	CN	Description
1.430	77	Brush, Fair, HSG D
5.740	84	50-75% Grass cover, Fair, HSG D
7.170	83	Weighted Average
7.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	690	0.0377	1.04		**Lag/CN Method,**

Hydrograph for Subcatchment 3S: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.14	0.00	0.00
6.00	0.33	0.00	0.00
9.00	0.61	0.02	0.14
12.00	2.76	1.25	**24.70**
15.00	3.55	1.90	**0.79**
18.00	3.83	2.14	0.48
21.00	4.01	2.30	0.33
24.00	**4.16**	**2.43**	0.29
27.00	4.16	2.43	0.00
30.00	4.16	2.43	0.00
33.00	4.16	2.43	0.00
36.00	4.16	2.43	0.00
39.00	4.16	2.43	0.00
42.00	4.16	2.43	0.00
45.00	4.16	2.43	0.00
48.00	4.16	2.43	0.00
51.00	4.16	2.43	0.00
54.00	4.16	2.43	0.00
57.00	4.16	2.43	0.00
60.00	4.16	2.43	0.00
63.00	4.16	2.43	0.00
66.00	4.16	2.43	0.00
69.00	4.16	2.43	0.00
72.00	4.16	2.43	0.00
75.00	4.16	2.43	0.00
78.00	4.16	2.43	0.00
81.00	4.16	2.43	0.00
84.00	4.16	2.43	0.00
87.00	4.16	2.43	0.00
90.00	4.16	2.43	0.00
93.00	4.16	2.43	0.00
96.00	4.16	2.43	0.00
99.00	4.16	2.43	0.00
102.00	4.16	2.43	0.00
105.00	4.16	2.43	0.00
108.00	4.16	2.43	0.00
111.00	4.16	2.43	0.00
114.00	4.16	2.43	0.00
117.00	4.16	2.43	0.00
120.00	4.16	2.43	0.00
123.00	4.16	2.43	0.00
126.00	4.16	2.43	0.00
129.00	4.16	2.43	0.00
132.00	4.16	2.43	0.00
135.00	4.16	2.43	0.00
138.00	4.16	2.43	0.00
141.00	4.16	2.43	0.00
144.00	4.16	2.43	0.00
147.00	4.16	2.43	0.00
150.00	4.16	2.43	0.00
153.00	4.16	2.43	0.00
156.00	4.16	2.43	0.00
159.00	4.16	2.43	0.00
162.00	4.16	2.43	0.00
165.00	4.16	2.43	0.00
168.00	4.16	2.43	0.00
171.00	4.16	2.43	0.00
174.00	4.16	2.43	0.00
177.00	4.16	2.43	0.00
180.00	4.16	2.43	0.00
183.00	4.16	2.43	0.00
186.00	4.16	2.43	0.00
189.00	4.16	2.43	0.00
192.00	4.16	2.43	0.00

Summary for Subcatchment 6S: DA-4

Runoff = 25.80 cfs @ 12.09 hrs, Volume= 1.744 af, Depth= 2.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 10 YR Rainfall=4.16"

Area (ac)	CN	Description
2.410	77	Brush, Fair, HSG D
6.530	84	50-75% Grass cover, Fair, HSG D
8.940	82	Weighted Average
8.940		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	1,100	0.0382	1.11		**Lag/CN Method,**

Hydrograph for Subcatchment 6S: DA-4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.14	0.00	0.00
6.00	0.33	0.00	0.00
9.00	0.61	0.01	0.13
12.00	2.76	1.19	**20.27**
15.00	3.55	1.82	**0.99**
18.00	3.83	2.06	0.59
21.00	4.01	2.21	0.40
24.00	**4.16**	**2.34**	0.36
27.00	4.16	2.34	0.00
30.00	4.16	2.34	0.00
33.00	4.16	2.34	0.00
36.00	4.16	2.34	0.00
39.00	4.16	2.34	0.00
42.00	4.16	2.34	0.00
45.00	4.16	2.34	0.00
48.00	4.16	2.34	0.00
51.00	4.16	2.34	0.00
54.00	4.16	2.34	0.00
57.00	4.16	2.34	0.00
60.00	4.16	2.34	0.00
63.00	4.16	2.34	0.00
66.00	4.16	2.34	0.00
69.00	4.16	2.34	0.00
72.00	4.16	2.34	0.00
75.00	4.16	2.34	0.00
78.00	4.16	2.34	0.00
81.00	4.16	2.34	0.00
84.00	4.16	2.34	0.00
87.00	4.16	2.34	0.00
90.00	4.16	2.34	0.00
93.00	4.16	2.34	0.00
96.00	4.16	2.34	0.00
99.00	4.16	2.34	0.00
102.00	4.16	2.34	0.00
105.00	4.16	2.34	0.00
108.00	4.16	2.34	0.00
111.00	4.16	2.34	0.00
114.00	4.16	2.34	0.00
117.00	4.16	2.34	0.00
120.00	4.16	2.34	0.00
123.00	4.16	2.34	0.00
126.00	4.16	2.34	0.00
129.00	4.16	2.34	0.00
132.00	4.16	2.34	0.00
135.00	4.16	2.34	0.00
138.00	4.16	2.34	0.00
141.00	4.16	2.34	0.00
144.00	4.16	2.34	0.00
147.00	4.16	2.34	0.00
150.00	4.16	2.34	0.00
153.00	4.16	2.34	0.00
156.00	4.16	2.34	0.00
159.00	4.16	2.34	0.00
162.00	4.16	2.34	0.00
165.00	4.16	2.34	0.00
168.00	4.16	2.34	0.00
171.00	4.16	2.34	0.00
174.00	4.16	2.34	0.00
177.00	4.16	2.34	0.00
180.00	4.16	2.34	0.00
183.00	4.16	2.34	0.00
186.00	4.16	2.34	0.00
189.00	4.16	2.34	0.00
192.00	4.16	2.34	0.00

Summary for Subcatchment 7S: DA-C1

Runoff = 16.05 cfs @ 12.11 hrs, Volume= 1.143 af, Depth= 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 10 YR Rainfall=4.16"

Area (ac)	CN	Description
2.290	84	50-75% Grass cover, Fair, HSG D
4.020	77	Brush, Fair, HSG D
6.310	80	Weighted Average
6.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	1,220	0.0420	1.12		**Lag/CN Method,**

Hydrograph for Subcatchment 7S: DA-C1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.14	0.00	0.00
6.00	0.33	0.00	0.00
9.00	0.61	0.00	0.05
12.00	2.76	1.07	**11.59**
15.00	3.55	1.68	**0.67**
18.00	3.83	1.90	0.40
21.00	4.01	2.05	0.28
24.00	**4.16**	**2.17**	0.25
27.00	4.16	2.17	0.00
30.00	4.16	2.17	0.00
33.00	4.16	2.17	0.00
36.00	4.16	2.17	0.00
39.00	4.16	2.17	0.00
42.00	4.16	2.17	0.00
45.00	4.16	2.17	0.00
48.00	4.16	2.17	0.00
51.00	4.16	2.17	0.00
54.00	4.16	2.17	0.00
57.00	4.16	2.17	0.00
60.00	4.16	2.17	0.00
63.00	4.16	2.17	0.00
66.00	4.16	2.17	0.00
69.00	4.16	2.17	0.00
72.00	4.16	2.17	0.00
75.00	4.16	2.17	0.00
78.00	4.16	2.17	0.00
81.00	4.16	2.17	0.00
84.00	4.16	2.17	0.00
87.00	4.16	2.17	0.00
90.00	4.16	2.17	0.00
93.00	4.16	2.17	0.00
96.00	4.16	2.17	0.00
99.00	4.16	2.17	0.00
102.00	4.16	2.17	0.00
105.00	4.16	2.17	0.00
108.00	4.16	2.17	0.00
111.00	4.16	2.17	0.00
114.00	4.16	2.17	0.00
117.00	4.16	2.17	0.00
120.00	4.16	2.17	0.00
123.00	4.16	2.17	0.00
126.00	4.16	2.17	0.00
129.00	4.16	2.17	0.00
132.00	4.16	2.17	0.00
135.00	4.16	2.17	0.00
138.00	4.16	2.17	0.00
141.00	4.16	2.17	0.00
144.00	4.16	2.17	0.00
147.00	4.16	2.17	0.00
150.00	4.16	2.17	0.00
153.00	4.16	2.17	0.00
156.00	4.16	2.17	0.00
159.00	4.16	2.17	0.00
162.00	4.16	2.17	0.00
165.00	4.16	2.17	0.00
168.00	4.16	2.17	0.00
171.00	4.16	2.17	0.00
174.00	4.16	2.17	0.00
177.00	4.16	2.17	0.00
180.00	4.16	2.17	0.00
183.00	4.16	2.17	0.00
186.00	4.16	2.17	0.00
189.00	4.16	2.17	0.00
192.00	4.16	2.17	0.00

Summary for Subcatchment 9S: DA-2A

Runoff = 48.09 cfs @ 11.97 hrs, Volume= 2.320 af, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 10 YR Rainfall=4.16"

Area (ac)	CN	Description
10.500	84	50-75% Grass cover, Fair, HSG D
0.580	91	Gravel roads, HSG D
11.080	84	Weighted Average
11.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	440	0.0568	1.21		**Lag/CN Method,**
0.2	174	0.2400	17.53	223.52	**Trap/Vee/Rect Channel Flow,** Bot.W=4.00' D=1.50' Z= 3.0 '/' Top.W=13.00' n= 0.040
6.3	614	Total			

Hydrograph for Subcatchment 9S: DA-2A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.14	0.00	0.00
6.00	0.33	0.00	0.00
9.00	0.61	0.02	**0.28**
12.00	2.76	1.32	**45.66**
15.00	3.55	1.98	1.22
18.00	3.83	2.22	0.74
21.00	4.01	2.38	0.51
24.00	**4.16**	**2.51**	0.46
27.00	4.16	2.51	0.00
30.00	4.16	2.51	0.00
33.00	4.16	2.51	0.00
36.00	4.16	2.51	0.00
39.00	4.16	2.51	0.00
42.00	4.16	2.51	0.00
45.00	4.16	2.51	0.00
48.00	4.16	2.51	0.00
51.00	4.16	2.51	0.00
54.00	4.16	2.51	0.00
57.00	4.16	2.51	0.00
60.00	4.16	2.51	0.00
63.00	4.16	2.51	0.00
66.00	4.16	2.51	0.00
69.00	4.16	2.51	0.00
72.00	4.16	2.51	0.00
75.00	4.16	2.51	0.00
78.00	4.16	2.51	0.00
81.00	4.16	2.51	0.00
84.00	4.16	2.51	0.00
87.00	4.16	2.51	0.00
90.00	4.16	2.51	0.00
93.00	4.16	2.51	0.00
96.00	4.16	2.51	0.00
99.00	4.16	2.51	0.00
102.00	4.16	2.51	0.00
105.00	4.16	2.51	0.00
108.00	4.16	2.51	0.00
111.00	4.16	2.51	0.00
114.00	4.16	2.51	0.00
117.00	4.16	2.51	0.00
120.00	4.16	2.51	0.00
123.00	4.16	2.51	0.00
126.00	4.16	2.51	0.00
129.00	4.16	2.51	0.00
132.00	4.16	2.51	0.00
135.00	4.16	2.51	0.00
138.00	4.16	2.51	0.00
141.00	4.16	2.51	0.00
144.00	4.16	2.51	0.00
147.00	4.16	2.51	0.00
150.00	4.16	2.51	0.00
153.00	4.16	2.51	0.00
156.00	4.16	2.51	0.00
159.00	4.16	2.51	0.00
162.00	4.16	2.51	0.00
165.00	4.16	2.51	0.00
168.00	4.16	2.51	0.00
171.00	4.16	2.51	0.00
174.00	4.16	2.51	0.00
177.00	4.16	2.51	0.00
180.00	4.16	2.51	0.00
183.00	4.16	2.51	0.00
186.00	4.16	2.51	0.00
189.00	4.16	2.51	0.00
192.00	4.16	2.51	0.00

Summary for Subcatchment 11S: DA-5

Runoff = 1.89 cfs @ 11.97 hrs, Volume= 0.090 af, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 10 YR Rainfall=4.16"

Area (ac)	CN	Description
0.430	84	50-75% Grass cover, Fair, HSG D
0.430		100.00% Pervious Area

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

Hydrograph for Subcatchment 11S: DA-5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.14	0.00	0.00
6.00	0.33	0.00	0.00
9.00	0.61	0.02	**0.01**
12.00	2.76	1.32	**1.76**
15.00	3.55	1.98	0.05
18.00	3.83	2.22	0.03
21.00	4.01	2.38	0.02
24.00	**4.16**	**2.51**	0.02
27.00	4.16	2.51	0.00
30.00	4.16	2.51	0.00
33.00	4.16	2.51	0.00
36.00	4.16	2.51	0.00
39.00	4.16	2.51	0.00
42.00	4.16	2.51	0.00
45.00	4.16	2.51	0.00
48.00	4.16	2.51	0.00
51.00	4.16	2.51	0.00
54.00	4.16	2.51	0.00
57.00	4.16	2.51	0.00
60.00	4.16	2.51	0.00
63.00	4.16	2.51	0.00
66.00	4.16	2.51	0.00
69.00	4.16	2.51	0.00
72.00	4.16	2.51	0.00
75.00	4.16	2.51	0.00
78.00	4.16	2.51	0.00
81.00	4.16	2.51	0.00
84.00	4.16	2.51	0.00
87.00	4.16	2.51	0.00
90.00	4.16	2.51	0.00
93.00	4.16	2.51	0.00
96.00	4.16	2.51	0.00
99.00	4.16	2.51	0.00
102.00	4.16	2.51	0.00
105.00	4.16	2.51	0.00
108.00	4.16	2.51	0.00
111.00	4.16	2.51	0.00
114.00	4.16	2.51	0.00
117.00	4.16	2.51	0.00
120.00	4.16	2.51	0.00
123.00	4.16	2.51	0.00
126.00	4.16	2.51	0.00
129.00	4.16	2.51	0.00
132.00	4.16	2.51	0.00
135.00	4.16	2.51	0.00
138.00	4.16	2.51	0.00
141.00	4.16	2.51	0.00
144.00	4.16	2.51	0.00
147.00	4.16	2.51	0.00
150.00	4.16	2.51	0.00
153.00	4.16	2.51	0.00
156.00	4.16	2.51	0.00
159.00	4.16	2.51	0.00
162.00	4.16	2.51	0.00
165.00	4.16	2.51	0.00
168.00	4.16	2.51	0.00
171.00	4.16	2.51	0.00
174.00	4.16	2.51	0.00
177.00	4.16	2.51	0.00
180.00	4.16	2.51	0.00
183.00	4.16	2.51	0.00
186.00	4.16	2.51	0.00
189.00	4.16	2.51	0.00
192.00	4.16	2.51	0.00

Summary for Subcatchment 18S: DA-C3

Runoff = 48.93 cfs @ 11.98 hrs, Volume= 2.387 af, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 10 YR Rainfall=4.16"

Area (ac)	CN	Description
11.400	84	50-75% Grass cover, Fair, HSG D
11.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	182	0.1484	1.64		**Lag/CN Method,**
4.3	534	0.0190	2.07		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	397	0.2400	17.53	223.52	**Trap/Vee/Rect Channel Flow,** Bot.W=4.00' D=1.50' Z= 3.0 '/' Top.W=13.00' n= 0.040
6.6	1,113	Total			

Hydrograph for Subcatchment 18S: DA-C3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.14	0.00	0.00
6.00	0.33	0.00	0.00
9.00	0.61	0.02	**0.29**
12.00	2.76	1.32	**47.19**
15.00	3.55	1.98	1.26
18.00	3.83	2.22	0.76
21.00	4.01	2.38	0.53
24.00	**4.16**	**2.51**	0.47
27.00	4.16	2.51	0.00
30.00	4.16	2.51	0.00
33.00	4.16	2.51	0.00
36.00	4.16	2.51	0.00
39.00	4.16	2.51	0.00
42.00	4.16	2.51	0.00
45.00	4.16	2.51	0.00
48.00	4.16	2.51	0.00
51.00	4.16	2.51	0.00
54.00	4.16	2.51	0.00
57.00	4.16	2.51	0.00
60.00	4.16	2.51	0.00
63.00	4.16	2.51	0.00
66.00	4.16	2.51	0.00
69.00	4.16	2.51	0.00
72.00	4.16	2.51	0.00
75.00	4.16	2.51	0.00
78.00	4.16	2.51	0.00
81.00	4.16	2.51	0.00
84.00	4.16	2.51	0.00
87.00	4.16	2.51	0.00
90.00	4.16	2.51	0.00
93.00	4.16	2.51	0.00
96.00	4.16	2.51	0.00
99.00	4.16	2.51	0.00
102.00	4.16	2.51	0.00
105.00	4.16	2.51	0.00
108.00	4.16	2.51	0.00
111.00	4.16	2.51	0.00
114.00	4.16	2.51	0.00
117.00	4.16	2.51	0.00
120.00	4.16	2.51	0.00
123.00	4.16	2.51	0.00
126.00	4.16	2.51	0.00
129.00	4.16	2.51	0.00
132.00	4.16	2.51	0.00
135.00	4.16	2.51	0.00
138.00	4.16	2.51	0.00
141.00	4.16	2.51	0.00
144.00	4.16	2.51	0.00
147.00	4.16	2.51	0.00
150.00	4.16	2.51	0.00
153.00	4.16	2.51	0.00
156.00	4.16	2.51	0.00
159.00	4.16	2.51	0.00
162.00	4.16	2.51	0.00
165.00	4.16	2.51	0.00
168.00	4.16	2.51	0.00
171.00	4.16	2.51	0.00
174.00	4.16	2.51	0.00
177.00	4.16	2.51	0.00
180.00	4.16	2.51	0.00
183.00	4.16	2.51	0.00
186.00	4.16	2.51	0.00
189.00	4.16	2.51	0.00
192.00	4.16	2.51	0.00

Summary for Subcatchment C2: DA-C2

Runoff = 15.23 cfs @ 11.97 hrs, Volume= 0.702 af, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 10 YR Rainfall=4.16"

Area (ac)	CN	Description
4.310	77	Brush, Fair, HSG D
0.040	91	Gravel roads, HSG D
4.350	77	Weighted Average
4.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	578	0.2007	1.92		**Lag/CN Method,**
0.5	149	0.0940	4.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	58	0.6200	12.68		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
5.6	785	Total			

Hydrograph for Subcatchment C2: DA-C2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.14	0.00	0.00
6.00	0.33	0.00	0.00
9.00	0.61	0.00	**0.00**
12.00	2.76	0.91	**13.99**
15.00	3.55	1.47	0.42
18.00	3.83	1.68	0.26
21.00	4.01	1.82	0.18
24.00	**4.16**	**1.94**	0.16
27.00	4.16	1.94	0.00
30.00	4.16	1.94	0.00
33.00	4.16	1.94	0.00
36.00	4.16	1.94	0.00
39.00	4.16	1.94	0.00
42.00	4.16	1.94	0.00
45.00	4.16	1.94	0.00
48.00	4.16	1.94	0.00
51.00	4.16	1.94	0.00
54.00	4.16	1.94	0.00
57.00	4.16	1.94	0.00
60.00	4.16	1.94	0.00
63.00	4.16	1.94	0.00
66.00	4.16	1.94	0.00
69.00	4.16	1.94	0.00
72.00	4.16	1.94	0.00
75.00	4.16	1.94	0.00
78.00	4.16	1.94	0.00
81.00	4.16	1.94	0.00
84.00	4.16	1.94	0.00
87.00	4.16	1.94	0.00
90.00	4.16	1.94	0.00
93.00	4.16	1.94	0.00
96.00	4.16	1.94	0.00
99.00	4.16	1.94	0.00
102.00	4.16	1.94	0.00
105.00	4.16	1.94	0.00
108.00	4.16	1.94	0.00
111.00	4.16	1.94	0.00
114.00	4.16	1.94	0.00
117.00	4.16	1.94	0.00
120.00	4.16	1.94	0.00
123.00	4.16	1.94	0.00
126.00	4.16	1.94	0.00
129.00	4.16	1.94	0.00
132.00	4.16	1.94	0.00
135.00	4.16	1.94	0.00
138.00	4.16	1.94	0.00
141.00	4.16	1.94	0.00
144.00	4.16	1.94	0.00
147.00	4.16	1.94	0.00
150.00	4.16	1.94	0.00
153.00	4.16	1.94	0.00
156.00	4.16	1.94	0.00
159.00	4.16	1.94	0.00
162.00	4.16	1.94	0.00
165.00	4.16	1.94	0.00
168.00	4.16	1.94	0.00
171.00	4.16	1.94	0.00
174.00	4.16	1.94	0.00
177.00	4.16	1.94	0.00
180.00	4.16	1.94	0.00
183.00	4.16	1.94	0.00
186.00	4.16	1.94	0.00
189.00	4.16	1.94	0.00
192.00	4.16	1.94	0.00

Summary for Subcatchment C4: DA-C4

Runoff = 80.41 cfs @ 11.98 hrs, Volume= 3.906 af, Depth= 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 10 YR Rainfall=4.16"

Area (ac)	CN	Description
1.960	84	50-75% Grass cover, Fair, HSG D
20.900	77	Brush, Fair, HSG D
0.400	91	Gravel roads, HSG D
23.260	78	Weighted Average
23.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	176	0.2500	1.74		**Lag/CN Method,**
5.2	600	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.9	776	Total			

Hydrograph for Subcatchment C4: DA-C4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.14	0.00	0.00
6.00	0.33	0.00	0.00
9.00	0.61	0.00	**0.07**
12.00	2.76	0.96	**79.15**
15.00	3.55	1.54	2.29
18.00	3.83	1.75	1.40
21.00	4.01	1.90	0.98
24.00	**4.16**	**2.02**	0.87
27.00	4.16	2.02	0.00
30.00	4.16	2.02	0.00
33.00	4.16	2.02	0.00
36.00	4.16	2.02	0.00
39.00	4.16	2.02	0.00
42.00	4.16	2.02	0.00
45.00	4.16	2.02	0.00
48.00	4.16	2.02	0.00
51.00	4.16	2.02	0.00
54.00	4.16	2.02	0.00
57.00	4.16	2.02	0.00
60.00	4.16	2.02	0.00
63.00	4.16	2.02	0.00
66.00	4.16	2.02	0.00
69.00	4.16	2.02	0.00
72.00	4.16	2.02	0.00
75.00	4.16	2.02	0.00
78.00	4.16	2.02	0.00
81.00	4.16	2.02	0.00
84.00	4.16	2.02	0.00
87.00	4.16	2.02	0.00
90.00	4.16	2.02	0.00
93.00	4.16	2.02	0.00
96.00	4.16	2.02	0.00
99.00	4.16	2.02	0.00
102.00	4.16	2.02	0.00
105.00	4.16	2.02	0.00
108.00	4.16	2.02	0.00
111.00	4.16	2.02	0.00
114.00	4.16	2.02	0.00
117.00	4.16	2.02	0.00
120.00	4.16	2.02	0.00
123.00	4.16	2.02	0.00
126.00	4.16	2.02	0.00
129.00	4.16	2.02	0.00
132.00	4.16	2.02	0.00
135.00	4.16	2.02	0.00
138.00	4.16	2.02	0.00
141.00	4.16	2.02	0.00
144.00	4.16	2.02	0.00
147.00	4.16	2.02	0.00
150.00	4.16	2.02	0.00
153.00	4.16	2.02	0.00
156.00	4.16	2.02	0.00
159.00	4.16	2.02	0.00
162.00	4.16	2.02	0.00
165.00	4.16	2.02	0.00
168.00	4.16	2.02	0.00
171.00	4.16	2.02	0.00
174.00	4.16	2.02	0.00
177.00	4.16	2.02	0.00
180.00	4.16	2.02	0.00
183.00	4.16	2.02	0.00
186.00	4.16	2.02	0.00
189.00	4.16	2.02	0.00
192.00	4.16	2.02	0.00

Summary for Reach 1R: Channel 5

Inflow Area = 22.850 ac, 0.00% Impervious, Inflow Depth = 2.32" for 10 YR event
Inflow = 37.41 cfs @ 12.38 hrs, Volume= 4.426 af
Outflow = 37.39 cfs @ 12.38 hrs, Volume= 4.426 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 9.15 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.98 fps, Avg. Travel Time= 0.4 min

Peak Storage= 204 cf @ 12.38 hrs
Average Depth at Peak Storage= 0.68'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 331.37 cfs

4.00' x 2.00' deep channel, n= 0.043
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 50.0' Slope= 0.1800 '/'
Inlet Invert= 876.00', Outlet Invert= 867.00'

‡

Hydrograph for Reach 1R: Channel 5

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	876.00	0.00
6.00	0.00	0	876.00	0.00
12.00	**7.69**	**68**	**876.28**	**7.58**
18.00	**1.69**	**25**	**876.12**	**1.69**
24.00	0.96	18	876.08	0.96
30.00	0.05	2	876.01	0.05
36.00	0.01	0	876.00	0.01
42.00	0.00	0	876.00	0.00
48.00	0.00	0	876.00	0.00
54.00	0.00	0	876.00	0.00
60.00	0.00	0	876.00	0.00
66.00	0.00	0	876.00	0.00
72.00	0.00	0	876.00	0.00
78.00	0.00	0	876.00	0.00
84.00	0.00	0	876.00	0.00
90.00	0.00	0	876.00	0.00
96.00	0.00	0	876.00	0.00
102.00	0.00	0	876.00	0.00
108.00	0.00	0	876.00	0.00
114.00	0.00	0	876.00	0.00
120.00	0.00	0	876.00	0.00
126.00	0.00	0	876.00	0.00
132.00	0.00	0	876.00	0.00
138.00	0.00	0	876.00	0.00
144.00	0.00	0	876.00	0.00
150.00	0.00	0	876.00	0.00
156.00	0.00	0	876.00	0.00
162.00	0.00	0	876.00	0.00
168.00	0.00	0	876.00	0.00
174.00	0.00	0	876.00	0.00
180.00	0.00	0	876.00	0.00
186.00	0.00	0	876.00	0.00
192.00	0.00	0	876.00	0.00

Summary for Reach 2R: Channel 6

Inflow Area = 75.070 ac, 0.00% Impervious, Inflow Depth = 2.32" for 10 YR event
Inflow = 14.18 cfs @ 11.99 hrs, Volume= 14.517 af
Outflow = 13.34 cfs @ 12.07 hrs, Volume= 14.517 af, Atten= 6%, Lag= 5.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.31 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.95 fps, Avg. Travel Time= 10.2 min

Peak Storage= 2,357 cf @ 12.03 hrs
Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 294.91 cfs

4.00' x 3.50' deep channel, n= 0.052
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 580.0' Slope= 0.0293 '/'
Inlet Invert= 857.00', Outlet Invert= 840.00'

Hydrograph for Reach 2R: Channel 6

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.02	0	857.00	0.00
6.00	0.25	174	857.07	0.25
12.00	**14.12**	**2,316**	**857.73**	**10.52**
18.00	11.24	**2,083**	**857.67**	**11.28**
24.00	7.38	1,560	857.53	7.43
30.00	2.02	660	857.25	2.06
36.00	0.65	319	857.13	0.67
42.00	0.30	195	857.08	0.31
48.00	0.17	136	857.06	0.18
54.00	0.10	96	857.04	0.10
60.00	0.06	65	857.03	0.06
66.00	0.03	37	857.02	0.03
72.00	0.02	21	857.01	0.02
78.00	0.01	12	857.01	0.01
84.00	0.01	7	857.00	0.01
90.00	0.00	4	857.00	0.00
96.00	0.00	2	857.00	0.00
102.00	0.00	1	857.00	0.00
108.00	0.00	1	857.00	0.00
114.00	0.00	0	857.00	0.00
120.00	0.00	0	857.00	0.00
126.00	0.00	0	857.00	0.00
132.00	0.00	0	857.00	0.00
138.00	0.00	0	857.00	0.00
144.00	0.00	0	857.00	0.00
150.00	0.00	0	857.00	0.00
156.00	0.00	0	857.00	0.00
162.00	0.00	0	857.00	0.00
168.00	0.00	0	857.00	0.00
174.00	0.00	0	857.00	0.00
180.00	0.00	0	857.00	0.00
186.00	0.00	0	857.00	0.00
192.00	0.00	0	857.00	0.00

Summary for Reach 4R: Channel 4

Inflow Area = 8.940 ac, 0.00% Impervious, Inflow Depth = 2.34" for 10 YR event
Inflow = 25.80 cfs @ 12.09 hrs, Volume= 1.744 af
Outflow = 20.76 cfs @ 12.33 hrs, Volume= 1.744 af, Atten= 20%, Lag= 14.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.53 fps, Min. Travel Time= 9.0 min
Avg. Velocity = 0.38 fps, Avg. Travel Time= 36.2 min

Peak Storage= 11,200 cf @ 12.18 hrs
Average Depth at Peak Storage= 1.56'
Bank-Full Depth= 3.00' Flow Area= 39.0 sf, Capacity= 86.14 cfs

4.00' x 3.00' deep channel, n= 0.100
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 825.0' Slope= 0.0109 '/'
Inlet Invert= 894.00', Outlet Invert= 885.00'

‡

Hydrograph for Reach 4R: Channel 4

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	894.00	0.00
6.00	0.00	0	894.00	0.00
12.00	**20.27**	**6,761**	**895.12**	**3.49**
18.00	**0.59**	**934**	**894.24**	**0.62**
24.00	0.36	665	894.18	0.37
30.00	0.00	8	894.00	0.00
36.00	0.00	0	894.00	0.00
42.00	0.00	0	894.00	0.00
48.00	0.00	0	894.00	0.00
54.00	0.00	0	894.00	0.00
60.00	0.00	0	894.00	0.00
66.00	0.00	0	894.00	0.00
72.00	0.00	0	894.00	0.00
78.00	0.00	0	894.00	0.00
84.00	0.00	0	894.00	0.00
90.00	0.00	0	894.00	0.00
96.00	0.00	0	894.00	0.00
102.00	0.00	0	894.00	0.00
108.00	0.00	0	894.00	0.00
114.00	0.00	0	894.00	0.00
120.00	0.00	0	894.00	0.00
126.00	0.00	0	894.00	0.00
132.00	0.00	0	894.00	0.00
138.00	0.00	0	894.00	0.00
144.00	0.00	0	894.00	0.00
150.00	0.00	0	894.00	0.00
156.00	0.00	0	894.00	0.00
162.00	0.00	0	894.00	0.00
168.00	0.00	0	894.00	0.00
174.00	0.00	0	894.00	0.00
180.00	0.00	0	894.00	0.00
186.00	0.00	0	894.00	0.00
192.00	0.00	0	894.00	0.00

Summary for Reach 5R: Channel 3

Inflow Area = 7.170 ac, 0.00% Impervious, Inflow Depth = 2.43" for 10 YR event
Inflow = 25.63 cfs @ 12.03 hrs, Volume= 1.449 af
Outflow = 20.99 cfs @ 12.21 hrs, Volume= 1.449 af, Atten= 18%, Lag= 10.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.78 fps, Min. Travel Time= 7.0 min
Avg. Velocity = 0.69 fps, Avg. Travel Time= 28.1 min

Peak Storage= 8,858 cf @ 12.09 hrs
Average Depth at Peak Storage= 1.19'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 192.38 cfs

4.00' x 3.50' deep channel, n= 0.077
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,170.0' Slope= 0.0274 '/'
Inlet Invert= 916.00', Outlet Invert= 884.00'

Hydrograph for Reach 5R: Channel 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	916.00	0.00
6.00	0.00	0	916.00	0.00
12.00	**24.70**	**7,215**	**917.02**	**6.71**
18.00	**0.48**	**702**	**916.14**	**0.50**
24.00	0.29	510	916.10	0.30
30.00	0.00	1	916.00	0.00
36.00	0.00	0	916.00	0.00
42.00	0.00	0	916.00	0.00
48.00	0.00	0	916.00	0.00
54.00	0.00	0	916.00	0.00
60.00	0.00	0	916.00	0.00
66.00	0.00	0	916.00	0.00
72.00	0.00	0	916.00	0.00
78.00	0.00	0	916.00	0.00
84.00	0.00	0	916.00	0.00
90.00	0.00	0	916.00	0.00
96.00	0.00	0	916.00	0.00
102.00	0.00	0	916.00	0.00
108.00	0.00	0	916.00	0.00
114.00	0.00	0	916.00	0.00
120.00	0.00	0	916.00	0.00
126.00	0.00	0	916.00	0.00
132.00	0.00	0	916.00	0.00
138.00	0.00	0	916.00	0.00
144.00	0.00	0	916.00	0.00
150.00	0.00	0	916.00	0.00
156.00	0.00	0	916.00	0.00
162.00	0.00	0	916.00	0.00
168.00	0.00	0	916.00	0.00
174.00	0.00	0	916.00	0.00
180.00	0.00	0	916.00	0.00
186.00	0.00	0	916.00	0.00
192.00	0.00	0	916.00	0.00

Summary for Reach 10R: Channel 2 Reach A

Inflow Area = 11.080 ac, 0.00% Impervious, Inflow Depth = 2.51" for 10 YR event
Inflow = 48.09 cfs @ 11.97 hrs, Volume= 2.320 af
Outflow = 33.75 cfs @ 12.20 hrs, Volume= 2.320 af, Atten= 30%, Lag= 13.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.78 fps, Min. Travel Time= 9.5 min
Avg. Velocity = 0.63 fps, Avg. Travel Time= 41.8 min

Peak Storage= 19,394 cf @ 12.04 hrs
Average Depth at Peak Storage= 1.67'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 160.67 cfs

4.00' x 3.50' deep channel, n= 0.100
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,585.0' Slope= 0.0322 '/'
Inlet Invert= 919.00', Outlet Invert= 868.00'

Hydrograph for Reach 10R: Channel 2 Reach A

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	919.00	0.00
6.00	**0.00**	0	919.00	0.00
12.00	**45.66**	**18,418**	**920.61**	**10.62**
18.00	0.74	**1,424**	**919.20**	**0.79**
24.00	0.46	1,024	919.15	0.47
30.00	0.00	13	919.00	0.00
36.00	0.00	0	919.00	0.00
42.00	0.00	0	919.00	0.00
48.00	0.00	0	919.00	0.00
54.00	0.00	0	919.00	0.00
60.00	0.00	0	919.00	0.00
66.00	0.00	0	919.00	0.00
72.00	0.00	0	919.00	0.00
78.00	0.00	0	919.00	0.00
84.00	0.00	0	919.00	0.00
90.00	0.00	0	919.00	0.00
96.00	0.00	0	919.00	0.00
102.00	0.00	0	919.00	0.00
108.00	0.00	0	919.00	0.00
114.00	0.00	0	919.00	0.00
120.00	0.00	0	919.00	0.00
126.00	0.00	0	919.00	0.00
132.00	0.00	0	919.00	0.00
138.00	0.00	0	919.00	0.00
144.00	0.00	0	919.00	0.00
150.00	0.00	0	919.00	0.00
156.00	0.00	0	919.00	0.00
162.00	0.00	0	919.00	0.00
168.00	0.00	0	919.00	0.00
174.00	0.00	0	919.00	0.00
180.00	0.00	0	919.00	0.00
186.00	0.00	0	919.00	0.00
192.00	0.00	0	919.00	0.00

Summary for Pond 1P: Culvert 1

Inflow Area = 22.850 ac, 0.00% Impervious, Inflow Depth = 2.32" for 10 YR event
Inflow = 37.39 cfs @ 12.38 hrs, Volume= 4.426 af
Outflow = 37.39 cfs @ 12.38 hrs, Volume= 4.426 af, Atten= 0%, Lag= 0.0 min
Primary = 37.39 cfs @ 12.38 hrs, Volume= 4.426 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Peak Elev= 867.91' @ 12.38 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	865.50'	**42.0" Round Culvert** L= 47.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 865.50' / 862.00' S= 0.0745 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 9.62 sf

Primary OutFlow Max=37.32 cfs @ 12.38 hrs HW=867.91' (Free Discharge)
1=Culvert (Inlet Controls 37.32 cfs @ 5.28 fps)

Hydrograph for Pond 1P: Culvert 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	865.50	0.00
3.00	0.00	865.50	0.00
6.00	0.00	865.50	0.00
9.00	0.03	865.55	0.03
12.00	**7.58**	**866.49**	**7.58**
15.00	**3.11**	**866.12**	**3.11**
18.00	1.69	865.96	1.69
21.00	1.14	865.87	1.14
24.00	0.96	865.84	0.96
27.00	0.17	865.64	0.17
30.00	0.05	865.58	0.05
33.00	0.02	865.55	0.02
36.00	0.01	865.53	0.01
39.00	0.00	865.51	0.00
42.00	0.00	865.50	0.00
45.00	0.00	865.50	0.00
48.00	0.00	865.50	0.00
51.00	0.00	865.50	0.00
54.00	0.00	865.50	0.00
57.00	0.00	865.50	0.00
60.00	0.00	865.50	0.00
63.00	0.00	865.50	0.00
66.00	0.00	865.50	0.00
69.00	0.00	865.50	0.00
72.00	0.00	865.50	0.00
75.00	0.00	865.50	0.00
78.00	0.00	865.50	0.00
81.00	0.00	865.50	0.00
84.00	0.00	865.50	0.00
87.00	0.00	865.50	0.00
90.00	0.00	865.50	0.00
93.00	0.00	865.50	0.00
96.00	0.00	865.50	0.00
99.00	0.00	865.50	0.00
102.00	0.00	865.50	0.00
105.00	0.00	865.50	0.00
108.00	0.00	865.50	0.00
111.00	0.00	865.50	0.00
114.00	0.00	865.50	0.00
117.00	0.00	865.50	0.00
120.00	0.00	865.50	0.00
123.00	0.00	865.50	0.00
126.00	0.00	865.50	0.00
129.00	0.00	865.50	0.00
132.00	0.00	865.50	0.00
135.00	0.00	865.50	0.00
138.00	0.00	865.50	0.00
141.00	0.00	865.50	0.00
144.00	0.00	865.50	0.00
147.00	0.00	865.50	0.00
150.00	0.00	865.50	0.00
153.00	0.00	865.50	0.00
156.00	0.00	865.50	0.00
159.00	0.00	865.50	0.00
162.00	0.00	865.50	0.00
165.00	0.00	865.50	0.00
168.00	0.00	865.50	0.00
171.00	0.00	865.50	0.00
174.00	0.00	865.50	0.00
177.00	0.00	865.50	0.00
180.00	0.00	865.50	0.00
183.00	0.00	865.50	0.00
186.00	0.00	865.50	0.00
189.00	0.00	865.50	0.00
192.00	0.00	865.50	0.00

Summary for Pond 4P: Downchute C Inlet

Inflow Area = 22.480 ac, 0.00% Impervious, Inflow Depth = 2.51" for 10 YR event
Inflow = 58.30 cfs @ 11.99 hrs, Volume= 4.707 af
Outflow = 58.30 cfs @ 11.99 hrs, Volume= 4.707 af, Atten= 0%, Lag= 0.0 min
Primary = 58.30 cfs @ 11.99 hrs, Volume= 4.707 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs / 3
Peak Elev= 866.95' @ 11.99 hrs Surf.Area= 0.000 ac Storage= 0.001 af

Plug-Flow detention time= 0.2 min calculated for 4.707 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (829.9 - 829.8)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	0.002 af	**4.00'W x 4.00'L x 5.00'H Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	863.50'	**48.0" Round Culvert** L= 120.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 863.50' / 862.00' S= 0.0125 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 12.57 sf

Primary OutFlow Max=57.60 cfs @ 11.99 hrs HW=866.93' (Free Discharge)
1=Culvert (Barrel Controls 57.60 cfs @ 6.75 fps)

Hydrograph for Pond 4P: Downchute C Inlet

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	863.00	0.00
6.00	0.00	0.000	863.00	0.00
12.00	**57.82**	**0.001**	**866.94**	**57.83**
18.00	1.55	0.000	864.01	1.55
24.00	0.94	0.000	863.90	0.94
30.00	0.00	0.000	863.51	0.00
36.00	0.00	0.000	863.50	0.00
42.00	0.00	0.000	863.50	0.00
48.00	0.00	0.000	863.50	0.00
54.00	0.00	0.000	863.50	0.00
60.00	0.00	0.000	863.50	0.00
66.00	0.00	0.000	863.50	0.00
72.00	0.00	0.000	863.50	0.00
78.00	0.00	0.000	863.50	0.00
84.00	0.00	0.000	863.50	0.00
90.00	0.00	0.000	863.50	0.00
96.00	0.00	0.000	863.50	0.00
102.00	0.00	0.000	863.50	0.00
108.00	0.00	0.000	863.50	0.00
114.00	0.00	0.000	863.50	0.00
120.00	0.00	0.000	863.50	0.00
126.00	0.00	0.000	863.50	0.00
132.00	0.00	0.000	863.50	0.00
138.00	0.00	0.000	863.50	0.00
144.00	0.00	0.000	863.50	0.00
150.00	0.00	0.000	863.50	0.00
156.00	0.00	0.000	863.50	0.00
162.00	0.00	0.000	863.50	0.00
168.00	0.00	0.000	863.50	0.00
174.00	0.00	0.000	863.50	0.00
180.00	0.00	0.000	863.50	0.00
186.00	0.00	0.000	863.50	0.00
192.00	0.00	0.000	863.50	0.00

Summary for Pond FB-C: Pond C Forebay

Inflow Area = 49.680 ac, 0.00% Impervious, Inflow Depth = 2.38" for 10 YR event
Inflow = 80.20 cfs @ 11.99 hrs, Volume= 9.836 af
Outflow = 67.73 cfs @ 12.30 hrs, Volume= 10.239 af, Atten= 16%, Lag= 18.7 min
Primary = 67.73 cfs @ 12.30 hrs, Volume= 10.239 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs / 3
Starting Elev= 859.00' Surf.Area= 16,463 sf Storage= 15,614 cf
Peak Elev= 859.53' @ 12.30 hrs Surf.Area= 17,354 sf Storage= 24,498 cf (8,885 cf above start)

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	206,682 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
858.00	14,765	0	0
860.00	18,160	32,925	32,925
862.00	21,799	39,959	72,884
864.00	25,683	47,482	120,366
866.00	29,812	55,495	175,861
867.00	31,830	30,821	206,682

Device	Routing	Invert	Outlet Devices
#1	Primary	858.00'	**Custom Weir/Orifice X 0.40, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 9.00 Width (feet) 25.00 61.00

Primary OutFlow Max=67.71 cfs @ 12.30 hrs HW=859.53' (Free Discharge)
↑—**1=Custom Weir/Orifice** (Weir Controls 67.71 cfs @ 1.58 fps)

Hydrograph for Pond FB-C: Pond C Forebay

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	15,614	859.00	34.85
6.00	0.00	0	858.00	0.00
12.00	**79.41**	**23,372**	**859.46**	**63.21**
18.00	3.50	**3,352**	**858.22**	**3.58**
24.00	2.06	2,312	858.16	2.08
30.00	0.05	92	858.01	0.06
36.00	0.01	14	858.00	0.01
42.00	0.00	2	858.00	0.00
48.00	0.00	0	858.00	0.00
54.00	0.00	0	858.00	0.00
60.00	0.00	0	858.00	0.00
66.00	0.00	0	858.00	0.00
72.00	0.00	0	858.00	0.00
78.00	0.00	0	858.00	0.00
84.00	0.00	0	858.00	0.00
90.00	0.00	0	858.00	0.00
96.00	0.00	0	858.00	0.00
102.00	0.00	0	858.00	0.00
108.00	0.00	0	858.00	0.00
114.00	0.00	0	858.00	0.00
120.00	0.00	0	858.00	0.00
126.00	0.00	0	858.00	0.00
132.00	0.00	0	858.00	0.00
138.00	0.00	0	858.00	0.00
144.00	0.00	0	858.00	0.00
150.00	0.00	0	858.00	0.00
156.00	0.00	0	858.00	0.00
162.00	0.00	0	858.00	0.00
168.00	0.00	0	858.00	0.00
174.00	0.00	0	858.00	0.00
180.00	0.00	0	858.00	0.00
186.00	0.00	0	858.00	0.00
192.00	0.00	0	858.00	0.00

Summary for Pond P-C: Pond C

Inflow Area = 72.940 ac, 0.00% Impervious, Inflow Depth = 2.33" for 10 YR event
Inflow = 142.38 cfs @ 12.00 hrs, Volume= 14.146 af
Outflow = 12.71 cfs @ 13.96 hrs, Volume= 14.117 af, Atten= 91%, Lag= 117.4 min
Primary = 12.71 cfs @ 13.96 hrs, Volume= 14.117 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs / 3
Starting Elev= 859.00' Surf.Area= 155,517 sf Storage= 711,694 cf
Peak Elev= 860.99' @ 13.96 hrs Surf.Area= 166,345 sf Storage= 1,032,527 cf (320,834 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 381.4 min (1,214.8 - 833.4)

Volume	Invert	Avail.Storage	Storage Description
#1	854.00'	1,557,643 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
854.00	129,407	0	0
856.00	139,654	269,061	269,061
858.00	150,147	289,801	558,862
860.00	160,886	311,033	869,895
862.00	171,871	332,757	1,202,652
864.00	183,120	354,991	1,557,643

Device	Routing	Invert	Outlet Devices
#1	Primary	858.42'	**24.0" Round Culvert** L= 259.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 858.42' / 857.13' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	859.00'	**24.0" W x 6.0" H Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	861.50'	**27.5" x 27.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	862.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.50 Width (feet) 33.00 42.00

Primary OutFlow Max=12.71 cfs @ 13.96 hrs HW=860.99' (Free Discharge)
└**1=Culvert** (Passes 12.71 cfs of 17.66 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 12.71 cfs @ 6.35 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=859.00' (Free Discharge)
└**4=Custom Weir/Orifice** (Controls 0.00 cfs)

Hydrograph for Pond P-C: Pond C

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	34.85	712,321	859.00	0.02	0.02	**0.00**
6.00	0.00	721,178	859.06	0.25	0.25	0.00
12.00	**142.36**	**817,866**	**859.67**	**6.17**	**6.17**	0.00
18.00	4.98	**964,594**	**860.58**	**11.10**	**11.10**	0.00
24.00	2.95	843,298	859.83	7.30	7.30	0.00
30.00	0.06	757,084	859.29	2.02	2.02	0.00
36.00	0.01	732,447	859.13	0.65	0.65	0.00
42.00	0.00	723,260	859.07	0.30	0.30	0.00
48.00	0.00	718,291	859.04	0.17	0.17	0.00
54.00	0.00	715,453	859.02	0.10	0.10	0.00
60.00	0.00	713,835	859.01	0.06	0.06	0.00
66.00	0.00	712,913	859.01	0.03	0.03	0.00
72.00	0.00	712,388	859.00	0.02	0.02	0.00
78.00	0.00	712,089	859.00	0.01	0.01	0.00
84.00	0.00	711,919	859.00	0.01	0.01	0.00
90.00	0.00	711,822	859.00	0.00	0.00	0.00
96.00	0.00	711,767	859.00	0.00	0.00	0.00
102.00	0.00	711,735	859.00	0.00	0.00	0.00
108.00	0.00	711,717	859.00	0.00	0.00	0.00
114.00	0.00	711,707	859.00	0.00	0.00	0.00
120.00	0.00	711,701	859.00	0.00	0.00	0.00
126.00	0.00	711,698	859.00	0.00	0.00	0.00
132.00	0.00	711,696	859.00	0.00	0.00	0.00
138.00	0.00	711,695	859.00	0.00	0.00	0.00
144.00	0.00	711,695	859.00	0.00	0.00	0.00
150.00	0.00	711,694	859.00	0.00	0.00	0.00
156.00	0.00	711,694	859.00	0.00	0.00	0.00
162.00	0.00	711,694	859.00	0.00	0.00	0.00
168.00	0.00	711,694	859.00	0.00	0.00	0.00
174.00	0.00	711,694	859.00	0.00	0.00	0.00
180.00	0.00	711,694	859.00	0.00	0.00	0.00
186.00	0.00	711,694	859.00	0.00	0.00	0.00
192.00	0.00	711,694	859.00	0.00	0.00	0.00

Summary for Pond ST-C: Sediment Trap C

Inflow Area = 22.420 ac, 0.00% Impervious, Inflow Depth = 2.32" for 10 YR event
Inflow = 48.97 cfs @ 12.22 hrs, Volume= 4.336 af
Outflow = 37.20 cfs @ 12.38 hrs, Volume= 4.336 af, Atten= 24%, Lag= 9.1 min
Primary = 37.20 cfs @ 12.38 hrs, Volume= 4.336 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs / 3
Peak Elev= 880.13' @ 12.38 hrs Surf.Area= 19,792 sf Storage= 37,809 cf

Plug-Flow detention time= 42.1 min calculated for 4.336 af (100% of inflow)
Center-of-Mass det. time= 41.8 min (889.6 - 847.8)

Volume	Invert	Avail.Storage	Storage Description
#1	878.00'	130,540 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
878.00	15,693	0	0
880.00	19,513	35,206	35,206
882.00	23,733	43,246	78,452
884.00	28,355	52,088	130,540

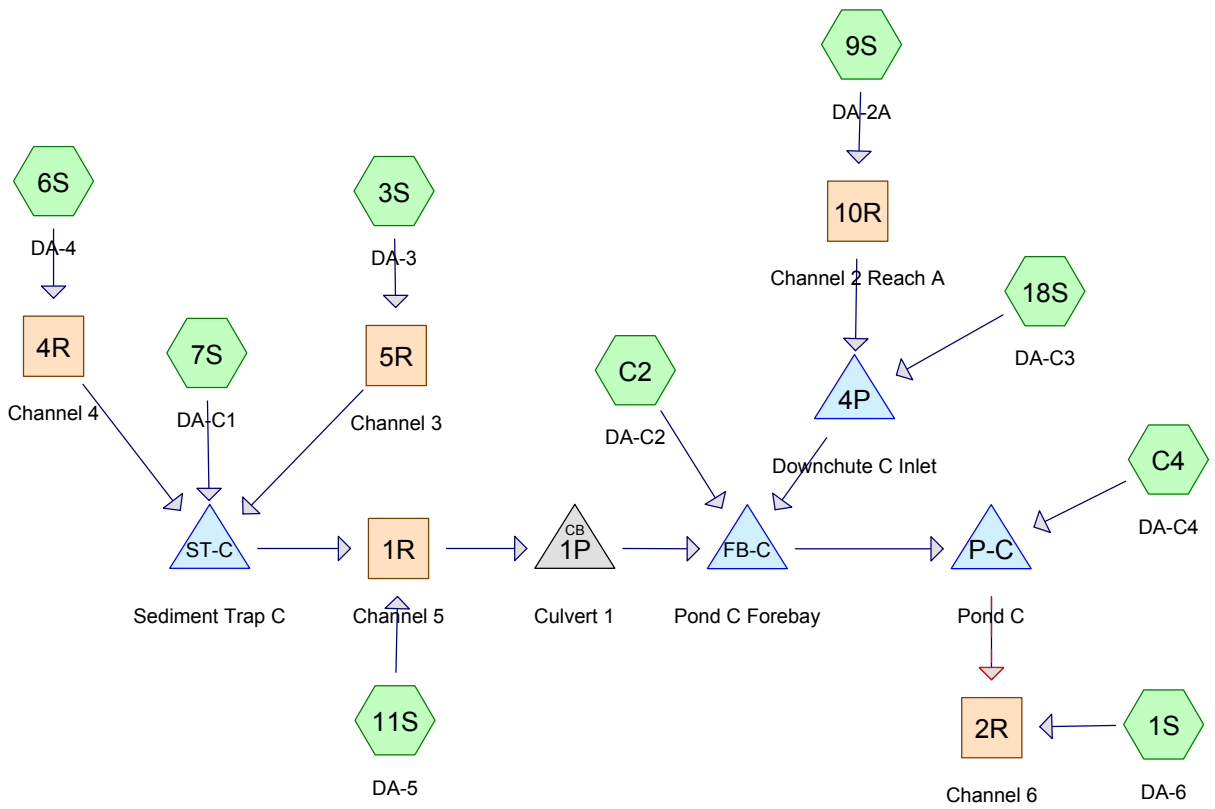
Device	Routing	Invert	Outlet Devices
#1	Primary	878.00'	**Custom Weir/Orifice X 0.40, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 6.00 Width (feet) 4.00 40.00

Primary OutFlow Max=37.12 cfs @ 12.38 hrs HW=880.13' (Free Discharge)
↑**1=Custom Weir/Orifice** (Weir Controls 37.12 cfs @ 1.68 fps)

Hydrograph for Pond ST-C: Sediment Trap C

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	878.00	0.00
6.00	0.00	0	878.00	0.00
12.00	**21.78**	**13,673**	**878.83**	**5.93**
18.00	**1.52**	**6,467**	**878.40**	**1.66**
24.00	0.91	4,567	878.29	0.94
30.00	0.00	592	878.04	0.05
36.00	0.00	98	878.01	0.01
42.00	0.00	16	878.00	0.00
48.00	0.00	3	878.00	0.00
54.00	0.00	0	878.00	0.00
60.00	0.00	0	878.00	0.00
66.00	0.00	0	878.00	0.00
72.00	0.00	0	878.00	0.00
78.00	0.00	0	878.00	0.00
84.00	0.00	0	878.00	0.00
90.00	0.00	0	878.00	0.00
96.00	0.00	0	878.00	0.00
102.00	0.00	0	878.00	0.00
108.00	0.00	0	878.00	0.00
114.00	0.00	0	878.00	0.00
120.00	0.00	0	878.00	0.00
126.00	0.00	0	878.00	0.00
132.00	0.00	0	878.00	0.00
138.00	0.00	0	878.00	0.00
144.00	0.00	0	878.00	0.00
150.00	0.00	0	878.00	0.00
156.00	0.00	0	878.00	0.00
162.00	0.00	0	878.00	0.00
168.00	0.00	0	878.00	0.00
174.00	0.00	0	878.00	0.00
180.00	0.00	0	878.00	0.00
186.00	0.00	0	878.00	0.00
192.00	0.00	0	878.00	0.00

POND C
25-YEAR, 24-HOUR STORM EVENT



Subcat Reach Pond Link

Routing Diagram for 144-189 Pond C
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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
40.100	84	50-75% Grass cover, Fair, HSG D (1S, 3S, 6S, 7S, 9S, 11S, 18S, C4)
33.950	77	Brush, Fair, HSG D (1S, 3S, 6S, 7S, C2, C4)
1.020	91	Gravel roads, HSG D (9S, C2, C4)
75.070	**81**	**TOTAL AREA**

Summary for Subcatchment 1S: DA-6

Runoff = 11.03 cfs @ 11.97 hrs, Volume= 0.525 af, Depth= 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
1.250	84	50-75% Grass cover, Fair, HSG D
0.880	77	Brush, Fair, HSG D
2.130	81	Weighted Average
2.130		100.00% Pervious Area

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

Hydrograph for Subcatchment 1S: DA-6

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.17	0.00	0.00
6.00	0.40	0.00	0.00
9.00	0.73	0.03	**0.06**
12.00	3.30	1.54	**10.28**
15.00	4.24	2.33	0.28
18.00	4.58	2.62	0.17
21.00	4.79	2.80	0.12
24.00	**4.97**	**2.96**	0.10
27.00	4.97	2.96	0.00
30.00	4.97	2.96	0.00
33.00	4.97	2.96	0.00
36.00	4.97	2.96	0.00
39.00	4.97	2.96	0.00
42.00	4.97	2.96	0.00
45.00	4.97	2.96	0.00
48.00	4.97	2.96	0.00
51.00	4.97	2.96	0.00
54.00	4.97	2.96	0.00
57.00	4.97	2.96	0.00
60.00	4.97	2.96	0.00
63.00	4.97	2.96	0.00
66.00	4.97	2.96	0.00
69.00	4.97	2.96	0.00
72.00	4.97	2.96	0.00
75.00	4.97	2.96	0.00
78.00	4.97	2.96	0.00
81.00	4.97	2.96	0.00
84.00	4.97	2.96	0.00
87.00	4.97	2.96	0.00
90.00	4.97	2.96	0.00
93.00	4.97	2.96	0.00
96.00	4.97	2.96	0.00
99.00	4.97	2.96	0.00
102.00	4.97	2.96	0.00
105.00	4.97	2.96	0.00
108.00	4.97	2.96	0.00
111.00	4.97	2.96	0.00
114.00	4.97	2.96	0.00
117.00	4.97	2.96	0.00
120.00	4.97	2.96	0.00
123.00	4.97	2.96	0.00
126.00	4.97	2.96	0.00
129.00	4.97	2.96	0.00
132.00	4.97	2.96	0.00
135.00	4.97	2.96	0.00
138.00	4.97	2.96	0.00
141.00	4.97	2.96	0.00
144.00	4.97	2.96	0.00
147.00	4.97	2.96	0.00
150.00	4.97	2.96	0.00
153.00	4.97	2.96	0.00
156.00	4.97	2.96	0.00
159.00	4.97	2.96	0.00
162.00	4.97	2.96	0.00
165.00	4.97	2.96	0.00
168.00	4.97	2.96	0.00
171.00	4.97	2.96	0.00
174.00	4.97	2.96	0.00
177.00	4.97	2.96	0.00
180.00	4.97	2.96	0.00
183.00	4.97	2.96	0.00
186.00	4.97	2.96	0.00
189.00	4.97	2.96	0.00
192.00	4.97	2.96	0.00

Summary for Subcatchment 3S: DA-3

Runoff = 33.01 cfs @ 12.03 hrs, Volume= 1.880 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
1.430	77	Brush, Fair, HSG D
5.740	84	50-75% Grass cover, Fair, HSG D
7.170	83	Weighted Average
7.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	690	0.0377	1.04		**Lag/CN Method,**

Hydrograph for Subcatchment 3S: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.17	0.00	0.00
6.00	0.40	0.00	0.00
9.00	0.73	0.04	0.26
12.00	3.30	1.69	**31.94**
15.00	4.24	2.50	**0.98**
18.00	4.58	2.79	0.59
21.00	4.79	2.99	0.41
24.00	**4.97**	**3.15**	0.36
27.00	4.97	3.15	0.00
30.00	4.97	3.15	0.00
33.00	4.97	3.15	0.00
36.00	4.97	3.15	0.00
39.00	4.97	3.15	0.00
42.00	4.97	3.15	0.00
45.00	4.97	3.15	0.00
48.00	4.97	3.15	0.00
51.00	4.97	3.15	0.00
54.00	4.97	3.15	0.00
57.00	4.97	3.15	0.00
60.00	4.97	3.15	0.00
63.00	4.97	3.15	0.00
66.00	4.97	3.15	0.00
69.00	4.97	3.15	0.00
72.00	4.97	3.15	0.00
75.00	4.97	3.15	0.00
78.00	4.97	3.15	0.00
81.00	4.97	3.15	0.00
84.00	4.97	3.15	0.00
87.00	4.97	3.15	0.00
90.00	4.97	3.15	0.00
93.00	4.97	3.15	0.00
96.00	4.97	3.15	0.00
99.00	4.97	3.15	0.00
102.00	4.97	3.15	0.00
105.00	4.97	3.15	0.00
108.00	4.97	3.15	0.00
111.00	4.97	3.15	0.00
114.00	4.97	3.15	0.00
117.00	4.97	3.15	0.00
120.00	4.97	3.15	0.00
123.00	4.97	3.15	0.00
126.00	4.97	3.15	0.00
129.00	4.97	3.15	0.00
132.00	4.97	3.15	0.00
135.00	4.97	3.15	0.00
138.00	4.97	3.15	0.00
141.00	4.97	3.15	0.00
144.00	4.97	3.15	0.00
147.00	4.97	3.15	0.00
150.00	4.97	3.15	0.00
153.00	4.97	3.15	0.00
156.00	4.97	3.15	0.00
159.00	4.97	3.15	0.00
162.00	4.97	3.15	0.00
165.00	4.97	3.15	0.00
168.00	4.97	3.15	0.00
171.00	4.97	3.15	0.00
174.00	4.97	3.15	0.00
177.00	4.97	3.15	0.00
180.00	4.97	3.15	0.00
183.00	4.97	3.15	0.00
186.00	4.97	3.15	0.00
189.00	4.97	3.15	0.00
192.00	4.97	3.15	0.00

Summary for Subcatchment 6S: DA-4

Runoff = 33.52 cfs @ 12.09 hrs, Volume= 2.274 af, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
2.410	77	Brush, Fair, HSG D
6.530	84	50-75% Grass cover, Fair, HSG D
8.940	82	Weighted Average
8.940		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	1,100	0.0382	1.11		**Lag/CN Method,**

Hydrograph for Subcatchment 6S: DA-4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.17	0.00	0.00
6.00	0.40	0.00	0.00
9.00	0.73	0.03	0.26
12.00	3.30	1.61	**26.71**
15.00	4.24	2.41	**1.23**
18.00	4.58	2.70	0.73
21.00	4.79	2.90	0.50
24.00	**4.97**	**3.05**	0.45
27.00	4.97	3.05	0.00
30.00	4.97	3.05	0.00
33.00	4.97	3.05	0.00
36.00	4.97	3.05	0.00
39.00	4.97	3.05	0.00
42.00	4.97	3.05	0.00
45.00	4.97	3.05	0.00
48.00	4.97	3.05	0.00
51.00	4.97	3.05	0.00
54.00	4.97	3.05	0.00
57.00	4.97	3.05	0.00
60.00	4.97	3.05	0.00
63.00	4.97	3.05	0.00
66.00	4.97	3.05	0.00
69.00	4.97	3.05	0.00
72.00	4.97	3.05	0.00
75.00	4.97	3.05	0.00
78.00	4.97	3.05	0.00
81.00	4.97	3.05	0.00
84.00	4.97	3.05	0.00
87.00	4.97	3.05	0.00
90.00	4.97	3.05	0.00
93.00	4.97	3.05	0.00
96.00	4.97	3.05	0.00
99.00	4.97	3.05	0.00
102.00	4.97	3.05	0.00
105.00	4.97	3.05	0.00
108.00	4.97	3.05	0.00
111.00	4.97	3.05	0.00
114.00	4.97	3.05	0.00
117.00	4.97	3.05	0.00
120.00	4.97	3.05	0.00
123.00	4.97	3.05	0.00
126.00	4.97	3.05	0.00
129.00	4.97	3.05	0.00
132.00	4.97	3.05	0.00
135.00	4.97	3.05	0.00
138.00	4.97	3.05	0.00
141.00	4.97	3.05	0.00
144.00	4.97	3.05	0.00
147.00	4.97	3.05	0.00
150.00	4.97	3.05	0.00
153.00	4.97	3.05	0.00
156.00	4.97	3.05	0.00
159.00	4.97	3.05	0.00
162.00	4.97	3.05	0.00
165.00	4.97	3.05	0.00
168.00	4.97	3.05	0.00
171.00	4.97	3.05	0.00
174.00	4.97	3.05	0.00
177.00	4.97	3.05	0.00
180.00	4.97	3.05	0.00
183.00	4.97	3.05	0.00
186.00	4.97	3.05	0.00
189.00	4.97	3.05	0.00
192.00	4.97	3.05	0.00

Summary for Subcatchment 7S: DA-C1

Runoff = 21.15 cfs @ 12.11 hrs, Volume= 1.507 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
2.290	84	50-75% Grass cover, Fair, HSG D
4.020	77	Brush, Fair, HSG D
6.310	80	Weighted Average
6.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	1,220	0.0420	1.12		**Lag/CN Method,**

Hydrograph for Subcatchment 7S: DA-C1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.17	0.00	0.00
6.00	0.40	0.00	0.00
9.00	0.73	0.02	0.13
12.00	3.30	1.48	**15.57**
15.00	4.24	2.24	**0.85**
18.00	4.58	2.53	0.51
21.00	4.79	2.71	0.35
24.00	**4.97**	**2.87**	0.31
27.00	4.97	2.87	0.00
30.00	4.97	2.87	0.00
33.00	4.97	2.87	0.00
36.00	4.97	2.87	0.00
39.00	4.97	2.87	0.00
42.00	4.97	2.87	0.00
45.00	4.97	2.87	0.00
48.00	4.97	2.87	0.00
51.00	4.97	2.87	0.00
54.00	4.97	2.87	0.00
57.00	4.97	2.87	0.00
60.00	4.97	2.87	0.00
63.00	4.97	2.87	0.00
66.00	4.97	2.87	0.00
69.00	4.97	2.87	0.00
72.00	4.97	2.87	0.00
75.00	4.97	2.87	0.00
78.00	4.97	2.87	0.00
81.00	4.97	2.87	0.00
84.00	4.97	2.87	0.00
87.00	4.97	2.87	0.00
90.00	4.97	2.87	0.00
93.00	4.97	2.87	0.00
96.00	4.97	2.87	0.00
99.00	4.97	2.87	0.00
102.00	4.97	2.87	0.00
105.00	4.97	2.87	0.00
108.00	4.97	2.87	0.00
111.00	4.97	2.87	0.00
114.00	4.97	2.87	0.00
117.00	4.97	2.87	0.00
120.00	4.97	2.87	0.00
123.00	4.97	2.87	0.00
126.00	4.97	2.87	0.00
129.00	4.97	2.87	0.00
132.00	4.97	2.87	0.00
135.00	4.97	2.87	0.00
138.00	4.97	2.87	0.00
141.00	4.97	2.87	0.00
144.00	4.97	2.87	0.00
147.00	4.97	2.87	0.00
150.00	4.97	2.87	0.00
153.00	4.97	2.87	0.00
156.00	4.97	2.87	0.00
159.00	4.97	2.87	0.00
162.00	4.97	2.87	0.00
165.00	4.97	2.87	0.00
168.00	4.97	2.87	0.00
171.00	4.97	2.87	0.00
174.00	4.97	2.87	0.00
177.00	4.97	2.87	0.00
180.00	4.97	2.87	0.00
183.00	4.97	2.87	0.00
186.00	4.97	2.87	0.00
189.00	4.97	2.87	0.00
192.00	4.97	2.87	0.00

Summary for Subcatchment 9S: DA-2A

Runoff = 61.37 cfs @ 11.97 hrs, Volume= 2.994 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
10.500	84	50-75% Grass cover, Fair, HSG D
0.580	91	Gravel roads, HSG D
11.080	84	Weighted Average
11.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	440	0.0568	1.21		**Lag/CN Method,**
0.2	174	0.2400	17.53	223.52	**Trap/Vee/Rect Channel Flow,** Bot.W=4.00' D=1.50' Z= 3.0 '/' Top.W=13.00' n= 0.040
6.3	614	Total			

Hydrograph for Subcatchment 9S: DA-2A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.17	0.00	0.00
6.00	0.40	0.00	0.01
9.00	0.73	0.05	**0.48**
12.00	3.30	1.76	**58.05**
15.00	4.24	2.59	1.52
18.00	4.58	2.89	0.91
21.00	4.79	3.08	0.63
24.00	**4.97**	**3.24**	0.56
27.00	4.97	3.24	0.00
30.00	4.97	3.24	0.00
33.00	4.97	3.24	0.00
36.00	4.97	3.24	0.00
39.00	4.97	3.24	0.00
42.00	4.97	3.24	0.00
45.00	4.97	3.24	0.00
48.00	4.97	3.24	0.00
51.00	4.97	3.24	0.00
54.00	4.97	3.24	0.00
57.00	4.97	3.24	0.00
60.00	4.97	3.24	0.00
63.00	4.97	3.24	0.00
66.00	4.97	3.24	0.00
69.00	4.97	3.24	0.00
72.00	4.97	3.24	0.00
75.00	4.97	3.24	0.00
78.00	4.97	3.24	0.00
81.00	4.97	3.24	0.00
84.00	4.97	3.24	0.00
87.00	4.97	3.24	0.00
90.00	4.97	3.24	0.00
93.00	4.97	3.24	0.00
96.00	4.97	3.24	0.00
99.00	4.97	3.24	0.00
102.00	4.97	3.24	0.00
105.00	4.97	3.24	0.00
108.00	4.97	3.24	0.00
111.00	4.97	3.24	0.00
114.00	4.97	3.24	0.00
117.00	4.97	3.24	0.00
120.00	4.97	3.24	0.00
123.00	4.97	3.24	0.00
126.00	4.97	3.24	0.00
129.00	4.97	3.24	0.00
132.00	4.97	3.24	0.00
135.00	4.97	3.24	0.00
138.00	4.97	3.24	0.00
141.00	4.97	3.24	0.00
144.00	4.97	3.24	0.00
147.00	4.97	3.24	0.00
150.00	4.97	3.24	0.00
153.00	4.97	3.24	0.00
156.00	4.97	3.24	0.00
159.00	4.97	3.24	0.00
162.00	4.97	3.24	0.00
165.00	4.97	3.24	0.00
168.00	4.97	3.24	0.00
171.00	4.97	3.24	0.00
174.00	4.97	3.24	0.00
177.00	4.97	3.24	0.00
180.00	4.97	3.24	0.00
183.00	4.97	3.24	0.00
186.00	4.97	3.24	0.00
189.00	4.97	3.24	0.00
192.00	4.97	3.24	0.00

Summary for Subcatchment 11S: DA-5

Runoff = 2.41 cfs @ 11.97 hrs, Volume= 0.116 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
0.430	84	50-75% Grass cover, Fair, HSG D
0.430		100.00% Pervious Area

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

Hydrograph for Subcatchment 11S: DA-5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.17	0.00	0.00
6.00	0.40	0.00	0.00
9.00	0.73	0.05	**0.02**
12.00	3.30	1.76	**2.23**
15.00	4.24	2.59	0.06
18.00	4.58	2.89	0.04
21.00	4.79	3.08	0.02
24.00	**4.97**	**3.24**	0.02
27.00	4.97	3.24	0.00
30.00	4.97	3.24	0.00
33.00	4.97	3.24	0.00
36.00	4.97	3.24	0.00
39.00	4.97	3.24	0.00
42.00	4.97	3.24	0.00
45.00	4.97	3.24	0.00
48.00	4.97	3.24	0.00
51.00	4.97	3.24	0.00
54.00	4.97	3.24	0.00
57.00	4.97	3.24	0.00
60.00	4.97	3.24	0.00
63.00	4.97	3.24	0.00
66.00	4.97	3.24	0.00
69.00	4.97	3.24	0.00
72.00	4.97	3.24	0.00
75.00	4.97	3.24	0.00
78.00	4.97	3.24	0.00
81.00	4.97	3.24	0.00
84.00	4.97	3.24	0.00
87.00	4.97	3.24	0.00
90.00	4.97	3.24	0.00
93.00	4.97	3.24	0.00
96.00	4.97	3.24	0.00
99.00	4.97	3.24	0.00
102.00	4.97	3.24	0.00
105.00	4.97	3.24	0.00
108.00	4.97	3.24	0.00
111.00	4.97	3.24	0.00
114.00	4.97	3.24	0.00
117.00	4.97	3.24	0.00
120.00	4.97	3.24	0.00
123.00	4.97	3.24	0.00
126.00	4.97	3.24	0.00
129.00	4.97	3.24	0.00
132.00	4.97	3.24	0.00
135.00	4.97	3.24	0.00
138.00	4.97	3.24	0.00
141.00	4.97	3.24	0.00
144.00	4.97	3.24	0.00
147.00	4.97	3.24	0.00
150.00	4.97	3.24	0.00
153.00	4.97	3.24	0.00
156.00	4.97	3.24	0.00
159.00	4.97	3.24	0.00
162.00	4.97	3.24	0.00
165.00	4.97	3.24	0.00
168.00	4.97	3.24	0.00
171.00	4.97	3.24	0.00
174.00	4.97	3.24	0.00
177.00	4.97	3.24	0.00
180.00	4.97	3.24	0.00
183.00	4.97	3.24	0.00
186.00	4.97	3.24	0.00
189.00	4.97	3.24	0.00
192.00	4.97	3.24	0.00

Summary for Subcatchment 18S: DA-C3

Runoff = 62.46 cfs @ 11.98 hrs, Volume= 3.081 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
11.400	84	50-75% Grass cover, Fair, HSG D
11.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	182	0.1484	1.64		**Lag/CN Method,**
4.3	534	0.0190	2.07		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	397	0.2400	17.53	223.52	**Trap/Vee/Rect Channel Flow,** Bot.W=4.00' D=1.50' Z= 3.0 '/' Top.W=13.00' n= 0.040
6.6	1,113	Total			

Hydrograph for Subcatchment 18S: DA-C3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.17	0.00	0.00
6.00	0.40	0.00	0.01
9.00	0.73	0.05	**0.49**
12.00	3.30	1.76	**60.04**
15.00	4.24	2.59	1.56
18.00	4.58	2.89	0.94
21.00	4.79	3.08	0.65
24.00	**4.97**	**3.24**	0.58
27.00	4.97	3.24	0.00
30.00	4.97	3.24	0.00
33.00	4.97	3.24	0.00
36.00	4.97	3.24	0.00
39.00	4.97	3.24	0.00
42.00	4.97	3.24	0.00
45.00	4.97	3.24	0.00
48.00	4.97	3.24	0.00
51.00	4.97	3.24	0.00
54.00	4.97	3.24	0.00
57.00	4.97	3.24	0.00
60.00	4.97	3.24	0.00
63.00	4.97	3.24	0.00
66.00	4.97	3.24	0.00
69.00	4.97	3.24	0.00
72.00	4.97	3.24	0.00
75.00	4.97	3.24	0.00
78.00	4.97	3.24	0.00
81.00	4.97	3.24	0.00
84.00	4.97	3.24	0.00
87.00	4.97	3.24	0.00
90.00	4.97	3.24	0.00
93.00	4.97	3.24	0.00
96.00	4.97	3.24	0.00
99.00	4.97	3.24	0.00
102.00	4.97	3.24	0.00
105.00	4.97	3.24	0.00
108.00	4.97	3.24	0.00
111.00	4.97	3.24	0.00
114.00	4.97	3.24	0.00
117.00	4.97	3.24	0.00
120.00	4.97	3.24	0.00
123.00	4.97	3.24	0.00
126.00	4.97	3.24	0.00
129.00	4.97	3.24	0.00
132.00	4.97	3.24	0.00
135.00	4.97	3.24	0.00
138.00	4.97	3.24	0.00
141.00	4.97	3.24	0.00
144.00	4.97	3.24	0.00
147.00	4.97	3.24	0.00
150.00	4.97	3.24	0.00
153.00	4.97	3.24	0.00
156.00	4.97	3.24	0.00
159.00	4.97	3.24	0.00
162.00	4.97	3.24	0.00
165.00	4.97	3.24	0.00
168.00	4.97	3.24	0.00
171.00	4.97	3.24	0.00
174.00	4.97	3.24	0.00
177.00	4.97	3.24	0.00
180.00	4.97	3.24	0.00
183.00	4.97	3.24	0.00
186.00	4.97	3.24	0.00
189.00	4.97	3.24	0.00
192.00	4.97	3.24	0.00

Summary for Subcatchment C2: DA-C2

Runoff = 20.30 cfs @ 11.97 hrs, Volume= 0.942 af, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
4.310	77	Brush, Fair, HSG D
0.040	91	Gravel roads, HSG D
4.350	77	Weighted Average
4.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	578	0.2007	1.92		**Lag/CN Method,**
0.5	149	0.0940	4.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	58	0.6200	12.68		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
5.6	785	Total			

Hydrograph for Subcatchment C2: DA-C2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.17	0.00	0.00
6.00	0.40	0.00	0.00
9.00	0.73	0.01	**0.05**
12.00	3.30	1.28	**18.53**
15.00	4.24	2.00	0.53
18.00	4.58	2.27	0.32
21.00	4.79	2.45	0.23
24.00	**4.97**	**2.60**	0.20
27.00	4.97	2.60	0.00
30.00	4.97	2.60	0.00
33.00	4.97	2.60	0.00
36.00	4.97	2.60	0.00
39.00	4.97	2.60	0.00
42.00	4.97	2.60	0.00
45.00	4.97	2.60	0.00
48.00	4.97	2.60	0.00
51.00	4.97	2.60	0.00
54.00	4.97	2.60	0.00
57.00	4.97	2.60	0.00
60.00	4.97	2.60	0.00
63.00	4.97	2.60	0.00
66.00	4.97	2.60	0.00
69.00	4.97	2.60	0.00
72.00	4.97	2.60	0.00
75.00	4.97	2.60	0.00
78.00	4.97	2.60	0.00
81.00	4.97	2.60	0.00
84.00	4.97	2.60	0.00
87.00	4.97	2.60	0.00
90.00	4.97	2.60	0.00
93.00	4.97	2.60	0.00
96.00	4.97	2.60	0.00
99.00	4.97	2.60	0.00
102.00	4.97	2.60	0.00
105.00	4.97	2.60	0.00
108.00	4.97	2.60	0.00
111.00	4.97	2.60	0.00
114.00	4.97	2.60	0.00
117.00	4.97	2.60	0.00
120.00	4.97	2.60	0.00
123.00	4.97	2.60	0.00
126.00	4.97	2.60	0.00
129.00	4.97	2.60	0.00
132.00	4.97	2.60	0.00
135.00	4.97	2.60	0.00
138.00	4.97	2.60	0.00
141.00	4.97	2.60	0.00
144.00	4.97	2.60	0.00
147.00	4.97	2.60	0.00
150.00	4.97	2.60	0.00
153.00	4.97	2.60	0.00
156.00	4.97	2.60	0.00
159.00	4.97	2.60	0.00
162.00	4.97	2.60	0.00
165.00	4.97	2.60	0.00
168.00	4.97	2.60	0.00
171.00	4.97	2.60	0.00
174.00	4.97	2.60	0.00
177.00	4.97	2.60	0.00
180.00	4.97	2.60	0.00
183.00	4.97	2.60	0.00
186.00	4.97	2.60	0.00
189.00	4.97	2.60	0.00
192.00	4.97	2.60	0.00

Summary for Subcatchment C4: DA-C4

Runoff = 106.62 cfs @ 11.98 hrs, Volume= 5.207 af, Depth= 2.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
1.960	84	50-75% Grass cover, Fair, HSG D
20.900	77	Brush, Fair, HSG D
0.400	91	Gravel roads, HSG D
23.260	78	Weighted Average
23.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	176	0.2500	1.74		**Lag/CN Method,**
5.2	600	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.9	776	Total			

Hydrograph for Subcatchment C4: DA-C4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.17	0.00	0.00
6.00	0.40	0.00	0.00
9.00	0.73	0.01	**0.35**
12.00	3.30	1.34	**104.57**
15.00	4.24	2.08	2.91
18.00	4.58	2.36	1.77
21.00	4.79	2.54	1.23
24.00	**4.97**	**2.69**	1.09
27.00	4.97	2.69	0.00
30.00	4.97	2.69	0.00
33.00	4.97	2.69	0.00
36.00	4.97	2.69	0.00
39.00	4.97	2.69	0.00
42.00	4.97	2.69	0.00
45.00	4.97	2.69	0.00
48.00	4.97	2.69	0.00
51.00	4.97	2.69	0.00
54.00	4.97	2.69	0.00
57.00	4.97	2.69	0.00
60.00	4.97	2.69	0.00
63.00	4.97	2.69	0.00
66.00	4.97	2.69	0.00
69.00	4.97	2.69	0.00
72.00	4.97	2.69	0.00
75.00	4.97	2.69	0.00
78.00	4.97	2.69	0.00
81.00	4.97	2.69	0.00
84.00	4.97	2.69	0.00
87.00	4.97	2.69	0.00
90.00	4.97	2.69	0.00
93.00	4.97	2.69	0.00
96.00	4.97	2.69	0.00
99.00	4.97	2.69	0.00
102.00	4.97	2.69	0.00
105.00	4.97	2.69	0.00
108.00	4.97	2.69	0.00
111.00	4.97	2.69	0.00
114.00	4.97	2.69	0.00
117.00	4.97	2.69	0.00
120.00	4.97	2.69	0.00
123.00	4.97	2.69	0.00
126.00	4.97	2.69	0.00
129.00	4.97	2.69	0.00
132.00	4.97	2.69	0.00
135.00	4.97	2.69	0.00
138.00	4.97	2.69	0.00
141.00	4.97	2.69	0.00
144.00	4.97	2.69	0.00
147.00	4.97	2.69	0.00
150.00	4.97	2.69	0.00
153.00	4.97	2.69	0.00
156.00	4.97	2.69	0.00
159.00	4.97	2.69	0.00
162.00	4.97	2.69	0.00
165.00	4.97	2.69	0.00
168.00	4.97	2.69	0.00
171.00	4.97	2.69	0.00
174.00	4.97	2.69	0.00
177.00	4.97	2.69	0.00
180.00	4.97	2.69	0.00
183.00	4.97	2.69	0.00
186.00	4.97	2.69	0.00
189.00	4.97	2.69	0.00
192.00	4.97	2.69	0.00

Summary for Reach 1R: Channel 5

Inflow Area = 22.850 ac, 0.00% Impervious, Inflow Depth = 3.03" for 25 YR event
Inflow = 52.61 cfs @ 12.34 hrs, Volume= 5.778 af
Outflow = 52.58 cfs @ 12.34 hrs, Volume= 5.778 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 10.09 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.09 fps, Avg. Travel Time= 0.4 min

Peak Storage= 261 cf @ 12.34 hrs
Average Depth at Peak Storage= 0.81'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 331.37 cfs

4.00' x 2.00' deep channel, n= 0.043
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 50.0' Slope= 0.1800 '/'
Inlet Invert= 876.00', Outlet Invert= 867.00'

‡

Hydrograph for Reach 1R: Channel 5

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	876.00	0.00
6.00	0.00	0	876.00	0.00
12.00	**12.54**	**95**	**876.37**	**12.37**
18.00	**2.08**	**29**	**876.13**	**2.09**
24.00	1.19	20	876.09	1.19
30.00	0.05	2	876.01	0.05
36.00	0.01	0	876.00	0.01
42.00	0.00	0	876.00	0.00
48.00	0.00	0	876.00	0.00
54.00	0.00	0	876.00	0.00
60.00	0.00	0	876.00	0.00
66.00	0.00	0	876.00	0.00
72.00	0.00	0	876.00	0.00
78.00	0.00	0	876.00	0.00
84.00	0.00	0	876.00	0.00
90.00	0.00	0	876.00	0.00
96.00	0.00	0	876.00	0.00
102.00	0.00	0	876.00	0.00
108.00	0.00	0	876.00	0.00
114.00	0.00	0	876.00	0.00
120.00	0.00	0	876.00	0.00
126.00	0.00	0	876.00	0.00
132.00	0.00	0	876.00	0.00
138.00	0.00	0	876.00	0.00
144.00	0.00	0	876.00	0.00
150.00	0.00	0	876.00	0.00
156.00	0.00	0	876.00	0.00
162.00	0.00	0	876.00	0.00
168.00	0.00	0	876.00	0.00
174.00	0.00	0	876.00	0.00
180.00	0.00	0	876.00	0.00
186.00	0.00	0	876.00	0.00
192.00	0.00	0	876.00	0.00

Summary for Reach 2R: Channel 6

Inflow Area = 75.070 ac, 0.00% Impervious, Inflow Depth = 3.02" for 25 YR event
Inflow = 18.62 cfs @ 11.98 hrs, Volume= 18.902 af
Outflow = 17.68 cfs @ 12.06 hrs, Volume= 18.902 af, Atten= 5%, Lag= 4.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.59 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 1.00 fps, Avg. Travel Time= 9.6 min

Peak Storage= 2,874 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.86'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 294.91 cfs

4.00' x 3.50' deep channel, n= 0.052
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 580.0' Slope= 0.0293 '/'
Inlet Invert= 857.00', Outlet Invert= 840.00'

Hydrograph for Reach 2R: Channel 6

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.02	0	857.00	0.00
6.00	**0.25**	174	857.07	0.25
12.00	**18.42**	**2,857**	**857.86**	**15.28**
18.00	13.54	**2,372**	**857.74**	**13.58**
24.00	9.73	1,885	857.62	9.78
30.00	3.51	951	857.35	3.60
36.00	0.93	400	857.16	0.95
42.00	0.37	220	857.09	0.37
48.00	0.21	156	857.07	0.21
54.00	0.12	108	857.05	0.12
60.00	0.07	78	857.03	0.07
66.00	0.04	45	857.02	0.04
72.00	0.02	25	857.01	0.02
78.00	0.01	14	857.01	0.01
84.00	0.01	8	857.00	0.01
90.00	0.00	5	857.00	0.00
96.00	0.00	3	857.00	0.00
102.00	0.00	2	857.00	0.00
108.00	0.00	1	857.00	0.00
114.00	0.00	0	857.00	0.00
120.00	0.00	0	857.00	0.00
126.00	0.00	0	857.00	0.00
132.00	0.00	0	857.00	0.00
138.00	0.00	0	857.00	0.00
144.00	0.00	0	857.00	0.00
150.00	0.00	0	857.00	0.00
156.00	0.00	0	857.00	0.00
162.00	0.00	0	857.00	0.00
168.00	0.00	0	857.00	0.00
174.00	0.00	0	857.00	0.00
180.00	0.00	0	857.00	0.00
186.00	0.00	0	857.00	0.00
192.00	0.00	0	857.00	0.00

Summary for Reach 4R: Channel 4

Inflow Area = 8.940 ac, 0.00% Impervious, Inflow Depth = 3.05" for 25 YR event
Inflow = 33.52 cfs @ 12.09 hrs, Volume= 2.274 af
Outflow = 27.49 cfs @ 12.31 hrs, Volume= 2.274 af, Atten= 18%, Lag= 13.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.65 fps, Min. Travel Time= 8.4 min
Avg. Velocity = 0.40 fps, Avg. Travel Time= 34.0 min

Peak Storage= 13,815 cf @ 12.17 hrs
Average Depth at Peak Storage= 1.79'
Bank-Full Depth= 3.00' Flow Area= 39.0 sf, Capacity= 86.14 cfs

4.00' x 3.00' deep channel, n= 0.100
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 825.0' Slope= 0.0109 '/'
Inlet Invert= 894.00', Outlet Invert= 885.00'

‡

Hydrograph for Reach 4R: Channel 4

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	894.00	0.00
6.00	0.00	0	894.00	0.00
12.00	**26.71**	**8,645**	**895.32**	**5.49**
18.00	**0.73**	**1,078**	**894.27**	**0.77**
24.00	0.45	763	894.20	0.45
30.00	0.00	8	894.00	0.00
36.00	0.00	0	894.00	0.00
42.00	0.00	0	894.00	0.00
48.00	0.00	0	894.00	0.00
54.00	0.00	0	894.00	0.00
60.00	0.00	0	894.00	0.00
66.00	0.00	0	894.00	0.00
72.00	0.00	0	894.00	0.00
78.00	0.00	0	894.00	0.00
84.00	0.00	0	894.00	0.00
90.00	0.00	0	894.00	0.00
96.00	0.00	0	894.00	0.00
102.00	0.00	0	894.00	0.00
108.00	0.00	0	894.00	0.00
114.00	0.00	0	894.00	0.00
120.00	0.00	0	894.00	0.00
126.00	0.00	0	894.00	0.00
132.00	0.00	0	894.00	0.00
138.00	0.00	0	894.00	0.00
144.00	0.00	0	894.00	0.00
150.00	0.00	0	894.00	0.00
156.00	0.00	0	894.00	0.00
162.00	0.00	0	894.00	0.00
168.00	0.00	0	894.00	0.00
174.00	0.00	0	894.00	0.00
180.00	0.00	0	894.00	0.00
186.00	0.00	0	894.00	0.00
192.00	0.00	0	894.00	0.00

Summary for Reach 5R: Channel 3

Inflow Area = 7.170 ac, 0.00% Impervious, Inflow Depth = 3.15" for 25 YR event
Inflow = 33.01 cfs @ 12.03 hrs, Volume= 1.880 af
Outflow = 27.47 cfs @ 12.19 hrs, Volume= 1.880 af, Atten= 17%, Lag= 10.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.00 fps, Min. Travel Time= 6.5 min
Avg. Velocity = 0.74 fps, Avg. Travel Time= 26.3 min

Peak Storage= 10,792 cf @ 12.08 hrs
Average Depth at Peak Storage= 1.37'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 192.38 cfs

4.00' x 3.50' deep channel, n= 0.077
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,170.0' Slope= 0.0274 '/'
Inlet Invert= 916.00', Outlet Invert= 884.00'

Hydrograph for Reach 5R: Channel 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	916.00	0.00
6.00	0.00	0	916.00	0.00
12.00	**31.94**	**8,965**	**917.20**	**10.08**
18.00	**0.59**	**801**	**916.16**	**0.62**
24.00	0.36	578	916.12	0.37
30.00	0.00	1	916.00	0.00
36.00	0.00	0	916.00	0.00
42.00	0.00	0	916.00	0.00
48.00	0.00	0	916.00	0.00
54.00	0.00	0	916.00	0.00
60.00	0.00	0	916.00	0.00
66.00	0.00	0	916.00	0.00
72.00	0.00	0	916.00	0.00
78.00	0.00	0	916.00	0.00
84.00	0.00	0	916.00	0.00
90.00	0.00	0	916.00	0.00
96.00	0.00	0	916.00	0.00
102.00	0.00	0	916.00	0.00
108.00	0.00	0	916.00	0.00
114.00	0.00	0	916.00	0.00
120.00	0.00	0	916.00	0.00
126.00	0.00	0	916.00	0.00
132.00	0.00	0	916.00	0.00
138.00	0.00	0	916.00	0.00
144.00	0.00	0	916.00	0.00
150.00	0.00	0	916.00	0.00
156.00	0.00	0	916.00	0.00
162.00	0.00	0	916.00	0.00
168.00	0.00	0	916.00	0.00
174.00	0.00	0	916.00	0.00
180.00	0.00	0	916.00	0.00
186.00	0.00	0	916.00	0.00
192.00	0.00	0	916.00	0.00

Summary for Reach 10R: Channel 2 Reach A

Inflow Area = 11.080 ac, 0.00% Impervious, Inflow Depth = 3.24" for 25 YR event
Inflow = 61.37 cfs @ 11.97 hrs, Volume= 2.994 af
Outflow = 44.71 cfs @ 12.18 hrs, Volume= 2.994 af, Atten= 27%, Lag= 12.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.00 fps, Min. Travel Time= 8.8 min
Avg. Velocity = 0.67 fps, Avg. Travel Time= 39.3 min

Peak Storage= 23,729 cf @ 12.04 hrs
Average Depth at Peak Storage= 1.91'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 160.67 cfs

4.00' x 3.50' deep channel, n= 0.100
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,585.0' Slope= 0.0322 '/'
Inlet Invert= 919.00', Outlet Invert= 868.00'

Hydrograph for Reach 10R: Channel 2 Reach A

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	919.00	0.00
6.00	**0.01**	2	919.00	0.00
12.00	**58.05**	**22,739**	**920.86**	**16.07**
18.00	0.91	**1,628**	**919.23**	**0.97**
24.00	0.56	1,171	919.17	0.57
30.00	0.00	14	919.00	0.00
36.00	0.00	0	919.00	0.00
42.00	0.00	0	919.00	0.00
48.00	0.00	0	919.00	0.00
54.00	0.00	0	919.00	0.00
60.00	0.00	0	919.00	0.00
66.00	0.00	0	919.00	0.00
72.00	0.00	0	919.00	0.00
78.00	0.00	0	919.00	0.00
84.00	0.00	0	919.00	0.00
90.00	0.00	0	919.00	0.00
96.00	0.00	0	919.00	0.00
102.00	0.00	0	919.00	0.00
108.00	0.00	0	919.00	0.00
114.00	0.00	0	919.00	0.00
120.00	0.00	0	919.00	0.00
126.00	0.00	0	919.00	0.00
132.00	0.00	0	919.00	0.00
138.00	0.00	0	919.00	0.00
144.00	0.00	0	919.00	0.00
150.00	0.00	0	919.00	0.00
156.00	0.00	0	919.00	0.00
162.00	0.00	0	919.00	0.00
168.00	0.00	0	919.00	0.00
174.00	0.00	0	919.00	0.00
180.00	0.00	0	919.00	0.00
186.00	0.00	0	919.00	0.00
192.00	0.00	0	919.00	0.00

Summary for Pond 1P: Culvert 1

Inflow Area = 22.850 ac, 0.00% Impervious, Inflow Depth = 3.03" for 25 YR event
Inflow = 52.58 cfs @ 12.34 hrs, Volume= 5.778 af
Outflow = 52.58 cfs @ 12.34 hrs, Volume= 5.778 af, Atten= 0%, Lag= 0.0 min
Primary = 52.58 cfs @ 12.34 hrs, Volume= 5.778 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Peak Elev= 868.54' @ 12.34 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	865.50'	**42.0" Round Culvert** L= 47.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 865.50' / 862.00' S= 0.0745 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 9.62 sf

Primary OutFlow Max=52.45 cfs @ 12.34 hrs HW=868.53' (Free Discharge)
↑**1=Culvert** (Inlet Controls 52.45 cfs @ 5.93 fps)

Hydrograph for Pond 1P: Culvert 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	865.50	0.00
3.00	0.00	865.50	0.00
6.00	0.00	865.50	0.00
9.00	0.10	865.61	0.10
12.00	**12.37**	**866.79**	**12.37**
15.00	**3.79**	**866.19**	**3.79**
18.00	2.09	866.01	2.09
21.00	1.39	865.91	1.39
24.00	1.19	865.88	1.19
27.00	0.18	865.65	0.18
30.00	0.05	865.58	0.05
33.00	0.02	865.55	0.02
36.00	0.01	865.53	0.01
39.00	0.00	865.51	0.00
42.00	0.00	865.50	0.00
45.00	0.00	865.50	0.00
48.00	0.00	865.50	0.00
51.00	0.00	865.50	0.00
54.00	0.00	865.50	0.00
57.00	0.00	865.50	0.00
60.00	0.00	865.50	0.00
63.00	0.00	865.50	0.00
66.00	0.00	865.50	0.00
69.00	0.00	865.50	0.00
72.00	0.00	865.50	0.00
75.00	0.00	865.50	0.00
78.00	0.00	865.50	0.00
81.00	0.00	865.50	0.00
84.00	0.00	865.50	0.00
87.00	0.00	865.50	0.00
90.00	0.00	865.50	0.00
93.00	0.00	865.50	0.00
96.00	0.00	865.50	0.00
99.00	0.00	865.50	0.00
102.00	0.00	865.50	0.00
105.00	0.00	865.50	0.00
108.00	0.00	865.50	0.00
111.00	0.00	865.50	0.00
114.00	0.00	865.50	0.00
117.00	0.00	865.50	0.00
120.00	0.00	865.50	0.00
123.00	0.00	865.50	0.00
126.00	0.00	865.50	0.00
129.00	0.00	865.50	0.00
132.00	0.00	865.50	0.00
135.00	0.00	865.50	0.00
138.00	0.00	865.50	0.00
141.00	0.00	865.50	0.00
144.00	0.00	865.50	0.00
147.00	0.00	865.50	0.00
150.00	0.00	865.50	0.00
153.00	0.00	865.50	0.00
156.00	0.00	865.50	0.00
159.00	0.00	865.50	0.00
162.00	0.00	865.50	0.00
165.00	0.00	865.50	0.00
168.00	0.00	865.50	0.00
171.00	0.00	865.50	0.00
174.00	0.00	865.50	0.00
177.00	0.00	865.50	0.00
180.00	0.00	865.50	0.00
183.00	0.00	865.50	0.00
186.00	0.00	865.50	0.00
189.00	0.00	865.50	0.00
192.00	0.00	865.50	0.00

Summary for Pond 4P: Downchute C Inlet

Inflow Area = 22.480 ac, 0.00% Impervious, Inflow Depth = 3.24" for 25 YR event
Inflow = 76.64 cfs @ 11.99 hrs, Volume= 6.075 af
Outflow = 76.64 cfs @ 11.99 hrs, Volume= 6.075 af, Atten= 0%, Lag= 0.0 min
Primary = 76.64 cfs @ 11.99 hrs, Volume= 6.075 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs / 3
Peak Elev= 867.72' @ 11.99 hrs Surf.Area= 0.000 ac Storage= 0.002 af

Plug-Flow detention time= 0.1 min calculated for 6.074 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (821.6 - 821.5)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	0.002 af	**4.00'W x 4.00'L x 5.00'H Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	863.50'	**48.0" Round Culvert** L= 120.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 863.50' / 862.00' S= 0.0125 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 12.57 sf

Primary OutFlow Max=75.80 cfs @ 11.99 hrs HW=867.68' (Free Discharge)
1=Culvert (Barrel Controls 75.80 cfs @ 7.17 fps)

Hydrograph for Pond 4P: Downchute C Inlet

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	863.00	0.00
6.00	0.01	0.000	863.10	0.00
12.00	**76.11**	**0.002**	**867.70**	**76.13**
18.00	1.91	0.000	864.06	1.91
24.00	1.15	0.000	863.94	1.15
30.00	0.00	0.000	863.51	0.00
36.00	0.00	0.000	863.50	0.00
42.00	0.00	0.000	863.50	0.00
48.00	0.00	0.000	863.50	0.00
54.00	0.00	0.000	863.50	0.00
60.00	0.00	0.000	863.50	0.00
66.00	0.00	0.000	863.50	0.00
72.00	0.00	0.000	863.50	0.00
78.00	0.00	0.000	863.50	0.00
84.00	0.00	0.000	863.50	0.00
90.00	0.00	0.000	863.50	0.00
96.00	0.00	0.000	863.50	0.00
102.00	0.00	0.000	863.50	0.00
108.00	0.00	0.000	863.50	0.00
114.00	0.00	0.000	863.50	0.00
120.00	0.00	0.000	863.50	0.00
126.00	0.00	0.000	863.50	0.00
132.00	0.00	0.000	863.50	0.00
138.00	0.00	0.000	863.50	0.00
144.00	0.00	0.000	863.50	0.00
150.00	0.00	0.000	863.50	0.00
156.00	0.00	0.000	863.50	0.00
162.00	0.00	0.000	863.50	0.00
168.00	0.00	0.000	863.50	0.00
174.00	0.00	0.000	863.50	0.00
180.00	0.00	0.000	863.50	0.00
186.00	0.00	0.000	863.50	0.00
192.00	0.00	0.000	863.50	0.00

Summary for Pond FB-C: Pond C Forebay

Inflow Area = 49.680 ac, 0.00% Impervious, Inflow Depth = 3.09" for 25 YR event
Inflow = 107.81 cfs @ 11.99 hrs, Volume= 12.795 af
Outflow = 94.19 cfs @ 12.27 hrs, Volume= 13.199 af, Atten= 13%, Lag= 17.0 min
Primary = 94.19 cfs @ 12.27 hrs, Volume= 13.199 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs / 3
Starting Elev= 859.00' Surf.Area= 16,463 sf Storage= 15,614 cf
Peak Elev= 859.88' @ 12.27 hrs Surf.Area= 17,948 sf Storage= 30,669 cf (15,055 cf above start)

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	206,682 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
858.00	14,765	0	0
860.00	18,160	32,925	32,925
862.00	21,799	39,959	72,884
864.00	25,683	47,482	120,366
866.00	29,812	55,495	175,861
867.00	31,830	30,821	206,682

Device	Routing	Invert	Outlet Devices
#1	Primary	858.00'	**Custom Weir/Orifice X 0.40, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 9.00 Width (feet) 25.00 61.00

Primary OutFlow Max=94.16 cfs @ 12.27 hrs HW=859.87' (Free Discharge)
↑—**1=Custom Weir/Orifice** (Weir Controls 94.16 cfs @ 1.75 fps)

Hydrograph for Pond FB-C: Pond C Forebay

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	15,614	859.00	34.85
6.00	0.00	0	858.00	0.00
12.00	**107.02**	**29,329**	**859.80**	**88.21**
18.00	4.32	**3,886**	**858.26**	**4.42**
24.00	2.54	2,702	858.18	2.56
30.00	0.06	96	858.01	0.06
36.00	0.01	15	858.00	0.01
42.00	0.00	2	858.00	0.00
48.00	0.00	0	858.00	0.00
54.00	0.00	0	858.00	0.00
60.00	0.00	0	858.00	0.00
66.00	0.00	0	858.00	0.00
72.00	0.00	0	858.00	0.00
78.00	0.00	0	858.00	0.00
84.00	0.00	0	858.00	0.00
90.00	0.00	0	858.00	0.00
96.00	0.00	0	858.00	0.00
102.00	0.00	0	858.00	0.00
108.00	0.00	0	858.00	0.00
114.00	0.00	0	858.00	0.00
120.00	0.00	0	858.00	0.00
126.00	0.00	0	858.00	0.00
132.00	0.00	0	858.00	0.00
138.00	0.00	0	858.00	0.00
144.00	0.00	0	858.00	0.00
150.00	0.00	0	858.00	0.00
156.00	0.00	0	858.00	0.00
162.00	0.00	0	858.00	0.00
168.00	0.00	0	858.00	0.00
174.00	0.00	0	858.00	0.00
180.00	0.00	0	858.00	0.00
186.00	0.00	0	858.00	0.00
192.00	0.00	0	858.00	0.00

Summary for Pond P-C: Pond C

Inflow Area = 72.940 ac, 0.00% Impervious, Inflow Depth = 3.03" for 25 YR event
Inflow = 192.78 cfs @ 12.00 hrs, Volume= 18.405 af
Outflow = 17.05 cfs @ 13.79 hrs, Volume= 18.377 af, Atten= 91%, Lag= 107.6 min
Primary = 17.05 cfs @ 13.79 hrs, Volume= 18.377 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs / 3
Starting Elev= 859.00' Surf.Area= 155,517 sf Storage= 711,694 cf
Peak Elev= 861.67' @ 13.79 hrs Surf.Area= 170,036 sf Storage= 1,145,537 cf (433,843 cf above start)

Plug-Flow detention time= 1,609.6 min calculated for 2.024 af (11% of inflow)
Center-of-Mass det. time= 408.6 min (1,237.3 - 828.7)

Volume	Invert	Avail.Storage	Storage Description
#1	854.00'	1,557,643 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
854.00	129,407	0	0
856.00	139,654	269,061	269,061
858.00	150,147	289,801	558,862
860.00	160,886	311,033	869,895
862.00	171,871	332,757	1,202,652
864.00	183,120	354,991	1,557,643

Device	Routing	Invert	Outlet Devices
#1	Primary	858.42'	**24.0" Round Culvert** L= 259.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 858.42' / 857.13' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	859.00'	**24.0" W x 6.0" H Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	861.50'	**27.5" x 27.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	862.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.50 Width (feet) 33.00 42.00

Primary OutFlow Max=16.99 cfs @ 13.79 hrs HW=861.67' (Free Discharge)
└**1=Culvert** (Passes 16.99 cfs of 19.47 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 14.96 cfs @ 7.48 fps)
  └**3=Orifice/Grate** (Weir Controls 2.03 cfs @ 1.33 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=859.00' (Free Discharge)
└**4=Custom Weir/Orifice** (Controls 0.00 cfs)

Hydrograph for Pond P-C: Pond C

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	34.85	712,321	859.00	0.02	0.02	**0.00**
6.00	0.00	721,178	859.06	0.25	0.25	0.00
12.00	**192.78**	**865,393**	**859.97**	**8.14**	**8.14**	0.00
18.00	6.18	**1,063,615**	**861.18**	**13.37**	**13.37**	0.00
24.00	3.65	910,992	860.25	9.62	9.62	0.00
30.00	0.06	777,489	859.42	3.51	3.51	0.00
36.00	0.01	738,294	859.17	0.93	0.93	0.00
42.00	0.00	725,729	859.09	0.37	0.37	0.00
48.00	0.00	719,698	859.05	0.21	0.21	0.00
54.00	0.00	716,254	859.03	0.12	0.12	0.00
60.00	0.00	714,291	859.02	0.07	0.07	0.00
66.00	0.00	713,173	859.01	0.04	0.04	0.00
72.00	0.00	712,536	859.01	0.02	0.02	0.00
78.00	0.00	712,174	859.00	0.01	0.01	0.00
84.00	0.00	711,967	859.00	0.01	0.01	0.00
90.00	0.00	711,849	859.00	0.00	0.00	0.00
96.00	0.00	711,782	859.00	0.00	0.00	0.00
102.00	0.00	711,744	859.00	0.00	0.00	0.00
108.00	0.00	711,722	859.00	0.00	0.00	0.00
114.00	0.00	711,710	859.00	0.00	0.00	0.00
120.00	0.00	711,703	859.00	0.00	0.00	0.00
126.00	0.00	711,699	859.00	0.00	0.00	0.00
132.00	0.00	711,697	859.00	0.00	0.00	0.00
138.00	0.00	711,695	859.00	0.00	0.00	0.00
144.00	0.00	711,695	859.00	0.00	0.00	0.00
150.00	0.00	711,694	859.00	0.00	0.00	0.00
156.00	0.00	711,694	859.00	0.00	0.00	0.00
162.00	0.00	711,694	859.00	0.00	0.00	0.00
168.00	0.00	711,694	859.00	0.00	0.00	0.00
174.00	0.00	711,694	859.00	0.00	0.00	0.00
180.00	0.00	711,694	859.00	0.00	0.00	0.00
186.00	0.00	711,694	859.00	0.00	0.00	0.00
192.00	0.00	711,694	859.00	0.00	0.00	0.00

Summary for Pond ST-C: Sediment Trap C

Inflow Area = 22.420 ac, 0.00% Impervious, Inflow Depth = 3.03" for 25 YR event
Inflow = 65.65 cfs @ 12.21 hrs, Volume= 5.662 af
Outflow = 52.34 cfs @ 12.34 hrs, Volume= 5.662 af, Atten= 20%, Lag= 7.8 min
Primary = 52.34 cfs @ 12.34 hrs, Volume= 5.662 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs / 3
Peak Elev= 880.51' @ 12.34 hrs Surf.Area= 20,595 sf Storage= 45,487 cf

Plug-Flow detention time= 37.7 min calculated for 5.662 af (100% of inflow)
Center-of-Mass det. time= 37.5 min (876.3 - 838.9)

Volume	Invert	Avail.Storage	Storage Description
#1	878.00'	130,540 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
878.00	15,693	0	0
880.00	19,513	35,206	35,206
882.00	23,733	43,246	78,452
884.00	28,355	52,088	130,540

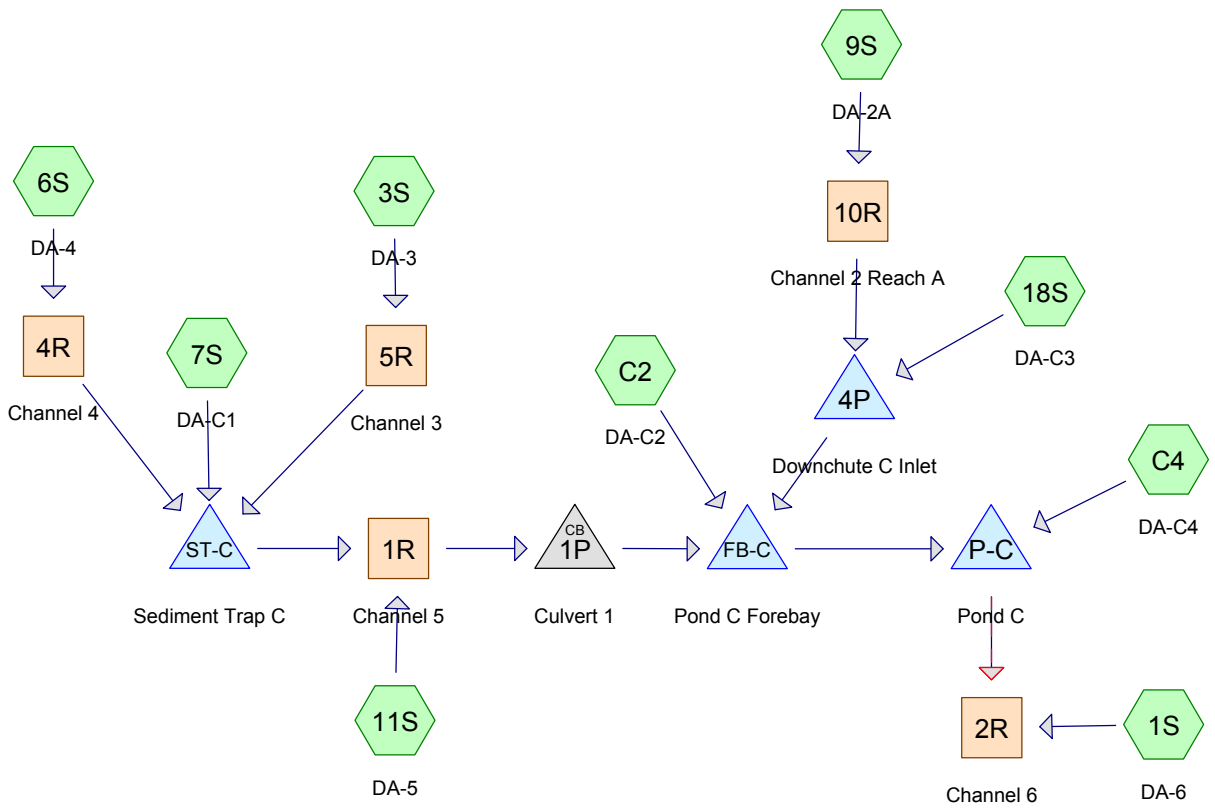
Device	Routing	Invert	Outlet Devices
#1	Primary	878.00'	**Custom Weir/Orifice X 0.40, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 6.00 Width (feet) 4.00 40.00

Primary OutFlow Max=52.21 cfs @ 12.34 hrs HW=880.51' (Free Discharge)
↑—**1=Custom Weir/Orifice** (Weir Controls 52.21 cfs @ 1.80 fps)

Hydrograph for Pond ST-C: Sediment Trap C

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	878.00	0.00
6.00	0.00	0	878.00	0.00
12.00	**31.13**	**18,686**	**879.11**	**10.30**
18.00	**1.89**	**7,330**	**878.45**	**2.05**
24.00	1.13	5,195	878.32	1.16
30.00	0.00	617	878.04	0.05
36.00	0.00	102	878.01	0.01
42.00	0.00	17	878.00	0.00
48.00	0.00	3	878.00	0.00
54.00	0.00	0	878.00	0.00
60.00	0.00	0	878.00	0.00
66.00	0.00	0	878.00	0.00
72.00	0.00	0	878.00	0.00
78.00	0.00	0	878.00	0.00
84.00	0.00	0	878.00	0.00
90.00	0.00	0	878.00	0.00
96.00	0.00	0	878.00	0.00
102.00	0.00	0	878.00	0.00
108.00	0.00	0	878.00	0.00
114.00	0.00	0	878.00	0.00
120.00	0.00	0	878.00	0.00
126.00	0.00	0	878.00	0.00
132.00	0.00	0	878.00	0.00
138.00	0.00	0	878.00	0.00
144.00	0.00	0	878.00	0.00
150.00	0.00	0	878.00	0.00
156.00	0.00	0	878.00	0.00
162.00	0.00	0	878.00	0.00
168.00	0.00	0	878.00	0.00
174.00	0.00	0	878.00	0.00
180.00	0.00	0	878.00	0.00
186.00	0.00	0	878.00	0.00
192.00	0.00	0	878.00	0.00

POND C
100-YEAR, 24-HOUR STORM EVENT



Subcat Reach Pond Link

Routing Diagram for 144-189 Pond C
Prepared by CEC, Inc., Printed 5/23/2016
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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
40.100	84	50-75% Grass cover, Fair, HSG D (1S, 3S, 6S, 7S, 9S, 11S, 18S, C4)
33.950	77	Brush, Fair, HSG D (1S, 3S, 6S, 7S, C2, C4)
1.020	91	Gravel roads, HSG D (9S, C2, C4)
75.070	**81**	**TOTAL AREA**

Summary for Subcatchment 1S: DA-6

Runoff = 15.49 cfs @ 11.97 hrs, Volume= 0.749 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
1.250	84	50-75% Grass cover, Fair, HSG D
0.880	77	Brush, Fair, HSG D
2.130	81	Weighted Average
2.130		100.00% Pervious Area

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

Hydrograph for Subcatchment 1S: DA-6

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.00	0.01
9.00	0.94	0.08	**0.13**
12.00	4.22	2.31	**14.35**
15.00	5.44	3.37	0.38
18.00	5.87	3.76	0.23
21.00	6.15	4.02	0.16
24.00	**6.37**	**4.22**	0.14
27.00	6.37	4.22	0.00
30.00	6.37	4.22	0.00
33.00	6.37	4.22	0.00
36.00	6.37	4.22	0.00
39.00	6.37	4.22	0.00
42.00	6.37	4.22	0.00
45.00	6.37	4.22	0.00
48.00	6.37	4.22	0.00
51.00	6.37	4.22	0.00
54.00	6.37	4.22	0.00
57.00	6.37	4.22	0.00
60.00	6.37	4.22	0.00
63.00	6.37	4.22	0.00
66.00	6.37	4.22	0.00
69.00	6.37	4.22	0.00
72.00	6.37	4.22	0.00
75.00	6.37	4.22	0.00
78.00	6.37	4.22	0.00
81.00	6.37	4.22	0.00
84.00	6.37	4.22	0.00
87.00	6.37	4.22	0.00
90.00	6.37	4.22	0.00
93.00	6.37	4.22	0.00
96.00	6.37	4.22	0.00
99.00	6.37	4.22	0.00
102.00	6.37	4.22	0.00
105.00	6.37	4.22	0.00
108.00	6.37	4.22	0.00
111.00	6.37	4.22	0.00
114.00	6.37	4.22	0.00
117.00	6.37	4.22	0.00
120.00	6.37	4.22	0.00
123.00	6.37	4.22	0.00
126.00	6.37	4.22	0.00
129.00	6.37	4.22	0.00
132.00	6.37	4.22	0.00
135.00	6.37	4.22	0.00
138.00	6.37	4.22	0.00
141.00	6.37	4.22	0.00
144.00	6.37	4.22	0.00
147.00	6.37	4.22	0.00
150.00	6.37	4.22	0.00
153.00	6.37	4.22	0.00
156.00	6.37	4.22	0.00
159.00	6.37	4.22	0.00
162.00	6.37	4.22	0.00
165.00	6.37	4.22	0.00
168.00	6.37	4.22	0.00
171.00	6.37	4.22	0.00
174.00	6.37	4.22	0.00
177.00	6.37	4.22	0.00
180.00	6.37	4.22	0.00
183.00	6.37	4.22	0.00
186.00	6.37	4.22	0.00
189.00	6.37	4.22	0.00
192.00	6.37	4.22	0.00

Summary for Subcatchment 3S: DA-3

Runoff = 45.88 cfs @ 12.02 hrs, Volume= 2.651 af, Depth= 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
1.430	77	Brush, Fair, HSG D
5.740	84	50-75% Grass cover, Fair, HSG D
7.170	83	Weighted Average
7.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	690	0.0377	1.04		**Lag/CN Method,**

Hydrograph for Subcatchment 3S: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.00	0.06
9.00	0.94	0.11	0.49
12.00	4.22	2.48	**44.59**
15.00	5.44	3.57	**1.31**
18.00	5.87	3.97	0.78
21.00	6.15	4.23	0.54
24.00	**6.37**	**4.44**	0.48
27.00	6.37	4.44	0.00
30.00	6.37	4.44	0.00
33.00	6.37	4.44	0.00
36.00	6.37	4.44	0.00
39.00	6.37	4.44	0.00
42.00	6.37	4.44	0.00
45.00	6.37	4.44	0.00
48.00	6.37	4.44	0.00
51.00	6.37	4.44	0.00
54.00	6.37	4.44	0.00
57.00	6.37	4.44	0.00
60.00	6.37	4.44	0.00
63.00	6.37	4.44	0.00
66.00	6.37	4.44	0.00
69.00	6.37	4.44	0.00
72.00	6.37	4.44	0.00
75.00	6.37	4.44	0.00
78.00	6.37	4.44	0.00
81.00	6.37	4.44	0.00
84.00	6.37	4.44	0.00
87.00	6.37	4.44	0.00
90.00	6.37	4.44	0.00
93.00	6.37	4.44	0.00
96.00	6.37	4.44	0.00
99.00	6.37	4.44	0.00
102.00	6.37	4.44	0.00
105.00	6.37	4.44	0.00
108.00	6.37	4.44	0.00
111.00	6.37	4.44	0.00
114.00	6.37	4.44	0.00
117.00	6.37	4.44	0.00
120.00	6.37	4.44	0.00
123.00	6.37	4.44	0.00
126.00	6.37	4.44	0.00
129.00	6.37	4.44	0.00
132.00	6.37	4.44	0.00
135.00	6.37	4.44	0.00
138.00	6.37	4.44	0.00
141.00	6.37	4.44	0.00
144.00	6.37	4.44	0.00
147.00	6.37	4.44	0.00
150.00	6.37	4.44	0.00
153.00	6.37	4.44	0.00
156.00	6.37	4.44	0.00
159.00	6.37	4.44	0.00
162.00	6.37	4.44	0.00
165.00	6.37	4.44	0.00
168.00	6.37	4.44	0.00
171.00	6.37	4.44	0.00
174.00	6.37	4.44	0.00
177.00	6.37	4.44	0.00
180.00	6.37	4.44	0.00
183.00	6.37	4.44	0.00
186.00	6.37	4.44	0.00
189.00	6.37	4.44	0.00
192.00	6.37	4.44	0.00

Summary for Subcatchment 6S: DA-4

Runoff = 47.10 cfs @ 12.08 hrs, Volume= 3.225 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
2.410	77	Brush, Fair, HSG D
6.530	84	50-75% Grass cover, Fair, HSG D
8.940	82	Weighted Average
8.940		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	1,100	0.0382	1.11		**Lag/CN Method,**

Hydrograph for Subcatchment 6S: DA-4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.00	0.04
9.00	0.94	0.09	0.53
12.00	4.22	2.40	**38.11**
15.00	5.44	3.47	**1.65**
18.00	5.87	3.86	0.98
21.00	6.15	4.12	0.67
24.00	**6.37**	**4.33**	0.59
27.00	6.37	4.33	0.00
30.00	6.37	4.33	0.00
33.00	6.37	4.33	0.00
36.00	6.37	4.33	0.00
39.00	6.37	4.33	0.00
42.00	6.37	4.33	0.00
45.00	6.37	4.33	0.00
48.00	6.37	4.33	0.00
51.00	6.37	4.33	0.00
54.00	6.37	4.33	0.00
57.00	6.37	4.33	0.00
60.00	6.37	4.33	0.00
63.00	6.37	4.33	0.00
66.00	6.37	4.33	0.00
69.00	6.37	4.33	0.00
72.00	6.37	4.33	0.00
75.00	6.37	4.33	0.00
78.00	6.37	4.33	0.00
81.00	6.37	4.33	0.00
84.00	6.37	4.33	0.00
87.00	6.37	4.33	0.00
90.00	6.37	4.33	0.00
93.00	6.37	4.33	0.00
96.00	6.37	4.33	0.00
99.00	6.37	4.33	0.00
102.00	6.37	4.33	0.00
105.00	6.37	4.33	0.00
108.00	6.37	4.33	0.00
111.00	6.37	4.33	0.00
114.00	6.37	4.33	0.00
117.00	6.37	4.33	0.00
120.00	6.37	4.33	0.00
123.00	6.37	4.33	0.00
126.00	6.37	4.33	0.00
129.00	6.37	4.33	0.00
132.00	6.37	4.33	0.00
135.00	6.37	4.33	0.00
138.00	6.37	4.33	0.00
141.00	6.37	4.33	0.00
144.00	6.37	4.33	0.00
147.00	6.37	4.33	0.00
150.00	6.37	4.33	0.00
153.00	6.37	4.33	0.00
156.00	6.37	4.33	0.00
159.00	6.37	4.33	0.00
162.00	6.37	4.33	0.00
165.00	6.37	4.33	0.00
168.00	6.37	4.33	0.00
171.00	6.37	4.33	0.00
174.00	6.37	4.33	0.00
177.00	6.37	4.33	0.00
180.00	6.37	4.33	0.00
183.00	6.37	4.33	0.00
186.00	6.37	4.33	0.00
189.00	6.37	4.33	0.00
192.00	6.37	4.33	0.00

Summary for Subcatchment 7S: DA-C1

Runoff = 30.20 cfs @ 12.10 hrs, Volume= 2.165 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
2.290	84	50-75% Grass cover, Fair, HSG D
4.020	77	Brush, Fair, HSG D
6.310	80	Weighted Average
6.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	1,220	0.0420	1.12		**Lag/CN Method,**

Hydrograph for Subcatchment 7S: DA-C1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.00	0.00
9.00	0.94	0.06	0.29
12.00	4.22	2.23	**22.70**
15.00	5.44	3.28	**1.15**
18.00	5.87	3.66	0.68
21.00	6.15	3.91	0.46
24.00	**6.37**	**4.12**	0.41
27.00	6.37	4.12	0.00
30.00	6.37	4.12	0.00
33.00	6.37	4.12	0.00
36.00	6.37	4.12	0.00
39.00	6.37	4.12	0.00
42.00	6.37	4.12	0.00
45.00	6.37	4.12	0.00
48.00	6.37	4.12	0.00
51.00	6.37	4.12	0.00
54.00	6.37	4.12	0.00
57.00	6.37	4.12	0.00
60.00	6.37	4.12	0.00
63.00	6.37	4.12	0.00
66.00	6.37	4.12	0.00
69.00	6.37	4.12	0.00
72.00	6.37	4.12	0.00
75.00	6.37	4.12	0.00
78.00	6.37	4.12	0.00
81.00	6.37	4.12	0.00
84.00	6.37	4.12	0.00
87.00	6.37	4.12	0.00
90.00	6.37	4.12	0.00
93.00	6.37	4.12	0.00
96.00	6.37	4.12	0.00
99.00	6.37	4.12	0.00
102.00	6.37	4.12	0.00
105.00	6.37	4.12	0.00
108.00	6.37	4.12	0.00
111.00	6.37	4.12	0.00
114.00	6.37	4.12	0.00
117.00	6.37	4.12	0.00
120.00	6.37	4.12	0.00
123.00	6.37	4.12	0.00
126.00	6.37	4.12	0.00
129.00	6.37	4.12	0.00
132.00	6.37	4.12	0.00
135.00	6.37	4.12	0.00
138.00	6.37	4.12	0.00
141.00	6.37	4.12	0.00
144.00	6.37	4.12	0.00
147.00	6.37	4.12	0.00
150.00	6.37	4.12	0.00
153.00	6.37	4.12	0.00
156.00	6.37	4.12	0.00
159.00	6.37	4.12	0.00
162.00	6.37	4.12	0.00
165.00	6.37	4.12	0.00
168.00	6.37	4.12	0.00
171.00	6.37	4.12	0.00
174.00	6.37	4.12	0.00
177.00	6.37	4.12	0.00
180.00	6.37	4.12	0.00
183.00	6.37	4.12	0.00
186.00	6.37	4.12	0.00
189.00	6.37	4.12	0.00
192.00	6.37	4.12	0.00

Summary for Subcatchment 9S: DA-2A

Runoff = 84.45 cfs @ 11.97 hrs, Volume= 4.196 af, Depth= 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
10.500	84	50-75% Grass cover, Fair, HSG D
0.580	91	Gravel roads, HSG D
11.080	84	Weighted Average
11.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	440	0.0568	1.21		**Lag/CN Method,**
0.2	174	0.2400	17.53	223.52	**Trap/Vee/Rect Channel Flow,** Bot.W=4.00' D=1.50' Z= 3.0 '/' Top.W=13.00' n= 0.040
6.3	614	Total			

Hydrograph for Subcatchment 9S: DA-2A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.01	0.14
9.00	0.94	0.13	**0.86**
12.00	4.22	2.57	**79.52**
15.00	5.44	3.67	2.02
18.00	5.87	4.07	1.21
21.00	6.15	4.33	0.84
24.00	**6.37**	**4.54**	0.74
27.00	6.37	4.54	0.00
30.00	6.37	4.54	0.00
33.00	6.37	4.54	0.00
36.00	6.37	4.54	0.00
39.00	6.37	4.54	0.00
42.00	6.37	4.54	0.00
45.00	6.37	4.54	0.00
48.00	6.37	4.54	0.00
51.00	6.37	4.54	0.00
54.00	6.37	4.54	0.00
57.00	6.37	4.54	0.00
60.00	6.37	4.54	0.00
63.00	6.37	4.54	0.00
66.00	6.37	4.54	0.00
69.00	6.37	4.54	0.00
72.00	6.37	4.54	0.00
75.00	6.37	4.54	0.00
78.00	6.37	4.54	0.00
81.00	6.37	4.54	0.00
84.00	6.37	4.54	0.00
87.00	6.37	4.54	0.00
90.00	6.37	4.54	0.00
93.00	6.37	4.54	0.00
96.00	6.37	4.54	0.00
99.00	6.37	4.54	0.00
102.00	6.37	4.54	0.00
105.00	6.37	4.54	0.00
108.00	6.37	4.54	0.00
111.00	6.37	4.54	0.00
114.00	6.37	4.54	0.00
117.00	6.37	4.54	0.00
120.00	6.37	4.54	0.00
123.00	6.37	4.54	0.00
126.00	6.37	4.54	0.00
129.00	6.37	4.54	0.00
132.00	6.37	4.54	0.00
135.00	6.37	4.54	0.00
138.00	6.37	4.54	0.00
141.00	6.37	4.54	0.00
144.00	6.37	4.54	0.00
147.00	6.37	4.54	0.00
150.00	6.37	4.54	0.00
153.00	6.37	4.54	0.00
156.00	6.37	4.54	0.00
159.00	6.37	4.54	0.00
162.00	6.37	4.54	0.00
165.00	6.37	4.54	0.00
168.00	6.37	4.54	0.00
171.00	6.37	4.54	0.00
174.00	6.37	4.54	0.00
177.00	6.37	4.54	0.00
180.00	6.37	4.54	0.00
183.00	6.37	4.54	0.00
186.00	6.37	4.54	0.00
189.00	6.37	4.54	0.00
192.00	6.37	4.54	0.00

Summary for Subcatchment 11S: DA-5

Runoff = 3.31 cfs @ 11.97 hrs, Volume= 0.163 af, Depth= 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
0.430	84	50-75% Grass cover, Fair, HSG D
0.430		100.00% Pervious Area

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

Hydrograph for Subcatchment 11S: DA-5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.01	0.01
9.00	0.94	0.13	**0.03**
12.00	4.22	2.57	**3.06**
15.00	5.44	3.67	0.08
18.00	5.87	4.07	0.05
21.00	6.15	4.33	0.03
24.00	**6.37**	**4.54**	0.03
27.00	6.37	4.54	0.00
30.00	6.37	4.54	0.00
33.00	6.37	4.54	0.00
36.00	6.37	4.54	0.00
39.00	6.37	4.54	0.00
42.00	6.37	4.54	0.00
45.00	6.37	4.54	0.00
48.00	6.37	4.54	0.00
51.00	6.37	4.54	0.00
54.00	6.37	4.54	0.00
57.00	6.37	4.54	0.00
60.00	6.37	4.54	0.00
63.00	6.37	4.54	0.00
66.00	6.37	4.54	0.00
69.00	6.37	4.54	0.00
72.00	6.37	4.54	0.00
75.00	6.37	4.54	0.00
78.00	6.37	4.54	0.00
81.00	6.37	4.54	0.00
84.00	6.37	4.54	0.00
87.00	6.37	4.54	0.00
90.00	6.37	4.54	0.00
93.00	6.37	4.54	0.00
96.00	6.37	4.54	0.00
99.00	6.37	4.54	0.00
102.00	6.37	4.54	0.00
105.00	6.37	4.54	0.00
108.00	6.37	4.54	0.00
111.00	6.37	4.54	0.00
114.00	6.37	4.54	0.00
117.00	6.37	4.54	0.00
120.00	6.37	4.54	0.00
123.00	6.37	4.54	0.00
126.00	6.37	4.54	0.00
129.00	6.37	4.54	0.00
132.00	6.37	4.54	0.00
135.00	6.37	4.54	0.00
138.00	6.37	4.54	0.00
141.00	6.37	4.54	0.00
144.00	6.37	4.54	0.00
147.00	6.37	4.54	0.00
150.00	6.37	4.54	0.00
153.00	6.37	4.54	0.00
156.00	6.37	4.54	0.00
159.00	6.37	4.54	0.00
162.00	6.37	4.54	0.00
165.00	6.37	4.54	0.00
168.00	6.37	4.54	0.00
171.00	6.37	4.54	0.00
174.00	6.37	4.54	0.00
177.00	6.37	4.54	0.00
180.00	6.37	4.54	0.00
183.00	6.37	4.54	0.00
186.00	6.37	4.54	0.00
189.00	6.37	4.54	0.00
192.00	6.37	4.54	0.00

Summary for Subcatchment 18S: DA-C3

Runoff = 85.97 cfs @ 11.98 hrs, Volume= 4.317 af, Depth= 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
11.400	84	50-75% Grass cover, Fair, HSG D
11.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	182	0.1484	1.64		**Lag/CN Method,**
4.3	534	0.0190	2.07		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	397	0.2400	17.53	223.52	**Trap/Vee/Rect Channel Flow,** Bot.W=4.00' D=1.50' Z= 3.0 '/' Top.W=13.00' n= 0.040
6.6	1,113	Total			

Hydrograph for Subcatchment 18S: DA-C3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.01	0.15
9.00	0.94	0.13	**0.89**
12.00	4.22	2.57	**82.30**
15.00	5.44	3.67	2.08
18.00	5.87	4.07	1.25
21.00	6.15	4.33	0.86
24.00	**6.37**	**4.54**	0.76
27.00	6.37	4.54	0.00
30.00	6.37	4.54	0.00
33.00	6.37	4.54	0.00
36.00	6.37	4.54	0.00
39.00	6.37	4.54	0.00
42.00	6.37	4.54	0.00
45.00	6.37	4.54	0.00
48.00	6.37	4.54	0.00
51.00	6.37	4.54	0.00
54.00	6.37	4.54	0.00
57.00	6.37	4.54	0.00
60.00	6.37	4.54	0.00
63.00	6.37	4.54	0.00
66.00	6.37	4.54	0.00
69.00	6.37	4.54	0.00
72.00	6.37	4.54	0.00
75.00	6.37	4.54	0.00
78.00	6.37	4.54	0.00
81.00	6.37	4.54	0.00
84.00	6.37	4.54	0.00
87.00	6.37	4.54	0.00
90.00	6.37	4.54	0.00
93.00	6.37	4.54	0.00
96.00	6.37	4.54	0.00
99.00	6.37	4.54	0.00
102.00	6.37	4.54	0.00
105.00	6.37	4.54	0.00
108.00	6.37	4.54	0.00
111.00	6.37	4.54	0.00
114.00	6.37	4.54	0.00
117.00	6.37	4.54	0.00
120.00	6.37	4.54	0.00
123.00	6.37	4.54	0.00
126.00	6.37	4.54	0.00
129.00	6.37	4.54	0.00
132.00	6.37	4.54	0.00
135.00	6.37	4.54	0.00
138.00	6.37	4.54	0.00
141.00	6.37	4.54	0.00
144.00	6.37	4.54	0.00
147.00	6.37	4.54	0.00
150.00	6.37	4.54	0.00
153.00	6.37	4.54	0.00
156.00	6.37	4.54	0.00
159.00	6.37	4.54	0.00
162.00	6.37	4.54	0.00
165.00	6.37	4.54	0.00
168.00	6.37	4.54	0.00
171.00	6.37	4.54	0.00
174.00	6.37	4.54	0.00
177.00	6.37	4.54	0.00
180.00	6.37	4.54	0.00
183.00	6.37	4.54	0.00
186.00	6.37	4.54	0.00
189.00	6.37	4.54	0.00
192.00	6.37	4.54	0.00

Summary for Subcatchment C2: DA-C2

Runoff = 29.36 cfs @ 11.97 hrs, Volume= 1.379 af, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
4.310	77	Brush, Fair, HSG D
0.040	91	Gravel roads, HSG D
4.350	77	Weighted Average
4.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	578	0.2007	1.92		**Lag/CN Method,**
0.5	149	0.0940	4.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	58	0.6200	12.68		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
5.6	785	Total			

Hydrograph for Subcatchment C2: DA-C2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.00	0.00
9.00	0.94	0.03	**0.16**
12.00	4.22	1.99	**26.57**
15.00	5.44	2.99	0.73
18.00	5.87	3.36	0.44
21.00	6.15	3.61	0.31
24.00	**6.37**	**3.80**	0.27
27.00	6.37	3.80	0.00
30.00	6.37	3.80	0.00
33.00	6.37	3.80	0.00
36.00	6.37	3.80	0.00
39.00	6.37	3.80	0.00
42.00	6.37	3.80	0.00
45.00	6.37	3.80	0.00
48.00	6.37	3.80	0.00
51.00	6.37	3.80	0.00
54.00	6.37	3.80	0.00
57.00	6.37	3.80	0.00
60.00	6.37	3.80	0.00
63.00	6.37	3.80	0.00
66.00	6.37	3.80	0.00
69.00	6.37	3.80	0.00
72.00	6.37	3.80	0.00
75.00	6.37	3.80	0.00
78.00	6.37	3.80	0.00
81.00	6.37	3.80	0.00
84.00	6.37	3.80	0.00
87.00	6.37	3.80	0.00
90.00	6.37	3.80	0.00
93.00	6.37	3.80	0.00
96.00	6.37	3.80	0.00
99.00	6.37	3.80	0.00
102.00	6.37	3.80	0.00
105.00	6.37	3.80	0.00
108.00	6.37	3.80	0.00
111.00	6.37	3.80	0.00
114.00	6.37	3.80	0.00
117.00	6.37	3.80	0.00
120.00	6.37	3.80	0.00
123.00	6.37	3.80	0.00
126.00	6.37	3.80	0.00
129.00	6.37	3.80	0.00
132.00	6.37	3.80	0.00
135.00	6.37	3.80	0.00
138.00	6.37	3.80	0.00
141.00	6.37	3.80	0.00
144.00	6.37	3.80	0.00
147.00	6.37	3.80	0.00
150.00	6.37	3.80	0.00
153.00	6.37	3.80	0.00
156.00	6.37	3.80	0.00
159.00	6.37	3.80	0.00
162.00	6.37	3.80	0.00
165.00	6.37	3.80	0.00
168.00	6.37	3.80	0.00
171.00	6.37	3.80	0.00
174.00	6.37	3.80	0.00
177.00	6.37	3.80	0.00
180.00	6.37	3.80	0.00
183.00	6.37	3.80	0.00
186.00	6.37	3.80	0.00
189.00	6.37	3.80	0.00
192.00	6.37	3.80	0.00

Summary for Subcatchment C4: DA-C4

Runoff = 153.23 cfs @ 11.98 hrs, Volume= 7.574 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
1.960	84	50-75% Grass cover, Fair, HSG D
20.900	77	Brush, Fair, HSG D
0.400	91	Gravel roads, HSG D
23.260	78	Weighted Average
23.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	176	0.2500	1.74		**Lag/CN Method,**
5.2	600	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.9	776	Total			

Hydrograph for Subcatchment C4: DA-C4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.00	0.00
9.00	0.94	0.04	**0.97**
12.00	4.22	2.07	**149.60**
15.00	5.44	3.09	3.97
18.00	5.87	3.46	2.40
21.00	6.15	3.71	1.66
24.00	**6.37**	**3.91**	1.47
27.00	6.37	3.91	0.00
30.00	6.37	3.91	0.00
33.00	6.37	3.91	0.00
36.00	6.37	3.91	0.00
39.00	6.37	3.91	0.00
42.00	6.37	3.91	0.00
45.00	6.37	3.91	0.00
48.00	6.37	3.91	0.00
51.00	6.37	3.91	0.00
54.00	6.37	3.91	0.00
57.00	6.37	3.91	0.00
60.00	6.37	3.91	0.00
63.00	6.37	3.91	0.00
66.00	6.37	3.91	0.00
69.00	6.37	3.91	0.00
72.00	6.37	3.91	0.00
75.00	6.37	3.91	0.00
78.00	6.37	3.91	0.00
81.00	6.37	3.91	0.00
84.00	6.37	3.91	0.00
87.00	6.37	3.91	0.00
90.00	6.37	3.91	0.00
93.00	6.37	3.91	0.00
96.00	6.37	3.91	0.00
99.00	6.37	3.91	0.00
102.00	6.37	3.91	0.00
105.00	6.37	3.91	0.00
108.00	6.37	3.91	0.00
111.00	6.37	3.91	0.00
114.00	6.37	3.91	0.00
117.00	6.37	3.91	0.00
120.00	6.37	3.91	0.00
123.00	6.37	3.91	0.00
126.00	6.37	3.91	0.00
129.00	6.37	3.91	0.00
132.00	6.37	3.91	0.00
135.00	6.37	3.91	0.00
138.00	6.37	3.91	0.00
141.00	6.37	3.91	0.00
144.00	6.37	3.91	0.00
147.00	6.37	3.91	0.00
150.00	6.37	3.91	0.00
153.00	6.37	3.91	0.00
156.00	6.37	3.91	0.00
159.00	6.37	3.91	0.00
162.00	6.37	3.91	0.00
165.00	6.37	3.91	0.00
168.00	6.37	3.91	0.00
171.00	6.37	3.91	0.00
174.00	6.37	3.91	0.00
177.00	6.37	3.91	0.00
180.00	6.37	3.91	0.00
183.00	6.37	3.91	0.00
186.00	6.37	3.91	0.00
189.00	6.37	3.91	0.00
192.00	6.37	3.91	0.00

Summary for Reach 1R: Channel 5

Inflow Area = 22.850 ac, 0.00% Impervious, Inflow Depth = 4.31" for 100 YR event
Inflow = 80.69 cfs @ 12.30 hrs, Volume= 8.203 af
Outflow = 80.66 cfs @ 12.30 hrs, Volume= 8.203 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 11.37 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.27 fps, Avg. Travel Time= 0.4 min

Peak Storage= 355 cf @ 12.30 hrs
Average Depth at Peak Storage= 1.01'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 331.37 cfs

4.00' x 2.00' deep channel, n= 0.043
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 50.0' Slope= 0.1800 '/'
Inlet Invert= 876.00', Outlet Invert= 867.00'

‡

Hydrograph for Reach 1R: Channel 5

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	876.00	0.00
6.00	0.01	0	876.00	0.01
12.00	**22.70**	**143**	**876.52**	**22.41**
18.00	**2.75**	**35**	**876.16**	**2.75**
24.00	1.57	24	876.11	1.57
30.00	0.05	3	876.01	0.06
36.00	0.01	0	876.00	0.01
42.00	0.00	0	876.00	0.00
48.00	0.00	0	876.00	0.00
54.00	0.00	0	876.00	0.00
60.00	0.00	0	876.00	0.00
66.00	0.00	0	876.00	0.00
72.00	0.00	0	876.00	0.00
78.00	0.00	0	876.00	0.00
84.00	0.00	0	876.00	0.00
90.00	0.00	0	876.00	0.00
96.00	0.00	0	876.00	0.00
102.00	0.00	0	876.00	0.00
108.00	0.00	0	876.00	0.00
114.00	0.00	0	876.00	0.00
120.00	0.00	0	876.00	0.00
126.00	0.00	0	876.00	0.00
132.00	0.00	0	876.00	0.00
138.00	0.00	0	876.00	0.00
144.00	0.00	0	876.00	0.00
150.00	0.00	0	876.00	0.00
156.00	0.00	0	876.00	0.00
162.00	0.00	0	876.00	0.00
168.00	0.00	0	876.00	0.00
174.00	0.00	0	876.00	0.00
180.00	0.00	0	876.00	0.00
186.00	0.00	0	876.00	0.00
192.00	0.00	0	876.00	0.00

Summary for Reach 2R: Channel 6

Inflow Area = 75.070 ac, 0.00% Impervious, Inflow Depth = 4.28" for 100 YR event
Inflow = 32.84 cfs @ 13.27 hrs, Volume= 26.793 af
Outflow = 32.82 cfs @ 13.33 hrs, Volume= 26.793 af, Atten= 0%, Lag= 4.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.28 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 1.08 fps, Avg. Travel Time= 9.0 min

Peak Storage= 4,445 cf @ 13.30 hrs
Average Depth at Peak Storage= 1.20'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 294.91 cfs

4.00' x 3.50' deep channel, n= 0.052
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 580.0' Slope= 0.0293 '/'
Inlet Invert= 857.00', Outlet Invert= 840.00'

Hydrograph for Reach 2R: Channel 6

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.02	0	857.00	0.00
6.00	0.26	177	857.07	0.26
12.00	**25.27**	**3,634**	**858.03**	**22.74**
18.00	**19.99**	**3,133**	**857.92**	**20.23**
24.00	11.94	2,173	857.70	11.99
30.00	5.93	1,349	857.47	6.02
36.00	1.38	517	857.20	1.41
42.00	0.48	263	857.11	0.49
48.00	0.25	176	857.07	0.26
54.00	0.14	121	857.05	0.15
60.00	0.08	88	857.04	0.08
66.00	0.05	54	857.02	0.05
72.00	0.03	31	857.01	0.03
78.00	0.02	18	857.01	0.02
84.00	0.01	10	857.00	0.01
90.00	0.00	6	857.00	0.01
96.00	0.00	3	857.00	0.00
102.00	0.00	2	857.00	0.00
108.00	0.00	1	857.00	0.00
114.00	0.00	1	857.00	0.00
120.00	0.00	0	857.00	0.00
126.00	0.00	0	857.00	0.00
132.00	0.00	0	857.00	0.00
138.00	0.00	0	857.00	0.00
144.00	0.00	0	857.00	0.00
150.00	0.00	0	857.00	0.00
156.00	0.00	0	857.00	0.00
162.00	0.00	0	857.00	0.00
168.00	0.00	0	857.00	0.00
174.00	0.00	0	857.00	0.00
180.00	0.00	0	857.00	0.00
186.00	0.00	0	857.00	0.00
192.00	0.00	0	857.00	0.00

Summary for Reach 4R: Channel 4

Inflow Area = 8.940 ac, 0.00% Impervious, Inflow Depth = 4.33" for 100 YR event
Inflow = 47.10 cfs @ 12.08 hrs, Volume= 3.225 af
Outflow = 39.65 cfs @ 12.29 hrs, Volume= 3.225 af, Atten= 16%, Lag= 12.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.81 fps, Min. Travel Time= 7.6 min
Avg. Velocity = 0.44 fps, Avg. Travel Time= 31.1 min

Peak Storage= 18,121 cf @ 12.16 hrs
Average Depth at Peak Storage= 2.12'
Bank-Full Depth= 3.00' Flow Area= 39.0 sf, Capacity= 86.14 cfs

4.00' x 3.00' deep channel, n= 0.100
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 825.0' Slope= 0.0109 '/'
Inlet Invert= 894.00', Outlet Invert= 885.00'

‡

Hydrograph for Reach 4R: Channel 4

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	894.00	0.00
6.00	0.04	26	894.01	0.00
12.00	**38.11**	**11,804**	**895.62**	**9.46**
18.00	**0.98**	**1,308**	**894.32**	**1.03**
24.00	0.59	922	894.24	0.60
30.00	0.00	8	894.00	0.00
36.00	0.00	0	894.00	0.00
42.00	0.00	0	894.00	0.00
48.00	0.00	0	894.00	0.00
54.00	0.00	0	894.00	0.00
60.00	0.00	0	894.00	0.00
66.00	0.00	0	894.00	0.00
72.00	0.00	0	894.00	0.00
78.00	0.00	0	894.00	0.00
84.00	0.00	0	894.00	0.00
90.00	0.00	0	894.00	0.00
96.00	0.00	0	894.00	0.00
102.00	0.00	0	894.00	0.00
108.00	0.00	0	894.00	0.00
114.00	0.00	0	894.00	0.00
120.00	0.00	0	894.00	0.00
126.00	0.00	0	894.00	0.00
132.00	0.00	0	894.00	0.00
138.00	0.00	0	894.00	0.00
144.00	0.00	0	894.00	0.00
150.00	0.00	0	894.00	0.00
156.00	0.00	0	894.00	0.00
162.00	0.00	0	894.00	0.00
168.00	0.00	0	894.00	0.00
174.00	0.00	0	894.00	0.00
180.00	0.00	0	894.00	0.00
186.00	0.00	0	894.00	0.00
192.00	0.00	0	894.00	0.00

Summary for Reach 5R: Channel 3

Inflow Area = 7.170 ac, 0.00% Impervious, Inflow Depth = 4.44" for 100 YR event
Inflow = 45.88 cfs @ 12.02 hrs, Volume= 2.651 af
Outflow = 39.13 cfs @ 12.18 hrs, Volume= 2.651 af, Atten= 15%, Lag= 9.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.30 fps, Min. Travel Time= 5.9 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 24.1 min

Peak Storage= 13,950 cf @ 12.08 hrs
Average Depth at Peak Storage= 1.64'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 192.38 cfs

4.00' x 3.50' deep channel, n= 0.077
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,170.0' Slope= 0.0274 '/'
Inlet Invert= 916.00', Outlet Invert= 884.00'

Hydrograph for Reach 5R: Channel 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	916.00	0.00
6.00	0.06	63	916.01	0.01
12.00	**44.59**	**11,846**	**917.46**	**16.47**
18.00	**0.78**	**961**	**916.19**	**0.82**
24.00	0.48	694	916.14	0.48
30.00	0.00	1	916.00	0.00
36.00	0.00	0	916.00	0.00
42.00	0.00	0	916.00	0.00
48.00	0.00	0	916.00	0.00
54.00	0.00	0	916.00	0.00
60.00	0.00	0	916.00	0.00
66.00	0.00	0	916.00	0.00
72.00	0.00	0	916.00	0.00
78.00	0.00	0	916.00	0.00
84.00	0.00	0	916.00	0.00
90.00	0.00	0	916.00	0.00
96.00	0.00	0	916.00	0.00
102.00	0.00	0	916.00	0.00
108.00	0.00	0	916.00	0.00
114.00	0.00	0	916.00	0.00
120.00	0.00	0	916.00	0.00
126.00	0.00	0	916.00	0.00
132.00	0.00	0	916.00	0.00
138.00	0.00	0	916.00	0.00
144.00	0.00	0	916.00	0.00
150.00	0.00	0	916.00	0.00
156.00	0.00	0	916.00	0.00
162.00	0.00	0	916.00	0.00
168.00	0.00	0	916.00	0.00
174.00	0.00	0	916.00	0.00
180.00	0.00	0	916.00	0.00
186.00	0.00	0	916.00	0.00
192.00	0.00	0	916.00	0.00

Summary for Reach 10R: Channel 2 Reach A

Inflow Area = 11.080 ac, 0.00% Impervious, Inflow Depth = 4.54" for 100 YR event
Inflow = 84.45 cfs @ 11.97 hrs, Volume= 4.196 af
Outflow = 63.33 cfs @ 12.16 hrs, Volume= 4.196 af, Atten= 25%, Lag= 11.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.29 fps, Min. Travel Time= 8.0 min
Avg. Velocity = 0.73 fps, Avg. Travel Time= 36.0 min

Peak Storage= 30,832 cf @ 12.03 hrs
Average Depth at Peak Storage= 2.28'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 160.67 cfs

4.00' x 3.50' deep channel, n= 0.100
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,585.0' Slope= 0.0322 '/'
Inlet Invert= 919.00', Outlet Invert= 868.00'

Hydrograph for Reach 10R: Channel 2 Reach A

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	919.00	0.00
6.00	**0.14**	221	919.03	0.03
12.00	**79.52**	**29,838**	**921.23**	**26.91**
18.00	1.21	**1,954**	**919.27**	**1.28**
24.00	0.74	1,397	919.20	0.76
30.00	0.00	15	919.00	0.00
36.00	0.00	0	919.00	0.00
42.00	0.00	0	919.00	0.00
48.00	0.00	0	919.00	0.00
54.00	0.00	0	919.00	0.00
60.00	0.00	0	919.00	0.00
66.00	0.00	0	919.00	0.00
72.00	0.00	0	919.00	0.00
78.00	0.00	0	919.00	0.00
84.00	0.00	0	919.00	0.00
90.00	0.00	0	919.00	0.00
96.00	0.00	0	919.00	0.00
102.00	0.00	0	919.00	0.00
108.00	0.00	0	919.00	0.00
114.00	0.00	0	919.00	0.00
120.00	0.00	0	919.00	0.00
126.00	0.00	0	919.00	0.00
132.00	0.00	0	919.00	0.00
138.00	0.00	0	919.00	0.00
144.00	0.00	0	919.00	0.00
150.00	0.00	0	919.00	0.00
156.00	0.00	0	919.00	0.00
162.00	0.00	0	919.00	0.00
168.00	0.00	0	919.00	0.00
174.00	0.00	0	919.00	0.00
180.00	0.00	0	919.00	0.00
186.00	0.00	0	919.00	0.00
192.00	0.00	0	919.00	0.00

Summary for Pond 1P: Culvert 1

Inflow Area = 22.850 ac, 0.00% Impervious, Inflow Depth = 4.31" for 100 YR event
Inflow = 80.66 cfs @ 12.30 hrs, Volume= 8.203 af
Outflow = 80.66 cfs @ 12.30 hrs, Volume= 8.203 af, Atten= 0%, Lag= 0.0 min
Primary = 80.66 cfs @ 12.30 hrs, Volume= 8.203 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Peak Elev= 870.28' @ 12.30 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	865.50'	**42.0" Round Culvert** L= 47.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 865.50' / 862.00' S= 0.0745 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 9.62 sf

Primary OutFlow Max=80.56 cfs @ 12.30 hrs HW=870.27' (Free Discharge)
↑**1=Culvert** (Inlet Controls 80.56 cfs @ 8.37 fps)

Hydrograph for Pond 1P: Culvert 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	865.50	0.00
3.00	0.00	865.50	0.00
6.00	0.01	865.52	0.01
9.00	0.53	865.75	0.53
12.00	**22.41**	**867.28**	**22.41**
15.00	**4.94**	**866.29**	**4.94**
18.00	2.75	866.08	2.75
21.00	1.84	865.97	1.84
24.00	1.57	865.94	1.57
27.00	0.20	865.65	0.20
30.00	0.06	865.58	0.06
33.00	0.02	865.55	0.02
36.00	0.01	865.53	0.01
39.00	0.00	865.51	0.00
42.00	0.00	865.50	0.00
45.00	0.00	865.50	0.00
48.00	0.00	865.50	0.00
51.00	0.00	865.50	0.00
54.00	0.00	865.50	0.00
57.00	0.00	865.50	0.00
60.00	0.00	865.50	0.00
63.00	0.00	865.50	0.00
66.00	0.00	865.50	0.00
69.00	0.00	865.50	0.00
72.00	0.00	865.50	0.00
75.00	0.00	865.50	0.00
78.00	0.00	865.50	0.00
81.00	0.00	865.50	0.00
84.00	0.00	865.50	0.00
87.00	0.00	865.50	0.00
90.00	0.00	865.50	0.00
93.00	0.00	865.50	0.00
96.00	0.00	865.50	0.00
99.00	0.00	865.50	0.00
102.00	0.00	865.50	0.00
105.00	0.00	865.50	0.00
108.00	0.00	865.50	0.00
111.00	0.00	865.50	0.00
114.00	0.00	865.50	0.00
117.00	0.00	865.50	0.00
120.00	0.00	865.50	0.00
123.00	0.00	865.50	0.00
126.00	0.00	865.50	0.00
129.00	0.00	865.50	0.00
132.00	0.00	865.50	0.00
135.00	0.00	865.50	0.00
138.00	0.00	865.50	0.00
141.00	0.00	865.50	0.00
144.00	0.00	865.50	0.00
147.00	0.00	865.50	0.00
150.00	0.00	865.50	0.00
153.00	0.00	865.50	0.00
156.00	0.00	865.50	0.00
159.00	0.00	865.50	0.00
162.00	0.00	865.50	0.00
165.00	0.00	865.50	0.00
168.00	0.00	865.50	0.00
171.00	0.00	865.50	0.00
174.00	0.00	865.50	0.00
177.00	0.00	865.50	0.00
180.00	0.00	865.50	0.00
183.00	0.00	865.50	0.00
186.00	0.00	865.50	0.00
189.00	0.00	865.50	0.00
192.00	0.00	865.50	0.00

Summary for Pond 4P: Downchute C Inlet

Inflow Area = 22.480 ac, 0.00% Impervious, Inflow Depth = 4.54" for 100 YR event
Inflow = 109.76 cfs @ 11.99 hrs, Volume= 8.512 af
Outflow = 109.80 cfs @ 11.99 hrs, Volume= 8.512 af, Atten= 0%, Lag= 0.0 min
Primary = 109.80 cfs @ 11.99 hrs, Volume= 8.512 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs / 3
Peak Elev= 870.38' @ 11.99 hrs Surf.Area= 0.000 ac Storage= 0.002 af

Plug-Flow detention time= 0.1 min calculated for 8.511 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (810.8 - 810.7)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	0.002 af	**4.00'W x 4.00'L x 5.00'H Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	863.50'	**48.0" Round Culvert** L= 120.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 863.50' / 862.00' S= 0.0125 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 12.57 sf

Primary OutFlow Max=108.73 cfs @ 11.99 hrs HW=870.30' (Free Discharge)
1=Culvert (Barrel Controls 108.73 cfs @ 8.65 fps)

Hydrograph for Pond 4P: Downchute C Inlet

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	863.00	0.00
6.00	0.18	**0.000**	863.68	0.18
12.00	**109.21**	**0.002**	**870.34**	**109.26**
18.00	2.53	0.000	864.14	2.53
24.00	1.52	0.000	864.00	1.52
30.00	0.00	0.000	863.51	0.00
36.00	0.00	0.000	863.50	0.00
42.00	0.00	0.000	863.50	0.00
48.00	0.00	0.000	863.50	0.00
54.00	0.00	0.000	863.50	0.00
60.00	0.00	0.000	863.50	0.00
66.00	0.00	0.000	863.50	0.00
72.00	0.00	0.000	863.50	0.00
78.00	0.00	0.000	863.50	0.00
84.00	0.00	0.000	863.50	0.00
90.00	0.00	0.000	863.50	0.00
96.00	0.00	0.000	863.50	0.00
102.00	0.00	0.000	863.50	0.00
108.00	0.00	0.000	863.50	0.00
114.00	0.00	0.000	863.50	0.00
120.00	0.00	0.000	863.50	0.00
126.00	0.00	0.000	863.50	0.00
132.00	0.00	0.000	863.50	0.00
138.00	0.00	0.000	863.50	0.00
144.00	0.00	0.000	863.50	0.00
150.00	0.00	0.000	863.50	0.00
156.00	0.00	0.000	863.50	0.00
162.00	0.00	0.000	863.50	0.00
168.00	0.00	0.000	863.50	0.00
174.00	0.00	0.000	863.50	0.00
180.00	0.00	0.000	863.50	0.00
186.00	0.00	0.000	863.50	0.00
192.00	0.00	0.000	863.50	0.00

Summary for Pond FB-C: Pond C Forebay

Inflow Area = 49.680 ac, 0.00% Impervious, Inflow Depth = 4.37" for 100 YR event
Inflow = 158.87 cfs @ 11.99 hrs, Volume= 18.094 af
Outflow = 142.67 cfs @ 12.24 hrs, Volume= 18.498 af, Atten= 10%, Lag= 15.0 min
Primary = 142.67 cfs @ 12.24 hrs, Volume= 18.498 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs / 3
Starting Elev= 859.00' Surf.Area= 16,463 sf Storage= 15,614 cf
Peak Elev= 860.42' @ 12.24 hrs Surf.Area= 18,929 sf Storage= 40,767 cf (25,153 cf above start)

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	206,682 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
858.00	14,765	0	0
860.00	18,160	32,925	32,925
862.00	21,799	39,959	72,884
864.00	25,683	47,482	120,366
866.00	29,812	55,495	175,861
867.00	31,830	30,821	206,682

Device	Routing	Invert	Outlet Devices
#1	Primary	858.00'	**Custom Weir/Orifice X 0.40, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 9.00 Width (feet) 25.00 61.00

Primary OutFlow Max=142.64 cfs @ 12.24 hrs HW=860.42' (Free Discharge)
↑—**1=Custom Weir/Orifice** (Weir Controls 142.64 cfs @ 1.97 fps)

Hydrograph for Pond FB-C: Pond C Forebay

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	15,614	859.00	34.85
6.00	0.18	166	858.01	0.11
12.00	**158.24**	**39,244**	**860.34**	**134.98**
18.00	5.72	**4,669**	**858.31**	**5.83**
24.00	3.36	3,230	858.22	3.39
30.00	0.06	101	858.01	0.07
36.00	0.01	16	858.00	0.01
42.00	0.00	3	858.00	0.00
48.00	0.00	0	858.00	0.00
54.00	0.00	0	858.00	0.00
60.00	0.00	0	858.00	0.00
66.00	0.00	0	858.00	0.00
72.00	0.00	0	858.00	0.00
78.00	0.00	0	858.00	0.00
84.00	0.00	0	858.00	0.00
90.00	0.00	0	858.00	0.00
96.00	0.00	0	858.00	0.00
102.00	0.00	0	858.00	0.00
108.00	0.00	0	858.00	0.00
114.00	0.00	0	858.00	0.00
120.00	0.00	0	858.00	0.00
126.00	0.00	0	858.00	0.00
132.00	0.00	0	858.00	0.00
138.00	0.00	0	858.00	0.00
144.00	0.00	0	858.00	0.00
150.00	0.00	0	858.00	0.00
156.00	0.00	0	858.00	0.00
162.00	0.00	0	858.00	0.00
168.00	0.00	0	858.00	0.00
174.00	0.00	0	858.00	0.00
180.00	0.00	0	858.00	0.00
186.00	0.00	0	858.00	0.00
192.00	0.00	0	858.00	0.00

Summary for Pond P-C: Pond C

Inflow Area = 72.940 ac, 0.00% Impervious, Inflow Depth = 4.29" for 100 YR event
Inflow = 284.60 cfs @ 12.00 hrs, Volume= 26.072 af
Outflow = 32.16 cfs @ 13.28 hrs, Volume= 26.043 af, Atten= 89%, Lag= 76.6 min
Primary = 23.07 cfs @ 13.28 hrs, Volume= 25.220 af
Secondary = 9.09 cfs @ 13.28 hrs, Volume= 0.823 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs / 3
Starting Elev= 859.00' Surf.Area= 155,517 sf Storage= 711,694 cf
Peak Elev= 862.69' @ 13.28 hrs Surf.Area= 175,745 sf Storage= 1,322,357 cf (610,664 cf above start)

Plug-Flow detention time= 1,005.3 min calculated for 9.689 af (37% of inflow)
Center-of-Mass det. time= 396.1 min (1,217.1 - 821.0)

Volume	Invert	Avail.Storage	Storage Description
#1	854.00'	1,557,643 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
854.00	129,407	0	0
856.00	139,654	269,061	269,061
858.00	150,147	289,801	558,862
860.00	160,886	311,033	869,895
862.00	171,871	332,757	1,202,652
864.00	183,120	354,991	1,557,643

Device	Routing	Invert	Outlet Devices
#1	Primary	858.42'	**24.0" Round Culvert** L= 259.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 858.42' / 857.13' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	859.00'	**24.0" W x 6.0" H Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	861.50'	**27.5" x 27.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	862.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.50 Width (feet) 33.00 42.00

Primary OutFlow Max=23.07 cfs @ 13.28 hrs HW=862.69' (Free Discharge)
└**1=Culvert** (Barrel Controls 23.07 cfs @ 7.34 fps)
  ├**2=Orifice/Grate** (Passes < 17.85 cfs potential flow)
  └**3=Orifice/Grate** (Passes < 27.57 cfs potential flow)

Secondary OutFlow Max=8.98 cfs @ 13.28 hrs HW=862.69' (Free Discharge)
└**4=Custom Weir/Orifice** (Weir Controls 8.98 cfs @ 1.42 fps)

Hydrograph for Pond P-C: Pond C

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	34.85	712,321	859.00	0.02	0.02	0.00
6.00	0.11	721,327	859.06	0.25	0.25	0.00
12.00	**284.58**	**957,410**	**860.54**	**10.91**	**10.91**	**0.00**
18.00	8.23	**1,166,720**	**861.79**	**19.76**	**19.76**	**0.00**
24.00	4.86	993,086	860.76	11.80	11.80	0.00
30.00	0.07	813,295	859.65	5.93	5.93	0.00
36.00	0.01	746,699	859.22	1.38	1.38	0.00
42.00	0.00	728,779	859.11	0.48	0.48	0.00
48.00	0.00	721,404	859.06	0.25	0.25	0.00
54.00	0.00	717,226	859.04	0.14	0.14	0.00
60.00	0.00	714,845	859.02	0.08	0.08	0.00
66.00	0.00	713,488	859.01	0.05	0.05	0.00
72.00	0.00	712,716	859.01	0.03	0.03	0.00
78.00	0.00	712,276	859.00	0.02	0.02	0.00
84.00	0.00	712,025	859.00	0.01	0.01	0.00
90.00	0.00	711,883	859.00	0.00	0.00	0.00
96.00	0.00	711,801	859.00	0.00	0.00	0.00
102.00	0.00	711,755	859.00	0.00	0.00	0.00
108.00	0.00	711,729	859.00	0.00	0.00	0.00
114.00	0.00	711,714	859.00	0.00	0.00	0.00
120.00	0.00	711,705	859.00	0.00	0.00	0.00
126.00	0.00	711,700	859.00	0.00	0.00	0.00
132.00	0.00	711,697	859.00	0.00	0.00	0.00
138.00	0.00	711,696	859.00	0.00	0.00	0.00
144.00	0.00	711,695	859.00	0.00	0.00	0.00
150.00	0.00	711,694	859.00	0.00	0.00	0.00
156.00	0.00	711,694	859.00	0.00	0.00	0.00
162.00	0.00	711,694	859.00	0.00	0.00	0.00
168.00	0.00	711,694	859.00	0.00	0.00	0.00
174.00	0.00	711,694	859.00	0.00	0.00	0.00
180.00	0.00	711,694	859.00	0.00	0.00	0.00
186.00	0.00	711,694	859.00	0.00	0.00	0.00
192.00	0.00	711,694	859.00	0.00	0.00	0.00

Summary for Pond ST-C: Sediment Trap C

Inflow Area = 22.420 ac, 0.00% Impervious, Inflow Depth = 4.30" for 100 YR event
Inflow = 95.96 cfs @ 12.19 hrs, Volume= 8.040 af
Outflow = 80.31 cfs @ 12.30 hrs, Volume= 8.040 af, Atten= 16%, Lag= 6.5 min
Primary = 80.31 cfs @ 12.30 hrs, Volume= 8.040 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs / 3
Peak Elev= 881.07' @ 12.30 hrs Surf.Area= 21,778 sf Storage= 57,370 cf

Plug-Flow detention time= 32.5 min calculated for 8.039 af (100% of inflow)
Center-of-Mass det. time= 32.6 min (859.9 - 827.4)

Volume	Invert	Avail.Storage	Storage Description
#1	878.00'	130,540 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
878.00	15,693	0	0
880.00	19,513	35,206	35,206
882.00	23,733	43,246	78,452
884.00	28,355	52,088	130,540

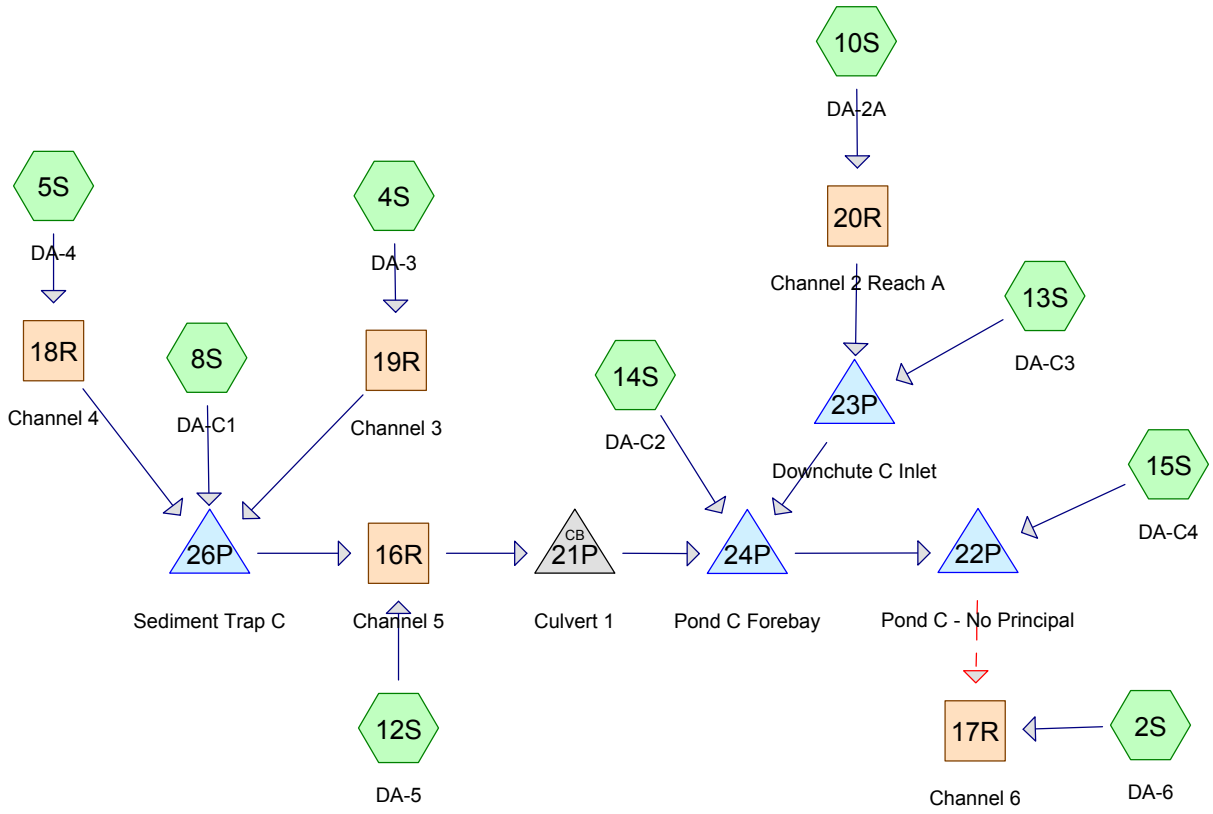
Device	Routing	Invert	Outlet Devices
#1	Primary	878.00'	**Custom Weir/Orifice X 0.40, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 6.00 Width (feet) 4.00 40.00

Primary OutFlow Max=80.26 cfs @ 12.30 hrs HW=881.07' (Free Discharge)
↑**1=Custom Weir/Orifice** (Weir Controls 80.26 cfs @ 1.98 fps)

Hydrograph for Pond ST-C: Sediment Trap C

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	878.00	0.00
6.00	0.02	12	878.00	0.00
12.00	**48.64**	**26,709**	**879.55**	**19.64**
18.00	**2.53**	**8,654**	**878.53**	**2.70**
24.00	1.50	6,171	878.38	1.54
30.00	0.00	649	878.04	0.05
36.00	0.00	107	878.01	0.01
42.00	0.00	17	878.00	0.00
48.00	0.00	3	878.00	0.00
54.00	0.00	0	878.00	0.00
60.00	0.00	0	878.00	0.00
66.00	0.00	0	878.00	0.00
72.00	0.00	0	878.00	0.00
78.00	0.00	0	878.00	0.00
84.00	0.00	0	878.00	0.00
90.00	0.00	0	878.00	0.00
96.00	0.00	0	878.00	0.00
102.00	0.00	0	878.00	0.00
108.00	0.00	0	878.00	0.00
114.00	0.00	0	878.00	0.00
120.00	0.00	0	878.00	0.00
126.00	0.00	0	878.00	0.00
132.00	0.00	0	878.00	0.00
138.00	0.00	0	878.00	0.00
144.00	0.00	0	878.00	0.00
150.00	0.00	0	878.00	0.00
156.00	0.00	0	878.00	0.00
162.00	0.00	0	878.00	0.00
168.00	0.00	0	878.00	0.00
174.00	0.00	0	878.00	0.00
180.00	0.00	0	878.00	0.00
186.00	0.00	0	878.00	0.00
192.00	0.00	0	878.00	0.00

POND C
100-YEAR, 24-HOUR STORM EVENT
NO PRINCIPAL SPILLWAY



Subcat Reach Pond Link

Routing Diagram for 144-189 Pond C
Prepared by CEC, Inc., Printed 5/23/2016
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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
40.100	84	50-75% Grass cover, Fair, HSG D (2S, 4S, 5S, 8S, 10S, 12S, 13S, 15S)
33.950	77	Brush, Fair, HSG D (2S, 4S, 5S, 8S, 14S, 15S)
1.020	91	Gravel roads, HSG D (10S, 14S, 15S)
75.070	**81**	**TOTAL AREA**

Summary for Subcatchment 2S: DA-6

Runoff = 15.49 cfs @ 11.97 hrs, Volume= 0.749 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
1.250	84	50-75% Grass cover, Fair, HSG D
0.880	77	Brush, Fair, HSG D
2.130	81	Weighted Average
2.130		100.00% Pervious Area

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

Hydrograph for Subcatchment 2S: DA-6

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.00	0.01
9.00	0.94	0.08	**0.13**
12.00	4.22	2.31	**14.35**
15.00	5.44	3.37	0.38
18.00	5.87	3.76	0.23
21.00	6.15	4.02	0.16
24.00	**6.37**	**4.22**	0.14
27.00	6.37	4.22	0.00
30.00	6.37	4.22	0.00
33.00	6.37	4.22	0.00
36.00	6.37	4.22	0.00
39.00	6.37	4.22	0.00
42.00	6.37	4.22	0.00
45.00	6.37	4.22	0.00
48.00	6.37	4.22	0.00
51.00	6.37	4.22	0.00
54.00	6.37	4.22	0.00
57.00	6.37	4.22	0.00
60.00	6.37	4.22	0.00
63.00	6.37	4.22	0.00
66.00	6.37	4.22	0.00
69.00	6.37	4.22	0.00
72.00	6.37	4.22	0.00
75.00	6.37	4.22	0.00
78.00	6.37	4.22	0.00
81.00	6.37	4.22	0.00
84.00	6.37	4.22	0.00
87.00	6.37	4.22	0.00
90.00	6.37	4.22	0.00
93.00	6.37	4.22	0.00
96.00	6.37	4.22	0.00
99.00	6.37	4.22	0.00
102.00	6.37	4.22	0.00
105.00	6.37	4.22	0.00
108.00	6.37	4.22	0.00
111.00	6.37	4.22	0.00
114.00	6.37	4.22	0.00
117.00	6.37	4.22	0.00
120.00	6.37	4.22	0.00
123.00	6.37	4.22	0.00
126.00	6.37	4.22	0.00
129.00	6.37	4.22	0.00
132.00	6.37	4.22	0.00
135.00	6.37	4.22	0.00
138.00	6.37	4.22	0.00
141.00	6.37	4.22	0.00
144.00	6.37	4.22	0.00
147.00	6.37	4.22	0.00
150.00	6.37	4.22	0.00
153.00	6.37	4.22	0.00
156.00	6.37	4.22	0.00
159.00	6.37	4.22	0.00
162.00	6.37	4.22	0.00
165.00	6.37	4.22	0.00
168.00	6.37	4.22	0.00
171.00	6.37	4.22	0.00
174.00	6.37	4.22	0.00
177.00	6.37	4.22	0.00
180.00	6.37	4.22	0.00
183.00	6.37	4.22	0.00
186.00	6.37	4.22	0.00
189.00	6.37	4.22	0.00
192.00	6.37	4.22	0.00

Summary for Subcatchment 4S: DA-3

Runoff = 45.88 cfs @ 12.02 hrs, Volume= 2.651 af, Depth= 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
1.430	77	Brush, Fair, HSG D
5.740	84	50-75% Grass cover, Fair, HSG D
7.170	83	Weighted Average
7.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	690	0.0377	1.04		**Lag/CN Method,**

Hydrograph for Subcatchment 4S: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.00	0.06
9.00	0.94	0.11	0.49
12.00	4.22	2.48	**44.59**
15.00	5.44	3.57	**1.31**
18.00	5.87	3.97	0.78
21.00	6.15	4.23	0.54
24.00	**6.37**	**4.44**	0.48
27.00	6.37	4.44	0.00
30.00	6.37	4.44	0.00
33.00	6.37	4.44	0.00
36.00	6.37	4.44	0.00
39.00	6.37	4.44	0.00
42.00	6.37	4.44	0.00
45.00	6.37	4.44	0.00
48.00	6.37	4.44	0.00
51.00	6.37	4.44	0.00
54.00	6.37	4.44	0.00
57.00	6.37	4.44	0.00
60.00	6.37	4.44	0.00
63.00	6.37	4.44	0.00
66.00	6.37	4.44	0.00
69.00	6.37	4.44	0.00
72.00	6.37	4.44	0.00
75.00	6.37	4.44	0.00
78.00	6.37	4.44	0.00
81.00	6.37	4.44	0.00
84.00	6.37	4.44	0.00
87.00	6.37	4.44	0.00
90.00	6.37	4.44	0.00
93.00	6.37	4.44	0.00
96.00	6.37	4.44	0.00
99.00	6.37	4.44	0.00
102.00	6.37	4.44	0.00
105.00	6.37	4.44	0.00
108.00	6.37	4.44	0.00
111.00	6.37	4.44	0.00
114.00	6.37	4.44	0.00
117.00	6.37	4.44	0.00
120.00	6.37	4.44	0.00
123.00	6.37	4.44	0.00
126.00	6.37	4.44	0.00
129.00	6.37	4.44	0.00
132.00	6.37	4.44	0.00
135.00	6.37	4.44	0.00
138.00	6.37	4.44	0.00
141.00	6.37	4.44	0.00
144.00	6.37	4.44	0.00
147.00	6.37	4.44	0.00
150.00	6.37	4.44	0.00
153.00	6.37	4.44	0.00
156.00	6.37	4.44	0.00
159.00	6.37	4.44	0.00
162.00	6.37	4.44	0.00
165.00	6.37	4.44	0.00
168.00	6.37	4.44	0.00
171.00	6.37	4.44	0.00
174.00	6.37	4.44	0.00
177.00	6.37	4.44	0.00
180.00	6.37	4.44	0.00
183.00	6.37	4.44	0.00
186.00	6.37	4.44	0.00
189.00	6.37	4.44	0.00
192.00	6.37	4.44	0.00

Summary for Subcatchment 5S: DA-4

Runoff = 47.10 cfs @ 12.08 hrs, Volume= 3.225 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
2.410	77	Brush, Fair, HSG D
6.530	84	50-75% Grass cover, Fair, HSG D
8.940	82	Weighted Average
8.940		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	1,100	0.0382	1.11		**Lag/CN Method,**

Hydrograph for Subcatchment 5S: DA-4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.00	0.04
9.00	0.94	0.09	0.53
12.00	4.22	2.40	**38.11**
15.00	5.44	3.47	**1.65**
18.00	5.87	3.86	0.98
21.00	6.15	4.12	0.67
24.00	**6.37**	**4.33**	0.59
27.00	6.37	4.33	0.00
30.00	6.37	4.33	0.00
33.00	6.37	4.33	0.00
36.00	6.37	4.33	0.00
39.00	6.37	4.33	0.00
42.00	6.37	4.33	0.00
45.00	6.37	4.33	0.00
48.00	6.37	4.33	0.00
51.00	6.37	4.33	0.00
54.00	6.37	4.33	0.00
57.00	6.37	4.33	0.00
60.00	6.37	4.33	0.00
63.00	6.37	4.33	0.00
66.00	6.37	4.33	0.00
69.00	6.37	4.33	0.00
72.00	6.37	4.33	0.00
75.00	6.37	4.33	0.00
78.00	6.37	4.33	0.00
81.00	6.37	4.33	0.00
84.00	6.37	4.33	0.00
87.00	6.37	4.33	0.00
90.00	6.37	4.33	0.00
93.00	6.37	4.33	0.00
96.00	6.37	4.33	0.00
99.00	6.37	4.33	0.00
102.00	6.37	4.33	0.00
105.00	6.37	4.33	0.00
108.00	6.37	4.33	0.00
111.00	6.37	4.33	0.00
114.00	6.37	4.33	0.00
117.00	6.37	4.33	0.00
120.00	6.37	4.33	0.00
123.00	6.37	4.33	0.00
126.00	6.37	4.33	0.00
129.00	6.37	4.33	0.00
132.00	6.37	4.33	0.00
135.00	6.37	4.33	0.00
138.00	6.37	4.33	0.00
141.00	6.37	4.33	0.00
144.00	6.37	4.33	0.00
147.00	6.37	4.33	0.00
150.00	6.37	4.33	0.00
153.00	6.37	4.33	0.00
156.00	6.37	4.33	0.00
159.00	6.37	4.33	0.00
162.00	6.37	4.33	0.00
165.00	6.37	4.33	0.00
168.00	6.37	4.33	0.00
171.00	6.37	4.33	0.00
174.00	6.37	4.33	0.00
177.00	6.37	4.33	0.00
180.00	6.37	4.33	0.00
183.00	6.37	4.33	0.00
186.00	6.37	4.33	0.00
189.00	6.37	4.33	0.00
192.00	6.37	4.33	0.00

Summary for Subcatchment 8S: DA-C1

Runoff = 30.20 cfs @ 12.10 hrs, Volume= 2.165 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
2.290	84	50-75% Grass cover, Fair, HSG D
4.020	77	Brush, Fair, HSG D
6.310	80	Weighted Average
6.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	1,220	0.0420	1.12		**Lag/CN Method,**

Hydrograph for Subcatchment 8S: DA-C1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.00	0.00
9.00	0.94	0.06	0.29
12.00	4.22	2.23	**22.70**
15.00	5.44	3.28	**1.15**
18.00	5.87	3.66	0.68
21.00	6.15	3.91	0.46
24.00	**6.37**	**4.12**	0.41
27.00	6.37	4.12	0.00
30.00	6.37	4.12	0.00
33.00	6.37	4.12	0.00
36.00	6.37	4.12	0.00
39.00	6.37	4.12	0.00
42.00	6.37	4.12	0.00
45.00	6.37	4.12	0.00
48.00	6.37	4.12	0.00
51.00	6.37	4.12	0.00
54.00	6.37	4.12	0.00
57.00	6.37	4.12	0.00
60.00	6.37	4.12	0.00
63.00	6.37	4.12	0.00
66.00	6.37	4.12	0.00
69.00	6.37	4.12	0.00
72.00	6.37	4.12	0.00
75.00	6.37	4.12	0.00
78.00	6.37	4.12	0.00
81.00	6.37	4.12	0.00
84.00	6.37	4.12	0.00
87.00	6.37	4.12	0.00
90.00	6.37	4.12	0.00
93.00	6.37	4.12	0.00
96.00	6.37	4.12	0.00
99.00	6.37	4.12	0.00
102.00	6.37	4.12	0.00
105.00	6.37	4.12	0.00
108.00	6.37	4.12	0.00
111.00	6.37	4.12	0.00
114.00	6.37	4.12	0.00
117.00	6.37	4.12	0.00
120.00	6.37	4.12	0.00
123.00	6.37	4.12	0.00
126.00	6.37	4.12	0.00
129.00	6.37	4.12	0.00
132.00	6.37	4.12	0.00
135.00	6.37	4.12	0.00
138.00	6.37	4.12	0.00
141.00	6.37	4.12	0.00
144.00	6.37	4.12	0.00
147.00	6.37	4.12	0.00
150.00	6.37	4.12	0.00
153.00	6.37	4.12	0.00
156.00	6.37	4.12	0.00
159.00	6.37	4.12	0.00
162.00	6.37	4.12	0.00
165.00	6.37	4.12	0.00
168.00	6.37	4.12	0.00
171.00	6.37	4.12	0.00
174.00	6.37	4.12	0.00
177.00	6.37	4.12	0.00
180.00	6.37	4.12	0.00
183.00	6.37	4.12	0.00
186.00	6.37	4.12	0.00
189.00	6.37	4.12	0.00
192.00	6.37	4.12	0.00

Summary for Subcatchment 10S: DA-2A

Runoff = 84.45 cfs @ 11.97 hrs, Volume= 4.196 af, Depth= 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
10.500	84	50-75% Grass cover, Fair, HSG D
0.580	91	Gravel roads, HSG D
11.080	84	Weighted Average
11.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	440	0.0568	1.21		**Lag/CN Method,**
0.2	174	0.2400	17.53	223.52	**Trap/Vee/Rect Channel Flow,** Bot.W=4.00' D=1.50' Z= 3.0 '/' Top.W=13.00' n= 0.040
6.3	614	Total			

Hydrograph for Subcatchment 10S: DA-2A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.01	0.14
9.00	0.94	0.13	**0.86**
12.00	4.22	2.57	**79.52**
15.00	5.44	3.67	2.02
18.00	5.87	4.07	1.21
21.00	6.15	4.33	0.84
24.00	**6.37**	**4.54**	0.74
27.00	6.37	4.54	0.00
30.00	6.37	4.54	0.00
33.00	6.37	4.54	0.00
36.00	6.37	4.54	0.00
39.00	6.37	4.54	0.00
42.00	6.37	4.54	0.00
45.00	6.37	4.54	0.00
48.00	6.37	4.54	0.00
51.00	6.37	4.54	0.00
54.00	6.37	4.54	0.00
57.00	6.37	4.54	0.00
60.00	6.37	4.54	0.00
63.00	6.37	4.54	0.00
66.00	6.37	4.54	0.00
69.00	6.37	4.54	0.00
72.00	6.37	4.54	0.00
75.00	6.37	4.54	0.00
78.00	6.37	4.54	0.00
81.00	6.37	4.54	0.00
84.00	6.37	4.54	0.00
87.00	6.37	4.54	0.00
90.00	6.37	4.54	0.00
93.00	6.37	4.54	0.00
96.00	6.37	4.54	0.00
99.00	6.37	4.54	0.00
102.00	6.37	4.54	0.00
105.00	6.37	4.54	0.00
108.00	6.37	4.54	0.00
111.00	6.37	4.54	0.00
114.00	6.37	4.54	0.00
117.00	6.37	4.54	0.00
120.00	6.37	4.54	0.00
123.00	6.37	4.54	0.00
126.00	6.37	4.54	0.00
129.00	6.37	4.54	0.00
132.00	6.37	4.54	0.00
135.00	6.37	4.54	0.00
138.00	6.37	4.54	0.00
141.00	6.37	4.54	0.00
144.00	6.37	4.54	0.00
147.00	6.37	4.54	0.00
150.00	6.37	4.54	0.00
153.00	6.37	4.54	0.00
156.00	6.37	4.54	0.00
159.00	6.37	4.54	0.00
162.00	6.37	4.54	0.00
165.00	6.37	4.54	0.00
168.00	6.37	4.54	0.00
171.00	6.37	4.54	0.00
174.00	6.37	4.54	0.00
177.00	6.37	4.54	0.00
180.00	6.37	4.54	0.00
183.00	6.37	4.54	0.00
186.00	6.37	4.54	0.00
189.00	6.37	4.54	0.00
192.00	6.37	4.54	0.00

Summary for Subcatchment 12S: DA-5

Runoff = 3.31 cfs @ 11.97 hrs, Volume= 0.163 af, Depth= 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
0.430	84	50-75% Grass cover, Fair, HSG D
0.430		100.00% Pervious Area

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

Hydrograph for Subcatchment 12S: DA-5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.01	0.01
9.00	0.94	0.13	**0.03**
12.00	4.22	2.57	**3.06**
15.00	5.44	3.67	0.08
18.00	5.87	4.07	0.05
21.00	6.15	4.33	0.03
24.00	**6.37**	**4.54**	0.03
27.00	6.37	4.54	0.00
30.00	6.37	4.54	0.00
33.00	6.37	4.54	0.00
36.00	6.37	4.54	0.00
39.00	6.37	4.54	0.00
42.00	6.37	4.54	0.00
45.00	6.37	4.54	0.00
48.00	6.37	4.54	0.00
51.00	6.37	4.54	0.00
54.00	6.37	4.54	0.00
57.00	6.37	4.54	0.00
60.00	6.37	4.54	0.00
63.00	6.37	4.54	0.00
66.00	6.37	4.54	0.00
69.00	6.37	4.54	0.00
72.00	6.37	4.54	0.00
75.00	6.37	4.54	0.00
78.00	6.37	4.54	0.00
81.00	6.37	4.54	0.00
84.00	6.37	4.54	0.00
87.00	6.37	4.54	0.00
90.00	6.37	4.54	0.00
93.00	6.37	4.54	0.00
96.00	6.37	4.54	0.00
99.00	6.37	4.54	0.00
102.00	6.37	4.54	0.00
105.00	6.37	4.54	0.00
108.00	6.37	4.54	0.00
111.00	6.37	4.54	0.00
114.00	6.37	4.54	0.00
117.00	6.37	4.54	0.00
120.00	6.37	4.54	0.00
123.00	6.37	4.54	0.00
126.00	6.37	4.54	0.00
129.00	6.37	4.54	0.00
132.00	6.37	4.54	0.00
135.00	6.37	4.54	0.00
138.00	6.37	4.54	0.00
141.00	6.37	4.54	0.00
144.00	6.37	4.54	0.00
147.00	6.37	4.54	0.00
150.00	6.37	4.54	0.00
153.00	6.37	4.54	0.00
156.00	6.37	4.54	0.00
159.00	6.37	4.54	0.00
162.00	6.37	4.54	0.00
165.00	6.37	4.54	0.00
168.00	6.37	4.54	0.00
171.00	6.37	4.54	0.00
174.00	6.37	4.54	0.00
177.00	6.37	4.54	0.00
180.00	6.37	4.54	0.00
183.00	6.37	4.54	0.00
186.00	6.37	4.54	0.00
189.00	6.37	4.54	0.00
192.00	6.37	4.54	0.00

Summary for Subcatchment 13S: DA-C3

Runoff = 85.97 cfs @ 11.98 hrs, Volume= 4.317 af, Depth= 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
11.400	84	50-75% Grass cover, Fair, HSG D
11.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	182	0.1484	1.64		**Lag/CN Method,**
4.3	534	0.0190	2.07		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	397	0.2400	17.53	223.52	**Trap/Vee/Rect Channel Flow,** Bot.W=4.00' D=1.50' Z= 3.0 '/' Top.W=13.00' n= 0.040
6.6	1,113	Total			

Hydrograph for Subcatchment 13S: DA-C3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.01	0.15
9.00	0.94	0.13	**0.89**
12.00	4.22	2.57	**82.30**
15.00	5.44	3.67	2.08
18.00	5.87	4.07	1.25
21.00	6.15	4.33	0.86
24.00	**6.37**	**4.54**	0.76
27.00	6.37	4.54	0.00
30.00	6.37	4.54	0.00
33.00	6.37	4.54	0.00
36.00	6.37	4.54	0.00
39.00	6.37	4.54	0.00
42.00	6.37	4.54	0.00
45.00	6.37	4.54	0.00
48.00	6.37	4.54	0.00
51.00	6.37	4.54	0.00
54.00	6.37	4.54	0.00
57.00	6.37	4.54	0.00
60.00	6.37	4.54	0.00
63.00	6.37	4.54	0.00
66.00	6.37	4.54	0.00
69.00	6.37	4.54	0.00
72.00	6.37	4.54	0.00
75.00	6.37	4.54	0.00
78.00	6.37	4.54	0.00
81.00	6.37	4.54	0.00
84.00	6.37	4.54	0.00
87.00	6.37	4.54	0.00
90.00	6.37	4.54	0.00
93.00	6.37	4.54	0.00
96.00	6.37	4.54	0.00
99.00	6.37	4.54	0.00
102.00	6.37	4.54	0.00
105.00	6.37	4.54	0.00
108.00	6.37	4.54	0.00
111.00	6.37	4.54	0.00
114.00	6.37	4.54	0.00
117.00	6.37	4.54	0.00
120.00	6.37	4.54	0.00
123.00	6.37	4.54	0.00
126.00	6.37	4.54	0.00
129.00	6.37	4.54	0.00
132.00	6.37	4.54	0.00
135.00	6.37	4.54	0.00
138.00	6.37	4.54	0.00
141.00	6.37	4.54	0.00
144.00	6.37	4.54	0.00
147.00	6.37	4.54	0.00
150.00	6.37	4.54	0.00
153.00	6.37	4.54	0.00
156.00	6.37	4.54	0.00
159.00	6.37	4.54	0.00
162.00	6.37	4.54	0.00
165.00	6.37	4.54	0.00
168.00	6.37	4.54	0.00
171.00	6.37	4.54	0.00
174.00	6.37	4.54	0.00
177.00	6.37	4.54	0.00
180.00	6.37	4.54	0.00
183.00	6.37	4.54	0.00
186.00	6.37	4.54	0.00
189.00	6.37	4.54	0.00
192.00	6.37	4.54	0.00

Summary for Subcatchment 14S: DA-C2

Runoff = 29.36 cfs @ 11.97 hrs, Volume= 1.379 af, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
4.310	77	Brush, Fair, HSG D
0.040	91	Gravel roads, HSG D
4.350	77	Weighted Average
4.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	578	0.2007	1.92		**Lag/CN Method,**
0.5	149	0.0940	4.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	58	0.6200	12.68		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
5.6	785	Total			

Hydrograph for Subcatchment 14S: DA-C2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.00	0.00
9.00	0.94	0.03	**0.16**
12.00	4.22	1.99	**26.57**
15.00	5.44	2.99	0.73
18.00	5.87	3.36	0.44
21.00	6.15	3.61	0.31
24.00	**6.37**	**3.80**	0.27
27.00	6.37	3.80	0.00
30.00	6.37	3.80	0.00
33.00	6.37	3.80	0.00
36.00	6.37	3.80	0.00
39.00	6.37	3.80	0.00
42.00	6.37	3.80	0.00
45.00	6.37	3.80	0.00
48.00	6.37	3.80	0.00
51.00	6.37	3.80	0.00
54.00	6.37	3.80	0.00
57.00	6.37	3.80	0.00
60.00	6.37	3.80	0.00
63.00	6.37	3.80	0.00
66.00	6.37	3.80	0.00
69.00	6.37	3.80	0.00
72.00	6.37	3.80	0.00
75.00	6.37	3.80	0.00
78.00	6.37	3.80	0.00
81.00	6.37	3.80	0.00
84.00	6.37	3.80	0.00
87.00	6.37	3.80	0.00
90.00	6.37	3.80	0.00
93.00	6.37	3.80	0.00
96.00	6.37	3.80	0.00
99.00	6.37	3.80	0.00
102.00	6.37	3.80	0.00
105.00	6.37	3.80	0.00
108.00	6.37	3.80	0.00
111.00	6.37	3.80	0.00
114.00	6.37	3.80	0.00
117.00	6.37	3.80	0.00
120.00	6.37	3.80	0.00
123.00	6.37	3.80	0.00
126.00	6.37	3.80	0.00
129.00	6.37	3.80	0.00
132.00	6.37	3.80	0.00
135.00	6.37	3.80	0.00
138.00	6.37	3.80	0.00
141.00	6.37	3.80	0.00
144.00	6.37	3.80	0.00
147.00	6.37	3.80	0.00
150.00	6.37	3.80	0.00
153.00	6.37	3.80	0.00
156.00	6.37	3.80	0.00
159.00	6.37	3.80	0.00
162.00	6.37	3.80	0.00
165.00	6.37	3.80	0.00
168.00	6.37	3.80	0.00
171.00	6.37	3.80	0.00
174.00	6.37	3.80	0.00
177.00	6.37	3.80	0.00
180.00	6.37	3.80	0.00
183.00	6.37	3.80	0.00
186.00	6.37	3.80	0.00
189.00	6.37	3.80	0.00
192.00	6.37	3.80	0.00

Summary for Subcatchment 15S: DA-C4

Runoff = 153.23 cfs @ 11.98 hrs, Volume= 7.574 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Type II 24-hr 100 YR Rainfall=6.37"

Area (ac)	CN	Description
1.960	84	50-75% Grass cover, Fair, HSG D
20.900	77	Brush, Fair, HSG D
0.400	91	Gravel roads, HSG D
23.260	78	Weighted Average
23.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	176	0.2500	1.74		**Lag/CN Method,**
5.2	600	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.9	776	Total			

Hydrograph for Subcatchment 15S: DA-C4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
3.00	0.22	0.00	0.00
6.00	0.51	0.00	0.00
9.00	0.94	0.04	**0.97**
12.00	4.22	2.07	**149.60**
15.00	5.44	3.09	3.97
18.00	5.87	3.46	2.40
21.00	6.15	3.71	1.66
24.00	**6.37**	**3.91**	1.47
27.00	6.37	3.91	0.00
30.00	6.37	3.91	0.00
33.00	6.37	3.91	0.00
36.00	6.37	3.91	0.00
39.00	6.37	3.91	0.00
42.00	6.37	3.91	0.00
45.00	6.37	3.91	0.00
48.00	6.37	3.91	0.00
51.00	6.37	3.91	0.00
54.00	6.37	3.91	0.00
57.00	6.37	3.91	0.00
60.00	6.37	3.91	0.00
63.00	6.37	3.91	0.00
66.00	6.37	3.91	0.00
69.00	6.37	3.91	0.00
72.00	6.37	3.91	0.00
75.00	6.37	3.91	0.00
78.00	6.37	3.91	0.00
81.00	6.37	3.91	0.00
84.00	6.37	3.91	0.00
87.00	6.37	3.91	0.00
90.00	6.37	3.91	0.00
93.00	6.37	3.91	0.00
96.00	6.37	3.91	0.00
99.00	6.37	3.91	0.00
102.00	6.37	3.91	0.00
105.00	6.37	3.91	0.00
108.00	6.37	3.91	0.00
111.00	6.37	3.91	0.00
114.00	6.37	3.91	0.00
117.00	6.37	3.91	0.00
120.00	6.37	3.91	0.00
123.00	6.37	3.91	0.00
126.00	6.37	3.91	0.00
129.00	6.37	3.91	0.00
132.00	6.37	3.91	0.00
135.00	6.37	3.91	0.00
138.00	6.37	3.91	0.00
141.00	6.37	3.91	0.00
144.00	6.37	3.91	0.00
147.00	6.37	3.91	0.00
150.00	6.37	3.91	0.00
153.00	6.37	3.91	0.00
156.00	6.37	3.91	0.00
159.00	6.37	3.91	0.00
162.00	6.37	3.91	0.00
165.00	6.37	3.91	0.00
168.00	6.37	3.91	0.00
171.00	6.37	3.91	0.00
174.00	6.37	3.91	0.00
177.00	6.37	3.91	0.00
180.00	6.37	3.91	0.00
183.00	6.37	3.91	0.00
186.00	6.37	3.91	0.00
189.00	6.37	3.91	0.00
192.00	6.37	3.91	0.00

Summary for Reach 16R: Channel 5

Inflow Area = 22.850 ac, 0.00% Impervious, Inflow Depth = 4.31" for 100 YR event
Inflow = 80.69 cfs @ 12.30 hrs, Volume= 8.203 af
Outflow = 80.66 cfs @ 12.30 hrs, Volume= 8.203 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 11.37 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.27 fps, Avg. Travel Time= 0.4 min

Peak Storage= 355 cf @ 12.30 hrs
Average Depth at Peak Storage= 1.01'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 331.37 cfs

4.00' x 2.00' deep channel, n= 0.043
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 50.0' Slope= 0.1800 '/'
Inlet Invert= 876.00', Outlet Invert= 867.00'

‡

Hydrograph for Reach 16R: Channel 5

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	876.00	0.00
6.00	0.01	0	876.00	0.01
12.00	**22.70**	**143**	**876.52**	**22.41**
18.00	**2.75**	**35**	**876.16**	**2.75**
24.00	1.57	24	876.11	1.57
30.00	0.05	3	876.01	0.06
36.00	0.01	0	876.00	0.01
42.00	0.00	0	876.00	0.00
48.00	0.00	0	876.00	0.00
54.00	0.00	0	876.00	0.00
60.00	0.00	0	876.00	0.00
66.00	0.00	0	876.00	0.00
72.00	0.00	0	876.00	0.00
78.00	0.00	0	876.00	0.00
84.00	0.00	0	876.00	0.00
90.00	0.00	0	876.00	0.00
96.00	0.00	0	876.00	0.00
102.00	0.00	0	876.00	0.00
108.00	0.00	0	876.00	0.00
114.00	0.00	0	876.00	0.00
120.00	0.00	0	876.00	0.00
126.00	0.00	0	876.00	0.00
132.00	0.00	0	876.00	0.00
138.00	0.00	0	876.00	0.00
144.00	0.00	0	876.00	0.00
150.00	0.00	0	876.00	0.00
156.00	0.00	0	876.00	0.00
162.00	0.00	0	876.00	0.00
168.00	0.00	0	876.00	0.00
174.00	0.00	0	876.00	0.00
180.00	0.00	0	876.00	0.00
186.00	0.00	0	876.00	0.00
192.00	0.00	0	876.00	0.00

Summary for Reach 17R: Channel 6

Inflow Area = 2.130 ac, 0.00% Impervious, Inflow Depth = 76.24" for 100 YR event
Inflow = 41.02 cfs @ 13.06 hrs, Volume= 13.533 af
Outflow = 40.97 cfs @ 13.12 hrs, Volume= 13.533 af, Atten= 0%, Lag= 3.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 4.56 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 7.5 min

Peak Storage= 5,218 cf @ 13.09 hrs
Average Depth at Peak Storage= 1.34'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 294.91 cfs

4.00' x 3.50' deep channel, n= 0.052
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 580.0' Slope= 0.0293 '/'
Inlet Invert= 857.00', Outlet Invert= 840.00'

Hydrograph for Reach 17R: Channel 6

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	857.00	0.00
6.00	0.01	2	857.00	0.00
12.00	**14.35**	**2,480**	**857.77**	**13.35**
18.00	**9.33**	**1,835**	**857.61**	**9.42**
24.00	5.17	1,224	857.43	5.19
30.00	0.24	175	857.07	0.26
36.00	0.02	26	857.01	0.02
42.00	0.00	4	857.00	0.00
48.00	0.00	1	857.00	0.00
54.00	0.00	0	857.00	0.00
60.00	0.00	0	857.00	0.00
66.00	0.00	0	857.00	0.00
72.00	0.00	0	857.00	0.00
78.00	0.00	0	857.00	0.00
84.00	0.00	0	857.00	0.00
90.00	0.00	0	857.00	0.00
96.00	0.00	0	857.00	0.00
102.00	0.00	0	857.00	0.00
108.00	0.00	0	857.00	0.00
114.00	0.00	0	857.00	0.00
120.00	0.00	0	857.00	0.00
126.00	0.00	0	857.00	0.00
132.00	0.00	0	857.00	0.00
138.00	0.00	0	857.00	0.00
144.00	0.00	0	857.00	0.00
150.00	0.00	0	857.00	0.00
156.00	0.00	0	857.00	0.00
162.00	0.00	0	857.00	0.00
168.00	0.00	0	857.00	0.00
174.00	0.00	0	857.00	0.00
180.00	0.00	0	857.00	0.00
186.00	0.00	0	857.00	0.00
192.00	0.00	0	857.00	0.00

Summary for Reach 18R: Channel 4

Inflow Area = 8.940 ac, 0.00% Impervious, Inflow Depth = 4.33" for 100 YR event
Inflow = 47.10 cfs @ 12.08 hrs, Volume= 3.225 af
Outflow = 39.65 cfs @ 12.29 hrs, Volume= 3.225 af, Atten= 16%, Lag= 12.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 1.81 fps, Min. Travel Time= 7.6 min
Avg. Velocity = 0.44 fps, Avg. Travel Time= 31.1 min

Peak Storage= 18,121 cf @ 12.16 hrs
Average Depth at Peak Storage= 2.12'
Bank-Full Depth= 3.00' Flow Area= 39.0 sf, Capacity= 86.14 cfs

4.00' x 3.00' deep channel, n= 0.100
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 825.0' Slope= 0.0109 '/'
Inlet Invert= 894.00', Outlet Invert= 885.00'

‡

Hydrograph for Reach 18R: Channel 4

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	894.00	0.00
6.00	0.04	26	894.01	0.00
12.00	**38.11**	**11,804**	**895.62**	**9.46**
18.00	**0.98**	**1,308**	**894.32**	**1.03**
24.00	0.59	922	894.24	0.60
30.00	0.00	8	894.00	0.00
36.00	0.00	0	894.00	0.00
42.00	0.00	0	894.00	0.00
48.00	0.00	0	894.00	0.00
54.00	0.00	0	894.00	0.00
60.00	0.00	0	894.00	0.00
66.00	0.00	0	894.00	0.00
72.00	0.00	0	894.00	0.00
78.00	0.00	0	894.00	0.00
84.00	0.00	0	894.00	0.00
90.00	0.00	0	894.00	0.00
96.00	0.00	0	894.00	0.00
102.00	0.00	0	894.00	0.00
108.00	0.00	0	894.00	0.00
114.00	0.00	0	894.00	0.00
120.00	0.00	0	894.00	0.00
126.00	0.00	0	894.00	0.00
132.00	0.00	0	894.00	0.00
138.00	0.00	0	894.00	0.00
144.00	0.00	0	894.00	0.00
150.00	0.00	0	894.00	0.00
156.00	0.00	0	894.00	0.00
162.00	0.00	0	894.00	0.00
168.00	0.00	0	894.00	0.00
174.00	0.00	0	894.00	0.00
180.00	0.00	0	894.00	0.00
186.00	0.00	0	894.00	0.00
192.00	0.00	0	894.00	0.00

Summary for Reach 19R: Channel 3

Inflow Area = 7.170 ac, 0.00% Impervious, Inflow Depth = 4.44" for 100 YR event
Inflow = 45.88 cfs @ 12.02 hrs, Volume= 2.651 af
Outflow = 39.13 cfs @ 12.18 hrs, Volume= 2.651 af, Atten= 15%, Lag= 9.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.30 fps, Min. Travel Time= 5.9 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 24.1 min

Peak Storage= 13,950 cf @ 12.08 hrs
Average Depth at Peak Storage= 1.64'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 192.38 cfs

4.00' x 3.50' deep channel, n= 0.077
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,170.0' Slope= 0.0274 '/'
Inlet Invert= 916.00', Outlet Invert= 884.00'

Hydrograph for Reach 19R: Channel 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	916.00	0.00
6.00	0.06	63	916.01	0.01
12.00	**44.59**	**11,846**	**917.46**	**16.47**
18.00	**0.78**	**961**	**916.19**	**0.82**
24.00	0.48	694	916.14	0.48
30.00	0.00	1	916.00	0.00
36.00	0.00	0	916.00	0.00
42.00	0.00	0	916.00	0.00
48.00	0.00	0	916.00	0.00
54.00	0.00	0	916.00	0.00
60.00	0.00	0	916.00	0.00
66.00	0.00	0	916.00	0.00
72.00	0.00	0	916.00	0.00
78.00	0.00	0	916.00	0.00
84.00	0.00	0	916.00	0.00
90.00	0.00	0	916.00	0.00
96.00	0.00	0	916.00	0.00
102.00	0.00	0	916.00	0.00
108.00	0.00	0	916.00	0.00
114.00	0.00	0	916.00	0.00
120.00	0.00	0	916.00	0.00
126.00	0.00	0	916.00	0.00
132.00	0.00	0	916.00	0.00
138.00	0.00	0	916.00	0.00
144.00	0.00	0	916.00	0.00
150.00	0.00	0	916.00	0.00
156.00	0.00	0	916.00	0.00
162.00	0.00	0	916.00	0.00
168.00	0.00	0	916.00	0.00
174.00	0.00	0	916.00	0.00
180.00	0.00	0	916.00	0.00
186.00	0.00	0	916.00	0.00
192.00	0.00	0	916.00	0.00

Summary for Reach 20R: Channel 2 Reach A

Inflow Area = 11.080 ac, 0.00% Impervious, Inflow Depth = 4.54" for 100 YR event
Inflow = 84.45 cfs @ 11.97 hrs, Volume= 4.196 af
Outflow = 63.33 cfs @ 12.16 hrs, Volume= 4.196 af, Atten= 25%, Lag= 11.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.29 fps, Min. Travel Time= 8.0 min
Avg. Velocity = 0.73 fps, Avg. Travel Time= 36.0 min

Peak Storage= 30,832 cf @ 12.03 hrs
Average Depth at Peak Storage= 2.28'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 160.67 cfs

4.00' x 3.50' deep channel, n= 0.100
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,585.0' Slope= 0.0322 '/'
Inlet Invert= 919.00', Outlet Invert= 868.00'

Hydrograph for Reach 20R: Channel 2 Reach A

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	919.00	0.00
6.00	**0.14**	221	919.03	0.03
12.00	**79.52**	**29,838**	**921.23**	**26.91**
18.00	1.21	**1,954**	**919.27**	**1.28**
24.00	0.74	1,397	919.20	0.76
30.00	0.00	15	919.00	0.00
36.00	0.00	0	919.00	0.00
42.00	0.00	0	919.00	0.00
48.00	0.00	0	919.00	0.00
54.00	0.00	0	919.00	0.00
60.00	0.00	0	919.00	0.00
66.00	0.00	0	919.00	0.00
72.00	0.00	0	919.00	0.00
78.00	0.00	0	919.00	0.00
84.00	0.00	0	919.00	0.00
90.00	0.00	0	919.00	0.00
96.00	0.00	0	919.00	0.00
102.00	0.00	0	919.00	0.00
108.00	0.00	0	919.00	0.00
114.00	0.00	0	919.00	0.00
120.00	0.00	0	919.00	0.00
126.00	0.00	0	919.00	0.00
132.00	0.00	0	919.00	0.00
138.00	0.00	0	919.00	0.00
144.00	0.00	0	919.00	0.00
150.00	0.00	0	919.00	0.00
156.00	0.00	0	919.00	0.00
162.00	0.00	0	919.00	0.00
168.00	0.00	0	919.00	0.00
174.00	0.00	0	919.00	0.00
180.00	0.00	0	919.00	0.00
186.00	0.00	0	919.00	0.00
192.00	0.00	0	919.00	0.00

Summary for Pond 21P: Culvert 1

Inflow Area = 22.850 ac, 0.00% Impervious, Inflow Depth = 4.31" for 100 YR event
Inflow = 80.66 cfs @ 12.30 hrs, Volume= 8.203 af
Outflow = 80.66 cfs @ 12.30 hrs, Volume= 8.203 af, Atten= 0%, Lag= 0.0 min
Primary = 80.66 cfs @ 12.30 hrs, Volume= 8.203 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs
Peak Elev= 870.28' @ 12.30 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	865.50'	**42.0" Round Culvert** L= 47.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 865.50' / 862.00' S= 0.0745 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 9.62 sf

Primary OutFlow Max=80.56 cfs @ 12.30 hrs HW=870.27' (Free Discharge)
↑**1=Culvert** (Inlet Controls 80.56 cfs @ 8.37 fps)

Hydrograph for Pond 21P: Culvert 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	865.50	0.00
3.00	0.00	865.50	0.00
6.00	0.01	865.52	0.01
9.00	0.53	865.75	0.53
12.00	**22.41**	**867.28**	**22.41**
15.00	**4.94**	**866.29**	**4.94**
18.00	2.75	866.08	2.75
21.00	1.84	865.97	1.84
24.00	1.57	865.94	1.57
27.00	0.20	865.65	0.20
30.00	0.06	865.58	0.06
33.00	0.02	865.55	0.02
36.00	0.01	865.53	0.01
39.00	0.00	865.51	0.00
42.00	0.00	865.50	0.00
45.00	0.00	865.50	0.00
48.00	0.00	865.50	0.00
51.00	0.00	865.50	0.00
54.00	0.00	865.50	0.00
57.00	0.00	865.50	0.00
60.00	0.00	865.50	0.00
63.00	0.00	865.50	0.00
66.00	0.00	865.50	0.00
69.00	0.00	865.50	0.00
72.00	0.00	865.50	0.00
75.00	0.00	865.50	0.00
78.00	0.00	865.50	0.00
81.00	0.00	865.50	0.00
84.00	0.00	865.50	0.00
87.00	0.00	865.50	0.00
90.00	0.00	865.50	0.00
93.00	0.00	865.50	0.00
96.00	0.00	865.50	0.00
99.00	0.00	865.50	0.00
102.00	0.00	865.50	0.00
105.00	0.00	865.50	0.00
108.00	0.00	865.50	0.00
111.00	0.00	865.50	0.00
114.00	0.00	865.50	0.00
117.00	0.00	865.50	0.00
120.00	0.00	865.50	0.00
123.00	0.00	865.50	0.00
126.00	0.00	865.50	0.00
129.00	0.00	865.50	0.00
132.00	0.00	865.50	0.00
135.00	0.00	865.50	0.00
138.00	0.00	865.50	0.00
141.00	0.00	865.50	0.00
144.00	0.00	865.50	0.00
147.00	0.00	865.50	0.00
150.00	0.00	865.50	0.00
153.00	0.00	865.50	0.00
156.00	0.00	865.50	0.00
159.00	0.00	865.50	0.00
162.00	0.00	865.50	0.00
165.00	0.00	865.50	0.00
168.00	0.00	865.50	0.00
171.00	0.00	865.50	0.00
174.00	0.00	865.50	0.00
177.00	0.00	865.50	0.00
180.00	0.00	865.50	0.00
183.00	0.00	865.50	0.00
186.00	0.00	865.50	0.00
189.00	0.00	865.50	0.00
192.00	0.00	865.50	0.00

Summary for Pond 22P: Pond C - No Principal

Inflow Area = 72.940 ac, 0.00% Impervious, Inflow Depth = 4.29" for 100 YR event
Inflow = 284.60 cfs @ 12.00 hrs, Volume= 26.072 af
Outflow = 40.27 cfs @ 13.06 hrs, Volume= 12.783 af, Atten= 86%, Lag= 63.8 min
Secondary = 40.27 cfs @ 13.06 hrs, Volume= 12.783 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs / 3
Starting Elev= 859.00' Surf.Area= 155,517 sf Storage= 711,694 cf
Peak Elev= 863.01' @ 13.06 hrs Surf.Area= 177,525 sf Storage= 1,378,260 cf (666,567 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 192.2 min (1,013.2 - 821.0)

Volume	Invert	Avail.Storage	Storage Description
#1	854.00'	1,557,643 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
854.00	129,407	0	0
856.00	139,654	269,061	269,061
858.00	150,147	289,801	558,862
860.00	160,886	311,033	869,895
862.00	171,871	332,757	1,202,652
864.00	183,120	354,991	1,557,643

Device	Routing	Invert	Outlet Devices
#1	Secondary	862.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.50 Width (feet) 33.00 42.00

Secondary OutFlow Max=40.22 cfs @ 13.06 hrs HW=863.01' (Free Discharge)
↑**1=Custom Weir/Orifice** (Weir Controls 40.22 cfs @ 2.31 fps)

Hydrograph for Pond 22P: Pond C - No Principal

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Secondary (cfs)
0.00	34.85	712,321	859.00	0.00
6.00	0.11	728,184	859.11	0.00
12.00	**284.58**	**993,536**	**860.76**	**0.00**
18.00	8.23	**1,322,405**	**862.69**	**9.11**
24.00	4.86	1,311,172	862.62	5.03
30.00	0.07	1,290,502	862.51	0.24
36.00	0.01	1,289,394	862.50	0.02
42.00	0.00	1,289,306	862.50	0.00
48.00	0.00	1,289,293	862.50	0.00
54.00	0.00	1,289,291	862.50	0.00
60.00	0.00	1,289,291	862.50	0.00
66.00	0.00	1,289,291	862.50	0.00
72.00	0.00	1,289,291	862.50	0.00
78.00	0.00	1,289,291	862.50	0.00
84.00	0.00	1,289,291	862.50	0.00
90.00	0.00	1,289,291	862.50	0.00
96.00	0.00	1,289,291	862.50	0.00
102.00	0.00	1,289,291	862.50	0.00
108.00	0.00	1,289,291	862.50	0.00
114.00	0.00	1,289,291	862.50	0.00
120.00	0.00	1,289,291	862.50	0.00
126.00	0.00	1,289,291	862.50	0.00
132.00	0.00	1,289,291	862.50	0.00
138.00	0.00	1,289,291	862.50	0.00
144.00	0.00	1,289,291	862.50	0.00
150.00	0.00	1,289,291	862.50	0.00
156.00	0.00	1,289,291	862.50	0.00
162.00	0.00	1,289,291	862.50	0.00
168.00	0.00	1,289,291	862.50	0.00
174.00	0.00	1,289,291	862.50	0.00
180.00	0.00	1,289,291	862.50	0.00
186.00	0.00	1,289,291	862.50	0.00
192.00	0.00	1,289,291	862.50	0.00

Summary for Pond 23P: Downchute C Inlet

Inflow Area = 22.480 ac, 0.00% Impervious, Inflow Depth = 4.54" for 100 YR event
Inflow = 109.76 cfs @ 11.99 hrs, Volume= 8.512 af
Outflow = 109.80 cfs @ 11.99 hrs, Volume= 8.512 af, Atten= 0%, Lag= 0.0 min
Primary = 109.80 cfs @ 11.99 hrs, Volume= 8.512 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs / 3
Peak Elev= 870.38' @ 11.99 hrs Surf.Area= 0.000 ac Storage= 0.002 af

Plug-Flow detention time= 0.1 min calculated for 8.511 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (810.8 - 810.7)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	0.002 af	**4.00'W x 4.00'L x 5.00'H Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	863.50'	**48.0" Round Culvert** L= 120.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 863.50' / 862.00' S= 0.0125 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 12.57 sf

Primary OutFlow Max=108.73 cfs @ 11.99 hrs HW=870.30' (Free Discharge)
1=Culvert (Barrel Controls 108.73 cfs @ 8.65 fps)

Hydrograph for Pond 23P: Downchute C Inlet

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	863.00	0.00
6.00	0.18	**0.000**	863.68	0.18
12.00	**109.21**	**0.002**	**870.34**	**109.26**
18.00	2.53	0.000	864.14	2.53
24.00	1.52	0.000	864.00	1.52
30.00	0.00	0.000	863.51	0.00
36.00	0.00	0.000	863.50	0.00
42.00	0.00	0.000	863.50	0.00
48.00	0.00	0.000	863.50	0.00
54.00	0.00	0.000	863.50	0.00
60.00	0.00	0.000	863.50	0.00
66.00	0.00	0.000	863.50	0.00
72.00	0.00	0.000	863.50	0.00
78.00	0.00	0.000	863.50	0.00
84.00	0.00	0.000	863.50	0.00
90.00	0.00	0.000	863.50	0.00
96.00	0.00	0.000	863.50	0.00
102.00	0.00	0.000	863.50	0.00
108.00	0.00	0.000	863.50	0.00
114.00	0.00	0.000	863.50	0.00
120.00	0.00	0.000	863.50	0.00
126.00	0.00	0.000	863.50	0.00
132.00	0.00	0.000	863.50	0.00
138.00	0.00	0.000	863.50	0.00
144.00	0.00	0.000	863.50	0.00
150.00	0.00	0.000	863.50	0.00
156.00	0.00	0.000	863.50	0.00
162.00	0.00	0.000	863.50	0.00
168.00	0.00	0.000	863.50	0.00
174.00	0.00	0.000	863.50	0.00
180.00	0.00	0.000	863.50	0.00
186.00	0.00	0.000	863.50	0.00
192.00	0.00	0.000	863.50	0.00

Summary for Pond 24P: Pond C Forebay

Inflow Area = 49.680 ac, 0.00% Impervious, Inflow Depth = 4.37" for 100 YR event
Inflow = 158.87 cfs @ 11.99 hrs, Volume= 18.094 af
Outflow = 142.67 cfs @ 12.24 hrs, Volume= 18.498 af, Atten= 10%, Lag= 15.0 min
Primary = 142.67 cfs @ 12.24 hrs, Volume= 18.498 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs / 3
Starting Elev= 859.00' Surf.Area= 16,463 sf Storage= 15,614 cf
Peak Elev= 860.42' @ 12.24 hrs Surf.Area= 18,929 sf Storage= 40,767 cf (25,153 cf above start)

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	206,682 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
858.00	14,765	0	0
860.00	18,160	32,925	32,925
862.00	21,799	39,959	72,884
864.00	25,683	47,482	120,366
866.00	29,812	55,495	175,861
867.00	31,830	30,821	206,682

Device	Routing	Invert	Outlet Devices
#1	Primary	858.00'	**Custom Weir/Orifice X 0.40, Cv= 2.62 (C= 3.28)**
			Head (feet) 0.00 9.00
			Width (feet) 25.00 61.00

Primary OutFlow Max=142.64 cfs @ 12.24 hrs HW=860.42' (Free Discharge)
↑—**1=Custom Weir/Orifice** (Weir Controls 142.64 cfs @ 1.97 fps)

Hydrograph for Pond 24P: Pond C Forebay

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	15,614	859.00	34.85
6.00	0.18	166	858.01	0.11
12.00	**158.24**	**39,244**	**860.34**	**134.98**
18.00	5.72	**4,669**	**858.31**	**5.83**
24.00	3.36	3,230	858.22	3.39
30.00	0.06	101	858.01	0.07
36.00	0.01	16	858.00	0.01
42.00	0.00	3	858.00	0.00
48.00	0.00	0	858.00	0.00
54.00	0.00	0	858.00	0.00
60.00	0.00	0	858.00	0.00
66.00	0.00	0	858.00	0.00
72.00	0.00	0	858.00	0.00
78.00	0.00	0	858.00	0.00
84.00	0.00	0	858.00	0.00
90.00	0.00	0	858.00	0.00
96.00	0.00	0	858.00	0.00
102.00	0.00	0	858.00	0.00
108.00	0.00	0	858.00	0.00
114.00	0.00	0	858.00	0.00
120.00	0.00	0	858.00	0.00
126.00	0.00	0	858.00	0.00
132.00	0.00	0	858.00	0.00
138.00	0.00	0	858.00	0.00
144.00	0.00	0	858.00	0.00
150.00	0.00	0	858.00	0.00
156.00	0.00	0	858.00	0.00
162.00	0.00	0	858.00	0.00
168.00	0.00	0	858.00	0.00
174.00	0.00	0	858.00	0.00
180.00	0.00	0	858.00	0.00
186.00	0.00	0	858.00	0.00
192.00	0.00	0	858.00	0.00

Summary for Pond 26P: Sediment Trap C

Inflow Area = 22.420 ac, 0.00% Impervious, Inflow Depth = 4.30" for 100 YR event
Inflow = 95.96 cfs @ 12.19 hrs, Volume= 8.040 af
Outflow = 80.31 cfs @ 12.30 hrs, Volume= 8.040 af, Atten= 16%, Lag= 6.5 min
Primary = 80.31 cfs @ 12.30 hrs, Volume= 8.040 af

Routing by Stor-Ind method, Time Span= 0.00-192.00 hrs, dt= 0.03 hrs / 3
Peak Elev= 881.07' @ 12.30 hrs Surf.Area= 21,778 sf Storage= 57,370 cf

Plug-Flow detention time= 32.5 min calculated for 8.039 af (100% of inflow)
Center-of-Mass det. time= 32.6 min (859.9 - 827.4)

Volume	Invert	Avail.Storage	Storage Description
#1	878.00'	130,540 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
878.00	15,693	0	0
880.00	19,513	35,206	35,206
882.00	23,733	43,246	78,452
884.00	28,355	52,088	130,540

Device	Routing	Invert	Outlet Devices
#1	Primary	878.00'	**Custom Weir/Orifice X 0.40, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 6.00 Width (feet) 4.00 40.00

Primary OutFlow Max=80.26 cfs @ 12.30 hrs HW=881.07' (Free Discharge)
↑**1=Custom Weir/Orifice** (Weir Controls 80.26 cfs @ 1.98 fps)

Hydrograph for Pond 26P: Sediment Trap C

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	878.00	0.00
6.00	0.02	12	878.00	0.00
12.00	**48.64**	**26,709**	**879.55**	**19.64**
18.00	**2.53**	**8,654**	**878.53**	**2.70**
24.00	1.50	6,171	878.38	1.54
30.00	0.00	649	878.04	0.05
36.00	0.00	107	878.01	0.01
42.00	0.00	17	878.00	0.00
48.00	0.00	3	878.00	0.00
54.00	0.00	0	878.00	0.00
60.00	0.00	0	878.00	0.00
66.00	0.00	0	878.00	0.00
72.00	0.00	0	878.00	0.00
78.00	0.00	0	878.00	0.00
84.00	0.00	0	878.00	0.00
90.00	0.00	0	878.00	0.00
96.00	0.00	0	878.00	0.00
102.00	0.00	0	878.00	0.00
108.00	0.00	0	878.00	0.00
114.00	0.00	0	878.00	0.00
120.00	0.00	0	878.00	0.00
126.00	0.00	0	878.00	0.00
132.00	0.00	0	878.00	0.00
138.00	0.00	0	878.00	0.00
144.00	0.00	0	878.00	0.00
150.00	0.00	0	878.00	0.00
156.00	0.00	0	878.00	0.00
162.00	0.00	0	878.00	0.00
168.00	0.00	0	878.00	0.00
174.00	0.00	0	878.00	0.00
180.00	0.00	0	878.00	0.00
186.00	0.00	0	878.00	0.00
192.00	0.00	0	878.00	0.00

ATTACHMENT 2

NORTH AMERICAN GREEN OUTPUT

Tensar International Corporation
5401 St. Wendel-Cynthiana Road
Poseyville, Indiana 47633
Tel. 800.772.2040
Fax 812.867.0247
www.nagreen.com

Erosion Control Materials Design Software
Version 5.0

Project Name: CHLF
Project Number: 87129
Channel Name: Channel 2A

Discharge	56.56
Peak Flow Period	24
Channel Slope	0.0322
Channel Bottom Width	4
Left Side Slope	2
Right Side Slope	2
Low Flow Liner	
Retardance Class	C
Vegtation Type	Bunch Type
Vegetation Density	Good 75-95%
Soil Type	Clay Loam

Rock Riprap - Class C - Bunch Type - Good 75-95%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
Rock Riprap Unvegetated	Straight	56.56 cfs	3.19 ft/s	2.14 ft	0.1	6 lbs/ft2	4.3 lbs/ft2	1.39	STABLE	--

Tensar International Corporation
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Version 5.0

Project Name: CHLF
Project Number: 87129
Channel Name: Channel 3

Discharge	33.01
Peak Flow Period	24
Channel Slope	0.0274
Channel Bottom Width	4
Left Side Slope	2
Right Side Slope	2
Low Flow Liner	
Retardance Class	C
Vegtation Type	Bunch Type
Vegetation Density	Good 75-95%
Soil Type	Clay Loam

Rock Riprap - Class C - Bunch Type - Good 75-95%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
Rock Riprap Unvegetated	Straight	33.01 cfs	3.14 ft/s	1.5 ft	0.077	4 lbs/ft2	2.57 lbs/ft2	1.56	STABLE	--

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Erosion Control Materials Design Software
Version 5.0

Project Name: CHLF
Project Number: 87129
Channel Name: Channel 4

Discharge	33.52
Peak Flow Period	24
Channel Slope	0.0109
Channel Bottom Width	4
Left Side Slope	2
Right Side Slope	2
Low Flow Liner	
Retardance Class	C
Vegtation Type	Bunch Type
Vegetation Density	Good 75-95%
Soil Type	Clay Loam

Rock Riprap - Class C - Bunch Type - Good 75-95%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
Rock Riprap Unvegetated	Straight	33.52 cfs	1.86 ft/s	2.16 ft	0.1	2 lbs/ft2	1.47 lbs/ft2	1.36	STABLE	--

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Erosion Control Materials Design Software
Version 5.0

Project Name: CHLF
Project Number: 87129
Channel Name: Channel 5

Discharge	51.65
Peak Flow Period	24
Channel Slope	0.18
Channel Bottom Width	4
Left Side Slope	3
Right Side Slope	3
Low Flow Liner	
Retardance Class	C
Vegtation Type	Bunch Type
Vegetation Density	Good 75-95%
Soil Type	Clay Loam

P550 - Class C - Bunch Type - Good 75-95%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
P550 Unvegetated	Straight	51.65 cfs	11.27 ft/s	0.74 ft	0.037	3.25 lbs/ft2	8.28 lbs/ft2	0.39	UNSTABLE	E
P550 Reinforced Vegetation	Straight	51.65 cfs	10.02 ft/s	0.8 ft	0.043	12 lbs/ft2	9.03 lbs/ft2	1.33	STABLE	E
Underlying Substrate	Straight	51.65 cfs	10.02 ft/s	0.8 ft	--	3.25 lbs/ft2	3.031 lbs/ft2	1.07	STABLE	--

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Erosion Control Materials Design Software
Version 5.0

Project Name: CHLF
Project Number: 87129
Channel Name: Channel 6

Discharge	18.17
Peak Flow Period	24
Channel Slope	0.0293
Channel Bottom Width	4
Left Side Slope	2
Right Side Slope	2
Low Flow Liner	
Retardance Class	C
Vegtation Type	Bunch Type
Vegetation Density	Good 75-95%
Soil Type	Clay Loam

Rock Riprap - Class C - Bunch Type - Good 75-95%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
Rock Riprap Unvegetated	Straight	18.17 cfs	3.9 ft/s	0.83 ft	0.047	2 lbs/ft2	1.51 lbs/ft2	1.33	STABLE	--

ATTACHMENT 3

DRAINAGE AREA FIGURE

NORTH

HV305A
EL. 915.7

BM#3

HV305A
EL. 916.64

DA3
7.2 AC

DA2A
11.1 AC

DA4
8.9 AC

DAC3
11.4 AC

DA5
0.4 AC

DAC1
6.1 AC

BM#2

DAC2
4.3 AC

DA6
2.1 AC

DAC4
23.3 AC

BM#1

SCALE IN FEET

0 300 600

*HAND SIGNATURE ON FILE

Civil & Environmental Consultants, Inc.
4000 Triangle Lane · Suite 200 · Export, PA 15632
724-327-5200 · 800-899-3610
www.cecinc.com

DAYTON POWER AND LIGHT COMPANY
CARTER HOLLOW LANDFILL
SPRIGG TOWNSHIP
ADAMS COUNTY, OHIO

POND C DRAINAGE AREA MAP

DRAWN BY:	RBD	CHECKED BY:	JRH	APPROVED BY:	*TDM	FIGURE NO.:	1
DATE:	MAY 2016	DWG SCALE:	1"=300'	PROJECT NO:	144-189		

P:\2014\144-189\-CADD\Dwg\CV02 Permit Drawings\144189-CV02-Pond C Drainage Area Map.dwg[C308] LS:(6/9/2016 - miapaluccj) - LP: 6/9/2016 2:20 PM

OBJECTIVE:

To design the proposed Sedimentation Pond D, which provides stormwater management and sedimentation control, by satisfying the following regulations for residual waste landfills:

OAC 3745-30-07(C)(4)(d)

(d) Any sedimentation ponds shall be designed and constructed in accordance with the following:

(i) Minimum storage volume shall be provided based on either the calculated runoff volume from a ten-year/twenty-four-hour storm event, or 0.125 acre-feet per year, for each acre of disturbed area within the upstream drainage area, multiplied by the scheduled frequency of pond clean-out (in years), whichever is greater.

(ii) The principal spillway shall safely discharge the flow from a ten-year/twenty-four-hour storm event. The inlet elevation of the emergency spillway shall be designed to provide flood storage, with no flow entering the emergency spillway, for a twenty-five-year/twenty-four-hour storm event, with allowance provided for the flow passed by the principal spillway during the event.

(iii) The combination of principal and emergency spillways shall safely discharge the flow from a one-hundred-year/twenty-four-hour storm event. The embankment design shall provide for no less than one foot net freeboard when flow is at the design depth, after allowance for embankment settlement.

(iv) The sedimentation pond shall be constructed using a recompacted soil liner, a flexible membrane liner, or a combination thereof, based on a design acceptable to the director.

The design is based upon accepted engineering design equations, methodologies and assumptions. Where applicable, design references have been made. Calculations have been performed using the software package, HydroCAD Version 9.10, Copyright 2009.

METHOD:

Stormwater routings have been performed with a storage-elevation routing methodology. The inflow hydrographs have been developed using the HydroCAD hydrograph method, which utilizes components of TR-20 and TR-55, using the times of concentration (Tc) and watershed parameters determined for each contributing watershed.

The rainfall values for this site are listed below. The NOAA Atlas 14(1), Point Precipitation Frequency Estimates, provided the estimated rainfall depths and are presented in "OAC 3745-30-05 (C)(6)(k) Permanent Surface Water Control Structures A Design Calculations".

RAINFALL DATA		
Frequency	**Duration**	**Depth (in)**
10 yr	24 hr	4.16
25 yr	24 hr	4.97
100 yr	24 hr	6.37

According to the TR-55 methods, times of concentration were estimated as the sum of sheet flow, shallow concentrated flow and channel flow. Flow calculations utilized a CN number representative of the post construction surface conditions. Maximum sheet flow length used was 100 feet. Shallow concentrated flow times of concentration were estimated depending on the condition of the flow path.

This site is located in an area of hydrologic soil group C. Based on the existing and proposed site conditions the following runoff coefficients have been determined and will be utilized.

CN DATA	
Description	**CN**
Existing (Woods Grass Combination, Fair)	76
Landfill (50-75% Grass Cover, Fair)	79

The inflow hydrographs were developed using HydroCAD for each contributing watershed based on the previously mentioned criteria and the delineated drainage areas. These areas can be found in **Figure D of (C)(6)(k) Surface Water Control Structures Design Calculations Drainage Area D**. The contributing drainage areas for this sedimentation pond, taken from the channel designs, are summarized below:

Drainage Area (Acre)	Cn #	Watershed Area (Acre)
D1	79	0.60
D2	79	2.61
D3	79	0.51
D4	79	1.10
D5	79	0.60
D6	79	1.10
D7	79	2.50
D8	79	1.07
EX-D	76	2.04
Total		**12.14**

Using the developed inflow hydrographs, all routings have been performed with the initial pool elevation within the pond at the invert of the principal spillway. The required sedimentation storage volume has been provided below the invert of the principal spillway. The inflow hydrograph from the 10-year/24-hour storm event was then used to size the principal spillway. The 25-year/24-hour storm event was then passed through the principal spillway in order to determine the elevation at which the emergency spillway was to be placed. The 100-year/24-hour storm event was then used to design the emergency spillway while providing a minimum of one foot of freeboard from the top of the embankment.

CALCULATIONS:

SEDIMENT VOLUME SIZING

According to OAC 3745-30-07(C)(4)(d)(i), the sedimentation pond must have adequate sediment storage volume for the larger of (1) the runoff from the 10-year/24-hour storm event or (2) 0.125 acre-feet per acre of disturbed area multiplied by the cleaning frequency in years.

Volume Requirement for ten-year/twenty-four-hour storm:
Utilizing the hydrographs from HydroCAD, the runoff from the 10-year/24-hour storm event is 2.11 acre-feet or 91,900 cubic feet.

Volume Requirement for 0.125 acre-feet per disturbed acre:

Per the mentioned regulation, the storage volume required for each Drainage Area is calculated as follows:

$$V = Disturbed\ Area\left(\frac{0.125\ acre-ft}{acre}\right)[1\ \text{cleaning per year}]$$

The expected total disturbed drainage area is approximately 12.1 acres. Therefore, 0.125 acre-feet per disturbed acre requires a total sediment storage volume of 65,900 cubic-feet.

The rule calculations are very conservative in nature and neglect site-specific erosion expectations; therefore, a calculation giving a more accurate representation of the expected sediment during post-closure would be prudent. The Revised Universal Soil Loss Equation (RUSLE) was utilized to estimate the soil loss from the site during a capped condition. A composite sediment volume will be determined utilizing an expected soil loss from existing areas and an expected soil loss from the capped portion of the landfill. The RUSLE analyses can be found in "OAC 3745-30-05 (C)(6)(j) - Soil Erosion" and "OAC 3745-30-05 (C)(6)(l) – Temporary Sediment Pond A - Design Calculations" respectively.

Summarizing the results of the RUSLE calculation, the estimated soil erosion rate is approximately 2.7 tons/acre/year in a closed condition and 200 tons/acre/year for the existing areas. In order to be conservative, the 5.0 tons/acre/year allowable soil erosion from the capped landfill will be used in order to calculate the required sediment storage volume. Based on a 10.1 acre capped landfill drainage area, and assuming a unit weight of soil of approximately 100 pounds per cubic foot, the estimated required sediment storage volume based on site-specific generated sediment is 1,000 cubic-feet. Likewise, from a 2.0 acre existing drainage area, the estimated required sediment storage volume based on site-specific generated sediment is 8,000 cubic-feet. Utilizing these site-specific minimum storage requirements and the HydroCAD elevation-storage table included with this calculation, the overall sediment storage volume is achieved at an elevation of approximately 901.00, but due to the outlet controlling, the invert of the principal spillway has been set at 904.00.

Item	Value
Required Storage to Invert of Principal Spillway	8,000 cubic-feet
Actual Storage at Invert of Principal Spillway (elevation 904.00), EXCEEDS REQUIRED	142,900 cubic-feet

Based on the above calculations and the actual available sediment storage of the sedimentation pond, it can be assumed that cleaning of Sedimentation Pond D will be required approximately once every year. However, cleaning of the sedimentation pond shall be performed when 50 percent of the volume below the principal spillway is occupied by sediment.

PRINCIPAL SPILLWAY DESIGN

According to OAC 3745-30-07(C)(4)(d)(ii), the principal spillway shall be designed to safely discharge the flow from a 10-year/24-hour storm event without the use of mechanical means. To fulfill this regulation, the principal spillway was placed at an elevation of 904.00 which provides the required sediment storage volume. The spillway was then sized accordingly to allow the 10-year/24-hour storm event to pass safely. The 25-year/24-hour storm event was then routed through the designed principal spillway in order to determine the 25-year/24-hour elevation. Therefore, if the principal spillway is capable of releasing the flow from the 25-year/24-hour storm event, it is capable of safely handling the flow from the 10-year/24-hour storm event.

The details of the principal spillway for Sedimentation Pond D are summarized as follows:

Item	Value
Spillway Type	RCP Pipe
Design Manning's n	0.012
Culvert Quantity	1
Culvert Dimension	12 inch Diameter
Culvert Length	81.30 feet
Principal Spillway Invert Elevation	904.00 feet
Maximum pool elevation 25-year 24-hour storm	905.43 feet
Maximum pool volume for 25-year 24-hour storm	64,800 cubic-feet

According to OAC 3745-30-07(C)(4)(d)(ii), the routing, included with this calculation, shows that the maximum pool elevation for the routed 25-year/24-hour storm event is below the invert elevation of the emergency spillway, which has been set at 906.10. Thus, during the 25-year/24-hour storm event, the emergency spillway provides flood storage with no flow entering the emergency spillway while allowing flow through the principal spillway.

EMERGENCY SPILLWAY DESIGN

According to OAC 3745-30-07(C)(4)(d)(iii), the emergency spillway has been designed such that the combination of the principal spillway and emergency spillway will safely discharge the 100-year/24-hour storm event. This design requirement has been evaluated by routing flow from the 100-year/24-hour storm through the pond using the previously designed principal spillway.

The emergency spillway shall be a broad-crested weir with a crest length of 10 feet, a width of 5 feet, and a weir height of 1.90 feet. The sideslopes of the emergency spillway shall be 4H:1V. The invert of the emergency spillway has been set above the elevation of the 25-year/24-hour storm event such that throughout the routing of the 100-year/24-hour storm, a minimum 1-ft of freeboard is maintained to the perimeter elevation of the pond. The routing of the 100-yr/24 hour storm event produces a pool elevation of 906.09, which allows for a freeboard of 1.91 ft below the embankment, which has an elevation of 908.00.

The details of the emergency spillway for Sedimentation Pond D are included in the HydroCAD output.

Item	Value
Spillway Type	Broad-Crested Weir
Weir Coefficient	2.34
Channel Lining	Stone
Channel Dimension	10'L, 5'W, 2'H
Emergency Spillway Invert Elevation	906.10 feet
Maximum pool elevation 100-year 24-hour storm	906.09 feet
Maximum pool volume for 100-year 24-hour storm	97,600 cubic-feet
Top of Embankment	908.00 feet
Freeboard above the 100-year elevation	1.90 feet

ANTI-SEEP COLLAR DESIGN

Anti-seep collars provide a means to reduce seepage along outlet pipes though the embankments for any pipes that may be saturated. The number and size of anti-seep collars shall be selected such that increase in seepage length (Ls), increases by a minimum 15% within the normal saturation zone. The normal saturation zone is determined by the phreatic line drawn at a 4H:1V slope. The principal spillway barrel pipe (12 inch) shall be placed at the Normal Water Surface Elevation of 904.00. Due to the 10-year/24-hour pool elevation of 905.06, the phreatic surface is within the cross section of the pipe; therefore, the saturation zone must be evaluated to determine how many anti-seep collars are required. The calculations below are based on The Ohio Department of Transportation design guidelines[7].

$$Ls = Y(Z+4)\left[1+\left(\frac{S}{(0.25-S)}\right)\right.$$

Where:
Ls = seepage length (ft)
Y = Depth of water in pond during the 10 yr/24-hour event (ft)
Z = Slope of upstream face of embankment (Z ft horizontal:1 vertical)
S = Slope of the Barrel Pipe (ft/ft)

$$Ls = 1.06(4+4)[1+\left(\frac{0.0369}{(0.25-0.0369)}\right) = 9.95\,ft$$

Required Seepage Length Increase:

$$\Delta L_s = L_s * 0.15 = 9.95 * 0.15 = 1.49 \text{ ft}$$

Anti-Seep collars must be sized to provide a minimum of 2' of projection on all sides of the outlet pipe and be sized in 1 foot increments. The outlet pipe is a 12" pipe; therefore the Anti-Seep collar shall be 5 feet by 5 feet.

Determine the total number of collars required:

$$P = W - D = 5 - 1.0 = 4.0'$$

Where:
P = Projection of Collar (ft)
W = Height or Width of Collar (ft)
D = Inside Diameter Outlet Pipe (ft)

$$\text{Number of Collars required} = \Delta L_s / P = 1.49/4.0 = 0.3725$$

One 5 feet by 5 feet anti-seep collar will be provided.

OUTLET CHANNEL

The proposed principal spillway and emergency spillway will outlet to the proposed Outboard Perimeter Channel which will convey the outflow from this pond downstream of the proposed landfill to the existing stream within Carter Hollow. (Please see "OAC 3745-30-05 (C)(6)(k) Permanent Surface Water Control Structures Outboard Perimeter Channel Design Calculations" for additional information regarding the channel design)

CONCLUSIONS:

The proposed Sedimentation Pond D has been designed to meet the regulations as outlined in OAC 3745-30-07(C)(4)(d) by utilizing a 12-inch RCP culvert pipe with an invert elevation of 904.00. This culvert has been designed to safely pass the flow from the 10-year/24-hour storm event. The routing of the 25-year/24-hour storm event produces a water level elevation of 905.42, which is below the invert of the proposed emergency spillway. The flow from the 100-yr/24-hr storm was routed through the proposed principal spillway and the emergency spillway, which has an invert elevation of 906.10 is not utilized in the 100-year/24-hour storm event. The maximum pool elevation for the 100-year/24-hour storm event is 906.09, which results in over one foot of freeboard in relation to the top of the embankment which is set at 908.00.

REFERENCES:

1. National Climatic Data Center, *Precipitation Frequency Estimates*, Point Precipitation Frequency Estimate From NOAA Atlas 14 Ohio 38.65 N 83.65 W 800 feet, Viewed 19 May 2009,< http://hdsc.nws.noaa.gov/hdsc/pfds/index.html>.

2. National Resources Conservation Service, PART 630 HYDROLOGY NATIONAL ENGINEERING HANDBOOK, July 2004.

3. Ven Te Chow, OPEN CHANNEL HYDRAULICS, Mc-Graw Hill Book Company, 1959.

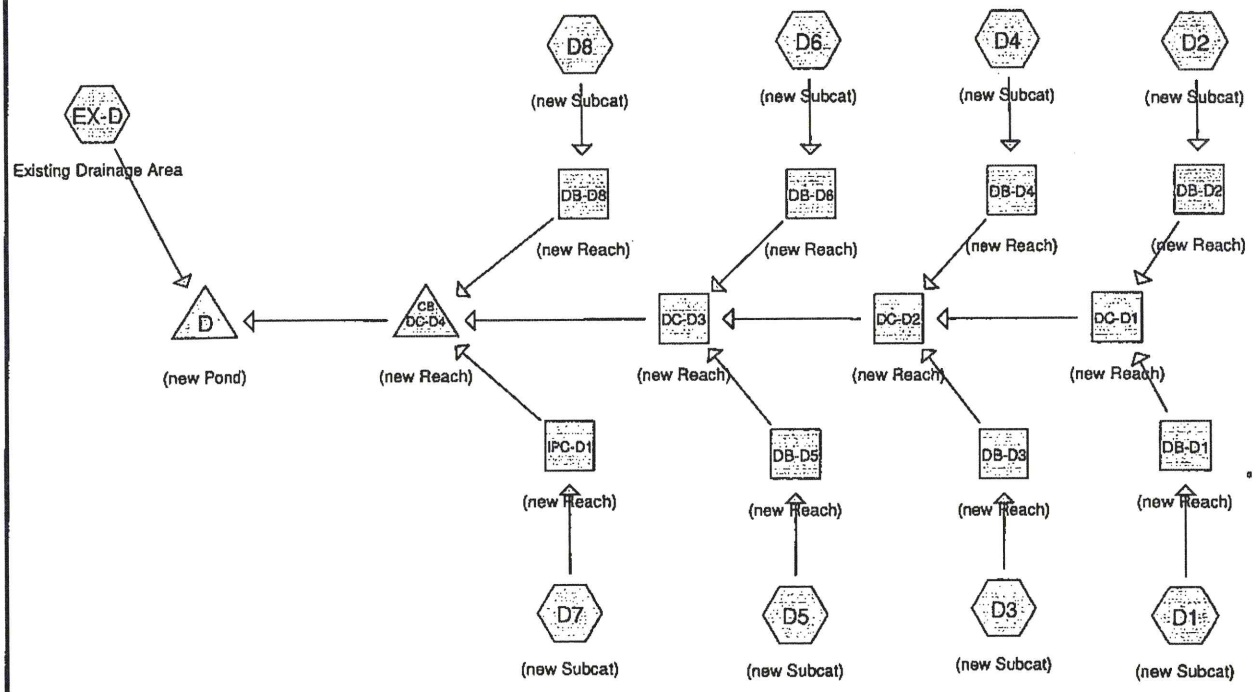
4. Goldman, Jackson and Bursztynsky, EROSION AND SEDIMENT CONTROL HANDBOOK, Mc-Graw Hill Book Company, 1986.

5. Soil Conservation Service, WATER MANAGEMENT AND SEDIMENT CONTROL FOR URBANIZING AREAS, distributed by Ohio Soil and Water Conservation Service.

6. HydroCAD Software Solutions LLC, HYDROCAD, Version 9.10, 2009, Computer Software Program.

7. The Ohio Department of Transportation, LOCATION AND DESIGN MANUAL VOLUME TWO: DRAINAGE DESIGN, July 2009.

SEDIMENTATION POND HYDROCAD OUTPUT AND HYDROGRAPH FILES



Subcat Reach Pond Link

Drainage Diagram for 071-644_SWM POND D, E, G

Prepared by Civil & Environmental Consultants, Inc., Printed 3/26/2010

HydroCAD® 9.10 s/n 05876 © 2009 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment D1: (new Subcat) Runoff Area=0.600 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=188' Tc=9.9 min CN=79 Runoff=1.95 cfs 0.104 af

Subcatchment D2: (new Subcat) Runoff Area=2.613 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=232' Tc=11.7 min CN=79 Runoff=7.94 cfs 0.455 af

Subcatchment D3: (new Subcat) Runoff Area=0.514 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=2.11 cfs 0.090 af

Subcatchment D4: (new Subcat) Runoff Area=1.098 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=4.52 cfs 0.191 af

Subcatchment D5: (new Subcat) Runoff Area=0.602 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=2.48 cfs 0.105 af

Subcatchment D6: (new Subcat) Runoff Area=1.098 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=4.52 cfs 0.191 af

Subcatchment D7: (new Subcat) Runoff Area=2.500 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=99' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=10.17 cfs 0.436 af

Subcatchment D8: (new Subcat) Runoff Area=1.071 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=4.40 cfs 0.187 af

Subcatchment EX-D: Existing Drainage Area Runoff Area=2.040 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=100' Slope=0.0460 '/' Tc=7.4 min CN=79 Runoff=7.24 cfs 0.355 af

Reach DB-D1: (new Reach) Avg. Flow Depth=0.41' Max Vel=3.25 fps Inflow=1.95 cfs 0.104 af
n=0.022 L=222.5' S=0.0202 '/' Capacity=130.80 cfs Outflow=1.92 cfs 0.104 af

Reach DB-D2: (new Reach) Avg. Flow Depth=0.69' Max Vel=4.59 fps Inflow=7.94 cfs 0.455 af
n=0.022 L=542.5' S=0.0200 '/' Capacity=130.16 cfs Outflow=7.72 cfs 0.454 af

Reach DB-D3: (new Reach) Avg. Flow Depth=0.42' Max Vel=3.30 fps Inflow=2.11 cfs 0.090 af
n=0.022 L=285.3' S=0.0202 '/' Capacity=130.72 cfs Outflow=2.04 cfs 0.089 af

Reach DB-D4: (new Reach) Avg. Flow Depth=0.55' Max Vel=3.94 fps Inflow=4.52 cfs 0.191 af
n=0.022 L=542.5' S=0.0200 '/' Capacity=130.10 cfs Outflow=4.20 cfs 0.191 af

Reach DB-D5: (new Reach) Avg. Flow Depth=0.45' Max Vel=3.36 fps Inflow=2.48 cfs 0.105 af
n=0.022 L=310.4' S=0.0191 '/' Capacity=127.27 cfs Outflow=2.38 cfs 0.105 af

Reach DB-D6: (new Reach) Avg. Flow Depth=0.55' Max Vel=3.94 fps Inflow=4.52 cfs 0.191 af
n=0.022 L=542.5' S=0.0200 '/' Capacity=130.22 cfs Outflow=4.20 cfs 0.191 af

Reach DB-D8: (new Reach) Avg. Flow Depth=0.55' Max Vel=3.92 fps Inflow=4.40 cfs 0.187 af
n=0.022 L=544.5' S=0.0200 '/' Capacity=130.22 cfs Outflow=4.10 cfs 0.186 af

Reach DC-D1: (new Reach) Avg. Flow Depth=0.28' Max Vel=7.07 fps Inflow=9.57 cfs 0.558 af
n=0.040 L=88.3' S=0.2501 '/' Capacity=419.86 cfs Outflow=9.57 cfs 0.558 af

Reach DC-D2: (new Reach) Avg. Flow Depth=0.34' Max Vel=7.94 fps Inflow=13.68 cfs 0.838 af
n=0.040 L=88.3' S=0.2503 '/' Capacity=420.05 cfs Outflow=13.68 cfs 0.838 af

Reach DC-D3: (new Reach) Avg. Flow Depth=0.41' Max Vel=9.07 fps Inflow=19.72 cfs 1.134 af
n=0.040 L=84.1' S=0.2630 '/' Capacity=430.60 cfs Outflow=19.72 cfs 1.134 af

Reach IPC-D1: (new Reach) Avg. Flow Depth=0.53' Max Vel=3.29 fps Inflow=10.17 cfs 0.436 af
n=0.022 L=863.4' S=0.0076 '/' Capacity=108.33 cfs Outflow=8.73 cfs 0.433 af

Pond D: (new Pond) Peak Elev=905.06' Storage=190,320 cf Inflow=39.64 cfs 2.108 af
Outflow=2.83 cfs 1.678 af

Pond DC-D4: (new Reach) Peak Elev=909.00' Inflow=32.43 cfs 1.753 af
24.0" Round Culvert x 2.00 n=0.012 L=83.3' S=0.0102 '/' Outflow=32.43 cfs 1.753 af

Total Runoff Area = 12.136 ac Runoff Volume = 2.114 af Average Runoff Depth = 2.09"
100.00% Pervious = 12.136 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment D1: (new Subcat)

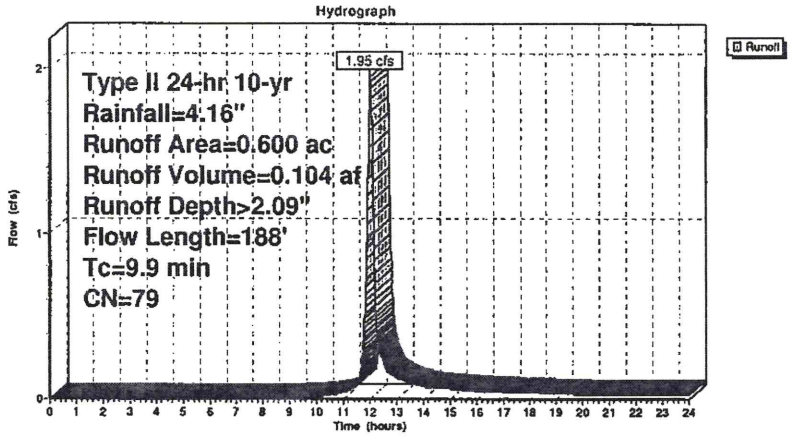
Runoff = 1.95 cfs @ 12.02 hrs, Volume= 0.104 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.600	79	50-75% Grass cover, Fair, HSG C
0.600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	77	0.0200	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"
1.2	23	0.2500	0.33		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"
0.4	88	0.2500	3.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.9	188	Total			

Subcatchment D1: (new Subcat)



Summary for Subcatchment D2: (new Subcat)

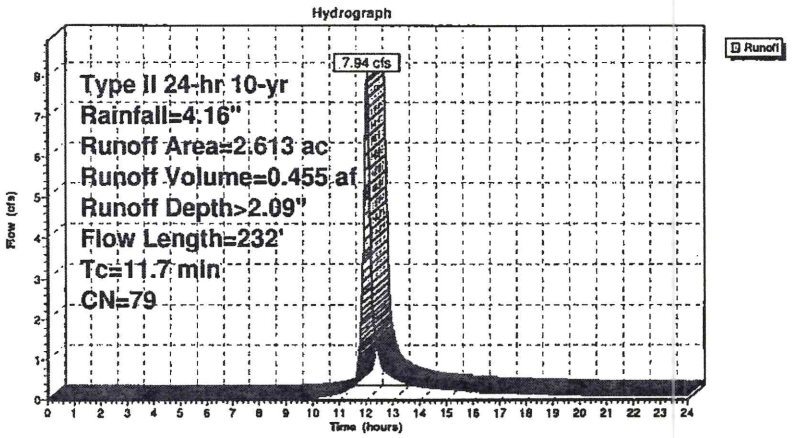
Runoff = 7.94 cfs @ 12.04 hrs, Volume= 0.455 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
2.613	79	50-75% Grass cover, Fair, HSG C
2.613		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0200	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"
1.0	58	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	74	0.2500	3.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
11.7	232	Total			

Subcatchment D2: (new Subcat)



Summary for Subcatchment D3: (new Subcat)

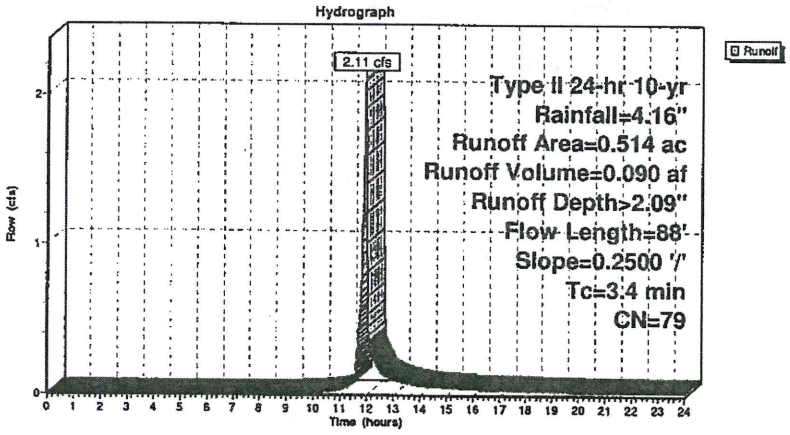
Runoff = 2.11 cfs @ 11.94 hrs, Volume= 0.090 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.514	79	50-75% Grass cover, Fair, HSG C
0.514		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D3: (new Subcat)



Summary for Subcatchment D4: (new Subcat)

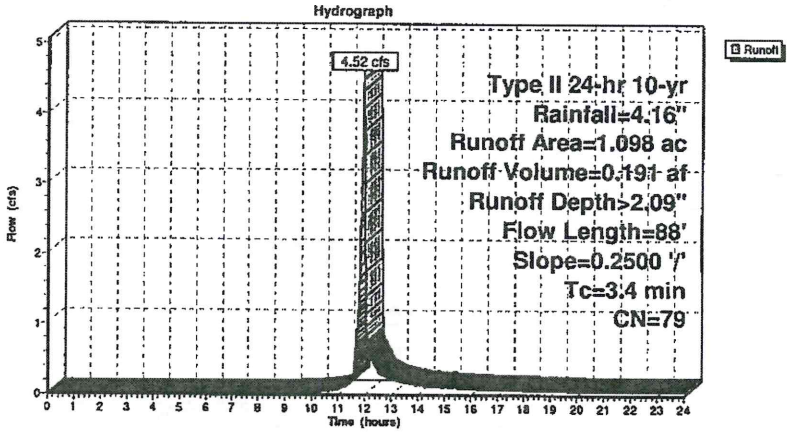
Runoff = 4.52 cfs @ 11.94 hrs, Volume= 0.191 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.098	79	50-75% Grass cover, Fair, HSG C
1.098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D4: (new Subcat)



Summary for Subcatchment D5: (new Subcat)

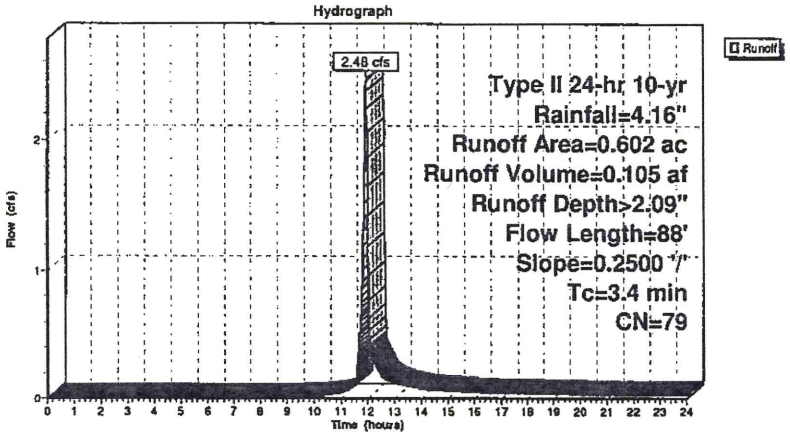
Runoff = 2.48 cfs @ 11.94 hrs, Volume= 0.105 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.602	79	50-75% Grass cover, Fair, HSG C
0.602		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D5: (new Subcat)



Summary for Subcatchment D6: (new Subcat)

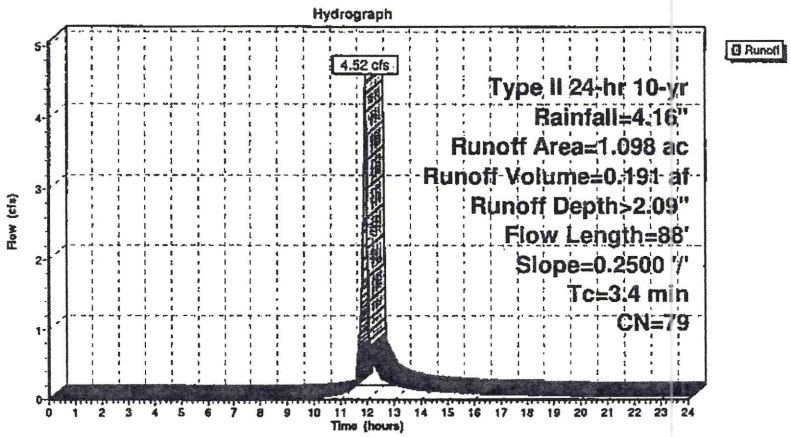
Runoff = 4.52 cfs @ 11.94 hrs, Volume= 0.191 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.098	79	50-75% Grass cover, Fair, HSG C
1.098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D6: (new Subcat)



Summary for Subcatchment D7: (new Subcat)

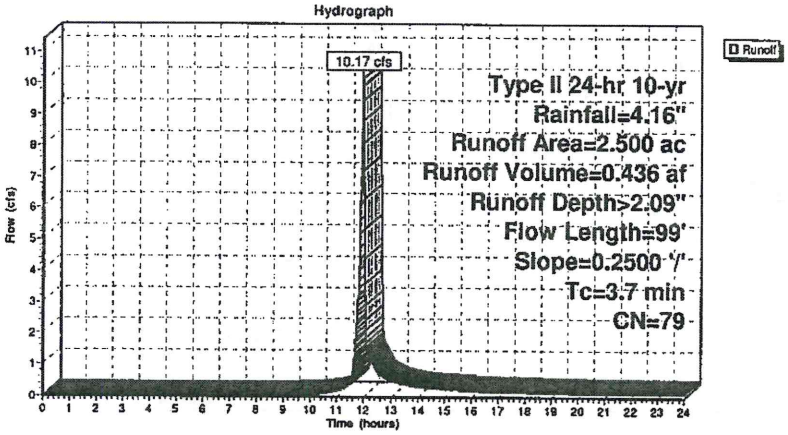
Runoff = 10.17 cfs @ 11.95 hrs, Volume= 0.436 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
2.500	79	50-75% Grass cover, Fair, HSG C
2.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	99	0.2500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D7: (new Subcat)



Summary for Subcatchment D8: (new Subcat)

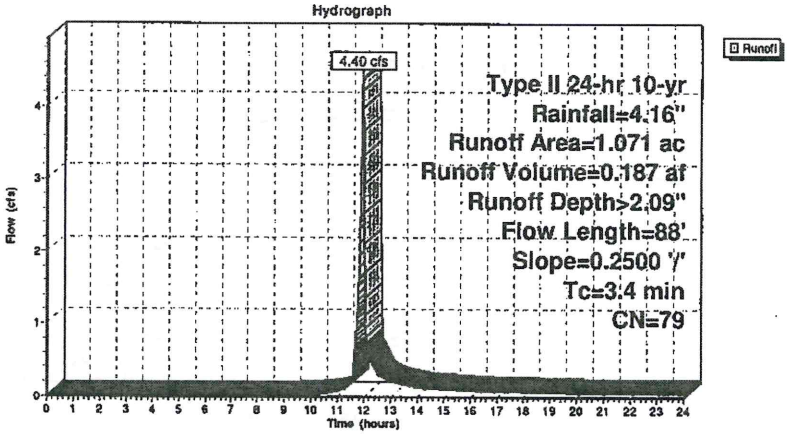
Runoff = 4.40 cfs @ 11.94 hrs, Volume= 0.187 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.071	79	50-75% Grass cover, Fair, HSG C
1.071		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D8: (new Subcat)



Summary for Subcatchment EX-D: Existing Drainage Area

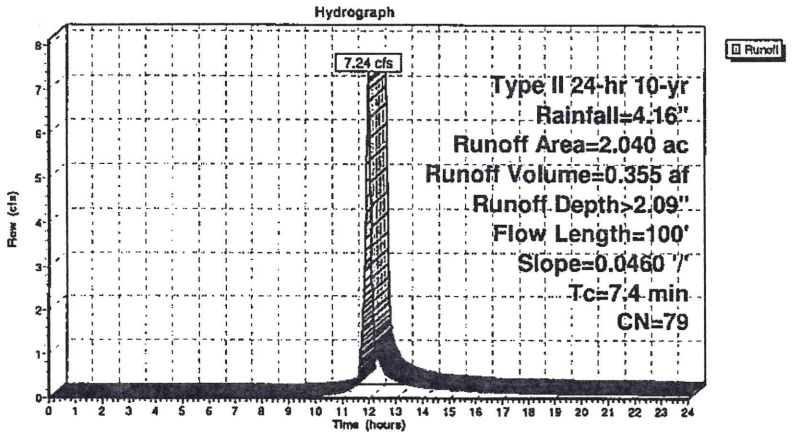
Runoff = 7.24 cfs @ 11.99 hrs, Volume= 0.355 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
2.040	79	50-75% Grass cover, Fair, HSG C
2.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0460	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.91"

Subcatchment EX-D: Existing Drainage Area



Summary for Reach DB-D1: (new Reach)

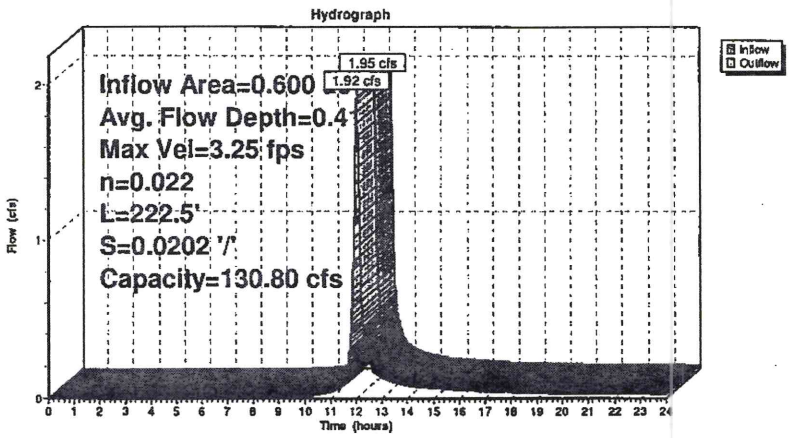
Inflow Area = 0.600 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 1.95 cfs @ 12.02 hrs, Volume= 0.104 af
Outflow = 1.92 cfs @ 12.03 hrs, Volume= 0.104 af, Atten= 1%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.25 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 2.9 min

Peak Storage= 131 cf @ 12.03 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.80 cfs

0.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 222.5' Slope= 0.0202 '/'
Inlet Invert= 981.14', Outlet Invert= 976.65'

Reach DB-D1: (new Reach)



Summary for Reach DB-D2: (new Reach)

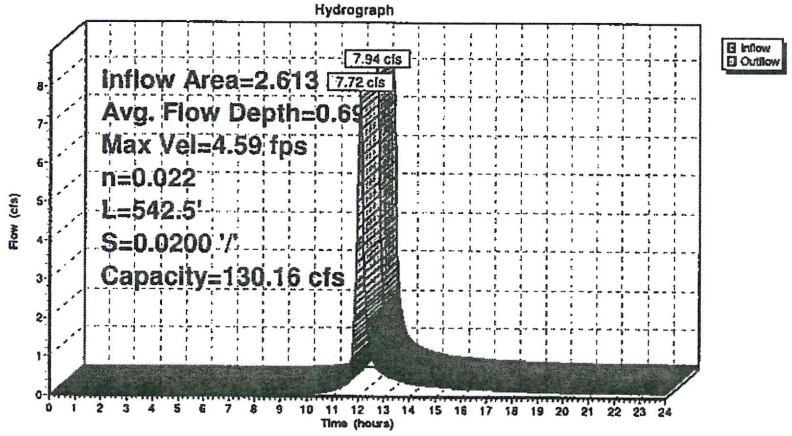
Inflow Area = 2.613 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 7.94 cfs @ 12.04 hrs, Volume= 0.455 af
Outflow = 7.72 cfs @ 12.06 hrs, Volume= 0.454 af, Atten= 3%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.59 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.81 fps, Avg. Travel Time= 5.0 min

Peak Storage= 913 cf @ 12.06 hrs
Average Depth at Peak Storage= 0.69'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.16 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 542.5' Slope= 0.0200 '/'
Inlet Invert= 987.49', Outlet Invert= 976.65'

Reach DB-D2: (new Reach)



Summary for Reach DB-D3: (new Reach)

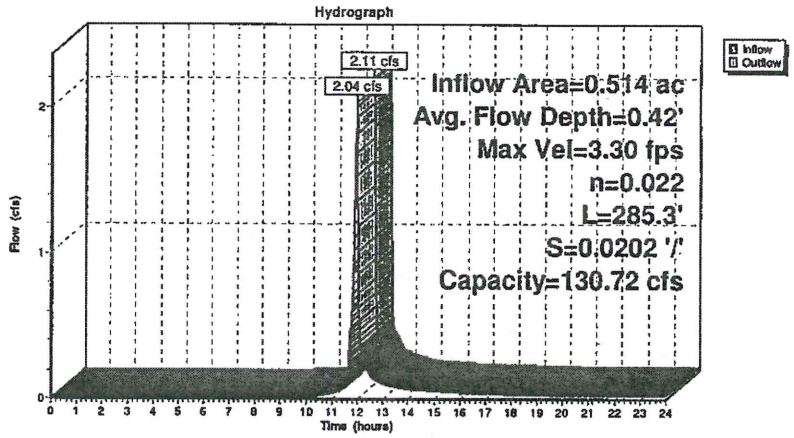
Inflow Area = 0.514 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 2.11 cfs @ 11.94 hrs, Volume= 0.090 af
Outflow = 2.04 cfs @ 11.96 hrs, Volume= 0.089 af, Atten= 3%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.30 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.21 fps, Avg. Travel Time= 3.9 min

Peak Storage= 176 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.72 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 285.3' Slope= 0.0202 '/'
Inlet Invert= 960.32', Outlet Invert= 954.57'

Reach DB-D3: (new Reach)



Summary for Reach DB-D4: (new Reach)

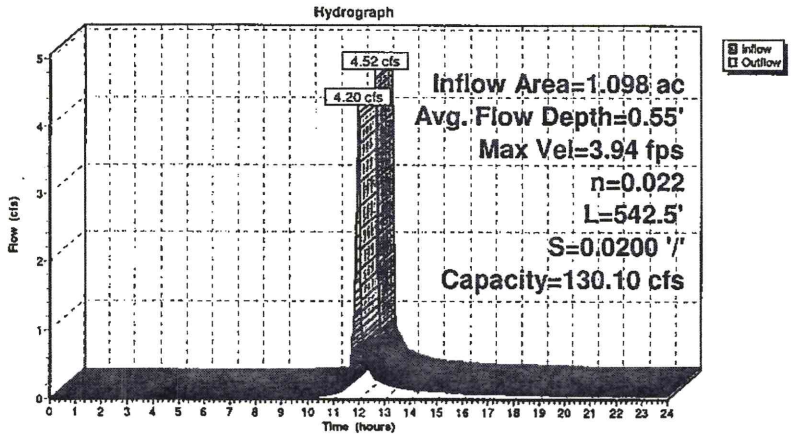
Inflow Area = 1.098 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 4.52 cfs @ 11.94 hrs, Volume= 0.191 af
Outflow = 4.20 cfs @ 11.97 hrs, Volume= 0.191 af, Atten= 7%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.94 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 1.45 fps, Avg. Travel Time= 6.2 min

Peak Storage= 579 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.10 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 542.5' Slope= 0.0200 '/'
Inlet Invert= 965.40', Outlet Invert= 954.57'

Reach DB-D4: (new Reach)



Summary for Reach DB-D5: (new Reach)

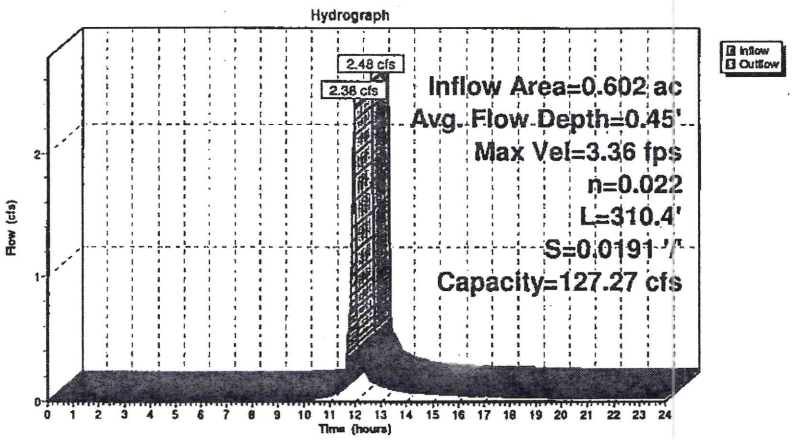
Inflow Area = 0.602 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 2.48 cfs @ 11.94 hrs, Volume= 0.105 af
Outflow = 2.38 cfs @ 11.96 hrs, Volume= 0.105 af, Atten= 4%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.36 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.24 fps, Avg. Travel Time= 4.2 min

Peak Storage= 220 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.45'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 127.27 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 310.4' Slope= 0.0191 '/'
Inlet Invert= 938.40', Outlet Invert= 932.47'

Reach DB-D5: (new Reach)



Summary for Reach DB-D6: (new Reach)

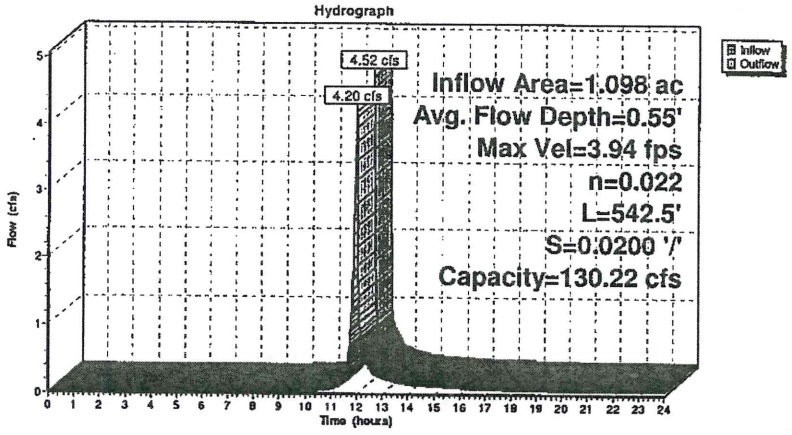
Inflow Area = 1.098 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 4.52 cfs @ 11.94 hrs, Volume= 0.191 af
Outflow = 4.20 cfs @ 11.97 hrs, Volume= 0.191 af, Atten= 7%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.94 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 6.2 min

Peak Storage= 578 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.22 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 542.5' Slope= 0.0200 '/'
Inlet Invert= 943.32', Outlet Invert= 932.47'

Reach DB-D6: (new Reach)



Summary for Reach DB-D8: (new Reach)

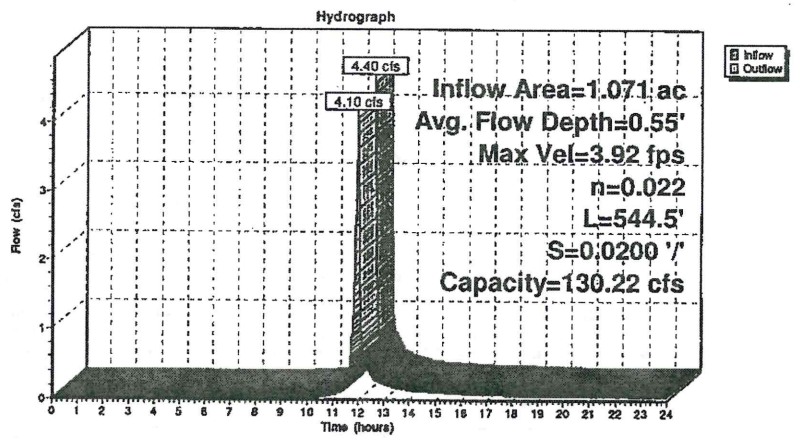
Inflow Area = 1.071 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 4.40 cfs @ 11.94 hrs, Volume= 0.187 af
Outflow = 4.10 cfs @ 11.97 hrs, Volume= 0.186 af, Atten= 7%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.92 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 1.45 fps, Avg. Travel Time= 6.3 min

Peak Storage= 569 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.22 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 544.5' Slope= 0.0200 '/'
Inlet Invert= 921.24', Outlet Invert= 910.35'

Reach DB-D8: (new Reach)



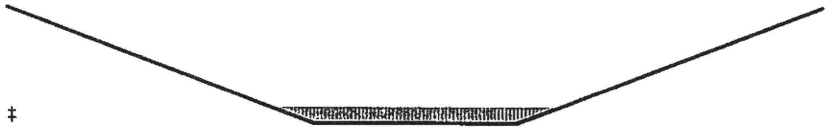
Summary for Reach DC-D1: (new Reach)

Inflow Area = 3.213 ac, 0.00% Impervious, Inflow Depth > 2.08" for 10-yr event
Inflow = 9.57 cfs @ 12.05 hrs, Volume= 0.558 af
Outflow = 9.57 cfs @ 12.06 hrs, Volume= 0.558 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.07 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.96 fps, Avg. Travel Time= 0.8 min

Peak Storage= 120 cf @ 12.06 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.86 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 88.3' Slope= 0.2501 '/'
Inlet Invert= 976.65', Outlet Invert= 954.57'



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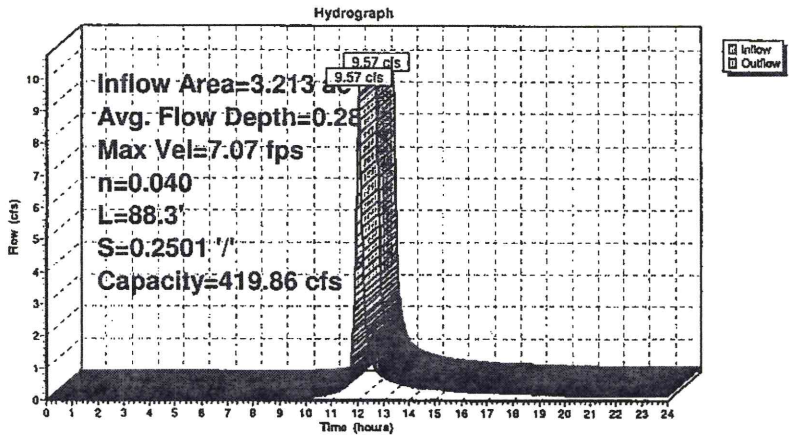
Reach DC-D1: (new Reach)



Summary for Reach DC-D2: (new Reach)

Inflow Area = 4.825 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 13.68 cfs @ 12.00 hrs, Volume= 0.838 af
Outflow = 13.68 cfs @ 12.00 hrs, Volume= 0.838 af, Atten= 0%, Lag= 0.1 min

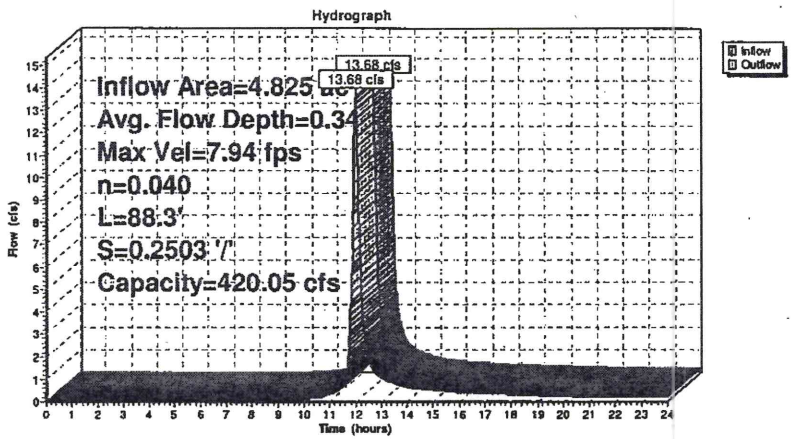
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.94 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.26 fps, Avg. Travel Time= 0.7 min

Peak Storage= 152 cf @ 12.00 hrs
Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 420.05 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 88.3' Slope= 0.2503 '/'
Inlet Invert= 954.57', Outlet Invert= 932.47'

‡

Reach DC-D2: (new Reach)



Summary for Reach DC-D3: (new Reach)

Inflow Area = 6.525 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 19.72 cfs @ 11.98 hrs, Volume= 1.134 af
Outflow = 19.72 cfs @ 11.98 hrs, Volume= 1.134 af, Atten= 0%, Lag= 0.1 min

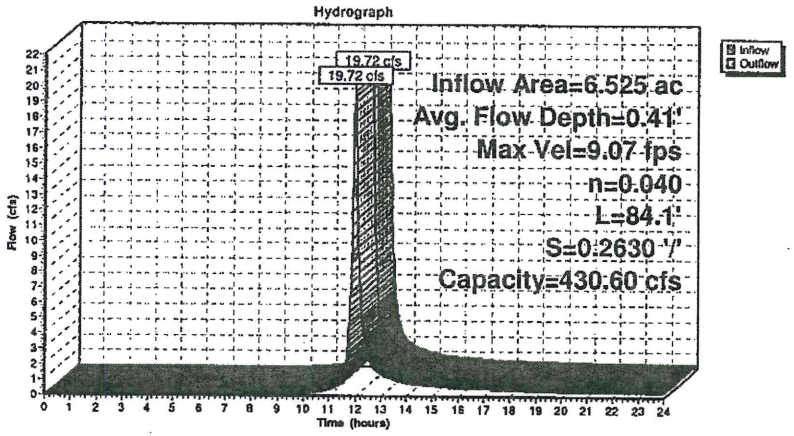
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.07 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.54 fps, Avg. Travel Time= 0.6 min

Peak Storage= 183 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 430.60 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 84.1' Slope= 0.2630 '/'
Inlet Invert= 932.47', Outlet Invert= 910.35'

‡

Reach DC-D3: (new Reach)



Summary for Reach IPC-D1: (new Reach)

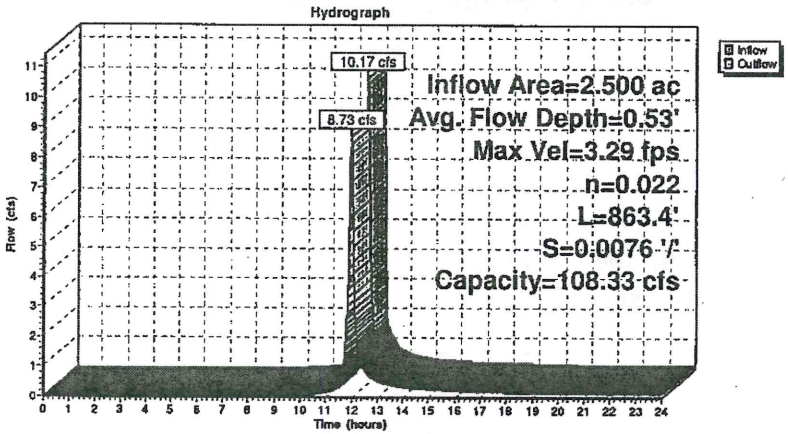
Inflow Area = 2.500 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 10.17 cfs @ 11.95 hrs, Volume= 0.436 af
Outflow = 8.73 cfs @ 11.98 hrs, Volume= 0.433 af, Atten= 14%, Lag= 2.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.29 fps, Min. Travel Time= 4.4 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 16.9 min

Peak Storage= 2,292 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 108.33 cfs

4.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 863.4' Slope= 0.0076 '/'
Inlet Invert= 916.89', Outlet Invert= 910.35'

Reach IPC-D1: (new Reach)



Summary for Pond D: (new Pond)

Inflow Area = 12.136 ac, 0.00% Impervious, Inflow Depth > 2.08" for 10-yr event
Inflow = 39.64 cfs @ 11.98 hrs, Volume= 2.108 af
Outflow = 2.83 cfs @ 12.90 hrs, Volume= 1.678 af, Atten= 93%, Lag= 55.1 min
Primary = 2.83 cfs @ 12.90 hrs, Volume= 1.678 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 904.00' Surf.Area= 42,821 sf Storage= 142,855 cf
Peak Elev= 905.06' @ 12.90 hrs Surf.Area= 46,776 sf Storage= 190,320 cf (47,465 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 158.6 min (990.9 - 832.2)

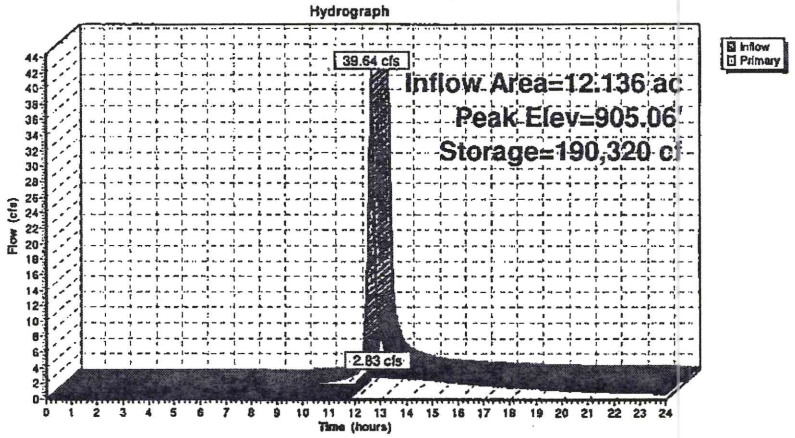
Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	344,653 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
900.00	28,862	0	0
901.00	32,187	30,525	30,525
902.00	35,631	33,909	64,434
903.00	39,195	37,413	101,847
904.00	42,821	41,008	142,855
905.00	46,548	44,685	187,539
906.00	50,374	48,461	236,000
907.00	54,301	52,338	288,338
908.00	58,329	56,315	344,653

Device	Routing	Invert	Outlet Devices
#1	Primary	904.00'	**12.0" Round Culvert** L= 81.3' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 904.00' / 901.00' S= 0.0369 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished
#2	Primary	906.10'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65

Primary OutFlow Max=2.83 cfs @ 12.90 hrs HW=905.06' (Free Discharge)
└1=**Culvert** (Inlet Controls 2.83 cfs @ 3.60 fps)
└2=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond D: (new Pond)



Summary for Pond DC-D4: (new Reach)

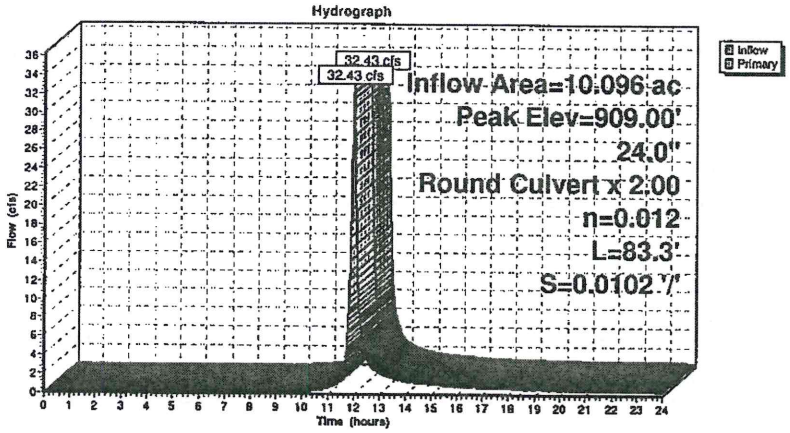
Inflow Area = 10.096 ac, 0.00% Impervious, Inflow Depth > 2.08" for 10-yr event
Inflow = 32.43 cfs @ 11.98 hrs, Volume= 1.753 af
Outflow = 32.43 cfs @ 11.98 hrs, Volume= 1.753 af, Atten= 0%, Lag= 0.0 min
Primary = 32.43 cfs @ 11.98 hrs, Volume= 1.753 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 909.00' @ 11.98 hrs
Flood Elev= 910.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	906.85'	**24.0" Round Culvert X 2.00** L= 83.3' Ke= 0.500 Inlet / Outlet Invert= 906.85' / 906.00' S= 0.0102 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished

Primary OutFlow Max=32.42 cfs @ 11.98 hrs HW=909.00' TW=904.57' (Dynamic Tailwater)
↳1=**Culvert** (Inlet Controls 32.42 cfs @ 5.16 fps)

Pond DC-D4: (new Reach)



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment D1: (new Subcat) Runoff Area=0.600 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=188' Tc=9.9 min CN=79 Runoff=2.57 cfs 0.138 af

Subcatchment D2: (new Subcat) Runoff Area=2.613 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=232' Tc=11.7 min CN=79 Runoff=10.50 cfs 0.603 af

Subcatchment D3: (new Subcat) Runoff Area=0.514 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=2.77 cfs 0.119 af

Subcatchment D4: (new Subcat) Runoff Area=1.098 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=5.93 cfs 0.254 af

Subcatchment D5: (new Subcat) Runoff Area=0.602 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=3.25 cfs 0.139 af

Subcatchment D6: (new Subcat) Runoff Area=1.098 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=5.93 cfs 0.254 af

Subcatchment D7: (new Subcat) Runoff Area=2.500 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=99' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=13.35 cfs 0.578 af

Subcatchment D8: (new Subcat) Runoff Area=1.071 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=5.78 cfs 0.248 af

Subcatchment EX-D: Existing Drainage Area Runoff Area=2.040 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=100' Slope=0.0460 '/' Tc=7.4 min CN=79 Runoff=9.54 cfs 0.471 af

Reach DB-D1: (new Reach) Avg. Flow Depth=0.46' Max Vel=3.49 fps Inflow=2.57 cfs 0.138 af
n=0.022 L=222.5' S=0.0202 '/' Capacity=130.80 cfs Outflow=2.54 cfs 0.138 af

Reach DB-D2: (new Reach) Avg. Flow Depth=0.77' Max Vel=4.92 fps Inflow=10.50 cfs 0.603 af
n=0.022 L=542.5' S=0.0200 '/' Capacity=130.16 cfs Outflow=10.25 cfs 0.602 af

Reach DB-D3: (new Reach) Avg. Flow Depth=0.47' Max Vel=3.54 fps Inflow=2.77 cfs 0.119 af
n=0.022 L=285.3' S=0.0202 '/' Capacity=130.72 cfs Outflow=2.69 cfs 0.119 af

Reach DB-D4: (new Reach) Avg. Flow Depth=0.61' Max Vel=4.23 fps Inflow=5.93 cfs 0.254 af
n=0.022 L=542.5' S=0.0200 '/' Capacity=130.10 cfs Outflow=5.57 cfs 0.253 af

Reach DB-D5: (new Reach) Avg. Flow Depth=0.50' Max Vel=3.60 fps Inflow=3.25 cfs 0.139 af
n=0.022 L=310.4' S=0.0191 '/' Capacity=127.27 cfs Outflow=3.14 cfs 0.139 af

Reach DB-D6: (new Reach) Avg. Flow Depth=0.61' Max Vel=4.23 fps Inflow=5.93 cfs 0.254 af
n=0.022 L=542.5' S=0.0200 '/' Capacity=130.22 cfs Outflow=5.57 cfs 0.253 af

Reach DB-D8: (new Reach) Avg. Flow Depth=0.61' Max Vel=4.20 fps Inflow=5.78 cfs 0.248 af
n=0.022 L=544.5' S=0.0200 '/' Capacity=130.22 cfs Outflow=5.43 cfs 0.247 af

Reach DC-D1: (new Reach) Avg. Flow Depth=0.33' Max Vel=7.75 fps Inflow=12.70 cfs 0.740 af
n=0.040 L=88.3' S=0.2501 '/' Capacity=419.86 cfs Outflow=12.70 cfs 0.740 af

Reach DC-D2: (new Reach) Avg. Flow Depth=0.40' Max Vel=8.69 fps Inflow=18.20 cfs 1.112 af
n=0.040 L=88.3' S=0.2503 '/' Capacity=420.05 cfs Outflow=18.20 cfs 1.112 af

Reach DC-D3: (new Reach) Avg. Flow Depth=0.49' Max Vel=9.90 fps Inflow=26.24 cfs 1.504 af
n=0.040 L=84.1' S=0.2630 '/' Capacity=430.60 cfs Outflow=26.24 cfs 1.503 af

Reach IPC-D1: (new Reach) Avg. Flow Depth=0.62' Max Vel=3.60 fps Inflow=13.35 cfs 0.578 af
n=0.022 L=863.4' S=0.0076 '/' Capacity=108.33 cfs Outflow=11.69 cfs 0.574 af

Pond D: (new Pond) Peak Elev=905.43' Storage=207,679 cf Inflow=52.70 cfs 2.796 af
Outflow=3.64 cfs 2.296 af

Pond DC-D4: (new Reach) Peak Elev=909.89' Inflow=43.22 cfs 2.325 af
24.0" Round Culvert x 2.00 n=0.012 L=83.3' S=0.0102 '/' Outflow=43.22 cfs 2.325 af

Total Runoff Area = 12.136 ac Runoff Volume = 2.803 af Average Runoff Depth = 2.77"
100.00% Pervious = 12.136 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment D1: (new Subcat)

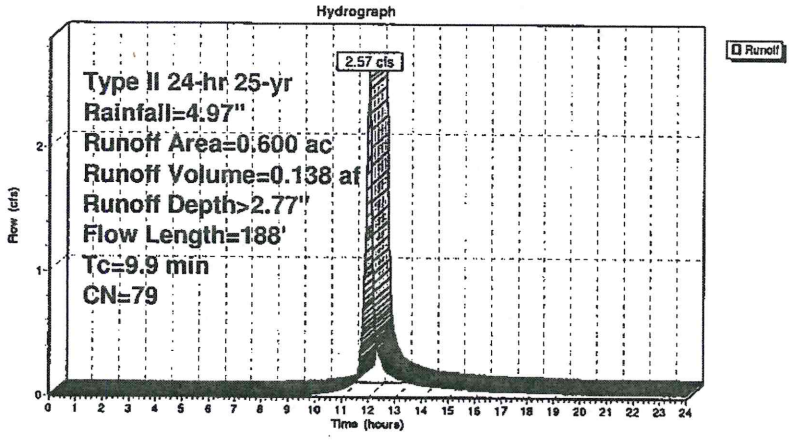
Runoff = 2.57 cfs @ 12.02 hrs, Volume= 0.138 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.600	79	50-75% Grass cover, Fair, HSG C
0.600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	77	0.0200	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"
1.2	23	0.2500	0.33		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"
0.4	88	0.2500	3.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.9	188	Total			

Subcatchment D1: (new Subcat)



Summary for Subcatchment D2: (new Subcat)

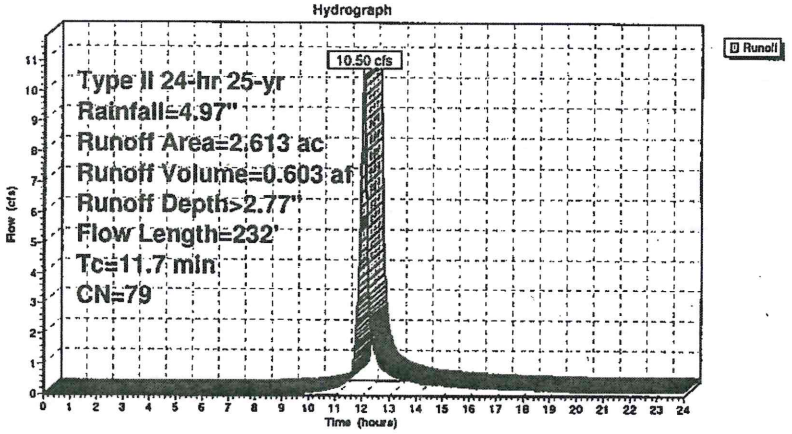
Runoff = 10.50 cfs @ 12.03 hrs, Volume= 0.603 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
2.613	79	50-75% Grass cover, Fair, HSG C
2.613		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0200	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"
1.0	58	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	74	0.2500	3.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
11.7	232	Total			

Subcatchment D2: (new Subcat)



Summary for Subcatchment D3: (new Subcat)

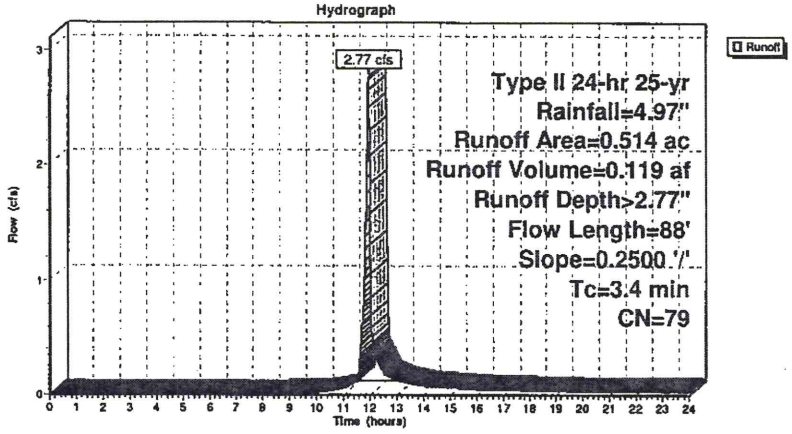
Runoff = 2.77 cfs @ 11.94 hrs, Volume= 0.119 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.514	79	50-75% Grass cover, Fair, HSG C
0.514		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D3: (new Subcat)



Summary for Subcatchment D4: (new Subcat)

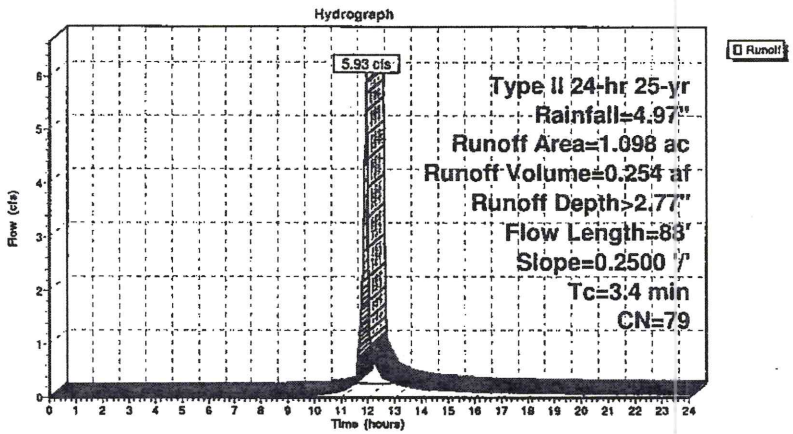
Runoff = 5.93 cfs @ 11.94 hrs, Volume= 0.254 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.098	79	50-75% Grass cover, Fair, HSG C
1.098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D4: (new Subcat)



Summary for Subcatchment D5: (new Subcat)

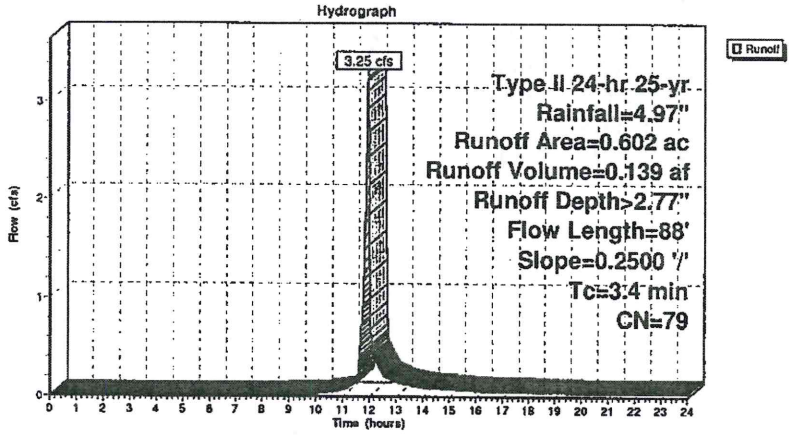
Runoff = 3.25 cfs @ 11.94 hrs, Volume= 0.139 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.602	79	50-75% Grass cover, Fair, HSG C
0.602		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D5: (new Subcat)



Summary for Subcatchment D6: (new Subcat)

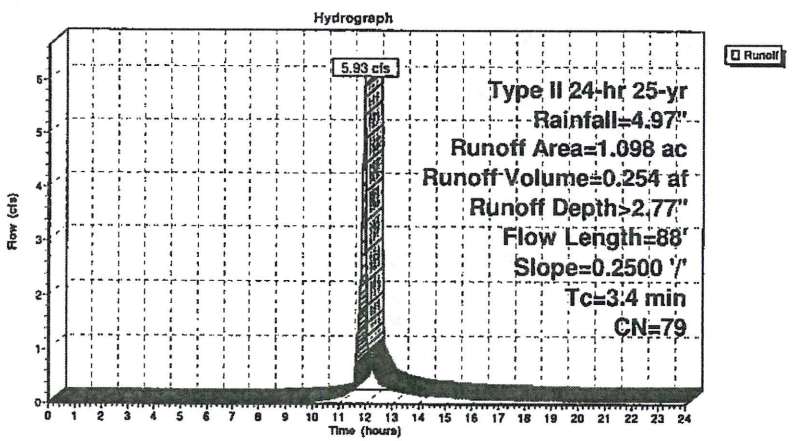
Runoff = 5.93 cfs @ 11.94 hrs, Volume= 0.254 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.098	79	50-75% Grass cover, Fair, HSG C
1.098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D6: (new Subcat)



Summary for Subcatchment D7: (new Subcat)

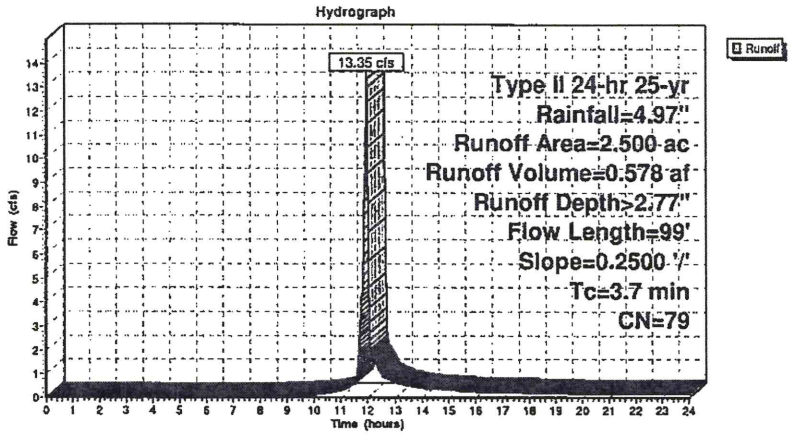
Runoff = 13.35 cfs @ 11.95 hrs, Volume= 0.578 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
2.500	79	50-75% Grass cover, Fair, HSG C
2.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	99	0.2500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D7: (new Subcat)



Summary for Subcatchment D8: (new Subcat)

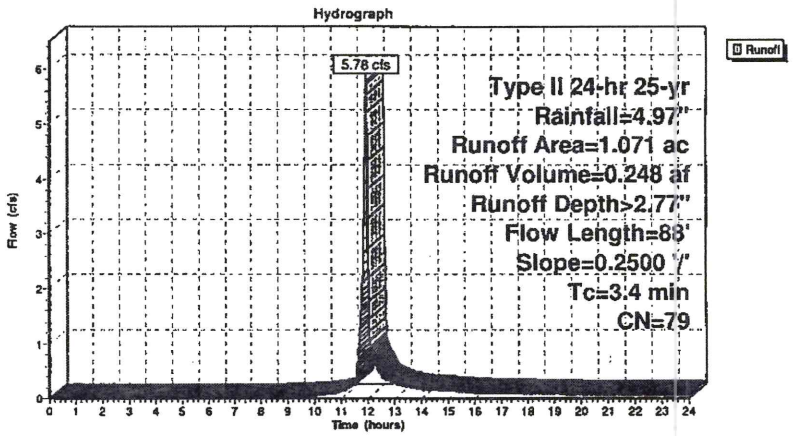
Runoff = 5.78 cfs @ 11.94 hrs, Volume= 0.248 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.071	79	50-75% Grass cover, Fair, HSG C
1.071		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D8: (new Subcat)



Summary for Subcatchment EX-D: Existing Drainage Area

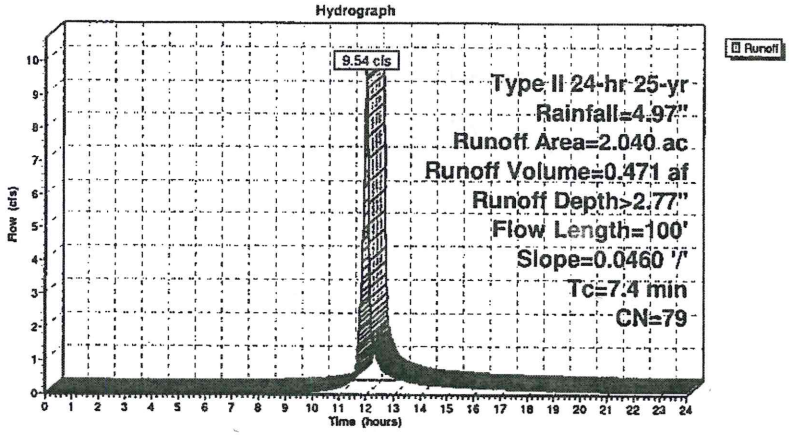
Runoff = 9.54 cfs @ 11.99 hrs, Volume= 0.471 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
2.040	79	50-75% Grass cover, Fair, HSG C
2.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0460	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.91"

Subcatchment EX-D: Existing Drainage Area



Summary for Reach DB-D1: (new Reach)

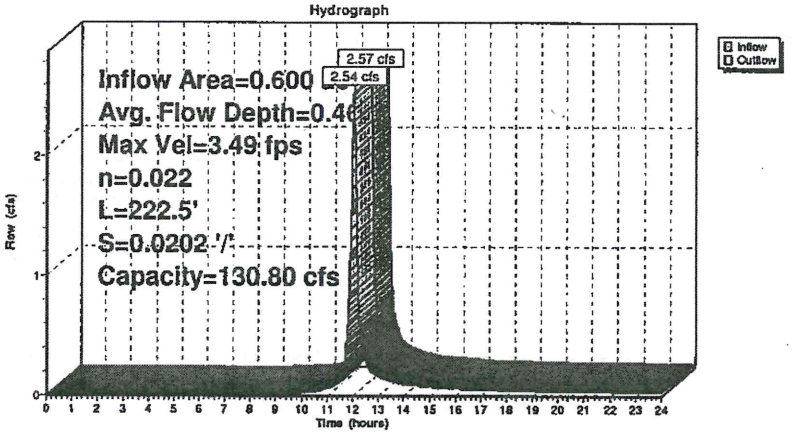
Inflow Area = 0.600 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 2.57 cfs @ 12.02 hrs, Volume= 0.138 af
Outflow = 2.54 cfs @ 12.03 hrs, Volume= 0.138 af, Atten= 1%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.49 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 2.8 min

Peak Storage= 162 cf @ 12.03 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.80 cfs

0.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 222.5' Slope= 0.0202 '/'
Inlet Invert= 981.14', Outlet Invert= 976.65'

Reach DB-D1: (new Reach)



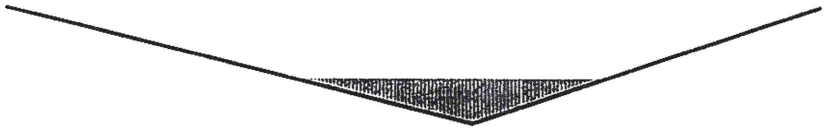
Summary for Reach DB-D2: (new Reach)

Inflow Area = 2.613 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 10.50 cfs @ 12.03 hrs, Volume= 0.603 af
Outflow = 10.25 cfs @ 12.06 hrs, Volume= 0.602 af, Atten= 2%, Lag= 1.3 min

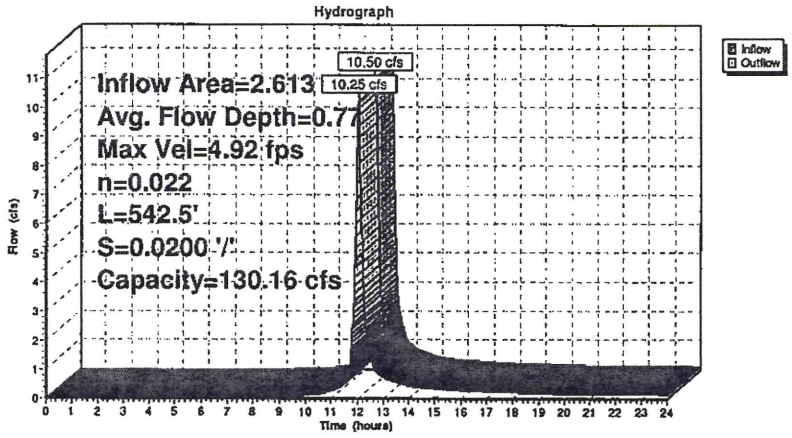
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.92 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.89 fps, Avg. Travel Time= 4.8 min

Peak Storage= 1,129 cf @ 12.06 hrs
Average Depth at Peak Storage= 0.77'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.16 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 542.5' Slope= 0.0200 '/'
Inlet Invert= 987.49', Outlet Invert= 976.65'



Reach DB-D2: (new Reach)



Summary for Reach DB-D3: (new Reach)

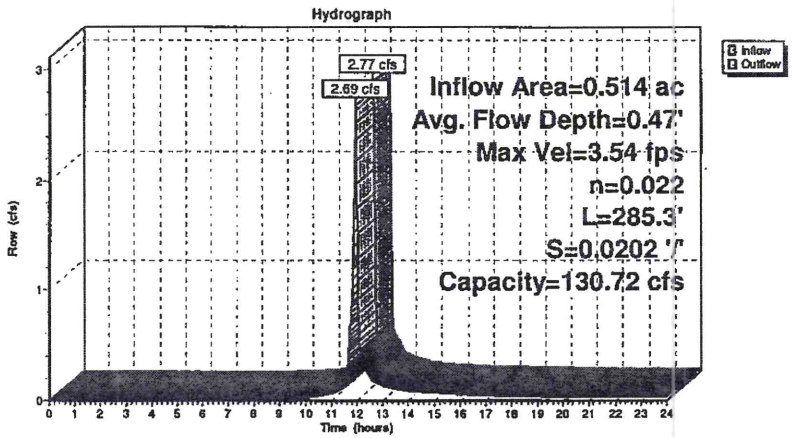
Inflow Area = 0.514 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 2.77 cfs @ 11.94 hrs, Volume= 0.119 af
Outflow = 2.69 cfs @ 11.96 hrs, Volume= 0.119 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.54 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.27 fps, Avg. Travel Time= 3.7 min

Peak Storage= 217 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.72 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 285.3' Slope= 0.0202 '/'
Inlet Invert= 960.32', Outlet Invert= 954.57'

Reach DB-D3: (new Reach)



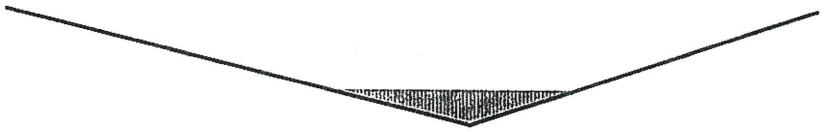
Summary for Reach DB-D4: (new Reach)

Inflow Area = 1.098 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 5.93 cfs @ 11.94 hrs, Volume= 0.254 af
Outflow = 5.57 cfs @ 11.96 hrs, Volume= 0.253 af, Atten= 6%, Lag= 1.3 min

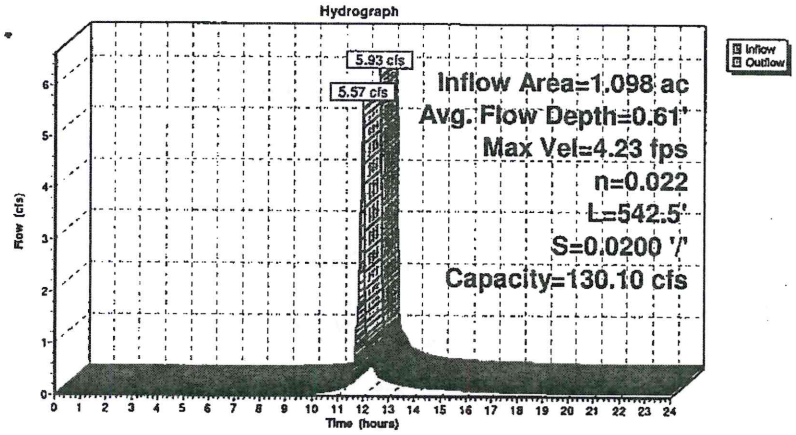
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.23 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 5.9 min

Peak Storage= 714 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.10 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 542.5' Slope= 0.0200 '/'
Inlet Invert= 965.40', Outlet Invert= 954.57'



Reach DB-D4: (new Reach)



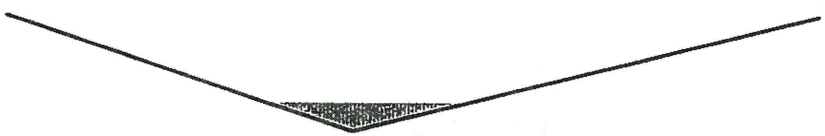
Summary for Reach DB-D5: (new Reach)

Inflow Area = 0.602 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 3.25 cfs @ 11.94 hrs, Volume= 0.139 af
Outflow = 3.14 cfs @ 11.96 hrs, Volume= 0.139 af, Atten= 3%, Lag= 0.9 min

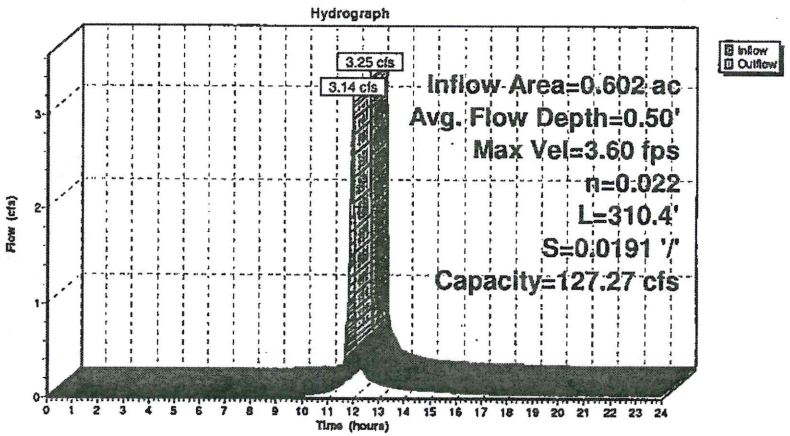
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.60 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 4.0 min

Peak Storage= 271 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 127.27 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 310.4' Slope= 0.0191 '/'
Inlet Invert= 938.40', Outlet Invert= 932.47'



Reach DB-D5: (new Reach)



Summary for Reach DB-D6: (new Reach)

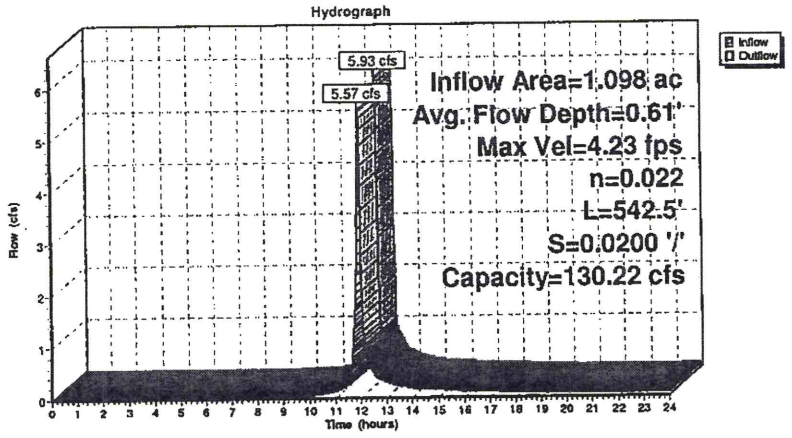
Inflow Area = 1.098 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 5.93 cfs @ 11.94 hrs, Volume= 0.254 af
Outflow = 5.57 cfs @ 11.96 hrs, Volume= 0.253 af, Atten= 6%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.23 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 5.9 min

Peak Storage= 714 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.22 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 542.5' Slope= 0.0200 '/'
Inlet Invert= 943.32', Outlet Invert= 932.47'

Reach DB-D6: (new Reach)



Summary for Reach DB-D8: (new Reach)

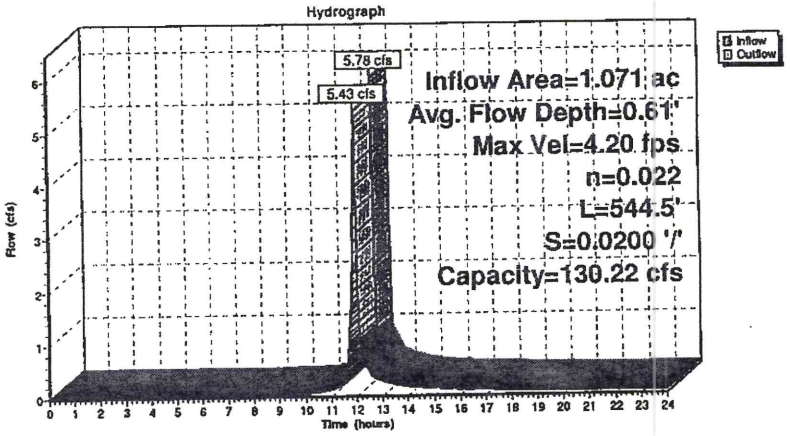
Inflow Area = 1.071 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 5.78 cfs @ 11.94 hrs, Volume= 0.248 af
Outflow = 5.43 cfs @ 11.96 hrs, Volume= 0.247 af, Atten= 6%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.20 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 6.0 min

Peak Storage= 703 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.22 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 544.5' Slope= 0.0200 '/'
Inlet Invert= 921.24', Outlet Invert= 910.35'

Reach DB-D8: (new Reach)



Summary for Reach DC-D1: (new Reach)

Inflow Area = 3.213 ac, 0.00% Impervious, Inflow Depth > 2.76" for 25-yr event
Inflow = 12.70 cfs @ 12.05 hrs, Volume= 0.740 af
Outflow = 12.70 cfs @ 12.05 hrs, Volume= 0.740 af, Atten= 0%, Lag= 0.1 min

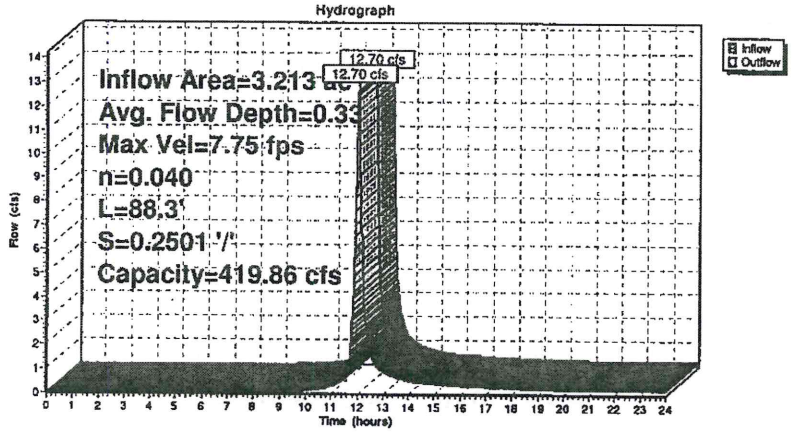
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.75 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.11 fps, Avg. Travel Time= 0.7 min

Peak Storage= 145 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.86 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 88.3' Slope= 0.2501 '/'
Inlet Invert= 976.65', Outlet Invert= 954.57'

‡

Reach DC-D1: (new Reach)



Summary for Reach DC-D2: (new Reach)

Inflow Area = 4.825 ac, 0.00% Impervious, Inflow Depth > 2.76" for 25-yr event
Inflow = 18.20 cfs @ 12.00 hrs, Volume= 1.112 af
Outflow = 18.20 cfs @ 12.00 hrs, Volume= 1.112 af, Atten= 0%, Lag= 0.1 min

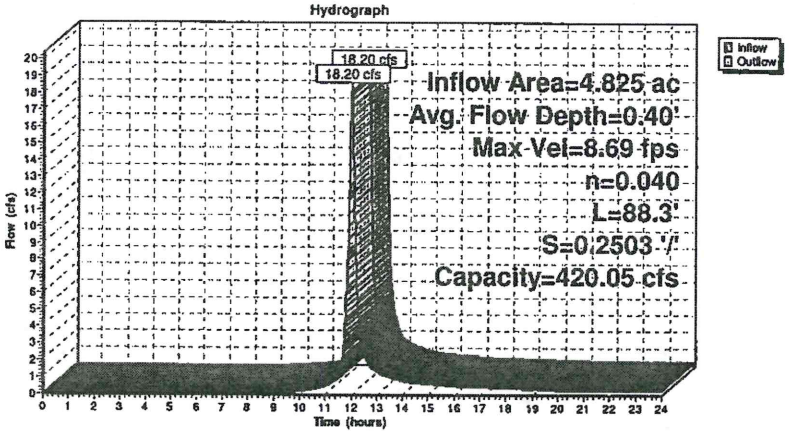
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.69 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.42 fps, Avg. Travel Time= 0.6 min

Peak Storage= 185 cf @ 12.00 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 420.05 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 88.3' Slope= 0.2503 '/'
Inlet Invert= 954.57', Outlet Invert= 932.47'

‡

Reach DC-D2: (new Reach)



Summary for Reach DC-D3: (new Reach)

Inflow Area = 6.525 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 26.24 cfs @ 11.98 hrs, Volume= 1.504 af
Outflow = 26.24 cfs @ 11.98 hrs, Volume= 1.503 af, Atten= 0%, Lag= 0.1 min

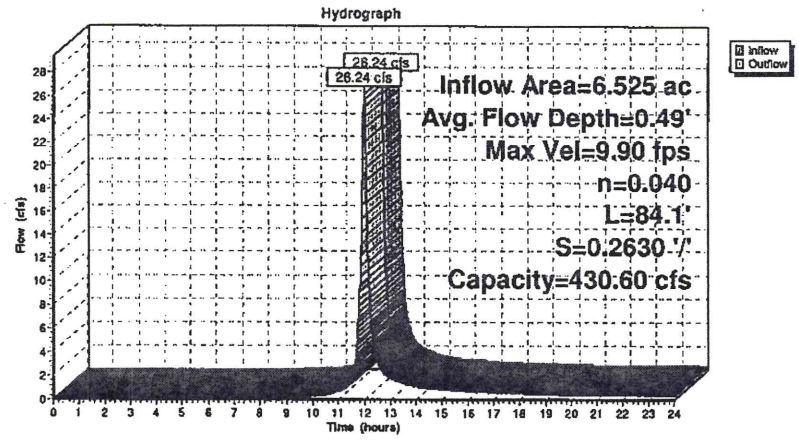
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.90 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.72 fps, Avg. Travel Time= 0.5 min

Peak Storage= 223 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 430.60 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 84.1' Slope= 0.2630 '/'
Inlet Invert= 932.47', Outlet Invert= 910.35'

‡

Reach DC-D3: (new Reach)



Summary for Reach IPC-D1: (new Reach)

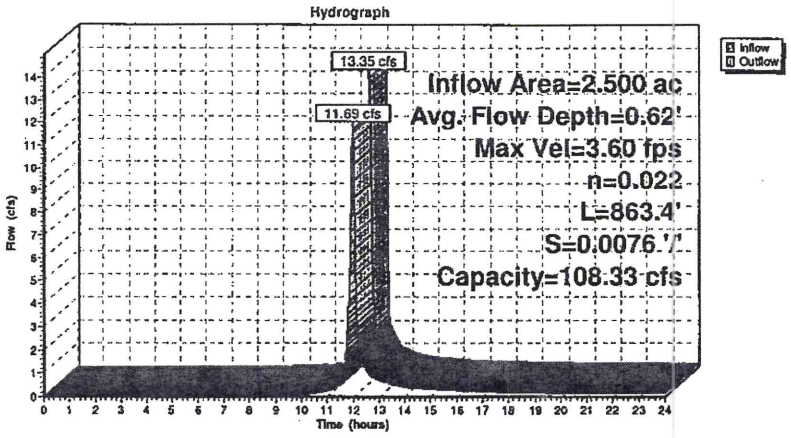
Inflow Area = 2.500 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 13.35 cfs @ 11.95 hrs, Volume= 0.578 af
Outflow = 11.69 cfs @ 11.98 hrs, Volume= 0.574 af, Atten= 12%, Lag= 2.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.60 fps, Min. Travel Time= 4.0 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 15.8 min

Peak Storage= 2,803 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 108.33 cfs

4.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 863.4' Slope= 0.0076 '/'
Inlet Invert= 916.89', Outlet Invert= 910.35'

Reach IPC-D1: (new Reach)



Summary for Pond D: (new Pond)

Inflow Area = 12.136 ac, 0.00% Impervious, Inflow Depth > 2.76" for 25-yr event
Inflow = 52.70 cfs @ 11.98 hrs, Volume= 2.796 af
Outflow = 3.64 cfs @ 12.88 hrs, Volume= 2.296 af, Atten= 93%, Lag= 54.3 min
Primary = 3.64 cfs @ 12.88 hrs, Volume= 2.296 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 904.00' Surf.Area= 42,821 sf Storage= 142,855 cf
Peak Elev= 905.43' @ 12.88 hrs Surf.Area= 48,175 sf Storage= 207,679 cf (64,824 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 169.3 min (993.4 - 824.0)

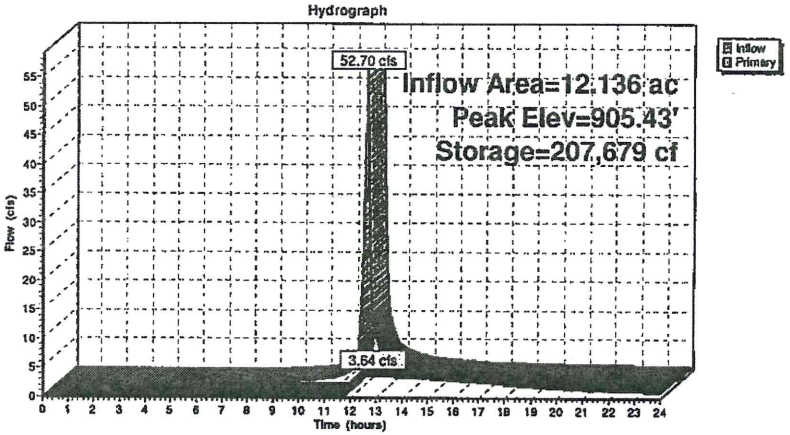
Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	344,653 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
900.00	28,862	0	0
901.00	32,187	30,525	30,525
902.00	35,631	33,909	64,434
903.00	39,195	37,413	101,847
904.00	42,821	41,008	142,855
905.00	46,548	44,685	187,539
906.00	50,374	48,461	236,000
907.00	54,301	52,338	288,338
908.00	58,329	56,315	344,653

Device	Routing	Invert	Outlet Devices
#1	Primary	904.00'	**12.0" Round Culvert**
			L= 81.3' RCP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 904.00' / 901.00' S= 0.0369 '/' Cc= 0.900
			n= 0.012 Concrete pipe, finished
#2	Primary	906.10'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65

Primary OutFlow Max=3.64 cfs @ 12.88 hrs HW=905.43' (Free Discharge)
1=**Culvert** (Inlet Controls 3.64 cfs @ 4.63 fps)
2=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond D: (new Pond)



Summary for Pond DC-D4: (new Reach)

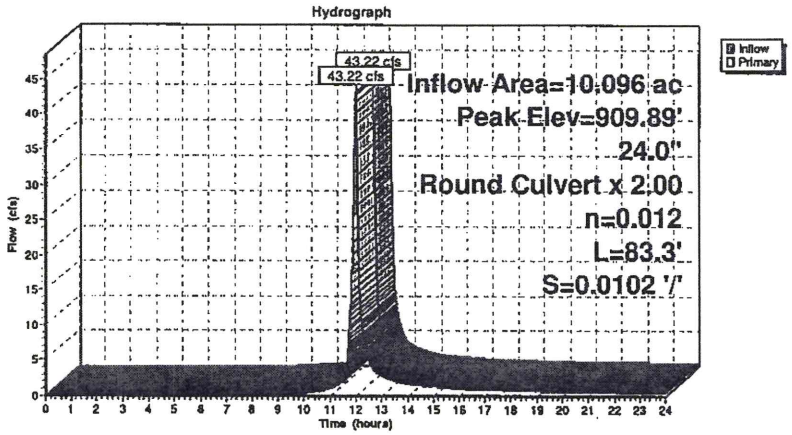
Inflow Area = 10.096 ac, 0.00% Impervious, Inflow Depth > 2.76" for 25-yr event
Inflow = 43.22 cfs @ 11.98 hrs, Volume= 2.325 af
Outflow = 43.22 cfs @ 11.98 hrs, Volume= 2.325 af, Atten= 0%, Lag= 0.0 min
Primary = 43.22 cfs @ 11.98 hrs, Volume= 2.325 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 909.89' @ 11.98 hrs
Flood Elev= 910.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	906.85'	24.0" Round Culvert X 2.00 L= 83.3' Ke= 0.500 Inlet / Outlet Invert= 906.85' / 906.00' S= 0.0102 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished

Primary OutFlow Max=43.16 cfs @ 11.98 hrs HW=909.89' TW=904.81' (Dynamic Tailwater)
↳1=Culvert (Inlet Controls 43.16 cfs @ 6.87 fps)

Pond DC-D4: (new Reach)



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment D1: (new Subcat) Runoff Area=0.600 ac 0.00% Impervious Runoff Depth>4.00"
Flow Length=188' Tc=9.9 min CN=79 Runoff=3.67 cfs 0.200 af

Subcatchment D2: (new Subcat) Runoff Area=2.613 ac 0.00% Impervious Runoff Depth>4.00"
Flow Length=232' Tc=11.7 min CN=79 Runoff=15.03 cfs 0.871 af

Subcatchment D3: (new Subcat) Runoff Area=0.514 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=3.94 cfs 0.172 af

Subcatchment D4: (new Subcat) Runoff Area=1.098 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=8.42 cfs 0.367 af

Subcatchment D5: (new Subcat) Runoff Area=0.602 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=4.62 cfs 0.201 af

Subcatchment D6: (new Subcat) Runoff Area=1.098 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=8.42 cfs 0.367 af

Subcatchment D7: (new Subcat) Runoff Area=2.500 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=99' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=18.98 cfs 0.835 af

Subcatchment D8: (new Subcat) Runoff Area=1.071 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=8.21 cfs 0.358 af

Subcatchment EX-D: Existing Drainage Area Runoff Area=2.040 ac 0.00% Impervious Runoff Depth>4.00"
Flow Length=100' Slope=0.0460 '/' Tc=7.4 min CN=79 Runoff=13.61 cfs 0.681 af

Reach DB-D1: (new Reach) Avg. Flow Depth=0.52' Max Vel=3.82 fps Inflow=3.67 cfs 0.200 af
n=0.022 L=222.5' S=0.0202 '/' Capacity=130.80 cfs Outflow=3.64 cfs 0.200 af

Reach DB-D2: (new Reach) Avg. Flow Depth=0.88' Max Vel=5.39 fps Inflow=15.03 cfs 0.871 af
n=0.022 L=542.5' S=0.0200 '/' Capacity=130.16 cfs Outflow=14.74 cfs 0.870 af

Reach DB-D3: (new Reach) Avg. Flow Depth=0.53' Max Vel=3.86 fps Inflow=3.94 cfs 0.172 af
n=0.022 L=285.3' S=0.0202 '/' Capacity=130.72 cfs Outflow=3.84 cfs 0.172 af

Reach DB-D4: (new Reach) Avg. Flow Depth=0.70' Max Vel=4.63 fps Inflow=8.42 cfs 0.367 af
n=0.022 L=542.5' S=0.0200 '/' Capacity=130.10 cfs Outflow=7.99 cfs 0.366 af

Reach DB-D5: (new Reach) Avg. Flow Depth=0.57' Max Vel=3.94 fps Inflow=4.62 cfs 0.201 af
n=0.022 L=310.4' S=0.0191 '/' Capacity=127.27 cfs Outflow=4.49 cfs 0.201 af

Reach DB-D6: (new Reach) Avg. Flow Depth=0.70' Max Vel=4.63 fps Inflow=8.42 cfs 0.367 af
n=0.022 L=542.5' S=0.0200 '/' Capacity=130.22 cfs Outflow=7.99 cfs 0.366 af

Reach DB-D8: (new Reach) Avg. Flow Depth=0.70' Max Vel=4.60 fps Inflow=8.21 cfs 0.358 af
n=0.022 L=544.5' S=0.0200 '/' Capacity=130.22 cfs Outflow=7.78 cfs 0.357 af

Reach DC-D1: (new Reach) Avg. Flow Depth=0.40' Max Vel=8.70 fps Inflow=18.26 cfs 1.070 af
n=0.040 L=88.3' S=0.2501 '/' Capacity=419.86 cfs Outflow=18.26 cfs 1.070 af

Reach DC-D2: (new Reach) Avg. Flow Depth=0.49' Max Vel=9.73 fps Inflow=26.25 cfs 1.607 af
n=0.040 L=88.3' S=0.2503 '/' Capacity=420.05 cfs Outflow=26.25 cfs 1.607 af

Reach DC-D3: (new Reach) Avg. Flow Depth=0.59' Max Vel=11.05 fps Inflow=37.85 cfs 2.174 af
n=0.040 L=84.1' S=0.2630 '/' Capacity=430.60 cfs Outflow=37.85 cfs 2.174 af

Reach IPC-D1: (new Reach) Avg. Flow Depth=0.76' Max Vel=4.03 fps Inflow=18.98 cfs 0.835 af
n=0.022 L=863.4' S=0.0076 '/' Capacity=108.33 cfs Outflow=16.97 cfs 0.831 af

Pond D: (new Pond) Peak Elev=906.09' Storage=240,468 cf Inflow=75.90 cfs 4.043 af
Outflow=4.77 cfs 3.389 af

Pond DC-D4: (new Reach) Peak Elev=912.11' Inflow=62.43 cfs 3.362 af
24.0" Round Culvert x 2.00 n=0.012 L=83.3' S=0.0102 '/' Outflow=62.43 cfs 3.362 af

Total Runoff Area = 12.136 ac Runoff Volume = 4.051 af Average Runoff Depth = 4.01"
100.00% Pervious = 12.136 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment D1: (new Subcat)

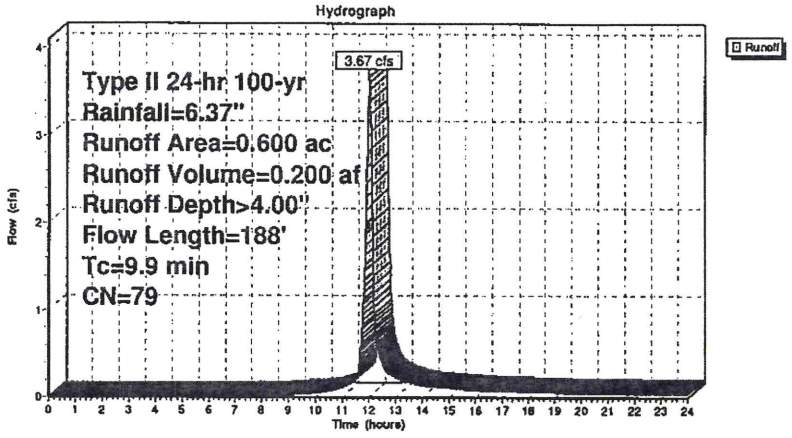
Runoff = 3.67 cfs @ 12.01 hrs, Volume= 0.200 af, Depth> 4.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.600	79	50-75% Grass cover, Fair, HSG C
0.600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	77	0.0200	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"
1.2	23	0.2500	0.33		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"
0.4	88	0.2500	3.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.9	188	Total			

Subcatchment D1: (new Subcat)



Summary for Subcatchment D2: (new Subcat)

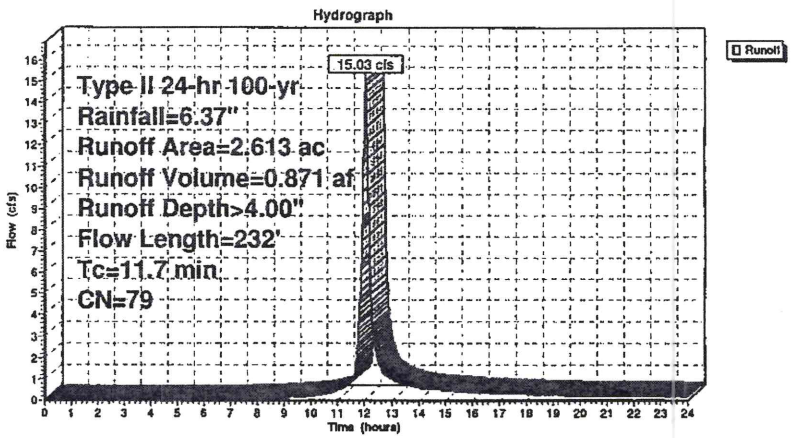
Runoff = 15.03 cfs @ 12.03 hrs, Volume= 0.871 af, Depth> 4.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
2.613	79	50-75% Grass cover, Fair, HSG C
2.613		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0200	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"
1.0	58	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	74	0.2500	3.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
11.7	232	Total			

Subcatchment D2: (new Subcat)



Summary for Subcatchment D3: (new Subcat)

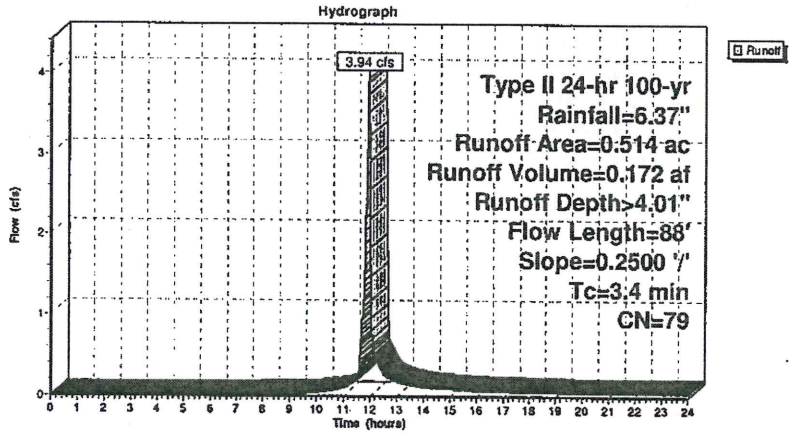
Runoff = 3.94 cfs @ 11.94 hrs, Volume= 0.172 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.514	79	50-75% Grass cover, Fair, HSG C
0.514		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D3: (new Subcat)



Summary for Subcatchment D4: (new Subcat)

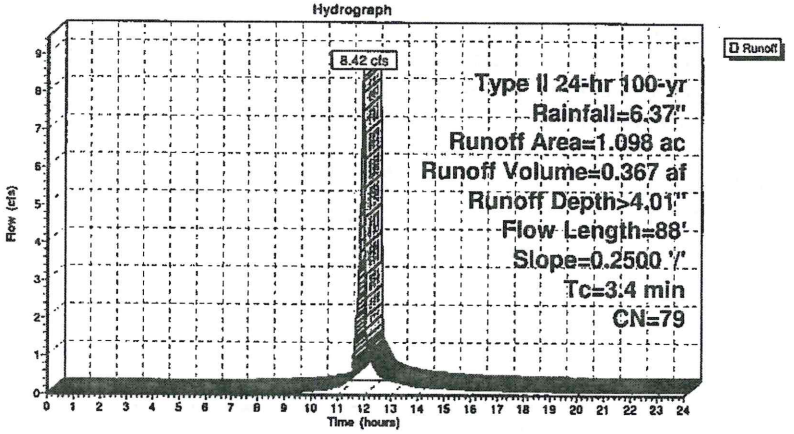
Runoff = 8.42 cfs @ 11.94 hrs, Volume= 0.367 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.098	79	50-75% Grass cover, Fair, HSG C
1.098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D4: (new Subcat)



Summary for Subcatchment D5: (new Subcat)

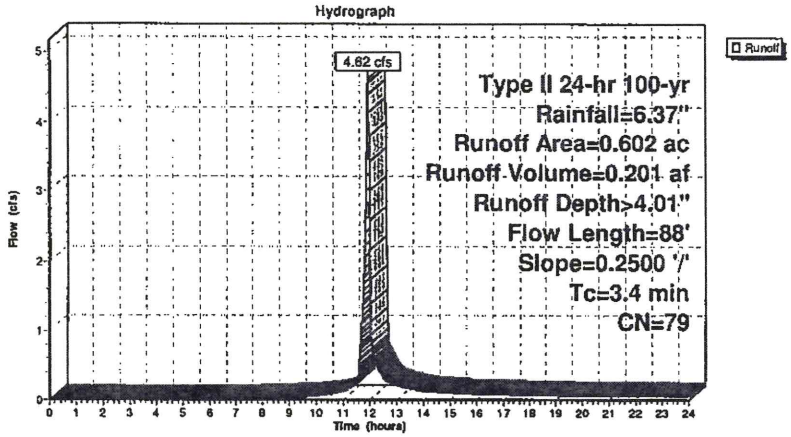
Runoff = 4.62 cfs @ 11.94 hrs, Volume= 0.201 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.602	79	50-75% Grass cover, Fair, HSG C
0.602		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D5: (new Subcat)



Summary for Subcatchment D6: (new Subcat)

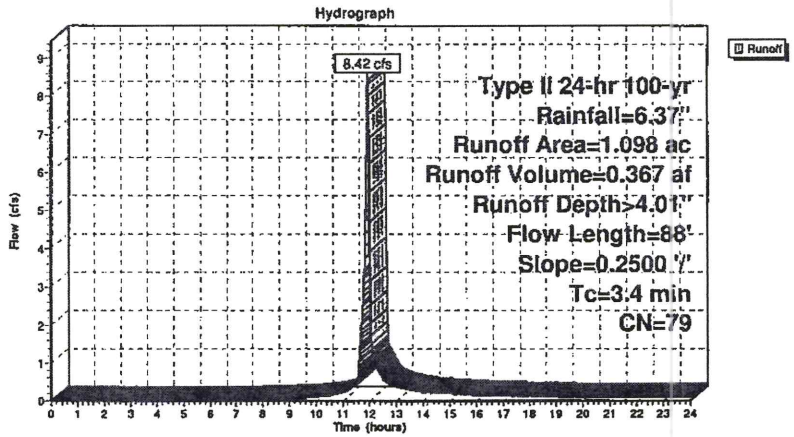
Runoff = 8.42 cfs @ 11.94 hrs, Volume= 0.367 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.098	79	50-75% Grass cover, Fair, HSG C
1.098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D6: (new Subcat)



Summary for Subcatchment D7: (new Subcat)

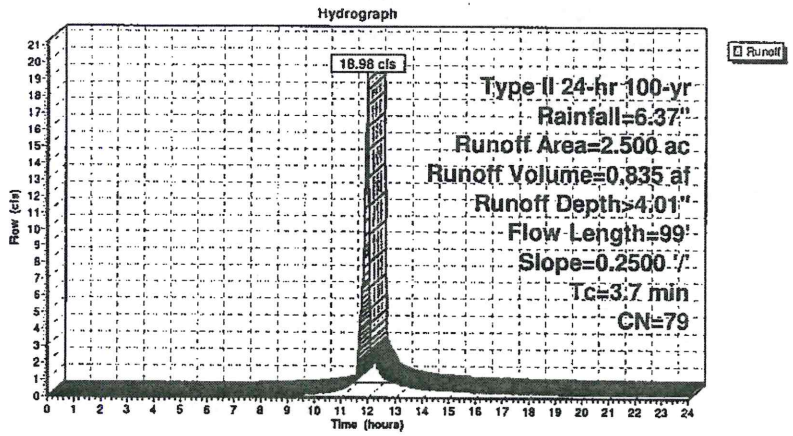
Runoff = 18.98 cfs @ 11.94 hrs, Volume= 0.835 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
2.500	79	50-75% Grass cover, Fair, HSG C
2.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	99	0.2500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D7: (new Subcat)



Summary for Subcatchment D8: (new Subcat)

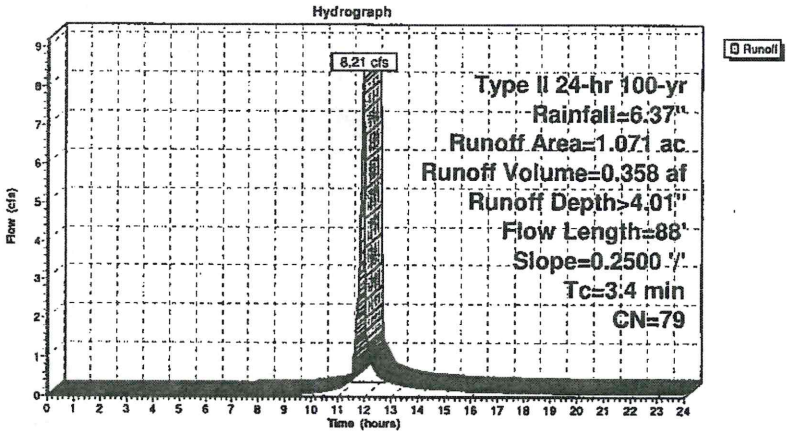
Runoff = 8.21 cfs @ 11.94 hrs, Volume= 0.358 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.071	79	50-75% Grass cover, Fair, HSG C
1.071		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment D8: (new Subcat)



Summary for Subcatchment EX-D: Existing Drainage Area

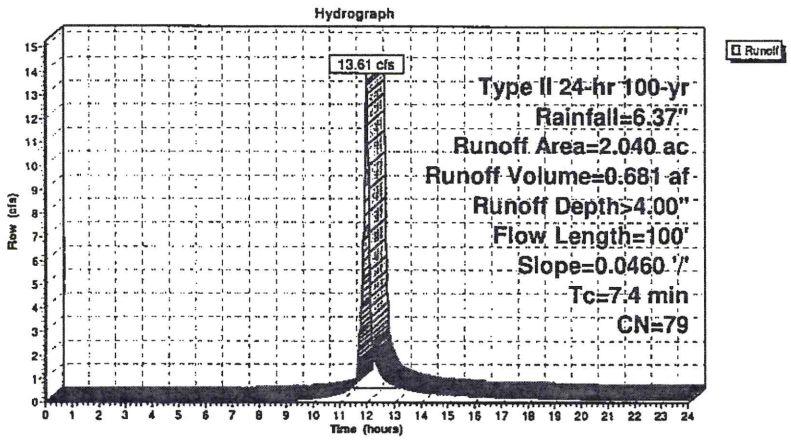
Runoff = 13.61 cfs @ 11.99 hrs, Volume= 0.681 af, Depth> 4.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
2.040	79	50-75% Grass cover, Fair, HSG C
2.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0460	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.91"

Subcatchment EX-D: Existing Drainage Area



Summary for Reach DB-D1: (new Reach)

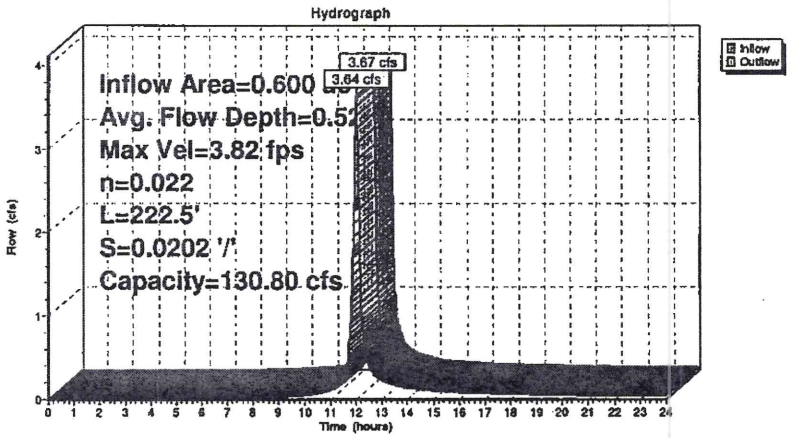
Inflow Area = 0.600 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 3.67 cfs @ 12.01 hrs, Volume= 0.200 af
Outflow = 3.64 cfs @ 12.03 hrs, Volume= 0.200 af, Atten= 1%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.82 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.41 fps, Avg. Travel Time= 2.6 min

Peak Storage= 212 cf @ 12.03 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.80 cfs

0.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 222.5' Slope= 0.0202 '/'
Inlet Invert= 981.14', Outlet Invert= 976.65'

Reach DB-D1: (new Reach)



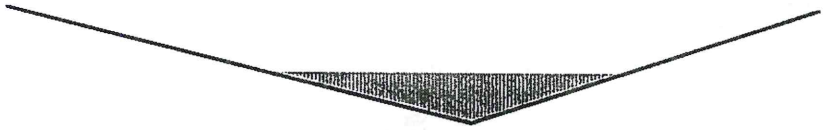
Summary for Reach DB-D2: (new Reach)

Inflow Area = 2.613 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 15.03 cfs @ 12.03 hrs, Volume= 0.871 af
Outflow = 14.74 cfs @ 12.05 hrs, Volume= 0.870 af, Atten= 2%, Lag= 1.2 min

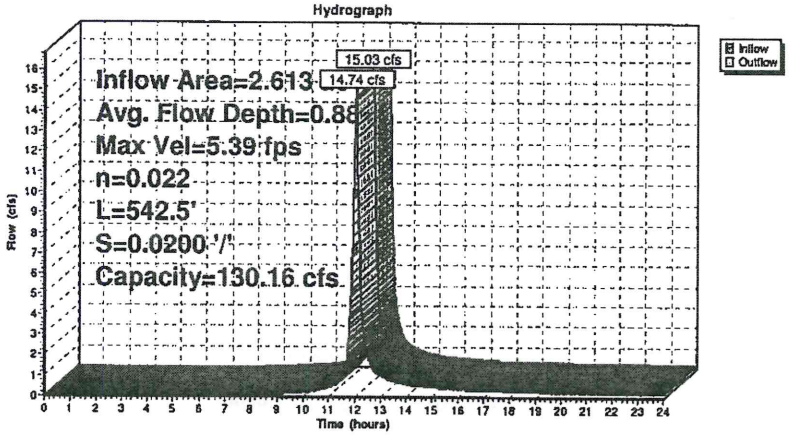
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.39 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 2.02 fps, Avg. Travel Time= 4.5 min

Peak Storage= 1,483 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.88'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.16 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 542.5' Slope= 0.0200 '/'
Inlet Invert= 987.49', Outlet Invert= 976.65'



Reach DB-D2: (new Reach)



Summary for Reach DB-D3: (new Reach)

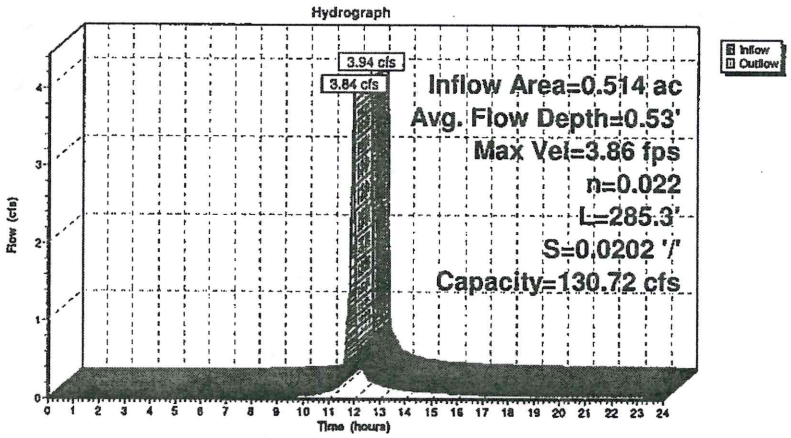
Inflow Area = 0.514 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 3.94 cfs @ 11.94 hrs, Volume= 0.172 af
Outflow = 3.84 cfs @ 11.95 hrs, Volume= 0.172 af, Atten= 3%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.86 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 3.5 min

Peak Storage= 283 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.72 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 285.3' Slope= 0.0202 '/'
Inlet Invert= 960.32', Outlet Invert= 954.57'

Reach DB-D3: (new Reach)



Summary for Reach DB-D4: (new Reach)

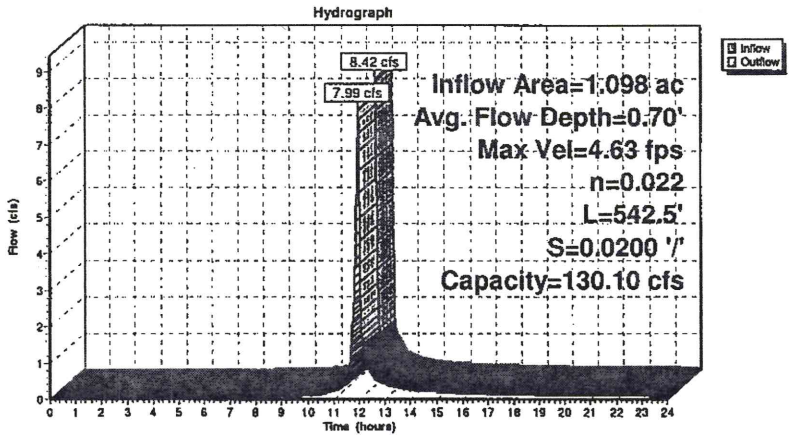
Inflow Area = 1.098 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 8.42 cfs @ 11.94 hrs, Volume= 0.367 af
Outflow = 7.99 cfs @ 11.96 hrs, Volume= 0.366 af, Atten= 5%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.63 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 5.5 min

Peak Storage= 937 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.10 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 542.5' Slope= 0.0200 '/'
Inlet Invert= 965.40', Outlet Invert= 954.57'

Reach DB-D4: (new Reach)



Summary for Reach DB-D5: (new Reach)

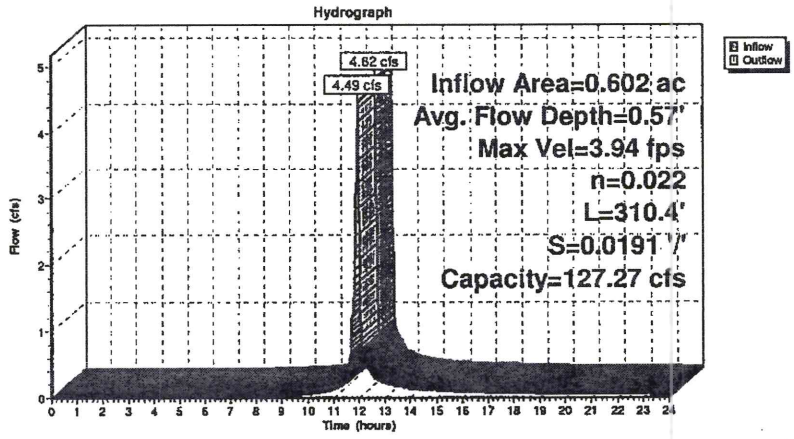
Inflow Area = 0.602 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 4.62 cfs @ 11.94 hrs, Volume= 0.201 af
Outflow = 4.49 cfs @ 11.96 hrs, Volume= 0.201 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.94 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 3.7 min

Peak Storage= 354 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 127.27 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 310.4' Slope= 0.0191 '/'
Inlet Invert= 938.40', Outlet Invert= 932.47'

Reach DB-D5: (new Reach)



Summary for Reach DB-D6: (new Reach)

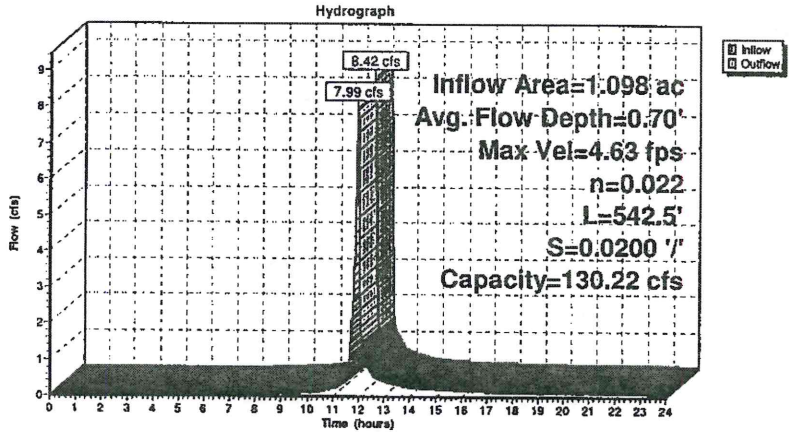
Inflow Area = 1.098 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 8.42 cfs @ 11.94 hrs, Volume= 0.367 af
Outflow = 7.99 cfs @ 11.96 hrs, Volume= 0.366 af, Atten= 5%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.63 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 5.5 min

Peak Storage= 936 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.22 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 542.5' Slope= 0.0200 '/'
Inlet Invert= 943.32', Outlet Invert= 932.47'

Reach DB-D6: (new Reach)



Summary for Reach DB-D8: (new Reach)

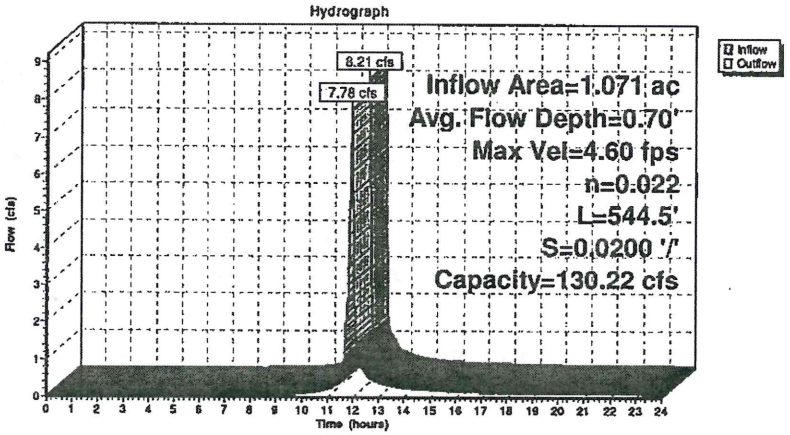
Inflow Area = 1.071 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 8.21 cfs @ 11.94 hrs, Volume= 0.358 af
Outflow = 7.78 cfs @ 11.96 hrs, Volume= 0.357 af, Atten= 5%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.60 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.62 fps, Avg. Travel Time= 5.6 min

Peak Storage= 921 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.22 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 544.5' Slope= 0.0200 '/'
Inlet Invert= 921.24', Outlet Invert= 910.35'

Reach DB-D8: (new Reach)



Summary for Reach DC-D1: (new Reach)

Inflow Area = 3.213 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 18.26 cfs @ 12.05 hrs, Volume= 1.070 af
Outflow = 18.26 cfs @ 12.05 hrs, Volume= 1.070 af, Atten= 0%, Lag= 0.1 min

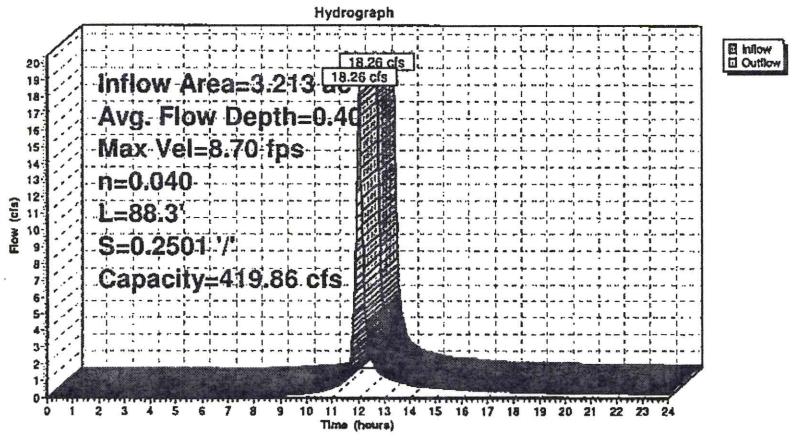
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.70 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.31 fps, Avg. Travel Time= 0.6 min

Peak Storage= 185 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.86 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 88.3' Slope= 0.2501 '/'
Inlet Invert= 976.65', Outlet Invert= 954.57'

‡

Reach DC-D1: (new Reach)



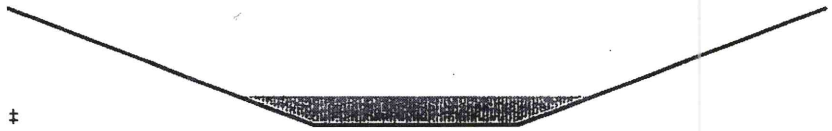
Summary for Reach DC-D2: (new Reach)

Inflow Area = 4.825 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 26.25 cfs @ 11.99 hrs, Volume= 1.607 af
Outflow = 26.25 cfs @ 12.00 hrs, Volume= 1.607 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.73 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.65 fps, Avg. Travel Time= 0.6 min

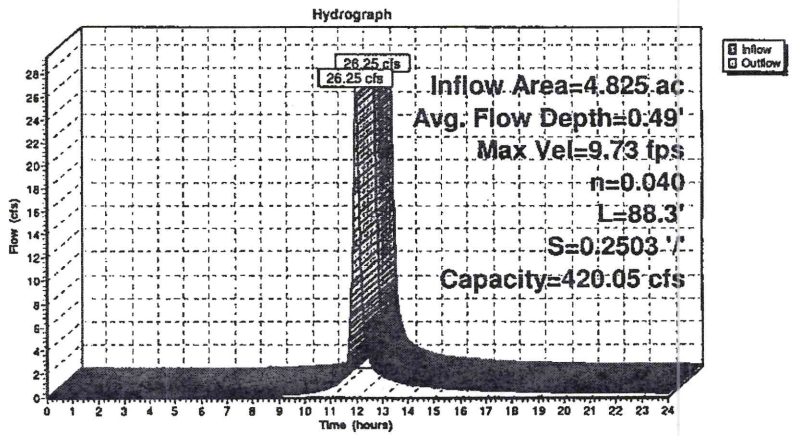
Peak Storage= 238 cf @ 12.00 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 420.05 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 88.3' Slope= 0.2503 '/'
Inlet Invert= 954.57', Outlet Invert= 932.47'



‡

Reach DC-D2: (new Reach)



Summary for Reach DC-D3: (new Reach)

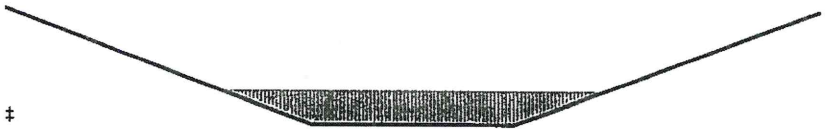
Inflow Area = 6.525 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 37.85 cfs @ 11.98 hrs, Volume= 2.174 af
Outflow = 37.85 cfs @ 11.98 hrs, Volume= 2.174 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.05 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.99 fps, Avg. Travel Time= 0.5 min

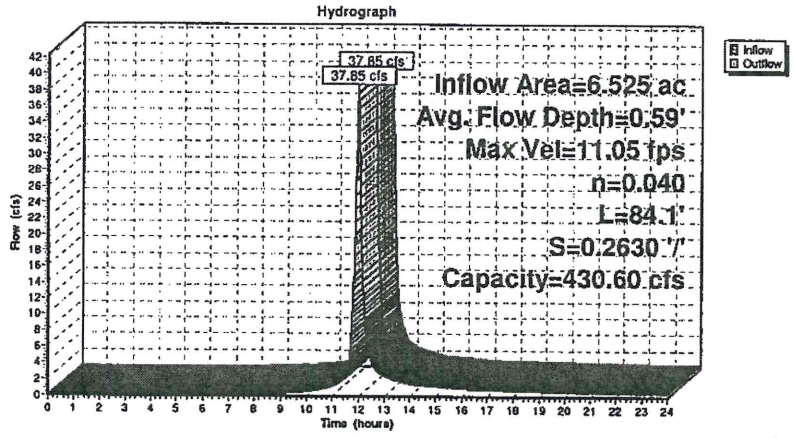
Peak Storage= 288 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 430.60 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 84.1' Slope= 0.2630 '/'
Inlet Invert= 932.47', Outlet Invert= 910.35'

‡



Reach DC-D3: (new Reach)



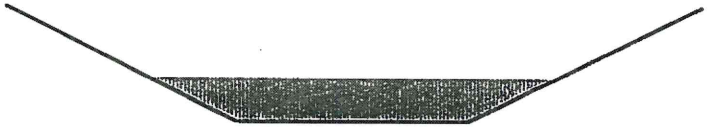
Summary for Reach IPC-D1: (new Reach)

Inflow Area = 2.500 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 18.98 cfs @ 11.94 hrs, Volume= 0.835 af
Outflow = 16.97 cfs @ 11.97 hrs, Volume= 0.831 af, Atten= 11%, Lag= 1.8 min

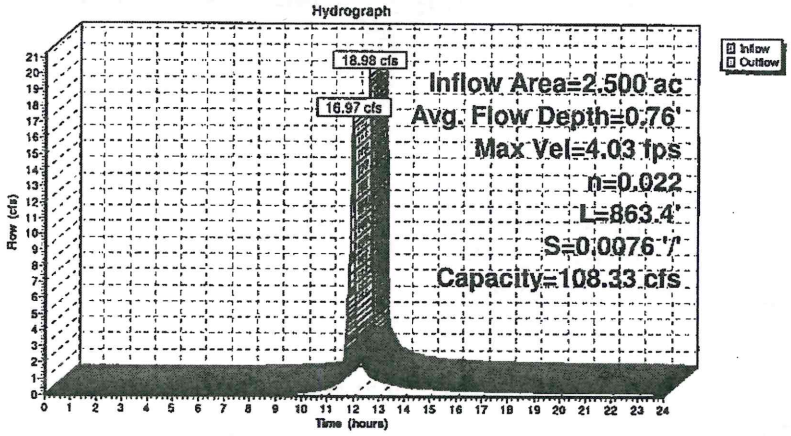
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.03 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 1.01 fps, Avg. Travel Time= 14.3 min

Peak Storage= 3,633 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.76'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 108.33 cfs

4.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 863.4' Slope= 0.0076 '/'
Inlet Invert= 916.89', Outlet Invert= 910.35'



Reach IPC-D1: (new Reach)



Summary for Pond D: (new Pond)

Inflow Area = 12.136 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 75.90 cfs @ 11.98 hrs, Volume= 4.043 af
Outflow = 4.77 cfs @ 12.95 hrs, Volume= 3.389 af, Atten= 94%, Lag= 58.2 min
Primary = 4.77 cfs @ 12.95 hrs, Volume= 3.389 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 904.00' Surf.Area= 42,821 sf Storage= 142,855 cf
Peak Elev= 906.09' @ 12.95 hrs Surf.Area= 50,721 sf Storage= 240,468 cf (97,614 cf above start)

Plug-Flow detention time= 870.7 min calculated for 0.109 af (3% of inflow)
Center-of-Mass det. time= 194.0 min (1,007.3 - 813.3)

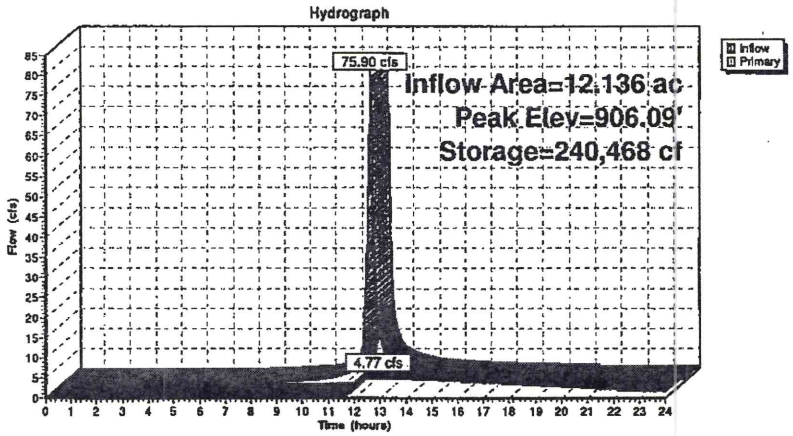
Volume	Invert	Avail.Storage	Storage Description
#1	900.00'	344,653 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
900.00	28,862	0	0
901.00	32,187	30,525	30,525
902.00	35,631	33,909	64,434
903.00	39,195	37,413	101,847
904.00	42,821	41,008	142,855
905.00	46,548	44,685	187,539
906.00	50,374	48,461	236,000
907.00	54,301	52,338	288,338
908.00	58,329	56,315	344,653

Device	Routing	Invert	Outlet Devices
#1	Primary	904.00'	**12.0" Round Culvert** L= 81.3' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 904.00' / 901.00' S= 0.0369 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished
#2	Primary	906.10'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65

Primary OutFlow Max=4.77 cfs @ 12.95 hrs HW=906.09' (Free Discharge)
└**1=Culvert** (Inlet Controls 4.77 cfs @ 6.07 fps)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond D: (new Pond)



Summary for Pond DC-D4: (new Reach)

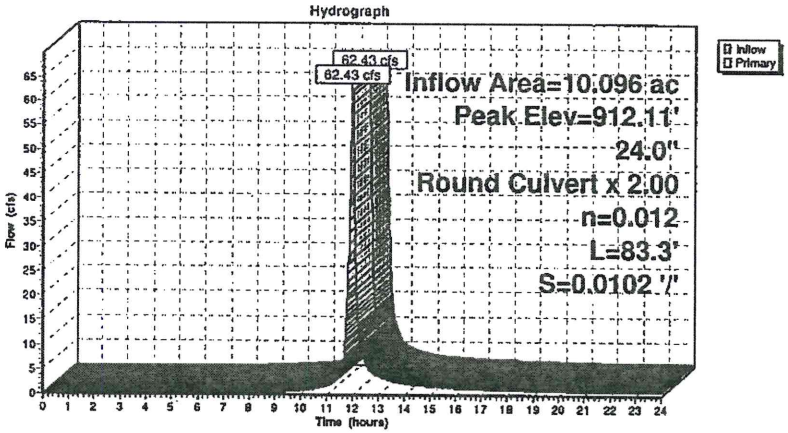
Inflow Area = 10.096 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 62.43 cfs @ 11.97 hrs, Volume= 3.362 af
Outflow = 62.43 cfs @ 11.97 hrs, Volume= 3.362 af, Atten= 0%, Lag= 0.0 min
Primary = 62.43 cfs @ 11.97 hrs, Volume= 3.362 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 912.11' @ 11.97 hrs
Flood Elev= 910.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	906.85'	**24.0" Round Culvert X 2.00** L= 83.3' Ke= 0.500 Inlet / Outlet Invert= 906.85' / 906.00' S= 0.0102 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished

Primary OutFlow Max=62.32 cfs @ 11.97 hrs HW=912.09' TW=905.24' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 62.32 cfs @ 9.92 fps)

Pond DC-D4: (new Reach)



SUBJECT	OAC 3745-30-05 (C)(6)(l) – Sediment Pond E Design Calculations					PROJECT NO.	071-644		
PROJECT	Dayton Power and Light – Carter Hollow Landfill Sprigg Township, Adams County, Ohio					PAGE	1	OF	11
	MADE BY	IIJ	DATE	03/04/10	CHECKED BY	JMP	DATE	03/05/10	

OBJECTIVE:

To design the proposed Sedimentation Pond E, which provides stormwater management and sedimentation control, by satisfying the following regulations for residual waste landfills:

OAC 3745-30-07(C)(4)(d)

(d) Any sedimentation ponds shall be designed and constructed in accordance with the following:

(i) Minimum storage volume shall be provided based on either the calculated runoff volume from a ten-year/twenty-four-hour storm event, or 0.125 acre-feet per year, for each acre of disturbed area within the upstream drainage area, multiplied by the scheduled frequency of pond clean-out (in years), whichever is greater.

(ii) The principal spillway shall safely discharge the flow from a ten-year/twenty-four-hour storm event. The inlet elevation of the emergency spillway shall be designed to provide flood storage, with no flow entering the emergency spillway, for a twenty-five-year/twenty-four-hour storm event, with allowance provided for the flow passed by the principal spillway during the event.

(iii) The combination of principal and emergency spillways shall safely discharge the flow from a one-hundred-year/twenty-four-hour storm event. The embankment design shall provide for no less than one foot net freeboard when flow is at the design depth, after allowance for embankment settlement.

(iv) The sedimentation pond shall be constructed using a recompacted soil liner, a flexible membrane liner, or a combination thereof, based on a design acceptable to the director.

The design is based upon accepted engineering design equations, methodologies and assumptions. Where applicable, design references have been made. Calculations have been performed using the software package, HydroCAD Version 9.10, Copyright 2009.

METHOD:

Stormwater routings have been performed with a storage-elevation routing methodology. The inflow hydrographs have been developed using the HydroCAD hydrograph method, which utilizes components of TR-20 and TR-55, using the times of concentration (Tc) and watershed parameters determined for each contributing watershed.

The rainfall values for this site are listed below. The NOAA Atlas 14(1), Point Precipitation Frequency Estimates, provided the estimated rainfall depths and are presented in "OAC 3745-30-05 (C)(6)(k) Permanent Surface Water Control Structures A Design Calculations".

RAINFALL DATA		
Frequency	**Duration**	**Depth (in)**
10 yr	24 hr	4.16
25 yr	24 hr	4.97
100 yr	24 hr	6.37

According to the TR-55 methods, times of concentration were estimated as the sum of sheet flow, shallow concentrated flow and channel flow. Flow calculations utilized a CN number representative of the post construction surface conditions. Maximum sheet flow length used was 100 feet. Shallow concentrated flow times of concentration were estimated depending on the condition of the flow path.

This site is located in an area of hydrologic soil group C. Based on the existing and proposed site conditions the following runoff coefficients have been determined and will be utilized.

CN DATA	
Description	**CN**
Existing (Woods Grass Combination, Fair)	76
Landfill (50-75% Grass Cover, Fair)	79

The inflow hydrographs were developed using HydroCAD for each contributing watershed based on the previously mentioned criteria and the delineated drainage areas. These areas can be found in **Figure E of (C)(6)(k) Surface Water Control Structures Design Calculations Drainage Area E.** The contributing drainage areas for this sedimentation pond, taken from the channel designs, are summarized below:

Drainage Area (Acre)	Channel #	Cn #	Watershed Area (Acre)
E1	DB-E1	79	1.35
E2	DB-E2	79	0.24
E3	DB-E3	79	0.78
E4	DB-E4	79	1.75
E5	DB-E5	79	0.75
E6	DB-E6	79	1.05
E7	DB-E7	79	0.67
E8	DB-E8	79	1.21
E9	DB-E9	79	1.60
EX-E	-	76	1.05
Total			**10.45**

Using the developed inflow hydrographs, all routings have been performed with the initial pool elevation within the pond at the invert of the principal spillway. The required sedimentation storage volume has been provided below the invert of the principal spillway. The inflow hydrograph from the 10-year/24-hour storm event was then used to size the principal spillway. The 25-year/24-hour storm event was then passed through the principal spillway in order to determine the elevation at which the emergency spillway was to be placed. The 100-year/24-hour storm event was then used to design the emergency spillway while providing a minimum of one foot of freeboard from the top of the embankment.

CALCULATIONS:

SEDIMENT VOLUME SIZING

According to OAC 3745-30-07(C)(4)(d)(i), the sedimentation pond must have adequate sediment storage volume for the larger of (1) the runoff from the 10-year/24-hour storm event or (2) 0.125 acre-feet per acre of disturbed area multiplied by the cleaning frequency in years.

Volume Requirement for ten-year/twenty-four-hour storm:

Utilizing the hydrographs from HydroCAD, the runoff from the 10-year/24-hour storm event is 1.81 acre-feet or 78,800 cubic feet. (Backup not included)

Volume Requirement for 0.125 acre-feet per disturbed acre:

Per the mentioned regulation, the storage volume required for each Drainage Area is calculated as follows:

$$V = Disturbed\ Area\left(\frac{0.125\ acre-ft}{acre}\right)[1\ \text{cleaning per year}]$$

The expected total disturbed drainage area is approximately 10.4 acres. Therefore, 0.125 acre-feet per disturbed acre requires a total sediment storage volume of 56,600 cubic-feet.

The rule calculations are very conservative in nature and neglect site-specific erosion expectations; therefore, a calculation giving a more accurate representation of the expected sediment during post-closure would be prudent. The Revised Universal Soil Loss Equation (RUSLE) was utilized to estimate the soil loss from the site during a capped condition. A composite sediment volume will be determined utilizing an expected soil loss from existing areas and an expected soil loss from the capped portion of the landfill. The RUSLE analyses can be found in "OAC 3745-30-05 (C)(6)(j) - Soil Erosion" and "OAC 3745-30-05 (C)(6)(l) – Temporary Sediment Pond A - Design Calculations" respectively.

Summarizing the results of the RUSLE calculation, the estimated soil erosion rate is approximately 2.7 tons/acre/year in a closed condition and 200 tons/acre/year for the existing areas. In order to be conservative, the 5.0 tons/acre/year allowable soil erosion from the capped landfill will be used in order to calculate the required sediment storage volume. Based on a 9.4 acre capped landfill drainage area, and assuming a unit weight of soil of approximately 100 pounds per cubic foot, the estimated required sediment storage volume based on site-specific generated sediment is 900 cubic-feet. Likewise, from a 1.0 acre existing drainage area, the estimated required sediment storage volume based on site-specific generated sediment is 4,000 cubic-feet. Utilizing these site-specific minimum storage requirements and the HydroCAD elevation-storage table included with this calculation, the overall sediment storage volume is achieved at an elevation of approximately 892.00, but due to the outlet controlling, the invert of the principal spillway has been set at 898.00.

Item	Value
Required Storage to Invert of Principal Spillway	4,900 cubic-feet
Actual Storage at Invert of Principal Spillway (elevation 898.00); EXCEEDS REQUIRED	74,200 cubic-feet

Based on the above calculations and the actual available sediment storage of the sedimentation pond, it can be assumed that cleaning of Sedimentation Pond E will be required approximately once every 5 years. However, cleaning of the sedimentation pond shall be performed when 50 percent of the volume below the principal spillway is occupied by sediment.

PRINCIPAL SPILLWAY DESIGN

According to OAC 3745-30-07(C)(4)(d)(ii), the principal spillway shall be designed to safely discharge the flow from a 10-year/24-hour storm event without the use of mechanical means. To fulfill this regulation, the principal spillway was placed at an elevation of 898.00 which provides the required sediment storage volume. The spillway was then sized accordingly to allow the 10-year/24-hour storm event to pass safely. The 25-year/24-hour storm event was then routed through the designed principal spillway in order to determine the 25-year/24-hour elevation. Therefore, if the principal spillway is capable of releasing the flow from the 25-year/24-hour storm event, it is capable of safely handling the flow from the 10-year/24-hour storm event.

The details of the principal spillway for Sedimentation Pond E are summarized as follows:

Item	Value
Spillway Type	RCP Pipe
Design Manning's n	0.012
Culvert Quantity	1
Culvert Dimension	12 inch Diameter
Culvert Length	90.00 feet
Principal Spillway Invert Elevation	898.00 feet
Maximum pool elevation 25-year 24-hour storm	900.46 feet
Maximum pool volume for 25-year 24-hour storm	48,700 cubic-feet

According to OAC 3745-30-07(C)(4)(d)(ii), the routing, included with this calculation, shows that the maximum pool elevation for the routed 25-year/24-hour storm event is below the invert elevation of the emergency spillway, which has been set at 901.70. Thus, during the 25-year/24-hour storm event, the emergency spillway provides flood storage with no flow entering the emergency spillway while allowing flow through the principal spillway.

EMERGENCY SPILLWAY DESIGN

According to OAC 3745-30-07(C)(4)(d)(iii), the emergency spillway has been designed such that the combination of the principal spillway and emergency spillway will safely discharge the 100-year/24-hour storm event. This design requirement has been evaluated by routing flow from the 100-year/24-hour storm through the pond using the previously designed principal spillway.

The emergency spillway shall be a broad-crested weir with a crest length of 10 feet, a width of 5 feet, and a weir height of 4.30 feet. The sideslopes of the emergency spillway shall be 4H:1V. The invert of the emergency spillway has been set above the elevation of the 25-year/24-hour storm event such that throughout the routing of the 100-year/24-hour storm, a minimum 1-ft of freeboard is maintained to the perimeter elevation of the pond. The routing of the 100-yr/24 hour storm event produces a pool elevation of 901.52, which allows for a freeboard of 4.48 ft below the embankment, which has an elevation of 906.00.

The details of the emergency spillway for Sedimentation Pond E are included in the HydroCAD output.

Item	Value
Spillway Type	Broad-Crested Weir
Weir Coefficient	2.65
Channel Lining	Stone
Channel Dimension	10'L, 5'W, 4.30'H
Emergency Spillway Invert Elevation	901.70 feet
Maximum pool elevation 100-year 24-hour storm	901.52 feet
Maximum pool volume for 100-year 24-hour storm	74,000 cubic-feet
Top of Embankment	906.00 feet
Freeboard above the 100-year elevation	4.48 feet

ANTI-SEEP COLLAR DESIGN

Anti-seep collars provide a means to reduce seepage along outlet pipes though the embankments for any pipes that may be saturated. The number and size of anti-seep collars shall be selected such that increase in seepage length (Ls), increases by a minimum 15% within the normal saturation zone. The normal saturation zone is determined by the phreatic line drawn at a 4H:1V slope. The principal spillway barrel pipe (18 inch) shall be placed at the Normal Water Surface Elevation of 898.00. Due to the 10-year/24-hour pool elevation of 899.84, the phreatic surface is within the cross section of the pipe; therefore, the saturation zone must be evaluated to determine how many anti-seep collars are required. The calculations below are based on The Ohio Department of Transportation design guidelines[7].

$$Ls = Y(Z+4)\left[1+\left(\frac{S}{(0.25-S)}\right)\right]$$

Where:
Ls = seepage length (ft)
Y = Depth of water in pond during the 10 yr/24-hour event (ft)
Z = Slope of upstream face of embankment (Z ft horizontal:1 vertical)
S = Slope of the Barrel Pipe (ft/ft)

$$Ls = 1.84(4+4)\left[1+\left(\frac{0.0112}{(0.25-0.0112)}\right)\right] = 15.41\,ft$$

Required Seepage Length Increase:

$$\Delta L_s = L_s * 0.15 = 15.41 * 0.15 = 2.31 \text{ ft}$$

Anti-Seep collars must be sized to provide a minimum of 3 feet of projection on all sides of the outlet pipe and be sized in 1 foot increments. The outlet pipe is a 12" pipe; therefore the Anti-Seep collar shall be 7 feet by 7 feet.

Determine the total number of collars required:

$$P = W - D = 7 - 1.0 = 6.0 \text{ feet}$$

Where:
P = Projection of Collar (ft)
W = Height or Width of Collar (ft)
D = Inside Diameter Outlet Pipe (ft)

$$\text{Number of Collars required} = \Delta L_s / P = 2.31/6.0 = 0.385$$

One 7 feet by 7 feet anti-seep collar will be provided.

OUTLET CHANNEL

The proposed principal spillway and emergency spillway will outlet to the proposed Outboard Perimeter Channel which will convey the outflow from this pond downstream of the proposed landfill to the existing stream within Carter Hollow. (Please see "OAC 3745-30-05 (C)(6)(k)

Permanent Surface Water Control Structures Outboard Perimeter Channel Design Calculations" for additional information regarding the channel design)

CONCLUSIONS:

The proposed Sedimentation Pond E has been designed to meet the regulations as outlined in OAC 3745-30-07(C)(4)(d) by utilizing a 12-inch RCP culvert pipe with an invert elevation of 898.00. This culvert has been designed to safely pass the flow from the 10-year/24-hour storm event. The routing of the 25-year/24-hour storm event produces a water level elevation of 900.46, which is below the invert of the proposed emergency spillway. The flow from the 100-yr/24-hr storm was routed through the proposed principal spillway and the emergency spillway, which has an invert elevation of 901.70. The maximum pool elevation for the 100-year/24-hour storm event is 901.52, which results in over one foot of freeboard in relation to the top of the embankment which is set at 906.00.

REFERENCES

1. National Climatic Data Center, *Precipitation Frequency Estimates*, Point Precipitation Frequency Estimate From NOAA Atlas 14 Ohio 38.65 N 83.65 W 800 feet, Viewed 19 May 2009,< http://hdsc.nws.noaa.gov/hdsc/pfds/index.html>.

2. National Resources Conservation Service, PART 630 HYDROLOGY NATIONAL ENGINEERING HANDBOOK, July 2004.

3. Ven Te Chow, OPEN CHANNEL HYDRAULICS, Mc-Graw Hill Book Company, 1959.

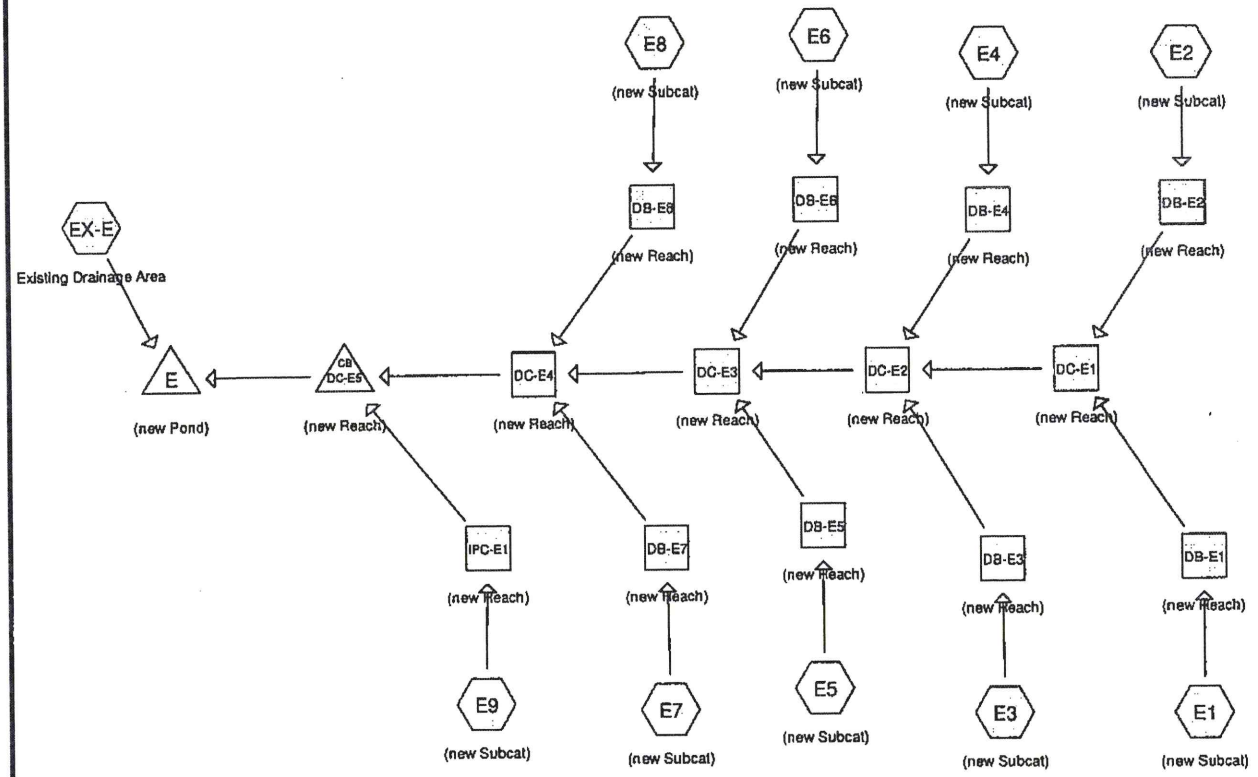
4. Goldman, Jackson and Bursztynsky, EROSION AND SEDIMENT CONTROL HANDBOOK, Mc-Graw Hill Book Company, 1986.

5. Soil Conservation Service, WATER MANAGEMENT AND SEDIMENT CONTROL FOR URBANIZING AREAS, distributed by Ohio Soil and Water Conservation Service.

6. HydroCAD Software Solutions LLC, HYDROCAD, Version 9.10, 2009, Computer Software Program.

7. The Ohio Department of Transportation, LOCATION AND DESIGN MANUAL VOLUME TWO: DRAINAGE DESIGN, July 2009.

SEDIMENTATION POND HYDROCAD OUTPUT AND HYDROGRAPH FILES



Subcat Reach Pond Link

Drainage Diagram for 071-644_SWM POND D, E, G
Prepared by Civil & Environmental Consultants, Inc., Printed 3/26/2010
HydroCAD® 9.10 s/n 05876 © 2009 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: (new Subcat) Runoff Area=1.354 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=195' Tc=11.1 min CN=79 Runoff=4.20 cfs 0.236 af

Subcatchment E2: (new Subcat) Runoff Area=0.239 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=98' Tc=7.9 min CN=79 Runoff=0.83 cfs 0.042 af

Subcatchment E3: (new Subcat) Runoff Area=0.777 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=3.20 cfs 0.135 af

Subcatchment E4: (new Subcat) Runoff Area=1.751 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=69' Slope=0.2500 '/' Tc=2.8 min CN=79 Runoff=7.36 cfs 0.305 af

Subcatchment E5: (new Subcat) Runoff Area=0.754 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=89' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=3.10 cfs 0.131 af

Subcatchment E6: (new Subcat) Runoff Area=1.051 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=87' Slope=0.2500 '/' Tc=3.3 min CN=79 Runoff=4.34 cfs 0.183 af

Subcatchment E7: (new Subcat) Runoff Area=0.667 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=89' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=2.74 cfs 0.116 af

Subcatchment E8: (new Subcat) Runoff Area=1.209 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=87' Slope=0.2500 '/' Tc=3.3 min CN=79 Runoff=4.99 cfs 0.211 af

Subcatchment E9: (new Subcat) Runoff Area=1.595 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=56' Slope=0.2500 '/' Tc=2.4 min CN=79 Runoff=6.80 cfs 0.278 af

Subcatchment EX-E: Existing Drainage Area Runoff Area=1.015 ac 0.00% Impervious Runoff Depth>2.09"
Flow Length=100' Slope=0.0460 '/' Tc=7.4 min CN=79 Runoff=3.60 cfs 0.177 af

Reach DB-E1: (new Reach) Avg. Flow Depth=0.51' Max Vel=4.56 fps Inflow=4.20 cfs 0.236 af
n=0.022 L=418.5' S=0.0298 '/' Capacity=159.07 cfs Outflow=4.13 cfs 0.235 af

Reach DB-E2: (new Reach) Avg. Flow Depth=0.22' Max Vel=4.76 fps Inflow=0.83 cfs 0.042 af
n=0.022 L=189.2' S=0.0973 '/' Capacity=287.15 cfs Outflow=0.83 cfs 0.042 af

Reach DB-E3: (new Reach) Avg. Flow Depth=0.50' Max Vel=3.47 fps Inflow=3.20 cfs 0.135 af
n=0.022 L=394.8' S=0.0177 '/' Capacity=122.43 cfs Outflow=3.03 cfs 0.135 af

Reach DB-E4: (new Reach) Avg. Flow Depth=0.68' Max Vel=4.45 fps Inflow=7.36 cfs 0.305 af
n=0.022 L=362.8' S=0.0195 '/' Capacity=128.45 cfs Outflow=7.10 cfs 0.305 af

Reach DB-E5: (new Reach) Avg. Flow Depth=0.49' Max Vel=3.58 fps Inflow=3.10 cfs 0.131 af
n=0.022 L=354.2' S=0.0195 '/' Capacity=128.52 cfs Outflow=2.97 cfs 0.131 af

Reach DB-E6: (new Reach) Avg. Flow Depth=0.54' Max Vel=3.86 fps Inflow=4.34 cfs 0.183 af
n=0.022 L=572.0' S=0.0196 '/' Capacity=128.90 cfs Outflow=4.00 cfs 0.183 af

Reach DB-E7: (new Reach) Avg. Flow Depth=0.46' Max Vel=3.56 fps Inflow=2.74 cfs 0.116 af
n=0.022 L=313.8' S=0.0207 '/' Capacity=132.62 cfs Outflow=2.65 cfs 0.116 af

Reach DB-E8: (new Reach) Avg. Flow Depth=0.57' Max Vel=4.00 fps Inflow=4.99 cfs 0.211 af
n=0.022 L=651.0' S=0.0198 '/' Capacity=129.41 cfs Outflow=4.55 cfs 0.210 af

Reach DC-E1: (new Reach) Avg. Flow Depth=0.19' Max Vel=5.63 fps Inflow=4.86 cfs 0.277 af
n=0.040 L=66.0' S=0.2512 '/' Capacity=420.83 cfs Outflow=4.86 cfs 0.277 af

Reach DC-E2: (new Reach) Avg. Flow Depth=0.34' Max Vel=7.92 fps Inflow=13.60 cfs 0.717 af
n=0.040 L=88.1' S=0.2497 '/' Capacity=419.57 cfs Outflow=13.59 cfs 0.717 af

Reach DC-E3: (new Reach) Avg. Flow Depth=0.43' Max Vel=9.04 fps Inflow=20.55 cfs 1.031 af
n=0.040 L=86.4' S=0.2510 '/' Capacity=420.68 cfs Outflow=20.55 cfs 1.031 af

Reach DC-E4: (new Reach) Avg. Flow Depth=0.49' Max Vel=10.30 fps Inflow=27.73 cfs 1.357 af
n=0.040 L=38.5' S=0.2608 '/' Capacity=444.90 cfs Outflow=27.73 cfs 1.357 af

Reach IPC-E1: (new Reach) Avg. Flow Depth=0.41' Max Vel=2.87 fps Inflow=6.80 cfs 0.278 af
n=0.022 L=832.8' S=0.0077 '/' Capacity=109.37 cfs Outflow=5.62 cfs 0.276 af

Pond DC-E5: (new Reach) Peak Elev=902.55' Inflow=33.35 cfs 1.633 af
36.0" Round Culvert n=0.012 L=59.1' S=0.0105 '/' Outflow=33.35 cfs 1.633 af

Pond E: (new Pond) Peak Elev=899.84' Storage=109,199 cf Inflow=36.82 cfs 1.810 af
Outflow=4.33 cfs 1.678 af

Total Runoff Area = 10.412 ac Runoff Volume = 1.815 af Average Runoff Depth = 2.09"
100.00% Pervious = 10.412 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment E1: (new Subcat)

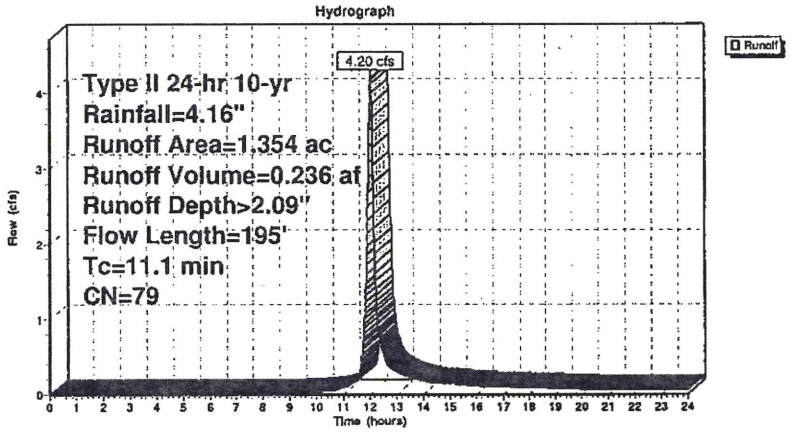
Runoff = 4.20 cfs @ 12.03 hrs, Volume= 0.236 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.354	79	50-75% Grass cover, Fair, HSG C
1.354		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
0.5	27	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	68	0.2500	3.50		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.1	195	Total			

Subcatchment E1: (new Subcat)



Summary for Subcatchment E2: (new Subcat)

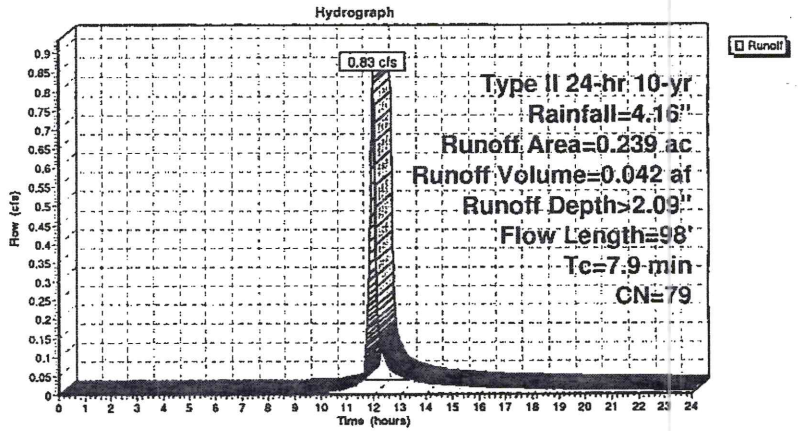
Runoff = 0.83 cfs @ 12.00 hrs, Volume= 0.042 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.239	79	50-75% Grass cover, Fair, HSG C
0.239		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	49	0.0200	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
2.1	49	0.2500	0.39		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
7.9	98	Total			

Subcatchment E2: (new Subcat)



Summary for Subcatchment E3: (new Subcat)

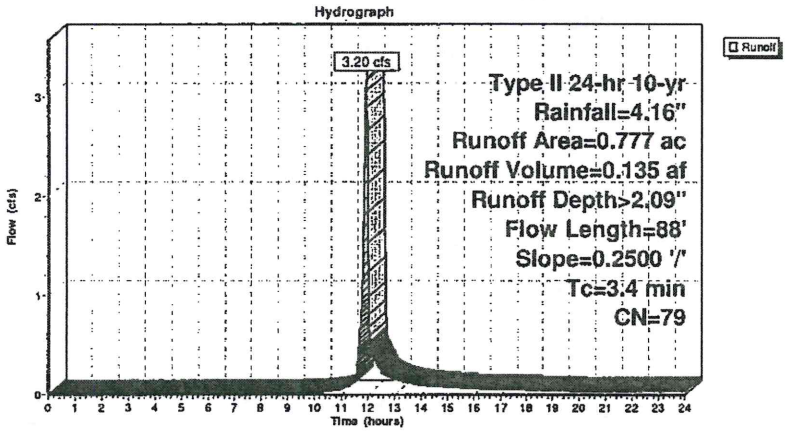
Runoff = 3.20 cfs @ 11.94 hrs, Volume= 0.135 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.777	79	50-75% Grass cover, Fair, HSG C
0.777		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E3: (new Subcat)



Summary for Subcatchment E4: (new Subcat)

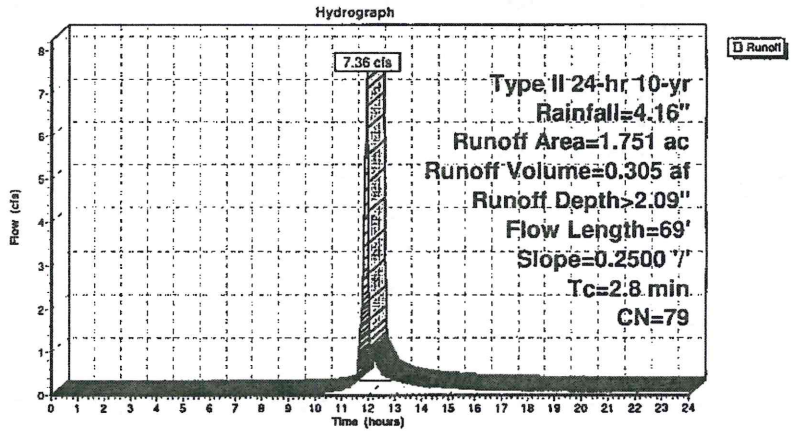
Runoff = 7.36 cfs @ 11.94 hrs, Volume= 0.305 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.751	79	50-75% Grass cover, Fair, HSG C
1.751		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	69	0.2500	0.41		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E4: (new Subcat)



Summary for Subcatchment E5: (new Subcat)

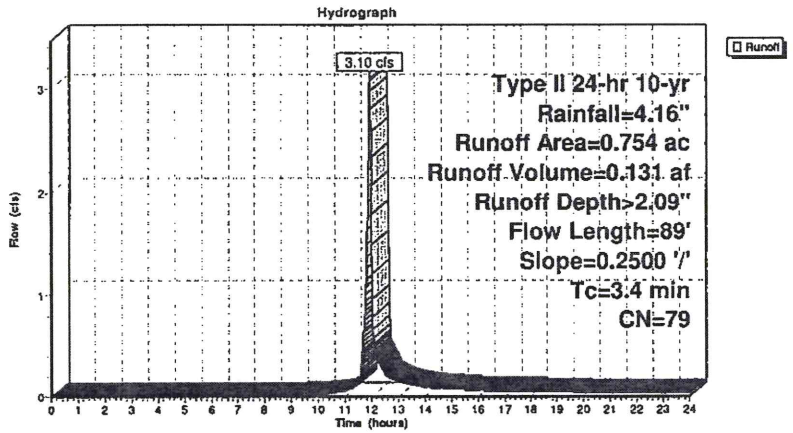
Runoff = 3.10 cfs @ 11.94 hrs, Volume= 0.131 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.754	79	50-75% Grass cover, Fair, HSG C
0.754		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	89	0.2500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E5: (new Subcat)



Summary for Subcatchment E6: (new Subcat)

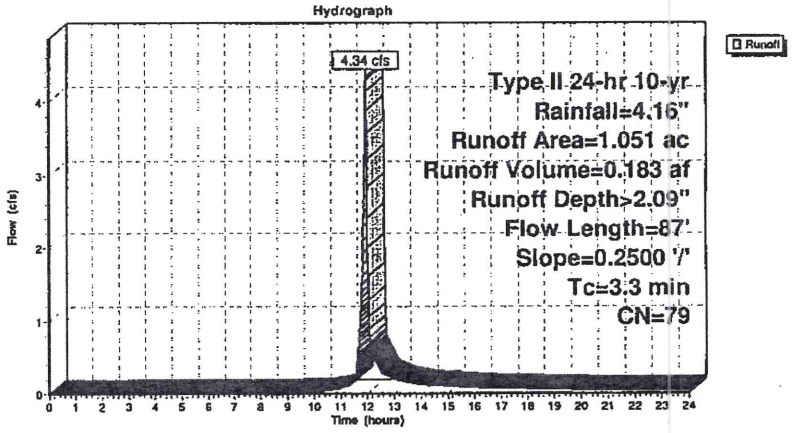
Runoff = 4.34 cfs @ 11.94 hrs, Volume= 0.183 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.051	79	50-75% Grass cover, Fair, HSG C
1.051		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	87	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E6: (new Subcat)



Summary for Subcatchment E7: (new Subcat)

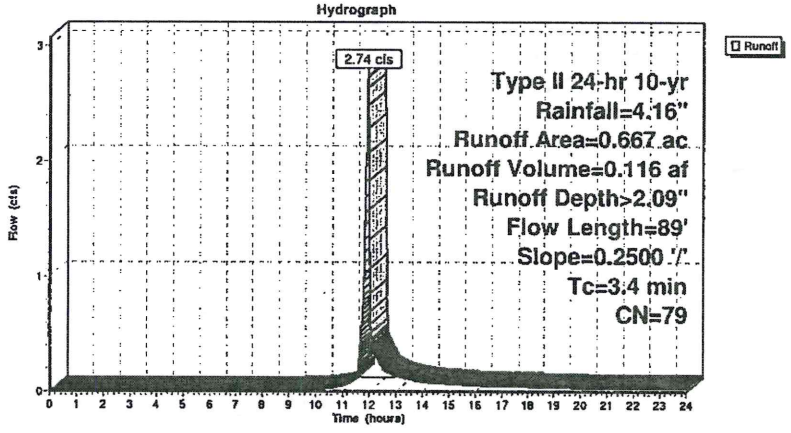
Runoff = 2.74 cfs @ 11.94 hrs, Volume= 0.116 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.667	79	50-75% Grass cover, Fair, HSG C
0.667		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	89	0.2500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E7: (new Subcat)



Summary for Subcatchment E8: (new Subcat)

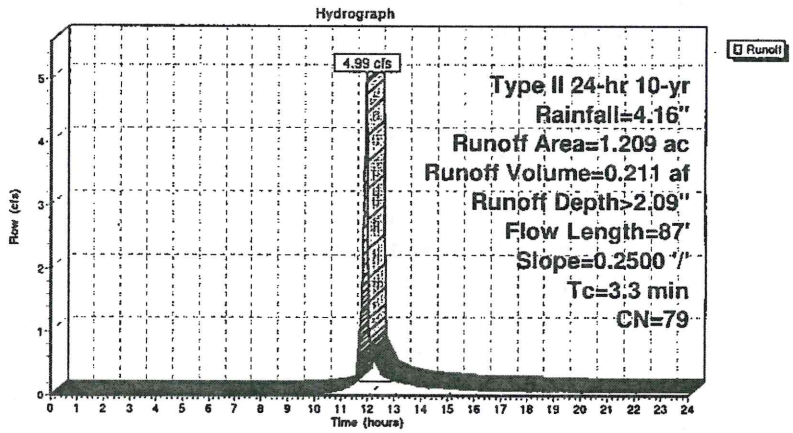
Runoff = 4.99 cfs @ 11.94 hrs, Volume= 0.211 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.209	79	50-75% Grass cover, Fair, HSG C
1.209		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	87	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E8: (new Subcat)



Summary for Subcatchment E9: (new Subcat)

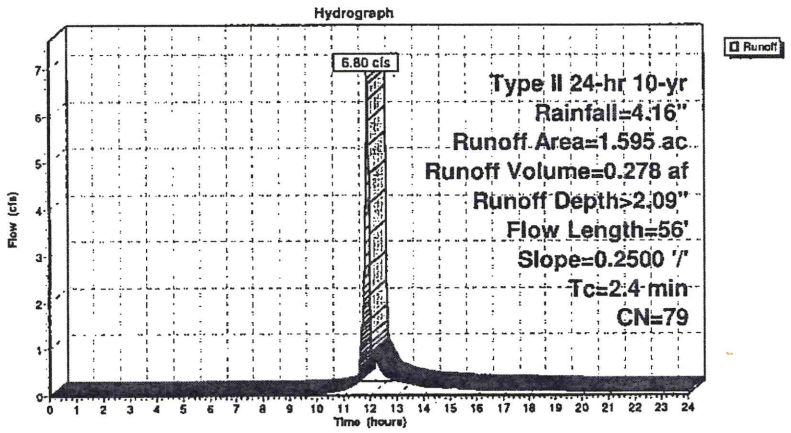
Runoff = 6.80 cfs @ 11.93 hrs, Volume= 0.278 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.595	79	50-75% Grass cover, Fair, HSG C
1.595		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	56	0.2500	0.40		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E9: (new Subcat)



Summary for Subcatchment EX-E: Existing Drainage Area

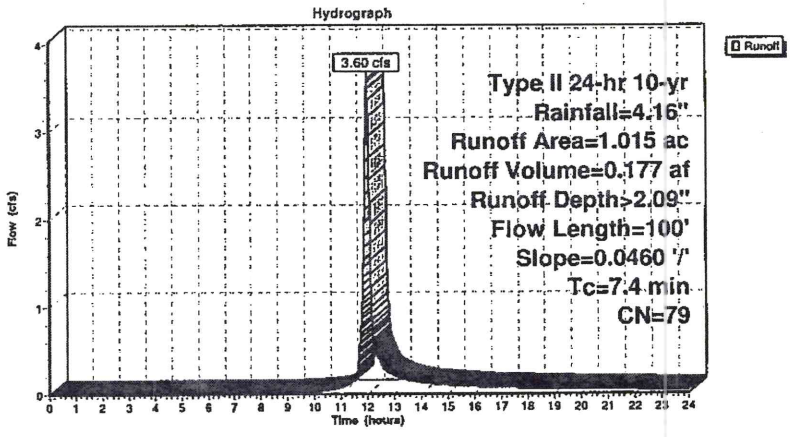
Runoff = 3.60 cfs @ 11.99 hrs, Volume= 0.177 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.015	79	50-75% Grass cover, Fair, HSG C
1.015		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0460	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.91"

Subcatchment EX-E: Existing Drainage Area



Summary for Reach DB-E1: (new Reach)

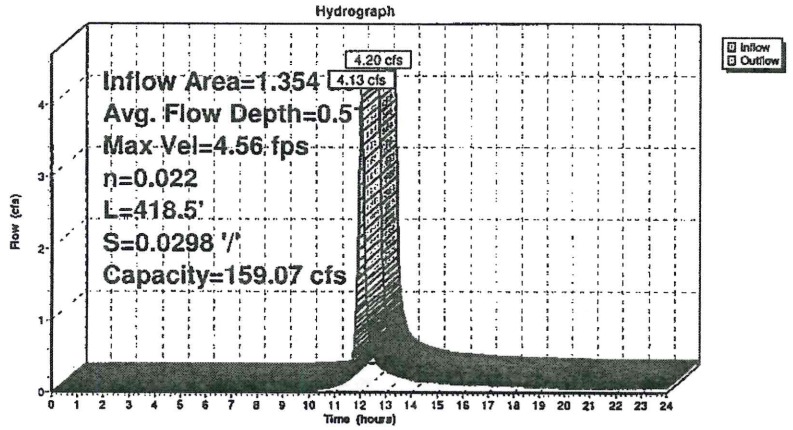
Inflow Area = 1.354 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 4.20 cfs @ 12.03 hrs, Volume= 0.236 af
Outflow = 4.13 cfs @ 12.05 hrs, Volume= 0.235 af, Atten= 2%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.56 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.79 fps, Avg. Travel Time= 3.9 min

Peak Storage= 379 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 159.07 cfs

0.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 418.5' Slope= 0.0298 '/'
Inlet Invert= 987.49', Outlet Invert= 975.00'

Reach DB-E1: (new Reach)



Summary for Reach DB-E2: (new Reach)

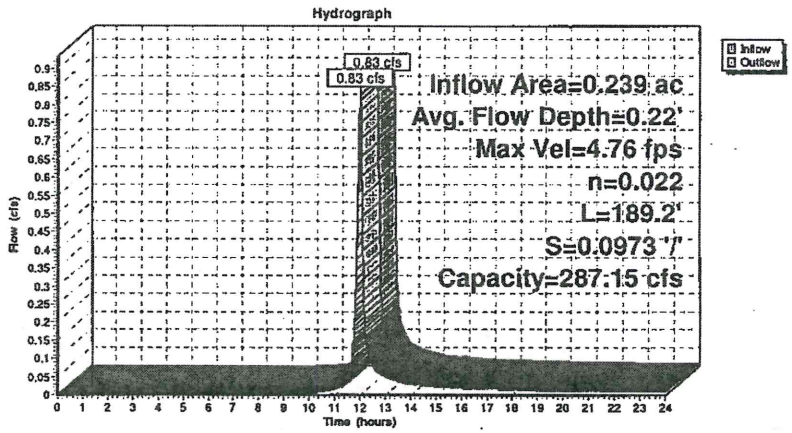
Inflow Area = 0.239 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 0.83 cfs @ 12.00 hrs, Volume= 0.042 af
Outflow = 0.83 cfs @ 12.00 hrs, Volume= 0.042 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.76 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.84 fps, Avg. Travel Time= 1.7 min

Peak Storage= 33 cf @ 12.00 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 287.15 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 189.2' Slope= 0.0973 '/'
Inlet Invert= 993.40', Outlet Invert= 975.00'

Reach DB-E2: (new Reach)



Summary for Reach DB-E3: (new Reach)

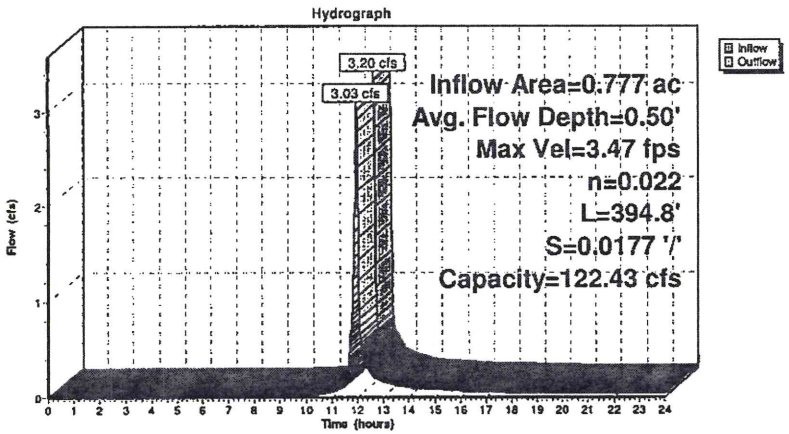
Inflow Area = 0.777 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 3.20 cfs @ 11.94 hrs, Volume= 0.135 af
Outflow = 3.03 cfs @ 11.96 hrs, Volume= 0.135 af, Atten= 5%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.47 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.28 fps, Avg. Travel Time= 5.1 min

Peak Storage= 345 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 122.43 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 394.8' Slope= 0.0177 '/'
Inlet Invert= 965.40', Outlet Invert= 958.42'

Reach DB-E3: (new Reach)



Summary for Reach DB-E4: (new Reach)

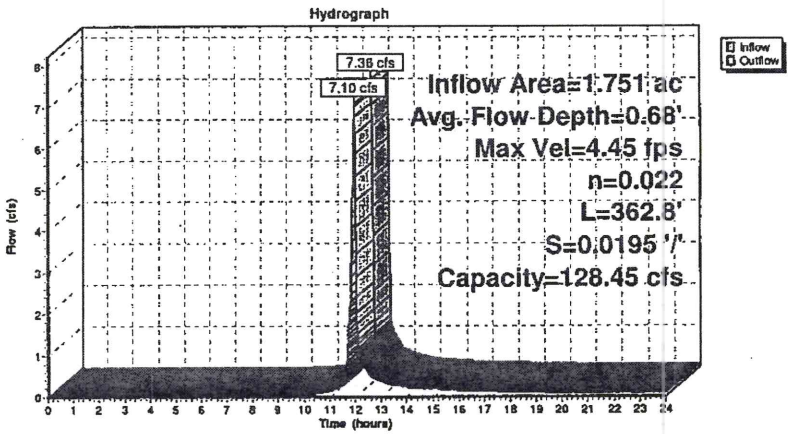
Inflow Area = 1.751 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 7.36 cfs @ 11.94 hrs, Volume= 0.305 af
Outflow = 7.10 cfs @ 11.95 hrs, Volume= 0.305 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.45 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.62 fps, Avg. Travel Time= 3.7 min

Peak Storage= 579 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.68'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 128.45 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 362.8' Slope= 0.0195 '/'
Inlet Invert= 965.48', Outlet Invert= 958.42'

Reach DB-E4: (new Reach)



Summary for Reach DB-E5: (new Reach)

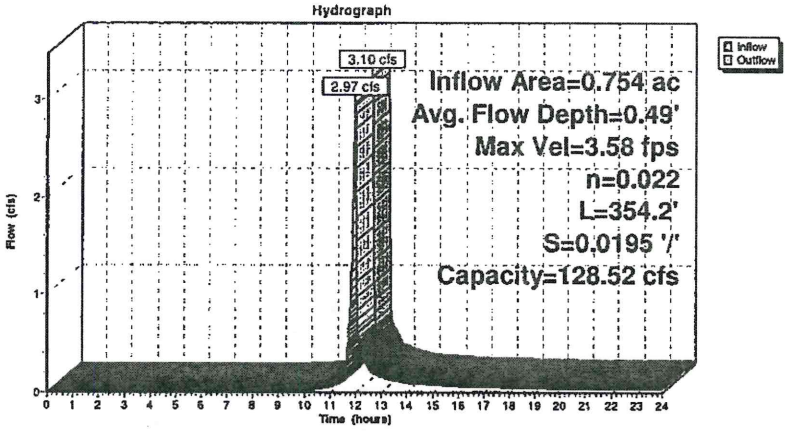
Inflow Area = 0.754 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 3.10 cfs @ 11.94 hrs, Volume= 0.131 af
Outflow = 2.97 cfs @ 11.96 hrs, Volume= 0.131 af, Atten= 4%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.58 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 4.5 min

Peak Storage= 294 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 128.52 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 354.2' Slope= 0.0195 '/'
Inlet Invert= 943.32', Outlet Invert= 936.42'

Reach DB-E5: (new Reach)



Summary for Reach DB-E6: (new Reach)

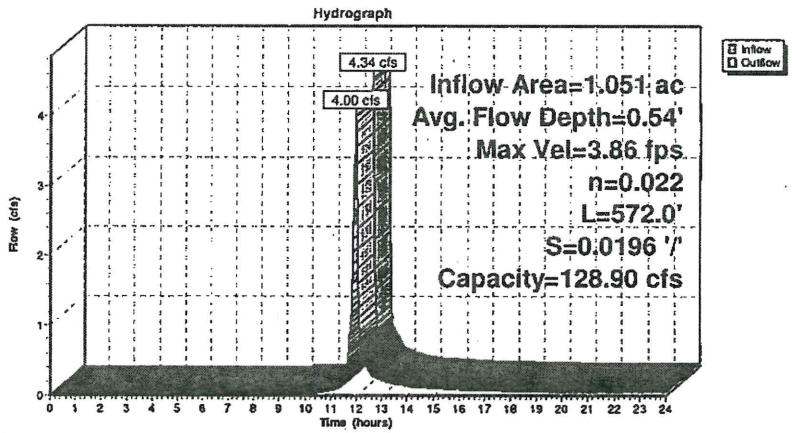
Inflow Area = 1.051 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 4.34 cfs @ 11.94 hrs, Volume= 0.183 af
Outflow = 4.00 cfs @ 11.97 hrs, Volume= 0.183 af, Atten= 8%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.86 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 6.7 min

Peak Storage= 592 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 128.90 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 572.0' Slope= 0.0196 '/'
Inlet Invert= 947.63', Outlet Invert= 936.42'

Reach DB-E6: (new Reach)



Summary for Reach DB-E7: (new Reach)

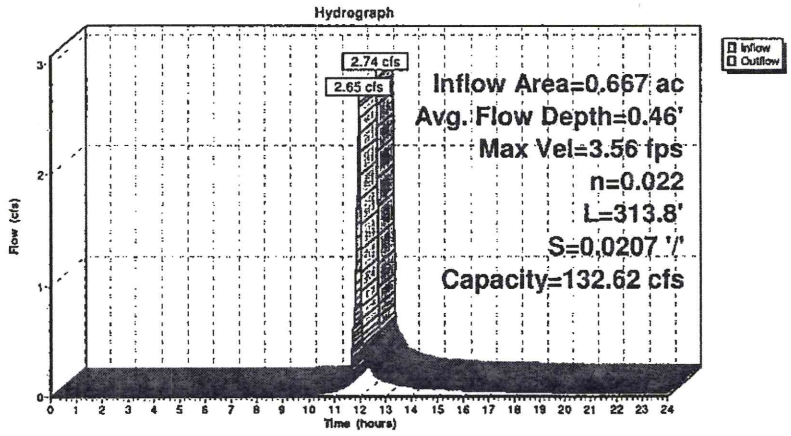
Inflow Area = 0.667 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 2.74 cfs @ 11.94 hrs, Volume= 0.116 af
Outflow = 2.65 cfs @ 11.96 hrs, Volume= 0.116 af, Atten= 4%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.56 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.31 fps, Avg. Travel Time= 4.0 min

Peak Storage= 233 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 132.62 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 313.8' Slope= 0.0207 '/'
Inlet Invert= 921.24', Outlet Invert= 914.73'

Reach DB-E7: (new Reach)



Summary for Reach DB-E8: (new Reach)

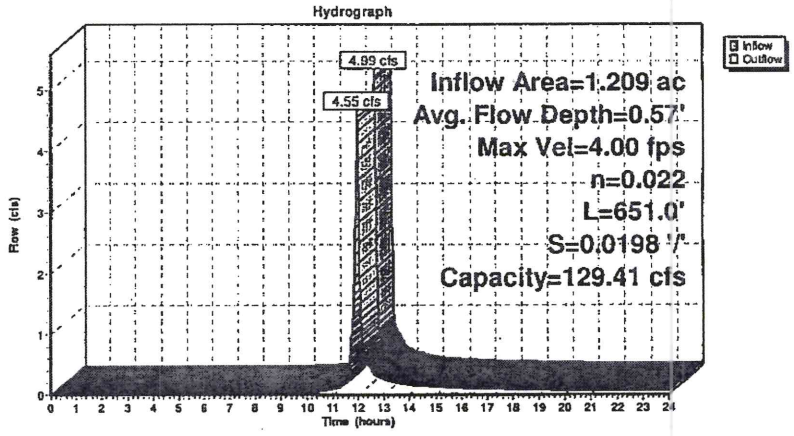
Inflow Area = 1.209 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 4.99 cfs @ 11.94 hrs, Volume= 0.211 af
Outflow = 4.55 cfs @ 11.97 hrs, Volume= 0.210 af, Atten= 9%, Lag= 1.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.00 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 7.3 min

Peak Storage= 740 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.41 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 651.0' Slope= 0.0198 '/'
Inlet Invert= 927.59', Outlet Invert= 914.73'

Reach DB-E8: (new Reach)



Summary for Reach DC-E1: (new Reach)

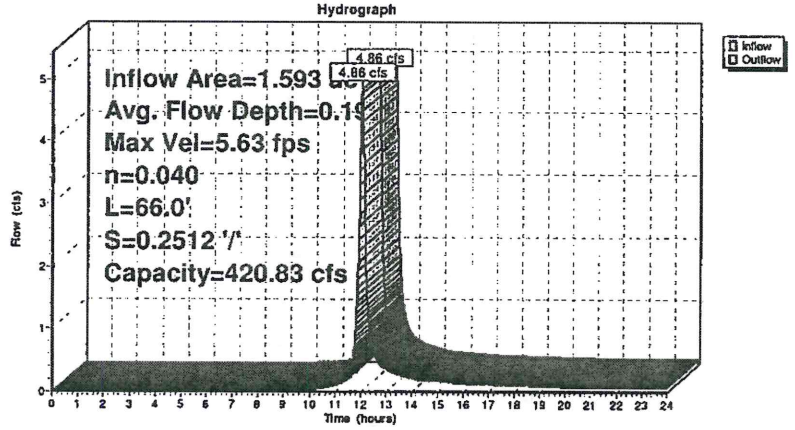
Inflow Area = 1.593 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 4.86 cfs @ 12.04 hrs, Volume= 0.277 af
Outflow = 4.86 cfs @ 12.04 hrs, Volume= 0.277 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.63 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.62 fps, Avg. Travel Time= 0.7 min

Peak Storage= 57 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 420.83 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 66.0' Slope= 0.2512 '/'
Inlet Invert= 975.00', Outlet Invert= 958.42'

Reach DC-E1: (new Reach)



Summary for Reach DC-E2: (new Reach)

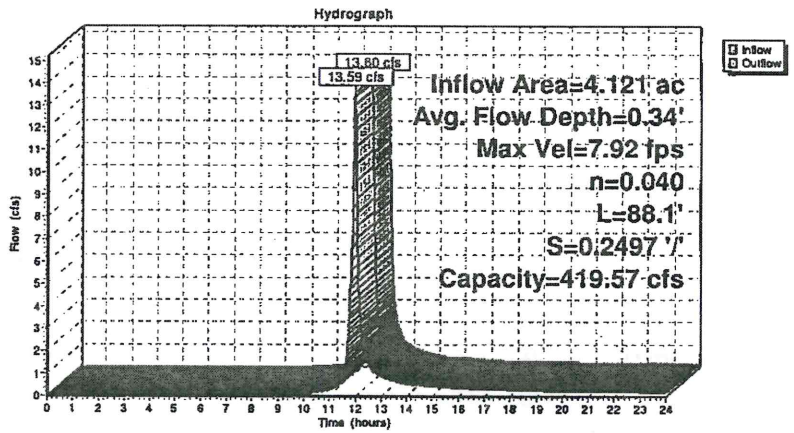
Inflow Area = 4.121 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 13.60 cfs @ 11.96 hrs, Volume= 0.717 af
Outflow = 13.59 cfs @ 11.97 hrs, Volume= 0.717 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.92 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.13 fps, Avg. Travel Time= 0.7 min

Peak Storage= 151 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.57 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 88.1' Slope= 0.2497 '/'
Inlet Invert= 958.42', Outlet Invert= 936.42'

Reach DC-E2: (new Reach)



Summary for Reach DC-E3: (new Reach)

Inflow Area = 5.926 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 20.55 cfs @ 11.97 hrs, Volume= 1.031 af
Outflow = 20.55 cfs @ 11.97 hrs, Volume= 1.031 af, Atten= 0%, Lag= 0.1 min

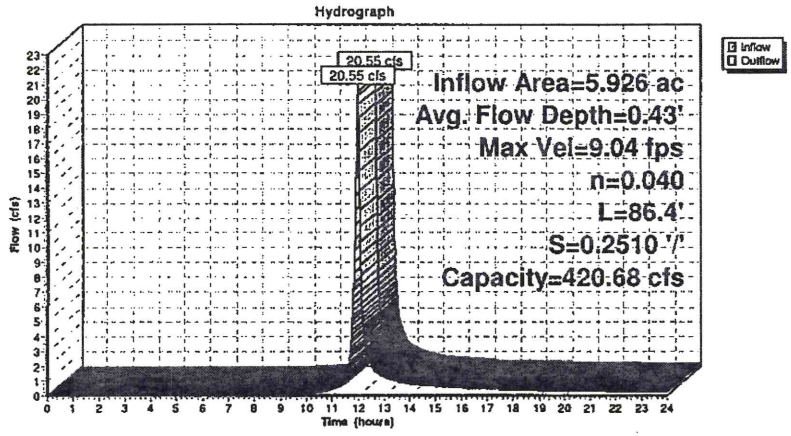
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.04 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.42 fps, Avg. Travel Time= 0.6 min

Peak Storage= 196 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 420.68 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 86.4' Slope= 0.2510 '/'
Inlet Invert= 936.42', Outlet Invert= 914.73'

‡

Reach DC-E3: (new Reach)



Summary for Reach DC-E4: (new Reach)

Inflow Area = 7.802 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 27.73 cfs @ 11.97 hrs, Volume= 1.357 af
Outflow = 27.73 cfs @ 11.97 hrs, Volume= 1.357 af, Atten= 0%, Lag= 0.0 min

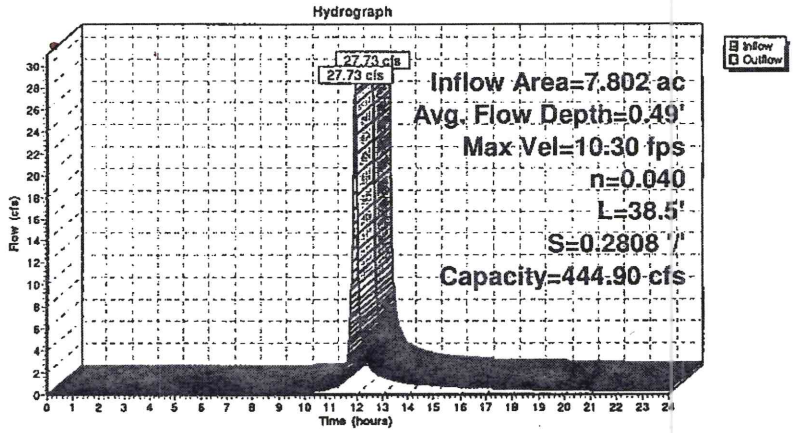
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.30 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.75 fps, Avg. Travel Time= 0.2 min

Peak Storage= 104 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 444.90 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 38.5' Slope= 0.2808 '/'
Inlet Invert= 914.73', Outlet Invert= 903.92'

‡

Reach DC-E4: (new Reach)



Summary for Reach IPC-E1: (new Reach)

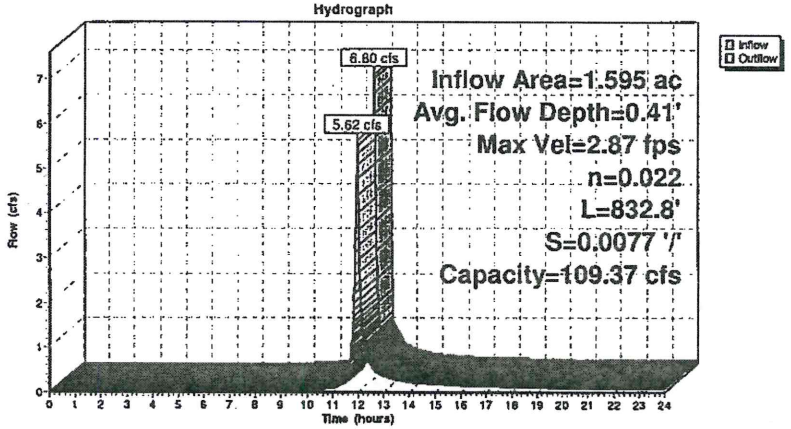
Inflow Area = 1.595 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 6.80 cfs @ 11.93 hrs, Volume= 0.278 af
Outflow = 5.62 cfs @ 11.97 hrs, Volume= 0.276 af, Atten= 17%, Lag= 2.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.87 fps, Min. Travel Time= 4.8 min
Avg. Velocity = 0.73 fps, Avg. Travel Time= 18.9 min

Peak Storage= 1,630 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 109.37 cfs

4.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 832.8' Slope= 0.0077 '/'
Inlet Invert= 910.35', Outlet Invert= 903.92'

Reach IPC-E1: (new Reach)



Summary for Pond DC-E5: (new Reach)

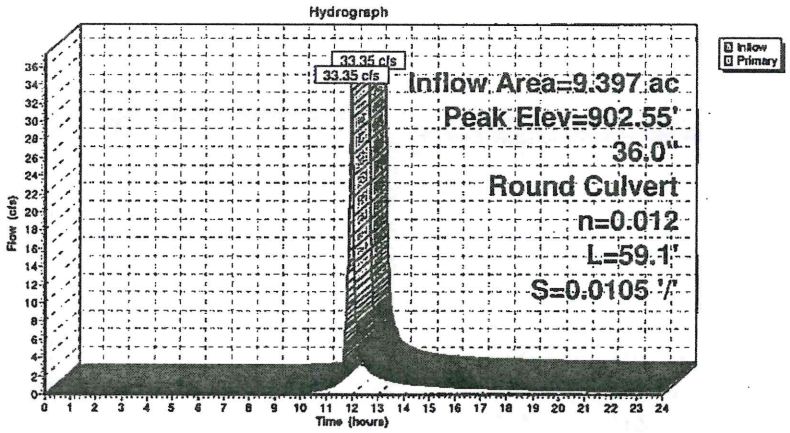
Inflow Area = 9.397 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 33.35 cfs @ 11.97 hrs, Volume= 1.633 af
Outflow = 33.35 cfs @ 11.97 hrs, Volume= 1.633 af, Atten= 0%, Lag= 0.0 min
Primary = 33.35 cfs @ 11.97 hrs, Volume= 1.633 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 902.55' @ 11.97 hrs
Flood Elev= 903.92'

Device	Routing	Invert	Outlet Devices
#1	Primary	899.92'	**36.0" Round Culvert** L= 59.1' Ke= 0.500 Inlet / Outlet Invert= 899.92' / 899.30' S= 0.0105 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished

Primary OutFlow Max=33.28 cfs @ 11.97 hrs HW=902.55' TW=899.16' (Dynamic Tailwater)
↑—1=Culvert (Barrel Controls 33.28 cfs @ 6.76 fps)

Pond DC-E5: (new Reach)



Summary for Pond E: (new Pond)

Inflow Area = 10.412 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 36.82 cfs @ 11.97 hrs, Volume= 1.810 af
Outflow = 4.33 cfs @ 12.42 hrs, Volume= 1.678 af, Atten= 88%, Lag= 27.0 min
Primary = 4.33 cfs @ 12.42 hrs, Volume= 1.678 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 898.00' Surf.Area= 16,933 sf Storage= 74,175 cf
Peak Elev= 899.84' @ 12.42 hrs Surf.Area= 21,174 sf Storage= 109,199 cf (35,024 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 89.8 min (920.9 - 831.0)

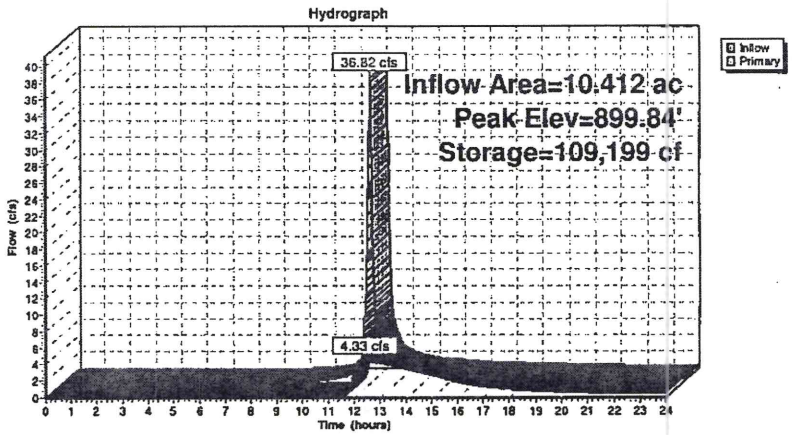
Volume	Invert	Avail.Storage	Storage Description
#1	890.00'	288,950 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
890.00	3,097	0	0
891.00	4,281	3,689	3,689
892.00	5,638	4,960	8,649
893.00	7,166	6,402	15,051
894.00	8,863	8,015	23,065
895.00	10,719	9,791	32,856
896.00	12,718	11,719	44,575
897.00	14,775	13,747	58,321
898.00	16,933	15,854	74,175
899.00	19,192	18,063	92,238
900.00	21,551	20,372	112,609
901.00	24,010	22,781	135,390
902.00	26,570	25,290	160,680
903.00	29,231	27,901	188,580
904.00	31,992	30,612	219,192
905.00	34,854	33,423	252,615
906.00	37,816	36,335	288,950

Device	Routing	Invert	Outlet Devices
#1	Primary	898.00'	**12.0" Round Culvert**
			L= 89.6' RCP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 898.00' / 897.00' S= 0.0112 '/' Cc= 0.900
			n= 0.012 Concrete pipe, finished
#2	Primary	901.70'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65

Primary OutFlow Max=4.33 cfs @ 12.42 hrs HW=899.84' (Free Discharge)
└1=**Culvert** (Barrel Controls 4.33 cfs @ 5.51 fps)
└2=**Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond E: (new Pond)



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: (new Subcat) Runoff Area=1.354 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=195' Tc=11.1 min CN=79 Runoff=5.55 cfs 0.312 af

Subcatchment E2: (new Subcat) Runoff Area=0.239 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=98' Tc=7.9 min CN=79 Runoff=1.10 cfs 0.055 af

Subcatchment E3: (new Subcat) Runoff Area=0.777 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=4.19 cfs 0.180 af

Subcatchment E4: (new Subcat) Runoff Area=1.751 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=69' Slope=0.2500 '/' Tc=2.8 min CN=79 Runoff=9.65 cfs 0.405 af

Subcatchment E5: (new Subcat) Runoff Area=0.754 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=89' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=4.07 cfs 0.174 af

Subcatchment E6: (new Subcat) Runoff Area=1.051 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=87' Slope=0.2500 '/' Tc=3.3 min CN=79 Runoff=5.69 cfs 0.243 af

Subcatchment E7: (new Subcat) Runoff Area=0.667 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=89' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=3.60 cfs 0.154 af

Subcatchment E8: (new Subcat) Runoff Area=1.209 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=87' Slope=0.2500 '/' Tc=3.3 min CN=79 Runoff=6.55 cfs 0.279 af

Subcatchment E9: (new Subcat) Runoff Area=1.595 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=56' Slope=0.2500 '/' Tc=2.4 min CN=79 Runoff=8.92 cfs 0.369 af

Subcatchment EX-E: Existing Drainage Area Runoff Area=1.015 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=100' Slope=0.0460 '/' Tc=7.4 min CN=79 Runoff=4.75 cfs 0.234 af

Reach DB-E1: (new Reach) Avg. Flow Depth=0.56' Max Vel=4.89 fps Inflow=5.55 cfs 0.312 af
n=0.022 L=418.5' S=0.0298 '/' Capacity=159.07 cfs Outflow=5.47 cfs 0.312 af

Reach DB-E2: (new Reach) Avg. Flow Depth=0.25' Max Vel=5.10 fps Inflow=1.10 cfs 0.055 af
n=0.022 L=189.2' S=0.0973 '/' Capacity=287.15 cfs Outflow=1.09 cfs 0.055 af

Reach DB-E3: (new Reach) Avg. Flow Depth=0.55' Max Vel=3.72 fps Inflow=4.19 cfs 0.180 af
n=0.022 L=394.8' S=0.0177 '/' Capacity=122.43 cfs Outflow=4.00 cfs 0.179 af

Reach DB-E4: (new Reach) Avg. Flow Depth=0.75' Max Vel=4.77 fps Inflow=9.65 cfs 0.405 af
n=0.022 L=362.8' S=0.0195 '/' Capacity=128.45 cfs Outflow=9.36 cfs 0.404 af

Reach DB-E5: (new Reach) Avg. Flow Depth=0.54' Max Vel=3.84 fps Inflow=4.07 cfs 0.174 af
n=0.022 L=354.2' S=0.0195 '/' Capacity=128.52 cfs Outflow=3.92 cfs 0.174 af

Reach DB-E6: (new Reach) Avg. Flow Depth=0.60' Max Vel=4.15 fps Inflow=5.69 cfs 0.243 af
n=0.022 L=572.0' S=0.0196 '/' Capacity=128.90 cfs Outflow=5.31 cfs 0.242 af

Reach DB-E7: (new Reach) Avg. Flow Depth=0.51' Max Vel=3.82 fps Inflow=3.60 cfs 0.154 af
n=0.022 L=313.8' S=0.0207 '/' Capacity=132.62 cfs Outflow=3.49 cfs 0.154 af

Reach DB-E8: (new Reach) Avg. Flow Depth=0.63' Max Vel=4.29 fps Inflow=6.55 cfs 0.279 af
n=0.022 L=651.0' S=0.0198 '/' Capacity=129.41 cfs Outflow=6.04 cfs 0.279 af

Reach DC-E1: (new Reach) Avg. Flow Depth=0.22' Max Vel=6.20 fps Inflow=6.44 cfs 0.367 af
n=0.040 L=66.0' S=0.2512 '/' Capacity=420.83 cfs Outflow=6.44 cfs 0.367 af

Reach DC-E2: (new Reach) Avg. Flow Depth=0.40' Max Vel=8.66 fps Inflow=18.03 cfs 0.951 af
n=0.040 L=88.1' S=0.2497 '/' Capacity=419.57 cfs Outflow=18.03 cfs 0.950 af

Reach DC-E3: (new Reach) Avg. Flow Depth=0.50' Max Vel=9.85 fps Inflow=27.24 cfs 1.367 af
n=0.040 L=86.4' S=0.2510 '/' Capacity=420.68 cfs Outflow=27.24 cfs 1.367 af

Reach DC-E4: (new Reach) Avg. Flow Depth=0.57' Max Vel=11.21 fps Inflow=36.75 cfs 1.799 af
n=0.040 L=38.5' S=0.2808 '/' Capacity=444.90 cfs Outflow=36.74 cfs 1.799 af

Reach IPC-E1: (new Reach) Avg. Flow Depth=0.48' Max Vel=3.16 fps Inflow=8.92 cfs 0.369 af
n=0.022 L=832.8' S=0.0077 '/' Capacity=109.37 cfs Outflow=7.56 cfs 0.366 af

Pond DC-E5: (new Reach) Peak Elev=903.17' Inflow=44.30 cfs 2.166 af
36.0" Round Culvert n=0.012 L=59.1' S=0.0105 '/' Outflow=44.30 cfs 2.166 af

Pond E: (new Pond) Peak Elev=900.46' Storage=122,872 cf Inflow=48.85 cfs 2.400 af
Outflow=5.01 cfs 2.251 af

Total Runoff Area = 10.412 ac Runoff Volume = 2.406 af Average Runoff Depth = 2.77"
100.00% Pervious = 10.412 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment E1: (new Subcat)

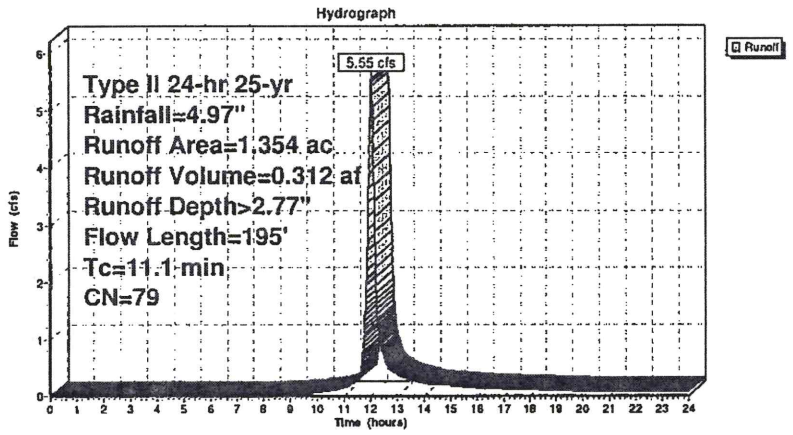
Runoff = 5.55 cfs @ 12.03 hrs, Volume= 0.312 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.354	79	50-75% Grass cover, Fair, HSG C
1.354		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
0.5	27	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	68	0.2500	3.50		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.1	195	Total			

Subcatchment E1: (new Subcat)



Summary for Subcatchment E2: (new Subcat)

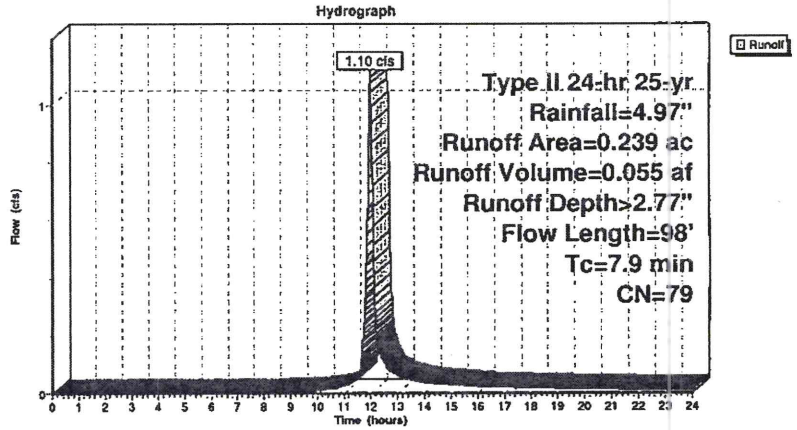
Runoff = 1.10 cfs @ 11.99 hrs, Volume= 0.055 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.239	79	50-75% Grass cover, Fair, HSG C
0.239		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	49	0.0200	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
2.1	49	0.2500	0.39		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
7.9	98	Total			

Subcatchment E2: (new Subcat)



Summary for Subcatchment E3: (new Subcat)

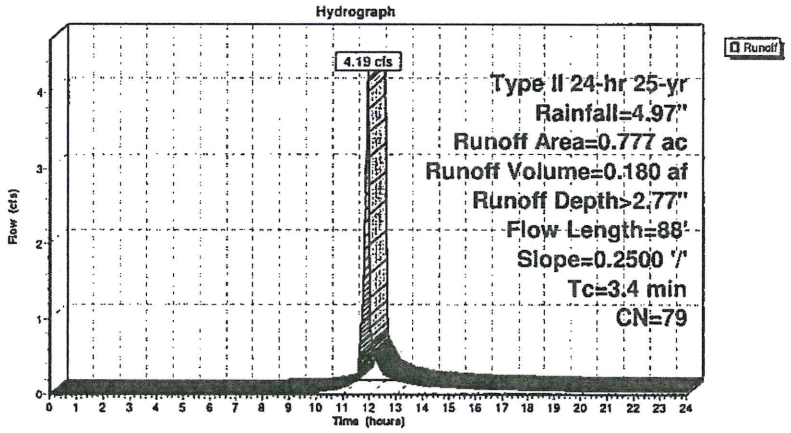
Runoff = 4.19 cfs @ 11.94 hrs, Volume= 0.180 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.777	79	50-75% Grass cover, Fair, HSG C
0.777		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E3: (new Subcat)



Summary for Subcatchment E4: (new Subcat)

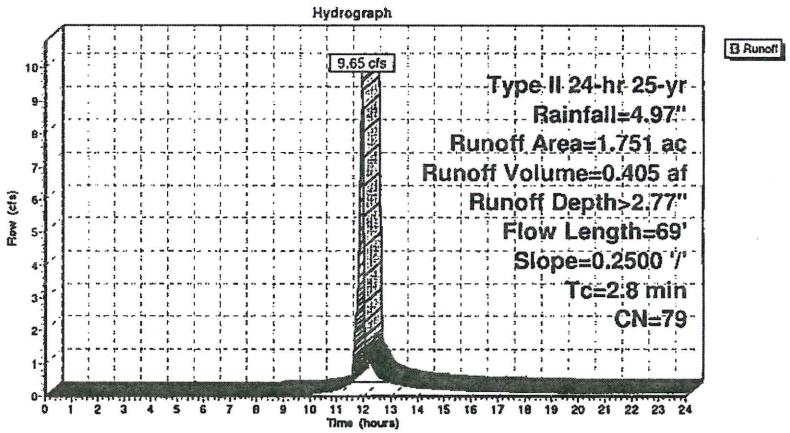
Runoff = 9.65 cfs @ 11.94 hrs, Volume= 0.405 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.751	79	50-75% Grass cover, Fair, HSG C
1.751		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	69	0.2500	0.41		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E4: (new Subcat)



Summary for Subcatchment E5: (new Subcat)

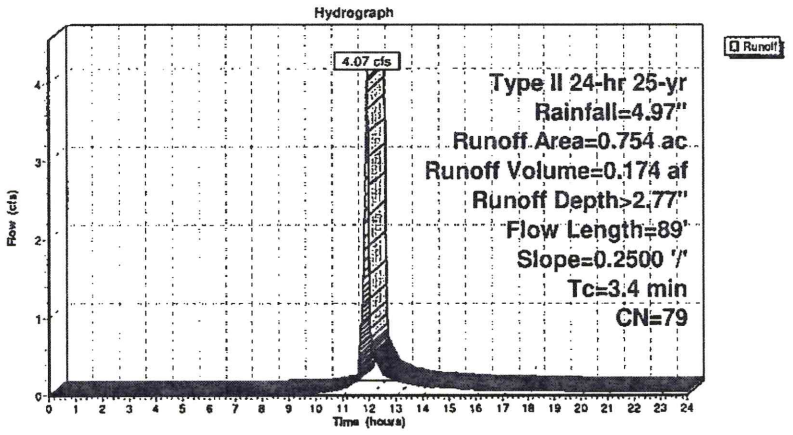
Runoff = 4.07 cfs @ 11.94 hrs, Volume= 0.174 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.754	79	50-75% Grass cover, Fair, HSG C
0.754		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	89	0.2500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E5: (new Subcat)



Summary for Subcatchment E6: (new Subcat)

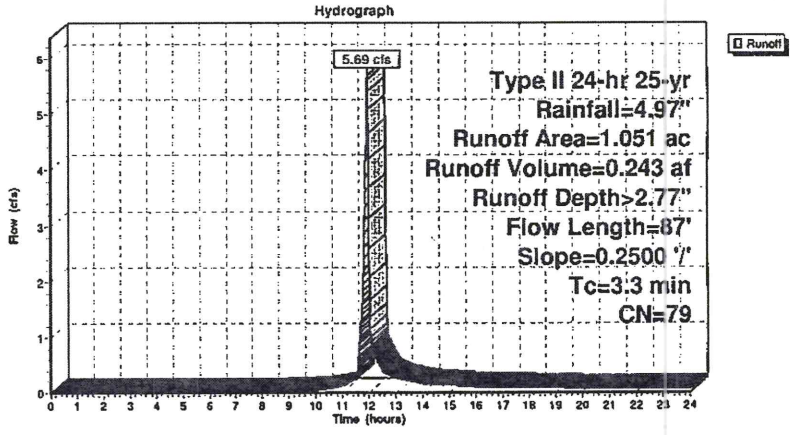
Runoff = 5.69 cfs @ 11.94 hrs, Volume= 0.243 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.051	79	50-75% Grass cover, Fair, HSG C
1.051		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	87	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E6: (new Subcat)



Summary for Subcatchment E7: (new Subcat)

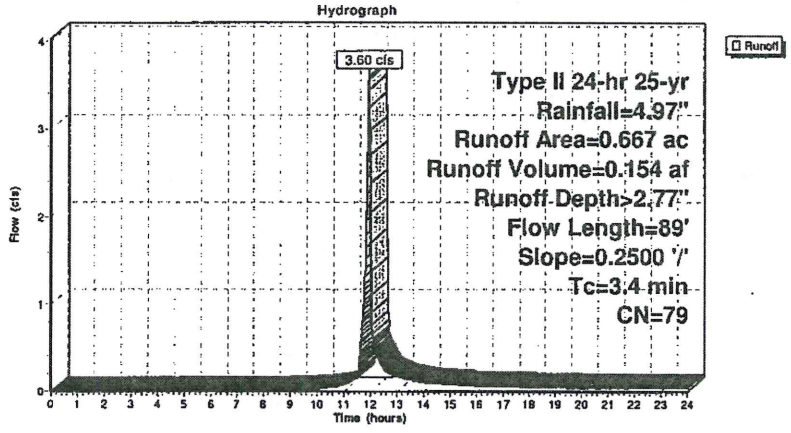
Runoff = 3.60 cfs @ 11.94 hrs, Volume= 0.154 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.667	79	50-75% Grass cover, Fair, HSG C
0.667		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	89	0.2500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E7: (new Subcat)



Summary for Subcatchment E8: (new Subcat)

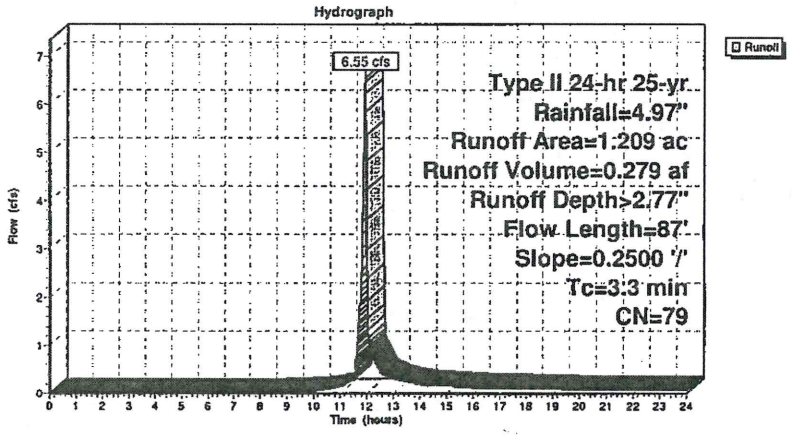
Runoff = 6.55 cfs @ 11.94 hrs, Volume= 0.279 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.209	79	50-75% Grass cover, Fair, HSG C
1.209		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	87	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E8: (new Subcat)



Summary for Subcatchment E9: (new Subcat)

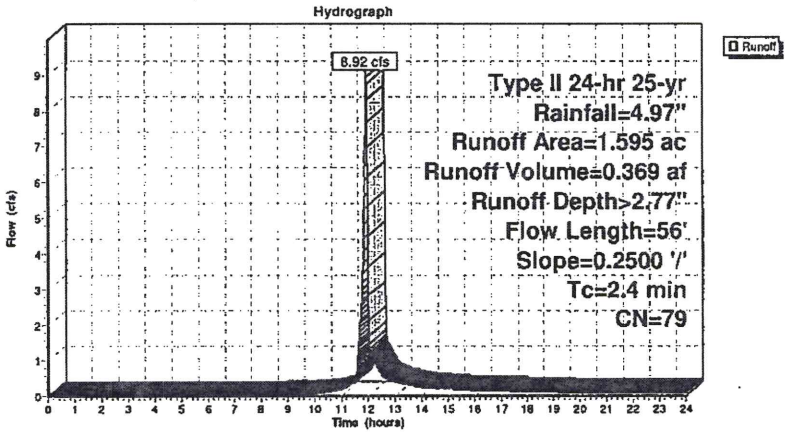
Runoff = 8.92 cfs @ 11.93 hrs, Volume= 0.369 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.595	79	50-75% Grass cover, Fair, HSG C
1.595		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	56	0.2500	0.40		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E9: (new Subcat)



Summary for Subcatchment EX-E: Existing Drainage Area

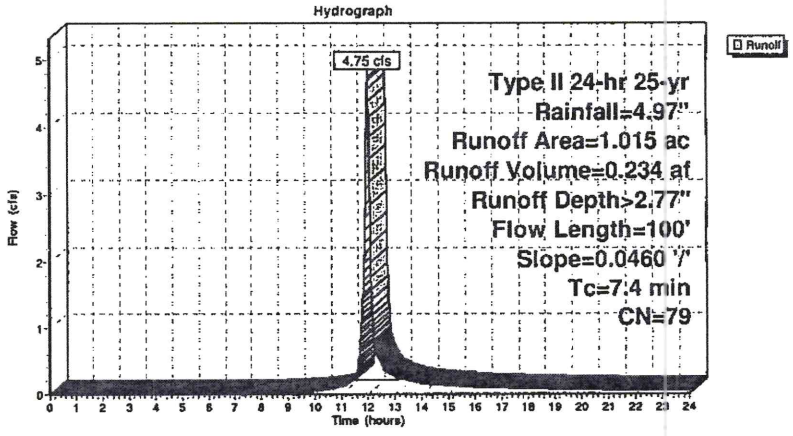
Runoff = 4.75 cfs @ 11.99 hrs, Volume= 0.234 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.015	79	50-75% Grass cover, Fair, HSG C
1.015		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0460	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.91"

Subcatchment EX-E: Existing Drainage Area



Summary for Reach DB-E1: (new Reach)

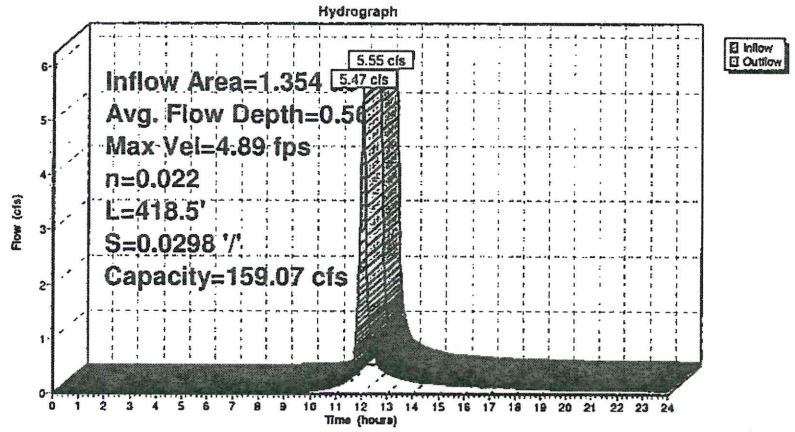
Inflow Area = 1.354 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 5.55 cfs @ 12.03 hrs, Volume= 0.312 af
Outflow = 5.47 cfs @ 12.05 hrs, Volume= 0.312 af, Atten= 2%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.89 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.87 fps, Avg. Travel Time= 3.7 min

Peak Storage= 468 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.56'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 159.07 cfs

0.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 418.5' Slope= 0.0298 '/'
Inlet Invert= 987.49', Outlet Invert= 975.00'

Reach DB-E1: (new Reach)



Summary for Reach DB-E2: (new Reach)

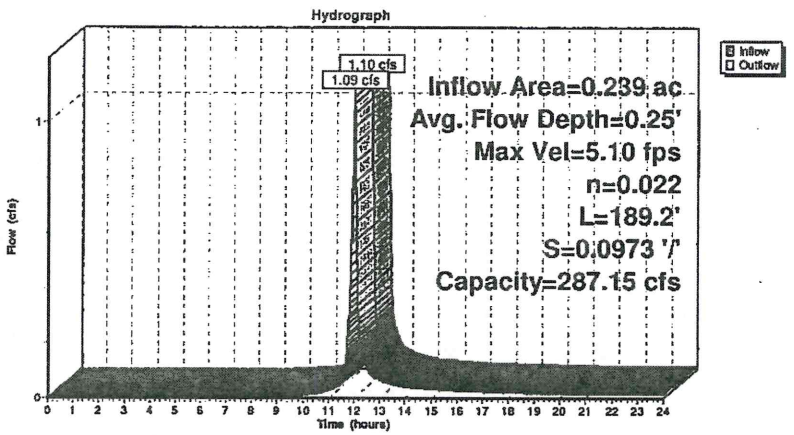
Inflow Area = 0.239 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 1.10 cfs @ 11.99 hrs, Volume= 0.055 af
Outflow = 1.09 cfs @ 12.00 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.10 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.93 fps, Avg. Travel Time= 1.6 min

Peak Storage= 41 cf @ 12.00 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 287.15 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 189.2' Slope= 0.0973 '/'
Inlet Invert= 993.40', Outlet Invert= 975.00'

Reach DB-E2: (new Reach)



Summary for Reach DB-E3: (new Reach)

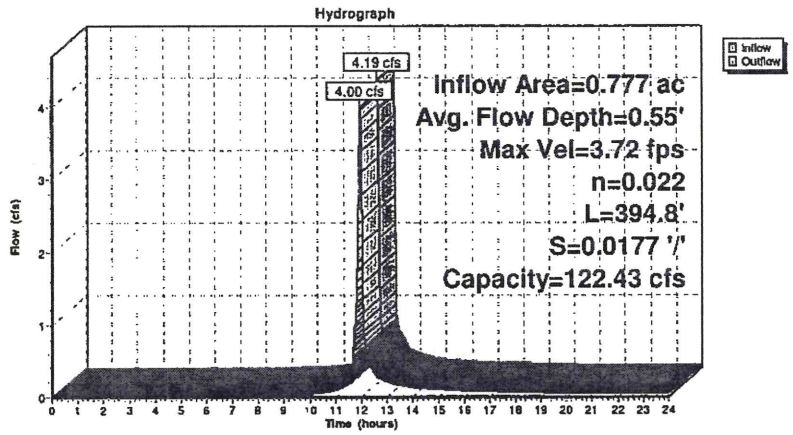
Inflow Area = 0.777 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 4.19 cfs @ 11.94 hrs Volume= 0.180 af
Outflow = 4.00 cfs @ 11.96 hrs Volume= 0.179 af, Atten= 5%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.72 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.34 fps, Avg. Travel Time= 4.9 min

Peak Storage= 425 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 122.43 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 394.8' Slope= 0.0177 '/'
Inlet Invert= 965.40', Outlet Invert= 958.42'

Reach DB-E3: (new Reach)



Summary for Reach DB-E4: (new Reach)

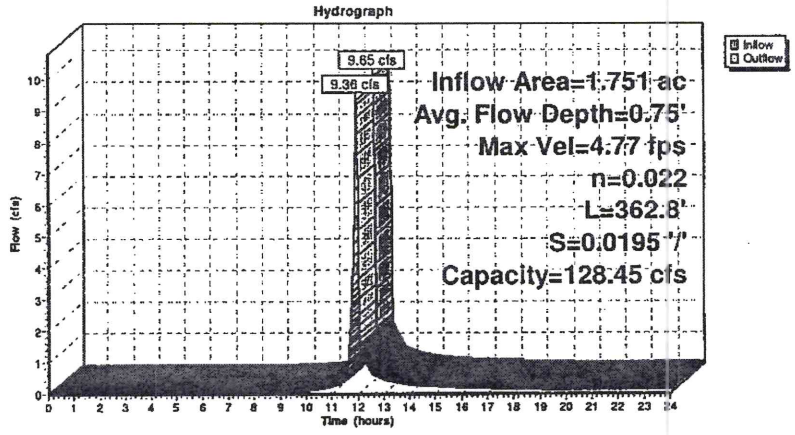
Inflow Area = 1.751 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 9.65 cfs @ 11.94 hrs, Volume= 0.405 af
Outflow = 9.36 cfs @ 11.95 hrs, Volume= 0.404 af, Atten= 3%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.77 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.70 fps, Avg. Travel Time= 3.6 min

Peak Storage= 712 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.75'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 128.45 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 362.8' Slope= 0.0195 '/'
Inlet Invert= 965.48', Outlet Invert= 958.42'

Reach DB-E4: (new Reach)



Summary for Reach DB-E5: (new Reach)

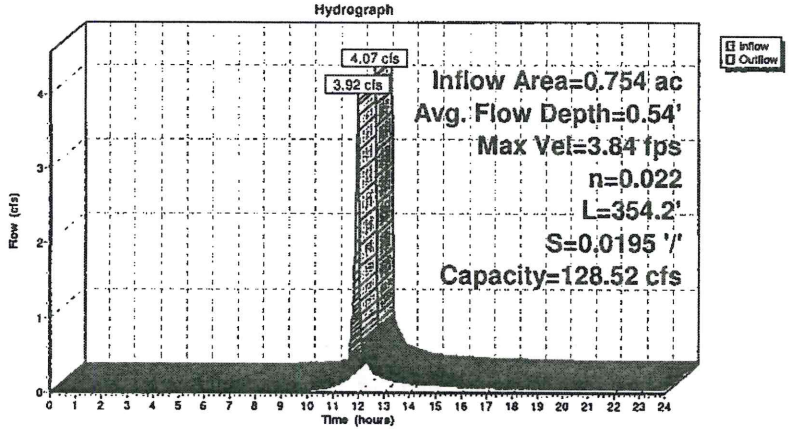
Inflow Area = 0.754 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 4.07 cfs @ 11.94 hrs, Volume= 0.174 af
Outflow = 3.92 cfs @ 11.96 hrs, Volume= 0.174 af, Atten= 4%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.84 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 4.3 min

Peak Storage= 362 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 128.52 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 354.2' Slope= 0.0195 '/'
Inlet Invert= 943.32', Outlet Invert= 936.42'

Reach DB-E5: (new Reach)



Summary for Reach DB-E6: (new Reach)

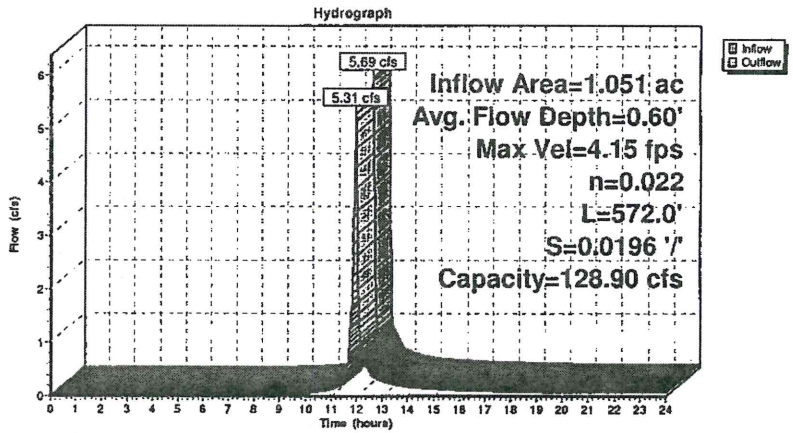
Inflow Area = 1.051 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 5.69 cfs @ 11.94 hrs, Volume= 0.243 af
Outflow = 5.31 cfs @ 11.96 hrs, Volume= 0.242 af, Atten= 7%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.15 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 1.50 fps, Avg. Travel Time= 6.4 min

Peak Storage= 732 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.60'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 128.90 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 572.0' Slope= 0.0196 '/'
Inlet Invert= 947.63', Outlet Invert= 936.42'

Reach DB-E6: (new Reach)



Summary for Reach DB-E7: (new Reach)

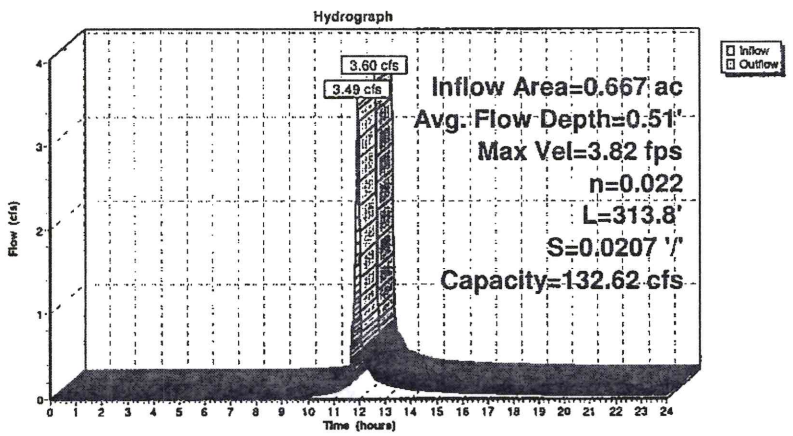
Inflow Area = 0.667 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 3.60 cfs @ 11.94 hrs, Volume= 0.154 af
Outflow = 3.49 cfs @ 11.96 hrs, Volume= 0.154 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.82 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 3.8 min

Peak Storage= 287 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 132.62 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 313.8' Slope= 0.0207 '/'
Inlet Invert= 921.24', Outlet Invert= 914.73'

Reach DB-E7: (new Reach)



Summary for Reach DB-E8: (new Reach)

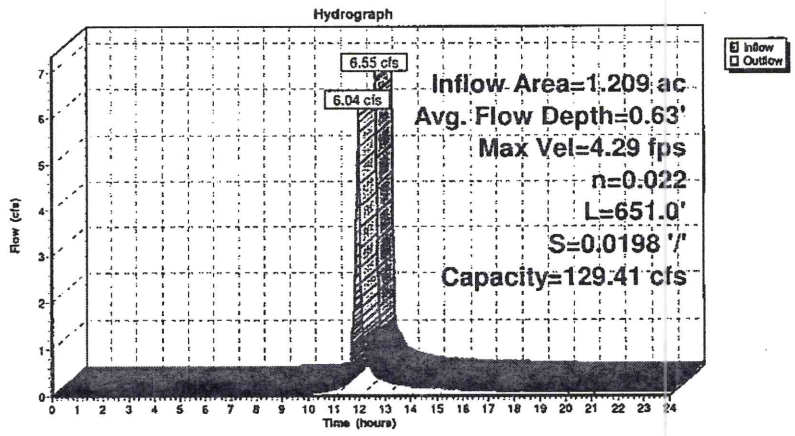
Inflow Area = 1.209 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 6.55 cfs @ 11.94 hrs, Volume= 0.279 af
Outflow = 6.04 cfs @ 11.97 hrs, Volume= 0.279 af, Atten= 8%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.29 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 1.55 fps, Avg. Travel Time= 7.0 min

Peak Storage= 915 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.63'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.41 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 651.0' Slope= 0.0198 '/'
Inlet Invert= 927.59', Outlet Invert= 914.73'

Reach DB-E8: (new Reach)



Summary for Reach DC-E1: (new Reach)

Inflow Area = 1.593 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 6.44 cfs @ 12.04 hrs, Volume= 0.367 af
Outflow = 6.44 cfs @ 12.04 hrs, Volume= 0.367 af, Atten= 0%, Lag= 0.1 min

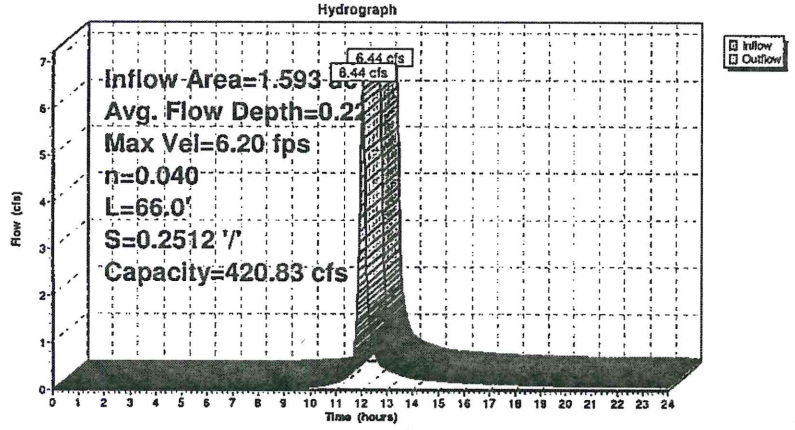
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.20 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.70 fps, Avg. Travel Time= 0.6 min

Peak Storage= 69 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 420.83 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 66.0' Slope= 0.2512 '/'
Inlet Invert= 975.00', Outlet Invert= 958.42'

‡

Reach DC-E1: (new Reach)



Summary for Reach DC-E2: (new Reach)

Inflow Area = 4.121 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 18.03 cfs @ 11.96 hrs, Volume= 0.951 af
Outflow = 18.03 cfs @ 11.96 hrs, Volume= 0.950 af, Atten= 0%, Lag= 0.1 min

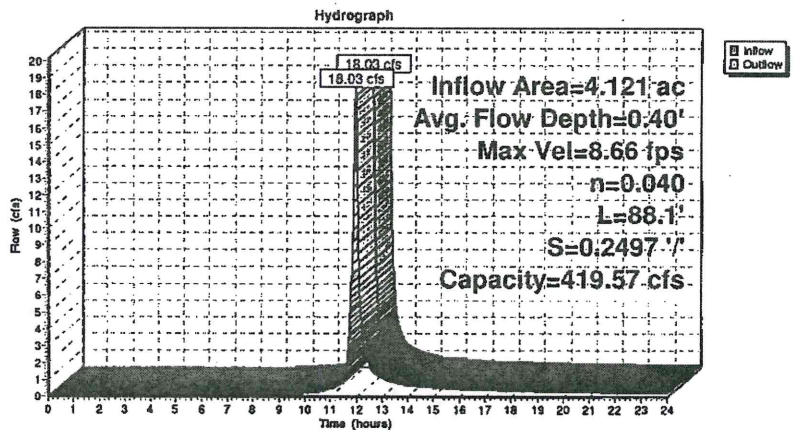
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.66 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.29 fps, Avg. Travel Time= 0.6 min

Peak Storage= 183 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.57 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 88.1' Slope= 0.2497 '/'
Inlet Invert= 958.42', Outlet Invert= 936.42'

‡

Reach DC-E2: (new Reach)



Summary for Reach DC-E3: (new Reach)

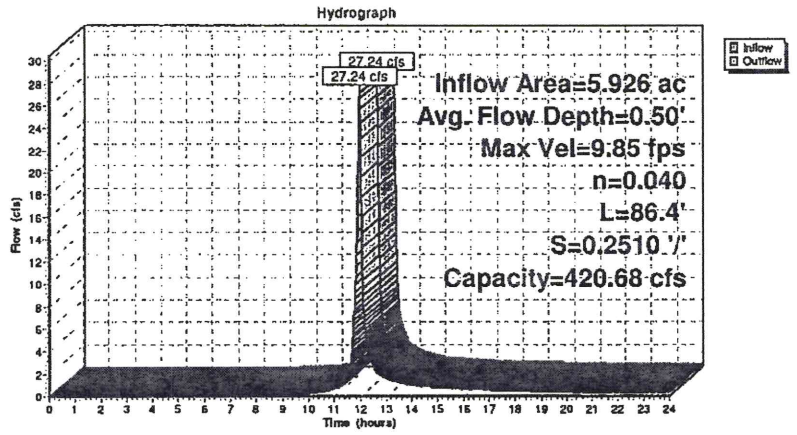
Inflow Area = 5.926 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 27.24 cfs @ 11.96 hrs, Volume= 1.367 af
Outflow = 27.24 cfs @ 11.96 hrs, Volume= 1.367 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.85 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.59 fps, Avg. Travel Time= 0.6 min

Peak Storage= 239 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 420.68 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 86.4' Slope= 0.2510 '/'
Inlet Invert= 936.42', Outlet Invert= 914.73'

Reach DC-E3: (new Reach)



Summary for Reach DC-E4: (new Reach)

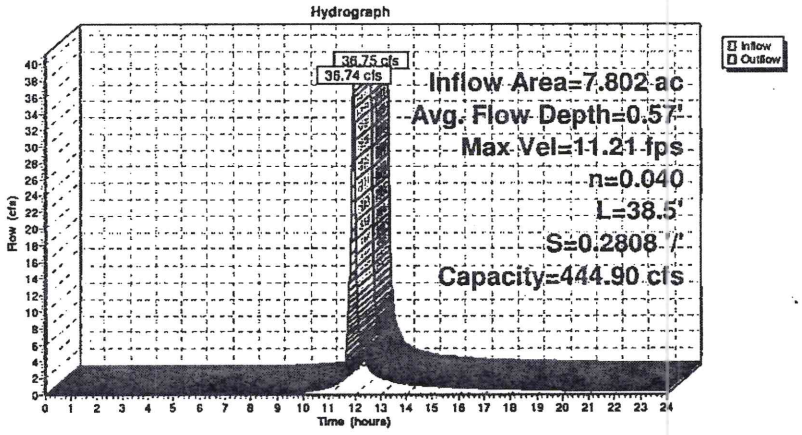
Inflow Area = 7.802 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 36.75 cfs @ 11.96 hrs, Volume= 1.799 af
Outflow = 36.74 cfs @ 11.96 hrs, Volume= 1.799 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.21 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.95 fps, Avg. Travel Time= 0.2 min

Peak Storage= 126 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 444.90 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 38.5' Slope= 0.2808 '/'
Inlet Invert= 914.73', Outlet Invert= 903.92'

Reach DC-E4: (new Reach)



Summary for Reach IPC-E1: (new Reach)

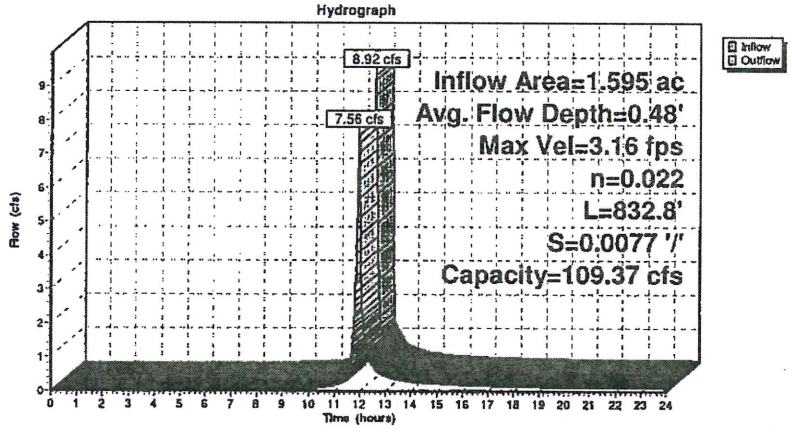
Inflow Area = 1.595 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 8.92 cfs @ 11.93 hrs, Volume= 0.369 af
Outflow = 7.56 cfs @ 11.96 hrs, Volume= 0.366 af, Atten= 15%, Lag= 1.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.16 fps, Min. Travel Time= 4.4 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 17.7 min

Peak Storage= 1,992 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.48'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 109.37 cfs

4.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 832.8' Slope= 0.0077 '/'
Inlet Invert= 910.35', Outlet Invert= 903.92'

Reach IPC-E1: (new Reach)



Summary for Pond DC-E5: (new Reach)

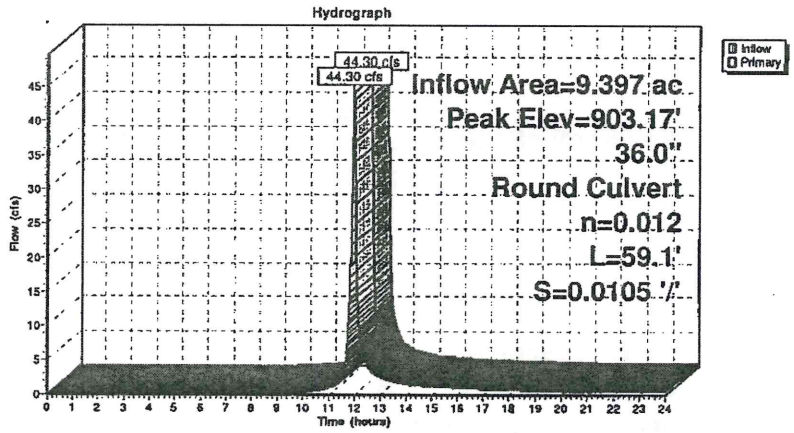
Inflow Area = 9.397 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 44.30 cfs @ 11.96 hrs, Volume= 2.166 af
Outflow = 44.30 cfs @ 11.96 hrs, Volume= 2.166 af, Atten= 0%, Lag= 0.0 min
Primary = 44.30 cfs @ 11.96 hrs, Volume= 2.166 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 903.17' @ 11.96 hrs
Flood Elev= 903.92'

Device	Routing	Invert	Outlet Devices
#1	Primary	899.92'	**36.0" Round Culvert** L= 59.1' Ke= 0.500 Inlet / Outlet Invert= 899.92' / 899.30' S= 0.0105 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished

Primary OutFlow Max=44.20 cfs @ 11.96 hrs HW=903.17' TW=899.58' (Dynamic Tailwater)
↑—1=Culvert (Barrel Controls 44.20 cfs @ 7.19 fps)

Pond DC-E5: (new Reach)



Summary for Pond E: (new Pond)

Inflow Area = 10.412 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 48.85 cfs @ 11.97 hrs, Volume= 2.400 af
Outflow = 5.01 cfs @ 12.47 hrs, Volume= 2.251 af, Atten= 90%, Lag= 30.2 min
Primary = 5.01 cfs @ 12.47 hrs, Volume= 2.251 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 898.00' Surf.Area= 16,933 sf Storage= 74,175 cf
Peak Elev= 900.46' @ 12.47 hrs Surf.Area= 22,692 sf Storage= 122,872 cf (48,697 cf above start)

Plug-Flow detention time= 495.5 min calculated for 0.548 af (23% of inflow)
Center-of-Mass det. time= 102.2 min (925.0 - 822.8)

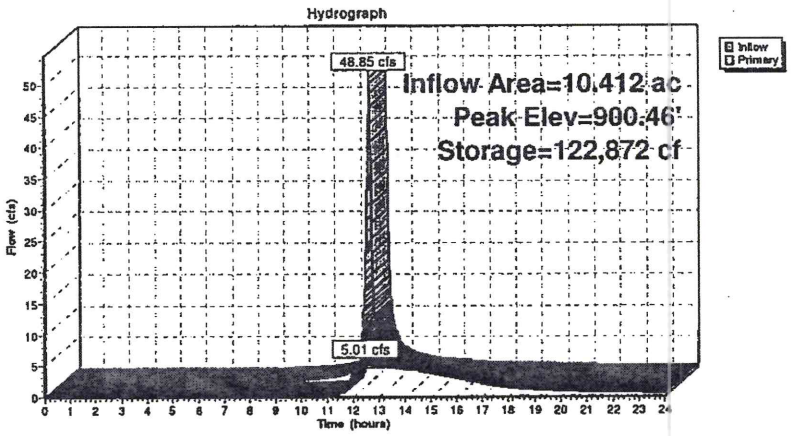
Volume	Invert	Avail.Storage	Storage Description
#1	890.00'	288,950 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
890.00	3,097	0	0
891.00	4,281	3,689	3,689
892.00	5,638	4,960	8,649
893.00	7,166	6,402	15,051
894.00	8,863	8,015	23,065
895.00	10,719	9,791	32,856
896.00	12,718	11,719	44,575
897.00	14,775	13,747	58,321
898.00	16,933	15,854	74,175
899.00	19,192	18,063	92,238
900.00	21,551	20,372	112,609
901.00	24,010	22,781	135,390
902.00	26,570	25,290	160,680
903.00	29,231	27,901	188,580
904.00	31,992	30,612	219,192
905.00	34,854	33,423	252,615
906.00	37,816	36,335	288,950

Device	Routing	Invert	Outlet Devices
#1	Primary	898.00'	**12.0" Round Culvert** L= 89.6' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 898.00' / 897.00' S= 0.0112 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished
#2	Primary	901.70'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65

Primary OutFlow Max=5.01 cfs @ 12.47 hrs HW=900.46' (Free Discharge)
└**1=Culvert** (Barrel Controls 5.01 cfs @ 6.38 fps)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond E: (new Pond)



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1: (new Subcat) Runoff Area=1.354 ac 0.00% Impervious Runoff Depth>4.00"
Flow Length=195' Tc=11.1 min CN=79 Runoff=7.95 cfs 0.451 af

Subcatchment E2: (new Subcat) Runoff Area=0.239 ac 0.00% Impervious Runoff Depth>4.00"
Flow Length=98' Tc=7.9 min CN=79 Runoff=1.57 cfs 0.080 af

Subcatchment E3: (new Subcat) Runoff Area=0.777 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=88' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=5.96 cfs 0.260 af

Subcatchment E4: (new Subcat) Runoff Area=1.751 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=69' Slope=0.2500 '/' Tc=2.8 min CN=79 Runoff=13.70 cfs 0.585 af

Subcatchment E5: (new Subcat) Runoff Area=0.754 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=89' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=5.78 cfs 0.252 af

Subcatchment E6: (new Subcat) Runoff Area=1.051 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=87' Slope=0.2500 '/' Tc=3.3 min CN=79 Runoff=8.09 cfs 0.351 af

Subcatchment E7: (new Subcat) Runoff Area=0.667 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=89' Slope=0.2500 '/' Tc=3.4 min CN=79 Runoff=5.12 cfs 0.223 af

Subcatchment E8: (new Subcat) Runoff Area=1.209 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=87' Slope=0.2500 '/' Tc=3.3 min CN=79 Runoff=9.31 cfs 0.404 af

Subcatchment E9: (new Subcat) Runoff Area=1.595 ac 0.00% Impervious Runoff Depth>4.01"
Flow Length=56' Slope=0.2500 '/' Tc=2.4 min CN=79 Runoff=12.66 cfs 0.533 af

Subcatchment EX-E: Existing Drainage Area Runoff Area=1.015 ac 0.00% Impervious Runoff Depth>4.00"
Flow Length=100' Slope=0.0460 '/' Tc=7.4 min CN=79 Runoff=6.77 cfs 0.339 af

Reach DB-E1: (new Reach) Avg. Flow Depth=0.65' Max Vel=5.36 fps Inflow=7.95 cfs 0.451 af
n=0.022 L=418.5' S=0.0298 '/' Capacity=159.07 cfs Outflow=7.85 cfs 0.451 af

Reach DB-E2: (new Reach) Avg. Flow Depth=0.28' Max Vel=5.57 fps Inflow=1.57 cfs 0.080 af
n=0.022 L=189.2' S=0.0973 '/' Capacity=287.15 cfs Outflow=1.56 cfs 0.080 af

Reach DB-E3: (new Reach) Avg. Flow Depth=0.63' Max Vel=4.07 fps Inflow=5.96 cfs 0.260 af
n=0.022 L=394.8' S=0.0177 '/' Capacity=122.43 cfs Outflow=5.73 cfs 0.259 af

Reach DB-E4: (new Reach) Avg. Flow Depth=0.86' Max Vel=5.21 fps Inflow=13.70 cfs 0.585 af
n=0.022 L=362.8' S=0.0195 '/' Capacity=128.45 cfs Outflow=13.36 cfs 0.584 af

Reach DB-E5: (new Reach) Avg. Flow Depth=0.62' Max Vel=4.19 fps Inflow=5.78 cfs 0.252 af
n=0.022 L=354.2' S=0.0195 '/' Capacity=128.52 cfs Outflow=5.60 cfs 0.252 af

Reach DB-E6: (new Reach) Avg. Flow Depth=0.69' Max Vel=4.54 fps Inflow=8.09 cfs 0.351 af
n=0.022 L=572.0' S=0.0196 '/' Capacity=128.90 cfs Outflow=7.62 cfs 0.350 af

Reach DB-E7: (new Reach) Avg. Flow Depth=0.58' Max Vel=4.17 fps Inflow=5.12 cfs 0.223 af
n=0.022 L=313.8' S=0.0207 '/' Capacity=132.62 cfs Outflow=4.98 cfs 0.223 af

Reach DB-E8: (new Reach) Avg. Flow Depth=0.73' Max Vel=4.71 fps Inflow=9.31 cfs 0.404 af
n=0.022 L=651.0' S=0.0198 '/' Capacity=129.41 cfs Outflow=8.69 cfs 0.403 af

Reach DC-E1: (new Reach) Avg. Flow Depth=0.27' Max Vel=7.00 fps Inflow=9.25 cfs 0.531 af
n=0.040 L=66.0' S=0.2512 '/' Capacity=420.83 cfs Outflow=9.25 cfs 0.531 af

Reach DC-E2: (new Reach) Avg. Flow Depth=0.49' Max Vel=9.69 fps Inflow=25.90 cfs 1.374 af
n=0.040 L=88.1' S=0.2497 '/' Capacity=419.57 cfs Outflow=25.90 cfs 1.374 af

Reach DC-E3: (new Reach) Avg. Flow Depth=0.61' Max Vel=10.98 fps Inflow=39.11 cfs 1.976 af
n=0.040 L=86.4' S=0.2510 '/' Capacity=420.68 cfs Outflow=39.10 cfs 1.976 af

Reach DC-E4: (new Reach) Avg. Flow Depth=0.70' Max Vel=12.47 fps Inflow=52.75 cfs 2.601 af
n=0.040 L=38.5' S=0.2808 '/' Capacity=444.90 cfs Outflow=52.74 cfs 2.601 af

Reach IPC-E1: (new Reach) Avg. Flow Depth=0.60' Max Vel=3.56 fps Inflow=12.66 cfs 0.533 af
n=0.022 L=832.8' S=0.0077 '/' Capacity=109.37 cfs Outflow=11.01 cfs 0.530 af

Pond DC-E5: (new Reach) Peak Elev=904.93' Inflow=63.75 cfs 3.131 af
36.0" Round Culvert n=0.012 L=59.1' S=0.0105 '/' Outflow=63.75 cfs 3.131 af

Pond E: (new Pond) Peak Elev=901.52' Storage=148,159 cf Inflow=70.22 cfs 3.470 af
Outflow=5.99 cfs 3.293 af

Total Runoff Area = 10.412 ac Runoff Volume = 3.477 af Average Runoff Depth = 4.01"
100.00% Pervious = 10.412 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment E1: (new Subcat)

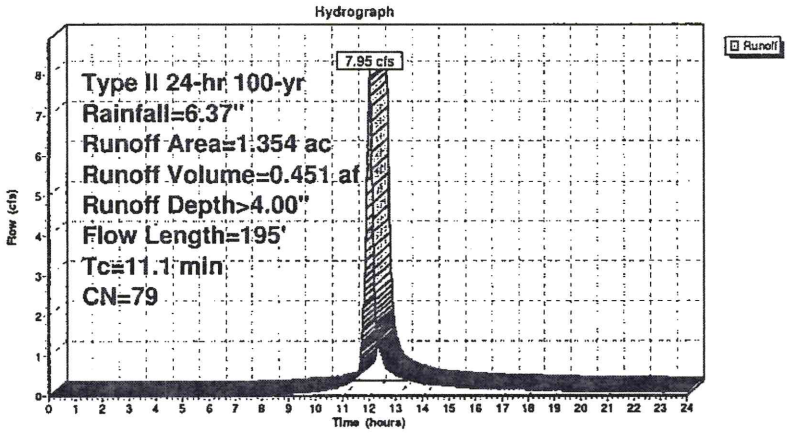
Runoff = 7.95 cfs @ 12.03 hrs, Volume= 0.451 af, Depth> 4.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.354	79	50-75% Grass cover, Fair, HSG C
1.354		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
0.5	27	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	68	0.2500	3.50		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.1	195	Total			

Subcatchment E1: (new Subcat)



Summary for Subcatchment E2: (new Subcat)

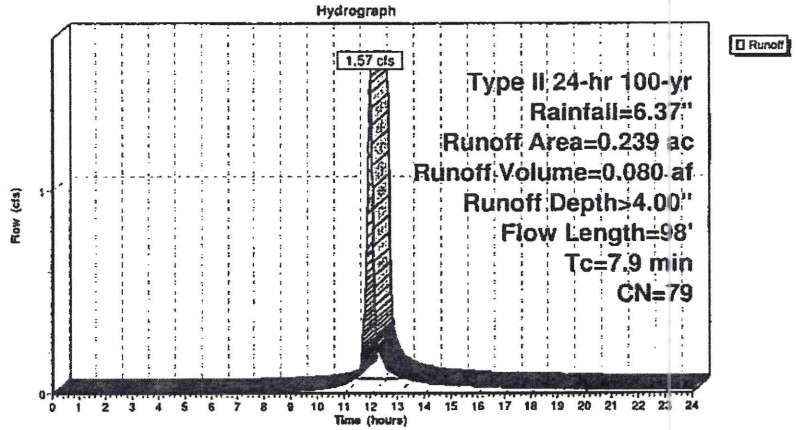
Runoff = 1.57 cfs @ 11.99 hrs, Volume= 0.080 af, Depth> 4.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.239	79	50-75% Grass cover, Fair, HSG C
0.239		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	49	0.0200	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
2.1	49	0.2500	0.39		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
7.9	98	Total			

Subcatchment E2: (new Subcat)



Summary for Subcatchment E3: (new Subcat)

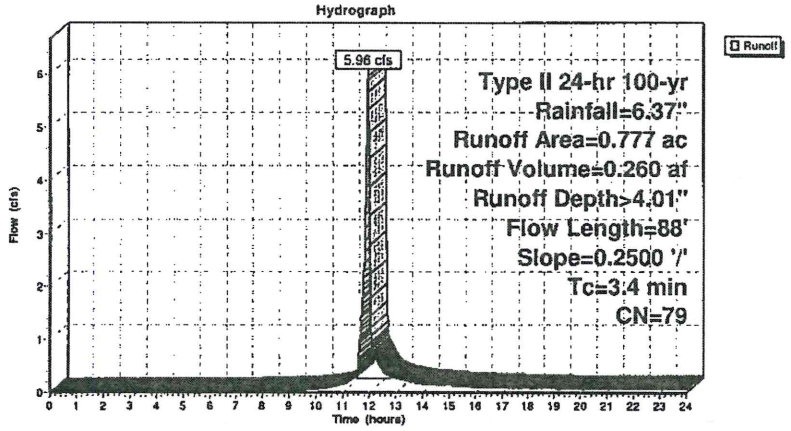
Runoff = 5.96 cfs @ 11.94 hrs, Volume= 0.260 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.777	79	50-75% Grass cover, Fair, HSG C
0.777		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	88	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E3: (new Subcat)



Summary for Subcatchment E4: (new Subcat)

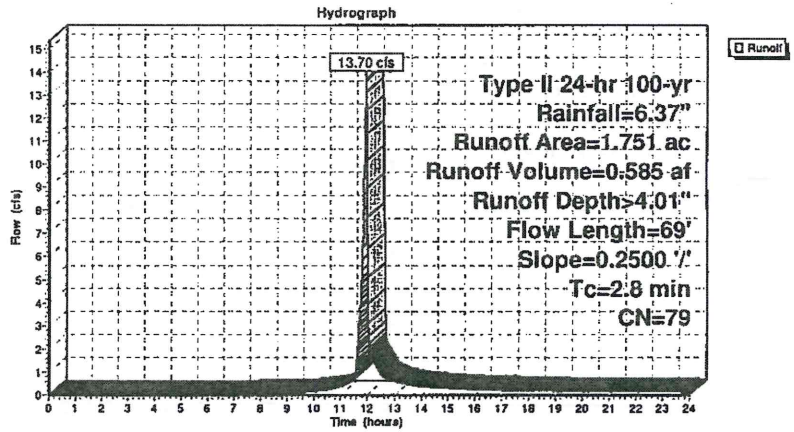
Runoff = 13.70 cfs @ 11.93 hrs, Volume= 0.585 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.751	79	50-75% Grass cover, Fair, HSG C
1.751		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	69	0.2500	0.41		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E4: (new Subcat)



Summary for Subcatchment E5: (new Subcat)

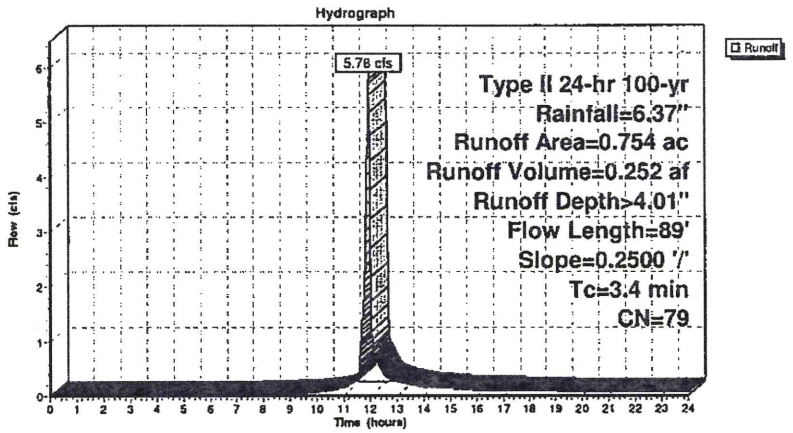
Runoff = 5.78 cfs @ 11.94 hrs, Volume= 0.252 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.754	79	50-75% Grass cover, Fair, HSG C
0.754		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	89	0.2500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E5: (new Subcat)



Summary for Subcatchment E6: (new Subcat)

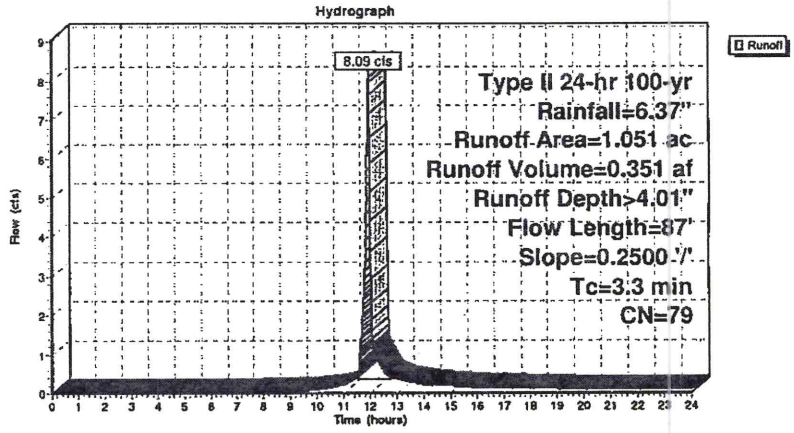
Runoff = 8.09 cfs @ 11.94 hrs, Volume= 0.351 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.051	79	50-75% Grass cover, Fair, HSG C
1.051		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	87	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E6: (new Subcat)



Summary for Subcatchment E7: (new Subcat)

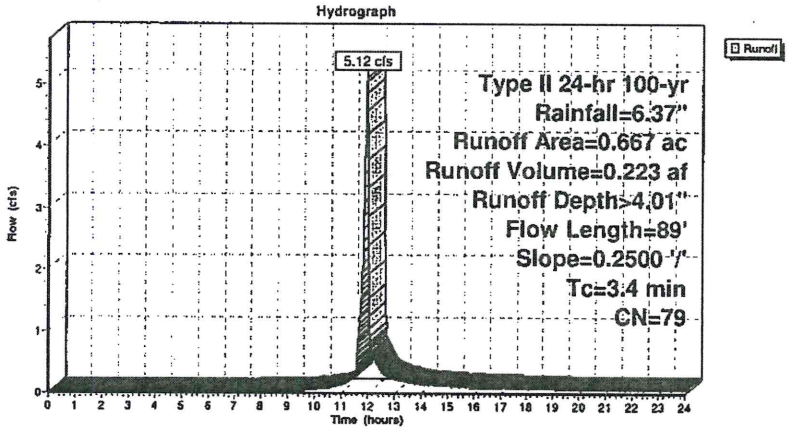
Runoff = 5.12 cfs @ 11.94 hrs, Volume= 0.223 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.667	79	50-75% Grass cover, Fair, HSG C
0.667		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	89	0.2500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E7: (new Subcat)



Summary for Subcatchment E8: (new Subcat)

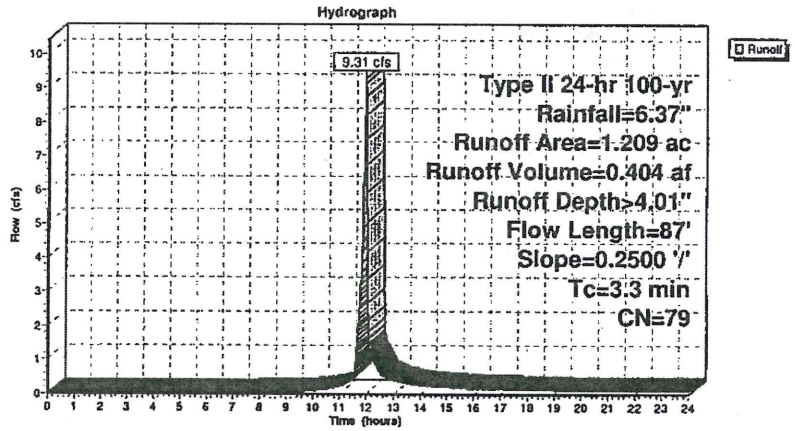
Runoff = 9.31 cfs @ 11.94 hrs, Volume= 0.404 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.209	79	50-75% Grass cover, Fair, HSG C
1.209		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	87	0.2500	0.43		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E8: (new Subcat)



Summary for Subcatchment E9: (new Subcat)

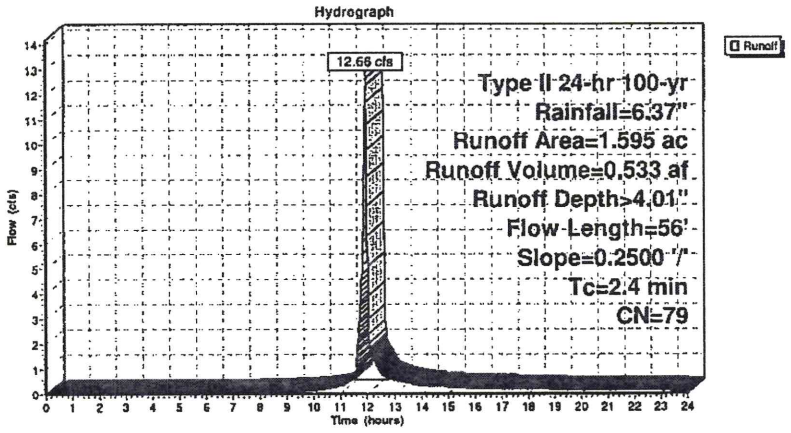
Runoff = 12.66 cfs @ 11.93 hrs, Volume= 0.533 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.595	79	50-75% Grass cover, Fair, HSG C
1.595		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	56	0.2500	0.40		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment E9: (new Subcat)



Summary for Subcatchment EX-E: Existing Drainage Area

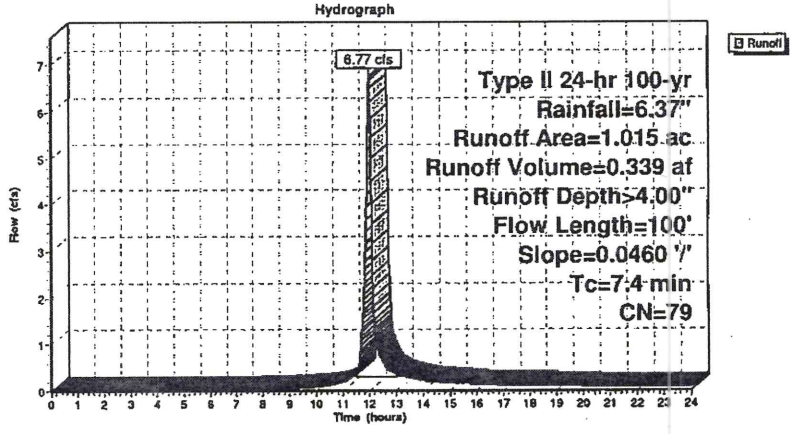
Runoff = 6.77 cfs @ 11.99 hrs, Volume= 0.339 af, Depth> 4.00"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.015	79	50-75% Grass cover, Fair, HSG C
1.015		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0460	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.91"

Subcatchment EX-E: Existing Drainage Area



Summary for Reach DB-E1: (new Reach)

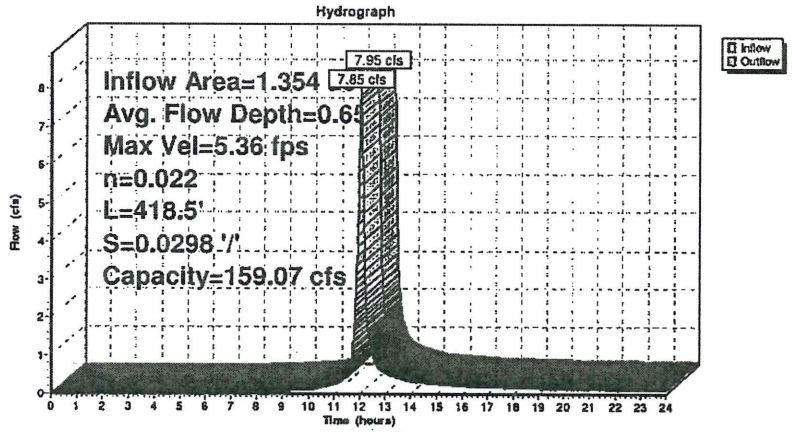
Inflow Area = 1.354 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 7.95 cfs @ 12.03 hrs, Volume= 0.451 af
Outflow = 7.85 cfs @ 12.04 hrs, Volume= 0.451 af, Atten= 1%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.36 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 2.00 fps, Avg. Travel Time= 3.5 min

Peak Storage= 613 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 159.07 cfs

0.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 418.5' Slope= 0.0298 '/'
Inlet Invert= 987.49', Outlet Invert= 975.00'

Reach DB-E1: (new Reach)



Summary for Reach DB-E2: (new Reach)

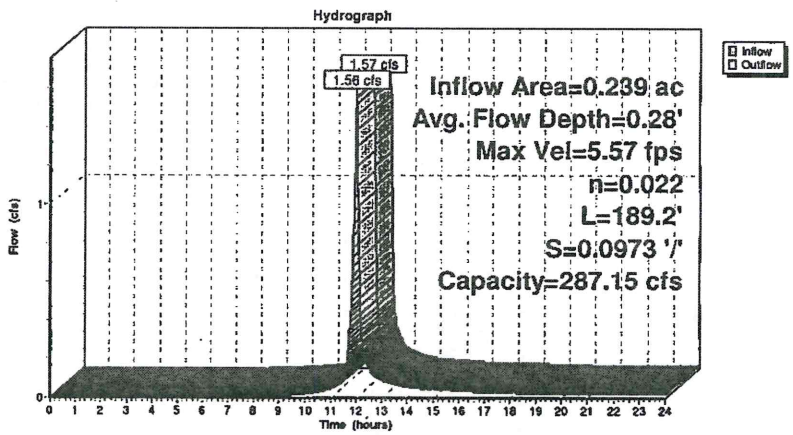
Inflow Area = 0.239 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 1.57 cfs @ 11.99 hrs, Volume= 0.080 af
Outflow = 1.56 cfs @ 12.00 hrs, Volume= 0.080 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.57 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.06 fps, Avg. Travel Time= 1.5 min

Peak Storage= 53 cf @ 12.00 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 287.15 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 189.2' Slope= 0.0973 '/'
Inlet Invert= 993.40', Outlet Invert= 975.00'

Reach DB-E2: (new Reach)



Summary for Reach DB-E3: (new Reach)

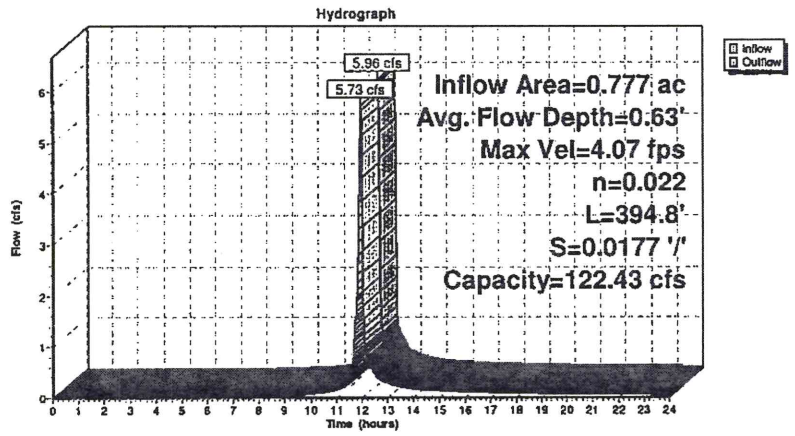
Inflow Area = 0.777 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 5.96 cfs @ 11.94 hrs, Volume= 0.260 af
Outflow = 5.73 cfs @ 11.96 hrs, Volume= 0.259 af, Atten= 4%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.07 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 4.6 min

Peak Storage= 556 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.63'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 122.43 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 394.8' Slope= 0.0177 '/'
Inlet Invert= 965.40', Outlet Invert= 958.42'

Reach DB-E3: (new Reach)



Summary for Reach DB-E4: (new Reach)

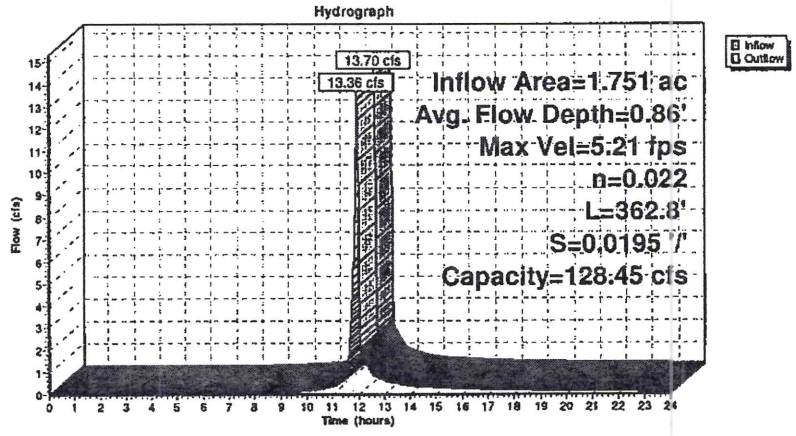
Inflow Area = 1.751 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 13.70 cfs @ 11.93 hrs, Volume= 0.585 af
Outflow = 13.36 cfs @ 11.95 hrs, Volume= 0.584 af, Atten= 3%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.21 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.81 fps, Avg. Travel Time= 3.3 min

Peak Storage= 930 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.86'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 128.45 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 362.8' Slope= 0.0195 '/'
Inlet Invert= 965.48', Outlet Invert= 958.42'

Reach DB-E4: (new Reach)



Summary for Reach DB-E5: (new Reach)

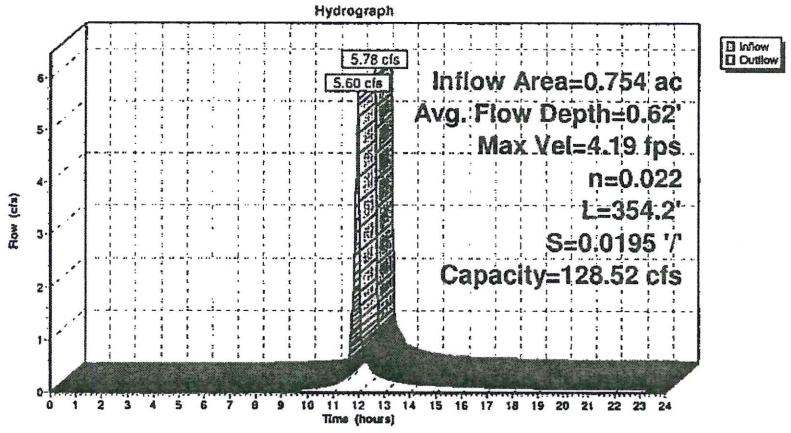
Inflow Area = 0.754 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 5.78 cfs @ 11.94 hrs, Volume= 0.252 af
Outflow = 5.60 cfs @ 11.96 hrs, Volume= 0.252 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.19 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.47 fps, Avg. Travel Time= 4.0 min

Peak Storage= 473 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 128.52 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 354.2' Slope= 0.0195 '/'
Inlet Invert= 943.32', Outlet Invert= 936.42'

Reach DB-E5: (new Reach)



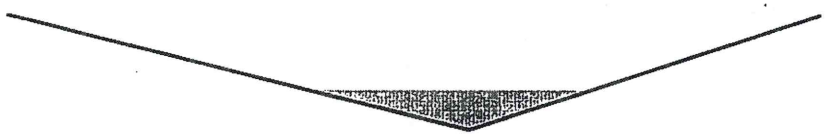
Summary for Reach DB-E6: (new Reach)

Inflow Area = 1.051 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 8.09 cfs @ 11.94 hrs, Volume= 0.351 af
Outflow = 7.62 cfs @ 11.96 hrs, Volume= 0.350 af, Atten= 6%, Lag= 1.2 min

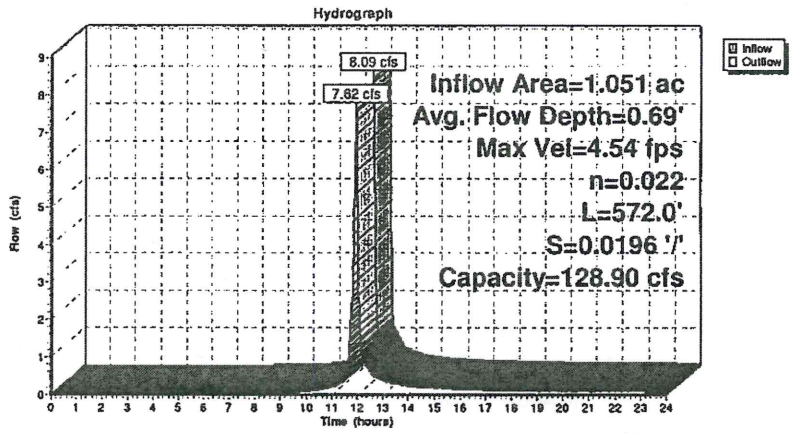
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.54 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 6.0 min

Peak Storage= 960 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.69'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 128.90 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 572.0' Slope= 0.0196 '/'
Inlet Invert= 947.63', Outlet Invert= 936.42'



Reach DB-E6: (new Reach)



Summary for Reach DB-E7: (new Reach)

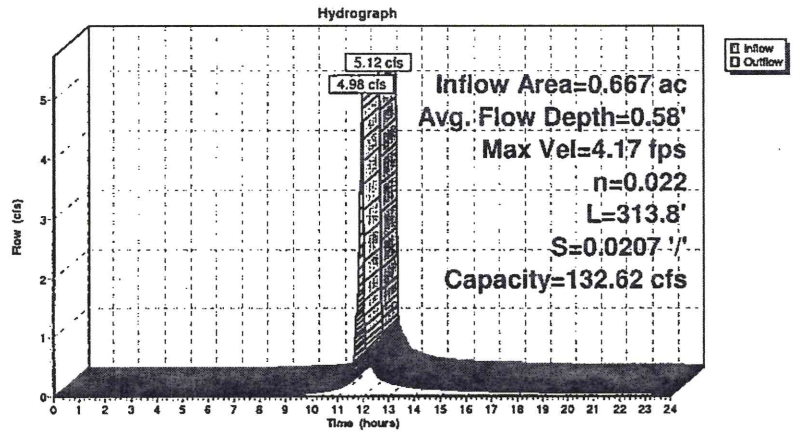
Inflow Area = 0.667 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 5.12 cfs @ 11.94 hrs, Volume= 0.223 af
Outflow = 4.98 cfs @ 11.95 hrs, Volume= 0.223 af, Atten= 3%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.17 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 3.6 min

Peak Storage= 375 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 132.62 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 313.8' Slope= 0.0207 '/'
Inlet Invert= 921.24', Outlet Invert= 914.73'

Reach DB-E7: (new Reach)



Summary for Reach DB-E8: (new Reach)

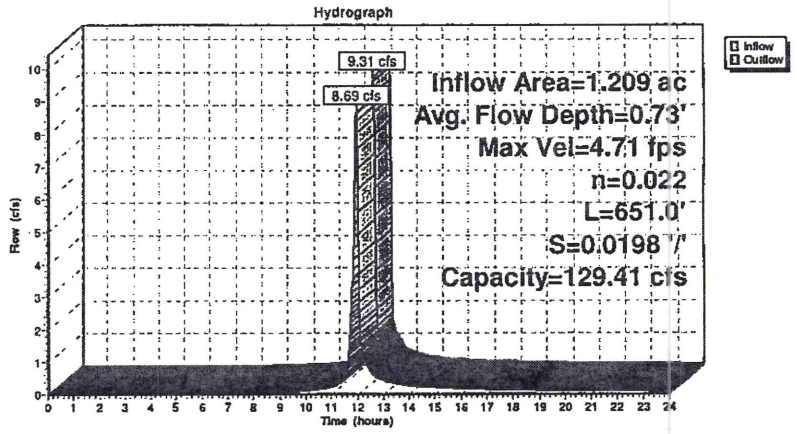
Inflow Area = 1.209 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 9.31 cfs @ 11.94 hrs, Volume= 0.404 af
Outflow = 8.69 cfs @ 11.96 hrs, Volume= 0.403 af, Atten= 7%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.71 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 1.66 fps, Avg. Travel Time= 6.5 min

Peak Storage= 1,202 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.41 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 651.0' Slope= 0.0198 '/'
Inlet Invert= 927.59', Outlet Invert= 914.73'

Reach DB-E8: (new Reach)



Summary for Reach DC-E1: (new Reach)

Inflow Area = 1.593 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 9.25 cfs @ 12.03 hrs, Volume= 0.531 af
Outflow = 9.25 cfs @ 12.04 hrs, Volume= 0.531 af, Atten= 0%, Lag= 0.1 min

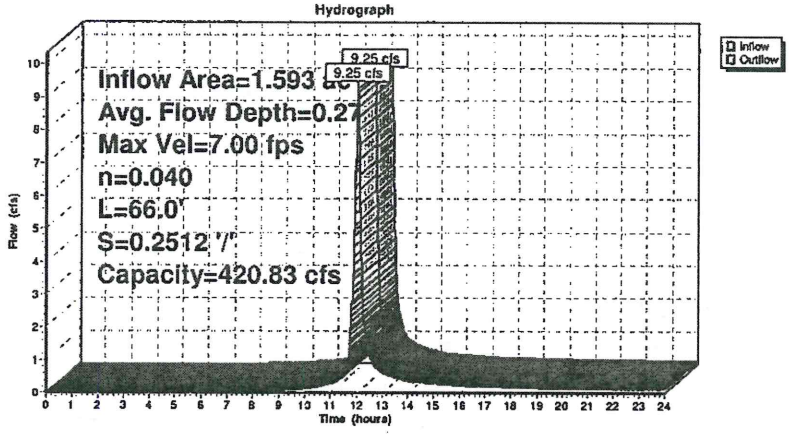
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.00 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.83 fps, Avg. Travel Time= 0.6 min

Peak Storage= 87 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 420.83 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 66.0' Slope= 0.2512 '/'
Inlet Invert= 975.00', Outlet Invert= 958.42'

‡

Reach DC-E1: (new Reach)



Summary for Reach DC-E2: (new Reach)

Inflow Area = 4.121 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 25.90 cfs @ 11.96 hrs, Volume= 1.374 af
Outflow = 25.90 cfs @ 11.96 hrs, Volume= 1.374 af, Atten= 0%, Lag= 0.1 min

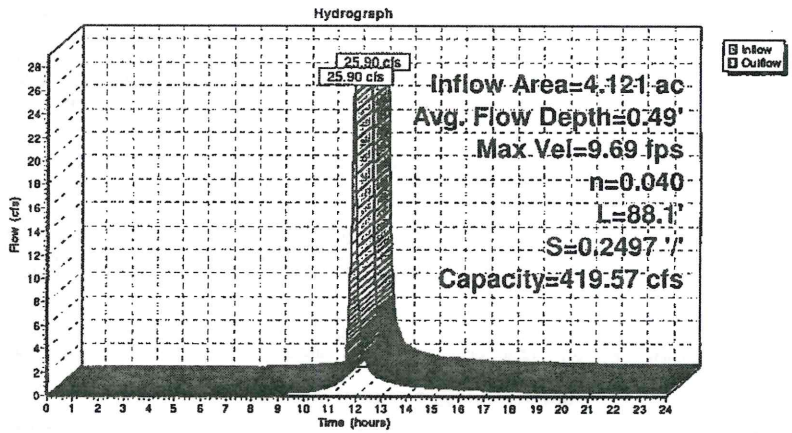
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.69 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.51 fps, Avg. Travel Time= 0.6 min

Peak Storage= 235 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.57 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 88.1' Slope= 0.2497 '/'
Inlet Invert= 958.42', Outlet Invert= 936.42'

‡

Reach DC-E2: (new Reach)



Summary for Reach DC-E3: (new Reach)

Inflow Area = 5.926 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 39.11 cfs @ 11.96 hrs, Volume= 1.976 af
Outflow = 39.10 cfs @ 11.96 hrs, Volume= 1.976 af, Atten= 0%, Lag= 0.1 min

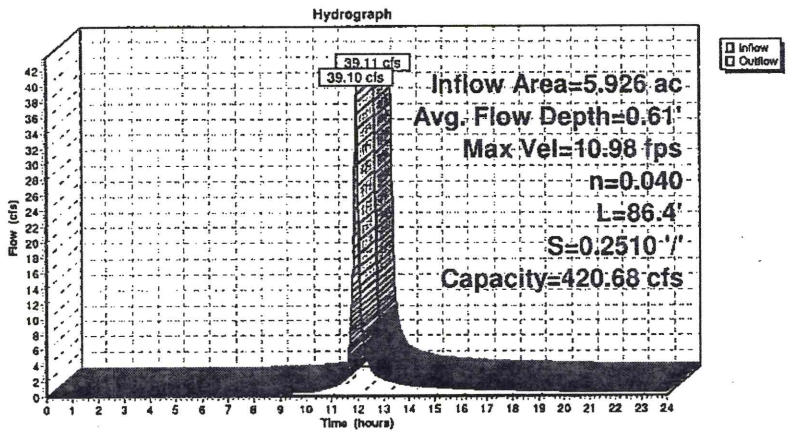
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.98 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.84 fps, Avg. Travel Time= 0.5 min

Peak Storage= 308 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 420.68 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 86.4' Slope= 0.2510 '/'
Inlet Invert= 936.42', Outlet Invert= 914.73'

‡

Reach DC-E3: (new Reach)



Summary for Reach DC-E4: (new Reach)

Inflow Area = 7.802 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 52.75 cfs @ 11.96 hrs, Volume= 2.601 af
Outflow = 52.74 cfs @ 11.96 hrs, Volume= 2.601 af, Atten= 0%, Lag= 0.0 min

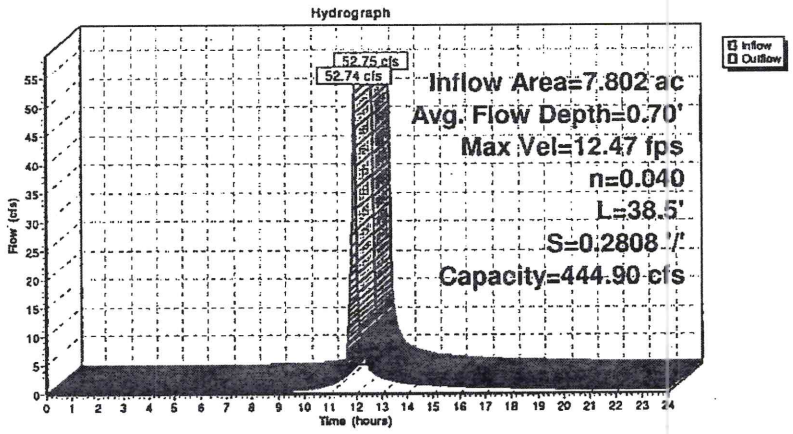
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 12.47 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.25 fps, Avg. Travel Time= 0.2 min

Peak Storage= 163 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 444.90 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 38.5' Slope= 0.2808 '/'
Inlet Invert= 914.73', Outlet Invert= 903.92'

‡

Reach DC-E4: (new Reach)



Summary for Reach IPC-E1: (new Reach)

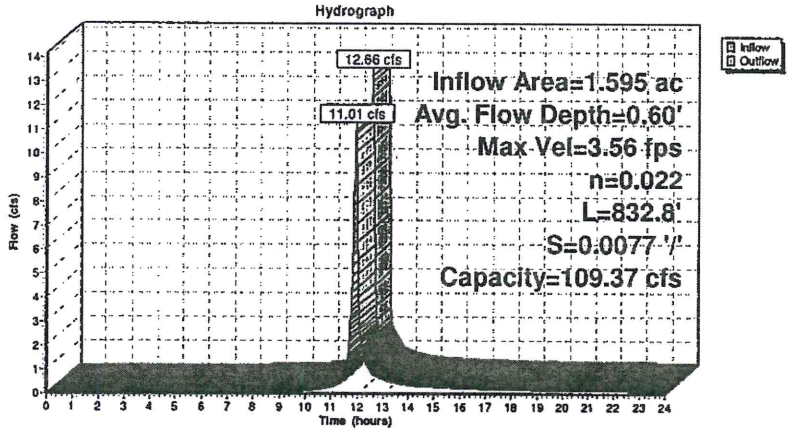
Inflow Area = 1.595 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 12.66 cfs @ 11.93 hrs, Volume= 0.533 af
Outflow = 11.01 cfs @ 11.96 hrs, Volume= 0.530 af, Atten= 13%, Lag= 1.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.56 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 16.1 min

Peak Storage= 2,577 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.60'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 109.37 cfs

4.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 832.8' Slope= 0.0077 '/'
Inlet Invert= 910.35', Outlet Invert= 903.92'

Reach IPC-E1: (new Reach)



Summary for Pond DC-E5: (new Reach)

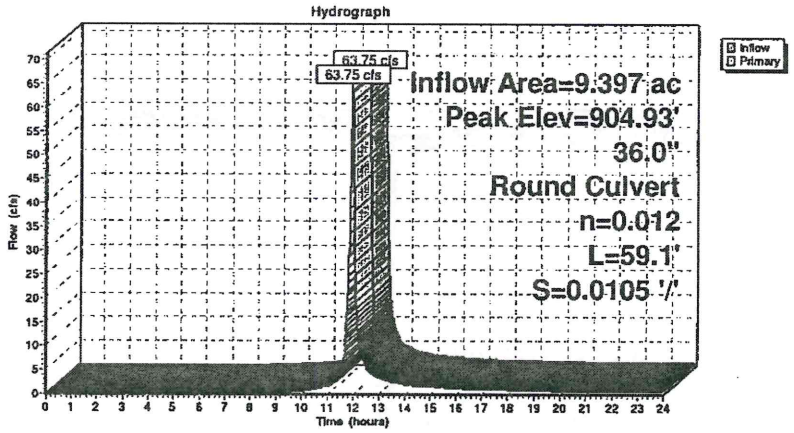
Inflow Area = 9.397 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 63.75 cfs @ 11.96 hrs, Volume= 3.131 af
Outflow = 63.75 cfs @ 11.96 hrs, Volume= 3.131 af, Atten= 0%, Lag= 0.0 min
Primary = 63.75 cfs @ 11.96 hrs, Volume= 3.131 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 904.93' @ 11.96 hrs
Flood Elev= 903.92'

Device	Routing	Invert	Outlet Devices
#1	Primary	899.92'	**36.0" Round Culvert** L= 59.1' Ke= 0.500 Inlet / Outlet Invert= 899.92' / 899.30' S= 0.0105 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished

Primary OutFlow Max=63.70 cfs @ 11.96 hrs HW=904.92' TW=900.31' (Dynamic Tailwater)
↑—1=Culvert (Inlet Controls 63.70 cfs @ 9.01 fps)

Pond DC-E5: (new Reach)



Summary for Pond E: (new Pond)

Inflow Area = 10.412 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 70.22 cfs @ 11.96 hrs, Volume= 3.470 af
Outflow = 5.99 cfs @ 12.54 hrs, Volume= 3.293 af, Atten= 91%, Lag= 34.4 min
Primary = 5.99 cfs @ 12.54 hrs, Volume= 3.293 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 898.00' Surf.Area= 16,933 sf Storage= 74,175 cf
Peak Elev= 901.52' @ 12.54 hrs Surf.Area= 25,335 sf Storage= 148,159 cf (73,984 cf above start)

Plug-Flow detention time= 392.4 min calculated for 1.590 af (46% of inflow)
Center-of-Mass det. time= 127.4 min (939.5 - 812.1)

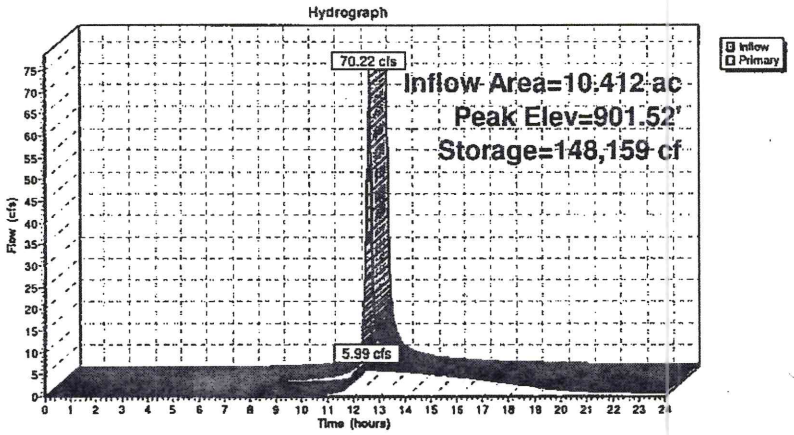
Volume	Invert	Avail.Storage	Storage Description
#1	890.00'	288,950 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
890.00	3,097	0	0
891.00	4,281	3,689	3,689
892.00	5,638	4,960	8,649
893.00	7,166	6,402	15,051
894.00	8,863	8,015	23,065
895.00	10,719	9,791	32,856
896.00	12,718	11,719	44,575
897.00	14,775	13,747	58,321
898.00	16,933	15,854	74,175
899.00	19,192	18,063	92,238
900.00	21,551	20,372	112,609
901.00	24,010	22,781	135,390
902.00	26,570	25,290	160,680
903.00	29,231	27,901	188,580
904.00	31,992	30,612	219,192
905.00	34,854	33,423	252,615
906.00	37,816	36,335	288,950

Device	Routing	Invert	Outlet Devices
#1	Primary	898.00'	**12.0" Round Culvert** L= 89.6' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 898.00' / 897.00' S= 0.0112 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished
#2	Primary	901.70'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65

Primary OutFlow Max=5.99 cfs @ 12.54 hrs HW=901.52' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 5.99 cfs @ 7.62 fps)
└—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond E: (new Pond)



OBJECTIVE:

To design the proposed Sedimentation Pond F, which provides stormwater management and sedimentation control, by satisfying the following regulations for residual waste landfills:

OAC 3745-30-07(C)(4)(d)

(d) Any sedimentation ponds shall be designed and constructed in accordance with the following:

(i) Minimum storage volume shall be provided based on either the calculated runoff volume from a ten-year/twenty-four-hour storm event, or 0.125 acre-feet per year, for each acre of disturbed area within the upstream drainage area, multiplied by the scheduled frequency of pond clean-out (in years), whichever is greater.

(ii) The principal spillway shall safely discharge the flow from a ten-year/twenty-four-hour storm event. The inlet elevation of the emergency spillway shall be designed to provide flood storage, with no flow entering the emergency spillway, for a twenty-five-year/twenty-four-hour storm event, with allowance provided for the flow passed by the principal spillway during the event.

(iii) The combination of principal and emergency spillways shall safely discharge the flow from a one-hundred-year/twenty-four-hour storm event. The embankment design shall provide for no less than one foot net freeboard when flow is at the design depth, after allowance for embankment settlement.

(iv) The sedimentation pond shall be constructed using a recompacted soil liner, a flexible membrane liner, or a combination thereof, based on a design acceptable to the director.

The design is based upon accepted engineering design equations, methodologies and assumptions. Where applicable, design references have been made. Calculations have been performed using the software package, HydroCAD Version 9.10, Copyright 2009.

Drainage Area	CN	Watershed Area (Acre)
F1	79	0.55
F2	79	0.60
F3	79	2.03
F4	79	0.82
F5	79	1.58
F6	79	0.85
F7	79	1.78
F8	79	0.87
F9	79	1.97
F10	79	0.89
F11	79	2.18
F12	79	0.92
F13	79	0.94
F14	79	0.94
F15	79	0.69
F16	79	1.31
EX-F	76	18.86
Total		**37.78**

Using the developed inflow hydrographs, all routings have been performed with the initial pool elevation within the pond at the invert of the principal spillway. The required sedimentation storage volume has been provided below the invert of the principal spillway. The inflow hydrograph from the 10-year/24-hour storm event was then used to size the principal spillway. The 25-year/24-hour storm event was then passed through the principal spillway in order to determine the elevation at which the emergency spillway was to be placed. The 100-year/24-hour storm event was then used to design the emergency spillway while providing a minimum of one foot of freeboard from the top of the embankment.

CALCULATIONS:

SEDIMENT VOLUME SIZING

According to OAC 3745-30-07(C)(4)(d)(i), the sedimentation pond must have adequate sediment storage volume for the larger of (1) the runoff from the 10-year/24-hour storm event or (2) 0.125 acre-feet per acre of disturbed area multiplied by the cleaning frequency in years.

Volume Requirement for ten-year/twenty-four-hour storm:
Utilizing the hydrographs from HydroCAD, the runoff from the 10-year/24-hour storm event is 6.23 acre-feet or 271,400 cubic feet. (Backup not included)

Volume Requirement for 0.125 acre-feet per disturbed acre:

Per the mentioned regulation, the storage volume required for each Drainage Area is calculated as follows:

$$V = Disturbed\ Area\left(\frac{0.125\ acre-ft}{acre}\right)[1\ \text{cleaning per year}]$$

The expected total disturbed drainage area is approximately 37.8 acres. Therefore, 0.125 acre-feet per disturbed acre requires a total sediment storage volume of 205,800 cubic-feet.

The rule calculations are very conservative in nature and neglect site-specific erosion expectations; therefore, a calculation giving a more accurate representation of the expected sediment during post-closure would be prudent. The Revised Universal Soil Loss Equation (RUSLE) was utilized to estimate the soil loss from the site during a capped condition. A composite sediment volume will be determined utilizing an expected soil loss from existing areas and an expected soil loss from the capped portion of the landfill. The RUSLE analyses can be found in "OAC 3745-30-05 (C)(6)(j) - Soil Erosion" and "OAC 3745-30-05 (C)(6)(l) – Temporary Sediment Pond A - Design Calculations" respectively.

Summarizing the results of the RUSLE calculation, the estimated soil erosion rate is approximately 2.7 tons/acre/year in a closed condition and 200 tons/acre/year for the existing areas. In order to be conservative, the 5.0 tons/acre/year allowable soil erosion from the

capped landfill will be used in order to calculate the required sediment storage volume. Based on an 18.9 acre capped landfill drainage area, and assuming a unit weight of soil of approximately 100 pounds per cubic foot, the estimated required sediment storage volume based on site-specific generated sediment is 1,900 cubic-feet. Likewise, from an 18.9 acre existing drainage area, the estimated required sediment storage volume based on site-specific generated sediment is 75,600 cubic-feet. Utilizing these site-specific minimum storage requirements and the HydroCAD elevation-storage table included with this calculation, the overall sediment storage volume is achieved at an elevation of approximately 828.00, but due to the outlet controlling, the invert of the principal spillway has been set at 831.00.

Item	Value
Required Storage to Invert of Principal Spillway	77,500 cubic-feet
Actual Storage at Invert of Principal Spillway (elevation 831.00), EXCEEDS REQUIRED	290,800 cubic-feet

Based on the above calculations and the actual available sediment storage of the sedimentation pond, it can be assumed that cleaning of Sedimentation Pond F will be required approximately once every three years. However, cleaning of the sedimentation pond shall be performed when 50 percent of the volume below the principal spillway is occupied by sediment.

PRINCIPAL SPILLWAY DESIGN

According to OAC 3745-30-07(C)(4)(d)(ii), the principal spillway shall be designed to safely discharge the flow from a 10-year/24-hour storm event without the use of mechanical means. To fulfill this regulation, the principal spillway was placed at an elevation of 831.00 which provides the required sediment storage volume. The spillway was then sized accordingly to allow the 10-year/24-hour storm event to pass safely. The 25-year/24-hour storm event was then routed through the designed principal spillway in order to determine the 25-year/24-hour elevation. Therefore, if the principal spillway is capable of releasing the flow from the 25-year/24-hour storm event, it is capable of safely handling the flow from the 10-year/24-hour storm event.

The details of the principal spillway for Sedimentation Pond F are summarized as follows:

Item	Value
Spillway Type	RCP Pipe
Design Manning's n	0.012
Culvert Quantity	1
Culvert Dimension	36 inch Diameter
Culvert Length	190 feet
Principal Spillway Invert Elevation	831.00 feet
Maximum pool elevation 25-year 24-hour storm	833.20 feet
Maximum pool volume for 25-year 24-hour storm	159,000 cubic-feet

According to OAC 3745-30-07(C)(4)(d)(ii), the routing, included with this calculation, shows that the maximum pool elevation for the routed 25-year/24-hour storm event is below the invert elevation of the emergency spillway, which has been set at 833.25. Thus, during the 25-year/24-hour storm event, the emergency spillway provides flood storage with no flow entering the emergency spillway while allowing flow through the principal spillway.

EMERGENCY SPILLWAY DESIGN

According to OAC 3745-30-07(C)(4)(d)(iii), the emergency spillway has been designed such that the combination of the principal spillway and emergency spillway will safely discharge the 100-year/24-hour storm event. This design requirement has been evaluated by routing flow from the 100-year/24-hour storm through the pond using the previously designed principal spillway.

The emergency spillway shall be a broad-crested weir with a crest length of 10.0 feet, a width of 5 feet, and a weir height of 1.75 feet. The sideslopes of the emergency spillway shall be 4H:1V. The invert of the emergency spillway has been set above the elevation of the 25-year/24-hour storm event such that throughout the routing of the 100-year/24-hour storm, a minimum 1-ft of freeboard is maintained to the perimeter elevation of the pond. The routing of the 100-yr/24 hour storm event produces a pool elevation of 834.03, which allows for a freeboard of 1.22 ft below the embankment, which has an elevation of 835.25.

The details of the emergency spillway for Sedimentation Pond F are included in the HydroCAD output.

Item	Value
Spillway Type	Broad-Crested Weir
Weir Coefficient	2.65
Channel Lining	Stone
Channel Dimension	10'L, 5'W, 1.75'H
Emergency Spillway Invert Elevation	833.25 feet
Maximum pool elevation 100-year 24-hour storm	834.03 feet
Maximum pool volume for 100-year 24-hour storm	224,700 cubic-feet
Top of Embankment	835.25 feet
Freeboard above the 100-year elevation	1.22 feet

ANTI-SEEP COLLAR DESIGN

Anti-seep collars provide a means to reduce seepage along outlet pipes through the embankments for any pipes that may be saturated. The number and size of anti-seep collars shall be selected such that increase in seepage length (Ls), increases by a minimum 15% within the normal saturation zone. The normal saturation zone is determined by the phreatic line drawn at a 4H:1V slope. The principal spillway barrel pipe (24") shall be placed at the Normal Water Surface Elevation of 831.00. Due to the 10-year/24-hour pool elevation of 832.67, the phreatic surface is within the cross section of the pipe; therefore, the saturation zone must be evaluated to determine how many anti-seep collars are required. The calculations below are based on The Ohio Department of Transportation design guidelines[7].

$$Ls = Y(Z+4)\left[1+\left(\frac{S}{(0.25-S)}\right)\right.$$

Where:

Ls = seepage length (ft)
Y = Depth of water in pond during the 10 yr/24-hour event (ft)
Z = Slope of upstream face of embankment (Z ft horizontal:1 vertical)
S = Slope of the Barrel Pipe (ft/ft)

$$Ls = 1.67(4+4)[1+\left(\frac{0.0105}{(0.25-0.0105)}\right) = 13.95\,ft$$

Required Seepage Length Increase:

$$\Delta L_s = L_s * 0.15 = 13.95 * 0.15 = 2.09 \text{ ft}$$

Anti-Seep collars must be sized to provide a minimum of 2 feet of projection on all sides of the outlet pipe and be sized in 1 foot increments. The outlet pipe is a 36" pipe; therefore the Anti-Seep collar shall be 7 feet by 7 feet.

Determine the total number of collars required:

$$P = W - D = 7 - 2 = 5.0 \text{ feet}$$

Where:
P = Projection of Collar (ft)
W = Height or Width of Collar (ft)
D = Inside Diameter Outlet Pipe (ft)

$$\text{Number of Collars required} = \Delta L_s / P = 2.09/5.0 = 0.418$$

One 6 feet by 6 feet anti-seep collar will be provided.

OUTLET CHANNEL

The proposed principal spillway and emergency spillway will outlet to the proposed Outboard Perimeter Channel which will convey the outflow from this pond downstream of the proposed landfill to the existing stream within Carter Hollow. (Please see "OAC 3745-30-05 (C)(6)(k)

Permanent Surface Water Control Structures Outboard Perimeter Channel Design Calculations" for additional information regarding the channel design)

CONCLUSIONS:

The proposed Sedimentation Pond F has been designed to meet the regulations as outlined in OAC 3745-30-07(C)(4)(d) by utilizing a 24-inch RCP culvert pipe with an invert elevation of 831.00. This culvert has been designed to safely pass the flow from the 10-year/24-hour storm event. The routing of the 25-year/24-hour storm event produces a water level elevation of 833.37, which is below the invert of the proposed emergency spillway. The flow from the 100-yr/24-hr storm was routed through the proposed principal spillway and the emergency spillway, which has an invert elevation of 833.50. The maximum pool elevation for the 100-year/24-hour storm event is 834.29, which results in over one foot of freeboard in relation to the top of the embankment which is set at 835.50.

REFERENCES

1. National Climatic Data Center, *Precipitation Frequency Estimates*, Point Precipitation Frequency Estimate From NOAA Atlas 14 Ohio 38.65 N 83.65 W 800 feet, Viewed 19 May 2009,< http://hdsc.nws.noaa.gov/hdsc/pfds/index.html>.

2. National Resources Conservation Service, PART 630 HYDROLOGY NATIONAL ENGINEERING HANDBOOK, July 2004.

3. Ven Te Chow, OPEN CHANNEL HYDRAULICS, Mc-Graw Hill Book Company, 1959.

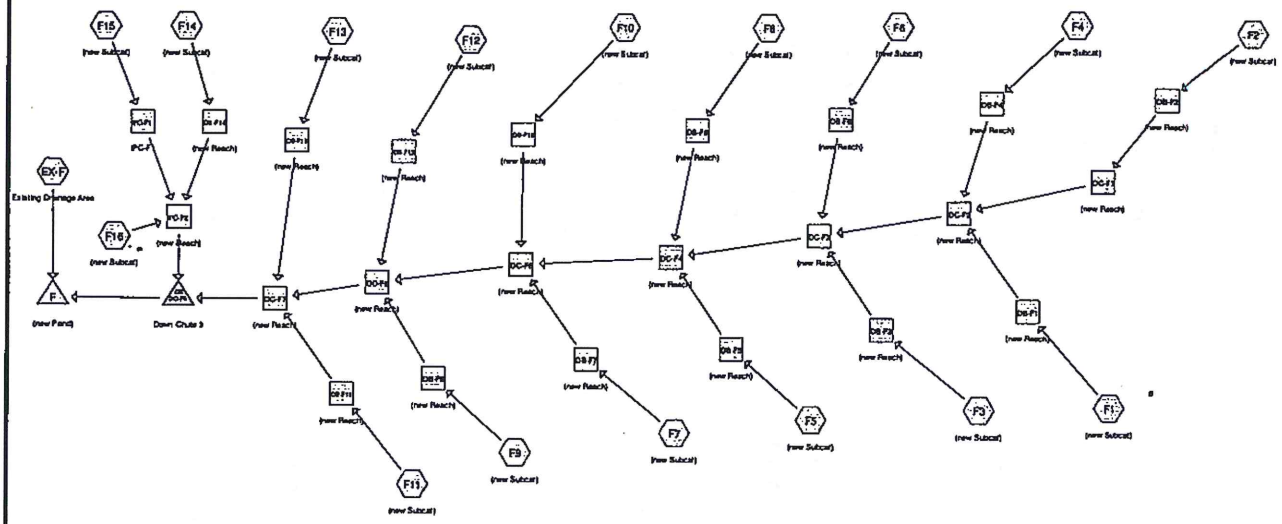
4. Goldman, Jackson and Bursztynsky, EROSION AND SEDIMENT CONTROL HANDBOOK, Mc-Graw Hill Book Company, 1986.

5. Soil Conservation Service, WATER MANAGEMENT AND SEDIMENT CONTROL FOR URBANIZING AREAS, distributed by Ohio Soil and Water Conservation Service.

6. HydroCAD Software Solutions LLC, HYDROCAD, Version 9.10, 2009, Computer Software Program.

7. The Ohio Department of Transportation, LOCATION AND DESIGN MANUAL VOLUME TWO: DRAINAGE DESIGN, July 2009.

SEDIMENTATION POND HYDROCAD OUTPUT AND HYDROGRAPH FILES



Subcat Reach Pond Link

Drainage Diagram for 071-644_SWM POND A,C,B,F
Prepared by {enter your company name here}, Printed 3/26/2010
HydroCAD® 9.10 s/n 05876 © 2009 HydroCAD Software Solutions LLC

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

Subcatchment EX-F: Existing Drainage Area Runoff Area=18.856 ac 0.00% Impervious Runoff Depth=1.86"
Flow Length=1,022' Tc=9.1 min CN=76 Runoff=55.97 cfs 2.926 af

Subcatchment F1: (new Subcat) Runoff Area=0.551 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=99' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=2.24 cfs 0.096 af

Subcatchment F10: (new Subcat) Runoff Area=0.894 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=3.64 cfs 0.156 af

Subcatchment F11: (new Subcat) Runoff Area=2.180 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=102' Slope=0.2500 '/' Tc=3.8 min CN=79 Runoff=8.84 cfs 0.380 af

Subcatchment F12: (new Subcat) Runoff Area=0.919 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=3.74 cfs 0.160 af

Subcatchment F13: (new Subcat) Runoff Area=0.944 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=3.84 cfs 0.165 af

Subcatchment F14: (new Subcat) Runoff Area=0.939 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=97' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=3.82 cfs 0.164 af

Subcatchment F15: (new Subcat) Runoff Area=0.688 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=117' Slope=0.2500 '/' Tc=3.8 min CN=79 Runoff=2.79 cfs 0.120 af

Subcatchment F16: (new Subcat) Runoff Area=1.310 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=108' Slope=0.2500 '/' Tc=4.0 min CN=79 Runoff=5.27 cfs 0.229 af

Subcatchment F2: (new Subcat) Runoff Area=0.604 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=116' Tc=11.0 min CN=79 Runoff=1.88 cfs 0.105 af

Subcatchment F3: (new Subcat) Runoff Area=2.028 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=99' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=8.25 cfs 0.354 af

Subcatchment F4: (new Subcat) Runoff Area=0.818 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=3.33 cfs 0.143 af

Subcatchment F5: (new Subcat) Runoff Area=1.579 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=6.42 cfs 0.276 af

Subcatchment F6: (new Subcat) Runoff Area=0.853 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=3.47 cfs 0.149 af

Subcatchment F7: (new Subcat) Runoff Area=1.775 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=7.22 cfs 0.310 af

Subcatchment F8: (new Subcat) Runoff Area=0.869 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=3.54 cfs 0.152 af

Subcatchment F9: (new Subcat) Runoff Area=1.973 ac 0.00% Impervious Runoff Depth=2.09"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=8.03 cfs 0.344 af

Reach DB-F1: (new Reach) Avg. Flow Depth=0.46' Max Vel=3.00 fps Inflow=2.24 cfs 0.096 af
n=0.022 L=164.0' S=0.0148 '/' Capacity=112.08 cfs Outflow=2.21 cfs 0.096 af

Reach DB-F10: (new Reach) Avg. Flow Depth=0.52' Max Vel=3.74 fps Inflow=3.64 cfs 0.156 af
n=0.022 L=387.0' S=0.0197 '/' Capacity=129.37 cfs Outflow=3.48 cfs 0.156 af

Reach DB-F11: (new Reach) Avg. Flow Depth=0.69' Max Vel=4.61 fps Inflow=8.84 cfs 0.380 af
n=0.022 L=996.2' S=0.0202 '/' Capacity=130.76 cfs Outflow=7.76 cfs 0.380 af

Reach DB-F12: (new Reach) Avg. Flow Depth=0.52' Max Vel=3.76 fps Inflow=3.74 cfs 0.160 af
n=0.022 L=397.9' S=0.0197 '/' Capacity=129.33 cfs Outflow=3.57 cfs 0.160 af

Reach DB-F13: (new Reach) Avg. Flow Depth=0.53' Max Vel=3.70 fps Inflow=3.84 cfs 0.165 af
n=0.022 L=408.9' S=0.0185 '/' Capacity=125.26 cfs Outflow=3.65 cfs 0.165 af

Reach DB-F14: (new Reach) Avg. Flow Depth=0.48' Max Vel=4.59 fps Inflow=3.82 cfs 0.164 af
n=0.022 L=465.2' S=0.0329 '/' Capacity=166.99 cfs Outflow=3.66 cfs 0.164 af

Reach DB-F2: (new Reach) Avg. Flow Depth=0.41' Max Vel=3.19 fps Inflow=1.88 cfs 0.105 af
n=0.022 L=343.1' S=0.0197 '/' Capacity=129.25 cfs Outflow=1.84 cfs 0.105 af

Reach DB-F3: (new Reach) Avg. Flow Depth=0.69' Max Vel=4.60 fps Inflow=8.25 cfs 0.354 af
n=0.022 L=552.7' S=0.0202 '/' Capacity=130.99 cfs Outflow=7.67 cfs 0.354 af

Reach DB-F4: (new Reach) Avg. Flow Depth=0.50' Max Vel=3.66 fps Inflow=3.33 cfs 0.143 af
n=0.022 L=354.1' S=0.0198 '/' Capacity=129.46 cfs Outflow=3.20 cfs 0.143 af

Reach DB-F5: (new Reach) Avg. Flow Depth=0.62' Max Vel=4.33 fps Inflow=6.42 cfs 0.276 af
n=0.022 L=738.3' S=0.0206 '/' Capacity=132.12 cfs Outflow=5.84 cfs 0.276 af

Reach DB-F6: (new Reach) Avg. Flow Depth=0.51' Max Vel=3.70 fps Inflow=3.47 cfs 0.149 af
n=0.022 L=369.2' S=0.0197 '/' Capacity=129.39 cfs Outflow=3.33 cfs 0.149 af

Reach DB-F7: (new Reach) Avg. Flow Depth=0.64' Max Vel=4.46 fps Inflow=7.22 cfs 0.310 af
n=0.022 L=823.9' S=0.0208 '/' Capacity=132.85 cfs Outflow=6.49 cfs 0.310 af

Reach DB-F8: (new Reach) Avg. Flow Depth=0.51' Max Vel=3.71 fps Inflow=3.54 cfs 0.152 af
n=0.022 L=376.0' S=0.0197 '/' Capacity=129.35 cfs Outflow=3.39 cfs 0.152 af

Reach DB-F9: (new Reach) Avg. Flow Depth=0.67' Max Vel=4.56 fps Inflow=8.03 cfs 0.344 af
n=0.022 L=909.5' S=0.0208 '/' Capacity=132.70 cfs Outflow=7.14 cfs 0.344 af

Reach DC-F1: (new Reach) Avg. Flow Depth=0.11' Max Vel=3.98 fps Inflow=1.84 cfs 0.105 af
n=0.040 L=100.0' S=0.2496 '/' Capacity=419.47 cfs Outflow=1.83 cfs 0.105 af

Reach DC-F2: (new Reach) Avg. Flow Depth=0.23' Max Vel=6.26 fps Inflow=6.66 cfs 0.344 af
n=0.040 L=100.0' S=0.2497 '/' Capacity=419.56 cfs Outflow=6.65 cfs 0.344 af

Reach DC-F3: (new Reach) Avg. Flow Depth=0.40' Max Vel=8.60 fps Inflow=17.64 cfs 0.847 af
n=0.040 L=100.0' S=0.2496 '/' Capacity=419.47 cfs Outflow=17.63 cfs 0.847 af

Reach DC-F4: (new Reach) Avg. Flow Depth=0.50' Max Vel=9.79 fps Inflow=26.84 cfs 1.274 af
n=0.040 L=100.0' S=0.2497 '/' Capacity=419.56 cfs Outflow=26.83 cfs 1.274 af

Reach DC-F5: (new Reach) Avg. Flow Depth=0.59' Max Vel=10.75 fps Inflow=36.78 cfs 1.740 af
n=0.040 L=100.0' S=0.2496 '/' Capacity=419.47 cfs Outflow=36.77 cfs 1.740 af

Reach DC-F6: (new Reach) Avg. Flow Depth=0.68' Max Vel=11.58 fps Inflow=47.44 cfs 2.245 af
n=0.040 L=100.0' S=0.2494 '/' Capacity=419.30 cfs Outflow=47.42 cfs 2.245 af

Reach DC-F7: (new Reach) Avg. Flow Depth=0.73' Max Vel=13.07 fps Inflow=58.78 cfs 2.790 af
n=0.040 L=26.2' S=0.2943 '/' Capacity=455.47 cfs Outflow=58.78 cfs 2.790 af

Reach IPC-F1: IPC-F1 Avg. Flow Depth=0.25' Max Vel=2.33 fps Inflow=2.79 cfs 0.120 af
n=0.040 L=261.9' S=0.0290 '/' Capacity=116.54 cfs Outflow=2.68 cfs 0.120 af

Reach IPC-F2: (new Reach) Avg. Flow Depth=0.55' Max Vel=3.63 fps Inflow=11.53 cfs 0.513 af
n=0.040 L=867.2' S=0.0291 '/' Capacity=116.70 cfs Outflow=10.14 cfs 0.513 af

Pond DC-F8: Down Chute 3 Peak Elev=835.86' Inflow=68.74 cfs 3.302 af
36.0" Round Culvert x 2.00 n=0.012 L=121.0' S=0.0110 '/' Outflow=68.74 cfs 3.302 af

Pond F: (new Pond) Peak Elev=832.67' Storage=409,541 cf Inflow=122.35 cfs 6.228 af
Primary=17.74 cfs 6.095 af Secondary=0.00 cfs 0.000 af Outflow=17.74 cfs 6.095 af

Total Runoff Area = 37.780 ac Runoff Volume = 6.228 af Average Runoff Depth = 1.98"
100.00% Pervious = 37.780 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment EX-F: Existing Drainage Area

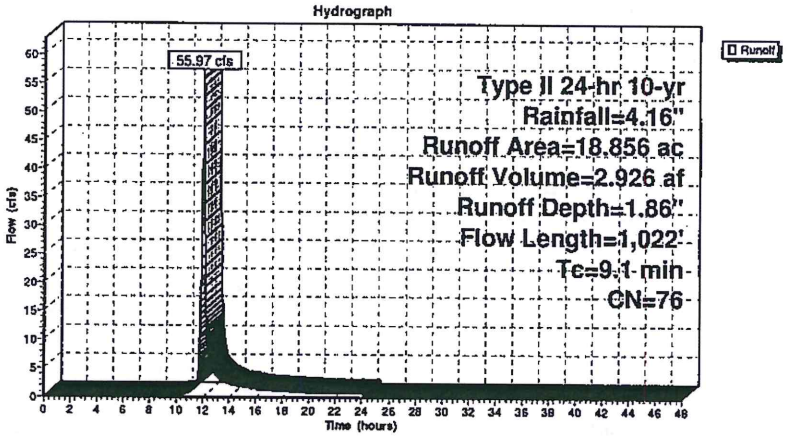
Runoff = 55.97 cfs @ 12.01 hrs, Volume= 2.926 af, Depth= 1.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
18.856	76	Woods/grass comb., Fair, HSG C
18.856		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0460	0.23		Sheet Flow, Sheet Flow Grass: Short n= 0.150 P2= 2.91"
1.1	179	0.1450	2.67		Shallow Concentrated Flow, Shallow Concentrated Short Grass Pasture Kv= 7.0 fps
0.6	743	0.1290	20.54	328.60	Channel Flow, Area= 16.0 sf Perim= 12.9' r= 1.24' n= 0.030 Earth, grassed & winding
9.1	1,022	Total			

Subcatchment EX-F: Existing Drainage Area



Summary for Subcatchment F1: (new Subcat)

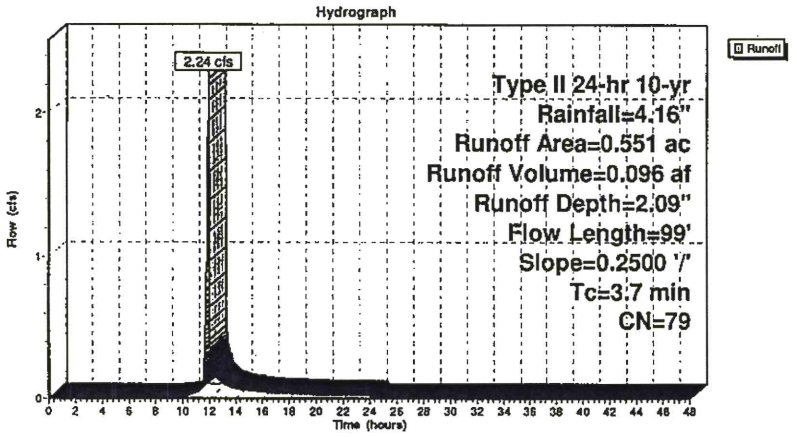
Runoff = 2.24 cfs @ 11.95 hrs, Volume= 0.096 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.551	79	50-75% Grass cover, Fair, HSG C
0.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	99	0.2500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F1: (new Subcat)



Summary for Subcatchment F10: (new Subcat)

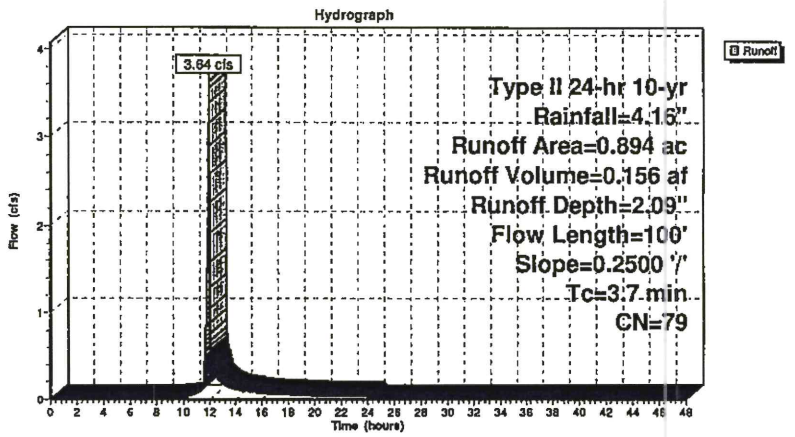
Runoff = 3.64 cfs @ 11.95 hrs, Volume= 0.156 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.894	79	50-75% Grass cover, Fair, HSG C
0.894		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F10: (new Subcat)



Summary for Subcatchment F11: (new Subcat)

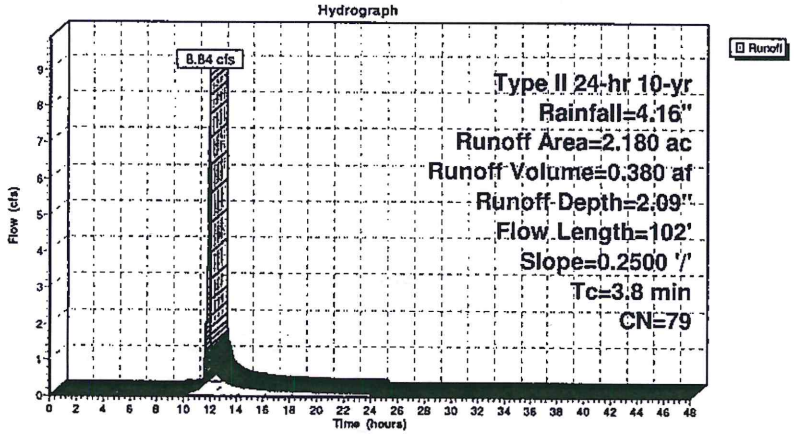
Runoff = 8.84 cfs @ 11.95 hrs, Volume= 0.380 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
2.180	79	50-75% Grass cover, Fair, HSG C
2.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	102	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F11: (new Subcat)



Summary for Subcatchment F12: (new Subcat)

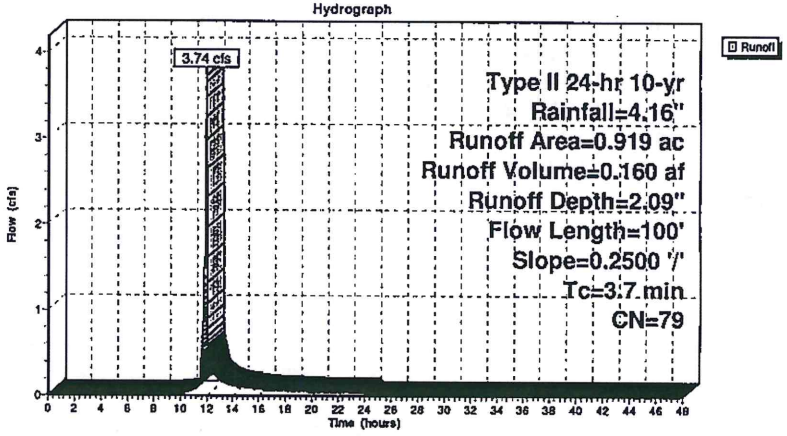
Runoff = 3.74 cfs @ 11.95 hrs, Volume= 0.160 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.919	79	50-75% Grass cover, Fair, HSG C
0.919		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F12: (new Subcat)



Summary for Subcatchment F13: (new Subcat)

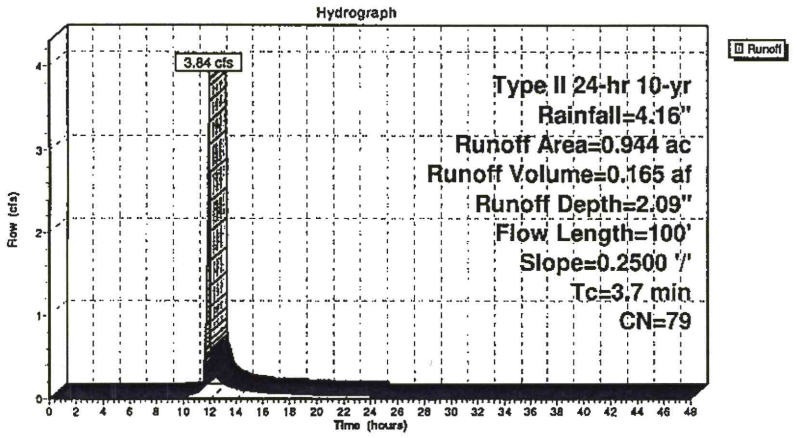
Runoff = 3.84 cfs @ 11.95 hrs, Volume= 0.165 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.944	79	50-75% Grass cover, Fair, HSG C
0.944		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F13: (new Subcat)



Summary for Subcatchment F14: (new Subcat)

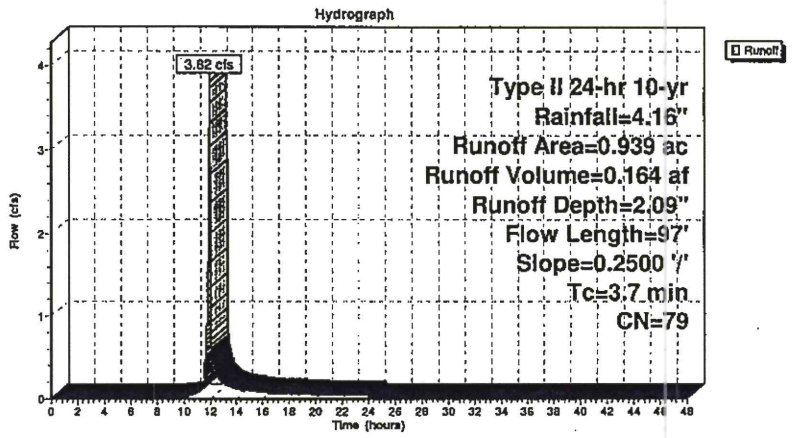
Runoff = 3.82 cfs @ 11.95 hrs, Volume= 0.164 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.939	79	50-75% Grass cover, Fair, HSG C
0.939		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	97	0.2500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F14: (new Subcat)



Summary for Subcatchment F15: (new Subcat)

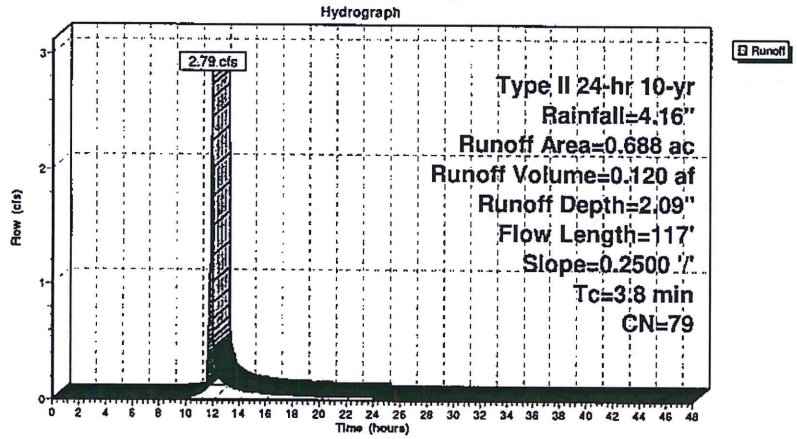
Runoff = 2.79 cfs @ 11.95 hrs, Volume= 0.120 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.688	79	50-75% Grass cover, Fair, HSG C
0.688		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"
0.1	17	0.2500	3.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.8	117	Total			

Subcatchment F15: (new Subcat)



Summary for Subcatchment F16: (new Subcat)

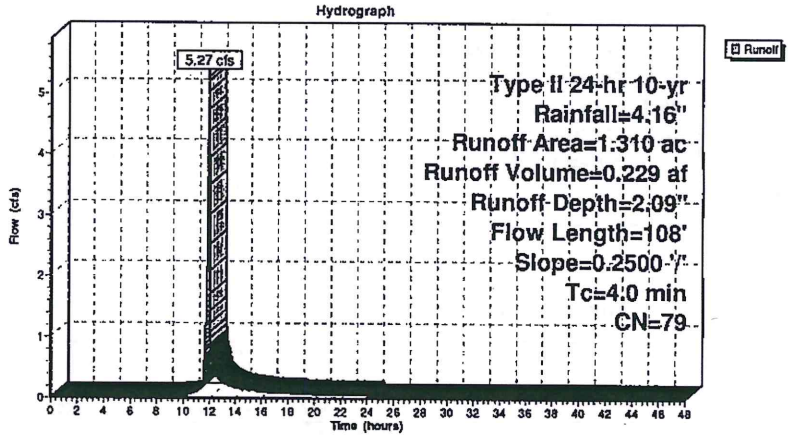
Runoff = 5.27 cfs @ 11.95 hrs, Volume= 0.229 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.310	79	50-75% Grass cover, Fair, HSG C
1.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	108	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F16: (new Subcat)



Summary for Subcatchment F2: (new Subcat)

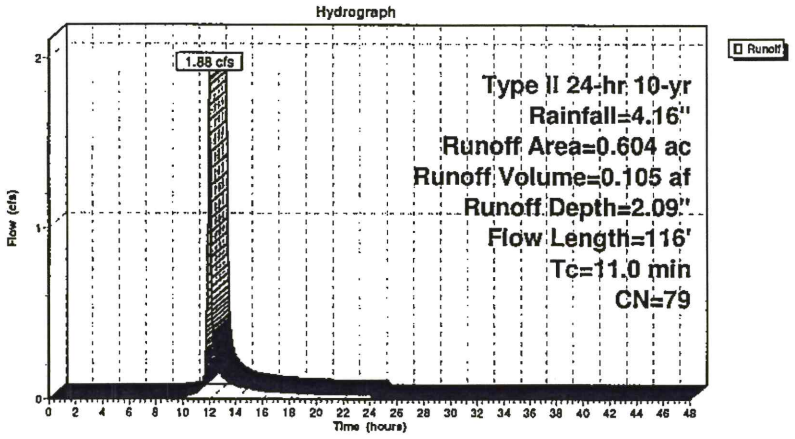
Runoff = 1.88 cfs @ 12.03 hrs, Volume= 0.105 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.604	79	50-75% Grass cover, Fair, HSG C
0.604		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	109	0.0200	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
0.0	7	0.2500	3.50		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	116	Total			

Subcatchment F2: (new Subcat)



Summary for Subcatchment F3: (new Subcat)

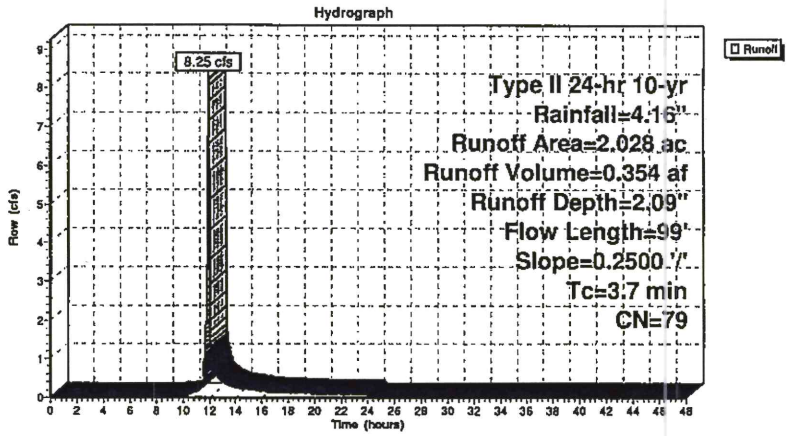
Runoff = 8.25 cfs @ 11.95 hrs, Volume= 0.354 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
2.028	79	50-75% Grass cover, Fair, HSG C
2.028		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	99	0.2500	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Subcatchment F3: (new Subcat)



Summary for Subcatchment F4: (new Subcat)

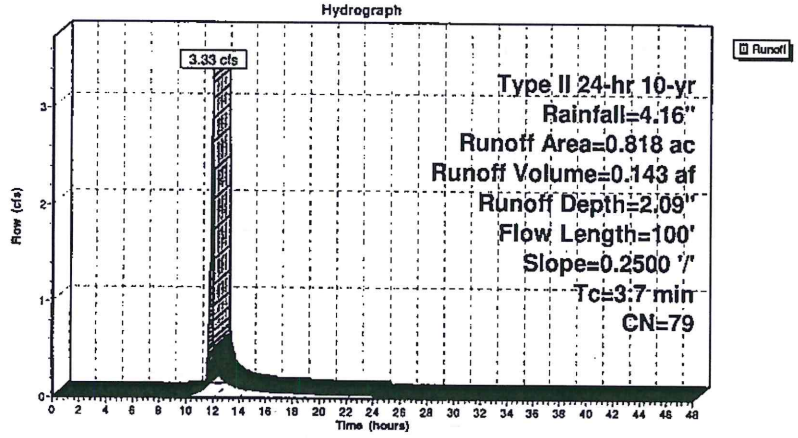
Runoff = 3.33 cfs @ 11.95 hrs, Volume= 0.143 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.818	79	50-75% Grass cover, Fair, HSG C
0.818		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F4: (new Subcat)



Summary for Subcatchment F5: (new Subcat)

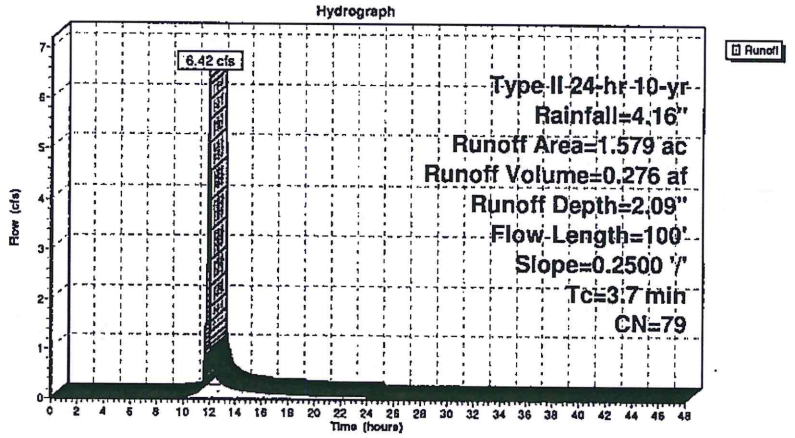
Runoff = 6.42 cfs @ 11.95 hrs, Volume= 0.276 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.579	79	50-75% Grass cover, Fair, HSG C
1.579		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F5: (new Subcat)



Summary for Subcatchment F6: (new Subcat)

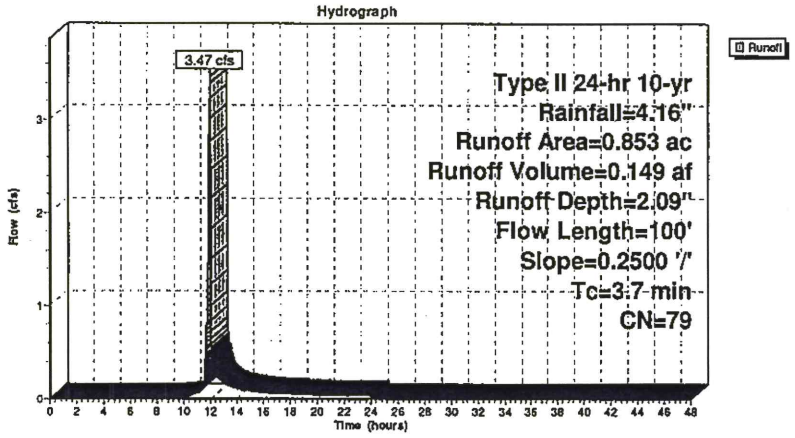
Runoff = 3.47 cfs @ 11.95 hrs, Volume= 0.149 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.853	79	50-75% Grass cover, Fair, HSG C
0.853		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F6: (new Subcat)



Summary for Subcatchment F7: (new Subcat)

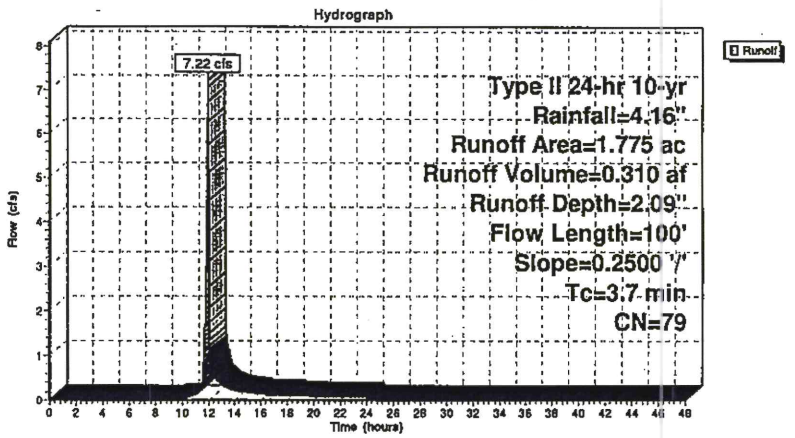
Runoff = 7.22 cfs @ 11.95 hrs, Volume= 0.310 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.775	79	50-75% Grass cover, Fair, HSG C
1.775		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F7: (new Subcat)



Summary for Subcatchment F8: (new Subcat)

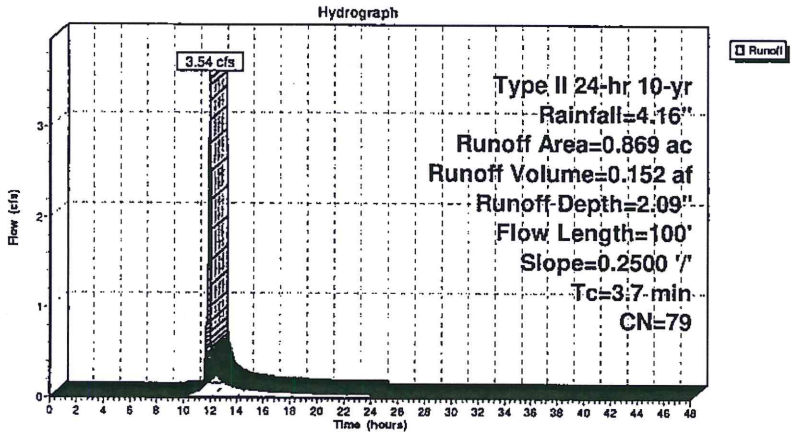
Runoff = 3.54 cfs @ 11.95 hrs, Volume= 0.152 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.869	79	50-75% Grass cover, Fair, HSG C
0.869		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F8: (new Subcat)



Summary for Subcatchment F9: (new Subcat)

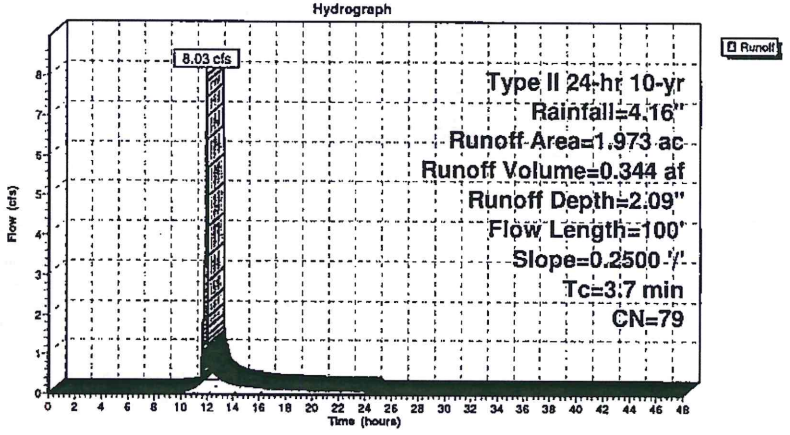
Runoff = 8.03 cfs @ 11.95 hrs, Volume= 0.344 af, Depth= 2.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.973	79	50-75% Grass cover, Fair, HSG C
1.973		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F9: (new Subcat)



Summary for Reach DB-F1: (new Reach)

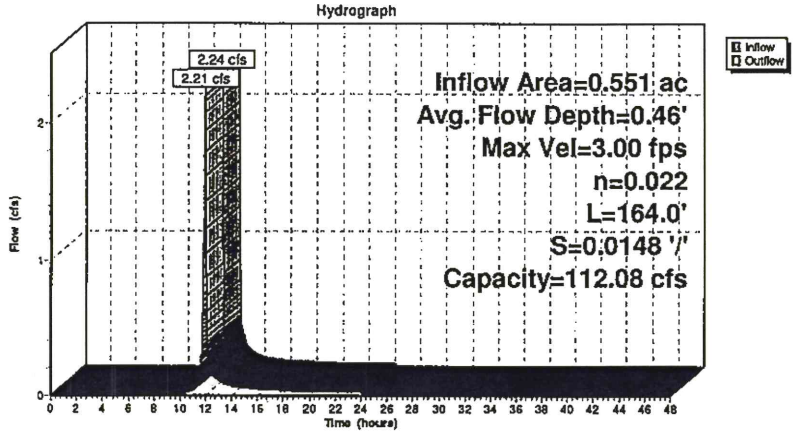
Inflow Area = 0.551 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 2.24 cfs @ 11.95 hrs, Volume= 0.096 af
Outflow = 2.21 cfs @ 11.96 hrs, Volume= 0.096 af, Atten= 2%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.00 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.08 fps, Avg. Travel Time= 2.5 min

Peak Storage= 121 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 112.08 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 164.0' Slope= 0.0148 '/'
Inlet Invert= 972.77', Outlet Invert= 970.34'

Reach DB-F1: (new Reach)



Summary for Reach DB-F10: (new Reach)

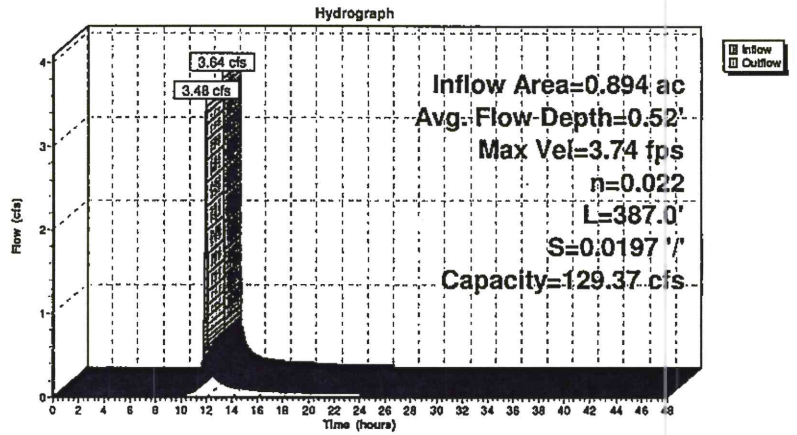
Inflow Area = 0.894 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 3.64 cfs @ 11.95 hrs, Volume= 0.156 af
Outflow = 3.48 cfs @ 11.97 hrs, Volume= 0.156 af, Atten= 4%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.74 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 4.9 min

Peak Storage= 360 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.37 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 387.0' Slope= 0.0197 '/'
Inlet Invert= 903.08', Outlet Invert= 895.44'

Reach DB-F10: (new Reach)



Summary for Reach DB-F11: (new Reach)

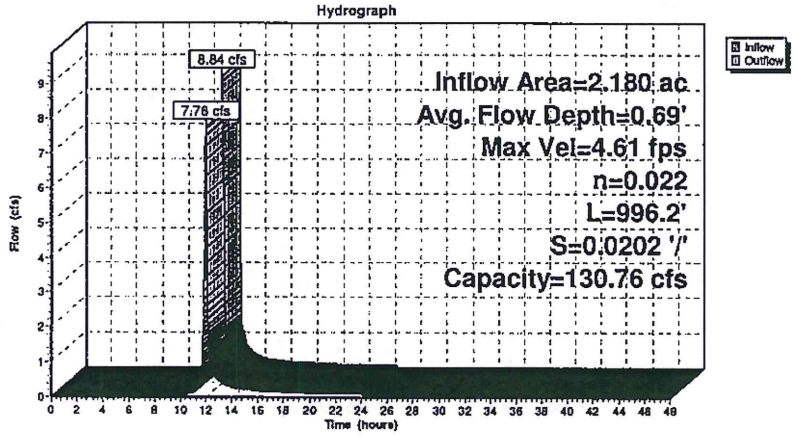
Inflow Area = 2.180 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 8.84 cfs @ 11.95 hrs, Volume= 0.380 af
Outflow = 7.76 cfs @ 11.98 hrs, Volume= 0.380 af, Atten= 12%, Lag= 1.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.61 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 1.55 fps, Avg. Travel Time= 10.7 min

Peak Storage= 1,676 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.69'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.76 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 996.2' Slope= 0.0202 '/'
Inlet Invert= 865.63', Outlet Invert= 845.54'

Reach DB-F11: (new Reach)



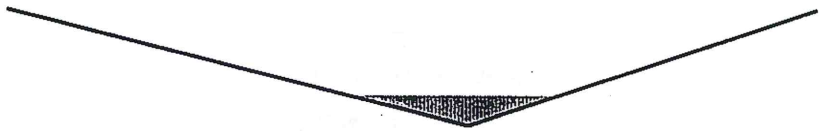
Summary for Reach DB-F12: (new Reach)

Inflow Area = 0.919 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 3.74 cfs @ 11.95 hrs, Volume= 0.160 af
Outflow = 3.57 cfs @ 11.97 hrs, Volume= 0.160 af, Atten= 5%, Lag= 1.1 min

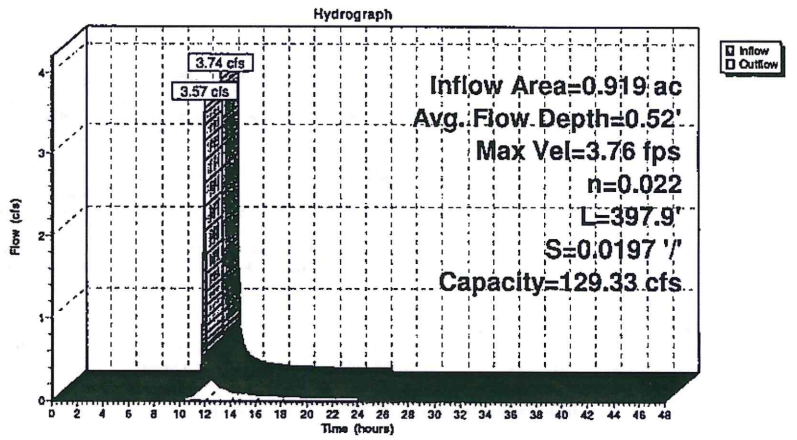
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.76 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 5.0 min

Peak Storage= 377 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.33 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 397.9' Slope= 0.0197 '/'
Inlet Invert= 878.33', Outlet Invert= 870.48'



Reach DB-F12: (new Reach)



Summary for Reach DB-F13: (new Reach)

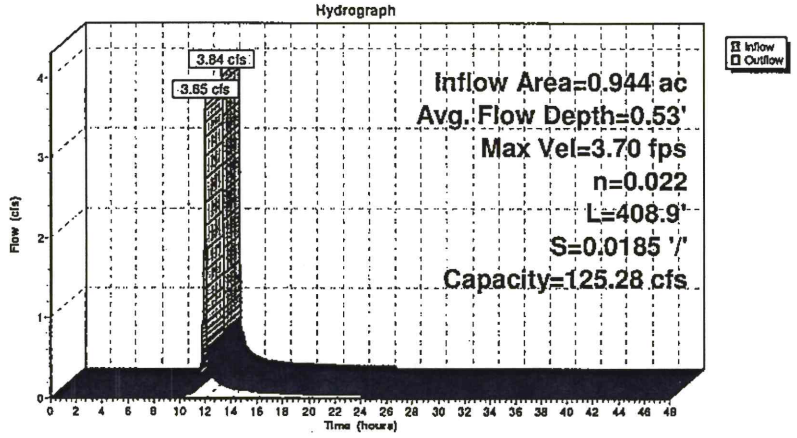
Inflow Area = 0.944 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 3.84 cfs @ 11.95 hrs, Volume= 0.165 af
Outflow = 3.65 cfs @ 11.97 hrs, Volume= 0.165 af, Atten= 5%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.70 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 5.2 min

Peak Storage= 404 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 125.28 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 408.9' Slope= 0.0185 '/'
Inlet Invert= 853.11', Outlet Invert= 845.54'

Reach DB-F13: (new Reach)



Summary for Reach DB-F14: (new Reach)

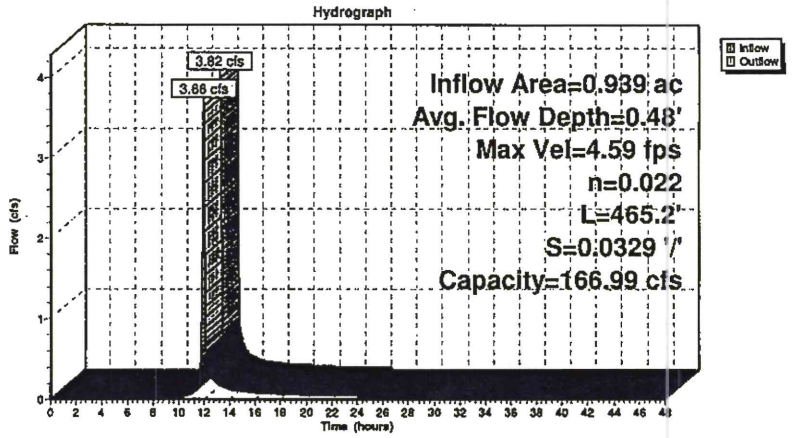
Inflow Area = 0.939 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 3.82 cfs @ 11.95 hrs, Volume= 0.164 af
Outflow = 3.66 cfs @ 11.96 hrs, Volume= 0.164 af, Atten= 4%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.59 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 4.8 min

Peak Storage= 371 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.48'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 166.99 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 465.2' Slope= 0.0329 '/'
Inlet Invert= 878.33', Outlet Invert= 863.03'

Reach DB-F14: (new Reach)



Summary for Reach DB-F2: (new Reach)

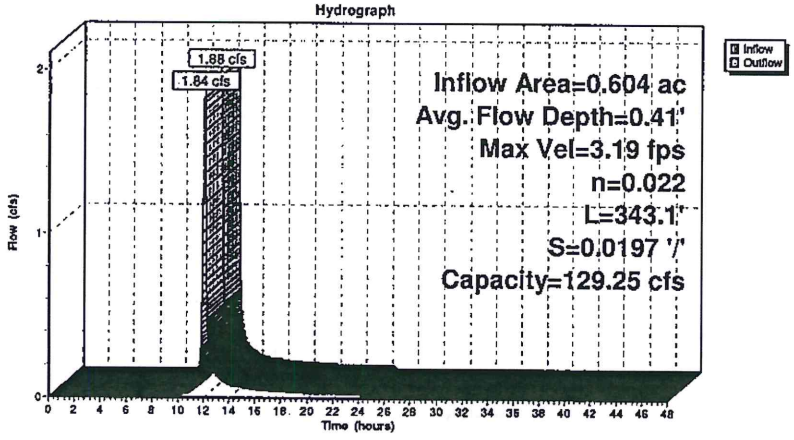
Inflow Area = 0.604 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 1.88 cfs @ 12.03 hrs, Volume= 0.105 af
Outflow = 1.84 cfs @ 12.05 hrs, Volume= 0.105 af, Atten= 2%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.19 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.21 fps, Avg. Travel Time= 4.7 min

Peak Storage= 198 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.25 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 343.1' Slope= 0.0197 '/'
Inlet Invert= 1,002.06', Outlet Invert= 995.30'

Reach DB-F2: (new Reach)



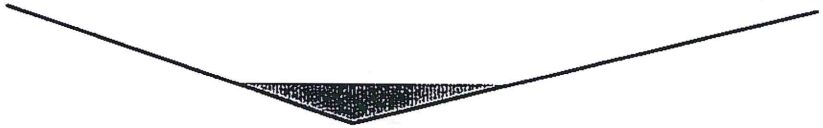
Summary for Reach DB-F3: (new Reach)

Inflow Area = 2.028 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 8.25 cfs @ 11.95 hrs, Volume= 0.354 af
Outflow = 7.67 cfs @ 11.97 hrs, Volume= 0.354 af, Atten= 7%, Lag= 1.4 min

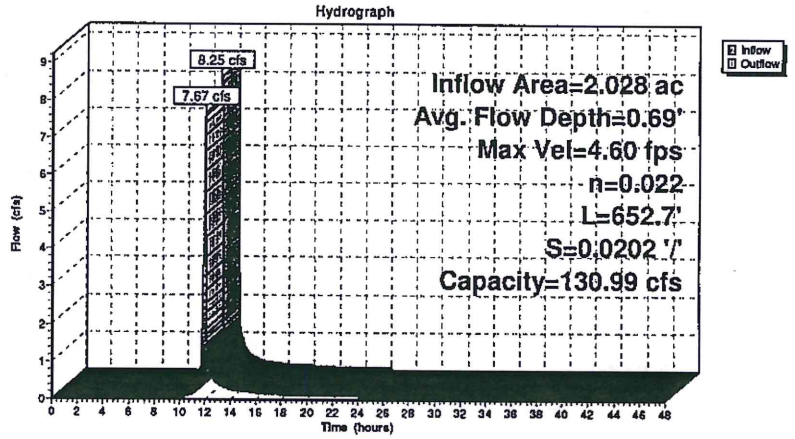
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.60 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 1.58 fps, Avg. Travel Time= 6.9 min

Peak Storage= 1,088 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.69'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.99 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 652.7' Slope= 0.0202 '/'
Inlet Invert= 958.58', Outlet Invert= 945.37'



Reach DB-F3: (new Reach)



Summary for Reach DB-F4: (new Reach)

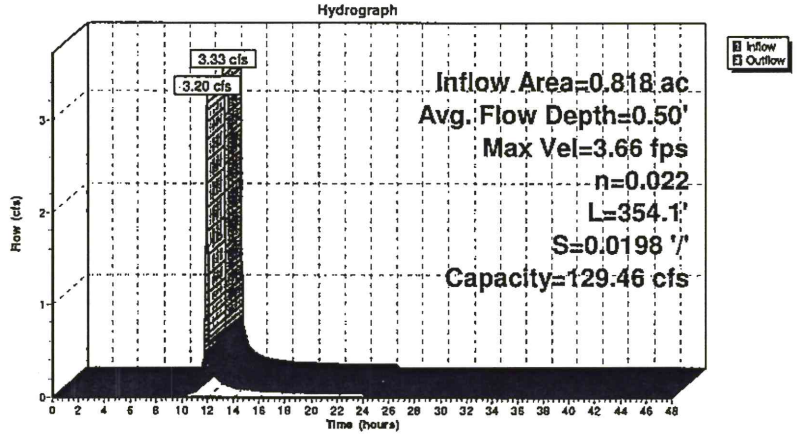
Inflow Area = 0.818 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 3.33 cfs @ 11.95 hrs, Volume= 0.143 af
Outflow = 3.20 cfs @ 11.96 hrs, Volume= 0.143 af, Atten= 4%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.66 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 4.5 min

Peak Storage= 309 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.46 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 354.1' Slope= 0.0198 '/'
Inlet Invert= 977.34', Outlet Invert= 970.34'

Reach DB-F4: (new Reach)



Summary for Reach DB-F5: (new Reach)

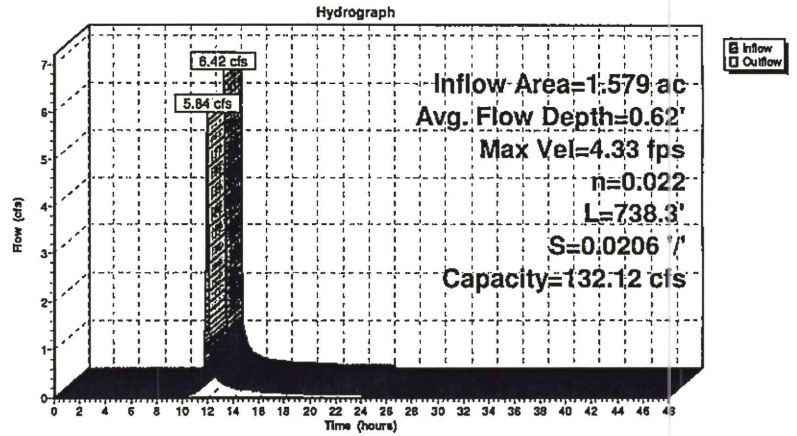
Inflow Area = 1.579 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 6.42 cfs @ 11.95 hrs, Volume= 0.276 af
Outflow = 5.84 cfs @ 11.97 hrs, Volume= 0.276 af, Atten= 9%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.33 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 8.3 min

Peak Storage= 997 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 132.12 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 738.3' Slope= 0.0206 '/'
Inlet Invert= 935.61', Outlet Invert= 920.41'

Reach DB-F5: (new Reach)



Summary for Reach DB-F6: (new Reach)

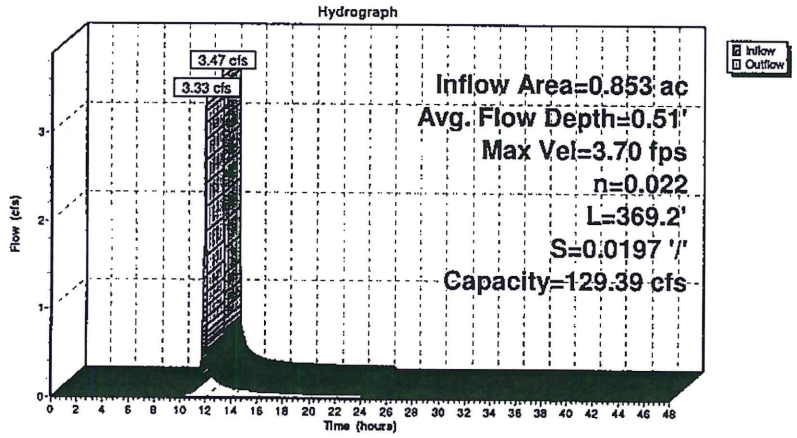
Inflow Area = 0.853 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 3.47 cfs @ 11.95 hrs, Volume= 0.149 af
Outflow = 3.33 cfs @ 11.96 hrs, Volume= 0.149 af, Atten= 4%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.70 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.31 fps, Avg. Travel Time= 4.7 min

Peak Storage= 332 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.39 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 369.2' Slope= 0.0197 '/'
Inlet Invert= 952.66', Outlet Invert= 945.37'

Reach DB-F6: (new Reach)



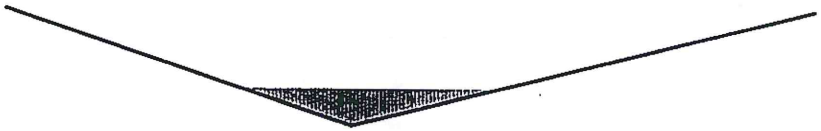
Summary for Reach DB-F7: (new Reach)

Inflow Area = 1.775 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 7.22 cfs @ 11.95 hrs, Volume= 0.310 af
Outflow = 6.49 cfs @ 11.98 hrs, Volume= 0.310 af, Atten= 10%, Lag= 1.7 min

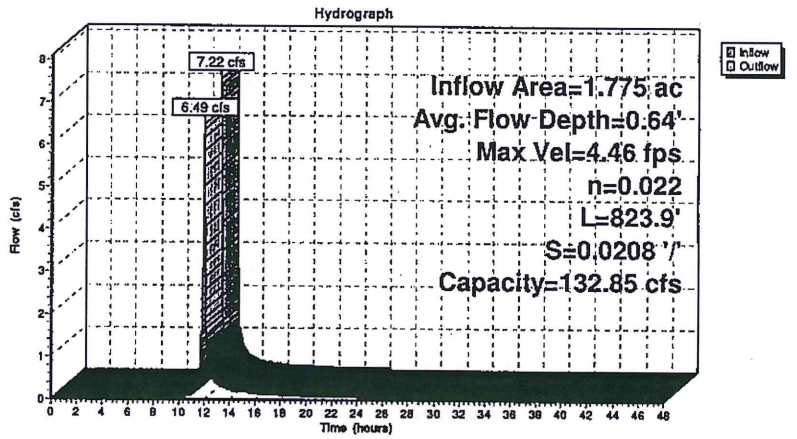
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.46 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 9.0 min

Peak Storage= 1,199 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.64'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 132.85 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 823.9' Slope= 0.0208 '/'
Inlet Invert= 912.59', Outlet Invert= 895.44'



Reach DB-F7: (new Reach)



Summary for Reach DB-F8: (new Reach)

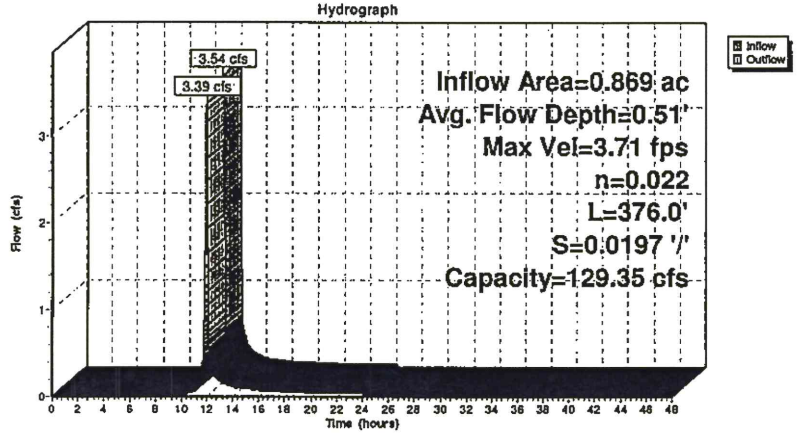
Inflow Area = 0.869 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 3.54 cfs @ 11.95 hrs, Volume= 0.152 af
Outflow = 3.39 cfs @ 11.96 hrs, Volume= 0.152 af, Atten= 4%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.71 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 4.8 min

Peak Storage= 342 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.35 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 376.0' Slope= 0.0197 '/'
Inlet Invert= 927.83', Outlet Invert= 920.41'

Reach DB-F8: (new Reach)



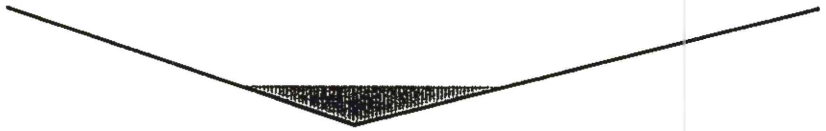
Summary for Reach DB-F9: (new Reach)

Inflow Area = 1.973 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 8.03 cfs @ 11.95 hrs, Volume= 0.344 af
Outflow = 7.14 cfs @ 11.98 hrs, Volume= 0.344 af, Atten= 11%, Lag= 1.8 min

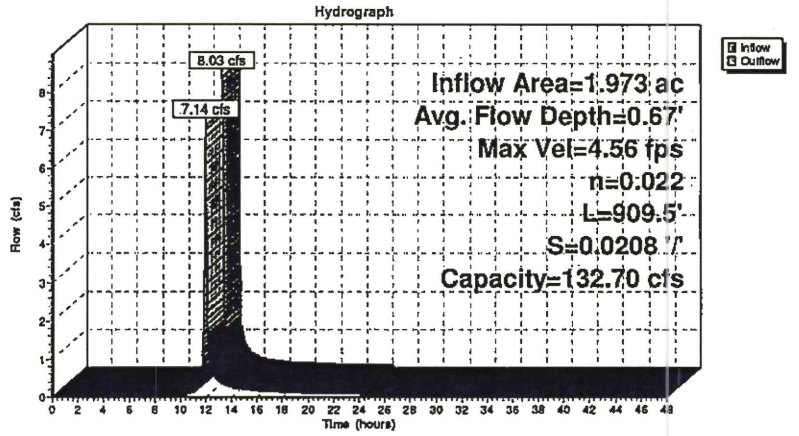
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.56 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.54 fps, Avg. Travel Time= 9.8 min

Peak Storage= 1,422 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.67'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 132.70 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 909.5' Slope= 0.0208 '/'
Inlet Invert= 889.37', Outlet Invert= 870.48'



Reach DB-F9: (new Reach)



Summary for Reach DC-F1: (new Reach)

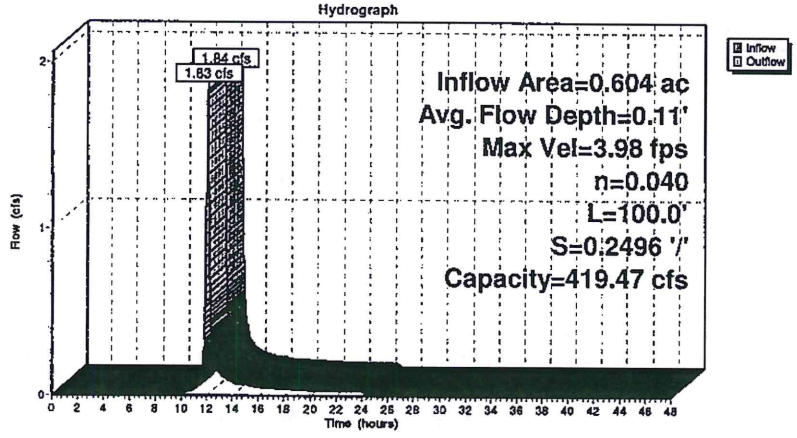
Inflow Area = 0.604 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 1.84 cfs @ 12.05 hrs, Volume= 0.105 af
Outflow = 1.83 cfs @ 12.05 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.98 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 1.2 min

Peak Storage= 46 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.47 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2496 '/'
Inlet Invert= 995.30', Outlet Invert= 970.34'

Reach DC-F1: (new Reach)



Summary for Reach DC-F2: (new Reach)

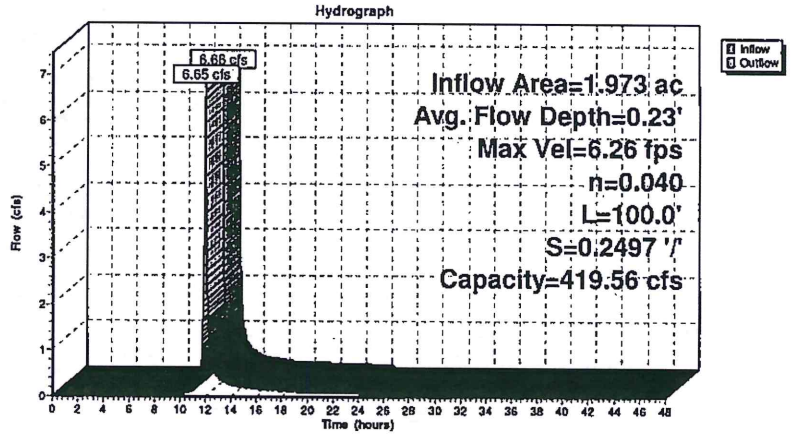
Inflow Area = 1.973 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 6.66 cfs @ 11.97 hrs, Volume= 0.344 af
Outflow = 6.65 cfs @ 11.97 hrs, Volume= 0.344 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.26 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.67 fps, Avg. Travel Time= 1.0 min

Peak Storage= 106 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.56 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2497 '/'
Inlet Invert= 970.34', Outlet Invert= 945.37'

Reach DC-F2: (new Reach)



Summary for Reach DC-F3: (new Reach)

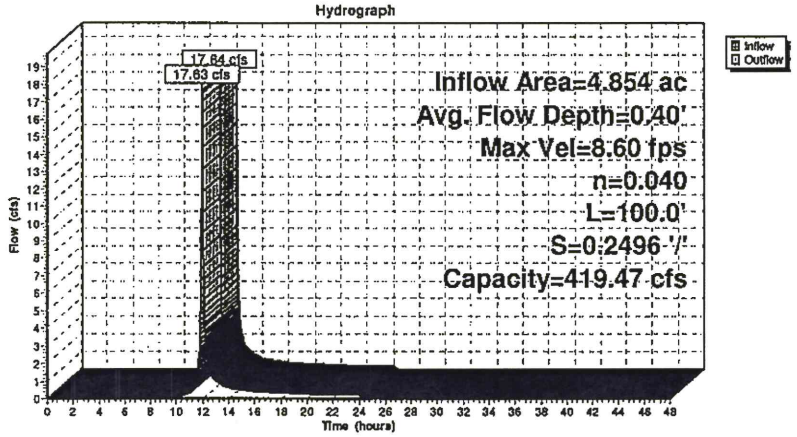
Inflow Area = 4.854 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 17.64 cfs @ 11.97 hrs, Volume= 0.847 af
Outflow = 17.63 cfs @ 11.97 hrs, Volume= 0.847 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.60 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.17 fps, Avg. Travel Time= 0.8 min

Peak Storage= 205 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.47 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2496 '/'
Inlet Invert= 945.37', Outlet Invert= 920.41'

Reach DC-F3: (new Reach)



Summary for Reach DC-F4: (new Reach)

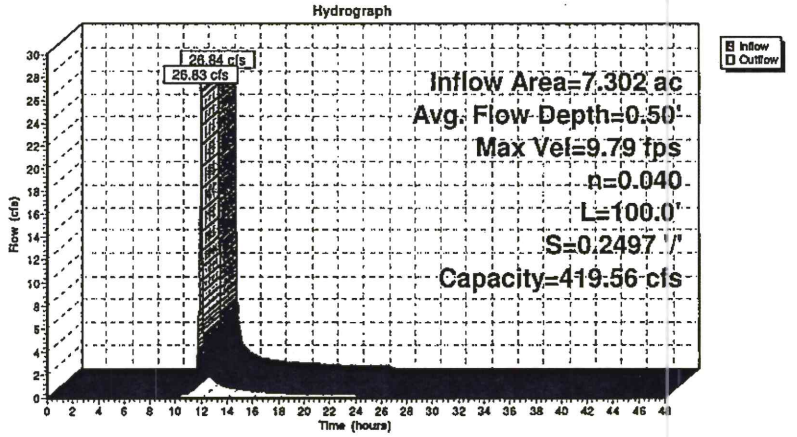
Inflow Area = 7.302 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 26.84 cfs @ 11.97 hrs, Volume= 1.274 af
Outflow = 26.83 cfs @ 11.97 hrs, Volume= 1.274 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.79 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.45 fps, Avg. Travel Time= 0.7 min

Peak Storage= 274 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.56 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2497 '/'
Inlet Invert= 920.41', Outlet Invert= 895.44'

Reach DC-F4: (new Reach)



Summary for Reach DC-F5: (new Reach)

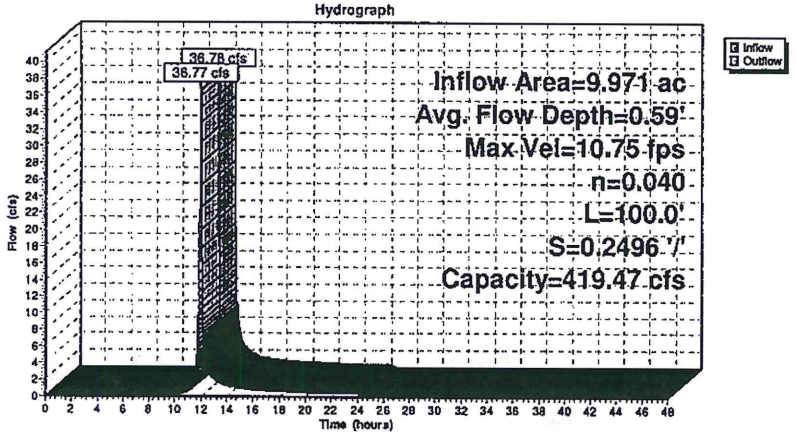
Inflow Area = 9.971 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 36.78 cfs @ 11.97 hrs, Volume= 1.740 af
Outflow = 36.77 cfs @ 11.97 hrs, Volume= 1.740 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.75 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.70 fps, Avg. Travel Time= 0.6 min

Peak Storage= 342 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.47 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2496 '/'
Inlet Invert= 895.44', Outlet Invert= 870.48'

Reach DC-F5: (new Reach)



Summary for Reach DC-F6: (new Reach)

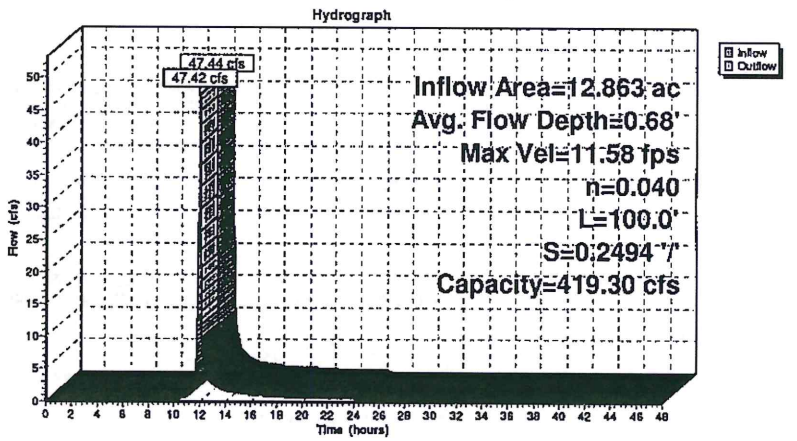
Inflow Area = 12.863 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 47.44 cfs @ 11.97 hrs, Volume= 2.245 af
Outflow = 47.42 cfs @ 11.98 hrs, Volume= 2.245 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.58 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.91 fps, Avg. Travel Time= 0.6 min

Peak Storage= 409 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.68'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.30 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2494 '/'
Inlet Invert= 870.48', Outlet Invert= 845.54'

Reach DC-F6: (new Reach)



Summary for Reach DC-F7: (new Reach)

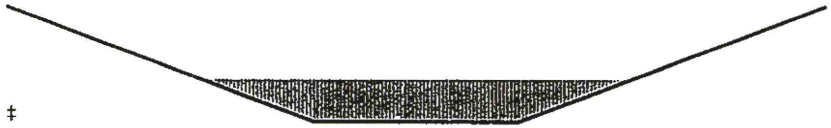
Inflow Area = 15.987 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 58.78 cfs @ 11.98 hrs, Volume= 2.790 af
Outflow = 58.78 cfs @ 11.98 hrs, Volume= 2.790 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 13.07 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.28 fps, Avg. Travel Time= 0.1 min

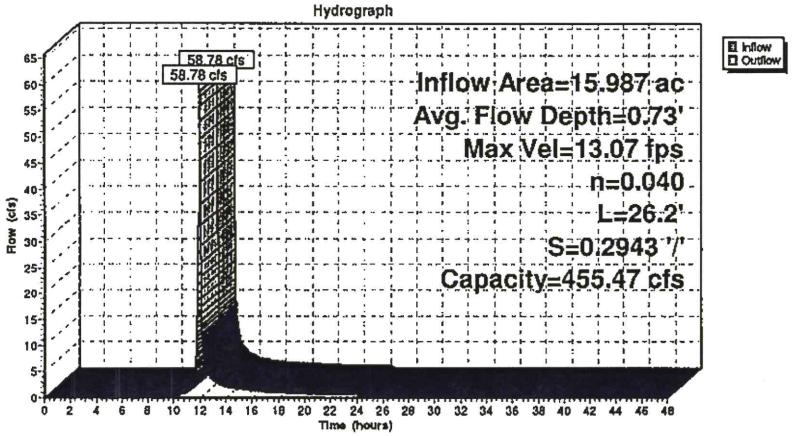
Peak Storage= 118 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 455.47 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 26.2' Slope= 0.2943 '/'
Inlet Invert= 845.54', Outlet Invert= 837.83'

‡



Reach DC-F7: (new Reach)



Summary for Reach IPC-F1: IPC-F1

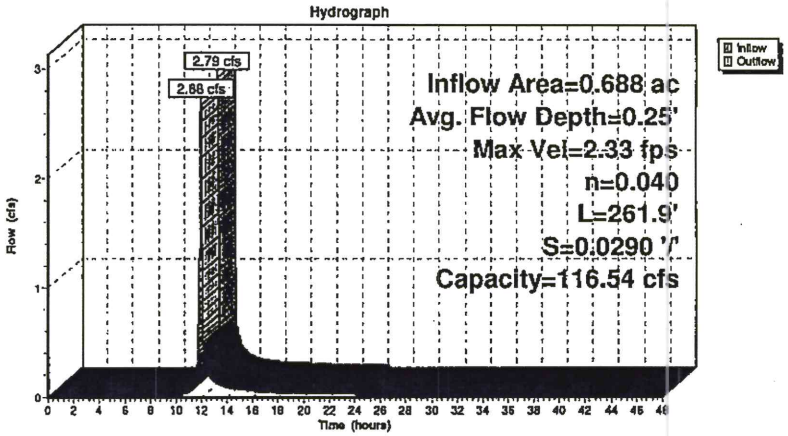
Inflow Area = 0.688 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 2.79 cfs @ 11.95 hrs, Volume= 0.120 af
Outflow = 2.68 cfs @ 11.97 hrs, Volume= 0.120 af, Atten= 4%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.33 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 0.57 fps, Avg. Travel Time= 7.6 min

Peak Storage= 301 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 116.54 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 261.9' Slope= 0.0290 '/'
Inlet Invert= 870.62', Outlet Invert= 863.03'

Reach IPC-F1: IPC-F1



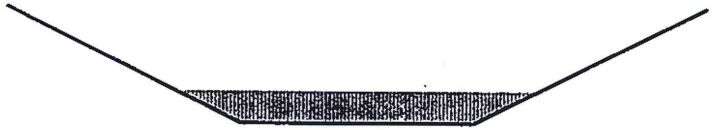
Summary for Reach IPC-F2: (new Reach)

Inflow Area = 2.937 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 11.53 cfs @ 11.96 hrs, Volume= 0.513 af
Outflow = 10.14 cfs @ 11.99 hrs, Volume= 0.513 af, Atten= 12%, Lag= 2.1 min

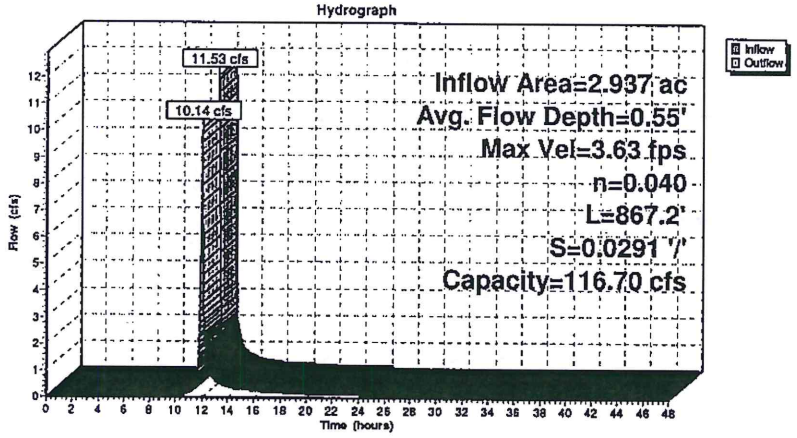
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.63 fps, Min. Travel Time= 4.0 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 17.0 min

Peak Storage= 2,425 cf @ 11.99 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 116.70 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 867.2' Slope= 0.0291 '/'
Inlet Invert= 863.03', Outlet Invert= 837.83'



Reach IPC-F2: (new Reach)



Summary for Pond DC-F8: Down Chute 3

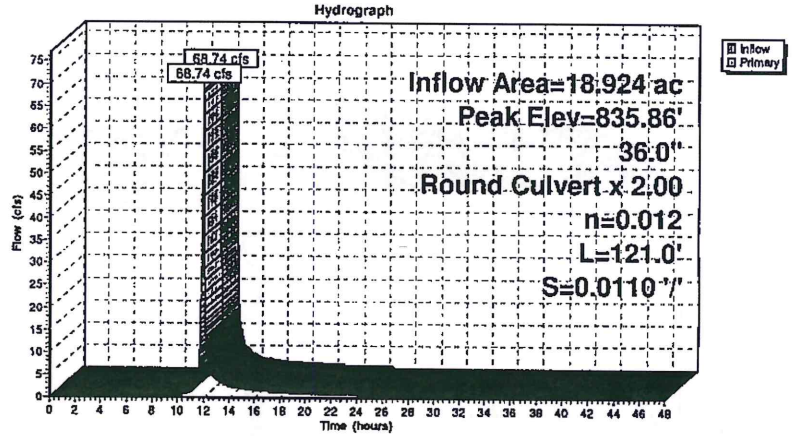
Inflow Area = 18.924 ac, 0.00% Impervious, Inflow Depth = 2.09" for 10-yr event
Inflow = 68.74 cfs @ 11.98 hrs, Volume= 3.302 af
Outflow = 68.74 cfs @ 11.98 hrs, Volume= 3.302 af, Atten= 0%, Lag= 0.0 min
Primary = 68.74 cfs @ 11.98 hrs, Volume= 3.302 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 835.86' @ 11.98 hrs
Flood Elev= 837.83'

Device	Routing	Invert	Outlet Devices
#1	Primary	833.33'	**36.0" Round Culvert X 2.00** L= 121.0' Ke= 0.500 Inlet / Outlet Invert= 833.33' / 832.00' S= 0.0110 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished

Primary OutFlow Max=68.66 cfs @ 11.98 hrs HW=835.85' TW=832.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 68.66 cfs @ 5.41 fps)

Pond DC-F8: Down Chute 3



Summary for Pond F: (new Pond)

Inflow Area = 37.780 ac, 0.00% Impervious, Inflow Depth = 1.98" for 10-yr event
Inflow = 122.35 cfs @ 11.99 hrs, Volume= 6.228 af
Outflow = 17.74 cfs @ 12.34 hrs, Volume= 6.095 af, Atten= 85%, Lag= 21.0 min
Primary = 17.74 cfs @ 12.34 hrs, Volume= 6.095 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 831.00' Surf.Area= 67,798 sf Storage= 290,806 cf
Peak Elev= 832.67' @ 12.34 hrs Surf.Area= 74,663 sf Storage= 409,541 cf (118,735 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 182.4 min (1,019.9 - 837.5)

Volume	Invert	Avail.Storage	Storage Description
#1	826.00'	595,319 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

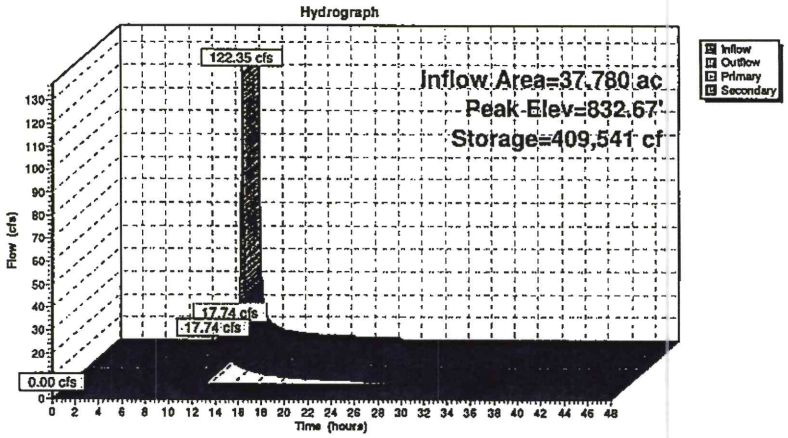
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
826.00	48,924	0	0
827.00	52,499	50,712	50,712
828.00	56,175	54,337	105,049
829.00	59,950	58,063	163,111
830.00	63,821	61,886	224,997
831.00	67,798	65,810	290,806
832.00	71,874	69,836	360,642
833.00	76,053	73,964	434,606
834.00	80,331	78,192	512,798
835.00	84,711	82,521	595,319

Device	Routing	Invert	Outlet Devices
#1	Primary	831.00'	**36.0" Round Culvert** L= 190.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 831.00' / 829.00' S= 0.0105 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished
#2	Secondary	833.25'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=17.74 cfs @ 12.34 hrs HW=832.67' (Free Discharge)
↑—1=Culvert (Inlet Controls 17.74 cfs @ 4.40 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=831.00' (Free Discharge)
↑—2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond F: (new Pond)



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

Subcatchment EX-F: Existing Drainage Area Runoff Area=18.856 ac 0.00% Impervious Runoff Depth=2.51"
Flow Length=1,022' Tc=9.1 min CN=76 Runoff=75.42 cfs 3.945 af

Subcatchment F1: (new Subcat) Runoff Area=0.551 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=99' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=2.94 cfs 0.127 af

Subcatchment F10: (new Subcat) Runoff Area=0.894 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=4.78 cfs 0.207 af

Subcatchment F11: (new Subcat) Runoff Area=2.180 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=102' Slope=0.2500 '/' Tc=3.8 min CN=79 Runoff=11.61 cfs 0.504 af

Subcatchment F12: (new Subcat) Runoff Area=0.919 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=4.91 cfs 0.213 af

Subcatchment F13: (new Subcat) Runoff Area=0.944 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=5.04 cfs 0.218 af

Subcatchment F14: (new Subcat) Runoff Area=0.939 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=97' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=5.02 cfs 0.217 af

Subcatchment F15: (new Subcat) Runoff Area=0.688 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=117' Slope=0.2500 '/' Tc=3.8 min CN=79 Runoff=3.66 cfs 0.159 af

Subcatchment F16: (new Subcat) Runoff Area=1.310 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=108' Slope=0.2500 '/' Tc=4.0 min CN=79 Runoff=6.92 cfs 0.303 af

Subcatchment F2: (new Subcat) Runoff Area=0.604 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=116' Tc=11.0 min CN=79 Runoff=2.49 cfs 0.140 af

Subcatchment F3: (new Subcat) Runoff Area=2.028 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=99' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=10.83 cfs 0.469 af

Subcatchment F4: (new Subcat) Runoff Area=0.818 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=4.37 cfs 0.189 af

Subcatchment F5: (new Subcat) Runoff Area=1.579 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=8.43 cfs 0.365 af

Subcatchment F6: (new Subcat) Runoff Area=0.853 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=4.56 cfs 0.197 af

Subcatchment F7: (new Subcat) Runoff Area=1.775 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=9.48 cfs 0.411 af

Subcatchment F8: (new Subcat) Runoff Area=0.869 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=4.64 cfs 0.201 af

Subcatchment F9: (new Subcat) Runoff Area=1.973 ac 0.00% Impervious Runoff Depth=2.78"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=10.54 cfs 0.456 af

Reach DB-F1: (new Reach) Avg. Flow Depth=0.51' Max Vel=3.21 fps Inflow=2.94 cfs 0.127 af
n=0.022 L=164.0' S=0.0148 '/' Capacity=112.08 cfs Outflow=2.90 cfs 0.127 af

Reach DB-F10: (new Reach) Avg. Flow Depth=0.57' Max Vel=4.01 fps Inflow=4.78 cfs 0.207 af
n=0.022 L=387.0' S=0.0197 '/' Capacity=129.37 cfs Outflow=4.59 cfs 0.207 af

Reach DB-F11: (new Reach) Avg. Flow Depth=0.77' Max Vel=4.95 fps Inflow=11.61 cfs 0.504 af
n=0.022 L=996.2' S=0.0202 '/' Capacity=130.76 cfs Outflow=10.35 cfs 0.504 af

Reach DB-F12: (new Reach) Avg. Flow Depth=0.58' Max Vel=4.04 fps Inflow=4.91 cfs 0.213 af
n=0.022 L=397.9' S=0.0197 '/' Capacity=129.33 cfs Outflow=4.71 cfs 0.213 af

Reach DB-F13: (new Reach) Avg. Flow Depth=0.59' Max Vel=3.96 fps Inflow=5.04 cfs 0.218 af
n=0.022 L=408.9' S=0.0185 '/' Capacity=125.28 cfs Outflow=4.83 cfs 0.218 af

Reach DB-F14: (new Reach) Avg. Flow Depth=0.53' Max Vel=4.92 fps Inflow=5.02 cfs 0.217 af
n=0.022 L=465.2' S=0.0329 '/' Capacity=166.99 cfs Outflow=4.83 cfs 0.217 af

Reach DB-F2: (new Reach) Avg. Flow Depth=0.45' Max Vel=3.42 fps Inflow=2.49 cfs 0.140 af
n=0.022 L=343.1' S=0.0197 '/' Capacity=129.25 cfs Outflow=2.43 cfs 0.140 af

Reach DB-F3: (new Reach) Avg. Flow Depth=0.77' Max Vel=4.94 fps Inflow=10.83 cfs 0.469 af
n=0.022 L=652.7' S=0.0202 '/' Capacity=130.99 cfs Outflow=10.17 cfs 0.469 af

Reach DB-F4: (new Reach) Avg. Flow Depth=0.55' Max Vel=3.93 fps Inflow=4.37 cfs 0.189 af
n=0.022 L=354.1' S=0.0198 '/' Capacity=129.46 cfs Outflow=4.22 cfs 0.189 af

Reach DB-F5: (new Reach) Avg. Flow Depth=0.69' Max Vel=4.65 fps Inflow=8.43 cfs 0.365 af
n=0.022 L=738.3' S=0.0206 '/' Capacity=132.12 cfs Outflow=7.76 cfs 0.365 af

Reach DB-F6: (new Reach) Avg. Flow Depth=0.56' Max Vel=3.97 fps Inflow=4.56 cfs 0.197 af
n=0.022 L=369.2' S=0.0197 '/' Capacity=129.39 cfs Outflow=4.39 cfs 0.197 af

Reach DB-F7: (new Reach) Avg. Flow Depth=0.72' Max Vel=4.79 fps Inflow=9.48 cfs 0.411 af
n=0.022 L=823.9' S=0.0208 '/' Capacity=132.85 cfs Outflow=8.64 cfs 0.411 af

Reach DB-F8: (new Reach) Avg. Flow Depth=0.57' Max Vel=3.98 fps Inflow=4.64 cfs 0.201 af
n=0.022 L=376.0' S=0.0197 '/' Capacity=129.35 cfs Outflow=4.47 cfs 0.201 af

Reach DB-F9: (new Reach) Avg. Flow Depth=0.74' Max Vel=4.90 fps Inflow=10.54 cfs 0.456 af
n=0.022 L=909.5' S=0.0208 '/' Capacity=132.70 cfs Outflow=9.50 cfs 0.456 af

Reach DC-F1: (new Reach) Avg. Flow Depth=0.13' Max Vel=4.40 fps Inflow=2.43 cfs 0.140 af
n=0.040 L=100.0' S=0.2496 '/' Capacity=419.47 cfs Outflow=2.43 cfs 0.140 af

Reach DC-F2: (new Reach) Avg. Flow Depth=0.27' Max Vel=6.88 fps Inflow=8.82 cfs 0.456 af
n=0.040 L=100.0' S=0.2497 '/' Capacity=419.56 cfs Outflow=8.82 cfs 0.456 af

Reach DC-F3: (new Reach) Avg. Flow Depth=0.46' Max Vel=9.38 fps Inflow=23.36 cfs 1.123 af
n=0.040 L=100.0' S=0.2496 '/' Capacity=419.47 cfs Outflow=23.35 cfs 1.123 af

Reach DC-F4: (new Reach) Avg. Flow Depth=0.58' Max Vel=10.65 fps Inflow=35.56 cfs 1.689 af
n=0.040 L=100.0' S=0.2497 '/' Capacity=419.56 cfs Outflow=35.55 cfs 1.689 af

Reach DC-F5: (new Reach) Avg. Flow Depth=0.69' Max Vel=11.68 fps Inflow=48.75 cfs 2.306 af
n=0.040 L=100.0' S=0.2496 '/' Capacity=419.47 cfs Outflow=48.74 cfs 2.306 af

Reach DC-F6: (new Reach) Avg. Flow Depth=0.79' Max Vel=12.56 fps Inflow=62.91 cfs 2.975 af
n=0.040 L=100.0' S=0.2494 '/' Capacity=419.30 cfs Outflow=62.90 cfs 2.975 af

Reach DC-F7: (new Reach) Avg. Flow Depth=0.84' Max Vel=14.17 fps Inflow=78.01 cfs 3.698 af
n=0.040 L=26.2' S=0.2943 '/' Capacity=455.47 cfs Outflow=78.01 cfs 3.698 af

Reach IPC-F1: IPC-F1 Avg. Flow Depth=0.30' Max Vel=2.56 fps Inflow=3.66 cfs 0.159 af
n=0.040 L=261.9' S=0.0290 '/' Capacity=116.54 cfs Outflow=3.54 cfs 0.159 af

Reach IPC-F2: (new Reach) Avg. Flow Depth=0.65' Max Vel=3.97 fps Inflow=15.21 cfs 0.679 af
n=0.040 L=867.2' S=0.0291 '/' Capacity=116.70 cfs Outflow=13.61 cfs 0.679 af

Pond DC-F8: Down Chute 3 Peak Elev=836.63' Inflow=91.40 cfs 4.378 af
36.0" Round Culvert x 2.00 n=0.012 L=121.0' S=0.0110 '/' Outflow=91.40 cfs 4.378 af

Pond F: (new Pond) Peak Elev=833.20' Storage=449,758 cf Inflow=163.44 cfs 8.323 af
Primary=28.02 cfs 8.188 af Secondary=0.00 cfs 0.000 af Outflow=28.02 cfs 8.188 af

Total Runoff Area = 37.780 ac Runoff Volume = 8.323 af Average Runoff Depth = 2.64"
100.00% Pervious = 37.780 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment EX-F: Existing Drainage Area

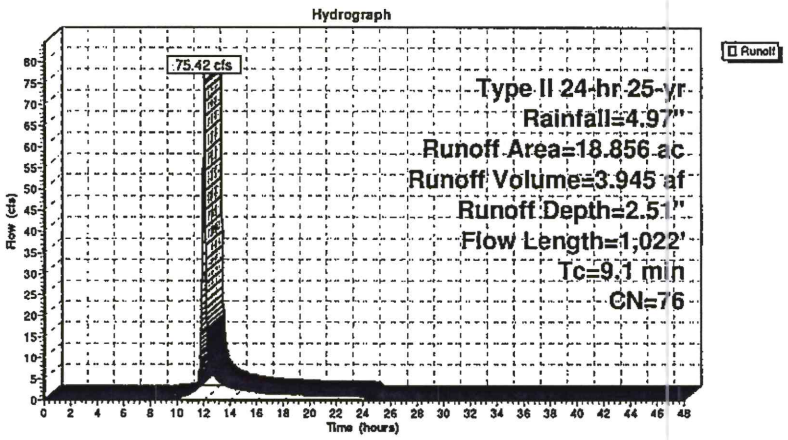
Runoff = 75.42 cfs @ 12.01 hrs, Volume= 3.945 af, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
18.856	76	Woods/grass comb., Fair, HSG C
18.856		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0460	0.23		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.91"
1.1	179	0.1450	2.67		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
0.6	743	0.1290	20.54	328.60	**Channel Flow,** Area= 16.0 sf Perim= 12.9' r= 1.24' n= 0.030 Earth, grassed & winding
9.1	1,022	Total			

Subcatchment EX-F: Existing Drainage Area



Summary for Subcatchment F1: (new Subcat)

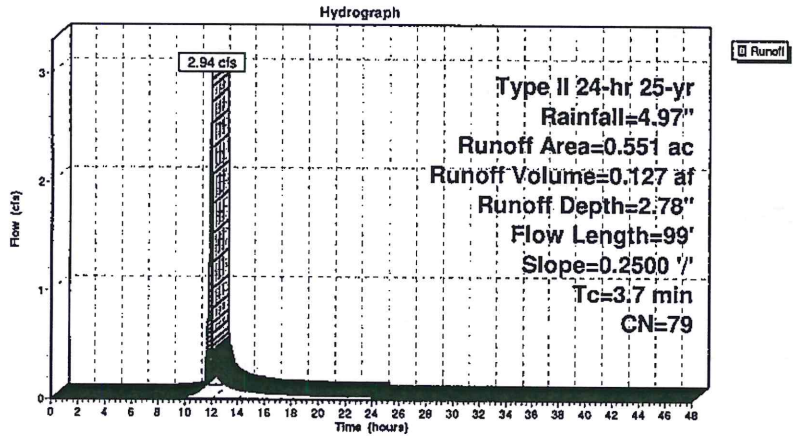
Runoff = 2.94 cfs @ 11.95 hrs, Volume= 0.127 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.551	79	50-75% Grass cover, Fair, HSG C
0.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	99	0.2500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F1: (new Subcat)



Summary for Subcatchment F10: (new Subcat)

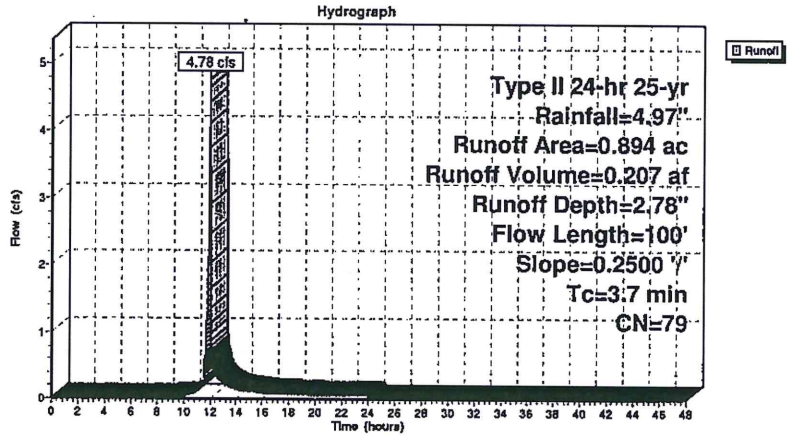
Runoff = 4.78 cfs @ 11.95 hrs, Volume= 0.207 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.894	79	50-75% Grass cover, Fair, HSG C
0.894		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F10: (new Subcat)



Summary for Subcatchment F11: (new Subcat)

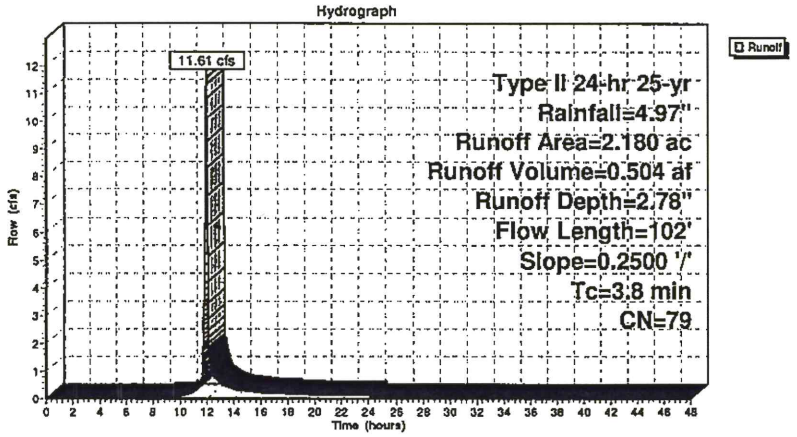
Runoff = 11.61 cfs @ 11.95 hrs, Volume= 0.504 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
2.180	79	50-75% Grass cover, Fair, HSG C
2.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	102	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F11: (new Subcat)



Summary for Subcatchment F12: (new Subcat)

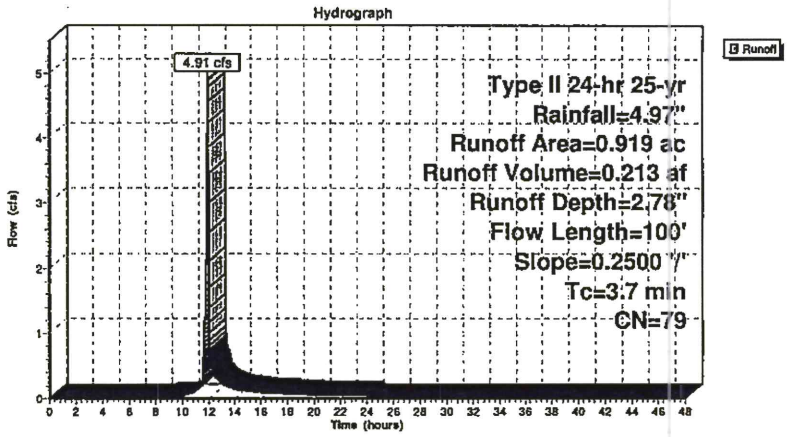
Runoff = 4.91 cfs @ 11.95 hrs, Volume= 0.213 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.919	79	50-75% Grass cover, Fair, HSG C
0.919		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F12: (new Subcat)



Summary for Subcatchment F13: (new Subcat)

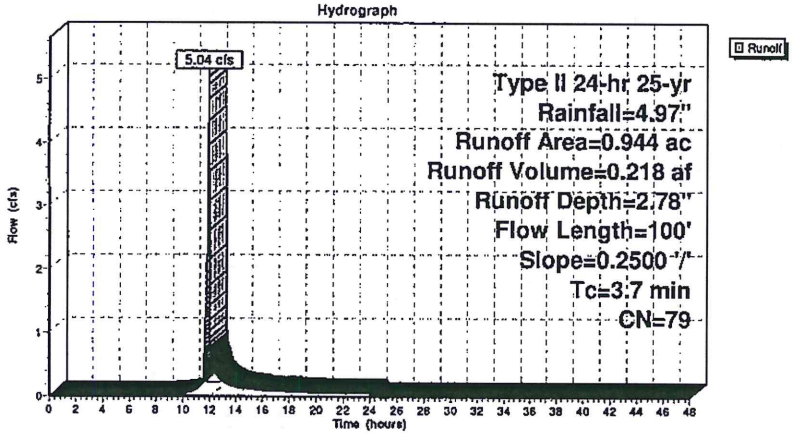
Runoff = 5.04 cfs @ 11.95 hrs, Volume= 0.218 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.944	79	50-75% Grass cover, Fair, HSG C
0.944		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F13: (new Subcat)



Summary for Subcatchment F14: (new Subcat)

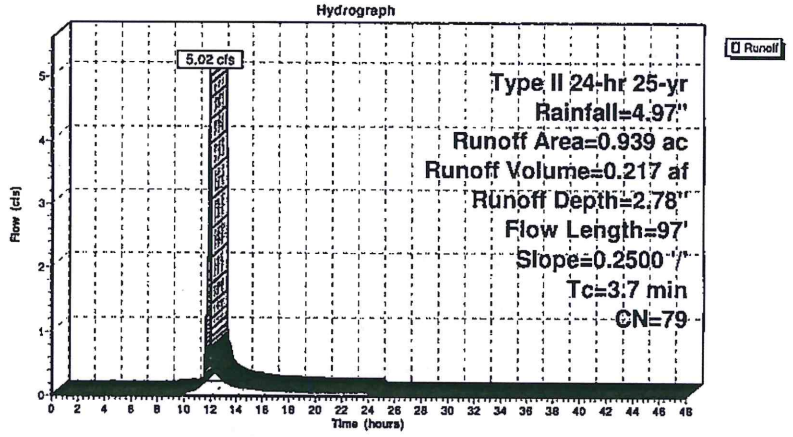
Runoff = 5.02 cfs @ 11.95 hrs, Volume= 0.217 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.939	79	50-75% Grass cover, Fair, HSG C
0.939		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	97	0.2500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F14: (new Subcat)



Summary for Subcatchment F15: (new Subcat)

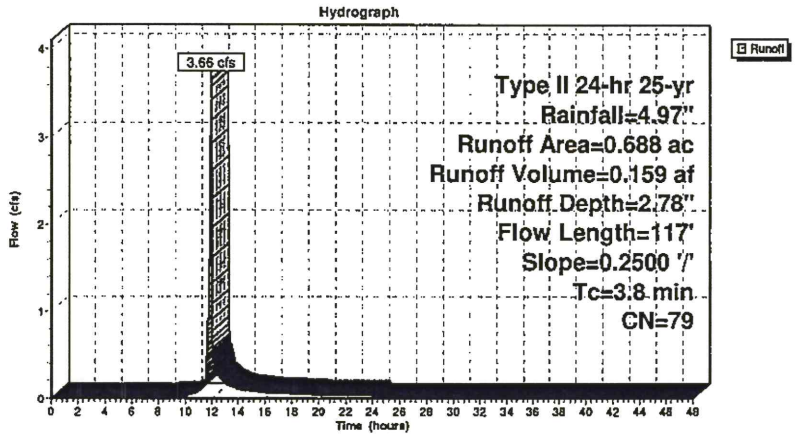
Runoff = 3.66 cfs @ 11.95 hrs, Volume= 0.159 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.688	79	50-75% Grass cover, Fair, HSG C
0.688		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"
0.1	17	0.2500	3.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.8	117	Total			

Subcatchment F15: (new Subcat)



Summary for Subcatchment F16: (new Subcat)

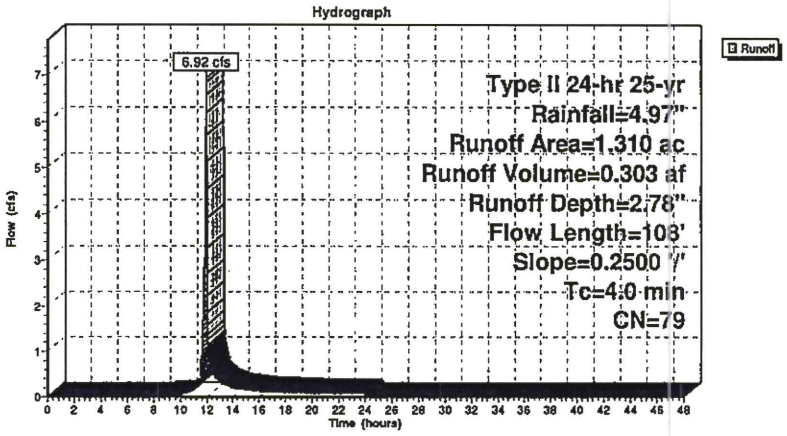
Runoff = 6.92 cfs @ 11.95 hrs, Volume= 0.303 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.310	79	50-75% Grass cover, Fair, HSG C
1.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	108	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F16: (new Subcat)



Summary for Subcatchment F2: (new Subcat)

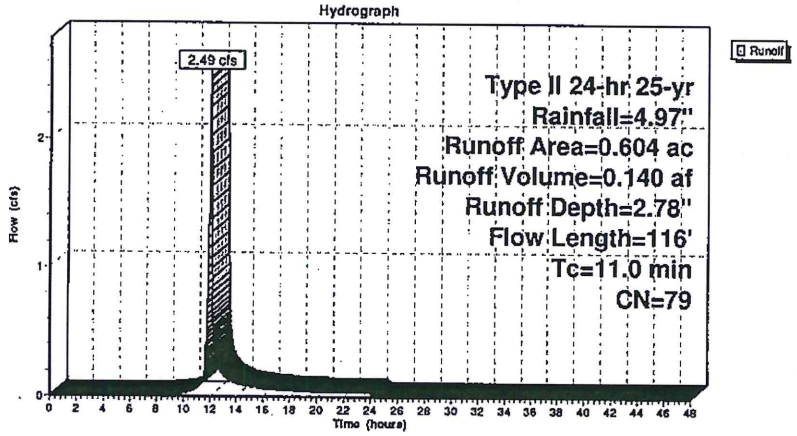
Runoff = 2.49 cfs @ 12.03 hrs, Volume= 0.140 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.604	79	50-75% Grass cover, Fair, HSG C
0.604		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	109	0.0200	0.17		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"
0.0	7	0.2500	3.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
11.0	116	Total			

Subcatchment F2: (new Subcat)



Summary for Subcatchment F3: (new Subcat)

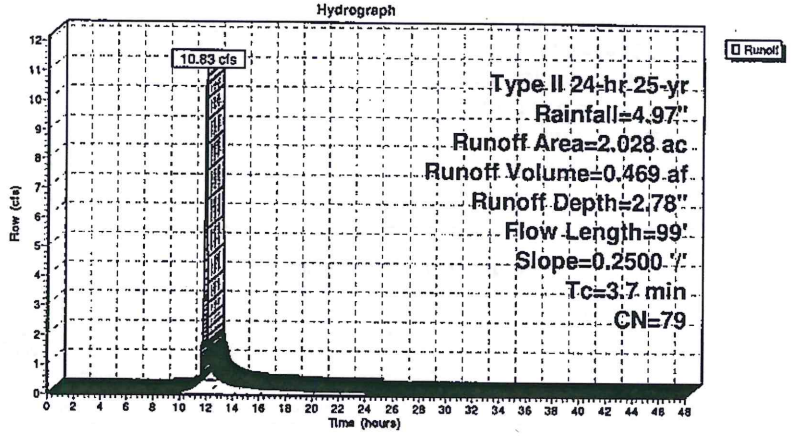
Runoff = 10.83 cfs @ 11.95 hrs, Volume= 0.469 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
2.028	79	50-75% Grass cover, Fair, HSG C
2.028		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	99	0.2500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F3: (new Subcat)



Summary for Subcatchment F4: (new Subcat)

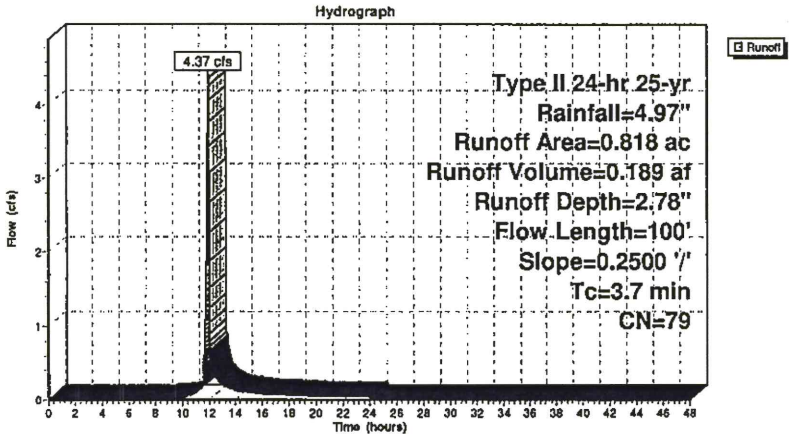
Runoff = 4.37 cfs @ 11.95 hrs, Volume= 0.189 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.818	79	50-75% Grass cover, Fair, HSG C
0.818		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F4: (new Subcat)



Summary for Subcatchment F5: (new Subcat)

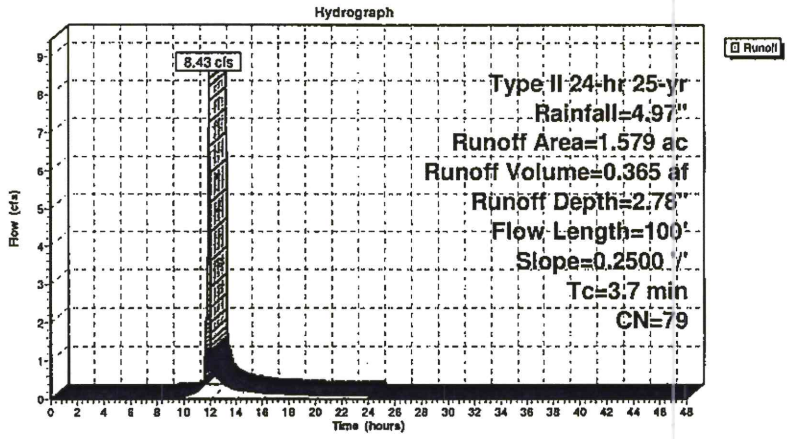
Runoff = 8.43 cfs @ 11.95 hrs, Volume= 0.365 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.579	79	50-75% Grass cover, Fair, HSG C
1.579		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F5: (new Subcat)



Summary for Subcatchment F6: (new Subcat)

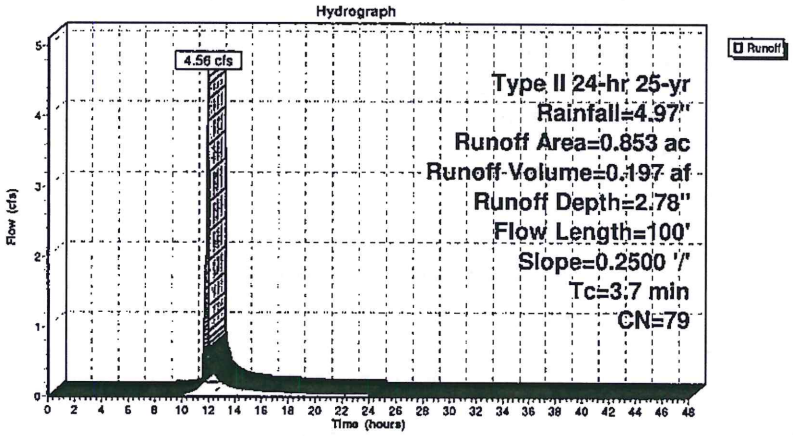
Runoff = 4.56 cfs @ 11.95 hrs, Volume= 0.197 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.853	79	50-75% Grass cover, Fair, HSG C
0.853		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F6: (new Subcat)



Summary for Subcatchment F7: (new Subcat)

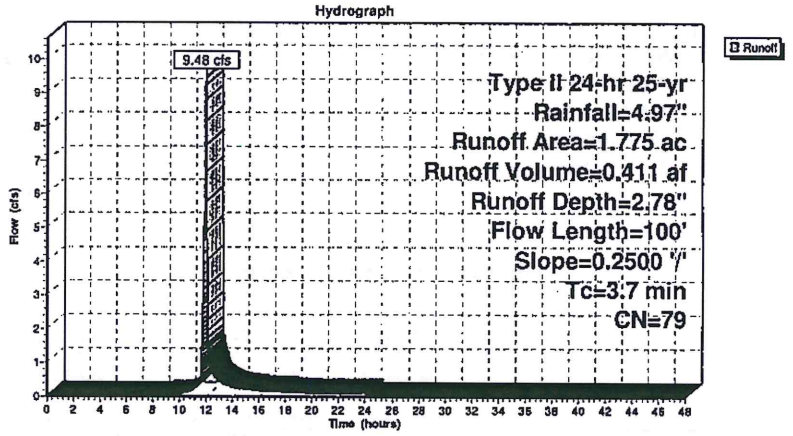
Runoff = 9.48 cfs @ 11.95 hrs, Volume= 0.411 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.775	79	50-75% Grass cover, Fair, HSG C
1.775		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F7: (new Subcat)



Summary for Subcatchment F8: (new Subcat)

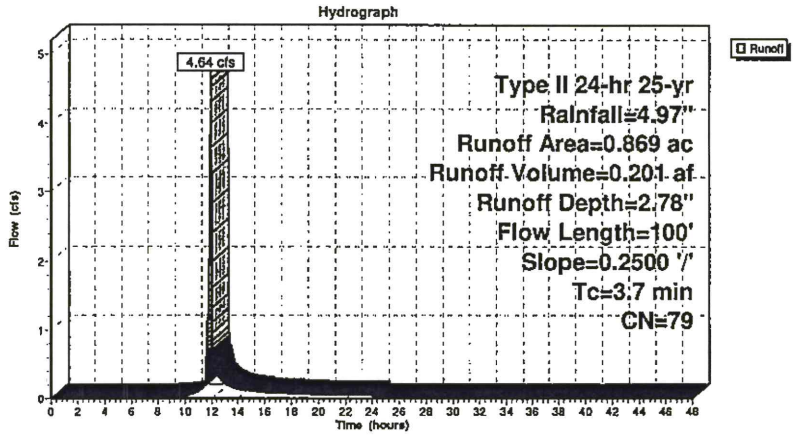
Runoff = 4.64 cfs @ 11.95 hrs, Volume= 0.201 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.869	79	50-75% Grass cover, Fair, HSG C
0.869		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F8: (new Subcat)



Summary for Subcatchment F9: (new Subcat)

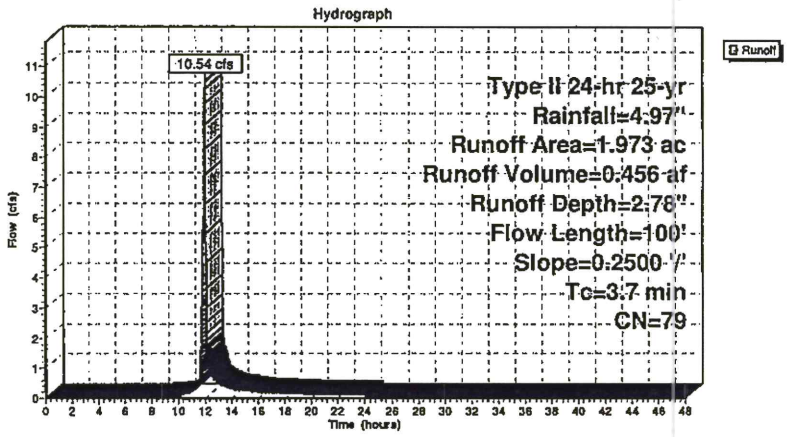
Runoff = 10.54 cfs @ 11.95 hrs, Volume= 0.456 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.973	79	50-75% Grass cover, Fair, HSG C
1.973		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F9: (new Subcat)



Summary for Reach DB-F1: (new Reach)

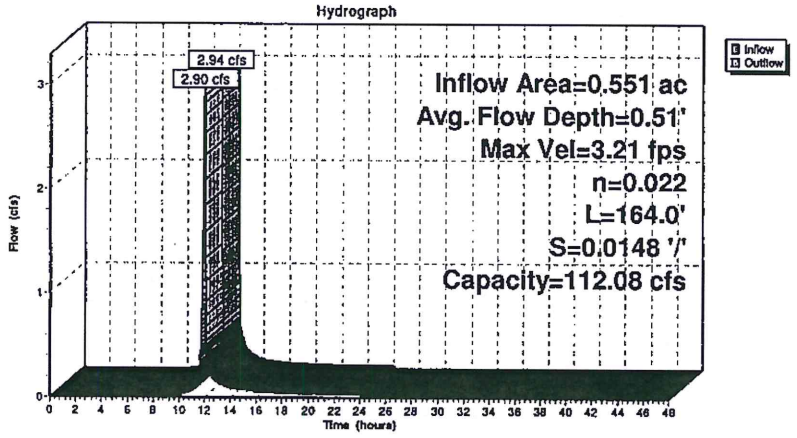
Inflow Area = 0.551 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 2.94 cfs @ 11.95 hrs, Volume= 0.127 af
Outflow = 2.90 cfs @ 11.96 hrs, Volume= 0.127 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.21 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 2.4 min

Peak Storage= 148 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 112.08 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 164.0' Slope= 0.0148 '/'
Inlet Invert= 972.77', Outlet Invert= 970.34'

Reach DB-F1: (new Reach)



Summary for Reach DB-F10: (new Reach)

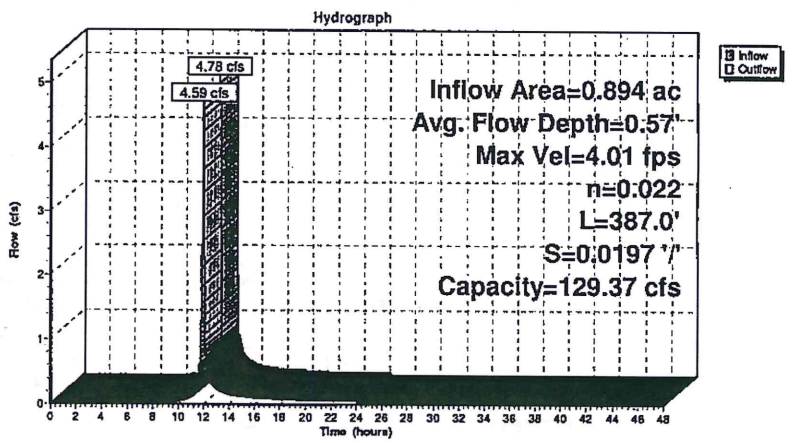
Inflow Area = 0.894 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 4.78 cfs @ 11.95 hrs, Volume= 0.207 af
Outflow = 4.59 cfs @ 11.96 hrs, Volume= 0.207 af, Atten= 4%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.01 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 4.7 min

Peak Storage= 443 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.37 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 387.0' Slope= 0.0197 '/'
Inlet Invert= 903.08', Outlet Invert= 895.44'

Reach DB-F10: (new Reach)



Summary for Reach DB-F11: (new Reach)

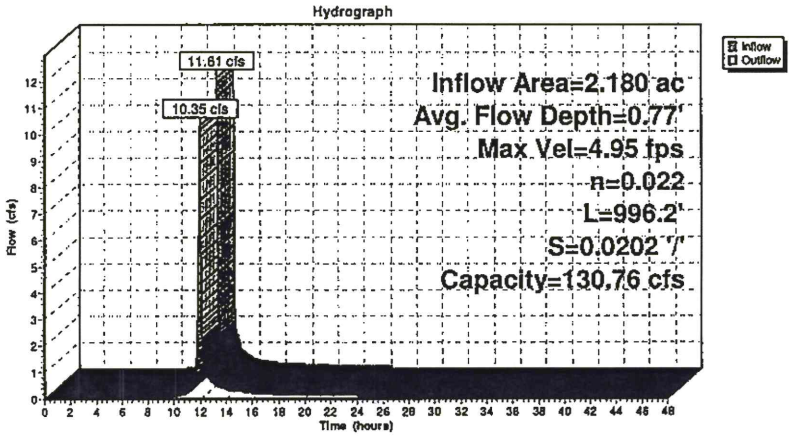
Inflow Area = 2.180 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 11.61 cfs @ 11.95 hrs, Volume= 0.504 af
Outflow = 10.35 cfs @ 11.98 hrs, Volume= 0.504 af, Atten= 11%, Lag= 1.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.95 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 1.62 fps, Avg. Travel Time= 10.2 min

Peak Storage= 2,080 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.77'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.76 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 996.2' Slope= 0.0202 '/'
Inlet Invert= 865.63', Outlet Invert= 845.54'

Reach DB-F11: (new Reach)



Summary for Reach DB-F12: (new Reach)

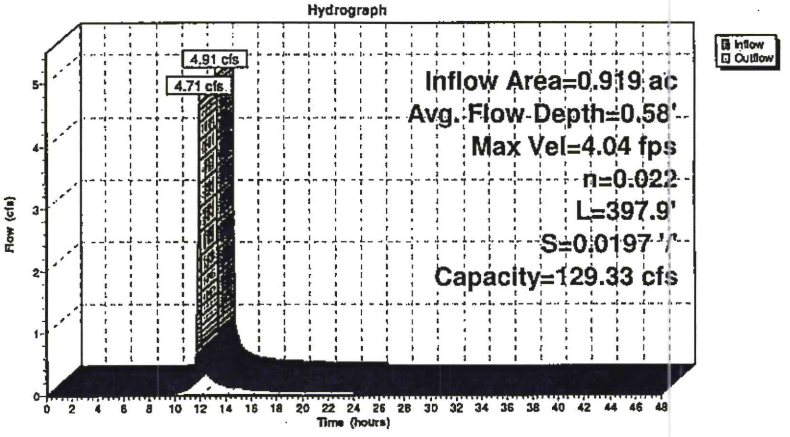
Inflow Area = 0.919 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 4.91 cfs @ 11.95 hrs, Volume= 0.213 af
Outflow = 4.71 cfs @ 11.96 hrs, Volume= 0.213 af, Atten= 4%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.04 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 4.8 min

Peak Storage= 465 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.33 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 397.9' Slope= 0.0197 '/'
Inlet Invert= 878.33', Outlet Invert= 870.48'

Reach DB-F12: (new Reach)



Summary for Reach DB-F13: (new Reach)

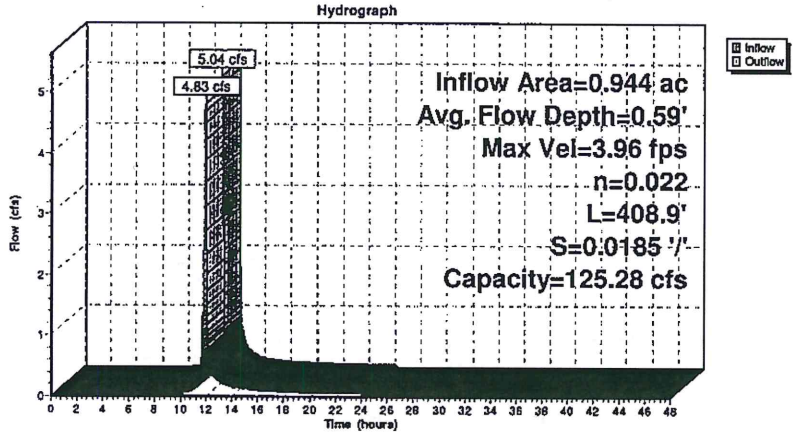
Inflow Area = 0.944 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 5.04 cfs @ 11.95 hrs, Volume= 0.218 af
Outflow = 4.83 cfs @ 11.96 hrs, Volume= 0.218 af, Atten= 4%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.96 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 5.0 min

Peak Storage= 498 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 125.28 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 408.9' Slope= 0.0185 '/'
Inlet Invert= 853.11', Outlet Invert= 845.54'

Reach DB-F13: (new Reach)



Summary for Reach DB-F14: (new Reach)

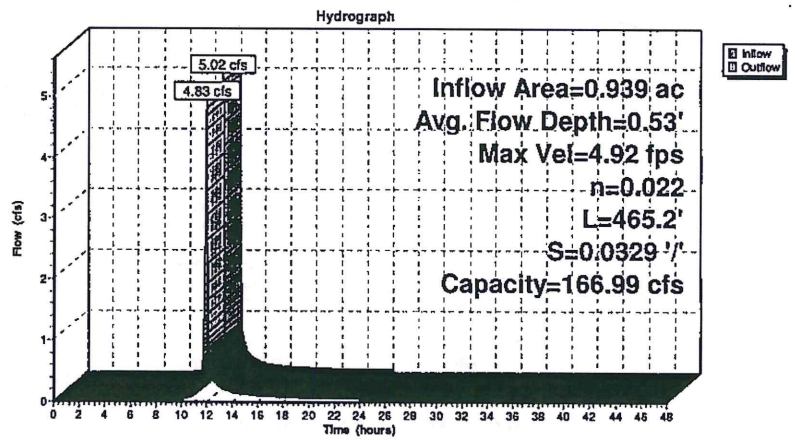
Inflow Area = 0.939 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 5.02 cfs @ 11.95 hrs, Volume= 0.217 af
Outflow = 4.83 cfs @ 11.96 hrs, Volume= 0.217 af, Atten= 4%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.92 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.71 fps, Avg. Travel Time= 4.5 min

Peak Storage= 457 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 166.99 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 465.2' Slope= 0.0329 '/'
Inlet Invert= 878.33', Outlet Invert= 863.03'

Reach DB-F14: (new Reach)



Summary for Reach DB-F2: (new Reach)

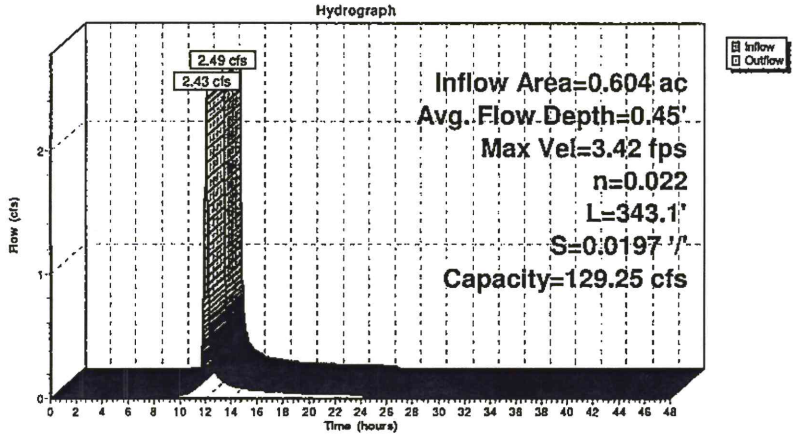
Inflow Area = 0.604 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 2.49 cfs @ 12.03 hrs, Volume= 0.140 af
Outflow = 2.43 cfs @ 12.05 hrs, Volume= 0.140 af, Atten= 2%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.42 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.27 fps, Avg. Travel Time= 4.5 min

Peak Storage= 244 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.45'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.25 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 343.1' Slope= 0.0197 '/'
Inlet Invert= 1,002.06', Outlet Invert= 995.30'

Reach DB-F2: (new Reach)



Summary for Reach DB-F3: (new Reach)

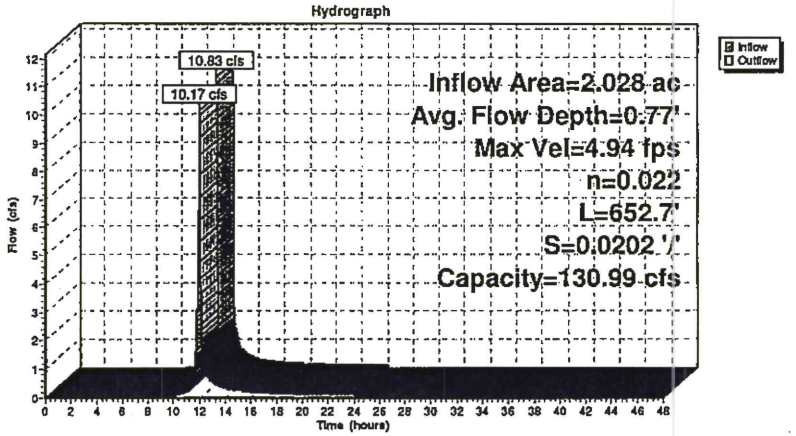
Inflow Area = 2.028 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 10.83 cfs @ 11.95 hrs, Volume= 0.469 af
Outflow = 10.17 cfs @ 11.97 hrs, Volume= 0.469 af, Atten= 6%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.94 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.66 fps, Avg. Travel Time= 6.6 min

Peak Storage= 1,344 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.77'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.99 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 652.7' Slope= 0.0202 '/'
Inlet Invert= 958.58', Outlet Invert= 945.37'

Reach DB-F3: (new Reach)



Summary for Reach DB-F4: (new Reach)

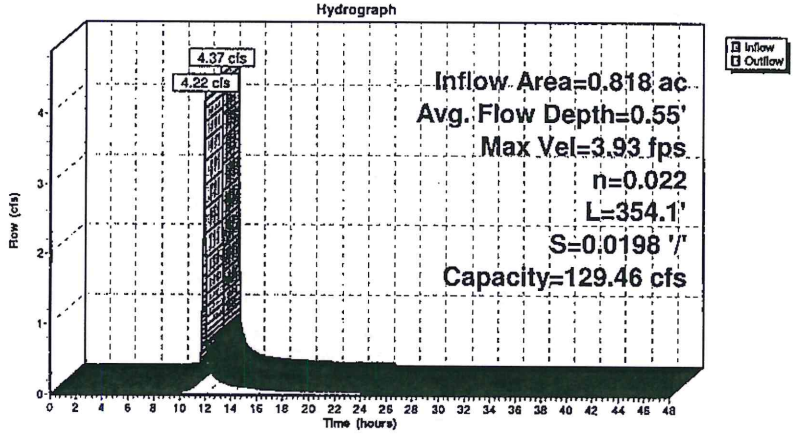
Inflow Area = 0.818 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 4.37 cfs @ 11.95 hrs, Volume= 0.189 af
Outflow = 4.22 cfs @ 11.96 hrs, Volume= 0.189 af, Atten= 3%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.93 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 4.3 min

Peak Storage= 380 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.46 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 354.1' Slope= 0.0198 '/'
Inlet Invert= 977.34', Outlet Invert= 970.34'

Reach DB-F4: (new Reach)



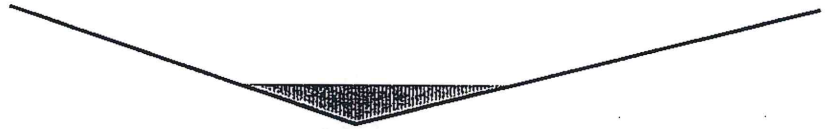
Summary for Reach DB-F5: (new Reach)

Inflow Area = 1.579 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 8.43 cfs @ 11.95 hrs, Volume= 0.365 af
Outflow = 7.76 cfs @ 11.97 hrs, Volume= 0.365 af, Atten= 8%, Lag= 1.5 min

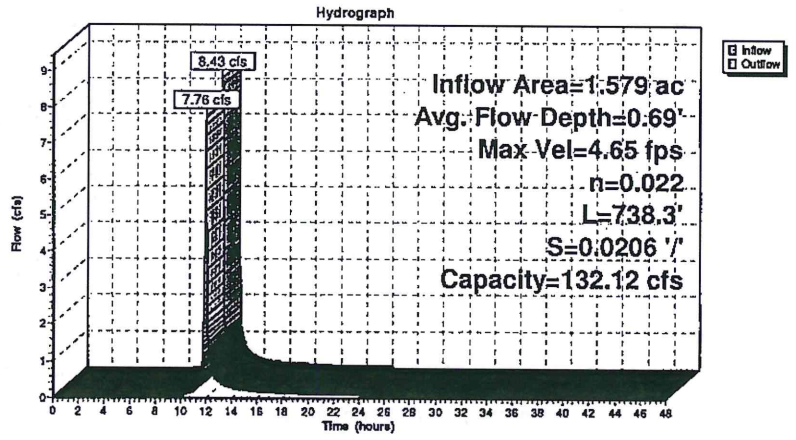
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.65 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 7.9 min

Peak Storage= 1,233 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.69'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 132.12 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 738.3' Slope= 0.0206 '/'
Inlet Invert= 935.61', Outlet Invert= 920.41'



Reach DB-F5: (new Reach)



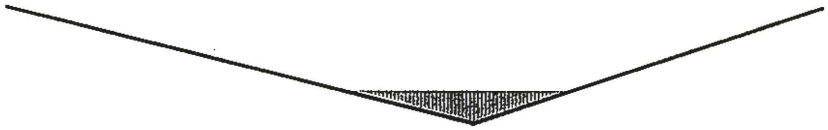
Summary for Reach DB-F6: (new Reach)

Inflow Area = 0.853 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 4.56 cfs @ 11.95 hrs, Volume= 0.197 af
Outflow = 4.39 cfs @ 11.96 hrs, Volume= 0.197 af, Atten= 4%, Lag= 1.0 min

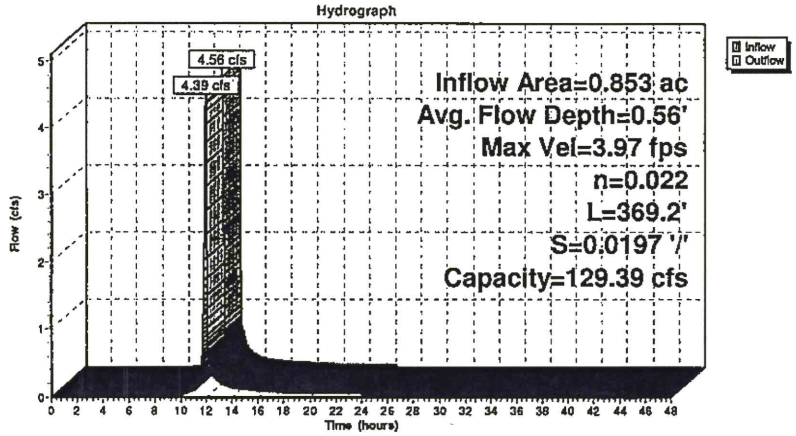
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.97 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 4.5 min

Peak Storage= 409 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.56'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.39 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 369.2' Slope= 0.0197 '/'
Inlet Invert= 952.66', Outlet Invert= 945.37'



Reach DB-F6: (new Reach)



Summary for Reach DB-F7: (new Reach)

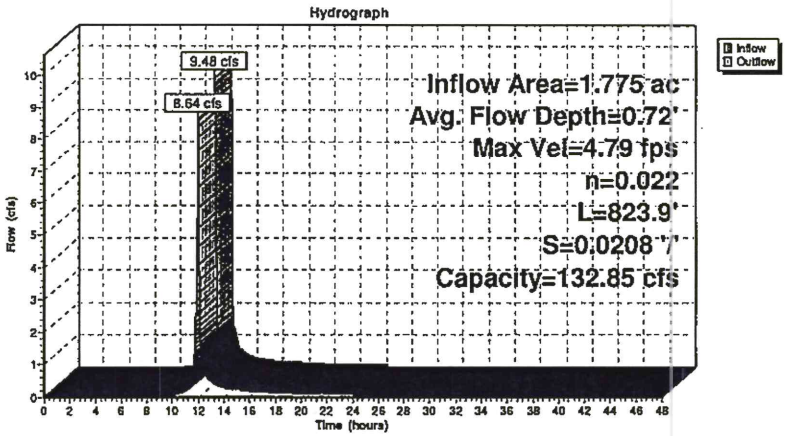
Inflow Area = 1.775 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 9.48 cfs @ 11.95 hrs, Volume= 0.411 af
Outflow = 8.64 cfs @ 11.97 hrs, Volume= 0.411 af, Atten= 9%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.79 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 8.6 min

Peak Storage= 1,485 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.72'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 132.85 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 823.9' Slope= 0.0208 '/'
Inlet Invert= 912.59', Outlet Invert= 895.44'

Reach DB-F7: (new Reach)



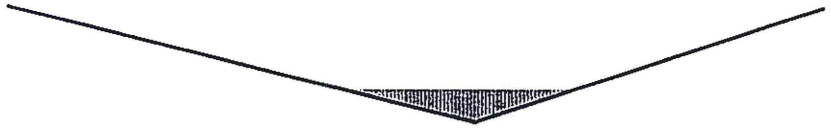
Summary for Reach DB-F8: (new Reach)

Inflow Area = 0.869 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 4.64 cfs @ 11.95 hrs, Volume= 0.201 af
Outflow = 4.47 cfs @ 11.96 hrs, Volume= 0.201 af, Atten= 4%, Lag= 1.0 min

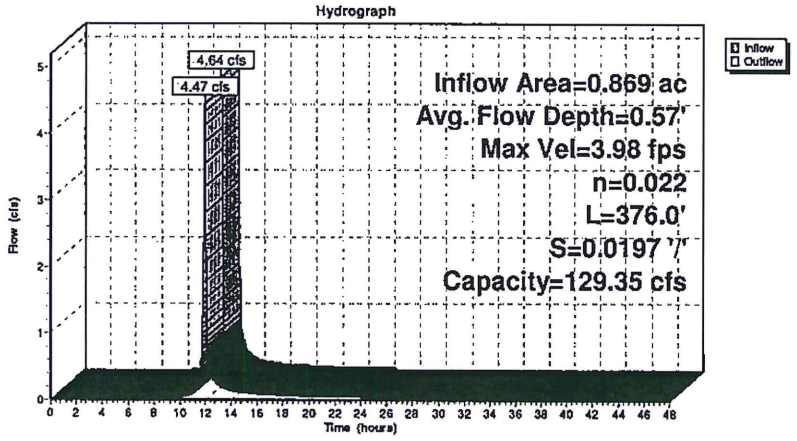
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.98 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 4.5 min

Peak Storage= 422 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.35 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 376.0' Slope= 0.0197 '/'
Inlet Invert= 927.83', Outlet Invert= 920.41'



Reach DB-F8: (new Reach)



Summary for Reach DB-F9: (new Reach)

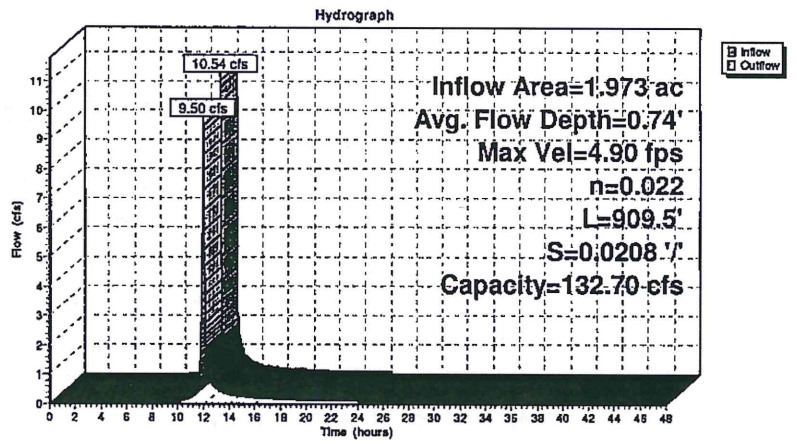
Inflow Area = 1.973 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 10.54 cfs @ 11.95 hrs, Volume= 0.456 af
Outflow = 9.50 cfs @ 11.97 hrs, Volume= 0.456 af, Atten= 10%, Lag= 1.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.90 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 1.62 fps, Avg. Travel Time= 9.4 min

Peak Storage= 1,762 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 132.70 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 909.5' Slope= 0.0208 '/'
Inlet Invert= 889.37', Outlet Invert= 870.48'

Reach DB-F9: (new Reach)



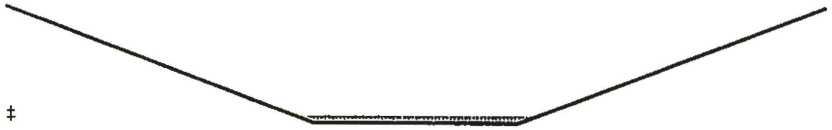
Summary for Reach DC-F1: (new Reach)

Inflow Area = 0.604 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 2.43 cfs @ 12.05 hrs, Volume= 0.140 af
Outflow = 2.43 cfs @ 12.05 hrs, Volume= 0.140 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.40 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 1.1 min

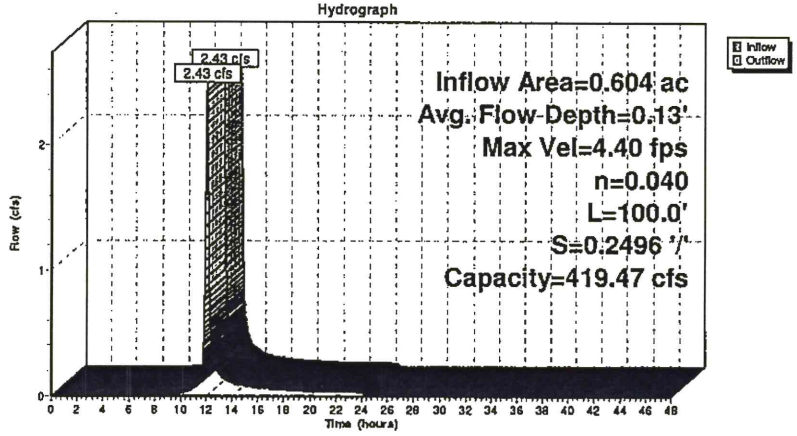
Peak Storage= 55 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.47 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2496 '/'
Inlet Invert= 995.30', Outlet Invert= 970.34'



‡

Reach DC-F1: (new Reach)



Summary for Reach DC-F2: (new Reach)

Inflow Area = 1.973 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 8.82 cfs @ 11.97 hrs, Volume= 0.456 af
Outflow = 8.82 cfs @ 11.97 hrs, Volume= 0.456 af, Atten= 0%, Lag= 0.2 min

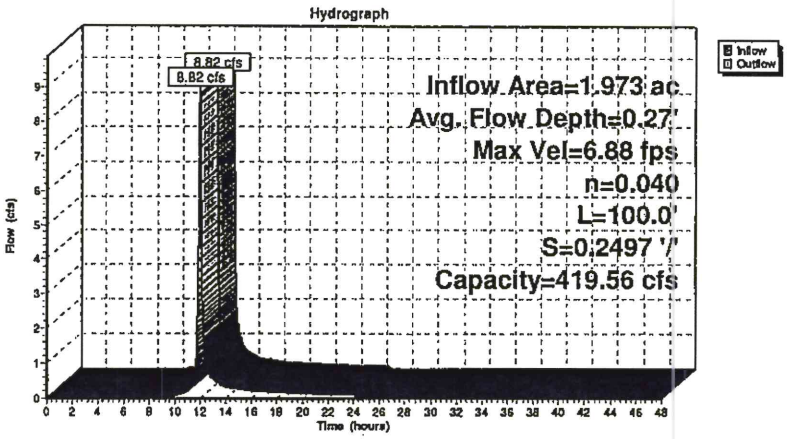
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.88 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.76 fps, Avg. Travel Time= 0.9 min

Peak Storage= 128 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.56 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2497 '/'
Inlet Invert= 970.34', Outlet Invert= 945.37'

‡

Reach DC-F2: (new Reach)



Summary for Reach DC-F3: (new Reach)

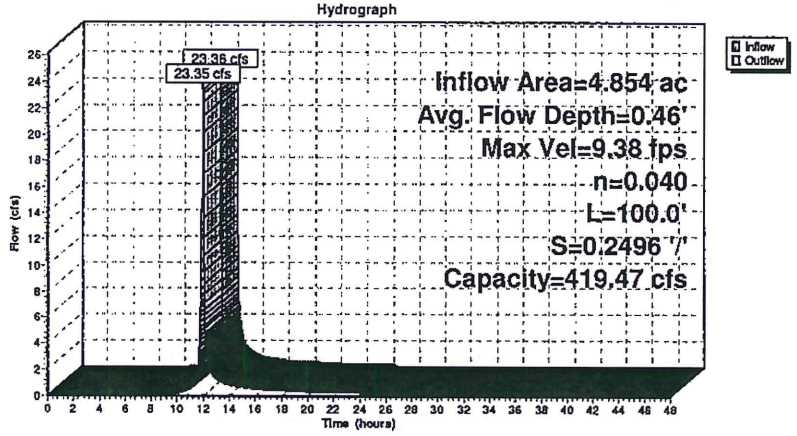
Inflow Area = 4.854 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 23.36 cfs @ 11.97 hrs, Volume= 1.123 af
Outflow = 23.35 cfs @ 11.97 hrs, Volume= 1.123 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.38 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.32 fps, Avg. Travel Time= 0.7 min

Peak Storage= 249 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.47 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2496 '/'
Inlet Invert= 945.37', Outlet Invert= 920.41'

Reach DC-F3: (new Reach)



Summary for Reach DC-F4: (new Reach)

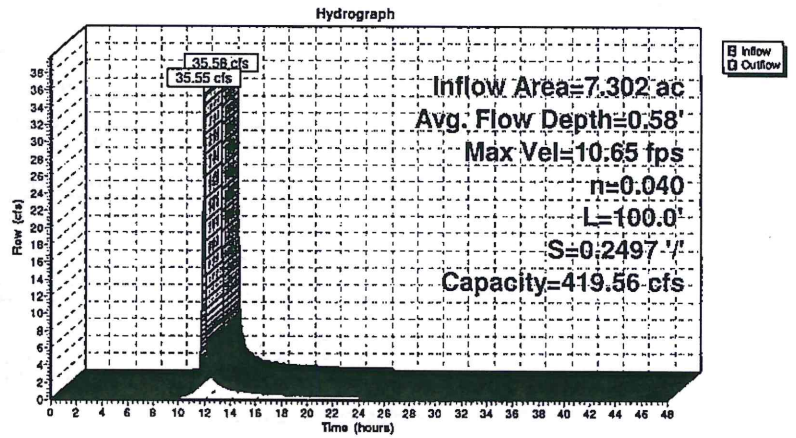
Inflow Area = 7.302 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 35.56 cfs @ 11.97 hrs, Volume= 1.689 af
Outflow = 35.55 cfs @ 11.97 hrs, Volume= 1.689 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.65 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.62 fps, Avg. Travel Time= 0.6 min

Peak Storage= 334 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.56 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2497 '/'
Inlet Invert= 920.41', Outlet Invert= 895.44'

Reach DC-F4: (new Reach)



Summary for Reach DC-F5: (new Reach)

Inflow Area = 9.971 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 48.75 cfs @ 11.97 hrs, Volume= 2.306 af
Outflow = 48.74 cfs @ 11.97 hrs, Volume= 2.306 af, Atten= 0%, Lag= 0.1 min

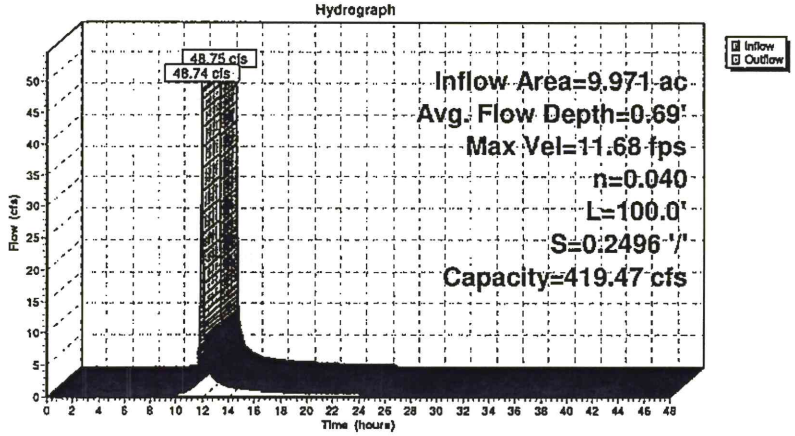
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.68 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.89 fps, Avg. Travel Time= 0.6 min

Peak Storage= 417 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.69'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.47 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2496 '/'
Inlet Invert= 895.44', Outlet Invert= 870.48'

‡

Reach DC-F5: (new Reach)



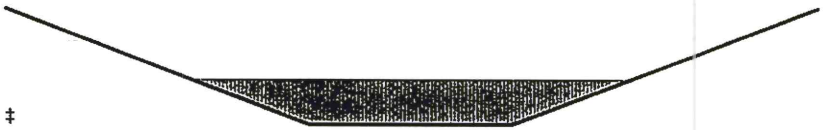
Summary for Reach DC-F6: (new Reach)

Inflow Area = 12.863 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 62.91 cfs @ 11.97 hrs, Volume= 2.975 af
Outflow = 62.90 cfs @ 11.97 hrs, Volume= 2.975 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 12.56 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.11 fps, Avg. Travel Time= 0.5 min

Peak Storage= 500 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.79'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.30 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2494 '/'
Inlet Invert= 870.48', Outlet Invert= 845.54'



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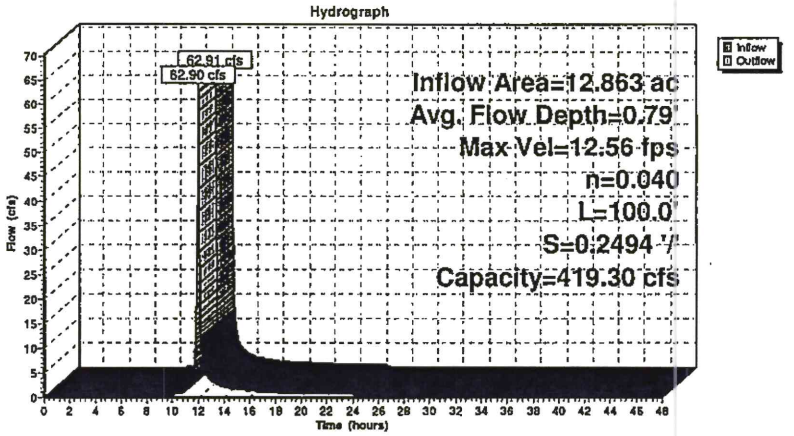
Reach DC-F6: (new Reach)



Summary for Reach DC-F7: (new Reach)

Inflow Area = 15.987 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 78.01 cfs @ 11.97 hrs, Volume= 3.698 af
Outflow = 78.01 cfs @ 11.97 hrs, Volume= 3.698 af, Atten= 0%, Lag= 0.0 min

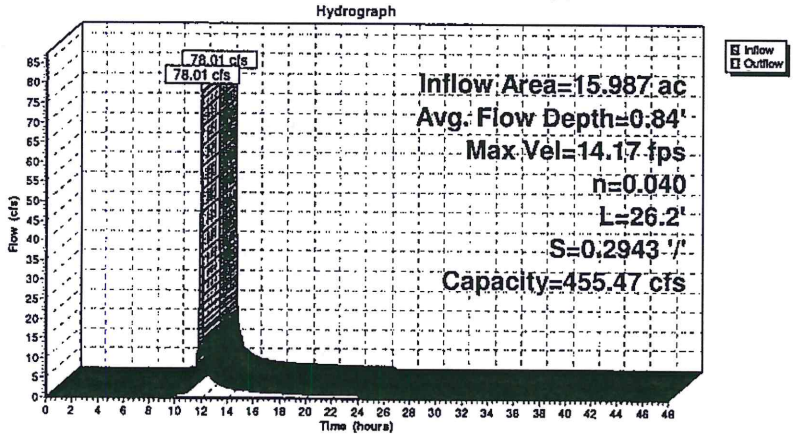
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 14.17 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.51 fps, Avg. Travel Time= 0.1 min

Peak Storage= 144 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.84'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 455.47 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 26.2' Slope= 0.2943 '/'
Inlet Invert= 845.54', Outlet Invert= 837.83'

‡

Reach DC-F7: (new Reach)



Summary for Reach IPC-F1: IPC-F1

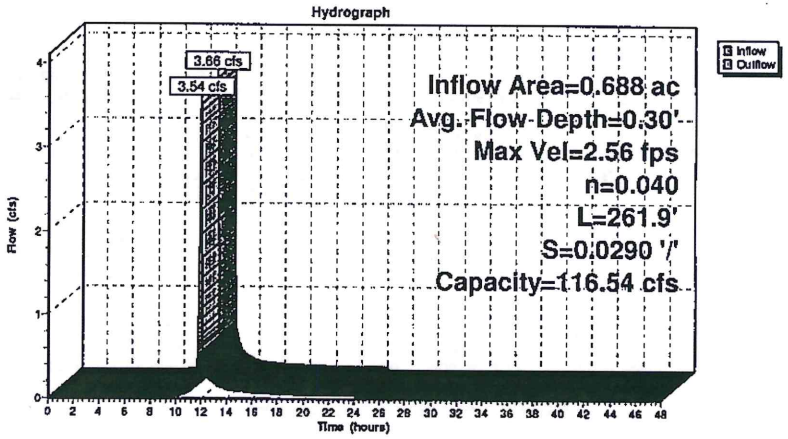
Inflow Area = 0.688 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 3.66 cfs @ 11.95 hrs, Volume= 0.159 af
Outflow = 3.54 cfs @ 11.96 hrs, Volume= 0.159 af, Atten= 3%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.56 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.60 fps, Avg. Travel Time= 7.2 min

Peak Storage= 361 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 116.54 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 261.9' Slope= 0.0290 '/'
Inlet Invert= 870.62', Outlet Invert= 863.03'

Reach IPC-F1: IPC-F1



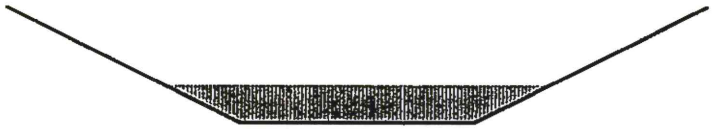
Summary for Reach IPC-F2: (new Reach)

Inflow Area = 2.937 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 15.21 cfs @ 11.96 hrs, Volume= 0.679 af
Outflow = 13.61 cfs @ 11.99 hrs, Volume= 0.679 af, Atten= 11%, Lag= 1.9 min

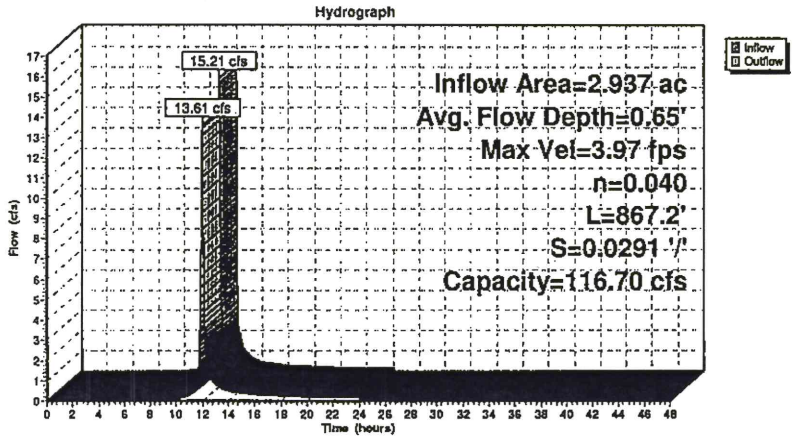
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.97 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 15.8 min

Peak Storage= 2,970 cf @ 11.99 hrs
Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 116.70 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 867.2' Slope= 0.0291 '/'
Inlet Invert= 863.03', Outlet Invert= 837.83'



Reach IPC-F2: (new Reach)



Summary for Pond DC-F8: Down Chute 3

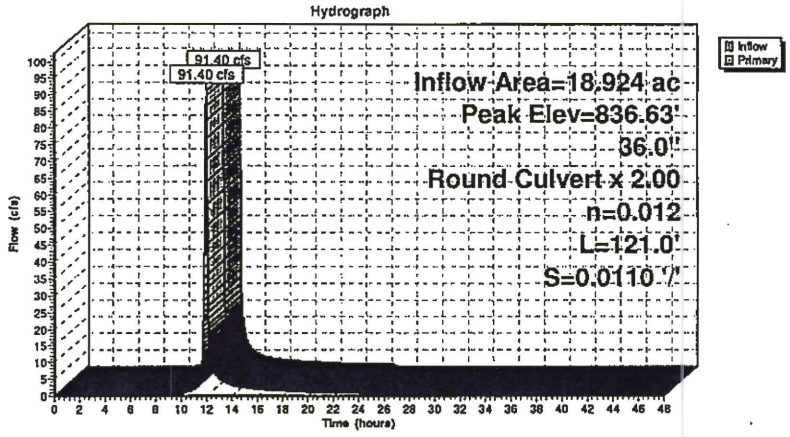
Inflow Area = 18.924 ac, 0.00% Impervious, Inflow Depth = 2.78" for 25-yr event
Inflow = 91.40 cfs @ 11.98 hrs, Volume= 4.378 af
Outflow = 91.40 cfs @ 11.98 hrs, Volume= 4.378 af, Atten= 0%, Lag= 0.0 min
Primary = 91.40 cfs @ 11.98 hrs, Volume= 4.378 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 836.63' @ 11.98 hrs
Flood Elev= 837.83'

Device	Routing	Invert	Outlet Devices
#1	Primary	833.33'	**36.0" Round Culvert X 2.00** L= 121.0' Ke= 0.500 Inlet / Outlet Invert= 833.33' / 832.00' S= 0.0110 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished

Primary OutFlow Max=91.20 cfs @ 11.98 hrs HW=836.62' TW=832.41' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 91.20 cfs @ 6.45 fps)

Pond DC-F8: Down Chute 3



Summary for Pond F: (new Pond)

Inflow Area = 37.780 ac, 0.00% Impervious, Inflow Depth = 2.64" for 25-yr event
Inflow = 163.44 cfs @ 11.99 hrs, Volume= 8.323 af
Outflow = 28.02 cfs @ 12.26 hrs, Volume= 8.188 af, Atten= 83%, Lag= 16.2 min
Primary = 28.02 cfs @ 12.26 hrs, Volume= 8.188 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 831.00' Surf.Area= 67,798 sf Storage= 290,806 cf
Peak Elev= 833.20' @ 12.26 hrs Surf.Area= 76,901 sf Storage= 449,758 cf (158,952 cf above start)

Plug-Flow detention time= 849.2 min calculated for 1.511 af (18% of inflow)
Center-of-Mass det. time= 160.2 min (989.2 - 829.0)

Volume	Invert	Avail.Storage	Storage Description
#1	826.00'	595,319 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

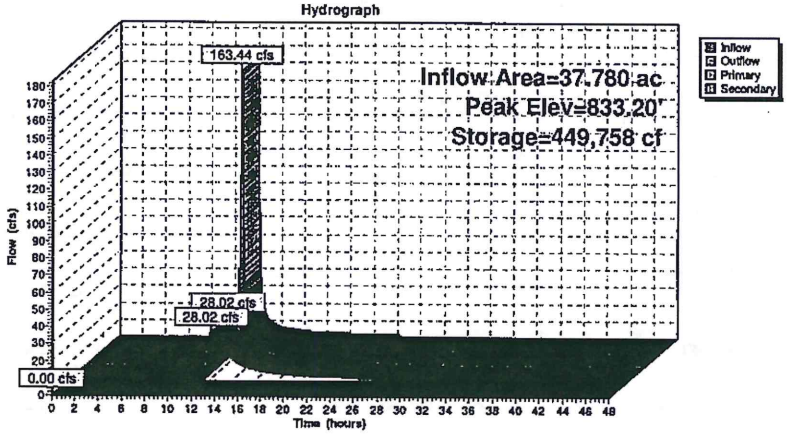
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
826.00	48,924	0	0
827.00	52,499	50,712	50,712
828.00	56,175	54,337	105,049
829.00	59,950	58,063	163,111
830.00	63,821	61,886	224,997
831.00	67,798	65,810	290,806
832.00	71,874	69,836	360,642
833.00	76,053	73,964	434,606
834.00	80,331	78,192	512,798
835.00	84,711	82,521	595,319

Device	Routing	Invert	Outlet Devices
#1	Primary	831.00'	**36.0" Round Culvert** L= 190.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 831.00' / 829.00' S= 0.0105 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished
#2	Secondary	833.25'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=28.02 cfs @ 12.26 hrs HW=833.20' (Free Discharge)
↑–1=Culvert (Inlet Controls 28.02 cfs @ 5.05 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=831.00' (Free Discharge)
↑–2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond F: (new Pond)



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

Subcatchment EX-F: Existing Drainage Area Runoff Area=18.856 ac 0.00% Impervious Runoff Depth=3.70"
Flow Length=1,022' Tc=9.1 min CN=76 Runoff=110.34 cfs 5.816 af

Subcatchment F1: (new Subcat) Runoff Area=0.551 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=99' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=4.18 cfs 0.184 af

Subcatchment F10: (new Subcat) Runoff Area=0.894 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=6.79 cfs 0.299 af

Subcatchment F11: (new Subcat) Runoff Area=2.180 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=102' Slope=0.2500 '/' Tc=3.8 min CN=79 Runoff=16.49 cfs 0.729 af

Subcatchment F12: (new Subcat) Runoff Area=0.919 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=6.98 cfs 0.307 af

Subcatchment F13: (new Subcat) Runoff Area=0.944 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=7.17 cfs 0.316 af

Subcatchment F14: (new Subcat) Runoff Area=0.939 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=97' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=7.13 cfs 0.314 af

Subcatchment F15: (new Subcat) Runoff Area=0.688 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=117' Slope=0.2500 '/' Tc=3.8 min CN=79 Runoff=5.21 cfs 0.230 af

Subcatchment F16: (new Subcat) Runoff Area=1.310 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=108' Slope=0.2500 '/' Tc=4.0 min CN=79 Runoff=9.84 cfs 0.438 af

Subcatchment F2: (new Subcat) Runoff Area=0.604 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=116' Tc=11.0 min CN=79 Runoff=3.56 cfs 0.202 af

Subcatchment F3: (new Subcat) Runoff Area=2.028 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=99' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=15.39 cfs 0.678 af

Subcatchment F4: (new Subcat) Runoff Area=0.818 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=6.21 cfs 0.273 af

Subcatchment F5: (new Subcat) Runoff Area=1.579 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=11.99 cfs 0.528 af

Subcatchment F6: (new Subcat) Runoff Area=0.853 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=6.47 cfs 0.285 af

Subcatchment F7: (new Subcat) Runoff Area=1.775 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=13.47 cfs 0.593 af

Subcatchment F8: (new Subcat) Runoff Area=0.869 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=6.60 cfs 0.291 af

Subcatchment F9: (new Subcat) Runoff Area=1.973 ac 0.00% Impervious Runoff Depth=4.01"
Flow Length=100' Slope=0.2500 '/' Tc=3.7 min CN=79 Runoff=14.98 cfs 0.660 af

Reach DB-F1: (new Reach) Avg. Flow Depth=0.58' Max Vel=3.51 fps Inflow=4.18 cfs 0.184 af
n=0.022 L=164.0' S=0.0148 '/' Capacity=112.08 cfs Outflow=4.14 cfs 0.184 af

Reach DB-F10: (new Reach) Avg. Flow Depth=0.65' Max Vel=4.39 fps Inflow=6.79 cfs 0.299 af
n=0.022 L=387.0' S=0.0197 '/' Capacity=129.37 cfs Outflow=6.57 cfs 0.299 af

Reach DB-F11: (new Reach) Avg. Flow Depth=0.89' Max Vel=5.43 fps Inflow=16.49 cfs 0.729 af
n=0.022 L=996.2' S=0.0202 '/' Capacity=130.76 cfs Outflow=14.96 cfs 0.729 af

Reach DB-F12: (new Reach) Avg. Flow Depth=0.66' Max Vel=4.41 fps Inflow=6.98 cfs 0.307 af
n=0.022 L=397.9' S=0.0197 '/' Capacity=129.33 cfs Outflow=6.74 cfs 0.307 af

Reach DB-F13: (new Reach) Avg. Flow Depth=0.67' Max Vel=4.34 fps Inflow=7.17 cfs 0.316 af
n=0.022 L=408.9' S=0.0185 '/' Capacity=125.28 cfs Outflow=6.91 cfs 0.316 af

Reach DB-F14: (new Reach) Avg. Flow Depth=0.61' Max Vel=5.38 fps Inflow=7.13 cfs 0.314 af
n=0.022 L=465.2' S=0.0329 '/' Capacity=166.99 cfs Outflow=6.91 cfs 0.314 af

Reach DB-F2: (new Reach) Avg. Flow Depth=0.52' Max Vel=3.74 fps Inflow=3.56 cfs 0.202 af
n=0.022 L=343.1' S=0.0197 '/' Capacity=129.25 cfs Outflow=3.50 cfs 0.202 af

Reach DB-F3: (new Reach) Avg. Flow Depth=0.88' Max Vel=5.40 fps Inflow=15.39 cfs 0.678 af
n=0.022 L=652.7' S=0.0202 '/' Capacity=130.99 cfs Outflow=14.59 cfs 0.678 af

Reach DB-F4: (new Reach) Avg. Flow Depth=0.63' Max Vel=4.30 fps Inflow=6.21 cfs 0.273 af
n=0.022 L=354.1' S=0.0198 '/' Capacity=129.46 cfs Outflow=6.03 cfs 0.273 af

Reach DB-F5: (new Reach) Avg. Flow Depth=0.79' Max Vel=5.09 fps Inflow=11.99 cfs 0.528 af
n=0.022 L=738.3' S=0.0206 '/' Capacity=132.12 cfs Outflow=11.17 cfs 0.528 af

Reach DB-F6: (new Reach) Avg. Flow Depth=0.64' Max Vel=4.34 fps Inflow=6.47 cfs 0.285 af
n=0.022 L=369.2' S=0.0197 '/' Capacity=129.39 cfs Outflow=6.28 cfs 0.285 af

Reach DB-F7: (new Reach) Avg. Flow Depth=0.82' Max Vel=5.25 fps Inflow=13.47 cfs 0.593 af
n=0.022 L=823.9' S=0.0208 '/' Capacity=132.85 cfs Outflow=12.45 cfs 0.593 af

Reach DB-F8: (new Reach) Avg. Flow Depth=0.65' Max Vel=4.36 fps Inflow=6.60 cfs 0.291 af
n=0.022 L=376.0' S=0.0197 '/' Capacity=129.35 cfs Outflow=6.39 cfs 0.291 af

Reach DB-F9: (new Reach) Avg. Flow Depth=0.85' Max Vel=5.37 fps Inflow=14.98 cfs 0.660 af
n=0.022 L=909.5' S=0.0208 '/' Capacity=132.70 cfs Outflow=13.72 cfs 0.660 af

Reach DC-F1: (new Reach) Avg. Flow Depth=0.16' Max Vel=5.01 fps Inflow=3.50 cfs 0.202 af
n=0.040 L=100.0' S=0.2496 '/' Capacity=419.47 cfs Outflow=3.49 cfs 0.202 af

Reach DC-F2: (new Reach) Avg. Flow Depth=0.33' Max Vel=7.74 fps Inflow=12.67 cfs 0.660 af
n=0.040 L=100.0' S=0.2497 '/' Capacity=419.56 cfs Outflow=12.66 cfs 0.660 af

Reach DC-F3: (new Reach) Avg. Flow Depth=0.56' Max Vel=10.46 fps Inflow=33.51 cfs 1.623 af
n=0.040 L=100.0' S=0.2496 '/' Capacity=419.47 cfs Outflow=33.50 cfs 1.623 af

Reach DC-F4: (new Reach) Avg. Flow Depth=0.70' Max Vel=11.84 fps Inflow=51.03 cfs 2.441 af
n=0.040 L=100.0' S=0.2497 '/' Capacity=419.56 cfs Outflow=51.02 cfs 2.441 af

Reach DC-F5: (new Reach) Avg. Flow Depth=0.83' Max Vel=12.96 fps Inflow=70.00 cfs 3.333 af
n=0.040 L=100.0' S=0.2496 '/' Capacity=419.47 cfs Outflow=69.98 cfs 3.333 af

Reach DC-F6: (new Reach) Avg. Flow Depth=0.95' Max Vel=13.91 fps Inflow=90.39 cfs 4.300 af
n=0.040 L=100.0' S=0.2494 '/' Capacity=419.30 cfs Outflow=90.37 cfs 4.300 af

Reach DC-F7: (new Reach) Avg. Flow Depth=1.02' Max Vel=15.68 fps Inflow=112.17 cfs 5.345 af
n=0.040 L=26.2' S=0.2943 '/' Capacity=455.47 cfs Outflow=112.17 cfs 5.345 af

Reach IPC-F1: IPC-F1 Avg. Flow Depth=0.37' Max Vel=2.89 fps Inflow=5.21 cfs 0.230 af
n=0.040 L=261.9' S=0.0290 '/' Capacity=116.54 cfs Outflow=5.06 cfs 0.230 af

Reach IPC-F2: (new Reach) Avg. Flow Depth=0.80' Max Vel=4.45 fps Inflow=21.71 cfs 0.982 af
n=0.040 L=867.2' S=0.0291 '/' Capacity=116.70 cfs Outflow=19.77 cfs 0.982 af

Pond DC-F8: Down Chute 3 Peak Elev=838.57' Inflow=131.69 cfs 6.327 af
36.0" Round Culvert x 2.00 n=0.012 L=121.0' S=0.0110 '/' Outflow=131.69 cfs 6.327 af

Pond F: (new Pond) Peak Elev=834.03' Storage=515,497 cf Inflow=236.81 cfs 12.143 af
Primary=42.15 cfs 11.301 af Secondary=18.60 cfs 0.703 af Outflow=60.75 cfs 12.004 af

Total Runoff Area = 37.780 ac Runoff Volume = 12.143 af Average Runoff Depth = 3.86"
100.00% Pervious = 37.780 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment EX-F: Existing Drainage Area

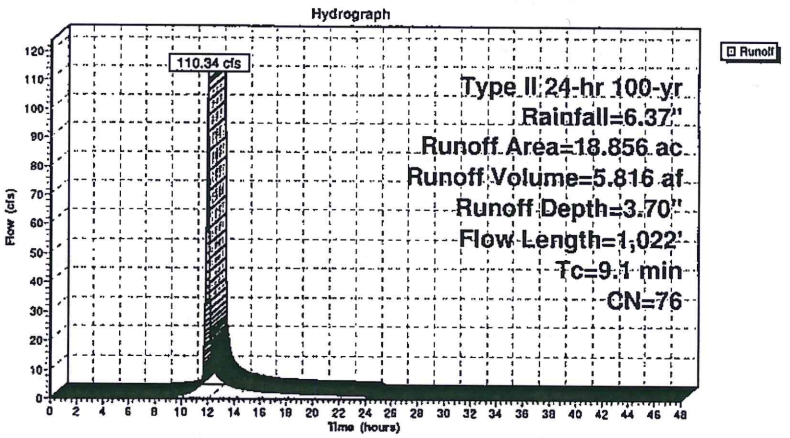
Runoff = 110.34 cfs @ 12.01 hrs, Volume= 5.816 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
18.856	76	Woods/grass comb., Fair, HSG C
18.856		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0460	0.23		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.91"
1.1	179	0.1450	2.67		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
0.6	743	0.1290	20.54	328.60	**Channel Flow,** Area= 16.0 sf Perim= 12.9' r= 1.24' n= 0.030 Earth, grassed & winding
9.1	1,022	Total			

Subcatchment EX-F: Existing Drainage Area



Summary for Subcatchment F1: (new Subcat)

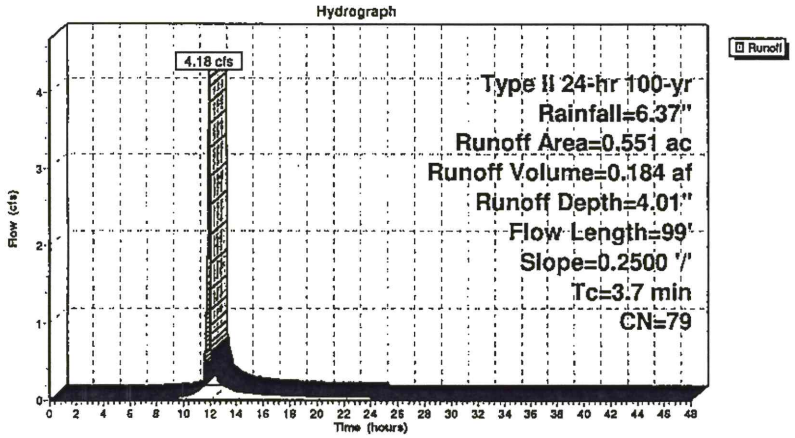
Runoff = 4.18 cfs @ 11.94 hrs, Volume= 0.184 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.551	79	50-75% Grass cover, Fair, HSG C
0.551		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	99	0.2500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F1: (new Subcat)



Summary for Subcatchment F10: (new Subcat)

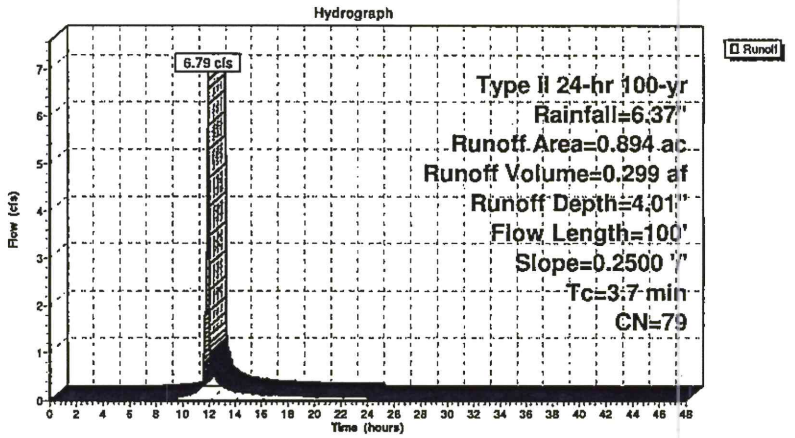
Runoff = 6.79 cfs @ 11.94 hrs, Volume= 0.299 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.894	79	50-75% Grass cover, Fair, HSG C
0.894		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F10: (new Subcat)



Summary for Subcatchment F11: (new Subcat)

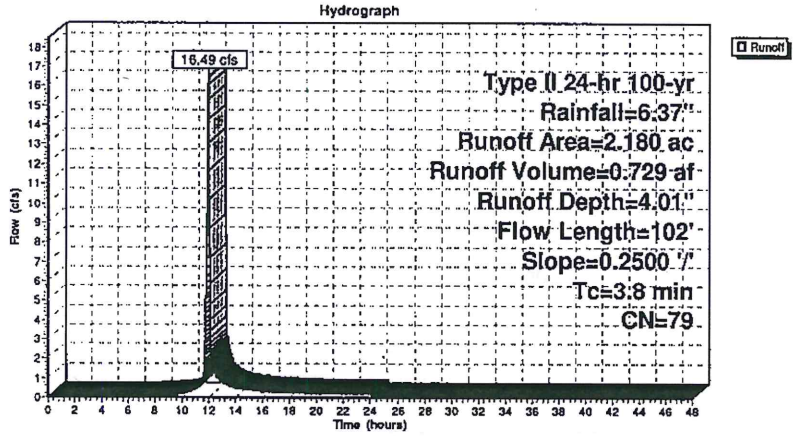
Runoff = 16.49 cfs @ 11.95 hrs, Volume= 0.729 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
2.180	79	50-75% Grass cover, Fair, HSG C
2.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	102	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F11: (new Subcat)



Summary for Subcatchment F12: (new Subcat)

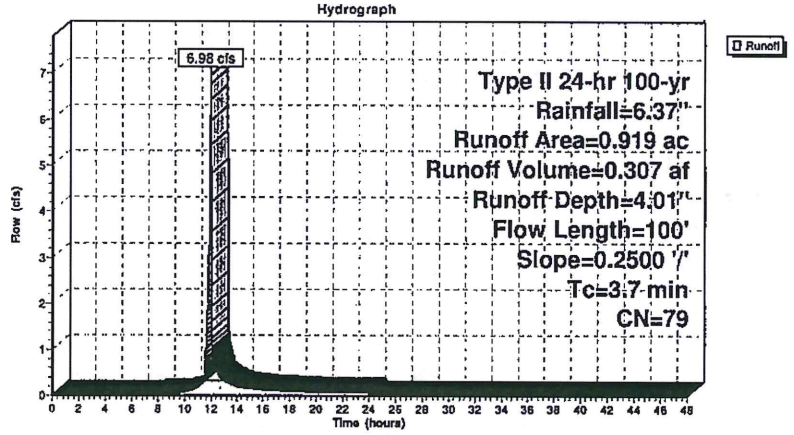
Runoff = 6.98 cfs @ 11.94 hrs, Volume= 0.307 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.919	79	50-75% Grass cover, Fair, HSG C
0.919		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F12: (new Subcat)



Summary for Subcatchment F13: (new Subcat)

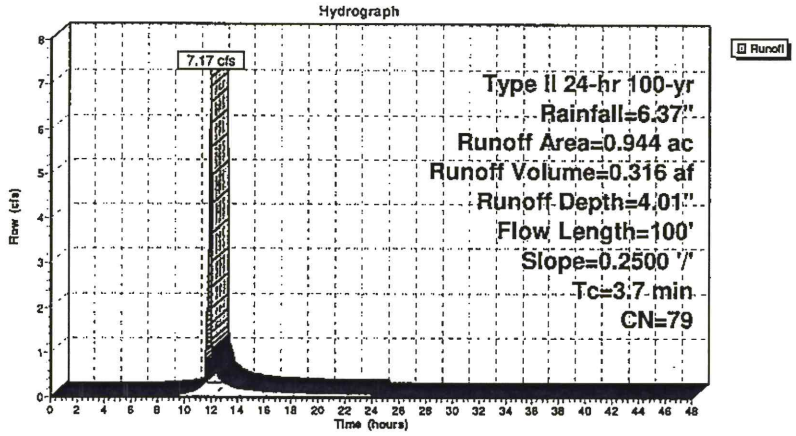
Runoff = 7.17 cfs @ 11.94 hrs, Volume= 0.316 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.944	79	50-75% Grass cover, Fair, HSG C
0.944		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F13: (new Subcat)



Summary for Subcatchment F14: (new Subcat)

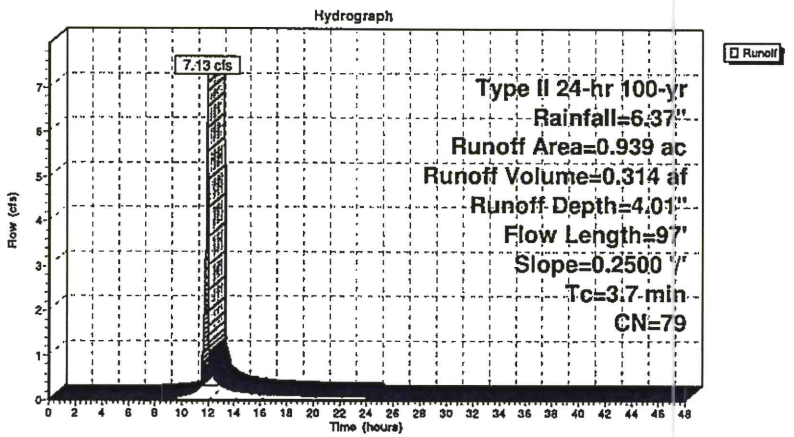
Runoff = 7.13 cfs @ 11.94 hrs, Volume= 0.314 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.939	79	50-75% Grass cover, Fair, HSG C
0.939		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	97	0.2500	0.44		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F14: (new Subcat)



Summary for Subcatchment F15: (new Subcat)

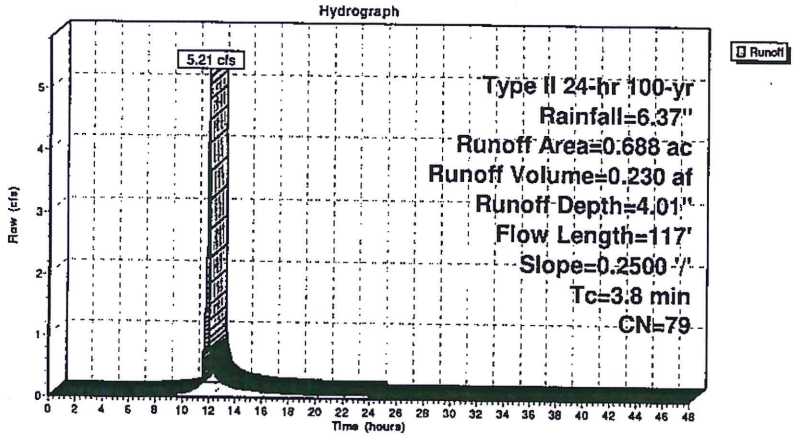
Runoff = 5.21 cfs @ 11.95 hrs, Volume= 0.230 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.688	79	50-75% Grass cover, Fair, HSG C
0.688		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"
0.1	17	0.2500	3.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
3.8	117	Total			

Subcatchment F15: (new Subcat)



Summary for Subcatchment F16: (new Subcat)

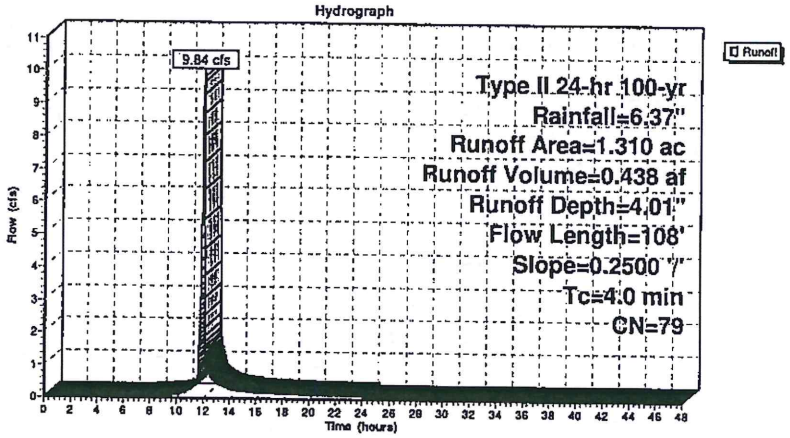
Runoff = 9.84 cfs @ 11.95 hrs, Volume= 0.438 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.310	79	50-75% Grass cover, Fair, HSG C
1.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	108	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F16: (new Subcat)



Summary for Subcatchment F2: (new Subcat)

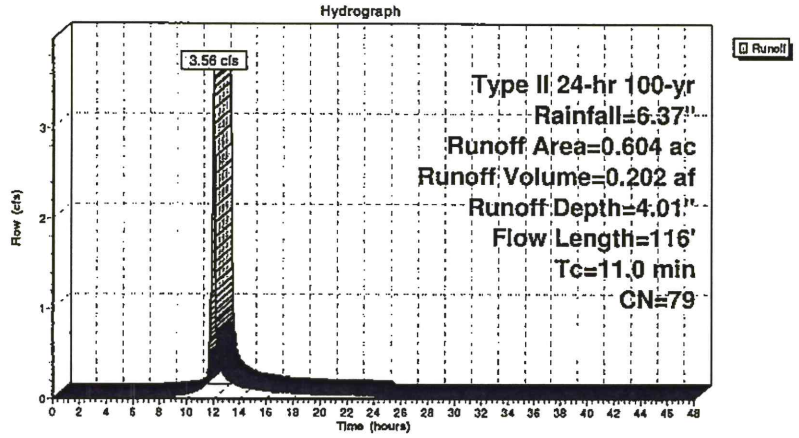
Runoff = 3.56 cfs @ 12.03 hrs, Volume= 0.202 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.604	79	50-75% Grass cover, Fair, HSG C
0.604		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	109	0.0200	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
0.0	7	0.2500	3.50		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	116	Total			

Subcatchment F2: (new Subcat)



Summary for Subcatchment F3: (new Subcat)

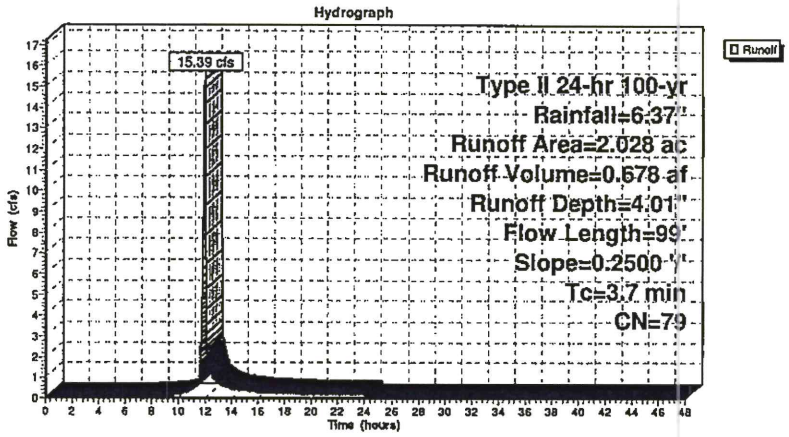
Runoff = 15.39 cfs @ 11.94 hrs, Volume= 0.678 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
2.028	79	50-75% Grass cover, Fair, HSG C
2.028		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	99	0.2500	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Subcatchment F3: (new Subcat)



Summary for Subcatchment F4: (new Subcat)

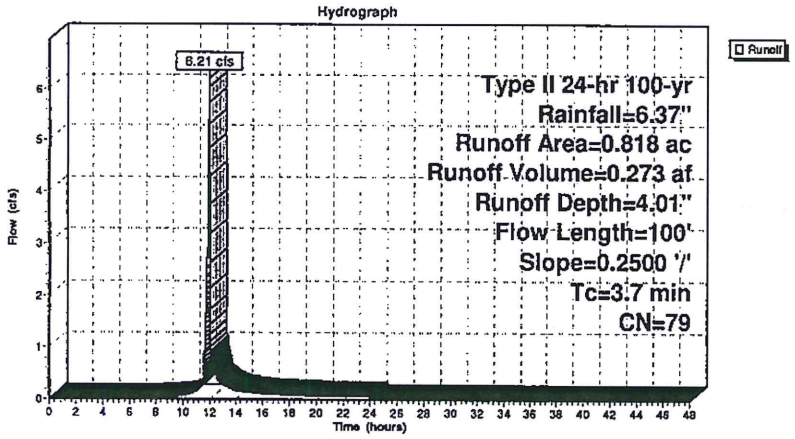
Runoff = 6.21 cfs @ 11.94 hrs, Volume= 0.273 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.818	79	50-75% Grass cover, Fair, HSG C
0.818		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F4: (new Subcat)



Summary for Subcatchment F5: (new Subcat)

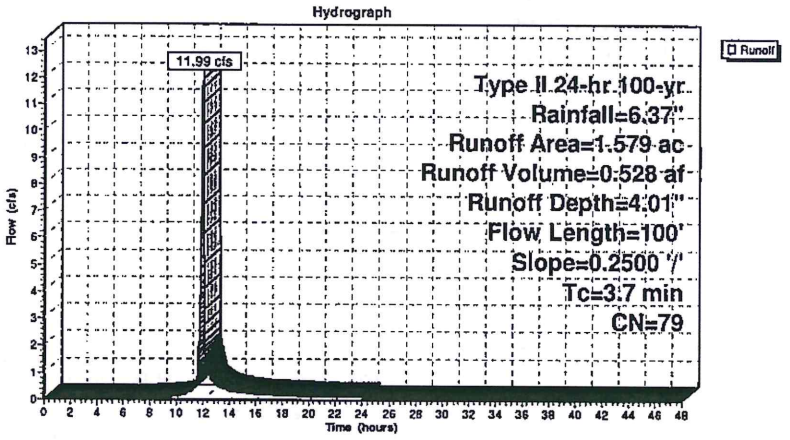
Runoff = 11.99 cfs @ 11.94 hrs, Volume= 0.528 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.579	79	50-75% Grass cover, Fair, HSG C
1.579		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F5: (new Subcat)



Summary for Subcatchment F6: (new Subcat)

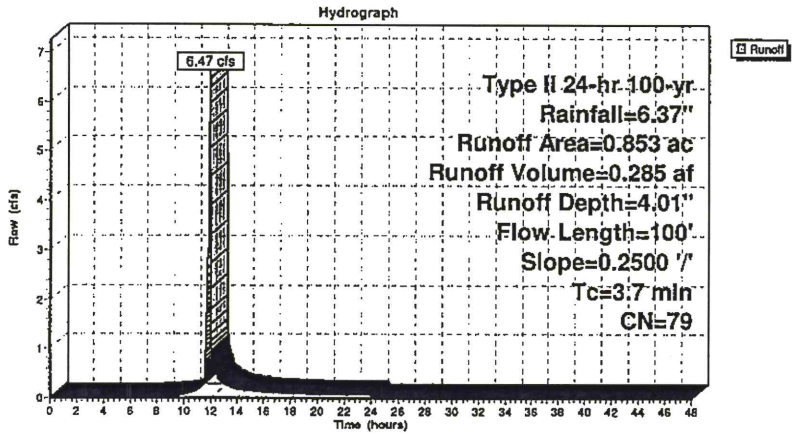
Runoff = 6.47 cfs @ 11.94 hrs, Volume= 0.285 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.853	79	50-75% Grass cover, Fair, HSG C
0.853		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F6: (new Subcat)



Summary for Subcatchment F7: (new Subcat)

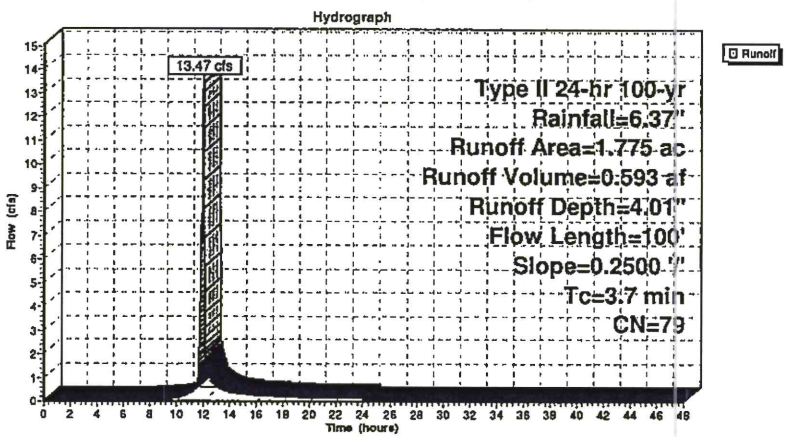
Runoff = 13.47 cfs @ 11.94 hrs, Volume= 0.593 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.775	79	50-75% Grass cover, Fair, HSG C
1.775		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F7: (new Subcat)



Summary for Subcatchment F8: (new Subcat)

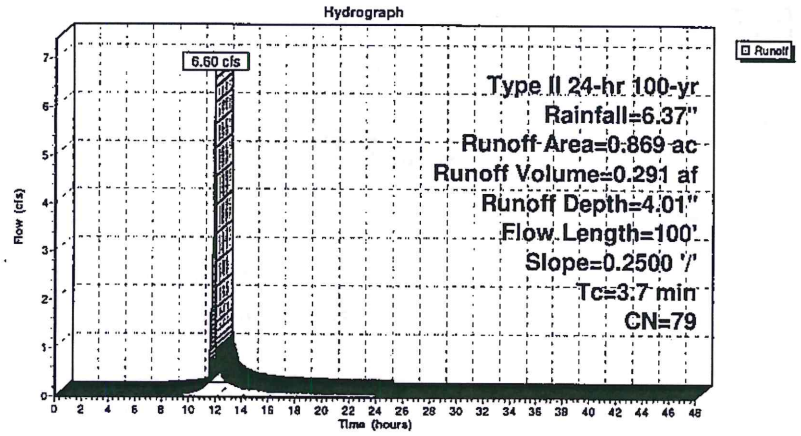
Runoff = 6.60 cfs @ 11.94 hrs, Volume= 0.291 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.869	79	50-75% Grass cover, Fair, HSG C
0.869		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F8: (new Subcat)



Summary for Subcatchment F9: (new Subcat)

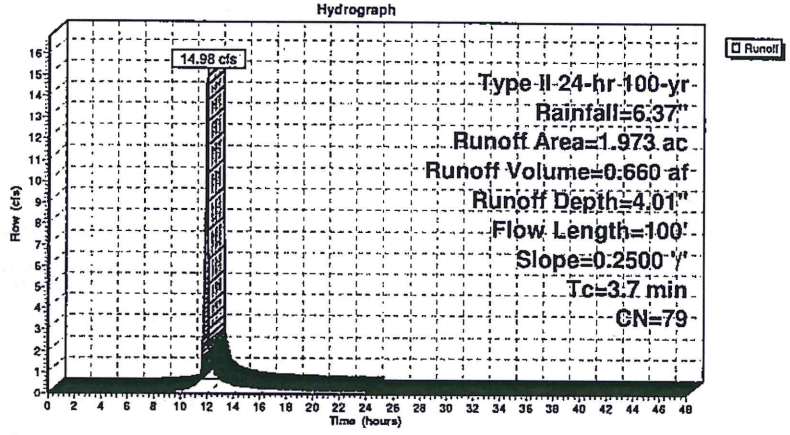
Runoff = 14.98 cfs @ 11.94 hrs, Volume= 0.660 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.973	79	50-75% Grass cover, Fair, HSG C
1.973		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		Sheet Flow, Grass: Short n= 0.150 P2= 2.91"

Subcatchment F9: (new Subcat)



Summary for Reach DB-F1: (new Reach)

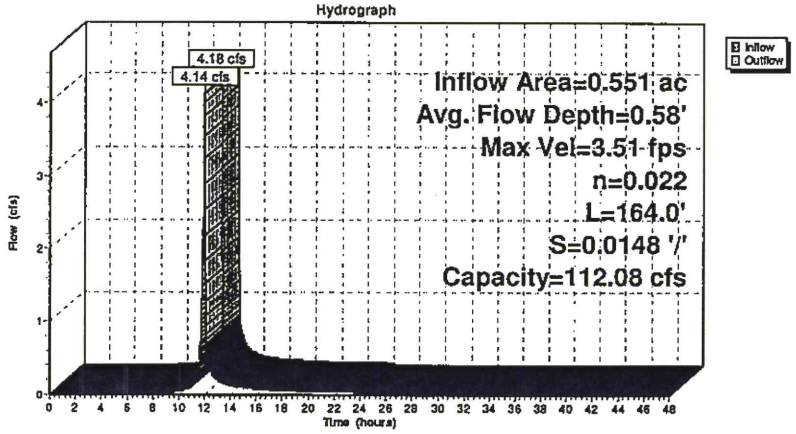
Inflow Area = 0.551 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 4.18 cfs @ 11.94 hrs, Volume= 0.184 af
Outflow = 4.14 cfs @ 11.95 hrs, Volume= 0.184 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.51 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.21 fps, Avg. Travel Time= 2.3 min

Peak Storage= 193 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 112.08 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 164.0' Slope= 0.0148 '/'
Inlet Invert= 972.77', Outlet Invert= 970.34'

Reach DB-F1: (new Reach)



Summary for Reach DB-F10: (new Reach)

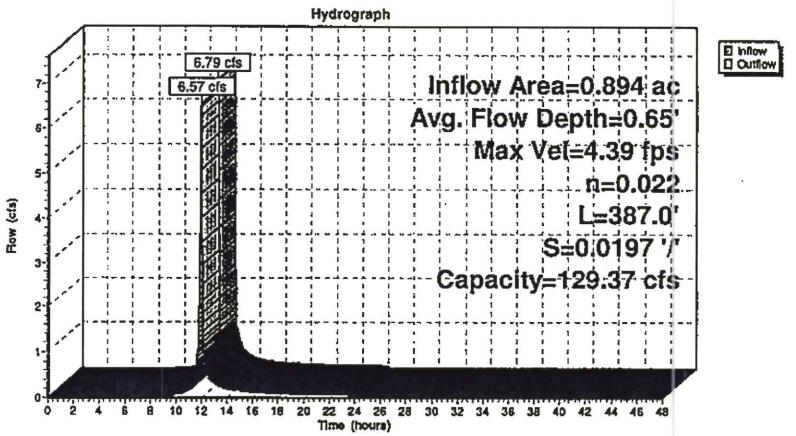
Inflow Area = 0.894 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 6.79 cfs @ 11.94 hrs, Volume= 0.299 af
Outflow = 6.57 cfs @ 11.96 hrs, Volume= 0.299 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.39 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 4.3 min

Peak Storage= 579 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.37 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 387.0' Slope= 0.0197 '/'
Inlet Invert= 903.08', Outlet Invert= 895.44'

Reach DB-F10: (new Reach)



Summary for Reach DB-F11: (new Reach)

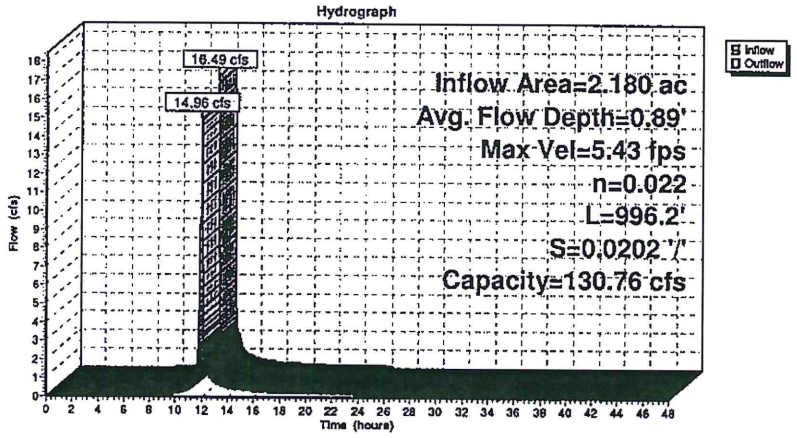
Inflow Area = 2.180 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 16.49 cfs @ 11.95 hrs, Volume= 0.729 af
Outflow = 14.96 cfs @ 11.97 hrs, Volume= 0.729 af, Atten= 9%, Lag= 1.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.43 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 1.74 fps, Avg. Travel Time= 9.5 min

Peak Storage= 2,743 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.89'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.76 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 996.2' Slope= 0.0202 '/'
Inlet Invert= 865.63', Outlet Invert= 845.54'

Reach DB-F11: (new Reach)



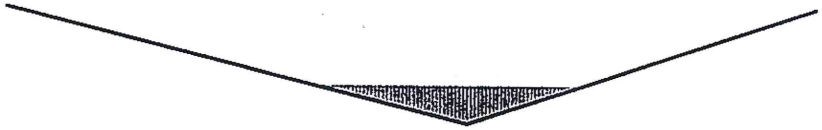
Summary for Reach DB-F12: (new Reach)

Inflow Area = 0.919 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 6.98 cfs @ 11.94 hrs, Volume= 0.307 af
Outflow = 6.74 cfs @ 11.96 hrs, Volume= 0.307 af, Atten= 3%, Lag= 1.0 min

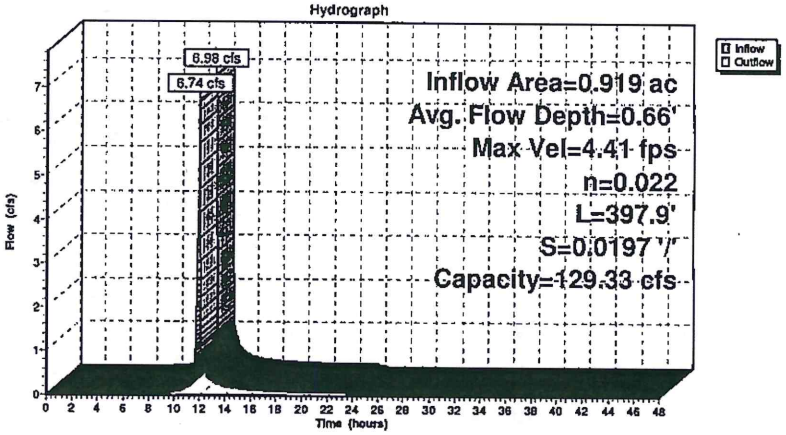
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.41 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.49 fps, Avg. Travel Time= 4.4 min

Peak Storage= 608 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.66'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.33 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 397.9' Slope= 0.0197 '/'
Inlet Invert= 878.33', Outlet Invert= 870.48'



Reach DB-F12: (new Reach)



Summary for Reach DB-F13: (new Reach)

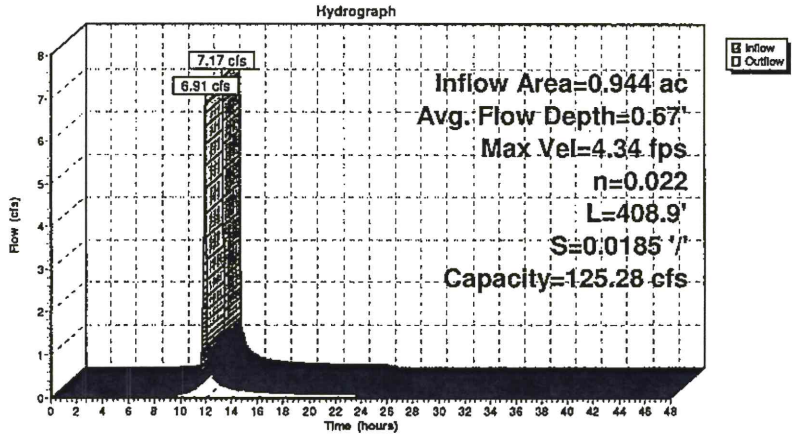
Inflow Area = 0.944 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 7.17 cfs @ 11.94 hrs, Volume= 0.316 af
Outflow = 6.91 cfs @ 11.96 hrs, Volume= 0.316 af, Atten= 4%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.34 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 4.7 min

Peak Storage= 651 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.67'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 125.28 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 408.9' Slope= 0.0185 '/'
Inlet Invert= 853.11', Outlet Invert= 845.54'

Reach DB-F13: (new Reach)



Summary for Reach DB-F14: (new Reach)

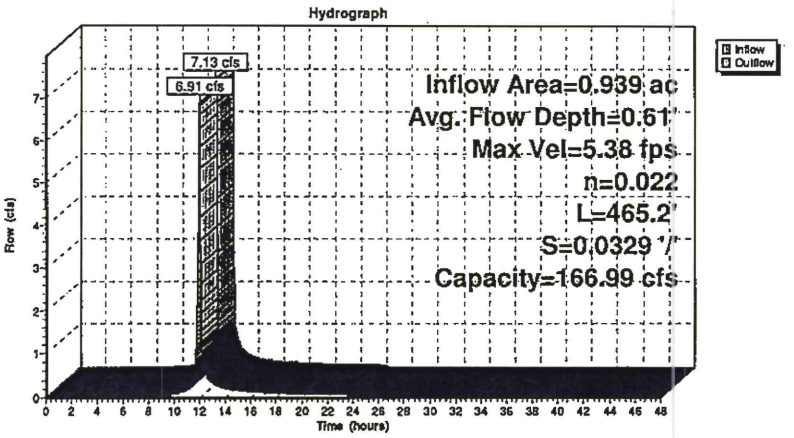
Inflow Area = 0.939 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 7.13 cfs @ 11.94 hrs, Volume= 0.314 af
Outflow = 6.91 cfs @ 11.96 hrs, Volume= 0.314 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.38 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.83 fps, Avg. Travel Time= 4.2 min

Peak Storage= 597 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 166.99 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 465.2' Slope= 0.0329 '/'
Inlet Invert= 878.33', Outlet Invert= 863.03'

Reach DB-F14: (new Reach)



Summary for Reach DB-F2: (new Reach)

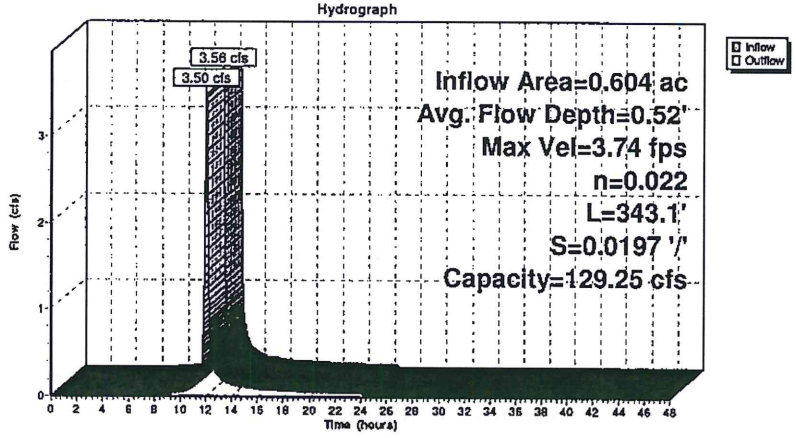
Inflow Area = 0.604 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 3.56 cfs @ 12.03 hrs, Volume= 0.202 af
Outflow = 3.50 cfs @ 12.04 hrs, Volume= 0.202 af, Atten= 2%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.74 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 4.2 min

Peak Storage= 320 cf @ 12.04 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.25 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 343.1' Slope= 0.0197 '/'
Inlet Invert= 1,002.06', Outlet Invert= 995.30'

Reach DB-F2: (new Reach)



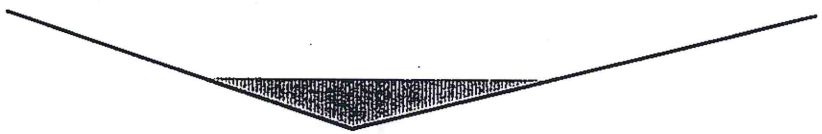
Summary for Reach DB-F3: (new Reach)

Inflow Area = 2.028 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 15.39 cfs @ 11.94 hrs, Volume= 0.678 af
Outflow = 14.59 cfs @ 11.97 hrs, Volume= 0.678 af, Atten= 5%, Lag= 1.2 min

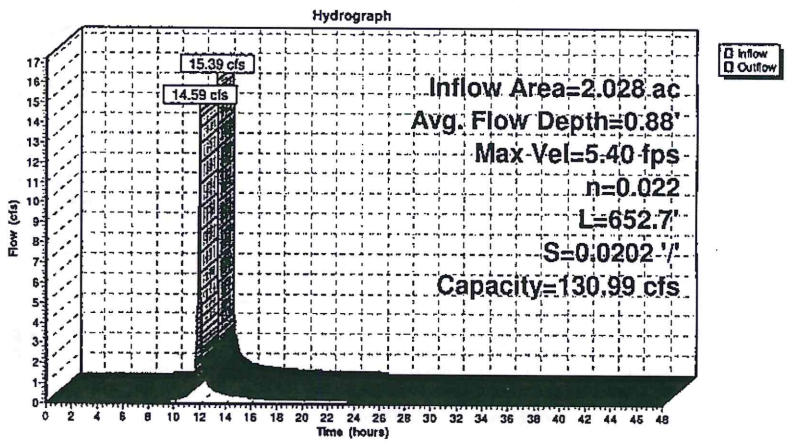
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.40 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 6.1 min

Peak Storage= 1,762 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.88'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 130.99 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 652.7' Slope= 0.0202 '/'
Inlet Invert= 958.58', Outlet Invert= 945.37'



Reach DB-F3: (new Reach)



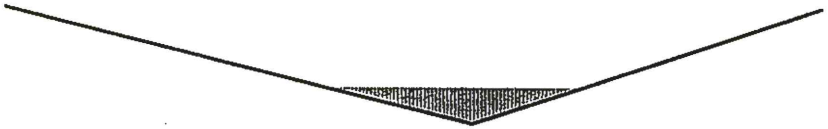
Summary for Reach DB-F4: (new Reach)

Inflow Area = 0.818 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 6.21 cfs @ 11.94 hrs, Volume= 0.273 af
Outflow = 6.03 cfs @ 11.96 hrs, Volume= 0.273 af, Atten= 3%, Lag= 0.9 min

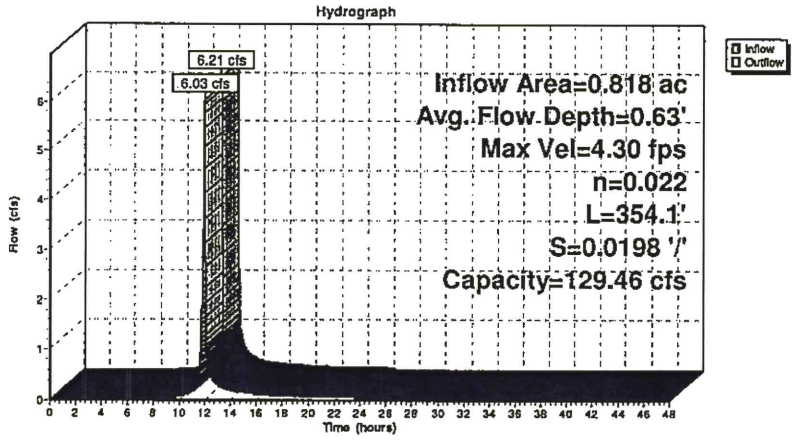
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.30 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 4.0 min

Peak Storage= 497 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.63'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.46 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 354.1' Slope= 0.0198 '/'
Inlet Invert= 977.34', Outlet Invert= 970.34'



Reach DB-F4: (new Reach)



Summary for Reach DB-F5: (new Reach)

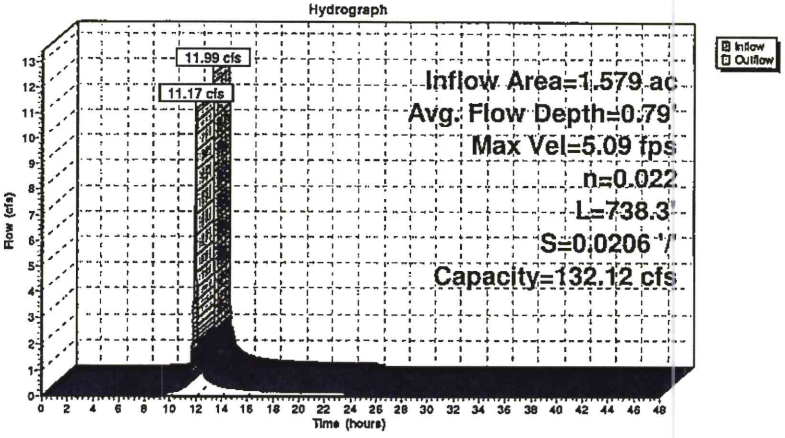
Inflow Area = 1.579 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 11.99 cfs @ 11.94 hrs, Volume= 0.528 af
Outflow = 11.17 cfs @ 11.97 hrs, Volume= 0.528 af, Atten= 7%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.09 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 1.67 fps, Avg. Travel Time= 7.4 min

Peak Storage= 1,621 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.79'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 132.12 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 738.3' Slope= 0.0206 '/'
Inlet Invert= 935.61', Outlet Invert= 920.41'

Reach DB-F5: (new Reach)



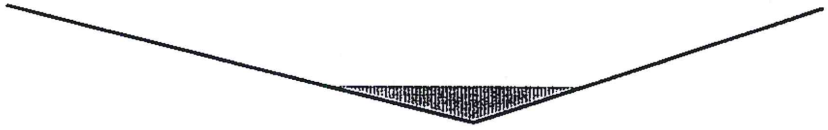
Summary for Reach DB-F6: (new Reach)

Inflow Area = 0.853 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 6.47 cfs @ 11.94 hrs, Volume= 0.285 af
Outflow = 6.28 cfs @ 11.96 hrs, Volume= 0.285 af, Atten= 3%, Lag= 0.9 min

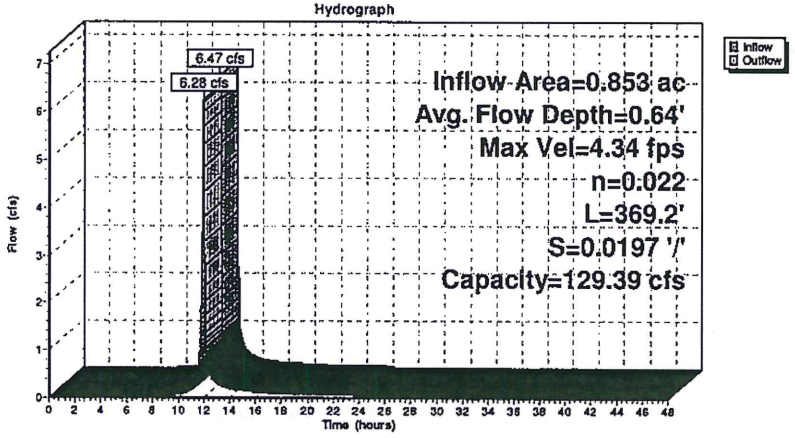
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.34 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.47 fps, Avg. Travel Time= 4.2 min

Peak Storage= 534 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.64'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.39 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 369.2' Slope= 0.0197 '/'
Inlet Invert= 952.66', Outlet Invert= 945.37'



Reach DB-F6: (new Reach)



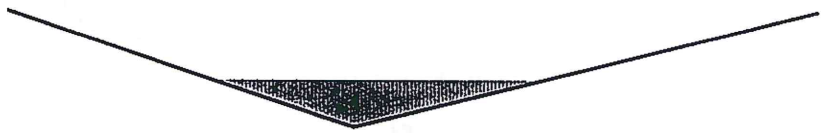
Summary for Reach DB-F7: (new Reach)

Inflow Area = 1.775 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 13.47 cfs @ 11.94 hrs, Volume= 0.593 af
Outflow = 12.45 cfs @ 11.97 hrs, Volume= 0.593 af, Atten= 8%, Lag= 1.5 min

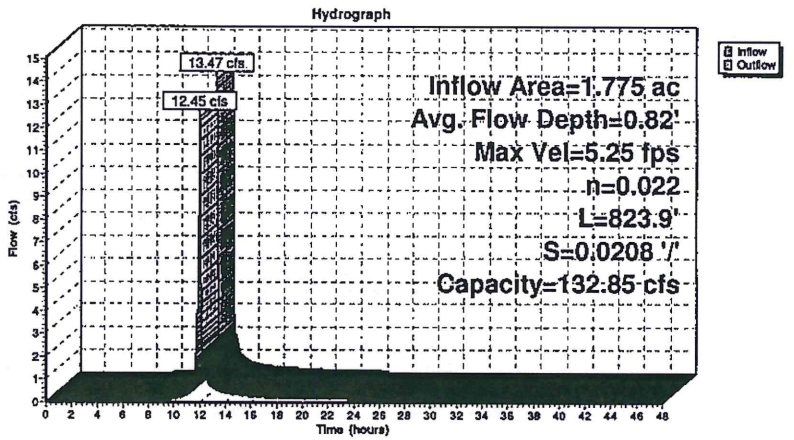
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.25 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 1.71 fps, Avg. Travel Time= 8.0 min

Peak Storage= 1,954 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.82'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 132.85 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 823.9' Slope= 0.0208 '/'
Inlet Invert= 912.59', Outlet Invert= 895.44'



Reach DB-F7: (new Reach)



Summary for Reach DB-F8: (new Reach)

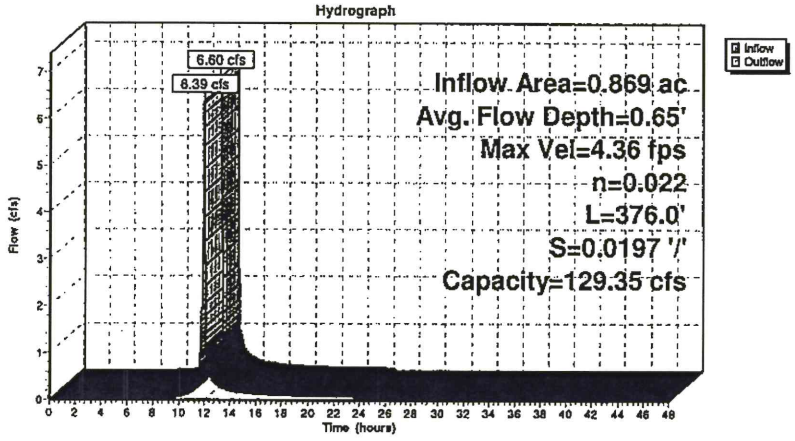
Inflow Area = 0.869 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 6.60 cfs @ 11.94 hrs, Volume= 0.291 af
Outflow = 6.39 cfs @ 11.96 hrs, Volume= 0.291 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.36 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.47 fps, Avg. Travel Time= 4.2 min

Peak Storage= 552 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 129.35 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 376.0' Slope= 0.0197 '/'
Inlet Invert= 927.83', Outlet Invert= 920.41'

Reach DB-F8: (new Reach)



Summary for Reach DB-F9: (new Reach)

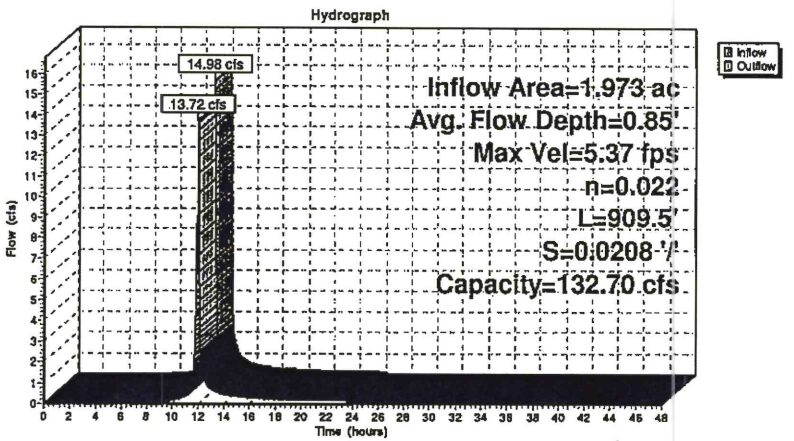
Inflow Area = 1.973 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 14.98 cfs @ 11.94 hrs, Volume= 0.660 af
Outflow = 13.72 cfs @ 11.97 hrs, Volume= 0.660 af, Atten= 8%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.37 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 1.74 fps, Avg. Travel Time= 8.7 min

Peak Storage= 2,321 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.85'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 132.70 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 909.5' Slope= 0.0208 '/'
Inlet Invert= 889.37', Outlet Invert= 870.48'

Reach DB-F9: (new Reach)



Summary for Reach DC-F1: (new Reach)

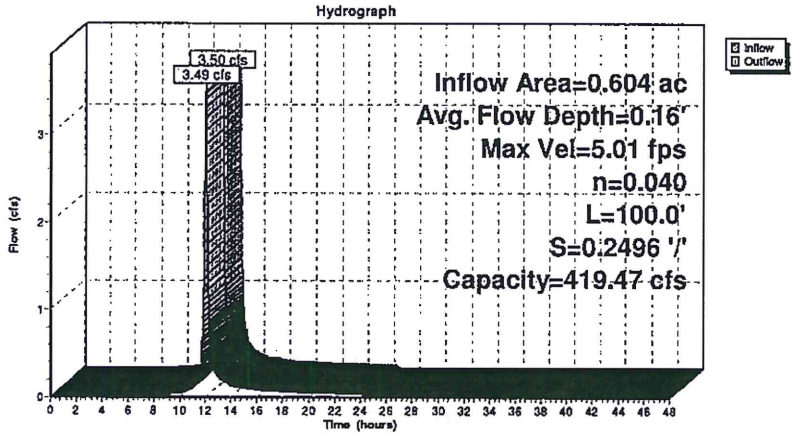
Inflow Area = 0.604 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 3.50 cfs @ 12.04 hrs, Volume= 0.202 af
Outflow = 3.49 cfs @ 12.05 hrs, Volume= 0.202 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.01 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.50 fps, Avg. Travel Time= 1.1 min

Peak Storage= 70 cf @ 12.05 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.47 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2496 '/'
Inlet Invert= 995.30', Outlet Invert= 970.34'

Reach DC-F1: (new Reach)



Summary for Reach DC-F2: (new Reach)

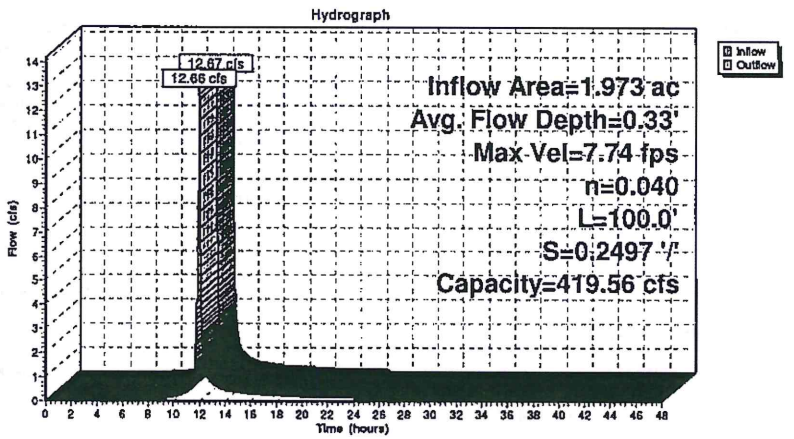
Inflow Area = 1.973 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 12.67 cfs @ 11.96 hrs, Volume= 0.660 af
Outflow = 12.66 cfs @ 11.97 hrs, Volume= 0.660 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.74 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.92 fps, Avg. Travel Time= 0.9 min

Peak Storage= 164 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.56 cfs

4.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2497 '/'
Inlet Invert= 970.34', Outlet Invert= 945.37'

Reach DC-F2: (new Reach)



Summary for Reach DC-F3: (new Reach)

Inflow Area = 4.854 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 33.51 cfs @ 11.96 hrs, Volume= 1.623 af
Outflow = 33.50 cfs @ 11.97 hrs, Volume= 1.623 af, Atten= 0%, Lag= 0.1 min

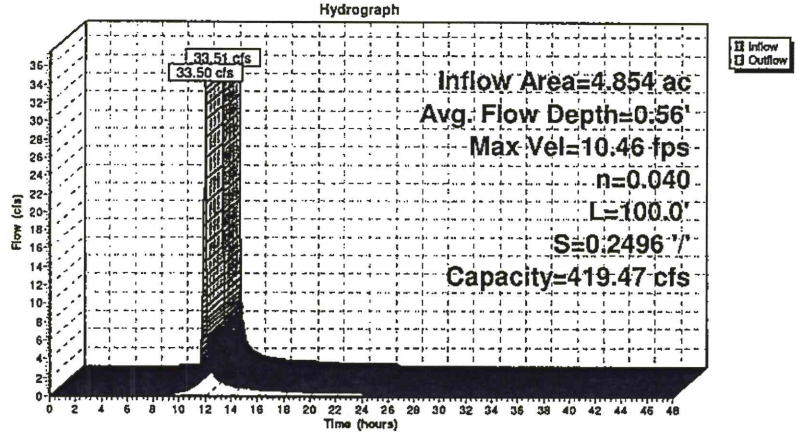
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.46 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.54 fps, Avg. Travel Time= 0.7 min

Peak Storage= 320 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.56'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.47 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2496 '/'
Inlet Invert= 945.37', Outlet Invert= 920.41'

‡

Reach DC-F3: (new Reach)



Summary for Reach DC-F4: (new Reach)

Inflow Area = 7.302 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 51.03 cfs @ 11.97 hrs, Volume= 2.441 af
Outflow = 51.02 cfs @ 11.97 hrs, Volume= 2.441 af, Atten= 0%, Lag= 0.1 min

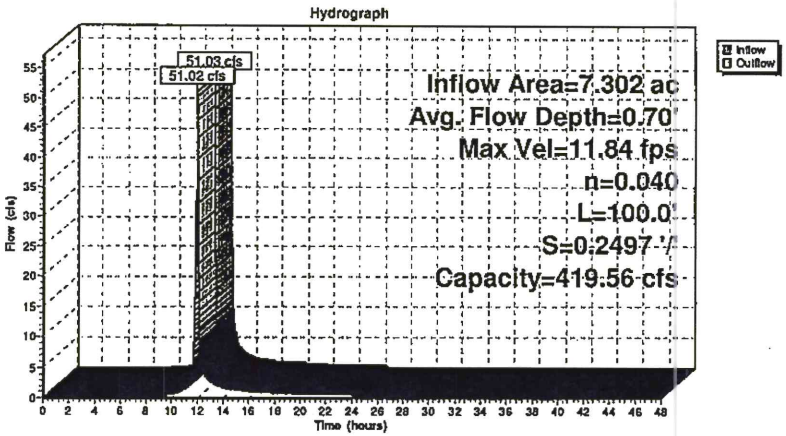
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.84 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.89 fps, Avg. Travel Time= 0.6 min

Peak Storage= 431 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.56 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2497 '/'
Inlet Invert= 920.41', Outlet Invert= 895.44'

‡

Reach DC-F4: (new Reach)



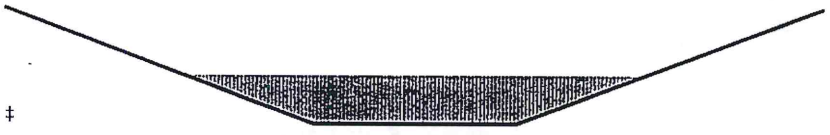
Summary for Reach DC-F5: (new Reach)

Inflow Area = 9.971 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 70.00 cfs @ 11.97 hrs, Volume= 3.333 af
Outflow = 69.98 cfs @ 11.97 hrs, Volume= 3.333 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 12.96 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.17 fps, Avg. Travel Time= 0.5 min

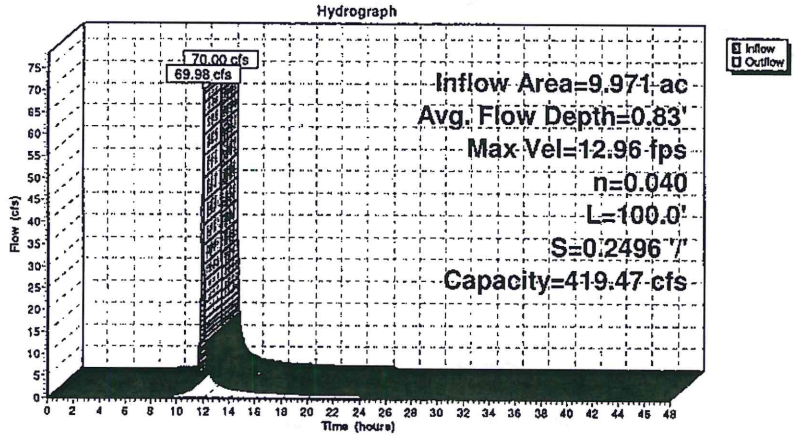
Peak Storage= 540 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.83'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.47 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2496 '/'
Inlet Invert= 895.44', Outlet Invert= 870.48'



‡

Reach DC-F5: (new Reach)



Summary for Reach DC-F6: (new Reach)

Inflow Area = 12.863 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 90.39 cfs @ 11.97 hrs, Volume= 4.300 af
Outflow = 90.37 cfs @ 11.97 hrs, Volume= 4.300 af, Atten= 0%, Lag= 0.1 min

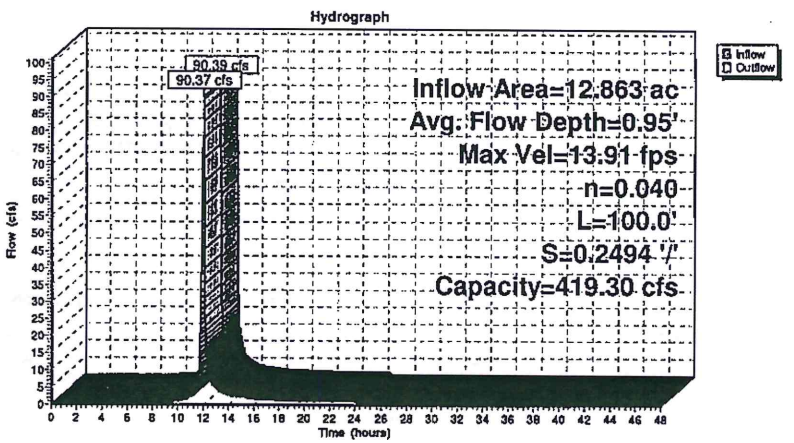
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 13.91 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.43 fps, Avg. Travel Time= 0.5 min

Peak Storage= 649 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.95'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 419.30 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 100.0' Slope= 0.2494 '/'
Inlet Invert= 870.48', Outlet Invert= 845.54'

‡

Reach DC-F6: (new Reach)



Summary for Reach DC-F7: (new Reach)

Inflow Area = 15.987 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 112.17 cfs @ 11.97 hrs, Volume= 5.345 af
Outflow = 112.17 cfs @ 11.97 hrs, Volume= 5.345 af, Atten= 0%, Lag= 0.0 min

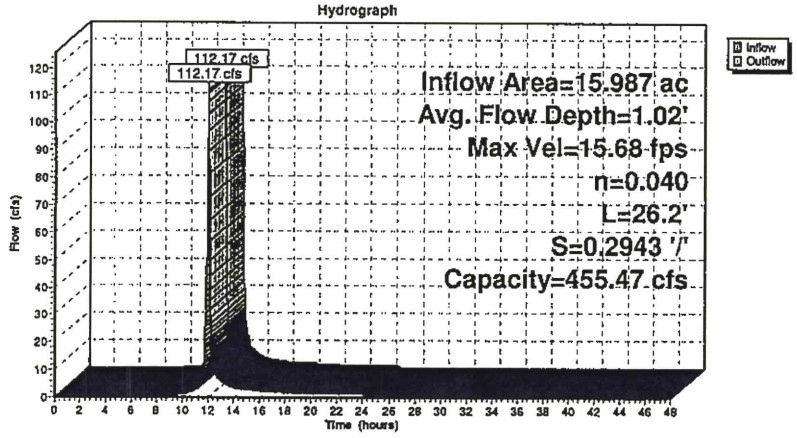
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 15.68 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.86 fps, Avg. Travel Time= 0.1 min

Peak Storage= 187 cf @ 11.97 hrs
Average Depth at Peak Storage= 1.02'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 455.47 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 26.2' Slope= 0.2943 '/'
Inlet Invert= 845.54', Outlet Invert= 837.83'

‡

Reach DC-F7: (new Reach)



Summary for Reach IPC-F1: IPC-F1

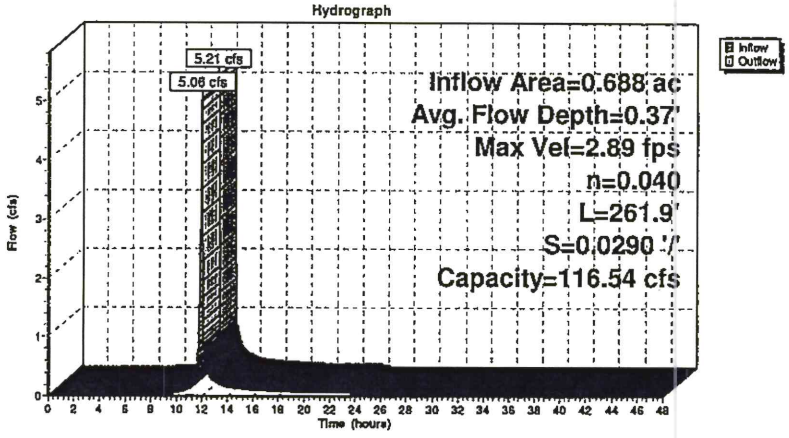
Inflow Area = 0.688 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 5.21 cfs @ 11.95 hrs, Volume= 0.230 af
Outflow = 5.06 cfs @ 11.96 hrs, Volume= 0.230 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.89 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 0.66 fps, Avg. Travel Time= 6.6 min

Peak Storage= 458 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 116.54 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 261.9' Slope= 0.0290 '/'
Inlet Invert= 870.62', Outlet Invert= 863.03'

Reach IPC-F1: IPC-F1



Summary for Reach IPC-F2: (new Reach)

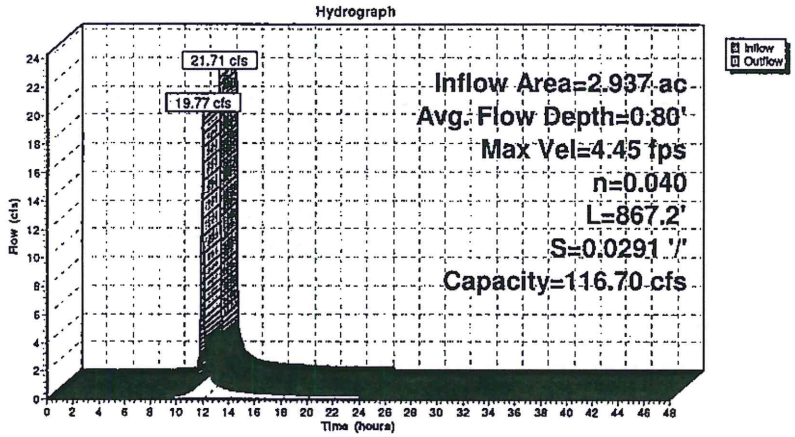
Inflow Area = 2.937 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 21.71 cfs @ 11.95 hrs, Volume= 0.982 af
Outflow = 19.77 cfs @ 11.98 hrs, Volume= 0.982 af, Atten= 9%, Lag= 1.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.45 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 1.00 fps, Avg. Travel Time= 14.4 min

Peak Storage= 3,856 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.80'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 116.70 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 867.2' Slope= 0.0291 '/'
Inlet Invert= 863.03', Outlet Invert= 837.83'

Reach IPC-F2: (new Reach)



Summary for Pond DC-F8: Down Chute 3

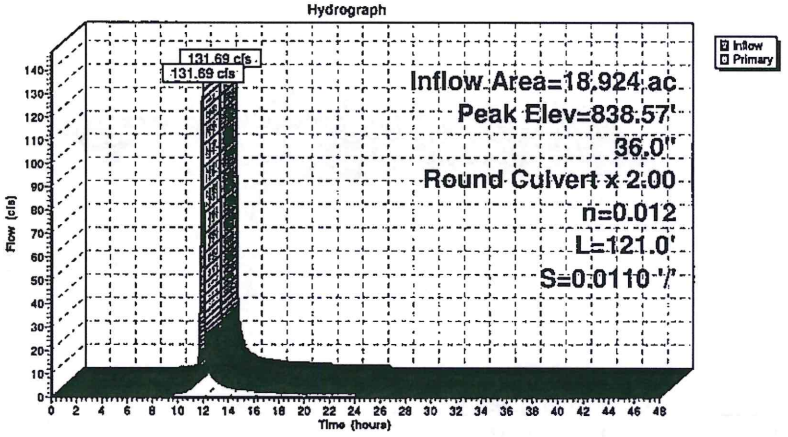
Inflow Area = 18.924 ac, 0.00% Impervious, Inflow Depth = 4.01" for 100-yr event
Inflow = 131.69 cfs @ 11.97 hrs, Volume= 6.327 af
Outflow = 131.69 cfs @ 11.97 hrs, Volume= 6.327 af, Atten= 0%, Lag= 0.0 min
Primary = 131.69 cfs @ 11.97 hrs, Volume= 6.327 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 838.57' @ 11.97 hrs
Flood Elev= 837.83'

Device	Routing	Invert	Outlet Devices
#1	Primary	833.33'	**36.0" Round Culvert X 2.00** L= 121.0' Ke= 0.500 Inlet / Outlet Invert= 833.33' / 832.00' S= 0.0110 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished

Primary OutFlow Max=131.50 cfs @ 11.97 hrs HW=838.56' TW=833.12' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 131.50 cfs @ 9.30 fps)

Pond DC-F8: Down Chute 3



Summary for Pond F: (new Pond)

Inflow Area = 37.780 ac, 0.00% Impervious, Inflow Depth = 3.86" for 100-yr event
Inflow = 236.81 cfs @ 11.98 hrs, Volume= 12.143 af
Outflow = 60.75 cfs @ 12.17 hrs, Volume= 12.004 af, Atten= 74%, Lag= 10.9 min
Primary = 42.15 cfs @ 12.17 hrs, Volume= 11.301 af
Secondary = 18.60 cfs @ 12.17 hrs, Volume= 0.703 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 831.00' Surf.Area= 67,798 sf Storage= 290,806 cf
Peak Elev= 834.03' @ 12.17 hrs Surf.Area= 80,478 sf Storage= 515,497 cf (224,691 cf above start)

Plug-Flow detention time= 483.7 min calculated for 5.328 af (44% of inflow)
Center-of-Mass det. time= 134.2 min (952.1 - 818.0)

Volume	Invert	Avail.Storage	Storage Description
#1	826.00'	595,319 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

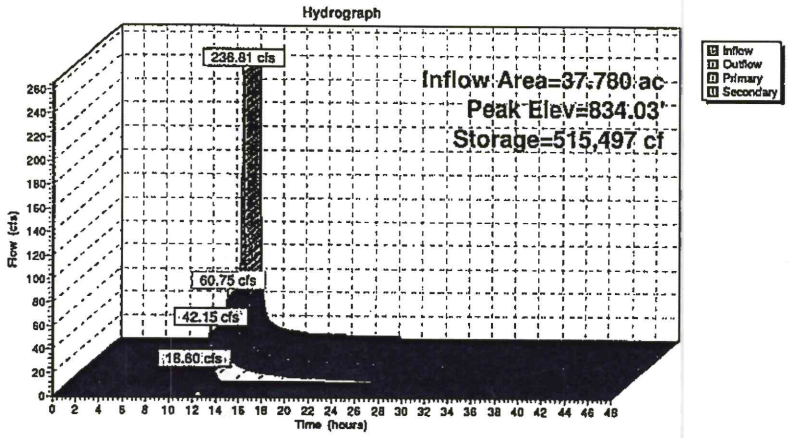
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
826.00	48,924	0	0
827.00	52,499	50,712	50,712
828.00	56,175	54,337	105,049
829.00	59,950	58,063	163,111
830.00	63,821	61,886	224,997
831.00	67,798	65,810	290,806
832.00	71,874	69,836	360,642
833.00	76,053	73,964	434,606
834.00	80,331	78,192	512,798
835.00	84,711	82,521	595,319

Device	Routing	Invert	Outlet Devices
#1	Primary	831.00'	**36.0" Round Culvert** L= 190.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 831.00' / 829.00' S= 0.0105 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished
#2	Secondary	833.25'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=42.15 cfs @ 12.17 hrs HW=834.03' (Free Discharge)
└1=Culvert (Inlet Controls 42.15 cfs @ 5.96 fps)

Secondary OutFlow Max=18.59 cfs @ 12.17 hrs HW=834.03' (Free Discharge)
└2=Broad-Crested Rectangular Weir (Weir Controls 18.59 cfs @ 2.37 fps)

Pond F: (new Pond)



DP&L CARTER HOLLOW LANDFILL
PERMIT ALTERATION – 2016 DESIGN CHANGES
(C)(6)(k)&(l) POND G DESIGN AND CAPACITY CALCULATIONS

NOTE:

1. **THIS ATTACHMENT REPLACES THE PREVIOUS SECTIONS (C)(6)(k)&(l) CALULATIONS FOR STORMWATER POND G.**

CALCULATION BRIEF

CARTER HOLLOW LANDFILL
PERMIT MODIFICATION - 2016 DESIGN CHANGES
(C)(6)(k)&(i) POND G PHASE 1 DESIGN AND CAPACITY CALCS

OBJECTIVE:

This calculation involves the design of the channels, culverts, and catch basins that are being used to convey stormwater to Pond G when Phase I has been constructed, but disposal of waste has not yet commenced. The stormwater controls were designed using the methodology and assumptions presented in the Stormwater Design Summary. The channels, culverts, and catch basins were designed for Phase I conditions using the 25-year, 24-hour storm event.

The attached HydroCAD output contains Pond G and associated features for routing purposes only. Refer to the Pond G calculation brief for a discussion of the designs for these features.

Pond G was designed for the worst case scenario, which was determined to be during development of the Phase I area when large portions of the upgradient area will be disturbed and flowing to pond G. Refer to the Pond G – Worst Case Scenario calculation brief for a discussion of the Pond G design.

DRAINAGE AREA:

The drainage areas to the channels and culverts were delineated using the Phase 1 conditions shown on the Permit Drawings. The following drainage areas were delineated and input in HydroCAD:

Drainage Area ID	Drainage Area (acres)	Curve Number
DAG1	6.93	77
	0.71	91
DA1D	1.80	77
	3.14	91
DAC6	0.35	91
	1.41	94
DA8-1	11.50	94
DA8-2	13.00	77
	0.84	91
DA9A	13.60	94
DA9B	23.10	77
	1.14	84
DA9C	7.70	77

DA12	0.16	77
	0.50	84
	1.16	94
DA13A	0.97	77
	1.20	84
	0.60	91
DA13B	1.69	77
	0.55	84
	0.28	91
	0.18	94

CHANNEL CALCULATIONS:

Table 1, which is attached to the Stormwater Design Summary, provides channel IDs, length, slope, inlet and outlet elevation, peak flow, flow depth, freeboard, maximum velocity, and channel linings for Channels 1D, 7, 8, 9A, 9B, 9C, 12, 13A, and 13B. The results of the North American Green (NAG) channel calculations are included as Attachment 2. These channels are described below.

- Channel 1D will convey flow from the landfill perimeter to the Pond G Forebay (Note the Pond G Forebay is only in operation prior to Phase 3 Operations).
- Channel 7 will convey flow from Channel 6 to Channel 9B.
- Channel 8 will convey non-contact stormwater from within the Phase I area to the Pond G Forebay.
- Channel 9A will convey non-contact stormwater from within the Phase I area to Channel 9B.
- Channel 9B will convey flow from Channels 6 and 9A to Channel 9C.
- Channel 9C will convey flow from Channel 9B to Culvert 4.
- Channel 12 will convey flow from a stockpile area to Culvert 12.
- Channel 13A will convey flow to Culvert 12.
- Channel 13B will convey flow from a stockpile area to the Pond G Forebay.

CULVERT CALCULATIONS:

Table 2, which is attached to the Stormwater Design Summary, provides the culvert ID, culvert cross-sectional dimension(s), length, slope, inlet and outlet elevation, peak flow, peak elevation, and culvert quantity.

Culvert 4 will convey flow from Channel 9C to the Pond G Forebay. This culvert will consist of three 36-inch diameter corrugated high-density polyethylene (HDPE) pipes with a smooth interior, with a length of approximately 80 feet and slope of 3.1 percent. Culvert 6 will convey flow from a low-lying area to Channel 8. This culvert will consist of one 24-inch diameter corrugated HDPE pipe with a smooth interior, with a length of approximately 105 feet and slope of 8.6 percent. Culvert 12

will convey flow from Channels 12 and 13A to Pond G. This culvert will consist of one 24-inch diameter reinforced concrete pipe, with a length of approximately 137 feet and slope of 16.8 percent.

CATCH BASIN CALCULATIONS:

Table 3, which is attached to the Stormwater Design Summary, provides the catch basin dimensions, invert elevations, and peak elevations.

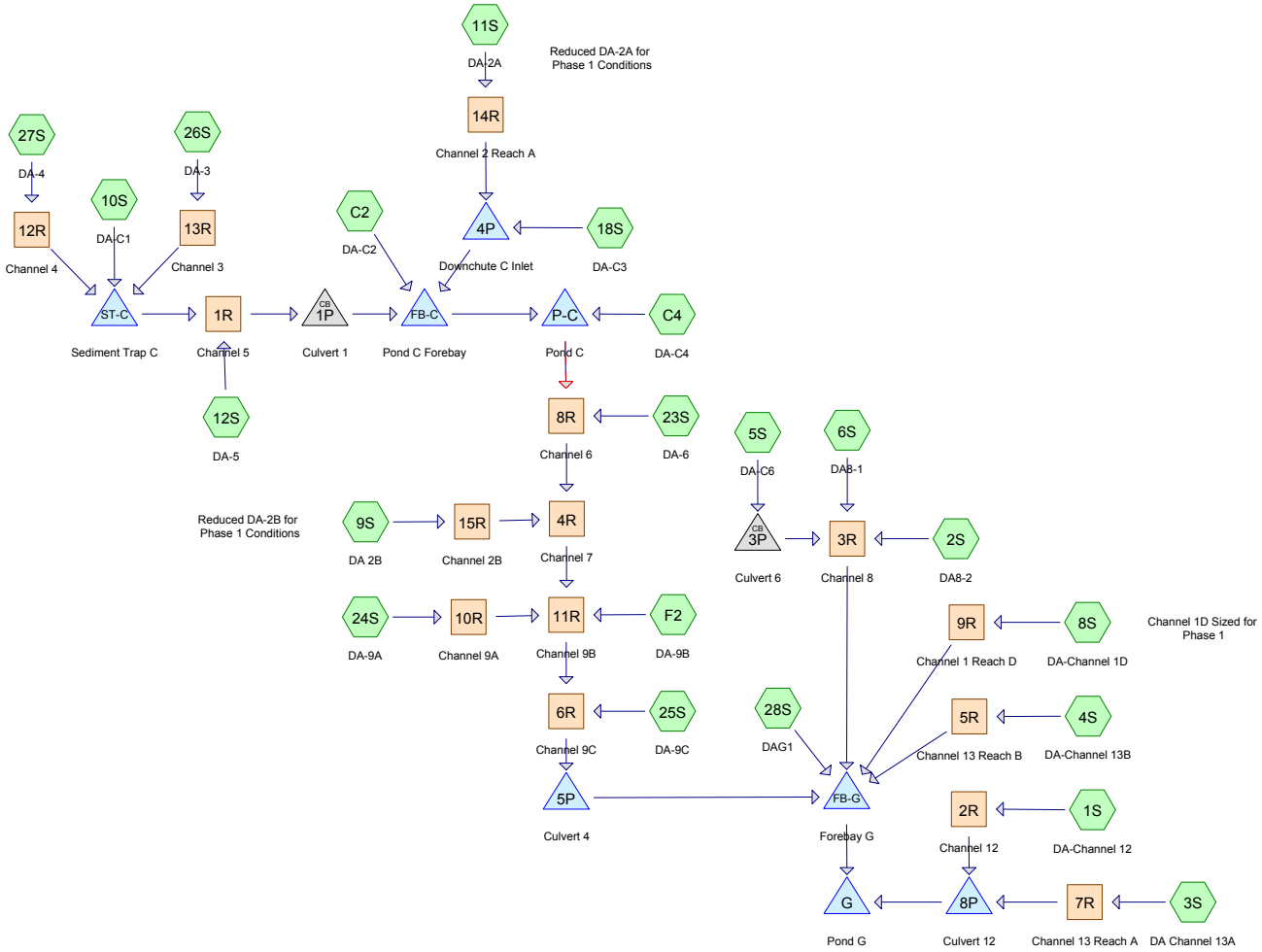
Drop Inlet 2 collects drainage from Channel 9C and conveys the flow through Culvert 4. The inlet will measure 4 feet in length, 12.5 feet in width, with a depth of 3.5 feet. Drop Inlet 3 collects drainage from Channels 12 and 13A and conveys the flow through Culvert 12. The inlet will measure 3 feet in length, 3 feet in width, with a depth of 4 feet.

CONCLUSIONS;

The channels, culverts, and catch basins were designed using the 25-year 24-hour storm event. The sediment basin was designed using the 25-year, and 100-year, 24-hour storm events as required in accordance the methodology and assumptions presented in the Stormwater Design Summary.

ATTACHMENT 1

HYDROCAD ANALYSIS OUTPUT
POND G – PHASE I



Subcat Reach Pond Link

Routing Diagram for 144-189 Pond G (Phase 1 Developed)
Prepared by CEC, Inc., Printed 5/20/2016
HydroCAD® 10.00 s/n 03447 © 2013 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
32.350	84	50-75% Grass cover, Fair, HSG D (1S, 3S, 4S, 10S, 12S, 18S, 23S, 26S, 27S, C4, F2)
89.300	77	Brush, Fair, HSG D (1S, 2S, 3S, 4S, 8S, 10S, 23S, 25S, 26S, 27S, 28S, C2, C4, F2)
7.750	91	Gravel roads, HSG D (2S, 3S, 4S, 5S, 8S, 9S, 11S, 28S, C2, C4)
27.850	94	Newly graded area, HSG D (1S, 4S, 5S, 6S, 24S)
157.250	**82**	**TOTAL AREA**

Summary for Subcatchment 1S: DA-Channel 12

Runoff = 11.66 cfs @ 11.97 hrs, Volume= 0.584 af, Depth= 3.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
0.500	84	50-75% Grass cover, Fair, HSG D
1.160	94	Newly graded area, HSG D
0.160	77	Brush, Fair, HSG D
1.820	90	Weighted Average
1.820		100.00% Pervious Area

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

Hydrograph for Subcatchment 1S: DA-Channel 12

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.02	0.04
8.00	0.60	0.09	0.09
10.00	0.90	0.26	**0.21**
12.00	3.30	2.26	**10.71**
14.00	4.08	2.99	0.34
16.00	4.37	3.27	0.21
18.00	4.58	3.47	0.16
20.00	4.73	3.62	0.12
22.00	4.86	3.74	0.11
24.00	**4.97**	**3.85**	0.10
26.00	4.97	3.85	0.00
28.00	4.97	3.85	0.00
30.00	4.97	3.85	0.00
32.00	4.97	3.85	0.00
34.00	4.97	3.85	0.00
36.00	4.97	3.85	0.00
38.00	4.97	3.85	0.00
40.00	4.97	3.85	0.00
42.00	4.97	3.85	0.00
44.00	4.97	3.85	0.00
46.00	4.97	3.85	0.00
48.00	4.97	3.85	0.00
50.00	4.97	3.85	0.00
52.00	4.97	3.85	0.00
54.00	4.97	3.85	0.00
56.00	4.97	3.85	0.00
58.00	4.97	3.85	0.00
60.00	4.97	3.85	0.00
62.00	4.97	3.85	0.00
64.00	4.97	3.85	0.00
66.00	4.97	3.85	0.00
68.00	4.97	3.85	0.00
70.00	4.97	3.85	0.00
72.00	4.97	3.85	0.00
74.00	4.97	3.85	0.00
76.00	4.97	3.85	0.00
78.00	4.97	3.85	0.00
80.00	4.97	3.85	0.00
82.00	4.97	3.85	0.00
84.00	4.97	3.85	0.00
86.00	4.97	3.85	0.00
88.00	4.97	3.85	0.00
90.00	4.97	3.85	0.00
92.00	4.97	3.85	0.00
94.00	4.97	3.85	0.00
96.00	4.97	3.85	0.00
98.00	4.97	3.85	0.00
100.00	4.97	3.85	0.00
102.00	4.97	3.85	0.00
104.00	4.97	3.85	0.00
106.00	4.97	3.85	0.00
108.00	4.97	3.85	0.00
110.00	4.97	3.85	0.00
112.00	4.97	3.85	0.00
114.00	4.97	3.85	0.00
116.00	4.97	3.85	0.00
118.00	4.97	3.85	0.00
120.00	4.97	3.85	0.00
122.00	4.97	3.85	0.00
124.00	4.97	3.85	0.00
126.00	4.97	3.85	0.00
128.00	4.97	3.85	0.00
130.00	4.97	3.85	0.00
132.00	4.97	3.85	0.00
134.00	4.97	3.85	0.00
136.00	4.97	3.85	0.00
138.00	4.97	3.85	0.00
140.00	4.97	3.85	0.00
142.00	4.97	3.85	0.00
144.00	4.97	3.85	0.00
146.00	4.97	3.85	0.00
148.00	4.97	3.85	0.00
150.00	4.97	3.85	0.00
152.00	4.97	3.85	0.00
154.00	4.97	3.85	0.00
156.00	4.97	3.85	0.00
158.00	4.97	3.85	0.00
160.00	4.97	3.85	0.00

Summary for Subcatchment 2S: DA8-2

Runoff = 66.09 cfs @ 11.97 hrs, Volume= 3.098 af, Depth= 2.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
13.000	77	Brush, Fair, HSG D
0.840	91	Gravel roads, HSG D
13.840	78	Weighted Average
13.840		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	632	0.3228	2.84		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.7	632	Total, Increased to minimum Tc = 6.0 min			

Hydrograph for Subcatchment 2S: DA8-2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.00
8.00	0.60	0.00	0.02
10.00	0.90	0.04	**0.51**
12.00	3.30	1.34	**61.88**
14.00	4.08	1.95	2.16
16.00	4.37	2.19	1.34
18.00	4.58	2.36	1.05
20.00	4.73	2.49	0.77
22.00	4.86	2.59	0.70
24.00	**4.97**	**2.69**	0.65
26.00	4.97	2.69	0.00
28.00	4.97	2.69	0.00
30.00	4.97	2.69	0.00
32.00	4.97	2.69	0.00
34.00	4.97	2.69	0.00
36.00	4.97	2.69	0.00
38.00	4.97	2.69	0.00
40.00	4.97	2.69	0.00
42.00	4.97	2.69	0.00
44.00	4.97	2.69	0.00
46.00	4.97	2.69	0.00
48.00	4.97	2.69	0.00
50.00	4.97	2.69	0.00
52.00	4.97	2.69	0.00
54.00	4.97	2.69	0.00
56.00	4.97	2.69	0.00
58.00	4.97	2.69	0.00
60.00	4.97	2.69	0.00
62.00	4.97	2.69	0.00
64.00	4.97	2.69	0.00
66.00	4.97	2.69	0.00
68.00	4.97	2.69	0.00
70.00	4.97	2.69	0.00
72.00	4.97	2.69	0.00
74.00	4.97	2.69	0.00
76.00	4.97	2.69	0.00
78.00	4.97	2.69	0.00
80.00	4.97	2.69	0.00
82.00	4.97	2.69	0.00
84.00	4.97	2.69	0.00
86.00	4.97	2.69	0.00
88.00	4.97	2.69	0.00
90.00	4.97	2.69	0.00
92.00	4.97	2.69	0.00
94.00	4.97	2.69	0.00
96.00	4.97	2.69	0.00
98.00	4.97	2.69	0.00
100.00	4.97	2.69	0.00
102.00	4.97	2.69	0.00
104.00	4.97	2.69	0.00
106.00	4.97	2.69	0.00
108.00	4.97	2.69	0.00
110.00	4.97	2.69	0.00
112.00	4.97	2.69	0.00
114.00	4.97	2.69	0.00
116.00	4.97	2.69	0.00
118.00	4.97	2.69	0.00
120.00	4.97	2.69	0.00
122.00	4.97	2.69	0.00
124.00	4.97	2.69	0.00
126.00	4.97	2.69	0.00
128.00	4.97	2.69	0.00
130.00	4.97	2.69	0.00
132.00	4.97	2.69	0.00
134.00	4.97	2.69	0.00
136.00	4.97	2.69	0.00
138.00	4.97	2.69	0.00
140.00	4.97	2.69	0.00
142.00	4.97	2.69	0.00
144.00	4.97	2.69	0.00
146.00	4.97	2.69	0.00
148.00	4.97	2.69	0.00
150.00	4.97	2.69	0.00
152.00	4.97	2.69	0.00
154.00	4.97	2.69	0.00
156.00	4.97	2.69	0.00
158.00	4.97	2.69	0.00
160.00	4.97	2.69	0.00

Summary for Subcatchment 3S: DA Channel 13A

Runoff = 15.22 cfs @ 11.97 hrs, Volume= 0.726 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
0.970	77	Brush, Fair, HSG D
1.200	84	50-75% Grass cover, Fair, HSG D
0.600	91	Gravel roads, HSG D
2.770	83	Weighted Average
2.770		100.00% Pervious Area

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

Hydrograph for Subcatchment 3S: DA Channel 13A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.00
8.00	0.60	0.02	0.05
10.00	0.90	0.09	**0.18**
12.00	3.30	1.69	**14.13**
14.00	4.08	2.35	0.47
16.00	4.37	2.61	0.29
18.00	4.58	2.79	0.23
20.00	4.73	2.93	0.16
22.00	4.86	3.04	0.15
24.00	**4.97**	**3.15**	0.14
26.00	4.97	3.15	0.00
28.00	4.97	3.15	0.00
30.00	4.97	3.15	0.00
32.00	4.97	3.15	0.00
34.00	4.97	3.15	0.00
36.00	4.97	3.15	0.00
38.00	4.97	3.15	0.00
40.00	4.97	3.15	0.00
42.00	4.97	3.15	0.00
44.00	4.97	3.15	0.00
46.00	4.97	3.15	0.00
48.00	4.97	3.15	0.00
50.00	4.97	3.15	0.00
52.00	4.97	3.15	0.00
54.00	4.97	3.15	0.00
56.00	4.97	3.15	0.00
58.00	4.97	3.15	0.00
60.00	4.97	3.15	0.00
62.00	4.97	3.15	0.00
64.00	4.97	3.15	0.00
66.00	4.97	3.15	0.00
68.00	4.97	3.15	0.00
70.00	4.97	3.15	0.00
72.00	4.97	3.15	0.00
74.00	4.97	3.15	0.00
76.00	4.97	3.15	0.00
78.00	4.97	3.15	0.00
80.00	4.97	3.15	0.00
82.00	4.97	3.15	0.00
84.00	4.97	3.15	0.00
86.00	4.97	3.15	0.00
88.00	4.97	3.15	0.00
90.00	4.97	3.15	0.00
92.00	4.97	3.15	0.00
94.00	4.97	3.15	0.00
96.00	4.97	3.15	0.00
98.00	4.97	3.15	0.00
100.00	4.97	3.15	0.00
102.00	4.97	3.15	0.00
104.00	4.97	3.15	0.00
106.00	4.97	3.15	0.00
108.00	4.97	3.15	0.00
110.00	4.97	3.15	0.00
112.00	4.97	3.15	0.00
114.00	4.97	3.15	0.00
116.00	4.97	3.15	0.00
118.00	4.97	3.15	0.00
120.00	4.97	3.15	0.00
122.00	4.97	3.15	0.00
124.00	4.97	3.15	0.00
126.00	4.97	3.15	0.00
128.00	4.97	3.15	0.00
130.00	4.97	3.15	0.00
132.00	4.97	3.15	0.00
134.00	4.97	3.15	0.00
136.00	4.97	3.15	0.00
138.00	4.97	3.15	0.00
140.00	4.97	3.15	0.00
142.00	4.97	3.15	0.00
144.00	4.97	3.15	0.00
146.00	4.97	3.15	0.00
148.00	4.97	3.15	0.00
150.00	4.97	3.15	0.00
152.00	4.97	3.15	0.00
154.00	4.97	3.15	0.00
156.00	4.97	3.15	0.00
158.00	4.97	3.15	0.00
160.00	4.97	3.15	0.00

Summary for Subcatchment 4S: DA-Channel 13B

Runoff = 14.07 cfs @ 11.97 hrs, Volume= 0.666 af, Depth= 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
1.690	77	Brush, Fair, HSG D
0.550	84	50-75% Grass cover, Fair, HSG D
0.280	91	Gravel roads, HSG D
0.180	94	Newly graded area, HSG D
2.700	81	Weighted Average
2.700		100.00% Pervious Area

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

Hydrograph for Subcatchment 4S: DA-Channel 13B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.00
8.00	0.60	0.01	0.03
10.00	0.90	0.07	**0.14**
12.00	3.30	1.54	**13.10**
14.00	4.08	2.19	0.44
16.00	4.37	2.44	0.27
18.00	4.58	2.62	0.21
20.00	4.73	2.75	0.16
22.00	4.86	2.86	0.14
24.00	**4.97**	**2.96**	0.13
26.00	4.97	2.96	0.00
28.00	4.97	2.96	0.00
30.00	4.97	2.96	0.00
32.00	4.97	2.96	0.00
34.00	4.97	2.96	0.00
36.00	4.97	2.96	0.00
38.00	4.97	2.96	0.00
40.00	4.97	2.96	0.00
42.00	4.97	2.96	0.00
44.00	4.97	2.96	0.00
46.00	4.97	2.96	0.00
48.00	4.97	2.96	0.00
50.00	4.97	2.96	0.00
52.00	4.97	2.96	0.00
54.00	4.97	2.96	0.00
56.00	4.97	2.96	0.00
58.00	4.97	2.96	0.00
60.00	4.97	2.96	0.00
62.00	4.97	2.96	0.00
64.00	4.97	2.96	0.00
66.00	4.97	2.96	0.00
68.00	4.97	2.96	0.00
70.00	4.97	2.96	0.00
72.00	4.97	2.96	0.00
74.00	4.97	2.96	0.00
76.00	4.97	2.96	0.00
78.00	4.97	2.96	0.00
80.00	4.97	2.96	0.00
82.00	4.97	2.96	0.00
84.00	4.97	2.96	0.00
86.00	4.97	2.96	0.00
88.00	4.97	2.96	0.00
90.00	4.97	2.96	0.00
92.00	4.97	2.96	0.00
94.00	4.97	2.96	0.00
96.00	4.97	2.96	0.00
98.00	4.97	2.96	0.00
100.00	4.97	2.96	0.00
102.00	4.97	2.96	0.00
104.00	4.97	2.96	0.00
106.00	4.97	2.96	0.00
108.00	4.97	2.96	0.00
110.00	4.97	2.96	0.00
112.00	4.97	2.96	0.00
114.00	4.97	2.96	0.00
116.00	4.97	2.96	0.00
118.00	4.97	2.96	0.00
120.00	4.97	2.96	0.00
122.00	4.97	2.96	0.00
124.00	4.97	2.96	0.00
126.00	4.97	2.96	0.00
128.00	4.97	2.96	0.00
130.00	4.97	2.96	0.00
132.00	4.97	2.96	0.00
134.00	4.97	2.96	0.00
136.00	4.97	2.96	0.00
138.00	4.97	2.96	0.00
140.00	4.97	2.96	0.00
142.00	4.97	2.96	0.00
144.00	4.97	2.96	0.00
146.00	4.97	2.96	0.00
148.00	4.97	2.96	0.00
150.00	4.97	2.96	0.00
152.00	4.97	2.96	0.00
154.00	4.97	2.96	0.00
156.00	4.97	2.96	0.00
158.00	4.97	2.96	0.00
160.00	4.97	2.96	0.00

Summary for Subcatchment 5S: DA-C6

Runoff = 11.84 cfs @ 11.97 hrs, Volume= 0.611 af, Depth= 4.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
0.350	91	Gravel roads, HSG D
1.410	94	Newly graded area, HSG D
1.760	93	Weighted Average
1.760		100.00% Pervious Area

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

Hydrograph for Subcatchment 5S: DA-C6

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.01	0.02
6.00	0.40	0.06	0.07
8.00	0.60	0.17	0.12
10.00	0.90	0.37	**0.25**
12.00	3.30	2.54	**10.83**
14.00	4.08	3.29	0.33
16.00	4.37	3.58	0.20
18.00	4.58	3.78	0.16
20.00	4.73	3.93	0.11
22.00	4.86	4.06	0.10
24.00	**4.97**	**4.17**	0.10
26.00	4.97	4.17	0.00
28.00	4.97	4.17	0.00
30.00	4.97	4.17	0.00
32.00	4.97	4.17	0.00
34.00	4.97	4.17	0.00
36.00	4.97	4.17	0.00
38.00	4.97	4.17	0.00
40.00	4.97	4.17	0.00
42.00	4.97	4.17	0.00
44.00	4.97	4.17	0.00
46.00	4.97	4.17	0.00
48.00	4.97	4.17	0.00
50.00	4.97	4.17	0.00
52.00	4.97	4.17	0.00
54.00	4.97	4.17	0.00
56.00	4.97	4.17	0.00
58.00	4.97	4.17	0.00
60.00	4.97	4.17	0.00
62.00	4.97	4.17	0.00
64.00	4.97	4.17	0.00
66.00	4.97	4.17	0.00
68.00	4.97	4.17	0.00
70.00	4.97	4.17	0.00
72.00	4.97	4.17	0.00
74.00	4.97	4.17	0.00
76.00	4.97	4.17	0.00
78.00	4.97	4.17	0.00
80.00	4.97	4.17	0.00
82.00	4.97	4.17	0.00
84.00	4.97	4.17	0.00
86.00	4.97	4.17	0.00
88.00	4.97	4.17	0.00
90.00	4.97	4.17	0.00
92.00	4.97	4.17	0.00
94.00	4.97	4.17	0.00
96.00	4.97	4.17	0.00
98.00	4.97	4.17	0.00
100.00	4.97	4.17	0.00
102.00	4.97	4.17	0.00
104.00	4.97	4.17	0.00
106.00	4.97	4.17	0.00
108.00	4.97	4.17	0.00
110.00	4.97	4.17	0.00
112.00	4.97	4.17	0.00
114.00	4.97	4.17	0.00
116.00	4.97	4.17	0.00
118.00	4.97	4.17	0.00
120.00	4.97	4.17	0.00
122.00	4.97	4.17	0.00
124.00	4.97	4.17	0.00
126.00	4.97	4.17	0.00
128.00	4.97	4.17	0.00
130.00	4.97	4.17	0.00
132.00	4.97	4.17	0.00
134.00	4.97	4.17	0.00
136.00	4.97	4.17	0.00
138.00	4.97	4.17	0.00
140.00	4.97	4.17	0.00
142.00	4.97	4.17	0.00
144.00	4.97	4.17	0.00
146.00	4.97	4.17	0.00
148.00	4.97	4.17	0.00
150.00	4.97	4.17	0.00
152.00	4.97	4.17	0.00
154.00	4.97	4.17	0.00
156.00	4.97	4.17	0.00
158.00	4.97	4.17	0.00
160.00	4.97	4.17	0.00

Summary for Subcatchment 6S: DA8-1

Runoff = 61.34 cfs @ 12.05 hrs, Volume= 4.100 af, Depth= 4.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
11.500	94	Newly graded area, HSG D
11.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	327	0.3333	4.12		**Lag/CN Method, Leachate Protection Side Slope**
12.4	1,534	0.0450	2.06		**Lag/CN Method, Leachate Protection Floor**
13.7	1,861	Total			

Hydrograph for Subcatchment 6S: DA8-1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.02	0.19
6.00	0.40	0.08	0.49
8.00	0.60	0.20	0.81
10.00	0.90	0.42	1.65
12.00	3.30	2.64	**56.09**
14.00	4.08	3.40	**2.33**
16.00	4.37	3.69	1.39
18.00	4.58	3.89	1.05
20.00	4.73	4.04	0.77
22.00	4.86	4.17	0.69
24.00	**4.97**	**4.28**	0.63
26.00	4.97	4.28	0.00
28.00	4.97	4.28	0.00
30.00	4.97	4.28	0.00
32.00	4.97	4.28	0.00
34.00	4.97	4.28	0.00
36.00	4.97	4.28	0.00
38.00	4.97	4.28	0.00
40.00	4.97	4.28	0.00
42.00	4.97	4.28	0.00
44.00	4.97	4.28	0.00
46.00	4.97	4.28	0.00
48.00	4.97	4.28	0.00
50.00	4.97	4.28	0.00
52.00	4.97	4.28	0.00
54.00	4.97	4.28	0.00
56.00	4.97	4.28	0.00
58.00	4.97	4.28	0.00
60.00	4.97	4.28	0.00
62.00	4.97	4.28	0.00
64.00	4.97	4.28	0.00
66.00	4.97	4.28	0.00
68.00	4.97	4.28	0.00
70.00	4.97	4.28	0.00
72.00	4.97	4.28	0.00
74.00	4.97	4.28	0.00
76.00	4.97	4.28	0.00
78.00	4.97	4.28	0.00
80.00	4.97	4.28	0.00
82.00	4.97	4.28	0.00
84.00	4.97	4.28	0.00
86.00	4.97	4.28	0.00
88.00	4.97	4.28	0.00
90.00	4.97	4.28	0.00
92.00	4.97	4.28	0.00
94.00	4.97	4.28	0.00
96.00	4.97	4.28	0.00
98.00	4.97	4.28	0.00
100.00	4.97	4.28	0.00
102.00	4.97	4.28	0.00
104.00	4.97	4.28	0.00
106.00	4.97	4.28	0.00
108.00	4.97	4.28	0.00
110.00	4.97	4.28	0.00
112.00	4.97	4.28	0.00
114.00	4.97	4.28	0.00
116.00	4.97	4.28	0.00
118.00	4.97	4.28	0.00
120.00	4.97	4.28	0.00
122.00	4.97	4.28	0.00
124.00	4.97	4.28	0.00
126.00	4.97	4.28	0.00
128.00	4.97	4.28	0.00
130.00	4.97	4.28	0.00
132.00	4.97	4.28	0.00
134.00	4.97	4.28	0.00
136.00	4.97	4.28	0.00
138.00	4.97	4.28	0.00
140.00	4.97	4.28	0.00
142.00	4.97	4.28	0.00
144.00	4.97	4.28	0.00
146.00	4.97	4.28	0.00
148.00	4.97	4.28	0.00
150.00	4.97	4.28	0.00
152.00	4.97	4.28	0.00
154.00	4.97	4.28	0.00
156.00	4.97	4.28	0.00
158.00	4.97	4.28	0.00
160.00	4.97	4.28	0.00

Summary for Subcatchment 8S: DA-Channel 1D

Runoff = 18.58 cfs @ 12.12 hrs, Volume= 1.416 af, Depth= 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
1.800	77	Brush, Fair, HSG D
3.140	91	Gravel roads, HSG D
4.940	86	Weighted Average
4.940		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.2	2,450	0.0100	2.02	5.05	**Trap/Vee/Rect Channel Flow,** Bot.W=4.00' D=0.50' Z= 2.0 '/' Top.W=6.00' n= 0.040 Earth, cobble bottom, clean sides

Hydrograph for Subcatchment 8S: DA-Channel 1D

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.02
8.00	0.60	0.04	0.13
10.00	0.90	0.15	0.37
12.00	3.30	1.92	**13.06**
14.00	4.08	2.61	**0.97**
16.00	4.37	2.89	0.57
18.00	4.58	3.07	0.43
20.00	4.73	3.22	0.32
22.00	4.86	3.33	0.28
24.00	**4.97**	**3.44**	0.26
26.00	4.97	3.44	0.00
28.00	4.97	3.44	0.00
30.00	4.97	3.44	0.00
32.00	4.97	3.44	0.00
34.00	4.97	3.44	0.00
36.00	4.97	3.44	0.00
38.00	4.97	3.44	0.00
40.00	4.97	3.44	0.00
42.00	4.97	3.44	0.00
44.00	4.97	3.44	0.00
46.00	4.97	3.44	0.00
48.00	4.97	3.44	0.00
50.00	4.97	3.44	0.00
52.00	4.97	3.44	0.00
54.00	4.97	3.44	0.00
56.00	4.97	3.44	0.00
58.00	4.97	3.44	0.00
60.00	4.97	3.44	0.00
62.00	4.97	3.44	0.00
64.00	4.97	3.44	0.00
66.00	4.97	3.44	0.00
68.00	4.97	3.44	0.00
70.00	4.97	3.44	0.00
72.00	4.97	3.44	0.00
74.00	4.97	3.44	0.00
76.00	4.97	3.44	0.00
78.00	4.97	3.44	0.00
80.00	4.97	3.44	0.00
82.00	4.97	3.44	0.00
84.00	4.97	3.44	0.00
86.00	4.97	3.44	0.00
88.00	4.97	3.44	0.00
90.00	4.97	3.44	0.00
92.00	4.97	3.44	0.00
94.00	4.97	3.44	0.00
96.00	4.97	3.44	0.00
98.00	4.97	3.44	0.00
100.00	4.97	3.44	0.00
102.00	4.97	3.44	0.00
104.00	4.97	3.44	0.00
106.00	4.97	3.44	0.00
108.00	4.97	3.44	0.00
110.00	4.97	3.44	0.00
112.00	4.97	3.44	0.00
114.00	4.97	3.44	0.00
116.00	4.97	3.44	0.00
118.00	4.97	3.44	0.00
120.00	4.97	3.44	0.00
122.00	4.97	3.44	0.00
124.00	4.97	3.44	0.00
126.00	4.97	3.44	0.00
128.00	4.97	3.44	0.00
130.00	4.97	3.44	0.00
132.00	4.97	3.44	0.00
134.00	4.97	3.44	0.00
136.00	4.97	3.44	0.00
138.00	4.97	3.44	0.00
140.00	4.97	3.44	0.00
142.00	4.97	3.44	0.00
144.00	4.97	3.44	0.00
146.00	4.97	3.44	0.00
148.00	4.97	3.44	0.00
150.00	4.97	3.44	0.00
152.00	4.97	3.44	0.00
154.00	4.97	3.44	0.00
156.00	4.97	3.44	0.00
158.00	4.97	3.44	0.00
160.00	4.97	3.44	0.00

Summary for Subcatchment 9S: DA 2B

Runoff = 5.28 cfs @ 11.97 hrs, Volume= 0.267 af, Depth= 3.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
0.810	91	Gravel roads, HSG D
0.810		100.00% Pervious Area

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

Hydrograph for Subcatchment 9S: DA 2B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.03	0.02
8.00	0.60	0.11	0.04
10.00	0.90	0.29	**0.10**
12.00	3.30	2.35	**4.84**
14.00	4.08	3.09	0.15
16.00	4.37	3.38	0.09
18.00	4.58	3.57	0.07
20.00	4.73	3.72	0.05
22.00	4.86	3.84	0.05
24.00	**4.97**	**3.95**	0.04
26.00	4.97	3.95	0.00
28.00	4.97	3.95	0.00
30.00	4.97	3.95	0.00
32.00	4.97	3.95	0.00
34.00	4.97	3.95	0.00
36.00	4.97	3.95	0.00
38.00	4.97	3.95	0.00
40.00	4.97	3.95	0.00
42.00	4.97	3.95	0.00
44.00	4.97	3.95	0.00
46.00	4.97	3.95	0.00
48.00	4.97	3.95	0.00
50.00	4.97	3.95	0.00
52.00	4.97	3.95	0.00
54.00	4.97	3.95	0.00
56.00	4.97	3.95	0.00
58.00	4.97	3.95	0.00
60.00	4.97	3.95	0.00
62.00	4.97	3.95	0.00
64.00	4.97	3.95	0.00
66.00	4.97	3.95	0.00
68.00	4.97	3.95	0.00
70.00	4.97	3.95	0.00
72.00	4.97	3.95	0.00
74.00	4.97	3.95	0.00
76.00	4.97	3.95	0.00
78.00	4.97	3.95	0.00
80.00	4.97	3.95	0.00
82.00	4.97	3.95	0.00
84.00	4.97	3.95	0.00
86.00	4.97	3.95	0.00
88.00	4.97	3.95	0.00
90.00	4.97	3.95	0.00
92.00	4.97	3.95	0.00
94.00	4.97	3.95	0.00
96.00	4.97	3.95	0.00
98.00	4.97	3.95	0.00
100.00	4.97	3.95	0.00
102.00	4.97	3.95	0.00
104.00	4.97	3.95	0.00
106.00	4.97	3.95	0.00
108.00	4.97	3.95	0.00
110.00	4.97	3.95	0.00
112.00	4.97	3.95	0.00
114.00	4.97	3.95	0.00
116.00	4.97	3.95	0.00
118.00	4.97	3.95	0.00
120.00	4.97	3.95	0.00
122.00	4.97	3.95	0.00
124.00	4.97	3.95	0.00
126.00	4.97	3.95	0.00
128.00	4.97	3.95	0.00
130.00	4.97	3.95	0.00
132.00	4.97	3.95	0.00
134.00	4.97	3.95	0.00
136.00	4.97	3.95	0.00
138.00	4.97	3.95	0.00
140.00	4.97	3.95	0.00
142.00	4.97	3.95	0.00
144.00	4.97	3.95	0.00
146.00	4.97	3.95	0.00
148.00	4.97	3.95	0.00
150.00	4.97	3.95	0.00
152.00	4.97	3.95	0.00
154.00	4.97	3.95	0.00
156.00	4.97	3.95	0.00
158.00	4.97	3.95	0.00
160.00	4.97	3.95	0.00

Summary for Subcatchment 10S: DA-C1

Runoff = 18.21 cfs @ 12.11 hrs, Volume= 1.312 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
1.650	84	50-75% Grass cover, Fair, HSG D
4.020	77	Brush, Fair, HSG D
5.670	79	Weighted Average
5.670		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.7	1,220	0.0420	1.08		**Lag/CN Method,**

Hydrograph for Subcatchment 10S: DA-C1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.00
8.00	0.60	0.00	0.02
10.00	0.90	0.04	0.20
12.00	3.30	1.41	**13.00**
14.00	4.08	2.02	**0.99**
16.00	4.37	2.27	0.59
18.00	4.58	2.44	0.45
20.00	4.73	2.57	0.33
22.00	4.86	2.68	0.29
24.00	**4.97**	**2.78**	0.27
26.00	4.97	2.78	0.00
28.00	4.97	2.78	0.00
30.00	4.97	2.78	0.00
32.00	4.97	2.78	0.00
34.00	4.97	2.78	0.00
36.00	4.97	2.78	0.00
38.00	4.97	2.78	0.00
40.00	4.97	2.78	0.00
42.00	4.97	2.78	0.00
44.00	4.97	2.78	0.00
46.00	4.97	2.78	0.00
48.00	4.97	2.78	0.00
50.00	4.97	2.78	0.00
52.00	4.97	2.78	0.00
54.00	4.97	2.78	0.00
56.00	4.97	2.78	0.00
58.00	4.97	2.78	0.00
60.00	4.97	2.78	0.00
62.00	4.97	2.78	0.00
64.00	4.97	2.78	0.00
66.00	4.97	2.78	0.00
68.00	4.97	2.78	0.00
70.00	4.97	2.78	0.00
72.00	4.97	2.78	0.00
74.00	4.97	2.78	0.00
76.00	4.97	2.78	0.00
78.00	4.97	2.78	0.00
80.00	4.97	2.78	0.00
82.00	4.97	2.78	0.00
84.00	4.97	2.78	0.00
86.00	4.97	2.78	0.00
88.00	4.97	2.78	0.00
90.00	4.97	2.78	0.00
92.00	4.97	2.78	0.00
94.00	4.97	2.78	0.00
96.00	4.97	2.78	0.00
98.00	4.97	2.78	0.00
100.00	4.97	2.78	0.00
102.00	4.97	2.78	0.00
104.00	4.97	2.78	0.00
106.00	4.97	2.78	0.00
108.00	4.97	2.78	0.00
110.00	4.97	2.78	0.00
112.00	4.97	2.78	0.00
114.00	4.97	2.78	0.00
116.00	4.97	2.78	0.00
118.00	4.97	2.78	0.00
120.00	4.97	2.78	0.00
122.00	4.97	2.78	0.00
124.00	4.97	2.78	0.00
126.00	4.97	2.78	0.00
128.00	4.97	2.78	0.00
130.00	4.97	2.78	0.00
132.00	4.97	2.78	0.00
134.00	4.97	2.78	0.00
136.00	4.97	2.78	0.00
138.00	4.97	2.78	0.00
140.00	4.97	2.78	0.00
142.00	4.97	2.78	0.00
144.00	4.97	2.78	0.00
146.00	4.97	2.78	0.00
148.00	4.97	2.78	0.00
150.00	4.97	2.78	0.00
152.00	4.97	2.78	0.00
154.00	4.97	2.78	0.00
156.00	4.97	2.78	0.00
158.00	4.97	2.78	0.00
160.00	4.97	2.78	0.00

Summary for Subcatchment 11S: DA-2A

Runoff = 3.78 cfs @ 11.97 hrs, Volume= 0.191 af, Depth= 3.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
0.580	91	Gravel roads, HSG D
0.580		100.00% Pervious Area

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

Hydrograph for Subcatchment 11S: DA-2A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.03	0.02
8.00	0.60	0.11	0.03
10.00	0.90	0.29	**0.07**
12.00	3.30	2.35	**3.47**
14.00	4.08	3.09	0.11
16.00	4.37	3.38	0.07
18.00	4.58	3.57	0.05
20.00	4.73	3.72	0.04
22.00	4.86	3.84	0.03
24.00	**4.97**	**3.95**	0.03
26.00	4.97	3.95	0.00
28.00	4.97	3.95	0.00
30.00	4.97	3.95	0.00
32.00	4.97	3.95	0.00
34.00	4.97	3.95	0.00
36.00	4.97	3.95	0.00
38.00	4.97	3.95	0.00
40.00	4.97	3.95	0.00
42.00	4.97	3.95	0.00
44.00	4.97	3.95	0.00
46.00	4.97	3.95	0.00
48.00	4.97	3.95	0.00
50.00	4.97	3.95	0.00
52.00	4.97	3.95	0.00
54.00	4.97	3.95	0.00
56.00	4.97	3.95	0.00
58.00	4.97	3.95	0.00
60.00	4.97	3.95	0.00
62.00	4.97	3.95	0.00
64.00	4.97	3.95	0.00
66.00	4.97	3.95	0.00
68.00	4.97	3.95	0.00
70.00	4.97	3.95	0.00
72.00	4.97	3.95	0.00
74.00	4.97	3.95	0.00
76.00	4.97	3.95	0.00
78.00	4.97	3.95	0.00
80.00	4.97	3.95	0.00
82.00	4.97	3.95	0.00
84.00	4.97	3.95	0.00
86.00	4.97	3.95	0.00
88.00	4.97	3.95	0.00
90.00	4.97	3.95	0.00
92.00	4.97	3.95	0.00
94.00	4.97	3.95	0.00
96.00	4.97	3.95	0.00
98.00	4.97	3.95	0.00
100.00	4.97	3.95	0.00
102.00	4.97	3.95	0.00
104.00	4.97	3.95	0.00
106.00	4.97	3.95	0.00
108.00	4.97	3.95	0.00
110.00	4.97	3.95	0.00
112.00	4.97	3.95	0.00
114.00	4.97	3.95	0.00
116.00	4.97	3.95	0.00
118.00	4.97	3.95	0.00
120.00	4.97	3.95	0.00
122.00	4.97	3.95	0.00
124.00	4.97	3.95	0.00
126.00	4.97	3.95	0.00
128.00	4.97	3.95	0.00
130.00	4.97	3.95	0.00
132.00	4.97	3.95	0.00
134.00	4.97	3.95	0.00
136.00	4.97	3.95	0.00
138.00	4.97	3.95	0.00
140.00	4.97	3.95	0.00
142.00	4.97	3.95	0.00
144.00	4.97	3.95	0.00
146.00	4.97	3.95	0.00
148.00	4.97	3.95	0.00
150.00	4.97	3.95	0.00
152.00	4.97	3.95	0.00
154.00	4.97	3.95	0.00
156.00	4.97	3.95	0.00
158.00	4.97	3.95	0.00
160.00	4.97	3.95	0.00

Summary for Subcatchment 12S: DA-5

Runoff = 2.42 cfs @ 11.97 hrs, Volume= 0.116 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
0.430	84	50-75% Grass cover, Fair, HSG D
0.430		100.00% Pervious Area

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

Hydrograph for Subcatchment 12S: DA-5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.00
8.00	0.60	0.02	0.01
10.00	0.90	0.11	**0.03**
12.00	3.30	1.76	**2.25**
14.00	4.08	2.44	0.07
16.00	4.37	2.70	0.05
18.00	4.58	2.89	0.04
20.00	4.73	3.03	0.03
22.00	4.86	3.14	0.02
24.00	**4.97**	**3.24**	0.02
26.00	4.97	3.24	0.00
28.00	4.97	3.24	0.00
30.00	4.97	3.24	0.00
32.00	4.97	3.24	0.00
34.00	4.97	3.24	0.00
36.00	4.97	3.24	0.00
38.00	4.97	3.24	0.00
40.00	4.97	3.24	0.00
42.00	4.97	3.24	0.00
44.00	4.97	3.24	0.00
46.00	4.97	3.24	0.00
48.00	4.97	3.24	0.00
50.00	4.97	3.24	0.00
52.00	4.97	3.24	0.00
54.00	4.97	3.24	0.00
56.00	4.97	3.24	0.00
58.00	4.97	3.24	0.00
60.00	4.97	3.24	0.00
62.00	4.97	3.24	0.00
64.00	4.97	3.24	0.00
66.00	4.97	3.24	0.00
68.00	4.97	3.24	0.00
70.00	4.97	3.24	0.00
72.00	4.97	3.24	0.00
74.00	4.97	3.24	0.00
76.00	4.97	3.24	0.00
78.00	4.97	3.24	0.00
80.00	4.97	3.24	0.00
82.00	4.97	3.24	0.00
84.00	4.97	3.24	0.00
86.00	4.97	3.24	0.00
88.00	4.97	3.24	0.00
90.00	4.97	3.24	0.00
92.00	4.97	3.24	0.00
94.00	4.97	3.24	0.00
96.00	4.97	3.24	0.00
98.00	4.97	3.24	0.00
100.00	4.97	3.24	0.00
102.00	4.97	3.24	0.00
104.00	4.97	3.24	0.00
106.00	4.97	3.24	0.00
108.00	4.97	3.24	0.00
110.00	4.97	3.24	0.00
112.00	4.97	3.24	0.00
114.00	4.97	3.24	0.00
116.00	4.97	3.24	0.00
118.00	4.97	3.24	0.00
120.00	4.97	3.24	0.00
122.00	4.97	3.24	0.00
124.00	4.97	3.24	0.00
126.00	4.97	3.24	0.00
128.00	4.97	3.24	0.00
130.00	4.97	3.24	0.00
132.00	4.97	3.24	0.00
134.00	4.97	3.24	0.00
136.00	4.97	3.24	0.00
138.00	4.97	3.24	0.00
140.00	4.97	3.24	0.00
142.00	4.97	3.24	0.00
144.00	4.97	3.24	0.00
146.00	4.97	3.24	0.00
148.00	4.97	3.24	0.00
150.00	4.97	3.24	0.00
152.00	4.97	3.24	0.00
154.00	4.97	3.24	0.00
156.00	4.97	3.24	0.00
158.00	4.97	3.24	0.00
160.00	4.97	3.24	0.00

Summary for Subcatchment 18S: DA-C3

Runoff = 62.89 cfs @ 11.98 hrs, Volume= 3.081 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
11.400	84	50-75% Grass cover, Fair, HSG D
11.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	182	0.1484	1.64		**Lag/CN Method,**
4.3	534	0.0190	2.07		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	397	0.2400	17.53	223.52	**Trap/Vee/Rect Channel Flow,** Bot.W=4.00' D=1.50' Z= 3.0 '/' Top.W=13.00' n= 0.040
6.6	1,113	Total			

Hydrograph for Subcatchment 18S: DA-C3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.01
8.00	0.60	0.02	0.23
10.00	0.90	0.11	**0.82**
12.00	3.30	1.76	**60.35**
14.00	4.08	2.44	1.97
16.00	4.37	2.70	1.21
18.00	4.58	2.89	0.94
20.00	4.73	3.03	0.69
22.00	4.86	3.14	0.63
24.00	**4.97**	**3.24**	0.58
26.00	4.97	3.24	0.00
28.00	4.97	3.24	0.00
30.00	4.97	3.24	0.00
32.00	4.97	3.24	0.00
34.00	4.97	3.24	0.00
36.00	4.97	3.24	0.00
38.00	4.97	3.24	0.00
40.00	4.97	3.24	0.00
42.00	4.97	3.24	0.00
44.00	4.97	3.24	0.00
46.00	4.97	3.24	0.00
48.00	4.97	3.24	0.00
50.00	4.97	3.24	0.00
52.00	4.97	3.24	0.00
54.00	4.97	3.24	0.00
56.00	4.97	3.24	0.00
58.00	4.97	3.24	0.00
60.00	4.97	3.24	0.00
62.00	4.97	3.24	0.00
64.00	4.97	3.24	0.00
66.00	4.97	3.24	0.00
68.00	4.97	3.24	0.00
70.00	4.97	3.24	0.00
72.00	4.97	3.24	0.00
74.00	4.97	3.24	0.00
76.00	4.97	3.24	0.00
78.00	4.97	3.24	0.00
80.00	4.97	3.24	0.00
82.00	4.97	3.24	0.00
84.00	4.97	3.24	0.00
86.00	4.97	3.24	0.00
88.00	4.97	3.24	0.00
90.00	4.97	3.24	0.00
92.00	4.97	3.24	0.00
94.00	4.97	3.24	0.00
96.00	4.97	3.24	0.00
98.00	4.97	3.24	0.00
100.00	4.97	3.24	0.00
102.00	4.97	3.24	0.00
104.00	4.97	3.24	0.00
106.00	4.97	3.24	0.00
108.00	4.97	3.24	0.00
110.00	4.97	3.24	0.00
112.00	4.97	3.24	0.00
114.00	4.97	3.24	0.00
116.00	4.97	3.24	0.00
118.00	4.97	3.24	0.00
120.00	4.97	3.24	0.00
122.00	4.97	3.24	0.00
124.00	4.97	3.24	0.00
126.00	4.97	3.24	0.00
128.00	4.97	3.24	0.00
130.00	4.97	3.24	0.00
132.00	4.97	3.24	0.00
134.00	4.97	3.24	0.00
136.00	4.97	3.24	0.00
138.00	4.97	3.24	0.00
140.00	4.97	3.24	0.00
142.00	4.97	3.24	0.00
144.00	4.97	3.24	0.00
146.00	4.97	3.24	0.00
148.00	4.97	3.24	0.00
150.00	4.97	3.24	0.00
152.00	4.97	3.24	0.00
154.00	4.97	3.24	0.00
156.00	4.97	3.24	0.00
158.00	4.97	3.24	0.00
160.00	4.97	3.24	0.00

Summary for Subcatchment 23S: DA-6

Runoff = 11.10 cfs @ 11.97 hrs, Volume= 0.525 af, Depth= 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
1.250	84	50-75% Grass cover, Fair, HSG D
0.880	77	Brush, Fair, HSG D
2.130	81	Weighted Average
2.130		100.00% Pervious Area

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

Hydrograph for Subcatchment 23S: DA-6

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.00
8.00	0.60	0.01	0.02
10.00	0.90	0.07	**0.11**
12.00	3.30	1.54	**10.34**
14.00	4.08	2.19	0.35
16.00	4.37	2.44	0.22
18.00	4.58	2.62	0.17
20.00	4.73	2.75	0.12
22.00	4.86	2.86	0.11
24.00	**4.97**	**2.96**	0.10
26.00	4.97	2.96	0.00
28.00	4.97	2.96	0.00
30.00	4.97	2.96	0.00
32.00	4.97	2.96	0.00
34.00	4.97	2.96	0.00
36.00	4.97	2.96	0.00
38.00	4.97	2.96	0.00
40.00	4.97	2.96	0.00
42.00	4.97	2.96	0.00
44.00	4.97	2.96	0.00
46.00	4.97	2.96	0.00
48.00	4.97	2.96	0.00
50.00	4.97	2.96	0.00
52.00	4.97	2.96	0.00
54.00	4.97	2.96	0.00
56.00	4.97	2.96	0.00
58.00	4.97	2.96	0.00
60.00	4.97	2.96	0.00
62.00	4.97	2.96	0.00
64.00	4.97	2.96	0.00
66.00	4.97	2.96	0.00
68.00	4.97	2.96	0.00
70.00	4.97	2.96	0.00
72.00	4.97	2.96	0.00
74.00	4.97	2.96	0.00
76.00	4.97	2.96	0.00
78.00	4.97	2.96	0.00
80.00	4.97	2.96	0.00
82.00	4.97	2.96	0.00
84.00	4.97	2.96	0.00
86.00	4.97	2.96	0.00
88.00	4.97	2.96	0.00
90.00	4.97	2.96	0.00
92.00	4.97	2.96	0.00
94.00	4.97	2.96	0.00
96.00	4.97	2.96	0.00
98.00	4.97	2.96	0.00
100.00	4.97	2.96	0.00
102.00	4.97	2.96	0.00
104.00	4.97	2.96	0.00
106.00	4.97	2.96	0.00
108.00	4.97	2.96	0.00
110.00	4.97	2.96	0.00
112.00	4.97	2.96	0.00
114.00	4.97	2.96	0.00
116.00	4.97	2.96	0.00
118.00	4.97	2.96	0.00
120.00	4.97	2.96	0.00
122.00	4.97	2.96	0.00
124.00	4.97	2.96	0.00
126.00	4.97	2.96	0.00
128.00	4.97	2.96	0.00
130.00	4.97	2.96	0.00
132.00	4.97	2.96	0.00
134.00	4.97	2.96	0.00
136.00	4.97	2.96	0.00
138.00	4.97	2.96	0.00
140.00	4.97	2.96	0.00
142.00	4.97	2.96	0.00
144.00	4.97	2.96	0.00
146.00	4.97	2.96	0.00
148.00	4.97	2.96	0.00
150.00	4.97	2.96	0.00
152.00	4.97	2.96	0.00
154.00	4.97	2.96	0.00
156.00	4.97	2.96	0.00
158.00	4.97	2.96	0.00
160.00	4.97	2.96	0.00

Summary for Subcatchment 24S: DA-9A

Runoff = 64.68 cfs @ 12.09 hrs, Volume= 4.849 af, Depth= 4.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
13.600	94	Newly graded area, HSG D
13.600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	327	0.3333	4.12		**Lag/CN Method, Leachate Protection Side Slope**
16.3	1,814	0.0342	1.86		**Lag/CN Method, Leachate Protection Floor**
17.6	2,141	Total			

Hydrograph for Subcatchment 24S: DA-9A

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.02	0.22
6.00	0.40	0.08	0.57
8.00	0.60	0.20	0.95
10.00	0.90	0.42	1.90
12.00	3.30	2.64	**51.98**
14.00	4.08	3.40	**2.84**
16.00	4.37	3.69	1.67
18.00	4.58	3.89	1.25
20.00	4.73	4.04	0.92
22.00	4.86	4.17	0.82
24.00	**4.97**	**4.28**	0.75
26.00	4.97	4.28	0.00
28.00	4.97	4.28	0.00
30.00	4.97	4.28	0.00
32.00	4.97	4.28	0.00
34.00	4.97	4.28	0.00
36.00	4.97	4.28	0.00
38.00	4.97	4.28	0.00
40.00	4.97	4.28	0.00
42.00	4.97	4.28	0.00
44.00	4.97	4.28	0.00
46.00	4.97	4.28	0.00
48.00	4.97	4.28	0.00
50.00	4.97	4.28	0.00
52.00	4.97	4.28	0.00
54.00	4.97	4.28	0.00
56.00	4.97	4.28	0.00
58.00	4.97	4.28	0.00
60.00	4.97	4.28	0.00
62.00	4.97	4.28	0.00
64.00	4.97	4.28	0.00
66.00	4.97	4.28	0.00
68.00	4.97	4.28	0.00
70.00	4.97	4.28	0.00
72.00	4.97	4.28	0.00
74.00	4.97	4.28	0.00
76.00	4.97	4.28	0.00
78.00	4.97	4.28	0.00
80.00	4.97	4.28	0.00
82.00	4.97	4.28	0.00
84.00	4.97	4.28	0.00
86.00	4.97	4.28	0.00
88.00	4.97	4.28	0.00
90.00	4.97	4.28	0.00
92.00	4.97	4.28	0.00
94.00	4.97	4.28	0.00
96.00	4.97	4.28	0.00
98.00	4.97	4.28	0.00
100.00	4.97	4.28	0.00
102.00	4.97	4.28	0.00
104.00	4.97	4.28	0.00
106.00	4.97	4.28	0.00
108.00	4.97	4.28	0.00
110.00	4.97	4.28	0.00
112.00	4.97	4.28	0.00
114.00	4.97	4.28	0.00
116.00	4.97	4.28	0.00
118.00	4.97	4.28	0.00
120.00	4.97	4.28	0.00
122.00	4.97	4.28	0.00
124.00	4.97	4.28	0.00
126.00	4.97	4.28	0.00
128.00	4.97	4.28	0.00
130.00	4.97	4.28	0.00
132.00	4.97	4.28	0.00
134.00	4.97	4.28	0.00
136.00	4.97	4.28	0.00
138.00	4.97	4.28	0.00
140.00	4.97	4.28	0.00
142.00	4.97	4.28	0.00
144.00	4.97	4.28	0.00
146.00	4.97	4.28	0.00
148.00	4.97	4.28	0.00
150.00	4.97	4.28	0.00
152.00	4.97	4.28	0.00
154.00	4.97	4.28	0.00
156.00	4.97	4.28	0.00
158.00	4.97	4.28	0.00
160.00	4.97	4.28	0.00

Summary for Subcatchment 25S: DA-9C

Runoff = 35.65 cfs @ 11.97 hrs, Volume= 1.667 af, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
7.700	77	Brush, Fair, HSG D
7.700		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	390	0.2400	1.94		**Lag/CN Method,**
2.2	360	0.3111	2.79		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.5	750	Total, Increased to minimum Tc = 6.0 min			

Hydrograph for Subcatchment 25S: DA-9C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.00
8.00	0.60	0.00	0.00
10.00	0.90	0.03	**0.25**
12.00	3.30	1.28	**33.43**
14.00	4.08	1.87	1.18
16.00	4.37	2.11	0.73
18.00	4.58	2.27	0.57
20.00	4.73	2.40	0.42
22.00	4.86	2.50	0.39
24.00	**4.97**	**2.60**	0.36
26.00	4.97	2.60	0.00
28.00	4.97	2.60	0.00
30.00	4.97	2.60	0.00
32.00	4.97	2.60	0.00
34.00	4.97	2.60	0.00
36.00	4.97	2.60	0.00
38.00	4.97	2.60	0.00
40.00	4.97	2.60	0.00
42.00	4.97	2.60	0.00
44.00	4.97	2.60	0.00
46.00	4.97	2.60	0.00
48.00	4.97	2.60	0.00
50.00	4.97	2.60	0.00
52.00	4.97	2.60	0.00
54.00	4.97	2.60	0.00
56.00	4.97	2.60	0.00
58.00	4.97	2.60	0.00
60.00	4.97	2.60	0.00
62.00	4.97	2.60	0.00
64.00	4.97	2.60	0.00
66.00	4.97	2.60	0.00
68.00	4.97	2.60	0.00
70.00	4.97	2.60	0.00
72.00	4.97	2.60	0.00
74.00	4.97	2.60	0.00
76.00	4.97	2.60	0.00
78.00	4.97	2.60	0.00
80.00	4.97	2.60	0.00
82.00	4.97	2.60	0.00
84.00	4.97	2.60	0.00
86.00	4.97	2.60	0.00
88.00	4.97	2.60	0.00
90.00	4.97	2.60	0.00
92.00	4.97	2.60	0.00
94.00	4.97	2.60	0.00
96.00	4.97	2.60	0.00
98.00	4.97	2.60	0.00
100.00	4.97	2.60	0.00
102.00	4.97	2.60	0.00
104.00	4.97	2.60	0.00
106.00	4.97	2.60	0.00
108.00	4.97	2.60	0.00
110.00	4.97	2.60	0.00
112.00	4.97	2.60	0.00
114.00	4.97	2.60	0.00
116.00	4.97	2.60	0.00
118.00	4.97	2.60	0.00
120.00	4.97	2.60	0.00
122.00	4.97	2.60	0.00
124.00	4.97	2.60	0.00
126.00	4.97	2.60	0.00
128.00	4.97	2.60	0.00
130.00	4.97	2.60	0.00
132.00	4.97	2.60	0.00
134.00	4.97	2.60	0.00
136.00	4.97	2.60	0.00
138.00	4.97	2.60	0.00
140.00	4.97	2.60	0.00
142.00	4.97	2.60	0.00
144.00	4.97	2.60	0.00
146.00	4.97	2.60	0.00
148.00	4.97	2.60	0.00
150.00	4.97	2.60	0.00
152.00	4.97	2.60	0.00
154.00	4.97	2.60	0.00
156.00	4.97	2.60	0.00
158.00	4.97	2.60	0.00
160.00	4.97	2.60	0.00

Summary for Subcatchment 26S: DA-3

Runoff = 33.10 cfs @ 12.03 hrs, Volume= 1.880 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
1.430	77	Brush, Fair, HSG D
5.740	84	50-75% Grass cover, Fair, HSG D
7.170	83	Weighted Average
7.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	690	0.0377	1.04		**Lag/CN Method,**

Hydrograph for Subcatchment 26S: DA-3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.00
8.00	0.60	0.02	0.11
10.00	0.90	0.09	0.44
12.00	3.30	1.69	**32.01**
14.00	4.08	2.35	**1.26**
16.00	4.37	2.61	0.77
18.00	4.58	2.79	0.59
20.00	4.73	2.93	0.43
22.00	4.86	3.04	0.39
24.00	**4.97**	**3.15**	0.36
26.00	4.97	3.15	0.00
28.00	4.97	3.15	0.00
30.00	4.97	3.15	0.00
32.00	4.97	3.15	0.00
34.00	4.97	3.15	0.00
36.00	4.97	3.15	0.00
38.00	4.97	3.15	0.00
40.00	4.97	3.15	0.00
42.00	4.97	3.15	0.00
44.00	4.97	3.15	0.00
46.00	4.97	3.15	0.00
48.00	4.97	3.15	0.00
50.00	4.97	3.15	0.00
52.00	4.97	3.15	0.00
54.00	4.97	3.15	0.00
56.00	4.97	3.15	0.00
58.00	4.97	3.15	0.00
60.00	4.97	3.15	0.00
62.00	4.97	3.15	0.00
64.00	4.97	3.15	0.00
66.00	4.97	3.15	0.00
68.00	4.97	3.15	0.00
70.00	4.97	3.15	0.00
72.00	4.97	3.15	0.00
74.00	4.97	3.15	0.00
76.00	4.97	3.15	0.00
78.00	4.97	3.15	0.00
80.00	4.97	3.15	0.00
82.00	4.97	3.15	0.00
84.00	4.97	3.15	0.00
86.00	4.97	3.15	0.00
88.00	4.97	3.15	0.00
90.00	4.97	3.15	0.00
92.00	4.97	3.15	0.00
94.00	4.97	3.15	0.00
96.00	4.97	3.15	0.00
98.00	4.97	3.15	0.00
100.00	4.97	3.15	0.00
102.00	4.97	3.15	0.00
104.00	4.97	3.15	0.00
106.00	4.97	3.15	0.00
108.00	4.97	3.15	0.00
110.00	4.97	3.15	0.00
112.00	4.97	3.15	0.00
114.00	4.97	3.15	0.00
116.00	4.97	3.15	0.00
118.00	4.97	3.15	0.00
120.00	4.97	3.15	0.00
122.00	4.97	3.15	0.00
124.00	4.97	3.15	0.00
126.00	4.97	3.15	0.00
128.00	4.97	3.15	0.00
130.00	4.97	3.15	0.00
132.00	4.97	3.15	0.00
134.00	4.97	3.15	0.00
136.00	4.97	3.15	0.00
138.00	4.97	3.15	0.00
140.00	4.97	3.15	0.00
142.00	4.97	3.15	0.00
144.00	4.97	3.15	0.00
146.00	4.97	3.15	0.00
148.00	4.97	3.15	0.00
150.00	4.97	3.15	0.00
152.00	4.97	3.15	0.00
154.00	4.97	3.15	0.00
156.00	4.97	3.15	0.00
158.00	4.97	3.15	0.00
160.00	4.97	3.15	0.00

Summary for Subcatchment 27S: DA-4

Runoff = 33.64 cfs @ 12.08 hrs, Volume= 2.274 af, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
2.410	77	Brush, Fair, HSG D
6.530	84	50-75% Grass cover, Fair, HSG D
8.940	82	Weighted Average
8.940		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	1,100	0.0382	1.11		**Lag/CN Method,**

Hydrograph for Subcatchment 27S: DA-4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.00
8.00	0.60	0.01	0.10
10.00	0.90	0.08	0.47
12.00	3.30	1.61	**26.72**
14.00	4.08	2.27	**1.62**
16.00	4.37	2.53	0.97
18.00	4.58	2.70	0.73
20.00	4.73	2.84	0.54
22.00	4.86	2.95	0.48
24.00	**4.97**	**3.05**	0.45
26.00	4.97	3.05	0.00
28.00	4.97	3.05	0.00
30.00	4.97	3.05	0.00
32.00	4.97	3.05	0.00
34.00	4.97	3.05	0.00
36.00	4.97	3.05	0.00
38.00	4.97	3.05	0.00
40.00	4.97	3.05	0.00
42.00	4.97	3.05	0.00
44.00	4.97	3.05	0.00
46.00	4.97	3.05	0.00
48.00	4.97	3.05	0.00
50.00	4.97	3.05	0.00
52.00	4.97	3.05	0.00
54.00	4.97	3.05	0.00
56.00	4.97	3.05	0.00
58.00	4.97	3.05	0.00
60.00	4.97	3.05	0.00
62.00	4.97	3.05	0.00
64.00	4.97	3.05	0.00
66.00	4.97	3.05	0.00
68.00	4.97	3.05	0.00
70.00	4.97	3.05	0.00
72.00	4.97	3.05	0.00
74.00	4.97	3.05	0.00
76.00	4.97	3.05	0.00
78.00	4.97	3.05	0.00
80.00	4.97	3.05	0.00
82.00	4.97	3.05	0.00
84.00	4.97	3.05	0.00
86.00	4.97	3.05	0.00
88.00	4.97	3.05	0.00
90.00	4.97	3.05	0.00
92.00	4.97	3.05	0.00
94.00	4.97	3.05	0.00
96.00	4.97	3.05	0.00
98.00	4.97	3.05	0.00
100.00	4.97	3.05	0.00
102.00	4.97	3.05	0.00
104.00	4.97	3.05	0.00
106.00	4.97	3.05	0.00
108.00	4.97	3.05	0.00
110.00	4.97	3.05	0.00
112.00	4.97	3.05	0.00
114.00	4.97	3.05	0.00
116.00	4.97	3.05	0.00
118.00	4.97	3.05	0.00
120.00	4.97	3.05	0.00
122.00	4.97	3.05	0.00
124.00	4.97	3.05	0.00
126.00	4.97	3.05	0.00
128.00	4.97	3.05	0.00
130.00	4.97	3.05	0.00
132.00	4.97	3.05	0.00
134.00	4.97	3.05	0.00
136.00	4.97	3.05	0.00
138.00	4.97	3.05	0.00
140.00	4.97	3.05	0.00
142.00	4.97	3.05	0.00
144.00	4.97	3.05	0.00
146.00	4.97	3.05	0.00
148.00	4.97	3.05	0.00
150.00	4.97	3.05	0.00
152.00	4.97	3.05	0.00
154.00	4.97	3.05	0.00
156.00	4.97	3.05	0.00
158.00	4.97	3.05	0.00
160.00	4.97	3.05	0.00

Summary for Subcatchment 28S: DAG1

Runoff = 36.48 cfs @ 11.97 hrs, Volume= 1.710 af, Depth= 2.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
6.930	77	Brush, Fair, HSG D
0.710	91	Gravel roads, HSG D
7.640	78	Weighted Average
7.640		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	562	0.3800	2.71		**Lag/CN Method,**
3.5	562	Total, Increased to minimum Tc = 6.0 min			

Hydrograph for Subcatchment 28S: DAG1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.00
8.00	0.60	0.00	0.01
10.00	0.90	0.04	**0.28**
12.00	3.30	1.34	**34.16**
14.00	4.08	1.95	1.19
16.00	4.37	2.19	0.74
18.00	4.58	2.36	0.58
20.00	4.73	2.49	0.42
22.00	4.86	2.59	0.39
24.00	**4.97**	**2.69**	0.36
26.00	4.97	2.69	0.00
28.00	4.97	2.69	0.00
30.00	4.97	2.69	0.00
32.00	4.97	2.69	0.00
34.00	4.97	2.69	0.00
36.00	4.97	2.69	0.00
38.00	4.97	2.69	0.00
40.00	4.97	2.69	0.00
42.00	4.97	2.69	0.00
44.00	4.97	2.69	0.00
46.00	4.97	2.69	0.00
48.00	4.97	2.69	0.00
50.00	4.97	2.69	0.00
52.00	4.97	2.69	0.00
54.00	4.97	2.69	0.00
56.00	4.97	2.69	0.00
58.00	4.97	2.69	0.00
60.00	4.97	2.69	0.00
62.00	4.97	2.69	0.00
64.00	4.97	2.69	0.00
66.00	4.97	2.69	0.00
68.00	4.97	2.69	0.00
70.00	4.97	2.69	0.00
72.00	4.97	2.69	0.00
74.00	4.97	2.69	0.00
76.00	4.97	2.69	0.00
78.00	4.97	2.69	0.00
80.00	4.97	2.69	0.00
82.00	4.97	2.69	0.00
84.00	4.97	2.69	0.00
86.00	4.97	2.69	0.00
88.00	4.97	2.69	0.00
90.00	4.97	2.69	0.00
92.00	4.97	2.69	0.00
94.00	4.97	2.69	0.00
96.00	4.97	2.69	0.00
98.00	4.97	2.69	0.00
100.00	4.97	2.69	0.00
102.00	4.97	2.69	0.00
104.00	4.97	2.69	0.00
106.00	4.97	2.69	0.00
108.00	4.97	2.69	0.00
110.00	4.97	2.69	0.00
112.00	4.97	2.69	0.00
114.00	4.97	2.69	0.00
116.00	4.97	2.69	0.00
118.00	4.97	2.69	0.00
120.00	4.97	2.69	0.00
122.00	4.97	2.69	0.00
124.00	4.97	2.69	0.00
126.00	4.97	2.69	0.00
128.00	4.97	2.69	0.00
130.00	4.97	2.69	0.00
132.00	4.97	2.69	0.00
134.00	4.97	2.69	0.00
136.00	4.97	2.69	0.00
138.00	4.97	2.69	0.00
140.00	4.97	2.69	0.00
142.00	4.97	2.69	0.00
144.00	4.97	2.69	0.00
146.00	4.97	2.69	0.00
148.00	4.97	2.69	0.00
150.00	4.97	2.69	0.00
152.00	4.97	2.69	0.00
154.00	4.97	2.69	0.00
156.00	4.97	2.69	0.00
158.00	4.97	2.69	0.00
160.00	4.97	2.69	0.00

Summary for Subcatchment C2: DA-C2

Runoff = 20.14 cfs @ 11.97 hrs, Volume= 0.942 af, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
4.310	77	Brush, Fair, HSG D
0.040	91	Gravel roads, HSG D
4.350	77	Weighted Average
4.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	578	0.2007	1.92		**Lag/CN Method,**
0.5	149	0.0940	4.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	58	0.6200	12.68		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
5.6	785	Total, Increased to minimum Tc = 6.0 min			

Hydrograph for Subcatchment C2: DA-C2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.00
8.00	0.60	0.00	0.00
10.00	0.90	0.03	**0.14**
12.00	3.30	1.28	**18.89**
14.00	4.08	1.87	0.67
16.00	4.37	2.11	0.41
18.00	4.58	2.27	0.32
20.00	4.73	2.40	0.24
22.00	4.86	2.50	0.22
24.00	**4.97**	**2.60**	0.20
26.00	4.97	2.60	0.00
28.00	4.97	2.60	0.00
30.00	4.97	2.60	0.00
32.00	4.97	2.60	0.00
34.00	4.97	2.60	0.00
36.00	4.97	2.60	0.00
38.00	4.97	2.60	0.00
40.00	4.97	2.60	0.00
42.00	4.97	2.60	0.00
44.00	4.97	2.60	0.00
46.00	4.97	2.60	0.00
48.00	4.97	2.60	0.00
50.00	4.97	2.60	0.00
52.00	4.97	2.60	0.00
54.00	4.97	2.60	0.00
56.00	4.97	2.60	0.00
58.00	4.97	2.60	0.00
60.00	4.97	2.60	0.00
62.00	4.97	2.60	0.00
64.00	4.97	2.60	0.00
66.00	4.97	2.60	0.00
68.00	4.97	2.60	0.00
70.00	4.97	2.60	0.00
72.00	4.97	2.60	0.00
74.00	4.97	2.60	0.00
76.00	4.97	2.60	0.00
78.00	4.97	2.60	0.00
80.00	4.97	2.60	0.00
82.00	4.97	2.60	0.00
84.00	4.97	2.60	0.00
86.00	4.97	2.60	0.00
88.00	4.97	2.60	0.00
90.00	4.97	2.60	0.00
92.00	4.97	2.60	0.00
94.00	4.97	2.60	0.00
96.00	4.97	2.60	0.00
98.00	4.97	2.60	0.00
100.00	4.97	2.60	0.00
102.00	4.97	2.60	0.00
104.00	4.97	2.60	0.00
106.00	4.97	2.60	0.00
108.00	4.97	2.60	0.00
110.00	4.97	2.60	0.00
112.00	4.97	2.60	0.00
114.00	4.97	2.60	0.00
116.00	4.97	2.60	0.00
118.00	4.97	2.60	0.00
120.00	4.97	2.60	0.00
122.00	4.97	2.60	0.00
124.00	4.97	2.60	0.00
126.00	4.97	2.60	0.00
128.00	4.97	2.60	0.00
130.00	4.97	2.60	0.00
132.00	4.97	2.60	0.00
134.00	4.97	2.60	0.00
136.00	4.97	2.60	0.00
138.00	4.97	2.60	0.00
140.00	4.97	2.60	0.00
142.00	4.97	2.60	0.00
144.00	4.97	2.60	0.00
146.00	4.97	2.60	0.00
148.00	4.97	2.60	0.00
150.00	4.97	2.60	0.00
152.00	4.97	2.60	0.00
154.00	4.97	2.60	0.00
156.00	4.97	2.60	0.00
158.00	4.97	2.60	0.00
160.00	4.97	2.60	0.00

Summary for Subcatchment C4: DA-C4

Runoff = 107.51 cfs @ 11.98 hrs, Volume= 5.207 af, Depth= 2.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
1.960	84	50-75% Grass cover, Fair, HSG D
20.900	77	Brush, Fair, HSG D
0.400	91	Gravel roads, HSG D
23.260	78	Weighted Average
23.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	176	0.2500	1.74		**Lag/CN Method,**
5.2	600	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.9	776	Total			

Hydrograph for Subcatchment C4: DA-C4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.00
8.00	0.60	0.00	0.04
10.00	0.90	0.04	**0.85**
12.00	3.30	1.34	**105.16**
14.00	4.08	1.95	3.65
16.00	4.37	2.19	2.27
18.00	4.58	2.36	1.77
20.00	4.73	2.49	1.29
22.00	4.86	2.59	1.18
24.00	**4.97**	**2.69**	1.09
26.00	4.97	2.69	0.00
28.00	4.97	2.69	0.00
30.00	4.97	2.69	0.00
32.00	4.97	2.69	0.00
34.00	4.97	2.69	0.00
36.00	4.97	2.69	0.00
38.00	4.97	2.69	0.00
40.00	4.97	2.69	0.00
42.00	4.97	2.69	0.00
44.00	4.97	2.69	0.00
46.00	4.97	2.69	0.00
48.00	4.97	2.69	0.00
50.00	4.97	2.69	0.00
52.00	4.97	2.69	0.00
54.00	4.97	2.69	0.00
56.00	4.97	2.69	0.00
58.00	4.97	2.69	0.00
60.00	4.97	2.69	0.00
62.00	4.97	2.69	0.00
64.00	4.97	2.69	0.00
66.00	4.97	2.69	0.00
68.00	4.97	2.69	0.00
70.00	4.97	2.69	0.00
72.00	4.97	2.69	0.00
74.00	4.97	2.69	0.00
76.00	4.97	2.69	0.00
78.00	4.97	2.69	0.00
80.00	4.97	2.69	0.00
82.00	4.97	2.69	0.00
84.00	4.97	2.69	0.00
86.00	4.97	2.69	0.00
88.00	4.97	2.69	0.00
90.00	4.97	2.69	0.00
92.00	4.97	2.69	0.00
94.00	4.97	2.69	0.00
96.00	4.97	2.69	0.00
98.00	4.97	2.69	0.00
100.00	4.97	2.69	0.00
102.00	4.97	2.69	0.00
104.00	4.97	2.69	0.00
106.00	4.97	2.69	0.00
108.00	4.97	2.69	0.00
110.00	4.97	2.69	0.00
112.00	4.97	2.69	0.00
114.00	4.97	2.69	0.00
116.00	4.97	2.69	0.00
118.00	4.97	2.69	0.00
120.00	4.97	2.69	0.00
122.00	4.97	2.69	0.00
124.00	4.97	2.69	0.00
126.00	4.97	2.69	0.00
128.00	4.97	2.69	0.00
130.00	4.97	2.69	0.00
132.00	4.97	2.69	0.00
134.00	4.97	2.69	0.00
136.00	4.97	2.69	0.00
138.00	4.97	2.69	0.00
140.00	4.97	2.69	0.00
142.00	4.97	2.69	0.00
144.00	4.97	2.69	0.00
146.00	4.97	2.69	0.00
148.00	4.97	2.69	0.00
150.00	4.97	2.69	0.00
152.00	4.97	2.69	0.00
154.00	4.97	2.69	0.00
156.00	4.97	2.69	0.00
158.00	4.97	2.69	0.00
160.00	4.97	2.69	0.00

Summary for Subcatchment F2: DA-9B

Runoff = 72.41 cfs @ 12.12 hrs, Volume= 5.248 af, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25 YR Rainfall=4.97"

Area (ac)	CN	Description
23.100	77	Brush, Fair, HSG D
1.140	84	50-75% Grass cover, Fair, HSG D
24.240	77	Weighted Average
24.240		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	250	0.2800	1.92		**Lag/CN Method,**
16.7	1,640	0.1073	1.64		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
18.9	1,890	Total			

Hydrograph for Subcatchment F2: DA-9B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.00
8.00	0.60	0.00	0.00
10.00	0.90	0.03	0.64
12.00	3.30	1.28	**50.52**
14.00	4.08	1.87	**4.08**
16.00	4.37	2.11	2.44
18.00	4.58	2.27	1.85
20.00	4.73	2.40	1.37
22.00	4.86	2.50	1.22
24.00	**4.97**	**2.60**	1.13
26.00	4.97	2.60	0.00
28.00	4.97	2.60	0.00
30.00	4.97	2.60	0.00
32.00	4.97	2.60	0.00
34.00	4.97	2.60	0.00
36.00	4.97	2.60	0.00
38.00	4.97	2.60	0.00
40.00	4.97	2.60	0.00
42.00	4.97	2.60	0.00
44.00	4.97	2.60	0.00
46.00	4.97	2.60	0.00
48.00	4.97	2.60	0.00
50.00	4.97	2.60	0.00
52.00	4.97	2.60	0.00
54.00	4.97	2.60	0.00
56.00	4.97	2.60	0.00
58.00	4.97	2.60	0.00
60.00	4.97	2.60	0.00
62.00	4.97	2.60	0.00
64.00	4.97	2.60	0.00
66.00	4.97	2.60	0.00
68.00	4.97	2.60	0.00
70.00	4.97	2.60	0.00
72.00	4.97	2.60	0.00
74.00	4.97	2.60	0.00
76.00	4.97	2.60	0.00
78.00	4.97	2.60	0.00
80.00	4.97	2.60	0.00
82.00	4.97	2.60	0.00
84.00	4.97	2.60	0.00
86.00	4.97	2.60	0.00
88.00	4.97	2.60	0.00
90.00	4.97	2.60	0.00
92.00	4.97	2.60	0.00
94.00	4.97	2.60	0.00
96.00	4.97	2.60	0.00
98.00	4.97	2.60	0.00
100.00	4.97	2.60	0.00
102.00	4.97	2.60	0.00
104.00	4.97	2.60	0.00
106.00	4.97	2.60	0.00
108.00	4.97	2.60	0.00
110.00	4.97	2.60	0.00
112.00	4.97	2.60	0.00
114.00	4.97	2.60	0.00
116.00	4.97	2.60	0.00
118.00	4.97	2.60	0.00
120.00	4.97	2.60	0.00
122.00	4.97	2.60	0.00
124.00	4.97	2.60	0.00
126.00	4.97	2.60	0.00
128.00	4.97	2.60	0.00
130.00	4.97	2.60	0.00
132.00	4.97	2.60	0.00
134.00	4.97	2.60	0.00
136.00	4.97	2.60	0.00
138.00	4.97	2.60	0.00
140.00	4.97	2.60	0.00
142.00	4.97	2.60	0.00
144.00	4.97	2.60	0.00
146.00	4.97	2.60	0.00
148.00	4.97	2.60	0.00
150.00	4.97	2.60	0.00
152.00	4.97	2.60	0.00
154.00	4.97	2.60	0.00
156.00	4.97	2.60	0.00
158.00	4.97	2.60	0.00
160.00	4.97	2.60	0.00

Summary for Reach 1R: Channel 5

Inflow Area = 22.210 ac, 0.00% Impervious, Inflow Depth = 3.02" for 25 YR event
Inflow = 50.85 cfs @ 12.35 hrs, Volume= 5.582 af
Outflow = 50.84 cfs @ 12.35 hrs, Volume= 5.582 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.00 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.07 fps, Avg. Travel Time= 0.4 min

Peak Storage= 254 cf @ 12.35 hrs
Average Depth at Peak Storage= 0.80'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 331.37 cfs

4.00' x 2.00' deep channel, n= 0.043
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 50.0' Slope= 0.1800 '/'
Inlet Invert= 876.00', Outlet Invert= 867.00'

‡

Hydrograph for Reach 1R: Channel 5

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	876.00	0.00
5.00	0.00	0	876.00	0.00
10.00	**0.40**	**10**	**876.05**	**0.40**
15.00	**3.68**	**42**	**876.18**	**3.69**
20.00	1.55	24	876.11	1.55
25.00	0.69	14	876.07	0.69
30.00	0.05	2	876.01	0.05
35.00	0.01	1	876.00	0.01
40.00	0.00	0	876.00	0.00
45.00	0.00	0	876.00	0.00
50.00	0.00	0	876.00	0.00
55.00	0.00	0	876.00	0.00
60.00	0.00	0	876.00	0.00
65.00	0.00	0	876.00	0.00
70.00	0.00	0	876.00	0.00
75.00	0.00	0	876.00	0.00
80.00	0.00	0	876.00	0.00
85.00	0.00	0	876.00	0.00
90.00	0.00	0	876.00	0.00
95.00	0.00	0	876.00	0.00
100.00	0.00	0	876.00	0.00
105.00	0.00	0	876.00	0.00
110.00	0.00	0	876.00	0.00
115.00	0.00	0	876.00	0.00
120.00	0.00	0	876.00	0.00
125.00	0.00	0	876.00	0.00
130.00	0.00	0	876.00	0.00
135.00	0.00	0	876.00	0.00
140.00	0.00	0	876.00	0.00
145.00	0.00	0	876.00	0.00
150.00	0.00	0	876.00	0.00
155.00	0.00	0	876.00	0.00
160.00	0.00	0	876.00	0.00

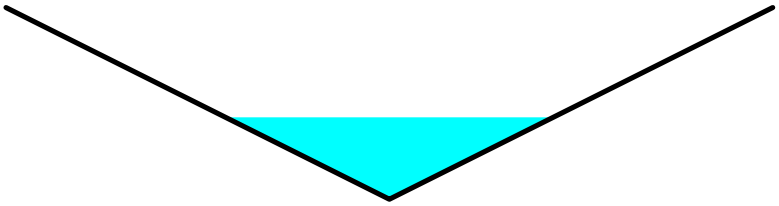
Summary for Reach 2R: Channel 12

Inflow Area = 1.820 ac, 0.00% Impervious, Inflow Depth = 3.85" for 25 YR event
Inflow = 11.66 cfs @ 11.97 hrs, Volume= 0.584 af
Outflow = 11.55 cfs @ 11.99 hrs, Volume= 0.584 af, Atten= 1%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.91 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.69 fps, Avg. Travel Time= 2.3 min

Peak Storage= 541 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.86'
Bank-Full Depth= 2.00' Flow Area= 8.0 sf, Capacity= 111.45 cfs

0.00' x 2.00' deep channel, n= 0.053
Side Slope Z-value= 2.0 '/' Top Width= 8.00'
Length= 370.0' Slope= 0.2865 '/'
Inlet Invert= 806.00', Outlet Invert= 700.00'



Hydrograph for Reach 2R: Channel 12

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	806.00	0.00
5.00	0.02	4	806.08	0.02
10.00	**0.21**	**27**	**806.19**	**0.21**
15.00	**0.27**	**32**	**806.21**	**0.27**
20.00	0.12	17	806.15	0.12
25.00	0.00	0	806.00	0.00
30.00	0.00	0	806.00	0.00
35.00	0.00	0	806.00	0.00
40.00	0.00	0	806.00	0.00
45.00	0.00	0	806.00	0.00
50.00	0.00	0	806.00	0.00
55.00	0.00	0	806.00	0.00
60.00	0.00	0	806.00	0.00
65.00	0.00	0	806.00	0.00
70.00	0.00	0	806.00	0.00
75.00	0.00	0	806.00	0.00
80.00	0.00	0	806.00	0.00
85.00	0.00	0	806.00	0.00
90.00	0.00	0	806.00	0.00
95.00	0.00	0	806.00	0.00
100.00	0.00	0	806.00	0.00
105.00	0.00	0	806.00	0.00
110.00	0.00	0	806.00	0.00
115.00	0.00	0	806.00	0.00
120.00	0.00	0	806.00	0.00
125.00	0.00	0	806.00	0.00
130.00	0.00	0	806.00	0.00
135.00	0.00	0	806.00	0.00
140.00	0.00	0	806.00	0.00
145.00	0.00	0	806.00	0.00
150.00	0.00	0	806.00	0.00
155.00	0.00	0	806.00	0.00
160.00	0.00	0	806.00	0.00

Summary for Reach 3R: Channel 8

Inflow Area = 27.100 ac, 0.00% Impervious, Inflow Depth = 3.46" for 25 YR event
Inflow = 129.79 cfs @ 11.99 hrs, Volume= 7.810 af
Outflow = 124.78 cfs @ 12.05 hrs, Volume= 7.810 af, Atten= 4%, Lag= 3.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 7.54 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 2.01 fps, Avg. Travel Time= 8.4 min

Peak Storage= 16,869 cf @ 12.01 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 3.00' Flow Area= 51.0 sf, Capacity= 569.04 cfs

5.00' x 3.00' deep channel, n= 0.041
Side Slope Z-value= 4.0 '/' Top Width= 29.00'
Length= 1,018.0' Slope= 0.0462 '/'
Inlet Invert= 737.00', Outlet Invert= 690.00'

‡

Hydrograph for Reach 3R: Channel 8

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	737.00	0.00
5.00	0.38	311	737.06	0.34
10.00	**2.42**	**1,034**	**737.18**	**2.25**
15.00	**3.77**	**1,444**	**737.24**	**3.86**
20.00	1.65	841	737.15	1.69
25.00	0.00	52	737.01	0.04
30.00	0.00	0	737.00	0.00
35.00	0.00	0	737.00	0.00
40.00	0.00	0	737.00	0.00
45.00	0.00	0	737.00	0.00
50.00	0.00	0	737.00	0.00
55.00	0.00	0	737.00	0.00
60.00	0.00	0	737.00	0.00
65.00	0.00	0	737.00	0.00
70.00	0.00	0	737.00	0.00
75.00	0.00	0	737.00	0.00
80.00	0.00	0	737.00	0.00
85.00	0.00	0	737.00	0.00
90.00	0.00	0	737.00	0.00
95.00	0.00	0	737.00	0.00
100.00	0.00	0	737.00	0.00
105.00	0.00	0	737.00	0.00
110.00	0.00	0	737.00	0.00
115.00	0.00	0	737.00	0.00
120.00	0.00	0	737.00	0.00
125.00	0.00	0	737.00	0.00
130.00	0.00	0	737.00	0.00
135.00	0.00	0	737.00	0.00
140.00	0.00	0	737.00	0.00
145.00	0.00	0	737.00	0.00
150.00	0.00	0	737.00	0.00
155.00	0.00	0	737.00	0.00
160.00	0.00	0	737.00	0.00

Summary for Reach 4R: Channel 7

Inflow Area = 64.740 ac, 0.00% Impervious, Inflow Depth > 2.97" for 25 YR event
Inflow = 18.17 cfs @ 12.09 hrs, Volume= 16.009 af
Outflow = 18.09 cfs @ 12.11 hrs, Volume= 16.009 af, Atten= 0%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.31 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.72 fps, Avg. Travel Time= 4.0 min

Peak Storage= 1,015 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 1.50' Flow Area= 13.1 sf, Capacity= 196.21 cfs

5.00' x 1.50' deep channel, n= 0.053
Side Slope Z-value= 2.5 '/' Top Width= 12.50'
Length= 410.0' Slope= 0.2829 '/'
Inlet Invert= 840.00', Outlet Invert= 724.00'

‡

Hydrograph for Reach 4R: Channel 7

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	840.00	0.00
5.00	0.06	27	840.01	0.06
10.00	**0.28**	**71**	**840.03**	**0.27**
15.00	**13.97**	**854**	**840.35**	**13.98**
20.00	10.94	727	840.31	10.97
25.00	5.42	461	840.20	5.45
30.00	2.33	269	840.12	2.34
35.00	1.21	179	840.08	1.21
40.00	0.72	130	840.06	0.73
45.00	0.47	100	840.05	0.47
50.00	0.33	80	840.04	0.33
55.00	0.23	65	840.03	0.23
60.00	0.19	57	840.03	0.19
65.00	0.15	49	840.02	0.15
70.00	0.12	43	840.02	0.13
75.00	0.10	38	840.02	0.10
80.00	0.08	34	840.02	0.08
85.00	0.07	31	840.01	0.07
90.00	0.05	25	840.01	0.05
95.00	0.05	23	840.01	0.05
100.00	0.05	22	840.01	0.05
105.00	0.05	21	840.01	0.05
110.00	0.04	19	840.01	0.04
115.00	0.04	18	840.01	0.04
120.00	0.04	17	840.01	0.04
125.00	0.04	16	840.01	0.04
130.00	0.03	15	840.01	0.03
135.00	0.03	14	840.01	0.03
140.00	0.03	13	840.01	0.03
145.00	0.03	12	840.01	0.03
150.00	0.03	12	840.01	0.03
155.00	0.02	11	840.01	0.02
160.00	0.02	10	840.00	0.02

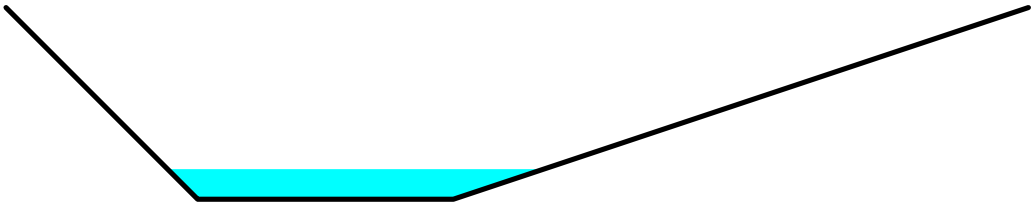
Summary for Reach 5R: Channel 13 Reach B

Inflow Area = 2.700 ac, 0.00% Impervious, Inflow Depth = 2.96" for 25 YR event
Inflow = 14.07 cfs @ 11.97 hrs, Volume= 0.666 af
Outflow = 13.87 cfs @ 12.00 hrs, Volume= 0.666 af, Atten= 1%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.98 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 4.4 min

Peak Storage= 917 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 3.00' Flow Area= 30.0 sf, Capacity= 487.62 cfs

4.00' x 3.00' deep channel, n= 0.032
Side Slope Z-value= 1.0 3.0 '/' Top Width= 16.00'
Length= 395.0' Slope= 0.0608 '/'
Inlet Invert= 700.00', Outlet Invert= 676.00'



Hydrograph for Reach 5R: Channel 13 Reach B

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	700.00	0.00
5.00	0.00	0	700.00	0.00
10.00	**0.14**	**48**	**700.03**	**0.13**
15.00	**0.35**	**86**	**700.05**	**0.36**
20.00	0.16	52	700.03	0.16
25.00	0.00	0	700.00	0.00
30.00	0.00	0	700.00	0.00
35.00	0.00	0	700.00	0.00
40.00	0.00	0	700.00	0.00
45.00	0.00	0	700.00	0.00
50.00	0.00	0	700.00	0.00
55.00	0.00	0	700.00	0.00
60.00	0.00	0	700.00	0.00
65.00	0.00	0	700.00	0.00
70.00	0.00	0	700.00	0.00
75.00	0.00	0	700.00	0.00
80.00	0.00	0	700.00	0.00
85.00	0.00	0	700.00	0.00
90.00	0.00	0	700.00	0.00
95.00	0.00	0	700.00	0.00
100.00	0.00	0	700.00	0.00
105.00	0.00	0	700.00	0.00
110.00	0.00	0	700.00	0.00
115.00	0.00	0	700.00	0.00
120.00	0.00	0	700.00	0.00
125.00	0.00	0	700.00	0.00
130.00	0.00	0	700.00	0.00
135.00	0.00	0	700.00	0.00
140.00	0.00	0	700.00	0.00
145.00	0.00	0	700.00	0.00
150.00	0.00	0	700.00	0.00
155.00	0.00	0	700.00	0.00
160.00	0.00	0	700.00	0.00

Summary for Reach 6R: Channel 9C

Inflow Area = 110.280 ac, 0.00% Impervious, Inflow Depth > 3.02" for 25 YR event
Inflow = 162.78 cfs @ 12.12 hrs, Volume= 27.773 af
Outflow = 161.72 cfs @ 12.16 hrs, Volume= 27.772 af, Atten= 1%, Lag= 2.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.80 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 0.76 fps, Avg. Travel Time= 9.3 min

Peak Storage= 14,164 cf @ 12.14 hrs
Average Depth at Peak Storage= 2.35'
Bank-Full Depth= 3.00' Flow Area= 51.0 sf, Capacity= 282.08 cfs

5.00' x 3.00' deep channel, n= 0.042
Side Slope Z-value= 4.0 '/' Top Width= 29.00'
Length= 420.0' Slope= 0.0119 '/'
Inlet Invert= 698.00', Outlet Invert= 693.00'

‡

Hydrograph for Reach 6R: Channel 9C

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	698.00	0.00
5.00	0.43	220	698.10	0.41
10.00	**2.97**	**788**	**698.30**	**2.83**
15.00	**20.19**	**3,082**	**698.87**	**20.28**
20.00	13.72	2,338	698.71	13.80
25.00	5.49	1,231	698.43	5.56
30.00	2.35	692	698.27	2.38
35.00	1.22	447	698.19	1.23
40.00	0.73	319	698.14	0.73
45.00	0.47	242	698.11	0.48
50.00	0.33	194	698.09	0.34
55.00	0.23	154	698.07	0.24
60.00	0.19	137	698.06	0.19
65.00	0.15	119	698.05	0.16
70.00	0.13	103	698.05	0.13
75.00	0.10	90	698.04	0.10
80.00	0.08	79	698.04	0.08
85.00	0.07	71	698.03	0.07
90.00	0.06	64	698.03	0.06
95.00	0.05	59	698.03	0.05
100.00	0.05	55	698.03	0.05
105.00	0.05	52	698.02	0.05
110.00	0.04	49	698.02	0.04
115.00	0.04	46	698.02	0.04
120.00	0.04	43	698.02	0.04
125.00	0.04	40	698.02	0.04
130.00	0.03	38	698.02	0.03
135.00	0.03	36	698.02	0.03
140.00	0.03	34	698.02	0.03
145.00	0.03	31	698.01	0.03
150.00	0.03	30	698.01	0.03
155.00	0.02	28	698.01	0.02
160.00	0.02	26	698.01	0.02

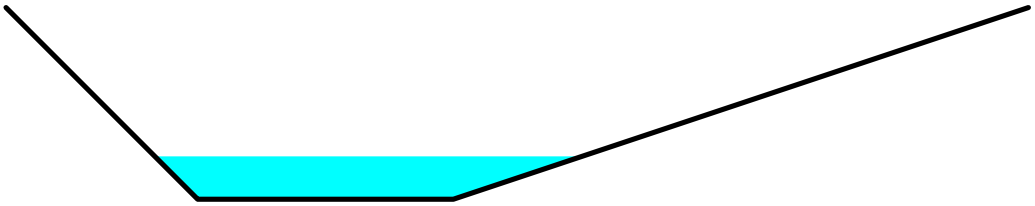
Summary for Reach 7R: Channel 13 Reach A

Inflow Area = 2.770 ac, 0.00% Impervious, Inflow Depth = 3.15" for 25 YR event
Inflow = 15.22 cfs @ 11.97 hrs, Volume= 0.726 af
Outflow = 14.55 cfs @ 12.03 hrs, Volume= 0.726 af, Atten= 4%, Lag= 3.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.08 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.00 fps, Avg. Travel Time= 8.9 min

Peak Storage= 1,906 cf @ 11.99 hrs
Average Depth at Peak Storage= 0.67'
Bank-Full Depth= 3.00' Flow Area= 30.0 sf, Capacity= 273.94 cfs

4.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 1.0 3.0 '/' Top Width= 16.00'
Length= 534.0' Slope= 0.0300 '/'
Inlet Invert= 716.00', Outlet Invert= 700.00'



Hydrograph for Reach 7R: Channel 13 Reach A

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	716.00	0.00
5.00	0.00	0	716.00	0.00
10.00	**0.18**	**103**	**716.05**	**0.16**
15.00	**0.37**	**175**	**716.08**	**0.38**
20.00	0.16	103	716.05	0.17
25.00	0.00	2	716.00	0.00
30.00	0.00	0	716.00	0.00
35.00	0.00	0	716.00	0.00
40.00	0.00	0	716.00	0.00
45.00	0.00	0	716.00	0.00
50.00	0.00	0	716.00	0.00
55.00	0.00	0	716.00	0.00
60.00	0.00	0	716.00	0.00
65.00	0.00	0	716.00	0.00
70.00	0.00	0	716.00	0.00
75.00	0.00	0	716.00	0.00
80.00	0.00	0	716.00	0.00
85.00	0.00	0	716.00	0.00
90.00	0.00	0	716.00	0.00
95.00	0.00	0	716.00	0.00
100.00	0.00	0	716.00	0.00
105.00	0.00	0	716.00	0.00
110.00	0.00	0	716.00	0.00
115.00	0.00	0	716.00	0.00
120.00	0.00	0	716.00	0.00
125.00	0.00	0	716.00	0.00
130.00	0.00	0	716.00	0.00
135.00	0.00	0	716.00	0.00
140.00	0.00	0	716.00	0.00
145.00	0.00	0	716.00	0.00
150.00	0.00	0	716.00	0.00
155.00	0.00	0	716.00	0.00
160.00	0.00	0	716.00	0.00

Summary for Reach 8R: Channel 6

Inflow Area = 63.930 ac, 0.00% Impervious, Inflow Depth > 2.96" for 25 YR event
Inflow = 15.49 cfs @ 11.99 hrs, Volume= 15.743 af
Outflow = 14.69 cfs @ 12.07 hrs, Volume= 15.743 af, Atten= 5%, Lag= 4.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.40 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.92 fps, Avg. Travel Time= 10.5 min

Peak Storage= 2,510 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.78'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 294.91 cfs

4.00' x 3.50' deep channel, n= 0.052
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 580.0' Slope= 0.0293 '/'
Inlet Invert= 857.00', Outlet Invert= 840.00'

Hydrograph for Reach 8R: Channel 6

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	857.00	0.00
5.00	0.05	59	857.02	0.05
10.00	**0.23**	**154**	**857.06**	**0.20**
15.00	**13.81**	**2,403**	**857.75**	**13.84**
20.00	10.80	2,029	857.66	10.88
25.00	5.33	1,253	857.44	5.41
30.00	2.29	715	857.27	2.33
35.00	1.19	467	857.18	1.21
40.00	0.71	337	857.14	0.72
45.00	0.47	259	857.11	0.47
50.00	0.33	205	857.08	0.33
55.00	0.23	167	857.07	0.23
60.00	0.19	144	857.06	0.19
65.00	0.15	125	857.05	0.15
70.00	0.12	110	857.05	0.12
75.00	0.10	97	857.04	0.10
80.00	0.08	87	857.04	0.08
85.00	0.07	75	857.03	0.07
90.00	0.05	61	857.03	0.05
95.00	0.05	57	857.02	0.05
100.00	0.05	54	857.02	0.05
105.00	0.04	51	857.02	0.05
110.00	0.04	48	857.02	0.04
115.00	0.04	45	857.02	0.04
120.00	0.04	42	857.02	0.04
125.00	0.03	39	857.02	0.04
130.00	0.03	37	857.02	0.03
135.00	0.03	35	857.01	0.03
140.00	0.03	33	857.01	0.03
145.00	0.03	31	857.01	0.03
150.00	0.03	29	857.01	0.03
155.00	0.02	27	857.01	0.02
160.00	0.02	25	857.01	0.02

Summary for Reach 9R: Channel 1 Reach D

Inflow Area = 4.940 ac, 0.00% Impervious, Inflow Depth = 3.44" for 25 YR event
Inflow = 18.58 cfs @ 12.12 hrs, Volume= 1.416 af
Outflow = 18.52 cfs @ 12.15 hrs, Volume= 1.416 af, Atten= 0%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.34 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 2.71 fps, Avg. Travel Time= 3.6 min

Peak Storage= 1,162 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 4.00' Flow Area= 43.2 sf, Capacity= 1,365.60 cfs

4.00' x 4.00' deep channel, n= 0.046
Side Slope Z-value= 1.7 '/' Top Width= 17.60'
Length= 586.0' Slope= 0.3379 '/'
Inlet Invert= 878.00', Outlet Invert= 680.00'

Hydrograph for Reach 9R: Channel 1 Reach D

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	878.00	0.00
5.00	0.00	0	878.00	0.00
10.00	**0.37**	**96**	**878.04**	**0.35**
15.00	**0.73**	**144**	**878.06**	**0.74**
20.00	0.32	87	878.04	0.32
25.00	0.00	0	878.00	0.00
30.00	0.00	0	878.00	0.00
35.00	0.00	0	878.00	0.00
40.00	0.00	0	878.00	0.00
45.00	0.00	0	878.00	0.00
50.00	0.00	0	878.00	0.00
55.00	0.00	0	878.00	0.00
60.00	0.00	0	878.00	0.00
65.00	0.00	0	878.00	0.00
70.00	0.00	0	878.00	0.00
75.00	0.00	0	878.00	0.00
80.00	0.00	0	878.00	0.00
85.00	0.00	0	878.00	0.00
90.00	0.00	0	878.00	0.00
95.00	0.00	0	878.00	0.00
100.00	0.00	0	878.00	0.00
105.00	0.00	0	878.00	0.00
110.00	0.00	0	878.00	0.00
115.00	0.00	0	878.00	0.00
120.00	0.00	0	878.00	0.00
125.00	0.00	0	878.00	0.00
130.00	0.00	0	878.00	0.00
135.00	0.00	0	878.00	0.00
140.00	0.00	0	878.00	0.00
145.00	0.00	0	878.00	0.00
150.00	0.00	0	878.00	0.00
155.00	0.00	0	878.00	0.00
160.00	0.00	0	878.00	0.00

Summary for Reach 10R: Channel 9A

Inflow Area = 13.600 ac, 0.00% Impervious, Inflow Depth = 4.28" for 25 YR event
Inflow = 64.68 cfs @ 12.09 hrs, Volume= 4.849 af
Outflow = 64.56 cfs @ 12.11 hrs, Volume= 4.849 af, Atten= 0%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.42 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.10 fps, Avg. Travel Time= 2.4 min

Peak Storage= 2,611 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.98'
Bank-Full Depth= 1.50' Flow Area= 16.5 sf, Capacity= 155.01 cfs

5.00' x 1.50' deep channel, n= 0.045
Side Slope Z-value= 4.0 '/' Top Width= 17.00'
Length= 300.0' Slope= 0.0867 '/'
Inlet Invert= 750.00', Outlet Invert= 724.00'

‡

Hydrograph for Reach 10R: Channel 9A

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	750.00	0.00
5.00	0.39	84	750.05	0.38
10.00	**1.90**	**231**	**750.14**	**1.87**
15.00	**2.14**	**252**	**750.15**	**2.15**
20.00	0.92	147	750.09	0.92
25.00	0.00	2	750.00	0.00
30.00	0.00	0	750.00	0.00
35.00	0.00	0	750.00	0.00
40.00	0.00	0	750.00	0.00
45.00	0.00	0	750.00	0.00
50.00	0.00	0	750.00	0.00
55.00	0.00	0	750.00	0.00
60.00	0.00	0	750.00	0.00
65.00	0.00	0	750.00	0.00
70.00	0.00	0	750.00	0.00
75.00	0.00	0	750.00	0.00
80.00	0.00	0	750.00	0.00
85.00	0.00	0	750.00	0.00
90.00	0.00	0	750.00	0.00
95.00	0.00	0	750.00	0.00
100.00	0.00	0	750.00	0.00
105.00	0.00	0	750.00	0.00
110.00	0.00	0	750.00	0.00
115.00	0.00	0	750.00	0.00
120.00	0.00	0	750.00	0.00
125.00	0.00	0	750.00	0.00
130.00	0.00	0	750.00	0.00
135.00	0.00	0	750.00	0.00
140.00	0.00	0	750.00	0.00
145.00	0.00	0	750.00	0.00
150.00	0.00	0	750.00	0.00
155.00	0.00	0	750.00	0.00
160.00	0.00	0	750.00	0.00

Summary for Reach 11R: Channel 9B

Inflow Area = 102.580 ac, 0.00% Impervious, Inflow Depth > 3.05" for 25 YR event
Inflow = 154.98 cfs @ 12.11 hrs, Volume= 26.106 af
Outflow = 154.75 cfs @ 12.13 hrs, Volume= 26.106 af, Atten= 0%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.16 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.58 fps, Avg. Travel Time= 3.6 min

Peak Storage= 5,182 cf @ 12.12 hrs
Average Depth at Peak Storage= 1.42'
Bank-Full Depth= 2.50' Flow Area= 37.5 sf, Capacity= 522.84 cfs

5.00' x 2.50' deep channel, n= 0.038
Side Slope Z-value= 4.0 '/' Top Width= 25.00'
Length= 340.0' Slope= 0.0765 '/'
Inlet Invert= 724.00', Outlet Invert= 698.00'

‡

Hydrograph for Reach 11R: Channel 9B

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	724.00	0.00
5.00	0.44	96	724.05	0.43
10.00	**2.78**	**312**	**724.16**	**2.73**
15.00	**19.22**	**1,159**	**724.49**	**19.25**
20.00	13.27	897	724.40	13.30
25.00	5.46	492	724.24	5.49
30.00	2.34	282	724.15	2.35
35.00	1.21	185	724.10	1.22
40.00	0.73	134	724.07	0.73
45.00	0.47	102	724.06	0.47
50.00	0.33	82	724.05	0.33
55.00	0.23	64	724.04	0.23
60.00	0.19	56	724.03	0.19
65.00	0.15	50	724.03	0.15
70.00	0.13	45	724.03	0.13
75.00	0.10	38	724.02	0.10
80.00	0.08	31	724.02	0.08
85.00	0.07	25	724.01	0.07
90.00	0.05	21	724.01	0.06
95.00	0.05	19	724.01	0.05
100.00	0.05	18	724.01	0.05
105.00	0.05	17	724.01	0.05
110.00	0.04	16	724.01	0.04
115.00	0.04	15	724.01	0.04
120.00	0.04	14	724.01	0.04
125.00	0.04	13	724.01	0.04
130.00	0.03	12	724.01	0.03
135.00	0.03	12	724.01	0.03
140.00	0.03	11	724.01	0.03
145.00	0.03	10	724.01	0.03
150.00	0.03	10	724.01	0.03
155.00	0.02	9	724.01	0.02
160.00	0.02	8	724.00	0.02

Summary for Reach 12R: Channel 4

Inflow Area = 8.940 ac, 0.00% Impervious, Inflow Depth = 3.05" for 25 YR event
Inflow = 33.64 cfs @ 12.08 hrs, Volume= 2.274 af
Outflow = 27.67 cfs @ 12.31 hrs, Volume= 2.274 af, Atten= 18%, Lag= 13.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.65 fps, Min. Travel Time= 8.3 min
Avg. Velocity = 0.40 fps, Avg. Travel Time= 34.0 min

Peak Storage= 13,844 cf @ 12.17 hrs
Average Depth at Peak Storage= 1.79'
Bank-Full Depth= 3.00' Flow Area= 39.0 sf, Capacity= 86.14 cfs

4.00' x 3.00' deep channel, n= 0.100
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 825.0' Slope= 0.0109 '/'
Inlet Invert= 894.00', Outlet Invert= 885.00'

‡

Hydrograph for Reach 12R: Channel 4

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	894.00	0.00
5.00	0.00	0	894.00	0.00
10.00	**0.47**	**687**	**894.18**	**0.35**
15.00	**1.23**	**1,546**	**894.37**	**1.33**
20.00	0.54	889	894.23	0.58
25.00	0.00	250	894.07	0.10
30.00	0.00	8	894.00	0.00
35.00	0.00	0	894.00	0.00
40.00	0.00	0	894.00	0.00
45.00	0.00	0	894.00	0.00
50.00	0.00	0	894.00	0.00
55.00	0.00	0	894.00	0.00
60.00	0.00	0	894.00	0.00
65.00	0.00	0	894.00	0.00
70.00	0.00	0	894.00	0.00
75.00	0.00	0	894.00	0.00
80.00	0.00	0	894.00	0.00
85.00	0.00	0	894.00	0.00
90.00	0.00	0	894.00	0.00
95.00	0.00	0	894.00	0.00
100.00	0.00	0	894.00	0.00
105.00	0.00	0	894.00	0.00
110.00	0.00	0	894.00	0.00
115.00	0.00	0	894.00	0.00
120.00	0.00	0	894.00	0.00
125.00	0.00	0	894.00	0.00
130.00	0.00	0	894.00	0.00
135.00	0.00	0	894.00	0.00
140.00	0.00	0	894.00	0.00
145.00	0.00	0	894.00	0.00
150.00	0.00	0	894.00	0.00
155.00	0.00	0	894.00	0.00
160.00	0.00	0	894.00	0.00

Summary for Reach 13R: Channel 3

Inflow Area = 7.170 ac, 0.00% Impervious, Inflow Depth = 3.15" for 25 YR event
Inflow = 33.10 cfs @ 12.03 hrs, Volume= 1.880 af
Outflow = 27.80 cfs @ 12.19 hrs, Volume= 1.880 af, Atten= 16%, Lag= 10.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.00 fps, Min. Travel Time= 6.5 min
Avg. Velocity = 0.74 fps, Avg. Travel Time= 26.3 min

Peak Storage= 10,833 cf @ 12.08 hrs
Average Depth at Peak Storage= 1.37'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 192.38 cfs

4.00' x 3.50' deep channel, n= 0.077
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,170.0' Slope= 0.0274 '/'
Inlet Invert= 916.00', Outlet Invert= 884.00'

Hydrograph for Reach 13R: Channel 3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	916.00	0.00
5.00	0.00	0	916.00	0.00
10.00	**0.44**	**589**	**916.12**	**0.35**
15.00	**0.98**	**1,123**	**916.22**	**1.05**
20.00	0.43	666	916.13	0.46
25.00	0.00	164	916.03	0.06
30.00	0.00	1	916.00	0.00
35.00	0.00	0	916.00	0.00
40.00	0.00	0	916.00	0.00
45.00	0.00	0	916.00	0.00
50.00	0.00	0	916.00	0.00
55.00	0.00	0	916.00	0.00
60.00	0.00	0	916.00	0.00
65.00	0.00	0	916.00	0.00
70.00	0.00	0	916.00	0.00
75.00	0.00	0	916.00	0.00
80.00	0.00	0	916.00	0.00
85.00	0.00	0	916.00	0.00
90.00	0.00	0	916.00	0.00
95.00	0.00	0	916.00	0.00
100.00	0.00	0	916.00	0.00
105.00	0.00	0	916.00	0.00
110.00	0.00	0	916.00	0.00
115.00	0.00	0	916.00	0.00
120.00	0.00	0	916.00	0.00
125.00	0.00	0	916.00	0.00
130.00	0.00	0	916.00	0.00
135.00	0.00	0	916.00	0.00
140.00	0.00	0	916.00	0.00
145.00	0.00	0	916.00	0.00
150.00	0.00	0	916.00	0.00
155.00	0.00	0	916.00	0.00
160.00	0.00	0	916.00	0.00

Summary for Reach 14R: Channel 2 Reach A

Inflow Area = 0.580 ac, 0.00% Impervious, Inflow Depth = 3.95" for 25 YR event
Inflow = 3.78 cfs @ 11.97 hrs, Volume= 0.191 af
Outflow = 1.88 cfs @ 12.44 hrs, Volume= 0.191 af, Atten= 50%, Lag= 28.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.17 fps, Min. Travel Time= 22.6 min
Avg. Velocity = 0.34 fps, Avg. Travel Time= 78.5 min

Peak Storage= 2,544 cf @ 12.06 hrs
Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 160.67 cfs

4.00' x 3.50' deep channel, n= 0.100
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,585.0' Slope= 0.0322 '/'
Inlet Invert= 919.00', Outlet Invert= 868.00'

Hydrograph for Reach 14R: Channel 2 Reach A

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	919.00	0.00
5.00	0.01	17	919.00	0.00
10.00	**0.07**	**247**	**919.04**	**0.04**
15.00	**0.09**	**407**	**919.06**	**0.12**
20.00	0.04	232	919.04	0.05
25.00	0.00	105	919.02	0.02
30.00	0.00	4	919.00	0.00
35.00	0.00	0	919.00	0.00
40.00	0.00	0	919.00	0.00
45.00	0.00	0	919.00	0.00
50.00	0.00	0	919.00	0.00
55.00	0.00	0	919.00	0.00
60.00	0.00	0	919.00	0.00
65.00	0.00	0	919.00	0.00
70.00	0.00	0	919.00	0.00
75.00	0.00	0	919.00	0.00
80.00	0.00	0	919.00	0.00
85.00	0.00	0	919.00	0.00
90.00	0.00	0	919.00	0.00
95.00	0.00	0	919.00	0.00
100.00	0.00	0	919.00	0.00
105.00	0.00	0	919.00	0.00
110.00	0.00	0	919.00	0.00
115.00	0.00	0	919.00	0.00
120.00	0.00	0	919.00	0.00
125.00	0.00	0	919.00	0.00
130.00	0.00	0	919.00	0.00
135.00	0.00	0	919.00	0.00
140.00	0.00	0	919.00	0.00
145.00	0.00	0	919.00	0.00
150.00	0.00	0	919.00	0.00
155.00	0.00	0	919.00	0.00
160.00	0.00	0	919.00	0.00

Summary for Reach 15R: Channel 2B

Inflow Area = 0.810 ac, 0.00% Impervious, Inflow Depth = 3.95" for 25 YR event
Inflow = 5.28 cfs @ 11.97 hrs, Volume= 0.267 af
Outflow = 4.23 cfs @ 12.14 hrs, Volume= 0.267 af, Atten= 20%, Lag= 10.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.59 fps, Min. Travel Time= 7.3 min
Avg. Velocity = 0.71 fps, Avg. Travel Time= 26.7 min

Peak Storage= 1,849 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 352.50 cfs

4.00' x 3.50' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,130.0' Slope= 0.0248 '/'
Inlet Invert= 868.00', Outlet Invert= 840.00'

Hydrograph for Reach 15R: Channel 2B

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	868.00	0.00
5.00	0.01	15	868.00	0.01
10.00	**0.10**	**152**	**868.03**	**0.08**
15.00	**0.12**	**194**	**868.04**	**0.13**
20.00	0.05	104	868.02	0.06
25.00	0.00	14	868.00	0.01
30.00	0.00	0	868.00	0.00
35.00	0.00	0	868.00	0.00
40.00	0.00	0	868.00	0.00
45.00	0.00	0	868.00	0.00
50.00	0.00	0	868.00	0.00
55.00	0.00	0	868.00	0.00
60.00	0.00	0	868.00	0.00
65.00	0.00	0	868.00	0.00
70.00	0.00	0	868.00	0.00
75.00	0.00	0	868.00	0.00
80.00	0.00	0	868.00	0.00
85.00	0.00	0	868.00	0.00
90.00	0.00	0	868.00	0.00
95.00	0.00	0	868.00	0.00
100.00	0.00	0	868.00	0.00
105.00	0.00	0	868.00	0.00
110.00	0.00	0	868.00	0.00
115.00	0.00	0	868.00	0.00
120.00	0.00	0	868.00	0.00
125.00	0.00	0	868.00	0.00
130.00	0.00	0	868.00	0.00
135.00	0.00	0	868.00	0.00
140.00	0.00	0	868.00	0.00
145.00	0.00	0	868.00	0.00
150.00	0.00	0	868.00	0.00
155.00	0.00	0	868.00	0.00
160.00	0.00	0	868.00	0.00

Summary for Pond 1P: Culvert 1

Inflow Area = 22.210 ac, 0.00% Impervious, Inflow Depth = 3.02" for 25 YR event
Inflow = 50.84 cfs @ 12.35 hrs, Volume= 5.582 af
Outflow = 50.84 cfs @ 12.35 hrs, Volume= 5.582 af, Atten= 0%, Lag= 0.0 min
Primary = 50.84 cfs @ 12.35 hrs, Volume= 5.582 af

Routing by Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Peak Elev= 868.46' @ 12.35 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	865.50'	**42.0" Round Culvert** L= 47.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 865.50' / 862.00' S= 0.0745 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 9.62 sf

Primary OutFlow Max=50.83 cfs @ 12.35 hrs HW=868.46' (Free Discharge)
1=Culvert (Inlet Controls 50.83 cfs @ 5.86 fps)

Hydrograph for Pond 1P: Culvert 1

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	865.50	0.00
2.00	0.00	865.50	0.00
4.00	0.00	865.50	0.00
6.00	0.00	865.50	0.00
8.00	0.02	865.55	0.02
10.00	0.40	865.72	0.40
12.00	**11.21**	**866.72**	**11.21**
14.00	**5.68**	**866.35**	**5.68**
16.00	2.88	866.10	2.88
18.00	2.03	866.00	2.03
20.00	1.55	865.94	1.55
22.00	1.26	865.89	1.26
24.00	1.15	865.87	1.15
26.00	0.33	865.70	0.33
28.00	0.11	865.61	0.11
30.00	0.05	865.58	0.05
32.00	0.03	865.56	0.03
34.00	0.02	865.54	0.02
36.00	0.01	865.53	0.01
38.00	0.00	865.52	0.00
40.00	0.00	865.51	0.00
42.00	0.00	865.50	0.00
44.00	0.00	865.50	0.00
46.00	0.00	865.50	0.00
48.00	0.00	865.50	0.00
50.00	0.00	865.50	0.00
52.00	0.00	865.50	0.00
54.00	0.00	865.50	0.00
56.00	0.00	865.50	0.00
58.00	0.00	865.50	0.00
60.00	0.00	865.50	0.00
62.00	0.00	865.50	0.00
64.00	0.00	865.50	0.00
66.00	0.00	865.50	0.00
68.00	0.00	865.50	0.00
70.00	0.00	865.50	0.00
72.00	0.00	865.50	0.00
74.00	0.00	865.50	0.00
76.00	0.00	865.50	0.00
78.00	0.00	865.50	0.00
80.00	0.00	865.50	0.00
82.00	0.00	865.50	0.00
84.00	0.00	865.50	0.00
86.00	0.00	865.50	0.00
88.00	0.00	865.50	0.00
90.00	0.00	865.50	0.00
92.00	0.00	865.50	0.00
94.00	0.00	865.50	0.00
96.00	0.00	865.50	0.00
98.00	0.00	865.50	0.00
100.00	0.00	865.50	0.00
102.00	0.00	865.50	0.00
104.00	0.00	865.50	0.00
106.00	0.00	865.50	0.00
108.00	0.00	865.50	0.00
110.00	0.00	865.50	0.00
112.00	0.00	865.50	0.00
114.00	0.00	865.50	0.00
116.00	0.00	865.50	0.00
118.00	0.00	865.50	0.00
120.00	0.00	865.50	0.00
122.00	0.00	865.50	0.00
124.00	0.00	865.50	0.00
126.00	0.00	865.50	0.00
128.00	0.00	865.50	0.00
130.00	0.00	865.50	0.00
132.00	0.00	865.50	0.00
134.00	0.00	865.50	0.00
136.00	0.00	865.50	0.00
138.00	0.00	865.50	0.00
140.00	0.00	865.50	0.00
142.00	0.00	865.50	0.00
144.00	0.00	865.50	0.00
146.00	0.00	865.50	0.00
148.00	0.00	865.50	0.00
150.00	0.00	865.50	0.00
152.00	0.00	865.50	0.00
154.00	0.00	865.50	0.00
156.00	0.00	865.50	0.00
158.00	0.00	865.50	0.00
160.00	0.00	865.50	0.00

Summary for Pond 3P: Culvert 6

Inflow Area = 1.760 ac, 0.00% Impervious, Inflow Depth = 4.17" for 25 YR event
Inflow = 11.84 cfs @ 11.97 hrs, Volume= 0.611 af
Outflow = 11.84 cfs @ 11.97 hrs, Volume= 0.611 af, Atten= 0%, Lag= 0.0 min
Primary = 11.84 cfs @ 11.97 hrs, Volume= 0.611 af

Routing by Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Peak Elev= 715.62' @ 11.97 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	714.00'	**24.0" Round Culvert** L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 714.00' / 705.00' S= 0.0857 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=11.82 cfs @ 11.97 hrs HW=715.62' (Free Discharge)
1=Culvert (Inlet Controls 11.82 cfs @ 4.33 fps)

Hydrograph for Pond 3P: Culvert 6

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	714.00	0.00
2.00	0.00	714.00	0.00
4.00	0.02	714.06	0.02
6.00	0.07	714.10	0.07
8.00	0.12	714.14	0.12
10.00	**0.25**	**714.20**	**0.25**
12.00	**10.83**	**715.53**	**10.83**
14.00	0.33	714.23	0.33
16.00	0.20	714.18	0.20
18.00	0.16	714.16	0.16
20.00	0.11	714.13	0.11
22.00	0.10	714.13	0.10
24.00	0.10	714.12	0.10
26.00	0.00	714.00	0.00
28.00	0.00	714.00	0.00
30.00	0.00	714.00	0.00
32.00	0.00	714.00	0.00
34.00	0.00	714.00	0.00
36.00	0.00	714.00	0.00
38.00	0.00	714.00	0.00
40.00	0.00	714.00	0.00
42.00	0.00	714.00	0.00
44.00	0.00	714.00	0.00
46.00	0.00	714.00	0.00
48.00	0.00	714.00	0.00
50.00	0.00	714.00	0.00
52.00	0.00	714.00	0.00
54.00	0.00	714.00	0.00
56.00	0.00	714.00	0.00
58.00	0.00	714.00	0.00
60.00	0.00	714.00	0.00
62.00	0.00	714.00	0.00
64.00	0.00	714.00	0.00
66.00	0.00	714.00	0.00
68.00	0.00	714.00	0.00
70.00	0.00	714.00	0.00
72.00	0.00	714.00	0.00
74.00	0.00	714.00	0.00
76.00	0.00	714.00	0.00
78.00	0.00	714.00	0.00
80.00	0.00	714.00	0.00
82.00	0.00	714.00	0.00
84.00	0.00	714.00	0.00
86.00	0.00	714.00	0.00
88.00	0.00	714.00	0.00
90.00	0.00	714.00	0.00
92.00	0.00	714.00	0.00
94.00	0.00	714.00	0.00
96.00	0.00	714.00	0.00
98.00	0.00	714.00	0.00
100.00	0.00	714.00	0.00
102.00	0.00	714.00	0.00
104.00	0.00	714.00	0.00
106.00	0.00	714.00	0.00
108.00	0.00	714.00	0.00
110.00	0.00	714.00	0.00
112.00	0.00	714.00	0.00
114.00	0.00	714.00	0.00
116.00	0.00	714.00	0.00
118.00	0.00	714.00	0.00
120.00	0.00	714.00	0.00
122.00	0.00	714.00	0.00
124.00	0.00	714.00	0.00
126.00	0.00	714.00	0.00
128.00	0.00	714.00	0.00
130.00	0.00	714.00	0.00
132.00	0.00	714.00	0.00
134.00	0.00	714.00	0.00
136.00	0.00	714.00	0.00
138.00	0.00	714.00	0.00
140.00	0.00	714.00	0.00
142.00	0.00	714.00	0.00
144.00	0.00	714.00	0.00
146.00	0.00	714.00	0.00
148.00	0.00	714.00	0.00
150.00	0.00	714.00	0.00
152.00	0.00	714.00	0.00
154.00	0.00	714.00	0.00
156.00	0.00	714.00	0.00
158.00	0.00	714.00	0.00
160.00	0.00	714.00	0.00

Summary for Pond 4P: Downchute C Inlet

Inflow Area = 11.980 ac, 0.00% Impervious, Inflow Depth = 3.28" for 25 YR event
Inflow = 63.06 cfs @ 11.98 hrs, Volume= 3.272 af
Outflow = 63.06 cfs @ 11.98 hrs, Volume= 3.272 af, Atten= 0%, Lag= 0.0 min
Primary = 63.06 cfs @ 11.98 hrs, Volume= 3.272 af

Routing by Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 867.73' @ 11.98 hrs Surf.Area= 0.000 ac Storage= 0.001 af

Plug-Flow detention time= 0.2 min calculated for 3.272 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (811.1 - 811.0)

Volume	Invert	Avail.Storage	Storage Description
#1	864.00'	0.002 af	**4.00'W x 4.00'L x 5.00'H Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	864.50'	**48.0" Round Culvert** L= 120.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 864.50' / 862.00' S= 0.0208 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 12.57 sf

Primary OutFlow Max=62.98 cfs @ 11.98 hrs HW=867.73' (Free Discharge)
1=Culvert (Barrel Controls 62.98 cfs @ 7.92 fps)

Hydrograph for Pond 4P: Downchute C Inlet

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	864.00	0.00
5.00	0.00	0.000	864.16	0.00
10.00	**0.85**	**0.000**	**864.84**	**0.85**
15.00	**1.68**	**0.000**	**864.97**	**1.68**
20.00	0.73	0.000	864.81	0.73
25.00	0.02	0.000	864.56	0.02
30.00	0.00	0.000	864.50	0.00
35.00	0.00	0.000	864.50	0.00
40.00	0.00	0.000	864.50	0.00
45.00	0.00	0.000	864.50	0.00
50.00	0.00	0.000	864.50	0.00
55.00	0.00	0.000	864.50	0.00
60.00	0.00	0.000	864.50	0.00
65.00	0.00	0.000	864.50	0.00
70.00	0.00	0.000	864.50	0.00
75.00	0.00	0.000	864.50	0.00
80.00	0.00	0.000	864.50	0.00
85.00	0.00	0.000	864.50	0.00
90.00	0.00	0.000	864.50	0.00
95.00	0.00	0.000	864.50	0.00
100.00	0.00	0.000	864.50	0.00
105.00	0.00	0.000	864.50	0.00
110.00	0.00	0.000	864.50	0.00
115.00	0.00	0.000	864.50	0.00
120.00	0.00	0.000	864.50	0.00
125.00	0.00	0.000	864.50	0.00
130.00	0.00	0.000	864.50	0.00
135.00	0.00	0.000	864.50	0.00
140.00	0.00	0.000	864.50	0.00
145.00	0.00	0.000	864.50	0.00
150.00	0.00	0.000	864.50	0.00
155.00	0.00	0.000	864.50	0.00
160.00	0.00	0.000	864.50	0.00

Summary for Pond 5P: Culvert 4

Inflow Area = 110.280 ac, 0.00% Impervious, Inflow Depth > 3.02" for 25 YR event
Inflow = 161.72 cfs @ 12.16 hrs, Volume= 27.772 af
Outflow = 161.68 cfs @ 12.16 hrs, Volume= 27.772 af, Atten= 0%, Lag= 0.0 min
Primary = 161.68 cfs @ 12.16 hrs, Volume= 27.772 af

Routing by Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Peak Elev= 693.51' @ 12.16 hrs Surf.Area= 50 sf Storage= 175 cf

Plug-Flow detention time= 0.1 min calculated for 27.772 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (1,141.8 - 1,141.7)

Volume	Invert	Avail.Storage	Storage Description
#1	689.50'	175 cf	**12.50'W x 4.00'L x 3.50'H Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	689.50'	**36.0" Round Culvert X 3.00** L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 689.50' / 687.00' S= 0.0313 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=161.66 cfs @ 12.16 hrs HW=693.51' (Free Discharge)
1=Culvert (Inlet Controls 161.66 cfs @ 7.62 fps)

Hydrograph for Pond 5P: Culvert 4

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	689.50	0.00
5.00	0.41	7	689.63	0.41
10.00	**2.83**	**18**	**689.85**	**2.83**
15.00	**20.28**	**49**	**690.48**	**20.29**
20.00	13.80	40	690.30	13.80
25.00	5.56	25	690.00	5.56
30.00	2.38	16	689.82	2.38
35.00	1.23	12	689.73	1.23
40.00	0.73	9	689.68	0.74
45.00	0.48	7	689.64	0.48
50.00	0.34	6	689.62	0.34
55.00	0.24	5	689.60	0.24
60.00	0.19	4	689.59	0.19
65.00	0.16	4	689.58	0.16
70.00	0.13	4	689.57	0.13
75.00	0.10	3	689.57	0.10
80.00	0.08	3	689.56	0.08
85.00	0.07	3	689.55	0.07
90.00	0.06	2	689.55	0.06
95.00	0.05	2	689.54	0.05
100.00	0.05	2	689.54	0.05
105.00	0.05	2	689.54	0.05
110.00	0.04	2	689.54	0.04
115.00	0.04	2	689.54	0.04
120.00	0.04	2	689.54	0.04
125.00	0.04	2	689.54	0.04
130.00	0.03	2	689.54	0.03
135.00	0.03	2	689.54	0.03
140.00	0.03	2	689.54	0.03
145.00	0.03	2	689.53	0.03
150.00	0.03	2	689.53	0.03
155.00	0.02	1	689.53	0.02
160.00	0.02	1	689.53	0.02

Summary for Pond 8P: Culvert 12

Inflow Area = 4.590 ac, 0.00% Impervious, Inflow Depth = 3.42" for 25 YR event
Inflow = 25.35 cfs @ 12.01 hrs, Volume= 1.310 af
Outflow = 25.34 cfs @ 12.01 hrs, Volume= 1.310 af, Atten= 0%, Lag= 0.0 min
Primary = 25.34 cfs @ 12.01 hrs, Volume= 1.310 af

Routing by Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 699.81' @ 12.01 hrs Surf.Area= 9 sf Storage= 34 cf

Plug-Flow detention time= 0.1 min calculated for 1.310 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (805.7 - 805.7)

Volume	Invert	Avail.Storage	Storage Description
#1	696.00'	36 cf	**3.00'W x 3.00'L x 4.00'H Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	696.00'	**24.0" Round Culvert** L= 137.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 696.00' / 673.00' S= 0.1679 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=25.32 cfs @ 12.01 hrs HW=699.80' (Free Discharge)
1=Culvert (Inlet Controls 25.32 cfs @ 8.06 fps)

Hydrograph for Pond 8P: Culvert 12

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	696.00	0.00
5.00	0.02	0	696.05	0.02
10.00	**0.37**	**2**	**696.24**	**0.37**
15.00	**0.65**	**3**	**696.33**	**0.65**
20.00	0.29	2	696.21	0.29
25.00	0.00	0	696.01	0.00
30.00	0.00	0	696.00	0.00
35.00	0.00	0	696.00	0.00
40.00	0.00	0	696.00	0.00
45.00	0.00	0	696.00	0.00
50.00	0.00	0	696.00	0.00
55.00	0.00	0	696.00	0.00
60.00	0.00	0	696.00	0.00
65.00	0.00	0	696.00	0.00
70.00	0.00	0	696.00	0.00
75.00	0.00	0	696.00	0.00
80.00	0.00	0	696.00	0.00
85.00	0.00	0	696.00	0.00
90.00	0.00	0	696.00	0.00
95.00	0.00	0	696.00	0.00
100.00	0.00	0	696.00	0.00
105.00	0.00	0	696.00	0.00
110.00	0.00	0	696.00	0.00
115.00	0.00	0	696.00	0.00
120.00	0.00	0	696.00	0.00
125.00	0.00	0	696.00	0.00
130.00	0.00	0	696.00	0.00
135.00	0.00	0	696.00	0.00
140.00	0.00	0	696.00	0.00
145.00	0.00	0	696.00	0.00
150.00	0.00	0	696.00	0.00
155.00	0.00	0	696.00	0.00
160.00	0.00	0	696.00	0.00

Summary for Pond FB-C: Pond C Forebay

Inflow Area = 38.540 ac, 0.00% Impervious, Inflow Depth = 3.05" for 25 YR event
Inflow = 93.31 cfs @ 11.98 hrs, Volume= 9.796 af
Outflow = 79.18 cfs @ 12.03 hrs, Volume= 10.169 af, Atten= 15%, Lag= 2.9 min
Primary = 79.18 cfs @ 12.03 hrs, Volume= 10.169 af

Routing by Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 859.00' Surf.Area= 16,463 sf Storage= 15,614 cf
Peak Elev= 859.68' @ 12.03 hrs Surf.Area= 17,621 sf Storage= 27,242 cf (11,628 cf above start)

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	858.00'	206,682 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
858.00	14,765	0	0
860.00	18,160	32,925	32,925
862.00	21,799	39,959	72,884
864.00	25,683	47,482	120,366
866.00	29,812	55,495	175,861
867.00	31,830	30,821	206,682

Device	Routing	Invert	Outlet Devices
#1	Primary	858.00'	**Custom Weir/Orifice X 0.40, Cv= 2.62 (C= 3.28)**
			Head (feet) 0.00 9.00
			Width (feet) 25.00 61.00

Primary OutFlow Max=79.10 cfs @ 12.03 hrs HW=859.68' (Free Discharge)
↑—**1=Custom Weir/Orifice** (Weir Controls 79.10 cfs @ 1.66 fps)

Hydrograph for Pond FB-C: Pond C Forebay

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	15,614	859.00	34.85
5.00	0.00	0	858.00	0.00
10.00	**1.39**	**1,527**	**858.10**	**1.12**
15.00	**5.90**	**4,850**	**858.32**	**6.17**
20.00	2.52	2,727	858.18	2.60
25.00	0.71	1,317	858.09	0.88
30.00	0.05	92	858.01	0.06
35.00	0.01	20	858.00	0.01
40.00	0.00	4	858.00	0.00
45.00	0.00	1	858.00	0.00
50.00	0.00	0	858.00	0.00
55.00	0.00	0	858.00	0.00
60.00	0.00	0	858.00	0.00
65.00	0.00	0	858.00	0.00
70.00	0.00	0	858.00	0.00
75.00	0.00	0	858.00	0.00
80.00	0.00	0	858.00	0.00
85.00	0.00	0	858.00	0.00
90.00	0.00	0	858.00	0.00
95.00	0.00	0	858.00	0.00
100.00	0.00	0	858.00	0.00
105.00	0.00	0	858.00	0.00
110.00	0.00	0	858.00	0.00
115.00	0.00	0	858.00	0.00
120.00	0.00	0	858.00	0.00
125.00	0.00	0	858.00	0.00
130.00	0.00	0	858.00	0.00
135.00	0.00	0	858.00	0.00
140.00	0.00	0	858.00	0.00
145.00	0.00	0	858.00	0.00
150.00	0.00	0	858.00	0.00
155.00	0.00	0	858.00	0.00
160.00	0.00	0	858.00	0.00

Summary for Pond FB-G: Forebay G

Inflow Area = 152.660 ac, 0.00% Impervious, Inflow Depth = 3.09" for 25 YR event
Inflow = 306.54 cfs @ 12.06 hrs, Volume= 39.373 af
Outflow = 267.45 cfs @ 12.17 hrs, Volume= 39.372 af, Atten= 13%, Lag= 6.5 min
Primary = 267.45 cfs @ 12.17 hrs, Volume= 39.372 af

Routing by Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 666.00' Surf.Area= 8,882 sf Storage= 30,306 cf
Peak Elev= 671.88' @ 12.17 hrs Surf.Area= 19,508 sf Storage= 107,606 cf (77,300 cf above start)

Plug-Flow detention time= 87.6 min calculated for 38.674 af (98% of inflow)
Center-of-Mass det. time= 8.4 min (1,052.1 - 1,043.7)

Volume	Invert	Avail.Storage	Storage Description
#1	660.00'	691,674 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
660.00	1,220	0	0
670.00	13,990	76,050	76,050
680.00	43,277	286,335	362,385
681.00	45,100	44,189	406,574
686.00	68,940	285,100	691,674

Device	Routing	Invert	Outlet Devices
#1	Primary	666.00'	**42.0" Round Culvert X 3.00** L= 206.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 666.00' / 665.00' S= 0.0049 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 9.62 sf

Primary OutFlow Max=267.46 cfs @ 12.17 hrs HW=671.88' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 267.46 cfs @ 9.27 fps)

Hydrograph for Pond FB-G: Forebay G

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	30,306	666.00	0.00
5.00	0.75	31,392	666.12	0.57
10.00	**5.85**	**35,007**	**666.51**	**5.47**
15.00	**26.19**	**41,326**	**667.15**	**26.38**
20.00	16.40	38,741	666.89	16.55
25.00	5.60	35,113	666.52	5.75
30.00	2.38	33,254	666.32	2.44
35.00	1.23	32,543	666.25	1.25
40.00	0.74	31,778	666.16	0.77
45.00	0.48	31,254	666.10	0.50
50.00	0.34	30,972	666.07	0.35
55.00	0.24	30,772	666.05	0.25
60.00	0.19	30,679	666.04	0.20
65.00	0.16	30,609	666.03	0.16
70.00	0.13	30,552	666.03	0.13
75.00	0.10	30,506	666.02	0.11
80.00	0.08	30,469	666.02	0.09
85.00	0.07	30,439	666.01	0.07
90.00	0.06	30,414	666.01	0.06
95.00	0.05	30,405	666.01	0.05
100.00	0.05	30,399	666.01	0.05
105.00	0.05	30,393	666.01	0.05
110.00	0.04	30,388	666.01	0.04
115.00	0.04	30,383	666.01	0.04
120.00	0.04	30,378	666.01	0.04
125.00	0.04	30,374	666.01	0.04
130.00	0.03	30,370	666.01	0.03
135.00	0.03	30,366	666.01	0.03
140.00	0.03	30,362	666.01	0.03
145.00	0.03	30,359	666.01	0.03
150.00	0.03	30,355	666.01	0.03
155.00	0.02	30,352	666.01	0.02
160.00	0.02	30,350	666.00	0.02

Summary for Pond G: Pond G

Inflow Area = 157.250 ac, 0.00% Impervious, Inflow Depth = 3.10" for 25 YR event
Inflow = 275.12 cfs @ 12.15 hrs, Volume= 40.682 af
Outflow = 207.77 cfs @ 12.36 hrs, Volume= 40.970 af, Atten= 24%, Lag= 12.6 min
Primary = 207.77 cfs @ 12.36 hrs, Volume= 40.970 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 667.12' Surf.Area= 30,801 sf Storage= 73,912 cf
Peak Elev= 677.06' @ 12.36 hrs Surf.Area= 52,924 sf Storage= 486,644 cf (412,732 cf above start)

Plug-Flow detention time= 970.8 min calculated for 39.273 af (97% of inflow)
Center-of-Mass det. time= 820.4 min (1,864.6 - 1,044.2)

Volume	Invert	Avail.Storage	Storage Description
#1	664.50'	652,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
664.50	25,620	0	0
670.00	36,497	170,822	170,822
680.00	59,752	481,245	652,067

Device	Routing	Invert	Outlet Devices
#1	Primary	663.00'	**48.0" Round Culvert** L= 184.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 663.00' / 656.88' S= 0.0332 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Device 1	675.15'	**72.0" x 72.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	677.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.50 Width (feet) 15.00 25.00
#4	Device 1	666.70'	**0.600 cfs Constant Flow/Skimmer X 2.00** Phase-In= 0.42'

Primary OutFlow Max=208.87 cfs @ 12.36 hrs HW=677.06' (Free Discharge)
└─**1=Culvert** (Passes 208.87 cfs of 210.15 cfs potential flow)
  ├─**2=Orifice/Grate** (Weir Controls 207.67 cfs @ 4.52 fps)
  └─**4=Constant Flow/Skimmer** (Constant Controls 1.20 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=667.12' (Free Discharge)
└─**3=Custom Weir/Orifice** (Controls 0.00 cfs)

Hydrograph for Pond G: Pond G

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	73,912	667.12	1.20	1.20	**0.00**
5.00	0.59	65,194	666.83	0.38	0.38	0.00
10.00	**5.84**	**89,996**	**667.63**	**1.20**	**1.20**	0.00
15.00	**27.04**	**413,254**	**675.63**	**27.61**	**27.61**	0.00
20.00	16.84	406,527	675.50	17.24	17.24	0.00
25.00	5.76	397,637	675.31	6.79	6.79	0.00
30.00	2.44	392,558	675.21	2.57	2.57	0.00
35.00	1.25	390,163	675.16	1.39	1.39	0.00
40.00	0.77	386,002	675.08	1.20	1.20	0.00
45.00	0.50	375,548	674.86	1.20	1.20	0.00
50.00	0.35	361,496	674.56	1.20	1.20	0.00
55.00	0.25	345,195	674.21	1.20	1.20	0.00
60.00	0.20	327,525	673.83	1.20	1.20	0.00
65.00	0.16	309,114	673.42	1.20	1.20	0.00
70.00	0.13	290,104	672.98	1.20	1.20	0.00
75.00	0.11	270,608	672.53	1.20	1.20	0.00
80.00	0.09	250,717	672.05	1.20	1.20	0.00
85.00	0.07	230,507	671.56	1.20	1.20	0.00
90.00	0.06	210,043	671.04	1.20	1.20	0.00
95.00	0.05	189,411	670.50	1.20	1.20	0.00
100.00	0.05	168,716	669.94	1.20	1.20	0.00
105.00	0.05	147,965	669.36	1.20	1.20	0.00
110.00	0.04	127,163	668.76	1.20	1.20	0.00
115.00	0.04	106,312	668.14	1.20	1.20	0.00
120.00	0.04	85,416	667.49	1.20	1.20	0.00
125.00	0.04	67,293	666.90	0.58	0.58	0.00
130.00	0.03	62,558	666.75	0.13	0.13	0.00
135.00	0.03	61,682	666.72	0.05	0.05	0.00
140.00	0.03	61,506	666.71	0.03	0.03	0.00
145.00	0.03	61,459	666.71	0.03	0.03	0.00
150.00	0.03	61,435	666.71	0.03	0.03	0.00
155.00	0.02	61,417	666.71	0.03	0.03	0.00
160.00	0.02	61,400	666.71	0.02	0.02	0.00

Summary for Pond P-C: Pond C

Inflow Area = 61.800 ac, 0.00% Impervious, Inflow Depth = 2.99" for 25 YR event
Inflow = 181.29 cfs @ 12.00 hrs, Volume= 15.375 af
Outflow = 13.75 cfs @ 13.88 hrs, Volume= 15.218 af, Atten= 92%, Lag= 113.1 min
Primary = 13.75 cfs @ 13.88 hrs, Volume= 15.218 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 859.00' Surf.Area= 155,517 sf Storage= 711,694 cf
Peak Elev= 861.29' @ 13.88 hrs Surf.Area= 167,984 sf Storage= 1,082,383 cf (370,689 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 563.6 min (1,391.7 - 828.1)

Volume	Invert	Avail.Storage	Storage Description
#1	854.00'	1,557,643 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
854.00	129,407	0	0
856.00	139,654	269,061	269,061
858.00	150,147	289,801	558,862
860.00	160,886	311,033	869,895
862.00	171,871	332,757	1,202,652
864.00	183,120	354,991	1,557,643

Device	Routing	Invert	Outlet Devices
#1	Primary	859.00'	**24.0" Round Culvert** L= 252.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 859.00' / 857.13' S= 0.0074 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf
#2	Device 1	859.00'	**24.0" W x 6.0" H Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	861.50'	**27.5" x 27.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	862.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.50 Width (feet) 33.00 42.00

Primary OutFlow Max=13.75 cfs @ 13.88 hrs HW=861.29' (Free Discharge)
└**1=Culvert** (Passes 13.75 cfs of 17.20 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 13.75 cfs @ 6.88 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=859.00' (Free Discharge)
└**4=Custom Weir/Orifice** (Controls 0.00 cfs)

Hydrograph for Pond P-C: Pond C

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	34.85	711,903	859.00	0.00	0.00	**0.00**
5.00	0.00	726,602	859.10	0.05	0.05	0.00
10.00	**1.97**	**732,637**	**859.13**	**0.12**	**0.12**	0.00
15.00	**9.07**	**1,071,272**	**861.23**	**13.53**	**13.53**	0.00
20.00	3.89	954,652	860.52	10.68	10.68	0.00
25.00	0.88	869,492	860.00	5.33	5.33	0.00
30.00	0.06	810,487	859.63	2.29	2.29	0.00
35.00	0.01	781,295	859.44	1.19	1.19	0.00
40.00	0.00	764,867	859.34	0.71	0.71	0.00
45.00	0.00	754,580	859.27	0.47	0.47	0.00
50.00	0.00	747,512	859.23	0.33	0.33	0.00
55.00	0.00	742,559	859.20	0.23	0.23	0.00
60.00	0.00	738,794	859.17	0.19	0.19	0.00
65.00	0.00	735,739	859.15	0.15	0.15	0.00
70.00	0.00	733,260	859.14	0.12	0.12	0.00
75.00	0.00	731,248	859.13	0.10	0.10	0.00
80.00	0.00	729,615	859.11	0.08	0.08	0.00
85.00	0.00	728,290	859.11	0.07	0.07	0.00
90.00	0.00	727,214	859.10	0.05	0.05	0.00
95.00	0.00	726,269	859.09	0.05	0.05	0.00
100.00	0.00	725,381	859.09	0.05	0.05	0.00
105.00	0.00	724,547	859.08	0.04	0.04	0.00
110.00	0.00	723,765	859.08	0.04	0.04	0.00
115.00	0.00	723,029	859.07	0.04	0.04	0.00
120.00	0.00	722,339	859.07	0.04	0.04	0.00
125.00	0.00	721,690	859.06	0.03	0.03	0.00
130.00	0.00	721,082	859.06	0.03	0.03	0.00
135.00	0.00	720,510	859.06	0.03	0.03	0.00
140.00	0.00	719,973	859.05	0.03	0.03	0.00
145.00	0.00	719,469	859.05	0.03	0.03	0.00
150.00	0.00	718,995	859.05	0.03	0.03	0.00
155.00	0.00	718,550	859.04	0.02	0.02	0.00
160.00	0.00	718,133	859.04	0.02	0.02	0.00

Summary for Pond ST-C: Sediment Trap C

Inflow Area = 21.780 ac, 0.00% Impervious, Inflow Depth = 3.01" for 25 YR event
Inflow = 64.27 cfs @ 12.21 hrs, Volume= 5.466 af
Outflow = 50.58 cfs @ 12.35 hrs, Volume= 5.466 af, Atten= 21%, Lag= 8.0 min
Primary = 50.58 cfs @ 12.35 hrs, Volume= 5.466 af

Routing by Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 880.47' @ 12.35 hrs Surf.Area= 20,509 sf Storage= 44,654 cf

Plug-Flow detention time= 37.9 min calculated for 5.465 af (100% of inflow)
Center-of-Mass det. time= 38.0 min (877.9 - 839.9)

Volume	Invert	Avail.Storage	Storage Description
#1	878.00'	130,540 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
878.00	15,693	0	0
880.00	19,513	35,206	35,206
882.00	23,733	43,246	78,452
884.00	28,355	52,088	130,540

Device	Routing	Invert	Outlet Devices
#1	Primary	878.00'	**Custom Weir/Orifice X 0.40, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 6.00 Width (feet) 4.00 40.00

Primary OutFlow Max=50.57 cfs @ 12.35 hrs HW=880.47' (Free Discharge)
↑**1=Custom Weir/Orifice** (Weir Controls 50.57 cfs @ 1.79 fps)

Hydrograph for Pond ST-C: Sediment Trap C

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	878.00	0.00
5.00	0.00	0	878.00	0.00
10.00	**0.90**	**2,521**	**878.16**	**0.37**
15.00	**3.13**	**10,278**	**878.63**	**3.62**
20.00	1.37	6,135	878.38	1.53
25.00	0.16	3,759	878.24	0.69
30.00	0.00	615	878.04	0.05
35.00	0.00	138	878.01	0.01
40.00	0.00	30	878.00	0.00
45.00	0.00	7	878.00	0.00
50.00	0.00	1	878.00	0.00
55.00	0.00	0	878.00	0.00
60.00	0.00	0	878.00	0.00
65.00	0.00	0	878.00	0.00
70.00	0.00	0	878.00	0.00
75.00	0.00	0	878.00	0.00
80.00	0.00	0	878.00	0.00
85.00	0.00	0	878.00	0.00
90.00	0.00	0	878.00	0.00
95.00	0.00	0	878.00	0.00
100.00	0.00	0	878.00	0.00
105.00	0.00	0	878.00	0.00
110.00	0.00	0	878.00	0.00
115.00	0.00	0	878.00	0.00
120.00	0.00	0	878.00	0.00
125.00	0.00	0	878.00	0.00
130.00	0.00	0	878.00	0.00
135.00	0.00	0	878.00	0.00
140.00	0.00	0	878.00	0.00
145.00	0.00	0	878.00	0.00
150.00	0.00	0	878.00	0.00
155.00	0.00	0	878.00	0.00
160.00	0.00	0	878.00	0.00

ATTACHMENT 2

NORTH AMERICAN GREEN OUTPUT

Tensar International Corporation
5401 St. Wendel-Cynthiana Road
Poseyville, Indiana 47633
Tel. 800.772.2040
Fax 812.867.0247
www.nagreen.com

Erosion Control Materials Design Software
Version 5.0

Project Name: CHLF
Project Number: 87129
Channel Name: Channel 1D

Discharge	18.58
Peak Flow Period	23
Channel Slope	0.3379
Channel Bottom Width	4
Left Side Slope	1.75
Right Side Slope	1.75
Low Flow Liner	
Retardance Class	C
Vegtation Type	Bunch Type
Vegetation Density	Good 75-95%
Soil Type	Clay Loam

P550 - Class C - Bunch Type - Good 75-95%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
P550 Unvegetated	Straight	18.58 cfs	10.07 ft/s	0.39 ft	0.041	3.25 lbs/ft2	8.3 lbs/ft2	0.39	UNSTABLE	E
P550 Reinforced Vegetation	Straight	18.58 cfs	8.65 ft/s	0.45 ft	0.051	12 lbs/ft2	9.47 lbs/ft2	1.27	STABLE	E
Underlying Substrate	Straight	18.58 cfs	8.65 ft/s	0.45 ft	--	3.25 lbs/ft2	3.003 lbs/ft2	1.08	STABLE	--

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Project Name: CHLF
Project Number: 87129
Channel Name: Channel 7

Discharge	18.13
Peak Flow Period	24
Channel Slope	0.2829
Channel Bottom Width	5
Left Side Slope	2.5
Right Side Slope	2.5
Low Flow Liner	
Retardance Class	C
Vegtation Type	Bunch Type
Vegetation Density	Good 75-95%
Soil Type	Clay Loam

P300 - Class C - Bunch Type - Good 75-95%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
P300 Unvegetated	Straight	18.13 cfs	9.83 ft/s	0.32 ft	0.034	2 lbs/ft2	5.62 lbs/ft2	0.36	UNSTABLE	E
P300 Reinforced Vegetation	Straight	18.13 cfs	7.01 ft/s	0.43 ft	0.057	8 lbs/ft2	7.53 lbs/ft2	1.06	STABLE	E
Underlying Substrate	Straight	18.13 cfs	7.01 ft/s	0.43 ft	--	2 lbs/ft2	1.363 lbs/ft2	1.47	STABLE	--

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Project Name: CHLF
Project Number: 87129
Channel Name: Channel 8

Discharge	129.79
Peak Flow Period	24
Channel Slope	0.0462
Channel Bottom Width	5
Left Side Slope	4
Right Side Slope	4
Low Flow Liner	
Retardance Class	C
Vegtation Type	Bunch Type
Vegetation Density	Good 75-95%
Soil Type	Clay Loam

P300 - Class C - Bunch Type - Good 75-95%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
P300 Unvegetated	Straight	129.79 cfs	10.35 ft/s	1.25 ft	0.027	2 lbs/ft2	3.61 lbs/ft2	0.55	UNSTABLE	E
P300 Reinforced Vegetation	Straight	129.79 cfs	7.67 ft/s	1.52 ft	0.041	8 lbs/ft2	4.4 lbs/ft2	1.82	STABLE	E
Underlying Substrate	Straight	129.79 cfs	7.67 ft/s	1.52 ft	--	2 lbs/ft2	0.796 lbs/ft2	2.51	STABLE	--

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Project Name: CHLF
Project Number: 87129
Channel Name: Channel 9A

Discharge	64.68
Peak Flow Period	24
Channel Slope	0.0867
Channel Bottom Width	5
Left Side Slope	4
Right Side Slope	4
Low Flow Liner	
Retardance Class	C
Vegtation Type	Mix (Sod & Bunch)
Vegetation Density	Fair 50-75%
Soil Type	Clay Loam

P300 - Class C - Mix (Sod & Bunch) - Fair 50-75%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
P300 Unvegetated	Straight	64.68 cfs	9.69 ft/s	0.81 ft	0.031	2 lbs/ft2	4.38 lbs/ft2	0.46	UNSTABLE	E
P300 Reinforced Vegetation	Straight	64.68 cfs	7.4 ft/s	0.98 ft	0.045	8 lbs/ft2	5.3 lbs/ft2	1.51	STABLE	E
Underlying Substrate	Straight	64.68 cfs	7.4 ft/s	0.98 ft	--	2 lbs/ft2	0.904 lbs/ft2	2.21	STABLE	--

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Project Name: CHLF
Project Number: 87129
Channel Name: Channel 9B

Discharge	154.98
Peak Flow Period	24
Channel Slope	0.0765
Channel Bottom Width	5
Left Side Slope	4
Right Side Slope	4
Low Flow Liner	
Retardance Class	C
Vegtation Type	Mix (Sod & Bunch)
Vegetation Density	Fair 50-75%
Soil Type	Clay Loam

P300 - Class C - Mix (Sod & Bunch) - Fair 50-75%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
P300 Unvegetated	Straight	154.98 cfs	12.94 ft/s	1.22 ft	0.027	2 lbs/ft2	5.8 lbs/ft2	0.34	UNSTABLE	E
P300 Reinforced Vegetation	Straight	154.98 cfs	10.1 ft/s	1.43 ft	0.038	8 lbs/ft2	6.83 lbs/ft2	1.17	STABLE	E
Underlying Substrate	Straight	154.98 cfs	10.1 ft/s	1.43 ft	--	2 lbs/ft2	1.194 lbs/ft2	1.68	STABLE	--

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Project Name: CHLF
Project Number: 87129
Channel Name: Channel 9C

Discharge	162.78
Peak Flow Period	24
Channel Slope	0.0119
Channel Bottom Width	5
Left Side Slope	4
Right Side Slope	4
Low Flow Liner	
Retardance Class	C
Vegtation Type	Mix (Sod & Bunch)
Vegetation Density	Fair 50-75%
Soil Type	Clay Loam

P300 - Class C - Mix (Sod & Bunch) - Fair 50-75%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
P300 Unvegetated	Straight	162.78 cfs	7.69 ft/s	1.76 ft	0.022	2 lbs/ft2	1.31 lbs/ft2	1.53	STABLE	E
P300 Reinforced Vegetation	Straight	162.78 cfs	4.79 ft/s	2.36 ft	0.042	8 lbs/ft2	1.75 lbs/ft2	4.57	STABLE	E
Underlying Substrate	Straight	162.78 cfs	4.79 ft/s	2.36 ft	--	2 lbs/ft2	0.157 lbs/ft2	12.73	STABLE	--

Tensar International Corporation
5401 St. Wendel-Cynthiana Road
Poseyville, Indiana 47633
Tel. 800.772.2040
Fax 812.867.0247
www.nagreen.com

Erosion Control Materials Design Software
Version 5.0

Project Name: CHLF
Project Number: 87129
Channel Name: Channel 12

Discharge	11.66
Peak Flow Period	24
Channel Slope	0.2865
Channel Bottom Width	0
Left Side Slope	2
Right Side Slope	2
Low Flow Liner	
Retardance Class	C
Vegtation Type	Mix (Sod & Bunch)
Vegetation Density	Fair 50-75%
Soil Type	Clay Loam

W3000 - Class C - Mix (Sod & Bunch) - Fair 50-75%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
W3000 Reinforced Vegetation	Straight	11.66 cfs	7.99 ft/s	0.85 ft	0.052	16 lbs/ft2	15.27 lbs/ft2	1.05	STABLE	
Underlying Substrate	Straight	11.66 cfs	7.99 ft/s	0.85 ft	--	3.25 lbs/ft2	2.63 lbs/ft2	1.24	STABLE	--

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Version 5.0

Project Name: CHLF
Project Number: 87129
Channel Name: Channel 13A

Discharge	15.22
Peak Flow Period	24
Channel Slope	0.03
Channel Bottom Width	4
Left Side Slope	1
Right Side Slope	3
Low Flow Liner	
Retardance Class	C
Vegtation Type	Bunch Type
Vegetation Density	Good 75-95%
Soil Type	Clay Loam

Rock Riprap - Class C - Bunch Type - Good 75-95%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
Rock Riprap Unvegetated	Straight	15.22 cfs	4.09 ft/s	0.69 ft	0.041	2 lbs/ft2	1.29 lbs/ft2	1.55	STABLE	--

Tensar International Corporation
5401 St. Wendel-Cynthiana Road
Poseyville, Indiana 47633
Tel. 800.772.2040
Fax 812.867.0247
www.nagreen.com

Erosion Control Materials Design Software
Version 5.0

Project Name: CHLF
Project Number: 87129
Channel Name: Channel 13B

Discharge	14.07
Peak Flow Period	24
Channel Slope	0.0608
Channel Bottom Width	4
Left Side Slope	1
Right Side Slope	3
Low Flow Liner	
Retardance Class	C
Vegtation Type	Bunch Type
Vegetation Density	Good 75-95%
Soil Type	Clay Loam

Rock Riprap - Class C - Bunch Type - Good 75-95%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
Rock Riprap Unvegetated	Straight	14.07 cfs	6.01 ft/s	0.47 ft	0.032	2 lbs/ft2	1.8 lbs/ft2	1.11	STABLE	--

ATTACHMENT 3

DRAINAGE AREA FIGURE

NORTH

BM#3

DA8–1
11.5 AC

DA8–2
13.8 AC

DA9A
13.6 AC

DAC6
1.8 AC

DA9B
24.2 AC

DA9C
7.7 AC

DA1D
4.94 AC

DA12
1.8 AC

DA13A
2.8 AC

DA13B
2.7 AC

DAG1
7.6 AC

STORMWATER POND "G"
SCALE: 1" = 1,000'

BM#2

BM#1

DON
ER RIDGE ROAD
83–00–00–072

DAYTON POWER AND LIGHT COMPANY
1022 GINGER RIDGE ROAD
PARCEL: 183–00–00–079

MIAMI VALLEY LEASING
1175 GINGER RIDGE ROAD
PARCEL: 183–00–00–077

SCALE IN FEET

0 300 600

*HAND SIGNATURE ON FILE

P:\2014\144-189\-CADD\Dwg\CV02 Permit Drawings\144189-CV02-Pond G Drainage Area Map_Phase I.dwg{POND G DRAINAGE AREA} LS:(6/9/2016 - miapalucci) - LP: 6/9/2016 2:24 PM

Civil & Environmental Consultants, Inc.
4000 Triangle Lane · Suite 200 · Export, PA 15632
724-327-5200 · 800-899-3610
www.cecinc.com

DAYTON POWER AND LIGHT COMPANY
CARTER HOLLOW LANDFILL
SPRIGG TOWNSHIP
ADAMS COUNTY, OHIO

POND G DRAINAGE AREA MAP
PHASE I

DRAWN BY:	RBD	CHECKED BY:	JRH	APPROVED BY:	*TDM	FIGURE NO.:	1
DATE:	MAY 2016	DWG SCALE:	1"=300'	PROJECT NO:	144-189		

DP&L CARTER HOLLOW LANDFILL
PERMIT ALTERATION – 2016 DESIGN CHANGES
(C)(6)(k)&(l) POND G DESIGN AND CAPACITY CALCULATIONS
WORST CASE SCENARIO

CALCULATION BRIEF

CARTER HOLLOW LANDFILL
PERMIT MODIFICATION - 2016 DESIGN CHANGES
(C)(6)(k)&(l) POND G – WORST CASE SCENARIO DESIGN AND CAPACITY CALCULATIONS

OBJECTIVE:

This calculation involves the design of the channels, culverts, and catch basins that are being used to convey stormwater to and from Pond G during the development of the Phase I Disposal Area. Pond G was designed for the most critical stage of development, which assumes no other stormwater ponds have been established, and all areas disturbed by development of Phase I will contribute flow to Pond G. The stormwater controls were designed using the methodology and assumptions presented in the Stormwater Design Summary. The channels, culverts, and catch basins were designed for Phase I development conditions using the 25-year, 24-hour storm event. The sediment basin was designed using the 10-year, 25-year, and 100-year, 24-hour storm events as required by OAC 3745-30-07(C)(4). Pond G was also evaluated under final conditions to determine if the revised pond design will adequately handle the 10-year, 25-year, and 100-year, 24-hour storm events following final development of the facility.

DRAINAGE AREA:

The drainage areas to Pond G during Phase 1 development conditions were delineated using the existing conditions shown on the Permit Drawings. The following drainage areas were delineated and input in HydroCAD for Pond G:

Drainage Area ID	Drainage Area (acres)	Curve Number
DAG1	106.00	77
	60.00	94
DAG2	3.90	77
	5.00	94

Channels 11B and 11C also receive additional drainage area, as summarized below:

Drainage Area ID	Drainage Area (acres)	Curve Number
DA11B	46.22	77
DA11C	2.56	77

CHANNEL CALCULATIONS:

Table 1, which is attached to the Stormwater Design Summary, provides channel IDs, length, slope, inlet and outlet elevation, peak flow, flow depth, freeboard, maximum velocity, and channel linings for Channels 11B and 11C. These channels are described below.

- During development of Phase I, Channel 11B will convey drainage from an undisturbed area to Channel 11C.
- Channel 11C will convey flow from Channel 11B and Basin G to Culvert 14.

CULVERT CALCULATIONS:

Table 2, which is attached to the Stormwater Design Summary, provides the culvert ID, culvert cross-sectional dimension(s), length, slope, inlet and outlet elevation, peak flow, peak elevation, and culvert quantity.

Culvert 13 was sized to convey flow from Forebay G to Pond G. This culvert will consist of three 42-inch diameter corrugated HDPE pipes with a smooth interior, with a length of approximately 206 feet and slope of 0.5 percent. Culvert 11 will serve as the outlet barrel for Pond G. This culvert will consist of one 48-inch diameter corrugated reinforced concrete pipe, with a length of approximately 185 feet and slope of 2.8 percent. Culvert 14 will convey flow from Channel 11B beneath the Leachate Access Road. This culvert will consist of three 42-inch diameter corrugated high-density polyethylene (HDPE) pipes with a smooth interior, with a length of approximately 135 feet and slope of 13.3 percent.

CATCH BASIN CALCULATIONS:

Table 3, which is attached to the Stormwater Design Summary, provides the catch basin dimensions, invert elevations, and peak elevations.

Drop Inlet 4 collects drainage from Channel 11B and conveys the flow through Culvert 14. The inlet will measure 4 feet in length, 12.5 feet in width, with a depth of 4 feet.

POND G CALCULATIONS:

As stated in the Stormwater Design Summary, sediment ponds have been designed in accordance with the facility's National Pollutant Discharge Elimination System (NPDES) Permit, which requires the following for a basin:

Requirement 1: A sediment storage zone of 1,000 cubic feet per disturbed acre.

The stage storage curve was generated using the proposed embankment contours. The stage storage curve for Pond G was estimated from elevation 664.5 to elevation 680.0. The following stage storage curve was generated:

Elevation	Area (sf)	Cumulative Volume (cf)
664.5	25,620	0
666.0	28,626	41,227
668.0	32,581	102,434
670.0	36,497	170,822
672.0	41,195	249,290
674.0	45,846	336,330
676.0	50,497	432,672
678.0	55,148	538,316
680.0	59,752	652,067

The sediment storage zone was calculated assuming that 65.0 acres of the total 174.9 acre drainage area is disturbed. Approximately 65,000 cubic feet (cf) (1,000 cf *65.0 acres) of volume is required for permanent sediment storage. The required sediment storage is met at approximately elevation 666.85. However, the permanent pool was set at elevation 667.12 to provide additional storage capacity.

Requirement 2: A dewatering zone of 1,800 cubic feet for each acre contributing drainage. The maximum depth of the dewatering zone is 5 feet.

The dewatering zone has been determined as a permanent zone located above the sediment storage zone. Approximately 314,820 cf (174.9 acres * 1,800 cf) of volume is required for the dewatering zone. The dewatering zone extends from the top of the sediment storage zone (elevation 667.12) to elevation 675.15 (Crest of the principal spillway) and provides approximately 315,800 cf of dewatering zone. The depth of the dewatering zone is approximately 8.0 feet which is greater than the maximum 5-foot depth. However, it is noted that the pond has been designed to dewater using skimmers, which provide high sediment removal efficiency. Therefore, the increase in dewatering zone depth should not adversely affect the sediment removal capacity of the pond.

Requirement 3: Dewatering time of at least 2 days.

Skimmers routed through the principal spillway riser are proposed to dewater the sediment basin. Using two 6-inch skimmers in combination with a 72-inch by 72-inch vertical riser, the calculated dewatering time is 154 hours, or approximately 6.4 days.

Requirement 4: A flow length to width ratio of at least 2:1. A ratio of 4:1 is recommended.

The flow length from the discharge point of the Forebay culverts (Culvert 13) to the principal spillway riser is approximately 300 feet. At the principal spillway location, the width of Pond G is approximately 150 feet measured from the 25-year, 24-hour storm elevation. This results in a flow length to width ratio of 2:1.

Principal Spillway Design

Item	Value
Riser Type	72” x 72” Concrete
Riser Quantity	1
Skimmer Size	6”
Number of Skimmers	2
Dewatering Orifice Phase-In Elevation	667.12
Maximum Sediment Cleanout Elevation	666.70
Principal Spillway Riser Inlet Elevation	675.15
Sediment Basin Crest Elevation	680.00
Maximum Pool Elevation (25-year, 24-hour storm event)	677.40
Freeboard for 25-year, 24-hour storm event	2.60
Outlet Barrel Type	48” diameter RCP

The principal spillway can safely discharge the 25-year, 24-hour storm event while maintaining approximately 2.6 feet of freeboard which is greater than the required 2-foot freeboard.

Emergency Spillway Design

Item	Value
Spillway Type	Trapezoidal Riprap Outlet
Emergency Spillway Dimensions	25-ft bottom width, 2.5-ft depth, 2H:1V side slopes
Emergency Spillway Inlet Elevation	677.50
Sediment Basin Crest Elevation	680.00
Maximum Pool Elevation (100-year, 24-hour storm event)	678.53

The principal and emergency spillways can safely discharge the 100-year, 24-hour storm event while maintaining approximately 1.47 feet of freeboard which is greater than the required 1-foot freeboard.

Additionally, assuming the principal spillway becomes clogged, the emergency spillway can discharge the 100-year, 24-hour storm event while maintaining approximately 0.25 feet of freeboard.

The HydroCAD results for the worst case analysis of Pond G are included in Attachment 1 to this calculation brief. As stated previously, Pond G was also evaluated under final conditions. The results of this analysis are also included in Attachment 1.

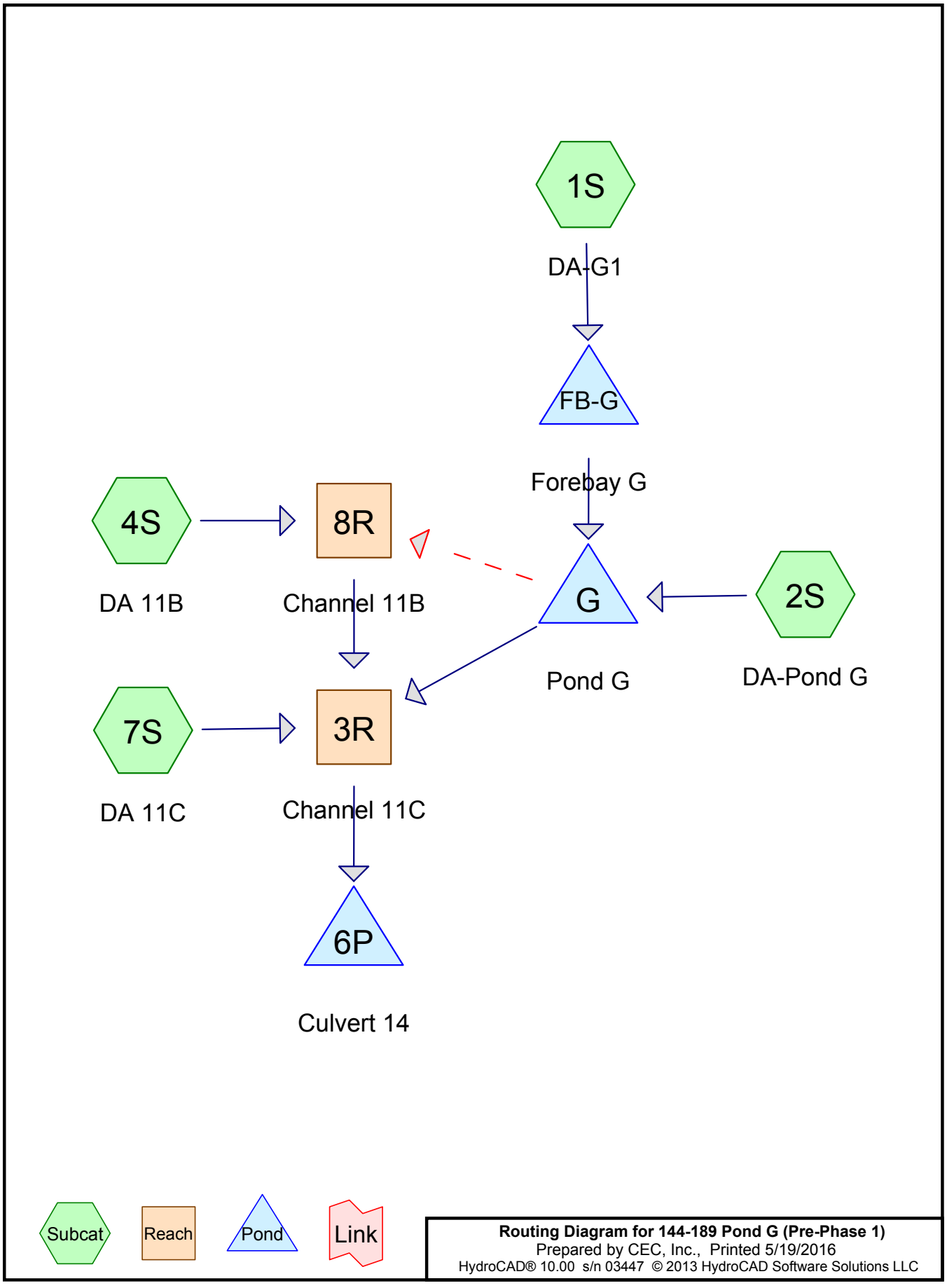
CONCLUSIONS;

The channels, culverts, and catch basins were designed using the 25-year 24-hour storm event. The sediment basin was designed using the 10-year, 25-year, and 100-year, 24-hour storm events as required in accordance the methodology and assumptions presented in the Stormwater Design Summary.

ATTACHMENT 1

HYDROCAD ANALYSIS OUTPUT
POND G – WORST CASE SCENARIO
POND G – FINAL CONDITIONS

POND G – WORST CASE SCENARIO
10-YEAR, 24-HOUR STORM EVENT



Routing Diagram for 144-189 Pond G (Pre-Phase 1)
Prepared by CEC, Inc., Printed 5/19/2016
HydroCAD® 10.00 s/n 03447 © 2013 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
109.900	77	Brush, Fair, HSG D (1S, 2S)
65.000	94	Newly graded area, HSG D (1S, 2S)
48.780	77	Woods, Good, HSG D (4S, 7S)
223.680	**82**	**TOTAL AREA**

Summary for Subcatchment 1S: DA-G1

Runoff = 282.22 cfs @ 12.38 hrs, Volume= 33.555 af, Depth= 2.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.16"

Area (ac)	CN	Description
60.000	94	Newly graded area, HSG D
106.000	77	Brush, Fair, HSG D
166.000	83	Weighted Average
166.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.0	4,500	0.0550	1.83		**Lag/CN Method,**

Hydrograph for Subcatchment 1S: DA-G1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.09	0.00	0.00
4.00	0.20	0.00	0.00
6.00	0.33	0.00	0.00
8.00	0.50	0.00	0.50
10.00	0.75	0.05	4.70
12.00	2.76	1.25	**87.78**
14.00	3.41	1.78	**30.99**
16.00	3.66	1.99	16.18
18.00	3.83	2.14	11.70
20.00	3.96	2.25	8.78
22.00	4.06	2.34	7.46
24.00	**4.16**	**2.43**	6.89
26.00	4.16	2.43	0.01
28.00	4.16	2.43	0.00
30.00	4.16	2.43	0.00
32.00	4.16	2.43	0.00
34.00	4.16	2.43	0.00
36.00	4.16	2.43	0.00
38.00	4.16	2.43	0.00
40.00	4.16	2.43	0.00
42.00	4.16	2.43	0.00
44.00	4.16	2.43	0.00
46.00	4.16	2.43	0.00
48.00	4.16	2.43	0.00
50.00	4.16	2.43	0.00
52.00	4.16	2.43	0.00
54.00	4.16	2.43	0.00
56.00	4.16	2.43	0.00
58.00	4.16	2.43	0.00
60.00	4.16	2.43	0.00
62.00	4.16	2.43	0.00
64.00	4.16	2.43	0.00
66.00	4.16	2.43	0.00
68.00	4.16	2.43	0.00
70.00	4.16	2.43	0.00
72.00	4.16	2.43	0.00
74.00	4.16	2.43	0.00
76.00	4.16	2.43	0.00
78.00	4.16	2.43	0.00
80.00	4.16	2.43	0.00
82.00	4.16	2.43	0.00
84.00	4.16	2.43	0.00
86.00	4.16	2.43	0.00
88.00	4.16	2.43	0.00
90.00	4.16	2.43	0.00
92.00	4.16	2.43	0.00
94.00	4.16	2.43	0.00
96.00	4.16	2.43	0.00
98.00	4.16	2.43	0.00
100.00	4.16	2.43	0.00
102.00	4.16	2.43	0.00
104.00	4.16	2.43	0.00
106.00	4.16	2.43	0.00
108.00	4.16	2.43	0.00
110.00	4.16	2.43	0.00
112.00	4.16	2.43	0.00
114.00	4.16	2.43	0.00
116.00	4.16	2.43	0.00
118.00	4.16	2.43	0.00
120.00	4.16	2.43	0.00
122.00	4.16	2.43	0.00
124.00	4.16	2.43	0.00
126.00	4.16	2.43	0.00
128.00	4.16	2.43	0.00
130.00	4.16	2.43	0.00
132.00	4.16	2.43	0.00
134.00	4.16	2.43	0.00
136.00	4.16	2.43	0.00
138.00	4.16	2.43	0.00
140.00	4.16	2.43	0.00
142.00	4.16	2.43	0.00
144.00	4.16	2.43	0.00
146.00	4.16	2.43	0.00
148.00	4.16	2.43	0.00
150.00	4.16	2.43	0.00
152.00	4.16	2.43	0.00
154.00	4.16	2.43	0.00
156.00	4.16	2.43	0.00
158.00	4.16	2.43	0.00
160.00	4.16	2.43	0.00

Summary for Subcatchment 2S: DA-Pond G

Runoff = 42.84 cfs @ 11.97 hrs, Volume= 2.065 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.16"

Area (ac)	CN	Description
5.000	94	Newly graded area, HSG D
3.900	77	Brush, Fair, HSG D
8.900	87	Weighted Average
8.900		100.00% Pervious Area

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

Hydrograph for Subcatchment 2S: DA-Pond G

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.09	0.00	0.00
4.00	0.20	0.00	0.00
6.00	0.33	0.00	0.02
8.00	0.50	0.02	0.17
10.00	0.75	0.11	**0.58**
12.00	2.76	1.53	**39.65**
14.00	3.41	2.10	1.30
16.00	3.66	2.33	0.80
18.00	3.83	2.48	0.62
20.00	3.96	2.60	0.45
22.00	4.06	2.70	0.41
24.00	**4.16**	**2.78**	0.38
26.00	4.16	2.78	0.00
28.00	4.16	2.78	0.00
30.00	4.16	2.78	0.00
32.00	4.16	2.78	0.00
34.00	4.16	2.78	0.00
36.00	4.16	2.78	0.00
38.00	4.16	2.78	0.00
40.00	4.16	2.78	0.00
42.00	4.16	2.78	0.00
44.00	4.16	2.78	0.00
46.00	4.16	2.78	0.00
48.00	4.16	2.78	0.00
50.00	4.16	2.78	0.00
52.00	4.16	2.78	0.00
54.00	4.16	2.78	0.00
56.00	4.16	2.78	0.00
58.00	4.16	2.78	0.00
60.00	4.16	2.78	0.00
62.00	4.16	2.78	0.00
64.00	4.16	2.78	0.00
66.00	4.16	2.78	0.00
68.00	4.16	2.78	0.00
70.00	4.16	2.78	0.00
72.00	4.16	2.78	0.00
74.00	4.16	2.78	0.00
76.00	4.16	2.78	0.00
78.00	4.16	2.78	0.00
80.00	4.16	2.78	0.00
82.00	4.16	2.78	0.00
84.00	4.16	2.78	0.00
86.00	4.16	2.78	0.00
88.00	4.16	2.78	0.00
90.00	4.16	2.78	0.00
92.00	4.16	2.78	0.00
94.00	4.16	2.78	0.00
96.00	4.16	2.78	0.00
98.00	4.16	2.78	0.00
100.00	4.16	2.78	0.00
102.00	4.16	2.78	0.00
104.00	4.16	2.78	0.00
106.00	4.16	2.78	0.00
108.00	4.16	2.78	0.00
110.00	4.16	2.78	0.00
112.00	4.16	2.78	0.00
114.00	4.16	2.78	0.00
116.00	4.16	2.78	0.00
118.00	4.16	2.78	0.00
120.00	4.16	2.78	0.00
122.00	4.16	2.78	0.00
124.00	4.16	2.78	0.00
126.00	4.16	2.78	0.00
128.00	4.16	2.78	0.00
130.00	4.16	2.78	0.00
132.00	4.16	2.78	0.00
134.00	4.16	2.78	0.00
136.00	4.16	2.78	0.00
138.00	4.16	2.78	0.00
140.00	4.16	2.78	0.00
142.00	4.16	2.78	0.00
144.00	4.16	2.78	0.00
146.00	4.16	2.78	0.00
148.00	4.16	2.78	0.00
150.00	4.16	2.78	0.00
152.00	4.16	2.78	0.00
154.00	4.16	2.78	0.00
156.00	4.16	2.78	0.00
158.00	4.16	2.78	0.00
160.00	4.16	2.78	0.00

Summary for Subcatchment 4S: DA 11B

Runoff = 87.02 cfs @ 12.19 hrs, Volume= 7.464 af, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.16"

Area (ac)	CN	Description
46.220	77	Woods, Good, HSG D
46.220		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.7	2,300	0.0960	1.55		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps

Hydrograph for Subcatchment 4S: DA 11B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.09	0.00	0.00
4.00	0.20	0.00	0.00
6.00	0.33	0.00	0.00
8.00	0.50	0.00	0.00
10.00	0.75	0.01	0.42
12.00	2.76	0.91	**45.62**
14.00	3.41	1.36	**6.34**
16.00	3.66	1.55	3.75
18.00	3.83	1.68	2.82
20.00	3.96	1.78	2.10
22.00	4.06	1.86	1.85
24.00	**4.16**	**1.94**	1.72
26.00	4.16	1.94	0.00
28.00	4.16	1.94	0.00
30.00	4.16	1.94	0.00
32.00	4.16	1.94	0.00
34.00	4.16	1.94	0.00
36.00	4.16	1.94	0.00
38.00	4.16	1.94	0.00
40.00	4.16	1.94	0.00
42.00	4.16	1.94	0.00
44.00	4.16	1.94	0.00
46.00	4.16	1.94	0.00
48.00	4.16	1.94	0.00
50.00	4.16	1.94	0.00
52.00	4.16	1.94	0.00
54.00	4.16	1.94	0.00
56.00	4.16	1.94	0.00
58.00	4.16	1.94	0.00
60.00	4.16	1.94	0.00
62.00	4.16	1.94	0.00
64.00	4.16	1.94	0.00
66.00	4.16	1.94	0.00
68.00	4.16	1.94	0.00
70.00	4.16	1.94	0.00
72.00	4.16	1.94	0.00
74.00	4.16	1.94	0.00
76.00	4.16	1.94	0.00
78.00	4.16	1.94	0.00
80.00	4.16	1.94	0.00
82.00	4.16	1.94	0.00
84.00	4.16	1.94	0.00
86.00	4.16	1.94	0.00
88.00	4.16	1.94	0.00
90.00	4.16	1.94	0.00
92.00	4.16	1.94	0.00
94.00	4.16	1.94	0.00
96.00	4.16	1.94	0.00
98.00	4.16	1.94	0.00
100.00	4.16	1.94	0.00
102.00	4.16	1.94	0.00
104.00	4.16	1.94	0.00
106.00	4.16	1.94	0.00
108.00	4.16	1.94	0.00
110.00	4.16	1.94	0.00
112.00	4.16	1.94	0.00
114.00	4.16	1.94	0.00
116.00	4.16	1.94	0.00
118.00	4.16	1.94	0.00
120.00	4.16	1.94	0.00
122.00	4.16	1.94	0.00
124.00	4.16	1.94	0.00
126.00	4.16	1.94	0.00
128.00	4.16	1.94	0.00
130.00	4.16	1.94	0.00
132.00	4.16	1.94	0.00
134.00	4.16	1.94	0.00
136.00	4.16	1.94	0.00
138.00	4.16	1.94	0.00
140.00	4.16	1.94	0.00
142.00	4.16	1.94	0.00
144.00	4.16	1.94	0.00
146.00	4.16	1.94	0.00
148.00	4.16	1.94	0.00
150.00	4.16	1.94	0.00
152.00	4.16	1.94	0.00
154.00	4.16	1.94	0.00
156.00	4.16	1.94	0.00
158.00	4.16	1.94	0.00
160.00	4.16	1.94	0.00

Summary for Subcatchment 7S: DA 11C

Runoff = 8.89 cfs @ 11.98 hrs, Volume= 0.413 af, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.16"

Area (ac)	CN	Description
2.560	77	Woods, Good, HSG D
2.560		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	600	0.4000	2.73		**Lag/CN Method,**
3.7	600	Total, Increased to minimum Tc = 6.0 min			

Hydrograph for Subcatchment 7S: DA 11C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.09	0.00	0.00
4.00	0.20	0.00	0.00
6.00	0.33	0.00	0.00
8.00	0.50	0.00	0.00
10.00	0.75	0.01	**0.04**
12.00	2.76	0.91	**8.38**
14.00	3.41	1.36	0.31
16.00	3.66	1.55	0.19
18.00	3.83	1.68	0.15
20.00	3.96	1.78	0.11
22.00	4.06	1.86	0.10
24.00	**4.16**	**1.94**	0.09
26.00	4.16	1.94	0.00
28.00	4.16	1.94	0.00
30.00	4.16	1.94	0.00
32.00	4.16	1.94	0.00
34.00	4.16	1.94	0.00
36.00	4.16	1.94	0.00
38.00	4.16	1.94	0.00
40.00	4.16	1.94	0.00
42.00	4.16	1.94	0.00
44.00	4.16	1.94	0.00
46.00	4.16	1.94	0.00
48.00	4.16	1.94	0.00
50.00	4.16	1.94	0.00
52.00	4.16	1.94	0.00
54.00	4.16	1.94	0.00
56.00	4.16	1.94	0.00
58.00	4.16	1.94	0.00
60.00	4.16	1.94	0.00
62.00	4.16	1.94	0.00
64.00	4.16	1.94	0.00
66.00	4.16	1.94	0.00
68.00	4.16	1.94	0.00
70.00	4.16	1.94	0.00
72.00	4.16	1.94	0.00
74.00	4.16	1.94	0.00
76.00	4.16	1.94	0.00
78.00	4.16	1.94	0.00
80.00	4.16	1.94	0.00
82.00	4.16	1.94	0.00
84.00	4.16	1.94	0.00
86.00	4.16	1.94	0.00
88.00	4.16	1.94	0.00
90.00	4.16	1.94	0.00
92.00	4.16	1.94	0.00
94.00	4.16	1.94	0.00
96.00	4.16	1.94	0.00
98.00	4.16	1.94	0.00
100.00	4.16	1.94	0.00
102.00	4.16	1.94	0.00
104.00	4.16	1.94	0.00
106.00	4.16	1.94	0.00
108.00	4.16	1.94	0.00
110.00	4.16	1.94	0.00
112.00	4.16	1.94	0.00
114.00	4.16	1.94	0.00
116.00	4.16	1.94	0.00
118.00	4.16	1.94	0.00
120.00	4.16	1.94	0.00
122.00	4.16	1.94	0.00
124.00	4.16	1.94	0.00
126.00	4.16	1.94	0.00
128.00	4.16	1.94	0.00
130.00	4.16	1.94	0.00
132.00	4.16	1.94	0.00
134.00	4.16	1.94	0.00
136.00	4.16	1.94	0.00
138.00	4.16	1.94	0.00
140.00	4.16	1.94	0.00
142.00	4.16	1.94	0.00
144.00	4.16	1.94	0.00
146.00	4.16	1.94	0.00
148.00	4.16	1.94	0.00
150.00	4.16	1.94	0.00
152.00	4.16	1.94	0.00
154.00	4.16	1.94	0.00
156.00	4.16	1.94	0.00
158.00	4.16	1.94	0.00
160.00	4.16	1.94	0.00

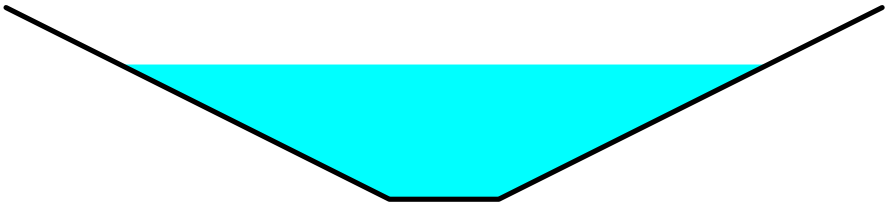
Summary for Reach 3R: Channel 11C

Inflow Area = 223.680 ac, 0.00% Impervious, Inflow Depth = 2.34" for 10-YR event
Inflow = 177.12 cfs @ 12.79 hrs, Volume= 43.640 af
Outflow = 177.10 cfs @ 12.80 hrs, Volume= 43.640 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 10.39 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.59 fps, Avg. Travel Time= 1.6 min

Peak Storage= 4,331 cf @ 12.80 hrs
Average Depth at Peak Storage= 2.46'
Bank-Full Depth= 3.50' Flow Area= 31.5 sf, Capacity= 401.89 cfs

2.00' x 3.50' deep channel, n= 0.034
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 254.0' Slope= 0.0394 '/'
Inlet Invert= 658.00', Outlet Invert= 648.00'



Hydrograph for Reach 3R: Channel 11C

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	1.20	20	658.04	0.08
5.00	0.22	39	658.07	0.22
10.00	**1.27**	**120**	**658.20**	**1.24**
15.00	**28.67**	**1,120**	**659.07**	**28.74**
20.00	12.05	594	658.69	12.07
25.00	3.64	256	658.37	3.70
30.00	1.20	118	658.19	1.20
35.00	1.20	118	658.19	1.20
40.00	1.20	118	658.19	1.20
45.00	1.20	118	658.19	1.20
50.00	1.20	118	658.19	1.20
55.00	1.20	118	658.19	1.20
60.00	1.20	118	658.19	1.20
65.00	1.20	118	658.19	1.20
70.00	1.20	118	658.19	1.20
75.00	1.20	118	658.19	1.20
80.00	1.20	118	658.19	1.20
85.00	1.20	118	658.19	1.20
90.00	1.20	118	658.19	1.20
95.00	1.20	118	658.19	1.20
100.00	1.20	118	658.19	1.20
105.00	1.20	118	658.19	1.20
110.00	1.20	118	658.19	1.20
115.00	1.20	118	658.19	1.20
120.00	1.20	118	658.19	1.20
125.00	1.20	118	658.19	1.20
130.00	1.20	118	658.19	1.20
135.00	0.73	85	658.15	0.73
140.00	0.20	37	658.07	0.21
145.00	0.06	16	658.03	0.06
150.00	0.02	4	658.01	0.02
155.00	0.00	1	658.00	0.00
160.00	0.00	0	658.00	0.00

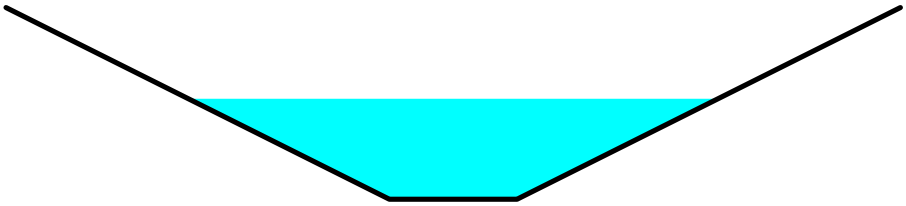
Summary for Reach 8R: Channel 11B

Inflow Area = 46.220 ac, 0.00% Impervious, Inflow Depth = 1.94" for 10-YR event
Inflow = 87.02 cfs @ 12.19 hrs, Volume= 7.464 af
Outflow = 86.91 cfs @ 12.19 hrs, Volume= 7.464 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 10.72 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 4.02 fps, Avg. Travel Time= 1.9 min

Peak Storage= 3,747 cf @ 12.19 hrs
Average Depth at Peak Storage= 1.57'
Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 371.46 cfs

2.00' x 3.00' deep channel, n= 0.036
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 462.0' Slope= 0.0779 '/'
Inlet Invert= 694.00', Outlet Invert= 658.00'



Hydrograph for Reach 8R: Channel 11B

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	694.00	0.00
5.00	0.00	0	694.00	0.00
10.00	**0.42**	**85**	**694.08**	**0.39**
15.00	**4.71**	**452**	**694.36**	**4.72**
20.00	2.10	259	694.23	2.11
25.00	0.02	15	694.02	0.04
30.00	0.00	0	694.00	0.00
35.00	0.00	0	694.00	0.00
40.00	0.00	0	694.00	0.00
45.00	0.00	0	694.00	0.00
50.00	0.00	0	694.00	0.00
55.00	0.00	0	694.00	0.00
60.00	0.00	0	694.00	0.00
65.00	0.00	0	694.00	0.00
70.00	0.00	0	694.00	0.00
75.00	0.00	0	694.00	0.00
80.00	0.00	0	694.00	0.00
85.00	0.00	0	694.00	0.00
90.00	0.00	0	694.00	0.00
95.00	0.00	0	694.00	0.00
100.00	0.00	0	694.00	0.00
105.00	0.00	0	694.00	0.00
110.00	0.00	0	694.00	0.00
115.00	0.00	0	694.00	0.00
120.00	0.00	0	694.00	0.00
125.00	0.00	0	694.00	0.00
130.00	0.00	0	694.00	0.00
135.00	0.00	0	694.00	0.00
140.00	0.00	0	694.00	0.00
145.00	0.00	0	694.00	0.00
150.00	0.00	0	694.00	0.00
155.00	0.00	0	694.00	0.00
160.00	0.00	0	694.00	0.00

Summary for Pond 6P: Culvert 14

Inflow Area = 223.680 ac, 0.00% Impervious, Inflow Depth = 2.34" for 10-YR event
Inflow = 177.10 cfs @ 12.80 hrs, Volume= 43.640 af
Outflow = 177.10 cfs @ 12.80 hrs, Volume= 43.640 af, Atten= 0%, Lag= 0.0 min
Primary = 177.10 cfs @ 12.80 hrs, Volume= 43.640 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 647.35' @ 12.80 hrs Surf.Area= 50 sf Storage= 167 cf

Plug-Flow detention time= 0.1 min calculated for 43.640 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (1,911.9 - 1,911.9)

Volume	Invert	Avail.Storage	Storage Description
#1	644.00'	200 cf	**12.50'W x 4.00'L x 4.00'H Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	644.00'	**42.0" Round Culvert X 3.00** L= 135.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 644.00' / 626.00' S= 0.1333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 9.62 sf

Primary OutFlow Max=177.10 cfs @ 12.80 hrs HW=647.35' (Free Discharge)
1=Culvert (Inlet Controls 177.10 cfs @ 6.23 fps)

Hydrograph for Pond 6P: Culvert 14

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.08	1	644.02	0.01
5.00	0.22	5	644.09	0.22
10.00	**1.24**	**11**	**644.22**	**1.23**
15.00	**28.74**	**56**	**645.12**	**28.74**
20.00	12.07	36	644.71	12.07
25.00	3.70	19	644.39	3.71
30.00	1.20	11	644.22	1.20
35.00	1.20	11	644.22	1.20
40.00	1.20	11	644.22	1.20
45.00	1.20	11	644.22	1.20
50.00	1.20	11	644.22	1.20
55.00	1.20	11	644.22	1.20
60.00	1.20	11	644.22	1.20
65.00	1.20	11	644.22	1.20
70.00	1.20	11	644.22	1.20
75.00	1.20	11	644.22	1.20
80.00	1.20	11	644.22	1.20
85.00	1.20	11	644.22	1.20
90.00	1.20	11	644.22	1.20
95.00	1.20	11	644.22	1.20
100.00	1.20	11	644.22	1.20
105.00	1.20	11	644.22	1.20
110.00	1.20	11	644.22	1.20
115.00	1.20	11	644.22	1.20
120.00	1.20	11	644.22	1.20
125.00	1.20	11	644.22	1.20
130.00	1.20	11	644.22	1.20
135.00	0.73	9	644.17	0.73
140.00	0.21	5	644.09	0.21
145.00	0.06	2	644.05	0.06
150.00	0.02	1	644.02	0.02
155.00	0.00	1	644.01	0.00
160.00	0.00	0	644.01	0.00

Summary for Pond FB-G: Forebay G

Inflow Area = 166.000 ac, 0.00% Impervious, Inflow Depth = 2.43" for 10-YR event
Inflow = 282.22 cfs @ 12.38 hrs, Volume= 33.555 af
Outflow = 168.60 cfs @ 12.65 hrs, Volume= 33.405 af, Atten= 40%, Lag= 16.1 min
Primary = 168.60 cfs @ 12.65 hrs, Volume= 33.405 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 666.00' Surf.Area= 8,882 sf Storage= 30,306 cf
Peak Elev= 678.12' @ 12.73 hrs Surf.Area= 37,770 sf Storage= 286,189 cf (255,883 cf above start)

Plug-Flow detention time= 442.6 min calculated for 32.707 af (97% of inflow)
Center-of-Mass det. time= 414.3 min (1,264.8 - 850.5)

Volume	Invert	Avail.Storage	Storage Description
#1	660.00'	691,674 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
660.00	1,220	0	0
670.00	13,990	76,050	76,050
680.00	43,277	286,335	362,385
681.00	45,100	44,189	406,574
686.00	68,940	285,100	691,674

Device	Routing	Invert	Outlet Devices
#1	Primary	666.00'	**42.0" Round Culvert X 3.00** L= 206.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 666.00' / 665.00' S= 0.0049 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 9.62 sf

Primary OutFlow Max=168.59 cfs @ 12.65 hrs HW=678.02' TW=676.55' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 168.59 cfs @ 5.84 fps)

Hydrograph for Pond FB-G: Forebay G

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	30,306	666.00	0.00
5.00	0.00	30,306	666.00	0.00
10.00	**4.70**	**40,173**	**667.03**	**3.58**
15.00	**20.36**	**200,568**	**675.61**	**21.31**
20.00	8.78	193,813	675.38	9.02
25.00	0.76	189,809	675.25	1.83
30.00	0.00	180,768	674.94	0.45
35.00	0.00	172,768	674.65	0.44
40.00	0.00	164,850	674.36	0.44
45.00	0.00	157,020	674.06	0.43
50.00	0.00	149,283	673.76	0.43
55.00	0.00	141,647	673.45	0.42
60.00	0.00	134,119	673.13	0.42
65.00	0.00	126,706	672.80	0.41
70.00	0.00	119,418	672.46	0.40
75.00	0.00	112,267	672.12	0.39
80.00	0.00	105,264	671.76	0.38
85.00	0.00	98,424	671.40	0.38
90.00	0.00	91,764	671.02	0.36
95.00	0.00	85,303	670.62	0.35
100.00	0.00	79,066	670.21	0.34
105.00	0.00	73,057	669.78	0.33
110.00	0.00	67,143	669.34	0.33
115.00	0.00	61,308	668.89	0.32
120.00	0.00	55,559	668.42	0.32
125.00	0.00	49,905	667.94	0.31
130.00	0.00	44,356	667.43	0.31
135.00	0.00	39,376	666.96	0.18
140.00	0.00	37,535	666.77	0.05
145.00	0.00	37,028	666.72	0.01
150.00	0.00	36,889	666.71	0.00
155.00	0.00	36,851	666.70	0.00
160.00	0.00	36,840	666.70	0.00

Summary for Pond G: Pond G

Inflow Area = 174.900 ac, 0.00% Impervious, Inflow Depth = 2.43" for 10-YR event
Inflow = 171.38 cfs @ 12.65 hrs, Volume= 35.469 af
Outflow = 159.07 cfs @ 12.82 hrs, Volume= 35.763 af, Atten= 7%, Lag= 10.5 min
Primary = 159.07 cfs @ 12.82 hrs, Volume= 35.763 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 667.12' Surf.Area= 30,801 sf Storage= 73,912 cf
Peak Elev= 676.74' @ 12.82 hrs Surf.Area= 52,179 sf Storage= 469,815 cf (395,903 cf above start)

Plug-Flow detention time= 1,202.7 min calculated for 34.066 af (96% of inflow)
Center-of-Mass det. time= 906.0 min (2,144.0 - 1,238.0)

Volume	Invert	Avail.Storage	Storage Description
#1	664.50'	652,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
664.50	25,620	0	0
670.00	36,497	170,822	170,822
680.00	59,752	481,245	652,067

Device	Routing	Invert	Outlet Devices
#1	Primary	662.00'	**48.0" Round Culvert** L= 184.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 662.00' / 656.88' S= 0.0278 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Device 1	675.15'	**72.0" x 72.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	677.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.50 Width (feet) 25.00 35.00
#4	Device 1	666.70'	**0.600 cfs Constant Flow/Skimmer X 2.00** Phase-In= 0.42'

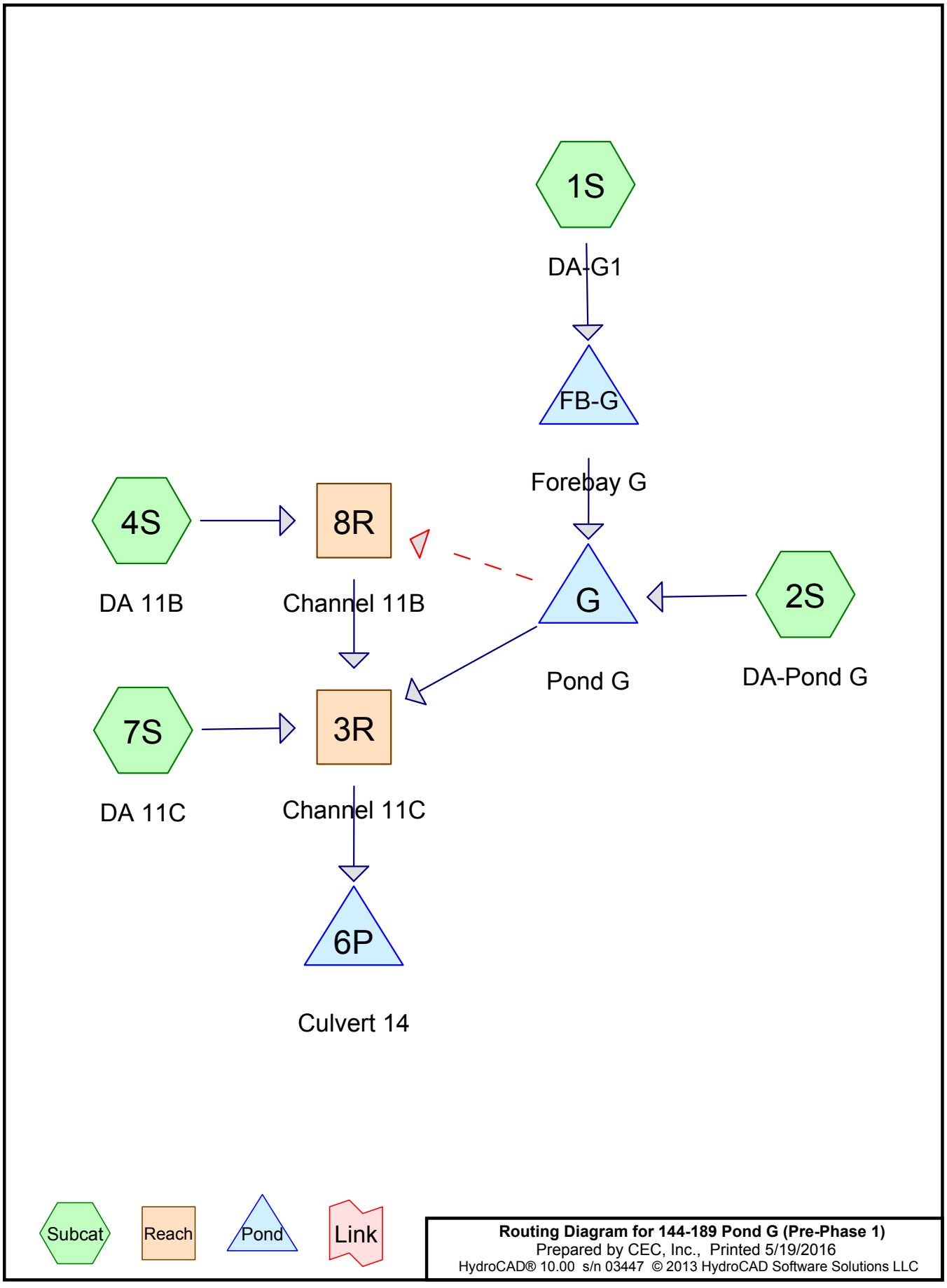
Primary OutFlow Max=159.06 cfs @ 12.82 hrs HW=676.74' TW=660.46' (Dynamic Tailwater)
└─**1=Culvert** (Passes 159.06 cfs of 216.00 cfs potential flow)
  ├─**2=Orifice/Grate** (Weir Controls 157.86 cfs @ 4.13 fps)
  └─**4=Constant Flow/Skimmer** (Constant Controls 1.20 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=667.12' TW=694.00' (Dynamic Tailwater)
└─**3=Custom Weir/Orifice** (Controls 0.00 cfs)

Hydrograph for Pond G: Pond G

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	73,912	667.12	1.20	1.20	**0.00**
5.00	0.00	63,471	666.78	0.22	0.22	0.00
10.00	**4.16**	**70,098**	**667.00**	**0.84**	**0.84**	0.00
15.00	**22.34**	**410,915**	**675.58**	**23.70**	**23.70**	0.00
20.00	9.47	400,808	675.38	9.83	9.83	0.00
25.00	1.83	394,372	675.25	3.60	3.60	0.00
30.00	0.45	379,267	674.94	1.20	1.20	0.00
35.00	0.44	365,667	674.65	1.20	1.20	0.00
40.00	0.44	351,985	674.36	1.20	1.20	0.00
45.00	0.43	338,215	674.06	1.20	1.20	0.00
50.00	0.43	324,351	673.76	1.20	1.20	0.00
55.00	0.42	310,387	673.45	1.20	1.20	0.00
60.00	0.42	296,316	673.13	1.20	1.20	0.00
65.00	0.41	282,129	672.80	1.20	1.20	0.00
70.00	0.40	267,816	672.46	1.20	1.20	0.00
75.00	0.39	253,367	672.12	1.20	1.20	0.00
80.00	0.38	238,770	671.76	1.20	1.20	0.00
85.00	0.38	224,011	671.40	1.20	1.20	0.00
90.00	0.36	209,071	671.02	1.20	1.20	0.00
95.00	0.35	193,931	670.62	1.20	1.20	0.00
100.00	0.34	178,568	670.21	1.20	1.20	0.00
105.00	0.33	162,978	669.78	1.20	1.20	0.00
110.00	0.33	147,291	669.34	1.20	1.20	0.00
115.00	0.32	131,526	668.89	1.20	1.20	0.00
120.00	0.32	115,675	668.42	1.20	1.20	0.00
125.00	0.31	99,730	667.94	1.20	1.20	0.00
130.00	0.31	83,678	667.43	1.20	1.20	0.00
135.00	0.18	68,867	666.96	0.73	0.73	0.00
140.00	0.05	63,285	666.77	0.20	0.20	0.00
145.00	0.01	61,737	666.72	0.06	0.06	0.00
150.00	0.00	61,311	666.71	0.02	0.02	0.00
155.00	0.00	61,194	666.70	0.00	0.00	0.00
160.00	0.00	61,162	666.70	0.00	0.00	0.00

POND G – WORST CASE SCENARIO
25-YEAR, 24-HOUR STORM EVENT



Routing Diagram for 144-189 Pond G (Pre-Phase 1)
Prepared by CEC, Inc., Printed 5/19/2016
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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
109.900	77	Brush, Fair, HSG D (1S, 2S)
65.000	94	Newly graded area, HSG D (1S, 2S)
48.780	77	Woods, Good, HSG D (4S, 7S)
223.680	**82**	**TOTAL AREA**

Summary for Subcatchment 1S: DA-G1

Runoff = 366.80 cfs @ 12.35 hrs, Volume= 43.533 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.97"

Area (ac)	CN	Description
60.000	94	Newly graded area, HSG D
106.000	77	Brush, Fair, HSG D
166.000	83	Weighted Average
166.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.0	4,500	0.0550	1.83		**Lag/CN Method,**

Hydrograph for Subcatchment 1S: DA-G1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.00
8.00	0.60	0.02	1.86
10.00	0.90	0.09	7.82
12.00	3.30	1.69	**118.80**
14.00	4.08	2.35	**38.75**
16.00	4.37	2.61	20.11
18.00	4.58	2.79	14.50
20.00	4.73	2.93	10.87
22.00	4.86	3.04	9.22
24.00	**4.97**	**3.15**	8.50
26.00	4.97	3.15	0.02
28.00	4.97	3.15	0.00
30.00	4.97	3.15	0.00
32.00	4.97	3.15	0.00
34.00	4.97	3.15	0.00
36.00	4.97	3.15	0.00
38.00	4.97	3.15	0.00
40.00	4.97	3.15	0.00
42.00	4.97	3.15	0.00
44.00	4.97	3.15	0.00
46.00	4.97	3.15	0.00
48.00	4.97	3.15	0.00
50.00	4.97	3.15	0.00
52.00	4.97	3.15	0.00
54.00	4.97	3.15	0.00
56.00	4.97	3.15	0.00
58.00	4.97	3.15	0.00
60.00	4.97	3.15	0.00
62.00	4.97	3.15	0.00
64.00	4.97	3.15	0.00
66.00	4.97	3.15	0.00
68.00	4.97	3.15	0.00
70.00	4.97	3.15	0.00
72.00	4.97	3.15	0.00
74.00	4.97	3.15	0.00
76.00	4.97	3.15	0.00
78.00	4.97	3.15	0.00
80.00	4.97	3.15	0.00
82.00	4.97	3.15	0.00
84.00	4.97	3.15	0.00
86.00	4.97	3.15	0.00
88.00	4.97	3.15	0.00
90.00	4.97	3.15	0.00
92.00	4.97	3.15	0.00
94.00	4.97	3.15	0.00
96.00	4.97	3.15	0.00
98.00	4.97	3.15	0.00
100.00	4.97	3.15	0.00
102.00	4.97	3.15	0.00
104.00	4.97	3.15	0.00
106.00	4.97	3.15	0.00
108.00	4.97	3.15	0.00
110.00	4.97	3.15	0.00
112.00	4.97	3.15	0.00
114.00	4.97	3.15	0.00
116.00	4.97	3.15	0.00
118.00	4.97	3.15	0.00
120.00	4.97	3.15	0.00
122.00	4.97	3.15	0.00
124.00	4.97	3.15	0.00
126.00	4.97	3.15	0.00
128.00	4.97	3.15	0.00
130.00	4.97	3.15	0.00
132.00	4.97	3.15	0.00
134.00	4.97	3.15	0.00
136.00	4.97	3.15	0.00
138.00	4.97	3.15	0.00
140.00	4.97	3.15	0.00
142.00	4.97	3.15	0.00
144.00	4.97	3.15	0.00
146.00	4.97	3.15	0.00
148.00	4.97	3.15	0.00
150.00	4.97	3.15	0.00
152.00	4.97	3.15	0.00
154.00	4.97	3.15	0.00
156.00	4.97	3.15	0.00
158.00	4.97	3.15	0.00
160.00	4.97	3.15	0.00

Summary for Subcatchment 2S: DA-Pond G

Runoff = 53.73 cfs @ 11.97 hrs, Volume= 2.625 af, Depth= 3.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.97"

Area (ac)	CN	Description
5.000	94	Newly graded area, HSG D
3.900	77	Brush, Fair, HSG D
8.900	87	Weighted Average
8.900		100.00% Pervious Area

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

Hydrograph for Subcatchment 2S: DA-Pond G

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.01	0.09
8.00	0.60	0.05	0.29
10.00	0.90	0.17	**0.83**
12.00	3.30	2.00	**49.56**
14.00	4.08	2.71	1.59
16.00	4.37	2.98	0.98
18.00	4.58	3.17	0.76
20.00	4.73	3.32	0.55
22.00	4.86	3.43	0.50
24.00	**4.97**	**3.54**	0.46
26.00	4.97	3.54	0.00
28.00	4.97	3.54	0.00
30.00	4.97	3.54	0.00
32.00	4.97	3.54	0.00
34.00	4.97	3.54	0.00
36.00	4.97	3.54	0.00
38.00	4.97	3.54	0.00
40.00	4.97	3.54	0.00
42.00	4.97	3.54	0.00
44.00	4.97	3.54	0.00
46.00	4.97	3.54	0.00
48.00	4.97	3.54	0.00
50.00	4.97	3.54	0.00
52.00	4.97	3.54	0.00
54.00	4.97	3.54	0.00
56.00	4.97	3.54	0.00
58.00	4.97	3.54	0.00
60.00	4.97	3.54	0.00
62.00	4.97	3.54	0.00
64.00	4.97	3.54	0.00
66.00	4.97	3.54	0.00
68.00	4.97	3.54	0.00
70.00	4.97	3.54	0.00
72.00	4.97	3.54	0.00
74.00	4.97	3.54	0.00
76.00	4.97	3.54	0.00
78.00	4.97	3.54	0.00
80.00	4.97	3.54	0.00
82.00	4.97	3.54	0.00
84.00	4.97	3.54	0.00
86.00	4.97	3.54	0.00
88.00	4.97	3.54	0.00
90.00	4.97	3.54	0.00
92.00	4.97	3.54	0.00
94.00	4.97	3.54	0.00
96.00	4.97	3.54	0.00
98.00	4.97	3.54	0.00
100.00	4.97	3.54	0.00
102.00	4.97	3.54	0.00
104.00	4.97	3.54	0.00
106.00	4.97	3.54	0.00
108.00	4.97	3.54	0.00
110.00	4.97	3.54	0.00
112.00	4.97	3.54	0.00
114.00	4.97	3.54	0.00
116.00	4.97	3.54	0.00
118.00	4.97	3.54	0.00
120.00	4.97	3.54	0.00
122.00	4.97	3.54	0.00
124.00	4.97	3.54	0.00
126.00	4.97	3.54	0.00
128.00	4.97	3.54	0.00
130.00	4.97	3.54	0.00
132.00	4.97	3.54	0.00
134.00	4.97	3.54	0.00
136.00	4.97	3.54	0.00
138.00	4.97	3.54	0.00
140.00	4.97	3.54	0.00
142.00	4.97	3.54	0.00
144.00	4.97	3.54	0.00
146.00	4.97	3.54	0.00
148.00	4.97	3.54	0.00
150.00	4.97	3.54	0.00
152.00	4.97	3.54	0.00
154.00	4.97	3.54	0.00
156.00	4.97	3.54	0.00
158.00	4.97	3.54	0.00
160.00	4.97	3.54	0.00

Summary for Subcatchment 4S: DA 11B

Runoff = 117.52 cfs @ 12.18 hrs, Volume= 10.006 af, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.97"

Area (ac)	CN	Description
46.220	77	Woods, Good, HSG D
46.220		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.7	2,300	0.0960	1.55		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps

Hydrograph for Subcatchment 4S: DA 11B

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.00
8.00	0.60	0.00	0.00
10.00	0.90	0.03	1.12
12.00	3.30	1.28	**64.01**
14.00	4.08	1.87	**8.12**
16.00	4.37	2.11	4.77
18.00	4.58	2.27	3.57
20.00	4.73	2.40	2.66
22.00	4.86	2.50	2.34
24.00	**4.97**	**2.60**	2.16
26.00	4.97	2.60	0.00
28.00	4.97	2.60	0.00
30.00	4.97	2.60	0.00
32.00	4.97	2.60	0.00
34.00	4.97	2.60	0.00
36.00	4.97	2.60	0.00
38.00	4.97	2.60	0.00
40.00	4.97	2.60	0.00
42.00	4.97	2.60	0.00
44.00	4.97	2.60	0.00
46.00	4.97	2.60	0.00
48.00	4.97	2.60	0.00
50.00	4.97	2.60	0.00
52.00	4.97	2.60	0.00
54.00	4.97	2.60	0.00
56.00	4.97	2.60	0.00
58.00	4.97	2.60	0.00
60.00	4.97	2.60	0.00
62.00	4.97	2.60	0.00
64.00	4.97	2.60	0.00
66.00	4.97	2.60	0.00
68.00	4.97	2.60	0.00
70.00	4.97	2.60	0.00
72.00	4.97	2.60	0.00
74.00	4.97	2.60	0.00
76.00	4.97	2.60	0.00
78.00	4.97	2.60	0.00
80.00	4.97	2.60	0.00
82.00	4.97	2.60	0.00
84.00	4.97	2.60	0.00
86.00	4.97	2.60	0.00
88.00	4.97	2.60	0.00
90.00	4.97	2.60	0.00
92.00	4.97	2.60	0.00
94.00	4.97	2.60	0.00
96.00	4.97	2.60	0.00
98.00	4.97	2.60	0.00
100.00	4.97	2.60	0.00
102.00	4.97	2.60	0.00
104.00	4.97	2.60	0.00
106.00	4.97	2.60	0.00
108.00	4.97	2.60	0.00
110.00	4.97	2.60	0.00
112.00	4.97	2.60	0.00
114.00	4.97	2.60	0.00
116.00	4.97	2.60	0.00
118.00	4.97	2.60	0.00
120.00	4.97	2.60	0.00
122.00	4.97	2.60	0.00
124.00	4.97	2.60	0.00
126.00	4.97	2.60	0.00
128.00	4.97	2.60	0.00
130.00	4.97	2.60	0.00
132.00	4.97	2.60	0.00
134.00	4.97	2.60	0.00
136.00	4.97	2.60	0.00
138.00	4.97	2.60	0.00
140.00	4.97	2.60	0.00
142.00	4.97	2.60	0.00
144.00	4.97	2.60	0.00
146.00	4.97	2.60	0.00
148.00	4.97	2.60	0.00
150.00	4.97	2.60	0.00
152.00	4.97	2.60	0.00
154.00	4.97	2.60	0.00
156.00	4.97	2.60	0.00
158.00	4.97	2.60	0.00
160.00	4.97	2.60	0.00

Summary for Subcatchment 7S: DA 11C

Runoff = 11.85 cfs @ 11.97 hrs, Volume= 0.554 af, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=4.97"

Area (ac)	CN	Description
2.560	77	Woods, Good, HSG D
2.560		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	600	0.4000	2.73		**Lag/CN Method,**
3.7	600	Total, Increased to minimum Tc = 6.0 min			

Hydrograph for Subcatchment 7S: DA 11C

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.11	0.00	0.00
4.00	0.24	0.00	0.00
6.00	0.40	0.00	0.00
8.00	0.60	0.00	0.00
10.00	0.90	0.03	**0.08**
12.00	3.30	1.28	**11.11**
14.00	4.08	1.87	0.39
16.00	4.37	2.11	0.24
18.00	4.58	2.27	0.19
20.00	4.73	2.40	0.14
22.00	4.86	2.50	0.13
24.00	**4.97**	**2.60**	0.12
26.00	4.97	2.60	0.00
28.00	4.97	2.60	0.00
30.00	4.97	2.60	0.00
32.00	4.97	2.60	0.00
34.00	4.97	2.60	0.00
36.00	4.97	2.60	0.00
38.00	4.97	2.60	0.00
40.00	4.97	2.60	0.00
42.00	4.97	2.60	0.00
44.00	4.97	2.60	0.00
46.00	4.97	2.60	0.00
48.00	4.97	2.60	0.00
50.00	4.97	2.60	0.00
52.00	4.97	2.60	0.00
54.00	4.97	2.60	0.00
56.00	4.97	2.60	0.00
58.00	4.97	2.60	0.00
60.00	4.97	2.60	0.00
62.00	4.97	2.60	0.00
64.00	4.97	2.60	0.00
66.00	4.97	2.60	0.00
68.00	4.97	2.60	0.00
70.00	4.97	2.60	0.00
72.00	4.97	2.60	0.00
74.00	4.97	2.60	0.00
76.00	4.97	2.60	0.00
78.00	4.97	2.60	0.00
80.00	4.97	2.60	0.00
82.00	4.97	2.60	0.00
84.00	4.97	2.60	0.00
86.00	4.97	2.60	0.00
88.00	4.97	2.60	0.00
90.00	4.97	2.60	0.00
92.00	4.97	2.60	0.00
94.00	4.97	2.60	0.00
96.00	4.97	2.60	0.00
98.00	4.97	2.60	0.00
100.00	4.97	2.60	0.00
102.00	4.97	2.60	0.00
104.00	4.97	2.60	0.00
106.00	4.97	2.60	0.00
108.00	4.97	2.60	0.00
110.00	4.97	2.60	0.00
112.00	4.97	2.60	0.00
114.00	4.97	2.60	0.00
116.00	4.97	2.60	0.00
118.00	4.97	2.60	0.00
120.00	4.97	2.60	0.00
122.00	4.97	2.60	0.00
124.00	4.97	2.60	0.00
126.00	4.97	2.60	0.00
128.00	4.97	2.60	0.00
130.00	4.97	2.60	0.00
132.00	4.97	2.60	0.00
134.00	4.97	2.60	0.00
136.00	4.97	2.60	0.00
138.00	4.97	2.60	0.00
140.00	4.97	2.60	0.00
142.00	4.97	2.60	0.00
144.00	4.97	2.60	0.00
146.00	4.97	2.60	0.00
148.00	4.97	2.60	0.00
150.00	4.97	2.60	0.00
152.00	4.97	2.60	0.00
154.00	4.97	2.60	0.00
156.00	4.97	2.60	0.00
158.00	4.97	2.60	0.00
160.00	4.97	2.60	0.00

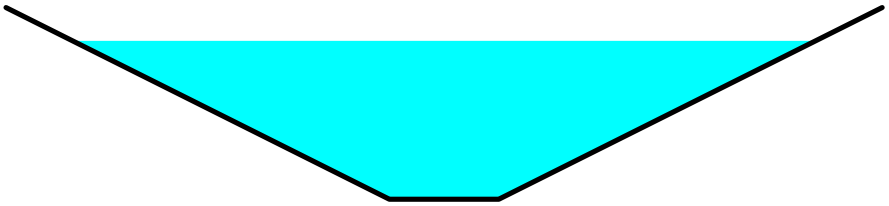
Summary for Reach 3R: Channel 11C

Inflow Area = 223.680 ac, 0.00% Impervious, Inflow Depth = 3.05" for 25-YR event
Inflow = 256.83 cfs @ 12.61 hrs, Volume= 56.862 af
Outflow = 256.70 cfs @ 12.61 hrs, Volume= 56.862 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 11.40 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.64 fps, Avg. Travel Time= 1.6 min

Peak Storage= 5,718 cf @ 12.61 hrs
Average Depth at Peak Storage= 2.89'
Bank-Full Depth= 3.50' Flow Area= 31.5 sf, Capacity= 401.89 cfs

2.00' x 3.50' deep channel, n= 0.034
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 254.0' Slope= 0.0394 '/'
Inlet Invert= 658.00', Outlet Invert= 648.00'



Hydrograph for Reach 3R: Channel 11C

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	1.20	20	658.04	0.08
5.00	0.22	39	658.07	0.22
10.00	**2.37**	**186**	**658.29**	**2.35**
15.00	**35.68**	**1,316**	**659.19**	**35.76**
20.00	14.92	694	658.77	14.94
25.00	4.29	287	658.40	4.37
30.00	1.20	118	658.19	1.20
35.00	1.20	118	658.19	1.20
40.00	1.20	118	658.19	1.20
45.00	1.20	118	658.19	1.20
50.00	1.20	118	658.19	1.20
55.00	1.20	118	658.19	1.20
60.00	1.20	118	658.19	1.20
65.00	1.20	118	658.19	1.20
70.00	1.20	118	658.19	1.20
75.00	1.20	118	658.19	1.20
80.00	1.20	118	658.19	1.20
85.00	1.20	118	658.19	1.20
90.00	1.20	118	658.19	1.20
95.00	1.20	118	658.19	1.20
100.00	1.20	118	658.19	1.20
105.00	1.20	118	658.19	1.20
110.00	1.20	118	658.19	1.20
115.00	1.20	118	658.19	1.20
120.00	1.20	118	658.19	1.20
125.00	1.20	118	658.19	1.20
130.00	1.20	118	658.19	1.20
135.00	0.75	86	658.15	0.75
140.00	0.21	38	658.07	0.21
145.00	0.06	16	658.03	0.06
150.00	0.02	5	658.01	0.02
155.00	0.00	1	658.00	0.00
160.00	0.00	0	658.00	0.00

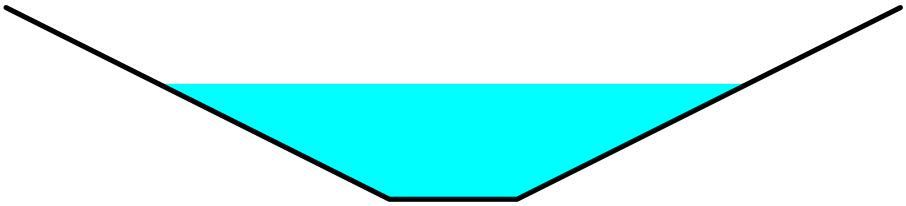
Summary for Reach 8R: Channel 11B

Inflow Area = 46.220 ac, 0.00% Impervious, Inflow Depth = 2.60" for 25-YR event
Inflow = 117.52 cfs @ 12.18 hrs, Volume= 10.006 af
Outflow = 117.41 cfs @ 12.19 hrs, Volume= 10.006 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 11.57 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 4.28 fps, Avg. Travel Time= 1.8 min

Peak Storage= 4,687 cf @ 12.19 hrs
Average Depth at Peak Storage= 1.81'
Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 371.46 cfs

2.00' x 3.00' deep channel, n= 0.036
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 462.0' Slope= 0.0779 '/'
Inlet Invert= 694.00', Outlet Invert= 658.00'



Hydrograph for Reach 8R: Channel 11B

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	694.00	0.00
5.00	0.00	0	694.00	0.00
10.00	**1.12**	**166**	**694.16**	**1.09**
15.00	**6.01**	**536**	**694.41**	**6.03**
20.00	2.66	304	694.26	2.67
25.00	0.02	18	694.02	0.04
30.00	0.00	0	694.00	0.00
35.00	0.00	0	694.00	0.00
40.00	0.00	0	694.00	0.00
45.00	0.00	0	694.00	0.00
50.00	0.00	0	694.00	0.00
55.00	0.00	0	694.00	0.00
60.00	0.00	0	694.00	0.00
65.00	0.00	0	694.00	0.00
70.00	0.00	0	694.00	0.00
75.00	0.00	0	694.00	0.00
80.00	0.00	0	694.00	0.00
85.00	0.00	0	694.00	0.00
90.00	0.00	0	694.00	0.00
95.00	0.00	0	694.00	0.00
100.00	0.00	0	694.00	0.00
105.00	0.00	0	694.00	0.00
110.00	0.00	0	694.00	0.00
115.00	0.00	0	694.00	0.00
120.00	0.00	0	694.00	0.00
125.00	0.00	0	694.00	0.00
130.00	0.00	0	694.00	0.00
135.00	0.00	0	694.00	0.00
140.00	0.00	0	694.00	0.00
145.00	0.00	0	694.00	0.00
150.00	0.00	0	694.00	0.00
155.00	0.00	0	694.00	0.00
160.00	0.00	0	694.00	0.00

Summary for Pond 6P: Culvert 14

Inflow Area = 223.680 ac, 0.00% Impervious, Inflow Depth = 3.05" for 25-YR event
Inflow = 256.70 cfs @ 12.61 hrs, Volume= 56.862 af
Outflow = 256.73 cfs @ 12.61 hrs, Volume= 56.861 af, Atten= 0%, Lag= 0.0 min
Primary = 256.73 cfs @ 12.61 hrs, Volume= 56.861 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 649.16' @ 12.61 hrs Surf.Area= 50 sf Storage= 200 cf

Plug-Flow detention time= 0.1 min calculated for 56.861 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (1,665.7 - 1,665.7)

Volume	Invert	Avail.Storage	Storage Description
#1	644.00'	200 cf	**12.50'W x 4.00'L x 4.00'H Prismatoid**

Device	Routing	Invert	Outlet Devices
#1	Primary	644.00'	**42.0" Round Culvert X 3.00** L= 135.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 644.00' / 626.00' S= 0.1333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 9.62 sf

Primary OutFlow Max=256.53 cfs @ 12.61 hrs HW=649.16' (Free Discharge)
1=Culvert (Inlet Controls 256.53 cfs @ 8.89 fps)

Hydrograph for Pond 6P: Culvert 14

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.08	1	644.02	0.01
5.00	0.22	5	644.09	0.22
10.00	**2.35**	**15**	**644.31**	**2.35**
15.00	**35.76**	**63**	**645.26**	**35.76**
20.00	14.94	40	644.79	14.94
25.00	4.37	21	644.42	4.38
30.00	1.20	11	644.22	1.20
35.00	1.20	11	644.22	1.20
40.00	1.20	11	644.22	1.20
45.00	1.20	11	644.22	1.20
50.00	1.20	11	644.22	1.20
55.00	1.20	11	644.22	1.20
60.00	1.20	11	644.22	1.20
65.00	1.20	11	644.22	1.20
70.00	1.20	11	644.22	1.20
75.00	1.20	11	644.22	1.20
80.00	1.20	11	644.22	1.20
85.00	1.20	11	644.22	1.20
90.00	1.20	11	644.22	1.20
95.00	1.20	11	644.22	1.20
100.00	1.20	11	644.22	1.20
105.00	1.20	11	644.22	1.20
110.00	1.20	11	644.22	1.20
115.00	1.20	11	644.22	1.20
120.00	1.20	11	644.22	1.20
125.00	1.20	11	644.22	1.20
130.00	1.20	11	644.22	1.20
135.00	0.75	9	644.17	0.75
140.00	0.21	5	644.09	0.21
145.00	0.06	2	644.05	0.06
150.00	0.02	1	644.03	0.02
155.00	0.00	1	644.01	0.00
160.00	0.00	0	644.01	0.00

Summary for Pond FB-G: Forebay G

Inflow Area = 166.000 ac, 0.00% Impervious, Inflow Depth = 3.15" for 25-YR event
Inflow = 366.80 cfs @ 12.35 hrs, Volume= 43.533 af
Outflow = 243.31 cfs @ 12.63 hrs, Volume= 43.383 af, Atten= 34%, Lag= 16.6 min
Primary = 243.31 cfs @ 12.63 hrs, Volume= 43.383 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 666.00' Surf.Area= 8,882 sf Storage= 30,306 cf
Peak Elev= 680.27' @ 12.67 hrs Surf.Area= 43,777 sf Storage= 374,328 cf (344,022 cf above start)

Plug-Flow detention time= 345.4 min calculated for 42.687 af (98% of inflow)
Center-of-Mass det. time= 323.8 min (1,166.9 - 843.1)

Volume	Invert	Avail.Storage	Storage Description
#1	660.00'	691,674 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
660.00	1,220	0	0
670.00	13,990	76,050	76,050
680.00	43,277	286,335	362,385
681.00	45,100	44,189	406,574
686.00	68,940	285,100	691,674

Device	Routing	Invert	Outlet Devices
#1	Primary	666.00'	**42.0" Round Culvert X 3.00** L= 206.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 666.00' / 665.00' S= 0.0049 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 9.62 sf

Primary OutFlow Max=243.30 cfs @ 12.63 hrs HW=680.24' TW=677.17' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 243.30 cfs @ 8.43 fps)

Hydrograph for Pond FB-G: Forebay G

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	30,306	666.00	0.00
5.00	0.00	30,306	666.00	0.00
10.00	**7.82**	**44,671**	**667.46**	**5.95**
15.00	**25.35**	**203,096**	**675.69**	**26.50**
20.00	10.87	195,037	675.42	11.14
25.00	0.94	190,306	675.27	2.19
30.00	0.00	180,928	674.94	0.45
35.00	0.00	172,926	674.66	0.44
40.00	0.00	165,007	674.36	0.44
45.00	0.00	157,175	674.07	0.43
50.00	0.00	149,436	673.76	0.43
55.00	0.00	141,798	673.45	0.42
60.00	0.00	134,267	673.13	0.42
65.00	0.00	126,852	672.81	0.41
70.00	0.00	119,562	672.47	0.40
75.00	0.00	112,408	672.13	0.39
80.00	0.00	105,402	671.77	0.38
85.00	0.00	98,559	671.40	0.38
90.00	0.00	91,894	671.02	0.36
95.00	0.00	85,430	670.63	0.35
100.00	0.00	79,188	670.22	0.34
105.00	0.00	73,175	669.79	0.33
110.00	0.00	67,260	669.35	0.33
115.00	0.00	61,424	668.90	0.32
120.00	0.00	55,673	668.43	0.32
125.00	0.00	50,016	667.95	0.31
130.00	0.00	44,466	667.44	0.31
135.00	0.00	39,442	666.96	0.19
140.00	0.00	37,553	666.77	0.05
145.00	0.00	37,033	666.72	0.01
150.00	0.00	36,890	666.71	0.00
155.00	0.00	36,851	666.70	0.00
160.00	0.00	36,840	666.70	0.00

Summary for Pond G: Pond G

Inflow Area = 174.900 ac, 0.00% Impervious, Inflow Depth = 3.16" for 25-YR event
Inflow = 246.79 cfs @ 12.63 hrs, Volume= 46.008 af
Outflow = 221.48 cfs @ 12.83 hrs, Volume= 46.301 af, Atten= 10%, Lag= 12.4 min
Primary = 221.48 cfs @ 12.83 hrs, Volume= 46.301 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 667.12' Surf.Area= 30,801 sf Storage= 73,912 cf
Peak Elev= 677.40' @ 12.83 hrs Surf.Area= 53,702 sf Storage= 504,494 cf (430,582 cf above start)

Plug-Flow detention time= 925.3 min calculated for 44.604 af (97% of inflow)
Center-of-Mass det. time= 706.1 min (1,852.0 - 1,145.9)

Volume	Invert	Avail.Storage	Storage Description
#1	664.50'	652,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
664.50	25,620	0	0
670.00	36,497	170,822	170,822
680.00	59,752	481,245	652,067

Device	Routing	Invert	Outlet Devices
#1	Primary	662.00'	**48.0" Round Culvert** L= 184.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 662.00' / 656.88' S= 0.0278 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Device 1	675.15'	**72.0" x 72.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	677.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.50 Width (feet) 25.00 35.00
#4	Device 1	666.70'	**0.600 cfs Constant Flow/Skimmer X 2.00** Phase-In= 0.42'

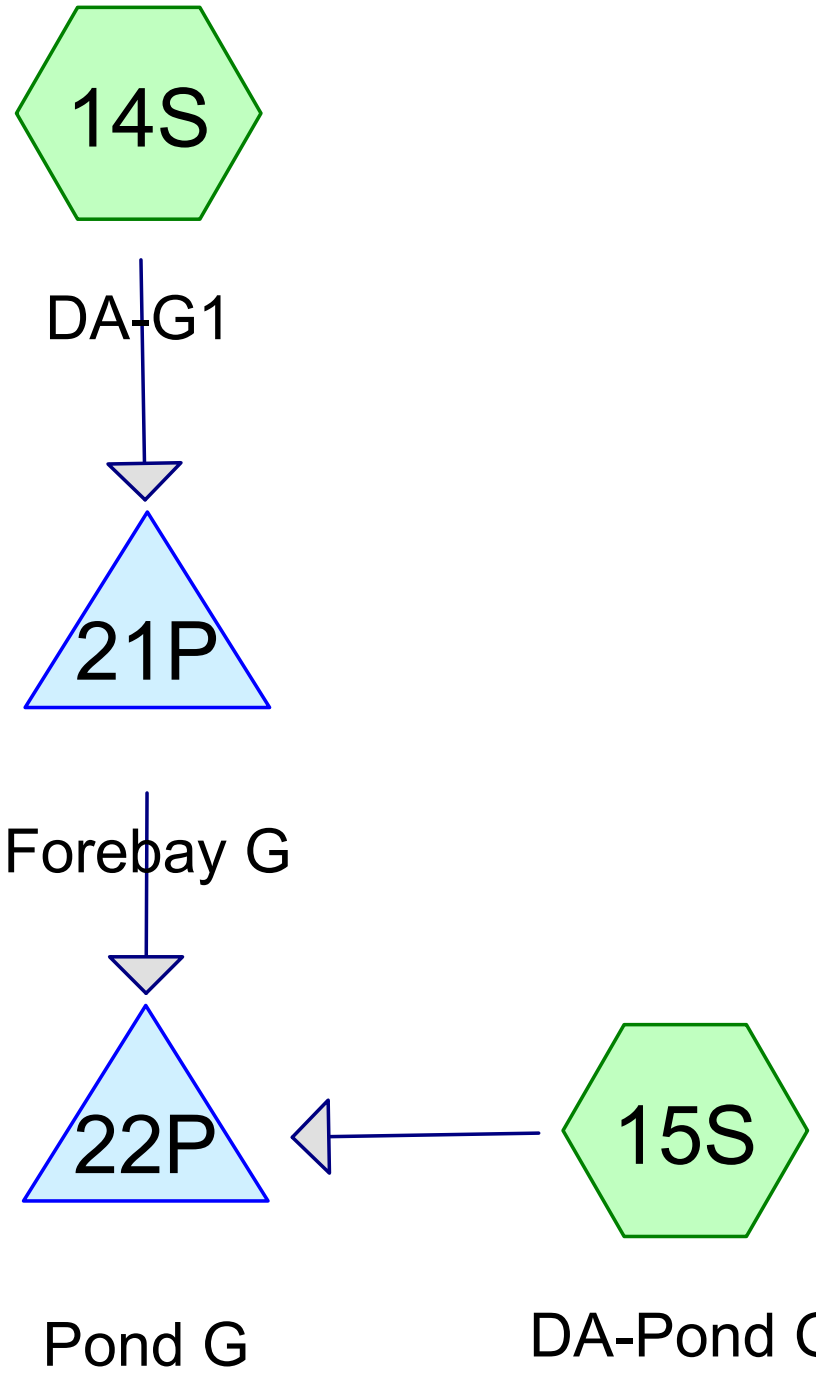
Primary OutFlow Max=221.48 cfs @ 12.83 hrs HW=677.40' TW=660.83' (Dynamic Tailwater)
- **1=Culvert** (Inlet Controls 221.48 cfs @ 17.62 fps)
  - **2=Orifice/Grate** (Passes < 259.92 cfs potential flow)
  - **4=Constant Flow/Skimmer** (Passes < 1.20 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=667.12' TW=694.00' (Dynamic Tailwater)
- **3=Custom Weir/Orifice** (Controls 0.00 cfs)

Hydrograph for Pond G: Pond G

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	73,912	667.12	1.20	1.20	**0.00**
5.00	0.01	63,472	666.78	0.22	0.22	0.00
10.00	**6.78**	**83,616**	**667.43**	**1.20**	**1.20**	0.00
15.00	**27.76**	**414,381**	**675.65**	**29.34**	**29.34**	0.00
20.00	11.69	402,713	675.42	12.11	12.11	0.00
25.00	2.19	395,191	675.26	4.25	4.25	0.00
30.00	0.45	379,537	674.94	1.20	1.20	0.00
35.00	0.44	365,939	674.66	1.20	1.20	0.00
40.00	0.44	352,258	674.36	1.20	1.20	0.00
45.00	0.43	338,490	674.07	1.20	1.20	0.00
50.00	0.43	324,629	673.76	1.20	1.20	0.00
55.00	0.42	310,667	673.45	1.20	1.20	0.00
60.00	0.42	296,598	673.13	1.20	1.20	0.00
65.00	0.41	282,413	672.81	1.20	1.20	0.00
70.00	0.40	268,103	672.47	1.20	1.20	0.00
75.00	0.39	253,657	672.13	1.20	1.20	0.00
80.00	0.38	239,063	671.77	1.20	1.20	0.00
85.00	0.38	224,306	671.40	1.20	1.20	0.00
90.00	0.36	209,371	671.02	1.20	1.20	0.00
95.00	0.35	194,235	670.63	1.20	1.20	0.00
100.00	0.34	178,877	670.22	1.20	1.20	0.00
105.00	0.33	163,290	669.79	1.20	1.20	0.00
110.00	0.33	147,605	669.35	1.20	1.20	0.00
115.00	0.32	131,841	668.90	1.20	1.20	0.00
120.00	0.32	115,992	668.43	1.20	1.20	0.00
125.00	0.31	100,048	667.95	1.20	1.20	0.00
130.00	0.31	83,999	667.44	1.20	1.20	0.00
135.00	0.19	69,066	666.96	0.75	0.75	0.00
140.00	0.05	63,341	666.77	0.21	0.21	0.00
145.00	0.01	61,752	666.72	0.06	0.06	0.00
150.00	0.00	61,315	666.71	0.02	0.02	0.00
155.00	0.00	61,195	666.70	0.00	0.00	0.00
160.00	0.00	61,162	666.70	0.00	0.00	0.00

POND G – WORST CASE SCENARIO
100-YEAR, 24-HOUR STORM EVENT



Subcat Reach Pond Link

Routing Diagram for 144-189 Pond G (Pre-Phase 1)
Prepared by CEC, Inc., Printed 5/19/2016
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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
109.900	77	Brush, Fair, HSG D (14S, 15S)
65.000	94	Newly graded area, HSG D (14S, 15S)
174.900	**83**	**TOTAL AREA**

Summary for Subcatchment 14S: DA-G1

Runoff = 515.36 cfs @ 12.35 hrs, Volume= 61.365 af, Depth= 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.37"

Area (ac)	CN	Description
60.000	94	Newly graded area, HSG D
106.000	77	Brush, Fair, HSG D
166.000	83	Weighted Average
166.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
41.0	4,500	0.0550	1.83		**Lag/CN Method,**

Hydrograph for Subcatchment 14S: DA-G1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.14	0.00	0.00
4.00	0.31	0.00	0.00
6.00	0.51	0.00	0.59
8.00	0.76	0.05	4.84
10.00	1.15	0.20	13.99
12.00	4.22	2.48	**174.64**
14.00	5.22	3.38	**52.10**
16.00	5.61	3.73	26.86
18.00	5.87	3.97	19.31
20.00	6.06	4.15	14.44
22.00	6.22	4.30	12.24
24.00	**6.37**	**4.44**	11.27
26.00	6.37	4.44	0.02
28.00	6.37	4.44	0.00
30.00	6.37	4.44	0.00
32.00	6.37	4.44	0.00
34.00	6.37	4.44	0.00
36.00	6.37	4.44	0.00
38.00	6.37	4.44	0.00
40.00	6.37	4.44	0.00
42.00	6.37	4.44	0.00
44.00	6.37	4.44	0.00
46.00	6.37	4.44	0.00
48.00	6.37	4.44	0.00
50.00	6.37	4.44	0.00
52.00	6.37	4.44	0.00
54.00	6.37	4.44	0.00
56.00	6.37	4.44	0.00
58.00	6.37	4.44	0.00
60.00	6.37	4.44	0.00
62.00	6.37	4.44	0.00
64.00	6.37	4.44	0.00
66.00	6.37	4.44	0.00
68.00	6.37	4.44	0.00
70.00	6.37	4.44	0.00
72.00	6.37	4.44	0.00
74.00	6.37	4.44	0.00
76.00	6.37	4.44	0.00
78.00	6.37	4.44	0.00
80.00	6.37	4.44	0.00
82.00	6.37	4.44	0.00
84.00	6.37	4.44	0.00
86.00	6.37	4.44	0.00
88.00	6.37	4.44	0.00
90.00	6.37	4.44	0.00
92.00	6.37	4.44	0.00
94.00	6.37	4.44	0.00
96.00	6.37	4.44	0.00
98.00	6.37	4.44	0.00
100.00	6.37	4.44	0.00
102.00	6.37	4.44	0.00
104.00	6.37	4.44	0.00
106.00	6.37	4.44	0.00
108.00	6.37	4.44	0.00
110.00	6.37	4.44	0.00
112.00	6.37	4.44	0.00
114.00	6.37	4.44	0.00
116.00	6.37	4.44	0.00
118.00	6.37	4.44	0.00
120.00	6.37	4.44	0.00
122.00	6.37	4.44	0.00
124.00	6.37	4.44	0.00
126.00	6.37	4.44	0.00
128.00	6.37	4.44	0.00
130.00	6.37	4.44	0.00
132.00	6.37	4.44	0.00
134.00	6.37	4.44	0.00
136.00	6.37	4.44	0.00
138.00	6.37	4.44	0.00
140.00	6.37	4.44	0.00
142.00	6.37	4.44	0.00
144.00	6.37	4.44	0.00
146.00	6.37	4.44	0.00
148.00	6.37	4.44	0.00
150.00	6.37	4.44	0.00
152.00	6.37	4.44	0.00
154.00	6.37	4.44	0.00
156.00	6.37	4.44	0.00
158.00	6.37	4.44	0.00
160.00	6.37	4.44	0.00

Summary for Subcatchment 15S: DA-Pond G

Runoff = 72.50 cfs @ 11.97 hrs, Volume= 3.613 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-YR Rainfall=6.37"

Area (ac)	CN	Description
5.000	94	Newly graded area, HSG D
3.900	77	Brush, Fair, HSG D
8.900	87	Weighted Average
8.900		100.00% Pervious Area

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

Hydrograph for Subcatchment 15S: DA-Pond G

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
2.00	0.14	0.00	0.00
4.00	0.31	0.00	0.00
6.00	0.51	0.03	0.23
8.00	0.76	0.11	0.51
10.00	1.15	0.31	**1.29**
12.00	4.22	2.84	**66.61**
14.00	5.22	3.78	2.10
16.00	5.61	4.14	1.29
18.00	5.87	4.39	1.00
20.00	6.06	4.58	0.72
22.00	6.22	4.73	0.66
24.00	**6.37**	**4.87**	0.61
26.00	6.37	4.87	0.00
28.00	6.37	4.87	0.00
30.00	6.37	4.87	0.00
32.00	6.37	4.87	0.00
34.00	6.37	4.87	0.00
36.00	6.37	4.87	0.00
38.00	6.37	4.87	0.00
40.00	6.37	4.87	0.00
42.00	6.37	4.87	0.00
44.00	6.37	4.87	0.00
46.00	6.37	4.87	0.00
48.00	6.37	4.87	0.00
50.00	6.37	4.87	0.00
52.00	6.37	4.87	0.00
54.00	6.37	4.87	0.00
56.00	6.37	4.87	0.00
58.00	6.37	4.87	0.00
60.00	6.37	4.87	0.00
62.00	6.37	4.87	0.00
64.00	6.37	4.87	0.00
66.00	6.37	4.87	0.00
68.00	6.37	4.87	0.00
70.00	6.37	4.87	0.00
72.00	6.37	4.87	0.00
74.00	6.37	4.87	0.00
76.00	6.37	4.87	0.00
78.00	6.37	4.87	0.00
80.00	6.37	4.87	0.00
82.00	6.37	4.87	0.00
84.00	6.37	4.87	0.00
86.00	6.37	4.87	0.00
88.00	6.37	4.87	0.00
90.00	6.37	4.87	0.00
92.00	6.37	4.87	0.00
94.00	6.37	4.87	0.00
96.00	6.37	4.87	0.00
98.00	6.37	4.87	0.00
100.00	6.37	4.87	0.00
102.00	6.37	4.87	0.00
104.00	6.37	4.87	0.00
106.00	6.37	4.87	0.00
108.00	6.37	4.87	0.00
110.00	6.37	4.87	0.00
112.00	6.37	4.87	0.00
114.00	6.37	4.87	0.00
116.00	6.37	4.87	0.00
118.00	6.37	4.87	0.00
120.00	6.37	4.87	0.00
122.00	6.37	4.87	0.00
124.00	6.37	4.87	0.00
126.00	6.37	4.87	0.00
128.00	6.37	4.87	0.00
130.00	6.37	4.87	0.00
132.00	6.37	4.87	0.00
134.00	6.37	4.87	0.00
136.00	6.37	4.87	0.00
138.00	6.37	4.87	0.00
140.00	6.37	4.87	0.00
142.00	6.37	4.87	0.00
144.00	6.37	4.87	0.00
146.00	6.37	4.87	0.00
148.00	6.37	4.87	0.00
150.00	6.37	4.87	0.00
152.00	6.37	4.87	0.00
154.00	6.37	4.87	0.00
156.00	6.37	4.87	0.00
158.00	6.37	4.87	0.00
160.00	6.37	4.87	0.00

Summary for Pond 21P: Forebay G

Inflow Area = 166.000 ac, 0.00% Impervious, Inflow Depth = 4.44" for 100-YR event
Inflow = 515.36 cfs @ 12.35 hrs, Volume= 61.365 af
Outflow = 328.42 cfs @ 12.64 hrs, Volume= 61.215 af, Atten= 36%, Lag= 17.2 min
Primary = 328.42 cfs @ 12.64 hrs, Volume= 61.215 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 666.00' Surf.Area= 8,882 sf Storage= 30,306 cf
Peak Elev= 684.01' @ 12.68 hrs Surf.Area= 59,474 sf Storage= 564,196 cf (533,890 cf above start)

Plug-Flow detention time= 252.3 min calculated for 60.519 af (99% of inflow)
Center-of-Mass det. time= 237.1 min (1,070.4 - 833.3)

Volume	Invert	Avail.Storage	Storage Description
#1	660.00'	691,674 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
660.00	1,220	0	0
670.00	13,990	76,050	76,050
680.00	43,277	286,335	362,385
681.00	45,100	44,189	406,574
686.00	68,940	285,100	691,674

Device	Routing	Invert	Outlet Devices
#1	Primary	666.00'	**42.0" Round Culvert X 3.00** L= 206.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 666.00' / 665.00' S= 0.0049 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 9.62 sf

Primary OutFlow Max=328.42 cfs @ 12.64 hrs HW=683.98' TW=678.39' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 328.42 cfs @ 11.38 fps)

Hydrograph for Pond 21P: Forebay G

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	30,306	666.00	0.00
5.00	0.00	30,306	666.00	0.00
10.00	**13.99**	**56,499**	**668.50**	**10.28**
15.00	**33.94**	**207,431**	**675.83**	**35.51**
20.00	14.44	197,004	675.49	14.78
25.00	1.24	191,053	675.29	2.78
30.00	0.00	181,128	674.95	0.45
35.00	0.00	173,124	674.66	0.44
40.00	0.00	165,202	674.37	0.44
45.00	0.00	157,368	674.07	0.43
50.00	0.00	149,628	673.77	0.43
55.00	0.00	141,987	673.46	0.42
60.00	0.00	134,453	673.14	0.42
65.00	0.00	127,035	672.81	0.41
70.00	0.00	119,742	672.48	0.40
75.00	0.00	112,584	672.13	0.39
80.00	0.00	105,574	671.78	0.39
85.00	0.00	98,727	671.41	0.38
90.00	0.00	92,058	671.03	0.37
95.00	0.00	85,588	670.64	0.35
100.00	0.00	79,340	670.23	0.34
105.00	0.00	73,323	669.80	0.33
110.00	0.00	67,407	669.36	0.33
115.00	0.00	61,568	668.91	0.32
120.00	0.00	55,815	668.44	0.32
125.00	0.00	50,156	667.96	0.31
130.00	0.00	44,602	667.46	0.31
135.00	0.00	39,526	666.97	0.19
140.00	0.00	37,576	666.78	0.05
145.00	0.00	37,039	666.72	0.01
150.00	0.00	36,892	666.71	0.00
155.00	0.00	36,852	666.70	0.00
160.00	0.00	36,840	666.70	0.00

Summary for Pond 22P: Pond G

Inflow Area = 174.900 ac, 0.00% Impervious, Inflow Depth = 4.45" for 100-YR event
Inflow = 333.00 cfs @ 12.64 hrs, Volume= 64.828 af
Outflow = 321.61 cfs @ 12.80 hrs, Volume= 65.121 af, Atten= 3%, Lag= 9.8 min
Primary = 230.63 cfs @ 12.80 hrs, Volume= 60.757 af
Secondary = 90.98 cfs @ 12.80 hrs, Volume= 4.364 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 667.12' Surf.Area= 30,801 sf Storage= 73,912 cf
Peak Elev= 678.53' @ 12.80 hrs Surf.Area= 56,329 sf Storage= 566,644 cf (492,732 cf above start)

Plug-Flow detention time= 659.6 min calculated for 63.424 af (98% of inflow)
Center-of-Mass det. time= 510.2 min (1,565.0 - 1,054.7)

Volume	Invert	Avail.Storage	Storage Description
#1	664.50'	652,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
664.50	25,620	0	0
670.00	36,497	170,822	170,822
680.00	59,752	481,245	652,067

Device	Routing	Invert	Outlet Devices
#1	Primary	662.00'	**48.0" Round Culvert** L= 184.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 662.00' / 656.88' S= 0.0278 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Device 1	675.15'	**72.0" x 72.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	677.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.50 Width (feet) 25.00 35.00
#4	Device 1	666.70'	**0.600 cfs Constant Flow/Skimmer X 2.00** Phase-In= 0.42'

Primary OutFlow Max=230.63 cfs @ 12.80 hrs HW=678.53' (Free Discharge)
└─**1=Culvert** (Inlet Controls 230.63 cfs @ 18.35 fps)
  ├─**2=Orifice/Grate** (Passes < 318.59 cfs potential flow)
  └─**4=Constant Flow/Skimmer** (Passes < 1.20 cfs potential flow)

Secondary OutFlow Max=90.98 cfs @ 12.80 hrs HW=678.53' (Free Discharge)
└─**3=Custom Weir/Orifice** (Weir Controls 90.98 cfs @ 3.27 fps)

Hydrograph for Pond 22P: Pond G

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	73,912	667.12	1.20	1.20	0.00
5.00	0.10	63,629	666.78	0.24	0.24	0.00
10.00	**11.57**	**117,710**	**668.48**	**1.20**	**1.20**	**0.00**
15.00	**37.17**	**419,933**	**675.77**	**39.17**	**39.17**	**0.00**
20.00	15.51	405,700	675.48	16.02	16.02	0.00
25.00	2.78	396,419	675.29	5.30	5.30	0.00
30.00	0.45	379,874	674.95	1.20	1.20	0.00
35.00	0.44	366,278	674.66	1.20	1.20	0.00
40.00	0.44	352,600	674.37	1.20	1.20	0.00
45.00	0.43	338,834	674.07	1.20	1.20	0.00
50.00	0.43	324,974	673.77	1.20	1.20	0.00
55.00	0.42	311,015	673.46	1.20	1.20	0.00
60.00	0.42	296,949	673.14	1.20	1.20	0.00
65.00	0.41	282,767	672.81	1.20	1.20	0.00
70.00	0.40	268,460	672.48	1.20	1.20	0.00
75.00	0.39	254,018	672.13	1.20	1.20	0.00
80.00	0.39	239,428	671.78	1.20	1.20	0.00
85.00	0.38	224,675	671.41	1.20	1.20	0.00
90.00	0.37	209,744	671.03	1.20	1.20	0.00
95.00	0.35	194,614	670.64	1.20	1.20	0.00
100.00	0.34	179,262	670.23	1.20	1.20	0.00
105.00	0.33	163,679	669.80	1.20	1.20	0.00
110.00	0.33	147,995	669.36	1.20	1.20	0.00
115.00	0.32	132,234	668.91	1.20	1.20	0.00
120.00	0.32	116,387	668.44	1.20	1.20	0.00
125.00	0.31	100,446	667.96	1.20	1.20	0.00
130.00	0.31	84,400	667.46	1.20	1.20	0.00
135.00	0.19	69,321	666.97	0.77	0.77	0.00
140.00	0.05	63,412	666.78	0.22	0.22	0.00
145.00	0.01	61,772	666.72	0.06	0.06	0.00
150.00	0.00	61,321	666.71	0.02	0.02	0.00
155.00	0.00	61,197	666.70	0.00	0.00	0.00
160.00	0.00	61,163	666.70	0.00	0.00	0.00

POND G – WORST CASE SCENARIO
100-YEAR, 24-HOUR STORM EVENT
NO PRINCIPAL SPILLWAY

Summary for Pond 8P: Pond G - No Principal

Inflow Area = 174.900 ac, 0.00% Impervious, Inflow Depth = 4.09" for 100-YR event
Inflow = 320.43 cfs @ 12.68 hrs, Volume= 59.636 af
Outflow = 316.57 cfs @ 12.77 hrs, Volume= 49.626 af, Atten= 1%, Lag= 5.3 min
Primary = 316.57 cfs @ 12.77 hrs, Volume= 49.626 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-160.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 667.12' Surf.Area= 30,801 sf Storage= 73,912 cf
Peak Elev= 679.75' @ 12.77 hrs Surf.Area= 59,175 sf Storage= 637,317 cf (563,405 cf above start)

Plug-Flow detention time= 135.7 min calculated for 47.926 af (80% of inflow)
Center-of-Mass det. time= 47.4 min (904.8 - 857.4)

Volume	Invert	Avail.Storage	Storage Description
#1	664.50'	652,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
664.50	25,620	0	0
670.00	36,497	170,822	170,822
680.00	59,752	481,245	652,067

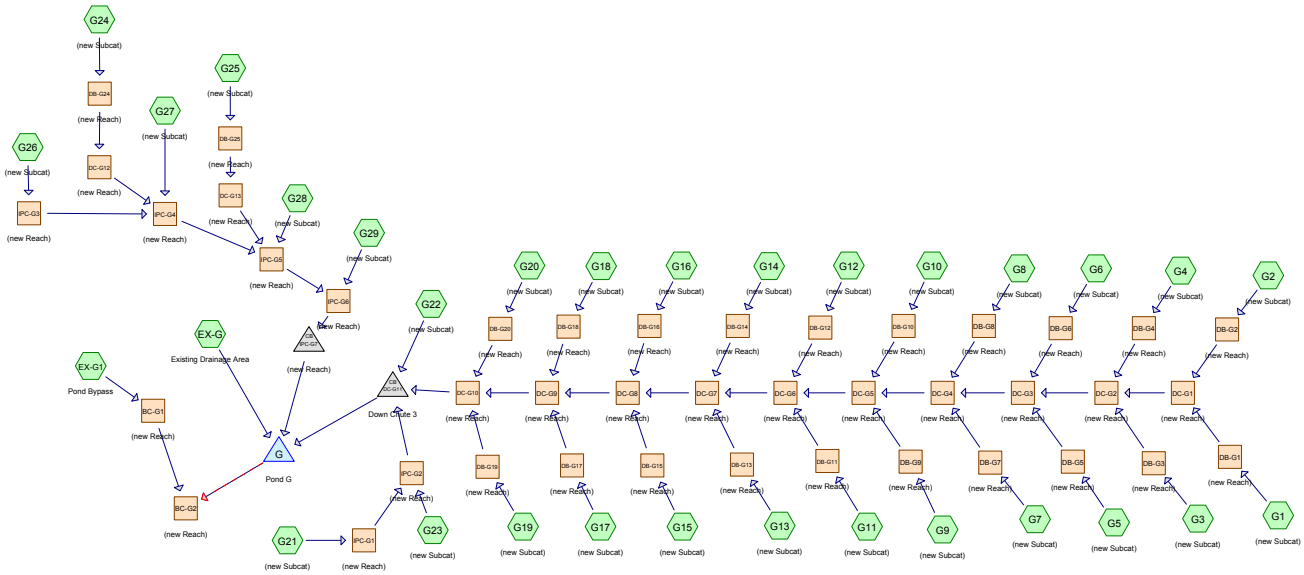
Device	Routing	Invert	Outlet Devices
#1	Primary	677.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.50 Width (feet) 25.00 35.00

Primary OutFlow Max=316.56 cfs @ 12.77 hrs HW=679.75' (Free Discharge)
↑**1=Custom Weir/Orifice** (Weir Controls 316.56 cfs @ 4.76 fps)

Hydrograph for Pond 8P: Pond G - No Principal

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	73,912	667.12	0.00
5.00	0.10	74,089	667.13	0.00
10.00	**11.17**	**134,361**	**668.97**	**0.00**
15.00	**37.43**	**542,731**	**678.10**	**39.50**
20.00	15.56	528,051	677.83	16.08
25.00	2.93	518,767	677.66	5.43
30.00	0.03	510,441	677.51	0.07
35.00	0.01	510,108	677.50	0.01
40.00	0.00	510,028	677.50	0.00
45.00	0.00	509,999	677.50	0.00
50.00	0.00	509,989	677.50	0.00
55.00	0.00	509,985	677.50	0.00
60.00	0.00	509,984	677.50	0.00
65.00	0.00	509,983	677.50	0.00
70.00	0.00	509,982	677.50	0.00
75.00	0.00	509,982	677.50	0.00
80.00	0.00	509,966	677.50	0.00
85.00	0.00	509,959	677.50	0.00
90.00	0.00	509,958	677.50	0.00
95.00	0.00	509,958	677.50	0.00
100.00	0.00	509,958	677.50	0.00
105.00	0.00	509,958	677.50	0.00
110.00	0.00	509,958	677.50	0.00
115.00	0.00	509,958	677.50	0.00
120.00	0.00	509,958	677.50	0.00
125.00	0.00	509,958	677.50	0.00
130.00	0.00	509,958	677.50	0.00
135.00	0.00	509,958	677.50	0.00
140.00	0.00	509,958	677.50	0.00
145.00	0.00	509,958	677.50	0.00
150.00	0.00	509,958	677.50	0.00
155.00	0.00	509,958	677.50	0.00
160.00	0.00	509,958	677.50	0.00

POND G – FINAL CONDITIONS
10-YEAR, 24-HOUR STORM EVENT



Subcat Reach Pond Link

Routing Diagram for 071-644_SWM POND D, E, G

Prepared by CEC, Inc., Printed 5/23/2016

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
25.769	79	50-75% Grass cover, Fair, HSG C (G1, G10, G11, G12, G13, G14, G15, G16, G17, G18, G19, G2, G20, G21, G22, G23, G24, G25, G26, G27, G28, G29, G3, G4, G5, G6, G7, G8, G9)
13.269	76	Woods/grass comb., Fair, HSG C (EX-G, EX-G1)
39.038	**78**	**TOTAL AREA**

Summary for Subcatchment EX-G: Existing Drainage Area

Runoff = 9.48 cfs @ 11.96 hrs, Volume= 0.421 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
2.715	76	Woods/grass comb., Fair, HSG C
2.715		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	100	0.2710	0.46		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.91"
1.2	349	0.4550	4.72		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
4.8	449	Total			

Hydrograph for Subcatchment EX-G: Existing Drainage Area

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.00
9.50	0.68	0.00	0.01
10.00	0.75	0.00	0.03
10.50	0.85	0.01	0.07
11.00	0.98	0.03	0.14
11.50	1.18	0.08	**0.33**
12.00	2.76	0.86	**8.07**
12.50	3.06	1.05	0.80
13.00	3.21	1.16	0.51
13.50	3.32	1.24	0.40
14.00	3.41	1.30	0.31
14.50	3.48	1.35	0.28
15.00	3.55	1.40	0.25
15.50	3.61	1.45	0.23
16.00	3.66	1.48	0.20
16.50	3.71	1.52	0.19
17.00	3.75	1.55	0.18
17.50	3.79	1.58	0.17
18.00	3.83	1.61	0.16
18.50	3.87	1.64	0.15
19.00	3.90	1.66	0.14
19.50	3.93	1.69	0.13
20.00	3.96	1.71	0.11
20.50	3.99	1.73	0.11
21.00	4.01	1.75	0.11
21.50	4.04	1.77	0.11
22.00	4.06	1.79	0.11
22.50	4.09	1.81	0.10
23.00	4.11	1.83	0.10
23.50	4.14	1.84	0.10
24.00	**4.16**	**1.86**	0.10

Summary for Subcatchment EX-G1: Pond Bypass

Runoff = 35.09 cfs @ 11.98 hrs, Volume= 1.635 af, Depth> 1.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
10.554	76	Woods/grass comb., Fair, HSG C
10.554		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	100	0.1602	0.37		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
1.6	406	0.3730	4.28		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.1	506	Total			

Hydrograph for Subcatchment EX-G1: Pond Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.00
9.50	0.68	0.00	0.03
10.00	0.75	0.00	0.11
10.50	0.85	0.01	0.25
11.00	0.98	0.03	0.53
11.50	1.18	0.08	**1.25**
12.00	2.76	0.86	**33.38**
12.50	3.06	1.05	3.24
13.00	3.21	1.16	2.03
13.50	3.32	1.24	1.55
14.00	3.41	1.30	1.23
14.50	3.48	1.35	1.09
15.00	3.55	1.40	0.99
15.50	3.61	1.45	0.88
16.00	3.66	1.48	0.77
16.50	3.71	1.52	0.72
17.00	3.75	1.55	0.68
17.50	3.79	1.58	0.65
18.00	3.83	1.61	0.61
18.50	3.87	1.64	0.57
19.00	3.90	1.66	0.53
19.50	3.93	1.69	0.49
20.00	3.96	1.71	0.45
20.50	3.99	1.73	0.43
21.00	4.01	1.75	0.43
21.50	4.04	1.77	0.42
22.00	4.06	1.79	0.41
22.50	4.09	1.81	0.40
23.00	4.11	1.83	0.40
23.50	4.14	1.84	0.39
24.00	**4.16**	**1.86**	0.38

Summary for Subcatchment G1: (new Subcat)

Runoff = 1.33 cfs @ 11.95 hrs, Volume= 0.057 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.327	79	50-75% Grass cover, Fair, HSG C
0.327		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G1: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.00
9.50	0.68	0.01	0.00
10.00	0.75	0.02	0.01
10.50	0.85	0.03	0.01
11.00	0.98	0.06	0.02
11.50	1.18	0.13	**0.05**
12.00	2.76	1.01	**0.95**
12.50	3.06	1.23	0.10
13.00	3.21	1.35	0.07
13.50	3.32	1.43	0.05
14.00	3.41	1.50	0.04
14.50	3.48	1.55	0.04
15.00	3.55	1.61	0.03
15.50	3.61	1.65	0.03
16.00	3.66	1.69	0.03
16.50	3.71	1.73	0.02
17.00	3.75	1.76	0.02
17.50	3.79	1.80	0.02
18.00	3.83	1.83	0.02
18.50	3.87	1.86	0.02
19.00	3.90	1.88	0.02
19.50	3.93	1.91	0.02
20.00	3.96	1.93	0.01
20.50	3.99	1.95	0.01
21.00	4.01	1.97	0.01
21.50	4.04	2.00	0.01
22.00	4.06	2.02	0.01
22.50	4.09	2.04	0.01
23.00	4.11	2.06	0.01
23.50	4.14	2.08	0.01
24.00	**4.16**	**2.09**	0.01

Summary for Subcatchment G10: (new Subcat)

Runoff = 3.83 cfs @ 11.95 hrs, Volume= 0.165 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.948	79	50-75% Grass cover, Fair, HSG C
0.948		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	105	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G10: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.01
9.50	0.68	0.01	0.01
10.00	0.75	0.02	0.02
10.50	0.85	0.03	0.04
11.00	0.98	0.06	0.07
11.50	1.18	0.13	**0.15**
12.00	2.76	1.01	**2.82**
12.50	3.06	1.23	0.29
13.00	3.21	1.35	0.19
13.50	3.32	1.43	0.15
14.00	3.41	1.50	0.12
14.50	3.48	1.55	0.10
15.00	3.55	1.61	0.09
15.50	3.61	1.65	0.08
16.00	3.66	1.69	0.07
16.50	3.71	1.73	0.07
17.00	3.75	1.76	0.07
17.50	3.79	1.80	0.06
18.00	3.83	1.83	0.06
18.50	3.87	1.86	0.05
19.00	3.90	1.88	0.05
19.50	3.93	1.91	0.05
20.00	3.96	1.93	0.04
20.50	3.99	1.95	0.04
21.00	4.01	1.97	0.04
21.50	4.04	2.00	0.04
22.00	4.06	2.02	0.04
22.50	4.09	2.04	0.04
23.00	4.11	2.06	0.04
23.50	4.14	2.08	0.04
24.00	**4.16**	**2.09**	0.04

Summary for Subcatchment G11: (new Subcat)

Runoff = 2.20 cfs @ 11.95 hrs, Volume= 0.094 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.540	79	50-75% Grass cover, Fair, HSG C
0.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G11: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.00
9.50	0.68	0.01	0.01
10.00	0.75	0.02	0.01
10.50	0.85	0.03	0.02
11.00	0.98	0.06	0.04
11.50	1.18	0.13	**0.09**
12.00	2.76	1.01	**1.56**
12.50	3.06	1.23	0.17
13.00	3.21	1.35	0.11
13.50	3.32	1.43	0.08
14.00	3.41	1.50	0.07
14.50	3.48	1.55	0.06
15.00	3.55	1.61	0.05
15.50	3.61	1.65	0.05
16.00	3.66	1.69	0.04
16.50	3.71	1.73	0.04
17.00	3.75	1.76	0.04
17.50	3.79	1.80	0.04
18.00	3.83	1.83	0.03
18.50	3.87	1.86	0.03
19.00	3.90	1.88	0.03
19.50	3.93	1.91	0.03
20.00	3.96	1.93	0.02
20.50	3.99	1.95	0.02
21.00	4.01	1.97	0.02
21.50	4.04	2.00	0.02
22.00	4.06	2.02	0.02
22.50	4.09	2.04	0.02
23.00	4.11	2.06	0.02
23.50	4.14	2.08	0.02
24.00	**4.16**	**2.09**	0.02

Summary for Subcatchment G12: (new Subcat)

Runoff = 4.48 cfs @ 11.95 hrs, Volume= 0.192 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.102	79	50-75% Grass cover, Fair, HSG C
1.102		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G12: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.01
9.50	0.68	0.01	0.01
10.00	0.75	0.02	0.03
10.50	0.85	0.03	0.05
11.00	0.98	0.06	0.08
11.50	1.18	0.13	**0.18**
12.00	2.76	1.01	**3.19**
12.50	3.06	1.23	0.34
13.00	3.21	1.35	0.22
13.50	3.32	1.43	0.17
14.00	3.41	1.50	0.14
14.50	3.48	1.55	0.12
15.00	3.55	1.61	0.11
15.50	3.61	1.65	0.10
16.00	3.66	1.69	0.09
16.50	3.71	1.73	0.08
17.00	3.75	1.76	0.08
17.50	3.79	1.80	0.07
18.00	3.83	1.83	0.07
18.50	3.87	1.86	0.06
19.00	3.90	1.88	0.06
19.50	3.93	1.91	0.05
20.00	3.96	1.93	0.05
20.50	3.99	1.95	0.05
21.00	4.01	1.97	0.05
21.50	4.04	2.00	0.05
22.00	4.06	2.02	0.05
22.50	4.09	2.04	0.04
23.00	4.11	2.06	0.04
23.50	4.14	2.08	0.04
24.00	**4.16**	**2.09**	0.04

Summary for Subcatchment G13: (new Subcat)

Runoff = 1.77 cfs @ 11.95 hrs, Volume= 0.076 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.435	79	50-75% Grass cover, Fair, HSG C
0.435		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G13: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.00
9.50	0.68	0.01	0.01
10.00	0.75	0.02	0.01
10.50	0.85	0.03	0.02
11.00	0.98	0.06	0.03
11.50	1.18	0.13	**0.07**
12.00	2.76	1.01	**1.26**
12.50	3.06	1.23	0.13
13.00	3.21	1.35	0.09
13.50	3.32	1.43	0.07
14.00	3.41	1.50	0.05
14.50	3.48	1.55	0.05
15.00	3.55	1.61	0.04
15.50	3.61	1.65	0.04
16.00	3.66	1.69	0.03
16.50	3.71	1.73	0.03
17.00	3.75	1.76	0.03
17.50	3.79	1.80	0.03
18.00	3.83	1.83	0.03
18.50	3.87	1.86	0.02
19.00	3.90	1.88	0.02
19.50	3.93	1.91	0.02
20.00	3.96	1.93	0.02
20.50	3.99	1.95	0.02
21.00	4.01	1.97	0.02
21.50	4.04	2.00	0.02
22.00	4.06	2.02	0.02
22.50	4.09	2.04	0.02
23.00	4.11	2.06	0.02
23.50	4.14	2.08	0.02
24.00	**4.16**	**2.09**	0.02

Summary for Subcatchment G14: (new Subcat)

Runoff = 4.91 cfs @ 11.95 hrs, Volume= 0.210 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.207	79	50-75% Grass cover, Fair, HSG C
1.207		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G14: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.01
9.50	0.68	0.01	0.02
10.00	0.75	0.02	0.03
10.50	0.85	0.03	0.05
11.00	0.98	0.06	0.09
11.50	1.18	0.13	**0.20**
12.00	2.76	1.01	**3.49**
12.50	3.06	1.23	0.37
13.00	3.21	1.35	0.24
13.50	3.32	1.43	0.19
14.00	3.41	1.50	0.15
14.50	3.48	1.55	0.13
15.00	3.55	1.61	0.12
15.50	3.61	1.65	0.11
16.00	3.66	1.69	0.09
16.50	3.71	1.73	0.09
17.00	3.75	1.76	0.08
17.50	3.79	1.80	0.08
18.00	3.83	1.83	0.07
18.50	3.87	1.86	0.07
19.00	3.90	1.88	0.06
19.50	3.93	1.91	0.06
20.00	3.96	1.93	0.05
20.50	3.99	1.95	0.05
21.00	4.01	1.97	0.05
21.50	4.04	2.00	0.05
22.00	4.06	2.02	0.05
22.50	4.09	2.04	0.05
23.00	4.11	2.06	0.05
23.50	4.14	2.08	0.05
24.00	**4.16**	**2.09**	0.05

Summary for Subcatchment G15: (new Subcat)

Runoff = 1.34 cfs @ 11.95 hrs, Volume= 0.057 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.329	79	50-75% Grass cover, Fair, HSG C
0.329		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G15: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.00
9.50	0.68	0.01	0.00
10.00	0.75	0.02	0.01
10.50	0.85	0.03	0.01
11.00	0.98	0.06	0.02
11.50	1.18	0.13	**0.05**
12.00	2.76	1.01	**0.95**
12.50	3.06	1.23	0.10
13.00	3.21	1.35	0.07
13.50	3.32	1.43	0.05
14.00	3.41	1.50	0.04
14.50	3.48	1.55	0.04
15.00	3.55	1.61	0.03
15.50	3.61	1.65	0.03
16.00	3.66	1.69	0.03
16.50	3.71	1.73	0.02
17.00	3.75	1.76	0.02
17.50	3.79	1.80	0.02
18.00	3.83	1.83	0.02
18.50	3.87	1.86	0.02
19.00	3.90	1.88	0.02
19.50	3.93	1.91	0.02
20.00	3.96	1.93	0.01
20.50	3.99	1.95	0.01
21.00	4.01	1.97	0.01
21.50	4.04	2.00	0.01
22.00	4.06	2.02	0.01
22.50	4.09	2.04	0.01
23.00	4.11	2.06	0.01
23.50	4.14	2.08	0.01
24.00	**4.16**	**2.09**	0.01

Summary for Subcatchment G16: (new Subcat)

Runoff = 4.35 cfs @ 11.95 hrs, Volume= 0.186 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.069	79	50-75% Grass cover, Fair, HSG C
1.069		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G16: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.01
9.50	0.68	0.01	0.01
10.00	0.75	0.02	0.02
10.50	0.85	0.03	0.04
11.00	0.98	0.06	0.08
11.50	1.18	0.13	**0.18**
12.00	2.76	1.01	**3.09**
12.50	3.06	1.23	0.33
13.00	3.21	1.35	0.22
13.50	3.32	1.43	0.17
14.00	3.41	1.50	0.13
14.50	3.48	1.55	0.12
15.00	3.55	1.61	0.11
15.50	3.61	1.65	0.09
16.00	3.66	1.69	0.08
16.50	3.71	1.73	0.08
17.00	3.75	1.76	0.07
17.50	3.79	1.80	0.07
18.00	3.83	1.83	0.07
18.50	3.87	1.86	0.06
19.00	3.90	1.88	0.06
19.50	3.93	1.91	0.05
20.00	3.96	1.93	0.05
20.50	3.99	1.95	0.05
21.00	4.01	1.97	0.05
21.50	4.04	2.00	0.04
22.00	4.06	2.02	0.04
22.50	4.09	2.04	0.04
23.00	4.11	2.06	0.04
23.50	4.14	2.08	0.04
24.00	**4.16**	**2.09**	0.04

Summary for Subcatchment G17: (new Subcat)

Runoff = 0.91 cfs @ 11.95 hrs, Volume= 0.039 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.224	79	50-75% Grass cover, Fair, HSG C
0.224		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G17: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.00
9.50	0.68	0.01	0.00
10.00	0.75	0.02	0.01
10.50	0.85	0.03	0.01
11.00	0.98	0.06	0.02
11.50	1.18	0.13	**0.04**
12.00	2.76	1.01	**0.65**
12.50	3.06	1.23	0.07
13.00	3.21	1.35	0.05
13.50	3.32	1.43	0.03
14.00	3.41	1.50	0.03
14.50	3.48	1.55	0.02
15.00	3.55	1.61	0.02
15.50	3.61	1.65	0.02
16.00	3.66	1.69	0.02
16.50	3.71	1.73	0.02
17.00	3.75	1.76	0.02
17.50	3.79	1.80	0.01
18.00	3.83	1.83	0.01
18.50	3.87	1.86	0.01
19.00	3.90	1.88	0.01
19.50	3.93	1.91	0.01
20.00	3.96	1.93	0.01
20.50	3.99	1.95	0.01
21.00	4.01	1.97	0.01
21.50	4.04	2.00	0.01
22.00	4.06	2.02	0.01
22.50	4.09	2.04	0.01
23.00	4.11	2.06	0.01
23.50	4.14	2.08	0.01
24.00	**4.16**	**2.09**	0.01

Summary for Subcatchment G18: (new Subcat)

Runoff = 3.67 cfs @ 11.95 hrs, Volume= 0.157 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.903	79	50-75% Grass cover, Fair, HSG C
0.903		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G18: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.01
9.50	0.68	0.01	0.01
10.00	0.75	0.02	0.02
10.50	0.85	0.03	0.04
11.00	0.98	0.06	0.07
11.50	1.18	0.13	**0.15**
12.00	2.76	1.01	**2.61**
12.50	3.06	1.23	0.28
13.00	3.21	1.35	0.18
13.50	3.32	1.43	0.14
14.00	3.41	1.50	0.11
14.50	3.48	1.55	0.10
15.00	3.55	1.61	0.09
15.50	3.61	1.65	0.08
16.00	3.66	1.69	0.07
16.50	3.71	1.73	0.07
17.00	3.75	1.76	0.06
17.50	3.79	1.80	0.06
18.00	3.83	1.83	0.06
18.50	3.87	1.86	0.05
19.00	3.90	1.88	0.05
19.50	3.93	1.91	0.04
20.00	3.96	1.93	0.04
20.50	3.99	1.95	0.04
21.00	4.01	1.97	0.04
21.50	4.04	2.00	0.04
22.00	4.06	2.02	0.04
22.50	4.09	2.04	0.04
23.00	4.11	2.06	0.04
23.50	4.14	2.08	0.04
24.00	**4.16**	**2.09**	0.03

Summary for Subcatchment G19: (new Subcat)

Runoff = 0.48 cfs @ 11.95 hrs, Volume= 0.021 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.118	79	50-75% Grass cover, Fair, HSG C
0.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G19: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.00
9.50	0.68	0.01	0.00
10.00	0.75	0.02	0.00
10.50	0.85	0.03	0.00
11.00	0.98	0.06	0.01
11.50	1.18	0.13	**0.02**
12.00	2.76	1.01	**0.34**
12.50	3.06	1.23	0.04
13.00	3.21	1.35	0.02
13.50	3.32	1.43	0.02
14.00	3.41	1.50	0.01
14.50	3.48	1.55	0.01
15.00	3.55	1.61	0.01
15.50	3.61	1.65	0.01
16.00	3.66	1.69	0.01
16.50	3.71	1.73	0.01
17.00	3.75	1.76	0.01
17.50	3.79	1.80	0.01
18.00	3.83	1.83	0.01
18.50	3.87	1.86	0.01
19.00	3.90	1.88	0.01
19.50	3.93	1.91	0.01
20.00	3.96	1.93	0.01
20.50	3.99	1.95	0.01
21.00	4.01	1.97	0.01
21.50	4.04	2.00	0.00
22.00	4.06	2.02	0.00
22.50	4.09	2.04	0.00
23.00	4.11	2.06	0.00
23.50	4.14	2.08	0.00
24.00	**4.16**	**2.09**	0.00

Summary for Subcatchment G2: (new Subcat)

Runoff = 1.00 cfs @ 11.95 hrs, Volume= 0.043 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.245	79	50-75% Grass cover, Fair, HSG C
0.245		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G2: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.00
9.50	0.68	0.01	0.00
10.00	0.75	0.02	0.01
10.50	0.85	0.03	0.01
11.00	0.98	0.06	0.02
11.50	1.18	0.13	**0.04**
12.00	2.76	1.01	**0.71**
12.50	3.06	1.23	0.08
13.00	3.21	1.35	0.05
13.50	3.32	1.43	0.04
14.00	3.41	1.50	0.03
14.50	3.48	1.55	0.03
15.00	3.55	1.61	0.02
15.50	3.61	1.65	0.02
16.00	3.66	1.69	0.02
16.50	3.71	1.73	0.02
17.00	3.75	1.76	0.02
17.50	3.79	1.80	0.02
18.00	3.83	1.83	0.01
18.50	3.87	1.86	0.01
19.00	3.90	1.88	0.01
19.50	3.93	1.91	0.01
20.00	3.96	1.93	0.01
20.50	3.99	1.95	0.01
21.00	4.01	1.97	0.01
21.50	4.04	2.00	0.01
22.00	4.06	2.02	0.01
22.50	4.09	2.04	0.01
23.00	4.11	2.06	0.01
23.50	4.14	2.08	0.01
24.00	**4.16**	**2.09**	0.01

Summary for Subcatchment G20: (new Subcat)

Runoff = 2.97 cfs @ 11.95 hrs, Volume= 0.127 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.729	79	50-75% Grass cover, Fair, HSG C
0.729		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G20: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.01
9.50	0.68	0.01	0.01
10.00	0.75	0.02	0.02
10.50	0.85	0.03	0.03
11.00	0.98	0.06	0.06
11.50	1.18	0.13	**0.12**
12.00	2.76	1.01	**2.11**
12.50	3.06	1.23	0.22
13.00	3.21	1.35	0.15
13.50	3.32	1.43	0.11
14.00	3.41	1.50	0.09
14.50	3.48	1.55	0.08
15.00	3.55	1.61	0.07
15.50	3.61	1.65	0.06
16.00	3.66	1.69	0.06
16.50	3.71	1.73	0.05
17.00	3.75	1.76	0.05
17.50	3.79	1.80	0.05
18.00	3.83	1.83	0.04
18.50	3.87	1.86	0.04
19.00	3.90	1.88	0.04
19.50	3.93	1.91	0.04
20.00	3.96	1.93	0.03
20.50	3.99	1.95	0.03
21.00	4.01	1.97	0.03
21.50	4.04	2.00	0.03
22.00	4.06	2.02	0.03
22.50	4.09	2.04	0.03
23.00	4.11	2.06	0.03
23.50	4.14	2.08	0.03
24.00	**4.16**	**2.09**	0.03

Summary for Subcatchment G21: (new Subcat)

Runoff = 9.12 cfs @ 11.92 hrs, Volume= 0.366 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
2.096	79	50-75% Grass cover, Fair, HSG C
2.096		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	39	0.2500	0.37		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G21: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.02
9.50	0.68	0.01	0.03
10.00	0.75	0.02	0.05
10.50	0.85	0.03	0.09
11.00	0.98	0.06	0.16
11.50	1.18	0.13	**0.36**
12.00	2.76	1.01	**3.78**
12.50	3.06	1.23	0.60
13.00	3.21	1.35	0.41
13.50	3.32	1.43	0.32
14.00	3.41	1.50	0.25
14.50	3.48	1.55	0.23
15.00	3.55	1.61	0.21
15.50	3.61	1.65	0.18
16.00	3.66	1.69	0.16
16.50	3.71	1.73	0.15
17.00	3.75	1.76	0.14
17.50	3.79	1.80	0.14
18.00	3.83	1.83	0.13
18.50	3.87	1.86	0.12
19.00	3.90	1.88	0.11
19.50	3.93	1.91	0.10
20.00	3.96	1.93	0.09
20.50	3.99	1.95	0.09
21.00	4.01	1.97	0.09
21.50	4.04	2.00	0.09
22.00	4.06	2.02	0.09
22.50	4.09	2.04	0.08
23.00	4.11	2.06	0.08
23.50	4.14	2.08	0.08
24.00	**4.16**	**2.09**	0.08

Summary for Subcatchment G22: (new Subcat)

Runoff = 3.18 cfs @ 11.96 hrs, Volume= 0.140 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.806	79	50-75% Grass cover, Fair, HSG C
0.806		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	125	0.2500	0.47		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G22: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.01
9.50	0.68	0.01	0.01
10.00	0.75	0.02	0.02
10.50	0.85	0.03	0.03
11.00	0.98	0.06	0.06
11.50	1.18	0.13	**0.13**
12.00	2.76	1.01	**2.58**
12.50	3.06	1.23	0.26
13.00	3.21	1.35	0.16
13.50	3.32	1.43	0.13
14.00	3.41	1.50	0.10
14.50	3.48	1.55	0.09
15.00	3.55	1.61	0.08
15.50	3.61	1.65	0.07
16.00	3.66	1.69	0.06
16.50	3.71	1.73	0.06
17.00	3.75	1.76	0.06
17.50	3.79	1.80	0.05
18.00	3.83	1.83	0.05
18.50	3.87	1.86	0.05
19.00	3.90	1.88	0.04
19.50	3.93	1.91	0.04
20.00	3.96	1.93	0.04
20.50	3.99	1.95	0.04
21.00	4.01	1.97	0.03
21.50	4.04	2.00	0.03
22.00	4.06	2.02	0.03
22.50	4.09	2.04	0.03
23.00	4.11	2.06	0.03
23.50	4.14	2.08	0.03
24.00	**4.16**	**2.09**	0.03

Summary for Subcatchment G23: (new Subcat)

Runoff = 17.17 cfs @ 11.97 hrs, Volume= 0.788 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
4.524	79	50-75% Grass cover, Fair, HSG C
4.524		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1510	0.36		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
0.8	165	0.2450	3.46		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	71	0.5490	5.19		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.6	336	Total			

Hydrograph for Subcatchment G23: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.03
9.50	0.68	0.01	0.06
10.00	0.75	0.02	0.10
10.50	0.85	0.03	0.18
11.00	0.98	0.06	0.33
11.50	1.18	0.13	**0.71**
12.00	2.76	1.01	**15.69**
12.50	3.06	1.23	1.49
13.00	3.21	1.35	0.93
13.50	3.32	1.43	0.71
14.00	3.41	1.50	0.56
14.50	3.48	1.55	0.50
15.00	3.55	1.61	0.45
15.50	3.61	1.65	0.40
16.00	3.66	1.69	0.35
16.50	3.71	1.73	0.33
17.00	3.75	1.76	0.31
17.50	3.79	1.80	0.29
18.00	3.83	1.83	0.28
18.50	3.87	1.86	0.26
19.00	3.90	1.88	0.24
19.50	3.93	1.91	0.22
20.00	3.96	1.93	0.20
20.50	3.99	1.95	0.20
21.00	4.01	1.97	0.19
21.50	4.04	2.00	0.19
22.00	4.06	2.02	0.19
22.50	4.09	2.04	0.18
23.00	4.11	2.06	0.18
23.50	4.14	2.08	0.18
24.00	**4.16**	**2.09**	0.17

Summary for Subcatchment G24: (new Subcat)

Runoff = 4.88 cfs @ 11.95 hrs, Volume= 0.211 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.208	79	50-75% Grass cover, Fair, HSG C
1.208		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	106	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G24: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.01
9.50	0.68	0.01	0.02
10.00	0.75	0.02	0.03
10.50	0.85	0.03	0.05
11.00	0.98	0.06	0.09
11.50	1.18	0.13	**0.20**
12.00	2.76	1.01	**3.60**
12.50	3.06	1.23	0.37
13.00	3.21	1.35	0.24
13.50	3.32	1.43	0.19
14.00	3.41	1.50	0.15
14.50	3.48	1.55	0.13
15.00	3.55	1.61	0.12
15.50	3.61	1.65	0.11
16.00	3.66	1.69	0.09
16.50	3.71	1.73	0.09
17.00	3.75	1.76	0.08
17.50	3.79	1.80	0.08
18.00	3.83	1.83	0.07
18.50	3.87	1.86	0.07
19.00	3.90	1.88	0.06
19.50	3.93	1.91	0.06
20.00	3.96	1.93	0.05
20.50	3.99	1.95	0.05
21.00	4.01	1.97	0.05
21.50	4.04	2.00	0.05
22.00	4.06	2.02	0.05
22.50	4.09	2.04	0.05
23.00	4.11	2.06	0.05
23.50	4.14	2.08	0.05
24.00	**4.16**	**2.09**	0.05

Summary for Subcatchment G25: (new Subcat)

Runoff = 1.05 cfs @ 11.95 hrs, Volume= 0.045 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.260	79	50-75% Grass cover, Fair, HSG C
0.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	102	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G25: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.00
9.50	0.68	0.01	0.00
10.00	0.75	0.02	0.01
10.50	0.85	0.03	0.01
11.00	0.98	0.06	0.02
11.50	1.18	0.13	**0.04**
12.00	2.76	1.01	**0.76**
12.50	3.06	1.23	0.08
13.00	3.21	1.35	0.05
13.50	3.32	1.43	0.04
14.00	3.41	1.50	0.03
14.50	3.48	1.55	0.03
15.00	3.55	1.61	0.03
15.50	3.61	1.65	0.02
16.00	3.66	1.69	0.02
16.50	3.71	1.73	0.02
17.00	3.75	1.76	0.02
17.50	3.79	1.80	0.02
18.00	3.83	1.83	0.02
18.50	3.87	1.86	0.01
19.00	3.90	1.88	0.01
19.50	3.93	1.91	0.01
20.00	3.96	1.93	0.01
20.50	3.99	1.95	0.01
21.00	4.01	1.97	0.01
21.50	4.04	2.00	0.01
22.00	4.06	2.02	0.01
22.50	4.09	2.04	0.01
23.00	4.11	2.06	0.01
23.50	4.14	2.08	0.01
24.00	**4.16**	**2.09**	0.01

Summary for Subcatchment G26: (new Subcat)

Runoff = 5.14 cfs @ 11.94 hrs, Volume= 0.219 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.254	79	50-75% Grass cover, Fair, HSG C
1.254		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	92	0.2500	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G26: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.01
9.50	0.68	0.01	0.02
10.00	0.75	0.02	0.03
10.50	0.85	0.03	0.05
11.00	0.98	0.06	0.10
11.50	1.18	0.13	**0.21**
12.00	2.76	1.01	**3.51**
12.50	3.06	1.23	0.38
13.00	3.21	1.35	0.25
13.50	3.32	1.43	0.19
14.00	3.41	1.50	0.15
14.50	3.48	1.55	0.14
15.00	3.55	1.61	0.12
15.50	3.61	1.65	0.11
16.00	3.66	1.69	0.10
16.50	3.71	1.73	0.09
17.00	3.75	1.76	0.09
17.50	3.79	1.80	0.08
18.00	3.83	1.83	0.08
18.50	3.87	1.86	0.07
19.00	3.90	1.88	0.07
19.50	3.93	1.91	0.06
20.00	3.96	1.93	0.06
20.50	3.99	1.95	0.05
21.00	4.01	1.97	0.05
21.50	4.04	2.00	0.05
22.00	4.06	2.02	0.05
22.50	4.09	2.04	0.05
23.00	4.11	2.06	0.05
23.50	4.14	2.08	0.05
24.00	**4.16**	**2.09**	0.05

Summary for Subcatchment G27: (new Subcat)

Runoff = 4.14 cfs @ 11.94 hrs, Volume= 0.176 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.010	79	50-75% Grass cover, Fair, HSG C
1.010		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	92	0.2500	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G27: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.01
9.50	0.68	0.01	0.01
10.00	0.75	0.02	0.02
10.50	0.85	0.03	0.04
11.00	0.98	0.06	0.08
11.50	1.18	0.13	**0.17**
12.00	2.76	1.01	**2.83**
12.50	3.06	1.23	0.31
13.00	3.21	1.35	0.20
13.50	3.32	1.43	0.16
14.00	3.41	1.50	0.12
14.50	3.48	1.55	0.11
15.00	3.55	1.61	0.10
15.50	3.61	1.65	0.09
16.00	3.66	1.69	0.08
16.50	3.71	1.73	0.07
17.00	3.75	1.76	0.07
17.50	3.79	1.80	0.07
18.00	3.83	1.83	0.06
18.50	3.87	1.86	0.06
19.00	3.90	1.88	0.05
19.50	3.93	1.91	0.05
20.00	3.96	1.93	0.05
20.50	3.99	1.95	0.04
21.00	4.01	1.97	0.04
21.50	4.04	2.00	0.04
22.00	4.06	2.02	0.04
22.50	4.09	2.04	0.04
23.00	4.11	2.06	0.04
23.50	4.14	2.08	0.04
24.00	**4.16**	**2.09**	0.04

Summary for Subcatchment G28: (new Subcat)

Runoff = 0.99 cfs @ 11.94 hrs, Volume= 0.042 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.241	79	50-75% Grass cover, Fair, HSG C
0.241		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	92	0.2500	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G28: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.00
9.50	0.68	0.01	0.00
10.00	0.75	0.02	0.01
10.50	0.85	0.03	0.01
11.00	0.98	0.06	0.02
11.50	1.18	0.13	**0.04**
12.00	2.76	1.01	**0.67**
12.50	3.06	1.23	0.07
13.00	3.21	1.35	0.05
13.50	3.32	1.43	0.04
14.00	3.41	1.50	0.03
14.50	3.48	1.55	0.03
15.00	3.55	1.61	0.02
15.50	3.61	1.65	0.02
16.00	3.66	1.69	0.02
16.50	3.71	1.73	0.02
17.00	3.75	1.76	0.02
17.50	3.79	1.80	0.02
18.00	3.83	1.83	0.01
18.50	3.87	1.86	0.01
19.00	3.90	1.88	0.01
19.50	3.93	1.91	0.01
20.00	3.96	1.93	0.01
20.50	3.99	1.95	0.01
21.00	4.01	1.97	0.01
21.50	4.04	2.00	0.01
22.00	4.06	2.02	0.01
22.50	4.09	2.04	0.01
23.00	4.11	2.06	0.01
23.50	4.14	2.08	0.01
24.00	**4.16**	**2.09**	0.01

Summary for Subcatchment G29: (new Subcat)

Runoff = 6.01 cfs @ 11.93 hrs, Volume= 0.249 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.425	79	50-75% Grass cover, Fair, HSG C
1.425		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	97	0.5540	0.61		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G29: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.01
9.50	0.68	0.01	0.02
10.00	0.75	0.02	0.03
10.50	0.85	0.03	0.06
11.00	0.98	0.06	0.11
11.50	1.18	0.13	**0.24**
12.00	2.76	1.01	**3.37**
12.50	3.06	1.23	0.42
13.00	3.21	1.35	0.28
13.50	3.32	1.43	0.22
14.00	3.41	1.50	0.17
14.50	3.48	1.55	0.16
15.00	3.55	1.61	0.14
15.50	3.61	1.65	0.13
16.00	3.66	1.69	0.11
16.50	3.71	1.73	0.10
17.00	3.75	1.76	0.10
17.50	3.79	1.80	0.09
18.00	3.83	1.83	0.09
18.50	3.87	1.86	0.08
19.00	3.90	1.88	0.08
19.50	3.93	1.91	0.07
20.00	3.96	1.93	0.06
20.50	3.99	1.95	0.06
21.00	4.01	1.97	0.06
21.50	4.04	2.00	0.06
22.00	4.06	2.02	0.06
22.50	4.09	2.04	0.06
23.00	4.11	2.06	0.06
23.50	4.14	2.08	0.06
24.00	**4.16**	**2.09**	0.05

Summary for Subcatchment G3: (new Subcat)

Runoff = 2.29 cfs @ 11.95 hrs, Volume= 0.099 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.565	79	50-75% Grass cover, Fair, HSG C
0.565		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	103	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G3: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.00
9.50	0.68	0.01	0.01
10.00	0.75	0.02	0.01
10.50	0.85	0.03	0.02
11.00	0.98	0.06	0.04
11.50	1.18	0.13	**0.09**
12.00	2.76	1.01	**1.66**
12.50	3.06	1.23	0.17
13.00	3.21	1.35	0.11
13.50	3.32	1.43	0.09
14.00	3.41	1.50	0.07
14.50	3.48	1.55	0.06
15.00	3.55	1.61	0.06
15.50	3.61	1.65	0.05
16.00	3.66	1.69	0.04
16.50	3.71	1.73	0.04
17.00	3.75	1.76	0.04
17.50	3.79	1.80	0.04
18.00	3.83	1.83	0.03
18.50	3.87	1.86	0.03
19.00	3.90	1.88	0.03
19.50	3.93	1.91	0.03
20.00	3.96	1.93	0.03
20.50	3.99	1.95	0.02
21.00	4.01	1.97	0.02
21.50	4.04	2.00	0.02
22.00	4.06	2.02	0.02
22.50	4.09	2.04	0.02
23.00	4.11	2.06	0.02
23.50	4.14	2.08	0.02
24.00	**4.16**	**2.09**	0.02

Summary for Subcatchment G4: (new Subcat)

Runoff = 1.68 cfs @ 11.95 hrs, Volume= 0.072 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.413	79	50-75% Grass cover, Fair, HSG C
0.413		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G4: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.00
9.50	0.68	0.01	0.01
10.00	0.75	0.02	0.01
10.50	0.85	0.03	0.02
11.00	0.98	0.06	0.03
11.50	1.18	0.13	**0.07**
12.00	2.76	1.01	**1.19**
12.50	3.06	1.23	0.13
13.00	3.21	1.35	0.08
13.50	3.32	1.43	0.06
14.00	3.41	1.50	0.05
14.50	3.48	1.55	0.05
15.00	3.55	1.61	0.04
15.50	3.61	1.65	0.04
16.00	3.66	1.69	0.03
16.50	3.71	1.73	0.03
17.00	3.75	1.76	0.03
17.50	3.79	1.80	0.03
18.00	3.83	1.83	0.03
18.50	3.87	1.86	0.02
19.00	3.90	1.88	0.02
19.50	3.93	1.91	0.02
20.00	3.96	1.93	0.02
20.50	3.99	1.95	0.02
21.00	4.01	1.97	0.02
21.50	4.04	2.00	0.02
22.00	4.06	2.02	0.02
22.50	4.09	2.04	0.02
23.00	4.11	2.06	0.02
23.50	4.14	2.08	0.02
24.00	**4.16**	**2.09**	0.02

Summary for Subcatchment G5: (new Subcat)

Runoff = 4.24 cfs @ 11.95 hrs, Volume= 0.184 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
1.053	79	50-75% Grass cover, Fair, HSG C
1.053		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
0.3	58	0.2500	3.50		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.0	158	Total			

Hydrograph for Subcatchment G5: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.01
9.50	0.68	0.01	0.01
10.00	0.75	0.02	0.02
10.50	0.85	0.03	0.04
11.00	0.98	0.06	0.08
11.50	1.18	0.13	**0.17**
12.00	2.76	1.01	**3.18**
12.50	3.06	1.23	0.33
13.00	3.21	1.35	0.21
13.50	3.32	1.43	0.16
14.00	3.41	1.50	0.13
14.50	3.48	1.55	0.12
15.00	3.55	1.61	0.10
15.50	3.61	1.65	0.09
16.00	3.66	1.69	0.08
16.50	3.71	1.73	0.08
17.00	3.75	1.76	0.07
17.50	3.79	1.80	0.07
18.00	3.83	1.83	0.06
18.50	3.87	1.86	0.06
19.00	3.90	1.88	0.06
19.50	3.93	1.91	0.05
20.00	3.96	1.93	0.05
20.50	3.99	1.95	0.05
21.00	4.01	1.97	0.04
21.50	4.04	2.00	0.04
22.00	4.06	2.02	0.04
22.50	4.09	2.04	0.04
23.00	4.11	2.06	0.04
23.50	4.14	2.08	0.04
24.00	**4.16**	**2.09**	0.04

Summary for Subcatchment G6: (new Subcat)

Runoff = 2.37 cfs @ 11.95 hrs, Volume= 0.102 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.583	79	50-75% Grass cover, Fair, HSG C
0.583		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G6: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.00
9.50	0.68	0.01	0.01
10.00	0.75	0.02	0.01
10.50	0.85	0.03	0.02
11.00	0.98	0.06	0.04
11.50	1.18	0.13	**0.10**
12.00	2.76	1.01	**1.69**
12.50	3.06	1.23	0.18
13.00	3.21	1.35	0.12
13.50	3.32	1.43	0.09
14.00	3.41	1.50	0.07
14.50	3.48	1.55	0.06
15.00	3.55	1.61	0.06
15.50	3.61	1.65	0.05
16.00	3.66	1.69	0.05
16.50	3.71	1.73	0.04
17.00	3.75	1.76	0.04
17.50	3.79	1.80	0.04
18.00	3.83	1.83	0.04
18.50	3.87	1.86	0.03
19.00	3.90	1.88	0.03
19.50	3.93	1.91	0.03
20.00	3.96	1.93	0.03
20.50	3.99	1.95	0.03
21.00	4.01	1.97	0.02
21.50	4.04	2.00	0.02
22.00	4.06	2.02	0.02
22.50	4.09	2.04	0.02
23.00	4.11	2.06	0.02
23.50	4.14	2.08	0.02
24.00	**4.16**	**2.09**	0.02

Summary for Subcatchment G7: (new Subcat)

Runoff = 3.06 cfs @ 11.95 hrs, Volume= 0.131 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.751	79	50-75% Grass cover, Fair, HSG C
0.751		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G7: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.01
9.50	0.68	0.01	0.01
10.00	0.75	0.02	0.02
10.50	0.85	0.03	0.03
11.00	0.98	0.06	0.06
11.50	1.18	0.13	**0.12**
12.00	2.76	1.01	**2.17**
12.50	3.06	1.23	0.23
13.00	3.21	1.35	0.15
13.50	3.32	1.43	0.12
14.00	3.41	1.50	0.09
14.50	3.48	1.55	0.08
15.00	3.55	1.61	0.07
15.50	3.61	1.65	0.07
16.00	3.66	1.69	0.06
16.50	3.71	1.73	0.05
17.00	3.75	1.76	0.05
17.50	3.79	1.80	0.05
18.00	3.83	1.83	0.05
18.50	3.87	1.86	0.04
19.00	3.90	1.88	0.04
19.50	3.93	1.91	0.04
20.00	3.96	1.93	0.03
20.50	3.99	1.95	0.03
21.00	4.01	1.97	0.03
21.50	4.04	2.00	0.03
22.00	4.06	2.02	0.03
22.50	4.09	2.04	0.03
23.00	4.11	2.06	0.03
23.50	4.14	2.08	0.03
24.00	**4.16**	**2.09**	0.03

Summary for Subcatchment G8: (new Subcat)

Runoff = 3.07 cfs @ 11.95 hrs, Volume= 0.132 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.758	79	50-75% Grass cover, Fair, HSG C
0.758		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	102	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G8: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.01
9.50	0.68	0.01	0.01
10.00	0.75	0.02	0.02
10.50	0.85	0.03	0.03
11.00	0.98	0.06	0.06
11.50	1.18	0.13	**0.12**
12.00	2.76	1.01	**2.23**
12.50	3.06	1.23	0.23
13.00	3.21	1.35	0.15
13.50	3.32	1.43	0.12
14.00	3.41	1.50	0.09
14.50	3.48	1.55	0.08
15.00	3.55	1.61	0.08
15.50	3.61	1.65	0.07
16.00	3.66	1.69	0.06
16.50	3.71	1.73	0.06
17.00	3.75	1.76	0.05
17.50	3.79	1.80	0.05
18.00	3.83	1.83	0.05
18.50	3.87	1.86	0.04
19.00	3.90	1.88	0.04
19.50	3.93	1.91	0.04
20.00	3.96	1.93	0.03
20.50	3.99	1.95	0.03
21.00	4.01	1.97	0.03
21.50	4.04	2.00	0.03
22.00	4.06	2.02	0.03
22.50	4.09	2.04	0.03
23.00	4.11	2.06	0.03
23.50	4.14	2.08	0.03
24.00	**4.16**	**2.09**	0.03

Summary for Subcatchment G9: (new Subcat)

Runoff = 2.63 cfs @ 11.95 hrs, Volume= 0.113 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.16"

Area (ac)	CN	Description
0.646	79	50-75% Grass cover, Fair, HSG C
0.646		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G9: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.02	0.00	0.00
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.00
4.00	0.20	0.00	0.00
4.50	0.23	0.00	0.00
5.00	0.26	0.00	0.00
5.50	0.30	0.00	0.00
6.00	0.33	0.00	0.00
6.50	0.37	0.00	0.00
7.00	0.41	0.00	0.00
7.50	0.45	0.00	0.00
8.00	0.50	0.00	0.00
8.50	0.55	0.00	0.00
9.00	0.61	0.00	0.00
9.50	0.68	0.01	0.01
10.00	0.75	0.02	0.02
10.50	0.85	0.03	0.03
11.00	0.98	0.06	0.05
11.50	1.18	0.13	**0.11**
12.00	2.76	1.01	**1.87**
12.50	3.06	1.23	0.20
13.00	3.21	1.35	0.13
13.50	3.32	1.43	0.10
14.00	3.41	1.50	0.08
14.50	3.48	1.55	0.07
15.00	3.55	1.61	0.06
15.50	3.61	1.65	0.06
16.00	3.66	1.69	0.05
16.50	3.71	1.73	0.05
17.00	3.75	1.76	0.04
17.50	3.79	1.80	0.04
18.00	3.83	1.83	0.04
18.50	3.87	1.86	0.04
19.00	3.90	1.88	0.03
19.50	3.93	1.91	0.03
20.00	3.96	1.93	0.03
20.50	3.99	1.95	0.03
21.00	4.01	1.97	0.03
21.50	4.04	2.00	0.03
22.00	4.06	2.02	0.03
22.50	4.09	2.04	0.03
23.00	4.11	2.06	0.03
23.50	4.14	2.08	0.03
24.00	**4.16**	**2.09**	0.02

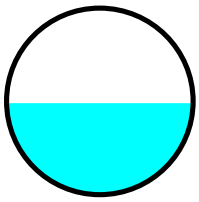
Summary for Reach BC-G1: (new Reach)

Inflow Area = 10.554 ac, 0.00% Impervious, Inflow Depth > 1.86" for 10-yr event
Inflow = 35.09 cfs @ 11.98 hrs, Volume= 1.635 af
Outflow = 35.09 cfs @ 11.98 hrs, Volume= 1.635 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.15 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.32 fps, Avg. Travel Time= 0.2 min

Peak Storage= 104 cf @ 11.98 hrs
Average Depth at Peak Storage= 1.47'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 72.26 cfs

36.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 30.0' Slope= 0.0100 '/'
Inlet Invert= 660.00', Outlet Invert= 659.70'



Hydrograph for Reach BC-G1: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	660.00	0.00
0.50	0.00	0	660.00	0.00
1.00	0.00	0	660.00	0.00
1.50	0.00	0	660.00	0.00
2.00	0.00	0	660.00	0.00
2.50	0.00	0	660.00	0.00
3.00	0.00	0	660.00	0.00
3.50	0.00	0	660.00	0.00
4.00	0.00	0	660.00	0.00
4.50	0.00	0	660.00	0.00
5.00	0.00	0	660.00	0.00
5.50	0.00	0	660.00	0.00
6.00	0.00	0	660.00	0.00
6.50	0.00	0	660.00	0.00
7.00	0.00	0	660.00	0.00
7.50	0.00	0	660.00	0.00
8.00	0.00	0	660.00	0.00
8.50	0.00	0	660.00	0.00
9.00	0.00	0	660.00	0.00
9.50	0.03	1	660.04	0.03
10.00	0.11	2	660.09	0.11
10.50	0.25	3	660.13	0.25
11.00	0.53	5	660.18	0.53
11.50	**1.25**	**10**	**660.27**	**1.25**
12.00	**33.38**	**100**	**661.43**	**33.47**
12.50	3.24	19	660.43	3.25
13.00	2.03	14	660.35	2.03
13.50	1.55	11	660.30	1.55
14.00	1.23	10	660.27	1.23
14.50	1.09	9	660.26	1.09
15.00	0.99	8	660.25	0.99
15.50	0.88	8	660.23	0.88
16.00	0.77	7	660.22	0.77
16.50	0.72	7	660.21	0.72
17.00	0.68	6	660.21	0.69
17.50	0.65	6	660.20	0.65
18.00	0.61	6	660.19	0.61
18.50	0.57	6	660.19	0.57
19.00	0.53	5	660.18	0.53
19.50	0.49	5	660.18	0.49
20.00	0.45	5	660.17	0.45
20.50	0.43	5	660.17	0.43
21.00	0.43	5	660.16	0.43
21.50	0.42	4	660.16	0.42
22.00	0.41	4	660.16	0.41
22.50	0.40	4	660.16	0.40
23.00	0.40	4	660.16	0.40
23.50	0.39	4	660.16	0.39
24.00	0.38	4	660.16	0.38

Summary for Reach BC-G2: (new Reach)

Inflow Area = 39.038 ac, 0.00% Impervious, Inflow Depth > 0.98" for 10-yr event
Inflow = 36.29 cfs @ 11.98 hrs, Volume= 3.198 af
Outflow = 35.86 cfs @ 11.99 hrs, Volume= 3.192 af, Atten= 1%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.10 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.89 fps, Avg. Travel Time= 3.2 min

Peak Storage= 2,162 cf @ 11.99 hrs
Average Depth at Peak Storage= 0.98'
Bank-Full Depth= 3.00' Flow Area= 30.0 sf, Capacity= 333.93 cfs

4.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 368.0' Slope= 0.0435 '/'
Inlet Invert= 656.00', Outlet Invert= 640.00'

Hydrograph for Reach BC-G2: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	1.20	21	656.01	0.04
0.50	1.02	200	656.13	1.03
1.00	0.86	181	656.12	0.87
1.50	0.73	162	656.10	0.73
2.00	0.61	146	656.09	0.62
2.50	0.52	132	656.09	0.53
3.00	0.44	118	656.08	0.44
3.50	0.37	106	656.07	0.37
4.00	0.31	96	656.06	0.32
4.50	0.26	87	656.06	0.27
5.00	0.22	77	656.05	0.23
5.50	0.19	68	656.05	0.19
6.00	0.16	61	656.04	0.16
6.50	0.13	55	656.04	0.14
7.00	0.11	50	656.03	0.11
7.50	0.09	46	656.03	0.10
8.00	0.08	41	656.03	0.08
8.50	0.07	35	656.02	0.07
9.00	0.06	31	656.02	0.06
9.50	0.11	44	656.03	0.09
10.00	0.23	73	656.05	0.21
10.50	0.46	116	656.08	0.43
11.00	0.91	180	656.12	0.87
11.50	**2.00**	**298**	**656.19**	**1.91**
12.00	**34.67**	**2,146**	**656.98**	**35.49**
12.50	4.45	527	656.31	4.59
13.00	3.23	421	656.25	3.26
13.50	2.75	379	656.23	2.77
14.00	2.43	350	656.21	2.45
14.50	2.29	336	656.21	2.30
15.00	2.19	326	656.20	2.20
15.50	2.08	315	656.20	2.09
16.00	1.97	305	656.19	1.98
16.50	1.92	299	656.19	1.93
17.00	1.89	296	656.18	1.89
17.50	1.85	292	656.18	1.85
18.00	1.81	288	656.18	1.81
18.50	1.77	284	656.18	1.77
19.00	1.73	280	656.17	1.73
19.50	1.69	275	656.17	1.69
20.00	1.65	271	656.17	1.65
20.50	1.63	269	656.17	1.63
21.00	1.63	268	656.17	1.63
21.50	1.62	268	656.17	1.62
22.00	1.61	267	656.17	1.61
22.50	1.60	266	656.17	1.60
23.00	1.60	265	656.17	1.60
23.50	1.59	264	656.17	1.59
24.00	1.58	264	656.17	1.58

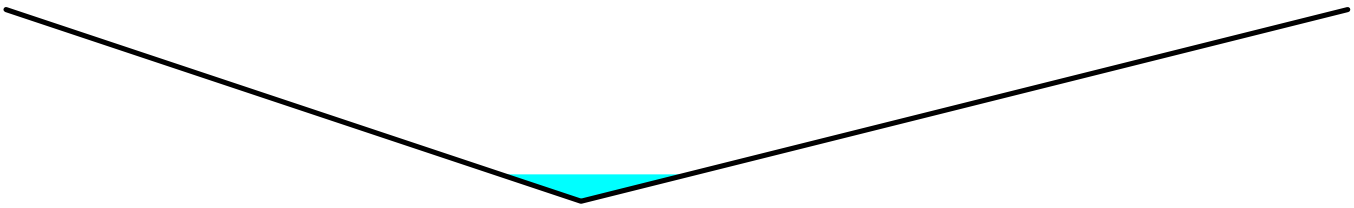
Summary for Reach DB-G1: (new Reach)

Inflow Area = 0.327 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 1.33 cfs @ 11.95 hrs, Volume= 0.057 af
Outflow = 1.32 cfs @ 11.96 hrs, Volume= 0.057 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.77 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 2.0 min

Peak Storage= 58 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 247.05 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 211.7' Slope= 0.0720 '/'
Inlet Invert= 947.63', Outlet Invert= 932.39'



Hydrograph for Reach DB-G1: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	947.63	0.00
0.50	0.00	0	947.63	0.00
1.00	0.00	0	947.63	0.00
1.50	0.00	0	947.63	0.00
2.00	0.00	0	947.63	0.00
2.50	0.00	0	947.63	0.00
3.00	0.00	0	947.63	0.00
3.50	0.00	0	947.63	0.00
4.00	0.00	0	947.63	0.00
4.50	0.00	0	947.63	0.00
5.00	0.00	0	947.63	0.00
5.50	0.00	0	947.63	0.00
6.00	0.00	0	947.63	0.00
6.50	0.00	0	947.63	0.00
7.00	0.00	0	947.63	0.00
7.50	0.00	0	947.63	0.00
8.00	0.00	0	947.63	0.00
8.50	0.00	0	947.63	0.00
9.00	0.00	0	947.65	0.00
9.50	0.00	1	947.66	0.00
10.00	0.01	1	947.67	0.01
10.50	0.01	2	947.68	0.01
11.00	0.02	3	947.69	0.02
11.50	**0.05**	**5**	**947.71**	**0.05**
12.00	**0.95**	**49**	**947.89**	**1.05**
12.50	0.10	9	947.74	0.10
13.00	0.07	6	947.72	0.07
13.50	0.05	5	947.71	0.05
14.00	0.04	4	947.71	0.04
14.50	0.04	4	947.70	0.04
15.00	0.03	4	947.70	0.03
15.50	0.03	3	947.70	0.03
16.00	0.03	3	947.69	0.03
16.50	0.02	3	947.69	0.02
17.00	0.02	3	947.69	0.02
17.50	0.02	3	947.69	0.02
18.00	0.02	3	947.69	0.02
18.50	0.02	2	947.69	0.02
19.00	0.02	2	947.68	0.02
19.50	0.02	2	947.68	0.02
20.00	0.01	2	947.68	0.01
20.50	0.01	2	947.68	0.01
21.00	0.01	2	947.68	0.01
21.50	0.01	2	947.68	0.01
22.00	0.01	2	947.68	0.01
22.50	0.01	2	947.68	0.01
23.00	0.01	2	947.68	0.01
23.50	0.01	2	947.68	0.01
24.00	0.01	2	947.68	0.01

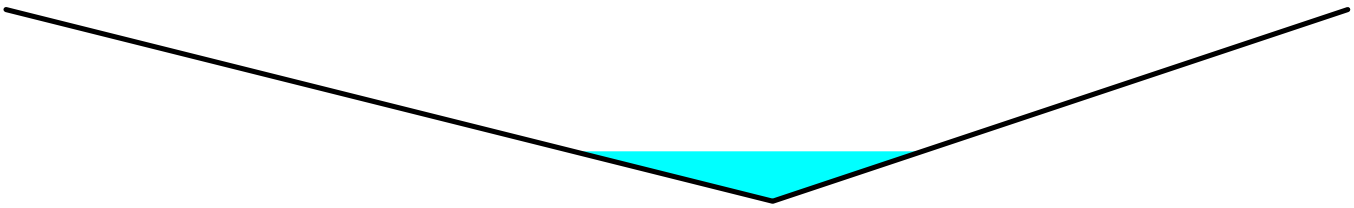
Summary for Reach DB-G10: (new Reach)

Inflow Area = 0.948 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 3.83 cfs @ 11.95 hrs, Volume= 0.165 af
Outflow = 3.63 cfs @ 11.97 hrs, Volume= 0.165 af, Atten= 5%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.81 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.41 fps, Avg. Travel Time= 5.3 min

Peak Storage= 424 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 130.38 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 443.9' Slope= 0.0200 '/'
Inlet Invert= 841.32', Outlet Invert= 832.42'



Hydrograph for Reach DB-G10: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	841.32	0.00
0.50	0.00	0	841.32	0.00
1.00	0.00	0	841.32	0.00
1.50	0.00	0	841.32	0.00
2.00	0.00	0	841.32	0.00
2.50	0.00	0	841.32	0.00
3.00	0.00	0	841.32	0.00
3.50	0.00	0	841.32	0.00
4.00	0.00	0	841.32	0.00
4.50	0.00	0	841.32	0.00
5.00	0.00	0	841.32	0.00
5.50	0.00	0	841.32	0.00
6.00	0.00	0	841.32	0.00
6.50	0.00	0	841.32	0.00
7.00	0.00	0	841.32	0.00
7.50	0.00	0	841.32	0.00
8.00	0.00	0	841.32	0.00
8.50	0.00	0	841.33	0.00
9.00	0.01	3	841.36	0.00
9.50	0.01	5	841.38	0.01
10.00	0.02	8	841.39	0.02
10.50	0.04	13	841.41	0.04
11.00	0.07	21	841.44	0.07
11.50	**0.15**	**37**	**841.48**	**0.14**
12.00	**2.82**	**396**	**841.82**	**3.31**
12.50	0.29	69	841.53	0.32
13.00	0.19	48	841.50	0.20
13.50	0.15	39	841.48	0.15
14.00	0.12	33	841.46	0.12
14.50	0.10	30	841.46	0.11
15.00	0.09	28	841.45	0.10
15.50	0.08	25	841.45	0.09
16.00	0.07	23	841.44	0.07
16.50	0.07	22	841.44	0.07
17.00	0.07	21	841.44	0.07
17.50	0.06	20	841.43	0.06
18.00	0.06	19	841.43	0.06
18.50	0.05	18	841.43	0.05
19.00	0.05	17	841.42	0.05
19.50	0.05	16	841.42	0.05
20.00	0.04	15	841.42	0.04
20.50	0.04	15	841.42	0.04
21.00	0.04	15	841.42	0.04
21.50	0.04	14	841.42	0.04
22.00	0.04	14	841.41	0.04
22.50	0.04	14	841.41	0.04
23.00	0.04	14	841.41	0.04
23.50	0.04	13	841.41	0.04
24.00	0.04	13	841.41	0.04

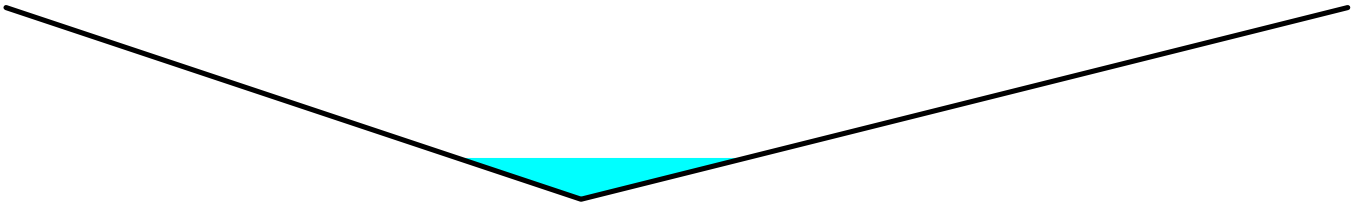
Summary for Reach DB-G11: (new Reach)

Inflow Area = 0.540 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 2.20 cfs @ 11.95 hrs, Volume= 0.094 af
Outflow = 2.15 cfs @ 11.96 hrs, Volume= 0.094 af, Atten= 2%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.32 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.22 fps, Avg. Travel Time= 2.9 min

Peak Storage= 139 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 129.15 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 213.5' Slope= 0.0197 '/'
Inlet Invert= 811.62', Outlet Invert= 807.42'



Hydrograph for Reach DB-G11: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	811.62	0.00
0.50	0.00	0	811.62	0.00
1.00	0.00	0	811.62	0.00
1.50	0.00	0	811.62	0.00
2.00	0.00	0	811.62	0.00
2.50	0.00	0	811.62	0.00
3.00	0.00	0	811.62	0.00
3.50	0.00	0	811.62	0.00
4.00	0.00	0	811.62	0.00
4.50	0.00	0	811.62	0.00
5.00	0.00	0	811.62	0.00
5.50	0.00	0	811.62	0.00
6.00	0.00	0	811.62	0.00
6.50	0.00	0	811.62	0.00
7.00	0.00	0	811.62	0.00
7.50	0.00	0	811.62	0.00
8.00	0.00	0	811.62	0.00
8.50	0.00	0	811.63	0.00
9.00	0.00	1	811.66	0.00
9.50	0.01	2	811.67	0.01
10.00	0.01	3	811.68	0.01
10.50	0.02	4	811.70	0.02
11.00	0.04	7	811.72	0.04
11.50	**0.09**	**12**	**811.75**	**0.09**
12.00	**1.56**	**120**	**812.02**	**1.78**
12.50	0.17	21	811.79	0.18
13.00	0.11	15	811.76	0.11
13.50	0.08	12	811.75	0.09
14.00	0.07	10	811.74	0.07
14.50	0.06	9	811.73	0.06
15.00	0.05	9	811.73	0.05
15.50	0.05	8	811.72	0.05
16.00	0.04	7	811.72	0.04
16.50	0.04	7	811.72	0.04
17.00	0.04	7	811.71	0.04
17.50	0.04	6	811.71	0.04
18.00	0.03	6	811.71	0.03
18.50	0.03	6	811.71	0.03
19.00	0.03	5	811.70	0.03
19.50	0.03	5	811.70	0.03
20.00	0.02	5	811.70	0.02
20.50	0.02	5	811.70	0.02
21.00	0.02	5	811.70	0.02
21.50	0.02	5	811.70	0.02
22.00	0.02	4	811.70	0.02
22.50	0.02	4	811.70	0.02
23.00	0.02	4	811.70	0.02
23.50	0.02	4	811.70	0.02
24.00	0.02	4	811.69	0.02

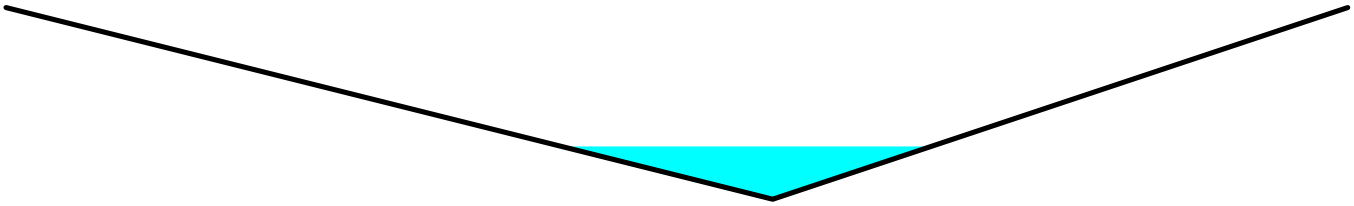
Summary for Reach DB-G12: (new Reach)

Inflow Area = 1.102 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 4.48 cfs @ 11.95 hrs, Volume= 0.192 af
Outflow = 4.20 cfs @ 11.97 hrs, Volume= 0.192 af, Atten= 6%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.95 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 5.9 min

Peak Storage= 552 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 130.47 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 518.5' Slope= 0.0201 '/'
Inlet Invert= 817.83', Outlet Invert= 807.42'



Hydrograph for Reach DB-G12: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	817.83	0.00
0.50	0.00	0	817.83	0.00
1.00	0.00	0	817.83	0.00
1.50	0.00	0	817.83	0.00
2.00	0.00	0	817.83	0.00
2.50	0.00	0	817.83	0.00
3.00	0.00	0	817.83	0.00
3.50	0.00	0	817.83	0.00
4.00	0.00	0	817.83	0.00
4.50	0.00	0	817.83	0.00
5.00	0.00	0	817.83	0.00
5.50	0.00	0	817.83	0.00
6.00	0.00	0	817.83	0.00
6.50	0.00	0	817.83	0.00
7.00	0.00	0	817.83	0.00
7.50	0.00	0	817.83	0.00
8.00	0.00	0	817.83	0.00
8.50	0.00	0	817.84	0.00
9.00	0.01	4	817.87	0.01
9.50	0.01	7	817.89	0.01
10.00	0.03	11	817.91	0.02
10.50	0.05	17	817.93	0.04
11.00	0.08	27	817.95	0.08
11.50	**0.18**	**49**	**817.99**	**0.17**
12.00	**3.19**	**514**	**818.36**	**3.83**
12.50	0.34	90	818.05	0.38
13.00	0.22	63	818.02	0.23
13.50	0.17	51	818.00	0.18
14.00	0.14	43	817.98	0.14
14.50	0.12	39	817.98	0.12
15.00	0.11	36	817.97	0.11
15.50	0.10	33	817.96	0.10
16.00	0.09	30	817.96	0.09
16.50	0.08	28	817.95	0.08
17.00	0.08	27	817.95	0.08
17.50	0.07	26	817.95	0.07
18.00	0.07	25	817.95	0.07
18.50	0.06	24	817.94	0.06
19.00	0.06	22	817.94	0.06
19.50	0.05	21	817.94	0.05
20.00	0.05	20	817.93	0.05
20.50	0.05	19	817.93	0.05
21.00	0.05	19	817.93	0.05
21.50	0.05	19	817.93	0.05
22.00	0.05	18	817.93	0.05
22.50	0.04	18	817.93	0.04
23.00	0.04	18	817.93	0.04
23.50	0.04	18	817.93	0.04
24.00	0.04	17	817.93	0.04

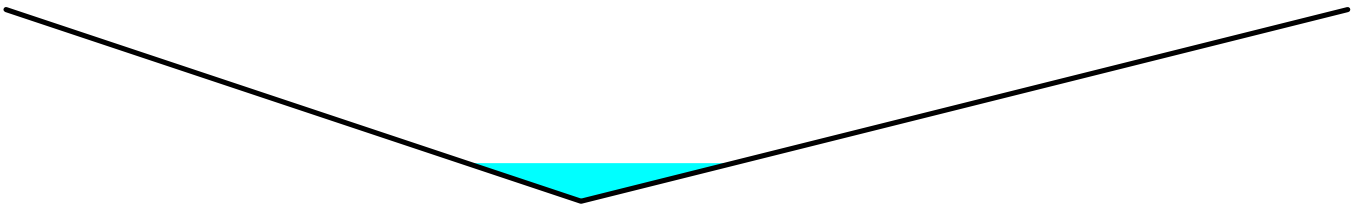
Summary for Reach DB-G13: (new Reach)

Inflow Area = 0.435 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 1.77 cfs @ 11.95 hrs, Volume= 0.076 af
Outflow = 1.74 cfs @ 11.96 hrs, Volume= 0.076 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.14 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 2.4 min

Peak Storage= 93 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 129.12 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 167.3' Slope= 0.0197 '/'
Inlet Invert= 785.72', Outlet Invert= 782.43'



Hydrograph for Reach DB-G13: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	785.72	0.00
0.50	0.00	0	785.72	0.00
1.00	0.00	0	785.72	0.00
1.50	0.00	0	785.72	0.00
2.00	0.00	0	785.72	0.00
2.50	0.00	0	785.72	0.00
3.00	0.00	0	785.72	0.00
3.50	0.00	0	785.72	0.00
4.00	0.00	0	785.72	0.00
4.50	0.00	0	785.72	0.00
5.00	0.00	0	785.72	0.00
5.50	0.00	0	785.72	0.00
6.00	0.00	0	785.72	0.00
6.50	0.00	0	785.72	0.00
7.00	0.00	0	785.72	0.00
7.50	0.00	0	785.72	0.00
8.00	0.00	0	785.72	0.00
8.50	0.00	0	785.73	0.00
9.00	0.00	1	785.75	0.00
9.50	0.01	1	785.76	0.01
10.00	0.01	2	785.78	0.01
10.50	0.02	3	785.79	0.02
11.00	0.03	5	785.81	0.03
11.50	**0.07**	**8**	**785.84**	**0.07**
12.00	**1.26**	**79**	**786.09**	**1.41**
12.50	0.13	14	785.87	0.14
13.00	0.09	10	785.85	0.09
13.50	0.07	8	785.84	0.07
14.00	0.05	7	785.83	0.05
14.50	0.05	6	785.82	0.05
15.00	0.04	6	785.82	0.04
15.50	0.04	5	785.81	0.04
16.00	0.03	5	785.81	0.03
16.50	0.03	5	785.81	0.03
17.00	0.03	4	785.81	0.03
17.50	0.03	4	785.80	0.03
18.00	0.03	4	785.80	0.03
18.50	0.02	4	785.80	0.02
19.00	0.02	4	785.80	0.02
19.50	0.02	3	785.80	0.02
20.00	0.02	3	785.79	0.02
20.50	0.02	3	785.79	0.02
21.00	0.02	3	785.79	0.02
21.50	0.02	3	785.79	0.02
22.00	0.02	3	785.79	0.02
22.50	0.02	3	785.79	0.02
23.00	0.02	3	785.79	0.02
23.50	0.02	3	785.79	0.02
24.00	0.02	3	785.79	0.02

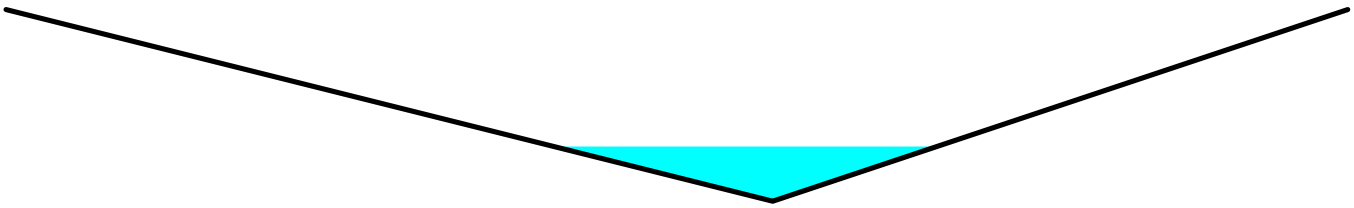
Summary for Reach DB-G14: (new Reach)

Inflow Area = 1.207 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 4.91 cfs @ 11.95 hrs, Volume= 0.210 af
Outflow = 4.63 cfs @ 11.97 hrs, Volume= 0.210 af, Atten= 6%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.04 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 1.49 fps, Avg. Travel Time= 5.6 min

Peak Storage= 574 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 130.41 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 502.0' Slope= 0.0201 '/'
Inlet Invert= 792.50', Outlet Invert= 782.43'



Hydrograph for Reach DB-G14: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	792.50	0.00
0.50	0.00	0	792.50	0.00
1.00	0.00	0	792.50	0.00
1.50	0.00	0	792.50	0.00
2.00	0.00	0	792.50	0.00
2.50	0.00	0	792.50	0.00
3.00	0.00	0	792.50	0.00
3.50	0.00	0	792.50	0.00
4.00	0.00	0	792.50	0.00
4.50	0.00	0	792.50	0.00
5.00	0.00	0	792.50	0.00
5.50	0.00	0	792.50	0.00
6.00	0.00	0	792.50	0.00
6.50	0.00	0	792.50	0.00
7.00	0.00	0	792.50	0.00
7.50	0.00	0	792.50	0.00
8.00	0.00	0	792.50	0.00
8.50	0.00	0	792.51	0.00
9.00	0.01	4	792.55	0.01
9.50	0.02	7	792.56	0.01
10.00	0.03	12	792.58	0.03
10.50	0.05	18	792.60	0.05
11.00	0.09	28	792.63	0.08
11.50	**0.20**	**51**	**792.67**	**0.18**
12.00	**3.49**	**532**	**793.05**	**4.18**
12.50	0.37	93	792.73	0.41
13.00	0.24	65	792.69	0.25
13.50	0.19	53	792.67	0.19
14.00	0.15	45	792.66	0.15
14.50	0.13	40	792.65	0.13
15.00	0.12	37	792.65	0.12
15.50	0.11	34	792.64	0.11
16.00	0.09	31	792.63	0.10
16.50	0.09	29	792.63	0.09
17.00	0.08	28	792.63	0.08
17.50	0.08	27	792.62	0.08
18.00	0.07	26	792.62	0.07
18.50	0.07	25	792.62	0.07
19.00	0.06	23	792.61	0.06
19.50	0.06	22	792.61	0.06
20.00	0.05	20	792.61	0.05
20.50	0.05	20	792.61	0.05
21.00	0.05	20	792.61	0.05
21.50	0.05	19	792.60	0.05
22.00	0.05	19	792.60	0.05
22.50	0.05	19	792.60	0.05
23.00	0.05	19	792.60	0.05
23.50	0.05	18	792.60	0.05
24.00	0.05	18	792.60	0.05

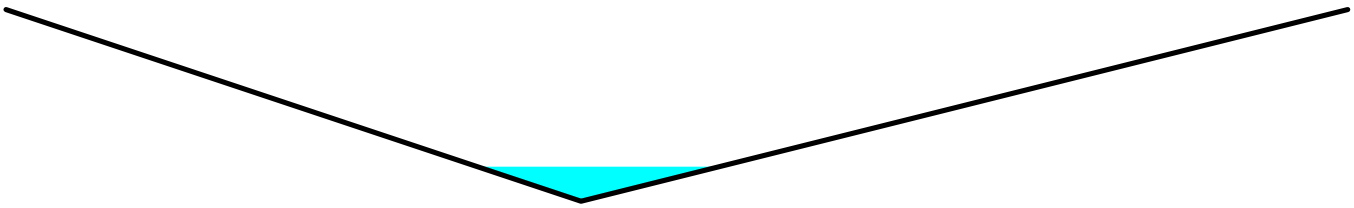
Summary for Reach DB-G15: (new Reach)

Inflow Area = 0.329 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 1.34 cfs @ 11.95 hrs, Volume= 0.057 af
Outflow = 1.33 cfs @ 11.96 hrs, Volume= 0.057 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.91 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.07 fps, Avg. Travel Time= 1.9 min

Peak Storage= 55 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 127.72 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 121.1' Slope= 0.0192 '/'
Inlet Invert= 759.76', Outlet Invert= 757.43'



Hydrograph for Reach DB-G15: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	759.76	0.00
0.50	0.00	0	759.76	0.00
1.00	0.00	0	759.76	0.00
1.50	0.00	0	759.76	0.00
2.00	0.00	0	759.76	0.00
2.50	0.00	0	759.76	0.00
3.00	0.00	0	759.76	0.00
3.50	0.00	0	759.76	0.00
4.00	0.00	0	759.76	0.00
4.50	0.00	0	759.76	0.00
5.00	0.00	0	759.76	0.00
5.50	0.00	0	759.76	0.00
6.00	0.00	0	759.76	0.00
6.50	0.00	0	759.76	0.00
7.00	0.00	0	759.76	0.00
7.50	0.00	0	759.76	0.00
8.00	0.00	0	759.76	0.00
8.50	0.00	0	759.77	0.00
9.00	0.00	0	759.79	0.00
9.50	0.00	1	759.80	0.00
10.00	0.01	1	759.81	0.01
10.50	0.01	2	759.82	0.01
11.00	0.02	3	759.84	0.02
11.50	**0.05**	**5**	**759.87**	**0.05**
12.00	**0.95**	**46**	**760.09**	**1.05**
12.50	0.10	8	759.90	0.11
13.00	0.07	6	759.88	0.07
13.50	0.05	5	759.87	0.05
14.00	0.04	4	759.86	0.04
14.50	0.04	4	759.85	0.04
15.00	0.03	3	759.85	0.03
15.50	0.03	3	759.85	0.03
16.00	0.03	3	759.84	0.03
16.50	0.02	3	759.84	0.02
17.00	0.02	3	759.84	0.02
17.50	0.02	2	759.84	0.02
18.00	0.02	2	759.83	0.02
18.50	0.02	2	759.83	0.02
19.00	0.02	2	759.83	0.02
19.50	0.02	2	759.83	0.02
20.00	0.01	2	759.83	0.01
20.50	0.01	2	759.83	0.01
21.00	0.01	2	759.82	0.01
21.50	0.01	2	759.82	0.01
22.00	0.01	2	759.82	0.01
22.50	0.01	2	759.82	0.01
23.00	0.01	2	759.82	0.01
23.50	0.01	2	759.82	0.01
24.00	0.01	2	759.82	0.01

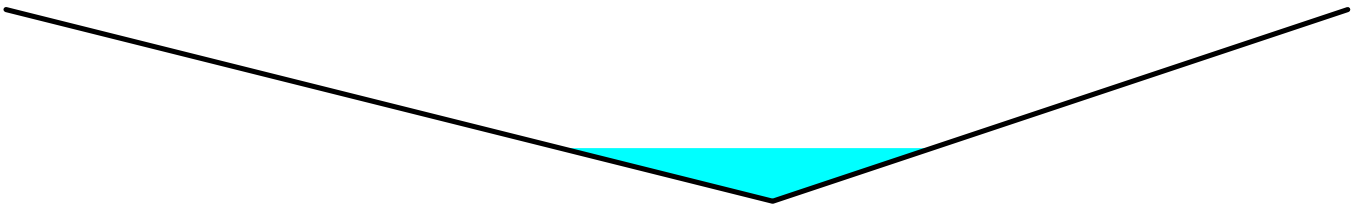
Summary for Reach DB-G16: (new Reach)

Inflow Area = 1.069 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 4.35 cfs @ 11.95 hrs, Volume= 0.186 af
Outflow = 4.13 cfs @ 11.97 hrs, Volume= 0.186 af, Atten= 5%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.83 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.41 fps, Avg. Travel Time= 5.1 min

Peak Storage= 465 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 126.14 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 431.1' Slope= 0.0188 '/'
Inlet Invert= 765.52', Outlet Invert= 757.43'



Hydrograph for Reach DB-G16: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	765.52	0.00
0.50	0.00	0	765.52	0.00
1.00	0.00	0	765.52	0.00
1.50	0.00	0	765.52	0.00
2.00	0.00	0	765.52	0.00
2.50	0.00	0	765.52	0.00
3.00	0.00	0	765.52	0.00
3.50	0.00	0	765.52	0.00
4.00	0.00	0	765.52	0.00
4.50	0.00	0	765.52	0.00
5.00	0.00	0	765.52	0.00
5.50	0.00	0	765.52	0.00
6.00	0.00	0	765.52	0.00
6.50	0.00	0	765.52	0.00
7.00	0.00	0	765.52	0.00
7.50	0.00	0	765.52	0.00
8.00	0.00	0	765.52	0.00
8.50	0.00	0	765.53	0.00
9.00	0.01	3	765.57	0.01
9.50	0.01	6	765.58	0.01
10.00	0.02	9	765.60	0.02
10.50	0.04	15	765.62	0.04
11.00	0.08	23	765.64	0.08
11.50	**0.18**	**41**	**765.68**	**0.16**
12.00	**3.09**	**426**	**766.05**	**3.69**
12.50	0.33	74	765.74	0.36
13.00	0.22	52	765.71	0.22
13.50	0.17	42	765.69	0.17
14.00	0.13	36	765.67	0.14
14.50	0.12	32	765.67	0.12
15.00	0.11	30	765.66	0.11
15.50	0.09	28	765.65	0.10
16.00	0.08	25	765.65	0.08
16.50	0.08	24	765.64	0.08
17.00	0.07	23	765.64	0.07
17.50	0.07	22	765.64	0.07
18.00	0.07	21	765.64	0.07
18.50	0.06	20	765.63	0.06
19.00	0.06	19	765.63	0.06
19.50	0.05	18	765.63	0.05
20.00	0.05	16	765.62	0.05
20.50	0.05	16	765.62	0.05
21.00	0.05	16	765.62	0.05
21.50	0.04	16	765.62	0.04
22.00	0.04	15	765.62	0.04
22.50	0.04	15	765.62	0.04
23.00	0.04	15	765.62	0.04
23.50	0.04	15	765.62	0.04
24.00	0.04	15	765.62	0.04

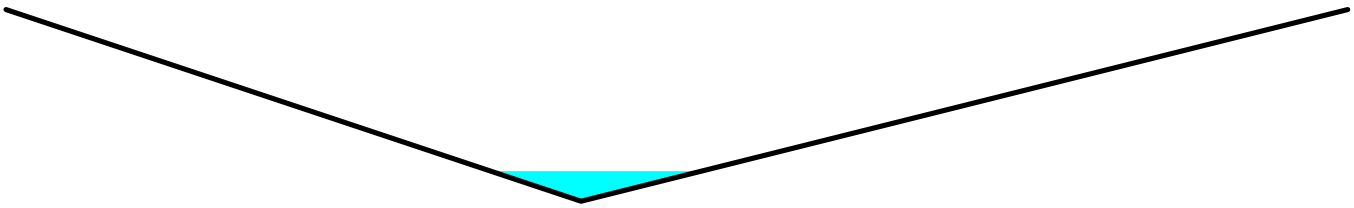
Summary for Reach DB-G17: (new Reach)

Inflow Area = 0.224 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 0.91 cfs @ 11.95 hrs, Volume= 0.039 af
Outflow = 0.91 cfs @ 11.95 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.63 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.97 fps, Avg. Travel Time= 1.3 min

Peak Storage= 26 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 126.25 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 75.0' Slope= 0.0188 '/'
Inlet Invert= 733.85', Outlet Invert= 732.44'



Hydrograph for Reach DB-G17: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	733.85	0.00
0.50	0.00	0	733.85	0.00
1.00	0.00	0	733.85	0.00
1.50	0.00	0	733.85	0.00
2.00	0.00	0	733.85	0.00
2.50	0.00	0	733.85	0.00
3.00	0.00	0	733.85	0.00
3.50	0.00	0	733.85	0.00
4.00	0.00	0	733.85	0.00
4.50	0.00	0	733.85	0.00
5.00	0.00	0	733.85	0.00
5.50	0.00	0	733.85	0.00
6.00	0.00	0	733.85	0.00
6.50	0.00	0	733.85	0.00
7.00	0.00	0	733.85	0.00
7.50	0.00	0	733.85	0.00
8.00	0.00	0	733.85	0.00
8.50	0.00	0	733.85	0.00
9.00	0.00	0	733.88	0.00
9.50	0.00	0	733.88	0.00
10.00	0.01	1	733.89	0.01
10.50	0.01	1	733.90	0.01
11.00	0.02	1	733.92	0.02
11.50	**0.04**	**2**	**733.94**	**0.04**
12.00	**0.65**	**21**	**734.13**	**0.70**
12.50	0.07	4	733.97	0.07
13.00	0.05	3	733.95	0.05
13.50	0.03	2	733.94	0.04
14.00	0.03	2	733.93	0.03
14.50	0.02	2	733.93	0.02
15.00	0.02	2	733.93	0.02
15.50	0.02	1	733.92	0.02
16.00	0.02	1	733.92	0.02
16.50	0.02	1	733.92	0.02
17.00	0.02	1	733.92	0.02
17.50	0.01	1	733.92	0.01
18.00	0.01	1	733.91	0.01
18.50	0.01	1	733.91	0.01
19.00	0.01	1	733.91	0.01
19.50	0.01	1	733.91	0.01
20.00	0.01	1	733.91	0.01
20.50	0.01	1	733.91	0.01
21.00	0.01	1	733.91	0.01
21.50	0.01	1	733.91	0.01
22.00	0.01	1	733.91	0.01
22.50	0.01	1	733.90	0.01
23.00	0.01	1	733.90	0.01
23.50	0.01	1	733.90	0.01
24.00	0.01	1	733.90	0.01

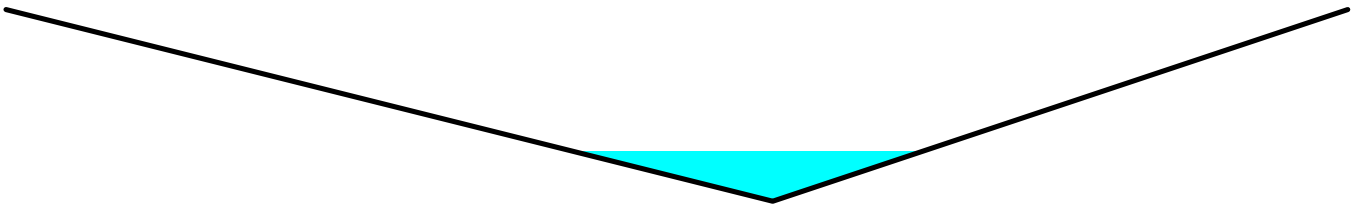
Summary for Reach DB-G18: (new Reach)

Inflow Area = 0.903 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 3.67 cfs @ 11.95 hrs, Volume= 0.157 af
Outflow = 3.53 cfs @ 11.96 hrs, Volume= 0.157 af, Atten= 4%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.69 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 4.4 min

Peak Storage= 340 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 126.22 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 355.5' Slope= 0.0188 '/'
Inlet Invert= 739.12', Outlet Invert= 732.44'



Hydrograph for Reach DB-G18: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	739.12	0.00
0.50	0.00	0	739.12	0.00
1.00	0.00	0	739.12	0.00
1.50	0.00	0	739.12	0.00
2.00	0.00	0	739.12	0.00
2.50	0.00	0	739.12	0.00
3.00	0.00	0	739.12	0.00
3.50	0.00	0	739.12	0.00
4.00	0.00	0	739.12	0.00
4.50	0.00	0	739.12	0.00
5.00	0.00	0	739.12	0.00
5.50	0.00	0	739.12	0.00
6.00	0.00	0	739.12	0.00
6.50	0.00	0	739.12	0.00
7.00	0.00	0	739.12	0.00
7.50	0.00	0	739.12	0.00
8.00	0.00	0	739.12	0.00
8.50	0.00	0	739.13	0.00
9.00	0.01	2	739.16	0.00
9.50	0.01	4	739.18	0.01
10.00	0.02	7	739.19	0.02
10.50	0.04	11	739.21	0.03
11.00	0.07	17	739.24	0.06
11.50	**0.15**	**30**	**739.28**	**0.14**
12.00	**2.61**	**307**	**739.62**	**3.08**
12.50	0.28	54	739.33	0.30
13.00	0.18	38	739.29	0.19
13.50	0.14	31	739.28	0.14
14.00	0.11	26	739.26	0.11
14.50	0.10	24	739.26	0.10
15.00	0.09	22	739.25	0.09
15.50	0.08	20	739.25	0.08
16.00	0.07	18	739.24	0.07
16.50	0.07	17	739.24	0.07
17.00	0.06	16	739.23	0.06
17.50	0.06	16	739.23	0.06
18.00	0.06	15	739.23	0.06
18.50	0.05	14	739.23	0.05
19.00	0.05	14	739.22	0.05
19.50	0.04	13	739.22	0.04
20.00	0.04	12	739.22	0.04
20.50	0.04	12	739.22	0.04
21.00	0.04	11	739.22	0.04
21.50	0.04	11	739.21	0.04
22.00	0.04	11	739.21	0.04
22.50	0.04	11	739.21	0.04
23.00	0.04	11	739.21	0.04
23.50	0.04	11	739.21	0.04
24.00	0.03	10	739.21	0.03

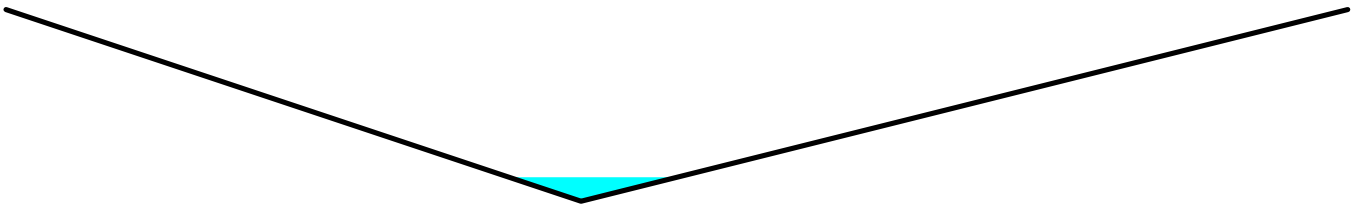
Summary for Reach DB-G19: (new Reach)

Inflow Area = 0.118 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 0.48 cfs @ 11.95 hrs, Volume= 0.021 af
Outflow = 0.48 cfs @ 11.95 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.19 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 0.6 min

Peak Storage= 6 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 122.53 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 28.8' Slope= 0.0177 '/'
Inlet Invert= 707.95', Outlet Invert= 707.44'



Hydrograph for Reach DB-G19: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	707.95	0.00
0.50	0.00	0	707.95	0.00
1.00	0.00	0	707.95	0.00
1.50	0.00	0	707.95	0.00
2.00	0.00	0	707.95	0.00
2.50	0.00	0	707.95	0.00
3.00	0.00	0	707.95	0.00
3.50	0.00	0	707.95	0.00
4.00	0.00	0	707.95	0.00
4.50	0.00	0	707.95	0.00
5.00	0.00	0	707.95	0.00
5.50	0.00	0	707.95	0.00
6.00	0.00	0	707.95	0.00
6.50	0.00	0	707.95	0.00
7.00	0.00	0	707.95	0.00
7.50	0.00	0	707.95	0.00
8.00	0.00	0	707.95	0.00
8.50	0.00	0	707.95	0.00
9.00	0.00	0	707.97	0.00
9.50	0.00	0	707.98	0.00
10.00	0.00	0	707.98	0.00
10.50	0.00	0	707.99	0.00
11.00	0.01	0	708.00	0.01
11.50	**0.02**	**1**	**708.02**	**0.02**
12.00	**0.34**	**5**	**708.17**	**0.35**
12.50	0.04	1	708.04	0.04
13.00	0.02	1	708.03	0.02
13.50	0.02	1	708.02	0.02
14.00	0.01	0	708.02	0.01
14.50	0.01	0	708.01	0.01
15.00	0.01	0	708.01	0.01
15.50	0.01	0	708.01	0.01
16.00	0.01	0	708.01	0.01
16.50	0.01	0	708.00	0.01
17.00	0.01	0	708.00	0.01
17.50	0.01	0	708.00	0.01
18.00	0.01	0	708.00	0.01
18.50	0.01	0	708.00	0.01
19.00	0.01	0	708.00	0.01
19.50	0.01	0	708.00	0.01
20.00	0.01	0	707.99	0.01
20.50	0.01	0	707.99	0.01
21.00	0.01	0	707.99	0.01
21.50	0.00	0	707.99	0.00
22.00	0.00	0	707.99	0.00
22.50	0.00	0	707.99	0.00
23.00	0.00	0	707.99	0.00
23.50	0.00	0	707.99	0.00
24.00	0.00	0	707.99	0.00

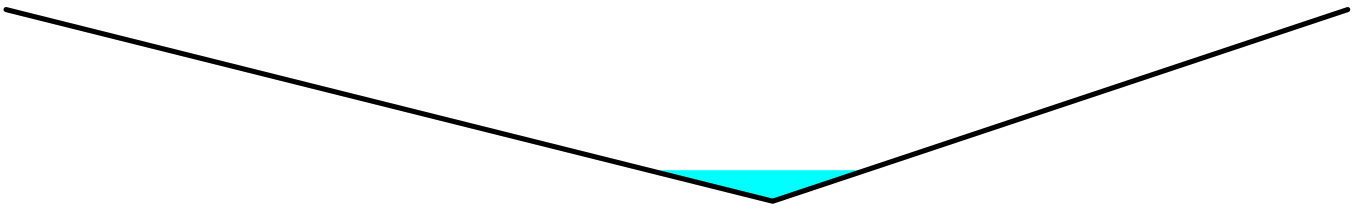
Summary for Reach DB-G2: (new Reach)

Inflow Area = 0.245 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 1.00 cfs @ 11.95 hrs, Volume= 0.043 af
Outflow = 0.98 cfs @ 11.96 hrs, Volume= 0.043 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.67 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 0.98 fps, Avg. Travel Time= 2.4 min

Peak Storage= 53 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 125.55 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 143.6' Slope= 0.0186 '/'
Inlet Invert= 935.61', Outlet Invert= 932.94'



Hydrograph for Reach DB-G2: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	935.61	0.00
0.50	0.00	0	935.61	0.00
1.00	0.00	0	935.61	0.00
1.50	0.00	0	935.61	0.00
2.00	0.00	0	935.61	0.00
2.50	0.00	0	935.61	0.00
3.00	0.00	0	935.61	0.00
3.50	0.00	0	935.61	0.00
4.00	0.00	0	935.61	0.00
4.50	0.00	0	935.61	0.00
5.00	0.00	0	935.61	0.00
5.50	0.00	0	935.61	0.00
6.00	0.00	0	935.61	0.00
6.50	0.00	0	935.61	0.00
7.00	0.00	0	935.61	0.00
7.50	0.00	0	935.61	0.00
8.00	0.00	0	935.61	0.00
8.50	0.00	0	935.61	0.00
9.00	0.00	0	935.64	0.00
9.50	0.00	1	935.65	0.00
10.00	0.01	1	935.65	0.01
10.50	0.01	2	935.67	0.01
11.00	0.02	3	935.68	0.02
11.50	**0.04**	**5**	**935.71**	**0.04**
12.00	**0.71**	**45**	**935.91**	**0.80**
12.50	0.08	8	935.74	0.08
13.00	0.05	6	935.72	0.05
13.50	0.04	5	935.71	0.04
14.00	0.03	4	935.70	0.03
14.50	0.03	4	935.69	0.03
15.00	0.02	3	935.69	0.02
15.50	0.02	3	935.69	0.02
16.00	0.02	3	935.68	0.02
16.50	0.02	3	935.68	0.02
17.00	0.02	2	935.68	0.02
17.50	0.02	2	935.68	0.02
18.00	0.01	2	935.68	0.01
18.50	0.01	2	935.67	0.01
19.00	0.01	2	935.67	0.01
19.50	0.01	2	935.67	0.01
20.00	0.01	2	935.67	0.01
20.50	0.01	2	935.67	0.01
21.00	0.01	2	935.67	0.01
21.50	0.01	2	935.67	0.01
22.00	0.01	2	935.67	0.01
22.50	0.01	2	935.67	0.01
23.00	0.01	2	935.67	0.01
23.50	0.01	2	935.67	0.01
24.00	0.01	2	935.67	0.01

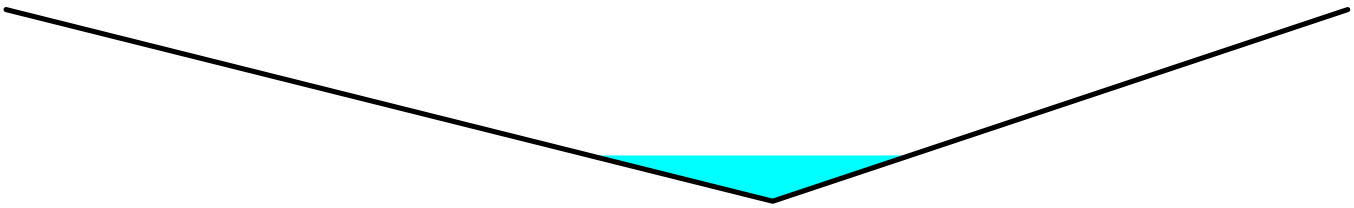
Summary for Reach DB-G20: (new Reach)

Inflow Area = 0.729 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 2.97 cfs @ 11.95 hrs, Volume= 0.127 af
Outflow = 2.88 cfs @ 11.96 hrs, Volume= 0.127 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.59 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 3.5 min

Peak Storage= 226 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.48'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 130.43 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 281.1' Slope= 0.0201 '/'
Inlet Invert= 713.08', Outlet Invert= 707.44'



Hydrograph for Reach DB-G20: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	713.08	0.00
0.50	0.00	0	713.08	0.00
1.00	0.00	0	713.08	0.00
1.50	0.00	0	713.08	0.00
2.00	0.00	0	713.08	0.00
2.50	0.00	0	713.08	0.00
3.00	0.00	0	713.08	0.00
3.50	0.00	0	713.08	0.00
4.00	0.00	0	713.08	0.00
4.50	0.00	0	713.08	0.00
5.00	0.00	0	713.08	0.00
5.50	0.00	0	713.08	0.00
6.00	0.00	0	713.08	0.00
6.50	0.00	0	713.08	0.00
7.00	0.00	0	713.08	0.00
7.50	0.00	0	713.08	0.00
8.00	0.00	0	713.08	0.00
8.50	0.00	0	713.09	0.00
9.00	0.01	2	713.12	0.00
9.50	0.01	3	713.13	0.01
10.00	0.02	5	713.15	0.02
10.50	0.03	7	713.16	0.03
11.00	0.06	11	713.19	0.05
11.50	**0.12**	**20**	**713.22**	**0.11**
12.00	**2.11**	**200**	**713.53**	**2.45**
12.50	0.22	35	713.27	0.24
13.00	0.15	25	713.24	0.15
13.50	0.11	20	713.22	0.12
14.00	0.09	17	713.21	0.09
14.50	0.08	15	713.20	0.08
15.00	0.07	14	713.20	0.07
15.50	0.06	13	713.20	0.07
16.00	0.06	12	713.19	0.06
16.50	0.05	11	713.19	0.05
17.00	0.05	11	713.18	0.05
17.50	0.05	10	713.18	0.05
18.00	0.04	10	713.18	0.04
18.50	0.04	9	713.18	0.04
19.00	0.04	9	713.17	0.04
19.50	0.04	8	713.17	0.04
20.00	0.03	8	713.17	0.03
20.50	0.03	8	713.17	0.03
21.00	0.03	8	713.17	0.03
21.50	0.03	7	713.17	0.03
22.00	0.03	7	713.17	0.03
22.50	0.03	7	713.17	0.03
23.00	0.03	7	713.16	0.03
23.50	0.03	7	713.16	0.03
24.00	0.03	7	713.16	0.03

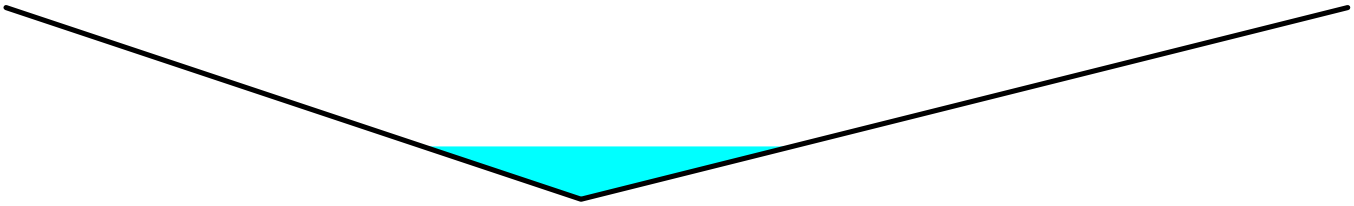
Summary for Reach DB-G24: (new Reach)

Inflow Area = 1.208 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 4.88 cfs @ 11.95 hrs, Volume= 0.211 af
Outflow = 4.61 cfs @ 11.97 hrs, Volume= 0.210 af, Atten= 6%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.35 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 1.61 fps, Avg. Travel Time= 5.6 min

Peak Storage= 569 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 143.93 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 537.4' Slope= 0.0244 '/'
Inlet Invert= 841.32', Outlet Invert= 828.19'



Hydrograph for Reach DB-G24: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	841.32	0.00
0.50	0.00	0	841.32	0.00
1.00	0.00	0	841.32	0.00
1.50	0.00	0	841.32	0.00
2.00	0.00	0	841.32	0.00
2.50	0.00	0	841.32	0.00
3.00	0.00	0	841.32	0.00
3.50	0.00	0	841.32	0.00
4.00	0.00	0	841.32	0.00
4.50	0.00	0	841.32	0.00
5.00	0.00	0	841.32	0.00
5.50	0.00	0	841.32	0.00
6.00	0.00	0	841.32	0.00
6.50	0.00	0	841.32	0.00
7.00	0.00	0	841.32	0.00
7.50	0.00	0	841.32	0.00
8.00	0.00	0	841.32	0.00
8.50	0.00	0	841.33	0.00
9.00	0.01	4	841.36	0.01
9.50	0.02	7	841.38	0.01
10.00	0.03	11	841.40	0.03
10.50	0.05	18	841.42	0.05
11.00	0.09	28	841.44	0.08
11.50	**0.20**	**50**	**841.48**	**0.18**
12.00	**3.60**	**534**	**841.85**	**4.23**
12.50	0.37	93	841.54	0.41
13.00	0.24	65	841.51	0.25
13.50	0.19	53	841.49	0.19
14.00	0.15	44	841.47	0.15
14.50	0.13	40	841.47	0.13
15.00	0.12	37	841.46	0.12
15.50	0.11	34	841.45	0.11
16.00	0.09	31	841.45	0.10
16.50	0.09	29	841.44	0.09
17.00	0.08	28	841.44	0.08
17.50	0.08	27	841.44	0.08
18.00	0.07	26	841.44	0.07
18.50	0.07	24	841.43	0.07
19.00	0.06	23	841.43	0.06
19.50	0.06	22	841.43	0.06
20.00	0.05	20	841.42	0.05
20.50	0.05	20	841.42	0.05
21.00	0.05	20	841.42	0.05
21.50	0.05	19	841.42	0.05
22.00	0.05	19	841.42	0.05
22.50	0.05	19	841.42	0.05
23.00	0.05	19	841.42	0.05
23.50	0.05	18	841.42	0.05
24.00	0.05	18	841.42	0.05

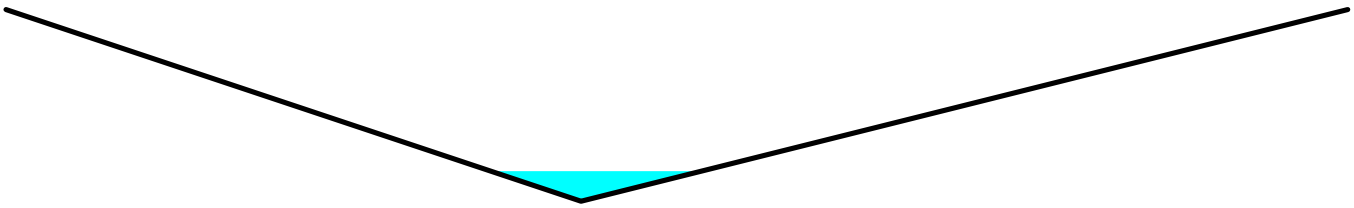
Summary for Reach DB-G25: (new Reach)

Inflow Area = 0.260 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 1.05 cfs @ 11.95 hrs, Volume= 0.045 af
Outflow = 1.04 cfs @ 11.96 hrs, Volume= 0.045 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.01 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 2.2 min

Peak Storage= 50 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 144.53 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 145.3' Slope= 0.0246 '/'
Inlet Invert= 817.83', Outlet Invert= 814.25'



Hydrograph for Reach DB-G25: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	817.83	0.00
0.50	0.00	0	817.83	0.00
1.00	0.00	0	817.83	0.00
1.50	0.00	0	817.83	0.00
2.00	0.00	0	817.83	0.00
2.50	0.00	0	817.83	0.00
3.00	0.00	0	817.83	0.00
3.50	0.00	0	817.83	0.00
4.00	0.00	0	817.83	0.00
4.50	0.00	0	817.83	0.00
5.00	0.00	0	817.83	0.00
5.50	0.00	0	817.83	0.00
6.00	0.00	0	817.83	0.00
6.50	0.00	0	817.83	0.00
7.00	0.00	0	817.83	0.00
7.50	0.00	0	817.83	0.00
8.00	0.00	0	817.83	0.00
8.50	0.00	0	817.83	0.00
9.00	0.00	0	817.86	0.00
9.50	0.00	1	817.86	0.00
10.00	0.01	1	817.87	0.01
10.50	0.01	2	817.88	0.01
11.00	0.02	2	817.90	0.02
11.50	**0.04**	**4**	**817.92**	**0.04**
12.00	**0.76**	**43**	**818.12**	**0.85**
12.50	0.08	8	817.95	0.08
13.00	0.05	5	817.93	0.05
13.50	0.04	4	817.92	0.04
14.00	0.03	4	817.91	0.03
14.50	0.03	3	817.91	0.03
15.00	0.03	3	817.91	0.03
15.50	0.02	3	817.90	0.02
16.00	0.02	3	817.90	0.02
16.50	0.02	2	817.90	0.02
17.00	0.02	2	817.90	0.02
17.50	0.02	2	817.90	0.02
18.00	0.02	2	817.89	0.02
18.50	0.01	2	817.89	0.01
19.00	0.01	2	817.89	0.01
19.50	0.01	2	817.89	0.01
20.00	0.01	2	817.89	0.01
20.50	0.01	2	817.89	0.01
21.00	0.01	2	817.89	0.01
21.50	0.01	2	817.89	0.01
22.00	0.01	2	817.89	0.01
22.50	0.01	2	817.89	0.01
23.00	0.01	2	817.88	0.01
23.50	0.01	2	817.88	0.01
24.00	0.01	2	817.88	0.01

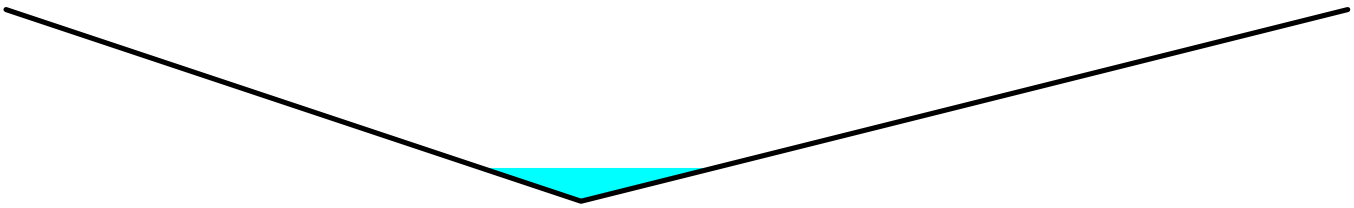
Summary for Reach DB-G3: (new Reach)

Inflow Area = 0.565 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 2.29 cfs @ 11.95 hrs, Volume= 0.099 af
Outflow = 2.26 cfs @ 11.96 hrs, Volume= 0.098 af, Atten= 2%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.36 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.97 fps, Avg. Travel Time= 2.5 min

Peak Storage= 124 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 240.93 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 294.9' Slope= 0.0685 '/'
Inlet Invert= 927.59', Outlet Invert= 907.40'



Hydrograph for Reach DB-G3: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	927.59	0.00
0.50	0.00	0	927.59	0.00
1.00	0.00	0	927.59	0.00
1.50	0.00	0	927.59	0.00
2.00	0.00	0	927.59	0.00
2.50	0.00	0	927.59	0.00
3.00	0.00	0	927.59	0.00
3.50	0.00	0	927.59	0.00
4.00	0.00	0	927.59	0.00
4.50	0.00	0	927.59	0.00
5.00	0.00	0	927.59	0.00
5.50	0.00	0	927.59	0.00
6.00	0.00	0	927.59	0.00
6.50	0.00	0	927.59	0.00
7.00	0.00	0	927.59	0.00
7.50	0.00	0	927.59	0.00
8.00	0.00	0	927.59	0.00
8.50	0.00	0	927.59	0.00
9.00	0.00	1	927.62	0.00
9.50	0.01	2	927.63	0.01
10.00	0.01	2	927.64	0.01
10.50	0.02	4	927.65	0.02
11.00	0.04	6	927.67	0.04
11.50	**0.09**	**11**	**927.69**	**0.09**
12.00	**1.66**	**108**	**927.91**	**1.86**
12.50	0.17	19	927.72	0.18
13.00	0.11	13	927.70	0.12
13.50	0.09	11	927.69	0.09
14.00	0.07	9	927.68	0.07
14.50	0.06	8	927.68	0.06
15.00	0.06	8	927.68	0.06
15.50	0.05	7	927.67	0.05
16.00	0.04	6	927.67	0.04
16.50	0.04	6	927.67	0.04
17.00	0.04	6	927.67	0.04
17.50	0.04	6	927.66	0.04
18.00	0.03	5	927.66	0.03
18.50	0.03	5	927.66	0.03
19.00	0.03	5	927.66	0.03
19.50	0.03	5	927.66	0.03
20.00	0.03	4	927.65	0.03
20.50	0.02	4	927.65	0.02
21.00	0.02	4	927.65	0.02
21.50	0.02	4	927.65	0.02
22.00	0.02	4	927.65	0.02
22.50	0.02	4	927.65	0.02
23.00	0.02	4	927.65	0.02
23.50	0.02	4	927.65	0.02
24.00	0.02	4	927.65	0.02

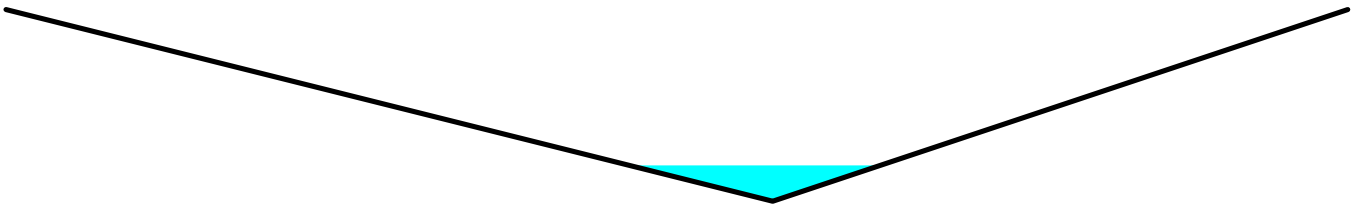
Summary for Reach DB-G4: (new Reach)

Inflow Area = 0.413 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 1.68 cfs @ 11.95 hrs, Volume= 0.072 af
Outflow = 1.65 cfs @ 11.96 hrs, Volume= 0.072 af, Atten= 2%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.33 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 3.0 min

Peak Storage= 107 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 142.24 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 217.5' Slope= 0.0239 '/'
Inlet Invert= 912.59', Outlet Invert= 907.40'



Hydrograph for Reach DB-G4: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	912.59	0.00
0.50	0.00	0	912.59	0.00
1.00	0.00	0	912.59	0.00
1.50	0.00	0	912.59	0.00
2.00	0.00	0	912.59	0.00
2.50	0.00	0	912.59	0.00
3.00	0.00	0	912.59	0.00
3.50	0.00	0	912.59	0.00
4.00	0.00	0	912.59	0.00
4.50	0.00	0	912.59	0.00
5.00	0.00	0	912.59	0.00
5.50	0.00	0	912.59	0.00
6.00	0.00	0	912.59	0.00
6.50	0.00	0	912.59	0.00
7.00	0.00	0	912.59	0.00
7.50	0.00	0	912.59	0.00
8.00	0.00	0	912.59	0.00
8.50	0.00	0	912.59	0.00
9.00	0.00	1	912.62	0.00
9.50	0.01	1	912.63	0.01
10.00	0.01	2	912.64	0.01
10.50	0.02	3	912.66	0.02
11.00	0.03	5	912.67	0.03
11.50	**0.07**	**9**	**912.70**	**0.06**
12.00	**1.19**	**93**	**912.94**	**1.37**
12.50	0.13	16	912.74	0.13
13.00	0.08	12	912.71	0.08
13.50	0.06	9	912.70	0.07
14.00	0.05	8	912.69	0.05
14.50	0.05	7	912.69	0.05
15.00	0.04	7	912.68	0.04
15.50	0.04	6	912.68	0.04
16.00	0.03	6	912.68	0.03
16.50	0.03	5	912.67	0.03
17.00	0.03	5	912.67	0.03
17.50	0.03	5	912.67	0.03
18.00	0.03	5	912.67	0.03
18.50	0.02	4	912.67	0.02
19.00	0.02	4	912.66	0.02
19.50	0.02	4	912.66	0.02
20.00	0.02	4	912.66	0.02
20.50	0.02	4	912.66	0.02
21.00	0.02	4	912.66	0.02
21.50	0.02	3	912.66	0.02
22.00	0.02	3	912.66	0.02
22.50	0.02	3	912.66	0.02
23.00	0.02	3	912.66	0.02
23.50	0.02	3	912.66	0.02
24.00	0.02	3	912.65	0.02

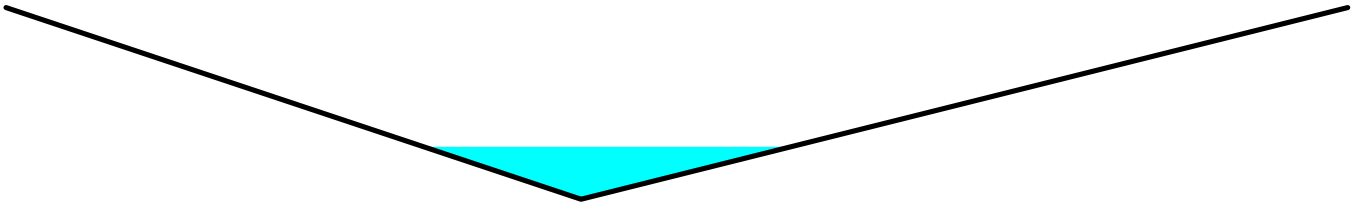
Summary for Reach DB-G5: (new Reach)

Inflow Area = 1.053 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 4.24 cfs @ 11.95 hrs, Volume= 0.184 af
Outflow = 4.09 cfs @ 11.97 hrs, Volume= 0.183 af, Atten= 3%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.89 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 4.1 min

Peak Storage= 370 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 128.99 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 352.1' Slope= 0.0196 '/'
Inlet Invert= 889.32', Outlet Invert= 882.41'



Hydrograph for Reach DB-G5: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	889.32	0.00
0.50	0.00	0	889.32	0.00
1.00	0.00	0	889.32	0.00
1.50	0.00	0	889.32	0.00
2.00	0.00	0	889.32	0.00
2.50	0.00	0	889.32	0.00
3.00	0.00	0	889.32	0.00
3.50	0.00	0	889.32	0.00
4.00	0.00	0	889.32	0.00
4.50	0.00	0	889.32	0.00
5.00	0.00	0	889.32	0.00
5.50	0.00	0	889.32	0.00
6.00	0.00	0	889.32	0.00
6.50	0.00	0	889.32	0.00
7.00	0.00	0	889.32	0.00
7.50	0.00	0	889.32	0.00
8.00	0.00	0	889.32	0.00
8.50	0.00	0	889.33	0.00
9.00	0.01	3	889.37	0.01
9.50	0.01	5	889.38	0.01
10.00	0.02	7	889.40	0.02
10.50	0.04	12	889.42	0.04
11.00	0.08	18	889.44	0.07
11.50	**0.17**	**33**	**889.48**	**0.16**
12.00	**3.18**	**341**	**889.85**	**3.66**
12.50	0.33	59	889.54	0.35
13.00	0.21	41	889.50	0.22
13.50	0.16	34	889.49	0.17
14.00	0.13	28	889.47	0.13
14.50	0.12	26	889.46	0.12
15.00	0.10	24	889.46	0.11
15.50	0.09	22	889.45	0.09
16.00	0.08	20	889.45	0.08
16.50	0.08	19	889.44	0.08
17.00	0.07	18	889.44	0.07
17.50	0.07	17	889.44	0.07
18.00	0.06	16	889.44	0.06
18.50	0.06	16	889.43	0.06
19.00	0.06	15	889.43	0.06
19.50	0.05	14	889.43	0.05
20.00	0.05	13	889.42	0.05
20.50	0.05	13	889.42	0.05
21.00	0.04	13	889.42	0.05
21.50	0.04	12	889.42	0.04
22.00	0.04	12	889.42	0.04
22.50	0.04	12	889.42	0.04
23.00	0.04	12	889.42	0.04
23.50	0.04	12	889.42	0.04
24.00	0.04	11	889.42	0.04

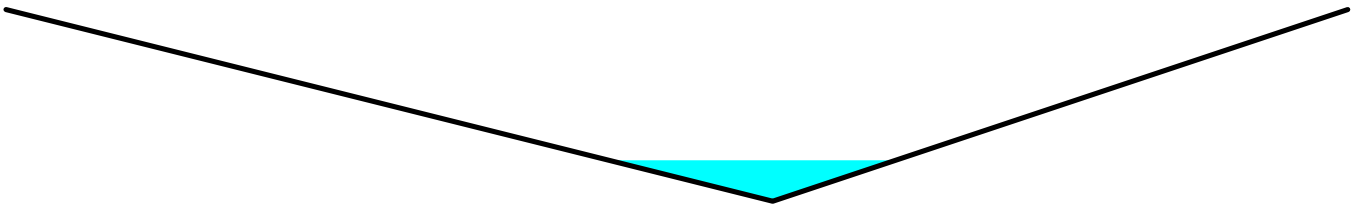
Summary for Reach DB-G6: (new Reach)

Inflow Area = 0.583 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 2.37 cfs @ 11.95 hrs, Volume= 0.102 af
Outflow = 2.30 cfs @ 11.96 hrs, Volume= 0.102 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.63 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.34 fps, Avg. Travel Time= 3.6 min

Peak Storage= 185 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 142.30 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 291.4' Slope= 0.0239 '/'
Inlet Invert= 889.37', Outlet Invert= 882.41'



Hydrograph for Reach DB-G6: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	889.37	0.00
0.50	0.00	0	889.37	0.00
1.00	0.00	0	889.37	0.00
1.50	0.00	0	889.37	0.00
2.00	0.00	0	889.37	0.00
2.50	0.00	0	889.37	0.00
3.00	0.00	0	889.37	0.00
3.50	0.00	0	889.37	0.00
4.00	0.00	0	889.37	0.00
4.50	0.00	0	889.37	0.00
5.00	0.00	0	889.37	0.00
5.50	0.00	0	889.37	0.00
6.00	0.00	0	889.37	0.00
6.50	0.00	0	889.37	0.00
7.00	0.00	0	889.37	0.00
7.50	0.00	0	889.37	0.00
8.00	0.00	0	889.37	0.00
8.50	0.00	0	889.37	0.00
9.00	0.00	1	889.40	0.00
9.50	0.01	2	889.42	0.01
10.00	0.01	4	889.43	0.01
10.50	0.02	6	889.44	0.02
11.00	0.04	9	889.46	0.04
11.50	**0.10**	**16**	**889.50**	**0.09**
12.00	**1.69**	**164**	**889.77**	**1.96**
12.50	0.18	29	889.54	0.19
13.00	0.12	20	889.51	0.12
13.50	0.09	17	889.50	0.09
14.00	0.07	14	889.49	0.07
14.50	0.06	13	889.48	0.06
15.00	0.06	12	889.48	0.06
15.50	0.05	11	889.47	0.05
16.00	0.05	10	889.47	0.05
16.50	0.04	9	889.46	0.04
17.00	0.04	9	889.46	0.04
17.50	0.04	8	889.46	0.04
18.00	0.04	8	889.46	0.04
18.50	0.03	8	889.46	0.03
19.00	0.03	7	889.45	0.03
19.50	0.03	7	889.45	0.03
20.00	0.03	6	889.45	0.03
20.50	0.03	6	889.45	0.03
21.00	0.02	6	889.45	0.02
21.50	0.02	6	889.45	0.02
22.00	0.02	6	889.45	0.02
22.50	0.02	6	889.45	0.02
23.00	0.02	6	889.45	0.02
23.50	0.02	6	889.44	0.02
24.00	0.02	6	889.44	0.02

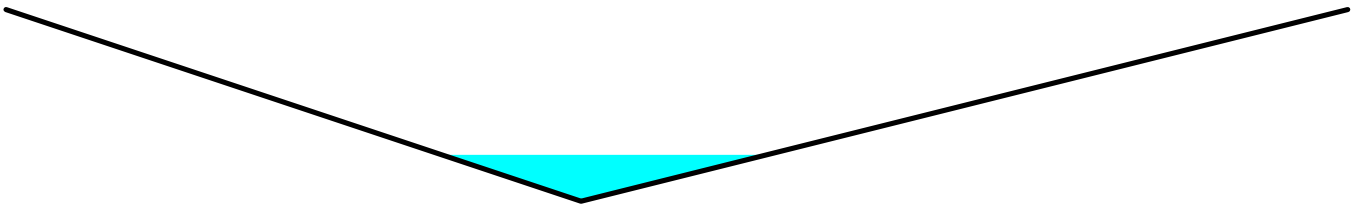
Summary for Reach DB-G7: (new Reach)

Inflow Area = 0.751 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 3.06 cfs @ 11.95 hrs, Volume= 0.131 af
Outflow = 2.96 cfs @ 11.96 hrs, Volume= 0.131 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.59 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 3.9 min

Peak Storage= 252 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 129.08 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 305.8' Slope= 0.0197 '/'
Inlet Invert= 863.42', Outlet Invert= 857.41'



Hydrograph for Reach DB-G7: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	863.42	0.00
0.50	0.00	0	863.42	0.00
1.00	0.00	0	863.42	0.00
1.50	0.00	0	863.42	0.00
2.00	0.00	0	863.42	0.00
2.50	0.00	0	863.42	0.00
3.00	0.00	0	863.42	0.00
3.50	0.00	0	863.42	0.00
4.00	0.00	0	863.42	0.00
4.50	0.00	0	863.42	0.00
5.00	0.00	0	863.42	0.00
5.50	0.00	0	863.42	0.00
6.00	0.00	0	863.42	0.00
6.50	0.00	0	863.42	0.00
7.00	0.00	0	863.42	0.00
7.50	0.00	0	863.42	0.00
8.00	0.00	0	863.42	0.00
8.50	0.00	0	863.43	0.00
9.00	0.01	2	863.46	0.00
9.50	0.01	3	863.47	0.01
10.00	0.02	5	863.49	0.02
10.50	0.03	8	863.51	0.03
11.00	0.06	12	863.53	0.05
11.50	**0.12**	**22**	**863.56**	**0.12**
12.00	**2.17**	**225**	**863.88**	**2.54**
12.50	0.23	39	863.61	0.25
13.00	0.15	28	863.58	0.16
13.50	0.12	23	863.57	0.12
14.00	0.09	19	863.55	0.09
14.50	0.08	17	863.55	0.08
15.00	0.07	16	863.54	0.08
15.50	0.07	15	863.54	0.07
16.00	0.06	13	863.53	0.06
16.50	0.05	13	863.53	0.05
17.00	0.05	12	863.53	0.05
17.50	0.05	12	863.52	0.05
18.00	0.05	11	863.52	0.05
18.50	0.04	11	863.52	0.04
19.00	0.04	10	863.52	0.04
19.50	0.04	9	863.51	0.04
20.00	0.03	9	863.51	0.03
20.50	0.03	9	863.51	0.03
21.00	0.03	8	863.51	0.03
21.50	0.03	8	863.51	0.03
22.00	0.03	8	863.51	0.03
22.50	0.03	8	863.51	0.03
23.00	0.03	8	863.51	0.03
23.50	0.03	8	863.51	0.03
24.00	0.03	8	863.50	0.03

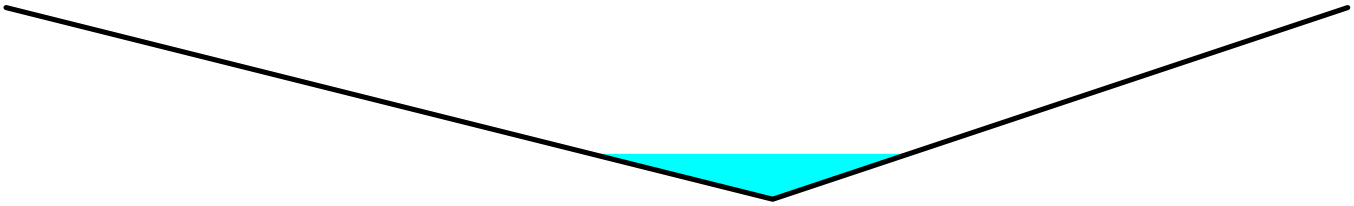
Summary for Reach DB-G8: (new Reach)

Inflow Area = 0.758 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 3.07 cfs @ 11.95 hrs, Volume= 0.132 af
Outflow = 2.95 cfs @ 11.97 hrs, Volume= 0.132 af, Atten= 4%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.77 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 4.4 min

Peak Storage= 287 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 137.92 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 366.4' Slope= 0.0224 '/'
Inlet Invert= 865.63', Outlet Invert= 857.41'



Hydrograph for Reach DB-G8: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	865.63	0.00
0.50	0.00	0	865.63	0.00
1.00	0.00	0	865.63	0.00
1.50	0.00	0	865.63	0.00
2.00	0.00	0	865.63	0.00
2.50	0.00	0	865.63	0.00
3.00	0.00	0	865.63	0.00
3.50	0.00	0	865.63	0.00
4.00	0.00	0	865.63	0.00
4.50	0.00	0	865.63	0.00
5.00	0.00	0	865.63	0.00
5.50	0.00	0	865.63	0.00
6.00	0.00	0	865.63	0.00
6.50	0.00	0	865.63	0.00
7.00	0.00	0	865.63	0.00
7.50	0.00	0	865.63	0.00
8.00	0.00	0	865.63	0.00
8.50	0.00	0	865.64	0.00
9.00	0.01	2	865.67	0.00
9.50	0.01	4	865.68	0.01
10.00	0.02	6	865.70	0.02
10.50	0.03	9	865.71	0.03
11.00	0.06	14	865.73	0.05
11.50	**0.12**	**25**	**865.77**	**0.12**
12.00	**2.23**	**262**	**866.08**	**2.61**
12.50	0.23	45	865.82	0.25
13.00	0.15	32	865.79	0.16
13.50	0.12	26	865.77	0.12
14.00	0.09	22	865.76	0.10
14.50	0.08	20	865.75	0.08
15.00	0.08	18	865.75	0.08
15.50	0.07	17	865.74	0.07
16.00	0.06	15	865.74	0.06
16.50	0.06	14	865.74	0.06
17.00	0.05	14	865.73	0.05
17.50	0.05	13	865.73	0.05
18.00	0.05	13	865.73	0.05
18.50	0.04	12	865.73	0.04
19.00	0.04	11	865.72	0.04
19.50	0.04	11	865.72	0.04
20.00	0.03	10	865.72	0.03
20.50	0.03	10	865.72	0.03
21.00	0.03	10	865.72	0.03
21.50	0.03	10	865.72	0.03
22.00	0.03	9	865.72	0.03
22.50	0.03	9	865.71	0.03
23.00	0.03	9	865.71	0.03
23.50	0.03	9	865.71	0.03
24.00	0.03	9	865.71	0.03

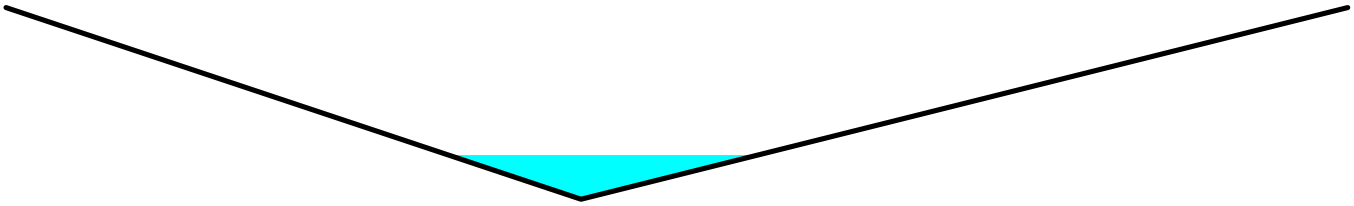
Summary for Reach DB-G9: (new Reach)

Inflow Area = 0.646 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 2.63 cfs @ 11.95 hrs, Volume= 0.113 af
Outflow = 2.56 cfs @ 11.96 hrs, Volume= 0.112 af, Atten= 3%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.46 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.27 fps, Avg. Travel Time= 3.4 min

Peak Storage= 192 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 129.06 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 259.6' Slope= 0.0196 '/'
Inlet Invert= 837.52', Outlet Invert= 832.42'



Hydrograph for Reach DB-G9: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	837.52	0.00
0.50	0.00	0	837.52	0.00
1.00	0.00	0	837.52	0.00
1.50	0.00	0	837.52	0.00
2.00	0.00	0	837.52	0.00
2.50	0.00	0	837.52	0.00
3.00	0.00	0	837.52	0.00
3.50	0.00	0	837.52	0.00
4.00	0.00	0	837.52	0.00
4.50	0.00	0	837.52	0.00
5.00	0.00	0	837.52	0.00
5.50	0.00	0	837.52	0.00
6.00	0.00	0	837.52	0.00
6.50	0.00	0	837.52	0.00
7.00	0.00	0	837.52	0.00
7.50	0.00	0	837.52	0.00
8.00	0.00	0	837.52	0.00
8.50	0.00	0	837.53	0.00
9.00	0.00	1	837.56	0.00
9.50	0.01	2	837.57	0.01
10.00	0.02	4	837.58	0.01
10.50	0.03	6	837.60	0.03
11.00	0.05	10	837.62	0.05
11.50	**0.11**	**17**	**837.66**	**0.10**
12.00	**1.87**	**169**	**837.95**	**2.16**
12.50	0.20	30	837.70	0.21
13.00	0.13	21	837.67	0.13
13.50	0.10	17	837.66	0.10
14.00	0.08	14	837.65	0.08
14.50	0.07	13	837.64	0.07
15.00	0.06	12	837.64	0.06
15.50	0.06	11	837.63	0.06
16.00	0.05	10	837.62	0.05
16.50	0.05	10	837.62	0.05
17.00	0.04	9	837.62	0.04
17.50	0.04	9	837.62	0.04
18.00	0.04	8	837.62	0.04
18.50	0.04	8	837.61	0.04
19.00	0.03	8	837.61	0.03
19.50	0.03	7	837.61	0.03
20.00	0.03	7	837.61	0.03
20.50	0.03	6	837.60	0.03
21.00	0.03	6	837.60	0.03
21.50	0.03	6	837.60	0.03
22.00	0.03	6	837.60	0.03
22.50	0.03	6	837.60	0.03
23.00	0.03	6	837.60	0.03
23.50	0.03	6	837.60	0.03
24.00	0.02	6	837.60	0.02

Summary for Reach DC-G1: (new Reach)

Inflow Area = 0.572 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 2.30 cfs @ 11.96 hrs, Volume= 0.100 af
Outflow = 2.29 cfs @ 11.96 hrs, Volume= 0.100 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.17 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 1.2 min

Peak Storage= 72 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 749.02 cfs

10.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 99.8' Slope= 0.2504 '/'
Inlet Invert= 932.39', Outlet Invert= 907.40'

‡

Hydrograph for Reach DC-G1: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	932.39	0.00
0.50	0.00	0	932.39	0.00
1.00	0.00	0	932.39	0.00
1.50	0.00	0	932.39	0.00
2.00	0.00	0	932.39	0.00
2.50	0.00	0	932.39	0.00
3.00	0.00	0	932.39	0.00
3.50	0.00	0	932.39	0.00
4.00	0.00	0	932.39	0.00
4.50	0.00	0	932.39	0.00
5.00	0.00	0	932.39	0.00
5.50	0.00	0	932.39	0.00
6.00	0.00	0	932.39	0.00
6.50	0.00	0	932.39	0.00
7.00	0.00	0	932.39	0.00
7.50	0.00	0	932.39	0.00
8.00	0.00	0	932.39	0.00
8.50	0.00	0	932.39	0.00
9.00	0.00	0	932.39	0.00
9.50	0.01	1	932.39	0.01
10.00	0.01	1	932.39	0.01
10.50	0.02	2	932.39	0.02
11.00	0.04	3	932.39	0.04
11.50	**0.09**	**6**	**932.40**	**0.09**
12.00	**1.84**	**65**	**932.45**	**1.93**
12.50	0.18	14	932.40	0.19
13.00	0.12	9	932.40	0.12
13.50	0.09	7	932.40	0.09
14.00	0.07	5	932.40	0.07
14.50	0.06	5	932.39	0.06
15.00	0.06	4	932.39	0.06
15.50	0.05	4	932.39	0.05
16.00	0.04	3	932.39	0.04
16.50	0.04	3	932.39	0.04
17.00	0.04	3	932.39	0.04
17.50	0.04	3	932.39	0.04
18.00	0.03	3	932.39	0.04
18.50	0.03	2	932.39	0.03
19.00	0.03	2	932.39	0.03
19.50	0.03	2	932.39	0.03
20.00	0.03	2	932.39	0.03
20.50	0.02	2	932.39	0.02
21.00	0.02	2	932.39	0.02
21.50	0.02	2	932.39	0.02
22.00	0.02	2	932.39	0.02
22.50	0.02	2	932.39	0.02
23.00	0.02	2	932.39	0.02
23.50	0.02	2	932.39	0.02
24.00	0.02	2	932.39	0.02

Summary for Reach DC-G10: (new Reach)

Inflow Area = 12.945 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 50.23 cfs @ 11.97 hrs, Volume= 2.250 af
Outflow = 50.21 cfs @ 11.97 hrs, Volume= 2.250 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.03 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.37 fps, Avg. Travel Time= 0.7 min

Peak Storage= 519 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.44'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 756.10 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 103.7' Slope= 0.2552 '/'
Inlet Invert= 707.44', Outlet Invert= 680.98'

‡

Hydrograph for Reach DC-G10: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	707.44	0.00
0.50	0.00	0	707.44	0.00
1.00	0.00	0	707.44	0.00
1.50	0.00	0	707.44	0.00
2.00	0.00	0	707.44	0.00
2.50	0.00	0	707.44	0.00
3.00	0.00	0	707.44	0.00
3.50	0.00	0	707.44	0.00
4.00	0.00	0	707.44	0.00
4.50	0.00	0	707.44	0.00
5.00	0.00	0	707.44	0.00
5.50	0.00	0	707.44	0.00
6.00	0.00	0	707.44	0.00
6.50	0.00	0	707.44	0.00
7.00	0.00	0	707.44	0.00
7.50	0.00	0	707.44	0.00
8.00	0.00	0	707.44	0.00
8.50	0.00	0	707.44	0.00
9.00	0.06	4	707.44	0.05
9.50	0.14	10	707.45	0.14
10.00	0.25	19	707.46	0.25
10.50	0.47	27	707.47	0.47
11.00	0.88	41	707.48	0.87
11.50	**1.91**	**67**	**707.50**	**1.89**
12.00	**46.56**	**497**	**707.87**	**47.02**
12.50	4.50	114	707.55	4.53
13.00	2.74	84	707.52	2.75
13.50	2.09	71	707.51	2.10
14.00	1.66	62	707.50	1.66
14.50	1.45	56	707.49	1.45
15.00	1.31	53	707.49	1.31
15.50	1.17	49	707.49	1.17
16.00	1.03	46	707.48	1.03
16.50	0.95	44	707.48	0.95
17.00	0.90	43	707.48	0.90
17.50	0.85	41	707.48	0.85
18.00	0.80	39	707.48	0.80
18.50	0.75	37	707.48	0.75
19.00	0.70	36	707.47	0.70
19.50	0.64	34	707.47	0.64
20.00	0.59	32	707.47	0.59
20.50	0.56	31	707.47	0.56
21.00	0.55	31	707.47	0.56
21.50	0.54	30	707.47	0.55
22.00	0.53	30	707.47	0.54
22.50	0.52	30	707.47	0.53
23.00	0.51	29	707.47	0.51
23.50	0.50	29	707.47	0.50
24.00	0.49	28	707.47	0.49

Summary for Reach DC-G12: (new Reach)

Inflow Area = 1.208 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 4.61 cfs @ 11.97 hrs, Volume= 0.210 af
Outflow = 4.61 cfs @ 11.97 hrs, Volume= 0.210 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.91 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 0.2 min

Peak Storage= 16 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 466.00 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 19.9' Slope= 0.3080 '/'
Inlet Invert= 828.19', Outlet Invert= 822.06'

‡

Hydrograph for Reach DC-G12: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	828.19	0.00
0.50	0.00	0	828.19	0.00
1.00	0.00	0	828.19	0.00
1.50	0.00	0	828.19	0.00
2.00	0.00	0	828.19	0.00
2.50	0.00	0	828.19	0.00
3.00	0.00	0	828.19	0.00
3.50	0.00	0	828.19	0.00
4.00	0.00	0	828.19	0.00
4.50	0.00	0	828.19	0.00
5.00	0.00	0	828.19	0.00
5.50	0.00	0	828.19	0.00
6.00	0.00	0	828.19	0.00
6.50	0.00	0	828.19	0.00
7.00	0.00	0	828.19	0.00
7.50	0.00	0	828.19	0.00
8.00	0.00	0	828.19	0.00
8.50	0.00	0	828.19	0.00
9.00	0.01	0	828.19	0.01
9.50	0.01	0	828.19	0.01
10.00	0.03	0	828.19	0.03
10.50	0.05	1	828.20	0.05
11.00	0.08	1	828.20	0.08
11.50	**0.18**	**2**	**828.21**	**0.18**
12.00	**4.23**	**15**	**828.35**	**4.25**
12.50	0.41	3	828.23	0.41
13.00	0.25	2	828.22	0.25
13.50	0.19	2	828.22	0.19
14.00	0.15	2	828.21	0.15
14.50	0.13	2	828.21	0.13
15.00	0.12	2	828.21	0.12
15.50	0.11	1	828.21	0.11
16.00	0.10	1	828.21	0.10
16.50	0.09	1	828.20	0.09
17.00	0.08	1	828.20	0.08
17.50	0.08	1	828.20	0.08
18.00	0.07	1	828.20	0.07
18.50	0.07	1	828.20	0.07
19.00	0.06	1	828.20	0.06
19.50	0.06	1	828.20	0.06
20.00	0.05	1	828.20	0.05
20.50	0.05	1	828.20	0.05
21.00	0.05	1	828.20	0.05
21.50	0.05	1	828.20	0.05
22.00	0.05	1	828.20	0.05
22.50	0.05	1	828.20	0.05
23.00	0.05	1	828.20	0.05
23.50	0.05	1	828.20	0.05
24.00	0.05	1	828.20	0.05

Summary for Reach DC-G13: (new Reach)

Inflow Area = 0.260 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 1.04 cfs @ 11.96 hrs, Volume= 0.045 af
Outflow = 1.04 cfs @ 11.96 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.46 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.54 fps, Avg. Travel Time= 0.2 min

Peak Storage= 6 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 466.79 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 19.8' Slope= 0.3091 '/'
Inlet Invert= 814.25', Outlet Invert= 808.13'

‡

Hydrograph for Reach DC-G13: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	814.25	0.00
0.50	0.00	0	814.25	0.00
1.00	0.00	0	814.25	0.00
1.50	0.00	0	814.25	0.00
2.00	0.00	0	814.25	0.00
2.50	0.00	0	814.25	0.00
3.00	0.00	0	814.25	0.00
3.50	0.00	0	814.25	0.00
4.00	0.00	0	814.25	0.00
4.50	0.00	0	814.25	0.00
5.00	0.00	0	814.25	0.00
5.50	0.00	0	814.25	0.00
6.00	0.00	0	814.25	0.00
6.50	0.00	0	814.25	0.00
7.00	0.00	0	814.25	0.00
7.50	0.00	0	814.25	0.00
8.00	0.00	0	814.25	0.00
8.50	0.00	0	814.25	0.00
9.00	0.00	0	814.25	0.00
9.50	0.00	0	814.25	0.00
10.00	0.01	0	814.25	0.01
10.50	0.01	0	814.25	0.01
11.00	0.02	0	814.25	0.02
11.50	**0.04**	**1**	**814.26**	**0.04**
12.00	**0.85**	**5**	**814.31**	**0.86**
12.50	0.08	1	814.26	0.08
13.00	0.05	1	814.26	0.05
13.50	0.04	1	814.26	0.04
14.00	0.03	0	814.26	0.03
14.50	0.03	0	814.25	0.03
15.00	0.03	0	814.25	0.03
15.50	0.02	0	814.25	0.02
16.00	0.02	0	814.25	0.02
16.50	0.02	0	814.25	0.02
17.00	0.02	0	814.25	0.02
17.50	0.02	0	814.25	0.02
18.00	0.02	0	814.25	0.02
18.50	0.01	0	814.25	0.01
19.00	0.01	0	814.25	0.01
19.50	0.01	0	814.25	0.01
20.00	0.01	0	814.25	0.01
20.50	0.01	0	814.25	0.01
21.00	0.01	0	814.25	0.01
21.50	0.01	0	814.25	0.01
22.00	0.01	0	814.25	0.01
22.50	0.01	0	814.25	0.01
23.00	0.01	0	814.25	0.01
23.50	0.01	0	814.25	0.01
24.00	0.01	0	814.25	0.01

Summary for Reach DC-G2: (new Reach)

Inflow Area = 1.550 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 6.19 cfs @ 11.96 hrs, Volume= 0.270 af
Outflow = 6.18 cfs @ 11.96 hrs, Volume= 0.270 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.62 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.45 fps, Avg. Travel Time= 1.2 min

Peak Storage= 134 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 747.52 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.2' Slope= 0.2494 '/'
Inlet Invert= 907.40', Outlet Invert= 882.41'

‡

Hydrograph for Reach DC-G2: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	907.40	0.00
0.50	0.00	0	907.40	0.00
1.00	0.00	0	907.40	0.00
1.50	0.00	0	907.40	0.00
2.00	0.00	0	907.40	0.00
2.50	0.00	0	907.40	0.00
3.00	0.00	0	907.40	0.00
3.50	0.00	0	907.40	0.00
4.00	0.00	0	907.40	0.00
4.50	0.00	0	907.40	0.00
5.00	0.00	0	907.40	0.00
5.50	0.00	0	907.40	0.00
6.00	0.00	0	907.40	0.00
6.50	0.00	0	907.40	0.00
7.00	0.00	0	907.40	0.00
7.50	0.00	0	907.40	0.00
8.00	0.00	0	907.40	0.00
8.50	0.00	0	907.40	0.00
9.00	0.01	1	907.40	0.01
9.50	0.02	1	907.40	0.02
10.00	0.03	2	907.40	0.03
10.50	0.06	4	907.40	0.06
11.00	0.11	8	907.41	0.11
11.50	**0.24**	**17**	**907.42**	**0.24**
12.00	**5.16**	**122**	**907.52**	**5.33**
12.50	0.51	29	907.43	0.52
13.00	0.32	22	907.42	0.32
13.50	0.24	18	907.42	0.25
14.00	0.19	14	907.41	0.20
14.50	0.17	13	907.41	0.17
15.00	0.16	11	907.41	0.16
15.50	0.14	10	907.41	0.14
16.00	0.12	9	907.41	0.12
16.50	0.11	8	907.41	0.11
17.00	0.11	8	907.41	0.11
17.50	0.10	7	907.41	0.10
18.00	0.09	7	907.41	0.10
18.50	0.09	7	907.41	0.09
19.00	0.08	6	907.41	0.08
19.50	0.08	6	907.41	0.08
20.00	0.07	5	907.41	0.07
20.50	0.07	5	907.40	0.07
21.00	0.07	5	907.40	0.07
21.50	0.07	5	907.40	0.07
22.00	0.06	5	907.40	0.06
22.50	0.06	5	907.40	0.06
23.00	0.06	5	907.40	0.06
23.50	0.06	4	907.40	0.06
24.00	0.06	4	907.40	0.06

Summary for Reach DC-G3: (new Reach)

Inflow Area = 3.186 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 12.57 cfs @ 11.96 hrs, Volume= 0.555 af
Outflow = 12.55 cfs @ 11.97 hrs, Volume= 0.554 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.04 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.57 fps, Avg. Travel Time= 1.1 min

Peak Storage= 207 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 749.17 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 99.8' Slope= 0.2505 '/'
Inlet Invert= 882.41', Outlet Invert= 857.41'

‡

Hydrograph for Reach DC-G3: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	882.41	0.00
0.50	0.00	0	882.41	0.00
1.00	0.00	0	882.41	0.00
1.50	0.00	0	882.41	0.00
2.00	0.00	0	882.41	0.00
2.50	0.00	0	882.41	0.00
3.00	0.00	0	882.41	0.00
3.50	0.00	0	882.41	0.00
4.00	0.00	0	882.41	0.00
4.50	0.00	0	882.41	0.00
5.00	0.00	0	882.41	0.00
5.50	0.00	0	882.41	0.00
6.00	0.00	0	882.41	0.00
6.50	0.00	0	882.41	0.00
7.00	0.00	0	882.41	0.00
7.50	0.00	0	882.41	0.00
8.00	0.00	0	882.41	0.00
8.50	0.00	0	882.41	0.00
9.00	0.02	1	882.41	0.02
9.50	0.04	3	882.41	0.04
10.00	0.07	5	882.41	0.07
10.50	0.12	9	882.42	0.12
11.00	0.23	16	882.43	0.22
11.50	**0.49**	**27**	**882.44**	**0.48**
12.00	**10.95**	**193**	**882.59**	**11.17**
12.50	1.06	45	882.45	1.08
13.00	0.66	33	882.44	0.67
13.50	0.51	28	882.44	0.51
14.00	0.40	24	882.43	0.40
14.50	0.35	23	882.43	0.36
15.00	0.32	22	882.43	0.32
15.50	0.29	20	882.43	0.29
16.00	0.25	18	882.43	0.25
16.50	0.23	17	882.43	0.23
17.00	0.22	16	882.43	0.22
17.50	0.21	15	882.43	0.21
18.00	0.20	14	882.42	0.20
18.50	0.18	13	882.42	0.18
19.00	0.17	12	882.42	0.17
19.50	0.16	12	882.42	0.16
20.00	0.14	11	882.42	0.14
20.50	0.14	10	882.42	0.14
21.00	0.14	10	882.42	0.14
21.50	0.13	10	882.42	0.13
22.00	0.13	10	882.42	0.13
22.50	0.13	9	882.42	0.13
23.00	0.13	9	882.42	0.13
23.50	0.12	9	882.42	0.12
24.00	0.12	9	882.42	0.12

Summary for Reach DC-G4: (new Reach)

Inflow Area = 4.695 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 18.46 cfs @ 11.97 hrs, Volume= 0.817 af
Outflow = 18.44 cfs @ 11.97 hrs, Volume= 0.817 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.96 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.69 fps, Avg. Travel Time= 1.0 min

Peak Storage= 265 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.27 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2499 '/'
Inlet Invert= 857.41', Outlet Invert= 832.42'

‡

Hydrograph for Reach DC-G4: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	857.41	0.00
0.50	0.00	0	857.41	0.00
1.00	0.00	0	857.41	0.00
1.50	0.00	0	857.41	0.00
2.00	0.00	0	857.41	0.00
2.50	0.00	0	857.41	0.00
3.00	0.00	0	857.41	0.00
3.50	0.00	0	857.41	0.00
4.00	0.00	0	857.41	0.00
4.50	0.00	0	857.41	0.00
5.00	0.00	0	857.41	0.00
5.50	0.00	0	857.41	0.00
6.00	0.00	0	857.41	0.00
6.50	0.00	0	857.41	0.00
7.00	0.00	0	857.41	0.00
7.50	0.00	0	857.41	0.00
8.00	0.00	0	857.41	0.00
8.50	0.00	0	857.41	0.00
9.00	0.03	2	857.41	0.02
9.50	0.06	4	857.41	0.05
10.00	0.10	7	857.42	0.10
10.50	0.18	13	857.42	0.18
11.00	0.33	22	857.43	0.33
11.50	**0.71**	**35**	**857.44**	**0.70**
12.00	**16.32**	**248**	**857.64**	**16.61**
12.50	1.58	58	857.47	1.60
13.00	0.98	43	857.45	0.98
13.50	0.75	36	857.45	0.75
14.00	0.59	31	857.44	0.60
14.50	0.52	29	857.44	0.52
15.00	0.47	27	857.44	0.47
15.50	0.42	25	857.43	0.42
16.00	0.37	23	857.43	0.37
16.50	0.34	23	857.43	0.34
17.00	0.33	22	857.43	0.33
17.50	0.31	21	857.43	0.31
18.00	0.29	21	857.43	0.29
18.50	0.27	20	857.43	0.27
19.00	0.25	18	857.43	0.25
19.50	0.23	17	857.43	0.23
20.00	0.21	16	857.43	0.21
20.50	0.20	15	857.42	0.20
21.00	0.20	15	857.42	0.20
21.50	0.20	14	857.42	0.20
22.00	0.19	14	857.42	0.19
22.50	0.19	14	857.42	0.19
23.00	0.19	14	857.42	0.19
23.50	0.18	13	857.42	0.18
24.00	0.18	13	857.42	0.18

Summary for Reach DC-G5: (new Reach)

Inflow Area = 6.289 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 24.62 cfs @ 11.97 hrs, Volume= 1.094 af
Outflow = 24.60 cfs @ 11.97 hrs, Volume= 1.094 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.73 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.82 fps, Avg. Travel Time= 0.9 min

Peak Storage= 318 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.42 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2500 '/'
Inlet Invert= 832.42', Outlet Invert= 807.42'

‡

Hydrograph for Reach DC-G5: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	832.42	0.00
0.50	0.00	0	832.42	0.00
1.00	0.00	0	832.42	0.00
1.50	0.00	0	832.42	0.00
2.00	0.00	0	832.42	0.00
2.50	0.00	0	832.42	0.00
3.00	0.00	0	832.42	0.00
3.50	0.00	0	832.42	0.00
4.00	0.00	0	832.42	0.00
4.50	0.00	0	832.42	0.00
5.00	0.00	0	832.42	0.00
5.50	0.00	0	832.42	0.00
6.00	0.00	0	832.42	0.00
6.50	0.00	0	832.42	0.00
7.00	0.00	0	832.42	0.00
7.50	0.00	0	832.42	0.00
8.00	0.00	0	832.42	0.00
8.50	0.00	0	832.42	0.00
9.00	0.03	2	832.42	0.03
9.50	0.07	5	832.43	0.07
10.00	0.13	9	832.43	0.13
10.50	0.24	17	832.44	0.23
11.00	0.44	26	832.45	0.43
11.50	**0.95**	**42**	**832.46**	**0.94**
12.00	**22.09**	**300**	**832.70**	**22.41**
12.50	2.13	70	832.49	2.16
13.00	1.32	52	832.47	1.32
13.50	1.01	44	832.46	1.01
14.00	0.80	38	832.46	0.80
14.50	0.70	35	832.45	0.70
15.00	0.63	32	832.45	0.64
15.50	0.57	30	832.45	0.57
16.00	0.50	28	832.45	0.50
16.50	0.46	26	832.45	0.46
17.00	0.44	26	832.45	0.44
17.50	0.41	25	832.44	0.41
18.00	0.39	24	832.44	0.39
18.50	0.36	23	832.44	0.36
19.00	0.34	22	832.44	0.34
19.50	0.31	21	832.44	0.31
20.00	0.29	21	832.44	0.29
20.50	0.27	20	832.44	0.27
21.00	0.27	20	832.44	0.27
21.50	0.26	19	832.44	0.26
22.00	0.26	19	832.44	0.26
22.50	0.25	19	832.44	0.25
23.00	0.25	18	832.44	0.25
23.50	0.24	18	832.44	0.24
24.00	0.24	18	832.44	0.24

Summary for Reach DC-G6: (new Reach)

Inflow Area = 7.931 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 30.93 cfs @ 11.97 hrs, Volume= 1.380 af
Outflow = 30.91 cfs @ 11.97 hrs, Volume= 1.379 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.39 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.97 fps, Avg. Travel Time= 0.8 min

Peak Storage= 369 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 747.52 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.2' Slope= 0.2494 '/'
Inlet Invert= 807.42', Outlet Invert= 782.43'

‡

Hydrograph for Reach DC-G6: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	807.42	0.00
0.50	0.00	0	807.42	0.00
1.00	0.00	0	807.42	0.00
1.50	0.00	0	807.42	0.00
2.00	0.00	0	807.42	0.00
2.50	0.00	0	807.42	0.00
3.00	0.00	0	807.42	0.00
3.50	0.00	0	807.42	0.00
4.00	0.00	0	807.42	0.00
4.50	0.00	0	807.42	0.00
5.00	0.00	0	807.42	0.00
5.50	0.00	0	807.42	0.00
6.00	0.00	0	807.42	0.00
6.50	0.00	0	807.42	0.00
7.00	0.00	0	807.42	0.00
7.50	0.00	0	807.42	0.00
8.00	0.00	0	807.42	0.00
8.50	0.00	0	807.42	0.00
9.00	0.04	3	807.42	0.04
9.50	0.09	7	807.43	0.09
10.00	0.16	12	807.43	0.16
10.50	0.29	21	807.44	0.29
11.00	0.55	29	807.45	0.54
11.50	**1.19**	**48**	**807.47**	**1.18**
12.00	**28.02**	**350**	**807.74**	**28.38**
12.50	2.71	81	807.50	2.74
13.00	1.67	60	807.48	1.67
13.50	1.27	51	807.47	1.28
14.00	1.01	44	807.46	1.01
14.50	0.89	41	807.46	0.89
15.00	0.80	38	807.46	0.80
15.50	0.71	35	807.45	0.72
16.00	0.63	32	807.45	0.63
16.50	0.58	31	807.45	0.58
17.00	0.55	30	807.45	0.55
17.50	0.52	29	807.45	0.52
18.00	0.49	28	807.45	0.49
18.50	0.46	26	807.45	0.46
19.00	0.42	25	807.45	0.43
19.50	0.39	24	807.44	0.39
20.00	0.36	23	807.44	0.36
20.50	0.35	23	807.44	0.35
21.00	0.34	22	807.44	0.34
21.50	0.33	22	807.44	0.33
22.00	0.33	22	807.44	0.33
22.50	0.32	22	807.44	0.32
23.00	0.32	22	807.44	0.32
23.50	0.31	21	807.44	0.31
24.00	0.30	21	807.44	0.30

Summary for Reach DC-G7: (new Reach)

Inflow Area = 9.573 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 37.24 cfs @ 11.97 hrs, Volume= 1.665 af
Outflow = 37.22 cfs @ 11.97 hrs, Volume= 1.665 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.97 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.12 fps, Avg. Travel Time= 0.8 min

Peak Storage= 415 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.42 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2500 '/'
Inlet Invert= 782.43', Outlet Invert= 757.43'

‡

Hydrograph for Reach DC-G7: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	782.43	0.00
0.50	0.00	0	782.43	0.00
1.00	0.00	0	782.43	0.00
1.50	0.00	0	782.43	0.00
2.00	0.00	0	782.43	0.00
2.50	0.00	0	782.43	0.00
3.00	0.00	0	782.43	0.00
3.50	0.00	0	782.43	0.00
4.00	0.00	0	782.43	0.00
4.50	0.00	0	782.43	0.00
5.00	0.00	0	782.43	0.00
5.50	0.00	0	782.43	0.00
6.00	0.00	0	782.43	0.00
6.50	0.00	0	782.43	0.00
7.00	0.00	0	782.43	0.00
7.50	0.00	0	782.43	0.00
8.00	0.00	0	782.43	0.00
8.50	0.00	0	782.43	0.00
9.00	0.05	3	782.43	0.04
9.50	0.11	8	782.44	0.11
10.00	0.19	14	782.44	0.19
10.50	0.35	23	782.45	0.35
11.00	0.66	33	782.46	0.65
11.50	**1.43**	**54**	**782.48**	**1.42**
12.00	**33.98**	**394**	**782.79**	**34.37**
12.50	3.29	91	782.52	3.32
13.00	2.02	67	782.50	2.03
13.50	1.54	57	782.49	1.54
14.00	1.22	49	782.48	1.22
14.50	1.07	45	782.47	1.07
15.00	0.97	43	782.47	0.97
15.50	0.86	40	782.47	0.87
16.00	0.76	37	782.47	0.76
16.50	0.70	35	782.46	0.70
17.00	0.67	33	782.46	0.67
17.50	0.63	32	782.46	0.63
18.00	0.59	31	782.46	0.59
18.50	0.55	30	782.46	0.55
19.00	0.51	28	782.46	0.51
19.50	0.47	27	782.46	0.47
20.00	0.43	26	782.46	0.44
20.50	0.42	25	782.45	0.42
21.00	0.41	25	782.45	0.41
21.50	0.40	25	782.45	0.40
22.00	0.40	24	782.45	0.40
22.50	0.39	24	782.45	0.39
23.00	0.38	24	782.45	0.38
23.50	0.37	23	782.45	0.37
24.00	0.37	23	782.45	0.37

Summary for Reach DC-G8: (new Reach)

Inflow Area = 10.971 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 42.62 cfs @ 11.97 hrs, Volume= 1.908 af
Outflow = 42.61 cfs @ 11.97 hrs, Volume= 1.907 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.41 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.22 fps, Avg. Travel Time= 0.8 min

Peak Storage= 453 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.27 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2499 '/'
Inlet Invert= 757.43', Outlet Invert= 732.44'

‡

Hydrograph for Reach DC-G8: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	757.43	0.00
0.50	0.00	0	757.43	0.00
1.00	0.00	0	757.43	0.00
1.50	0.00	0	757.43	0.00
2.00	0.00	0	757.43	0.00
2.50	0.00	0	757.43	0.00
3.00	0.00	0	757.43	0.00
3.50	0.00	0	757.43	0.00
4.00	0.00	0	757.43	0.00
4.50	0.00	0	757.43	0.00
5.00	0.00	0	757.43	0.00
5.50	0.00	0	757.43	0.00
6.00	0.00	0	757.43	0.00
6.50	0.00	0	757.43	0.00
7.00	0.00	0	757.43	0.00
7.50	0.00	0	757.43	0.00
8.00	0.00	0	757.43	0.00
8.50	0.00	0	757.43	0.00
9.00	0.05	3	757.43	0.05
9.50	0.12	9	757.44	0.12
10.00	0.22	16	757.45	0.21
10.50	0.40	24	757.45	0.40
11.00	0.75	36	757.47	0.74
11.50	**1.63**	**59**	**757.49**	**1.61**
12.00	**39.11**	**431**	**757.82**	**39.53**
12.50	3.78	99	757.53	3.81
13.00	2.32	73	757.50	2.33
13.50	1.77	62	757.49	1.77
14.00	1.40	53	757.48	1.40
14.50	1.23	49	757.48	1.23
15.00	1.11	46	757.48	1.11
15.50	0.99	43	757.47	0.99
16.00	0.87	40	757.47	0.87
16.50	0.81	38	757.47	0.81
17.00	0.76	37	757.47	0.76
17.50	0.72	35	757.46	0.72
18.00	0.68	34	757.46	0.68
18.50	0.63	32	757.46	0.63
19.00	0.59	31	757.46	0.59
19.50	0.54	29	757.46	0.54
20.00	0.50	28	757.46	0.50
20.50	0.48	27	757.46	0.48
21.00	0.47	27	757.46	0.47
21.50	0.46	27	757.46	0.46
22.00	0.45	26	757.46	0.45
22.50	0.44	26	757.46	0.44
23.00	0.44	26	757.46	0.44
23.50	0.43	25	757.46	0.43
24.00	0.42	25	757.45	0.42

Summary for Reach DC-G9: (new Reach)

Inflow Area = 12.098 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 46.97 cfs @ 11.97 hrs, Volume= 2.104 af
Outflow = 46.95 cfs @ 11.97 hrs, Volume= 2.103 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.73 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.30 fps, Avg. Travel Time= 0.7 min

Peak Storage= 482 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.42 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2500 '/'
Inlet Invert= 732.44', Outlet Invert= 707.44'

‡

Hydrograph for Reach DC-G9: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	732.44	0.00
0.50	0.00	0	732.44	0.00
1.00	0.00	0	732.44	0.00
1.50	0.00	0	732.44	0.00
2.00	0.00	0	732.44	0.00
2.50	0.00	0	732.44	0.00
3.00	0.00	0	732.44	0.00
3.50	0.00	0	732.44	0.00
4.00	0.00	0	732.44	0.00
4.50	0.00	0	732.44	0.00
5.00	0.00	0	732.44	0.00
5.50	0.00	0	732.44	0.00
6.00	0.00	0	732.44	0.00
6.50	0.00	0	732.44	0.00
7.00	0.00	0	732.44	0.00
7.50	0.00	0	732.44	0.00
8.00	0.00	0	732.44	0.00
8.50	0.00	0	732.44	0.00
9.00	0.05	4	732.44	0.05
9.50	0.13	10	732.45	0.13
10.00	0.24	17	732.46	0.23
10.50	0.44	26	732.47	0.44
11.00	0.82	39	732.48	0.82
11.50	**1.79**	**62**	**732.50**	**1.77**
12.00	**43.31**	**461**	**732.85**	**43.76**
12.50	4.19	106	732.54	4.22
13.00	2.56	78	732.52	2.57
13.50	1.95	66	732.50	1.96
14.00	1.55	57	732.50	1.55
14.50	1.35	52	732.49	1.35
15.00	1.22	49	732.49	1.23
15.50	1.09	46	732.49	1.10
16.00	0.96	43	732.48	0.96
16.50	0.89	41	732.48	0.89
17.00	0.84	39	732.48	0.84
17.50	0.79	38	732.48	0.80
18.00	0.75	36	732.48	0.75
18.50	0.70	35	732.47	0.70
19.00	0.65	33	732.47	0.65
19.50	0.60	31	732.47	0.60
20.00	0.55	30	732.47	0.55
20.50	0.53	29	732.47	0.53
21.00	0.52	28	732.47	0.52
21.50	0.51	28	732.47	0.51
22.00	0.50	28	732.47	0.50
22.50	0.49	27	732.47	0.49
23.00	0.48	27	732.47	0.48
23.50	0.47	27	732.47	0.47
24.00	0.46	27	732.47	0.46

Summary for Reach IPC-G1: (new Reach)

Inflow Area = 2.096 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 9.12 cfs @ 11.92 hrs, Volume= 0.366 af
Outflow = 6.57 cfs @ 11.97 hrs, Volume= 0.361 af, Atten= 28%, Lag= 2.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.61 fps, Min. Travel Time= 7.7 min
Avg. Velocity = 0.40 fps, Avg. Travel Time= 30.6 min

Peak Storage= 3,030 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 117.90 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 741.7' Slope= 0.0076 '/'
Inlet Invert= 903.92', Outlet Invert= 898.26'

‡

Hydrograph for Reach IPC-G1: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	903.92	0.00
0.50	0.00	0	903.92	0.00
1.00	0.00	0	903.92	0.00
1.50	0.00	0	903.92	0.00
2.00	0.00	0	903.92	0.00
2.50	0.00	0	903.92	0.00
3.00	0.00	0	903.92	0.00
3.50	0.00	0	903.92	0.00
4.00	0.00	0	903.92	0.00
4.50	0.00	0	903.92	0.00
5.00	0.00	0	903.92	0.00
5.50	0.00	0	903.92	0.00
6.00	0.00	0	903.92	0.00
6.50	0.00	0	903.92	0.00
7.00	0.00	0	903.92	0.00
7.50	0.00	0	903.92	0.00
8.00	0.00	0	903.92	0.00
8.50	0.00	1	903.92	0.00
9.00	0.02	13	903.92	0.00
9.50	0.03	38	903.93	0.01
10.00	0.05	75	903.93	0.02
10.50	0.09	139	903.94	0.04
11.00	0.16	232	903.95	0.11
11.50	**0.36**	**393**	**903.97**	**0.24**
12.00	**3.78**	**2,889**	**904.28**	**6.10**
12.50	0.60	884	904.04	0.91
13.00	0.41	611	904.00	0.49
13.50	0.32	506	903.99	0.37
14.00	0.25	439	903.98	0.29
14.50	0.23	396	903.97	0.25
15.00	0.21	370	903.97	0.22
15.50	0.18	346	903.97	0.20
16.00	0.16	322	903.96	0.17
16.50	0.15	305	903.96	0.16
17.00	0.14	295	903.96	0.15
17.50	0.14	284	903.96	0.14
18.00	0.13	273	903.96	0.13
18.50	0.12	261	903.95	0.13
19.00	0.11	249	903.95	0.12
19.50	0.10	236	903.95	0.11
20.00	0.09	224	903.95	0.10
20.50	0.09	215	903.95	0.09
21.00	0.09	211	903.95	0.09
21.50	0.09	209	903.95	0.09
22.00	0.09	206	903.95	0.09
22.50	0.08	204	903.95	0.09
23.00	0.08	201	903.95	0.08
23.50	0.08	199	903.95	0.08
24.00	0.08	196	903.95	0.08

Summary for Reach IPC-G2: (new Reach)

Inflow Area = 6.620 ac, 0.00% Impervious, Inflow Depth > 2.08" for 10-yr event
Inflow = 23.74 cfs @ 11.97 hrs, Volume= 1.149 af
Outflow = 22.80 cfs @ 11.99 hrs, Volume= 1.145 af, Atten= 4%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.38 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.79 fps, Avg. Travel Time= 9.1 min

Peak Storage= 3,011 cf @ 11.99 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 637.02 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 975.4' Slope= 0.2228 '/'
Inlet Invert= 898.26', Outlet Invert= 680.98'

‡

Hydrograph for Reach IPC-G2: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	898.26	0.00
0.50	0.00	0	898.26	0.00
1.00	0.00	0	898.26	0.00
1.50	0.00	0	898.26	0.00
2.00	0.00	0	898.26	0.00
2.50	0.00	0	898.26	0.00
3.00	0.00	0	898.26	0.00
3.50	0.00	0	898.26	0.00
4.00	0.00	0	898.26	0.00
4.50	0.00	0	898.26	0.00
5.00	0.00	0	898.26	0.00
5.50	0.00	0	898.26	0.00
6.00	0.00	0	898.26	0.00
6.50	0.00	0	898.26	0.00
7.00	0.00	0	898.26	0.00
7.50	0.00	0	898.26	0.00
8.00	0.00	0	898.26	0.00
8.50	0.00	1	898.26	0.00
9.00	0.03	16	898.26	0.02
9.50	0.07	41	898.26	0.05
10.00	0.13	76	898.27	0.10
10.50	0.23	138	898.27	0.18
11.00	0.44	241	898.28	0.39
11.50	**0.96**	**396**	**898.30**	**0.83**
12.00	**21.79**	**2,997**	**898.55**	**22.62**
12.50	2.39	797	898.34	2.64
13.00	1.43	564	898.32	1.50
13.50	1.08	468	898.31	1.12
14.00	0.85	408	898.30	0.88
14.50	0.75	373	898.30	0.76
15.00	0.67	346	898.30	0.69
15.50	0.60	321	898.29	0.62
16.00	0.53	295	898.29	0.54
16.50	0.49	279	898.29	0.49
17.00	0.46	269	898.29	0.47
17.50	0.44	260	898.29	0.44
18.00	0.41	251	898.29	0.42
18.50	0.38	242	898.28	0.39
19.00	0.36	232	898.28	0.36
19.50	0.33	223	898.28	0.34
20.00	0.30	213	898.28	0.31
20.50	0.29	208	898.28	0.29
21.00	0.28	205	898.28	0.29
21.50	0.28	203	898.28	0.28
22.00	0.27	202	898.28	0.27
22.50	0.27	200	898.28	0.27
23.00	0.26	198	898.28	0.26
23.50	0.26	196	898.28	0.26
24.00	0.25	193	898.28	0.25

Summary for Reach IPC-G3: (new Reach)

Inflow Area = 1.254 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 5.14 cfs @ 11.94 hrs, Volume= 0.219 af
Outflow = 4.67 cfs @ 11.97 hrs, Volume= 0.218 af, Atten= 9%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.84 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 0.71 fps, Avg. Travel Time= 12.6 min

Peak Storage= 880 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 117.63 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 534.2' Slope= 0.0295 '/'
Inlet Invert= 837.83', Outlet Invert= 822.06'

Hydrograph for Reach IPC-G3: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	837.83	0.00
0.50	0.00	0	837.83	0.00
1.00	0.00	0	837.83	0.00
1.50	0.00	0	837.83	0.00
2.00	0.00	0	837.83	0.00
2.50	0.00	0	837.83	0.00
3.00	0.00	0	837.83	0.00
3.50	0.00	0	837.83	0.00
4.00	0.00	0	837.83	0.00
4.50	0.00	0	837.83	0.00
5.00	0.00	0	837.83	0.00
5.50	0.00	0	837.83	0.00
6.00	0.00	0	837.83	0.00
6.50	0.00	0	837.83	0.00
7.00	0.00	0	837.83	0.00
7.50	0.00	0	837.83	0.00
8.00	0.00	0	837.83	0.00
8.50	0.00	0	837.83	0.00
9.00	0.01	5	837.83	0.00
9.50	0.02	13	837.84	0.01
10.00	0.03	24	837.84	0.02
10.50	0.05	44	837.85	0.04
11.00	0.10	66	837.86	0.08
11.50	**0.21**	**110**	**837.88**	**0.18**
12.00	**3.51**	**836**	**838.16**	**4.32**
12.50	0.38	195	837.92	0.45
13.00	0.25	142	837.89	0.27
13.50	0.19	120	837.88	0.21
14.00	0.15	104	837.88	0.16
14.50	0.14	95	837.87	0.14
15.00	0.12	90	837.87	0.13
15.50	0.11	84	837.87	0.11
16.00	0.10	77	837.87	0.10
16.50	0.09	73	837.86	0.09
17.00	0.09	70	837.86	0.09
17.50	0.08	67	837.86	0.08
18.00	0.08	65	837.86	0.08
18.50	0.07	62	837.86	0.07
19.00	0.07	59	837.86	0.07
19.50	0.06	57	837.86	0.06
20.00	0.06	54	837.85	0.06
20.50	0.05	52	837.85	0.05
21.00	0.05	52	837.85	0.05
21.50	0.05	51	837.85	0.05
22.00	0.05	51	837.85	0.05
22.50	0.05	50	837.85	0.05
23.00	0.05	50	837.85	0.05
23.50	0.05	49	837.85	0.05
24.00	0.05	49	837.85	0.05

Summary for Reach IPC-G4: (new Reach)

Inflow Area = 3.472 ac, 0.00% Impervious, Inflow Depth > 2.09" for 10-yr event
Inflow = 13.16 cfs @ 11.96 hrs, Volume= 0.604 af
Outflow = 12.61 cfs @ 11.98 hrs, Volume= 0.602 af, Atten= 4%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.91 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.01 fps, Avg. Travel Time= 7.8 min

Peak Storage= 1,518 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 117.82 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 470.3' Slope= 0.0296 '/'
Inlet Invert= 822.06', Outlet Invert= 808.13'

Hydrograph for Reach IPC-G4: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	822.06	0.00
0.50	0.00	0	822.06	0.00
1.00	0.00	0	822.06	0.00
1.50	0.00	0	822.06	0.00
2.00	0.00	0	822.06	0.00
2.50	0.00	0	822.06	0.00
3.00	0.00	0	822.06	0.00
3.50	0.00	0	822.06	0.00
4.00	0.00	0	822.06	0.00
4.50	0.00	0	822.06	0.00
5.00	0.00	0	822.06	0.00
5.50	0.00	0	822.06	0.00
6.00	0.00	0	822.06	0.00
6.50	0.00	0	822.06	0.00
7.00	0.00	0	822.06	0.00
7.50	0.00	0	822.06	0.00
8.00	0.00	0	822.06	0.00
8.50	0.00	0	822.06	0.00
9.00	0.02	9	822.06	0.01
9.50	0.04	28	822.07	0.03
10.00	0.07	48	822.09	0.06
10.50	0.13	72	822.10	0.11
11.00	0.24	110	822.12	0.22
11.50	**0.53**	**179**	**822.15**	**0.48**
12.00	**11.39**	**1,489**	**822.67**	**12.27**
12.50	1.17	333	822.22	1.28
13.00	0.73	239	822.18	0.76
13.50	0.56	201	822.16	0.57
14.00	0.44	173	822.15	0.45
14.50	0.39	159	822.14	0.39
15.00	0.35	149	822.14	0.36
15.50	0.31	139	822.13	0.32
16.00	0.27	128	822.13	0.28
16.50	0.25	122	822.12	0.26
17.00	0.24	118	822.12	0.24
17.50	0.23	114	822.12	0.23
18.00	0.21	109	822.12	0.22
18.50	0.20	105	822.11	0.20
19.00	0.19	100	822.11	0.19
19.50	0.17	95	822.11	0.17
20.00	0.16	90	822.11	0.16
20.50	0.15	88	822.11	0.15
21.00	0.15	87	822.10	0.15
21.50	0.15	86	822.10	0.15
22.00	0.14	85	822.10	0.14
22.50	0.14	84	822.10	0.14
23.00	0.14	83	822.10	0.14
23.50	0.14	82	822.10	0.14
24.00	0.13	81	822.10	0.13

Summary for Reach IPC-G5: (new Reach)

Inflow Area = 3.973 ac, 0.00% Impervious, Inflow Depth > 2.08" for 10-yr event
Inflow = 14.43 cfs @ 11.98 hrs, Volume= 0.689 af
Outflow = 14.35 cfs @ 11.99 hrs, Volume= 0.689 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.05 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.06 fps, Avg. Travel Time= 2.7 min

Peak Storage= 617 cf @ 11.99 hrs
Average Depth at Peak Storage= 0.66'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 117.42 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 174.4' Slope= 0.0294 '/'
Inlet Invert= 808.13', Outlet Invert= 803.00'

Hydrograph for Reach IPC-G5: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	808.13	0.00
0.50	0.00	0	808.13	0.00
1.00	0.00	0	808.13	0.00
1.50	0.00	0	808.13	0.00
2.00	0.00	0	808.13	0.00
2.50	0.00	0	808.13	0.00
3.00	0.00	0	808.13	0.00
3.50	0.00	0	808.13	0.00
4.00	0.00	0	808.13	0.00
4.50	0.00	0	808.13	0.00
5.00	0.00	0	808.13	0.00
5.50	0.00	0	808.13	0.00
6.00	0.00	0	808.13	0.00
6.50	0.00	0	808.13	0.00
7.00	0.00	0	808.13	0.00
7.50	0.00	0	808.13	0.00
8.00	0.00	0	808.13	0.00
8.50	0.00	0	808.13	0.00
9.00	0.01	3	808.13	0.01
9.50	0.03	11	808.15	0.03
10.00	0.07	19	808.16	0.07
10.50	0.13	29	808.17	0.12
11.00	0.25	44	808.19	0.24
11.50	**0.56**	**72**	**808.23**	**0.54**
12.00	**13.80**	**609**	**808.79**	**14.09**
12.50	1.43	136	808.31	1.48
13.00	0.86	97	808.26	0.87
13.50	0.65	81	808.24	0.66
14.00	0.52	70	808.23	0.52
14.50	0.45	64	808.22	0.45
15.00	0.41	60	808.21	0.41
15.50	0.36	56	808.21	0.37
16.00	0.32	52	808.20	0.32
16.50	0.29	49	808.20	0.29
17.00	0.28	47	808.20	0.28
17.50	0.26	46	808.19	0.26
18.00	0.25	44	808.19	0.25
18.50	0.23	43	808.19	0.23
19.00	0.21	41	808.19	0.22
19.50	0.20	39	808.18	0.20
20.00	0.18	37	808.18	0.18
20.50	0.17	35	808.18	0.17
21.00	0.17	35	808.18	0.17
21.50	0.17	35	808.18	0.17
22.00	0.16	34	808.18	0.16
22.50	0.16	34	808.18	0.16
23.00	0.16	33	808.18	0.16
23.50	0.16	33	808.18	0.16
24.00	0.15	33	808.18	0.15

Summary for Reach IPC-G6: (new Reach)

Inflow Area = 5.398 ac, 0.00% Impervious, Inflow Depth > 2.08" for 10-yr event
Inflow = 19.06 cfs @ 11.97 hrs, Volume= 0.937 af
Outflow = 18.83 cfs @ 11.98 hrs, Volume= 0.935 af, Atten= 1%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.68 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 2.23 fps, Avg. Travel Time= 4.4 min

Peak Storage= 1,280 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.44'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 314.54 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 589.9' Slope= 0.2111 '/'
Inlet Invert= 803.00', Outlet Invert= 678.48'

Hydrograph for Reach IPC-G6: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	803.00	0.00
0.50	0.00	0	803.00	0.00
1.00	0.00	0	803.00	0.00
1.50	0.00	0	803.00	0.00
2.00	0.00	0	803.00	0.00
2.50	0.00	0	803.00	0.00
3.00	0.00	0	803.00	0.00
3.50	0.00	0	803.00	0.00
4.00	0.00	0	803.00	0.00
4.50	0.00	0	803.00	0.00
5.00	0.00	0	803.00	0.00
5.50	0.00	0	803.00	0.00
6.00	0.00	0	803.00	0.00
6.50	0.00	0	803.00	0.00
7.00	0.00	0	803.00	0.00
7.50	0.00	0	803.00	0.00
8.00	0.00	0	803.00	0.00
8.50	0.00	0	803.00	0.00
9.00	0.02	6	803.00	0.01
9.50	0.05	19	803.01	0.04
10.00	0.10	40	803.02	0.08
10.50	0.18	63	803.03	0.17
11.00	0.35	98	803.04	0.33
11.50	**0.78**	**159**	**803.07**	**0.73**
12.00	**17.46**	**1,251**	**803.44**	**18.21**
12.50	1.90	298	803.12	1.99
13.00	1.15	214	803.09	1.18
13.50	0.88	180	803.07	0.89
14.00	0.70	156	803.06	0.71
14.50	0.61	143	803.06	0.61
15.00	0.55	133	803.06	0.55
15.50	0.49	124	803.05	0.50
16.00	0.43	115	803.05	0.44
16.50	0.40	109	803.05	0.40
17.00	0.38	105	803.04	0.38
17.50	0.36	102	803.04	0.36
18.00	0.33	99	803.04	0.34
18.50	0.31	95	803.04	0.32
19.00	0.29	90	803.04	0.29
19.50	0.27	85	803.04	0.27
20.00	0.25	81	803.03	0.25
20.50	0.24	78	803.03	0.24
21.00	0.23	77	803.03	0.23
21.50	0.23	76	803.03	0.23
22.00	0.22	75	803.03	0.22
22.50	0.22	74	803.03	0.22
23.00	0.21	73	803.03	0.22
23.50	0.21	72	803.03	0.21
24.00	0.21	71	803.03	0.21

Summary for Pond DC-G11: Down Chute 3

Inflow Area = 20.371 ac, 0.00% Impervious, Inflow Depth > 2.08" for 10-yr event
Inflow = 75.70 cfs @ 11.98 hrs, Volume= 3.535 af
Outflow = 75.70 cfs @ 11.98 hrs, Volume= 3.535 af, Atten= 0%, Lag= 0.0 min
Primary = 75.70 cfs @ 11.98 hrs, Volume= 3.535 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 677.72' @ 11.98 hrs
Flood Elev= 680.98'

Device	Routing	Invert	Outlet Devices
#1	Primary	675.00'	**36.0" Round Culvert X 2.00** L= 70.6' Ke= 0.500 Inlet / Outlet Invert= 675.00' / 665.00' S= 0.1416 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=75.57 cfs @ 11.98 hrs HW=677.72' TW=668.60' (Dynamic Tailwater)
1=Culvert (Inlet Controls 75.57 cfs @ 5.61 fps)

Hydrograph for Pond DC-G11: Down Chute 3

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	675.00	0.00
0.50	0.00	675.00	0.00
1.00	0.00	675.00	0.00
1.50	0.00	675.00	0.00
2.00	0.00	675.00	0.00
2.50	0.00	675.00	0.00
3.00	0.00	675.00	0.00
3.50	0.00	675.00	0.00
4.00	0.00	675.00	0.00
4.50	0.00	675.00	0.00
5.00	0.00	675.00	0.00
5.50	0.00	675.00	0.00
6.00	0.00	675.00	0.00
6.50	0.00	675.00	0.00
7.00	0.00	675.00	0.00
7.50	0.00	675.00	0.00
8.00	0.00	675.00	0.00
8.50	0.00	675.01	0.00
9.00	0.08	675.07	0.08
9.50	0.20	675.11	0.20
10.00	0.37	675.15	0.37
10.50	0.68	675.21	0.68
11.00	1.31	675.29	1.31
11.50	**2.86**	**675.44**	**2.86**
12.00	**72.22**	**677.62**	**72.22**
12.50	7.42	675.71	7.42
13.00	4.42	675.55	4.42
13.50	3.34	675.47	3.34
14.00	2.64	675.42	2.64
14.50	2.30	675.39	2.30
15.00	2.08	675.37	2.08
15.50	1.86	675.35	1.86
16.00	1.63	675.33	1.63
16.50	1.50	675.31	1.50
17.00	1.42	675.31	1.42
17.50	1.35	675.30	1.35
18.00	1.26	675.29	1.26
18.50	1.18	675.28	1.18
19.00	1.10	675.27	1.10
19.50	1.02	675.26	1.02
20.00	0.93	675.25	0.93
20.50	0.89	675.24	0.89
21.00	0.88	675.24	0.88
21.50	0.86	675.24	0.86
22.00	0.84	675.23	0.84
22.50	0.83	675.23	0.83
23.00	0.81	675.23	0.81
23.50	0.80	675.23	0.80
24.00	0.78	675.23	0.78

Summary for Pond G: Pond G

Inflow Area = 28.484 ac, 0.00% Impervious, Inflow Depth > 2.06" for 10-yr event
Inflow = 103.75 cfs @ 11.98 hrs, Volume= 4.891 af
Outflow = 1.20 cfs @ 11.72 hrs, Volume= 1.563 af, Atten= 99%, Lag= 0.0 min
Primary = 1.20 cfs @ 11.72 hrs, Volume= 1.563 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 667.12' Surf.Area= 30,801 sf Storage= 73,912 cf
Peak Elev= 671.28' @ 21.38 hrs Surf.Area= 39,475 sf Storage= 219,474 cf (145,562 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 56.9 min (889.5 - 832.7)

Volume	Invert	Avail.Storage	Storage Description
#1	664.50'	652,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
664.50	25,620	0	0
670.00	36,497	170,822	170,822
680.00	59,752	481,245	652,067

Device	Routing	Invert	Outlet Devices
#1	Primary	663.00'	**48.0" Round Culvert** L= 184.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 663.00' / 656.88' S= 0.0332 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Device 1	675.15'	**72.0" x 72.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	677.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.50 Width (feet) 15.00 25.00
#4	Device 1	666.70'	**0.600 cfs Constant Flow/Skimmer X 2.00** Phase-In= 0.42'

Primary OutFlow Max=1.20 cfs @ 11.72 hrs HW=667.13' TW=656.38' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.20 cfs of 88.37 cfs potential flow)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Constant Flow/Skimmer** (Constant Controls 1.20 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=667.12' TW=656.01' (Dynamic Tailwater)
└─**3=Custom Weir/Orifice** (Controls 0.00 cfs)

Hydrograph for Pond G: Pond G

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	73,912	667.12	1.20	1.20	**0.00**
0.50	0.00	71,923	667.06	1.02	1.02	0.00
1.00	0.00	70,241	667.00	0.86	0.86	0.00
1.50	0.00	68,819	666.95	0.73	0.73	0.00
2.00	0.00	67,618	666.91	0.61	0.61	0.00
2.50	0.00	66,605	666.88	0.52	0.52	0.00
3.00	0.00	65,749	666.85	0.44	0.44	0.00
3.50	0.00	65,027	666.83	0.37	0.37	0.00
4.00	0.00	64,418	666.81	0.31	0.31	0.00
4.50	0.00	63,904	666.79	0.26	0.26	0.00
5.00	0.00	63,471	666.78	0.22	0.22	0.00
5.50	0.00	63,106	666.77	0.19	0.19	0.00
6.00	0.00	62,798	666.75	0.16	0.16	0.00
6.50	0.00	62,538	666.75	0.13	0.13	0.00
7.00	0.00	62,320	666.74	0.11	0.11	0.00
7.50	0.00	62,135	666.73	0.09	0.09	0.00
8.00	0.00	61,980	666.73	0.08	0.08	0.00
8.50	0.00	61,850	666.72	0.07	0.07	0.00
9.00	0.09	61,803	666.72	0.06	0.06	0.00
9.50	0.25	61,984	666.73	0.08	0.08	0.00
10.00	0.48	62,441	666.74	0.12	0.12	0.00
10.50	0.92	63,375	666.77	0.21	0.21	0.00
11.00	1.78	65,189	666.83	0.38	0.38	0.00
11.50	**3.92**	69,040	666.96	**0.75**	**0.75**	0.00
12.00	**98.51**	129,755	668.84	**1.20**	**1.20**	0.00
12.50	10.22	175,058	670.12	1.20	1.20	0.00
13.00	6.11	186,479	670.42	1.20	1.20	0.00
13.50	4.63	193,829	670.62	1.20	1.20	0.00
14.00	3.66	199,081	670.76	1.20	1.20	0.00
14.50	3.19	203,003	670.86	1.20	1.20	0.00
15.00	2.89	206,317	670.94	1.20	1.20	0.00
15.50	2.58	209,081	671.02	1.20	1.20	0.00
16.00	2.27	211,290	671.07	1.20	1.20	0.00
16.50	2.09	213,021	671.12	1.20	1.20	0.00
17.00	1.98	214,522	671.15	1.20	1.20	0.00
17.50	1.87	215,825	671.19	1.20	1.20	0.00
18.00	1.76	216,929	671.22	1.20	1.20	0.00
18.50	1.65	217,831	671.24	1.20	1.20	0.00
19.00	1.53	218,529	671.26	1.20	1.20	0.00
19.50	1.41	219,020	671.27	1.20	1.20	0.00
20.00	1.30	219,302	671.28	1.20	1.20	0.00
20.50	1.24	219,412	671.28	1.20	1.20	0.00
21.00	1.22	**219,463**	**671.28**	1.20	1.20	0.00
21.50	1.19	**219,473**	**671.28**	1.20	1.20	0.00
22.00	1.17	219,443	671.28	1.20	1.20	0.00
22.50	1.15	219,373	671.28	1.20	1.20	0.00
23.00	1.13	219,264	671.28	1.20	1.20	0.00
23.50	1.11	219,115	671.27	1.20	1.20	0.00
24.00	1.08	218,926	671.27	1.20	1.20	0.00

Summary for Pond IPC-G7: (new Reach)

Inflow Area = 5.398 ac, 0.00% Impervious, Inflow Depth > 2.08" for 10-yr event
Inflow = 18.83 cfs @ 11.98 hrs, Volume= 0.935 af
Outflow = 18.83 cfs @ 11.98 hrs, Volume= 0.935 af, Atten= 0%, Lag= 0.0 min
Primary = 18.83 cfs @ 11.98 hrs, Volume= 0.935 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 675.90' @ 11.98 hrs
Flood Elev= 678.48'

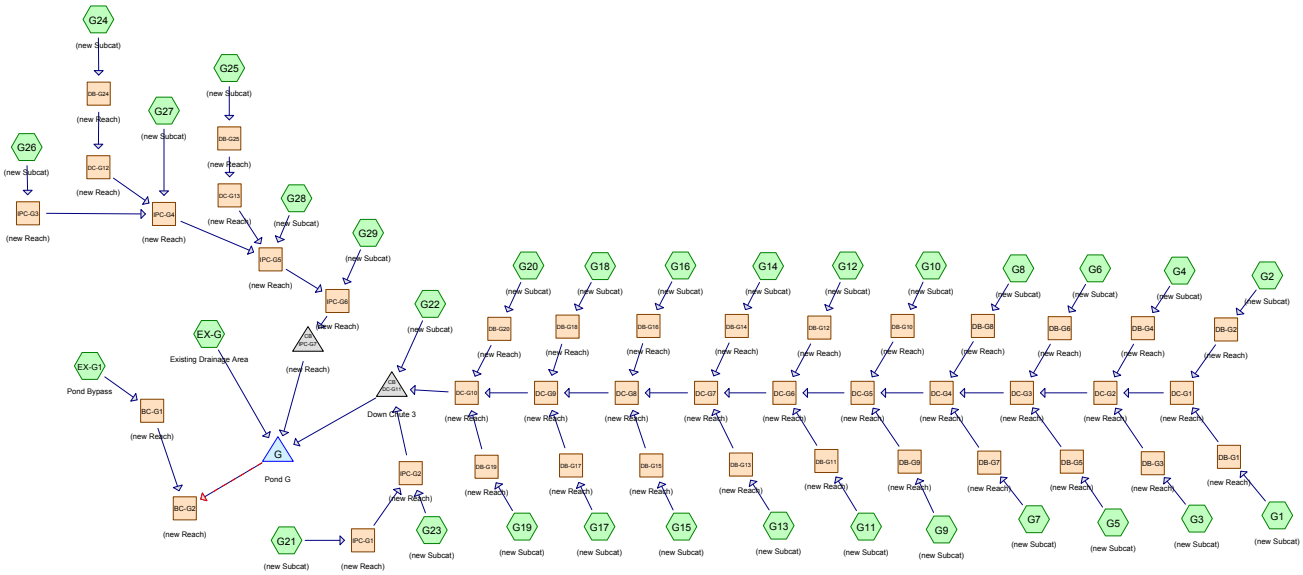
Device	Routing	Invert	Outlet Devices
#1	Primary	674.00'	**30.0" Round Culvert** L= 120.0' Ke= 0.500 Inlet / Outlet Invert= 674.00' / 669.00' S= 0.0417 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf

Primary OutFlow Max=18.82 cfs @ 11.98 hrs HW=675.90' TW=668.61' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 18.82 cfs @ 4.70 fps)

Hydrograph for Pond IPC-G7: (new Reach)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	674.00	0.00
0.50	0.00	674.00	0.00
1.00	0.00	674.00	0.00
1.50	0.00	674.00	0.00
2.00	0.00	674.00	0.00
2.50	0.00	674.00	0.00
3.00	0.00	674.00	0.00
3.50	0.00	674.00	0.00
4.00	0.00	674.00	0.00
4.50	0.00	674.00	0.00
5.00	0.00	674.00	0.00
5.50	0.00	674.00	0.00
6.00	0.00	674.00	0.00
6.50	0.00	674.00	0.00
7.00	0.00	674.00	0.00
7.50	0.00	674.00	0.00
8.00	0.00	674.00	0.00
8.50	0.00	674.01	0.00
9.00	0.01	674.04	0.01
9.50	0.04	674.08	0.04
10.00	0.08	674.11	0.08
10.50	0.17	674.16	0.17
11.00	0.33	674.22	0.33
11.50	**0.73**	**674.33**	**0.73**
12.00	**18.21**	**675.86**	**18.21**
12.50	1.99	674.55	1.99
13.00	1.18	674.42	1.18
13.50	0.89	674.36	0.89
14.00	0.71	674.32	0.71
14.50	0.61	674.30	0.61
15.00	0.55	674.28	0.55
15.50	0.50	674.27	0.50
16.00	0.44	674.25	0.44
16.50	0.40	674.24	0.40
17.00	0.38	674.23	0.38
17.50	0.36	674.23	0.36
18.00	0.34	674.22	0.34
18.50	0.32	674.21	0.32
19.00	0.29	674.20	0.29
19.50	0.27	674.20	0.27
20.00	0.25	674.19	0.25
20.50	0.24	674.18	0.24
21.00	0.23	674.18	0.23
21.50	0.23	674.18	0.23
22.00	0.22	674.18	0.22
22.50	0.22	674.18	0.22
23.00	0.22	674.18	0.22
23.50	0.21	674.17	0.21
24.00	0.21	674.17	0.21

POND G – FINAL CONDITIONS
25-YEAR, 24-HOUR STORM EVENT



Subcat Reach Pond Link

Routing Diagram for 071-644_SWM POND D, E, G

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
25.769	79	50-75% Grass cover, Fair, HSG C (G1, G10, G11, G12, G13, G14, G15, G16, G17, G18, G19, G2, G20, G21, G22, G23, G24, G25, G26, G27, G28, G29, G3, G4, G5, G6, G7, G8, G9)
13.269	76	Woods/grass comb., Fair, HSG C (EX-G, EX-G1)
39.038	**78**	**TOTAL AREA**

Summary for Subcatchment EX-G: Existing Drainage Area

Runoff = 12.72 cfs @ 11.96 hrs, Volume= 0.567 af, Depth> 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
2.715	76	Woods/grass comb., Fair, HSG C
2.715		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	100	0.2710	0.46		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.91"
1.2	349	0.4550	4.72		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
4.8	449	Total			

Hydrograph for Subcatchment EX-G: Existing Drainage Area

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.00	0.00
9.00	0.73	0.00	0.02
9.50	0.81	0.01	0.04
10.00	0.90	0.02	0.08
10.50	1.01	0.04	0.13
11.00	1.17	0.08	0.24
11.50	1.41	0.15	**0.52**
12.00	3.30	1.22	**10.72**
12.50	3.65	1.48	1.04
13.00	3.84	1.61	0.66
13.50	3.97	1.72	0.51
14.00	4.08	1.80	0.40
14.50	4.16	1.86	0.36
15.00	4.24	1.93	0.32
15.50	4.31	1.98	0.29
16.00	4.37	2.03	0.25
16.50	4.43	2.07	0.24
17.00	4.48	2.12	0.22
17.50	4.53	2.15	0.21
18.00	4.58	2.19	0.20
18.50	4.62	2.23	0.19
19.00	4.66	2.26	0.17
19.50	4.70	2.29	0.16
20.00	4.73	2.32	0.15
20.50	4.76	2.34	0.14
21.00	4.79	2.37	0.14
21.50	4.83	2.39	0.14
22.00	4.86	2.42	0.13
22.50	4.89	2.44	0.13
23.00	4.91	2.46	0.13
23.50	4.94	2.49	0.13
24.00	**4.97**	**2.51**	0.12

Summary for Subcatchment EX-G1: Pond Bypass

Runoff = 47.13 cfs @ 11.98 hrs, Volume= 2.205 af, Depth> 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
10.554	76	Woods/grass comb., Fair, HSG C
10.554		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	100	0.1602	0.37		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
1.6	406	0.3730	4.28		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.1	506	Total			

Hydrograph for Subcatchment EX-G1: Pond Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.00	0.01
9.00	0.73	0.00	0.08
9.50	0.81	0.01	0.16
10.00	0.90	0.02	0.29
10.50	1.01	0.04	0.51
11.00	1.17	0.08	0.93
11.50	1.41	0.15	**1.98**
12.00	3.30	1.22	**44.58**
12.50	3.65	1.48	4.21
13.00	3.84	1.61	2.62
13.50	3.97	1.72	2.00
14.00	4.08	1.80	1.58
14.50	4.16	1.86	1.40
15.00	4.24	1.93	1.27
15.50	4.31	1.98	1.13
16.00	4.37	2.03	0.99
16.50	4.43	2.07	0.92
17.00	4.48	2.12	0.87
17.50	4.53	2.15	0.82
18.00	4.58	2.19	0.77
18.50	4.62	2.23	0.72
19.00	4.66	2.26	0.67
19.50	4.70	2.29	0.62
20.00	4.73	2.32	0.57
20.50	4.76	2.34	0.55
21.00	4.79	2.37	0.54
21.50	4.83	2.39	0.53
22.00	4.86	2.42	0.52
22.50	4.89	2.44	0.51
23.00	4.91	2.46	0.50
23.50	4.94	2.49	0.49
24.00	**4.97**	**2.51**	0.48

Summary for Subcatchment G1: (new Subcat)

Runoff = 1.75 cfs @ 11.95 hrs, Volume= 0.076 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.327	79	50-75% Grass cover, Fair, HSG C
0.327		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G1: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.00
9.00	0.73	0.01	0.01
9.50	0.81	0.03	0.01
10.00	0.90	0.04	0.01
10.50	1.01	0.07	0.02
11.00	1.17	0.12	0.04
11.50	1.41	0.22	**0.08**
12.00	3.30	1.41	**1.23**
12.50	3.65	1.69	0.13
13.00	3.84	1.83	0.08
13.50	3.97	1.94	0.06
14.00	4.08	2.02	0.05
14.50	4.16	2.10	0.05
15.00	4.24	2.16	0.04
15.50	4.31	2.22	0.04
16.00	4.37	2.27	0.03
16.50	4.43	2.32	0.03
17.00	4.48	2.36	0.03
17.50	4.53	2.40	0.03
18.00	4.58	2.44	0.03
18.50	4.62	2.48	0.02
19.00	4.66	2.51	0.02
19.50	4.70	2.54	0.02
20.00	4.73	2.57	0.02
20.50	4.76	2.60	0.02
21.00	4.79	2.63	0.02
21.50	4.83	2.65	0.02
22.00	4.86	2.68	0.02
22.50	4.89	2.70	0.02
23.00	4.91	2.73	0.02
23.50	4.94	2.75	0.02
24.00	**4.97**	**2.78**	0.02

Summary for Subcatchment G10: (new Subcat)

Runoff = 5.03 cfs @ 11.95 hrs, Volume= 0.219 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.948	79	50-75% Grass cover, Fair, HSG C
0.948		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	105	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G10: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.02
9.50	0.81	0.03	0.03
10.00	0.90	0.04	0.04
10.50	1.01	0.07	0.07
11.00	1.17	0.12	0.11
11.50	1.41	0.22	**0.23**
12.00	3.30	1.41	**3.67**
12.50	3.65	1.69	0.38
13.00	3.84	1.83	0.24
13.50	3.97	1.94	0.19
14.00	4.08	2.02	0.15
14.50	4.16	2.10	0.13
15.00	4.24	2.16	0.12
15.50	4.31	2.22	0.11
16.00	4.37	2.27	0.09
16.50	4.43	2.32	0.09
17.00	4.48	2.36	0.08
17.50	4.53	2.40	0.08
18.00	4.58	2.44	0.07
18.50	4.62	2.48	0.07
19.00	4.66	2.51	0.06
19.50	4.70	2.54	0.06
20.00	4.73	2.57	0.05
20.50	4.76	2.60	0.05
21.00	4.79	2.63	0.05
21.50	4.83	2.65	0.05
22.00	4.86	2.68	0.05
22.50	4.89	2.70	0.05
23.00	4.91	2.73	0.05
23.50	4.94	2.75	0.05
24.00	**4.97**	**2.78**	0.05

Summary for Subcatchment G11: (new Subcat)

Runoff = 2.88 cfs @ 11.95 hrs, Volume= 0.125 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.540	79	50-75% Grass cover, Fair, HSG C
0.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G11: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.01
9.50	0.81	0.03	0.02
10.00	0.90	0.04	0.02
10.50	1.01	0.07	0.04
11.00	1.17	0.12	0.06
11.50	1.41	0.22	**0.13**
12.00	3.30	1.41	**2.03**
12.50	3.65	1.69	0.21
13.00	3.84	1.83	0.14
13.50	3.97	1.94	0.11
14.00	4.08	2.02	0.08
14.50	4.16	2.10	0.08
15.00	4.24	2.16	0.07
15.50	4.31	2.22	0.06
16.00	4.37	2.27	0.05
16.50	4.43	2.32	0.05
17.00	4.48	2.36	0.05
17.50	4.53	2.40	0.04
18.00	4.58	2.44	0.04
18.50	4.62	2.48	0.04
19.00	4.66	2.51	0.04
19.50	4.70	2.54	0.03
20.00	4.73	2.57	0.03
20.50	4.76	2.60	0.03
21.00	4.79	2.63	0.03
21.50	4.83	2.65	0.03
22.00	4.86	2.68	0.03
22.50	4.89	2.70	0.03
23.00	4.91	2.73	0.03
23.50	4.94	2.75	0.03
24.00	**4.97**	**2.78**	0.03

Summary for Subcatchment G12: (new Subcat)

Runoff = 5.89 cfs @ 11.95 hrs, Volume= 0.255 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.102	79	50-75% Grass cover, Fair, HSG C
1.102		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G12: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.01
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.02
9.50	0.81	0.03	0.03
10.00	0.90	0.04	0.05
10.50	1.01	0.07	0.08
11.00	1.17	0.12	0.13
11.50	1.41	0.22	**0.27**
12.00	3.30	1.41	**4.14**
12.50	3.65	1.69	0.43
13.00	3.84	1.83	0.28
13.50	3.97	1.94	0.22
14.00	4.08	2.02	0.17
14.50	4.16	2.10	0.15
15.00	4.24	2.16	0.14
15.50	4.31	2.22	0.12
16.00	4.37	2.27	0.11
16.50	4.43	2.32	0.10
17.00	4.48	2.36	0.10
17.50	4.53	2.40	0.09
18.00	4.58	2.44	0.08
18.50	4.62	2.48	0.08
19.00	4.66	2.51	0.07
19.50	4.70	2.54	0.07
20.00	4.73	2.57	0.06
20.50	4.76	2.60	0.06
21.00	4.79	2.63	0.06
21.50	4.83	2.65	0.06
22.00	4.86	2.68	0.06
22.50	4.89	2.70	0.06
23.00	4.91	2.73	0.05
23.50	4.94	2.75	0.05
24.00	**4.97**	**2.78**	0.05

Summary for Subcatchment G13: (new Subcat)

Runoff = 2.32 cfs @ 11.95 hrs, Volume= 0.101 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.435	79	50-75% Grass cover, Fair, HSG C
0.435		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G13: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.00
9.00	0.73	0.01	0.01
9.50	0.81	0.03	0.01
10.00	0.90	0.04	0.02
10.50	1.01	0.07	0.03
11.00	1.17	0.12	0.05
11.50	1.41	0.22	**0.11**
12.00	3.30	1.41	**1.63**
12.50	3.65	1.69	0.17
13.00	3.84	1.83	0.11
13.50	3.97	1.94	0.09
14.00	4.08	2.02	0.07
14.50	4.16	2.10	0.06
15.00	4.24	2.16	0.05
15.50	4.31	2.22	0.05
16.00	4.37	2.27	0.04
16.50	4.43	2.32	0.04
17.00	4.48	2.36	0.04
17.50	4.53	2.40	0.04
18.00	4.58	2.44	0.03
18.50	4.62	2.48	0.03
19.00	4.66	2.51	0.03
19.50	4.70	2.54	0.03
20.00	4.73	2.57	0.02
20.50	4.76	2.60	0.02
21.00	4.79	2.63	0.02
21.50	4.83	2.65	0.02
22.00	4.86	2.68	0.02
22.50	4.89	2.70	0.02
23.00	4.91	2.73	0.02
23.50	4.94	2.75	0.02
24.00	**4.97**	**2.78**	0.02

Summary for Subcatchment G14: (new Subcat)

Runoff = 6.45 cfs @ 11.95 hrs, Volume= 0.279 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.207	79	50-75% Grass cover, Fair, HSG C
1.207		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G14: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.01
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.02
9.50	0.81	0.03	0.03
10.00	0.90	0.04	0.05
10.50	1.01	0.07	0.08
11.00	1.17	0.12	0.14
11.50	1.41	0.22	**0.29**
12.00	3.30	1.41	**4.53**
12.50	3.65	1.69	0.48
13.00	3.84	1.83	0.31
13.50	3.97	1.94	0.24
14.00	4.08	2.02	0.19
14.50	4.16	2.10	0.17
15.00	4.24	2.16	0.15
15.50	4.31	2.22	0.13
16.00	4.37	2.27	0.12
16.50	4.43	2.32	0.11
17.00	4.48	2.36	0.10
17.50	4.53	2.40	0.10
18.00	4.58	2.44	0.09
18.50	4.62	2.48	0.09
19.00	4.66	2.51	0.08
19.50	4.70	2.54	0.07
20.00	4.73	2.57	0.07
20.50	4.76	2.60	0.07
21.00	4.79	2.63	0.06
21.50	4.83	2.65	0.06
22.00	4.86	2.68	0.06
22.50	4.89	2.70	0.06
23.00	4.91	2.73	0.06
23.50	4.94	2.75	0.06
24.00	**4.97**	**2.78**	0.06

Summary for Subcatchment G15: (new Subcat)

Runoff = 1.76 cfs @ 11.95 hrs, Volume= 0.076 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.329	79	50-75% Grass cover, Fair, HSG C
0.329		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G15: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.00
9.00	0.73	0.01	0.01
9.50	0.81	0.03	0.01
10.00	0.90	0.04	0.01
10.50	1.01	0.07	0.02
11.00	1.17	0.12	0.04
11.50	1.41	0.22	**0.08**
12.00	3.30	1.41	**1.24**
12.50	3.65	1.69	0.13
13.00	3.84	1.83	0.08
13.50	3.97	1.94	0.06
14.00	4.08	2.02	0.05
14.50	4.16	2.10	0.05
15.00	4.24	2.16	0.04
15.50	4.31	2.22	0.04
16.00	4.37	2.27	0.03
16.50	4.43	2.32	0.03
17.00	4.48	2.36	0.03
17.50	4.53	2.40	0.03
18.00	4.58	2.44	0.03
18.50	4.62	2.48	0.02
19.00	4.66	2.51	0.02
19.50	4.70	2.54	0.02
20.00	4.73	2.57	0.02
20.50	4.76	2.60	0.02
21.00	4.79	2.63	0.02
21.50	4.83	2.65	0.02
22.00	4.86	2.68	0.02
22.50	4.89	2.70	0.02
23.00	4.91	2.73	0.02
23.50	4.94	2.75	0.02
24.00	**4.97**	**2.78**	0.02

Summary for Subcatchment G16: (new Subcat)

Runoff = 5.71 cfs @ 11.95 hrs, Volume= 0.247 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.069	79	50-75% Grass cover, Fair, HSG C
1.069		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G16: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.02
9.50	0.81	0.03	0.03
10.00	0.90	0.04	0.05
10.50	1.01	0.07	0.08
11.00	1.17	0.12	0.13
11.50	1.41	0.22	**0.26**
12.00	3.30	1.41	**4.02**
12.50	3.65	1.69	0.42
13.00	3.84	1.83	0.27
13.50	3.97	1.94	0.21
14.00	4.08	2.02	0.17
14.50	4.16	2.10	0.15
15.00	4.24	2.16	0.13
15.50	4.31	2.22	0.12
16.00	4.37	2.27	0.10
16.50	4.43	2.32	0.10
17.00	4.48	2.36	0.09
17.50	4.53	2.40	0.09
18.00	4.58	2.44	0.08
18.50	4.62	2.48	0.08
19.00	4.66	2.51	0.07
19.50	4.70	2.54	0.07
20.00	4.73	2.57	0.06
20.50	4.76	2.60	0.06
21.00	4.79	2.63	0.06
21.50	4.83	2.65	0.06
22.00	4.86	2.68	0.06
22.50	4.89	2.70	0.05
23.00	4.91	2.73	0.05
23.50	4.94	2.75	0.05
24.00	**4.97**	**2.78**	0.05

Summary for Subcatchment G17: (new Subcat)

Runoff = 1.20 cfs @ 11.95 hrs, Volume= 0.052 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.224	79	50-75% Grass cover, Fair, HSG C
0.224		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G17: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.00
9.00	0.73	0.01	0.00
9.50	0.81	0.03	0.01
10.00	0.90	0.04	0.01
10.50	1.01	0.07	0.02
11.00	1.17	0.12	0.03
11.50	1.41	0.22	**0.05**
12.00	3.30	1.41	**0.84**
12.50	3.65	1.69	0.09
13.00	3.84	1.83	0.06
13.50	3.97	1.94	0.04
14.00	4.08	2.02	0.03
14.50	4.16	2.10	0.03
15.00	4.24	2.16	0.03
15.50	4.31	2.22	0.03
16.00	4.37	2.27	0.02
16.50	4.43	2.32	0.02
17.00	4.48	2.36	0.02
17.50	4.53	2.40	0.02
18.00	4.58	2.44	0.02
18.50	4.62	2.48	0.02
19.00	4.66	2.51	0.01
19.50	4.70	2.54	0.01
20.00	4.73	2.57	0.01
20.50	4.76	2.60	0.01
21.00	4.79	2.63	0.01
21.50	4.83	2.65	0.01
22.00	4.86	2.68	0.01
22.50	4.89	2.70	0.01
23.00	4.91	2.73	0.01
23.50	4.94	2.75	0.01
24.00	**4.97**	**2.78**	0.01

Summary for Subcatchment G18: (new Subcat)

Runoff = 4.82 cfs @ 11.95 hrs, Volume= 0.209 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.903	79	50-75% Grass cover, Fair, HSG C
0.903		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G18: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.02
9.50	0.81	0.03	0.03
10.00	0.90	0.04	0.04
10.50	1.01	0.07	0.06
11.00	1.17	0.12	0.11
11.50	1.41	0.22	**0.22**
12.00	3.30	1.41	**3.39**
12.50	3.65	1.69	0.36
13.00	3.84	1.83	0.23
13.50	3.97	1.94	0.18
14.00	4.08	2.02	0.14
14.50	4.16	2.10	0.13
15.00	4.24	2.16	0.11
15.50	4.31	2.22	0.10
16.00	4.37	2.27	0.09
16.50	4.43	2.32	0.08
17.00	4.48	2.36	0.08
17.50	4.53	2.40	0.07
18.00	4.58	2.44	0.07
18.50	4.62	2.48	0.06
19.00	4.66	2.51	0.06
19.50	4.70	2.54	0.06
20.00	4.73	2.57	0.05
20.50	4.76	2.60	0.05
21.00	4.79	2.63	0.05
21.50	4.83	2.65	0.05
22.00	4.86	2.68	0.05
22.50	4.89	2.70	0.05
23.00	4.91	2.73	0.04
23.50	4.94	2.75	0.04
24.00	**4.97**	**2.78**	0.04

Summary for Subcatchment G19: (new Subcat)

Runoff = 0.63 cfs @ 11.95 hrs, Volume= 0.027 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.118	79	50-75% Grass cover, Fair, HSG C
0.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G19: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.00
9.00	0.73	0.01	0.00
9.50	0.81	0.03	0.00
10.00	0.90	0.04	0.01
10.50	1.01	0.07	0.01
11.00	1.17	0.12	0.01
11.50	1.41	0.22	**0.03**
12.00	3.30	1.41	**0.44**
12.50	3.65	1.69	0.05
13.00	3.84	1.83	0.03
13.50	3.97	1.94	0.02
14.00	4.08	2.02	0.02
14.50	4.16	2.10	0.02
15.00	4.24	2.16	0.01
15.50	4.31	2.22	0.01
16.00	4.37	2.27	0.01
16.50	4.43	2.32	0.01
17.00	4.48	2.36	0.01
17.50	4.53	2.40	0.01
18.00	4.58	2.44	0.01
18.50	4.62	2.48	0.01
19.00	4.66	2.51	0.01
19.50	4.70	2.54	0.01
20.00	4.73	2.57	0.01
20.50	4.76	2.60	0.01
21.00	4.79	2.63	0.01
21.50	4.83	2.65	0.01
22.00	4.86	2.68	0.01
22.50	4.89	2.70	0.01
23.00	4.91	2.73	0.01
23.50	4.94	2.75	0.01
24.00	**4.97**	**2.78**	0.01

Summary for Subcatchment G2: (new Subcat)

Runoff = 1.31 cfs @ 11.95 hrs, Volume= 0.057 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.245	79	50-75% Grass cover, Fair, HSG C
0.245		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G2: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.00
9.00	0.73	0.01	0.00
9.50	0.81	0.03	0.01
10.00	0.90	0.04	0.01
10.50	1.01	0.07	0.02
11.00	1.17	0.12	0.03
11.50	1.41	0.22	**0.06**
12.00	3.30	1.41	**0.92**
12.50	3.65	1.69	0.10
13.00	3.84	1.83	0.06
13.50	3.97	1.94	0.05
14.00	4.08	2.02	0.04
14.50	4.16	2.10	0.03
15.00	4.24	2.16	0.03
15.50	4.31	2.22	0.03
16.00	4.37	2.27	0.02
16.50	4.43	2.32	0.02
17.00	4.48	2.36	0.02
17.50	4.53	2.40	0.02
18.00	4.58	2.44	0.02
18.50	4.62	2.48	0.02
19.00	4.66	2.51	0.02
19.50	4.70	2.54	0.01
20.00	4.73	2.57	0.01
20.50	4.76	2.60	0.01
21.00	4.79	2.63	0.01
21.50	4.83	2.65	0.01
22.00	4.86	2.68	0.01
22.50	4.89	2.70	0.01
23.00	4.91	2.73	0.01
23.50	4.94	2.75	0.01
24.00	**4.97**	**2.78**	0.01

Summary for Subcatchment G20: (new Subcat)

Runoff = 3.89 cfs @ 11.95 hrs, Volume= 0.168 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.729	79	50-75% Grass cover, Fair, HSG C
0.729		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G20: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.01
9.50	0.81	0.03	0.02
10.00	0.90	0.04	0.03
10.50	1.01	0.07	0.05
11.00	1.17	0.12	0.09
11.50	1.41	0.22	**0.18**
12.00	3.30	1.41	**2.74**
12.50	3.65	1.69	0.29
13.00	3.84	1.83	0.19
13.50	3.97	1.94	0.14
14.00	4.08	2.02	0.11
14.50	4.16	2.10	0.10
15.00	4.24	2.16	0.09
15.50	4.31	2.22	0.08
16.00	4.37	2.27	0.07
16.50	4.43	2.32	0.07
17.00	4.48	2.36	0.06
17.50	4.53	2.40	0.06
18.00	4.58	2.44	0.06
18.50	4.62	2.48	0.05
19.00	4.66	2.51	0.05
19.50	4.70	2.54	0.04
20.00	4.73	2.57	0.04
20.50	4.76	2.60	0.04
21.00	4.79	2.63	0.04
21.50	4.83	2.65	0.04
22.00	4.86	2.68	0.04
22.50	4.89	2.70	0.04
23.00	4.91	2.73	0.04
23.50	4.94	2.75	0.04
24.00	**4.97**	**2.78**	0.03

Summary for Subcatchment G21: (new Subcat)

Runoff = 11.96 cfs @ 11.92 hrs, Volume= 0.485 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
2.096	79	50-75% Grass cover, Fair, HSG C
2.096		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	39	0.2500	0.37		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G21: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.01
8.50	0.66	0.01	0.02
9.00	0.73	0.01	0.04
9.50	0.81	0.03	0.06
10.00	0.90	0.04	0.09
10.50	1.01	0.07	0.15
11.00	1.17	0.12	0.26
11.50	1.41	0.22	**0.53**
12.00	3.30	1.41	**4.88**
12.50	3.65	1.69	0.77
13.00	3.84	1.83	0.53
13.50	3.97	1.94	0.41
14.00	4.08	2.02	0.32
14.50	4.16	2.10	0.29
15.00	4.24	2.16	0.26
15.50	4.31	2.22	0.23
16.00	4.37	2.27	0.20
16.50	4.43	2.32	0.19
17.00	4.48	2.36	0.18
17.50	4.53	2.40	0.17
18.00	4.58	2.44	0.16
18.50	4.62	2.48	0.15
19.00	4.66	2.51	0.14
19.50	4.70	2.54	0.13
20.00	4.73	2.57	0.12
20.50	4.76	2.60	0.11
21.00	4.79	2.63	0.11
21.50	4.83	2.65	0.11
22.00	4.86	2.68	0.11
22.50	4.89	2.70	0.11
23.00	4.91	2.73	0.10
23.50	4.94	2.75	0.10
24.00	**4.97**	**2.78**	0.10

Summary for Subcatchment G22: (new Subcat)

Runoff = 4.18 cfs @ 11.96 hrs, Volume= 0.186 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.806	79	50-75% Grass cover, Fair, HSG C
0.806		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	125	0.2500	0.47		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G22: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.02
9.50	0.81	0.03	0.02
10.00	0.90	0.04	0.03
10.50	1.01	0.07	0.06
11.00	1.17	0.12	0.09
11.50	1.41	0.22	**0.19**
12.00	3.30	1.41	**3.36**
12.50	3.65	1.69	0.33
13.00	3.84	1.83	0.21
13.50	3.97	1.94	0.16
14.00	4.08	2.02	0.13
14.50	4.16	2.10	0.11
15.00	4.24	2.16	0.10
15.50	4.31	2.22	0.09
16.00	4.37	2.27	0.08
16.50	4.43	2.32	0.07
17.00	4.48	2.36	0.07
17.50	4.53	2.40	0.07
18.00	4.58	2.44	0.06
18.50	4.62	2.48	0.06
19.00	4.66	2.51	0.05
19.50	4.70	2.54	0.05
20.00	4.73	2.57	0.05
20.50	4.76	2.60	0.04
21.00	4.79	2.63	0.04
21.50	4.83	2.65	0.04
22.00	4.86	2.68	0.04
22.50	4.89	2.70	0.04
23.00	4.91	2.73	0.04
23.50	4.94	2.75	0.04
24.00	**4.97**	**2.78**	0.04

Summary for Subcatchment G23: (new Subcat)

Runoff = 22.58 cfs @ 11.97 hrs, Volume= 1.045 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
4.524	79	50-75% Grass cover, Fair, HSG C
4.524		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1510	0.36		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
0.8	165	0.2450	3.46		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	71	0.5490	5.19		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.6	336	Total			

Hydrograph for Subcatchment G23: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.02
8.50	0.66	0.01	0.05
9.00	0.73	0.01	0.09
9.50	0.81	0.03	0.13
10.00	0.90	0.04	0.19
10.50	1.01	0.07	0.31
11.00	1.17	0.12	0.52
11.50	1.41	0.22	**1.06**
12.00	3.30	1.41	**20.50**
12.50	3.65	1.69	1.90
13.00	3.84	1.83	1.19
13.50	3.97	1.94	0.91
14.00	4.08	2.02	0.72
14.50	4.16	2.10	0.63
15.00	4.24	2.16	0.57
15.50	4.31	2.22	0.51
16.00	4.37	2.27	0.45
16.50	4.43	2.32	0.42
17.00	4.48	2.36	0.39
17.50	4.53	2.40	0.37
18.00	4.58	2.44	0.35
18.50	4.62	2.48	0.32
19.00	4.66	2.51	0.30
19.50	4.70	2.54	0.28
20.00	4.73	2.57	0.25
20.50	4.76	2.60	0.25
21.00	4.79	2.63	0.24
21.50	4.83	2.65	0.24
22.00	4.86	2.68	0.23
22.50	4.89	2.70	0.23
23.00	4.91	2.73	0.22
23.50	4.94	2.75	0.22
24.00	**4.97**	**2.78**	0.22

Summary for Subcatchment G24: (new Subcat)

Runoff = 6.41 cfs @ 11.95 hrs, Volume= 0.279 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.208	79	50-75% Grass cover, Fair, HSG C
1.208		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	106	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G24: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.01
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.02
9.50	0.81	0.03	0.03
10.00	0.90	0.04	0.05
10.50	1.01	0.07	0.08
11.00	1.17	0.12	0.14
11.50	1.41	0.22	**0.29**
12.00	3.30	1.41	**4.68**
12.50	3.65	1.69	0.48
13.00	3.84	1.83	0.31
13.50	3.97	1.94	0.24
14.00	4.08	2.02	0.19
14.50	4.16	2.10	0.17
15.00	4.24	2.16	0.15
15.50	4.31	2.22	0.14
16.00	4.37	2.27	0.12
16.50	4.43	2.32	0.11
17.00	4.48	2.36	0.10
17.50	4.53	2.40	0.10
18.00	4.58	2.44	0.09
18.50	4.62	2.48	0.09
19.00	4.66	2.51	0.08
19.50	4.70	2.54	0.07
20.00	4.73	2.57	0.07
20.50	4.76	2.60	0.07
21.00	4.79	2.63	0.06
21.50	4.83	2.65	0.06
22.00	4.86	2.68	0.06
22.50	4.89	2.70	0.06
23.00	4.91	2.73	0.06
23.50	4.94	2.75	0.06
24.00	**4.97**	**2.78**	0.06

Summary for Subcatchment G25: (new Subcat)

Runoff = 1.38 cfs @ 11.95 hrs, Volume= 0.060 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.260	79	50-75% Grass cover, Fair, HSG C
0.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	102	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G25: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.00
9.00	0.73	0.01	0.01
9.50	0.81	0.03	0.01
10.00	0.90	0.04	0.01
10.50	1.01	0.07	0.02
11.00	1.17	0.12	0.03
11.50	1.41	0.22	**0.06**
12.00	3.30	1.41	**0.99**
12.50	3.65	1.69	0.10
13.00	3.84	1.83	0.07
13.50	3.97	1.94	0.05
14.00	4.08	2.02	0.04
14.50	4.16	2.10	0.04
15.00	4.24	2.16	0.03
15.50	4.31	2.22	0.03
16.00	4.37	2.27	0.03
16.50	4.43	2.32	0.02
17.00	4.48	2.36	0.02
17.50	4.53	2.40	0.02
18.00	4.58	2.44	0.02
18.50	4.62	2.48	0.02
19.00	4.66	2.51	0.02
19.50	4.70	2.54	0.02
20.00	4.73	2.57	0.01
20.50	4.76	2.60	0.01
21.00	4.79	2.63	0.01
21.50	4.83	2.65	0.01
22.00	4.86	2.68	0.01
22.50	4.89	2.70	0.01
23.00	4.91	2.73	0.01
23.50	4.94	2.75	0.01
24.00	**4.97**	**2.78**	0.01

Summary for Subcatchment G26: (new Subcat)

Runoff = 6.75 cfs @ 11.94 hrs, Volume= 0.290 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.254	79	50-75% Grass cover, Fair, HSG C
1.254		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	92	0.2500	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G26: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.01
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.03
9.50	0.81	0.03	0.04
10.00	0.90	0.04	0.05
10.50	1.01	0.07	0.09
11.00	1.17	0.12	0.15
11.50	1.41	0.22	**0.31**
12.00	3.30	1.41	**4.56**
12.50	3.65	1.69	0.49
13.00	3.84	1.83	0.32
13.50	3.97	1.94	0.25
14.00	4.08	2.02	0.20
14.50	4.16	2.10	0.17
15.00	4.24	2.16	0.16
15.50	4.31	2.22	0.14
16.00	4.37	2.27	0.12
16.50	4.43	2.32	0.11
17.00	4.48	2.36	0.11
17.50	4.53	2.40	0.10
18.00	4.58	2.44	0.10
18.50	4.62	2.48	0.09
19.00	4.66	2.51	0.08
19.50	4.70	2.54	0.08
20.00	4.73	2.57	0.07
20.50	4.76	2.60	0.07
21.00	4.79	2.63	0.07
21.50	4.83	2.65	0.07
22.00	4.86	2.68	0.06
22.50	4.89	2.70	0.06
23.00	4.91	2.73	0.06
23.50	4.94	2.75	0.06
24.00	**4.97**	**2.78**	0.06

Summary for Subcatchment G27: (new Subcat)

Runoff = 5.43 cfs @ 11.94 hrs, Volume= 0.233 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.010	79	50-75% Grass cover, Fair, HSG C
1.010		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	92	0.2500	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G27: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.02
9.50	0.81	0.03	0.03
10.00	0.90	0.04	0.04
10.50	1.01	0.07	0.07
11.00	1.17	0.12	0.12
11.50	1.41	0.22	**0.25**
12.00	3.30	1.41	**3.67**
12.50	3.65	1.69	0.40
13.00	3.84	1.83	0.26
13.50	3.97	1.94	0.20
14.00	4.08	2.02	0.16
14.50	4.16	2.10	0.14
15.00	4.24	2.16	0.13
15.50	4.31	2.22	0.11
16.00	4.37	2.27	0.10
16.50	4.43	2.32	0.09
17.00	4.48	2.36	0.09
17.50	4.53	2.40	0.08
18.00	4.58	2.44	0.08
18.50	4.62	2.48	0.07
19.00	4.66	2.51	0.07
19.50	4.70	2.54	0.06
20.00	4.73	2.57	0.06
20.50	4.76	2.60	0.06
21.00	4.79	2.63	0.05
21.50	4.83	2.65	0.05
22.00	4.86	2.68	0.05
22.50	4.89	2.70	0.05
23.00	4.91	2.73	0.05
23.50	4.94	2.75	0.05
24.00	**4.97**	**2.78**	0.05

Summary for Subcatchment G28: (new Subcat)

Runoff = 1.30 cfs @ 11.94 hrs, Volume= 0.056 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.241	79	50-75% Grass cover, Fair, HSG C
0.241		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	92	0.2500	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G28: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.00
9.00	0.73	0.01	0.00
9.50	0.81	0.03	0.01
10.00	0.90	0.04	0.01
10.50	1.01	0.07	0.02
11.00	1.17	0.12	0.03
11.50	1.41	0.22	**0.06**
12.00	3.30	1.41	**0.88**
12.50	3.65	1.69	0.09
13.00	3.84	1.83	0.06
13.50	3.97	1.94	0.05
14.00	4.08	2.02	0.04
14.50	4.16	2.10	0.03
15.00	4.24	2.16	0.03
15.50	4.31	2.22	0.03
16.00	4.37	2.27	0.02
16.50	4.43	2.32	0.02
17.00	4.48	2.36	0.02
17.50	4.53	2.40	0.02
18.00	4.58	2.44	0.02
18.50	4.62	2.48	0.02
19.00	4.66	2.51	0.02
19.50	4.70	2.54	0.01
20.00	4.73	2.57	0.01
20.50	4.76	2.60	0.01
21.00	4.79	2.63	0.01
21.50	4.83	2.65	0.01
22.00	4.86	2.68	0.01
22.50	4.89	2.70	0.01
23.00	4.91	2.73	0.01
23.50	4.94	2.75	0.01
24.00	**4.97**	**2.78**	0.01

Summary for Subcatchment G29: (new Subcat)

Runoff = 7.88 cfs @ 11.93 hrs, Volume= 0.329 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.425	79	50-75% Grass cover, Fair, HSG C
1.425		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	97	0.5540	0.61		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G29: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.01
8.50	0.66	0.01	0.02
9.00	0.73	0.01	0.03
9.50	0.81	0.03	0.04
10.00	0.90	0.04	0.06
10.50	1.01	0.07	0.10
11.00	1.17	0.12	0.17
11.50	1.41	0.22	**0.35**
12.00	3.30	1.41	**4.37**
12.50	3.65	1.69	0.54
13.00	3.84	1.83	0.36
13.50	3.97	1.94	0.28
14.00	4.08	2.02	0.22
14.50	4.16	2.10	0.20
15.00	4.24	2.16	0.18
15.50	4.31	2.22	0.16
16.00	4.37	2.27	0.14
16.50	4.43	2.32	0.13
17.00	4.48	2.36	0.12
17.50	4.53	2.40	0.12
18.00	4.58	2.44	0.11
18.50	4.62	2.48	0.10
19.00	4.66	2.51	0.09
19.50	4.70	2.54	0.09
20.00	4.73	2.57	0.08
20.50	4.76	2.60	0.08
21.00	4.79	2.63	0.08
21.50	4.83	2.65	0.07
22.00	4.86	2.68	0.07
22.50	4.89	2.70	0.07
23.00	4.91	2.73	0.07
23.50	4.94	2.75	0.07
24.00	**4.97**	**2.78**	0.07

Summary for Subcatchment G3: (new Subcat)

Runoff = 3.01 cfs @ 11.95 hrs, Volume= 0.131 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.565	79	50-75% Grass cover, Fair, HSG C
0.565		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	103	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G3: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.01
9.50	0.81	0.03	0.02
10.00	0.90	0.04	0.02
10.50	1.01	0.07	0.04
11.00	1.17	0.12	0.07
11.50	1.41	0.22	**0.14**
12.00	3.30	1.41	**2.16**
12.50	3.65	1.69	0.22
13.00	3.84	1.83	0.15
13.50	3.97	1.94	0.11
14.00	4.08	2.02	0.09
14.50	4.16	2.10	0.08
15.00	4.24	2.16	0.07
15.50	4.31	2.22	0.06
16.00	4.37	2.27	0.06
16.50	4.43	2.32	0.05
17.00	4.48	2.36	0.05
17.50	4.53	2.40	0.05
18.00	4.58	2.44	0.04
18.50	4.62	2.48	0.04
19.00	4.66	2.51	0.04
19.50	4.70	2.54	0.03
20.00	4.73	2.57	0.03
20.50	4.76	2.60	0.03
21.00	4.79	2.63	0.03
21.50	4.83	2.65	0.03
22.00	4.86	2.68	0.03
22.50	4.89	2.70	0.03
23.00	4.91	2.73	0.03
23.50	4.94	2.75	0.03
24.00	**4.97**	**2.78**	0.03

Summary for Subcatchment G4: (new Subcat)

Runoff = 2.21 cfs @ 11.95 hrs, Volume= 0.095 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.413	79	50-75% Grass cover, Fair, HSG C
0.413		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G4: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.00
9.00	0.73	0.01	0.01
9.50	0.81	0.03	0.01
10.00	0.90	0.04	0.02
10.50	1.01	0.07	0.03
11.00	1.17	0.12	0.05
11.50	1.41	0.22	**0.10**
12.00	3.30	1.41	**1.55**
12.50	3.65	1.69	0.16
13.00	3.84	1.83	0.11
13.50	3.97	1.94	0.08
14.00	4.08	2.02	0.06
14.50	4.16	2.10	0.06
15.00	4.24	2.16	0.05
15.50	4.31	2.22	0.05
16.00	4.37	2.27	0.04
16.50	4.43	2.32	0.04
17.00	4.48	2.36	0.04
17.50	4.53	2.40	0.03
18.00	4.58	2.44	0.03
18.50	4.62	2.48	0.03
19.00	4.66	2.51	0.03
19.50	4.70	2.54	0.03
20.00	4.73	2.57	0.02
20.50	4.76	2.60	0.02
21.00	4.79	2.63	0.02
21.50	4.83	2.65	0.02
22.00	4.86	2.68	0.02
22.50	4.89	2.70	0.02
23.00	4.91	2.73	0.02
23.50	4.94	2.75	0.02
24.00	**4.97**	**2.78**	0.02

Summary for Subcatchment G5: (new Subcat)

Runoff = 5.57 cfs @ 11.95 hrs, Volume= 0.243 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
1.053	79	50-75% Grass cover, Fair, HSG C
1.053		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
0.3	58	0.2500	3.50		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.0	158	Total			

Hydrograph for Subcatchment G5: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.02
9.50	0.81	0.03	0.03
10.00	0.90	0.04	0.05
10.50	1.01	0.07	0.07
11.00	1.17	0.12	0.12
11.50	1.41	0.22	**0.25**
12.00	3.30	1.41	**4.14**
12.50	3.65	1.69	0.42
13.00	3.84	1.83	0.27
13.50	3.97	1.94	0.21
14.00	4.08	2.02	0.16
14.50	4.16	2.10	0.15
15.00	4.24	2.16	0.13
15.50	4.31	2.22	0.12
16.00	4.37	2.27	0.10
16.50	4.43	2.32	0.10
17.00	4.48	2.36	0.09
17.50	4.53	2.40	0.09
18.00	4.58	2.44	0.08
18.50	4.62	2.48	0.08
19.00	4.66	2.51	0.07
19.50	4.70	2.54	0.06
20.00	4.73	2.57	0.06
20.50	4.76	2.60	0.06
21.00	4.79	2.63	0.06
21.50	4.83	2.65	0.06
22.00	4.86	2.68	0.05
22.50	4.89	2.70	0.05
23.00	4.91	2.73	0.05
23.50	4.94	2.75	0.05
24.00	**4.97**	**2.78**	0.05

Summary for Subcatchment G6: (new Subcat)

Runoff = 3.11 cfs @ 11.95 hrs, Volume= 0.135 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.583	79	50-75% Grass cover, Fair, HSG C
0.583		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G6: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.01
9.50	0.81	0.03	0.02
10.00	0.90	0.04	0.03
10.50	1.01	0.07	0.04
11.00	1.17	0.12	0.07
11.50	1.41	0.22	**0.14**
12.00	3.30	1.41	**2.19**
12.50	3.65	1.69	0.23
13.00	3.84	1.83	0.15
13.50	3.97	1.94	0.11
14.00	4.08	2.02	0.09
14.50	4.16	2.10	0.08
15.00	4.24	2.16	0.07
15.50	4.31	2.22	0.07
16.00	4.37	2.27	0.06
16.50	4.43	2.32	0.05
17.00	4.48	2.36	0.05
17.50	4.53	2.40	0.05
18.00	4.58	2.44	0.04
18.50	4.62	2.48	0.04
19.00	4.66	2.51	0.04
19.50	4.70	2.54	0.04
20.00	4.73	2.57	0.03
20.50	4.76	2.60	0.03
21.00	4.79	2.63	0.03
21.50	4.83	2.65	0.03
22.00	4.86	2.68	0.03
22.50	4.89	2.70	0.03
23.00	4.91	2.73	0.03
23.50	4.94	2.75	0.03
24.00	**4.97**	**2.78**	0.03

Summary for Subcatchment G7: (new Subcat)

Runoff = 4.01 cfs @ 11.95 hrs, Volume= 0.174 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.751	79	50-75% Grass cover, Fair, HSG C
0.751		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G7: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.02
9.50	0.81	0.03	0.02
10.00	0.90	0.04	0.03
10.50	1.01	0.07	0.05
11.00	1.17	0.12	0.09
11.50	1.41	0.22	**0.18**
12.00	3.30	1.41	**2.82**
12.50	3.65	1.69	0.30
13.00	3.84	1.83	0.19
13.50	3.97	1.94	0.15
14.00	4.08	2.02	0.12
14.50	4.16	2.10	0.10
15.00	4.24	2.16	0.09
15.50	4.31	2.22	0.08
16.00	4.37	2.27	0.07
16.50	4.43	2.32	0.07
17.00	4.48	2.36	0.07
17.50	4.53	2.40	0.06
18.00	4.58	2.44	0.06
18.50	4.62	2.48	0.05
19.00	4.66	2.51	0.05
19.50	4.70	2.54	0.05
20.00	4.73	2.57	0.04
20.50	4.76	2.60	0.04
21.00	4.79	2.63	0.04
21.50	4.83	2.65	0.04
22.00	4.86	2.68	0.04
22.50	4.89	2.70	0.04
23.00	4.91	2.73	0.04
23.50	4.94	2.75	0.04
24.00	**4.97**	**2.78**	0.04

Summary for Subcatchment G8: (new Subcat)

Runoff = 4.04 cfs @ 11.95 hrs, Volume= 0.175 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.758	79	50-75% Grass cover, Fair, HSG C
0.758		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	102	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G8: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.02
9.50	0.81	0.03	0.02
10.00	0.90	0.04	0.03
10.50	1.01	0.07	0.05
11.00	1.17	0.12	0.09
11.50	1.41	0.22	**0.18**
12.00	3.30	1.41	**2.89**
12.50	3.65	1.69	0.30
13.00	3.84	1.83	0.19
13.50	3.97	1.94	0.15
14.00	4.08	2.02	0.12
14.50	4.16	2.10	0.11
15.00	4.24	2.16	0.10
15.50	4.31	2.22	0.08
16.00	4.37	2.27	0.07
16.50	4.43	2.32	0.07
17.00	4.48	2.36	0.07
17.50	4.53	2.40	0.06
18.00	4.58	2.44	0.06
18.50	4.62	2.48	0.05
19.00	4.66	2.51	0.05
19.50	4.70	2.54	0.05
20.00	4.73	2.57	0.04
20.50	4.76	2.60	0.04
21.00	4.79	2.63	0.04
21.50	4.83	2.65	0.04
22.00	4.86	2.68	0.04
22.50	4.89	2.70	0.04
23.00	4.91	2.73	0.04
23.50	4.94	2.75	0.04
24.00	**4.97**	**2.78**	0.04

Summary for Subcatchment G9: (new Subcat)

Runoff = 3.45 cfs @ 11.95 hrs, Volume= 0.149 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=4.97"

Area (ac)	CN	Description
0.646	79	50-75% Grass cover, Fair, HSG C
0.646		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G9: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.05	0.00	0.00
1.50	0.08	0.00	0.00
2.00	0.11	0.00	0.00
2.50	0.14	0.00	0.00
3.00	0.17	0.00	0.00
3.50	0.20	0.00	0.00
4.00	0.24	0.00	0.00
4.50	0.27	0.00	0.00
5.00	0.31	0.00	0.00
5.50	0.35	0.00	0.00
6.00	0.40	0.00	0.00
6.50	0.44	0.00	0.00
7.00	0.49	0.00	0.00
7.50	0.54	0.00	0.00
8.00	0.60	0.00	0.00
8.50	0.66	0.01	0.01
9.00	0.73	0.01	0.01
9.50	0.81	0.03	0.02
10.00	0.90	0.04	0.03
10.50	1.01	0.07	0.05
11.00	1.17	0.12	0.08
11.50	1.41	0.22	**0.16**
12.00	3.30	1.41	**2.43**
12.50	3.65	1.69	0.25
13.00	3.84	1.83	0.17
13.50	3.97	1.94	0.13
14.00	4.08	2.02	0.10
14.50	4.16	2.10	0.09
15.00	4.24	2.16	0.08
15.50	4.31	2.22	0.07
16.00	4.37	2.27	0.06
16.50	4.43	2.32	0.06
17.00	4.48	2.36	0.06
17.50	4.53	2.40	0.05
18.00	4.58	2.44	0.05
18.50	4.62	2.48	0.05
19.00	4.66	2.51	0.04
19.50	4.70	2.54	0.04
20.00	4.73	2.57	0.04
20.50	4.76	2.60	0.04
21.00	4.79	2.63	0.03
21.50	4.83	2.65	0.03
22.00	4.86	2.68	0.03
22.50	4.89	2.70	0.03
23.00	4.91	2.73	0.03
23.50	4.94	2.75	0.03
24.00	**4.97**	**2.78**	0.03

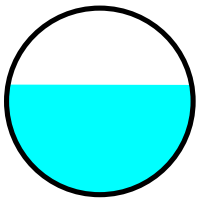
Summary for Reach BC-G1: (new Reach)

Inflow Area = 10.554 ac, 0.00% Impervious, Inflow Depth > 2.51" for 25-yr event
Inflow = 47.13 cfs @ 11.98 hrs, Volume= 2.205 af
Outflow = 47.13 cfs @ 11.98 hrs, Volume= 2.205 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.89 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.53 fps, Avg. Travel Time= 0.1 min

Peak Storage= 130 cf @ 11.98 hrs
Average Depth at Peak Storage= 1.77'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 72.26 cfs

36.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 30.0' Slope= 0.0100 '/'
Inlet Invert= 660.00', Outlet Invert= 659.70'



Hydrograph for Reach BC-G1: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	660.00	0.00
0.50	0.00	0	660.00	0.00
1.00	0.00	0	660.00	0.00
1.50	0.00	0	660.00	0.00
2.00	0.00	0	660.00	0.00
2.50	0.00	0	660.00	0.00
3.00	0.00	0	660.00	0.00
3.50	0.00	0	660.00	0.00
4.00	0.00	0	660.00	0.00
4.50	0.00	0	660.00	0.00
5.00	0.00	0	660.00	0.00
5.50	0.00	0	660.00	0.00
6.00	0.00	0	660.00	0.00
6.50	0.00	0	660.00	0.00
7.00	0.00	0	660.00	0.00
7.50	0.00	0	660.00	0.00
8.00	0.00	0	660.00	0.00
8.50	0.01	0	660.03	0.01
9.00	0.08	1	660.08	0.08
9.50	0.16	2	660.10	0.16
10.00	0.29	3	660.14	0.29
10.50	0.51	5	660.18	0.51
11.00	0.93	8	660.24	0.92
11.50	**1.98**	**13**	**660.34**	**1.98**
12.00	**44.58**	**125**	**661.71**	**44.69**
12.50	4.21	23	660.49	4.22
13.00	2.62	16	660.39	2.62
13.50	2.00	13	660.34	2.00
14.00	1.58	11	660.31	1.58
14.50	1.40	10	660.29	1.40
15.00	1.27	10	660.28	1.27
15.50	1.13	9	660.26	1.13
16.00	0.99	8	660.25	0.99
16.50	0.92	8	660.24	0.92
17.00	0.87	8	660.23	0.87
17.50	0.82	7	660.22	0.82
18.00	0.77	7	660.22	0.77
18.50	0.72	7	660.21	0.72
19.00	0.67	6	660.20	0.67
19.50	0.62	6	660.20	0.62
20.00	0.57	6	660.19	0.57
20.50	0.55	5	660.19	0.55
21.00	0.54	5	660.18	0.54
21.50	0.53	5	660.18	0.53
22.00	0.52	5	660.18	0.52
22.50	0.51	5	660.18	0.51
23.00	0.50	5	660.18	0.50
23.50	0.49	5	660.18	0.49
24.00	0.48	5	660.17	0.48

Summary for Reach BC-G2: (new Reach)

Inflow Area = 39.038 ac, 0.00% Impervious, Inflow Depth > 1.17" for 25-yr event
Inflow = 48.33 cfs @ 11.98 hrs, Volume= 3.822 af
Outflow = 47.85 cfs @ 11.99 hrs, Volume= 3.816 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.62 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.99 fps, Avg. Travel Time= 3.1 min

Peak Storage= 2,658 cf @ 11.99 hrs
Average Depth at Peak Storage= 1.15'
Bank-Full Depth= 3.00' Flow Area= 30.0 sf, Capacity= 333.93 cfs

4.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 368.0' Slope= 0.0435 '/'
Inlet Invert= 656.00', Outlet Invert= 640.00'

Hydrograph for Reach BC-G2: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	1.20	21	656.01	0.04
0.50	1.02	200	656.13	1.03
1.00	0.86	181	656.12	0.87
1.50	0.73	162	656.10	0.73
2.00	0.61	146	656.09	0.62
2.50	0.52	132	656.09	0.53
3.00	0.44	118	656.08	0.44
3.50	0.37	106	656.07	0.37
4.00	0.31	96	656.06	0.32
4.50	0.26	87	656.06	0.27
5.00	0.22	77	656.05	0.23
5.50	0.19	68	656.05	0.19
6.00	0.16	61	656.04	0.16
6.50	0.13	55	656.04	0.14
7.00	0.11	50	656.03	0.11
7.50	0.09	46	656.03	0.10
8.00	0.08	42	656.03	0.08
8.50	0.10	44	656.03	0.09
9.00	0.20	68	656.04	0.19
9.50	0.35	99	656.07	0.34
10.00	0.57	136	656.09	0.55
10.50	0.96	188	656.12	0.93
11.00	1.66	267	656.17	1.61
11.50	**3.18**	**408**	**656.25**	**3.11**
12.00	**45.89**	**2,628**	**657.14**	**47.11**
12.50	5.42	601	656.35	5.59
13.00	3.82	470	656.28	3.86
13.50	3.20	418	656.25	3.23
14.00	2.78	382	656.23	2.80
14.50	2.60	364	656.22	2.61
15.00	2.47	352	656.22	2.47
15.50	2.33	339	656.21	2.34
16.00	2.19	326	656.20	2.20
16.50	2.12	319	656.20	2.13
17.00	2.07	314	656.19	2.08
17.50	2.02	309	656.19	2.03
18.00	1.97	304	656.19	1.98
18.50	1.92	299	656.19	1.93
19.00	1.87	294	656.18	1.87
19.50	1.82	289	656.18	1.82
20.00	1.77	284	656.18	1.77
20.50	1.75	282	656.18	1.75
21.00	1.74	281	656.18	1.74
21.50	1.73	280	656.17	1.73
22.00	1.72	279	656.17	1.72
22.50	1.71	278	656.17	1.71
23.00	1.70	276	656.17	1.70
23.50	1.69	275	656.17	1.69
24.00	1.68	274	656.17	1.68

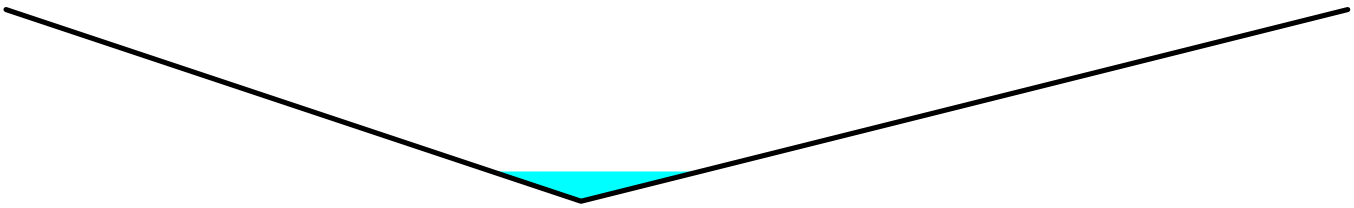
Summary for Reach DB-G1: (new Reach)

Inflow Area = 0.327 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 1.75 cfs @ 11.95 hrs, Volume= 0.076 af
Outflow = 1.73 cfs @ 11.95 hrs, Volume= 0.076 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.11 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.85 fps, Avg. Travel Time= 1.9 min

Peak Storage= 72 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 247.05 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 211.7' Slope= 0.0720 '/'
Inlet Invert= 947.63', Outlet Invert= 932.39'



Hydrograph for Reach DB-G1: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	947.63	0.00
0.50	0.00	0	947.63	0.00
1.00	0.00	0	947.63	0.00
1.50	0.00	0	947.63	0.00
2.00	0.00	0	947.63	0.00
2.50	0.00	0	947.63	0.00
3.00	0.00	0	947.63	0.00
3.50	0.00	0	947.63	0.00
4.00	0.00	0	947.63	0.00
4.50	0.00	0	947.63	0.00
5.00	0.00	0	947.63	0.00
5.50	0.00	0	947.63	0.00
6.00	0.00	0	947.63	0.00
6.50	0.00	0	947.63	0.00
7.00	0.00	0	947.63	0.00
7.50	0.00	0	947.63	0.00
8.00	0.00	0	947.65	0.00
8.50	0.00	1	947.66	0.00
9.00	0.01	1	947.67	0.01
9.50	0.01	1	947.67	0.01
10.00	0.01	2	947.68	0.01
10.50	0.02	3	947.69	0.02
11.00	0.04	4	947.70	0.04
11.50	**0.08**	**7**	**947.73**	**0.08**
12.00	**1.23**	**60**	**947.91**	**1.36**
12.50	0.13	11	947.75	0.13
13.00	0.08	7	947.73	0.09
13.50	0.06	6	947.72	0.07
14.00	0.05	5	947.71	0.05
14.50	0.05	5	947.71	0.05
15.00	0.04	4	947.71	0.04
15.50	0.04	4	947.70	0.04
16.00	0.03	4	947.70	0.03
16.50	0.03	3	947.70	0.03
17.00	0.03	3	947.70	0.03
17.50	0.03	3	947.69	0.03
18.00	0.03	3	947.69	0.03
18.50	0.02	3	947.69	0.02
19.00	0.02	3	947.69	0.02
19.50	0.02	3	947.69	0.02
20.00	0.02	2	947.69	0.02
20.50	0.02	2	947.68	0.02
21.00	0.02	2	947.68	0.02
21.50	0.02	2	947.68	0.02
22.00	0.02	2	947.68	0.02
22.50	0.02	2	947.68	0.02
23.00	0.02	2	947.68	0.02
23.50	0.02	2	947.68	0.02
24.00	0.02	2	947.68	0.02

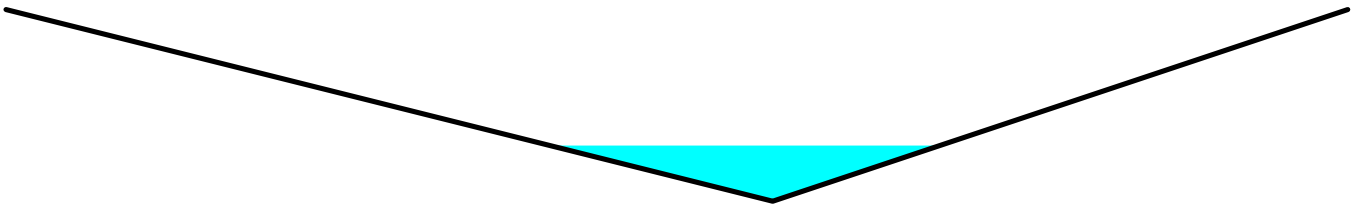
Summary for Reach DB-G10: (new Reach)

Inflow Area = 0.948 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 5.03 cfs @ 11.95 hrs, Volume= 0.219 af
Outflow = 4.80 cfs @ 11.97 hrs, Volume= 0.219 af, Atten= 5%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.08 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.47 fps, Avg. Travel Time= 5.0 min

Peak Storage= 522 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 130.38 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 443.9' Slope= 0.0200 '/'
Inlet Invert= 841.32', Outlet Invert= 832.42'



Hydrograph for Reach DB-G10: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	841.32	0.00
0.50	0.00	0	841.32	0.00
1.00	0.00	0	841.32	0.00
1.50	0.00	0	841.32	0.00
2.00	0.00	0	841.32	0.00
2.50	0.00	0	841.32	0.00
3.00	0.00	0	841.32	0.00
3.50	0.00	0	841.32	0.00
4.00	0.00	0	841.32	0.00
4.50	0.00	0	841.32	0.00
5.00	0.00	0	841.32	0.00
5.50	0.00	0	841.32	0.00
6.00	0.00	0	841.32	0.00
6.50	0.00	0	841.32	0.00
7.00	0.00	0	841.32	0.00
7.50	0.00	0	841.32	0.00
8.00	0.00	2	841.36	0.00
8.50	0.01	5	841.37	0.01
9.00	0.02	8	841.39	0.02
9.50	0.03	10	841.40	0.03
10.00	0.04	14	841.41	0.04
10.50	0.07	20	841.43	0.06
11.00	0.11	30	841.46	0.11
11.50	**0.23**	**51**	**841.50**	**0.21**
12.00	**3.67**	**482**	**841.88**	**4.32**
12.50	0.38	83	841.55	0.41
13.00	0.24	57	841.51	0.25
13.50	0.19	47	841.49	0.19
14.00	0.15	39	841.48	0.15
14.50	0.13	36	841.47	0.13
15.00	0.12	33	841.47	0.12
15.50	0.11	30	841.46	0.11
16.00	0.09	27	841.45	0.09
16.50	0.09	26	841.45	0.09
17.00	0.08	25	841.45	0.08
17.50	0.08	24	841.44	0.08
18.00	0.07	23	841.44	0.07
18.50	0.07	22	841.44	0.07
19.00	0.06	20	841.43	0.06
19.50	0.06	19	841.43	0.06
20.00	0.05	18	841.43	0.05
20.50	0.05	17	841.43	0.05
21.00	0.05	17	841.42	0.05
21.50	0.05	17	841.42	0.05
22.00	0.05	17	841.42	0.05
22.50	0.05	16	841.42	0.05
23.00	0.05	16	841.42	0.05
23.50	0.05	16	841.42	0.05
24.00	0.05	16	841.42	0.05

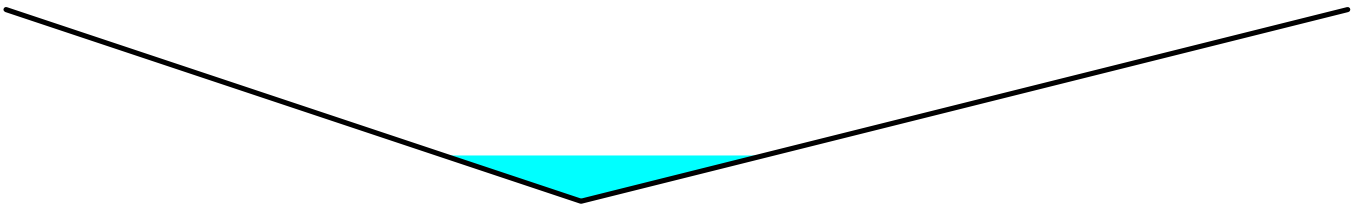
Summary for Reach DB-G11: (new Reach)

Inflow Area = 0.540 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 2.88 cfs @ 11.95 hrs, Volume= 0.125 af
Outflow = 2.83 cfs @ 11.96 hrs, Volume= 0.125 af, Atten= 2%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.55 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.28 fps, Avg. Travel Time= 2.8 min

Peak Storage= 170 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.48'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 129.15 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 213.5' Slope= 0.0197 '/'
Inlet Invert= 811.62', Outlet Invert= 807.42'



Hydrograph for Reach DB-G11: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	811.62	0.00
0.50	0.00	0	811.62	0.00
1.00	0.00	0	811.62	0.00
1.50	0.00	0	811.62	0.00
2.00	0.00	0	811.62	0.00
2.50	0.00	0	811.62	0.00
3.00	0.00	0	811.62	0.00
3.50	0.00	0	811.62	0.00
4.00	0.00	0	811.62	0.00
4.50	0.00	0	811.62	0.00
5.00	0.00	0	811.62	0.00
5.50	0.00	0	811.62	0.00
6.00	0.00	0	811.62	0.00
6.50	0.00	0	811.62	0.00
7.00	0.00	0	811.62	0.00
7.50	0.00	0	811.62	0.00
8.00	0.00	1	811.65	0.00
8.50	0.01	2	811.66	0.01
9.00	0.01	3	811.68	0.01
9.50	0.02	3	811.69	0.01
10.00	0.02	5	811.70	0.02
10.50	0.04	6	811.71	0.04
11.00	0.06	10	811.73	0.06
11.50	**0.13**	**17**	**811.77**	**0.13**
12.00	**2.03**	**146**	**812.06**	**2.31**
12.50	0.21	25	811.80	0.22
13.00	0.14	18	811.77	0.14
13.50	0.11	15	811.76	0.11
14.00	0.08	12	811.75	0.09
14.50	0.08	11	811.74	0.08
15.00	0.07	10	811.74	0.07
15.50	0.06	10	811.73	0.06
16.00	0.05	9	811.73	0.05
16.50	0.05	8	811.72	0.05
17.00	0.05	8	811.72	0.05
17.50	0.04	8	811.72	0.04
18.00	0.04	7	811.72	0.04
18.50	0.04	7	811.71	0.04
19.00	0.04	6	811.71	0.04
19.50	0.03	6	811.71	0.03
20.00	0.03	6	811.71	0.03
20.50	0.03	6	811.71	0.03
21.00	0.03	5	811.70	0.03
21.50	0.03	5	811.70	0.03
22.00	0.03	5	811.70	0.03
22.50	0.03	5	811.70	0.03
23.00	0.03	5	811.70	0.03
23.50	0.03	5	811.70	0.03
24.00	0.03	5	811.70	0.03

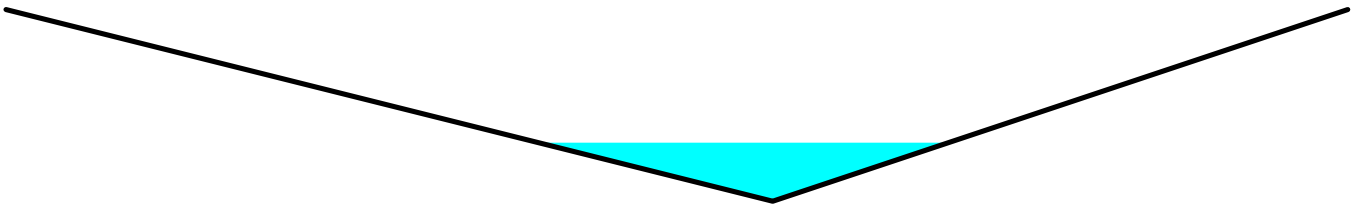
Summary for Reach DB-G12: (new Reach)

Inflow Area = 1.102 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 5.89 cfs @ 11.95 hrs, Volume= 0.255 af
Outflow = 5.56 cfs @ 11.97 hrs, Volume= 0.254 af, Atten= 5%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.23 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 5.6 min

Peak Storage= 681 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 130.47 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 518.5' Slope= 0.0201 '/'
Inlet Invert= 817.83', Outlet Invert= 807.42'



Hydrograph for Reach DB-G12: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	817.83	0.00
0.50	0.00	0	817.83	0.00
1.00	0.00	0	817.83	0.00
1.50	0.00	0	817.83	0.00
2.00	0.00	0	817.83	0.00
2.50	0.00	0	817.83	0.00
3.00	0.00	0	817.83	0.00
3.50	0.00	0	817.83	0.00
4.00	0.00	0	817.83	0.00
4.50	0.00	0	817.83	0.00
5.00	0.00	0	817.83	0.00
5.50	0.00	0	817.83	0.00
6.00	0.00	0	817.83	0.00
6.50	0.00	0	817.83	0.00
7.00	0.00	0	817.83	0.00
7.50	0.00	0	817.83	0.00
8.00	0.01	3	817.87	0.00
8.50	0.01	6	817.89	0.01
9.00	0.02	10	817.90	0.02
9.50	0.03	13	817.92	0.03
10.00	0.05	18	817.93	0.04
10.50	0.08	26	817.95	0.07
11.00	0.13	39	817.98	0.12
11.50	**0.27**	**66**	**818.02**	**0.25**
12.00	**4.14**	**627**	**818.42**	**4.98**
12.50	0.43	108	818.07	0.48
13.00	0.28	75	818.03	0.29
13.50	0.22	61	818.01	0.22
14.00	0.17	51	818.00	0.18
14.50	0.15	47	817.99	0.16
15.00	0.14	43	817.98	0.14
15.50	0.12	39	817.98	0.13
16.00	0.11	36	817.97	0.11
16.50	0.10	34	817.97	0.10
17.00	0.10	32	817.96	0.10
17.50	0.09	31	817.96	0.09
18.00	0.08	30	817.96	0.09
18.50	0.08	28	817.95	0.08
19.00	0.07	27	817.95	0.07
19.50	0.07	25	817.95	0.07
20.00	0.06	23	817.94	0.06
20.50	0.06	23	817.94	0.06
21.00	0.06	22	817.94	0.06
21.50	0.06	22	817.94	0.06
22.00	0.06	22	817.94	0.06
22.50	0.06	21	817.94	0.06
23.00	0.05	21	817.94	0.05
23.50	0.05	21	817.94	0.05
24.00	0.05	21	817.94	0.05

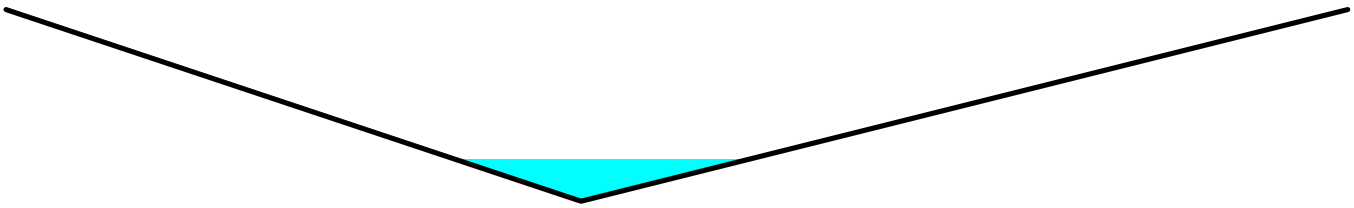
Summary for Reach DB-G13: (new Reach)

Inflow Area = 0.435 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 2.32 cfs @ 11.95 hrs, Volume= 0.101 af
Outflow = 2.29 cfs @ 11.96 hrs, Volume= 0.100 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.37 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.21 fps, Avg. Travel Time= 2.3 min

Peak Storage= 114 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.44'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 129.12 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 167.3' Slope= 0.0197 '/'
Inlet Invert= 785.72', Outlet Invert= 782.43'



Hydrograph for Reach DB-G13: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	785.72	0.00
0.50	0.00	0	785.72	0.00
1.00	0.00	0	785.72	0.00
1.50	0.00	0	785.72	0.00
2.00	0.00	0	785.72	0.00
2.50	0.00	0	785.72	0.00
3.00	0.00	0	785.72	0.00
3.50	0.00	0	785.72	0.00
4.00	0.00	0	785.72	0.00
4.50	0.00	0	785.72	0.00
5.00	0.00	0	785.72	0.00
5.50	0.00	0	785.72	0.00
6.00	0.00	0	785.72	0.00
6.50	0.00	0	785.72	0.00
7.00	0.00	0	785.72	0.00
7.50	0.00	0	785.72	0.00
8.00	0.00	0	785.75	0.00
8.50	0.00	1	785.76	0.00
9.00	0.01	2	785.77	0.01
9.50	0.01	2	785.78	0.01
10.00	0.02	3	785.79	0.02
10.50	0.03	4	785.81	0.03
11.00	0.05	6	785.82	0.05
11.50	**0.11**	**11**	**785.86**	**0.10**
12.00	**1.63**	**96**	**786.13**	**1.83**
12.50	0.17	17	785.89	0.18
13.00	0.11	12	785.86	0.11
13.50	0.09	10	785.85	0.09
14.00	0.07	8	785.84	0.07
14.50	0.06	7	785.83	0.06
15.00	0.05	7	785.83	0.06
15.50	0.05	6	785.82	0.05
16.00	0.04	6	785.82	0.04
16.50	0.04	5	785.82	0.04
17.00	0.04	5	785.81	0.04
17.50	0.04	5	785.81	0.04
18.00	0.03	5	785.81	0.03
18.50	0.03	5	785.81	0.03
19.00	0.03	4	785.80	0.03
19.50	0.03	4	785.80	0.03
20.00	0.02	4	785.80	0.02
20.50	0.02	4	785.80	0.02
21.00	0.02	4	785.80	0.02
21.50	0.02	4	785.80	0.02
22.00	0.02	4	785.80	0.02
22.50	0.02	3	785.80	0.02
23.00	0.02	3	785.80	0.02
23.50	0.02	3	785.80	0.02
24.00	0.02	3	785.79	0.02

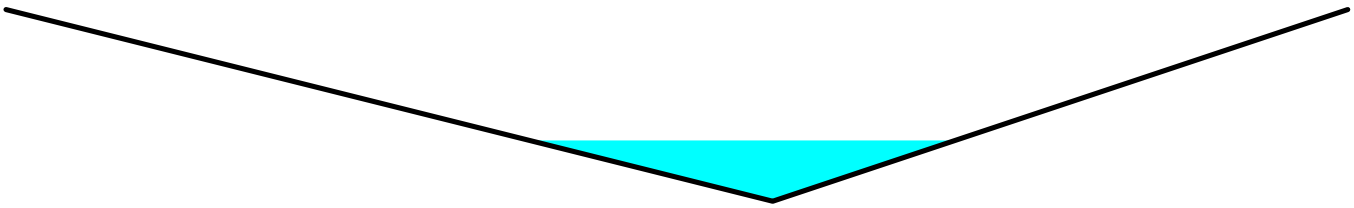
Summary for Reach DB-G14: (new Reach)

Inflow Area = 1.207 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 6.45 cfs @ 11.95 hrs, Volume= 0.279 af
Outflow = 6.12 cfs @ 11.97 hrs, Volume= 0.278 af, Atten= 5%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.33 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 5.3 min

Peak Storage= 709 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.64'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 130.41 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 502.0' Slope= 0.0201 '/'
Inlet Invert= 792.50', Outlet Invert= 782.43'



Hydrograph for Reach DB-G14: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	792.50	0.00
0.50	0.00	0	792.50	0.00
1.00	0.00	0	792.50	0.00
1.50	0.00	0	792.50	0.00
2.00	0.00	0	792.50	0.00
2.50	0.00	0	792.50	0.00
3.00	0.00	0	792.50	0.00
3.50	0.00	0	792.50	0.00
4.00	0.00	0	792.50	0.00
4.50	0.00	0	792.50	0.00
5.00	0.00	0	792.50	0.00
5.50	0.00	0	792.50	0.00
6.00	0.00	0	792.50	0.00
6.50	0.00	0	792.50	0.00
7.00	0.00	0	792.50	0.00
7.50	0.00	0	792.50	0.00
8.00	0.01	3	792.54	0.00
8.50	0.01	6	792.56	0.01
9.00	0.02	10	792.58	0.02
9.50	0.03	14	792.59	0.03
10.00	0.05	19	792.60	0.05
10.50	0.08	27	792.62	0.08
11.00	0.14	40	792.65	0.14
11.50	**0.29**	**69**	**792.70**	**0.27**
12.00	**4.53**	**649**	**793.11**	**5.44**
12.50	0.48	112	792.75	0.52
13.00	0.31	78	792.71	0.32
13.50	0.24	63	792.69	0.24
14.00	0.19	53	792.67	0.19
14.50	0.17	48	792.67	0.17
15.00	0.15	45	792.66	0.15
15.50	0.13	41	792.65	0.14
16.00	0.12	37	792.64	0.12
16.50	0.11	35	792.64	0.11
17.00	0.10	34	792.64	0.11
17.50	0.10	32	792.64	0.10
18.00	0.09	31	792.63	0.09
18.50	0.09	29	792.63	0.09
19.00	0.08	28	792.62	0.08
19.50	0.07	26	792.62	0.07
20.00	0.07	24	792.62	0.07
20.50	0.07	24	792.62	0.07
21.00	0.06	23	792.61	0.06
21.50	0.06	23	792.61	0.06
22.00	0.06	23	792.61	0.06
22.50	0.06	22	792.61	0.06
23.00	0.06	22	792.61	0.06
23.50	0.06	22	792.61	0.06
24.00	0.06	21	792.61	0.06

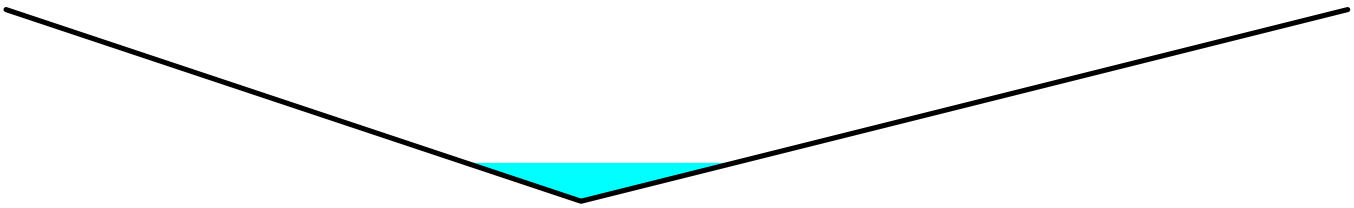
Summary for Reach DB-G15: (new Reach)

Inflow Area = 0.329 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 1.76 cfs @ 11.95 hrs, Volume= 0.076 af
Outflow = 1.74 cfs @ 11.95 hrs, Volume= 0.076 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.12 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.12 fps, Avg. Travel Time= 1.8 min

Peak Storage= 68 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 127.72 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 121.1' Slope= 0.0192 '/'
Inlet Invert= 759.76', Outlet Invert= 757.43'



Hydrograph for Reach DB-G15: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	759.76	0.00
0.50	0.00	0	759.76	0.00
1.00	0.00	0	759.76	0.00
1.50	0.00	0	759.76	0.00
2.00	0.00	0	759.76	0.00
2.50	0.00	0	759.76	0.00
3.00	0.00	0	759.76	0.00
3.50	0.00	0	759.76	0.00
4.00	0.00	0	759.76	0.00
4.50	0.00	0	759.76	0.00
5.00	0.00	0	759.76	0.00
5.50	0.00	0	759.76	0.00
6.00	0.00	0	759.76	0.00
6.50	0.00	0	759.76	0.00
7.00	0.00	0	759.76	0.00
7.50	0.00	0	759.76	0.00
8.00	0.00	0	759.79	0.00
8.50	0.00	1	759.80	0.00
9.00	0.01	1	759.81	0.01
9.50	0.01	1	759.81	0.01
10.00	0.01	2	759.82	0.01
10.50	0.02	3	759.84	0.02
11.00	0.04	4	759.85	0.04
11.50	**0.08**	**7**	**759.88**	**0.08**
12.00	**1.24**	**56**	**760.12**	**1.36**
12.50	0.13	10	759.91	0.13
13.00	0.08	7	759.89	0.09
13.50	0.06	6	759.88	0.07
14.00	0.05	5	759.87	0.05
14.50	0.05	4	759.86	0.05
15.00	0.04	4	759.86	0.04
15.50	0.04	4	759.85	0.04
16.00	0.03	3	759.85	0.03
16.50	0.03	3	759.85	0.03
17.00	0.03	3	759.84	0.03
17.50	0.03	3	759.84	0.03
18.00	0.03	3	759.84	0.03
18.50	0.02	3	759.84	0.02
19.00	0.02	3	759.84	0.02
19.50	0.02	2	759.83	0.02
20.00	0.02	2	759.83	0.02
20.50	0.02	2	759.83	0.02
21.00	0.02	2	759.83	0.02
21.50	0.02	2	759.83	0.02
22.00	0.02	2	759.83	0.02
22.50	0.02	2	759.83	0.02
23.00	0.02	2	759.83	0.02
23.50	0.02	2	759.83	0.02
24.00	0.02	2	759.83	0.02

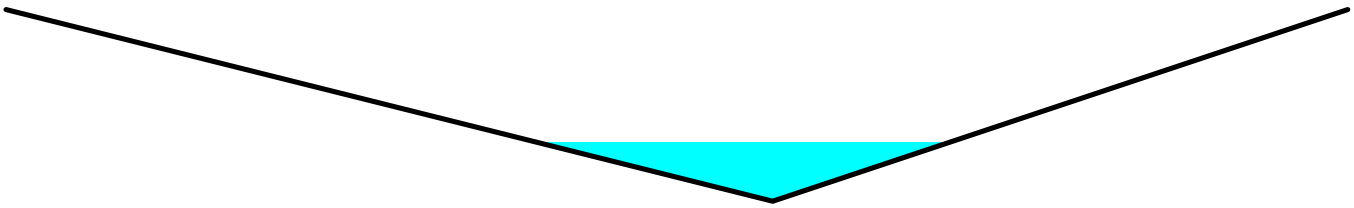
Summary for Reach DB-G16: (new Reach)

Inflow Area = 1.069 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 5.71 cfs @ 11.95 hrs, Volume= 0.247 af
Outflow = 5.46 cfs @ 11.96 hrs, Volume= 0.247 af, Atten= 4%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.11 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 4.9 min

Peak Storage= 573 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 126.14 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 431.1' Slope= 0.0188 '/'
Inlet Invert= 765.52', Outlet Invert= 757.43'



Hydrograph for Reach DB-G16: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	765.52	0.00
0.50	0.00	0	765.52	0.00
1.00	0.00	0	765.52	0.00
1.50	0.00	0	765.52	0.00
2.00	0.00	0	765.52	0.00
2.50	0.00	0	765.52	0.00
3.00	0.00	0	765.52	0.00
3.50	0.00	0	765.52	0.00
4.00	0.00	0	765.52	0.00
4.50	0.00	0	765.52	0.00
5.00	0.00	0	765.52	0.00
5.50	0.00	0	765.52	0.00
6.00	0.00	0	765.52	0.00
6.50	0.00	0	765.52	0.00
7.00	0.00	0	765.52	0.00
7.50	0.00	0	765.52	0.00
8.00	0.00	2	765.56	0.00
8.50	0.01	5	765.58	0.01
9.00	0.02	8	765.59	0.02
9.50	0.03	11	765.61	0.03
10.00	0.05	15	765.62	0.04
10.50	0.08	22	765.64	0.07
11.00	0.13	33	765.67	0.12
11.50	**0.26**	**56**	**765.71**	**0.24**
12.00	**4.02**	**519**	**766.11**	**4.79**
12.50	0.42	89	765.76	0.46
13.00	0.27	62	765.72	0.28
13.50	0.21	51	765.70	0.22
14.00	0.17	43	765.69	0.17
14.50	0.15	39	765.68	0.15
15.00	0.13	36	765.67	0.14
15.50	0.12	33	765.67	0.12
16.00	0.10	30	765.66	0.11
16.50	0.10	28	765.66	0.10
17.00	0.09	27	765.65	0.09
17.50	0.09	26	765.65	0.09
18.00	0.08	25	765.65	0.08
18.50	0.08	23	765.64	0.08
19.00	0.07	22	765.64	0.07
19.50	0.07	21	765.64	0.07
20.00	0.06	19	765.63	0.06
20.50	0.06	19	765.63	0.06
21.00	0.06	19	765.63	0.06
21.50	0.06	18	765.63	0.06
22.00	0.06	18	765.63	0.06
22.50	0.05	18	765.63	0.05
23.00	0.05	18	765.63	0.05
23.50	0.05	17	765.63	0.05
24.00	0.05	17	765.63	0.05

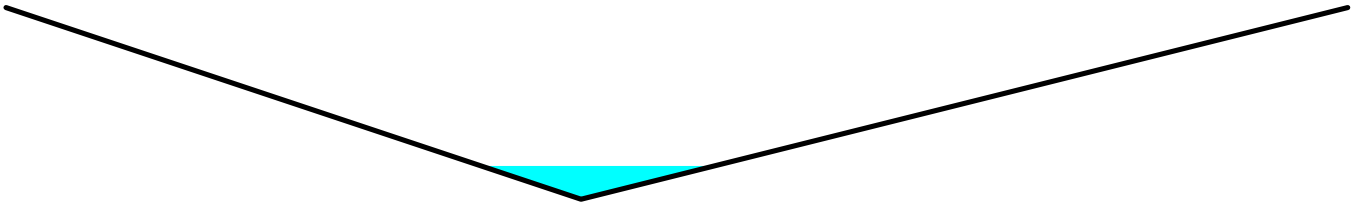
Summary for Reach DB-G17: (new Reach)

Inflow Area = 0.224 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 1.20 cfs @ 11.95 hrs, Volume= 0.052 af
Outflow = 1.19 cfs @ 11.95 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.81 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.01 fps, Avg. Travel Time= 1.2 min

Peak Storage= 32 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 126.25 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 75.0' Slope= 0.0188 '/'
Inlet Invert= 733.85', Outlet Invert= 732.44'



Hydrograph for Reach DB-G17: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	733.85	0.00
0.50	0.00	0	733.85	0.00
1.00	0.00	0	733.85	0.00
1.50	0.00	0	733.85	0.00
2.00	0.00	0	733.85	0.00
2.50	0.00	0	733.85	0.00
3.00	0.00	0	733.85	0.00
3.50	0.00	0	733.85	0.00
4.00	0.00	0	733.85	0.00
4.50	0.00	0	733.85	0.00
5.00	0.00	0	733.85	0.00
5.50	0.00	0	733.85	0.00
6.00	0.00	0	733.85	0.00
6.50	0.00	0	733.85	0.00
7.00	0.00	0	733.85	0.00
7.50	0.00	0	733.85	0.00
8.00	0.00	0	733.87	0.00
8.50	0.00	0	733.88	0.00
9.00	0.00	0	733.89	0.00
9.50	0.01	1	733.90	0.01
10.00	0.01	1	733.91	0.01
10.50	0.02	1	733.92	0.02
11.00	0.03	2	733.93	0.03
11.50	**0.05**	**3**	**733.96**	**0.05**
12.00	**0.84**	**26**	**734.16**	**0.90**
12.50	0.09	5	733.98	0.09
13.00	0.06	3	733.96	0.06
13.50	0.04	3	733.95	0.04
14.00	0.03	2	733.94	0.04
14.50	0.03	2	733.94	0.03
15.00	0.03	2	733.93	0.03
15.50	0.03	2	733.93	0.03
16.00	0.02	2	733.93	0.02
16.50	0.02	2	733.93	0.02
17.00	0.02	1	733.92	0.02
17.50	0.02	1	733.92	0.02
18.00	0.02	1	733.92	0.02
18.50	0.02	1	733.92	0.02
19.00	0.01	1	733.92	0.01
19.50	0.01	1	733.91	0.01
20.00	0.01	1	733.91	0.01
20.50	0.01	1	733.91	0.01
21.00	0.01	1	733.91	0.01
21.50	0.01	1	733.91	0.01
22.00	0.01	1	733.91	0.01
22.50	0.01	1	733.91	0.01
23.00	0.01	1	733.91	0.01
23.50	0.01	1	733.91	0.01
24.00	0.01	1	733.91	0.01

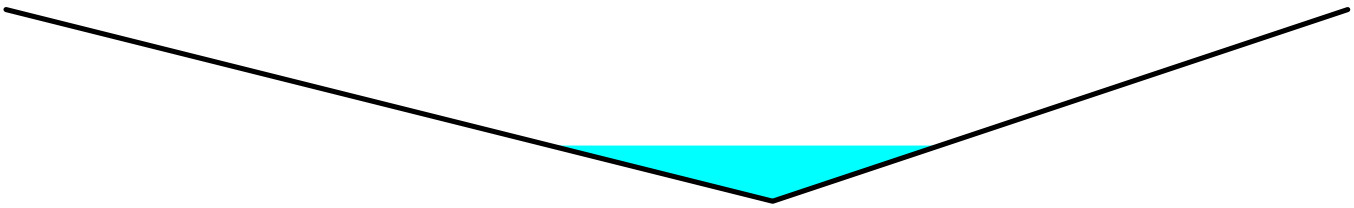
Summary for Reach DB-G18: (new Reach)

Inflow Area = 0.903 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 4.82 cfs @ 11.95 hrs, Volume= 0.209 af
Outflow = 4.66 cfs @ 11.96 hrs, Volume= 0.208 af, Atten= 3%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.95 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.42 fps, Avg. Travel Time= 4.2 min

Peak Storage= 419 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 126.22 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 355.5' Slope= 0.0188 '/'
Inlet Invert= 739.12', Outlet Invert= 732.44'



Hydrograph for Reach DB-G18: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	739.12	0.00
0.50	0.00	0	739.12	0.00
1.00	0.00	0	739.12	0.00
1.50	0.00	0	739.12	0.00
2.00	0.00	0	739.12	0.00
2.50	0.00	0	739.12	0.00
3.00	0.00	0	739.12	0.00
3.50	0.00	0	739.12	0.00
4.00	0.00	0	739.12	0.00
4.50	0.00	0	739.12	0.00
5.00	0.00	0	739.12	0.00
5.50	0.00	0	739.12	0.00
6.00	0.00	0	739.12	0.00
6.50	0.00	0	739.12	0.00
7.00	0.00	0	739.12	0.00
7.50	0.00	0	739.12	0.00
8.00	0.00	2	739.16	0.00
8.50	0.01	4	739.17	0.01
9.00	0.02	6	739.19	0.02
9.50	0.03	8	739.20	0.02
10.00	0.04	11	739.21	0.04
10.50	0.06	16	739.23	0.06
11.00	0.11	24	739.26	0.10
11.50	**0.22**	**41**	**739.30**	**0.21**
12.00	**3.39**	**374**	**739.67**	**4.00**
12.50	0.36	64	739.35	0.38
13.00	0.23	45	739.31	0.24
13.50	0.18	37	739.29	0.18
14.00	0.14	31	739.28	0.14
14.50	0.13	28	739.27	0.13
15.00	0.11	26	739.26	0.11
15.50	0.10	24	739.26	0.10
16.00	0.09	22	739.25	0.09
16.50	0.08	20	739.25	0.08
17.00	0.08	20	739.25	0.08
17.50	0.07	19	739.24	0.07
18.00	0.07	18	739.24	0.07
18.50	0.06	17	739.24	0.07
19.00	0.06	16	739.23	0.06
19.50	0.06	15	739.23	0.06
20.00	0.05	14	739.23	0.05
20.50	0.05	14	739.22	0.05
21.00	0.05	14	739.22	0.05
21.50	0.05	13	739.22	0.05
22.00	0.05	13	739.22	0.05
22.50	0.05	13	739.22	0.05
23.00	0.04	13	739.22	0.04
23.50	0.04	13	739.22	0.04
24.00	0.04	12	739.22	0.04

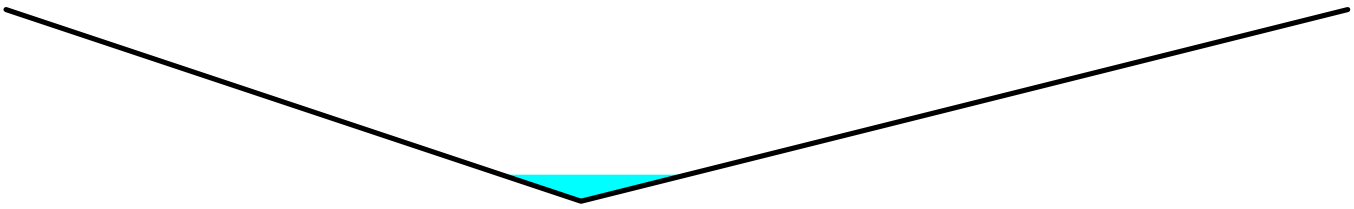
Summary for Reach DB-G19: (new Reach)

Inflow Area = 0.118 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 0.63 cfs @ 11.95 hrs, Volume= 0.027 af
Outflow = 0.63 cfs @ 11.95 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.34 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 0.6 min

Peak Storage= 8 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 122.53 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 28.8' Slope= 0.0177 '/'
Inlet Invert= 707.95', Outlet Invert= 707.44'



Hydrograph for Reach DB-G19: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	707.95	0.00
0.50	0.00	0	707.95	0.00
1.00	0.00	0	707.95	0.00
1.50	0.00	0	707.95	0.00
2.00	0.00	0	707.95	0.00
2.50	0.00	0	707.95	0.00
3.00	0.00	0	707.95	0.00
3.50	0.00	0	707.95	0.00
4.00	0.00	0	707.95	0.00
4.50	0.00	0	707.95	0.00
5.00	0.00	0	707.95	0.00
5.50	0.00	0	707.95	0.00
6.00	0.00	0	707.95	0.00
6.50	0.00	0	707.95	0.00
7.00	0.00	0	707.95	0.00
7.50	0.00	0	707.95	0.00
8.00	0.00	0	707.97	0.00
8.50	0.00	0	707.97	0.00
9.00	0.00	0	707.98	0.00
9.50	0.00	0	707.99	0.00
10.00	0.01	0	707.99	0.01
10.50	0.01	0	708.00	0.01
11.00	0.01	0	708.02	0.01
11.50	**0.03**	**1**	**708.04**	**0.03**
12.00	**0.44**	**6**	**708.20**	**0.46**
12.50	0.05	1	708.05	0.05
13.00	0.03	1	708.04	0.03
13.50	0.02	1	708.03	0.02
14.00	0.02	1	708.02	0.02
14.50	0.02	0	708.02	0.02
15.00	0.01	0	708.02	0.01
15.50	0.01	0	708.01	0.01
16.00	0.01	0	708.01	0.01
16.50	0.01	0	708.01	0.01
17.00	0.01	0	708.01	0.01
17.50	0.01	0	708.01	0.01
18.00	0.01	0	708.01	0.01
18.50	0.01	0	708.00	0.01
19.00	0.01	0	708.00	0.01
19.50	0.01	0	708.00	0.01
20.00	0.01	0	708.00	0.01
20.50	0.01	0	708.00	0.01
21.00	0.01	0	708.00	0.01
21.50	0.01	0	708.00	0.01
22.00	0.01	0	708.00	0.01
22.50	0.01	0	708.00	0.01
23.00	0.01	0	708.00	0.01
23.50	0.01	0	708.00	0.01
24.00	0.01	0	708.00	0.01

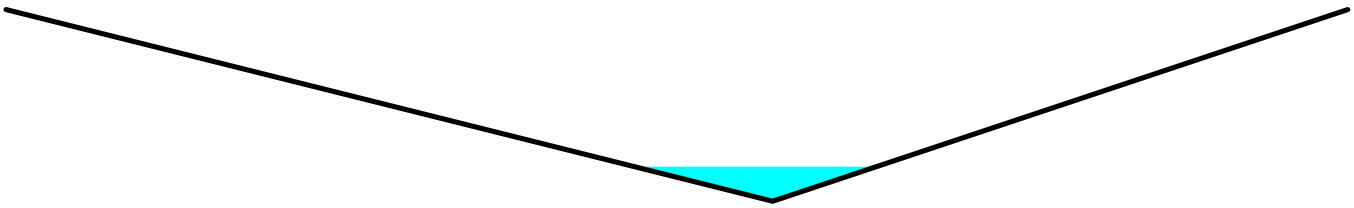
Summary for Reach DB-G2: (new Reach)

Inflow Area = 0.245 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 1.31 cfs @ 11.95 hrs, Volume= 0.057 af
Outflow = 1.29 cfs @ 11.96 hrs, Volume= 0.057 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.85 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.03 fps, Avg. Travel Time= 2.3 min

Peak Storage= 65 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 125.55 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 143.6' Slope= 0.0186 '/'
Inlet Invert= 935.61', Outlet Invert= 932.94'



Hydrograph for Reach DB-G2: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	935.61	0.00
0.50	0.00	0	935.61	0.00
1.00	0.00	0	935.61	0.00
1.50	0.00	0	935.61	0.00
2.00	0.00	0	935.61	0.00
2.50	0.00	0	935.61	0.00
3.00	0.00	0	935.61	0.00
3.50	0.00	0	935.61	0.00
4.00	0.00	0	935.61	0.00
4.50	0.00	0	935.61	0.00
5.00	0.00	0	935.61	0.00
5.50	0.00	0	935.61	0.00
6.00	0.00	0	935.61	0.00
6.50	0.00	0	935.61	0.00
7.00	0.00	0	935.61	0.00
7.50	0.00	0	935.61	0.00
8.00	0.00	0	935.63	0.00
8.50	0.00	1	935.64	0.00
9.00	0.00	1	935.65	0.00
9.50	0.01	1	935.66	0.01
10.00	0.01	2	935.67	0.01
10.50	0.02	2	935.68	0.02
11.00	0.03	4	935.70	0.03
11.50	**0.06**	**6**	**935.72**	**0.06**
12.00	**0.92**	**55**	**935.94**	**1.03**
12.50	0.10	10	935.75	0.10
13.00	0.06	7	935.73	0.06
13.50	0.05	6	935.71	0.05
14.00	0.04	5	935.71	0.04
14.50	0.03	4	935.70	0.03
15.00	0.03	4	935.70	0.03
15.50	0.03	4	935.69	0.03
16.00	0.02	3	935.69	0.02
16.50	0.02	3	935.69	0.02
17.00	0.02	3	935.69	0.02
17.50	0.02	3	935.68	0.02
18.00	0.02	3	935.68	0.02
18.50	0.02	3	935.68	0.02
19.00	0.02	2	935.68	0.02
19.50	0.01	2	935.68	0.02
20.00	0.01	2	935.67	0.01
20.50	0.01	2	935.67	0.01
21.00	0.01	2	935.67	0.01
21.50	0.01	2	935.67	0.01
22.00	0.01	2	935.67	0.01
22.50	0.01	2	935.67	0.01
23.00	0.01	2	935.67	0.01
23.50	0.01	2	935.67	0.01
24.00	0.01	2	935.67	0.01

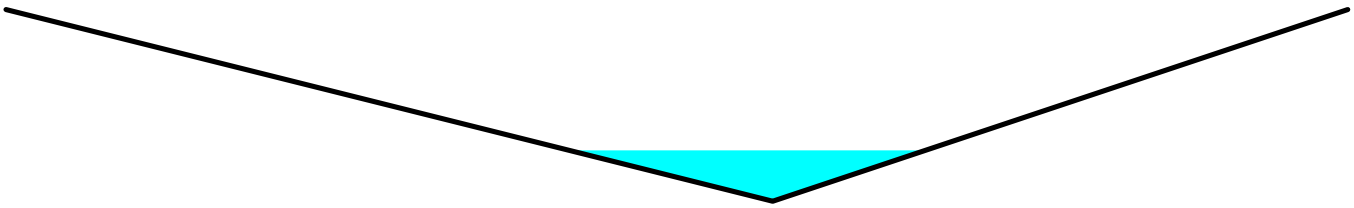
Summary for Reach DB-G20: (new Reach)

Inflow Area = 0.729 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 3.89 cfs @ 11.95 hrs, Volume= 0.168 af
Outflow = 3.80 cfs @ 11.96 hrs, Volume= 0.168 af, Atten= 2%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.85 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 3.4 min

Peak Storage= 277 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 130.43 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 281.1' Slope= 0.0201 '/'
Inlet Invert= 713.08', Outlet Invert= 707.44'



Hydrograph for Reach DB-G20: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	713.08	0.00
0.50	0.00	0	713.08	0.00
1.00	0.00	0	713.08	0.00
1.50	0.00	0	713.08	0.00
2.00	0.00	0	713.08	0.00
2.50	0.00	0	713.08	0.00
3.00	0.00	0	713.08	0.00
3.50	0.00	0	713.08	0.00
4.00	0.00	0	713.08	0.00
4.50	0.00	0	713.08	0.00
5.00	0.00	0	713.08	0.00
5.50	0.00	0	713.08	0.00
6.00	0.00	0	713.08	0.00
6.50	0.00	0	713.08	0.00
7.00	0.00	0	713.08	0.00
7.50	0.00	0	713.08	0.00
8.00	0.00	1	713.11	0.00
8.50	0.01	2	713.13	0.01
9.00	0.01	4	713.14	0.01
9.50	0.02	5	713.15	0.02
10.00	0.03	7	713.17	0.03
10.50	0.05	11	713.18	0.05
11.00	0.09	16	713.21	0.08
11.50	**0.18**	**27**	**713.25**	**0.17**
12.00	**2.74**	**242**	**713.58**	**3.17**
12.50	0.29	42	713.29	0.31
13.00	0.19	29	713.25	0.19
13.50	0.14	24	713.24	0.15
14.00	0.11	20	713.22	0.12
14.50	0.10	18	713.22	0.10
15.00	0.09	17	713.21	0.09
15.50	0.08	16	713.21	0.08
16.00	0.07	14	713.20	0.07
16.50	0.07	13	713.20	0.07
17.00	0.06	13	713.19	0.06
17.50	0.06	12	713.19	0.06
18.00	0.06	12	713.19	0.06
18.50	0.05	11	713.19	0.05
19.00	0.05	11	713.18	0.05
19.50	0.04	10	713.18	0.04
20.00	0.04	9	713.18	0.04
20.50	0.04	9	713.18	0.04
21.00	0.04	9	713.17	0.04
21.50	0.04	9	713.17	0.04
22.00	0.04	9	713.17	0.04
22.50	0.04	9	713.17	0.04
23.00	0.04	8	713.17	0.04
23.50	0.04	8	713.17	0.04
24.00	0.03	8	713.17	0.03

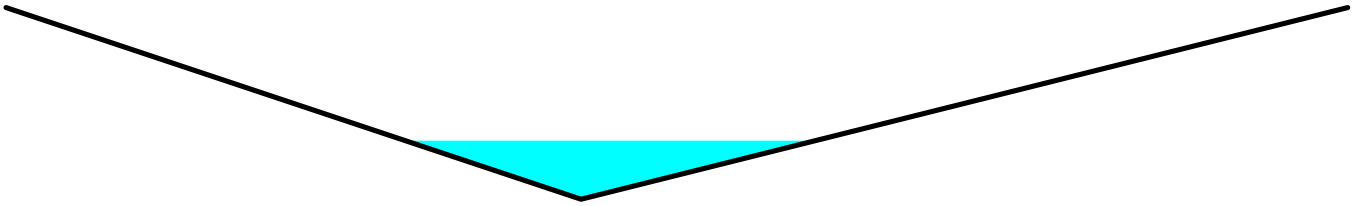
Summary for Reach DB-G24: (new Reach)

Inflow Area = 1.208 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 6.41 cfs @ 11.95 hrs, Volume= 0.279 af
Outflow = 6.09 cfs @ 11.97 hrs, Volume= 0.279 af, Atten= 5%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.66 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.69 fps, Avg. Travel Time= 5.3 min

Peak Storage= 702 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 143.93 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 537.4' Slope= 0.0244 '/'
Inlet Invert= 841.32', Outlet Invert= 828.19'



Hydrograph for Reach DB-G24: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	841.32	0.00
0.50	0.00	0	841.32	0.00
1.00	0.00	0	841.32	0.00
1.50	0.00	0	841.32	0.00
2.00	0.00	0	841.32	0.00
2.50	0.00	0	841.32	0.00
3.00	0.00	0	841.32	0.00
3.50	0.00	0	841.32	0.00
4.00	0.00	0	841.32	0.00
4.50	0.00	0	841.32	0.00
5.00	0.00	0	841.32	0.00
5.50	0.00	0	841.32	0.00
6.00	0.00	0	841.32	0.00
6.50	0.00	0	841.32	0.00
7.00	0.00	0	841.32	0.00
7.50	0.00	0	841.32	0.00
8.00	0.01	3	841.36	0.00
8.50	0.01	6	841.38	0.01
9.00	0.02	10	841.39	0.02
9.50	0.03	14	841.41	0.03
10.00	0.05	19	841.42	0.05
10.50	0.08	27	841.44	0.08
11.00	0.14	40	841.47	0.14
11.50	**0.29**	**68**	**841.51**	**0.27**
12.00	**4.68**	**652**	**841.91**	**5.52**
12.50	0.48	112	841.56	0.53
13.00	0.31	77	841.52	0.32
13.50	0.24	63	841.50	0.25
14.00	0.19	53	841.49	0.19
14.50	0.17	48	841.48	0.17
15.00	0.15	44	841.47	0.15
15.50	0.14	41	841.47	0.14
16.00	0.12	37	841.46	0.12
16.50	0.11	35	841.46	0.11
17.00	0.10	33	841.45	0.11
17.50	0.10	32	841.45	0.10
18.00	0.09	30	841.45	0.09
18.50	0.09	29	841.44	0.09
19.00	0.08	27	841.44	0.08
19.50	0.07	26	841.44	0.07
20.00	0.07	24	841.43	0.07
20.50	0.07	23	841.43	0.07
21.00	0.06	23	841.43	0.06
21.50	0.06	23	841.43	0.06
22.00	0.06	22	841.43	0.06
22.50	0.06	22	841.43	0.06
23.00	0.06	22	841.43	0.06
23.50	0.06	22	841.43	0.06
24.00	0.06	21	841.43	0.06

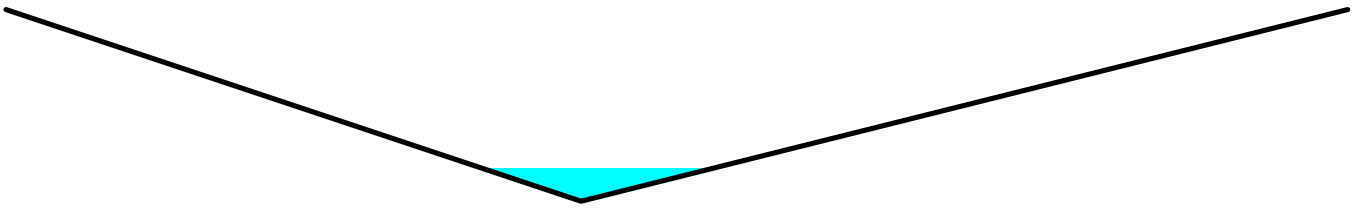
Summary for Reach DB-G25: (new Reach)

Inflow Area = 0.260 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 1.38 cfs @ 11.95 hrs, Volume= 0.060 af
Outflow = 1.37 cfs @ 11.96 hrs, Volume= 0.060 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.22 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 2.1 min

Peak Storage= 62 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 144.53 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 145.3' Slope= 0.0246 '/'
Inlet Invert= 817.83', Outlet Invert= 814.25'



Hydrograph for Reach DB-G25: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	817.83	0.00
0.50	0.00	0	817.83	0.00
1.00	0.00	0	817.83	0.00
1.50	0.00	0	817.83	0.00
2.00	0.00	0	817.83	0.00
2.50	0.00	0	817.83	0.00
3.00	0.00	0	817.83	0.00
3.50	0.00	0	817.83	0.00
4.00	0.00	0	817.83	0.00
4.50	0.00	0	817.83	0.00
5.00	0.00	0	817.83	0.00
5.50	0.00	0	817.83	0.00
6.00	0.00	0	817.83	0.00
6.50	0.00	0	817.83	0.00
7.00	0.00	0	817.83	0.00
7.50	0.00	0	817.83	0.00
8.00	0.00	0	817.85	0.00
8.50	0.00	1	817.86	0.00
9.00	0.01	1	817.87	0.01
9.50	0.01	1	817.88	0.01
10.00	0.01	2	817.89	0.01
10.50	0.02	2	817.90	0.02
11.00	0.03	4	817.91	0.03
11.50	**0.06**	**6**	**817.94**	**0.06**
12.00	**0.99**	**52**	**818.15**	**1.10**
12.50	0.10	9	817.96	0.11
13.00	0.07	6	817.94	0.07
13.50	0.05	5	817.93	0.05
14.00	0.04	4	817.92	0.04
14.50	0.04	4	817.92	0.04
15.00	0.03	4	817.92	0.03
15.50	0.03	3	817.91	0.03
16.00	0.03	3	817.91	0.03
16.50	0.02	3	817.91	0.02
17.00	0.02	3	817.90	0.02
17.50	0.02	3	817.90	0.02
18.00	0.02	3	817.90	0.02
18.50	0.02	2	817.90	0.02
19.00	0.02	2	817.90	0.02
19.50	0.02	2	817.89	0.02
20.00	0.01	2	817.89	0.01
20.50	0.01	2	817.89	0.01
21.00	0.01	2	817.89	0.01
21.50	0.01	2	817.89	0.01
22.00	0.01	2	817.89	0.01
22.50	0.01	2	817.89	0.01
23.00	0.01	2	817.89	0.01
23.50	0.01	2	817.89	0.01
24.00	0.01	2	817.89	0.01

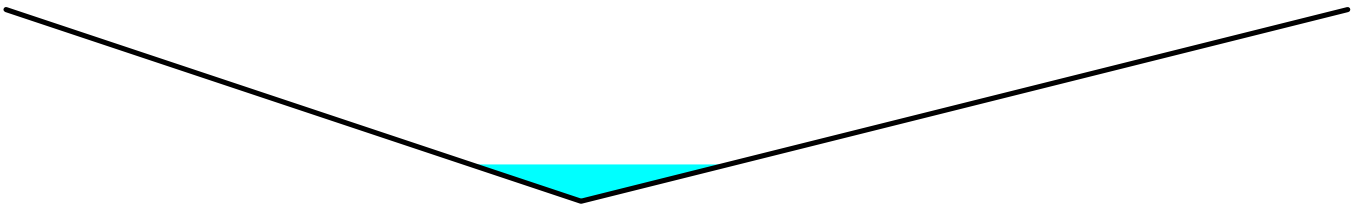
Summary for Reach DB-G3: (new Reach)

Inflow Area = 0.565 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 3.01 cfs @ 11.95 hrs, Volume= 0.131 af
Outflow = 2.97 cfs @ 11.96 hrs, Volume= 0.130 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.73 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.07 fps, Avg. Travel Time= 2.4 min

Peak Storage= 153 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 240.93 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 294.9' Slope= 0.0685 '/'
Inlet Invert= 927.59', Outlet Invert= 907.40'



Hydrograph for Reach DB-G3: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	927.59	0.00
0.50	0.00	0	927.59	0.00
1.00	0.00	0	927.59	0.00
1.50	0.00	0	927.59	0.00
2.00	0.00	0	927.59	0.00
2.50	0.00	0	927.59	0.00
3.00	0.00	0	927.59	0.00
3.50	0.00	0	927.59	0.00
4.00	0.00	0	927.59	0.00
4.50	0.00	0	927.59	0.00
5.00	0.00	0	927.59	0.00
5.50	0.00	0	927.59	0.00
6.00	0.00	0	927.59	0.00
6.50	0.00	0	927.59	0.00
7.00	0.00	0	927.59	0.00
7.50	0.00	0	927.59	0.00
8.00	0.00	1	927.61	0.00
8.50	0.01	1	927.63	0.01
9.00	0.01	2	927.64	0.01
9.50	0.02	3	927.64	0.02
10.00	0.02	4	927.65	0.02
10.50	0.04	6	927.66	0.04
11.00	0.07	9	927.68	0.07
11.50	**0.14**	**15**	**927.71**	**0.13**
12.00	**2.16**	**131**	**927.95**	**2.41**
12.50	0.22	23	927.74	0.23
13.00	0.15	16	927.71	0.15
13.50	0.11	13	927.70	0.11
14.00	0.09	11	927.69	0.09
14.50	0.08	10	927.69	0.08
15.00	0.07	9	927.68	0.07
15.50	0.06	8	927.68	0.06
16.00	0.06	8	927.68	0.06
16.50	0.05	7	927.67	0.05
17.00	0.05	7	927.67	0.05
17.50	0.05	7	927.67	0.05
18.00	0.04	6	927.67	0.04
18.50	0.04	6	927.67	0.04
19.00	0.04	6	927.66	0.04
19.50	0.03	5	927.66	0.03
20.00	0.03	5	927.66	0.03
20.50	0.03	5	927.66	0.03
21.00	0.03	5	927.66	0.03
21.50	0.03	5	927.66	0.03
22.00	0.03	5	927.66	0.03
22.50	0.03	5	927.66	0.03
23.00	0.03	5	927.66	0.03
23.50	0.03	4	927.66	0.03
24.00	0.03	4	927.65	0.03

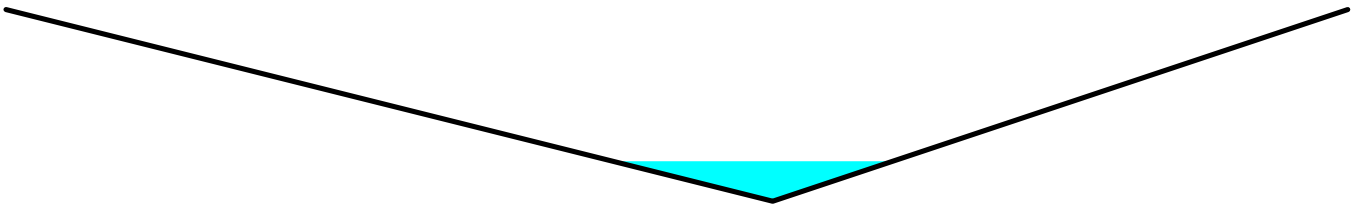
Summary for Reach DB-G4: (new Reach)

Inflow Area = 0.413 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 2.21 cfs @ 11.95 hrs, Volume= 0.095 af
Outflow = 2.17 cfs @ 11.96 hrs, Volume= 0.095 af, Atten= 2%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.57 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.29 fps, Avg. Travel Time= 2.8 min

Peak Storage= 132 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 142.24 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 217.5' Slope= 0.0239 '/'
Inlet Invert= 912.59', Outlet Invert= 907.40'



Hydrograph for Reach DB-G4: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	912.59	0.00
0.50	0.00	0	912.59	0.00
1.00	0.00	0	912.59	0.00
1.50	0.00	0	912.59	0.00
2.00	0.00	0	912.59	0.00
2.50	0.00	0	912.59	0.00
3.00	0.00	0	912.59	0.00
3.50	0.00	0	912.59	0.00
4.00	0.00	0	912.59	0.00
4.50	0.00	0	912.59	0.00
5.00	0.00	0	912.59	0.00
5.50	0.00	0	912.59	0.00
6.00	0.00	0	912.59	0.00
6.50	0.00	0	912.59	0.00
7.00	0.00	0	912.59	0.00
7.50	0.00	0	912.59	0.00
8.00	0.00	1	912.62	0.00
8.50	0.00	1	912.63	0.00
9.00	0.01	2	912.64	0.01
9.50	0.01	3	912.65	0.01
10.00	0.02	3	912.66	0.02
10.50	0.03	5	912.67	0.03
11.00	0.05	8	912.69	0.05
11.50	**0.10**	**13**	**912.72**	**0.10**
12.00	**1.55**	**113**	**912.98**	**1.77**
12.50	0.16	20	912.75	0.17
13.00	0.11	14	912.72	0.11
13.50	0.08	11	912.71	0.08
14.00	0.06	10	912.70	0.07
14.50	0.06	9	912.70	0.06
15.00	0.05	8	912.69	0.05
15.50	0.05	7	912.69	0.05
16.00	0.04	7	912.68	0.04
16.50	0.04	6	912.68	0.04
17.00	0.04	6	912.68	0.04
17.50	0.03	6	912.68	0.03
18.00	0.03	6	912.67	0.03
18.50	0.03	5	912.67	0.03
19.00	0.03	5	912.67	0.03
19.50	0.03	5	912.67	0.03
20.00	0.02	4	912.67	0.02
20.50	0.02	4	912.66	0.02
21.00	0.02	4	912.66	0.02
21.50	0.02	4	912.66	0.02
22.00	0.02	4	912.66	0.02
22.50	0.02	4	912.66	0.02
23.00	0.02	4	912.66	0.02
23.50	0.02	4	912.66	0.02
24.00	0.02	4	912.66	0.02

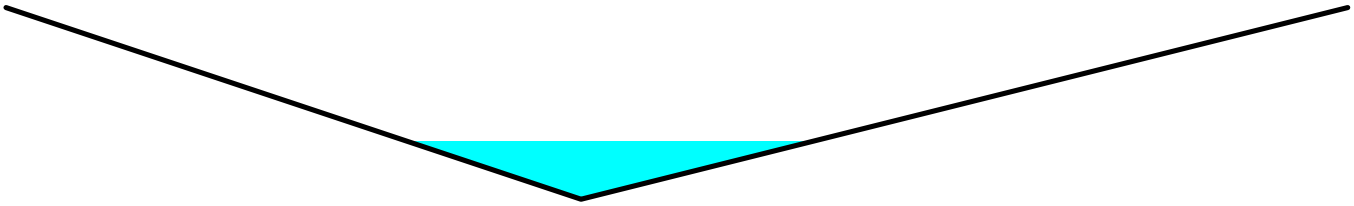
Summary for Reach DB-G5: (new Reach)

Inflow Area = 1.053 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 5.57 cfs @ 11.95 hrs, Volume= 0.243 af
Outflow = 5.40 cfs @ 11.97 hrs, Volume= 0.243 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.17 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.50 fps, Avg. Travel Time= 3.9 min

Peak Storage= 456 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 128.99 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 352.1' Slope= 0.0196 '/'
Inlet Invert= 889.32', Outlet Invert= 882.41'



Hydrograph for Reach DB-G5: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	889.32	0.00
0.50	0.00	0	889.32	0.00
1.00	0.00	0	889.32	0.00
1.50	0.00	0	889.32	0.00
2.00	0.00	0	889.32	0.00
2.50	0.00	0	889.32	0.00
3.00	0.00	0	889.32	0.00
3.50	0.00	0	889.32	0.00
4.00	0.00	0	889.32	0.00
4.50	0.00	0	889.32	0.00
5.00	0.00	0	889.32	0.00
5.50	0.00	0	889.32	0.00
6.00	0.00	0	889.32	0.00
6.50	0.00	0	889.32	0.00
7.00	0.00	0	889.32	0.00
7.50	0.00	0	889.32	0.00
8.00	0.00	2	889.36	0.00
8.50	0.01	4	889.38	0.01
9.00	0.02	7	889.39	0.02
9.50	0.03	9	889.40	0.03
10.00	0.05	12	889.42	0.04
10.50	0.07	18	889.44	0.07
11.00	0.12	26	889.47	0.12
11.50	**0.25**	**44**	**889.51**	**0.24**
12.00	**4.14**	**415**	**889.90**	**4.75**
12.50	0.42	71	889.56	0.45
13.00	0.27	49	889.52	0.28
13.50	0.21	40	889.50	0.21
14.00	0.16	34	889.49	0.17
14.50	0.15	31	889.48	0.15
15.00	0.13	28	889.47	0.13
15.50	0.12	26	889.47	0.12
16.00	0.10	24	889.46	0.10
16.50	0.10	22	889.45	0.10
17.00	0.09	21	889.45	0.09
17.50	0.09	20	889.45	0.09
18.00	0.08	20	889.45	0.08
18.50	0.08	19	889.44	0.08
19.00	0.07	18	889.44	0.07
19.50	0.06	17	889.44	0.07
20.00	0.06	15	889.43	0.06
20.50	0.06	15	889.43	0.06
21.00	0.06	15	889.43	0.06
21.50	0.06	15	889.43	0.06
22.00	0.05	14	889.43	0.05
22.50	0.05	14	889.43	0.05
23.00	0.05	14	889.43	0.05
23.50	0.05	14	889.43	0.05
24.00	0.05	14	889.42	0.05

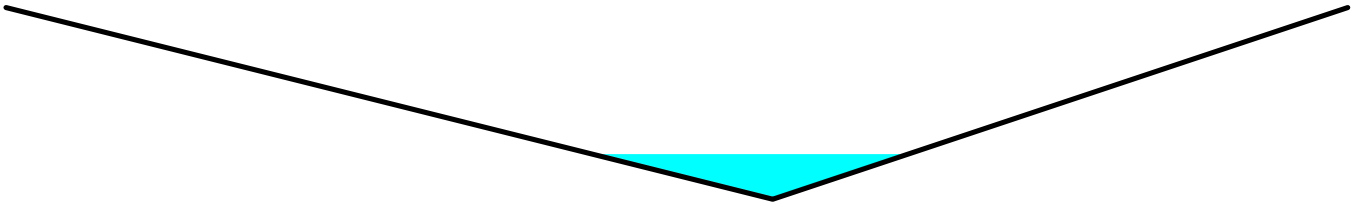
Summary for Reach DB-G6: (new Reach)

Inflow Area = 0.583 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 3.11 cfs @ 11.95 hrs, Volume= 0.135 af
Outflow = 3.03 cfs @ 11.96 hrs, Volume= 0.135 af, Atten= 3%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.89 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 3.5 min

Peak Storage= 228 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 142.30 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 291.4' Slope= 0.0239 '/'
Inlet Invert= 889.37', Outlet Invert= 882.41'



Hydrograph for Reach DB-G6: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	889.37	0.00
0.50	0.00	0	889.37	0.00
1.00	0.00	0	889.37	0.00
1.50	0.00	0	889.37	0.00
2.00	0.00	0	889.37	0.00
2.50	0.00	0	889.37	0.00
3.00	0.00	0	889.37	0.00
3.50	0.00	0	889.37	0.00
4.00	0.00	0	889.37	0.00
4.50	0.00	0	889.37	0.00
5.00	0.00	0	889.37	0.00
5.50	0.00	0	889.37	0.00
6.00	0.00	0	889.37	0.00
6.50	0.00	0	889.37	0.00
7.00	0.00	0	889.37	0.00
7.50	0.00	0	889.37	0.00
8.00	0.00	1	889.40	0.00
8.50	0.01	2	889.41	0.01
9.00	0.01	3	889.43	0.01
9.50	0.02	4	889.44	0.02
10.00	0.03	6	889.45	0.02
10.50	0.04	9	889.46	0.04
11.00	0.07	13	889.48	0.07
11.50	**0.14**	**22**	**889.52**	**0.14**
12.00	**2.19**	**199**	**889.81**	**2.54**
12.50	0.23	34	889.55	0.24
13.00	0.15	24	889.52	0.15
13.50	0.11	20	889.51	0.12
14.00	0.09	17	889.50	0.09
14.50	0.08	15	889.49	0.08
15.00	0.07	14	889.49	0.07
15.50	0.07	13	889.48	0.07
16.00	0.06	12	889.48	0.06
16.50	0.05	11	889.47	0.05
17.00	0.05	11	889.47	0.05
17.50	0.05	10	889.47	0.05
18.00	0.04	10	889.47	0.04
18.50	0.04	9	889.46	0.04
19.00	0.04	9	889.46	0.04
19.50	0.04	8	889.46	0.04
20.00	0.03	8	889.46	0.03
20.50	0.03	7	889.45	0.03
21.00	0.03	7	889.45	0.03
21.50	0.03	7	889.45	0.03
22.00	0.03	7	889.45	0.03
22.50	0.03	7	889.45	0.03
23.00	0.03	7	889.45	0.03
23.50	0.03	7	889.45	0.03
24.00	0.03	7	889.45	0.03

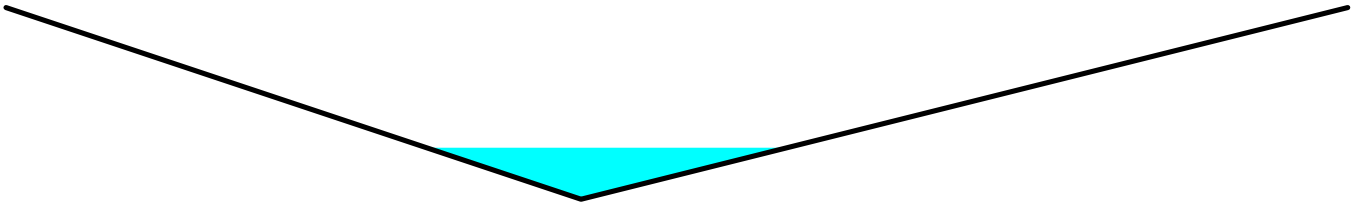
Summary for Reach DB-G7: (new Reach)

Inflow Area = 0.751 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 4.01 cfs @ 11.95 hrs, Volume= 0.174 af
Outflow = 3.90 cfs @ 11.96 hrs, Volume= 0.173 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.84 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 3.7 min

Peak Storage= 310 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 129.08 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 305.8' Slope= 0.0197 '/'
Inlet Invert= 863.42', Outlet Invert= 857.41'



Hydrograph for Reach DB-G7: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	863.42	0.00
0.50	0.00	0	863.42	0.00
1.00	0.00	0	863.42	0.00
1.50	0.00	0	863.42	0.00
2.00	0.00	0	863.42	0.00
2.50	0.00	0	863.42	0.00
3.00	0.00	0	863.42	0.00
3.50	0.00	0	863.42	0.00
4.00	0.00	0	863.42	0.00
4.50	0.00	0	863.42	0.00
5.00	0.00	0	863.42	0.00
5.50	0.00	0	863.42	0.00
6.00	0.00	0	863.42	0.00
6.50	0.00	0	863.42	0.00
7.00	0.00	0	863.42	0.00
7.50	0.00	0	863.42	0.00
8.00	0.00	1	863.45	0.00
8.50	0.01	3	863.47	0.01
9.00	0.02	5	863.48	0.01
9.50	0.02	6	863.49	0.02
10.00	0.03	8	863.51	0.03
10.50	0.05	12	863.52	0.05
11.00	0.09	18	863.55	0.09
11.50	**0.18**	**30**	**863.59**	**0.17**
12.00	**2.82**	**273**	**863.93**	**3.29**
12.50	0.30	47	863.63	0.32
13.00	0.19	33	863.60	0.20
13.50	0.15	27	863.58	0.15
14.00	0.12	23	863.57	0.12
14.50	0.10	21	863.56	0.11
15.00	0.09	19	863.55	0.10
15.50	0.08	18	863.55	0.08
16.00	0.07	16	863.54	0.07
16.50	0.07	15	863.54	0.07
17.00	0.07	14	863.54	0.07
17.50	0.06	14	863.53	0.06
18.00	0.06	13	863.53	0.06
18.50	0.05	12	863.53	0.05
19.00	0.05	12	863.52	0.05
19.50	0.05	11	863.52	0.05
20.00	0.04	10	863.52	0.04
20.50	0.04	10	863.52	0.04
21.00	0.04	10	863.52	0.04
21.50	0.04	10	863.52	0.04
22.00	0.04	10	863.51	0.04
22.50	0.04	10	863.51	0.04
23.00	0.04	9	863.51	0.04
23.50	0.04	9	863.51	0.04
24.00	0.04	9	863.51	0.04

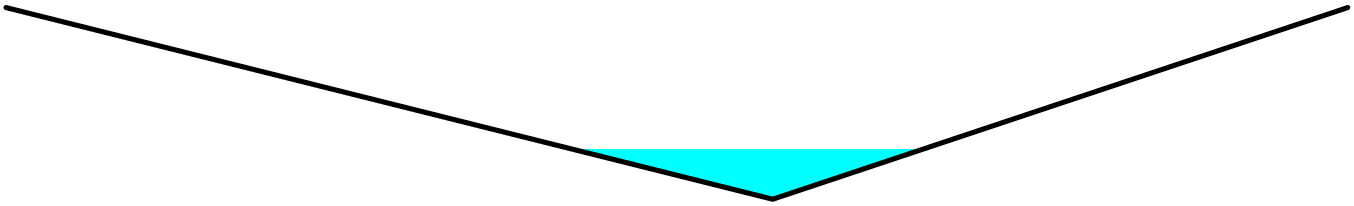
Summary for Reach DB-G8: (new Reach)

Inflow Area = 0.758 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 4.04 cfs @ 11.95 hrs, Volume= 0.175 af
Outflow = 3.90 cfs @ 11.96 hrs, Volume= 0.175 af, Atten= 3%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.04 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 4.2 min

Peak Storage= 353 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 137.92 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 366.4' Slope= 0.0224 '/'
Inlet Invert= 865.63', Outlet Invert= 857.41'



Hydrograph for Reach DB-G8: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	865.63	0.00
0.50	0.00	0	865.63	0.00
1.00	0.00	0	865.63	0.00
1.50	0.00	0	865.63	0.00
2.00	0.00	0	865.63	0.00
2.50	0.00	0	865.63	0.00
3.00	0.00	0	865.63	0.00
3.50	0.00	0	865.63	0.00
4.00	0.00	0	865.63	0.00
4.50	0.00	0	865.63	0.00
5.00	0.00	0	865.63	0.00
5.50	0.00	0	865.63	0.00
6.00	0.00	0	865.63	0.00
6.50	0.00	0	865.63	0.00
7.00	0.00	0	865.63	0.00
7.50	0.00	0	865.63	0.00
8.00	0.00	1	865.66	0.00
8.50	0.01	3	865.68	0.01
9.00	0.02	5	865.69	0.01
9.50	0.02	7	865.70	0.02
10.00	0.03	9	865.72	0.03
10.50	0.05	14	865.73	0.05
11.00	0.09	20	865.76	0.09
11.50	**0.18**	**34**	**865.79**	**0.17**
12.00	**2.89**	**318**	**866.13**	**3.39**
12.50	0.30	55	865.84	0.32
13.00	0.19	38	865.80	0.20
13.50	0.15	31	865.79	0.15
14.00	0.12	26	865.77	0.12
14.50	0.11	24	865.77	0.11
15.00	0.10	22	865.76	0.10
15.50	0.08	20	865.76	0.09
16.00	0.07	18	865.75	0.08
16.50	0.07	17	865.75	0.07
17.00	0.07	17	865.74	0.07
17.50	0.06	16	865.74	0.06
18.00	0.06	15	865.74	0.06
18.50	0.05	14	865.74	0.05
19.00	0.05	14	865.73	0.05
19.50	0.05	13	865.73	0.05
20.00	0.04	12	865.73	0.04
20.50	0.04	12	865.72	0.04
21.00	0.04	11	865.72	0.04
21.50	0.04	11	865.72	0.04
22.00	0.04	11	865.72	0.04
22.50	0.04	11	865.72	0.04
23.00	0.04	11	865.72	0.04
23.50	0.04	11	865.72	0.04
24.00	0.04	10	865.72	0.04

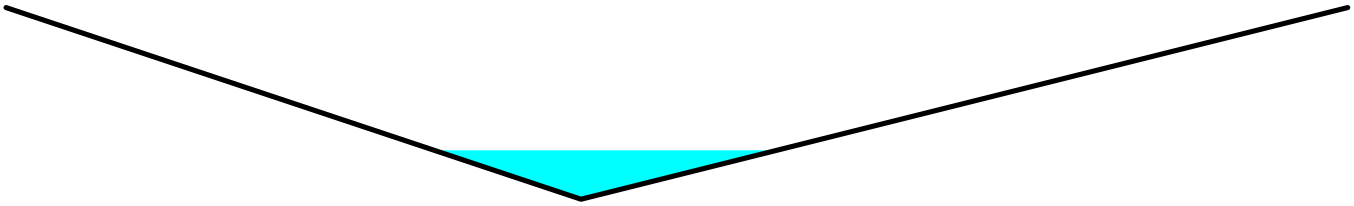
Summary for Reach DB-G9: (new Reach)

Inflow Area = 0.646 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 3.45 cfs @ 11.95 hrs, Volume= 0.149 af
Outflow = 3.37 cfs @ 11.96 hrs, Volume= 0.149 af, Atten= 2%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.71 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 3.2 min

Peak Storage= 236 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 129.06 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 259.6' Slope= 0.0196 '/'
Inlet Invert= 837.52', Outlet Invert= 832.42'



Hydrograph for Reach DB-G9: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	837.52	0.00
0.50	0.00	0	837.52	0.00
1.00	0.00	0	837.52	0.00
1.50	0.00	0	837.52	0.00
2.00	0.00	0	837.52	0.00
2.50	0.00	0	837.52	0.00
3.00	0.00	0	837.52	0.00
3.50	0.00	0	837.52	0.00
4.00	0.00	0	837.52	0.00
4.50	0.00	0	837.52	0.00
5.00	0.00	0	837.52	0.00
5.50	0.00	0	837.52	0.00
6.00	0.00	0	837.52	0.00
6.50	0.00	0	837.52	0.00
7.00	0.00	0	837.52	0.00
7.50	0.00	0	837.52	0.00
8.00	0.00	1	837.55	0.00
8.50	0.01	2	837.57	0.01
9.00	0.01	3	837.58	0.01
9.50	0.02	5	837.59	0.02
10.00	0.03	6	837.60	0.03
10.50	0.05	9	837.62	0.04
11.00	0.08	13	837.64	0.07
11.50	**0.16**	**23**	**837.68**	**0.15**
12.00	**2.43**	**205**	**838.00**	**2.80**
12.50	0.25	36	837.72	0.27
13.00	0.17	25	837.69	0.17
13.50	0.13	20	837.67	0.13
14.00	0.10	17	837.66	0.10
14.50	0.09	16	837.65	0.09
15.00	0.08	14	837.65	0.08
15.50	0.07	13	837.64	0.07
16.00	0.06	12	837.63	0.06
16.50	0.06	11	837.63	0.06
17.00	0.06	11	837.63	0.06
17.50	0.05	10	837.63	0.05
18.00	0.05	10	837.62	0.05
18.50	0.05	9	837.62	0.05
19.00	0.04	9	837.62	0.04
19.50	0.04	8	837.62	0.04
20.00	0.04	8	837.61	0.04
20.50	0.04	8	837.61	0.04
21.00	0.03	8	837.61	0.03
21.50	0.03	7	837.61	0.03
22.00	0.03	7	837.61	0.03
22.50	0.03	7	837.61	0.03
23.00	0.03	7	837.61	0.03
23.50	0.03	7	837.61	0.03
24.00	0.03	7	837.61	0.03

Summary for Reach DC-G1: (new Reach)

Inflow Area = 0.572 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 3.02 cfs @ 11.95 hrs, Volume= 0.132 af
Outflow = 3.01 cfs @ 11.96 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.51 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 1.2 min

Peak Storage= 86 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 749.02 cfs

10.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 99.8' Slope= 0.2504 '/'
Inlet Invert= 932.39', Outlet Invert= 907.40'

‡

Hydrograph for Reach DC-G1: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	932.39	0.00
0.50	0.00	0	932.39	0.00
1.00	0.00	0	932.39	0.00
1.50	0.00	0	932.39	0.00
2.00	0.00	0	932.39	0.00
2.50	0.00	0	932.39	0.00
3.00	0.00	0	932.39	0.00
3.50	0.00	0	932.39	0.00
4.00	0.00	0	932.39	0.00
4.50	0.00	0	932.39	0.00
5.00	0.00	0	932.39	0.00
5.50	0.00	0	932.39	0.00
6.00	0.00	0	932.39	0.00
6.50	0.00	0	932.39	0.00
7.00	0.00	0	932.39	0.00
7.50	0.00	0	932.39	0.00
8.00	0.00	0	932.39	0.00
8.50	0.01	0	932.39	0.01
9.00	0.01	1	932.39	0.01
9.50	0.02	1	932.39	0.02
10.00	0.02	2	932.39	0.02
10.50	0.04	3	932.39	0.04
11.00	0.07	5	932.39	0.07
11.50	**0.14**	**10**	**932.40**	**0.13**
12.00	**2.39**	**76**	**932.46**	**2.51**
12.50	0.23	18	932.41	0.24
13.00	0.15	11	932.40	0.15
13.50	0.11	8	932.40	0.12
14.00	0.09	7	932.40	0.09
14.50	0.08	6	932.40	0.08
15.00	0.07	5	932.40	0.07
15.50	0.06	5	932.39	0.06
16.00	0.06	4	932.39	0.06
16.50	0.05	4	932.39	0.05
17.00	0.05	4	932.39	0.05
17.50	0.05	3	932.39	0.05
18.00	0.04	3	932.39	0.04
18.50	0.04	3	932.39	0.04
19.00	0.04	3	932.39	0.04
19.50	0.04	3	932.39	0.04
20.00	0.03	2	932.39	0.03
20.50	0.03	2	932.39	0.03
21.00	0.03	2	932.39	0.03
21.50	0.03	2	932.39	0.03
22.00	0.03	2	932.39	0.03
22.50	0.03	2	932.39	0.03
23.00	0.03	2	932.39	0.03
23.50	0.03	2	932.39	0.03
24.00	0.03	2	932.39	0.03

Summary for Reach DC-G10: (new Reach)

Inflow Area = 12.945 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 66.36 cfs @ 11.97 hrs, Volume= 2.984 af
Outflow = 66.34 cfs @ 11.97 hrs, Volume= 2.983 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.05 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.54 fps, Avg. Travel Time= 0.7 min

Peak Storage= 623 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 756.10 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 103.7' Slope= 0.2552 '/'
Inlet Invert= 707.44', Outlet Invert= 680.98'

‡

Hydrograph for Reach DC-G10: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	707.44	0.00
0.50	0.00	0	707.44	0.00
1.00	0.00	0	707.44	0.00
1.50	0.00	0	707.44	0.00
2.00	0.00	0	707.44	0.00
2.50	0.00	0	707.44	0.00
3.00	0.00	0	707.44	0.00
3.50	0.00	0	707.44	0.00
4.00	0.00	0	707.44	0.00
4.50	0.00	0	707.44	0.00
5.00	0.00	0	707.44	0.00
5.50	0.00	0	707.44	0.00
6.00	0.00	0	707.44	0.00
6.50	0.00	0	707.44	0.00
7.00	0.00	0	707.44	0.00
7.50	0.00	0	707.44	0.00
8.00	0.04	3	707.44	0.03
8.50	0.11	8	707.45	0.11
9.00	0.22	16	707.46	0.21
9.50	0.34	23	707.46	0.34
10.00	0.51	29	707.47	0.51
10.50	0.83	40	707.48	0.82
11.00	1.42	55	707.49	1.41
11.50	**2.88**	**86**	**707.52**	**2.86**
12.00	**60.44**	**589**	**707.93**	**61.05**
12.50	5.71	132	707.56	5.75
13.00	3.48	97	707.53	3.49
13.50	2.65	82	707.52	2.65
14.00	2.09	71	707.51	2.10
14.50	1.83	65	707.50	1.83
15.00	1.66	61	707.50	1.66
15.50	1.48	57	707.49	1.48
16.00	1.29	52	707.49	1.30
16.50	1.20	50	707.49	1.20
17.00	1.13	48	707.49	1.13
17.50	1.07	47	707.48	1.07
18.00	1.00	45	707.48	1.00
18.50	0.94	43	707.48	0.94
19.00	0.87	42	707.48	0.87
19.50	0.81	39	707.48	0.81
20.00	0.74	37	707.48	0.74
20.50	0.71	36	707.47	0.71
21.00	0.70	36	707.47	0.70
21.50	0.68	35	707.47	0.68
22.00	0.67	35	707.47	0.67
22.50	0.66	34	707.47	0.66
23.00	0.64	34	707.47	0.64
23.50	0.63	33	707.47	0.63
24.00	0.62	33	707.47	0.62

Summary for Reach DC-G12: (new Reach)

Inflow Area = 1.208 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 6.09 cfs @ 11.97 hrs, Volume= 0.279 af
Outflow = 6.09 cfs @ 11.97 hrs, Volume= 0.279 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.51 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.74 fps, Avg. Travel Time= 0.2 min

Peak Storage= 19 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 466.00 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 19.9' Slope= 0.3080 '/'
Inlet Invert= 828.19', Outlet Invert= 822.06'

‡

Hydrograph for Reach DC-G12: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	828.19	0.00
0.50	0.00	0	828.19	0.00
1.00	0.00	0	828.19	0.00
1.50	0.00	0	828.19	0.00
2.00	0.00	0	828.19	0.00
2.50	0.00	0	828.19	0.00
3.00	0.00	0	828.19	0.00
3.50	0.00	0	828.19	0.00
4.00	0.00	0	828.19	0.00
4.50	0.00	0	828.19	0.00
5.00	0.00	0	828.19	0.00
5.50	0.00	0	828.19	0.00
6.00	0.00	0	828.19	0.00
6.50	0.00	0	828.19	0.00
7.00	0.00	0	828.19	0.00
7.50	0.00	0	828.19	0.00
8.00	0.00	0	828.19	0.00
8.50	0.01	0	828.19	0.01
9.00	0.02	0	828.19	0.02
9.50	0.03	0	828.20	0.03
10.00	0.05	1	828.20	0.05
10.50	0.08	1	828.20	0.08
11.00	0.14	2	828.21	0.13
11.50	**0.27**	**3**	**828.22**	**0.27**
12.00	**5.52**	**17**	**828.38**	**5.54**
12.50	0.53	4	828.24	0.53
13.00	0.32	3	828.23	0.32
13.50	0.25	2	828.22	0.25
14.00	0.19	2	828.22	0.19
14.50	0.17	2	828.21	0.17
15.00	0.15	2	828.21	0.15
15.50	0.14	2	828.21	0.14
16.00	0.12	2	828.21	0.12
16.50	0.11	1	828.21	0.11
17.00	0.11	1	828.21	0.11
17.50	0.10	1	828.21	0.10
18.00	0.09	1	828.21	0.09
18.50	0.09	1	828.20	0.09
19.00	0.08	1	828.20	0.08
19.50	0.07	1	828.20	0.07
20.00	0.07	1	828.20	0.07
20.50	0.07	1	828.20	0.07
21.00	0.06	1	828.20	0.06
21.50	0.06	1	828.20	0.06
22.00	0.06	1	828.20	0.06
22.50	0.06	1	828.20	0.06
23.00	0.06	1	828.20	0.06
23.50	0.06	1	828.20	0.06
24.00	0.06	1	828.20	0.06

Summary for Reach DC-G13: (new Reach)

Inflow Area = 0.260 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 1.37 cfs @ 11.96 hrs, Volume= 0.060 af
Outflow = 1.37 cfs @ 11.96 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.82 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.55 fps, Avg. Travel Time= 0.2 min

Peak Storage= 7 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 466.79 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 19.8' Slope= 0.3091 '/'
Inlet Invert= 814.25', Outlet Invert= 808.13'

‡

Hydrograph for Reach DC-G13: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	814.25	0.00
0.50	0.00	0	814.25	0.00
1.00	0.00	0	814.25	0.00
1.50	0.00	0	814.25	0.00
2.00	0.00	0	814.25	0.00
2.50	0.00	0	814.25	0.00
3.00	0.00	0	814.25	0.00
3.50	0.00	0	814.25	0.00
4.00	0.00	0	814.25	0.00
4.50	0.00	0	814.25	0.00
5.00	0.00	0	814.25	0.00
5.50	0.00	0	814.25	0.00
6.00	0.00	0	814.25	0.00
6.50	0.00	0	814.25	0.00
7.00	0.00	0	814.25	0.00
7.50	0.00	0	814.25	0.00
8.00	0.00	0	814.25	0.00
8.50	0.00	0	814.25	0.00
9.00	0.01	0	814.25	0.01
9.50	0.01	0	814.25	0.01
10.00	0.01	0	814.25	0.01
10.50	0.02	0	814.25	0.02
11.00	0.03	0	814.25	0.03
11.50	**0.06**	**1**	**814.26**	**0.06**
12.00	**1.10**	**6**	**814.32**	**1.11**
12.50	0.11	1	814.27	0.11
13.00	0.07	1	814.26	0.07
13.50	0.05	1	814.26	0.05
14.00	0.04	1	814.26	0.04
14.50	0.04	0	814.26	0.04
15.00	0.03	0	814.26	0.03
15.50	0.03	0	814.25	0.03
16.00	0.03	0	814.25	0.03
16.50	0.02	0	814.25	0.02
17.00	0.02	0	814.25	0.02
17.50	0.02	0	814.25	0.02
18.00	0.02	0	814.25	0.02
18.50	0.02	0	814.25	0.02
19.00	0.02	0	814.25	0.02
19.50	0.02	0	814.25	0.02
20.00	0.01	0	814.25	0.01
20.50	0.01	0	814.25	0.01
21.00	0.01	0	814.25	0.01
21.50	0.01	0	814.25	0.01
22.00	0.01	0	814.25	0.01
22.50	0.01	0	814.25	0.01
23.00	0.01	0	814.25	0.01
23.50	0.01	0	814.25	0.01
24.00	0.01	0	814.25	0.01

Summary for Reach DC-G2: (new Reach)

Inflow Area = 1.550 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 8.15 cfs @ 11.96 hrs, Volume= 0.358 af
Outflow = 8.14 cfs @ 11.96 hrs, Volume= 0.358 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.13 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.47 fps, Avg. Travel Time= 1.1 min

Peak Storage= 159 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 747.52 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.2' Slope= 0.2494 '/'
Inlet Invert= 907.40', Outlet Invert= 882.41'

‡

Hydrograph for Reach DC-G2: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	907.40	0.00
0.50	0.00	0	907.40	0.00
1.00	0.00	0	907.40	0.00
1.50	0.00	0	907.40	0.00
2.00	0.00	0	907.40	0.00
2.50	0.00	0	907.40	0.00
3.00	0.00	0	907.40	0.00
3.50	0.00	0	907.40	0.00
4.00	0.00	0	907.40	0.00
4.50	0.00	0	907.40	0.00
5.00	0.00	0	907.40	0.00
5.50	0.00	0	907.40	0.00
6.00	0.00	0	907.40	0.00
6.50	0.00	0	907.40	0.00
7.00	0.00	0	907.40	0.00
7.50	0.00	0	907.40	0.00
8.00	0.01	0	907.40	0.01
8.50	0.02	1	907.40	0.02
9.00	0.03	2	907.40	0.03
9.50	0.04	3	907.40	0.04
10.00	0.07	5	907.40	0.06
10.50	0.11	8	907.41	0.10
11.00	0.18	13	907.41	0.17
11.50	**0.36**	**23**	**907.42**	**0.36**
12.00	**6.69**	**144**	**907.54**	**6.89**
12.50	0.65	33	907.43	0.66
13.00	0.41	25	907.42	0.41
13.50	0.31	21	907.42	0.31
14.00	0.25	18	907.42	0.25
14.50	0.22	16	907.42	0.22
15.00	0.20	15	907.41	0.20
15.50	0.17	13	907.41	0.18
16.00	0.15	11	907.41	0.15
16.50	0.14	11	907.41	0.14
17.00	0.13	10	907.41	0.14
17.50	0.13	9	907.41	0.13
18.00	0.12	9	907.41	0.12
18.50	0.11	8	907.41	0.11
19.00	0.10	8	907.41	0.10
19.50	0.10	7	907.41	0.10
20.00	0.09	6	907.41	0.09
20.50	0.08	6	907.41	0.08
21.00	0.08	6	907.41	0.08
21.50	0.08	6	907.41	0.08
22.00	0.08	6	907.41	0.08
22.50	0.08	6	907.41	0.08
23.00	0.08	6	907.41	0.08
23.50	0.08	6	907.41	0.08
24.00	0.07	5	907.41	0.07

Summary for Reach DC-G3: (new Reach)

Inflow Area = 3.186 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 16.56 cfs @ 11.96 hrs, Volume= 0.735 af
Outflow = 16.55 cfs @ 11.96 hrs, Volume= 0.735 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.69 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 1.0 min

Peak Storage= 247 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 749.17 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 99.8' Slope= 0.2505 '/'
Inlet Invert= 882.41', Outlet Invert= 857.41'

‡

Hydrograph for Reach DC-G3: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	882.41	0.00
0.50	0.00	0	882.41	0.00
1.00	0.00	0	882.41	0.00
1.50	0.00	0	882.41	0.00
2.00	0.00	0	882.41	0.00
2.50	0.00	0	882.41	0.00
3.00	0.00	0	882.41	0.00
3.50	0.00	0	882.41	0.00
4.00	0.00	0	882.41	0.00
4.50	0.00	0	882.41	0.00
5.00	0.00	0	882.41	0.00
5.50	0.00	0	882.41	0.00
6.00	0.00	0	882.41	0.00
6.50	0.00	0	882.41	0.00
7.00	0.00	0	882.41	0.00
7.50	0.00	0	882.41	0.00
8.00	0.01	1	882.41	0.01
8.50	0.03	2	882.41	0.03
9.00	0.06	4	882.41	0.06
9.50	0.09	6	882.42	0.09
10.00	0.13	9	882.42	0.13
10.50	0.21	15	882.43	0.21
11.00	0.36	23	882.43	0.36
11.50	**0.73**	**35**	**882.45**	**0.73**
12.00	**14.18**	**227**	**882.62**	**14.48**
12.50	1.35	53	882.46	1.37
13.00	0.84	40	882.45	0.85
13.50	0.64	33	882.44	0.65
14.00	0.51	28	882.44	0.51
14.50	0.45	26	882.44	0.45
15.00	0.41	25	882.43	0.41
15.50	0.36	23	882.43	0.36
16.00	0.32	22	882.43	0.32
16.50	0.29	21	882.43	0.29
17.00	0.28	20	882.43	0.28
17.50	0.26	19	882.43	0.26
18.00	0.25	18	882.43	0.25
18.50	0.23	17	882.43	0.23
19.00	0.21	16	882.43	0.21
19.50	0.20	14	882.42	0.20
20.00	0.18	13	882.42	0.18
20.50	0.17	13	882.42	0.17
21.00	0.17	13	882.42	0.17
21.50	0.17	12	882.42	0.17
22.00	0.16	12	882.42	0.16
22.50	0.16	12	882.42	0.16
23.00	0.16	12	882.42	0.16
23.50	0.15	11	882.42	0.16
24.00	0.15	11	882.42	0.15

Summary for Reach DC-G4: (new Reach)

Inflow Area = 4.695 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 24.33 cfs @ 11.96 hrs, Volume= 1.083 af
Outflow = 24.32 cfs @ 11.97 hrs, Volume= 1.083 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.70 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.78 fps, Avg. Travel Time= 0.9 min

Peak Storage= 316 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.27 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2499 '/'
Inlet Invert= 857.41', Outlet Invert= 832.42'

‡

Hydrograph for Reach DC-G4: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	857.41	0.00
0.50	0.00	0	857.41	0.00
1.00	0.00	0	857.41	0.00
1.50	0.00	0	857.41	0.00
2.00	0.00	0	857.41	0.00
2.50	0.00	0	857.41	0.00
3.00	0.00	0	857.41	0.00
3.50	0.00	0	857.41	0.00
4.00	0.00	0	857.41	0.00
4.50	0.00	0	857.41	0.00
5.00	0.00	0	857.41	0.00
5.50	0.00	0	857.41	0.00
6.00	0.00	0	857.41	0.00
6.50	0.00	0	857.41	0.00
7.00	0.00	0	857.41	0.00
7.50	0.00	0	857.41	0.00
8.00	0.02	1	857.41	0.02
8.50	0.04	3	857.41	0.04
9.00	0.09	6	857.42	0.08
9.50	0.13	9	857.42	0.13
10.00	0.19	14	857.42	0.19
10.50	0.31	21	857.43	0.31
11.00	0.53	29	857.44	0.52
11.50	**1.07**	**45**	**857.45**	**1.06**
12.00	**21.16**	**292**	**857.68**	**21.52**
12.50	2.01	67	857.48	2.03
13.00	1.25	50	857.46	1.25
13.50	0.95	42	857.45	0.95
14.00	0.75	37	857.45	0.76
14.50	0.66	33	857.44	0.66
15.00	0.60	31	857.44	0.60
15.50	0.53	29	857.44	0.53
16.00	0.47	27	857.44	0.47
16.50	0.43	26	857.44	0.43
17.00	0.41	25	857.43	0.41
17.50	0.39	24	857.43	0.39
18.00	0.36	23	857.43	0.36
18.50	0.34	22	857.43	0.34
19.00	0.31	22	857.43	0.32
19.50	0.29	21	857.43	0.29
20.00	0.27	20	857.43	0.27
20.50	0.26	19	857.43	0.26
21.00	0.25	19	857.43	0.25
21.50	0.25	18	857.43	0.25
22.00	0.24	18	857.43	0.24
22.50	0.24	17	857.43	0.24
23.00	0.23	17	857.43	0.23
23.50	0.23	17	857.43	0.23
24.00	0.22	16	857.43	0.22

Summary for Reach DC-G5: (new Reach)

Inflow Area = 6.289 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 32.47 cfs @ 11.97 hrs, Volume= 1.451 af
Outflow = 32.46 cfs @ 11.97 hrs, Volume= 1.450 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.54 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.96 fps, Avg. Travel Time= 0.8 min

Peak Storage= 380 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.42 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2500 '/'
Inlet Invert= 832.42', Outlet Invert= 807.42'

‡

Hydrograph for Reach DC-G5: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	832.42	0.00
0.50	0.00	0	832.42	0.00
1.00	0.00	0	832.42	0.00
1.50	0.00	0	832.42	0.00
2.00	0.00	0	832.42	0.00
2.50	0.00	0	832.42	0.00
3.00	0.00	0	832.42	0.00
3.50	0.00	0	832.42	0.00
4.00	0.00	0	832.42	0.00
4.50	0.00	0	832.42	0.00
5.00	0.00	0	832.42	0.00
5.50	0.00	0	832.42	0.00
6.00	0.00	0	832.42	0.00
6.50	0.00	0	832.42	0.00
7.00	0.00	0	832.42	0.00
7.50	0.00	0	832.42	0.00
8.00	0.02	1	832.42	0.02
8.50	0.06	4	832.42	0.06
9.00	0.11	8	832.43	0.11
9.50	0.17	12	832.43	0.17
10.00	0.25	18	832.44	0.25
10.50	0.41	25	832.44	0.41
11.00	0.70	35	832.45	0.70
11.50	**1.43**	**54**	**832.47**	**1.42**
12.00	**28.64**	**354**	**832.74**	**29.05**
12.50	2.72	81	832.50	2.74
13.00	1.68	60	832.48	1.68
13.50	1.28	50	832.47	1.28
14.00	1.01	44	832.46	1.01
14.50	0.89	41	832.46	0.89
15.00	0.80	38	832.46	0.80
15.50	0.71	35	832.45	0.72
16.00	0.63	32	832.45	0.63
16.50	0.58	31	832.45	0.58
17.00	0.55	30	832.45	0.55
17.50	0.52	28	832.45	0.52
18.00	0.49	27	832.45	0.49
18.50	0.45	26	832.45	0.45
19.00	0.42	25	832.44	0.42
19.50	0.39	24	832.44	0.39
20.00	0.36	23	832.44	0.36
20.50	0.34	22	832.44	0.34
21.00	0.34	22	832.44	0.34
21.50	0.33	22	832.44	0.33
22.00	0.33	22	832.44	0.33
22.50	0.32	22	832.44	0.32
23.00	0.31	21	832.44	0.31
23.50	0.31	21	832.44	0.31
24.00	0.30	21	832.44	0.30

Summary for Reach DC-G6: (new Reach)

Inflow Area = 7.931 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 40.82 cfs @ 11.97 hrs, Volume= 1.829 af
Outflow = 40.81 cfs @ 11.97 hrs, Volume= 1.829 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.26 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.13 fps, Avg. Travel Time= 0.8 min

Peak Storage= 441 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 747.52 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.2' Slope= 0.2494 '/'
Inlet Invert= 807.42', Outlet Invert= 782.43'

‡

Hydrograph for Reach DC-G6: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	807.42	0.00
0.50	0.00	0	807.42	0.00
1.00	0.00	0	807.42	0.00
1.50	0.00	0	807.42	0.00
2.00	0.00	0	807.42	0.00
2.50	0.00	0	807.42	0.00
3.00	0.00	0	807.42	0.00
3.50	0.00	0	807.42	0.00
4.00	0.00	0	807.42	0.00
4.50	0.00	0	807.42	0.00
5.00	0.00	0	807.42	0.00
5.50	0.00	0	807.42	0.00
6.00	0.00	0	807.42	0.00
6.50	0.00	0	807.42	0.00
7.00	0.00	0	807.42	0.00
7.50	0.00	0	807.42	0.00
8.00	0.03	2	807.42	0.02
8.50	0.07	5	807.43	0.07
9.00	0.14	10	807.43	0.14
9.50	0.21	15	807.44	0.21
10.00	0.32	22	807.44	0.31
10.50	0.52	28	807.45	0.51
11.00	0.88	41	807.46	0.88
11.50	**1.79**	**62**	**807.48**	**1.78**
12.00	**36.35**	**413**	**807.79**	**36.82**
12.50	3.45	94	807.51	3.48
13.00	2.12	69	807.49	2.13
13.50	1.61	59	807.48	1.62
14.00	1.28	51	807.47	1.28
14.50	1.12	47	807.47	1.12
15.00	1.01	44	807.46	1.01
15.50	0.90	41	807.46	0.90
16.00	0.79	38	807.46	0.79
16.50	0.73	36	807.46	0.73
17.00	0.69	35	807.45	0.69
17.50	0.65	33	807.45	0.65
18.00	0.61	32	807.45	0.61
18.50	0.57	30	807.45	0.57
19.00	0.53	29	807.45	0.53
19.50	0.49	28	807.45	0.49
20.00	0.45	26	807.45	0.45
20.50	0.43	26	807.45	0.43
21.00	0.43	25	807.45	0.43
21.50	0.42	25	807.44	0.42
22.00	0.41	25	807.44	0.41
22.50	0.40	25	807.44	0.40
23.00	0.39	24	807.44	0.39
23.50	0.39	24	807.44	0.39
24.00	0.38	24	807.44	0.38

Summary for Reach DC-G7: (new Reach)

Inflow Area = 9.573 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 49.17 cfs @ 11.97 hrs, Volume= 2.208 af
Outflow = 49.16 cfs @ 11.97 hrs, Volume= 2.207 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.90 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.27 fps, Avg. Travel Time= 0.7 min

Peak Storage= 497 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.44'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.42 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2500 '/'
Inlet Invert= 782.43', Outlet Invert= 757.43'

‡

Hydrograph for Reach DC-G7: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	782.43	0.00
0.50	0.00	0	782.43	0.00
1.00	0.00	0	782.43	0.00
1.50	0.00	0	782.43	0.00
2.00	0.00	0	782.43	0.00
2.50	0.00	0	782.43	0.00
3.00	0.00	0	782.43	0.00
3.50	0.00	0	782.43	0.00
4.00	0.00	0	782.43	0.00
4.50	0.00	0	782.43	0.00
5.00	0.00	0	782.43	0.00
5.50	0.00	0	782.43	0.00
6.00	0.00	0	782.43	0.00
6.50	0.00	0	782.43	0.00
7.00	0.00	0	782.43	0.00
7.50	0.00	0	782.43	0.00
8.00	0.03	2	782.43	0.03
8.50	0.09	6	782.44	0.08
9.00	0.17	12	782.44	0.17
9.50	0.25	18	782.45	0.25
10.00	0.38	24	782.45	0.38
10.50	0.62	32	782.46	0.62
11.00	1.06	45	782.47	1.05
11.50	**2.16**	**69**	**782.50**	**2.14**
12.00	**44.09**	**466**	**782.84**	**44.61**
12.50	4.18	106	782.53	4.21
13.00	2.56	78	782.51	2.57
13.50	1.95	66	782.49	1.95
14.00	1.54	57	782.49	1.55
14.50	1.35	52	782.48	1.35
15.00	1.22	49	782.48	1.22
15.50	1.09	46	782.48	1.09
16.00	0.95	43	782.47	0.96
16.50	0.88	41	782.47	0.89
17.00	0.84	39	782.47	0.84
17.50	0.79	38	782.47	0.79
18.00	0.74	36	782.47	0.74
18.50	0.69	34	782.46	0.69
19.00	0.64	33	782.46	0.64
19.50	0.59	31	782.46	0.59
20.00	0.54	29	782.46	0.55
20.50	0.52	29	782.46	0.52
21.00	0.51	28	782.46	0.51
21.50	0.50	28	782.46	0.50
22.00	0.50	28	782.46	0.50
22.50	0.49	27	782.46	0.49
23.00	0.48	27	782.46	0.48
23.50	0.47	27	782.46	0.47
24.00	0.46	26	782.46	0.46

Summary for Reach DC-G8: (new Reach)

Inflow Area = 10.971 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 56.30 cfs @ 11.97 hrs, Volume= 2.530 af
Outflow = 56.28 cfs @ 11.97 hrs, Volume= 2.529 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.37 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.38 fps, Avg. Travel Time= 0.7 min

Peak Storage= 543 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.27 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2499 '/'
Inlet Invert= 757.43', Outlet Invert= 732.44'

‡

Hydrograph for Reach DC-G8: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	757.43	0.00
0.50	0.00	0	757.43	0.00
1.00	0.00	0	757.43	0.00
1.50	0.00	0	757.43	0.00
2.00	0.00	0	757.43	0.00
2.50	0.00	0	757.43	0.00
3.00	0.00	0	757.43	0.00
3.50	0.00	0	757.43	0.00
4.00	0.00	0	757.43	0.00
4.50	0.00	0	757.43	0.00
5.00	0.00	0	757.43	0.00
5.50	0.00	0	757.43	0.00
6.00	0.00	0	757.43	0.00
6.50	0.00	0	757.43	0.00
7.00	0.00	0	757.43	0.00
7.50	0.00	0	757.43	0.00
8.00	0.03	2	757.43	0.03
8.50	0.10	7	757.44	0.09
9.00	0.19	14	757.44	0.19
9.50	0.29	21	757.45	0.29
10.00	0.44	26	757.46	0.43
10.50	0.71	35	757.46	0.70
11.00	1.21	49	757.48	1.20
11.50	**2.46**	**75**	**757.50**	**2.44**
12.00	**50.76**	**511**	**757.88**	**51.32**
12.50	4.80	115	757.54	4.84
13.00	2.94	85	757.51	2.95
13.50	2.24	71	757.50	2.24
14.00	1.77	62	757.49	1.78
14.50	1.55	57	757.49	1.55
15.00	1.40	53	757.48	1.40
15.50	1.25	50	757.48	1.25
16.00	1.10	46	757.48	1.10
16.50	1.01	44	757.47	1.01
17.00	0.96	43	757.47	0.96
17.50	0.91	41	757.47	0.91
18.00	0.85	40	757.47	0.85
18.50	0.79	38	757.47	0.80
19.00	0.74	36	757.47	0.74
19.50	0.68	34	757.46	0.68
20.00	0.62	32	757.46	0.63
20.50	0.60	31	757.46	0.60
21.00	0.59	31	757.46	0.59
21.50	0.58	30	757.46	0.58
22.00	0.57	30	757.46	0.57
22.50	0.56	30	757.46	0.56
23.00	0.55	29	757.46	0.55
23.50	0.53	29	757.46	0.53
24.00	0.52	29	757.46	0.52

Summary for Reach DC-G9: (new Reach)

Inflow Area = 12.098 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 62.04 cfs @ 11.97 hrs, Volume= 2.789 af
Outflow = 62.03 cfs @ 11.97 hrs, Volume= 2.789 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.73 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.47 fps, Avg. Travel Time= 0.7 min

Peak Storage= 578 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.42 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2500 '/'
Inlet Invert= 732.44', Outlet Invert= 707.44'

‡

Hydrograph for Reach DC-G9: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	732.44	0.00
0.50	0.00	0	732.44	0.00
1.00	0.00	0	732.44	0.00
1.50	0.00	0	732.44	0.00
2.00	0.00	0	732.44	0.00
2.50	0.00	0	732.44	0.00
3.00	0.00	0	732.44	0.00
3.50	0.00	0	732.44	0.00
4.00	0.00	0	732.44	0.00
4.50	0.00	0	732.44	0.00
5.00	0.00	0	732.44	0.00
5.50	0.00	0	732.44	0.00
6.00	0.00	0	732.44	0.00
6.50	0.00	0	732.44	0.00
7.00	0.00	0	732.44	0.00
7.50	0.00	0	732.44	0.00
8.00	0.04	2	732.44	0.03
8.50	0.10	7	732.45	0.10
9.00	0.21	15	732.45	0.20
9.50	0.32	22	732.46	0.32
10.00	0.48	27	732.47	0.48
10.50	0.78	37	732.48	0.77
11.00	1.33	51	732.49	1.32
11.50	**2.71**	**80**	**732.52**	**2.68**
12.00	**56.22**	**546**	**732.92**	**56.80**
12.50	5.32	123	732.56	5.36
13.00	3.25	90	732.53	3.26
13.50	2.47	76	732.51	2.48
14.00	1.95	66	732.50	1.96
14.50	1.71	61	732.50	1.71
15.00	1.55	57	732.50	1.55
15.50	1.38	53	732.49	1.38
16.00	1.21	49	732.49	1.21
16.50	1.12	47	732.49	1.12
17.00	1.06	45	732.48	1.06
17.50	1.00	44	732.48	1.00
18.00	0.94	42	732.48	0.94
18.50	0.88	41	732.48	0.88
19.00	0.81	39	732.48	0.82
19.50	0.75	36	732.48	0.75
20.00	0.69	34	732.47	0.69
20.50	0.66	33	732.47	0.66
21.00	0.65	33	732.47	0.65
21.50	0.64	33	732.47	0.64
22.00	0.63	32	732.47	0.63
22.50	0.61	32	732.47	0.61
23.00	0.60	31	732.47	0.60
23.50	0.59	31	732.47	0.59
24.00	0.58	30	732.47	0.58

Summary for Reach IPC-G1: (new Reach)

Inflow Area = 2.096 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 11.96 cfs @ 11.92 hrs, Volume= 0.485 af
Outflow = 9.03 cfs @ 11.96 hrs, Volume= 0.479 af, Atten= 24%, Lag= 2.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.81 fps, Min. Travel Time= 6.8 min
Avg. Velocity = 0.43 fps, Avg. Travel Time= 28.6 min

Peak Storage= 3,709 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 117.90 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 741.7' Slope= 0.0076 '/'
Inlet Invert= 903.92', Outlet Invert= 898.26'

‡

Hydrograph for Reach IPC-G1: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	903.92	0.00
0.50	0.00	0	903.92	0.00
1.00	0.00	0	903.92	0.00
1.50	0.00	0	903.92	0.00
2.00	0.00	0	903.92	0.00
2.50	0.00	0	903.92	0.00
3.00	0.00	0	903.92	0.00
3.50	0.00	0	903.92	0.00
4.00	0.00	0	903.92	0.00
4.50	0.00	0	903.92	0.00
5.00	0.00	0	903.92	0.00
5.50	0.00	0	903.92	0.00
6.00	0.00	0	903.92	0.00
6.50	0.00	0	903.92	0.00
7.00	0.00	0	903.92	0.00
7.50	0.00	0	903.92	0.00
8.00	0.01	9	903.92	0.00
8.50	0.02	29	903.92	0.01
9.00	0.04	63	903.93	0.02
9.50	0.06	108	903.93	0.03
10.00	0.09	165	903.94	0.06
10.50	0.15	234	903.95	0.11
11.00	0.26	339	903.97	0.19
11.50	**0.53**	**529**	**903.99**	**0.39**
12.00	**4.88**	**3,478**	**904.35**	**8.17**
12.50	0.77	1,004	904.05	1.12
13.00	0.53	699	904.01	0.62
13.50	0.41	582	904.00	0.46
14.00	0.32	502	903.99	0.36
14.50	0.29	457	903.98	0.31
15.00	0.26	429	903.98	0.28
15.50	0.23	399	903.97	0.25
16.00	0.20	369	903.97	0.22
16.50	0.19	348	903.97	0.20
17.00	0.18	335	903.96	0.19
17.50	0.17	324	903.96	0.18
18.00	0.16	313	903.96	0.17
18.50	0.15	302	903.96	0.16
19.00	0.14	290	903.96	0.15
19.50	0.13	276	903.96	0.14
20.00	0.12	261	903.95	0.13
20.50	0.11	250	903.95	0.12
21.00	0.11	245	903.95	0.11
21.50	0.11	241	903.95	0.11
22.00	0.11	238	903.95	0.11
22.50	0.11	235	903.95	0.11
23.00	0.10	232	903.95	0.11
23.50	0.10	229	903.95	0.10
24.00	0.10	226	903.95	0.10

Summary for Reach IPC-G2: (new Reach)

Inflow Area = 6.620 ac, 0.00% Impervious, Inflow Depth > 2.76" for 25-yr event
Inflow = 31.60 cfs @ 11.97 hrs, Volume= 1.525 af
Outflow = 30.57 cfs @ 11.99 hrs, Volume= 1.520 af, Atten= 3%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.23 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.94 fps, Avg. Travel Time= 8.4 min

Peak Storage= 3,622 cf @ 11.99 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 637.02 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 975.4' Slope= 0.2228 '/'
Inlet Invert= 898.26', Outlet Invert= 680.98'

‡

Hydrograph for Reach IPC-G2: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	898.26	0.00
0.50	0.00	0	898.26	0.00
1.00	0.00	0	898.26	0.00
1.50	0.00	0	898.26	0.00
2.00	0.00	0	898.26	0.00
2.50	0.00	0	898.26	0.00
3.00	0.00	0	898.26	0.00
3.50	0.00	0	898.26	0.00
4.00	0.00	0	898.26	0.00
4.50	0.00	0	898.26	0.00
5.00	0.00	0	898.26	0.00
5.50	0.00	0	898.26	0.00
6.00	0.00	0	898.26	0.00
6.50	0.00	0	898.26	0.00
7.00	0.00	0	898.26	0.00
7.50	0.00	0	898.26	0.00
8.00	0.02	11	898.26	0.01
8.50	0.06	32	898.26	0.04
9.00	0.11	66	898.27	0.09
9.50	0.16	106	898.27	0.14
10.00	0.25	158	898.28	0.21
10.50	0.42	238	898.28	0.38
11.00	0.71	332	898.29	0.65
11.50	**1.45**	**519**	**898.31**	**1.32**
12.00	**28.67**	**3,587**	**898.60**	**30.09**
12.50	3.02	913	898.35	3.32
13.00	1.81	647	898.33	1.89
13.50	1.36	542	898.31	1.42
14.00	1.08	467	898.31	1.12
14.50	0.94	427	898.30	0.96
15.00	0.85	404	898.30	0.86
15.50	0.76	377	898.30	0.78
16.00	0.67	345	898.30	0.68
16.50	0.62	324	898.29	0.62
17.00	0.58	311	898.29	0.59
17.50	0.55	299	898.29	0.55
18.00	0.51	288	898.29	0.52
18.50	0.48	276	898.29	0.49
19.00	0.45	264	898.29	0.45
19.50	0.41	253	898.29	0.42
20.00	0.38	241	898.28	0.39
20.50	0.36	234	898.28	0.37
21.00	0.36	231	898.28	0.36
21.50	0.35	228	898.28	0.35
22.00	0.34	226	898.28	0.34
22.50	0.34	224	898.28	0.34
23.00	0.33	221	898.28	0.33
23.50	0.32	219	898.28	0.32
24.00	0.32	217	898.28	0.32

Summary for Reach IPC-G3: (new Reach)

Inflow Area = 1.254 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 6.75 cfs @ 11.94 hrs, Volume= 0.290 af
Outflow = 6.21 cfs @ 11.97 hrs, Volume= 0.289 af, Atten= 8%, Lag= 1.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.12 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.76 fps, Avg. Travel Time= 11.7 min

Peak Storage= 1,065 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 117.63 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 534.2' Slope= 0.0295 '/'
Inlet Invert= 837.83', Outlet Invert= 822.06'

Hydrograph for Reach IPC-G3: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	837.83	0.00
0.50	0.00	0	837.83	0.00
1.00	0.00	0	837.83	0.00
1.50	0.00	0	837.83	0.00
2.00	0.00	0	837.83	0.00
2.50	0.00	0	837.83	0.00
3.00	0.00	0	837.83	0.00
3.50	0.00	0	837.83	0.00
4.00	0.00	0	837.83	0.00
4.50	0.00	0	837.83	0.00
5.00	0.00	0	837.83	0.00
5.50	0.00	0	837.83	0.00
6.00	0.00	0	837.83	0.00
6.50	0.00	0	837.83	0.00
7.00	0.00	0	837.83	0.00
7.50	0.00	0	837.83	0.00
8.00	0.01	4	837.83	0.00
8.50	0.01	10	837.83	0.01
9.00	0.03	21	837.84	0.02
9.50	0.04	33	837.85	0.03
10.00	0.05	48	837.85	0.05
10.50	0.09	65	837.86	0.08
11.00	0.15	92	837.87	0.13
11.50	**0.31**	**143**	**837.89**	**0.27**
12.00	**4.56**	**999**	**838.22**	**5.65**
12.50	0.49	226	837.93	0.56
13.00	0.32	165	837.90	0.34
13.50	0.25	139	837.89	0.26
14.00	0.20	120	837.88	0.21
14.50	0.17	110	837.88	0.18
15.00	0.16	103	837.88	0.16
15.50	0.14	96	837.87	0.14
16.00	0.12	90	837.87	0.13
16.50	0.11	85	837.87	0.12
17.00	0.11	82	837.87	0.11
17.50	0.10	79	837.87	0.10
18.00	0.10	75	837.86	0.10
18.50	0.09	72	837.86	0.09
19.00	0.08	69	837.86	0.09
19.50	0.08	65	837.86	0.08
20.00	0.07	62	837.86	0.07
20.50	0.07	60	837.86	0.07
21.00	0.07	59	837.86	0.07
21.50	0.07	58	837.86	0.07
22.00	0.06	58	837.86	0.06
22.50	0.06	57	837.86	0.06
23.00	0.06	56	837.86	0.06
23.50	0.06	56	837.86	0.06
24.00	0.06	55	837.86	0.06

Summary for Reach IPC-G4: (new Reach)

Inflow Area = 3.472 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25-yr event
Inflow = 17.45 cfs @ 11.96 hrs, Volume= 0.801 af
Outflow = 16.81 cfs @ 11.98 hrs, Volume= 0.799 af, Atten= 4%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.26 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.08 fps, Avg. Travel Time= 7.2 min

Peak Storage= 1,854 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.72'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 117.82 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 470.3' Slope= 0.0296 '/'
Inlet Invert= 822.06', Outlet Invert= 808.13'

Hydrograph for Reach IPC-G4: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	822.06	0.00
0.50	0.00	0	822.06	0.00
1.00	0.00	0	822.06	0.00
1.50	0.00	0	822.06	0.00
2.00	0.00	0	822.06	0.00
2.50	0.00	0	822.06	0.00
3.00	0.00	0	822.06	0.00
3.50	0.00	0	822.06	0.00
4.00	0.00	0	822.06	0.00
4.50	0.00	0	822.06	0.00
5.00	0.00	0	822.06	0.00
5.50	0.00	0	822.06	0.00
6.00	0.00	0	822.06	0.00
6.50	0.00	0	822.06	0.00
7.00	0.00	0	822.06	0.00
7.50	0.00	0	822.06	0.00
8.00	0.01	6	822.06	0.01
8.50	0.03	21	822.07	0.02
9.00	0.06	44	822.08	0.05
9.50	0.09	59	822.09	0.08
10.00	0.14	78	822.10	0.13
10.50	0.23	107	822.12	0.21
11.00	0.39	150	822.14	0.36
11.50	**0.79**	**234**	**822.18**	**0.73**
12.00	**14.85**	**1,803**	**822.77**	**16.15**
12.50	1.49	386	822.25	1.61
13.00	0.92	278	822.20	0.96
13.50	0.70	233	822.18	0.72
14.00	0.56	201	822.16	0.57
14.50	0.49	183	822.15	0.50
15.00	0.44	172	822.15	0.45
15.50	0.39	161	822.14	0.40
16.00	0.34	148	822.14	0.35
16.50	0.32	140	822.13	0.32
17.00	0.30	135	822.13	0.31
17.50	0.29	131	822.13	0.29
18.00	0.27	126	822.12	0.27
18.50	0.25	121	822.12	0.25
19.00	0.23	116	822.12	0.24
19.50	0.22	110	822.12	0.22
20.00	0.20	104	822.11	0.20
20.50	0.19	101	822.11	0.19
21.00	0.19	99	822.11	0.19
21.50	0.18	98	822.11	0.18
22.00	0.18	97	822.11	0.18
22.50	0.18	96	822.11	0.18
23.00	0.17	95	822.11	0.17
23.50	0.17	94	822.11	0.17
24.00	0.17	92	822.11	0.17

Summary for Reach IPC-G5: (new Reach)

Inflow Area = 3.973 ac, 0.00% Impervious, Inflow Depth > 2.76" for 25-yr event
Inflow = 19.24 cfs @ 11.97 hrs, Volume= 0.914 af
Outflow = 19.14 cfs @ 11.98 hrs, Volume= 0.913 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.42 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 2.6 min

Peak Storage= 755 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.78'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 117.42 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 174.4' Slope= 0.0294 '/'
Inlet Invert= 808.13', Outlet Invert= 803.00'

Hydrograph for Reach IPC-G5: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	808.13	0.00
0.50	0.00	0	808.13	0.00
1.00	0.00	0	808.13	0.00
1.50	0.00	0	808.13	0.00
2.00	0.00	0	808.13	0.00
2.50	0.00	0	808.13	0.00
3.00	0.00	0	808.13	0.00
3.50	0.00	0	808.13	0.00
4.00	0.00	0	808.13	0.00
4.50	0.00	0	808.13	0.00
5.00	0.00	0	808.13	0.00
5.50	0.00	0	808.13	0.00
6.00	0.00	0	808.13	0.00
6.50	0.00	0	808.13	0.00
7.00	0.00	0	808.13	0.00
7.50	0.00	0	808.13	0.00
8.00	0.01	2	808.13	0.01
8.50	0.03	8	808.14	0.02
9.00	0.06	17	808.15	0.05
9.50	0.10	24	808.16	0.09
10.00	0.15	31	808.17	0.14
10.50	0.24	43	808.19	0.24
11.00	0.42	60	808.21	0.41
11.50	**0.85**	**94**	**808.26**	**0.83**
12.00	**18.14**	**739**	**808.90**	**18.59**
12.50	1.82	158	808.34	1.87
13.00	1.09	113	808.28	1.10
13.50	0.82	94	808.26	0.83
14.00	0.65	81	808.24	0.66
14.50	0.57	74	808.23	0.57
15.00	0.51	70	808.23	0.51
15.50	0.46	65	808.22	0.46
16.00	0.40	60	808.21	0.40
16.50	0.37	57	808.21	0.37
17.00	0.35	55	808.21	0.35
17.50	0.33	53	808.20	0.33
18.00	0.31	51	808.20	0.31
18.50	0.29	49	808.20	0.29
19.00	0.27	47	808.19	0.27
19.50	0.25	45	808.19	0.25
20.00	0.23	42	808.19	0.23
20.50	0.22	41	808.19	0.22
21.00	0.21	40	808.19	0.21
21.50	0.21	40	808.19	0.21
22.00	0.21	39	808.18	0.21
22.50	0.20	39	808.18	0.20
23.00	0.20	38	808.18	0.20
23.50	0.19	38	808.18	0.19
24.00	0.19	37	808.18	0.19

Summary for Reach IPC-G6: (new Reach)

Inflow Area = 5.398 ac, 0.00% Impervious, Inflow Depth > 2.76" for 25-yr event
Inflow = 25.48 cfs @ 11.96 hrs, Volume= 1.243 af
Outflow = 25.22 cfs @ 11.98 hrs, Volume= 1.241 af, Atten= 1%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.52 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 2.39 fps, Avg. Travel Time= 4.1 min

Peak Storage= 1,561 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 314.54 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 589.9' Slope= 0.2111 '/'
Inlet Invert= 803.00', Outlet Invert= 678.48'

Hydrograph for Reach IPC-G6: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	803.00	0.00
0.50	0.00	0	803.00	0.00
1.00	0.00	0	803.00	0.00
1.50	0.00	0	803.00	0.00
2.00	0.00	0	803.00	0.00
2.50	0.00	0	803.00	0.00
3.00	0.00	0	803.00	0.00
3.50	0.00	0	803.00	0.00
4.00	0.00	0	803.00	0.00
4.50	0.00	0	803.00	0.00
5.00	0.00	0	803.00	0.00
5.50	0.00	0	803.00	0.00
6.00	0.00	0	803.00	0.00
6.50	0.00	0	803.00	0.00
7.00	0.00	0	803.00	0.00
7.50	0.00	0	803.00	0.00
8.00	0.01	4	803.00	0.01
8.50	0.04	14	803.01	0.03
9.00	0.08	33	803.01	0.07
9.50	0.13	54	803.02	0.13
10.00	0.20	68	803.03	0.19
10.50	0.34	96	803.04	0.32
11.00	0.58	133	803.05	0.55
11.50	**1.18**	**208**	**803.08**	**1.13**
12.00	**22.96**	**1,512**	**803.51**	**24.06**
12.50	2.41	345	803.14	2.52
13.00	1.46	248	803.10	1.49
13.50	1.11	208	803.08	1.13
14.00	0.88	180	803.07	0.89
14.50	0.77	164	803.07	0.77
15.00	0.69	154	803.06	0.70
15.50	0.62	145	803.06	0.62
16.00	0.54	133	803.05	0.55
16.50	0.50	125	803.05	0.50
17.00	0.47	121	803.05	0.48
17.50	0.45	117	803.05	0.45
18.00	0.42	112	803.05	0.42
18.50	0.39	108	803.04	0.39
19.00	0.36	104	803.04	0.37
19.50	0.34	99	803.04	0.34
20.00	0.31	95	803.04	0.31
20.50	0.30	91	803.04	0.30
21.00	0.29	90	803.04	0.29
21.50	0.28	89	803.04	0.29
22.00	0.28	87	803.04	0.28
22.50	0.27	86	803.04	0.27
23.00	0.27	85	803.04	0.27
23.50	0.26	84	803.03	0.26
24.00	0.26	83	803.03	0.26

Summary for Pond DC-G11: Down Chute 3

Inflow Area = 20.371 ac, 0.00% Impervious, Inflow Depth > 2.76" for 25-yr event
Inflow = 100.52 cfs @ 11.97 hrs, Volume= 4.689 af
Outflow = 100.52 cfs @ 11.97 hrs, Volume= 4.689 af, Atten= 0%, Lag= 0.0 min
Primary = 100.52 cfs @ 11.97 hrs, Volume= 4.689 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 678.68' @ 11.97 hrs
Flood Elev= 680.98'

Device	Routing	Invert	Outlet Devices
#1	Primary	675.00'	**36.0" Round Culvert X 2.00** L= 70.6' Ke= 0.500 Inlet / Outlet Invert= 675.00' / 665.00' S= 0.1416 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=100.27 cfs @ 11.97 hrs HW=678.67' TW=669.36' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 100.27 cfs @ 7.09 fps)

Hydrograph for Pond DC-G11: Down Chute 3

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	675.00	0.00
0.50	0.00	675.00	0.00
1.00	0.00	675.00	0.00
1.50	0.00	675.00	0.00
2.00	0.00	675.00	0.00
2.50	0.00	675.00	0.00
3.00	0.00	675.00	0.00
3.50	0.00	675.00	0.00
4.00	0.00	675.00	0.00
4.50	0.00	675.00	0.00
5.00	0.00	675.00	0.00
5.50	0.00	675.00	0.00
6.00	0.00	675.00	0.00
6.50	0.00	675.00	0.00
7.00	0.00	675.00	0.00
7.50	0.00	675.01	0.00
8.00	0.05	675.06	0.05
8.50	0.16	675.10	0.16
9.00	0.32	675.14	0.32
9.50	0.50	675.18	0.50
10.00	0.75	675.22	0.75
10.50	1.26	675.29	1.26
11.00	2.15	675.38	2.15
11.50	**4.38**	**675.54**	**4.38**
12.00	**94.51**	**678.43**	**94.51**
12.50	9.39	675.81	9.39
13.00	5.59	675.62	5.59
13.50	4.23	675.53	4.23
14.00	3.34	675.47	3.34
14.50	2.90	675.44	2.90
15.00	2.62	675.42	2.62
15.50	2.35	675.39	2.35
16.00	2.06	675.37	2.06
16.50	1.90	675.35	1.90
17.00	1.79	675.34	1.79
17.50	1.69	675.33	1.69
18.00	1.59	675.32	1.59
18.50	1.48	675.31	1.48
19.00	1.38	675.30	1.38
19.50	1.28	675.29	1.28
20.00	1.17	675.28	1.17
20.50	1.12	675.27	1.12
21.00	1.10	675.27	1.10
21.50	1.08	675.27	1.08
22.00	1.06	675.26	1.06
22.50	1.04	675.26	1.04
23.00	1.02	675.26	1.02
23.50	0.99	675.25	0.99
24.00	0.97	675.25	0.97

Summary for Pond G: Pond G

Inflow Area = 28.484 ac, 0.00% Impervious, Inflow Depth > 2.74" for 25-yr event
Inflow = 138.19 cfs @ 11.97 hrs, Volume= 6.498 af
Outflow = 1.20 cfs @ 11.45 hrs, Volume= 1.617 af, Atten= 99%, Lag= 0.0 min
Primary = 1.20 cfs @ 11.45 hrs, Volume= 1.617 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 667.12' Surf.Area= 30,801 sf Storage= 73,912 cf
Peak Elev= 672.90' @ 24.00 hrs Surf.Area= 43,244 sf Storage= 286,507 cf (212,595 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 56.8 min (881.1 - 824.3)

Volume	Invert	Avail.Storage	Storage Description
#1	664.50'	652,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
664.50	25,620	0	0
670.00	36,497	170,822	170,822
680.00	59,752	481,245	652,067

Device	Routing	Invert	Outlet Devices
#1	Primary	663.00'	**48.0" Round Culvert** L= 184.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 663.00' / 656.88' S= 0.0332 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Device 1	675.15'	**72.0" x 72.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	677.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.50 Width (feet) 15.00 25.00
#4	Device 1	666.70'	**0.600 cfs Constant Flow/Skimmer X 2.00** Phase-In= 0.42'

Primary OutFlow Max=1.20 cfs @ 11.45 hrs HW=667.12' TW=656.24' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.20 cfs of 88.18 cfs potential flow)
  ├─**2=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Constant Flow/Skimmer** (Constant Controls 1.20 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=667.12' TW=656.01' (Dynamic Tailwater)
└─**3=Custom Weir/Orifice** (Controls 0.00 cfs)

Hydrograph for Pond G: Pond G

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	73,912	667.12	1.20	1.20	**0.00**
0.50	0.00	71,923	667.06	1.02	1.02	0.00
1.00	0.00	70,241	667.00	0.86	0.86	0.00
1.50	0.00	68,819	666.95	0.73	0.73	0.00
2.00	0.00	67,618	666.91	0.61	0.61	0.00
2.50	0.00	66,605	666.88	0.52	0.52	0.00
3.00	0.00	65,749	666.85	0.44	0.44	0.00
3.50	0.00	65,027	666.83	0.37	0.37	0.00
4.00	0.00	64,418	666.81	0.31	0.31	0.00
4.50	0.00	63,904	666.79	0.26	0.26	0.00
5.00	0.00	63,471	666.78	0.22	0.22	0.00
5.50	0.00	63,106	666.77	0.19	0.19	0.00
6.00	0.00	62,798	666.75	0.16	0.16	0.00
6.50	0.00	62,538	666.75	0.13	0.13	0.00
7.00	0.00	62,320	666.74	0.11	0.11	0.00
7.50	0.00	62,135	666.73	0.09	0.09	0.00
8.00	0.06	62,019	666.73	0.08	0.08	0.00
8.50	0.19	62,081	666.73	0.09	0.09	0.00
9.00	0.41	62,422	666.74	0.12	0.12	0.00
9.50	0.67	63,127	666.77	0.19	0.19	0.00
10.00	1.02	64,179	666.80	0.29	0.29	0.00
10.50	1.71	65,925	666.86	0.45	0.45	0.00
11.00	2.95	68,958	666.96	**0.74**	**0.74**	0.00
11.50	**6.03**	74,859	667.15	**1.20**	**1.20**	0.00
12.00	**129.29**	160,107	669.70	1.20	1.20	0.00
12.50	12.95	218,223	671.25	1.20	1.20	0.00
13.00	7.75	233,269	671.63	1.20	1.20	0.00
13.50	5.87	243,159	671.87	1.20	1.20	0.00
14.00	4.64	250,388	672.05	1.20	1.20	0.00
14.50	4.03	255,916	672.18	1.20	1.20	0.00
15.00	3.65	260,668	672.29	1.20	1.20	0.00
15.50	3.26	264,721	672.39	1.20	1.20	0.00
16.00	2.86	268,071	672.47	1.20	1.20	0.00
16.50	2.64	270,816	672.54	1.20	1.20	0.00
17.00	2.49	273,270	672.59	1.20	1.20	0.00
17.50	2.35	275,470	672.64	1.20	1.20	0.00
18.00	2.21	277,413	672.69	1.20	1.20	0.00
18.50	2.06	279,097	672.73	1.20	1.20	0.00
19.00	1.92	280,523	672.76	1.20	1.20	0.00
19.50	1.78	281,689	672.79	1.20	1.20	0.00
20.00	1.63	282,593	672.81	1.20	1.20	0.00
20.50	1.56	283,283	672.83	1.20	1.20	0.00
21.00	1.53	283,898	672.84	1.20	1.20	0.00
21.50	1.50	284,460	672.85	1.20	1.20	0.00
22.00	1.47	284,971	672.87	1.20	1.20	0.00
22.50	1.44	285,432	672.88	1.20	1.20	0.00
23.00	1.41	285,842	672.89	1.20	1.20	0.00
23.50	1.38	286,200	672.89	1.20	1.20	0.00
24.00	1.36	**286,507**	**672.90**	1.20	1.20	0.00

Summary for Pond IPC-G7: (new Reach)

Inflow Area = 5.398 ac, 0.00% Impervious, Inflow Depth > 2.76" for 25-yr event
Inflow = 25.22 cfs @ 11.98 hrs, Volume= 1.241 af
Outflow = 25.22 cfs @ 11.98 hrs, Volume= 1.241 af, Atten= 0%, Lag= 0.0 min
Primary = 25.22 cfs @ 11.98 hrs, Volume= 1.241 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 676.37' @ 11.98 hrs
Flood Elev= 678.48'

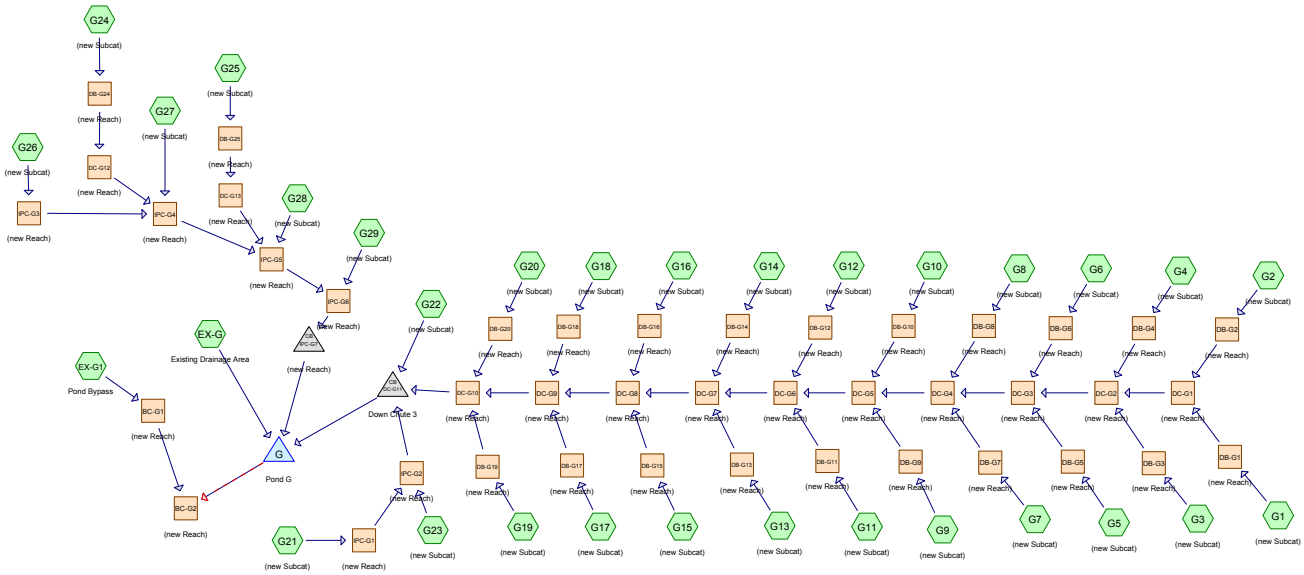
Device	Routing	Invert	Outlet Devices
#1	Primary	674.00'	**30.0" Round Culvert** L= 120.0' Ke= 0.500 Inlet / Outlet Invert= 674.00' / 669.00' S= 0.0417 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf

Primary OutFlow Max=25.18 cfs @ 11.98 hrs HW=676.37' TW=669.37' (Dynamic Tailwater)
1=Culvert (Inlet Controls 25.18 cfs @ 5.24 fps)

Hydrograph for Pond IPC-G7: (new Reach)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	674.00	0.00
0.50	0.00	674.00	0.00
1.00	0.00	674.00	0.00
1.50	0.00	674.00	0.00
2.00	0.00	674.00	0.00
2.50	0.00	674.00	0.00
3.00	0.00	674.00	0.00
3.50	0.00	674.00	0.00
4.00	0.00	674.00	0.00
4.50	0.00	674.00	0.00
5.00	0.00	674.00	0.00
5.50	0.00	674.00	0.00
6.00	0.00	674.00	0.00
6.50	0.00	674.00	0.00
7.00	0.00	674.00	0.00
7.50	0.00	674.01	0.00
8.00	0.01	674.04	0.01
8.50	0.03	674.07	0.03
9.00	0.07	674.10	0.07
9.50	0.13	674.13	0.13
10.00	0.19	674.17	0.19
10.50	0.32	674.21	0.32
11.00	0.55	674.28	0.55
11.50	**1.13**	**674.41**	**1.13**
12.00	**24.06**	**676.27**	**24.06**
12.50	2.52	674.62	2.52
13.00	1.49	674.47	1.49
13.50	1.13	674.41	1.13
14.00	0.89	674.36	0.89
14.50	0.77	674.33	0.77
15.00	0.70	674.32	0.70
15.50	0.62	674.30	0.62
16.00	0.55	674.28	0.55
16.50	0.50	674.27	0.50
17.00	0.48	674.26	0.48
17.50	0.45	674.25	0.45
18.00	0.42	674.25	0.42
18.50	0.39	674.24	0.39
19.00	0.37	674.23	0.37
19.50	0.34	674.22	0.34
20.00	0.31	674.21	0.31
20.50	0.30	674.21	0.30
21.00	0.29	674.20	0.29
21.50	0.29	674.20	0.29
22.00	0.28	674.20	0.28
22.50	0.27	674.20	0.27
23.00	0.27	674.20	0.27
23.50	0.26	674.19	0.26
24.00	0.26	674.19	0.26

POND G – FINAL CONDITIONS
100-YEAR, 24-HOUR STORM EVENT



Subcat Reach Pond Link

Routing Diagram for 071-644_SWM POND D, E, G

Prepared by CEC, Inc., Printed 5/23/2016

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
25.769	79	50-75% Grass cover, Fair, HSG C (G1, G10, G11, G12, G13, G14, G15, G16, G17, G18, G19, G2, G20, G21, G22, G23, G24, G25, G26, G27, G28, G29, G3, G4, G5, G6, G7, G8, G9)
13.269	76	Woods/grass comb., Fair, HSG C (EX-G, EX-G1)
39.038	**78**	**TOTAL AREA**

Summary for Subcatchment EX-G: Existing Drainage Area

Runoff = 18.52 cfs @ 11.96 hrs, Volume= 0.836 af, Depth> 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
2.715	76	Woods/grass comb., Fair, HSG C
2.715		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	100	0.2710	0.46		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.91"
1.2	349	0.4550	4.72		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
4.8	449	Total			

Hydrograph for Subcatchment EX-G: Existing Drainage Area

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.00	0.01
8.00	0.76	0.01	0.03
8.50	0.84	0.01	0.05
9.00	0.94	0.03	0.09
9.50	1.04	0.05	0.12
10.00	1.15	0.07	0.17
10.50	1.30	0.12	0.27
11.00	1.50	0.19	0.45
11.50	1.80	0.32	**0.89**
12.00	4.22	1.91	**15.43**
12.50	4.68	2.28	1.46
13.00	4.92	2.47	0.93
13.50	5.09	2.61	0.71
14.00	5.22	2.72	0.56
14.50	5.34	2.81	0.50
15.00	5.44	2.90	0.45
15.50	5.53	2.98	0.40
16.00	5.61	3.04	0.35
16.50	5.68	3.10	0.33
17.00	5.74	3.16	0.31
17.50	5.81	3.21	0.29
18.00	5.87	3.27	0.27
18.50	5.92	3.31	0.25
19.00	5.97	3.36	0.24
19.50	6.02	3.40	0.22
20.00	6.06	3.44	0.20
20.50	6.11	3.47	0.19
21.00	6.15	3.51	0.19
21.50	6.18	3.54	0.19
22.00	6.22	3.57	0.18
22.50	6.26	3.61	0.18
23.00	6.30	3.64	0.18
23.50	6.33	3.67	0.17
24.00	**6.37**	**3.70**	0.17

Summary for Subcatchment EX-G1: Pond Bypass

Runoff = 68.70 cfs @ 11.97 hrs, Volume= 3.251 af, Depth> 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
10.554	76	Woods/grass comb., Fair, HSG C
10.554		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	100	0.1602	0.37		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
1.6	406	0.3730	4.28		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.1	506	Total			

Hydrograph for Subcatchment EX-G1: Pond Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.00	0.05
8.00	0.76	0.01	0.11
8.50	0.84	0.01	0.20
9.00	0.94	0.03	0.34
9.50	1.04	0.05	0.45
10.00	1.15	0.07	0.66
10.50	1.30	0.12	1.04
11.00	1.50	0.19	1.72
11.50	1.80	0.32	**3.39**
12.00	4.22	1.91	**64.54**
12.50	4.68	2.28	5.92
13.00	4.92	2.47	3.65
13.50	5.09	2.61	2.78
14.00	5.22	2.72	2.20
14.50	5.34	2.81	1.94
15.00	5.44	2.90	1.75
15.50	5.53	2.98	1.56
16.00	5.61	3.04	1.36
16.50	5.68	3.10	1.27
17.00	5.74	3.16	1.20
17.50	5.81	3.21	1.13
18.00	5.87	3.27	1.06
18.50	5.92	3.31	0.99
19.00	5.97	3.36	0.92
19.50	6.02	3.40	0.85
20.00	6.06	3.44	0.78
20.50	6.11	3.47	0.75
21.00	6.15	3.51	0.74
21.50	6.18	3.54	0.72
22.00	6.22	3.57	0.71
22.50	6.26	3.61	0.70
23.00	6.30	3.64	0.68
23.50	6.33	3.67	0.67
24.00	**6.37**	**3.70**	0.65

Summary for Subcatchment G1: (new Subcat)

Runoff = 2.48 cfs @ 11.94 hrs, Volume= 0.109 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.327	79	50-75% Grass cover, Fair, HSG C
0.327		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G1: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.00
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.01
9.00	0.94	0.05	0.02
9.50	1.04	0.08	0.02
10.00	1.15	0.12	0.03
10.50	1.30	0.17	0.04
11.00	1.50	0.26	0.07
11.50	1.80	0.41	**0.13**
12.00	4.22	2.15	**1.72**
12.50	4.68	2.53	0.18
13.00	4.92	2.73	0.12
13.50	5.09	2.88	0.09
14.00	5.22	2.99	0.07
14.50	5.34	3.09	0.06
15.00	5.44	3.18	0.06
15.50	5.53	3.26	0.05
16.00	5.61	3.33	0.04
16.50	5.68	3.39	0.04
17.00	5.74	3.45	0.04
17.50	5.81	3.51	0.04
18.00	5.87	3.56	0.03
18.50	5.92	3.61	0.03
19.00	5.97	3.66	0.03
19.50	6.02	3.70	0.03
20.00	6.06	3.74	0.02
20.50	6.11	3.77	0.02
21.00	6.15	3.81	0.02
21.50	6.18	3.85	0.02
22.00	6.22	3.88	0.02
22.50	6.26	3.91	0.02
23.00	6.30	3.95	0.02
23.50	6.33	3.98	0.02
24.00	**6.37**	**4.01**	0.02

Summary for Subcatchment G10: (new Subcat)

Runoff = 7.15 cfs @ 11.95 hrs, Volume= 0.317 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.948	79	50-75% Grass cover, Fair, HSG C
0.948		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	105	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G10: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.03
9.00	0.94	0.05	0.05
9.50	1.04	0.08	0.06
10.00	1.15	0.12	0.08
10.50	1.30	0.17	0.12
11.00	1.50	0.26	0.19
11.50	1.80	0.41	**0.37**
12.00	4.22	2.15	**5.16**
12.50	4.68	2.53	0.52
13.00	4.92	2.73	0.33
13.50	5.09	2.88	0.26
14.00	5.22	2.99	0.20
14.50	5.34	3.09	0.18
15.00	5.44	3.18	0.16
15.50	5.53	3.26	0.14
16.00	5.61	3.33	0.13
16.50	5.68	3.39	0.12
17.00	5.74	3.45	0.11
17.50	5.81	3.51	0.10
18.00	5.87	3.56	0.10
18.50	5.92	3.61	0.09
19.00	5.97	3.66	0.09
19.50	6.02	3.70	0.08
20.00	6.06	3.74	0.07
20.50	6.11	3.77	0.07
21.00	6.15	3.81	0.07
21.50	6.18	3.85	0.07
22.00	6.22	3.88	0.07
22.50	6.26	3.91	0.06
23.00	6.30	3.95	0.06
23.50	6.33	3.98	0.06
24.00	**6.37**	**4.01**	0.06

Summary for Subcatchment G11: (new Subcat)

Runoff = 4.10 cfs @ 11.94 hrs, Volume= 0.180 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.540	79	50-75% Grass cover, Fair, HSG C
0.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G11: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.02
9.00	0.94	0.05	0.03
9.50	1.04	0.08	0.03
10.00	1.15	0.12	0.05
10.50	1.30	0.17	0.07
11.00	1.50	0.26	0.11
11.50	1.80	0.41	**0.21**
12.00	4.22	2.15	**2.85**
12.50	4.68	2.53	0.29
13.00	4.92	2.73	0.19
13.50	5.09	2.88	0.15
14.00	5.22	2.99	0.11
14.50	5.34	3.09	0.10
15.00	5.44	3.18	0.09
15.50	5.53	3.26	0.08
16.00	5.61	3.33	0.07
16.50	5.68	3.39	0.07
17.00	5.74	3.45	0.06
17.50	5.81	3.51	0.06
18.00	5.87	3.56	0.06
18.50	5.92	3.61	0.05
19.00	5.97	3.66	0.05
19.50	6.02	3.70	0.04
20.00	6.06	3.74	0.04
20.50	6.11	3.77	0.04
21.00	6.15	3.81	0.04
21.50	6.18	3.85	0.04
22.00	6.22	3.88	0.04
22.50	6.26	3.91	0.04
23.00	6.30	3.95	0.04
23.50	6.33	3.98	0.04
24.00	**6.37**	**4.01**	0.03

Summary for Subcatchment G12: (new Subcat)

Runoff = 8.36 cfs @ 11.94 hrs, Volume= 0.368 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.102	79	50-75% Grass cover, Fair, HSG C
1.102		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G12: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.02
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.04
9.00	0.94	0.05	0.05
9.50	1.04	0.08	0.07
10.00	1.15	0.12	0.09
10.50	1.30	0.17	0.14
11.00	1.50	0.26	0.22
11.50	1.80	0.41	**0.43**
12.00	4.22	2.15	**5.81**
12.50	4.68	2.53	0.60
13.00	4.92	2.73	0.39
13.50	5.09	2.88	0.30
14.00	5.22	2.99	0.23
14.50	5.34	3.09	0.21
15.00	5.44	3.18	0.19
15.50	5.53	3.26	0.17
16.00	5.61	3.33	0.15
16.50	5.68	3.39	0.14
17.00	5.74	3.45	0.13
17.50	5.81	3.51	0.12
18.00	5.87	3.56	0.11
18.50	5.92	3.61	0.11
19.00	5.97	3.66	0.10
19.50	6.02	3.70	0.09
20.00	6.06	3.74	0.08
20.50	6.11	3.77	0.08
21.00	6.15	3.81	0.08
21.50	6.18	3.85	0.08
22.00	6.22	3.88	0.08
22.50	6.26	3.91	0.07
23.00	6.30	3.95	0.07
23.50	6.33	3.98	0.07
24.00	**6.37**	**4.01**	0.07

Summary for Subcatchment G13: (new Subcat)

Runoff = 3.30 cfs @ 11.94 hrs, Volume= 0.145 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.435	79	50-75% Grass cover, Fair, HSG C
0.435		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G13: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.01
9.00	0.94	0.05	0.02
9.50	1.04	0.08	0.03
10.00	1.15	0.12	0.04
10.50	1.30	0.17	0.06
11.00	1.50	0.26	0.09
11.50	1.80	0.41	**0.17**
12.00	4.22	2.15	**2.29**
12.50	4.68	2.53	0.24
13.00	4.92	2.73	0.15
13.50	5.09	2.88	0.12
14.00	5.22	2.99	0.09
14.50	5.34	3.09	0.08
15.00	5.44	3.18	0.07
15.50	5.53	3.26	0.07
16.00	5.61	3.33	0.06
16.50	5.68	3.39	0.05
17.00	5.74	3.45	0.05
17.50	5.81	3.51	0.05
18.00	5.87	3.56	0.05
18.50	5.92	3.61	0.04
19.00	5.97	3.66	0.04
19.50	6.02	3.70	0.04
20.00	6.06	3.74	0.03
20.50	6.11	3.77	0.03
21.00	6.15	3.81	0.03
21.50	6.18	3.85	0.03
22.00	6.22	3.88	0.03
22.50	6.26	3.91	0.03
23.00	6.30	3.95	0.03
23.50	6.33	3.98	0.03
24.00	**6.37**	**4.01**	0.03

Summary for Subcatchment G14: (new Subcat)

Runoff = 9.16 cfs @ 11.94 hrs, Volume= 0.403 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.207	79	50-75% Grass cover, Fair, HSG C
1.207		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G14: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.02
8.00	0.76	0.02	0.03
8.50	0.84	0.03	0.04
9.00	0.94	0.05	0.06
9.50	1.04	0.08	0.07
10.00	1.15	0.12	0.10
10.50	1.30	0.17	0.15
11.00	1.50	0.26	0.25
11.50	1.80	0.41	**0.47**
12.00	4.22	2.15	**6.36**
12.50	4.68	2.53	0.66
13.00	4.92	2.73	0.42
13.50	5.09	2.88	0.33
14.00	5.22	2.99	0.26
14.50	5.34	3.09	0.23
15.00	5.44	3.18	0.21
15.50	5.53	3.26	0.18
16.00	5.61	3.33	0.16
16.50	5.68	3.39	0.15
17.00	5.74	3.45	0.14
17.50	5.81	3.51	0.13
18.00	5.87	3.56	0.13
18.50	5.92	3.61	0.12
19.00	5.97	3.66	0.11
19.50	6.02	3.70	0.10
20.00	6.06	3.74	0.09
20.50	6.11	3.77	0.09
21.00	6.15	3.81	0.09
21.50	6.18	3.85	0.09
22.00	6.22	3.88	0.08
22.50	6.26	3.91	0.08
23.00	6.30	3.95	0.08
23.50	6.33	3.98	0.08
24.00	**6.37**	**4.01**	0.08

Summary for Subcatchment G15: (new Subcat)

Runoff = 2.50 cfs @ 11.94 hrs, Volume= 0.110 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.329	79	50-75% Grass cover, Fair, HSG C
0.329		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G15: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.00
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.01
9.00	0.94	0.05	0.02
9.50	1.04	0.08	0.02
10.00	1.15	0.12	0.03
10.50	1.30	0.17	0.04
11.00	1.50	0.26	0.07
11.50	1.80	0.41	**0.13**
12.00	4.22	2.15	**1.73**
12.50	4.68	2.53	0.18
13.00	4.92	2.73	0.12
13.50	5.09	2.88	0.09
14.00	5.22	2.99	0.07
14.50	5.34	3.09	0.06
15.00	5.44	3.18	0.06
15.50	5.53	3.26	0.05
16.00	5.61	3.33	0.04
16.50	5.68	3.39	0.04
17.00	5.74	3.45	0.04
17.50	5.81	3.51	0.04
18.00	5.87	3.56	0.03
18.50	5.92	3.61	0.03
19.00	5.97	3.66	0.03
19.50	6.02	3.70	0.03
20.00	6.06	3.74	0.02
20.50	6.11	3.77	0.02
21.00	6.15	3.81	0.02
21.50	6.18	3.85	0.02
22.00	6.22	3.88	0.02
22.50	6.26	3.91	0.02
23.00	6.30	3.95	0.02
23.50	6.33	3.98	0.02
24.00	**6.37**	**4.01**	0.02

Summary for Subcatchment G16: (new Subcat)

Runoff = 8.11 cfs @ 11.94 hrs, Volume= 0.357 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.069	79	50-75% Grass cover, Fair, HSG C
1.069		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G16: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.02
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.04
9.00	0.94	0.05	0.05
9.50	1.04	0.08	0.06
10.00	1.15	0.12	0.09
10.50	1.30	0.17	0.14
11.00	1.50	0.26	0.22
11.50	1.80	0.41	**0.42**
12.00	4.22	2.15	**5.64**
12.50	4.68	2.53	0.58
13.00	4.92	2.73	0.38
13.50	5.09	2.88	0.29
14.00	5.22	2.99	0.23
14.50	5.34	3.09	0.20
15.00	5.44	3.18	0.18
15.50	5.53	3.26	0.16
16.00	5.61	3.33	0.14
16.50	5.68	3.39	0.13
17.00	5.74	3.45	0.13
17.50	5.81	3.51	0.12
18.00	5.87	3.56	0.11
18.50	5.92	3.61	0.10
19.00	5.97	3.66	0.10
19.50	6.02	3.70	0.09
20.00	6.06	3.74	0.08
20.50	6.11	3.77	0.08
21.00	6.15	3.81	0.08
21.50	6.18	3.85	0.08
22.00	6.22	3.88	0.07
22.50	6.26	3.91	0.07
23.00	6.30	3.95	0.07
23.50	6.33	3.98	0.07
24.00	**6.37**	**4.01**	0.07

Summary for Subcatchment G17: (new Subcat)

Runoff = 1.70 cfs @ 11.94 hrs, Volume= 0.075 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.224	79	50-75% Grass cover, Fair, HSG C
0.224		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G17: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.00
8.00	0.76	0.02	0.00
8.50	0.84	0.03	0.01
9.00	0.94	0.05	0.01
9.50	1.04	0.08	0.01
10.00	1.15	0.12	0.02
10.50	1.30	0.17	0.03
11.00	1.50	0.26	0.05
11.50	1.80	0.41	**0.09**
12.00	4.22	2.15	**1.18**
12.50	4.68	2.53	0.12
13.00	4.92	2.73	0.08
13.50	5.09	2.88	0.06
14.00	5.22	2.99	0.05
14.50	5.34	3.09	0.04
15.00	5.44	3.18	0.04
15.50	5.53	3.26	0.03
16.00	5.61	3.33	0.03
16.50	5.68	3.39	0.03
17.00	5.74	3.45	0.03
17.50	5.81	3.51	0.02
18.00	5.87	3.56	0.02
18.50	5.92	3.61	0.02
19.00	5.97	3.66	0.02
19.50	6.02	3.70	0.02
20.00	6.06	3.74	0.02
20.50	6.11	3.77	0.02
21.00	6.15	3.81	0.02
21.50	6.18	3.85	0.02
22.00	6.22	3.88	0.02
22.50	6.26	3.91	0.02
23.00	6.30	3.95	0.01
23.50	6.33	3.98	0.01
24.00	**6.37**	**4.01**	0.01

Summary for Subcatchment G18: (new Subcat)

Runoff = 6.85 cfs @ 11.94 hrs, Volume= 0.302 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.903	79	50-75% Grass cover, Fair, HSG C
0.903		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G18: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.03
9.00	0.94	0.05	0.04
9.50	1.04	0.08	0.05
10.00	1.15	0.12	0.08
10.50	1.30	0.17	0.11
11.00	1.50	0.26	0.18
11.50	1.80	0.41	**0.35**
12.00	4.22	2.15	**4.76**
12.50	4.68	2.53	0.49
13.00	4.92	2.73	0.32
13.50	5.09	2.88	0.24
14.00	5.22	2.99	0.19
14.50	5.34	3.09	0.17
15.00	5.44	3.18	0.15
15.50	5.53	3.26	0.14
16.00	5.61	3.33	0.12
16.50	5.68	3.39	0.11
17.00	5.74	3.45	0.11
17.50	5.81	3.51	0.10
18.00	5.87	3.56	0.09
18.50	5.92	3.61	0.09
19.00	5.97	3.66	0.08
19.50	6.02	3.70	0.07
20.00	6.06	3.74	0.07
20.50	6.11	3.77	0.07
21.00	6.15	3.81	0.07
21.50	6.18	3.85	0.06
22.00	6.22	3.88	0.06
22.50	6.26	3.91	0.06
23.00	6.30	3.95	0.06
23.50	6.33	3.98	0.06
24.00	**6.37**	**4.01**	0.06

Summary for Subcatchment G19: (new Subcat)

Runoff = 0.90 cfs @ 11.94 hrs, Volume= 0.039 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.118	79	50-75% Grass cover, Fair, HSG C
0.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G19: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.00
8.00	0.76	0.02	0.00
8.50	0.84	0.03	0.00
9.00	0.94	0.05	0.01
9.50	1.04	0.08	0.01
10.00	1.15	0.12	0.01
10.50	1.30	0.17	0.02
11.00	1.50	0.26	0.02
11.50	1.80	0.41	**0.05**
12.00	4.22	2.15	**0.62**
12.50	4.68	2.53	0.06
13.00	4.92	2.73	0.04
13.50	5.09	2.88	0.03
14.00	5.22	2.99	0.03
14.50	5.34	3.09	0.02
15.00	5.44	3.18	0.02
15.50	5.53	3.26	0.02
16.00	5.61	3.33	0.02
16.50	5.68	3.39	0.01
17.00	5.74	3.45	0.01
17.50	5.81	3.51	0.01
18.00	5.87	3.56	0.01
18.50	5.92	3.61	0.01
19.00	5.97	3.66	0.01
19.50	6.02	3.70	0.01
20.00	6.06	3.74	0.01
20.50	6.11	3.77	0.01
21.00	6.15	3.81	0.01
21.50	6.18	3.85	0.01
22.00	6.22	3.88	0.01
22.50	6.26	3.91	0.01
23.00	6.30	3.95	0.01
23.50	6.33	3.98	0.01
24.00	**6.37**	**4.01**	0.01

Summary for Subcatchment G2: (new Subcat)

Runoff = 1.86 cfs @ 11.94 hrs, Volume= 0.082 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.245	79	50-75% Grass cover, Fair, HSG C
0.245		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G2: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.00
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.01
9.00	0.94	0.05	0.01
9.50	1.04	0.08	0.01
10.00	1.15	0.12	0.02
10.50	1.30	0.17	0.03
11.00	1.50	0.26	0.05
11.50	1.80	0.41	**0.10**
12.00	4.22	2.15	**1.29**
12.50	4.68	2.53	0.13
13.00	4.92	2.73	0.09
13.50	5.09	2.88	0.07
14.00	5.22	2.99	0.05
14.50	5.34	3.09	0.05
15.00	5.44	3.18	0.04
15.50	5.53	3.26	0.04
16.00	5.61	3.33	0.03
16.50	5.68	3.39	0.03
17.00	5.74	3.45	0.03
17.50	5.81	3.51	0.03
18.00	5.87	3.56	0.03
18.50	5.92	3.61	0.02
19.00	5.97	3.66	0.02
19.50	6.02	3.70	0.02
20.00	6.06	3.74	0.02
20.50	6.11	3.77	0.02
21.00	6.15	3.81	0.02
21.50	6.18	3.85	0.02
22.00	6.22	3.88	0.02
22.50	6.26	3.91	0.02
23.00	6.30	3.95	0.02
23.50	6.33	3.98	0.02
24.00	**6.37**	**4.01**	0.02

Summary for Subcatchment G20: (new Subcat)

Runoff = 5.53 cfs @ 11.94 hrs, Volume= 0.244 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.729	79	50-75% Grass cover, Fair, HSG C
0.729		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G20: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.02
9.00	0.94	0.05	0.04
9.50	1.04	0.08	0.04
10.00	1.15	0.12	0.06
10.50	1.30	0.17	0.09
11.00	1.50	0.26	0.15
11.50	1.80	0.41	**0.29**
12.00	4.22	2.15	**3.84**
12.50	4.68	2.53	0.40
13.00	4.92	2.73	0.26
13.50	5.09	2.88	0.20
14.00	5.22	2.99	0.16
14.50	5.34	3.09	0.14
15.00	5.44	3.18	0.12
15.50	5.53	3.26	0.11
16.00	5.61	3.33	0.10
16.50	5.68	3.39	0.09
17.00	5.74	3.45	0.09
17.50	5.81	3.51	0.08
18.00	5.87	3.56	0.08
18.50	5.92	3.61	0.07
19.00	5.97	3.66	0.07
19.50	6.02	3.70	0.06
20.00	6.06	3.74	0.06
20.50	6.11	3.77	0.05
21.00	6.15	3.81	0.05
21.50	6.18	3.85	0.05
22.00	6.22	3.88	0.05
22.50	6.26	3.91	0.05
23.00	6.30	3.95	0.05
23.50	6.33	3.98	0.05
24.00	**6.37**	**4.01**	0.05

Summary for Subcatchment G21: (new Subcat)

Runoff = 16.96 cfs @ 11.92 hrs, Volume= 0.700 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
2.096	79	50-75% Grass cover, Fair, HSG C
2.096		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	39	0.2500	0.37		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G21: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.01
7.00	0.63	0.00	0.02
7.50	0.70	0.01	0.03
8.00	0.76	0.02	0.04
8.50	0.84	0.03	0.07
9.00	0.94	0.05	0.10
9.50	1.04	0.08	0.13
10.00	1.15	0.12	0.18
10.50	1.30	0.17	0.27
11.00	1.50	0.26	0.44
11.50	1.80	0.41	**0.85**
12.00	4.22	2.15	**6.81**
12.50	4.68	2.53	1.06
13.00	4.92	2.73	0.72
13.50	5.09	2.88	0.56
14.00	5.22	2.99	0.44
14.50	5.34	3.09	0.40
15.00	5.44	3.18	0.36
15.50	5.53	3.26	0.32
16.00	5.61	3.33	0.28
16.50	5.68	3.39	0.26
17.00	5.74	3.45	0.25
17.50	5.81	3.51	0.23
18.00	5.87	3.56	0.22
18.50	5.92	3.61	0.20
19.00	5.97	3.66	0.19
19.50	6.02	3.70	0.17
20.00	6.06	3.74	0.16
20.50	6.11	3.77	0.15
21.00	6.15	3.81	0.15
21.50	6.18	3.85	0.15
22.00	6.22	3.88	0.15
22.50	6.26	3.91	0.14
23.00	6.30	3.95	0.14
23.50	6.33	3.98	0.14
24.00	**6.37**	**4.01**	0.13

Summary for Subcatchment G22: (new Subcat)

Runoff = 5.95 cfs @ 11.95 hrs, Volume= 0.269 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.806	79	50-75% Grass cover, Fair, HSG C
0.806		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	125	0.2500	0.47		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G22: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.03
9.00	0.94	0.05	0.04
9.50	1.04	0.08	0.05
10.00	1.15	0.12	0.07
10.50	1.30	0.17	0.10
11.00	1.50	0.26	0.16
11.50	1.80	0.41	**0.31**
12.00	4.22	2.15	**4.74**
12.50	4.68	2.53	0.45
13.00	4.92	2.73	0.29
13.50	5.09	2.88	0.22
14.00	5.22	2.99	0.17
14.50	5.34	3.09	0.15
15.00	5.44	3.18	0.14
15.50	5.53	3.26	0.12
16.00	5.61	3.33	0.11
16.50	5.68	3.39	0.10
17.00	5.74	3.45	0.09
17.50	5.81	3.51	0.09
18.00	5.87	3.56	0.08
18.50	5.92	3.61	0.08
19.00	5.97	3.66	0.07
19.50	6.02	3.70	0.07
20.00	6.06	3.74	0.06
20.50	6.11	3.77	0.06
21.00	6.15	3.81	0.06
21.50	6.18	3.85	0.06
22.00	6.22	3.88	0.06
22.50	6.26	3.91	0.05
23.00	6.30	3.95	0.05
23.50	6.33	3.98	0.05
24.00	**6.37**	**4.01**	0.05

Summary for Subcatchment G23: (new Subcat)

Runoff = 32.15 cfs @ 11.97 hrs, Volume= 1.510 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
4.524	79	50-75% Grass cover, Fair, HSG C
4.524		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1510	0.36		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
0.8	165	0.2450	3.46		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	71	0.5490	5.19		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.6	336	Total			

Hydrograph for Subcatchment G23: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.01
7.00	0.63	0.00	0.04
7.50	0.70	0.01	0.06
8.00	0.76	0.02	0.09
8.50	0.84	0.03	0.14
9.00	0.94	0.05	0.22
9.50	1.04	0.08	0.27
10.00	1.15	0.12	0.38
10.50	1.30	0.17	0.56
11.00	1.50	0.26	0.90
11.50	1.80	0.41	**1.71**
12.00	4.22	2.15	**28.97**
12.50	4.68	2.53	2.62
13.00	4.92	2.73	1.63
13.50	5.09	2.88	1.24
14.00	5.22	2.99	0.98
14.50	5.34	3.09	0.86
15.00	5.44	3.18	0.78
15.50	5.53	3.26	0.69
16.00	5.61	3.33	0.60
16.50	5.68	3.39	0.56
17.00	5.74	3.45	0.53
17.50	5.81	3.51	0.50
18.00	5.87	3.56	0.47
18.50	5.92	3.61	0.44
19.00	5.97	3.66	0.41
19.50	6.02	3.70	0.38
20.00	6.06	3.74	0.34
20.50	6.11	3.77	0.33
21.00	6.15	3.81	0.33
21.50	6.18	3.85	0.32
22.00	6.22	3.88	0.31
22.50	6.26	3.91	0.31
23.00	6.30	3.95	0.30
23.50	6.33	3.98	0.30
24.00	**6.37**	**4.01**	0.29

Summary for Subcatchment G24: (new Subcat)

Runoff = 9.11 cfs @ 11.95 hrs, Volume= 0.403 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.208	79	50-75% Grass cover, Fair, HSG C
1.208		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	106	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G24: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.02
8.00	0.76	0.02	0.03
8.50	0.84	0.03	0.04
9.00	0.94	0.05	0.06
9.50	1.04	0.08	0.07
10.00	1.15	0.12	0.10
10.50	1.30	0.17	0.15
11.00	1.50	0.26	0.24
11.50	1.80	0.41	**0.47**
12.00	4.22	2.15	**6.57**
12.50	4.68	2.53	0.66
13.00	4.92	2.73	0.43
13.50	5.09	2.88	0.33
14.00	5.22	2.99	0.26
14.50	5.34	3.09	0.23
15.00	5.44	3.18	0.21
15.50	5.53	3.26	0.18
16.00	5.61	3.33	0.16
16.50	5.68	3.39	0.15
17.00	5.74	3.45	0.14
17.50	5.81	3.51	0.13
18.00	5.87	3.56	0.13
18.50	5.92	3.61	0.12
19.00	5.97	3.66	0.11
19.50	6.02	3.70	0.10
20.00	6.06	3.74	0.09
20.50	6.11	3.77	0.09
21.00	6.15	3.81	0.09
21.50	6.18	3.85	0.09
22.00	6.22	3.88	0.08
22.50	6.26	3.91	0.08
23.00	6.30	3.95	0.08
23.50	6.33	3.98	0.08
24.00	**6.37**	**4.01**	0.08

Summary for Subcatchment G25: (new Subcat)

Runoff = 1.97 cfs @ 11.95 hrs, Volume= 0.087 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.260	79	50-75% Grass cover, Fair, HSG C
0.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	102	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G25: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.00
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.01
9.00	0.94	0.05	0.01
9.50	1.04	0.08	0.02
10.00	1.15	0.12	0.02
10.50	1.30	0.17	0.03
11.00	1.50	0.26	0.05
11.50	1.80	0.41	**0.10**
12.00	4.22	2.15	**1.39**
12.50	4.68	2.53	0.14
13.00	4.92	2.73	0.09
13.50	5.09	2.88	0.07
14.00	5.22	2.99	0.06
14.50	5.34	3.09	0.05
15.00	5.44	3.18	0.04
15.50	5.53	3.26	0.04
16.00	5.61	3.33	0.03
16.50	5.68	3.39	0.03
17.00	5.74	3.45	0.03
17.50	5.81	3.51	0.03
18.00	5.87	3.56	0.03
18.50	5.92	3.61	0.03
19.00	5.97	3.66	0.02
19.50	6.02	3.70	0.02
20.00	6.06	3.74	0.02
20.50	6.11	3.77	0.02
21.00	6.15	3.81	0.02
21.50	6.18	3.85	0.02
22.00	6.22	3.88	0.02
22.50	6.26	3.91	0.02
23.00	6.30	3.95	0.02
23.50	6.33	3.98	0.02
24.00	**6.37**	**4.01**	0.02

Summary for Subcatchment G26: (new Subcat)

Runoff = 9.59 cfs @ 11.94 hrs, Volume= 0.419 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.254	79	50-75% Grass cover, Fair, HSG C
1.254		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	92	0.2500	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G26: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.02
8.00	0.76	0.02	0.03
8.50	0.84	0.03	0.04
9.00	0.94	0.05	0.06
9.50	1.04	0.08	0.07
10.00	1.15	0.12	0.11
10.50	1.30	0.17	0.16
11.00	1.50	0.26	0.26
11.50	1.80	0.41	**0.49**
12.00	4.22	2.15	**6.39**
12.50	4.68	2.53	0.68
13.00	4.92	2.73	0.44
13.50	5.09	2.88	0.34
14.00	5.22	2.99	0.27
14.50	5.34	3.09	0.24
15.00	5.44	3.18	0.21
15.50	5.53	3.26	0.19
16.00	5.61	3.33	0.17
16.50	5.68	3.39	0.16
17.00	5.74	3.45	0.15
17.50	5.81	3.51	0.14
18.00	5.87	3.56	0.13
18.50	5.92	3.61	0.12
19.00	5.97	3.66	0.11
19.50	6.02	3.70	0.10
20.00	6.06	3.74	0.09
20.50	6.11	3.77	0.09
21.00	6.15	3.81	0.09
21.50	6.18	3.85	0.09
22.00	6.22	3.88	0.09
22.50	6.26	3.91	0.09
23.00	6.30	3.95	0.08
23.50	6.33	3.98	0.08
24.00	**6.37**	**4.01**	0.08

Summary for Subcatchment G27: (new Subcat)

Runoff = 7.72 cfs @ 11.94 hrs, Volume= 0.337 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.010	79	50-75% Grass cover, Fair, HSG C
1.010		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	92	0.2500	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G27: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.03
9.00	0.94	0.05	0.05
9.50	1.04	0.08	0.06
10.00	1.15	0.12	0.09
10.50	1.30	0.17	0.13
11.00	1.50	0.26	0.21
11.50	1.80	0.41	**0.40**
12.00	4.22	2.15	**5.15**
12.50	4.68	2.53	0.55
13.00	4.92	2.73	0.35
13.50	5.09	2.88	0.27
14.00	5.22	2.99	0.21
14.50	5.34	3.09	0.19
15.00	5.44	3.18	0.17
15.50	5.53	3.26	0.15
16.00	5.61	3.33	0.13
16.50	5.68	3.39	0.13
17.00	5.74	3.45	0.12
17.50	5.81	3.51	0.11
18.00	5.87	3.56	0.10
18.50	5.92	3.61	0.10
19.00	5.97	3.66	0.09
19.50	6.02	3.70	0.08
20.00	6.06	3.74	0.08
20.50	6.11	3.77	0.07
21.00	6.15	3.81	0.07
21.50	6.18	3.85	0.07
22.00	6.22	3.88	0.07
22.50	6.26	3.91	0.07
23.00	6.30	3.95	0.07
23.50	6.33	3.98	0.07
24.00	**6.37**	**4.01**	0.06

Summary for Subcatchment G28: (new Subcat)

Runoff = 1.84 cfs @ 11.94 hrs, Volume= 0.081 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.241	79	50-75% Grass cover, Fair, HSG C
0.241		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	92	0.2500	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G28: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.00
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.01
9.00	0.94	0.05	0.01
9.50	1.04	0.08	0.01
10.00	1.15	0.12	0.02
10.50	1.30	0.17	0.03
11.00	1.50	0.26	0.05
11.50	1.80	0.41	**0.09**
12.00	4.22	2.15	**1.23**
12.50	4.68	2.53	0.13
13.00	4.92	2.73	0.08
13.50	5.09	2.88	0.06
14.00	5.22	2.99	0.05
14.50	5.34	3.09	0.05
15.00	5.44	3.18	0.04
15.50	5.53	3.26	0.04
16.00	5.61	3.33	0.03
16.50	5.68	3.39	0.03
17.00	5.74	3.45	0.03
17.50	5.81	3.51	0.03
18.00	5.87	3.56	0.02
18.50	5.92	3.61	0.02
19.00	5.97	3.66	0.02
19.50	6.02	3.70	0.02
20.00	6.06	3.74	0.02
20.50	6.11	3.77	0.02
21.00	6.15	3.81	0.02
21.50	6.18	3.85	0.02
22.00	6.22	3.88	0.02
22.50	6.26	3.91	0.02
23.00	6.30	3.95	0.02
23.50	6.33	3.98	0.02
24.00	**6.37**	**4.01**	0.02

Summary for Subcatchment G29: (new Subcat)

Runoff = 11.19 cfs @ 11.93 hrs, Volume= 0.476 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.425	79	50-75% Grass cover, Fair, HSG C
1.425		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	97	0.5540	0.61		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G29: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.02
8.00	0.76	0.02	0.03
8.50	0.84	0.03	0.05
9.00	0.94	0.05	0.07
9.50	1.04	0.08	0.09
10.00	1.15	0.12	0.12
10.50	1.30	0.17	0.18
11.00	1.50	0.26	0.29
11.50	1.80	0.41	**0.57**
12.00	4.22	2.15	**6.11**
12.50	4.68	2.53	0.75
13.00	4.92	2.73	0.50
13.50	5.09	2.88	0.38
14.00	5.22	2.99	0.30
14.50	5.34	3.09	0.27
15.00	5.44	3.18	0.24
15.50	5.53	3.26	0.22
16.00	5.61	3.33	0.19
16.50	5.68	3.39	0.18
17.00	5.74	3.45	0.17
17.50	5.81	3.51	0.16
18.00	5.87	3.56	0.15
18.50	5.92	3.61	0.14
19.00	5.97	3.66	0.13
19.50	6.02	3.70	0.12
20.00	6.06	3.74	0.11
20.50	6.11	3.77	0.10
21.00	6.15	3.81	0.10
21.50	6.18	3.85	0.10
22.00	6.22	3.88	0.10
22.50	6.26	3.91	0.10
23.00	6.30	3.95	0.09
23.50	6.33	3.98	0.09
24.00	**6.37**	**4.01**	0.09

Summary for Subcatchment G3: (new Subcat)

Runoff = 4.28 cfs @ 11.95 hrs, Volume= 0.189 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.565	79	50-75% Grass cover, Fair, HSG C
0.565		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	103	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G3: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.02
9.00	0.94	0.05	0.03
9.50	1.04	0.08	0.03
10.00	1.15	0.12	0.05
10.50	1.30	0.17	0.07
11.00	1.50	0.26	0.11
11.50	1.80	0.41	**0.22**
12.00	4.22	2.15	**3.03**
12.50	4.68	2.53	0.31
13.00	4.92	2.73	0.20
13.50	5.09	2.88	0.15
14.00	5.22	2.99	0.12
14.50	5.34	3.09	0.11
15.00	5.44	3.18	0.10
15.50	5.53	3.26	0.09
16.00	5.61	3.33	0.07
16.50	5.68	3.39	0.07
17.00	5.74	3.45	0.07
17.50	5.81	3.51	0.06
18.00	5.87	3.56	0.06
18.50	5.92	3.61	0.05
19.00	5.97	3.66	0.05
19.50	6.02	3.70	0.05
20.00	6.06	3.74	0.04
20.50	6.11	3.77	0.04
21.00	6.15	3.81	0.04
21.50	6.18	3.85	0.04
22.00	6.22	3.88	0.04
22.50	6.26	3.91	0.04
23.00	6.30	3.95	0.04
23.50	6.33	3.98	0.04
24.00	**6.37**	**4.01**	0.04

Summary for Subcatchment G4: (new Subcat)

Runoff = 3.13 cfs @ 11.94 hrs, Volume= 0.138 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.413	79	50-75% Grass cover, Fair, HSG C
0.413		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G4: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.01
9.00	0.94	0.05	0.02
9.50	1.04	0.08	0.02
10.00	1.15	0.12	0.03
10.50	1.30	0.17	0.05
11.00	1.50	0.26	0.08
11.50	1.80	0.41	**0.16**
12.00	4.22	2.15	**2.18**
12.50	4.68	2.53	0.22
13.00	4.92	2.73	0.15
13.50	5.09	2.88	0.11
14.00	5.22	2.99	0.09
14.50	5.34	3.09	0.08
15.00	5.44	3.18	0.07
15.50	5.53	3.26	0.06
16.00	5.61	3.33	0.05
16.50	5.68	3.39	0.05
17.00	5.74	3.45	0.05
17.50	5.81	3.51	0.05
18.00	5.87	3.56	0.04
18.50	5.92	3.61	0.04
19.00	5.97	3.66	0.04
19.50	6.02	3.70	0.03
20.00	6.06	3.74	0.03
20.50	6.11	3.77	0.03
21.00	6.15	3.81	0.03
21.50	6.18	3.85	0.03
22.00	6.22	3.88	0.03
22.50	6.26	3.91	0.03
23.00	6.30	3.95	0.03
23.50	6.33	3.98	0.03
24.00	**6.37**	**4.01**	0.03

Summary for Subcatchment G5: (new Subcat)

Runoff = 7.91 cfs @ 11.95 hrs, Volume= 0.352 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.053	79	50-75% Grass cover, Fair, HSG C
1.053		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
0.3	58	0.2500	3.50		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.0	158	Total			

Hydrograph for Subcatchment G5: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.02
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.03
9.00	0.94	0.05	0.05
9.50	1.04	0.08	0.06
10.00	1.15	0.12	0.09
10.50	1.30	0.17	0.13
11.00	1.50	0.26	0.21
11.50	1.80	0.41	**0.41**
12.00	4.22	2.15	**5.81**
12.50	4.68	2.53	0.58
13.00	4.92	2.73	0.37
13.50	5.09	2.88	0.28
14.00	5.22	2.99	0.22
14.50	5.34	3.09	0.20
15.00	5.44	3.18	0.18
15.50	5.53	3.26	0.16
16.00	5.61	3.33	0.14
16.50	5.68	3.39	0.13
17.00	5.74	3.45	0.12
17.50	5.81	3.51	0.12
18.00	5.87	3.56	0.11
18.50	5.92	3.61	0.10
19.00	5.97	3.66	0.09
19.50	6.02	3.70	0.09
20.00	6.06	3.74	0.08
20.50	6.11	3.77	0.08
21.00	6.15	3.81	0.08
21.50	6.18	3.85	0.07
22.00	6.22	3.88	0.07
22.50	6.26	3.91	0.07
23.00	6.30	3.95	0.07
23.50	6.33	3.98	0.07
24.00	**6.37**	**4.01**	0.07

Summary for Subcatchment G6: (new Subcat)

Runoff = 4.43 cfs @ 11.94 hrs, Volume= 0.195 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.583	79	50-75% Grass cover, Fair, HSG C
0.583		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G6: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.02
9.00	0.94	0.05	0.03
9.50	1.04	0.08	0.03
10.00	1.15	0.12	0.05
10.50	1.30	0.17	0.07
11.00	1.50	0.26	0.12
11.50	1.80	0.41	**0.23**
12.00	4.22	2.15	**3.07**
12.50	4.68	2.53	0.32
13.00	4.92	2.73	0.21
13.50	5.09	2.88	0.16
14.00	5.22	2.99	0.12
14.50	5.34	3.09	0.11
15.00	5.44	3.18	0.10
15.50	5.53	3.26	0.09
16.00	5.61	3.33	0.08
16.50	5.68	3.39	0.07
17.00	5.74	3.45	0.07
17.50	5.81	3.51	0.06
18.00	5.87	3.56	0.06
18.50	5.92	3.61	0.06
19.00	5.97	3.66	0.05
19.50	6.02	3.70	0.05
20.00	6.06	3.74	0.04
20.50	6.11	3.77	0.04
21.00	6.15	3.81	0.04
21.50	6.18	3.85	0.04
22.00	6.22	3.88	0.04
22.50	6.26	3.91	0.04
23.00	6.30	3.95	0.04
23.50	6.33	3.98	0.04
24.00	**6.37**	**4.01**	0.04

Summary for Subcatchment G7: (new Subcat)

Runoff = 5.70 cfs @ 11.94 hrs, Volume= 0.251 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.751	79	50-75% Grass cover, Fair, HSG C
0.751		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G7: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.02
9.00	0.94	0.05	0.04
9.50	1.04	0.08	0.04
10.00	1.15	0.12	0.06
10.50	1.30	0.17	0.10
11.00	1.50	0.26	0.15
11.50	1.80	0.41	**0.29**
12.00	4.22	2.15	**3.96**
12.50	4.68	2.53	0.41
13.00	4.92	2.73	0.26
13.50	5.09	2.88	0.20
14.00	5.22	2.99	0.16
14.50	5.34	3.09	0.14
15.00	5.44	3.18	0.13
15.50	5.53	3.26	0.11
16.00	5.61	3.33	0.10
16.50	5.68	3.39	0.09
17.00	5.74	3.45	0.09
17.50	5.81	3.51	0.08
18.00	5.87	3.56	0.08
18.50	5.92	3.61	0.07
19.00	5.97	3.66	0.07
19.50	6.02	3.70	0.06
20.00	6.06	3.74	0.06
20.50	6.11	3.77	0.06
21.00	6.15	3.81	0.05
21.50	6.18	3.85	0.05
22.00	6.22	3.88	0.05
22.50	6.26	3.91	0.05
23.00	6.30	3.95	0.05
23.50	6.33	3.98	0.05
24.00	**6.37**	**4.01**	0.05

Summary for Subcatchment G8: (new Subcat)

Runoff = 5.74 cfs @ 11.95 hrs, Volume= 0.253 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.758	79	50-75% Grass cover, Fair, HSG C
0.758		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	102	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G8: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.02
9.00	0.94	0.05	0.04
9.50	1.04	0.08	0.05
10.00	1.15	0.12	0.06
10.50	1.30	0.17	0.10
11.00	1.50	0.26	0.15
11.50	1.80	0.41	**0.30**
12.00	4.22	2.15	**4.06**
12.50	4.68	2.53	0.41
13.00	4.92	2.73	0.27
13.50	5.09	2.88	0.20
14.00	5.22	2.99	0.16
14.50	5.34	3.09	0.14
15.00	5.44	3.18	0.13
15.50	5.53	3.26	0.12
16.00	5.61	3.33	0.10
16.50	5.68	3.39	0.09
17.00	5.74	3.45	0.09
17.50	5.81	3.51	0.08
18.00	5.87	3.56	0.08
18.50	5.92	3.61	0.07
19.00	5.97	3.66	0.07
19.50	6.02	3.70	0.06
20.00	6.06	3.74	0.06
20.50	6.11	3.77	0.06
21.00	6.15	3.81	0.05
21.50	6.18	3.85	0.05
22.00	6.22	3.88	0.05
22.50	6.26	3.91	0.05
23.00	6.30	3.95	0.05
23.50	6.33	3.98	0.05
24.00	**6.37**	**4.01**	0.05

Summary for Subcatchment G9: (new Subcat)

Runoff = 4.90 cfs @ 11.94 hrs, Volume= 0.216 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.646	79	50-75% Grass cover, Fair, HSG C
0.646		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G9: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.02
9.00	0.94	0.05	0.03
9.50	1.04	0.08	0.04
10.00	1.15	0.12	0.05
10.50	1.30	0.17	0.08
11.00	1.50	0.26	0.13
11.50	1.80	0.41	**0.25**
12.00	4.22	2.15	**3.41**
12.50	4.68	2.53	0.35
13.00	4.92	2.73	0.23
13.50	5.09	2.88	0.17
14.00	5.22	2.99	0.14
14.50	5.34	3.09	0.12
15.00	5.44	3.18	0.11
15.50	5.53	3.26	0.10
16.00	5.61	3.33	0.09
16.50	5.68	3.39	0.08
17.00	5.74	3.45	0.08
17.50	5.81	3.51	0.07
18.00	5.87	3.56	0.07
18.50	5.92	3.61	0.06
19.00	5.97	3.66	0.06
19.50	6.02	3.70	0.05
20.00	6.06	3.74	0.05
20.50	6.11	3.77	0.05
21.00	6.15	3.81	0.05
21.50	6.18	3.85	0.05
22.00	6.22	3.88	0.04
22.50	6.26	3.91	0.04
23.00	6.30	3.95	0.04
23.50	6.33	3.98	0.04
24.00	**6.37**	**4.01**	0.04

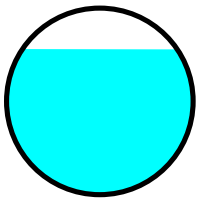
Summary for Reach BC-G1: (new Reach)

Inflow Area = 10.554 ac, 0.00% Impervious, Inflow Depth > 3.70" for 100-yr event
Inflow = 68.70 cfs @ 11.97 hrs, Volume= 3.251 af
Outflow = 68.70 cfs @ 11.97 hrs, Volume= 3.250 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.63 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.82 fps, Avg. Travel Time= 0.1 min

Peak Storage= 177 cf @ 11.97 hrs
Average Depth at Peak Storage= 2.34'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 72.26 cfs

36.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 30.0' Slope= 0.0100 '/'
Inlet Invert= 660.00', Outlet Invert= 659.70'



Hydrograph for Reach BC-G1: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	660.00	0.00
0.50	0.00	0	660.00	0.00
1.00	0.00	0	660.00	0.00
1.50	0.00	0	660.00	0.00
2.00	0.00	0	660.00	0.00
2.50	0.00	0	660.00	0.00
3.00	0.00	0	660.00	0.00
3.50	0.00	0	660.00	0.00
4.00	0.00	0	660.00	0.00
4.50	0.00	0	660.00	0.00
5.00	0.00	0	660.00	0.00
5.50	0.00	0	660.00	0.00
6.00	0.00	0	660.00	0.00
6.50	0.00	0	660.00	0.00
7.00	0.00	0	660.00	0.00
7.50	0.05	1	660.06	0.04
8.00	0.11	2	660.09	0.11
8.50	0.20	3	660.12	0.20
9.00	0.34	4	660.15	0.33
9.50	0.45	5	660.17	0.45
10.00	0.66	6	660.20	0.66
10.50	1.04	8	660.25	1.04
11.00	1.72	12	660.32	1.71
11.50	**3.39**	**19**	**660.44**	**3.39**
12.00	**64.54**	**168**	**662.22**	**64.73**
12.50	5.92	29	660.58	5.93
13.00	3.65	21	660.46	3.66
13.50	2.78	17	660.40	2.78
14.00	2.20	14	660.36	2.20
14.50	1.94	13	660.34	1.94
15.00	1.75	12	660.32	1.75
15.50	1.56	11	660.30	1.56
16.00	1.36	10	660.29	1.36
16.50	1.27	10	660.28	1.27
17.00	1.20	9	660.27	1.20
17.50	1.13	9	660.26	1.13
18.00	1.06	9	660.25	1.06
18.50	0.99	8	660.25	0.99
19.00	0.92	8	660.24	0.92
19.50	0.85	7	660.23	0.85
20.00	0.78	7	660.22	0.78
20.50	0.75	7	660.22	0.75
21.00	0.74	7	660.21	0.74
21.50	0.72	7	660.21	0.72
22.00	0.71	7	660.21	0.71
22.50	0.70	6	660.21	0.70
23.00	0.68	6	660.21	0.68
23.50	0.67	6	660.20	0.67
24.00	0.65	6	660.20	0.65

Summary for Reach BC-G2: (new Reach)

Inflow Area = 39.038 ac, 0.00% Impervious, Inflow Depth > 1.65" for 100-yr event
Inflow = 69.90 cfs @ 11.97 hrs, Volume= 5.370 af
Outflow = 69.33 cfs @ 11.98 hrs, Volume= 5.362 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.34 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.24 fps, Avg. Travel Time= 2.7 min

Peak Storage= 3,473 cf @ 11.98 hrs
Average Depth at Peak Storage= 1.39'
Bank-Full Depth= 3.00' Flow Area= 30.0 sf, Capacity= 333.93 cfs

4.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 368.0' Slope= 0.0435 '/'
Inlet Invert= 656.00', Outlet Invert= 640.00'

Hydrograph for Reach BC-G2: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	1.20	21	656.01	0.04
0.50	1.02	200	656.13	1.03
1.00	0.86	181	656.12	0.87
1.50	0.73	162	656.10	0.73
2.00	0.61	146	656.09	0.62
2.50	0.52	132	656.09	0.53
3.00	0.44	118	656.08	0.44
3.50	0.37	106	656.07	0.37
4.00	0.31	96	656.06	0.32
4.50	0.26	87	656.06	0.27
5.00	0.22	77	656.05	0.23
5.50	0.19	68	656.05	0.19
6.00	0.16	61	656.04	0.16
6.50	0.13	55	656.04	0.14
7.00	0.12	53	656.04	0.12
7.50	0.18	64	656.04	0.17
8.00	0.28	86	656.06	0.27
8.50	0.44	114	656.07	0.42
9.00	0.69	153	656.10	0.67
9.50	0.96	191	656.12	0.95
10.00	1.38	239	656.15	1.35
10.50	2.06	308	656.19	2.01
11.00	2.91	388	656.24	2.87
11.50	**4.59**	**520**	**656.31**	**4.50**
12.00	**65.93**	**3,419**	**657.38**	**67.83**
12.50	7.13	721	656.41	7.35
13.00	4.86	551	656.32	4.92
13.50	3.98	483	656.29	4.02
14.00	3.40	435	656.26	3.42
14.50	3.14	412	656.25	3.15
15.00	2.95	396	656.24	2.96
15.50	2.76	378	656.23	2.77
16.00	2.56	361	656.22	2.57
16.50	2.47	352	656.22	2.47
17.00	2.40	346	656.21	2.40
17.50	2.33	339	656.21	2.33
18.00	2.26	332	656.20	2.26
18.50	2.51	352	656.22	2.47
19.00	3.12	408	656.25	3.11
19.50	3.23	418	656.25	3.23
20.00	3.09	407	656.25	3.10
20.50	2.94	395	656.24	2.95
21.00	2.86	387	656.23	2.86
21.50	2.79	381	656.23	2.79
22.00	2.73	376	656.23	2.74
22.50	2.68	371	656.23	2.68
23.00	2.63	366	656.22	2.63
23.50	2.58	361	656.22	2.58
24.00	2.52	357	656.22	2.53

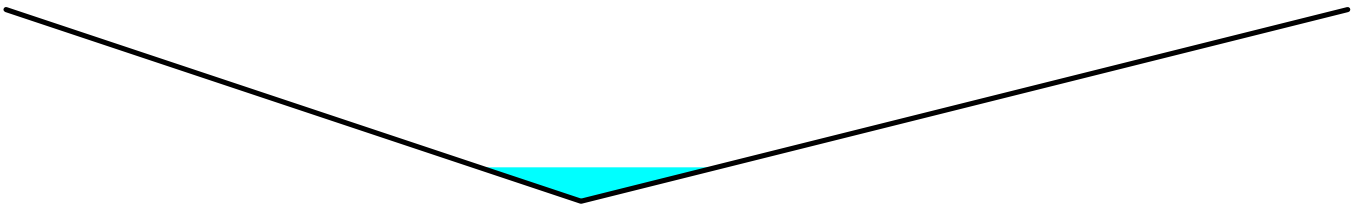
Summary for Reach DB-G1: (new Reach)

Inflow Area = 0.327 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 2.48 cfs @ 11.94 hrs, Volume= 0.109 af
Outflow = 2.46 cfs @ 11.95 hrs, Volume= 0.109 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.58 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.97 fps, Avg. Travel Time= 1.8 min

Peak Storage= 93 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 247.05 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 211.7' Slope= 0.0720 '/'
Inlet Invert= 947.63', Outlet Invert= 932.39'



Hydrograph for Reach DB-G1: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	947.63	0.00
0.50	0.00	0	947.63	0.00
1.00	0.00	0	947.63	0.00
1.50	0.00	0	947.63	0.00
2.00	0.00	0	947.63	0.00
2.50	0.00	0	947.63	0.00
3.00	0.00	0	947.63	0.00
3.50	0.00	0	947.63	0.00
4.00	0.00	0	947.63	0.00
4.50	0.00	0	947.63	0.00
5.00	0.00	0	947.63	0.00
5.50	0.00	0	947.63	0.00
6.00	0.00	0	947.63	0.00
6.50	0.00	0	947.64	0.00
7.00	0.00	1	947.65	0.00
7.50	0.00	1	947.66	0.00
8.00	0.01	1	947.67	0.01
8.50	0.01	2	947.67	0.01
9.00	0.02	2	947.68	0.02
9.50	0.02	2	947.69	0.02
10.00	0.03	3	947.69	0.03
10.50	0.04	4	947.71	0.04
11.00	0.07	6	947.72	0.07
11.50	**0.13**	**10**	**947.75**	**0.13**
12.00	**1.72**	**77**	**947.95**	**1.89**
12.50	0.18	13	947.76	0.18
13.00	0.12	9	947.74	0.12
13.50	0.09	8	947.73	0.09
14.00	0.07	6	947.72	0.07
14.50	0.06	6	947.72	0.06
15.00	0.06	5	947.72	0.06
15.50	0.05	5	947.71	0.05
16.00	0.04	5	947.71	0.04
16.50	0.04	4	947.71	0.04
17.00	0.04	4	947.70	0.04
17.50	0.04	4	947.70	0.04
18.00	0.03	4	947.70	0.03
18.50	0.03	4	947.70	0.03
19.00	0.03	3	947.70	0.03
19.50	0.03	3	947.69	0.03
20.00	0.02	3	947.69	0.02
20.50	0.02	3	947.69	0.02
21.00	0.02	3	947.69	0.02
21.50	0.02	3	947.69	0.02
22.00	0.02	3	947.69	0.02
22.50	0.02	3	947.69	0.02
23.00	0.02	3	947.69	0.02
23.50	0.02	3	947.69	0.02
24.00	0.02	3	947.69	0.02

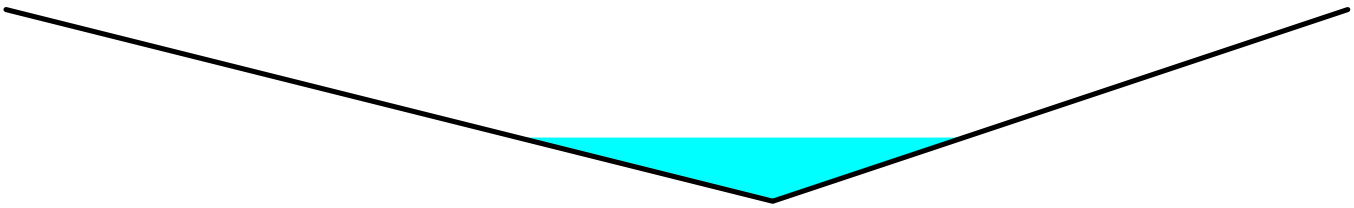
Summary for Reach DB-G10: (new Reach)

Inflow Area = 0.948 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 7.15 cfs @ 11.95 hrs, Volume= 0.317 af
Outflow = 6.88 cfs @ 11.96 hrs, Volume= 0.316 af, Atten= 4%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.46 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.57 fps, Avg. Travel Time= 4.7 min

Peak Storage= 684 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.66'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 130.38 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 443.9' Slope= 0.0200 '/'
Inlet Invert= 841.32', Outlet Invert= 832.42'



Hydrograph for Reach DB-G10: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	841.32	0.00
0.50	0.00	0	841.32	0.00
1.00	0.00	0	841.32	0.00
1.50	0.00	0	841.32	0.00
2.00	0.00	0	841.32	0.00
2.50	0.00	0	841.32	0.00
3.00	0.00	0	841.32	0.00
3.50	0.00	0	841.32	0.00
4.00	0.00	0	841.32	0.00
4.50	0.00	0	841.32	0.00
5.00	0.00	0	841.32	0.00
5.50	0.00	0	841.32	0.00
6.00	0.00	0	841.32	0.00
6.50	0.00	1	841.34	0.00
7.00	0.01	4	841.37	0.01
7.50	0.01	6	841.38	0.01
8.00	0.02	8	841.39	0.02
8.50	0.03	11	841.40	0.03
9.00	0.05	15	841.42	0.04
9.50	0.06	18	841.43	0.06
10.00	0.08	23	841.44	0.08
10.50	0.12	32	841.46	0.12
11.00	0.19	45	841.49	0.18
11.50	**0.37**	**73**	**841.54**	**0.35**
12.00	**5.16**	**622**	**841.95**	**6.06**
12.50	0.52	105	841.58	0.56
13.00	0.33	73	841.54	0.35
13.50	0.26	59	841.51	0.26
14.00	0.20	49	841.50	0.21
14.50	0.18	45	841.49	0.18
15.00	0.16	41	841.48	0.16
15.50	0.14	38	841.48	0.15
16.00	0.13	34	841.47	0.13
16.50	0.12	32	841.46	0.12
17.00	0.11	31	841.46	0.11
17.50	0.10	30	841.46	0.11
18.00	0.10	28	841.45	0.10
18.50	0.09	27	841.45	0.09
19.00	0.09	25	841.45	0.09
19.50	0.08	24	841.44	0.08
20.00	0.07	22	841.44	0.07
20.50	0.07	22	841.44	0.07
21.00	0.07	22	841.44	0.07
21.50	0.07	21	841.44	0.07
22.00	0.07	21	841.44	0.07
22.50	0.06	21	841.43	0.06
23.00	0.06	20	841.43	0.06
23.50	0.06	20	841.43	0.06
24.00	0.06	20	841.43	0.06

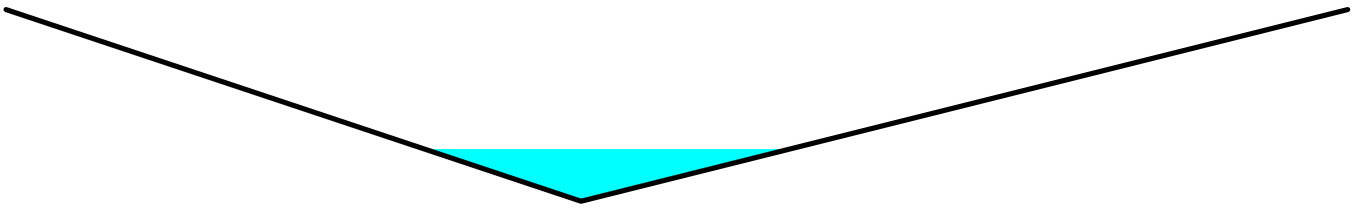
Summary for Reach DB-G11: (new Reach)

Inflow Area = 0.540 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 4.10 cfs @ 11.94 hrs, Volume= 0.180 af
Outflow = 4.04 cfs @ 11.96 hrs, Volume= 0.180 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.88 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 2.6 min

Peak Storage= 222 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 129.15 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 213.5' Slope= 0.0197 '/'
Inlet Invert= 811.62', Outlet Invert= 807.42'



Hydrograph for Reach DB-G11: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	811.62	0.00
0.50	0.00	0	811.62	0.00
1.00	0.00	0	811.62	0.00
1.50	0.00	0	811.62	0.00
2.00	0.00	0	811.62	0.00
2.50	0.00	0	811.62	0.00
3.00	0.00	0	811.62	0.00
3.50	0.00	0	811.62	0.00
4.00	0.00	0	811.62	0.00
4.50	0.00	0	811.62	0.00
5.00	0.00	0	811.62	0.00
5.50	0.00	0	811.62	0.00
6.00	0.00	0	811.62	0.00
6.50	0.00	0	811.64	0.00
7.00	0.00	1	811.66	0.00
7.50	0.01	2	811.67	0.01
8.00	0.01	3	811.68	0.01
8.50	0.02	4	811.69	0.02
9.00	0.03	5	811.70	0.03
9.50	0.03	6	811.71	0.03
10.00	0.05	8	811.72	0.04
10.50	0.07	10	811.74	0.07
11.00	0.11	15	811.76	0.11
11.50	**0.21**	**24**	**811.80**	**0.21**
12.00	**2.85**	**188**	**812.12**	**3.22**
12.50	0.29	32	811.83	0.31
13.00	0.19	23	811.79	0.19
13.50	0.15	19	811.78	0.15
14.00	0.11	16	811.76	0.12
14.50	0.10	14	811.76	0.10
15.00	0.09	13	811.75	0.09
15.50	0.08	12	811.75	0.08
16.00	0.07	11	811.74	0.07
16.50	0.07	10	811.74	0.07
17.00	0.06	10	811.73	0.06
17.50	0.06	9	811.73	0.06
18.00	0.06	9	811.73	0.06
18.50	0.05	9	811.73	0.05
19.00	0.05	8	811.72	0.05
19.50	0.04	8	811.72	0.04
20.00	0.04	7	811.72	0.04
20.50	0.04	7	811.72	0.04
21.00	0.04	7	811.72	0.04
21.50	0.04	7	811.71	0.04
22.00	0.04	7	811.71	0.04
22.50	0.04	7	811.71	0.04
23.00	0.04	6	811.71	0.04
23.50	0.04	6	811.71	0.04
24.00	0.03	6	811.71	0.03

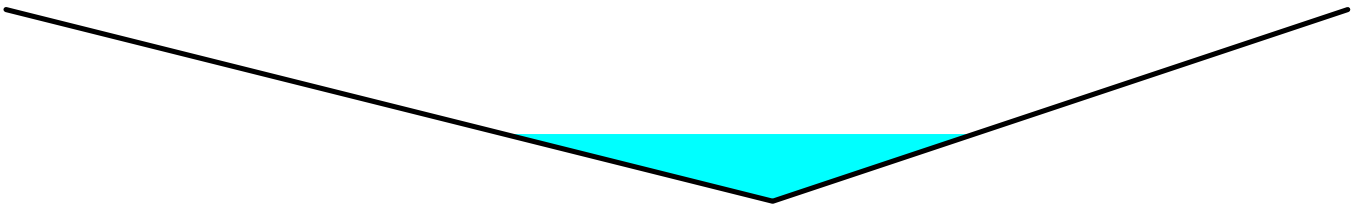
Summary for Reach DB-G12: (new Reach)

Inflow Area = 1.102 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 8.36 cfs @ 11.94 hrs, Volume= 0.368 af
Outflow = 7.98 cfs @ 11.96 hrs, Volume= 0.368 af, Atten= 5%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.63 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 5.3 min

Peak Storage= 892 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 130.47 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 518.5' Slope= 0.0201 '/'
Inlet Invert= 817.83', Outlet Invert= 807.42'



Hydrograph for Reach DB-G12: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	817.83	0.00
0.50	0.00	0	817.83	0.00
1.00	0.00	0	817.83	0.00
1.50	0.00	0	817.83	0.00
2.00	0.00	0	817.83	0.00
2.50	0.00	0	817.83	0.00
3.00	0.00	0	817.83	0.00
3.50	0.00	0	817.83	0.00
4.00	0.00	0	817.83	0.00
4.50	0.00	0	817.83	0.00
5.00	0.00	0	817.83	0.00
5.50	0.00	0	817.83	0.00
6.00	0.00	0	817.83	0.00
6.50	0.00	1	817.85	0.00
7.00	0.01	5	817.88	0.01
7.50	0.02	8	817.89	0.01
8.00	0.02	11	817.91	0.02
8.50	0.04	15	817.92	0.03
9.00	0.05	20	817.93	0.05
9.50	0.07	24	817.94	0.06
10.00	0.09	30	817.96	0.09
10.50	0.14	41	817.98	0.13
11.00	0.22	59	818.01	0.21
11.50	**0.43**	**96**	**818.06**	**0.41**
12.00	**5.81**	**809**	**818.50**	**7.00**
12.50	0.60	137	818.10	0.66
13.00	0.39	95	818.06	0.40
13.50	0.30	77	818.04	0.31
14.00	0.23	65	818.02	0.24
14.50	0.21	59	818.01	0.21
15.00	0.19	54	818.00	0.19
15.50	0.17	50	818.00	0.17
16.00	0.15	45	817.99	0.15
16.50	0.14	42	817.98	0.14
17.00	0.13	41	817.98	0.13
17.50	0.12	39	817.98	0.12
18.00	0.11	37	817.97	0.12
18.50	0.11	35	817.97	0.11
19.00	0.10	33	817.97	0.10
19.50	0.09	31	817.96	0.09
20.00	0.08	29	817.96	0.08
20.50	0.08	29	817.96	0.08
21.00	0.08	28	817.95	0.08
21.50	0.08	28	817.95	0.08
22.00	0.08	27	817.95	0.08
22.50	0.07	27	817.95	0.08
23.00	0.07	27	817.95	0.07
23.50	0.07	26	817.95	0.07
24.00	0.07	26	817.95	0.07

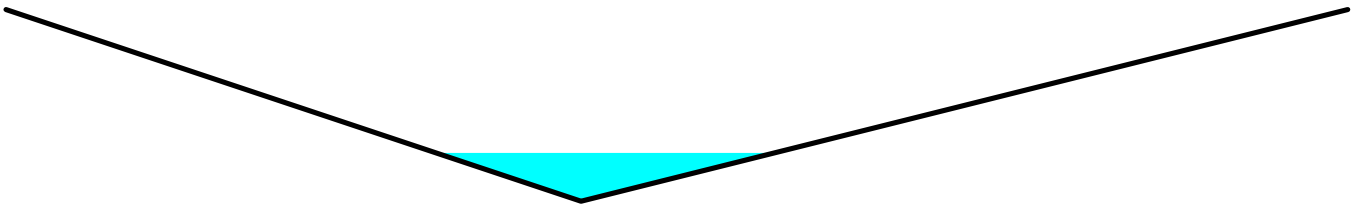
Summary for Reach DB-G13: (new Reach)

Inflow Area = 0.435 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 3.30 cfs @ 11.94 hrs, Volume= 0.145 af
Outflow = 3.27 cfs @ 11.95 hrs, Volume= 0.145 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.68 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.29 fps, Avg. Travel Time= 2.2 min

Peak Storage= 149 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 129.12 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 167.3' Slope= 0.0197 '/'
Inlet Invert= 785.72', Outlet Invert= 782.43'



Hydrograph for Reach DB-G13: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	785.72	0.00
0.50	0.00	0	785.72	0.00
1.00	0.00	0	785.72	0.00
1.50	0.00	0	785.72	0.00
2.00	0.00	0	785.72	0.00
2.50	0.00	0	785.72	0.00
3.00	0.00	0	785.72	0.00
3.50	0.00	0	785.72	0.00
4.00	0.00	0	785.72	0.00
4.50	0.00	0	785.72	0.00
5.00	0.00	0	785.72	0.00
5.50	0.00	0	785.72	0.00
6.00	0.00	0	785.72	0.00
6.50	0.00	0	785.74	0.00
7.00	0.00	1	785.76	0.00
7.50	0.01	1	785.77	0.01
8.00	0.01	2	785.77	0.01
8.50	0.01	2	785.78	0.01
9.00	0.02	3	785.79	0.02
9.50	0.03	4	785.80	0.03
10.00	0.04	5	785.81	0.04
10.50	0.06	7	785.83	0.05
11.00	0.09	10	785.85	0.09
11.50	**0.17**	**16**	**785.88**	**0.17**
12.00	**2.29**	**124**	**786.18**	**2.55**
12.50	0.24	21	785.91	0.25
13.00	0.15	15	785.88	0.16
13.50	0.12	12	785.86	0.12
14.00	0.09	10	785.85	0.09
14.50	0.08	9	785.85	0.08
15.00	0.07	9	785.84	0.07
15.50	0.07	8	785.84	0.07
16.00	0.06	7	785.83	0.06
16.50	0.05	7	785.83	0.05
17.00	0.05	7	785.83	0.05
17.50	0.05	6	785.82	0.05
18.00	0.05	6	785.82	0.05
18.50	0.04	6	785.82	0.04
19.00	0.04	5	785.82	0.04
19.50	0.04	5	785.81	0.04
20.00	0.03	5	785.81	0.03
20.50	0.03	5	785.81	0.03
21.00	0.03	5	785.81	0.03
21.50	0.03	4	785.81	0.03
22.00	0.03	4	785.81	0.03
22.50	0.03	4	785.81	0.03
23.00	0.03	4	785.80	0.03
23.50	0.03	4	785.80	0.03
24.00	0.03	4	785.80	0.03

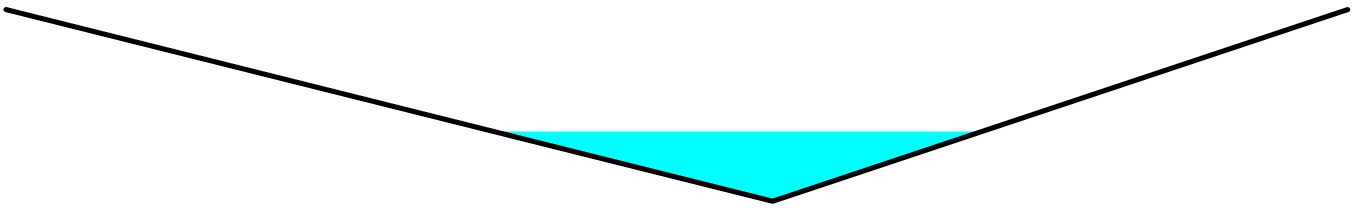
Summary for Reach DB-G14: (new Reach)

Inflow Area = 1.207 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 9.16 cfs @ 11.94 hrs, Volume= 0.403 af
Outflow = 8.77 cfs @ 11.96 hrs, Volume= 0.403 af, Atten= 4%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.74 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.67 fps, Avg. Travel Time= 5.0 min

Peak Storage= 928 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 130.41 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 502.0' Slope= 0.0201 '/'
Inlet Invert= 792.50', Outlet Invert= 782.43'



Hydrograph for Reach DB-G14: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	792.50	0.00
0.50	0.00	0	792.50	0.00
1.00	0.00	0	792.50	0.00
1.50	0.00	0	792.50	0.00
2.00	0.00	0	792.50	0.00
2.50	0.00	0	792.50	0.00
3.00	0.00	0	792.50	0.00
3.50	0.00	0	792.50	0.00
4.00	0.00	0	792.50	0.00
4.50	0.00	0	792.50	0.00
5.00	0.00	0	792.50	0.00
5.50	0.00	0	792.50	0.00
6.00	0.00	0	792.50	0.00
6.50	0.00	1	792.52	0.00
7.00	0.01	5	792.55	0.01
7.50	0.02	8	792.57	0.02
8.00	0.03	11	792.58	0.02
8.50	0.04	15	792.59	0.04
9.00	0.06	21	792.61	0.06
9.50	0.07	25	792.62	0.07
10.00	0.10	32	792.63	0.10
10.50	0.15	43	792.66	0.15
11.00	0.25	61	792.69	0.23
11.50	**0.47**	**100**	**792.74**	**0.45**
12.00	**6.36**	**837**	**793.19**	**7.64**
12.50	0.66	142	792.78	0.72
13.00	0.42	98	792.74	0.44
13.50	0.33	80	792.71	0.33
14.00	0.26	67	792.70	0.26
14.50	0.23	61	792.69	0.23
15.00	0.21	56	792.68	0.21
15.50	0.18	51	792.67	0.19
16.00	0.16	47	792.66	0.16
16.50	0.15	44	792.66	0.15
17.00	0.14	42	792.65	0.14
17.50	0.13	40	792.65	0.13
18.00	0.13	38	792.65	0.13
18.50	0.12	37	792.64	0.12
19.00	0.11	35	792.64	0.11
19.50	0.10	33	792.64	0.10
20.00	0.09	30	792.63	0.09
20.50	0.09	30	792.63	0.09
21.00	0.09	29	792.63	0.09
21.50	0.09	29	792.63	0.09
22.00	0.08	28	792.63	0.08
22.50	0.08	28	792.63	0.08
23.00	0.08	27	792.62	0.08
23.50	0.08	27	792.62	0.08
24.00	0.08	27	792.62	0.08

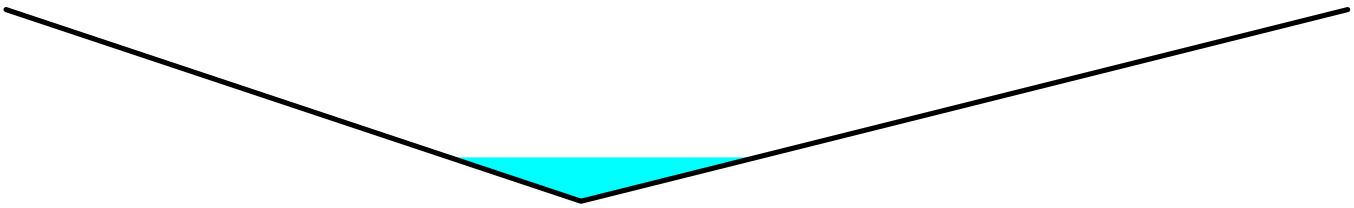
Summary for Reach DB-G15: (new Reach)

Inflow Area = 0.329 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 2.50 cfs @ 11.94 hrs, Volume= 0.110 af
Outflow = 2.48 cfs @ 11.95 hrs, Volume= 0.110 af, Atten= 1%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.41 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 1.7 min

Peak Storage= 88 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 127.72 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 121.1' Slope= 0.0192 '/'
Inlet Invert= 759.76', Outlet Invert= 757.43'



Hydrograph for Reach DB-G15: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	759.76	0.00
0.50	0.00	0	759.76	0.00
1.00	0.00	0	759.76	0.00
1.50	0.00	0	759.76	0.00
2.00	0.00	0	759.76	0.00
2.50	0.00	0	759.76	0.00
3.00	0.00	0	759.76	0.00
3.50	0.00	0	759.76	0.00
4.00	0.00	0	759.76	0.00
4.50	0.00	0	759.76	0.00
5.00	0.00	0	759.76	0.00
5.50	0.00	0	759.76	0.00
6.00	0.00	0	759.76	0.00
6.50	0.00	0	759.78	0.00
7.00	0.00	0	759.79	0.00
7.50	0.00	1	759.80	0.00
8.00	0.01	1	759.81	0.01
8.50	0.01	1	759.82	0.01
9.00	0.02	2	759.83	0.02
9.50	0.02	2	759.83	0.02
10.00	0.03	3	759.84	0.03
10.50	0.04	4	759.86	0.04
11.00	0.07	6	759.88	0.07
11.50	**0.13**	**9**	**759.91**	**0.13**
12.00	**1.73**	**72**	**760.17**	**1.89**
12.50	0.18	13	759.93	0.18
13.00	0.12	9	759.90	0.12
13.50	0.09	7	759.89	0.09
14.00	0.07	6	759.88	0.07
14.50	0.06	6	759.87	0.06
15.00	0.06	5	759.87	0.06
15.50	0.05	5	759.87	0.05
16.00	0.04	4	759.86	0.04
16.50	0.04	4	759.86	0.04
17.00	0.04	4	759.86	0.04
17.50	0.04	4	759.85	0.04
18.00	0.03	4	759.85	0.03
18.50	0.03	3	759.85	0.03
19.00	0.03	3	759.85	0.03
19.50	0.03	3	759.84	0.03
20.00	0.02	3	759.84	0.02
20.50	0.02	3	759.84	0.02
21.00	0.02	3	759.84	0.02
21.50	0.02	3	759.84	0.02
22.00	0.02	3	759.84	0.02
22.50	0.02	3	759.84	0.02
23.00	0.02	3	759.84	0.02
23.50	0.02	2	759.84	0.02
24.00	0.02	2	759.84	0.02

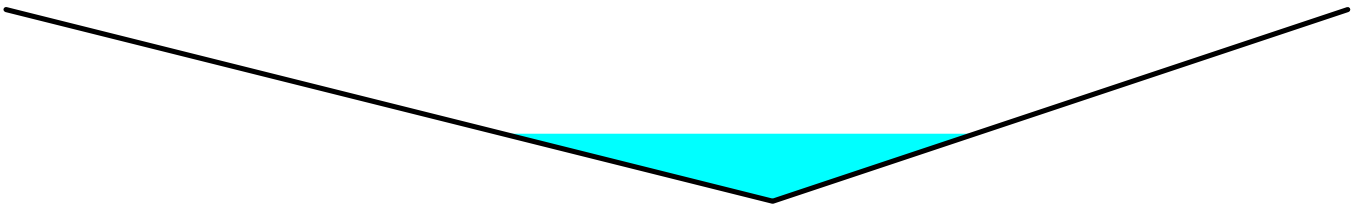
Summary for Reach DB-G16: (new Reach)

Inflow Area = 1.069 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 8.11 cfs @ 11.94 hrs, Volume= 0.357 af
Outflow = 7.82 cfs @ 11.96 hrs, Volume= 0.357 af, Atten= 4%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.50 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.58 fps, Avg. Travel Time= 4.5 min

Peak Storage= 750 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 126.14 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 431.1' Slope= 0.0188 '/'
Inlet Invert= 765.52', Outlet Invert= 757.43'



Hydrograph for Reach DB-G16: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	765.52	0.00
0.50	0.00	0	765.52	0.00
1.00	0.00	0	765.52	0.00
1.50	0.00	0	765.52	0.00
2.00	0.00	0	765.52	0.00
2.50	0.00	0	765.52	0.00
3.00	0.00	0	765.52	0.00
3.50	0.00	0	765.52	0.00
4.00	0.00	0	765.52	0.00
4.50	0.00	0	765.52	0.00
5.00	0.00	0	765.52	0.00
5.50	0.00	0	765.52	0.00
6.00	0.00	0	765.52	0.00
6.50	0.00	1	765.54	0.00
7.00	0.01	4	765.57	0.01
7.50	0.02	7	765.59	0.01
8.00	0.02	9	765.60	0.02
8.50	0.04	12	765.61	0.03
9.00	0.05	17	765.62	0.05
9.50	0.06	20	765.63	0.06
10.00	0.09	26	765.65	0.09
10.50	0.14	35	765.67	0.13
11.00	0.22	49	765.70	0.21
11.50	**0.42**	**80**	**765.75**	**0.40**
12.00	**5.64**	**669**	**766.19**	**6.71**
12.50	0.58	113	765.79	0.63
13.00	0.38	79	765.75	0.39
13.50	0.29	64	765.73	0.30
14.00	0.23	54	765.71	0.23
14.50	0.20	49	765.70	0.21
15.00	0.18	45	765.69	0.18
15.50	0.16	41	765.69	0.16
16.00	0.14	37	765.68	0.14
16.50	0.13	35	765.67	0.13
17.00	0.13	34	765.67	0.13
17.50	0.12	32	765.67	0.12
18.00	0.11	31	765.66	0.11
18.50	0.10	29	765.66	0.10
19.00	0.10	28	765.66	0.10
19.50	0.09	26	765.65	0.09
20.00	0.08	24	765.65	0.08
20.50	0.08	24	765.65	0.08
21.00	0.08	23	765.64	0.08
21.50	0.08	23	765.64	0.08
22.00	0.07	23	765.64	0.07
22.50	0.07	22	765.64	0.07
23.00	0.07	22	765.64	0.07
23.50	0.07	22	765.64	0.07
24.00	0.07	21	765.64	0.07

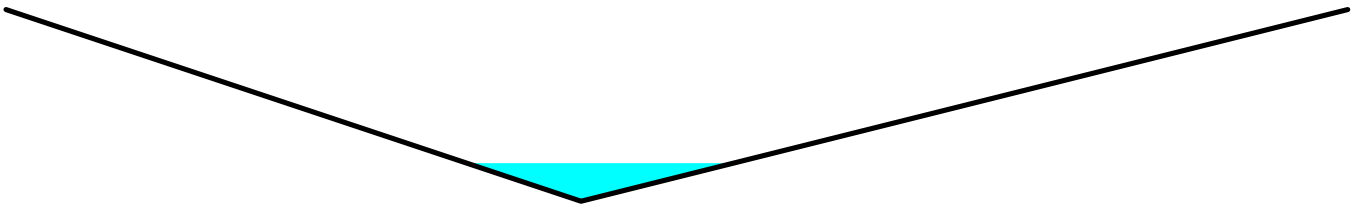
Summary for Reach DB-G17: (new Reach)

Inflow Area = 0.224 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 1.70 cfs @ 11.94 hrs, Volume= 0.075 af
Outflow = 1.69 cfs @ 11.95 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.07 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.08 fps, Avg. Travel Time= 1.2 min

Peak Storage= 41 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 126.25 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 75.0' Slope= 0.0188 '/'
Inlet Invert= 733.85', Outlet Invert= 732.44'



Hydrograph for Reach DB-G17: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	733.85	0.00
0.50	0.00	0	733.85	0.00
1.00	0.00	0	733.85	0.00
1.50	0.00	0	733.85	0.00
2.00	0.00	0	733.85	0.00
2.50	0.00	0	733.85	0.00
3.00	0.00	0	733.85	0.00
3.50	0.00	0	733.85	0.00
4.00	0.00	0	733.85	0.00
4.50	0.00	0	733.85	0.00
5.00	0.00	0	733.85	0.00
5.50	0.00	0	733.85	0.00
6.00	0.00	0	733.85	0.00
6.50	0.00	0	733.87	0.00
7.00	0.00	0	733.88	0.00
7.50	0.00	0	733.89	0.00
8.00	0.00	0	733.89	0.00
8.50	0.01	1	733.90	0.01
9.00	0.01	1	733.91	0.01
9.50	0.01	1	733.91	0.01
10.00	0.02	1	733.92	0.02
10.50	0.03	2	733.93	0.03
11.00	0.05	3	733.95	0.05
11.50	**0.09**	**4**	**733.98**	**0.09**
12.00	**1.18**	**33**	**734.21**	**1.26**
12.50	0.12	6	734.00	0.12
13.00	0.08	4	733.98	0.08
13.50	0.06	3	733.96	0.06
14.00	0.05	3	733.95	0.05
14.50	0.04	3	733.95	0.04
15.00	0.04	2	733.95	0.04
15.50	0.03	2	733.94	0.03
16.00	0.03	2	733.94	0.03
16.50	0.03	2	733.93	0.03
17.00	0.03	2	733.93	0.03
17.50	0.02	2	733.93	0.02
18.00	0.02	2	733.93	0.02
18.50	0.02	2	733.93	0.02
19.00	0.02	1	733.92	0.02
19.50	0.02	1	733.92	0.02
20.00	0.02	1	733.92	0.02
20.50	0.02	1	733.92	0.02
21.00	0.02	1	733.92	0.02
21.50	0.02	1	733.92	0.02
22.00	0.02	1	733.92	0.02
22.50	0.02	1	733.92	0.02
23.00	0.01	1	733.92	0.01
23.50	0.01	1	733.92	0.01
24.00	0.01	1	733.92	0.01

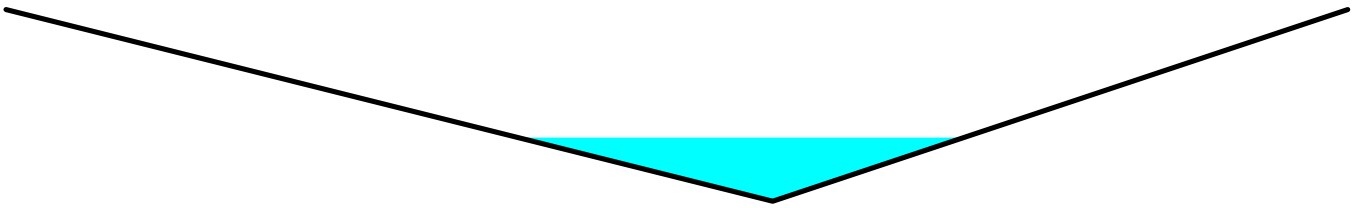
Summary for Reach DB-G18: (new Reach)

Inflow Area = 0.903 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 6.85 cfs @ 11.94 hrs, Volume= 0.302 af
Outflow = 6.66 cfs @ 11.96 hrs, Volume= 0.301 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.32 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 3.9 min

Peak Storage= 548 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.66'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 126.22 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 355.5' Slope= 0.0188 '/'
Inlet Invert= 739.12', Outlet Invert= 732.44'



Hydrograph for Reach DB-G18: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	739.12	0.00
0.50	0.00	0	739.12	0.00
1.00	0.00	0	739.12	0.00
1.50	0.00	0	739.12	0.00
2.00	0.00	0	739.12	0.00
2.50	0.00	0	739.12	0.00
3.00	0.00	0	739.12	0.00
3.50	0.00	0	739.12	0.00
4.00	0.00	0	739.12	0.00
4.50	0.00	0	739.12	0.00
5.00	0.00	0	739.12	0.00
5.50	0.00	0	739.12	0.00
6.00	0.00	0	739.12	0.00
6.50	0.00	1	739.14	0.00
7.00	0.01	3	739.17	0.01
7.50	0.01	5	739.18	0.01
8.00	0.02	6	739.19	0.02
8.50	0.03	9	739.20	0.03
9.00	0.04	12	739.22	0.04
9.50	0.05	14	739.23	0.05
10.00	0.08	19	739.24	0.07
10.50	0.11	25	739.26	0.11
11.00	0.18	36	739.29	0.18
11.50	**0.35**	**59**	**739.34**	**0.34**
12.00	**4.76**	**481**	**739.74**	**5.60**
12.50	0.49	82	739.38	0.53
13.00	0.32	57	739.33	0.33
13.50	0.24	46	739.31	0.25
14.00	0.19	39	739.30	0.20
14.50	0.17	35	739.29	0.17
15.00	0.15	33	739.28	0.16
15.50	0.14	30	739.28	0.14
16.00	0.12	27	739.27	0.12
16.50	0.11	26	739.26	0.11
17.00	0.11	25	739.26	0.11
17.50	0.10	24	739.26	0.10
18.00	0.09	22	739.25	0.09
18.50	0.09	21	739.25	0.09
19.00	0.08	20	739.25	0.08
19.50	0.07	19	739.24	0.08
20.00	0.07	18	739.24	0.07
20.50	0.07	17	739.24	0.07
21.00	0.07	17	739.24	0.07
21.50	0.06	17	739.24	0.06
22.00	0.06	17	739.23	0.06
22.50	0.06	16	739.23	0.06
23.00	0.06	16	739.23	0.06
23.50	0.06	16	739.23	0.06
24.00	0.06	16	739.23	0.06

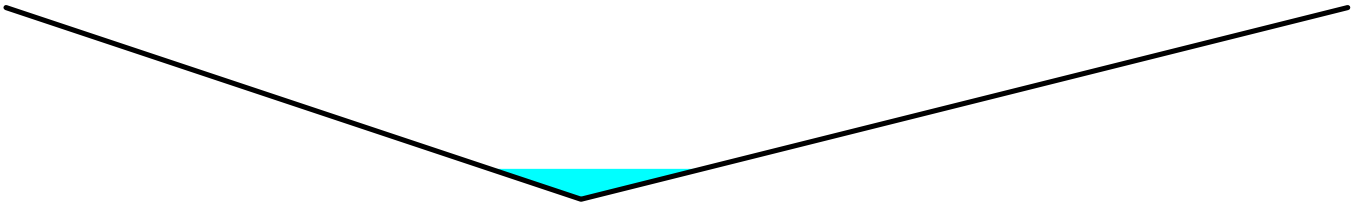
Summary for Reach DB-G19: (new Reach)

Inflow Area = 0.118 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 0.90 cfs @ 11.94 hrs, Volume= 0.039 af
Outflow = 0.90 cfs @ 11.95 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.56 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 0.5 min

Peak Storage= 10 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 122.53 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 28.8' Slope= 0.0177 '/'
Inlet Invert= 707.95', Outlet Invert= 707.44'



Hydrograph for Reach DB-G19: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	707.95	0.00
0.50	0.00	0	707.95	0.00
1.00	0.00	0	707.95	0.00
1.50	0.00	0	707.95	0.00
2.00	0.00	0	707.95	0.00
2.50	0.00	0	707.95	0.00
3.00	0.00	0	707.95	0.00
3.50	0.00	0	707.95	0.00
4.00	0.00	0	707.95	0.00
4.50	0.00	0	707.95	0.00
5.00	0.00	0	707.95	0.00
5.50	0.00	0	707.95	0.00
6.00	0.00	0	707.95	0.00
6.50	0.00	0	707.96	0.00
7.00	0.00	0	707.97	0.00
7.50	0.00	0	707.98	0.00
8.00	0.00	0	707.98	0.00
8.50	0.00	0	707.99	0.00
9.00	0.01	0	708.00	0.01
9.50	0.01	0	708.00	0.01
10.00	0.01	0	708.01	0.01
10.50	0.02	0	708.02	0.01
11.00	0.02	1	708.03	0.02
11.50	**0.05**	**1**	**708.05**	**0.05**
12.00	**0.62**	**8**	**708.23**	**0.64**
12.50	0.06	1	708.07	0.06
13.00	0.04	1	708.05	0.04
13.50	0.03	1	708.04	0.03
14.00	0.03	1	708.03	0.03
14.50	0.02	1	708.03	0.02
15.00	0.02	1	708.03	0.02
15.50	0.02	1	708.02	0.02
16.00	0.02	0	708.02	0.02
16.50	0.01	0	708.02	0.01
17.00	0.01	0	708.02	0.01
17.50	0.01	0	708.01	0.01
18.00	0.01	0	708.01	0.01
18.50	0.01	0	708.01	0.01
19.00	0.01	0	708.01	0.01
19.50	0.01	0	708.01	0.01
20.00	0.01	0	708.01	0.01
20.50	0.01	0	708.00	0.01
21.00	0.01	0	708.00	0.01
21.50	0.01	0	708.00	0.01
22.00	0.01	0	708.00	0.01
22.50	0.01	0	708.00	0.01
23.00	0.01	0	708.00	0.01
23.50	0.01	0	708.00	0.01
24.00	0.01	0	708.00	0.01

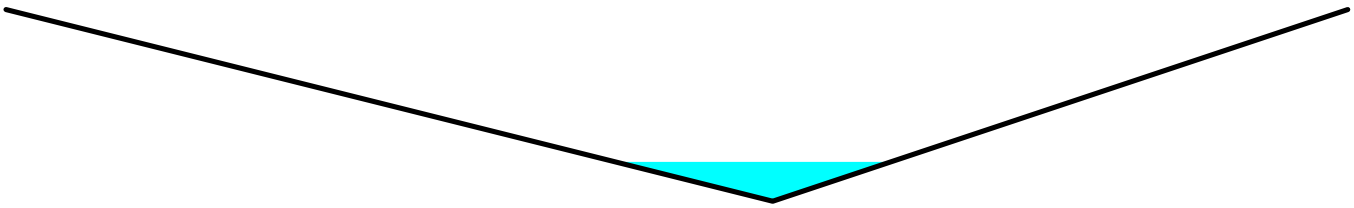
Summary for Reach DB-G2: (new Reach)

Inflow Area = 0.245 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 1.86 cfs @ 11.94 hrs, Volume= 0.082 af
Outflow = 1.84 cfs @ 11.95 hrs, Volume= 0.082 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.12 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.10 fps, Avg. Travel Time= 2.2 min

Peak Storage= 85 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 125.55 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 143.6' Slope= 0.0186 '/'
Inlet Invert= 935.61', Outlet Invert= 932.94'



Hydrograph for Reach DB-G2: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	935.61	0.00
0.50	0.00	0	935.61	0.00
1.00	0.00	0	935.61	0.00
1.50	0.00	0	935.61	0.00
2.00	0.00	0	935.61	0.00
2.50	0.00	0	935.61	0.00
3.00	0.00	0	935.61	0.00
3.50	0.00	0	935.61	0.00
4.00	0.00	0	935.61	0.00
4.50	0.00	0	935.61	0.00
5.00	0.00	0	935.61	0.00
5.50	0.00	0	935.61	0.00
6.00	0.00	0	935.61	0.00
6.50	0.00	0	935.62	0.00
7.00	0.00	0	935.64	0.00
7.50	0.00	1	935.65	0.00
8.00	0.01	1	935.65	0.01
8.50	0.01	1	935.66	0.01
9.00	0.01	2	935.67	0.01
9.50	0.01	2	935.68	0.01
10.00	0.02	3	935.68	0.02
10.50	0.03	4	935.70	0.03
11.00	0.05	6	935.71	0.05
11.50	**0.10**	**9**	**935.74**	**0.09**
12.00	**1.29**	**70**	**935.98**	**1.44**
12.50	0.13	12	935.77	0.14
13.00	0.09	9	935.74	0.09
13.50	0.07	7	935.73	0.07
14.00	0.05	6	935.72	0.05
14.50	0.05	5	935.71	0.05
15.00	0.04	5	935.71	0.04
15.50	0.04	5	935.70	0.04
16.00	0.03	4	935.70	0.03
16.50	0.03	4	935.70	0.03
17.00	0.03	4	935.70	0.03
17.50	0.03	4	935.69	0.03
18.00	0.03	3	935.69	0.03
18.50	0.02	3	935.69	0.02
19.00	0.02	3	935.69	0.02
19.50	0.02	3	935.68	0.02
20.00	0.02	3	935.68	0.02
20.50	0.02	3	935.68	0.02
21.00	0.02	3	935.68	0.02
21.50	0.02	3	935.68	0.02
22.00	0.02	2	935.68	0.02
22.50	0.02	2	935.68	0.02
23.00	0.02	2	935.68	0.02
23.50	0.02	2	935.68	0.02
24.00	0.02	2	935.68	0.02

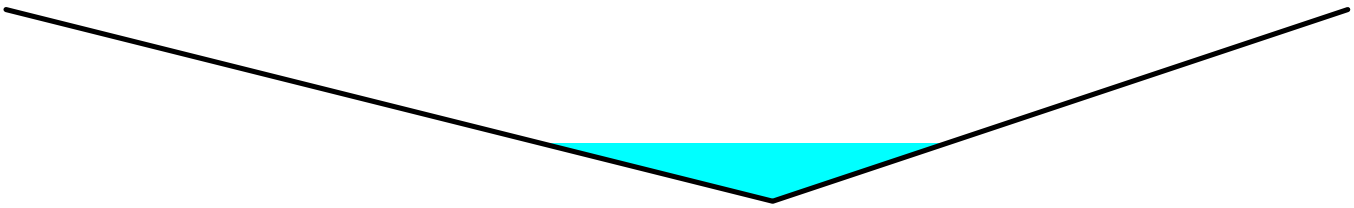
Summary for Reach DB-G20: (new Reach)

Inflow Area = 0.729 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 5.53 cfs @ 11.94 hrs, Volume= 0.244 af
Outflow = 5.42 cfs @ 11.96 hrs, Volume= 0.243 af, Atten= 2%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.21 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 3.2 min

Peak Storage= 362 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 130.43 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 281.1' Slope= 0.0201 '/'
Inlet Invert= 713.08', Outlet Invert= 707.44'



Hydrograph for Reach DB-G20: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	713.08	0.00
0.50	0.00	0	713.08	0.00
1.00	0.00	0	713.08	0.00
1.50	0.00	0	713.08	0.00
2.00	0.00	0	713.08	0.00
2.50	0.00	0	713.08	0.00
3.00	0.00	0	713.08	0.00
3.50	0.00	0	713.08	0.00
4.00	0.00	0	713.08	0.00
4.50	0.00	0	713.08	0.00
5.00	0.00	0	713.08	0.00
5.50	0.00	0	713.08	0.00
6.00	0.00	0	713.08	0.00
6.50	0.00	1	713.10	0.00
7.00	0.01	2	713.12	0.01
7.50	0.01	3	713.14	0.01
8.00	0.02	4	713.15	0.01
8.50	0.02	6	713.16	0.02
9.00	0.04	8	713.17	0.03
9.50	0.04	10	713.18	0.04
10.00	0.06	12	713.19	0.06
10.50	0.09	17	713.21	0.09
11.00	0.15	24	713.24	0.14
11.50	**0.29**	**39**	**713.28**	**0.28**
12.00	**3.84**	**311**	**713.64**	**4.43**
12.50	0.40	53	713.31	0.42
13.00	0.26	37	713.27	0.26
13.50	0.20	30	713.26	0.20
14.00	0.16	26	713.24	0.16
14.50	0.14	23	713.23	0.14
15.00	0.12	21	713.23	0.13
15.50	0.11	20	713.22	0.11
16.00	0.10	18	713.21	0.10
16.50	0.09	17	713.21	0.09
17.00	0.09	16	713.21	0.09
17.50	0.08	15	713.20	0.08
18.00	0.08	15	713.20	0.08
18.50	0.07	14	713.20	0.07
19.00	0.07	13	713.20	0.07
19.50	0.06	12	713.19	0.06
20.00	0.06	12	713.19	0.06
20.50	0.05	11	713.19	0.05
21.00	0.05	11	713.19	0.05
21.50	0.05	11	713.19	0.05
22.00	0.05	11	713.18	0.05
22.50	0.05	11	713.18	0.05
23.00	0.05	11	713.18	0.05
23.50	0.05	10	713.18	0.05
24.00	0.05	10	713.18	0.05

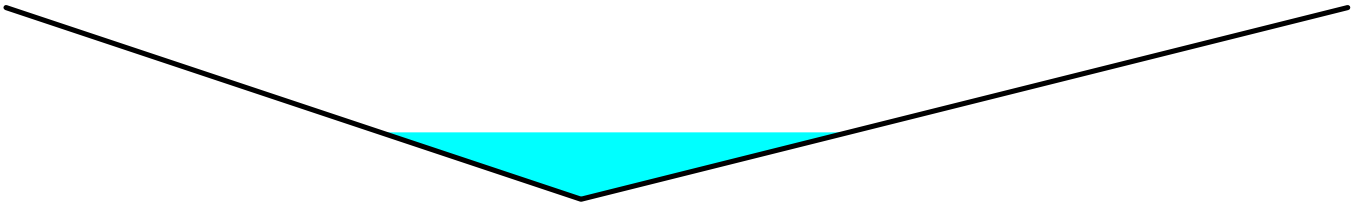
Summary for Reach DB-G24: (new Reach)

Inflow Area = 1.208 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 9.11 cfs @ 11.95 hrs, Volume= 0.403 af
Outflow = 8.73 cfs @ 11.97 hrs, Volume= 0.403 af, Atten= 4%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.10 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 5.0 min

Peak Storage= 919 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 143.93 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 537.4' Slope= 0.0244 '/'
Inlet Invert= 841.32', Outlet Invert= 828.19'



Hydrograph for Reach DB-G24: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	841.32	0.00
0.50	0.00	0	841.32	0.00
1.00	0.00	0	841.32	0.00
1.50	0.00	0	841.32	0.00
2.00	0.00	0	841.32	0.00
2.50	0.00	0	841.32	0.00
3.00	0.00	0	841.32	0.00
3.50	0.00	0	841.32	0.00
4.00	0.00	0	841.32	0.00
4.50	0.00	0	841.32	0.00
5.00	0.00	0	841.32	0.00
5.50	0.00	0	841.32	0.00
6.00	0.00	0	841.32	0.00
6.50	0.00	1	841.34	0.00
7.00	0.01	5	841.37	0.01
7.50	0.02	8	841.38	0.02
8.00	0.03	11	841.40	0.02
8.50	0.04	15	841.41	0.04
9.00	0.06	21	841.42	0.06
9.50	0.07	25	841.43	0.07
10.00	0.10	31	841.45	0.10
10.50	0.15	43	841.47	0.15
11.00	0.24	61	841.50	0.23
11.50	**0.47**	**99**	**841.55**	**0.45**
12.00	**6.57**	**841**	**841.99**	**7.75**
12.50	0.66	141	841.59	0.72
13.00	0.43	98	841.55	0.44
13.50	0.33	80	841.53	0.34
14.00	0.26	67	841.51	0.26
14.50	0.23	61	841.50	0.23
15.00	0.21	56	841.49	0.21
15.50	0.18	51	841.48	0.19
16.00	0.16	46	841.48	0.16
16.50	0.15	44	841.47	0.15
17.00	0.14	42	841.47	0.14
17.50	0.13	40	841.47	0.13
18.00	0.13	38	841.46	0.13
18.50	0.12	36	841.46	0.12
19.00	0.11	34	841.45	0.11
19.50	0.10	32	841.45	0.10
20.00	0.09	30	841.45	0.09
20.50	0.09	29	841.44	0.09
21.00	0.09	29	841.44	0.09
21.50	0.09	29	841.44	0.09
22.00	0.08	28	841.44	0.08
22.50	0.08	28	841.44	0.08
23.00	0.08	27	841.44	0.08
23.50	0.08	27	841.44	0.08
24.00	0.08	27	841.44	0.08

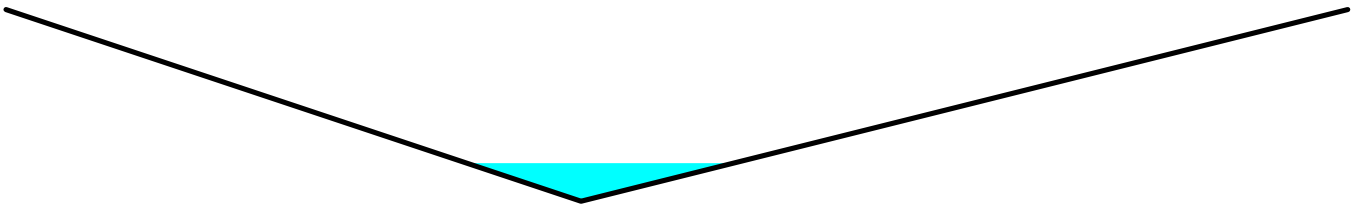
Summary for Reach DB-G25: (new Reach)

Inflow Area = 0.260 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 1.97 cfs @ 11.95 hrs, Volume= 0.087 af
Outflow = 1.95 cfs @ 11.95 hrs, Volume= 0.087 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.52 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.24 fps, Avg. Travel Time= 1.9 min

Peak Storage= 80 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 144.53 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 145.3' Slope= 0.0246 '/'
Inlet Invert= 817.83', Outlet Invert= 814.25'



Hydrograph for Reach DB-G25: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	817.83	0.00
0.50	0.00	0	817.83	0.00
1.00	0.00	0	817.83	0.00
1.50	0.00	0	817.83	0.00
2.00	0.00	0	817.83	0.00
2.50	0.00	0	817.83	0.00
3.00	0.00	0	817.83	0.00
3.50	0.00	0	817.83	0.00
4.00	0.00	0	817.83	0.00
4.50	0.00	0	817.83	0.00
5.00	0.00	0	817.83	0.00
5.50	0.00	0	817.83	0.00
6.00	0.00	0	817.83	0.00
6.50	0.00	0	817.84	0.00
7.00	0.00	0	817.86	0.00
7.50	0.00	1	817.87	0.00
8.00	0.01	1	817.87	0.01
8.50	0.01	1	817.88	0.01
9.00	0.01	2	817.89	0.01
9.50	0.02	2	817.89	0.02
10.00	0.02	3	817.90	0.02
10.50	0.03	4	817.91	0.03
11.00	0.05	5	817.93	0.05
11.50	**0.10**	**9**	**817.96**	**0.10**
12.00	**1.39**	**67**	**818.19**	**1.53**
12.50	0.14	12	817.98	0.15
13.00	0.09	8	817.96	0.09
13.50	0.07	7	817.94	0.07
14.00	0.06	6	817.93	0.06
14.50	0.05	5	817.93	0.05
15.00	0.04	5	817.93	0.04
15.50	0.04	4	817.92	0.04
16.00	0.03	4	817.92	0.03
16.50	0.03	4	817.91	0.03
17.00	0.03	4	817.91	0.03
17.50	0.03	3	817.91	0.03
18.00	0.03	3	817.91	0.03
18.50	0.03	3	817.91	0.03
19.00	0.02	3	817.90	0.02
19.50	0.02	3	817.90	0.02
20.00	0.02	3	817.90	0.02
20.50	0.02	2	817.90	0.02
21.00	0.02	2	817.90	0.02
21.50	0.02	2	817.90	0.02
22.00	0.02	2	817.90	0.02
22.50	0.02	2	817.90	0.02
23.00	0.02	2	817.90	0.02
23.50	0.02	2	817.90	0.02
24.00	0.02	2	817.90	0.02

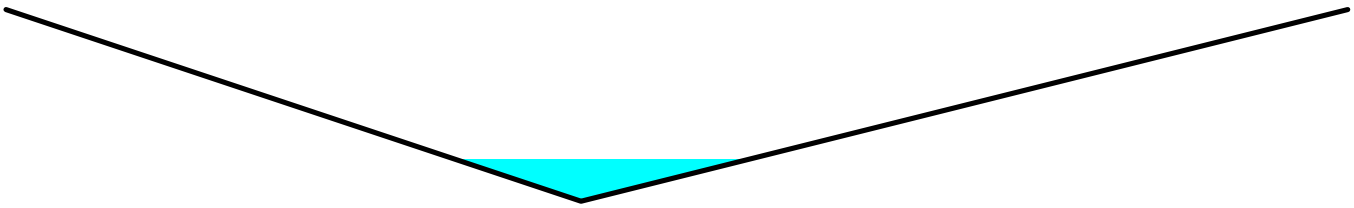
Summary for Reach DB-G3: (new Reach)

Inflow Area = 0.565 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 4.28 cfs @ 11.95 hrs, Volume= 0.189 af
Outflow = 4.23 cfs @ 11.96 hrs, Volume= 0.189 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.26 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.21 fps, Avg. Travel Time= 2.2 min

Peak Storage= 199 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.44'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 240.93 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 294.9' Slope= 0.0685 '/'
Inlet Invert= 927.59', Outlet Invert= 907.40'



Hydrograph for Reach DB-G3: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	927.59	0.00
0.50	0.00	0	927.59	0.00
1.00	0.00	0	927.59	0.00
1.50	0.00	0	927.59	0.00
2.00	0.00	0	927.59	0.00
2.50	0.00	0	927.59	0.00
3.00	0.00	0	927.59	0.00
3.50	0.00	0	927.59	0.00
4.00	0.00	0	927.59	0.00
4.50	0.00	0	927.59	0.00
5.00	0.00	0	927.59	0.00
5.50	0.00	0	927.59	0.00
6.00	0.00	0	927.59	0.00
6.50	0.00	0	927.61	0.00
7.00	0.00	1	927.62	0.00
7.50	0.01	2	927.63	0.01
8.00	0.01	2	927.64	0.01
8.50	0.02	3	927.65	0.02
9.00	0.03	4	927.65	0.03
9.50	0.03	5	927.66	0.03
10.00	0.05	7	927.67	0.05
10.50	0.07	9	927.68	0.07
11.00	0.11	13	927.70	0.11
11.50	**0.22**	**21**	**927.73**	**0.22**
12.00	**3.03**	**168**	**927.99**	**3.37**
12.50	0.31	29	927.76	0.32
13.00	0.20	20	927.73	0.20
13.50	0.15	17	927.72	0.15
14.00	0.12	14	927.71	0.12
14.50	0.11	13	927.70	0.11
15.00	0.10	12	927.70	0.10
15.50	0.09	11	927.69	0.09
16.00	0.07	10	927.69	0.08
16.50	0.07	9	927.68	0.07
17.00	0.07	9	927.68	0.07
17.50	0.06	8	927.68	0.06
18.00	0.06	8	927.68	0.06
18.50	0.05	8	927.68	0.05
19.00	0.05	7	927.67	0.05
19.50	0.05	7	927.67	0.05
20.00	0.04	6	927.67	0.04
20.50	0.04	6	927.67	0.04
21.00	0.04	6	927.67	0.04
21.50	0.04	6	927.67	0.04
22.00	0.04	6	927.67	0.04
22.50	0.04	6	927.66	0.04
23.00	0.04	6	927.66	0.04
23.50	0.04	6	927.66	0.04
24.00	0.04	6	927.66	0.04

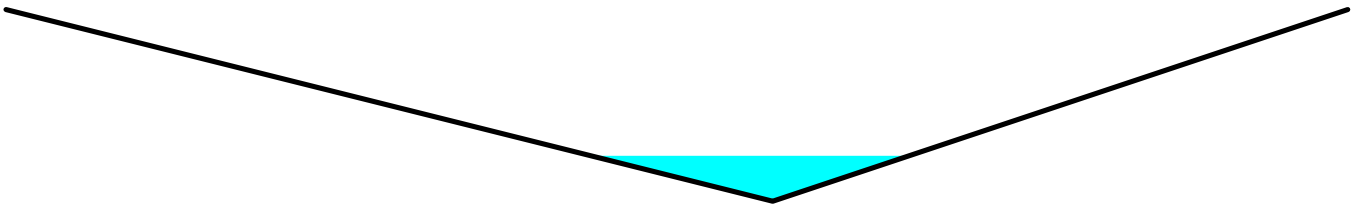
Summary for Reach DB-G4: (new Reach)

Inflow Area = 0.413 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 3.13 cfs @ 11.94 hrs, Volume= 0.138 af
Outflow = 3.09 cfs @ 11.96 hrs, Volume= 0.138 af, Atten= 2%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.90 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 2.6 min

Peak Storage= 172 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.48'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 142.24 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 217.5' Slope= 0.0239 '/'
Inlet Invert= 912.59', Outlet Invert= 907.40'



Hydrograph for Reach DB-G4: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	912.59	0.00
0.50	0.00	0	912.59	0.00
1.00	0.00	0	912.59	0.00
1.50	0.00	0	912.59	0.00
2.00	0.00	0	912.59	0.00
2.50	0.00	0	912.59	0.00
3.00	0.00	0	912.59	0.00
3.50	0.00	0	912.59	0.00
4.00	0.00	0	912.59	0.00
4.50	0.00	0	912.59	0.00
5.00	0.00	0	912.59	0.00
5.50	0.00	0	912.59	0.00
6.00	0.00	0	912.59	0.00
6.50	0.00	0	912.61	0.00
7.00	0.00	1	912.62	0.00
7.50	0.01	2	912.63	0.01
8.00	0.01	2	912.64	0.01
8.50	0.01	3	912.65	0.01
9.00	0.02	4	912.66	0.02
9.50	0.02	5	912.67	0.02
10.00	0.03	6	912.68	0.03
10.50	0.05	8	912.69	0.05
11.00	0.08	11	912.71	0.08
11.50	**0.16**	**18**	**912.75**	**0.16**
12.00	**2.18**	**146**	**913.03**	**2.47**
12.50	0.22	25	912.77	0.24
13.00	0.15	18	912.74	0.15
13.50	0.11	14	912.73	0.11
14.00	0.09	12	912.72	0.09
14.50	0.08	11	912.71	0.08
15.00	0.07	10	912.71	0.07
15.50	0.06	9	912.70	0.06
16.00	0.05	8	912.69	0.06
16.50	0.05	8	912.69	0.05
17.00	0.05	8	912.69	0.05
17.50	0.05	7	912.69	0.05
18.00	0.04	7	912.69	0.04
18.50	0.04	7	912.68	0.04
19.00	0.04	6	912.68	0.04
19.50	0.03	6	912.68	0.03
20.00	0.03	5	912.67	0.03
20.50	0.03	5	912.67	0.03
21.00	0.03	5	912.67	0.03
21.50	0.03	5	912.67	0.03
22.00	0.03	5	912.67	0.03
22.50	0.03	5	912.67	0.03
23.00	0.03	5	912.67	0.03
23.50	0.03	5	912.67	0.03
24.00	0.03	5	912.67	0.03

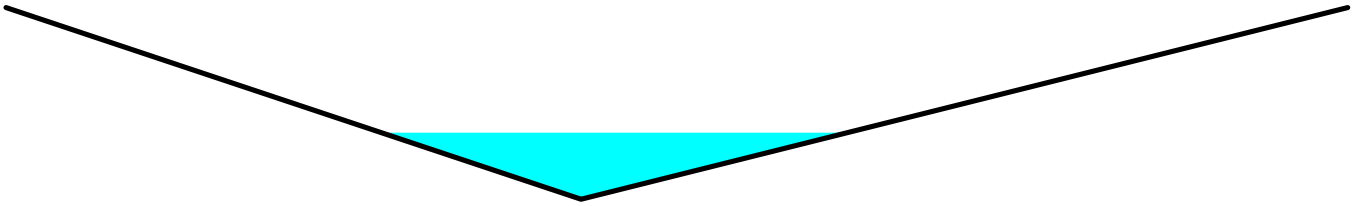
Summary for Reach DB-G5: (new Reach)

Inflow Area = 1.053 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 7.91 cfs @ 11.95 hrs, Volume= 0.352 af
Outflow = 7.71 cfs @ 11.96 hrs, Volume= 0.351 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.56 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 3.7 min

Peak Storage= 596 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 128.99 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 352.1' Slope= 0.0196 '/'
Inlet Invert= 889.32', Outlet Invert= 882.41'



Hydrograph for Reach DB-G5: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	889.32	0.00
0.50	0.00	0	889.32	0.00
1.00	0.00	0	889.32	0.00
1.50	0.00	0	889.32	0.00
2.00	0.00	0	889.32	0.00
2.50	0.00	0	889.32	0.00
3.00	0.00	0	889.32	0.00
3.50	0.00	0	889.32	0.00
4.00	0.00	0	889.32	0.00
4.50	0.00	0	889.32	0.00
5.00	0.00	0	889.32	0.00
5.50	0.00	0	889.32	0.00
6.00	0.00	0	889.32	0.00
6.50	0.00	1	889.34	0.00
7.00	0.01	3	889.37	0.01
7.50	0.02	5	889.38	0.01
8.00	0.02	7	889.40	0.02
8.50	0.03	10	889.41	0.03
9.00	0.05	13	889.42	0.05
9.50	0.06	16	889.43	0.06
10.00	0.09	20	889.45	0.09
10.50	0.13	28	889.47	0.13
11.00	0.21	39	889.50	0.21
11.50	**0.41**	**64**	**889.55**	**0.39**
12.00	**5.81**	**534**	**889.98**	**6.66**
12.50	0.58	90	889.59	0.62
13.00	0.37	63	889.55	0.38
13.50	0.28	51	889.52	0.29
14.00	0.22	43	889.51	0.23
14.50	0.20	39	889.50	0.20
15.00	0.18	36	889.49	0.18
15.50	0.16	33	889.48	0.16
16.00	0.14	30	889.47	0.14
16.50	0.13	28	889.47	0.13
17.00	0.12	27	889.47	0.12
17.50	0.12	26	889.46	0.12
18.00	0.11	25	889.46	0.11
18.50	0.10	23	889.46	0.10
19.00	0.09	22	889.45	0.10
19.50	0.09	21	889.45	0.09
20.00	0.08	19	889.45	0.08
20.50	0.08	19	889.44	0.08
21.00	0.08	19	889.44	0.08
21.50	0.07	18	889.44	0.07
22.00	0.07	18	889.44	0.07
22.50	0.07	18	889.44	0.07
23.00	0.07	18	889.44	0.07
23.50	0.07	17	889.44	0.07
24.00	0.07	17	889.44	0.07

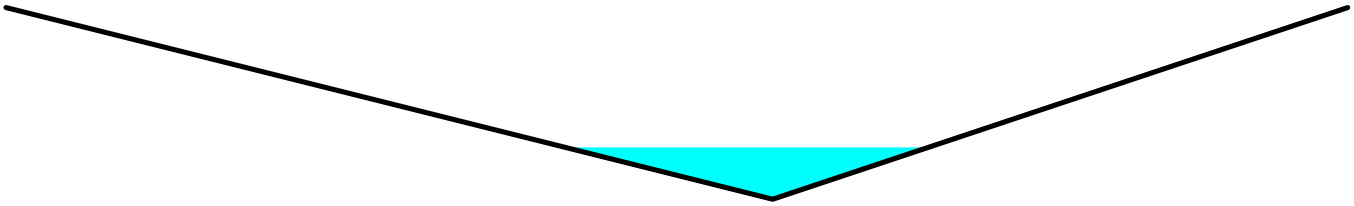
Summary for Reach DB-G6: (new Reach)

Inflow Area = 0.583 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 4.43 cfs @ 11.94 hrs, Volume= 0.195 af
Outflow = 4.33 cfs @ 11.96 hrs, Volume= 0.195 af, Atten= 2%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.24 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.49 fps, Avg. Travel Time= 3.3 min

Peak Storage= 297 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 142.30 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 291.4' Slope= 0.0239 '/'
Inlet Invert= 889.37', Outlet Invert= 882.41'



Hydrograph for Reach DB-G6: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	889.37	0.00
0.50	0.00	0	889.37	0.00
1.00	0.00	0	889.37	0.00
1.50	0.00	0	889.37	0.00
2.00	0.00	0	889.37	0.00
2.50	0.00	0	889.37	0.00
3.00	0.00	0	889.37	0.00
3.50	0.00	0	889.37	0.00
4.00	0.00	0	889.37	0.00
4.50	0.00	0	889.37	0.00
5.00	0.00	0	889.37	0.00
5.50	0.00	0	889.37	0.00
6.00	0.00	0	889.37	0.00
6.50	0.00	0	889.39	0.00
7.00	0.00	2	889.41	0.00
7.50	0.01	3	889.42	0.01
8.00	0.01	4	889.43	0.01
8.50	0.02	5	889.44	0.02
9.00	0.03	7	889.45	0.03
9.50	0.03	8	889.46	0.03
10.00	0.05	10	889.47	0.05
10.50	0.07	14	889.49	0.07
11.00	0.12	20	889.51	0.11
11.50	**0.23**	**32**	**889.55**	**0.22**
12.00	**3.07**	**256**	**889.87**	**3.55**
12.50	0.32	44	889.58	0.34
13.00	0.21	31	889.54	0.21
13.50	0.16	25	889.53	0.16
14.00	0.12	21	889.51	0.13
14.50	0.11	19	889.51	0.11
15.00	0.10	18	889.50	0.10
15.50	0.09	16	889.50	0.09
16.00	0.08	15	889.49	0.08
16.50	0.07	14	889.49	0.07
17.00	0.07	13	889.48	0.07
17.50	0.06	13	889.48	0.06
18.00	0.06	12	889.48	0.06
18.50	0.06	11	889.48	0.06
19.00	0.05	11	889.47	0.05
19.50	0.05	10	889.47	0.05
20.00	0.04	10	889.47	0.04
20.50	0.04	9	889.47	0.04
21.00	0.04	9	889.46	0.04
21.50	0.04	9	889.46	0.04
22.00	0.04	9	889.46	0.04
22.50	0.04	9	889.46	0.04
23.00	0.04	9	889.46	0.04
23.50	0.04	8	889.46	0.04
24.00	0.04	8	889.46	0.04

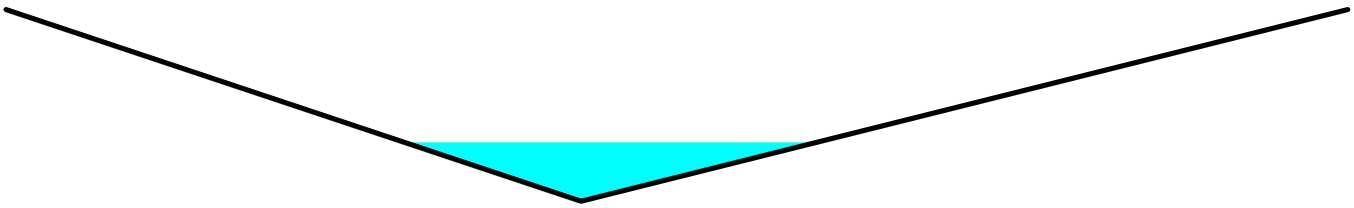
Summary for Reach DB-G7: (new Reach)

Inflow Area = 0.751 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 5.70 cfs @ 11.94 hrs, Volume= 0.251 af
Outflow = 5.57 cfs @ 11.96 hrs, Volume= 0.251 af, Atten= 2%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.20 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 3.5 min

Peak Storage= 405 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 129.08 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 305.8' Slope= 0.0197 '/'
Inlet Invert= 863.42', Outlet Invert= 857.41'



Hydrograph for Reach DB-G7: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	863.42	0.00
0.50	0.00	0	863.42	0.00
1.00	0.00	0	863.42	0.00
1.50	0.00	0	863.42	0.00
2.00	0.00	0	863.42	0.00
2.50	0.00	0	863.42	0.00
3.00	0.00	0	863.42	0.00
3.50	0.00	0	863.42	0.00
4.00	0.00	0	863.42	0.00
4.50	0.00	0	863.42	0.00
5.00	0.00	0	863.42	0.00
5.50	0.00	0	863.42	0.00
6.00	0.00	0	863.42	0.00
6.50	0.00	1	863.44	0.00
7.00	0.01	2	863.46	0.01
7.50	0.01	4	863.48	0.01
8.00	0.02	5	863.49	0.02
8.50	0.02	7	863.50	0.02
9.00	0.04	9	863.51	0.04
9.50	0.04	11	863.52	0.04
10.00	0.06	14	863.53	0.06
10.50	0.10	19	863.55	0.09
11.00	0.15	27	863.58	0.15
11.50	**0.29**	**43**	**863.62**	**0.28**
12.00	**3.96**	**351**	**863.99**	**4.60**
12.50	0.41	60	863.66	0.43
13.00	0.26	42	863.62	0.27
13.50	0.20	34	863.60	0.21
14.00	0.16	29	863.58	0.16
14.50	0.14	26	863.58	0.14
15.00	0.13	24	863.57	0.13
15.50	0.11	22	863.56	0.12
16.00	0.10	20	863.56	0.10
16.50	0.09	19	863.55	0.09
17.00	0.09	18	863.55	0.09
17.50	0.08	17	863.55	0.08
18.00	0.08	16	863.54	0.08
18.50	0.07	16	863.54	0.07
19.00	0.07	15	863.54	0.07
19.50	0.06	14	863.53	0.06
20.00	0.06	13	863.53	0.06
20.50	0.06	13	863.53	0.06
21.00	0.05	13	863.53	0.05
21.50	0.05	12	863.53	0.05
22.00	0.05	12	863.53	0.05
22.50	0.05	12	863.53	0.05
23.00	0.05	12	863.52	0.05
23.50	0.05	12	863.52	0.05
24.00	0.05	11	863.52	0.05

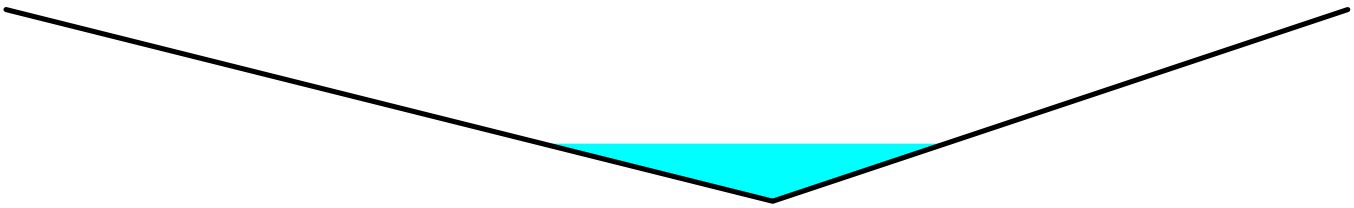
Summary for Reach DB-G8: (new Reach)

Inflow Area = 0.758 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 5.74 cfs @ 11.95 hrs, Volume= 0.253 af
Outflow = 5.57 cfs @ 11.96 hrs, Volume= 0.253 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.42 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 3.9 min

Peak Storage= 462 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.60'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 137.92 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 366.4' Slope= 0.0224 '/'
Inlet Invert= 865.63', Outlet Invert= 857.41'



Hydrograph for Reach DB-G8: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	865.63	0.00
0.50	0.00	0	865.63	0.00
1.00	0.00	0	865.63	0.00
1.50	0.00	0	865.63	0.00
2.00	0.00	0	865.63	0.00
2.50	0.00	0	865.63	0.00
3.00	0.00	0	865.63	0.00
3.50	0.00	0	865.63	0.00
4.00	0.00	0	865.63	0.00
4.50	0.00	0	865.63	0.00
5.00	0.00	0	865.63	0.00
5.50	0.00	0	865.63	0.00
6.00	0.00	0	865.63	0.00
6.50	0.00	1	865.65	0.00
7.00	0.01	3	865.67	0.01
7.50	0.01	4	865.69	0.01
8.00	0.02	5	865.69	0.02
8.50	0.02	8	865.71	0.02
9.00	0.04	10	865.72	0.04
9.50	0.05	12	865.73	0.04
10.00	0.06	16	865.74	0.06
10.50	0.10	21	865.76	0.09
11.00	0.15	30	865.78	0.15
11.50	**0.30**	**49**	**865.83**	**0.28**
12.00	**4.06**	**410**	**866.20**	**4.74**
12.50	0.41	69	865.86	0.44
13.00	0.27	48	865.82	0.27
13.50	0.20	39	865.80	0.21
14.00	0.16	33	865.79	0.16
14.50	0.14	30	865.78	0.15
15.00	0.13	28	865.78	0.13
15.50	0.12	25	865.77	0.12
16.00	0.10	23	865.76	0.10
16.50	0.09	22	865.76	0.09
17.00	0.09	21	865.76	0.09
17.50	0.08	20	865.75	0.08
18.00	0.08	19	865.75	0.08
18.50	0.07	18	865.75	0.07
19.00	0.07	17	865.74	0.07
19.50	0.06	16	865.74	0.06
20.00	0.06	15	865.74	0.06
20.50	0.06	15	865.74	0.06
21.00	0.05	14	865.74	0.05
21.50	0.05	14	865.73	0.05
22.00	0.05	14	865.73	0.05
22.50	0.05	14	865.73	0.05
23.00	0.05	14	865.73	0.05
23.50	0.05	13	865.73	0.05
24.00	0.05	13	865.73	0.05

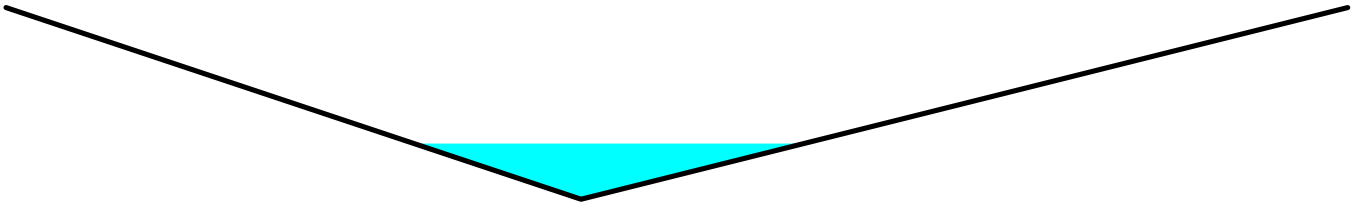
Summary for Reach DB-G9: (new Reach)

Inflow Area = 0.646 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 4.90 cfs @ 11.94 hrs, Volume= 0.216 af
Outflow = 4.81 cfs @ 11.96 hrs, Volume= 0.216 af, Atten= 2%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.05 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.42 fps, Avg. Travel Time= 3.0 min

Peak Storage= 308 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 129.06 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 259.6' Slope= 0.0196 '/'
Inlet Invert= 837.52', Outlet Invert= 832.42'



Hydrograph for Reach DB-G9: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	837.52	0.00
0.50	0.00	0	837.52	0.00
1.00	0.00	0	837.52	0.00
1.50	0.00	0	837.52	0.00
2.00	0.00	0	837.52	0.00
2.50	0.00	0	837.52	0.00
3.00	0.00	0	837.52	0.00
3.50	0.00	0	837.52	0.00
4.00	0.00	0	837.52	0.00
4.50	0.00	0	837.52	0.00
5.00	0.00	0	837.52	0.00
5.50	0.00	0	837.52	0.00
6.00	0.00	0	837.52	0.00
6.50	0.00	0	837.54	0.00
7.00	0.01	2	837.56	0.00
7.50	0.01	3	837.57	0.01
8.00	0.01	4	837.58	0.01
8.50	0.02	5	837.59	0.02
9.00	0.03	7	837.61	0.03
9.50	0.04	8	837.61	0.04
10.00	0.05	10	837.63	0.05
10.50	0.08	14	837.64	0.08
11.00	0.13	20	837.67	0.13
11.50	**0.25**	**33**	**837.71**	**0.24**
12.00	**3.41**	**264**	**838.06**	**3.91**
12.50	0.35	45	837.74	0.37
13.00	0.23	32	837.71	0.23
13.50	0.17	26	837.69	0.18
14.00	0.14	22	837.67	0.14
14.50	0.12	20	837.67	0.12
15.00	0.11	18	837.66	0.11
15.50	0.10	17	837.66	0.10
16.00	0.09	15	837.65	0.09
16.50	0.08	14	837.65	0.08
17.00	0.08	14	837.64	0.08
17.50	0.07	13	837.64	0.07
18.00	0.07	13	837.64	0.07
18.50	0.06	12	837.63	0.06
19.00	0.06	11	837.63	0.06
19.50	0.05	11	837.63	0.05
20.00	0.05	10	837.62	0.05
20.50	0.05	10	837.62	0.05
21.00	0.05	10	837.62	0.05
21.50	0.05	9	837.62	0.05
22.00	0.04	9	837.62	0.04
22.50	0.04	9	837.62	0.04
23.00	0.04	9	837.62	0.04
23.50	0.04	9	837.62	0.04
24.00	0.04	9	837.62	0.04

Summary for Reach DC-G1: (new Reach)

Inflow Area = 0.572 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 4.30 cfs @ 11.95 hrs, Volume= 0.191 af
Outflow = 4.29 cfs @ 11.96 hrs, Volume= 0.191 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.02 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.42 fps, Avg. Travel Time= 1.2 min

Peak Storage= 107 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 749.02 cfs

10.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 99.8' Slope= 0.2504 '/'
Inlet Invert= 932.39', Outlet Invert= 907.40'

‡

Hydrograph for Reach DC-G1: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	932.39	0.00
0.50	0.00	0	932.39	0.00
1.00	0.00	0	932.39	0.00
1.50	0.00	0	932.39	0.00
2.00	0.00	0	932.39	0.00
2.50	0.00	0	932.39	0.00
3.00	0.00	0	932.39	0.00
3.50	0.00	0	932.39	0.00
4.00	0.00	0	932.39	0.00
4.50	0.00	0	932.39	0.00
5.00	0.00	0	932.39	0.00
5.50	0.00	0	932.39	0.00
6.00	0.00	0	932.39	0.00
6.50	0.00	0	932.39	0.00
7.00	0.00	0	932.39	0.00
7.50	0.01	1	932.39	0.01
8.00	0.01	1	932.39	0.01
8.50	0.02	1	932.39	0.02
9.00	0.03	2	932.39	0.03
9.50	0.03	2	932.39	0.03
10.00	0.05	3	932.39	0.05
10.50	0.07	5	932.40	0.07
11.00	0.11	8	932.40	0.11
11.50	**0.22**	**16**	**932.41**	**0.21**
12.00	**3.33**	**94**	**932.48**	**3.49**
12.50	0.32	22	932.41	0.33
13.00	0.20	15	932.41	0.21
13.50	0.16	12	932.40	0.16
14.00	0.12	9	932.40	0.12
14.50	0.11	8	932.40	0.11
15.00	0.10	7	932.40	0.10
15.50	0.09	6	932.40	0.09
16.00	0.08	6	932.40	0.08
16.50	0.07	5	932.40	0.07
17.00	0.07	5	932.39	0.07
17.50	0.06	5	932.39	0.06
18.00	0.06	4	932.39	0.06
18.50	0.06	4	932.39	0.06
19.00	0.05	4	932.39	0.05
19.50	0.05	3	932.39	0.05
20.00	0.04	3	932.39	0.04
20.50	0.04	3	932.39	0.04
21.00	0.04	3	932.39	0.04
21.50	0.04	3	932.39	0.04
22.00	0.04	3	932.39	0.04
22.50	0.04	3	932.39	0.04
23.00	0.04	3	932.39	0.04
23.50	0.04	3	932.39	0.04
24.00	0.04	3	932.39	0.04

Summary for Reach DC-G10: (new Reach)

Inflow Area = 12.945 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 94.92 cfs @ 11.97 hrs, Volume= 4.315 af
Outflow = 94.89 cfs @ 11.97 hrs, Volume= 4.314 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 12.47 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.80 fps, Avg. Travel Time= 0.6 min

Peak Storage= 789 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.64'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 756.10 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 103.7' Slope= 0.2552 '/'
Inlet Invert= 707.44', Outlet Invert= 680.98'

‡

Hydrograph for Reach DC-G10: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	707.44	0.00
0.50	0.00	0	707.44	0.00
1.00	0.00	0	707.44	0.00
1.50	0.00	0	707.44	0.00
2.00	0.00	0	707.44	0.00
2.50	0.00	0	707.44	0.00
3.00	0.00	0	707.44	0.00
3.50	0.00	0	707.44	0.00
4.00	0.00	0	707.44	0.00
4.50	0.00	0	707.44	0.00
5.00	0.00	0	707.44	0.00
5.50	0.00	0	707.44	0.00
6.00	0.00	0	707.44	0.00
6.50	0.01	1	707.44	0.01
7.00	0.08	6	707.45	0.08
7.50	0.16	12	707.45	0.16
8.00	0.24	18	707.46	0.24
8.50	0.38	24	707.46	0.38
9.00	0.58	31	707.47	0.58
9.50	0.74	37	707.48	0.74
10.00	1.02	45	707.48	1.02
10.50	1.55	58	707.50	1.54
11.00	2.48	78	707.51	2.46
11.50	**4.73**	**116**	**707.55**	**4.71**
12.00	**84.54**	**736**	**708.04**	**85.42**
12.50	7.80	160	707.59	7.85
13.00	4.76	117	707.55	4.78
13.50	3.61	99	707.53	3.62
14.00	2.85	86	707.52	2.86
14.50	2.49	79	707.51	2.50
15.00	2.25	74	707.51	2.25
15.50	2.00	69	707.51	2.01
16.00	1.76	64	707.50	1.76
16.50	1.62	61	707.50	1.62
17.00	1.53	58	707.50	1.54
17.50	1.45	56	707.49	1.45
18.00	1.36	54	707.49	1.36
18.50	1.27	52	707.49	1.27
19.00	1.18	49	707.49	1.18
19.50	1.09	47	707.48	1.09
20.00	0.99	45	707.48	1.00
20.50	0.95	44	707.48	0.96
21.00	0.94	43	707.48	0.94
21.50	0.92	43	707.48	0.92
22.00	0.90	43	707.48	0.90
22.50	0.88	42	707.48	0.88
23.00	0.87	41	707.48	0.87
23.50	0.85	41	707.48	0.85
24.00	0.83	40	707.48	0.83

Summary for Reach DC-G12: (new Reach)

Inflow Area = 1.208 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 8.73 cfs @ 11.97 hrs, Volume= 0.403 af
Outflow = 8.73 cfs @ 11.97 hrs, Volume= 0.403 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.35 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.83 fps, Avg. Travel Time= 0.2 min

Peak Storage= 24 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 466.00 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 19.9' Slope= 0.3080 '/'
Inlet Invert= 828.19', Outlet Invert= 822.06'

‡

Hydrograph for Reach DC-G12: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	828.19	0.00
0.50	0.00	0	828.19	0.00
1.00	0.00	0	828.19	0.00
1.50	0.00	0	828.19	0.00
2.00	0.00	0	828.19	0.00
2.50	0.00	0	828.19	0.00
3.00	0.00	0	828.19	0.00
3.50	0.00	0	828.19	0.00
4.00	0.00	0	828.19	0.00
4.50	0.00	0	828.19	0.00
5.00	0.00	0	828.19	0.00
5.50	0.00	0	828.19	0.00
6.00	0.00	0	828.19	0.00
6.50	0.00	0	828.19	0.00
7.00	0.01	0	828.19	0.01
7.50	0.02	0	828.19	0.02
8.00	0.02	0	828.19	0.02
8.50	0.04	0	828.20	0.04
9.00	0.06	1	828.20	0.06
9.50	0.07	1	828.20	0.07
10.00	0.10	1	828.21	0.10
10.50	0.15	2	828.21	0.15
11.00	0.23	2	828.22	0.23
11.50	**0.45**	**4**	**828.23**	**0.45**
12.00	**7.75**	**22**	**828.42**	**7.78**
12.50	0.72	5	828.25	0.72
13.00	0.44	4	828.23	0.44
13.50	0.34	3	828.23	0.34
14.00	0.26	3	828.22	0.26
14.50	0.23	2	828.22	0.23
15.00	0.21	2	828.22	0.21
15.50	0.19	2	828.21	0.19
16.00	0.16	2	828.21	0.16
16.50	0.15	2	828.21	0.15
17.00	0.14	2	828.21	0.14
17.50	0.13	2	828.21	0.13
18.00	0.13	2	828.21	0.13
18.50	0.12	2	828.21	0.12
19.00	0.11	1	828.21	0.11
19.50	0.10	1	828.21	0.10
20.00	0.09	1	828.21	0.09
20.50	0.09	1	828.20	0.09
21.00	0.09	1	828.20	0.09
21.50	0.09	1	828.20	0.09
22.00	0.08	1	828.20	0.08
22.50	0.08	1	828.20	0.08
23.00	0.08	1	828.20	0.08
23.50	0.08	1	828.20	0.08
24.00	0.08	1	828.20	0.08

Summary for Reach DC-G13: (new Reach)

Inflow Area = 0.260 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 1.95 cfs @ 11.95 hrs, Volume= 0.087 af
Outflow = 1.95 cfs @ 11.96 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.34 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 0.2 min

Peak Storage= 9 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 466.79 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 19.8' Slope= 0.3091 '/'
Inlet Invert= 814.25', Outlet Invert= 808.13'

‡

Hydrograph for Reach DC-G13: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	814.25	0.00
0.50	0.00	0	814.25	0.00
1.00	0.00	0	814.25	0.00
1.50	0.00	0	814.25	0.00
2.00	0.00	0	814.25	0.00
2.50	0.00	0	814.25	0.00
3.00	0.00	0	814.25	0.00
3.50	0.00	0	814.25	0.00
4.00	0.00	0	814.25	0.00
4.50	0.00	0	814.25	0.00
5.00	0.00	0	814.25	0.00
5.50	0.00	0	814.25	0.00
6.00	0.00	0	814.25	0.00
6.50	0.00	0	814.25	0.00
7.00	0.00	0	814.25	0.00
7.50	0.00	0	814.25	0.00
8.00	0.01	0	814.25	0.01
8.50	0.01	0	814.25	0.01
9.00	0.01	0	814.25	0.01
9.50	0.02	0	814.25	0.02
10.00	0.02	0	814.25	0.02
10.50	0.03	0	814.26	0.03
11.00	0.05	1	814.26	0.05
11.50	**0.10**	**1**	**814.27**	**0.10**
12.00	**1.53**	**8**	**814.34**	**1.55**
12.50	0.15	2	814.27	0.15
13.00	0.09	1	814.27	0.09
13.50	0.07	1	814.26	0.07
14.00	0.06	1	814.26	0.06
14.50	0.05	1	814.26	0.05
15.00	0.04	1	814.26	0.04
15.50	0.04	1	814.26	0.04
16.00	0.03	0	814.26	0.03
16.50	0.03	0	814.26	0.03
17.00	0.03	0	814.26	0.03
17.50	0.03	0	814.25	0.03
18.00	0.03	0	814.25	0.03
18.50	0.03	0	814.25	0.03
19.00	0.02	0	814.25	0.02
19.50	0.02	0	814.25	0.02
20.00	0.02	0	814.25	0.02
20.50	0.02	0	814.25	0.02
21.00	0.02	0	814.25	0.02
21.50	0.02	0	814.25	0.02
22.00	0.02	0	814.25	0.02
22.50	0.02	0	814.25	0.02
23.00	0.02	0	814.25	0.02
23.50	0.02	0	814.25	0.02
24.00	0.02	0	814.25	0.02

Summary for Reach DC-G2: (new Reach)

Inflow Area = 1.550 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 11.61 cfs @ 11.96 hrs, Volume= 0.517 af
Outflow = 11.59 cfs @ 11.96 hrs, Volume= 0.517 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.86 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 1.1 min

Peak Storage= 198 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 747.52 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.2' Slope= 0.2494 '/'
Inlet Invert= 907.40', Outlet Invert= 882.41'

‡

Hydrograph for Reach DC-G2: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	907.40	0.00
0.50	0.00	0	907.40	0.00
1.00	0.00	0	907.40	0.00
1.50	0.00	0	907.40	0.00
2.00	0.00	0	907.40	0.00
2.50	0.00	0	907.40	0.00
3.00	0.00	0	907.40	0.00
3.50	0.00	0	907.40	0.00
4.00	0.00	0	907.40	0.00
4.50	0.00	0	907.40	0.00
5.00	0.00	0	907.40	0.00
5.50	0.00	0	907.40	0.00
6.00	0.00	0	907.40	0.00
6.50	0.00	0	907.40	0.00
7.00	0.01	1	907.40	0.01
7.50	0.02	2	907.40	0.02
8.00	0.03	2	907.40	0.03
8.50	0.05	4	907.40	0.05
9.00	0.07	5	907.41	0.07
9.50	0.09	7	907.41	0.09
10.00	0.13	9	907.41	0.13
10.50	0.19	14	907.41	0.19
11.00	0.31	21	907.42	0.30
11.50	**0.59**	**31**	**907.43**	**0.58**
12.00	**9.32**	**176**	**907.57**	**9.59**
12.50	0.89	41	907.44	0.90
13.00	0.56	30	907.43	0.56
13.50	0.43	25	907.43	0.43
14.00	0.34	22	907.42	0.34
14.50	0.30	21	907.42	0.30
15.00	0.27	20	907.42	0.27
15.50	0.24	18	907.42	0.24
16.00	0.21	15	907.42	0.21
16.50	0.19	14	907.41	0.19
17.00	0.18	13	907.41	0.18
17.50	0.17	13	907.41	0.17
18.00	0.16	12	907.41	0.16
18.50	0.15	11	907.41	0.15
19.00	0.14	10	907.41	0.14
19.50	0.13	10	907.41	0.13
20.00	0.12	9	907.41	0.12
20.50	0.11	8	907.41	0.11
21.00	0.11	8	907.41	0.11
21.50	0.11	8	907.41	0.11
22.00	0.11	8	907.41	0.11
22.50	0.11	8	907.41	0.11
23.00	0.10	8	907.41	0.10
23.50	0.10	7	907.41	0.10
24.00	0.10	7	907.41	0.10

Summary for Reach DC-G3: (new Reach)

Inflow Area = 3.186 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 23.63 cfs @ 11.96 hrs, Volume= 1.063 af
Outflow = 23.61 cfs @ 11.96 hrs, Volume= 1.063 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.62 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.74 fps, Avg. Travel Time= 1.0 min

Peak Storage= 309 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 749.17 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 99.8' Slope= 0.2505 '/'
Inlet Invert= 882.41', Outlet Invert= 857.41'

‡

Hydrograph for Reach DC-G3: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	882.41	0.00
0.50	0.00	0	882.41	0.00
1.00	0.00	0	882.41	0.00
1.50	0.00	0	882.41	0.00
2.00	0.00	0	882.41	0.00
2.50	0.00	0	882.41	0.00
3.00	0.00	0	882.41	0.00
3.50	0.00	0	882.41	0.00
4.00	0.00	0	882.41	0.00
4.50	0.00	0	882.41	0.00
5.00	0.00	0	882.41	0.00
5.50	0.00	0	882.41	0.00
6.00	0.00	0	882.41	0.00
6.50	0.00	0	882.41	0.00
7.00	0.02	2	882.41	0.02
7.50	0.04	3	882.41	0.04
8.00	0.06	5	882.41	0.06
8.50	0.10	7	882.42	0.10
9.00	0.15	11	882.42	0.15
9.50	0.19	14	882.42	0.18
10.00	0.26	19	882.43	0.26
10.50	0.39	24	882.43	0.39
11.00	0.62	32	882.44	0.62
11.50	**1.19**	**48**	**882.46**	**1.18**
12.00	**19.81**	**280**	**882.67**	**20.20**
12.50	1.85	64	882.47	1.87
13.00	1.15	47	882.46	1.16
13.50	0.88	41	882.45	0.88
14.00	0.69	34	882.44	0.70
14.50	0.61	32	882.44	0.61
15.00	0.55	30	882.44	0.55
15.50	0.49	27	882.44	0.49
16.00	0.43	25	882.44	0.43
16.50	0.40	24	882.43	0.40
17.00	0.38	24	882.43	0.38
17.50	0.35	23	882.43	0.35
18.00	0.33	22	882.43	0.33
18.50	0.31	21	882.43	0.31
19.00	0.29	21	882.43	0.29
19.50	0.27	19	882.43	0.27
20.00	0.24	18	882.43	0.24
20.50	0.23	17	882.43	0.23
21.00	0.23	17	882.43	0.23
21.50	0.23	17	882.43	0.23
22.00	0.22	16	882.43	0.22
22.50	0.22	16	882.43	0.22
23.00	0.21	16	882.43	0.21
23.50	0.21	15	882.43	0.21
24.00	0.20	15	882.42	0.20

Summary for Reach DC-G4: (new Reach)

Inflow Area = 4.695 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 34.74 cfs @ 11.96 hrs, Volume= 1.566 af
Outflow = 34.72 cfs @ 11.96 hrs, Volume= 1.566 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.75 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.96 fps, Avg. Travel Time= 0.9 min

Peak Storage= 397 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.27 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2499 '/'
Inlet Invert= 857.41', Outlet Invert= 832.42'

‡

Hydrograph for Reach DC-G4: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	857.41	0.00
0.50	0.00	0	857.41	0.00
1.00	0.00	0	857.41	0.00
1.50	0.00	0	857.41	0.00
2.00	0.00	0	857.41	0.00
2.50	0.00	0	857.41	0.00
3.00	0.00	0	857.41	0.00
3.50	0.00	0	857.41	0.00
4.00	0.00	0	857.41	0.00
4.50	0.00	0	857.41	0.00
5.00	0.00	0	857.41	0.00
5.50	0.00	0	857.41	0.00
6.00	0.00	0	857.41	0.00
6.50	0.01	0	857.41	0.00
7.00	0.03	2	857.41	0.03
7.50	0.06	5	857.41	0.06
8.00	0.09	7	857.42	0.09
8.50	0.14	10	857.42	0.14
9.00	0.22	16	857.43	0.21
9.50	0.27	20	857.43	0.27
10.00	0.38	24	857.43	0.38
10.50	0.57	30	857.44	0.57
11.00	0.92	41	857.45	0.91
11.50	**1.75**	**62**	**857.47**	**1.74**
12.00	**29.54**	**361**	**857.74**	**30.04**
12.50	2.75	82	857.49	2.78
13.00	1.71	61	857.47	1.71
13.50	1.30	51	857.46	1.30
14.00	1.02	44	857.45	1.03
14.50	0.90	41	857.45	0.90
15.00	0.81	39	857.45	0.81
15.50	0.72	35	857.45	0.72
16.00	0.63	32	857.44	0.63
16.50	0.59	31	857.44	0.59
17.00	0.55	30	857.44	0.56
17.50	0.52	29	857.44	0.52
18.00	0.49	28	857.44	0.49
18.50	0.46	26	857.44	0.46
19.00	0.42	25	857.44	0.43
19.50	0.39	24	857.43	0.39
20.00	0.36	23	857.43	0.36
20.50	0.35	23	857.43	0.35
21.00	0.34	22	857.43	0.34
21.50	0.33	22	857.43	0.33
22.00	0.33	22	857.43	0.33
22.50	0.32	22	857.43	0.32
23.00	0.31	21	857.43	0.31
23.50	0.31	21	857.43	0.31
24.00	0.30	21	857.43	0.30

Summary for Reach DC-G5: (new Reach)

Inflow Area = 6.289 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 46.38 cfs @ 11.96 hrs, Volume= 2.098 af
Outflow = 46.36 cfs @ 11.96 hrs, Volume= 2.097 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.69 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.17 fps, Avg. Travel Time= 0.8 min

Peak Storage= 478 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.42 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2500 '/'
Inlet Invert= 832.42', Outlet Invert= 807.42'

‡

Hydrograph for Reach DC-G5: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	832.42	0.00
0.50	0.00	0	832.42	0.00
1.00	0.00	0	832.42	0.00
1.50	0.00	0	832.42	0.00
2.00	0.00	0	832.42	0.00
2.50	0.00	0	832.42	0.00
3.00	0.00	0	832.42	0.00
3.50	0.00	0	832.42	0.00
4.00	0.00	0	832.42	0.00
4.50	0.00	0	832.42	0.00
5.00	0.00	0	832.42	0.00
5.50	0.00	0	832.42	0.00
6.00	0.00	0	832.42	0.00
6.50	0.01	0	832.42	0.01
7.00	0.04	3	832.42	0.04
7.50	0.08	6	832.43	0.08
8.00	0.12	9	832.43	0.12
8.50	0.19	14	832.43	0.19
9.00	0.29	20	832.44	0.29
9.50	0.36	23	832.44	0.36
10.00	0.51	28	832.45	0.50
10.50	0.76	37	832.46	0.76
11.00	1.22	49	832.47	1.21
11.50	**2.34**	**73**	**832.49**	**2.32**
12.00	**40.01**	**439**	**832.81**	**40.59**
12.50	3.71	98	832.52	3.74
13.00	2.29	73	832.49	2.30
13.50	1.74	62	832.48	1.75
14.00	1.37	53	832.47	1.38
14.50	1.21	49	832.47	1.21
15.00	1.09	46	832.47	1.09
15.50	0.97	43	832.46	0.97
16.00	0.85	40	832.46	0.85
16.50	0.79	38	832.46	0.79
17.00	0.74	36	832.46	0.74
17.50	0.70	35	832.45	0.70
18.00	0.66	33	832.45	0.66
18.50	0.61	32	832.45	0.61
19.00	0.57	30	832.45	0.57
19.50	0.53	29	832.45	0.53
20.00	0.48	27	832.45	0.48
20.50	0.46	27	832.45	0.46
21.00	0.46	26	832.45	0.46
21.50	0.45	26	832.45	0.45
22.00	0.44	26	832.45	0.44
22.50	0.43	25	832.45	0.43
23.00	0.42	25	832.44	0.42
23.50	0.41	25	832.44	0.41
24.00	0.40	25	832.44	0.40

Summary for Reach DC-G6: (new Reach)

Inflow Area = 7.931 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 58.34 cfs @ 11.96 hrs, Volume= 2.645 af
Outflow = 58.32 cfs @ 11.97 hrs, Volume= 2.644 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.49 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.34 fps, Avg. Travel Time= 0.7 min

Peak Storage= 557 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 747.52 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.2' Slope= 0.2494 '/'
Inlet Invert= 807.42', Outlet Invert= 782.43'

‡

Hydrograph for Reach DC-G6: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	807.42	0.00
0.50	0.00	0	807.42	0.00
1.00	0.00	0	807.42	0.00
1.50	0.00	0	807.42	0.00
2.00	0.00	0	807.42	0.00
2.50	0.00	0	807.42	0.00
3.00	0.00	0	807.42	0.00
3.50	0.00	0	807.42	0.00
4.00	0.00	0	807.42	0.00
4.50	0.00	0	807.42	0.00
5.00	0.00	0	807.42	0.00
5.50	0.00	0	807.42	0.00
6.00	0.00	0	807.42	0.00
6.50	0.01	0	807.42	0.01
7.00	0.05	4	807.42	0.05
7.50	0.10	7	807.43	0.10
8.00	0.15	11	807.43	0.15
8.50	0.24	17	807.44	0.23
9.00	0.36	23	807.44	0.36
9.50	0.46	26	807.45	0.46
10.00	0.64	32	807.45	0.63
10.50	0.96	43	807.46	0.95
11.00	1.53	57	807.48	1.52
11.50	**2.93**	**84**	**807.50**	**2.91**
12.00	**50.81**	**513**	**807.87**	**51.47**
12.50	4.71	114	807.53	4.75
13.00	2.90	84	807.50	2.91
13.50	2.20	71	807.49	2.21
14.00	1.74	62	807.48	1.74
14.50	1.52	57	807.48	1.53
15.00	1.38	53	807.47	1.38
15.50	1.22	49	807.47	1.23
16.00	1.07	46	807.46	1.07
16.50	0.99	44	807.46	0.99
17.00	0.94	42	807.46	0.94
17.50	0.88	41	807.46	0.89
18.00	0.83	39	807.46	0.83
18.50	0.77	37	807.46	0.78
19.00	0.72	35	807.45	0.72
19.50	0.66	34	807.45	0.66
20.00	0.61	32	807.45	0.61
20.50	0.58	31	807.45	0.58
21.00	0.57	30	807.45	0.57
21.50	0.56	30	807.45	0.56
22.00	0.55	30	807.45	0.55
22.50	0.54	29	807.45	0.54
23.00	0.53	29	807.45	0.53
23.50	0.52	29	807.45	0.52
24.00	0.51	28	807.45	0.51

Summary for Reach DC-G7: (new Reach)

Inflow Area = 9.573 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 70.30 cfs @ 11.96 hrs, Volume= 3.192 af
Outflow = 70.28 cfs @ 11.97 hrs, Volume= 3.191 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.19 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.50 fps, Avg. Travel Time= 0.7 min

Peak Storage= 628 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.42 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2500 '/'
Inlet Invert= 782.43', Outlet Invert= 757.43'

‡

Hydrograph for Reach DC-G7: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	782.43	0.00
0.50	0.00	0	782.43	0.00
1.00	0.00	0	782.43	0.00
1.50	0.00	0	782.43	0.00
2.00	0.00	0	782.43	0.00
2.50	0.00	0	782.43	0.00
3.00	0.00	0	782.43	0.00
3.50	0.00	0	782.43	0.00
4.00	0.00	0	782.43	0.00
4.50	0.00	0	782.43	0.00
5.00	0.00	0	782.43	0.00
5.50	0.00	0	782.43	0.00
6.00	0.00	0	782.43	0.00
6.50	0.01	1	782.43	0.01
7.00	0.06	4	782.43	0.06
7.50	0.12	9	782.44	0.12
8.00	0.19	13	782.44	0.18
8.50	0.28	20	782.45	0.28
9.00	0.43	25	782.46	0.43
9.50	0.55	30	782.46	0.55
10.00	0.76	37	782.47	0.76
10.50	1.15	47	782.48	1.15
11.00	1.84	63	782.49	1.84
11.50	**3.53**	**94**	**782.52**	**3.51**
12.00	**61.66**	**580**	**782.93**	**62.39**
12.50	5.71	128	782.55	5.75
13.00	3.50	94	782.52	3.52
13.50	2.66	80	782.51	2.67
14.00	2.10	69	782.50	2.10
14.50	1.84	64	782.49	1.84
15.00	1.66	60	782.49	1.66
15.50	1.48	55	782.48	1.48
16.00	1.29	51	782.48	1.30
16.50	1.20	48	782.48	1.20
17.00	1.13	47	782.48	1.13
17.50	1.07	45	782.47	1.07
18.00	1.00	44	782.47	1.00
18.50	0.94	42	782.47	0.94
19.00	0.87	40	782.47	0.87
19.50	0.80	38	782.47	0.80
20.00	0.73	36	782.47	0.74
20.50	0.71	35	782.46	0.71
21.00	0.69	34	782.46	0.69
21.50	0.68	34	782.46	0.68
22.00	0.67	34	782.46	0.67
22.50	0.65	33	782.46	0.65
23.00	0.64	33	782.46	0.64
23.50	0.63	32	782.46	0.63
24.00	0.61	32	782.46	0.61

Summary for Reach DC-G8: (new Reach)

Inflow Area = 10.971 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 80.50 cfs @ 11.97 hrs, Volume= 3.658 af
Outflow = 80.48 cfs @ 11.97 hrs, Volume= 3.657 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.72 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.62 fps, Avg. Travel Time= 0.6 min

Peak Storage= 687 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.27 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2499 '/'
Inlet Invert= 757.43', Outlet Invert= 732.44'

‡

Hydrograph for Reach DC-G8: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	757.43	0.00
0.50	0.00	0	757.43	0.00
1.00	0.00	0	757.43	0.00
1.50	0.00	0	757.43	0.00
2.00	0.00	0	757.43	0.00
2.50	0.00	0	757.43	0.00
3.00	0.00	0	757.43	0.00
3.50	0.00	0	757.43	0.00
4.00	0.00	0	757.43	0.00
4.50	0.00	0	757.43	0.00
5.00	0.00	0	757.43	0.00
5.50	0.00	0	757.43	0.00
6.00	0.00	0	757.43	0.00
6.50	0.01	1	757.43	0.01
7.00	0.07	5	757.43	0.07
7.50	0.14	10	757.44	0.14
8.00	0.21	15	757.45	0.21
8.50	0.32	22	757.45	0.32
9.00	0.50	28	757.46	0.49
9.50	0.63	32	757.46	0.63
10.00	0.87	40	757.47	0.87
10.50	1.32	51	757.48	1.31
11.00	2.11	69	757.50	2.10
11.50	**4.03**	**103**	**757.53**	**4.01**
12.00	**71.00**	**637**	**757.98**	**71.78**
12.50	6.56	139	757.56	6.61
13.00	4.02	103	757.53	4.04
13.50	3.05	87	757.51	3.06
14.00	2.41	75	757.50	2.41
14.50	2.11	69	757.50	2.11
15.00	1.91	65	757.49	1.91
15.50	1.70	61	757.49	1.70
16.00	1.48	56	757.48	1.49
16.50	1.37	53	757.48	1.38
17.00	1.30	51	757.48	1.30
17.50	1.22	49	757.48	1.23
18.00	1.15	47	757.48	1.15
18.50	1.07	45	757.47	1.07
19.00	1.00	44	757.47	1.00
19.50	0.92	42	757.47	0.92
20.00	0.84	40	757.47	0.84
20.50	0.81	38	757.47	0.81
21.00	0.79	38	757.47	0.79
21.50	0.78	37	757.47	0.78
22.00	0.76	37	757.47	0.76
22.50	0.75	36	757.47	0.75
23.00	0.73	36	757.47	0.73
23.50	0.72	35	757.46	0.72
24.00	0.70	35	757.46	0.70

Summary for Reach DC-G9: (new Reach)

Inflow Area = 12.098 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 88.73 cfs @ 11.97 hrs, Volume= 4.033 af
Outflow = 88.71 cfs @ 11.97 hrs, Volume= 4.032 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 12.11 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.71 fps, Avg. Travel Time= 0.6 min

Peak Storage= 732 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.42 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2500 '/'
Inlet Invert= 732.44', Outlet Invert= 707.44'

‡

Hydrograph for Reach DC-G9: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	732.44	0.00
0.50	0.00	0	732.44	0.00
1.00	0.00	0	732.44	0.00
1.50	0.00	0	732.44	0.00
2.00	0.00	0	732.44	0.00
2.50	0.00	0	732.44	0.00
3.00	0.00	0	732.44	0.00
3.50	0.00	0	732.44	0.00
4.00	0.00	0	732.44	0.00
4.50	0.00	0	732.44	0.00
5.00	0.00	0	732.44	0.00
5.50	0.00	0	732.44	0.00
6.00	0.00	0	732.44	0.00
6.50	0.01	1	732.44	0.01
7.00	0.08	5	732.45	0.07
7.50	0.15	11	732.45	0.15
8.00	0.23	17	732.46	0.23
8.50	0.36	23	732.46	0.35
9.00	0.54	29	732.47	0.54
9.50	0.70	34	732.47	0.69
10.00	0.96	43	732.48	0.96
10.50	1.45	54	732.49	1.44
11.00	2.32	73	732.51	2.31
11.50	**4.43**	**109**	**732.55**	**4.41**
12.00	**78.64**	**681**	**733.02**	**79.47**
12.50	7.26	149	732.58	7.31
13.00	4.44	109	732.55	4.46
13.50	3.37	92	732.53	3.38
14.00	2.66	80	732.52	2.67
14.50	2.33	73	732.51	2.33
15.00	2.10	69	732.51	2.10
15.50	1.87	64	732.50	1.87
16.00	1.64	59	732.50	1.64
16.50	1.52	56	732.50	1.52
17.00	1.43	54	732.49	1.43
17.50	1.35	52	732.49	1.35
18.00	1.27	50	732.49	1.27
18.50	1.18	48	732.49	1.18
19.00	1.10	46	732.49	1.10
19.50	1.01	44	732.48	1.02
20.00	0.93	42	732.48	0.93
20.50	0.89	41	732.48	0.89
21.00	0.88	41	732.48	0.88
21.50	0.86	40	732.48	0.86
22.00	0.84	40	732.48	0.84
22.50	0.83	39	732.48	0.83
23.00	0.81	38	732.48	0.81
23.50	0.79	38	732.48	0.79
24.00	0.78	37	732.48	0.78

Summary for Reach IPC-G1: (new Reach)

Inflow Area = 2.096 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 16.96 cfs @ 11.92 hrs, Volume= 0.700 af
Outflow = 13.45 cfs @ 11.96 hrs, Volume= 0.694 af, Atten= 21%, Lag= 2.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.08 fps, Min. Travel Time= 5.9 min
Avg. Velocity = 0.48 fps, Avg. Travel Time= 26.0 min

Peak Storage= 4,794 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 117.90 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 741.7' Slope= 0.0076 '/'
Inlet Invert= 903.92', Outlet Invert= 898.26'

‡

Hydrograph for Reach IPC-G1: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	903.92	0.00
0.50	0.00	0	903.92	0.00
1.00	0.00	0	903.92	0.00
1.50	0.00	0	903.92	0.00
2.00	0.00	0	903.92	0.00
2.50	0.00	0	903.92	0.00
3.00	0.00	0	903.92	0.00
3.50	0.00	0	903.92	0.00
4.00	0.00	0	903.92	0.00
4.50	0.00	0	903.92	0.00
5.00	0.00	0	903.92	0.00
5.50	0.00	0	903.92	0.00
6.00	0.00	0	903.92	0.00
6.50	0.01	3	903.92	0.00
7.00	0.02	19	903.92	0.01
7.50	0.03	45	903.93	0.01
8.00	0.04	78	903.93	0.03
8.50	0.07	123	903.94	0.04
9.00	0.10	184	903.94	0.07
9.50	0.13	231	903.95	0.10
10.00	0.18	285	903.96	0.14
10.50	0.27	369	903.97	0.22
11.00	0.44	497	903.99	0.36
11.50	**0.85**	**740**	**904.02**	**0.68**
12.00	**6.81**	**4,390**	**904.45**	**11.74**
12.50	1.06	1,189	904.08	1.47
13.00	0.72	837	904.03	0.83
13.50	0.56	699	904.01	0.62
14.00	0.44	604	904.00	0.49
14.50	0.40	548	903.99	0.42
15.00	0.36	513	903.99	0.37
15.50	0.32	480	903.98	0.33
16.00	0.28	446	903.98	0.29
16.50	0.26	420	903.98	0.27
17.00	0.25	404	903.97	0.25
17.50	0.23	389	903.97	0.24
18.00	0.22	374	903.97	0.22
18.50	0.20	359	903.97	0.21
19.00	0.19	344	903.97	0.20
19.50	0.17	329	903.96	0.18
20.00	0.16	313	903.96	0.17
20.50	0.15	304	903.96	0.16
21.00	0.15	300	903.96	0.15
21.50	0.15	297	903.96	0.15
22.00	0.15	293	903.96	0.15
22.50	0.14	289	903.96	0.14
23.00	0.14	284	903.96	0.14
23.50	0.14	280	903.96	0.14
24.00	0.13	276	903.96	0.14

Summary for Reach IPC-G2: (new Reach)

Inflow Area = 6.620 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 45.53 cfs @ 11.96 hrs, Volume= 2.205 af
Outflow = 44.37 cfs @ 11.98 hrs, Volume= 2.199 af, Atten= 3%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.43 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 2.14 fps, Avg. Travel Time= 7.6 min

Peak Storage= 4,590 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 637.02 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 975.4' Slope= 0.2228 '/'
Inlet Invert= 898.26', Outlet Invert= 680.98'

‡

Hydrograph for Reach IPC-G2: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	898.26	0.00
0.50	0.00	0	898.26	0.00
1.00	0.00	0	898.26	0.00
1.50	0.00	0	898.26	0.00
2.00	0.00	0	898.26	0.00
2.50	0.00	0	898.26	0.00
3.00	0.00	0	898.26	0.00
3.50	0.00	0	898.26	0.00
4.00	0.00	0	898.26	0.00
4.50	0.00	0	898.26	0.00
5.00	0.00	0	898.26	0.00
5.50	0.00	0	898.26	0.00
6.00	0.00	0	898.26	0.00
6.50	0.01	3	898.26	0.00
7.00	0.04	22	898.26	0.03
7.50	0.08	48	898.26	0.06
8.00	0.12	77	898.27	0.10
8.50	0.18	118	898.27	0.16
9.00	0.29	184	898.28	0.24
9.50	0.37	230	898.28	0.36
10.00	0.52	275	898.29	0.48
10.50	0.78	360	898.30	0.73
11.00	1.25	482	898.31	1.18
11.50	**2.39**	**716**	**898.33**	**2.23**
12.00	**40.71**	**4,509**	**898.69**	**43.14**
12.50	4.09	1,094	898.37	4.45
13.00	2.46	782	898.34	2.56
13.50	1.86	653	898.33	1.92
14.00	1.46	566	898.32	1.51
14.50	1.28	513	898.31	1.30
15.00	1.15	481	898.31	1.17
15.50	1.03	449	898.31	1.04
16.00	0.90	417	898.30	0.92
16.50	0.83	398	898.30	0.84
17.00	0.79	384	898.30	0.80
17.50	0.74	368	898.30	0.75
18.00	0.70	352	898.30	0.70
18.50	0.65	336	898.29	0.66
19.00	0.60	320	898.29	0.61
19.50	0.56	303	898.29	0.57
20.00	0.51	287	898.29	0.52
20.50	0.49	278	898.29	0.49
21.00	0.48	274	898.29	0.48
21.50	0.47	271	898.29	0.47
22.00	0.46	268	898.29	0.46
22.50	0.45	265	898.29	0.45
23.00	0.44	261	898.29	0.45
23.50	0.43	258	898.29	0.44
24.00	0.43	255	898.29	0.43

Summary for Reach IPC-G3: (new Reach)

Inflow Area = 1.254 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 9.59 cfs @ 11.94 hrs, Volume= 0.419 af
Outflow = 8.96 cfs @ 11.96 hrs, Volume= 0.417 af, Atten= 7%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.50 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 10.7 min

Peak Storage= 1,365 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 117.63 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 534.2' Slope= 0.0295 '/'
Inlet Invert= 837.83', Outlet Invert= 822.06'

Hydrograph for Reach IPC-G3: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	837.83	0.00
0.50	0.00	0	837.83	0.00
1.00	0.00	0	837.83	0.00
1.50	0.00	0	837.83	0.00
2.00	0.00	0	837.83	0.00
2.50	0.00	0	837.83	0.00
3.00	0.00	0	837.83	0.00
3.50	0.00	0	837.83	0.00
4.00	0.00	0	837.83	0.00
4.50	0.00	0	837.83	0.00
5.00	0.00	0	837.83	0.00
5.50	0.00	0	837.83	0.00
6.00	0.00	0	837.83	0.00
6.50	0.00	1	837.83	0.00
7.00	0.01	7	837.83	0.01
7.50	0.02	15	837.84	0.01
8.00	0.03	24	837.84	0.02
8.50	0.04	37	837.85	0.03
9.00	0.06	52	837.85	0.05
9.50	0.07	61	837.86	0.07
10.00	0.11	74	837.86	0.10
10.50	0.16	98	837.87	0.15
11.00	0.26	131	837.89	0.23
11.50	**0.49**	**196**	**837.92**	**0.45**
12.00	**6.39**	**1,259**	**838.31**	**7.95**
12.50	0.68	275	837.95	0.77
13.00	0.44	200	837.92	0.47
13.50	0.34	169	837.91	0.35
14.00	0.27	145	837.90	0.28
14.50	0.24	134	837.89	0.24
15.00	0.21	126	837.89	0.22
15.50	0.19	116	837.88	0.20
16.00	0.17	107	837.88	0.17
16.50	0.16	102	837.88	0.16
17.00	0.15	98	837.88	0.15
17.50	0.14	95	837.87	0.14
18.00	0.13	92	837.87	0.13
18.50	0.12	88	837.87	0.12
19.00	0.11	84	837.87	0.11
19.50	0.10	80	837.87	0.11
20.00	0.09	75	837.86	0.10
20.50	0.09	73	837.86	0.09
21.00	0.09	72	837.86	0.09
21.50	0.09	71	837.86	0.09
22.00	0.09	70	837.86	0.09
22.50	0.09	69	837.86	0.09
23.00	0.08	68	837.86	0.08
23.50	0.08	67	837.86	0.08
24.00	0.08	66	837.86	0.08

Summary for Reach IPC-G4: (new Reach)

Inflow Area = 3.472 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 25.06 cfs @ 11.96 hrs, Volume= 1.158 af
Outflow = 24.28 cfs @ 11.97 hrs, Volume= 1.155 af, Atten= 3%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.75 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 6.6 min

Peak Storage= 2,401 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.88'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 117.82 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 470.3' Slope= 0.0296 '/'
Inlet Invert= 822.06', Outlet Invert= 808.13'

Hydrograph for Reach IPC-G4: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	822.06	0.00
0.50	0.00	0	822.06	0.00
1.00	0.00	0	822.06	0.00
1.50	0.00	0	822.06	0.00
2.00	0.00	0	822.06	0.00
2.50	0.00	0	822.06	0.00
3.00	0.00	0	822.06	0.00
3.50	0.00	0	822.06	0.00
4.00	0.00	0	822.06	0.00
4.50	0.00	0	822.06	0.00
5.00	0.00	0	822.06	0.00
5.50	0.00	0	822.06	0.00
6.00	0.00	0	822.06	0.00
6.50	0.01	2	822.06	0.00
7.00	0.02	14	822.07	0.01
7.50	0.04	33	822.08	0.03
8.00	0.07	48	822.09	0.06
8.50	0.10	63	822.09	0.09
9.00	0.16	86	822.10	0.15
9.50	0.20	102	822.11	0.19
10.00	0.28	124	822.12	0.26
10.50	0.42	160	822.14	0.40
11.00	0.67	214	822.17	0.64
11.50	**1.29**	**323**	**822.22**	**1.22**
12.00	**20.88**	**2,305**	**822.92**	**22.92**
12.50	2.04	471	822.29	2.19
13.00	1.26	338	822.23	1.31
13.50	0.96	283	822.20	0.99
14.00	0.76	243	822.18	0.78
14.50	0.67	222	822.17	0.67
15.00	0.60	208	822.17	0.61
15.50	0.54	194	822.16	0.54
16.00	0.47	179	822.15	0.48
16.50	0.43	169	822.15	0.44
17.00	0.41	164	822.14	0.41
17.50	0.39	158	822.14	0.39
18.00	0.36	152	822.14	0.37
18.50	0.34	145	822.13	0.34
19.00	0.31	139	822.13	0.32
19.50	0.29	132	822.13	0.29
20.00	0.27	125	822.12	0.27
20.50	0.26	122	822.12	0.26
21.00	0.25	120	822.12	0.25
21.50	0.25	119	822.12	0.25
22.00	0.24	118	822.12	0.24
22.50	0.24	117	822.12	0.24
23.00	0.23	115	822.12	0.23
23.50	0.23	113	822.12	0.23
24.00	0.22	112	822.12	0.22

Summary for Reach IPC-G5: (new Reach)

Inflow Area = 3.973 ac, 0.00% Impervious, Inflow Depth > 3.99" for 100-yr event
Inflow = 27.80 cfs @ 11.97 hrs, Volume= 1.322 af
Outflow = 27.68 cfs @ 11.98 hrs, Volume= 1.321 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.93 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.25 fps, Avg. Travel Time= 2.3 min

Peak Storage= 979 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.95'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 117.42 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 174.4' Slope= 0.0294 '/'
Inlet Invert= 808.13', Outlet Invert= 803.00'

Hydrograph for Reach IPC-G5: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	808.13	0.00
0.50	0.00	0	808.13	0.00
1.00	0.00	0	808.13	0.00
1.50	0.00	0	808.13	0.00
2.00	0.00	0	808.13	0.00
2.50	0.00	0	808.13	0.00
3.00	0.00	0	808.13	0.00
3.50	0.00	0	808.13	0.00
4.00	0.00	0	808.13	0.00
4.50	0.00	0	808.13	0.00
5.00	0.00	0	808.13	0.00
5.50	0.00	0	808.13	0.00
6.00	0.00	0	808.13	0.00
6.50	0.00	1	808.13	0.00
7.00	0.02	5	808.14	0.01
7.50	0.04	13	808.15	0.03
8.00	0.07	19	808.16	0.07
8.50	0.11	26	808.17	0.10
9.00	0.17	34	808.18	0.17
9.50	0.22	41	808.19	0.22
10.00	0.31	50	808.20	0.30
10.50	0.46	64	808.22	0.45
11.00	0.74	86	808.25	0.72
11.50	**1.41**	**130**	**808.30**	**1.38**
12.00	**25.69**	**948**	**809.06**	**26.44**
12.50	2.47	192	808.38	2.54
13.00	1.48	137	808.31	1.50
13.50	1.12	115	808.28	1.13
14.00	0.88	99	808.26	0.89
14.50	0.77	90	808.25	0.77
15.00	0.70	84	808.24	0.70
15.50	0.62	79	808.24	0.62
16.00	0.54	73	808.23	0.55
16.50	0.50	69	808.22	0.50
17.00	0.47	66	808.22	0.47
17.50	0.45	64	808.22	0.45
18.00	0.42	61	808.21	0.42
18.50	0.39	59	808.21	0.39
19.00	0.36	56	808.21	0.37
19.50	0.34	54	808.20	0.34
20.00	0.31	51	808.20	0.31
20.50	0.29	49	808.20	0.29
21.00	0.29	49	808.20	0.29
21.50	0.28	48	808.20	0.28
22.00	0.28	47	808.20	0.28
22.50	0.27	47	808.19	0.27
23.00	0.27	46	808.19	0.27
23.50	0.26	46	808.19	0.26
24.00	0.26	45	808.19	0.26

Summary for Reach IPC-G6: (new Reach)

Inflow Area = 5.398 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 36.93 cfs @ 11.96 hrs, Volume= 1.797 af
Outflow = 36.61 cfs @ 11.97 hrs, Volume= 1.795 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.70 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.63 fps, Avg. Travel Time= 3.7 min

Peak Storage= 2,018 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 314.54 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 589.9' Slope= 0.2111 '/'
Inlet Invert= 803.00', Outlet Invert= 678.48'

Hydrograph for Reach IPC-G6: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	803.00	0.00
0.50	0.00	0	803.00	0.00
1.00	0.00	0	803.00	0.00
1.50	0.00	0	803.00	0.00
2.00	0.00	0	803.00	0.00
2.50	0.00	0	803.00	0.00
3.00	0.00	0	803.00	0.00
3.50	0.00	0	803.00	0.00
4.00	0.00	0	803.00	0.00
4.50	0.00	0	803.00	0.00
5.00	0.00	0	803.00	0.00
5.50	0.00	0	803.00	0.00
6.00	0.00	0	803.00	0.00
6.50	0.01	1	803.00	0.00
7.00	0.03	9	803.00	0.02
7.50	0.06	23	803.01	0.05
8.00	0.10	41	803.02	0.09
8.50	0.15	57	803.02	0.14
9.00	0.24	75	803.03	0.22
9.50	0.31	92	803.04	0.30
10.00	0.42	110	803.05	0.41
10.50	0.64	143	803.06	0.61
11.00	1.02	191	803.08	0.99
11.50	**1.95**	**287**	**803.11**	**1.88**
12.00	**32.55**	**1,927**	**803.62**	**34.26**
12.50	3.28	418	803.16	3.42
13.00	2.00	301	803.12	2.03
13.50	1.51	253	803.10	1.54
14.00	1.19	217	803.09	1.21
14.50	1.04	199	803.08	1.05
15.00	0.94	187	803.08	0.95
15.50	0.84	174	803.07	0.85
16.00	0.74	160	803.07	0.74
16.50	0.68	152	803.06	0.68
17.00	0.64	147	803.06	0.64
17.50	0.60	142	803.06	0.61
18.00	0.57	136	803.06	0.57
18.50	0.53	130	803.05	0.53
19.00	0.49	124	803.05	0.50
19.50	0.45	118	803.05	0.46
20.00	0.42	112	803.05	0.42
20.50	0.40	109	803.05	0.40
21.00	0.39	108	803.04	0.39
21.50	0.38	106	803.04	0.38
22.00	0.38	105	803.04	0.38
22.50	0.37	104	803.04	0.37
23.00	0.36	103	803.04	0.36
23.50	0.35	102	803.04	0.36
24.00	0.35	101	803.04	0.35

Summary for Pond DC-G11: Down Chute 3

Inflow Area = 20.371 ac, 0.00% Impervious, Inflow Depth > 3.99" for 100-yr event
Inflow = 144.56 cfs @ 11.97 hrs, Volume= 6.782 af
Outflow = 144.56 cfs @ 11.97 hrs, Volume= 6.782 af, Atten= 0%, Lag= 0.0 min
Primary = 144.56 cfs @ 11.97 hrs, Volume= 6.782 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 681.01' @ 11.97 hrs
Flood Elev= 680.98'

Device	Routing	Invert	Outlet Devices
#1	Primary	675.00'	**36.0" Round Culvert X 2.00** L= 70.6' Ke= 0.500 Inlet / Outlet Invert= 675.00' / 665.00' S= 0.1416 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=144.43 cfs @ 11.97 hrs HW=681.00' TW=670.75' (Dynamic Tailwater)
1=Culvert (Inlet Controls 144.43 cfs @ 10.22 fps)

Hydrograph for Pond DC-G11: Down Chute 3

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	675.00	0.00
0.50	0.00	675.00	0.00
1.00	0.00	675.00	0.00
1.50	0.00	675.00	0.00
2.00	0.00	675.00	0.00
2.50	0.00	675.00	0.00
3.00	0.00	675.00	0.00
3.50	0.00	675.00	0.00
4.00	0.00	675.00	0.00
4.50	0.00	675.00	0.00
5.00	0.00	675.00	0.00
5.50	0.00	675.00	0.00
6.00	0.00	675.00	0.00
6.50	0.01	675.03	0.01
7.00	0.11	675.09	0.11
7.50	0.23	675.12	0.23
8.00	0.36	675.15	0.36
8.50	0.56	675.19	0.56
9.00	0.86	675.24	0.86
9.50	1.15	675.27	1.15
10.00	1.57	675.32	1.57
10.50	2.37	675.40	2.37
11.00	3.80	675.51	3.80
11.50	**7.25**	**675.71**	**7.25**
12.00	**133.29**	**680.33**	**133.29**
12.50	12.75	675.95	12.75
13.00	7.62	675.72	7.62
13.50	5.75	675.63	5.75
14.00	4.54	675.55	4.54
14.50	3.95	675.52	3.95
15.00	3.56	675.49	3.56
15.50	3.17	675.46	3.17
16.00	2.78	675.44	2.78
16.50	2.57	675.44	2.57
17.00	2.43	675.44	2.43
17.50	2.29	675.45	2.29
18.00	2.15	675.46	2.15
18.50	2.00	675.46	2.00
19.00	1.86	675.46	1.86
19.50	1.72	675.45	1.72
20.00	1.58	675.43	1.58
20.50	1.51	675.42	1.51
21.00	1.48	675.42	1.48
21.50	1.45	675.42	1.45
22.00	1.42	675.41	1.42
22.50	1.39	675.41	1.39
23.00	1.37	675.41	1.37
23.50	1.34	675.40	1.34
24.00	1.31	675.40	1.31

Summary for Pond G: Pond G

Inflow Area = 28.484 ac, 0.00% Impervious, Inflow Depth > 3.97" for 100-yr event
Inflow = 199.41 cfs @ 11.97 hrs, Volume= 9.413 af
Outflow = 2.38 cfs @ 19.53 hrs, Volume= 2.120 af, Atten= 99%, Lag= 453.6 min
Primary = 2.38 cfs @ 19.53 hrs, Volume= 2.120 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 667.12' Surf.Area= 30,801 sf Storage= 73,912 cf
Peak Elev= 675.21' @ 19.53 hrs Surf.Area= 48,615 sf Storage= 392,579 cf (318,667 cf above start)

Plug-Flow detention time= 779.7 min calculated for 0.423 af (4% of inflow)
Center-of-Mass det. time= 127.4 min (940.8 - 813.4)

Volume	Invert	Avail.Storage	Storage Description
#1	664.50'	652,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
664.50	25,620	0	0
670.00	36,497	170,822	170,822
680.00	59,752	481,245	652,067

Device	Routing	Invert	Outlet Devices
#1	Primary	663.00'	**48.0" Round Culvert** L= 184.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 663.00' / 656.88' S= 0.0332 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Device 1	675.15'	**72.0" x 72.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	677.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.50 Width (feet) 15.00 25.00
#4	Device 1	666.70'	**0.600 cfs Constant Flow/Skimmer X 2.00** Phase-In= 0.42'

Primary OutFlow Max=2.38 cfs @ 19.53 hrs HW=675.21' TW=656.25' (Dynamic Tailwater)
└─**1=Culvert** (Passes 2.38 cfs of 193.35 cfs potential flow)
  ├─**2=Orifice/Grate** (Weir Controls 1.18 cfs @ 0.81 fps)
  └─**4=Constant Flow/Skimmer** (Constant Controls 1.20 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=667.12' TW=656.01' (Dynamic Tailwater)
└─**3=Custom Weir/Orifice** (Controls 0.00 cfs)

Hydrograph for Pond G: Pond G

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	73,912	667.12	1.20	1.20	**0.00**
0.50	0.00	71,923	667.06	1.02	1.02	0.00
1.00	0.00	70,241	667.00	0.86	0.86	0.00
1.50	0.00	68,819	666.95	0.73	0.73	0.00
2.00	0.00	67,618	666.91	0.61	0.61	0.00
2.50	0.00	66,605	666.88	0.52	0.52	0.00
3.00	0.00	65,749	666.85	0.44	0.44	0.00
3.50	0.00	65,027	666.83	0.37	0.37	0.00
4.00	0.00	64,418	666.81	0.31	0.31	0.00
4.50	0.00	63,904	666.79	0.26	0.26	0.00
5.00	0.00	63,471	666.78	0.22	0.22	0.00
5.50	0.00	63,106	666.77	0.19	0.19	0.00
6.00	0.00	62,798	666.75	0.16	0.16	0.00
6.50	0.02	62,543	666.75	0.13	0.13	0.00
7.00	0.13	62,441	666.74	0.12	0.12	0.00
7.50	0.29	62,589	666.75	0.14	0.14	0.00
8.00	0.48	62,998	666.76	0.18	0.18	0.00
8.50	0.75	63,704	666.78	0.24	0.24	0.00
9.00	1.17	64,882	666.82	0.35	0.35	0.00
9.50	1.56	66,603	666.88	0.52	0.52	0.00
10.00	2.15	68,757	666.95	0.72	0.72	0.00
10.50	3.25	71,989	667.06	1.02	1.02	0.00
11.00	5.24	77,367	667.23	1.20	1.20	0.00
11.50	**10.03**	88,328	667.58	1.20	1.20	0.00
12.00	**182.98**	218,813	671.26	1.20	1.20	0.00
12.50	17.63	298,847	673.18	1.20	1.20	0.00
13.00	10.58	320,151	673.66	1.20	1.20	0.00
13.50	8.00	334,444	673.98	1.20	1.20	0.00
14.00	6.31	345,070	674.21	1.20	1.20	0.00
14.50	5.50	353,384	674.39	1.20	1.20	0.00
15.00	4.96	360,634	674.54	1.20	1.20	0.00
15.50	4.42	366,914	674.68	1.20	1.20	0.00
16.00	3.87	372,215	674.79	1.20	1.20	0.00
16.50	3.57	376,700	674.88	1.20	1.20	0.00
17.00	3.38	380,794	674.97	1.20	1.20	0.00
17.50	3.18	384,540	675.04	1.20	1.20	0.00
18.00	2.99	387,934	675.12	1.20	1.20	0.00
18.50	2.79	390,862	675.18	1.52	1.52	0.00
19.00	2.59	392,274	675.20	2.20	2.20	0.00
19.50	2.39	**392,578**	**675.21**	**2.38**	**2.38**	0.00
20.00	2.19	**392,462**	**675.21**	**2.31**	**2.31**	0.00
20.50	2.10	392,252	675.20	2.19	2.19	0.00
21.00	2.06	392,120	675.20	2.12	2.12	0.00
21.50	2.02	392,027	675.20	2.07	2.07	0.00
22.00	1.98	391,947	675.20	2.02	2.02	0.00
22.50	1.94	391,872	675.20	1.98	1.98	0.00
23.00	1.90	391,797	675.19	1.95	1.95	0.00
23.50	1.86	391,721	675.19	1.91	1.91	0.00
24.00	1.83	391,645	675.19	1.87	1.87	0.00

Summary for Pond IPC-G7: (new Reach)

Inflow Area = 5.398 ac, 0.00% Impervious, Inflow Depth > 3.99" for 100-yr event
Inflow = 36.61 cfs @ 11.97 hrs, Volume= 1.795 af
Outflow = 36.61 cfs @ 11.97 hrs, Volume= 1.795 af, Atten= 0%, Lag= 0.0 min
Primary = 36.61 cfs @ 11.97 hrs, Volume= 1.795 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 677.65' @ 11.97 hrs
Flood Elev= 678.48'

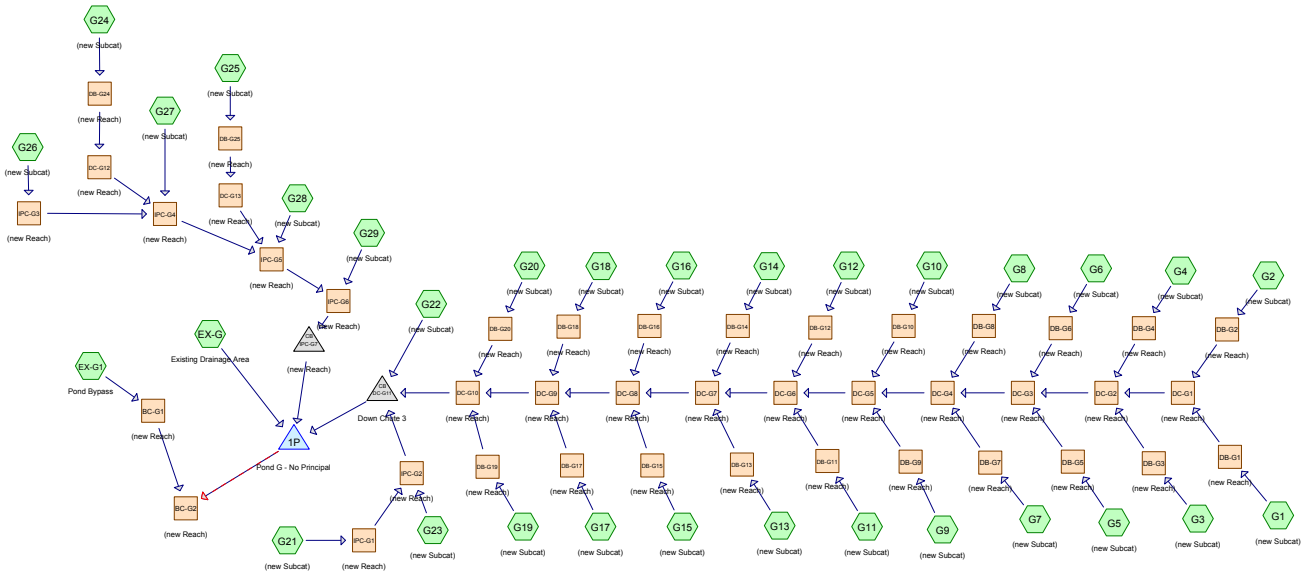
Device	Routing	Invert	Outlet Devices
#1	Primary	674.00'	**30.0" Round Culvert** L= 120.0' Ke= 0.500 Inlet / Outlet Invert= 674.00' / 669.00' S= 0.0417 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf

Primary OutFlow Max=36.59 cfs @ 11.97 hrs HW=677.65' TW=670.74' (Dynamic Tailwater)
1=Culvert (Inlet Controls 36.59 cfs @ 7.45 fps)

Hydrograph for Pond IPC-G7: (new Reach)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	674.00	0.00
0.50	0.00	674.00	0.00
1.00	0.00	674.00	0.00
1.50	0.00	674.00	0.00
2.00	0.00	674.00	0.00
2.50	0.00	674.00	0.00
3.00	0.00	674.00	0.00
3.50	0.00	674.00	0.00
4.00	0.00	674.00	0.00
4.50	0.00	674.00	0.00
5.00	0.00	674.00	0.00
5.50	0.00	674.00	0.00
6.00	0.00	674.00	0.00
6.50	0.00	674.02	0.00
7.00	0.02	674.05	0.02
7.50	0.05	674.08	0.05
8.00	0.09	674.11	0.09
8.50	0.14	674.14	0.14
9.00	0.22	674.18	0.22
9.50	0.30	674.21	0.30
10.00	0.41	674.24	0.41
10.50	0.61	674.30	0.61
11.00	0.99	674.38	0.99
11.50	**1.88**	**674.53**	**1.88**
12.00	**34.26**	**677.35**	**34.26**
12.50	3.42	674.72	3.42
13.00	2.03	674.57	2.03
13.50	1.54	674.56	1.54
14.00	1.21	674.56	1.21
14.50	1.05	674.60	1.05
15.00	0.95	674.66	0.95
15.50	0.85	674.74	0.85
16.00	0.74	674.82	0.74
16.50	0.68	674.90	0.68
17.00	0.64	674.98	0.64
17.50	0.61	675.05	0.61
18.00	0.57	675.12	0.57
18.50	0.53	675.18	0.53
19.00	0.50	675.21	0.50
19.50	0.46	675.21	0.46
20.00	0.42	675.21	0.42
20.50	0.40	675.21	0.40
21.00	0.39	675.20	0.39
21.50	0.38	675.20	0.38
22.00	0.38	675.20	0.38
22.50	0.37	675.20	0.37
23.00	0.36	675.20	0.36
23.50	0.36	675.20	0.36
24.00	0.35	675.19	0.35

POND G – FINAL CONDITIONS
100-YEAR, 24-HOUR STORM EVENT
NO PRINCIPAL SPILLWAY



Subcat Reach Pond Link

Routing Diagram for 071-644_SWM POND D, E, G

Prepared by CEC, Inc., Printed 5/23/2016

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
25.769	79	50-75% Grass cover, Fair, HSG C (G1, G10, G11, G12, G13, G14, G15, G16, G17, G18, G19, G2, G20, G21, G22, G23, G24, G25, G26, G27, G28, G29, G3, G4, G5, G6, G7, G8, G9)
13.269	76	Woods/grass comb., Fair, HSG C (EX-G, EX-G1)
39.038	**78**	**TOTAL AREA**

Summary for Subcatchment EX-G: Existing Drainage Area

Runoff = 18.52 cfs @ 11.96 hrs, Volume= 0.836 af, Depth> 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
2.715	76	Woods/grass comb., Fair, HSG C
2.715		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	100	0.2710	0.46		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.91"
1.2	349	0.4550	4.72		**Shallow Concentrated Flow, Shallow Concentrated** Short Grass Pasture Kv= 7.0 fps
4.8	449	Total			

Hydrograph for Subcatchment EX-G: Existing Drainage Area

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.00	0.01
8.00	0.76	0.01	0.03
8.50	0.84	0.01	0.05
9.00	0.94	0.03	0.09
9.50	1.04	0.05	0.12
10.00	1.15	0.07	0.17
10.50	1.30	0.12	0.27
11.00	1.50	0.19	0.45
11.50	1.80	0.32	**0.89**
12.00	4.22	1.91	**15.43**
12.50	4.68	2.28	1.46
13.00	4.92	2.47	0.93
13.50	5.09	2.61	0.71
14.00	5.22	2.72	0.56
14.50	5.34	2.81	0.50
15.00	5.44	2.90	0.45
15.50	5.53	2.98	0.40
16.00	5.61	3.04	0.35
16.50	5.68	3.10	0.33
17.00	5.74	3.16	0.31
17.50	5.81	3.21	0.29
18.00	5.87	3.27	0.27
18.50	5.92	3.31	0.25
19.00	5.97	3.36	0.24
19.50	6.02	3.40	0.22
20.00	6.06	3.44	0.20
20.50	6.11	3.47	0.19
21.00	6.15	3.51	0.19
21.50	6.18	3.54	0.19
22.00	6.22	3.57	0.18
22.50	6.26	3.61	0.18
23.00	6.30	3.64	0.18
23.50	6.33	3.67	0.17
24.00	**6.37**	**3.70**	0.17

Summary for Subcatchment EX-G1: Pond Bypass

Runoff = 68.70 cfs @ 11.97 hrs, Volume= 3.251 af, Depth> 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
10.554	76	Woods/grass comb., Fair, HSG C
10.554		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	100	0.1602	0.37		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
1.6	406	0.3730	4.28		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.1	506	Total			

Hydrograph for Subcatchment EX-G1: Pond Bypass

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.00	0.05
8.00	0.76	0.01	0.11
8.50	0.84	0.01	0.20
9.00	0.94	0.03	0.34
9.50	1.04	0.05	0.45
10.00	1.15	0.07	0.66
10.50	1.30	0.12	1.04
11.00	1.50	0.19	1.72
11.50	1.80	0.32	**3.39**
12.00	4.22	1.91	**64.54**
12.50	4.68	2.28	5.92
13.00	4.92	2.47	3.65
13.50	5.09	2.61	2.78
14.00	5.22	2.72	2.20
14.50	5.34	2.81	1.94
15.00	5.44	2.90	1.75
15.50	5.53	2.98	1.56
16.00	5.61	3.04	1.36
16.50	5.68	3.10	1.27
17.00	5.74	3.16	1.20
17.50	5.81	3.21	1.13
18.00	5.87	3.27	1.06
18.50	5.92	3.31	0.99
19.00	5.97	3.36	0.92
19.50	6.02	3.40	0.85
20.00	6.06	3.44	0.78
20.50	6.11	3.47	0.75
21.00	6.15	3.51	0.74
21.50	6.18	3.54	0.72
22.00	6.22	3.57	0.71
22.50	6.26	3.61	0.70
23.00	6.30	3.64	0.68
23.50	6.33	3.67	0.67
24.00	**6.37**	**3.70**	0.65

Summary for Subcatchment G1: (new Subcat)

Runoff = 2.48 cfs @ 11.94 hrs, Volume= 0.109 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.327	79	50-75% Grass cover, Fair, HSG C
0.327		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G1: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.00
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.01
9.00	0.94	0.05	0.02
9.50	1.04	0.08	0.02
10.00	1.15	0.12	0.03
10.50	1.30	0.17	0.04
11.00	1.50	0.26	0.07
11.50	1.80	0.41	**0.13**
12.00	4.22	2.15	**1.72**
12.50	4.68	2.53	0.18
13.00	4.92	2.73	0.12
13.50	5.09	2.88	0.09
14.00	5.22	2.99	0.07
14.50	5.34	3.09	0.06
15.00	5.44	3.18	0.06
15.50	5.53	3.26	0.05
16.00	5.61	3.33	0.04
16.50	5.68	3.39	0.04
17.00	5.74	3.45	0.04
17.50	5.81	3.51	0.04
18.00	5.87	3.56	0.03
18.50	5.92	3.61	0.03
19.00	5.97	3.66	0.03
19.50	6.02	3.70	0.03
20.00	6.06	3.74	0.02
20.50	6.11	3.77	0.02
21.00	6.15	3.81	0.02
21.50	6.18	3.85	0.02
22.00	6.22	3.88	0.02
22.50	6.26	3.91	0.02
23.00	6.30	3.95	0.02
23.50	6.33	3.98	0.02
24.00	**6.37**	**4.01**	0.02

Summary for Subcatchment G10: (new Subcat)

Runoff = 7.15 cfs @ 11.95 hrs, Volume= 0.317 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.948	79	50-75% Grass cover, Fair, HSG C
0.948		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	105	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G10: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.03
9.00	0.94	0.05	0.05
9.50	1.04	0.08	0.06
10.00	1.15	0.12	0.08
10.50	1.30	0.17	0.12
11.00	1.50	0.26	0.19
11.50	1.80	0.41	**0.37**
12.00	4.22	2.15	**5.16**
12.50	4.68	2.53	0.52
13.00	4.92	2.73	0.33
13.50	5.09	2.88	0.26
14.00	5.22	2.99	0.20
14.50	5.34	3.09	0.18
15.00	5.44	3.18	0.16
15.50	5.53	3.26	0.14
16.00	5.61	3.33	0.13
16.50	5.68	3.39	0.12
17.00	5.74	3.45	0.11
17.50	5.81	3.51	0.10
18.00	5.87	3.56	0.10
18.50	5.92	3.61	0.09
19.00	5.97	3.66	0.09
19.50	6.02	3.70	0.08
20.00	6.06	3.74	0.07
20.50	6.11	3.77	0.07
21.00	6.15	3.81	0.07
21.50	6.18	3.85	0.07
22.00	6.22	3.88	0.07
22.50	6.26	3.91	0.06
23.00	6.30	3.95	0.06
23.50	6.33	3.98	0.06
24.00	**6.37**	**4.01**	0.06

Summary for Subcatchment G11: (new Subcat)

Runoff = 4.10 cfs @ 11.94 hrs, Volume= 0.180 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.540	79	50-75% Grass cover, Fair, HSG C
0.540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G11: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.02
9.00	0.94	0.05	0.03
9.50	1.04	0.08	0.03
10.00	1.15	0.12	0.05
10.50	1.30	0.17	0.07
11.00	1.50	0.26	0.11
11.50	1.80	0.41	**0.21**
12.00	4.22	2.15	**2.85**
12.50	4.68	2.53	0.29
13.00	4.92	2.73	0.19
13.50	5.09	2.88	0.15
14.00	5.22	2.99	0.11
14.50	5.34	3.09	0.10
15.00	5.44	3.18	0.09
15.50	5.53	3.26	0.08
16.00	5.61	3.33	0.07
16.50	5.68	3.39	0.07
17.00	5.74	3.45	0.06
17.50	5.81	3.51	0.06
18.00	5.87	3.56	0.06
18.50	5.92	3.61	0.05
19.00	5.97	3.66	0.05
19.50	6.02	3.70	0.04
20.00	6.06	3.74	0.04
20.50	6.11	3.77	0.04
21.00	6.15	3.81	0.04
21.50	6.18	3.85	0.04
22.00	6.22	3.88	0.04
22.50	6.26	3.91	0.04
23.00	6.30	3.95	0.04
23.50	6.33	3.98	0.04
24.00	**6.37**	**4.01**	0.03

Summary for Subcatchment G12: (new Subcat)

Runoff = 8.36 cfs @ 11.94 hrs, Volume= 0.368 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.102	79	50-75% Grass cover, Fair, HSG C
1.102		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G12: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.02
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.04
9.00	0.94	0.05	0.05
9.50	1.04	0.08	0.07
10.00	1.15	0.12	0.09
10.50	1.30	0.17	0.14
11.00	1.50	0.26	0.22
11.50	1.80	0.41	**0.43**
12.00	4.22	2.15	**5.81**
12.50	4.68	2.53	0.60
13.00	4.92	2.73	0.39
13.50	5.09	2.88	0.30
14.00	5.22	2.99	0.23
14.50	5.34	3.09	0.21
15.00	5.44	3.18	0.19
15.50	5.53	3.26	0.17
16.00	5.61	3.33	0.15
16.50	5.68	3.39	0.14
17.00	5.74	3.45	0.13
17.50	5.81	3.51	0.12
18.00	5.87	3.56	0.11
18.50	5.92	3.61	0.11
19.00	5.97	3.66	0.10
19.50	6.02	3.70	0.09
20.00	6.06	3.74	0.08
20.50	6.11	3.77	0.08
21.00	6.15	3.81	0.08
21.50	6.18	3.85	0.08
22.00	6.22	3.88	0.08
22.50	6.26	3.91	0.07
23.00	6.30	3.95	0.07
23.50	6.33	3.98	0.07
24.00	**6.37**	**4.01**	0.07

Summary for Subcatchment G13: (new Subcat)

Runoff = 3.30 cfs @ 11.94 hrs, Volume= 0.145 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.435	79	50-75% Grass cover, Fair, HSG C
0.435		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G13: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.01
9.00	0.94	0.05	0.02
9.50	1.04	0.08	0.03
10.00	1.15	0.12	0.04
10.50	1.30	0.17	0.06
11.00	1.50	0.26	0.09
11.50	1.80	0.41	**0.17**
12.00	4.22	2.15	**2.29**
12.50	4.68	2.53	0.24
13.00	4.92	2.73	0.15
13.50	5.09	2.88	0.12
14.00	5.22	2.99	0.09
14.50	5.34	3.09	0.08
15.00	5.44	3.18	0.07
15.50	5.53	3.26	0.07
16.00	5.61	3.33	0.06
16.50	5.68	3.39	0.05
17.00	5.74	3.45	0.05
17.50	5.81	3.51	0.05
18.00	5.87	3.56	0.05
18.50	5.92	3.61	0.04
19.00	5.97	3.66	0.04
19.50	6.02	3.70	0.04
20.00	6.06	3.74	0.03
20.50	6.11	3.77	0.03
21.00	6.15	3.81	0.03
21.50	6.18	3.85	0.03
22.00	6.22	3.88	0.03
22.50	6.26	3.91	0.03
23.00	6.30	3.95	0.03
23.50	6.33	3.98	0.03
24.00	**6.37**	**4.01**	0.03

Summary for Subcatchment G14: (new Subcat)

Runoff = 9.16 cfs @ 11.94 hrs, Volume= 0.403 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.207	79	50-75% Grass cover, Fair, HSG C
1.207		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G14: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.02
8.00	0.76	0.02	0.03
8.50	0.84	0.03	0.04
9.00	0.94	0.05	0.06
9.50	1.04	0.08	0.07
10.00	1.15	0.12	0.10
10.50	1.30	0.17	0.15
11.00	1.50	0.26	0.25
11.50	1.80	0.41	**0.47**
12.00	4.22	2.15	**6.36**
12.50	4.68	2.53	0.66
13.00	4.92	2.73	0.42
13.50	5.09	2.88	0.33
14.00	5.22	2.99	0.26
14.50	5.34	3.09	0.23
15.00	5.44	3.18	0.21
15.50	5.53	3.26	0.18
16.00	5.61	3.33	0.16
16.50	5.68	3.39	0.15
17.00	5.74	3.45	0.14
17.50	5.81	3.51	0.13
18.00	5.87	3.56	0.13
18.50	5.92	3.61	0.12
19.00	5.97	3.66	0.11
19.50	6.02	3.70	0.10
20.00	6.06	3.74	0.09
20.50	6.11	3.77	0.09
21.00	6.15	3.81	0.09
21.50	6.18	3.85	0.09
22.00	6.22	3.88	0.08
22.50	6.26	3.91	0.08
23.00	6.30	3.95	0.08
23.50	6.33	3.98	0.08
24.00	**6.37**	**4.01**	0.08

Summary for Subcatchment G15: (new Subcat)

Runoff = 2.50 cfs @ 11.94 hrs, Volume= 0.110 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.329	79	50-75% Grass cover, Fair, HSG C
0.329		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G15: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.00
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.01
9.00	0.94	0.05	0.02
9.50	1.04	0.08	0.02
10.00	1.15	0.12	0.03
10.50	1.30	0.17	0.04
11.00	1.50	0.26	0.07
11.50	1.80	0.41	**0.13**
12.00	4.22	2.15	**1.73**
12.50	4.68	2.53	0.18
13.00	4.92	2.73	0.12
13.50	5.09	2.88	0.09
14.00	5.22	2.99	0.07
14.50	5.34	3.09	0.06
15.00	5.44	3.18	0.06
15.50	5.53	3.26	0.05
16.00	5.61	3.33	0.04
16.50	5.68	3.39	0.04
17.00	5.74	3.45	0.04
17.50	5.81	3.51	0.04
18.00	5.87	3.56	0.03
18.50	5.92	3.61	0.03
19.00	5.97	3.66	0.03
19.50	6.02	3.70	0.03
20.00	6.06	3.74	0.02
20.50	6.11	3.77	0.02
21.00	6.15	3.81	0.02
21.50	6.18	3.85	0.02
22.00	6.22	3.88	0.02
22.50	6.26	3.91	0.02
23.00	6.30	3.95	0.02
23.50	6.33	3.98	0.02
24.00	**6.37**	**4.01**	0.02

Summary for Subcatchment G16: (new Subcat)

Runoff = 8.11 cfs @ 11.94 hrs, Volume= 0.357 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.069	79	50-75% Grass cover, Fair, HSG C
1.069		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G16: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.02
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.04
9.00	0.94	0.05	0.05
9.50	1.04	0.08	0.06
10.00	1.15	0.12	0.09
10.50	1.30	0.17	0.14
11.00	1.50	0.26	0.22
11.50	1.80	0.41	**0.42**
12.00	4.22	2.15	**5.64**
12.50	4.68	2.53	0.58
13.00	4.92	2.73	0.38
13.50	5.09	2.88	0.29
14.00	5.22	2.99	0.23
14.50	5.34	3.09	0.20
15.00	5.44	3.18	0.18
15.50	5.53	3.26	0.16
16.00	5.61	3.33	0.14
16.50	5.68	3.39	0.13
17.00	5.74	3.45	0.13
17.50	5.81	3.51	0.12
18.00	5.87	3.56	0.11
18.50	5.92	3.61	0.10
19.00	5.97	3.66	0.10
19.50	6.02	3.70	0.09
20.00	6.06	3.74	0.08
20.50	6.11	3.77	0.08
21.00	6.15	3.81	0.08
21.50	6.18	3.85	0.08
22.00	6.22	3.88	0.07
22.50	6.26	3.91	0.07
23.00	6.30	3.95	0.07
23.50	6.33	3.98	0.07
24.00	**6.37**	**4.01**	0.07

Summary for Subcatchment G17: (new Subcat)

Runoff = 1.70 cfs @ 11.94 hrs, Volume= 0.075 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.224	79	50-75% Grass cover, Fair, HSG C
0.224		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G17: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.00
8.00	0.76	0.02	0.00
8.50	0.84	0.03	0.01
9.00	0.94	0.05	0.01
9.50	1.04	0.08	0.01
10.00	1.15	0.12	0.02
10.50	1.30	0.17	0.03
11.00	1.50	0.26	0.05
11.50	1.80	0.41	**0.09**
12.00	4.22	2.15	**1.18**
12.50	4.68	2.53	0.12
13.00	4.92	2.73	0.08
13.50	5.09	2.88	0.06
14.00	5.22	2.99	0.05
14.50	5.34	3.09	0.04
15.00	5.44	3.18	0.04
15.50	5.53	3.26	0.03
16.00	5.61	3.33	0.03
16.50	5.68	3.39	0.03
17.00	5.74	3.45	0.03
17.50	5.81	3.51	0.02
18.00	5.87	3.56	0.02
18.50	5.92	3.61	0.02
19.00	5.97	3.66	0.02
19.50	6.02	3.70	0.02
20.00	6.06	3.74	0.02
20.50	6.11	3.77	0.02
21.00	6.15	3.81	0.02
21.50	6.18	3.85	0.02
22.00	6.22	3.88	0.02
22.50	6.26	3.91	0.02
23.00	6.30	3.95	0.01
23.50	6.33	3.98	0.01
24.00	**6.37**	**4.01**	0.01

Summary for Subcatchment G18: (new Subcat)

Runoff = 6.85 cfs @ 11.94 hrs, Volume= 0.302 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.903	79	50-75% Grass cover, Fair, HSG C
0.903		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G18: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.03
9.00	0.94	0.05	0.04
9.50	1.04	0.08	0.05
10.00	1.15	0.12	0.08
10.50	1.30	0.17	0.11
11.00	1.50	0.26	0.18
11.50	1.80	0.41	**0.35**
12.00	4.22	2.15	**4.76**
12.50	4.68	2.53	0.49
13.00	4.92	2.73	0.32
13.50	5.09	2.88	0.24
14.00	5.22	2.99	0.19
14.50	5.34	3.09	0.17
15.00	5.44	3.18	0.15
15.50	5.53	3.26	0.14
16.00	5.61	3.33	0.12
16.50	5.68	3.39	0.11
17.00	5.74	3.45	0.11
17.50	5.81	3.51	0.10
18.00	5.87	3.56	0.09
18.50	5.92	3.61	0.09
19.00	5.97	3.66	0.08
19.50	6.02	3.70	0.07
20.00	6.06	3.74	0.07
20.50	6.11	3.77	0.07
21.00	6.15	3.81	0.07
21.50	6.18	3.85	0.06
22.00	6.22	3.88	0.06
22.50	6.26	3.91	0.06
23.00	6.30	3.95	0.06
23.50	6.33	3.98	0.06
24.00	**6.37**	**4.01**	0.06

Summary for Subcatchment G19: (new Subcat)

Runoff = 0.90 cfs @ 11.94 hrs, Volume= 0.039 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.118	79	50-75% Grass cover, Fair, HSG C
0.118		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G19: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.00
8.00	0.76	0.02	0.00
8.50	0.84	0.03	0.00
9.00	0.94	0.05	0.01
9.50	1.04	0.08	0.01
10.00	1.15	0.12	0.01
10.50	1.30	0.17	0.02
11.00	1.50	0.26	0.02
11.50	1.80	0.41	**0.05**
12.00	4.22	2.15	**0.62**
12.50	4.68	2.53	0.06
13.00	4.92	2.73	0.04
13.50	5.09	2.88	0.03
14.00	5.22	2.99	0.03
14.50	5.34	3.09	0.02
15.00	5.44	3.18	0.02
15.50	5.53	3.26	0.02
16.00	5.61	3.33	0.02
16.50	5.68	3.39	0.01
17.00	5.74	3.45	0.01
17.50	5.81	3.51	0.01
18.00	5.87	3.56	0.01
18.50	5.92	3.61	0.01
19.00	5.97	3.66	0.01
19.50	6.02	3.70	0.01
20.00	6.06	3.74	0.01
20.50	6.11	3.77	0.01
21.00	6.15	3.81	0.01
21.50	6.18	3.85	0.01
22.00	6.22	3.88	0.01
22.50	6.26	3.91	0.01
23.00	6.30	3.95	0.01
23.50	6.33	3.98	0.01
24.00	**6.37**	**4.01**	0.01

Summary for Subcatchment G2: (new Subcat)

Runoff = 1.86 cfs @ 11.94 hrs, Volume= 0.082 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.245	79	50-75% Grass cover, Fair, HSG C
0.245		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G2: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.00
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.01
9.00	0.94	0.05	0.01
9.50	1.04	0.08	0.01
10.00	1.15	0.12	0.02
10.50	1.30	0.17	0.03
11.00	1.50	0.26	0.05
11.50	1.80	0.41	**0.10**
12.00	4.22	2.15	**1.29**
12.50	4.68	2.53	0.13
13.00	4.92	2.73	0.09
13.50	5.09	2.88	0.07
14.00	5.22	2.99	0.05
14.50	5.34	3.09	0.05
15.00	5.44	3.18	0.04
15.50	5.53	3.26	0.04
16.00	5.61	3.33	0.03
16.50	5.68	3.39	0.03
17.00	5.74	3.45	0.03
17.50	5.81	3.51	0.03
18.00	5.87	3.56	0.03
18.50	5.92	3.61	0.02
19.00	5.97	3.66	0.02
19.50	6.02	3.70	0.02
20.00	6.06	3.74	0.02
20.50	6.11	3.77	0.02
21.00	6.15	3.81	0.02
21.50	6.18	3.85	0.02
22.00	6.22	3.88	0.02
22.50	6.26	3.91	0.02
23.00	6.30	3.95	0.02
23.50	6.33	3.98	0.02
24.00	**6.37**	**4.01**	0.02

Summary for Subcatchment G20: (new Subcat)

Runoff = 5.53 cfs @ 11.94 hrs, Volume= 0.244 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.729	79	50-75% Grass cover, Fair, HSG C
0.729		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G20: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.02
9.00	0.94	0.05	0.04
9.50	1.04	0.08	0.04
10.00	1.15	0.12	0.06
10.50	1.30	0.17	0.09
11.00	1.50	0.26	0.15
11.50	1.80	0.41	**0.29**
12.00	4.22	2.15	**3.84**
12.50	4.68	2.53	0.40
13.00	4.92	2.73	0.26
13.50	5.09	2.88	0.20
14.00	5.22	2.99	0.16
14.50	5.34	3.09	0.14
15.00	5.44	3.18	0.12
15.50	5.53	3.26	0.11
16.00	5.61	3.33	0.10
16.50	5.68	3.39	0.09
17.00	5.74	3.45	0.09
17.50	5.81	3.51	0.08
18.00	5.87	3.56	0.08
18.50	5.92	3.61	0.07
19.00	5.97	3.66	0.07
19.50	6.02	3.70	0.06
20.00	6.06	3.74	0.06
20.50	6.11	3.77	0.05
21.00	6.15	3.81	0.05
21.50	6.18	3.85	0.05
22.00	6.22	3.88	0.05
22.50	6.26	3.91	0.05
23.00	6.30	3.95	0.05
23.50	6.33	3.98	0.05
24.00	**6.37**	**4.01**	0.05

Summary for Subcatchment G21: (new Subcat)

Runoff = 16.96 cfs @ 11.92 hrs, Volume= 0.700 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
2.096	79	50-75% Grass cover, Fair, HSG C
2.096		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	39	0.2500	0.37		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G21: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.01
7.00	0.63	0.00	0.02
7.50	0.70	0.01	0.03
8.00	0.76	0.02	0.04
8.50	0.84	0.03	0.07
9.00	0.94	0.05	0.10
9.50	1.04	0.08	0.13
10.00	1.15	0.12	0.18
10.50	1.30	0.17	0.27
11.00	1.50	0.26	0.44
11.50	1.80	0.41	**0.85**
12.00	4.22	2.15	**6.81**
12.50	4.68	2.53	1.06
13.00	4.92	2.73	0.72
13.50	5.09	2.88	0.56
14.00	5.22	2.99	0.44
14.50	5.34	3.09	0.40
15.00	5.44	3.18	0.36
15.50	5.53	3.26	0.32
16.00	5.61	3.33	0.28
16.50	5.68	3.39	0.26
17.00	5.74	3.45	0.25
17.50	5.81	3.51	0.23
18.00	5.87	3.56	0.22
18.50	5.92	3.61	0.20
19.00	5.97	3.66	0.19
19.50	6.02	3.70	0.17
20.00	6.06	3.74	0.16
20.50	6.11	3.77	0.15
21.00	6.15	3.81	0.15
21.50	6.18	3.85	0.15
22.00	6.22	3.88	0.15
22.50	6.26	3.91	0.14
23.00	6.30	3.95	0.14
23.50	6.33	3.98	0.14
24.00	**6.37**	**4.01**	0.13

Summary for Subcatchment G22: (new Subcat)

Runoff = 5.95 cfs @ 11.95 hrs, Volume= 0.269 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.806	79	50-75% Grass cover, Fair, HSG C
0.806		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	125	0.2500	0.47		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G22: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.03
9.00	0.94	0.05	0.04
9.50	1.04	0.08	0.05
10.00	1.15	0.12	0.07
10.50	1.30	0.17	0.10
11.00	1.50	0.26	0.16
11.50	1.80	0.41	**0.31**
12.00	4.22	2.15	**4.74**
12.50	4.68	2.53	0.45
13.00	4.92	2.73	0.29
13.50	5.09	2.88	0.22
14.00	5.22	2.99	0.17
14.50	5.34	3.09	0.15
15.00	5.44	3.18	0.14
15.50	5.53	3.26	0.12
16.00	5.61	3.33	0.11
16.50	5.68	3.39	0.10
17.00	5.74	3.45	0.09
17.50	5.81	3.51	0.09
18.00	5.87	3.56	0.08
18.50	5.92	3.61	0.08
19.00	5.97	3.66	0.07
19.50	6.02	3.70	0.07
20.00	6.06	3.74	0.06
20.50	6.11	3.77	0.06
21.00	6.15	3.81	0.06
21.50	6.18	3.85	0.06
22.00	6.22	3.88	0.06
22.50	6.26	3.91	0.05
23.00	6.30	3.95	0.05
23.50	6.33	3.98	0.05
24.00	**6.37**	**4.01**	0.05

Summary for Subcatchment G23: (new Subcat)

Runoff = 32.15 cfs @ 11.97 hrs, Volume= 1.510 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
4.524	79	50-75% Grass cover, Fair, HSG C
4.524		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1510	0.36		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
0.8	165	0.2450	3.46		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	71	0.5490	5.19		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.6	336	Total			

Hydrograph for Subcatchment G23: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.01
7.00	0.63	0.00	0.04
7.50	0.70	0.01	0.06
8.00	0.76	0.02	0.09
8.50	0.84	0.03	0.14
9.00	0.94	0.05	0.22
9.50	1.04	0.08	0.27
10.00	1.15	0.12	0.38
10.50	1.30	0.17	0.56
11.00	1.50	0.26	0.90
11.50	1.80	0.41	**1.71**
12.00	4.22	2.15	**28.97**
12.50	4.68	2.53	2.62
13.00	4.92	2.73	1.63
13.50	5.09	2.88	1.24
14.00	5.22	2.99	0.98
14.50	5.34	3.09	0.86
15.00	5.44	3.18	0.78
15.50	5.53	3.26	0.69
16.00	5.61	3.33	0.60
16.50	5.68	3.39	0.56
17.00	5.74	3.45	0.53
17.50	5.81	3.51	0.50
18.00	5.87	3.56	0.47
18.50	5.92	3.61	0.44
19.00	5.97	3.66	0.41
19.50	6.02	3.70	0.38
20.00	6.06	3.74	0.34
20.50	6.11	3.77	0.33
21.00	6.15	3.81	0.33
21.50	6.18	3.85	0.32
22.00	6.22	3.88	0.31
22.50	6.26	3.91	0.31
23.00	6.30	3.95	0.30
23.50	6.33	3.98	0.30
24.00	**6.37**	**4.01**	0.29

Summary for Subcatchment G24: (new Subcat)

Runoff = 9.11 cfs @ 11.95 hrs, Volume= 0.403 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.208	79	50-75% Grass cover, Fair, HSG C
1.208		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	106	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G24: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.02
8.00	0.76	0.02	0.03
8.50	0.84	0.03	0.04
9.00	0.94	0.05	0.06
9.50	1.04	0.08	0.07
10.00	1.15	0.12	0.10
10.50	1.30	0.17	0.15
11.00	1.50	0.26	0.24
11.50	1.80	0.41	**0.47**
12.00	4.22	2.15	**6.57**
12.50	4.68	2.53	0.66
13.00	4.92	2.73	0.43
13.50	5.09	2.88	0.33
14.00	5.22	2.99	0.26
14.50	5.34	3.09	0.23
15.00	5.44	3.18	0.21
15.50	5.53	3.26	0.18
16.00	5.61	3.33	0.16
16.50	5.68	3.39	0.15
17.00	5.74	3.45	0.14
17.50	5.81	3.51	0.13
18.00	5.87	3.56	0.13
18.50	5.92	3.61	0.12
19.00	5.97	3.66	0.11
19.50	6.02	3.70	0.10
20.00	6.06	3.74	0.09
20.50	6.11	3.77	0.09
21.00	6.15	3.81	0.09
21.50	6.18	3.85	0.09
22.00	6.22	3.88	0.08
22.50	6.26	3.91	0.08
23.00	6.30	3.95	0.08
23.50	6.33	3.98	0.08
24.00	**6.37**	**4.01**	0.08

Summary for Subcatchment G25: (new Subcat)

Runoff = 1.97 cfs @ 11.95 hrs, Volume= 0.087 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.260	79	50-75% Grass cover, Fair, HSG C
0.260		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	102	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G25: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.00
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.01
9.00	0.94	0.05	0.01
9.50	1.04	0.08	0.02
10.00	1.15	0.12	0.02
10.50	1.30	0.17	0.03
11.00	1.50	0.26	0.05
11.50	1.80	0.41	**0.10**
12.00	4.22	2.15	**1.39**
12.50	4.68	2.53	0.14
13.00	4.92	2.73	0.09
13.50	5.09	2.88	0.07
14.00	5.22	2.99	0.06
14.50	5.34	3.09	0.05
15.00	5.44	3.18	0.04
15.50	5.53	3.26	0.04
16.00	5.61	3.33	0.03
16.50	5.68	3.39	0.03
17.00	5.74	3.45	0.03
17.50	5.81	3.51	0.03
18.00	5.87	3.56	0.03
18.50	5.92	3.61	0.03
19.00	5.97	3.66	0.02
19.50	6.02	3.70	0.02
20.00	6.06	3.74	0.02
20.50	6.11	3.77	0.02
21.00	6.15	3.81	0.02
21.50	6.18	3.85	0.02
22.00	6.22	3.88	0.02
22.50	6.26	3.91	0.02
23.00	6.30	3.95	0.02
23.50	6.33	3.98	0.02
24.00	**6.37**	**4.01**	0.02

Summary for Subcatchment G26: (new Subcat)

Runoff = 9.59 cfs @ 11.94 hrs, Volume= 0.419 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.254	79	50-75% Grass cover, Fair, HSG C
1.254		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	92	0.2500	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G26: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.02
8.00	0.76	0.02	0.03
8.50	0.84	0.03	0.04
9.00	0.94	0.05	0.06
9.50	1.04	0.08	0.07
10.00	1.15	0.12	0.11
10.50	1.30	0.17	0.16
11.00	1.50	0.26	0.26
11.50	1.80	0.41	**0.49**
12.00	4.22	2.15	**6.39**
12.50	4.68	2.53	0.68
13.00	4.92	2.73	0.44
13.50	5.09	2.88	0.34
14.00	5.22	2.99	0.27
14.50	5.34	3.09	0.24
15.00	5.44	3.18	0.21
15.50	5.53	3.26	0.19
16.00	5.61	3.33	0.17
16.50	5.68	3.39	0.16
17.00	5.74	3.45	0.15
17.50	5.81	3.51	0.14
18.00	5.87	3.56	0.13
18.50	5.92	3.61	0.12
19.00	5.97	3.66	0.11
19.50	6.02	3.70	0.10
20.00	6.06	3.74	0.09
20.50	6.11	3.77	0.09
21.00	6.15	3.81	0.09
21.50	6.18	3.85	0.09
22.00	6.22	3.88	0.09
22.50	6.26	3.91	0.09
23.00	6.30	3.95	0.08
23.50	6.33	3.98	0.08
24.00	**6.37**	**4.01**	0.08

Summary for Subcatchment G27: (new Subcat)

Runoff = 7.72 cfs @ 11.94 hrs, Volume= 0.337 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.010	79	50-75% Grass cover, Fair, HSG C
1.010		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	92	0.2500	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G27: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.03
9.00	0.94	0.05	0.05
9.50	1.04	0.08	0.06
10.00	1.15	0.12	0.09
10.50	1.30	0.17	0.13
11.00	1.50	0.26	0.21
11.50	1.80	0.41	**0.40**
12.00	4.22	2.15	**5.15**
12.50	4.68	2.53	0.55
13.00	4.92	2.73	0.35
13.50	5.09	2.88	0.27
14.00	5.22	2.99	0.21
14.50	5.34	3.09	0.19
15.00	5.44	3.18	0.17
15.50	5.53	3.26	0.15
16.00	5.61	3.33	0.13
16.50	5.68	3.39	0.13
17.00	5.74	3.45	0.12
17.50	5.81	3.51	0.11
18.00	5.87	3.56	0.10
18.50	5.92	3.61	0.10
19.00	5.97	3.66	0.09
19.50	6.02	3.70	0.08
20.00	6.06	3.74	0.08
20.50	6.11	3.77	0.07
21.00	6.15	3.81	0.07
21.50	6.18	3.85	0.07
22.00	6.22	3.88	0.07
22.50	6.26	3.91	0.07
23.00	6.30	3.95	0.07
23.50	6.33	3.98	0.07
24.00	**6.37**	**4.01**	0.06

Summary for Subcatchment G28: (new Subcat)

Runoff = 1.84 cfs @ 11.94 hrs, Volume= 0.081 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.241	79	50-75% Grass cover, Fair, HSG C
0.241		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	92	0.2500	0.44		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G28: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.00
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.01
9.00	0.94	0.05	0.01
9.50	1.04	0.08	0.01
10.00	1.15	0.12	0.02
10.50	1.30	0.17	0.03
11.00	1.50	0.26	0.05
11.50	1.80	0.41	**0.09**
12.00	4.22	2.15	**1.23**
12.50	4.68	2.53	0.13
13.00	4.92	2.73	0.08
13.50	5.09	2.88	0.06
14.00	5.22	2.99	0.05
14.50	5.34	3.09	0.05
15.00	5.44	3.18	0.04
15.50	5.53	3.26	0.04
16.00	5.61	3.33	0.03
16.50	5.68	3.39	0.03
17.00	5.74	3.45	0.03
17.50	5.81	3.51	0.03
18.00	5.87	3.56	0.02
18.50	5.92	3.61	0.02
19.00	5.97	3.66	0.02
19.50	6.02	3.70	0.02
20.00	6.06	3.74	0.02
20.50	6.11	3.77	0.02
21.00	6.15	3.81	0.02
21.50	6.18	3.85	0.02
22.00	6.22	3.88	0.02
22.50	6.26	3.91	0.02
23.00	6.30	3.95	0.02
23.50	6.33	3.98	0.02
24.00	**6.37**	**4.01**	0.02

Summary for Subcatchment G29: (new Subcat)

Runoff = 11.19 cfs @ 11.93 hrs, Volume= 0.476 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.425	79	50-75% Grass cover, Fair, HSG C
1.425		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	97	0.5540	0.61		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G29: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.02
8.00	0.76	0.02	0.03
8.50	0.84	0.03	0.05
9.00	0.94	0.05	0.07
9.50	1.04	0.08	0.09
10.00	1.15	0.12	0.12
10.50	1.30	0.17	0.18
11.00	1.50	0.26	0.29
11.50	1.80	0.41	**0.57**
12.00	4.22	2.15	**6.11**
12.50	4.68	2.53	0.75
13.00	4.92	2.73	0.50
13.50	5.09	2.88	0.38
14.00	5.22	2.99	0.30
14.50	5.34	3.09	0.27
15.00	5.44	3.18	0.24
15.50	5.53	3.26	0.22
16.00	5.61	3.33	0.19
16.50	5.68	3.39	0.18
17.00	5.74	3.45	0.17
17.50	5.81	3.51	0.16
18.00	5.87	3.56	0.15
18.50	5.92	3.61	0.14
19.00	5.97	3.66	0.13
19.50	6.02	3.70	0.12
20.00	6.06	3.74	0.11
20.50	6.11	3.77	0.10
21.00	6.15	3.81	0.10
21.50	6.18	3.85	0.10
22.00	6.22	3.88	0.10
22.50	6.26	3.91	0.10
23.00	6.30	3.95	0.09
23.50	6.33	3.98	0.09
24.00	**6.37**	**4.01**	0.09

Summary for Subcatchment G3: (new Subcat)

Runoff = 4.28 cfs @ 11.95 hrs, Volume= 0.189 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.565	79	50-75% Grass cover, Fair, HSG C
0.565		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	103	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G3: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.02
9.00	0.94	0.05	0.03
9.50	1.04	0.08	0.03
10.00	1.15	0.12	0.05
10.50	1.30	0.17	0.07
11.00	1.50	0.26	0.11
11.50	1.80	0.41	**0.22**
12.00	4.22	2.15	**3.03**
12.50	4.68	2.53	0.31
13.00	4.92	2.73	0.20
13.50	5.09	2.88	0.15
14.00	5.22	2.99	0.12
14.50	5.34	3.09	0.11
15.00	5.44	3.18	0.10
15.50	5.53	3.26	0.09
16.00	5.61	3.33	0.07
16.50	5.68	3.39	0.07
17.00	5.74	3.45	0.07
17.50	5.81	3.51	0.06
18.00	5.87	3.56	0.06
18.50	5.92	3.61	0.05
19.00	5.97	3.66	0.05
19.50	6.02	3.70	0.05
20.00	6.06	3.74	0.04
20.50	6.11	3.77	0.04
21.00	6.15	3.81	0.04
21.50	6.18	3.85	0.04
22.00	6.22	3.88	0.04
22.50	6.26	3.91	0.04
23.00	6.30	3.95	0.04
23.50	6.33	3.98	0.04
24.00	**6.37**	**4.01**	0.04

Summary for Subcatchment G4: (new Subcat)

Runoff = 3.13 cfs @ 11.94 hrs, Volume= 0.138 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.413	79	50-75% Grass cover, Fair, HSG C
0.413		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G4: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.01
9.00	0.94	0.05	0.02
9.50	1.04	0.08	0.02
10.00	1.15	0.12	0.03
10.50	1.30	0.17	0.05
11.00	1.50	0.26	0.08
11.50	1.80	0.41	**0.16**
12.00	4.22	2.15	**2.18**
12.50	4.68	2.53	0.22
13.00	4.92	2.73	0.15
13.50	5.09	2.88	0.11
14.00	5.22	2.99	0.09
14.50	5.34	3.09	0.08
15.00	5.44	3.18	0.07
15.50	5.53	3.26	0.06
16.00	5.61	3.33	0.05
16.50	5.68	3.39	0.05
17.00	5.74	3.45	0.05
17.50	5.81	3.51	0.05
18.00	5.87	3.56	0.04
18.50	5.92	3.61	0.04
19.00	5.97	3.66	0.04
19.50	6.02	3.70	0.03
20.00	6.06	3.74	0.03
20.50	6.11	3.77	0.03
21.00	6.15	3.81	0.03
21.50	6.18	3.85	0.03
22.00	6.22	3.88	0.03
22.50	6.26	3.91	0.03
23.00	6.30	3.95	0.03
23.50	6.33	3.98	0.03
24.00	**6.37**	**4.01**	0.03

Summary for Subcatchment G5: (new Subcat)

Runoff = 7.91 cfs @ 11.95 hrs, Volume= 0.352 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
1.053	79	50-75% Grass cover, Fair, HSG C
1.053		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"
0.3	58	0.2500	3.50		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.0	158	Total			

Hydrograph for Subcatchment G5: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.02
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.03
9.00	0.94	0.05	0.05
9.50	1.04	0.08	0.06
10.00	1.15	0.12	0.09
10.50	1.30	0.17	0.13
11.00	1.50	0.26	0.21
11.50	1.80	0.41	**0.41**
12.00	4.22	2.15	**5.81**
12.50	4.68	2.53	0.58
13.00	4.92	2.73	0.37
13.50	5.09	2.88	0.28
14.00	5.22	2.99	0.22
14.50	5.34	3.09	0.20
15.00	5.44	3.18	0.18
15.50	5.53	3.26	0.16
16.00	5.61	3.33	0.14
16.50	5.68	3.39	0.13
17.00	5.74	3.45	0.12
17.50	5.81	3.51	0.12
18.00	5.87	3.56	0.11
18.50	5.92	3.61	0.10
19.00	5.97	3.66	0.09
19.50	6.02	3.70	0.09
20.00	6.06	3.74	0.08
20.50	6.11	3.77	0.08
21.00	6.15	3.81	0.08
21.50	6.18	3.85	0.07
22.00	6.22	3.88	0.07
22.50	6.26	3.91	0.07
23.00	6.30	3.95	0.07
23.50	6.33	3.98	0.07
24.00	**6.37**	**4.01**	0.07

Summary for Subcatchment G6: (new Subcat)

Runoff = 4.43 cfs @ 11.94 hrs, Volume= 0.195 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.583	79	50-75% Grass cover, Fair, HSG C
0.583		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G6: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.00
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.02
9.00	0.94	0.05	0.03
9.50	1.04	0.08	0.03
10.00	1.15	0.12	0.05
10.50	1.30	0.17	0.07
11.00	1.50	0.26	0.12
11.50	1.80	0.41	**0.23**
12.00	4.22	2.15	**3.07**
12.50	4.68	2.53	0.32
13.00	4.92	2.73	0.21
13.50	5.09	2.88	0.16
14.00	5.22	2.99	0.12
14.50	5.34	3.09	0.11
15.00	5.44	3.18	0.10
15.50	5.53	3.26	0.09
16.00	5.61	3.33	0.08
16.50	5.68	3.39	0.07
17.00	5.74	3.45	0.07
17.50	5.81	3.51	0.06
18.00	5.87	3.56	0.06
18.50	5.92	3.61	0.06
19.00	5.97	3.66	0.05
19.50	6.02	3.70	0.05
20.00	6.06	3.74	0.04
20.50	6.11	3.77	0.04
21.00	6.15	3.81	0.04
21.50	6.18	3.85	0.04
22.00	6.22	3.88	0.04
22.50	6.26	3.91	0.04
23.00	6.30	3.95	0.04
23.50	6.33	3.98	0.04
24.00	**6.37**	**4.01**	0.04

Summary for Subcatchment G7: (new Subcat)

Runoff = 5.70 cfs @ 11.94 hrs, Volume= 0.251 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.751	79	50-75% Grass cover, Fair, HSG C
0.751		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G7: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.02
9.00	0.94	0.05	0.04
9.50	1.04	0.08	0.04
10.00	1.15	0.12	0.06
10.50	1.30	0.17	0.10
11.00	1.50	0.26	0.15
11.50	1.80	0.41	**0.29**
12.00	4.22	2.15	**3.96**
12.50	4.68	2.53	0.41
13.00	4.92	2.73	0.26
13.50	5.09	2.88	0.20
14.00	5.22	2.99	0.16
14.50	5.34	3.09	0.14
15.00	5.44	3.18	0.13
15.50	5.53	3.26	0.11
16.00	5.61	3.33	0.10
16.50	5.68	3.39	0.09
17.00	5.74	3.45	0.09
17.50	5.81	3.51	0.08
18.00	5.87	3.56	0.08
18.50	5.92	3.61	0.07
19.00	5.97	3.66	0.07
19.50	6.02	3.70	0.06
20.00	6.06	3.74	0.06
20.50	6.11	3.77	0.06
21.00	6.15	3.81	0.05
21.50	6.18	3.85	0.05
22.00	6.22	3.88	0.05
22.50	6.26	3.91	0.05
23.00	6.30	3.95	0.05
23.50	6.33	3.98	0.05
24.00	**6.37**	**4.01**	0.05

Summary for Subcatchment G8: (new Subcat)

Runoff = 5.74 cfs @ 11.95 hrs, Volume= 0.253 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.758	79	50-75% Grass cover, Fair, HSG C
0.758		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	102	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G8: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.02
8.50	0.84	0.03	0.02
9.00	0.94	0.05	0.04
9.50	1.04	0.08	0.05
10.00	1.15	0.12	0.06
10.50	1.30	0.17	0.10
11.00	1.50	0.26	0.15
11.50	1.80	0.41	**0.30**
12.00	4.22	2.15	**4.06**
12.50	4.68	2.53	0.41
13.00	4.92	2.73	0.27
13.50	5.09	2.88	0.20
14.00	5.22	2.99	0.16
14.50	5.34	3.09	0.14
15.00	5.44	3.18	0.13
15.50	5.53	3.26	0.12
16.00	5.61	3.33	0.10
16.50	5.68	3.39	0.09
17.00	5.74	3.45	0.09
17.50	5.81	3.51	0.08
18.00	5.87	3.56	0.08
18.50	5.92	3.61	0.07
19.00	5.97	3.66	0.07
19.50	6.02	3.70	0.06
20.00	6.06	3.74	0.06
20.50	6.11	3.77	0.06
21.00	6.15	3.81	0.05
21.50	6.18	3.85	0.05
22.00	6.22	3.88	0.05
22.50	6.26	3.91	0.05
23.00	6.30	3.95	0.05
23.50	6.33	3.98	0.05
24.00	**6.37**	**4.01**	0.05

Summary for Subcatchment G9: (new Subcat)

Runoff = 4.90 cfs @ 11.94 hrs, Volume= 0.216 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=6.37"

Area (ac)	CN	Description
0.646	79	50-75% Grass cover, Fair, HSG C
0.646		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	100	0.2500	0.45		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.91"

Hydrograph for Subcatchment G9: (new Subcat)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.03	0.00	0.00
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.00
3.00	0.22	0.00	0.00
3.50	0.26	0.00	0.00
4.00	0.31	0.00	0.00
4.50	0.35	0.00	0.00
5.00	0.40	0.00	0.00
5.50	0.45	0.00	0.00
6.00	0.51	0.00	0.00
6.50	0.57	0.00	0.00
7.00	0.63	0.00	0.01
7.50	0.70	0.01	0.01
8.00	0.76	0.02	0.01
8.50	0.84	0.03	0.02
9.00	0.94	0.05	0.03
9.50	1.04	0.08	0.04
10.00	1.15	0.12	0.05
10.50	1.30	0.17	0.08
11.00	1.50	0.26	0.13
11.50	1.80	0.41	**0.25**
12.00	4.22	2.15	**3.41**
12.50	4.68	2.53	0.35
13.00	4.92	2.73	0.23
13.50	5.09	2.88	0.17
14.00	5.22	2.99	0.14
14.50	5.34	3.09	0.12
15.00	5.44	3.18	0.11
15.50	5.53	3.26	0.10
16.00	5.61	3.33	0.09
16.50	5.68	3.39	0.08
17.00	5.74	3.45	0.08
17.50	5.81	3.51	0.07
18.00	5.87	3.56	0.07
18.50	5.92	3.61	0.06
19.00	5.97	3.66	0.06
19.50	6.02	3.70	0.05
20.00	6.06	3.74	0.05
20.50	6.11	3.77	0.05
21.00	6.15	3.81	0.05
21.50	6.18	3.85	0.05
22.00	6.22	3.88	0.04
22.50	6.26	3.91	0.04
23.00	6.30	3.95	0.04
23.50	6.33	3.98	0.04
24.00	**6.37**	**4.01**	0.04

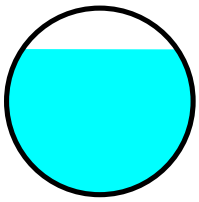
Summary for Reach BC-G1: (new Reach)

Inflow Area = 10.554 ac, 0.00% Impervious, Inflow Depth > 3.70" for 100-yr event
Inflow = 68.70 cfs @ 11.97 hrs, Volume= 3.251 af
Outflow = 68.70 cfs @ 11.97 hrs, Volume= 3.250 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.63 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.82 fps, Avg. Travel Time= 0.1 min

Peak Storage= 177 cf @ 11.97 hrs
Average Depth at Peak Storage= 2.34'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 72.26 cfs

36.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 30.0' Slope= 0.0100 '/'
Inlet Invert= 660.00', Outlet Invert= 659.70'



Hydrograph for Reach BC-G1: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	660.00	0.00
0.50	0.00	0	660.00	0.00
1.00	0.00	0	660.00	0.00
1.50	0.00	0	660.00	0.00
2.00	0.00	0	660.00	0.00
2.50	0.00	0	660.00	0.00
3.00	0.00	0	660.00	0.00
3.50	0.00	0	660.00	0.00
4.00	0.00	0	660.00	0.00
4.50	0.00	0	660.00	0.00
5.00	0.00	0	660.00	0.00
5.50	0.00	0	660.00	0.00
6.00	0.00	0	660.00	0.00
6.50	0.00	0	660.00	0.00
7.00	0.00	0	660.00	0.00
7.50	0.05	1	660.06	0.04
8.00	0.11	2	660.09	0.11
8.50	0.20	3	660.12	0.20
9.00	0.34	4	660.15	0.33
9.50	0.45	5	660.17	0.45
10.00	0.66	6	660.20	0.66
10.50	1.04	8	660.25	1.04
11.00	1.72	12	660.32	1.71
11.50	**3.39**	**19**	**660.44**	**3.39**
12.00	**64.54**	**168**	**662.22**	**64.73**
12.50	5.92	29	660.58	5.93
13.00	3.65	21	660.46	3.66
13.50	2.78	17	660.40	2.78
14.00	2.20	14	660.36	2.20
14.50	1.94	13	660.34	1.94
15.00	1.75	12	660.32	1.75
15.50	1.56	11	660.30	1.56
16.00	1.36	10	660.29	1.36
16.50	1.27	10	660.28	1.27
17.00	1.20	9	660.27	1.20
17.50	1.13	9	660.26	1.13
18.00	1.06	9	660.25	1.06
18.50	0.99	8	660.25	0.99
19.00	0.92	8	660.24	0.92
19.50	0.85	7	660.23	0.85
20.00	0.78	7	660.22	0.78
20.50	0.75	7	660.22	0.75
21.00	0.74	7	660.21	0.74
21.50	0.72	7	660.21	0.72
22.00	0.71	7	660.21	0.71
22.50	0.70	6	660.21	0.70
23.00	0.68	6	660.21	0.68
23.50	0.67	6	660.20	0.67
24.00	0.65	6	660.20	0.65

Summary for Reach BC-G2: (new Reach)

Inflow Area = 39.038 ac, 0.00% Impervious, Inflow Depth > 1.00" for 100-yr event
Inflow = 68.70 cfs @ 11.97 hrs, Volume= 3.250 af
Outflow = 68.12 cfs @ 11.98 hrs, Volume= 3.247 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.31 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.01 fps, Avg. Travel Time= 3.0 min

Peak Storage= 3,430 cf @ 11.98 hrs
Average Depth at Peak Storage= 1.38'
Bank-Full Depth= 3.00' Flow Area= 30.0 sf, Capacity= 333.93 cfs

4.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 368.0' Slope= 0.0435 '/'
Inlet Invert= 656.00', Outlet Invert= 640.00'

Hydrograph for Reach BC-G2: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	656.00	0.00
0.50	0.00	0	656.00	0.00
1.00	0.00	0	656.00	0.00
1.50	0.00	0	656.00	0.00
2.00	0.00	0	656.00	0.00
2.50	0.00	0	656.00	0.00
3.00	0.00	0	656.00	0.00
3.50	0.00	0	656.00	0.00
4.00	0.00	0	656.00	0.00
4.50	0.00	0	656.00	0.00
5.00	0.00	0	656.00	0.00
5.50	0.00	0	656.00	0.00
6.00	0.00	0	656.00	0.00
6.50	0.00	0	656.00	0.00
7.00	0.00	0	656.00	0.00
7.50	0.04	15	656.01	0.03
8.00	0.11	44	656.03	0.09
8.50	0.20	67	656.04	0.18
9.00	0.33	97	656.06	0.32
9.50	0.45	117	656.08	0.44
10.00	0.66	149	656.10	0.64
10.50	1.04	198	656.13	1.01
11.00	1.71	273	656.17	1.67
11.50	**3.39**	**423**	**656.25**	**3.29**
12.00	**64.73**	**3,375**	**657.36**	**66.64**
12.50	5.93	641	656.37	6.16
13.00	3.66	459	656.27	3.72
13.50	2.78	383	656.23	2.82
14.00	2.20	329	656.20	2.23
14.50	1.94	302	656.19	1.95
15.00	1.75	283	656.18	1.76
15.50	1.56	262	656.16	1.57
16.00	1.36	241	656.15	1.37
16.50	1.27	230	656.15	1.27
17.00	1.20	222	656.14	1.20
17.50	1.13	213	656.14	1.14
18.00	1.06	205	656.13	1.07
18.50	0.99	197	656.13	1.00
19.00	0.92	188	656.12	0.92
19.50	0.85	178	656.11	0.85
20.00	0.78	168	656.11	0.78
20.50	0.75	164	656.11	0.75
21.00	0.74	163	656.10	0.74
21.50	0.72	161	656.10	0.72
22.00	0.71	159	656.10	0.71
22.50	0.70	157	656.10	0.70
23.00	0.68	155	656.10	0.68
23.50	0.67	153	656.10	0.67
24.00	0.65	151	656.10	0.66

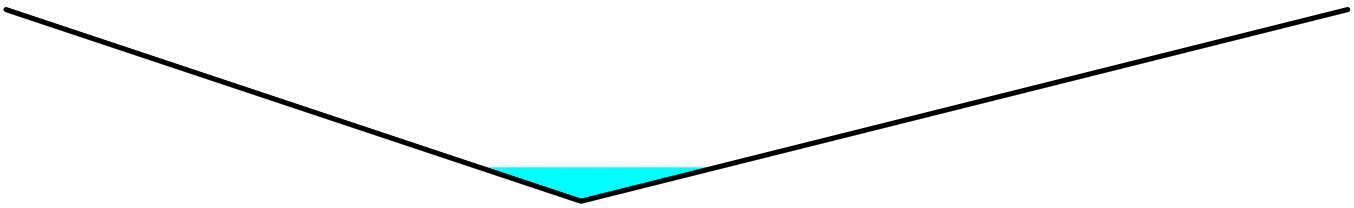
Summary for Reach DB-G1: (new Reach)

Inflow Area = 0.327 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 2.48 cfs @ 11.94 hrs, Volume= 0.109 af
Outflow = 2.46 cfs @ 11.95 hrs, Volume= 0.109 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.58 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.97 fps, Avg. Travel Time= 1.8 min

Peak Storage= 93 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 247.05 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 211.7' Slope= 0.0720 '/'
Inlet Invert= 947.63', Outlet Invert= 932.39'



Hydrograph for Reach DB-G1: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	947.63	0.00
0.50	0.00	0	947.63	0.00
1.00	0.00	0	947.63	0.00
1.50	0.00	0	947.63	0.00
2.00	0.00	0	947.63	0.00
2.50	0.00	0	947.63	0.00
3.00	0.00	0	947.63	0.00
3.50	0.00	0	947.63	0.00
4.00	0.00	0	947.63	0.00
4.50	0.00	0	947.63	0.00
5.00	0.00	0	947.63	0.00
5.50	0.00	0	947.63	0.00
6.00	0.00	0	947.63	0.00
6.50	0.00	0	947.64	0.00
7.00	0.00	1	947.65	0.00
7.50	0.00	1	947.66	0.00
8.00	0.01	1	947.67	0.01
8.50	0.01	2	947.67	0.01
9.00	0.02	2	947.68	0.02
9.50	0.02	2	947.69	0.02
10.00	0.03	3	947.69	0.03
10.50	0.04	4	947.71	0.04
11.00	0.07	6	947.72	0.07
11.50	**0.13**	**10**	**947.75**	**0.13**
12.00	**1.72**	**77**	**947.95**	**1.89**
12.50	0.18	13	947.76	0.18
13.00	0.12	9	947.74	0.12
13.50	0.09	8	947.73	0.09
14.00	0.07	6	947.72	0.07
14.50	0.06	6	947.72	0.06
15.00	0.06	5	947.72	0.06
15.50	0.05	5	947.71	0.05
16.00	0.04	5	947.71	0.04
16.50	0.04	4	947.71	0.04
17.00	0.04	4	947.70	0.04
17.50	0.04	4	947.70	0.04
18.00	0.03	4	947.70	0.03
18.50	0.03	4	947.70	0.03
19.00	0.03	3	947.70	0.03
19.50	0.03	3	947.69	0.03
20.00	0.02	3	947.69	0.02
20.50	0.02	3	947.69	0.02
21.00	0.02	3	947.69	0.02
21.50	0.02	3	947.69	0.02
22.00	0.02	3	947.69	0.02
22.50	0.02	3	947.69	0.02
23.00	0.02	3	947.69	0.02
23.50	0.02	3	947.69	0.02
24.00	0.02	3	947.69	0.02

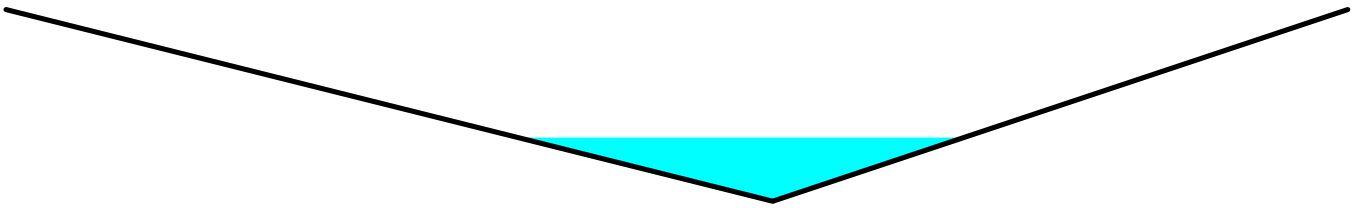
Summary for Reach DB-G10: (new Reach)

Inflow Area = 0.948 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 7.15 cfs @ 11.95 hrs, Volume= 0.317 af
Outflow = 6.88 cfs @ 11.96 hrs, Volume= 0.316 af, Atten= 4%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.46 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.57 fps, Avg. Travel Time= 4.7 min

Peak Storage= 684 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.66'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 130.38 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 443.9' Slope= 0.0200 '/'
Inlet Invert= 841.32', Outlet Invert= 832.42'



Hydrograph for Reach DB-G10: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	841.32	0.00
0.50	0.00	0	841.32	0.00
1.00	0.00	0	841.32	0.00
1.50	0.00	0	841.32	0.00
2.00	0.00	0	841.32	0.00
2.50	0.00	0	841.32	0.00
3.00	0.00	0	841.32	0.00
3.50	0.00	0	841.32	0.00
4.00	0.00	0	841.32	0.00
4.50	0.00	0	841.32	0.00
5.00	0.00	0	841.32	0.00
5.50	0.00	0	841.32	0.00
6.00	0.00	0	841.32	0.00
6.50	0.00	1	841.34	0.00
7.00	0.01	4	841.37	0.01
7.50	0.01	6	841.38	0.01
8.00	0.02	8	841.39	0.02
8.50	0.03	11	841.40	0.03
9.00	0.05	15	841.42	0.04
9.50	0.06	18	841.43	0.06
10.00	0.08	23	841.44	0.08
10.50	0.12	32	841.46	0.12
11.00	0.19	45	841.49	0.18
11.50	**0.37**	**73**	**841.54**	**0.35**
12.00	**5.16**	**622**	**841.95**	**6.06**
12.50	0.52	105	841.58	0.56
13.00	0.33	73	841.54	0.35
13.50	0.26	59	841.51	0.26
14.00	0.20	49	841.50	0.21
14.50	0.18	45	841.49	0.18
15.00	0.16	41	841.48	0.16
15.50	0.14	38	841.48	0.15
16.00	0.13	34	841.47	0.13
16.50	0.12	32	841.46	0.12
17.00	0.11	31	841.46	0.11
17.50	0.10	30	841.46	0.11
18.00	0.10	28	841.45	0.10
18.50	0.09	27	841.45	0.09
19.00	0.09	25	841.45	0.09
19.50	0.08	24	841.44	0.08
20.00	0.07	22	841.44	0.07
20.50	0.07	22	841.44	0.07
21.00	0.07	22	841.44	0.07
21.50	0.07	21	841.44	0.07
22.00	0.07	21	841.44	0.07
22.50	0.06	21	841.43	0.06
23.00	0.06	20	841.43	0.06
23.50	0.06	20	841.43	0.06
24.00	0.06	20	841.43	0.06

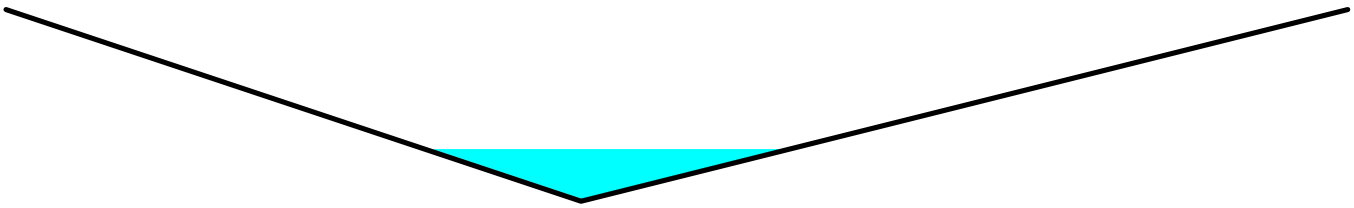
Summary for Reach DB-G11: (new Reach)

Inflow Area = 0.540 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 4.10 cfs @ 11.94 hrs, Volume= 0.180 af
Outflow = 4.04 cfs @ 11.96 hrs, Volume= 0.180 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.88 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 2.6 min

Peak Storage= 222 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 129.15 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 213.5' Slope= 0.0197 '/'
Inlet Invert= 811.62', Outlet Invert= 807.42'



Hydrograph for Reach DB-G11: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	811.62	0.00
0.50	0.00	0	811.62	0.00
1.00	0.00	0	811.62	0.00
1.50	0.00	0	811.62	0.00
2.00	0.00	0	811.62	0.00
2.50	0.00	0	811.62	0.00
3.00	0.00	0	811.62	0.00
3.50	0.00	0	811.62	0.00
4.00	0.00	0	811.62	0.00
4.50	0.00	0	811.62	0.00
5.00	0.00	0	811.62	0.00
5.50	0.00	0	811.62	0.00
6.00	0.00	0	811.62	0.00
6.50	0.00	0	811.64	0.00
7.00	0.00	1	811.66	0.00
7.50	0.01	2	811.67	0.01
8.00	0.01	3	811.68	0.01
8.50	0.02	4	811.69	0.02
9.00	0.03	5	811.70	0.03
9.50	0.03	6	811.71	0.03
10.00	0.05	8	811.72	0.04
10.50	0.07	10	811.74	0.07
11.00	0.11	15	811.76	0.11
11.50	**0.21**	**24**	**811.80**	**0.21**
12.00	**2.85**	**188**	**812.12**	**3.22**
12.50	0.29	32	811.83	0.31
13.00	0.19	23	811.79	0.19
13.50	0.15	19	811.78	0.15
14.00	0.11	16	811.76	0.12
14.50	0.10	14	811.76	0.10
15.00	0.09	13	811.75	0.09
15.50	0.08	12	811.75	0.08
16.00	0.07	11	811.74	0.07
16.50	0.07	10	811.74	0.07
17.00	0.06	10	811.73	0.06
17.50	0.06	9	811.73	0.06
18.00	0.06	9	811.73	0.06
18.50	0.05	9	811.73	0.05
19.00	0.05	8	811.72	0.05
19.50	0.04	8	811.72	0.04
20.00	0.04	7	811.72	0.04
20.50	0.04	7	811.72	0.04
21.00	0.04	7	811.72	0.04
21.50	0.04	7	811.71	0.04
22.00	0.04	7	811.71	0.04
22.50	0.04	7	811.71	0.04
23.00	0.04	6	811.71	0.04
23.50	0.04	6	811.71	0.04
24.00	0.03	6	811.71	0.03

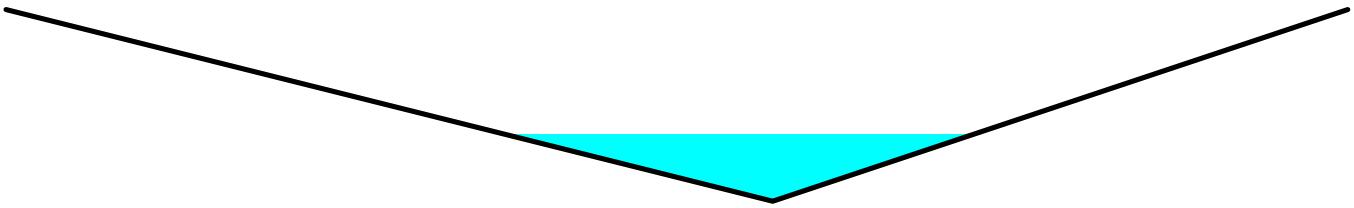
Summary for Reach DB-G12: (new Reach)

Inflow Area = 1.102 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 8.36 cfs @ 11.94 hrs, Volume= 0.368 af
Outflow = 7.98 cfs @ 11.96 hrs, Volume= 0.368 af, Atten= 5%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.63 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 5.3 min

Peak Storage= 892 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 130.47 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 518.5' Slope= 0.0201 '/'
Inlet Invert= 817.83', Outlet Invert= 807.42'



Hydrograph for Reach DB-G12: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	817.83	0.00
0.50	0.00	0	817.83	0.00
1.00	0.00	0	817.83	0.00
1.50	0.00	0	817.83	0.00
2.00	0.00	0	817.83	0.00
2.50	0.00	0	817.83	0.00
3.00	0.00	0	817.83	0.00
3.50	0.00	0	817.83	0.00
4.00	0.00	0	817.83	0.00
4.50	0.00	0	817.83	0.00
5.00	0.00	0	817.83	0.00
5.50	0.00	0	817.83	0.00
6.00	0.00	0	817.83	0.00
6.50	0.00	1	817.85	0.00
7.00	0.01	5	817.88	0.01
7.50	0.02	8	817.89	0.01
8.00	0.02	11	817.91	0.02
8.50	0.04	15	817.92	0.03
9.00	0.05	20	817.93	0.05
9.50	0.07	24	817.94	0.06
10.00	0.09	30	817.96	0.09
10.50	0.14	41	817.98	0.13
11.00	0.22	59	818.01	0.21
11.50	**0.43**	**96**	**818.06**	**0.41**
12.00	**5.81**	**809**	**818.50**	**7.00**
12.50	0.60	137	818.10	0.66
13.00	0.39	95	818.06	0.40
13.50	0.30	77	818.04	0.31
14.00	0.23	65	818.02	0.24
14.50	0.21	59	818.01	0.21
15.00	0.19	54	818.00	0.19
15.50	0.17	50	818.00	0.17
16.00	0.15	45	817.99	0.15
16.50	0.14	42	817.98	0.14
17.00	0.13	41	817.98	0.13
17.50	0.12	39	817.98	0.12
18.00	0.11	37	817.97	0.12
18.50	0.11	35	817.97	0.11
19.00	0.10	33	817.97	0.10
19.50	0.09	31	817.96	0.09
20.00	0.08	29	817.96	0.08
20.50	0.08	29	817.96	0.08
21.00	0.08	28	817.95	0.08
21.50	0.08	28	817.95	0.08
22.00	0.08	27	817.95	0.08
22.50	0.07	27	817.95	0.08
23.00	0.07	27	817.95	0.07
23.50	0.07	26	817.95	0.07
24.00	0.07	26	817.95	0.07

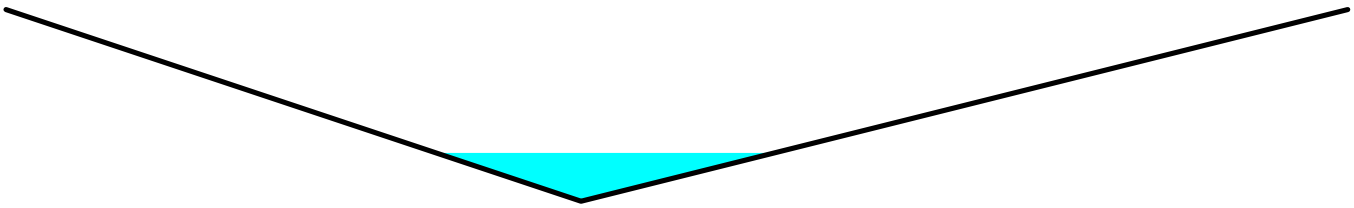
Summary for Reach DB-G13: (new Reach)

Inflow Area = 0.435 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 3.30 cfs @ 11.94 hrs, Volume= 0.145 af
Outflow = 3.27 cfs @ 11.95 hrs, Volume= 0.145 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.68 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.29 fps, Avg. Travel Time= 2.2 min

Peak Storage= 149 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 129.12 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 167.3' Slope= 0.0197 '/'
Inlet Invert= 785.72', Outlet Invert= 782.43'



Hydrograph for Reach DB-G13: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	785.72	0.00
0.50	0.00	0	785.72	0.00
1.00	0.00	0	785.72	0.00
1.50	0.00	0	785.72	0.00
2.00	0.00	0	785.72	0.00
2.50	0.00	0	785.72	0.00
3.00	0.00	0	785.72	0.00
3.50	0.00	0	785.72	0.00
4.00	0.00	0	785.72	0.00
4.50	0.00	0	785.72	0.00
5.00	0.00	0	785.72	0.00
5.50	0.00	0	785.72	0.00
6.00	0.00	0	785.72	0.00
6.50	0.00	0	785.74	0.00
7.00	0.00	1	785.76	0.00
7.50	0.01	1	785.77	0.01
8.00	0.01	2	785.77	0.01
8.50	0.01	2	785.78	0.01
9.00	0.02	3	785.79	0.02
9.50	0.03	4	785.80	0.03
10.00	0.04	5	785.81	0.04
10.50	0.06	7	785.83	0.05
11.00	0.09	10	785.85	0.09
11.50	**0.17**	**16**	**785.88**	**0.17**
12.00	**2.29**	**124**	**786.18**	**2.55**
12.50	0.24	21	785.91	0.25
13.00	0.15	15	785.88	0.16
13.50	0.12	12	785.86	0.12
14.00	0.09	10	785.85	0.09
14.50	0.08	9	785.85	0.08
15.00	0.07	9	785.84	0.07
15.50	0.07	8	785.84	0.07
16.00	0.06	7	785.83	0.06
16.50	0.05	7	785.83	0.05
17.00	0.05	7	785.83	0.05
17.50	0.05	6	785.82	0.05
18.00	0.05	6	785.82	0.05
18.50	0.04	6	785.82	0.04
19.00	0.04	5	785.82	0.04
19.50	0.04	5	785.81	0.04
20.00	0.03	5	785.81	0.03
20.50	0.03	5	785.81	0.03
21.00	0.03	5	785.81	0.03
21.50	0.03	4	785.81	0.03
22.00	0.03	4	785.81	0.03
22.50	0.03	4	785.81	0.03
23.00	0.03	4	785.80	0.03
23.50	0.03	4	785.80	0.03
24.00	0.03	4	785.80	0.03

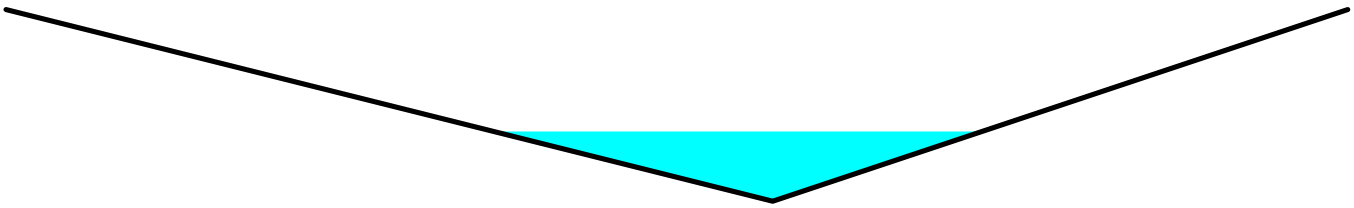
Summary for Reach DB-G14: (new Reach)

Inflow Area = 1.207 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 9.16 cfs @ 11.94 hrs, Volume= 0.403 af
Outflow = 8.77 cfs @ 11.96 hrs, Volume= 0.403 af, Atten= 4%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.74 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.67 fps, Avg. Travel Time= 5.0 min

Peak Storage= 928 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 130.41 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 502.0' Slope= 0.0201 '/'
Inlet Invert= 792.50', Outlet Invert= 782.43'



Hydrograph for Reach DB-G14: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	792.50	0.00
0.50	0.00	0	792.50	0.00
1.00	0.00	0	792.50	0.00
1.50	0.00	0	792.50	0.00
2.00	0.00	0	792.50	0.00
2.50	0.00	0	792.50	0.00
3.00	0.00	0	792.50	0.00
3.50	0.00	0	792.50	0.00
4.00	0.00	0	792.50	0.00
4.50	0.00	0	792.50	0.00
5.00	0.00	0	792.50	0.00
5.50	0.00	0	792.50	0.00
6.00	0.00	0	792.50	0.00
6.50	0.00	1	792.52	0.00
7.00	0.01	5	792.55	0.01
7.50	0.02	8	792.57	0.02
8.00	0.03	11	792.58	0.02
8.50	0.04	15	792.59	0.04
9.00	0.06	21	792.61	0.06
9.50	0.07	25	792.62	0.07
10.00	0.10	32	792.63	0.10
10.50	0.15	43	792.66	0.15
11.00	0.25	61	792.69	0.23
11.50	**0.47**	**100**	**792.74**	**0.45**
12.00	**6.36**	**837**	**793.19**	**7.64**
12.50	0.66	142	792.78	0.72
13.00	0.42	98	792.74	0.44
13.50	0.33	80	792.71	0.33
14.00	0.26	67	792.70	0.26
14.50	0.23	61	792.69	0.23
15.00	0.21	56	792.68	0.21
15.50	0.18	51	792.67	0.19
16.00	0.16	47	792.66	0.16
16.50	0.15	44	792.66	0.15
17.00	0.14	42	792.65	0.14
17.50	0.13	40	792.65	0.13
18.00	0.13	38	792.65	0.13
18.50	0.12	37	792.64	0.12
19.00	0.11	35	792.64	0.11
19.50	0.10	33	792.64	0.10
20.00	0.09	30	792.63	0.09
20.50	0.09	30	792.63	0.09
21.00	0.09	29	792.63	0.09
21.50	0.09	29	792.63	0.09
22.00	0.08	28	792.63	0.08
22.50	0.08	28	792.63	0.08
23.00	0.08	27	792.62	0.08
23.50	0.08	27	792.62	0.08
24.00	0.08	27	792.62	0.08

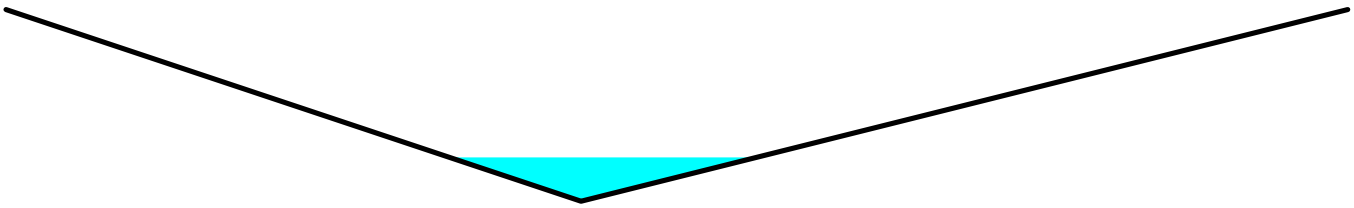
Summary for Reach DB-G15: (new Reach)

Inflow Area = 0.329 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 2.50 cfs @ 11.94 hrs, Volume= 0.110 af
Outflow = 2.48 cfs @ 11.95 hrs, Volume= 0.110 af, Atten= 1%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.41 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 1.7 min

Peak Storage= 88 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 127.72 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 121.1' Slope= 0.0192 '/'
Inlet Invert= 759.76', Outlet Invert= 757.43'



Hydrograph for Reach DB-G15: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	759.76	0.00
0.50	0.00	0	759.76	0.00
1.00	0.00	0	759.76	0.00
1.50	0.00	0	759.76	0.00
2.00	0.00	0	759.76	0.00
2.50	0.00	0	759.76	0.00
3.00	0.00	0	759.76	0.00
3.50	0.00	0	759.76	0.00
4.00	0.00	0	759.76	0.00
4.50	0.00	0	759.76	0.00
5.00	0.00	0	759.76	0.00
5.50	0.00	0	759.76	0.00
6.00	0.00	0	759.76	0.00
6.50	0.00	0	759.78	0.00
7.00	0.00	0	759.79	0.00
7.50	0.00	1	759.80	0.00
8.00	0.01	1	759.81	0.01
8.50	0.01	1	759.82	0.01
9.00	0.02	2	759.83	0.02
9.50	0.02	2	759.83	0.02
10.00	0.03	3	759.84	0.03
10.50	0.04	4	759.86	0.04
11.00	0.07	6	759.88	0.07
11.50	**0.13**	**9**	**759.91**	**0.13**
12.00	**1.73**	**72**	**760.17**	**1.89**
12.50	0.18	13	759.93	0.18
13.00	0.12	9	759.90	0.12
13.50	0.09	7	759.89	0.09
14.00	0.07	6	759.88	0.07
14.50	0.06	6	759.87	0.06
15.00	0.06	5	759.87	0.06
15.50	0.05	5	759.87	0.05
16.00	0.04	4	759.86	0.04
16.50	0.04	4	759.86	0.04
17.00	0.04	4	759.86	0.04
17.50	0.04	4	759.85	0.04
18.00	0.03	4	759.85	0.03
18.50	0.03	3	759.85	0.03
19.00	0.03	3	759.85	0.03
19.50	0.03	3	759.84	0.03
20.00	0.02	3	759.84	0.02
20.50	0.02	3	759.84	0.02
21.00	0.02	3	759.84	0.02
21.50	0.02	3	759.84	0.02
22.00	0.02	3	759.84	0.02
22.50	0.02	3	759.84	0.02
23.00	0.02	3	759.84	0.02
23.50	0.02	2	759.84	0.02
24.00	0.02	2	759.84	0.02

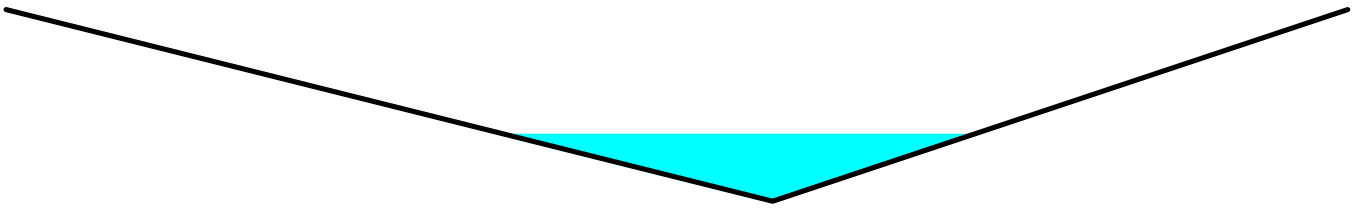
Summary for Reach DB-G16: (new Reach)

Inflow Area = 1.069 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 8.11 cfs @ 11.94 hrs, Volume= 0.357 af
Outflow = 7.82 cfs @ 11.96 hrs, Volume= 0.357 af, Atten= 4%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.50 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.58 fps, Avg. Travel Time= 4.5 min

Peak Storage= 750 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 126.14 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 431.1' Slope= 0.0188 '/'
Inlet Invert= 765.52', Outlet Invert= 757.43'



Hydrograph for Reach DB-G16: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	765.52	0.00
0.50	0.00	0	765.52	0.00
1.00	0.00	0	765.52	0.00
1.50	0.00	0	765.52	0.00
2.00	0.00	0	765.52	0.00
2.50	0.00	0	765.52	0.00
3.00	0.00	0	765.52	0.00
3.50	0.00	0	765.52	0.00
4.00	0.00	0	765.52	0.00
4.50	0.00	0	765.52	0.00
5.00	0.00	0	765.52	0.00
5.50	0.00	0	765.52	0.00
6.00	0.00	0	765.52	0.00
6.50	0.00	1	765.54	0.00
7.00	0.01	4	765.57	0.01
7.50	0.02	7	765.59	0.01
8.00	0.02	9	765.60	0.02
8.50	0.04	12	765.61	0.03
9.00	0.05	17	765.62	0.05
9.50	0.06	20	765.63	0.06
10.00	0.09	26	765.65	0.09
10.50	0.14	35	765.67	0.13
11.00	0.22	49	765.70	0.21
11.50	**0.42**	**80**	**765.75**	**0.40**
12.00	**5.64**	**669**	**766.19**	**6.71**
12.50	0.58	113	765.79	0.63
13.00	0.38	79	765.75	0.39
13.50	0.29	64	765.73	0.30
14.00	0.23	54	765.71	0.23
14.50	0.20	49	765.70	0.21
15.00	0.18	45	765.69	0.18
15.50	0.16	41	765.69	0.16
16.00	0.14	37	765.68	0.14
16.50	0.13	35	765.67	0.13
17.00	0.13	34	765.67	0.13
17.50	0.12	32	765.67	0.12
18.00	0.11	31	765.66	0.11
18.50	0.10	29	765.66	0.10
19.00	0.10	28	765.66	0.10
19.50	0.09	26	765.65	0.09
20.00	0.08	24	765.65	0.08
20.50	0.08	24	765.65	0.08
21.00	0.08	23	765.64	0.08
21.50	0.08	23	765.64	0.08
22.00	0.07	23	765.64	0.07
22.50	0.07	22	765.64	0.07
23.00	0.07	22	765.64	0.07
23.50	0.07	22	765.64	0.07
24.00	0.07	21	765.64	0.07

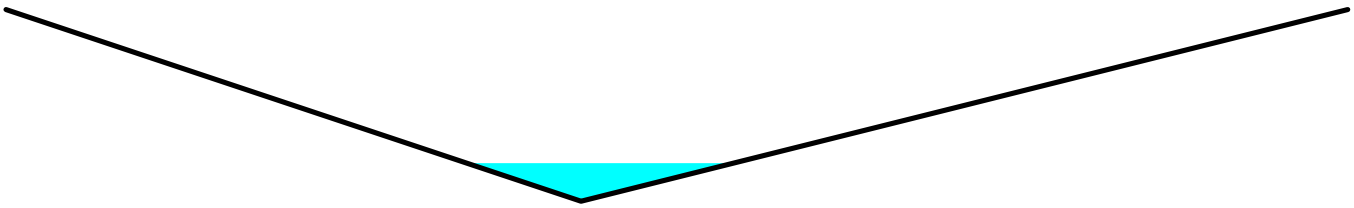
Summary for Reach DB-G17: (new Reach)

Inflow Area = 0.224 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 1.70 cfs @ 11.94 hrs, Volume= 0.075 af
Outflow = 1.69 cfs @ 11.95 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.07 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.08 fps, Avg. Travel Time= 1.2 min

Peak Storage= 41 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 126.25 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 75.0' Slope= 0.0188 '/'
Inlet Invert= 733.85', Outlet Invert= 732.44'



Hydrograph for Reach DB-G17: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	733.85	0.00
0.50	0.00	0	733.85	0.00
1.00	0.00	0	733.85	0.00
1.50	0.00	0	733.85	0.00
2.00	0.00	0	733.85	0.00
2.50	0.00	0	733.85	0.00
3.00	0.00	0	733.85	0.00
3.50	0.00	0	733.85	0.00
4.00	0.00	0	733.85	0.00
4.50	0.00	0	733.85	0.00
5.00	0.00	0	733.85	0.00
5.50	0.00	0	733.85	0.00
6.00	0.00	0	733.85	0.00
6.50	0.00	0	733.87	0.00
7.00	0.00	0	733.88	0.00
7.50	0.00	0	733.89	0.00
8.00	0.00	0	733.89	0.00
8.50	0.01	1	733.90	0.01
9.00	0.01	1	733.91	0.01
9.50	0.01	1	733.91	0.01
10.00	0.02	1	733.92	0.02
10.50	0.03	2	733.93	0.03
11.00	0.05	3	733.95	0.05
11.50	**0.09**	**4**	**733.98**	**0.09**
12.00	**1.18**	**33**	**734.21**	**1.26**
12.50	0.12	6	734.00	0.12
13.00	0.08	4	733.98	0.08
13.50	0.06	3	733.96	0.06
14.00	0.05	3	733.95	0.05
14.50	0.04	3	733.95	0.04
15.00	0.04	2	733.95	0.04
15.50	0.03	2	733.94	0.03
16.00	0.03	2	733.94	0.03
16.50	0.03	2	733.93	0.03
17.00	0.03	2	733.93	0.03
17.50	0.02	2	733.93	0.02
18.00	0.02	2	733.93	0.02
18.50	0.02	2	733.93	0.02
19.00	0.02	1	733.92	0.02
19.50	0.02	1	733.92	0.02
20.00	0.02	1	733.92	0.02
20.50	0.02	1	733.92	0.02
21.00	0.02	1	733.92	0.02
21.50	0.02	1	733.92	0.02
22.00	0.02	1	733.92	0.02
22.50	0.02	1	733.92	0.02
23.00	0.01	1	733.92	0.01
23.50	0.01	1	733.92	0.01
24.00	0.01	1	733.92	0.01

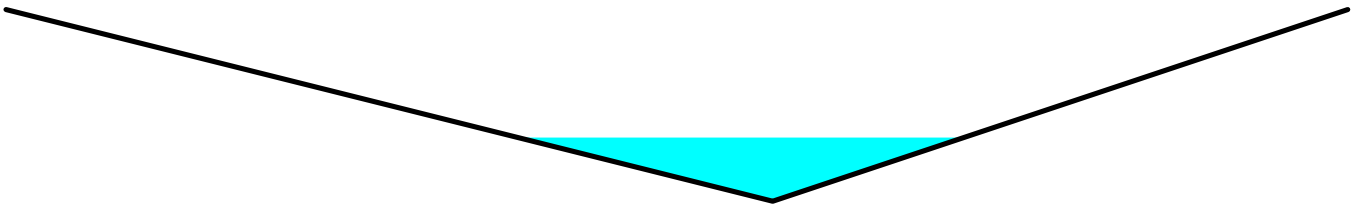
Summary for Reach DB-G18: (new Reach)

Inflow Area = 0.903 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 6.85 cfs @ 11.94 hrs, Volume= 0.302 af
Outflow = 6.66 cfs @ 11.96 hrs, Volume= 0.301 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.32 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 3.9 min

Peak Storage= 548 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.66'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 126.22 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 355.5' Slope= 0.0188 '/'
Inlet Invert= 739.12', Outlet Invert= 732.44'



Hydrograph for Reach DB-G18: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	739.12	0.00
0.50	0.00	0	739.12	0.00
1.00	0.00	0	739.12	0.00
1.50	0.00	0	739.12	0.00
2.00	0.00	0	739.12	0.00
2.50	0.00	0	739.12	0.00
3.00	0.00	0	739.12	0.00
3.50	0.00	0	739.12	0.00
4.00	0.00	0	739.12	0.00
4.50	0.00	0	739.12	0.00
5.00	0.00	0	739.12	0.00
5.50	0.00	0	739.12	0.00
6.00	0.00	0	739.12	0.00
6.50	0.00	1	739.14	0.00
7.00	0.01	3	739.17	0.01
7.50	0.01	5	739.18	0.01
8.00	0.02	6	739.19	0.02
8.50	0.03	9	739.20	0.03
9.00	0.04	12	739.22	0.04
9.50	0.05	14	739.23	0.05
10.00	0.08	19	739.24	0.07
10.50	0.11	25	739.26	0.11
11.00	0.18	36	739.29	0.18
11.50	**0.35**	**59**	**739.34**	**0.34**
12.00	**4.76**	**481**	**739.74**	**5.60**
12.50	0.49	82	739.38	0.53
13.00	0.32	57	739.33	0.33
13.50	0.24	46	739.31	0.25
14.00	0.19	39	739.30	0.20
14.50	0.17	35	739.29	0.17
15.00	0.15	33	739.28	0.16
15.50	0.14	30	739.28	0.14
16.00	0.12	27	739.27	0.12
16.50	0.11	26	739.26	0.11
17.00	0.11	25	739.26	0.11
17.50	0.10	24	739.26	0.10
18.00	0.09	22	739.25	0.09
18.50	0.09	21	739.25	0.09
19.00	0.08	20	739.25	0.08
19.50	0.07	19	739.24	0.08
20.00	0.07	18	739.24	0.07
20.50	0.07	17	739.24	0.07
21.00	0.07	17	739.24	0.07
21.50	0.06	17	739.24	0.06
22.00	0.06	17	739.23	0.06
22.50	0.06	16	739.23	0.06
23.00	0.06	16	739.23	0.06
23.50	0.06	16	739.23	0.06
24.00	0.06	16	739.23	0.06

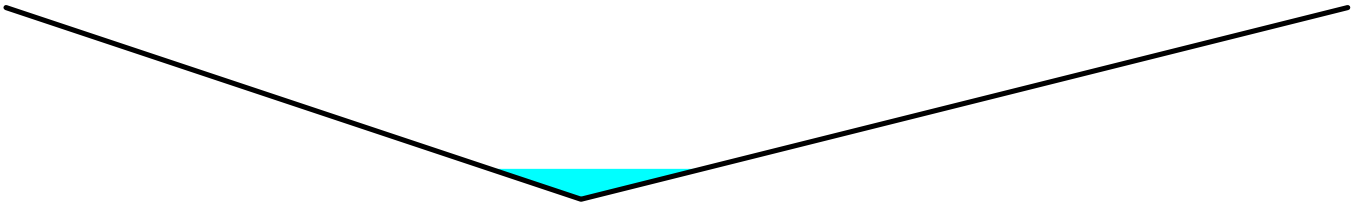
Summary for Reach DB-G19: (new Reach)

Inflow Area = 0.118 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 0.90 cfs @ 11.94 hrs, Volume= 0.039 af
Outflow = 0.90 cfs @ 11.95 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.56 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 0.5 min

Peak Storage= 10 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 122.53 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 28.8' Slope= 0.0177 '/'
Inlet Invert= 707.95', Outlet Invert= 707.44'



Hydrograph for Reach DB-G19: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	707.95	0.00
0.50	0.00	0	707.95	0.00
1.00	0.00	0	707.95	0.00
1.50	0.00	0	707.95	0.00
2.00	0.00	0	707.95	0.00
2.50	0.00	0	707.95	0.00
3.00	0.00	0	707.95	0.00
3.50	0.00	0	707.95	0.00
4.00	0.00	0	707.95	0.00
4.50	0.00	0	707.95	0.00
5.00	0.00	0	707.95	0.00
5.50	0.00	0	707.95	0.00
6.00	0.00	0	707.95	0.00
6.50	0.00	0	707.96	0.00
7.00	0.00	0	707.97	0.00
7.50	0.00	0	707.98	0.00
8.00	0.00	0	707.98	0.00
8.50	0.00	0	707.99	0.00
9.00	0.01	0	708.00	0.01
9.50	0.01	0	708.00	0.01
10.00	0.01	0	708.01	0.01
10.50	0.02	0	708.02	0.01
11.00	0.02	1	708.03	0.02
11.50	**0.05**	**1**	**708.05**	**0.05**
12.00	**0.62**	**8**	**708.23**	**0.64**
12.50	0.06	1	708.07	0.06
13.00	0.04	1	708.05	0.04
13.50	0.03	1	708.04	0.03
14.00	0.03	1	708.03	0.03
14.50	0.02	1	708.03	0.02
15.00	0.02	1	708.03	0.02
15.50	0.02	1	708.02	0.02
16.00	0.02	0	708.02	0.02
16.50	0.01	0	708.02	0.01
17.00	0.01	0	708.02	0.01
17.50	0.01	0	708.01	0.01
18.00	0.01	0	708.01	0.01
18.50	0.01	0	708.01	0.01
19.00	0.01	0	708.01	0.01
19.50	0.01	0	708.01	0.01
20.00	0.01	0	708.01	0.01
20.50	0.01	0	708.00	0.01
21.00	0.01	0	708.00	0.01
21.50	0.01	0	708.00	0.01
22.00	0.01	0	708.00	0.01
22.50	0.01	0	708.00	0.01
23.00	0.01	0	708.00	0.01
23.50	0.01	0	708.00	0.01
24.00	0.01	0	708.00	0.01

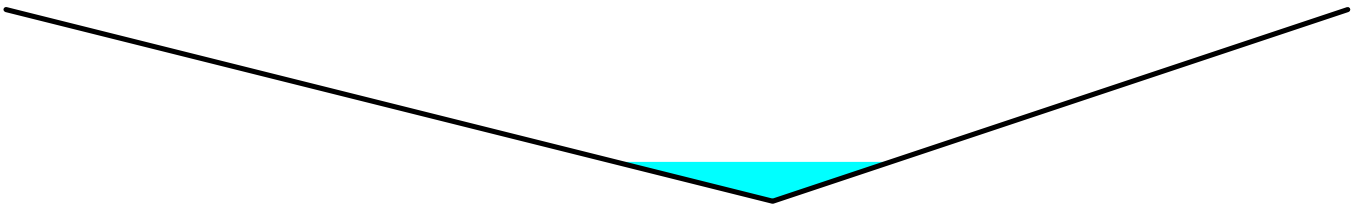
Summary for Reach DB-G2: (new Reach)

Inflow Area = 0.245 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 1.86 cfs @ 11.94 hrs, Volume= 0.082 af
Outflow = 1.84 cfs @ 11.95 hrs, Volume= 0.082 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.12 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.10 fps, Avg. Travel Time= 2.2 min

Peak Storage= 85 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 125.55 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 143.6' Slope= 0.0186 '/'
Inlet Invert= 935.61', Outlet Invert= 932.94'



Hydrograph for Reach DB-G2: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	935.61	0.00
0.50	0.00	0	935.61	0.00
1.00	0.00	0	935.61	0.00
1.50	0.00	0	935.61	0.00
2.00	0.00	0	935.61	0.00
2.50	0.00	0	935.61	0.00
3.00	0.00	0	935.61	0.00
3.50	0.00	0	935.61	0.00
4.00	0.00	0	935.61	0.00
4.50	0.00	0	935.61	0.00
5.00	0.00	0	935.61	0.00
5.50	0.00	0	935.61	0.00
6.00	0.00	0	935.61	0.00
6.50	0.00	0	935.62	0.00
7.00	0.00	0	935.64	0.00
7.50	0.00	1	935.65	0.00
8.00	0.01	1	935.65	0.01
8.50	0.01	1	935.66	0.01
9.00	0.01	2	935.67	0.01
9.50	0.01	2	935.68	0.01
10.00	0.02	3	935.68	0.02
10.50	0.03	4	935.70	0.03
11.00	0.05	6	935.71	0.05
11.50	**0.10**	**9**	**935.74**	**0.09**
12.00	**1.29**	**70**	**935.98**	**1.44**
12.50	0.13	12	935.77	0.14
13.00	0.09	9	935.74	0.09
13.50	0.07	7	935.73	0.07
14.00	0.05	6	935.72	0.05
14.50	0.05	5	935.71	0.05
15.00	0.04	5	935.71	0.04
15.50	0.04	5	935.70	0.04
16.00	0.03	4	935.70	0.03
16.50	0.03	4	935.70	0.03
17.00	0.03	4	935.70	0.03
17.50	0.03	4	935.69	0.03
18.00	0.03	3	935.69	0.03
18.50	0.02	3	935.69	0.02
19.00	0.02	3	935.69	0.02
19.50	0.02	3	935.68	0.02
20.00	0.02	3	935.68	0.02
20.50	0.02	3	935.68	0.02
21.00	0.02	3	935.68	0.02
21.50	0.02	3	935.68	0.02
22.00	0.02	2	935.68	0.02
22.50	0.02	2	935.68	0.02
23.00	0.02	2	935.68	0.02
23.50	0.02	2	935.68	0.02
24.00	0.02	2	935.68	0.02

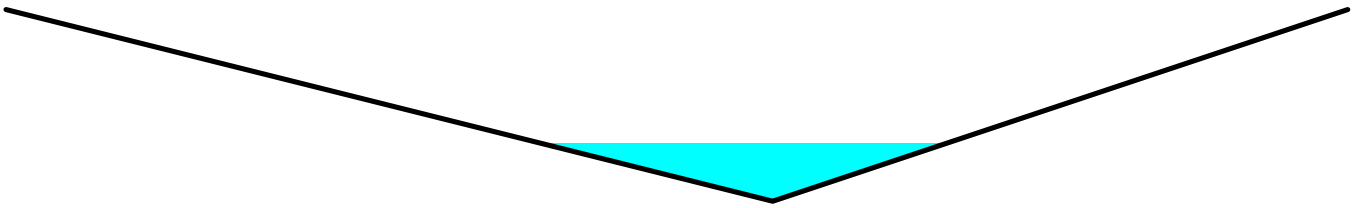
Summary for Reach DB-G20: (new Reach)

Inflow Area = 0.729 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 5.53 cfs @ 11.94 hrs, Volume= 0.244 af
Outflow = 5.42 cfs @ 11.96 hrs, Volume= 0.243 af, Atten= 2%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.21 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 3.2 min

Peak Storage= 362 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 130.43 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 281.1' Slope= 0.0201 '/'
Inlet Invert= 713.08', Outlet Invert= 707.44'



Hydrograph for Reach DB-G20: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	713.08	0.00
0.50	0.00	0	713.08	0.00
1.00	0.00	0	713.08	0.00
1.50	0.00	0	713.08	0.00
2.00	0.00	0	713.08	0.00
2.50	0.00	0	713.08	0.00
3.00	0.00	0	713.08	0.00
3.50	0.00	0	713.08	0.00
4.00	0.00	0	713.08	0.00
4.50	0.00	0	713.08	0.00
5.00	0.00	0	713.08	0.00
5.50	0.00	0	713.08	0.00
6.00	0.00	0	713.08	0.00
6.50	0.00	1	713.10	0.00
7.00	0.01	2	713.12	0.01
7.50	0.01	3	713.14	0.01
8.00	0.02	4	713.15	0.01
8.50	0.02	6	713.16	0.02
9.00	0.04	8	713.17	0.03
9.50	0.04	10	713.18	0.04
10.00	0.06	12	713.19	0.06
10.50	0.09	17	713.21	0.09
11.00	0.15	24	713.24	0.14
11.50	**0.29**	**39**	**713.28**	**0.28**
12.00	**3.84**	**311**	**713.64**	**4.43**
12.50	0.40	53	713.31	0.42
13.00	0.26	37	713.27	0.26
13.50	0.20	30	713.26	0.20
14.00	0.16	26	713.24	0.16
14.50	0.14	23	713.23	0.14
15.00	0.12	21	713.23	0.13
15.50	0.11	20	713.22	0.11
16.00	0.10	18	713.21	0.10
16.50	0.09	17	713.21	0.09
17.00	0.09	16	713.21	0.09
17.50	0.08	15	713.20	0.08
18.00	0.08	15	713.20	0.08
18.50	0.07	14	713.20	0.07
19.00	0.07	13	713.20	0.07
19.50	0.06	12	713.19	0.06
20.00	0.06	12	713.19	0.06
20.50	0.05	11	713.19	0.05
21.00	0.05	11	713.19	0.05
21.50	0.05	11	713.19	0.05
22.00	0.05	11	713.18	0.05
22.50	0.05	11	713.18	0.05
23.00	0.05	11	713.18	0.05
23.50	0.05	10	713.18	0.05
24.00	0.05	10	713.18	0.05

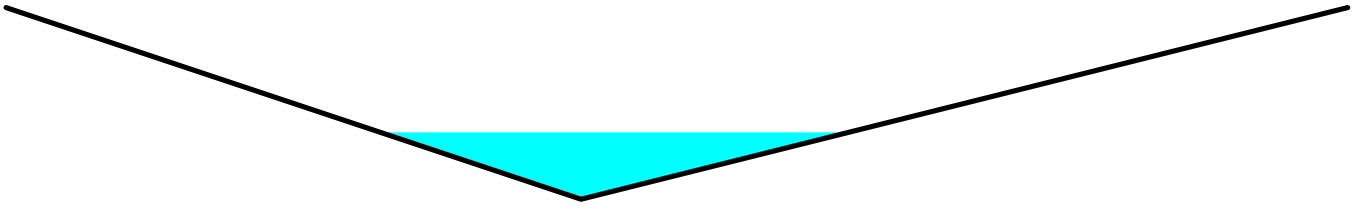
Summary for Reach DB-G24: (new Reach)

Inflow Area = 1.208 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 9.11 cfs @ 11.95 hrs, Volume= 0.403 af
Outflow = 8.73 cfs @ 11.97 hrs, Volume= 0.403 af, Atten= 4%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.10 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 5.0 min

Peak Storage= 919 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 143.93 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 537.4' Slope= 0.0244 '/'
Inlet Invert= 841.32', Outlet Invert= 828.19'



Hydrograph for Reach DB-G24: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	841.32	0.00
0.50	0.00	0	841.32	0.00
1.00	0.00	0	841.32	0.00
1.50	0.00	0	841.32	0.00
2.00	0.00	0	841.32	0.00
2.50	0.00	0	841.32	0.00
3.00	0.00	0	841.32	0.00
3.50	0.00	0	841.32	0.00
4.00	0.00	0	841.32	0.00
4.50	0.00	0	841.32	0.00
5.00	0.00	0	841.32	0.00
5.50	0.00	0	841.32	0.00
6.00	0.00	0	841.32	0.00
6.50	0.00	1	841.34	0.00
7.00	0.01	5	841.37	0.01
7.50	0.02	8	841.38	0.02
8.00	0.03	11	841.40	0.02
8.50	0.04	15	841.41	0.04
9.00	0.06	21	841.42	0.06
9.50	0.07	25	841.43	0.07
10.00	0.10	31	841.45	0.10
10.50	0.15	43	841.47	0.15
11.00	0.24	61	841.50	0.23
11.50	**0.47**	**99**	**841.55**	**0.45**
12.00	**6.57**	**841**	**841.99**	**7.75**
12.50	0.66	141	841.59	0.72
13.00	0.43	98	841.55	0.44
13.50	0.33	80	841.53	0.34
14.00	0.26	67	841.51	0.26
14.50	0.23	61	841.50	0.23
15.00	0.21	56	841.49	0.21
15.50	0.18	51	841.48	0.19
16.00	0.16	46	841.48	0.16
16.50	0.15	44	841.47	0.15
17.00	0.14	42	841.47	0.14
17.50	0.13	40	841.47	0.13
18.00	0.13	38	841.46	0.13
18.50	0.12	36	841.46	0.12
19.00	0.11	34	841.45	0.11
19.50	0.10	32	841.45	0.10
20.00	0.09	30	841.45	0.09
20.50	0.09	29	841.44	0.09
21.00	0.09	29	841.44	0.09
21.50	0.09	29	841.44	0.09
22.00	0.08	28	841.44	0.08
22.50	0.08	28	841.44	0.08
23.00	0.08	27	841.44	0.08
23.50	0.08	27	841.44	0.08
24.00	0.08	27	841.44	0.08

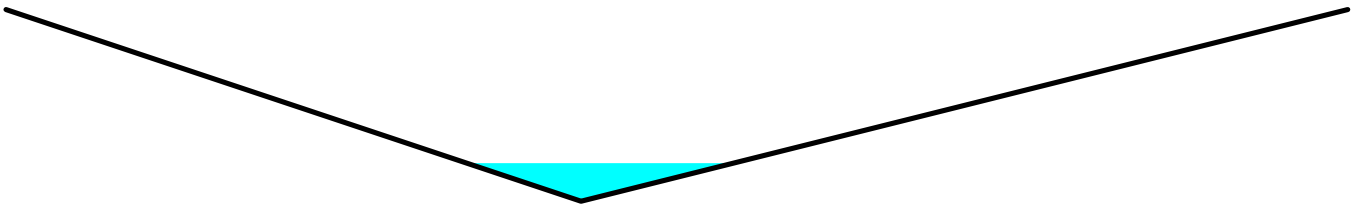
Summary for Reach DB-G25: (new Reach)

Inflow Area = 0.260 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 1.97 cfs @ 11.95 hrs, Volume= 0.087 af
Outflow = 1.95 cfs @ 11.95 hrs, Volume= 0.087 af, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.52 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.24 fps, Avg. Travel Time= 1.9 min

Peak Storage= 80 cf @ 11.95 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 144.53 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 145.3' Slope= 0.0246 '/'
Inlet Invert= 817.83', Outlet Invert= 814.25'



Hydrograph for Reach DB-G25: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	817.83	0.00
0.50	0.00	0	817.83	0.00
1.00	0.00	0	817.83	0.00
1.50	0.00	0	817.83	0.00
2.00	0.00	0	817.83	0.00
2.50	0.00	0	817.83	0.00
3.00	0.00	0	817.83	0.00
3.50	0.00	0	817.83	0.00
4.00	0.00	0	817.83	0.00
4.50	0.00	0	817.83	0.00
5.00	0.00	0	817.83	0.00
5.50	0.00	0	817.83	0.00
6.00	0.00	0	817.83	0.00
6.50	0.00	0	817.84	0.00
7.00	0.00	0	817.86	0.00
7.50	0.00	1	817.87	0.00
8.00	0.01	1	817.87	0.01
8.50	0.01	1	817.88	0.01
9.00	0.01	2	817.89	0.01
9.50	0.02	2	817.89	0.02
10.00	0.02	3	817.90	0.02
10.50	0.03	4	817.91	0.03
11.00	0.05	5	817.93	0.05
11.50	**0.10**	**9**	**817.96**	**0.10**
12.00	**1.39**	**67**	**818.19**	**1.53**
12.50	0.14	12	817.98	0.15
13.00	0.09	8	817.96	0.09
13.50	0.07	7	817.94	0.07
14.00	0.06	6	817.93	0.06
14.50	0.05	5	817.93	0.05
15.00	0.04	5	817.93	0.04
15.50	0.04	4	817.92	0.04
16.00	0.03	4	817.92	0.03
16.50	0.03	4	817.91	0.03
17.00	0.03	4	817.91	0.03
17.50	0.03	3	817.91	0.03
18.00	0.03	3	817.91	0.03
18.50	0.03	3	817.91	0.03
19.00	0.02	3	817.90	0.02
19.50	0.02	3	817.90	0.02
20.00	0.02	3	817.90	0.02
20.50	0.02	2	817.90	0.02
21.00	0.02	2	817.90	0.02
21.50	0.02	2	817.90	0.02
22.00	0.02	2	817.90	0.02
22.50	0.02	2	817.90	0.02
23.00	0.02	2	817.90	0.02
23.50	0.02	2	817.90	0.02
24.00	0.02	2	817.90	0.02

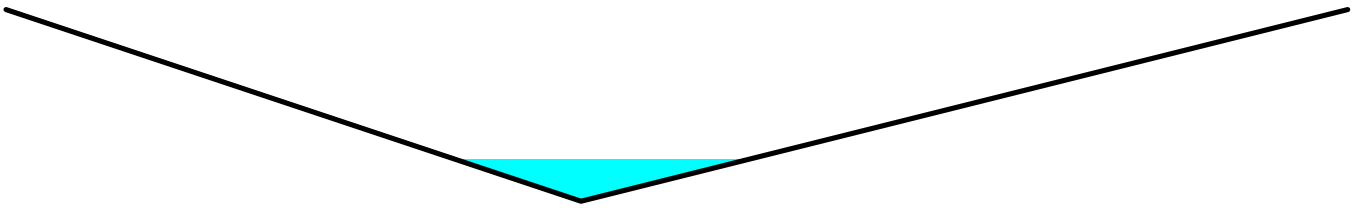
Summary for Reach DB-G3: (new Reach)

Inflow Area = 0.565 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 4.28 cfs @ 11.95 hrs, Volume= 0.189 af
Outflow = 4.23 cfs @ 11.96 hrs, Volume= 0.189 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.26 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.21 fps, Avg. Travel Time= 2.2 min

Peak Storage= 199 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.44'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 240.93 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 294.9' Slope= 0.0685 '/'
Inlet Invert= 927.59', Outlet Invert= 907.40'



Hydrograph for Reach DB-G3: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	927.59	0.00
0.50	0.00	0	927.59	0.00
1.00	0.00	0	927.59	0.00
1.50	0.00	0	927.59	0.00
2.00	0.00	0	927.59	0.00
2.50	0.00	0	927.59	0.00
3.00	0.00	0	927.59	0.00
3.50	0.00	0	927.59	0.00
4.00	0.00	0	927.59	0.00
4.50	0.00	0	927.59	0.00
5.00	0.00	0	927.59	0.00
5.50	0.00	0	927.59	0.00
6.00	0.00	0	927.59	0.00
6.50	0.00	0	927.61	0.00
7.00	0.00	1	927.62	0.00
7.50	0.01	2	927.63	0.01
8.00	0.01	2	927.64	0.01
8.50	0.02	3	927.65	0.02
9.00	0.03	4	927.65	0.03
9.50	0.03	5	927.66	0.03
10.00	0.05	7	927.67	0.05
10.50	0.07	9	927.68	0.07
11.00	0.11	13	927.70	0.11
11.50	**0.22**	**21**	**927.73**	**0.22**
12.00	**3.03**	**168**	**927.99**	**3.37**
12.50	0.31	29	927.76	0.32
13.00	0.20	20	927.73	0.20
13.50	0.15	17	927.72	0.15
14.00	0.12	14	927.71	0.12
14.50	0.11	13	927.70	0.11
15.00	0.10	12	927.70	0.10
15.50	0.09	11	927.69	0.09
16.00	0.07	10	927.69	0.08
16.50	0.07	9	927.68	0.07
17.00	0.07	9	927.68	0.07
17.50	0.06	8	927.68	0.06
18.00	0.06	8	927.68	0.06
18.50	0.05	8	927.68	0.05
19.00	0.05	7	927.67	0.05
19.50	0.05	7	927.67	0.05
20.00	0.04	6	927.67	0.04
20.50	0.04	6	927.67	0.04
21.00	0.04	6	927.67	0.04
21.50	0.04	6	927.67	0.04
22.00	0.04	6	927.67	0.04
22.50	0.04	6	927.66	0.04
23.00	0.04	6	927.66	0.04
23.50	0.04	6	927.66	0.04
24.00	0.04	6	927.66	0.04

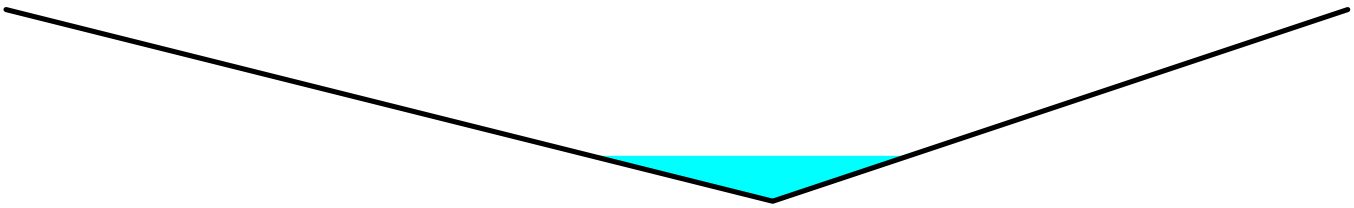
Summary for Reach DB-G4: (new Reach)

Inflow Area = 0.413 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 3.13 cfs @ 11.94 hrs, Volume= 0.138 af
Outflow = 3.09 cfs @ 11.96 hrs, Volume= 0.138 af, Atten= 2%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.90 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 2.6 min

Peak Storage= 172 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.48'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 142.24 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 217.5' Slope= 0.0239 '/'
Inlet Invert= 912.59', Outlet Invert= 907.40'



Hydrograph for Reach DB-G4: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	912.59	0.00
0.50	0.00	0	912.59	0.00
1.00	0.00	0	912.59	0.00
1.50	0.00	0	912.59	0.00
2.00	0.00	0	912.59	0.00
2.50	0.00	0	912.59	0.00
3.00	0.00	0	912.59	0.00
3.50	0.00	0	912.59	0.00
4.00	0.00	0	912.59	0.00
4.50	0.00	0	912.59	0.00
5.00	0.00	0	912.59	0.00
5.50	0.00	0	912.59	0.00
6.00	0.00	0	912.59	0.00
6.50	0.00	0	912.61	0.00
7.00	0.00	1	912.62	0.00
7.50	0.01	2	912.63	0.01
8.00	0.01	2	912.64	0.01
8.50	0.01	3	912.65	0.01
9.00	0.02	4	912.66	0.02
9.50	0.02	5	912.67	0.02
10.00	0.03	6	912.68	0.03
10.50	0.05	8	912.69	0.05
11.00	0.08	11	912.71	0.08
11.50	**0.16**	**18**	**912.75**	**0.16**
12.00	**2.18**	**146**	**913.03**	**2.47**
12.50	0.22	25	912.77	0.24
13.00	0.15	18	912.74	0.15
13.50	0.11	14	912.73	0.11
14.00	0.09	12	912.72	0.09
14.50	0.08	11	912.71	0.08
15.00	0.07	10	912.71	0.07
15.50	0.06	9	912.70	0.06
16.00	0.05	8	912.69	0.06
16.50	0.05	8	912.69	0.05
17.00	0.05	8	912.69	0.05
17.50	0.05	7	912.69	0.05
18.00	0.04	7	912.69	0.04
18.50	0.04	7	912.68	0.04
19.00	0.04	6	912.68	0.04
19.50	0.03	6	912.68	0.03
20.00	0.03	5	912.67	0.03
20.50	0.03	5	912.67	0.03
21.00	0.03	5	912.67	0.03
21.50	0.03	5	912.67	0.03
22.00	0.03	5	912.67	0.03
22.50	0.03	5	912.67	0.03
23.00	0.03	5	912.67	0.03
23.50	0.03	5	912.67	0.03
24.00	0.03	5	912.67	0.03

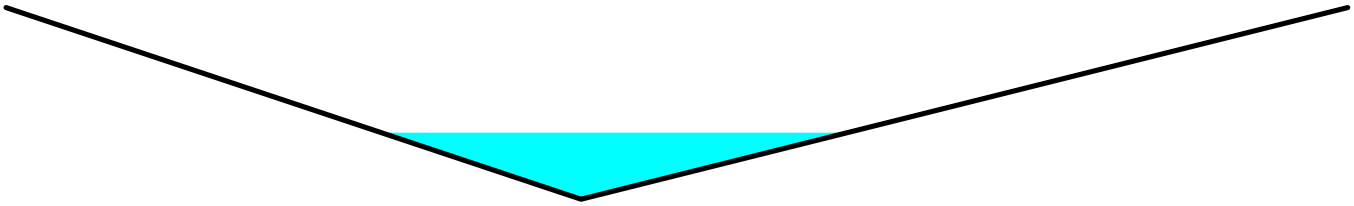
Summary for Reach DB-G5: (new Reach)

Inflow Area = 1.053 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 7.91 cfs @ 11.95 hrs, Volume= 0.352 af
Outflow = 7.71 cfs @ 11.96 hrs, Volume= 0.351 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.56 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 3.7 min

Peak Storage= 596 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 128.99 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 352.1' Slope= 0.0196 '/'
Inlet Invert= 889.32', Outlet Invert= 882.41'



Hydrograph for Reach DB-G5: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	889.32	0.00
0.50	0.00	0	889.32	0.00
1.00	0.00	0	889.32	0.00
1.50	0.00	0	889.32	0.00
2.00	0.00	0	889.32	0.00
2.50	0.00	0	889.32	0.00
3.00	0.00	0	889.32	0.00
3.50	0.00	0	889.32	0.00
4.00	0.00	0	889.32	0.00
4.50	0.00	0	889.32	0.00
5.00	0.00	0	889.32	0.00
5.50	0.00	0	889.32	0.00
6.00	0.00	0	889.32	0.00
6.50	0.00	1	889.34	0.00
7.00	0.01	3	889.37	0.01
7.50	0.02	5	889.38	0.01
8.00	0.02	7	889.40	0.02
8.50	0.03	10	889.41	0.03
9.00	0.05	13	889.42	0.05
9.50	0.06	16	889.43	0.06
10.00	0.09	20	889.45	0.09
10.50	0.13	28	889.47	0.13
11.00	0.21	39	889.50	0.21
11.50	**0.41**	**64**	**889.55**	**0.39**
12.00	**5.81**	**534**	**889.98**	**6.66**
12.50	0.58	90	889.59	0.62
13.00	0.37	63	889.55	0.38
13.50	0.28	51	889.52	0.29
14.00	0.22	43	889.51	0.23
14.50	0.20	39	889.50	0.20
15.00	0.18	36	889.49	0.18
15.50	0.16	33	889.48	0.16
16.00	0.14	30	889.47	0.14
16.50	0.13	28	889.47	0.13
17.00	0.12	27	889.47	0.12
17.50	0.12	26	889.46	0.12
18.00	0.11	25	889.46	0.11
18.50	0.10	23	889.46	0.10
19.00	0.09	22	889.45	0.10
19.50	0.09	21	889.45	0.09
20.00	0.08	19	889.45	0.08
20.50	0.08	19	889.44	0.08
21.00	0.08	19	889.44	0.08
21.50	0.07	18	889.44	0.07
22.00	0.07	18	889.44	0.07
22.50	0.07	18	889.44	0.07
23.00	0.07	18	889.44	0.07
23.50	0.07	17	889.44	0.07
24.00	0.07	17	889.44	0.07

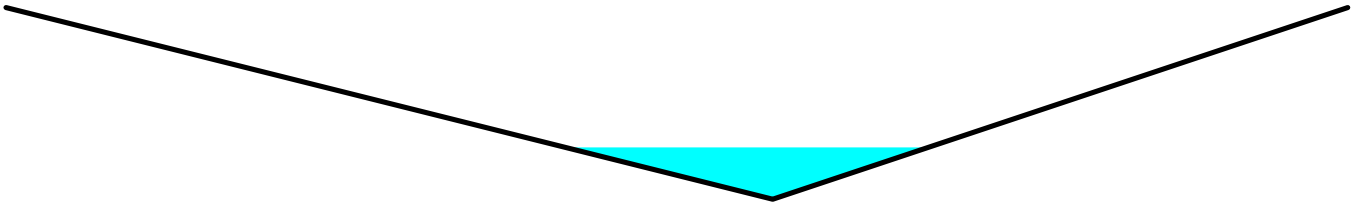
Summary for Reach DB-G6: (new Reach)

Inflow Area = 0.583 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 4.43 cfs @ 11.94 hrs, Volume= 0.195 af
Outflow = 4.33 cfs @ 11.96 hrs, Volume= 0.195 af, Atten= 2%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.24 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.49 fps, Avg. Travel Time= 3.3 min

Peak Storage= 297 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 142.30 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 291.4' Slope= 0.0239 '/'
Inlet Invert= 889.37', Outlet Invert= 882.41'



Hydrograph for Reach DB-G6: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	889.37	0.00
0.50	0.00	0	889.37	0.00
1.00	0.00	0	889.37	0.00
1.50	0.00	0	889.37	0.00
2.00	0.00	0	889.37	0.00
2.50	0.00	0	889.37	0.00
3.00	0.00	0	889.37	0.00
3.50	0.00	0	889.37	0.00
4.00	0.00	0	889.37	0.00
4.50	0.00	0	889.37	0.00
5.00	0.00	0	889.37	0.00
5.50	0.00	0	889.37	0.00
6.00	0.00	0	889.37	0.00
6.50	0.00	0	889.39	0.00
7.00	0.00	2	889.41	0.00
7.50	0.01	3	889.42	0.01
8.00	0.01	4	889.43	0.01
8.50	0.02	5	889.44	0.02
9.00	0.03	7	889.45	0.03
9.50	0.03	8	889.46	0.03
10.00	0.05	10	889.47	0.05
10.50	0.07	14	889.49	0.07
11.00	0.12	20	889.51	0.11
11.50	**0.23**	**32**	**889.55**	**0.22**
12.00	**3.07**	**256**	**889.87**	**3.55**
12.50	0.32	44	889.58	0.34
13.00	0.21	31	889.54	0.21
13.50	0.16	25	889.53	0.16
14.00	0.12	21	889.51	0.13
14.50	0.11	19	889.51	0.11
15.00	0.10	18	889.50	0.10
15.50	0.09	16	889.50	0.09
16.00	0.08	15	889.49	0.08
16.50	0.07	14	889.49	0.07
17.00	0.07	13	889.48	0.07
17.50	0.06	13	889.48	0.06
18.00	0.06	12	889.48	0.06
18.50	0.06	11	889.48	0.06
19.00	0.05	11	889.47	0.05
19.50	0.05	10	889.47	0.05
20.00	0.04	10	889.47	0.04
20.50	0.04	9	889.47	0.04
21.00	0.04	9	889.46	0.04
21.50	0.04	9	889.46	0.04
22.00	0.04	9	889.46	0.04
22.50	0.04	9	889.46	0.04
23.00	0.04	9	889.46	0.04
23.50	0.04	8	889.46	0.04
24.00	0.04	8	889.46	0.04

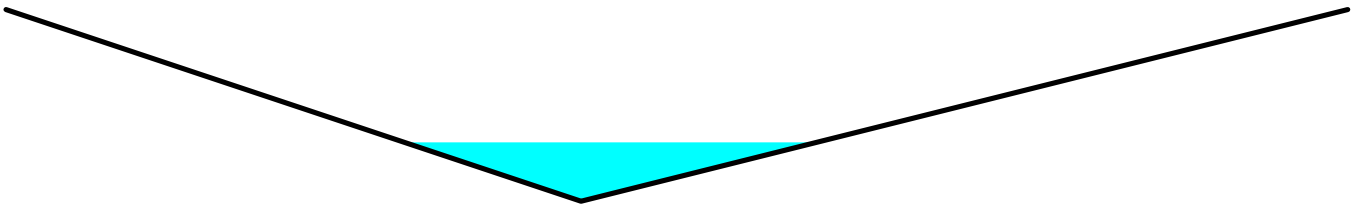
Summary for Reach DB-G7: (new Reach)

Inflow Area = 0.751 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 5.70 cfs @ 11.94 hrs, Volume= 0.251 af
Outflow = 5.57 cfs @ 11.96 hrs, Volume= 0.251 af, Atten= 2%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.20 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 3.5 min

Peak Storage= 405 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 129.08 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 305.8' Slope= 0.0197 '/'
Inlet Invert= 863.42', Outlet Invert= 857.41'



Hydrograph for Reach DB-G7: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	863.42	0.00
0.50	0.00	0	863.42	0.00
1.00	0.00	0	863.42	0.00
1.50	0.00	0	863.42	0.00
2.00	0.00	0	863.42	0.00
2.50	0.00	0	863.42	0.00
3.00	0.00	0	863.42	0.00
3.50	0.00	0	863.42	0.00
4.00	0.00	0	863.42	0.00
4.50	0.00	0	863.42	0.00
5.00	0.00	0	863.42	0.00
5.50	0.00	0	863.42	0.00
6.00	0.00	0	863.42	0.00
6.50	0.00	1	863.44	0.00
7.00	0.01	2	863.46	0.01
7.50	0.01	4	863.48	0.01
8.00	0.02	5	863.49	0.02
8.50	0.02	7	863.50	0.02
9.00	0.04	9	863.51	0.04
9.50	0.04	11	863.52	0.04
10.00	0.06	14	863.53	0.06
10.50	0.10	19	863.55	0.09
11.00	0.15	27	863.58	0.15
11.50	**0.29**	**43**	**863.62**	**0.28**
12.00	**3.96**	**351**	**863.99**	**4.60**
12.50	0.41	60	863.66	0.43
13.00	0.26	42	863.62	0.27
13.50	0.20	34	863.60	0.21
14.00	0.16	29	863.58	0.16
14.50	0.14	26	863.58	0.14
15.00	0.13	24	863.57	0.13
15.50	0.11	22	863.56	0.12
16.00	0.10	20	863.56	0.10
16.50	0.09	19	863.55	0.09
17.00	0.09	18	863.55	0.09
17.50	0.08	17	863.55	0.08
18.00	0.08	16	863.54	0.08
18.50	0.07	16	863.54	0.07
19.00	0.07	15	863.54	0.07
19.50	0.06	14	863.53	0.06
20.00	0.06	13	863.53	0.06
20.50	0.06	13	863.53	0.06
21.00	0.05	13	863.53	0.05
21.50	0.05	12	863.53	0.05
22.00	0.05	12	863.53	0.05
22.50	0.05	12	863.53	0.05
23.00	0.05	12	863.52	0.05
23.50	0.05	12	863.52	0.05
24.00	0.05	11	863.52	0.05

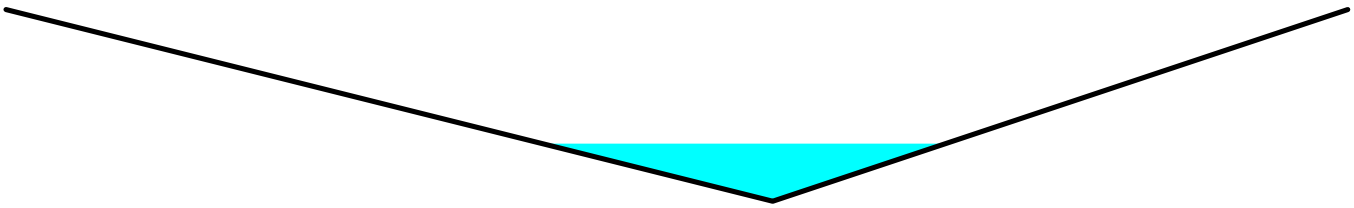
Summary for Reach DB-G8: (new Reach)

Inflow Area = 0.758 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 5.74 cfs @ 11.95 hrs, Volume= 0.253 af
Outflow = 5.57 cfs @ 11.96 hrs, Volume= 0.253 af, Atten= 3%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.42 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 3.9 min

Peak Storage= 462 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.60'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 137.92 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 3.0 '/' Top Width= 14.00'
Length= 366.4' Slope= 0.0224 '/'
Inlet Invert= 865.63', Outlet Invert= 857.41'



Hydrograph for Reach DB-G8: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	865.63	0.00
0.50	0.00	0	865.63	0.00
1.00	0.00	0	865.63	0.00
1.50	0.00	0	865.63	0.00
2.00	0.00	0	865.63	0.00
2.50	0.00	0	865.63	0.00
3.00	0.00	0	865.63	0.00
3.50	0.00	0	865.63	0.00
4.00	0.00	0	865.63	0.00
4.50	0.00	0	865.63	0.00
5.00	0.00	0	865.63	0.00
5.50	0.00	0	865.63	0.00
6.00	0.00	0	865.63	0.00
6.50	0.00	1	865.65	0.00
7.00	0.01	3	865.67	0.01
7.50	0.01	4	865.69	0.01
8.00	0.02	5	865.69	0.02
8.50	0.02	8	865.71	0.02
9.00	0.04	10	865.72	0.04
9.50	0.05	12	865.73	0.04
10.00	0.06	16	865.74	0.06
10.50	0.10	21	865.76	0.09
11.00	0.15	30	865.78	0.15
11.50	**0.30**	**49**	**865.83**	**0.28**
12.00	**4.06**	**410**	**866.20**	**4.74**
12.50	0.41	69	865.86	0.44
13.00	0.27	48	865.82	0.27
13.50	0.20	39	865.80	0.21
14.00	0.16	33	865.79	0.16
14.50	0.14	30	865.78	0.15
15.00	0.13	28	865.78	0.13
15.50	0.12	25	865.77	0.12
16.00	0.10	23	865.76	0.10
16.50	0.09	22	865.76	0.09
17.00	0.09	21	865.76	0.09
17.50	0.08	20	865.75	0.08
18.00	0.08	19	865.75	0.08
18.50	0.07	18	865.75	0.07
19.00	0.07	17	865.74	0.07
19.50	0.06	16	865.74	0.06
20.00	0.06	15	865.74	0.06
20.50	0.06	15	865.74	0.06
21.00	0.05	14	865.74	0.05
21.50	0.05	14	865.73	0.05
22.00	0.05	14	865.73	0.05
22.50	0.05	14	865.73	0.05
23.00	0.05	14	865.73	0.05
23.50	0.05	13	865.73	0.05
24.00	0.05	13	865.73	0.05

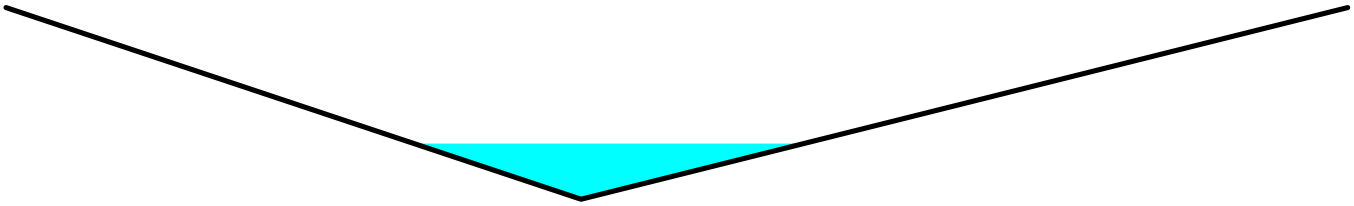
Summary for Reach DB-G9: (new Reach)

Inflow Area = 0.646 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 4.90 cfs @ 11.94 hrs, Volume= 0.216 af
Outflow = 4.81 cfs @ 11.96 hrs, Volume= 0.216 af, Atten= 2%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.05 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.42 fps, Avg. Travel Time= 3.0 min

Peak Storage= 308 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 2.00' Flow Area= 14.0 sf, Capacity= 129.06 cfs

0.00' x 2.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 4.0 '/' Top Width= 14.00'
Length= 259.6' Slope= 0.0196 '/'
Inlet Invert= 837.52', Outlet Invert= 832.42'



Hydrograph for Reach DB-G9: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	837.52	0.00
0.50	0.00	0	837.52	0.00
1.00	0.00	0	837.52	0.00
1.50	0.00	0	837.52	0.00
2.00	0.00	0	837.52	0.00
2.50	0.00	0	837.52	0.00
3.00	0.00	0	837.52	0.00
3.50	0.00	0	837.52	0.00
4.00	0.00	0	837.52	0.00
4.50	0.00	0	837.52	0.00
5.00	0.00	0	837.52	0.00
5.50	0.00	0	837.52	0.00
6.00	0.00	0	837.52	0.00
6.50	0.00	0	837.54	0.00
7.00	0.01	2	837.56	0.00
7.50	0.01	3	837.57	0.01
8.00	0.01	4	837.58	0.01
8.50	0.02	5	837.59	0.02
9.00	0.03	7	837.61	0.03
9.50	0.04	8	837.61	0.04
10.00	0.05	10	837.63	0.05
10.50	0.08	14	837.64	0.08
11.00	0.13	20	837.67	0.13
11.50	**0.25**	**33**	**837.71**	**0.24**
12.00	**3.41**	**264**	**838.06**	**3.91**
12.50	0.35	45	837.74	0.37
13.00	0.23	32	837.71	0.23
13.50	0.17	26	837.69	0.18
14.00	0.14	22	837.67	0.14
14.50	0.12	20	837.67	0.12
15.00	0.11	18	837.66	0.11
15.50	0.10	17	837.66	0.10
16.00	0.09	15	837.65	0.09
16.50	0.08	14	837.65	0.08
17.00	0.08	14	837.64	0.08
17.50	0.07	13	837.64	0.07
18.00	0.07	13	837.64	0.07
18.50	0.06	12	837.63	0.06
19.00	0.06	11	837.63	0.06
19.50	0.05	11	837.63	0.05
20.00	0.05	10	837.62	0.05
20.50	0.05	10	837.62	0.05
21.00	0.05	10	837.62	0.05
21.50	0.05	9	837.62	0.05
22.00	0.04	9	837.62	0.04
22.50	0.04	9	837.62	0.04
23.00	0.04	9	837.62	0.04
23.50	0.04	9	837.62	0.04
24.00	0.04	9	837.62	0.04

Summary for Reach DC-G1: (new Reach)

Inflow Area = 0.572 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 4.30 cfs @ 11.95 hrs, Volume= 0.191 af
Outflow = 4.29 cfs @ 11.96 hrs, Volume= 0.191 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.02 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.42 fps, Avg. Travel Time= 1.2 min

Peak Storage= 107 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 749.02 cfs

10.00' x 2.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 99.8' Slope= 0.2504 '/'
Inlet Invert= 932.39', Outlet Invert= 907.40'

‡

Hydrograph for Reach DC-G1: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	932.39	0.00
0.50	0.00	0	932.39	0.00
1.00	0.00	0	932.39	0.00
1.50	0.00	0	932.39	0.00
2.00	0.00	0	932.39	0.00
2.50	0.00	0	932.39	0.00
3.00	0.00	0	932.39	0.00
3.50	0.00	0	932.39	0.00
4.00	0.00	0	932.39	0.00
4.50	0.00	0	932.39	0.00
5.00	0.00	0	932.39	0.00
5.50	0.00	0	932.39	0.00
6.00	0.00	0	932.39	0.00
6.50	0.00	0	932.39	0.00
7.00	0.00	0	932.39	0.00
7.50	0.01	1	932.39	0.01
8.00	0.01	1	932.39	0.01
8.50	0.02	1	932.39	0.02
9.00	0.03	2	932.39	0.03
9.50	0.03	2	932.39	0.03
10.00	0.05	3	932.39	0.05
10.50	0.07	5	932.40	0.07
11.00	0.11	8	932.40	0.11
11.50	**0.22**	**16**	**932.41**	**0.21**
12.00	**3.33**	**94**	**932.48**	**3.49**
12.50	0.32	22	932.41	0.33
13.00	0.20	15	932.41	0.21
13.50	0.16	12	932.40	0.16
14.00	0.12	9	932.40	0.12
14.50	0.11	8	932.40	0.11
15.00	0.10	7	932.40	0.10
15.50	0.09	6	932.40	0.09
16.00	0.08	6	932.40	0.08
16.50	0.07	5	932.40	0.07
17.00	0.07	5	932.39	0.07
17.50	0.06	5	932.39	0.06
18.00	0.06	4	932.39	0.06
18.50	0.06	4	932.39	0.06
19.00	0.05	4	932.39	0.05
19.50	0.05	3	932.39	0.05
20.00	0.04	3	932.39	0.04
20.50	0.04	3	932.39	0.04
21.00	0.04	3	932.39	0.04
21.50	0.04	3	932.39	0.04
22.00	0.04	3	932.39	0.04
22.50	0.04	3	932.39	0.04
23.00	0.04	3	932.39	0.04
23.50	0.04	3	932.39	0.04
24.00	0.04	3	932.39	0.04

Summary for Reach DC-G10: (new Reach)

Inflow Area = 12.945 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 94.92 cfs @ 11.97 hrs, Volume= 4.315 af
Outflow = 94.89 cfs @ 11.97 hrs, Volume= 4.314 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 12.47 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.80 fps, Avg. Travel Time= 0.6 min

Peak Storage= 789 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.64'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 756.10 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 103.7' Slope= 0.2552 '/'
Inlet Invert= 707.44', Outlet Invert= 680.98'

‡

Hydrograph for Reach DC-G10: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	707.44	0.00
0.50	0.00	0	707.44	0.00
1.00	0.00	0	707.44	0.00
1.50	0.00	0	707.44	0.00
2.00	0.00	0	707.44	0.00
2.50	0.00	0	707.44	0.00
3.00	0.00	0	707.44	0.00
3.50	0.00	0	707.44	0.00
4.00	0.00	0	707.44	0.00
4.50	0.00	0	707.44	0.00
5.00	0.00	0	707.44	0.00
5.50	0.00	0	707.44	0.00
6.00	0.00	0	707.44	0.00
6.50	0.01	1	707.44	0.01
7.00	0.08	6	707.45	0.08
7.50	0.16	12	707.45	0.16
8.00	0.24	18	707.46	0.24
8.50	0.38	24	707.46	0.38
9.00	0.58	31	707.47	0.58
9.50	0.74	37	707.48	0.74
10.00	1.02	45	707.48	1.02
10.50	1.55	58	707.50	1.54
11.00	2.48	78	707.51	2.46
11.50	**4.73**	**116**	**707.55**	**4.71**
12.00	**84.54**	**736**	**708.04**	**85.42**
12.50	7.80	160	707.59	7.85
13.00	4.76	117	707.55	4.78
13.50	3.61	99	707.53	3.62
14.00	2.85	86	707.52	2.86
14.50	2.49	79	707.51	2.50
15.00	2.25	74	707.51	2.25
15.50	2.00	69	707.51	2.01
16.00	1.76	64	707.50	1.76
16.50	1.62	61	707.50	1.62
17.00	1.53	58	707.50	1.54
17.50	1.45	56	707.49	1.45
18.00	1.36	54	707.49	1.36
18.50	1.27	52	707.49	1.27
19.00	1.18	49	707.49	1.18
19.50	1.09	47	707.48	1.09
20.00	0.99	45	707.48	1.00
20.50	0.95	44	707.48	0.96
21.00	0.94	43	707.48	0.94
21.50	0.92	43	707.48	0.92
22.00	0.90	43	707.48	0.90
22.50	0.88	42	707.48	0.88
23.00	0.87	41	707.48	0.87
23.50	0.85	41	707.48	0.85
24.00	0.83	40	707.48	0.83

Summary for Reach DC-G12: (new Reach)

Inflow Area = 1.208 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 8.73 cfs @ 11.97 hrs, Volume= 0.403 af
Outflow = 8.73 cfs @ 11.97 hrs, Volume= 0.403 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.35 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.83 fps, Avg. Travel Time= 0.2 min

Peak Storage= 24 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 466.00 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 19.9' Slope= 0.3080 '/'
Inlet Invert= 828.19', Outlet Invert= 822.06'

‡

Hydrograph for Reach DC-G12: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	828.19	0.00
0.50	0.00	0	828.19	0.00
1.00	0.00	0	828.19	0.00
1.50	0.00	0	828.19	0.00
2.00	0.00	0	828.19	0.00
2.50	0.00	0	828.19	0.00
3.00	0.00	0	828.19	0.00
3.50	0.00	0	828.19	0.00
4.00	0.00	0	828.19	0.00
4.50	0.00	0	828.19	0.00
5.00	0.00	0	828.19	0.00
5.50	0.00	0	828.19	0.00
6.00	0.00	0	828.19	0.00
6.50	0.00	0	828.19	0.00
7.00	0.01	0	828.19	0.01
7.50	0.02	0	828.19	0.02
8.00	0.02	0	828.19	0.02
8.50	0.04	0	828.20	0.04
9.00	0.06	1	828.20	0.06
9.50	0.07	1	828.20	0.07
10.00	0.10	1	828.21	0.10
10.50	0.15	2	828.21	0.15
11.00	0.23	2	828.22	0.23
11.50	**0.45**	**4**	**828.23**	**0.45**
12.00	**7.75**	**22**	**828.42**	**7.78**
12.50	0.72	5	828.25	0.72
13.00	0.44	4	828.23	0.44
13.50	0.34	3	828.23	0.34
14.00	0.26	3	828.22	0.26
14.50	0.23	2	828.22	0.23
15.00	0.21	2	828.22	0.21
15.50	0.19	2	828.21	0.19
16.00	0.16	2	828.21	0.16
16.50	0.15	2	828.21	0.15
17.00	0.14	2	828.21	0.14
17.50	0.13	2	828.21	0.13
18.00	0.13	2	828.21	0.13
18.50	0.12	2	828.21	0.12
19.00	0.11	1	828.21	0.11
19.50	0.10	1	828.21	0.10
20.00	0.09	1	828.21	0.09
20.50	0.09	1	828.20	0.09
21.00	0.09	1	828.20	0.09
21.50	0.09	1	828.20	0.09
22.00	0.08	1	828.20	0.08
22.50	0.08	1	828.20	0.08
23.00	0.08	1	828.20	0.08
23.50	0.08	1	828.20	0.08
24.00	0.08	1	828.20	0.08

Summary for Reach DC-G13: (new Reach)

Inflow Area = 0.260 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 1.95 cfs @ 11.95 hrs, Volume= 0.087 af
Outflow = 1.95 cfs @ 11.96 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.34 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 0.2 min

Peak Storage= 9 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 466.79 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 16.00'
Length= 19.8' Slope= 0.3091 '/'
Inlet Invert= 814.25', Outlet Invert= 808.13'

‡

Hydrograph for Reach DC-G13: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	814.25	0.00
0.50	0.00	0	814.25	0.00
1.00	0.00	0	814.25	0.00
1.50	0.00	0	814.25	0.00
2.00	0.00	0	814.25	0.00
2.50	0.00	0	814.25	0.00
3.00	0.00	0	814.25	0.00
3.50	0.00	0	814.25	0.00
4.00	0.00	0	814.25	0.00
4.50	0.00	0	814.25	0.00
5.00	0.00	0	814.25	0.00
5.50	0.00	0	814.25	0.00
6.00	0.00	0	814.25	0.00
6.50	0.00	0	814.25	0.00
7.00	0.00	0	814.25	0.00
7.50	0.00	0	814.25	0.00
8.00	0.01	0	814.25	0.01
8.50	0.01	0	814.25	0.01
9.00	0.01	0	814.25	0.01
9.50	0.02	0	814.25	0.02
10.00	0.02	0	814.25	0.02
10.50	0.03	0	814.26	0.03
11.00	0.05	1	814.26	0.05
11.50	**0.10**	**1**	**814.27**	**0.10**
12.00	**1.53**	**8**	**814.34**	**1.55**
12.50	0.15	2	814.27	0.15
13.00	0.09	1	814.27	0.09
13.50	0.07	1	814.26	0.07
14.00	0.06	1	814.26	0.06
14.50	0.05	1	814.26	0.05
15.00	0.04	1	814.26	0.04
15.50	0.04	1	814.26	0.04
16.00	0.03	0	814.26	0.03
16.50	0.03	0	814.26	0.03
17.00	0.03	0	814.26	0.03
17.50	0.03	0	814.25	0.03
18.00	0.03	0	814.25	0.03
18.50	0.03	0	814.25	0.03
19.00	0.02	0	814.25	0.02
19.50	0.02	0	814.25	0.02
20.00	0.02	0	814.25	0.02
20.50	0.02	0	814.25	0.02
21.00	0.02	0	814.25	0.02
21.50	0.02	0	814.25	0.02
22.00	0.02	0	814.25	0.02
22.50	0.02	0	814.25	0.02
23.00	0.02	0	814.25	0.02
23.50	0.02	0	814.25	0.02
24.00	0.02	0	814.25	0.02

Summary for Reach DC-G2: (new Reach)

Inflow Area = 1.550 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 11.61 cfs @ 11.96 hrs, Volume= 0.517 af
Outflow = 11.59 cfs @ 11.96 hrs, Volume= 0.517 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.86 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 1.1 min

Peak Storage= 198 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 747.52 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.2' Slope= 0.2494 '/'
Inlet Invert= 907.40', Outlet Invert= 882.41'

‡

Hydrograph for Reach DC-G2: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	907.40	0.00
0.50	0.00	0	907.40	0.00
1.00	0.00	0	907.40	0.00
1.50	0.00	0	907.40	0.00
2.00	0.00	0	907.40	0.00
2.50	0.00	0	907.40	0.00
3.00	0.00	0	907.40	0.00
3.50	0.00	0	907.40	0.00
4.00	0.00	0	907.40	0.00
4.50	0.00	0	907.40	0.00
5.00	0.00	0	907.40	0.00
5.50	0.00	0	907.40	0.00
6.00	0.00	0	907.40	0.00
6.50	0.00	0	907.40	0.00
7.00	0.01	1	907.40	0.01
7.50	0.02	2	907.40	0.02
8.00	0.03	2	907.40	0.03
8.50	0.05	4	907.40	0.05
9.00	0.07	5	907.41	0.07
9.50	0.09	7	907.41	0.09
10.00	0.13	9	907.41	0.13
10.50	0.19	14	907.41	0.19
11.00	0.31	21	907.42	0.30
11.50	**0.59**	**31**	**907.43**	**0.58**
12.00	**9.32**	**176**	**907.57**	**9.59**
12.50	0.89	41	907.44	0.90
13.00	0.56	30	907.43	0.56
13.50	0.43	25	907.43	0.43
14.00	0.34	22	907.42	0.34
14.50	0.30	21	907.42	0.30
15.00	0.27	20	907.42	0.27
15.50	0.24	18	907.42	0.24
16.00	0.21	15	907.42	0.21
16.50	0.19	14	907.41	0.19
17.00	0.18	13	907.41	0.18
17.50	0.17	13	907.41	0.17
18.00	0.16	12	907.41	0.16
18.50	0.15	11	907.41	0.15
19.00	0.14	10	907.41	0.14
19.50	0.13	10	907.41	0.13
20.00	0.12	9	907.41	0.12
20.50	0.11	8	907.41	0.11
21.00	0.11	8	907.41	0.11
21.50	0.11	8	907.41	0.11
22.00	0.11	8	907.41	0.11
22.50	0.11	8	907.41	0.11
23.00	0.10	8	907.41	0.10
23.50	0.10	7	907.41	0.10
24.00	0.10	7	907.41	0.10

Summary for Reach DC-G3: (new Reach)

Inflow Area = 3.186 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 23.63 cfs @ 11.96 hrs, Volume= 1.063 af
Outflow = 23.61 cfs @ 11.96 hrs, Volume= 1.063 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.62 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.74 fps, Avg. Travel Time= 1.0 min

Peak Storage= 309 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 749.17 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 99.8' Slope= 0.2505 '/'
Inlet Invert= 882.41', Outlet Invert= 857.41'

‡

Hydrograph for Reach DC-G3: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	882.41	0.00
0.50	0.00	0	882.41	0.00
1.00	0.00	0	882.41	0.00
1.50	0.00	0	882.41	0.00
2.00	0.00	0	882.41	0.00
2.50	0.00	0	882.41	0.00
3.00	0.00	0	882.41	0.00
3.50	0.00	0	882.41	0.00
4.00	0.00	0	882.41	0.00
4.50	0.00	0	882.41	0.00
5.00	0.00	0	882.41	0.00
5.50	0.00	0	882.41	0.00
6.00	0.00	0	882.41	0.00
6.50	0.00	0	882.41	0.00
7.00	0.02	2	882.41	0.02
7.50	0.04	3	882.41	0.04
8.00	0.06	5	882.41	0.06
8.50	0.10	7	882.42	0.10
9.00	0.15	11	882.42	0.15
9.50	0.19	14	882.42	0.18
10.00	0.26	19	882.43	0.26
10.50	0.39	24	882.43	0.39
11.00	0.62	32	882.44	0.62
11.50	**1.19**	**48**	**882.46**	**1.18**
12.00	**19.81**	**280**	**882.67**	**20.20**
12.50	1.85	64	882.47	1.87
13.00	1.15	47	882.46	1.16
13.50	0.88	41	882.45	0.88
14.00	0.69	34	882.44	0.70
14.50	0.61	32	882.44	0.61
15.00	0.55	30	882.44	0.55
15.50	0.49	27	882.44	0.49
16.00	0.43	25	882.44	0.43
16.50	0.40	24	882.43	0.40
17.00	0.38	24	882.43	0.38
17.50	0.35	23	882.43	0.35
18.00	0.33	22	882.43	0.33
18.50	0.31	21	882.43	0.31
19.00	0.29	21	882.43	0.29
19.50	0.27	19	882.43	0.27
20.00	0.24	18	882.43	0.24
20.50	0.23	17	882.43	0.23
21.00	0.23	17	882.43	0.23
21.50	0.23	17	882.43	0.23
22.00	0.22	16	882.43	0.22
22.50	0.22	16	882.43	0.22
23.00	0.21	16	882.43	0.21
23.50	0.21	15	882.43	0.21
24.00	0.20	15	882.42	0.20

Summary for Reach DC-G4: (new Reach)

Inflow Area = 4.695 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 34.74 cfs @ 11.96 hrs, Volume= 1.566 af
Outflow = 34.72 cfs @ 11.96 hrs, Volume= 1.566 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.75 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.96 fps, Avg. Travel Time= 0.9 min

Peak Storage= 397 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.27 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2499 '/'
Inlet Invert= 857.41', Outlet Invert= 832.42'

‡

Hydrograph for Reach DC-G4: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	857.41	0.00
0.50	0.00	0	857.41	0.00
1.00	0.00	0	857.41	0.00
1.50	0.00	0	857.41	0.00
2.00	0.00	0	857.41	0.00
2.50	0.00	0	857.41	0.00
3.00	0.00	0	857.41	0.00
3.50	0.00	0	857.41	0.00
4.00	0.00	0	857.41	0.00
4.50	0.00	0	857.41	0.00
5.00	0.00	0	857.41	0.00
5.50	0.00	0	857.41	0.00
6.00	0.00	0	857.41	0.00
6.50	0.01	0	857.41	0.00
7.00	0.03	2	857.41	0.03
7.50	0.06	5	857.41	0.06
8.00	0.09	7	857.42	0.09
8.50	0.14	10	857.42	0.14
9.00	0.22	16	857.43	0.21
9.50	0.27	20	857.43	0.27
10.00	0.38	24	857.43	0.38
10.50	0.57	30	857.44	0.57
11.00	0.92	41	857.45	0.91
11.50	**1.75**	**62**	**857.47**	**1.74**
12.00	**29.54**	**361**	**857.74**	**30.04**
12.50	2.75	82	857.49	2.78
13.00	1.71	61	857.47	1.71
13.50	1.30	51	857.46	1.30
14.00	1.02	44	857.45	1.03
14.50	0.90	41	857.45	0.90
15.00	0.81	39	857.45	0.81
15.50	0.72	35	857.45	0.72
16.00	0.63	32	857.44	0.63
16.50	0.59	31	857.44	0.59
17.00	0.55	30	857.44	0.56
17.50	0.52	29	857.44	0.52
18.00	0.49	28	857.44	0.49
18.50	0.46	26	857.44	0.46
19.00	0.42	25	857.44	0.43
19.50	0.39	24	857.43	0.39
20.00	0.36	23	857.43	0.36
20.50	0.35	23	857.43	0.35
21.00	0.34	22	857.43	0.34
21.50	0.33	22	857.43	0.33
22.00	0.33	22	857.43	0.33
22.50	0.32	22	857.43	0.32
23.00	0.31	21	857.43	0.31
23.50	0.31	21	857.43	0.31
24.00	0.30	21	857.43	0.30

Summary for Reach DC-G5: (new Reach)

Inflow Area = 6.289 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 46.38 cfs @ 11.96 hrs, Volume= 2.098 af
Outflow = 46.36 cfs @ 11.96 hrs, Volume= 2.097 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.69 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.17 fps, Avg. Travel Time= 0.8 min

Peak Storage= 478 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.42 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2500 '/'
Inlet Invert= 832.42', Outlet Invert= 807.42'

‡

Hydrograph for Reach DC-G5: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	832.42	0.00
0.50	0.00	0	832.42	0.00
1.00	0.00	0	832.42	0.00
1.50	0.00	0	832.42	0.00
2.00	0.00	0	832.42	0.00
2.50	0.00	0	832.42	0.00
3.00	0.00	0	832.42	0.00
3.50	0.00	0	832.42	0.00
4.00	0.00	0	832.42	0.00
4.50	0.00	0	832.42	0.00
5.00	0.00	0	832.42	0.00
5.50	0.00	0	832.42	0.00
6.00	0.00	0	832.42	0.00
6.50	0.01	0	832.42	0.01
7.00	0.04	3	832.42	0.04
7.50	0.08	6	832.43	0.08
8.00	0.12	9	832.43	0.12
8.50	0.19	14	832.43	0.19
9.00	0.29	20	832.44	0.29
9.50	0.36	23	832.44	0.36
10.00	0.51	28	832.45	0.50
10.50	0.76	37	832.46	0.76
11.00	1.22	49	832.47	1.21
11.50	**2.34**	**73**	**832.49**	**2.32**
12.00	**40.01**	**439**	**832.81**	**40.59**
12.50	3.71	98	832.52	3.74
13.00	2.29	73	832.49	2.30
13.50	1.74	62	832.48	1.75
14.00	1.37	53	832.47	1.38
14.50	1.21	49	832.47	1.21
15.00	1.09	46	832.47	1.09
15.50	0.97	43	832.46	0.97
16.00	0.85	40	832.46	0.85
16.50	0.79	38	832.46	0.79
17.00	0.74	36	832.46	0.74
17.50	0.70	35	832.45	0.70
18.00	0.66	33	832.45	0.66
18.50	0.61	32	832.45	0.61
19.00	0.57	30	832.45	0.57
19.50	0.53	29	832.45	0.53
20.00	0.48	27	832.45	0.48
20.50	0.46	27	832.45	0.46
21.00	0.46	26	832.45	0.46
21.50	0.45	26	832.45	0.45
22.00	0.44	26	832.45	0.44
22.50	0.43	25	832.45	0.43
23.00	0.42	25	832.44	0.42
23.50	0.41	25	832.44	0.41
24.00	0.40	25	832.44	0.40

Summary for Reach DC-G6: (new Reach)

Inflow Area = 7.931 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 58.34 cfs @ 11.96 hrs, Volume= 2.645 af
Outflow = 58.32 cfs @ 11.97 hrs, Volume= 2.644 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.49 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.34 fps, Avg. Travel Time= 0.7 min

Peak Storage= 557 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 747.52 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.2' Slope= 0.2494 '/'
Inlet Invert= 807.42', Outlet Invert= 782.43'

‡

Hydrograph for Reach DC-G6: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	807.42	0.00
0.50	0.00	0	807.42	0.00
1.00	0.00	0	807.42	0.00
1.50	0.00	0	807.42	0.00
2.00	0.00	0	807.42	0.00
2.50	0.00	0	807.42	0.00
3.00	0.00	0	807.42	0.00
3.50	0.00	0	807.42	0.00
4.00	0.00	0	807.42	0.00
4.50	0.00	0	807.42	0.00
5.00	0.00	0	807.42	0.00
5.50	0.00	0	807.42	0.00
6.00	0.00	0	807.42	0.00
6.50	0.01	0	807.42	0.01
7.00	0.05	4	807.42	0.05
7.50	0.10	7	807.43	0.10
8.00	0.15	11	807.43	0.15
8.50	0.24	17	807.44	0.23
9.00	0.36	23	807.44	0.36
9.50	0.46	26	807.45	0.46
10.00	0.64	32	807.45	0.63
10.50	0.96	43	807.46	0.95
11.00	1.53	57	807.48	1.52
11.50	**2.93**	**84**	**807.50**	**2.91**
12.00	**50.81**	**513**	**807.87**	**51.47**
12.50	4.71	114	807.53	4.75
13.00	2.90	84	807.50	2.91
13.50	2.20	71	807.49	2.21
14.00	1.74	62	807.48	1.74
14.50	1.52	57	807.48	1.53
15.00	1.38	53	807.47	1.38
15.50	1.22	49	807.47	1.23
16.00	1.07	46	807.46	1.07
16.50	0.99	44	807.46	0.99
17.00	0.94	42	807.46	0.94
17.50	0.88	41	807.46	0.89
18.00	0.83	39	807.46	0.83
18.50	0.77	37	807.46	0.78
19.00	0.72	35	807.45	0.72
19.50	0.66	34	807.45	0.66
20.00	0.61	32	807.45	0.61
20.50	0.58	31	807.45	0.58
21.00	0.57	30	807.45	0.57
21.50	0.56	30	807.45	0.56
22.00	0.55	30	807.45	0.55
22.50	0.54	29	807.45	0.54
23.00	0.53	29	807.45	0.53
23.50	0.52	29	807.45	0.52
24.00	0.51	28	807.45	0.51

Summary for Reach DC-G7: (new Reach)

Inflow Area = 9.573 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 70.30 cfs @ 11.96 hrs, Volume= 3.192 af
Outflow = 70.28 cfs @ 11.97 hrs, Volume= 3.191 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.19 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.50 fps, Avg. Travel Time= 0.7 min

Peak Storage= 628 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.42 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2500 '/'
Inlet Invert= 782.43', Outlet Invert= 757.43'

‡

Hydrograph for Reach DC-G7: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	782.43	0.00
0.50	0.00	0	782.43	0.00
1.00	0.00	0	782.43	0.00
1.50	0.00	0	782.43	0.00
2.00	0.00	0	782.43	0.00
2.50	0.00	0	782.43	0.00
3.00	0.00	0	782.43	0.00
3.50	0.00	0	782.43	0.00
4.00	0.00	0	782.43	0.00
4.50	0.00	0	782.43	0.00
5.00	0.00	0	782.43	0.00
5.50	0.00	0	782.43	0.00
6.00	0.00	0	782.43	0.00
6.50	0.01	1	782.43	0.01
7.00	0.06	4	782.43	0.06
7.50	0.12	9	782.44	0.12
8.00	0.19	13	782.44	0.18
8.50	0.28	20	782.45	0.28
9.00	0.43	25	782.46	0.43
9.50	0.55	30	782.46	0.55
10.00	0.76	37	782.47	0.76
10.50	1.15	47	782.48	1.15
11.00	1.84	63	782.49	1.84
11.50	**3.53**	**94**	**782.52**	**3.51**
12.00	**61.66**	**580**	**782.93**	**62.39**
12.50	5.71	128	782.55	5.75
13.00	3.50	94	782.52	3.52
13.50	2.66	80	782.51	2.67
14.00	2.10	69	782.50	2.10
14.50	1.84	64	782.49	1.84
15.00	1.66	60	782.49	1.66
15.50	1.48	55	782.48	1.48
16.00	1.29	51	782.48	1.30
16.50	1.20	48	782.48	1.20
17.00	1.13	47	782.48	1.13
17.50	1.07	45	782.47	1.07
18.00	1.00	44	782.47	1.00
18.50	0.94	42	782.47	0.94
19.00	0.87	40	782.47	0.87
19.50	0.80	38	782.47	0.80
20.00	0.73	36	782.47	0.74
20.50	0.71	35	782.46	0.71
21.00	0.69	34	782.46	0.69
21.50	0.68	34	782.46	0.68
22.00	0.67	34	782.46	0.67
22.50	0.65	33	782.46	0.65
23.00	0.64	33	782.46	0.64
23.50	0.63	32	782.46	0.63
24.00	0.61	32	782.46	0.61

Summary for Reach DC-G8: (new Reach)

Inflow Area = 10.971 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 80.50 cfs @ 11.97 hrs, Volume= 3.658 af
Outflow = 80.48 cfs @ 11.97 hrs, Volume= 3.657 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.72 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.62 fps, Avg. Travel Time= 0.6 min

Peak Storage= 687 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.27 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2499 '/'
Inlet Invert= 757.43', Outlet Invert= 732.44'

‡

Hydrograph for Reach DC-G8: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	757.43	0.00
0.50	0.00	0	757.43	0.00
1.00	0.00	0	757.43	0.00
1.50	0.00	0	757.43	0.00
2.00	0.00	0	757.43	0.00
2.50	0.00	0	757.43	0.00
3.00	0.00	0	757.43	0.00
3.50	0.00	0	757.43	0.00
4.00	0.00	0	757.43	0.00
4.50	0.00	0	757.43	0.00
5.00	0.00	0	757.43	0.00
5.50	0.00	0	757.43	0.00
6.00	0.00	0	757.43	0.00
6.50	0.01	1	757.43	0.01
7.00	0.07	5	757.43	0.07
7.50	0.14	10	757.44	0.14
8.00	0.21	15	757.45	0.21
8.50	0.32	22	757.45	0.32
9.00	0.50	28	757.46	0.49
9.50	0.63	32	757.46	0.63
10.00	0.87	40	757.47	0.87
10.50	1.32	51	757.48	1.31
11.00	2.11	69	757.50	2.10
11.50	**4.03**	**103**	**757.53**	**4.01**
12.00	**71.00**	**637**	**757.98**	**71.78**
12.50	6.56	139	757.56	6.61
13.00	4.02	103	757.53	4.04
13.50	3.05	87	757.51	3.06
14.00	2.41	75	757.50	2.41
14.50	2.11	69	757.50	2.11
15.00	1.91	65	757.49	1.91
15.50	1.70	61	757.49	1.70
16.00	1.48	56	757.48	1.49
16.50	1.37	53	757.48	1.38
17.00	1.30	51	757.48	1.30
17.50	1.22	49	757.48	1.23
18.00	1.15	47	757.48	1.15
18.50	1.07	45	757.47	1.07
19.00	1.00	44	757.47	1.00
19.50	0.92	42	757.47	0.92
20.00	0.84	40	757.47	0.84
20.50	0.81	38	757.47	0.81
21.00	0.79	38	757.47	0.79
21.50	0.78	37	757.47	0.78
22.00	0.76	37	757.47	0.76
22.50	0.75	36	757.47	0.75
23.00	0.73	36	757.47	0.73
23.50	0.72	35	757.46	0.72
24.00	0.70	35	757.46	0.70

Summary for Reach DC-G9: (new Reach)

Inflow Area = 12.098 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 88.73 cfs @ 11.97 hrs, Volume= 4.033 af
Outflow = 88.71 cfs @ 11.97 hrs, Volume= 4.032 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 12.11 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.71 fps, Avg. Travel Time= 0.6 min

Peak Storage= 732 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 748.42 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 100.0' Slope= 0.2500 '/'
Inlet Invert= 732.44', Outlet Invert= 707.44'

‡

Hydrograph for Reach DC-G9: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	732.44	0.00
0.50	0.00	0	732.44	0.00
1.00	0.00	0	732.44	0.00
1.50	0.00	0	732.44	0.00
2.00	0.00	0	732.44	0.00
2.50	0.00	0	732.44	0.00
3.00	0.00	0	732.44	0.00
3.50	0.00	0	732.44	0.00
4.00	0.00	0	732.44	0.00
4.50	0.00	0	732.44	0.00
5.00	0.00	0	732.44	0.00
5.50	0.00	0	732.44	0.00
6.00	0.00	0	732.44	0.00
6.50	0.01	1	732.44	0.01
7.00	0.08	5	732.45	0.07
7.50	0.15	11	732.45	0.15
8.00	0.23	17	732.46	0.23
8.50	0.36	23	732.46	0.35
9.00	0.54	29	732.47	0.54
9.50	0.70	34	732.47	0.69
10.00	0.96	43	732.48	0.96
10.50	1.45	54	732.49	1.44
11.00	2.32	73	732.51	2.31
11.50	**4.43**	**109**	**732.55**	**4.41**
12.00	**78.64**	**681**	**733.02**	**79.47**
12.50	7.26	149	732.58	7.31
13.00	4.44	109	732.55	4.46
13.50	3.37	92	732.53	3.38
14.00	2.66	80	732.52	2.67
14.50	2.33	73	732.51	2.33
15.00	2.10	69	732.51	2.10
15.50	1.87	64	732.50	1.87
16.00	1.64	59	732.50	1.64
16.50	1.52	56	732.50	1.52
17.00	1.43	54	732.49	1.43
17.50	1.35	52	732.49	1.35
18.00	1.27	50	732.49	1.27
18.50	1.18	48	732.49	1.18
19.00	1.10	46	732.49	1.10
19.50	1.01	44	732.48	1.02
20.00	0.93	42	732.48	0.93
20.50	0.89	41	732.48	0.89
21.00	0.88	41	732.48	0.88
21.50	0.86	40	732.48	0.86
22.00	0.84	40	732.48	0.84
22.50	0.83	39	732.48	0.83
23.00	0.81	38	732.48	0.81
23.50	0.79	38	732.48	0.79
24.00	0.78	37	732.48	0.78

Summary for Reach IPC-G1: (new Reach)

Inflow Area = 2.096 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 16.96 cfs @ 11.92 hrs, Volume= 0.700 af
Outflow = 13.45 cfs @ 11.96 hrs, Volume= 0.694 af, Atten= 21%, Lag= 2.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.08 fps, Min. Travel Time= 5.9 min
Avg. Velocity = 0.48 fps, Avg. Travel Time= 26.0 min

Peak Storage= 4,794 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 117.90 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 741.7' Slope= 0.0076 '/'
Inlet Invert= 903.92', Outlet Invert= 898.26'

‡

Hydrograph for Reach IPC-G1: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	903.92	0.00
0.50	0.00	0	903.92	0.00
1.00	0.00	0	903.92	0.00
1.50	0.00	0	903.92	0.00
2.00	0.00	0	903.92	0.00
2.50	0.00	0	903.92	0.00
3.00	0.00	0	903.92	0.00
3.50	0.00	0	903.92	0.00
4.00	0.00	0	903.92	0.00
4.50	0.00	0	903.92	0.00
5.00	0.00	0	903.92	0.00
5.50	0.00	0	903.92	0.00
6.00	0.00	0	903.92	0.00
6.50	0.01	3	903.92	0.00
7.00	0.02	19	903.92	0.01
7.50	0.03	45	903.93	0.01
8.00	0.04	78	903.93	0.03
8.50	0.07	123	903.94	0.04
9.00	0.10	184	903.94	0.07
9.50	0.13	231	903.95	0.10
10.00	0.18	285	903.96	0.14
10.50	0.27	369	903.97	0.22
11.00	0.44	497	903.99	0.36
11.50	**0.85**	**740**	**904.02**	**0.68**
12.00	**6.81**	**4,390**	**904.45**	**11.74**
12.50	1.06	1,189	904.08	1.47
13.00	0.72	837	904.03	0.83
13.50	0.56	699	904.01	0.62
14.00	0.44	604	904.00	0.49
14.50	0.40	548	903.99	0.42
15.00	0.36	513	903.99	0.37
15.50	0.32	480	903.98	0.33
16.00	0.28	446	903.98	0.29
16.50	0.26	420	903.98	0.27
17.00	0.25	404	903.97	0.25
17.50	0.23	389	903.97	0.24
18.00	0.22	374	903.97	0.22
18.50	0.20	359	903.97	0.21
19.00	0.19	344	903.97	0.20
19.50	0.17	329	903.96	0.18
20.00	0.16	313	903.96	0.17
20.50	0.15	304	903.96	0.16
21.00	0.15	300	903.96	0.15
21.50	0.15	297	903.96	0.15
22.00	0.15	293	903.96	0.15
22.50	0.14	289	903.96	0.14
23.00	0.14	284	903.96	0.14
23.50	0.14	280	903.96	0.14
24.00	0.13	276	903.96	0.14

Summary for Reach IPC-G2: (new Reach)

Inflow Area = 6.620 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 45.53 cfs @ 11.96 hrs, Volume= 2.205 af
Outflow = 44.37 cfs @ 11.98 hrs, Volume= 2.199 af, Atten= 3%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.43 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 2.14 fps, Avg. Travel Time= 7.6 min

Peak Storage= 4,590 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 637.02 cfs

10.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 975.4' Slope= 0.2228 '/'
Inlet Invert= 898.26', Outlet Invert= 680.98'

‡

Hydrograph for Reach IPC-G2: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	898.26	0.00
0.50	0.00	0	898.26	0.00
1.00	0.00	0	898.26	0.00
1.50	0.00	0	898.26	0.00
2.00	0.00	0	898.26	0.00
2.50	0.00	0	898.26	0.00
3.00	0.00	0	898.26	0.00
3.50	0.00	0	898.26	0.00
4.00	0.00	0	898.26	0.00
4.50	0.00	0	898.26	0.00
5.00	0.00	0	898.26	0.00
5.50	0.00	0	898.26	0.00
6.00	0.00	0	898.26	0.00
6.50	0.01	3	898.26	0.00
7.00	0.04	22	898.26	0.03
7.50	0.08	48	898.26	0.06
8.00	0.12	77	898.27	0.10
8.50	0.18	118	898.27	0.16
9.00	0.29	184	898.28	0.24
9.50	0.37	230	898.28	0.36
10.00	0.52	275	898.29	0.48
10.50	0.78	360	898.30	0.73
11.00	1.25	482	898.31	1.18
11.50	**2.39**	**716**	**898.33**	**2.23**
12.00	**40.71**	**4,509**	**898.69**	**43.14**
12.50	4.09	1,094	898.37	4.45
13.00	2.46	782	898.34	2.56
13.50	1.86	653	898.33	1.92
14.00	1.46	566	898.32	1.51
14.50	1.28	513	898.31	1.30
15.00	1.15	481	898.31	1.17
15.50	1.03	449	898.31	1.04
16.00	0.90	417	898.30	0.92
16.50	0.83	398	898.30	0.84
17.00	0.79	384	898.30	0.80
17.50	0.74	368	898.30	0.75
18.00	0.70	352	898.30	0.70
18.50	0.65	336	898.29	0.66
19.00	0.60	320	898.29	0.61
19.50	0.56	303	898.29	0.57
20.00	0.51	287	898.29	0.52
20.50	0.49	278	898.29	0.49
21.00	0.48	274	898.29	0.48
21.50	0.47	271	898.29	0.47
22.00	0.46	268	898.29	0.46
22.50	0.45	265	898.29	0.45
23.00	0.44	261	898.29	0.45
23.50	0.43	258	898.29	0.44
24.00	0.43	255	898.29	0.43

Summary for Reach IPC-G3: (new Reach)

Inflow Area = 1.254 ac, 0.00% Impervious, Inflow Depth > 4.01" for 100-yr event
Inflow = 9.59 cfs @ 11.94 hrs, Volume= 0.419 af
Outflow = 8.96 cfs @ 11.96 hrs, Volume= 0.417 af, Atten= 7%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.50 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 10.7 min

Peak Storage= 1,365 cf @ 11.96 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 117.63 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 534.2' Slope= 0.0295 '/'
Inlet Invert= 837.83', Outlet Invert= 822.06'

Hydrograph for Reach IPC-G3: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	837.83	0.00
0.50	0.00	0	837.83	0.00
1.00	0.00	0	837.83	0.00
1.50	0.00	0	837.83	0.00
2.00	0.00	0	837.83	0.00
2.50	0.00	0	837.83	0.00
3.00	0.00	0	837.83	0.00
3.50	0.00	0	837.83	0.00
4.00	0.00	0	837.83	0.00
4.50	0.00	0	837.83	0.00
5.00	0.00	0	837.83	0.00
5.50	0.00	0	837.83	0.00
6.00	0.00	0	837.83	0.00
6.50	0.00	1	837.83	0.00
7.00	0.01	7	837.83	0.01
7.50	0.02	15	837.84	0.01
8.00	0.03	24	837.84	0.02
8.50	0.04	37	837.85	0.03
9.00	0.06	52	837.85	0.05
9.50	0.07	61	837.86	0.07
10.00	0.11	74	837.86	0.10
10.50	0.16	98	837.87	0.15
11.00	0.26	131	837.89	0.23
11.50	**0.49**	**196**	**837.92**	**0.45**
12.00	**6.39**	**1,259**	**838.31**	**7.95**
12.50	0.68	275	837.95	0.77
13.00	0.44	200	837.92	0.47
13.50	0.34	169	837.91	0.35
14.00	0.27	145	837.90	0.28
14.50	0.24	134	837.89	0.24
15.00	0.21	126	837.89	0.22
15.50	0.19	116	837.88	0.20
16.00	0.17	107	837.88	0.17
16.50	0.16	102	837.88	0.16
17.00	0.15	98	837.88	0.15
17.50	0.14	95	837.87	0.14
18.00	0.13	92	837.87	0.13
18.50	0.12	88	837.87	0.12
19.00	0.11	84	837.87	0.11
19.50	0.10	80	837.87	0.11
20.00	0.09	75	837.86	0.10
20.50	0.09	73	837.86	0.09
21.00	0.09	72	837.86	0.09
21.50	0.09	71	837.86	0.09
22.00	0.09	70	837.86	0.09
22.50	0.09	69	837.86	0.09
23.00	0.08	68	837.86	0.08
23.50	0.08	67	837.86	0.08
24.00	0.08	66	837.86	0.08

Summary for Reach IPC-G4: (new Reach)

Inflow Area = 3.472 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 25.06 cfs @ 11.96 hrs, Volume= 1.158 af
Outflow = 24.28 cfs @ 11.97 hrs, Volume= 1.155 af, Atten= 3%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.75 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 6.6 min

Peak Storage= 2,401 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.88'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 117.82 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 470.3' Slope= 0.0296 '/'
Inlet Invert= 822.06', Outlet Invert= 808.13'

Hydrograph for Reach IPC-G4: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	822.06	0.00
0.50	0.00	0	822.06	0.00
1.00	0.00	0	822.06	0.00
1.50	0.00	0	822.06	0.00
2.00	0.00	0	822.06	0.00
2.50	0.00	0	822.06	0.00
3.00	0.00	0	822.06	0.00
3.50	0.00	0	822.06	0.00
4.00	0.00	0	822.06	0.00
4.50	0.00	0	822.06	0.00
5.00	0.00	0	822.06	0.00
5.50	0.00	0	822.06	0.00
6.00	0.00	0	822.06	0.00
6.50	0.01	2	822.06	0.00
7.00	0.02	14	822.07	0.01
7.50	0.04	33	822.08	0.03
8.00	0.07	48	822.09	0.06
8.50	0.10	63	822.09	0.09
9.00	0.16	86	822.10	0.15
9.50	0.20	102	822.11	0.19
10.00	0.28	124	822.12	0.26
10.50	0.42	160	822.14	0.40
11.00	0.67	214	822.17	0.64
11.50	**1.29**	**323**	**822.22**	**1.22**
12.00	**20.88**	**2,305**	**822.92**	**22.92**
12.50	2.04	471	822.29	2.19
13.00	1.26	338	822.23	1.31
13.50	0.96	283	822.20	0.99
14.00	0.76	243	822.18	0.78
14.50	0.67	222	822.17	0.67
15.00	0.60	208	822.17	0.61
15.50	0.54	194	822.16	0.54
16.00	0.47	179	822.15	0.48
16.50	0.43	169	822.15	0.44
17.00	0.41	164	822.14	0.41
17.50	0.39	158	822.14	0.39
18.00	0.36	152	822.14	0.37
18.50	0.34	145	822.13	0.34
19.00	0.31	139	822.13	0.32
19.50	0.29	132	822.13	0.29
20.00	0.27	125	822.12	0.27
20.50	0.26	122	822.12	0.26
21.00	0.25	120	822.12	0.25
21.50	0.25	119	822.12	0.25
22.00	0.24	118	822.12	0.24
22.50	0.24	117	822.12	0.24
23.00	0.23	115	822.12	0.23
23.50	0.23	113	822.12	0.23
24.00	0.22	112	822.12	0.22

Summary for Reach IPC-G5: (new Reach)

Inflow Area = 3.973 ac, 0.00% Impervious, Inflow Depth > 3.99" for 100-yr event
Inflow = 27.80 cfs @ 11.97 hrs, Volume= 1.322 af
Outflow = 27.68 cfs @ 11.98 hrs, Volume= 1.321 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.93 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.25 fps, Avg. Travel Time= 2.3 min

Peak Storage= 979 cf @ 11.98 hrs
Average Depth at Peak Storage= 0.95'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 117.42 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 174.4' Slope= 0.0294 '/'
Inlet Invert= 808.13', Outlet Invert= 803.00'

Hydrograph for Reach IPC-G5: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	808.13	0.00
0.50	0.00	0	808.13	0.00
1.00	0.00	0	808.13	0.00
1.50	0.00	0	808.13	0.00
2.00	0.00	0	808.13	0.00
2.50	0.00	0	808.13	0.00
3.00	0.00	0	808.13	0.00
3.50	0.00	0	808.13	0.00
4.00	0.00	0	808.13	0.00
4.50	0.00	0	808.13	0.00
5.00	0.00	0	808.13	0.00
5.50	0.00	0	808.13	0.00
6.00	0.00	0	808.13	0.00
6.50	0.00	1	808.13	0.00
7.00	0.02	5	808.14	0.01
7.50	0.04	13	808.15	0.03
8.00	0.07	19	808.16	0.07
8.50	0.11	26	808.17	0.10
9.00	0.17	34	808.18	0.17
9.50	0.22	41	808.19	0.22
10.00	0.31	50	808.20	0.30
10.50	0.46	64	808.22	0.45
11.00	0.74	86	808.25	0.72
11.50	**1.41**	**130**	**808.30**	**1.38**
12.00	**25.69**	**948**	**809.06**	**26.44**
12.50	2.47	192	808.38	2.54
13.00	1.48	137	808.31	1.50
13.50	1.12	115	808.28	1.13
14.00	0.88	99	808.26	0.89
14.50	0.77	90	808.25	0.77
15.00	0.70	84	808.24	0.70
15.50	0.62	79	808.24	0.62
16.00	0.54	73	808.23	0.55
16.50	0.50	69	808.22	0.50
17.00	0.47	66	808.22	0.47
17.50	0.45	64	808.22	0.45
18.00	0.42	61	808.21	0.42
18.50	0.39	59	808.21	0.39
19.00	0.36	56	808.21	0.37
19.50	0.34	54	808.20	0.34
20.00	0.31	51	808.20	0.31
20.50	0.29	49	808.20	0.29
21.00	0.29	49	808.20	0.29
21.50	0.28	48	808.20	0.28
22.00	0.28	47	808.20	0.28
22.50	0.27	47	808.19	0.27
23.00	0.27	46	808.19	0.27
23.50	0.26	46	808.19	0.26
24.00	0.26	45	808.19	0.26

Summary for Reach IPC-G6: (new Reach)

Inflow Area = 5.398 ac, 0.00% Impervious, Inflow Depth > 4.00" for 100-yr event
Inflow = 36.93 cfs @ 11.96 hrs, Volume= 1.797 af
Outflow = 36.61 cfs @ 11.97 hrs, Volume= 1.795 af, Atten= 1%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.70 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.63 fps, Avg. Travel Time= 3.7 min

Peak Storage= 2,018 cf @ 11.97 hrs
Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 314.54 cfs

4.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 589.9' Slope= 0.2111 '/'
Inlet Invert= 803.00', Outlet Invert= 678.48'

Hydrograph for Reach IPC-G6: (new Reach)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	803.00	0.00
0.50	0.00	0	803.00	0.00
1.00	0.00	0	803.00	0.00
1.50	0.00	0	803.00	0.00
2.00	0.00	0	803.00	0.00
2.50	0.00	0	803.00	0.00
3.00	0.00	0	803.00	0.00
3.50	0.00	0	803.00	0.00
4.00	0.00	0	803.00	0.00
4.50	0.00	0	803.00	0.00
5.00	0.00	0	803.00	0.00
5.50	0.00	0	803.00	0.00
6.00	0.00	0	803.00	0.00
6.50	0.01	1	803.00	0.00
7.00	0.03	9	803.00	0.02
7.50	0.06	23	803.01	0.05
8.00	0.10	41	803.02	0.09
8.50	0.15	57	803.02	0.14
9.00	0.24	75	803.03	0.22
9.50	0.31	92	803.04	0.30
10.00	0.42	110	803.05	0.41
10.50	0.64	143	803.06	0.61
11.00	1.02	191	803.08	0.99
11.50	**1.95**	**287**	**803.11**	**1.88**
12.00	**32.55**	**1,927**	**803.62**	**34.26**
12.50	3.28	418	803.16	3.42
13.00	2.00	301	803.12	2.03
13.50	1.51	253	803.10	1.54
14.00	1.19	217	803.09	1.21
14.50	1.04	199	803.08	1.05
15.00	0.94	187	803.08	0.95
15.50	0.84	174	803.07	0.85
16.00	0.74	160	803.07	0.74
16.50	0.68	152	803.06	0.68
17.00	0.64	147	803.06	0.64
17.50	0.60	142	803.06	0.61
18.00	0.57	136	803.06	0.57
18.50	0.53	130	803.05	0.53
19.00	0.49	124	803.05	0.50
19.50	0.45	118	803.05	0.46
20.00	0.42	112	803.05	0.42
20.50	0.40	109	803.05	0.40
21.00	0.39	108	803.04	0.39
21.50	0.38	106	803.04	0.38
22.00	0.38	105	803.04	0.38
22.50	0.37	104	803.04	0.37
23.00	0.36	103	803.04	0.36
23.50	0.35	102	803.04	0.36
24.00	0.35	101	803.04	0.35

Summary for Pond 1P: Pond G - No Principal

Inflow Area = 28.484 ac, 0.00% Impervious, Inflow Depth > 3.97" for 100-yr event
Inflow = 199.41 cfs @ 11.97 hrs, Volume= 9.413 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 667.12' Surf.Area= 30,801 sf Storage= 73,912 cf
Peak Elev= 677.01' @ 24.00 hrs Surf.Area= 52,804 sf Storage= 483,926 cf (410,014 cf above start)

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

Volume	Invert	Avail.Storage	Storage Description
#1	664.50'	652,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
664.50	25,620	0	0
670.00	36,497	170,822	170,822
680.00	59,752	481,245	652,067

Device	Routing	Invert	Outlet Devices
#1	Secondary	677.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.50 Width (feet) 15.00 25.00

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=667.12' TW=656.00' (Dynamic Tailwater)
1=Custom Weir/Orifice (Controls 0.00 cfs)

Hydrograph for Pond 1P: Pond G - No Principal

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Secondary (cfs)
0.00	0.00	73,912	667.12	**0.00**
0.50	0.00	73,912	667.12	0.00
1.00	0.00	73,912	667.12	0.00
1.50	0.00	73,912	667.12	0.00
2.00	0.00	73,912	667.12	0.00
2.50	0.00	73,912	667.12	0.00
3.00	0.00	73,912	667.12	0.00
3.50	0.00	73,912	667.12	0.00
4.00	0.00	73,912	667.12	0.00
4.50	0.00	73,912	667.12	0.00
5.00	0.00	73,912	667.12	0.00
5.50	0.00	73,912	667.12	0.00
6.00	0.00	73,912	667.12	0.00
6.50	0.02	73,917	667.12	0.00
7.00	0.13	74,042	667.12	0.00
7.50	0.29	74,420	667.14	0.00
8.00	0.48	75,107	667.16	0.00
8.50	0.75	76,184	667.19	0.00
9.00	1.17	77,891	667.25	0.00
9.50	1.56	80,391	667.33	0.00
10.00	2.15	83,647	667.43	0.00
10.50	3.25	88,426	667.58	0.00
11.00	5.24	95,892	667.82	0.00
11.50	**10.03**	109,012	668.22	0.00
12.00	**182.98**	241,657	671.83	0.00
12.50	17.63	323,851	673.75	0.00
13.00	10.58	347,315	674.26	0.00
13.50	8.00	363,768	674.61	0.00
14.00	6.31	376,555	674.88	0.00
14.50	5.50	387,028	675.10	0.00
15.00	4.96	396,438	675.29	0.00
15.50	4.42	404,878	675.46	0.00
16.00	3.87	412,340	675.61	0.00
16.50	3.57	418,984	675.75	0.00
17.00	3.38	425,238	675.87	0.00
17.50	3.18	431,144	675.99	0.00
18.00	2.99	436,698	676.10	0.00
18.50	2.79	441,899	676.20	0.00
19.00	2.59	446,745	676.30	0.00
19.50	2.39	451,234	676.38	0.00
20.00	2.19	455,364	676.46	0.00
20.50	2.10	459,202	676.54	0.00
21.00	2.06	462,944	676.61	0.00
21.50	2.02	466,615	676.68	0.00
22.00	1.98	470,217	676.75	0.00
22.50	1.94	473,749	676.82	0.00
23.00	1.90	477,212	676.88	0.00
23.50	1.86	480,604	676.95	0.00
24.00	1.83	**483,926**	**677.01**	0.00

Summary for Pond DC-G11: Down Chute 3

Inflow Area = 20.371 ac, 0.00% Impervious, Inflow Depth > 3.99" for 100-yr event
Inflow = 144.56 cfs @ 11.97 hrs, Volume= 6.782 af
Outflow = 144.56 cfs @ 11.97 hrs, Volume= 6.782 af, Atten= 0%, Lag= 0.0 min
Primary = 144.56 cfs @ 11.97 hrs, Volume= 6.782 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 681.01' @ 11.97 hrs
Flood Elev= 680.98'

Device	Routing	Invert	Outlet Devices
#1	Primary	675.00'	**36.0" Round Culvert X 2.00** L= 70.6' Ke= 0.500 Inlet / Outlet Invert= 675.00' / 665.00' S= 0.1416 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 7.07 sf

Primary OutFlow Max=144.43 cfs @ 11.97 hrs HW=681.00' TW=671.33' (Dynamic Tailwater)
1=Culvert (Inlet Controls 144.43 cfs @ 10.22 fps)

Hydrograph for Pond DC-G11: Down Chute 3

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	675.00	0.00
0.50	0.00	675.00	0.00
1.00	0.00	675.00	0.00
1.50	0.00	675.00	0.00
2.00	0.00	675.00	0.00
2.50	0.00	675.00	0.00
3.00	0.00	675.00	0.00
3.50	0.00	675.00	0.00
4.00	0.00	675.00	0.00
4.50	0.00	675.00	0.00
5.00	0.00	675.00	0.00
5.50	0.00	675.00	0.00
6.00	0.00	675.00	0.00
6.50	0.01	675.03	0.01
7.00	0.11	675.09	0.11
7.50	0.23	675.12	0.23
8.00	0.36	675.15	0.36
8.50	0.56	675.19	0.56
9.00	0.86	675.24	0.86
9.50	1.15	675.27	1.15
10.00	1.57	675.32	1.57
10.50	2.37	675.40	2.37
11.00	3.80	675.51	3.80
11.50	**7.25**	**675.71**	**7.25**
12.00	**133.29**	**680.33**	**133.29**
12.50	12.75	675.95	12.75
13.00	7.62	675.72	7.62
13.50	5.75	675.63	5.75
14.00	4.54	675.57	4.54
14.50	3.95	675.58	3.95
15.00	3.56	675.61	3.56
15.50	3.17	675.66	3.17
16.00	2.78	675.72	2.78
16.50	2.57	675.81	2.57
17.00	2.43	675.91	2.43
17.50	2.29	676.01	2.29
18.00	2.15	676.11	2.15
18.50	2.00	676.21	2.00
19.00	1.86	676.30	1.86
19.50	1.72	676.39	1.72
20.00	1.58	676.47	1.58
20.50	1.51	676.54	1.51
21.00	1.48	676.61	1.48
21.50	1.45	676.68	1.45
22.00	1.42	676.75	1.42
22.50	1.39	676.82	1.39
23.00	1.37	676.88	1.37
23.50	1.34	676.95	1.34
24.00	1.31	677.01	1.31

Summary for Pond IPC-G7: (new Reach)

Inflow Area = 5.398 ac, 0.00% Impervious, Inflow Depth > 3.99" for 100-yr event
Inflow = 36.61 cfs @ 11.97 hrs, Volume= 1.795 af
Outflow = 36.61 cfs @ 11.97 hrs, Volume= 1.795 af, Atten= 0%, Lag= 0.0 min
Primary = 36.61 cfs @ 11.97 hrs, Volume= 1.795 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 677.65' @ 11.97 hrs
Flood Elev= 678.48'

Device	Routing	Invert	Outlet Devices
#1	Primary	674.00'	**30.0" Round Culvert** L= 120.0' Ke= 0.500 Inlet / Outlet Invert= 674.00' / 669.00' S= 0.0417 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf

Primary OutFlow Max=36.59 cfs @ 11.97 hrs HW=677.65' TW=671.33' (Dynamic Tailwater)
1=Culvert (Inlet Controls 36.59 cfs @ 7.45 fps)

Hydrograph for Pond IPC-G7: (new Reach)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	674.00	0.00
0.50	0.00	674.00	0.00
1.00	0.00	674.00	0.00
1.50	0.00	674.00	0.00
2.00	0.00	674.00	0.00
2.50	0.00	674.00	0.00
3.00	0.00	674.00	0.00
3.50	0.00	674.00	0.00
4.00	0.00	674.00	0.00
4.50	0.00	674.00	0.00
5.00	0.00	674.00	0.00
5.50	0.00	674.00	0.00
6.00	0.00	674.00	0.00
6.50	0.00	674.02	0.00
7.00	0.02	674.05	0.02
7.50	0.05	674.08	0.05
8.00	0.09	674.11	0.09
8.50	0.14	674.14	0.14
9.00	0.22	674.18	0.22
9.50	0.30	674.21	0.30
10.00	0.41	674.24	0.41
10.50	0.61	674.30	0.61
11.00	0.99	674.38	0.99
11.50	**1.88**	**674.53**	**1.88**
12.00	**34.26**	**677.35**	**34.26**
12.50	3.42	674.74	3.42
13.00	2.03	674.70	2.03
13.50	1.54	674.78	1.54
14.00	1.21	674.93	1.21
14.50	1.05	675.12	1.05
15.00	0.95	675.30	0.95
15.50	0.85	675.47	0.85
16.00	0.74	675.61	0.74
16.50	0.68	675.75	0.68
17.00	0.64	675.87	0.64
17.50	0.61	675.99	0.61
18.00	0.57	676.10	0.57
18.50	0.53	676.20	0.53
19.00	0.50	676.30	0.50
19.50	0.46	676.38	0.46
20.00	0.42	676.46	0.42
20.50	0.40	676.54	0.40
21.00	0.39	676.61	0.39
21.50	0.38	676.68	0.38
22.00	0.38	676.75	0.38
22.50	0.37	676.82	0.37
23.00	0.36	676.88	0.36
23.50	0.36	676.95	0.36
24.00	0.35	677.01	0.35

ATTACHMENT 2

NORTH AMERICAN GREEN OUTPUT

Tensar International Corporation
5401 St. Wendel-Cynthiana Road
Poseyville, Indiana 47633
Tel. 800.772.2040
Fax 812.867.0247
www.nagreen.com

Erosion Control Materials Design Software
Version 5.0

Project Name: CHLF
Project Number: 87129
Channel Name: Channel 11B - Worst Case

Discharge	117.52
Peak Flow Period	24
Channel Slope	0.0779
Channel Bottom Width	2
Left Side Slope	2
Right Side Slope	2
Low Flow Liner	
Retardance Class	C
Vegtation Type	Mix (Sod & Bunch)
Vegetation Density	Fair 50-75%
Soil Type	Clay Loam

C350 - Class C - Mix (Sod & Bunch) - Fair 50-75%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
C350 Unvegetated	Straight	117.52 cfs	16.42 ft/s	1.46 ft	0.023	3 lbs/ft2	7.08 lbs/ft2	0.42	UNSTABLE	E
C350 Reinforced Vegetation	Straight	117.52 cfs	11.47 ft/s	1.82 ft	0.036	10 lbs/ft2	8.84 lbs/ft2	1.13	STABLE	E
Underlying Substrate	Straight	117.52 cfs	11.47 ft/s	1.82 ft	--	1.2 lbs/ft2	0.642 lbs/ft2	1.87	STABLE	--

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Poseyville, Indiana 47633
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www.nagreen.com

Erosion Control Materials Design Software
Version 5.0

Project Name: CHLF
Project Number: 87129
Channel Name: Channel 11C - Worst Case

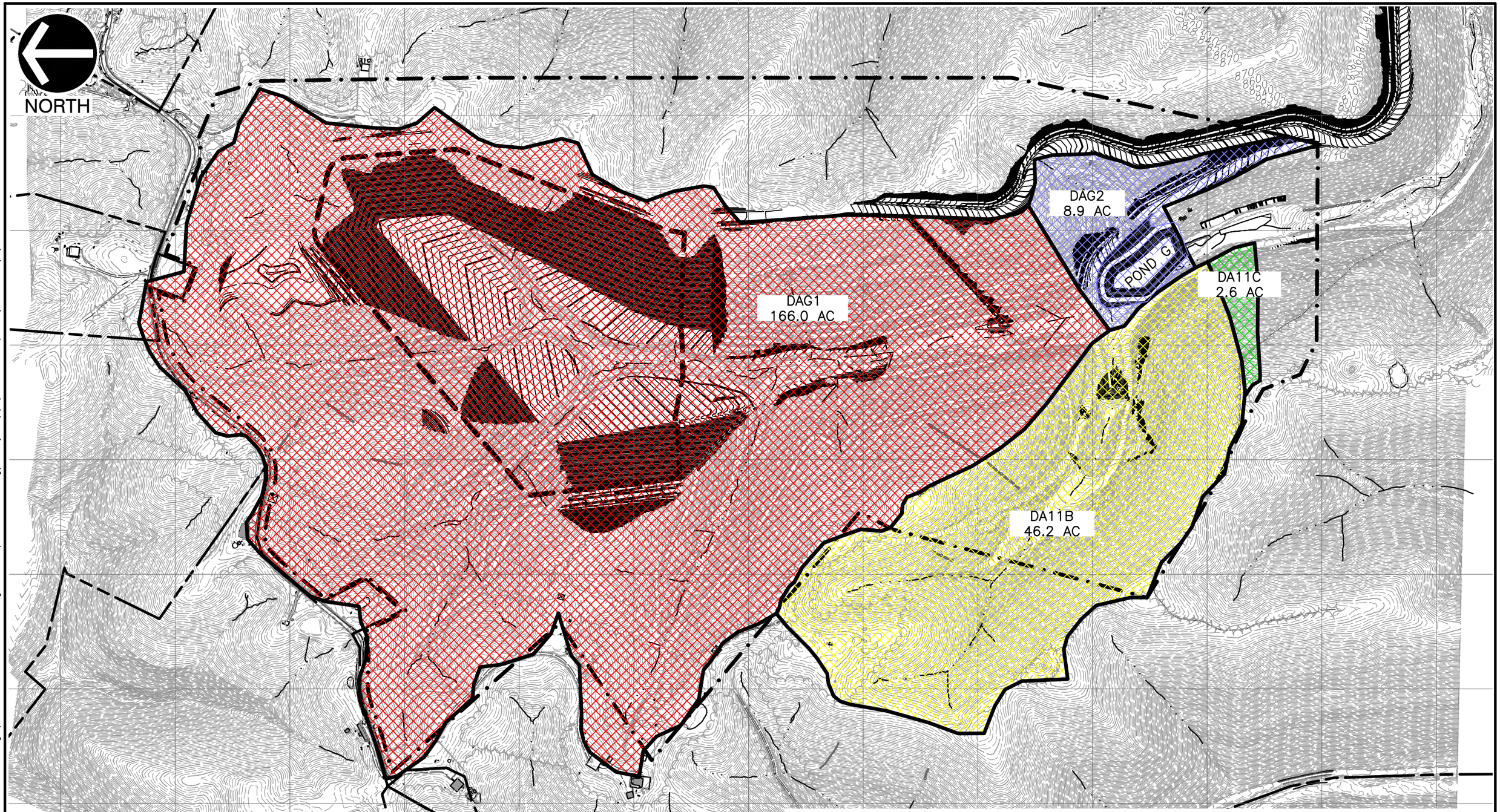
Discharge	256.83
Peak Flow Period	24
Channel Slope	0.0394
Channel Bottom Width	2
Left Side Slope	2
Right Side Slope	2
Low Flow Liner	
Retardance Class	C
Vegtation Type	Mix (Sod & Bunch)
Vegetation Density	Fair 50-75%
Soil Type	Clay Loam

C350 - Class C - Mix (Sod & Bunch) - Fair 50-75%

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
C350 Unvegetated	Straight	256.83 cfs	22.81 ft/s	1.92 ft	0.013	3 lbs/ft2	4.73 lbs/ft2	0.63	UNSTABLE	E
C350 Reinforced Vegetation	Straight	256.83 cfs	11.38 ft/s	2.9 ft	0.034	10 lbs/ft2	7.12 lbs/ft2	1.4	STABLE	E
Underlying Substrate	Straight	256.83 cfs	11.38 ft/s	2.9 ft	--	1.2 lbs/ft2	0.353 lbs/ft2	3.4	STABLE	--

ATTACHMENT 3

DRAINAGE AREA FIGURE



*HAND SIGNATURE ON FILE

SCALE IN FEET

0 400 800

Civil & Environmental Consultants, Inc.
4000 Triangle Lane · Suite 200 · Export, PA 15632
724-327-5200 · 800-899-3610
www.cecinc.com

DAYTON POWER AND LIGHT COMPANY
CARTER HOLLOW LANDFILL
SPRIGG TOWNSHIP
ADAMS COUNTY, OHIO

POND G DRAINAGE AREA MAP
WORST CASE SCENARIO

DRAWN BY:	RBD	CHECKED BY:	JRH	APPROVED BY:	*TDM	FIGURE NO.:	1
DATE:	MAY 2016	DWG SCALE:	1"=400'	PROJECT NO:	144-189		

P:\2014\144-189\-CADD\Dwg\CV02 Permit Drawings\144189-CV02-Pond G Drainage Area Map_Worst Case.dwg(C300A) LS:(6/9/2016 - miapaluccl) - LP: 6/9/2016 2:28 PM

APPENDIX A; SECTION 2

RUN-OFF CONTROL FEATURE SUPPORTING CALCULATIONS

LEACHATE GENERATION CALCULATION

(Taken from the existing PTI Permit Application for the Carter Hollow Landfill)

OBJECTIVE:

Estimation of the leachate and drainage yields during active operations as well as post closure for the Carter Hollow Landfill. This calculation will also demonstrate that the maximum leachate head on the recompacted soil liner (RSL) does not exceed 12 inches in accordance with the Ohio Administrative Code (OAC) 3745-30-07 (C)(3)(b).

METHOD:

The Hydrologic Evaluation of Landfill Performance (HELP) Model Version 3.07 was used to simulate leachate generation. The model utilizes climatologic, soil and design data, and performs a solution technique that accounts for the effects of surface layer storage, runoff, infiltration, percolation, evapotranspiration, soil moisture storage, and lateral drainage to calculate a leachate generation volume. This model is applicable for open, partially closed and fully closed landfills. For the purpose of modeling, discrete one acre units were modeled.

PARAMETERS

Climatological Data:

The HELP Model utilizes historical precipitation data and generates synthetic temperature and solar radiation data for various cities in the United States. The nearest pre-defined climatic data location to the Carter Hollow Landfill is Covington, Kentucky. This data was used to evaluate leachate generation over a period of 100 years. This time frame is only intended for data validation per Ohio EPA's Guidance Document #0528(GD 528). The guidance document is included in Attachment 3. The model was run until flow equilibrium was achieved, which is indicated by a change in water storage of less than 1%.

Soil and Design Data:

To model the leachate flow of the landfill, six profiles were considered and are discussed below.

Profile Open-B and Open-S represent conditions during active waste placement in a cell with bottom slopes of 6.0% (shallowest liner grades) and 40% (steepest liner grades) respectively. A 10-foot thick layer of waste was considered per GD 528 because it reflects a high level of leachate production.

Profile FF10-7, FS10-7, SF10-7, and SS10-7 represent post closure conditions with a waste thickness of 10 feet and the final cover system installed. Each profile represents a different geometry of final capped slope compared to the liner slope below. Figure 1 in Attachment 4 presents the areas modeled by each profile.

It is expected that the Carter Hollow Landfill will accept gypsum, bottom ash, and fly ash for disposal. For modeling purposes, gypsum will be used as the residual waste layer. This is conservative as the gypsum is expected to be the primary waste disposed at the landfill. It is more permeable than fly ash, and less permeable than bottom ash. Although bottom ash is more permeable and would generate larger leachate quantities DP&L produces less of it, is able to use it onsite and can sell it as a beneficial reuse material, therefore bottom ash disposal quantities will remain at low levels, less than 10% of the total disposal volume. Based on the attached laboratory testing, the permeability of the gypsum was determined to be 5.6×10^{-4} cm/sec.

The following tables summarize the landfill profiles for each condition from the top down and present the following data: HELP Model default material texture number, component thickness, and component permeability. The default material texture number classifies each component within the given profile with specific default values for the proposed soil and liner components. A texture number of 0 (zero) was used for the residual waste and the leachate drainage layer and specified as custom in the following tables. This indicates that a standard material was not provided by the HELP model. For modeling purposes, texture numbers for the residual waste and the leachate drainage layer were determined based on the material properties determined from laboratory testing. For the residual waste, the best match was texture number 9 and for the leachate drainage layer texture number 1. From the laboratory testing, permeabilities of the gypsum and the leachate drainage layer for the side slopes were determined and manually entered for their respective layer. The laboratory data is included in Attachment 2.

Open-B– 10 feet of Waste Sloped at 2% with 6% Liner Slope

	Layer	HELP Texture No.	Thickness	Permeability (cm/sec)
Layer 1	Residual Waste	Custom	10 feet	5.6E-04
Layer 2	Leachate Drainage Layer	Custom	12 inches	4.0E-02
Layer 3	Recompacted Soil Liner	16	36 inches	1.0E-07

Open-S–10 feet of Waste Sloped at 2% with 40% Liner Slope

	Layer	HELP Texture No.	Thickness	Permeability (cm/sec)
Layer 1	Residual Waste	Custom	10 feet	5.6E-04
Layer 2	Leachate Drainage Layer	Custom	12 inches	2.3E-02
Layer 3	Recompacted Soil Liner	16	36 inches	1.0E-07

FF10-7 – Capped Condition (2% Slope), 10 feet Waste with 6% Liner Slope

	Layer	HELP Texture No.	Thickness	Permeability (cm/sec)
Layer 1	Protective Layer	10	6 inches	1.2E-04
Layer 2	Frost Protection	22	18 inches	1.9E-05
Layer 3	Recompacted Soil Barrier	16	24 inches	1.0E-07
Layer 4	Residual Waste	Custom	10 feet	5.6E-04
Layer 5	Leachate Drainage Layer	Custom	12 inches	4.0E-02
Layer 6	Recompacted Soil Liner	16	36 inches	1.0E-07

FS10-7 – Capped Condition (2% Slope), 10 feet Waste with 40% Liner Slope

	Layer	HELP Texture No.	Thickness	Permeability (cm/sec)
Layer 1	Protective Layer	10	6 inches	1.2E-04
Layer 2	Frost Protection	22	18 inches	1.9E-05
Layer 3	Recompacted Soil Barrier	16	24 inches	1.0E-07
Layer 4	Residual Waste	Custom	10 feet	5.6E-04
Layer 5	Leachate Drainage Layer	Custom	12 inches	2.3E-02
Layer 6	Recompacted Soil Liner	16	36 inches	1.0E-07

SF10-7 – Capped Condition (25% Slope), 10 feet Waste with 6% Liner Slope

	Layer	HELP Texture No.	Thickness	Permeability (cm/sec)
Layer 1	Protective Layer	10	6 inches	1.2E-04
Layer 2	Frost Protection	22	18 inches	1.9E-05
Layer 3	Recompacted Soil Barrier	16	24 inches	1.0E-07
Layer 4	Residual Waste	Custom	10 feet	5.6E-04
Layer 5	Leachate Drainage Layer	Custom	12 inches	4.0E-02
Layer 6	Recompacted Soil Liner	16	36 inches	1.0E-07

SS10-7 – Capped Condition (25% Slope), 10 feet Waste with 40% Liner Slope

	Layer	HELP Texture No.	Thickness	Permeability (cm/sec)
Layer 1	Protective Layer	10	6 inches	1.2E-04
Layer 2	Frost Protection	22	18 inches	1.9E-05
Layer 3	Recompacted Soil Barrier	16	24 inches	1.0E-07
Layer 4	Residual Waste	Custom	10 feet	5.6E-04
Layer 5	Leachate Drainage Layer	Custom	12 inches	2.3E-02
Layer 6	Recompacted Soil Liner	16	36 inches	1.0E-07

ASSUMPTIONS:

1. Geotextiles were omitted from HELP Model runs as their relative thickness and high permeability will not affect leachate generation results.
2. The leachate drainage layer conforms to OAC 3745-30-07 (C)(3)(b) by having a minimum thickness of 12-inches and a minimum permeability of $1x10^{-3}$ cm/sec.
3. The longest drainage length on the liner bottom and side slopes is 525-feet.
4. The recompacted soil barrier layer within the cap system conforms to OAC 3745-30-07.
5. In all profiles the HELP Model automatically calculated the CN number.

CALCULATIONS:

Six analyses were performed incorporating the design parameters described above. The calculated leachate generation estimates were performed for a landfill area of 1-acre. The calculated leachate generation estimates will be used in other calculations to design components within the leachate management system. The average annual flow rate is used as a design basis for the leachate collection system. The peak daily head value is used to determine compliance with OAC 3745-30-07 (C)(3)(b). The HELP Model outputs are included in Attachment 1.

The following table summarizes the results of the analyses:

Profile	Waste Depth (ft)	Leachate Collection Material Permeability (cm/sec)	Leachate Collection Material Thickness (in)	Bottom Slope (%)	Floor Flow Length/ Pipe Spacing (ft)	Max. Head (in)	Peak Daily Leachate Collected (cu.ft.)	Average Annual Flow (in/yr)	Annual Peak Volume (gal/ac/d)
Open–B	10	$4.0x10^{-2}$	12	6	525	9.403	475.54269	6.52109	2,900
Open-S	10	$2.3x10^{-2}$	12	40	525	3.639	569.72284	6.74013	3,000
FF10-7	10	$4.0x10^{-2}$	12	6	525	0.254	12.12215	0.42437	190
FS10-7	10	$2.3\ x10^{-2}$	12	40	525	0.068	12.32993	0.42600	190
SF10-7	10	$4.0\ x10^{-2}$	12	6	525	0.255	12.08298	0.41299	190
SS10-7	10	$2.3x10^{-2}$	12	40	525	0.068	12.32904	0.41458	190

The annual peak volume of leachate collected is determined by multiplying the average annual flow by a factor of six as described in GD 528.

$$6 \times \frac{6.52109\,\text{in}}{\text{yr}} \times \frac{1\,\text{yr}}{365\,\text{days}} \times \frac{43{,}560\,\text{ft}^2}{\text{acre}} \times \frac{1\,\text{ft}}{12\,\text{inch}} \times \frac{7.48\,\text{gal}}{\text{ft}^3} \approx \textbf{2,900 gal/ac/day}$$

CONCLUSIONS:

The post-closure scenarios indicate that a final cover system will minimize infiltration and substantially reduce leachate generation.

The leachate drainage layer must have permeabilities on the side slopes of a minimum of $2.3x10^{-2}$ cm/sec and on the flatter areas of a minimum of $4.0x10^{-2}$ cm/sec.

The maximum head on the liner does not exceed 12-inches as required by OAC 3745-30-07(C)(3)(b).

The values in the above table will be utilized to design the leachate collection management system.

Attachment 1

Help Model Output Files

HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
HELP MODEL VERSION 3.07 (1 NOVEMBER 1997)
DEVELOPED BY ENVIRONMENTAL LABORATORY
USAE WATERWAYS EXPERIMENT STATION
FOR USEPA RISK REDUCTION ENGINEERING LABORATORY

PRECIPITATION DATA FILE: C:\071-644\help\PRECIP-O.D4
TEMPERATURE DATA FILE: C:\071-644\HELP\TEMP-O.D7
SOLAR RADIATION DATA FILE: C:\071-644\HELP\SOLRAD-O.D13
EVAPOTRANSPIRATION DATA: C:\071-644\HELP\EVAPO-O.D11
SOIL AND DESIGN DATA FILE: C:\071-644\HELP\OPEN-B.D10
OUTPUT DATA FILE: C:\071-644\HELP\OPEN-B.OUT

TIME: 13:46 DATE: 3/ 3/2010

TITLE: Carter Hollow Landfill (Active Filling over Shallow Liner)

NOTE: INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.

LAYER 1

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	120.00	INCHES
POROSITY	=	0.5010	VOL/VOL
FIELD CAPACITY	=	0.2840	VOL/VOL
WILTING POINT	=	0.1350	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3032	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.5600000150000E-03	CM/SEC

LAYER 2

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4170	VOL/VOL
FIELD CAPACITY	=	0.0450	VOL/VOL
WILTING POINT	=	0.0180	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1167	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.3999999991000E-01	CM/SEC
SLOPE	=	6.00	PERCENT
DRAINAGE LENGTH	=	525.0	FEET

LAYER 3

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.1000000010000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 9 WITH BARE GROUND CONDITIONS, A SURFACE SLOPE OF 2.% AND A SLOPE LENGTH OF 450. FEET.

SCS RUNOFF CURVE NUMBER	=	91.50	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	9.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	1.975	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	4.509	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.215	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	53.156	INCHES
TOTAL INITIAL WATER	=	53.156	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM COVINGTON KENTUCKY

STATION LATITUDE	=	38.60	DEGREES
MAXIMUM LEAF AREA INDEX	=	0.00	
START OF GROWING SEASON (JULIAN DATE)	=	105	
END OF GROWING SEASON (JULIAN DATE)	=	299	
EVAPORATIVE ZONE DEPTH	=	9.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	9.10	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	70.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	67.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	73.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	72.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR COVINGTON KENTUCKY

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
3.13	2.73	3.95	3.58	3.84	4.09
4.28	2.97	2.91	2.54	3.12	3.00

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR COVINGTON KENTUCKY

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
29.20	31.60	42.00	53.00	64.00	73.00
76.00	75.00	68.00	57.00	45.00	35.00

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR COVINGTON KENTUCKY AND STATION LATITUDE = 38.60 DEGREES

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 100

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.42	2.87	3.77	3.69	3.83	4.10
	4.42	2.86	2.79	2.35	3.22	2.94
STD. DEVIATIONS	1.59	1.34	1.48	1.54	1.84	2.18
	1.91	1.59	1.78	1.10	1.36	1.21
RUNOFF						
TOTALS	1.151	1.958	1.576	0.275	0.280	0.569
	0.540	0.312	0.317	0.186	0.258	0.278
STD. DEVIATIONS	1.337	1.447	1.859	0.316	0.341	0.654
	0.573	0.362	0.415	0.242	0.331	0.557
EVAPOTRANSPIRATION						
TOTALS	0.663	0.570	2.033	3.230	3.292	3.078
	3.456	2.472	1.954	1.766	1.455	1.039
STD. DEVIATIONS	0.282	0.330	0.662	0.868	1.268	1.268
	1.256	1.244	0.985	0.660	0.366	0.272
LATERAL DRAINAGE COLLECTED FROM LAYER 2						
TOTALS	0.9546	0.8027	0.5981	1.0344	0.8482	0.3971
	0.2980	0.3423	0.2390	0.2385	0.2373	0.5310
STD. DEVIATIONS	0.6274	0.6647	0.5269	0.4617	0.6366	0.4566
	0.3490	0.3952	0.3000	0.3500	0.3006	0.4131
PERCOLATION/LEAKAGE THROUGH LAYER 3						
TOTALS	0.1005	0.0834	0.0918	0.1054	0.1054	0.0824
	0.0833	0.0790	0.0697	0.0668	0.0758	0.0984
STD. DEVIATIONS	0.0281	0.0329	0.0275	0.0032	0.0113	0.0315
	0.0335	0.0383	0.0376	0.0411	0.0351	0.0240

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 3						
AVERAGES	1.1924	1.1006	0.7471	1.3352	1.0596	0.5126
	0.3723	0.4275	0.3085	0.2980	0.3063	0.6633
STD. DEVIATIONS	0.7837	0.9158	0.6582	0.5960	0.7952	0.5894
	0.4360	0.4936	0.3873	0.4372	0.3880	0.5161

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 100

	INCHES		CU. FEET	PERCENT
PRECIPITATION	40.25	(5.550)	146111.1	100.00
RUNOFF	7.701	(3.0077)	27953.96	19.132
EVAPOTRANSPIRATION	25.008	(3.3309)	90778.94	62.130
LATERAL DRAINAGE COLLECTED FROM LAYER 2	6.52109	(2.45679)	23671.568	16.20107
PERCOLATION/LEAKAGE THROUGH LAYER 3	1.04219	(0.14520)	3783.140	2.58922
AVERAGE HEAD ON TOP OF LAYER 3	0.694	(0.263)		
CHANGE IN WATER STORAGE	-0.021	(1.8553)	-76.44	-0.052

PEAK DAILY VALUES FOR YEARS 1 THROUGH 100

	(INCHES)	(CU. FT.)
PRECIPITATION	3.84	13939.199
RUNOFF	4.186	15195.7178
DRAINAGE COLLECTED FROM LAYER 2	0.13100	475.54269
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.003881	14.08751
AVERAGE HEAD ON TOP OF LAYER 3	5.073	
MAXIMUM HEAD ON TOP OF LAYER 3	9.403	
LOCATION OF MAXIMUM HEAD IN LAYER 2 (DISTANCE FROM DRAIN)	36.7 FEET	
SNOW WATER	7.77	28219.2871

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.4624

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.1350

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

FINAL WATER STORAGE AT END OF YEAR 100

LAYER	(INCHES)	(VOL/VOL)
1	35.0801	0.2923
2	0.5984	0.0499
3	15.3720	0.4270
SNOW WATER	0.000	

HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
HELP MODEL VERSION 3.07 (1 NOVEMBER 1997)
DEVELOPED BY ENVIRONMENTAL LABORATORY
USAE WATERWAYS EXPERIMENT STATION
FOR USEPA RISK REDUCTION ENGINEERING LABORATORY

PRECIPITATION DATA FILE: C:\071-644\help\PRECIP-O.D4
TEMPERATURE DATA FILE: C:\071-644\HELP\TEMP-O.D7
SOLAR RADIATION DATA FILE: C:\071-644\HELP\SOLRAD-O.D13
EVAPOTRANSPIRATION DATA: C:\071-644\HELP\EVAPO-O.D11
SOIL AND DESIGN DATA FILE: C:\071-644\HELP\OPEN-S.D10
OUTPUT DATA FILE: C:\071-644\HELP\OPEN-S.OUT

TIME: 13:45 DATE: 3/ 3/2010

TITLE: Carter Hollow Landfill (Active Filling over Liner Side Slope

NOTE: INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.

LAYER 1

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	120.00	INCHES
POROSITY	=	0.5010	VOL/VOL
FIELD CAPACITY	=	0.2840	VOL/VOL
WILTING POINT	=	0.1350	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3032	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.5600000150000E-03	CM/SEC

LAYER 2

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4170	VOL/VOL
FIELD CAPACITY	=	0.0450	VOL/VOL
WILTING POINT	=	0.0180	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0825	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.2300000000000E-01	CM/SEC
SLOPE	=	40.00	PERCENT
DRAINAGE LENGTH	=	525.0	FEET

LAYER 3

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.1000000010000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 9 WITH BARE GROUND CONDITIONS, A SURFACE SLOPE OF 2.% AND A SLOPE LENGTH OF 450. FEET.

SCS RUNOFF CURVE NUMBER	=	91.50	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	9.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	1.875	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	4.509	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.215	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	52.746	INCHES
TOTAL INITIAL WATER	=	52.746	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM COVINGTON KENTUCKY

STATION LATITUDE	=	38.60	DEGREES
MAXIMUM LEAF AREA INDEX	=	0.00	
START OF GROWING SEASON (JULIAN DATE)	=	105	
END OF GROWING SEASON (JULIAN DATE)	=	299	
EVAPORATIVE ZONE DEPTH	=	9.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	9.10	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	70.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	67.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	73.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	72.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR COVINGTON KENTUCKY

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
3.13	2.73	3.95	3.58	3.84	4.09
4.28	2.97	2.91	2.54	3.12	3.00

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR COVINGTON KENTUCKY

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
29.20	31.60	42.00	53.00	64.00	73.00
76.00	75.00	68.00	57.00	45.00	35.00

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR COVINGTON KENTUCKY AND STATION LATITUDE = 38.60 DEGREES

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 100

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.42	2.87	3.77	3.69	3.83	4.10
	4.42	2.86	2.79	2.35	3.22	2.94
STD. DEVIATIONS	1.59	1.34	1.48	1.54	1.84	2.18
	1.91	1.59	1.78	1.10	1.36	1.21
RUNOFF						
TOTALS	1.151	1.958	1.578	0.275	0.280	0.569
	0.540	0.312	0.317	0.186	0.258	0.278
STD. DEVIATIONS	1.337	1.447	1.859	0.316	0.341	0.654
	0.573	0.362	0.415	0.242	0.331	0.557
EVAPOTRANSPIRATION						
TOTALS	0.663	0.570	2.033	3.230	3.292	3.078
	3.456	2.472	1.954	1.766	1.455	1.039
STD. DEVIATIONS	0.282	0.330	0.662	0.868	1.268	1.268
	1.256	1.244	0.985	0.660	0.366	0.272
LATERAL DRAINAGE COLLECTED FROM LAYER 2						
TOTALS	1.0561	0.7257	0.5998	1.2036	0.6960	0.3337
	0.3205	0.3603	0.2302	0.2695	0.2550	0.6897
STD. DEVIATIONS	0.7316	0.7091	0.5121	0.5786	0.6909	0.4321
	0.3990	0.4129	0.3367	0.4100	0.3155	0.5139
PERCOLATION/LEAKAGE THROUGH LAYER 3						
TOTALS	0.0894	0.0619	0.0752	0.0979	0.0738	0.0533
	0.0606	0.0608	0.0466	0.0475	0.0598	0.0928
STD. DEVIATIONS	0.0337	0.0394	0.0344	0.0135	0.0330	0.0381
	0.0332	0.0394	0.0371	0.0385	0.0352	0.0269

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 3						
AVERAGES	0.3978	0.3000	0.2259	0.4685	0.2621	0.1299
	0.1207	0.1357	0.0896	0.1015	0.0993	0.2598
STD. DEVIATIONS	0.2756	0.2942	0.1929	0.2252	0.2602	0.1682
	0.1503	0.1555	0.1310	0.1544	0.1228	0.1936

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 100

	INCHES		CU. FEET	PERCENT
PRECIPITATION	40.25	(5.550)	146111.1	100.00
RUNOFF	7.701	(3.0077)	27953.96	19.132
EVAPOTRANSPIRATION	25.008	(3.3309)	90778.94	62.130
LATERAL DRAINAGE COLLECTED FROM LAYER 2	6.74013	(2.44196)	24466.658	16.74524
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.81963	(0.14714)	2975.272	2.03631
AVERAGE HEAD ON TOP OF LAYER 3	0.216	(0.079)		
CHANGE IN WATER STORAGE	-0.018	(1.7328)	-63.66	-0.044

PEAK DAILY VALUES FOR YEARS 1 THROUGH 100

	(INCHES)	(CU. FT.)
PRECIPITATION	3.84	13939.199
RUNOFF	4.186	15195.7178
DRAINAGE COLLECTED FROM LAYER 2	0.15695	569.72284
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.003575	12.97607
AVERAGE HEAD ON TOP OF LAYER 3	1.833	
MAXIMUM HEAD ON TOP OF LAYER 3	3.639	
LOCATION OF MAXIMUM HEAD IN LAYER 2 (DISTANCE FROM DRAIN)	0.0 FEET	
SNOW WATER	7.77	28219.2871

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.4624

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.1350

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

FINAL WATER STORAGE AT END OF YEAR 100

LAYER	(INCHES)	(VOL/VOL)
1	35.0801	0.2923
2	0.5400	0.0450
3	15.3720	0.4270
SNOW WATER	0.000	

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**********************************************************************
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**                                                                  **
**                                                                  **
**          HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE           **
**               HELP MODEL VERSION 3.07 (1 NOVEMBER 1997)          **
**                DEVELOPED BY ENVIRONMENTAL LABORATORY             **
**                USAE WATERWAYS EXPERIMENT STATION                 **
**          FOR USEPA RISK REDUCTION ENGINEERING LABORATORY         **
**                                                                  **
**                                                                  **
**********************************************************************
**********************************************************************

PRECIPITATION DATA FILE:     C:\071-644\holp\PRECIP-C.D4
TEMPERATURE DATA FILE:       C:\071-644\HELP\TEMP-C.D7
SOLAR RADIATION DATA FILE:   C:\071-644\HELP\SOLRAD-C.D13
EVAPOTRANSPIRATION DATA:     C:\071-644\HELP\EVAPO-C.D11
SOIL AND DESIGN DATA FILE:   C:\071-644\HELP\FF10-7.D10
OUTPUT DATA FILE:            C:\071-644\HELP\FF10-7.OUT

TIME:  15:43     DATE:  3/ 3/2010

**********************************************************************

TITLE:  Carter Hollow Landfill (Shallow Cap over Shallow Liner)

**********************************************************************

NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
       COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.

                          LAYER  1
                          --------

          TYPE 1 - VERTICAL PERCOLATION LAYER
               MATERIAL TEXTURE NUMBER  10
THICKNESS                     =      6.00   INCHES
POROSITY                      =    0.3980 VOL/VOL
FIELD CAPACITY                =    0.2440 VOL/VOL
WILTING POINT                 =    0.1360 VOL/VOL
INITIAL SOIL WATER CONTENT    =    0.3165 VOL/VOL
EFFECTIVE SAT. HYD. COND.     =  0.1199999997000E-03 CM/SEC
NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  3.00
       FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.

                          LAYER  2
                          --------

          TYPE 1 - VERTICAL PERCOLATION LAYER
               MATERIAL TEXTURE NUMBER  22
THICKNESS                     =     18.00   INCHES
POROSITY                      =    0.4190 VOL/VOL
FIELD CAPACITY                =    0.3070 VOL/VOL
WILTING POINT                 =    0.1800 VOL/VOL
INITIAL SOIL WATER CONTENT    =    0.4182 VOL/VOL
EFFECTIVE SAT. HYD. COND.     =  0.189999992000E-04 CM/SEC

                          LAYER  3
                          --------

          TYPE 3 - BARRIER SOIL LINER
               MATERIAL TEXTURE NUMBER  0
THICKNESS                     =     24.00   INCHES
POROSITY                      =    0.4270 VOL/VOL
FIELD CAPACITY                =    0.4180 VOL/VOL
WILTING POINT                 =    0.3670 VOL/VOL
INITIAL SOIL WATER CONTENT    =    0.4270 VOL/VOL
EFFECTIVE SAT. HYD. COND.     =  0.100000001000E-06 CM/SEC

                          LAYER  4
                          --------

          TYPE 1 - VERTICAL PERCOLATION LAYER
               MATERIAL TEXTURE NUMBER  0
THICKNESS                     =    120.00   INCHES
POROSITY                      =    0.5010 VOL/VOL
FIELD CAPACITY                =    0.2840 VOL/VOL
WILTING POINT                 =    0.1350 VOL/VOL
INITIAL SOIL WATER CONTENT    =    0.2840 VOL/VOL
EFFECTIVE SAT. HYD. COND.     =  0.560000015000E-03 CM/SEC

                          LAYER  5
                          --------

          TYPE 2 - LATERAL DRAINAGE LAYER
               MATERIAL TEXTURE NUMBER  0
THICKNESS                     =     12.00   INCHES
POROSITY                      =    0.4170 VOL/VOL
FIELD CAPACITY                =    0.0450 VOL/VOL
WILTING POINT                 =    0.0180 VOL/VOL
INITIAL SOIL WATER CONTENT    =    0.0485 VOL/VOL
EFFECTIVE SAT. HYD. COND.     =  0.399999991000E-01 CM/SEC
SLOPE                         =     6.00   PERCENT
DRAINAGE LENGTH               =    525.0   FEET

                          LAYER  6
                          --------

          TYPE 3 - BARRIER SOIL LINER
               MATERIAL TEXTURE NUMBER  16
THICKNESS                     =     36.00   INCHES
POROSITY                      =    0.4270 VOL/VOL
FIELD CAPACITY                =    0.4180 VOL/VOL
WILTING POINT                 =    0.3670 VOL/VOL
INITIAL SOIL WATER CONTENT    =    0.4270 VOL/VOL
EFFECTIVE SAT. HYD. COND.     =  0.100000001000E-06 CM/SEC

                GENERAL DESIGN AND EVAPORATIVE ZONE DATA
                ----------------------------------------

NOTE:  SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
       SOIL DATA BASE USING SOIL TEXTURE #10 WITH A
       FAIR STAND OF GRASS, A SURFACE SLOPE OF  2.%
       AND A SLOPE LENGTH OF  450. FEET.

SCS RUNOFF CURVE NUMBER             =   85.40
FRACTION OF AREA ALLOWING RUNOFF    =  100.0    PERCENT
AREA PROJECTED ON HORIZONTAL PLANE  =    1.000  ACRES
EVAPORATIVE ZONE DEPTH              =   21.0    INCHES
INITIAL WATER IN EVAPORATIVE ZONE   =    8.169  INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE  =    8.673  INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE  =    3.516  INCHES
INITIAL SNOW WATER                  =    0.000  INCHES
INITIAL WATER IN LAYER MATERIALS    =   69.708  INCHES
TOTAL INITIAL WATER                 =   69.708  INCHES
TOTAL SUBSURFACE INFLOW             =    0.00   INCHES/YEAR

                EVAPOTRANSPIRATION AND WEATHER DATA
                -----------------------------------

NOTE:  EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
       COVINGTON              KENTUCKY

STATION LATITUDE                    =  38.60 DEGREES
MAXIMUM LEAF AREA INDEX             =   2.00
START OF GROWING SEASON (JULIAN DATE) =  105
END OF GROWING SEASON (JULIAN DATE) =   299
EVAPORATIVE ZONE DEPTH              =  21.0  INCHES
AVERAGE ANNUAL WIND SPEED           =   9.10 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY =  70.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY =  67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY =  73.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY =  72.00 %

NOTE:  PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
       COEFFICIENTS FOR    COVINGTON              KENTUCKY

       NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

 JAN/JUL    FEB/AUG    MAR/SEP    APR/OCT    MAY/NOV    JUN/DEC
 -------    -------    -------    -------    -------    -------
  3.13       2.73       3.95       3.58       3.84       4.09
  4.28       2.97       2.91       2.54       3.12       3.00

NOTE:  TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
       COEFFICIENTS FOR    COVINGTON              KENTUCKY

       NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

 JAN/JUL    FEB/AUG    MAR/SEP    APR/OCT    MAY/NOV    JUN/DEC
 -------    -------    -------    -------    -------    -------
 29.20      31.60      42.00      53.00      64.00      73.00
 76.00      75.00      68.00      57.00      45.00      35.00

NOTE:  SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
       COEFFICIENTS FOR    COVINGTON              KENTUCKY
       AND STATION LATITUDE =  38.60 DEGREES

**********************************************************************

        AVERAGE MONTHLY VALUES IN INCHES FOR YEARS    1 THROUGH  100
----------------------------------------------------------------------

                          JAN/JUL    FEB/AUG    MAR/SEP    APR/OCT    MAY/NOV    JUN/DEC
                          -------    -------    -------    -------    -------    -------
PRECIPITATION
-------------
  TOTALS                    3.42       2.87       3.77       3.69       3.83       4.10
                            4.42       2.86       2.79       2.35       3.22       2.94

  STD. DEVIATIONS           1.59       1.34       1.48       1.54       1.84       2.18
                            1.91       1.59       1.78       1.10       1.36       1.21

RUNOFF
------
  TOTALS                    1.808      2.481      2.429      0.636      0.321      0.324
                            0.211      0.083      0.101      0.070      0.305      0.736

  STD. DEVIATIONS           1.536      1.561      2.057      0.940      0.597      0.651
                            0.414      0.154      0.196      0.174      0.670      0.983

EVAPOTRANSPIRATION
------------------
  TOTALS                    0.628      0.563      1.912      3.472      3.960      5.396
                            4.808      3.249      1.962      1.307      1.119      0.844

  STD. DEVIATIONS           0.225      0.287      0.605      0.680      1.218      0.843
                            1.465      1.542      0.954      0.375      0.211      0.195

PERCOLATION/LEAKAGE THROUGH LAYER  3
-------------------------------------
  TOTALS                    0.1395     0.1127     0.1661     0.1770     0.1699     0.1446
                            0.1236     0.1169     0.1047     0.0561     0.0760     0.1498

  STD. DEVIATIONS           0.0465     0.0306     0.0324     0.0117     0.0113     0.0124
                            0.0148     0.0064     0.0127     0.0542     0.0641     0.0581

LATERAL DRAINAGE COLLECTED FROM LAYER  5
-----------------------------------------
```

TOTALS	0.0501	0.0257	0.0435	0.0713	0.0693	0.0523
	0.0284	0.0138	0.0072	0.0061	0.0135	0.0432
STD. DEVIATIONS	0.0301	0.0205	0.0243	0.0128	0.0101	0.0099
	0.0233	0.0093	0.0059	0.0132	0.0212	0.0310

PERCOLATION/LEAKAGE THROUGH LAYER 6

TOTALS	0.0989	0.0921	0.1035	0.1022	0.1057	0.1022
	0.1056	0.1055	0.0993	0.0493	0.0539	0.0926
STD. DEVIATIONS	0.0245	0.0177	0.0123	0.0006	0.0000	0.0000
	0.0000	0.0001	0.0076	0.0428	0.0405	0.0293

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 3

AVERAGES	9.2933	5.1600	14.2782	17.6440	14.6610	10.0019
	4.1271	2.1496	1.3243	1.6530	5.1580	13.0073
STD. DEVIATIONS	7.3041	5.6885	5.9906	2.7379	2.5820	2.9182
	3.3191	1.4656	2.0010	3.9874	6.6666	7.9433

DAILY AVERAGE HEAD ON TOP OF LAYER 6

AVERAGES	0.0626	0.0352	0.0544	0.0920	0.0866	0.0675
	0.0355	0.0173	0.0092	0.0076	0.0174	0.0539
STD. DEVIATIONS	0.0376	0.0280	0.0304	0.0166	0.0127	0.0127
	0.0166	0.0116	0.0076	0.0164	0.0274	0.0387

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 100

	INCHES		CU. FEET	PERCENT
PRECIPITATION	40.25	(5.550)	146111.1	100.00
RUNOFF	9.507	(3.5880)	34510.62	23.619
EVAPOTRANSPIRATION	29.219	(3.4550)	106064.78	72.592
PERCOLATION/LEAKAGE THROUGH LAYER 3	1.53484	(0.19079)	5571.454	3.81316
AVERAGE HEAD ON TOP OF LAYER 3	8.205	(2.131)		
LATERAL DRAINAGE COLLECTED FROM LAYER 5	0.42437	(0.10808)	1540.477	1.05432
PERCOLATION/LEAKAGE THROUGH LAYER 6	1.11085	(0.09943)	4032.392	2.75981
AVERAGE HEAD ON TOP OF LAYER 6	0.045	(0.011)		
CHANGE IN WATER STORAGE	-0.010	(1.5909)	-37.13	-0.025

PEAK DAILY VALUES FOR YEARS 1 THROUGH 100

	(INCHES)	(CU. FT.)
PRECIPITATION	3.84	13939.199
RUNOFF	4.263	15476.4990
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.006803	24.69493
AVERAGE HEAD ON TOP OF LAYER 3	24.000	
DRAINAGE COLLECTED FROM LAYER 5	0.00334	12.12215
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.003414	12.39187
AVERAGE HEAD ON TOP OF LAYER 6	0.129	
MAXIMUM HEAD ON TOP OF LAYER 6	0.254	
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	8.3 FEET	
SNOW WATER	7.77	28219.2871

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.4130

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.1674

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

FINAL WATER STORAGE AT END OF YEAR 100

LAYER	(INCHES)	(VOL/VOL)
1	1.4225	0.2371
2	7.0196	0.3900
3	10.2480	0.4270
4	34.0800	0.2840
5	0.5432	0.0453
6	15.3720	0.4270
SNOW WATER	0.000	

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**                                                                  **
**        HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE             **
**           HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)             **
**           DEVELOPED BY ENVIRONMENTAL LABORATORY                  **
**           USAE WATERWAYS EXPERIMENT STATION                      **
**        FOR USEPA RISK REDUCTION ENGINEERING LABORATORY           **
**                                                                  **
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PRECIPITATION DATA FILE: C:\071-644\help\PRECIP-C.D4
TEMPERATURE DATA FILE: C:\071-644\HELP\TEMP-C.D7
SOLAR RADIATION DATA FILE: C:\071-644\HELP\SOLRAD-C.D13
EVAPOTRANSPIRATION DATA: C:\071-644\HELP\EVAPO-C.D11
SOIL AND DESIGN DATA FILE: C:\071-644\HELP\FS10-7.D10
OUTPUT DATA FILE: C:\071-644\HELP\FS10-7.OUT

TIME: 15:42 DATE: 3/ 3/2010

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TITLE: Carter Hollow Landfill (Shallow Cap over Liner Side Slope)

****

NOTE: INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.

LAYER 1

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 10

THICKNESS	=	6.00	INCHES
POROSITY	=	0.3980	VOL/VOL
FIELD CAPACITY	=	0.2440	VOL/VOL
WILTING POINT	=	0.1360	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3165	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.119999997000E-03	CM/SEC

NOTE: SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 3.00 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 22

THICKNESS	=	18.00	INCHES
POROSITY	=	0.4190	VOL/VOL
FIELD CAPACITY	=	0.3070	VOL/VOL
WILTING POINT	=	0.1800	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4182	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.189999992000E-04	CM/SEC

LAYER 3

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	24.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	120.00	INCHES
POROSITY	=	0.5010	VOL/VOL
FIELD CAPACITY	=	0.2840	VOL/VOL
WILTING POINT	=	0.1350	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2840	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.560000015000E-03	CM/SEC

LAYER 5

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4170	VOL/VOL
FIELD CAPACITY	=	0.0450	VOL/VOL
WILTING POINT	=	0.0180	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0461	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.230000000000E-01	CM/SEC
SLOPE	=	40.00	PERCENT
DRAINAGE LENGTH	=	525.0	FEET

LAYER 6

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE #10 WITH A FAIR STAND OF GRASS, A SURFACE SLOPE OF 2.% AND A SLOPE LENGTH OF 450. FEET.

SCS RUNOFF CURVE NUMBER	=	85.40	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	21.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	8.169	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	8.673	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	3.516	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	69.679	INCHES
TOTAL INITIAL WATER	=	69.679	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM COVINGTON KENTUCKY

STATION LATITUDE	=	38.60	DEGREES
MAXIMUM LEAF AREA INDEX	=	2.00	
START OF GROWING SEASON (JULIAN DATE)	=	105	
END OF GROWING SEASON (JULIAN DATE)	=	299	
EVAPORATIVE ZONE DEPTH	=	21.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	9.10	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	70.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	67.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	73.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	72.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR COVINGTON KENTUCKY

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
3.13	2.73	3.95	3.58	3.84	4.09
4.28	2.97	2.91	2.54	3.12	3.00

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR COVINGTON KENTUCKY

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
29.20	31.60	42.00	53.00	64.00	73.00
76.00	75.00	68.00	57.00	45.00	35.00

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR COVINGTON KENTUCKY AND STATION LATITUDE = 38.60 DEGREES

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 100

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.42	2.87	3.77	3.69	3.83	4.10
	4.42	2.86	2.79	2.35	3.22	2.94
STD. DEVIATIONS	1.59	1.34	1.48	1.54	1.86	2.18
	1.91	1.59	1.78	1.10	1.36	1.21
RUNOFF						
TOTALS	1.808	2.481	2.429	0.636	0.321	0.324
	0.211	0.083	0.101	0.070	0.305	0.736
STD. DEVIATIONS	1.536	1.561	2.057	0.940	0.597	0.651
	0.414	0.154	0.196	0.174	0.670	0.983
EVAPOTRANSPIRATION						
TOTALS	0.628	0.563	1.912	3.472	3.960	5.396
	4.808	3.249	1.962	1.307	1.119	0.844
STD. DEVIATIONS	0.225	0.287	0.605	0.680	1.218	0.843
	1.465	1.542	0.954	0.375	0.211	0.195
PERCOLATION/LEAKAGE THROUGH LAYER 3						
TOTALS	0.1395	0.1127	0.1661	0.1770	0.1699	0.1446
	0.1236	0.1149	0.1047	0.0561	0.0760	0.1498
STD. DEVIATIONS	0.0465	0.0306	0.0324	0.0117	0.0113	0.0124
	0.0146	0.0064	0.0127	0.0542	0.0641	0.0581
LATERAL DRAINAGE COLLECTED FROM LAYER 5						

TOTALS	0.0457	0.0208	0.0552	0.0759	0.0664	0.0462
	0.0205	0.0105	0.0059	0.0068	0.0184	0.0537
STD. DEVIATIONS	0.0323	0.0219	0.0272	0.0118	0.0111	0.0113
	0.0148	0.0076	0.0073	0.0162	0.0257	0.0345

PERCOLATION/LEAKAGE THROUGH LAYER 6

TOTALS	0.0988	0.0921	0.1034	0.1021	0.1055	0.1021
	0.1055	0.1055	0.0991	0.0488	0.0538	0.0925
STD. DEVIATIONS	0.0245	0.0177	0.0123	0.0006	0.0000	0.0001
	0.0000	0.0000	0.0078	0.0430	0.0405	0.0292

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 3

AVERAGES	9.2933	5.1600	14.2782	17.6440	14.6610	10.0019
	4.1271	2.1496	1.3243	1.6530	5.1580	13.0073
STD. DEVIATIONS	7.3041	5.6885	5.9906	2.7379	2.5820	2.9162
	3.3191	1.4656	2.0010	3.9874	6.6666	7.9433

DAILY AVERAGE HEAD ON TOP OF LAYER 6

AVERAGES	0.0172	0.0086	0.0208	0.0296	0.0250	0.0180
	0.0077	0.0039	0.0023	0.0026	0.0072	0.0202
STD. DEVIATIONS	0.0122	0.0090	0.0102	0.0046	0.0042	0.0044
	0.0056	0.0029	0.0028	0.0061	0.0100	0.0130

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 100

	INCHES	CU. FEET	PERCENT
PRECIPITATION	40.25 (5.550)	146111.1	100.00
RUNOFF	9.567 (3.5880)	34510.62	23.619
EVAPOTRANSPIRATION	29.219 (3.4550)	106064.78	72.592
PERCOLATION/LEAKAGE THROUGH LAYER 3	1.53484 (0.19079)	5571.454	3.81316
AVERAGE HEAD ON TOP OF LAYER 3	8.205 (2.131)		
LATERAL DRAINAGE COLLECTED FROM LAYER 5	0.42600 (0.11010)	1546.393	1.05837
PERCOLATION/LEAKAGE THROUGH LAYER 6	1.10896 (0.09945)	4025.511	2.75510
AVERAGE HEAD ON TOP OF LAYER 6	0.014 (0.004)		
CHANGE IN WATER STORAGE	-0.010 (1.5809)	-36.16	-0.025

PEAK DAILY VALUES FOR YEARS 1 THROUGH 100

	(INCHES)	(CU. FT.)
PRECIPITATION	3.84	13939.199
RUNOFF	4.263	15476.4990
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.006803	24.69493
AVERAGE HEAD ON TOP OF LAYER 3	24.000	
DRAINAGE COLLECTED FROM LAYER 5	0.00340	12.32993
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.003405	12.36112
AVERAGE HEAD ON TOP OF LAYER 6	0.040	
MAXIMUM HEAD ON TOP OF LAYER 6	0.068	
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	0.0 FEET	
SNOW WATER	7.77	28219.2871

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.4130

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.1674

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

FINAL WATER STORAGE AT END OF YEAR 100

LAYER	(INCHES)	(VOL/VOL)
1	1.4225	0.2371
2	7.0196	0.1900
3	10.2480	0.4270
4	34.0800	0.2840
5	0.5411	0.0451
6	15.3720	0.4270
SNOW WATER	0.000	

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**          HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE           **
**               HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)         **
**            DEVELOPED BY ENVIRONMENTAL LABORATORY                 **
**          USAE WATERWAYS EXPERIMENT STATION                       **
**       FOR USEPA RISK REDUCTION ENGINEERING LABORATORY            **
**                                                                  **
**                                                                  **
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PRECIPITATION DATA FILE: C:\071-644\help\PRECIP-C.D6
TEMPERATURE DATA FILE: C:\071-644\HELP\TEMP-C.D7
SOLAR RADIATION DATA FILE: C:\071-644\HELP\SOLRAD-C.D13
EVAPOTRANSPIRATION DATA: C:\071-644\HELP\EVAPO-C.D11
SOIL AND DESIGN DATA FILE: C:\071-644\HELP\SF10-7.D10
OUTPUT DATA FILE: C:\071-644\HELP\SF10-7.OUT

TIME: 15:41 DATE: 3/ 3/2010

****

TITLE: Carter Hollow Landfill (Cap Side Slope over Shallow Liner)

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NOTE: INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.

LAYER 1

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 10

THICKNESS	=	6.00	INCHES
POROSITY	=	0.3980	VOL/VOL
FIELD CAPACITY	=	0.2440	VOL/VOL
WILTING POINT	=	0.1360	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3178	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.1199999997000E-03	CM/SEC

NOTE: SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 3.00 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 22

THICKNESS	=	18.00	INCHES
POROSITY	=	0.4190	VOL/VOL
FIELD CAPACITY	=	0.3070	VOL/VOL
WILTING POINT	=	0.1800	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4182	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.1899999992000E-04	CM/SEC

LAYER 3

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	24.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.1000000010000E-06	CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	120.00	INCHES
POROSITY	=	0.5010	VOL/VOL
FIELD CAPACITY	=	0.2840	VOL/VOL
WILTING POINT	=	0.1350	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2840	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.5600000150000E-03	CM/SEC

LAYER 5

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4170	VOL/VOL
FIELD CAPACITY	=	0.0450	VOL/VOL
WILTING POINT	=	0.0180	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0485	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.3999999910000E-01	CM/SEC
SLOPE	=	6.00	PERCENT
DRAINAGE LENGTH	=	525.0	FEET

LAYER 6

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.1000000010000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE #10 WITH A FAIR STAND OF GRASS, A SURFACE SLOPE OF 25.% AND A SLOPE LENGTH OF 103. FEET.

SCS RUNOFF CURVE NUMBER	=	87.30	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	21.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	8.177	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	8.673	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	3.516	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	69.716	INCHES
TOTAL INITIAL WATER	=	69.716	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM COVINGTON KENTUCKY

STATION LATITUDE	=	38.60	DEGREES
MAXIMUM LEAF AREA INDEX	=	2.00	
START OF GROWING SEASON (JULIAN DATE)	=	105	
END OF GROWING SEASON (JULIAN DATE)	=	299	
EVAPORATIVE ZONE DEPTH	=	21.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	9.10	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	70.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	67.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	73.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	72.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR COVINGTON KENTUCKY

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
3.13	2.73	3.95	3.58	3.84	4.09
4.28	2.97	2.91	2.54	3.12	3.00

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR COVINGTON KENTUCKY

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
29.20	31.60	42.00	53.00	64.00	73.00
76.00	75.00	68.00	57.00	45.00	35.00

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR COVINGTON KENTUCKY AND STATION LATITUDE = 38.60 DEGREES

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 100

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.42	2.87	3.77	3.69	3.83	4.10
	4.42	2.86	2.79	2.35	3.22	2.94
STD. DEVIATIONS	1.59	1.34	1.48	1.54	1.84	2.18
	1.91	1.59	1.78	1.10	1.36	1.21
RUNOFF						
TOTALS	1.789	2.473	2.436	0.669	0.360	0.393
	0.278	0.124	0.145	0.094	0.314	0.717
STD. DEVIATIONS	1.534	1.559	2.055	0.926	0.602	0.675
	0.466	0.200	0.252	0.180	0.646	0.978
EVAPOTRANSPIRATION						
TOTALS	0.628	0.563	1.911	3.462	3.912	5.374
	4.729	3.184	1.938	1.307	1.114	0.840
STD. DEVIATIONS	0.224	0.287	0.605	0.673	1.211	0.852
	1.465	1.501	0.939	0.378	0.211	0.193
PERCOLATION/LEAKAGE THROUGH LAYER 3						
TOTALS	0.1388	0.1123	0.1655	0.1764	0.1689	0.1435
	0.1226	0.1142	0.1034	0.0480	0.0706	0.1464
STD. DEVIATIONS	0.0472	0.0310	0.0326	0.0116	0.0109	0.0118
	0.0135	0.0053	0.0124	0.0532	0.0631	0.0590

LATERAL DRAINAGE COLLECTED FROM LAYER 5

TOTALS	0.0490	0.0255	0.0433	0.0708	0.0685	0.0512
	0.0274	0.0130	0.0065	0.0050	0.0119	0.0409
STD. DEVIATIONS	0.0299	0.0205	0.0243	0.0128	0.0099	0.0094
	0.0126	0.0081	0.0051	0.0116	0.0196	0.0304

PERCOLATION/LEAKAGE THROUGH LAYER 6

TOTALS	0.0986	0.0918	0.1032	0.1022	0.1057	0.1022
	0.1055	0.1055	0.0987	0.0423	0.0505	0.0914
STD. DEVIATIONS	0.0256	0.0181	0.0125	0.0006	0.0000	0.0000
	0.0001	0.0001	0.0082	0.0428	0.0410	0.0303

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 3

AVERAGES	9.1902	5.1445	14.2083	17.4922	14.4411	9.7411
	3.9065	1.9825	1.1604	1.3847	4.6666	12.5023
STD. DEVIATIONS	7.2702	5.6818	5.9742	2.7150	2.4870	2.7639
	3.0797	1.1952	1.7478	3.5479	6.3235	7.9206

DAILY AVERAGE HEAD ON TOP OF LAYER 6

AVERAGES	0.0612	0.0349	0.0541	0.0914	0.0855	0.0662
	0.0342	0.0162	0.0084	0.0063	0.0156	0.0511
STD. DEVIATIONS	0.0373	0.0280	0.0303	0.0165	0.0123	0.0121
	0.0157	0.0101	0.0066	0.0145	0.0253	0.0380

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 100

	INCHES		CU. FEET	PERCENT
PRECIPITATION	40.25	(5.550)	146111.1	100.00
RUNOFF	9.791	(3.6003)	35541.64	24.325
EVAPOTRANSPIRATION	28.960	(3.3949)	105124.46	71.948
PERCOLATION/LEAKAGE THROUGH LAYER 3	1.51043	(0.18812)	5482.872	3.75254
AVERAGE HEAD ON TOP OF LAYER 3	7.985	(2.069)		
LATERAL DRAINAGE COLLECTED FROM LAYER 5	0.41299	(0.10474)	1499.136	1.02602
PERCOLATION/LEAKAGE THROUGH LAYER 6	1.09784	(0.09963)	3985.171	2.72749
AVERAGE HEAD ON TOP OF LAYER 6	0.044	(0.011)		
CHANGE IN WATER STORAGE	-0.011	(1.5859)	-39.27	-0.027

PEAK DAILY VALUES FOR YEARS 1 THROUGH 100

	(INCHES)	(CU. FT.)
PRECIPITATION	3.84	13939.199
RUNOFF	4.263	15473.8232
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.006803	24.69493
AVERAGE HEAD ON TOP OF LAYER 3	24.000	
DRAINAGE COLLECTED FROM LAYER 5	0.00333	12.08298
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.003414	12.39173
AVERAGE HEAD ON TOP OF LAYER 6	0.129	
MAXIMUM HEAD ON TOP OF LAYER 6	0.255	
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	3.6 FEET	
SNOW WATER	7.77	28219.2871
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4130	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1674	

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

FINAL WATER STORAGE AT END OF YEAR 100

LAYER	(INCHES)	(VOL/VOL)
1	1.4225	0.2371
2	6.9688	0.3872
3	10.2480	0.4270
4	34.0800	0.2840
5	0.5424	0.0452
6	15.3720	0.4270
SNOW WATER	0.000	

HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
HELP MODEL VERSION 3.07 (1 NOVEMBER 1997)
DEVELOPED BY ENVIRONMENTAL LABORATORY
USAE WATERWAYS EXPERIMENT STATION
FOR USEPA RISK REDUCTION ENGINEERING LABORATORY

PRECIPITATION DATA FILE: C:\071-644\help\PRECIP-C.D4
TEMPERATURE DATA FILE: C:\071-644\HELP\TEMP-C.D7
SOLAR RADIATION DATA FILE: C:\071-644\HELP\SOLRAD-C.D13
EVAPOTRANSPIRATION DATA: C:\071-644\HELP\EVAPO-C.D11
SOIL AND DESIGN DATA FILE: C:\071-644\HELP\SS10-7.D10
OUTPUT DATA FILE: C:\071-644\HELP\SS10-7.OUT

TIME: 15:41 DATE: 3/ 3/2010

TITLE: Carter Hollow Landfill (Cap Side Slope over Liner Side Slope

NOTE: INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.

LAYER 1

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 10

THICKNESS	=	6.00	INCHES
POROSITY	=	0.3980	VOL/VOL
FIELD CAPACITY	=	0.2440	VOL/VOL
WILTING POINT	=	0.1360	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3178	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.1199999997000E-03	CM/SEC

NOTE: SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 3.00 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 22

THICKNESS	=	18.00	INCHES
POROSITY	=	0.4190	VOL/VOL
FIELD CAPACITY	=	0.3070	VOL/VOL
WILTING POINT	=	0.1800	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4182	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.189999992000E-04	CM/SEC

LAYER 3

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	24.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

LAYER 4

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	120.00	INCHES
POROSITY	=	0.5010	VOL/VOL
FIELD CAPACITY	=	0.2840	VOL/VOL
WILTING POINT	=	0.1350	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2840	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.560000015000E-03	CM/SEC

LAYER 5

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4170	VOL/VOL
FIELD CAPACITY	=	0.0450	VOL/VOL
WILTING POINT	=	0.0180	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0461	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.230000000000E-01	CM/SEC
SLOPE	=	40.00	PERCENT
DRAINAGE LENGTH	=	525.0	FEET

LAYER 6

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE #10 WITH A FAIR STAND OF GRASS, A SURFACE SLOPE OF 25.% AND A SLOPE LENGTH OF 103. FEET.

SCS RUNOFF CURVE NUMBER	=	87.10	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	21.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	8.177	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	8.673	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	3.516	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	69.687	INCHES
TOTAL INITIAL WATER	=	69.687	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM COVINGTON KENTUCKY

STATION LATITUDE	=	38.60	DEGREES
MAXIMUM LEAF AREA INDEX	=	2.00	
START OF GROWING SEASON (JULIAN DATE)	=	105	
END OF GROWING SEASON (JULIAN DATE)	=	299	
EVAPORATIVE ZONE DEPTH	=	21.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	9.10	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	70.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	67.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	73.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	72.00	%

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR COVINGTON KENTUCKY

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
3.13	2.73	3.95	3.58	3.84	4.09
4.28	2.97	2.91	2.54	3.12	3.00

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR COVINGTON KENTUCKY

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
29.20	31.60	42.00	53.00	64.00	73.00
76.00	75.00	68.00	57.00	45.00	35.00

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR COVINGTON KENTUCKY AND STATION LATITUDE = 38.60 DEGREES

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 100

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.42	2.87	3.77	3.69	3.83	4.10
	4.42	2.86	2.79	2.35	3.22	2.94
STD. DEVIATIONS	1.59	1.34	1.48	1.54	1.84	2.18
	1.91	1.59	1.78	1.10	1.36	1.21
RUNOFF						
TOTALS	1.789	2.473	2.436	0.669	0.360	0.393
	0.278	0.124	0.145	0.094	0.314	0.717
STD. DEVIATIONS	1.534	1.559	2.055	0.926	0.602	0.675
	0.466	0.200	0.252	0.180	0.646	0.978
EVAPOTRANSPIRATION						
TOTALS	0.628	0.563	1.911	3.462	3.912	5.374
	4.729	3.184	1.938	1.307	1.114	0.840
STD. DEVIATIONS	0.224	0.287	0.605	0.673	1.211	0.652
	1.465	1.501	0.939	0.378	0.211	0.193
PERCOLATION/LEAKAGE THROUGH LAYER 3						
TOTALS	0.1388	0.1123	0.1655	0.1764	0.1689	0.1435
	0.1226	0.1162	0.1034	0.0480	0.0706	0.1464
STD. DEVIATIONS	0.0472	0.0310	0.0326	0.0116	0.0109	0.0118
	0.0135	0.0053	0.0124	0.0532	0.0631	0.0590
LATERAL DRAINAGE COLLECTED FROM LAYER 5						

TOTALS	0.0451	0.0208	0.0550	0.0754	0.0655	0.0451
	0.0195	0.0097	0.0052	0.0057	0.0165	0.0513
STD. DEVIATIONS	0.0321	0.0219	0.0271	0.0117	0.0108	0.0107
	0.0139	0.0063	0.0084	0.0143	0.0242	0.0343

PERCOLATION/LEAKAGE THROUGH LAYER 6

TOTALS	0.0984	0.0917	0.1031	0.1021	0.1055	0.1021
	0.1055	0.1055	0.0985	0.0419	0.0504	0.0913
STD. DEVIATIONS	0.0255	0.0181	0.0125	0.0006	0.0000	0.0001
	0.0000	0.0000	0.0084	0.0429	0.0409	0.0303

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 3

AVERAGES	9.1902	5.1445	14.2083	17.4922	14.4411	9.7411
	3.9065	1.9825	1.1604	1.3847	4.6666	12.5023
STD. DEVIATIONS	7.2702	5.6818	5.9742	2.7150	2.4870	2.7639
	3.0797	1.1952	1.7478	3.5479	6.3235	7.9206

DAILY AVERAGE HEAD ON TOP OF LAYER 6

AVERAGES	0.0170	0.0086	0.0207	0.0293	0.0247	0.0175
	0.0073	0.0036	0.0020	0.0021	0.0064	0.0193
STD. DEVIATIONS	0.0121	0.0090	0.0102	0.0046	0.0041	0.0042
	0.0052	0.0024	0.0025	0.0054	0.0094	0.0129

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 100

	INCHES		CU. FEET	PERCENT
PRECIPITATION	40.25	(5.550)	146111.1	100.00
RUNOFF	9.791	(3.6003)	35541.64	24.325
EVAPOTRANSPIRATION	28.960	(3.3949)	105124.46	71.948
PERCOLATION/LEAKAGE THROUGH LAYER 3	1.51043	(0.18812)	5482.872	3.75254
AVERAGE HEAD ON TOP OF LAYER 3	7.985	(2.069)		
LATERAL DRAINAGE COLLECTED FROM LAYER 5	0.41458	(0.10678)	1504.919	1.02998
PERCOLATION/LEAKAGE THROUGH LAYER 6	1.09598	(0.09971)	3978.415	2.72287
AVERAGE HEAD ON TOP OF LAYER 6	0.013	(0.003)		
CHANGE IN WATER STORAGE	-0.011	(1.5760)	-38.30	-0.026

PEAK DAILY VALUES FOR YEARS 1 THROUGH 100

	(INCHES)	(CU. FT.)
PRECIPITATION	3.84	13939.199
RUNOFF	4.263	15473.8232
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.006803	24.69493
AVERAGE HEAD ON TOP OF LAYER 3	24.000	
DRAINAGE COLLECTED FROM LAYER 5	0.00340	12.32904
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.003405	12.36112
AVERAGE HEAD ON TOP OF LAYER 6	0.040	
MAXIMUM HEAD ON TOP OF LAYER 6	0.068	
LOCATION OF MAXIMUM HEAD IN LAYER 5 (DISTANCE FROM DRAIN)	0.0 FEET	
SNOW WATER	7.77	28219.2871

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.4130

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.1674

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

FINAL WATER STORAGE AT END OF YEAR 100

LAYER	(INCHES)	(VOL/VOL)
1	1.4225	0.2371
2	6.9688	0.3872
3	10.2480	0.4270
4	34.0800	0.2840
5	0.5409	0.0451
6	15.3720	0.4270
SNOW WATER	0.000	

Attachment 2

Laboratory Testing Results

PARTICLE-SIZE ANALYSIS OF SOILS
ASTM D 422

Client	Civil & Environmental Consultants, I	Boring	F-01 thru F-08
Client Project	Carter Hollow Landfill	Depth	Composite
Project No.	30165	Sample	Fly Ash
		Lab Sample No.	30165001

USCS Description: **DARK GRAY SILT WITH SAND**
USCS Group Symbol: **ML**
USDA Description: **SILT LOAM**

MECHANICAL SIEVE ANALYSIS

As-Received Sample Correction For Split Samples (J-Factor)	
+3/4" Air Dry Wt, gm	0.0
100% Passing 3/4 Sieve No Correction Needed.	
Passing -3/4" (J-Factor)	1.00
Split Sample, -3/4"	
Tare No.	702
Wt. Tare + WS., gm	1083.5
Wt. Tare + DS., gm	941.4
Wt. Tare, gm	98.08
Wt. of DS., gm	843.32
Water Content, %	16.9
Wt. of +#200 Sample, gm	143.8
Wt. of -#200 Sample, gm	699.5

US Std. Sieve Size	Sieve Opening (mm)	Wt. of Soil Retained (gm)	Percent Retained (%)	Cumulative Percent Retained	Percent Finer (%)	Final Percent Finer
3"	75	0	0.0	0.0	100.0	100.0
2 1/2"	62.5	0	0.0	0.0	100.0	100.0
2"	50	0	0.0	0.0	100.0	100.0
1 1/2"	37.5	0	0.0	0.0	100.0	100.0
1"	25	0	0.0	0.0	100.0	100.0
3/4"	19	0	0.0	0.0	100.0	100.0
1/2"	12.5	0	0.0	0.0	100.0	100.0
3/8"	9.5	2.75	0.3	0.3	99.7	99.7
#4	4.75	1.79	0.2	0.5	99.5	99.5
#10	2	3.56	0.4	1.0	99.0	99.0
#20	0.85	4.63	0.5	1.5	98.5	98.5
#40	0.425	5.32	0.6	2.1	97.9	97.9
#60	0.25	5.82	0.7	2.8	97.2	97.2
#140	0.106	63.67	7.5	10.4	89.6	89.6
#200	0.075	56.3	6.7	17.1	82.9	82.9
Pan	-	699.5	82.9	100.0	-	-

The final percent finer combines the gradation of the plus 3/4" and minus 3/4" material.

HYDROMETER ANALYSIS

Hydrometer Sample Weight	
Tare No.	844
Wt. Tare + DS., gm	153.5
Wt. Tare, gm	102.75
Wt. Dispers., gm	5
Wt. Dry Soil, gm	45.75
-#10 Dispersed 1min in Hamilton Beach Mixer	
K Factor	0.0156
Composite Correction	7
a Factor	1.11
Average Test Temp, °C	19.4
Specific Gravity, Measured	2.29

Elapsed Time (min.)	R Measured	Composite Correction	R Corrected	Percent Finer (%)	Particle Diameter (mm)	Adjusted % Finer (%)
0	NA	NA	NA	NA	NA	NA
2	39	7	32	77.3	0.0345	64.1
5	33	7	26	62.8	0.0229	52.1
15	25	7	18	43.5	0.0140	36.1
30	21	7	14	33.8	0.0102	28.1
60	16	7	9	21.7	0.0074	18.0
250	10	7	3	7.2	0.0038	6.0
1440	8	7	1	2.4	0.0016	2.0

The adjusted percent finer is corrected for the percent passing the -#200 sieve.

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**0.5**	Silt=71.6%	Clay=11%
Coarse=0; Fine=0.5		D60, mm	NA
% Sand (-#4 & +#200)	**16.5**	D30, mm	NA
Coarse=0.4; Med.=1.2; Fine=14.9		D10, mm	NA
% Fines (-#200)	**82.9**	Cc	NA
% Plus #200 (-3")	**17.1**	Cu	NA

USCS Description
SILT WITH SAND

USCS Group Symbol	Atterberg Limits Group Symbol
ML	**NP, ML assumed for class.**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)	Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
100	100			
		Gravel	1.0	0
2	99.0			
		Sand	25.9	26.2
0.05	73.1			
		Silt	70.0	70.7
0.002	3.1			
		Clay	3.1	3.1

USDA Classification
SILT LOAM

Input Validation: Reviewed By: Date Tested: 2/15/2010

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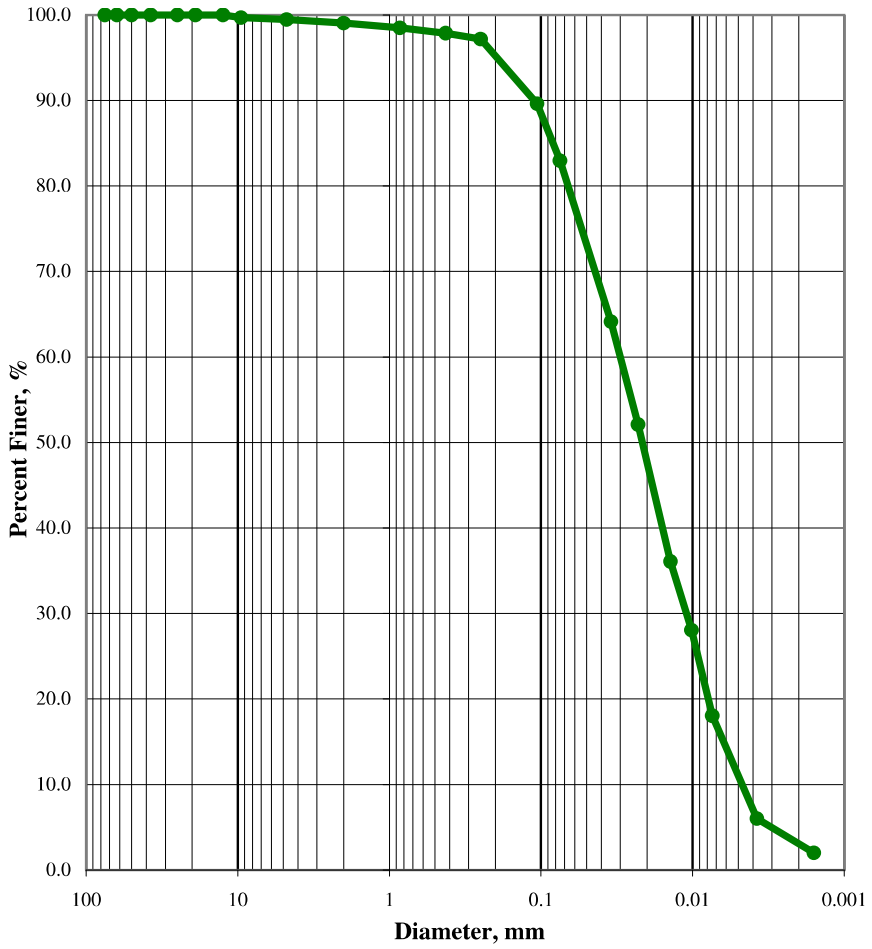
PARTICLE-SIZE ANALYSIS OF SOILS

Client	Civil & Environmental Consultants, I	Boring	F-01 thru F-08
Client Project	Carter Hollow Landfill	Depth	Composite
Project No.	30165	Sample	Fly Ash
		Lab Sample No.	30165001
USCS Description	**DARK GRAY SILT WITH SAND**		
USCS Group Symbol	**ML**		
USDA Description	**SILT LOAM**		



US Std. Sieve Size	Particle Diameter (mm)	Percent Finer (%)
3"	75	100.0
2 1/2"	62.5	100.0
2"	50	100.0
1 1/2"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
1/2"	12.5	100.0
3/8"	9.5	99.7
#4	4.75	99.5
#10	2	99.0
#20	0.85	98.5
#40	0.425	97.9
#60	0.25	97.2
#140	0.106	89.6
#200	0.075	82.9
NA	0.0345	64.1
NA	0.0229	52.1
NA	0.0140	36.1
NA	0.0102	28.1
NA	0.0074	18.0
NA	0.0038	6.0
NA	0.0016	2.0

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**0.5**	Silt=71.6% Clay=11%	
Coarse=0; Fine=0.5		D60, mm	NA
% Sand (-#4 & +#200)	**16.5**	D30, mm	NA
Coarse=0.4; Med.=1.2; Fine=14.9		D10, mm	NA
% Fines (-#200)	**82.9**	Cc	NA
% Plus #200 (-3")	**17.1**	Cu	NA

USCS Description
SILT WITH SAND

USCS Group Symbol	Atterberg Limits Group Symbol
ML	**NP, ML assumed for class.**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)
100	100
2	99.0
0.05	73.1
0.002	3.1

Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
Gravel	1.0	0
Sand	25.9	26.2
Silt	70.0	70.7
Clay	3.1	3.1

USDA Classification
SILT LOAM

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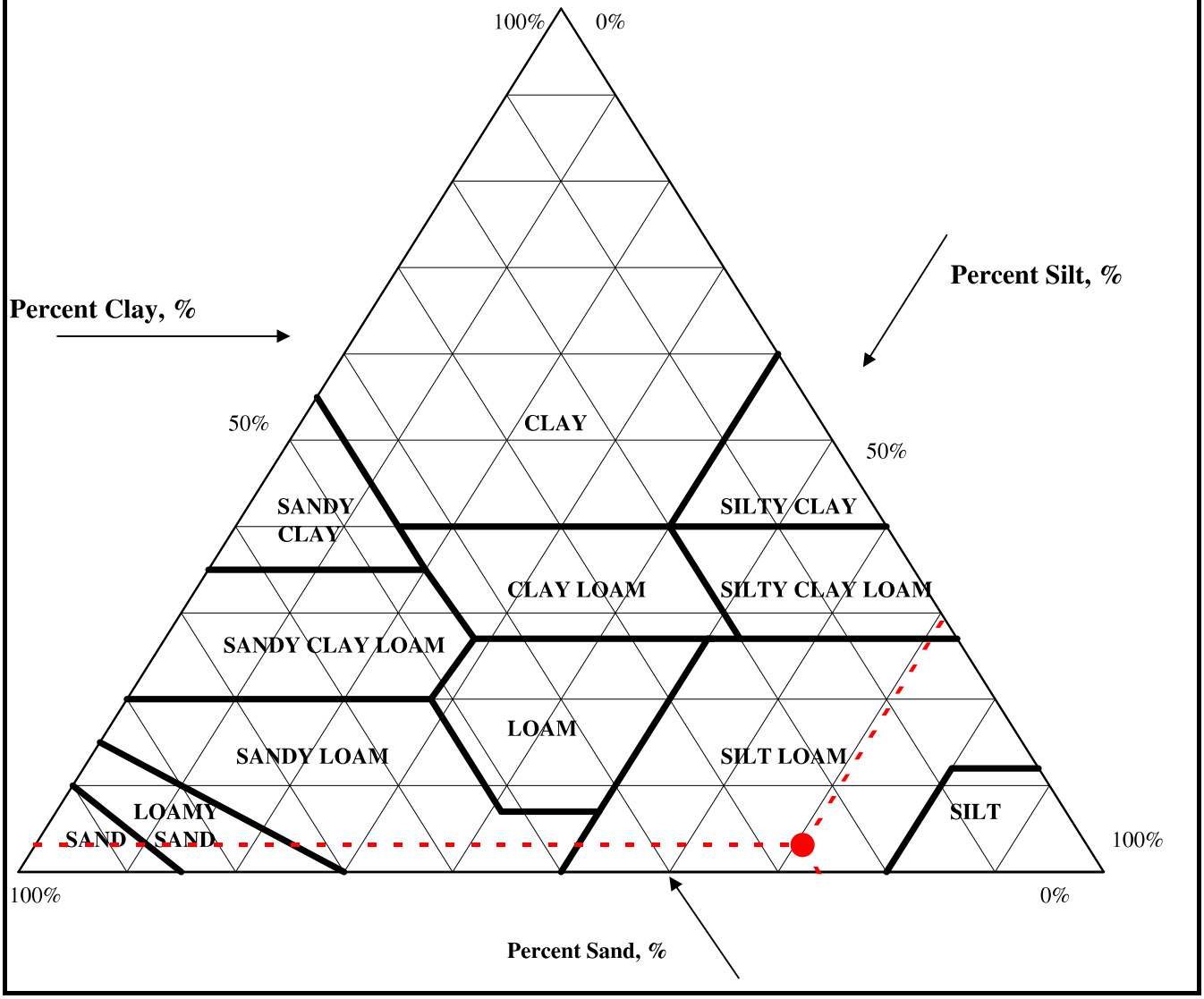
USDA CLASSIFICATION CHART

Client	Civil & Environmental Consultants, I	Boring	F-01 thru F-08
Client Project	Carter Hollow Landfill	Depth	Composite
Project No.	30165	Sample	Fly Ash
		Lab Sample No.	30165001
USCS Description	**DARK GRAY SILT WITH SAND**		
USCS Group Symbol	**ML**		
USDA Description	**SILT LOAM**		

Corrected for 0% gravel	
Percent Gravel, %	0.0
Percent Sand, %	26.2
Percent Silt, %	70.7
Percent Clay, %	3.1

Sand Subsizes Corrected Percentages	
Very Coarse Sand; 2-1	0.4
Coarse Sand; 1-0.5	0.6
Medium Sand; 0.5-0.25	0.8
Fine Sand; 0.25-0.1	8.8
Very Fine Sand; 0.1-0.05	15.5
Total	**26.2**



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PARTICLE-SIZE ANALYSIS

Client	Civil & Environmental Consultants, Ir	Boring	B-01 thru B-08
Client Project	Carter Hollow Landfill	Depth	Composite
Project No.	30165	Sample	Bottom Ash
		Lab Sample No.	30165002
USCS Description	DARK GRAY POORLY GRADED SAND WITH SILT AND GRAVEL		
USCS Group Symbol	sp-sm		

MECHANICAL SIEVE ANALYSIS

As-Received Sample Correction For Split Samples (J-Factor)	
+3/4" Air Dry Wt, gm	34.3
-3/4 Wet Wt., gm	3739.1
-3/4 Dry Wt., gm	3250.2
Total Sample Dry Wt, gm	3284.5
Passing -3/4" (J-Factor)	0.99
Split Sample, -3/4"	
Tare No.	710
Wt. Tare + WS., gm	1276.5
Wt. Tare + DS., gm	1122.7
Wt. Tare, gm	100.3
Wt. of DS., gm	1022.4
Water Content, %	15.0
Wt. of +#200 Sample, gm	903.7
Wt. of -#200 Sample, gm	118.7

US Std. Sieve Size	Sieve Opening (mm)	Wt. of Soil Retained (gm)	Percent Retained (%)	Cumulative Percent Retained	Percent Finer (%)	Final Percent Finer
3"	75	0	0.0	0.0	100.0	100.0
2 1/2"	62.5	0	0.0	0.0	100.0	100.0
2"	50	0	0.0	0.0	100.0	100.0
1 1/2"	37.5	0	0.0	0.0	100.0	100.0
1"	25	25.8	0.8	0.8	99.2	99.2
3/4"	19	8.5	0.3	1.0	99.0	99.0
1/2"	12.5	33.1	3.2	3.2	96.8	95.8
3/8"	9.5	26.76	2.6	5.9	94.1	93.2
#4	4.75	84.38	8.3	14.1	85.9	85.0
#8	2.36	169.84	16.6	30.7	69.3	68.6
#16	1.18	199.72	19.5	50.3	49.7	49.2
#40	0.425	105.74	10.3	60.6	39.4	39.0
#60	0.25	80.39	7.9	68.5	31.5	31.2
#140	0.106	154.33	15.1	83.6	16.4	16.3
#200	0.075	49.44	4.8	88.4	11.6	11.5
Pan	-	118.7	11.6	100.0	-	-

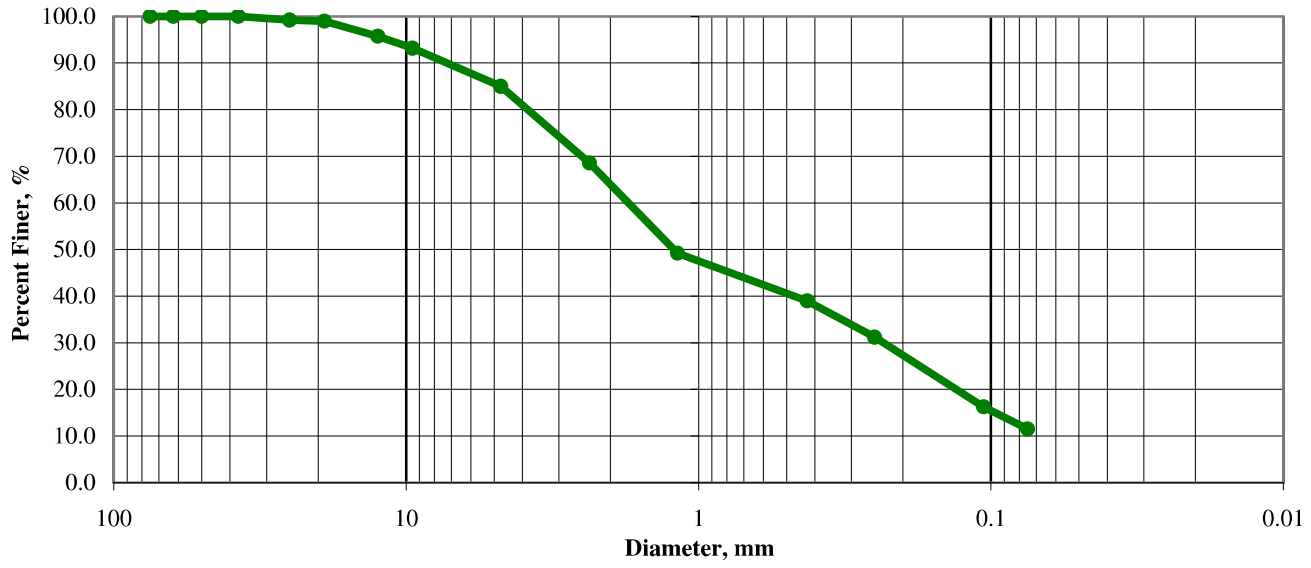
The final percent finer combines the gradation of the plus 3/4" and minus 3/4" material.

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**15.0**		
Coarse=1; Fine=14		D60, mm	1.736
% Sand (-#4 & +#200)	**73.5**	D30, mm	0.233
Coarse=16.4; Med.=29.6; Fine=27.5		D10, mm	0.0673
% Fines (-#200)	**11.5**	Cc	0.5
% Plus #200 (-3")	**88.5**	Cu	25.8

USCS Description			
POORLY GRADED SAND WITH SILT AND GRAVEL			
USCS Group Symbol	Atterberg Limits Group Symbol		
sp-sm	**ml, Limits Assumed**		
Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0



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LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT - D698

Client	CECI	Boring	NA
Client Project	Carter Hollow Landfill	Depth	NA
Project No.	27535	Sample	Synthetic Gypsum
		Lab Sample No.	27535

Visual Description: Very Pale Brown Silt

WET DENSITY

Compaction Point #	1	2	3	4	
Wt. Mold & WS, gm.	5717.4	5793	5867	5864	
Wt. Mold, gm.	4241.7	4241.7	4241.7	4241.7	
Wt. WS, gm.	1475.7	1551.3	1625.3	1622.3	
Mold Volume, cc	940.7	940.7	940.7	940.7	
Wet Density, gm./cc	1.57	1.65	1.73	1.72	
Wet Density, pcf	97.9	102.9	107.8	107.6	

WATER CONTENT @ 60*C

Tare Number	718	811	803	917	
Wt. Tare & WS, gm.	866.4	1079.5	1045.9	1053.5	
Wt. Tare & DS, gm.	780.3	944.3	893.3	884.4	
Wt. Tare, gm.	99.5	102.7	111.9	102.4	
Water Content, %	12.6	16.1	19.5	21.6	

DRY DENSITY vs. WATER CONTENT

LABORATORY TEST VALUES

Water Content, %	12.6	16.1	19.5	21.6	
Dry Density, pcf	86.9	88.7	90.2	88.5	

TEST SUMMARY

Compaction Effort	Standard
Test Procedure	A
Mold Diameter, in	4
Compacted Layers	3
Blows Per Layer	25
Rammer Weight / Fall	5.5 lbs / 12 in.
Size of Material Used	-#4 Sieve
Mold Volume, cc	940.7
Wt. of Mold, gm.	4241.7

OVERSIZE PARTICLE CORRECTION

Percent Retained on 3/4" Sieve, %	<5%
Percent Retained on 3/8" Sieve, %	NA
Percent Retained on #4 Sieve, %	NA

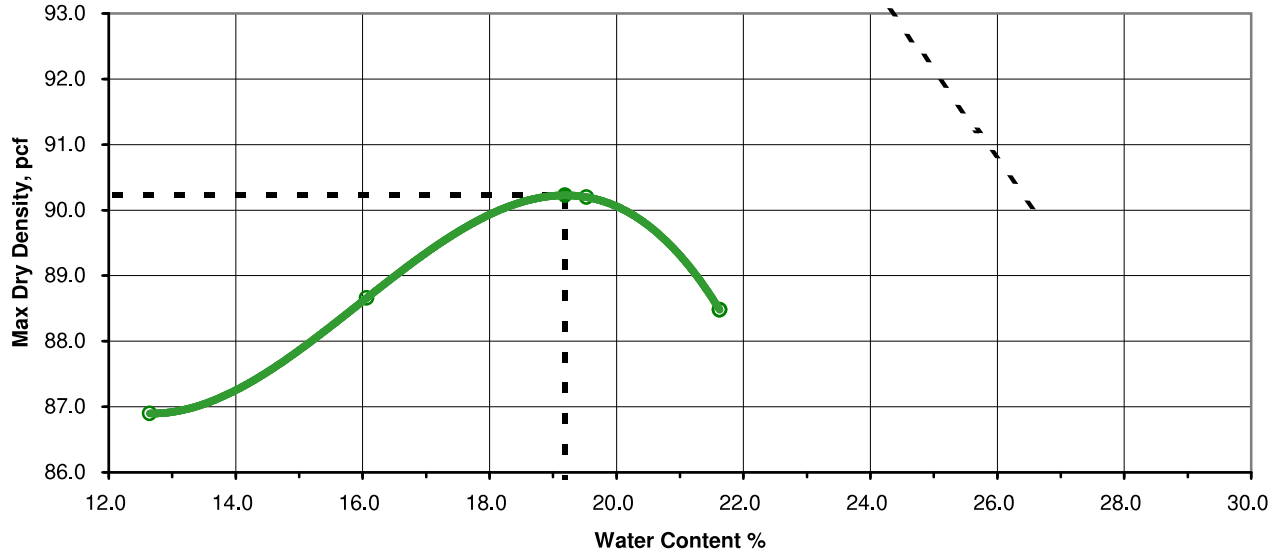
(Based on As Received Screening)

No Oversize Correction Needed

SAMPLE SUMMARY

As-Received Water Content, %	8.8
Lab Optimum Water Content, %	***19.2***
Lab Maximum Dry Density, pcf	***90.2***

Note: Maximum Density and Optimum Water Content reported from estimated best fit smooth curve!



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MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS USING A FLEXIBLE WALL PERMEAMETER ASTM D 5084

Client	CECI	Boring	NA
Client Project	Carter Hollow LF	Depth	Synthetic Gypsum
Project No.	27535	Sample	1
		Lab Sample No.	27535001
Visual Description	Very Pale Brown Silt		
Sample Condition	Remolded		

TEST PRESSURES		
Position	**psi**	**cm**
Top (Outflow)	77	5,413.8
Bottom (Inflow)	78	5,484.1
Cell (Confining)	80	5,624.7
Pressure Head	1.0	70.3
Note: 1psi = 70.3 cm water		

SAMPLE SUMMARY	
Avg. Hyd. Cond. @20°C, cm/sec	**5.6E-04**
Water Content, %	19.0%
Dry Density, pcf	85.7
Permeant	Deaired Water
B Parameter	84
Sample Condition	Remolded

SAMPLE CONDITIONS			FLOW DATA														
	Initial	Final	Test Status	Date	Time	Elapsed	Total	Total	Inflow /	Total	% Head	Gradient	**Effective Consol. Stress, *psi***			Temp	Hyd. Cond.
Tare Number	A10	52	*Start, Flow*			Time	Inflow	Outflow	Outflow	Head	From Run		**Min.= 1.7**	**Max.= 3**	**Avg.= 2.3**		@ 20°C
Wt. Tare & WS, gm	131.05	611.76	*& Stop*	*m-day-yr*	*hr:min:sec*	*hr*	*cc*	*cc*	Inc. Ratio	*cm*	*%*		(Inflow)	(Outflow)	Mid-Height	*°C*	*cm/sec*
Wt. Tare & DS, gm	111.61	485.65	Start	12-5-07	10:00:00	0	0	0	NA	91.4	100%	12.0	1.66	2.96	2.31	17.3	NA
Wt. Tare, gm	9.33	84.4	Flow	12-5-07	10:00:04	0.001	1.0	1.0	1.0	89.4	97.8%	11.7	1.68	2.95	2.31	17.3	5.6E-04
Moisture Content, %	19.0%	31.4%	Flow	12-5-07	10:00:08	0.002	2.0	2.0	1.0	87.3	95.6%	11.5	1.69	2.94	2.31	17.3	5.8E-04
Wt. Tube & WS., gm	517.9	NA	Flow	12-5-07	10:00:12	0.003	3.0	3.0	1.0	85.3	93.4%	11.2	1.71	2.92	2.31	17.3	5.5E-04
Wt. Of Tube, gm	0	NA	Flow	12-5-07	10:00:16	0.004	4.0	4.0	1.0	83.3	91.1%	10.9	1.72	2.91	2.31	17.3	5.7E-04
Wt. Of WS., gm	517.9	571.9	Flow	12-5-07	10:00:20	0.006	5.0	5.0	1.0	81.3	88.9%	10.7	1.74	2.89	2.31	17.3	5.5E-04
Length 1, in	3.00		Stop	12-5-07	10:00:24	0.007	6.0	6.0	1.0	79.2	86.7%	10.4	1.75	2.88	2.31	17.3	5.7E-04
Length 2, in	3.00																
Length 3, in	3.00																
Top Diameter, in	2.86																
Middle Diameter, in	2.87																
Bottom Diameter, in	2.87																
Average Length, cm	7.62	7.62															
Average Area, cm^2	41.59	41.59															
Sample Volume, cc	316.9	316.9															
Unit Wet Wt., gm/cc	1.63	1.80															
Unit Wet Wt., pcf	102.0	112.6															
Unit Dry Wt., pcf	85.7	85.7															
Unit Dry Wt., gm/cc	1.37	1.37															
Specific Gravity, Measure	2.34	2.34															
Void Ratio, e	0.704	0.704															
Porosity, n	0.413	0.413															
Pore Volume, cc	130.93	130.93															
Saturation, %	63.2%	104.5%															

Input Validation: Reviewed By: Date Tested: 12/3/2007

Note: The average Hydraulic Conductivity is calculated using the average of the last 4 determinations where all requisite flow and H.C. conditions are achieved!

Prerequisits: Inflow / Outflow Ratio = 0.75 to 1.25; Hydraulic Conductivity = +-25% of average last 4 determinations when k > 1E-8 cm/sec.

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MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS USING A FLEXIBLE WALL PERMEAMETER ASTM D 5084

Sheet 2 of 2

Client	CECI	Boring	NA
Client Project	Carter Hollow LF	Depth	Synthetic Gypsum
Project No.	27535	Sample	1
		Lab Sample No.	27535001
Visual Description	Very Pale Brown Silt		
Sample Condition	Remolded		

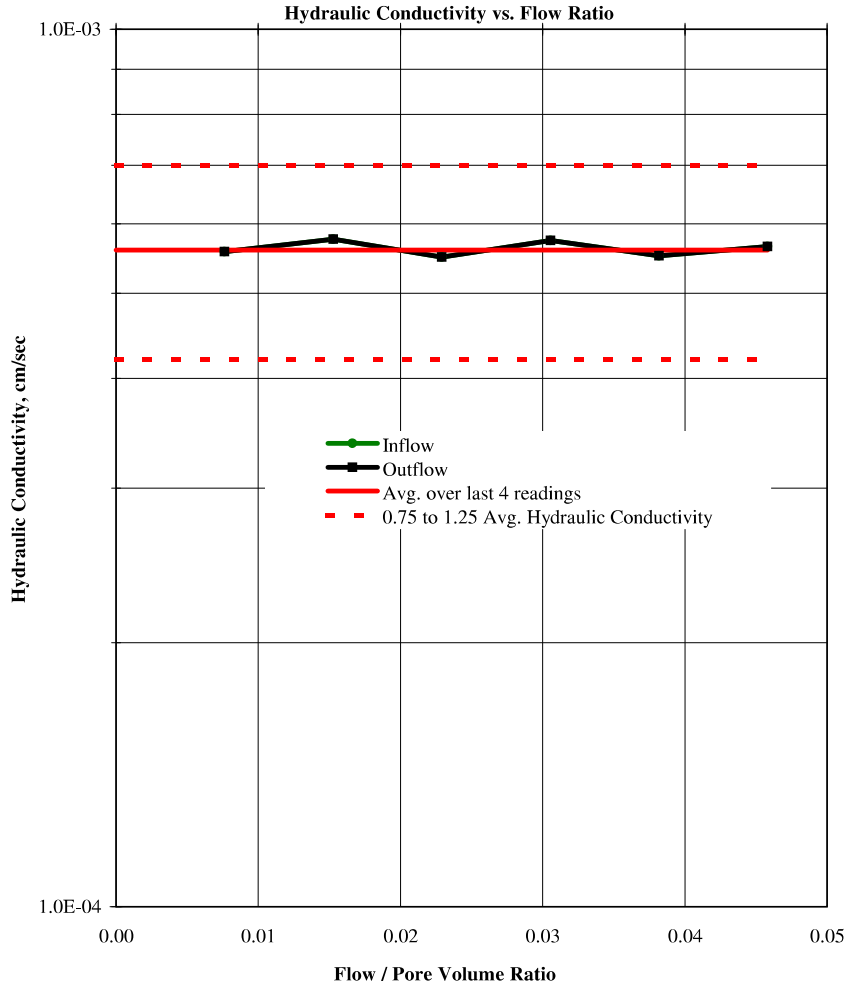
TEST PRESSURES

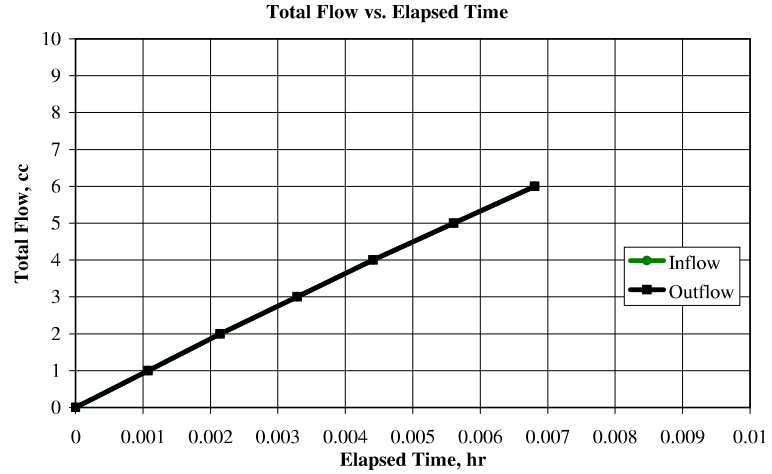
Position	psi	cm
Top (Outflow)	77	60.0
Bottom (Inflow)	78	61.0
Cell (Confining)	80	70.0
Pressure Head	1.0	70.3

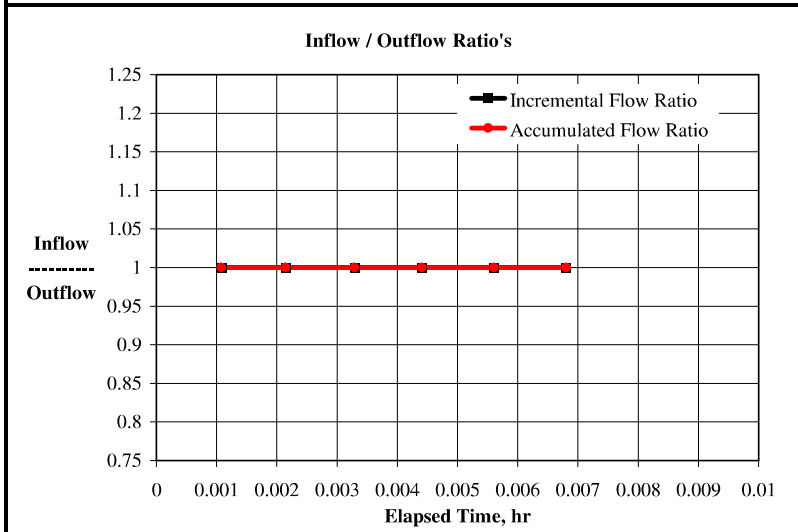
Note: 1psi = 70.3 cm water

SAMPLE SUMMARY

Avg. Hyd. Cond. @20°C, cm/sec	5.6E-04
Water Content, %	19.0%
Dry Density, pcf	85.7
Permeant	Deaired Water
B Parameter	84
Sample Condition	Remolded







Note: The average Hydraulic Conductivity is calculated using the average of the last 4 determinations where all requisite flow and H.C. conditions are achieved!

Prerequisits: Inflow / Outflow Ratio = 0.75 to 1.25; Hydraulic Conductivity = +-25% of average last 4 determinations when k > 1E-8 cm/sec.

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HYDRAULIC CONDUCTIVITY OF GRANULAR SOILS (CONSTANT HEAD)

Client	Civil & Environmental Consultants, Inc.	Boring	B-01 thru B-08
Client Project	Carter Hollow Landfill	Depth	Composite
Project No.	30165	Sample	Bottom Ash
		Lab Sample No.	30165002

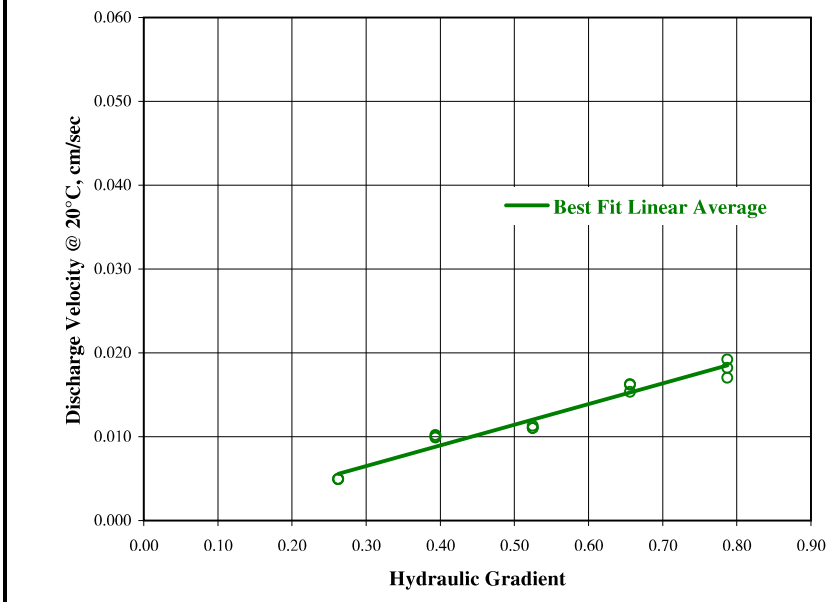
Visual Description DARK GRAY POORLY GRADED SAND WITH SILT AND GRAVEL

SAMPLE CONDITION		*TEST SUMMARY*	
Tare Number	710		
Wt. Tare & WS, gm	1276.50	Particle Sizes Tested (Insufficient mass to run 6" Dia. Mold)	-# 3/8
Wt. Tare & DS ,gm	1122.70	Percent of Oversize (+3/8") Material Removed	6.8%
Wt. Tare, gm	100.30	Average Particle Diameter (Assume D_{50}), cm	0.13
Moisture Content, %	15.0	Percent Passing #200 Sieve, %	11.5%
Wt. of WS., gm	297.3	Support Screen Size	#200 - 75µm
Sample Length - **L**, cm	7.62	Reservoir Area - A_R, cm^2	45.60
Permeameter Diameter, cm	7.62	Temperature, - **T** °C	20.1
Permeameter Area - **A**, cm^2	45.60	Temperature Correction Factor - R_T	1.00
Sample Volume, cc	347	Viscosity Coefficient @ 20°C - µ, gm/(cm x sec)	9.81E-03
Unit Dry Wt., gm/cc	0.74	Water Density @ 20°C - ρ, gm/cc	1
Unit Dry Wt., pcf	46.4		
Specific Gravity, Measured	2.17	**Average Hydraulic Conductivity @ 20°C - k, cm/sec**	**2.3E-02**
Void Ratio	1.92		

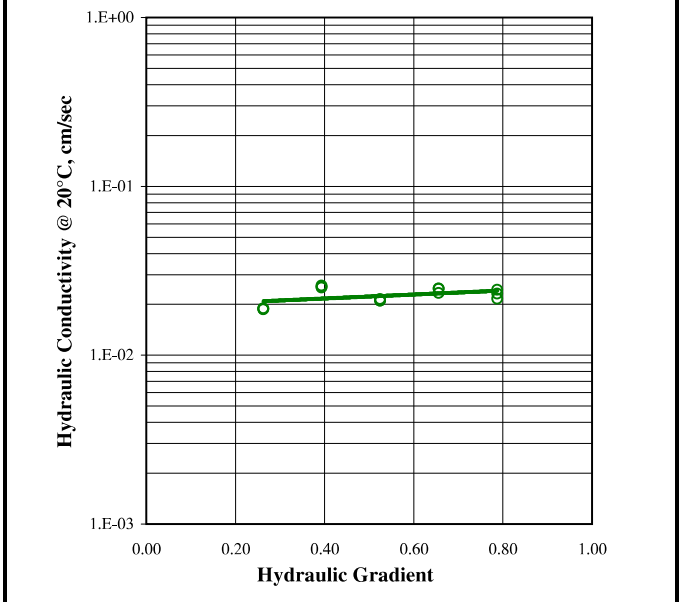
PERMEABILITY FLOW DATA

Initial Reservoir Reading R_i	Final Reservoir Reading R_f	Volume Change Q	Elapsed Time t	Elevation Head Difference H	Hydraulic Gradient i	Hydraulic Conductivity @ 20°C k	Discharge Velocity @ 20°C v	Reynolds No. @ 20°C
		$(R_i - R_f)A_R$			H / L	$(Q R_T)/(i A t)$	$(Q R_T) / (t A)$	$(v D_{50} \rho) / \mu$
(cm)	*(cm)*	*(cm^3)*	*(sec)*	*(cm)*	*(cm/cm)*	*(cm/sec)*	*(cm/sec)*	
56.2	56.1	4.6	20.38	2	0.26	1.9E-02	0.0049	0.065
56.2	56	9.1	40.23	2	0.26	1.9E-02	0.0050	0.066
56.2	55.9	13.7	60.98	2	0.26	1.9E-02	0.0049	0.065
55.8	55.7	4.6	9.84	3	0.39	2.6E-02	0.0102	0.135
55.8	55.6	9.1	20.22	3	0.39	2.5E-02	0.0099	0.131
55.8	55.5	13.7	30.06	3	0.39	2.5E-02	0.0100	0.132
55	54.9	4.6	8.86	4	0.52	2.2E-02	0.0113	0.150
55	54.8	9.1	18.16	4	0.52	2.1E-02	0.0110	0.146
55	54.7	13.7	27.23	4	0.52	2.1E-02	0.0110	0.146
54.4	54.3	4.6	6.53	5	0.66	2.3E-02	0.0153	0.203
54.4	54.2	9.1	12.36	5	0.66	2.5E-02	0.0162	0.215
54.4	54.1	13.7	18.47	5	0.66	2.5E-02	0.0163	0.215
52	51.9	4.6	5.50	6	0.79	2.3E-02	0.0182	0.241
52	51.8	9.1	10.42	6	0.79	2.4E-02	0.0192	0.255
52	51.7	13.7	17.66	6	0.79	2.2E-02	0.0170	0.225

DISCHARGE VELOCITY vs. GRADIENT



HYDRAULIC CONDUCTIVITY vs. GRADIENT



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Attachment 3

Ohio EPA's Guidance Document #0528

Using the HELP Model to Design the Leachate Collection and Management System

PURPOSE

This educational guideline provides information regarding the use of the Hydrogeologic Evaluation of Landfill Performance (HELP) model for the design of leachate collection and management systems (LCMS).

APPLICABLE RULES/STATUTES

MSW: OAC 3745-27-08(C)(3)(c)
OAC 3745-27-08(D)(17)
ISW: OAC 3745-29-08(C)(3)(c)
OAC 3745-29-08(D)(17)
RSW: OAC 3745-30-07(C)(3)(b)
OAC 3745-30-07(C)(3)(f)(v)
Tires: OAC 3745-27-72(C)(4)(b)(ii)
OAC 3745-27-72(C)(5)(b)

APPLICABILITY

This document applies to owners and operators of municipal (MSW), industrial (ISW), and residual (RSW) solid waste landfills and scrap tire monofills.

DETAILED DISCUSSION

The rules require that the LCMS be designed to limit the level of leachate to one foot (other than at sumps or lift stations) throughout the operational and post closure periods. The maximum head requirement is applied to each point within the facility and is not averaged across the entire facility. The rules also require that storage structures have a minimum of one week of storage capacity calculated under final cap system conditions. Leachate generation calculations can also be used in estimating post-closure care costs for transport and treatment.

To meet these requirements, it is necessary for the designer to predict the amount of leachate which will be generated and collected by the LCMS. The designer can use any method that provides reasonable results based on professional judgement. The most widely used method is the HELP model which is a computerized water balance analysis.

Although the HELP model was developed primarily to provide landfill designers with a tool for rapid, economical screening of alternative designs, it is typically used to calculate leachate generation rates. When used for this purpose, it is necessary to pay particular attention to selection of the input values used in running the program, whether equilibrium is reached, and the output values used for evaluation.

Data validation

Using a computer model, it is important to check the output to confirm that the results are valid.

Average monthly values and their standard deviations can be used to determine whether the precipitation, runoff, and evapotranspiration estimates are reasonable. The values entered for precipitation and evapotranspiration are compared to monthly average values available from the National Climatic Data Center (http://lwf.ncdc.noaa.gov/oa/ncdc.html) for weather stations near the landfill. Estimates of runoff are evaluated to determine their reasonableness given the general climate for the state where the landfill is located.

The estimates of average annual lateral drainage from each drainage layer can be used to determine whether flow and moisture equilibrium have been reached by the model. If no flow is predicted in a lateral drainage layer, it is likely that flow equilibrium has not been reached during the simulation. This can happen if the model is run for five years or less.

The change in water storage also is an indication of whether moisture and flow equilibrium has been reached during the simulation. A large positive value indicates that water is still accumulating in the landfill profile. A negative number (typical of arid areas) indicates that water is being lost from the landfill profile. The model should be run at least until moisture equilibrium is reached (e.g., 100 years). The number of years run in the HELP model are not necessarily related to the proposed life of the landfill.

Data on final water storage at the end of the model run can be used to support the determination that moisture and flow equilibrium have been reached. If the final water storage does not change as the length of the model run increases, then equilibrium has been reached. If longer time periods are simulated using multiple sequential model runs, the final water storage values should be used as input for the initial moisture content for each layer in subsequent model runs.

Designing the leachate collection system

To design the LCMS (i.e., filter layer, protective/drainage layer, collection pipes, pump, conveyance pipes, storage containers, etc.) to limit the level of leachate to one foot, many designers use an "open" landfill consisting of ten feet of waste and daily cover. The Peak Daily output value is typically used to verify that the design standard is met because it reflects the high level of leachate production.

DSIWM has observed from landfill data, that applying a multiplier of 2 to the Average Annual output value will result in an LCMS design that will be sufficient to accommodate the annual average volume of leachate collected; and a multiplier of 6 will be sufficient to accommodate the annual peak volume of leachate collected.

Sizing leachate storage structures

Sizing of storage structures is based on the landfill under final cap system conditions. Either the Peak Daily output can be used and multiplied by 7 to make a week, or the Peak Average Monthly output value can be used and divided by 4 to make a week.

DSIWM recommends, however, that sizing of storage structures be based on operating landfill conditions. Storage structures sized for a landfill under final cap system conditions, when leachate generation rates are much lower, could be woefully inadequate and cause difficulties for the operator scheduling leachate removal and disposal, especially during peak generation.

Estimating post-closure care costs

To estimate the costs of leachate management during the post-closure care period, the Average Annual output value can be used.

Note, however, that the HELP model is a poor predictor of leachate collected immediately after closure.

If the landfill has a final cap that does not include a flexible membrane liner, DSIWM has observed from landfill data that multiplying the Average Annual output value by a multiplier of 40 to 75 matched the actual leachate collected. The multiplier of 75 is more appropriate for the first few years after closure.

REFERENCES

Krantz, Bernard J. and Sharon L. Bailey, P.E. September 19 & 20, 1990. "An Evaluation of Predictive Models Ability to Estimate Leachate Generation, " Thirteenth Annual Madison Waste Conference, University of Wisconsin-Madison.

Schroeder, P.R., C.M. Lloyd, P.A. Zappi, and N.M. Aziz. 1994. "The Hydrogeologic Evaluation of Landfill Performance (HELP) Model: User's Guide for Version 3," EPA/600/R-94/168a, U.S. Environmental Protection Agency Risk Reduction Engineering Laboratory, Cincinnati, Ohio.

U.S. EPA. 1995. "Evaluation of Subtitle D Landfill Designs Using the HELP and MULTIMED Models: Addendum," U.S. Environmental Protection Agency, Office of Solid Waste, Washington DC.

POINT OF CONTACT

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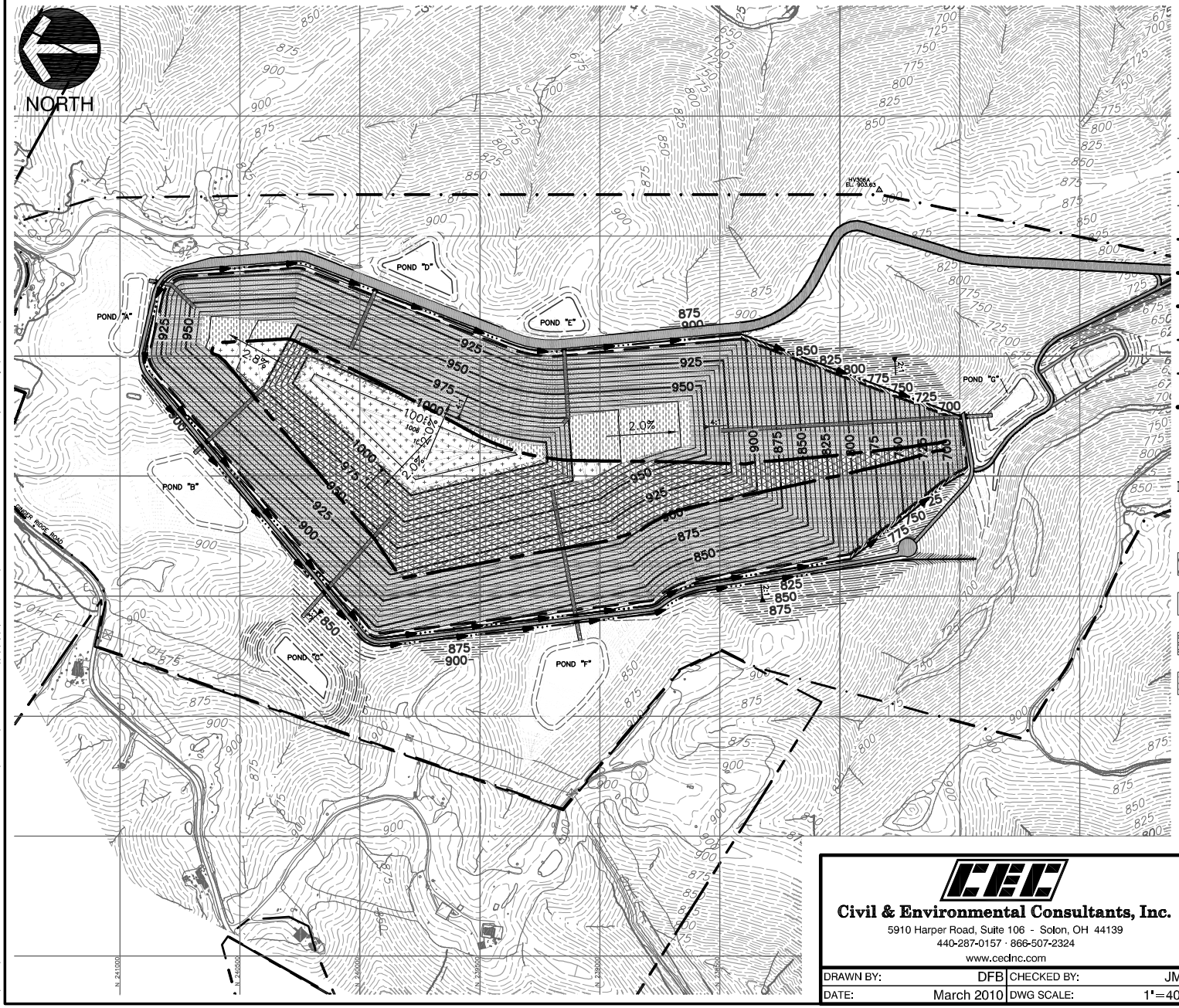
DISCLAIMER

The procedures set out in this document are intended solely for guidance of government personnel. The procedures are not intended and cannot be relied upon to create rights, substantive or procedural, enforceable by any party against Ohio EPA. While this guidance document is not legally binding, all statutes and rules referenced herein are binding and enforceable. Ohio EPA reserves the right to vary this guidance or to change it at any time without public notice and also reserves the right to deviate from this guidance on a case-by-case basis.

Attachment 4

Figure 1



DP&L

LEGEND

- EXISTING CONTOUR (700)
- PROPOSED CONTOUR WITHIN WASTE LIMITS (725)
- PROPOSED CONTOUR OUTSIDE WASTE LIMITS (850)
- PROPERTY LINE
- PROPOSED LIMITS OF WASTE
- FACILITY BOUNDARY
- PROPOSED DITCH
- PROPOSED NORMAL WATER SURFACE
- RECOMPACTED SOIL LINER GRADE BRAKE
- HV306A EL. 903.63 — AERIAL SURVEY CONTROL POINTS
- PROPOSED HAUL/ACCESS ROAD
- ROCK CHANNEL PROTECTION
- HELP MODEL PROFILE – SHALLOW CAP OVER SHALLOW LINER (6 AC)
- HELP MODEL PROFILE – SHALLOW CAP OVER LINER SIDE SLOPE (3 AC)
- HELP MODEL PROFILE – CAP SIDE SLOPE OVER SHALLOW LINER (16 AC)
- HELP MODEL PROFILE – CAP SIDE SLOPE OVER LINER SIDE SLOPE (48 AC)

SCALE IN FEET
0 400 800

CEC
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THE DAYTON POWER AND LIGHT COMPANY
J.M. STUART STATION
CARTER HOLOW LANDFILL
SPRIGG TOWNSHIP, ADAMS CO., OHIO

HELP MODEL
PROFILE AREAS

DRAWN BY:	DFB	CHECKED BY:	JML	APPROVED BY:	PCC	FIGURE NO.:
DATE:	March 2010	DWG SCALE:	1"=400'	PROJECT NO:	071-644	1

P:\2007\071-644 DP&L CARTER HOLLOW LANDFILL\DESIGN\CALCULATIONS\(C)(6)(C) LEACHATE\071-644_HELP MODEL AREAS.DWG[LAYOUT1] (JLYNDON) – MAR 5, 2010 – 17:12:37

LEACHATE COLLECTION PIPE SIZING CALCULATION

(Taken from the existing PTI Permit Application for the Carter Hollow Landfill)

CALCULATION BRIEF

CARTER HOLLOW LANDFILL
PERMIT MODIFICATION - 2016 DESIGN CHANGES
(C)(6)(f) LEACHATE COLLECTION PIPE SIZING

OBJECTIVE: **Demonstrate that the proposed design of the leachate collection pipes can adequately convey flow from the leachate collection layer and chimney drains to the leachate collection pond at Carter Hollow Landfill (Carter Hollow).**

REFERENCE:

1. "Permit Drawings for Class III Residual Waste Disposal Facility; J.M. Stuart Station – Carter Hollow Landfill; Sprigg Township; Adams County, Ohio;" prepared for The Dayton Power and Light Company; prepared by Civil & Environmental Consultants, Inc.; last revised on April 2016.

2. "Leachate Generation", Carter Hollow Permit to Install prepared by Civil & Environmental Consultants, Inc., March 2010.

3. "Chimney Drain Evaluation", Carter Hollow Landfill Permit Alteration Application; prepared by Civil & Environmental Consultants, Inc., May 2016.

4. "Second Edition Handbook of PE Pipe", Plastics Pipe Institute, Inc, 2015.

METHODOLOGY:

Determine the required size of leachate piping in the leachate collection layer using the anticipated peak leachate generation rates from the waste and the anticipated flows from the proposed chimney drains. Use the proposed permit drawing set (Reference No. 1) to determine the critical leachate collection pipe segments

ANALYSIS:

From the Leachate Generation Calculation Brief (Reference No. 2) the maximum flow from the leachate collection layer was determined to be approximately 570 cubic feet per acre per day (cu. ft./acre/day). The flow through the leachate collection area depends on the open area. Therefore, for each construction phase the flow through the leachate collection area was estimated by:

$$\frac{570\ \text{cu.ft.}}{\text{acre day}} \times \frac{1\ \text{day}}{86{,}400\ \text{sec}} \times ConstructionPhaseOpenArea = FlowThroughCollectionLayer\ (\text{cfs})$$

The maximum flow through the leachate collection layer will occur in the pipe segment exiting each construction phase. This critical segment of pipe must be sized to convey flow from the entire construction phase (e.g., Phase 1A, 1B, 2, 3, or 4) and assumes all of the chimney drains for a particular phase are open. Proposed chimney drain locations for are included on Figures 1-5 provided at the end of this calculation brief. CEC assumes the chimney drains are flowing at full capacity with the maximum possible flow exiting the chimney drains as the controlling flow of 3.072 cfs (Ref. No. 3). The flow required to be conveyed by the leachate collection pipes for each phase was estimated as follows:

$$Q_{Required} = FlowThroughCollectionLayer\ (\text{cfs}) + \text{No. of Chimney Drains} \times 3.072\ \text{cfs}$$

The following table summarizes the open area, flow through the leachate collection layer, and the number of open chimney drains for each phase of the landfill.

Construction Phase	Open Area (acres)	Flow Through Collection Layer (cfs)	No. of Chimney Drains	Chimney Drain Flow (cfs)	Flow Capacity Required (cfs)
1A	20	0.132	5	15.36	15.49
1B	24	0.158	6	18.43	18.59
2	33	0.218	6	18.43	15.65
3	36	0.238	6	18.43	18.67
4	40	0.264	16	49.15	49.42

Using Manning's equation, flow capacity for the proposed leachate collection pipe to use in the leachate collection layer can be determined as follows:

$$Q = A * \frac{1.49}{n} * \left(\frac{A}{P}\right)^{(2/3)} * \sqrt{S}$$

Where:

Q = Discharge (cfs);
A = Area of pipe (ft^2); = $(\pi/4) * D^2$
D = Pipe diameter (ft);
n = Manning's roughness coefficient;

P = Wetted perimeter (ft);
S = Minimum design slope of leachate collection pipes (ft/ft);

Leachate Collection Pipes

The leachate collection system piping at Carter Hollow Landfill consists of 12-inch diameter HDPE pipes laid along the toe of the side slopes and through the center of the floor. Based on the proposed leachate chimney drain and leachate collection-piping layout, a critical leachate collection pipe segment was identified and analyzed for each construction phase. Critical pipe segments are identified on the attached Figures. Each critical segment was identified because it collected flow from the maximum number of open chimney drains. If multiple lines accepted the flow from the same number of chimney drains, the pipe with the lesser pipe slope was identified as critical.

CEC used Manning's equation to estimate the number of 12-inch diameter pipes required to convey flow from the leachate collection layer and the chimney drains. Using the Plastic Pipe Institute's (PPI) design manual (Reference No. 5), the inside diameter for a 12-inch diameter standard dimension ratio (SDR) 11 plastic pipe is 10.29 inches.

The flow capacity and number of pipes required to convey leachate through the collection system are summarized in Attachment No. 3. Construction Phase 1A has a maximum of two chimney drains open along any leachate collection pipe and a single 12-inch leachate collection pipe can adequately convey flow. Construction Phases 1B through 3 require a single 12-inch leachate collection pipe along the toe of the side slopes and 3 leachate collection pipes through the center of the floor. As shown, the critical leachate pipe segment exiting Phase 4 requires seven, 12-inch diameter pipes to convey flow through the leachate collection layer due to the relatively high number of open chimney drains. However, not all chimney drains in the Phase 4 area will be open at one time. For construction cost purposes, CEC limited the number of leachate collection pipes for in any give segment to 3 and determined the maximum number of chimney drains that can be open in Phase 4. CEC recommends that no more than seven chimney drains be open during any construction phase (See Attachment No. 3) in order for three 12-inch diameter leachate collection pipes to adequately convey leachate to the collection pond.

Leachate Transmission Pipe

CEC used Manning's equation to determine if the proposed 24-inch diameter SDR 26 HDPE leachate transmission pipe can adequately convey flow construction Phase 3 to the leachate collection pond. Similar to the previous analysis, Reference No. 5 was used to determine the inside diameter of a 24-inch diameter SDR 26 pipe. Additionally, CEC assumed that a

maximum of 7 chimney drains are open during any construction phase at Carter Hollow Landfill. Output for the leachate transmission line calculation has been in included in Attachment No. 3.

CONCLUSION: Leachate flows from each phase of construction for the Carter Hollow Landfill was evaluated. The main leachate conveyance piping (i.e., along the center of the floor) will require three 12-inch diameter leachate collection pipes after Phase 1A. Lateral leachate collection pipes can also be installed and convey flow from a maximum of two chimney drains. Additionally, a single 24-inch diameter pipe can convey flow from the Phase 3 sump area to the Leachate Pond.

FIGURES

FIGURE 1

PHASE 1A LEACHATE COLLECTION PIPE LAYOUT

CONSTRUCTION NOTES:

1. EXCAVATE AND FILL PHASE TO LIMITS AS SHOWN. INSTALL UNDERDRAIN, PLACE STRUCTURAL FILL IN DESIGNATED AREAS, AND CONSTRUCT LINER SYSTEM AND LEACHATE MANAGEMENT SYSTEM.
2. INSTALL GROUNDWATER MONITORING WELLS UAS–1, UAS–7, UDS–1, D–1/S–1, AND D–2/S–2.
3. SOIL STOCKPILES MAY BE CONSTRUCTED AS NEEDED OR TO LESSER EXTENTS SHOWN ON THE DRAWINGS.

GENERAL OPERATION NOTES:

1. THE BASE GRADES SHOWN IN THE CONSTRUCTED PHASE ARE THE TOP OF LEACHATE COLLECTION LAYER. GRADES SHOWN IN WASTE PLACEMENT PHASES ARE TOP OF WASTE.
2. THE MAXIMUM EXTENT OF EACH PHASE IS SHOWN ON THESE PHASING DRAWINGS. PHASES MAY BE DIVIDED INTO SEPARATE SUB–PHASES OR CONSTRUCTED IN THEIR ENTIRETY DEPENDING ON ANTICIPATED FILLING RATE, CONSTRUCTION SCHEDULING AND SEASONAL CONSTRUCTION FEASIBILITY. SUBDIVIDING PHASES REQUIRES PRIOR OEPA APPROVAL.
3. THE WASTE ELEVATIONS SHOWN ARE THE MAXIMUM PROPOSED TOP OF WASTE GRADES. FILLING MAY STOP SHORT OF THESE GRADES. TRANSITIONS BETWEEN AND TYPICAL FILLING OPERATIONS OF PHASES REQUIRES CONSULTATION WITH OEPA TO INSURE THAT THE FINAL SLOPE WITHIN THE PREVIOUS PHASE IS CONSTRUCTED TO MAXIMUM EXTENT. SOLID WASTE MAY BE PLACED IN SUBSEQUENT PHASES PRIOR TO THE COMPLETION OF PREVIOUS PHASES TO PROVIDE FROST PROTECTION, SURFACE WATER DRAINAGE OR FOR PROPER OPERATION OF THE FACILITY. REMAINING AIRSPACE WITHIN PREVIOUS PHASES WILL BE FILLED TO THE PERMITTED GRADES AS QUICKLY AS POSSIBLE.
4. LOCATIONS OF TEMPORARY HAUL ROADS ARE APPROXIMATE AND MAY BE ADJUSTED BASED ON FIELD CONDITIONS, WEATHER AND WASTE ACCEPTANCE RATES. HAUL ROAD WILL BE INSTALLED WITH PROPER APPURTENANCES FOR STORM WATER CONTROL
5. SURFACE WATER FLOW PATTERNS ARE APPROXIMATE AND ARE SHOWN HERE TO SHOW GENERAL FLOW DIRECTIONS. CHANNELS, CULVERTS, BERMS, ETC. SHALL BE CONSTRUCTED AND MAINTAINED AS NECESSARY TO DIRECT RUN–OFF TO THE SURFACE WATER MANAGEMENT SYSTEM. TEMPORARY EROSION CONTROLS SUCH AS SILT FENCE, STRAW BALE DIKES, STRAW WATTLES, AND SEEDING WILL BE INSTALLED AS NECESSARY TO REDUCE EROSION AND SEDIMENTATION.
6. FINAL COVER WILL BE INSTALLED OVER AREAS OF THE PHASE THAT HAVE REACHED PERMITTED FINAL ELEVATIONS FOR SOLID WASTE PLACEMENT. THE EXTENT OF FINAL COVER CONSTRUCTED IN ANY GIVEN CONSTRUCTION SEASON WILL BE BASED ON CONSTRUCTION CONSIDERATIONS SUCH AS SURFACE WATER MANAGEMENT, FUTURE TIE–INS, AND ACCESSIBILITY.
7. WASTE PLACED DURING LANDFILL OPERATION SHALL BE GRADED SUCH THAT SURFACE WATER DRAINS TO THE CHIMNEY DRAINS WITHIN THE LANDFILL, AWAY FROM THE LANDFILL PERIMETER BOUNDARIES.
8. TACK–ON BERMS SHALL BE CONSTRUCTED ON THE SOUTHERN INTERMEDIATE SLOPE TO DIRECT RUN–OFF EAST AND WEST TO THE ESTABLISHED STORMWATER CONVEYANCE CHANNELS LEADING TO POND G.
9. TEMPORARY WASTE PLACEMENT PERIMETER BERMS MAY BE CONSTRUCTED AS PART OF FUTURE LANDFILL OPERATIONS TO DIVERT NON–CONTACT STORMWATER. THE LANDFILL OPERATOR SHALL CONFIRM THAT ANY WASTE IS SUFFICIENTLY COVERED WITH SOIL AND/OR VEGETATION PRIOR TO CONVEYING STORMWATER TO THE LANDFILL STORMWATER SYSTEM.

NORTH

El. 805 ft.

Phase 1A Open Area = 20 Acres

Phase 1A Critical Pipe Segment

El. 770 ft.

1A

1B

PROPOSED HIGH VISIBILITY PROTECTIVE FENCE AND "WETLAND–KEEP OUT" SIGN

HV205A EL. 913.73

HV306A EL. 903.63

HV305A EL. 916.64

C 7A STORMWATER CHANNEL 1

K 7A LEACHATE COLLECTION PIPE SECTION

B 7A HAUL/ACCESS ROAD

H 7A I 7A ZZ 7A AAA 7A SIDE SLOPE LINER

L 7A TYPICAL LEACHATE COLLECTION PIPE AT TOE OF SLOPE

A 7A TYPICAL PERIMETER BERM SECTION

STORMWATER CHANNEL 3 C 7A

M 7A LEACHATE CLEANOUT PIPE

CCC 7G CHIMNEY DRAIN

STORMWATER CHANNEL 2 C 7A

TYPICAL LEACHATE COLLECTION PIPE AT TOE OF SLOPE L 7A

SEDIMENT TRAP

STORMWATER CHANNEL 5 C 7A

GINGER RIDGE ROAD

DDD 7G SIDE SLOPE INTERIOR PHASING BERM AT LINER TERMINATION

EEE 7G INTERIOR PHASE BERM

GGG 7G LEACHATE TRANSMISSION PIPE ABOVE GROUND DETAIL

LEACHATE TRANSMISSION PIPE ABOVE GROUND DETAIL GGG 7G

D-2/S-2

UAS-1

F 7A G 7A BOTTOM LINER

GRADE TO DRAIN

D-1/S-1

BASIN LINER ANCHOR TRENCH DETAIL PP 7F

PROPOSED SOIL STOCKPILE AREA

C 7A STORMWATER CHANNEL 1D

STORMWATER POND G MM 7E

STORMWATER CHANNEL 13 C 7A

CULVERT

POND G FORBAY

TEMPORARY ACCESS ROAD

C 7A STORMWATER CHANNEL 9

WW 7A LEACHATE TRANSMISSION PIPE

MM 7E LEACHATE POND

PIPE TO PLANT

UDS-1

UAS-7

RR 7F BASIN LINER OUTLET PIPE PENETRATION DETAIL

BBB 7F LEACHATE POND LINER DETAIL

QQ 7F BASIN LINER INLET PIPE PENETRATION DETAIL

C 7A STORMWATER CHANNEL 11

HHH 7G LEACHATE TRANSMISSION PIPE BELOW GROUND DETAIL

SCALE IN FEET

0 200 400

DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

REF: EXISTING SITE TOPOGRAPHIC SURVEY WAS PROVIDED TO CIVIL & ENVIRONMENTAL CONSULTANTS, INC. BY THE DAYTON POWER AND LIGHT COMPANY IN THE FILE NAMED "CARTER HOLLOW TOPO APRIL 2013.XML". CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.

STATE OF OHIO
ANTHONY P. AMICON
E–58805
REGISTERED
PROFESSIONAL ENGINEER
6-9-14

SUBMITTAL RECORD

NO	DATE	DESCRIPTION
1	04/07/2010	INITIAL PERMIT TO INSTALL APPLICATION

REVISION RECORD

NO	DATE	DESCRIPTION
1	09/02/2010	OEPA NOD1
2	02/14/2011	OEPA NOD2
3	07/01/2015	PTI ALTERATION REQUEST TO ELIMINATE UNDERDRAIN CLEANOUTS
4	06/2016	PTI ALTERATION TO REQUEST 2016 DESIGN CHANGES

3745–30–05 (B)(6) RULE REFERENCE		DRAWING LOCATION
(a)	LOCATION OF GROUND WATER MONITORING WELLS, PIEZOMETERS, EXPLOSIVE GAS PERMANENT MONITORS, LEACHATE COLLECTION AND MANAGEMENT STRUCTURES, OR SURFACE WATER CONTROL STRUCTURES	6A THRU 6E
(b)	EXTENT OF WASTE PLACEMENT FOR THAT PHASE	6A THRU 6E
(c)	CONTOURS OF ANY PREVIOUSLY FILLED PHASES	6A THRU 6E
(d)	LIMITS OF FINAL COVER AND INTERMEDIATE COVER ON PREVIOUSLY FILLED PHASES	6A THRU 6E
(e)	CONTOURS OF THE BOTTOM LIMITS OF SOLID WASTE PLACEMENT FOR THE DEPICTED PHASE	6A THRU 6E
(f)	LOCATION OF ACCESS ROADS FOR THE DEPICTED PHASE	6A THRU 6E
(g)	PERMANENT AND TEMPORARY MEASURES TO BE UTILIZED TO CONTROL SURFACE WATER RUN–ON AND RUN–OFF, EROSION, AND ANY TEMPORARY OR PERMANENT GROUND WATER CONTROL STRUCTURES	6A THRU 6E

DP&L

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR WITHIN WASTE LIMITS
- PROPOSED CONTOUR OUTSIDE WASTE LIMITS
- EXISTING OVERHEAD POWER LINE
- EXISTING STREAM
- PROPERTY LINE
- PROPOSED LIMITS OF RESIDUAL WASTE
- FACILITY BOUNDARY
- PROPOSED CHANNEL
- LCP PROPOSED LEACHATE COLLECTION PIPE
- LCO PROPOSED LEACHATE CLEANOUT PIPE
- LTP PROPOSED LEACHATE TRANSMISSION PIPE
- PROPOSED CHIMNEY DRAIN
- PROPOSED NORMAL WATER SURFACE ELEVATION
- ANCHOR TRENCH
- PROPOSED CLEANOUT LOCATION
- UAS-1 PROPOSED MONITORING WELLS
- UDS-1 PROPOSED UNDERDRAIN MONITORING POINT
- HV306A EL. 903.63 AERIAL SURVEY CONTROL POINT
- PROPOSED ACCESS/HAUL ROAD
- TEMPORARY HAUL/ACCESS ROAD
- 1B PHASE ID
- INTERMEDIATE COVER
- FINAL COVER
- ROCK CHANNEL PROTECTION

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PERMIT TO INSTALL APPLICATION
THE DAYTON POWER AND LIGHT COMPANY
J.M. STUART STATION
CARTER HOLLOW LANDFILL
SPRIGG TOWNSHIP, ADAMS CO., OHIO

DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	1"=200	PROJECT NO:	071-644

PHASE 1A DEVELOPMENT PLAN

DRAWING NO.: 6A

SHEET 21A OF 30

G:\PROJECTS\2007\071-644\PERMIT\DWG\MXD2\PTI-6A 071644.DWG(PTI-6A PHASE ONE DEVELOPMENT PLAN) (LINDOU) - FEB 4, 2011 - 15:16:45

FIGURE 2

PHASE 1B LEACHATE COLLECTION PIPE LAYOUT

NORTH

CONSTRUCTION NOTES:

1. CONTINUE WASTE FILING IN EXISITING UNIT.
2. CONSTRUCT LINER SYSTEM, PERIMETER BERMS, AND LEACHATE CONVEYANCE LINE FOR NEXT PHASE. TIE PHASED LINER SYTEMS AND LEACAHTE COLLECTION SYSTEM INTO EXISTING.
3. SOIL STOCKPILES MAY BE CONSTRUCTED AS NEEDED OR TO LESSER EXTENTS SHOWN ON THE DRAWINGS.

GENERAL OPERATION NOTES:

1. THE BASE GRADES SHOWN IN THE CONSTRUCTED PHASE ARE THE TOP OF LEACHATE COLLECTION LAYER. GRADES SHOWN IN WASTE PLACEMENT PHASES ARE TOP OF WASTE.
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4. LOCATIONS OF TEMPORARY HAUL ROADS ARE APPROXIMATE AND MAY BE ADJUSTED BASED ON FIELD CONDITIONS, WEATHER AND WASTE ACCEPTANCE RATES. HAUL ROAD WILL BE INSTALLED WITH PROPER APPURTENANCES FOR STORM WATER CONTROL
5. SURFACE WATER FLOW PATTERNS ARE APPROXIMATE AND ARE SHOWN HERE TO SHOW GENERAL FLOW DIRECTIONS. CHANNELS, CULVERTS, BERMS, ETC. SHALL BE CONSTRUCTED AND MAINTAINED AS NECESSARY TO DIRECT RUN-OFF TO THE SURFACE WATER MANAGEMENT SYSTEM. TEMPORARY EROSION CONTROLS SUCH AS SILT FENCE, STRAW BALE DIKES, STRAW WATTLES, AND SEEDING WILL BE INSTALLED AS NECESSARY TO REDUCE EROSION AND SEDIMENTATION.
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9. TEMPORARY WASTE PLACEMENT PERIMETER BERMS MAY BE CONSTRUCTED AS PART OF FUTURE LANDFILL OPERATIONS TO DIVERT NON-CONTACT STORMWATER. THE LANDFILL OPERATOR SHALL CONFIRM THAT ANY WASTE IS SUFFICIENTLY COVERED WITH SOIL AND/OR VEGETATION PRIOR TO CONVEYING STORMWATER TO THE LANDFILL STORMWATER SYSTEM.

Phase 1B Area = 24 Acres

El. 768 ft.

El. 730 ft.

749.241

1A

1B

HV205A EL. 915.73

HV305A EL. 916.64

HV306A EL. 903.63

PROPOSED HIGH VISIBILITY PROTECTIVE FENCE AND "WETLAND-KEEP OUT" SIGN

STORMWATER CHANNEL 1 (C 7A)

HAUL/ACCESS ROAD (B 7A)

TEMPORARY WASTE PLACEMENT PERIMETER BERM (FFF 7G)

SIDE SLOPE LINER (H 7A, I 7A, ZZ 7A, AAA 7A)

TYPICAL LEACHATE COLLECTION PIPE AT TOE OF SLOPE (L 7A)

LEACHATE COLLECTION PIPE SECTION (K 7A)

SLOPE TO DRAIN TOWARDS CHIMNEY DRAINS

STORMWATER CHANNEL 3 (C 7A)

STORMWATER CHANNEL 2 (C 7A)

CONNECT TO PHASE 1A LCP SYSTEM

SIDE SLOPE INTERIOR PHASING BERM AT LINER TERMINATION (DDD 7G)

INTERIOR PHASE BERM (EEE 7G)

LEACHATE TRANSMISSION PIPE ABOVE GROUND DETAIL (GGG 7G)

D-2/S-2

UAS-1

D-1/S-1

TEMPORARY WASTE PLACEMENT PERIMETER BERM (FFF 7G)

SEDIMENT TRAP

STORMWATER CHANNEL 5 (C 7A)

CHIMNEY DRAIN (CCC 7G)

DOWNCHUTE CHANNEL/SURFACE WATER CHANNEL/CULVERT (W 7C, X 7C)

POND C FOREBAY

PROPOSED STORMWATER POND LINER DETAIL (Z 7C)

GINGER RIDGE ROAD

CULVERT

SPUR ROAD

GRADE TO DRAIN

BOTTOM LINER (F 7A, G 7A)

STORMWATER CHANNEL 7 (C 7A)

TYPICAL LEACHATE COLLECTION PIPE AT TOE OF SLOPE (L 7A)

SIDE SLOPE INTERIOR PHASING BERM AT LINER TERMINATION (DDD 7G)

STORMWATER CHANNEL 6 (C 7A)

STORMWATER POND C (II 7D)

LEACHATE CLEANOUT PIPE (M 7A)

POND C LINER (YY 7C)

TYPICAL PERIMETER BERM SECTION (A 7A)

BASIN LINER ANCHOR TRENCH DETAIL (PP 7F)

PROPOSED SOIL STOCKPILE AREA

STORMWATER CHANNEL 1D (C 7A)

STORMWATER POND G (MM 7E)

STORMWATER CHANNEL 13 (C 7A)

POND G FORBAY

TEMPORARY ACCESS ROAD

STORMWATER CHANNEL 9 (C 7A)

LEACHATE TRANSMISSION PIPE (WW 7A)

PROPOSED SOIL STOCKPILE AREA

LEACHATE POND (MM 7E)

PIPE TO PLANT

BASIN LINER OUTLET PIPE PENETRATION DETAIL (RR 7F)

LEACHATE POND LINER DETAIL (BBB 7F)

BASIN LINER INLET PIPE PENETRATION DETAIL (QQ 7F)

STORMWATER CHANNEL 11 (C 7A)

LEACHATE TRANSMISSION PIPE BELOW GROUND DETAIL (HHH 7G)

SUBMITTAL RECORD

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4	06/2016	PTI ALTERATION TO REQUEST 2016 DESIGN CHANGES

3745-30-05 (B)(6) RULE REFERENCE		DRAWING LOCATION
(a)	LOCATION OF GROUND WATER MONITORING WELLS, PIEZOMETERS, EXPLOSIVE GAS PERMANENT MONITORS, LEACHATE COLLECTION AND MANAGEMENT STRUCTURES, OR SURFACE WATER CONTROL STRUCTURES	6A THRU 6E
(b)	EXTENT OF WASTE PLACEMENT FOR THAT PHASE	6A THRU 6E
(c)	CONTOURS OF ANY PREVIOUSLY FILLED PHASES	6A THRU 6E
(d)	LIMITS OF FINAL COVER AND INTERMEDIATE COVER ON PREVIOUSLY FILLED PHASES	6A THRU 6E
(e)	CONTOURS OF THE BOTTOM LIMITS OF SOLID WASTE PLACEMENT FOR THE DEPICTED PHASE	6A THRU 6E
(f)	LOCATION OF ACCESS ROADS FOR THE DEPICTED PHASE	6A THRU 6E
(g)	PERMANENT AND TEMPORARY MEASURES TO BE UTILIZED TO CONTROL SURFACE WATER RUN-ON AND RUN-OFF, EROSION, AND ANY TEMPORARY OR PERMANENT GROUND WATER CONTROL STRUCTURES	6A THRU 6E

DP&L

LEGEND

- EXISTING CONTOUR (700)
- PROPOSED CONTOUR WITHIN WASTE LIMITS (700)
- PROPOSED CONTOUR OUTSIDE WASTE LIMITS (700)
- EXISTING OVERHEAD POWER LINE (OH-E)
- EXISTING STREAM
- PROPERTY LINE
- PROPOSED LIMITS OF RESIDUAL WASTE
- FACILITY BOUNDARY
- PROPOSED CHANNEL
- PROPOSED LEACHATE COLLECTION PIPE (LCP)
- PROPOSED LEACHATE CLEANOUT PIPE (LCO)
- PROPOSED LEACHATE TRANSMISSION PIPE (LTP) 4
- PROPOSED CHIMNEY DRAIN 4
- PROPOSED NORMAL WATER SURFACE ELEVATION
- ANCHOR TRENCH
- PROPOSED CLEANOUT LOCATION
- D1/S1 - UAS-7: PROPOSED MONITORING WELL/TRENCH BOX
- UDS-1: PROPOSED UNDERDRAIN MONITORING POINT 4
- HV306A EL. 903.63: AERIAL SURVEY CONTROL POINT
- PROPOSED ACCESS/HAUL ROAD
- TEMPORARY HAUL/ACCESS ROAD
- 1B: PHASE ID
- INTERMEDIATE COVER
- FINAL COVER
- ROCK CHANNEL PROTECTION
- UAS-1: EXISTING TRENCH BOX 4

4

STATE OF OHIO
ANTHONY P. AMICON
E-58805
REGISTERED PROFESSIONAL ENGINEER
6-9-16

SCALE IN FEET
0 200 400
DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

REF: EXISTING SITE TOPOGRAPHIC SURVEY WAS PROVIDED TO CIVIL & ENVIRONMENTAL CONSULTANTS, INC. BY THE DAYTON POWER AND LIGHT COMPANY IN THE FILE NAMED "CARTER HOLLOW TOPO APRIL 2013.XML". CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.

Civil & Environmental Consultants, Inc.
5910 Harper Road, Suite 106 - Solon, OH 44139
Ph: 440.287.0157 · 866.507.2324
www.cecinc.com

PERMIT TO INSTALL APPLICATION
THE DAYTON POWER AND LIGHT COMPANY
J.M. STUART STATION
CARTER HOLLOW LANDFILL
SPRIGG TOWNSHIP, ADAMS CO., OHIO

DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	1"=200	PROJECT NO:	071-644

PHASE 1B DEVELOPMENT PLAN

DRAWING NO.: 6B

SHEET 21B OF 30

G:\PROJECTS\2007\071-644\PERMIT\DWG\W202\PTI-64 071644.DWG\PTI-64 PHASE ONE DEVELOPMENT PLAN (LANDFILL) - FEB 4, 2011 - 15:16:45

FIGURE 3

PHASE 2 LEACHATE COLLECTION PIPE LAYOUT

NORTH

CONSTRUCTION NOTES:

1. CONTINUE WASTE FILLING IN EXISTING UNIT.
2. INSTALL GROUNDWATER MONITORING WELLS UAS–3, D–3/S–3, AND D–4/S–4.
3. ABANDON GROUNDWATER MONITORING WELLS UAS–1, D–1/S–1, AND D–2/S–2.
4. CONSTRUCT LINER SYSTEM, PERIMETER BERMS, AND LEACHATE CONVEYANCE LINE FOR NEXT PHASE. TIE PHASED LINER SYTEMS AND LEACAHTE COLLECTION SYSTEM INTO EXISTING.
5. SOIL STOCKPILES MAY BE CONSTRUCTED AS NEEDED OR TO LESSER EXTENTS SHOWN ON THE DRAWINGS.

GENERAL OPERATION NOTES:

1. THE BASE GRADES SHOWN IN THE CONSTRUCTED PHASE ARE THE TOP OF LEACHATE COLLECTION LAYER. GRADES SHOWN IN WASTE PLACEMENT PHASES ARE TOP OF WASTE.
2. THE MAXIMUM EXTENT OF EACH PHASE IS SHOWN ON THESE PHASING DRAWINGS. PHASES MAY BE DIVIDED INTO SEPARATE SUB–PHASES OR CONSTRUCTED IN THEIR ENTIRETY DEPENDING ON ANTICIPATED FILLING RATE, CONSTRUCTION SCHEDULING AND SEASONAL CONSTRUCTION FEASIBILITY. SUBDIVIDING PHASES REQUIRES PRIOR OEPA APPROVAL.
3. THE WASTE ELEVATIONS SHOWN ARE THE MAXIMUM PROPOSED TOP OF WASTE GRADES. FILLING MAY STOP SHORT OF THESE GRADES. TRANSITIONS BETWEEN AND TYPICAL FILLING OPERATIONS OF PHASES REQUIRES CONSULTATION WITH OEPA TO INSURE THAT THE FINAL SLOPE WITHIN THE PREVIOUS PHASE IS CONSTRUCTED TO MAXIMUM EXTENT. SOLID WASTE MAY BE PLACED IN SUBSEQUENT PHASES PRIOR TO THE COMPLETION OF PREVIOUS PHASES TO PROVIDE FROST PROTECTION, SURFACE WATER DRAINAGE OR FOR PROPER OPERATION OF THE FACILITY. REMAINING AIRSPACE WITHIN PREVIOUS PHASES WILL BE FILLED TO THE PERMITTED GRADES AS QUICKLY AS POSSIBLE.
4. LOCATIONS OF TEMPORARY HAUL ROADS ARE APPROXIMATE AND MAY BE ADJUSTED BASED ON FIELD CONDITIONS, WEATHER AND WASTE ACCEPTANCE RATES. HAUL ROAD WILL BE INSTALLED WITH PROPER APPURTENANCES FOR STORM WATER CONTROL
5. SURFACE WATER FLOW PATTERNS ARE APPROXIMATE AND ARE SHOWN HERE TO SHOW GENERAL FLOW DIRECTIONS. CHANNELS, CULVERTS, BERMS, ETC. SHALL BE CONSTRUCTED AND MAINTAINED AS NECESSARY TO DIRECT RUN–OFF TO THE SURFACE WATER MANAGEMENT SYSTEM. TEMPORARY EROSION CONTROLS SUCH AS SILT FENCE, STRAW BALE DIKES, STRAW WATTLES, AND SEEDING WILL BE INSTALLED AS NECESSARY TO REDUCE EROSION AND SEDIMENTATION.
6. FINAL COVER WILL BE INSTALLED OVER AREAS OF THE PHASE THAT HAVE REACHED PERMITTED FINAL ELEVATIONS FOR SOLID WASTE PLACEMENT. THE EXTENT OF FINAL COVER CONSTRUCTED IN ANY GIVEN CONSTRUCTION SEASON WILL BE BASED ON CONSTRUCTION CONSIDERATIONS SUCH AS SURFACE WATER MANAGEMENT, FUTURE TIE–INS, AND ACCESSIBILITY.
7. WASTE PLACED DURING LANDFILL OPERATION SHALL BE GRADED SUCH THAT SURFACE WATER DRAINS TO THE CHIMNEY DRAINS WITHIN THE LANDFILL, AWAY FROM THE LANDFILL PERIMETER BOUNDARIES.
8. TACK–ON BERMS SHALL BE CONSTRUCTED ON THE SOUTHERN INTERMEDIATE SLOPE TO DIRECT RUN–OFF EAST AND WEST TO THE ESTABLISHED STORMWATER CONVEYANCE CHANNELS LEADING TO POND G.
9. TEMPORARY WASTE PLACEMENT PERIMETER BERMS MAY BE CONSTRUCTED AS PART OF FUTURE LANDFILL OPERATIONS TO DIVERT NON–CONTACT STORMWATER. THE LANDFILL OPERATOR SHALL CONFIRM THAT ANY WASTE IS SUFFICIENTLY COVERED WITH SOIL AND/OR VEGETATION PRIOR TO CONVEYING STORMWATER TO THE LANDFILL STORMWATER SYSTEM.

Phase 2 Open Area = 33 Acres

Phase 2 Critical Pipe Segment

El. 735 ft.

928.7 ft

El. 693 ft.

HV205A EL. 915.73

HV306A EL. 903.63

SLOPE TO DRAIN TOWARDS CHIMNEY DRAINS

SEDIMENT TRAP

CONNECT TO PHASE 1B LCP SYSTEM

POND C FOREBAY

TEMPORARY ACCESS ROAD

POND G FORBAY

PROPOSED SOIL STOCKPILE AREA

PROPOSED SOIL STOCKPILE AREA

PIPE TO PLANT

UAS-7

UAS-3

D-4/S-4

D-3/S-3

CULVERT

B 7A HAUL/ACCESS ROAD

JJ 7E STORMWATER POND D

FFF 7G TEMPORARY WASTE PLACEMENT PERIMETER BERM

KK 7E STORMWATER POND E

M 7A LEACHATE CLEANOUT PIPE

C 7A STORMWATER CHANNEL 1

H 7A I 7A ZZ 7A AAA 7A SIDE SLOPE LINER

L 7A TYPICAL LEACHATE COLLECTION PIPE AT TOE OF SLOPE

BASIN LINER ANCHOR TRENCH DETAIL PP 7F

MM 7E LEACHATE POND

OO 7F STORMWATER RUN–ON PREVENTION DITCH

C 7A STORMWATER CHANNEL 1D

STORMWATER POND G MM 7E

STORMWATER CHANNEL 13 C 7A

RR 7F BASIN LINER OUTLET PIPE PENETRATION DETAIL

BBB 7F LEACHATE POND LINER DETAIL

QQ 7F BASIN LINER INLET PIPE PENETRATION DETAIL

CCC 7G CHIMNEY DRAIN

EEE 7G INTERIOR PHASE BERM

C 7A STORMWATER CHANNEL 11

HHH 7G LEACHATE TRANSMISSION PIPE BELOW GROUND DETAIL

WW 7A LEACHATE TRANSMISSION PIPE

GGG 7G LEACHATE TRANSMISSION PIPE ABOVE GROUND DETAIL

F 7A G 7A BOTTOM LINER

L 7A TYPICAL LEACHATE COLLECTION PIPE AT TOE OF SLOPE

A 7A TYPICAL PERIMETER BERM SECTION

OO 7F STORMWATER RUN–ON PREVENTION DITCH

K 7A LEACHATE COLLECTION PIPE SECTION

LL 7E STORMWATER POND F

STORMWATER CHANNEL 3 C 7A

STORMWATER CHANNEL 2 C 7A

STORMWATER CHANNEL 5 C 7A

DOWNCHUTE CHANNEL DETAILS V 7C W 7C X 7C

PROPOSED STORMWATER POND LINER DETAIL Z 7C

TEMPORARY WASTE PLACEMENT PERIMETER BERM FFF 7G

II 7D STORMWATER POND C

YY 7C POND C LINER

STORMWATER CHANNEL 6 C 7A

SUBMITTAL RECORD

NO	DATE	DESCRIPTION
1	04/07/2010	INITIAL PERMIT TO INSTALL APPLICATION

REVISION RECORD

NO	DATE	DESCRIPTION
1	09/02/2010	OEPA NOD1
2	02/14/2011	OEPA NOD2
3	07/01/2015	PTI ALTERATION REQUEST TO ELIMINATE UNDERDRAIN CLEANOUTS
4	06/2016	PTI ALTERATION TO REQUEST 2016 DESIGN CHANGES

3745–30–05 (B)(6) RULE REFERENCE		DRAWING LOCATION
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(e)	CONTOURS OF THE BOTTOM OF LIMITS OF SOLID WASTE PLACEMENT FOR THE DEPICTED PHASE	6A THRU 6E
(f)	LOCATION OF ACCESS ROADS FOR THE DEPICTED PHASE	6A THRU 6E
(g)	PERMANENT AND TEMPORARY MEASURES TO BE UTILIZED TO CONTROL SURFACE WATER RUN–ON AND RUN–OFF, EROSION, AND ANY TEMPORARY OR PERMANENT GROUND WATER CONTROL STRUCTURES	6A THRU 6E

DP&L

LEGEND

- EXISTING CONTOUR
- 700 PROPOSED CONTOUR WITHIN WASTE LIMITS
- 700 PROPOSED CONTOUR OUTSIDE WASTE LIMITS
- OH–E EXISTING OVERHEAD POWER LINE
- EXISTING STREAM
- PROPERTY LINE
- PROPOSED LIMITS OF RESIDUAL WASTE
- FACILITY BOUNDARY
- PROPOSED CHANNEL
- LCP PROPOSED LEACHATE COLLECTION PIPE
- LCO PROPOSED LEACHATE CLEANOUT PIPE
- LTP PROPOSED LEACHATE TRANSMISSION PIPE 4
- PROPOSED CHIMNEY DRAIN 4
- PROPOSED NORMAL WATER SURFACE ELEVATION
- ANCHOR TRENCH
- PROPOSED CLEANOUT LOCATION
- UAS-1 PROPOSED MONITORING WELLS
- UDS-1 PROPOSED UNDERDRAIN MONITORING POINT 4
- HV306A EL. 903.63 AERIAL SURVEY CONTROL POINT
- PROPOSED ACCESS/HAUL ROAD
- TEMPORARY HAUL/ACCESS ROAD
- 2 PHASE ID
- INTERMEDIATE COVER
- FINAL COVER
- ROCK CHANNEL PROTECTION

STATE OF OHIO ANTHONY P. AMICON E–58805 REGISTERED PROFESSIONAL ENGINEER

SCALE IN FEET
0 200 400
DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

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SPRIGG TOWNSHIP, ADAMS CO., OHIO

DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	1"=200	PROJECT NO:	071-644

PHASE 2 DEVELOPMENT PLAN

DRAWING NO.: 6C

SHEET 22 OF 30

G:\PROJECTS\2007\071-644\PERMIT\DWG\VOL1\PTI-6B 071644.DWG[6B] (BMORMAN) - OCT 26, 2010 - 16:41:34

FIGURE 4

PHASE 3 LEACHATE COLLECTION PIPE LAYOUT

NORTH

CONSTRUCTION NOTES:

1. CONTINUE WASTE FILLING IN EXISTING UNIT.
2. INSTALL GROUNDWATER MONITORING WELLS UAS-5, D-5/S-5, AND D-6/S-6.
3. ABANDON GROUNDWATER MONITORING WELLS UAS-3, D-3/S-3, AND D-4/S-4.
4. CONSTRUCT LINER SYSTEM, PERIMETER BERMS, AND LEACHATE CONVEYANCE LINE FOR NEXT PHASE. TIE PHASED LINER SYTEMS AND LEACAHTE COLLECTION SYSTEM INTO EXISTING.
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4. LOCATIONS OF TEMPORARY HAUL ROADS ARE APPROXIMATE AND MAY BE ADJUSTED BASED ON FIELD CONDITIONS, WEATHER AND WASTE ACCEPTANCE RATES. HAUL ROAD WILL BE INSTALLED WITH PROPER APPURTENANCES FOR STORM WATER CONTROL
5. SURFACE WATER FLOW PATTERNS ARE APPROXIMATE AND ARE SHOWN HERE TO SHOW GENERAL FLOW DIRECTIONS. CHANNELS, CULVERTS, BERMS, ETC. SHALL BE CONSTRUCTED AND MAINTAINED AS NECESSARY TO DIRECT RUN-OFF TO THE SURFACE WATER MANAGEMENT SYSTEM. TEMPORARY EROSION CONTROLS SUCH AS SILT FENCE, STRAW BALE DIKES, STRAW WATTLES, AND SEEDING WILL BE INSTALLED AS NECESSARY TO REDUCE EROSION AND SEDIMENTATION.
6. FINAL COVER WILL BE INSTALLED OVER AREAS OF THE PHASE THAT HAVE REACHED PERMITTED FINAL ELEVATIONS FOR SOLID WASTE PLACEMENT. THE EXTENT OF FINAL COVER CONSTRUCTED IN ANY GIVEN CONSTRUCTION SEASON WILL BE BASED ON CONSTRUCTION CONSIDERATIONS SUCH AS SURFACE WATER MANAGEMENT, FUTURE TIE-INS, AND ACCESSIBILITY.
7. WASTE PLACED DURING LANDFILL OPERATION SHALL BE GRADED SUCH THAT SURFACE WATER DRAINS TO THE CHIMNEY DRAINS WITHIN THE LANDFILL, AWAY FROM THE LANDFILL PERIMETER BOUNDARIES.
8. TACK-ON BERMS SHALL BE CONSTRUCTED ON THE SOUTHERN INTERMEDIATE SLOPE TO DIRECT RUN-OFF EAST AND WEST TO THE ESTABLISHED STORMWATER CONVEYANCE CHANNELS LEADING TO POND G.
9. TEMPORARY WASTE PLACEMENT PERIMETER BERMS MAY BE CONSTRUCTED AS PART OF FUTURE LANDFILL OPERATIONS TO DIVERT NON-CONTACT STORMWATER. THE LANDFILL OPERATOR SHALL CONFIRM THAT ANY WASTE IS SUFFICIENTLY COVERED WITH SOIL AND/OR VEGETATION PRIOR TO CONVEYING STORMWATER TO THE LANDFILL STORMWATER SYSTEM.

Phase 3 Open Area = 36 Acres

El. 693 ft.

El. 655 ft.

875.8 ft.

3

SLOPE TO DRAIN TOWARDS CHIMNEY DRAINS

CONNECT TO PHASE 2 LCP SYSTEM

SEDIMENT TRAP

POND C FOREBAY

PROPOSED STORMWATER POND LINER DETAIL

PROPOSED SOIL STOCKPILE AREA

DOWNCHUTE CHANNEL DETAILS

STORMWATER CHANNEL 1

STORMWATER CHANNEL 2

STORMWATER CHANNEL 3

STORMWATER CHANNEL 5

STORMWATER CHANNEL 6

STORMWATER CHANNEL 11

STORMWATER CHANNEL 13

STORMWATER POND C

STORMWATER POND D

STORMWATER POND E

STORMWATER POND F

STORMWATER POND G

LEACHATE POND

HAUL/ACCESS ROAD

SIDE SLOPE LINER

TEMPORARY WASTE PLACEMENT PERIMETER BERM

ROCK-LINED CHANNEL

TYPICAL PERIMETER BERM SECTION

BASIN LINER ANCHOR TRENCH DETAIL

BASIN LINER OUTLET PIPE PENETRATION DETAIL

BASIN LINER INLET PIPE PENETRATION DETAIL

LEACHATE POND LINER DETAIL

LEACHATE TRANSMISSION PIPE

LEACHATE TRANSMISSION PIPE BELOW GROUND DETAIL

LEACHATE COLLECTION LINE PENETRATION

LEACHATE COLLECTION PIPE

LEACHATE CLEANOUT PIPE

BOTTOM LINER

KICKER BERM

CHIMNEY DRAIN

POND C LINER

PIPE TO PLANT

CULVERT

HV205A EL. 915.73

HV306A EL. 903.63

UAS-5

UAS-7

UDS

D-5/S-5

D-6/S-6

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR WITHIN WASTE LIMITS
- PROPOSED CONTOUR OUTSIDE WASTE LIMITS
- EXISTING OVERHEAD POWER LINE
- EXISTING STREAM
- PROPERTY LINE
- PROPOSED LIMITS OF RESIDUAL WASTE
- FACILITY BOUNDARY
- PROPOSED CHANNEL
- LCP — PROPOSED LEACHATE COLLECTION PIPE
- LCO — PROPOSED LEACHATE CLEANOUT PIPE
- LTP — PROPOSED LEACHATE TRANSMISSION PIPE 4
- PROPOSED CHIMNEY DRAIN 4
- PROPOSED NORMAL WATER SURFACE ELEVATION
- ANCHOR TRENCH
- PROPOSED CLEANOUT LOCATION
- UAS-1 — PROPOSED MONITORING WELLS
- UDS-1 — PROPOSED UNDERDRAIN MONITORING POINT 4
- HV306A EL. 903.63 — AERIAL SURVEY CONTROL POINT
- PROPOSED ACCESS/HAUL ROAD
- TEMPORARY HAUL/ACCESS ROAD
- 2 — PHASE ID
- INTERMEDIATE COVER
- FINAL COVER
- ROCK CHANNEL PROTECTION

SCALE IN FEET
0 200 400
DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

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STATE OF OHIO
ANTHONY P. AMICON
E-58805
REGISTERED PROFESSIONAL ENGINEER

SUBMITTAL RECORD

NO	DATE	DESCRIPTION
1	04/07/2010	INITIAL PERMIT TO INSTALL APPLICATION

REVISION RECORD

NO	DATE	DESCRIPTION
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2	02/14/2011	OEPA NOD2
3	07/01/2015	PTI ALTERATION REQUEST TO ELIMINATE UNDERDRAIN CLEANOUTS
4	06/2016	PTI ALTERATION TO REQUEST 2016 DESIGN CHANGES

3745-30-05 (B)(6) RULE REFERENCE		DRAWING LOCATION
(a)	LOCATION OF GROUND WATER MONITORING WELLS, PIEZOMETERS, EXPLOSIVE GAS PERMANENT MONITORS, LEACHATE COLLECTION AND MANAGEMENT STRUCTURES, OR SURFACE WATER CONTROL STRUCTURES	6A THRU 6E
(b)	EXTENT OF WASTE PLACEMENT FOR THAT PHASE	6A THRU 6E
(c)	CONTOURS OF ANY PREVIOUSLY FILLED PHASES	6A THRU 6E
(d)	LIMITS OF FINAL COVER AND INTERMEDIATE COVER ON PREVIOUSLY FILLED PHASES	6A THRU 6E
(e)	CONTOURS OF THE BOTTOM OF LIMITS OF SOLID WASTE PLACEMENT FOR THE DEPICTED PHASE	6A THRU 6E
(f)	LOCATION OF ACCESS ROADS FOR THE DEPICTED PHASE	6A THRU 6E
(g)	PERMANENT AND TEMPORARY MEASURES TO BE UTILIZED TO CONTROL SURFACE WATER RUN-ON AND RUN-OFF, EROSION, AND ANY TEMPORARY OR PERMANENT GROUND WATER CONTROL STRUCTURES	6A THRU 6E

4

DP&L

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PERMIT TO INSTALL APPLICATION
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J.M. STUART STATION
CARTER HOLLOW LANDFILL
SPRIGG TOWNSHIP, ADAMS CO., OHIO

DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	1"=200	PROJECT NO:	071-644

PHASE 3 DEVELOPMENT PLAN

DRAWING NO.: 6D

SHEET 23 OF 30

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FIGURE 5

PHASE 4 LEACHATE COLLECTION PIPE LAYOUT

NORTH

CONSTRUCTION NOTES:

1. FOR FINAL PERMITTED CONTOURS SEE DRAWING 4E.
2. FOR PHASE 4, ONLY 7 CHIMNEY DRAINS CAN BE OPERATIONAL AT ONE TIME.
3. FOR PHASE 4 OPERATIONS, A PERIMETER WASTE CONTAINMENT BERM SHALL BE CONSTRUCTED PRIOR TO WASTE PLACEMENT. EXISTING CHIMNEY DRAINS WILL THEN BE OPENED, EXTENDED VERTICALLY AS NEEDED AND MADE OPERATIONAL.
4. SOIL STOCKPILES MAY BE CONSTRUCTED AS NEEDED OR TO LESSER EXTENTS SHOWN ON THE DRAWINGS.

GENERAL OPERATION NOTES:

1. THE WASTE ELEVATIONS SHOWN ARE THE MAXIMUM PROPOSED TOP OF WASTE GRADES. TRANSITIONS BETWEEN AND TYPICAL FILLING OPERATIONS OF PHASES REQUIRES CONSULTATION WITH OEPA TO INSURE THAT THE FINAL SLOPE WITHIN THE PREVIOUS PHASE IS CONSTRUCTED TO MAXIMUM EXTENT. REMAINING AIRSPACE WITHIN PREVIOUS PHASES WILL BE FILLED TO THE PERMITTED GRADES AS QUICKLY AS POSSIBLE.
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4. WASTE PLACED DURING LANDFILL OPERATION SHALL BE GRADED SUCH THAT SURFACE WATER DRAINS TO THE CHIMNEY DRAINS WITHIN THE LANDFILL, AWAY FROM THE LANDFILL PERIMETER BOUNDARIES.
5. TACK-ON BERMS SHALL BE CONSTRUCTED ON THE SOUTHERN INTERMEDIATE SLOPE TO DIRECT RUN-OFF EAST AND WEST TO THE ESTABLISHED STORMWATER CONVEYANCE CHANNELS LEADING TO POND G.

Phase 4 Open Area = 40 Acres

Phase 4 Critical Pipe Segment

844.6 ft

El. 690 ft.

HV205A EL. 915.73

HV306A EL. 903.63

JJ 7E STORMWATER POND D

KK 7E STORMWATER POND E

B 7A HAUL/ACCESS ROAD

V 7C W 7C X 7C DOWNCHUTE CHANNEL DETAILS

C 7A STORMWATER CHANNEL 1

BASIN LINER ANCHOR TRENCH DETAIL PP 7F

LEACHATE TRANSMISSION PIPE WW 7A

LEACHATE TRANSMISSION PIPE BELOW GROUND DETAIL HHH 7G

MM 7E LEACHATE POND

PROPOSED SOIL STOCKPILE AREA

FF 7C ROCK-LINED CHANNEL

STORMWATER POND G MM 7E

STORMWATER CHANNEL 13 C 7A

D-6 S-6

UAS-5

UAS-7

UDS-1

PIPE TO PLANT

CULVERT

RR 7F BASIN LINER OUTLET PIPE PENETRATION DETAIL

BBB 7F LEACHATE POND LINER DETAIL

QQ 7F BASIN LINER INLET PIPE PENETRATION DETAIL

STORMWATER CHANNEL 11 C 7A

Y 7C KICKER BERM

STORMWATER CHANNEL 3 C 7A

STORMWATER CHANNEL 2 C 7A

SLOPE TO DRAIN (SEE NOTE CONSTRUCTION NOTE 3)

4

SEDIMENT TRAP

STORMWATER CHANNEL 5 C 7A

DOWNCHUTE CHANNEL DETAILS V 7C W 7C X 7C

POND C FOREBAY

PROPOSED STORMWATER POND LINER DETAIL Z 7C

II 7D STORMWATER POND C

STORMWATER CHANNEL 6 C 7A

YY 7C POND C LINER

LL 7E STORMWATER POND F

A 7A TYPICAL PERIMETER BERM SECTION

FF 7C ROCK-LINED CHANNEL

PROPOSED SOIL STOCKPILE AREA

CULVERT

OH-E

SCALE IN FEET

0 200 400

DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

REF: EXISTING SITE TOPOGRAPHIC SURVEY WAS PROVIDED TO CIVIL & ENVIRONMENTAL CONSULTANTS, INC. BY THE DAYTON POWER AND LIGHT COMPANY IN THE FILE NAMED "CARTER HOLLOW TOPO APRIL 2013.XML". CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.

SUBMITTAL RECORD

NO	DATE	DESCRIPTION
1	04/07/2010	INITIAL PERMIT TO INSTALL APPLICATION

REVISION RECORD

NO	DATE	DESCRIPTION
1	09/02/2010	OEPA NOD1
2	02/14/2011	OEPA NOD2
3	07/01/2015	PTI ALTERATION REQUEST TO ELIMINATE UNDERDRAIN CLEANOUTS
4	06/2016	PTI ALTERATION TO REQUEST 2016 DESIGN CHANGES

3745-30-05 (B)(6) RULE REFERENCE		DRAWING LOCATION
(a)	LOCATION OF GROUND WATER MONITORING WELLS, PIEZOMETERS, EXPLOSIVE GAS PERMANENT MONITORS, LEACHATE COLLECTION AND MANAGEMENT STRUCTURES, OR SURFACE WATER CONTROL STRUCTURES	6A THRU 6E
(b)	EXTENT OF WASTE PLACEMENT FOR THAT PHASE	6A THRU 6E
(c)	CONTOURS OF ANY PREVIOUSLY FILLED PHASES	6A THRU 6E
(d)	LIMITS OF FINAL COVER AND INTERMEDIATE COVER ON PREVIOUSLY FILLED PHASES	6A THRU 6E
(e)	CONTOURS OF THE BOTTOM OF LIMITS OF SOLID WASTE PLACEMENT FOR THE DEPICTED PHASE	6A THRU 6E
(f)	LOCATION OF ACCESS ROADS FOR THE DEPICTED PHASE	6A THRU 6E
(g)	PERMANENT AND TEMPORARY MEASURES TO BE UTILIZED TO CONTROL SURFACE WATER RUN-ON AND RUN-OFF, EROSION, AND ANY TEMPORARY OR PERMANENT GROUND WATER CONTROL STRUCTURES	6A THRU 6E

4

DP&L

LEGEND

- EXISTING CONTOUR
- 700 PROPOSED CONTOUR WITHIN WASTE LIMITS
- 700 PROPOSED CONTOUR OUTSIDE WASTE LIMITS
- OH-E EXISTING OVERHEAD POWER LINE
- EXISTING STREAM
- PROPERTY LINE
- PROPOSED LIMITS OF WASTE
- FACILITY BOUNDARY
- PROPOSED DITCH
- LCP PROPOSED LEACHATE COLLECTION PIPE
- LCO PROPOSED LEACHATE CLEANOUT PIPE
- LTP PROPOSED LEACHATE TRANSMISSION PIPE 4
- PROPOSED CHIMNEY DRAIN 4
- PROPOSED NORMAL WATER SURFACE ELEVATION
- ANCHOR TRENCH
- UAS-1 PROPOSED MONITORING WELLS
- UDS-1 PROPOSED UNDERDRAIN MONITORING POINT 4
- HV306A EL. 903.63 AERIAL SURVEY CONTROL POINT
- PROPOSED ACCESS/HAUL ROAD
- TEMPORARY HAUL/ACCESS ROAD
- 2 PHASE ID
- INTERMEDIATE COVER
- FINAL COVER
- ROCK CHANNEL PROTECTION

STATE OF OHIO ANTHONY P. AMICON E-58805 REGISTERED PROFESSIONAL ENGINEER

Civil & Environmental Consultants, Inc.
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PERMIT TO INSTALL APPLICATION
THE DAYTON POWER AND LIGHT COMPANY
J.M. STUART STATION
CARTER HOLLOW LANDFILL
SPRIGG TOWNSHIP, ADAMS CO., OHIO

DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	1"=200	PROJECT NO:	071-644

PHASE 4 DEVELOPMENT PLAN

DRAWING NO.: 6E

SHEET 24 OF 30

G:\PROJECTS\2007\071-644\PERMIT\DWG\MXD\[PTI-6D 071644DWG[PTI-6D PHASE FOUR DEVELOPMENT PLAN] (LYNDON) - FEB 7, 2011 - 13:31:39

ATTACHMENT 1

PLASTIC PIPE INSTITUTE DESIGN TABLE

Appendix A.2

PIPE WEIGHTS AND DIMENSIONS (IPS)
(BLACK)

OD			Pipe inside diameter (d)	Minimum Wall Thickness (t)	Weight (w)
Nominal in.	Actual in.	DR	in.	in.	lb. per foot
		7	0.59	0.120	0.118
		7.3	0.60	0.115	0.114
1/2	0.840	9	0.64	0.093	0.095
		9.3	0.65	0.090	0.093
		11	0.68	0.076	0.080
		11.5	0.69	0.073	0.077
		7	0.73	0.150	0.184
		7.3	0.75	0.144	0.178
3/4	1.050	9	0.80	0.117	0.149
		9.3	0.81	0.113	0.145
		11	0.85	0.095	0.125
		11.5	0.86	0.091	0.120
		7	0.92	0.188	0.289
		7.3	0.93	0.180	0.279
1	1.315	9	1.01	0.146	0.234
		9.3	1.02	0.141	0.227
		11	1.06	0.120	0.196
		11.5	1.07	0.114	0.188
		7	1.16	0.237	0.461
		7.3	1.18	0.227	0.445
		9	1.27	0.184	0.372
1 1/4	1.660	9.3	1.28	0.178	0.362
		11	1.34	0.151	0.312
		11.5	1.35	0.144	0.300
		13.5	1.40	0.123	0.259

OD			Pipe inside diameter (d)	Minimum Wall Thickness (t)	Weight (w)
Nominal in.	Actual in.	DR	in.	in.	lb. per foot
		7	1.32	0.271	0.603
		7.3	1.35	0.260	0.583
		9	1.45	0.211	0.488
1 1/2	1.900	9.3	1.47	0.204	0.474
		11	1.53	0.173	0.409
		11.5	1.55	0.165	0.393
		13.5	1.60	0.141	0.340
		15.5	1.64	0.123	0.299
		7	1.66	0.339	0.943
		7.3	1.69	0.325	0.911
		9	1.82	0.264	0.762
		9.3	1.83	0.255	0.741
2	2.375	11	1.92	0.216	0.639
		11.5	1.94	0.207	0.614
		13.5	2.00	0.176	0.531
		15.5	2.05	0.153	0.467
		17	2.08	0.140	0.429
		7	2.44	0.500	2.047
		7.3	2.48	0.479	1.978
		9	2.68	0.389	1.656
		9.3	2.70	0.376	1.609
		11	2.83	0.318	1.387
3	3.500	11.5	2.85	0.304	1.333
		13.5	2.95	0.259	1.153
		15.5	3.02	0.226	1.015
		17	3.06	0.206	0.932
		21	3.15	0.167	0.764
		26	3.21	0.135	0.623

OD			Pipe inside diameter (d)	Minimum Wall Thickness (t)	Weight (w)
Nominal in.	Actual in.	DR	in.	in.	lb. per foot
		7	3.14	0.643	3.384
		7.3	3.19	0.616	3.269
		9	3.44	0.500	2.737
		9.3	3.47	0.484	2.660
		11	3.63	0.409	2.294
4	4.500	11.5	3.67	0.391	2.204
		13.5	3.79	0.333	1.906
		15.5	3.88	0.290	1.678
		17	3.94	0.265	1.540
		21	4.05	0.214	1.262
		26	4.13	0.173	1.030
		32.5	4.21	0.138	0.831
		7	3.88	0.795	5.172
		7.3	3.95	0.762	4.996
		9	4.25	0.618	4.182
		9.3	4.29	0.598	4.065
		11	4.49	0.506	3.505
5	5.563	11.5	4.54	0.484	3.368
		13.5	4.69	0.412	2.912
		15.5	4.80	0.359	2.564
		17	4.87	0.327	2.353
		21	5.00	0.265	1.929
		26	5.11	0.214	1.574
		32.5	5.20	0.171	1.270
		7	4.62	0.946	7.336
		7.3	4.70	0.908	7.086
		9	5.06	0.736	5.932
		9.3	5.11	0.712	5.765
		11	5.35	0.602	4.971
6	6.625	11.5	5.40	0.576	4.777
		13.5	5.58	0.491	4.130
		15.5	5.72	0.427	3.637
		17	5.80	0.390	3.338
		21	5.96	0.315	2.736
		26	6.08	0.255	2.233
		32.5	6.19	0.204	1.801

OD			Pipe inside diameter (d)	Minimum Wall Thickness (t)	Weight (w)
Nominal in.	Actual in.	DR	in.	in.	lb. per foot
		7	6.01	1.232	12.433
		7.3	6.12	1.182	12.010
		9	6.59	0.958	10.054
		9.3	6.66	0.927	9.771
		11	6.96	0.784	8.425
8	8.625	11.5	7.04	0.750	8.096
		13.5	7.27	0.639	7.001
		15.5	7.45	0.556	6.164
		17	7.55	0.507	5.657
		21	7.75	0.411	4.637
		26	7.92	0.332	3.784
		7	7.49	1.536	19.314
		7.3	7.63	1.473	18.656
		9	8.22	1.194	15.618
		9.3	8.30	1.156	15.179
		11	8.68	0.977	13.089
10	10.750	11.5	8.77	0.935	12.578
		13.5	9.06	0.796	10.875
		15.5	9.28	0.694	9.576
		17	9.41	0.632	8.788
		21	9.66	0.512	7.204
		26	9.87	0.413	5.878
		32.5	10.05	0.331	4.742
		7	8.89	1.821	27.170
		7.3	9.05	1.747	26.244
		9	9.75	1.417	21.970
		9.3	9.84	1.371	21.353
		11	10.29	1.159	18.412
12	12.750	11.5	10.40	1.109	17.693
		13.5	10.75	0.944	15.298
		15.5	11.01	0.823	13.471
		17	11.16	0.750	12.362
		21	11.46	0.607	10.134
		26	11.71	0.490	8.269
		32.5	11.92	0.392	6.671

OD			Pipe inside diameter (d)	Minimum Wall Thickness (t)	Weight (w)
Nominal in.	Actual in.	DR	in.	in.	lb. per foot
		7	9.76	2.000	32.758
		7.3	9.93	1.918	31.642
		9	10.70	1.556	26.489
		9.3	10.81	1.505	25.745
		11	11.30	1.273	22.199
14	14.000	11.5	11.42	1.217	21.332
		13.5	11.80	1.037	18.445
		15.5	12.09	0.903	16.242
		17	12.25	0.824	14.905
		21	12.59	0.667	12.218
		26	12.86	0.538	9.970
		32.5	13.09	0.431	8.044
		7	11.15	2.286	42.786
		7.3	11.35	2.192	41.329
		9	12.23	1.778	34.598
		9.3	12.35	1.720	33.626
		11	12.92	1.455	28.994
16	16.000	11.5	13.05	1.391	27.862
		13.5	13.49	1.185	24.092
		15.5	13.81	1.032	21.214
		17	14.00	0.941	19.467
		21	14.38	0.762	15.959
		26	14.70	0.615	13.022
		7	12.55	2.571	54.151
		7.3	12.77	2.466	52.307
		9	13.76	2.000	43.788
		9.3	13.90	1.935	42.558
		11	14.53	1.636	36.696
18	18.000	11.5	14.68	1.565	35.263
		13.5	15.17	1.333	30.491
		15.5	15.54	1.161	26.849
		17	15.76	1.059	24.638
		21	16.18	0.857	20.198
		26	16.53	0.692	16.480
		32.5	16.83	0.554	13.296

OD			Pipe inside diameter (d)	Minimum Wall Thickness (t)	Weight (w)
Nominal in.	Actual in.	DR	in.	in.	lb. per foot
		7	13.94	2.857	66.853
		7.3	14.19	2.740	64.576
		9	15.29	2.222	54.059
		9.3	15.44	2.151	52.541
		11	16.15	1.818	45.304
20	20.000	11.5	16.31	1.739	43.535
		13.5	16.86	1.481	37.643
		15.5	17.26	1.290	33.146
		17	17.51	1.176	30.418
		21	17.98	0.952	24.936
		26	18.37	0.769	20.346
		32.5	18.70	0.615	16.415
		9	16.82	2.444	65.412
		9.3	16.98	2.366	63.574
		11	17.76	2.000	54.818
		11.5	17.94	1.913	52.677
22	22.000	13.5	18.55	1.630	45.548
		15.5	18.99	1.419	40.107
		17	19.26	1.294	36.805
		21	19.78	1.048	30.172
		26	20.21	0.846	24.619
		32.5	20.56	0.677	19.863
		9	18.35	2.667	77.845
		9.3	18.53	2.581	75.658
		11	19.37	2.182	65.237
		11.5	19.58	2.087	62.690
24	24.000	13.5	20.23	1.778	54.206
		15.5	20.72	1.548	47.731
		17	21.01	1.412	43.801
		21	21.58	1.143	35.907
		26	22.04	0.923	29.299
		32.5	22.43	0.738	23.638

OD			Pipe inside diameter (d)	Minimum Wall Thickness (t)	Weight (w)
Nominal in.	Actual in.	DR	in.	in.	lb. per foot
		11	22.60	2.545	88.795
		11.5	22.84	2.435	85.329
		13.5	23.60	2.074	73.781
		15.5	24.17	1.806	64.967
28	28.000	17	24.51	1.647	59.618
		21	25.17	1.333	48.874
		26	25.72	1.077	39.879
		32.5	26.17	0.862	32.174
		11	24.22	2.727	101.934
		11.5	24.47	2.609	97.954
		13.5	25.29	2.222	84.697
		15.5	25.90	1.935	74.580
30	30.000	17	26.26	1.765	68.439
		21	26.97	1.429	56.105
		26	27.55	1.154	45.779
		32.5	28.04	0.923	36.934
		13.5	26.97	2.370	96.367
		15.5	27.62	2.065	84.855
32	32.000	17	28.01	1.882	77.869
		21	28.77	1.524	63.835
		26	29.39	1.231	52.086
		32.5	29.91	0.985	42.023
		15.5	31.08	2.323	107.395
		17	31.51	2.118	98.553
36	36.000	21	32.37	1.714	80.791
		26	33.06	1.385	65.922
		32.5	33.65	1.108	53.186
		15.5	36.26	2.710	146.176
		17	36.76	2.471	134.141
42	42.000	21	37.76	2.000	109.966
		26	38.58	1.615	89.727
		32.5	39.26	1.292	72.392

OD			Pipe inside diameter (d)	Minimum Wall Thickness (t)	Weight (w)
Nominal in.	Actual in.	DR	in.	in.	lb. per foot
		17	42.01	2.824	175.205
48	48.000	21	43.15	2.286	143.629
		26	44.09	1.846	117.194
		32.5	44.87	1.477	94.552
		21	48.55	2.571	181.781
54	54.000	26	49.60	2.077	148.324
		32.5	50.48	1.662	119.668

ATTACHMENT 2

CRITICAL LEACHATE PIPE SEGMENTS CALCULATIONS

144-189 Carter Hollow Landfill
Leachate Collection System Pipe Requirements

Critical Pipe Segment	Length (ft.)	Inlet El. (ft.)	Outlet El. (ft.)	Slope (ft./ft.)	Manning's n	Inner Pipe Dia. (in.)[1]	Pipe Area (sf)	Wetted Perimeter (ft.)	Base Flow (cfs)	CD Flow (cfs)	No. CD	$Q_{Required}$ (cfs)	$Q_{Capacity}$ (cfs)	Pipes Required
Phase 1A	1011.7	805	770	0.035	0.009	10.290	0.578	2.694	0.132	3.07	2	6.276	6.370	**1**
Phase 1B	750	768	730	0.051	0.009	10.290	0.578	2.694	0.158	3.07	6	18.590	7.709	**3**
Phase 2	929	735	693	0.045	0.009	10.290	0.578	2.694	0.218	3.07	6	18.650	7.282	**3**
Phase 3	875	693	655	0.043	0.009	10.290	0.578	2.694	0.238	3.07	6	18.670	7.137	**3**
Phase 4	845	700	655	0.053	0.009	10.290	0.578	2.694	0.264	3.07	16	49.416	7.903	**7**
Phase 4 (Limited CD)	845	700	655	0.053	0.009	10.290	0.578	2.694	0.264	3.07	7	21.768	7.903	**3**
Phase 3 Conveyance Pipe	757	655	634	0.028	0.009	22.040	2.649	5.770	0.181	3.07	7	21.685	43.481	**1**

Notes:
1. Inner pipe diameter's correspond to 12-inch diameter SDR 11 and 24-inch SDR 26 plastic pipe

LEACHATE COLLECTION PIPE PERFORATION SIZING CALCULATION

(Taken from the existing PTI Permit Application for the Carter Hollow Landfill)

Civil & Environmental Consultants, Inc.

SUBJECT	**OAC 3745-30-05 (C)(6)(f) – Leachate Collection Pipe Perforation Sizing**						PROJECT NO.	**071-644**			
PROJECT	**Dayton Power and Light – Carter Hollow Landfill Sprigg Township, Adams County, Ohio**						PAGE	**1**	OF	**2**	
	MADE BY	**JML**	DATE	**3/5/10**	CHECKED BY	**RTM**	DATE				

OBJECTIVE:

Determine the leachate pipe perforation diameter and perforation spacing along the collection pipes to accommodate the anticipated daily leachate generation volume.

METHOD:

1. Estimate the maximum leachate flow into the leachate collection pipe.

2. Estimate the maximum leachate production rate by using the Hydrologic Evaluation of Landfill Performance (HELP) Model.

3. Calculate the minimum required hole spacing based on a maximum entrance velocity of 0.1 ft/sec. (1)

4. Compare the D_{85} of the drainage media to the hole diameter.

$$\frac{D_{85}\text{ of drainage media}}{\text{hole diameter}} \geq 1.2 \text{ (2)}$$

CALCULATIONS:

The HELP Model considers a maximum leachate drainage flow path of 525 feet along the cell floor before entering the collection pipe. This corresponds to a collection area of 525 ft^2 per linear foot (LF) of pipe. From the Leachate Generation Calculation contained in Section (C)(6)(c) of the PTI, the maximum daily flow rate is 570 cu.ft. per acre per day.

Method 1, the maximum leachate flow (Q) is:

$$Q = \frac{570\text{ cu.ft.}}{\text{acre - day}} * \frac{1\text{ day}}{86{,}400\text{ sec}} * \frac{1\text{ acre.}}{43{,}560\text{ sq. ft.}} * \frac{525\text{ sq. ft.}}{1\text{ LF of pipe}} = 7.95 \text{ x} 10^{-5} \text{ cfs/LF of pipe}$$

Method 3, the required open area of the leachate collection pipe is determined by:

$$A = \frac{Q, cfs}{\text{entrance velocity}, ft/sec} = \frac{7.95 \times 10^{-5} \text{ cfs / LF of pipe}}{0.1 \text{ ft/sec}} = 7.95 \times 10^{-4} \text{ ft}^2 / \text{LF of pipe}$$

The minimum number of holes per linear foot, assuming a hole diameter of 0.375-inch, is determined by:

$$\#\text{Holes} = \frac{\text{Required Open Area}}{\text{Area of Holes}} = \frac{7.95 \times 10^{-4} \text{ ft}^2}{7.67 \times 10^{-4} \text{ ft}^2} = 1.04 = 2 \text{ Holes / LF of pipe}$$

Comparing D_{85} of the drainage media to the hole diameter, assuming a D_{85} of 22.4 mm:

$$0.375 \text{ in} * \frac{25.4 \text{ mm}}{1 \text{ in}} = 9.52 \text{ mm}$$

$$\frac{D_{85} \text{ of drainage media}}{\text{hole diameter}} \geq \frac{22.4 \text{ mm}}{9.5 \text{ mm}} = 2.35 \geq 1.2 \text{ (Compatible)}$$

CONCLUSIONS:

The proposed leachate collection pipe will have 4 holes per foot, which exceeds the required 2 holes per foot. Pipes will be fabricated with 2 rows of perforations, 6-inches on center, oriented at 120 degree angles from one another. For a drainage media having a D_{85} greater than 11.4 mm, the proposed leachate collection pipe will be sufficient to carry the required flows without clogging.

REFERENCES:

(1) Driscoll, Fletcher G., Groundwater and Wells, Reynolds Guyar Designs, 1986.

(2) United States Environmental Protection Agency. *Lining of Waste Containment and Other Impoundment Facilities*. Washington: Government Printing Office, 1988.

LEACHATE POND SIZING CALCULATION

(Taken from the existing PTI Permit Application for the Carter Hollow Landfill)

CALCULATION BRIEF

CARTER HOLLOW LANDFILL
PERMIT MODIFICATION - 2016 DESIGN CHANGES
(C)(6)(e) LEACHATE POND SIZING

OBJECTIVE: **Demonstrate that the proposed design of the Leachate Pond provides a minimum of one week of storage capacity for the post-closure conditions in accordance with Ohio Environmental Protection Agency (OEPA) regulation OAC 3745-30-07(C)(3). Additionally, demonstrate that the Leachate Pond is adequately sized to store and convey flow during active conditions at Carter Hollow Landfill (Carter Hollow).**

REFERENCE:

1. "Permit Drawings for Class III Residual Waste Disposal Facility; J.M. Stuart Station – Carter Hollow Landfill; Sprigg Township; Adams County, Ohio;" prepared for The Dayton Power and Light Company; prepared by Civil & Environmental Consultants, Inc.; last revised on May 2016.

2. AutoCAD Civil 3D Autodesk, 2015

3. "Hydraulic Evaluation of Landfill Performance (HELP) Version 3.07," United States Army Corps of Engineers, Engineer Research and Development Center, March 1997.

4. "HydroCAD 10.00," HydroCAD Software Solutions LLC, 2011.

5. Point Precipitation Frequency Estimates; NOAA Atlas 14, Volume 2 Version 3; Location Name: Manchester Ohio, US, Latitude: 38.6320^{o}, Longitude: -83.6646^{o}; Elevation 536 ft; accessed 12/21/2015. (Attachment 4)

6. "Chimney Drain Evaluation", prepared by Civil & Environmental Consultants, Inc., May 2016.

7. "Second Edition Handbook of PE Pipe", Plastics Pipe Institute, Inc, 2015.

8. OAC 3745-30-05 (C)(6)(c) - Leachate Generation Calculation; Prepared by Civil & Environmental Consultants, Inc. March 2010.

METHODOLOGY:

Use AutoCAD Civil 3D (Ref. No. 2) to determine the available storage capacity of the Leachate Pond. See Attachment No. 1 for the proposed Leachate Pond stage-storage output. Then compare the daily leachate production volume from the HELP model (Ref No. 3) for post-closure conditions to the available storage capacity to demonstrate that the leachate pond has the required one week of storage capacity.

Additionally, perform HELP models for the 10-year/24-hour and 100-year/24-hour rainfall events to determine peak leachate generation rates during active waste placement. Use the runoff values from these 10-year/24-hour and 100-year/24-hour HELP model runs to model the runoff routed to the chimney drain. The chimney drains and flow from the base of the landfill will then be routed to the Leachate Pond using Ref. No. 4 to determine peak stages of the pond. Rainfall events were selected from available precipitation data for the site-specific location from Ref. No. 5. The drainage area of the leachate collection pond, peak leachate flows, and the leachate collection pond's outlet pipe were modeled in HydroCAD (Ref No. 4) to demonstrate that the leachate collection pond is capable of storing and conveying flows without overtopping for the 10-year/24-hour and 100-yr/24-hour rainfall events (Worst Case).

ANALYSIS:

Post-Closure Conditions

The HELP model for the base and slope during closed conditions estimates a peak daily leachate production volume for the landfill as approximately 12.0 cubic feet (cf) per acre per day (Ref. No. 8). To determine the storage volume required, multiply the peak leachate production volume by the total landfill footprint of 73 acres.

$$\frac{\mathbf{12.0}\ \boldsymbol{cf}}{\boldsymbol{acre-day}} \times \mathbf{73}\ \boldsymbol{acres} \approx \mathbf{876}\ \boldsymbol{cf/day}$$

The volume of the proposed leachate collection pond was determined using AutoCAD Civil 3D. Assuming 2 feet of freeboard, the available storage capacity of the leachate collection pond is 194,755 cf. The available storage time of the proposed leachate collection pond, assuming no outflow, is estimated as follows:

$$\frac{\mathbf{194,755}\ \boldsymbol{cf}}{\mathbf{876}\ \boldsymbol{cf/day}} \approx \mathbf{222}\ \boldsymbol{days}$$

Active Conditions

CEC modeled the leachate collection pond in HydroCAD (Ref. No. 4) to demonstrate that the leachate collection pond can adequately store and convey flows associated with the 10-year/24-hour and 100-year/24-hour rainfall events during the operational phases that will result in the greatest volume of leachate generation. During the active conditions, the leachate collection pond will receive flow from the pond drainage area, flow through the leachate collection layer, and flow from active chimney drains.

CEC used the proposed construction phasing plans (Ref. No. 1) to determine the critical scenario for leachate generation during active waste placement at the Carter Hollow Landfill. Throughout waste-placement, the leachate generation will be a function of the acreage for the capped, open base, and open slope conditions. HELP models were created and modified to include rainfall events for the 10-year/24-hour and 100-year/24-hour rainfall events. The 10-year/24-hour and 100-year/24-hour rainfall events are 4.17 inches and 6.39 inches, respectively (see Attachment No. 3). These HELP Model outputs are included with Ref. No. 6 and showed leachate generation rates of approximately 533 cf per acre per day for the base slope area and 779 cf per acre per day for the side slope area.

Additionally, a varying number of chimney drains will be operational during each Phase of operation. From Attachment No. 2, it was determined that Phase 3 is poses the "worst-case" for leachate generation. As such, CEC used the Phase 3 construction scenario to estimate the storage capacity of the Leachate Pond.

The flow through the leachate collection system (i.e., leachate percolating from the base of the waste mass) was modeled in HydroCAD as a baseflow. The baseflow through the leachate collection system during Phase 3 operations is estimated at approximately 0.32 cubic feet per second (cfs) as shown in Attachment No. 2.

The proposed chimney drains at the Carter Hollow Landfill will be installed at a frequency of about 1 chimney drain per 5-acre open area. For the purpose of this analysis, CEC assumed that only the chimney drains in "open" areas would contribute to the leachate generation. Based on the proposed grading for Phase 3 an approximately 36-acre open area will have active chimney drains. As such, construction Phase 3 should have a total of 8 ($36 \div 5 \approx 8$) chimney drains collecting flow. However, as identified in Section (C)(6)(f) Leachate Pipe Sizing Calc, open area will be limited to 7 open chimney drains at any one time. Therefore, the model was limited to show a maximum of 7 chimney drains at any one point.

Chimney drains were modeled to collect flow from a 5-acre area in HydroCAD (Ref. No. 4). HydroCAD generated hydrographs for the 10-yr and 100-yr rainfall events (see Attachment 4).

In order to model the Phase 3 chimney drain scenario, the flows from the hydrographs were multiplied by 7 to represent the maximum flow from the active chimney drains during Phase 3 operations.

The leachate collection pond was modeled with a stage-storage data from AutoCAD Civil 3D. The leachate collection pond's proposed 24-inch diameter outlet pipe was modeled based on the location and elevations proposed in Ref. No. 1. Additionally, CEC used the Plastic Pipe Institute's design table (Ref. No. 7) for a 24-inch diameter IPS SDR 26 pipe to determine the inside diameter of the leachate collection pond's outlet pipe. The reference table is located in Attachment No. 5. The outlet pipe was modeled with the following parameters:

Pipe Outer Dia. (in.)	Pipe Inner Dia. (in.)	Pipe Inlet Invert (ft.)	Pipe Outlet Invert (ft.)	Pipe Length (ft.)	Pipe Slope (%)
24	22	635.00	522.00	4,417.0	2.56

Based on the HydroCAD model, the peak storage elevations for the 10-year/24-hour and 100-year/24-hour for the Leachate Pond is 640 ft. The HydroCAD output for the leachate collection pond is included in Attachment No. 6. With the perimeter berm of the leachate Pond being positioned at Elevation 650 and an emergency spillway at Elevation 649, the leachate pond provides more than 2-foot of freeboard.

CONCLUSION:

The proposed leachate storage pond will provide more than one week of storage capacity during the post-closure conditions in accordance with OAC 3745-30-07(C)(3).

The proposed leachate storage pond has a peak elevation of 640 ft for the 10-year/24-hour and 100-year, 24-hour rainfall events, as such, it is adequately sized to store leachate during the "worst-case" operations conditions at Carter Hollow Landfill.

ATTACHMENT 1

AUTOCAD CIVIL 3D OUTPUT
LEACHATE COLLECTION POND STAGE-STORAGE DATA

Project:
Basin Description:

Contour Elevation	Contour Area (sq. ft)	Depth (ft)	Incremental Volume Conic (cu. ft.)	Cumulative Volume Conic (cu. ft.)
632.000	1,318.74	N/A	N/A	0
633.000	2,144.81	1.000	1715	1715
634.000	3,200.45	1.000	2655	4370
635.000	4,383.96	1.000	3777	8147
636.000	5,640.14	1.000	4999	13146
637.000	6,968.98	1.000	6293	19439
638.000	8,370.40	1.000	7659	27098
639.000	9,844.35	1.000	9097	36195
640.000	11,390.86	1.000	10608	46803
641.000	13,009.92	1.000	12191	58995
642.000	14,701.54	1.000	13847	72842
643.000	16,465.72	1.000	15575	88417
644.000	18,302.46	1.000	17376	105793
645.000	20,211.78	1.000	19249	125042
646.000	22,193.68	1.000	21195	146237
647.000	24,248.15	1.000	23213	169451
648.000	26,375.19	1.000	25304	194755
649.000	28,574.81	1.000	27468	222223
650.000	30,847.01	1.000	29704	251926

ATTACHMENT 2

LEACHATE GENERATION PER PHASE SPREADSHEET

144-189 Carter Hollow Landfill
Leachate Collection Pond Sizing
Leachate Generation per Phase

	Disposal Area				Flow Percolating from Waste				Flow from Chimney Drains			Peak Daily Flow Estimates		
Phase	Base Area (acres)	Slope Area (acres)	Cap Area (acres)	Total Area (acres)	Base Flow (cf/day)	Slope Flow (cf/day)	Cap Flow (cf/day)	Total (cf/s)	No. of Open CDs	Chimney Drain Flow (10-year Event) (cf/day)	Cumulative Chimney Drain Flow (100-year Event) (cf/day)	Average Daily Flow Estimates	10-year Storm Event Flow (cf/day)	100-year Storm Event Flow (cf/day)
1A	6	14	0	20	3,427	10,735	0	0.16	5	31,145	151,150	14,162	45,307	165,312
1B	9	10	0	19	4,733	8,102	0	0.15	6	37,374	181,380	12,835	50,209	194,215
2	6	27	17	50	3,198	21,033	209	0.28	7	43,603	211,610	24,440	68,043	236,050
3	2	34	37	73	1,066	26,486	455	0.32	7	43,603	211,610	28,007	71,610	239,617
4	40	0	33	73	21,320	0	406	0.25	7	43,603	211,610	21,726	65,329	233,336

Closed	12	cf/acre-day
Base	533	cf/acre-day
Slope	779	cf/acre-day
CD Flow (10-year)	6,229	cf/acre-day
CD Flow (100-year)	30,230	cf/acre-day

ATTACHMENT 3

STORM EVENTS FOR MANCHESTER OHIO

NOAA Atlas 14, Volume 2, Version 3
Location name: Manchester, Ohio, US*
Latitude: 38.6320°, Longitude: -83.6646°
Elevation: 536 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_&_aerials

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	0.378 (0.343–0.415)	0.449 (0.409–0.495)	0.536 (0.488–0.590)	0.605 (0.549–0.665)	0.692 (0.626–0.759)	0.760 (0.685–0.833)	0.827 (0.741–0.905)	0.895 (0.799–0.979)	0.987 (0.875–1.08)	1.06 (0.930–1.16)
10-min	0.587 (0.533–0.645)	0.701 (0.638–0.772)	0.834 (0.759–0.917)	0.934 (0.848–1.03)	1.06 (0.958–1.16)	1.15 (1.04–1.26)	1.24 (1.12–1.36)	1.34 (1.19–1.46)	1.45 (1.29–1.59)	1.54 (1.35–1.68)
15-min	0.719 (0.654–0.790)	0.857 (0.781–0.945)	1.02 (0.932–1.13)	1.15 (1.04–1.26)	1.31 (1.18–1.43)	1.43 (1.29–1.56)	1.55 (1.39–1.69)	1.66 (1.48–1.82)	1.81 (1.61–1.98)	1.92 (1.69–2.10)
30-min	0.952 (0.865–1.05)	1.15 (1.05–1.26)	1.40 (1.28–1.54)	1.60 (1.45–1.75)	1.85 (1.67–2.03)	2.04 (1.84–2.24)	2.23 (2.00–2.44)	2.43 (2.16–2.65)	2.68 (2.38–2.94)	2.88 (2.54–3.15)
60-min	1.16 (1.06–1.28)	1.41 (1.28–1.55)	1.76 (1.60–1.93)	2.03 (1.84–2.23)	2.39 (2.17–2.63)	2.69 (2.42–2.95)	2.98 (2.68–3.27)	3.29 (2.94–3.60)	3.71 (3.29–4.06)	4.05 (3.56–4.43)
2-hr	1.36 (1.23–1.52)	1.65 (1.49–1.84)	2.06 (1.86–2.29)	2.39 (2.16–2.66)	2.85 (2.56–3.16)	3.23 (2.89–3.58)	3.63 (3.23–4.01)	4.05 (3.58–4.47)	4.64 (4.07–5.11)	5.12 (4.46–5.64)
3-hr	1.46 (1.32–1.63)	1.76 (1.59–1.96)	2.20 (1.99–2.45)	2.56 (2.31–2.85)	3.08 (2.76–3.41)	3.49 (3.12–3.87)	3.94 (3.50–4.36)	4.42 (3.91–4.88)	5.10 (4.47–5.62)	5.67 (4.92–6.24)
6-hr	1.76 (1.60–1.94)	2.11 (1.92–2.34)	2.63 (2.39–2.91)	3.06 (2.77–3.37)	3.67 (3.31–4.03)	4.18 (3.75–4.58)	4.72 (4.21–5.17)	5.30 (4.70–5.79)	6.13 (5.39–6.70)	6.83 (5.95–7.45)
12-hr	2.08 (1.90–2.28)	2.49 (2.28–2.75)	3.08 (2.82–3.39)	3.57 (3.26–3.92)	4.27 (3.87–4.66)	4.85 (4.38–5.29)	5.46 (4.91–5.95)	6.13 (5.48–6.65)	7.07 (6.26–7.67)	7.86 (6.90–8.52)
24-hr	2.44 (2.27–2.64)	2.92 (2.71–3.15)	3.60 (3.35–3.89)	4.17 (3.87–4.49)	4.98 (4.60–5.36)	5.66 (5.20–6.09)	6.39 (5.83–6.87)	7.16 (6.50–7.70)	8.27 (7.43–8.91)	9.19 (8.18–9.91)
2-day	2.90 (2.69–3.14)	3.46 (3.22–3.75)	4.24 (3.94–4.60)	4.88 (4.52–5.28)	5.78 (5.33–6.25)	6.51 (5.99–7.04)	7.29 (6.66–7.88)	8.11 (7.37–8.77)	9.26 (8.34–10.0)	10.2 (9.10–11.1)
3-day	3.10 (2.89–3.35)	3.70 (3.46–3.99)	4.52 (4.21–4.87)	5.18 (4.82–5.58)	6.10 (5.65–6.56)	6.84 (6.32–7.36)	7.62 (7.00–8.20)	8.42 (7.70–9.08)	9.56 (8.65–10.3)	10.5 (9.40–11.3)
4-day	3.31 (3.10–3.55)	3.95 (3.70–4.23)	4.80 (4.48–5.14)	5.48 (5.11–5.87)	6.41 (5.97–6.87)	7.16 (6.65–7.67)	7.94 (7.33–8.51)	8.74 (8.03–9.38)	9.86 (8.97–10.6)	10.7 (9.70–11.6)
7-day	3.92 (3.67–4.21)	4.67 (4.37–5.01)	5.63 (5.26–6.04)	6.42 (5.99–6.88)	7.51 (6.98–8.05)	8.41 (7.78–9.01)	9.34 (8.60–10.0)	10.3 (9.43–11.1)	11.7 (10.6–12.6)	12.8 (11.5–13.8)
10-day	4.47 (4.20–4.78)	5.31 (4.98–5.67)	6.37 (5.97–6.81)	7.23 (6.77–7.72)	8.43 (7.86–8.99)	9.39 (8.72–10.0)	10.4 (9.60–11.1)	11.4 (10.5–12.2)	12.9 (11.7–13.8)	14.0 (12.7–15.1)
20-day	6.14 (5.80–6.50)	7.26 (6.85–7.68)	8.56 (8.07–9.06)	9.58 (9.03–10.1)	10.9 (10.3–11.6)	12.0 (11.3–12.7)	13.0 (12.2–13.8)	14.1 (13.1–15.0)	15.5 (14.4–16.5)	16.6 (15.3–17.7)
30-day	7.74 (7.35–8.14)	9.11 (8.65–9.58)	10.6 (10.1–11.1)	11.7 (11.1–12.3)	13.2 (12.5–13.9)	14.4 (13.6–15.1)	15.5 (14.6–16.3)	16.6 (15.5–17.5)	18.0 (16.8–19.0)	19.0 (17.7–20.1)
45-day	9.84 (9.40–10.3)	11.5 (11.0–12.1)	13.2 (12.6–13.9)	14.5 (13.8–15.2)	16.0 (15.2–16.8)	17.1 (16.3–18.0)	18.2 (17.3–19.1)	19.2 (18.2–20.2)	20.4 (19.3–21.5)	21.3 (20.1–22.5)
60-day	11.8 (11.3–12.3)	13.8 (13.2–14.4)	15.7 (15.0–16.4)	17.1 (16.3–17.8)	18.8 (17.9–19.6)	20.0 (19.1–20.9)	21.1 (20.1–22.1)	22.2 (21.1–23.2)	23.5 (22.3–24.6)	24.4 (23.1–25.6)

[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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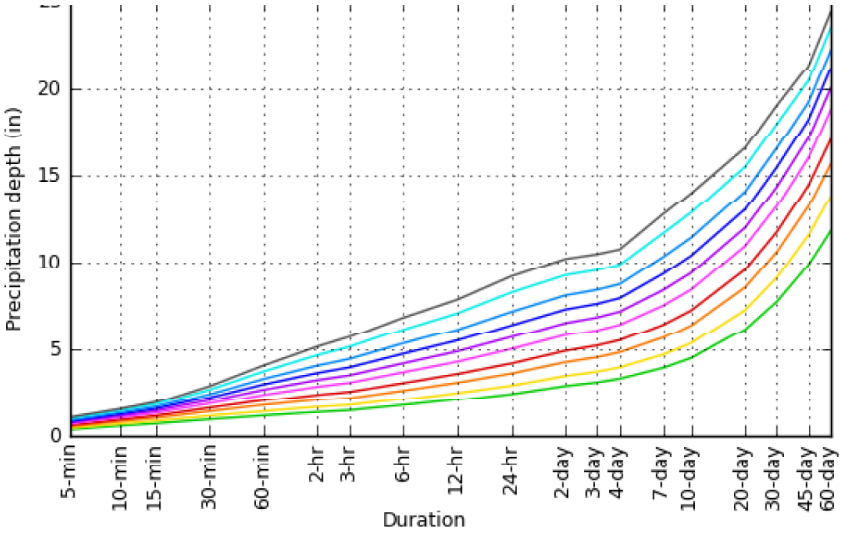
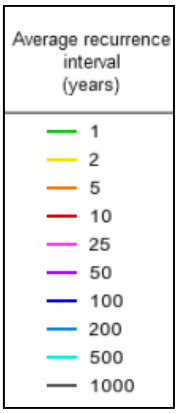
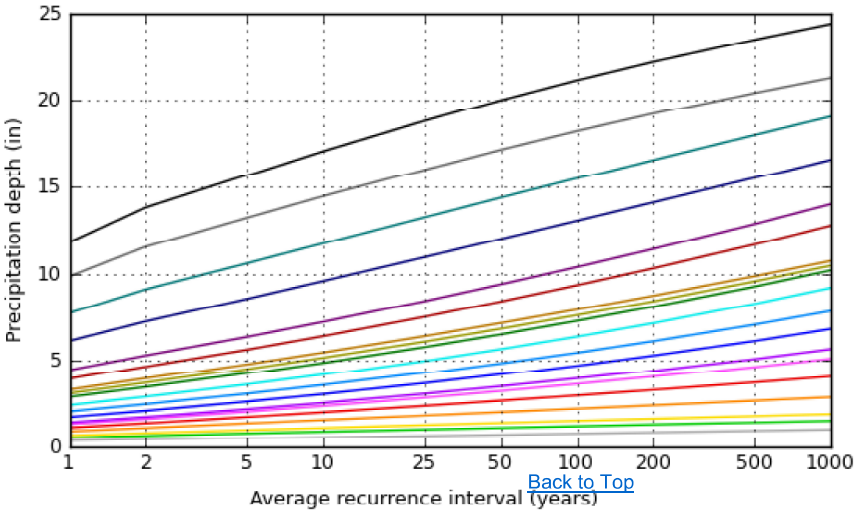
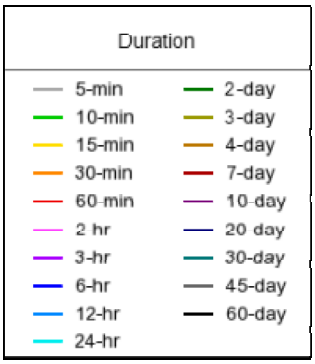
PF graphical









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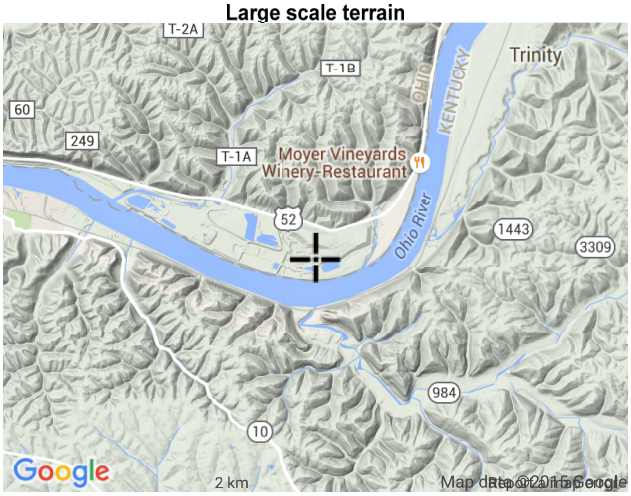
Maps & aerials

NOAA Atlas 14, Volume 2, Version 3

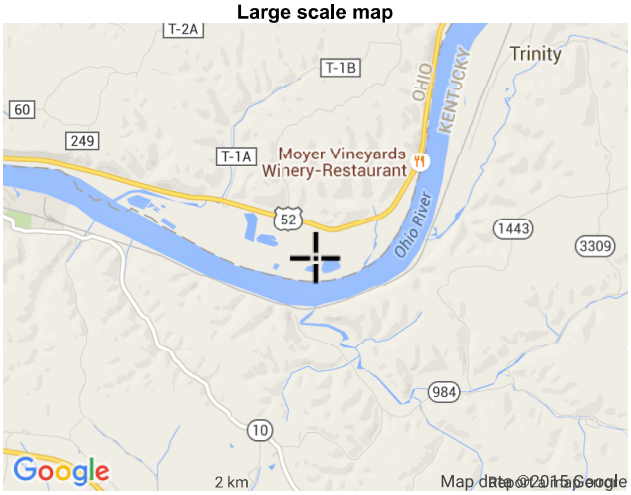
Created (GMT): Tue Dec 22 04:04:24 2015

Small scale terrain

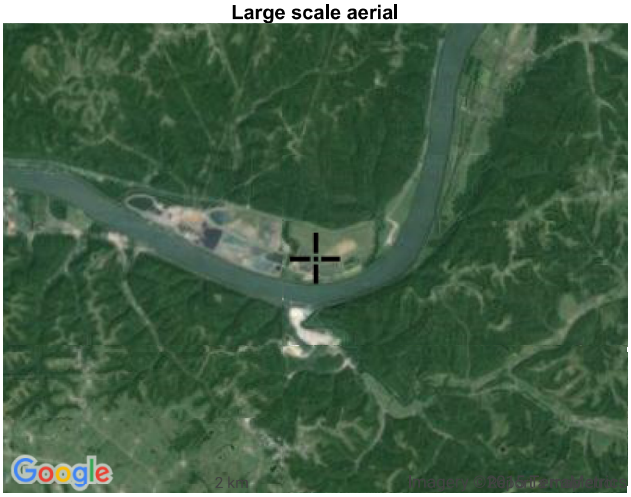
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910

Questions?: HDSC.Questions@noaa.gov

Disclaimer

ATTACHMENT 4

CHIMNEY DRAIN HYDROGRAPH TABLES

CHIMNEY DRAIN HYDROGRAPH TABLE

24-HOUR, 10-YEAR RAINFALL EVENT

144-189 Carter Hollow Landfill
Leachate Collection Pond Sizing

Chimney Drain Hydrograph
24-Hour, 10-Year Rainfall Event

Time (hours)	Chimney Drain Flow (cfs)	7 Chimney Drain Flow (cfs)
0	0	0
1	0.23	1.61
2	0.25	1.75
3	0.27	1.89
4	0.29	2.03
5	0.33	2.31
6	0.38	2.66
7	0.42	2.94
8	0.46	3.22
9	0.66	4.62
10	0.82	5.74
11	1.47	10.29
12	3.25	22.75
13	3.22	22.54
14	0.63	4.41
15	0.49	3.43
16	0.43	3.01
17	0.38	2.66
18	0.33	2.31
19	0.27	1.89
20	0.26	1.82
21	0.25	1.75
22	0.24	1.68
23	0.23	1.61
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0

CHIMNEY DRAIN HYDROGRAPH TABLE

24-HOUR, 100-YEAR RAINFALL EVENT

144-189 Carter Hollow Landfill
Leachate Collection Pond Sizing

Chimney Drain Hydrograph
24-Hour, 100-Year Rainfall Event

Time (hours)	Chimney Drain Flow (cfs)	7 Chimney Drain Flow (cfs)
0	0	0
1	0.23	1.61
2	0.25	1.75
3	0.27	1.89
4	0.29	2.03
5	0.33	2.31
6	0.38	2.66
7	0.42	2.94
8	0.46	3.22
9	0.66	4.62
10	0.82	5.74
11	1.47	10.29
12	3.28	22.96
13	3.27	22.89
14	3.25	22.75
15	0.63	4.41
16	0.49	3.43
17	0.43	3.01
18	0.38	2.66
19	0.33	2.31
20	0.27	1.89
21	0.26	1.82
22	0.25	1.75
23	0.24	1.68
24	0.23	1.61
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	0	0
38	0	0
39	0	0
40	0	0

ATTACHMENT 5

PLASTIC PIPE INSTITUTE DESIGN TABLE

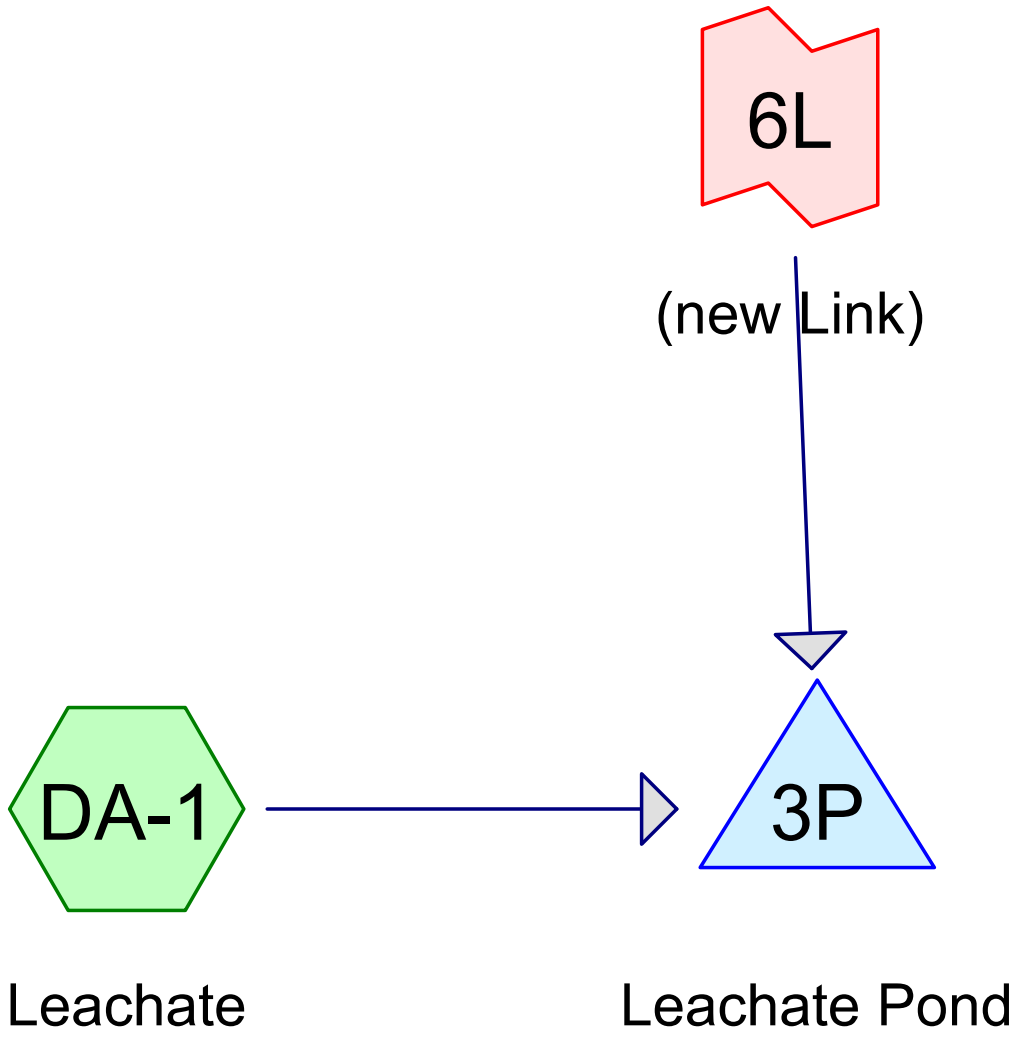
OD			Pipe inside diameter (d)	Minimum Wall Thickness (t)	Weight (w)
Nominal in.	Actual in.	DR	in.	in.	lb. per foot
		7	13.94	2.857	66.853
		7.3	14.19	2.740	64.576
		9	15.29	2.222	54.059
		9.3	15.44	2.151	52.541
		11	16.15	1.818	45.304
20	20.000	11.5	16.31	1.739	43.535
		13.5	16.86	1.481	37.643
		15.5	17.26	1.290	33.146
		17	17.51	1.176	30.418
		21	17.98	0.952	24.936
		26	18.37	0.769	20.346
		32.5	18.70	0.615	16.415
		9	16.82	2.444	65.412
		9.3	16.98	2.366	63.574
		11	17.76	2.000	54.818
		11.5	17.94	1.913	52.677
22	22.000	13.5	18.55	1.630	45.548
		15.5	18.99	1.419	40.107
		17	19.26	1.294	36.805
		21	19.78	1.048	30.172
		26	20.21	0.846	24.619
		32.5	20.56	0.677	19.863
		9	18.35	2.667	77.845
		9.3	18.53	2.581	75.658
		11	19.37	2.182	65.237
		11.5	19.58	2.087	62.690
24	24.000	13.5	20.23	1.778	54.206
		15.5	20.72	1.548	47.731
		17	21.01	1.412	43.801
		21	21.58	1.143	35.907
		26	22.04	0.923	29.299
		32.5	22.43	0.738	23.638

ATTACHMENT 6

LEACHATE COLLECTION POND HYDROCAD OUTPUT

LEACHATE COLLECTION POND HYDROCAD OUTPUT

24-HOUR, 10-YEAR RAINFALL EVENT



Subcat Reach Pond Link

Routing Diagram for 144-189 LP Option 2 10-yr
Prepared by CEC, Inc., Printed 6/9/2016
HydroCAD® 10.00-11 s/n 04930 © 2014 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.740	94	Fallow, bare soil, HSG D (DA-1)
1.740	**94**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
1.740	HSG D	DA-1
0.000	Other	
1.740		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	1.740	0.000	1.740	Fallow, bare soil	DA-1
0.000	**0.000**	**0.000**	**1.740**	**0.000**	**1.740**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	3P	635.00	522.00	4,417.0	0.0256	0.010	22.0	0.0	0.0

Time span=1.00-48.00 hrs, dt=0.05 hrs, 941 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA-1: Leachate Runoff Area=1.740 ac 0.00% Impervious Runoff Depth=3.49"
Flow Length=145' Slope=0.1330 '/' Tc=0.8 min CN=94 Runoff=10.96 cfs 0.506 af

Pond 3P: Leachate Pond Peak Elev=639.89' Storage=45,686 cf Inflow=32.77 cfs 10.689 af
22.0" Round Culvert n=0.010 L=4,417.0' S=0.0256 '/' Outflow=22.37 cfs 10.474 af

Link 6L: (new Link) Manual Hydrograph Inflow=22.75 cfs 8.938 af
Primary=22.75 cfs 8.938 af

Total Runoff Area = 1.740 ac Runoff Volume = 0.506 af Average Runoff Depth = 3.49"
100.00% Pervious = 1.740 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment DA-1: Leachate

[49] Hint: Tc<2dt may require smaller dt

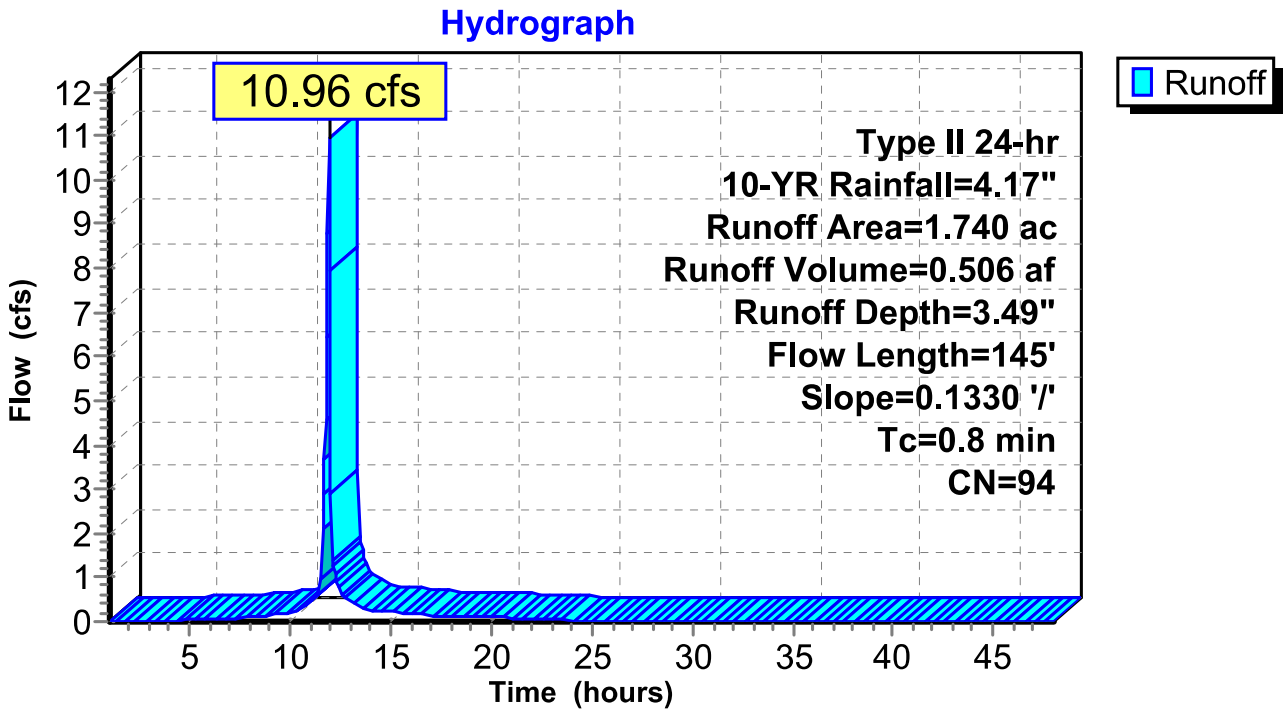
Runoff = 10.96 cfs @ 11.90 hrs, Volume= 0.506 af, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR Rainfall=4.17"

Area (ac)	CN	Description
1.740	94	Fallow, bare soil, HSG D
1.740		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	145	0.1330	3.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.91"

Subcatchment DA-1: Leachate



Hydrograph for Subcatchment DA-1: Leachate

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
1.00	0.04	0.00	0.00
1.50	0.07	0.00	0.00
2.00	0.09	0.00	0.00
2.50	0.12	0.00	0.00
3.00	0.14	0.00	0.00
3.50	0.17	0.00	0.01
4.00	0.20	0.01	0.02
4.50	0.23	0.01	0.03
5.00	0.26	0.02	0.04
5.50	0.30	0.04	0.05
6.00	0.33	0.05	0.06
6.50	0.37	0.07	0.07
7.00	0.41	0.09	0.08
7.50	0.46	0.11	0.09
8.00	0.50	0.14	0.10
8.50	0.55	0.17	0.13
9.00	0.61	0.21	0.16
9.50	0.68	0.26	0.17
10.00	0.75	0.31	0.22
10.50	0.85	0.38	0.29
11.00	0.98	0.49	0.43
11.50	1.18	0.66	**0.77**
12.00	2.76	2.12	**2.92**
12.50	3.06	2.41	0.64
13.00	3.22	2.56	0.44
13.50	3.33	2.67	0.34
14.00	3.42	2.76	0.27
14.50	3.49	2.83	0.24
15.00	3.56	2.89	0.21
15.50	3.62	2.95	0.19
16.00	3.67	3.00	0.17
16.50	3.72	3.05	0.16
17.00	3.76	3.09	0.15
17.50	3.80	3.13	0.14
18.00	3.84	3.17	0.13
18.50	3.88	3.20	0.12
19.00	3.91	3.24	0.11
19.50	3.94	3.27	0.10
20.00	3.97	3.29	0.09
20.50	4.00	3.32	0.09
21.00	4.02	3.35	0.09
21.50	4.05	3.37	0.09
22.00	4.07	3.40	0.09
22.50	4.10	3.42	0.08
23.00	4.12	3.45	0.08
23.50	4.15	3.47	0.08
24.00	**4.17**	**3.49**	0.06
24.50	4.17	3.49	0.00
25.00	4.17	3.49	0.00
25.50	4.17	3.49	0.00
26.00	4.17	3.49	0.00
26.50	4.17	3.49	0.00
27.00	4.17	3.49	0.00
27.50	4.17	3.49	0.00
28.00	4.17	3.49	0.00
28.50	4.17	3.49	0.00
29.00	4.17	3.49	0.00
29.50	4.17	3.49	0.00
30.00	4.17	3.49	0.00
30.50	4.17	3.49	0.00
31.00	4.17	3.49	0.00
31.50	4.17	3.49	0.00
32.00	4.17	3.49	0.00
32.50	4.17	3.49	0.00
33.00	4.17	3.49	0.00
33.50	4.17	3.49	0.00
34.00	4.17	3.49	0.00
34.50	4.17	3.49	0.00
35.00	4.17	3.49	0.00
35.50	4.17	3.49	0.00
36.00	4.17	3.49	0.00
36.50	4.17	3.49	0.00
37.00	4.17	3.49	0.00
37.50	4.17	3.49	0.00
38.00	4.17	3.49	0.00
38.50	4.17	3.49	0.00
39.00	4.17	3.49	0.00
39.50	4.17	3.49	0.00
40.00	4.17	3.49	0.00
40.50	4.17	3.49	0.00
41.00	4.17	3.49	0.00
41.50	4.17	3.49	0.00
42.00	4.17	3.49	0.00
42.50	4.17	3.49	0.00
43.00	4.17	3.49	0.00
43.50	4.17	3.49	0.00
44.00	4.17	3.49	0.00
44.50	4.17	3.49	0.00
45.00	4.17	3.49	0.00
45.50	4.17	3.49	0.00
46.00	4.17	3.49	0.00
46.50	4.17	3.49	0.00
47.00	4.17	3.49	0.00
47.50	4.17	3.49	0.00
48.00	4.17	3.49	0.00

Summary for Pond 3P: Leachate Pond

[82] Warning: Early inflow requires earlier time span

Inflow Area = 1.740 ac, 0.00% Impervious, Inflow Depth > 73.72" for 10-YR event
Inflow = 32.77 cfs @ 11.90 hrs, Volume= 10.689 af, Incl. 0.32 cfs Base Flow
Outflow = 22.37 cfs @ 13.05 hrs, Volume= 10.474 af, Atten= 32%, Lag= 69.0 min
Primary = 22.37 cfs @ 13.05 hrs, Volume= 10.474 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 639.89' @ 13.05 hrs Surf.Area= 0 sf Storage= 45,686 cf

Plug-Flow detention time= 70.3 min calculated for 10.459 af (98% of inflow)
Center-of-Mass det. time= 32.3 min (843.7 - 811.5)

Volume	Invert	Avail.Storage	Storage Description
#1	632.00'	251,926 cf	**Custom Stage Data**Listed below

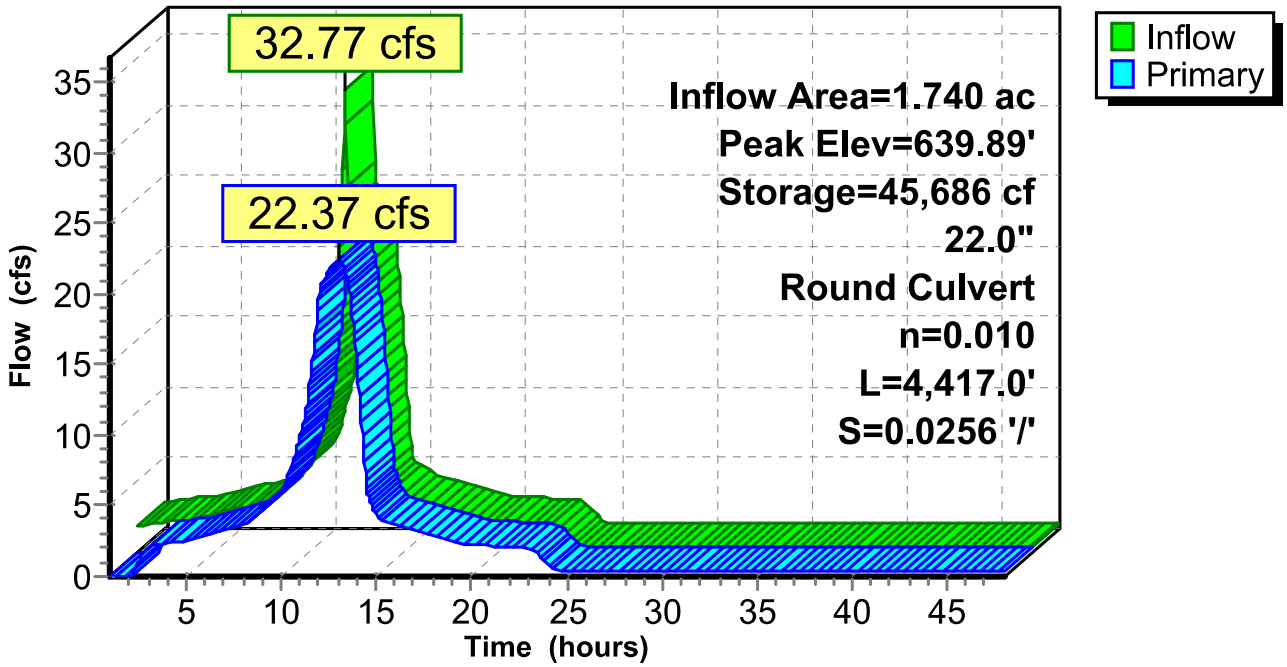
Elevation (feet)	Cum.Store (cubic-feet)
632.00	0
633.00	1,715
634.00	4,370
635.00	8,147
636.00	13,146
637.00	19,439
638.00	27,098
639.00	36,195
640.00	46,803
641.00	58,995
642.00	72,842
643.00	88,417
644.00	105,793
645.00	125,042
646.00	146,237
647.00	169,451
648.00	194,755
649.00	222,223
650.00	251,926

Device	Routing	Invert	Outlet Devices
#1	Primary	635.00'	**22.0" Round Culvert** L= 4,417.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 635.00' / 522.00' S= 0.0256 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 2.64 sf

Primary OutFlow Max=22.37 cfs @ 13.05 hrs HW=639.89' (Free Discharge)
1=Culvert (Inlet Controls 22.37 cfs @ 8.47 fps)

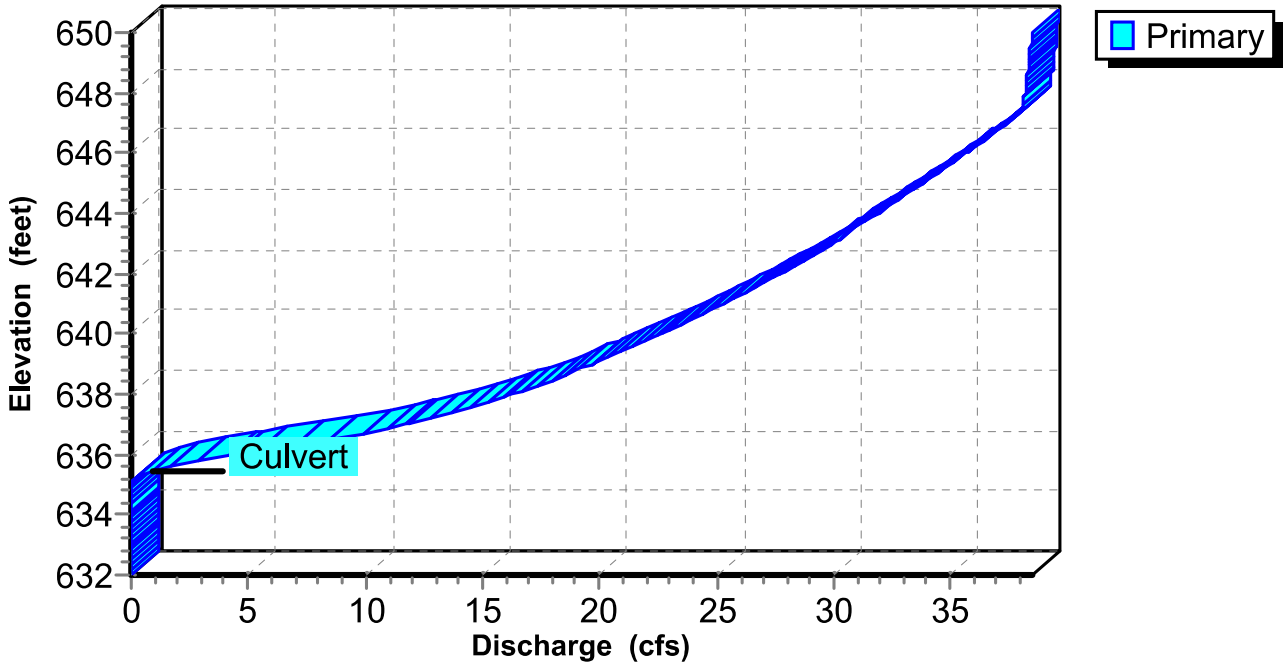
Pond 3P: Leachate Pond

Hydrograph

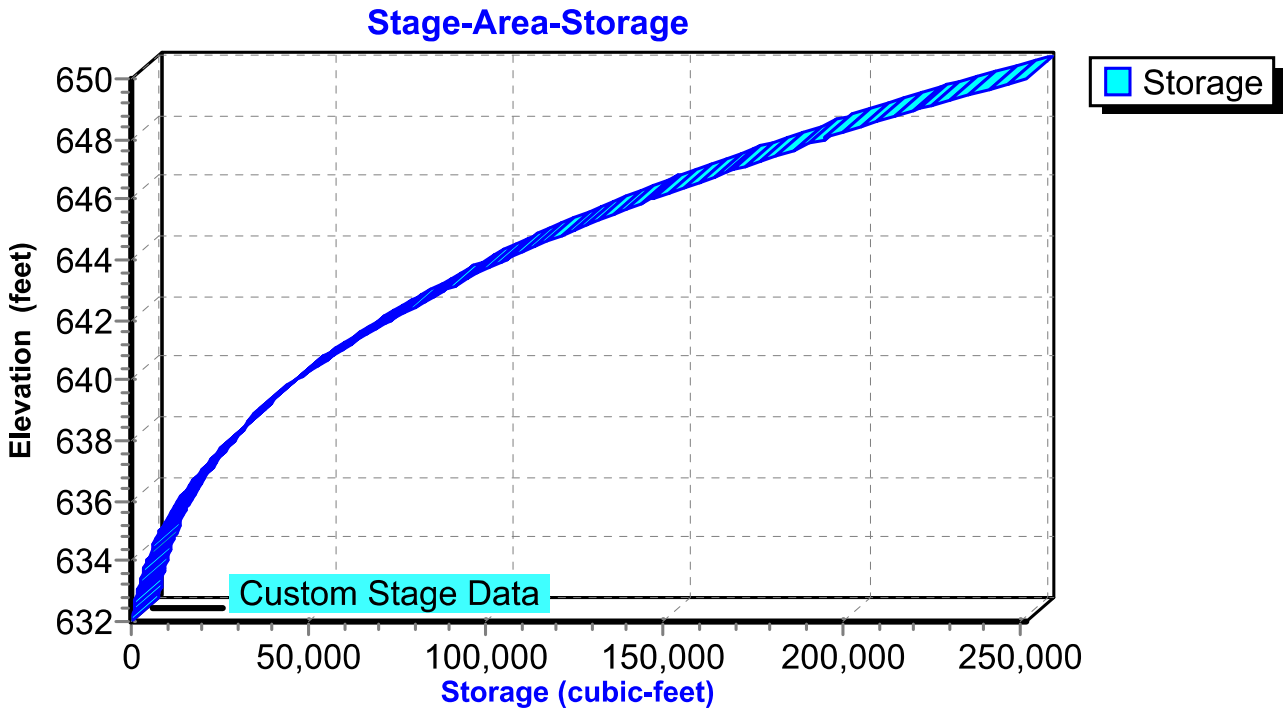


Pond 3P: Leachate Pond

Stage-Discharge



Pond 3P: Leachate Pond



Hydrograph for Pond 3P: Leachate Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
1.00	1.93	174	632.10	0.00
2.00	2.07	7,374	634.80	0.00
3.00	2.21	11,385	635.65	2.04
4.00	2.37	11,628	635.70	2.33
5.00	2.67	11,848	635.74	2.60
6.00	3.04	12,132	635.80	2.96
7.00	3.34	12,354	635.84	3.28
8.00	3.64	12,565	635.88	3.58
9.00	5.10	13,437	636.05	4.79
10.00	6.28	14,395	636.20	6.02
11.00	**11.04**	17,500	636.69	9.94
12.00	**25.99**	37,450	639.12	20.07
13.00	23.30	**45,599**	**639.89**	**22.34**
14.00	5.00	**24,286**	**637.63**	**14.69**
15.00	3.96	13,090	635.99	4.34
16.00	3.50	12,573	635.89	3.59
17.00	3.13	12,299	635.83	3.20
18.00	2.76	12,040	635.78	2.83
19.00	2.32	11,701	635.71	2.42
20.00	2.23	11,564	635.68	2.25
21.00	2.16	11,500	635.67	2.18
22.00	2.09	11,439	635.66	2.10
23.00	2.01	11,378	635.65	2.03
24.00	0.38	10,204	635.41	0.86
25.00	0.32	9,456	635.26	0.37
26.00	0.32	9,385	635.25	0.32
27.00	0.32	9,378	635.25	0.32
28.00	0.32	9,378	635.25	0.32
29.00	0.32	9,378	635.25	0.32
30.00	0.32	9,378	635.25	0.32
31.00	0.32	9,378	635.25	0.32
32.00	0.32	9,378	635.25	0.32
33.00	0.32	9,378	635.25	0.32
34.00	0.32	9,378	635.25	0.32
35.00	0.32	9,378	635.25	0.32
36.00	0.32	9,378	635.25	0.32
37.00	0.32	9,378	635.25	0.32
38.00	0.32	9,378	635.25	0.32
39.00	0.32	9,378	635.25	0.32
40.00	0.32	9,378	635.25	0.32
41.00	0.32	9,378	635.25	0.32
42.00	0.32	9,378	635.25	0.32
43.00	0.32	9,378	635.25	0.32
44.00	0.32	9,378	635.25	0.32
45.00	0.32	9,378	635.25	0.32
46.00	0.32	9,378	635.25	0.32
47.00	0.32	9,378	635.25	0.32
48.00	0.32	9,378	635.25	0.32

Stage-Discharge for Pond 3P: Leachate Pond

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
632.00	0.00	642.40	28.56
632.20	0.00	642.60	28.99
632.40	0.00	642.80	29.42
632.60	0.00	643.00	29.85
632.80	0.00	643.20	30.27
633.00	0.00	643.40	30.68
633.20	0.00	643.60	31.09
633.40	0.00	643.80	31.49
633.60	0.00	644.00	31.89
633.80	0.00	644.20	32.28
634.00	0.00	644.40	32.67
634.20	0.00	644.60	33.05
634.40	0.00	644.80	33.43
634.60	0.00	645.00	33.80
634.80	0.00	645.20	34.17
635.00	0.00	645.40	34.54
635.20	0.21	645.60	34.90
635.40	0.81	645.80	35.26
635.60	1.75	646.00	35.61
635.80	2.97	646.20	35.96
636.00	4.42	646.40	36.31
636.20	6.03	646.60	36.66
636.40	7.69	646.80	37.00
636.60	9.29	647.00	37.34
636.80	10.60	647.20	37.67
637.00	11.67	647.40	38.01
637.20	12.71	647.60	38.09
637.40	13.66	647.80	38.12
637.60	14.55	648.00	38.15
637.80	15.39	648.20	38.18
638.00	16.19	648.40	38.22
638.20	16.95	648.60	38.25
638.40	17.67	648.80	38.28
638.60	18.37	649.00	38.31
638.80	19.04	649.20	38.34
639.00	19.69	649.40	38.37
639.20	20.32	649.60	38.40
639.40	20.93	649.80	38.43
639.60	21.52	650.00	**38.46**
639.80	22.10		
640.00	22.66		
640.20	23.21		
640.40	23.75		
640.60	24.27		
640.80	24.78		
641.00	25.29		
641.20	25.78		
641.40	26.26		
641.60	26.74		
641.80	27.20		
642.00	27.66		
642.20	28.11		

Stage-Area-Storage for Pond 3P: Leachate Pond

Elevation (feet)	Storage (cubic-feet)
632.00	0
632.20	343
632.40	686
632.60	1,029
632.80	1,372
633.00	1,715
633.20	2,246
633.40	2,777
633.60	3,308
633.80	3,839
634.00	4,370
634.20	5,125
634.40	5,881
634.60	6,636
634.80	7,392
635.00	8,147
635.20	9,147
635.40	10,147
635.60	11,146
635.80	12,146
636.00	13,146
636.20	14,405
636.40	15,663
636.60	16,922
636.80	18,180
637.00	19,439
637.20	20,971
637.40	22,503
637.60	24,034
637.80	25,566
638.00	27,098
638.20	28,917
638.40	30,737
638.60	32,556
638.80	34,376
639.00	36,195
639.20	38,317
639.40	40,438
639.60	42,560
639.80	44,681
640.00	46,803
640.20	49,241
640.40	51,680
640.60	54,118
640.80	56,557
641.00	58,995
641.20	61,764
641.40	64,534
641.60	67,303
641.80	70,073
642.00	72,842
642.20	75,957
642.40	79,072
642.60	82,187
642.80	85,302
643.00	88,417
643.20	91,892
643.40	95,367
643.60	98,843
643.80	102,318
644.00	105,793
644.20	109,643
644.40	113,493
644.60	117,342
644.80	121,192
645.00	125,042
645.20	129,281
645.40	133,520
645.60	137,759
645.80	141,998
646.00	146,237
646.20	150,880
646.40	155,523
646.60	160,165
646.80	164,808
647.00	169,451
647.20	174,512
647.40	179,573
647.60	184,633
647.80	189,694
648.00	194,755
648.20	200,249
648.40	205,742
648.60	211,236
648.80	216,729
649.00	222,223
649.20	228,164
649.40	234,104
649.60	240,045
649.80	245,985
650.00	**251,926**

Summary for Link 6L: (new Link)

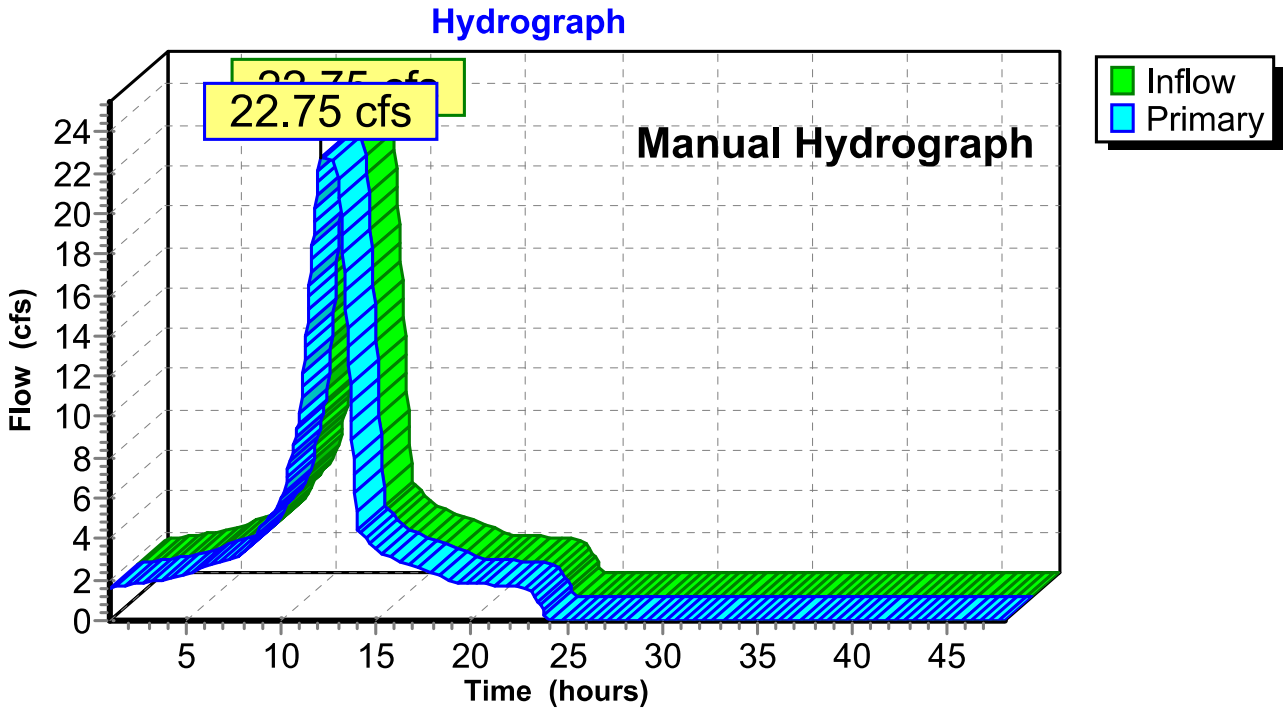
Inflow = 22.75 cfs @ 12.00 hrs, Volume= 8.938 af
Primary = 22.75 cfs @ 12.00 hrs, Volume= 8.938 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

109 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	1.61	1.75	1.89	2.03	2.31	2.66	2.94	3.22	4.62
5.74	10.29	22.75	22.54	4.41	3.43	3.01	2.66	2.31	1.89
1.82	1.75	1.68	1.61	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Link 6L: (new Link)

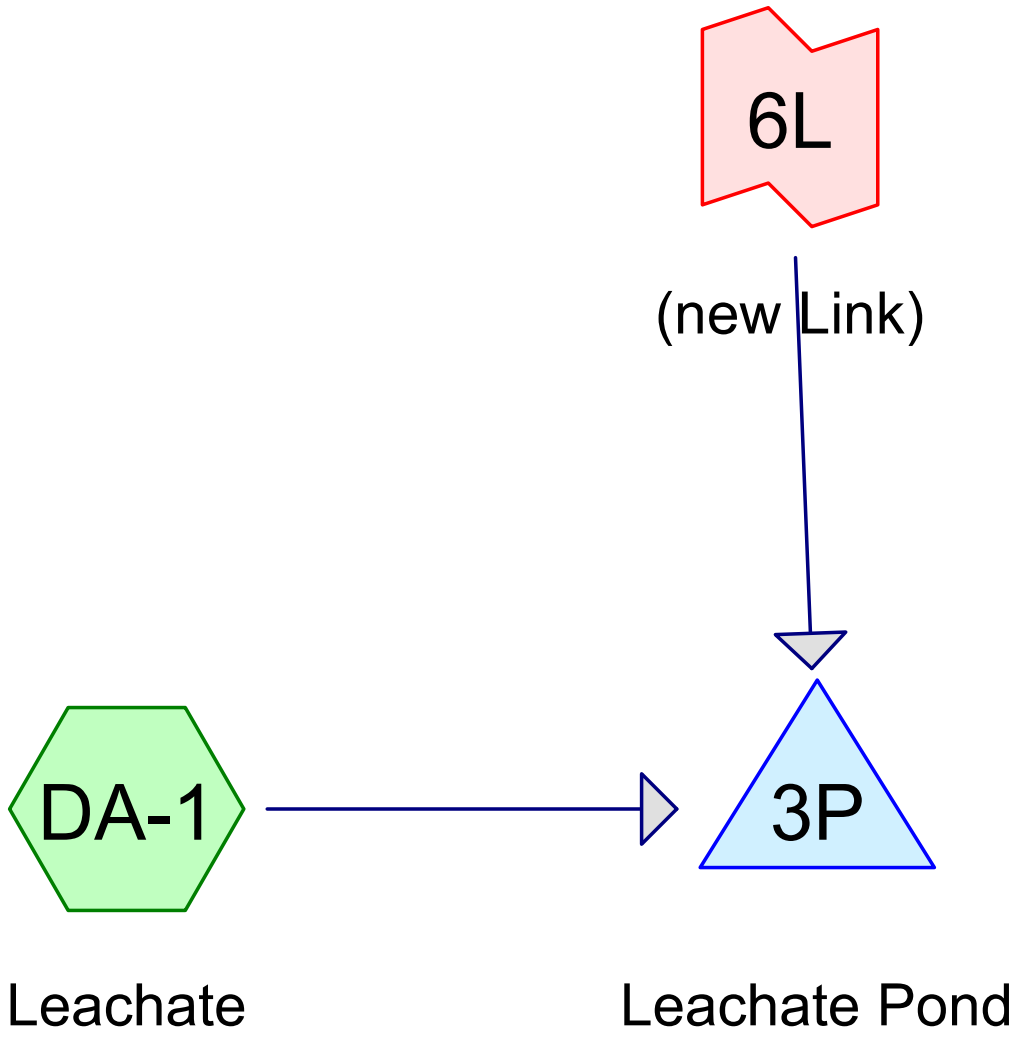


Hydrograph for Link 6L: (new Link)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
1.00	1.61	**0.00**	1.61	27.00	0.00	0.00	0.00
1.50	1.68	0.00	1.68	27.50	0.00	0.00	0.00
2.00	1.75	0.00	1.75	28.00	0.00	0.00	0.00
2.50	1.82	0.00	1.82	28.50	0.00	0.00	0.00
3.00	1.89	0.00	1.89	29.00	0.00	0.00	0.00
3.50	1.96	0.00	1.96	29.50	0.00	0.00	0.00
4.00	2.03	0.00	2.03	30.00	0.00	0.00	0.00
4.50	2.17	0.00	2.17	30.50	0.00	0.00	0.00
5.00	2.31	0.00	2.31	31.00	0.00	0.00	0.00
5.50	2.49	0.00	2.49	31.50	0.00	0.00	0.00
6.00	2.66	0.00	2.66	32.00	0.00	0.00	0.00
6.50	2.80	0.00	2.80	32.50	0.00	0.00	0.00
7.00	2.94	0.00	2.94	33.00	0.00	0.00	0.00
7.50	3.08	0.00	3.08	33.50	0.00	0.00	0.00
8.00	3.22	0.00	3.22	34.00	0.00	0.00	0.00
8.50	3.92	0.00	3.92	34.50	0.00	0.00	0.00
9.00	4.62	0.00	4.62	35.00	0.00	0.00	0.00
9.50	5.18	0.00	5.18	35.50	0.00	0.00	0.00
10.00	5.74	0.00	5.74	36.00	0.00	0.00	0.00
10.50	8.02	0.00	8.02	36.50	0.00	0.00	0.00
11.00	10.29	0.00	10.29	37.00	0.00	0.00	0.00
11.50	16.52	0.00	16.52	37.50	0.00	0.00	0.00
12.00	**22.75**	0.00	**22.75**	38.00	0.00	0.00	0.00
12.50	22.64	0.00	22.64	38.50	0.00	0.00	0.00
13.00	22.54	0.00	22.54	39.00	0.00	0.00	0.00
13.50	13.47	0.00	13.47	39.50	0.00	0.00	0.00
14.00	4.41	0.00	4.41	40.00	0.00	0.00	0.00
14.50	3.92	0.00	3.92	40.50	0.00	0.00	0.00
15.00	3.43	0.00	3.43	41.00	0.00	0.00	0.00
15.50	3.22	0.00	3.22	41.50	0.00	0.00	0.00
16.00	3.01	0.00	3.01	42.00	0.00	0.00	0.00
16.50	2.83	0.00	2.83	42.50	0.00	0.00	0.00
17.00	2.66	0.00	2.66	43.00	0.00	0.00	0.00
17.50	2.49	0.00	2.49	43.50	0.00	0.00	0.00
18.00	2.31	0.00	2.31	44.00	0.00	0.00	0.00
18.50	2.10	0.00	2.10	44.50	0.00	0.00	0.00
19.00	1.89	0.00	1.89	45.00	0.00	0.00	0.00
19.50	1.85	0.00	1.85	45.50	0.00	0.00	0.00
20.00	1.82	0.00	1.82	46.00	0.00	0.00	0.00
20.50	1.79	0.00	1.79	46.50	0.00	0.00	0.00
21.00	1.75	0.00	1.75	47.00	0.00	0.00	0.00
21.50	1.71	0.00	1.71	47.50	0.00	0.00	0.00
22.00	1.68	0.00	1.68	48.00	0.00	0.00	0.00
22.50	1.65	0.00	1.65				
23.00	1.61	0.00	1.61				
23.50	0.81	0.00	0.81				
24.00	0.00	0.00	0.00				
24.50	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
26.50	0.00	0.00	0.00				

LEACHATE COLLECTION POND HYDROCAD OUTPUT

24-HOUR, 100-YEAR RAINFALL EVENT



Subcat Reach Pond Link

Routing Diagram for 144-189 LP Option 2 100-yr
Prepared by CEC, Inc., Printed 6/9/2016
HydroCAD® 10.00-11 s/n 04930 © 2014 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.740	94	Fallow, bare soil, HSG D (DA-1)
1.740	**94**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
1.740	HSG D	DA-1
0.000	Other	
1.740		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	1.740	0.000	1.740	Fallow, bare soil	DA-1
0.000	**0.000**	**0.000**	**1.740**	**0.000**	**1.740**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	3P	635.00	522.00	4,417.0	0.0256	0.010	22.0	0.0	0.0

Time span=1.00-48.00 hrs, dt=0.05 hrs, 941 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA-1: Leachate Runoff Area=1.740 ac 0.00% Impervious Runoff Depth=5.68"
Flow Length=145' Slope=0.1330 '/' Tc=0.8 min CN=94 Runoff=17.28 cfs 0.824 af

Pond 3P: Leachate Pond Peak Elev=640.29' Storage=50,280 cf Inflow=39.26 cfs 12.933 af
22.0" Round Culvert n=0.010 L=4,417.0' S=0.0256 '/' Outflow=23.44 cfs 12.718 af

Link 6L: (new Link) Manual Hydrograph Inflow=22.96 cfs 10.865 af
Primary=22.96 cfs 10.865 af

Total Runoff Area = 1.740 ac Runoff Volume = 0.824 af Average Runoff Depth = 5.68"
100.00% Pervious = 1.740 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment DA-1: Leachate

[49] Hint: Tc<2dt may require smaller dt

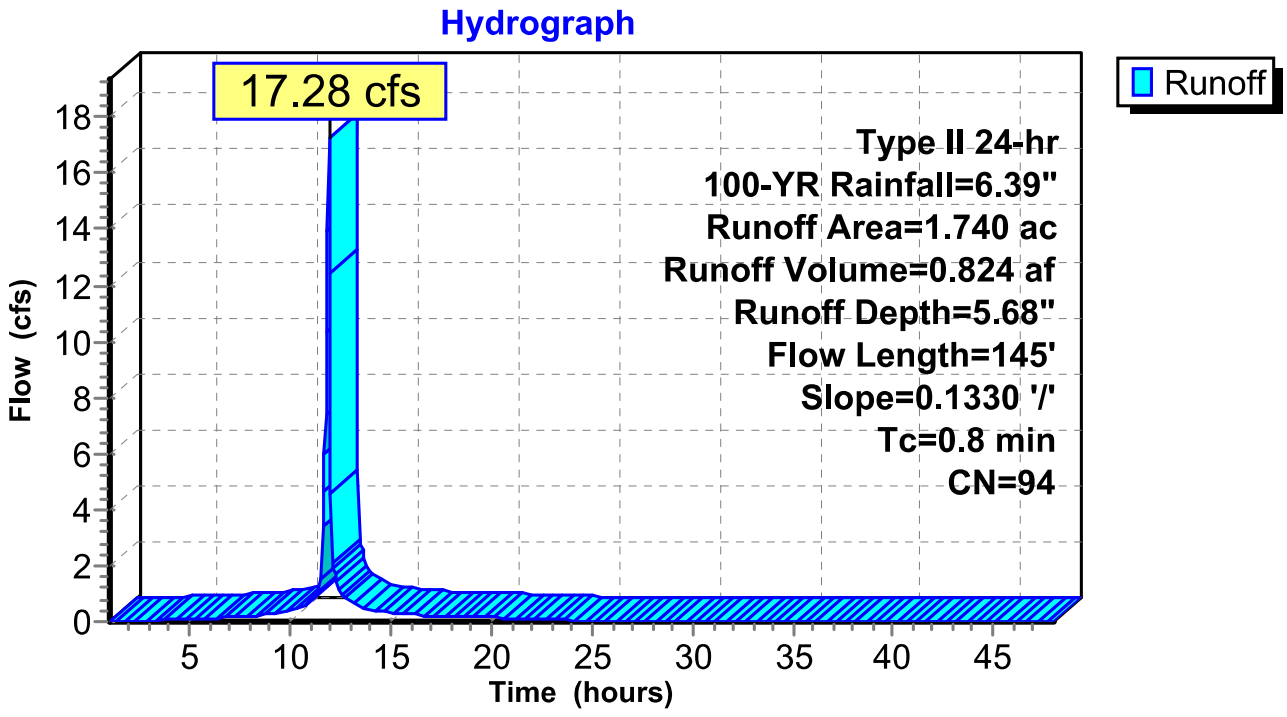
Runoff = 17.28 cfs @ 11.90 hrs, Volume= 0.824 af, Depth= 5.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR Rainfall=6.39"

Area (ac)	CN	Description
1.740	94	Fallow, bare soil, HSG D
1.740		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	145	0.1330	3.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.91"

Subcatchment DA-1: Leachate



Hydrograph for Subcatchment DA-1: Leachate

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
1.00	0.07	0.00	0.00
1.50	0.10	0.00	0.00
2.00	0.14	0.00	0.00
2.50	0.18	0.00	0.02
3.00	0.22	0.01	0.03
3.50	0.26	0.02	0.05
4.00	0.31	0.04	0.06
4.50	0.35	0.06	0.08
5.00	0.40	0.08	0.09
5.50	0.46	0.11	0.11
6.00	0.51	0.14	0.12
6.50	0.57	0.18	0.14
7.00	0.63	0.22	0.15
7.50	0.70	0.27	0.17
8.00	0.77	0.32	0.18
8.50	0.85	0.38	0.23
9.00	0.94	0.45	0.29
9.50	1.04	0.54	0.30
10.00	1.16	0.64	0.38
10.50	1.30	0.76	0.51
11.00	1.50	0.94	0.72
11.50	1.81	1.22	**1.28**
12.00	4.24	3.56	**4.56**
12.50	4.70	4.01	1.00
13.00	4.93	4.24	0.68
13.50	5.11	4.41	0.52
14.00	5.24	4.54	0.41
14.50	5.35	4.66	0.37
15.00	5.45	4.76	0.33
15.50	5.54	4.85	0.29
16.00	5.62	4.92	0.26
16.50	5.69	4.99	0.24
17.00	5.76	5.06	0.23
17.50	5.83	5.12	0.21
18.00	5.89	5.18	0.20
18.50	5.94	5.24	0.19
19.00	5.99	5.29	0.17
19.50	6.04	5.34	0.16
20.00	6.08	5.38	0.14
20.50	6.12	5.42	0.14
21.00	6.16	5.46	0.14
21.50	6.20	5.50	0.14
22.00	6.24	5.54	0.13
22.50	6.28	5.58	0.13
23.00	6.32	5.61	0.13
23.50	6.35	5.65	0.13
24.00	**6.39**	**5.68**	0.09
24.50	6.39	5.68	0.00
25.00	6.39	5.68	0.00
25.50	6.39	5.68	0.00
26.00	6.39	5.68	0.00
26.50	6.39	5.68	0.00
27.00	6.39	5.68	0.00
27.50	6.39	5.68	0.00
28.00	6.39	5.68	0.00
28.50	6.39	5.68	0.00
29.00	6.39	5.68	0.00
29.50	6.39	5.68	0.00
30.00	6.39	5.68	0.00
30.50	6.39	5.68	0.00
31.00	6.39	5.68	0.00
31.50	6.39	5.68	0.00
32.00	6.39	5.68	0.00
32.50	6.39	5.68	0.00
33.00	6.39	5.68	0.00
33.50	6.39	5.68	0.00
34.00	6.39	5.68	0.00
34.50	6.39	5.68	0.00
35.00	6.39	5.68	0.00
35.50	6.39	5.68	0.00
36.00	6.39	5.68	0.00
36.50	6.39	5.68	0.00
37.00	6.39	5.68	0.00
37.50	6.39	5.68	0.00
38.00	6.39	5.68	0.00
38.50	6.39	5.68	0.00
39.00	6.39	5.68	0.00
39.50	6.39	5.68	0.00
40.00	6.39	5.68	0.00
40.50	6.39	5.68	0.00
41.00	6.39	5.68	0.00
41.50	6.39	5.68	0.00
42.00	6.39	5.68	0.00
42.50	6.39	5.68	0.00
43.00	6.39	5.68	0.00
43.50	6.39	5.68	0.00
44.00	6.39	5.68	0.00
44.50	6.39	5.68	0.00
45.00	6.39	5.68	0.00
45.50	6.39	5.68	0.00
46.00	6.39	5.68	0.00
46.50	6.39	5.68	0.00
47.00	6.39	5.68	0.00
47.50	6.39	5.68	0.00
48.00	6.39	5.68	0.00

Summary for Pond 3P: Leachate Pond

[82] Warning: Early inflow requires earlier time span

Inflow Area = 1.740 ac, 0.00% Impervious, Inflow Depth > 89.19" for 100-YR event
Inflow = 39.26 cfs @ 11.90 hrs, Volume= 12.933 af, Incl. 0.32 cfs Base Flow
Outflow = 23.44 cfs @ 13.98 hrs, Volume= 12.718 af, Atten= 40%, Lag= 124.9 min
Primary = 23.44 cfs @ 13.98 hrs, Volume= 12.718 af

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 640.29' @ 13.98 hrs Surf.Area= 0 sf Storage= 50,280 cf

Plug-Flow detention time= 63.2 min calculated for 12.700 af (98% of inflow)
Center-of-Mass det. time= 32.3 min (855.3 - 823.1)

Volume	Invert	Avail.Storage	Storage Description
#1	632.00'	251,926 cf	**Custom Stage Data**Listed below

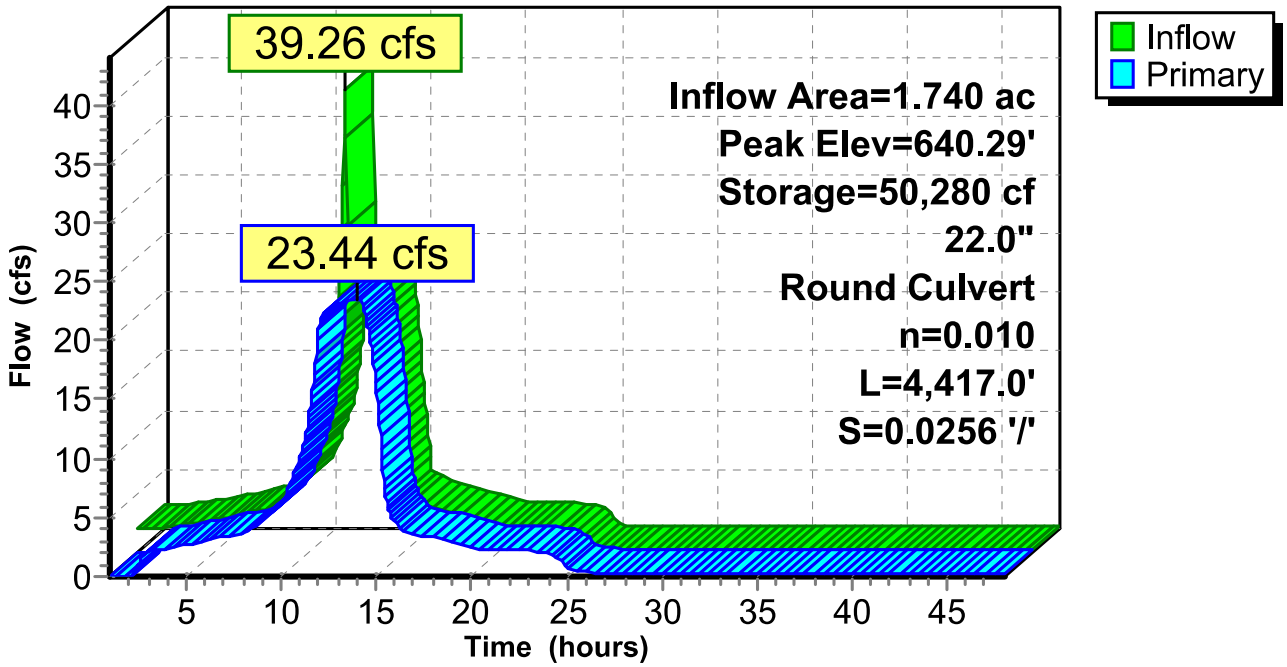
Elevation (feet)	Cum.Store (cubic-feet)
632.00	0
633.00	1,715
634.00	4,370
635.00	8,147
636.00	13,146
637.00	19,439
638.00	27,098
639.00	36,195
640.00	46,803
641.00	58,995
642.00	72,842
643.00	88,417
644.00	105,793
645.00	125,042
646.00	146,237
647.00	169,451
648.00	194,755
649.00	222,223
650.00	251,926

Device	Routing	Invert	Outlet Devices
#1	Primary	635.00'	**22.0" Round Culvert** L= 4,417.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 635.00' / 522.00' S= 0.0256 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 2.64 sf

Primary OutFlow Max=23.44 cfs @ 13.98 hrs HW=640.28' (Free Discharge)
1=Culvert (Inlet Controls 23.44 cfs @ 8.88 fps)

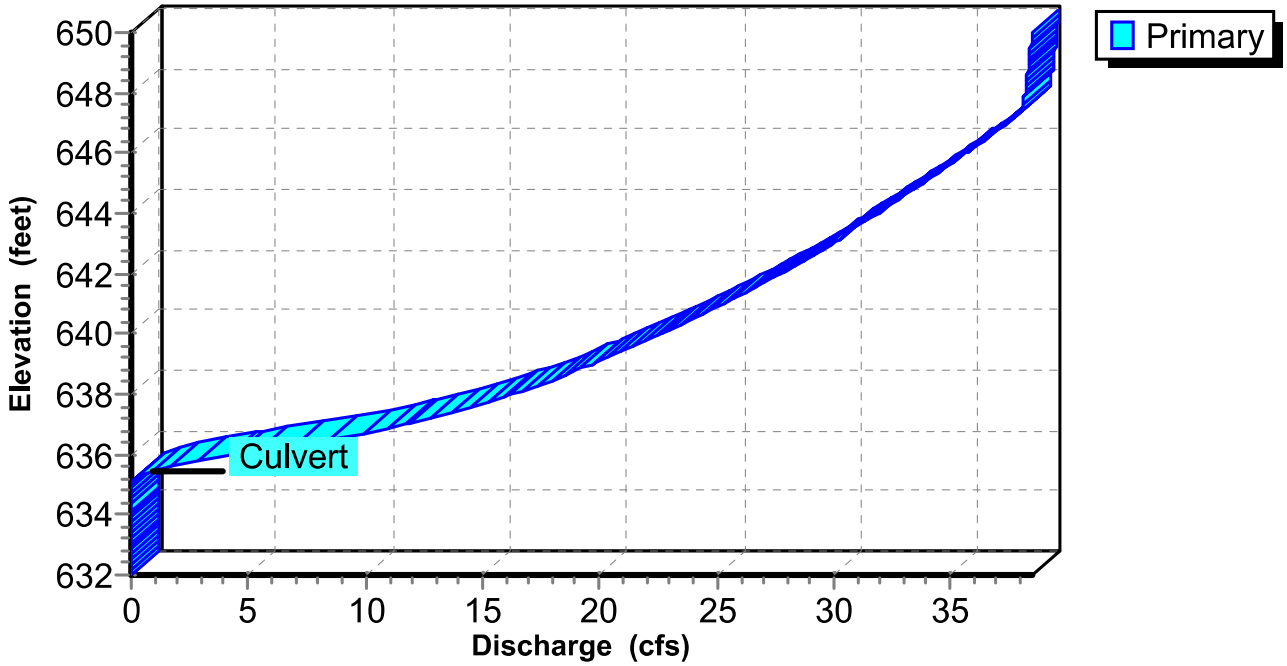
Pond 3P: Leachate Pond

Hydrograph

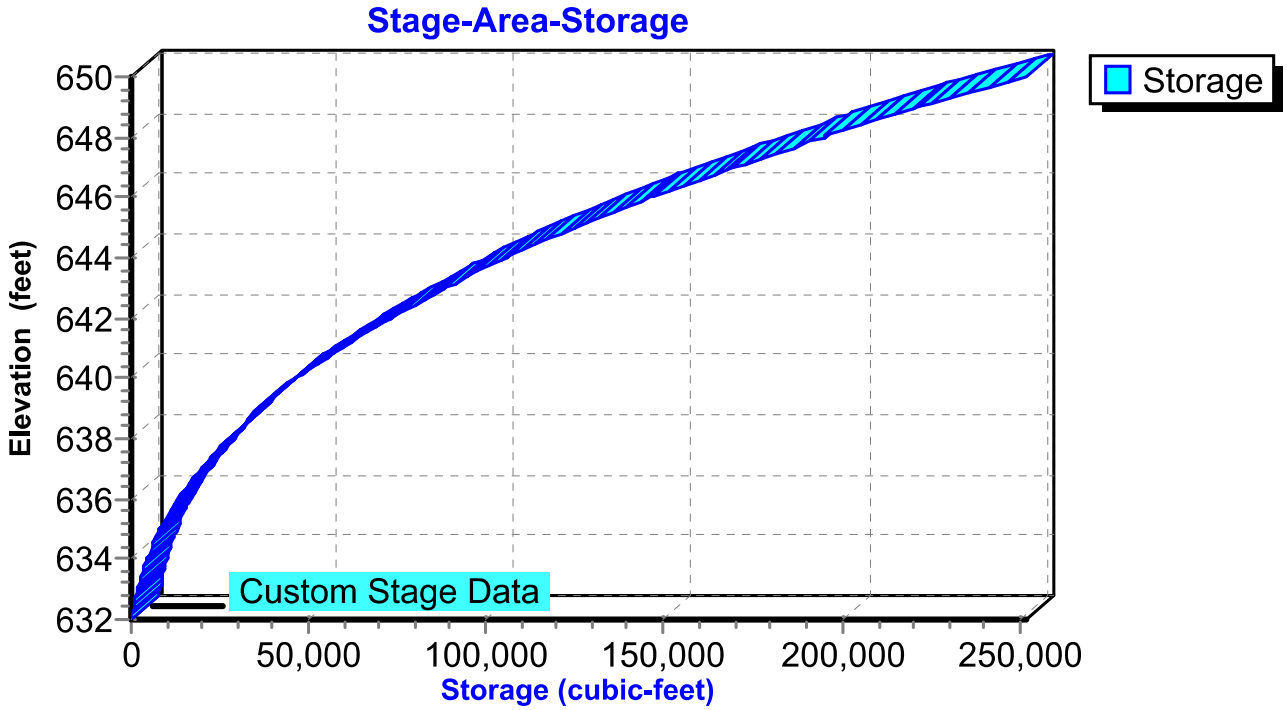


Pond 3P: Leachate Pond

Stage-Discharge



Pond 3P: Leachate Pond



Hydrograph for Pond 3P: Leachate Pond

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
1.00	1.93	174	632.10	0.00
2.00	2.07	7,375	634.80	0.00
3.00	2.24	11,408	635.65	2.06
4.00	2.41	11,660	635.70	2.37
5.00	2.72	11,890	635.75	2.65
6.00	3.10	12,178	635.81	3.03
7.00	3.41	12,407	635.85	3.35
8.00	3.72	12,626	635.90	3.66
9.00	5.23	13,530	636.06	4.91
10.00	6.44	14,511	636.22	6.17
11.00	**11.33**	17,721	636.73	10.14
12.00	**27.84**	42,257	639.57	21.44
13.00	23.89	49,126	640.19	23.18
14.00	23.48	**50,274**	**640.28**	**23.44**
15.00	5.06	26,074	637.87	15.66
16.00	4.01	13,157	636.00	4.44
17.00	3.56	12,614	635.89	3.65
18.00	3.18	12,338	635.84	3.25
19.00	2.80	12,072	635.79	2.88
20.00	2.35	11,731	635.72	2.46
21.00	2.28	11,599	635.69	2.30
22.00	2.20	11,536	635.68	2.22
23.00	2.13	11,474	635.67	2.15
24.00	2.02	11,409	635.65	2.07
25.00	0.32	10,122	635.40	0.81
26.00	0.32	9,448	635.26	0.37
27.00	0.32	9,384	635.25	0.32
28.00	0.32	9,378	635.25	0.32
29.00	0.32	9,378	635.25	0.32
30.00	0.32	9,378	635.25	0.32
31.00	0.32	9,378	635.25	0.32
32.00	0.32	9,378	635.25	0.32
33.00	0.32	9,378	635.25	0.32
34.00	0.32	9,378	635.25	0.32
35.00	0.32	9,378	635.25	0.32
36.00	0.32	9,378	635.25	0.32
37.00	0.32	9,378	635.25	0.32
38.00	0.32	9,378	635.25	0.32
39.00	0.32	9,378	635.25	0.32
40.00	0.32	9,378	635.25	0.32
41.00	0.32	9,378	635.25	0.32
42.00	0.32	9,378	635.25	0.32
43.00	0.32	9,378	635.25	0.32
44.00	0.32	9,378	635.25	0.32
45.00	0.32	9,378	635.25	0.32
46.00	0.32	9,378	635.25	0.32
47.00	0.32	9,378	635.25	0.32
48.00	0.32	9,378	635.25	0.32

Stage-Discharge for Pond 3P: Leachate Pond

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
632.00	0.00	642.40	28.56
632.20	0.00	642.60	28.99
632.40	0.00	642.80	29.42
632.60	0.00	643.00	29.85
632.80	0.00	643.20	30.27
633.00	0.00	643.40	30.68
633.20	0.00	643.60	31.09
633.40	0.00	643.80	31.49
633.60	0.00	644.00	31.89
633.80	0.00	644.20	32.28
634.00	0.00	644.40	32.67
634.20	0.00	644.60	33.05
634.40	0.00	644.80	33.43
634.60	0.00	645.00	33.80
634.80	0.00	645.20	34.17
635.00	0.00	645.40	34.54
635.20	0.21	645.60	34.90
635.40	0.81	645.80	35.26
635.60	1.75	646.00	35.61
635.80	2.97	646.20	35.96
636.00	4.42	646.40	36.31
636.20	6.03	646.60	36.66
636.40	7.69	646.80	37.00
636.60	9.29	647.00	37.34
636.80	10.60	647.20	37.67
637.00	11.67	647.40	38.01
637.20	12.71	647.60	38.09
637.40	13.66	647.80	38.12
637.60	14.55	648.00	38.15
637.80	15.39	648.20	38.18
638.00	16.19	648.40	38.22
638.20	16.95	648.60	38.25
638.40	17.67	648.80	38.28
638.60	18.37	649.00	38.31
638.80	19.04	649.20	38.34
639.00	19.69	649.40	38.37
639.20	20.32	649.60	38.40
639.40	20.93	649.80	38.43
639.60	21.52	650.00	**38.46**
639.80	22.10		
640.00	22.66		
640.20	23.21		
640.40	23.75		
640.60	24.27		
640.80	24.78		
641.00	25.29		
641.20	25.78		
641.40	26.26		
641.60	26.74		
641.80	27.20		
642.00	27.66		
642.20	28.11		

Stage-Area-Storage for Pond 3P: Leachate Pond

Elevation (feet)	Storage (cubic-feet)
632.00	0
632.20	343
632.40	686
632.60	1,029
632.80	1,372
633.00	1,715
633.20	2,246
633.40	2,777
633.60	3,308
633.80	3,839
634.00	4,370
634.20	5,125
634.40	5,881
634.60	6,636
634.80	7,392
635.00	8,147
635.20	9,147
635.40	10,147
635.60	11,146
635.80	12,146
636.00	13,146
636.20	14,405
636.40	15,663
636.60	16,922
636.80	18,180
637.00	19,439
637.20	20,971
637.40	22,503
637.60	24,034
637.80	25,566
638.00	27,098
638.20	28,917
638.40	30,737
638.60	32,556
638.80	34,376
639.00	36,195
639.20	38,317
639.40	40,438
639.60	42,560
639.80	44,681
640.00	46,803
640.20	49,241
640.40	51,680
640.60	54,118
640.80	56,557
641.00	58,995
641.20	61,764
641.40	64,534
641.60	67,303
641.80	70,073
642.00	72,842
642.20	75,957
642.40	79,072
642.60	82,187
642.80	85,302
643.00	88,417
643.20	91,892
643.40	95,367
643.60	98,843
643.80	102,318
644.00	105,793
644.20	109,643
644.40	113,493
644.60	117,342
644.80	121,192
645.00	125,042
645.20	129,281
645.40	133,520
645.60	137,759
645.80	141,998
646.00	146,237
646.20	150,880
646.40	155,523
646.60	160,165
646.80	164,808
647.00	169,451
647.20	174,512
647.40	179,573
647.60	184,633
647.80	189,694
648.00	194,755
648.20	200,249
648.40	205,742
648.60	211,236
648.80	216,729
649.00	222,223
649.20	228,164
649.40	234,104
649.60	240,045
649.80	245,985
650.00	**251,926**

Summary for Link 6L: (new Link)

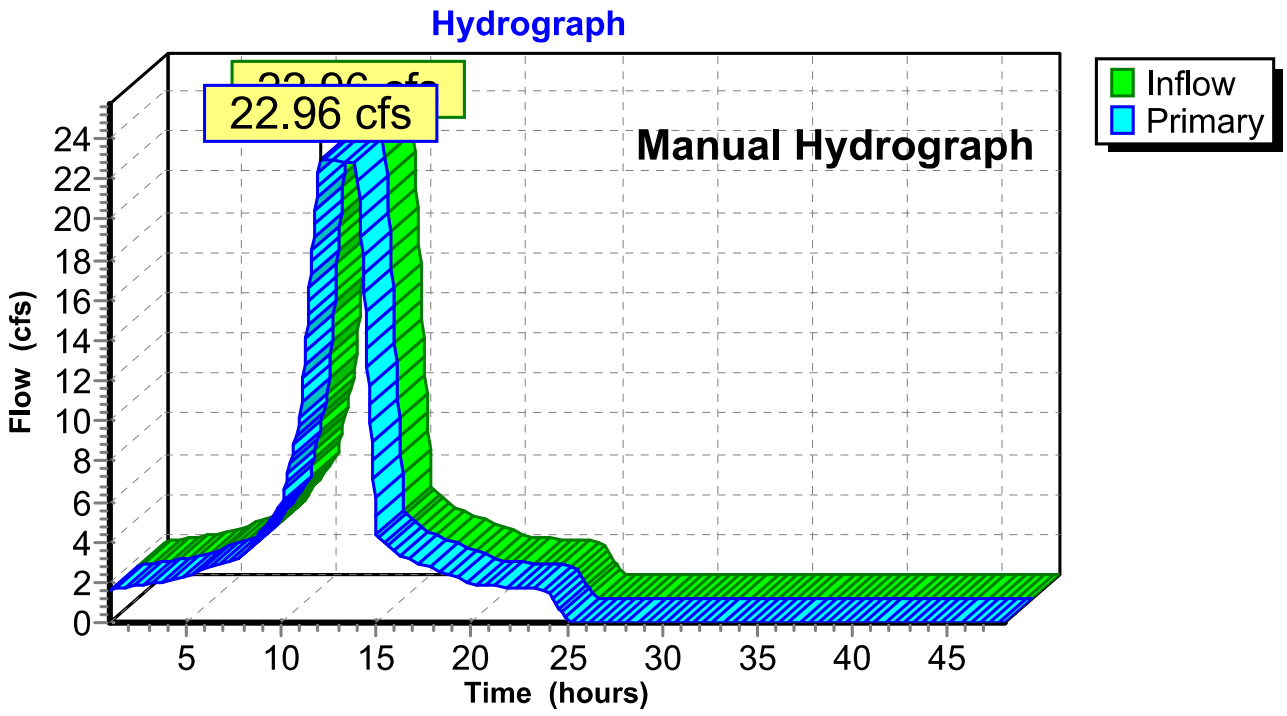
Inflow = 22.96 cfs @ 12.00 hrs, Volume= 10.865 af
Primary = 22.96 cfs @ 12.00 hrs, Volume= 10.865 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

107 Point manual hydrograph, To= 0.00 hrs, dt= 1.00 hrs, cfs =

0.00	1.61	1.75	1.89	2.03	2.31	2.66	2.94	3.22	4.62
5.74	10.29	22.96	22.89	22.75	4.41	3.43	3.01	2.66	2.31
1.89	1.82	1.75	1.68	1.61	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			

Link 6L: (new Link)



Hydrograph for Link 6L: (new Link)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
1.00	1.61	**0.00**	1.61	27.00	0.00	0.00	0.00
1.50	1.68	0.00	1.68	27.50	0.00	0.00	0.00
2.00	1.75	0.00	1.75	28.00	0.00	0.00	0.00
2.50	1.82	0.00	1.82	28.50	0.00	0.00	0.00
3.00	1.89	0.00	1.89	29.00	0.00	0.00	0.00
3.50	1.96	0.00	1.96	29.50	0.00	0.00	0.00
4.00	2.03	0.00	2.03	30.00	0.00	0.00	0.00
4.50	2.17	0.00	2.17	30.50	0.00	0.00	0.00
5.00	2.31	0.00	2.31	31.00	0.00	0.00	0.00
5.50	2.49	0.00	2.49	31.50	0.00	0.00	0.00
6.00	2.66	0.00	2.66	32.00	0.00	0.00	0.00
6.50	2.80	0.00	2.80	32.50	0.00	0.00	0.00
7.00	2.94	0.00	2.94	33.00	0.00	0.00	0.00
7.50	3.08	0.00	3.08	33.50	0.00	0.00	0.00
8.00	3.22	0.00	3.22	34.00	0.00	0.00	0.00
8.50	3.92	0.00	3.92	34.50	0.00	0.00	0.00
9.00	4.62	0.00	4.62	35.00	0.00	0.00	0.00
9.50	5.18	0.00	5.18	35.50	0.00	0.00	0.00
10.00	5.74	0.00	5.74	36.00	0.00	0.00	0.00
10.50	8.02	0.00	8.02	36.50	0.00	0.00	0.00
11.00	10.29	0.00	10.29	37.00	0.00	0.00	0.00
11.50	16.63	0.00	16.63	37.50	0.00	0.00	0.00
12.00	**22.96**	0.00	**22.96**	38.00	0.00	0.00	0.00
12.50	22.93	0.00	22.93	38.50	0.00	0.00	0.00
13.00	22.89	0.00	22.89	39.00	0.00	0.00	0.00
13.50	22.82	0.00	22.82	39.50	0.00	0.00	0.00
14.00	22.75	0.00	22.75	40.00	0.00	0.00	0.00
14.50	13.58	0.00	13.58	40.50	0.00	0.00	0.00
15.00	4.41	0.00	4.41	41.00	0.00	0.00	0.00
15.50	3.92	0.00	3.92	41.50	0.00	0.00	0.00
16.00	3.43	0.00	3.43	42.00	0.00	0.00	0.00
16.50	3.22	0.00	3.22	42.50	0.00	0.00	0.00
17.00	3.01	0.00	3.01	43.00	0.00	0.00	0.00
17.50	2.83	0.00	2.83	43.50	0.00	0.00	0.00
18.00	2.66	0.00	2.66	44.00	0.00	0.00	0.00
18.50	2.49	0.00	2.49	44.50	0.00	0.00	0.00
19.00	2.31	0.00	2.31	45.00	0.00	0.00	0.00
19.50	2.10	0.00	2.10	45.50	0.00	0.00	0.00
20.00	1.89	0.00	1.89	46.00	0.00	0.00	0.00
20.50	1.85	0.00	1.85	46.50	0.00	0.00	0.00
21.00	1.82	0.00	1.82	47.00	0.00	0.00	0.00
21.50	1.79	0.00	1.79	47.50	0.00	0.00	0.00
22.00	1.75	0.00	1.75	48.00	0.00	0.00	0.00
22.50	1.71	0.00	1.71				
23.00	1.68	0.00	1.68				
23.50	1.65	0.00	1.65				
24.00	1.61	0.00	1.61				
24.50	0.81	0.00	0.81				
25.00	0.00	0.00	0.00				
25.50	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
26.50	0.00	0.00	0.00				

CHIMNEY DRAIN EVALUATION

(Taken from the existing PTI Permit Application for the Carter Hollow Landfill)

CALCULATION BRIEF

CARTER HOLLOW LANDFILL
PERMIT ALTERATION – 2016 DESIGN CHANGES
(C)(6)(m)(6) CHIMNEY DRAIN EVALUATION

OBJECTIVE: **Evaluate the effects of incorporating chimney drains into the design of the Carter Hollow Landfill.**

REFERENCES:

1. Permit Application; "Class III Residual Waste Landfill; Carter Hollow Landfill, Sprigg Township; Adams County, Ohio;" prepared for The Dayton Power and Light Company; prepared by Civil & Environmental Consultants, Inc.; last revised on February 2011.

2. "HydroCAD 10.00," HydroCAD Software Solutions LLC, 2011.

3. Point Precipitation Frequency Estimates; NOAA Atlas 14, Volume 2 Version 3; Location Name: Manchester Ohio, US, Latitude: 38.6320^{o}, Longitude: -83.6646^{o}; Elevation 536 ft; accessed 12/21/2015. (Attachment 3)

4. "Hydraulic Evaluation of Landfill Performance (HELP) Version 3.07," United States Army Corps of Engineers, Engineer Research and Development Center, March 1997.

METHODOLOGY:

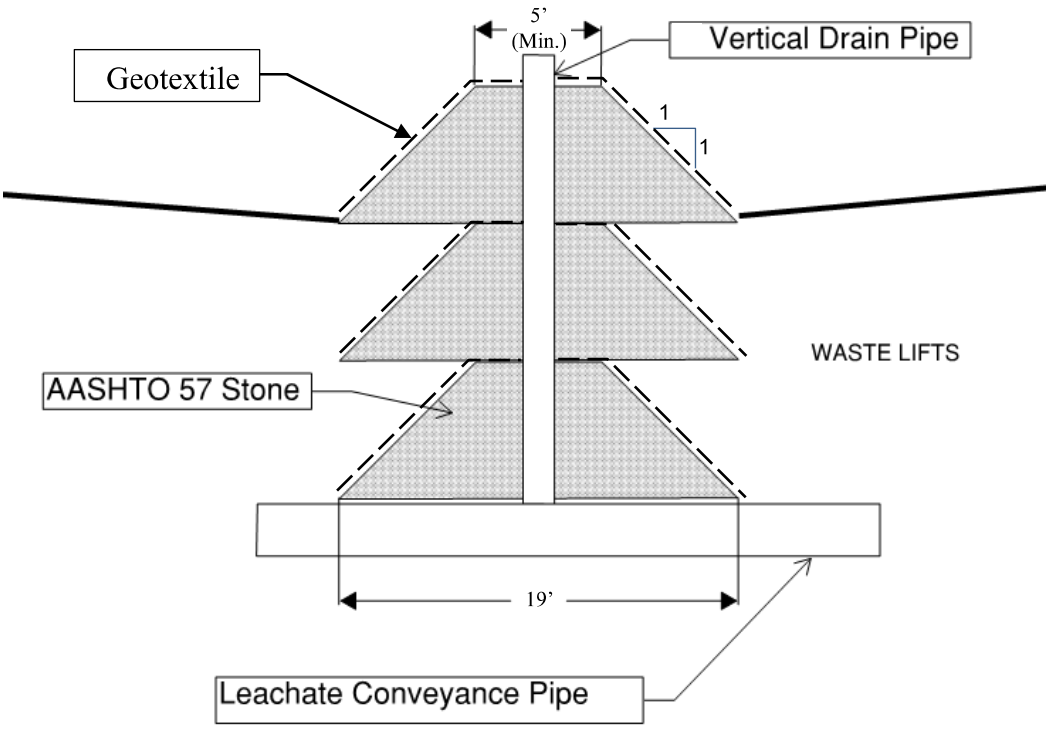
To determine the effects of incorporating chimney drains into the design of the Carter Hollow Landfill, first identify general chimney drain design parameters and anticipated contributing drainage areas. Next, determine the maximum flow through the chimney drains using for flow through the sides of the chimney drain and flow through the vertical column of the chimney drain.

ANALYSIS:

Chimney Drain Evaluation:

Chimney drains will be incorporated into the construction of the Carter Hollow Landfill. Generally, the surface of the waste disposal area will be graded at a minimum 2 percent (%) slope toward the proposed chimney drains. Chimney drains will be constructed using coarse

aggregate [American Association of State and Highway Transportation Officials (AASHTO) gradation No. 57 stone] and will be located overtop of leachate collection pipes. A vertical perforated drainage pipe (~~6~~ 24 inch minimum) will BE FILLED WITH COARSE AGGREGATE AND SET THROUGH THE CENTER OF THE CHIMNEY DRAIN TO PROVIDE STRUCTURAL SUPPORT. ~~also be included in the chimney drain design to help convey flow vertically.~~ Additionally, to prevent clogging of the chimney drains, the drainage media of the chimney drains will be covered with a 10 ounce per square yard (oz/sy) non-woven geotextile placed atop of the coarse aggregate or a bottom ash aggregate. Each chimney drain will extend vertically as waste placement progresses. Chimney drains have been designed to dewater the surface of the waste disposal area for a 10-year/24-hour storm event (requirements identified by the Ohio Environmental Protection Agency [OEPA]). The chimney drains will have the following general dimensions:



The chimney drains will receive stormwater from the contributing waste surface drainage area. Flow into and through the chimney drains will occur in two fashions, including: 1) flow into the sides of the chimney drain when stormwater runoff pools around the chimney drain and infiltrates into it; and 2) flow through the vertical stone/pipe column of the chimney drain. The maximum stormwater flow rate and volume that can be accepted by a chimney drain will be dictated by the flow limitations of the chimney drain geometry and material properties. Flow

through the sides and through the vertical column of the stone of the chimney drain was determined using Darcy's Law as follows:

$$Q = kia$$

Where: Q = Flow rate [cubic feet per second (cfs)]
k = hydraulic conductivity of drainage media [feet per second (ft/s)]
i = hydraulic gradient [feet per foot (ft/ft)]
a = area [square feet (ft^2)]

CEC reviewed historical permeability for samples of AASHTO No. 57 stone. The results for the AASHTO gradation No. 57 stone ranged from a hydraulic conductivity of 3.1 x 10^1 cm/s (1.017 ft/s) to 2.2 x 10^1 cm/s (0.722 ft/s). For this Chimney Drain Design, a hydraulic conductivity of .2 x 10^1 cm/s (0.722 ft/s) was used for the coarse aggregate.

Generally, chimney drains will be constructed with a height of 5 ft and waste will be placed adjacent to the chimney drains in 2-ft maximum lifts. As such, it was assumed the minimum side area available to convey flow will be at a height of 1-foot (top of the chimney drain). Flow through the sides of the chimney drain will be limited by the permeability of the geotextile covering the chimney drain as well as the permeability of the chimney drain drainage media. As shown in Attachment 4, the geotextile has a water flow rate of 75 gallons per minute per square foot (gpm/ft^2) for a 10 oz/sy non-woven geotextile.

The surface area for the side of the chimney drain was determined assuming a minimum top radius of 5 feet assuming a conical shape with 1H:1V side slopes. The area of the side of the chimney drain (assumed to be a section of a cone) was determined as follows:

$$a = \pi (R+r)\, s$$

Where: π = pi (dimensionless); use 3.14.
R = lower radius of chimney drain (ft)
r = upper radius of chimney drain (ft)
s = length of side (ft) = $\sqrt{(h^2)+(h)^2}$
h = height of leachate (ft)

Additionally, the hydraulic gradient is defined as the change in head divided by the flow length. For the vertical flow through the chimney drain, the change in height will equal the flow length, therefore the hydraulic gradient is one. Using Darcy's Law to estimate Q, the following table summarizes the flow capacity per of the pooling runoff adjacent to the chimney drain.

h (ft)	r (ft)	R (ft)	s (ft)	a (sf)	k (ft/s)	i	Q (Side of Chimney Drain) (cfs)	Q (Geotextile) (gpm)
0.00	1.25	2.25	0.000	0.000	0.722	1	0.000	0.000
0.10	1.25	2.25	0.141	1.555	0.722	1	1.123	0.257
0.20	1.25	2.25	0.283	3.110	0.722	1	2.245	0.513
0.30	1.25	2.25	0.424	4.665	0.722	1	3.368	0.770
0.40	1.25	2.25	0.566	6.220	0.722	1	4.491	1.026
0.50	1.25	2.25	0.707	7.775	0.722	1	5.614	1.283
0.60	1.25	2.25	0.849	9.330	0.722	1	6.736	1.539
0.70	1.25	2.25	0.990	10.885	0.722	1	7.859	1.796
0.80	1.25	2.25	1.131	12.440	0.722	1	8.982	2.053
0.90	1.25	2.25	1.273	13.995	0.722	1	10.104	2.309
1.00	1.25	2.25	1.414	15.550	0.722	1	11.227	2.566
1.01	1.25	2.25	1.414	20.262	0.722	1	14.630	3.343

Additionally, the area of the vertical column was determined as follows:

$$a = \pi (r)^2$$

Where: π = pi (dimensionless); use 3.14.
r = minimum radius of chimney drain (ft)
Other variables previously defined

Therefore, the area of the chimney drain vertical column, accounting for the 6" (minimum) perforated vertical pipe, is determined as follows:

$$a = \pi (5/2)^2 - \pi (\text{~~0.5~~} 2/2)^2 = \text{~~19.44~~} 16.49 \text{ ft}^2$$

Therefore, the maximum flow through the vertical coarse aggregate column of the chimney drain is:

$$Q = (0.722 \text{ ft/s}) (1) (\text{~~19.44~~} 16.49 \text{ ft}^2)$$

$$Q = \text{~~14.03~~} 11.90 \text{ cfs}$$

However, a 10 oz/sy non-woven geotextile will be placed atop of each chimney drain as it is extended vertically. Therefore, the flow through the chimney drain will also be limited by the water flow rate of the geotextile, and is calculated as follows:

Q = (a) (geotextile water flow rate)

Q = (~~19.44~~ 16.49 ft^2) (75 gpm/ft^2) (0.0022 cfs / 1 gpm)

Q = ~~3.207~~ 2.721 cfs

As such, the flow through the vertical column of the course aggregate column of the chimney drain is ~~3.207~~ 2.721 cfs.

Similar models to the ones used to determine the leachate generation [see Section (C)(6)(c)] for the site were updated using Ref. No. 4 (HELP Model) to determine the amount of runoff (stormwater not infiltrating into the waste mass) for a 10-year/24-hour storm event. The models were generated to include weather data with a peak daily rainfall corresponding to the 10-year/24-hour storm event [4.17 inches (see Attachment 3)]. From that output, for a 10-year/24-hour storm event, the maximum stormwater runoff produced was 2.05 inches of runoff. The remaining 2.12 inches is assumed to infiltrate into the waste mass and will eventually leachate through the base of the landfill. HELP model runs are included as Attachment No. 1. Next, Ref. No. 2 (HydroCAD) was used to evaluate the drainage effects of an individual chimney drain assuming a 5-acre drainage area. Additionally, the HydroCAD model assumes that pooled runoff infiltrates into the waste at a rate of 5.6×10^{-4} cm/s (0.79 in/hr), which corresponds to the laboratory test results for permeability for gypsum tested as part of the initial permit application.

As shown in the attached HydroCAD output (Attachment No. 2), for a 5-acre drainage area, runoff around the chimney drain comprised of AASHTO gradation No. 57 stone will pool to a maximum depth of ~~1.37~~ 3.08 feet and will completely dewater the 10-year/24-hour storm event in approximately 24 hours. It should be noted that a depth of 1-foot is exceeded for a time period of ~~less than one hour~~ APPROXIMATELY 2 HOURS with the typical depth less than 0.1 feet. The spike in depth of pooled runoff around the chimney drain is a result of modeled storm type (NCRS Type II Storm) with a majority of the rainfall falling at within a one-hour period. In reality, the rainfall will be spread over a longer a period with a similar spike unlikely for a real world storm event. The maximum flow out of the chimney drain is ~~3.21~~ 2.72 cfs.

CONCLUSION: **For an assumed 5-acre drainage area, during a 10-year/24-hour storm event, runoff will pool around a chimney drain to a depth of ~~1.37~~ 3.08 feet and will dewater in 24 hours. The peak flow out of the chimney drain is ~~3.21~~ 2.72 cfs. Pooling around the chimney drain will occur for a period of ~~less than one hour~~ APPROXIMATELY 2 HOURS with typical depths during the storm event of less than 0.1 feet. Therefore, the chimney drain design as presented is adequate to convey water from the surface of the waste disposal area to the leachate collection layer.**

ATTACHMENT 1

HELP MODEL RUNS

OPEN BASE

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**   **
**   **
**   HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE   **
**   HELP MODEL VERSION 3.07 (1 NOVEMBER 1997)   **
**   DEVELOPED BY ENVIRONMENTAL LABORATORY   **
**   USAE WATERWAYS EXPERIMENT STATION   **
**   FOR USEPA RISK REDUCTION ENGINEERING LABORATORY   **
**   **
**   **
****
****

PRECIPITATION DATA FILE: C:\P.D4
TEMPERATURE DATA FILE: C:\T.D7
SOLAR RADIATION DATA FILE: C:\S.D13
EVAPOTRANSPIRATION DATA: C:\E.D11
SOIL AND DESIGN DATA FILE: C:\OPEN-B.D10
OUTPUT DATA FILE: C:\OPEN-B.OUT

TIME: 10: 8   DATE: 4/ 1/2016

****

TITLE: Carter Hollow Landfill (Active Filling over Liner Base Slope

****

NOTE: INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
         COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.

LAYER 1

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER   0

THICKNESS	=	120.00	INCHES
POROSITY	=	0.5010	VOL/VOL
FIELD CAPACITY	=	0.2840	VOL/VOL
WILTING POINT	=	0.1350	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3057	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.560000015000E-03	CM/SEC

LAYER 2

TYPE 2 - LATERAL DRAINAGE LAYER

MATERIAL TEXTURE NUMBER 0

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4170	VOL/VOL
FIELD CAPACITY	=	0.0450	VOL/VOL
WILTING POINT	=	0.0180	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1262	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.399999991000E-01	CM/SEC
SLOPE	=	6.00	PERCENT
DRAINAGE LENGTH	=	525.0	FEET

LAYER 3

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 1 WITH BARE GROUND CONDITIONS, A SURFACE SLOPE OF 2.% AND A SLOPE LENGTH OF 260. FEET.

SCS RUNOFF CURVE NUMBER	=	73.10	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	9.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	1.975	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	4.509	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.215	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	53.575	INCHES
TOTAL INITIAL WATER	=	53.575	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM COVINGTON KENTUCKY

STATION LATITUDE	=	38.60	DEGREES
MAXIMUM LEAF AREA INDEX	=	0.00	
START OF GROWING SEASON (JULIAN DATE)	=	105	
END OF GROWING SEASON (JULIAN DATE)	=	299	
EVAPORATIVE ZONE DEPTH	=	9.0	INCHES

AVERAGE ANNUAL WIND SPEED = 9.10 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 70.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 73.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 72.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR COVINGTON KENTUCKY

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
3.13	2.73	3.95	3.58	3.84	4.09
4.28	2.97	2.91	2.54	3.12	3.00

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR COVINGTON KENTUCKY

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
29.20	31.60	42.00	53.00	64.00	73.00
76.00	75.00	68.00	57.00	45.00	35.00

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR COVINGTON KENTUCKY
AND STATION LATITUDE = 37.10 DEGREES

****

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 10

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.16	2.42	3.82	4.06	4.39	4.87
	3.28	3.09	2.42	2.59	3.80	2.79
STD. DEVIATIONS	2.20	1.73	1.22	1.82	1.23	1.49
	1.20	1.84	2.02	1.34	1.66	1.13
RUNOFF						
TOTALS	1.396	1.235	0.455	0.000	0.011	0.060
	0.001	0.000	0.025	0.006	0.015	0.072
STD. DEVIATIONS	1.910	1.312	0.865	0.000	0.035	0.146
	0.002	0.001	0.078	0.018	0.047	0.126

EVAPOTRANSPIRATION

TOTALS	0.619	0.780	2.156	3.487	3.915	3.878
	2.579	2.756	1.737	1.859	1.591	0.928
STD. DEVIATIONS	0.336	0.578	0.519	0.644	0.777	1.079
	1.256	1.300	0.790	0.586	0.284	0.269

LATERAL DRAINAGE COLLECTED FROM LAYER 2

TOTALS	1.7070	1.0123	0.6219	1.3365	1.3387	0.7133
	0.7229	0.5795	0.4660	0.3822	0.4340	0.9042
STD. DEVIATIONS	0.7137	0.4669	0.4703	0.3550	1.0548	0.9480
	0.7261	0.5742	0.4322	0.6036	0.5453	0.5196

PERCOLATION/LEAKAGE THROUGH LAYER 3

TOTALS	0.1117	0.0996	0.1033	0.1069	0.1103	0.0940
	0.0935	0.1026	0.0826	0.0790	0.0877	0.1088
STD. DEVIATIONS	0.0026	0.0021	0.0147	0.0013	0.0039	0.0264
	0.0277	0.0086	0.0357	0.0341	0.0238	0.0019

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 3

AVERAGES	2.1324	1.3914	0.7769	1.7251	1.6723	0.9207
	0.9031	0.7239	0.6016	0.4775	0.5602	1.1295
STD. DEVIATIONS	0.8915	0.6382	0.5874	0.4582	1.3176	1.2237
	0.9070	0.7173	0.5580	0.7540	0.7039	0.6491

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 10

	INCHES		CU. FEET	PERCENT
PRECIPITATION	40.69	(3.569)	147715.6	100.00
RUNOFF	3.276	(2.3016)	11890.79	8.050
EVAPOTRANSPIRATION	26.285	(2.5128)	95412.79	64.592
LATERAL DRAINAGE COLLECTED FROM LAYER 2	10.21858	(3.85651)	37093.461	25.11140
PERCOLATION/LEAKAGE THROUGH LAYER 3	1.18017	(0.07775)	4284.017	2.90018
AVERAGE HEAD ON TOP OF LAYER 3	1.085	(0.409)		

CHANGE IN WATER STORAGE	-0.266	(2.0884)	-965.45	-0.654

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 10

	(INCHES)	(CU. FT.)
PRECIPITATION	4.17	15137.101
RUNOFF	2.053	7451.6445
DRAINAGE COLLECTED FROM LAYER 2	0.14684	533.02283
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.003939	14.29783
AVERAGE HEAD ON TOP OF LAYER 3	5.686	
MAXIMUM HEAD ON TOP OF LAYER 3	10.474	
LOCATION OF MAXIMUM HEAD IN LAYER 2 (DISTANCE FROM DRAIN)	39.7 FEET	
SNOW WATER	3.28	11910.3887

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.5010
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1350

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 10

LAYER	(INCHES)	(VOL/VOL)
1	34.3228	0.2860
2	1.2201	0.1017
3	15.3720	0.4270

SNOW WATER 0.000

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OPEN SLOPE

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****
**   **
**   **
**   HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE   **
**   HELP MODEL VERSION 3.07 (1 NOVEMBER 1997)   **
**   DEVELOPED BY ENVIRONMENTAL LABORATORY   **
**   USAE WATERWAYS EXPERIMENT STATION   **
**   FOR USEPA RISK REDUCTION ENGINEERING LABORATORY   **
**   **
**   **
****
****

PRECIPITATION DATA FILE: C:\P.D4
TEMPERATURE DATA FILE: C:\T.D7
SOLAR RADIATION DATA FILE: C:\S.D13
EVAPOTRANSPIRATION DATA: C:\E.D11
SOIL AND DESIGN DATA FILE: C:\OPEN-S.D10
OUTPUT DATA FILE: C:\OPEN-S.OUT

TIME: 11: 9   DATE: 4/ 1/2016

****

TITLE: Carter Hollow Landfill (Active Filling over Liner Side Slope

****

NOTE: INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
         COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.

LAYER 1

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER   0

THICKNESS	=	120.00	INCHES
POROSITY	=	0.5010	VOL/VOL
FIELD CAPACITY	=	0.2840	VOL/VOL
WILTING POINT	=	0.1350	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3057	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.560000015000E-03	CM/SEC

LAYER 2

TYPE 2 - LATERAL DRAINAGE LAYER

MATERIAL TEXTURE NUMBER 0

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4170	VOL/VOL
FIELD CAPACITY	=	0.0450	VOL/VOL
WILTING POINT	=	0.0180	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0741	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.399900004000E-01	CM/SEC
SLOPE	=	40.00	PERCENT
DRAINAGE LENGTH	=	525.0	FEET

LAYER 3

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 1 WITH BARE GROUND CONDITIONS, A SURFACE SLOPE OF 2.% AND A SLOPE LENGTH OF 260. FEET.

SCS RUNOFF CURVE NUMBER	=	73.10	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	9.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	1.975	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	4.509	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.215	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	52.949	INCHES
TOTAL INITIAL WATER	=	52.949	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM COVINGTON KENTUCKY

STATION LATITUDE	=	38.60	DEGREES
MAXIMUM LEAF AREA INDEX	=	0.00	
START OF GROWING SEASON (JULIAN DATE)	=	105	
END OF GROWING SEASON (JULIAN DATE)	=	299	
EVAPORATIVE ZONE DEPTH	=	9.0	INCHES

AVERAGE ANNUAL WIND SPEED = 9.10 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 70.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 67.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 73.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 72.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR COVINGTON KENTUCKY

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
3.13	2.73	3.95	3.58	3.84	4.09
4.28	2.97	2.91	2.54	3.12	3.00

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR COVINGTON KENTUCKY

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
29.20	31.60	42.00	53.00	64.00	73.00
76.00	75.00	68.00	57.00	45.00	35.00

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR COVINGTON KENTUCKY
AND STATION LATITUDE = 37.10 DEGREES

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 10

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	3.16	2.42	3.82	4.06	4.39	4.87
	3.28	3.09	2.42	2.59	3.80	2.79
STD. DEVIATIONS	2.20	1.73	1.22	1.82	1.23	1.49
	1.20	1.84	2.02	1.34	1.66	1.13
RUNOFF						
TOTALS	1.396	1.235	0.455	0.000	0.011	0.060
	0.001	0.000	0.025	0.006	0.015	0.072
STD. DEVIATIONS	1.910	1.312	0.865	0.000	0.035	0.146
	0.002	0.001	0.078	0.018	0.047	0.126

EVAPOTRANSPIRATION

TOTALS	0.619	0.780	2.156	3.487	3.915	3.878
	2.579	2.756	1.737	1.859	1.591	0.928
STD. DEVIATIONS	0.336	0.578	0.519	0.644	0.777	1.079
	1.256	1.300	0.790	0.586	0.284	0.269

LATERAL DRAINAGE COLLECTED FROM LAYER 2

TOTALS	1.8281	0.6890	0.6494	1.6983	1.1806	0.5316
	0.8061	0.5365	0.4293	0.4149	0.5201	1.2231
STD. DEVIATIONS	0.6788	0.5523	0.4537	0.6816	1.2821	0.8524
	0.6936	0.4946	0.6269	0.7392	0.5510	0.7408

PERCOLATION/LEAKAGE THROUGH LAYER 3

TOTALS	0.1055	0.0619	0.0759	0.1010	0.0807	0.0556
	0.0750	0.0694	0.0420	0.0494	0.0691	0.1013
STD. DEVIATIONS	0.0028	0.0324	0.0338	0.0060	0.0340	0.0372
	0.0335	0.0391	0.0402	0.0355	0.0322	0.0079

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 3

AVERAGES	0.3960	0.1639	0.1407	0.3802	0.2558	0.1190
	0.1746	0.1162	0.0961	0.0899	0.1164	0.2650
STD. DEVIATIONS	0.1470	0.1299	0.0983	0.1526	0.2777	0.1908
	0.1502	0.1072	0.1403	0.1601	0.1233	0.1605

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 10

	INCHES		CU. FEET	PERCENT
PRECIPITATION	40.69	(3.569)	147715.6	100.00
RUNOFF	3.276	(2.3016)	11890.79	8.050
EVAPOTRANSPIRATION	26.285	(2.5128)	95412.79	64.592
LATERAL DRAINAGE COLLECTED FROM LAYER 2	10.50698	(3.62346)	38140.332	25.82011
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.88685	(0.11490)	3219.280	2.17938
AVERAGE HEAD ON TOP OF LAYER 3	0.193	(0.067)		

CHANGE IN WATER STORAGE	-0.261	(1.7121)	-947.57	-0.641

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PEAK DAILY VALUES FOR YEARS 1 THROUGH 10

	(INCHES)	(CU. FT.)
PRECIPITATION	4.17	15137.101
RUNOFF	2.053	7451.6445
DRAINAGE COLLECTED FROM LAYER 2	0.21473	779.45990
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.003538	12.84211
AVERAGE HEAD ON TOP OF LAYER 3	1.442	
MAXIMUM HEAD ON TOP OF LAYER 3	2.873	
LOCATION OF MAXIMUM HEAD IN LAYER 2 (DISTANCE FROM DRAIN)	0.0 FEET	
SNOW WATER	3.28	11910.3887

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.5010
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1350

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 10

LAYER	(INCHES)	(VOL/VOL)
1	34.3228	0.2860
2	0.6437	0.0536
3	15.3720	0.4270

SNOW WATER 0.000

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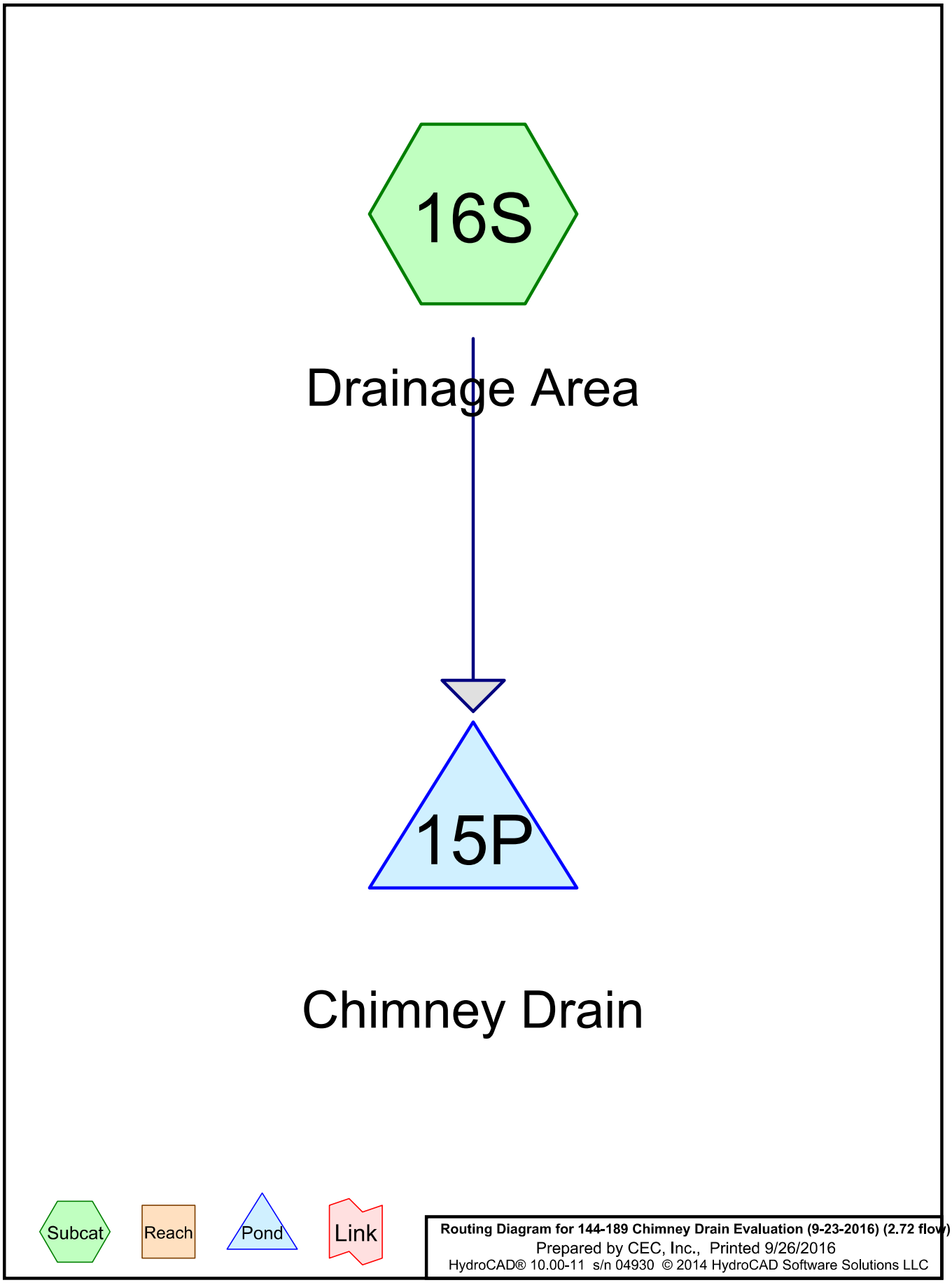
ATTACHMENT 2

HYDROCAD OUTPUT
TYPICAL CHIMNEY DRAIN DRAINAGE AREA



Routing Diagram for 144-189 Chimney Drain Evaluation (9-23-2016) (2.72 flow)
Prepared by CEC, Inc., Printed 9/26/2016
HydroCAD® 10.00-11 s/n 04930 © 2014 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.000	100	(16S)
5.000	**100**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
5.000	Other	16S
5.000		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	5.000	5.000		16S
0.000	**0.000**	**0.000**	**0.000**	**5.000**	**5.000**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	15P	776.00	726.00	50.0	1.0000	0.013	6.0	0.0	0.0

Time span=0.00-40.00 hrs, dt=0.01 hrs, 4001 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment16S: Drainage Area Runoff Area=5.000 ac 100.00% Impervious Runoff Depth=2.05"
Flow Length=149' Slope=0.0200 '/' Tc=2.1 min CN=100 Runoff=16.53 cfs 0.854 af

Pond 15P: Chimney Drain Peak Elev=777.41' Storage=0.210 af Inflow=16.53 cfs 0.854 af
Discarded=0.32 cfs 0.030 af Primary=2.72 cfs 0.820 af Secondary=0.04 cfs 0.004 af Outflow=3.08 cfs 0.854 af

Total Runoff Area = 5.000 ac Runoff Volume = 0.854 af Average Runoff Depth = 2.05"
0.00% Pervious = 0.000 ac 100.00% Impervious = 5.000 ac

Summary for Subcatchment 16S: Drainage Area

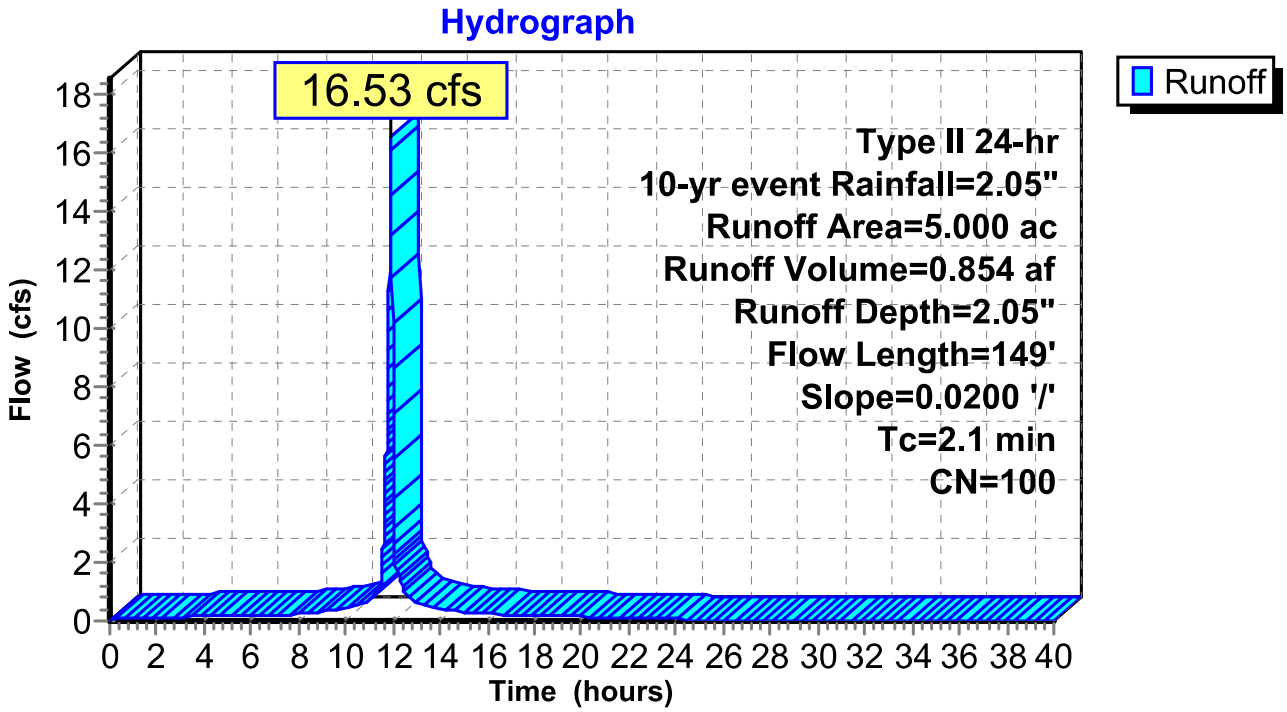
Runoff = 16.53 cfs @ 11.92 hrs, Volume= 0.854 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr event Rainfall=2.05"

	Area (ac)	CN	Description
*	5.000	100	
	5.000		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	149	0.0200	1.18		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 2.00"

Subcatchment 16S: Drainage Area



Hydrograph for Subcatchment 16S: Drainage Area

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.50	0.01	0.01	0.11
1.00	0.02	0.02	0.11
1.50	0.03	0.03	0.12
2.00	0.05	0.05	0.12
2.50	0.06	0.06	0.13
3.00	0.07	0.07	0.13
3.50	0.08	0.08	0.14
4.00	0.10	0.10	0.14
4.50	0.11	0.11	0.15
5.00	0.13	0.13	0.16
5.50	0.15	0.15	0.18
6.00	0.16	0.16	0.19
6.50	0.18	0.18	0.20
7.00	0.20	0.20	0.21
7.50	0.22	0.22	0.22
8.00	0.25	0.25	0.23
8.50	0.27	0.27	0.28
9.00	0.30	0.30	0.33
9.50	0.33	0.33	0.33
10.00	0.37	0.37	0.41
10.50	0.42	0.42	0.53
11.00	0.48	0.48	0.73
11.50	0.58	0.58	**1.21**
12.00	1.36	1.36	**7.10**
12.50	1.51	1.51	0.98
13.00	1.58	1.58	0.65
13.50	1.64	1.64	0.50
14.00	1.68	1.68	0.39
14.50	1.72	1.72	0.35
15.00	1.75	1.75	0.31
15.50	1.78	1.78	0.28
16.00	1.80	1.80	0.24
16.50	1.83	1.83	0.23
17.00	1.85	1.85	0.21
17.50	1.87	1.87	0.20
18.00	1.89	1.89	0.19
18.50	1.91	1.91	0.17
19.00	1.92	1.92	0.16
19.50	1.94	1.94	0.15
20.00	1.95	1.95	0.14
20.50	1.96	1.96	0.13
21.00	1.98	1.98	0.13
21.50	1.99	1.99	0.13
22.00	2.00	2.00	0.12
22.50	2.02	2.02	0.12
23.00	2.03	2.03	0.12
23.50	2.04	2.04	0.12
24.00	**2.05**	**2.05**	0.11
24.50	2.05	2.05	0.00
25.00	2.05	2.05	0.00
25.50	2.05	2.05	0.00
26.00	2.05	2.05	0.00
26.50	2.05	2.05	0.00
27.00	2.05	2.05	0.00
27.50	2.05	2.05	0.00
28.00	2.05	2.05	0.00
28.50	2.05	2.05	0.00
29.00	2.05	2.05	0.00
29.50	2.05	2.05	0.00
30.00	2.05	2.05	0.00
30.50	2.05	2.05	0.00
31.00	2.05	2.05	0.00
31.50	2.05	2.05	0.00
32.00	2.05	2.05	0.00
32.50	2.05	2.05	0.00
33.00	2.05	2.05	0.00
33.50	2.05	2.05	0.00
34.00	2.05	2.05	0.00
34.50	2.05	2.05	0.00
35.00	2.05	2.05	0.00
35.50	2.05	2.05	0.00
36.00	2.05	2.05	0.00
36.50	2.05	2.05	0.00
37.00	2.05	2.05	0.00
37.50	2.05	2.05	0.00
38.00	2.05	2.05	0.00
38.50	2.05	2.05	0.00
39.00	2.05	2.05	0.00
39.50	2.05	2.05	0.00
40.00	2.05	2.05	0.00

Summary for Pond 15P: Chimney Drain

Inflow Area = 5.000 ac,100.00% Impervious, Inflow Depth = 2.05" for 10-yr event event
Inflow = 16.53 cfs @ 11.92 hrs, Volume= 0.854 af
Outflow = 3.08 cfs @ 12.03 hrs, Volume= 0.854 af, Atten= 81%, Lag= 6.6 min
Discarded = 0.32 cfs @ 12.03 hrs, Volume= 0.030 af
Primary = 2.72 cfs @ 11.61 hrs, Volume= 0.820 af
Secondary = 0.04 cfs @ 12.03 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 777.41' @ 12.03 hrs Surf.Area= 0.403 ac Storage= 0.210 af

Plug-Flow detention time= 13.1 min calculated for 0.854 af (100% of inflow)
Center-of-Mass det. time= 13.1 min (730.6 - 717.5)

Volume	Invert	Avail.Storage	Storage Description
#1	776.00'	1.712 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

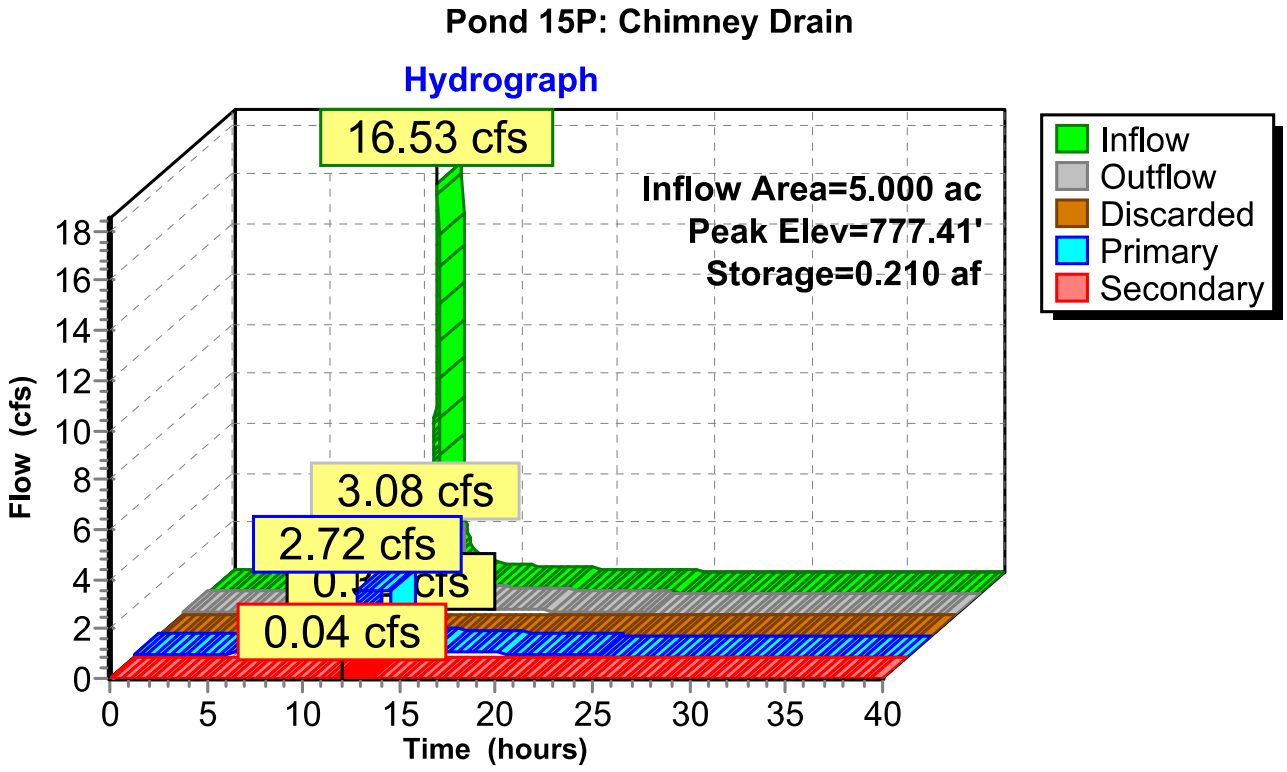
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
776.00	0.000	0.000	0.000
777.00	0.180	0.090	0.090
778.00	0.721	0.450	0.540
779.00	1.623	1.172	1.712

Device	Routing	Invert	Outlet Devices
#1	Device 5	776.00'	**Flow into Sides** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.01 10.00 Disch. (cfs) 0.000 1.925 3.948 5.774 7.699 9.623 11.548 13.473 15.397 17.322 19.247 33.281 33.281
#2	Discarded	776.00'	**0.794 in/hr Exfiltration over Horizontal area** Conductivity to Groundwater Elevation = 0.00'
#3	Device 4	776.00'	**0.4" Vert. Perforated Riser X 2.00 columns** X 20 rows with 3.0" cc spacing C= 0.600
#4	Secondary	776.00'	**6.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 776.00' / 726.00' S= 1.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#5	Primary	776.00'	**Flow through the Vertical Column** Head (feet) 0.00 0.01 10.00 Disch. (cfs) 0.000 2.720 2.720
#6	Device 1	0.00'	**Flow through Geotextile** Elev. (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.01 10.00 Disch. (cfs) 0.000 0.440 0.880 1.320 1.759 2.199 2.639 3.079 3.519 3.959 4.398 7.606 7.606

Discarded OutFlow Max=0.32 cfs @ 12.03 hrs HW=777.41' (Free Discharge)
└**2=Exfiltration** (Controls 0.32 cfs)

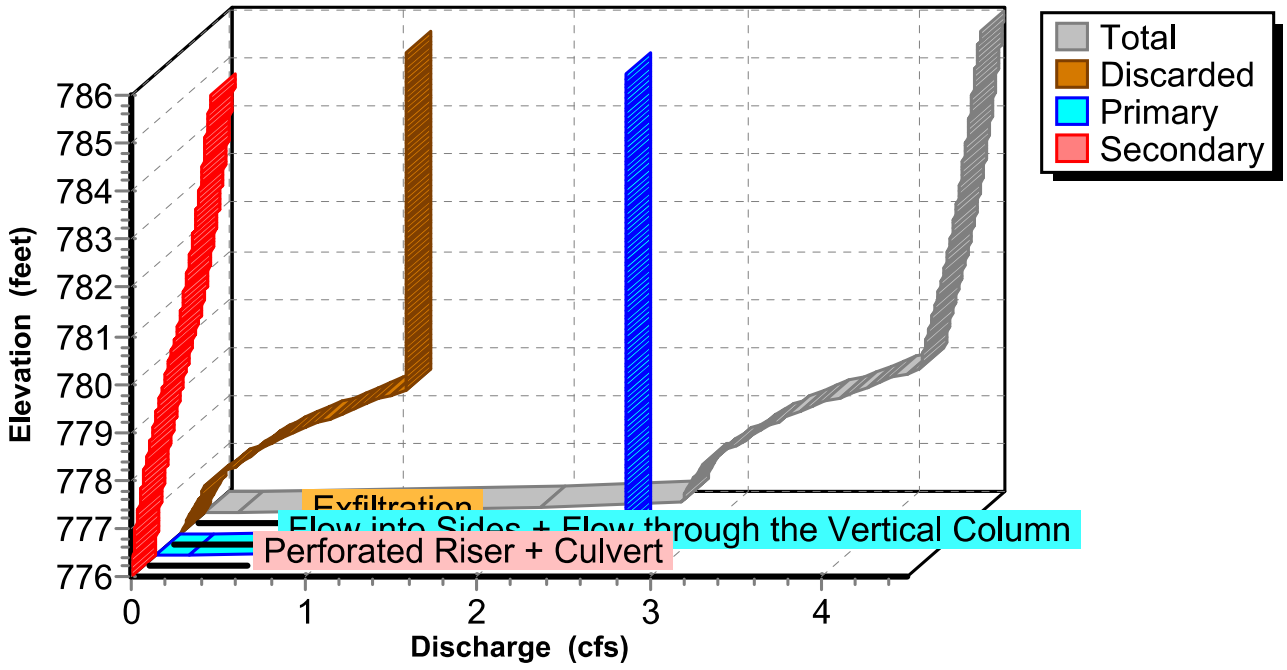
Primary OutFlow Max=2.72 cfs @ 11.61 hrs HW=776.14' (Free Discharge)
└**5=Flow through the Vertical Column** (Custom Controls 2.72 cfs)
└**1=Flow into Sides** (Passes 2.72 cfs of 2.80 cfs potential flow)
└**6=Flow through Geotextile** (Passes 2.72 cfs of 7.61 cfs potential flow)

Secondary OutFlow Max=0.04 cfs @ 12.03 hrs HW=777.41' (Free Discharge)
└**4=Culvert** (Passes 0.04 cfs of 1.02 cfs potential flow)
└**3=Perforated Riser** (Orifice Controls 0.04 cfs @ 4.02 fps)



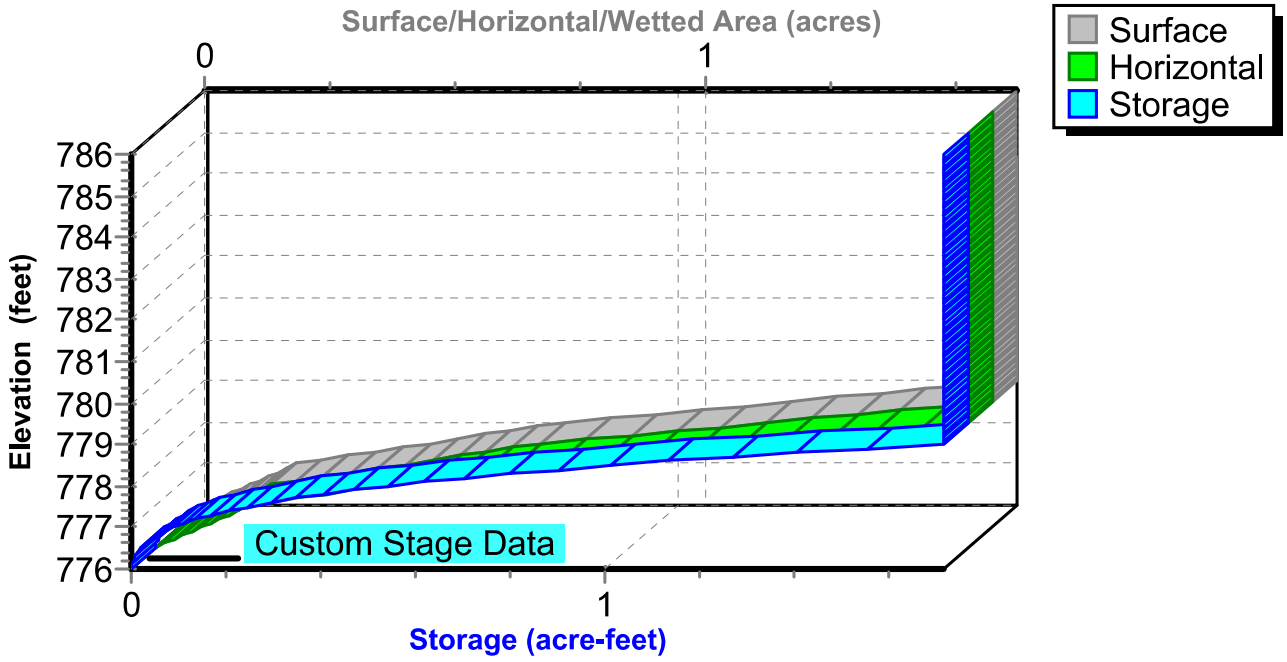
Pond 15P: Chimney Drain

Stage-Discharge



Pond 15P: Chimney Drain

Stage-Area-Storage



Hydrograph for Pond 15P: Chimney Drain

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00
1.00	0.11	0.000	776.01	0.11	0.00	0.11	0.00
2.00	0.12	0.000	776.01	0.12	0.00	0.12	0.00
3.00	0.13	0.000	776.01	0.13	0.00	0.13	0.00
4.00	0.14	0.000	776.01	0.14	0.00	0.14	0.00
5.00	0.16	0.000	776.01	0.16	0.00	0.16	0.00
6.00	0.19	0.000	776.01	0.19	0.00	0.18	0.00
7.00	0.21	0.000	776.01	0.21	0.00	0.20	0.00
8.00	0.23	0.000	776.01	0.23	0.00	0.22	0.00
9.00	0.33	0.000	776.02	0.33	0.00	0.32	0.00
10.00	0.41	0.000	776.02	0.41	0.00	0.40	0.00
11.00	**0.73**	0.000	776.04	0.73	0.01	**0.72**	0.00
12.00	**7.10**	**0.205**	**777.40**	**3.08**	**0.32**	**2.72**	**0.04**
13.00	0.65	**0.063**	**776.84**	**2.86**	**0.12**	2.72	**0.02**
14.00	0.39	0.000	776.02	0.39	0.00	0.39	0.00
15.00	0.31	0.000	776.02	0.31	0.00	0.31	0.00
16.00	0.24	0.000	776.01	0.24	0.00	0.24	0.00
17.00	0.21	0.000	776.01	0.21	0.00	0.21	0.00
18.00	0.19	0.000	776.01	0.19	0.00	0.19	0.00
19.00	0.16	0.000	776.01	0.16	0.00	0.16	0.00
20.00	0.14	0.000	776.01	0.14	0.00	0.13	0.00
21.00	0.13	0.000	776.01	0.13	0.00	0.13	0.00
22.00	0.12	0.000	776.01	0.12	0.00	0.12	0.00
23.00	0.12	0.000	776.01	0.12	0.00	0.12	0.00
24.00	0.11	0.000	776.01	0.11	0.00	0.11	0.00
25.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00
26.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00
27.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00
28.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00
29.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00
30.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00
31.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00
32.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00
33.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00
34.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00
35.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00
36.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00
37.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00
38.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00
39.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00
40.00	0.00	0.000	776.00	0.00	0.00	0.00	0.00

Stage-Discharge for Pond 15P: Chimney Drain

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
776.00	0.00	0.00	**0.00**	0.00
776.20	2.75	0.03	**2.72**	0.00
776.40	2.79	0.06	2.72	0.01
776.60	2.82	0.09	2.72	0.01
776.80	2.85	0.12	2.72	0.02
777.00	2.89	0.14	2.72	0.03
777.20	2.98	0.23	2.72	0.03
777.40	3.08	0.32	2.72	0.04
777.60	3.17	0.40	2.72	0.05
777.80	3.27	0.49	2.72	0.06
778.00	3.37	0.58	2.72	0.07
778.20	3.52	0.72	2.72	0.08
778.40	3.68	0.87	2.72	0.09
778.60	3.83	1.01	2.72	0.10
778.80	3.99	1.16	2.72	0.11
779.00	4.14	1.30	2.72	0.12
779.20	4.16	1.30	2.72	0.13
779.40	4.17	1.30	2.72	0.15
779.60	4.18	1.30	2.72	0.16
779.80	4.20	1.30	2.72	0.17
780.00	4.21	1.30	2.72	0.19
780.20	4.22	1.30	2.72	0.20
780.40	4.24	1.30	2.72	0.21
780.60	4.25	1.30	2.72	0.23
780.80	4.27	1.30	2.72	0.24
781.00	4.28	1.30	2.72	0.26
781.20	4.30	1.30	2.72	0.27
781.40	4.31	1.31	2.72	0.28
781.60	4.32	1.31	2.72	0.29
781.80	4.33	1.31	2.72	0.30
782.00	4.34	1.31	2.72	0.31
782.20	4.35	1.31	2.72	0.32
782.40	4.36	1.31	2.72	0.33
782.60	4.37	1.31	2.72	0.34
782.80	4.38	1.31	2.72	0.35
783.00	4.38	1.31	2.72	0.36
783.20	4.39	1.31	2.72	0.36
783.40	4.40	1.31	2.72	0.37
783.60	4.41	1.31	2.72	0.38
783.80	4.42	1.31	2.72	0.39
784.00	4.42	1.31	2.72	0.39
784.20	4.43	1.31	2.72	0.40
784.40	4.44	1.31	2.72	0.41
784.60	4.45	1.31	2.72	0.42
784.80	4.45	1.31	2.72	0.42
785.00	4.46	1.31	2.72	0.43
785.20	4.47	1.31	2.72	0.44
785.40	4.47	1.31	2.72	0.44
785.60	4.48	1.31	2.72	0.45
785.80	4.49	1.31	2.72	0.46
786.00	**4.49**	**1.31**	2.72	**0.46**

Stage-Area-Storage for Pond 15P: Chimney Drain

Elevation (feet)	Surface (acres)	Horizontal (acres)	Storage (acre-feet)
776.00	0.000	0.000	0.000
776.10	0.018	0.018	0.001
776.20	0.036	0.036	0.004
776.30	0.054	0.054	0.008
776.40	0.072	0.072	0.014
776.50	0.090	0.090	0.022
776.60	0.108	0.108	0.032
776.70	0.126	0.126	0.044
776.80	0.144	0.144	0.058
776.90	0.162	0.162	0.073
777.00	0.180	0.180	0.090
777.10	0.234	0.234	0.111
777.20	0.288	0.288	0.137
777.30	0.342	0.342	0.168
777.40	0.396	0.396	0.205
777.50	0.450	0.450	0.248
777.60	0.505	0.505	0.295
777.70	0.559	0.559	0.349
777.80	0.613	0.613	0.407
777.90	0.667	0.667	0.471
778.00	0.721	0.721	0.540
778.10	0.811	0.811	0.617
778.20	0.901	0.901	0.703
778.30	0.992	0.992	0.797
778.40	1.082	1.082	0.901
778.50	1.172	1.172	1.014
778.60	1.262	1.262	1.135
778.70	1.352	1.352	1.266
778.80	1.443	1.443	1.406
778.90	1.533	1.533	1.555
779.00	**1.623**	**1.623**	**1.712**
779.10	1.623	1.623	1.712
779.20	1.623	1.623	1.712
779.30	1.623	1.623	1.712
779.40	1.623	1.623	1.712
779.50	1.623	1.623	1.712
779.60	1.623	1.623	1.712
779.70	1.623	1.623	1.712
779.80	1.623	1.623	1.712
779.90	1.623	1.623	1.712
780.00	1.623	1.623	1.712
780.10	1.623	1.623	1.712
780.20	1.623	1.623	1.712
780.30	1.623	1.623	1.712
780.40	1.623	1.623	1.712
780.50	1.623	1.623	1.712
780.60	1.623	1.623	1.712
780.70	1.623	1.623	1.712
780.80	1.623	1.623	1.712
780.90	1.623	1.623	1.712
781.00	1.623	1.623	1.712
781.10	1.623	1.623	1.712
781.20	1.623	1.623	1.712
781.30	1.623	1.623	1.712
781.40	1.623	1.623	1.712
781.50	1.623	1.623	1.712
781.60	1.623	1.623	1.712
781.70	1.623	1.623	1.712
781.80	1.623	1.623	1.712
781.90	1.623	1.623	1.712
782.00	1.623	1.623	1.712
782.10	1.623	1.623	1.712
782.20	1.623	1.623	1.712
782.30	1.623	1.623	1.712
782.40	1.623	1.623	1.712
782.50	1.623	1.623	1.712
782.60	1.623	1.623	1.712
782.70	1.623	1.623	1.712
782.80	1.623	1.623	1.712
782.90	1.623	1.623	1.712
783.00	1.623	1.623	1.712
783.10	1.623	1.623	1.712
783.20	1.623	1.623	1.712
783.30	1.623	1.623	1.712
783.40	1.623	1.623	1.712
783.50	1.623	1.623	1.712
783.60	1.623	1.623	1.712
783.70	1.623	1.623	1.712
783.80	1.623	1.623	1.712
783.90	1.623	1.623	1.712
784.00	1.623	1.623	1.712
784.10	1.623	1.623	1.712
784.20	1.623	1.623	1.712
784.30	1.623	1.623	1.712
784.40	1.623	1.623	1.712
784.50	1.623	1.623	1.712
784.60	1.623	1.623	1.712
784.70	1.623	1.623	1.712
784.80	1.623	1.623	1.712
784.90	1.623	1.623	1.712
785.00	1.623	1.623	1.712
785.10	1.623	1.623	1.712
785.20	1.623	1.623	1.712
785.30	1.623	1.623	1.712
785.40	1.623	1.623	1.712
785.50	1.623	1.623	1.712
785.60	1.623	1.623	1.712
785.70	1.623	1.623	1.712
785.80	1.623	1.623	1.712
785.90	1.623	1.623	1.712
786.00	1.623	1.623	1.712

ATTACHMENT 3

STORM EVENTS FOR MANCHESTER OHIO

NOAA Atlas 14, Volume 2, Version 3
Location name: Manchester, Ohio, US*
Latitude: 38.6320°, Longitude: -83.6646°
Elevation: 536 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_&_aerials

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	0.378 (0.343–0.415)	0.449 (0.409–0.495)	0.536 (0.488–0.590)	0.605 (0.549–0.665)	0.692 (0.626–0.759)	0.760 (0.685–0.833)	0.827 (0.741–0.905)	0.895 (0.799–0.979)	0.987 (0.875–1.08)	1.06 (0.930–1.16)
10-min	0.587 (0.533–0.645)	0.701 (0.638–0.772)	0.834 (0.759–0.917)	0.934 (0.848–1.03)	1.06 (0.958–1.16)	1.15 (1.04–1.26)	1.24 (1.12–1.36)	1.34 (1.19–1.46)	1.45 (1.29–1.59)	1.54 (1.35–1.68)
15-min	0.719 (0.654–0.790)	0.857 (0.781–0.945)	1.02 (0.932–1.13)	1.15 (1.04–1.26)	1.31 (1.18–1.43)	1.43 (1.29–1.56)	1.55 (1.39–1.69)	1.66 (1.48–1.82)	1.81 (1.61–1.98)	1.92 (1.69–2.10)
30-min	0.952 (0.865–1.05)	1.15 (1.05–1.26)	1.40 (1.28–1.54)	1.60 (1.45–1.75)	1.85 (1.67–2.03)	2.04 (1.84–2.24)	2.23 (2.00–2.44)	2.43 (2.16–2.65)	2.68 (2.38–2.94)	2.88 (2.54–3.15)
60-min	1.16 (1.06–1.28)	1.41 (1.28–1.55)	1.76 (1.60–1.93)	2.03 (1.84–2.23)	2.39 (2.17–2.63)	2.69 (2.42–2.95)	2.98 (2.68–3.27)	3.29 (2.94–3.60)	3.71 (3.29–4.06)	4.05 (3.56–4.43)
2-hr	1.36 (1.23–1.52)	1.65 (1.49–1.84)	2.06 (1.86–2.29)	2.39 (2.16–2.66)	2.85 (2.56–3.16)	3.23 (2.89–3.58)	3.63 (3.23–4.01)	4.05 (3.58–4.47)	4.64 (4.07–5.11)	5.12 (4.46–5.64)
3-hr	1.46 (1.32–1.63)	1.76 (1.59–1.96)	2.20 (1.99–2.45)	2.56 (2.31–2.85)	3.08 (2.76–3.41)	3.49 (3.12–3.87)	3.94 (3.50–4.36)	4.42 (3.91–4.88)	5.10 (4.47–5.62)	5.67 (4.92–6.24)
6-hr	1.76 (1.60–1.94)	2.11 (1.92–2.34)	2.63 (2.39–2.91)	3.06 (2.77–3.37)	3.67 (3.31–4.03)	4.18 (3.75–4.58)	4.72 (4.21–5.17)	5.30 (4.70–5.79)	6.13 (5.39–6.70)	6.83 (5.95–7.45)
12-hr	2.08 (1.90–2.28)	2.49 (2.28–2.75)	3.08 (2.82–3.39)	3.57 (3.26–3.92)	4.27 (3.87–4.66)	4.85 (4.38–5.29)	5.46 (4.91–5.95)	6.13 (5.48–6.65)	7.07 (6.26–7.67)	7.86 (6.90–8.52)
24-hr	2.44 (2.27–2.64)	2.92 (2.71–3.15)	3.60 (3.35–3.89)	4.17 (3.87–4.49)	4.98 (4.60–5.36)	5.66 (5.20–6.09)	6.39 (5.83–6.87)	7.16 (6.50–7.70)	8.27 (7.43–8.91)	9.19 (8.18–9.91)
2-day	2.90 (2.69–3.14)	3.46 (3.22–3.75)	4.24 (3.94–4.60)	4.88 (4.52–5.28)	5.78 (5.33–6.25)	6.51 (5.99–7.04)	7.29 (6.66–7.88)	8.11 (7.37–8.77)	9.26 (8.34–10.0)	10.2 (9.10–11.1)
3-day	3.10 (2.89–3.35)	3.70 (3.46–3.99)	4.52 (4.21–4.87)	5.18 (4.82–5.58)	6.10 (5.65–6.56)	6.84 (6.32–7.36)	7.62 (7.00–8.20)	8.42 (7.70–9.08)	9.56 (8.65–10.3)	10.5 (9.40–11.3)
4-day	3.31 (3.10–3.55)	3.95 (3.70–4.23)	4.80 (4.48–5.14)	5.48 (5.11–5.87)	6.41 (5.97–6.87)	7.16 (6.65–7.67)	7.94 (7.33–8.51)	8.74 (8.03–9.38)	9.86 (8.97–10.6)	10.7 (9.70–11.6)
7-day	3.92 (3.67–4.21)	4.67 (4.37–5.01)	5.63 (5.26–6.04)	6.42 (5.99–6.88)	7.51 (6.98–8.05)	8.41 (7.78–9.01)	9.34 (8.60–10.0)	10.3 (9.43–11.1)	11.7 (10.6–12.6)	12.8 (11.5–13.8)
10-day	4.47 (4.20–4.78)	5.31 (4.98–5.67)	6.37 (5.97–6.81)	7.23 (6.77–7.72)	8.43 (7.86–8.99)	9.39 (8.72–10.0)	10.4 (9.60–11.1)	11.4 (10.5–12.2)	12.9 (11.7–13.8)	14.0 (12.7–15.1)
20-day	6.14 (5.80–6.50)	7.26 (6.85–7.68)	8.56 (8.07–9.06)	9.58 (9.03–10.1)	10.9 (10.3–11.6)	12.0 (11.3–12.7)	13.0 (12.2–13.8)	14.1 (13.1–15.0)	15.5 (14.4–16.5)	16.6 (15.3–17.7)
30-day	7.74 (7.35–8.14)	9.11 (8.65–9.58)	10.6 (10.1–11.1)	11.7 (11.1–12.3)	13.2 (12.5–13.9)	14.4 (13.6–15.1)	15.5 (14.6–16.3)	16.6 (15.5–17.5)	18.0 (16.8–19.0)	19.0 (17.7–20.1)
45-day	9.84 (9.40–10.3)	11.5 (11.0–12.1)	13.2 (12.6–13.9)	14.5 (13.8–15.2)	16.0 (15.2–16.8)	17.1 (16.3–18.0)	18.2 (17.3–19.1)	19.2 (18.2–20.2)	20.4 (19.3–21.5)	21.3 (20.1–22.5)
60-day	11.8 (11.3–12.3)	13.8 (13.2–14.4)	15.7 (15.0–16.4)	17.1 (16.3–17.8)	18.8 (17.9–19.6)	20.0 (19.1–20.9)	21.1 (20.1–22.1)	22.2 (21.1–23.2)	23.5 (22.3–24.6)	24.4 (23.1–25.6)

[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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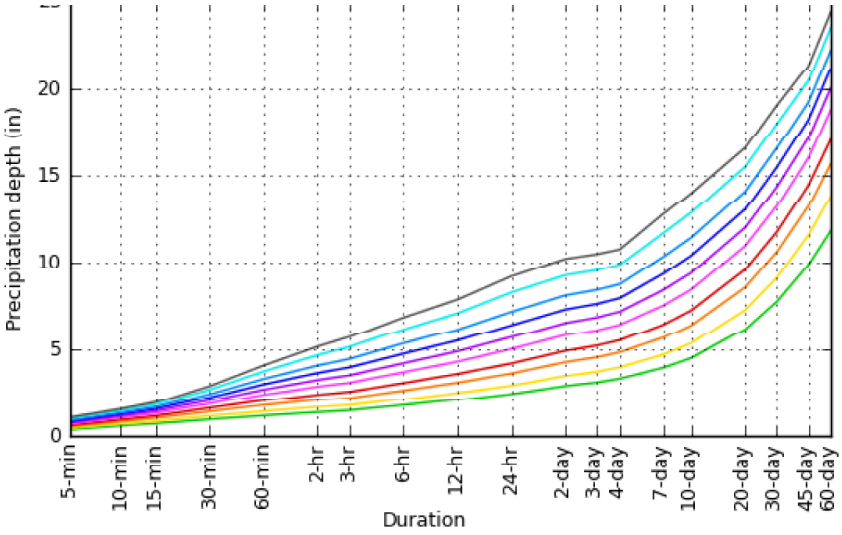
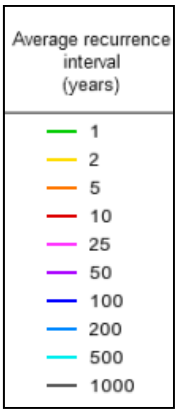
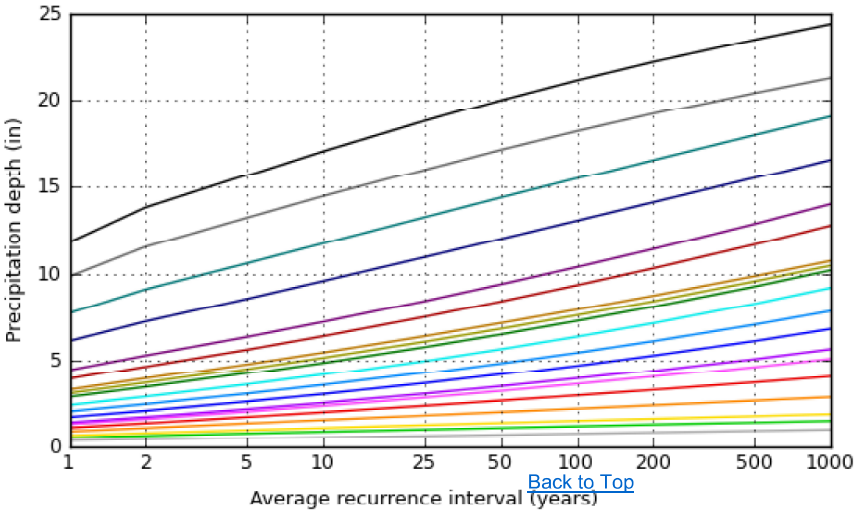
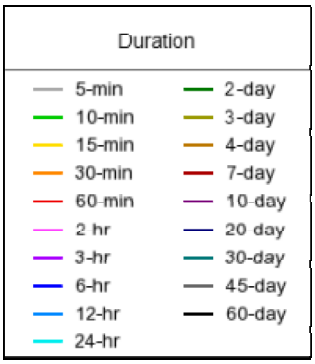
PF graphical









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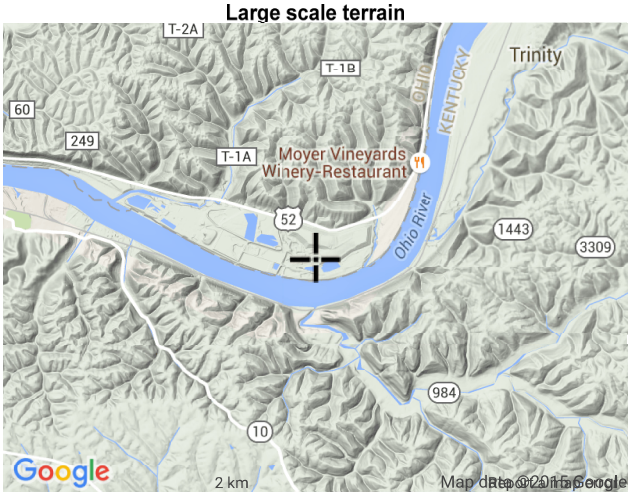
Maps & aerials

NOAA Atlas 14, Volume 2, Version 3

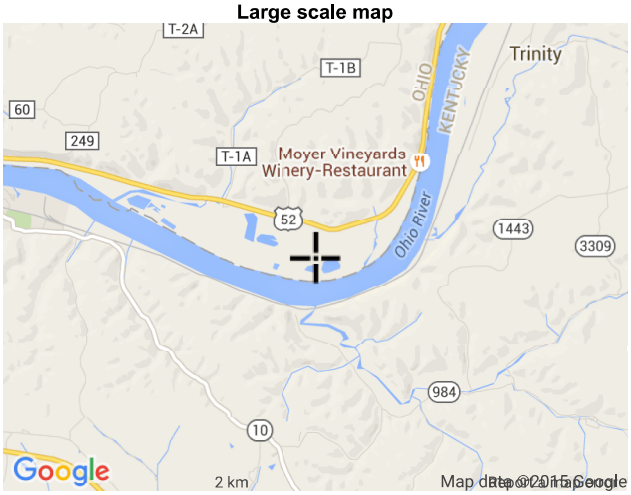
Created (GMT): Tue Dec 22 04:04:24 2015

Small scale terrain

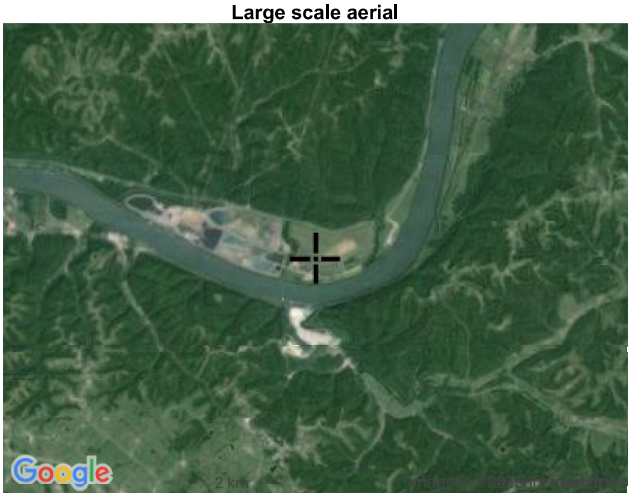
Large scale terrain



Large scale map



Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910

Questions?: HDSC.Questions@noaa.gov

Disclaimer

ATTACHMENT 4

TYPICAL NONWOVEN GEOTEXTILE SPECIFICATION SHEET

PRODUCT DATA SHEET

GSE Nonwoven Geotextiles

GSE Nonwoven Geotextiles are a family of staple fiber needlepunched geotextiles. The geotextiles are manufactured using an advanced manufacturing and quality system to produce the most uniform and consistent nonwoven needlepunched geotextile currently available in the industry. GSE combines a fiber selection and approval system with an in-line quality control and a state-of-the-art laboratory to ensure that every roll shipped meets customer specifications.

AT THE CORE:
A family of geotextiles used for separation, filtration, protection and drainage applications.

Product Specifications

These product specifications meet GRI GT12, GRI GT13 and AASHTO M288

Tested Property[1]	Test Method	Frequency	Minimum Average Roll Value					
			NW4	NW6	NW8	NW10	NW12	NW16
AASHTO M288 Class			3	2	1	>1	>>1	>>>1
Mass per Unit Area, oz/yd^2	ASTM D 5261	90,000 ft^2	4	6	8	10	12	16
Grab Tensile Strength, lb	ASTM D 4632	90,000 ft^2	120	160	220	260	320	390
Grab Elongation, %	ASTM D 4632	90,000 ft^2	50	50	50	50	50	50
CBR Puncture Strength, lb	ASTM D 6241	540,000 ft^2	303	435	575	725	925	1,125
Trapezoidal Tear Strength, lb	ASTM D 4533	90,000 ft^2	50	65	90	100	125	150
Apparent Opening Size, Sieve No. (mm)	ASTM D 4751	540,000 ft^2	70 (0.212)	70 (0.212)	80 (0.180)	100 (0.150)	100 (0.150)	100 (0.150)
Permittivity, sec^{-1}	ASTM D 4491	540,000 ft^2	1.80	1.50	1.30	1.00	0.80	0.60
Water Flow Rate, gpm/ft^2	ASTM D 4491	540,000 ft^2	135	110	95	75	60	45
UV Resistance % retained after 500 hours	ASTM D 4355	per formulation		70	70	70	70	70
TYPICAL ROLL DIMENSIONS								
Roll Length[2], ft			850	850	600	500	400	300
Roll Width[2], ft			15	15	15	15	15	15
Roll Area, ft^2			12,750	12,750	9,000	7,500	6,000	4,500

NOTES:
- [1]The property values listed are in weaker principal direction. All values listed are Minimum Average Roll Values except apparent opening size in mm and UV resistance. Apparent opening size (mm) is a Maximum Average Roll Value. UV is a typical value.
- [2]Roll lengths and widths have a tolerance of ±1%.

GSE is a leading manufacturer and marketer of geosynthetic lining products and services. We've built a reputation of reliability through our dedication to providing consistency of product, price and protection to our global customers.

Our commitment to innovation, our focus on quality and our industry expertise allow us the flexibility to collaborate with our clients to develop a custom, purpose-fit solution.

GSE ENVIRONMENTAL™

DURABILITY RUNS DEEP

For more information on this product and others, please visit us at GSEworld.com, call 800.435.2008 or contact your local sales office.

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LEACHATE 25 YEAR CAPACITY

Civil & Environmental Consultants, Inc.

PROJECT **Carter Hollow Landfill** PROJECT NO. **144-189**

Leachate Pond Storage Volume Evaluation PAGE **1** OF **1**

MADE BY **TDM** DATE **10/14/2016** CHECKED BY **APA** DATE **10/14/2016**

CALCULATION BRIEF

OBJECTIVE: As required by §257.81(a)(2), demonstrate that the run-off (i.e., leachate) control structures can store the water volume resulting from a 24-hour, 25-year storm event.

METHOD: Using information previously prepared for the Leachate Pond Sizing Calculation in Reference (Ref.) No. 1 to demonstrate that the Leachate Pond storage capacity is more than adequate to store the 24-hour, 25-year storm event

REFERENCES:

1. Carter Hollow Landfill, Class III Residual Waste Landfill Permit Application, Last Revised September 2016.

ANALYSIS:

From Ref. No. 1, the volumes of leachate generated under various phases of landfill development were estimated. Since the chimney drains for the Carter Hollow Landfill allow for surface contact water to directly flow into the leachate collection system, the collection system is influenced by storm events. The Leachate Pond was originally evaluated to determine if enough capacity was provided for a 24-hour, 100-year storm event. Attachment 2 to this calculation brief shows the estimated worst case leachate generation per phase. As shown, under the Phase 3 configuration the 24-hour, 100-year storm event results in approximately 240,000 cubic feet of leachate generated.

As shown in Attachment 1 to this calculation brief, the Leachate Pond has a designed storage capacity at Elevation 650 of approximately 252,000 cubic feet. Therefore, the Leachate Pond has enough storage capacity to store a 24-hour, 100-year storm event. As such, the Leachate Pond has more than enough storage capacity to store run-off generated in association with the 24-hour, 25-year storm event (e.g., 24-hour, 25-year storm event will generate less volume than the 24-hour, 100-year storm event).

CONCLUSIONS The Leachate Pond has enough storage capacity to store leachate generated from the 24-hour, 100-year storm event. As such, the Leachate Pond has more than enough storage capacity to store run-off generated in association with the 24-hour, 25-year storm event (e.g., 24-hour, 25-year storm event will generate less volume than the 24-hour, 100-year storm event).

ATTACHMENT 1

LEACHATE POND STAGE STORAGE CURVE

Project:
Basin Description:

Contour Elevation	Contour Area (sq. ft)	Depth (ft)	Incremental Volume Conic (cu. ft.)	Cumulative Volume Conic (cu. ft.)
632.000	1,318.74	N/A	N/A	0
633.000	2,144.81	1.000	1715	1715
634.000	3,200.45	1.000	2655	4370
635.000	4,383.96	1.000	3777	8147
636.000	5,640.14	1.000	4999	13146
637.000	6,968.98	1.000	6293	19439
638.000	8,370.40	1.000	7659	27098
639.000	9,844.35	1.000	9097	36195
640.000	11,390.86	1.000	10608	46803
641.000	13,009.92	1.000	12191	58995
642.000	14,701.54	1.000	13847	72842
643.000	16,465.72	1.000	15575	88417
644.000	18,302.46	1.000	17376	105793
645.000	20,211.78	1.000	19249	125042
646.000	22,193.68	1.000	21195	146237
647.000	24,248.15	1.000	23213	169451
648.000	26,375.19	1.000	25304	194755
649.000	28,574.81	1.000	27468	222223
650.000	30,847.01	1.000	29704	251926

Approximately 240,000 cf of storage provided between elevations 649 and 650

ATTACHMENT 2

LEACHATE GENERATION PER PHASE SPREADSHEET

144-189 Carter Hollow Landfill
Leachate Collection Pond Sizing
Leachate Generation per Phase

	Disposal Area				Flow Percolating from Waste				Flow from Chimney Drains			Peak Daily Flow Estimates		
Phase	Base Area (acres)	Slope Area (acres)	Cap Area (acres)	Total Area (acres)	Base Flow (cf/day)	Slope Flow (cf/day)	Cap Flow (cf/day)	Total (cf/s)	No. of Open CDs	Chimney Drain Flow (10-year Event) (cf/day)	Cumulative Chimney Drain Flow (100-year Event) (cf/day)	Average Daily Flow Estimates	10-year Storm Event Flow (cf/day)	100-year Storm Event Flow (cf/day)
1A	6	14	0	20	3,427	10,735	0	0.16	5	31,145	151,150	14,162	45,307	165,312
1B	9	10	0	19	4,733	8,102	0	0.15	6	37,374	181,380	12,835	50,209	194,215
2	6	27	17	50	3,198	21,033	209	0.28	7	43,603	211,610	24,440	68,043	236,050
3	2	34	37	73	1,066	26,486	455	0.32	7	43,603	211,610	28,007	71,610	239,617
4	40	0	33	73	21,320	0	406	0.25	7	43,603	211,610	21,726	65,329	233,336

Closed	12	cf/acre-day
Base	533	cf/acre-day
Slope	779	cf/acre-day
CD Flow (10-year)	6,229	cf/acre-day
CD Flow (100-year)	30,230	cf/acre-day

Maximum Leachate generated from a 100-year storm event

APPENDIX B

SUPPORTING FIGURES

(Drawing Nos. 1, 3A, 4D, 4F, 6A – 6E, and 7A - 7G taken from the PTI Permit Application for the Carter Hollow Landfill)

PERMIT TO INSTALL APPLICATION FOR
CLASS III RESIDUAL WASTE DISPOSAL FACILITY
J.M. STUART STATION - CARTER HOLLOW LANDFILL
SPRIGG TOWNSHIP
ADAMS COUNTY, OHIO

SUBMITTAL RECORD		
NO	DATE	DESCRIPTION
1	04/07/2010	INITIAL PERMIT TO INSTALL APPLICATION

REVISION RECORD		
NO	DATE	DESCRIPTION
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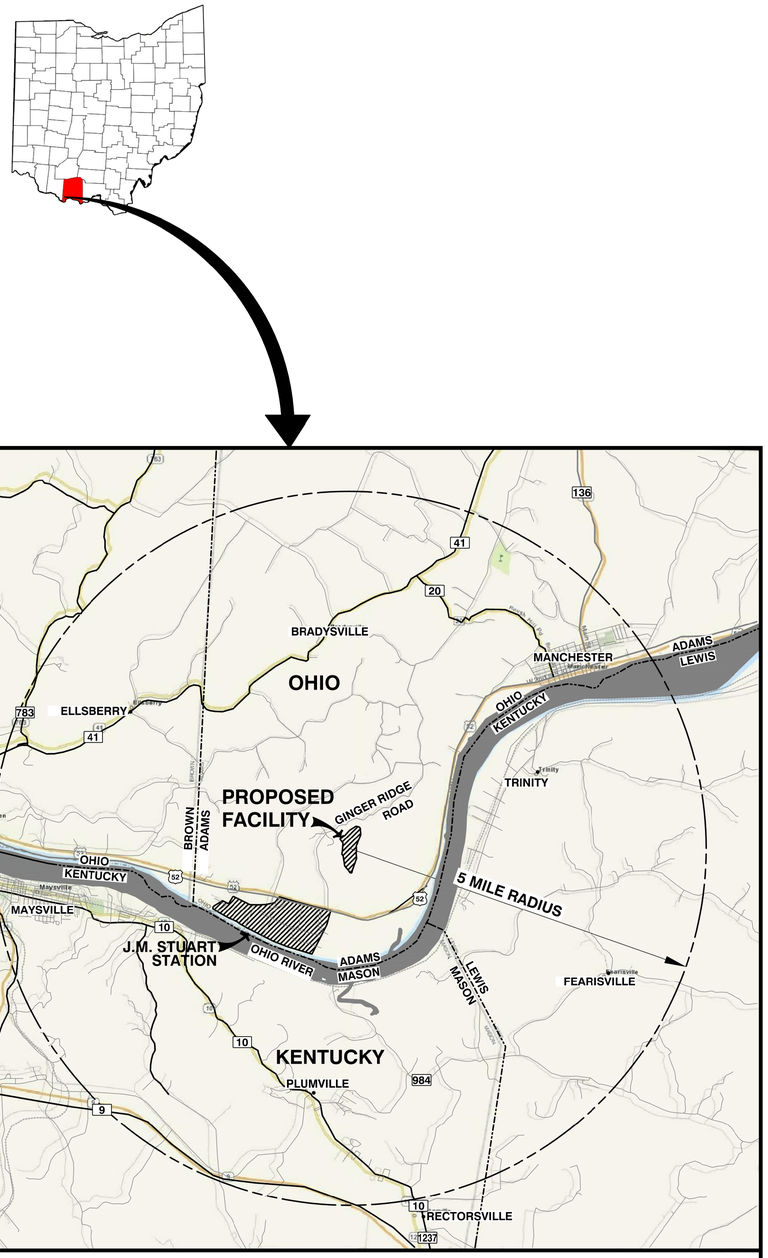
2	02/14/2011	OEPA NOD2
3	07/01/2015	PTI ALTERATION REQUEST TO ELIMINATE UNDERDRAIN CLEANOUTS
4	06/2016	PTI ALTERATION TO REQUEST 2016 DESIGN CHANGES
5	09/2016	PTI ALTERATION REQUEST NO. 4

3745-30-05 (B)(1) RULE REFERENCE		DRAWING LOCATION
(a)	NAME OF RESIDUAL WASTE LANDFILL FACILITY	1
(b)	GEOGRAPHIC LOCATION AND BOUNDARIES OF THE RESIDUAL WASTE LANDFILL FACILITY AND AREA WITHIN A 5 MILE RADIUS SHOWN ON A ROAD MAP	1
(c)	NAME AND ADDRESS OF APPLICANT AND THE RESIDUAL WASTE LANDFILL FACILITY OPERATOR	1
(d)	NAME AND ADDRESS OF OWNER(S) OF THE LAND TO BE USED FOR RESIDUAL WASTE LANDFILL FACILITY	1
(e)	NAME AND ADDRESS OF PLAN PREPARER	1
(f)	INDEX OF PLAN SHEETS	1



LOCATION MAP SCALE: 1"=1 MILE

GENERAL NOTES:
THESE DRAWINGS HAVE BEEN PREPARED FOR PERMITTING PURPOSES ONLY AND ARE NOT TO BE USED AS CONSTRUCTION DRAWINGS. CONSTRUCTION DRAWINGS MUST COMPLY WITH THE APPROVED PERMITTED DRAWINGS.

PREPARED FOR:

DP&L

THE DAYTON POWER AND LIGHT COMPANY
APPLICANT/OPERATOR/LAND CO-OWNER
J.M. STUART STATION - CARTER HOLLOW LANDFILL
745 US 52, MANCHESTER, OHIO

LAND CO-OWNERS
COLUMBUS SOUTHERN POWER COMPANY
1 RIVERSIDE PLAZA
COLUMBUS, OHIO 43215-2372

DUKE ENERGY OHIO, INC.
139 EAST FOURTH STREET
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PREPARED BY:

CEC
Civil & Environmental Consultants, Inc.
5910 HARPER ROAD, SUITE 106
SOLON, OHIO 44139

CEC PROJECT NO. 144-189

△5

LIST OF DRAWINGS

SHEET NUMBER	DRAWING NUMBER	DRAWING TITLE	REVISION NUMBER
1	1	COVER	5
2	2A	EXISTING PROPERTY AND SITE CONDITIONS	1
3	2B	PUBLICLY AVAILABLE INFORMATION AND SITING CRITERIA	1
4	3A	LANDFILL FACILITIES/UTILITIES LOCATION PLAN	4
5	3B	SUBSURFACE INVESTIGATION AND UAS POTENTIOMETRIC SURFACE CONTOUR MAP	1
6	4A	HORIZONTAL AND VERTICAL LIMITS OF EXCAVATION	4
7	4B	BOTTOM OF THE RECOMPACTED SOIL LINER	4
8	4C	TOP OF THE RECOMPACTED SOIL LINER	4
9	4D	TOP OF THE LEACHATE COLLECTION LAYER AND BOTTOM OF THE RESIDUAL WASTE	4
10	4E	TOP OF THE RESIDUAL WASTE AND BOTTOM OF THE CAP SYSTEM	4
11	4F	TOP OF THE CAP SYSTEM	4
12	5A	GEOLOGIC CROSS SECTION LOCATION PLAN	1
13	5B	GEOLOGIC CROSS SECTION A-A'	1
14	5C	GEOLOGIC CROSS SECTIONS B-B' AND C-C'	1
15	5D	GEOLOGIC CROSS SECTION D-D'	1
16	5E	GEOLOGIC CROSS SECTIONS E-E' AND F-F'	1
17	5F	GEOLOGIC CROSS SECTIONS G-G' AND H-H'	1
18	5G	GENERALIZED GEOLOGIC CROSS SECTION	1
19	5H	ENGINEERING CROSS SECTION LOCATION PLAN	4
20	5I	ENGINEERING CROSS SECTIONS	4
21A	6A	PHASE 1A DEVELOPMENT PLAN	4
21B	6B	PHASE 1B DEVELOPMENT PLAN	4
22	6C	PHASE 2 DEVELOPMENT PLAN	4
23	6D	PHASE 3 DEVELOPMENT PLAN	4
24	6E	PHASE 4 DEVELOPMENT PLAN	4
25	7A	LINER, LEACHATE AND SURFACE WATER STRUCTURES DETAILS	5
26	7B	SURFACE WATER CONTROL AND LEACHATE COLLECTION SYSTEM DETAILS	4
27	7C	MISCELLANEOUS DETAILS (SHEET 1 OF 3)	4
28	7D	STORMWATER PONDS "A", "B", "C"	4
29	7E	STORMWATER PONDS "D", "E", "F", & "G"	4
30A	7F	MISCELLANEOUS DETAILS (SHEET 2 OF 3)	4
30B	7G	MISCELLANEOUS DETAILS (SHEET 3 OF 3)	5

STATE OF OHIO
Anthony P. Amicon
E-58905
REGISTERED
PROFESSIONAL ENGINEER
12-2-16

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www.cecinc.com

PERMIT TO INSTALL APPLICATION
THE DAYTON POWER AND LIGHT COMPANY
J.M. STUART STATION
CARTER HOLLOW LANDFILL
SPRIGG TOWNSHIP, ADAMS CO., OHIO

DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	AS NOTED	PROJECT NO:	071-644

COVER

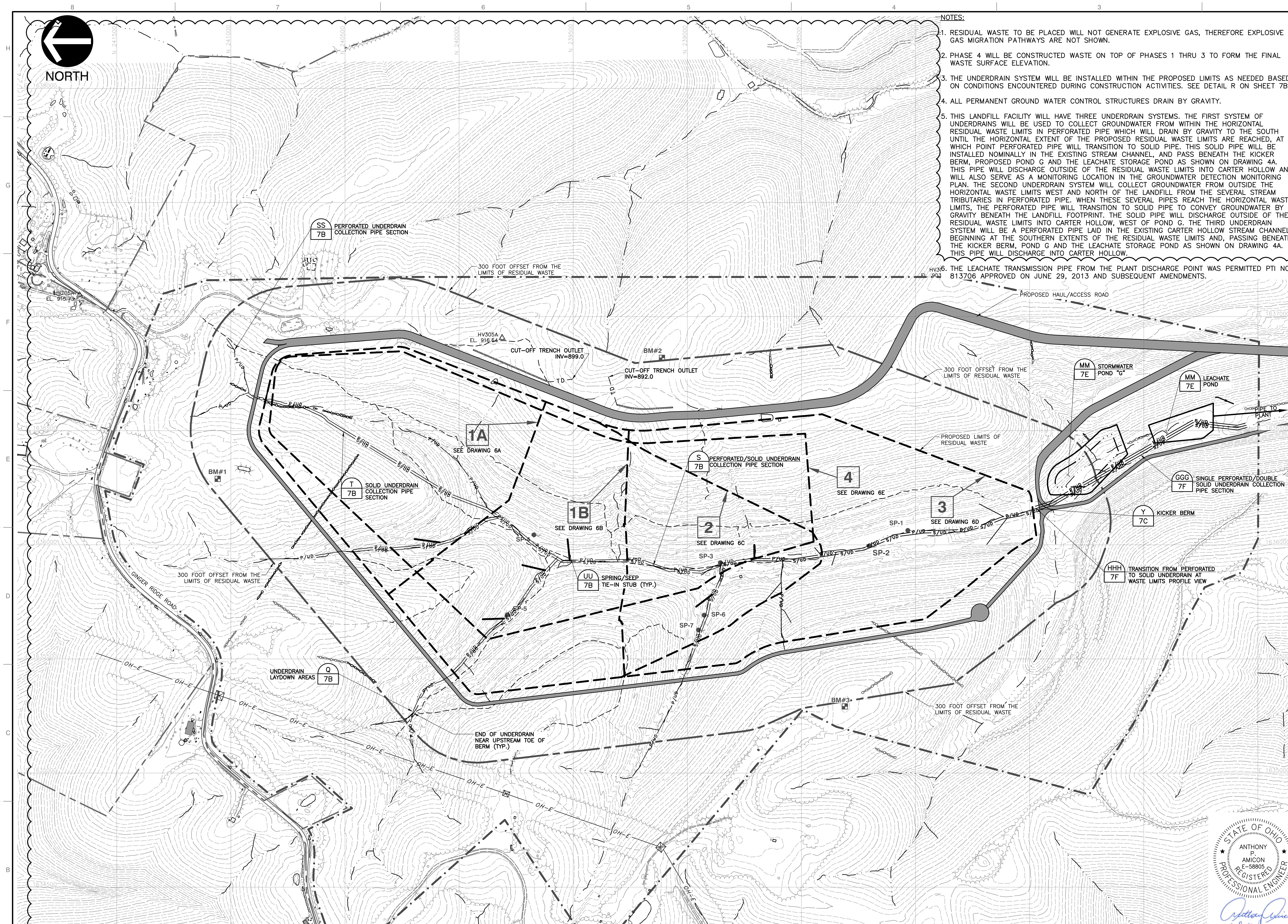
DRAWING NO.: 1

SHEET 1 OF 30

P:\2014\144-189\-CADD\Dwg\Civil\Permit Drawings\MXD2\Utility 1 071644.dwg[1 LS](9/26/2016 - jgilligan) - LP, 9/26/2016 11:23 AM

NOTES:

1. RESIDUAL WASTE TO BE PLACED WILL NOT GENERATE EXPLOSIVE GAS, THEREFORE EXPLOSIVE GAS MIGRATION PATHWAYS ARE NOT SHOWN.
2. PHASE 4 WILL BE CONSTRUCTED WASTE ON TOP OF PHASES 1 THRU 3 TO FORM THE FINAL WASTE SURFACE ELEVATION.
3. THE UNDERDRAIN SYSTEM WILL BE INSTALLED WITHIN THE PROPOSED LIMITS AS NEEDED BASED ON CONDITIONS ENCOUNTERED DURING CONSTRUCTION ACTIVITIES. SEE DETAIL R ON SHEET 7B.
4. ALL PERMANENT GROUND WATER CONTROL STRUCTURES DRAIN BY GRAVITY.
5. THIS LANDFILL FACILITY WILL HAVE THREE UNDERDRAIN SYSTEMS. THE FIRST SYSTEM OF UNDERDRAINS WILL BE USED TO COLLECT GROUNDWATER FROM WITHIN THE HORIZONTAL RESIDUAL WASTE LIMITS IN PERFORATED PIPE WHICH WILL DRAIN BY GRAVITY TO THE SOUTH UNTIL THE HORIZONTAL EXTENT OF THE PROPOSED RESIDUAL WASTE LIMITS ARE REACHED, AT WHICH POINT PERFORATED PIPE WILL TRANSITION TO SOLID PIPE. THIS SOLID PIPE WILL BE INSTALLED NOMINALLY IN THE EXISTING STREAM CHANNEL, AND PASS BENEATH THE KICKER BERM, PROPOSED POND G AND THE LEACHATE STORAGE POND AS SHOWN ON DRAWING 4A. THIS PIPE WILL DISCHARGE OUTSIDE OF THE RESIDUAL WASTE LIMITS INTO CARTER HOLLOW AND WILL ALSO SERVE AS A MONITORING LOCATION IN THE GROUNDWATER DETECTION MONITORING PLAN. THE SECOND UNDERDRAIN SYSTEM WILL COLLECT GROUNDWATER FROM OUTSIDE THE HORIZONTAL WASTE LIMITS WEST AND NORTH OF THE LANDFILL FROM THE SEVERAL STREAM TRIBUTARIES IN PERFORATED PIPE. WHEN THESE SEVERAL PIPES REACH THE HORIZONTAL WASTE LIMITS, THE PERFORATED PIPE WILL TRANSITION TO SOLID PIPE TO CONVEY GROUNDWATER BY GRAVITY BENEATH THE LANDFILL FOOTPRINT. THE SOLID PIPE WILL DISCHARGE OUTSIDE OF THE RESIDUAL WASTE LIMITS INTO CARTER HOLLOW, WEST OF POND G. THE THIRD UNDERDRAIN SYSTEM WILL BE A PERFORATED PIPE LAID IN THE EXISTING CARTER HOLLOW STREAM CHANNEL BEGINNING AT THE SOUTHERN EXTENTS OF THE RESIDUAL WASTE LIMITS AND, PASSING BENEATH THE KICKER BERM, POND G AND THE LEACHATE STORAGE POND AS SHOWN ON DRAWING 4A. THIS PIPE WILL DISCHARGE INTO CARTER HOLLOW.
6. THE LEACHATE TRANSMISSION PIPE FROM THE PLANT DISCHARGE POINT WAS PERMITTED PTI NO. 813706 APPROVED ON JUNE 29, 2013 AND SUBSEQUENT AMENDMENTS.



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NO	DATE	DESCRIPTION
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4	06/2016	PTI ALTERATION TO REQUEST 2016 DESIGN CHANGES

	3745–30–05 (B)(3) RULE REFERENCE	DRAWING LOCATION
(a)	ITEMS SPECIFIED IN PARAGRAPH (B)(2)(a)	ALL "3 SERIES"
(b)	EXISTING OR PROPOSED PIPES, CONDUIT, ELECTRIC LINES, FRENCH DRAINS, ROADS, RAILROADS, AND EASEMENTS	ALL "3 SERIES"
(c)	LOCATION OF ALL SUBSURFACE INVESTIGATION SITES	3B
(d)	POTENTIOMETRIC MAP OF THE UPPERMOST AQUIFER SYSTEM	3B
(e)	PERMANENT GROUND WATER CONTROL STRUCTURES	3A
(f)	EXISTING OR PROPOSED EXPLOSIVE GAS CONTROL SYSTEM	NOTE 1
(g)	PHASING DIAGRAM	3A
(h)	LAND SET ASIDE FOR LEACHATE TREATMENT/PRE–TREATMENT FACILITIES	3A

DP&L

LEGEND

- OCCUPIED STRUCTURE
- 700 — EXISTING CONTOUR
- OH–E — EXISTING OVERHEAD POWER LINE
- EXISTING STREAM
- PROPERTY LINE
- PROPOSED LIMITS OF RESIDUAL WASTE/PHASING
- 300 FOOT OFFSET
- FACILITY BOUNDARY
- HV306A EL. 903.63 — AERIAL SURVEY CONTROL POINT
- PROPOSED SEEPAGE CUT–OFF TRENCH
- TD — PROPOSED SEEPAGE CUT–OFF TRENCH DRAIN
- P/UD — PROPOSED PERFORATED UNDERDRAIN
- S/UD — PROPOSED SOLID UNDERDRAIN
- SPRING/SEEP TIE–IN STUB
- SP-4 — SPRING
- BM#1 — PROPOSED BENCHMARKS
- PROPOSED ACCESS/HAUL ROAD
- 1 — PHASE ID

BM	NORTHING	EASTING	ELEV.
1	241058	1636289	922
2	239111	1636819	913
3	238310	1635291	911

ACTUAL BENCHMARK LOCATIONS WILL BE ESTABLISHED IN ACCORDANCE WITH OAC 3745–30–07(C)(5) PRIOR TO ANY CONSTRUCTION. THE ACTUAL COORDINATES AND THEIR ELEVATIONS WILL BE MEMORIALIZED INTO THE APPROVED PERMIT THROUGH THE SUBMISSION OF A CONSTRUCTION CERTIFICATION AND A REVISED PLAN SHEET 2B. THE REVISED PLAN SHEET WILL BE INCORPORATED INTO THE PERMIT THROUGH AN ALTERATION.

SCALE IN FEET

0 200 400

DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

EXISTING SITE TOPOGRAPHIC SURVEY WAS PROVIDED TO CIVIL & ENVIRONMENTAL CONSULTANTS, INC. BY THE DAYTON POWER AND LIGHT COMPANY IN THE FILE NAMED "CARTER HOLLOW TOPO APRIL 2013.XML". CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.

DATE OF BOUNDARY SURVEY, 2005
BY: L.R. KIMBALL & ASSOCIATES., INC.

STATE OF OHIO ANTHONY P. AMICON E–58805 REGISTERED PROFESSIONAL ENGINEER

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DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	1"=200'	PROJECT NO:	071-644

LANDFILL
FACILITIES/UTILITIES
LOCATION PLAN

DRAWING NO.: 3A

SHEET 4 OF 30

NORTH

1. NOTES:
2. CHIMNEY DRAIN LOCATIONS SHALL BE ADJUSTED AS NEEDED DURING PHASE CONSTRUCTION TO SUIT FIELD CONDITIONS.
3. NO MORE THAN 7 CHIMNEY DRAINS SHALL BE OPERATIONAL AT ANY ONE TIME.
4. GRADING SHOWN IN THE LEACHATE POND REPRESENTS THE TOP OF PROTECTIVE COVER ELEVATIONS.
5. SOIL STOCKPILES MAY BE CONSTRUCTED AS NEEDED OR TO LESSER EXTENTS SHOWN ON THE DRAWINGS.

HV205A EL. 913.73

HV306A EL. 903.63

HV305A EL. 916.64

C 7A STORMWATER CHANNEL 1A

L 7A LEACHATE COLLECTION PIPE AT TOE OF SLOPE

M 7A LEACHATE COLLECTION PIPE CLEANOUT

B 7A TYPICAL ROADWAY SECTION – LANDFILL ACCESS ROAD

H 7A I 7A ZZ 7A AAA 7A SIDE SLOPE LINER SYSTEM DETAILS

C 7A STORMWATER CHANNEL 1C

F 7A G 7A BOTTOM LINER SYSTEM DETAILS

C 7A STORMWATER CHANNEL 1B

III 7A MULTIPLE LEACHATE COLLECTION PIPES

FF 7C ROCK LINED CHANNEL

C 7A STORMWATER CHANNEL 13B

C 7A STORMWATER CHANNEL 13A

C 7A STORMWATER CHANNEL 14

LEACHATE POND MM 7E

PIPE TO PLANT

AA 7C PROPOSED LEACHATE POND LINER DETAIL

C 7A STORMWATER CHANNEL 11B

WW 7A LEACHATE TRANSMISSION PIPE

MM 7E STORMWATER POND "G"

C 7A STORMWATER CHANNEL 11A

HHH 7G LEACHATE TRANSMISSION PIPE BELOW GROUND DETAIL

Y 7C KICKER BERM

N 7B LEACHATE COLLECTION LINE PENETRATION

K 7A LEACHATE COLLECTION PIPE SECTION

FF 7C ROCK LINED CHANNEL

C 7A STORMWATER CHANNEL 6

CHIMNEY DRAIN CCC 7G

STORMWATER CHANNEL 3 C 7A

STORMWATER CHANNEL 2B C 7A

TYPICAL PERIMETER BERM SECTION A 7A

XX 7A LEACHATE COLLECTION PIPE

LIMITS OF TYPE B STRUCTURAL FILL (TYP.)

LIMITS OF TYPE B STRUCTURAL FILL (TYP.)

① ② ③ ④

TIMBER ACCESS ROAD

SCALE IN FEET
0 200 400
DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

REF: EXISTING SITE TOPOGRAPHIC SURVEY WAS PROVIDED TO CIVIL & ENVIRONMENTAL CONSULTANTS, INC. BY THE DAYTON POWER AND LIGHT COMPANY IN THE FILE NAMED "CARTER HOLLOW TOPO APRIL 2013.XML". CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.

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3745-30-05 (B)(4) RULE REFERENCE		DRAWING LOCATION
(a)	HORIZONTAL AND VERTICAL LIMITS OF EXCAVATION	4A
(b)	HORIZONTAL LIMITS AND THE BOTTOM ELEVATION OF THE RECOMPACTED SOIL LINER	4B
(b)	HORIZONTAL LIMITS AND THE TOP ELEVATION OF THE RECOMPACTED SOIL LINER	4C
(c)	THE TOP ELEVATION OF THE LEACHATE COLLECTION LAYER, PIPE INVERTS, AND LAYOUT OF THE LEACHATE COLLECTION SYSTEM	4D
(d)	HORIZONTAL LIMITS AND THE BOTTOM ELEVATION OF THE RESIDUAL WASTE	4D
(d)	HORIZONTAL LIMITS AND THE TOP ELEVATION OF THE RESIDUAL WASTE	4E
(e)	SEPARATORY LINER/LEACHATE COLLECTION SYSTEM	NOT REQUIRED
(f)	HORIZONTAL LIMITS AND THE BOTTOM ELEVATION OF THE CAP SYSTEM	4E
(f)	HORIZONTAL LIMITS AND THE TOP ELEVATION OF THE CAP SYSTEM	4F
(g)	GRID SYSTEM WITH NORTHINGS AND EASTINGS NO MORE THAN 500' APART	ALL "4 SERIES"

DP&L

LEGEND

- EXISTING CONTOUR
- 700 PROPOSED CONTOUR WITHIN WASTE LIMITS
- 700 PROPOSED CONTOUR OUTSIDE WASTE LIMITS
- OH-E EXISTING OVERHEAD POWER LINE
- EXISTING STREAM
- PROPERTY LINE
- PROPOSED LIMITS OF WASTE
- FACILITY BOUNDARY
- PROPOSED CHANNEL
- LCP PROPOSED LEACHATE COLLECTION PIPE
- LCO PROPOSED LEACHATE CLEAN OUT PIPE
- PROPOSED CLEANOUT LOCATION
- PROPOSED ACCESS/HAUL ROAD
- CHIMNEY DRAIN
- LTP PROPOSED LEACHATE TRANSMISSION PIPE (A4)

STATE OF OHIO
ANTHONY P. AMICON
E-58805
REGISTERED PROFESSIONAL ENGINEER
6-9-16

Civil & Environmental Consultants, Inc.
5910 Haper Road, Suite 106 - Solon, OH 44139
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PERMIT TO INSTALL APPLICATION
THE DAYTON POWER AND LIGHT COMPANY
J.M. STUART STATION
CARTER HOLLOW LANDFILL
SPRIGG TOWNSHIP, ADAMS CO., OHIO

DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	1"=200'	PROJECT NO:	071-644

TOP OF THE LEACHATE COLLECTION LAYER AND BOTTOM OF THE RESIDUAL WASTE

DRAWING NO.: 4D

SHEET 9 OF 30

G:\PROJECTS\2007\071-644\PERMIT\DWG\1602\[PTI-4D 071644.DWG]4D (LANDW) -- FEB 7, 2011 -- 10:16:4

NORTH

NOTE:

1. SEE DETAIL SHEETS 7D AND 7E FOR POND INLET AND OUTLET DETAILS.
2. GRADING SHOWN IN THE LEACHATE POND REPRESENTS THE TOP OF PROTECTIVE COVER ELEVATIONS.
3. SOIL STOCKPILES MAY BE CONSTRUCTED AS NEEDED OR TO LESSER EXTENTS SHOWN ON THE DRAWINGS.

HV205A EL. 915.73

HV306A EL. 903.63

C 7A STORMWATER CHANNEL 1A

U 7B SURFACE WATER DIVERSION BERM

JJ 7E STORMWATER POND "D"

B 7A TYPICAL ROADWAY SECTION – LANDFILL ACCESS ROAD

C 7A STORMWATER CHANNEL 1B

KK 7E STORMWATER POND "E"

V 7C DOWNCHUTE CHANNEL

C 7A STORMWATER CHANNEL 1C

E 7A CAP SYSTEM

FF 7C ROCK LINED CHANNEL

C 7A STORMWATER CHANNEL 13A

C 7A STORMWATER CHANNEL 14

LEACHATE POND MM 7E

PIPE TO PLANT

C 7A STORMWATER CHANNEL 13B

C 7A STORMWATER CHANNEL 11B

MM 7E STORMWATER POND "G"

C 7A STORMWATER CHANNEL 11A

HHH 7G LEACHATE TRANSMISSION PIPE BELOW GROUND DETAIL

Y 7C KICKER BERM

C 7A STORMWATER CHANNEL 4

STORMWATER CHANNEL 3 C 7A

STORMWATER CHANNEL 2B C 7A

TYPICAL PERIMETER BERM SECTION A 7A

STORMWATER CHANNEL 5 C 7A

STORMWATER POND "C" II 7D

DIVERSION BERM DIVIDE (TYP.)

STORMWATER POND "F" LL 7E

FF 7C ROCK LINED CHANNEL

C 7A STORMWATER CHANNEL 6

2.8%

2.0%

4:1

LTP

OH-E

SCALE IN FEET

0 200 400

DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

REF: EXISTING SITE TOPOGRAPHIC SURVEY WAS PROVIDED TO CIVIL & ENVIRONMENTAL CONSULTANTS, INC. BY THE DAYTON POWER AND LIGHT COMPANY IN THE FILE NAMED "CARTER HOLLOW TOPO APRIL 2013.XML". CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.

SUBMITTAL RECORD

NO	DATE	DESCRIPTION
1	04/07/2010	INITIAL PERMIT TO INSTALL APPLICATION

REVISION RECORD

NO	DATE	DESCRIPTION
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2	02/14/2011	OEPA NOD2
3	07/01/2015	PTI ALTERATION REQUEST TO ELIMINATE UNDERDRAIN CLEANOUTS
4	06/2016	PTI ALTERATION TO REQUEST 2016 DESIGN CHANGES

3745-30-05 (B)(4) RULE REFERENCE		DRAWING LOCATION
(a)	HORIZONTAL AND VERTICAL LIMITS OF EXCAVATION	4A
(b)	HORIZONTAL LIMITS AND THE BOTTOM ELEVATION OF THE RECOMPACTED SOIL LINER	4B
(b)	HORIZONTAL LIMITS AND THE TOP ELEVATION OF THE RECOMPACTED SOIL LINER	4C
(c)	THE TOP ELEVATION OF THE LEACHATE COLLECTION LAYER, PIPE INVERTS, AND LAYOUT OF THE LEACHATE COLLECTION SYSTEM	4D
(d)	HORIZONTAL LIMITS AND THE BOTTOM ELEVATION OF THE RESIDUAL WASTE	4D
(d)	HORIZONTAL LIMITS AND THE TOP ELEVATION OF THE RESIDUAL WASTE	4E
(e)	SEPARATORY LINER/LEACHATE COLLECTION SYSTEM	NOT REQUIRED
(f)	HORIZONTAL LIMITS AND THE BOTTOM ELEVATION OF THE CAP SYSTEM	4E
(f)	HORIZONTAL LIMITS AND THE TOP ELEVATION OF THE CAP SYSTEM	4F
(g)	GRID SYSTEM WITH NORTHINGS AND EASTINGS NO MORE THAN 500' APART	ALL "4 SERIES"

DP&L

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR WITHIN WASTE LIMITS
- PROPOSED CONTOUR OUTSIDE WASTE LIMITS
- EXISTING OVERHEAD POWER LINE
- EXISTING STREAM
- PROPERTY LINE
- PROPOSED LIMITS OF WASTE
- FACILITY BOUNDARY
- PROPOSED CHANNEL
- PROPOSED NORMAL WATER SURFACE ELEVATION
- PROPOSED ACCESS/HAUL ROAD
- ROCK CHANNEL PROTECTION
- LTP PROPOSED LEACHATE TRANSMISSION PIPE 4

STATE OF OHIO
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PERMIT TO INSTALL APPLICATION
THE DAYTON POWER AND LIGHT COMPANY
J.M. STUART STATION
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SPRIGG TOWNSHIP, ADAMS CO., OHIO

DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	1"=200'	PROJECT NO:	071-644

TOP OF THE CAP SYSTEM

DRAWING NO.: **4F**

SHEET 11 OF 30

P:\2014\1144-1891--CADD\Dwg's\Civil Permit Drawings\W2021\PTI--4F 071644.dwg[4F] LS:6/10/2016 -- mlapolla(cc) -- LP: 6/10/2016 3:09 PM

NORTH

CONSTRUCTION NOTES:

1. EXCAVATE AND FILL PHASE TO LIMITS AS SHOWN. INSTALL UNDERDRAIN, PLACE STRUCTURAL FILL IN DESIGNATED AREAS, AND CONSTRUCT LINER SYSTEM AND LEACHATE MANAGEMENT SYSTEM.
2. INSTALL GROUNDWATER MONITORING WELLS UAS–1, UAS–7, UDS–1, D–1/S–1, AND D–2/S–2.
3. SOIL STOCKPILES MAY BE CONSTRUCTED AS NEEDED OR TO LESSER EXTENTS SHOWN ON THE DRAWINGS.

GENERAL OPERATION NOTES:

1. THE BASE GRADES SHOWN IN THE CONSTRUCTED PHASE ARE THE TOP OF LEACHATE COLLECTION LAYER. GRADES SHOWN IN WASTE PLACEMENT PHASES ARE TOP OF WASTE.
2. THE MAXIMUM EXTENT OF EACH PHASE IS SHOWN ON THESE PHASING DRAWINGS. PHASES MAY BE DIVIDED INTO SEPARATE SUB–PHASES OR CONSTRUCTED IN THEIR ENTIRETY DEPENDING ON ANTICIPATED FILLING RATE, CONSTRUCTION SCHEDULING AND SEASONAL CONSTRUCTION FEASIBILITY. SUBDIVIDING PHASES REQUIRES PRIOR OEPA APPROVAL.
3. THE WASTE ELEVATIONS SHOWN ARE THE MAXIMUM PROPOSED TOP OF WASTE GRADES. FILLING MAY STOP SHORT OF THESE GRADES. TRANSITIONS BETWEEN AND TYPICAL FILLING OPERATIONS OF PHASES REQUIRES CONSULTATION WITH OEPA TO INSURE THAT THE FINAL SLOPE WITHIN THE PREVIOUS PHASE IS CONSTRUCTED TO MAXIMUM EXTENT. SOLID WASTE MAY BE PLACED IN SUBSEQUENT PHASES PRIOR TO THE COMPLETION OF PREVIOUS PHASES TO PROVIDE FROST PROTECTION, SURFACE WATER DRAINAGE OR FOR PROPER OPERATION OF THE FACILITY. REMAINING AIRSPACE WITHIN PREVIOUS PHASES WILL BE FILLED TO THE PERMITTED GRADES AS QUICKLY AS POSSIBLE.
4. LOCATIONS OF TEMPORARY HAUL ROADS ARE APPROXIMATE AND MAY BE ADJUSTED BASED ON FIELD CONDITIONS, WEATHER AND WASTE ACCEPTANCE RATES. HAUL ROAD WILL BE INSTALLED WITH PROPER APPURTENANCES FOR STORM WATER CONTROL
5. SURFACE WATER FLOW PATTERNS ARE APPROXIMATE AND ARE SHOWN HERE TO SHOW GENERAL FLOW DIRECTIONS. CHANNELS, CULVERTS, BERMS, ETC. SHALL BE CONSTRUCTED AND MAINTAINED AS NECESSARY TO DIRECT RUN–OFF TO THE SURFACE WATER MANAGEMENT SYSTEM. TEMPORARY EROSION CONTROLS SUCH AS SILT FENCE, STRAW BALE DIKES, STRAW WATTLES, AND SEEDING WILL BE INSTALLED AS NECESSARY TO REDUCE EROSION AND SEDIMENTATION.
6. FINAL COVER WILL BE INSTALLED OVER AREAS OF THE PHASE THAT HAVE REACHED PERMITTED FINAL ELEVATIONS FOR SOLID WASTE PLACEMENT. THE EXTENT OF FINAL COVER CONSTRUCTED IN ANY GIVEN CONSTRUCTION SEASON WILL BE BASED ON CONSTRUCTION CONSIDERATIONS SUCH AS SURFACE WATER MANAGEMENT, FUTURE TIE–INS, AND ACCESSIBILITY.
7. WASTE PLACED DURING LANDFILL OPERATION SHALL BE GRADED SUCH THAT SURFACE WATER DRAINS TO THE CHIMNEY DRAINS WITHIN THE LANDFILL, AWAY FROM THE LANDFILL PERIMETER BOUNDARIES.
8. TACK–ON BERMS SHALL BE CONSTRUCTED ON THE SOUTHERN INTERMEDIATE SLOPE TO DIRECT RUN–OFF EAST AND WEST TO THE ESTABLISHED STORMWATER CONVEYANCE CHANNELS LEADING TO POND G.
9. TEMPORARY WASTE PLACEMENT PERIMETER BERMS MAY BE CONSTRUCTED AS PART OF FUTURE LANDFILL OPERATIONS TO DIVERT NON–CONTACT STORMWATER. THE LANDFILL OPERATOR SHALL CONFIRM THAT ANY WASTE IS SUFFICIENTLY COVERED WITH SOIL AND/OR VEGETATION PRIOR TO CONVEYING STORMWATER TO THE LANDFILL STORMWATER SYSTEM.

PROPOSED HIGH VISIBILITY PROTECTIVE FENCE AND "WETLAND–KEEP OUT" SIGN

HV205A EL. 915.73

HV306A EL. 903.63

HV305A EL. 916.64

TYPICAL PERIMETER BERM SECTION A 7A

STORMWATER CHANNEL 1A C 7A

K 7A LEACHATE COLLECTION PIPE SECTION

B 7A HAUL/ACCESS ROAD

STORMWATER CHANNEL 1B C 7A

H 7A I 7A ZZ 7A AAA 7A SIDE SLOPE LINER

L 7A TYPICAL LEACHATE COLLECTION PIPE AT TOE OF SLOPE

STORMWATER CHANNEL 1C C 7A

BASIN LINER ANCHOR TRENCH DETAIL PP 7F

STORMWATER CHANNEL 13A C 7A

STORMWATER CHANNEL 14 C 7A

PROPOSED SOIL STOCKPILE AREA

STORMWATER CHANNEL 1D C 7A

STORMWATER POND G MM 7E

LEACHATE POND MM 7E

CULVERT

PIPE TO PLANT UAS-7 UDS-1

STORMWATER CHANNEL 13B C 7A

RR 7F BASIN LINER OUTLET PIPE PENETRATION DETAIL

BBB 7F LEACHATE POND LINER DETAIL

STORMWATER CHANNEL 3 C 7A

LEACHATE CLEANOUT PIPE M 7A

CHIMNEY DRAIN CCC 7G

STORMWATER CHANNEL 2A C 7A

TYPICAL LEACHATE COLLECTION PIPE AT TOE OF SLOPE L 7A

1A

DDD 7G SIDE SLOPE INTERIOR PHASING BERM AT LINER TERMINATION

EEE 7G INTERIOR PHASE BERM

STORMWATER CHANNEL 8 C 7A

GGG 7G LEACHATE TRANSMISSION PIPE ABOVE GROUND DETAIL

LEACHATE TRANSMISSION PIPE ABOVE GROUND DETAIL GGG 7G

TEMPORARY ACCESS ROAD

POND G FORBAY

CULVERT

STORMWATER CHANNEL 11B C 7A

QQ 7F BASIN LINER INLET PIPE PENETRATION DETAIL

STORMWATER CHANNEL 11A C 7A

HHH 7G LEACHATE TRANSMISSION PIPE BELOW GROUND DETAIL

D-2/S-2

UAS-1

STORMWATER CHANNEL 4 C 7A

SEDIMENT TRAP

STORMWATER CHANNEL 5 C 7A

GINGER RIDGE ROAD

STORMWATER CHANNEL 9B C 7A

GRADE TO DRAIN

D-1/S-1

STORMWATER CHANNEL 9C C 7A

WW 7A LEACHATE TRANSMISSION PIPE

PROPOSED SOIL STOCKPILE AREA

F 7A G 7A BOTTOM LINER

STORMWATER CHANNEL 7 C 7A

DDD 7G SIDE SLOPE INTERIOR PHASING BERM AT LINER TERMINATION

OH–E

SUBMITTAL RECORD

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3745–30–05 (B)(6) RULE REFERENCE		DRAWING LOCATION
(a)	LOCATION OF GROUND WATER MONITORING WELLS, PIEZOMETERS, EXPLOSIVE GAS PERMANENT MONITORS, LEACHATE COLLECTION AND MANAGEMENT STRUCTURES, OR SURFACE WATER CONTROL STRUCTURES	6A THRU 6E
(b)	EXTENT OF WASTE PLACEMENT FOR THAT PHASE	6A THRU 6E
(c)	CONTOURS OF ANY PREVIOUSLY FILLED PHASES	6A THRU 6E
(d)	LIMITS OF FINAL COVER AND INTERMEDIATE COVER ON PREVIOUSLY FILLED PHASES	6A THRU 6E
(e)	CONTOURS OF THE BOTTOM LIMITS OF SOLID WASTE PLACEMENT FOR THE DEPICTED PHASE	6A THRU 6E
(f)	LOCATION OF ACCESS ROADS FOR THE DEPICTED PHASE	6A THRU 6E
(g)	PERMANENT AND TEMPORARY MEASURES TO BE UTILIZED TO CONTROL SURFACE WATER RUN–ON AND RUN–OFF, EROSION, AND ANY TEMPORARY OR PERMANENT GROUND WATER CONTROL STRUCTURES	6A THRU 6E

DP&L

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR WITHIN WASTE LIMITS
- PROPOSED CONTOUR OUTSIDE WASTE LIMITS
- EXISTING OVERHEAD POWER LINE
- EXISTING STREAM
- PROPERTY LINE
- PROPOSED LIMITS OF RESIDUAL WASTE
- FACILITY BOUNDARY
- PROPOSED CHANNEL
- LCP PROPOSED LEACHATE COLLECTION PIPE
- LCO PROPOSED LEACHATE CLEANOUT PIPE
- LTP PROPOSED LEACHATE TRANSMISSION PIPE
- PROPOSED CHIMNEY DRAIN
- PROPOSED NORMAL WATER SURFACE ELEVATION
- ANCHOR TRENCH
- PROPOSED CLEANOUT LOCATION
- UAS-1 PROPOSED MONITORING WELLS
- UDS-1 PROPOSED UNDERDRAIN MONITORING POINT
- HV306A EL. 903.63 AERIAL SURVEY CONTROL POINT
- PROPOSED ACCESS/HAUL ROAD
- TEMPORARY HAUL/ACCESS ROAD
- 1B PHASE ID
- INTERMEDIATE COVER
- FINAL COVER
- ROCK CHANNEL PROTECTION

STATE OF OHIO ANTHONY P. AMICON E–58805 REGISTERED PROFESSIONAL ENGINEER 6-9-16

SCALE IN FEET
0 200 400
DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

REF: EXISTING SITE TOPOGRAPHIC SURVEY WAS PROVIDED TO CIVIL & ENVIRONMENTAL CONSULTANTS, INC. BY THE DAYTON POWER AND LIGHT COMPANY IN THE FILE NAMED "CARTER HOLLOW TOPO APRIL 2013.XML". CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.

CEC
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DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	1"=200	PROJECT NO:	071-644

PHASE 1A DEVELOPMENT PLAN

DRAWING NO.: 6A

SHEET 21A OF 30

G:\PROJECTS\2007\071-644\PERMIT\DWG\MXD2\PTI-64 071644.DWG(PTI-64 PHASE ONE DEVELOPMENT PLAN) (JLINDOW) - FEB 4, 2011 - 15:16:45

NORTH

CONSTRUCTION NOTES:

1. CONTINUE WASTE FILING IN EXISITING UNIT.
2. CONSTRUCT LINER SYSTEM, PERIMETER BERMS, AND LEACHATE CONVEYANCE LINE FOR NEXT PHASE. TIE PHASED LINER SYTEMS AND LEACAHTE COLLECTION SYSTEM INTO EXISTING.
3. SOIL STOCKPILES MAY BE CONSTRUCTED AS NEEDED OR TO LESSER EXTENTS SHOWN ON THE DRAWINGS.

GENERAL OPERATION NOTES:

1. THE BASE GRADES SHOWN IN THE CONSTRUCTED PHASE ARE THE TOP OF LEACHATE COLLECTION LAYER. GRADES SHOWN IN WASTE PLACEMENT PHASES ARE TOP OF WASTE.
2. THE MAXIMUM EXTENT OF EACH PHASE IS SHOWN ON THESE PHASING DRAWINGS. PHASES MAY BE DIVIDED INTO SEPARATE SUB-PHASES OR CONSTRUCTED IN THEIR ENTIRETY DEPENDING ON ANTICIPATED FILLING RATE, CONSTRUCTION SCHEDULING AND SEASONAL CONSTRUCTION FEASIBILITY. SUBDIVIDING PHASES REQUIRES PRIOR OEPA APPROVAL.
3. THE WASTE ELEVATIONS SHOWN ARE THE MAXIMUM PROPOSED TOP OF WASTE GRADES. FILLING MAY STOP SHORT OF THESE GRADES. TRANSITIONS BETWEEN AND TYPICAL FILLING OPERATIONS OF PHASES REQUIRES CONSULTATION WITH OEPA TO INSURE THAT THE FINAL SLOPE WITHIN THE PREVIOUS PHASE IS CONSTRUCTED TO MAXIMUM EXTENT. SOLID WASTE MAY BE PLACED IN SUBSEQUENT PHASES PRIOR TO THE COMPLETION OF PREVIOUS PHASES TO PROVIDE FROST PROTECTION, SURFACE WATER DRAINAGE OR FOR PROPER OPERATION OF THE FACILITY. REMAINING AIRSPACE WITHIN PREVIOUS PHASES WILL BE FILLED TO THE PERMITTED GRADES AS QUICKLY AS POSSIBLE.
4. LOCATIONS OF TEMPORARY HAUL ROADS ARE APPROXIMATE AND MAY BE ADJUSTED BASED ON FIELD CONDITIONS, WEATHER AND WASTE ACCEPTANCE RATES. HAUL ROAD WILL BE INSTALLED WITH PROPER APPURTENANCES FOR STORM WATER CONTROL
5. SURFACE WATER FLOW PATTERNS ARE APPROXIMATE AND ARE SHOWN HERE TO SHOW GENERAL FLOW DIRECTIONS. CHANNELS, CULVERTS, BERMS, ETC. SHALL BE CONSTRUCTED AND MAINTAINED AS NECESSARY TO DIRECT RUN-OFF TO THE SURFACE WATER MANAGEMENT SYSTEM. TEMPORARY EROSION CONTROLS SUCH AS SILT FENCE, STRAW BALE DIKES, STRAW WATTLES, AND SEEDING WILL BE INSTALLED AS NECESSARY TO REDUCE EROSION AND SEDIMENTATION.
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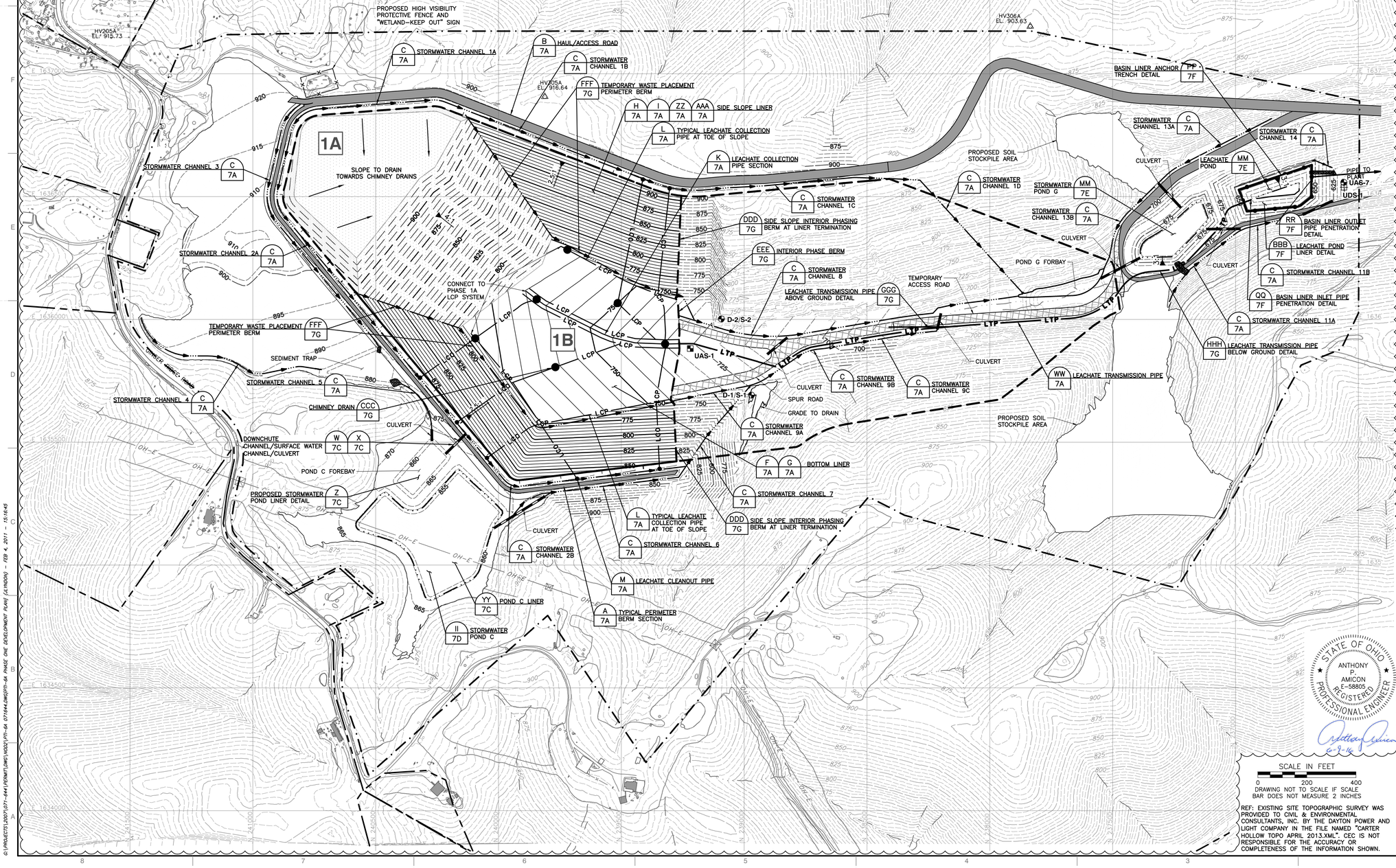
7. WASTE PLACED DURING LANDFILL OPERATION SHALL BE GRADED SUCH THAT SURFACE WATER DRAINS TO THE CHIMNEY DRAINS WITHIN THE LANDFILL, AWAY FROM THE LANDFILL PERIMETER BOUNDARIES.
8. TACK-ON BERMS SHALL BE CONSTRUCTED ON THE SOUTHERN INTERMEDIATE SLOPE TO DIRECT RUN-OFF EAST AND WEST TO THE ESTABLISHED STORMWATER CONVEYANCE CHANNELS LEADING TO POND G.
9. TEMPORARY WASTE PLACEMENT PERIMETER BERMS MAY BE CONSTRUCTED AS PART OF FUTURE LANDFILL OPERATIONS TO DIVERT NON-CONTACT STORMWATER. THE LANDFILL OPERATOR SHALL CONFIRM THAT ANY WASTE IS SUFFICIENTLY COVERED WITH SOIL AND/OR VEGETATION PRIOR TO CONVEYING STORMWATER TO THE LANDFILL STORMWATER SYSTEM.



SCALE IN FEET
0 200 400
DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

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3745-30-05 (B)(6) RULE REFERENCE		DRAWING LOCATION
(a)	LOCATION OF GROUND WATER MONITORING WELLS, PIEZOMETERS, EXPLOSIVE GAS PERMANENT MONITORS, LEACHATE COLLECTION AND MANAGEMENT STRUCTURES, OR SURFACE WATER CONTROL STRUCTURES	6A THRU 6E
(b)	EXTENT OF WASTE PLACEMENT FOR THAT PHASE	6A THRU 6E
(c)	CONTOURS OF ANY PREVIOUSLY FILLED PHASES	6A THRU 6E
(d)	LIMITS OF FINAL COVER AND INTERMEDIATE COVER ON PREVIOUSLY FILLED PHASES	6A THRU 6E
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(f)	LOCATION OF ACCESS ROADS FOR THE DEPICTED PHASE	6A THRU 6E
(g)	PERMANENT AND TEMPORARY MEASURES TO BE UTILIZED TO CONTROL SURFACE WATER RUN-ON AND RUN-OFF, EROSION, AND ANY TEMPORARY OR PERMANENT GROUND WATER CONTROL STRUCTURES	6A THRU 6E

DP&L

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR WITHIN WASTE LIMITS
- PROPOSED CONTOUR OUTSIDE WASTE LIMITS
- EXISTING OVERHEAD POWER LINE
- EXISTING STREAM
- PROPERTY LINE
- PROPOSED LIMITS OF RESIDUAL WASTE
- FACILITY BOUNDARY
- PROPOSED CHANNEL
- LCP PROPOSED LEACHATE COLLECTION PIPE
- LCO PROPOSED LEACHATE CLEANOUT PIPE
- LTP PROPOSED LEACHATE TRANSMISSION PIPE 4
- PROPOSED CHIMNEY DRAIN 4
- PROPOSED NORMAL WATER SURFACE ELEVATION
- ANCHOR TRENCH
- PROPOSED CLEANOUT LOCATION
- D1/S1 - UAS-7 PROPOSED MONITORING WELL/TRENCH BOX
- UDS-1 PROPOSED UNDERDRAIN MONITORING POINT 4
- HV306A EL. 903.63 AERIAL SURVEY CONTROL POINT
- PROPOSED ACCESS/HAUL ROAD
- TEMPORARY HAUL/ACCESS ROAD
- 1B PHASE ID
- INTERMEDIATE COVER
- FINAL COVER
- ROCK CHANNEL PROTECTION
- UAS-1 EXISTING TRENCH BOX 4

STATE OF OHIO
ANTHONY P. AMICON
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2-9-11

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DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	1"=200	PROJECT NO:	071-644

PHASE 1B DEVELOPMENT PLAN

DRAWING NO.: 6B
SHEET 21B OF 30

G:\PROJECTS\2007\071-644\PERMIT\DWG\V032\PTI-6A 071644.DWG(PTI-6A PHASE ONE DEVELOPMENT PLAN) (4.WINDOW) - FEB 4, 2011 - 15:16:45

NORTH

CONSTRUCTION NOTES:

1. CONTINUE WASTE FILLING IN EXISTING UNIT.
2. INSTALL GROUNDWATER MONITORING WELLS UAS-3, D-3/S-3, AND D-4/S-4.
3. ABANDON GROUNDWATER MONITORING WELLS UAS-1, D-1/S-1, AND D-2/S-2.
4. CONSTRUCT LINER SYSTEM, PERIMETER BERMS, AND LEACHATE CONVEYANCE LINE FOR NEXT PHASE. TIE PHASED LINER SYTEMS AND LEACAHTE COLLECTION SYSTEM INTO EXISTING.
5. SOIL STOCKPILES MAY BE CONSTRUCTED AS NEEDED OR TO LESSER EXTENTS SHOWN ON THE DRAWINGS.

GENERAL OPERATION NOTES:

1. THE BASE GRADES SHOWN IN THE CONSTRUCTED PHASE ARE THE TOP OF LEACHATE COLLECTION LAYER. GRADES SHOWN IN WASTE PLACEMENT PHASES ARE TOP OF WASTE.
2. THE MAXIMUM EXTENT OF EACH PHASE IS SHOWN ON THESE PHASING DRAWINGS. PHASES MAY BE DIVIDED INTO SEPARATE SUB-PHASES OR CONSTRUCTED IN THEIR ENTIRETY DEPENDING ON ANTICIPATED FILLING RATE, CONSTRUCTION SCHEDULING AND SEASONAL CONSTRUCTION FEASIBILITY. SUBDIVIDING PHASES REQUIRES PRIOR OEPA APPROVAL.
3. THE WASTE ELEVATIONS SHOWN ARE THE MAXIMUM PROPOSED TOP OF WASTE GRADES. FILLING MAY STOP SHORT OF THESE GRADES. TRANSITIONS BETWEEN AND TYPICAL FILLING OPERATIONS OF PHASES REQUIRES CONSULTATION WITH OEPA TO INSURE THAT THE FINAL SLOPE WITHIN THE PREVIOUS PHASE IS CONSTRUCTED TO MAXIMUM EXTENT. SOLID WASTE MAY BE PLACED IN SUBSEQUENT PHASES PRIOR TO THE COMPLETION OF PREVIOUS PHASES TO PROVIDE FROST PROTECTION, SURFACE WATER DRAINAGE OR FOR PROPER OPERATION OF THE FACILITY. REMAINING AIRSPACE WITHIN PREVIOUS PHASES WILL BE FILLED TO THE PERMITTED GRADES AS QUICKLY AS POSSIBLE.
4. LOCATIONS OF TEMPORARY HAUL ROADS ARE APPROXIMATE AND MAY BE ADJUSTED BASED ON FIELD CONDITIONS, WEATHER AND WASTE ACCEPTANCE RATES. HAUL ROAD WILL BE INSTALLED WITH PROPER APPURTENANCES FOR STORM WATER CONTROL
5. SURFACE WATER FLOW PATTERNS ARE APPROXIMATE AND ARE SHOWN HERE TO SHOW GENERAL FLOW DIRECTIONS. CHANNELS, CULVERTS, BERMS, ETC. SHALL BE CONSTRUCTED AND MAINTAINED AS NECESSARY TO DIRECT RUN-OFF TO THE SURFACE WATER MANAGEMENT SYSTEM. TEMPORARY EROSION CONTROLS SUCH AS SILT FENCE, STRAW BALE DIKES, STRAW WATTLES, AND SEEDING WILL BE INSTALLED AS NECESSARY TO REDUCE EROSION AND SEDIMENTATION.
6. FINAL COVER WILL BE INSTALLED OVER AREAS OF THE PHASE THAT HAVE REACHED PERMITTED FINAL ELEVATIONS FOR SOLID WASTE PLACEMENT. THE EXTENT OF FINAL COVER CONSTRUCTED IN ANY GIVEN CONSTRUCTION SEASON WILL BE BASED ON CONSTRUCTION CONSIDERATIONS SUCH AS SURFACE WATER MANAGEMENT, FUTURE TIE-INS, AND ACCESSIBILITY.
7. WASTE PLACED DURING LANDFILL OPERATION SHALL BE GRADED SUCH THAT SURFACE WATER DRAINS TO THE CHIMNEY DRAINS WITHIN THE LANDFILL, AWAY FROM THE LANDFILL PERIMETER BOUNDARIES.
8. TACK-ON BERMS SHALL BE CONSTRUCTED ON THE SOUTHERN INTERMEDIATE SLOPE TO DIRECT RUN-OFF EAST AND WEST TO THE ESTABLISHED STORMWATER CONVEYANCE CHANNELS LEADING TO POND G.
9. TEMPORARY WASTE PLACEMENT PERIMETER BERMS MAY BE CONSTRUCTED AS PART OF FUTURE LANDFILL OPERATIONS TO DIVERT NON-CONTACT STORMWATER. THE LANDFILL OPERATOR SHALL CONFIRM THAT ANY WASTE IS SUFFICIENTLY COVERED WITH SOIL AND/OR VEGETATION PRIOR TO CONVEYING STORMWATER TO THE LANDFILL STORMWATER SYSTEM.

HV205A EL. 913.73

HV306A EL. 903.63

STORMWATER CHANNEL 1A (C 7A)
HAUL/ACCESS ROAD (B 7A)
STORMWATER POND D (JJ 7E)
STORMWATER CHANNEL 1B (C 7A)
TEMPORARY WASTE PLACEMENT PERIMETER BERM (FFF 7G)
STORMWATER POND E (KK 7E)
LEACHATE CLEANOUT PIPE (M 7A)
STORMWATER CHANNEL 1C (C 7A)
TYPICAL LEACHATE COLLECTION PIPE AT TOE OF SLOPE (L 7A)
SIDE SLOPE LINER (H 7A, I 7A, ZZ 7A, AAA 7A)
BASIN LINER ANCHOR TRENCH DETAIL (PP 7F)
PROPOSED SOIL STOCKPILE AREA
STORMWATER CHANNEL 13A (C 7A)
STORMWATER CHANNEL 14 (C 7A)
CULVERT
LEACHATE POND (MM 7E)
PIPE TO PLANT UAS-7 UDS-1
STORMWATER CHANNEL 3 (C 7A)
SLOPE TO DRAIN TOWARDS CHIMNEY DRAINS
STORMWATER RUN-ON PREVENTION DITCH (OO 7F)
STORMWATER POND G (MM 7E)
STORMWATER CHANNEL 1D (C 7A)
STORMWATER CHANNEL 13B (C 7A)
RR 7F BASIN LINER OUTLET PIPE PENETRATION DETAIL
BBB 7F LEACHATE POND LINER DETAIL
STORMWATER CHANNEL 2A (C 7A)
CHIMNEY DRAIN (CCC 7G)
TEMPORARY ACCESS ROAD
POND G FORBAY
INTERIOR PHASE BERM (EEE 7G)
STORMWATER CHANNEL 11B (C 7A)
QQ 7F BASIN LINER INLET PIPE PENETRATION DETAIL
STORMWATER CHANNEL 11A (C 7A)
HHH 7G LEACHATE TRANSMISSION PIPE BELOW GROUND DETAIL
SEDIMENT TRAP
UAS-3
D-4/S-4
D-3/S-3
CONNECT TO PHASE 1B LCP SYSTEM
WW 7A LEACHATE TRANSMISSION PIPE
GGG 7G LEACHATE TRANSMISSION PIPE ABOVE GROUND DETAIL
F 7A G 7A BOTTOM LINER
L 7A TYPICAL LEACHATE COLLECTION PIPE AT TOE OF SLOPE
PROPOSED SOIL STOCKPILE AREA
STORMWATER CHANNEL 5 (C 7A)
DOWNCHUTE CHANNEL DETAILS (V 7C, W 7C, X 7C)
POND C FOREBAY
PROPOSED STORMWATER POND LINER DETAIL (Z 7C)
A 7A TYPICAL PERIMETER BERM SECTION
OO 7F STORMWATER RUN-ON PREVENTION DITCH
K 7A LEACHATE COLLECTION PIPE SECTION
CULVERT
TEMPORARY WASTE PLACEMENT PERIMETER BERM (FFF 7G)
STORMWATER CHANNEL 2B (C 7A)
STORMWATER CHANNEL 6 (C 7A)
LL 7E STORMWATER POND F
YY 7C POND C LINER
II 7D STORMWATER POND C

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR WITHIN WASTE LIMITS
- PROPOSED CONTOUR OUTSIDE WASTE LIMITS
- EXISTING OVERHEAD POWER LINE
- EXISTING STREAM
- PROPERTY LINE
- PROPOSED LIMITS OF RESIDUAL WASTE
- FACILITY BOUNDARY
- PROPOSED CHANNEL
- LCP — PROPOSED LEACHATE COLLECTION PIPE
- LCO — PROPOSED LEACHATE CLEANOUT PIPE
- LTP — PROPOSED LEACHATE TRANSMISSION PIPE 4
- PROPOSED CHIMNEY DRAIN 4
- PROPOSED NORMAL WATER SURFACE ELEVATION
- ANCHOR TRENCH
- PROPOSED CLEANOUT LOCATION
- UAS-1 PROPOSED MONITORING WELLS
- UDS-1 PROPOSED UNDERDRAIN MONITORING POINT 4
- HV306A EL. 903.63 AERIAL SURVEY CONTROL POINT
- PROPOSED ACCESS/HAUL ROAD
- TEMPORARY HAUL/ACCESS ROAD
- 2 PHASE ID
- INTERMEDIATE COVER
- FINAL COVER
- ROCK CHANNEL PROTECTION

SCALE IN FEET
0 200 400
DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

REF: EXISTING SITE TOPOGRAPHIC SURVEY WAS PROVIDED TO CIVIL & ENVIRONMENTAL CONSULTANTS, INC. BY THE DAYTON POWER AND LIGHT COMPANY IN THE FILE NAMED "CARTER HOLLOW TOPO APRIL 2013.XML". CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.

STATE OF OHIO — ANTHONY P. AMICON E-58805 — REGISTERED PROFESSIONAL ENGINEER

SUBMITTAL RECORD

NO	DATE	DESCRIPTION
1	04/07/2010	INITIAL PERMIT TO INSTALL APPLICATION

REVISION RECORD

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2	02/14/2011	OEPA NOD2
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4	06/2016	PTI ALTERATION TO REQUEST 2016 DESIGN CHANGES

3745-30-05 (B)(6) RULE REFERENCE		DRAWING LOCATION
(a)	LOCATION OF GROUND WATER MONITORING WELLS, PIEZOMETERS, EXPLOSIVE GAS PERMANENT MONITORS, LEACHATE COLLECTION AND MANAGEMENT STRUCTURES, OR SURFACE WATER CONTROL STRUCTURES	6A THRU 6E
(b)	EXTENT OF WASTE PLACEMENT FOR THAT PHASE	6A THRU 6E
(c)	CONTOURS OF ANY PREVIOUSLY FILLED PHASES	6A THRU 6E
(d)	LIMITS OF FINAL COVER AND INTERMEDIATE COVER ON PREVIOUSLY FILLED PHASES	6A THRU 6E
(e)	CONTOURS OF THE BOTTOM OF LIMITS OF SOLID WASTE PLACEMENT FOR THE DEPICTED PHASE	6A THRU 6E
(f)	LOCATION OF ACCESS ROADS FOR THE DEPICTED PHASE	6A THRU 6E
(g)	PERMANENT AND TEMPORARY MEASURES TO BE UTILIZED TO CONTROL SURFACE WATER RUN-ON AND RUN-OFF, EROSION, AND ANY TEMPORARY OR PERMANENT GROUND WATER CONTROL STRUCTURES	6A THRU 6E

4

DP&L

Civil & Environmental Consultants, Inc.
5910 Harper Road, Suite 106 - Solon, OH 44139
Ph: 440.287.0157 · 866.507.2324
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PERMIT TO INSTALL APPLICATION
THE DAYTON POWER AND LIGHT COMPANY
J.M. STUART STATION
CARTER HOLLOW LANDFILL
SPRIGG TOWNSHIP, ADAMS CO., OHIO

DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	1"=200	PROJECT NO:	071-644

PHASE 2 DEVELOPMENT PLAN

DRAWING NO.: 6C
SHEET 22 OF 30

G:\PROJECTS\2007\071-644\PERMIT\DWG\MOD1\PTI-BB 071644.DWG[6B] (BMORMANO) - OCT 20, 2010 - 16:41:34

NORTH

CONSTRUCTION NOTES:

1. CONTINUE WASTE FILLING IN EXISTING UNIT.
2. INSTALL GROUNDWATER MONITORING WELLS UAS-5, D-5/S-5, AND D-6/S-6.
3. ABANDON GROUNDWATER MONITORING WELLS UAS-3, D-3/S-3, AND D-4/S-4.
4. CONSTRUCT LINER SYSTEM, PERIMETER BERMS, AND LEACHATE CONVEYANCE LINE FOR NEXT PHASE. TIE PHASED LINER SYTEMS AND LEACAHTE COLLECTION SYSTEM INTO EXISTING.
5. SOIL STOCKPILES MAY BE CONSTRUCTED AS NEEDED OR TO LESSER EXTENTS SHOWN ON THE DRAWINGS.

GENERAL OPERATION NOTES:

1. THE BASE GRADES SHOWN IN THE CONSTRUCTED PHASE ARE THE TOP OF LEACHATE COLLECTION LAYER. GRADES SHOWN IN WASTE PLACEMENT PHASES ARE TOP OF WASTE.
2. THE MAXIMUM EXTENT OF EACH PHASE IS SHOWN ON THESE PHASING DRAWINGS. PHASES MAY BE DIVIDED INTO SEPARATE SUB-PHASES OR CONSTRUCTED IN THEIR ENTIRETY DEPENDING ON ANTICIPATED FILLING RATE, CONSTRUCTION SCHEDULING AND SEASONAL CONSTRUCTION FEASIBILITY. SUBDIVIDING PHASES REQUIRES PRIOR OEPA APPROVAL.
3. THE WASTE ELEVATIONS SHOWN ARE THE MAXIMUM PROPOSED TOP OF WASTE GRADES. FILLING MAY STOP SHORT OF THESE GRADES. TRANSITIONS BETWEEN AND TYPICAL FILLING OPERATIONS OF PHASES REQUIRES CONSULTATION WITH OEPA TO INSURE THAT THE FINAL SLOPE WITHIN THE PREVIOUS PHASE IS CONSTRUCTED TO MAXIMUM EXTENT. SOLID WASTE MAY BE PLACED IN SUBSEQUENT PHASES PRIOR TO THE COMPLETION OF PREVIOUS PHASES TO PROVIDE FROST PROTECTION, SURFACE WATER DRAINAGE OR FOR PROPER OPERATION OF THE FACILITY. REMAINING AIRSPACE WITHIN PREVIOUS PHASES WILL BE FILLED TO THE PERMITTED GRADES AS QUICKLY AS POSSIBLE.
4. LOCATIONS OF TEMPORARY HAUL ROADS ARE APPROXIMATE AND MAY BE ADJUSTED BASED ON FIELD CONDITIONS, WEATHER AND WASTE ACCEPTANCE RATES. HAUL ROAD WILL BE INSTALLED WITH PROPER APPURTENANCES FOR STORM WATER CONTROL
5. SURFACE WATER FLOW PATTERNS ARE APPROXIMATE AND ARE SHOWN HERE TO SHOW GENERAL FLOW DIRECTIONS. CHANNELS, CULVERTS, BERMS, ETC. SHALL BE CONSTRUCTED AND MAINTAINED AS NECESSARY TO DIRECT RUN-OFF TO THE SURFACE WATER MANAGEMENT SYSTEM. TEMPORARY EROSION CONTROLS SUCH AS SILT FENCE, STRAW BALE DIKES, STRAW WATTLES, AND SEEDING WILL BE INSTALLED AS NECESSARY TO REDUCE EROSION AND SEDIMENTATION.
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7. WASTE PLACED DURING LANDFILL OPERATION SHALL BE GRADED SUCH THAT SURFACE WATER DRAINS TO THE CHIMNEY DRAINS WITHIN THE LANDFILL, AWAY FROM THE LANDFILL PERIMETER BOUNDARIES.
8. TACK-ON BERMS SHALL BE CONSTRUCTED ON THE SOUTHERN INTERMEDIATE SLOPE TO DIRECT RUN-OFF EAST AND WEST TO THE ESTABLISHED STORMWATER CONVEYANCE CHANNELS LEADING TO POND G.
9. TEMPORARY WASTE PLACEMENT PERIMETER BERMS MAY BE CONSTRUCTED AS PART OF FUTURE LANDFILL OPERATIONS TO DIVERT NON-CONTACT STORMWATER. THE LANDFILL OPERATOR SHALL CONFIRM THAT ANY WASTE IS SUFFICIENTLY COVERED WITH SOIL AND/OR VEGETATION PRIOR TO CONVEYING STORMWATER TO THE LANDFILL STORMWATER SYSTEM.

DOWNCHUTE CHANNEL DETAILS V 7C W 7C X 7C
HV205A EL. 915.73
C 7A STORMWATER CHANNEL 1A
JJ 7E STORMWATER POND D
B 7A HAUL/ACCESS ROAD
C 7A STORMWATER CHANNEL 1B
KK 7E STORMWATER POND E
C 7A STORMWATER CHANNEL 1C
H 7A I 7A ZZ 7A AAA 7A SIDE SLOPE LINER
FFF 7G TEMPORARY WASTE PLACEMENT PERIMETER BERM
HV306A EL. 903.63
BASIN LINER ANCHOR TRENCH DETAIL PPP 7F
STORMWATER CHANNEL 13A C 7A
LEACHATE TRANSMISSION PIPE WW 7A
LEACHATE TRANSMISSION PIPE BELOW GROUND DETAIL HHH 7G
PROPOSED SOIL STOCKPILE AREA
FF 7C ROCK-LINED CHANNEL
STORMWATER CHANNEL 3 C 7A
STORMWATER CHANNEL 2A C 7A
STORMWATER CHANNEL 4 C 7A
SLOPE TO DRAIN TOWARDS CHIMNEY DRAINS
SEDIMENT TRAP
STORMWATER CHANNEL 5 C 7A
DOWNCHUTE CHANNEL DETAILS V 7C W 7C X 7C
POND C FOREBAY
PROPOSED STORMWATER POND LINER DETAIL Z 7C
STORMWATER CHANNEL 2B C 7A
II 7D STORMWATER POND C
STORMWATER CHANNEL 6 C 7A
YY 7C POND C LINER
LL 7E STORMWATER POND F
A 7A TYPICAL PERIMETER BERM SECTION
CONNECT TO PHASE 2 LCP SYSTEM
3
4:1
2.5:1
STORMWATER POND G MM 7E
STORMWATER CHANNEL 13B C 7A
D-6/S-6
UAS-5
D-5/S-5
LEACHATE POND MM 7E
STORMWATER CHANNEL 14 C 7A
PIPE TO PLANT UAS-7 UDS-1
RR 7F BASIN LINER OUT PIPE PENETRATION DETAIL
BBB 7F LEACHATE POND LINER DETAIL
STORMWATER CHANNEL 11B C 7A
QQ 7F BASIN LINER INLET PIPE PENETRATION DETAIL
STORMWATER CHANNEL 11A C 7A
KICKER BERM Y 7C
LEACHATE COLLECTION LINE PENETRATION N 7B
BOTTOM LINER F 7A G 7A
LEACHATE COLLECTION PIPE K 7A
ROCK-LINED CHANNEL FF 7C
CHIMNEY DRAIN CCC 7G
STROMWATER CHANNEL 6 C 7A
LEACHATE CLEANOUT PIPE M 7A
TEMPORARY WASTE PLACEMENT PERIMETER BERM FFF 7G
PROPOSED SOIL STOCKPILE AREA
CULVERT
LCP / LCO / LTP

SUBMITTAL RECORD

NO	DATE	DESCRIPTION
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REVISION RECORD

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3745-30-05 (B)(6) RULE REFERENCE		DRAWING LOCATION
(a)	LOCATION OF GROUND WATER MONITORING WELLS, PIEZOMETERS, EXPLOSIVE GAS PERMANENT MONITORS, LEACHATE COLLECTION AND MANAGEMENT STRUCTURES, OR SURFACE WATER CONTROL STRUCTURES	6A THRU 6E
(b)	EXTENT OF WASTE PLACEMENT FOR THAT PHASE	6A THRU 6E
(c)	CONTOURS OF ANY PREVIOUSLY FILLED PHASES	6A THRU 6E
(d)	LIMITS OF FINAL COVER AND INTERMEDIATE COVER ON PREVIOUSLY FILLED PHASES	6A THRU 6E
(e)	CONTOURS OF THE BOTTOM OF LIMITS OF SOLID WASTE PLACEMENT FOR THE DEPICTED PHASE	6A THRU 6E
(f)	LOCATION OF ACCESS ROADS FOR THE DEPICTED PHASE	6A THRU 6E
(g)	PERMANENT AND TEMPORARY MEASURES TO BE UTILIZED TO CONTROL SURFACE WATER RUN-ON AND RUN-OFF, EROSION, AND ANY TEMPORARY OR PERMANENT GROUND WATER CONTROL STRUCTURES	6A THRU 6E

4

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LEGEND

- EXISTING CONTOUR
- 700 PROPOSED CONTOUR WITHIN WASTE LIMITS
- 700 PROPOSED CONTOUR OUTSIDE WASTE LIMITS
- OH-E EXISTING OVERHEAD POWER LINE
- EXISTING STREAM
- PROPERTY LINE
- PROPOSED LIMITS OF RESIDUAL WASTE
- FACILITY BOUNDARY
- PROPOSED CHANNEL
- LCP PROPOSED LEACHATE COLLECTION PIPE
- LCO PROPOSED LEACHATE CLEANOUT PIPE
- LTP PROPOSED LEACHATE TRANSMISSION PIPE 4
- PROPOSED CHIMNEY DRAIN 4
- PROPOSED NORMAL WATER SURFACE ELEVATION
- ANCHOR TRENCH
- PROPOSED CLEANOUT LOCATION
- UAS-1 PROPOSED MONITORING WELLS
- UDS-1 PROPOSED UNDERDRAIN MONITORING POINT 4
- HV306A EL. 903.63 AERIAL SURVEY CONTROL POINT
- PROPOSED ACCESS/HAUL ROAD
- TEMPORARY HAUL/ACCESS ROAD
- 2 PHASE ID
- INTERMEDIATE COVER
- FINAL COVER
- ROCK CHANNEL PROTECTION

STATE OF OHIO
ANTHONY P. AMICON
E-58805
REGISTERED
PROFESSIONAL ENGINEER

SCALE IN FEET
0 200 400
DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

REF: EXISTING SITE TOPOGRAPHIC SURVEY WAS PROVIDED TO CIVIL & ENVIRONMENTAL CONSULTANTS, INC. BY THE DAYTON POWER AND LIGHT COMPANY IN THE FILE NAMED "CARTER HOLLOW TOPO APRIL 2013.XML". CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.

CEC
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5910 Harper Road, Suite 106 - Solon, OH 44139
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PERMIT TO INSTALL APPLICATION
THE DAYTON POWER AND LIGHT COMPANY
J.M. STUART STATION
CARTER HOLLOW LANDFILL
SPRIGG TOWNSHIP, ADAMS CO., OHIO

DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	1"=200	PROJECT NO:	071-644

PHASE 3 DEVELOPMENT PLAN

DRAWING NO.: 6D
SHEET 23 OF 30

G:\PROJECTS\2007\071-644\PERMIT\DWG\MXD\071-6D 071644.DWG[TTI-6D PHASE THREE DEVELOPMENT PLAN] (BMORMAN) - OCT 20, 2010 - 16:56:38

NORTH

CONSTRUCTION NOTES:

1. FOR FINAL PERMITTED CONTOURS SEE DRAWING 4E.
2. FOR PHASE 4, ONLY 7 CHIMNEY DRAINS CAN BE OPERATIONAL AT ONE TIME.
3. FOR PHASE 4 OPERATIONS, A PERIMETER WASTE CONTAINMENT BERM SHALL BE CONSTRUCTED PRIOR TO WASTE PLACEMENT. EXISTING CHIMNEY DRAINS WILL THEN BE OPENED, EXTENDED VERTICALLY AS NEEDED AND MADE OPERATIONAL.
4. SOIL STOCKPILES MAY BE CONSTRUCTED AS NEEDED OR TO LESSER EXTENTS SHOWN ON THE DRAWINGS.

GENERAL OPERATION NOTES:

1. THE WASTE ELEVATIONS SHOWN ARE THE MAXIMUM PROPOSED TOP OF WASTE GRADES. TRANSITIONS BETWEEN AND TYPICAL FILLING OPERATIONS OF PHASES REQUIRES CONSULTATION WITH OEPA TO INSURE THAT THE FINAL SLOPE WITHIN THE PREVIOUS PHASE IS CONSTRUCTED TO MAXIMUM EXTENT. REMAINING AIRSPACE WITHIN PREVIOUS PHASES WILL BE FILLED TO THE PERMITTED GRADES AS QUICKLY AS POSSIBLE.
2. LOCATIONS OF TEMPORARY HAUL ROADS ARE APPROXIMATE AND MAY BE ADJUSTED BASED ON FIELD CONDITIONS, WEATHER AND WASTE ACCEPTANCE RATES. HAUL ROAD WILL BE INSTALLED WITH PROPER APPURTENANCES FOR STORM WATER CONTROL
3. SURFACE WATER FLOW PATTERNS ARE APPROXIMATE AND ARE SHOWN HERE TO SHOW GENERAL FLOW DIRECTIONS. CHANNELS, CULVERTS, BERMS, ETC. SHALL BE CONSTRUCTED AND MAINTAINED AS NECESSARY TO DIRECT RUN-OFF TO THE SURFACE WATER MANAGEMENT SYSTEM. TEMPORARY EROSION CONTROLS SUCH AS SILT FENCE, STRAW BALE DIKES, STRAW WATTLES, AND SEEDING WILL BE INSTALLED AS NECESSARY TO REDUCE EROSION AND SEDIMENTATION.
4. WASTE PLACED DURING LANDFILL OPERATION SHALL BE GRADED SUCH THAT SURFACE WATER DRAINS TO THE CHIMNEY DRAINS WITHIN THE LANDFILL, AWAY FROM THE LANDFILL PERIMETER BOUNDARIES.
5. TACK-ON BERMS SHALL BE CONSTRUCTED ON THE SOUTHERN INTERMEDIATE SLOPE TO DIRECT RUN-OFF EAST AND WEST TO THE ESTABLISHED STORMWATER CONVEYANCE CHANNELS LEADING TO POND G.

HV205A EL. 915.73

HV306A EL. 903.63

C 7A STORMWATER CHANNEL 1A

JJ 7E STORMWATER POND D

B 7A HAUL/ACCESS ROAD

C 7A STORMWATER CHANNEL 1B

KK 7E STORMWATER POND E

V 7C W 7C X 7C DOWNCHUTE CHANNEL DETAILS

C 7A STORMWATER CHANNEL 1C

BASIN LINER ANCHOR TRENCH DETAIL PP 7F

STORMWATER CHANNEL 13A C 7A

LEACHATE TRANSMISSION PIPE WW 7A

LEACHATE TRANSMISSION PIPE BELOW GROUND DETAIL HHH 7G

STORMWATER CHANNEL 14 C 7A

PROPOSED SOIL STOCKPILE AREA

FF 7C ROCK-LINED CHANNEL

LEACHATE POND MM 7E

PIPE TO PLANT

UAS-7

UDS-1

STORMWATER POND G MM 7E

STORMWATER CHANNEL 13B C 7A

D-6/S-6

RR 7F BASIN LINER OUTLET PIPE PENETRATION DETAIL

BBB 7F LEACHATE POND LINER DETAIL

UAS-5

CULVERT

C 7A STORMWATER CHANNEL 11B

QQ 7F BASIN LINER INLET PIPE PENETRATION DETAIL

C 7A STORMWATER CHANNEL 11A

Y 7C KICKER BERM

D-5/S-5

FF 7C ROCK-LINED CHANNEL

A 7A TYPICAL PERIMETER BERM SECTION

PROPOSED SOIL STOCKPILE AREA

STORMWATER CHANNEL 3 C 7A

STORMWATER CHANNEL 2A C 7A

C 7A STORMWATER CHANNEL 4

SLOPE TO DRAIN (SEE NOTE CONSTRUCTION NOTE 3)

4

SLOPE TO DRAIN (SEE NOTE CONSTRUCTION NOTE 3)

4:1

SEDIMENT TRAP

STORMWATER CHANNEL 5 C 7A

CULVERT

DOWNCHUTE CHANNEL DETAILS V 7C W 7C X 7C

POND C FOREBAY

PROPOSED STORMWATER POND LINER DETAIL Z 7C

CULVERT

C 7A STORMWATER CHANNEL 2B

II 7D STORMWATER POND C

STORMWATER CHANNEL 6 C 7A

YY 7C POND C LINER

LL 7E STORMWATER POND F

CULVERT

OH-E

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DP&L

LEGEND

- EXISTING CONTOUR
- 700 PROPOSED CONTOUR WITHIN WASTE LIMITS
- 700 PROPOSED CONTOUR OUTSIDE WASTE LIMITS
- OH-E EXISTING OVERHEAD POWER LINE
- EXISTING STREAM
- PROPERTY LINE
- PROPOSED LIMITS OF WASTE
- PHASE 4 BOUNDARY
- FACILITY BOUNDARY
- PROPOSED DITCH
- LCP PROPOSED LEACHATE COLLECTION PIPE
- LCO PROPOSED LEACHATE CLEANOUT PIPE
- LTP PROPOSED LEACHATE TRANSMISSION PIPE 4
- PROPOSED CHIMNEY DRAIN 4
- PROPOSED NORMAL WATER SURFACE ELEVATION
- ANCHOR TRENCH
- UAS-1 PROPOSED MONITORING WELLS
- UDS-1 PROPOSED UNDERDRAIN MONITORING POINT 4
- HV306A EL. 903.63 AERIAL SURVEY CONTROL POINT
- PROPOSED ACCESS/HAUL ROAD
- TEMPORARY HAUL/ACCESS ROAD
- 2 PHASE ID
- INTERMEDIATE COVER
- FINAL COVER
- ROCK CHANNEL PROTECTION

4

STATE OF OHIO ANTHONY P. AMICON E-58805 REGISTERED PROFESSIONAL ENGINEER

6-9-16

SCALE IN FEET

0 200 400

DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

REF: EXISTING SITE TOPOGRAPHIC SURVEY WAS PROVIDED TO CIVIL & ENVIRONMENTAL CONSULTANTS, INC. BY THE DAYTON POWER AND LIGHT COMPANY IN THE FILE NAMED "CARTER HOLLOW TOPO APRIL 2013.XML". CEC IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN.

Civil & Environmental Consultants, Inc.
5910 Harper Road, Suite 106 - Solon, OH 44139
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PERMIT TO INSTALL APPLICATION
THE DAYTON POWER AND LIGHT COMPANY
J.M. STUART STATION
CARTER HOLLOW LANDFILL
SPRIGG TOWNSHIP, ADAMS CO., OHIO

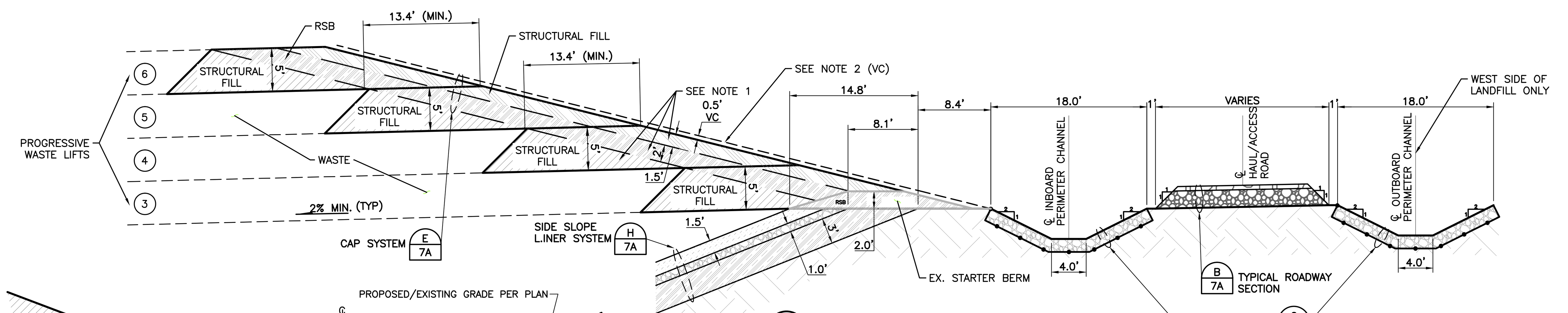
DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	1"=200	PROJECT NO:	071-644

PHASE 4 DEVELOPMENT PLAN

DRAWING NO.: 6E

SHEET 24 OF 30

G:\PROJECTS\2007\071-644\PERMIT\DWG\WD02\PTI-6D 071644.DWG[PTI-6D PHASE FOUR DEVELOPMENT PLAN] (LAYOUT) - FEB 7, 2011 - 13:31:59

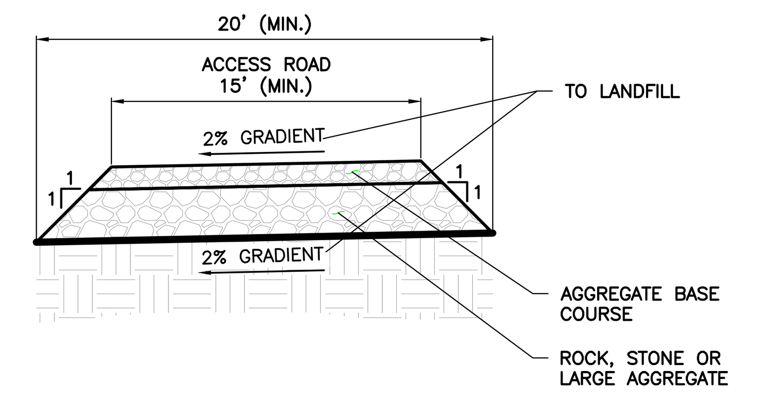


A 7A TYPICAL PERIMETER BERM SECTION

NOT TO SCALE

NOTE:

1. THE VEGETATIVE COVER (VC) AND FROST PROTECTION (FPL) LAYERS SHALL BE CONSTRUCTED FOLLOWING RSB CONSTRUCTION AND PRIOR TO ANY FREEZING TEMPERATURES.
2. WASTE LIFT THICKNESSES OF 5 FEET ARE SHOWN, HOWEVER, THE WASTE SHALL BE PLACED IN MAXIMUM INDIVIDUAL LIFT THICKNESS OF 2 FEET OR LESS.

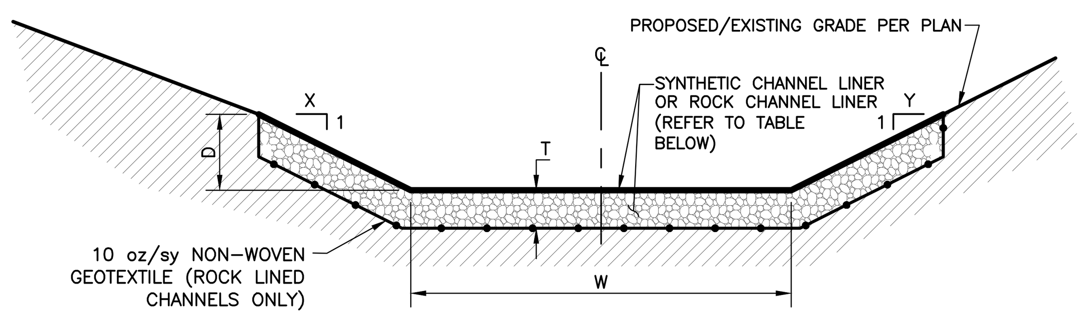


B 7A TYPICAL ROADWAY SECTION - LANDFILL ACCESS ROAD

N.T.S.

NOTES:

1. AGGREGATE SHALL BE PLACED ABOVE GRADED SURFACE.
2. ROADWAY WIDTHS NEAR STORMWATER PONDS MAY VARY.



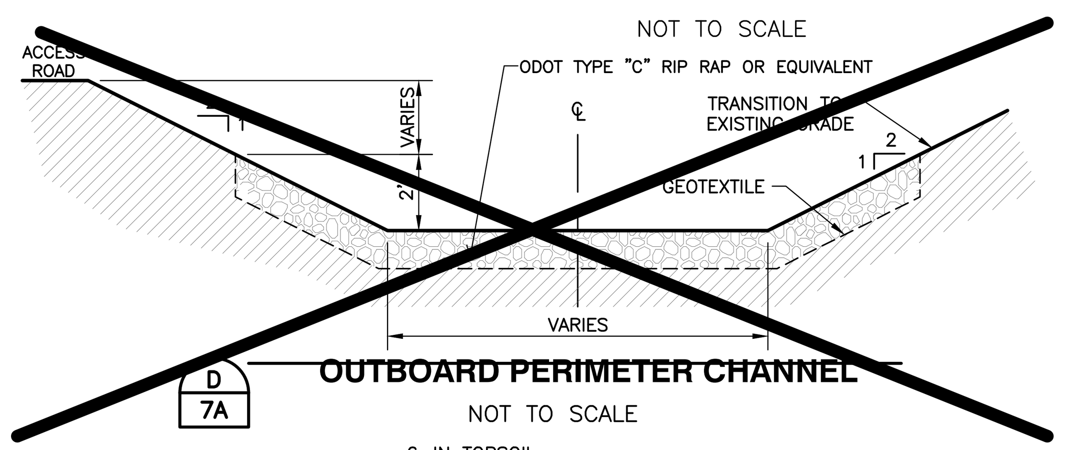
Channel ID	Bottom Width	Depth (ft)	Left Side Slope	Right Side	Channel Length	Channel Slope	Channel Lining	RipRap D_{50} (in.)	RipRap D_{MAX} (in.)
1A	4	3.5	2:1	2:1	917	0.0076	ODOT Type D Riprap / Flexamat (see Note 1)	6	12
1B	4	3.5	2:1	2:1	834	0.0084	ODOT Type D Riprap / Flexamat (see Note 1)	6	12
1C	4	3.5	2:1	2:1	1,090	0.0248	ODOT Type D Riprap / Flexamat (see Note 1)	6	12
1D	4	4	1.75:1	1.75:1	586	0.3379	NAG P550 Reinforced Vegetation	--	--
2A	4	3.5	2:1	2:1	1,585	0.0322	ODOT Type B Riprap / Flexamat (see Note 1)	18	24
2B	4	3.5	2:1	2:1	997	0.0281	ODOT Type D Riprap / Flexamat (see Note 1)	6	12
2C	4	3.5	2:1	2:1	1,179	0.0297	ODOT Type D Riprap / Flexamat (see Note 1)	6	12
2D	4	3.5	2:1	2:1	614	0.2036	ODOT Type B Riprap / Flexamat (see Note 1)	18	24
3	4	3.5	2:1	2:1	1,170	0.0274	ODOT Type C Riprap / Flexamat (see Note 1)	12	18
4	4	3	2:1	2:1	825	0.0109	ODOT Type D Riprap / Flexamat (see Note 1)	6	12
5	4	2	3:1	3:1	50	0.1800	NAG P550 Reinforced Vegetation	--	--
6	4	3.5	2:1	2:1	580	0.0293	ODOT Type D Riprap / Flexamat (see Note 1)	6	12
7	5	1.5	2.5:1	2.5:1	410	0.2829	NAG P300 Reinforced Vegetation	--	--
8	5	3	4:1	4:1	1,018	0.0462	NAG P300 Reinforced Vegetation	--	--
9A	5	1.5	4:1	4:1	300	0.0867	NAG P300 Reinforced Vegetation	--	--
9B	5	2.5	4:1	4:1	340	0.0765	NAG P300 Reinforced Vegetation	--	--
9C	5	3	4:1	4:1	420	0.0119	NAG P300 Reinforced Vegetation	--	--
11B	2	3	2:1	2:1	462	0.0779	NAG C350 Reinforced Vegetation	--	--
11C	2	3.5	2:1	2:1	254	0.0394	NAG C350 Reinforced Vegetation	--	--
12	0	2	2:1	2:1	370	0.2865	Flexamat Erosion Control Mat	--	--
13A	4	3	1:1	3:1	534	0.0300	ODOT Type D Riprap / Flexamat (see Note 1)	6	12
13B	4	3	1:1	3:1	395	0.0608	ODOT Type D Riprap / Flexamat (see Note 1)	6	12

NOTE:

1. CHANNEL LININGS LISTED CAN BE PERFORMED WITH THE RIPRAP TYPE IDENTIFIED OR FLEXAMAT.
2. CHANNEL LININGS AND DIMENSIONS MAY BE REVISED FROM THOSE IDENTIFIED STORMWATER CHANNEL SCHEDULE WITH ENGINEER APPROVED ALTERNATIVES.

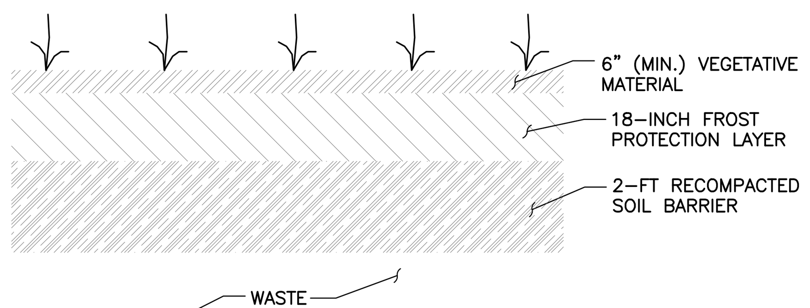
C 7A STORMWATER CHANNEL

NOT TO SCALE



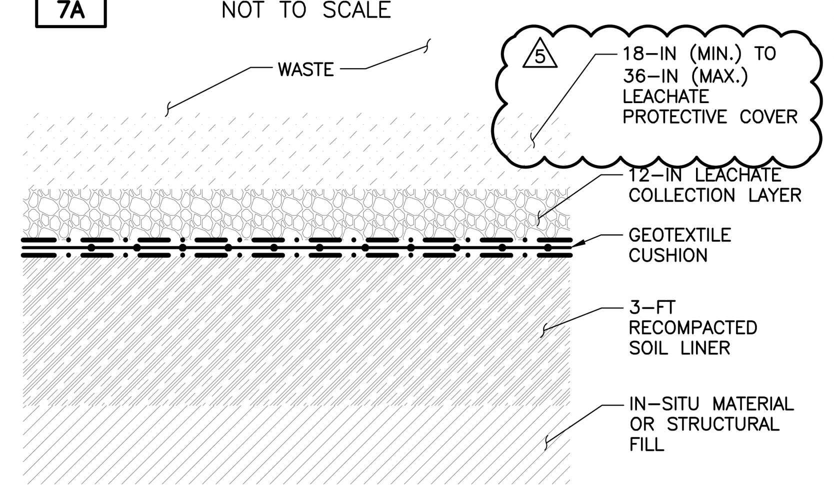
D 7A OUTBOARD PERIMETER CHANNEL

NOT TO SCALE



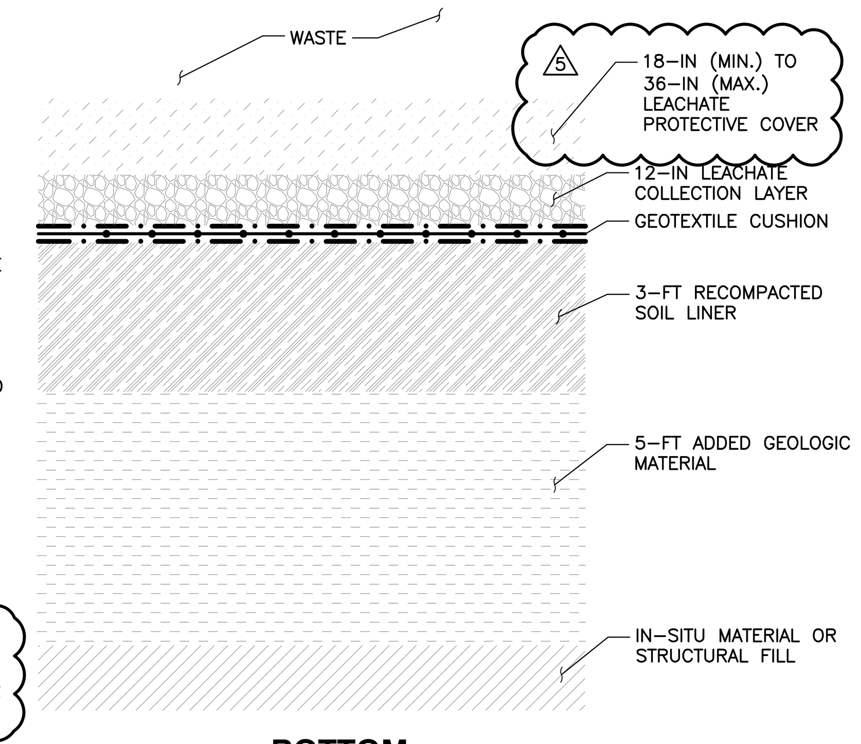
E 7A CAP SYSTEM

NOT TO SCALE



F 7A BOTTOM LINER SYSTEM OUTSIDE LIMITS OF UAS

NOT TO SCALE

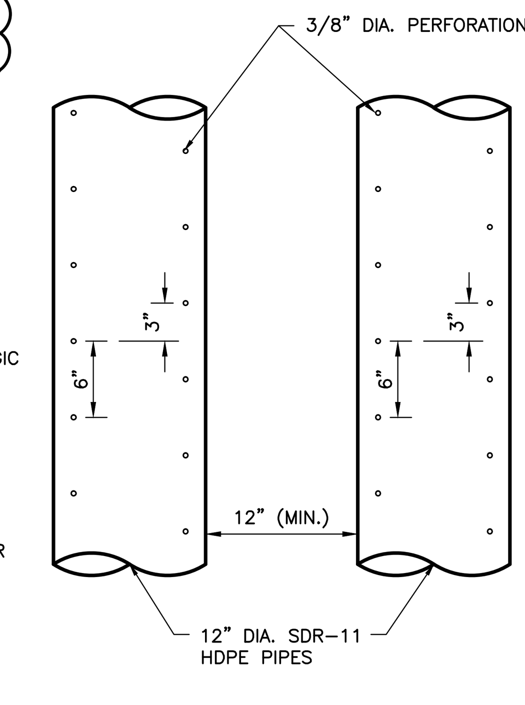


G 7A BOTTOM LINER SYSTEM WITHIN LIMITS OF UAS

NOT TO SCALE

NOTE:

1. IF GRAVEL OR AN OPEN GRADED AGGREGATE IS USED FOR THE LEACHATE COLLECTION MATERIAL A FILTER MEDIA SHALL BE APPROVED BY THE ENGINEER.

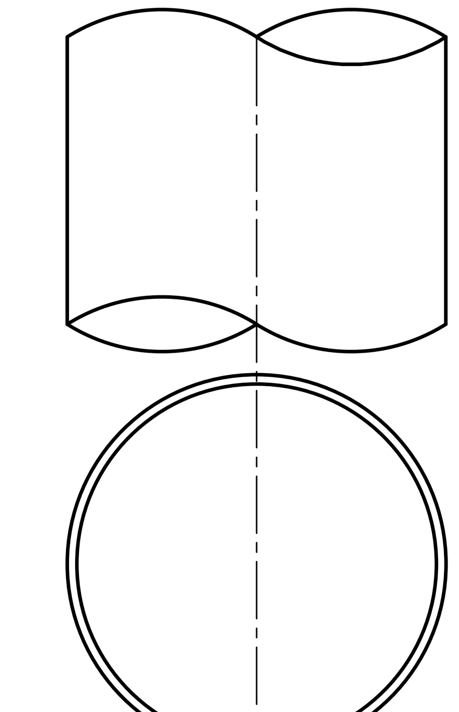


III 7A MULTIPLE LEACHATE COLLECTION PIPES

N.T.S.

NOTE:

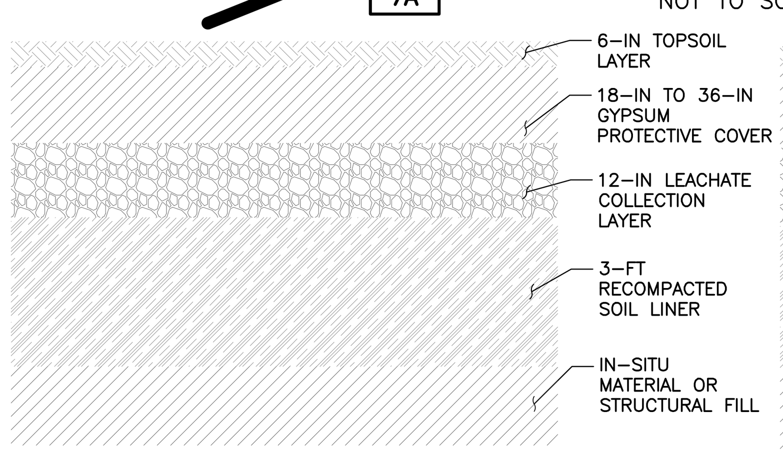
1. WHERE PRESENT MULTIPLE LEACHATE COLLECTION PIPES SHALL BE SEPARATED BY AT LEAST 12 INCHES.



NOTE:
24" DIAMETER SDR-26 HDPE IPS PIPE

WW 7A LEACHATE TRANSMISSION PIPE

N.T.S.

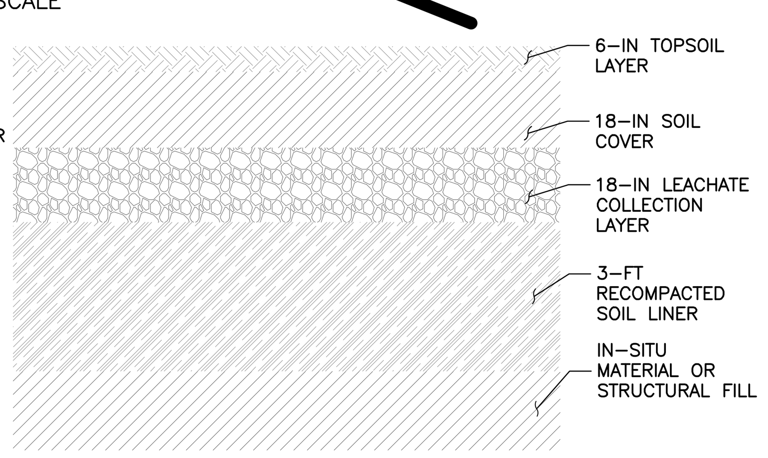


ZZ 7A TEMPORARY SIDE SLOPE LINER SYSTEM OUTSIDE LIMITS OF UAS ALTERNATIVE 1

NOT TO SCALE

NOTE:

1. TOPSOIL SHALL BE REMOVED PRIOR TO WASTE PLACEMENT.

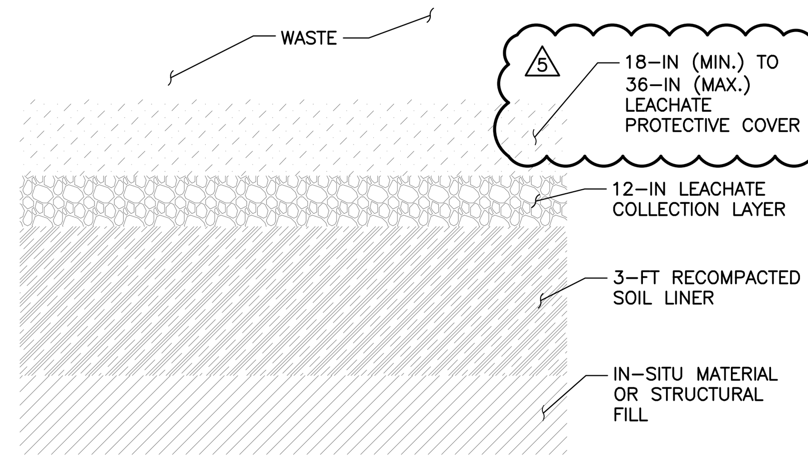


AAA 7A TEMPORARY SIDE SLOPE LINER SYSTEM OUTSIDE LIMITS OF UAS ALTERNATIVE 2

NOT TO SCALE

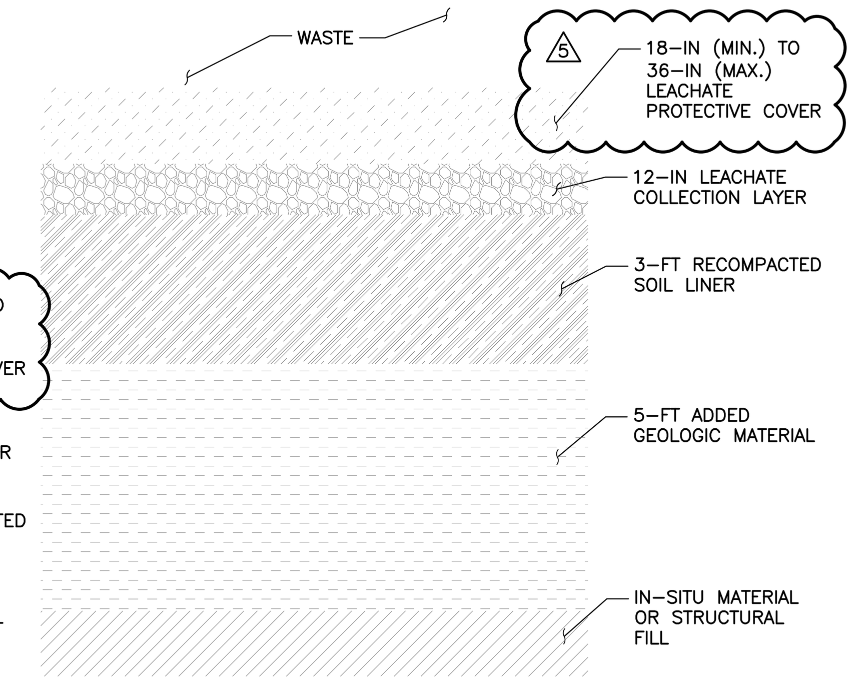
NOTE:

1. TOPSOIL, SOIL COVER AND CONTAMINATED LEACHATE COLLECTION LAYER SHALL BE REMOVED PRIOR TO WASTE PLACEMENT.



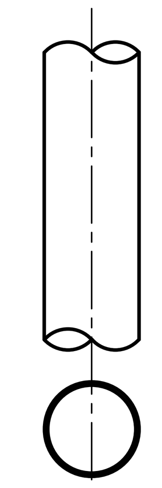
H 7A SIDE SLOPE LINER SYSTEM OUTSIDE LIMITS OF UAS

NOT TO SCALE



I 7A SIDE SLOPE LINER SYSTEM WITHIN LIMITS OF UAS

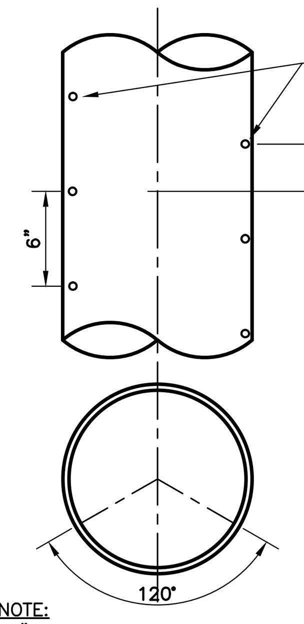
NOT TO SCALE



NOTE:
6" DIAMETER SDR-11 HDPE PIPE

V V 7A LEACHATE CLEANOUT PIPES

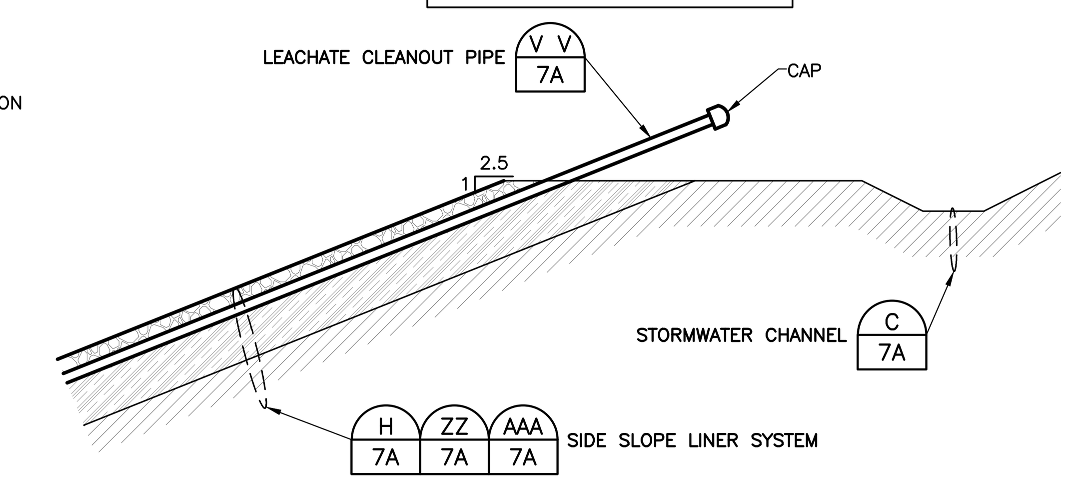
N.T.S



NOTE:
12" DIAMETER SDR-11 HDPE PIPE

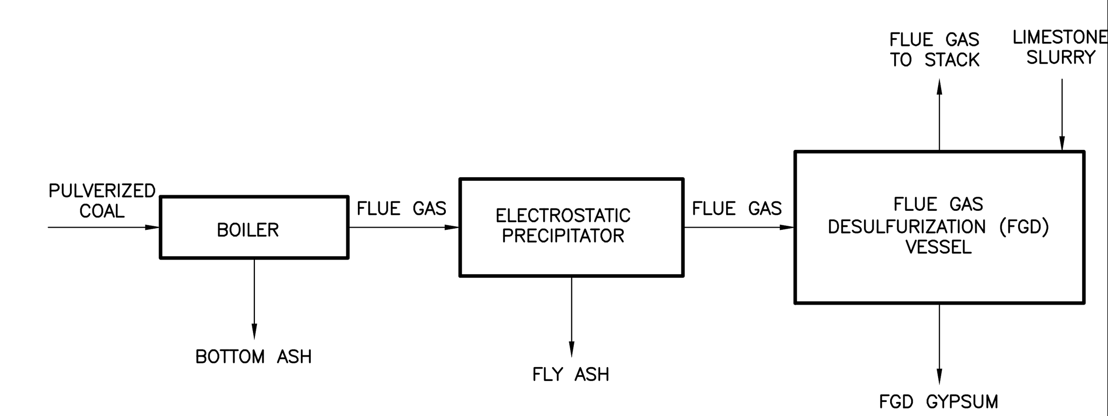
XX 7A LEACHATE COLLECTION PIPE

N.T.S.



M 7A LEACHATE CLENOUT PIPE

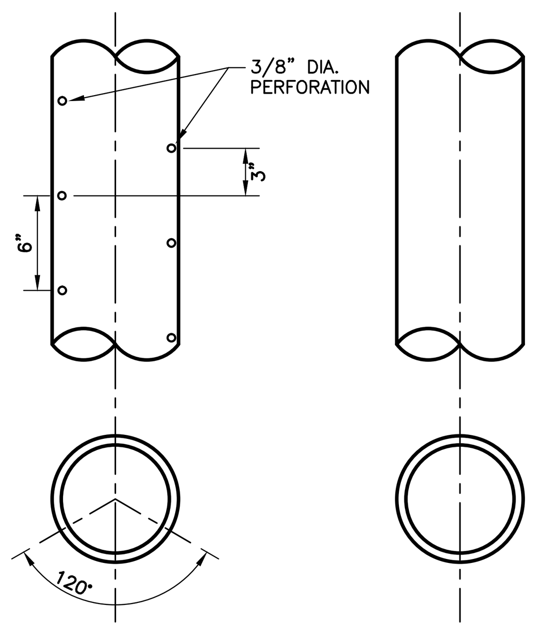
N.T.S.



NOTE: PROCESS FLOW DIAGRAM IS FOR BOTH J.M. STUART STATION AND KILLEN STATION

GENERAL PROCESS FLOW DIAGRAM

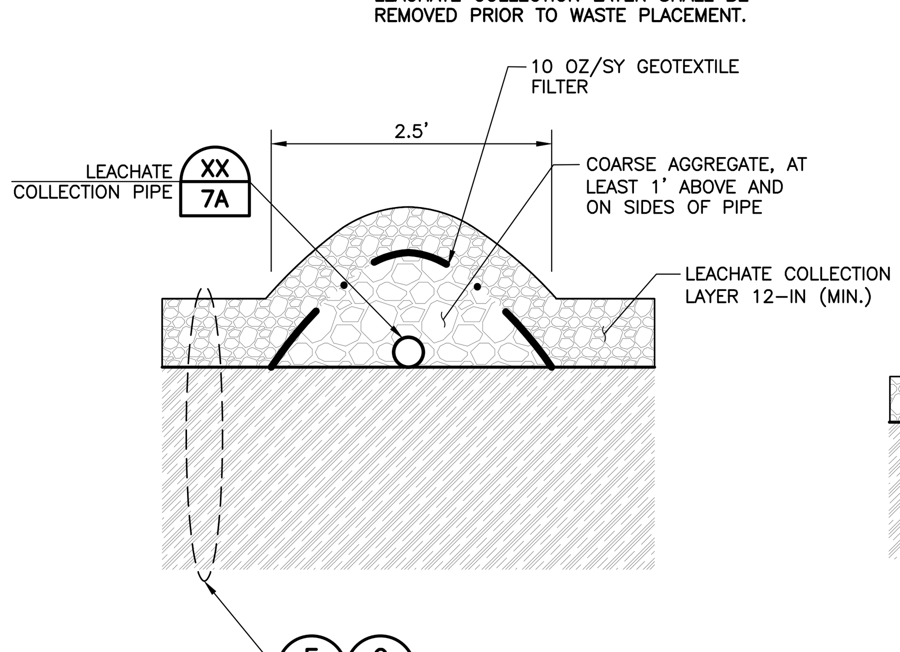
NOT TO SCALE



NOTE:
8" DIAMETER SDR-11 HDPE PIPE

J 7A PERFORATED/SOLID UNDERDRAIN COLLECTION PIPE

N.T.S.

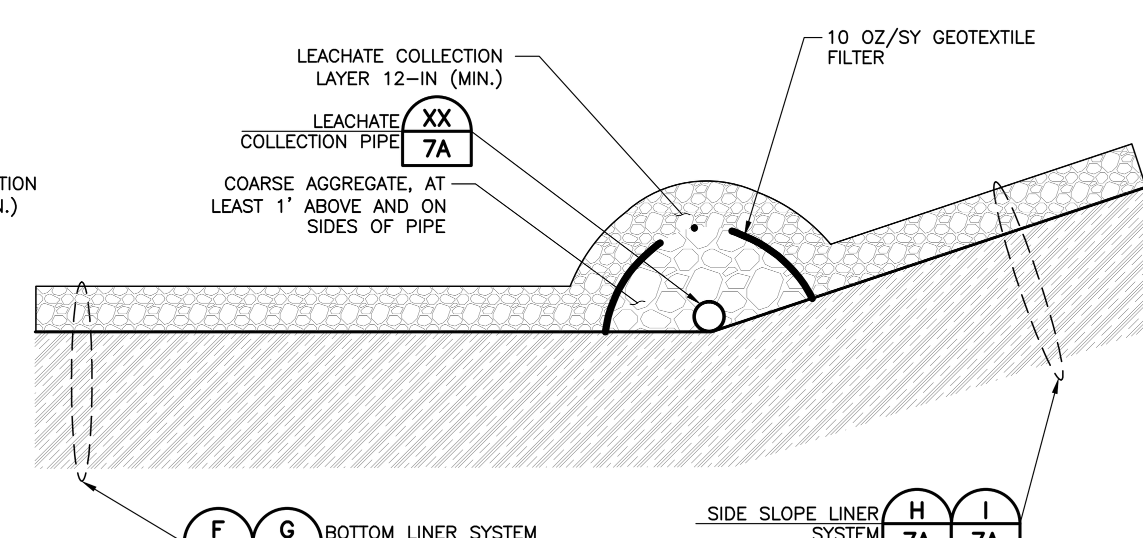


K 7A LEACHATE COLLECTION PIPE SECTION

NOT TO SCALE

NOTE:

1. WHERE PRESENT MULTIPLE LEACHATE COLLECTION PIPES SHALL BE SEPARATED BY AT LEAST 12 INCHES.



L 7A LEACHATE COLLECTION PIPE AT TOE OF SLOPE

NOT TO SCALE

NOTE:

1. WHERE PRESENT MULTIPLE LEACHATE COLLECTION PIPES SHALL BE SEPARATED BY AT LEAST 12 INCHES.

SYSTEM COMPONENT SUMMARY TABLE

COMPONENT NAME	SYMBOL	REQUIRED PROPERTY SUMMARY
VEGETATIVE LAYER		MINIMUM THICKNESS 6"
FROST PROTECTION LAYER		MINIMUM THICKNESS 18"
RECOMPACTED SOIL BARRIER		MAXIMUM PERMEABILITY $1X10^{-7}$ CM/SEC MINIMUM THICKNESS 2'
LEACHATE COLLECTION LAYER		MINIMUM PERMEABILITY ON BOTTOM SLOPES $4.0X10^{-2}$ CM/SEC. MINIMUM PERMEABILITY ON SIDE SLOPES $2.3X10^{-2}$ CM/SEC. MINIMUM THICKNESS 12"
GEOTEXTILE CUSHION		10 oz/sy MARV
RECOMPACTED SOIL LINER		MAXIMUM PERMEABILITY $1X10^{-7}$ CM/SEC MINIMUM THICKNESS 3'
ADDED GEOLOGIC MATERIAL		MAXIMUM PERMEABILITY $1X10^{-5}$ CM/SEC MINIMUM THICKNESS 5'
COHESIVE STRUCTURAL FILL		
STRUCTURAL FILL OR IN-SITU SOIL OR ROCK		
LEACHATE PROTECTIVE COVER		SHALL CONSIST OF FLUE-GAS DESULFURIZATION GYPSUM, UNPROCESSED BOTTOM ASH, OR SOIL

NOTE: SEE CQA/QC PLAN FOR DETAILED INFORMATION.

SUBMITTAL RECORD

NO	DATE	DESCRIPTION
1	04/07/2010	INITIAL PERMIT TO INSTALL APPLICATION

REVISION RECORD

NO	DATE	DESCRIPTION
1	09/02/2010	OEPA NOD1
2	02/14/2011	OEPA NOD2
3	07/01/2015	PTI ALTERATION REQUEST TO ELIMINATE UNDERDRAIN CLEANOUTS
4	06/2016	PTI ALTERATION TO REQUEST 2016 DESIGN CHANGES
5	09/2016	PTI ALTERATION REQUEST NO. 4

3745-30-05 (B)(7) RULE REFERENCE		DRAWING LOCATION
(a)	RECOMPACTED SOIL LINER, LINER CUSHION LAYER, LEACHATE COLLECTION LAYER, AND FILTER LAYER INCLUDING ANY ENGINEERED COMPONENTS THAT ARE CONSTRUCTED THROUGH THE LINER SYSTEM, AND THE INTERFACE BETWEEN PHASES	7A, 7B, 7C AND 7G
(b)	CAP SYSTEM, INCLUDING ANY ENGINEERED COMPONENTS THAT ARE CONSTRUCTED THROUGH THE CAP SYSTEM, AND SURFACE WATER CONTROL STRUCTURES	7A THROUGH 7E
(c)	RELATIONSHIP OF THE CAP SYSTEM WITH THE LEACHATE COLLECTION AND MANAGEMENT SYSTEM AND RECOMPACTED SOIL LINER	7A AND 7B
(d)(i)	LEACHATE COLLECTION LAYER	7A, 7B, AND 7G
(d)(ii)	COLLECTION PIPES, INCLUDING BEDDING MEDIA AND BOOTS	7A, 7B, 7C, 7F AND 7G
(d)(iii)	FILTER LAYER, IF REQUIRED	7A
(d)(iv)	ANY SUMPS	7A, 7B, 7F AND 7G
(d)(v)	ANY CONVEYANCE APPARATUS	7A THROUGH 7G
(d)(vi)	ANY STORAGE TANKS	NOT APPLICABLE
(e)	PERMANENT GROUND WATER CONTROL STRUCTURES	7A, 7B AND 7F
(f)	GROUND WATER MONITORING WELL AND PIEZOMETER CONSTRUCTION	7B
(g)	EXPLOSIVE GAS CONTROL SYSTEM ELEMENTS	NOT APPLICABLE
(h)	SEPARATORY LINER/LEACHATE COLLECTION SYSTEMS	NOT APPLICABLE
(i)	SEDIMENTATION POND AND DISCHARGE STRUCTURES, IF ANY, AND SURFACE WATER RUN-ON AND RUNOFF CONTROL STRUCTURES	7A THROUGH 7G
(j)	A GENERAL PROCESS FLOW DIAGRAM WHICH DISPLAYS THE PROCESSES, POINTS OF WASTE GENERATION, AND TYPES OF WASTES GENERATED	7A
(k)	OTHER NECESSARY DETAILS	ALL "7" SERIES

DP&L

STATE OF OHIO Anthony P. Amicon E-58805 REGISTERED PROFESSIONAL ENGINEER

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PERMIT TO INSTALL APPLICATION
THE DAYTON POWER AND LIGHT COMPANY
J.M. STUART STATION
CARTER HOLLOW LANDFILL
SPRIGG TOWNSHIP, ADAMS CO., OHIO

DRAWN BY: DFB	CHECKED BY: PCC	APPROVED BY: SFP
DATE: FEB 14, 2011	DWG SCALE: AS NOTED	PROJECT NO: 071-644

LINER, LEACHATE AND SURFACE WATER CONTROL STRUCTURES DETAILS

DRAWING NO.: 7A

SHEET 25 OF 30

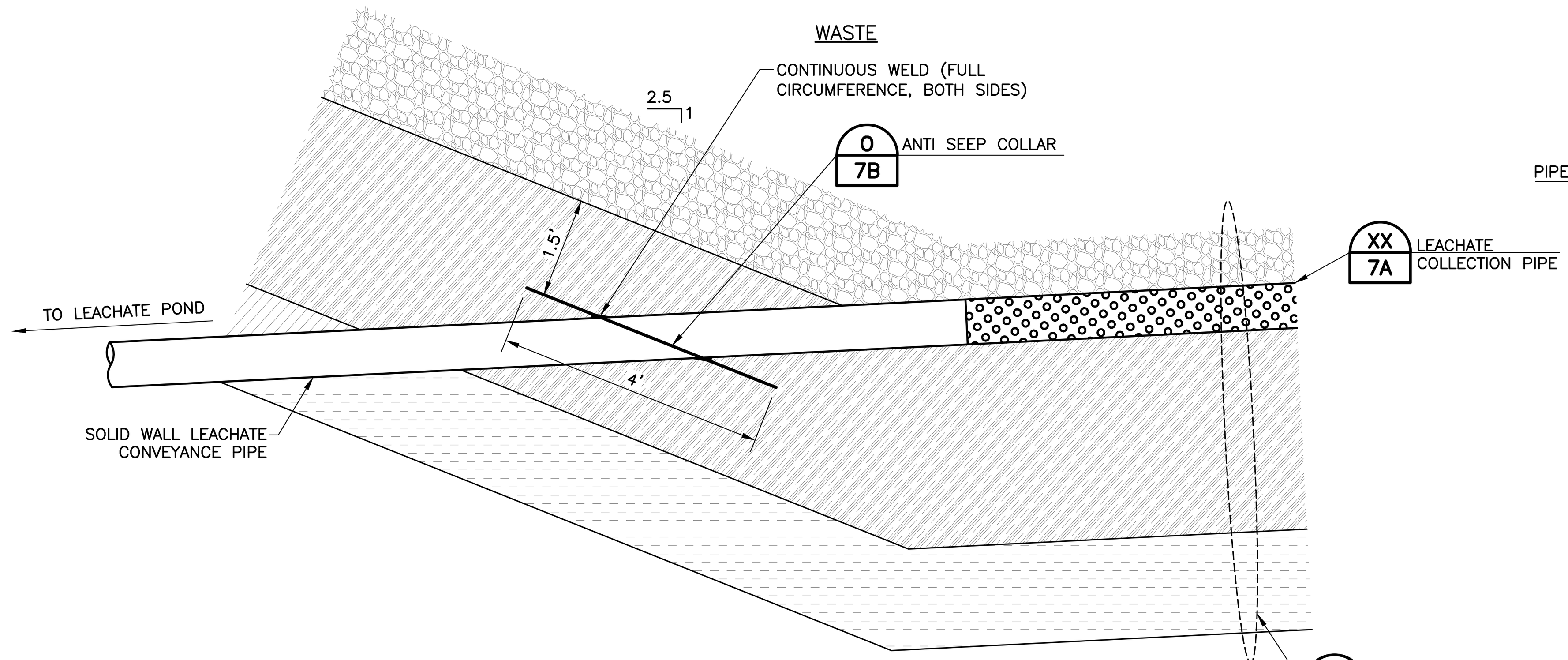
NO	DATE	DESCRIPTION
1	04/07/2010	INITIAL PERMIT TO INSTALL APPLICATION

REVISION RECORD

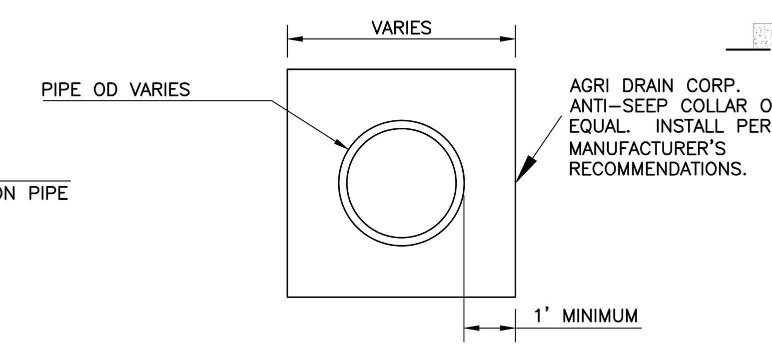
NO	DATE	DESCRIPTION
1	09/02/2010	OEPA NOD1
2	02/14/2011	OEPA NOD2
3	07/01/2015	PTI ALTERATION REQUEST TO ELIMINATE UNDERDRAIN CLEANOUTS
4	06/2016	PTI ALTERATION REQUEST 2016 DESIGN CHANGES

	3745-30-05 (B)(7) RULE REFERENCE	DRAWING LOCATION
(a)	RECOMPACTED SOIL LINER, LINER CUSHION LAYER, LEACHATE COLLECTION LAYER, AND FILTER LAYER INCLUDING ANY ENGINEERED COMPONENTS THAT ARE CONSTRUCTED THROUGH THE LINER SYSTEM, AND THE INTERFACE BETWEEN PHASES	7A, 7B, 7C AND 7G
(b)	CAP SYSTEM, INCLUDING ANY ENGINEERED COMPONENTS THAT ARE CONSTRUCTED THROUGH THE CAP SYSTEM, AND SURFACE WATER CONTROL STRUCTURES	7A THROUGH 7E
(c)	RELATIONSHIP OF THE CAP SYSTEM WITH THE LEACHATE COLLECTION AND MANAGEMENT SYSTEM AND RECOMPACTED SOIL LINER	7A AND 7B
(d)(i)	LEACHATE COLLECTION LAYER	7A, 7B, AND 7G
(d)(ii)	COLLECTION PIPES, INCLUDING BEDDING MEDIA AND BOOTS	7A, 7B, 7C, 7F AND 7G
(d)(iii)	FILTER LAYER, IF REQUIRED	7A
(d)(iv)	ANY SUMPS	7A, 7B, 7F AND 7G
(d)(v)	ANY CONVEYANCE APPARATUS	7A THROUGH 7G
(d)(vi)	ANY STORAGE TANKS	NOT APPLICABLE
(e)	PERMANENT GROUND WATER CONTROL STRUCTURES	7A, 7B AND 7F
(f)	GROUND WATER MONITORING WELL AND PIEZOMETER CONSTRUCTION	7B
(g)	EXPLOSIVE GAS CONTROL SYSTEM ELEMENTS	NOT APPLICABLE
(h)	SEPARATORY LINER/LEACHATE COLLECTION SYSTEMS	NOT APPLICABLE
(i)	SEDIMENTATION POND AND DISCHARGE STRUCTURES, IF ANY, AND SURFACE WATER RUN-ON AND RUNOFF CONTROL STRUCTURES	7A THROUGH 7G
(j)	A GENERAL PROCESS FLOW DIAGRAM WHICH DISPLAYS THE PROCESSES, POINTS OF WASTE GENERATION, AND TYPES OF WASTES GENERATED	7A
(k)	OTHER NECESSARY DETAILS	ALL "7" SERIES

DP&L



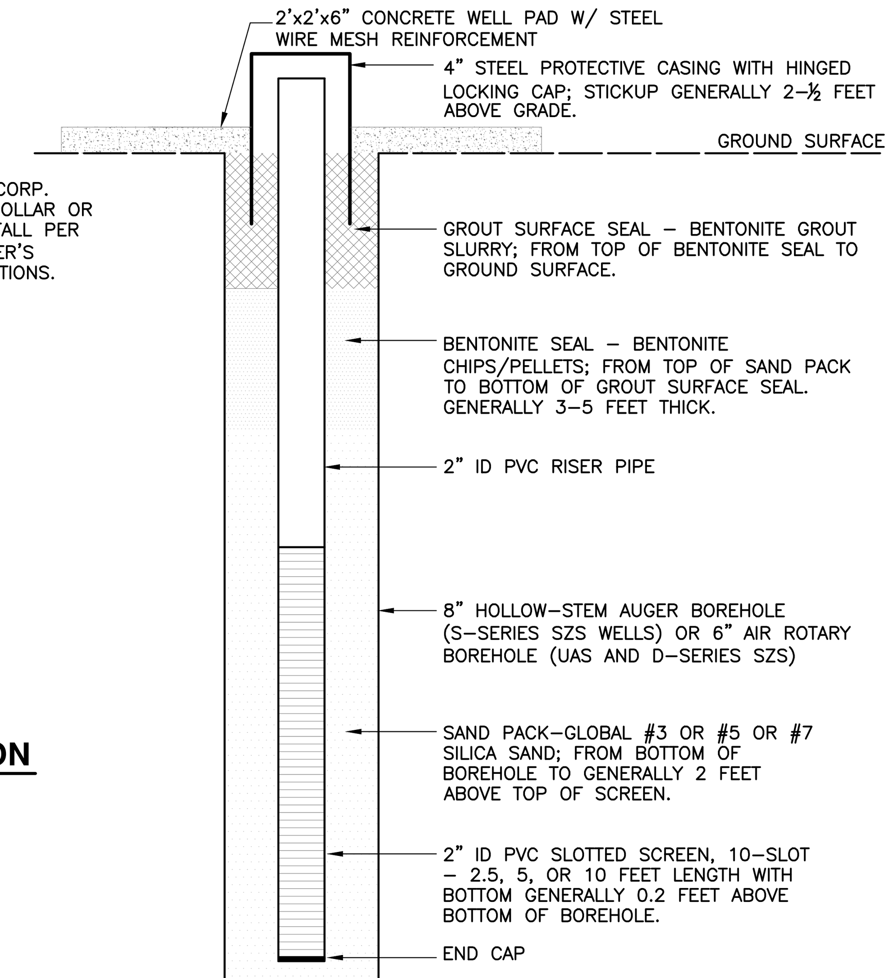
LEACHATE COLLECTION LINE PENETRATION (N / 7B)
NOT TO SCALE



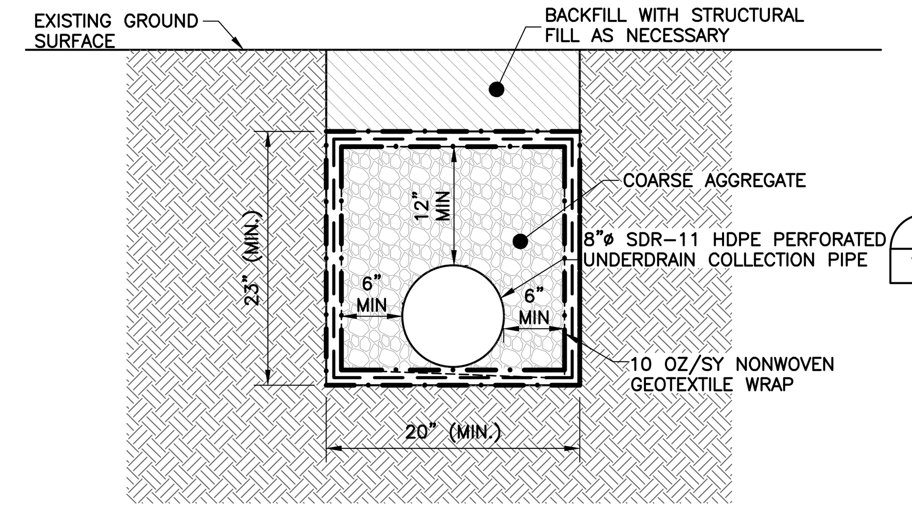
ANTI SEEP COLLAR (O / 7B)
NOT TO SCALE

DETAIL HAS BEEN ELIMINATED

SOLID UNDERDRAIN COLLECTION PIPE SECTION (T / 7B)
NOT TO SCALE



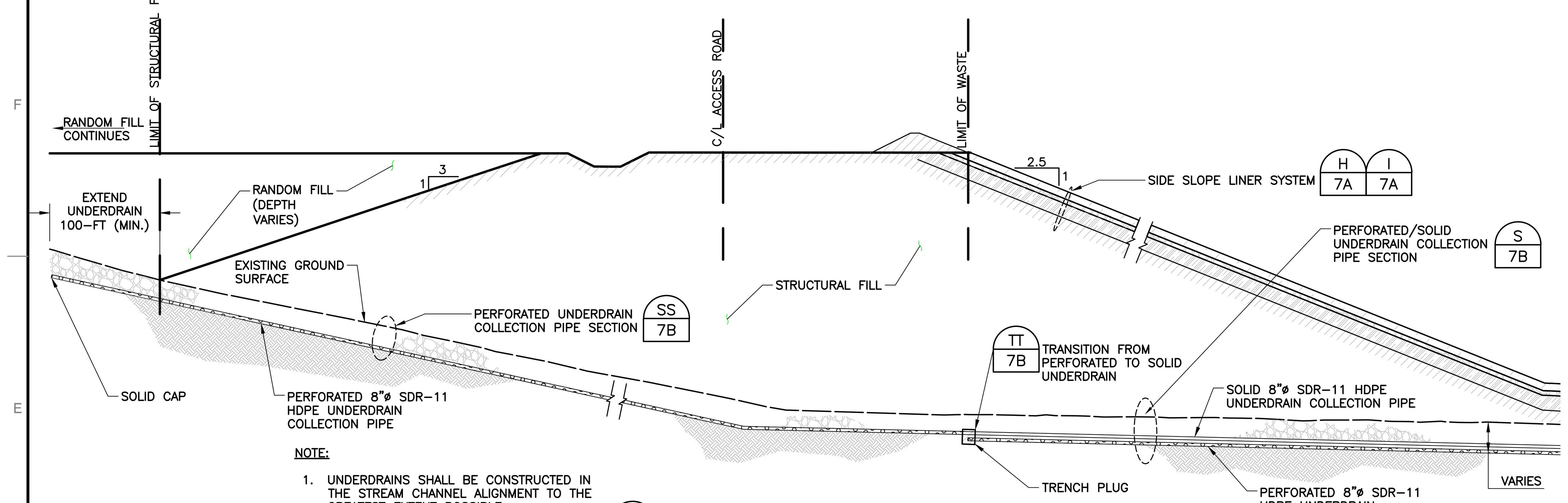
PROPOSED WELL CONSTRUCTION DIAGRAM (P / 7B)
NOT TO SCALE



NOTES:

1. PREPARE EXISTING STREAMBED WITH PIPE BEDDING AS NECESSARY TO PROVIDE UNIFORM FOUNDATION PRIOR TO PLACING PIPE.
2. NONWOVEN GEOTEXTILE FABRIC MAY BE OMITTED ON PIPE TRENCH BOTTOM AND/OR SIDES WHEN BEDROCK IS EXPOSED.
3. GEOTEXTILE SHALL BE OVERLAPPED A MINIMUM OF 12 INCHES TO COMPLETE WRAP. ADDITIONALLY, ADJACENT PANELS OF GEOTEXTILE WILL BE OVERLAPPED A MINIMUM OF 12 INCHES.
4. UNDERDRAIN PREVIOUSLY INSTALLED IS NOT SUBJECT TO THE GEOTEXTILE WRAP REQUIREMENTS.
5. PIPE SECTION MAY BE CONSTRUCTED ABOVE EXISTING GROUND SURFACE, HOWEVER PERFORATED PIPE INVERT SHALL BE A MINIMUM OF 12 INCHES BELOW THE EXISTING GROUND SURFACE.
6. WYE AND TEE CONNECTIONS OF LIKE PIPE SHALL BE USED AS NECESSARY.

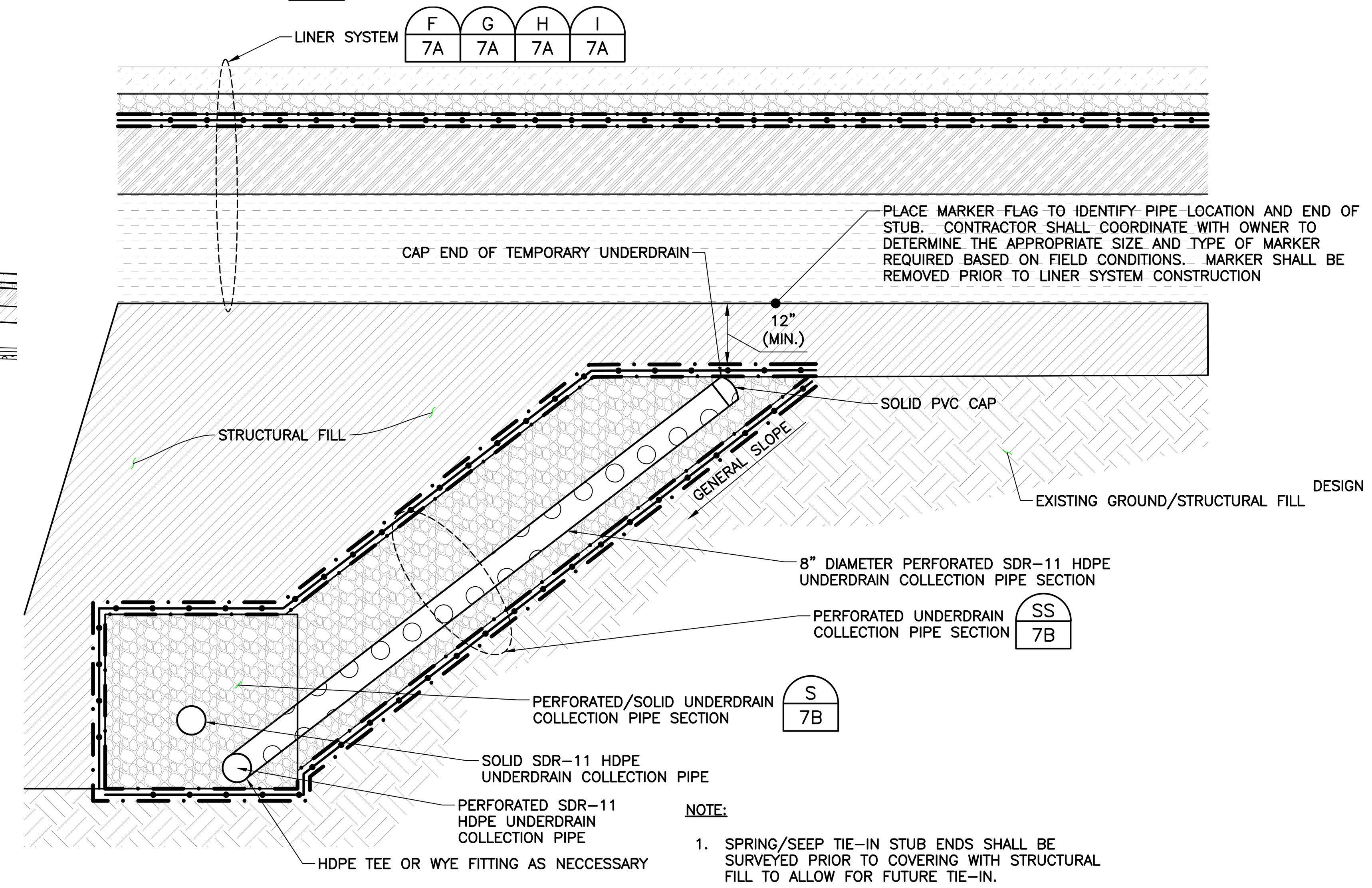
PERFORATED UNDERDRAIN COLLECTION PIPE SECTION (SS / 7B)
N.T.S.



NOTE:

1. UNDERDRAINS SHALL BE CONSTRUCTED IN THE STREAM CHANNEL ALIGNMENT TO THE GREATEST EXTENT POSSIBLE.

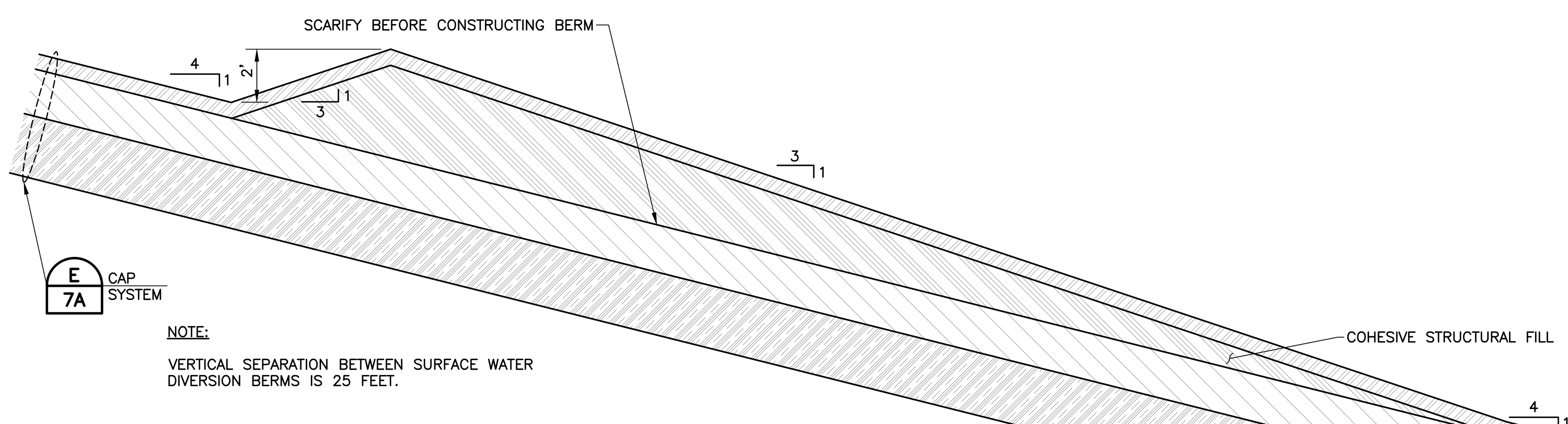
UNDERDRAIN IN LAY DOWN AREAS (Q / 7B)
N.T.S.



NOTE:

1. SPRING/SEEP TIE-IN STUB ENDS SHALL BE SURVEYED PRIOR TO COVERING WITH STRUCTURAL FILL TO ALLOW FOR FUTURE TIE-IN.

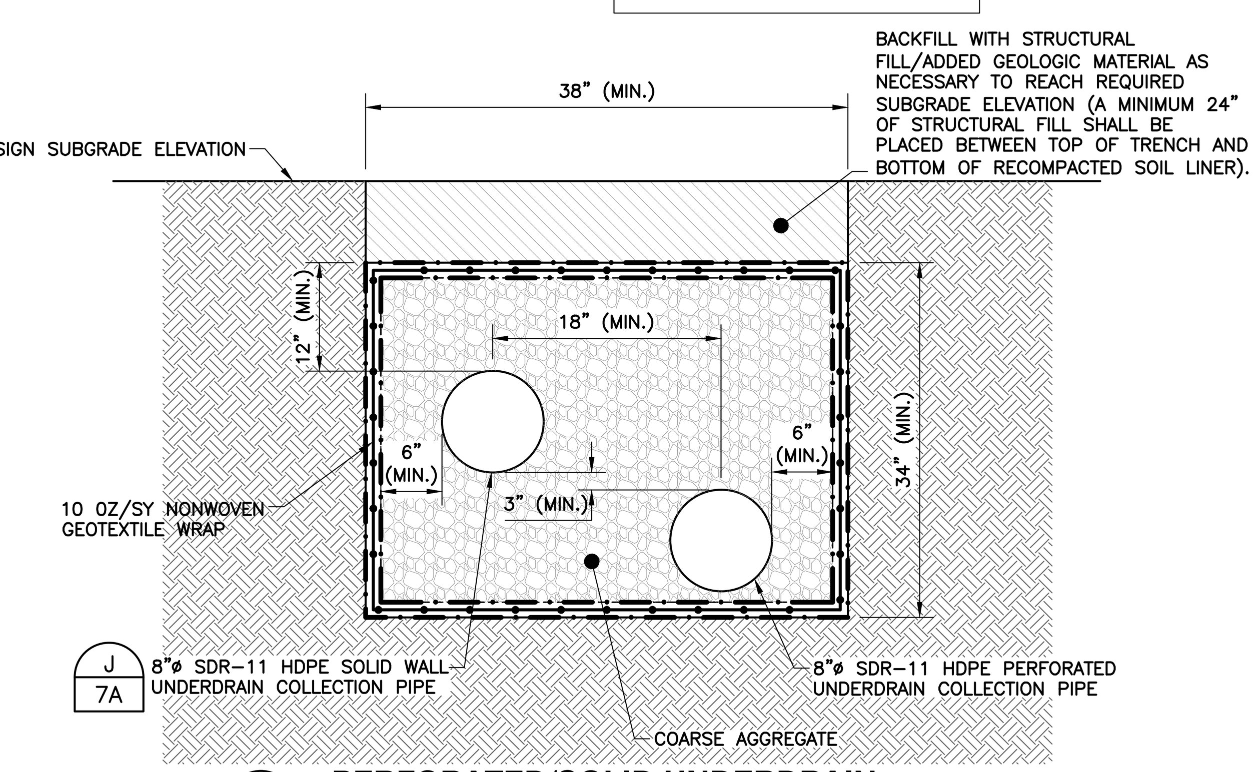
SPRING/SEEP TIE-IN STUB (UU / 7B)
N.T.S.



NOTE:

VERTICAL SEPARATION BETWEEN SURFACE WATER DIVERSION BERMS IS 25 FEET.

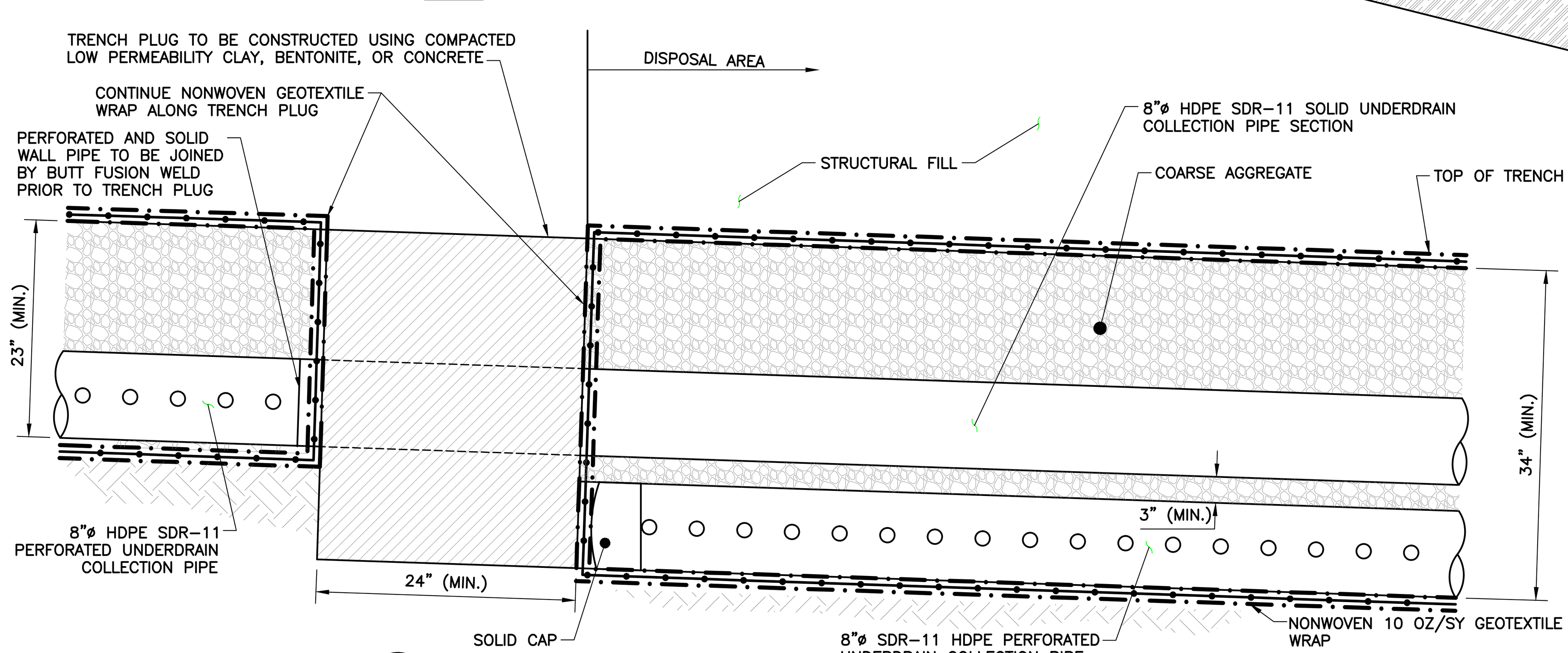
SURFACE WATER DIVERSION BERM (U / 7B)
NOT TO SCALE



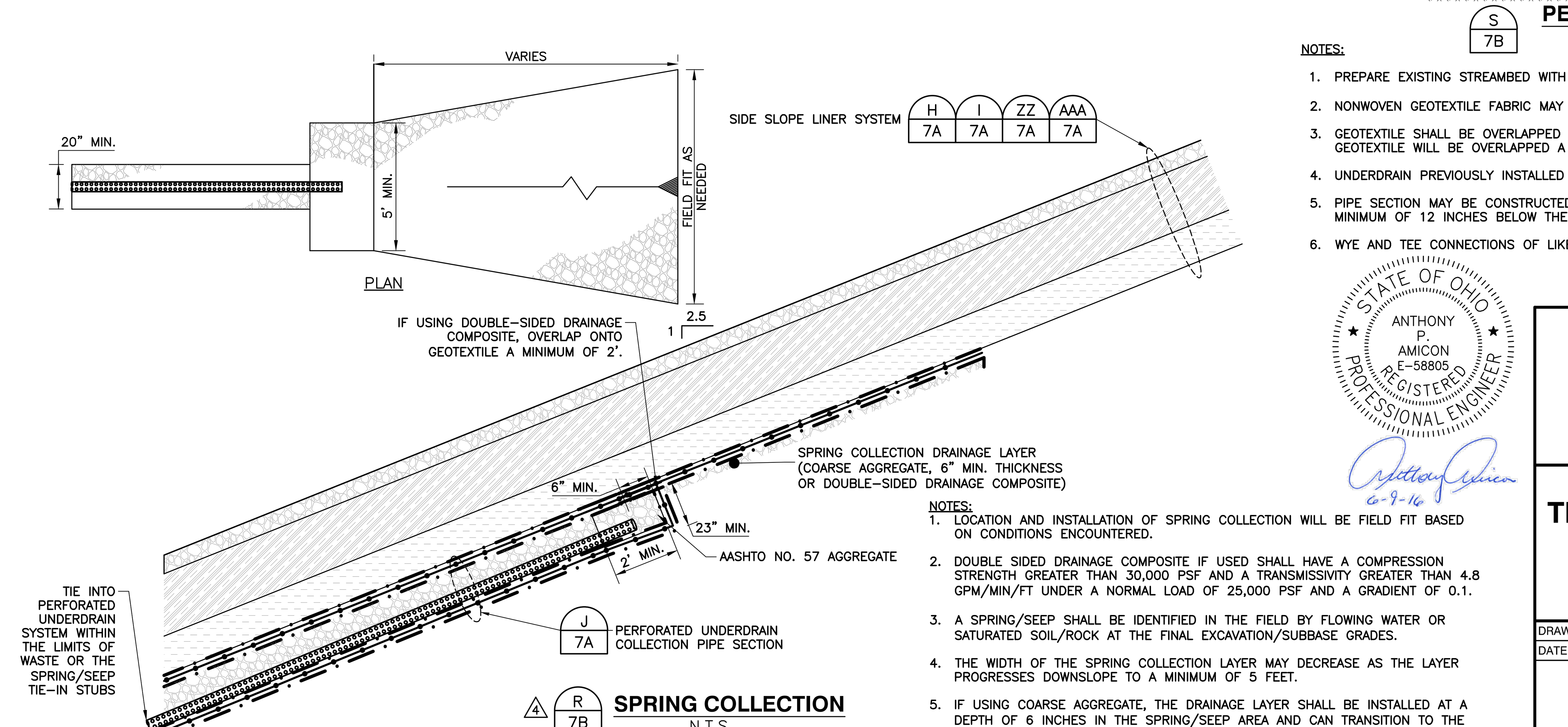
PERFORATED/SOLID UNDERDRAIN COLLECTION PIPE SECTION (S / 7B)
N.T.S.

NOTES:

1. PREPARE EXISTING STREAMBED WITH PIPE BEDDING AS NECESSARY TO PROVIDE UNIFORM FOUNDATION PRIOR TO PLACING PIPE.
2. NONWOVEN GEOTEXTILE FABRIC MAY BE OMITTED ON PIPE TRENCH BOTTOM AND/OR SIDES WHEN BEDROCK IS EXPOSED.
3. GEOTEXTILE SHALL BE OVERLAPPED A MINIMUM OF 12 INCHES TO COMPLETE WRAP. ADDITIONALLY, ADJACENT PANELS OF GEOTEXTILE WILL BE OVERLAPPED A MINIMUM OF 12 INCHES.
4. UNDERDRAIN PREVIOUSLY INSTALLED IS NOT SUBJECT TO THE GEOTEXTILE WRAP REQUIREMENTS.
5. PIPE SECTION MAY BE CONSTRUCTED ABOVE EXISTING GROUND SURFACE, HOWEVER PERFORATED PIPE INVERT SHALL BE A MINIMUM OF 12 INCHES BELOW THE EXISTING GROUND SURFACE.
6. WYE AND TEE CONNECTIONS OF LIKE PIPE SHALL BE USED AS NECESSARY.



TRANSITION FROM PERFORATED TO SOLID UNDERDRAIN PROFILE VIEW (TT / 7B)
N.T.S.



NOTES:

1. LOCATION AND INSTALLATION OF SPRING COLLECTION WILL BE FIELD FIT BASED ON CONDITIONS ENCOUNTERED.
2. DOUBLE SIDED DRAINAGE COMPOSITE IF USED SHALL HAVE A COMPRESSION STRENGTH GREATER THAN 30,000 PSF AND A TRANSMISSIVITY GREATER THAN 4.8 GPM/MIN/FT UNDER A NORMAL LOAD OF 25,000 PSF AND A GRADIENT OF 0.1.
3. A SPRING/SEEP SHALL BE IDENTIFIED IN THE FIELD BY FLOWING WATER OR SATURATED SOIL/ROCK AT THE FINAL EXCAVATION/SUBBASE GRADES.
4. THE WIDTH OF THE SPRING COLLECTION LAYER MAY DECREASE AS THE LAYER PROGRESSES DOWNSLOPE TO A MINIMUM OF 5 FEET.
5. IF USING COARSE AGGREGATE, THE DRAINAGE LAYER SHALL BE INSTALLED AT A DEPTH OF 6 INCHES IN THE SPRING/SEEP AREA AND CAN TRANSITION TO THE GROUND SURFACE AS THE LAYER MOVES DOWN GRADIENT.

SPRING COLLECTION (R / 7B)
N.T.S.

STATE OF OHIO
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6-9-16

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PERMIT TO INSTALL APPLICATION
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J.M. STUART STATION
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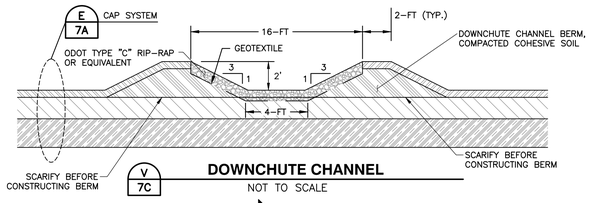
SPRIGG TOWNSHIP, ADAMS CO., OHIO

DRAWN BY: DFB	CHECKED BY: PCC	APPROVED BY: SFP
DATE: FEB 14, 2011	DWG SCALE: AS NOTED	PROJECT NO: 071-644

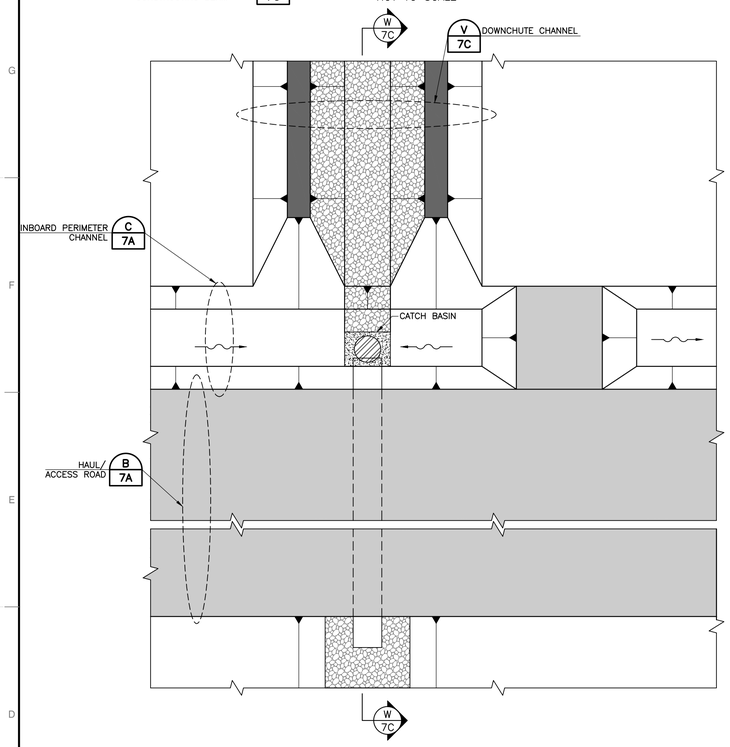
SURFACE WATER CONTROL AND LEACHATE COLLECTION SYSTEM DETAILS

DRAWING NO.: 7B
SHEET 26 OF 30

P:\2014\144-189\-CADD\Dwg\Civil\02 Permit Drawings\NOD2\PTI-7B 071644.dwg[7B] LS:6/10/2016 - mlapolucci - LP: 6/10/2016 12:42 PM



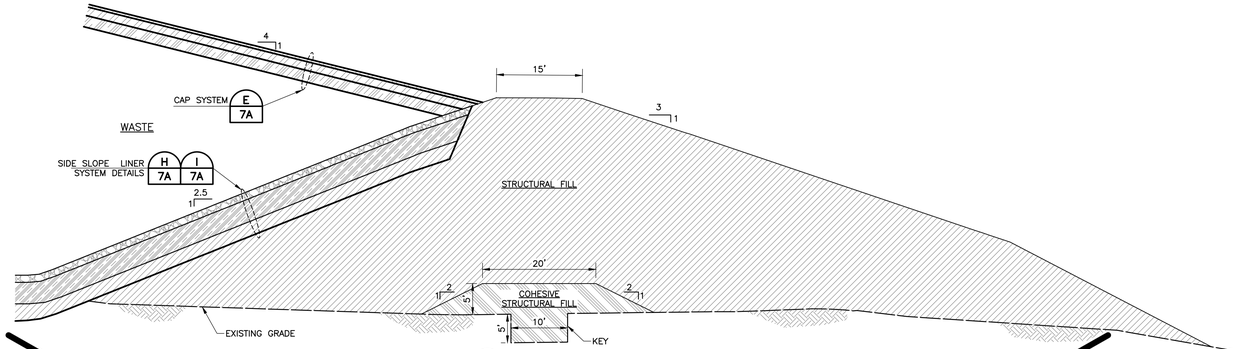
V 7C **DOWNCHUTE CHANNEL**
NOT TO SCALE



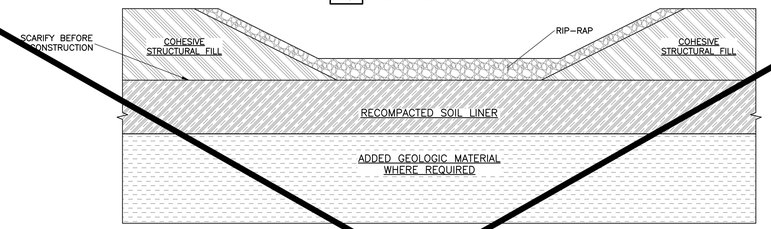
4 **X 7C** **CULVERT OUTLET EROSION PROTECTION**
NOT TO SCALE

NOTES:

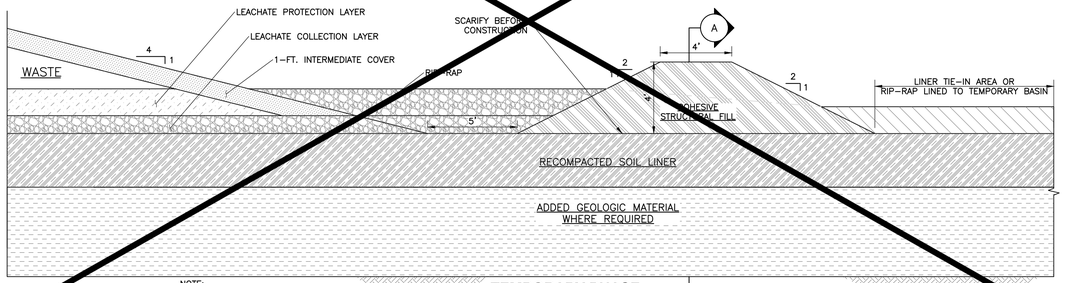
1. CULVERT OUTLET EROSION PROTECTION SHALL BE DETERMINED USING OHIO DEPARTMENT OF TRANSPORTATION (ODOT) STANDARDS OR ENGINEER APPROVED EQUIVALENT AT THE TIME OF CONSTRUCTION.



Y 7C **KICKER BERM**
NOT TO SCALE

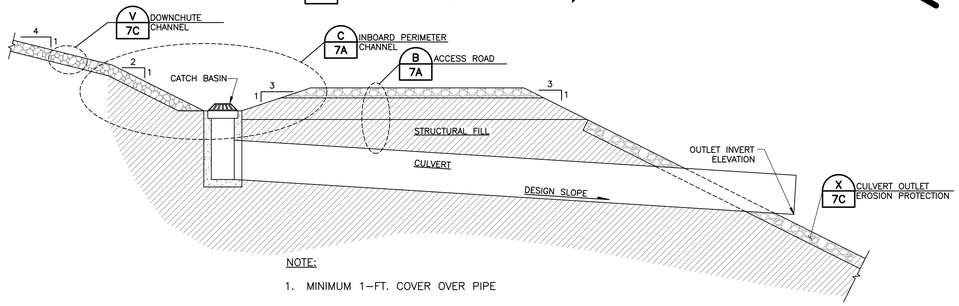


A-A' – TEMPORARY CONTACT WATER/LEACHATE SEDIMENTATION BASIN INLET



NOTE:
INSTALL EROSION CONTROL ON EITHER SIDE OF BERM AS NECESSARY

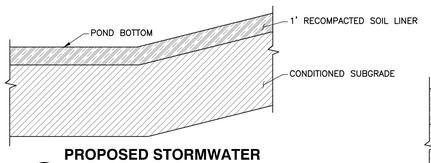
4 **BB 7C** **TEMPORARY PHASE CONTAINMENT BERM**
NOT TO SCALE



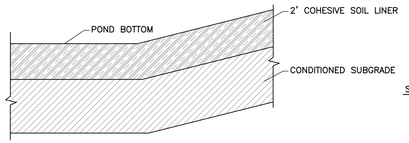
NOTE:

1. MINIMUM 1-FT. COVER OVER PIPE

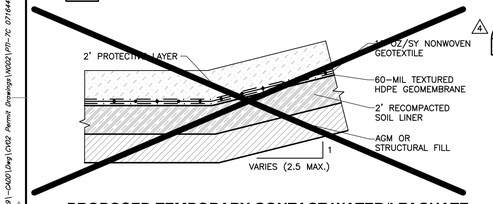
DOWNCHUTE CHANNEL/SURFACE WATER CHANNEL/CULVERT
W 7C
NOT TO SCALE



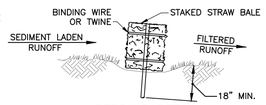
PROPOSED STORMWATER POND LINER DETAIL
Z 7C
NOT TO SCALE



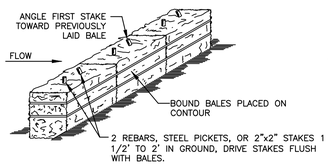
4 **YY 7C** **POND C POND LINER DETAIL**
NOT TO SCALE



4 **AA 7C** **PROPOSED TEMPORARY CONTACT WATER/LEACHATE SEDIMENTATION BASIN LINER DETAIL**
NOT TO SCALE

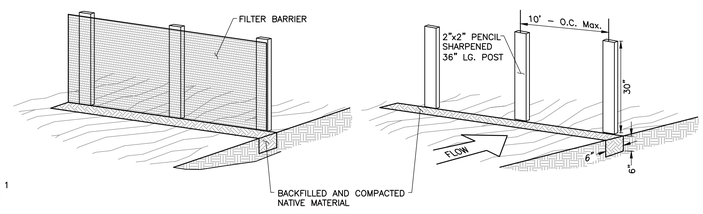


BEDDING DETAIL

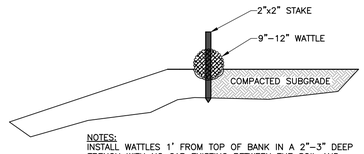


ANCHORING DETAIL

CC 7C **STRAW BALE DIKE**
NOT TO SCALE

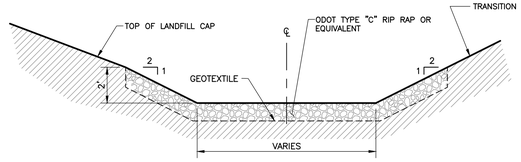


DD 7C **SEDIMENT FENCE**
NOT TO SCALE



NOTES:
INSTALL WATTLES 1' FROM TOP OF BANK IN A 2"-3" DEEP TRENCH WITH NO GAP EXISTING BETWEEN THE SOIL AND THE BOTTOM OF THE WATTLE. TIGHTLY ABUT THE ADJACENT WATTLE ENDS. STACK WATTLES AT ENDS AND EVERY 4'.

EE 7C **STRAW WATTLE DETAIL**
NOT TO SCALE



FF 7C **ROCK LINED CHANNEL**
NOT TO SCALE

SUBMITTAL RECORD

NO	DATE	DESCRIPTION
1	04/07/2010	INITIAL PERMIT TO INSTALL APPLICATION

REVISION RECORD

NO	DATE	DESCRIPTION
1	09/02/2010	OEPA NOD1
2	02/14/2011	OEPA NOD2
3	07/01/2015	PTI ALTERATION REQUEST TO ELIMINATE UNDERDRAIN CLEANOUTS
4	06/2016	PTI ALTERATION TO REQUEST 2016 DESIGN CHANGES

3745-30-05 (B)(7) RULE REFERENCE		DRAWING LOCATION
(a)	RECOMPACTED SOIL LINER, LINER CUSHION LAYER, LEACHATE COLLECTION LAYER, AND FILTER LAYER INCLUDING ANY ENGINEERED COMPONENTS THAT ARE CONSTRUCTED THROUGH THE LINER SYSTEM, AND THE INTERFACE BETWEEN PHASES	7A, 7B, 7C AND 7G
(b)	CAP SYSTEM, INCLUDING ANY ENGINEERED COMPONENTS THAT ARE CONSTRUCTED THROUGH THE CAP SYSTEM, AND SURFACE WATER CONTROL STRUCTURES	7A THROUGH 7E
(c)	RELATIONSHIP OF THE CAP SYSTEM WITH THE LEACHATE COLLECTION AND MANAGEMENT SYSTEM AND RECOMPACTED SOIL LINER	7A AND 7B
(d)(i)	LEACHATE COLLECTION LAYER	7A, 7B, AND 7G
(d)(ii)	COLLECTION PIPES, INCLUDING BEDDING MEDIA AND BOOTS	7A, 7B, 7C, 7F AND 7G
(d)(iii)	FILTER LAYER, IF REQUIRED	7A
(d)(iv)	ANY SUMPS	7A, 7B, 7F AND 7G
(d)(v)	ANY CONVEYANCE APPARATUS	7A THROUGH 7G
(d)(vi)	ANY STORAGE TANKS	NOT APPLICABLE
(e)	PERMANENT GROUND WATER CONTROL STRUCTURES	7A, 7B AND 7F
(f)	GROUND WATER MONITORING WELL AND PIEZOMETER CONSTRUCTION	7B
(g)	EXPLOSIVE GAS CONTROL SYSTEM ELEMENTS	NOT APPLICABLE
(h)	SEPARATORY LINER/LEACHATE COLLECTION SYSTEMS	NOT APPLICABLE
(i)	SEDIMENTATION POND AND DISCHARGE STRUCTURES, IF ANY, AND SURFACE WATER RUN-ON AND RUNOFF CONTROL STRUCTURES	7A THROUGH 7G
(j)	A GENERAL PROCESS FLOW DIAGRAM WHICH DISPLAYS THE PROCESSES, POINTS OF WASTE GENERATION, AND TYPES OF WASTES GENERATED	7A
(k)	OTHER NECESSARY DETAILS	ALL "7" SERIES

4

DP&L

STATE OF OHIO
ANTHONY P. AMICON
E-58805
REGISTERED PROFESSIONAL ENGINEER
6-9-16

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PERMIT TO INSTALL APPLICATION
THE DAYTON POWER AND LIGHT COMPANY
J.M. STUART STATION
CARTER HOLLOW LANDFILL
SPRIGG TOWNSHIP, ADAMS CO., OHIO

DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	AS NOTED	PROJECT NO:	071-644

MISCELLANEOUS DETAILS
(SHEET 1 OF 3)

DRAWING NO.: 7C
SHEET 27 OF 30

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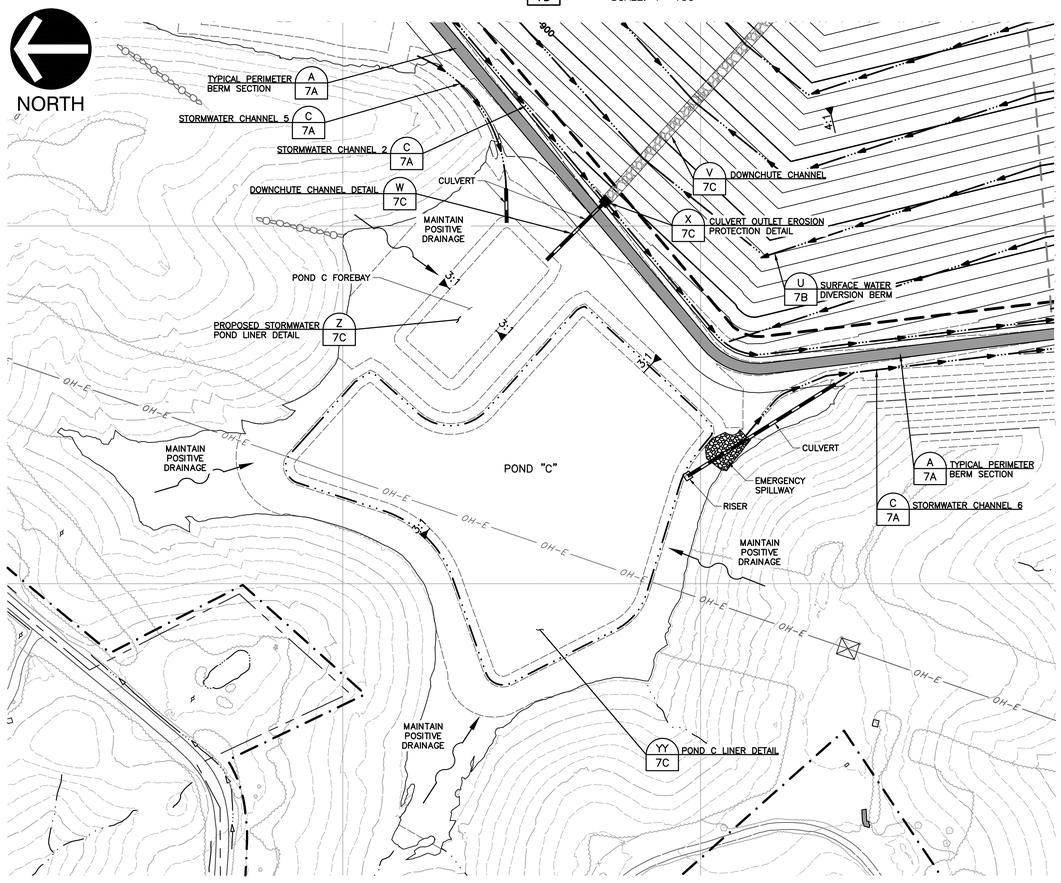
DETAIL HAS BEEN ELIMINATED

GG 7D **STORMWATER POND "A"**
SCALE: 1"=100'

DETAIL HAS BEEN ELIMINATED

HH 7D **STORMWATER POND "B"**
SCALE: 1"=100'



II 7D **STORMWATER POND "C"**
SCALE: 1"=100'

SUBMITTAL RECORD

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1	04/07/2010	INITIAL PERMIT TO INSTALL APPLICATION

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(d)(iv)	ANY SUMPS	7A, 7B, 7F AND 7G
(d)(v)	ANY CONVEYANCE APPARATUS	7A THROUGH 7G
(d)(vi)	ANY STORAGE TANKS	NOT APPLICABLE
(e)	PERMANENT GROUND WATER CONTROL STRUCTURES	7A, 7B AND 7F
(f)	GROUND WATER MONITORING WELL AND PIEZOMETER CONSTRUCTION	7B
(g)	EXPLOSIVE GAS CONTROL SYSTEM ELEMENTS	NOT APPLICABLE
(h)	SEPARATORY LINER/LEACHATE COLLECTION SYSTEMS	NOT APPLICABLE
(i)	SEDIMENTATION POND AND DISCHARGE STRUCTURES, IF ANY, AND SURFACE WATER RUN-ON AND RUNOFF CONTROL STRUCTURES	7A THROUGH 7G
(j)	A GENERAL PROCESS FLOW DIAGRAM WHICH DISPLAYS THE PROCESSES, POINTS OF WASTE GENERATION, AND TYPES OF WASTES GENERATED	7A
(k)	OTHER NECESSARY DETAILS	ALL "7" SERIES

4

DP&L

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR WITHIN WASTE LIMITS
- PROPOSED CONTOUR OUTSIDE WASTE LIMITS
- EXISTING OVERHEAD POWER LINE
- EXISTING STREAM
- PROPERTY LINE
- PROPOSED LIMITS OF WASTE
- FACILITY BOUNDARY
- PROPOSED DITCH
- PROPOSED NORMAL WATER SURFACE ELEVATION
- PROPOSED ACCESS/HAUL ROAD
- ROCK CHANNEL PROTECTION
- PROPOSED CATCH BASIN

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DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	1"=100'	PROJECT NO:	071-644

STORMWATER PONDS "A", "B", "C"

DRAWING NO.: **7D**
SHEET 28 OF 30

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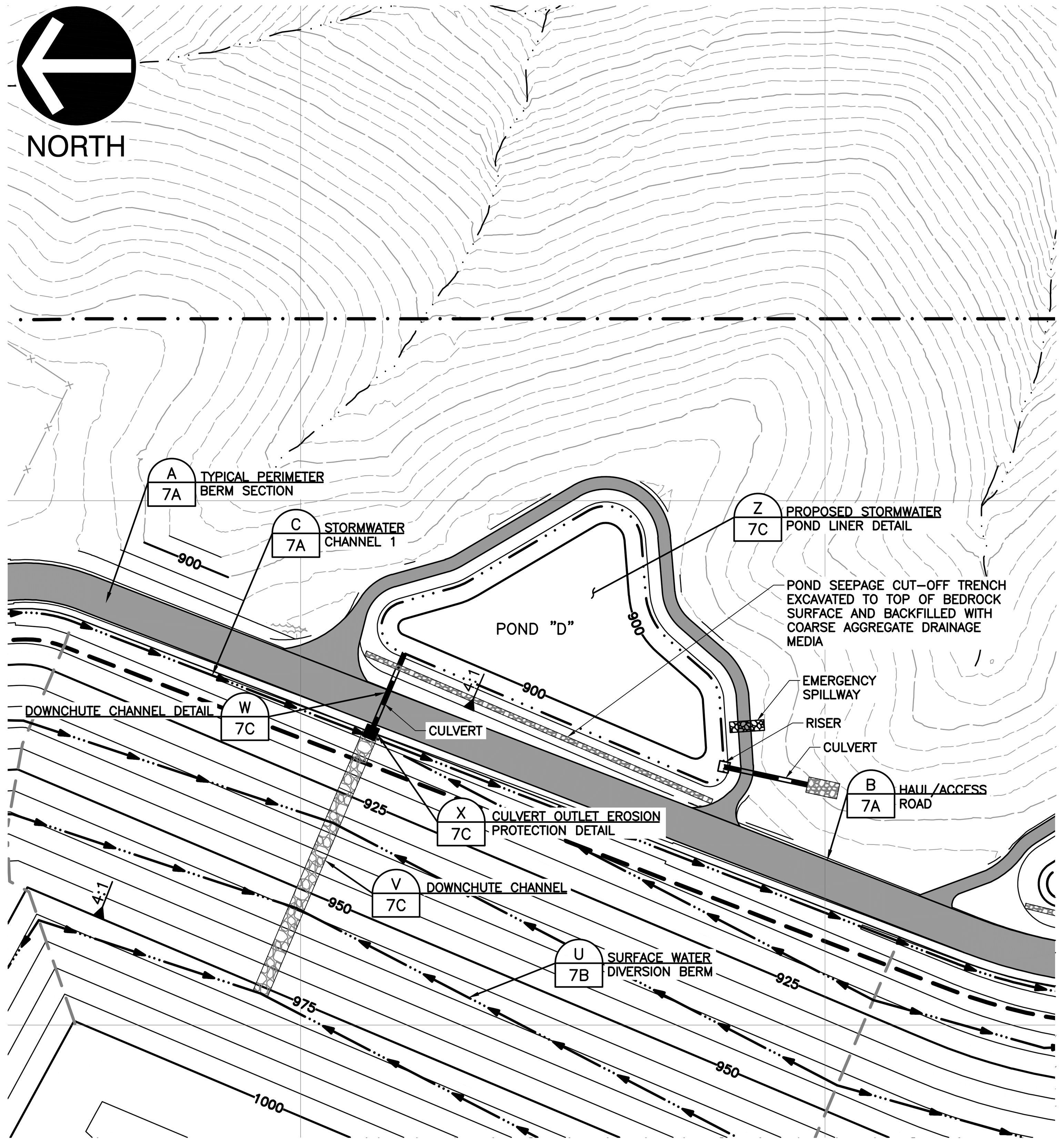
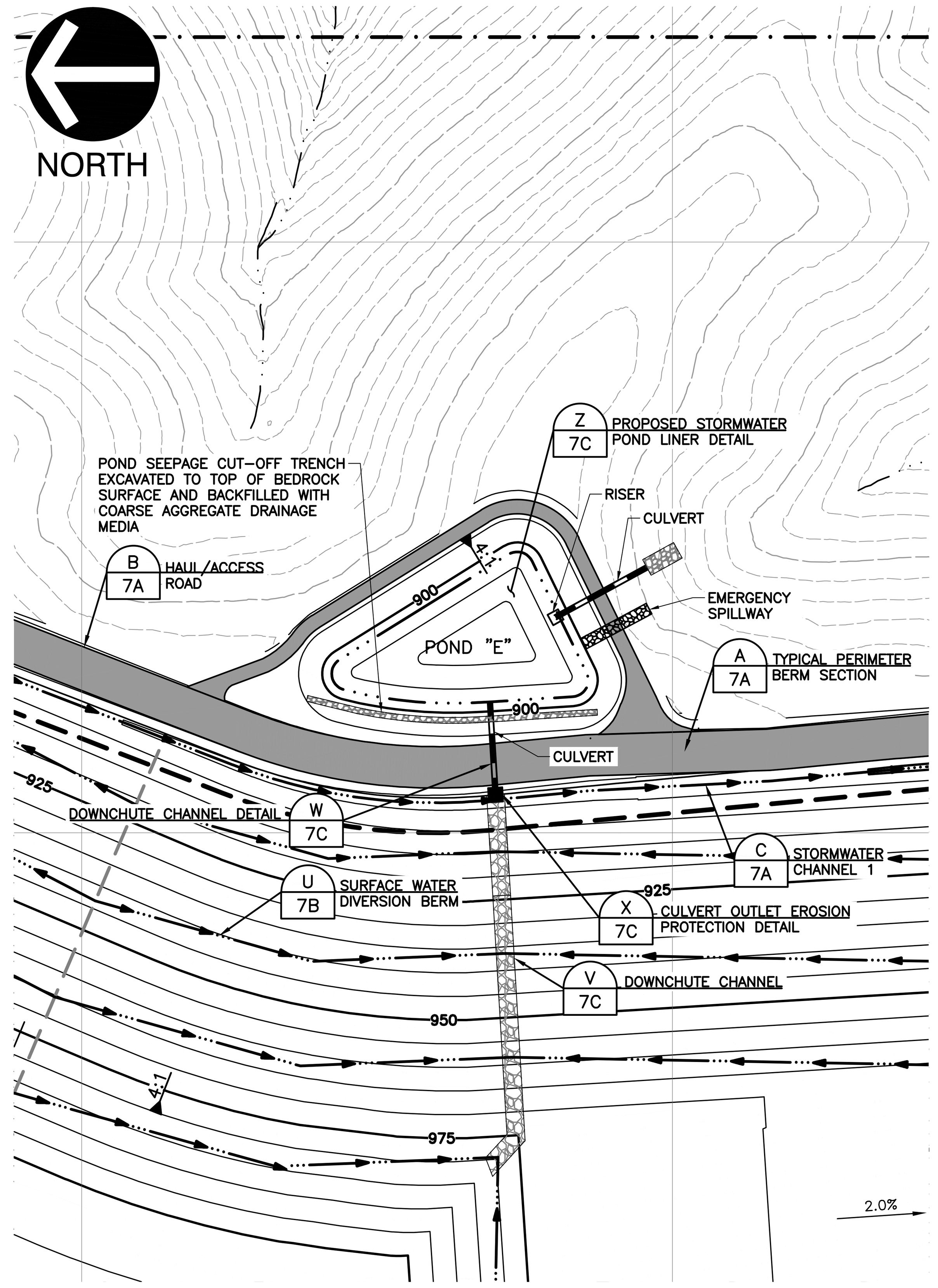
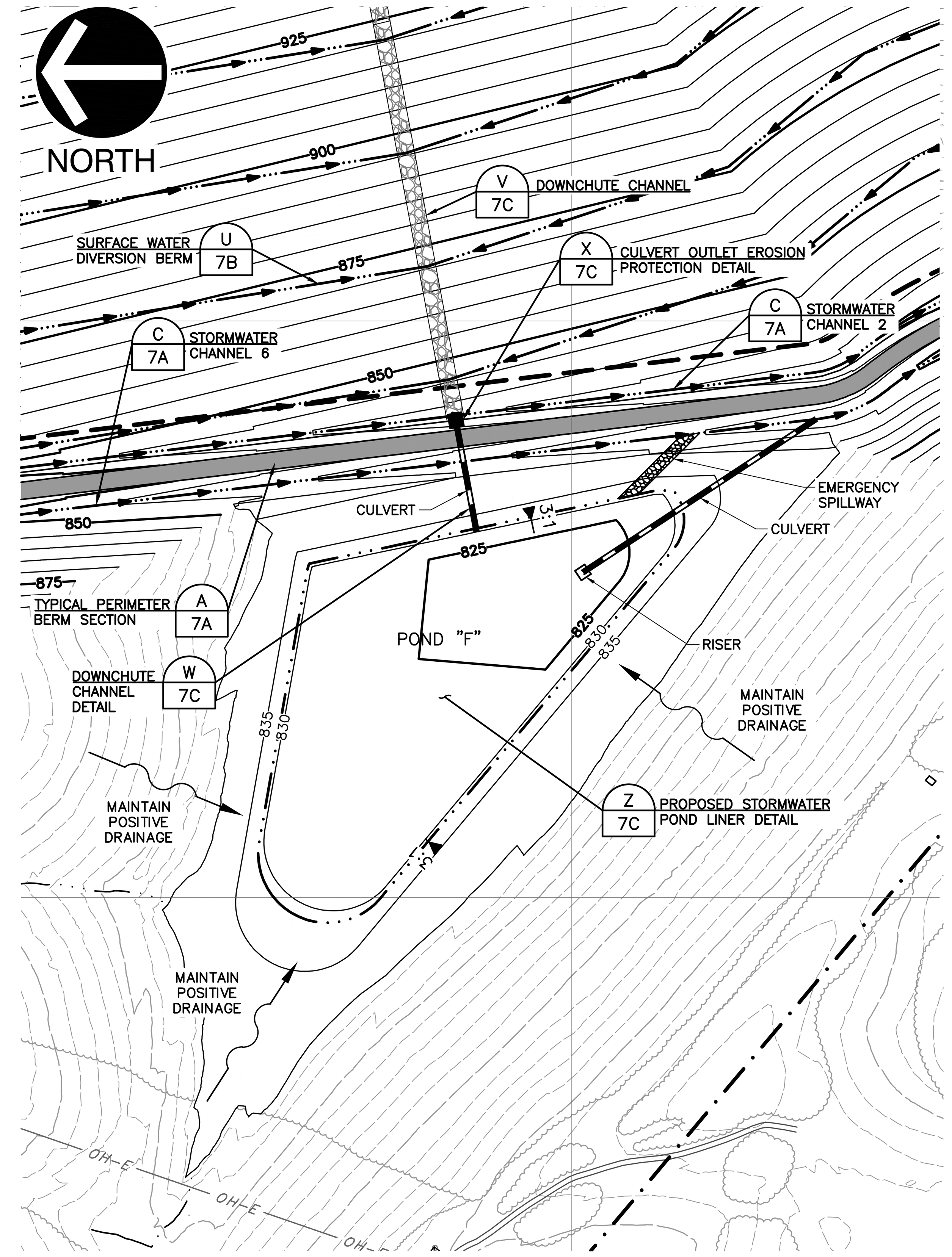


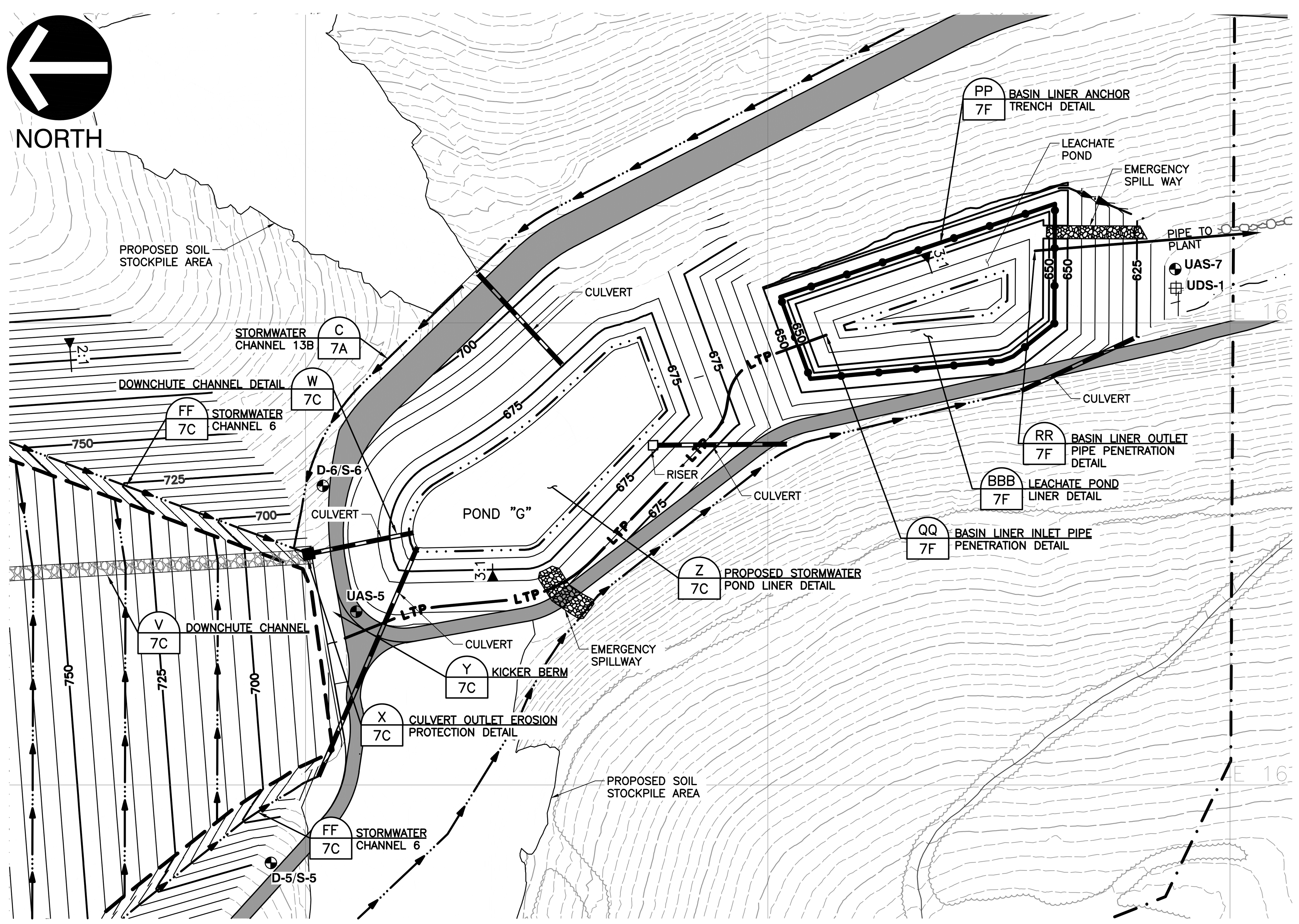
JJ 7E **STORMWATER POND "D"**
SCALE: 1"=100'



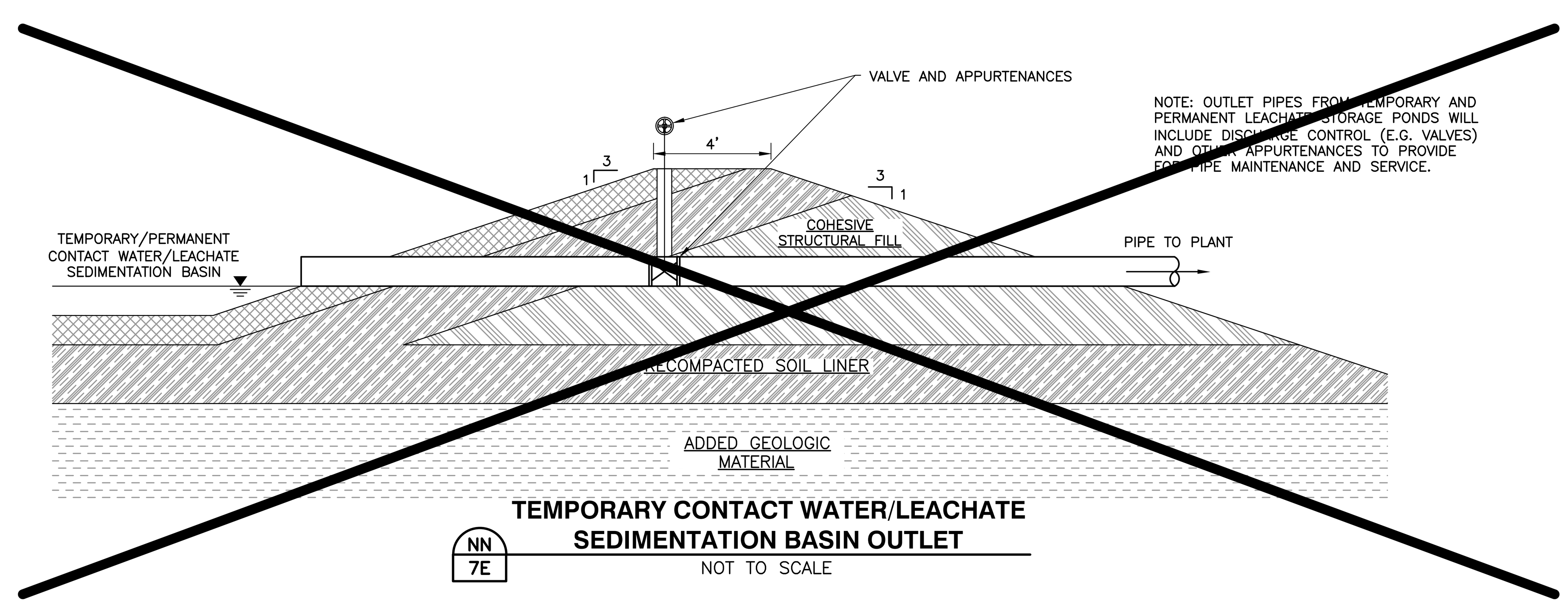
KK 7E **STORMWATER POND "E"**
SCALE: 1"=100'



LL 7E **STORMWATER POND "F"**
SCALE: 1"=100'



MM 7E **STORMWATER POND "G" AND LEACHATE POND**
SCALE: 1"=100'



NN 7E **TEMPORARY CONTACT WATER/LEACHATE SEDIMENTATION BASIN OUTLET**
NOT TO SCALE

SUBMITTAL RECORD

NO	DATE	DESCRIPTION
1	04/07/2010	INITIAL PERMIT TO INSTALL APPLICATION

REVISION RECORD

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4	06/2016	PTI ALTERATION TO REQUEST 2016 DESIGN CHANGES

3745-30-05 (B)(7) RULE REFERENCE		DRAWING LOCATION
(a)	RECOMPACTED SOIL LINER, LINER CUSHION LAYER, LEACHATE COLLECTION LAYER, AND FILTER LAYER INCLUDING ANY ENGINEERED COMPONENTS THAT ARE CONSTRUCTED THROUGH THE LINER SYSTEM, AND THE INTERFACE BETWEEN PHASES	7A, 7B, 7C AND 7G
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(d)(ii)	COLLECTION PIPES, INCLUDING BEDDING MEDIA AND BOOTS	7A, 7B, 7C, 7F AND 7G
(d)(iii)	FILTER LAYER, IF REQUIRED	7A
(d)(iv)	ANY SUMPS	7A, 7B, 7F AND 7G
(d)(v)	ANY CONVEYANCE APPARATUS	7A THROUGH 7G
(d)(vi)	ANY STORAGE TANKS	NOT APPLICABLE
(e)	PERMANENT GROUND WATER CONTROL STRUCTURES	7A, 7B AND 7F
(f)	GROUND WATER MONITORING WELL AND PIEZOMETER CONSTRUCTION	7B
(g)	EXPLOSIVE GAS CONTROL SYSTEM ELEMENTS	NOT APPLICABLE
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(k)	OTHER NECESSARY DETAILS	ALL "7" SERIES

DP&L

LEGEND

- 700 — EXISTING CONTOUR
- 700 — PROPOSED CONTOUR WITHIN WASTE LIMITS
- 700 — PROPOSED CONTOUR OUTSIDE WASTE LIMITS
- OH-E — EXISTING OVERHEAD POWER LINE
- EXISTING STREAM
- PROPERTY LINE
- PROPOSED LIMITS OF WASTE
- FACILITY BOUNDARY
- PROPOSED DITCH
- PROPOSED NORMAL WATER SURFACE ELEVATION
- PROPOSED ACCESS/HAUL ROAD
- ROCK CHANNEL PROTECTION
- PROPOSED CATCH BASIN
- ANCHOR TRENCH
- LTP — PROPOSED LEACHATE TRANSMISSION PIPE 4

STATE OF OHIO ANTHONY P. AMICON E-58805 REGISTERED PROFESSIONAL ENGINEER
6-9-16

CEC
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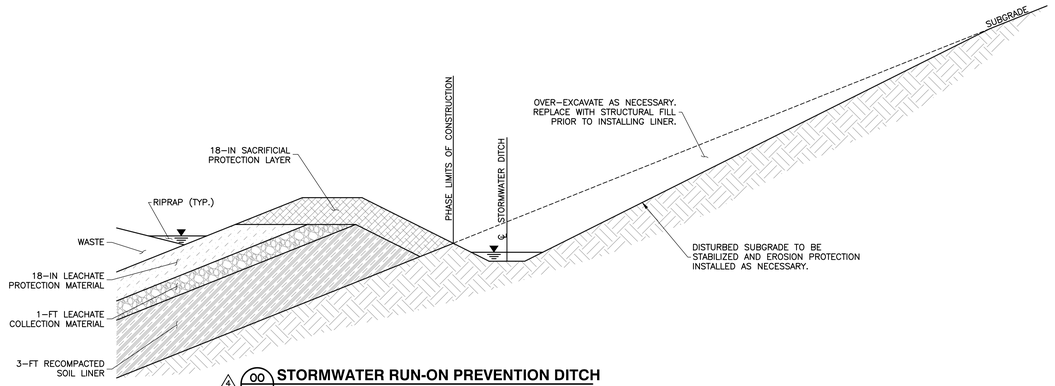
PERMIT TO INSTALL APPLICATION
THE DAYTON POWER AND LIGHT COMPANY
J.M. STUART STATION
CARTER HOLLOW LANDFILL
SPRIGG TOWNSHIP, ADAMS CO., OHIO

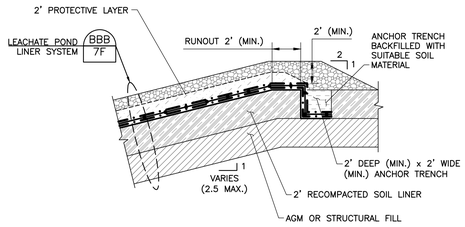
DRAWN BY: DFB	CHECKED BY: PCC	APPROVED BY: SFP
DATE: FEB 14, 2011	DWG SCALE: 1"=100'	PROJECT NO: 071-644

STORMWATER PONDS "D", "E", "F", & "G"
DRAWING NO.: **7E**
SHEET 29 OF 30

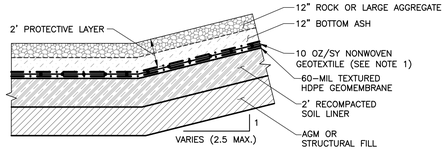
G:\PROJECTS\2007\071-644\PERMIT\DWG\NOD2\PTI-7D 071644.DWG[PTI-7D STORMWATER PONDS C D & E] (DBROGNOW) - FEB 15, 2011 - 12:20:28



STORMWATER RUN-ON PREVENTION DITCH (4, OO, 7F)
NOT TO SCALE



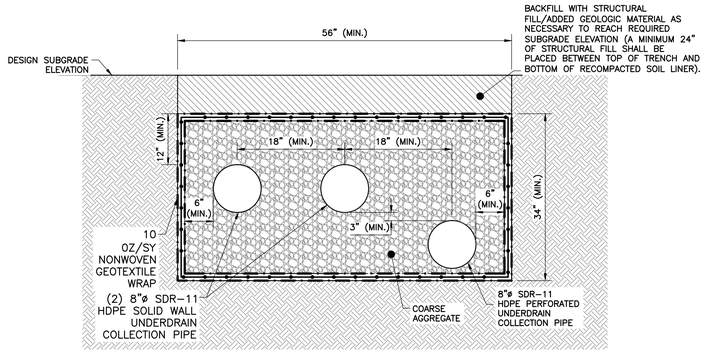
LEACHATE POND LINER ANCHOR TRENCH DETAIL (4, PP, 7F)
NOT TO SCALE



LEACHATE POND LINER ANCHOR TRENCH DETAIL (4, BBB, 7F)
NOT TO SCALE

NOTES:

1. IF PROTECTIVE LAYER MATERIAL SIZE IMMEDIATELY ADJACENT TO THE GEOTEXTILE EXCEEDS 3/4-INCH, THE GEOTEXTILE THICKNESS SHALL BE INCREASED AS REQUIRED BY THE ENGINEER. IF TWO GEOTEXTILE LAYERS ARE USED, THE INTERFACE FRICTION SHALL BE CONFIRMED PER THE CQA PLAN.



SINGLE PERFORATED/DOUBLE SOLID UNDERDRAIN COLLECTION PIPE SECTION (4, GGG, 7F)
NOT TO SCALE

NOTES:

1. PREPARE EXISTING STREAMBED WITH PIPE BEDDING AS NECESSARY TO PROVIDE UNIFORM FOUNDATION PRIOR TO PLACING PIPE.
2. NONWOVEN GEOTEXTILE FABRIC MAY BE OMITTED ON PIPE TRENCH BOTTOM AND/OR SIDES WHEN BEDROCK IS EXPOSED.
3. GEOTEXTILE SHALL BE OVERLAPPED A MINIMUM OF 12 INCHES TO COMPLETE WRAP. ADDITIONALLY, ADJACENT PANELS OF GEOTEXTILE WILL BE OVERLAPPED A MINIMUM OF 12 INCHES.
4. UNDERDRAIN PREVIOUSLY INSTALLED IS NOT SUBJECT TO THE GEOTEXTILE WRAP REQUIREMENTS.
5. PERFORATED PIPE SECTION MAY BE CONSTRUCTED ABOVE EXISTING GROUND SURFACE, HOWEVER PERFORATED PIPE INVERT SHALL BE A MINIMUM OF 12 INCHES BELOW THE EXISTING GROUND SURFACE.
6. WYE AND TEE CONNECTIONS OF LIKE PIPE SHALL BE USED AS NECESSARY.

SUBMITTAL RECORD

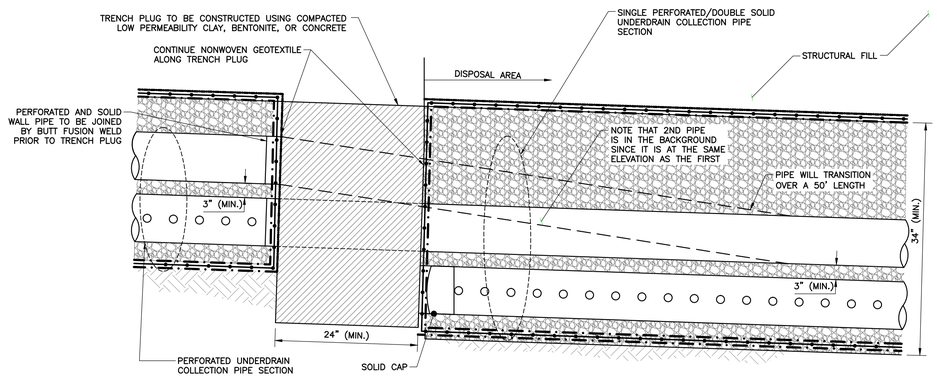
NO	DATE	DESCRIPTION
1	04/07/2010	INITIAL PERMIT TO INSTALL APPLICATION

REVISION RECORD

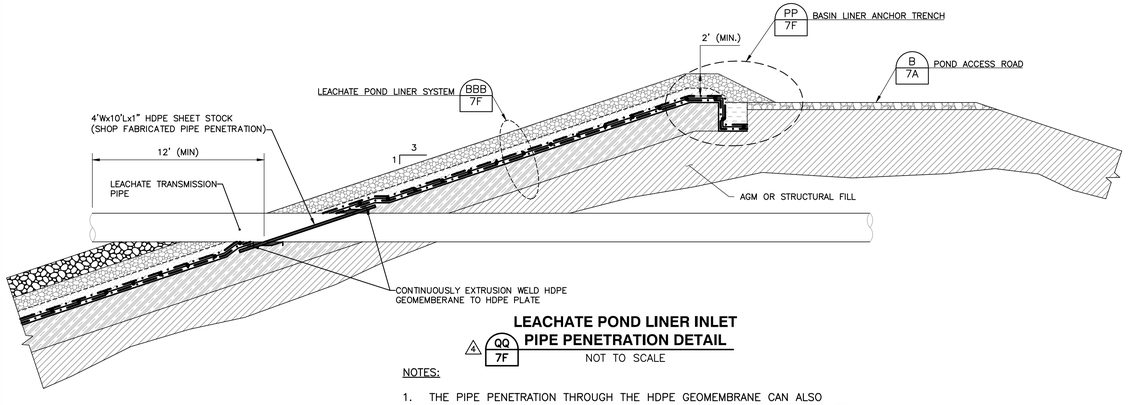
NO	DATE	DESCRIPTION
1	09/02/2010	OEPA NOD1
2	02/14/2011	OEPA NOD2
3	07/01/2015	PTI ALTERATION REQUEST TO ELIMINATE UNDERDRAIN CLEANOUTS
4	06/2016	PTI ALTERATION TO REQUEST 2016 DESIGN CHANGES

3745-30-05 (B)(7) RULE REFERENCE		DRAWING LOCATION
(a)	RECOMPACTED SOIL LINER, LINER CUSHION LAYER, LEACHATE COLLECTION LAYER, AND FILTER LAYER INCLUDING ANY ENGINEERED COMPONENTS THAT ARE CONSTRUCTED THROUGH THE LINER SYSTEM, AND THE INTERFACE BETWEEN PHASES	7A, 7B, 7C AND 7G
(b)	CAP SYSTEM, INCLUDING ANY ENGINEERED COMPONENTS THAT ARE CONSTRUCTED THROUGH THE CAP SYSTEM, AND SURFACE WATER CONTROL STRUCTURES	7A THROUGH 7E
(c)	RELATIONSHIP OF THE CAP SYSTEM WITH THE LEACHATE COLLECTION AND MANAGEMENT SYSTEM AND RECOMPACTED SOIL LINER	7A AND 7B
(d)(i)	LEACHATE COLLECTION LAYER	7A, 7B, AND 7G
(d)(ii)	COLLECTION PIPES, INCLUDING BEDDING MEDIA AND BOOTS	7A, 7B, 7C, 7F AND 7G
(d)(iii)	FILTER LAYER, IF REQUIRED	7A
(d)(iv)	ANY SUMPS	7A, 7B, 7F AND 7G
(d)(v)	ANY CONVEYANCE APPARATUS	7A THROUGH 7G
(d)(vi)	ANY STORAGE TANKS	NOT APPLICABLE
(e)	PERMANENT GROUND WATER CONTROL STRUCTURES	7A, 7B AND 7F
(f)	GROUND WATER MONITORING WELL AND PIEZOMETER CONSTRUCTION	7B
(g)	EXPLOSIVE GAS CONTROL SYSTEM ELEMENTS	NOT APPLICABLE
(h)	SEPARATORY LINER/LEACHATE COLLECTION SYSTEMS	NOT APPLICABLE
(i)	SEDIMENTATION POND AND DISCHARGE STRUCTURES, IF ANY, AND SURFACE WATER RUN-ON AND RUNOFF CONTROL STRUCTURES	7A THROUGH 7G
(j)	A GENERAL PROCESS FLOW DIAGRAM WHICH DISPLAYS THE PROCESSES, POINTS OF WASTE GENERATION, AND TYPES OF WASTES GENERATED	7A
(k)	OTHER NECESSARY DETAILS	ALL "7" SERIES

4



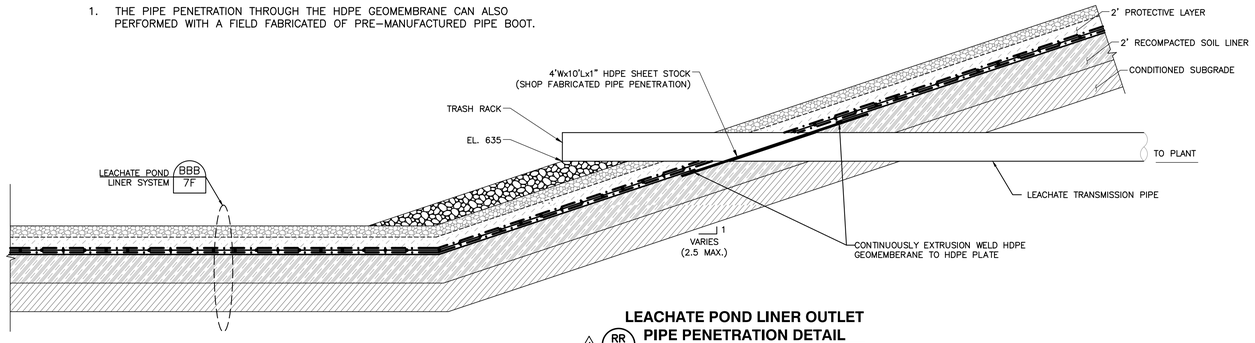
TRANSITION FROM PERFORATED TO SOLID UNDERDRAIN AT WASTE LIMITS PROFILE VIEW (4, HHH, 7F)



LEACHATE POND LINER INLET PIPE PENETRATION DETAIL (4, QQ, 7F)
NOT TO SCALE

NOTES:

1. THE PIPE PENETRATION THROUGH THE HDPE GEOMEMBRANE CAN ALSO PERFORMED WITH A FIELD FABRICATED OF PRE-MANUFACTURED PIPE BOOT.



LEACHATE POND LINER OUTLET PIPE PENETRATION DETAIL (4, RR, 7F)
NOT TO SCALE

NOTES:

1. THE PIPE PENETRATION THROUGH THE HDPE GEOMEMBRANE CAN ALSO PERFORMED WITH A FIELD FABRICATED OF PRE-MANUFACTURED PIPE BOOT.

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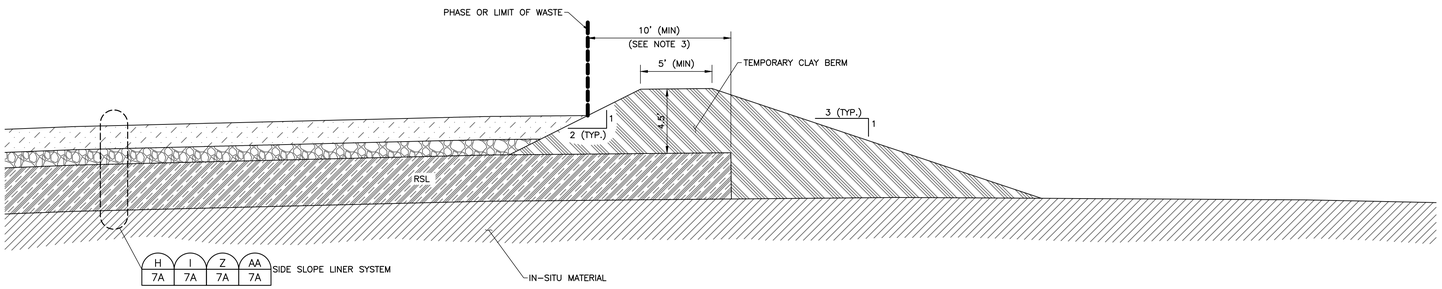
DRAWN BY:	DFB	CHECKED BY:	PCC	APPROVED BY:	SFP
DATE:	FEB 14, 2011	DWG SCALE:	1"=100'	PROJECT NO:	071-644

MISCELLANEOUS DETAILS (SHEET 2 OF 3)

DRAWING NO.: **7F**
SHEET 30AA OF 30

G:\PROJECTS\2007\071-644\PERMIT\DWG\MISC\[071-7F 071644.DWG]071-7F MISCELLANEOUS DETAILS [ALYNDON] - FEB 4, 2011 - 14:43:40



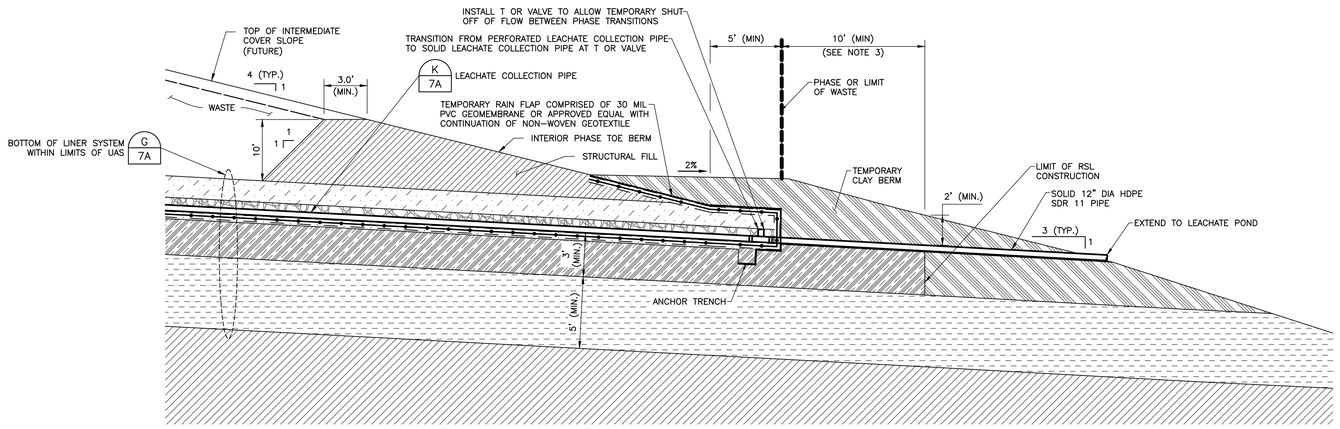
SIDE SLOPE INTERIOR PHASING BERM AT LINER TERMINATION

DDD / 7G

NOT TO SCALE

NOTES:

1. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION OF THE SIDE SLOPE INTERIOR PHASING BERM AS NEEDED TO FACILITATE CONSTRUCTION OF THE LEACHATE COLLECTION AND PROTECTIVE COVER LAYERS. THE CONTRACTOR SHALL ALSO FIELD FIT THE TRANSITION FROM THE SIDE SLOPE INTERIOR PHASING BERM TO THE INTERIOR PHASE TOE BERM.
2. IF WASTE MATERIALS ARE UTILIZED FOR THE LEACHATE COLLECTION OR PROTECTIVE COVER LAYER, THE BERM CONSTRUCTION SHALL BE COMPLETED AS NECESSARY TO CONTAIN AND COLLECT CONTACT WATER WITHIN THE LIMITS OF CONSTRUCTED RSL LINER AND DEFINED LIMITS OF WASTE, AND THEN CONVEYED TO THE LEACHATE POND.
3. RSL SHALL BE EXTENDED A MINIMUM OF 10 FEET FROM PHASE LIMIT TO ALLOW FUTURE TIE-IN. ALL RSL SHALL BE CERTIFIED AND PROTECTED WITH AT LEAST 2 FEET OF SOIL.



INTERIOR PHASE BERM

EEE / 7G

NOT TO SCALE

NOTES:

1. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION OF THE VALLEY BOTTOM TOE BERM AS NEEDED TO FACILITATE CONSTRUCTION OF THE LEACHATE COLLECTION AND PROTECTIVE COVER LAYERS. THE CONTRACTOR SHALL ALSO FIELD FIT THE TRANSITION FROM THE INTERIOR PHASE TOE BERM TO THE SIDE SLOPE PHASING BERM.
2. IF WASTE MATERIALS ARE UTILIZED FOR THE LEACHATE COLLECTION OR PROTECTIVE COVER LAYER, THE BERM CONSTRUCTION SHALL BE COMPLETED AS NECESSARY TO CONTAIN AND COLLECT CONTACT WATER WITHIN THE LIMITS OF CONSTRUCTED RSL LINER AND DEFINED LIMITS OF WASTE, AND THEN CONVEYED TO THE LEACHATE POND.
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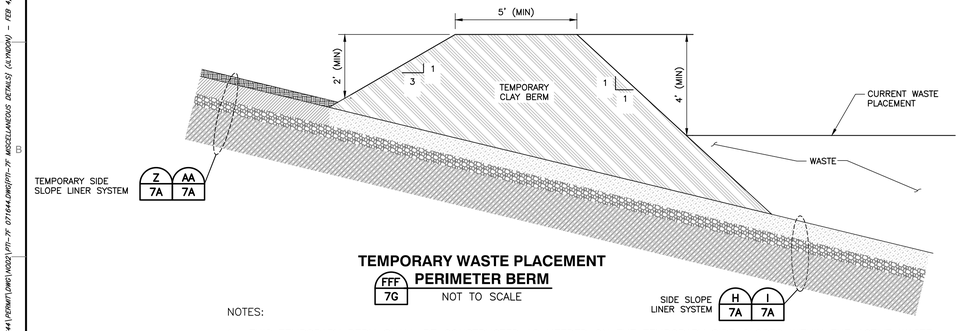


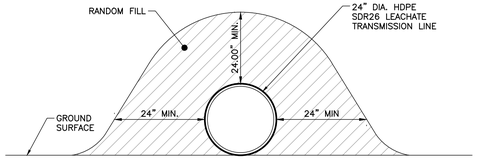
TEMPORARY WASTE PLACEMENT PERIMETER BERM

FFF / 7G

NOT TO SCALE

NOTES:

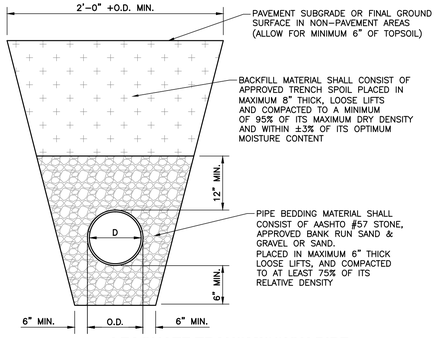
1. THIS TEMPORARY BERM SHALL BE CONSTRUCTED AS NEEDED ON THE TEMPORARY SIDE SLOPES WITHIN THE ACTIVE WASTE PLACEMENT LIMITS, AS DETERMINED BY THE LANDFILL OPERATOR.
2. THE BERM SHALL COLLECT AND CONVEY STORMWATER AWAY FROM THE ACTIVE DISPOSAL AREA.
3. THE LANDFILL OPERATOR SHALL CONFIRM THAT THE TOPSOIL AND/OR STABILIZED SURFACE UP GRADIENT FROM THE BERM AS WELL AS THE BERM CHANNEL IS SUFFICIENTLY COVERING GYPSUM PROTECTIVE COVER (IF PRESENT) ON A REGULAR BASIS.



LEACHATE TRANSMISSION PIPE ABOVE GROUND DETAIL

GGG / 7G

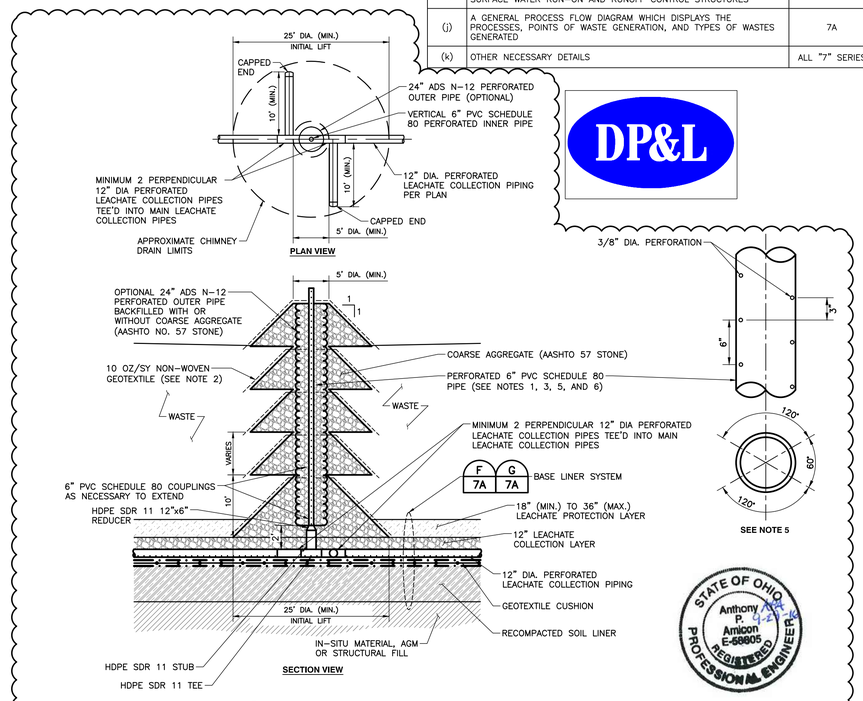
NOT TO SCALE



LEACHATE TRANSMISSION PIPE BELOW GROUND DETAIL

HHH / 7G

NOT TO SCALE



CHIMNEY DRAIN

CCC / 7G

NOT TO SCALE

NOTES:

1. THE INNER VERTICAL PIPE SHALL HAVE A MINIMUM DIAMETER OF 6 INCHES, SHALL BE COMPRISED OF SCHEDULE 80 PVC OR ENGINEER APPROVED EQUIVALENT AND SHALL REMAIN FREE OF AGGREGATE.
2. AS AN ALTERNATIVE TO THE 10 OZ/SY NON-WOVEN GEOTEXTILE, AN AGGREGATE FILTER MAY BE USED.
3. THE OUTER VERTICAL DRAINAGE PIPE SHALL BE A 24 INCH ADS N-12 PERFORATED PIPE OR ENGINEER APPROVED EQUIVALENT.
4. PERFORATED VERTICAL PIPE SHALL BE SET ON COARSE AGGREGATE BASE THAT IS AT LEAST 2-FEET ABOVE GEOTEXTILE WRAP FOR LEACHATE COLLECTION PIPE PRIOR TO WASTE PLACEMENT.
5. THE PERFORATION PATTERN FOR THE INNER AND OUTER VERTICAL DRAINAGE PIPES SHALL BE THE SAME.
6. THE INNER VERTICAL PIPE SHALL BE TEMPORARILY CAPPED TO PREVENT AGGREGATE FROM ENTERING THE PIPE AS PART OF OPERATIONS AND EXTENSION OF THE CHIMNEY DRAIN AGGREGATE.

SUBMITTAL RECORD

NO	DATE	DESCRIPTION
1	04/07/2010	INITIAL PERMIT TO INSTALL APPLICATION

REVISION RECORD

NO	DATE	DESCRIPTION
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4	06/2016	PTI ALTERATION TO REQUEST 2016 DESIGN CHANGES
5	09/2016	PTI ALTERATION REQUEST NO. 4

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DRAWN BY:	JHG	CHECKED BY:	DRAFT	APPROVED BY:	DRAFT
DATE:	MAY 18, 2016	DWG SCALE:	1"=100'	PROJECT NO:	071-644

MISCELLANEOUS DETAILS (SHEET 3 OF 3)

DRAWING NO.: **7G**

SHEET **30B** OF **30**

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