EPC STORMWATER REVIEW COMMENTS ARE SHOWN IN ORANGE BOXES WITH BLACK TEXT

Final Drainage Report

Winsome Subdivision Filing No. 2
El Paso County, Colorado

Prepared for:
Joe DesJardin
Winsome, LLC
1864 Woodmoor Drive, Suite 100
Monument, CO 80132

Prepared by:
Kimley-Horn and Associates, Inc.
2 North Nevada Avenue, Suite 300
Colorado Springs, Colorado 80903
(719) 453-0180
Contact: Brice Hammersland, P.E.

Project #: 196106000

Prepared: June 4, 2021

Kimley»Horn

Add "PCD File No. SF-21-015"

CERTIFICATION

DESIGN ENGINEER'S STATEMENT

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparation of this report.

SIGNATURE (Affix Seal): _____

Colorado P.E. No. 56012 Date

type engineer of records name.

Unresolved. Type your name between the signature line and the Colorado PE No. line.

OWNER/DEVELOPER'S STATEMENT

I, the developer, have read and will comply with all of the requ s Drainage Report and Plan.

_____
Name of Developer

_____
Authorized Signature Date

_____
Printed Name

_____
Title

_____
Address:

EL PASO COUNTY

Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

_____ _____
Jennifer Irvine, P.E. Date
County Engineer/ ECM Administrator

Conditions:

TABLE OF CONTENTS

INTRODUCTION

PURPOSE AND SCOPE OF STUDY

The purpose of this Final Drainage Report (FDR) is to provide the hydrologic and hydraulic calculations and to document and finalize the drainage design methodology in support of the proposed Winsome Subdivision ("the Project") Filing No. 2 ("the Site") for Winsome LLC. The Project is located within the jurisdictional limits of El Paso County ("the County"). Thus, the guidelines for the hydrologic and hydraulic design components were based on the criteria for the County and City of Colorado Springs, described below.

LOCATION

The Project is located approximately 17 miles west of Monument, Colorado within Township 11 South, Range 65 West of the 6th Principal Meridian, County of El Paso, State of Colorado (the "Site"). More specifically, the Site is located north of Hodgen Road, and west of Meridian Road. A vicinity map has been provided in the **Appendix A** of this report.

The Site is currently owned by Winsome, LLC and will be developed by Winsome, LLC.

DESCRIPTION OF PROPERTY

The Project is located on approximately 768 acres of land consisting of vacant land with native vegetation and is classified as "Pasture and Meadow" per Table 6-6 of the City of Colorado Springs Drainage Criteria Manual. Filing No 2 consists of 61 residential lots and a commercial lot. The Site does not currently provide water quality or detention for the Project area. The existing land use is undeveloped vacant land.

The existing topography consists of slopes ranging from 1% to 16%. The West Kiowa Creek ("the Creek") runs in the northwest corner of the site.

NRCS soil data is available for this Site and it has been noted that soils onsite are generally USCS Type B. The NRCS soil data can be found in **Appendix E** as part of the excerpts from the approved PDR. There are no major drainage ways or irrigation facilities within the Site.

Improvements will consist of mowing, clearing and grubbing, weed control, paved access road construction, roadway grading, one detention pond, roadside ditches, culverts, drainage swales, native seeding and a proposed channel to convey flows to the detention pond.

The Site proposes to plat 61 lots for single family development, one commercial lot, as well as, provide the grading, roadway and drainage improvements.

An updated Topographic field survey was completed for the Project by Edward-James Surveying, Inc. dated November 3th, 2020 and is the basis for design for the drainage improvements.

Update narrative to reference the CLOMR case number and include a copy of the CLOMR. A recent email by the developer for an upcoming early assistance meeting for filing 3 indicated that they have obtained a CLOMR. No record of the CLOMR is on file.

Unresolved. Elaborate on the floodplain in the vicinity of the filing. Provide a reference to the floodplain certification letter submitted with this filing.

DRAINAGE BASINS

MAJOR BASIN DESCRIPTIONS

A preliminary drainage report was comple
previously completed by The Vertex Com
Preliminary Drainage Report prepared by
design.

The Site improvements are located outside of the 100-year floodplain as determined by the Flood Insurance Rate Map (FIRM) number 08041C0350G effective date, December 7, 2018 (see **Appendix A**).

The Project is located within El Paso County's West Kiowa C

Add the FEMA Zone A.

Unresolved.

EXISTING SUB-BASIN DESCRIPTIONS

Per the approved Preliminary Drainage Report prepared by The Vertex Companies (PDR). The Site was divided into 2 subbasins Eb and F. Drainage flows from southeast to northwest overland over vacant land to the West Kiowa Creek. Below is a description of the existing sub-basins.

Update. Per the filing 2 plat, portion of the site is also located within basin Dc

Unresolved.

Sub-Basin Eb

Per the approved PDR sub-basin Eb con
southeast corner of the property. Drainag
at
into the West Kiowa Creek. Runoff during the 5-year and 100-year events are 4.0 cfs and 85.8 cfs respectively. Refer to **Appendix E** for the Existing Conditions Drainage Map.

Sub-basin F

Per the approved PDR sub-basin F consists of an on-site area of 44.5 acres, located in the northeast corner of the property. Drainage flows overland from south to north at the West Kiowa Creek. Runoff during the 5-year and 100-year events are 6.6 cfs and 56.6 cfs respectively. Refer to **Appendix E** for the Existing Conditions Drainage Map.

Offsite flows entering the Site from sub-basin Ea will be conveyed through the Site following historical drainage paths and outfall to West Kiowa Creek. Offsite flows from sub-basin Ea will be routed to Pond 5 and detained on site.

Excerpts from the approved PDR for the Existing Drainage Conditions are included in the **Appendix E** of this report for reference.

PROPOSED HEC-HMS SUB-BASIN DESCRIPTIONS

For the proposed condition, stormwater will generally maintain historic flow patterns from southwest to northeast. The proposed roadways will alter some of the existing flow paths. The roadway ditches will capture runoff from the roadways and direct flows back to the existing flow paths, which will ultimately outfall to Pond 5. To determine the design flows for the proposed culverts the existing basins were broken out and design points were created at each culvert crossing location.

The proposed project has been divided into 13 larger sub-basins for the HEC-HMS model and 5 sub basins for rational calculations.

Sub-Basin E0 is an offsite basin on the southeast side of Filing No. 2. Runoff from this basin will be directed to design point E0 where it will be directed to the north in an existing culvert to subbasin E1.1. This sub-basin has an area of 37.9 acres. The curve number for Sub-Basin E0 is 60.00. The basin will generate runoff of 4.9 cfs and 24.6 cfs in the minor and major storm event.

Sub-Basin E1.1 is an onsite basin on the southeast corner of Filing No. 2. The basin will remain unchanged for this report. This basin will drain into an existing swale and outfall into Basin E1.2 as it has done historically. Once developed, future flows will be directed to design point E1.5 through culvert [illegible] of 8.7 acres. The curve number for Sub-Basin [illegible] 7 cfs and 16.6 cfs in the minor and major stor[illegible] pectrum detention pond will be required as part of the development and release at historic flows.

Update. HEC-HMS and drainage map shows this draining to subbasin E3

Sub-Basin E1.2 consists of 4 large lots. Runoff from this basin will be directed to design point E1.2 where it will be directed to the northwest in the proposed culvert E1.2 to subbasin F2. This sub-basin has an area of 15.3 acres. The curve number for Sub-Basin E1.2 is 65.00. The basin will generate runoff of 5.0 cfs and 21.4 cfs in the minor and major storm event.

Sub-Basin E2 consists of a portion of a large residential lot at the southwest corner of Flapjack Lane and Early Light Drive. Runoff from this basin will be directed to design point E2 where it will be directed to the north in the proposed culvert E2 to subbasin E3. This sub-basin has an area of 2.6 acres. The curve number for Sub-Basin E2 is 69.00. The basin will generate runoff of 2.3 cfs and 8.9 cfs in the minor and major storm event.

Sub-Basin E3 consists of 6 large residential lots west of Early Light Drive and south of Rambling Road. Runoff from this basin will be directed to design point E3 where it will be directed to the north in the proposed culvert E3 to subbasin E4. This sub-basin has an area of 19.8 acres. The curve number for Sub-Basin E3 is 66.00. The basin will generate runoff of 7.6 cfs and 33.7 cfs in the minor and major storm event.

Sub-Basin E4 consists of 5 large residential lots west of Early Light Drive and south of Alamar Way. Runoff from this basin will be directed to design point E4 where it will be directed to the north in E4 culvert to subbasin E7. This sub-basin has an area of 18.2 acres. The curve number for Sub-Basin E4 is 66.00. The basin will generate runoff of 7.6 cfs and 33.7 cfs in the minor and major storm event.

Sub-Basin E5 consists of several portions of 7 large residential lots south of Alamar Way near the southern terminus of Clove Hitch Ct. Runoff from this basin will be directed to design point E5 where it will be directed to the north in the proposed culvert E5 to subbasin E6. This sub-basin has an area of 13.5 acres. The curve number for Sub-Basin E5 is 65.00. The basin will generate runoff of 3.9 cfs and 18.4 cfs in the minor and major storm event.

Sub-Basin E6 consists of 3 large residential lots north of Alamar Way. Runoff from this basin will be directed to Channel 10 where it will drain into the full spectrum detention Pond 5 which will outfall into West Kiowa Creek. This sub-basin has an area of 9.3 acres. The curve number for Sub-Basin E6 is 63.00. The basin will generate runoff of 2.7 cfs and 14.1 cfs in the minor and major storm event.

Sub-Basin E7 consists of several portions of 5 large residential lots on the north side of the site

and west of Early Light Drive. Runoff from this basin will be directed to Channel E4 which drains to Channel 10. Channel 10 will convey flows into the full spectrum detention Pond 5 which will outfall into West Kiowa Creek. This sub-basin has an area of 10.2 acres. The curve number for Sub-Basin E7 is 65.00. The basin will generate runoff of 3.3 cfs and 16.1 cfs in the minor and major storm event.

Sub-Basin E8 consists [illegible] nd 5. Runoff from this basin [illegible] trum detention Pond 5 which [illegible] basin accounts for the future [illegible] **ix C** for the basin area calcul[illegible] er for Sub-Basin E8 is 62.00. [illegible] and major storm event.

Since this is not going into a WQ facility include a narrative identifying the applicable exclusion from WQ. See ECM Appendix I Section I.7.1.B. for excluded sites.
Provide said narrative for all sub-basins that does not drain to a WQ facility. Make sure to cite the specific criteria.

Likely exclusions that would apply is #5 Large Lot Single Family Sites and/or #7 Sites w/ land disturbance to undeveloped land that will remain undeveloped.

Sub-Basin E9 consists [illegible] ll be directed to West Kiowa [illegible] a of 3.82acres. The curve number for Sub-Basin E9 is 61.00. The basin will generate runoff of 0.3 cfs and 5.8 cfs in the minor and major storm event.

Sub-Basin F1 consists of 7 large residential lots on the east of Early Light Drive and west of Meridian Road as well as a portion of Early Light Drive. Runoff from this basin will be directed to an existing drainage channel which flows offsite and outfalls into West Kiowa Creek. This sub-basin has an area of 32.1 acres. The curve number for Sub-Basin F1 is 62.00. The basin will generate runoff of 8.1 cfs and 36.6 cfs in the minor and major storm event. When comparing the proposed results to the outfall location of F1 to the existing conditions sub-basin F. The total proposed peak flows for basin F1 and F3 total 51.1 cfs. This is below the existing conditions flow that was determined for basin F which resulted in a peak flow of 56.6 cfs. Runoff reduction is being accounted for to meet water quality requirements for the roadway runoff within this basin. Refer to the runoff reduction section for additional information.

Sub-Basin F2 consists of 2 [illegible] ace and Early Light Drive. Runoff [illegible] will be directed to the northwest in [illegible] an area of 4.4 acres. The curve nu [illegible] ff of 2.2 cfs and 8.6 cfs in the minor [illegible]

Elaborate on the conveyance. Is this to be contained within the roadside ditch or does the culvert discharge across Lot 38? If it discharges across Lot 38 then a drainage easement must be provided along the drainage path.

Sub-Basin F3 consists of 3 large residential at the northeast corner of the site along Meridian Road. Runoff from this basin will be directed to an existing drainage channel which flows offsite and outfalls into West Kiowa Creek. This sub-basin has an area of 9.6 acres. The curve number for Sub-Basin F2 is 63.00. The basin will generate runoff of 2.2 cfs and 14.5 cfs in the minor and major storm event. As previously mentioned the total proposed peak flows for basin F1 and F3 total 51.1 cfs. This is below the existing conditions flow that was determined for basin F which resulted in a peak flow of 56.6 cfs. Runoff reduction is being accounted for to meet water quality requirements for the roadway runoff within this basin. Refer to the runoff reduction section for additional information.

Per PDR sub-basin D1.2 is an off-site basin to the south of Hodgen Road consisting of agricultural land and large residential lots. Runoff from this basin will be directed to an existing culvert under Hodgen Road where it will be directed to subbasin D3. This sub-basin has an area of 49.90 acres. The curve number for Sub-Basin D1.2 is 60.00. The basin will generate runoff of 5.7 cfs and 34.1 cfs in the minor and major storm event.

Please add a sentence stating F3 is excluded from PBMPs because it is undeveloped land where undeveloped land remains undeveloped following construction activities.

Per PDR sub-basin D3 is an off-site basin consisting of 12 undeveloped, large residential lots. Runoff from this basin will be directed to design point O1 where it will be directed to the north in O1 culvert to subbasin D4. This sub-basin has an area of 41.20 acres. The curve number for Sub-Basin D3 is 64.00. The basin will generat
major storm event.

Provide an intro paragraph to explain why some of the drainage basins under the HEC-HMS was further subdivided to include these "DA#" subbasins.

Per PDR sub-basin D4 is an off-site basin co
Runoff from this basin will be directed to d
northwest in O2 culvert to an existing drainag
This sub-basin has an area of 34.30 acres. T
basin will generate runoff of 7.7 cfs and 44.8 c

PROPOSED RATIONAL SUB-BASIN DESCRIPTIONS

Sub-Basin DA1 consists of portions of 1 residential lots at the southwest corner of FlapJack Lane and Early Light Drive. Runoff from this basin will be directed into design point E2. Where it will be directed to the north in the proposed E2 culvert to subbasin E3. This sub-basin has an area of 1.11 acres. The impervious value for Sub-Basin DA1 is 19%. The basin will generate runoff of 0.98 cfs and 3.82 cfs in the minor and major storm event.

Sub-Basin DA2 consists of portions of large residential lots south of Rambling Road. Runoff from this basin will be directed into design point E3. Where it will be directed to culvert E3 and outfall into Channel E3. This sub-basin has an area of 8.16 acres. The impervious value for Sub-Basin DA2 is 10%. The basin will generate runoff of 3.08 and 16.11 cfs in the minor and major storm event.

Sub-Basin DA3 consists of portions of large residential lots located in the north side of the site, south of Alamar Way. Runoff from this basin will be directed into design point E5 and where it will be directed to the north in the proposed culvert E5 to Channel 9. This sub-basin has an area of 2.09 acres. The impervious value for Sub-Basin DA3 is 10%. The basin will generate runoff of 0.80 cfs and 4.19 cfs in the minor and major storm event.

Sub-Basin DA4 consists of 4 large residential lots located in the north side of the site, south of Alamar Way. Runoff from this basin will be directed into design point E5 and where it will be directed to the north in the proposed culvert E5 to Channel 9. This sub-basin has an area of 10.54 acres. The impervious value for Sub-Basin DA4 is 8%. The basin will generate runoff of 3.68 cfs and 21.00 cfs in the minor and major storm event.

Sub-Basin DA5 consists of portions of large residential lots located in the north side of the site, south of Alamar Way. Runoff from this basin will be directed into design point E5 and where it will be directed to the north in the proposed culvert E5 to Channel 9. This sub-basin has an area of 3.00 acres. The impervious value for Sub-Basin DA5 is 14%. The basin will generate runoff of 1.53 cfs and 7.00 cfs in the minor and major storm event.

DRAINAGE DESIGN CRITERIA

DEVELOPMENT CRITERIA REFERENCE

The proposed storm facilities are designed to be in compliance with the City of Colorado Springs and El Paso County “Drainage Criteria Manual (DCM)” dated October 2018 (”the MANUAL”), El Paso County “Engineering Criteria Manual” (“the Engineering Manual”), Chapter

6 and Section 3.2.1 of Chapter 13 of the City of Colorado Springs Drainage Criteria Manual dated May 2014 ("the Colorado Springs MANUAL").

Site drainage is not significantly impacted by such constraints as utilities or existing development.

A preliminary drainage report was completed for the overall Winsome subdivision. This was previously completed by The Vertex Companies. This Final Drainage Report used the approved Preliminary Drainage Report prepared by The Vertex Companies (PDR) for the Site's final design. The proposed release rate for Pond 5 are less than what was determined in the PDR.

HYDROLOGIC CRITERIA

The 5-year and 100-year design storm events were used in determining rainfall and runoff for the proposed drainage analysis per the MANUAL. Table 6-2 of the Colorado Springs MANUAL is the source for rainfall data for the 5-year and 100-year design storm events. Design runoff was calculated using the NRCS curve number method for developed conditions as established in the MANUAL. This aligns with what was completed in the PDR. The NRCS curve number method was used for existing conditions and proposed conditions due to the on-site and off-site basins containing more than 130 acres. Per the PDR the runoff curve numbers for the existing and proposed drainage basins used the curve numbers in DCM. The PDR developed the following values for the 2 ½ and 5 acre lots in **Table 1** below. These values were also used for the final design in this report.

Table 1: ***Values Extrapolated per the PDR***

		Soil Type			
Lot Size (Acres)	**% Imp**	**A**	**B**	**C**	**D**
2 /12	11	N/A	64	76	81
5	7	N/A	60	72	77

The rainfall depths that were determined in the PDR were also used for the final design. The rainfall depths utilized the Frontal Storm which produced higher design flows. See **Table 2** below for the Frontal Storm rainfall values.

Table 2: ***Frontal Storm Rainfall Depths***

	Duration (HRS)	
Storm Event	**1 HR**	**24 HR**
5 Year	1.5	2.7
100 Year	2.52	4.6

Calculations for the composite curve numbers are included in the **Appendix C**. Rational method peak flows were determined to size proposed ditch channels. The rational calculations utilized the frontal storm values of 1.5 inches and 2.52 inches for a 1-hour storm, for the 5-year and 100-year storms respectively.

The proposed impervious values were determined in the PDR and were utilized in this report for the final design.

The Site is providing one full spectrum detention pond as the Site is not significantly increasing the imperviousness of the Site, the Project is maintaining the historic drainage patterns as much as possible and not significantly increasing developed flows.

There are no additional provisions selected or deviations from the criteria in both the MANUAL and Colorado Springs MANUAL.

HYDRAULIC CRITERIA

Applicable design methods were utilized to size the proposed pond, culverts, and drainage channels, which includes the use of the UD-Detention spreadsheet, rational calculations spreadsheet, HY-8 and FlowMaster, V8i software.

Proposed drainage features on-site have been analyzed and sized for the following design storm events:

- Major Storm: 100-year Storm Event

For the stormwater modeling for the Site was completed utilizing the NRCS Curve Number Method as required by the City of Colorado Springs. The Rational Method peak flows were determined to size the proposed culverts and channels. The same assumptions were kept from the PDR for the time of concentration calculations. **Table 3** below outlines these assumptions from the PDR:

Table 3: *Time of Concentration Assumptions*

	Shape	Side Slope	Depth (ft)	Wetted Perimeter (ft)	Cross Sectional Area (sq. ft.)
< 100 Acre Basin Channels	Triangular	4:1	4	32.98	64
>100 Acre Basin Channels	Triangular	4:1	3	24.74	36

For the conveyance flow paths the same assumptions and method was carried through from the PDR. These flow paths were for between the basin and the main channels and used 3 profiles. Per the PDR the 3 profiles utilized are as follows: “triangular profiles were used for the majority of the conveyance channels, larger branching tributaries with an 8 ft bottom, and the main channels were modeled as trapezoidal with a 20 ft bottom.”

One full spectrum detention pond is proposed in order to maintain historic flows and water quality. It is known as Pond 5. Pond 5 is located in the northwest corner of the Site with a proposed volume of 6.973 ac-ft and discharge rate of 94.4 cfs into the West Kiowa Creek. Pond calculations are provided in the **Appendix D**. For Pond 5 a rock chute is proposed with a downstream stilling basin to dissipate the energy of the flow being conveyed into the pond through the rock chute. The stilling basin will have dual purposes one to assist in dissipating the energy before out fallin structure. The concrete lined trickle ch pool. The outlet

Elaborate on the pond design process. Explain how you merged the UD-Detention design to the overall HEC-HMS/EPASWMM model.

structure is design to provide full spectrum characteristics. The 100-year storm volume will be released via 42" RCP. An emergency spillway is proposed that will convey the 100-year flow in less than 1' of flow depth. The outlet structure has been designed to provide a minimum of 1' of freeboard. A 15' wide access road is proposed from the right-of-way to the bottom of the pond for maintenance. The pond reduces proposed flows at the main outfall below historic levels relative to the impact of Filing 2. It should be noted that proposed basins F1 and F3 will not be directed to Pond 5. Instead they will maintain the historic flow patterns and outfall points at the northeast corner of the site. Both basins outfall to the proposed HEC-HMS node Out-1 and then to node Reach 6 Kiowa Creek Outfall. When comparing the proposed Reach 6 Kiowa Creek Outfall node to the existing conditions model Reach-5. The proposed 100-year peak flow (2,035.2 cfs) remain less than the existing conditions peak flow (2,470 cfs). It should be noted when the commercial lot does get developed the site will be required to construct a detention pond as part of the development.

Channels and roadside ditches are designed to carry flows to Pond 5. The channels have varying bottom widths, and slopes, with equal 4:1 side slopes. The channel sizing and capacity calculations are provided in the **Appendix D** and channel design point are provided in the Proposed Drainage Maps

Roadside ditches are provided along the proposed roadways to route flows to the proposed culverts. The roadside ditches are sized to convey the major event flow. The majority of the roadside ditches have been designed to have an average depth of approximately 3 feet, a v-ditch, a left-side slope of 4:1, and a right-side slope of 4:1. Roadside ditch sizing and capacity calculations are provided in the **Appendix D**.

Culverts were sized to convey flows from the ditches and channels, underneath the Site's paved roads. The proposed culverts range in diameter from 18" to 48" and have been designed to convey the 100-year storm event. Culvert calculations are provided in the **Appendix D** and culvert locations are provided in the Proposed Drainage Maps.

THE FOUR STEP PROCESS

The Project was designed in accordance with the four-step process to minimize adverse impacts of urbanization, as outlined in Chapter 1 Section 4.0 of the Colorado Springs MANUAL.

Step 1. **Employ Runoff Reduction Practices**- The project is proposing a low-density residential development that will be designed to minimize the impact to the current existing terrain. The Site's proposed paved roadways will increase the Site's impervious area however roadside ditches and channels will be constructed to slow down the runoff velocity and reduce runoff peaks. The one full spectrum detention pond will be used to capture stormwater and maintain flows discharging off site at or below historic levels. For portions of (Early Light Drive and Woodbridge Terrace) runoff reduction has been employed by removing the ditch on the downhill side of the road and sending stormwater that contacts the road across a receiving previous area

Step 2. Implement BMPs That Provide a Water Quality Capture Volume with Slow Release –Permanent water quality measures and detention facilities will be necessary for the Project. Temporary water quality and erosion control measures will be provided during construction to prevent sediment laden water from discharging from the Site. Water quality measures are being used for all stormwater that contacts roadways.

Step 3 Stabilize Drainageways– Stabilizing proposed roadside ditches, swales, and channels by designing them with slopes that control the flow rates. Placement of riprap upstream and downstream of culverts to help reduce erosion of the roadside ditches. Rock chutes will be constructed to reduce the velocities of runoff entering the pond at the channel locations. We anticipate this will minimize erosion. Existing drainage ways have been graded to reduce the velocity of the water to minimize erosion. The existing natural channels have been analyzed for width and velocity for the 100-year storm event. Easements are proposed to accommodate the full width of the major storm event.

Step 4. Implement Site Specific and Other Source Control BMPs – The erosion control construction BMPs of the Project were designed to reduce contamination. Source control BMPs include the use of vehicle tracking control, culvert protection, stockpile management, and stabilized staging areas.

DRAINAGE FACILITY DESIGN

GENERAL CONCEPT

The proposed drainage patterns will match the historic patterns. To maintain historic flows, one full spectrum detention pond is being proposed and will capture and control the flows from the proposed development into a series of channels and culverts.

Provided in the **Appendix C** are hydrologic calculations utilizing the NRCS/HEC-HMS method for the proposed conditions. Provided in **Appendix D** are the hydraulic calculations for the proposed conditions HY-8 culvert calculations, Flowmaster details and cross sections for proposed drainage features. As previously mentioned the and existing drainage map can be found in **Appendix E** and the proposed drainage maps can be found in **Appendix B**.

SPECIFIC DETAILS

The existing conditions of the Site have flows conveying from the southeast to the northwest and discharging in the West Kiowa Creek. Runoff conditions for the Site were developed utilizing the previously referenced Hydrologic Criteria per the approved PDR for the Winsome subdivision. The proposed development looks to preserve the natural drainage patterns as much as possible.

Sub-basins E1.1 through E7, F1 and F2 consist of future residential lots, one commercial lot, and paved roadways. All basins have flows being captured and conveyed onsite with the exception of F1 and F3. Flows are conveyed from the southeast corner of the Site to the northwest corner through existing channels, roadside ditches, culverts and constructed channels. On site flows enter Pond 5 which then discharges into the West Kiowa Creek.

A Proposed Drainage Conditions Map and hydrologic calculations are included in the **Appendix B, Appendix C,** and **Appendix D** of this report for reference.

The Site will disturb more than 1 acre and will require a Colorado Discharge Permit System (CDPS) General Permit for Stormwater Discharge Associated with Construction Activities from the Colorado Department of Public Health and Environment (CDPHE).

There are no current drainage and fees for the Project as the West Kiowa Creek Drainage Basin is not part of the El Paso County Drainage Basin Fee Program.

update. "...drainage and bridge fees..."

RUNOFF REDUCTION

Runoff reduction was implemented in two select areas of the site. The north east portion of Woodbridge Terrace, and the north portion of Early Light Drive have the road travel perpendicular to grade, therefore the roadside ditch has been removed on the downhill side of the road. All roadway runoff at these sections can be treated using the receiving pervious area between the roadway boundary and property line. Runoff reduction calculations and locations are provided in the **Appendix D.**

DRIVEWAY CULVERTS

Culverts were analyzed and sized for driveway crossings at each ditch crossing from the roadways. Design assumptions were made for the culverts to have a max slope of 2%. Refer to **Appendix D** for the driveway culvert calculations.

EXISTING MINOR DRAINAGE CHANNELS

The existing drainage channels within Filing 2 were analyzed to determine top widths for proposed easements and velocities for erosion. Proposed regrading of existing drainage channels E4 and E3 will be proposed as part of this Filing 2. All existing channels are fully vegetated and channels E4 and E3 will be reseeded as part of this Filing. RipRap protection is proposed on the outer bend of channel E4 to reduce the potential of erosion in this location. Per MHFD criteria a maximum velocity of 7 fps is allowed, and all channels onsite are below this level. Refer to **Appendix D** for the channel calculations.

SUMMARY

The proposed drainage design is to maintain the historic drainage patterns, the overall imperviousness and release rates for the Site. Runoff from the Site will flow overland to existing El Paso County drainage basins: The West Kiowa Creek Basin. The basin ultimately discharges to the West Kiowa Creek. The drainage design presented within this report conforms to the criteria presented in both the MANUAL and the Colorado Springs MANUAL. Additionally, the Site runoff and storm drain facilities will not adversely affect the downstream and surrounding developments, including West Kiowa Creek.

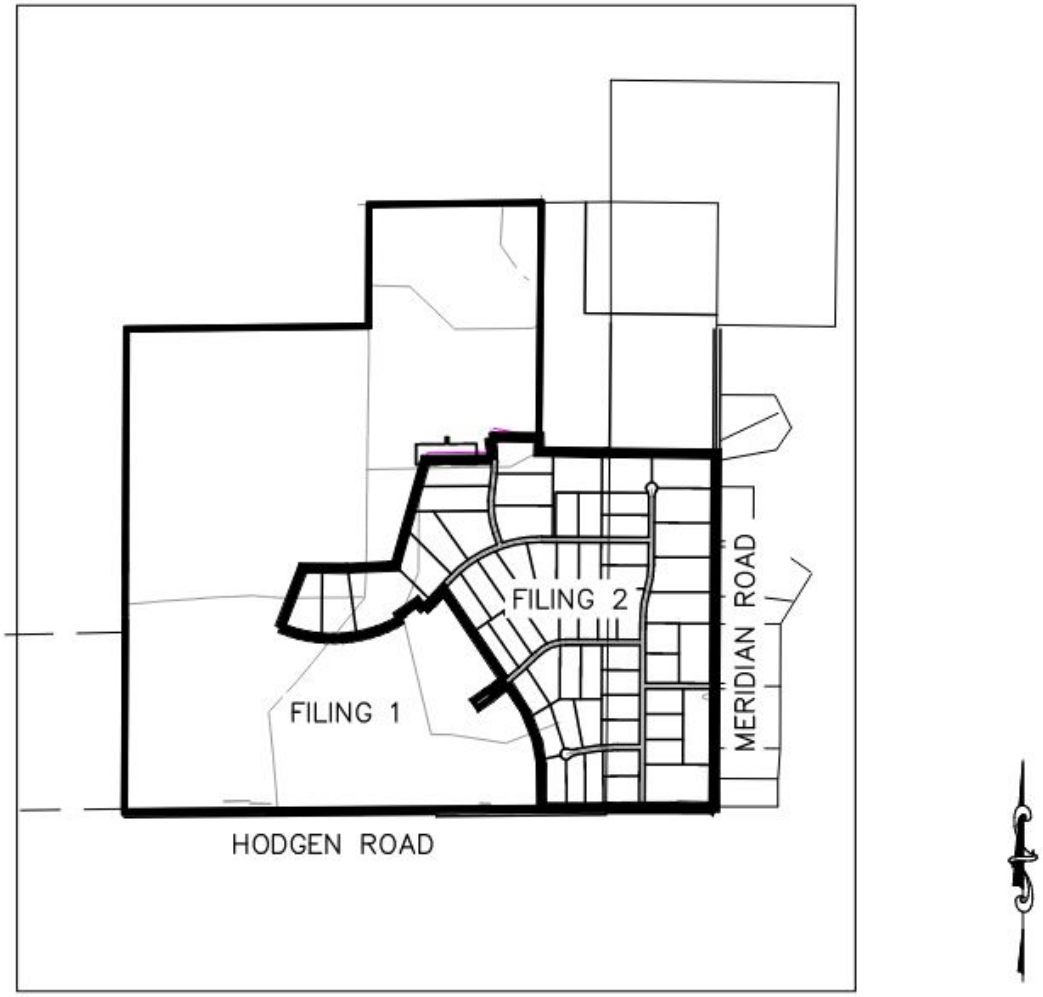
REFERENCES

1. City of Colorado Springs “Drainage Criteria Manual (DCM) Volume 1”, dated May, 2014
2. El Paso County “Drainage Criteria Manual”, dated October 31, 2018
3. El Paso County “Engineering Criteria Manual” Revision 6, dated December 13, 2016
4. Chapter 6 and Section 3.2.1. of Chapter 13-City of Colorado Springs Drainage Criteria Manual, May 2014.
5. Urban Drainage and Flood Control District Drainage Criteria Manual (UDFCDCM), Vol. 1, prepared by Wright-McLaughlin Engineers, June 2001, with latest revisions.
6. Flood Insurance Rate Map, El Paso County, Colorado and Incorporated Areas, Map Number 08041C0507F and 08041C0530F, Effective Date March 17, 1997, prepared by the Federal Emergency Management Agency (FEMA).
7. Winsome Subdivision Preliminary Drainage Report (PDR), prepared by The Vertex Companies, Inc, May 15, 2019.

Add (PCD File No SP-18-006)

APPENDIX

APPENDIX A: FIGURES



VICINITY MAP

1"=2,000'

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the **North American Vertical Datum of 1988 (NAVD88)**. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was provided in digital format by El Paso County, Colorado Springs Utilities, City of Fountain, Bureau of Land Management, National Oceanic and Atmospheric Administration, United States Geological Survey, and Anderson Consulting Engineers, Inc. These data are current as of 2006.

This map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles and Floodway Data Tables if applicable, in the FIS report. As a result, the profile baselines may deviate significantly from the new base map channel representation and may appear outside of the floodplain.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

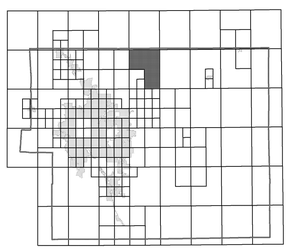
Contact **FEMA Map Service Center** (MSC) via the FEMA Map Information eXchange (FMIX) 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The MSC may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

El Paso County Vertical Datum Offset Table

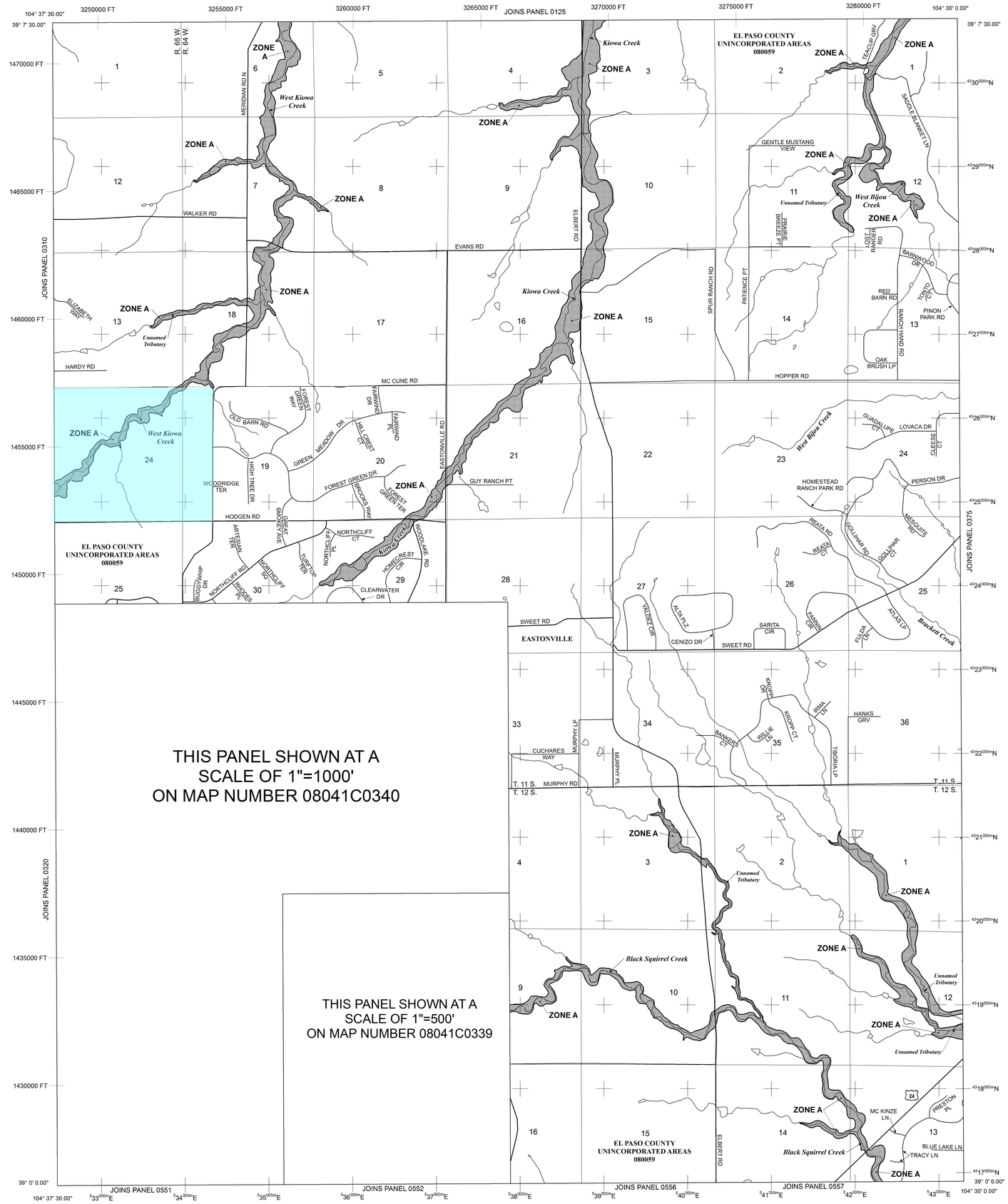
Flooding Source	Vertical Datum Offset (ft)
REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY FOR STREAM BY STREAM VERTICAL DATUM CONVERSION INFORMATION	

Panel Location Map



This Digital Flood Insurance Rate Map (DFIRM) was produced through a Cooperating Technical Partner (CTP) agreement between the State of Colorado Water Conservation Board (CWCB) and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard information and resources are available from local communities and the Colorado Water Conservation Board.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area Formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain boundary
	Floodway boundary
	Zone D Boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A	Cross section line
23 - - - - - 23	Transect line
97° 07' 30.00" 32° 22' 30.00"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000mN	1000-meter Universal Transverse Mercator grid ticks, zone 13
6000000 FT	5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'

1000 0 2000 4000 FEET

600 0 600 1200 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0350G

FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY, COLORADO
AND INCORPORATED AREAS

PANEL 350 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO COUNTY	080059	0350	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

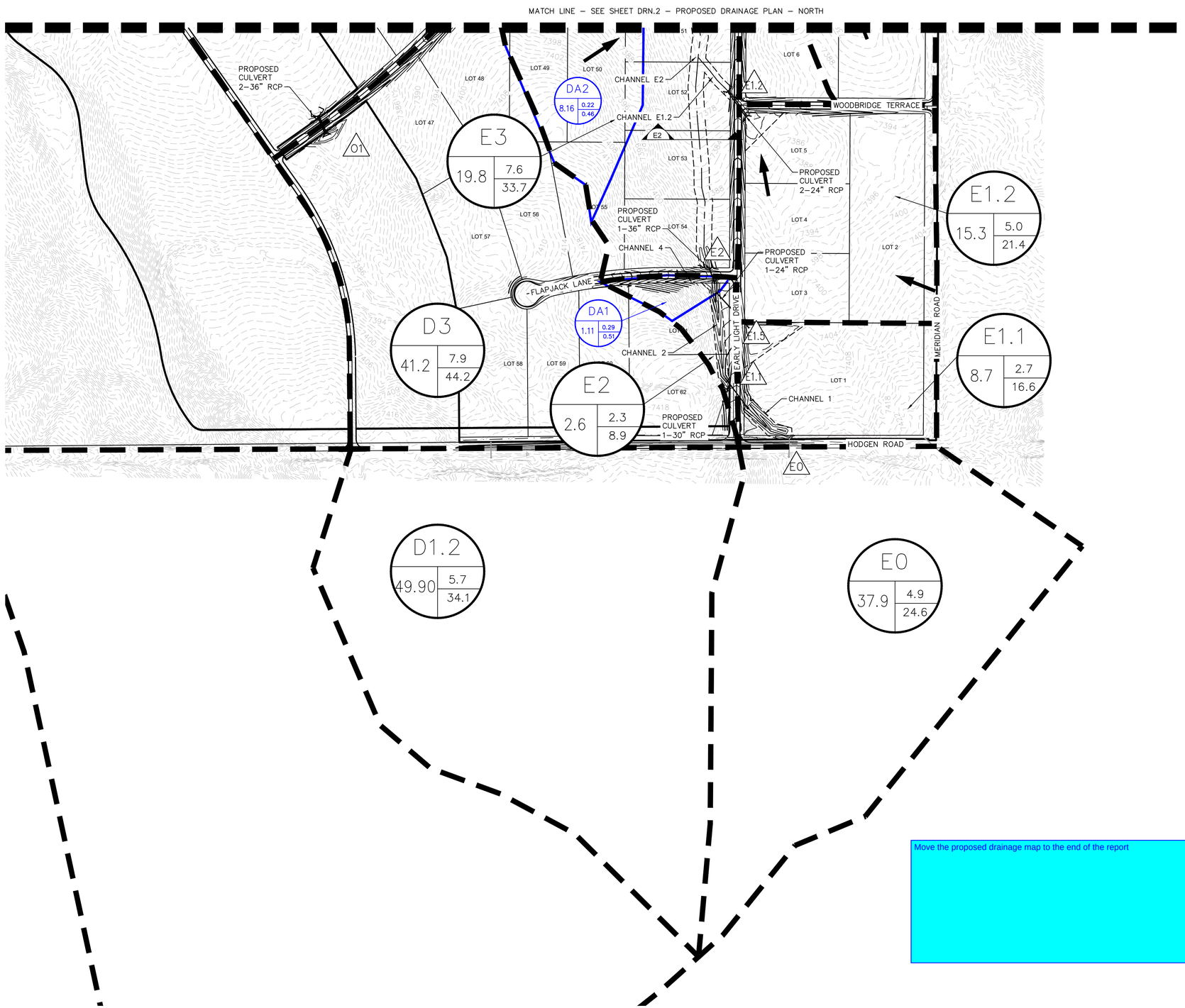
MAP NUMBER
08041C0350G

MAP REVISED
DECEMBER 7, 2018

Federal Emergency Management Agency

APPENDIX B: DRAIANGE MAPS

Move the proposed drainage map to the end of the report



LEGEND

DRAINAGE BASIN AREAS

DRAINAGE SUB–BASIN AREAS

A – HEC–HMS BASINS
B – BASIN ACREAGE
C – 5–YR RUNOFF
D – 100–YR RUNOFF

A – RATIONAL METHOD BASINS
B – BASIN ACREAGE
C – 5–YR RUNOFF COEFF
D – 100–YR RUNOFF COEFF

CULVERT DESIGN POINT

EXISTING CONTOURS

PROPOSED CONTOURS

FLOW ARROW

CHANNEL CROSS SECTION

DEVELOPED RUNOFF					
Design Point	Basin	Direct Runoff (CFS)		Routed Flowrates (CFS)	
		Q5	*Q100*	*Q5*	*Q100*
	E1.1	2.7	16.60		
E1.5	E1.1			2.70	16.6
	E1.2	5.0	21.4		
E1.2*	E1.2			5.00	21.40
	E0	4.9	24.6		
E1.1	E0			4.9	24.6
	E2	2.3	8.90		
E2	E0+E1.1+E2			7.30	36.60
	E3	7.6	33.7		
E3	E1.1+E1.2+E0+E2+E3			18.60	84.60
F2	F2	2.2	8.60		
	E4	6.3	27.00		
E4	DP_E3+F2+E4			26.60	117.60
	E7	3.3	16.20		
E5	E5	3.9	18.40	3.90	18.40
E6	E6	2.7	14.10	30.30	137.30
E8	E8	5.2	25.60		
Pond 5	DP_E4+E5+E6+E7			35.30	160.90

*In existing conditions culvert E1.2 will receive flows from E1.1 and E1.2 but once Basin E1.2 is developed, flows will be directed to E1.5

Move the proposed drainage map to the end of the report

NORTH

GRAPHIC SCALE IN FEET
0 100 200 400

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2021 KIMLEY–HORN AND ASSOCIATES, INC.
2 N NEVADA AVE, SUITE 300, COLORADO SPRINGS, CO 80903
PHONE: 719–453–0180
WWW.KIMLEY–HORN.COM

LICENSED PROFESSIONAL
KEVIN KOFFORD
CO LICENSE NUMBER 57234
DATE: ____

KHA PROJECT 019610600
DATE 01/08/2021
SCALE AS SHOWN
DESIGNED BY KHTAM
DRAWN BY KHTAM
CHECKED BY TLC

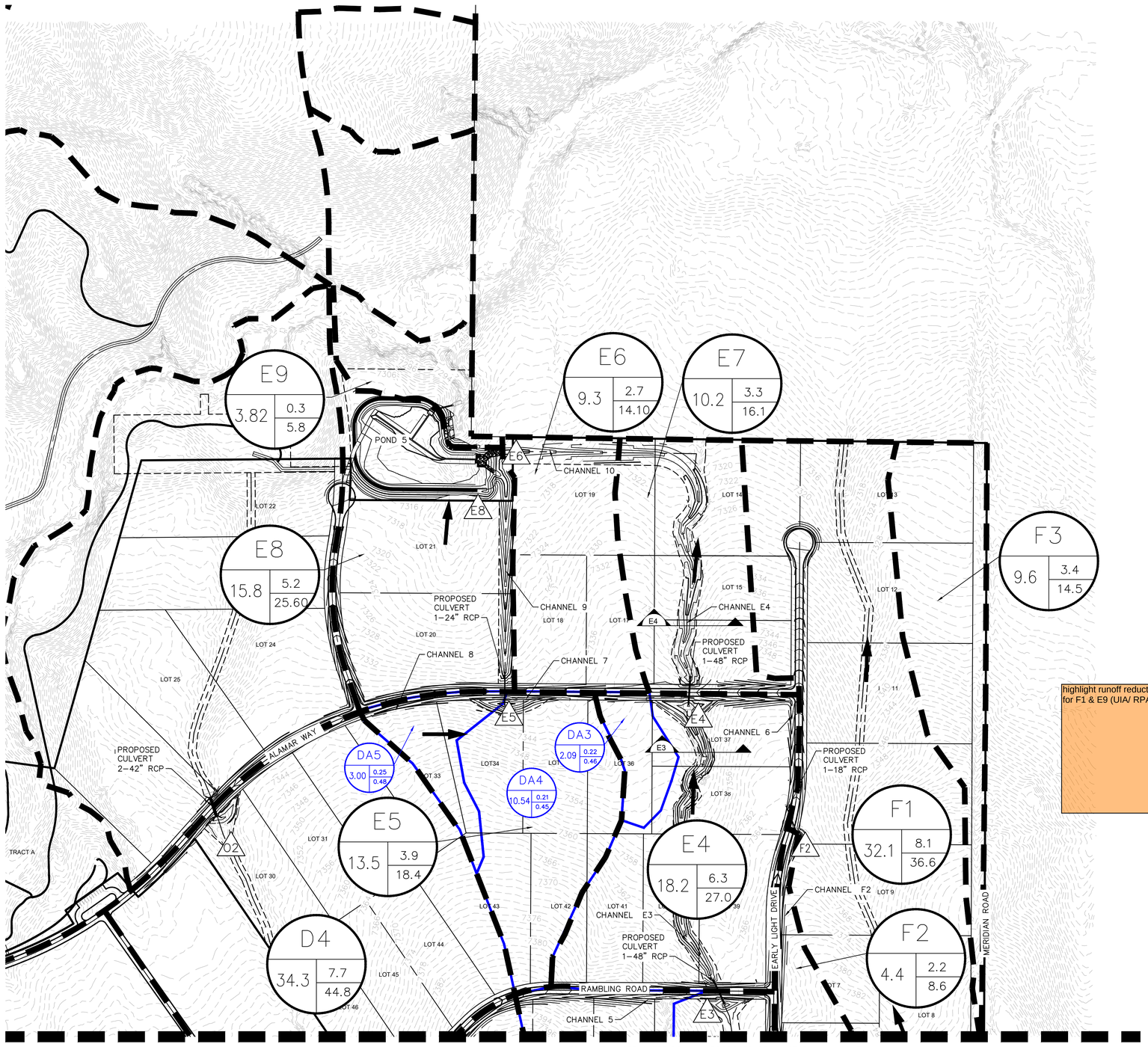
PROPOSED DRAINAGE MAP - SOUTH

WINSOME FILING NO. 2
PREPARED FOR
WINSOME LLC

EL PASO COUNTY CO

SHEET NUMBER
DRN.1

Move the proposed drainage map to the end of the report



highlight runoff reduction areas for F1 & E9 (UIA/ RPA)

DRAINAGE BASIN AREAS

DRAINAGE SUB–BASIN AREAS

A – HEC–HMS BASINS
B – BASIN ACREAGE
C – 5–YR RUNOFF
D – 100–YR RUNOFF

A – RATIONAL METHOD BASINS
B – BASIN ACREAGE
C – 5–YR RUNOFF COEFF
D – 100–YR RUNOFF COEFF

CULVERT DESIGN POINT

EXISTING CONTOURS

PROPOSED CONTOURS

FLOW ARROW

CHANNEL CROSS SECTION

DEVELOPED RUNOFF					
Design Point	Basin	Direct Runoff (CFS)		Routed Flowrates (CFS)	
		Q5	*Q100*	*Q5*	*Q100*
	E1.1	2.7	16.60		
E1.5	E1.1			2.70	16.6
	E1.2	5.0	21.4		
E1.2*	E1.2			5.00	21.40
	E0	4.9	24.6		
E1.1	E0			4.9	24.6
	E2	2.3	8.90		
E2	E0+E1.1+E2			7.30	36.60
	E3	7.6	33.7		
E3	E1.1+E1.2+E0+E2+E3			18.60	84.60
F2	F2	2.2	8.60		
	E4	6.3	27.00		
E4	DP_E3+F2+E4			26.60	117.60
	E7	3.3	16.20		
E5	E5	3.9	18.40	3.90	18.40
E6	E6	2.7	14.10	30.30	137.30
E8	E8	5.2	25.60		
Pond 5	DP_E4+E5+E6+E7			35.30	160.90

*In existing conditions culvert E1.2 will receive flows from E1.1 and E1.2 but once Basin E1.2 is developed, flows will be directed to E1.5

NORTH

GRAPHIC SCALE IN FEET
0 100 200 400

No.	REVISIONS	DATE	BY

Kimley»Horn

2 N NEVADA AVE, SUITE 300, COLORADO SPRINGS, CO 80903
PHONE: 719–453–0180
WWW.KIMLEY–HORN.COM

LICENSED PROFESSIONAL
KEVIN KOFFORD
CO LICENSE NUMBER 57234
DATE:

KHA PROJECT 019610600
DATE 01/08/2021
SCALE AS SHOWN
DESIGNED BY KHTAM
DRAWN BY KHTAM
CHECKED BY TLC

PROPOSED DRAINAGE MAP - NORTH

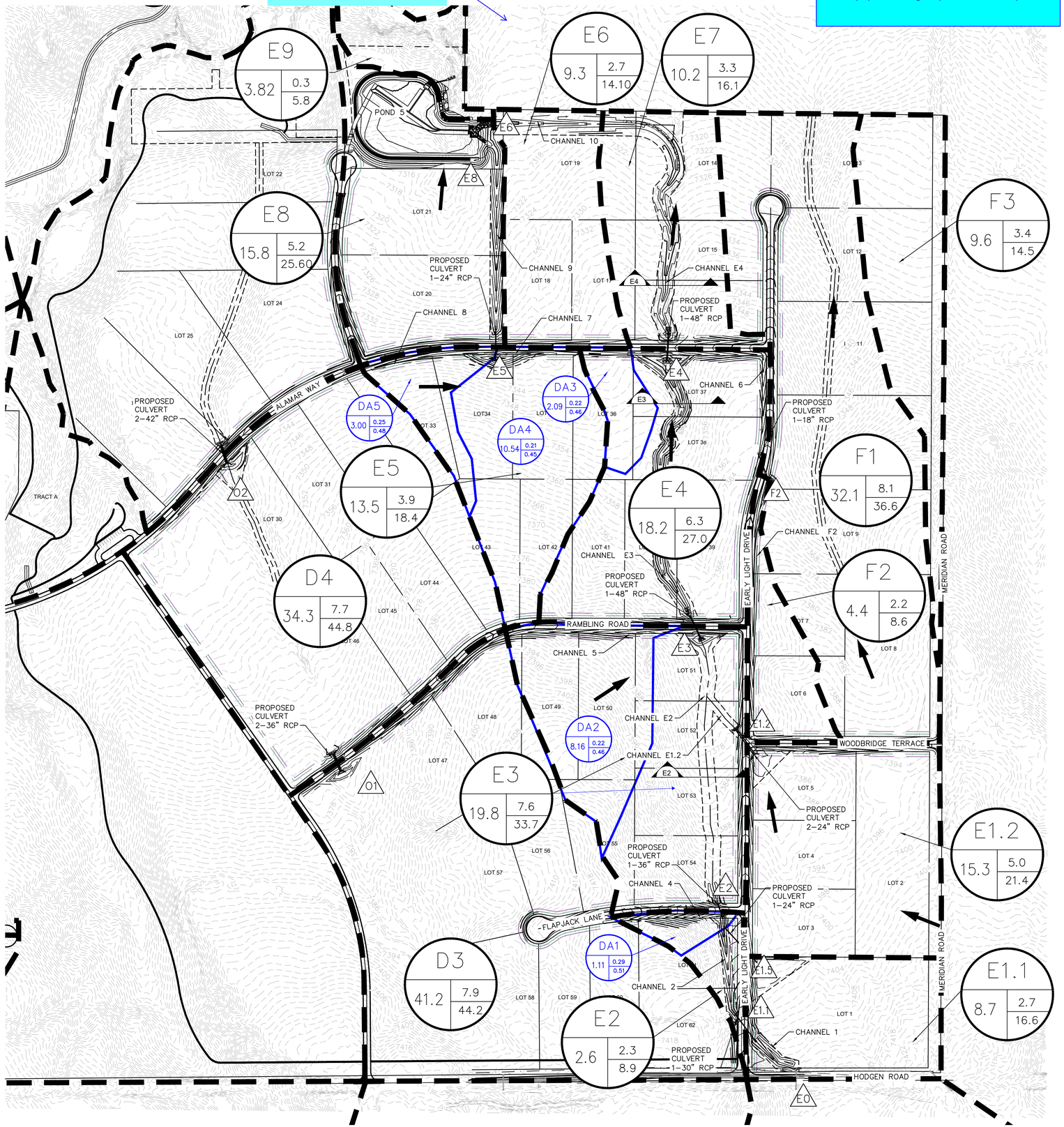
WINSOME FILING NO. 2
PREPARED FOR
WINSOME LLC

EL PASO COUNTY CO

SHEET NUMBER
DRN.2

Extend the viewport and provide a design point/label for Out-1 and Reach 6.

Move the proposed drainage map to the end of the report



LEGEND

DRAINAGE BASIN AREAS

DRAINAGE SUB–BASIN AREAS

A – DRAINAGE BASIN
B – BASIN ACREAGE
C – 5–YR RUNOFF
D – 100–YR RUNOFF

A – DRAINAGE BASIN
B – BASIN ACREAGE
C – 5–YR RUNOFF COEFF
D – 100–YR RUNOFF COEFF

E0 CULVERT DESIGN POINT

EXISTING CONTOURS

Add a footnote explaining the difference between these two.

PROPOSED CONTOURS

FLOW ARROW

E4 CHANNEL CROSS SECTION

DEVELOPED RUNOFF					
Design Point	Basin	Direct Runoff (CFS)		Routed Flowrates (CFS)	
		Q5	*Q100*	*Q5*	*Q100*
	E1.1	2.7	16.60		
E1.5	E1.1			2.70	16.6
	E1.2	5.0	21.4		
E1.2*	E1.2			5.00	21.40
	E0	4.9	24.6		
E1.1	E0			4.9	24.6
	E2	2.3	8.90		
E2	E0+E1.1+E2			7.30	36.60
	E3	7.6	33.7		
E3	E1.1+E1.2+E0+E2+E3			18.60	84.60
F2	F2	2.2	8.60		
	E4	6.3	27.00		
E4	DP_E3+F2+E4			26.60	117.60
	E7	3.3	16.20		
E5	E5	3.9	18.40	3.90	18.40
E6	E6	2.7	14.10	30.30	137.30
E8	E8	5.2	25.60		
Pond 5	DP_E4+E5+E6+E7			35.30	160.90

*In existing conditions culvert E1.2 will receive flows from E1.1 and E1.2 but once Basin E1.2 is developed, flows will be directed to E1.5

Add Out-1 design point

Add a pond summary table

NORTH

GRAPHIC SCALE IN FEET
0 100 200 400

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2021 KIMLEY–HORN AND ASSOCIATES, INC.
2 N NEVADA AVE, SUITE 300, COLORADO SPRINGS, CO 80903
PHONE: 719–453–0180
WWW.KIMLEY–HORN.COM

LICENSED PROFESSIONAL
KEVIN KOFFORD
CO LICENSE NUMBER 57234
DATE:

KHA PROJECT 019610600
DATE 01/08/2021
SCALE AS SHOWN
DESIGNED BY KHTAM
DRAWN BY KHTAM
CHECKED BY TLC

PROPOSED DRAINAGE MAP - OVERALL

WINSOME FILING NO. 2
PREPARED FOR
WINSOME LLC

EL PASO COUNTY CO

SHEET NUMBER

APPENDIX C: HYDROLOGY

IMPERVIOUS FACTOR CALCULATION TABLE - ALL BASINS

	Design Pt	Basin	Area (Acre)	5 acre lot (7%)	2.5 acre lot (11%)	Open Space (2%)	Commerical (85%)	Roadway (100%)	Total % Check	Weighted Impervious
Pond 5	P5	E1.2	15.28	33%	61%	0%	0%	6%	100%	15%
		E2	2.60	0%	84%	0%	0%	16%	100%	25%
		E3	19.80	0%	94%	0%	0%	6%	100%	16%
		E4	18.20	0%	95%	0%	0%	5%	100%	16%
		E5	13.50	0%	97%	0%	0%	3%	100%	13%
		E6	9.26	34%	63%	0%	0%	2%	100%	11%
		E7	10.22	0%	98%	0%	0%	2%	100%	13%
		F2	4.40	88%	0%	0%	0%	12%	100%	19%
		E8	15.78	63%	0%	31%	0%	5%	100%	11%
		E9	3.82	0%	0%	100%	0%	0%	100%	2%
		E0	37.90	100%	0%	0%	0%	0%	100%	7%
		E1.1	8.71	0%	0%	91%	0%	9%	100%	11%
Offsite	Offsite	F1	32.10	86%	10%	0%	0%	4%	100%	11%
		F3	9.62	93%	0%	0%	0%	7%	100%	14%
Total			201.19							11.2%

IMPERVIOUS FACTOR CALCULATION TABLE - BASINS GOING TO POND 5

	Design Pt	Basin	Area (Acre)	5 acre lot (7%)	2.5 acre lot (11%)	Open Space (2%)	Commerical (85%)	Roadway (100%)	Total % Check	Weighted Impervious
Pond 5	P5	E1.2	15.28	33%	61%	0%	0%	6%	100%	15%
		E2	2.60	0%	84%	0%	0%	16%	100%	25%
		E3	19.80	0%	94%	0%	0%	6%	100%	16%
		E4	18.20	0%	95%	0%	0%	5%	100%	16%
		E5	13.50	0%	97%	0%	0%	3%	100%	13%
		E6	9.26	34%	63%	0%	0%	2%	100%	11%
		E7	10.22	0%	98%	0%	0%	2%	100%	13%
		E8	15.78	63%	0%	31%	0%	5%	100%	11%
		F2	4.40	88%	0%	0%	0%	12%	100%	19%
		E0	37.90	100%	0%	0%	0%	0%	100%	7%
		E1.1	8.71	0%	0%	91%	0%	9%	100%	11%
Total			155.65							12.3%

Kimley»Horn

PROJECT NAME: Winsome Filing 2 5/17/2021
PROJECT NUMBER: 196106000
CALCULATED BY: TOS
CHECKED BY: BAH

RATIONAL CALCULATIONS SUMMARY

TRIBUTARY BASINS	TRIBUTARY AREA (AC)	Q5	Q100
On-Site Basins			
DA1	1.11	0.98	3.82
DA2	8.16	3.08	16.11
DA3	2.09	0.80	4.19
DA4	10.54	3.68	21.00
DA5	3.00	1.53	7.00
TOTAL	**24.90**	**10.06**	**52.12**

Kimley»Horn

STANDARD FORM SF-1
RUNOFF COEFFICIENTS - IMPERVIOUS CALCULATION

PROJECT NAME: **Winsome Filing 2**
PROJECT NUMBER: **196106000**
CALCULATED BY: **TOS**
CHECKED BY: **BAH**

DATE: 5/17/2021

SOIL:

LAND USE:	Residenital Lots (2.5 acres) AREA	Residential Lots (5 acres) AREA	Roadway AREA	Commerical AREA	Landscape AREA
2-YEAR COEFF.	0.12	0.12	0.89	0.79	0.02
5-YEAR COEFF.	0.20	0.20	0.90	0.81	0.08
10-YEAR COEFF.	0.27	0.27	0.92	0.83	0.15
100-YEAR COEFF.	0.44	0.44	0.96	0.88	0.35
IMPERVIOUS %	7%	11%	100%	95%	0%

DESIGN BASIN	Residenital Lots (2.5 acres) AREA (AC)	Residential Lots (5 acres) AREA (AC)	Roadway AREA (AC)	Commerical AREA (AC)	Landscape AREA (AC)	TOTAL AREA (AC)	C(2)	C(5)	C(10)	C(100)	Imp %
On-Site Basins											
DA1	0.97	0.00	0.14	0.00	0.00	**1.11**	0.22	0.29	0.35	0.51	19%
DA2	7.87	0.00	0.29	0.00	0.00	**8.16**	0.15	0.22	0.29	0.46	10%
DA3	2.02	0.00	0.07	0.00	0.00	**2.09**	0.15	0.22	0.29	0.46	10%
DA4	10.38	0.00	0.16	0.00	0.00	**10.54**	0.13	0.21	0.28	0.45	8%
DA5	2.78	0.00	0.22	0.00	0.00	**3.00**	0.18	0.25	0.32	0.48	14%
	24.02	**0.00**	**0.88**	**0.00**	**0.00**	**24.90**	0.15	0.22	0.29	0.46	10%
BASIN SUBTOTAL	**96%**	**0%**	**4%**	**0%**	**0%**	**100%**					

Kimley»Horn

STANDARD FORM SF-2
Time of Concentration

PROJECT NAME: Winsome Filing 2
PROJECT NUMBER: 196106000
CALCULATED BY: TOS
CHECKED BY: BAH

DATE: 5/17/2021

SUB-BASIN DATA			INITIAL TIME (T_i)			TRAVEL TIME (T_t)					Tc CHECK (URBANIZED BASINS)					FINAL Tc
DESIGN BASIN (1)	AREA Ac (2)	C5 (3)	LENGTH Ft (4)	SLOPE % (5)	T_i Min. (6)	LENGTH Ft. (7)	SLOPE % (8)	C_v (9)	VEL fps (11)	T_t Min. (12)	COMP. tc (13)	TOTAL LENGTH (14)	TOTAL SLOPE (15)	TOTAL IMP. (16)	Tc Min. (17)	Min.
On-Site Basins																
DA1	1.110	0.288	36	8.8%	4.3	464	3.7%	7.0	1.3	5.7	10.1	500	4.1%	19%	26.4	10.1
DA2	8.160	0.225	300	2.3%	21.0	559	7.4%	7.0	1.9	4.9	25.9	859	5.6%	10%	30.0	25.9
DA3	2.090	0.224	135	1.6%	16.0	551	2.1%	7.0	1.0	9.1	25.2	686	2.0%	10%	32.1	25.2
DA4	10.540	0.211	64	1.1%	12.8	1,056	4.7%	7.0	1.5	11.6	24.4	1120	4.5%	8%	33.2	24.4
DA5	3.000	0.250	157	3.7%	12.7	731	4.9%	7.0	1.5	7.9	20.5	888	4.7%	14%	29.9	20.5

$$t_i = \frac{0.395(1.1 - C_5)\sqrt{L_i}}{S_o^{0.33}} \qquad t_t = \frac{L_t}{60K\sqrt{S_o}} = \frac{L_t}{60V_t} \qquad t_c = (26 - 17i) + \frac{L_t}{60(14i + 9)\sqrt{S_t}}$$

Kimley»Horn

STANDARD FORM SF-3
STORM DRAINAGE DESIGN - RATIONAL METHOD 5 YEAR EVENT

PROJECT NAME: Winsome Filing 2
PROJECT NUMBER: 1.96E+08
CALCULATED BY: TOS
CHECKED BY: BAH

DATE: 5/17/2021

P_1 (1-Hour Rainfall) = **1.5**

STORM LINE		DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		DESIGN BASIN	AREA (AC)	RUNOFF COEFF	tc (min)	C*A(ac)	I (in/hr)	Q (cfs)	tc(max)	S(C*A) (ac)	I (in/hr)	Q (cfs)	SLOPE (%)	STREET FLOW(cfs)	DESIGN FLOW(cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCITY (fps)	tt (min)	
(1)		(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
On-Site Basins																					
		DA1	1.11	0.22	10.06	0.24	4.05	0.98													
		DA2	8.16	0.15	25.89	1.20	2.56	3.08													
		DA3	2.09	0.15	25.15	0.31	2.60	0.80													
		DA4	10.54	0.13	24.42	1.39	2.65	3.68													
		DA5	3.00	0.18	20.54	0.53	2.91	1.53													

Kimley»Horn

STANDARD FORM SF-3
STORM DRAINAGE DESIGN - RATIONAL METHOD 100 YEAR EVENT

PROJECT NAME: Winsome Filing 2
PROJECT NUMBER: 1.96E+08
CALCULATED BY: TOS
CHECKED BY: BAH

DATE: 5/17/2021

P_1 (1-Hour Rainfall) = 2.52

STORM LINE		DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		DESIGN BASIN	AREA (AC)	RUNOFF COEFF	tc (min)	C*A(ac)	I (in/hr)	Q (cfs)	tc(max)	S(C*A) (ac)	I (in/hr)	Q (cfs)	SLOPE (%)	STREET FLOW(cfs)	DESIGN FLOW(cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCITY (fps)	tt (min)	
(1)		(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
On-Site Basins																					
		DA1	1.11	0.51	10.06	0.56	6.80	3.82													
		DA2	8.16	0.46	25.89	3.74	4.31	16.11													
		DA3	2.09	0.46	25.15	0.96	4.38	4.19													
		DA4	10.54	0.45	24.42	4.72	4.45	21.00													
		DA5	3.00	0.48	20.54	1.43	4.89	7.00													

Project: **Winsome Filing 2**
Subject: **Lag Time Calculations (Velocity Method)**
Designed by: TOS Date: 5/19/2021
Checked by: BAH Date: 5/19/2021

2-yr, 24-hr Rainfall (in) = 2.1

Sheet Flow Equation (TR-55 Equation 3-3)

$$T_t = \frac{0.007(n\ell)^{0.8}}{(P_2)^{0.5} S^{0.4}}$$

Shallow Concentrated Flow (TR-55 Equation 3-1)

$$T_t = \frac{\ell}{3{,}600V}$$

Channel Flow Velocity (Mannings Equation)

$$V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$$

Time of Concentration Calculation

Drainage Area ID	Area (mi^2)	Sheet Flow					Shallow Concentrated Flow				Channel Flow Computations								Lag (min)
		n	Length (ft)	Slope (ft/ft)	P_2 (in)	Tt (hr)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Tt (hr)	n	Length (ft)	Slope (ft/ft)	Cross Section Area (ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Tt (min)	Total TOC (min)	
E0	0.06	0.1	300	0.020	2.1	0.35	1000	0.049	1.11	0.25	0.04	748	0.049	36.00	24.74	10.59	1.18	37.20	22.32
E1.1	0.01	0.1	283	0.040	2.1	0.25	442	0.032	0.90	0.14	0.00	#N/A	0.000	0.00	0	0.00	#N/A	23.45	14.07
E1.2	0.02	0.1	300	0.040	2.1	0.27	506	0.024	0.79	0.18	0.04	372	0.024	64.00	24.74	10.96	0.57	27.25	16.35
E2	0.00	0.1	55	0.020	2.1	0.09	0	#N/A	#N/A	#N/A	0.04	500	0.038	64.00	24.74	13.68	0.61	6.03	3.62
E3	0.03	0.1	300	0.020	2.1	0.35	100	0.054	1.17	0.02	0.04	101	0.054	64.00	24.74	16.31	0.10	22.59	13.55
E4	0.03	0.1	300	0.020	2.1	0.35	500	0.038	1.36	0.10	0.04	528	0.038	64.00	24.74	13.68	0.64	27.81	16.69
E5	0.02	0.1	300	0.020	2.1	0.35	500	0.047	1.52	0.09	0.04	335	0.047	64.00	24.74	15.22	0.37	26.92	16.15
E6	0.01	0.1	132	0.013	2.1	0.22	220	0.027	1.15	0.05	0.04	850	0.027	64.00	24.74	11.49	1.23	17.39	10.44
E8	0.02	0.1	80	0.024	2.1	0.11	330	0.048	1.53	0.06	1.04	520	0.020	64.00	24.74	9.93	0.87	11.34	6.80
E9	0.01	0.1	32	0.012	2.1	0.07	129	0.140	2.62	0.01	2.04	150	0.062	64.00	24.74	17.48	0.14	5.27	3.16
E7	0.02	0.1	300	0.021	2.1	0.34	200	0.027	1.14	0.05	0.04	474	0.027	64.00	24.74	11.51	0.69	21.34	12.80
F1	0.05	0.1	300	0.027	2.1	0.31	235	0.027	1.15	0.06	0.04	2123	0.035	64.00	24.74	13.13	2.69	24.78	14.87
F2	0.01	0.1	46	0.003	2.1	0.17	503	0.034	1.29	0.11	0.04	546	0.02	64.00	24.74	10.87	0.84	17.50	10.50
F3	0.02	0.1	205	0.024	2.1	0.24	200	0.024	1.08	0.05	0.04	1846	0.04	64.00	24.74	13.50	2.28	19.79	11.87

Calculated using the Velocity Method in chapter 15 of NRCS Part 630 Hydrology National Engineering Handbook, May 2010

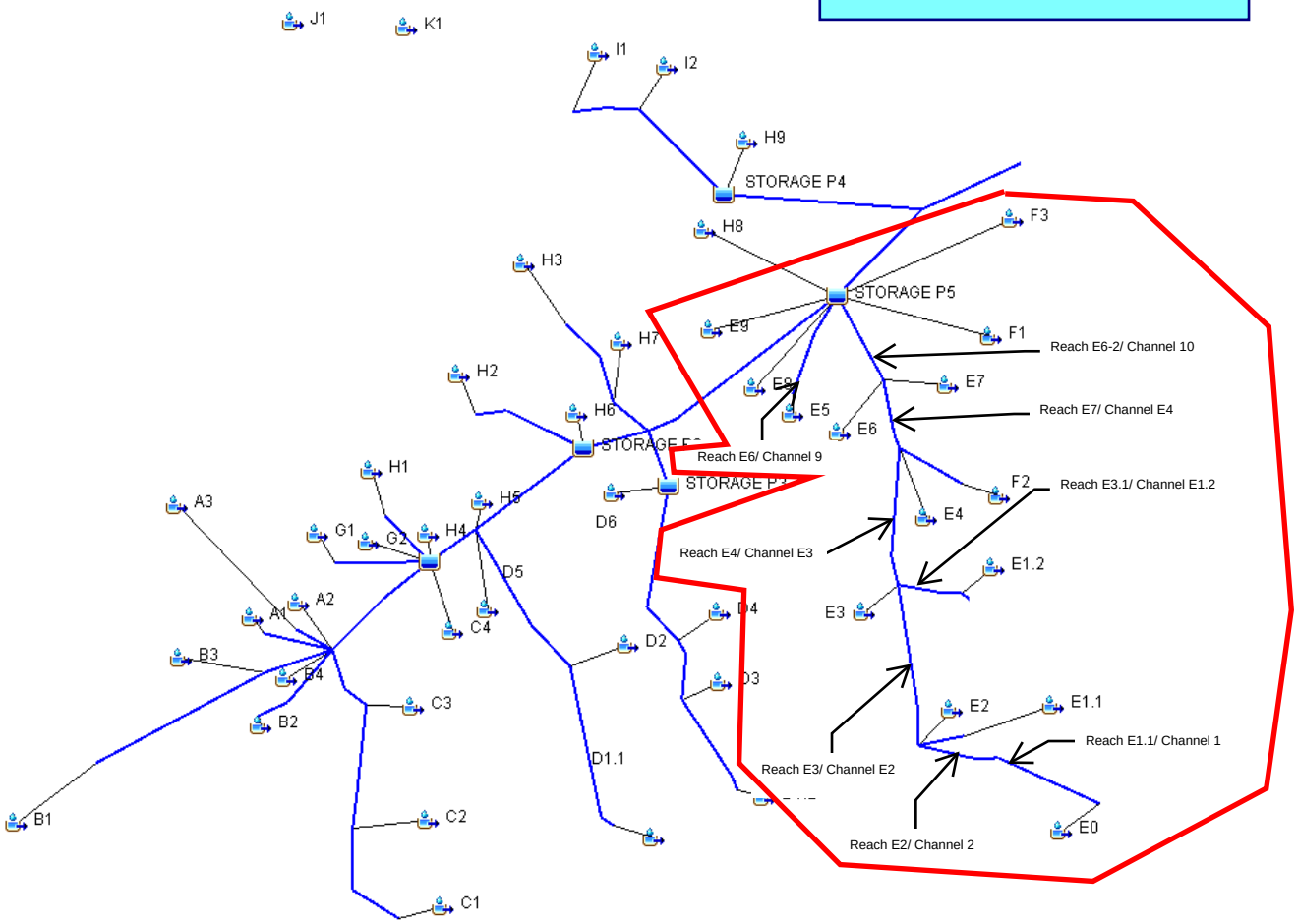
Project: **Winsome Filing 2**
Subject: **Curve Number Calculations**
Designed by: TOS Date: 5/19/2021
Checked by: BAH Date: 5/19/2021

Drainage Area ID	Area (mi^2)	Area (ac)	Area (ft^2)	HSG	CN	Percent (%)	Initial Abstration	Lag Time
E0	0.0592188	37.9	1650924	B	60	100%	0.667	22.32
E1.1	0.0136094	8.7	379408	B	70	100%	0.429	14.07
E1.2	0.0238750	15.3	665597	B	65	100%	0.543	16.35
E2	0.0040625	2.6	113256	B	69	100%	0.440	3.62
E3	0.0309375	19.8	862488	B	66	100%	0.514	13.55
E4	0.0284375	18.2	792792	B	66	100%	0.522	16.69
E5	0.0210938	13.5	588060	B	65	100%	0.538	16.15
E6	0.0144609	9.3	403148	B, C/D	63	100%	0.579	10.44
E8	0.0246594	15.8	687464	B, C/D	62	100%	0.603	6.80
E9	0.0059688	3.8	166399	B, C/D	61	100%	0.639	3.16
E7	0.0159688	10.2	445183	B	65	100%	0.542	12.80
F1	0.0501563	32.1	1398276	B	62	100%	0.624	14.87
F2	0.0068750	4.4	191664	B	65	100%	0.539	10.50
F3	0.0150313	9.6	419047	B	63	100%	0.592	11.87

Soils data obtained from NRCS Web Soil Survey, version 7 (Aug 2014)

Proposed Conditions Filing No. 2 HEC-HMS Layout

Label Out-1 and Reach 6 that was discussed in pg 11



HEC-HMS Label/ Drainage Map Label

	EPASWMM Curve Data		
	Stage-Area Realationship for Pond 5		
Elevation	**Depth [ft]**	**Area [sq ft]**	**AC-FT**
7298.00	0	20	0.00
7298.25	0.25	20	0.00
7298.50	0.5	20	0.00
7298.75	0.75	20	0.00
7299.00	1	2300	0.05
7299.25	1.25	8225	0.19
7299.50	1.5	14150	0.32
7299.75	1.75	20075	0.46
7300.00	2	26000	0.60
7300.25	2.25	33871	0.78
7300.50	2.5	41741	0.96
7300.75	2.75	49612	1.14
7301.00	3	57483	1.32
7301.25	3.25	63712	1.46
7301.50	3.5	69941	1.61
7301.75	3.75	76171	1.75
7302.00	4	82400	1.89
7302.25	4.25	86475	1.99
7302.50	4.5	90550	2.08
7302.75	4.75	94625	2.17
7303.00	5	98700	2.27
7303.25	5.25	101025	2.32
7303.50	5.5	103350	2.37
7303.75	5.75	105675	2.43
7304.00	6	108000	2.48

	HEC-HMS Curve Data	
	Stage-Discharge Realationship for Pond 5	
Elevation	**Depth [ft]**	**Discharge [cfs]**
7298	0	0.00
7298.25	0.25	0.05
7298.5	0.5	0.07
7298.75	0.75	0.09
7299	1	0.10
7299.25	1.25	0.15
7299.5	1.5	0.19
7299.75	1.75	0.22
7300	2	0.25
7300.25	2.25	0.27
7300.5	2.5	0.44
7300.75	2.75	0.53
7301	3	0.60
7301.25	3.25	0.67
7301.5	3.5	1.81
7301.75	3.75	8.18
7302	4	18.06
7302.25	4.25	30.98
7302.5	4.5	46.77
7302.75	4.75	65.38
7303	5	86.25
7303.25	5.25	89.33
7303.5	5.5	91.52
7303.75	5.75	93.58
7304	6	95.59

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr

Start of Run: 26Feb2019, 00:00 Basin Model: Proposed Basins
End of Run: 27Feb2019, 12:00 Meteorologic Model: Prop Basins 5yr
Compute Time: 04Jun2021, 14:49:53 Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
A1	1.3529000	84.1	26Feb2019, 12:26	0.19
A2	0.0577812	4.7	26Feb2019, 12:14	0.19
A3	0.0648125	18.1	26Feb2019, 12:14	0.29
BOX CULVERT 1	7.9557326	375.9	26Feb2019, 12:43	0.19
BOX CULV 2	8.9615089	420.0	26Feb2019, 12:48	0.19
B1	5.9948000	286.7	26Feb2019, 12:42	0.19
B2	0.0204688	3.3	26Feb2019, 12:07	0.30
B3	0.0857813	6.8	26Feb2019, 12:15	0.19
B4	0.0648125	5.5	26Feb2019, 12:16	0.19
CLV E4	0.1670157	26.6	26Feb2019, 12:11	0.34
CULV B2	0.0204688	3.3	26Feb2019, 12:07	0.30
CULV C2	0.2892200	23.8	26Feb2019, 12:16	0.19
CULV C3	0.3143763	26.5	26Feb2019, 12:18	0.20
CULV D2	0.3593700	31.5	26Feb2019, 12:18	0.21
CULV D3	0.1423438	13.2	26Feb2019, 12:19	0.24
CULV D4	0.1959376	18.8	26Feb2019, 12:19	0.25
CULV E1.1	0.0592188	4.9	26Feb2019, 12:16	0.19
CULV E1.2	0.0238750	5.0	26Feb2019, 12:08	0.41
CULV E1.5	0.0136094	2.7	26Feb2019, 12:08	0.32
CULV E2	0.0768907	7.3	26Feb2019, 12:13	0.24
CULV E5	0.0210938	3.9	26Feb2019, 12:08	0.35
CULV F2	0.0068750	2.2	26Feb2019, 12:03	0.51
CULV H2	0.0610938	5.4	26Feb2019, 12:12	0.19
CULV H3	0.0090625	1.2	26Feb2019, 12:07	0.24
CULV I1	0.0106250	2.2	26Feb2019, 12:09	0.25
CULV-E3	0.1317032	18.6	26Feb2019, 12:09	0.31
C1	0.2542200	21.0	26Feb2019, 12:14	0.19

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
C2	0.0350000	3.1	26Feb2019, 12:11	0.19
C3	0.0251563	3.8	26Feb2019, 12:09	0.30
C4	0.0371875	1.9	26Feb2019, 12:16	0.12
D1.1	0.2520300	20.8	26Feb2019, 12:14	0.19
D1.2	0.0779688	5.8	26Feb2019, 12:18	0.19
D2	0.1073400	11.8	26Feb2019, 12:12	0.24
D3	0.0643750	8.1	26Feb2019, 12:15	0.30
D4	0.0535938	7.8	26Feb2019, 12:10	0.30
D5	0.0200000	0.8	26Feb2019, 12:10	0.08
D6	0.0653125	4.4	26Feb2019, 12:15	0.16
EX CULV C1	0.2542200	21.0	26Feb2019, 12:14	0.19
EX CULV D1.1	0.2520300	20.8	26Feb2019, 12:14	0.19
EX CULV D1.2	0.0779688	5.8	26Feb2019, 12:18	0.19
EX CULV E0	0.0592188	4.9	26Feb2019, 12:14	0.19
E0	0.0592188	4.9	26Feb2019, 12:14	0.19
E1.1	0.0136094	2.7	26Feb2019, 12:08	0.32
E1.2	0.0238750	5.0	26Feb2019, 12:08	0.41
E2	0.0040625	2.3	26Feb2019, 11:56	0.69
E3	0.0309375	7.6	26Feb2019, 12:06	0.43
E4	0.0284375	6.3	26Feb2019, 12:09	0.43
E5	0.0210938	3.9	26Feb2019, 12:08	0.35
E6	0.0144609	2.7	26Feb2019, 12:03	0.30
E7	0.0159688	3.3	26Feb2019, 12:05	0.35
E8	0.0246594	5.2	26Feb2019, 11:59	0.30
E9	0.0059688	0.3	26Feb2019, 11:55	0.05
F1	0.0501563	8.1	26Feb2019, 12:07	0.30
F2	0.0068750	2.2	26Feb2019, 12:03	0.51
F3	0.0150313	3.4	26Feb2019, 12:04	0.38
G1	0.0393750	2.5	26Feb2019, 12:08	0.12
G2	0.0331250	4.5	26Feb2019, 12:15	0.16
H1	0.0217187	3.4	26Feb2019, 12:10	0.22

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
H2	0.0610938	5.4	26Feb2019, 12:11	0.19
H3	0.0090625	1.2	26Feb2019, 12:07	0.24
H4	0.0423437	8.6	26Feb2019, 12:14	0.26
H5	0.0315625	7.4	26Feb2019, 12:14	0.26
H6	0.0493750	1.8	26Feb2019, 12:13	0.08
H7	0.0403125	4.4	26Feb2019, 12:13	0.17
H8	0.0132812	3.4	26Feb2019, 12:10	0.23
H9	0.0107812	1.8	26Feb2019, 12:09	0.22
I1	0.0106250	2.2	26Feb2019, 12:09	0.25
I2	0.0231250	4.8	26Feb2019, 12:09	0.25
J1	0.0157813	2.1	26Feb2019, 12:08	0.20
K1	0.0278125	10.3	26Feb2019, 12:09	0.34
OUT 2	0.0445312	7.0	26Feb2019, 12:22	0.24
OUT-1	9.2891451	430.4	26Feb2019, 12:51	0.19
REACH A1	1.3529000	83.8	26Feb2019, 12:31	0.19
Reach E3.1	0.0238750	5.0	26Feb2019, 12:11	0.41
Reach H7	0.0493750	5.6	26Feb2019, 12:13	0.18
Reach-A2	0.0648125	18.1	26Feb2019, 12:17	0.29
Reach-B1	5.9948000	286.6	26Feb2019, 12:46	0.19
Reach-B2	0.0204688	3.3	26Feb2019, 12:15	0.30
Reach-B3	6.0805813	288.7	26Feb2019, 12:50	0.19
Reach-B4-3	0.3143763	26.5	26Feb2019, 12:19	0.20
Reach-C1	0.2542200	20.9	26Feb2019, 12:17	0.19
Reach-C2	0.2892200	23.8	26Feb2019, 12:20	0.19
Reach-D1.1	0.2520300	20.7	26Feb2019, 12:20	0.19
Reach-D3	0.0779688	5.7	26Feb2019, 12:24	0.19
Reach-D4	0.1423438	13.2	26Feb2019, 12:24	0.24
Reach-D5	0.3593700	31.4	26Feb2019, 12:22	0.21
Reach-D6	0.1959376	18.7	26Feb2019, 12:23	0.25
Reach-E1.1	0.0592188	4.9	26Feb2019, 12:15	0.19
Reach-E2	0.0592188	4.9	26Feb2019, 12:18	0.19

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-E3	0.0768907	7.3	26Feb2019, 12:18	0.24
Reach-E4	0.1317032	18.6	26Feb2019, 12:13	0.31
Reach-E6	0.0210938	3.8	26Feb2019, 12:13	0.35
Reach-E6-2	0.1974454	30.3	26Feb2019, 12:15	0.34
Reach-E7	0.1670157	26.6	26Feb2019, 12:14	0.34
Reach-F2	0.0068750	2.2	26Feb2019, 12:08	0.51
Reach-G2	0.0393750	2.4	26Feb2019, 12:14	0.12
Reach-H4	0.0217187	3.3	26Feb2019, 12:15	0.22
Reach-H6	0.0610938	5.4	26Feb2019, 12:14	0.19
Reach-H7-1	0.0090625	1.2	26Feb2019, 12:12	0.24
Reach-H9	0.0337500	7.0	26Feb2019, 12:12	0.25
Reach-I2-1	0.0106250	2.2	26Feb2019, 12:11	0.25
Reach-P3	0.2612501	21.0	26Feb2019, 12:30	0.23
Reach-1	7.9557326	375.8	26Feb2019, 12:45	0.19
Reach-2	8.1294825	384.2	26Feb2019, 12:47	0.19
Reach-3	8.5404150	400.2	26Feb2019, 12:47	0.19
Reach-4	8.6508838	404.1	26Feb2019, 12:49	0.19
Reach-5	8.9615089	420.0	26Feb2019, 12:49	0.19
Reach-6 Kiowa Outfall	9.2336763	431.7	26Feb2019, 12:51	0.19
STORAGE P1	0.1365624	8.1	26Feb2019, 12:33	0.19
STORAGE P2	0.1104688	4.8	26Feb2019, 12:27	0.14
STORAGE P3	0.2612501	21.0	26Feb2019, 12:29	0.23
STORAGE P4	0.0445312	7.0	26Feb2019, 12:18	0.24
STORAGE P5	0.2431986	9.0	26Feb2019, 12:54	0.25

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: CULV E1.1

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units:IN

Computed Results

Peak Inflow:	4.9 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:14
Peak Discharge:	4.9 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:16
Inflow Volume:	0.19 (IN)	Discharge Volume:	0.19 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: CULV E1.2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	04Jun2021, 14:49:53	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	5.0 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:07
Peak Discharge:	5.0 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:08
Inflow Volume:	0.41 (IN)	Discharge Volume:	0.41 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: CULV E1.5

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	04Jun2021, 14:49:53	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	2.7 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:07
Peak Discharge:	2.7 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:08
Inflow Volume:	0.32 (IN)	Discharge Volume:	0.32 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: CULV E2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	04Jun2021, 14:49:53	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	7.3 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:12
Peak Discharge:	7.3 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:13
Inflow Volume:	0.24 (IN)	Discharge Volume:	0.24 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: CULV-E3

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	04Jun2021, 14:49:53	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	18.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:08
Peak Discharge:	18.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:09
Inflow Volume:	0.31 (IN)	Discharge Volume:	0.31 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: CLV E4

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	04Jun2021, 14:49:53	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	26.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:10
Peak Discharge:	26.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:11
Inflow Volume:	0.34 (IN)	Discharge Volume:	0.34 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: CULV E5

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units:IN

Computed Results

Peak Inflow:	3.9 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:07
Peak Discharge:	3.9 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:08
Inflow Volume:	0.35 (IN)	Discharge Volume:	0.35 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: CULV F2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units:IN

Computed Results

Peak Inflow:	2.2 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:02
Peak Discharge:	2.2 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:03
Inflow Volume:	0.51 (IN)	Discharge Volume:	0.51 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Subbasin: E0

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	4.9 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:14
Precipitation Volume	2.71 (IN)	Direct Runoff Volume:	0.19 (IN)
Loss Volume:	2.52 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.19 (IN)	Discharge Volume:	0.19 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Subbasin: E1.1

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	2.7 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:08
Precipitation Volume	2.71 (IN)	Direct Runoff Volume:	0.32 (IN)
Loss Volume:	2.39 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.32 (IN)	Discharge Volume:	0.32 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Subbasin: E1.2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	5.0 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:08
Precipitation Volume	2.71 (IN)	Direct Runoff Volume:	0.41 (IN)
Loss Volume:	2.30 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.41 (IN)	Discharge Volume:	0.41 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Subbasin: E2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	2.3 (CFS)	Date/Time of Peak Discharge	26Feb2019, 11:56
Precipitation Volume	2.71 (IN)	Direct Runoff Volume:	0.69 (IN)
Loss Volume:	2.02 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.69 (IN)	Discharge Volume:	0.69 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Subbasin: E3

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	7.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:06
Precipitation Volume	2.71 (IN)	Direct Runoff Volume:	0.43 (IN)
Loss Volume:	2.27 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.43 (IN)	Discharge Volume:	0.43 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Subbasin: E4

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	6.3 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:09
Precipitation Volume	2.71 (IN)	Direct Runoff Volume:	0.43 (IN)
Loss Volume:	2.27 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.43 (IN)	Discharge Volume:	0.43 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Subbasin: E5

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	3.9 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:08
Precipitation Volume	2.71 (IN)	Direct Runoff Volume:	0.35 (IN)
Loss Volume:	2.35 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.35 (IN)	Discharge Volume:	0.35 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Subbasin: E6

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	2.7 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:03
Precipitation Volume	2.71 (IN)	Direct Runoff Volume:	0.30 (IN)
Loss Volume:	2.41 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.30 (IN)	Discharge Volume:	0.30 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Subbasin: E7

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	3.3 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:05
Precipitation Volume	2.71 (IN)	Direct Runoff Volume:	0.35 (IN)
Loss Volume:	2.35 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.35 (IN)	Discharge Volume:	0.35 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Subbasin: E8

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	5.2 (CFS)	Date/Time of Peak Discharge	26Feb2019, 11:59
Precipitation Volume	2.71 (IN)	Direct Runoff Volume:	0.30 (IN)
Loss Volume:	2.41 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.30 (IN)	Discharge Volume:	0.30 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Subbasin: E9

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	0.3 (CFS)	Date/Time of Peak Discharge	26Feb2019, 11:55
Precipitation Volume	2.71 (IN)	Direct Runoff Volume:	0.05 (IN)
Loss Volume:	2.65 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.05 (IN)	Discharge Volume:	0.05 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: EX CULV E0

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units:IN

Computed Results

Peak Inflow:	4.9 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:13
Peak Discharge:	4.9 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:14
Inflow Volume:	0.19 (IN)	Discharge Volume:	0.19 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Subbasin: F1

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	19May2021, 11:48:19	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	8.1 (CFS)	Date/Time of Peak Discharge:	26Feb2019, 12:07
Precipitation Volume:	2.71 (IN)	Direct Runoff Volume:	0.30 (IN)
Loss Volume:	2.41 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.30 (IN)	Discharge Volume:	0.30 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Subbasin: F2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	2.2 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:03
Precipitation Volume	2.71 (IN)	Direct Runoff Volume:	0.51 (IN)
Loss Volume:	2.19 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.51 (IN)	Discharge Volume:	0.51 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr

Subbasin: F3

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	19May2021, 11:48:19	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	3.4 (CFS)	Date/Time of Peak Discharge:	26Feb2019, 12:04
Precipitation Volume:	2.71 (IN)	Direct Runoff Volume:	0.38 (IN)
Loss Volume:	2.33 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.38 (IN)	Discharge Volume:	0.38 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: Reach-6 Kiowa Outfall

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	19May2021, 18:43:35	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	431.7 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:50
Peak Discharge:	431.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:51
Inflow Volume:	0.19 (IN)	Discharge Volume:	0.19 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: OUT-1

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	19May2021, 18:43:35	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	430.4 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:48
Peak Discharge:	430.3 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:51
Inflow Volume:	0.19 (IN)	Discharge Volume:	0.19 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr

Reservoir: STORAGE P5

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	04Jun2021, 14:49:53	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	35.3 (CFS)	Date/Time of Peak Inflow:	26Feb2019, 12:14
Peak Discharge:	9.0 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:54
Inflow Volume:	0.34 (IN)	Peak Storage:	2.5 (AC-FT)
Discharge Volume	0.25 (IN)	Peak Elevation:	7301.8 (FT)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reservoir: STORAGE P5

Start of Run: 26Feb2019, 00:00 Basin Model: Proposed Basins
End of Run: 27Feb2019, 12:00 Meteorologic Model: Prop Basins 5yr
Compute Time: 04Jun2021, 14:49:53 Control Specifications: Control 1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	00:00	0.0	0.0		0.1
26Feb2019	00:01	0.0	0.0		0.0
26Feb2019	00:02	0.0	0.0		0.0
26Feb2019	00:03	0.0	0.0		0.0
26Feb2019	00:04	0.0	0.0		0.0
26Feb2019	00:05	0.0	0.0		0.0
26Feb2019	00:06	0.0	0.0		0.0
26Feb2019	00:07	0.0	0.0		0.0
26Feb2019	00:08	0.0	0.0		0.0
26Feb2019	00:09	0.0	0.0		0.0
26Feb2019	00:10	0.0	0.0		0.0
26Feb2019	00:11	0.0	0.0		0.0
26Feb2019	00:12	0.0	0.0		0.0
26Feb2019	00:13	0.0	0.0		0.0
26Feb2019	00:14	0.0	0.0		0.0
26Feb2019	00:15	0.0	0.0		0.0
26Feb2019	00:16	0.0	0.0		0.0
26Feb2019	00:17	0.0	0.0		0.0
26Feb2019	00:18	0.0	0.0		0.0
26Feb2019	00:19	0.0	0.0		0.0
26Feb2019	00:20	0.1	0.0		0.1
26Feb2019	00:21	0.1	0.0		0.1
26Feb2019	00:22	0.1	0.0		0.1
26Feb2019	00:23	0.1	0.0		0.1
26Feb2019	00:24	0.1	0.0		0.1
26Feb2019	00:25	0.1	0.0		0.1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	00:26	0.1	0.0		0.1
26Feb2019	00:27	0.1	0.0		0.1
26Feb2019	00:28	0.1	0.0		0.1
26Feb2019	00:29	0.1	0.0		0.1
26Feb2019	00:30	0.1	0.0		0.1
26Feb2019	00:31	0.1	0.0	7298.8	0.1
26Feb2019	00:32	0.1	0.0	7298.8	0.1
26Feb2019	00:33	0.1	0.0	7298.8	0.1
26Feb2019	00:34	0.1	0.0	7298.8	0.1
26Feb2019	00:35	0.1	0.0	7298.8	0.1
26Feb2019	00:36	0.1	0.0	7298.8	0.1
26Feb2019	00:37	0.1	0.0	7298.8	0.1
26Feb2019	00:38	0.1	0.0	7298.8	0.1
26Feb2019	00:39	0.1	0.0	7298.8	0.1
26Feb2019	00:40	0.1	0.0	7298.8	0.1
26Feb2019	00:41	0.1	0.0	7298.8	0.1
26Feb2019	00:42	0.2	0.0	7298.8	0.1
26Feb2019	00:43	0.2	0.0	7298.8	0.1
26Feb2019	00:44	0.2	0.0	7298.8	0.1
26Feb2019	00:45	0.2	0.0	7298.8	0.1
26Feb2019	00:46	0.2	0.0	7298.8	0.1
26Feb2019	00:47	0.2	0.0	7298.8	0.1
26Feb2019	00:48	0.2	0.0	7298.8	0.1
26Feb2019	00:49	0.2	0.0	7298.8	0.1
26Feb2019	00:50	0.2	0.0	7298.8	0.1
26Feb2019	00:51	0.2	0.0	7298.9	0.1
26Feb2019	00:52	0.3	0.0	7298.9	0.1
26Feb2019	00:53	0.3	0.0	7298.9	0.1
26Feb2019	00:54	0.3	0.0	7298.9	0.1
26Feb2019	00:55	0.3	0.0	7298.9	0.1
26Feb2019	00:56	0.3	0.0	7298.9	0.1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	00:57	0.3	0.0	7298.9	0.1
26Feb2019	00:58	0.3	0.0	7299.0	0.1
26Feb2019	00:59	0.3	0.0	7299.0	0.1
26Feb2019	01:00	0.4	0.0	7299.0	0.1
26Feb2019	01:01	0.4	0.0	7299.0	0.1
26Feb2019	01:02	0.4	0.0	7299.0	0.1
26Feb2019	01:03	0.4	0.0	7299.0	0.1
26Feb2019	01:04	0.4	0.0	7299.0	0.1
26Feb2019	01:05	0.4	0.0	7299.0	0.1
26Feb2019	01:06	0.4	0.0	7299.0	0.1
26Feb2019	01:07	0.4	0.0	7299.0	0.1
26Feb2019	01:08	0.4	0.0	7299.0	0.1
26Feb2019	01:09	0.4	0.0	7299.0	0.1
26Feb2019	01:10	0.4	0.0	7299.0	0.1
26Feb2019	01:11	0.4	0.0	7299.0	0.1
26Feb2019	01:12	0.5	0.0	7299.0	0.1
26Feb2019	01:13	0.5	0.0	7299.0	0.1
26Feb2019	01:14	0.5	0.0	7299.1	0.1
26Feb2019	01:15	0.5	0.0	7299.1	0.1
26Feb2019	01:16	0.5	0.0	7299.1	0.1
26Feb2019	01:17	0.5	0.0	7299.1	0.1
26Feb2019	01:18	0.5	0.0	7299.1	0.1
26Feb2019	01:19	0.5	0.0	7299.1	0.1
26Feb2019	01:20	0.5	0.0	7299.1	0.1
26Feb2019	01:21	0.5	0.0	7299.1	0.1
26Feb2019	01:22	0.5	0.0	7299.1	0.1
26Feb2019	01:23	0.5	0.0	7299.1	0.1
26Feb2019	01:24	0.5	0.0	7299.1	0.1
26Feb2019	01:25	0.5	0.0	7299.1	0.1
26Feb2019	01:26	0.5	0.0	7299.1	0.1
26Feb2019	01:27	0.5	0.0	7299.1	0.1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	01:28	0.5	0.0	7299.1	0.1
26Feb2019	01:29	0.5	0.0	7299.1	0.1
26Feb2019	01:30	0.5	0.0	7299.1	0.1
26Feb2019	01:31	0.5	0.0	7299.1	0.1
26Feb2019	01:32	0.5	0.0	7299.1	0.1
26Feb2019	01:33	0.5	0.0	7299.1	0.1
26Feb2019	01:34	0.6	0.0	7299.2	0.1
26Feb2019	01:35	0.6	0.0	7299.2	0.1
26Feb2019	01:36	0.6	0.0	7299.2	0.1
26Feb2019	01:37	0.6	0.0	7299.2	0.1
26Feb2019	01:38	0.6	0.0	7299.2	0.1
26Feb2019	01:39	0.6	0.0	7299.2	0.1
26Feb2019	01:40	0.6	0.0	7299.2	0.1
26Feb2019	01:41	0.6	0.0	7299.2	0.1
26Feb2019	01:42	0.6	0.0	7299.2	0.1
26Feb2019	01:43	0.6	0.0	7299.2	0.1
26Feb2019	01:44	0.6	0.0	7299.2	0.1
26Feb2019	01:45	0.6	0.0	7299.2	0.1
26Feb2019	01:46	0.6	0.0	7299.2	0.1
26Feb2019	01:47	0.6	0.0	7299.2	0.1
26Feb2019	01:48	0.6	0.0	7299.2	0.1
26Feb2019	01:49	0.6	0.0	7299.2	0.1
26Feb2019	01:50	0.6	0.0	7299.2	0.1
26Feb2019	01:51	0.6	0.0	7299.2	0.1
26Feb2019	01:52	0.6	0.0	7299.2	0.1
26Feb2019	01:53	0.6	0.0	7299.2	0.2
26Feb2019	01:54	0.6	0.0	7299.3	0.2
26Feb2019	01:55	0.6	0.0	7299.3	0.2
26Feb2019	01:56	0.6	0.0	7299.3	0.2
26Feb2019	01:57	0.6	0.0	7299.3	0.2
26Feb2019	01:58	0.6	0.0	7299.3	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	01:59	0.6	0.0	7299.3	0.2
26Feb2019	02:00	0.6	0.0	7299.3	0.2
26Feb2019	02:01	0.6	0.0	7299.3	0.2
26Feb2019	02:02	0.6	0.0	7299.3	0.2
26Feb2019	02:03	0.6	0.0	7299.3	0.2
26Feb2019	02:04	0.6	0.0	7299.3	0.2
26Feb2019	02:05	0.6	0.0	7299.3	0.2
26Feb2019	02:06	0.6	0.0	7299.3	0.2
26Feb2019	02:07	0.6	0.0	7299.3	0.2
26Feb2019	02:08	0.6	0.0	7299.3	0.2
26Feb2019	02:09	0.6	0.0	7299.3	0.2
26Feb2019	02:10	0.6	0.0	7299.3	0.2
26Feb2019	02:11	0.6	0.0	7299.3	0.2
26Feb2019	02:12	0.6	0.0	7299.3	0.2
26Feb2019	02:13	0.6	0.0	7299.3	0.2
26Feb2019	02:14	0.6	0.0	7299.3	0.2
26Feb2019	02:15	0.6	0.0	7299.3	0.2
26Feb2019	02:16	0.6	0.0	7299.3	0.2
26Feb2019	02:17	0.6	0.0	7299.3	0.2
26Feb2019	02:18	0.6	0.0	7299.3	0.2
26Feb2019	02:19	0.6	0.0	7299.3	0.2
26Feb2019	02:20	0.6	0.0	7299.3	0.2
26Feb2019	02:21	0.6	0.0	7299.3	0.2
26Feb2019	02:22	0.6	0.0	7299.3	0.2
26Feb2019	02:23	0.6	0.1	7299.3	0.2
26Feb2019	02:24	0.6	0.1	7299.3	0.2
26Feb2019	02:25	0.6	0.1	7299.3	0.2
26Feb2019	02:26	0.6	0.1	7299.3	0.2
26Feb2019	02:27	0.6	0.1	7299.3	0.2
26Feb2019	02:28	0.6	0.1	7299.3	0.2
26Feb2019	02:29	0.6	0.1	7299.3	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	02:30	0.6	0.1	7299.3	0.2
26Feb2019	02:31	0.6	0.1	7299.3	0.2
26Feb2019	02:32	0.6	0.1	7299.3	0.2
26Feb2019	02:33	0.6	0.1	7299.3	0.2
26Feb2019	02:34	0.6	0.1	7299.4	0.2
26Feb2019	02:35	0.6	0.1	7299.4	0.2
26Feb2019	02:36	0.6	0.1	7299.4	0.2
26Feb2019	02:37	0.6	0.1	7299.4	0.2
26Feb2019	02:38	0.6	0.1	7299.4	0.2
26Feb2019	02:39	0.6	0.1	7299.4	0.2
26Feb2019	02:40	0.6	0.1	7299.4	0.2
26Feb2019	02:41	0.6	0.1	7299.4	0.2
26Feb2019	02:42	0.6	0.1	7299.4	0.2
26Feb2019	02:43	0.6	0.1	7299.4	0.2
26Feb2019	02:44	0.6	0.1	7299.4	0.2
26Feb2019	02:45	0.6	0.1	7299.4	0.2
26Feb2019	02:46	0.6	0.1	7299.4	0.2
26Feb2019	02:47	0.6	0.1	7299.4	0.2
26Feb2019	02:48	0.6	0.1	7299.4	0.2
26Feb2019	02:49	0.6	0.1	7299.4	0.2
26Feb2019	02:50	0.6	0.1	7299.4	0.2
26Feb2019	02:51	0.6	0.1	7299.4	0.2
26Feb2019	02:52	0.6	0.1	7299.4	0.2
26Feb2019	02:53	0.6	0.1	7299.4	0.2
26Feb2019	02:54	0.6	0.1	7299.4	0.2
26Feb2019	02:55	0.6	0.1	7299.4	0.2
26Feb2019	02:56	0.6	0.1	7299.4	0.2
26Feb2019	02:57	0.6	0.1	7299.4	0.2
26Feb2019	02:58	0.6	0.1	7299.4	0.2
26Feb2019	02:59	0.6	0.1	7299.4	0.2
26Feb2019	03:00	0.6	0.1	7299.4	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	03:01	0.6	0.1	7299.4	0.2
26Feb2019	03:02	0.6	0.1	7299.4	0.2
26Feb2019	03:03	0.6	0.1	7299.4	0.2
26Feb2019	03:04	0.6	0.1	7299.4	0.2
26Feb2019	03:05	0.6	0.1	7299.4	0.2
26Feb2019	03:06	0.7	0.1	7299.4	0.2
26Feb2019	03:07	0.7	0.1	7299.4	0.2
26Feb2019	03:08	0.7	0.1	7299.4	0.2
26Feb2019	03:09	0.7	0.1	7299.4	0.2
26Feb2019	03:10	0.7	0.1	7299.4	0.2
26Feb2019	03:11	0.7	0.1	7299.4	0.2
26Feb2019	03:12	0.7	0.1	7299.4	0.2
26Feb2019	03:13	0.7	0.1	7299.4	0.2
26Feb2019	03:14	0.7	0.1	7299.5	0.2
26Feb2019	03:15	0.7	0.1	7299.5	0.2
26Feb2019	03:16	0.7	0.1	7299.5	0.2
26Feb2019	03:17	0.7	0.1	7299.5	0.2
26Feb2019	03:18	0.7	0.1	7299.5	0.2
26Feb2019	03:19	0.7	0.1	7299.5	0.2
26Feb2019	03:20	0.7	0.1	7299.5	0.2
26Feb2019	03:21	0.7	0.1	7299.5	0.2
26Feb2019	03:22	0.7	0.1	7299.5	0.2
26Feb2019	03:23	0.7	0.1	7299.5	0.2
26Feb2019	03:24	0.7	0.1	7299.5	0.2
26Feb2019	03:25	0.7	0.1	7299.5	0.2
26Feb2019	03:26	0.7	0.1	7299.5	0.2
26Feb2019	03:27	0.7	0.1	7299.5	0.2
26Feb2019	03:28	0.7	0.1	7299.5	0.2
26Feb2019	03:29	0.7	0.1	7299.5	0.2
26Feb2019	03:30	0.7	0.1	7299.5	0.2
26Feb2019	03:31	0.7	0.1	7299.5	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	03:32	0.7	0.1	7299.5	0.2
26Feb2019	03:33	0.7	0.1	7299.5	0.2
26Feb2019	03:34	0.7	0.1	7299.5	0.2
26Feb2019	03:35	0.7	0.1	7299.5	0.2
26Feb2019	03:36	0.7	0.1	7299.5	0.2
26Feb2019	03:37	0.7	0.1	7299.5	0.2
26Feb2019	03:38	0.7	0.1	7299.5	0.2
26Feb2019	03:39	0.7	0.1	7299.5	0.2
26Feb2019	03:40	0.7	0.1	7299.5	0.2
26Feb2019	03:41	0.7	0.1	7299.5	0.2
26Feb2019	03:42	0.7	0.1	7299.5	0.2
26Feb2019	03:43	0.7	0.1	7299.5	0.2
26Feb2019	03:44	0.7	0.1	7299.5	0.2
26Feb2019	03:45	0.7	0.1	7299.5	0.2
26Feb2019	03:46	0.7	0.1	7299.5	0.2
26Feb2019	03:47	0.7	0.1	7299.5	0.2
26Feb2019	03:48	0.7	0.1	7299.5	0.2
26Feb2019	03:49	0.7	0.1	7299.5	0.2
26Feb2019	03:50	0.7	0.1	7299.5	0.2
26Feb2019	03:51	0.7	0.1	7299.5	0.2
26Feb2019	03:52	0.7	0.1	7299.5	0.2
26Feb2019	03:53	0.7	0.1	7299.5	0.2
26Feb2019	03:54	0.7	0.1	7299.5	0.2
26Feb2019	03:55	0.7	0.1	7299.5	0.2
26Feb2019	03:56	0.7	0.1	7299.5	0.2
26Feb2019	03:57	0.7	0.1	7299.5	0.2
26Feb2019	03:58	0.7	0.1	7299.5	0.2
26Feb2019	03:59	0.7	0.1	7299.5	0.2
26Feb2019	04:00	0.7	0.1	7299.5	0.2
26Feb2019	04:01	0.7	0.1	7299.6	0.2
26Feb2019	04:02	0.7	0.1	7299.6	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	04:03	0.7	0.1	7299.6	0.2
26Feb2019	04:04	0.7	0.1	7299.6	0.2
26Feb2019	04:05	0.7	0.1	7299.6	0.2
26Feb2019	04:06	0.7	0.1	7299.6	0.2
26Feb2019	04:07	0.7	0.1	7299.6	0.2
26Feb2019	04:08	0.7	0.1	7299.6	0.2
26Feb2019	04:09	0.7	0.1	7299.6	0.2
26Feb2019	04:10	0.7	0.1	7299.6	0.2
26Feb2019	04:11	0.7	0.1	7299.6	0.2
26Feb2019	04:12	0.7	0.1	7299.6	0.2
26Feb2019	04:13	0.7	0.1	7299.6	0.2
26Feb2019	04:14	0.7	0.1	7299.6	0.2
26Feb2019	04:15	0.7	0.1	7299.6	0.2
26Feb2019	04:16	0.7	0.1	7299.6	0.2
26Feb2019	04:17	0.7	0.1	7299.6	0.2
26Feb2019	04:18	0.7	0.1	7299.6	0.2
26Feb2019	04:19	0.7	0.1	7299.6	0.2
26Feb2019	04:20	0.7	0.1	7299.6	0.2
26Feb2019	04:21	0.7	0.1	7299.6	0.2
26Feb2019	04:22	0.7	0.1	7299.6	0.2
26Feb2019	04:23	0.7	0.1	7299.6	0.2
26Feb2019	04:24	0.7	0.1	7299.6	0.2
26Feb2019	04:25	0.7	0.1	7299.6	0.2
26Feb2019	04:26	0.7	0.1	7299.6	0.2
26Feb2019	04:27	0.7	0.1	7299.6	0.2
26Feb2019	04:28	0.7	0.1	7299.6	0.2
26Feb2019	04:29	0.7	0.1	7299.6	0.2
26Feb2019	04:30	0.7	0.1	7299.6	0.2
26Feb2019	04:31	0.7	0.1	7299.6	0.2
26Feb2019	04:32	0.7	0.1	7299.6	0.2
26Feb2019	04:33	0.7	0.1	7299.6	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	04:34	0.7	0.1	7299.6	0.2
26Feb2019	04:35	0.7	0.1	7299.6	0.2
26Feb2019	04:36	0.7	0.1	7299.6	0.2
26Feb2019	04:37	0.7	0.1	7299.6	0.2
26Feb2019	04:38	0.7	0.1	7299.6	0.2
26Feb2019	04:39	0.7	0.1	7299.6	0.2
26Feb2019	04:40	0.7	0.1	7299.6	0.2
26Feb2019	04:41	0.7	0.1	7299.6	0.2
26Feb2019	04:42	0.7	0.1	7299.6	0.2
26Feb2019	04:43	0.7	0.1	7299.6	0.2
26Feb2019	04:44	0.7	0.1	7299.6	0.2
26Feb2019	04:45	0.7	0.1	7299.6	0.2
26Feb2019	04:46	0.7	0.1	7299.6	0.2
26Feb2019	04:47	0.8	0.1	7299.6	0.2
26Feb2019	04:48	0.8	0.1	7299.6	0.2
26Feb2019	04:49	0.8	0.1	7299.6	0.2
26Feb2019	04:50	0.8	0.2	7299.6	0.2
26Feb2019	04:51	0.8	0.2	7299.6	0.2
26Feb2019	04:52	0.8	0.2	7299.6	0.2
26Feb2019	04:53	0.8	0.2	7299.6	0.2
26Feb2019	04:54	0.8	0.2	7299.6	0.2
26Feb2019	04:55	0.8	0.2	7299.7	0.2
26Feb2019	04:56	0.8	0.2	7299.7	0.2
26Feb2019	04:57	0.8	0.2	7299.7	0.2
26Feb2019	04:58	0.8	0.2	7299.7	0.2
26Feb2019	04:59	0.8	0.2	7299.7	0.2
26Feb2019	05:00	0.8	0.2	7299.7	0.2
26Feb2019	05:01	0.8	0.2	7299.7	0.2
26Feb2019	05:02	0.8	0.2	7299.7	0.2
26Feb2019	05:03	0.8	0.2	7299.7	0.2
26Feb2019	05:04	0.8	0.2	7299.7	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	05:05	0.8	0.2	7299.7	0.2
26Feb2019	05:06	0.8	0.2	7299.7	0.2
26Feb2019	05:07	0.8	0.2	7299.7	0.2
26Feb2019	05:08	0.8	0.2	7299.7	0.2
26Feb2019	05:09	0.8	0.2	7299.7	0.2
26Feb2019	05:10	0.8	0.2	7299.7	0.2
26Feb2019	05:11	0.8	0.2	7299.7	0.2
26Feb2019	05:12	0.8	0.2	7299.7	0.2
26Feb2019	05:13	0.8	0.2	7299.7	0.2
26Feb2019	05:14	0.8	0.2	7299.7	0.2
26Feb2019	05:15	0.8	0.2	7299.7	0.2
26Feb2019	05:16	0.8	0.2	7299.7	0.2
26Feb2019	05:17	0.8	0.2	7299.7	0.2
26Feb2019	05:18	0.8	0.2	7299.7	0.2
26Feb2019	05:19	0.8	0.2	7299.7	0.2
26Feb2019	05:20	0.8	0.2	7299.7	0.2
26Feb2019	05:21	0.8	0.2	7299.7	0.2
26Feb2019	05:22	0.8	0.2	7299.7	0.2
26Feb2019	05:23	0.8	0.2	7299.7	0.2
26Feb2019	05:24	0.8	0.2	7299.7	0.2
26Feb2019	05:25	0.8	0.2	7299.7	0.2
26Feb2019	05:26	0.8	0.2	7299.7	0.2
26Feb2019	05:27	0.8	0.2	7299.7	0.2
26Feb2019	05:28	0.8	0.2	7299.7	0.2
26Feb2019	05:29	0.8	0.2	7299.7	0.2
26Feb2019	05:30	0.8	0.2	7299.7	0.2
26Feb2019	05:31	0.8	0.2	7299.7	0.2
26Feb2019	05:32	0.8	0.2	7299.7	0.2
26Feb2019	05:33	0.8	0.2	7299.7	0.2
26Feb2019	05:34	0.8	0.2	7299.7	0.2
26Feb2019	05:35	0.8	0.2	7299.7	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	05:36	0.8	0.2	7299.7	0.2
26Feb2019	05:37	0.8	0.2	7299.7	0.2
26Feb2019	05:38	0.8	0.2	7299.7	0.2
26Feb2019	05:39	0.8	0.2	7299.7	0.2
26Feb2019	05:40	0.8	0.2	7299.7	0.2
26Feb2019	05:41	0.8	0.2	7299.7	0.2
26Feb2019	05:42	0.8	0.2	7299.7	0.2
26Feb2019	05:43	0.8	0.2	7299.8	0.2
26Feb2019	05:44	0.8	0.2	7299.8	0.2
26Feb2019	05:45	0.8	0.2	7299.8	0.2
26Feb2019	05:46	0.8	0.2	7299.8	0.2
26Feb2019	05:47	0.9	0.2	7299.8	0.2
26Feb2019	05:48	0.9	0.2	7299.8	0.2
26Feb2019	05:49	0.9	0.2	7299.8	0.2
26Feb2019	05:50	0.9	0.2	7299.8	0.2
26Feb2019	05:51	0.9	0.2	7299.8	0.2
26Feb2019	05:52	0.9	0.2	7299.8	0.2
26Feb2019	05:53	0.9	0.2	7299.8	0.2
26Feb2019	05:54	0.9	0.2	7299.8	0.2
26Feb2019	05:55	0.9	0.2	7299.8	0.2
26Feb2019	05:56	0.9	0.2	7299.8	0.2
26Feb2019	05:57	0.9	0.2	7299.8	0.2
26Feb2019	05:58	0.9	0.2	7299.8	0.2
26Feb2019	05:59	0.9	0.2	7299.8	0.2
26Feb2019	06:00	0.9	0.2	7299.8	0.2
26Feb2019	06:01	0.9	0.2	7299.8	0.2
26Feb2019	06:02	0.9	0.2	7299.8	0.2
26Feb2019	06:03	0.9	0.2	7299.8	0.2
26Feb2019	06:04	0.9	0.2	7299.8	0.2
26Feb2019	06:05	0.9	0.2	7299.8	0.2
26Feb2019	06:06	0.9	0.2	7299.8	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	06:07	0.9	0.2	7299.8	0.2
26Feb2019	06:08	0.9	0.2	7299.8	0.2
26Feb2019	06:09	0.9	0.2	7299.8	0.2
26Feb2019	06:10	0.9	0.2	7299.8	0.2
26Feb2019	06:11	0.9	0.2	7299.8	0.2
26Feb2019	06:12	0.9	0.2	7299.8	0.2
26Feb2019	06:13	0.9	0.2	7299.8	0.2
26Feb2019	06:14	0.9	0.2	7299.8	0.2
26Feb2019	06:15	0.9	0.2	7299.8	0.2
26Feb2019	06:16	0.9	0.2	7299.8	0.2
26Feb2019	06:17	0.9	0.2	7299.8	0.2
26Feb2019	06:18	0.9	0.2	7299.8	0.2
26Feb2019	06:19	0.9	0.2	7299.8	0.2
26Feb2019	06:20	0.9	0.2	7299.8	0.2
26Feb2019	06:21	0.9	0.2	7299.8	0.2
26Feb2019	06:22	0.9	0.2	7299.8	0.2
26Feb2019	06:23	0.9	0.2	7299.8	0.2
26Feb2019	06:24	0.9	0.2	7299.8	0.2
26Feb2019	06:25	0.9	0.2	7299.8	0.2
26Feb2019	06:26	0.9	0.2	7299.8	0.2
26Feb2019	06:27	0.9	0.2	7299.8	0.2
26Feb2019	06:28	0.9	0.2	7299.8	0.2
26Feb2019	06:29	0.9	0.2	7299.8	0.2
26Feb2019	06:30	0.9	0.2	7299.8	0.2
26Feb2019	06:31	0.9	0.2	7299.8	0.2
26Feb2019	06:32	0.9	0.2	7299.8	0.2
26Feb2019	06:33	0.9	0.2	7299.8	0.2
26Feb2019	06:34	0.9	0.2	7299.8	0.2
26Feb2019	06:35	0.9	0.2	7299.8	0.2
26Feb2019	06:36	0.9	0.2	7299.8	0.2
26Feb2019	06:37	0.9	0.2	7299.8	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	06:38	0.9	0.2	7299.8	0.2
26Feb2019	06:39	0.9	0.2	7299.8	0.2
26Feb2019	06:40	0.9	0.2	7299.9	0.2
26Feb2019	06:41	0.9	0.2	7299.9	0.2
26Feb2019	06:42	0.9	0.2	7299.9	0.2
26Feb2019	06:43	0.9	0.2	7299.9	0.2
26Feb2019	06:44	1.0	0.2	7299.9	0.2
26Feb2019	06:45	1.0	0.3	7299.9	0.2
26Feb2019	06:46	1.0	0.3	7299.9	0.2
26Feb2019	06:47	1.0	0.3	7299.9	0.2
26Feb2019	06:48	1.0	0.3	7299.9	0.2
26Feb2019	06:49	1.0	0.3	7299.9	0.2
26Feb2019	06:50	1.0	0.3	7299.9	0.2
26Feb2019	06:51	1.0	0.3	7299.9	0.2
26Feb2019	06:52	1.0	0.3	7299.9	0.2
26Feb2019	06:53	1.0	0.3	7299.9	0.2
26Feb2019	06:54	1.0	0.3	7299.9	0.2
26Feb2019	06:55	1.0	0.3	7299.9	0.2
26Feb2019	06:56	1.0	0.3	7299.9	0.2
26Feb2019	06:57	1.0	0.3	7299.9	0.2
26Feb2019	06:58	1.0	0.3	7299.9	0.2
26Feb2019	06:59	1.0	0.3	7299.9	0.2
26Feb2019	07:00	1.0	0.3	7299.9	0.2
26Feb2019	07:01	1.0	0.3	7299.9	0.2
26Feb2019	07:02	1.0	0.3	7299.9	0.2
26Feb2019	07:03	1.0	0.3	7299.9	0.2
26Feb2019	07:04	1.0	0.3	7299.9	0.2
26Feb2019	07:05	1.0	0.3	7299.9	0.2
26Feb2019	07:06	1.0	0.3	7299.9	0.2
26Feb2019	07:07	1.0	0.3	7299.9	0.2
26Feb2019	07:08	1.0	0.3	7299.9	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	07:09	1.0	0.3	7299.9	0.2
26Feb2019	07:10	1.0	0.3	7299.9	0.2
26Feb2019	07:11	1.0	0.3	7299.9	0.2
26Feb2019	07:12	1.0	0.3	7299.9	0.2
26Feb2019	07:13	1.0	0.3	7299.9	0.2
26Feb2019	07:14	1.0	0.3	7299.9	0.2
26Feb2019	07:15	1.0	0.3	7299.9	0.2
26Feb2019	07:16	1.0	0.3	7299.9	0.2
26Feb2019	07:17	1.0	0.3	7299.9	0.2
26Feb2019	07:18	1.0	0.3	7299.9	0.2
26Feb2019	07:19	1.0	0.3	7299.9	0.2
26Feb2019	07:20	1.0	0.3	7299.9	0.2
26Feb2019	07:21	1.0	0.3	7299.9	0.2
26Feb2019	07:22	1.0	0.3	7299.9	0.2
26Feb2019	07:23	1.0	0.3	7299.9	0.2
26Feb2019	07:24	1.0	0.3	7299.9	0.2
26Feb2019	07:25	1.0	0.3	7299.9	0.2
26Feb2019	07:26	1.0	0.3	7299.9	0.2
26Feb2019	07:27	1.0	0.3	7299.9	0.2
26Feb2019	07:28	1.0	0.3	7299.9	0.2
26Feb2019	07:29	1.0	0.3	7299.9	0.2
26Feb2019	07:30	1.0	0.3	7299.9	0.2
26Feb2019	07:31	1.0	0.3	7300.0	0.2
26Feb2019	07:32	1.0	0.3	7300.0	0.2
26Feb2019	07:33	1.0	0.3	7300.0	0.2
26Feb2019	07:34	1.0	0.3	7300.0	0.2
26Feb2019	07:35	1.0	0.3	7300.0	0.2
26Feb2019	07:36	1.0	0.3	7300.0	0.2
26Feb2019	07:37	1.0	0.3	7300.0	0.2
26Feb2019	07:38	1.0	0.3	7300.0	0.2
26Feb2019	07:39	1.0	0.3	7300.0	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	07:40	1.1	0.3	7300.0	0.2
26Feb2019	07:41	1.1	0.3	7300.0	0.2
26Feb2019	07:42	1.1	0.3	7300.0	0.2
26Feb2019	07:43	1.1	0.3	7300.0	0.2
26Feb2019	07:44	1.1	0.3	7300.0	0.2
26Feb2019	07:45	1.1	0.3	7300.0	0.2
26Feb2019	07:46	1.1	0.3	7300.0	0.2
26Feb2019	07:47	1.1	0.3	7300.0	0.2
26Feb2019	07:48	1.1	0.3	7300.0	0.2
26Feb2019	07:49	1.1	0.3	7300.0	0.2
26Feb2019	07:50	1.1	0.3	7300.0	0.2
26Feb2019	07:51	1.1	0.3	7300.0	0.2
26Feb2019	07:52	1.1	0.3	7300.0	0.2
26Feb2019	07:53	1.1	0.3	7300.0	0.2
26Feb2019	07:54	1.1	0.3	7300.0	0.2
26Feb2019	07:55	1.1	0.3	7300.0	0.3
26Feb2019	07:56	1.1	0.3	7300.0	0.3
26Feb2019	07:57	1.1	0.3	7300.0	0.3
26Feb2019	07:58	1.1	0.3	7300.0	0.3
26Feb2019	07:59	1.1	0.3	7300.0	0.3
26Feb2019	08:00	1.1	0.3	7300.0	0.3
26Feb2019	08:01	1.1	0.3	7300.0	0.3
26Feb2019	08:02	1.1	0.3	7300.0	0.3
26Feb2019	08:03	1.1	0.3	7300.0	0.3
26Feb2019	08:04	1.1	0.3	7300.0	0.3
26Feb2019	08:05	1.1	0.3	7300.0	0.3
26Feb2019	08:06	1.1	0.3	7300.0	0.3
26Feb2019	08:07	1.1	0.3	7300.0	0.3
26Feb2019	08:08	1.1	0.3	7300.0	0.3
26Feb2019	08:09	1.1	0.3	7300.0	0.3
26Feb2019	08:10	1.1	0.3	7300.0	0.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	08:11	1.1	0.3	7300.0	0.3
26Feb2019	08:12	1.1	0.3	7300.0	0.3
26Feb2019	08:13	1.1	0.3	7300.0	0.3
26Feb2019	08:14	1.1	0.3	7300.0	0.3
26Feb2019	08:15	1.1	0.3	7300.0	0.3
26Feb2019	08:16	1.1	0.3	7300.0	0.3
26Feb2019	08:17	1.1	0.4	7300.0	0.3
26Feb2019	08:18	1.1	0.4	7300.0	0.3
26Feb2019	08:19	1.1	0.4	7300.0	0.3
26Feb2019	08:20	1.1	0.4	7300.0	0.3
26Feb2019	08:21	1.1	0.4	7300.0	0.3
26Feb2019	08:22	1.1	0.4	7300.0	0.3
26Feb2019	08:23	1.1	0.4	7300.0	0.3
26Feb2019	08:24	1.1	0.4	7300.1	0.3
26Feb2019	08:25	1.1	0.4	7300.1	0.3
26Feb2019	08:26	1.2	0.4	7300.1	0.3
26Feb2019	08:27	1.2	0.4	7300.1	0.3
26Feb2019	08:28	1.2	0.4	7300.1	0.3
26Feb2019	08:29	1.2	0.4	7300.1	0.3
26Feb2019	08:30	1.2	0.4	7300.1	0.3
26Feb2019	08:31	1.2	0.4	7300.1	0.3
26Feb2019	08:32	1.2	0.4	7300.1	0.3
26Feb2019	08:33	1.2	0.4	7300.1	0.3
26Feb2019	08:34	1.2	0.4	7300.1	0.3
26Feb2019	08:35	1.2	0.4	7300.1	0.3
26Feb2019	08:36	1.2	0.4	7300.1	0.3
26Feb2019	08:37	1.2	0.4	7300.1	0.3
26Feb2019	08:38	1.2	0.4	7300.1	0.3
26Feb2019	08:39	1.2	0.4	7300.1	0.3
26Feb2019	08:40	1.2	0.4	7300.1	0.3
26Feb2019	08:41	1.2	0.4	7300.1	0.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	08:42	1.2	0.4	7300.1	0.3
26Feb2019	08:43	1.2	0.4	7300.1	0.3
26Feb2019	08:44	1.2	0.4	7300.1	0.3
26Feb2019	08:45	1.2	0.4	7300.1	0.3
26Feb2019	08:46	1.3	0.4	7300.1	0.3
26Feb2019	08:47	1.3	0.4	7300.1	0.3
26Feb2019	08:48	1.3	0.4	7300.1	0.3
26Feb2019	08:49	1.3	0.4	7300.1	0.3
26Feb2019	08:50	1.3	0.4	7300.1	0.3
26Feb2019	08:51	1.3	0.4	7300.1	0.3
26Feb2019	08:52	1.3	0.4	7300.1	0.3
26Feb2019	08:53	1.3	0.4	7300.1	0.3
26Feb2019	08:54	1.3	0.4	7300.1	0.3
26Feb2019	08:55	1.3	0.4	7300.1	0.3
26Feb2019	08:56	1.3	0.4	7300.1	0.3
26Feb2019	08:57	1.3	0.4	7300.1	0.3
26Feb2019	08:58	1.3	0.4	7300.1	0.3
26Feb2019	08:59	1.3	0.4	7300.1	0.3
26Feb2019	09:00	1.4	0.4	7300.1	0.3
26Feb2019	09:01	1.4	0.4	7300.1	0.3
26Feb2019	09:02	1.4	0.4	7300.1	0.3
26Feb2019	09:03	1.4	0.4	7300.1	0.3
26Feb2019	09:04	1.4	0.4	7300.1	0.3
26Feb2019	09:05	1.4	0.4	7300.1	0.3
26Feb2019	09:06	1.4	0.4	7300.1	0.3
26Feb2019	09:07	1.4	0.4	7300.1	0.3
26Feb2019	09:08	1.4	0.4	7300.1	0.3
26Feb2019	09:09	1.4	0.4	7300.1	0.3
26Feb2019	09:10	1.4	0.4	7300.1	0.3
26Feb2019	09:11	1.4	0.4	7300.1	0.3
26Feb2019	09:12	1.4	0.4	7300.1	0.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	09:13	1.5	0.4	7300.2	0.3
26Feb2019	09:14	1.5	0.4	7300.2	0.3
26Feb2019	09:15	1.5	0.4	7300.2	0.3
26Feb2019	09:16	1.5	0.4	7300.2	0.3
26Feb2019	09:17	1.5	0.4	7300.2	0.3
26Feb2019	09:18	1.5	0.4	7300.2	0.3
26Feb2019	09:19	1.5	0.4	7300.2	0.3
26Feb2019	09:20	1.5	0.4	7300.2	0.3
26Feb2019	09:21	1.5	0.4	7300.2	0.3
26Feb2019	09:22	1.5	0.4	7300.2	0.3
26Feb2019	09:23	1.5	0.4	7300.2	0.3
26Feb2019	09:24	1.5	0.4	7300.2	0.3
26Feb2019	09:25	1.5	0.4	7300.2	0.3
26Feb2019	09:26	1.6	0.5	7300.2	0.3
26Feb2019	09:27	1.6	0.5	7300.2	0.3
26Feb2019	09:28	1.6	0.5	7300.2	0.3
26Feb2019	09:29	1.6	0.5	7300.2	0.3
26Feb2019	09:30	1.6	0.5	7300.2	0.3
26Feb2019	09:31	1.6	0.5	7300.2	0.3
26Feb2019	09:32	1.6	0.5	7300.2	0.3
26Feb2019	09:33	1.6	0.5	7300.2	0.3
26Feb2019	09:34	1.6	0.5	7300.2	0.3
26Feb2019	09:35	1.6	0.5	7300.2	0.3
26Feb2019	09:36	1.6	0.5	7300.2	0.3
26Feb2019	09:37	1.6	0.5	7300.2	0.3
26Feb2019	09:38	1.6	0.5	7300.2	0.3
26Feb2019	09:39	1.6	0.5	7300.2	0.3
26Feb2019	09:40	1.6	0.5	7300.2	0.3
26Feb2019	09:41	1.6	0.5	7300.2	0.3
26Feb2019	09:42	1.6	0.5	7300.2	0.3
26Feb2019	09:43	1.6	0.5	7300.2	0.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	09:44	1.6	0.5	7300.2	0.3
26Feb2019	09:45	1.6	0.5	7300.2	0.3
26Feb2019	09:46	1.7	0.5	7300.2	0.3
26Feb2019	09:47	1.7	0.5	7300.2	0.3
26Feb2019	09:48	1.7	0.5	7300.2	0.3
26Feb2019	09:49	1.7	0.5	7300.2	0.3
26Feb2019	09:50	1.7	0.5	7300.2	0.3
26Feb2019	09:51	1.7	0.5	7300.2	0.3
26Feb2019	09:52	1.7	0.5	7300.3	0.3
26Feb2019	09:53	1.7	0.5	7300.3	0.3
26Feb2019	09:54	1.7	0.5	7300.3	0.3
26Feb2019	09:55	1.7	0.5	7300.3	0.3
26Feb2019	09:56	1.7	0.5	7300.3	0.3
26Feb2019	09:57	1.7	0.5	7300.3	0.3
26Feb2019	09:58	1.7	0.5	7300.3	0.3
26Feb2019	09:59	1.7	0.5	7300.3	0.3
26Feb2019	10:00	1.7	0.5	7300.3	0.3
26Feb2019	10:01	1.7	0.5	7300.3	0.3
26Feb2019	10:02	1.7	0.5	7300.3	0.3
26Feb2019	10:03	1.7	0.5	7300.3	0.3
26Feb2019	10:04	1.8	0.5	7300.3	0.3
26Feb2019	10:05	1.8	0.5	7300.3	0.3
26Feb2019	10:06	1.8	0.5	7300.3	0.3
26Feb2019	10:07	1.8	0.5	7300.3	0.3
26Feb2019	10:08	1.8	0.5	7300.3	0.3
26Feb2019	10:09	1.8	0.5	7300.3	0.3
26Feb2019	10:10	1.8	0.5	7300.3	0.3
26Feb2019	10:11	1.8	0.5	7300.3	0.3
26Feb2019	10:12	1.8	0.5	7300.3	0.3
26Feb2019	10:13	1.8	0.5	7300.3	0.3
26Feb2019	10:14	1.8	0.5	7300.3	0.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	10:15	1.9	0.5	7300.3	0.3
26Feb2019	10:16	1.9	0.5	7300.3	0.3
26Feb2019	10:17	1.9	0.5	7300.3	0.3
26Feb2019	10:18	1.9	0.6	7300.3	0.3
26Feb2019	10:19	1.9	0.6	7300.3	0.3
26Feb2019	10:20	1.9	0.6	7300.3	0.3
26Feb2019	10:21	1.9	0.6	7300.3	0.3
26Feb2019	10:22	1.9	0.6	7300.3	0.3
26Feb2019	10:23	2.0	0.6	7300.3	0.3
26Feb2019	10:24	2.0	0.6	7300.3	0.3
26Feb2019	10:25	2.0	0.6	7300.3	0.3
26Feb2019	10:26	2.0	0.6	7300.3	0.3
26Feb2019	10:27	2.0	0.6	7300.3	0.3
26Feb2019	10:28	2.0	0.6	7300.3	0.3
26Feb2019	10:29	2.0	0.6	7300.3	0.3
26Feb2019	10:30	2.1	0.6	7300.3	0.3
26Feb2019	10:31	2.1	0.6	7300.3	0.3
26Feb2019	10:32	2.1	0.6	7300.4	0.3
26Feb2019	10:33	2.1	0.6	7300.4	0.3
26Feb2019	10:34	2.1	0.6	7300.4	0.3
26Feb2019	10:35	2.1	0.6	7300.4	0.3
26Feb2019	10:36	2.2	0.6	7300.4	0.3
26Feb2019	10:37	2.2	0.6	7300.4	0.3
26Feb2019	10:38	2.2	0.6	7300.4	0.3
26Feb2019	10:39	2.2	0.6	7300.4	0.4
26Feb2019	10:40	2.2	0.6	7300.4	0.4
26Feb2019	10:41	2.2	0.6	7300.4	0.4
26Feb2019	10:42	2.3	0.6	7300.4	0.4
26Feb2019	10:43	2.3	0.6	7300.4	0.4
26Feb2019	10:44	2.3	0.6	7300.4	0.4
26Feb2019	10:45	2.3	0.6	7300.4	0.4

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	10:46	2.3	0.6	7300.4	0.4
26Feb2019	10:47	2.4	0.6	7300.4	0.4
26Feb2019	10:48	2.4	0.6	7300.4	0.4
26Feb2019	10:49	2.4	0.6	7300.4	0.4
26Feb2019	10:50	2.4	0.6	7300.4	0.4
26Feb2019	10:51	2.5	0.6	7300.4	0.4
26Feb2019	10:52	2.5	0.6	7300.4	0.4
26Feb2019	10:53	2.5	0.6	7300.4	0.4
26Feb2019	10:54	2.5	0.6	7300.4	0.4
26Feb2019	10:55	2.6	0.6	7300.4	0.4
26Feb2019	10:56	2.6	0.6	7300.4	0.4
26Feb2019	10:57	2.6	0.7	7300.4	0.4
26Feb2019	10:58	2.6	0.7	7300.4	0.4
26Feb2019	10:59	2.7	0.7	7300.4	0.4
26Feb2019	11:00	2.7	0.7	7300.4	0.4
26Feb2019	11:01	2.7	0.7	7300.4	0.4
26Feb2019	11:02	2.7	0.7	7300.4	0.4
26Feb2019	11:03	2.8	0.7	7300.4	0.4
26Feb2019	11:04	2.8	0.7	7300.5	0.4
26Feb2019	11:05	2.8	0.7	7300.5	0.4
26Feb2019	11:06	2.9	0.7	7300.5	0.4
26Feb2019	11:07	2.9	0.7	7300.5	0.4
26Feb2019	11:08	2.9	0.7	7300.5	0.4
26Feb2019	11:09	2.9	0.7	7300.5	0.4
26Feb2019	11:10	3.0	0.7	7300.5	0.4
26Feb2019	11:11	3.0	0.7	7300.5	0.4
26Feb2019	11:12	3.1	0.7	7300.5	0.4
26Feb2019	11:13	3.1	0.7	7300.5	0.4
26Feb2019	11:14	3.1	0.7	7300.5	0.4
26Feb2019	11:15	3.2	0.7	7300.5	0.4
26Feb2019	11:16	3.2	0.7	7300.5	0.4

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	11:17	3.2	0.7	7300.5	0.4
26Feb2019	11:18	3.3	0.7	7300.5	0.4
26Feb2019	11:19	3.3	0.7	7300.5	0.4
26Feb2019	11:20	3.4	0.7	7300.5	0.4
26Feb2019	11:21	3.4	0.7	7300.5	0.4
26Feb2019	11:22	3.5	0.7	7300.5	0.4
26Feb2019	11:23	3.5	0.7	7300.5	0.5
26Feb2019	11:24	3.6	0.7	7300.5	0.5
26Feb2019	11:25	3.6	0.8	7300.5	0.5
26Feb2019	11:26	3.7	0.8	7300.5	0.5
26Feb2019	11:27	3.7	0.8	7300.5	0.5
26Feb2019	11:28	3.8	0.8	7300.5	0.5
26Feb2019	11:29	3.8	0.8	7300.6	0.5
26Feb2019	11:30	3.9	0.8	7300.6	0.5
26Feb2019	11:31	3.9	0.8	7300.6	0.5
26Feb2019	11:32	4.0	0.8	7300.6	0.5
26Feb2019	11:33	4.1	0.8	7300.6	0.5
26Feb2019	11:34	4.2	0.8	7300.6	0.5
26Feb2019	11:35	4.3	0.8	7300.6	0.5
26Feb2019	11:36	4.4	0.8	7300.6	0.5
26Feb2019	11:37	4.5	0.8	7300.6	0.5
26Feb2019	11:38	4.7	0.8	7300.6	0.5
26Feb2019	11:39	4.9	0.8	7300.6	0.5
26Feb2019	11:40	5.1	0.8	7300.6	0.5
26Feb2019	11:41	5.3	0.8	7300.6	0.5
26Feb2019	11:42	5.6	0.8	7300.6	0.5
26Feb2019	11:43	5.8	0.8	7300.6	0.5
26Feb2019	11:44	6.1	0.9	7300.6	0.5
26Feb2019	11:45	6.5	0.9	7300.6	0.5
26Feb2019	11:46	6.9	0.9	7300.7	0.5
26Feb2019	11:47	7.3	0.9	7300.7	0.5

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	11:48	7.8	0.9	7300.7	0.5
26Feb2019	11:49	8.3	0.9	7300.7	0.5
26Feb2019	11:50	8.9	0.9	7300.7	0.5
26Feb2019	11:51	9.5	0.9	7300.7	0.5
26Feb2019	11:52	10.3	0.9	7300.7	0.5
26Feb2019	11:53	11.2	1.0	7300.7	0.5
26Feb2019	11:54	12.2	1.0	7300.7	0.5
26Feb2019	11:55	13.3	1.0	7300.8	0.5
26Feb2019	11:56	14.4	1.0	7300.8	0.5
26Feb2019	11:57	15.7	1.0	7300.8	0.5
26Feb2019	11:58	16.9	1.0	7300.8	0.5
26Feb2019	11:59	18.2	1.1	7300.8	0.6
26Feb2019	12:00	19.6	1.1	7300.8	0.6
26Feb2019	12:01	21.0	1.1	7300.9	0.6
26Feb2019	12:02	22.4	1.1	7300.9	0.6
26Feb2019	12:03	23.8	1.2	7300.9	0.6
26Feb2019	12:04	25.3	1.2	7300.9	0.6
26Feb2019	12:05	26.6	1.2	7301.0	0.6
26Feb2019	12:06	28.1	1.3	7301.0	0.6
26Feb2019	12:07	29.5	1.3	7301.0	0.6
26Feb2019	12:08	30.8	1.4	7301.1	0.6
26Feb2019	12:09	32.1	1.4	7301.1	0.6
26Feb2019	12:10	33.1	1.5	7301.1	0.6
26Feb2019	12:11	34.0	1.5	7301.2	0.6
26Feb2019	12:12	34.6	1.5	7301.2	0.7
26Feb2019	12:13	35.1	1.6	7301.2	0.7
26Feb2019	12:14	35.3	1.6	7301.3	0.7
26Feb2019	12:15	35.3	1.7	7301.3	0.8
26Feb2019	12:16	35.1	1.7	7301.3	1.0
26Feb2019	12:17	34.7	1.8	7301.3	1.1
26Feb2019	12:18	34.1	1.8	7301.4	1.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	12:19	33.4	1.9	7301.4	1.4
26Feb2019	12:20	32.6	1.9	7301.4	1.5
26Feb2019	12:21	31.7	2.0	7301.5	1.6
26Feb2019	12:22	30.7	2.0	7301.5	1.8
26Feb2019	12:23	29.7	2.0	7301.5	2.1
26Feb2019	12:24	28.7	2.1	7301.5	2.7
26Feb2019	12:25	27.7	2.1	7301.6	3.2
26Feb2019	12:26	26.7	2.1	7301.6	3.7
26Feb2019	12:27	25.7	2.2	7301.6	4.2
26Feb2019	12:28	24.7	2.2	7301.6	4.6
26Feb2019	12:29	23.7	2.2	7301.6	5.0
26Feb2019	12:30	22.8	2.2	7301.6	5.4
26Feb2019	12:31	21.8	2.3	7301.7	5.7
26Feb2019	12:32	21.0	2.3	7301.7	6.1
26Feb2019	12:33	20.1	2.3	7301.7	6.4
26Feb2019	12:34	19.3	2.3	7301.7	6.6
26Feb2019	12:35	18.5	2.3	7301.7	6.9
26Feb2019	12:36	17.8	2.4	7301.7	7.1
26Feb2019	12:37	17.1	2.4	7301.7	7.3
26Feb2019	12:38	16.4	2.4	7301.7	7.5
26Feb2019	12:39	15.7	2.4	7301.7	7.7
26Feb2019	12:40	15.1	2.4	7301.7	7.9
26Feb2019	12:41	14.5	2.4	7301.7	8.0
26Feb2019	12:42	14.0	2.4	7301.7	8.1
26Feb2019	12:43	13.4	2.4	7301.8	8.3
26Feb2019	12:44	12.9	2.4	7301.8	8.4
26Feb2019	12:45	12.4	2.5	7301.8	8.6
26Feb2019	12:46	12.0	2.5	7301.8	8.7
26Feb2019	12:47	11.5	2.5	7301.8	8.7
26Feb2019	12:48	11.1	2.5	7301.8	8.8
26Feb2019	12:49	10.7	2.5	7301.8	8.9

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	12:50	10.3	2.5	7301.8	8.9
26Feb2019	12:51	9.9	2.5	7301.8	9.0
26Feb2019	12:52	9.6	2.5	7301.8	9.0
26Feb2019	12:53	9.3	2.5	7301.8	9.0
26Feb2019	12:54	8.9	2.5	7301.8	9.0
26Feb2019	12:55	8.6	2.5	7301.8	9.0
26Feb2019	12:56	8.4	2.5	7301.8	9.0
26Feb2019	12:57	8.1	2.5	7301.8	9.0
26Feb2019	12:58	7.8	2.5	7301.8	8.9
26Feb2019	12:59	7.6	2.5	7301.8	8.9
26Feb2019	13:00	7.4	2.5	7301.8	8.9
26Feb2019	13:01	7.1	2.5	7301.8	8.8
26Feb2019	13:02	6.9	2.5	7301.8	8.8
26Feb2019	13:03	6.7	2.5	7301.8	8.7
26Feb2019	13:04	6.6	2.5	7301.8	8.6
26Feb2019	13:05	6.4	2.5	7301.8	8.6
26Feb2019	13:06	6.2	2.4	7301.8	8.5
26Feb2019	13:07	6.1	2.4	7301.8	8.4
26Feb2019	13:08	5.9	2.4	7301.8	8.4
26Feb2019	13:09	5.8	2.4	7301.8	8.3
26Feb2019	13:10	5.6	2.4	7301.8	8.2
26Feb2019	13:11	5.5	2.4	7301.7	8.1
26Feb2019	13:12	5.4	2.4	7301.7	8.1
26Feb2019	13:13	5.2	2.4	7301.7	8.0
26Feb2019	13:14	5.1	2.4	7301.7	8.0
26Feb2019	13:15	5.0	2.4	7301.7	7.9
26Feb2019	13:16	4.9	2.4	7301.7	7.9
26Feb2019	13:17	4.8	2.4	7301.7	7.8
26Feb2019	13:18	4.7	2.4	7301.7	7.7
26Feb2019	13:19	4.6	2.4	7301.7	7.7
26Feb2019	13:20	4.5	2.4	7301.7	7.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	13:21	4.5	2.4	7301.7	7.5
26Feb2019	13:22	4.4	2.4	7301.7	7.5
26Feb2019	13:23	4.3	2.4	7301.7	7.4
26Feb2019	13:24	4.2	2.4	7301.7	7.3
26Feb2019	13:25	4.1	2.4	7301.7	7.3
26Feb2019	13:26	4.1	2.4	7301.7	7.2
26Feb2019	13:27	4.0	2.4	7301.7	7.1
26Feb2019	13:28	3.9	2.4	7301.7	7.1
26Feb2019	13:29	3.9	2.4	7301.7	7.0
26Feb2019	13:30	3.8	2.4	7301.7	7.0
26Feb2019	13:31	3.8	2.3	7301.7	6.9
26Feb2019	13:32	3.7	2.3	7301.7	6.8
26Feb2019	13:33	3.7	2.3	7301.7	6.8
26Feb2019	13:34	3.6	2.3	7301.7	6.7
26Feb2019	13:35	3.6	2.3	7301.7	6.6
26Feb2019	13:36	3.5	2.3	7301.7	6.6
26Feb2019	13:37	3.5	2.3	7301.7	6.5
26Feb2019	13:38	3.4	2.3	7301.7	6.4
26Feb2019	13:39	3.4	2.3	7301.7	6.4
26Feb2019	13:40	3.3	2.3	7301.7	6.3
26Feb2019	13:41	3.3	2.3	7301.7	6.3
26Feb2019	13:42	3.3	2.3	7301.7	6.2
26Feb2019	13:43	3.2	2.3	7301.7	6.1
26Feb2019	13:44	3.2	2.3	7301.7	6.1
26Feb2019	13:45	3.2	2.3	7301.7	6.0
26Feb2019	13:46	3.1	2.3	7301.7	5.9
26Feb2019	13:47	3.1	2.3	7301.7	5.9
26Feb2019	13:48	3.0	2.3	7301.7	5.8
26Feb2019	13:49	3.0	2.3	7301.7	5.8
26Feb2019	13:50	3.0	2.3	7301.7	5.7
26Feb2019	13:51	3.0	2.3	7301.7	5.7

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	13:52	2.9	2.3	7301.6	5.6
26Feb2019	13:53	2.9	2.3	7301.6	5.5
26Feb2019	13:54	2.9	2.3	7301.6	5.5
26Feb2019	13:55	2.8	2.3	7301.6	5.4
26Feb2019	13:56	2.8	2.2	7301.6	5.4
26Feb2019	13:57	2.8	2.2	7301.6	5.3
26Feb2019	13:58	2.8	2.2	7301.6	5.3
26Feb2019	13:59	2.7	2.2	7301.6	5.2
26Feb2019	14:00	2.7	2.2	7301.6	5.2
26Feb2019	14:01	2.7	2.2	7301.6	5.1
26Feb2019	14:02	2.7	2.2	7301.6	5.1
26Feb2019	14:03	2.6	2.2	7301.6	5.0
26Feb2019	14:04	2.6	2.2	7301.6	5.0
26Feb2019	14:05	2.6	2.2	7301.6	4.9
26Feb2019	14:06	2.6	2.2	7301.6	4.9
26Feb2019	14:07	2.5	2.2	7301.6	4.8
26Feb2019	14:08	2.5	2.2	7301.6	4.8
26Feb2019	14:09	2.5	2.2	7301.6	4.7
26Feb2019	14:10	2.5	2.2	7301.6	4.7
26Feb2019	14:11	2.4	2.2	7301.6	4.6
26Feb2019	14:12	2.4	2.2	7301.6	4.6
26Feb2019	14:13	2.4	2.2	7301.6	4.5
26Feb2019	14:14	2.4	2.2	7301.6	4.5
26Feb2019	14:15	2.4	2.2	7301.6	4.5
26Feb2019	14:16	2.3	2.2	7301.6	4.4
26Feb2019	14:17	2.3	2.2	7301.6	4.4
26Feb2019	14:18	2.3	2.2	7301.6	4.3
26Feb2019	14:19	2.3	2.2	7301.6	4.3
26Feb2019	14:20	2.3	2.2	7301.6	4.2
26Feb2019	14:21	2.3	2.2	7301.6	4.2
26Feb2019	14:22	2.2	2.2	7301.6	4.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	14:23	2.2	2.2	7301.6	4.1
26Feb2019	14:24	2.2	2.2	7301.6	4.1
26Feb2019	14:25	2.2	2.2	7301.6	4.0
26Feb2019	14:26	2.2	2.2	7301.6	4.0
26Feb2019	14:27	2.2	2.2	7301.6	4.0
26Feb2019	14:28	2.1	2.2	7301.6	3.9
26Feb2019	14:29	2.1	2.2	7301.6	3.9
26Feb2019	14:30	2.1	2.1	7301.6	3.9
26Feb2019	14:31	2.1	2.1	7301.6	3.8
26Feb2019	14:32	2.1	2.1	7301.6	3.8
26Feb2019	14:33	2.1	2.1	7301.6	3.8
26Feb2019	14:34	2.1	2.1	7301.6	3.7
26Feb2019	14:35	2.1	2.1	7301.6	3.7
26Feb2019	14:36	2.0	2.1	7301.6	3.6
26Feb2019	14:37	2.0	2.1	7301.6	3.6
26Feb2019	14:38	2.0	2.1	7301.6	3.6
26Feb2019	14:39	2.0	2.1	7301.6	3.6
26Feb2019	14:40	2.0	2.1	7301.6	3.5
26Feb2019	14:41	2.0	2.1	7301.6	3.5
26Feb2019	14:42	2.0	2.1	7301.6	3.5
26Feb2019	14:43	2.0	2.1	7301.6	3.4
26Feb2019	14:44	2.0	2.1	7301.6	3.4
26Feb2019	14:45	2.0	2.1	7301.6	3.4
26Feb2019	14:46	1.9	2.1	7301.6	3.3
26Feb2019	14:47	1.9	2.1	7301.6	3.3
26Feb2019	14:48	1.9	2.1	7301.6	3.3
26Feb2019	14:49	1.9	2.1	7301.6	3.3
26Feb2019	14:50	1.9	2.1	7301.6	3.2
26Feb2019	14:51	1.9	2.1	7301.6	3.2
26Feb2019	14:52	1.9	2.1	7301.6	3.2
26Feb2019	14:53	1.9	2.1	7301.6	3.1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	14:54	1.9	2.1	7301.6	3.1
26Feb2019	14:55	1.9	2.1	7301.6	3.1
26Feb2019	14:56	1.9	2.1	7301.5	3.1
26Feb2019	14:57	1.8	2.1	7301.5	3.0
26Feb2019	14:58	1.8	2.1	7301.5	3.0
26Feb2019	14:59	1.8	2.1	7301.5	3.0
26Feb2019	15:00	1.8	2.1	7301.5	3.0
26Feb2019	15:01	1.8	2.1	7301.5	2.9
26Feb2019	15:02	1.8	2.1	7301.5	2.9
26Feb2019	15:03	1.8	2.1	7301.5	2.9
26Feb2019	15:04	1.8	2.1	7301.5	2.9
26Feb2019	15:05	1.8	2.1	7301.5	2.9
26Feb2019	15:06	1.8	2.1	7301.5	2.8
26Feb2019	15:07	1.8	2.1	7301.5	2.8
26Feb2019	15:08	1.8	2.1	7301.5	2.8
26Feb2019	15:09	1.8	2.1	7301.5	2.8
26Feb2019	15:10	1.8	2.1	7301.5	2.7
26Feb2019	15:11	1.7	2.1	7301.5	2.7
26Feb2019	15:12	1.7	2.1	7301.5	2.7
26Feb2019	15:13	1.7	2.1	7301.5	2.7
26Feb2019	15:14	1.7	2.1	7301.5	2.7
26Feb2019	15:15	1.7	2.1	7301.5	2.6
26Feb2019	15:16	1.7	2.1	7301.5	2.6
26Feb2019	15:17	1.7	2.1	7301.5	2.6
26Feb2019	15:18	1.7	2.1	7301.5	2.6
26Feb2019	15:19	1.7	2.1	7301.5	2.6
26Feb2019	15:20	1.7	2.1	7301.5	2.6
26Feb2019	15:21	1.7	2.1	7301.5	2.5
26Feb2019	15:22	1.7	2.1	7301.5	2.5
26Feb2019	15:23	1.7	2.1	7301.5	2.5
26Feb2019	15:24	1.7	2.1	7301.5	2.5

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	15:25	1.7	2.1	7301.5	2.5
26Feb2019	15:26	1.7	2.1	7301.5	2.4
26Feb2019	15:27	1.6	2.1	7301.5	2.4
26Feb2019	15:28	1.6	2.1	7301.5	2.4
26Feb2019	15:29	1.6	2.1	7301.5	2.4
26Feb2019	15:30	1.6	2.1	7301.5	2.4
26Feb2019	15:31	1.6	2.1	7301.5	2.4
26Feb2019	15:32	1.6	2.0	7301.5	2.4
26Feb2019	15:33	1.6	2.0	7301.5	2.3
26Feb2019	15:34	1.6	2.0	7301.5	2.3
26Feb2019	15:35	1.6	2.0	7301.5	2.3
26Feb2019	15:36	1.6	2.0	7301.5	2.3
26Feb2019	15:37	1.6	2.0	7301.5	2.3
26Feb2019	15:38	1.6	2.0	7301.5	2.3
26Feb2019	15:39	1.6	2.0	7301.5	2.2
26Feb2019	15:40	1.6	2.0	7301.5	2.2
26Feb2019	15:41	1.6	2.0	7301.5	2.2
26Feb2019	15:42	1.6	2.0	7301.5	2.2
26Feb2019	15:43	1.5	2.0	7301.5	2.2
26Feb2019	15:44	1.5	2.0	7301.5	2.2
26Feb2019	15:45	1.5	2.0	7301.5	2.2
26Feb2019	15:46	1.5	2.0	7301.5	2.2
26Feb2019	15:47	1.5	2.0	7301.5	2.1
26Feb2019	15:48	1.5	2.0	7301.5	2.1
26Feb2019	15:49	1.5	2.0	7301.5	2.1
26Feb2019	15:50	1.5	2.0	7301.5	2.1
26Feb2019	15:51	1.5	2.0	7301.5	2.1
26Feb2019	15:52	1.5	2.0	7301.5	2.1
26Feb2019	15:53	1.5	2.0	7301.5	2.1
26Feb2019	15:54	1.5	2.0	7301.5	2.1
26Feb2019	15:55	1.5	2.0	7301.5	2.0

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	15:56	1.5	2.0	7301.5	2.0
26Feb2019	15:57	1.5	2.0	7301.5	2.0
26Feb2019	15:58	1.5	2.0	7301.5	2.0
26Feb2019	15:59	1.5	2.0	7301.5	2.0
26Feb2019	16:00	1.5	2.0	7301.5	2.0
26Feb2019	16:01	1.4	2.0	7301.5	2.0
26Feb2019	16:02	1.4	2.0	7301.5	2.0
26Feb2019	16:03	1.4	2.0	7301.5	2.0
26Feb2019	16:04	1.4	2.0	7301.5	1.9
26Feb2019	16:05	1.4	2.0	7301.5	1.9
26Feb2019	16:06	1.4	2.0	7301.5	1.9
26Feb2019	16:07	1.4	2.0	7301.5	1.9
26Feb2019	16:08	1.4	2.0	7301.5	1.9
26Feb2019	16:09	1.4	2.0	7301.5	1.9
26Feb2019	16:10	1.4	2.0	7301.5	1.9
26Feb2019	16:11	1.4	2.0	7301.5	1.9
26Feb2019	16:12	1.4	2.0	7301.5	1.9
26Feb2019	16:13	1.4	2.0	7301.5	1.8
26Feb2019	16:14	1.4	2.0	7301.5	1.8
26Feb2019	16:15	1.4	2.0	7301.5	1.8
26Feb2019	16:16	1.4	2.0	7301.5	1.8
26Feb2019	16:17	1.4	2.0	7301.5	1.8
26Feb2019	16:18	1.3	2.0	7301.5	1.8
26Feb2019	16:19	1.3	2.0	7301.5	1.8
26Feb2019	16:20	1.3	2.0	7301.5	1.8
26Feb2019	16:21	1.3	2.0	7301.5	1.8
26Feb2019	16:22	1.3	2.0	7301.5	1.8
26Feb2019	16:23	1.3	2.0	7301.5	1.8
26Feb2019	16:24	1.3	2.0	7301.5	1.8
26Feb2019	16:25	1.3	2.0	7301.5	1.8
26Feb2019	16:26	1.3	2.0	7301.5	1.8

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	16:27	1.3	2.0	7301.5	1.8
26Feb2019	16:28	1.3	2.0	7301.5	1.8
26Feb2019	16:29	1.3	2.0	7301.5	1.8
26Feb2019	16:30	1.3	2.0	7301.5	1.8
26Feb2019	16:31	1.3	2.0	7301.5	1.8
26Feb2019	16:32	1.3	2.0	7301.5	1.8
26Feb2019	16:33	1.3	2.0	7301.5	1.8
26Feb2019	16:34	1.3	2.0	7301.5	1.8
26Feb2019	16:35	1.3	2.0	7301.5	1.8
26Feb2019	16:36	1.3	2.0	7301.5	1.8
26Feb2019	16:37	1.2	2.0	7301.5	1.8
26Feb2019	16:38	1.2	2.0	7301.5	1.8
26Feb2019	16:39	1.2	2.0	7301.5	1.8
26Feb2019	16:40	1.2	2.0	7301.5	1.8
26Feb2019	16:41	1.2	2.0	7301.5	1.8
26Feb2019	16:42	1.2	2.0	7301.5	1.8
26Feb2019	16:43	1.2	2.0	7301.5	1.8
26Feb2019	16:44	1.2	2.0	7301.5	1.8
26Feb2019	16:45	1.2	2.0	7301.5	1.8
26Feb2019	16:46	1.2	2.0	7301.5	1.7
26Feb2019	16:47	1.2	2.0	7301.5	1.7
26Feb2019	16:48	1.2	2.0	7301.5	1.7
26Feb2019	16:49	1.2	2.0	7301.5	1.7
26Feb2019	16:50	1.2	2.0	7301.5	1.7
26Feb2019	16:51	1.2	2.0	7301.5	1.7
26Feb2019	16:52	1.2	2.0	7301.5	1.7
26Feb2019	16:53	1.2	2.0	7301.5	1.7
26Feb2019	16:54	1.2	2.0	7301.5	1.7
26Feb2019	16:55	1.2	2.0	7301.5	1.7
26Feb2019	16:56	1.2	2.0	7301.5	1.7
26Feb2019	16:57	1.2	2.0	7301.5	1.7

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	16:58	1.2	2.0	7301.5	1.7
26Feb2019	16:59	1.2	2.0	7301.5	1.7
26Feb2019	17:00	1.2	2.0	7301.5	1.7
26Feb2019	17:01	1.2	2.0	7301.5	1.7
26Feb2019	17:02	1.2	2.0	7301.5	1.7
26Feb2019	17:03	1.2	2.0	7301.5	1.7
26Feb2019	17:04	1.2	2.0	7301.5	1.7
26Feb2019	17:05	1.2	2.0	7301.5	1.7
26Feb2019	17:06	1.2	2.0	7301.5	1.7
26Feb2019	17:07	1.2	2.0	7301.5	1.7
26Feb2019	17:08	1.2	2.0	7301.5	1.7
26Feb2019	17:09	1.2	2.0	7301.5	1.7
26Feb2019	17:10	1.2	2.0	7301.5	1.7
26Feb2019	17:11	1.2	2.0	7301.5	1.7
26Feb2019	17:12	1.2	2.0	7301.5	1.7
26Feb2019	17:13	1.2	2.0	7301.5	1.7
26Feb2019	17:14	1.2	2.0	7301.5	1.7
26Feb2019	17:15	1.2	2.0	7301.5	1.7
26Feb2019	17:16	1.2	2.0	7301.5	1.7
26Feb2019	17:17	1.2	2.0	7301.5	1.7
26Feb2019	17:18	1.2	2.0	7301.5	1.7
26Feb2019	17:19	1.2	2.0	7301.5	1.7
26Feb2019	17:20	1.2	2.0	7301.5	1.7
26Feb2019	17:21	1.2	2.0	7301.5	1.7
26Feb2019	17:22	1.2	2.0	7301.5	1.7
26Feb2019	17:23	1.3	2.0	7301.5	1.7
26Feb2019	17:24	1.3	2.0	7301.5	1.7
26Feb2019	17:25	1.3	2.0	7301.5	1.7
26Feb2019	17:26	1.3	2.0	7301.5	1.7
26Feb2019	17:27	1.3	2.0	7301.5	1.7
26Feb2019	17:28	1.3	2.0	7301.5	1.7

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	17:29	1.2	2.0	7301.5	1.7
26Feb2019	17:30	1.2	2.0	7301.5	1.7
26Feb2019	17:31	1.2	2.0	7301.5	1.7
26Feb2019	17:32	1.2	2.0	7301.5	1.7
26Feb2019	17:33	1.2	2.0	7301.5	1.7
26Feb2019	17:34	1.2	2.0	7301.5	1.7
26Feb2019	17:35	1.2	2.0	7301.5	1.7
26Feb2019	17:36	1.2	2.0	7301.5	1.6
26Feb2019	17:37	1.2	2.0	7301.5	1.6
26Feb2019	17:38	1.3	2.0	7301.5	1.6
26Feb2019	17:39	1.3	2.0	7301.5	1.6
26Feb2019	17:40	1.3	2.0	7301.5	1.6
26Feb2019	17:41	1.3	2.0	7301.5	1.6
26Feb2019	17:42	1.3	2.0	7301.5	1.6
26Feb2019	17:43	1.2	2.0	7301.5	1.6
26Feb2019	17:44	1.2	2.0	7301.5	1.6
26Feb2019	17:45	1.2	2.0	7301.5	1.6
26Feb2019	17:46	1.2	2.0	7301.5	1.6
26Feb2019	17:47	1.2	2.0	7301.5	1.6
26Feb2019	17:48	1.2	2.0	7301.5	1.6
26Feb2019	17:49	1.2	2.0	7301.5	1.6
26Feb2019	17:50	1.2	2.0	7301.5	1.6
26Feb2019	17:51	1.2	2.0	7301.5	1.6
26Feb2019	17:52	1.2	2.0	7301.5	1.6
26Feb2019	17:53	1.2	2.0	7301.5	1.6
26Feb2019	17:54	1.1	1.9	7301.5	1.6
26Feb2019	17:55	1.1	1.9	7301.5	1.6
26Feb2019	17:56	1.1	1.9	7301.5	1.6
26Feb2019	17:57	1.1	1.9	7301.5	1.6
26Feb2019	17:58	1.1	1.9	7301.5	1.6
26Feb2019	17:59	1.1	1.9	7301.5	1.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	18:00	1.1	1.9	7301.5	1.6
26Feb2019	18:01	1.1	1.9	7301.5	1.6
26Feb2019	18:02	1.1	1.9	7301.5	1.6
26Feb2019	18:03	1.0	1.9	7301.5	1.6
26Feb2019	18:04	1.0	1.9	7301.5	1.6
26Feb2019	18:05	1.0	1.9	7301.5	1.6
26Feb2019	18:06	1.0	1.9	7301.5	1.6
26Feb2019	18:07	1.0	1.9	7301.5	1.6
26Feb2019	18:08	1.0	1.9	7301.5	1.6
26Feb2019	18:09	1.0	1.9	7301.5	1.6
26Feb2019	18:10	1.0	1.9	7301.5	1.6
26Feb2019	18:11	1.0	1.9	7301.4	1.6
26Feb2019	18:12	1.0	1.9	7301.4	1.6
26Feb2019	18:13	1.0	1.9	7301.4	1.6
26Feb2019	18:14	1.0	1.9	7301.4	1.6
26Feb2019	18:15	1.0	1.9	7301.4	1.6
26Feb2019	18:16	1.0	1.9	7301.4	1.6
26Feb2019	18:17	1.0	1.9	7301.4	1.6
26Feb2019	18:18	1.0	1.9	7301.4	1.6
26Feb2019	18:19	1.0	1.9	7301.4	1.6
26Feb2019	18:20	1.0	1.9	7301.4	1.6
26Feb2019	18:21	1.0	1.9	7301.4	1.6
26Feb2019	18:22	1.0	1.9	7301.4	1.6
26Feb2019	18:23	1.0	1.9	7301.4	1.6
26Feb2019	18:24	1.0	1.9	7301.4	1.6
26Feb2019	18:25	1.0	1.9	7301.4	1.5
26Feb2019	18:26	1.0	1.9	7301.4	1.5
26Feb2019	18:27	1.0	1.9	7301.4	1.5
26Feb2019	18:28	1.0	1.9	7301.4	1.5
26Feb2019	18:29	1.0	1.9	7301.4	1.5
26Feb2019	18:30	1.0	1.9	7301.4	1.5

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	18:31	1.0	1.9	7301.4	1.5
26Feb2019	18:32	1.0	1.9	7301.4	1.5
26Feb2019	18:33	0.9	1.9	7301.4	1.5
26Feb2019	18:34	0.9	1.9	7301.4	1.5
26Feb2019	18:35	0.9	1.9	7301.4	1.5
26Feb2019	18:36	0.9	1.9	7301.4	1.5
26Feb2019	18:37	0.9	1.9	7301.4	1.5
26Feb2019	18:38	0.9	1.9	7301.4	1.5
26Feb2019	18:39	0.9	1.9	7301.4	1.5
26Feb2019	18:40	0.9	1.9	7301.4	1.5
26Feb2019	18:41	0.9	1.9	7301.4	1.5
26Feb2019	18:42	0.9	1.9	7301.4	1.5
26Feb2019	18:43	0.9	1.9	7301.4	1.5
26Feb2019	18:44	0.9	1.9	7301.4	1.5
26Feb2019	18:45	0.9	1.9	7301.4	1.5
26Feb2019	18:46	0.9	1.9	7301.4	1.5
26Feb2019	18:47	0.9	1.9	7301.4	1.5
26Feb2019	18:48	0.9	1.9	7301.4	1.5
26Feb2019	18:49	0.9	1.9	7301.4	1.5
26Feb2019	18:50	0.9	1.9	7301.4	1.5
26Feb2019	18:51	0.9	1.9	7301.4	1.5
26Feb2019	18:52	0.9	1.9	7301.4	1.5
26Feb2019	18:53	0.9	1.9	7301.4	1.5
26Feb2019	18:54	0.9	1.9	7301.4	1.5
26Feb2019	18:55	0.9	1.9	7301.4	1.5
26Feb2019	18:56	0.9	1.9	7301.4	1.5
26Feb2019	18:57	0.9	1.9	7301.4	1.5
26Feb2019	18:58	0.9	1.9	7301.4	1.5
26Feb2019	18:59	0.9	1.9	7301.4	1.5
26Feb2019	19:00	0.9	1.9	7301.4	1.5
26Feb2019	19:01	0.9	1.9	7301.4	1.5

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	19:02	0.9	1.9	7301.4	1.5
26Feb2019	19:03	0.9	1.9	7301.4	1.5
26Feb2019	19:04	0.9	1.9	7301.4	1.5
26Feb2019	19:05	0.9	1.9	7301.4	1.5
26Feb2019	19:06	0.9	1.9	7301.4	1.5
26Feb2019	19:07	0.9	1.9	7301.4	1.4
26Feb2019	19:08	0.9	1.9	7301.4	1.4
26Feb2019	19:09	0.9	1.9	7301.4	1.4
26Feb2019	19:10	0.9	1.9	7301.4	1.4
26Feb2019	19:11	0.9	1.9	7301.4	1.4
26Feb2019	19:12	0.9	1.9	7301.4	1.4
26Feb2019	19:13	0.9	1.9	7301.4	1.4
26Feb2019	19:14	0.9	1.9	7301.4	1.4
26Feb2019	19:15	0.9	1.9	7301.4	1.4
26Feb2019	19:16	0.9	1.9	7301.4	1.4
26Feb2019	19:17	0.9	1.9	7301.4	1.4
26Feb2019	19:18	0.9	1.9	7301.4	1.4
26Feb2019	19:19	0.9	1.9	7301.4	1.4
26Feb2019	19:20	0.9	1.9	7301.4	1.4
26Feb2019	19:21	0.9	1.9	7301.4	1.4
26Feb2019	19:22	0.9	1.9	7301.4	1.4
26Feb2019	19:23	0.9	1.9	7301.4	1.4
26Feb2019	19:24	0.9	1.9	7301.4	1.4
26Feb2019	19:25	0.8	1.9	7301.4	1.4
26Feb2019	19:26	0.8	1.9	7301.4	1.4
26Feb2019	19:27	0.8	1.9	7301.4	1.4
26Feb2019	19:28	0.8	1.9	7301.4	1.4
26Feb2019	19:29	0.8	1.9	7301.4	1.4
26Feb2019	19:30	0.8	1.9	7301.4	1.4
26Feb2019	19:31	0.8	1.9	7301.4	1.4
26Feb2019	19:32	0.8	1.9	7301.4	1.4

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	19:33	0.8	1.9	7301.4	1.4
26Feb2019	19:34	0.8	1.9	7301.4	1.4
26Feb2019	19:35	0.8	1.9	7301.4	1.4
26Feb2019	19:36	0.8	1.9	7301.4	1.4
26Feb2019	19:37	0.8	1.9	7301.4	1.4
26Feb2019	19:38	0.8	1.9	7301.4	1.4
26Feb2019	19:39	0.8	1.9	7301.4	1.4
26Feb2019	19:40	0.8	1.9	7301.4	1.4
26Feb2019	19:41	0.8	1.9	7301.4	1.4
26Feb2019	19:42	0.8	1.9	7301.4	1.4
26Feb2019	19:43	0.8	1.9	7301.4	1.4
26Feb2019	19:44	0.8	1.9	7301.4	1.4
26Feb2019	19:45	0.8	1.9	7301.4	1.4
26Feb2019	19:46	0.8	1.9	7301.4	1.4
26Feb2019	19:47	0.8	1.9	7301.4	1.4
26Feb2019	19:48	0.8	1.9	7301.4	1.4
26Feb2019	19:49	0.8	1.9	7301.4	1.4
26Feb2019	19:50	0.8	1.9	7301.4	1.4
26Feb2019	19:51	0.8	1.9	7301.4	1.4
26Feb2019	19:52	0.8	1.9	7301.4	1.3
26Feb2019	19:53	0.8	1.9	7301.4	1.3
26Feb2019	19:54	0.8	1.9	7301.4	1.3
26Feb2019	19:55	0.8	1.9	7301.4	1.3
26Feb2019	19:56	0.8	1.9	7301.4	1.3
26Feb2019	19:57	0.8	1.9	7301.4	1.3
26Feb2019	19:58	0.8	1.9	7301.4	1.3
26Feb2019	19:59	0.8	1.9	7301.4	1.3
26Feb2019	20:00	0.8	1.9	7301.4	1.3
26Feb2019	20:01	0.8	1.9	7301.4	1.3
26Feb2019	20:02	0.8	1.9	7301.4	1.3
26Feb2019	20:03	0.8	1.9	7301.4	1.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	20:04	0.8	1.8	7301.4	1.3
26Feb2019	20:05	0.8	1.8	7301.4	1.3
26Feb2019	20:06	0.8	1.8	7301.4	1.3
26Feb2019	20:07	0.8	1.8	7301.4	1.3
26Feb2019	20:08	0.8	1.8	7301.4	1.3
26Feb2019	20:09	0.8	1.8	7301.4	1.3
26Feb2019	20:10	0.8	1.8	7301.4	1.3
26Feb2019	20:11	0.8	1.8	7301.4	1.3
26Feb2019	20:12	0.8	1.8	7301.4	1.3
26Feb2019	20:13	0.8	1.8	7301.4	1.3
26Feb2019	20:14	0.8	1.8	7301.4	1.3
26Feb2019	20:15	0.8	1.8	7301.4	1.3
26Feb2019	20:16	0.8	1.8	7301.4	1.3
26Feb2019	20:17	0.8	1.8	7301.4	1.3
26Feb2019	20:18	0.8	1.8	7301.4	1.3
26Feb2019	20:19	0.8	1.8	7301.4	1.3
26Feb2019	20:20	0.7	1.8	7301.4	1.3
26Feb2019	20:21	0.7	1.8	7301.4	1.3
26Feb2019	20:22	0.7	1.8	7301.4	1.3
26Feb2019	20:23	0.7	1.8	7301.4	1.3
26Feb2019	20:24	0.7	1.8	7301.4	1.3
26Feb2019	20:25	0.7	1.8	7301.4	1.3
26Feb2019	20:26	0.7	1.8	7301.4	1.3
26Feb2019	20:27	0.7	1.8	7301.4	1.3
26Feb2019	20:28	0.7	1.8	7301.4	1.3
26Feb2019	20:29	0.7	1.8	7301.4	1.3
26Feb2019	20:30	0.7	1.8	7301.4	1.3
26Feb2019	20:31	0.7	1.8	7301.4	1.3
26Feb2019	20:32	0.7	1.8	7301.4	1.3
26Feb2019	20:33	0.7	1.8	7301.4	1.3
26Feb2019	20:34	0.7	1.8	7301.4	1.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	20:35	0.7	1.8	7301.4	1.3
26Feb2019	20:36	0.7	1.8	7301.4	1.3
26Feb2019	20:37	0.7	1.8	7301.4	1.2
26Feb2019	20:38	0.7	1.8	7301.4	1.2
26Feb2019	20:39	0.7	1.8	7301.4	1.2
26Feb2019	20:40	0.7	1.8	7301.4	1.2
26Feb2019	20:41	0.7	1.8	7301.4	1.2
26Feb2019	20:42	0.7	1.8	7301.4	1.2
26Feb2019	20:43	0.7	1.8	7301.4	1.2
26Feb2019	20:44	0.7	1.8	7301.4	1.2
26Feb2019	20:45	0.7	1.8	7301.4	1.2
26Feb2019	20:46	0.7	1.8	7301.4	1.2
26Feb2019	20:47	0.7	1.8	7301.4	1.2
26Feb2019	20:48	0.7	1.8	7301.4	1.2
26Feb2019	20:49	0.7	1.8	7301.4	1.2
26Feb2019	20:50	0.7	1.8	7301.4	1.2
26Feb2019	20:51	0.7	1.8	7301.4	1.2
26Feb2019	20:52	0.7	1.8	7301.4	1.2
26Feb2019	20:53	0.7	1.8	7301.4	1.2
26Feb2019	20:54	0.7	1.8	7301.4	1.2
26Feb2019	20:55	0.7	1.8	7301.4	1.2
26Feb2019	20:56	0.7	1.8	7301.4	1.2
26Feb2019	20:57	0.7	1.8	7301.4	1.2
26Feb2019	20:58	0.7	1.8	7301.4	1.2
26Feb2019	20:59	0.7	1.8	7301.4	1.2
26Feb2019	21:00	0.7	1.8	7301.4	1.2
26Feb2019	21:01	0.7	1.8	7301.4	1.2
26Feb2019	21:02	0.7	1.8	7301.4	1.2
26Feb2019	21:03	0.7	1.8	7301.4	1.2
26Feb2019	21:04	0.7	1.8	7301.4	1.2
26Feb2019	21:05	0.7	1.8	7301.4	1.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	21:06	0.7	1.8	7301.4	1.2
26Feb2019	21:07	0.7	1.8	7301.4	1.2
26Feb2019	21:08	0.7	1.8	7301.4	1.2
26Feb2019	21:09	0.7	1.8	7301.4	1.2
26Feb2019	21:10	0.7	1.8	7301.4	1.2
26Feb2019	21:11	0.7	1.8	7301.4	1.2
26Feb2019	21:12	0.7	1.8	7301.4	1.2
26Feb2019	21:13	0.7	1.8	7301.4	1.2
26Feb2019	21:14	0.7	1.8	7301.4	1.2
26Feb2019	21:15	0.7	1.8	7301.4	1.2
26Feb2019	21:16	0.7	1.8	7301.4	1.2
26Feb2019	21:17	0.7	1.8	7301.4	1.2
26Feb2019	21:18	0.7	1.8	7301.4	1.2
26Feb2019	21:19	0.7	1.8	7301.4	1.2
26Feb2019	21:20	0.7	1.8	7301.4	1.2
26Feb2019	21:21	0.7	1.8	7301.4	1.2
26Feb2019	21:22	0.7	1.8	7301.4	1.2
26Feb2019	21:23	0.7	1.8	7301.4	1.1
26Feb2019	21:24	0.7	1.8	7301.4	1.1
26Feb2019	21:25	0.7	1.8	7301.4	1.1
26Feb2019	21:26	0.7	1.8	7301.4	1.1
26Feb2019	21:27	0.7	1.8	7301.4	1.1
26Feb2019	21:28	0.7	1.8	7301.4	1.1
26Feb2019	21:29	0.7	1.8	7301.4	1.1
26Feb2019	21:30	0.7	1.8	7301.4	1.1
26Feb2019	21:31	0.7	1.8	7301.4	1.1
26Feb2019	21:32	0.7	1.8	7301.4	1.1
26Feb2019	21:33	0.7	1.8	7301.4	1.1
26Feb2019	21:34	0.7	1.8	7301.4	1.1
26Feb2019	21:35	0.7	1.8	7301.3	1.1
26Feb2019	21:36	0.7	1.8	7301.3	1.1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	21:37	0.7	1.8	7301.3	1.1
26Feb2019	21:38	0.7	1.8	7301.3	1.1
26Feb2019	21:39	0.7	1.8	7301.3	1.1
26Feb2019	21:40	0.7	1.8	7301.3	1.1
26Feb2019	21:41	0.7	1.8	7301.3	1.1
26Feb2019	21:42	0.7	1.8	7301.3	1.1
26Feb2019	21:43	0.7	1.8	7301.3	1.1
26Feb2019	21:44	0.7	1.8	7301.3	1.1
26Feb2019	21:45	0.7	1.8	7301.3	1.1
26Feb2019	21:46	0.7	1.8	7301.3	1.1
26Feb2019	21:47	0.7	1.8	7301.3	1.1
26Feb2019	21:48	0.7	1.8	7301.3	1.1
26Feb2019	21:49	0.7	1.8	7301.3	1.1
26Feb2019	21:50	0.7	1.8	7301.3	1.1
26Feb2019	21:51	0.7	1.8	7301.3	1.1
26Feb2019	21:52	0.7	1.8	7301.3	1.1
26Feb2019	21:53	0.7	1.8	7301.3	1.1
26Feb2019	21:54	0.7	1.8	7301.3	1.1
26Feb2019	21:55	0.7	1.8	7301.3	1.1
26Feb2019	21:56	0.7	1.8	7301.3	1.1
26Feb2019	21:57	0.7	1.8	7301.3	1.1
26Feb2019	21:58	0.7	1.8	7301.3	1.1
26Feb2019	21:59	0.6	1.8	7301.3	1.1
26Feb2019	22:00	0.6	1.8	7301.3	1.1
26Feb2019	22:01	0.6	1.8	7301.3	1.1
26Feb2019	22:02	0.6	1.8	7301.3	1.1
26Feb2019	22:03	0.6	1.8	7301.3	1.1
26Feb2019	22:04	0.6	1.8	7301.3	1.1
26Feb2019	22:05	0.6	1.8	7301.3	1.1
26Feb2019	22:06	0.6	1.8	7301.3	1.1
26Feb2019	22:07	0.6	1.8	7301.3	1.1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	22:08	0.6	1.8	7301.3	1.1
26Feb2019	22:09	0.6	1.8	7301.3	1.1
26Feb2019	22:10	0.6	1.8	7301.3	1.1
26Feb2019	22:11	0.6	1.8	7301.3	1.1
26Feb2019	22:12	0.6	1.8	7301.3	1.1
26Feb2019	22:13	0.6	1.8	7301.3	1.1
26Feb2019	22:14	0.6	1.8	7301.3	1.1
26Feb2019	22:15	0.6	1.8	7301.3	1.1
26Feb2019	22:16	0.6	1.8	7301.3	1.1
26Feb2019	22:17	0.6	1.8	7301.3	1.1
26Feb2019	22:18	0.6	1.8	7301.3	1.0
26Feb2019	22:19	0.6	1.8	7301.3	1.0
26Feb2019	22:20	0.6	1.8	7301.3	1.0
26Feb2019	22:21	0.6	1.8	7301.3	1.0
26Feb2019	22:22	0.6	1.8	7301.3	1.0
26Feb2019	22:23	0.6	1.8	7301.3	1.0
26Feb2019	22:24	0.6	1.8	7301.3	1.0
26Feb2019	22:25	0.6	1.8	7301.3	1.0
26Feb2019	22:26	0.6	1.8	7301.3	1.0
26Feb2019	22:27	0.6	1.8	7301.3	1.0
26Feb2019	22:28	0.6	1.8	7301.3	1.0
26Feb2019	22:29	0.6	1.8	7301.3	1.0
26Feb2019	22:30	0.6	1.8	7301.3	1.0
26Feb2019	22:31	0.6	1.8	7301.3	1.0
26Feb2019	22:32	0.6	1.7	7301.3	1.0
26Feb2019	22:33	0.6	1.7	7301.3	1.0
26Feb2019	22:34	0.6	1.7	7301.3	1.0
26Feb2019	22:35	0.6	1.7	7301.3	1.0
26Feb2019	22:36	0.6	1.7	7301.3	1.0
26Feb2019	22:37	0.6	1.7	7301.3	1.0
26Feb2019	22:38	0.6	1.7	7301.3	1.0

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	22:39	0.6	1.7	7301.3	1.0
26Feb2019	22:40	0.6	1.7	7301.3	1.0
26Feb2019	22:41	0.6	1.7	7301.3	1.0
26Feb2019	22:42	0.6	1.7	7301.3	1.0
26Feb2019	22:43	0.6	1.7	7301.3	1.0
26Feb2019	22:44	0.6	1.7	7301.3	1.0
26Feb2019	22:45	0.6	1.7	7301.3	1.0
26Feb2019	22:46	0.6	1.7	7301.3	1.0
26Feb2019	22:47	0.6	1.7	7301.3	1.0
26Feb2019	22:48	0.6	1.7	7301.3	1.0
26Feb2019	22:49	0.6	1.7	7301.3	1.0
26Feb2019	22:50	0.6	1.7	7301.3	1.0
26Feb2019	22:51	0.6	1.7	7301.3	1.0
26Feb2019	22:52	0.6	1.7	7301.3	1.0
26Feb2019	22:53	0.6	1.7	7301.3	1.0
26Feb2019	22:54	0.6	1.7	7301.3	1.0
26Feb2019	22:55	0.6	1.7	7301.3	1.0
26Feb2019	22:56	0.6	1.7	7301.3	1.0
26Feb2019	22:57	0.6	1.7	7301.3	1.0
26Feb2019	22:58	0.6	1.7	7301.3	1.0
26Feb2019	22:59	0.6	1.7	7301.3	1.0
26Feb2019	23:00	0.6	1.7	7301.3	1.0
26Feb2019	23:01	0.6	1.7	7301.3	1.0
26Feb2019	23:02	0.6	1.7	7301.3	1.0
26Feb2019	23:03	0.6	1.7	7301.3	1.0
26Feb2019	23:04	0.6	1.7	7301.3	1.0
26Feb2019	23:05	0.6	1.7	7301.3	1.0
26Feb2019	23:06	0.6	1.7	7301.3	1.0
26Feb2019	23:07	0.6	1.7	7301.3	1.0
26Feb2019	23:08	0.6	1.7	7301.3	1.0
26Feb2019	23:09	0.6	1.7	7301.3	1.0

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	23:10	0.6	1.7	7301.3	1.0
26Feb2019	23:11	0.6	1.7	7301.3	1.0
26Feb2019	23:12	0.6	1.7	7301.3	1.0
26Feb2019	23:13	0.6	1.7	7301.3	1.0
26Feb2019	23:14	0.6	1.7	7301.3	1.0
26Feb2019	23:15	0.6	1.7	7301.3	1.0
26Feb2019	23:16	0.6	1.7	7301.3	1.0
26Feb2019	23:17	0.6	1.7	7301.3	1.0
26Feb2019	23:18	0.6	1.7	7301.3	1.0
26Feb2019	23:19	0.6	1.7	7301.3	1.0
26Feb2019	23:20	0.6	1.7	7301.3	1.0
26Feb2019	23:21	0.6	1.7	7301.3	1.0
26Feb2019	23:22	0.6	1.7	7301.3	1.0
26Feb2019	23:23	0.6	1.7	7301.3	1.0
26Feb2019	23:24	0.6	1.7	7301.3	0.9
26Feb2019	23:25	0.6	1.7	7301.3	0.9
26Feb2019	23:26	0.6	1.7	7301.3	0.9
26Feb2019	23:27	0.6	1.7	7301.3	0.9
26Feb2019	23:28	0.6	1.7	7301.3	0.9
26Feb2019	23:29	0.6	1.7	7301.3	0.9
26Feb2019	23:30	0.6	1.7	7301.3	0.9
26Feb2019	23:31	0.6	1.7	7301.3	0.9
26Feb2019	23:32	0.6	1.7	7301.3	0.9
26Feb2019	23:33	0.6	1.7	7301.3	0.9
26Feb2019	23:34	0.6	1.7	7301.3	0.9
26Feb2019	23:35	0.6	1.7	7301.3	0.9
26Feb2019	23:36	0.6	1.7	7301.3	0.9
26Feb2019	23:37	0.6	1.7	7301.3	0.9
26Feb2019	23:38	0.6	1.7	7301.3	0.9
26Feb2019	23:39	0.6	1.7	7301.3	0.9
26Feb2019	23:40	0.6	1.7	7301.3	0.9

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	23:41	0.6	1.7	7301.3	0.9
26Feb2019	23:42	0.6	1.7	7301.3	0.9
26Feb2019	23:43	0.6	1.7	7301.3	0.9
26Feb2019	23:44	0.6	1.7	7301.3	0.9
26Feb2019	23:45	0.6	1.7	7301.3	0.9
26Feb2019	23:46	0.6	1.7	7301.3	0.9
26Feb2019	23:47	0.6	1.7	7301.3	0.9
26Feb2019	23:48	0.6	1.7	7301.3	0.9
26Feb2019	23:49	0.6	1.7	7301.3	0.9
26Feb2019	23:50	0.6	1.7	7301.3	0.9
26Feb2019	23:51	0.6	1.7	7301.3	0.9
26Feb2019	23:52	0.6	1.7	7301.3	0.9
26Feb2019	23:53	0.6	1.7	7301.3	0.9
26Feb2019	23:54	0.6	1.7	7301.3	0.9
26Feb2019	23:55	0.6	1.7	7301.3	0.9
26Feb2019	23:56	0.6	1.7	7301.3	0.9
26Feb2019	23:57	0.6	1.7	7301.3	0.9
26Feb2019	23:58	0.6	1.7	7301.3	0.9
26Feb2019	23:59	0.6	1.7	7301.3	0.9
27Feb2019	00:00	0.6	1.7	7301.3	0.9
27Feb2019	00:01	0.6	1.7	7301.3	0.9
27Feb2019	00:02	0.6	1.7	7301.3	0.9
27Feb2019	00:03	0.6	1.7	7301.3	0.9
27Feb2019	00:04	0.6	1.7	7301.3	0.9
27Feb2019	00:05	0.6	1.7	7301.3	0.9
27Feb2019	00:06	0.6	1.7	7301.3	0.9
27Feb2019	00:07	0.6	1.7	7301.3	0.9
27Feb2019	00:08	0.6	1.7	7301.3	0.9
27Feb2019	00:09	0.6	1.7	7301.3	0.9
27Feb2019	00:10	0.6	1.7	7301.3	0.9
27Feb2019	00:11	0.5	1.7	7301.3	0.9

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	00:12	0.5	1.7	7301.3	0.9
27Feb2019	00:13	0.5	1.7	7301.3	0.9
27Feb2019	00:14	0.5	1.7	7301.3	0.9
27Feb2019	00:15	0.5	1.7	7301.3	0.9
27Feb2019	00:16	0.5	1.7	7301.3	0.9
27Feb2019	00:17	0.5	1.7	7301.3	0.9
27Feb2019	00:18	0.5	1.7	7301.3	0.9
27Feb2019	00:19	0.5	1.7	7301.3	0.9
27Feb2019	00:20	0.5	1.7	7301.3	0.9
27Feb2019	00:21	0.5	1.7	7301.3	0.9
27Feb2019	00:22	0.5	1.7	7301.3	0.9
27Feb2019	00:23	0.5	1.7	7301.3	0.9
27Feb2019	00:24	0.5	1.7	7301.3	0.9
27Feb2019	00:25	0.5	1.7	7301.3	0.9
27Feb2019	00:26	0.5	1.7	7301.3	0.9
27Feb2019	00:27	0.4	1.7	7301.3	0.9
27Feb2019	00:28	0.4	1.7	7301.3	0.9
27Feb2019	00:29	0.4	1.7	7301.3	0.9
27Feb2019	00:30	0.4	1.7	7301.3	0.9
27Feb2019	00:31	0.4	1.7	7301.3	0.9
27Feb2019	00:32	0.4	1.7	7301.3	0.9
27Feb2019	00:33	0.4	1.7	7301.3	0.9
27Feb2019	00:34	0.4	1.7	7301.3	0.9
27Feb2019	00:35	0.4	1.7	7301.3	0.8
27Feb2019	00:36	0.4	1.7	7301.3	0.8
27Feb2019	00:37	0.4	1.7	7301.3	0.8
27Feb2019	00:38	0.4	1.7	7301.3	0.8
27Feb2019	00:39	0.3	1.7	7301.3	0.8
27Feb2019	00:40	0.3	1.7	7301.3	0.8
27Feb2019	00:41	0.3	1.7	7301.3	0.8
27Feb2019	00:42	0.3	1.7	7301.3	0.8

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	00:43	0.3	1.7	7301.3	0.8
27Feb2019	00:44	0.3	1.7	7301.3	0.8
27Feb2019	00:45	0.3	1.7	7301.3	0.8
27Feb2019	00:46	0.3	1.7	7301.3	0.8
27Feb2019	00:47	0.3	1.7	7301.3	0.8
27Feb2019	00:48	0.3	1.7	7301.3	0.8
27Feb2019	00:49	0.3	1.7	7301.3	0.8
27Feb2019	00:50	0.2	1.7	7301.3	0.8
27Feb2019	00:51	0.2	1.7	7301.3	0.8
27Feb2019	00:52	0.2	1.7	7301.3	0.8
27Feb2019	00:53	0.2	1.7	7301.3	0.8
27Feb2019	00:54	0.2	1.7	7301.3	0.8
27Feb2019	00:55	0.2	1.7	7301.3	0.8
27Feb2019	00:56	0.2	1.7	7301.3	0.8
27Feb2019	00:57	0.2	1.7	7301.3	0.8
27Feb2019	00:58	0.2	1.7	7301.3	0.8
27Feb2019	00:59	0.2	1.7	7301.3	0.8
27Feb2019	01:00	0.2	1.7	7301.3	0.8
27Feb2019	01:01	0.2	1.7	7301.3	0.8
27Feb2019	01:02	0.2	1.7	7301.3	0.8
27Feb2019	01:03	0.2	1.7	7301.3	0.8
27Feb2019	01:04	0.2	1.7	7301.3	0.8
27Feb2019	01:05	0.2	1.7	7301.3	0.8
27Feb2019	01:06	0.1	1.7	7301.3	0.8
27Feb2019	01:07	0.1	1.7	7301.3	0.8
27Feb2019	01:08	0.1	1.7	7301.3	0.8
27Feb2019	01:09	0.1	1.7	7301.3	0.8
27Feb2019	01:10	0.1	1.7	7301.3	0.8
27Feb2019	01:11	0.1	1.7	7301.3	0.8
27Feb2019	01:12	0.1	1.7	7301.3	0.8
27Feb2019	01:13	0.1	1.7	7301.3	0.8

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	01:14	0.1	1.7	7301.3	0.8
27Feb2019	01:15	0.1	1.7	7301.3	0.8
27Feb2019	01:16	0.1	1.7	7301.3	0.8
27Feb2019	01:17	0.1	1.7	7301.3	0.7
27Feb2019	01:18	0.1	1.7	7301.3	0.7
27Feb2019	01:19	0.1	1.7	7301.3	0.7
27Feb2019	01:20	0.1	1.7	7301.3	0.7
27Feb2019	01:21	0.1	1.7	7301.3	0.7
27Feb2019	01:22	0.1	1.7	7301.3	0.7
27Feb2019	01:23	0.1	1.7	7301.3	0.7
27Feb2019	01:24	0.1	1.7	7301.3	0.7
27Feb2019	01:25	0.1	1.6	7301.3	0.7
27Feb2019	01:26	0.1	1.6	7301.3	0.7
27Feb2019	01:27	0.1	1.6	7301.3	0.7
27Feb2019	01:28	0.1	1.6	7301.3	0.7
27Feb2019	01:29	0.1	1.6	7301.3	0.7
27Feb2019	01:30	0.1	1.6	7301.3	0.7
27Feb2019	01:31	0.1	1.6	7301.3	0.7
27Feb2019	01:32	0.1	1.6	7301.3	0.7
27Feb2019	01:33	0.1	1.6	7301.3	0.7
27Feb2019	01:34	0.1	1.6	7301.3	0.7
27Feb2019	01:35	0.1	1.6	7301.3	0.7
27Feb2019	01:36	0.1	1.6	7301.3	0.7
27Feb2019	01:37	0.1	1.6	7301.3	0.7
27Feb2019	01:38	0.1	1.6	7301.3	0.7
27Feb2019	01:39	0.1	1.6	7301.3	0.7
27Feb2019	01:40	0.1	1.6	7301.3	0.7
27Feb2019	01:41	0.1	1.6	7301.3	0.7
27Feb2019	01:42	0.0	1.6	7301.3	0.7
27Feb2019	01:43	0.0	1.6	7301.3	0.7
27Feb2019	01:44	0.0	1.6	7301.3	0.7

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	01:45	0.0	1.6	7301.3	0.7
27Feb2019	01:46	0.0	1.6	7301.3	0.7
27Feb2019	01:47	0.0	1.6	7301.2	0.7
27Feb2019	01:48	0.0	1.6	7301.2	0.7
27Feb2019	01:49	0.0	1.6	7301.2	0.7
27Feb2019	01:50	0.0	1.6	7301.2	0.7
27Feb2019	01:51	0.0	1.6	7301.2	0.7
27Feb2019	01:52	0.0	1.6	7301.2	0.7
27Feb2019	01:53	0.0	1.6	7301.2	0.7
27Feb2019	01:54	0.0	1.6	7301.2	0.7
27Feb2019	01:55	0.0	1.6	7301.2	0.7
27Feb2019	01:56	0.0	1.6	7301.2	0.7
27Feb2019	01:57	0.0	1.6	7301.2	0.7
27Feb2019	01:58	0.0	1.6	7301.2	0.7
27Feb2019	01:59	0.0	1.6	7301.2	0.7
27Feb2019	02:00	0.0	1.6	7301.2	0.7
27Feb2019	02:01	0.0	1.6	7301.2	0.7
27Feb2019	02:02	0.0	1.6	7301.2	0.7
27Feb2019	02:03	0.0	1.6	7301.2	0.7
27Feb2019	02:04	0.0	1.6	7301.2	0.7
27Feb2019	02:05	0.0	1.6	7301.2	0.7
27Feb2019	02:06	0.0	1.6	7301.2	0.7
27Feb2019	02:07	0.0	1.6	7301.2	0.7
27Feb2019	02:08	0.0	1.6	7301.2	0.7
27Feb2019	02:09	0.0	1.6	7301.2	0.7
27Feb2019	02:10	0.0	1.6	7301.2	0.7
27Feb2019	02:11	0.0	1.6	7301.2	0.7
27Feb2019	02:12	0.0	1.6	7301.2	0.7
27Feb2019	02:13	0.0	1.6	7301.2	0.7
27Feb2019	02:14	0.0	1.6	7301.2	0.7
27Feb2019	02:15	0.0	1.6	7301.2	0.7

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	02:16	0.0	1.6	7301.2	0.7
27Feb2019	02:17	0.0	1.6	7301.2	0.7
27Feb2019	02:18	0.0	1.6	7301.2	0.7
27Feb2019	02:19	0.0	1.6	7301.2	0.7
27Feb2019	02:20	0.0	1.6	7301.2	0.7
27Feb2019	02:21	0.0	1.6	7301.2	0.7
27Feb2019	02:22	0.0	1.6	7301.2	0.7
27Feb2019	02:23	0.0	1.6	7301.2	0.7
27Feb2019	02:24	0.0	1.6	7301.2	0.7
27Feb2019	02:25	0.0	1.6	7301.2	0.7
27Feb2019	02:26	0.0	1.6	7301.2	0.7
27Feb2019	02:27	0.0	1.6	7301.2	0.7
27Feb2019	02:28	0.0	1.6	7301.2	0.7
27Feb2019	02:29	0.0	1.6	7301.2	0.7
27Feb2019	02:30	0.0	1.6	7301.2	0.7
27Feb2019	02:31	0.0	1.6	7301.2	0.7
27Feb2019	02:32	0.0	1.6	7301.2	0.7
27Feb2019	02:33	0.0	1.6	7301.2	0.7
27Feb2019	02:34	0.0	1.6	7301.2	0.7
27Feb2019	02:35	0.0	1.6	7301.2	0.7
27Feb2019	02:36	0.0	1.6	7301.2	0.7
27Feb2019	02:37	0.0	1.6	7301.2	0.7
27Feb2019	02:38	0.0	1.6	7301.2	0.7
27Feb2019	02:39	0.0	1.6	7301.2	0.7
27Feb2019	02:40	0.0	1.6	7301.2	0.7
27Feb2019	02:41	0.0	1.6	7301.2	0.7
27Feb2019	02:42	0.0	1.6	7301.2	0.7
27Feb2019	02:43	0.0	1.6	7301.2	0.7
27Feb2019	02:44	0.0	1.6	7301.2	0.7
27Feb2019	02:45	0.0	1.6	7301.2	0.7
27Feb2019	02:46	0.0	1.6	7301.2	0.7

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	02:47	0.0	1.6	7301.2	0.7
27Feb2019	02:48	0.0	1.6	7301.2	0.7
27Feb2019	02:49	0.0	1.6	7301.2	0.7
27Feb2019	02:50	0.0	1.6	7301.2	0.7
27Feb2019	02:51	0.0	1.6	7301.2	0.7
27Feb2019	02:52	0.0	1.6	7301.2	0.7
27Feb2019	02:53	0.0	1.6	7301.2	0.7
27Feb2019	02:54	0.0	1.6	7301.2	0.7
27Feb2019	02:55	0.0	1.6	7301.2	0.7
27Feb2019	02:56	0.0	1.6	7301.2	0.7
27Feb2019	02:57	0.0	1.6	7301.2	0.7
27Feb2019	02:58	0.0	1.6	7301.2	0.7
27Feb2019	02:59	0.0	1.6	7301.2	0.7
27Feb2019	03:00	0.0	1.6	7301.2	0.7
27Feb2019	03:01	0.0	1.6	7301.2	0.7
27Feb2019	03:02	0.0	1.6	7301.2	0.7
27Feb2019	03:03	0.0	1.6	7301.2	0.7
27Feb2019	03:04	0.0	1.6	7301.2	0.7
27Feb2019	03:05	0.0	1.6	7301.2	0.7
27Feb2019	03:06	0.0	1.6	7301.2	0.7
27Feb2019	03:07	0.0	1.6	7301.2	0.7
27Feb2019	03:08	0.0	1.6	7301.2	0.7
27Feb2019	03:09	0.0	1.6	7301.2	0.7
27Feb2019	03:10	0.0	1.6	7301.2	0.7
27Feb2019	03:11	0.0	1.6	7301.2	0.7
27Feb2019	03:12	0.0	1.6	7301.2	0.7
27Feb2019	03:13	0.0	1.6	7301.2	0.7
27Feb2019	03:14	0.0	1.6	7301.2	0.7
27Feb2019	03:15	0.0	1.6	7301.2	0.7
27Feb2019	03:16	0.0	1.6	7301.2	0.7
27Feb2019	03:17	0.0	1.5	7301.2	0.7

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	03:18	0.0	1.5	7301.2	0.7
27Feb2019	03:19	0.0	1.5	7301.2	0.7
27Feb2019	03:20	0.0	1.5	7301.2	0.7
27Feb2019	03:21	0.0	1.5	7301.2	0.7
27Feb2019	03:22	0.0	1.5	7301.2	0.7
27Feb2019	03:23	0.0	1.5	7301.2	0.7
27Feb2019	03:24	0.0	1.5	7301.2	0.7
27Feb2019	03:25	0.0	1.5	7301.2	0.7
27Feb2019	03:26	0.0	1.5	7301.2	0.7
27Feb2019	03:27	0.0	1.5	7301.2	0.7
27Feb2019	03:28	0.0	1.5	7301.2	0.7
27Feb2019	03:29	0.0	1.5	7301.2	0.7
27Feb2019	03:30	0.0	1.5	7301.2	0.7
27Feb2019	03:31	0.0	1.5	7301.2	0.7
27Feb2019	03:32	0.0	1.5	7301.2	0.7
27Feb2019	03:33	0.0	1.5	7301.2	0.7
27Feb2019	03:34	0.0	1.5	7301.2	0.7
27Feb2019	03:35	0.0	1.5	7301.2	0.7
27Feb2019	03:36	0.0	1.5	7301.2	0.7
27Feb2019	03:37	0.0	1.5	7301.2	0.7
27Feb2019	03:38	0.0	1.5	7301.2	0.7
27Feb2019	03:39	0.0	1.5	7301.2	0.6
27Feb2019	03:40	0.0	1.5	7301.2	0.6
27Feb2019	03:41	0.0	1.5	7301.2	0.6
27Feb2019	03:42	0.0	1.5	7301.2	0.6
27Feb2019	03:43	0.0	1.5	7301.2	0.6
27Feb2019	03:44	0.0	1.5	7301.2	0.6
27Feb2019	03:45	0.0	1.5	7301.2	0.6
27Feb2019	03:46	0.0	1.5	7301.2	0.6
27Feb2019	03:47	0.0	1.5	7301.2	0.6
27Feb2019	03:48	0.0	1.5	7301.2	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	03:49	0.0	1.5	7301.2	0.6
27Feb2019	03:50	0.0	1.5	7301.2	0.6
27Feb2019	03:51	0.0	1.5	7301.2	0.6
27Feb2019	03:52	0.0	1.5	7301.2	0.6
27Feb2019	03:53	0.0	1.5	7301.2	0.6
27Feb2019	03:54	0.0	1.5	7301.2	0.6
27Feb2019	03:55	0.0	1.5	7301.2	0.6
27Feb2019	03:56	0.0	1.5	7301.2	0.6
27Feb2019	03:57	0.0	1.5	7301.2	0.6
27Feb2019	03:58	0.0	1.5	7301.2	0.6
27Feb2019	03:59	0.0	1.5	7301.2	0.6
27Feb2019	04:00	0.0	1.5	7301.2	0.6
27Feb2019	04:01	0.0	1.5	7301.2	0.6
27Feb2019	04:02	0.0	1.5	7301.2	0.6
27Feb2019	04:03	0.0	1.5	7301.2	0.6
27Feb2019	04:04	0.0	1.5	7301.2	0.6
27Feb2019	04:05	0.0	1.5	7301.2	0.6
27Feb2019	04:06	0.0	1.5	7301.2	0.6
27Feb2019	04:07	0.0	1.5	7301.2	0.6
27Feb2019	04:08	0.0	1.5	7301.2	0.6
27Feb2019	04:09	0.0	1.5	7301.2	0.6
27Feb2019	04:10	0.0	1.5	7301.2	0.6
27Feb2019	04:11	0.0	1.5	7301.2	0.6
27Feb2019	04:12	0.0	1.5	7301.2	0.6
27Feb2019	04:13	0.0	1.5	7301.2	0.6
27Feb2019	04:14	0.0	1.5	7301.2	0.6
27Feb2019	04:15	0.0	1.5	7301.2	0.6
27Feb2019	04:16	0.0	1.5	7301.2	0.6
27Feb2019	04:17	0.0	1.5	7301.2	0.6
27Feb2019	04:18	0.0	1.5	7301.2	0.6
27Feb2019	04:19	0.0	1.5	7301.2	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	04:20	0.0	1.5	7301.2	0.6
27Feb2019	04:21	0.0	1.5	7301.2	0.6
27Feb2019	04:22	0.0	1.5	7301.2	0.6
27Feb2019	04:23	0.0	1.5	7301.1	0.6
27Feb2019	04:24	0.0	1.5	7301.1	0.6
27Feb2019	04:25	0.0	1.5	7301.1	0.6
27Feb2019	04:26	0.0	1.5	7301.1	0.6
27Feb2019	04:27	0.0	1.5	7301.1	0.6
27Feb2019	04:28	0.0	1.5	7301.1	0.6
27Feb2019	04:29	0.0	1.5	7301.1	0.6
27Feb2019	04:30	0.0	1.5	7301.1	0.6
27Feb2019	04:31	0.0	1.5	7301.1	0.6
27Feb2019	04:32	0.0	1.5	7301.1	0.6
27Feb2019	04:33	0.0	1.5	7301.1	0.6
27Feb2019	04:34	0.0	1.5	7301.1	0.6
27Feb2019	04:35	0.0	1.5	7301.1	0.6
27Feb2019	04:36	0.0	1.5	7301.1	0.6
27Feb2019	04:37	0.0	1.5	7301.1	0.6
27Feb2019	04:38	0.0	1.5	7301.1	0.6
27Feb2019	04:39	0.0	1.5	7301.1	0.6
27Feb2019	04:40	0.0	1.5	7301.1	0.6
27Feb2019	04:41	0.0	1.5	7301.1	0.6
27Feb2019	04:42	0.0	1.5	7301.1	0.6
27Feb2019	04:43	0.0	1.5	7301.1	0.6
27Feb2019	04:44	0.0	1.5	7301.1	0.6
27Feb2019	04:45	0.0	1.5	7301.1	0.6
27Feb2019	04:46	0.0	1.5	7301.1	0.6
27Feb2019	04:47	0.0	1.5	7301.1	0.6
27Feb2019	04:48	0.0	1.5	7301.1	0.6
27Feb2019	04:49	0.0	1.5	7301.1	0.6
27Feb2019	04:50	0.0	1.5	7301.1	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	04:51	0.0	1.5	7301.1	0.6
27Feb2019	04:52	0.0	1.5	7301.1	0.6
27Feb2019	04:53	0.0	1.5	7301.1	0.6
27Feb2019	04:54	0.0	1.5	7301.1	0.6
27Feb2019	04:55	0.0	1.5	7301.1	0.6
27Feb2019	04:56	0.0	1.5	7301.1	0.6
27Feb2019	04:57	0.0	1.5	7301.1	0.6
27Feb2019	04:58	0.0	1.5	7301.1	0.6
27Feb2019	04:59	0.0	1.5	7301.1	0.6
27Feb2019	05:00	0.0	1.5	7301.1	0.6
27Feb2019	05:01	0.0	1.5	7301.1	0.6
27Feb2019	05:02	0.0	1.5	7301.1	0.6
27Feb2019	05:03	0.0	1.5	7301.1	0.6
27Feb2019	05:04	0.0	1.5	7301.1	0.6
27Feb2019	05:05	0.0	1.5	7301.1	0.6
27Feb2019	05:06	0.0	1.5	7301.1	0.6
27Feb2019	05:07	0.0	1.5	7301.1	0.6
27Feb2019	05:08	0.0	1.5	7301.1	0.6
27Feb2019	05:09	0.0	1.5	7301.1	0.6
27Feb2019	05:10	0.0	1.5	7301.1	0.6
27Feb2019	05:11	0.0	1.4	7301.1	0.6
27Feb2019	05:12	0.0	1.4	7301.1	0.6
27Feb2019	05:13	0.0	1.4	7301.1	0.6
27Feb2019	05:14	0.0	1.4	7301.1	0.6
27Feb2019	05:15	0.0	1.4	7301.1	0.6
27Feb2019	05:16	0.0	1.4	7301.1	0.6
27Feb2019	05:17	0.0	1.4	7301.1	0.6
27Feb2019	05:18	0.0	1.4	7301.1	0.6
27Feb2019	05:19	0.0	1.4	7301.1	0.6
27Feb2019	05:20	0.0	1.4	7301.1	0.6
27Feb2019	05:21	0.0	1.4	7301.1	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	05:22	0.0	1.4	7301.1	0.6
27Feb2019	05:23	0.0	1.4	7301.1	0.6
27Feb2019	05:24	0.0	1.4	7301.1	0.6
27Feb2019	05:25	0.0	1.4	7301.1	0.6
27Feb2019	05:26	0.0	1.4	7301.1	0.6
27Feb2019	05:27	0.0	1.4	7301.1	0.6
27Feb2019	05:28	0.0	1.4	7301.1	0.6
27Feb2019	05:29	0.0	1.4	7301.1	0.6
27Feb2019	05:30	0.0	1.4	7301.1	0.6
27Feb2019	05:31	0.0	1.4	7301.1	0.6
27Feb2019	05:32	0.0	1.4	7301.1	0.6
27Feb2019	05:33	0.0	1.4	7301.1	0.6
27Feb2019	05:34	0.0	1.4	7301.1	0.6
27Feb2019	05:35	0.0	1.4	7301.1	0.6
27Feb2019	05:36	0.0	1.4	7301.1	0.6
27Feb2019	05:37	0.0	1.4	7301.1	0.6
27Feb2019	05:38	0.0	1.4	7301.1	0.6
27Feb2019	05:39	0.0	1.4	7301.1	0.6
27Feb2019	05:40	0.0	1.4	7301.1	0.6
27Feb2019	05:41	0.0	1.4	7301.1	0.6
27Feb2019	05:42	0.0	1.4	7301.1	0.6
27Feb2019	05:43	0.0	1.4	7301.1	0.6
27Feb2019	05:44	0.0	1.4	7301.1	0.6
27Feb2019	05:45	0.0	1.4	7301.1	0.6
27Feb2019	05:46	0.0	1.4	7301.1	0.6
27Feb2019	05:47	0.0	1.4	7301.1	0.6
27Feb2019	05:48	0.0	1.4	7301.1	0.6
27Feb2019	05:49	0.0	1.4	7301.1	0.6
27Feb2019	05:50	0.0	1.4	7301.1	0.6
27Feb2019	05:51	0.0	1.4	7301.1	0.6
27Feb2019	05:52	0.0	1.4	7301.1	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	05:53	0.0	1.4	7301.1	0.6
27Feb2019	05:54	0.0	1.4	7301.1	0.6
27Feb2019	05:55	0.0	1.4	7301.1	0.6
27Feb2019	05:56	0.0	1.4	7301.1	0.6
27Feb2019	05:57	0.0	1.4	7301.1	0.6
27Feb2019	05:58	0.0	1.4	7301.1	0.6
27Feb2019	05:59	0.0	1.4	7301.1	0.6
27Feb2019	06:00	0.0	1.4	7301.1	0.6
27Feb2019	06:01	0.0	1.4	7301.1	0.6
27Feb2019	06:02	0.0	1.4	7301.1	0.6
27Feb2019	06:03	0.0	1.4	7301.1	0.6
27Feb2019	06:04	0.0	1.4	7301.1	0.6
27Feb2019	06:05	0.0	1.4	7301.1	0.6
27Feb2019	06:06	0.0	1.4	7301.1	0.6
27Feb2019	06:07	0.0	1.4	7301.1	0.6
27Feb2019	06:08	0.0	1.4	7301.1	0.6
27Feb2019	06:09	0.0	1.4	7301.1	0.6
27Feb2019	06:10	0.0	1.4	7301.1	0.6
27Feb2019	06:11	0.0	1.4	7301.1	0.6
27Feb2019	06:12	0.0	1.4	7301.1	0.6
27Feb2019	06:13	0.0	1.4	7301.1	0.6
27Feb2019	06:14	0.0	1.4	7301.1	0.6
27Feb2019	06:15	0.0	1.4	7301.1	0.6
27Feb2019	06:16	0.0	1.4	7301.1	0.6
27Feb2019	06:17	0.0	1.4	7301.1	0.6
27Feb2019	06:18	0.0	1.4	7301.1	0.6
27Feb2019	06:19	0.0	1.4	7301.1	0.6
27Feb2019	06:20	0.0	1.4	7301.1	0.6
27Feb2019	06:21	0.0	1.4	7301.1	0.6
27Feb2019	06:22	0.0	1.4	7301.1	0.6
27Feb2019	06:23	0.0	1.4	7301.1	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	06:24	0.0	1.4	7301.1	0.6
27Feb2019	06:25	0.0	1.4	7301.1	0.6
27Feb2019	06:26	0.0	1.4	7301.1	0.6
27Feb2019	06:27	0.0	1.4	7301.1	0.6
27Feb2019	06:28	0.0	1.4	7301.1	0.6
27Feb2019	06:29	0.0	1.4	7301.1	0.6
27Feb2019	06:30	0.0	1.4	7301.1	0.6
27Feb2019	06:31	0.0	1.4	7301.1	0.6
27Feb2019	06:32	0.0	1.4	7301.1	0.6
27Feb2019	06:33	0.0	1.4	7301.1	0.6
27Feb2019	06:34	0.0	1.4	7301.1	0.6
27Feb2019	06:35	0.0	1.4	7301.1	0.6
27Feb2019	06:36	0.0	1.4	7301.1	0.6
27Feb2019	06:37	0.0	1.4	7301.1	0.6
27Feb2019	06:38	0.0	1.4	7301.1	0.6
27Feb2019	06:39	0.0	1.4	7301.1	0.6
27Feb2019	06:40	0.0	1.4	7301.1	0.6
27Feb2019	06:41	0.0	1.4	7301.1	0.6
27Feb2019	06:42	0.0	1.4	7301.1	0.6
27Feb2019	06:43	0.0	1.4	7301.1	0.6
27Feb2019	06:44	0.0	1.4	7301.1	0.6
27Feb2019	06:45	0.0	1.4	7301.1	0.6
27Feb2019	06:46	0.0	1.4	7301.1	0.6
27Feb2019	06:47	0.0	1.4	7301.1	0.6
27Feb2019	06:48	0.0	1.4	7301.1	0.6
27Feb2019	06:49	0.0	1.4	7301.1	0.6
27Feb2019	06:50	0.0	1.4	7301.1	0.6
27Feb2019	06:51	0.0	1.4	7301.1	0.6
27Feb2019	06:52	0.0	1.4	7301.1	0.6
27Feb2019	06:53	0.0	1.4	7301.1	0.6
27Feb2019	06:54	0.0	1.4	7301.1	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	06:55	0.0	1.4	7301.1	0.6
27Feb2019	06:56	0.0	1.4	7301.1	0.6
27Feb2019	06:57	0.0	1.4	7301.1	0.6
27Feb2019	06:58	0.0	1.4	7301.1	0.6
27Feb2019	06:59	0.0	1.4	7301.1	0.6
27Feb2019	07:00	0.0	1.4	7301.1	0.6
27Feb2019	07:01	0.0	1.4	7301.1	0.6
27Feb2019	07:02	0.0	1.4	7301.1	0.6
27Feb2019	07:03	0.0	1.4	7301.1	0.6
27Feb2019	07:04	0.0	1.4	7301.0	0.6
27Feb2019	07:05	0.0	1.4	7301.0	0.6
27Feb2019	07:06	0.0	1.4	7301.0	0.6
27Feb2019	07:07	0.0	1.3	7301.0	0.6
27Feb2019	07:08	0.0	1.3	7301.0	0.6
27Feb2019	07:09	0.0	1.3	7301.0	0.6
27Feb2019	07:10	0.0	1.3	7301.0	0.6
27Feb2019	07:11	0.0	1.3	7301.0	0.6
27Feb2019	07:12	0.0	1.3	7301.0	0.6
27Feb2019	07:13	0.0	1.3	7301.0	0.6
27Feb2019	07:14	0.0	1.3	7301.0	0.6
27Feb2019	07:15	0.0	1.3	7301.0	0.6
27Feb2019	07:16	0.0	1.3	7301.0	0.6
27Feb2019	07:17	0.0	1.3	7301.0	0.6
27Feb2019	07:18	0.0	1.3	7301.0	0.6
27Feb2019	07:19	0.0	1.3	7301.0	0.6
27Feb2019	07:20	0.0	1.3	7301.0	0.6
27Feb2019	07:21	0.0	1.3	7301.0	0.6
27Feb2019	07:22	0.0	1.3	7301.0	0.6
27Feb2019	07:23	0.0	1.3	7301.0	0.6
27Feb2019	07:24	0.0	1.3	7301.0	0.6
27Feb2019	07:25	0.0	1.3	7301.0	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	07:26	0.0	1.3	7301.0	0.6
27Feb2019	07:27	0.0	1.3	7301.0	0.6
27Feb2019	07:28	0.0	1.3	7301.0	0.6
27Feb2019	07:29	0.0	1.3	7301.0	0.6
27Feb2019	07:30	0.0	1.3	7301.0	0.6
27Feb2019	07:31	0.0	1.3	7301.0	0.6
27Feb2019	07:32	0.0	1.3	7301.0	0.6
27Feb2019	07:33	0.0	1.3	7301.0	0.6
27Feb2019	07:34	0.0	1.3	7301.0	0.6
27Feb2019	07:35	0.0	1.3	7301.0	0.6
27Feb2019	07:36	0.0	1.3	7301.0	0.6
27Feb2019	07:37	0.0	1.3	7301.0	0.6
27Feb2019	07:38	0.0	1.3	7301.0	0.6
27Feb2019	07:39	0.0	1.3	7301.0	0.6
27Feb2019	07:40	0.0	1.3	7301.0	0.6
27Feb2019	07:41	0.0	1.3	7301.0	0.6
27Feb2019	07:42	0.0	1.3	7301.0	0.6
27Feb2019	07:43	0.0	1.3	7301.0	0.6
27Feb2019	07:44	0.0	1.3	7301.0	0.6
27Feb2019	07:45	0.0	1.3	7301.0	0.6
27Feb2019	07:46	0.0	1.3	7301.0	0.6
27Feb2019	07:47	0.0	1.3	7301.0	0.6
27Feb2019	07:48	0.0	1.3	7301.0	0.6
27Feb2019	07:49	0.0	1.3	7301.0	0.6
27Feb2019	07:50	0.0	1.3	7301.0	0.6
27Feb2019	07:51	0.0	1.3	7301.0	0.6
27Feb2019	07:52	0.0	1.3	7301.0	0.6
27Feb2019	07:53	0.0	1.3	7301.0	0.6
27Feb2019	07:54	0.0	1.3	7301.0	0.6
27Feb2019	07:55	0.0	1.3	7301.0	0.6
27Feb2019	07:56	0.0	1.3	7301.0	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	07:57	0.0	1.3	7301.0	0.6
27Feb2019	07:58	0.0	1.3	7301.0	0.6
27Feb2019	07:59	0.0	1.3	7301.0	0.6
27Feb2019	08:00	0.0	1.3	7301.0	0.6
27Feb2019	08:01	0.0	1.3	7301.0	0.6
27Feb2019	08:02	0.0	1.3	7301.0	0.6
27Feb2019	08:03	0.0	1.3	7301.0	0.6
27Feb2019	08:04	0.0	1.3	7301.0	0.6
27Feb2019	08:05	0.0	1.3	7301.0	0.6
27Feb2019	08:06	0.0	1.3	7301.0	0.6
27Feb2019	08:07	0.0	1.3	7301.0	0.6
27Feb2019	08:08	0.0	1.3	7301.0	0.6
27Feb2019	08:09	0.0	1.3	7301.0	0.6
27Feb2019	08:10	0.0	1.3	7301.0	0.6
27Feb2019	08:11	0.0	1.3	7301.0	0.6
27Feb2019	08:12	0.0	1.3	7301.0	0.6
27Feb2019	08:13	0.0	1.3	7301.0	0.6
27Feb2019	08:14	0.0	1.3	7301.0	0.6
27Feb2019	08:15	0.0	1.3	7301.0	0.6
27Feb2019	08:16	0.0	1.3	7301.0	0.6
27Feb2019	08:17	0.0	1.3	7301.0	0.6
27Feb2019	08:18	0.0	1.3	7301.0	0.6
27Feb2019	08:19	0.0	1.3	7301.0	0.6
27Feb2019	08:20	0.0	1.3	7301.0	0.6
27Feb2019	08:21	0.0	1.3	7301.0	0.6
27Feb2019	08:22	0.0	1.3	7301.0	0.6
27Feb2019	08:23	0.0	1.3	7301.0	0.6
27Feb2019	08:24	0.0	1.3	7301.0	0.6
27Feb2019	08:25	0.0	1.3	7301.0	0.6
27Feb2019	08:26	0.0	1.3	7301.0	0.6
27Feb2019	08:27	0.0	1.3	7301.0	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	08:28	0.0	1.3	7301.0	0.6
27Feb2019	08:29	0.0	1.3	7301.0	0.6
27Feb2019	08:30	0.0	1.3	7301.0	0.6
27Feb2019	08:31	0.0	1.3	7301.0	0.6
27Feb2019	08:32	0.0	1.3	7301.0	0.6
27Feb2019	08:33	0.0	1.3	7301.0	0.6
27Feb2019	08:34	0.0	1.3	7301.0	0.6
27Feb2019	08:35	0.0	1.3	7301.0	0.6
27Feb2019	08:36	0.0	1.3	7301.0	0.6
27Feb2019	08:37	0.0	1.3	7301.0	0.6
27Feb2019	08:38	0.0	1.3	7301.0	0.6
27Feb2019	08:39	0.0	1.3	7301.0	0.6
27Feb2019	08:40	0.0	1.3	7301.0	0.6
27Feb2019	08:41	0.0	1.3	7301.0	0.6
27Feb2019	08:42	0.0	1.3	7301.0	0.6
27Feb2019	08:43	0.0	1.3	7301.0	0.6
27Feb2019	08:44	0.0	1.3	7301.0	0.6
27Feb2019	08:45	0.0	1.3	7301.0	0.6
27Feb2019	08:46	0.0	1.3	7301.0	0.6
27Feb2019	08:47	0.0	1.3	7301.0	0.6
27Feb2019	08:48	0.0	1.3	7301.0	0.6
27Feb2019	08:49	0.0	1.3	7301.0	0.6
27Feb2019	08:50	0.0	1.3	7301.0	0.6
27Feb2019	08:51	0.0	1.3	7301.0	0.6
27Feb2019	08:52	0.0	1.3	7301.0	0.6
27Feb2019	08:53	0.0	1.3	7301.0	0.6
27Feb2019	08:54	0.0	1.3	7301.0	0.6
27Feb2019	08:55	0.0	1.3	7301.0	0.6
27Feb2019	08:56	0.0	1.3	7301.0	0.6
27Feb2019	08:57	0.0	1.3	7301.0	0.6
27Feb2019	08:58	0.0	1.3	7301.0	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	08:59	0.0	1.3	7301.0	0.6
27Feb2019	09:00	0.0	1.3	7301.0	0.6
27Feb2019	09:01	0.0	1.3	7301.0	0.6
27Feb2019	09:02	0.0	1.3	7301.0	0.6
27Feb2019	09:03	0.0	1.3	7301.0	0.6
27Feb2019	09:04	0.0	1.3	7301.0	0.6
27Feb2019	09:05	0.0	1.3	7301.0	0.6
27Feb2019	09:06	0.0	1.3	7301.0	0.6
27Feb2019	09:07	0.0	1.3	7301.0	0.6
27Feb2019	09:08	0.0	1.2	7301.0	0.6
27Feb2019	09:09	0.0	1.2	7301.0	0.6
27Feb2019	09:10	0.0	1.2	7301.0	0.6
27Feb2019	09:11	0.0	1.2	7301.0	0.6
27Feb2019	09:12	0.0	1.2	7301.0	0.6
27Feb2019	09:13	0.0	1.2	7301.0	0.6
27Feb2019	09:14	0.0	1.2	7301.0	0.6
27Feb2019	09:15	0.0	1.2	7301.0	0.6
27Feb2019	09:16	0.0	1.2	7301.0	0.6
27Feb2019	09:17	0.0	1.2	7301.0	0.6
27Feb2019	09:18	0.0	1.2	7301.0	0.6
27Feb2019	09:19	0.0	1.2	7301.0	0.6
27Feb2019	09:20	0.0	1.2	7301.0	0.6
27Feb2019	09:21	0.0	1.2	7301.0	0.6
27Feb2019	09:22	0.0	1.2	7301.0	0.6
27Feb2019	09:23	0.0	1.2	7301.0	0.6
27Feb2019	09:24	0.0	1.2	7301.0	0.6
27Feb2019	09:25	0.0	1.2	7301.0	0.6
27Feb2019	09:26	0.0	1.2	7301.0	0.6
27Feb2019	09:27	0.0	1.2	7301.0	0.6
27Feb2019	09:28	0.0	1.2	7301.0	0.6
27Feb2019	09:29	0.0	1.2	7301.0	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	09:30	0.0	1.2	7301.0	0.6
27Feb2019	09:31	0.0	1.2	7301.0	0.6
27Feb2019	09:32	0.0	1.2	7301.0	0.6
27Feb2019	09:33	0.0	1.2	7301.0	0.6
27Feb2019	09:34	0.0	1.2	7301.0	0.6
27Feb2019	09:35	0.0	1.2	7301.0	0.6
27Feb2019	09:36	0.0	1.2	7301.0	0.6
27Feb2019	09:37	0.0	1.2	7301.0	0.6
27Feb2019	09:38	0.0	1.2	7301.0	0.6
27Feb2019	09:39	0.0	1.2	7301.0	0.6
27Feb2019	09:40	0.0	1.2	7301.0	0.6
27Feb2019	09:41	0.0	1.2	7301.0	0.6
27Feb2019	09:42	0.0	1.2	7301.0	0.6
27Feb2019	09:43	0.0	1.2	7300.9	0.6
27Feb2019	09:44	0.0	1.2	7300.9	0.6
27Feb2019	09:45	0.0	1.2	7300.9	0.6
27Feb2019	09:46	0.0	1.2	7300.9	0.6
27Feb2019	09:47	0.0	1.2	7300.9	0.6
27Feb2019	09:48	0.0	1.2	7300.9	0.6
27Feb2019	09:49	0.0	1.2	7300.9	0.6
27Feb2019	09:50	0.0	1.2	7300.9	0.6
27Feb2019	09:51	0.0	1.2	7300.9	0.6
27Feb2019	09:52	0.0	1.2	7300.9	0.6
27Feb2019	09:53	0.0	1.2	7300.9	0.6
27Feb2019	09:54	0.0	1.2	7300.9	0.6
27Feb2019	09:55	0.0	1.2	7300.9	0.6
27Feb2019	09:56	0.0	1.2	7300.9	0.6
27Feb2019	09:57	0.0	1.2	7300.9	0.6
27Feb2019	09:58	0.0	1.2	7300.9	0.6
27Feb2019	09:59	0.0	1.2	7300.9	0.6
27Feb2019	10:00	0.0	1.2	7300.9	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	10:01	0.0	1.2	7300.9	0.6
27Feb2019	10:02	0.0	1.2	7300.9	0.6
27Feb2019	10:03	0.0	1.2	7300.9	0.6
27Feb2019	10:04	0.0	1.2	7300.9	0.6
27Feb2019	10:05	0.0	1.2	7300.9	0.6
27Feb2019	10:06	0.0	1.2	7300.9	0.6
27Feb2019	10:07	0.0	1.2	7300.9	0.6
27Feb2019	10:08	0.0	1.2	7300.9	0.6
27Feb2019	10:09	0.0	1.2	7300.9	0.6
27Feb2019	10:10	0.0	1.2	7300.9	0.6
27Feb2019	10:11	0.0	1.2	7300.9	0.6
27Feb2019	10:12	0.0	1.2	7300.9	0.6
27Feb2019	10:13	0.0	1.2	7300.9	0.6
27Feb2019	10:14	0.0	1.2	7300.9	0.6
27Feb2019	10:15	0.0	1.2	7300.9	0.6
27Feb2019	10:16	0.0	1.2	7300.9	0.6
27Feb2019	10:17	0.0	1.2	7300.9	0.6
27Feb2019	10:18	0.0	1.2	7300.9	0.6
27Feb2019	10:19	0.0	1.2	7300.9	0.6
27Feb2019	10:20	0.0	1.2	7300.9	0.6
27Feb2019	10:21	0.0	1.2	7300.9	0.6
27Feb2019	10:22	0.0	1.2	7300.9	0.6
27Feb2019	10:23	0.0	1.2	7300.9	0.6
27Feb2019	10:24	0.0	1.2	7300.9	0.6
27Feb2019	10:25	0.0	1.2	7300.9	0.6
27Feb2019	10:26	0.0	1.2	7300.9	0.6
27Feb2019	10:27	0.0	1.2	7300.9	0.6
27Feb2019	10:28	0.0	1.2	7300.9	0.6
27Feb2019	10:29	0.0	1.2	7300.9	0.6
27Feb2019	10:30	0.0	1.2	7300.9	0.6
27Feb2019	10:31	0.0	1.2	7300.9	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	10:32	0.0	1.2	7300.9	0.6
27Feb2019	10:33	0.0	1.2	7300.9	0.6
27Feb2019	10:34	0.0	1.2	7300.9	0.6
27Feb2019	10:35	0.0	1.2	7300.9	0.6
27Feb2019	10:36	0.0	1.2	7300.9	0.6
27Feb2019	10:37	0.0	1.2	7300.9	0.6
27Feb2019	10:38	0.0	1.2	7300.9	0.6
27Feb2019	10:39	0.0	1.2	7300.9	0.6
27Feb2019	10:40	0.0	1.2	7300.9	0.6
27Feb2019	10:41	0.0	1.2	7300.9	0.6
27Feb2019	10:42	0.0	1.2	7300.9	0.6
27Feb2019	10:43	0.0	1.2	7300.9	0.6
27Feb2019	10:44	0.0	1.2	7300.9	0.6
27Feb2019	10:45	0.0	1.2	7300.9	0.6
27Feb2019	10:46	0.0	1.2	7300.9	0.6
27Feb2019	10:47	0.0	1.2	7300.9	0.6
27Feb2019	10:48	0.0	1.2	7300.9	0.6
27Feb2019	10:49	0.0	1.2	7300.9	0.6
27Feb2019	10:50	0.0	1.2	7300.9	0.6
27Feb2019	10:51	0.0	1.2	7300.9	0.6
27Feb2019	10:52	0.0	1.2	7300.9	0.6
27Feb2019	10:53	0.0	1.2	7300.9	0.6
27Feb2019	10:54	0.0	1.2	7300.9	0.6
27Feb2019	10:55	0.0	1.2	7300.9	0.6
27Feb2019	10:56	0.0	1.2	7300.9	0.6
27Feb2019	10:57	0.0	1.2	7300.9	0.6
27Feb2019	10:58	0.0	1.2	7300.9	0.6
27Feb2019	10:59	0.0	1.2	7300.9	0.6
27Feb2019	11:00	0.0	1.2	7300.9	0.6
27Feb2019	11:01	0.0	1.2	7300.9	0.6
27Feb2019	11:02	0.0	1.2	7300.9	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	11:03	0.0	1.2	7300.9	0.6
27Feb2019	11:04	0.0	1.2	7300.9	0.6
27Feb2019	11:05	0.0	1.2	7300.9	0.6
27Feb2019	11:06	0.0	1.2	7300.9	0.6
27Feb2019	11:07	0.0	1.2	7300.9	0.6
27Feb2019	11:08	0.0	1.2	7300.9	0.6
27Feb2019	11:09	0.0	1.2	7300.9	0.6
27Feb2019	11:10	0.0	1.2	7300.9	0.6
27Feb2019	11:11	0.0	1.2	7300.9	0.6
27Feb2019	11:12	0.0	1.1	7300.9	0.6
27Feb2019	11:13	0.0	1.1	7300.9	0.6
27Feb2019	11:14	0.0	1.1	7300.9	0.6
27Feb2019	11:15	0.0	1.1	7300.9	0.6
27Feb2019	11:16	0.0	1.1	7300.9	0.6
27Feb2019	11:17	0.0	1.1	7300.9	0.6
27Feb2019	11:18	0.0	1.1	7300.9	0.6
27Feb2019	11:19	0.0	1.1	7300.9	0.6
27Feb2019	11:20	0.0	1.1	7300.9	0.6
27Feb2019	11:21	0.0	1.1	7300.9	0.6
27Feb2019	11:22	0.0	1.1	7300.9	0.6
27Feb2019	11:23	0.0	1.1	7300.9	0.6
27Feb2019	11:24	0.0	1.1	7300.9	0.6
27Feb2019	11:25	0.0	1.1	7300.9	0.6
27Feb2019	11:26	0.0	1.1	7300.9	0.6
27Feb2019	11:27	0.0	1.1	7300.9	0.6
27Feb2019	11:28	0.0	1.1	7300.9	0.6
27Feb2019	11:29	0.0	1.1	7300.9	0.6
27Feb2019	11:30	0.0	1.1	7300.9	0.6
27Feb2019	11:31	0.0	1.1	7300.9	0.6
27Feb2019	11:32	0.0	1.1	7300.9	0.6
27Feb2019	11:33	0.0	1.1	7300.9	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	11:34	0.0	1.1	7300.9	0.6
27Feb2019	11:35	0.0	1.1	7300.9	0.6
27Feb2019	11:36	0.0	1.1	7300.9	0.6
27Feb2019	11:37	0.0	1.1	7300.9	0.6
27Feb2019	11:38	0.0	1.1	7300.9	0.6
27Feb2019	11:39	0.0	1.1	7300.9	0.6
27Feb2019	11:40	0.0	1.1	7300.9	0.6
27Feb2019	11:41	0.0	1.1	7300.9	0.6
27Feb2019	11:42	0.0	1.1	7300.9	0.6
27Feb2019	11:43	0.0	1.1	7300.9	0.6
27Feb2019	11:44	0.0	1.1	7300.9	0.6
27Feb2019	11:45	0.0	1.1	7300.9	0.6
27Feb2019	11:46	0.0	1.1	7300.9	0.6
27Feb2019	11:47	0.0	1.1	7300.9	0.6
27Feb2019	11:48	0.0	1.1	7300.9	0.6
27Feb2019	11:49	0.0	1.1	7300.9	0.6
27Feb2019	11:50	0.0	1.1	7300.9	0.6
27Feb2019	11:51	0.0	1.1	7300.9	0.6
27Feb2019	11:52	0.0	1.1	7300.9	0.6
27Feb2019	11:53	0.0	1.1	7300.9	0.6
27Feb2019	11:54	0.0	1.1	7300.9	0.6
27Feb2019	11:55	0.0	1.1	7300.9	0.6
27Feb2019	11:56	0.0	1.1	7300.9	0.6
27Feb2019	11:57	0.0	1.1	7300.9	0.6
27Feb2019	11:58	0.0	1.1	7300.9	0.6
27Feb2019	11:59	0.0	1.1	7300.9	0.6
27Feb2019	12:00	0.0	1.1	7300.9	0.6

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: Reach-E1.1

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units:IN

Computed Results

Peak Inflow:	4.9 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:13
Peak Discharge:	4.9 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:15
Inflow Volume:	0.19 (IN)	Discharge Volume:	0.19 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: Reach E1.2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units:IN

Computed Results

Peak Inflow:	2.7 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:07
Peak Discharge:	2.7 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:14
Inflow Volume:	0.32 (IN)	Discharge Volume:	0.32 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: Reach-E2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	04Jun2021, 14:49:53	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	4.9 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:15
Peak Discharge:	4.9 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:18
Inflow Volume:	0.19 (IN)	Discharge Volume:	0.19 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: Reach E3.1

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	04Jun2021, 14:49:53	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	5.0 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:07
Peak Discharge:	5.0 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:11
Inflow Volume:	0.41 (IN)	Discharge Volume:	0.41 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: Reach-E3

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	04Jun2021, 14:49:53	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	7.3 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:12
Peak Discharge:	7.3 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:18
Inflow Volume:	0.24 (IN)	Discharge Volume:	0.24 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: Reach-E4

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	04Jun2021, 14:49:53	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	18.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:08
Peak Discharge:	18.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:13
Inflow Volume:	0.31 (IN)	Discharge Volume:	0.31 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: Reach-E6

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units:IN

Computed Results

Peak Inflow:	3.9 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:07
Peak Discharge:	3.8 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:13
Inflow Volume:	0.35 (IN)	Discharge Volume:	0.35 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: Reach-E7

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	04Jun2021, 14:49:53	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	26.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:10
Peak Discharge:	26.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:14
Inflow Volume:	0.34 (IN)	Discharge Volume:	0.34 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: Reach-F2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	18May2021, 16:01:51	Control Specifications:	Control 1

Volume Units:IN

Computed Results

Peak Inflow:	2.2 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:02
Peak Discharge:	2.2 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:08
Inflow Volume:	0.51 (IN)	Discharge Volume:	0.51 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basin 5yr
Reach: Reach-E6-2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 5yr
Compute Time:	04Jun2021, 14:49:53	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	30.4 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:12
Peak Discharge:	30.3 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:15
Inflow Volume:	0.34 (IN)	Discharge Volume:	0.34 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr

Start of Run: 26Feb2019, 00:00 Basin Model: Proposed B
End of Run: 27Feb2019, 12:00 Meteorologic Model: Prop Basins
Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
A1	1.3529000	402.8	26Feb2019, 12:28	0.56
A2	0.0577812	36.8	26Feb2019, 12:16	0.73
A3	0.0648125	81.5	26Feb2019, 12:13	1.60
BOX CULVERT7	19.9557326	1722.9	26Feb2019, 12:41	0.57
BOX CULV 2	8.9615089	1934.2	26Feb2019, 12:44	0.59
B1	5.9948000	1289.0	26Feb2019, 12:44	0.56
B2	0.0204688	17.2	26Feb2019, 12:09	0.83
B3	0.0857813	49.3	26Feb2019, 12:17	0.70
B4	0.0648125	46.3	26Feb2019, 12:17	0.83
CLV E4	0.1670157	117.6	26Feb2019, 12:12	0.91
CULV B2	0.0204688	17.2	26Feb2019, 12:09	0.83
CULV C2	0.2892200	120.4	26Feb2019, 12:18	0.55
CULV C3	0.3143763	134.2	26Feb2019, 12:19	0.57
CULV D2	0.3593700	170.8	26Feb2019, 12:18	0.61
CULV D3	0.1423438	64.0	26Feb2019, 12:20	0.68
CULV D4	0.1959376	92.3	26Feb2019, 12:19	0.72
CULV E1.1	0.0592188	24.6	26Feb2019, 12:17	0.55
CULV E1.2	0.0238750	21.4	26Feb2019, 12:10	1.03
CULV E1.5	0.0136094	16.6	26Feb2019, 12:08	1.05
CULV E2	0.0768907	36.6	26Feb2019, 12:14	0.69
CULV E5	0.0210938	18.4	26Feb2019, 12:10	0.95
CULV F2	0.0068750	8.6	26Feb2019, 12:05	1.20
CULV H2	0.0610938	46.5	26Feb2019, 12:13	0.78
CULV H3	0.0090625	8.4	26Feb2019, 12:08	0.82
CULV I1	0.0106250	13.6	26Feb2019, 12:08	1.04
CULV-E3	0.1317032	84.6	26Feb2019, 12:11	0.85
C1	0.2542200	105.6	26Feb2019, 12:16	0.55

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
C2	0.0350000	16.1	26Feb2019, 12:13	0.55
C3	0.0251563	19.1	26Feb2019, 12:11	0.83
C4	0.0371875	19.1	26Feb2019, 12:18	0.59
D1.1	0.2520300	105.2	26Feb2019, 12:16	0.55
D1.2	0.0779688	28.2	26Feb2019, 12:20	0.55
D2	0.1073400	69.8	26Feb2019, 12:14	0.77
D3	0.0643750	38.1	26Feb2019, 12:17	0.83
D4	0.0535938	38.6	26Feb2019, 12:12	0.83
D5	0.0200000	15.0	26Feb2019, 12:12	0.61
D6	0.0653125	28.1	26Feb2019, 12:17	0.55
EX CULV C1	0.2542200	105.6	26Feb2019, 12:16	0.55
EX CULV D1.1	0.2520300	105.2	26Feb2019, 12:16	0.55
EX CULV D1.2	0.0779688	28.2	26Feb2019, 12:20	0.55
EX CULV E0	0.0592188	24.6	26Feb2019, 12:16	0.55
E0	0.0592188	24.6	26Feb2019, 12:16	0.55
E1.1	0.0136094	16.6	26Feb2019, 12:08	1.05
E1.2	0.0238750	21.4	26Feb2019, 12:10	1.03
E2	0.0040625	8.9	26Feb2019, 11:56	1.58
E3	0.0309375	33.7	26Feb2019, 12:07	1.11
E4	0.0284375	27.0	26Feb2019, 12:10	1.10
E5	0.0210938	18.4	26Feb2019, 12:10	0.95
E6	0.0144609	14.1	26Feb2019, 12:05	0.80
E7	0.0159688	16.2	26Feb2019, 12:07	0.95
E8	0.0246594	25.6	26Feb2019, 12:01	0.76
E9	0.0059688	5.8	26Feb2019, 11:56	0.36
F1	0.0501563	36.6	26Feb2019, 12:09	0.77
F2	0.0068750	8.6	26Feb2019, 12:04	1.20
F3	0.0150313	14.5	26Feb2019, 12:06	0.93
G1	0.0393750	30.9	26Feb2019, 12:10	0.63
G2	0.0331250	32.7	26Feb2019, 12:14	0.98
H1	0.0217187	24.0	26Feb2019, 12:10	0.94

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
H2	0.0610938	46.6	26Feb2019, 12:13	0.78
H3	0.0090625	8.4	26Feb2019, 12:08	0.82
H4	0.0423437	46.7	26Feb2019, 12:13	1.24
H5	0.0315625	37.5	26Feb2019, 12:13	1.36
H6	0.0493750	31.2	26Feb2019, 12:15	0.59
H7	0.0403125	38.6	26Feb2019, 12:12	0.84
H8	0.0132812	18.2	26Feb2019, 12:09	1.29
H9	0.0107812	12.9	26Feb2019, 12:08	0.94
I1	0.0106250	13.6	26Feb2019, 12:08	1.04
I2	0.0231250	29.9	26Feb2019, 12:08	1.04
J1	0.0157813	18.0	26Feb2019, 12:07	0.87
K1	0.0278125	43.4	26Feb2019, 12:08	1.61
OUT 2	0.0445312	27.5	26Feb2019, 12:25	1.01
OUT-1	9.2891451	2013.7	26Feb2019, 12:44	0.60
REACH A1	1.3529000	402.3	26Feb2019, 12:31	0.56
Reach E3.1	0.0238750	21.4	26Feb2019, 12:12	1.03
Reach H7	0.0493750	46.9	26Feb2019, 12:12	0.84
Reach-A2	0.0648125	81.4	26Feb2019, 12:15	1.60
Reach-B1	5.9948000	1288.9	26Feb2019, 12:46	0.56
Reach-B2	0.0204688	17.2	26Feb2019, 12:14	0.83
Reach-B3	6.0805813	1301.2	26Feb2019, 12:48	0.56
Reach-B4-3	0.3143763	134.2	26Feb2019, 12:19	0.57
Reach-C1	0.2542200	105.5	26Feb2019, 12:18	0.55
Reach-C2	0.2892200	120.3	26Feb2019, 12:20	0.55
Reach-D1.1	0.2520300	105.1	26Feb2019, 12:20	0.55
Reach-D3	0.0779688	28.2	26Feb2019, 12:24	0.55
Reach-D4	0.1423438	64.0	26Feb2019, 12:23	0.68
Reach-D5	0.3593700	170.6	26Feb2019, 12:20	0.61
Reach-D6	0.1959376	92.2	26Feb2019, 12:22	0.72
Reach-E1.1	0.0592188	24.6	26Feb2019, 12:17	0.55
Reach-E2	0.0592188	24.5	26Feb2019, 12:19	0.55

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Reach-E3	0.0768907	36.6	26Feb2019, 12:17	0.69
Reach-E4	0.1317032	84.5	26Feb2019, 12:14	0.85
Reach-E6	0.0210938	18.4	26Feb2019, 12:13	0.95
Reach-E6-2	0.1974454	137.3	26Feb2019, 12:14	0.90
Reach-E7	0.1670157	117.5	26Feb2019, 12:14	0.91
Reach-F2	0.0068750	8.6	26Feb2019, 12:08	1.20
Reach-G2	0.0393750	30.8	26Feb2019, 12:13	0.63
Reach-H4	0.0217187	24.0	26Feb2019, 12:13	0.94
Reach-H6	0.0610938	46.5	26Feb2019, 12:15	0.78
Reach-H7-1	0.0090625	8.4	26Feb2019, 12:12	0.82
Reach-H9	0.0337500	43.3	26Feb2019, 12:10	1.04
Reach-I2-1	0.0106250	13.6	26Feb2019, 12:09	1.04
Reach-P3	0.2612501	79.0	26Feb2019, 12:37	0.68
Reach-1	7.9557326	1722.8	26Feb2019, 12:42	0.57
Reach-2	8.1294825	1754.4	26Feb2019, 12:43	0.58
Reach-3	8.5404150	1831.4	26Feb2019, 12:42	0.58
Reach-4	8.6508838	1852.0	26Feb2019, 12:44	0.58
Reach-5	8.9615089	1934.1	26Feb2019, 12:44	0.59
Reach-6 Kiowa Creek	9.3536763	2035.1	26Feb2019, 12:44	0.60
STORAGE P1	0.1365624	25.4	26Feb2019, 12:42	0.95
STORAGE P2	0.1104688	21.0	26Feb2019, 12:39	0.69
STORAGE P3	0.2612501	79.0	26Feb2019, 12:36	0.68
STORAGE P4	0.0445312	27.5	26Feb2019, 12:22	1.01
STORAGE P5	0.2431986	87.1	26Feb2019, 12:29	0.80

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr

Reach: CULV E1.5

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	04Jun2021, 13:52:40	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	16.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:07
Peak Discharge:	16.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:08
Inflow Volume:	1.05 (IN)	Discharge Volume:	1.05 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: CULV E1.1

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units:IN

Computed Results

Peak Inflow:	24.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:16
Peak Discharge:	24.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:17
Inflow Volume:	0.55 (IN)	Discharge Volume:	0.55 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: CULV E1.2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	04Jun2021, 13:52:40	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	21.4 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:09
Peak Discharge:	21.4 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:10
Inflow Volume:	1.03 (IN)	Discharge Volume:	1.03 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: CULV E2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	DATA CHANGED, RECOMPUTE	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	36.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:12
Peak Discharge:	36.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:14
Inflow Volume:	0.69 (IN)	Discharge Volume:	0.69 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: CULV-E3

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	DATA CHANGED, RECOMPUTE	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	84.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:10
Peak Discharge:	84.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:11
Inflow Volume:	0.85 (IN)	Discharge Volume:	0.85 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr

Reach: CLV E4

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	DATA CHANGED, RECOMPUTE	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	117.7 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:11
Peak Discharge:	117.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:12
Inflow Volume:	0.91 (IN)	Discharge Volume:	0.91 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: CULV E5

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units:IN

Computed Results

Peak Inflow:	18.4 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:09
Peak Discharge:	18.4 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:10
Inflow Volume:	0.95 (IN)	Discharge Volume:	0.95 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: CULV F2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units:IN

Computed Results

Peak Inflow:	8.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:03
Peak Discharge:	8.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:05
Inflow Volume:	1.20 (IN)	Discharge Volume:	1.20 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Subbasin: E0

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	24.6 (CFS)	Date/Time of Peak Discharge:	26Feb2019, 12:16
Precipitation Volume:	4.60 (IN)	Direct Runoff Volume:	0.55 (IN)
Loss Volume:	4.05 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.55 (IN)	Discharge Volume:	0.55 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: Reach-E1.1

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units:IN

Computed Results

Peak Inflow:	24.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:15
Peak Discharge:	24.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:17
Inflow Volume:	0.55 (IN)	Discharge Volume:	0.55 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr

Subbasin: E1.1

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	16.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:08
Precipitation Volume	4.60 (IN)	Direct Runoff Volume:	1.05 (IN)
Loss Volume:	3.54 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	1.05 (IN)	Discharge Volume:	1.05 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr

Subbasin: E1.2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	21.4 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:10
Precipitation Volume:	4.60 (IN)	Direct Runoff Volume:	1.03 (IN)
Loss Volume:	3.56 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	1.03 (IN)	Discharge Volume:	1.03 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Subbasin: E2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	8.9 (CFS)	Date/Time of Peak Discharge	26Feb2019, 11:56
Precipitation Volume:	4.60 (IN)	Direct Runoff Volume:	1.58 (IN)
Loss Volume:	3.02 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	1.58 (IN)	Discharge Volume:	1.58 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Subbasin: E3

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	33.7 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:07
Precipitation Volume	4.60 (IN)	Direct Runoff Volume:	1.11 (IN)
Loss Volume:	3.49 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	1.11 (IN)	Discharge Volume:	1.11 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Subbasin: E4

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	27.0 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:10
Precipitation Volume	4.60 (IN)	Direct Runoff Volume:	1.10 (IN)
Loss Volume:	3.49 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	1.10 (IN)	Discharge Volume:	1.10 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Subbasin: E5

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	18.4 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:10
Precipitation Volume	4.60 (IN)	Direct Runoff Volume:	0.95 (IN)
Loss Volume:	3.65 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.95 (IN)	Discharge Volume:	0.95 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr

Subbasin: E6

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	14.1 (CFS)	Date/Time of Peak Discharge:	26Feb2019, 12:05
Precipitation Volume:	4.60 (IN)	Direct Runoff Volume:	0.80 (IN)
Loss Volume:	3.79 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.80 (IN)	Discharge Volume:	0.80 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Subbasin: E7

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	16.2 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:07
Precipitation Volume	4.60 (IN)	Direct Runoff Volume:	0.95 (IN)
Loss Volume:	3.65 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.95 (IN)	Discharge Volume:	0.95 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Subbasin: E8

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	25.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:01
Precipitation Volume	4.60 (IN)	Direct Runoff Volume:	0.76 (IN)
Loss Volume:	3.84 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.76 (IN)	Discharge Volume:	0.76 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Subbasin: E9

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	5.8 (CFS)	Date/Time of Peak Discharge	26Feb2019, 11:56
Precipitation Volume:	4.60 (IN)	Direct Runoff Volume:	0.36 (IN)
Loss Volume:	4.24 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.36 (IN)	Discharge Volume:	0.36 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: EX CULV E0

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units:IN

Computed Results

Peak Inflow:	24.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:15
Peak Discharge:	24.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:16
Inflow Volume:	0.55 (IN)	Discharge Volume:	0.55 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr

Subbasin: F1

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	19May2021, 11:47:46	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	36.6 (CFS)	Date/Time of Peak Discharge:	26Feb2019, 12:09
Precipitation Volume:	4.60 (IN)	Direct Runoff Volume:	0.77 (IN)
Loss Volume:	3.82 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.77 (IN)	Discharge Volume:	0.77 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Subbasin: F2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	8.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:04
Precipitation Volume:	4.60 (IN)	Direct Runoff Volume:	1.20 (IN)
Loss Volume:	3.39 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	1.20 (IN)	Discharge Volume:	1.20 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr

Subbasin: F3

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	19May2021, 11:47:46	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Discharge:	14.5 (CFS)	Date/Time of Peak Discharge:	26Feb2019, 12:06
Precipitation Volume:	4.60 (IN)	Direct Runoff Volume:	0.93 (IN)
Loss Volume:	3.67 (IN)	Baseflow Volume:	0.00 (IN)
Excess Volume:	0.93 (IN)	Discharge Volume:	0.93 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: Reach-6 Kiowa Outfall

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	19May2021, 18:42:54	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	2035.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:43
Peak Discharge:	2035.4 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:44
Inflow Volume:	0.60 (IN)	Discharge Volume:	0.60 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr

Reach: OUT-1

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	19May2021, 18:42:54	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	2014.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:42
Peak Discharge:	2014.0 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:45
Inflow Volume:	0.60 (IN)	Discharge Volume:	0.60 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr

Reservoir: STORAGE P5

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	DATA CHANGED, RECOMPUTE	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	160.9 (CFS)	Date/Time of Peak Inflow:	26Feb2019, 12:12
Peak Discharge:	87.1 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:29
Inflow Volume:	0.89 (IN)	Peak Storage:	5.1 (AC-FT)
Discharge Volume	0.80 (IN)	Peak Elevation:	7303.1 (FT)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reservoir: STORAGE P5

Start of Run: 26Feb2019, 00:00 Basin Model: Proposed B
End of Run: 27Feb2019, 12:00 Meteorologic Model: Prop Basins
Compute Time: DATA CHANGED, RECOMPUTE Control Specifications: Control 1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	00:00	0.0	0.0		0.1
26Feb2019	00:01	0.0	0.0		0.0
26Feb2019	00:02	0.0	0.0		0.0
26Feb2019	00:03	0.0	0.0		0.0
26Feb2019	00:04	0.0	0.0		0.0
26Feb2019	00:05	0.0	0.0		0.0
26Feb2019	00:06	0.0	0.0		0.0
26Feb2019	00:07	0.0	0.0		0.0
26Feb2019	00:08	0.0	0.0		0.0
26Feb2019	00:09	0.0	0.0		0.0
26Feb2019	00:10	0.0	0.0		0.0
26Feb2019	00:11	0.0	0.0		0.0
26Feb2019	00:12	0.0	0.0		0.0
26Feb2019	00:13	0.0	0.0		0.0
26Feb2019	00:14	0.0	0.0		0.0
26Feb2019	00:15	0.0	0.0		0.0
26Feb2019	00:16	0.1	0.0		0.1
26Feb2019	00:17	0.1	0.0		0.1
26Feb2019	00:18	0.1	0.0		0.1
26Feb2019	00:19	0.1	0.0		0.1
26Feb2019	00:20	0.1	0.0		0.1
26Feb2019	00:21	0.1	0.0		0.1
26Feb2019	00:22	0.1	0.0		0.1
26Feb2019	00:23	0.1	0.0		0.1
26Feb2019	00:24	0.1	0.0		0.1
26Feb2019	00:25	0.1	0.0		0.1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	00:26	0.1	0.0	7298.8	0.1
26Feb2019	00:27	0.1	0.0	7298.8	0.1
26Feb2019	00:28	0.1	0.0	7298.8	0.1
26Feb2019	00:29	0.1	0.0	7298.8	0.1
26Feb2019	00:30	0.1	0.0	7298.8	0.1
26Feb2019	00:31	0.1	0.0	7298.8	0.1
26Feb2019	00:32	0.1	0.0	7298.8	0.1
26Feb2019	00:33	0.1	0.0	7298.8	0.1
26Feb2019	00:34	0.2	0.0	7298.8	0.1
26Feb2019	00:35	0.2	0.0	7298.8	0.1
26Feb2019	00:36	0.2	0.0	7298.8	0.1
26Feb2019	00:37	0.2	0.0	7298.8	0.1
26Feb2019	00:38	0.2	0.0	7298.8	0.1
26Feb2019	00:39	0.2	0.0	7298.8	0.1
26Feb2019	00:40	0.2	0.0	7298.8	0.1
26Feb2019	00:41	0.2	0.0	7298.8	0.1
26Feb2019	00:42	0.2	0.0	7298.8	0.1
26Feb2019	00:43	0.2	0.0	7298.8	0.1
26Feb2019	00:44	0.3	0.0	7298.9	0.1
26Feb2019	00:45	0.3	0.0	7298.9	0.1
26Feb2019	00:46	0.3	0.0	7298.9	0.1
26Feb2019	00:47	0.3	0.0	7298.9	0.1
26Feb2019	00:48	0.3	0.0	7298.9	0.1
26Feb2019	00:49	0.3	0.0	7298.9	0.1
26Feb2019	00:50	0.4	0.0	7299.0	0.1
26Feb2019	00:51	0.4	0.0	7299.0	0.1
26Feb2019	00:52	0.4	0.0	7299.0	0.1
26Feb2019	00:53	0.4	0.0	7299.0	0.1
26Feb2019	00:54	0.4	0.0	7299.0	0.1
26Feb2019	00:55	0.5	0.0	7299.0	0.1
26Feb2019	00:56	0.5	0.0	7299.0	0.1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	00:57	0.5	0.0	7299.0	0.1
26Feb2019	00:58	0.5	0.0	7299.0	0.1
26Feb2019	00:59	0.6	0.0	7299.0	0.1
26Feb2019	01:00	0.6	0.0	7299.0	0.1
26Feb2019	01:01	0.6	0.0	7299.0	0.1
26Feb2019	01:02	0.6	0.0	7299.1	0.1
26Feb2019	01:03	0.6	0.0	7299.1	0.1
26Feb2019	01:04	0.7	0.0	7299.1	0.1
26Feb2019	01:05	0.7	0.0	7299.1	0.1
26Feb2019	01:06	0.7	0.0	7299.1	0.1
26Feb2019	01:07	0.7	0.0	7299.1	0.1
26Feb2019	01:08	0.7	0.0	7299.1	0.1
26Feb2019	01:09	0.7	0.0	7299.1	0.1
26Feb2019	01:10	0.8	0.0	7299.1	0.1
26Feb2019	01:11	0.8	0.0	7299.1	0.1
26Feb2019	01:12	0.8	0.0	7299.1	0.1
26Feb2019	01:13	0.8	0.0	7299.1	0.1
26Feb2019	01:14	0.8	0.0	7299.1	0.1
26Feb2019	01:15	0.8	0.0	7299.1	0.1
26Feb2019	01:16	0.8	0.0	7299.2	0.1
26Feb2019	01:17	0.8	0.0	7299.2	0.1
26Feb2019	01:18	0.8	0.0	7299.2	0.1
26Feb2019	01:19	0.9	0.0	7299.2	0.1
26Feb2019	01:20	0.9	0.0	7299.2	0.1
26Feb2019	01:21	0.9	0.0	7299.2	0.1
26Feb2019	01:22	0.9	0.0	7299.2	0.1
26Feb2019	01:23	0.9	0.0	7299.2	0.1
26Feb2019	01:24	0.9	0.0	7299.2	0.1
26Feb2019	01:25	0.9	0.0	7299.2	0.1
26Feb2019	01:26	0.9	0.0	7299.2	0.1
26Feb2019	01:27	0.9	0.0	7299.3	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	01:28	0.9	0.0	7299.3	0.2
26Feb2019	01:29	0.9	0.0	7299.3	0.2
26Feb2019	01:30	0.9	0.0	7299.3	0.2
26Feb2019	01:31	0.9	0.0	7299.3	0.2
26Feb2019	01:32	0.9	0.0	7299.3	0.2
26Feb2019	01:33	0.9	0.0	7299.3	0.2
26Feb2019	01:34	0.9	0.0	7299.3	0.2
26Feb2019	01:35	1.0	0.0	7299.3	0.2
26Feb2019	01:36	1.0	0.0	7299.3	0.2
26Feb2019	01:37	1.0	0.0	7299.3	0.2
26Feb2019	01:38	1.0	0.0	7299.3	0.2
26Feb2019	01:39	1.0	0.0	7299.3	0.2
26Feb2019	01:40	1.0	0.0	7299.3	0.2
26Feb2019	01:41	1.0	0.0	7299.3	0.2
26Feb2019	01:42	1.0	0.0	7299.3	0.2
26Feb2019	01:43	1.0	0.1	7299.3	0.2
26Feb2019	01:44	1.0	0.1	7299.3	0.2
26Feb2019	01:45	1.0	0.1	7299.3	0.2
26Feb2019	01:46	1.0	0.1	7299.3	0.2
26Feb2019	01:47	1.0	0.1	7299.3	0.2
26Feb2019	01:48	1.0	0.1	7299.3	0.2
26Feb2019	01:49	1.0	0.1	7299.3	0.2
26Feb2019	01:50	1.0	0.1	7299.4	0.2
26Feb2019	01:51	1.0	0.1	7299.4	0.2
26Feb2019	01:52	1.0	0.1	7299.4	0.2
26Feb2019	01:53	1.0	0.1	7299.4	0.2
26Feb2019	01:54	1.0	0.1	7299.4	0.2
26Feb2019	01:55	1.0	0.1	7299.4	0.2
26Feb2019	01:56	1.0	0.1	7299.4	0.2
26Feb2019	01:57	1.0	0.1	7299.4	0.2
26Feb2019	01:58	1.0	0.1	7299.4	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	01:59	1.0	0.1	7299.4	0.2
26Feb2019	02:00	1.0	0.1	7299.4	0.2
26Feb2019	02:01	1.0	0.1	7299.4	0.2
26Feb2019	02:02	1.0	0.1	7299.4	0.2
26Feb2019	02:03	1.0	0.1	7299.4	0.2
26Feb2019	02:04	1.0	0.1	7299.4	0.2
26Feb2019	02:05	1.0	0.1	7299.4	0.2
26Feb2019	02:06	1.0	0.1	7299.4	0.2
26Feb2019	02:07	1.0	0.1	7299.4	0.2
26Feb2019	02:08	1.0	0.1	7299.4	0.2
26Feb2019	02:09	1.0	0.1	7299.4	0.2
26Feb2019	02:10	1.0	0.1	7299.4	0.2
26Feb2019	02:11	1.0	0.1	7299.4	0.2
26Feb2019	02:12	1.0	0.1	7299.5	0.2
26Feb2019	02:13	1.0	0.1	7299.5	0.2
26Feb2019	02:14	1.0	0.1	7299.5	0.2
26Feb2019	02:15	1.0	0.1	7299.5	0.2
26Feb2019	02:16	1.0	0.1	7299.5	0.2
26Feb2019	02:17	1.0	0.1	7299.5	0.2
26Feb2019	02:18	1.0	0.1	7299.5	0.2
26Feb2019	02:19	1.0	0.1	7299.5	0.2
26Feb2019	02:20	1.0	0.1	7299.5	0.2
26Feb2019	02:21	1.0	0.1	7299.5	0.2
26Feb2019	02:22	1.0	0.1	7299.5	0.2
26Feb2019	02:23	1.0	0.1	7299.5	0.2
26Feb2019	02:24	1.0	0.1	7299.5	0.2
26Feb2019	02:25	1.1	0.1	7299.5	0.2
26Feb2019	02:26	1.1	0.1	7299.5	0.2
26Feb2019	02:27	1.1	0.1	7299.5	0.2
26Feb2019	02:28	1.1	0.1	7299.5	0.2
26Feb2019	02:29	1.1	0.1	7299.5	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	02:30	1.1	0.1	7299.5	0.2
26Feb2019	02:31	1.1	0.1	7299.5	0.2
26Feb2019	02:32	1.1	0.1	7299.5	0.2
26Feb2019	02:33	1.1	0.1	7299.5	0.2
26Feb2019	02:34	1.1	0.1	7299.5	0.2
26Feb2019	02:35	1.1	0.1	7299.5	0.2
26Feb2019	02:36	1.1	0.1	7299.5	0.2
26Feb2019	02:37	1.1	0.1	7299.5	0.2
26Feb2019	02:38	1.1	0.1	7299.5	0.2
26Feb2019	02:39	1.1	0.1	7299.6	0.2
26Feb2019	02:40	1.1	0.1	7299.6	0.2
26Feb2019	02:41	1.1	0.1	7299.6	0.2
26Feb2019	02:42	1.1	0.1	7299.6	0.2
26Feb2019	02:43	1.1	0.1	7299.6	0.2
26Feb2019	02:44	1.1	0.1	7299.6	0.2
26Feb2019	02:45	1.1	0.1	7299.6	0.2
26Feb2019	02:46	1.1	0.1	7299.6	0.2
26Feb2019	02:47	1.1	0.1	7299.6	0.2
26Feb2019	02:48	1.1	0.1	7299.6	0.2
26Feb2019	02:49	1.1	0.1	7299.6	0.2
26Feb2019	02:50	1.1	0.1	7299.6	0.2
26Feb2019	02:51	1.1	0.1	7299.6	0.2
26Feb2019	02:52	1.1	0.1	7299.6	0.2
26Feb2019	02:53	1.1	0.1	7299.6	0.2
26Feb2019	02:54	1.1	0.1	7299.6	0.2
26Feb2019	02:55	1.1	0.1	7299.6	0.2
26Feb2019	02:56	1.1	0.1	7299.6	0.2
26Feb2019	02:57	1.1	0.1	7299.6	0.2
26Feb2019	02:58	1.1	0.1	7299.6	0.2
26Feb2019	02:59	1.1	0.1	7299.6	0.2
26Feb2019	03:00	1.1	0.1	7299.6	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	03:01	1.1	0.1	7299.6	0.2
26Feb2019	03:02	1.1	0.1	7299.6	0.2
26Feb2019	03:03	1.1	0.1	7299.6	0.2
26Feb2019	03:04	1.1	0.1	7299.6	0.2
26Feb2019	03:05	1.1	0.1	7299.6	0.2
26Feb2019	03:06	1.1	0.1	7299.6	0.2
26Feb2019	03:07	1.1	0.2	7299.6	0.2
26Feb2019	03:08	1.1	0.2	7299.6	0.2
26Feb2019	03:09	1.1	0.2	7299.6	0.2
26Feb2019	03:10	1.1	0.2	7299.7	0.2
26Feb2019	03:11	1.1	0.2	7299.7	0.2
26Feb2019	03:12	1.1	0.2	7299.7	0.2
26Feb2019	03:13	1.1	0.2	7299.7	0.2
26Feb2019	03:14	1.1	0.2	7299.7	0.2
26Feb2019	03:15	1.1	0.2	7299.7	0.2
26Feb2019	03:16	1.1	0.2	7299.7	0.2
26Feb2019	03:17	1.1	0.2	7299.7	0.2
26Feb2019	03:18	1.1	0.2	7299.7	0.2
26Feb2019	03:19	1.1	0.2	7299.7	0.2
26Feb2019	03:20	1.1	0.2	7299.7	0.2
26Feb2019	03:21	1.1	0.2	7299.7	0.2
26Feb2019	03:22	1.1	0.2	7299.7	0.2
26Feb2019	03:23	1.1	0.2	7299.7	0.2
26Feb2019	03:24	1.1	0.2	7299.7	0.2
26Feb2019	03:25	1.1	0.2	7299.7	0.2
26Feb2019	03:26	1.1	0.2	7299.7	0.2
26Feb2019	03:27	1.1	0.2	7299.7	0.2
26Feb2019	03:28	1.1	0.2	7299.7	0.2
26Feb2019	03:29	1.1	0.2	7299.7	0.2
26Feb2019	03:30	1.1	0.2	7299.7	0.2
26Feb2019	03:31	1.2	0.2	7299.7	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	03:32	1.2	0.2	7299.7	0.2
26Feb2019	03:33	1.2	0.2	7299.7	0.2
26Feb2019	03:34	1.2	0.2	7299.7	0.2
26Feb2019	03:35	1.2	0.2	7299.7	0.2
26Feb2019	03:36	1.2	0.2	7299.7	0.2
26Feb2019	03:37	1.2	0.2	7299.7	0.2
26Feb2019	03:38	1.2	0.2	7299.7	0.2
26Feb2019	03:39	1.2	0.2	7299.7	0.2
26Feb2019	03:40	1.2	0.2	7299.8	0.2
26Feb2019	03:41	1.2	0.2	7299.8	0.2
26Feb2019	03:42	1.2	0.2	7299.8	0.2
26Feb2019	03:43	1.2	0.2	7299.8	0.2
26Feb2019	03:44	1.2	0.2	7299.8	0.2
26Feb2019	03:45	1.2	0.2	7299.8	0.2
26Feb2019	03:46	1.2	0.2	7299.8	0.2
26Feb2019	03:47	1.2	0.2	7299.8	0.2
26Feb2019	03:48	1.2	0.2	7299.8	0.2
26Feb2019	03:49	1.2	0.2	7299.8	0.2
26Feb2019	03:50	1.2	0.2	7299.8	0.2
26Feb2019	03:51	1.2	0.2	7299.8	0.2
26Feb2019	03:52	1.2	0.2	7299.8	0.2
26Feb2019	03:53	1.2	0.2	7299.8	0.2
26Feb2019	03:54	1.2	0.2	7299.8	0.2
26Feb2019	03:55	1.2	0.2	7299.8	0.2
26Feb2019	03:56	1.2	0.2	7299.8	0.2
26Feb2019	03:57	1.2	0.2	7299.8	0.2
26Feb2019	03:58	1.2	0.2	7299.8	0.2
26Feb2019	03:59	1.2	0.2	7299.8	0.2
26Feb2019	04:00	1.2	0.2	7299.8	0.2
26Feb2019	04:01	1.2	0.2	7299.8	0.2
26Feb2019	04:02	1.2	0.2	7299.8	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	04:03	1.2	0.2	7299.8	0.2
26Feb2019	04:04	1.2	0.2	7299.8	0.2
26Feb2019	04:05	1.2	0.2	7299.8	0.2
26Feb2019	04:06	1.2	0.2	7299.8	0.2
26Feb2019	04:07	1.2	0.2	7299.8	0.2
26Feb2019	04:08	1.2	0.2	7299.8	0.2
26Feb2019	04:09	1.2	0.2	7299.8	0.2
26Feb2019	04:10	1.2	0.2	7299.8	0.2
26Feb2019	04:11	1.2	0.2	7299.8	0.2
26Feb2019	04:12	1.2	0.2	7299.8	0.2
26Feb2019	04:13	1.2	0.2	7299.8	0.2
26Feb2019	04:14	1.2	0.2	7299.8	0.2
26Feb2019	04:15	1.2	0.2	7299.8	0.2
26Feb2019	04:16	1.2	0.2	7299.8	0.2
26Feb2019	04:17	1.2	0.2	7299.8	0.2
26Feb2019	04:18	1.2	0.2	7299.8	0.2
26Feb2019	04:19	1.2	0.2	7299.8	0.2
26Feb2019	04:20	1.2	0.2	7299.9	0.2
26Feb2019	04:21	1.2	0.2	7299.9	0.2
26Feb2019	04:22	1.2	0.2	7299.9	0.2
26Feb2019	04:23	1.2	0.2	7299.9	0.2
26Feb2019	04:24	1.2	0.3	7299.9	0.2
26Feb2019	04:25	1.2	0.3	7299.9	0.2
26Feb2019	04:26	1.2	0.3	7299.9	0.2
26Feb2019	04:27	1.2	0.3	7299.9	0.2
26Feb2019	04:28	1.2	0.3	7299.9	0.2
26Feb2019	04:29	1.2	0.3	7299.9	0.2
26Feb2019	04:30	1.2	0.3	7299.9	0.2
26Feb2019	04:31	1.2	0.3	7299.9	0.2
26Feb2019	04:32	1.2	0.3	7299.9	0.2
26Feb2019	04:33	1.3	0.3	7299.9	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	04:34	1.3	0.3	7299.9	0.2
26Feb2019	04:35	1.3	0.3	7299.9	0.2
26Feb2019	04:36	1.3	0.3	7299.9	0.2
26Feb2019	04:37	1.3	0.3	7299.9	0.2
26Feb2019	04:38	1.3	0.3	7299.9	0.2
26Feb2019	04:39	1.3	0.3	7299.9	0.2
26Feb2019	04:40	1.3	0.3	7299.9	0.2
26Feb2019	04:41	1.3	0.3	7299.9	0.2
26Feb2019	04:42	1.3	0.3	7299.9	0.2
26Feb2019	04:43	1.3	0.3	7299.9	0.2
26Feb2019	04:44	1.3	0.3	7299.9	0.2
26Feb2019	04:45	1.3	0.3	7299.9	0.2
26Feb2019	04:46	1.3	0.3	7299.9	0.2
26Feb2019	04:47	1.3	0.3	7299.9	0.2
26Feb2019	04:48	1.3	0.3	7299.9	0.2
26Feb2019	04:49	1.3	0.3	7299.9	0.2
26Feb2019	04:50	1.3	0.3	7299.9	0.2
26Feb2019	04:51	1.3	0.3	7299.9	0.2
26Feb2019	04:52	1.3	0.3	7299.9	0.2
26Feb2019	04:53	1.3	0.3	7299.9	0.2
26Feb2019	04:54	1.3	0.3	7299.9	0.2
26Feb2019	04:55	1.3	0.3	7299.9	0.2
26Feb2019	04:56	1.3	0.3	7299.9	0.2
26Feb2019	04:57	1.3	0.3	7300.0	0.2
26Feb2019	04:58	1.3	0.3	7300.0	0.2
26Feb2019	04:59	1.3	0.3	7300.0	0.2
26Feb2019	05:00	1.3	0.3	7300.0	0.2
26Feb2019	05:01	1.3	0.3	7300.0	0.2
26Feb2019	05:02	1.3	0.3	7300.0	0.2
26Feb2019	05:03	1.3	0.3	7300.0	0.2
26Feb2019	05:04	1.3	0.3	7300.0	0.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	05:05	1.3	0.3	7300.0	0.2
26Feb2019	05:06	1.3	0.3	7300.0	0.2
26Feb2019	05:07	1.3	0.3	7300.0	0.2
26Feb2019	05:08	1.3	0.3	7300.0	0.2
26Feb2019	05:09	1.3	0.3	7300.0	0.2
26Feb2019	05:10	1.3	0.3	7300.0	0.2
26Feb2019	05:11	1.4	0.3	7300.0	0.2
26Feb2019	05:12	1.4	0.3	7300.0	0.2
26Feb2019	05:13	1.4	0.3	7300.0	0.2
26Feb2019	05:14	1.4	0.3	7300.0	0.2
26Feb2019	05:15	1.4	0.3	7300.0	0.3
26Feb2019	05:16	1.4	0.3	7300.0	0.3
26Feb2019	05:17	1.4	0.3	7300.0	0.3
26Feb2019	05:18	1.4	0.3	7300.0	0.3
26Feb2019	05:19	1.4	0.3	7300.0	0.3
26Feb2019	05:20	1.4	0.3	7300.0	0.3
26Feb2019	05:21	1.4	0.3	7300.0	0.3
26Feb2019	05:22	1.4	0.3	7300.0	0.3
26Feb2019	05:23	1.4	0.3	7300.0	0.3
26Feb2019	05:24	1.4	0.3	7300.0	0.3
26Feb2019	05:25	1.4	0.3	7300.0	0.3
26Feb2019	05:26	1.4	0.3	7300.0	0.3
26Feb2019	05:27	1.4	0.3	7300.0	0.3
26Feb2019	05:28	1.4	0.3	7300.0	0.3
26Feb2019	05:29	1.4	0.3	7300.0	0.3
26Feb2019	05:30	1.4	0.3	7300.0	0.3
26Feb2019	05:31	1.4	0.4	7300.0	0.3
26Feb2019	05:32	1.4	0.4	7300.0	0.3
26Feb2019	05:33	1.4	0.4	7300.0	0.3
26Feb2019	05:34	1.4	0.4	7300.0	0.3
26Feb2019	05:35	1.4	0.4	7300.0	0.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	05:36	1.4	0.4	7300.0	0.3
26Feb2019	05:37	1.4	0.4	7300.1	0.3
26Feb2019	05:38	1.4	0.4	7300.1	0.3
26Feb2019	05:39	1.4	0.4	7300.1	0.3
26Feb2019	05:40	1.4	0.4	7300.1	0.3
26Feb2019	05:41	1.4	0.4	7300.1	0.3
26Feb2019	05:42	1.4	0.4	7300.1	0.3
26Feb2019	05:43	1.4	0.4	7300.1	0.3
26Feb2019	05:44	1.4	0.4	7300.1	0.3
26Feb2019	05:45	1.5	0.4	7300.1	0.3
26Feb2019	05:46	1.5	0.4	7300.1	0.3
26Feb2019	05:47	1.5	0.4	7300.1	0.3
26Feb2019	05:48	1.5	0.4	7300.1	0.3
26Feb2019	05:49	1.5	0.4	7300.1	0.3
26Feb2019	05:50	1.5	0.4	7300.1	0.3
26Feb2019	05:51	1.5	0.4	7300.1	0.3
26Feb2019	05:52	1.5	0.4	7300.1	0.3
26Feb2019	05:53	1.5	0.4	7300.1	0.3
26Feb2019	05:54	1.5	0.4	7300.1	0.3
26Feb2019	05:55	1.5	0.4	7300.1	0.3
26Feb2019	05:56	1.5	0.4	7300.1	0.3
26Feb2019	05:57	1.5	0.4	7300.1	0.3
26Feb2019	05:58	1.5	0.4	7300.1	0.3
26Feb2019	05:59	1.5	0.4	7300.1	0.3
26Feb2019	06:00	1.5	0.4	7300.1	0.3
26Feb2019	06:01	1.5	0.4	7300.1	0.3
26Feb2019	06:02	1.5	0.4	7300.1	0.3
26Feb2019	06:03	1.5	0.4	7300.1	0.3
26Feb2019	06:04	1.5	0.4	7300.1	0.3
26Feb2019	06:05	1.5	0.4	7300.1	0.3
26Feb2019	06:06	1.5	0.4	7300.1	0.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	06:07	1.5	0.4	7300.1	0.3
26Feb2019	06:08	1.5	0.4	7300.1	0.3
26Feb2019	06:09	1.5	0.4	7300.1	0.3
26Feb2019	06:10	1.5	0.4	7300.1	0.3
26Feb2019	06:11	1.5	0.4	7300.1	0.3
26Feb2019	06:12	1.5	0.4	7300.1	0.3
26Feb2019	06:13	1.5	0.4	7300.1	0.3
26Feb2019	06:14	1.5	0.4	7300.1	0.3
26Feb2019	06:15	1.5	0.4	7300.1	0.3
26Feb2019	06:16	1.5	0.4	7300.1	0.3
26Feb2019	06:17	1.5	0.4	7300.1	0.3
26Feb2019	06:18	1.6	0.4	7300.2	0.3
26Feb2019	06:19	1.6	0.4	7300.2	0.3
26Feb2019	06:20	1.6	0.4	7300.2	0.3
26Feb2019	06:21	1.6	0.4	7300.2	0.3
26Feb2019	06:22	1.6	0.4	7300.2	0.3
26Feb2019	06:23	1.6	0.4	7300.2	0.3
26Feb2019	06:24	1.6	0.4	7300.2	0.3
26Feb2019	06:25	1.6	0.4	7300.2	0.3
26Feb2019	06:26	1.6	0.4	7300.2	0.3
26Feb2019	06:27	1.6	0.4	7300.2	0.3
26Feb2019	06:28	1.6	0.4	7300.2	0.3
26Feb2019	06:29	1.6	0.4	7300.2	0.3
26Feb2019	06:30	1.6	0.5	7300.2	0.3
26Feb2019	06:31	1.6	0.5	7300.2	0.3
26Feb2019	06:32	1.6	0.5	7300.2	0.3
26Feb2019	06:33	1.6	0.5	7300.2	0.3
26Feb2019	06:34	1.6	0.5	7300.2	0.3
26Feb2019	06:35	1.6	0.5	7300.2	0.3
26Feb2019	06:36	1.6	0.5	7300.2	0.3
26Feb2019	06:37	1.6	0.5	7300.2	0.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	06:38	1.6	0.5	7300.2	0.3
26Feb2019	06:39	1.6	0.5	7300.2	0.3
26Feb2019	06:40	1.6	0.5	7300.2	0.3
26Feb2019	06:41	1.6	0.5	7300.2	0.3
26Feb2019	06:42	1.6	0.5	7300.2	0.3
26Feb2019	06:43	1.6	0.5	7300.2	0.3
26Feb2019	06:44	1.6	0.5	7300.2	0.3
26Feb2019	06:45	1.6	0.5	7300.2	0.3
26Feb2019	06:46	1.6	0.5	7300.2	0.3
26Feb2019	06:47	1.6	0.5	7300.2	0.3
26Feb2019	06:48	1.6	0.5	7300.2	0.3
26Feb2019	06:49	1.6	0.5	7300.2	0.3
26Feb2019	06:50	1.6	0.5	7300.2	0.3
26Feb2019	06:51	1.7	0.5	7300.2	0.3
26Feb2019	06:52	1.7	0.5	7300.2	0.3
26Feb2019	06:53	1.7	0.5	7300.2	0.3
26Feb2019	06:54	1.7	0.5	7300.2	0.3
26Feb2019	06:55	1.7	0.5	7300.3	0.3
26Feb2019	06:56	1.7	0.5	7300.3	0.3
26Feb2019	06:57	1.7	0.5	7300.3	0.3
26Feb2019	06:58	1.7	0.5	7300.3	0.3
26Feb2019	06:59	1.7	0.5	7300.3	0.3
26Feb2019	07:00	1.7	0.5	7300.3	0.3
26Feb2019	07:01	1.7	0.5	7300.3	0.3
26Feb2019	07:02	1.7	0.5	7300.3	0.3
26Feb2019	07:03	1.7	0.5	7300.3	0.3
26Feb2019	07:04	1.7	0.5	7300.3	0.3
26Feb2019	07:05	1.7	0.5	7300.3	0.3
26Feb2019	07:06	1.7	0.5	7300.3	0.3
26Feb2019	07:07	1.7	0.5	7300.3	0.3
26Feb2019	07:08	1.7	0.5	7300.3	0.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	07:09	1.7	0.5	7300.3	0.3
26Feb2019	07:10	1.7	0.5	7300.3	0.3
26Feb2019	07:11	1.7	0.5	7300.3	0.3
26Feb2019	07:12	1.7	0.5	7300.3	0.3
26Feb2019	07:13	1.7	0.5	7300.3	0.3
26Feb2019	07:14	1.7	0.5	7300.3	0.3
26Feb2019	07:15	1.7	0.5	7300.3	0.3
26Feb2019	07:16	1.7	0.5	7300.3	0.3
26Feb2019	07:17	1.7	0.5	7300.3	0.3
26Feb2019	07:18	1.7	0.5	7300.3	0.3
26Feb2019	07:19	1.7	0.5	7300.3	0.3
26Feb2019	07:20	1.7	0.5	7300.3	0.3
26Feb2019	07:21	1.7	0.5	7300.3	0.3
26Feb2019	07:22	1.7	0.6	7300.3	0.3
26Feb2019	07:23	1.7	0.6	7300.3	0.3
26Feb2019	07:24	1.8	0.6	7300.3	0.3
26Feb2019	07:25	1.8	0.6	7300.3	0.3
26Feb2019	07:26	1.8	0.6	7300.3	0.3
26Feb2019	07:27	1.8	0.6	7300.3	0.3
26Feb2019	07:28	1.8	0.6	7300.3	0.3
26Feb2019	07:29	1.8	0.6	7300.3	0.3
26Feb2019	07:30	1.8	0.6	7300.3	0.3
26Feb2019	07:31	1.8	0.6	7300.3	0.3
26Feb2019	07:32	1.8	0.6	7300.3	0.3
26Feb2019	07:33	1.8	0.6	7300.3	0.3
26Feb2019	07:34	1.8	0.6	7300.3	0.3
26Feb2019	07:35	1.8	0.6	7300.3	0.3
26Feb2019	07:36	1.8	0.6	7300.3	0.3
26Feb2019	07:37	1.8	0.6	7300.3	0.3
26Feb2019	07:38	1.8	0.6	7300.3	0.3
26Feb2019	07:39	1.8	0.6	7300.4	0.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	07:40	1.8	0.6	7300.4	0.3
26Feb2019	07:41	1.8	0.6	7300.4	0.3
26Feb2019	07:42	1.8	0.6	7300.4	0.3
26Feb2019	07:43	1.8	0.6	7300.4	0.3
26Feb2019	07:44	1.8	0.6	7300.4	0.3
26Feb2019	07:45	1.8	0.6	7300.4	0.3
26Feb2019	07:46	1.8	0.6	7300.4	0.3
26Feb2019	07:47	1.8	0.6	7300.4	0.4
26Feb2019	07:48	1.8	0.6	7300.4	0.4
26Feb2019	07:49	1.8	0.6	7300.4	0.4
26Feb2019	07:50	1.8	0.6	7300.4	0.4
26Feb2019	07:51	1.8	0.6	7300.4	0.4
26Feb2019	07:52	1.8	0.6	7300.4	0.4
26Feb2019	07:53	1.8	0.6	7300.4	0.4
26Feb2019	07:54	1.8	0.6	7300.4	0.4
26Feb2019	07:55	1.8	0.6	7300.4	0.4
26Feb2019	07:56	1.8	0.6	7300.4	0.4
26Feb2019	07:57	1.8	0.6	7300.4	0.4
26Feb2019	07:58	1.9	0.6	7300.4	0.4
26Feb2019	07:59	1.9	0.6	7300.4	0.4
26Feb2019	08:00	1.9	0.6	7300.4	0.4
26Feb2019	08:01	1.9	0.6	7300.4	0.4
26Feb2019	08:02	1.9	0.6	7300.4	0.4
26Feb2019	08:03	1.9	0.6	7300.4	0.4
26Feb2019	08:04	1.9	0.6	7300.4	0.4
26Feb2019	08:05	1.9	0.6	7300.4	0.4
26Feb2019	08:06	1.9	0.6	7300.4	0.4
26Feb2019	08:07	1.9	0.6	7300.4	0.4
26Feb2019	08:08	1.9	0.6	7300.4	0.4
26Feb2019	08:09	1.9	0.6	7300.4	0.4
26Feb2019	08:10	1.9	0.6	7300.4	0.4

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	08:11	1.9	0.6	7300.4	0.4
26Feb2019	08:12	1.9	0.7	7300.4	0.4
26Feb2019	08:13	1.9	0.7	7300.4	0.4
26Feb2019	08:14	1.9	0.7	7300.4	0.4
26Feb2019	08:15	1.9	0.7	7300.4	0.4
26Feb2019	08:16	1.9	0.7	7300.4	0.4
26Feb2019	08:17	1.9	0.7	7300.4	0.4
26Feb2019	08:18	1.9	0.7	7300.4	0.4
26Feb2019	08:19	1.9	0.7	7300.4	0.4
26Feb2019	08:20	1.9	0.7	7300.4	0.4
26Feb2019	08:21	1.9	0.7	7300.4	0.4
26Feb2019	08:22	1.9	0.7	7300.5	0.4
26Feb2019	08:23	2.0	0.7	7300.5	0.4
26Feb2019	08:24	2.0	0.7	7300.5	0.4
26Feb2019	08:25	2.0	0.7	7300.5	0.4
26Feb2019	08:26	2.0	0.7	7300.5	0.4
26Feb2019	08:27	2.0	0.7	7300.5	0.4
26Feb2019	08:28	2.0	0.7	7300.5	0.4
26Feb2019	08:29	2.0	0.7	7300.5	0.4
26Feb2019	08:30	2.0	0.7	7300.5	0.4
26Feb2019	08:31	2.0	0.7	7300.5	0.4
26Feb2019	08:32	2.0	0.7	7300.5	0.4
26Feb2019	08:33	2.0	0.7	7300.5	0.4
26Feb2019	08:34	2.0	0.7	7300.5	0.4
26Feb2019	08:35	2.0	0.7	7300.5	0.4
26Feb2019	08:36	2.1	0.7	7300.5	0.4
26Feb2019	08:37	2.1	0.7	7300.5	0.4
26Feb2019	08:38	2.1	0.7	7300.5	0.4
26Feb2019	08:39	2.1	0.7	7300.5	0.4
26Feb2019	08:40	2.1	0.7	7300.5	0.4
26Feb2019	08:41	2.1	0.7	7300.5	0.4

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	08:42	2.1	0.7	7300.5	0.4
26Feb2019	08:43	2.1	0.7	7300.5	0.4
26Feb2019	08:44	2.1	0.7	7300.5	0.4
26Feb2019	08:45	2.1	0.7	7300.5	0.4
26Feb2019	08:46	2.2	0.7	7300.5	0.4
26Feb2019	08:47	2.2	0.7	7300.5	0.4
26Feb2019	08:48	2.2	0.7	7300.5	0.4
26Feb2019	08:49	2.2	0.7	7300.5	0.4
26Feb2019	08:50	2.2	0.7	7300.5	0.4
26Feb2019	08:51	2.2	0.7	7300.5	0.4
26Feb2019	08:52	2.2	0.7	7300.5	0.4
26Feb2019	08:53	2.2	0.7	7300.5	0.4
26Feb2019	08:54	2.3	0.7	7300.5	0.5
26Feb2019	08:55	2.3	0.7	7300.5	0.5
26Feb2019	08:56	2.3	0.7	7300.5	0.5
26Feb2019	08:57	2.3	0.8	7300.5	0.5
26Feb2019	08:58	2.3	0.8	7300.5	0.5
26Feb2019	08:59	2.3	0.8	7300.5	0.5
26Feb2019	09:00	2.3	0.8	7300.5	0.5
26Feb2019	09:01	2.4	0.8	7300.5	0.5
26Feb2019	09:02	2.4	0.8	7300.5	0.5
26Feb2019	09:03	2.4	0.8	7300.6	0.5
26Feb2019	09:04	2.4	0.8	7300.6	0.5
26Feb2019	09:05	2.4	0.8	7300.6	0.5
26Feb2019	09:06	2.4	0.8	7300.6	0.5
26Feb2019	09:07	2.4	0.8	7300.6	0.5
26Feb2019	09:08	2.4	0.8	7300.6	0.5
26Feb2019	09:09	2.5	0.8	7300.6	0.5
26Feb2019	09:10	2.5	0.8	7300.6	0.5
26Feb2019	09:11	2.5	0.8	7300.6	0.5
26Feb2019	09:12	2.5	0.8	7300.6	0.5

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	09:13	2.5	0.8	7300.6	0.5
26Feb2019	09:14	2.5	0.8	7300.6	0.5
26Feb2019	09:15	2.5	0.8	7300.6	0.5
26Feb2019	09:16	2.6	0.8	7300.6	0.5
26Feb2019	09:17	2.6	0.8	7300.6	0.5
26Feb2019	09:18	2.6	0.8	7300.6	0.5
26Feb2019	09:19	2.6	0.8	7300.6	0.5
26Feb2019	09:20	2.6	0.8	7300.6	0.5
26Feb2019	09:21	2.6	0.8	7300.6	0.5
26Feb2019	09:22	2.6	0.8	7300.6	0.5
26Feb2019	09:23	2.6	0.8	7300.6	0.5
26Feb2019	09:24	2.7	0.8	7300.6	0.5
26Feb2019	09:25	2.7	0.8	7300.6	0.5
26Feb2019	09:26	2.7	0.8	7300.6	0.5
26Feb2019	09:27	2.7	0.8	7300.6	0.5
26Feb2019	09:28	2.7	0.8	7300.6	0.5
26Feb2019	09:29	2.7	0.8	7300.6	0.5
26Feb2019	09:30	2.7	0.8	7300.6	0.5
26Feb2019	09:31	2.7	0.8	7300.6	0.5
26Feb2019	09:32	2.7	0.9	7300.6	0.5
26Feb2019	09:33	2.7	0.9	7300.6	0.5
26Feb2019	09:34	2.7	0.9	7300.6	0.5
26Feb2019	09:35	2.8	0.9	7300.6	0.5
26Feb2019	09:36	2.8	0.9	7300.6	0.5
26Feb2019	09:37	2.8	0.9	7300.6	0.5
26Feb2019	09:38	2.8	0.9	7300.6	0.5
26Feb2019	09:39	2.8	0.9	7300.7	0.5
26Feb2019	09:40	2.8	0.9	7300.7	0.5
26Feb2019	09:41	2.8	0.9	7300.7	0.5
26Feb2019	09:42	2.8	0.9	7300.7	0.5
26Feb2019	09:43	2.8	0.9	7300.7	0.5

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	09:44	2.8	0.9	7300.7	0.5
26Feb2019	09:45	2.8	0.9	7300.7	0.5
26Feb2019	09:46	2.8	0.9	7300.7	0.5
26Feb2019	09:47	2.8	0.9	7300.7	0.5
26Feb2019	09:48	2.8	0.9	7300.7	0.5
26Feb2019	09:49	2.9	0.9	7300.7	0.5
26Feb2019	09:50	2.9	0.9	7300.7	0.5
26Feb2019	09:51	2.9	0.9	7300.7	0.5
26Feb2019	09:52	2.9	0.9	7300.7	0.5
26Feb2019	09:53	2.9	0.9	7300.7	0.5
26Feb2019	09:54	2.9	0.9	7300.7	0.5
26Feb2019	09:55	2.9	0.9	7300.7	0.5
26Feb2019	09:56	2.9	0.9	7300.7	0.5
26Feb2019	09:57	2.9	0.9	7300.7	0.5
26Feb2019	09:58	2.9	0.9	7300.7	0.5
26Feb2019	09:59	2.9	0.9	7300.7	0.5
26Feb2019	10:00	3.0	0.9	7300.7	0.5
26Feb2019	10:01	3.0	0.9	7300.7	0.5
26Feb2019	10:02	3.0	0.9	7300.7	0.5
26Feb2019	10:03	3.0	1.0	7300.7	0.5
26Feb2019	10:04	3.0	1.0	7300.7	0.5
26Feb2019	10:05	3.0	1.0	7300.7	0.5
26Feb2019	10:06	3.0	1.0	7300.7	0.5
26Feb2019	10:07	3.0	1.0	7300.7	0.5
26Feb2019	10:08	3.1	1.0	7300.7	0.5
26Feb2019	10:09	3.1	1.0	7300.7	0.5
26Feb2019	10:10	3.1	1.0	7300.8	0.5
26Feb2019	10:11	3.1	1.0	7300.8	0.5
26Feb2019	10:12	3.1	1.0	7300.8	0.5
26Feb2019	10:13	3.2	1.0	7300.8	0.5
26Feb2019	10:14	3.2	1.0	7300.8	0.5

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	10:15	3.2	1.0	7300.8	0.5
26Feb2019	10:16	3.2	1.0	7300.8	0.5
26Feb2019	10:17	3.2	1.0	7300.8	0.5
26Feb2019	10:18	3.3	1.0	7300.8	0.5
26Feb2019	10:19	3.3	1.0	7300.8	0.5
26Feb2019	10:20	3.3	1.0	7300.8	0.5
26Feb2019	10:21	3.3	1.0	7300.8	0.5
26Feb2019	10:22	3.3	1.0	7300.8	0.5
26Feb2019	10:23	3.4	1.0	7300.8	0.5
26Feb2019	10:24	3.4	1.0	7300.8	0.5
26Feb2019	10:25	3.4	1.0	7300.8	0.5
26Feb2019	10:26	3.4	1.0	7300.8	0.5
26Feb2019	10:27	3.5	1.0	7300.8	0.5
26Feb2019	10:28	3.5	1.0	7300.8	0.5
26Feb2019	10:29	3.5	1.0	7300.8	0.5
26Feb2019	10:30	3.5	1.1	7300.8	0.5
26Feb2019	10:31	3.6	1.1	7300.8	0.5
26Feb2019	10:32	3.6	1.1	7300.8	0.5
26Feb2019	10:33	3.6	1.1	7300.8	0.6
26Feb2019	10:34	3.7	1.1	7300.8	0.6
26Feb2019	10:35	3.7	1.1	7300.8	0.6
26Feb2019	10:36	3.7	1.1	7300.8	0.6
26Feb2019	10:37	3.8	1.1	7300.8	0.6
26Feb2019	10:38	3.8	1.1	7300.8	0.6
26Feb2019	10:39	3.8	1.1	7300.8	0.6
26Feb2019	10:40	3.9	1.1	7300.8	0.6
26Feb2019	10:41	3.9	1.1	7300.9	0.6
26Feb2019	10:42	3.9	1.1	7300.9	0.6
26Feb2019	10:43	4.0	1.1	7300.9	0.6
26Feb2019	10:44	4.0	1.1	7300.9	0.6
26Feb2019	10:45	4.0	1.1	7300.9	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	10:46	4.1	1.1	7300.9	0.6
26Feb2019	10:47	4.1	1.1	7300.9	0.6
26Feb2019	10:48	4.1	1.1	7300.9	0.6
26Feb2019	10:49	4.2	1.1	7300.9	0.6
26Feb2019	10:50	4.2	1.1	7300.9	0.6
26Feb2019	10:51	4.3	1.1	7300.9	0.6
26Feb2019	10:52	4.3	1.2	7300.9	0.6
26Feb2019	10:53	4.3	1.2	7300.9	0.6
26Feb2019	10:54	4.4	1.2	7300.9	0.6
26Feb2019	10:55	4.4	1.2	7300.9	0.6
26Feb2019	10:56	4.5	1.2	7300.9	0.6
26Feb2019	10:57	4.5	1.2	7300.9	0.6
26Feb2019	10:58	4.6	1.2	7300.9	0.6
26Feb2019	10:59	4.6	1.2	7300.9	0.6
26Feb2019	11:00	4.7	1.2	7300.9	0.6
26Feb2019	11:01	4.7	1.2	7300.9	0.6
26Feb2019	11:02	4.7	1.2	7300.9	0.6
26Feb2019	11:03	4.8	1.2	7300.9	0.6
26Feb2019	11:04	4.8	1.2	7300.9	0.6
26Feb2019	11:05	4.9	1.2	7301.0	0.6
26Feb2019	11:06	5.0	1.2	7301.0	0.6
26Feb2019	11:07	5.0	1.2	7301.0	0.6
26Feb2019	11:08	5.1	1.2	7301.0	0.6
26Feb2019	11:09	5.1	1.2	7301.0	0.6
26Feb2019	11:10	5.2	1.3	7301.0	0.6
26Feb2019	11:11	5.2	1.3	7301.0	0.6
26Feb2019	11:12	5.3	1.3	7301.0	0.6
26Feb2019	11:13	5.4	1.3	7301.0	0.6
26Feb2019	11:14	5.4	1.3	7301.0	0.6
26Feb2019	11:15	5.5	1.3	7301.0	0.6
26Feb2019	11:16	5.6	1.3	7301.0	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	11:17	5.6	1.3	7301.0	0.6
26Feb2019	11:18	5.7	1.3	7301.0	0.6
26Feb2019	11:19	5.8	1.3	7301.0	0.6
26Feb2019	11:20	5.9	1.3	7301.0	0.6
26Feb2019	11:21	5.9	1.3	7301.0	0.6
26Feb2019	11:22	6.0	1.3	7301.0	0.6
26Feb2019	11:23	6.1	1.3	7301.0	0.6
26Feb2019	11:24	6.2	1.4	7301.1	0.6
26Feb2019	11:25	6.3	1.4	7301.1	0.6
26Feb2019	11:26	6.4	1.4	7301.1	0.6
26Feb2019	11:27	6.5	1.4	7301.1	0.6
26Feb2019	11:28	6.5	1.4	7301.1	0.6
26Feb2019	11:29	6.6	1.4	7301.1	0.6
26Feb2019	11:30	6.7	1.4	7301.1	0.6
26Feb2019	11:31	6.9	1.4	7301.1	0.6
26Feb2019	11:32	7.0	1.4	7301.1	0.6
26Feb2019	11:33	7.1	1.4	7301.1	0.6
26Feb2019	11:34	7.3	1.4	7301.1	0.6
26Feb2019	11:35	7.5	1.4	7301.1	0.6
26Feb2019	11:36	7.7	1.5	7301.1	0.6
26Feb2019	11:37	7.9	1.5	7301.1	0.6
26Feb2019	11:38	8.2	1.5	7301.1	0.6
26Feb2019	11:39	8.5	1.5	7301.1	0.6
26Feb2019	11:40	8.9	1.5	7301.2	0.6
26Feb2019	11:41	9.3	1.5	7301.2	0.6
26Feb2019	11:42	9.7	1.5	7301.2	0.6
26Feb2019	11:43	10.2	1.5	7301.2	0.7
26Feb2019	11:44	10.8	1.5	7301.2	0.7
26Feb2019	11:45	11.4	1.6	7301.2	0.7
26Feb2019	11:46	12.1	1.6	7301.2	0.7
26Feb2019	11:47	12.9	1.6	7301.2	0.7

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	11:48	13.7	1.6	7301.2	0.7
26Feb2019	11:49	14.8	1.6	7301.2	0.7
26Feb2019	11:50	16.2	1.6	7301.3	0.7
26Feb2019	11:51	18.0	1.7	7301.3	0.8
26Feb2019	11:52	20.6	1.7	7301.3	0.9
26Feb2019	11:53	24.1	1.7	7301.3	1.0
26Feb2019	11:54	28.5	1.8	7301.3	1.1
26Feb2019	11:55	33.6	1.8	7301.4	1.2
26Feb2019	11:56	39.3	1.9	7301.4	1.3
26Feb2019	11:57	45.6	1.9	7301.4	1.5
26Feb2019	11:58	52.3	2.0	7301.5	1.7
26Feb2019	11:59	59.3	2.0	7301.5	2.3
26Feb2019	12:00	67.1	2.1	7301.6	3.6
26Feb2019	12:01	75.5	2.2	7301.6	5.0
26Feb2019	12:02	84.5	2.3	7301.7	6.5
26Feb2019	12:03	94.4	2.4	7301.8	8.3
26Feb2019	12:04	105.0	2.6	7301.8	11.0
26Feb2019	12:05	115.6	2.7	7301.9	13.9
26Feb2019	12:06	125.9	2.8	7302.0	17.1
26Feb2019	12:07	135.0	3.0	7302.1	20.9
26Feb2019	12:08	142.6	3.2	7302.1	25.2
26Feb2019	12:09	149.0	3.3	7302.2	29.5
26Feb2019	12:10	154.0	3.5	7302.3	34.4
26Feb2019	12:11	157.8	3.6	7302.4	39.5
26Feb2019	12:12	160.1	3.8	7302.5	44.5
26Feb2019	12:13	160.9	4.0	7302.5	49.6
26Feb2019	12:14	160.3	4.1	7302.6	54.9
26Feb2019	12:15	158.5	4.3	7302.7	59.8
26Feb2019	12:16	155.8	4.4	7302.7	64.4
26Feb2019	12:17	152.3	4.5	7302.8	68.8
26Feb2019	12:18	148.2	4.6	7302.8	73.0

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	12:19	143.5	4.7	7302.9	76.6
26Feb2019	12:20	138.3	4.8	7302.9	79.9
26Feb2019	12:21	132.8	4.9	7303.0	82.7
26Feb2019	12:22	127.0	4.9	7303.0	85.1
26Feb2019	12:23	121.1	5.0	7303.0	86.4
26Feb2019	12:24	115.3	5.0	7303.0	86.6
26Feb2019	12:25	109.5	5.1	7303.0	86.8
26Feb2019	12:26	103.8	5.1	7303.1	86.9
26Feb2019	12:27	98.2	5.1	7303.1	87.0
26Feb2019	12:28	92.9	5.1	7303.1	87.1
26Feb2019	12:29	87.8	5.1	7303.1	87.1
26Feb2019	12:30	82.9	5.1	7303.1	87.1
26Feb2019	12:31	78.4	5.1	7303.1	87.1
26Feb2019	12:32	74.1	5.1	7303.1	87.0
26Feb2019	12:33	70.1	5.1	7303.1	86.9
26Feb2019	12:34	66.3	5.1	7303.0	86.7
26Feb2019	12:35	62.7	5.0	7303.0	86.6
26Feb2019	12:36	59.4	5.0	7303.0	86.4
26Feb2019	12:37	56.2	5.0	7303.0	85.7
26Feb2019	12:38	53.2	4.9	7303.0	84.2
26Feb2019	12:39	50.3	4.9	7303.0	82.5
26Feb2019	12:40	47.6	4.8	7302.9	80.8
26Feb2019	12:41	45.1	4.8	7302.9	79.1
26Feb2019	12:42	42.6	4.7	7302.9	77.3
26Feb2019	12:43	40.4	4.7	7302.9	75.5
26Feb2019	12:44	38.2	4.6	7302.8	73.7
26Feb2019	12:45	36.2	4.6	7302.8	71.8
26Feb2019	12:46	34.3	4.5	7302.8	70.0
26Feb2019	12:47	32.5	4.5	7302.8	68.1
26Feb2019	12:48	30.8	4.4	7302.8	66.3
26Feb2019	12:49	29.2	4.4	7302.7	64.5

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	12:50	27.7	4.3	7302.7	62.8
26Feb2019	12:51	26.3	4.3	7302.7	61.1
26Feb2019	12:52	25.0	4.2	7302.7	59.5
26Feb2019	12:53	23.8	4.2	7302.6	57.8
26Feb2019	12:54	22.7	4.2	7302.6	56.2
26Feb2019	12:55	21.6	4.1	7302.6	54.6
26Feb2019	12:56	20.7	4.1	7302.6	53.0
26Feb2019	12:57	19.8	4.0	7302.6	51.5
26Feb2019	12:58	18.9	4.0	7302.5	49.9
26Feb2019	12:59	18.1	3.9	7302.5	48.5
26Feb2019	13:00	17.4	3.9	7302.5	47.0
26Feb2019	13:01	16.7	3.8	7302.5	45.7
26Feb2019	13:02	16.0	3.8	7302.5	44.5
26Feb2019	13:03	15.4	3.8	7302.4	43.3
26Feb2019	13:04	14.8	3.7	7302.4	42.1
26Feb2019	13:05	14.3	3.7	7302.4	41.0
26Feb2019	13:06	13.7	3.7	7302.4	39.8
26Feb2019	13:07	13.3	3.6	7302.4	38.7
26Feb2019	13:08	12.8	3.6	7302.4	37.7
26Feb2019	13:09	12.4	3.6	7302.3	36.6
26Feb2019	13:10	12.0	3.5	7302.3	35.6
26Feb2019	13:11	11.6	3.5	7302.3	34.6
26Feb2019	13:12	11.2	3.5	7302.3	33.6
26Feb2019	13:13	10.8	3.4	7302.3	32.7
26Feb2019	13:14	10.5	3.4	7302.3	31.7
26Feb2019	13:15	10.2	3.4	7302.2	30.9
26Feb2019	13:16	9.9	3.3	7302.2	30.1
26Feb2019	13:17	9.6	3.3	7302.2	29.4
26Feb2019	13:18	9.4	3.3	7302.2	28.7
26Feb2019	13:19	9.1	3.3	7302.2	28.0
26Feb2019	13:20	8.9	3.2	7302.2	27.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	13:21	8.6	3.2	7302.2	26.6
26Feb2019	13:22	8.4	3.2	7302.2	26.0
26Feb2019	13:23	8.2	3.2	7302.1	25.3
26Feb2019	13:24	8.0	3.1	7302.1	24.7
26Feb2019	13:25	7.8	3.1	7302.1	24.1
26Feb2019	13:26	7.6	3.1	7302.1	23.5
26Feb2019	13:27	7.5	3.1	7302.1	22.9
26Feb2019	13:28	7.3	3.1	7302.1	22.4
26Feb2019	13:29	7.2	3.0	7302.1	21.8
26Feb2019	13:30	7.0	3.0	7302.1	21.3
26Feb2019	13:31	6.9	3.0	7302.1	20.8
26Feb2019	13:32	6.7	3.0	7302.0	20.3
26Feb2019	13:33	6.6	3.0	7302.0	19.8
26Feb2019	13:34	6.5	2.9	7302.0	19.3
26Feb2019	13:35	6.4	2.9	7302.0	18.8
26Feb2019	13:36	6.3	2.9	7302.0	18.4
26Feb2019	13:37	6.2	2.9	7302.0	18.0
26Feb2019	13:38	6.1	2.9	7302.0	17.6
26Feb2019	13:39	6.0	2.9	7302.0	17.3
26Feb2019	13:40	5.9	2.8	7302.0	17.0
26Feb2019	13:41	5.8	2.8	7302.0	16.6
26Feb2019	13:42	5.7	2.8	7302.0	16.3
26Feb2019	13:43	5.7	2.8	7301.9	16.0
26Feb2019	13:44	5.6	2.8	7301.9	15.7
26Feb2019	13:45	5.5	2.8	7301.9	15.4
26Feb2019	13:46	5.4	2.8	7301.9	15.1
26Feb2019	13:47	5.4	2.7	7301.9	14.8
26Feb2019	13:48	5.3	2.7	7301.9	14.5
26Feb2019	13:49	5.2	2.7	7301.9	14.3
26Feb2019	13:50	5.2	2.7	7301.9	14.0
26Feb2019	13:51	5.1	2.7	7301.9	13.7

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	13:52	5.0	2.7	7301.9	13.5
26Feb2019	13:53	5.0	2.7	7301.9	13.2
26Feb2019	13:54	4.9	2.7	7301.9	13.0
26Feb2019	13:55	4.9	2.6	7301.9	12.7
26Feb2019	13:56	4.8	2.6	7301.9	12.5
26Feb2019	13:57	4.8	2.6	7301.9	12.3
26Feb2019	13:58	4.7	2.6	7301.8	12.1
26Feb2019	13:59	4.7	2.6	7301.8	11.8
26Feb2019	14:00	4.6	2.6	7301.8	11.6
26Feb2019	14:01	4.6	2.6	7301.8	11.4
26Feb2019	14:02	4.5	2.6	7301.8	11.2
26Feb2019	14:03	4.5	2.6	7301.8	11.0
26Feb2019	14:04	4.4	2.6	7301.8	10.8
26Feb2019	14:05	4.4	2.5	7301.8	10.6
26Feb2019	14:06	4.3	2.5	7301.8	10.5
26Feb2019	14:07	4.3	2.5	7301.8	10.3
26Feb2019	14:08	4.2	2.5	7301.8	10.1
26Feb2019	14:09	4.2	2.5	7301.8	9.9
26Feb2019	14:10	4.2	2.5	7301.8	9.8
26Feb2019	14:11	4.1	2.5	7301.8	9.6
26Feb2019	14:12	4.1	2.5	7301.8	9.4
26Feb2019	14:13	4.0	2.5	7301.8	9.3
26Feb2019	14:14	4.0	2.5	7301.8	9.1
26Feb2019	14:15	4.0	2.5	7301.8	9.0
26Feb2019	14:16	3.9	2.5	7301.8	8.8
26Feb2019	14:17	3.9	2.5	7301.8	8.7
26Feb2019	14:18	3.9	2.4	7301.8	8.5
26Feb2019	14:19	3.8	2.4	7301.8	8.4
26Feb2019	14:20	3.8	2.4	7301.8	8.3
26Feb2019	14:21	3.8	2.4	7301.7	8.1
26Feb2019	14:22	3.8	2.4	7301.7	8.1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	14:23	3.7	2.4	7301.7	8.0
26Feb2019	14:24	3.7	2.4	7301.7	7.9
26Feb2019	14:25	3.7	2.4	7301.7	7.8
26Feb2019	14:26	3.6	2.4	7301.7	7.7
26Feb2019	14:27	3.6	2.4	7301.7	7.6
26Feb2019	14:28	3.6	2.4	7301.7	7.5
26Feb2019	14:29	3.6	2.4	7301.7	7.5
26Feb2019	14:30	3.6	2.4	7301.7	7.4
26Feb2019	14:31	3.5	2.4	7301.7	7.3
26Feb2019	14:32	3.5	2.4	7301.7	7.2
26Feb2019	14:33	3.5	2.4	7301.7	7.1
26Feb2019	14:34	3.5	2.4	7301.7	7.1
26Feb2019	14:35	3.4	2.4	7301.7	7.0
26Feb2019	14:36	3.4	2.4	7301.7	6.9
26Feb2019	14:37	3.4	2.3	7301.7	6.8
26Feb2019	14:38	3.4	2.3	7301.7	6.8
26Feb2019	14:39	3.4	2.3	7301.7	6.7
26Feb2019	14:40	3.4	2.3	7301.7	6.6
26Feb2019	14:41	3.3	2.3	7301.7	6.6
26Feb2019	14:42	3.3	2.3	7301.7	6.5
26Feb2019	14:43	3.3	2.3	7301.7	6.4
26Feb2019	14:44	3.3	2.3	7301.7	6.4
26Feb2019	14:45	3.3	2.3	7301.7	6.3
26Feb2019	14:46	3.3	2.3	7301.7	6.2
26Feb2019	14:47	3.2	2.3	7301.7	6.2
26Feb2019	14:48	3.2	2.3	7301.7	6.1
26Feb2019	14:49	3.2	2.3	7301.7	6.1
26Feb2019	14:50	3.2	2.3	7301.7	6.0
26Feb2019	14:51	3.2	2.3	7301.7	5.9
26Feb2019	14:52	3.2	2.3	7301.7	5.9
26Feb2019	14:53	3.2	2.3	7301.7	5.8

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	14:54	3.2	2.3	7301.7	5.8
26Feb2019	14:55	3.1	2.3	7301.7	5.7
26Feb2019	14:56	3.1	2.3	7301.7	5.7
26Feb2019	14:57	3.1	2.3	7301.6	5.6
26Feb2019	14:58	3.1	2.3	7301.6	5.6
26Feb2019	14:59	3.1	2.3	7301.6	5.5
26Feb2019	15:00	3.1	2.3	7301.6	5.5
26Feb2019	15:01	3.1	2.3	7301.6	5.4
26Feb2019	15:02	3.1	2.2	7301.6	5.4
26Feb2019	15:03	3.0	2.2	7301.6	5.3
26Feb2019	15:04	3.0	2.2	7301.6	5.3
26Feb2019	15:05	3.0	2.2	7301.6	5.2
26Feb2019	15:06	3.0	2.2	7301.6	5.2
26Feb2019	15:07	3.0	2.2	7301.6	5.1
26Feb2019	15:08	3.0	2.2	7301.6	5.1
26Feb2019	15:09	3.0	2.2	7301.6	5.0
26Feb2019	15:10	3.0	2.2	7301.6	5.0
26Feb2019	15:11	2.9	2.2	7301.6	5.0
26Feb2019	15:12	2.9	2.2	7301.6	4.9
26Feb2019	15:13	2.9	2.2	7301.6	4.9
26Feb2019	15:14	2.9	2.2	7301.6	4.8
26Feb2019	15:15	2.9	2.2	7301.6	4.8
26Feb2019	15:16	2.9	2.2	7301.6	4.8
26Feb2019	15:17	2.9	2.2	7301.6	4.7
26Feb2019	15:18	2.9	2.2	7301.6	4.7
26Feb2019	15:19	2.9	2.2	7301.6	4.6
26Feb2019	15:20	2.9	2.2	7301.6	4.6
26Feb2019	15:21	2.8	2.2	7301.6	4.6
26Feb2019	15:22	2.8	2.2	7301.6	4.5
26Feb2019	15:23	2.8	2.2	7301.6	4.5
26Feb2019	15:24	2.8	2.2	7301.6	4.5

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	15:25	2.8	2.2	7301.6	4.4
26Feb2019	15:26	2.8	2.2	7301.6	4.4
26Feb2019	15:27	2.8	2.2	7301.6	4.4
26Feb2019	15:28	2.8	2.2	7301.6	4.3
26Feb2019	15:29	2.8	2.2	7301.6	4.3
26Feb2019	15:30	2.7	2.2	7301.6	4.3
26Feb2019	15:31	2.7	2.2	7301.6	4.2
26Feb2019	15:32	2.7	2.2	7301.6	4.2
26Feb2019	15:33	2.7	2.2	7301.6	4.2
26Feb2019	15:34	2.7	2.2	7301.6	4.1
26Feb2019	15:35	2.7	2.2	7301.6	4.1
26Feb2019	15:36	2.7	2.2	7301.6	4.1
26Feb2019	15:37	2.7	2.2	7301.6	4.1
26Feb2019	15:38	2.7	2.2	7301.6	4.0
26Feb2019	15:39	2.7	2.2	7301.6	4.0
26Feb2019	15:40	2.6	2.2	7301.6	4.0
26Feb2019	15:41	2.6	2.2	7301.6	3.9
26Feb2019	15:42	2.6	2.2	7301.6	3.9
26Feb2019	15:43	2.6	2.2	7301.6	3.9
26Feb2019	15:44	2.6	2.1	7301.6	3.9
26Feb2019	15:45	2.6	2.1	7301.6	3.8
26Feb2019	15:46	2.6	2.1	7301.6	3.8
26Feb2019	15:47	2.6	2.1	7301.6	3.8
26Feb2019	15:48	2.6	2.1	7301.6	3.8
26Feb2019	15:49	2.5	2.1	7301.6	3.7
26Feb2019	15:50	2.5	2.1	7301.6	3.7
26Feb2019	15:51	2.5	2.1	7301.6	3.7
26Feb2019	15:52	2.5	2.1	7301.6	3.7
26Feb2019	15:53	2.5	2.1	7301.6	3.6
26Feb2019	15:54	2.5	2.1	7301.6	3.6
26Feb2019	15:55	2.5	2.1	7301.6	3.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	15:56	2.5	2.1	7301.6	3.6
26Feb2019	15:57	2.5	2.1	7301.6	3.5
26Feb2019	15:58	2.5	2.1	7301.6	3.5
26Feb2019	15:59	2.4	2.1	7301.6	3.5
26Feb2019	16:00	2.4	2.1	7301.6	3.5
26Feb2019	16:01	2.4	2.1	7301.6	3.5
26Feb2019	16:02	2.4	2.1	7301.6	3.4
26Feb2019	16:03	2.4	2.1	7301.6	3.4
26Feb2019	16:04	2.4	2.1	7301.6	3.4
26Feb2019	16:05	2.4	2.1	7301.6	3.4
26Feb2019	16:06	2.4	2.1	7301.6	3.4
26Feb2019	16:07	2.4	2.1	7301.6	3.3
26Feb2019	16:08	2.4	2.1	7301.6	3.3
26Feb2019	16:09	2.3	2.1	7301.6	3.3
26Feb2019	16:10	2.3	2.1	7301.6	3.3
26Feb2019	16:11	2.3	2.1	7301.6	3.3
26Feb2019	16:12	2.3	2.1	7301.6	3.2
26Feb2019	16:13	2.3	2.1	7301.6	3.2
26Feb2019	16:14	2.3	2.1	7301.6	3.2
26Feb2019	16:15	2.3	2.1	7301.6	3.2
26Feb2019	16:16	2.3	2.1	7301.6	3.2
26Feb2019	16:17	2.3	2.1	7301.6	3.1
26Feb2019	16:18	2.3	2.1	7301.6	3.1
26Feb2019	16:19	2.2	2.1	7301.6	3.1
26Feb2019	16:20	2.2	2.1	7301.5	3.1
26Feb2019	16:21	2.2	2.1	7301.5	3.1
26Feb2019	16:22	2.2	2.1	7301.5	3.0
26Feb2019	16:23	2.2	2.1	7301.5	3.0
26Feb2019	16:24	2.2	2.1	7301.5	3.0
26Feb2019	16:25	2.2	2.1	7301.5	3.0
26Feb2019	16:26	2.2	2.1	7301.5	3.0

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	16:27	2.2	2.1	7301.5	3.0
26Feb2019	16:28	2.2	2.1	7301.5	2.9
26Feb2019	16:29	2.2	2.1	7301.5	2.9
26Feb2019	16:30	2.2	2.1	7301.5	2.9
26Feb2019	16:31	2.1	2.1	7301.5	2.9
26Feb2019	16:32	2.1	2.1	7301.5	2.9
26Feb2019	16:33	2.1	2.1	7301.5	2.9
26Feb2019	16:34	2.1	2.1	7301.5	2.9
26Feb2019	16:35	2.1	2.1	7301.5	2.8
26Feb2019	16:36	2.1	2.1	7301.5	2.8
26Feb2019	16:37	2.1	2.1	7301.5	2.8
26Feb2019	16:38	2.1	2.1	7301.5	2.8
26Feb2019	16:39	2.1	2.1	7301.5	2.8
26Feb2019	16:40	2.1	2.1	7301.5	2.8
26Feb2019	16:41	2.1	2.1	7301.5	2.8
26Feb2019	16:42	2.1	2.1	7301.5	2.7
26Feb2019	16:43	2.1	2.1	7301.5	2.7
26Feb2019	16:44	2.1	2.1	7301.5	2.7
26Feb2019	16:45	2.1	2.1	7301.5	2.7
26Feb2019	16:46	2.1	2.1	7301.5	2.7
26Feb2019	16:47	2.0	2.1	7301.5	2.7
26Feb2019	16:48	2.0	2.1	7301.5	2.7
26Feb2019	16:49	2.0	2.1	7301.5	2.6
26Feb2019	16:50	2.0	2.1	7301.5	2.6
26Feb2019	16:51	2.0	2.1	7301.5	2.6
26Feb2019	16:52	2.0	2.1	7301.5	2.6
26Feb2019	16:53	2.0	2.1	7301.5	2.6
26Feb2019	16:54	2.0	2.1	7301.5	2.6
26Feb2019	16:55	2.0	2.1	7301.5	2.6
26Feb2019	16:56	2.0	2.1	7301.5	2.6
26Feb2019	16:57	2.0	2.1	7301.5	2.5

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	16:58	2.0	2.1	7301.5	2.5
26Feb2019	16:59	2.0	2.1	7301.5	2.5
26Feb2019	17:00	2.0	2.1	7301.5	2.5
26Feb2019	17:01	2.0	2.1	7301.5	2.5
26Feb2019	17:02	2.0	2.1	7301.5	2.5
26Feb2019	17:03	2.0	2.1	7301.5	2.5
26Feb2019	17:04	2.0	2.1	7301.5	2.5
26Feb2019	17:05	2.0	2.1	7301.5	2.5
26Feb2019	17:06	2.0	2.1	7301.5	2.5
26Feb2019	17:07	2.0	2.1	7301.5	2.4
26Feb2019	17:08	1.9	2.1	7301.5	2.4
26Feb2019	17:09	1.9	2.1	7301.5	2.4
26Feb2019	17:10	1.9	2.1	7301.5	2.4
26Feb2019	17:11	1.9	2.1	7301.5	2.4
26Feb2019	17:12	1.9	2.1	7301.5	2.4
26Feb2019	17:13	1.9	2.1	7301.5	2.4
26Feb2019	17:14	1.9	2.1	7301.5	2.4
26Feb2019	17:15	1.9	2.1	7301.5	2.4
26Feb2019	17:16	1.9	2.0	7301.5	2.4
26Feb2019	17:17	1.9	2.0	7301.5	2.3
26Feb2019	17:18	1.9	2.0	7301.5	2.3
26Feb2019	17:19	1.9	2.0	7301.5	2.3
26Feb2019	17:20	1.9	2.0	7301.5	2.3
26Feb2019	17:21	1.9	2.0	7301.5	2.3
26Feb2019	17:22	1.9	2.0	7301.5	2.3
26Feb2019	17:23	1.9	2.0	7301.5	2.3
26Feb2019	17:24	1.9	2.0	7301.5	2.3
26Feb2019	17:25	1.9	2.0	7301.5	2.3
26Feb2019	17:26	1.9	2.0	7301.5	2.3
26Feb2019	17:27	1.9	2.0	7301.5	2.3
26Feb2019	17:28	1.9	2.0	7301.5	2.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	17:29	1.9	2.0	7301.5	2.2
26Feb2019	17:30	1.9	2.0	7301.5	2.2
26Feb2019	17:31	1.9	2.0	7301.5	2.2
26Feb2019	17:32	1.9	2.0	7301.5	2.2
26Feb2019	17:33	1.9	2.0	7301.5	2.2
26Feb2019	17:34	1.8	2.0	7301.5	2.2
26Feb2019	17:35	1.8	2.0	7301.5	2.2
26Feb2019	17:36	1.8	2.0	7301.5	2.2
26Feb2019	17:37	1.8	2.0	7301.5	2.2
26Feb2019	17:38	1.8	2.0	7301.5	2.2
26Feb2019	17:39	1.8	2.0	7301.5	2.2
26Feb2019	17:40	1.8	2.0	7301.5	2.2
26Feb2019	17:41	1.8	2.0	7301.5	2.2
26Feb2019	17:42	1.8	2.0	7301.5	2.1
26Feb2019	17:43	1.8	2.0	7301.5	2.1
26Feb2019	17:44	1.8	2.0	7301.5	2.1
26Feb2019	17:45	1.8	2.0	7301.5	2.1
26Feb2019	17:46	1.8	2.0	7301.5	2.1
26Feb2019	17:47	1.8	2.0	7301.5	2.1
26Feb2019	17:48	1.8	2.0	7301.5	2.1
26Feb2019	17:49	1.8	2.0	7301.5	2.1
26Feb2019	17:50	1.8	2.0	7301.5	2.1
26Feb2019	17:51	1.8	2.0	7301.5	2.1
26Feb2019	17:52	1.8	2.0	7301.5	2.1
26Feb2019	17:53	1.8	2.0	7301.5	2.1
26Feb2019	17:54	1.8	2.0	7301.5	2.1
26Feb2019	17:55	1.8	2.0	7301.5	2.1
26Feb2019	17:56	1.8	2.0	7301.5	2.1
26Feb2019	17:57	1.8	2.0	7301.5	2.1
26Feb2019	17:58	1.8	2.0	7301.5	2.0
26Feb2019	17:59	1.8	2.0	7301.5	2.0

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	18:00	1.8	2.0	7301.5	2.0
26Feb2019	18:01	1.7	2.0	7301.5	2.0
26Feb2019	18:02	1.7	2.0	7301.5	2.0
26Feb2019	18:03	1.7	2.0	7301.5	2.0
26Feb2019	18:04	1.7	2.0	7301.5	2.0
26Feb2019	18:05	1.7	2.0	7301.5	2.0
26Feb2019	18:06	1.7	2.0	7301.5	2.0
26Feb2019	18:07	1.7	2.0	7301.5	2.0
26Feb2019	18:08	1.7	2.0	7301.5	2.0
26Feb2019	18:09	1.7	2.0	7301.5	2.0
26Feb2019	18:10	1.7	2.0	7301.5	2.0
26Feb2019	18:11	1.7	2.0	7301.5	2.0
26Feb2019	18:12	1.7	2.0	7301.5	2.0
26Feb2019	18:13	1.7	2.0	7301.5	2.0
26Feb2019	18:14	1.7	2.0	7301.5	2.0
26Feb2019	18:15	1.7	2.0	7301.5	2.0
26Feb2019	18:16	1.7	2.0	7301.5	1.9
26Feb2019	18:17	1.7	2.0	7301.5	1.9
26Feb2019	18:18	1.7	2.0	7301.5	1.9
26Feb2019	18:19	1.7	2.0	7301.5	1.9
26Feb2019	18:20	1.7	2.0	7301.5	1.9
26Feb2019	18:21	1.7	2.0	7301.5	1.9
26Feb2019	18:22	1.7	2.0	7301.5	1.9
26Feb2019	18:23	1.7	2.0	7301.5	1.9
26Feb2019	18:24	1.7	2.0	7301.5	1.9
26Feb2019	18:25	1.7	2.0	7301.5	1.9
26Feb2019	18:26	1.7	2.0	7301.5	1.9
26Feb2019	18:27	1.7	2.0	7301.5	1.9
26Feb2019	18:28	1.6	2.0	7301.5	1.9
26Feb2019	18:29	1.6	2.0	7301.5	1.9
26Feb2019	18:30	1.6	2.0	7301.5	1.9

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	18:31	1.6	2.0	7301.5	1.9
26Feb2019	18:32	1.6	2.0	7301.5	1.9
26Feb2019	18:33	1.6	2.0	7301.5	1.9
26Feb2019	18:34	1.6	2.0	7301.5	1.9
26Feb2019	18:35	1.6	2.0	7301.5	1.8
26Feb2019	18:36	1.6	2.0	7301.5	1.8
26Feb2019	18:37	1.6	2.0	7301.5	1.8
26Feb2019	18:38	1.6	2.0	7301.5	1.8
26Feb2019	18:39	1.6	2.0	7301.5	1.8
26Feb2019	18:40	1.6	2.0	7301.5	1.8
26Feb2019	18:41	1.6	2.0	7301.5	1.8
26Feb2019	18:42	1.6	2.0	7301.5	1.8
26Feb2019	18:43	1.6	2.0	7301.5	1.8
26Feb2019	18:44	1.6	2.0	7301.5	1.8
26Feb2019	18:45	1.6	2.0	7301.5	1.8
26Feb2019	18:46	1.6	2.0	7301.5	1.8
26Feb2019	18:47	1.6	2.0	7301.5	1.8
26Feb2019	18:48	1.6	2.0	7301.5	1.8
26Feb2019	18:49	1.6	2.0	7301.5	1.8
26Feb2019	18:50	1.6	2.0	7301.5	1.8
26Feb2019	18:51	1.6	2.0	7301.5	1.8
26Feb2019	18:52	1.6	2.0	7301.5	1.8
26Feb2019	18:53	1.6	2.0	7301.5	1.8
26Feb2019	18:54	1.6	2.0	7301.5	1.8
26Feb2019	18:55	1.5	2.0	7301.5	1.8
26Feb2019	18:56	1.5	2.0	7301.5	1.8
26Feb2019	18:57	1.5	2.0	7301.5	1.8
26Feb2019	18:58	1.5	2.0	7301.5	1.8
26Feb2019	18:59	1.5	2.0	7301.5	1.8
26Feb2019	19:00	1.5	2.0	7301.5	1.8
26Feb2019	19:01	1.5	2.0	7301.5	1.8

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	19:02	1.5	2.0	7301.5	1.8
26Feb2019	19:03	1.5	2.0	7301.5	1.8
26Feb2019	19:04	1.5	2.0	7301.5	1.8
26Feb2019	19:05	1.5	2.0	7301.5	1.8
26Feb2019	19:06	1.5	2.0	7301.5	1.8
26Feb2019	19:07	1.5	2.0	7301.5	1.8
26Feb2019	19:08	1.5	2.0	7301.5	1.8
26Feb2019	19:09	1.5	2.0	7301.5	1.8
26Feb2019	19:10	1.5	2.0	7301.5	1.8
26Feb2019	19:11	1.5	2.0	7301.5	1.8
26Feb2019	19:12	1.5	2.0	7301.5	1.8
26Feb2019	19:13	1.5	2.0	7301.5	1.8
26Feb2019	19:14	1.5	2.0	7301.5	1.8
26Feb2019	19:15	1.5	2.0	7301.5	1.8
26Feb2019	19:16	1.5	2.0	7301.5	1.8
26Feb2019	19:17	1.5	2.0	7301.5	1.8
26Feb2019	19:18	1.5	2.0	7301.5	1.8
26Feb2019	19:19	1.5	2.0	7301.5	1.8
26Feb2019	19:20	1.5	2.0	7301.5	1.8
26Feb2019	19:21	1.5	2.0	7301.5	1.8
26Feb2019	19:22	1.4	2.0	7301.5	1.8
26Feb2019	19:23	1.4	2.0	7301.5	1.8
26Feb2019	19:24	1.4	2.0	7301.5	1.8
26Feb2019	19:25	1.4	2.0	7301.5	1.8
26Feb2019	19:26	1.4	2.0	7301.5	1.8
26Feb2019	19:27	1.4	2.0	7301.5	1.8
26Feb2019	19:28	1.4	2.0	7301.5	1.8
26Feb2019	19:29	1.4	2.0	7301.5	1.8
26Feb2019	19:30	1.4	2.0	7301.5	1.8
26Feb2019	19:31	1.4	2.0	7301.5	1.8
26Feb2019	19:32	1.4	2.0	7301.5	1.8

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	19:33	1.4	2.0	7301.5	1.8
26Feb2019	19:34	1.4	2.0	7301.5	1.8
26Feb2019	19:35	1.4	2.0	7301.5	1.7
26Feb2019	19:36	1.4	2.0	7301.5	1.7
26Feb2019	19:37	1.4	2.0	7301.5	1.7
26Feb2019	19:38	1.4	2.0	7301.5	1.7
26Feb2019	19:39	1.4	2.0	7301.5	1.7
26Feb2019	19:40	1.4	2.0	7301.5	1.7
26Feb2019	19:41	1.4	2.0	7301.5	1.7
26Feb2019	19:42	1.4	2.0	7301.5	1.7
26Feb2019	19:43	1.4	2.0	7301.5	1.7
26Feb2019	19:44	1.4	2.0	7301.5	1.7
26Feb2019	19:45	1.4	2.0	7301.5	1.7
26Feb2019	19:46	1.4	2.0	7301.5	1.7
26Feb2019	19:47	1.4	2.0	7301.5	1.7
26Feb2019	19:48	1.4	2.0	7301.5	1.7
26Feb2019	19:49	1.3	2.0	7301.5	1.7
26Feb2019	19:50	1.3	2.0	7301.5	1.7
26Feb2019	19:51	1.3	2.0	7301.5	1.7
26Feb2019	19:52	1.3	2.0	7301.5	1.7
26Feb2019	19:53	1.3	2.0	7301.5	1.7
26Feb2019	19:54	1.3	2.0	7301.5	1.7
26Feb2019	19:55	1.3	2.0	7301.5	1.7
26Feb2019	19:56	1.3	2.0	7301.5	1.7
26Feb2019	19:57	1.3	2.0	7301.5	1.7
26Feb2019	19:58	1.3	2.0	7301.5	1.7
26Feb2019	19:59	1.3	2.0	7301.5	1.7
26Feb2019	20:00	1.3	2.0	7301.5	1.7
26Feb2019	20:01	1.3	2.0	7301.5	1.7
26Feb2019	20:02	1.3	2.0	7301.5	1.7
26Feb2019	20:03	1.3	2.0	7301.5	1.7

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	20:04	1.3	2.0	7301.5	1.7
26Feb2019	20:05	1.3	2.0	7301.5	1.7
26Feb2019	20:06	1.3	2.0	7301.5	1.7
26Feb2019	20:07	1.3	2.0	7301.5	1.7
26Feb2019	20:08	1.3	2.0	7301.5	1.7
26Feb2019	20:09	1.3	2.0	7301.5	1.7
26Feb2019	20:10	1.3	2.0	7301.5	1.7
26Feb2019	20:11	1.3	2.0	7301.5	1.7
26Feb2019	20:12	1.3	2.0	7301.5	1.7
26Feb2019	20:13	1.3	2.0	7301.5	1.7
26Feb2019	20:14	1.3	2.0	7301.5	1.7
26Feb2019	20:15	1.3	2.0	7301.5	1.7
26Feb2019	20:16	1.3	2.0	7301.5	1.7
26Feb2019	20:17	1.2	2.0	7301.5	1.7
26Feb2019	20:18	1.2	2.0	7301.5	1.7
26Feb2019	20:19	1.2	2.0	7301.5	1.7
26Feb2019	20:20	1.2	2.0	7301.5	1.7
26Feb2019	20:21	1.2	2.0	7301.5	1.7
26Feb2019	20:22	1.2	2.0	7301.5	1.7
26Feb2019	20:23	1.2	2.0	7301.5	1.7
26Feb2019	20:24	1.2	2.0	7301.5	1.7
26Feb2019	20:25	1.2	2.0	7301.5	1.7
26Feb2019	20:26	1.2	2.0	7301.5	1.7
26Feb2019	20:27	1.2	2.0	7301.5	1.7
26Feb2019	20:28	1.2	2.0	7301.5	1.7
26Feb2019	20:29	1.2	2.0	7301.5	1.7
26Feb2019	20:30	1.2	2.0	7301.5	1.7
26Feb2019	20:31	1.2	2.0	7301.5	1.7
26Feb2019	20:32	1.2	2.0	7301.5	1.7
26Feb2019	20:33	1.2	2.0	7301.5	1.7
26Feb2019	20:34	1.2	2.0	7301.5	1.7

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	20:35	1.2	2.0	7301.5	1.6
26Feb2019	20:36	1.2	2.0	7301.5	1.6
26Feb2019	20:37	1.2	2.0	7301.5	1.6
26Feb2019	20:38	1.2	2.0	7301.5	1.6
26Feb2019	20:39	1.2	2.0	7301.5	1.6
26Feb2019	20:40	1.2	2.0	7301.5	1.6
26Feb2019	20:41	1.2	2.0	7301.5	1.6
26Feb2019	20:42	1.2	2.0	7301.5	1.6
26Feb2019	20:43	1.2	2.0	7301.5	1.6
26Feb2019	20:44	1.2	2.0	7301.5	1.6
26Feb2019	20:45	1.2	2.0	7301.5	1.6
26Feb2019	20:46	1.2	2.0	7301.5	1.6
26Feb2019	20:47	1.2	2.0	7301.5	1.6
26Feb2019	20:48	1.2	2.0	7301.5	1.6
26Feb2019	20:49	1.2	2.0	7301.5	1.6
26Feb2019	20:50	1.2	2.0	7301.5	1.6
26Feb2019	20:51	1.2	1.9	7301.5	1.6
26Feb2019	20:52	1.2	1.9	7301.5	1.6
26Feb2019	20:53	1.2	1.9	7301.5	1.6
26Feb2019	20:54	1.2	1.9	7301.5	1.6
26Feb2019	20:55	1.2	1.9	7301.5	1.6
26Feb2019	20:56	1.2	1.9	7301.5	1.6
26Feb2019	20:57	1.2	1.9	7301.5	1.6
26Feb2019	20:58	1.2	1.9	7301.5	1.6
26Feb2019	20:59	1.2	1.9	7301.5	1.6
26Feb2019	21:00	1.2	1.9	7301.5	1.6
26Feb2019	21:01	1.2	1.9	7301.5	1.6
26Feb2019	21:02	1.2	1.9	7301.5	1.6
26Feb2019	21:03	1.2	1.9	7301.5	1.6
26Feb2019	21:04	1.2	1.9	7301.5	1.6
26Feb2019	21:05	1.2	1.9	7301.5	1.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	21:06	1.1	1.9	7301.5	1.6
26Feb2019	21:07	1.1	1.9	7301.5	1.6
26Feb2019	21:08	1.1	1.9	7301.5	1.6
26Feb2019	21:09	1.1	1.9	7301.5	1.6
26Feb2019	21:10	1.1	1.9	7301.5	1.6
26Feb2019	21:11	1.1	1.9	7301.5	1.6
26Feb2019	21:12	1.1	1.9	7301.4	1.6
26Feb2019	21:13	1.1	1.9	7301.4	1.6
26Feb2019	21:14	1.1	1.9	7301.4	1.6
26Feb2019	21:15	1.1	1.9	7301.4	1.6
26Feb2019	21:16	1.1	1.9	7301.4	1.6
26Feb2019	21:17	1.1	1.9	7301.4	1.6
26Feb2019	21:18	1.1	1.9	7301.4	1.6
26Feb2019	21:19	1.1	1.9	7301.4	1.6
26Feb2019	21:20	1.1	1.9	7301.4	1.6
26Feb2019	21:21	1.1	1.9	7301.4	1.6
26Feb2019	21:22	1.1	1.9	7301.4	1.6
26Feb2019	21:23	1.1	1.9	7301.4	1.6
26Feb2019	21:24	1.1	1.9	7301.4	1.6
26Feb2019	21:25	1.1	1.9	7301.4	1.6
26Feb2019	21:26	1.1	1.9	7301.4	1.6
26Feb2019	21:27	1.1	1.9	7301.4	1.6
26Feb2019	21:28	1.1	1.9	7301.4	1.6
26Feb2019	21:29	1.1	1.9	7301.4	1.6
26Feb2019	21:30	1.1	1.9	7301.4	1.5
26Feb2019	21:31	1.1	1.9	7301.4	1.5
26Feb2019	21:32	1.1	1.9	7301.4	1.5
26Feb2019	21:33	1.1	1.9	7301.4	1.5
26Feb2019	21:34	1.1	1.9	7301.4	1.5
26Feb2019	21:35	1.1	1.9	7301.4	1.5
26Feb2019	21:36	1.1	1.9	7301.4	1.5

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	21:37	1.1	1.9	7301.4	1.5
26Feb2019	21:38	1.1	1.9	7301.4	1.5
26Feb2019	21:39	1.1	1.9	7301.4	1.5
26Feb2019	21:40	1.1	1.9	7301.4	1.5
26Feb2019	21:41	1.1	1.9	7301.4	1.5
26Feb2019	21:42	1.1	1.9	7301.4	1.5
26Feb2019	21:43	1.1	1.9	7301.4	1.5
26Feb2019	21:44	1.1	1.9	7301.4	1.5
26Feb2019	21:45	1.1	1.9	7301.4	1.5
26Feb2019	21:46	1.1	1.9	7301.4	1.5
26Feb2019	21:47	1.1	1.9	7301.4	1.5
26Feb2019	21:48	1.1	1.9	7301.4	1.5
26Feb2019	21:49	1.1	1.9	7301.4	1.5
26Feb2019	21:50	1.1	1.9	7301.4	1.5
26Feb2019	21:51	1.1	1.9	7301.4	1.5
26Feb2019	21:52	1.1	1.9	7301.4	1.5
26Feb2019	21:53	1.1	1.9	7301.4	1.5
26Feb2019	21:54	1.1	1.9	7301.4	1.5
26Feb2019	21:55	1.1	1.9	7301.4	1.5
26Feb2019	21:56	1.1	1.9	7301.4	1.5
26Feb2019	21:57	1.1	1.9	7301.4	1.5
26Feb2019	21:58	1.1	1.9	7301.4	1.5
26Feb2019	21:59	1.1	1.9	7301.4	1.5
26Feb2019	22:00	1.1	1.9	7301.4	1.5
26Feb2019	22:01	1.1	1.9	7301.4	1.5
26Feb2019	22:02	1.1	1.9	7301.4	1.5
26Feb2019	22:03	1.1	1.9	7301.4	1.5
26Feb2019	22:04	1.1	1.9	7301.4	1.5
26Feb2019	22:05	1.1	1.9	7301.4	1.5
26Feb2019	22:06	1.1	1.9	7301.4	1.5
26Feb2019	22:07	1.1	1.9	7301.4	1.5

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	22:08	1.1	1.9	7301.4	1.5
26Feb2019	22:09	1.1	1.9	7301.4	1.5
26Feb2019	22:10	1.1	1.9	7301.4	1.5
26Feb2019	22:11	1.1	1.9	7301.4	1.5
26Feb2019	22:12	1.1	1.9	7301.4	1.5
26Feb2019	22:13	1.1	1.9	7301.4	1.5
26Feb2019	22:14	1.1	1.9	7301.4	1.5
26Feb2019	22:15	1.1	1.9	7301.4	1.5
26Feb2019	22:16	1.1	1.9	7301.4	1.5
26Feb2019	22:17	1.1	1.9	7301.4	1.5
26Feb2019	22:18	1.1	1.9	7301.4	1.5
26Feb2019	22:19	1.1	1.9	7301.4	1.5
26Feb2019	22:20	1.1	1.9	7301.4	1.5
26Feb2019	22:21	1.1	1.9	7301.4	1.5
26Feb2019	22:22	1.1	1.9	7301.4	1.5
26Feb2019	22:23	1.1	1.9	7301.4	1.5
26Feb2019	22:24	1.1	1.9	7301.4	1.5
26Feb2019	22:25	1.1	1.9	7301.4	1.5
26Feb2019	22:26	1.1	1.9	7301.4	1.5
26Feb2019	22:27	1.1	1.9	7301.4	1.5
26Feb2019	22:28	1.1	1.9	7301.4	1.5
26Feb2019	22:29	1.1	1.9	7301.4	1.5
26Feb2019	22:30	1.1	1.9	7301.4	1.5
26Feb2019	22:31	1.1	1.9	7301.4	1.5
26Feb2019	22:32	1.1	1.9	7301.4	1.4
26Feb2019	22:33	1.1	1.9	7301.4	1.4
26Feb2019	22:34	1.1	1.9	7301.4	1.4
26Feb2019	22:35	1.1	1.9	7301.4	1.4
26Feb2019	22:36	1.1	1.9	7301.4	1.4
26Feb2019	22:37	1.1	1.9	7301.4	1.4
26Feb2019	22:38	1.1	1.9	7301.4	1.4

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	22:39	1.1	1.9	7301.4	1.4
26Feb2019	22:40	1.1	1.9	7301.4	1.4
26Feb2019	22:41	1.1	1.9	7301.4	1.4
26Feb2019	22:42	1.1	1.9	7301.4	1.4
26Feb2019	22:43	1.1	1.9	7301.4	1.4
26Feb2019	22:44	1.1	1.9	7301.4	1.4
26Feb2019	22:45	1.1	1.9	7301.4	1.4
26Feb2019	22:46	1.1	1.9	7301.4	1.4
26Feb2019	22:47	1.1	1.9	7301.4	1.4
26Feb2019	22:48	1.1	1.9	7301.4	1.4
26Feb2019	22:49	1.1	1.9	7301.4	1.4
26Feb2019	22:50	1.1	1.9	7301.4	1.4
26Feb2019	22:51	1.1	1.9	7301.4	1.4
26Feb2019	22:52	1.1	1.9	7301.4	1.4
26Feb2019	22:53	1.1	1.9	7301.4	1.4
26Feb2019	22:54	1.1	1.9	7301.4	1.4
26Feb2019	22:55	1.1	1.9	7301.4	1.4
26Feb2019	22:56	1.1	1.9	7301.4	1.4
26Feb2019	22:57	1.1	1.9	7301.4	1.4
26Feb2019	22:58	1.1	1.9	7301.4	1.4
26Feb2019	22:59	1.1	1.9	7301.4	1.4
26Feb2019	23:00	1.1	1.9	7301.4	1.4
26Feb2019	23:01	1.1	1.9	7301.4	1.4
26Feb2019	23:02	1.1	1.9	7301.4	1.4
26Feb2019	23:03	1.1	1.9	7301.4	1.4
26Feb2019	23:04	1.1	1.9	7301.4	1.4
26Feb2019	23:05	1.1	1.9	7301.4	1.4
26Feb2019	23:06	1.1	1.9	7301.4	1.4
26Feb2019	23:07	1.1	1.9	7301.4	1.4
26Feb2019	23:08	1.1	1.9	7301.4	1.4
26Feb2019	23:09	1.1	1.9	7301.4	1.4

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	23:10	1.1	1.9	7301.4	1.4
26Feb2019	23:11	1.1	1.9	7301.4	1.4
26Feb2019	23:12	1.1	1.9	7301.4	1.4
26Feb2019	23:13	1.1	1.9	7301.4	1.4
26Feb2019	23:14	1.0	1.9	7301.4	1.4
26Feb2019	23:15	1.0	1.9	7301.4	1.4
26Feb2019	23:16	1.0	1.9	7301.4	1.4
26Feb2019	23:17	1.0	1.9	7301.4	1.4
26Feb2019	23:18	1.0	1.9	7301.4	1.4
26Feb2019	23:19	1.0	1.9	7301.4	1.4
26Feb2019	23:20	1.0	1.9	7301.4	1.4
26Feb2019	23:21	1.0	1.9	7301.4	1.4
26Feb2019	23:22	1.0	1.9	7301.4	1.4
26Feb2019	23:23	1.0	1.9	7301.4	1.4
26Feb2019	23:24	1.0	1.9	7301.4	1.4
26Feb2019	23:25	1.0	1.9	7301.4	1.4
26Feb2019	23:26	1.0	1.9	7301.4	1.4
26Feb2019	23:27	1.0	1.9	7301.4	1.4
26Feb2019	23:28	1.0	1.9	7301.4	1.4
26Feb2019	23:29	1.0	1.9	7301.4	1.4
26Feb2019	23:30	1.0	1.9	7301.4	1.4
26Feb2019	23:31	1.0	1.9	7301.4	1.4
26Feb2019	23:32	1.0	1.9	7301.4	1.4
26Feb2019	23:33	1.0	1.9	7301.4	1.4
26Feb2019	23:34	1.0	1.9	7301.4	1.4
26Feb2019	23:35	1.0	1.9	7301.4	1.4
26Feb2019	23:36	1.0	1.9	7301.4	1.4
26Feb2019	23:37	1.0	1.9	7301.4	1.4
26Feb2019	23:38	1.0	1.9	7301.4	1.4
26Feb2019	23:39	1.0	1.9	7301.4	1.4
26Feb2019	23:40	1.0	1.9	7301.4	1.4

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
26Feb2019	23:41	1.0	1.9	7301.4	1.4
26Feb2019	23:42	1.0	1.9	7301.4	1.4
26Feb2019	23:43	1.0	1.9	7301.4	1.3
26Feb2019	23:44	1.0	1.9	7301.4	1.3
26Feb2019	23:45	1.0	1.9	7301.4	1.3
26Feb2019	23:46	1.0	1.9	7301.4	1.3
26Feb2019	23:47	1.0	1.9	7301.4	1.3
26Feb2019	23:48	1.0	1.9	7301.4	1.3
26Feb2019	23:49	1.0	1.9	7301.4	1.3
26Feb2019	23:50	1.0	1.9	7301.4	1.3
26Feb2019	23:51	1.0	1.9	7301.4	1.3
26Feb2019	23:52	1.0	1.9	7301.4	1.3
26Feb2019	23:53	1.0	1.9	7301.4	1.3
26Feb2019	23:54	1.0	1.9	7301.4	1.3
26Feb2019	23:55	1.0	1.9	7301.4	1.3
26Feb2019	23:56	1.0	1.9	7301.4	1.3
26Feb2019	23:57	1.0	1.9	7301.4	1.3
26Feb2019	23:58	1.0	1.9	7301.4	1.3
26Feb2019	23:59	1.0	1.9	7301.4	1.3
27Feb2019	00:00	1.0	1.9	7301.4	1.3
27Feb2019	00:01	1.0	1.9	7301.4	1.3
27Feb2019	00:02	1.0	1.9	7301.4	1.3
27Feb2019	00:03	1.0	1.9	7301.4	1.3
27Feb2019	00:04	1.0	1.8	7301.4	1.3
27Feb2019	00:05	1.0	1.8	7301.4	1.3
27Feb2019	00:06	1.0	1.8	7301.4	1.3
27Feb2019	00:07	1.0	1.8	7301.4	1.3
27Feb2019	00:08	1.0	1.8	7301.4	1.3
27Feb2019	00:09	1.0	1.8	7301.4	1.3
27Feb2019	00:10	0.9	1.8	7301.4	1.3
27Feb2019	00:11	0.9	1.8	7301.4	1.3

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	00:12	0.9	1.8	7301.4	1.3
27Feb2019	00:13	0.9	1.8	7301.4	1.3
27Feb2019	00:14	0.9	1.8	7301.4	1.3
27Feb2019	00:15	0.9	1.8	7301.4	1.3
27Feb2019	00:16	0.9	1.8	7301.4	1.3
27Feb2019	00:17	0.9	1.8	7301.4	1.3
27Feb2019	00:18	0.9	1.8	7301.4	1.3
27Feb2019	00:19	0.8	1.8	7301.4	1.3
27Feb2019	00:20	0.8	1.8	7301.4	1.3
27Feb2019	00:21	0.8	1.8	7301.4	1.3
27Feb2019	00:22	0.8	1.8	7301.4	1.3
27Feb2019	00:23	0.8	1.8	7301.4	1.3
27Feb2019	00:24	0.8	1.8	7301.4	1.3
27Feb2019	00:25	0.8	1.8	7301.4	1.3
27Feb2019	00:26	0.8	1.8	7301.4	1.3
27Feb2019	00:27	0.7	1.8	7301.4	1.3
27Feb2019	00:28	0.7	1.8	7301.4	1.3
27Feb2019	00:29	0.7	1.8	7301.4	1.3
27Feb2019	00:30	0.7	1.8	7301.4	1.3
27Feb2019	00:31	0.7	1.8	7301.4	1.3
27Feb2019	00:32	0.7	1.8	7301.4	1.3
27Feb2019	00:33	0.6	1.8	7301.4	1.3
27Feb2019	00:34	0.6	1.8	7301.4	1.3
27Feb2019	00:35	0.6	1.8	7301.4	1.3
27Feb2019	00:36	0.6	1.8	7301.4	1.3
27Feb2019	00:37	0.6	1.8	7301.4	1.3
27Feb2019	00:38	0.5	1.8	7301.4	1.3
27Feb2019	00:39	0.5	1.8	7301.4	1.3
27Feb2019	00:40	0.5	1.8	7301.4	1.2
27Feb2019	00:41	0.5	1.8	7301.4	1.2
27Feb2019	00:42	0.5	1.8	7301.4	1.2

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	00:43	0.5	1.8	7301.4	1.2
27Feb2019	00:44	0.4	1.8	7301.4	1.2
27Feb2019	00:45	0.4	1.8	7301.4	1.2
27Feb2019	00:46	0.4	1.8	7301.4	1.2
27Feb2019	00:47	0.4	1.8	7301.4	1.2
27Feb2019	00:48	0.4	1.8	7301.4	1.2
27Feb2019	00:49	0.4	1.8	7301.4	1.2
27Feb2019	00:50	0.4	1.8	7301.4	1.2
27Feb2019	00:51	0.3	1.8	7301.4	1.2
27Feb2019	00:52	0.3	1.8	7301.4	1.2
27Feb2019	00:53	0.3	1.8	7301.4	1.2
27Feb2019	00:54	0.3	1.8	7301.4	1.2
27Feb2019	00:55	0.3	1.8	7301.4	1.2
27Feb2019	00:56	0.3	1.8	7301.4	1.2
27Feb2019	00:57	0.3	1.8	7301.4	1.2
27Feb2019	00:58	0.3	1.8	7301.4	1.2
27Feb2019	00:59	0.3	1.8	7301.4	1.2
27Feb2019	01:00	0.3	1.8	7301.4	1.2
27Feb2019	01:01	0.2	1.8	7301.4	1.2
27Feb2019	01:02	0.2	1.8	7301.4	1.2
27Feb2019	01:03	0.2	1.8	7301.4	1.2
27Feb2019	01:04	0.2	1.8	7301.4	1.2
27Feb2019	01:05	0.2	1.8	7301.4	1.2
27Feb2019	01:06	0.2	1.8	7301.4	1.2
27Feb2019	01:07	0.2	1.8	7301.4	1.2
27Feb2019	01:08	0.2	1.8	7301.4	1.1
27Feb2019	01:09	0.2	1.8	7301.4	1.1
27Feb2019	01:10	0.2	1.8	7301.4	1.1
27Feb2019	01:11	0.2	1.8	7301.4	1.1
27Feb2019	01:12	0.2	1.8	7301.4	1.1
27Feb2019	01:13	0.2	1.8	7301.4	1.1

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	01:14	0.2	1.8	7301.3	1.1
27Feb2019	01:15	0.2	1.8	7301.3	1.1
27Feb2019	01:16	0.1	1.8	7301.3	1.1
27Feb2019	01:17	0.1	1.8	7301.3	1.1
27Feb2019	01:18	0.1	1.8	7301.3	1.1
27Feb2019	01:19	0.1	1.8	7301.3	1.1
27Feb2019	01:20	0.1	1.8	7301.3	1.1
27Feb2019	01:21	0.1	1.8	7301.3	1.1
27Feb2019	01:22	0.1	1.8	7301.3	1.1
27Feb2019	01:23	0.1	1.8	7301.3	1.1
27Feb2019	01:24	0.1	1.8	7301.3	1.1
27Feb2019	01:25	0.1	1.8	7301.3	1.1
27Feb2019	01:26	0.1	1.8	7301.3	1.1
27Feb2019	01:27	0.1	1.8	7301.3	1.1
27Feb2019	01:28	0.1	1.8	7301.3	1.1
27Feb2019	01:29	0.1	1.8	7301.3	1.1
27Feb2019	01:30	0.1	1.8	7301.3	1.1
27Feb2019	01:31	0.1	1.8	7301.3	1.1
27Feb2019	01:32	0.1	1.8	7301.3	1.1
27Feb2019	01:33	0.1	1.8	7301.3	1.0
27Feb2019	01:34	0.1	1.8	7301.3	1.0
27Feb2019	01:35	0.1	1.8	7301.3	1.0
27Feb2019	01:36	0.1	1.8	7301.3	1.0
27Feb2019	01:37	0.1	1.8	7301.3	1.0
27Feb2019	01:38	0.1	1.8	7301.3	1.0
27Feb2019	01:39	0.1	1.7	7301.3	1.0
27Feb2019	01:40	0.1	1.7	7301.3	1.0
27Feb2019	01:41	0.1	1.7	7301.3	1.0
27Feb2019	01:42	0.1	1.7	7301.3	1.0
27Feb2019	01:43	0.1	1.7	7301.3	1.0
27Feb2019	01:44	0.1	1.7	7301.3	1.0

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	01:45	0.1	1.7	7301.3	1.0
27Feb2019	01:46	0.1	1.7	7301.3	1.0
27Feb2019	01:47	0.1	1.7	7301.3	1.0
27Feb2019	01:48	0.1	1.7	7301.3	1.0
27Feb2019	01:49	0.0	1.7	7301.3	1.0
27Feb2019	01:50	0.0	1.7	7301.3	1.0
27Feb2019	01:51	0.0	1.7	7301.3	1.0
27Feb2019	01:52	0.0	1.7	7301.3	1.0
27Feb2019	01:53	0.0	1.7	7301.3	1.0
27Feb2019	01:54	0.0	1.7	7301.3	1.0
27Feb2019	01:55	0.0	1.7	7301.3	1.0
27Feb2019	01:56	0.0	1.7	7301.3	1.0
27Feb2019	01:57	0.0	1.7	7301.3	1.0
27Feb2019	01:58	0.0	1.7	7301.3	1.0
27Feb2019	01:59	0.0	1.7	7301.3	0.9
27Feb2019	02:00	0.0	1.7	7301.3	0.9
27Feb2019	02:01	0.0	1.7	7301.3	0.9
27Feb2019	02:02	0.0	1.7	7301.3	0.9
27Feb2019	02:03	0.0	1.7	7301.3	0.9
27Feb2019	02:04	0.0	1.7	7301.3	0.9
27Feb2019	02:05	0.0	1.7	7301.3	0.9
27Feb2019	02:06	0.0	1.7	7301.3	0.9
27Feb2019	02:07	0.0	1.7	7301.3	0.9
27Feb2019	02:08	0.0	1.7	7301.3	0.9
27Feb2019	02:09	0.0	1.7	7301.3	0.9
27Feb2019	02:10	0.0	1.7	7301.3	0.9
27Feb2019	02:11	0.0	1.7	7301.3	0.9
27Feb2019	02:12	0.0	1.7	7301.3	0.9
27Feb2019	02:13	0.0	1.7	7301.3	0.9
27Feb2019	02:14	0.0	1.7	7301.3	0.9
27Feb2019	02:15	0.0	1.7	7301.3	0.9

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	02:16	0.0	1.7	7301.3	0.9
27Feb2019	02:17	0.0	1.7	7301.3	0.9
27Feb2019	02:18	0.0	1.7	7301.3	0.9
27Feb2019	02:19	0.0	1.7	7301.3	0.9
27Feb2019	02:20	0.0	1.7	7301.3	0.9
27Feb2019	02:21	0.0	1.7	7301.3	0.9
27Feb2019	02:22	0.0	1.7	7301.3	0.9
27Feb2019	02:23	0.0	1.7	7301.3	0.9
27Feb2019	02:24	0.0	1.7	7301.3	0.9
27Feb2019	02:25	0.0	1.7	7301.3	0.9
27Feb2019	02:26	0.0	1.7	7301.3	0.9
27Feb2019	02:27	0.0	1.7	7301.3	0.8
27Feb2019	02:28	0.0	1.7	7301.3	0.8
27Feb2019	02:29	0.0	1.7	7301.3	0.8
27Feb2019	02:30	0.0	1.7	7301.3	0.8
27Feb2019	02:31	0.0	1.7	7301.3	0.8
27Feb2019	02:32	0.0	1.7	7301.3	0.8
27Feb2019	02:33	0.0	1.7	7301.3	0.8
27Feb2019	02:34	0.0	1.7	7301.3	0.8
27Feb2019	02:35	0.0	1.7	7301.3	0.8
27Feb2019	02:36	0.0	1.7	7301.3	0.8
27Feb2019	02:37	0.0	1.7	7301.3	0.8
27Feb2019	02:38	0.0	1.7	7301.3	0.8
27Feb2019	02:39	0.0	1.7	7301.3	0.8
27Feb2019	02:40	0.0	1.7	7301.3	0.8
27Feb2019	02:41	0.0	1.7	7301.3	0.8
27Feb2019	02:42	0.0	1.7	7301.3	0.8
27Feb2019	02:43	0.0	1.7	7301.3	0.8
27Feb2019	02:44	0.0	1.7	7301.3	0.8
27Feb2019	02:45	0.0	1.7	7301.3	0.8
27Feb2019	02:46	0.0	1.7	7301.3	0.8

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	02:47	0.0	1.7	7301.3	0.8
27Feb2019	02:48	0.0	1.7	7301.3	0.8
27Feb2019	02:49	0.0	1.7	7301.3	0.8
27Feb2019	02:50	0.0	1.7	7301.3	0.8
27Feb2019	02:51	0.0	1.7	7301.3	0.8
27Feb2019	02:52	0.0	1.7	7301.3	0.8
27Feb2019	02:53	0.0	1.7	7301.3	0.8
27Feb2019	02:54	0.0	1.7	7301.3	0.8
27Feb2019	02:55	0.0	1.7	7301.3	0.8
27Feb2019	02:56	0.0	1.7	7301.3	0.8
27Feb2019	02:57	0.0	1.7	7301.3	0.8
27Feb2019	02:58	0.0	1.7	7301.3	0.7
27Feb2019	02:59	0.0	1.7	7301.3	0.7
27Feb2019	03:00	0.0	1.7	7301.3	0.7
27Feb2019	03:01	0.0	1.7	7301.3	0.7
27Feb2019	03:02	0.0	1.7	7301.3	0.7
27Feb2019	03:03	0.0	1.7	7301.3	0.7
27Feb2019	03:04	0.0	1.7	7301.3	0.7
27Feb2019	03:05	0.0	1.6	7301.3	0.7
27Feb2019	03:06	0.0	1.6	7301.3	0.7
27Feb2019	03:07	0.0	1.6	7301.3	0.7
27Feb2019	03:08	0.0	1.6	7301.3	0.7
27Feb2019	03:09	0.0	1.6	7301.3	0.7
27Feb2019	03:10	0.0	1.6	7301.3	0.7
27Feb2019	03:11	0.0	1.6	7301.3	0.7
27Feb2019	03:12	0.0	1.6	7301.3	0.7
27Feb2019	03:13	0.0	1.6	7301.3	0.7
27Feb2019	03:14	0.0	1.6	7301.3	0.7
27Feb2019	03:15	0.0	1.6	7301.3	0.7
27Feb2019	03:16	0.0	1.6	7301.3	0.7
27Feb2019	03:17	0.0	1.6	7301.3	0.7

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	03:18	0.0	1.6	7301.3	0.7
27Feb2019	03:19	0.0	1.6	7301.3	0.7
27Feb2019	03:20	0.0	1.6	7301.3	0.7
27Feb2019	03:21	0.0	1.6	7301.3	0.7
27Feb2019	03:22	0.0	1.6	7301.3	0.7
27Feb2019	03:23	0.0	1.6	7301.3	0.7
27Feb2019	03:24	0.0	1.6	7301.3	0.7
27Feb2019	03:25	0.0	1.6	7301.3	0.7
27Feb2019	03:26	0.0	1.6	7301.2	0.7
27Feb2019	03:27	0.0	1.6	7301.2	0.7
27Feb2019	03:28	0.0	1.6	7301.2	0.7
27Feb2019	03:29	0.0	1.6	7301.2	0.7
27Feb2019	03:30	0.0	1.6	7301.2	0.7
27Feb2019	03:31	0.0	1.6	7301.2	0.7
27Feb2019	03:32	0.0	1.6	7301.2	0.7
27Feb2019	03:33	0.0	1.6	7301.2	0.7
27Feb2019	03:34	0.0	1.6	7301.2	0.7
27Feb2019	03:35	0.0	1.6	7301.2	0.7
27Feb2019	03:36	0.0	1.6	7301.2	0.7
27Feb2019	03:37	0.0	1.6	7301.2	0.7
27Feb2019	03:38	0.0	1.6	7301.2	0.7
27Feb2019	03:39	0.0	1.6	7301.2	0.7
27Feb2019	03:40	0.0	1.6	7301.2	0.7
27Feb2019	03:41	0.0	1.6	7301.2	0.7
27Feb2019	03:42	0.0	1.6	7301.2	0.7
27Feb2019	03:43	0.0	1.6	7301.2	0.7
27Feb2019	03:44	0.0	1.6	7301.2	0.7
27Feb2019	03:45	0.0	1.6	7301.2	0.7
27Feb2019	03:46	0.0	1.6	7301.2	0.7
27Feb2019	03:47	0.0	1.6	7301.2	0.7
27Feb2019	03:48	0.0	1.6	7301.2	0.7

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	03:49	0.0	1.6	7301.2	0.7
27Feb2019	03:50	0.0	1.6	7301.2	0.7
27Feb2019	03:51	0.0	1.6	7301.2	0.7
27Feb2019	03:52	0.0	1.6	7301.2	0.7
27Feb2019	03:53	0.0	1.6	7301.2	0.7
27Feb2019	03:54	0.0	1.6	7301.2	0.7
27Feb2019	03:55	0.0	1.6	7301.2	0.7
27Feb2019	03:56	0.0	1.6	7301.2	0.7
27Feb2019	03:57	0.0	1.6	7301.2	0.7
27Feb2019	03:58	0.0	1.6	7301.2	0.7
27Feb2019	03:59	0.0	1.6	7301.2	0.7
27Feb2019	04:00	0.0	1.6	7301.2	0.7
27Feb2019	04:01	0.0	1.6	7301.2	0.7
27Feb2019	04:02	0.0	1.6	7301.2	0.7
27Feb2019	04:03	0.0	1.6	7301.2	0.7
27Feb2019	04:04	0.0	1.6	7301.2	0.7
27Feb2019	04:05	0.0	1.6	7301.2	0.7
27Feb2019	04:06	0.0	1.6	7301.2	0.7
27Feb2019	04:07	0.0	1.6	7301.2	0.7
27Feb2019	04:08	0.0	1.6	7301.2	0.7
27Feb2019	04:09	0.0	1.6	7301.2	0.7
27Feb2019	04:10	0.0	1.6	7301.2	0.7
27Feb2019	04:11	0.0	1.6	7301.2	0.7
27Feb2019	04:12	0.0	1.6	7301.2	0.7
27Feb2019	04:13	0.0	1.6	7301.2	0.7
27Feb2019	04:14	0.0	1.6	7301.2	0.7
27Feb2019	04:15	0.0	1.6	7301.2	0.7
27Feb2019	04:16	0.0	1.6	7301.2	0.7
27Feb2019	04:17	0.0	1.6	7301.2	0.7
27Feb2019	04:18	0.0	1.6	7301.2	0.7
27Feb2019	04:19	0.0	1.6	7301.2	0.7

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	04:20	0.0	1.6	7301.2	0.7
27Feb2019	04:21	0.0	1.6	7301.2	0.7
27Feb2019	04:22	0.0	1.6	7301.2	0.7
27Feb2019	04:23	0.0	1.6	7301.2	0.7
27Feb2019	04:24	0.0	1.6	7301.2	0.7
27Feb2019	04:25	0.0	1.6	7301.2	0.7
27Feb2019	04:26	0.0	1.6	7301.2	0.7
27Feb2019	04:27	0.0	1.6	7301.2	0.7
27Feb2019	04:28	0.0	1.6	7301.2	0.7
27Feb2019	04:29	0.0	1.6	7301.2	0.7
27Feb2019	04:30	0.0	1.6	7301.2	0.7
27Feb2019	04:31	0.0	1.6	7301.2	0.7
27Feb2019	04:32	0.0	1.6	7301.2	0.7
27Feb2019	04:33	0.0	1.6	7301.2	0.7
27Feb2019	04:34	0.0	1.6	7301.2	0.7
27Feb2019	04:35	0.0	1.6	7301.2	0.7
27Feb2019	04:36	0.0	1.6	7301.2	0.7
27Feb2019	04:37	0.0	1.6	7301.2	0.7
27Feb2019	04:38	0.0	1.6	7301.2	0.7
27Feb2019	04:39	0.0	1.6	7301.2	0.7
27Feb2019	04:40	0.0	1.6	7301.2	0.7
27Feb2019	04:41	0.0	1.6	7301.2	0.7
27Feb2019	04:42	0.0	1.6	7301.2	0.7
27Feb2019	04:43	0.0	1.6	7301.2	0.7
27Feb2019	04:44	0.0	1.6	7301.2	0.7
27Feb2019	04:45	0.0	1.6	7301.2	0.7
27Feb2019	04:46	0.0	1.6	7301.2	0.7
27Feb2019	04:47	0.0	1.6	7301.2	0.7
27Feb2019	04:48	0.0	1.6	7301.2	0.7
27Feb2019	04:49	0.0	1.6	7301.2	0.7
27Feb2019	04:50	0.0	1.6	7301.2	0.7

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	04:51	0.0	1.6	7301.2	0.7
27Feb2019	04:52	0.0	1.6	7301.2	0.7
27Feb2019	04:53	0.0	1.6	7301.2	0.7
27Feb2019	04:54	0.0	1.5	7301.2	0.7
27Feb2019	04:55	0.0	1.5	7301.2	0.7
27Feb2019	04:56	0.0	1.5	7301.2	0.7
27Feb2019	04:57	0.0	1.5	7301.2	0.7
27Feb2019	04:58	0.0	1.5	7301.2	0.7
27Feb2019	04:59	0.0	1.5	7301.2	0.7
27Feb2019	05:00	0.0	1.5	7301.2	0.7
27Feb2019	05:01	0.0	1.5	7301.2	0.7
27Feb2019	05:02	0.0	1.5	7301.2	0.7
27Feb2019	05:03	0.0	1.5	7301.2	0.7
27Feb2019	05:04	0.0	1.5	7301.2	0.7
27Feb2019	05:05	0.0	1.5	7301.2	0.7
27Feb2019	05:06	0.0	1.5	7301.2	0.7
27Feb2019	05:07	0.0	1.5	7301.2	0.7
27Feb2019	05:08	0.0	1.5	7301.2	0.7
27Feb2019	05:09	0.0	1.5	7301.2	0.7
27Feb2019	05:10	0.0	1.5	7301.2	0.7
27Feb2019	05:11	0.0	1.5	7301.2	0.7
27Feb2019	05:12	0.0	1.5	7301.2	0.7
27Feb2019	05:13	0.0	1.5	7301.2	0.7
27Feb2019	05:14	0.0	1.5	7301.2	0.7
27Feb2019	05:15	0.0	1.5	7301.2	0.7
27Feb2019	05:16	0.0	1.5	7301.2	0.6
27Feb2019	05:17	0.0	1.5	7301.2	0.6
27Feb2019	05:18	0.0	1.5	7301.2	0.6
27Feb2019	05:19	0.0	1.5	7301.2	0.6
27Feb2019	05:20	0.0	1.5	7301.2	0.6
27Feb2019	05:21	0.0	1.5	7301.2	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	05:22	0.0	1.5	7301.2	0.6
27Feb2019	05:23	0.0	1.5	7301.2	0.6
27Feb2019	05:24	0.0	1.5	7301.2	0.6
27Feb2019	05:25	0.0	1.5	7301.2	0.6
27Feb2019	05:26	0.0	1.5	7301.2	0.6
27Feb2019	05:27	0.0	1.5	7301.2	0.6
27Feb2019	05:28	0.0	1.5	7301.2	0.6
27Feb2019	05:29	0.0	1.5	7301.2	0.6
27Feb2019	05:30	0.0	1.5	7301.2	0.6
27Feb2019	05:31	0.0	1.5	7301.2	0.6
27Feb2019	05:32	0.0	1.5	7301.2	0.6
27Feb2019	05:33	0.0	1.5	7301.2	0.6
27Feb2019	05:34	0.0	1.5	7301.2	0.6
27Feb2019	05:35	0.0	1.5	7301.2	0.6
27Feb2019	05:36	0.0	1.5	7301.2	0.6
27Feb2019	05:37	0.0	1.5	7301.2	0.6
27Feb2019	05:38	0.0	1.5	7301.2	0.6
27Feb2019	05:39	0.0	1.5	7301.2	0.6
27Feb2019	05:40	0.0	1.5	7301.2	0.6
27Feb2019	05:41	0.0	1.5	7301.2	0.6
27Feb2019	05:42	0.0	1.5	7301.2	0.6
27Feb2019	05:43	0.0	1.5	7301.2	0.6
27Feb2019	05:44	0.0	1.5	7301.2	0.6
27Feb2019	05:45	0.0	1.5	7301.2	0.6
27Feb2019	05:46	0.0	1.5	7301.2	0.6
27Feb2019	05:47	0.0	1.5	7301.2	0.6
27Feb2019	05:48	0.0	1.5	7301.2	0.6
27Feb2019	05:49	0.0	1.5	7301.2	0.6
27Feb2019	05:50	0.0	1.5	7301.2	0.6
27Feb2019	05:51	0.0	1.5	7301.2	0.6
27Feb2019	05:52	0.0	1.5	7301.2	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	05:53	0.0	1.5	7301.2	0.6
27Feb2019	05:54	0.0	1.5	7301.2	0.6
27Feb2019	05:55	0.0	1.5	7301.2	0.6
27Feb2019	05:56	0.0	1.5	7301.2	0.6
27Feb2019	05:57	0.0	1.5	7301.2	0.6
27Feb2019	05:58	0.0	1.5	7301.2	0.6
27Feb2019	05:59	0.0	1.5	7301.2	0.6
27Feb2019	06:00	0.0	1.5	7301.1	0.6
27Feb2019	06:01	0.0	1.5	7301.1	0.6
27Feb2019	06:02	0.0	1.5	7301.1	0.6
27Feb2019	06:03	0.0	1.5	7301.1	0.6
27Feb2019	06:04	0.0	1.5	7301.1	0.6
27Feb2019	06:05	0.0	1.5	7301.1	0.6
27Feb2019	06:06	0.0	1.5	7301.1	0.6
27Feb2019	06:07	0.0	1.5	7301.1	0.6
27Feb2019	06:08	0.0	1.5	7301.1	0.6
27Feb2019	06:09	0.0	1.5	7301.1	0.6
27Feb2019	06:10	0.0	1.5	7301.1	0.6
27Feb2019	06:11	0.0	1.5	7301.1	0.6
27Feb2019	06:12	0.0	1.5	7301.1	0.6
27Feb2019	06:13	0.0	1.5	7301.1	0.6
27Feb2019	06:14	0.0	1.5	7301.1	0.6
27Feb2019	06:15	0.0	1.5	7301.1	0.6
27Feb2019	06:16	0.0	1.5	7301.1	0.6
27Feb2019	06:17	0.0	1.5	7301.1	0.6
27Feb2019	06:18	0.0	1.5	7301.1	0.6
27Feb2019	06:19	0.0	1.5	7301.1	0.6
27Feb2019	06:20	0.0	1.5	7301.1	0.6
27Feb2019	06:21	0.0	1.5	7301.1	0.6
27Feb2019	06:22	0.0	1.5	7301.1	0.6
27Feb2019	06:23	0.0	1.5	7301.1	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	06:24	0.0	1.5	7301.1	0.6
27Feb2019	06:25	0.0	1.5	7301.1	0.6
27Feb2019	06:26	0.0	1.5	7301.1	0.6
27Feb2019	06:27	0.0	1.5	7301.1	0.6
27Feb2019	06:28	0.0	1.5	7301.1	0.6
27Feb2019	06:29	0.0	1.5	7301.1	0.6
27Feb2019	06:30	0.0	1.5	7301.1	0.6
27Feb2019	06:31	0.0	1.5	7301.1	0.6
27Feb2019	06:32	0.0	1.5	7301.1	0.6
27Feb2019	06:33	0.0	1.5	7301.1	0.6
27Feb2019	06:34	0.0	1.5	7301.1	0.6
27Feb2019	06:35	0.0	1.5	7301.1	0.6
27Feb2019	06:36	0.0	1.5	7301.1	0.6
27Feb2019	06:37	0.0	1.5	7301.1	0.6
27Feb2019	06:38	0.0	1.5	7301.1	0.6
27Feb2019	06:39	0.0	1.5	7301.1	0.6
27Feb2019	06:40	0.0	1.5	7301.1	0.6
27Feb2019	06:41	0.0	1.5	7301.1	0.6
27Feb2019	06:42	0.0	1.5	7301.1	0.6
27Feb2019	06:43	0.0	1.5	7301.1	0.6
27Feb2019	06:44	0.0	1.5	7301.1	0.6
27Feb2019	06:45	0.0	1.5	7301.1	0.6
27Feb2019	06:46	0.0	1.5	7301.1	0.6
27Feb2019	06:47	0.0	1.4	7301.1	0.6
27Feb2019	06:48	0.0	1.4	7301.1	0.6
27Feb2019	06:49	0.0	1.4	7301.1	0.6
27Feb2019	06:50	0.0	1.4	7301.1	0.6
27Feb2019	06:51	0.0	1.4	7301.1	0.6
27Feb2019	06:52	0.0	1.4	7301.1	0.6
27Feb2019	06:53	0.0	1.4	7301.1	0.6
27Feb2019	06:54	0.0	1.4	7301.1	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	06:55	0.0	1.4	7301.1	0.6
27Feb2019	06:56	0.0	1.4	7301.1	0.6
27Feb2019	06:57	0.0	1.4	7301.1	0.6
27Feb2019	06:58	0.0	1.4	7301.1	0.6
27Feb2019	06:59	0.0	1.4	7301.1	0.6
27Feb2019	07:00	0.0	1.4	7301.1	0.6
27Feb2019	07:01	0.0	1.4	7301.1	0.6
27Feb2019	07:02	0.0	1.4	7301.1	0.6
27Feb2019	07:03	0.0	1.4	7301.1	0.6
27Feb2019	07:04	0.0	1.4	7301.1	0.6
27Feb2019	07:05	0.0	1.4	7301.1	0.6
27Feb2019	07:06	0.0	1.4	7301.1	0.6
27Feb2019	07:07	0.0	1.4	7301.1	0.6
27Feb2019	07:08	0.0	1.4	7301.1	0.6
27Feb2019	07:09	0.0	1.4	7301.1	0.6
27Feb2019	07:10	0.0	1.4	7301.1	0.6
27Feb2019	07:11	0.0	1.4	7301.1	0.6
27Feb2019	07:12	0.0	1.4	7301.1	0.6
27Feb2019	07:13	0.0	1.4	7301.1	0.6
27Feb2019	07:14	0.0	1.4	7301.1	0.6
27Feb2019	07:15	0.0	1.4	7301.1	0.6
27Feb2019	07:16	0.0	1.4	7301.1	0.6
27Feb2019	07:17	0.0	1.4	7301.1	0.6
27Feb2019	07:18	0.0	1.4	7301.1	0.6
27Feb2019	07:19	0.0	1.4	7301.1	0.6
27Feb2019	07:20	0.0	1.4	7301.1	0.6
27Feb2019	07:21	0.0	1.4	7301.1	0.6
27Feb2019	07:22	0.0	1.4	7301.1	0.6
27Feb2019	07:23	0.0	1.4	7301.1	0.6
27Feb2019	07:24	0.0	1.4	7301.1	0.6
27Feb2019	07:25	0.0	1.4	7301.1	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	07:26	0.0	1.4	7301.1	0.6
27Feb2019	07:27	0.0	1.4	7301.1	0.6
27Feb2019	07:28	0.0	1.4	7301.1	0.6
27Feb2019	07:29	0.0	1.4	7301.1	0.6
27Feb2019	07:30	0.0	1.4	7301.1	0.6
27Feb2019	07:31	0.0	1.4	7301.1	0.6
27Feb2019	07:32	0.0	1.4	7301.1	0.6
27Feb2019	07:33	0.0	1.4	7301.1	0.6
27Feb2019	07:34	0.0	1.4	7301.1	0.6
27Feb2019	07:35	0.0	1.4	7301.1	0.6
27Feb2019	07:36	0.0	1.4	7301.1	0.6
27Feb2019	07:37	0.0	1.4	7301.1	0.6
27Feb2019	07:38	0.0	1.4	7301.1	0.6
27Feb2019	07:39	0.0	1.4	7301.1	0.6
27Feb2019	07:40	0.0	1.4	7301.1	0.6
27Feb2019	07:41	0.0	1.4	7301.1	0.6
27Feb2019	07:42	0.0	1.4	7301.1	0.6
27Feb2019	07:43	0.0	1.4	7301.1	0.6
27Feb2019	07:44	0.0	1.4	7301.1	0.6
27Feb2019	07:45	0.0	1.4	7301.1	0.6
27Feb2019	07:46	0.0	1.4	7301.1	0.6
27Feb2019	07:47	0.0	1.4	7301.1	0.6
27Feb2019	07:48	0.0	1.4	7301.1	0.6
27Feb2019	07:49	0.0	1.4	7301.1	0.6
27Feb2019	07:50	0.0	1.4	7301.1	0.6
27Feb2019	07:51	0.0	1.4	7301.1	0.6
27Feb2019	07:52	0.0	1.4	7301.1	0.6
27Feb2019	07:53	0.0	1.4	7301.1	0.6
27Feb2019	07:54	0.0	1.4	7301.1	0.6
27Feb2019	07:55	0.0	1.4	7301.1	0.6
27Feb2019	07:56	0.0	1.4	7301.1	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	07:57	0.0	1.4	7301.1	0.6
27Feb2019	07:58	0.0	1.4	7301.1	0.6
27Feb2019	07:59	0.0	1.4	7301.1	0.6
27Feb2019	08:00	0.0	1.4	7301.1	0.6
27Feb2019	08:01	0.0	1.4	7301.1	0.6
27Feb2019	08:02	0.0	1.4	7301.1	0.6
27Feb2019	08:03	0.0	1.4	7301.1	0.6
27Feb2019	08:04	0.0	1.4	7301.1	0.6
27Feb2019	08:05	0.0	1.4	7301.1	0.6
27Feb2019	08:06	0.0	1.4	7301.1	0.6
27Feb2019	08:07	0.0	1.4	7301.1	0.6
27Feb2019	08:08	0.0	1.4	7301.1	0.6
27Feb2019	08:09	0.0	1.4	7301.1	0.6
27Feb2019	08:10	0.0	1.4	7301.1	0.6
27Feb2019	08:11	0.0	1.4	7301.1	0.6
27Feb2019	08:12	0.0	1.4	7301.1	0.6
27Feb2019	08:13	0.0	1.4	7301.1	0.6
27Feb2019	08:14	0.0	1.4	7301.1	0.6
27Feb2019	08:15	0.0	1.4	7301.1	0.6
27Feb2019	08:16	0.0	1.4	7301.1	0.6
27Feb2019	08:17	0.0	1.4	7301.1	0.6
27Feb2019	08:18	0.0	1.4	7301.1	0.6
27Feb2019	08:19	0.0	1.4	7301.1	0.6
27Feb2019	08:20	0.0	1.4	7301.1	0.6
27Feb2019	08:21	0.0	1.4	7301.1	0.6
27Feb2019	08:22	0.0	1.4	7301.1	0.6
27Feb2019	08:23	0.0	1.4	7301.1	0.6
27Feb2019	08:24	0.0	1.4	7301.1	0.6
27Feb2019	08:25	0.0	1.4	7301.1	0.6
27Feb2019	08:26	0.0	1.4	7301.1	0.6
27Feb2019	08:27	0.0	1.4	7301.1	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	08:28	0.0	1.4	7301.1	0.6
27Feb2019	08:29	0.0	1.4	7301.1	0.6
27Feb2019	08:30	0.0	1.4	7301.1	0.6
27Feb2019	08:31	0.0	1.4	7301.1	0.6
27Feb2019	08:32	0.0	1.4	7301.1	0.6
27Feb2019	08:33	0.0	1.4	7301.1	0.6
27Feb2019	08:34	0.0	1.4	7301.1	0.6
27Feb2019	08:35	0.0	1.4	7301.1	0.6
27Feb2019	08:36	0.0	1.4	7301.1	0.6
27Feb2019	08:37	0.0	1.4	7301.1	0.6
27Feb2019	08:38	0.0	1.4	7301.1	0.6
27Feb2019	08:39	0.0	1.4	7301.1	0.6
27Feb2019	08:40	0.0	1.4	7301.1	0.6
27Feb2019	08:41	0.0	1.4	7301.0	0.6
27Feb2019	08:42	0.0	1.4	7301.0	0.6
27Feb2019	08:43	0.0	1.4	7301.0	0.6
27Feb2019	08:44	0.0	1.3	7301.0	0.6
27Feb2019	08:45	0.0	1.3	7301.0	0.6
27Feb2019	08:46	0.0	1.3	7301.0	0.6
27Feb2019	08:47	0.0	1.3	7301.0	0.6
27Feb2019	08:48	0.0	1.3	7301.0	0.6
27Feb2019	08:49	0.0	1.3	7301.0	0.6
27Feb2019	08:50	0.0	1.3	7301.0	0.6
27Feb2019	08:51	0.0	1.3	7301.0	0.6
27Feb2019	08:52	0.0	1.3	7301.0	0.6
27Feb2019	08:53	0.0	1.3	7301.0	0.6
27Feb2019	08:54	0.0	1.3	7301.0	0.6
27Feb2019	08:55	0.0	1.3	7301.0	0.6
27Feb2019	08:56	0.0	1.3	7301.0	0.6
27Feb2019	08:57	0.0	1.3	7301.0	0.6
27Feb2019	08:58	0.0	1.3	7301.0	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	08:59	0.0	1.3	7301.0	0.6
27Feb2019	09:00	0.0	1.3	7301.0	0.6
27Feb2019	09:01	0.0	1.3	7301.0	0.6
27Feb2019	09:02	0.0	1.3	7301.0	0.6
27Feb2019	09:03	0.0	1.3	7301.0	0.6
27Feb2019	09:04	0.0	1.3	7301.0	0.6
27Feb2019	09:05	0.0	1.3	7301.0	0.6
27Feb2019	09:06	0.0	1.3	7301.0	0.6
27Feb2019	09:07	0.0	1.3	7301.0	0.6
27Feb2019	09:08	0.0	1.3	7301.0	0.6
27Feb2019	09:09	0.0	1.3	7301.0	0.6
27Feb2019	09:10	0.0	1.3	7301.0	0.6
27Feb2019	09:11	0.0	1.3	7301.0	0.6
27Feb2019	09:12	0.0	1.3	7301.0	0.6
27Feb2019	09:13	0.0	1.3	7301.0	0.6
27Feb2019	09:14	0.0	1.3	7301.0	0.6
27Feb2019	09:15	0.0	1.3	7301.0	0.6
27Feb2019	09:16	0.0	1.3	7301.0	0.6
27Feb2019	09:17	0.0	1.3	7301.0	0.6
27Feb2019	09:18	0.0	1.3	7301.0	0.6
27Feb2019	09:19	0.0	1.3	7301.0	0.6
27Feb2019	09:20	0.0	1.3	7301.0	0.6
27Feb2019	09:21	0.0	1.3	7301.0	0.6
27Feb2019	09:22	0.0	1.3	7301.0	0.6
27Feb2019	09:23	0.0	1.3	7301.0	0.6
27Feb2019	09:24	0.0	1.3	7301.0	0.6
27Feb2019	09:25	0.0	1.3	7301.0	0.6
27Feb2019	09:26	0.0	1.3	7301.0	0.6
27Feb2019	09:27	0.0	1.3	7301.0	0.6
27Feb2019	09:28	0.0	1.3	7301.0	0.6
27Feb2019	09:29	0.0	1.3	7301.0	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	09:30	0.0	1.3	7301.0	0.6
27Feb2019	09:31	0.0	1.3	7301.0	0.6
27Feb2019	09:32	0.0	1.3	7301.0	0.6
27Feb2019	09:33	0.0	1.3	7301.0	0.6
27Feb2019	09:34	0.0	1.3	7301.0	0.6
27Feb2019	09:35	0.0	1.3	7301.0	0.6
27Feb2019	09:36	0.0	1.3	7301.0	0.6
27Feb2019	09:37	0.0	1.3	7301.0	0.6
27Feb2019	09:38	0.0	1.3	7301.0	0.6
27Feb2019	09:39	0.0	1.3	7301.0	0.6
27Feb2019	09:40	0.0	1.3	7301.0	0.6
27Feb2019	09:41	0.0	1.3	7301.0	0.6
27Feb2019	09:42	0.0	1.3	7301.0	0.6
27Feb2019	09:43	0.0	1.3	7301.0	0.6
27Feb2019	09:44	0.0	1.3	7301.0	0.6
27Feb2019	09:45	0.0	1.3	7301.0	0.6
27Feb2019	09:46	0.0	1.3	7301.0	0.6
27Feb2019	09:47	0.0	1.3	7301.0	0.6
27Feb2019	09:48	0.0	1.3	7301.0	0.6
27Feb2019	09:49	0.0	1.3	7301.0	0.6
27Feb2019	09:50	0.0	1.3	7301.0	0.6
27Feb2019	09:51	0.0	1.3	7301.0	0.6
27Feb2019	09:52	0.0	1.3	7301.0	0.6
27Feb2019	09:53	0.0	1.3	7301.0	0.6
27Feb2019	09:54	0.0	1.3	7301.0	0.6
27Feb2019	09:55	0.0	1.3	7301.0	0.6
27Feb2019	09:56	0.0	1.3	7301.0	0.6
27Feb2019	09:57	0.0	1.3	7301.0	0.6
27Feb2019	09:58	0.0	1.3	7301.0	0.6
27Feb2019	09:59	0.0	1.3	7301.0	0.6
27Feb2019	10:00	0.0	1.3	7301.0	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	10:01	0.0	1.3	7301.0	0.6
27Feb2019	10:02	0.0	1.3	7301.0	0.6
27Feb2019	10:03	0.0	1.3	7301.0	0.6
27Feb2019	10:04	0.0	1.3	7301.0	0.6
27Feb2019	10:05	0.0	1.3	7301.0	0.6
27Feb2019	10:06	0.0	1.3	7301.0	0.6
27Feb2019	10:07	0.0	1.3	7301.0	0.6
27Feb2019	10:08	0.0	1.3	7301.0	0.6
27Feb2019	10:09	0.0	1.3	7301.0	0.6
27Feb2019	10:10	0.0	1.3	7301.0	0.6
27Feb2019	10:11	0.0	1.3	7301.0	0.6
27Feb2019	10:12	0.0	1.3	7301.0	0.6
27Feb2019	10:13	0.0	1.3	7301.0	0.6
27Feb2019	10:14	0.0	1.3	7301.0	0.6
27Feb2019	10:15	0.0	1.3	7301.0	0.6
27Feb2019	10:16	0.0	1.3	7301.0	0.6
27Feb2019	10:17	0.0	1.3	7301.0	0.6
27Feb2019	10:18	0.0	1.3	7301.0	0.6
27Feb2019	10:19	0.0	1.3	7301.0	0.6
27Feb2019	10:20	0.0	1.3	7301.0	0.6
27Feb2019	10:21	0.0	1.3	7301.0	0.6
27Feb2019	10:22	0.0	1.3	7301.0	0.6
27Feb2019	10:23	0.0	1.3	7301.0	0.6
27Feb2019	10:24	0.0	1.3	7301.0	0.6
27Feb2019	10:25	0.0	1.3	7301.0	0.6
27Feb2019	10:26	0.0	1.3	7301.0	0.6
27Feb2019	10:27	0.0	1.3	7301.0	0.6
27Feb2019	10:28	0.0	1.3	7301.0	0.6
27Feb2019	10:29	0.0	1.3	7301.0	0.6
27Feb2019	10:30	0.0	1.3	7301.0	0.6
27Feb2019	10:31	0.0	1.3	7301.0	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	10:32	0.0	1.3	7301.0	0.6
27Feb2019	10:33	0.0	1.3	7301.0	0.6
27Feb2019	10:34	0.0	1.3	7301.0	0.6
27Feb2019	10:35	0.0	1.3	7301.0	0.6
27Feb2019	10:36	0.0	1.3	7301.0	0.6
27Feb2019	10:37	0.0	1.3	7301.0	0.6
27Feb2019	10:38	0.0	1.3	7301.0	0.6
27Feb2019	10:39	0.0	1.3	7301.0	0.6
27Feb2019	10:40	0.0	1.3	7301.0	0.6
27Feb2019	10:41	0.0	1.3	7301.0	0.6
27Feb2019	10:42	0.0	1.3	7301.0	0.6
27Feb2019	10:43	0.0	1.3	7301.0	0.6
27Feb2019	10:44	0.0	1.2	7301.0	0.6
27Feb2019	10:45	0.0	1.2	7301.0	0.6
27Feb2019	10:46	0.0	1.2	7301.0	0.6
27Feb2019	10:47	0.0	1.2	7301.0	0.6
27Feb2019	10:48	0.0	1.2	7301.0	0.6
27Feb2019	10:49	0.0	1.2	7301.0	0.6
27Feb2019	10:50	0.0	1.2	7301.0	0.6
27Feb2019	10:51	0.0	1.2	7301.0	0.6
27Feb2019	10:52	0.0	1.2	7301.0	0.6
27Feb2019	10:53	0.0	1.2	7301.0	0.6
27Feb2019	10:54	0.0	1.2	7301.0	0.6
27Feb2019	10:55	0.0	1.2	7301.0	0.6
27Feb2019	10:56	0.0	1.2	7301.0	0.6
27Feb2019	10:57	0.0	1.2	7301.0	0.6
27Feb2019	10:58	0.0	1.2	7301.0	0.6
27Feb2019	10:59	0.0	1.2	7301.0	0.6
27Feb2019	11:00	0.0	1.2	7301.0	0.6
27Feb2019	11:01	0.0	1.2	7301.0	0.6
27Feb2019	11:02	0.0	1.2	7301.0	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	11:03	0.0	1.2	7301.0	0.6
27Feb2019	11:04	0.0	1.2	7301.0	0.6
27Feb2019	11:05	0.0	1.2	7301.0	0.6
27Feb2019	11:06	0.0	1.2	7301.0	0.6
27Feb2019	11:07	0.0	1.2	7301.0	0.6
27Feb2019	11:08	0.0	1.2	7301.0	0.6
27Feb2019	11:09	0.0	1.2	7301.0	0.6
27Feb2019	11:10	0.0	1.2	7301.0	0.6
27Feb2019	11:11	0.0	1.2	7301.0	0.6
27Feb2019	11:12	0.0	1.2	7301.0	0.6
27Feb2019	11:13	0.0	1.2	7301.0	0.6
27Feb2019	11:14	0.0	1.2	7301.0	0.6
27Feb2019	11:15	0.0	1.2	7301.0	0.6
27Feb2019	11:16	0.0	1.2	7301.0	0.6
27Feb2019	11:17	0.0	1.2	7301.0	0.6
27Feb2019	11:18	0.0	1.2	7301.0	0.6
27Feb2019	11:19	0.0	1.2	7300.9	0.6
27Feb2019	11:20	0.0	1.2	7300.9	0.6
27Feb2019	11:21	0.0	1.2	7300.9	0.6
27Feb2019	11:22	0.0	1.2	7300.9	0.6
27Feb2019	11:23	0.0	1.2	7300.9	0.6
27Feb2019	11:24	0.0	1.2	7300.9	0.6
27Feb2019	11:25	0.0	1.2	7300.9	0.6
27Feb2019	11:26	0.0	1.2	7300.9	0.6
27Feb2019	11:27	0.0	1.2	7300.9	0.6
27Feb2019	11:28	0.0	1.2	7300.9	0.6
27Feb2019	11:29	0.0	1.2	7300.9	0.6
27Feb2019	11:30	0.0	1.2	7300.9	0.6
27Feb2019	11:31	0.0	1.2	7300.9	0.6
27Feb2019	11:32	0.0	1.2	7300.9	0.6
27Feb2019	11:33	0.0	1.2	7300.9	0.6

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)
27Feb2019	11:34	0.0	1.2	7300.9	0.6
27Feb2019	11:35	0.0	1.2	7300.9	0.6
27Feb2019	11:36	0.0	1.2	7300.9	0.6
27Feb2019	11:37	0.0	1.2	7300.9	0.6
27Feb2019	11:38	0.0	1.2	7300.9	0.6
27Feb2019	11:39	0.0	1.2	7300.9	0.6
27Feb2019	11:40	0.0	1.2	7300.9	0.6
27Feb2019	11:41	0.0	1.2	7300.9	0.6
27Feb2019	11:42	0.0	1.2	7300.9	0.6
27Feb2019	11:43	0.0	1.2	7300.9	0.6
27Feb2019	11:44	0.0	1.2	7300.9	0.6
27Feb2019	11:45	0.0	1.2	7300.9	0.6
27Feb2019	11:46	0.0	1.2	7300.9	0.6
27Feb2019	11:47	0.0	1.2	7300.9	0.6
27Feb2019	11:48	0.0	1.2	7300.9	0.6
27Feb2019	11:49	0.0	1.2	7300.9	0.6
27Feb2019	11:50	0.0	1.2	7300.9	0.6
27Feb2019	11:51	0.0	1.2	7300.9	0.6
27Feb2019	11:52	0.0	1.2	7300.9	0.6
27Feb2019	11:53	0.0	1.2	7300.9	0.6
27Feb2019	11:54	0.0	1.2	7300.9	0.6
27Feb2019	11:55	0.0	1.2	7300.9	0.6
27Feb2019	11:56	0.0	1.2	7300.9	0.6
27Feb2019	11:57	0.0	1.2	7300.9	0.6
27Feb2019	11:58	0.0	1.2	7300.9	0.6
27Feb2019	11:59	0.0	1.2	7300.9	0.6
27Feb2019	12:00	0.0	1.2	7300.9	0.6

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: Reach E1.2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units:IN

Computed Results

Peak Inflow:	16.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:07
Peak Discharge:	16.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:12
Inflow Volume:	1.05 (IN)	Discharge Volume:	1.05 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: Reach-E2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	03Jun2021, 16:54:42	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	24.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:16
Peak Discharge:	24.5 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:19
Inflow Volume:	0.55 (IN)	Discharge Volume:	0.55 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: Reach E3.1

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	04Jun2021, 13:52:40	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	21.4 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:09
Peak Discharge:	21.4 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:12
Inflow Volume:	1.03 (IN)	Discharge Volume:	1.03 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: Reach-E3

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	DATA CHANGED, RECOMPUTE	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	36.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:13
Peak Discharge:	36.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:17
Inflow Volume:	0.69 (IN)	Discharge Volume:	0.69 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: Reach-E4

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	DATA CHANGED, RECOMPUTE	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	84.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:10
Peak Discharge:	84.5 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:14
Inflow Volume:	0.85 (IN)	Discharge Volume:	0.85 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: Reach-E6

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units:IN

Computed Results

Peak Inflow:	18.4 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:09
Peak Discharge:	18.4 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:13
Inflow Volume:	0.95 (IN)	Discharge Volume:	0.95 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: Reach-E7

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	DATA CHANGED, RECOMPUTE	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	117.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:11
Peak Discharge:	117.5 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:14
Inflow Volume:	0.91 (IN)	Discharge Volume:	0.91 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: Reach-F2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	18May2021, 16:01:20	Control Specifications:	Control 1

Volume Units:IN

Computed Results

Peak Inflow:	8.6 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:04
Peak Discharge:	8.6 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:08
Inflow Volume:	1.20 (IN)	Discharge Volume:	1.20 (IN)

Project: Winsome_EX_Basins Simulation Run: Prop Basins 100 yr
Reach: Reach-E6-2

Start of Run:	26Feb2019, 00:00	Basin Model:	Proposed Basins
End of Run:	27Feb2019, 12:00	Meteorologic Model:	Prop Basins 100yr
Compute Time:	DATA CHANGED, RECOMPUTE	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	137.4 (CFS)	Date/Time of Peak Inflow	26Feb2019, 12:11
Peak Discharge:	137.3 (CFS)	Date/Time of Peak Discharge	26Feb2019, 12:14
Inflow Volume:	0.90 (IN)	Discharge Volume:	0.90 (IN)

APPENDIX D: HYDRAULICS

Provide the culvert calculation for Culvert 13 - Design Point E1.3

Channel Flows Summary	
Channel Label	*Q100 (cfs)*
2	24.60
E4	117.70
E3	84.60
E1.2	21.40
E2	36.60
9	18.40
1	24.60
10	137.40
6	8.60
4	3.82
7	25.19
5	16.11
F2	8.40
8	7.00

Update the summary table to include the columns:
Velocity, channel lining.

COMPANION DOCUMENT 580-10

ALLOWABLE VELOCITY AND MAXIMUM SHEAR STRESS
Streambank and Shoreland Protection Code 580

Type of Treatment	Allowable Shear lb/sq ft	Velocity ft/sec
Brush Mattresses[1]		
Staked only w/ rock riprap toe (initial)	0.8 - 4.1	5
Staked only w/ rock riprap toe (grown)	4.0 - 8.0	12
Coir Geotextile Roll[2]		
Roll with coir rope mesh staked only without rock riprap toe	0.2 - 0.8	< 5
Roll with Polypropylene rope mesh staked only without rock riprap toe	0.8 - 3.0	< 8
Roll with Polypropylene rope mesh staked and with rock riprap toe	3.0 - 4.0	< 12
Live Fascine[3]		
LF Bundle w/ rock riprap toe	2.0 - 3.1	8
Soils[4]		
Fine colloidal sand	0.02-0.03	1.5
Sandy loam (noncolloidal)	0.03-0.04	1.75
Alluvial silt (noncolloidal)	0.045-0.05	2
Silty loam (noncolloidal)	0.045-0.05	1.75-2.25
Firm loam	0.075	2.5
Fine gravels	0.075	2.5
Stiff clay	0.26	3-4.5
Alluvial silt (colloidal)	0.26	3.75
Graded loam to cobbles	0.38	3.75
Graded silts to cobbles	0.43	4
Shales and hardpan	0.67	6
Gravel/Cobble[4]		
1-inch	0.33	2.5-5
2-inch	0.67	3-6
6-inch	2	4-7.5
12-inch	4	5.5-12
Vegetation[4]		
Class A turf (ret class)	3.7	6-8
Class B turf (ret class)	2.1	4-7
Class C turf (ret class)	1	3.5
Retardance Class D	0.6	Design of roadside channels HEC-15
Retardance Class E	0.35	
Long native grasses	1.2-1.7	4-6
Short native and bunch grass	0.7-0.95	3-4

EFH Notice 210-WI-119
February 2009

Add a footnote or update they hydraulic criteria section of the narrative to define the permissible velocity for "short native grass" and other channel lining proposed for road side ditches, and channels. Include the reference document.

Staff typically use the attached companion document 580-10 which notes 3-4 fps for short native grass. However staff is amenable to other publications such as MHFD DCM, just make sure to include the specific table or section of said manual in the FDR.

Channels 10, E4, & E3 exceeds the allowable velocity for short native grass.

Worksheet for Triangular Channel - 8

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.012 ft/ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	7.00 cfs

Results	
Normal Depth	10.5 in
Flow Area	3.0 ft²
Wetted Perimeter	7.2 ft
Hydraulic Radius	5.1 in
Top Width	6.97 ft
Critical Depth	8.6 in
Critical Slope	0.034 ft/ft
Velocity	2.30 ft/s
Velocity Head	0.08 ft
Specific Energy	0.95 ft
Froude Number	0.615
Flow Type	Subcritical

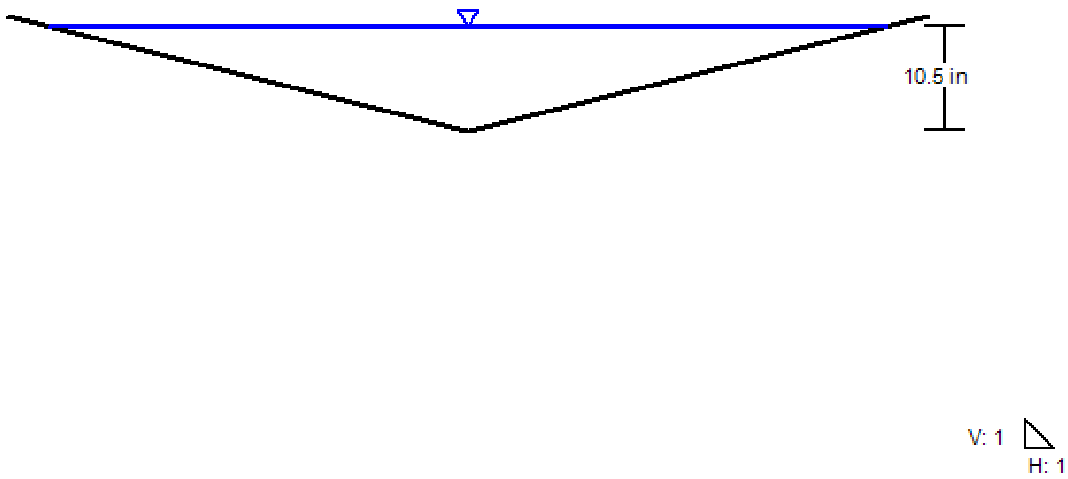
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	10.5 in
Critical Depth	8.6 in
Channel Slope	0.012 ft/ft
Critical Slope	0.034 ft/ft

Cross Section for Triangular Channel - 8

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.012 ft/ft
Normal Depth	10.5 in
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	7.00 cfs



Worksheet for Triangular Channel - F2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.010 ft/ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	8.40 cfs

Results	
Normal Depth	11.6 in
Flow Area	3.7 ft²
Wetted Perimeter	8.0 ft
Hydraulic Radius	5.6 in
Top Width	7.74 ft
Critical Depth	9.3 in
Critical Slope	0.033 ft/ft
Velocity	2.24 ft/s
Velocity Head	0.08 ft
Specific Energy	1.05 ft
Froude Number	0.569
Flow Type	Subcritical

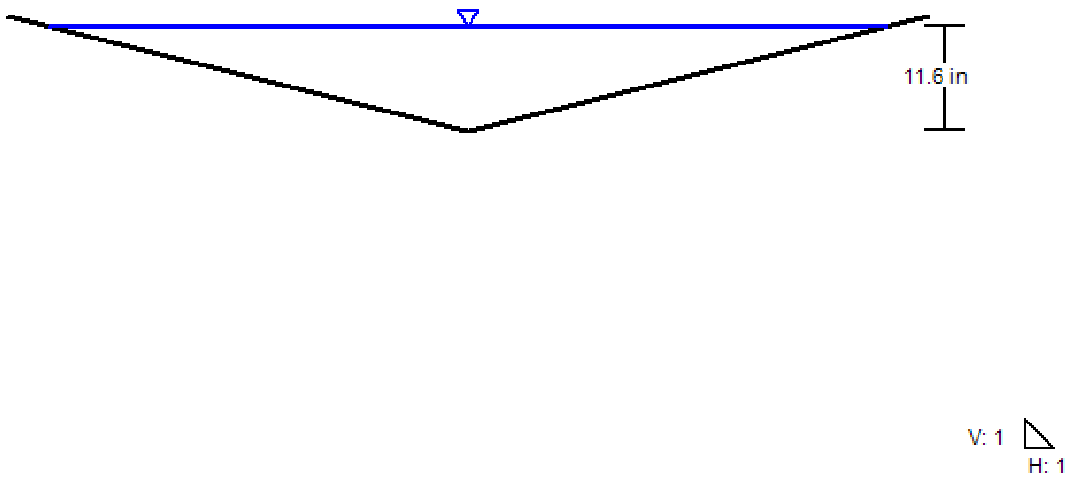
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	11.6 in
Critical Depth	9.3 in
Channel Slope	0.010 ft/ft
Critical Slope	0.033 ft/ft

Cross Section for Triangular Channel - F2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.010 ft/ft
Normal Depth	11.6 in
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	8.40 cfs



Worksheet for Triangular Channel - 5

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.022 ft/ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	16.11 cfs

Results	
Normal Depth	12.8 in
Flow Area	4.5 ft²
Wetted Perimeter	8.8 ft
Hydraulic Radius	6.2 in
Top Width	8.52 ft
Critical Depth	12.0 in
Critical Slope	0.031 ft/ft
Velocity	3.55 ft/s
Velocity Head	0.20 ft
Specific Energy	1.26 ft
Froude Number	0.857
Flow Type	Subcritical

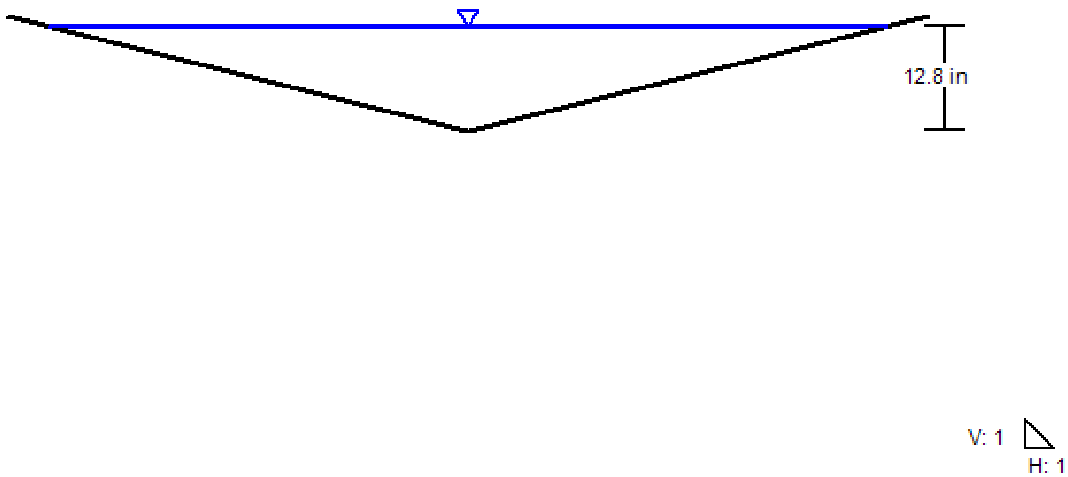
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	12.8 in
Critical Depth	12.0 in
Channel Slope	0.022 ft/ft
Critical Slope	0.031 ft/ft

Cross Section for Triangular Channel - 5

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.022 ft/ft
Normal Depth	12.8 in
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	16.11 cfs



Worksheet for Triangular Channel - 7

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.022 ft/ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	25.19 cfs

Results	
Normal Depth	15.1 in
Flow Area	6.3 ft²
Wetted Perimeter	10.4 ft
Hydraulic Radius	7.3 in
Top Width	10.08 ft
Critical Depth	14.4 in
Critical Slope	0.029 ft/ft
Velocity	3.97 ft/s
Velocity Head	0.24 ft
Specific Energy	1.50 ft
Froude Number	0.881
Flow Type	Subcritical

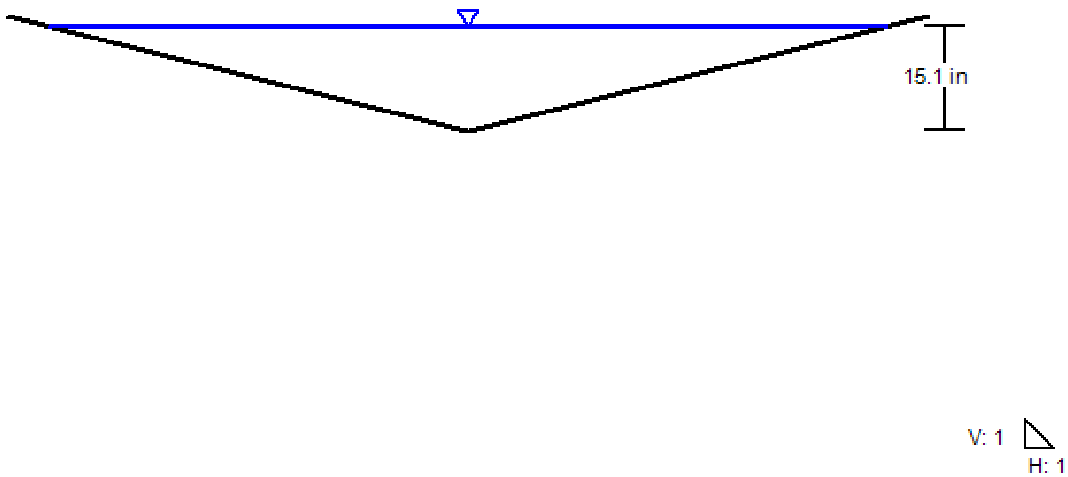
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	15.1 in
Critical Depth	14.4 in
Channel Slope	0.022 ft/ft
Critical Slope	0.029 ft/ft

Cross Section for Triangular Channel - 7

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.022 ft/ft
Normal Depth	15.1 in
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	25.19 cfs



Worksheet for Triangular Channel - 4

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.055 ft/ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	3.82 cfs

Results	
Normal Depth	6.3 in
Flow Area	1.1 ft²
Wetted Perimeter	4.3 ft
Hydraulic Radius	3.0 in
Top Width	4.18 ft
Critical Depth	6.8 in
Critical Slope	0.037 ft/ft
Velocity	3.49 ft/s
Velocity Head	0.19 ft
Specific Energy	0.71 ft
Froude Number	1.204
Flow Type	Supercritical

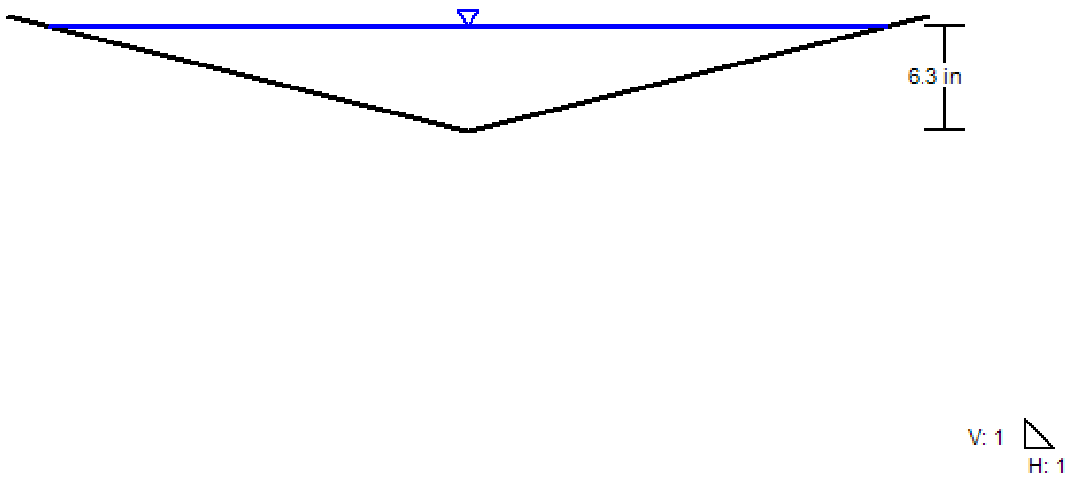
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	6.3 in
Critical Depth	6.8 in
Channel Slope	0.055 ft/ft
Critical Slope	0.037 ft/ft

Cross Section for Triangular Channel - 4

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.055 ft/ft
Normal Depth	6.3 in
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	3.82 cfs



Worksheet for Triangular Channel - 6

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.030 ft/ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	8.60 cfs

Results	
Normal Depth	9.5 in
Flow Area	2.5 ft²
Wetted Perimeter	6.6 ft
Hydraulic Radius	4.6 in
Top Width	6.36 ft
Critical Depth	9.3 in
Critical Slope	0.033 ft/ft
Velocity	3.41 ft/s
Velocity Head	0.18 ft
Specific Energy	0.97 ft
Froude Number	0.952
Flow Type	Subcritical

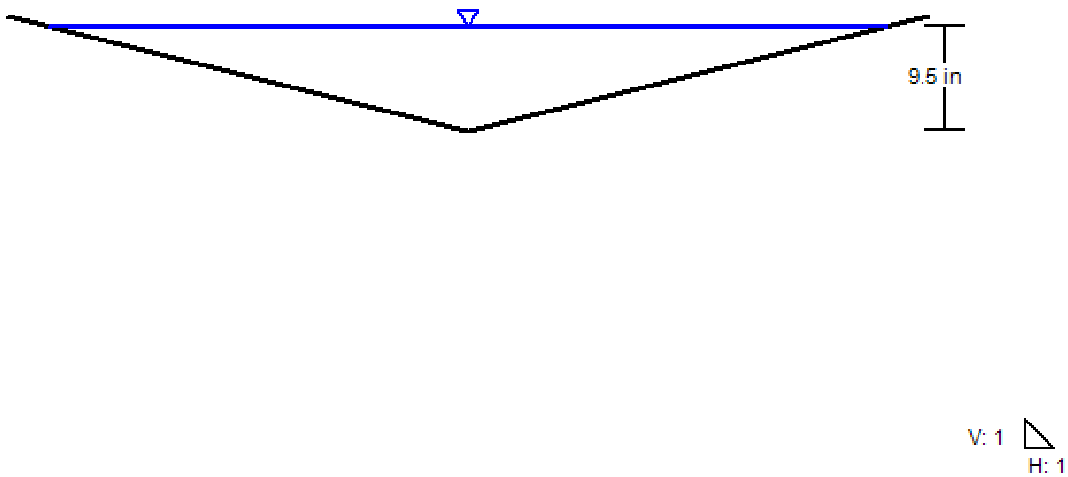
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	9.5 in
Critical Depth	9.3 in
Channel Slope	0.030 ft/ft
Critical Slope	0.033 ft/ft

Cross Section for Triangular Channel - 6

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.030 ft/ft
Normal Depth	9.5 in
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	8.60 cfs



Worksheet for Trapezoidal Channel - 1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.023 ft/ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Bottom Width	6.00 ft
Discharge	24.60 cfs

Results	
Normal Depth	8.8 in
Flow Area	6.6 ft²
Wetted Perimeter	12.1 ft
Hydraulic Radius	6.5 in
Top Width	11.88 ft
Critical Depth	8.2 in
Critical Slope	0.030 ft/ft
Velocity	3.74 ft/s
Velocity Head	0.22 ft
Specific Energy	0.95 ft
Froude Number	0.887
Flow Type	Subcritical

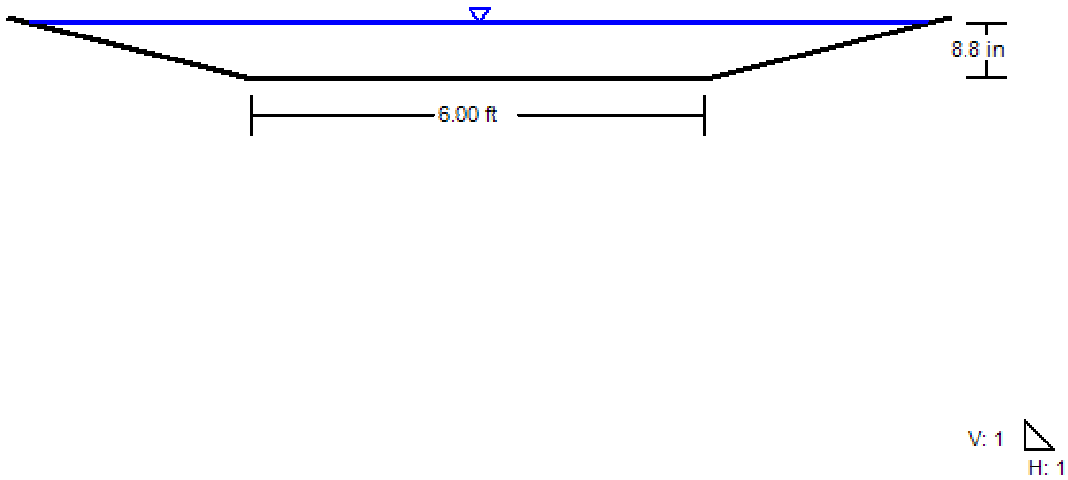
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	8.8 in
Critical Depth	8.2 in
Channel Slope	0.023 ft/ft
Critical Slope	0.030 ft/ft

Cross Section for Trapezoidal Channel - 1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.023 ft/ft
Normal Depth	8.8 in
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Bottom Width	6.00 ft
Discharge	24.60 cfs



Worksheet for Trapezoidal Channel - 9

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.022 ft/ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Bottom Width	6.00 ft
Discharge	18.40 cfs

Results	
Normal Depth	7.6 in
Flow Area	5.4 ft²
Wetted Perimeter	11.2 ft
Hydraulic Radius	5.8 in
Top Width	11.08 ft
Critical Depth	7.0 in
Critical Slope	0.031 ft/ft
Velocity	3.39 ft/s
Velocity Head	0.18 ft
Specific Energy	0.81 ft
Froude Number	0.854
Flow Type	Subcritical

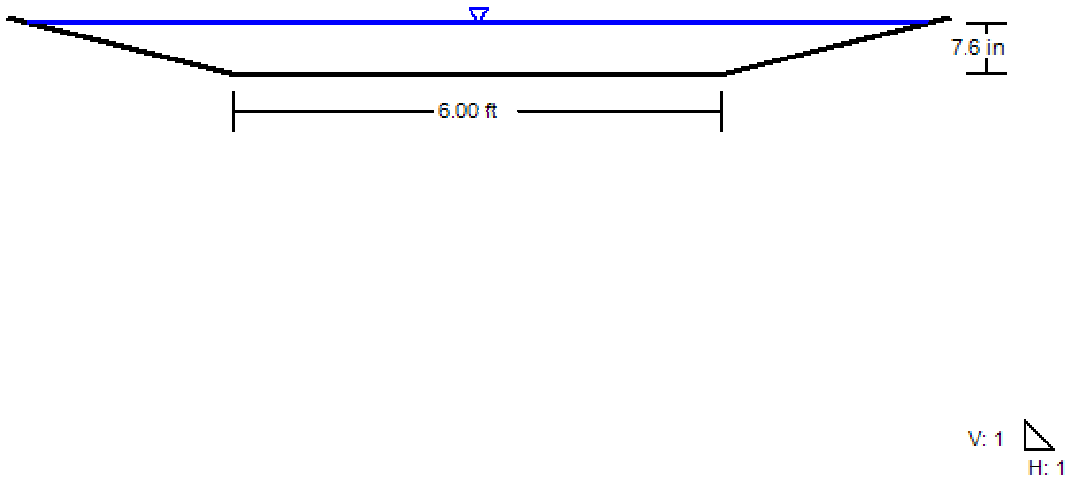
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	7.6 in
Critical Depth	7.0 in
Channel Slope	0.022 ft/ft
Critical Slope	0.031 ft/ft

Cross Section for Trapezoidal Channel - 9

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.022 ft/ft
Normal Depth	7.6 in
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Bottom Width	6.00 ft
Discharge	18.40 cfs



Worksheet for Irregular Section - 2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Discharge	24.60 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,410.00
0+39	7,405.57
0+57	7,401.34
0+62	7,401.35
0+74	7,404.35
1+00	7,404.83

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,410.00)	(1+00, 7,404.83)	0.040

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	9.4 in
Roughness Coefficient	0.040
Elevation	7,402.12 ft
Elevation Range	7,401.3 to 7,410.0 ft
Flow Area	6.3 ft²
Wetted Perimeter	11.5 ft
Hydraulic Radius	6.6 in
Top Width	11.27 ft
Normal Depth	9.4 in
Critical Depth	9.0 in
Critical Slope	0.029 ft/ft
Velocity	3.93 ft/s
Velocity Head	0.24 ft
Specific Energy	1.02 ft
Froude Number	0.929

Worksheet for Irregular Section - 2

Results	
Flow Type	Subcritical

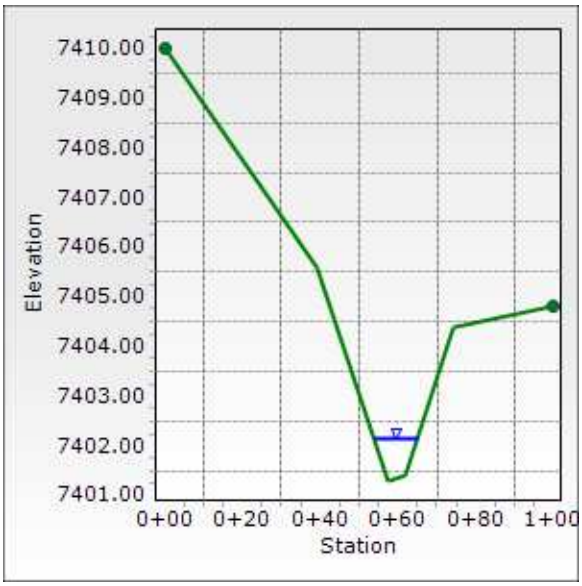
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	9.4 in
Critical Depth	9.0 in
Channel Slope	0.025 ft/ft
Critical Slope	0.029 ft/ft

Cross Section for Irregular Section - 2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Normal Depth	9.4 in
Discharge	24.60 cfs



Worksheet for Irregular Section - E2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.030 ft/ft
Discharge	36.60 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+39	7,385.99
1+32	7,380.81
1+75	7,380.67
2+43	7,383.38
2+76	7,384.91

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+39, 7,385.99)	(2+76, 7,384.91)	0.040

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	4.3 in
Roughness Coefficient	0.040
Elevation	7,381.02 ft
Elevation Range	7,380.7 to 7,386.0 ft
Flow Area	14.2 ft²
Wetted Perimeter	55.5 ft
Hydraulic Radius	3.1 in
Top Width	55.51 ft
Normal Depth	4.3 in
Critical Depth	4.0 in
Critical Slope	0.038 ft/ft
Velocity	2.59 ft/s
Velocity Head	0.10 ft
Specific Energy	0.46 ft
Froude Number	0.903
Flow Type	Subcritical

Worksheet for Irregular Section - E2

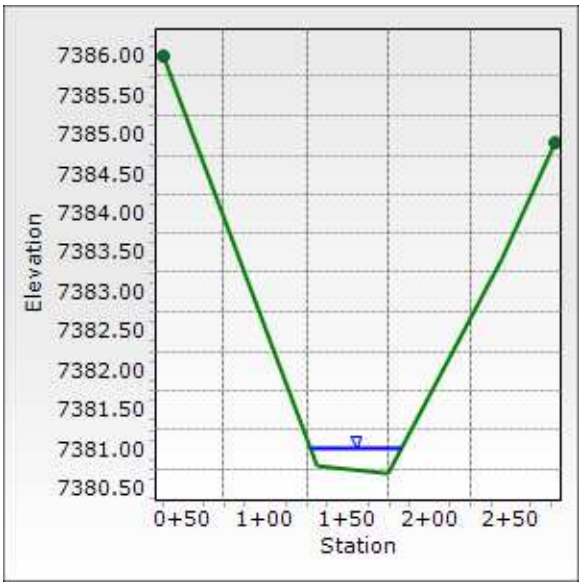
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	4.3 in
Critical Depth	4.0 in
Channel Slope	0.030 ft/ft
Critical Slope	0.038 ft/ft

Cross Section for Irregular Section - E2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.030 ft/ft
Normal Depth	4.3 in
Discharge	36.60 cfs



Worksheet for Trapezoidal Channel - 10

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.013 ft/ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Bottom Width	10.00 ft
Discharge	137.40 cfs

Results	
Normal Depth	20.5 in
Flow Area	28.8 ft²
Wetted Perimeter	24.1 ft
Hydraulic Radius	14.3 in
Top Width	23.68 ft
Critical Depth	17.7 in
Critical Slope	0.023 ft/ft
Velocity	4.77 ft/s
Velocity Head	0.35 ft
Specific Energy	2.06 ft
Froude Number	0.763
Flow Type	Subcritical

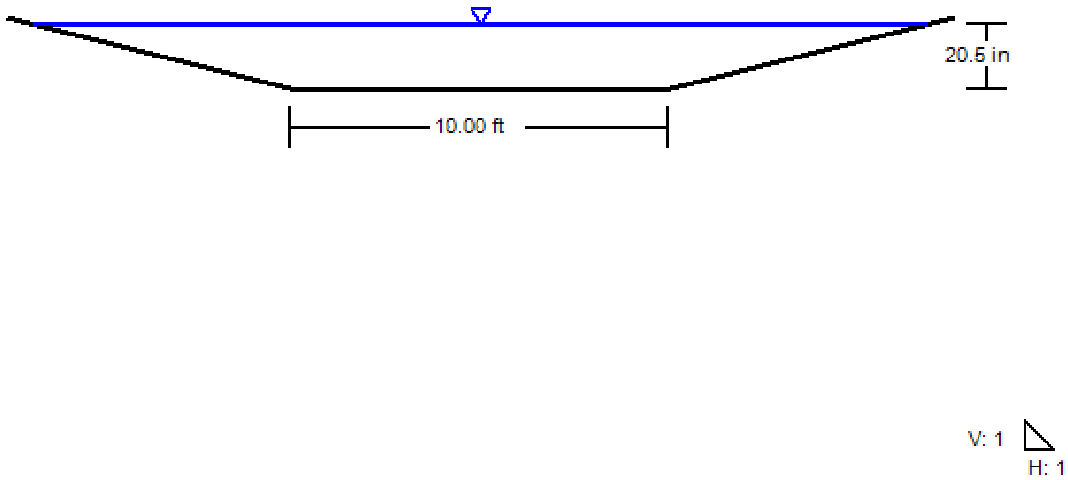
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	20.5 in
Critical Depth	17.7 in
Channel Slope	0.013 ft/ft
Critical Slope	0.023 ft/ft

Cross Section for Trapezoidal Channel - 10

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.040
Channel Slope	0.013 ft/ft
Normal Depth	20.5 in
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Bottom Width	10.00 ft
Discharge	137.40 cfs



Worksheet for Irregular Section - E1.2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Discharge	21.40 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+01	7,377.99
0+45	7,376.39
0+57	7,376.38
0+64	7,376.40
0+97	7,377.99

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+01, 7,377.99)	(0+97, 7,377.99)	0.040

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	4.1 in
Roughness Coefficient	0.040
Elevation	7,376.72 ft
Elevation Range	7,376.4 to 7,378.0 ft
Flow Area	9.0 ft²
Wetted Perimeter	35.0 ft
Hydraulic Radius	3.1 in
Top Width	34.97 ft
Normal Depth	4.1 in
Critical Depth	3.7 in
Critical Slope	0.038 ft/ft
Velocity	2.37 ft/s
Velocity Head	0.09 ft
Specific Energy	0.43 ft
Froude Number	0.825
Flow Type	Subcritical

Worksheet for Irregular Section - E1.2

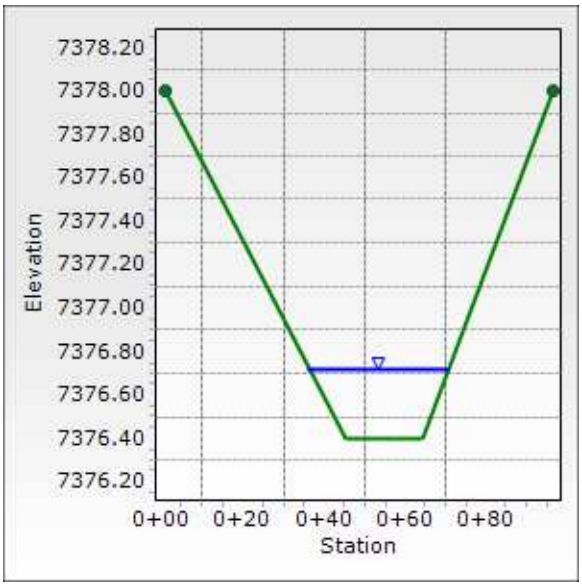
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	4.1 in
Critical Depth	3.7 in
Channel Slope	0.025 ft/ft
Critical Slope	0.038 ft/ft

Cross Section for Irregular Section - E1.2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.025 ft/ft
Normal Depth	4.1 in
Discharge	21.40 cfs



Worksheet for Irregular Section - E4

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.020 ft/ft
Discharge	117.70 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+37	7,336.30
1+12	7,334.36
1+20	7,332.86
1+32	7,332.76
1+47	7,329.66
1+55	7,329.64
1+67	7,332.65
1+78	7,332.76
1+84	7,333.99
2+40	7,337.25

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+37, 7,336.30)	(2+40, 7,337.25)	0.040

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	17.7 in
Roughness Coefficient	0.040
Elevation	7,331.11 ft
Elevation Range	7,329.6 to 7,337.3 ft
Flow Area	22.1 ft²
Wetted Perimeter	21.8 ft
Hydraulic Radius	12.2 in
Top Width	21.43 ft
Normal Depth	17.7 in
Critical Depth	16.9 in
Critical Slope	0.024 ft/ft

Worksheet for Irregular Section - E4

Results	
Velocity	5.32 ft/s
Velocity Head	0.44 ft
Specific Energy	1.91 ft
Froude Number	0.922
Flow Type	Subcritical

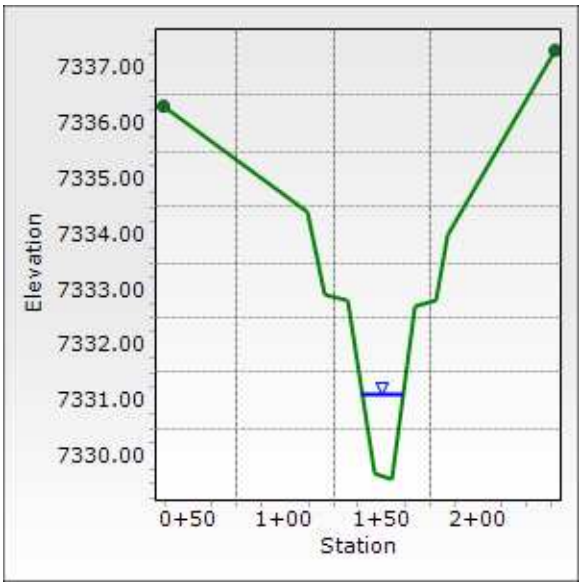
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	17.7 in
Critical Depth	16.9 in
Channel Slope	0.020 ft/ft
Critical Slope	0.024 ft/ft

Cross Section for Irregular Section - E4

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.020 ft/ft
Normal Depth	17.7 in
Discharge	117.70 cfs



Worksheet for Irregular Section - E3

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.023 ft/ft
Discharge	84.60 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05	7,349.91
0+25	7,348.99
0+49	7,348.00
0+68	7,345.99
0+77	7,342.29
0+95	7,340.96
1+24	7,344.37
1+38	7,346.51
1+59	7,350.70

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05, 7,349.91)	(1+59, 7,350.70)	0.040

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	16.0 in
Roughness Coefficient	0.040
Elevation	7,342.29 ft
Elevation Range	7,341.0 to 7,350.7 ft
Flow Area	19.8 ft²
Wetted Perimeter	29.9 ft
Hydraulic Radius	7.9 in
Top Width	29.75 ft
Normal Depth	16.0 in
Critical Depth	15.5 in
Critical Slope	0.027 ft/ft
Velocity	4.28 ft/s

Worksheet for Irregular Section - E3

Results	
Velocity Head	0.28 ft
Specific Energy	1.61 ft
Froude Number	0.925
Flow Type	Subcritical

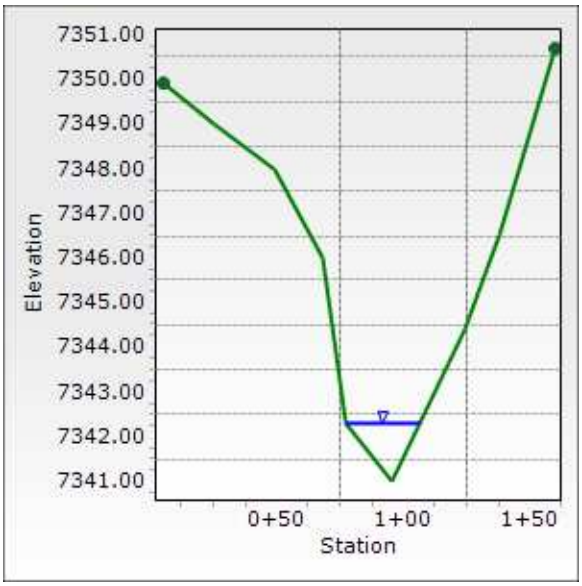
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	16.0 in
Critical Depth	15.5 in
Channel Slope	0.023 ft/ft
Critical Slope	0.027 ft/ft

Cross Section for Irregular Section - E3

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.023 ft/ft
Normal Depth	16.0 in
Discharge	84.60 cfs



Proposed Channel E4 RipRap Sizing at Bend								
Channel ID	100-yr WSEL [ft]	Channel Bottom [ft]	100-yr depth [ft]	100-yr Channel Velocities (ft/sec)	Channel Slope [ft/ft]	Tractive Force (100-yr) [psf]	Requried Riprap D50 [inches] to Meet Criteria	Permisable Shear Stresses [psf] (US DOT Design of Roadside Channels Table 4.1)
E4	7331.1	7329.6	1.5	5.32	0.0200	1.87	12	5.0

Tractive Force (psf) = 62.4(lb/cf) x Depth(ft) x S (ft/ft)

Culvert Summary		
Culvert Label	*Q100 (cfs)*	*Headwater Elevation*
E1.1	24.6	7414.46
E1.2*	37.8	7382.93
E1.5	16.6	7402.83
E2	36.6	7401.41
E3	84.6	7368.38
E4	117.6	7342.67
E5	18.4	7332.45
F2	8.6	7365.78
O1	78.3	7373.04
O2	123	7339.47
*In existing conditions culvert E1.2 will receive flows from E1.1 and E1.2 but once Basin E1.2 is developed, flows will be directed to E1.5		

Update summary table to include the following columns:
HW/D, culvert size.

See EPC DCM Table 6-5 for Hw/D. Adjust pipe size if any does not meet this criteria.

Staff will review the summary on the resubmittal

Elaborate and state whether or not culvert E2 is sized for the diverted flow.

TABLE 6-5

ALLOWABLE CULVERT HEADWATER DEPTHS FOR DESIGN FLOWS

Clear Opening (Ft^2)	Hw/D
200 or Greater	See allowable bridge clearance
200 to 50	$\frac{500 - Area}{300}$
50 or Less	Greater than 1.5 If approved by City/County.

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 37.8 cfs

Maximum Flow: 100 cfs

Table 1 - Summary of Culvert Flows at Crossing: Crossing E1.2

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert E1.2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7380.23	0.00	0.00	0.00	1
7381.32	10.00	10.00	0.00	1
7381.91	20.00	20.00	0.00	1
7382.46	30.00	30.00	0.00	1
7382.98	37.80	37.80	0.00	1
7384.04	50.00	50.00	0.00	1
7384.67	60.00	55.85	4.06	13
7384.77	70.00	56.69	13.24	6
7384.84	80.00	57.33	22.47	4
7384.91	90.00	57.90	32.02	4
7384.97	100.00	58.40	41.57	4
7384.59	55.14	55.14	0.00	Overtopping

Rating Curve Plot for Crossing: Crossing E1.2

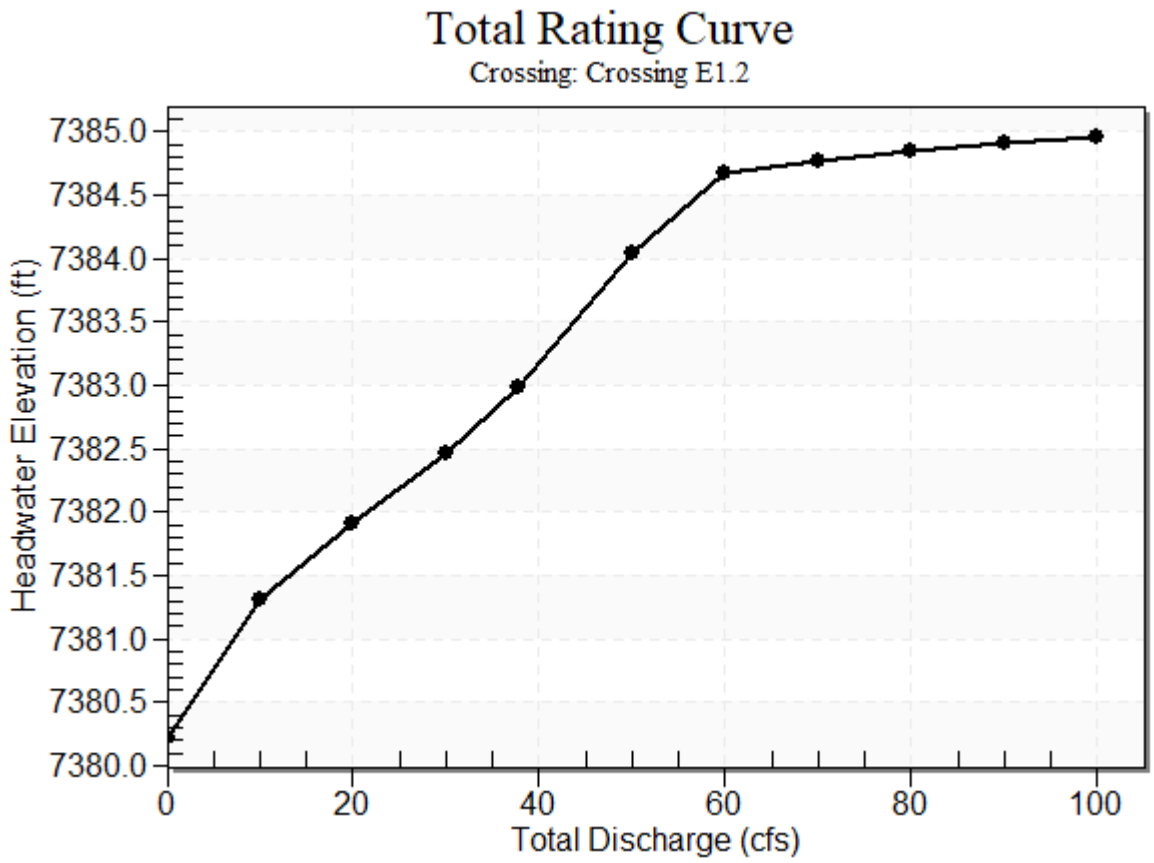


Table 2 - Culvert Summary Table: Culvert E1.2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	7380.23	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
10.00	10.00	7381.32	1.088	0.0*	1-S2n	0.506	0.788	0.506	0.735	8.012	0.617
20.00	20.00	7381.91	1.682	0.0*	1-S2n	0.724	1.131	0.724	0.961	9.744	0.733
30.00	30.00	7382.46	2.234	0.0*	5-S2n	0.905	1.396	0.931	1.123	10.469	0.811
37.80	37.80	7382.98	2.752	0.617	5-S2n	1.035	1.564	1.064	1.227	11.132	0.860
50.00	50.00	7384.04	3.813	1.934	5-S2n	1.234	1.762	1.262	1.365	11.968	0.922
60.00	55.85	7384.67	4.440	2.672	5-S2n	1.332	1.827	1.371	1.464	12.164	0.965
70.00	56.69	7384.77	4.537	2.784	5-S2n	1.347	1.835	1.383	1.552	12.231	1.003
80.00	57.33	7384.84	4.611	2.869	5-S2n	1.358	1.840	1.390	1.633	12.298	1.037
90.00	57.90	7384.91	4.677	2.945	5-S2n	1.368	1.845	1.402	1.708	12.304	1.068
100.00	58.40	7384.97	4.736	3.014	5-S2n	1.376	1.850	1.414	1.778	12.302	1.097

* Full Flow Headwater elevation is below inlet invert.

****

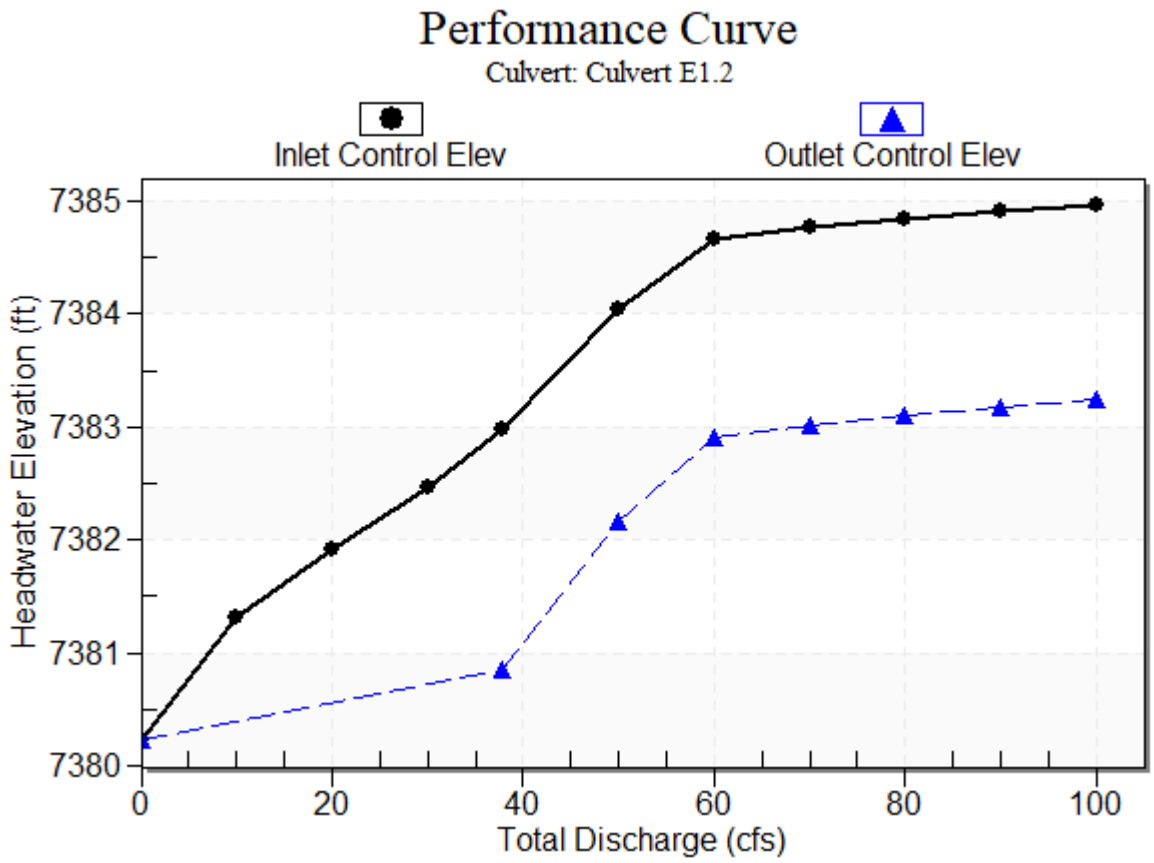
Straight Culvert

Inlet Elevation (invert): 7380.23 ft, Outlet Elevation (invert): 7377.44 ft

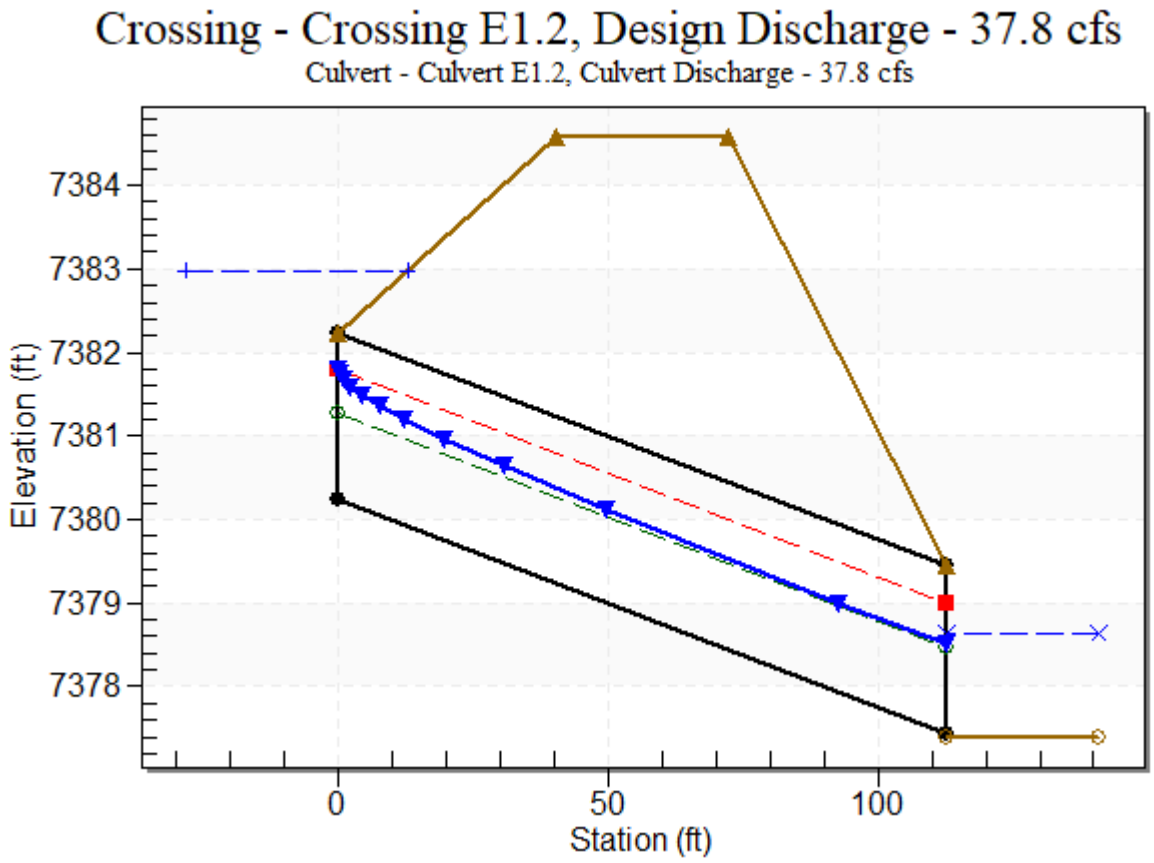
Culvert Length: 112.71 ft, Culvert Slope: 0.0248

****

Culvert Performance Curve Plot: Culvert E1.2



Water Surface Profile Plot for Culvert: Culvert E1.2



Site Data - Culvert E1.2

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 7380.23 ft

Outlet Station: 112.68 ft

Outlet Elevation: 7377.44 ft

Number of Barrels: 2

Culvert Data Summary - Culvert E1.2

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: Crossing E1.2)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	7377.40	0.00	0.00	0.00	0.00
10.00	7378.13	0.73	0.62	0.05	0.18
20.00	7378.36	0.96	0.73	0.06	0.18
30.00	7378.52	1.12	0.81	0.07	0.19
37.80	7378.63	1.23	0.86	0.08	0.19
50.00	7378.77	1.37	0.92	0.09	0.19
60.00	7378.86	1.46	0.97	0.09	0.20
70.00	7378.95	1.55	1.00	0.10	0.20
80.00	7379.03	1.63	1.04	0.10	0.20
90.00	7379.11	1.71	1.07	0.11	0.20
100.00	7379.18	1.78	1.10	0.11	0.20

Tailwater Channel Data - Crossing E1.2

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 1.50 ft

Side Slope (H:V): 28.00 (_:1)

Channel Slope: 0.0010

Channel Manning's n: 0.0400

Channel Invert Elevation: 7377.40 ft

Roadway Data for Crossing: Crossing E1.2

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 60.00 ft

Crest Elevation: 7384.59 ft

Roadway Surface: Paved

Roadway Top Width: 32.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 36.6 cfs

Maximum Flow: 100 cfs

Table 4 - Summary of Culvert Flows at Crossing: Crossing E2

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert E2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7398.34	0.00	0.00	0.00	1
7399.70	10.00	10.00	0.00	1
7400.42	20.00	20.00	0.00	1
7401.02	30.00	30.00	0.00	1
7401.41	36.60	36.60	0.00	1
7402.32	50.00	50.00	0.00	1
7403.17	60.00	60.00	0.00	1
7403.62	70.00	64.57	5.38	8
7403.77	80.00	66.03	13.86	5
7403.89	90.00	67.22	22.75	5
7404.00	100.00	68.25	31.68	4
7403.44	62.81	62.81	0.00	Overtopping

Rating Curve Plot for Crossing: Crossing E2

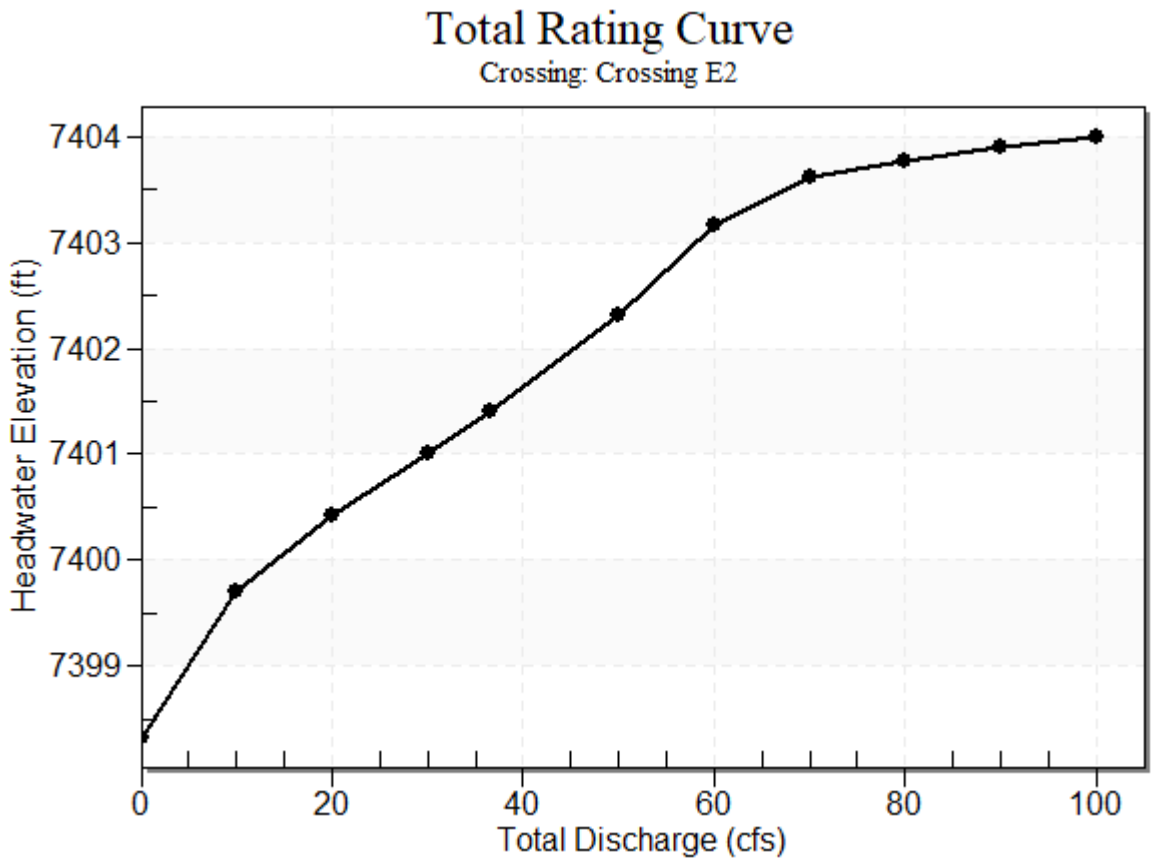


Table 5 - Culvert Summary Table: Culvert E2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	7398.34	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
10.00	10.00	7399.70	1.366	0.282	1-S2n	0.718	1.000	0.740	0.461	7.366	1.834
20.00	20.00	7400.42	2.081	0.894	1-S2n	1.026	1.435	1.083	0.683	8.701	2.302
30.00	30.00	7401.02	2.680	1.527	1-S2n	1.278	1.774	1.368	0.855	9.558	2.615
36.60	36.60	7401.41	3.070	1.979	5-S2n	1.430	1.967	1.540	0.953	10.018	2.779
50.00	50.00	7402.32	3.980	3.346	5-S2n	1.726	2.301	1.861	1.129	10.856	3.052
60.00	60.00	7403.17	4.831	4.094	5-S2n	1.948	2.501	2.090	1.244	11.411	3.220
70.00	64.57	7403.62	5.278	4.468	5-S2n	2.054	2.578	2.192	1.350	11.668	3.368
80.00	66.03	7403.77	5.429	4.592	5-S2n	2.089	2.601	2.225	1.448	11.745	3.500
90.00	67.22	7403.89	5.554	4.694	5-S2n	2.118	2.619	2.252	1.539	11.809	3.619
100.00	68.25	7404.00	5.666	4.784	5-S2n	2.143	2.633	2.276	1.625	11.864	3.729

****

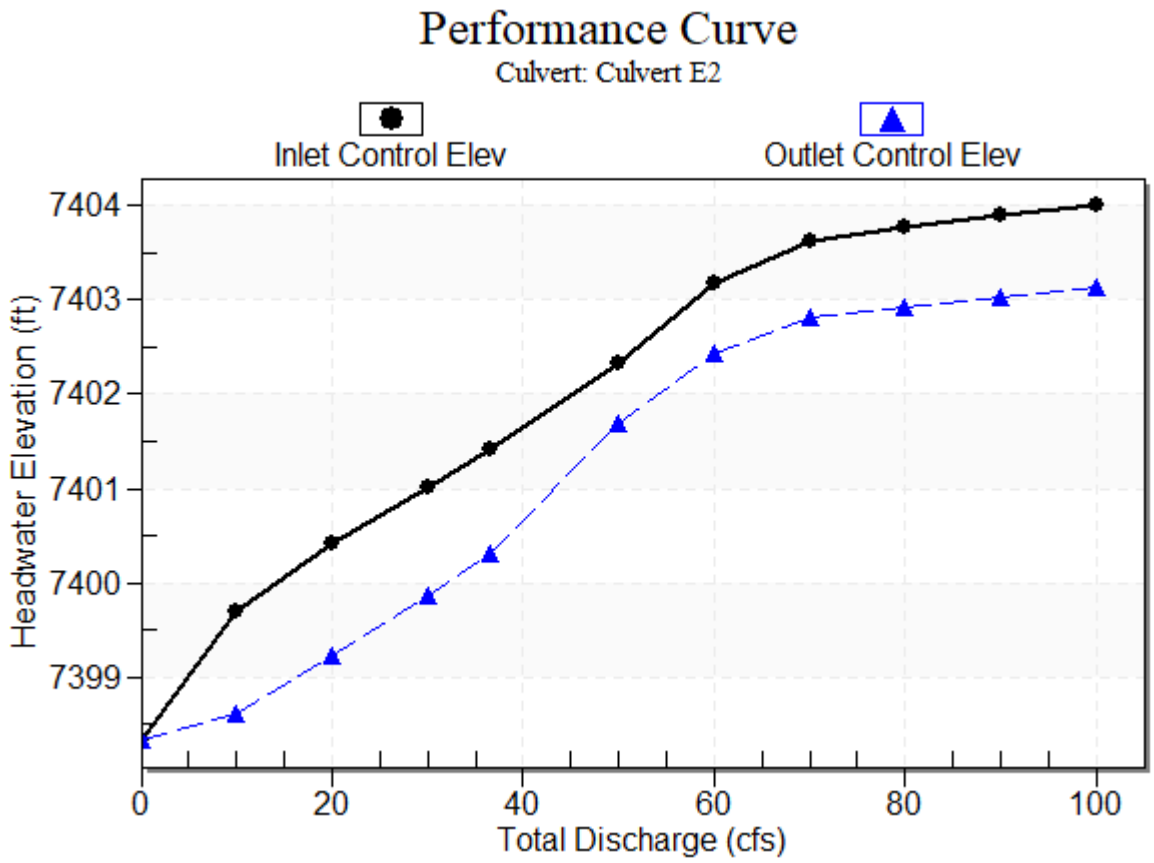
Straight Culvert

Inlet Elevation (invert): 7398.34 ft, Outlet Elevation (invert): 7397.56 ft

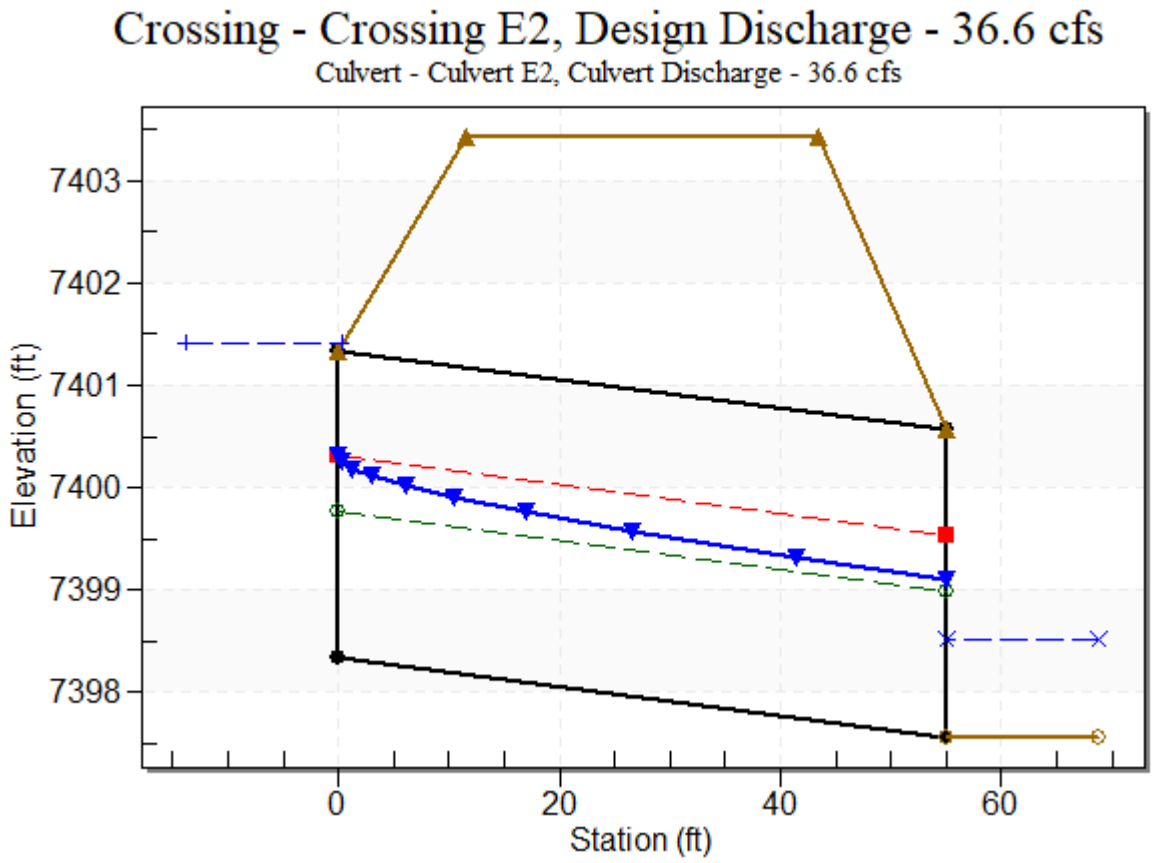
Culvert Length: 55.01 ft, Culvert Slope: 0.0141

****

Culvert Performance Curve Plot: Culvert E2



Water Surface Profile Plot for Culvert: Culvert E2



Site Data - Culvert E2

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 7398.34 ft

Outlet Station: 55.00 ft

Outlet Elevation: 7397.56 ft

Number of Barrels: 1

Culvert Data Summary - Culvert E2

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 6 - Downstream Channel Rating Curve (Crossing: Crossing E2)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	7397.56	0.00	0.00	0.00	0.00
10.00	7398.02	0.46	1.83	0.24	0.51
20.00	7398.24	0.68	2.30	0.36	0.54
30.00	7398.41	0.85	2.61	0.45	0.56
36.60	7398.51	0.95	2.78	0.50	0.57
50.00	7398.69	1.13	3.05	0.59	0.58
60.00	7398.80	1.24	3.22	0.65	0.59
70.00	7398.91	1.35	3.37	0.71	0.59
80.00	7399.01	1.45	3.50	0.76	0.60
90.00	7399.10	1.54	3.62	0.81	0.60
100.00	7399.19	1.63	3.73	0.85	0.61

Tailwater Channel Data - Crossing E2

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 10.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0084

Channel Manning's n: 0.0400

Channel Invert Elevation: 7397.56 ft

Roadway Data for Crossing: Crossing E2

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 24.80 ft

Crest Elevation: 7403.44 ft

Roadway Surface: Paved

Roadway Top Width: 32.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 84.6 cfs

Maximum Flow: 100 cfs

Table 7 - Summary of Culvert Flows at Crossing: Crossing E3

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert E3 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7363.65	0.00	0.00	0.00	1
7364.91	10.00	10.00	0.00	1
7365.46	20.00	20.00	0.00	1
7365.94	30.00	30.00	0.00	1
7366.39	40.00	40.00	0.00	1
7366.80	50.00	50.00	0.00	1
7367.18	60.00	60.00	0.00	1
7367.56	70.00	70.00	0.00	1
7368.14	84.60	84.60	0.00	1
7368.38	90.00	90.00	0.00	1
7368.84	100.00	100.00	0.00	1
7372.18	153.11	153.11	0.00	Overtopping

Rating Curve Plot for Crossing: Crossing E3

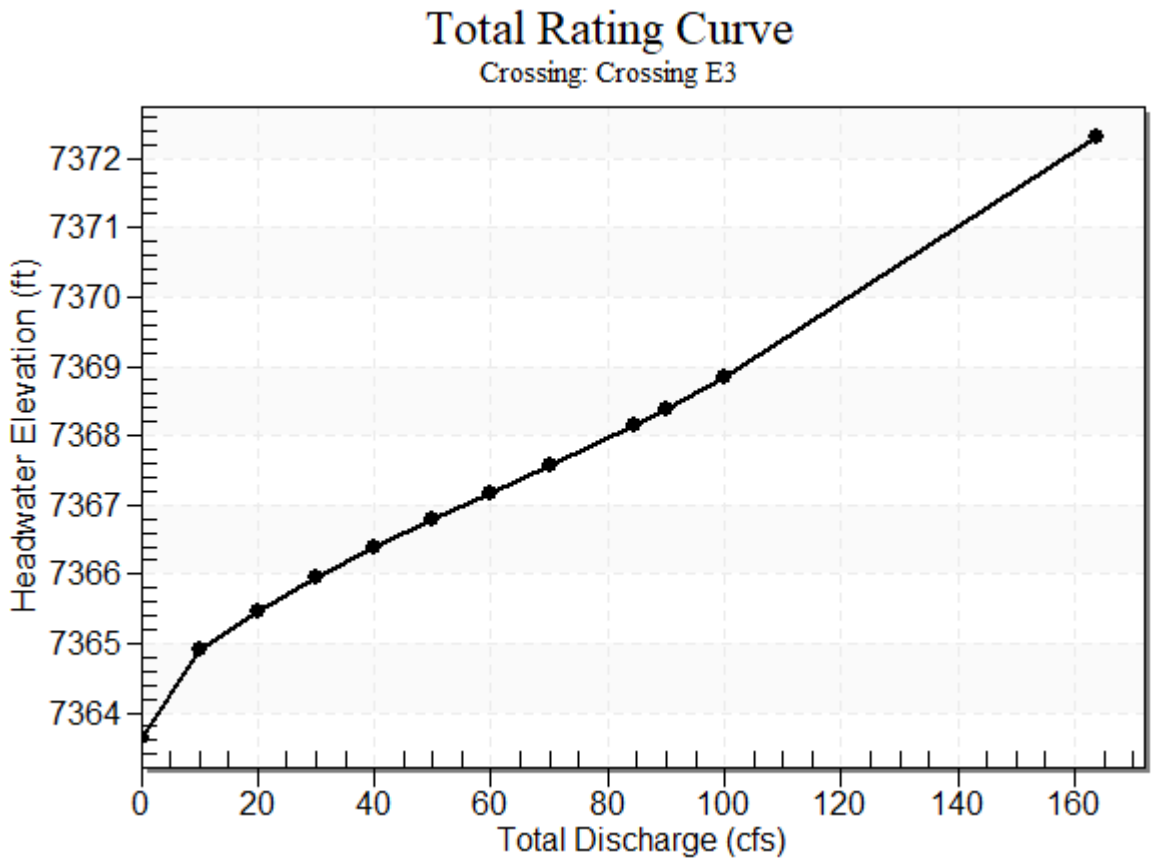


Table 8 - Culvert Summary Table: Culvert E3

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	7363.65	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
10.00	10.00	7364.91	1.250	0.0*	1-S2n	0.714	0.921	0.714	0.248	6.583	3.675
20.00	20.00	7365.46	1.802	0.439	1-S2n	1.007	1.316	1.024	0.371	7.872	4.695
30.00	30.00	7365.94	2.289	0.844	1-S2n	1.239	1.624	1.271	0.469	8.740	5.391
40.00	40.00	7366.39	2.739	1.243	1-S2n	1.442	1.887	1.487	0.552	9.403	5.931
50.00	50.00	7366.80	3.142	1.651	1-S2n	1.627	2.121	1.691	0.627	9.898	6.380
60.00	60.00	7367.18	3.522	2.076	1-S2n	1.800	2.334	1.877	0.694	10.362	6.764
70.00	70.00	7367.56	3.901	2.523	1-S2n	1.968	2.529	2.056	0.757	10.756	7.101
84.60	84.60	7368.14	4.487	3.218	5-S2n	2.205	2.787	2.305	0.840	11.285	7.534
90.00	90.00	7368.38	4.721	3.489	5-S2n	2.292	2.876	2.395	0.870	11.463	7.679
100.00	100.00	7368.84	5.185	4.496	5-S2n	2.454	3.030	2.560	0.921	11.773	7.932

* Full Flow Headwater elevation is below inlet invert.

****

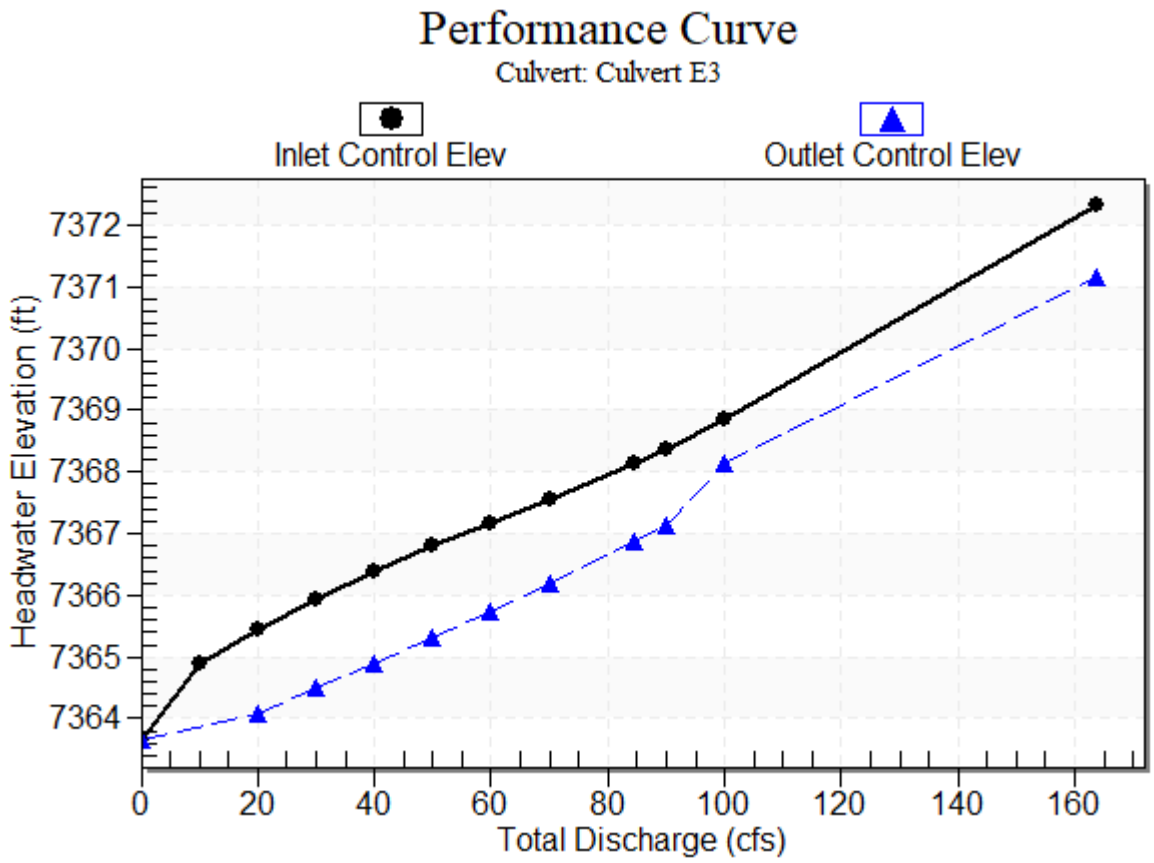
Straight Culvert

Inlet Elevation (invert): 7363.65 ft, Outlet Elevation (invert): 7362.70 ft

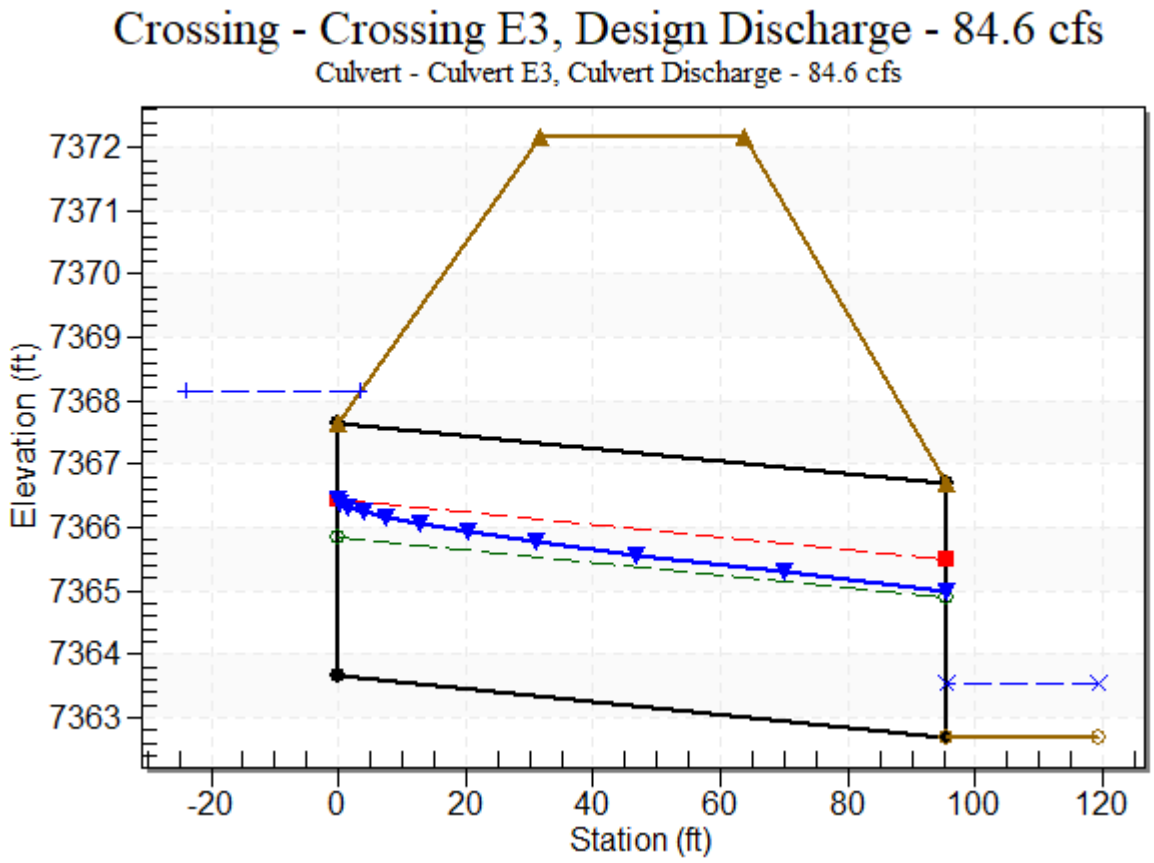
Culvert Length: 95.40 ft, Culvert Slope: 0.0100

****

Culvert Performance Curve Plot: Culvert E3



Water Surface Profile Plot for Culvert: Culvert E3



Site Data - Culvert E3

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 7363.65 ft

Outlet Station: 95.40 ft

Outlet Elevation: 7362.70 ft

Number of Barrels: 1

Culvert Data Summary - Culvert E3

Barrel Shape: Circular

Barrel Diameter: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 9 - Downstream Channel Rating Curve (Crossing: Crossing E3)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	7362.70	0.00	0.00	0.00	0.00
10.00	7362.95	0.25	3.68	0.62	1.36
20.00	7363.07	0.37	4.69	0.93	1.44
30.00	7363.17	0.47	5.39	1.17	1.49
40.00	7363.25	0.55	5.93	1.38	1.53
50.00	7363.33	0.63	6.38	1.56	1.56
60.00	7363.40	0.69	6.76	1.73	1.58
70.00	7363.46	0.76	7.10	1.89	1.60
84.60	7363.54	0.84	7.53	2.10	1.62
90.00	7363.57	0.87	7.68	2.17	1.63
100.00	7363.62	0.92	7.93	2.30	1.64

Tailwater Channel Data - Crossing E3

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 10.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0400

Channel Manning's n: 0.0300

Channel Invert Elevation: 7362.70 ft

Roadway Data for Crossing: Crossing E3

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 53.00 ft

Crest Elevation: 7372.18 ft

Roadway Surface: Paved

Roadway Top Width: 32.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 117.6 cfs

Maximum Flow: 150 cfs

Table 10 - Summary of Culvert Flows at Crossing: Crossing E4

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert E4 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7336.55	0.00	0.00	0.00	1
7338.09	15.00	15.00	0.00	1
7338.84	30.00	30.00	0.00	1
7339.49	45.00	45.00	0.00	1
7340.07	60.00	60.00	0.00	1
7340.64	75.00	75.00	0.00	1
7341.27	90.00	90.00	0.00	1
7341.98	105.00	105.00	0.00	1
7342.67	117.60	117.60	0.00	1
7343.12	135.00	125.10	9.78	12
7343.20	150.00	126.43	23.38	5
7343.01	123.36	123.36	0.00	Overtopping

Rating Curve Plot for Crossing: Crossing E4

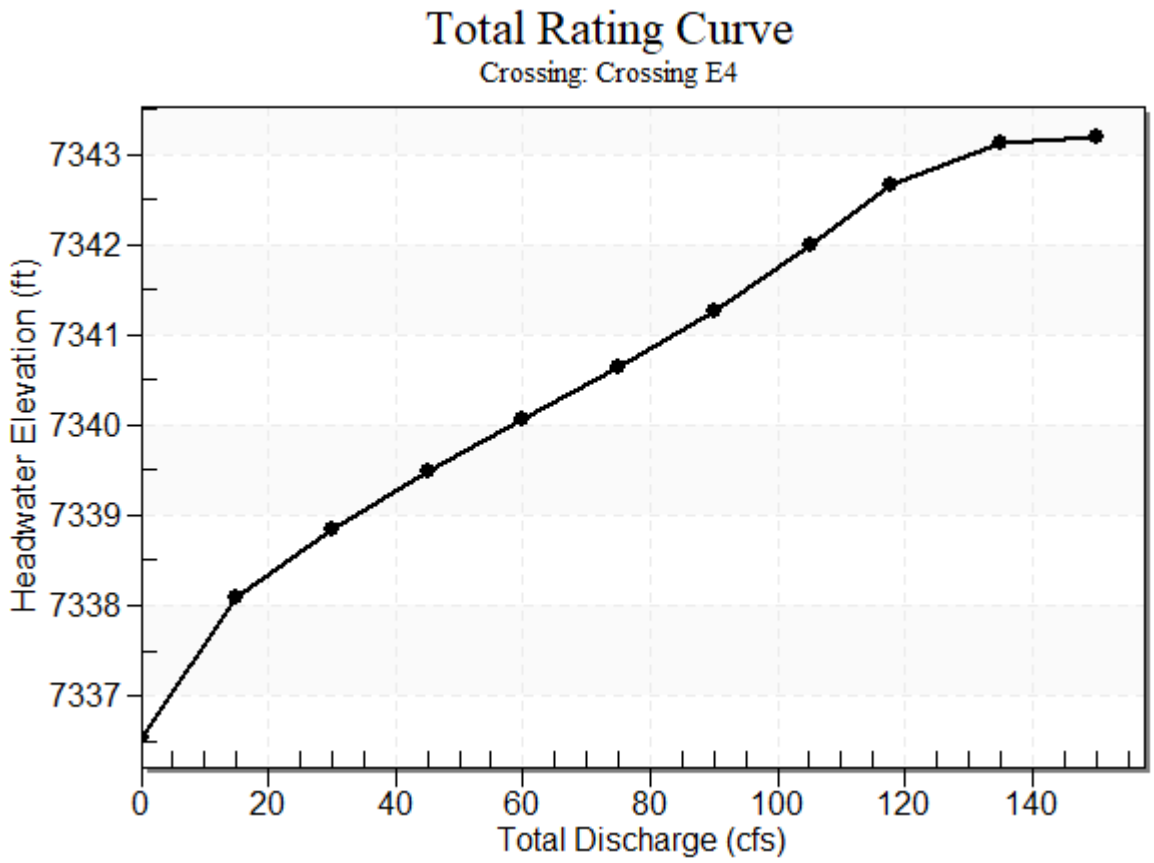


Table 11 - Culvert Summary Table: Culvert E4

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	7336.55	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
15.00	15.00	7338.09	1.547	0.334	1-S2n	0.871	1.134	0.885	0.382	7.251	2.012
30.00	30.00	7338.84	2.289	0.950	1-S2n	1.239	1.624	1.277	0.532	8.677	2.421
45.00	45.00	7339.49	2.945	1.545	1-S2n	1.536	2.007	1.601	0.642	9.575	2.692
60.00	60.00	7340.07	3.522	2.168	1-S2n	1.800	2.334	1.886	0.731	10.297	2.900
75.00	75.00	7340.64	4.096	2.836	5-S2n	2.049	2.621	2.155	0.808	10.863	3.072
90.00	90.00	7341.27	4.721	3.557	5-S2n	2.292	2.876	2.409	0.876	11.383	3.219
105.00	105.00	7341.98	5.434	4.782	5-S2n	2.536	3.102	2.652	0.938	11.872	3.349
117.60	117.60	7342.67	6.120	5.393	5-S2n	2.749	3.268	2.861	0.985	12.229	3.448
135.00	125.10	7343.12	6.568	5.779	5-S2n	2.883	3.357	2.985	1.046	12.440	3.571
150.00	126.43	7343.20	6.652	5.850	5-S2n	2.908	3.372	3.007	1.095	12.477	3.668

****

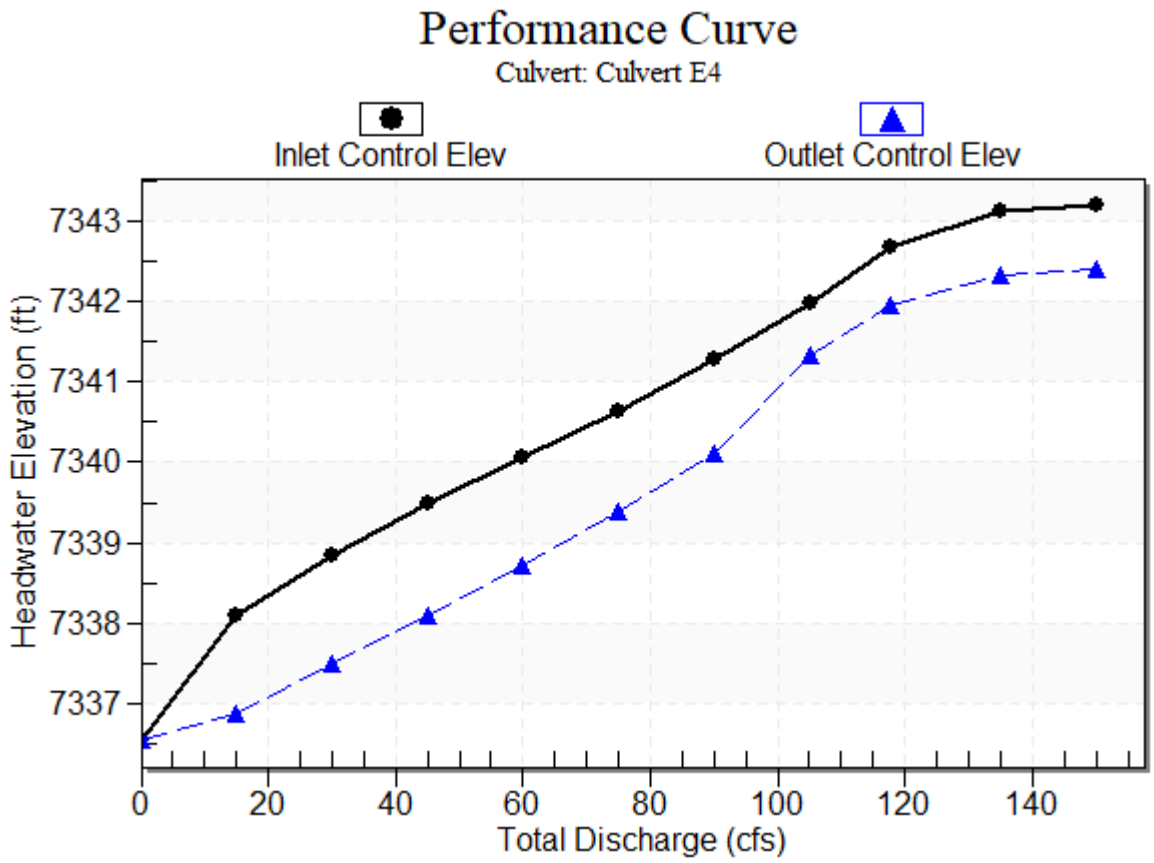
Straight Culvert

Inlet Elevation (invert): 7336.55 ft, Outlet Elevation (invert): 7335.70 ft

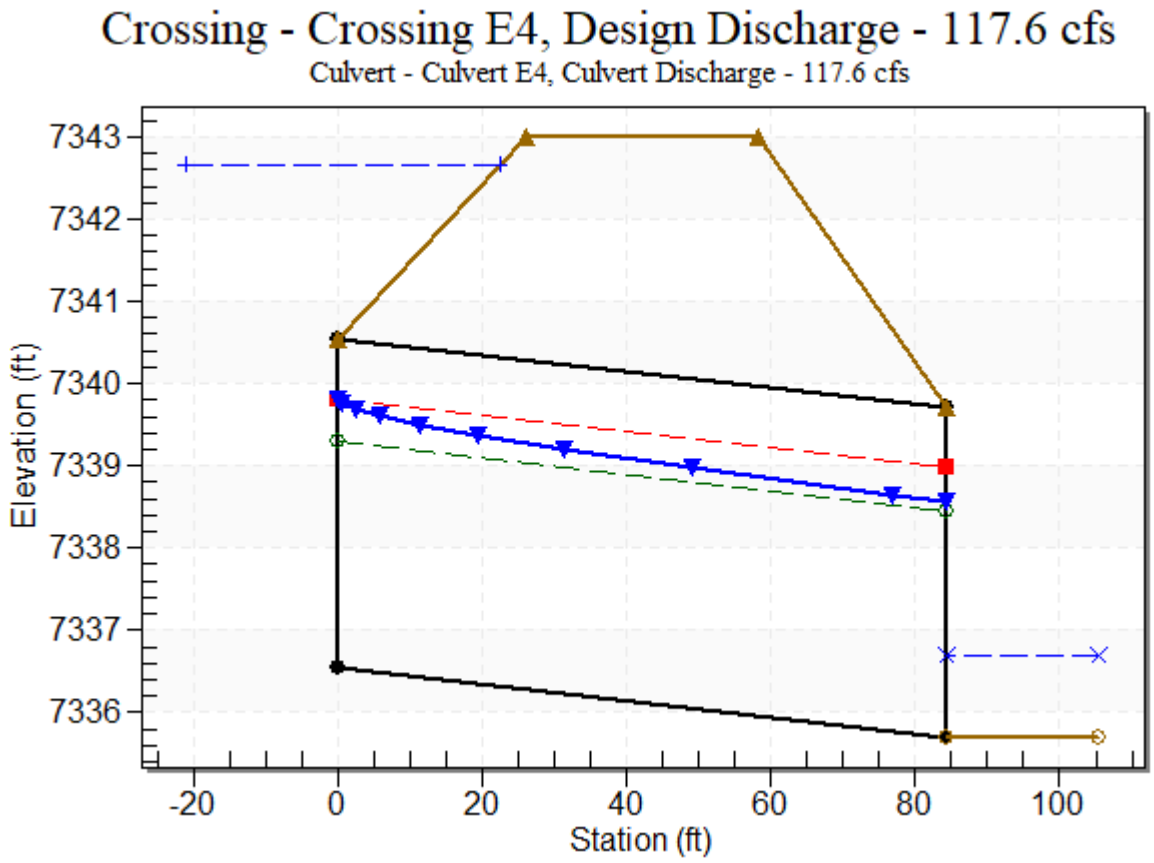
Culvert Length: 84.27 ft, Culvert Slope: 0.0100

****

Culvert Performance Curve Plot: Culvert E4



Water Surface Profile Plot for Culvert: Culvert E4



Site Data - Culvert E4

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 7336.55 ft

Outlet Station: 84.27 ft

Outlet Elevation: 7335.70 ft

Number of Barrels: 1

Culvert Data Summary - Culvert E4

Barrel Shape: Circular

Barrel Diameter: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 12 - Downstream Channel Rating Curve (Crossing: Crossing E4)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	7335.70	0.00	0.00	0.00	0.00
15.00	7336.09	0.38	2.01	0.43	0.70
30.00	7336.24	0.53	2.42	0.60	0.73
45.00	7336.35	0.64	2.69	0.72	0.75
60.00	7336.44	0.73	2.90	0.82	0.77
75.00	7336.51	0.81	3.07	0.91	0.78
90.00	7336.58	0.88	3.22	0.98	0.79
105.00	7336.64	0.94	3.35	1.05	0.80
117.60	7336.69	0.99	3.45	1.11	0.80
135.00	7336.75	1.05	3.57	1.17	0.81
150.00	7336.80	1.09	3.67	1.23	0.81

Tailwater Channel Data - Crossing E4

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 10.00 ft

Side Slope (H:V): 25.00 (_:1)

Channel Slope: 0.0180

Channel Manning's n: 0.0400

Channel Invert Elevation: 7335.70 ft

Roadway Data for Crossing: Crossing E4

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 95.00 ft

Crest Elevation: 7343.01 ft

Roadway Surface: Paved

Roadway Top Width: 32.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 18.4 cfs

Maximum Flow: 100 cfs

Table 13 - Summary of Culvert Flows at Crossing: Crossing E5

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert E5 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7329.77	0.00	0.00	0.00	1
7331.45	10.00	10.00	0.00	1
7332.45	18.40	18.40	0.00	1
7334.70	30.00	30.00	0.00	1
7337.64	40.00	40.00	0.00	1
7338.08	50.00	41.24	8.53	13
7338.13	60.00	41.38	18.51	5
7338.17	70.00	41.49	28.37	4
7338.20	80.00	41.60	38.34	4
7338.24	90.00	41.69	48.12	3
7338.27	100.00	41.78	58.11	3
7338.00	41.03	41.03	0.00	Overtopping

Rating Curve Plot for Crossing: Crossing E5

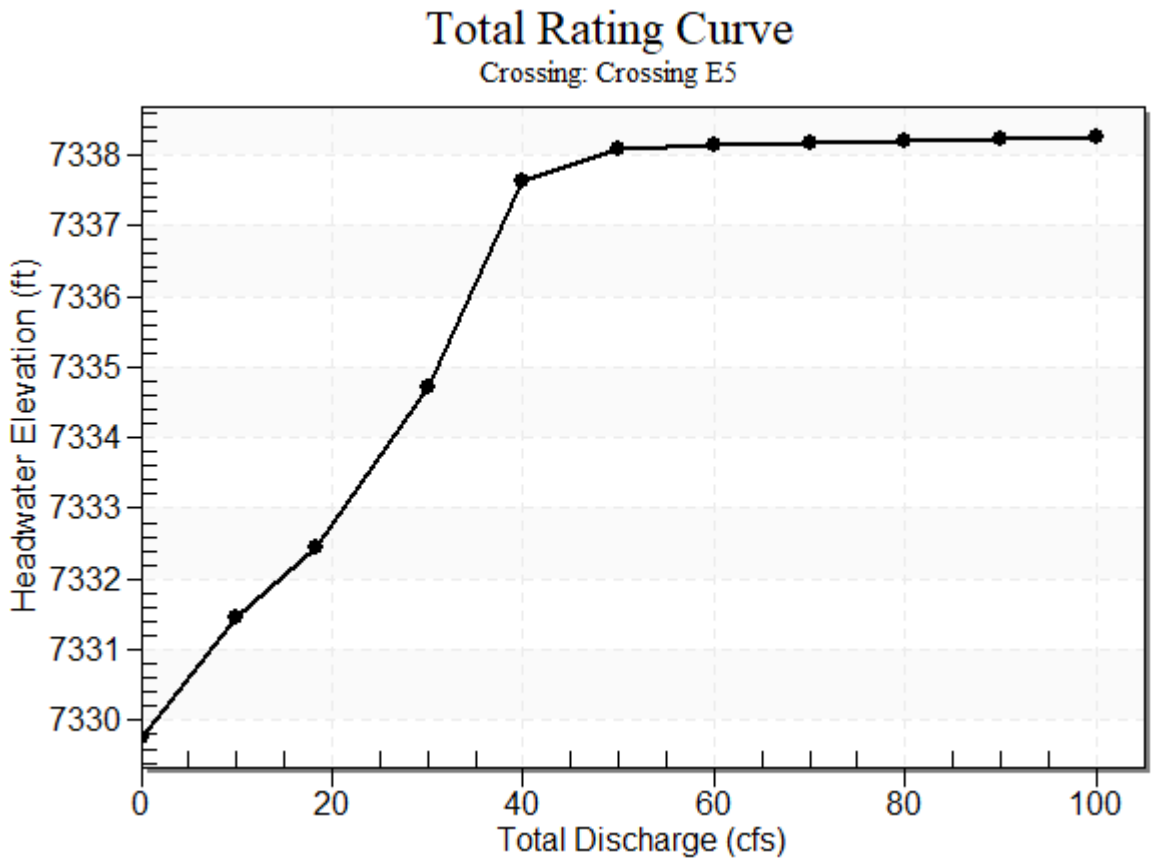


Table 14 - Culvert Summary Table: Culvert E5

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	7329.77	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
10.00	10.00	7331.45	1.681	0.0*	1-S2n	0.723	1.131	0.723	0.662	9.774	3.641
18.40	18.40	7332.45	2.679	0.713	5-S2n	1.016	1.544	1.044	0.869	11.089	4.258
30.00	30.00	7334.70	4.929	3.299	5-S2n	1.400	1.862	1.449	1.074	12.312	4.821
40.00	40.00	7337.64	7.873	6.394	6-FFc	2.000	2.000	2.000	1.214	12.732	5.184
50.00	41.24	7338.08	8.305	6.829	6-FFc	2.000	2.000	2.000	1.334	13.127	5.485
60.00	41.38	7338.13	8.355	6.879	6-FFc	2.000	2.000	2.000	1.440	13.172	5.742
70.00	41.49	7338.17	8.396	6.920	6-FFc	2.000	2.000	2.000	1.535	13.208	5.970
80.00	41.60	7338.20	8.433	6.957	6-FFc	2.000	2.000	2.000	1.622	13.241	6.174
90.00	41.69	7338.24	8.465	6.990	6-FFc	2.000	2.000	2.000	1.703	13.270	6.359
100.00	41.78	7338.27	8.497	7.022	6-FFc	2.000	2.000	2.000	1.778	13.298	6.530

* Full Flow Headwater elevation is below inlet invert.

****

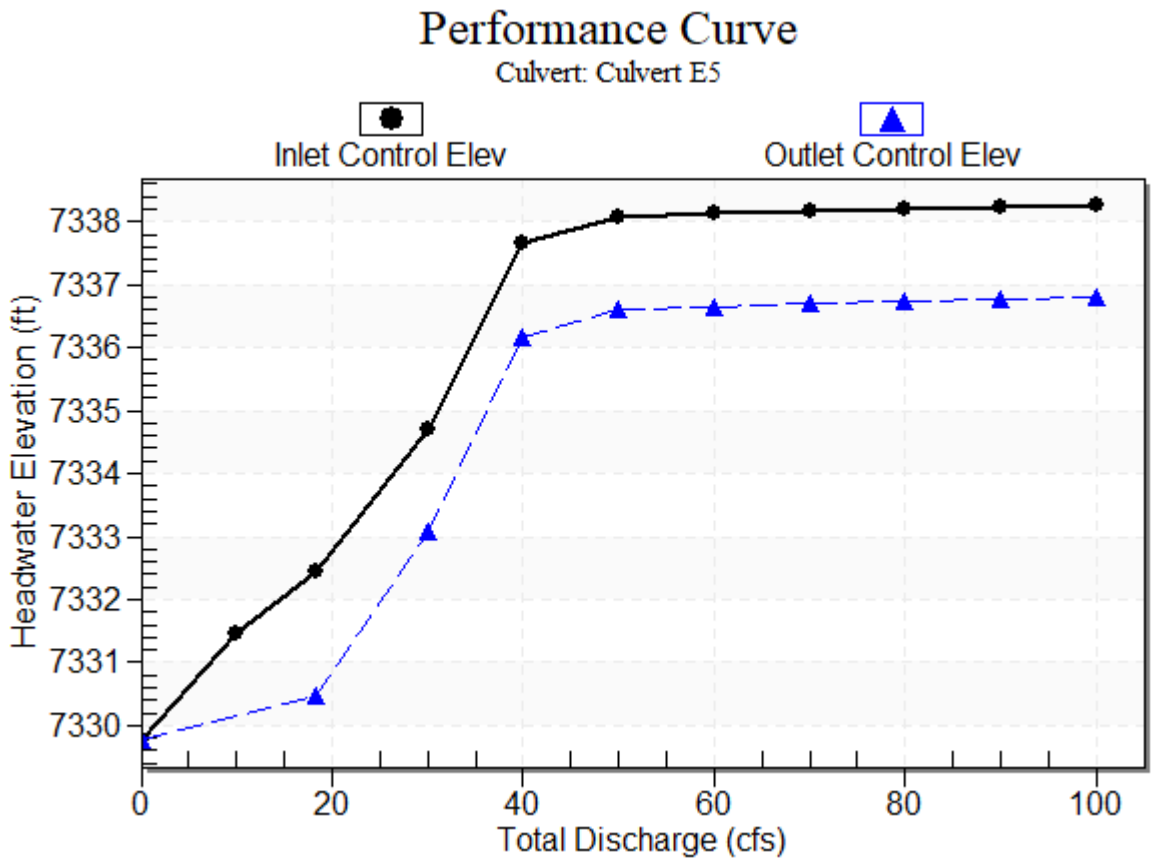
Straight Culvert

Inlet Elevation (invert): 7329.77 ft, Outlet Elevation (invert): 7327.25 ft

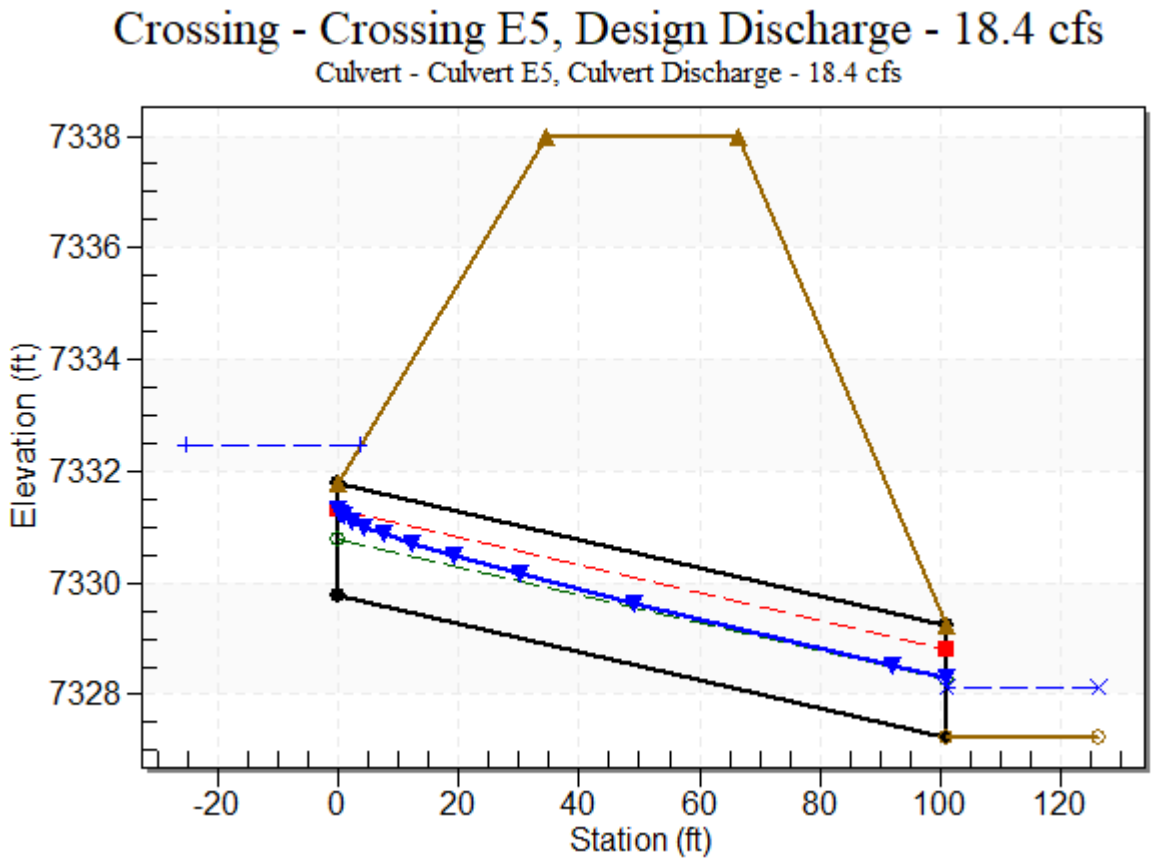
Culvert Length: 101.03 ft, Culvert Slope: 0.0250

****

Culvert Performance Curve Plot: Culvert E5



Water Surface Profile Plot for Culvert: Culvert E5



Site Data - Culvert E5

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 7329.77 ft

Outlet Station: 101.00 ft

Outlet Elevation: 7327.25 ft

Number of Barrels: 1

Culvert Data Summary - Culvert E5

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 15 - Downstream Channel Rating Curve (Crossing: Crossing E5)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	7327.25	0.00	0.00	0.00	0.00
10.00	7327.91	0.66	3.64	1.37	1.01
18.40	7328.12	0.87	4.26	1.80	1.05
30.00	7328.32	1.07	4.82	2.22	1.08
40.00	7328.46	1.21	5.18	2.52	1.10
50.00	7328.58	1.33	5.48	2.76	1.12
60.00	7328.69	1.44	5.74	2.98	1.13
70.00	7328.78	1.53	5.97	3.18	1.14
80.00	7328.87	1.62	6.17	3.36	1.15
90.00	7328.95	1.70	6.36	3.53	1.16
100.00	7329.03	1.78	6.53	3.68	1.17

Tailwater Channel Data - Crossing E5

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 1.50 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0332

Channel Manning's n: 0.0400

Channel Invert Elevation: 7327.25 ft

Roadway Data for Crossing: Crossing E5

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 141.30 ft

Crest Elevation: 7338.00 ft

Roadway Surface: Paved

Roadway Top Width: 32.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 78.3 cfs

Maximum Flow: 100 cfs

Table 16 - Summary of Culvert Flows at Crossing: Crossing O1

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert O1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7369.81	0.00	0.00	0.00	1
7370.76	10.00	10.00	0.00	1
7371.18	20.00	20.00	0.00	1
7371.56	30.00	30.00	0.00	1
7371.90	40.00	40.00	0.00	1
7372.20	50.00	50.00	0.00	1
7372.50	60.00	60.00	0.00	1
7372.79	70.00	70.00	0.00	1
7373.04	78.30	78.30	0.00	1
7373.43	90.00	90.00	0.00	1
7373.80	100.00	100.00	0.00	1
7377.50	169.41	169.41	0.00	Overtopping

Rating Curve Plot for Crossing: Crossing O1

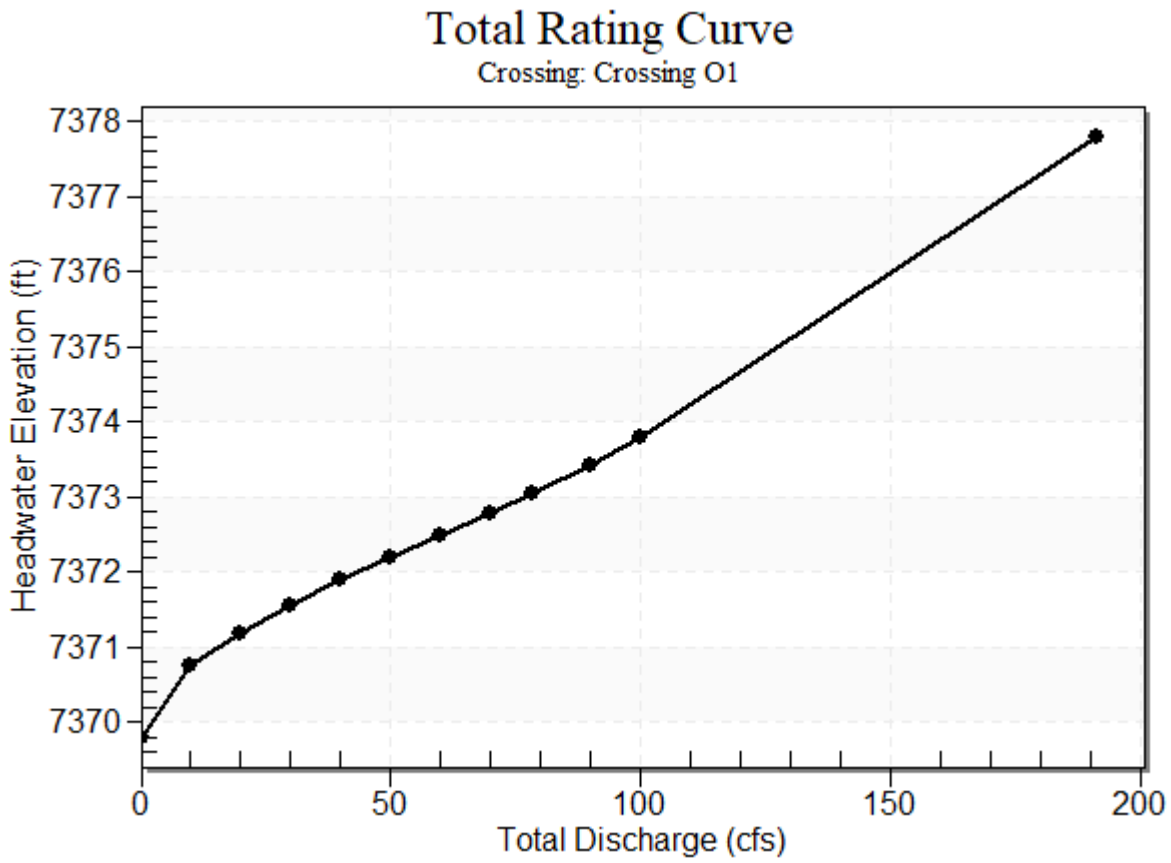


Table 17 - Culvert Summary Table: Culvert O1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	7369.81	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
10.00	10.00	7370.76	0.951	0.012	1-S2n	0.557	0.700	0.562	0.158	5.446	1.830
20.00	20.00	7371.18	1.371	0.359	1-S2n	0.788	1.000	0.798	0.239	6.628	2.397
30.00	30.00	7371.56	1.746	0.672	1-S2n	0.971	1.235	0.989	0.304	7.379	2.802
40.00	40.00	7371.90	2.088	0.982	1-S2n	1.132	1.435	1.158	0.361	7.944	3.128
50.00	50.00	7372.20	2.395	1.301	1-S2n	1.279	1.613	1.314	0.412	8.397	3.405
60.00	60.00	7372.50	2.687	1.635	1-S2n	1.418	1.774	1.459	0.459	8.791	3.647
70.00	70.00	7372.79	2.980	1.987	1-S2n	1.552	1.922	1.599	0.503	9.133	3.864
78.30	78.30	7373.04	3.234	2.294	5-S2n	1.662	2.037	1.712	0.538	9.391	4.029
90.00	90.00	7373.43	3.621	2.751	5-S2n	1.816	2.185	1.869	0.584	9.722	4.243
100.00	100.00	7373.80	3.986	3.514	5-S2n	1.951	2.301	2.002	0.621	9.978	4.412

****

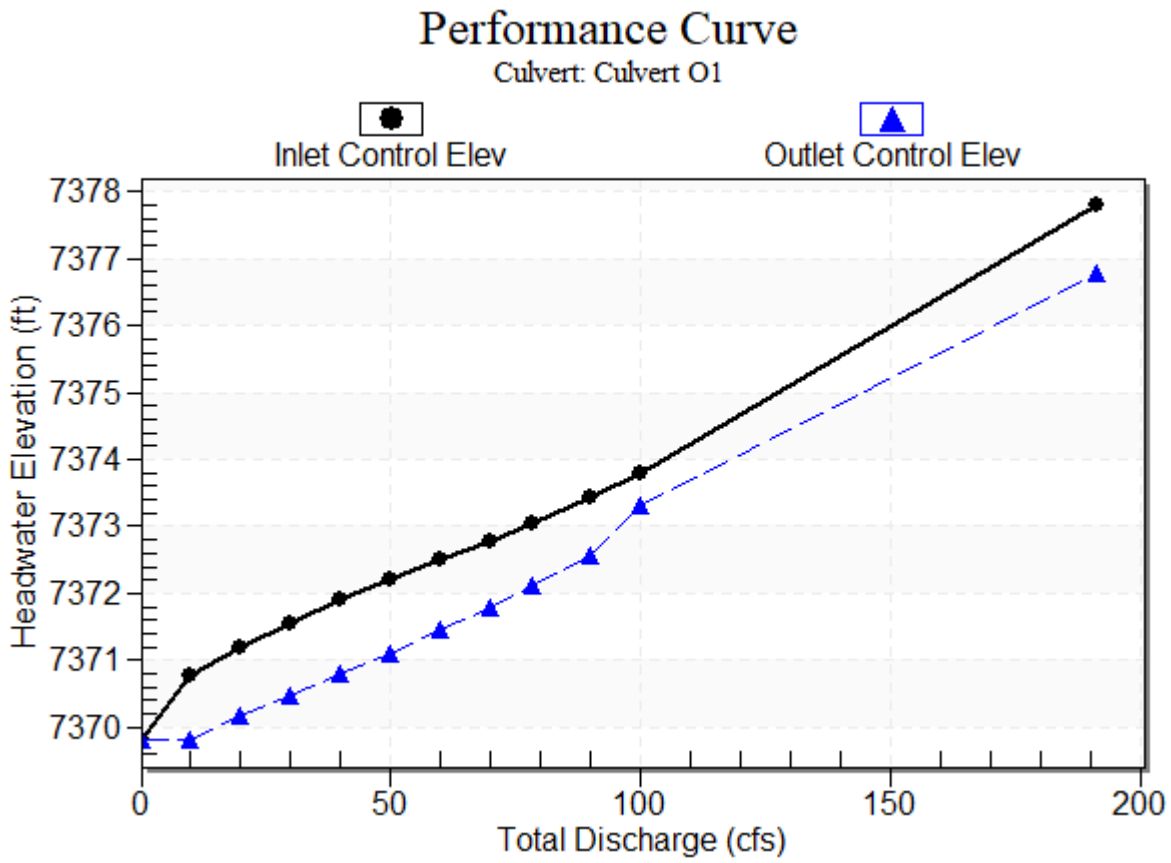
Straight Culvert

Inlet Elevation (invert): 7369.81 ft, Outlet Elevation (invert): 7369.11 ft

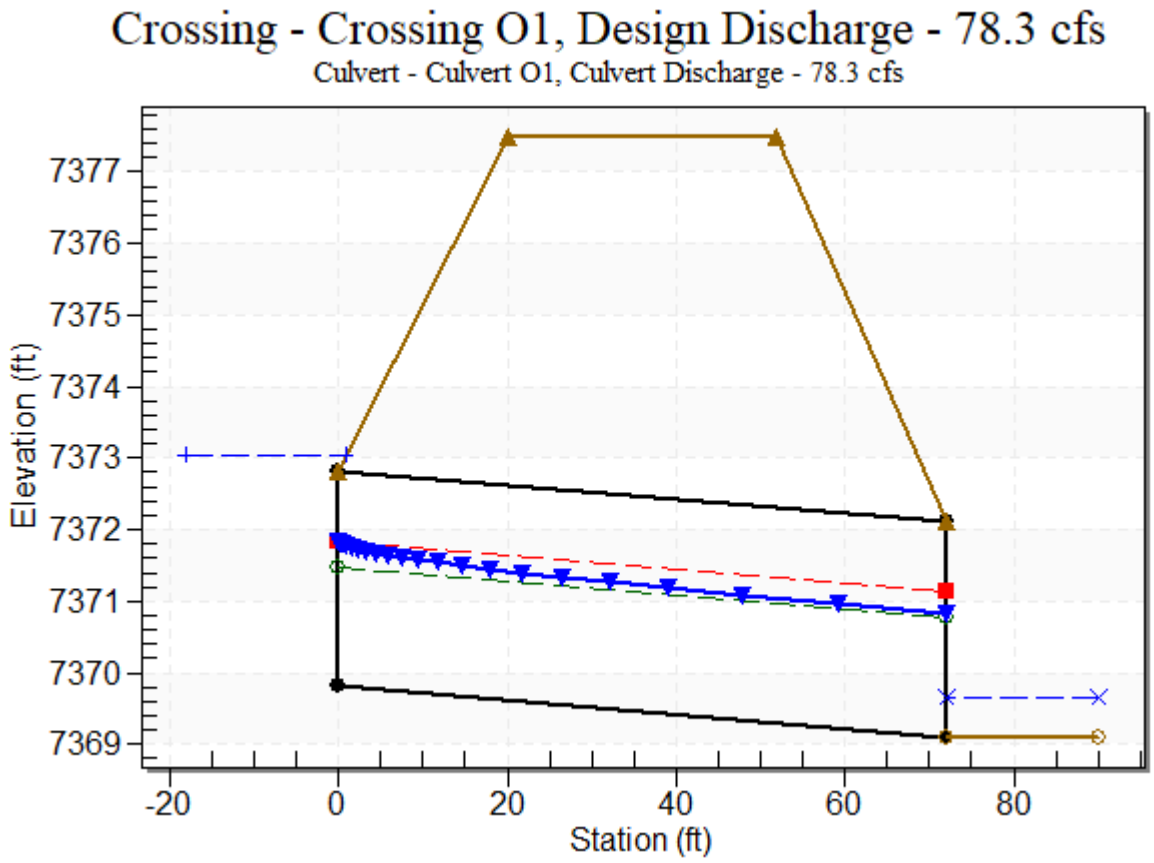
Culvert Length: 72.00 ft, Culvert Slope: 0.0098

****

Culvert Performance Curve Plot: Culvert O1



Water Surface Profile Plot for Culvert: Culvert O1



Site Data - Culvert O1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 7369.81 ft

Outlet Station: 72.00 ft

Outlet Elevation: 7369.11 ft

Number of Barrels: 2

Culvert Data Summary - Culvert O1

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 18 - Downstream Channel Rating Curve (Crossing: Crossing O1)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	7369.11	0.00	0.00	0.00	0.00
10.00	7369.26	0.16	1.83	0.29	0.82
20.00	7369.34	0.24	2.40	0.44	0.88
30.00	7369.41	0.30	2.80	0.55	0.91
40.00	7369.47	0.36	3.13	0.66	0.94
50.00	7369.52	0.41	3.40	0.75	0.96
60.00	7369.57	0.46	3.65	0.84	0.97
70.00	7369.61	0.50	3.86	0.92	0.99
78.30	7369.64	0.54	4.03	0.98	1.00
90.00	7369.69	0.58	4.24	1.06	1.01
100.00	7369.73	0.62	4.41	1.13	1.02

Tailwater Channel Data - Crossing O1

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 34.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0292

Channel Manning's n: 0.0400

Channel Invert Elevation: 7369.11 ft

Roadway Data for Crossing: Crossing O1

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 34.00 ft

Crest Elevation: 7377.50 ft

Roadway Surface: Paved

Roadway Top Width: 32.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 123 cfs

Maximum Flow: 123 cfs

Table 19 - Summary of Culvert Flows at Crossing: Crossing O2

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert O2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7335.34	0.00	0.00	0.00	1
7336.36	12.30	12.30	0.00	1
7336.80	24.60	24.60	0.00	1
7337.17	36.90	36.90	0.00	1
7337.53	49.20	49.20	0.00	1
7337.85	61.50	61.50	0.00	1
7338.15	73.80	73.80	0.00	1
7338.44	86.10	86.10	0.00	1
7338.72	98.40	98.40	0.00	1
7339.01	110.70	110.70	0.00	1
7339.47	123.00	123.00	0.00	1
7342.90	221.20	221.20	0.00	Overtopping

Rating Curve Plot for Crossing: Crossing O2

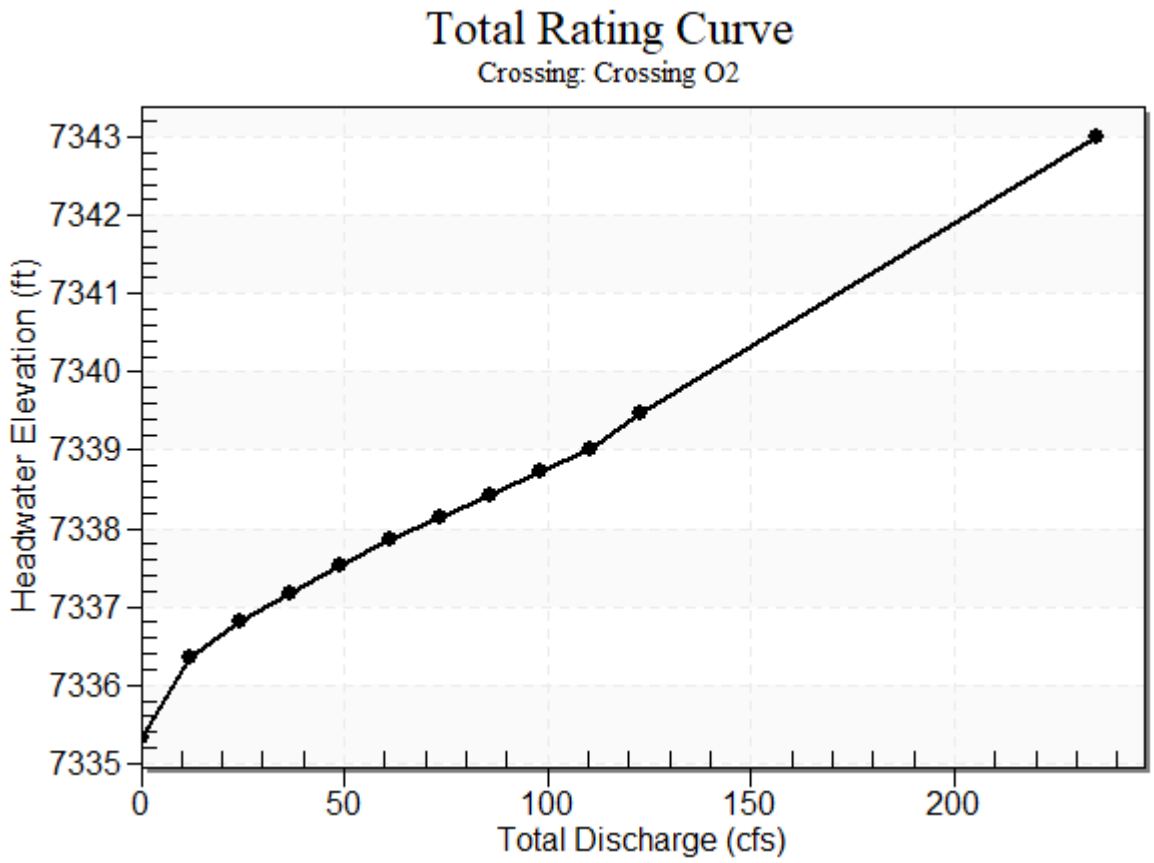


Table 20 - Culvert Summary Table: Culvert O2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	7335.34	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
12.30	12.30	7336.36	1.014	0.384	1-S2n	0.694	0.745	0.694	0.192	4.545	2.071
24.60	24.60	7336.80	1.460	0.739	1-S2n	0.983	1.064	0.983	0.291	5.550	2.707
36.90	36.90	7337.17	1.826	1.049	1-S2n	1.214	1.313	1.217	0.370	6.204	3.158
49.20	49.20	7337.53	2.190	1.348	1-S2n	1.418	1.525	1.422	0.439	6.707	3.518
61.50	61.50	7337.85	2.512	1.647	1-S2n	1.606	1.714	1.610	0.501	7.114	3.823
73.80	73.80	7338.15	2.809	1.954	1-S2n	1.786	1.885	1.790	0.558	7.455	4.090
86.10	86.10	7338.44	3.094	2.272	1-S2n	1.961	2.044	1.964	0.611	7.744	4.329
98.40	98.40	7338.72	3.379	2.604	1-S2n	2.137	2.191	2.137	0.661	7.996	4.545
110.70	110.70	7339.01	3.672	2.951	5-S2n	2.317	2.329	2.317	0.709	8.190	4.744
123.00	123.00	7339.47	3.982	4.128	7-M2c	2.507	2.458	2.458	0.754	8.521	4.928

****

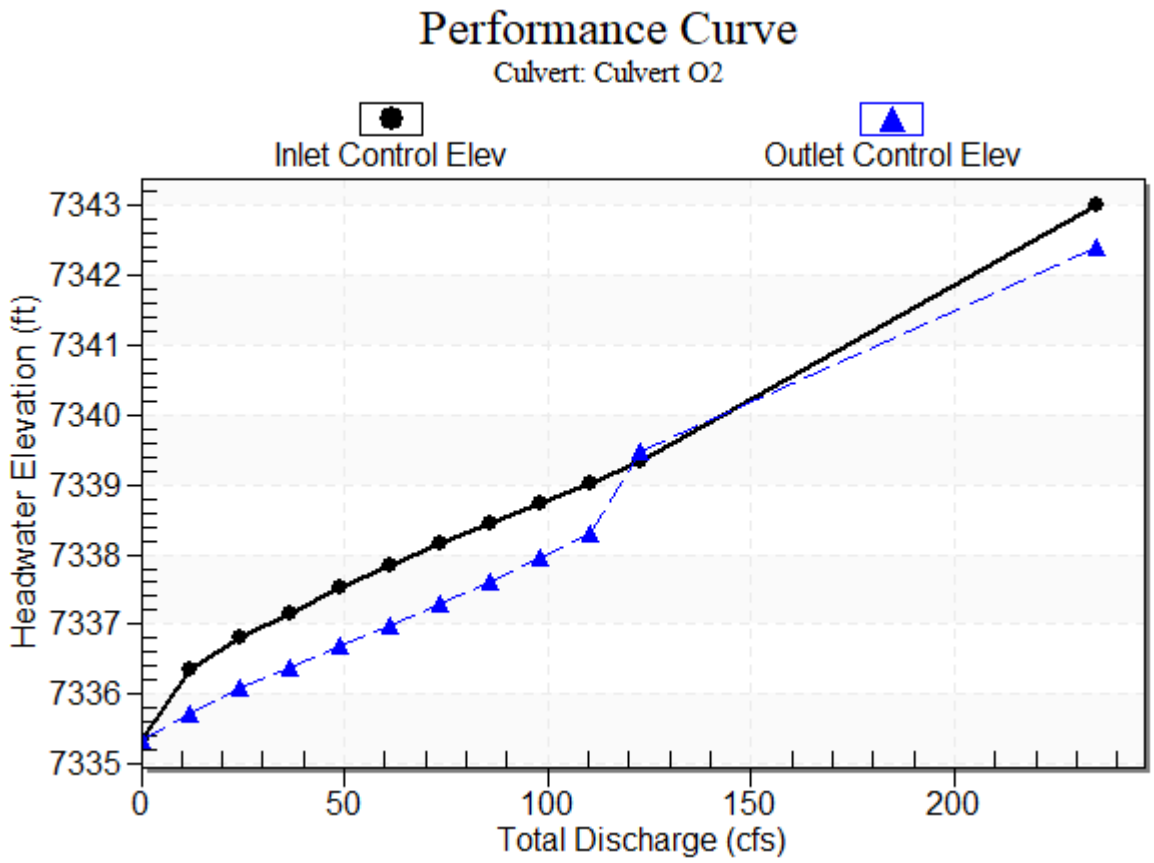
Straight Culvert

Inlet Elevation (invert): 7335.34 ft, Outlet Elevation (invert): 7334.97 ft

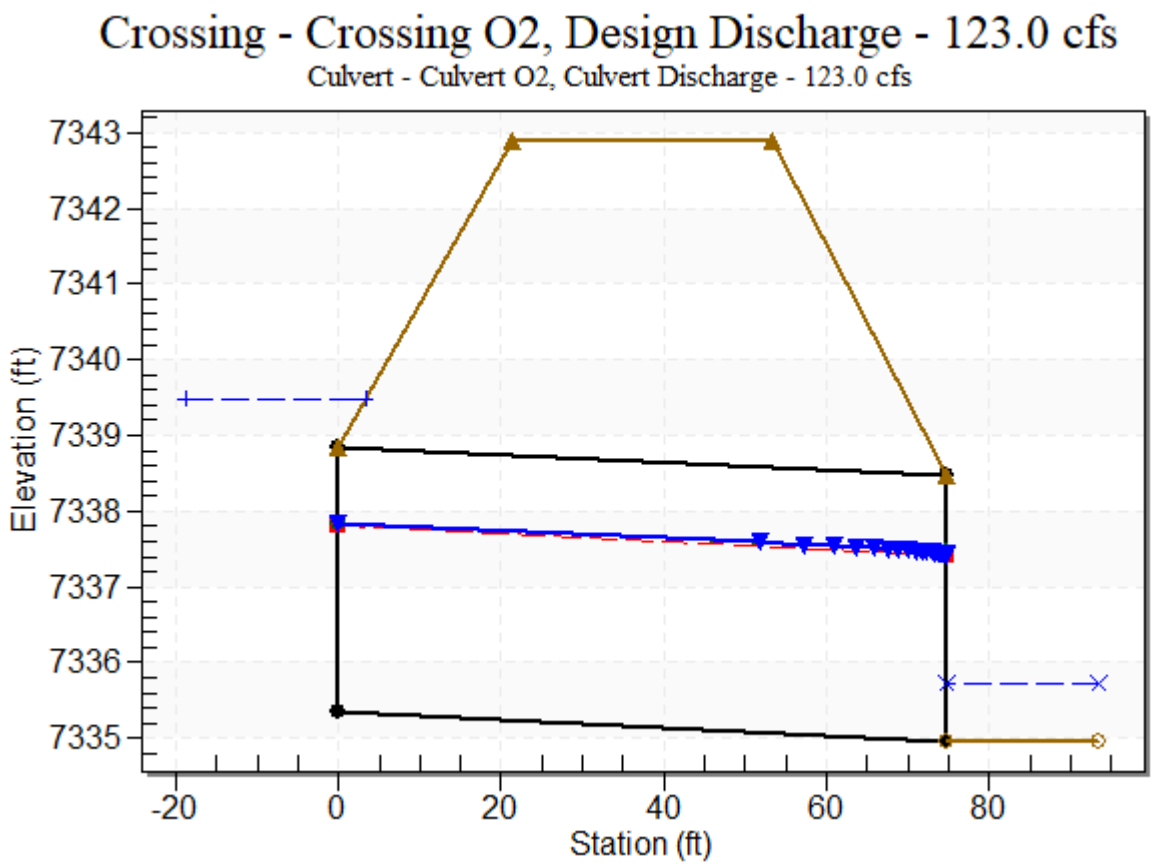
Culvert Length: 74.72 ft, Culvert Slope: 0.0050

****

Culvert Performance Curve Plot: Culvert O2



Water Surface Profile Plot for Culvert: Culvert O2



Site Data - Culvert O2

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 7335.34 ft

Outlet Station: 74.72 ft

Outlet Elevation: 7334.97 ft

Number of Barrels: 2

Culvert Data Summary - Culvert O2

Barrel Shape: Circular

Barrel Diameter: 3.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 21 - Downstream Channel Rating Curve (Crossing: Crossing O2)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	7334.97	0.00	0.00	0.00	0.00
12.30	7335.16	0.19	2.07	0.35	0.84
24.60	7335.26	0.29	2.71	0.53	0.90
36.90	7335.34	0.37	3.16	0.67	0.94
49.20	7335.41	0.44	3.52	0.79	0.96
61.50	7335.47	0.50	3.82	0.91	0.98
73.80	7335.53	0.56	4.09	1.01	1.00
86.10	7335.58	0.61	4.33	1.11	1.01
98.40	7335.63	0.66	4.54	1.20	1.02
110.70	7335.68	0.71	4.74	1.28	1.03
123.00	7335.72	0.75	4.93	1.36	1.04

Tailwater Channel Data - Crossing O2

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 30.10 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0290

Channel Manning's n: 0.0400

Channel Invert Elevation: 7334.97 ft

Roadway Data for Crossing: Crossing O2

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 97.00 ft

Crest Elevation: 7342.90 ft

Roadway Surface: Paved

Roadway Top Width: 32.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 24.6 cfs

Maximum Flow: 100 cfs

Table 22 - Summary of Culvert Flows at Crossing: Crossing E1.1

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert E1.1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7411.80	0.00	0.00	0.00	1
7413.29	10.00	10.00	0.00	1
7414.46	24.60	24.60	0.00	1
7414.94	30.00	30.00	0.00	1
7416.07	40.00	40.00	0.00	1
7417.56	50.00	50.00	0.00	1
7417.71	60.00	50.93	8.86	7
7417.78	70.00	51.34	18.56	5
7417.84	80.00	51.68	28.19	4
7417.89	90.00	51.98	37.96	4
7417.94	100.00	52.25	47.58	3
7417.60	50.26	50.26	0.00	Overtopping

Rating Curve Plot for Crossing: Crossing E1.1

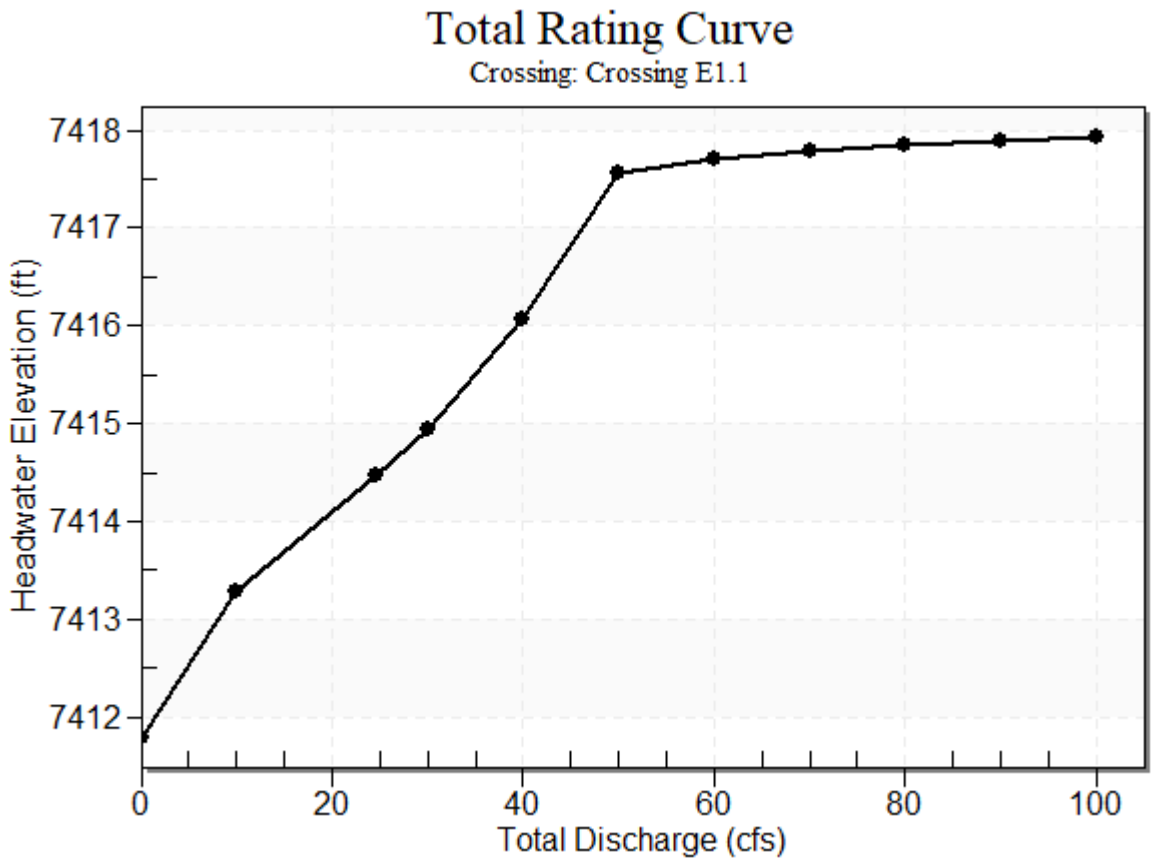


Table 23 - Culvert Summary Table: Culvert E1.1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	7411.80	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
10.00	10.00	7413.29	1.489	0.0*	1-S2n	0.671	1.056	0.682	0.414	9.219	3.156
24.60	24.60	7414.46	2.664	0.0*	5-S2n	1.082	1.689	1.119	0.678	11.556	4.161
30.00	30.00	7414.94	3.142	0.628	5-S2n	1.212	1.867	1.258	0.754	12.127	4.412
40.00	40.00	7416.07	4.268	2.227	5-S2n	1.442	2.129	1.505	0.877	12.961	4.793
50.00	50.00	7417.56	5.756	3.793	5-S2n	1.677	2.300	1.746	0.985	13.655	5.108
60.00	50.93	7417.71	5.913	3.953	5-S2n	1.699	2.311	1.770	1.081	13.707	5.375
70.00	51.34	7417.78	5.983	4.025	5-S2n	1.710	2.316	1.782	1.169	13.720	5.609
80.00	51.68	7417.84	6.041	4.084	5-S2n	1.718	2.320	1.791	1.250	13.733	5.819
90.00	51.98	7417.89	6.093	4.137	5-S2n	1.725	2.323	1.799	1.325	13.747	6.009
100.00	52.25	7417.94	6.140	4.185	5-S2n	1.732	2.326	1.806	1.396	13.761	6.183

* Full Flow Headwater elevation is below inlet invert.

****

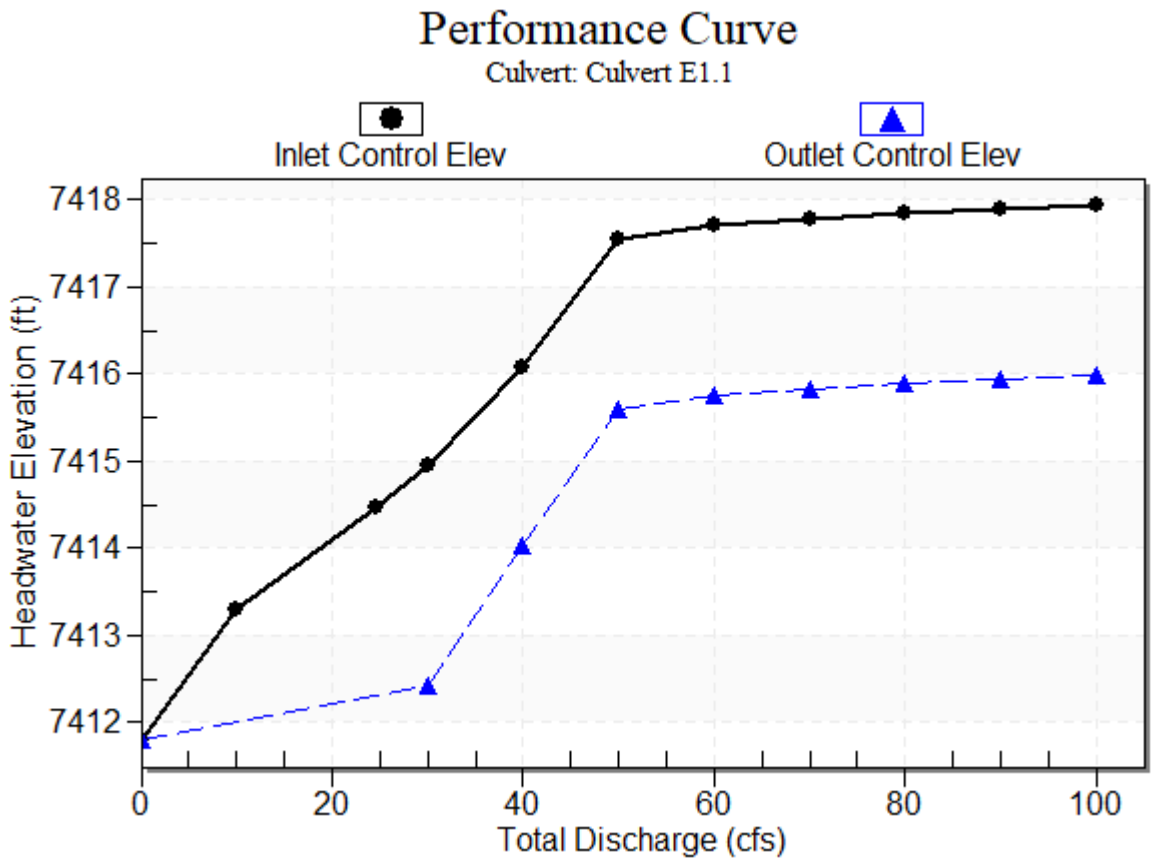
Straight Culvert

Inlet Elevation (invert): 7411.80 ft, Outlet Elevation (invert): 7409.08 ft

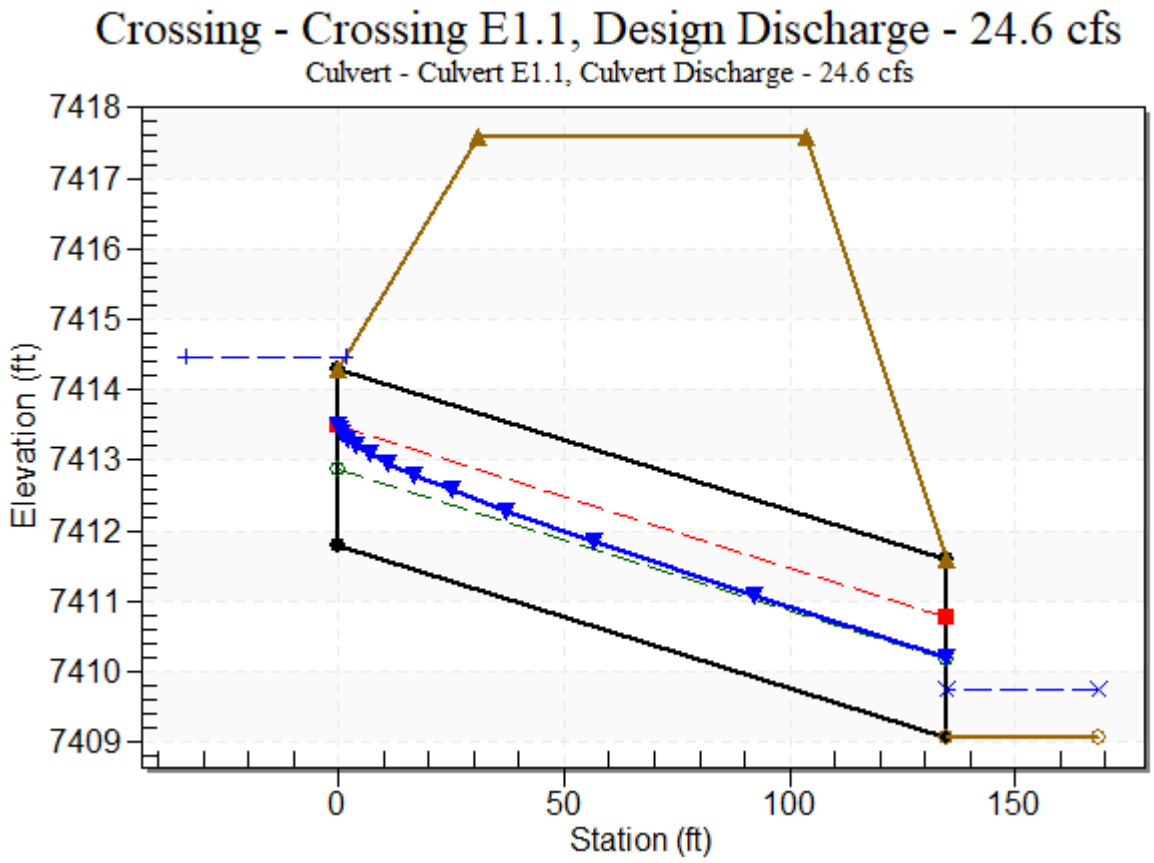
Culvert Length: 134.73 ft, Culvert Slope: 0.0202

****

Culvert Performance Curve Plot: Culvert E1.1



Water Surface Profile Plot for Culvert: Culvert E1.1



Site Data - Culvert E1.1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 7411.80 ft

Outlet Station: 134.70 ft

Outlet Elevation: 7409.08 ft

Number of Barrels: 1

Culvert Data Summary - Culvert E1.1

Barrel Shape: Circular

Barrel Diameter: 2.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 24 - Downstream Channel Rating Curve (Crossing: Crossing E1.1)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	7409.08	0.00	0.00	0.00	0.00
10.00	7409.49	0.41	3.16	0.80	0.95
24.60	7409.76	0.68	4.16	1.30	1.02
30.00	7409.83	0.75	4.41	1.45	1.03
40.00	7409.96	0.88	4.79	1.69	1.06
50.00	7410.06	0.98	5.11	1.89	1.07
60.00	7410.16	1.08	5.37	2.08	1.09
70.00	7410.25	1.17	5.61	2.25	1.10
80.00	7410.33	1.25	5.82	2.40	1.11
90.00	7410.41	1.33	6.01	2.55	1.11
100.00	7410.48	1.40	6.18	2.68	1.12

Tailwater Channel Data - Crossing E1.1

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 6.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0308

Channel Manning's n: 0.0400

Channel Invert Elevation: 7409.08 ft

Roadway Data for Crossing: Crossing E1.1

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 80.00 ft

Crest Elevation: 7417.60 ft

Roadway Surface: Paved

Roadway Top Width: 73.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 8.6 cfs

Maximum Flow: 100 cfs

Table 25 - Summary of Culvert Flows at Crossing: Crossing F2

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert F2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7363.83	0.00	0.00	0.00	1
7365.78	8.60	8.60	0.00	1
7368.30	20.00	15.02	4.97	8
7368.63	30.00	15.68	14.30	5
7368.90	40.00	16.20	23.76	4
7369.14	50.00	16.54	33.44	4
7369.36	60.00	16.75	43.24	4
7369.56	70.00	16.94	53.05	4
7369.75	80.00	17.13	62.87	4
7369.93	90.00	17.30	72.66	3
7370.10	100.00	17.48	82.51	3
7367.97	14.32	14.32	0.00	Overtopping

Rating Curve Plot for Crossing: Crossing F2

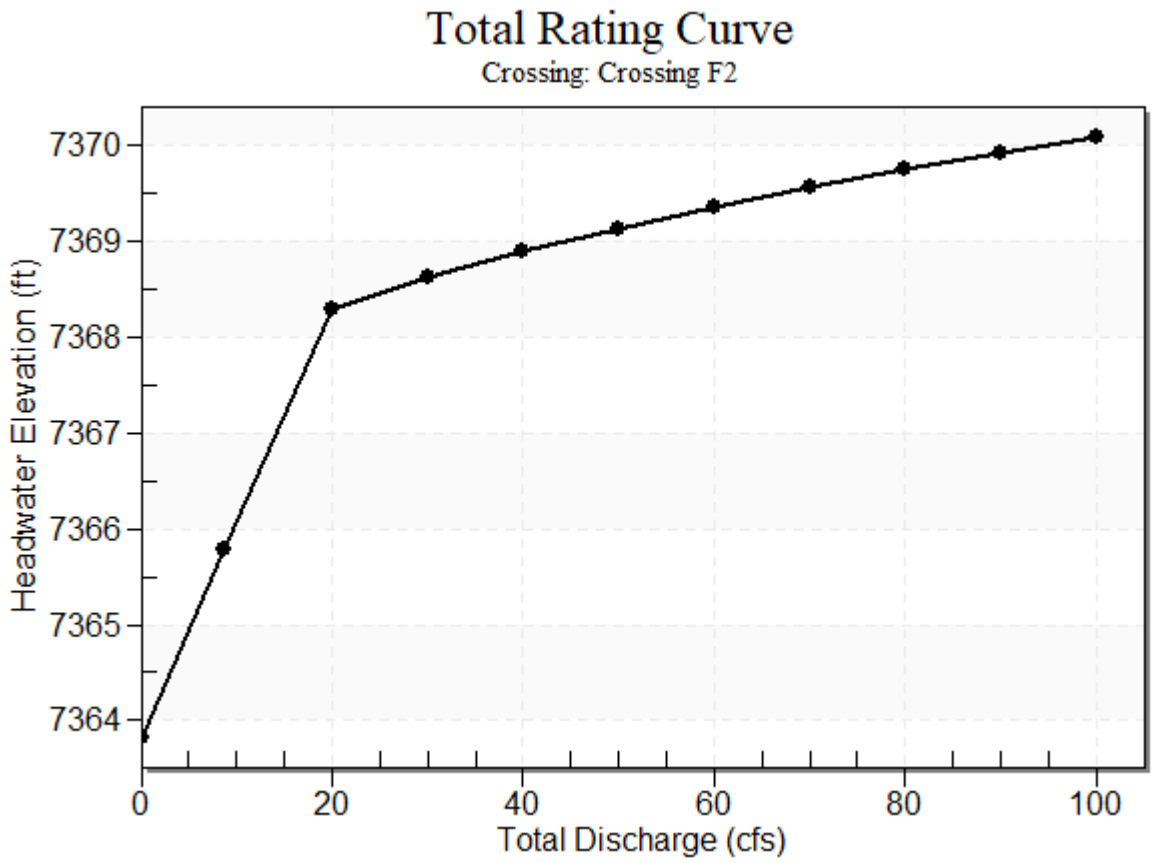


Table 26 - Culvert Summary Table: Culvert F2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	7363.83	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
8.60	8.60	7365.78	1.945	1.948	7-M2c	1.290	1.135	1.135	0.794	5.993	3.407
20.00	15.02	7368.30	3.865	4.471	7-M2c	1.500	1.406	1.406	1.090	8.726	4.208
30.00	15.68	7368.63	4.129	4.802	7-M2c	1.500	1.419	1.419	1.269	9.065	4.656
40.00	16.20	7368.90	4.341	5.069	7-M2c	1.500	1.428	1.428	1.414	9.334	5.004
50.00	16.54	7369.14	4.482	5.308	4-FFf	1.500	1.433	1.500	1.537	9.359	5.291
60.00	16.75	7369.36	4.573	5.526	4-FFf	1.500	1.412	1.500	1.646	9.476	5.538
70.00	16.94	7369.56	4.662	5.728	4-FFf	1.500	1.392	1.500	1.744	9.586	5.755
80.00	17.13	7369.75	4.748	5.918	4-FFf	1.500	1.378	1.500	1.833	9.691	5.950
90.00	17.30	7369.93	4.832	6.098	4-FFf	1.500	1.367	1.500	1.916	9.792	6.128
100.00	17.48	7370.10	4.913	6.271	4-FFf	1.500	1.357	1.500	1.993	9.889	6.292

****

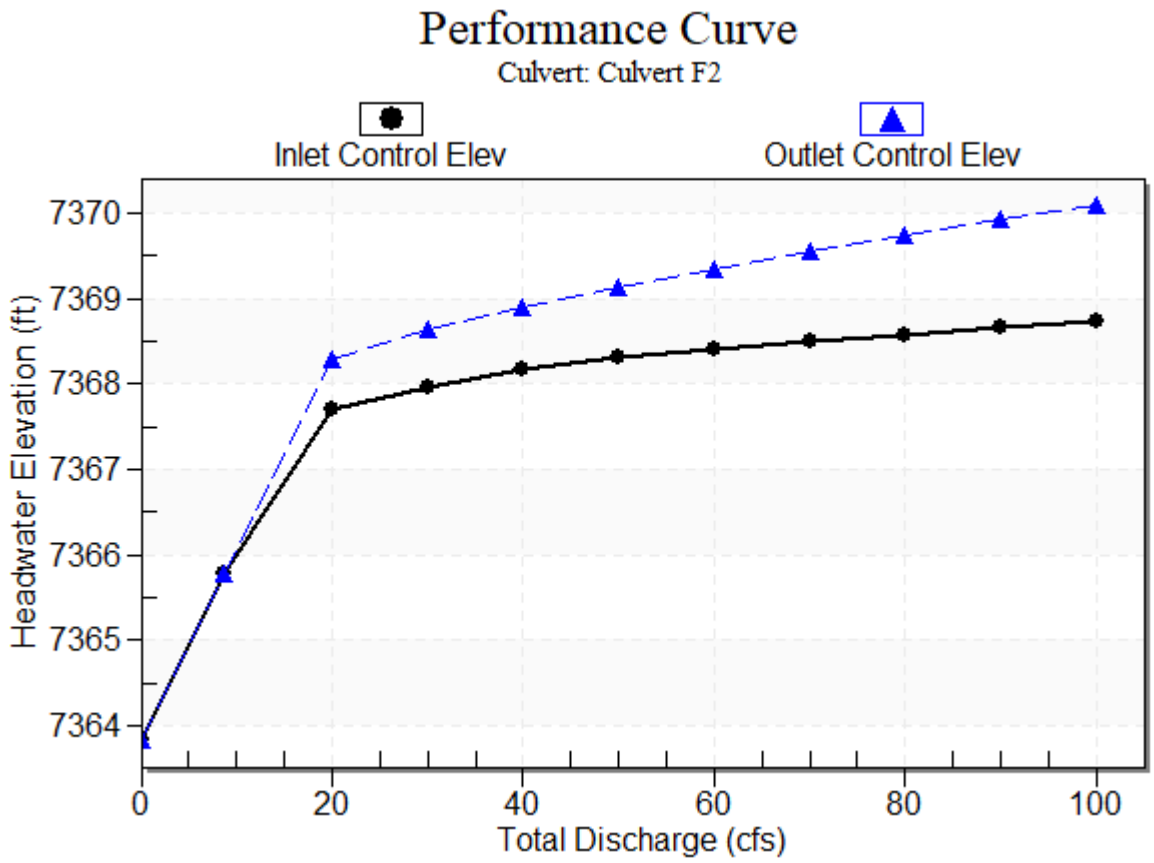
Straight Culvert

Inlet Elevation (invert): 7363.83 ft, Outlet Elevation (invert): 7363.25 ft

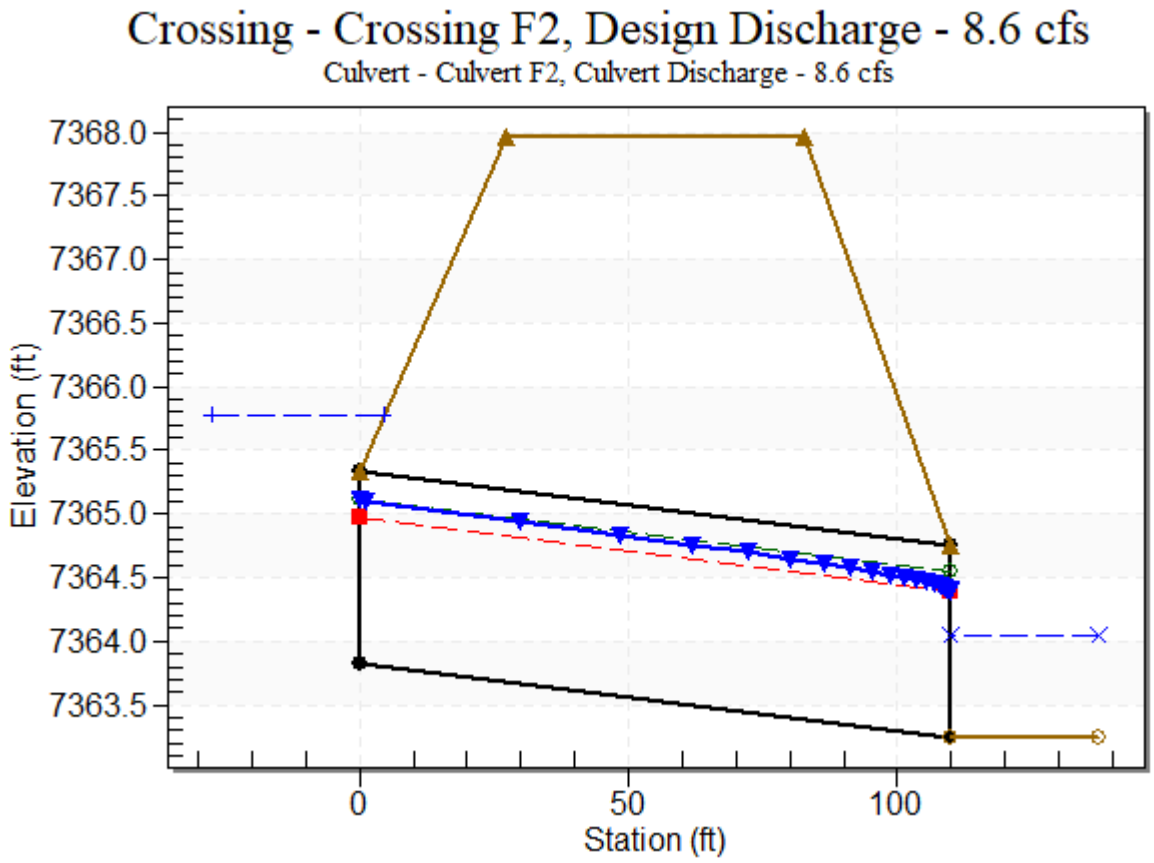
Culvert Length: 110.00 ft, Culvert Slope: 0.0053

****

Culvert Performance Curve Plot: Culvert F2



Water Surface Profile Plot for Culvert: Culvert F2



Site Data - Culvert F2

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 7363.83 ft

Outlet Station: 110.00 ft

Outlet Elevation: 7363.25 ft

Number of Barrels: 1

Culvert Data Summary - Culvert F2

Barrel Shape: Circular

Barrel Diameter: 1.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 27 - Downstream Channel Rating Curve (Crossing: Crossing F2)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	7363.25	0.00	0.00	0.00	0.00
8.60	7364.04	0.79	3.41	1.49	0.95
20.00	7364.34	1.09	4.21	2.04	1.00
30.00	7364.52	1.27	4.66	2.38	1.03
40.00	7364.66	1.41	5.00	2.65	1.05
50.00	7364.79	1.54	5.29	2.88	1.06
60.00	7364.90	1.65	5.54	3.08	1.08
70.00	7364.99	1.74	5.76	3.26	1.09
80.00	7365.08	1.83	5.95	3.43	1.10
90.00	7365.17	1.92	6.13	3.59	1.10
100.00	7365.24	1.99	6.29	3.73	1.11

Tailwater Channel Data - Crossing F2

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0300

Channel Manning's n: 0.0400

Channel Invert Elevation: 7363.25 ft

Roadway Data for Crossing: Crossing F2

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 55.34 ft

Crest Elevation: 7367.97 ft

Roadway Surface: Paved

Roadway Top Width: 55.34 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 10 cfs

Maximum Flow: 100 cfs

Table 28 - Summary of Culvert Flows at Crossing: General Driveway-18in

Headwater Elevation (ft)	Total Discharge (cfs)	Driveway Culvert 18in Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7388.00	0.00	0.00	0.00	1
7390.26	10.00	10.00	0.00	1
7392.71	20.00	17.08	2.91	10
7393.05	30.00	17.78	12.20	5
7393.30	40.00	18.30	21.69	5
7393.52	50.00	18.73	31.22	4
7393.72	60.00	19.12	40.84	4
7393.90	70.00	19.48	50.50	4
7394.07	80.00	19.79	60.15	3
7394.23	90.00	20.09	69.87	3
7394.39	100.00	20.37	79.62	3
7392.50	16.61	16.61	0.00	Overtopping

Rating Curve Plot for Crossing: General Driveway-18in

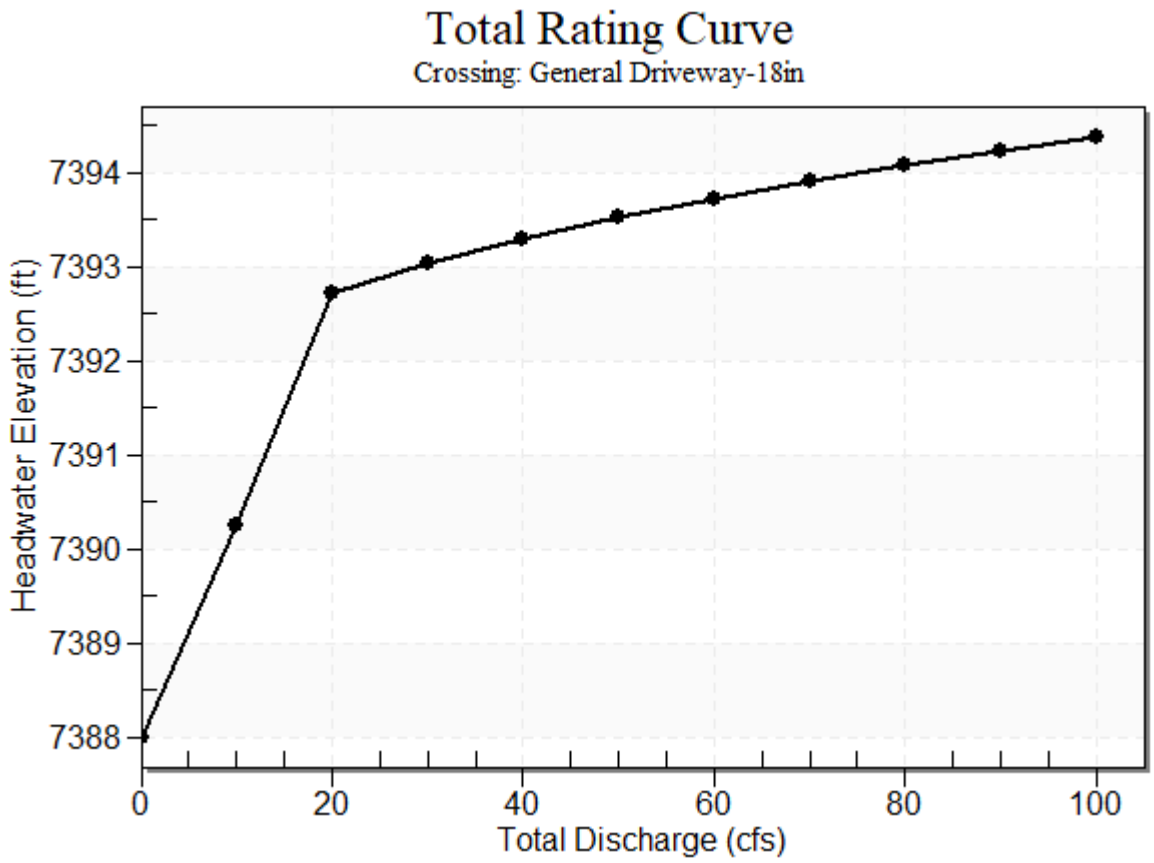


Table 29 - Culvert Summary Table: Driveway Culvert 18in

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	7388.00	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
10.00	10.00	7390.26	2.256	1.995	5-S2n	0.900	1.219	1.033	0.907	7.709	3.039
20.00	17.08	7392.71	4.713	3.730	7-M2c	1.500	1.382	1.382	1.176	10.031	3.614
30.00	17.78	7393.05	5.046	3.943	7-M2t	1.500	1.308	1.369	1.369	10.507	4.000
40.00	18.30	7393.30	5.300	4.124	4-FFf	1.500	1.492	1.500	1.525	10.354	4.298
50.00	18.73	7393.52	5.520	4.393	4-FFf	1.500	1.500	1.500	1.658	10.601	4.544
60.00	19.12	7393.72	5.720	4.633	4-FFf	1.500	1.500	1.500	1.776	10.821	4.756
70.00	19.48	7393.90	5.905	4.853	4-FFf	1.500	1.500	1.500	1.882	11.021	4.943
80.00	19.79	7394.07	6.071	5.051	4-FFf	1.500	1.500	1.500	1.978	11.197	5.111
90.00	20.09	7394.23	6.233	5.240	4-FFf	1.500	1.500	1.500	2.067	11.367	5.264
100.00	20.37	7394.39	6.388	5.419	4-FFf	1.500	1.500	1.500	2.151	11.526	5.404

****

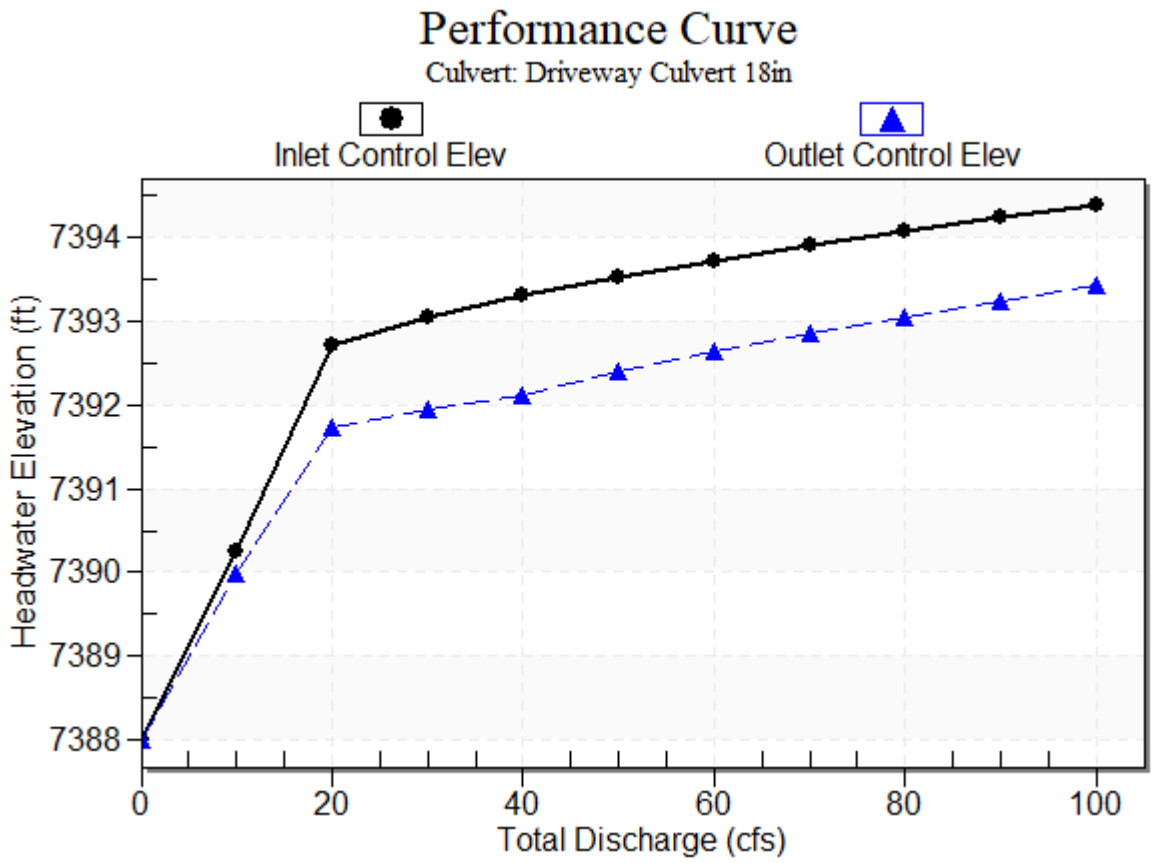
Straight Culvert

Inlet Elevation (invert): 7388.00 ft, Outlet Elevation (invert): 7387.80 ft

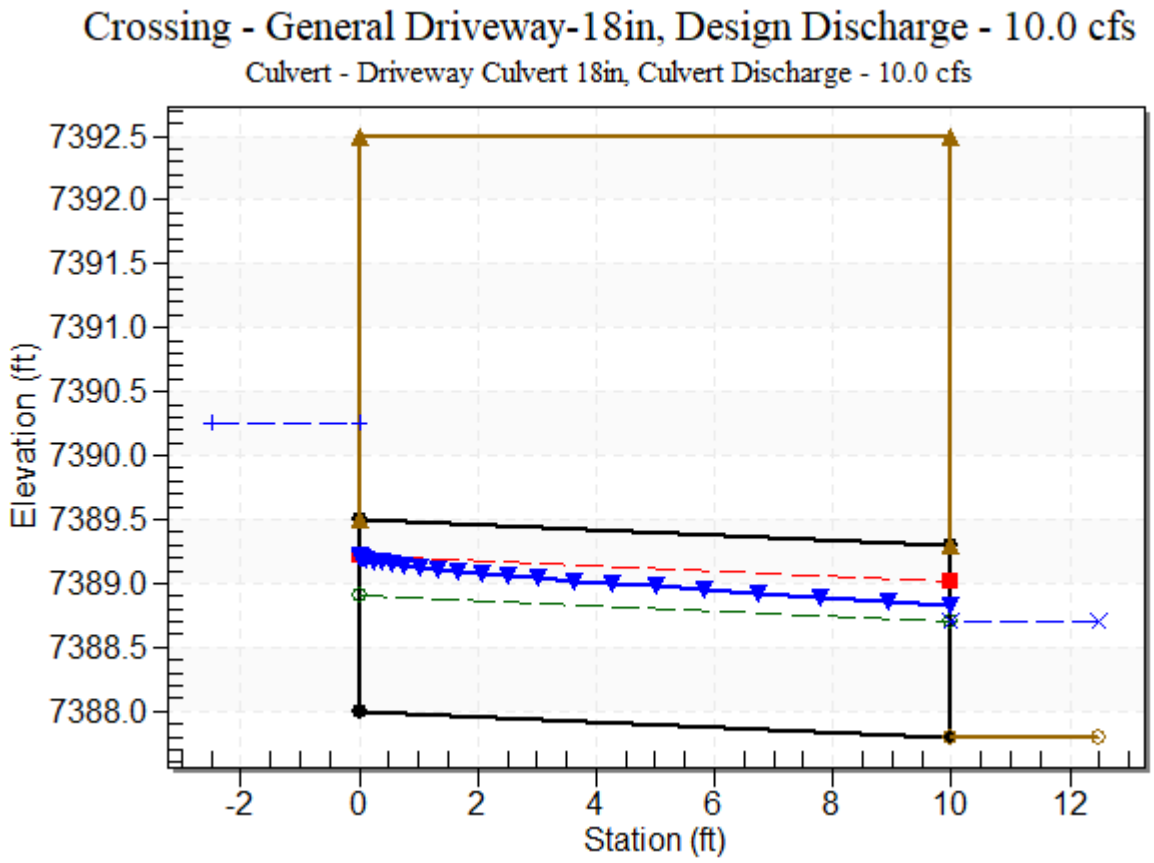
Culvert Length: 10.00 ft, Culvert Slope: 0.0200

****

Culvert Performance Curve Plot: Driveway Culvert 18in



Water Surface Profile Plot for Culvert: Driveway Culvert 18in



Site Data - Driveway Culvert 18in

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 7388.00 ft

Outlet Station: 10.00 ft

Outlet Elevation: 7387.80 ft

Number of Barrels: 1

Culvert Data Summary - Driveway Culvert 18in

Barrel Shape: Circular

Barrel Diameter: 1.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 30 - Downstream Channel Rating Curve (Crossing: General Driveway-18in)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	7387.80	0.00	0.00	0.00	0.00
10.00	7388.71	0.91	3.04	1.13	0.80
20.00	7388.98	1.18	3.61	1.47	0.83
30.00	7389.17	1.37	4.00	1.71	0.85
40.00	7389.33	1.53	4.30	1.90	0.87
50.00	7389.46	1.66	4.54	2.07	0.88
60.00	7389.58	1.78	4.76	2.22	0.89
70.00	7389.68	1.88	4.94	2.35	0.90
80.00	7389.78	1.98	5.11	2.47	0.91
90.00	7389.87	2.07	5.26	2.58	0.91
100.00	7389.95	2.15	5.40	2.68	0.92

Tailwater Channel Data - General Driveway-18in

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0200

Channel Manning's n: 0.0400

Channel Invert Elevation: 7387.80 ft

Roadway Data for Crossing: General Driveway-18in

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 10.00 ft

Crest Elevation: 7392.50 ft

Roadway Surface: Paved

Roadway Top Width: 10.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 20 cfs

Maximum Flow: 100 cfs

Table 31 - Summary of Culvert Flows at Crossing: General Driveway-24in

Headwater Elevation (ft)	Total Discharge (cfs)	Driveway Culvert 24in Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7388.00	0.00	0.00	0.00	1
7389.69	10.00	10.00	0.00	1
7390.92	20.00	20.00	0.00	1
7392.93	30.00	30.00	0.00	1
7393.41	40.00	31.91	8.05	5
7393.68	50.00	32.92	17.07	5
7393.91	60.00	33.75	26.20	4
7394.11	70.00	34.48	35.49	4
7394.30	80.00	35.10	44.87	4
7394.47	90.00	35.68	54.30	4
7394.63	100.00	36.19	63.77	3
7393.00	30.27	30.27	0.00	Overtopping

Rating Curve Plot for Crossing: General Driveway-24in

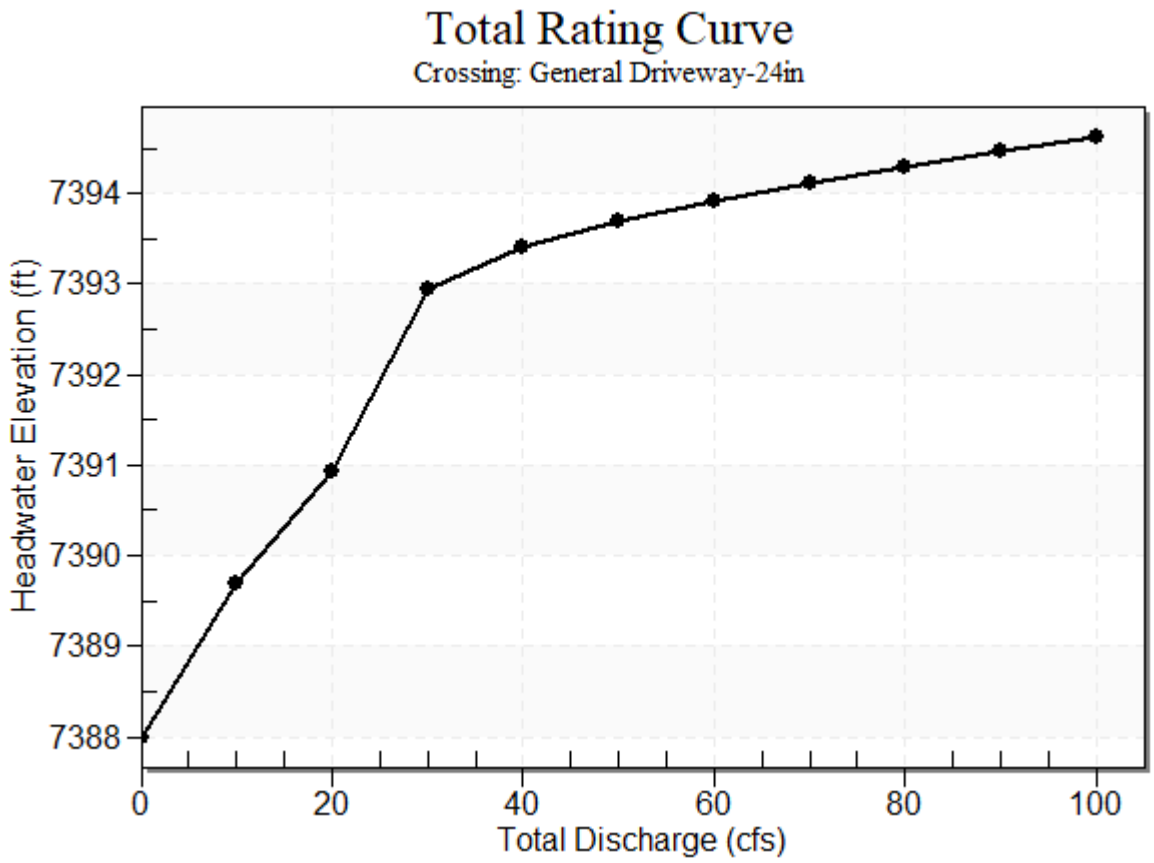


Table 32 - Culvert Summary Table: Driveway Culvert 24in

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	7388.00	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
10.00	10.00	7389.69	1.686	1.187	1-S2n	0.767	1.131	0.915	0.907	7.140	3.039
20.00	20.00	7390.92	2.924	2.625	5-S2n	1.144	1.606	1.370	1.176	8.719	3.614
30.00	30.00	7392.93	4.934	4.030	5-S2n	1.535	1.862	1.724	1.369	10.421	4.000
40.00	31.91	7393.41	5.415	4.345	5-S2n	1.631	1.889	1.786	1.525	10.776	4.298
50.00	32.92	7393.68	5.682	4.518	5-S2n	1.692	1.900	1.822	1.658	10.961	4.544
60.00	33.75	7393.91	5.907	4.665	5-S2n	1.758	1.909	1.858	1.776	11.095	4.756
70.00	34.48	7394.11	6.111	4.794	3-M2t	2.000	1.874	1.882	1.882	11.244	4.943
80.00	35.10	7394.30	6.298	4.926	7-M2t	2.000	1.840	1.978	1.978	11.195	5.111
90.00	35.68	7394.47	6.474	5.119	4-FFf	2.000	1.817	2.000	2.067	11.357	5.264
100.00	36.19	7394.63	6.632	5.297	4-FFf	2.000	1.778	2.000	2.151	11.520	5.404

****

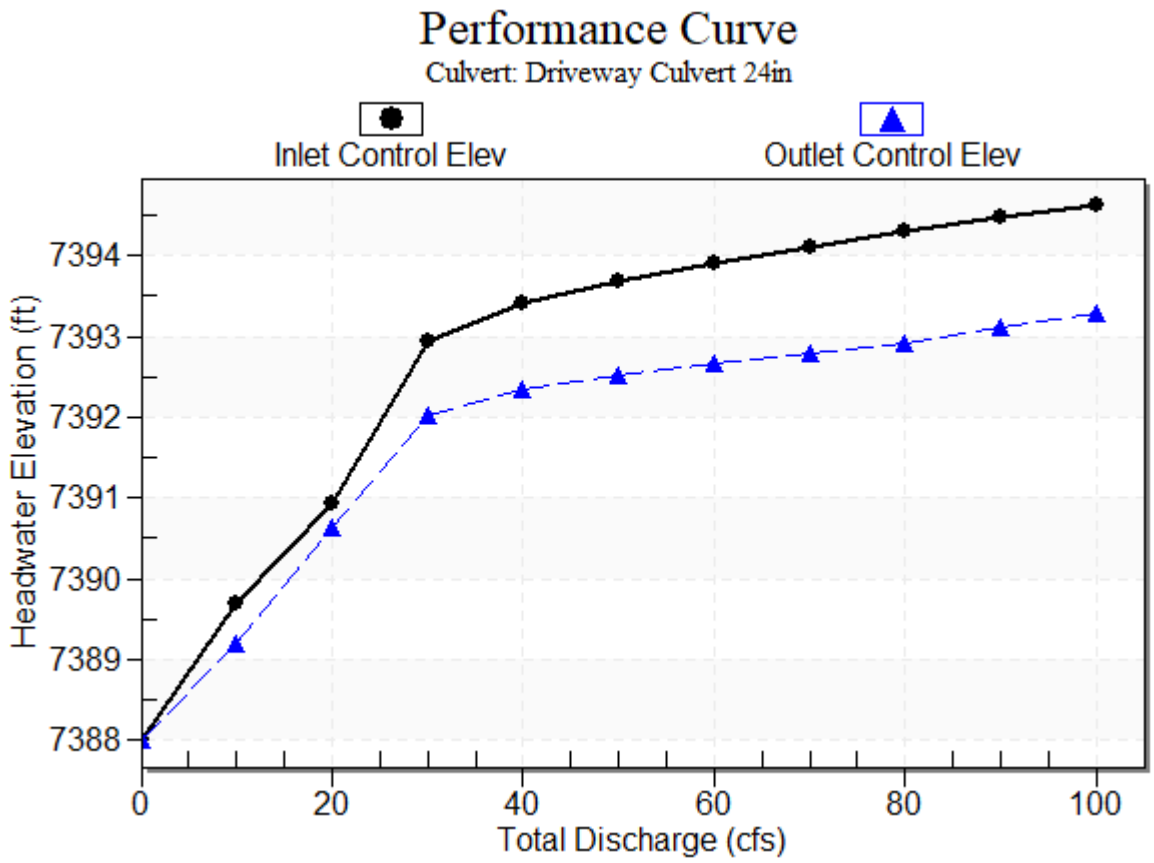
Straight Culvert

Inlet Elevation (invert): 7388.00 ft, Outlet Elevation (invert): 7387.80 ft

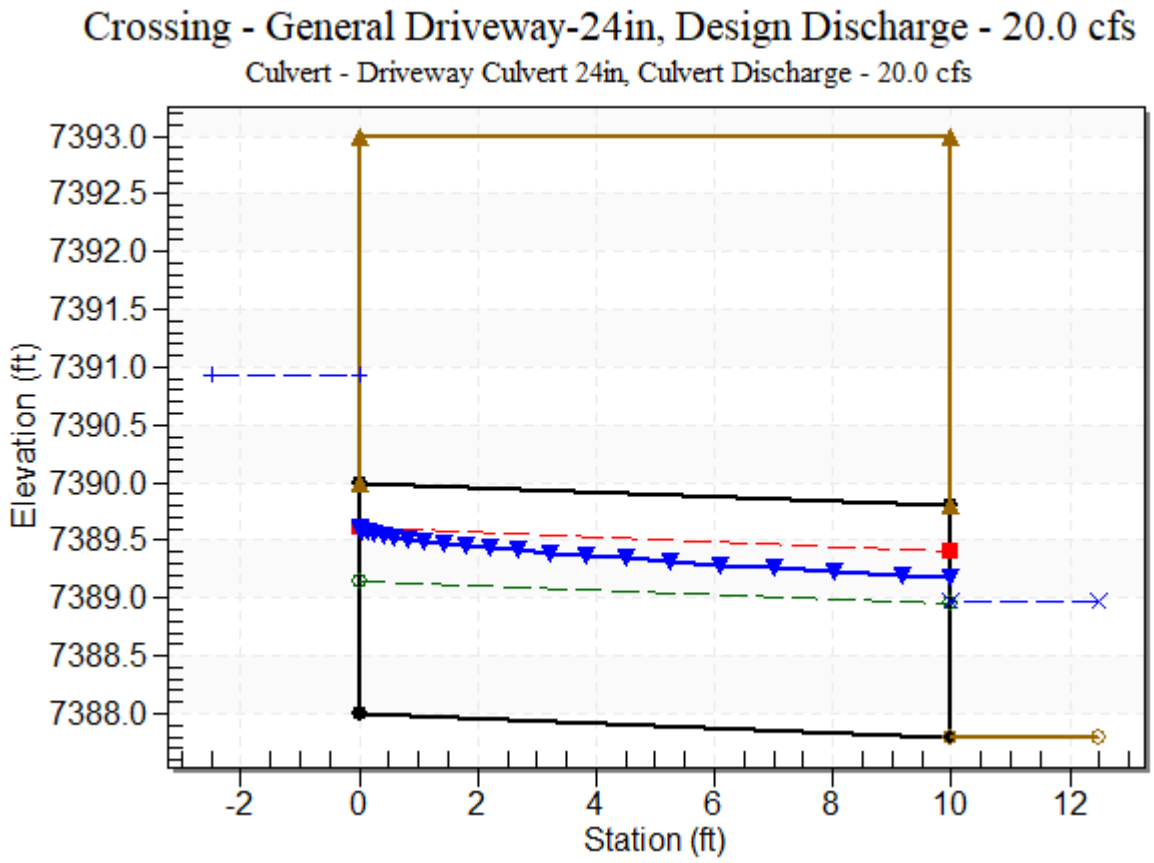
Culvert Length: 10.00 ft, Culvert Slope: 0.0200

****

Culvert Performance Curve Plot: Driveway Culvert 24in



Water Surface Profile Plot for Culvert: Driveway Culvert 24in



Site Data - Driveway Culvert 24in

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 7388.00 ft

Outlet Station: 10.00 ft

Outlet Elevation: 7387.80 ft

Number of Barrels: 1

Culvert Data Summary - Driveway Culvert 24in

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 33 - Downstream Channel Rating Curve (Crossing: General Driveway-24in)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	7387.80	0.00	0.00	0.00	0.00
10.00	7388.71	0.91	3.04	1.13	0.80
20.00	7388.98	1.18	3.61	1.47	0.83
30.00	7389.17	1.37	4.00	1.71	0.85
40.00	7389.33	1.53	4.30	1.90	0.87
50.00	7389.46	1.66	4.54	2.07	0.88
60.00	7389.58	1.78	4.76	2.22	0.89
70.00	7389.68	1.88	4.94	2.35	0.90
80.00	7389.78	1.98	5.11	2.47	0.91
90.00	7389.87	2.07	5.26	2.58	0.91
100.00	7389.95	2.15	5.40	2.68	0.92

Provide a summary table for the lots and required driveway culvert sizes. Example below from another project. It's unclear which lots these general driveway culvert calculations applies to.

DRIVEWAY CULVERT SIZING CALCULATIONS

Lot Number	100 yr. Flow (cfs)	Culvert Size (in.)	Anticipated Driveway Location (24' width max.)	Notes (See Appendix for non-std. driveway culvert calculations)
1	N/A	N/A	North end of lot	No ditch on west side of roadway
2	N/A	N/A	Middle of lot	No ditch on west side of roadway
3	**143**	**Triple 36**	North end of cul-de-sac bulb	**Need Triple 36" culverts to cross natural ravine within lot to allow for the HFR Pond 26 Outfall**
4	2	18	South end of lot	
5	2	18	Middle of lot, north of 30" culvert crossing	Driveway access to Billings Ct. only
6	3	18	Flag stem of Lot 7	**Lots 6, 7 & 8 have single shared driveway access directly to Stagecoach Rd. per Final Plat and deviation 18003**
7	3	18	Flag stem	**Lots 6, 7 & 8 have single shared driveway access directly to Stagecoach Rd. per Final Plat and deviation 18003**
8	3	18	Flag stem of Lot 7	**Lots 6, 7 & 8 have single shared driveway access directly to Stagecoach Rd. per Final Plat and deviation 18003**
9	2	18	West side of lot, near high point of roadway	Allowed direct drieway access to Stagecoach Rd. per deviation 18003
10	7	18	Middle of lot	Allowed direct drieway access to Stagecoach Rd. per deviation 18003
11	**10**	**24**	Middle of lot	Allowed direct drieway access to Stagecoach Rd. per deviation 18003
12	4	18	West side of lot	Allowed direct drieway access to Stagecoach Rd. per deviation 18003
13	4	18	Middle of lot	Allowed direct drieway access to Stagecoach Rd. per deviation 18003
14	7	18	West side of lot	Allowed direct drieway access to Stagecoach Rd. per deviation 18003
15	8	18	Middle of lot, west of natural ravne	Allowed direct drieway access to Stagecoach Rd. per deviation 18003
16	**65**	**Dual 30**	North end of cul-de-sac	Driveway access to Old Stagecoach Rd. Cul-de-sac only. Crossing of natural ravine within drainage esmt.
17	**65**	**Dual 30**	South end of cul-de-sac	Driveway access to Old Stagecoach Rd. Cul-de-sac only. Crossing of natural ravine within drainage esmt.
18	3	18	Middle of lot	Driveway access to Old Stagecoach Rd. Cul-de-sac only.
19	2	18	Middle of lot	Driveway access to Old Stagecoach Rd. Cul-de-sac only.
20	**30**	**Dual 24**	Middle of lot	Large off-site basins tributary to driveway culvert
21	4	18	East side of lot	
22	2	18	East side of lot	
23	4	18	Middle of lot	
24	N/A	N/A	Middle of lot	No ditch on north side of roadway

Tailwater Channel Data - General Driveway-24in

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0200

Channel Manning's n: 0.0400

Channel Invert Elevation: 7387.80 ft

Roadway Data for Crossing: General Driveway-24in

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 10.00 ft

Crest Elevation: 7393.00 ft

Roadway Surface: Paved

Roadway Top Width: 10.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 30 cfs

Maximum Flow: 100 cfs

Table 34 - Summary of Culvert Flows at Crossing: General Driveway-30in

Headwater Elevation (ft)	Total Discharge (cfs)	Driveway Culvert 30in Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7388.00	0.00	0.00	0.00	1
7389.49	10.00	10.00	0.00	1
7390.30	20.00	20.00	0.00	1
7391.14	30.00	30.00	0.00	1
7392.27	40.00	40.00	0.00	1
7393.60	50.00	49.05	0.92	10
7393.94	60.00	51.10	8.87	5
7394.19	70.00	52.55	17.44	5
7394.41	80.00	53.76	26.20	4
7394.60	90.00	54.84	35.13	4
7394.78	100.00	55.83	44.15	4
7393.50	48.44	48.44	0.00	Overtopping

Rating Curve Plot for Crossing: General Driveway-30in

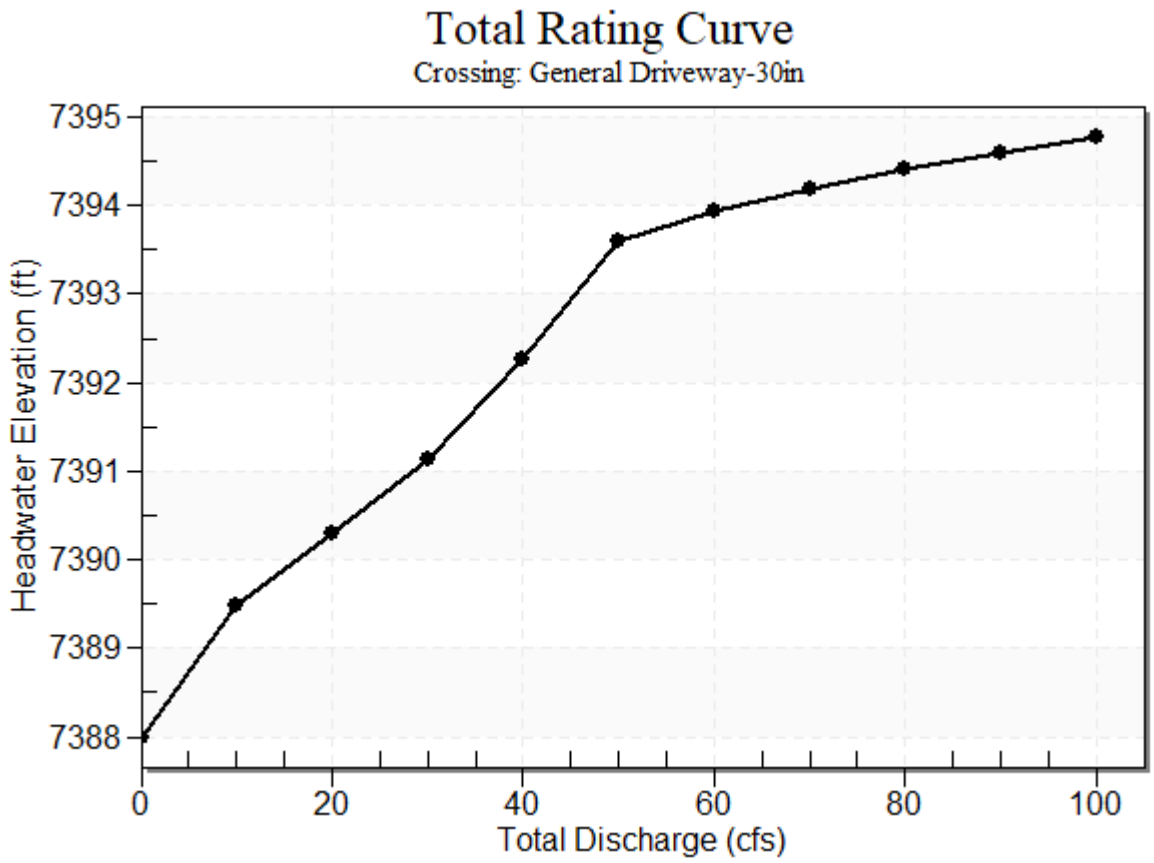


Table 35 - Culvert Summary Table: Driveway Culvert 30in

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	7388.00	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
10.00	10.00	7389.49	1.489	0.959	1-S2n	0.702	1.056	0.843	0.907	6.874	3.039
20.00	20.00	7390.30	2.301	1.728	1-S2n	1.011	1.518	1.253	1.176	8.121	3.614
30.00	30.00	7391.14	3.142	2.590	5-S2n	1.274	1.867	1.585	1.369	9.144	4.000
40.00	40.00	7392.27	4.268	3.756	5-S2n	1.524	2.129	1.866	1.525	10.180	4.298
50.00	49.05	7393.60	5.599	4.662	5-S2n	1.761	2.287	2.082	1.658	11.232	4.544
60.00	51.10	7393.94	5.942	4.885	5-S2n	1.819	2.313	2.126	1.776	11.488	4.756
70.00	52.55	7394.19	6.192	5.047	5-S2n	1.861	2.330	2.156	1.882	11.674	4.943
80.00	53.76	7394.41	6.407	5.186	5-S2n	1.899	2.342	2.182	1.978	11.829	5.111
90.00	54.84	7394.60	6.603	5.311	5-S2n	1.933	2.353	2.204	2.067	11.974	5.264
100.00	55.83	7394.78	6.785	5.428	5-S2n	1.966	2.361	2.224	2.151	12.103	5.404

****

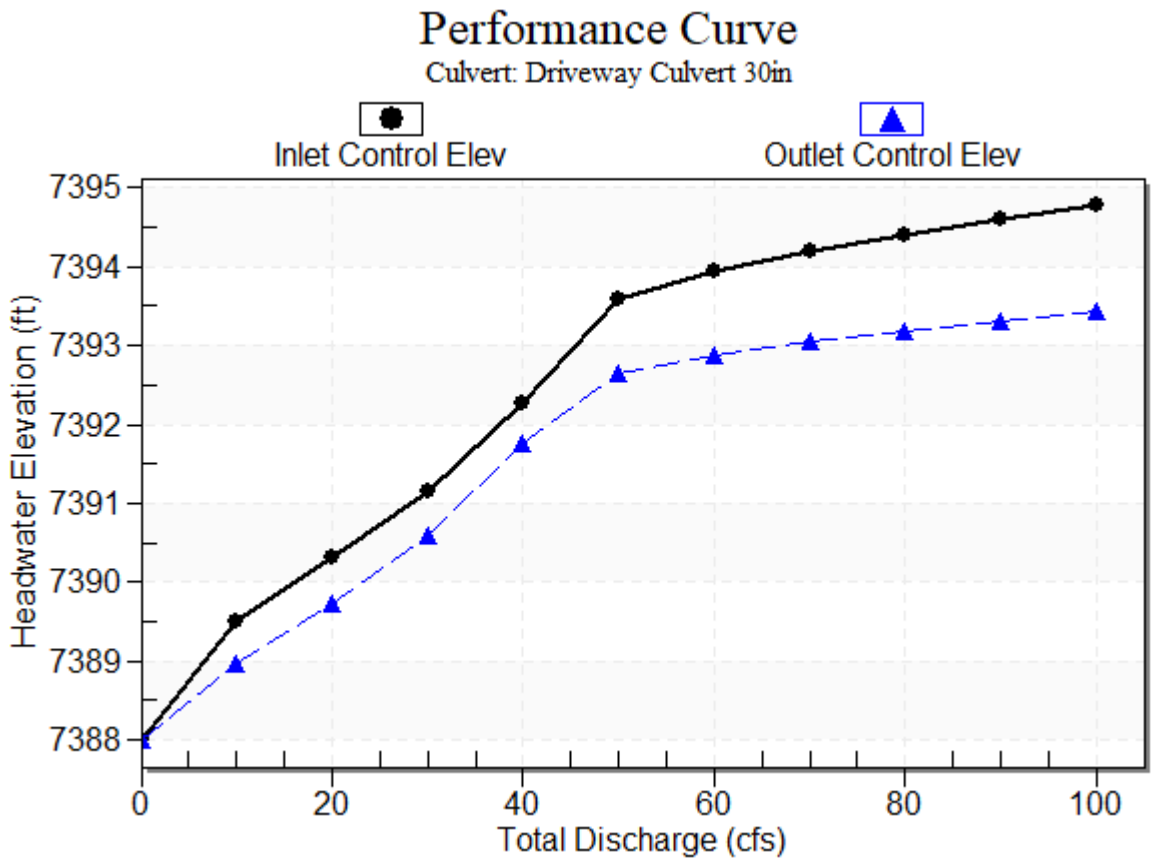
Straight Culvert

Inlet Elevation (invert): 7388.00 ft, Outlet Elevation (invert): 7387.80 ft

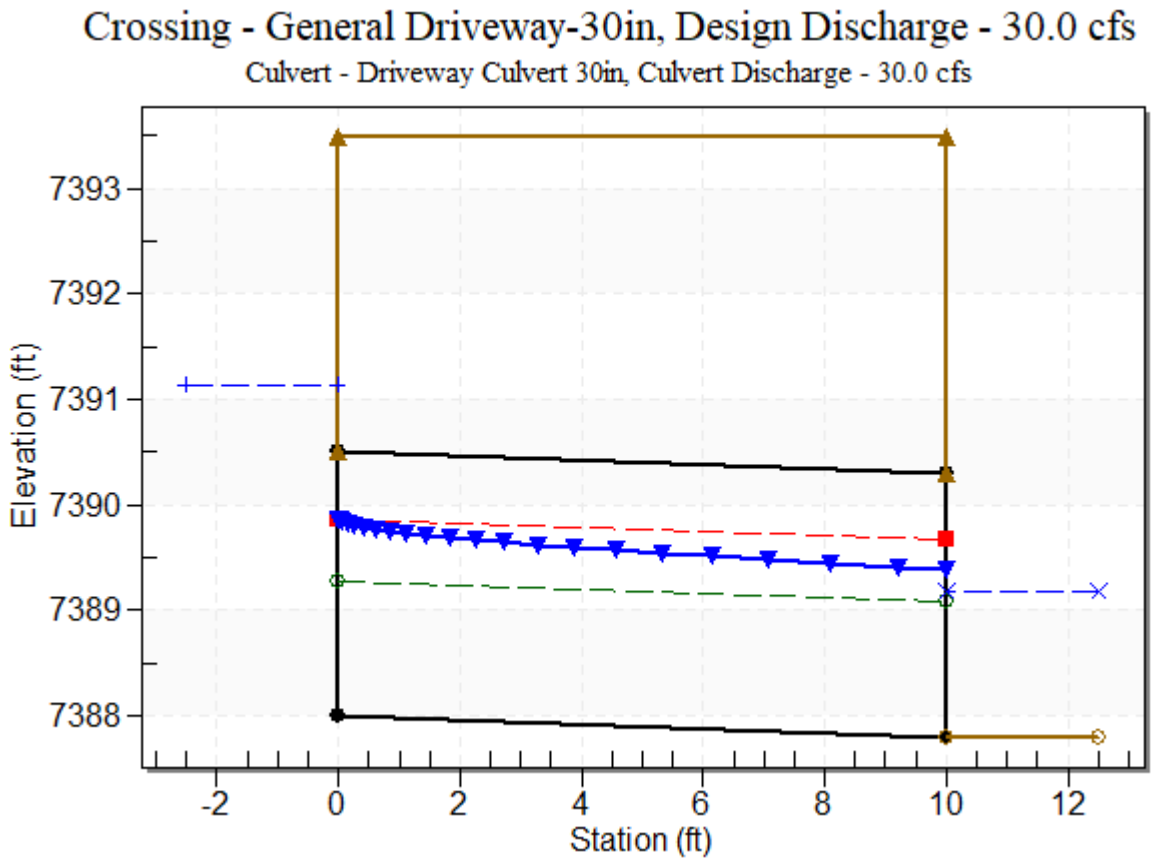
Culvert Length: 10.00 ft, Culvert Slope: 0.0200

****

Culvert Performance Curve Plot: Driveway Culvert 30in



Water Surface Profile Plot for Culvert: Driveway Culvert 30in



Site Data - Driveway Culvert 30in

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 7388.00 ft

Outlet Station: 10.00 ft

Outlet Elevation: 7387.80 ft

Number of Barrels: 1

Culvert Data Summary - Driveway Culvert 30in

Barrel Shape: Circular

Barrel Diameter: 2.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 36 - Downstream Channel Rating Curve (Crossing: General Driveway-30in)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	7387.80	0.00	0.00	0.00	0.00
10.00	7388.71	0.91	3.04	1.13	0.80
20.00	7388.98	1.18	3.61	1.47	0.83
30.00	7389.17	1.37	4.00	1.71	0.85
40.00	7389.33	1.53	4.30	1.90	0.87
50.00	7389.46	1.66	4.54	2.07	0.88
60.00	7389.58	1.78	4.76	2.22	0.89
70.00	7389.68	1.88	4.94	2.35	0.90
80.00	7389.78	1.98	5.11	2.47	0.91
90.00	7389.87	2.07	5.26	2.58	0.91
100.00	7389.95	2.15	5.40	2.68	0.92

Tailwater Channel Data - General Driveway-30in

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0200

Channel Manning's n: 0.0400

Channel Invert Elevation: 7387.80 ft

Roadway Data for Crossing: General Driveway-30in

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 10.00 ft

Crest Elevation: 7393.50 ft

Roadway Surface: Paved

Roadway Top Width: 10.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 50 cfs

Maximum Flow: 100 cfs

Table 37 - Summary of Culvert Flows at Crossing: General Driveway-36in

Headwater Elevation (ft)	Total Discharge (cfs)	Driveway Culvert 36in Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7388.00	0.00	0.00	0.00	1
7389.36	10.00	10.00	0.00	1
7390.07	20.00	20.00	0.00	1
7390.67	30.00	30.00	0.00	1
7391.27	40.00	40.00	0.00	1
7391.97	50.00	50.00	0.00	1
7392.82	60.00	60.00	0.00	1
7393.85	70.00	70.00	0.00	1
7394.33	80.00	74.20	5.79	6
7394.59	90.00	76.31	13.68	5
7394.81	100.00	78.06	21.90	4
7394.00	71.34	71.34	0.00	Overtopping

Rating Curve Plot for Crossing: General Driveway-36in

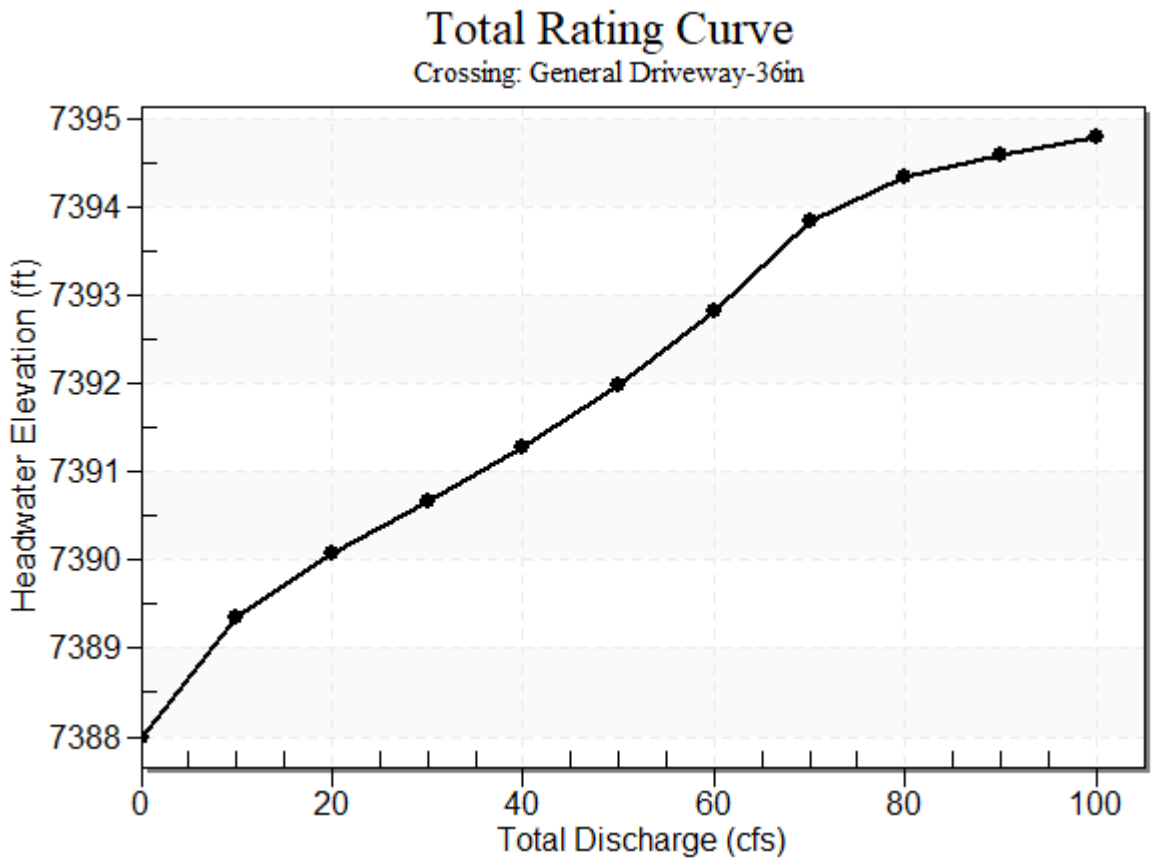


Table 38 - Culvert Summary Table: Driveway Culvert 36in

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	7388.00	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
10.00	10.00	7389.36	1.359	0.849	1-S2n	0.658	1.000	0.792	0.907	6.697	3.039
20.00	20.00	7390.07	2.073	1.430	1-S2n	0.937	1.435	1.172	1.176	7.820	3.614
30.00	30.00	7390.67	2.671	2.014	1-S2n	1.161	1.774	1.478	1.369	8.653	4.000
40.00	40.00	7391.27	3.272	2.641	5-S2n	1.362	2.059	1.743	1.525	9.388	4.298
50.00	50.00	7391.97	3.971	3.672	5-S2n	1.551	2.301	1.981	1.658	10.100	4.544
60.00	60.00	7392.82	4.823	4.309	5-S2n	1.735	2.501	2.193	1.776	10.837	4.756
70.00	70.00	7393.85	5.849	5.023	5-S2n	1.922	2.657	2.382	1.882	11.631	4.943
80.00	74.20	7394.33	6.333	5.345	5-S2n	2.002	2.710	2.454	1.978	11.989	5.111
90.00	76.31	7394.59	6.588	5.512	5-S2n	2.044	2.733	2.489	2.067	12.176	5.264
100.00	78.06	7394.81	6.805	5.653	5-S2n	2.078	2.751	2.517	2.151	12.332	5.404

****

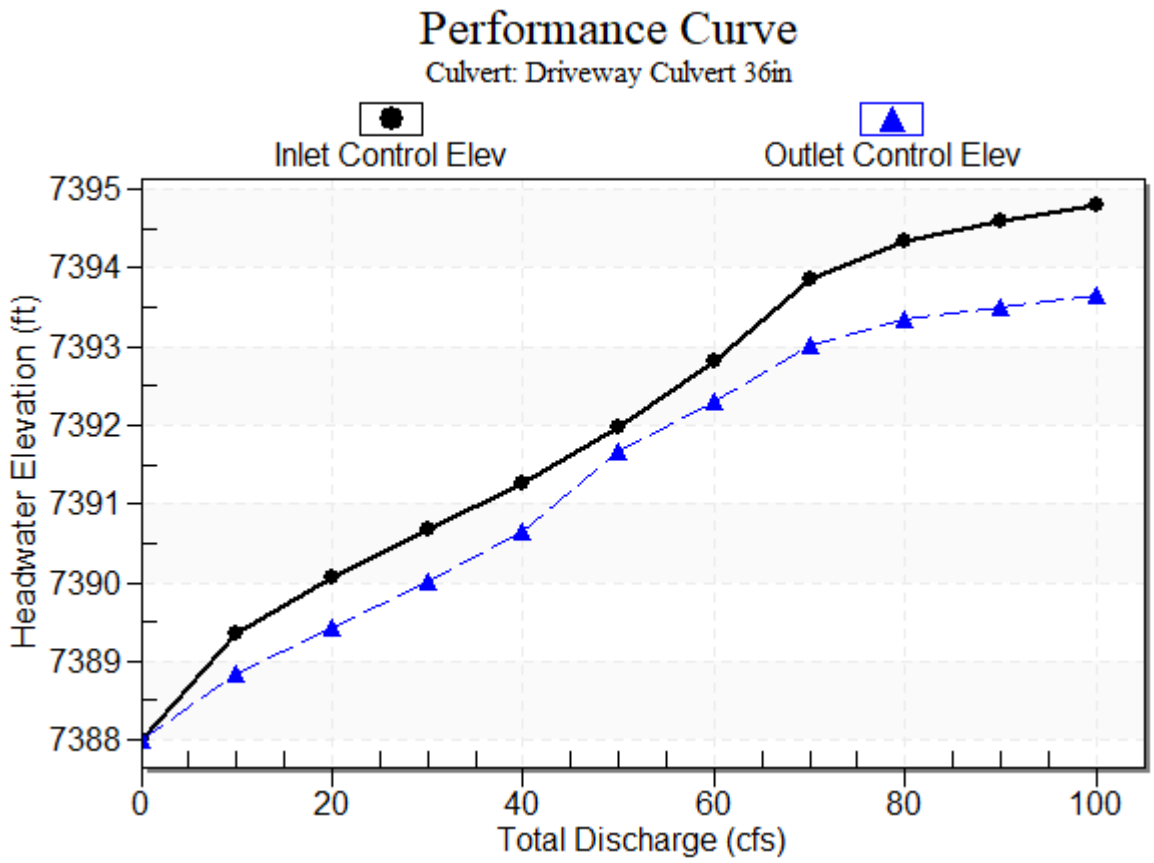
Straight Culvert

Inlet Elevation (invert): 7388.00 ft, Outlet Elevation (invert): 7387.80 ft

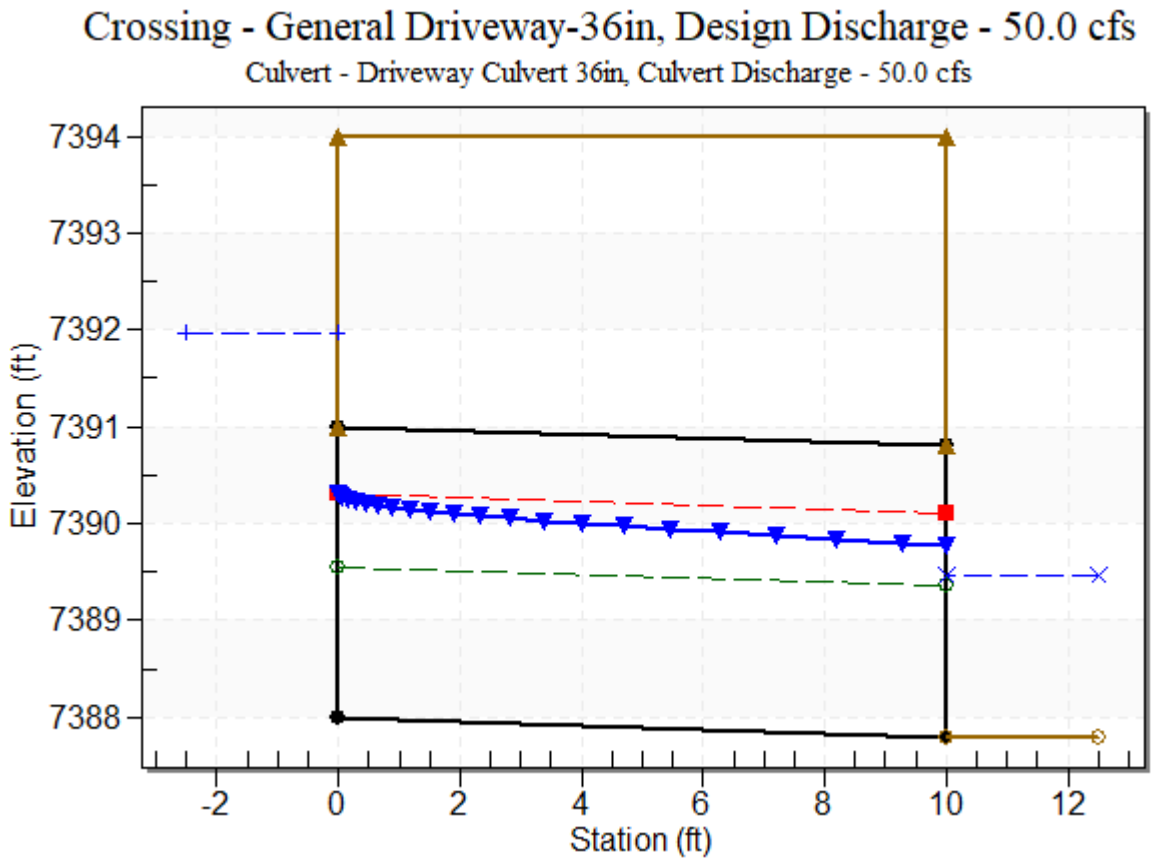
Culvert Length: 10.00 ft, Culvert Slope: 0.0200

****

Culvert Performance Curve Plot: Driveway Culvert 36in



Water Surface Profile Plot for Culvert: Driveway Culvert 36in



Site Data - Driveway Culvert 36in

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 7388.00 ft

Outlet Station: 10.00 ft

Outlet Elevation: 7387.80 ft

Number of Barrels: 1

Culvert Data Summary - Driveway Culvert 36in

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 39 - Downstream Channel Rating Curve (Crossing: General Driveway-36in)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	7387.80	0.00	0.00	0.00	0.00
10.00	7388.71	0.91	3.04	1.13	0.80
20.00	7388.98	1.18	3.61	1.47	0.83
30.00	7389.17	1.37	4.00	1.71	0.85
40.00	7389.33	1.53	4.30	1.90	0.87
50.00	7389.46	1.66	4.54	2.07	0.88
60.00	7389.58	1.78	4.76	2.22	0.89
70.00	7389.68	1.88	4.94	2.35	0.90
80.00	7389.78	1.98	5.11	2.47	0.91
90.00	7389.87	2.07	5.26	2.58	0.91
100.00	7389.95	2.15	5.40	2.68	0.92

Tailwater Channel Data - General Driveway-36in

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0200

Channel Manning's n: 0.0400

Channel Invert Elevation: 7387.80 ft

Roadway Data for Crossing: General Driveway-36in

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 10.00 ft

Crest Elevation: 7394.00 ft

Roadway Surface: Paved

Roadway Top Width: 10.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 70 cfs

Maximum Flow: 100 cfs

Table 40 - Summary of Culvert Flows at Crossing: General Driveway-42in

Headwater Elevation (ft)	Total Discharge (cfs)	Driveway Culvert 42in Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7388.00	0.00	0.00	0.00	1
7389.29	10.00	10.00	0.00	1
7389.90	20.00	20.00	0.00	1
7390.45	30.00	30.00	0.00	1
7390.93	40.00	40.00	0.00	1
7391.39	50.00	50.00	0.00	1
7391.88	60.00	60.00	0.00	1
7392.42	70.00	70.00	0.00	1
7393.05	80.00	80.00	0.00	1
7393.76	90.00	90.00	0.00	1
7394.55	100.00	99.71	0.28	7
7394.50	99.18	99.18	0.00	Overtopping

Rating Curve Plot for Crossing: General Driveway-42in

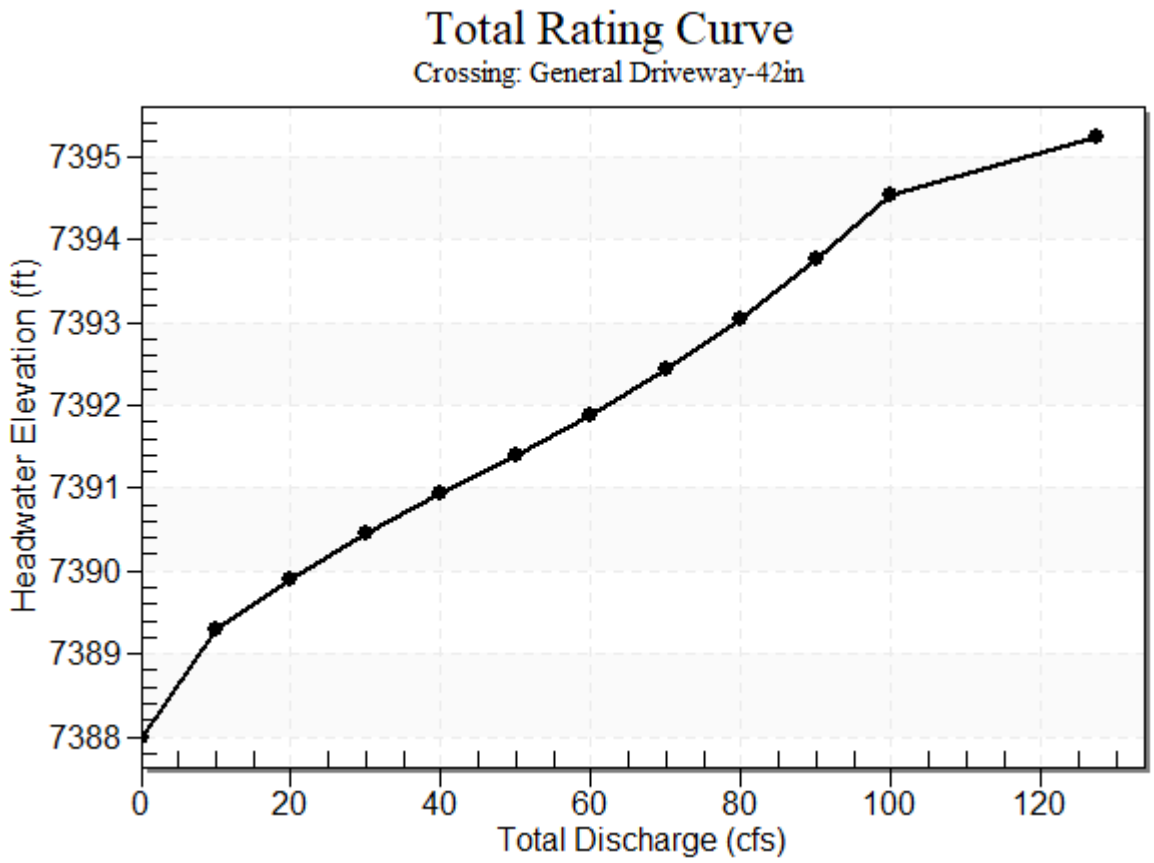


Table 41 - Culvert Summary Table: Driveway Culvert 42in

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	7388.00	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
10.00	10.00	7389.29	1.292	0.783	1-S2n	0.628	0.957	0.754	0.907	6.564	3.039
20.00	20.00	7389.90	1.896	1.274	1-S2n	0.885	1.369	1.111	1.176	7.620	3.614
30.00	30.00	7390.45	2.448	1.727	1-S2n	1.089	1.692	1.397	1.369	8.370	4.000
40.00	40.00	7390.93	2.927	2.185	1-S2n	1.268	1.967	1.646	1.525	8.996	4.298
50.00	50.00	7391.39	3.390	2.663	1-S2n	1.431	2.210	1.870	1.658	9.561	4.544
60.00	60.00	7391.88	3.878	3.168	5-S2n	1.584	2.427	2.075	1.776	10.097	4.756
70.00	70.00	7392.42	4.424	3.703	5-S2n	1.731	2.622	2.265	1.882	10.628	4.943
80.00	80.00	7393.05	5.047	4.620	5-S2n	1.875	2.794	2.441	1.978	11.167	5.111
90.00	90.00	7393.76	5.761	5.139	5-S2n	2.017	2.943	2.603	2.067	11.729	5.264
100.00	99.71	7394.55	6.545	5.682	5-S2n	2.156	3.065	2.747	2.151	12.309	5.404

****

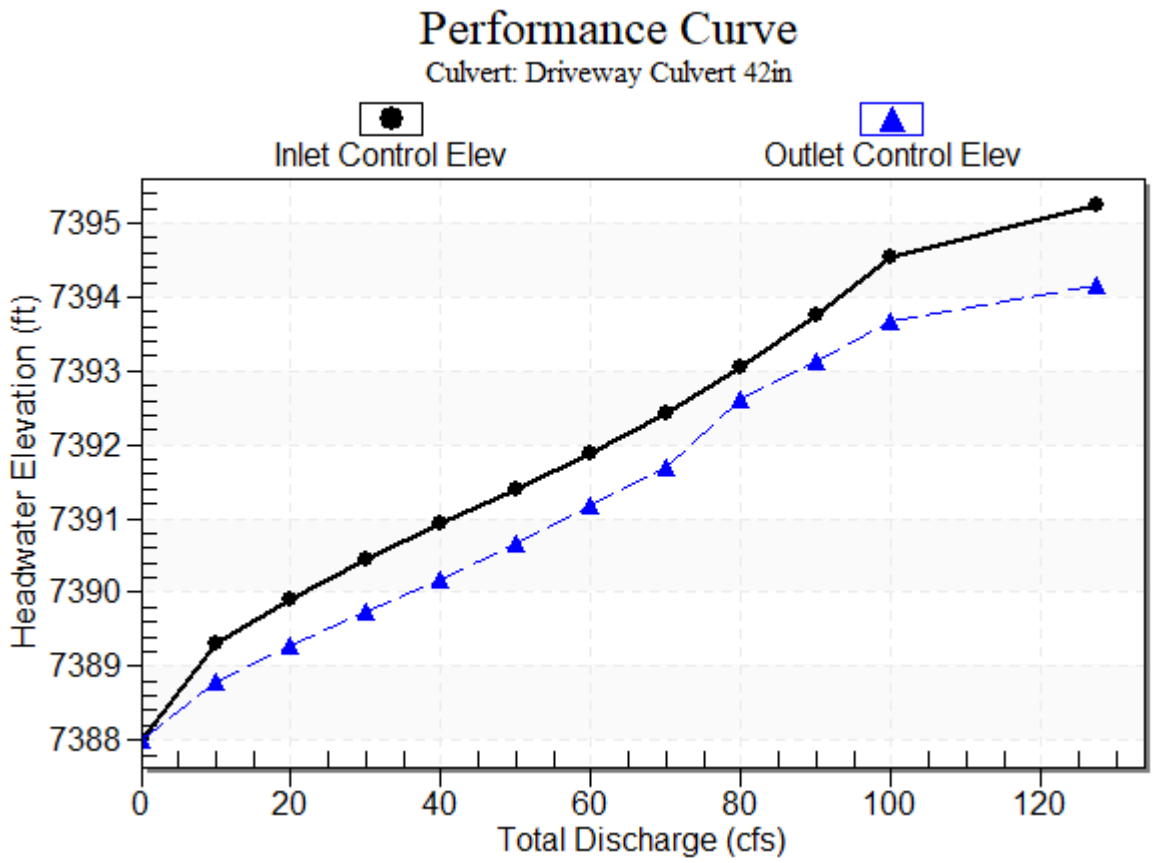
Straight Culvert

Inlet Elevation (invert): 7388.00 ft, Outlet Elevation (invert): 7387.80 ft

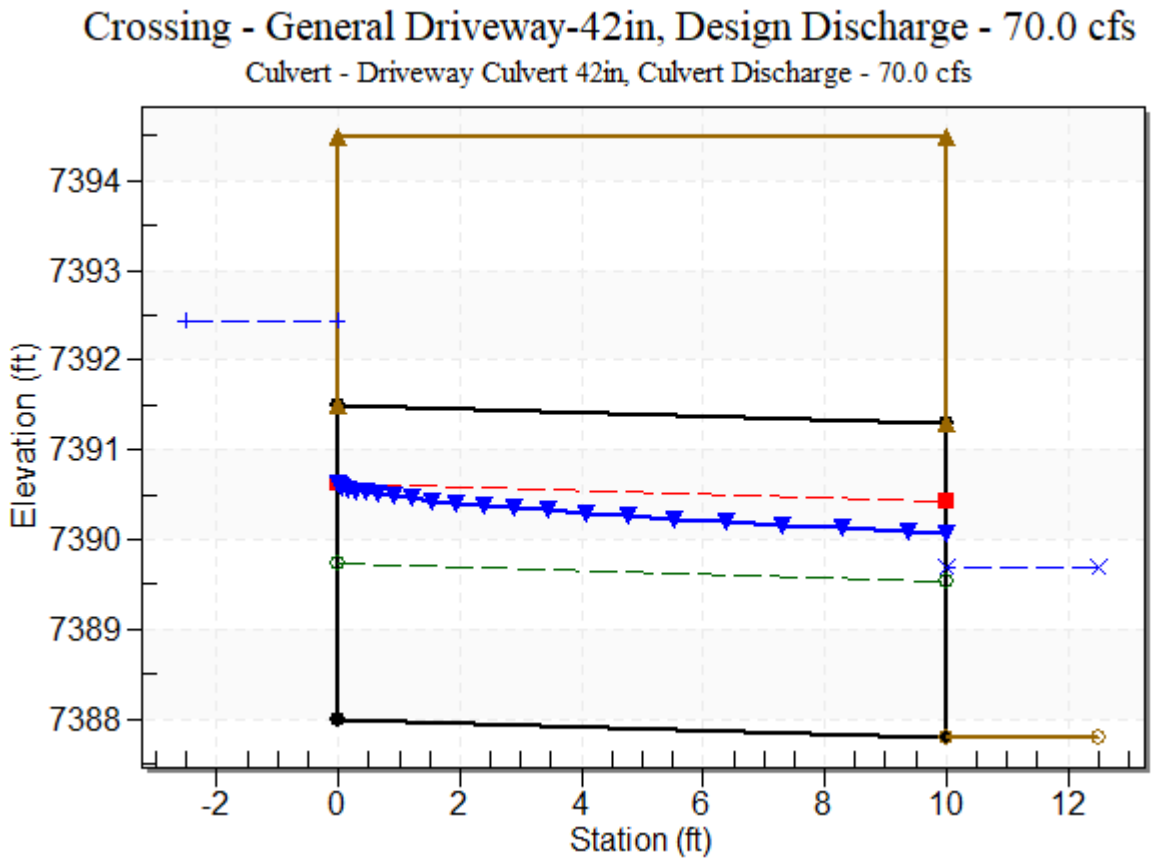
Culvert Length: 10.00 ft, Culvert Slope: 0.0200

****

Culvert Performance Curve Plot: Driveway Culvert 42in



Water Surface Profile Plot for Culvert: Driveway Culvert 42in



Site Data - Driveway Culvert 42in

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 7388.00 ft

Outlet Station: 10.00 ft

Outlet Elevation: 7387.80 ft

Number of Barrels: 1

Culvert Data Summary - Driveway Culvert 42in

Barrel Shape: Circular

Barrel Diameter: 3.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 42 - Downstream Channel Rating Curve (Crossing: General Driveway-42in)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	7387.80	0.00	0.00	0.00	0.00
10.00	7388.71	0.91	3.04	1.13	0.80
20.00	7388.98	1.18	3.61	1.47	0.83
30.00	7389.17	1.37	4.00	1.71	0.85
40.00	7389.33	1.53	4.30	1.90	0.87
50.00	7389.46	1.66	4.54	2.07	0.88
60.00	7389.58	1.78	4.76	2.22	0.89
70.00	7389.68	1.88	4.94	2.35	0.90
80.00	7389.78	1.98	5.11	2.47	0.91
90.00	7389.87	2.07	5.26	2.58	0.91
100.00	7389.95	2.15	5.40	2.68	0.92

Tailwater Channel Data - General Driveway-42in

Tailwater Channel Option: Triangular Channel

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0200

Channel Manning's n: 0.0400

Channel Invert Elevation: 7387.80 ft

Roadway Data for Crossing: General Driveway-42in

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 10.00 ft

Crest Elevation: 7394.50 ft

Roadway Surface: Paved

Roadway Top Width: 10.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 94.4 cfs

Maximum Flow: 105 cfs

Table 43 - Summary of Culvert Flows at Crossing: Pond Outfall

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7296.50	0.00	0.00	0.00	1
7297.84	10.50	10.50	0.00	1
7298.48	21.00	21.00	0.00	1
7299.05	31.50	31.50	0.00	1
7299.54	42.00	42.00	0.00	1
7300.01	52.50	52.03	0.26	29
7300.10	63.00	53.88	8.92	6
7300.16	73.50	55.10	18.31	5
7300.21	84.00	56.11	27.76	4
7300.25	94.40	57.01	37.33	4
7300.29	105.00	57.83	46.97	3
7300.00	51.84	51.84	0.00	Overtopping

Rating Curve Plot for Crossing: Pond Outfall

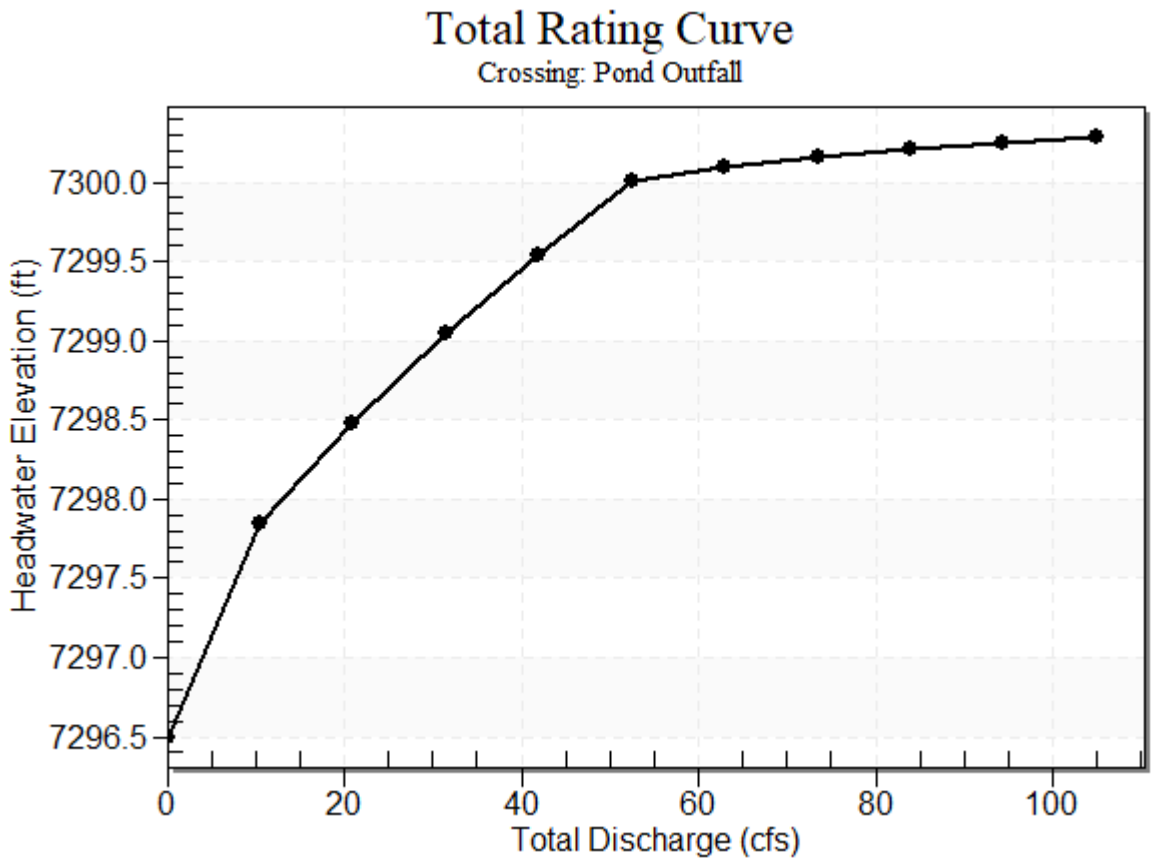


Table 44 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	7296.50	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
10.50	10.50	7297.84	1.340	0.516	1-S2n	0.838	0.981	0.844	0.360	5.875	4.865
21.00	21.00	7298.48	1.980	1.047	1-S2n	1.196	1.404	1.211	0.558	7.107	6.275
31.50	31.50	7299.05	2.546	1.556	1-S2n	1.490	1.736	1.513	0.725	7.904	7.245
42.00	42.00	7299.54	3.043	2.088	1-S2n	1.757	2.018	1.785	0.875	8.515	8.002
52.50	52.03	7300.01	3.509	2.631	5-S2n	2.002	2.256	2.031	1.014	8.989	8.625
63.00	53.88	7300.10	3.597	2.736	5-S2n	2.047	2.297	2.075	1.146	9.068	9.159
73.50	55.10	7300.16	3.656	2.805	5-S2n	2.077	2.323	2.105	1.273	9.119	9.625
84.00	56.11	7300.21	3.706	2.863	5-S2n	2.101	2.345	2.129	1.394	9.160	10.040
94.40	57.01	7300.25	3.750	2.915	5-S2n	2.123	2.364	2.150	1.511	9.196	10.410
105.00	57.83	7300.29	3.791	2.963	5-S2n	2.144	2.382	2.170	1.627	9.229	10.753

****

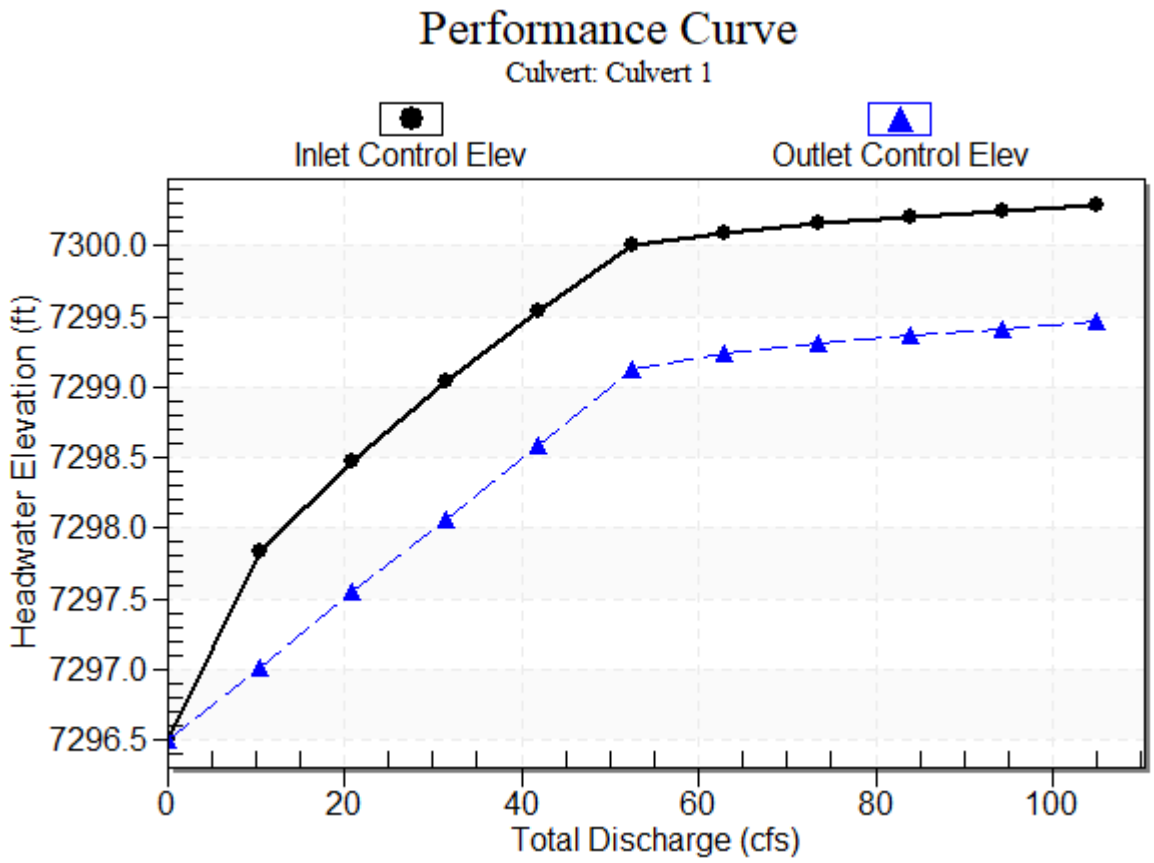
Straight Culvert

Inlet Elevation (invert): 7296.50 ft, Outlet Elevation (invert): 7296.00 ft

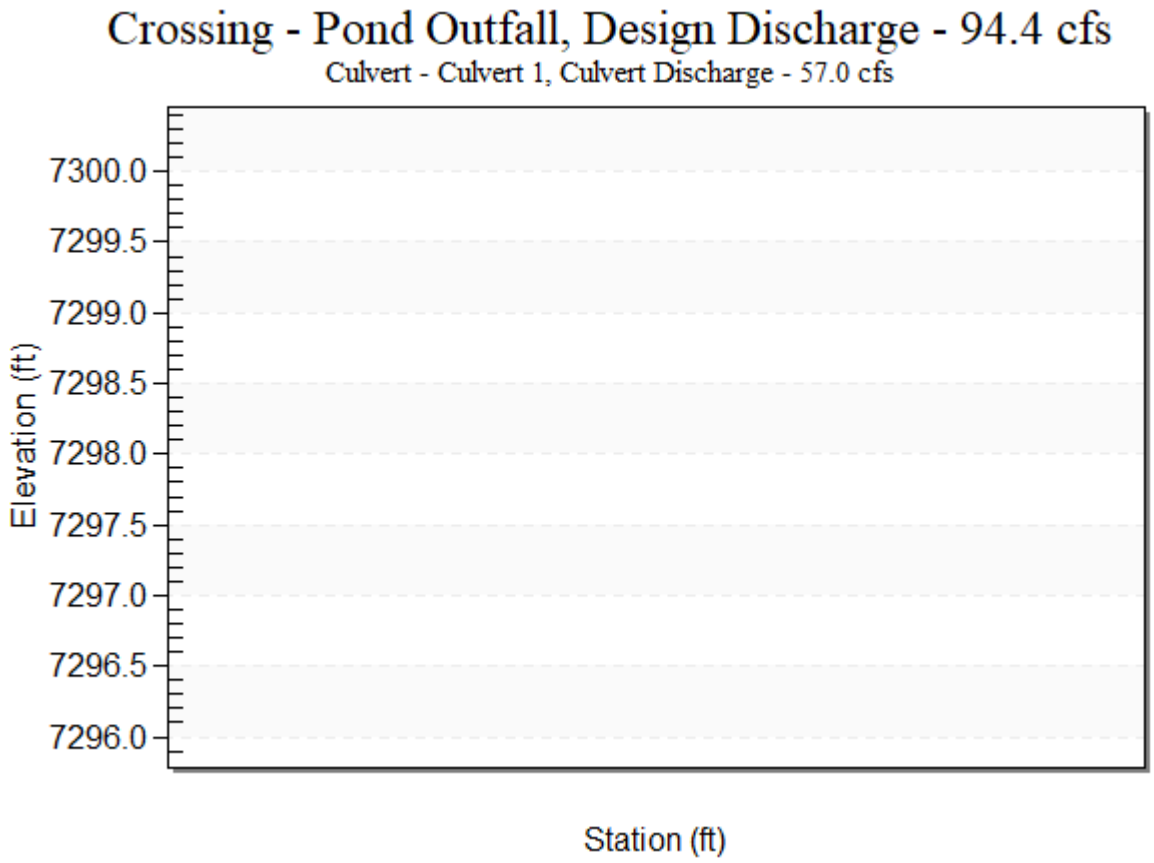
Culvert Length: 73.00 ft, Culvert Slope: 0.0068

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 7296.50 ft

Outlet Station: 73.00 ft

Outlet Elevation: 7296.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 3.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 45 - Downstream Channel Rating Curve (Crossing: Pond Outfall)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	7296.00	0.00	0.00	0.00	0.00
10.50	7296.36	0.36	4.86	1.75	1.43
21.00	7296.56	0.56	6.28	2.71	1.48
31.50	7296.72	0.72	7.25	3.53	1.50
42.00	7296.87	0.87	8.00	4.26	1.51
52.50	7297.01	1.01	8.63	4.94	1.51
63.00	7297.15	1.15	9.16	5.58	1.51
73.50	7297.27	1.27	9.63	6.19	1.50
84.00	7297.39	1.39	10.04	6.79	1.50
94.40	7297.51	1.51	10.41	7.36	1.49
105.00	7297.63	1.63	10.75	7.92	1.49

Tailwater Channel Data - Pond Outfall

Tailwater Channel Option: Rectangular Channel

Bottom Width: 6.00 ft

Channel Slope: 0.0780

Channel Manning's n: 0.0400

Channel Invert Elevation: 7296.00 ft

Roadway Data for Crossing: Pond Outfall

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 7300.00 ft

Roadway Surface: Paved

Roadway Top Width: 100.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0 cfs

Design Flow: 16.6 cfs

Maximum Flow: 100 cfs

Table 46 - Summary of Culvert Flows at Crossing: Crossing E1.1.5

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert E1.1.5 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7400.32	0.00	0.00	0.00	1
7402.02	10.00	10.00	0.00	1
7402.83	16.60	16.60	0.00	1
7406.02	30.00	30.00	0.00	1
7406.47	40.00	31.34	8.56	12
7406.54	50.00	31.55	18.35	5
7406.60	60.00	31.72	28.15	4
7406.65	70.00	31.88	38.07	4
7406.70	80.00	32.02	47.81	3
7406.75	90.00	32.15	57.76	3
7406.79	100.00	32.27	67.69	3
7406.36	31.02	31.02	0.00	Overtopping

Rating Curve Plot for Crossing: Crossing E1.1.5

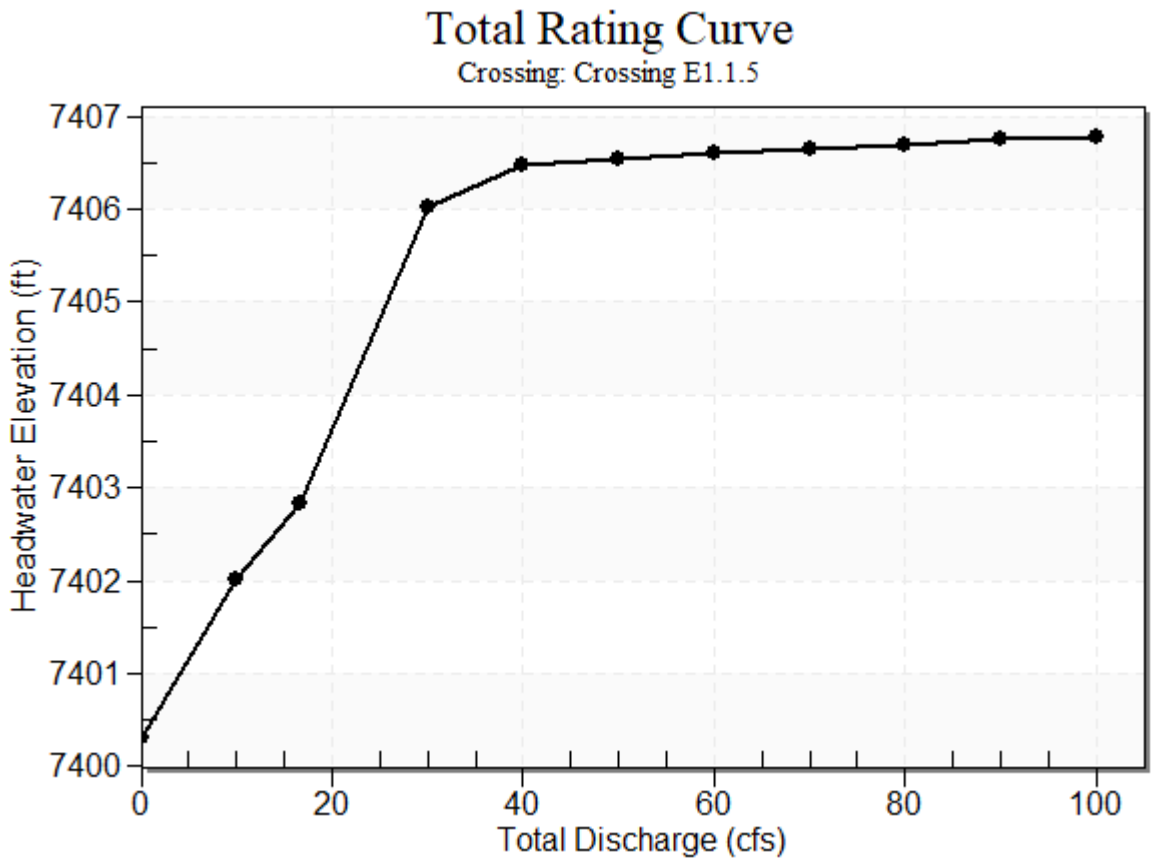


Table 47 - Culvert Summary Table: Culvert E1.1.5

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	7400.32	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
10.00	10.00	7402.02	1.701	0.660	1-S2n	1.049	1.131	1.049	0.414	5.993	3.156
16.60	16.60	7402.83	2.453	2.513	7-M2c	1.483	1.469	1.469	0.548	6.713	3.696
30.00	30.00	7406.02	4.948	5.704	7-M2c	2.000	1.862	1.862	0.754	9.845	4.412
40.00	31.34	7406.47	5.284	6.150	7-M2c	2.000	1.881	1.881	0.877	10.223	4.793
50.00	31.55	7406.54	5.337	6.222	7-M2c	2.000	1.884	1.884	0.985	10.282	5.108
60.00	31.72	7406.60	5.382	6.281	7-M2c	2.000	1.886	1.886	1.081	10.332	5.375
70.00	31.88	7406.65	5.423	6.333	7-M2c	2.000	1.888	1.888	1.169	10.377	5.609
80.00	32.02	7406.70	5.458	6.380	7-M2c	2.000	1.890	1.890	1.250	10.417	5.819
90.00	32.15	7406.75	5.492	6.425	7-M2c	2.000	1.891	1.891	1.325	10.454	6.009
100.00	32.27	7406.79	5.523	6.468	7-M2c	2.000	1.893	1.893	1.396	10.488	6.183

****

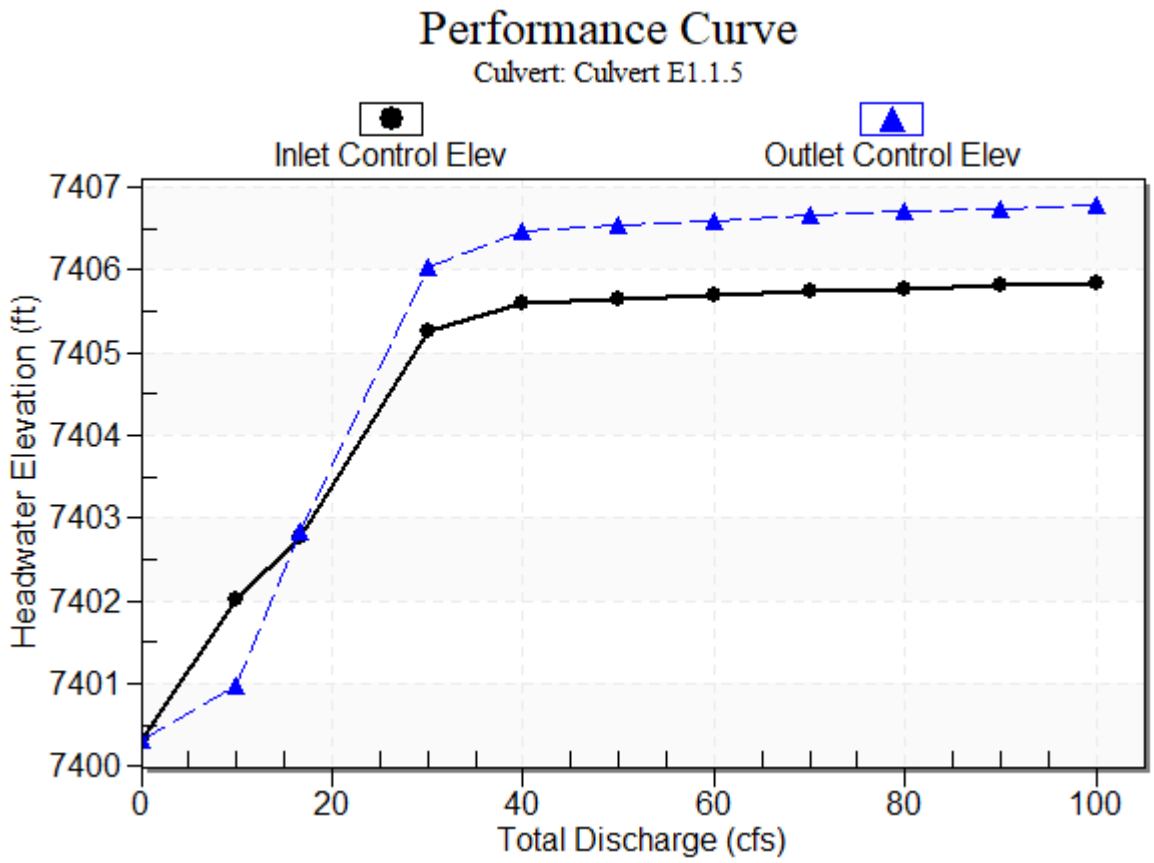
Straight Culvert

Inlet Elevation (invert): 7400.32 ft, Outlet Elevation (invert): 7399.32 ft

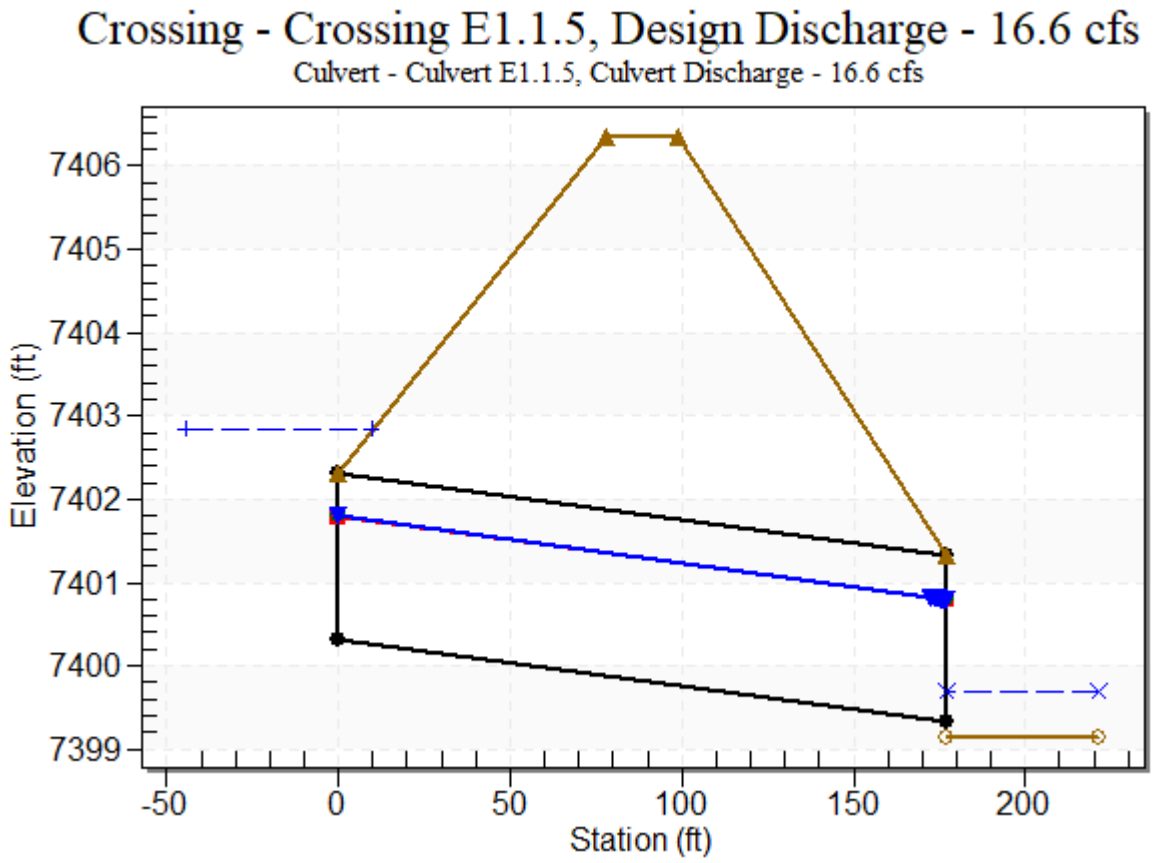
Culvert Length: 177.00 ft, Culvert Slope: 0.0056

****

Culvert Performance Curve Plot: Culvert E1.1.5



Water Surface Profile Plot for Culvert: Culvert E1.1.5



Site Data - Culvert E1.1.5

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 7400.32 ft

Outlet Station: 177.00 ft

Outlet Elevation: 7399.32 ft

Number of Barrels: 1

Culvert Data Summary - Culvert E1.1.5

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 48 - Downstream Channel Rating Curve (Crossing: Crossing E1.1.5)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
0.00	7399.15	0.00	0.00	0.00	0.00
10.00	7399.56	0.41	3.16	0.80	0.95
16.60	7399.70	0.55	3.70	1.05	0.99
30.00	7399.90	0.75	4.41	1.45	1.03
40.00	7400.03	0.88	4.79	1.69	1.06
50.00	7400.13	0.98	5.11	1.89	1.07
60.00	7400.23	1.08	5.37	2.08	1.09
70.00	7400.32	1.17	5.61	2.25	1.10
80.00	7400.40	1.25	5.82	2.40	1.11
90.00	7400.48	1.33	6.01	2.55	1.11
100.00	7400.55	1.40	6.18	2.68	1.12

Tailwater Channel Data - Crossing E1.1.5

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 6.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0308

Channel Manning's n: 0.0400

Channel Invert Elevation: 7399.15 ft

Roadway Data for Crossing: Crossing E1.1.5

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 80.00 ft

Crest Elevation: 7406.36 ft

Roadway Surface: Paved

Roadway Top Width: 20.77 ft

Riprap Summary					
Culvert	*Length (ft)*	*Width (ft)*	*Size (in)*	*Type*	*Thickness (in)*
E1.1	13.0	7.0	12	M	24
E1.5	10.0	6.0	9	L	18
E1.2	7.0	6.0	9	L	18
E2	18.0	8.0	9	L	18
E3	29.0	20.0	18	H	36
E4	37.0	23.0	24	VL	48
E5	10.0	4.0	9	L	18
F2	5.0	3.0	9	L	18
O1	11.0	28.0	18	H	36
O2	15.0	32.0	18	H	36
Pond Outfall	32.0	13.0	12	M	24

Rip-Rap Calculation

Culvert E1.2

.

Applicable Equations:

$L_p = (1/2\tan\Theta)(A_t/Y_t - D)$	Equation 9-11 per USCDM
$A_t = Q/V$	Equation 9-12 per USDCM
$\Theta = \tan^{-1}(1/(2*\text{ExpansionFactor}))$	Equation 9-13 per USDCM
$W = 2(L_p\tan\Theta)+D$	Equation 9-14 per USDCM
$T = 2D_{50}$	Equation 9-15 per USDCM

Assumptions

Maximum Major Event Velocity is 7fps for FES outletting into trickle channels

Input parameters:

Description		Variable	Input	Unit
Width of the conduit (use diameter for circular conduits),		D:	2.00	ft
Rectangular conduit		H:	2.00	
HGL Elevation			7378.67	ft
Invert Elevation			7377.44	ft
Tailwater depth (ft),		Y_t:	1.23	ft
Expansion angle of the culvert flow		Θ:	0.08	radians
Design discharge (cfs)*		Q:	18.90	cfs
Froude Number		F_r	0.96	Subcritical
Unitless Variables for Tables:				
	For Figure 9-35	$Q/D^{2.5}$	3.34	
	For Figure 9-36	$Q/WH^{3/2}$	3.34	
	For Figure 9-35	Y_t/D	0.62	
	For Figure 9-38	$Q/D^{1.5}$	6.68	
	For Figure 9-38	Y_t/D	0.62	
Allowable non-eroding velocity in the downstream channel (ft/sec)		V:	5	ft/sec
Expansion Factor (Figure 9-35), 1/(2tan(θ))			6.5	

Solve for:

Description	Variable	Output	Unit
1. Required area of flow at allowable velocity (ft^2)	A_t:	3.78	ft^2
2. Length of Protection	L_p:	6.98	ft
	$L_p < 3D$?	No	
	L_{pmin}:	6.98	ft
3. Width of downstream riprap protection	W:	3.00	ft
4. Rip Rap Type (Figure 9-38)	-	L	
5. Rip Rap Size (Figure 8-34)	D_{50}:	9	inches

Rip Rap Summary

Length	L_p	7.00	ft
Width (Note: 2 - 2 ft diameter barrel culverts)	W	6.00	ft
Size	D_{50}	9	inches
Type	-	L	-
Thickness	T	18	inches

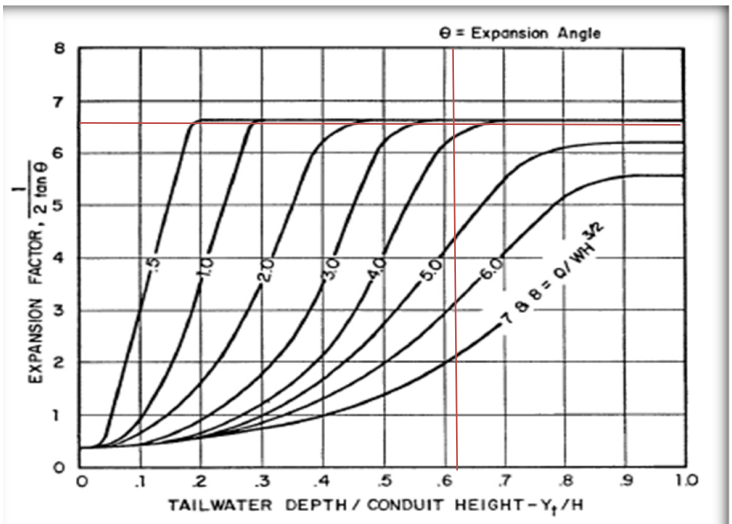


Figure 9-36. Expansion factor for rectangular conduits

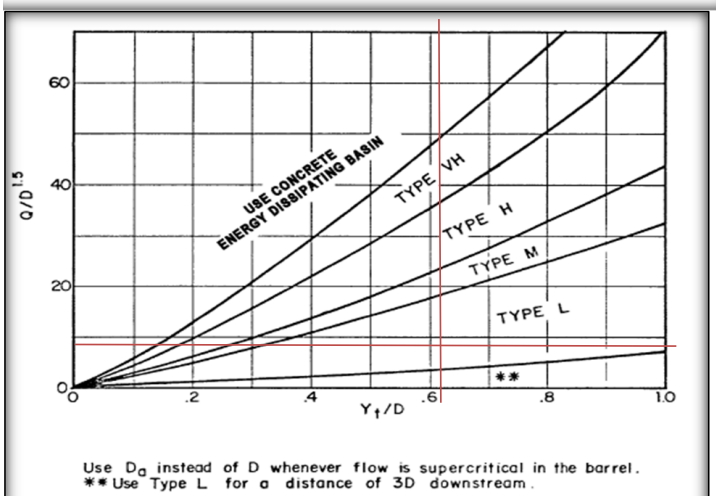


Figure 9-38. Riprap erosion protection at circular conduit outlet (valid for $Q/D_{2.5} \leq 6.0$)

RIPRAP DESIGNATION	% SMALLER THAN GIVEN SIZE BY WEIGHT	INTERMEDIATE ROCK DIMENSION (INCHES)	D_{50}* (INCHES)
TYPE VL	70 – 100 50 – 70 35 – 50 2 – 10	12 9 6 2	6
TYPE L	70 – 100 50 – 70 35 – 50 2 – 10	15 12 9 3	9
TYPE M	70 – 100 50 – 70 35 – 50 2 – 10	21 18 12 4	12
TYPE H	70 – 100 50 – 70 35 – 50 2 – 10	30 24 18 6	18

*D_{50} = MEAN ROCK SIZE

Figure 8-34. Riprap and soil riprap placement and gradation (part 1 of 3)

Rip-Rap Calculation

Culvert E2

.

Applicable Equations:

$L_p = (1/2\tan\Theta)(A_t/Y_t - D)$	Equation 9-11 per USCDM
$A_t = Q/V$	Equation 9-12 per USDCM
$\Theta = \tan^{-1}(1/(2*\text{ExpansionFactor}))$	Equation 9-13 per USDCM
$W = 2(L_p\tan\Theta)+D$	Equation 9-14 per USDCM
$T = 2D_{50}$	Equation 9-15 per USDCM

Assumptions

Maximum Major Event Velocity is 7fps for FES outletting into trickle channels

Input parameters:

Description		Variable	Input	Unit
Width of the conduit (use diameter for circular conduits),		D:	2.50	ft
Rectangular conduit		H:	0.00	
HGL Elevation			7398.51	ft
Invert Elevation			7397.56	ft
Tailwater depth (ft),		Y_t:	0.95	ft
Expansion angle of the culvert flow		Θ:	0.14	radians
Design discharge (cfs)*		Q:	36.60	cfs
Froude Number		F_r	1.35	Supercritical
Unitless Variables for Tables:				
	For Figure 9-35	$Q/D^{2.5}$	3.70	
	For Figure 9-36	$Q/WH^{3/2}$	#DIV/0!	
	For Figure 9-35	Y_t/D	0.38	
	For Figure 9-38	$Q/D^{1.5}$	9.26	
	For Figure 9-38	Y_t/D	0.38	
Allowable non-eroding velocity in the downstream channel (ft/sec)		V:	5	ft/sec
Expansion Factor (Figure 9-35), 1/(2tan(θ))			3.5	

Solve for:

Description	Variable	Output	Unit
1. Required area of flow at allowable velocity (ft^2)	A_t:	7.32	ft^2
2. Length of Protection	L_p:	18.22	ft
	$L_p < 3D$?	No	
	L_{pmin}:	18.22	ft
3. Width of downstream riprap protection	W:	8.00	ft
4. Rip Rap Type (Figure 9-38)	-	L	
5. Rip Rap Size (Figure 8-34)	D_{50}:	9	inches

Rip Rap Summary

Length	L_p	18.00	ft
Width	W	8.00	ft
Size	D_{50}	9	inches
Type	-	L	-
Thickness	T	18	inches

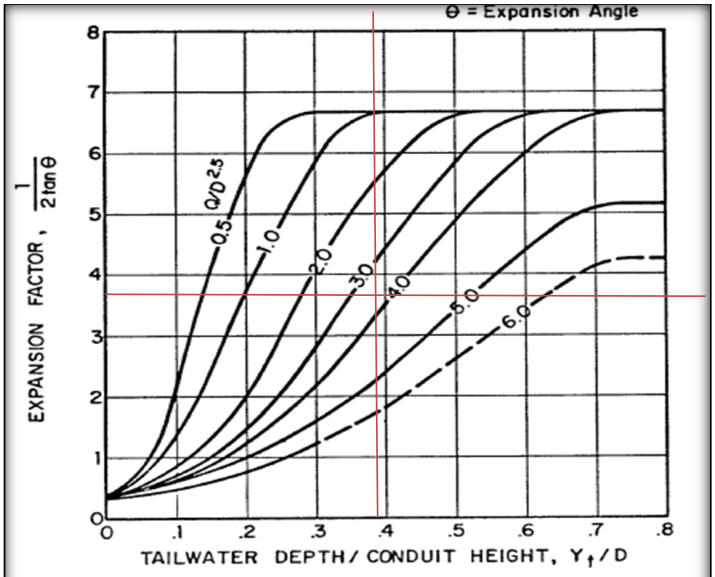
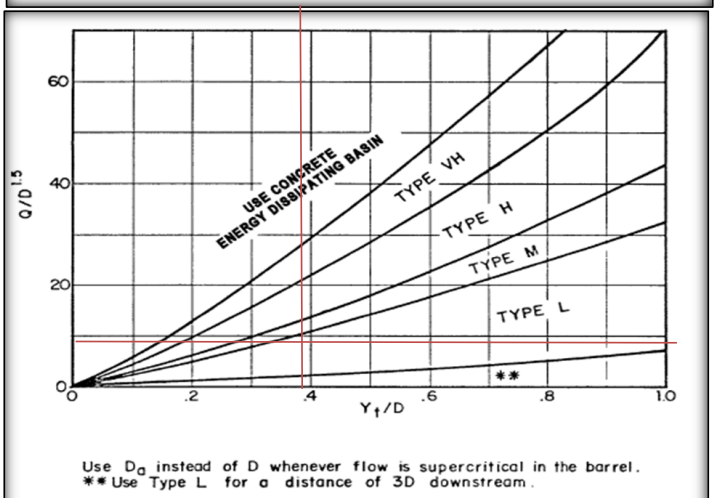


Figure 9-35. Expansion factor for circular conduits



Use D_a instead of D whenever flow is supercritical in the barrel.
** Use Type L for a distance of 3D downstream.

Figure 9-38. Riprap erosion protection at circular conduit outlet (valid for $Q/D_{2.5} \leq 6.0$)

RIPRAP DESIGNATION	% SMALLER THAN GIVEN SIZE BY WEIGHT	INTERMEDIATE ROCK DIMENSION (INCHES)	D_{50}* (INCHES)
TYPE VL	70 – 100 50 – 70 35 – 50 2 – 10	12 9 6 2	6
TYPE L	70 – 100 50 – 70 35 – 50 2 – 10	15 12 9 3	9
TYPE M	70 – 100 50 – 70 35 – 50 2 – 10	21 18 12 4	12
TYPE H	70 – 100 50 – 70 35 – 50 2 – 10	30 24 18 6	18

*D_{50} = MEAN ROCK SIZE

Figure 8-34. Riprap and soil riprap placement and gradation (part 1 of 3)

Rip-Rap Calculation

Culvert E3

.

Applicable Equations:

$L_p = (1/2\tan\Theta)(A_t/Y_t - D)$	Equation 9-11 per USCDM
$A_t = Q/V$	Equation 9-12 per USDCM
$\Theta = \tan^{-1}(1/(2*\text{ExpansionFactor}))$	Equation 9-13 per USDCM
$W = 2(L_p\tan\Theta)+D$	Equation 9-14 per USDCM
$T = 2D_{50}$	Equation 9-15 per USDCM

Assumptions

Maximum Major Event Velocity is 7fps for FES outletting into trickle channels

Input parameters:

Description		Variable	Input	Unit
Width of the conduit (use diameter for circular conduits),		D:	4.00	ft
Rectangular conduit		H:		
HGL Elevation			7363.54	ft
Invert Elevation			7362.70	ft
Tailwater depth (ft),		Y_t:	0.84	ft
Expansion angle of the culvert flow		Θ:	0.27	radians
Design discharge (cfs)*		Q:	84.60	cfs
Froude Number		F_r	1.30	Supercritical
Unitless Variables for Tables:				
	For Figure 9-35	$Q/D^{2.5}$	2.64	
	For Figure 9-36	$Q/WH^{3/2}$	#DIV/0!	
	For Figure 9-35	Y_t/D	0.21	
	For Figure 9-38	$Q/D^{1.5}$	10.58	
	For Figure 9-38	Y_t/D	0.21	
Allowable non-eroding velocity in the downstream channel (ft/sec)		V:	5	ft/sec
Expansion Factor (Figure 9-35), 1/(2tan(θ))			1.8	

Solve for:

Description	Variable	Output	Unit
1. Required area of flow at allowable velocity (ft^2)	A_t:	16.92	ft^2
2. Length of Protection	L_p:	29.10	ft
	$L_p < 3D$?	No	
	L_{pmin}:	29.10	ft
3. Width of downstream riprap protection	W:	20.00	ft
4. Rip Rap Type (Figure 9-38)	-	H	
5. Rip Rap Size (Figure 8-34)	D_{50}:	18	inches

Rip Rap Summary

Length	L_p	29.00	ft
Width	W	20.00	ft
Size	D_{50}	18	inches
Type	-	H	-
Thickness	T	36	inches

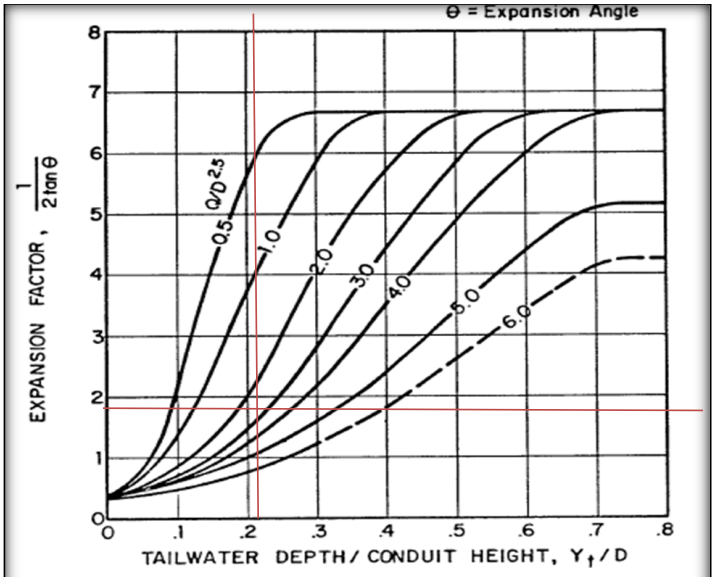
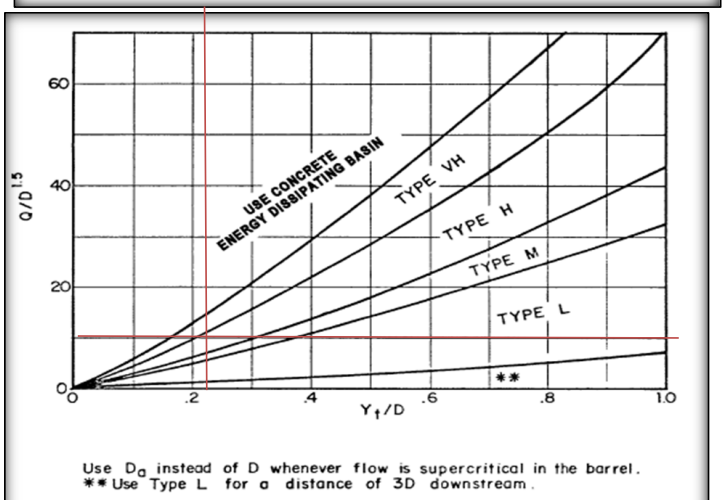


Figure 9-35. Expansion factor for circular conduits



Use D_a instead of D whenever flow is supercritical in the barrel.
** Use Type L for a distance of 3D downstream.

Figure 9-38. Riprap erosion protection at circular conduit outlet (valid for $Q/D_{2.5} \leq 6.0$)

RIPRAP DESIGNATION	% SMALLER THAN GIVEN SIZE BY WEIGHT	INTERMEDIATE ROCK DIMENSION (INCHES)	D_{50}* (INCHES)
TYPE VL	70 – 100 50 – 70 35 – 50 2 – 10	12 9 6 2	6
TYPE L	70 – 100 50 – 70 35 – 50 2 – 10	15 12 9 3	9
TYPE M	70 – 100 50 – 70 35 – 50 2 – 10	21 18 12 4	12
TYPE H	70 – 100 50 – 70 35 – 50 2 – 10	30 24 18 6	18

*D_{50} = MEAN ROCK SIZE

Figure 8-34. Riprap and soil riprap placement and gradation (part 1 of 3)

Rip-Rap Calculation

Culvert E4

.

Applicable Equations:

$L_p = (1/2\tan\Theta)(A_t/Y_t - D)$	Equation 9-11 per USCDM
$A_t = Q/V$	Equation 9-12 per USDCM
$\Theta = \tan^{-1}(1/(2*\text{ExpansionFactor}))$	Equation 9-13 per USDCM
$W = 2(L_p\tan\Theta)+D$	Equation 9-14 per USDCM
$T = 2D_{50}$	Equation 9-15 per USDCM

Assumptions

Maximum Major Event Velocity is 7fps for FES outletting into trickle channels

Input parameters:

Description		Variable	Input	Unit
Width of the conduit (use diameter for circular conduits),		D:	4.00	ft
Rectangular conduit		H:		
HGL Elevation			7336.75	ft
Invert Elevation			7335.71	ft
Tailwater depth (ft),		Y_t:	1.05	ft
Expansion angle of the culvert flow		Θ:	0.24	radians
Design discharge (cfs)*		Q:	117.60	cfs
Froude Number		F_r	1.61	Supercritical
Unitless Variables for Tables:				
	For Figure 9-35	$Q/D^{2.5}$	3.68	
	For Figure 9-36	$Q/WH^{3/2}$	#DIV/0!	
	For Figure 9-35	Y_t/D	0.26	
	For Figure 9-38	$Q/D^{1.5}$	14.70	
	For Figure 9-38	Y_t/D	0.26	
Allowable non-eroding velocity in the downstream channel (ft/sec)		V:	5	ft/sec
Expansion Factor (Figure 9-35), 1/(2tan(θ))			2	

Solve for:

Description	Variable	Output	Unit
1. Required area of flow at allowable velocity (ft^2)	A_t:	23.52	ft^2
2. Length of Protection	L_p:	37.01	ft
	$L_p < 3D$?	No	
	L_{pmin}:	37.01	ft
3. Width of downstream riprap protection	W:	23.00	ft
4. Rip Rap Type (Figure 9-38)	-	VL	
5. Rip Rap Size (Figure 8-34)	D_{50}:	24	inches

Rip Rap Summary

Length	L_p	37.00	ft
Width	W	23.00	ft
Size	D_{50}	24	inches
Type	-	VL	-
Thickness	T	48	inches

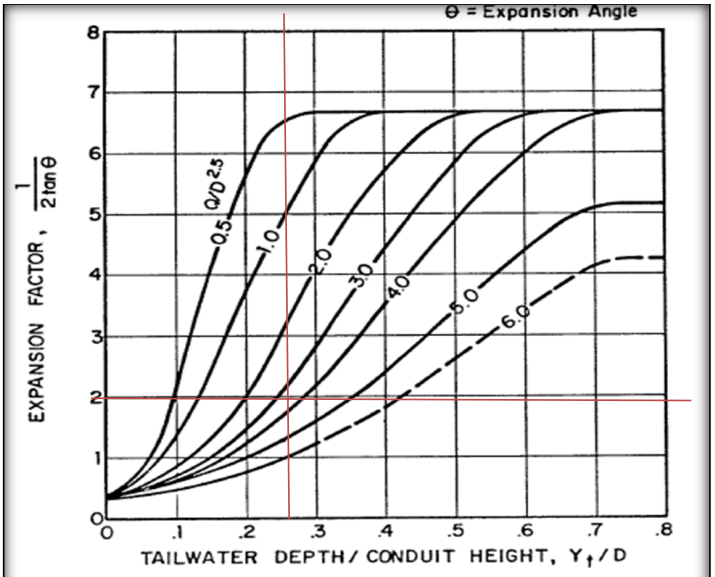


Figure 9-35. Expansion factor for circular conduits

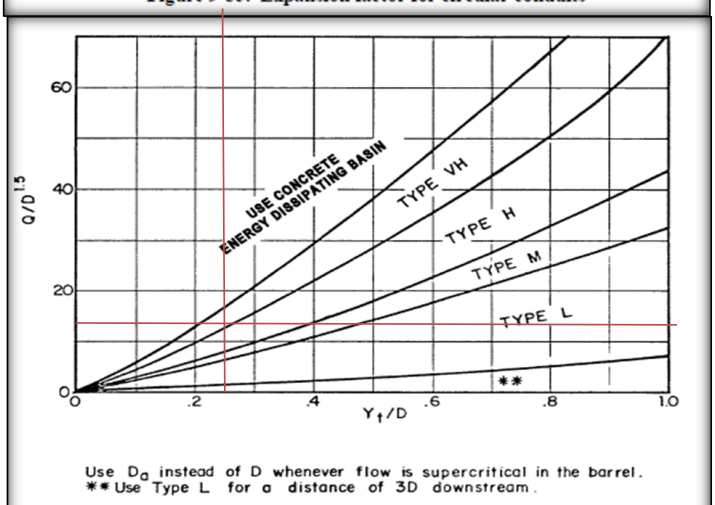


Figure 9-38. Riprap erosion protection at circular conduit outlet (valid for $Q/D_{2.5} \leq 6.0$)

Riprap Designation	% Smaller Than Given Size By Weight	Intermediate Rock Dimension (inches)	d_{50}* (inches)
Type VL	70 - 100 50 - 70 35 - 50 2 - 10	12 9 6 2	6**
Type L	70 - 100 50 - 70 35 - 50 2 - 10	15 12 9 3	9**
Type M	70 - 100 50 - 70 35 - 50 2 - 10	21 18 12 4	12**
Type H	70 - 100 50 - 70 35 - 50 2 - 10	30 24 18 6	18
Type VH	70 - 100 50 - 70 35 - 50 2 - 10	41 33 24 9	24

Rip-Rap Calculation

Culvert E5

.

Applicable Equations:

$L_p = (1/2\tan\Theta)(A_t/Y_t - D)$	Equation 9-11 per USCDM
$A_t = Q/V$	Equation 9-12 per USDCM
$\Theta = \tan^{-1}(1/(2*\text{ExpansionFactor}))$	Equation 9-13 per USDCM
$W = 2(L_p\tan\Theta)+D$	Equation 9-14 per USDCM
$T = 2D_{50}$	Equation 9-15 per USDCM

Assumptions

Maximum Major Event Velocity is 7fps for FES outletting into trickle channels

Input parameters:

Description		Variable	Input	Unit
Width of the conduit (use diameter for circular conduits),		D:	2.00	ft
Rectangular conduit		H:	0.00	
HGL Elevation			7328.12	ft
Invert Elevation			7327.25	ft
Tailwater depth (ft),		Y_t:	0.87	ft
Expansion angle of the culvert flow		Θ:	0.11	radians
Design discharge (cfs)*		Q:	18.40	cfs
Froude Number		F_r	1.11	Supercritical
Unitless Variables for Tables:				
	For Figure 9-35	$Q/D^{2.5}$	3.25	
	For Figure 9-36	$Q/WH^{3/2}$	#DIV/0!	
	For Figure 9-35	Y_t/D	0.43	
	For Figure 9-38	$Q/D^{1.5}$	6.51	
	For Figure 9-38	Y_t/D	0.43	
Allowable non-eroding velocity in the downstream channel (ft/sec)		V:	5	ft/sec
Expansion Factor (Figure 9-35), 1/(2tan(θ))			4.6	

Solve for:

Description	Variable	Output	Unit
1. Required area of flow at allowable velocity (ft^2)	A_t:	3.68	ft^2
2. Length of Protection	L_p:	10.26	ft
	$L_p < 3D$?	No	
	L_{pmin}:	10.26	ft
3. Width of downstream riprap protection	W:	4.00	ft
4. Rip Rap Type (Figure 9-38)	-	L	
5. Rip Rap Size (Figure 8-34)	D_{50}:	9	inches

Rip Rap Summary

Length	L_p	10.00	ft
Width	W	4.00	ft
Size	D_{50}	9	inches
Type	-	L	-
Thickness	T	18	inches

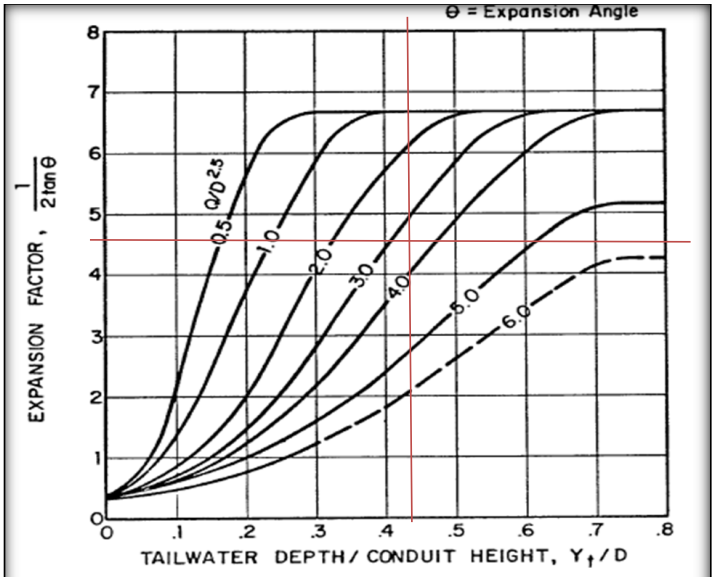
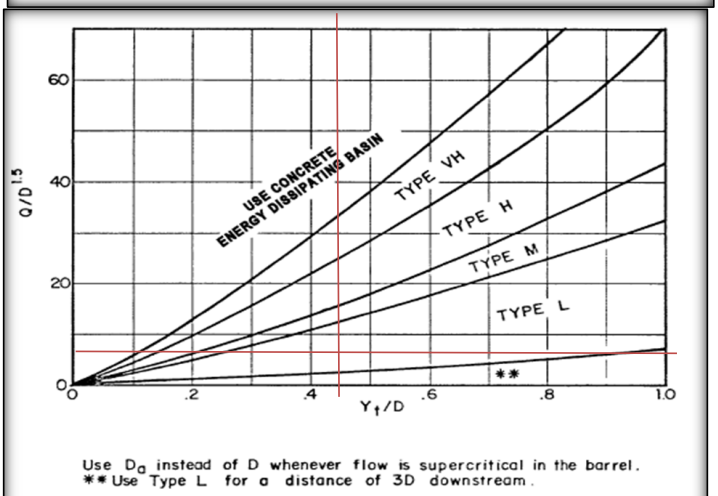


Figure 9-35. Expansion factor for circular conduits



Use D_a instead of D whenever flow is supercritical in the barrel.
** Use Type L for a distance of 3D downstream.

Figure 9-38. Riprap erosion protection at circular conduit outlet (valid for $Q/D_{2.5} \leq 6.0$)

RIPRAP DESIGNATION	% SMALLER THAN GIVEN SIZE BY WEIGHT	INTERMEDIATE ROCK DIMENSION (INCHES)	D_{50}* (INCHES)
TYPE VL	70 – 100 50 – 70 35 – 50 2 – 10	12 9 6 2	6
TYPE L	70 – 100 50 – 70 35 – 50 2 – 10	15 12 9 3	9
TYPE M	70 – 100 50 – 70 35 – 50 2 – 10	21 18 12 4	12
TYPE H	70 – 100 50 – 70 35 – 50 2 – 10	30 24 18 6	18

*D_{50} = MEAN ROCK SIZE

Figure 8-34. Riprap and soil riprap placement and gradation (part 1 of 3)

Rip-Rap Calculation

Culvert O1

.

Applicable Equations:

$L_p = (1/2\tan\Theta)(A_t/Y_t - D)$	Equation 9-11 per USCDM
$A_t = Q/V$	Equation 9-12 per USDCM
$\Theta = \tan^{-1}(1/(2*\text{ExpansionFactor}))$	Equation 9-13 per USDCM
$W = 2(L_p\tan\Theta)+D$	Equation 9-14 per USDCM
$T = 2D_{50}$	Equation 9-15 per USDCM

Assumptions

Maximum Major Event Velocity is 7fps for FES outletting into trickle channels

Input parameters:

Description		Variable	Input	Unit
Width of the conduit (use diameter for circular conduits),		D:	3.00	ft
Rectangular conduit		H:	3.00	
HGL Elevation			7369.65	ft
Invert Elevation			7369.11	ft
Tailwater depth (ft),		Y_t:	0.54	ft
Expansion angle of the culvert flow		Θ:	0.46	radians
Design discharge (cfs)*		Q:	39.00	cfs
Froude Number		F_r	1.32	Supercritical
Unitless Variables for Tables:				
	For Figure 9-35	$Q/D^{2.5}$	2.50	
	For Figure 9-36	$Q/WH^{3/2}$	2.50	
	For Figure 9-35	Y_t/D	0.18	
	For Figure 9-38	$Q/D^{1.5}$	7.51	
	For Figure 9-38	Y_t/D	0.18	
Allowable non-eroding velocity in the downstream channel (ft/sec)		V:	5	ft/sec
Expansion Factor (Figure 9-35), 1/(2tan(θ))			1	

Solve for:

Description	Variable	Output	Unit
1. Required area of flow at allowable velocity (ft^2)	A_t:	7.80	ft^2
2. Length of Protection	L_p:	11.34	ft
	$L_p < 3D$?	No	
	L_{pmin}:	11.34	ft
3. Width of downstream riprap protection	W:	14.00	ft
4. Rip Rap Type (Figure 9-38)	-	H	
5. Rip Rap Size (Figure 8-34)	D_{50}:	18	inches

Rip Rap Summary

Length	L_p	11.00	ft
Width (Note: 2- 3' barrels)	W	28.00	ft
Size	D_{50}	18	inches
Type	-	H	-
Thickness	T	36	inches

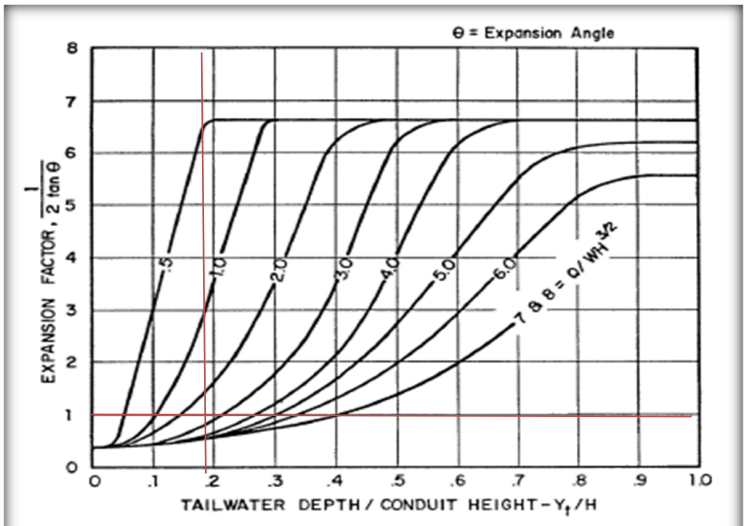
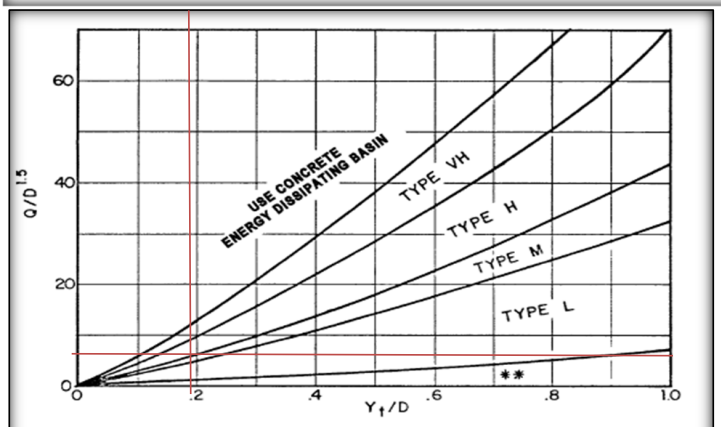


Figure 9-36. Expansion factor for rectangular conduits



Use D_a instead of D whenever flow is supercritical in the barrel.
** Use Type L for a distance of 3D downstream.

Figure 9-38. Riprap erosion protection at circular conduit outlet (valid for $Q/D_{2.5} \leq 6.0$)

RIPRAP DESIGNATION	% SMALLER THAN GIVEN SIZE BY WEIGHT	INTERMEDIATE ROCK DIMENSION (INCHES)	D_{50}* (INCHES)
TYPE VL	70 – 100 50 – 70 35 – 50 2 – 10	12 9 6 2	6
TYPE L	70 – 100 50 – 70 35 – 50 2 – 10	15 12 9 3	9
TYPE M	70 – 100 50 – 70 35 – 50 2 – 10	21 18 12 4	12
TYPE H	70 – 100 50 – 70 35 – 50 2 – 10	30 24 18 6	18

*D_{50} = MEAN ROCK SIZE

Figure 8-34. Riprap and soil riprap placement and gradation (part 1 of 3)

Rip-Rap Calculation

Culvert O2

.

Applicable Equations:

$L_p = (1/2\tan\Theta)(A_t/Y_t - D)$	Equation 9-11 per USCDM
$A_t = Q/V$	Equation 9-12 per USDCM
$\Theta = \tan^{-1}(1/(2*\text{ExpansionFactor}))$	Equation 9-13 per USDCM
$W = 2(L_p\tan\Theta)+D$	Equation 9-14 per USDCM
$T = 2D_{50}$	Equation 9-15 per USDCM

Assumptions

Maximum Major Event Velocity is 7fps for FES outletting into trickle channels

Input parameters:

Description		Variable	Input	Unit
Width of the conduit (use diameter for circular conduits),		D:	3.50	ft
Rectangular conduit		H:	3.50	
HGL Elevation			7335.72	ft
Invert Elevation			7334.97	ft
Tailwater depth (ft),		Y_t:	0.75	ft
Expansion angle of the culvert flow		Θ:	0.39	radians
Design discharge (cfs)*		Q:	61.50	cfs
Froude Number		F_r	1.30	Supercritical
Unitless Variables for Tables:				
	For Figure 9-35	$Q/D^{2.5}$	2.68	
	For Figure 9-36	$Q/WH^{3/2}$	2.68	
	For Figure 9-35	Y_t/D	0.21	
	For Figure 9-38	$Q/D^{1.5}$	9.39	
	For Figure 9-38	Y_t/D	0.21	
Allowable non-eroding velocity in the downstream channel (ft/sec)		V:	5	ft/sec
Expansion Factor (Figure 9-35), 1/(2tan(θ))			1.2	

Solve for:

Description	Variable	Output	Unit
1. Required area of flow at allowable velocity (ft^2)	A_t:	12.30	ft^2
2. Length of Protection	L_p:	15.43	ft
	$L_p < 3D$?	No	
	L_{pmin}:	15.43	ft
3. Width of downstream riprap protection	W:	16.00	ft
4. Rip Rap Type (Figure 9-38)	-	H	
5. Rip Rap Size (Figure 8-34)	D_{50}:	18	inches

Rip Rap Summary

Length	L_p	15.00	ft
Width (Note: 2 - 3.5' barrels)	W	32.00	ft
Size	D_{50}	18	inches
Type	-	H	-
Thickness	T	36	inches

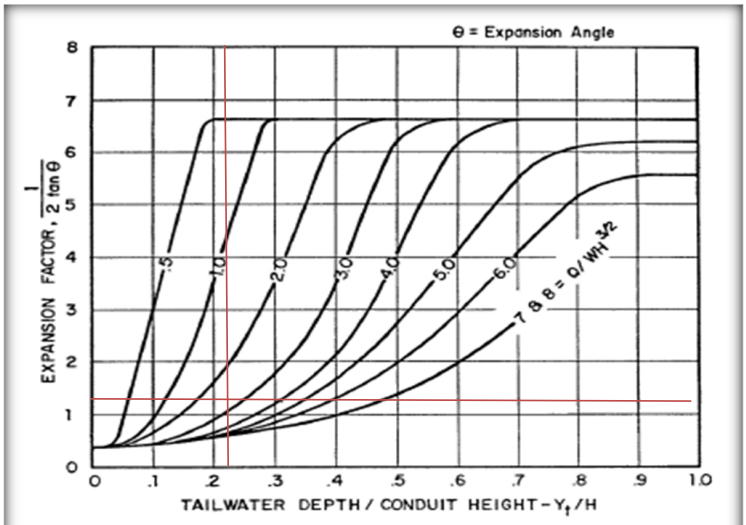
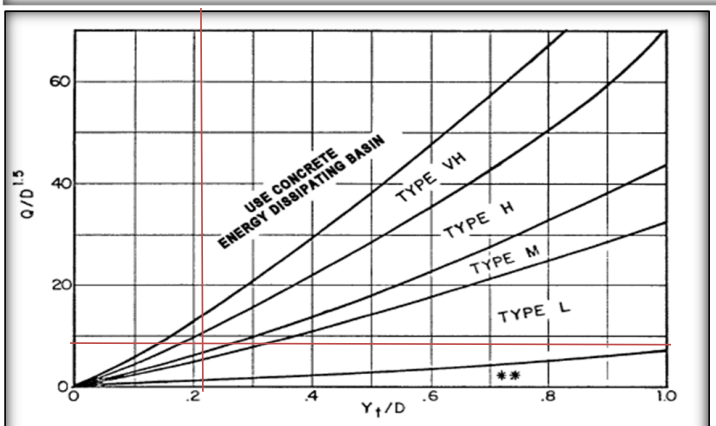


Figure 9-36. Expansion factor for rectangular conduits



Use D_a instead of D whenever flow is supercritical in the barrel.
** Use Type L for a distance of 3D downstream.

Figure 9-38. Riprap erosion protection at circular conduit outlet (valid for $Q/D_{2.5} \leq 6.0$)

RIPRAP DESIGNATION	% SMALLER THAN GIVEN SIZE BY WEIGHT	INTERMEDIATE ROCK DIMENSION (INCHES)	D_{50}* (INCHES)
TYPE VL	70 – 100 50 – 70 35 – 50 2 – 10	12 9 6 2	6
TYPE L	70 – 100 50 – 70 35 – 50 2 – 10	15 12 9 3	9
TYPE M	70 – 100 50 – 70 35 – 50 2 – 10	21 18 12 4	12
TYPE H	70 – 100 50 – 70 35 – 50 2 – 10	30 24 18 6	18

*D_{50} = MEAN ROCK SIZE

Figure 8-34. Riprap and soil riprap placement and gradation (part 1 of 3)

Rip-Rap Calculation

Culvert E1.1

.

Applicable Equations:

$L_p = (1/2\tan\Theta)(A_t/Y_t - D)$	Equation 9-11 per USCDM
$A_t = Q/V$	Equation 9-12 per USDCM
$\Theta = \tan^{-1}(1/(2*\text{ExpansionFactor}))$	Equation 9-13 per USDCM
$W = 2(L_p\tan\Theta)+D$	Equation 9-14 per USDCM
$T = 2D_{50}$	Equation 9-15 per USDCM

Assumptions

Maximum Major Event Velocity is 7fps for FES outletting into trickle channels

Input parameters:

Description		Variable	Input	Unit
Width of the conduit (use diameter for circular conduits),		D:	2.50	ft
Rectangular conduit		H:		
HGL Elevation			7409.76	ft
Invert Elevation			7409.08	ft
Tailwater depth (ft),		Y_t:	0.68	ft
Expansion angle of the culvert flow		Θ:	0.18	radians
Design discharge (cfs)*		Q:	24.60	cfs
Froude Number		F_r	1.07	Supercritical
Unitless Variables for Tables:				
	For Figure 9-35	$Q/D^{2.5}$	2.49	
	For Figure 9-36	$Q/WH^{3/2}$	#DIV/0!	
	For Figure 9-35	Y_t/D	0.27	
	For Figure 9-38	$Q/D^{1.5}$	6.22	
	For Figure 9-38	Y_t/D	0.27	
Allowable non-eroding velocity in the downstream channel (ft/sec)		V:	5	ft/sec
Expansion Factor (Figure 9-35), 1/(2tan(θ))			2.8	

Solve for:

Description	Variable	Output	Unit
1. Required area of flow at allowable velocity (ft^2)	A_t:	4.92	ft^2
2. Length of Protection	L_p:	13.26	ft
	$L_p < 3D$?	No	
	L_{pmin}:	13.26	ft
3. Width of downstream riprap protection	W:	7.00	ft
4. Rip Rap Type (Figure 9-38)	-	M	
5. Rip Rap Size (Figure 8-34)	D_{50}:	12	inches

Rip Rap Summary

Length	L_p	13.00	ft
Width	W	7.00	ft
Size	D_{50}	12	inches
Type	-	M	-
Thickness	T	24	inches

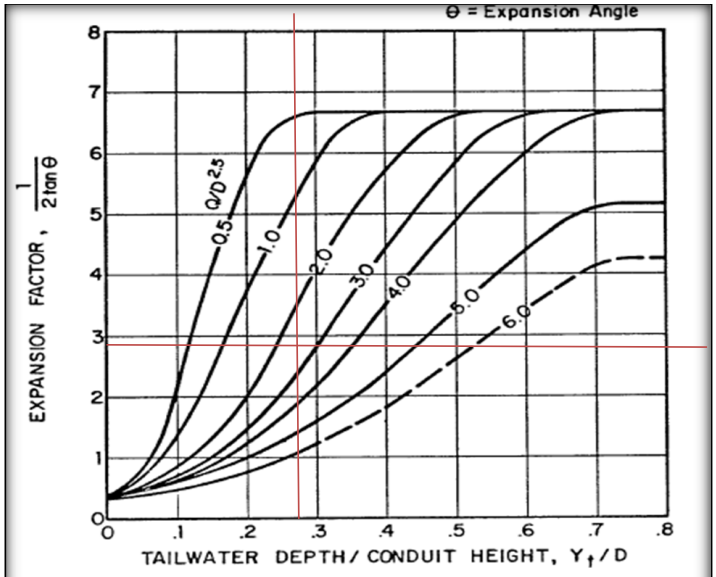
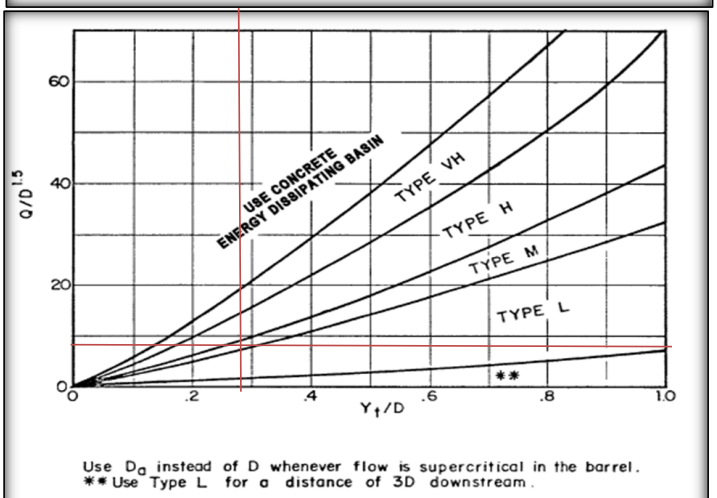


Figure 9-35. Expansion factor for circular conduits



Use D_a instead of D whenever flow is supercritical in the barrel.
** Use Type L for a distance of 3D downstream.

Figure 9-38. Riprap erosion protection at circular conduit outlet (valid for $Q/D_{2.5} \leq 6.0$)

RIPRAP DESIGNATION	% SMALLER THAN GIVEN SIZE BY WEIGHT	INTERMEDIATE ROCK DIMENSION (INCHES)	D_{50}* (INCHES)
TYPE VL	70 – 100 50 – 70 35 – 50 2 – 10	12 9 6 2	6
TYPE L	70 – 100 50 – 70 35 – 50 2 – 10	15 12 9 3	9
TYPE M	70 – 100 50 – 70 35 – 50 2 – 10	21 18 12 4	12
TYPE H	70 – 100 50 – 70 35 – 50 2 – 10	30 24 18 6	18
*D_{50} = MEAN ROCK SIZE			

Figure 8-34. Riprap and soil riprap placement and gradation (part 1 of 3)

Rip-Rap Calculation

Culvert E1.5

.

Applicable Equations:

$L_p = (1/2\tan\Theta)(A_t/Y_t - D)$	Equation 9-11 per USCDM
$A_t = Q/V$	Equation 9-12 per USDCM
$\Theta = \tan^{-1}(1/(2*\text{ExpansionFactor}))$	Equation 9-13 per USDCM
$W = 2(L_p\tan\Theta)+D$	Equation 9-14 per USDCM
$T = 2D_{50}$	Equation 9-15 per USDCM

Assumptions

Maximum Major Event Velocity is 7fps for FES outletting into trickle channels

Input parameters:

Description		Variable	Input	Unit
Width of the conduit (use diameter for circular conduits),		D:	2.00	ft
Rectangular conduit		H:		
HGL Elevation			7399.87	ft
Invert Elevation			7399.32	ft
Tailwater depth (ft),		Y_t:	0.55	ft
Expansion angle of the culvert flow		Θ:	0.20	radians
Design discharge (cfs)*		Q:	16.60	cfs
Froude Number		F_r	1.26	Supercritical
Unitless Variables for Tables:				
	For Figure 9-35	$Q/D^{2.5}$	2.93	
	For Figure 9-36	$Q/WH^{3/2}$	#DIV/0!	
	For Figure 9-35	Y_t/D	0.28	
	For Figure 9-38	$Q/D^{1.5}$	5.87	
	For Figure 9-38	Y_t/D	0.28	
Allowable non-eroding velocity in the downstream channel (ft/sec)		V:	5	ft/sec
Expansion Factor (Figure 9-35), 1/(2tan(θ))			2.5	

Solve for:

Description	Variable	Output	Unit
1. Required area of flow at allowable velocity (ft^2)	A_t:	3.32	ft^2
2. Length of Protection	L_p:	10.09	ft
	$L_p < 3D$?	No	
	L_{pmin}:	10.09	ft
3. Width of downstream riprap protection	W:	6.00	ft
4. Rip Rap Type (Figure 9-38)	-	L	
5. Rip Rap Size (Figure 8-34)	D_{50}:	9	inches

Rip Rap Summary

Length	L_p	10.00	ft
Width	W	6.00	ft
Size	D_{50}	9	inches
Type	-	L	-
Thickness	T	18	inches

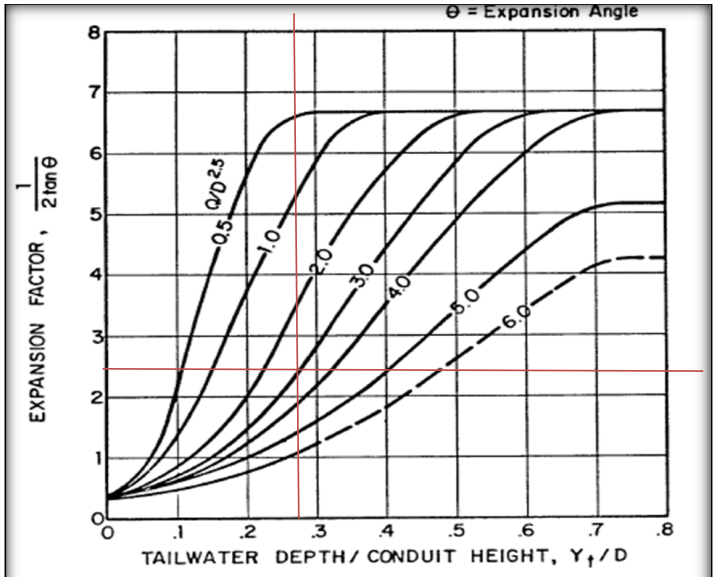
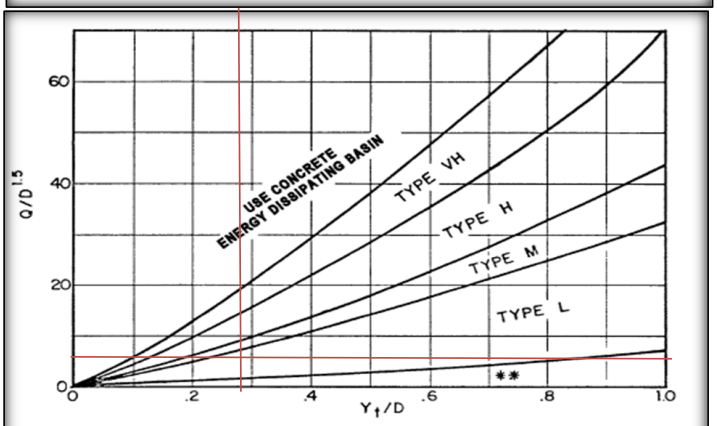


Figure 9-35. Expansion factor for circular conduits



Use D_a instead of D whenever flow is supercritical in the barrel.
** Use Type L for a distance of 3D downstream.

Figure 9-38. Riprap erosion protection at circular conduit outlet (valid for $Q/D_{2.5} \leq 6.0$)

RIPRAP DESIGNATION	% SMALLER THAN GIVEN SIZE BY WEIGHT	INTERMEDIATE ROCK DIMENSION (INCHES)	D_{50}* (INCHES)
TYPE VL	70 – 100 50 – 70 35 – 50 2 – 10	12 9 6 2	6
TYPE L	70 – 100 50 – 70 35 – 50 2 – 10	15 12 9 3	9
TYPE M	70 – 100 50 – 70 35 – 50 2 – 10	21 18 12 4	12
TYPE H	70 – 100 50 – 70 35 – 50 2 – 10	30 24 18 6	18

*D_{50} = MEAN ROCK SIZE

Figure 8-34. Riprap and soil riprap placement and gradation (part 1 of 3)

Rip-Rap Calculation

Culvert F2

.

Applicable Equations:

$L_p = (1/2\tan\Theta)(A_t/Y_t - D)$	Equation 9-11 per USCDM
$A_t = Q/V$	Equation 9-12 per USDCM
$\Theta = \tan^{-1}(1/(2*\text{ExpansionFactor}))$	Equation 9-13 per USDCM
$W = 2(L_p\tan\Theta)+D$	Equation 9-14 per USDCM
$T = 2D_{50}$	Equation 9-15 per USDCM

Assumptions

Maximum Major Event Velocity is 7fps for FES outletting into trickle channels

Input parameters:

Description		Variable	Input	Unit
Width of the conduit (use diameter for circular conduits),		D:	1.50	ft
Rectangular conduit		H:		
HGL Elevation			7364.04	ft
Invert Elevation			7363.25	ft
Tailwater depth (ft),		Y_t:	0.79	ft
Expansion angle of the culvert flow		Θ:	0.12	radians
Design discharge (cfs)*		Q:	8.60	cfs
Froude Number		F_r	0.96	Subcritical
Unitless Variables for Tables:				
	For Figure 9-35	$Q/D^{2.5}$	3.12	
	For Figure 9-36	$Q/WH^{3/2}$	#DIV/0!	
	For Figure 9-35	Y_t/D	0.53	
	For Figure 9-38	$Q/D^{1.5}$	4.68	
	For Figure 9-38	Y_t/D	0.53	
Allowable non-eroding velocity in the downstream channel (ft/sec)		V:	5	ft/sec
Expansion Factor (Figure 9-35), 1/(2tan(θ))			4.3	

Solve for:

Description	Variable	Output	Unit
1. Required area of flow at allowable velocity (ft^2)	A_t:	1.72	ft^2
2. Length of Protection	L_p:	2.91	ft
	$L_p < 3D$?	Yes	
	L_{pmin}:	4.50	ft
3. Width of downstream riprap protection	W:	3.00	ft
4. Rip Rap Type (Figure 9-38)	-	L	
5. Rip Rap Size (Figure 8-34)	D_{50}:	9	inches

Rip Rap Summary

Length	L_p	5.00	ft
Width	W	3.00	ft
Size	D_{50}	9	inches
Type	-	L	-
Thickness	T	18	inches

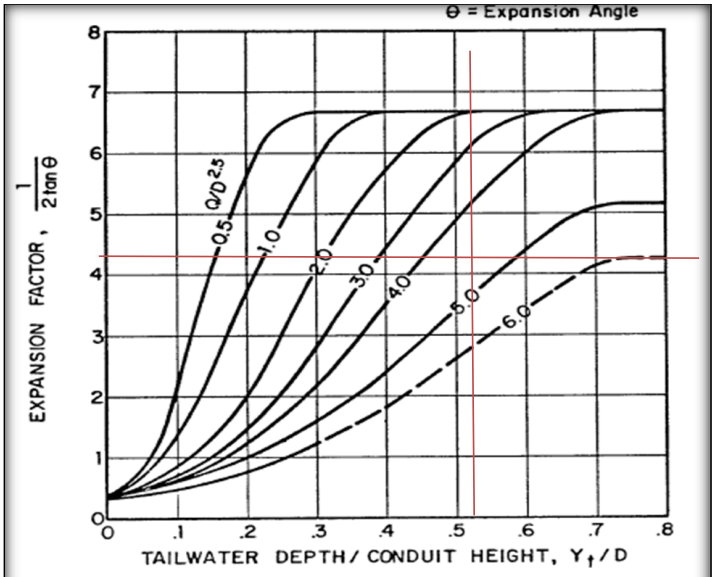
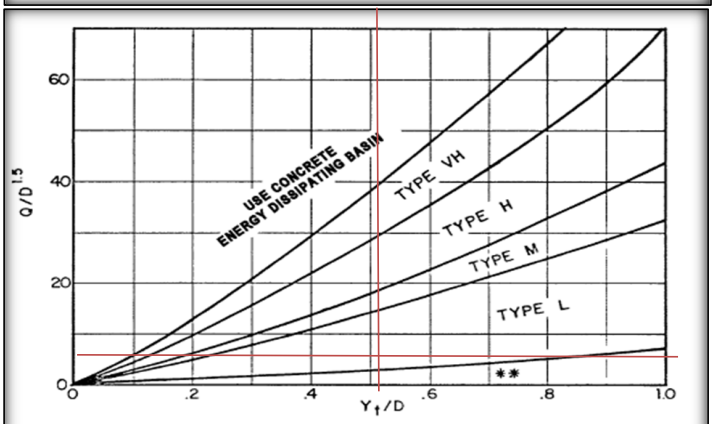


Figure 9-35. Expansion factor for circular conduits



Use D_a instead of D whenever flow is supercritical in the barrel.
** Use Type L for a distance of 3D downstream.

Figure 9-38. Riprap erosion protection at circular conduit outlet (valid for $Q/D_{2.5} \leq 6.0$)

RIPRAP DESIGNATION	% SMALLER THAN GIVEN SIZE BY WEIGHT	INTERMEDIATE ROCK DIMENSION (INCHES)	D_{50}* (INCHES)
TYPE VL	70 – 100 50 – 70 35 – 50 2 – 10	12 9 6 2	6
TYPE L	70 – 100 50 – 70 35 – 50 2 – 10	15 12 9 3	9
TYPE M	70 – 100 50 – 70 35 – 50 2 – 10	21 18 12 4	12
TYPE H	70 – 100 50 – 70 35 – 50 2 – 10	30 24 18 6	18

*D_{50} = MEAN ROCK SIZE

Figure 8-34. Riprap and soil riprap placement and gradation (part 1 of 3)

Rip-Rap Calculation

Pond Outfall

.

Applicable Equations:

$L_p = (1/2\tan\Theta)(A_t/Y_t - D)$	Equation 9-11 per USCDM
$A_t = Q/V$	Equation 9-12 per USDCM
$\Theta = \tan^{-1}(1/(2*\text{ExpansionFactor}))$	Equation 9-13 per USDCM
$W = 2(L_p\tan\Theta)+D$	Equation 9-14 per USDCM
$T = 2D_{50}$	Equation 9-15 per USDCM

Assumptions

Maximum Major Event Velocity is 7fps for FES outletting into trickle channels

Input parameters:

Description		Variable	Input	Unit
Width of the conduit (use diameter for circular conduits),		D:	3.50	ft
Rectangular conduit		H:		
HGL Elevation			7297.51	ft
Invert Elevation			7296.00	ft
Tailwater depth (ft),		Y_t:	1.51	ft
Expansion angle of the culvert flow		Θ:	0.14	radians
Design discharge (cfs)*		Q:	94.40	cfs
Froude Number		F_r	1.41	Supercritical
Unitless Variables for Tables:				
	For Figure 9-35	$Q/D^{2.5}$	4.12	
	For Figure 9-36	$Q/WH^{3/2}$	#DIV/0!	
	For Figure 9-35	Y_t/D	0.43	
	For Figure 9-38	$Q/D^{1.5}$	14.42	
	For Figure 9-38	Y_t/D	0.43	
Allowable non-eroding velocity in the downstream channel (ft/sec)		V:	5	ft/sec
Expansion Factor (Figure 9-35), 1/(2tan(θ))			3.6	

Solve for:

Description	Variable	Output	Unit
1. Required area of flow at allowable velocity (ft^2)	A_t:	18.88	ft^2
2. Length of Protection	L_p:	32.41	ft
	$L_p < 3D$?	No	
	L_{pmin}:	32.41	ft
3. Width of downstream riprap protection	W:	13.00	ft
4. Rip Rap Type (Figure 9-38)	-	M	
5. Rip Rap Size (Figure 8-34)	D_{50}:	12	inches

Rip Rap Summary

Length	L_p	32.00	ft
Width	W	13.00	ft
Size	D_{50}	12	inches
Type	-	M	-
Thickness	T	24	inches

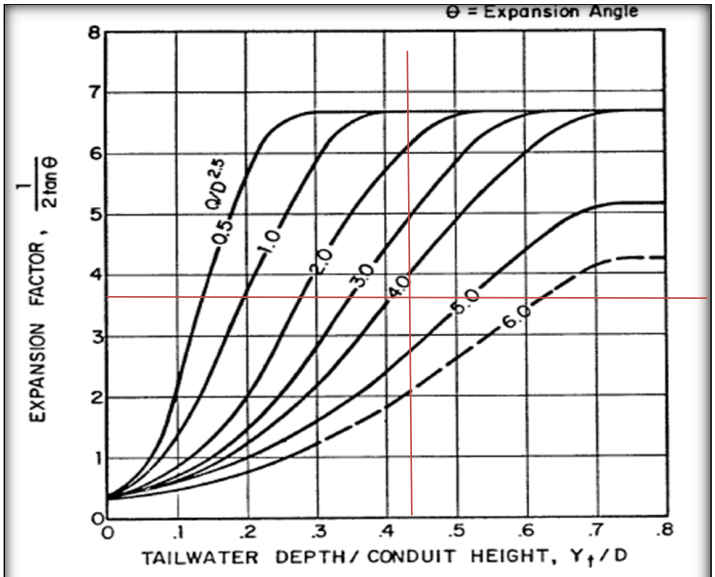
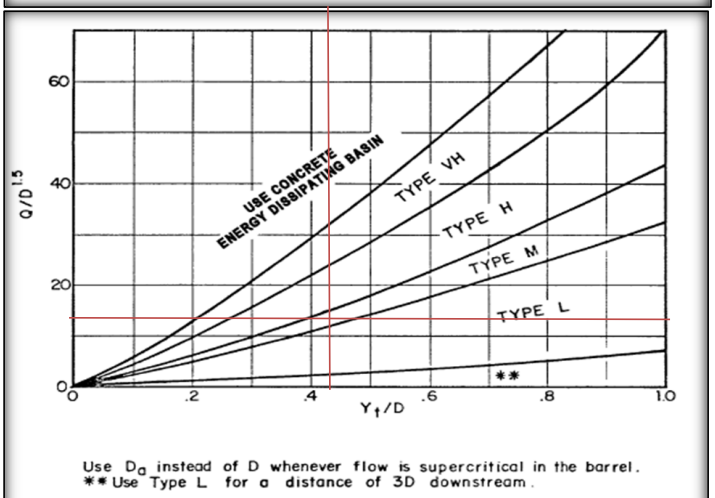


Figure 9-35. Expansion factor for circular conduits



Use D_a instead of D whenever flow is supercritical in the barrel.
** Use Type L for a distance of 3D downstream.

Figure 9-38. Riprap erosion protection at circular conduit outlet (valid for $Q/D_{2.5} \leq 6.0$)

RIPRAP DESIGNATION	% SMALLER THAN GIVEN SIZE BY WEIGHT	INTERMEDIATE ROCK DIMENSION (INCHES)	D_{50}* (INCHES)
TYPE VL	70 – 100 50 – 70 35 – 50 2 – 10	12 9 6 2	6
TYPE L	70 – 100 50 – 70 35 – 50 2 – 10	15 12 9 3	9
TYPE M	70 – 100 50 – 70 35 – 50 2 – 10	21 18 12 4	12
TYPE H	70 – 100 50 – 70 35 – 50 2 – 10	30 24 18 6	18

*D_{50} = MEAN ROCK SIZE

Figure 8-34. Riprap and soil riprap placement and gradation (part 1 of 3)

GENERIC DRIVEWAY CULVERT SIZING TABLE					
Lot	**Street Name**	**Culvert Slope (%)**	**Total Q100 (cfs)**	**Required Culvert Size (in)**	**Notes**
5	Woodbridge Terrace	2	3.57	18	1/6th of Basin E1.2
6	Early Light Drive	2	8.40	18	Channel F2 Flows
7	Early Light Drive	2	8.40	18	Channel F2 Flows
8	Early Light Drive	2	8.40	18	Channel F2 Flows
33	Alamar Way	2	7.00	18	Channel 8 flows
34	Alamar Way	2	7.00	18	Channel 8 flows
35	Alamar Way	2	25.10	30	Channel 7 flows
36	Alamar Way	2	4.90	18	Basin DA3 Flows
37	Alamar Way	2	8.60	18	Channel 6 Flows
38	Early Light Drive	2	8.60	18	Channel 6 Flows
49	Rambling Road	2	8.06	18	1/2 of Channel 5 Flows
50	Rambling Road	2	16.11	24	Channel 5 Flows
51	Early Light Drive	2	38.25	36	1/2th of Basin E3 + Basin E1.2
61	Flapjack Lane	2	3.82	18	Channel 4 Flows
62	Early Light Drive	2	25.00	30	Channel 2 Flows

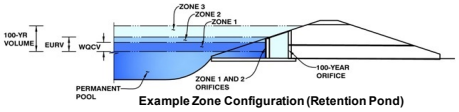
*Culvert sizing is based on flows in roadside ditch. If driveways cross natural channels an engineering site plan would be required.

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.03 (May 2020)

Project: **Winsome Filing No. 2**

Basin ID: **Pond 5**



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	**EDB**	
Watershed Area =	155.65	acres
Watershed Length =	6,210	ft
Watershed Length to Centroid =	2,295	ft
Watershed Slope =	0.026	ft/ft
Watershed Imperviousness =	12.30%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	98.1%	percent
Percentage Hydrologic Soil Groups C/D =	1.9%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

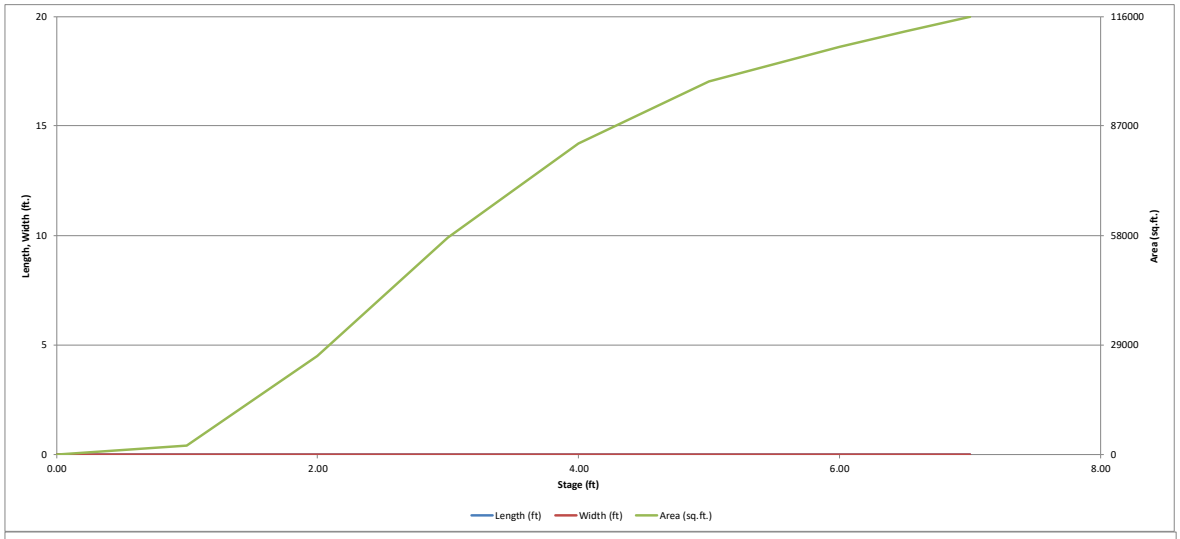
			Optional User Overrides	
Water Quality Capture Volume (WQCV) =	1.033	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	1.825	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	2.396	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	4.987	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	7.554	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	11.985	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	15.055	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	19.430	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.14 in.) =	27.465	acre-feet		inches
Approximate 2-yr Detention Volume =	1.195	acre-feet		
Approximate 5-yr Detention Volume =	1.860	acre-feet		
Approximate 10-yr Detention Volume =	3.510	acre-feet		
Approximate 25-yr Detention Volume =	4.723	acre-feet		
Approximate 50-yr Detention Volume =	4.964	acre-feet		
Approximate 100-yr Detention Volume =	6.342	acre-feet		

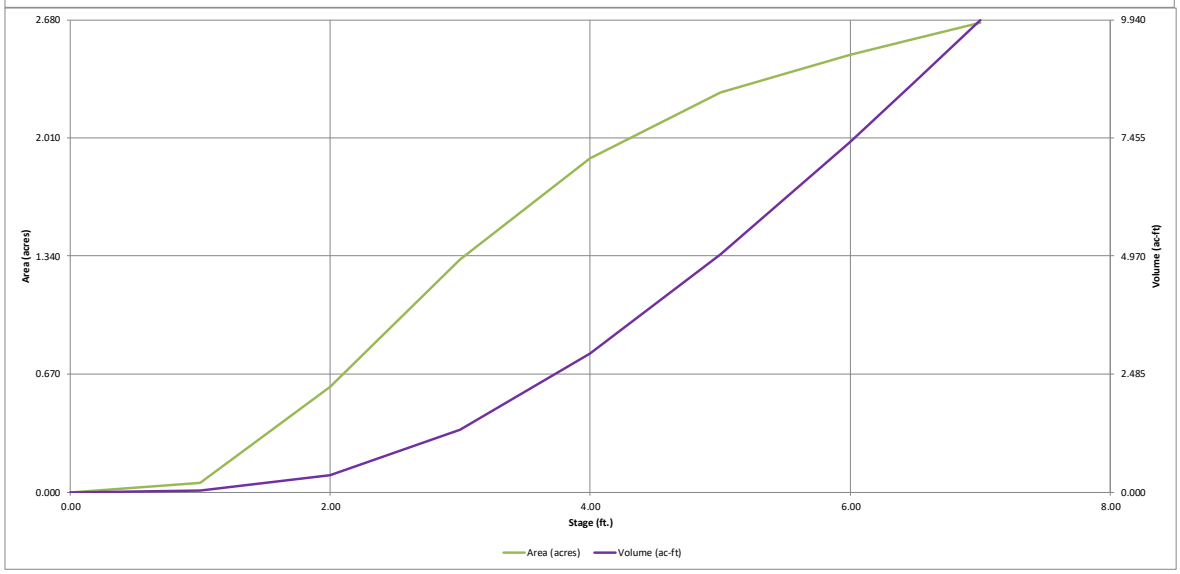
Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	1.033	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.793	acre-feet
Zone 3 (100yr + 1 / 2 WQCV - Zones 1 & 2) =	5.033	acre-feet
Total Detention Basin Volume =	6.858	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	20	0.000		
7299	--	1.00	--	--	--	2,300	0.053	1,160	0.027
	--	2.00	--	--	--	26,000	0.597	15,310	0.351
	--	3.00	--	--	--	57,483	1.320	57,051	1.310
	--	4.00	--	--	--	82,400	1.892	126,993	2.915
	--	5.00	--	--	--	98,700	2.266	217,543	4.994
Spillway Crest	--	6.00	--	--	--	108,000	2.479	320,893	7.367
	--	6.50	--	--	--	112,000	2.571	375,893	8.629
7305	--	7.00	--	--	--	116,000	2.663	432,893	9.938


20
15
10
5
0
Length, Width (ft.)
116000
87000
58000
29000
0
Area (sq.ft.)
0.00
2.00
4.00
6.00
8.00
Stage (ft)
Length (ft)
Width (ft)
Area (sq.ft.)

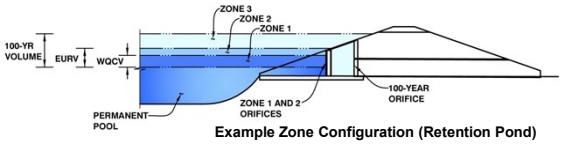

2.680
2.010
1.340
0.670
0.000
Area (acres)
9.940
7.455
4.970
2.485
0.000
Volume (ac-ft)
0.00
2.00
4.00
6.00
8.00
Stage (ft.)
Area (acres)
Volume (ac-ft)

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.03 (May 2020)

Project: **Winsome Filing No. 2**

Basin ID: **Pond 5**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.78	1.033	Orifice Plate
Zone 2 (EURV)	3.37	0.793	Orifice Plate
Zone 3 (100+1/2WQCV)	5.80	5.033	Weir&Pipe (Restrict)
Total (all zones)		6.858	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =		ft (distance below the filtration media surface)	Underdrain Orifice Area =		ft^2
Underdrain Orifice Diameter =		inches	Underdrain Orifice Centroid =		feet

Calculated Parameters for Underdrain

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	N/A	ft^2
Depth at top of Zone using Orifice Plate =	3.37	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	N/A	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	N/A	inches	Elliptical Slot Area =	N/A	ft^2

Calculated Parameters for Plate

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.15	2.30					
Orifice Area (sq. inches)	3.14	3.14	10.00					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected			Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Area =	N/A	N/A	ft^2
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Centroid =	N/A	N/A	feet
Vertical Orifice Diameter =	N/A	N/A	inches				

Calculated Parameters for Vertical Orifice

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir (and No Outlet Pipe)

	Zone 3 Weir	Not Selected			Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	3.40	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	4.86	N/A	feet
Overflow Weir Front Edge Length =	20.44	N/A	feet	Overflow Weir Slope Length =	6.02	N/A	feet
Overflow Weir Grate Slope =	4.00	N/A	H:V	Grate Open Area / 100-yr Orifice Area =	10.62	N/A	
Horiz. Length of Weir Sides =	5.84	N/A	feet	Overflow Grate Open Area w/o Debris =	86.13	N/A	ft^2
Overflow Grate Open Area % =	70%	N/A	%, grate open area/total area	Overflow Grate Open Area w/ Debris =	43.07	N/A	ft^2
Debris Clogging % =	50%	N/A	%				

Calculated Parameters for Overflow Weir

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Restrictor	Not Selected			Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	1.50	N/A	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	8.11	N/A	ft^2
Outlet Pipe Diameter =	42.00	N/A	inches	Outlet Orifice Centroid =	1.51	N/A	feet
Restrictor Plate Height Above Pipe Invert =	33.00		inches	Half-Central Angle of Restrictor Plate on Pipe =	2.18	N/A	radians

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	6.00	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	0.89	feet
Spillway Crest Length =	65.00	feet	Stage at Top of Freeboard =	7.89	feet
Spillway End Slopes =	4.00	H:V	Basin Area at Top of Freeboard =	2.66	acres
Freeboard above Max Water Surface =	1.00	feet	Basin Volume at Top of Freeboard =	9.94	acre-ft

Calculated Parameters for Spillway

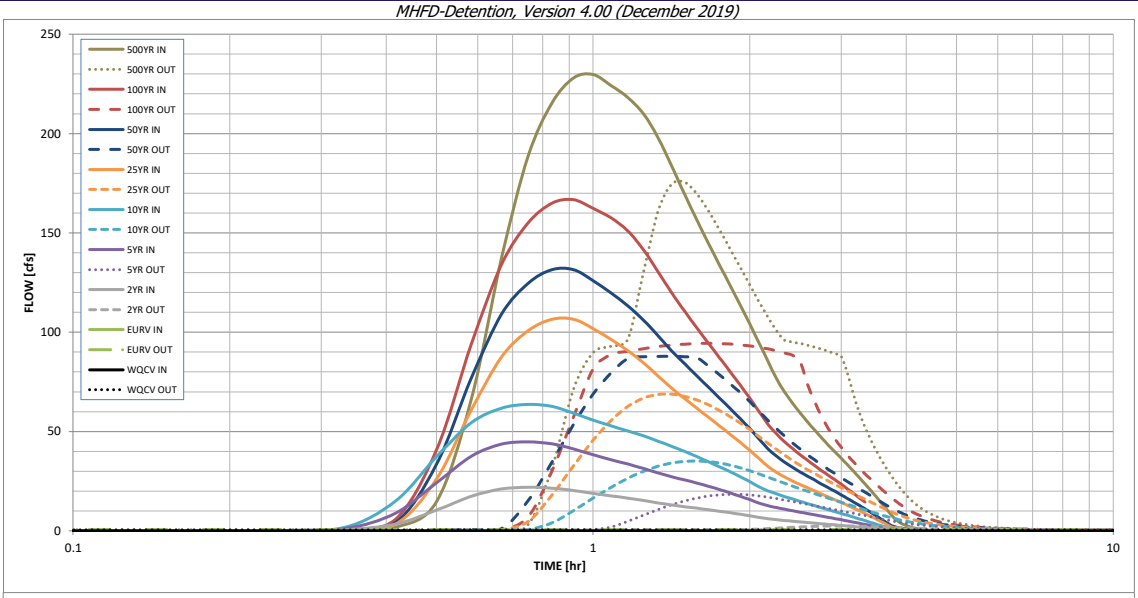
Routed Hydrograph Results

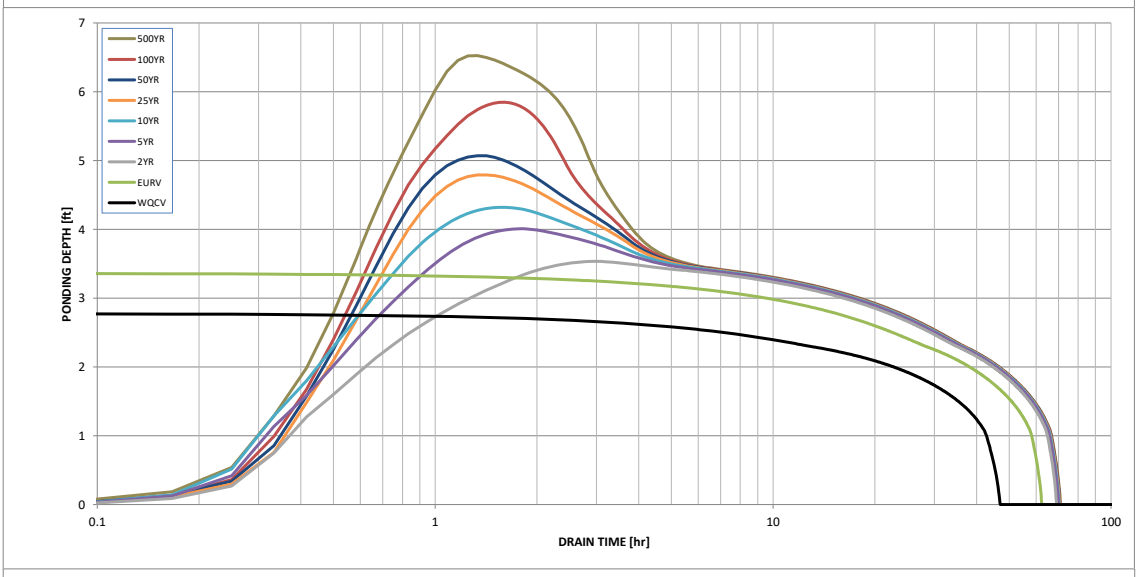
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

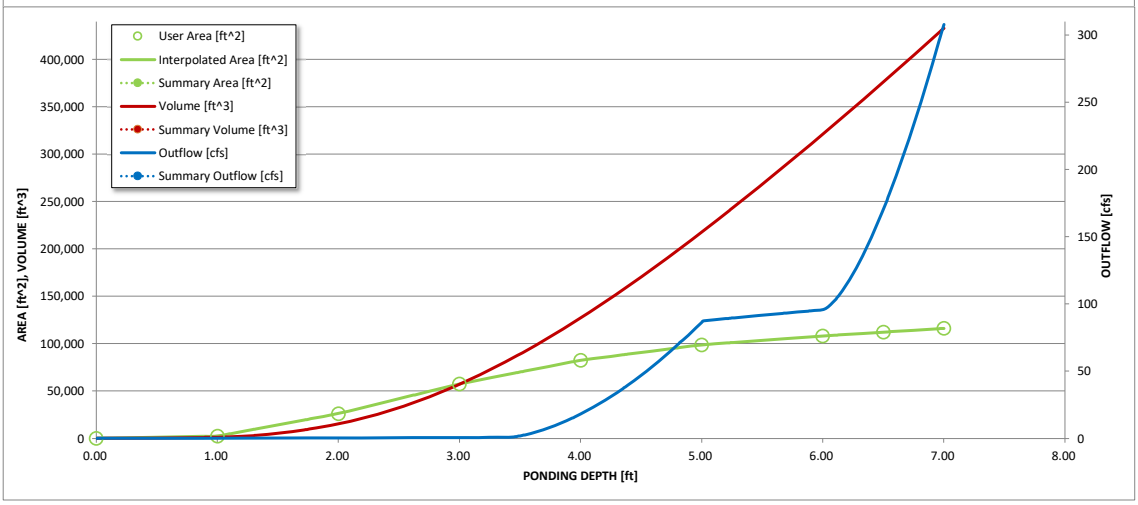
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.14
CUHP Runoff Volume (acre-ft) =	1.033	1.825	2.396	4.987	7.554	11.985	15.055	19.430	27.465
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	2.396	4.987	7.554	11.985	15.055	19.430	27.465
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	12.0	33.5	52.0	95.8	120.4	154.8	217.2
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.08	0.22	0.33	0.62	0.77	0.99	1.40
Peak Inflow Q (cfs) =	N/A	N/A	21.9	44.8	63.7	106.6	131.5	166.7	229.7
Peak Outflow Q (cfs) =	0.5	0.7	2.4	18.4	35.2	68.8	87.9	94.4	175.4
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.5	0.7	0.7	0.7	0.6	0.8
Structure Controlling Flow =	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	0.02	0.2	0.4	0.8	1.0	1.1	1.1
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	42	56	61	57	53	46	42	36	29
Time to Drain 99% of Inflow Volume (hours) =	**45**	59	65	63	62	59	57	55	51
Maximum Ponding Depth (ft) =	2.78	3.37	3.53	4.01	4.32	4.79	5.07	5.85	6.52
Area at Maximum Ponding Depth (acres) =	1.16	1.53	1.62	1.89	2.01	2.19	2.28	2.45	2.57
Maximum Volume Stored (acre-ft) =	1.037	1.837	2.089	2.915	3.540	4.527	5.153	6.973	8.681

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.00 (December 2019)







S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename: _____

Inflow Hydrographs

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.04
	0:15:00	0.00	0.00	0.10	0.17	0.21	0.14	0.19	0.17	0.30
	0:20:00	0.00	0.00	0.50	1.18	1.81	0.55	0.67	0.82	1.83
	0:25:00	0.00	0.00	3.42	8.83	14.94	3.34	4.24	5.88	14.71
	0:30:00	0.00	0.00	10.42	24.25	37.31	26.06	33.44	40.73	66.41
	0:35:00	0.00	0.00	17.41	37.62	54.43	60.95	77.03	94.06	137.19
	0:40:00	0.00	0.00	21.05	43.63	61.74	87.48	109.00	134.10	188.57
	0:45:00	0.00	0.00	21.94	44.78	63.70	100.74	124.59	154.95	215.35
	0:50:00	0.00	0.00	21.50	43.78	62.64	106.52	131.46	164.91	227.92
	0:55:00	0.00	0.00	20.30	41.27	59.27	106.56	131.52	166.70	229.73
	1:00:00	0.00	0.00	18.85	38.31	55.69	101.81	125.91	162.35	224.17
	1:05:00	0.00	0.00	17.63	35.80	52.84	96.30	119.64	157.49	218.17
	1:10:00	0.00	0.00	16.50	33.60	50.29	90.73	113.27	150.98	209.98
	1:15:00	0.00	0.00	15.30	31.39	47.81	84.56	106.08	141.47	197.96
	1:20:00	0.00	0.00	14.08	29.15	45.17	78.02	98.22	130.51	183.70
	1:25:00	0.00	0.00	13.03	27.22	42.56	71.80	90.57	119.79	169.36
	1:30:00	0.00	0.00	12.17	25.61	39.95	66.54	84.04	110.49	156.50
	1:35:00	0.00	0.00	11.38	24.07	37.34	61.70	77.99	102.10	144.74
	1:40:00	0.00	0.00	10.62	22.48	34.76	57.20	72.32	94.44	133.92
	1:45:00	0.00	0.00	9.87	20.80	32.23	52.88	66.89	87.21	123.67
	1:50:00	0.00	0.00	9.12	19.10	29.75	48.72	61.67	80.24	113.82
	1:55:00	0.00	0.00	8.36	17.40	27.29	44.61	56.53	73.44	104.24
	2:00:00	0.00	0.00	7.59	15.72	24.77	40.58	51.48	66.83	94.92
	2:05:00	0.00	0.00	6.81	14.05	22.23	36.54	46.42	60.27	85.67
	2:10:00	0.00	0.00	6.12	12.68	20.20	32.56	41.41	53.85	76.86
	2:15:00	0.00	0.00	5.62	11.70	18.66	29.55	37.67	48.93	70.03
	2:20:00	0.00	0.00	5.22	10.88	17.32	27.18	34.66	44.97	64.40
	2:25:00	0.00	0.00	4.87	10.13	16.07	25.16	32.08	41.51	59.42
	2:30:00	0.00	0.00	4.53	9.42	14.89	23.34	29.72	38.39	54.90
	2:35:00	0.00	0.00	4.20	8.73	13.77	21.68	27.58	35.53	50.76
	2:40:00	0.00	0.00	3.89	8.07	12.68	20.10	25.54	32.86	46.87
	2:45:00	0.00	0.00	3.58	7.42	11.64	18.58	23.59	30.35	43.23
	2:50:00	0.00	0.00	3.29	6.79	10.64	17.13	21.73	28.02	39.85
	2:55:00	0.00	0.00	3.00	6.17	9.67	15.70	19.91	25.73	36.54
	3:00:00	0.00	0.00	2.71	5.57	8.75	14.28	18.12	23.46	33.30
	3:05:00	0.00	0.00	2.42	4.97	7.84	12.88	16.35	21.19	30.07
	3:10:00	0.00	0.00	2.14	4.38	6.93	11.49	14.58	18.93	26.85
	3:15:00	0.00	0.00	1.86	3.80	6.04	10.10	12.83	16.68	23.64
	3:20:00	0.00	0.00	1.58	3.22	5.15	8.71	11.08	14.43	20.44
	3:25:00	0.00	0.00	1.30	2.65	4.27	7.33	9.33	12.18	17.25
	3:30:00	0.00	0.00	1.03	2.07	3.40	5.95	7.60	9.95	14.07
	3:35:00	0.00	0.00	0.76	1.51	2.54	4.58	5.87	7.72	10.91
	3:40:00	0.00	0.00	0.49	0.97	1.74	3.23	4.17	5.53	7.87
	3:45:00	0.00	0.00	0.30	0.63	1.27	2.00	2.66	3.60	5.33
	3:50:00	0.00	0.00	0.22	0.48	1.01	1.32	1.81	2.44	3.75
	3:55:00	0.00	0.00	0.17	0.38	0.82	0.89	1.27	1.68	2.68
	4:00:00	0.00	0.00	0.14	0.31	0.66	0.62	0.91	1.14	1.88
	4:05:00	0.00	0.00	0.11	0.25	0.53	0.43	0.65	0.76	1.30
	4:10:00	0.00	0.00	0.09	0.20	0.42	0.31	0.47	0.48	0.87
	4:15:00	0.00	0.00	0.07	0.15	0.32	0.21	0.33	0.29	0.56
	4:20:00	0.00	0.00	0.06	0.12	0.24	0.15	0.24	0.18	0.37
	4:25:00	0.00	0.00	0.05	0.09	0.17	0.11	0.18	0.14	0.27
	4:30:00	0.00	0.00	0.04	0.07	0.12	0.09	0.13	0.11	0.21
	4:35:00	0.00	0.00	0.03	0.05	0.09	0.07	0.10	0.09	0.17
	4:40:00	0.00	0.00	0.02	0.03	0.07	0.05	0.08	0.07	0.13
	4:45:00	0.00	0.00	0.02	0.02	0.05	0.04	0.06	0.05	0.10
	4:50:00	0.00	0.00	0.01	0.01	0.03	0.03	0.04	0.04	0.07
	4:55:00	0.00	0.00	0.01	0.01	0.02	0.02	0.03	0.02	0.04
	5:00:00	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.01	0.03
	5:05:00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
	5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Kimley»Horn

Project: Winsome Filing 2 -Pond 5

Date: 6/4/2021

Emergency Overflow Weir Calculation

Q (cfs) =	160.9	(100-yr peak inflow)
C_{BCW} =	3	
Z =	4	
H =	0.9	
L (ft) =	59.94	Rounded to 65

*orange cells require input

$$Q = C_{BCW} L H^{1.5} + 2\left[\left(\tfrac{2}{5}\right) C_{BCW} Z H^{2.5}\right]$$

rearrange to solve for length:

$$L = \frac{Q - \left(\tfrac{4}{5}\right) C_{BCW} Z H^{2.5}}{C_{BCW} H^{1.5}}$$

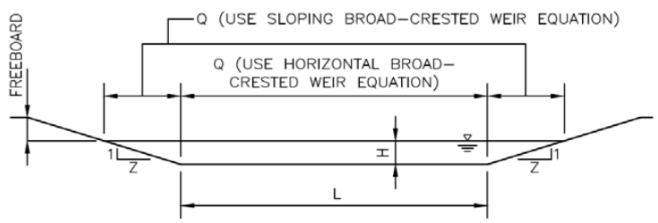


Figure 12-20. Sloping broad-crest weir

Horizontal Broad Crested Weir Equation (from USDCM Eqn. 12-8)

$$Q = C_{BCW} L H^{1.5} \qquad \text{Equation 12-8}$$

Where:

Q = discharge (cfs)

C_{BCW} = broad-crested weir coefficient (This ranges from 2.6 to 3.0. A value of 3.0 is often used in practice.) See Hydraulic Engineering Circular No. 22 for additional information.

L = broad-crested weir length (ft)

H = head above weir crest (ft)

Sloping Broad Crested Weir Equation (from USDCM Eqn. 12-9)

$$Q = \left(\frac{2}{5}\right) C_{BCW} Z H^{2.5} \qquad \text{Equation 12-9}$$

Where:

Q = discharge (cfs)

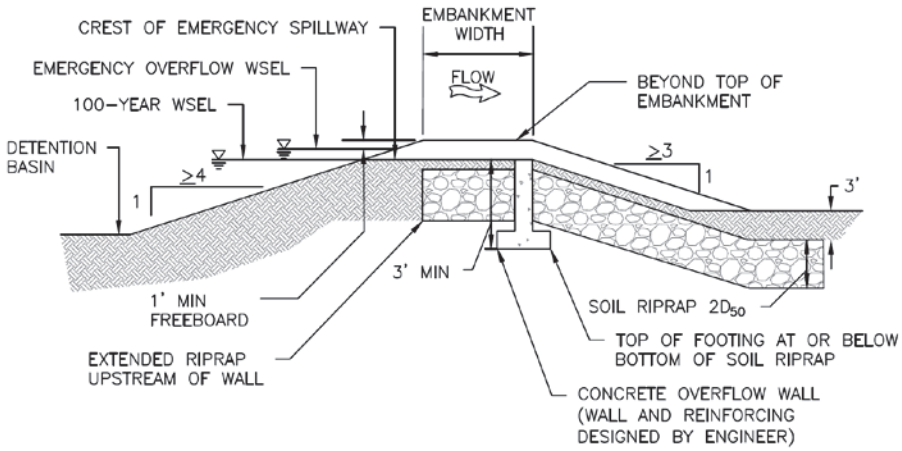
C_{BCW} = broad-crested weir coefficient (This ranges from 2.6 to 3.0. A value of 3.0 is often used in practice.) See Hydraulic Engineering Circular No. 22 for additional information.

Z = side slope (horizontal: vertical)

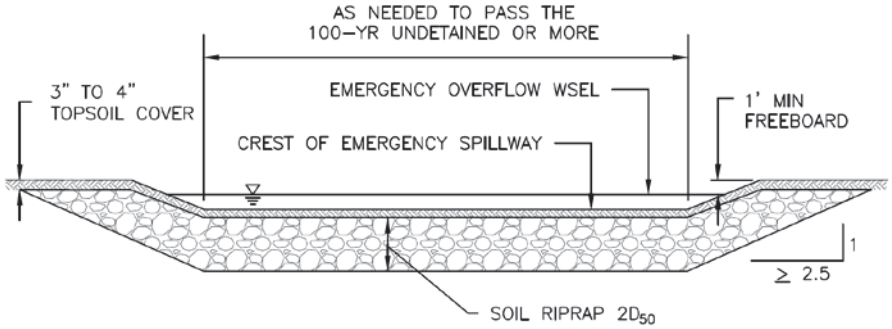
H = head above weir crest (ft)

Note that in order to calculate the total flow over the weir depicted in Figure 12-20, the results from Equation 12-8 must be added to two times the results from Equation 12-9.

Pond 5 Spillway



EMERGENCY SPILLWAY PROFILE



EMERGENCY SPILLWAY SECTION AND SPILLWAY CHANNEL

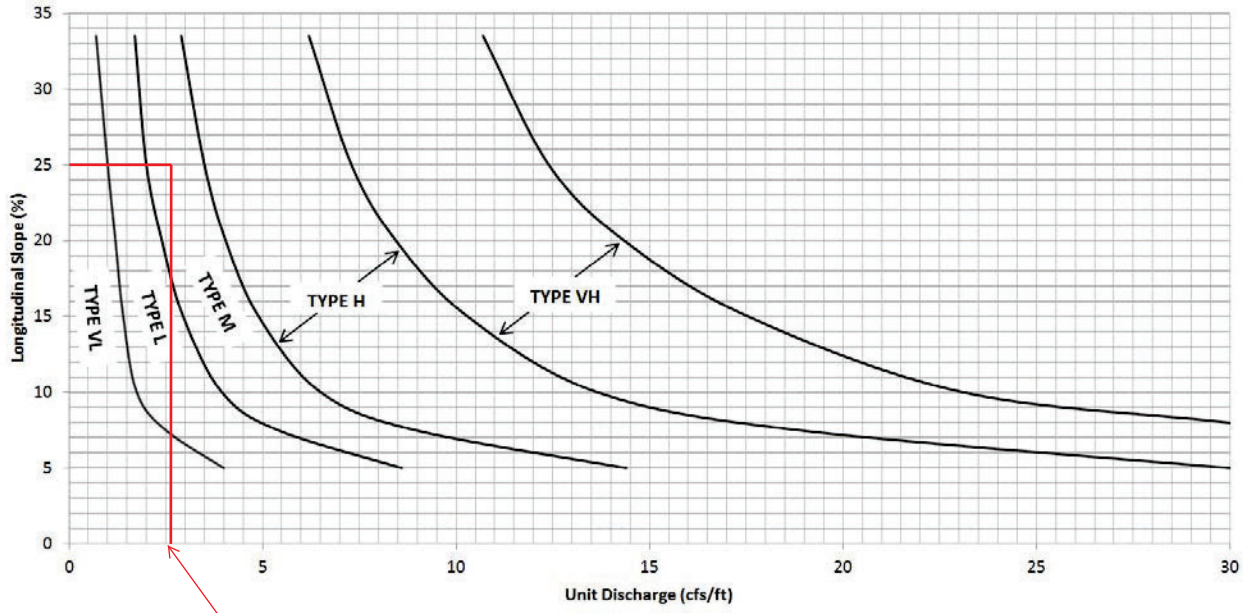


Figure 12-21. Embankment protection details and rock sizing chart (adapted from Arapahoe County)

172.5 cfs/65 ft = 2.65

update to identify the pertinent channel, basin or design point

Rock

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: *Winsome* **County:** *El Paso*
Designer: *BAH* **Checked by:** _____
Date: *June 4, 2021* **Date:** _____

Input Geometry:

Upstream Channel	Chute		Downstream Channel
Bw = *10.0* ft.	Bw = *10.0* ft.		Bw = *35.0* ft.
Side slopes = *4.0* (m:1)	Factor of safety = *1.60* (F_s)	*1.2 Min*	Side slopes = *4.0* (m:1)
Velocity n-value = *0.040*	Side slopes = *4.0* (m:1) →	*2.0:1 max.*	Velocity n-value = *0.040*
Bed slope = *0.0200* ft./ft.	Bed slope (6.3:1) = *0.160* ft./ft →	*3.0:1 max.*	Bed slope = *0.0040* ft./ft.
Note: n value = a) velocity n from waterway program or b) computed mannings n for channel	Freeboard = *0.5* ft. →		
	Outlet apron depth, d = *2.3* ft.		Base flow = *0.0* cfs

Design Storm Data (Table 2, FOTG, WI-NRCS Grade Stabilization Structure No. 410):

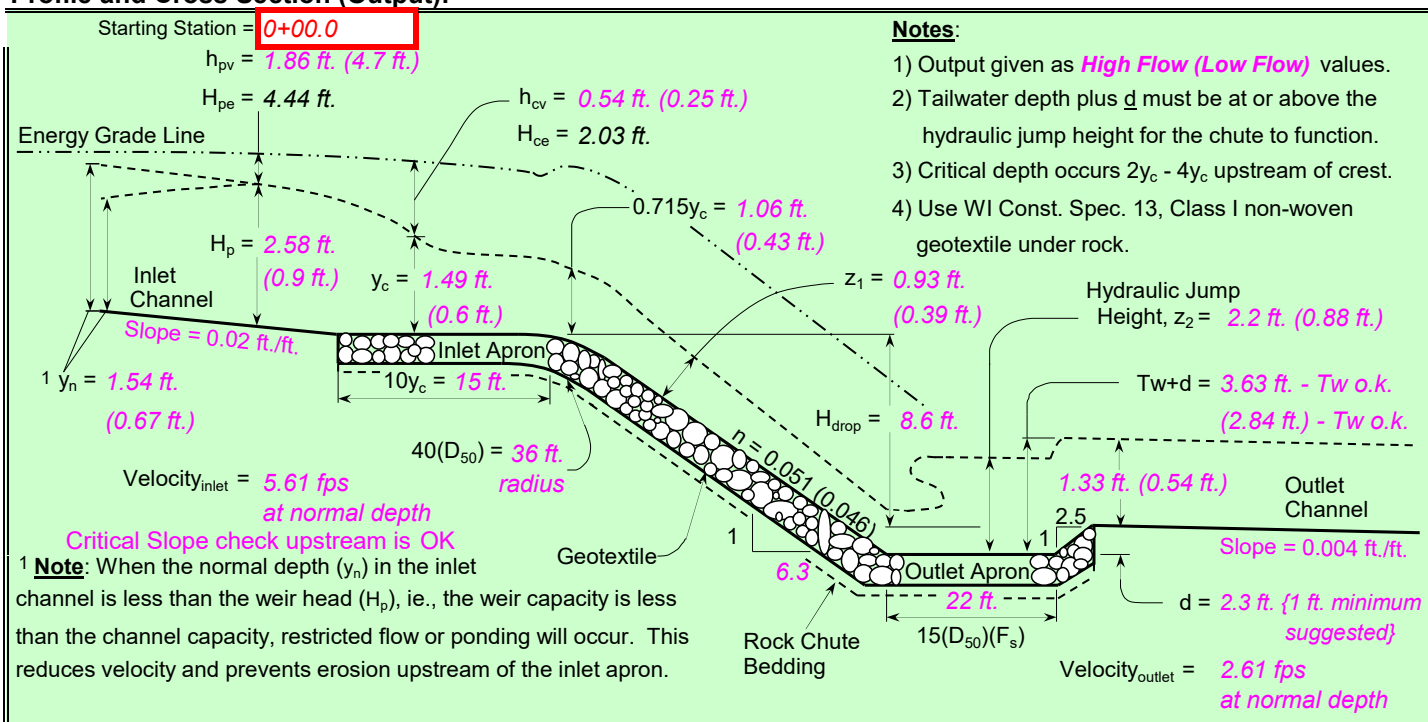
Apron elev. --- Inlet = *7309.3* ft. ------- Outlet *7298.4* ft. --- (H_{drop} = 8.6 ft.)

Q_{high} = Runoff from design storm capacity from Table 2, FOTG Standard 410
Q_5 = Runofff from a 5-year,24-hour storm.

Q_{high} = *140.0* cfs High flow storm through chute → Tw (ft.) = *Program*
Q_5 = *30.0* cfs Low flow storm through chute → Tw (ft.) = *Program*

***Note**: The total required capacity is routed through the chute (principal spillway) or in combination with an auxiliary spillway.*
***Input tailwater (Tw)**:* 0.16 1.60

Profile and Cross Section (Output):

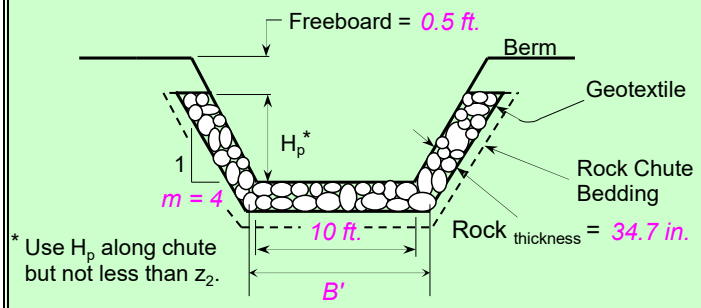


Notes:
1) Output given as ***High Flow (Low Flow)*** values.
2) Tailwater depth plus d must be at or above the hydraulic jump height for the chute to function.
3) Critical depth occurs 2y_c - 4y_c upstream of crest.
4) Use WI Const. Spec. 13, Class I non-woven geotextile under rock.

[1] **Note**: When the normal depth (y_n) in the inlet channel is less than the weir head (H_p), ie., the weir capacity is less than the channel capacity, restricted flow or ponding will occur. This reduces velocity and prevents erosion upstream of the inlet apron.

Profile Along Centerline of Chute

Typical Cross Section



* Use H_p along chute but not less than z_2.

	10.29 cfs/ft.	Equivalent unit discharge
F_S =	*1.60*	Factor of safety (multiplier)
z_1 =	*0.93 ft.*	Normal depth in chute
n-value =	*0.051*	Manning's roughness coefficient
$D_{50}(F_s)$ =	*17.4 in.*	Minimum Design D50*
$2(D_{50})(F_s)$ =	*34.7 in.*	Rock chute thickness
Tw + d =	*3.63 ft.*	Tailwater above outlet apron
z_2 =	*2.2 ft.*	Hydraulic jump height
***** The outlet**	***will***	***function adequately***

High Flow Storm Information

Rock Chute Design Calculations

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Winsome **County:** El Paso
Designer: BAH **Checked by:**
Date: 6/4/2021 **Date:**

I. Calculate the normal depth in the inlet channel

High Flow			*Low Flow*			
y_n =	**1.54**	**ft.**	**y_n =**	**0.67**	**ft.**	(Normal depth)
Area =	25.0	ft^2	Area =	8.5	ft^2	(Flow area in channel)
Q_{high} =	140.0	cfs	Q_{low} =	30.0	cfs	(Capacity in channel)
Scupstreamchannel =	0.023	ft/ft				

II. Calculate the critical depth in the chute

High Flow			*Low Flow*			
y_c =	**1.49**	**ft.**	**y_c =**	**0.60**	**ft.**	(Critical depth in chute)
Area =	23.7	ft^2	Area =	7.5	ft^2	(Flow area in channel)
Q_{high} =	140.0	cfs	Q_{low} =	30.0	cfs	(Capacity in channel)
H_{ce} =	2.03	ft.	H_{ce} =	0.85	ft.	(Total minimum specific energy head)
h_{cv} =	0.54	ft.	h_{cv} =	0.25	ft.	(Velocity head corresponding to y_c)
$10y_c$ =	**14.87**	**ft.**	---	---		(Required inlet apron length)
$0.715y_c$ =	**1.06**	**ft.**	**$0.715y_c$ =**	**0.43**	**ft.**	(Depth of flow over the weir crest or brink)

III. Calculate the tailwater depth in the outlet channel

High Flow			*Low Flow*			
Tw =	**1.33**	**ft.**	**Tw =**	**0.54**	**ft.**	(Tailwater depth)
Area =	53.6	ft^2	Area =	20.0	ft^2	(Flow area in channel)
Q_{high} =	140.0	cfs	Q_{low} =	30.0	cfs	(Capacity in channel)
H_2 =	0.00	ft.	H_2 =	0.00	ft.	(Downstream head above weir crest, $H_2 = 0$, if $H_2 < 0.715*y_c$)

IV. Calculate the head for a trapezoidal shaped broadcrested weir

Cd = 2.80 (Coefficient of discharge for broadcrested weirs)

High Flow						
H_p =	2.67	ft.	**2.58**	**ft.**	(Weir head)
Area =	55.2	ft^2	52.6	ft^2	(Flow area in channel)
V_o =	0.00	fps	**7.46**	**fps**	(Approach velocity)
h_{pv} =	0.00	ft.	0.86	ft.	(Velocity head corresponding to H_p)
Q_{high} =	392.0	cfs	491.6	cfs	(Capacity in channel)

Trial and error procedure solving simultaneously for velocity and head

Low Flow					
H_p =	0.97	ft.	**0.90**	**ft.**	(Weir head)
Area =	13.5	ft^2	12.2	ft^2	(Flow area in channel)
V_o =	0.00	fps	**6.86**	**fps**	(Approach velocity)
h_{pv} =	0.00	ft.	0.73	ft.	(Velocity head corresponding to H_p)
Q_{low} =	84.0	cfs	126.2	cfs	(Capacity in channel)

Trial and error procedure solving simultaneously for velocity and head

Rock Chute Design Calculations

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Winsome **County:** El Paso
Designer: BAH **Checked by:**
Date: 6/4/2021 **Date:**

V. Calculate the rock chute parameters (w/o a factor of safety applied)

	High Flow		*Low Flow*		
q_t =	0.96	cms/m	q_t =	0.25 cms/m	(Equivalent unit discharge)
D_{50} (mm) =	275.50 → ***(10.85 in.)***		D_{50} =	134.22 mm	(Median ***angular*** rock size)
n =	0.051		n =	0.046	(Manning's roughness coefficient)
z_1 =	0.93	ft.	z_1 =	0.39 ft.	(Normal depth in the chute)
A_1 =	12.7	ft^2	A_1 =	4.4 ft^2	(Area associated with normal depth)
Velocity =	11.01	fps	Velocity =	6.75 fps	(Velocity in chute slope)
z_{mean} =	0.73	ft.	z_{mean} =	0.34 ft.	(Mean depth)
F_1 =	2.27		F_1 =	2.04	(Froude number)
$L_{rock\ apron}$ =	13.56	ft.	----	----	(Length of rock outlet apron = 15*D_{50})

VI. Calculate the height of hydraulic jump height (conjugate depth)

	High Flow		*Low Flow*		
z_2 =	**2.20**	**ft.**	**z_2 =**	**0.88** **ft.**	(Hydraulic jump height)
Q_{high} =	140.0	cfs	Q_{high} =	30.0 cfs	(Capacity in channel)
A_2 =	41.5	ft^2	A_2 =	11.9 ft^2	(Flow area in channel)

VII. Calculate the energy lost through the jump (absorbed by the rock)

	High Flow		*Low Flow*		
E_1 =	2.81	ft.	E_1 =	1.09 ft.	(Total energy before the jump)
E_2 =	2.38	ft.	E_2 =	0.98 ft.	(Total energy after the jump)
R_E =	15.29	%	R_E =	10.62 %	(Relative loss of energy)

Calculate Quantities for Rock Chute

-------Rock Riprap Volume-------

Area Calculations	**Length @ Rock CL**
h = 2.58	Inlet = 14.88
x_1 = 12.37	Outlet = 22.41
L = 10.64	Slope = 68.99
A_s = 31.91	2.5:1 Lip = 5.88
x_2 = 12.00	**Total = 112.16 ft.**
A_b = 68.22	**Rock Volume**
A_b+2*A_s = 132.04 ft^2	**548.52 yd^3**

-------Bedding Volume-------

Area Calculations	
h = 5.58	**Bedding Thickness**
x_1 = 2.06	t_1, t_2 = ***6.00*** in.
L = 23.01	
A_s = 11.50	**Length @ Bed CL**
x_2 = 2.00	**Total = 112.14 ft.**
A_b = 6.43	**Bedding Volume**
A_b+2*A_s = 29.44 ft^2	**122.26 yd^3**

-------Geotextile Quantity-------

Width	**Length @ Bot. Rock**
2*Slope = 46.01	**Total = 112.14 ft.**
Bottom = 10.74	**Geotextile Area**
Total = 56.75 ft.	**707.14 yd^2**

Note: 1) The radius is not considered when calculating quantities of riprap, bedding, or geotextile.
2) The geotextile quantity does not include over-overlapping (18-in. min.) or anchoring material (18-in. min. along sides, 24-in. min. on ends).

update to identify the pertinent channel, basin or design point

Rock Chute Desi

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: *Winsome* **County:** *El Paso*
Designer: *BAH* **Checked by:** _____
Date: *May 17, 2021* **Date:** _____

Input Geometry:

Upstream Channel	Chute		Downstream Channel
Bw = *6.0* ft.	Bw = *6.0* ft.		Bw = *15.0* ft.
Side slopes = *4.0* (m:1)	Factor of safety = *1.60* (F_s)	*1.2 Min*	Side slopes = *4.0* (m:1)
Velocity n-value = *0.040*	Side slopes = *4.0* (m:1) →	*2.0:1 max.*	Velocity n-value = *0.040*
Bed slope = *0.0239* ft./ft.	Bed slope (6.3:1) = *0.160* ft./ft →	*3.0:1 max.*	Bed slope = *0.0040* ft./ft.
Note: n value = a) velocity n from waterway program or b) computed mannings n for channel	Freeboard = *0.5* ft. →		
	Outlet apron depth, d = *2.3* ft.		Base flow = *0.0* cfs

Design Storm Data (Table 2, FOTG, WI-NRCS Grade Stabilization Structure No. 410):

Apron elev. --- Inlet = *7309.0* ft. ------- Outlet *7298.4* ft. --- (H_{drop} = 8.3 ft.)

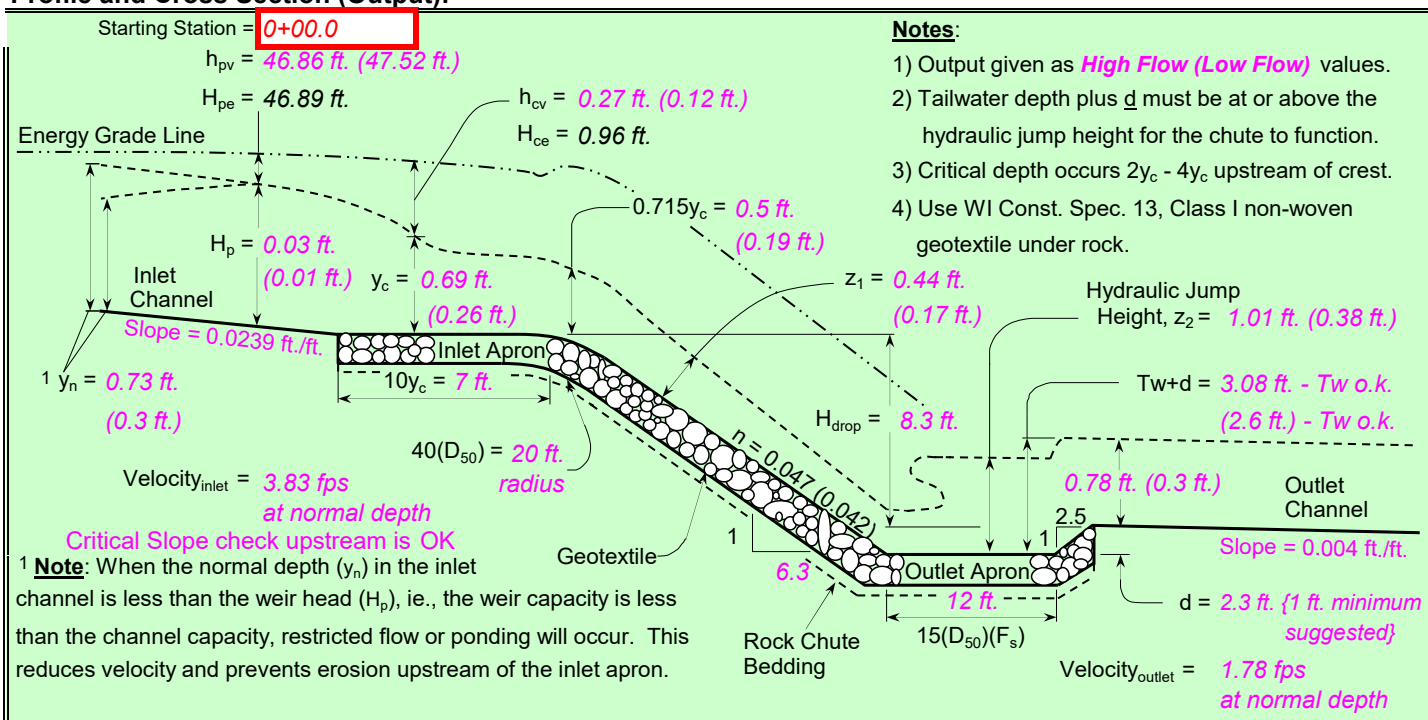
Q_{high} = Runoff from design storm capacity from Table 2, FOTG Standard 410
Q_5 = Runofff from a 5-year,24-hour storm.

Q_{high} = *25.0* cfs High flow storm through chute → Tw (ft.) = *Program*
Q_5 = *5.0* cfs Low flow storm through chute → Tw (ft.) = *Program*

***Note**: The total required capacity is routed through the chute (principal spillway) or in combination with an auxiliary spillway.*
***Input tailwater (Tw)**:* 0.16 1.60

Profile and Cross Section (Output):

Starting Station = 0+00.0

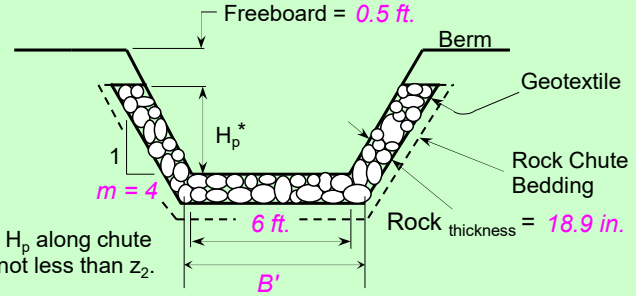


Notes:
1) Output given as ***High Flow (Low Flow)*** values.
2) Tailwater depth plus d must be at or above the hydraulic jump height for the chute to function.
3) Critical depth occurs 2y_c - 4y_c upstream of crest.
4) Use WI Const. Spec. 13, Class I non-woven geotextile under rock.

[1] **Note**: When the normal depth (y_n) in the inlet channel is less than the weir head (H_p), ie., the weir capacity is less than the channel capacity, restricted flow or ponding will occur. This reduces velocity and prevents erosion upstream of the inlet apron.

Profile Along Centerline of Chute

Typical Cross Section



* Use H_p along chute but not less than z_2.

	3.27 cfs/ft.	Equivalent unit discharge
F_S =	*1.60*	Factor of safety (multiplier)
z_1 =	*0.44 ft.*	Normal depth in chute
n-value =	*0.047*	Manning's roughness coefficient
$D_{50}(F_s)$ =	*9.5 in.*	Minimum Design D50*
$2(D_{50})(F_s)$ =	*18.9 in.*	Rock chute thickness
Tw + d =	*3.08 ft.*	Tailwater above outlet apron
z_2 =	*1.01 ft.*	Hydraulic jump height
****** The outlet***	***will***	***function adequately***

High Flow Storm Information

Rock Chute Design Calculations

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Winsome **County:** El Paso
Designer: BAH **Checked by:**
Date: 5/17/2021 **Date:**

I. Calculate the normal depth in the inlet channel

High Flow			*Low Flow*			
y_n =	**0.73**	**ft.**	**y_n =**	**0.30**	**ft.**	(Normal depth)
Area =	6.5	ft^2	Area =	2.2	ft^2	(Flow area in channel)
Q_{high} =	25.0	cfs	Q_{low} =	5.0	cfs	(Capacity in channel)
Scupstreamchannel =	0.029	ft/ft				

II. Calculate the critical depth in the chute

High Flow			*Low Flow*			
y_c =	**0.69**	**ft.**	**y_c =**	**0.26**	**ft.**	(Critical depth in chute)
Area =	6.1	ft^2	Area =	1.8	ft^2	(Flow area in channel)
Q_{high} =	25.0	cfs	Q_{low} =	5.0	cfs	(Capacity in channel)
H_{ce} =	0.96	ft.	H_{ce} =	0.38	ft.	(Total minimum specific energy head)
h_{cv} =	0.27	ft.	h_{cv} =	0.12	ft.	(Velocity head corresponding to y_c)
$10y_c$ =	**6.92**	**ft.**	---	---		(Required inlet apron length)
$0.715y_c$ =	**0.50**	**ft.**	**$0.715y_c$ =**	**0.19**	**ft.**	(Depth of flow over the weir crest or brink)

III. Calculate the tailwater depth in the outlet channel

High Flow			*Low Flow*			
Tw =	**0.78**	**ft.**	**Tw =**	**0.30**	**ft.**	(Tailwater depth)
Area =	14.0	ft^2	Area =	4.9	ft^2	(Flow area in channel)
Q_{high} =	25.0	cfs	Q_{low} =	5.0	cfs	(Capacity in channel)
H_2 =	0.00	ft.	H_2 =	0.00	ft.	(Downstream head above weir crest, $H_2 = 0$, if $H_2 < 0.715*y_c$)

IV. Calculate the head for a trapezoidal shaped broadcrested weir

Cd = 2.80 (Coefficient of discharge for broadcrested weirs)

High Flow						
H_p =	0.58	ft.	**0.14**	**ft.**	(Weir head)
Area =	4.8	ft^2	0.9	ft^2	(Flow area in channel)
V_o =	0.00	fps	**15.58**	**fps**	(Approach velocity)
h_{pv} =	0.00	ft.	3.77	ft.	(Velocity head corresponding to H_p)
Q_{high} =	23.3	cfs	21.8	cfs	(Capacity in channel)

Trial and error procedure solving simultaneously for velocity and head

Low Flow					
H_p =	0.20	ft.	**0.03**	**ft.**	(Weir head)
Area =	1.4	ft^2	0.2	ft^2	(Flow area in channel)
V_o =	0.00	fps	**13.62**	**fps**	(Approach velocity)
h_{pv} =	0.00	ft.	2.88	ft.	(Velocity head corresponding to H_p)
Q_{low} =	4.7	cfs	4.4	cfs	(Capacity in channel)

Trial and error procedure solving simultaneously for velocity and head

Rock Chute Design Calculations

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Winsome **County:** El Paso
Designer: BAH **Checked by:**
Date: 5/17/2021 **Date:**

V. Calculate the rock chute parameters (w/o a factor of safety applied)

	High Flow		*Low Flow*		
q_t =	0.30	cms/m	q_t =	0.07	cms/m (Equivalent unit discharge)
D_{50} (mm) =	150.23 → ***(5.91 in.)***		D_{50} =	69.43	mm (Median ***angular*** rock size)
n =	0.047		n =	0.042	(Manning's roughness coefficient)
z_1 =	0.44	ft.	z_1 =	0.17	ft. (Normal depth in the chute)
A_1 =	3.4	ft^2	A_1 =	1.2	ft^2 (Area associated with normal depth)
Velocity =	7.28	fps	Velocity =	4.35	fps (Velocity in chute slope)
z_{mean} =	0.36	ft.	z_{mean} =	0.16	ft. (Mean depth)
F_1 =	2.14		F_1 =	1.94	(Froude number)
$L_{rock\ apron}$ =	7.39	ft.	----	----	(Length of rock outlet apron = 15*D_{50})

VI. Calculate the height of hydraulic jump height (conjugate depth)

	High Flow		*Low Flow*		
z_2 =	**1.01**	**ft.**	**z_2 =**	**0.38**	**ft.** (Hydraulic jump height)
Q_{high} =	25.0	cfs	Q_{high} =	5.0	cfs (Capacity in channel)
A_2 =	10.2	ft^2	A_2 =	2.8	ft^2 (Flow area in channel)

VII. Calculate the energy lost through the jump (absorbed by the rock)

	High Flow		*Low Flow*		
E_1 =	1.27	ft.	E_1 =	0.47	ft. (Total energy before the jump)
E_2 =	1.11	ft.	E_2 =	0.42	ft. (Total energy after the jump)
R_E =	12.68	%	R_E =	8.69	% (Relative loss of energy)

Calculate Quantities for Rock Chute

-------Rock Riprap Volume-------

Area Calculations	**Length @ Rock CL**
h = 1.01	Inlet = 9.92
x_1 = 8.25	Outlet = 12.27
L = 4.16	Slope = 67.09
A_s = 8.33	2.5:1 Lip = 5.99
x_2 = 8.00	**Total = 95.27 ft.**
A_b = 28.98	**Rock Volume**
A_b+2*A_s = 45.64 ft^2	**161.05 yd^3**

-------Bedding Volume-------

Area Calculations	
h = 3.01	**Bedding Thickness**
x_1 = 2.06	t_1, t_2 = ***6.00*** in.
L = 12.41	
A_s = 6.21	**Length @ Bed CL**
x_2 = 2.00	**Total = 95.25 ft.**
A_b = 4.31	**Bedding Volume**
A_b+2*A_s = 16.72 ft^2	**58.98 yd^3**

-------Geotextile Quantity-------

Width	**Length @ Bot. Rock**
2*Slope = 24.82	**Total = 95.26 ft.**
Bottom = 6.49	**Geotextile Area**
Total = 31.31 ft.	**331.42 yd^2**

Note: 1) The radius is not considered when calculating quantities of riprap, bedding, or geotextile.
2) The geotextile quantity does not include over-overlapping (18-in. min.) or anchoring material (18-in. min. along sides, 24-in. min. on ends).

include drainage basin name

Design Procedure Form: Runoff Reduction

UD-BMP (Version 3.07, March 2018)

Designer:	**BAH**
Company:	**Kimley-Horn**
Date:	**May 13, 2021**
Project:	**Winsome Filing 2**
Location:	**El Paso County**

SITE INFORMATION (User Input in Blue Cells)

WQCV Rainfall Depth	0.60	inches
Depth of Average Runoff Producing Storm, d_6 =	0.43	inches (for Watersheds Outside of the Denver Region, Figure 3-1 in USDCM Vol. 3)

Area Type	UIA:RPA	UIA:RPA	UIA:RPA									
Area ID	NW	NE	SE									
Downstream Design Point ID												
Downstream BMP Type	None	None	None									
DCIA (ft^2)	--	--	--									
UIA (ft^2)	11,333	19,318	5,731									
RPA (ft^2)	22,173	44,036	14,008									
SPA (ft^2)	--	--	--									
HSG A (%)	0%	0%	0%									
HSG B (%)	100%	100%	100%									
HSG C/D (%)	0%	0%	0%									
Average Slope of RPA (ft/ft)	0.005	0.042	0.045									
UIA:RPA Interface Width (ft)	660.00	1219.00	411.00									

CALCULATED RUNOFF RESULTS

Area ID	NW	NE	SE									
UIA:RPA Area (ft^2)	33,506	63,354	19,739									
L / W Ratio	0.08	0.06	0.12									
UIA / Area	0.3382	0.3049	0.2903									
Runoff (in)	0.00	0.00	0.00									
Runoff (ft^3)	0	0	0									
Runoff Reduction (ft^3)	472	805	239									

CALCULATED WQCV RESULTS

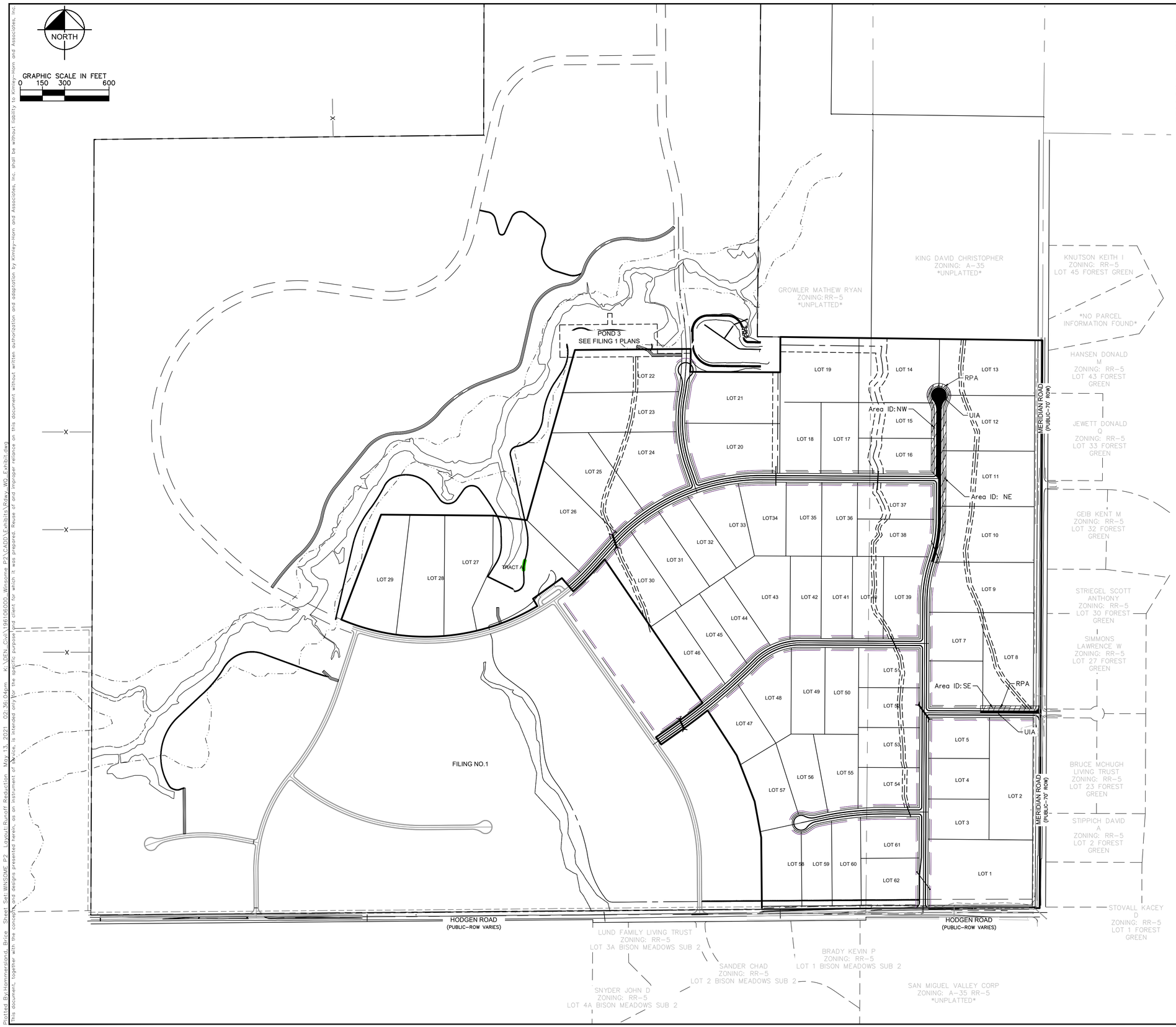
Area ID	NW	NE	SE									
WQCV (ft^3)	472	805	239									
WQCV Reduction (ft^3)	472	805	239									
WQCV Reduction (%)	100%	100%	100%									
Untreated WQCV (ft^3)	0	0	0									

CALCULATED DESIGN POINT RESULTS (sums results from all columns with the same Downstream Design Point ID)

Downstream Design Point ID												
DCIA (ft^2)												
UIA (ft^2)												
RPA (ft^2)												
SPA (ft^2)												
Total Area (ft^2)												
Total Impervious Area (ft^2)												
WQCV (ft^3)												
WQCV Reduction (ft^3)												
WQCV Reduction (%)												
Untreated WQCV (ft^3)												

CALCULATED SITE RESULTS (sums results from all columns in worksheet)

Total Area (ft^2)	
Total Impervious Area (ft^2)	
WQCV (ft^3)	
WQCV Reduction (ft^3)	
WQCV Reduction (%)	
Untreated WQCV (ft^3)	



BENCHMARK

A 2.5" ALUMINUM CAP BEING A 30 FOOT WITNESS CORNER NORTH OF THE SOUTHWEST CORNER OF SECTION 24, TOWNSHIP 11 SOUTH, RANGE 65 WEST OF THE 6TH PRINCIPAL MERIDIAN.

BASIS OF BEARINGS

THE WEST LINE OF THE NORTHWEST QUARTER OF SECTION 24, TOWNSHIP 11 SOUTH, RANGE 65 WEST OF THE 6TH/ PRINCIPAL MERIDIAN BEING MONUMENTED ON THE SOUTHERLY END BY A 2-1/2" ALUMINUM CAP STAMPED "LS 28658" AND AT THE NORTHERLY END BY A 3-1/2" ALUMINUM CAP STAMPED "LS 12103" BEING ASSUMED TO BEAR N00°14'25"E A DISTANCE OF 2636.99 FEET AS SHOWN IN LAND SURVEY PLAT RECORDED UNDER RECEPTION 218900072 RECORDS OF EL PASO COUNTY.

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2021 KIMLEY-HORN AND ASSOCIATES, INC.
2 N NEVADA AVE. SUITE 300, COLORADO SPRINGS, CO 80903
PHONE: 719-453-0180
WWW.KIMLEY-HORN.COM

LICENSED PROFESSIONAL
KEVIN KOFFORD
CO LICENSE NUMBER
57234
DATE: _____

KHA PROJECT 019610600
DATE 01/08/2021
SCALE AS SHOWN
DESIGNED BY KHTAM
DRAWN BY KHTAM
CHECKED BY TLC

RUNOFF REDUCTION EXHIBIT

WINSOME FILING NO. 2
PREPARED FOR
WINSOME LLC

EL PASO COUNTY CO

SHEET NUMBER

APPENDIX E: REFERENCES

Delete the Preliminary Drainage Report with the exception of the existing drainage map.

Winsome Subdivision
17480 Meridian Road North
Colorado Springs, Colorado 80924

Preliminary Drainage Report

MAY 15, 2019

PREPARED FOR:
PT McCune, LLC
Joseph W DesJardin
1864 Woodmoor Drive
Suite 100
Monument, Colorado 80132

PREPARED BY:
The Vertex Companies, Inc.
2420 W. 26th Avenue, Suite 100-D
Denver, Colorado 80211
PHONE: 303-623-9116

VERTEX Project: 49388
PCD File No. SP-18-006
FEMA Case No: 19-08-0185R

Jason Priddy
Project Engineer

Lance VanDemark, P.E.
Project Manager

VERTEX®

Engineer's Certification

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the applicable master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

COLORADO LICENSED
LANCE PATRICK VANDEMARK
05/16/19
43911
PROFESSIONAL ENGINEER

5/16/2019

Lance VanDemark, P.E.
Registered Professional Engineer
State of Colorado No. 43911

Owner Certification

I, the owner/developer have read and will comply with all of the requirements specified in this drainage report and plan.

5/21/19

Joseph W DesJardin
Director of Projects
PT McCune, LLC

Date

El Paso County

Filed in accordance with the requirements of the Colorado Springs Drainage Criteria Manual Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

Approved
By: Elizabeth NijKamp
Date:05/22/2019
El Paso County Planning & Community Development

Jennifer Irvine, P.E.
County Engineer / ECM Administrator

Date

2.0 DRAINAGE BASINS AND SUB-BASINS

MAJOR BASIN DESCRIPTION

The site resides within the West Kiowa Creek Drainage Basin (KIKI0200) which is located near the northern boundary of El Paso County, approximately 14.5 miles east of downtown Monument, CO. This watershed begins approximately 5 miles southwest of the Winsome property and continues another 10 miles to the northeast where it outfalls into Kiowa Creek which eventually discharges into the South Platte River near Fort Morgan, CO.

DRAINAGE STUDIES, OUTFALL SYSTEM PLANS, & SITE CONSTRAINTS

There are no major drainage studies (DBPS or MDDP) for this area on record and no base flood elevations for this reach of West Kiowa Creek that have been established. In conjunction with the development of this site, a floodplain study has been performed on the section of West Kiowa Creek located within the property. A Conditional Letter of Map Revision (CLOMR) has been submitted to FEMA to establish the floodplain boundary on-site. A plan showing the new proposed 100-year floodplain line is included in the appendix along with supporting documentation. The site is shown on FEMA flood map 08041C0350G with an effective date of 12/7/2018 which indicates that the site is in Zone X – an area outside of the 0.2% annual chance of flood (see the accompanying exhibits in the Appendix). The areas immediately adjacent to West Kiowa Creek are designated as Zone A, which is a 100-year Flood Hazard Area in which no base flood elevations have been determined. There are no known irrigation facilities located on the property at the current time.

EXISTING SUB-BASIN DESCRIPTION

Historically, the runoff from the property flows into West Kiowa Creek, which bisects the site flowing from the southwest corner of the property to the northeast corner. There are 10 on-site sub-basins and 6 off-site sub-basin that contribute flows to West Kiowa Creek. The 10 on-site

year event. Stormwater generated within the basin flows north discharges into West Kiowa Creek immediately near the center of the project site.

Sub-Basin Ea consists of an off-site area located near the southeast corner of the property. This sub-basin has an area of 37.9-acres and generates peak runoff of 5.4cfs in the 5-year event and peak runoff of 34.8cfs in the 100-year event. This sub-basin discharges into a 30" RCP culvert under Hodgen Road flowing into sub-basin Eb.

Sub-Basin Eb located in the southeast corner of the property and consists of an on-site watershed that discharges into West Kiowa Creek at the eastern property line. This sub-basin has an area of 74.6-acres and generates peak runoff of 4.0cfs in the 5-year event and peak runoff of 85.8cfs in the 100-year event. This sub-basin consists of the land tributary to a minor drainage channel that is north of Hodgen Road on the eastern side of the site.

Sub-Basin F located in the southeast corner of the property and consists of an on-site watershed that discharges into West Kiowa Creek to the east of the property. This sub-basin has an area of 44.5-acres and generates peak runoff of 6.6cfs in the 5-year event and peak runoff of 56.6cfs in the 100-year event. This sub-basin consists of the land tributary to a minor drainage channel that is north of Hodgen Road on the eastern side of the site.

Sub-Basin G located on the western side of the property and consists of an on-site watershed of a minor natural drainage channel that flows from west to east and discharges into West Kiowa Creek near the west of the property. This sub-basin has an area of 107.6 acres and generates peak runoff of 45.3cfs in the 5-year event and peak runoff of 199.0cfs in the 100-year event.

Sub-Basin H located in the northern side corner of the property and consists of an on-site watershed that discharges into West Kiowa Creek on the north side of the property. This sub-basin has an area of 121.8 acres and generates peak runoff of 34.8cfs in the 5-year event and

Sub-Basin D1.1 is an off-site sub-basin to the south of Hodgen Road consisting of agricultural land and large residential lots. This sub-basin has an area of 161.30 acres. The curve number for Sub-Basin D1 is 60.00. The basin will generate runoff of 20.6cfs and 127.3cfs in the minor and major storms, respectively. Flows from this sub-basin will be conveyed north by a natural drainage channel to an existing 72" CMP culvert that will convey flows under Hodgen Road into Sub-Basin D2.

Sub-Basin D1.2 is an off-site sub-basin to the south of Hodgen Road consisting of agricultural land and large residential lots. This sub-basin has an area of 49.90 acres. The curve number for Sub-Basin D1 is 60.00. The basin will generate runoff of 5.7cfs and 34.1cfs in the minor and major storms, respectively. Flows from this sub-basin will be conveyed north by a natural drainage channel to a 30" CMP culvert that will convey flows under Hodgen Road into Sub-Basin D3.

Sub-Basin D2 consists of 17 large residential lots and the southern tributary to West Kiowa Creek. This sub-basin has an area of 68.70 acres. The curve number for Sub-Basin D2 is 65.50. The basin will generate runoff of 11.7cfs and 81.3cfs in the minor and major storms, respectively. A culvert will convey flows across Alamar Way into Sub-Basin D5.

Sub-Basin D3 consists of 12 large residential lots at the southeast corner of the property. This sub-basin has an area of 41.20 acres. The curve number for Sub-Basin D3 is 64.00. The basin will generate runoff of 7.9cfs and 44.2cfs in the minor and major storms, respectively. Stormwater from this sub-basin will flow west across the residential lots to a natural channel that will convey flows to the north to a culvert under Asteria Lane. From the culvert runoff will continue to flow north through Sub-Basin D4 in a natural drainageway.

Sub-Basin D4 consists of 12 large residential lots to the south of the southern loop of Alamar Way. This sub-basin has an area of 34.30 acres. The curve number for Sub-Basin D4 is 64.00. The basin will generate runoff of 7.7cfs and 44.8cfs in the minor and major storms, respectively.

Stormwater from this sub-basin will flow across the residential lots to a natural drainage channel that will convey flows north to a culvert under Alamar Way. From the culvert, runoff will continue north through Sub-Basin D6 to stormwater detention pond 3 and then discharge to a natural drainage channel flowing to West Kiowa Creek.

Sub-Basin D5 consists of a portion of the southern tributary to West Kiowa Creek immediately to the north of the southern loop of Alamar Way. This sub-basin has an area of 12.80 acres. The curve number for Sub-Basin D5 is 67.20. The basin will generate runoff of 0.8cfs and 17.5cfs in the minor and major storms, respectively. Stormwater from this sub-basin generally flows south to north along the southern tributary streambed.

Sub-Basin D6 consists of 5 large residential lots and the portion of West Kiowa Creek on the northwest corner of Twinkling Star Lane and Alamar Way. This sub-basin has an area of 41.80 acres. The curve number for Sub-Basin D6 is 64.80. The basin will generate runoff of 4.4cfs and 33.2cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows northwest across the residential lots to the 7.1 ac-ft stormwater detention pond, Pond 3, which will discharge to West Kiowa Creek. Flows in the creek pass under Alamar Way through a double box culvert.

Sub-Basin E0 off-site sub-basin is located south of the southeast corner of the property. This sub-basin has an area of 37.9 acres. The curve number for Sub-Basin E0 is 60.00. The basin will generate runoff of 4.8cfs and 29.7cfs in the minor and major storms, respectively. Stormwater from this sub-basin will flow north across the residential lots to a 30” RCP culvert under Hodgen Road. From the culvert flows proceed north through Sub-Basin E1.1 to be treated in stormwater detention pond P6.

Sub-Basin E1.1 consists of one commercial lot in the southeast corner of the property. The commercial lot will have its own full spectrum stormwater detention pond, Pond 6 in place and

outlet to the road side ditch still ultimately flowing to the culvert at the north end of the basin. This sub-basin has an area of 7.9 acres. Half of this lot is forested and will remain undeveloped. The curve number for Sub-Basin E1.1 is 76.00. The basin will generate runoff of 9.0cfs and 20.7cfs in the minor and major storms, respectively.

Sub-Basin E1.2 consists of 3 large lots towards the southeast corner of the property. This sub-basin has an area of 16.30 acres. The curve number for Sub-Basin E1.2 is 64.00. The basin will generate runoff of 2.7cfs and 15.5cfs in the minor and major storms, respectively. Stormwater from this sub-basin will flow north across the residential lots through a culvert under Woodridge Terrace to Sub-basin F1.

Sub-Basin E2 consists of a portion of a large residential lot at the southwest corner of Flapjack Lane and Early Light Drive. This sub-basin has an area of 2.60 acres. The curve number for Sub-Basin E2 is 64.00. The basin will generate runoff of 0.7cfs and 4.2cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows north to a culvert under Flapjack Lane. Form the culvert, runoff flows in a natural drainage channel to Sub-Basin E3.

Sub-Basin E3 consists of 6 large residential lots on the south side of Asteria Lane. This sub-basin has an area of 19.80 acres. The curve number for Sub-Basin E3 is 64.00. The sub-basin will generate runoff of 4.7cfs and 27.9cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows east across the lots to a natural drainage channel which conveys flows north to the culvert under Asteria Lane. From the culvert, runoff continues down the proposed swale through Sub-Basins E4.

Sub-Basin E4 consists of 5 large residential lots to the north of Asteria Lane in the southeast corner of the property. This sub-basin has an area of 18.20 acres. The curve number for Sub-Basin E4 is 64.00. The basin will generate runoff of 4.2cfs and 25.1cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows to the proposed swale running through the

center of the sub-basin and are conveyed north to the culvert under Alamar Way. From the culvert, the flows continue north through the proposed swale that runs through Sub-Basin E7.

Sub-Basin E5 consists of portions of 7 large residential lots south of Alamar Way near the southern terminus of Clove Hitch Ct. This sub-basin has an area of 13.50 acres. The curve number for Sub-Basin E5 is 64.00. The basin will generate runoff of 3.2cfs and 19.2cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots through the center of the sub-basin and is conveyed north to the culvert under Alamar Way. From the culvert the flows continue north through Sub-Basin E6 in a natural drainage channel.

Sub-Basin E6 consists of 6 large residential lots along the eastern boundary of the property north of Alamar Way. This sub-basin has an area of 28.90 acres. The curve number for Sub-Basin E6 is 61.70. The basin will generate runoff of 5.5cfs and 34.4cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the natural drainage channel running through the center of the sub-basin and are conveyed north to stormwater detention pond 5. From the pond flows continue north in a natural drainage channel and are discharged from the property to the north as they were in the existing condition.

Sub-Basin E7 consists of a portion of 5 large residential lots on the eastern side of the property north of Alamar Way. This sub-basin has an area of 9.80 acres. The curve number for Sub-Basin E7 is 62.00. The basin will generate runoff of 2.0cfs and 12.3cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the proposed swale running through the center of the sub-basin and discharges to the proposed swale to the north that flows through to Sub-basin E6 into stormwater detention pond 5.

Sub-Basin F1 consists of portions of 8 large residential lots along the eastern boundary of the project, on the east side of Twinkling Star Lane. This sub-basin has an area of 42.90 acres. The curve number for Sub-Basin F2 is 60.40. The basin will generate runoff of 6.0cfs and 36.0cfs in

the minor and major storms, respectively. Stormwater from this sub-basin flows across the existing drainage channel through the center of the sub-basin and is discharged from the property to the north to a proposed swale that runs along the north property line ultimately entering detention pond P5.

Sub-Basin G1 consists of a portion of 3 large residential lots and off-site grassland along the western boundary of the project, on the west side of Alamar Way. This sub-basin has an area of 25.20 acres. The curve number for Sub-Basin G1 is 66.00. The basin will generate runoff of 2.5cfs and 36.3cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the natural drainage channel running through the center of the sub-basin and are conveyed east to a culvert under Alamar Way. From the culvert the flows continue east through Sub-Basin G2.

Sub-Basin G2 consists of a portion of 5 large residential lots on the east side of the western loop of Alamar Way. This sub-basin has an area of 21.20 acres. The curve number for Sub-Basin G2 is 73.40. The basin will generate runoff of 7.6cfs and 35.9cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the proposed swale running through the center of the sub-basin and are conveyed east to the 8.8 ac-ft stormwater detention pond, Pond 1. From the pond flows continue east and are discharged to West Kiowa Creek.

Sub-Basin H1 consists portions of 3 large residential lots along the western boundary of the project, on the north side of Alamar Way. This sub-basin has an area of 13.90 acres. The curve number for Sub-Basin H1 is 60.00. The basin will generate runoff of 5.5cfs and 26.2cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows across the lots to the natural drainage channel running through the center of the sub-basin and are conveyed southeast to the culvert under Alamar Way. From the culvert, the flows continue southeast through Sub-Basin H4.

Sub-Basin K1 consists of portions of 4 large residential lots along the northern boundary of the project. This sub-basin has an area of 17.80 acres. The curve number for Sub-Basin K1 would appear to be lower than the historic use at 72 versus 76. This could result from cleanup of leaves, pine needles, and other debris exposing more ground and allowing more direct contact with water. Conservatively however, using the larger of the two curve numbers, the basin will generate runoff of 12.9cfs and 45.1cfs in the minor and major storms, respectively. Stormwater from this sub-basin flows north across the lots from the property to the north boundary of the project as it did in the existing condition. Flows flowing offsite will be at or below historic levels.

3.0 DRAINAGE DESIGN CRITERIA

REGULATIONS

The hydrologic calculations in this report comply with the El Paso County Drainage Criteria Manuals. There are no previous drainage studies that cover this property.

HYDROLOGICAL CRITERIA

Since this project contains both sub-basins over 100 acres and sub-basins less than 100 acres, times of concentration and peak runoff values were calculated for the 5-year and 100-year storm events using the NRCS Curve Number Method as required by the City of Colorado Springs/El Paso County Drainage Criteria Manuals. The model utilizes the NRCS Type II 24-hr rainfall distribution, the cumulative depth for the 5-year storm is 2.7 inches and cumulative depth of the 100-year storm is 4.6 inches. Per the Drainage Criteria Manual, both Frontal Storms and Thunder Storms were evaluated to determine the higher design flow. The comparative analysis of these storms show that the Frontal Storm produces significantly higher flow rates, so this storm type was used for drainage design. The table below outlines the rain gage data used for the comparison.

Frontal Storm Rainfall Depths		
	1 H	24 H
5 Year	1.5	2.7
100 Year	2.52	4.6

Thunder Storm 2H Rainfall Depths			
Minutes	Fraction of 1 H	5Y	100Y
5	0.01	0.02	0.04
10	0.05	0.07	0.12
15	0.08	0.12	0.20
20	0.12	0.18	0.30
25	0.18	0.27	0.45
30	0.26	0.39	0.65
35	0.42	0.63	1.06
40	0.71	1.07	1.79
45	0.82	1.24	2.08
50	0.89	1.34	2.25
55	0.94	1.40	2.36
60	0.97	1.46	2.45
65	1.00	1.51	2.53
70	1.02	1.53	2.57
75	1.03	1.55	2.60
80	1.04	1.56	2.62
85	1.05	1.58	2.65
90	1.06	1.59	2.68
95	1.07	1.61	2.70
100	1.08	1.62	2.73
105	1.09	1.64	2.75
110	1.10	1.65	2.77
115	1.11	1.66	2.79
120	1.12	1.68	2.82

The peak outfall results for each storm type were reviewed and the frontal storm was identified to have over a 200% greater peak.

NRCS TR-55 CURVE NUMBER SELECTION

Basin runoff curve numbers were generated using the runoff curve tables and methods presented in the Colorado Springs/El Paso County Stormwater Criteria Manual.

With curve values for a developed condition only listed up to a 2-acre lot size, some conservative interpolation was necessary. Taking into account that the curve numbers are not linear as the lot sizes increase, the following table was extrapolated for this study.

LOT SIZE	IMPERVIOUS %	SOIL GROUP A	SOIL GROUP B	SOIL GROUP C	SOIL GROUP D
2 ½ ACRE	11%	NA	64	76	81
5 ACRE	7%	NA	60	72	77

Impervious areas were referenced from the county Engineering Criteria Manual (Appendix L Table 3-1) in the table shown below.

Table 3-1
Typical Values of Percent Impervious

Type of Development	Percent Impervious
Commercial	95%
Industrial	85%
Multi-Family	65%
Single Family - 0.1377 acre lots (6,000 SF)	53%
Single-Family – 0.20 acre lots	43%
Single-Family – 0.25 acre lots	40%
Single-Family – 0.33 acre lots	30%
Single-Family – 0.5 acre lots	25%
Single-Family – 1.0 acre lots	20%
Single-Family – 2.5 acre lots	11%
Single-Family – 5 acre lots	7%

FLOODPLAIN STUDY

A formal floodplain study has not been done for this site in the past. A CLOMR submittal has been assembled for this project and was submitted to FEMA in November 2018. The proposed 100-year floodplain line has been calculated and is shown on the plans.

HYDRAULIC CRITERIA

Routing of stormwater runoff and modelling of drainageways on the site, was done using the NRCS Curve Number Method as required by the City of Colorado Springs. However, ultimate culvert and full spectrum detention pond sizing shall be based on Rational Method peak flows and will utilize Urban Drainage UD-Culvert & UD-Detention calculations. Culvert sizing will be included in the final drainage report and has not been completed at this time.

Time of Concentration

Assumptions were made for channelized flows through basins to calculate Time of Concentration values. To recognize that larger basins produce more runoff, we structured the hydrology model with 2 channelized flow profiles for basin over and under 100 acres. The table below outlines these assumptions:

	Shape	Side Slopes	Depth	Wetted Perimeter	Cross Sectional Area
< 100 Acre Basin Channels	Triangular	4:1	4’	32.98’	64 sqft
> 100 Acre Basin Channels	Triangular	4:1	3’	24.74’	36 sqft

Conveyance Flow Paths

For conveyance flow paths between basins and the main channel where basins converge, 3 flow profiles were used. Triangular profiles were used for a majority of the conveyances, larger branching tributaries were trapezoidal with an 8’ bottom, and the main channel was modeled as trapezoidal with a 20’ bottom. A full HEC-RAS section analysis was completed that modeled the shape of the main floodplain drainage way. The 20’ bottom is a conservative average.

Box Culvert Sizing Requirements

Detailed sizing of road bridge crossings will be included in a subsequent Final Drainage Report. Hydraulic modeling associated with determining the floodplain width and box culvert requirements has been performed and the requirements outlined in the Drainage Criteria Manual V1 section 6.4 have been referenced. Both of the 2 bridge crossings will have a Q100 value over 1500cfs and the 2' freeboard requirement will apply. The culvert design will follow standard dimensions from the Colorado Department of Transportation specifications.

Detention Pond Summary

Preliminary full spectrum detention pond sizing has been completed. A summary is shown in the table below and full details are included in the appendix. A total of 6 ponds are proposed, all providing over detention to account for basins that are not being detained. This network of detention ponds works together to achieve a lower proposed flow at the main outfall relative to historic levels. Ownership and maintenance of the ponds will be through a subdivision metro district. An overview of the pond characteristics is shown in the table below:

	Proposed Volume	Q100 Flow Entering Pond (Developed)	Flow Exiting Pond (Developed)	Flow Ratio (Developed vs Historic)
Pond 1	7.9 ac-ft	174.1cfs	31.9cfs	0.3
Pond 2	7.2 ac-ft	184.5cfs	35.1cfs	0.3
Pond 3	6.9 ac-ft	220.6cfs	126.8cfs	0.8
Pond 4	1.3 ac-ft	56.1cfs	30.6cfs	0.8
Pond 5	9.7 ac-ft	257.1cfs	120cfs	0.7
Pond 6	3.8 ac-ft	79.5cfs	18.0cfs	0.4

Pond 5 is a unique situation with having tributary basins that flow into it, and also receiving the outfall of Pond 6. To accurately calculate this situation, the outflow hydrograph of Pond 6 was

5.0 REFERENCES

1. Urban Storm Drainage Criteria Manuals (Volumes 1, 2, and 3) Urban Drainage & Flood Control District.

2. El Paso County Drainage Criteria Manual, Volumes 1 & 2, Stormwater Quality Policies, Procedures and Best Management Practices (BMPs), Dates May 2014.

3. Federal Emergency Management Agency, Flood Insurance Rate Map Index 08041C0507F and 08041C0530F, dated March 17, 1997.

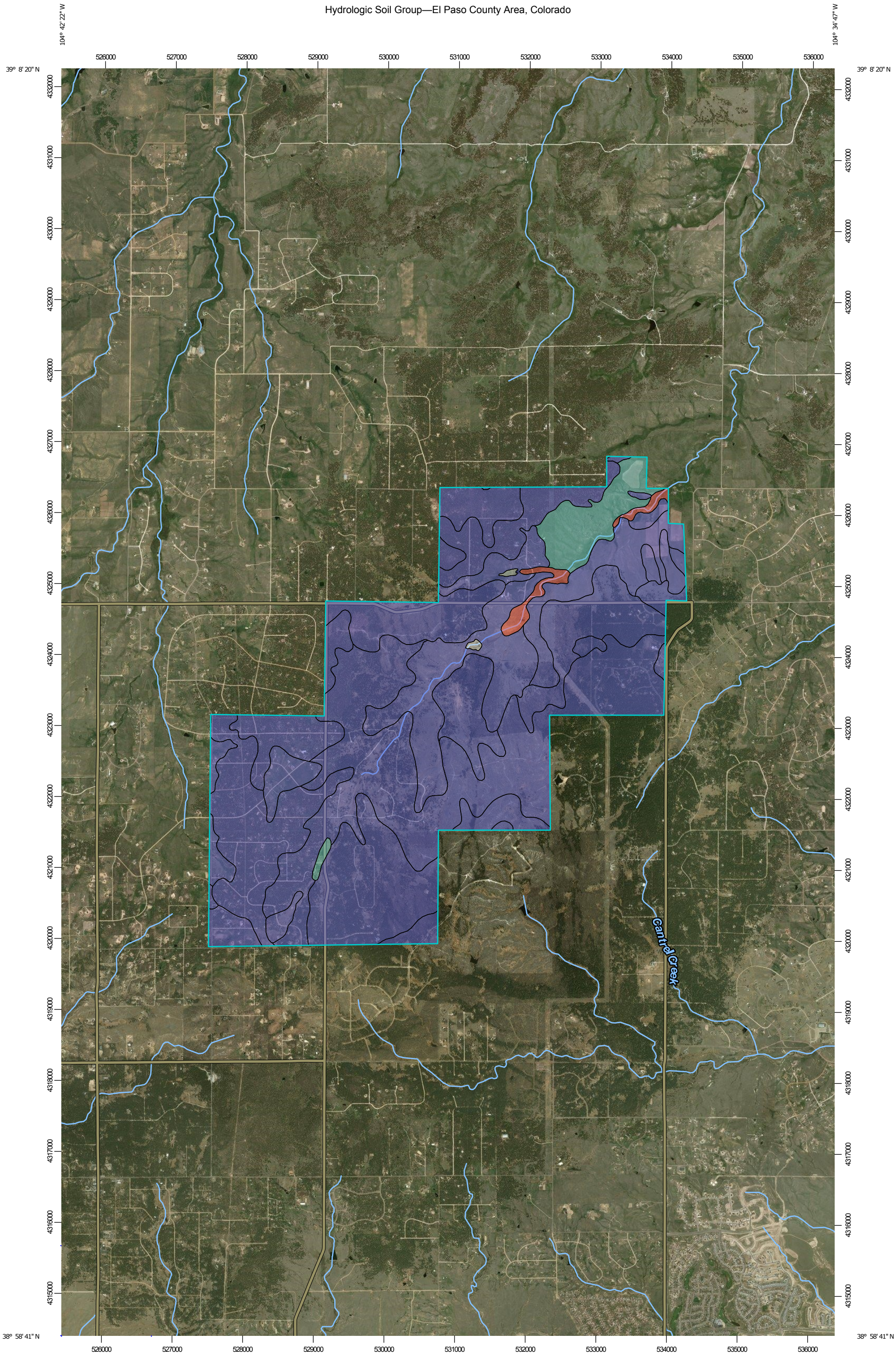
4. Natural Resources Conservation Service, Web Soil Survey, dated October 10, 2017.

5. Entech Engineering Geotechnical Report, Dated October 2, 2018

6. El Paso County Planning Website, Tri-Lakes Drainage and Flood Control Vision: http://dev.adm2.elpasoco.com/Planning/Tri-Lakes/Tri-Drainage.asp

2.0 HYDROLOGIC SOILS MAP

Hydrologic Soil Group—El Paso County Area, Colorado



Map Scale: 1:50,000 if printed on B portrait (11" x 17") sheet.

N

Meters: 0 500 1000 2000 3000

Feet: 0 2000 4000 8000 12000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads

Background

Aerial Photography

MAP INFORMATION

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 15, Oct 10, 2017

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

Date(s) aerial images were photographed: May 22, 2016—Mar 9, 2017

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Alamosa loam, 1 to 3 percent slopes	D	80.6	1.2%
15	Brussett loam, 3 to 5 percent slopes	B	6.0	0.1%
21	Cruckton sandy loam, 1 to 9 percent slopes	B	4.7	0.1%
25	Elbeth sandy loam, 3 to 8 percent slopes	B	2,081.3	31.8%
26	Elbeth sandy loam, 8 to 15 percent slopes	B	2,075.9	31.7%
34	Holderness loam, 1 to 5 percent slopes	C	15.5	0.2%
36	Holderness loam, 8 to 15 percent slopes	C	278.7	4.3%
40	Kettle gravelly loamy sand, 3 to 8 percent slopes	B	400.4	6.1%
41	Kettle gravelly loamy sand, 8 to 40 percent slopes	B	265.1	4.0%
67	Peyton sandy loam, 5 to 9 percent slopes	B	36.3	0.6%
68	Peyton-Pring complex, 3 to 8 percent slopes	B	38.1	0.6%
71	Pring coarse sandy loam, 3 to 8 percent slopes	B	26.0	0.4%
92	Tomah-Crowfoot loamy sands, 3 to 8 percent slopes	B	661.6	10.1%
93	Tomah-Crowfoot complex, 8 to 15 percent slopes	B	574.4	8.8%
111	Water		10.0	0.2%
Totals for Area of Interest			**6,554.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

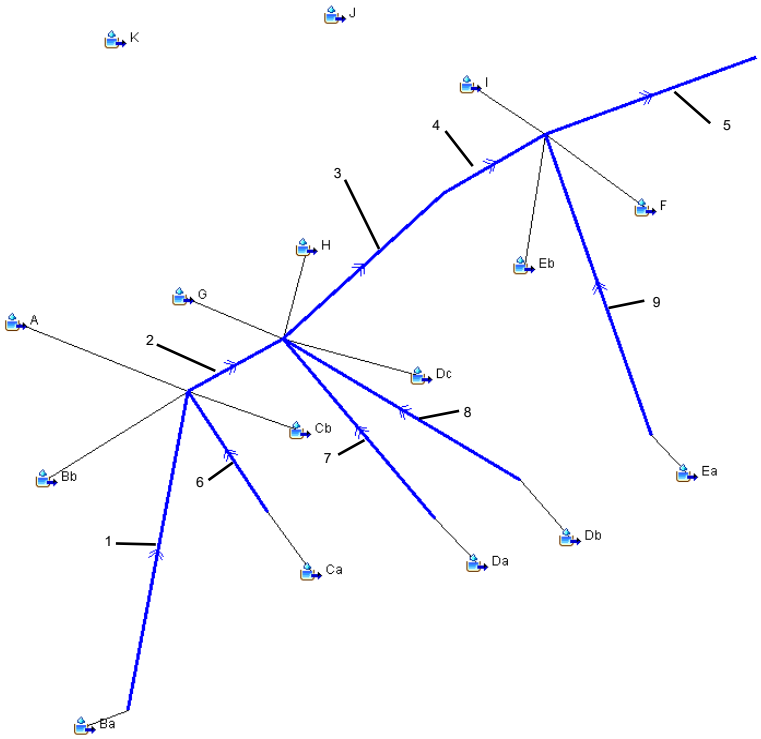
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

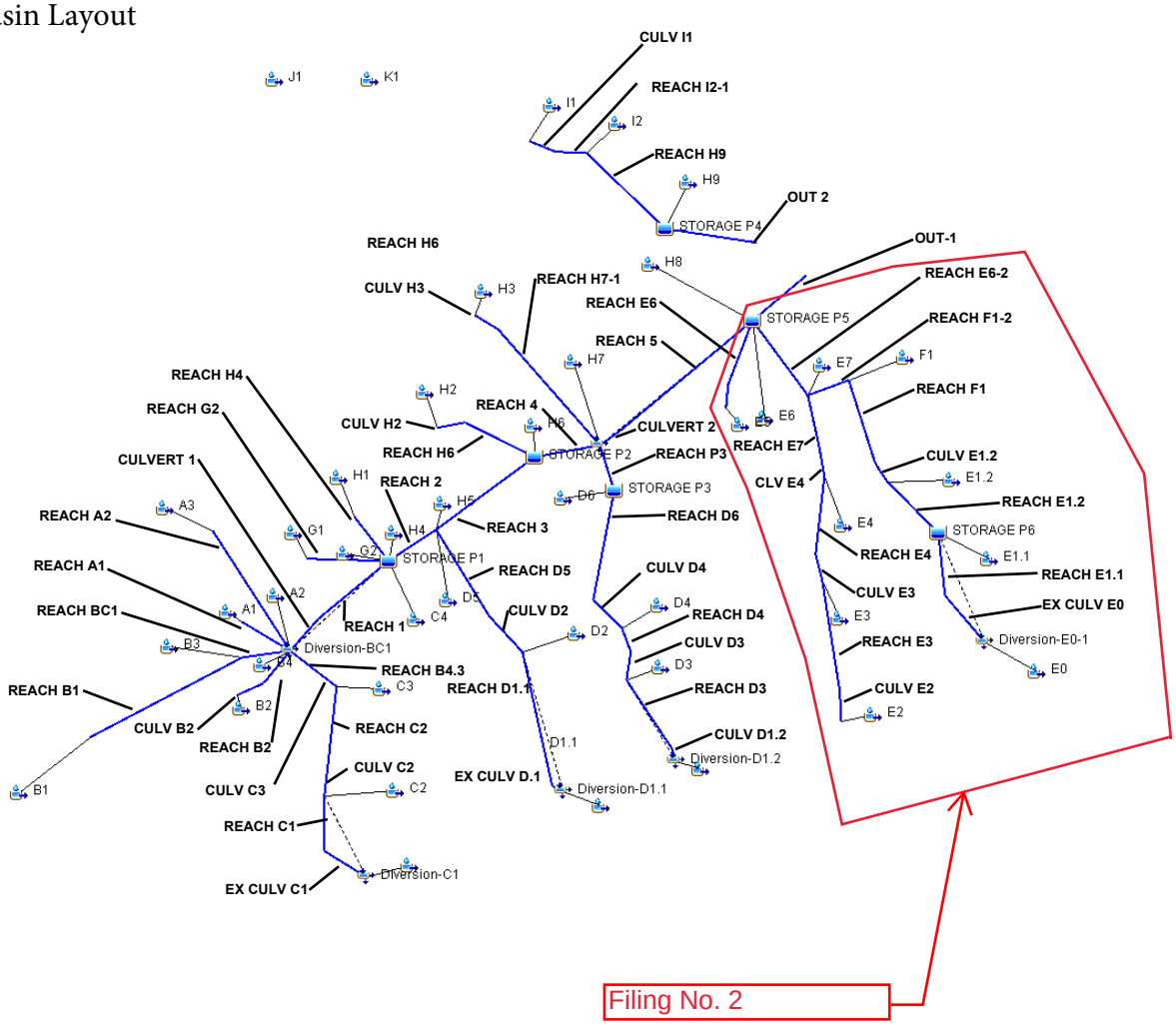
Tie-break Rule: Higher

4.1 MODEL SCHEMATICS

Existing Basin Layout



Proposed Basin Layout



4.2 FRONTAL STORM RAIN GAGE DATA

Frontal Storm Rain Gage

Time	5Y Values	100Y Values	Time	5Y Values	100Y Values
0:00	0	0	12:00	1.7901	3.0498
0:06	0.00273	0.00465	12:06	1.84129	3.13702
0:12	0.00545	0.00929	12:12	1.88633	3.21374
0:18	0.00824	0.01403	12:18	1.92521	3.27998
0:24	0.01102	0.01877	12:24	1.95793	3.33574
0:30	0.01385	0.0236	12:30	1.9845	3.381
0:36	0.01669	0.02843	12:36	2.00729	3.41982
0:42	0.01958	0.03335	12:42	2.02867	3.45626
0:48	0.02246	0.03827	12:48	2.04865	3.4903
0:54	0.02541	0.04329	12:54	2.06723	3.52194
1:00	0.02835	0.0483	13:00	2.0844	3.5512
1:06	0.03135	0.05341	13:06	2.10049	3.57862
1:12	0.03434	0.05851	13:12	2.11583	3.60474
1:18	0.0374	0.06371	13:18	2.13041	3.62958
1:24	0.04045	0.06891	13:24	2.14423	3.65314
1:30	0.04355	0.0742	13:30	2.1573	3.6754
1:36	0.04666	0.07949	13:36	2.16972	3.69656
1:42	0.04982	0.08487	13:42	2.1816	3.7168
1:48	0.05297	0.09025	13:48	2.19294	3.73612
1:54	0.05619	0.09573	13:54	2.20374	3.75452
2:00	0.0594	0.1012	14:00	2.214	3.772
2:06	0.06267	0.10677	14:06	2.22391	3.78888
2:12	0.06593	0.11233	14:12	2.2336	3.8054
2:18	0.06926	0.11799	14:18	2.24313	3.82163
2:24	0.07258	0.12365	14:24	2.25245	3.8375
2:30	0.07595	0.1294	14:30	2.2616	3.8531
2:36	0.07933	0.13515	14:36	2.27054	3.86832
2:42	0.08276	0.14099	14:42	2.27931	3.88327
2:48	0.08618	0.14683	14:48	2.28787	3.89786
2:54	0.08967	0.15277	14:54	2.29627	3.91216
3:00	0.09315	0.1587	15:00	2.30445	3.9261
3:06	0.09669	0.16473	15:06	2.31247	3.93976
3:12	0.10022	0.17075	15:12	2.32027	3.95306
3:18	0.10381	0.17687	15:18	2.32791	3.96607
3:24	0.10741	0.18299	15:24	2.33534	3.97872
3:30	0.11105	0.1892	15:30	2.3426	3.9911
3:36	0.1147	0.19541	15:36	2.34965	4.0031
3:42	0.1184	0.20171	15:42	2.35653	4.01483
3:48	0.12209	0.20801	15:48	2.3632	4.0262
3:54	0.12585	0.21441	15:54	2.36971	4.03728
4:00	0.1296	0.2208	16:00	2.376	4.048
4:06	0.13341	0.22729	16:06	2.38218	4.05853
4:12	0.13727	0.23386	16:12	2.38828	4.06893
4:18	0.14118	0.24053	16:18	2.39433	4.07923
4:24	0.14515	0.2473	16:24	2.4003	4.0894
4:30	0.14918	0.25415	16:30	2.40621	4.09947
4:36	0.15325	0.2611	16:36	2.41205	4.10941
4:42	0.15738	0.26813	16:42	2.41782	4.11925
4:48	0.16157	0.27526	16:48	2.42352	4.12896
4:54	0.16581	0.28249	16:54	2.42916	4.13857
5:00	0.1701	0.2898	17:00	2.43473	4.14805
5:06	0.17445	0.29721	17:06	2.44023	4.15743
5:12	0.17885	0.3047	17:12	2.44566	4.16668
5:18	0.1833	0.31229	17:18	2.45103	4.17583
5:24	0.18781	0.31998	17:24	2.45632	4.18485
5:30	0.19238	0.32775	17:30	2.46156	4.19377
5:36	0.19699	0.33562	17:36	2.46672	4.20256
5:42	0.20166	0.34357	17:42	2.47182	4.21125
5:48	0.20639	0.35162	17:48	2.47685	4.21981
5:54	0.21117	0.35977	17:54	2.48181	4.22827
6:00	0.216	0.368	18:00	2.4867	4.2366
6:06	0.22089	0.37633	18:06	2.49153	4.24483
6:12	0.22583	0.38474	18:12	2.49629	4.25293
6:18	0.23082	0.39325	18:18	2.50098	4.26093
6:24	0.23587	0.40186	18:24	2.5056	4.2688
6:30	0.24098	0.41055	18:30	2.51016	4.27657
6:36	0.24613	0.41934	18:36	2.51465	4.28421
6:42	0.25134	0.42821	18:42	2.51907	4.29175
6:48	0.25661	0.43718	18:48	2.52342	4.29916
6:54	0.26193	0.44625	18:54	2.52771	4.30647
7:00	0.2673	0.4554	19:00	2.53192	4.31365
7:06	0.27273	0.46465	19:06	2.53608	4.32073
7:12	0.27821	0.47398	19:12	2.54016	4.32768
7:18	0.28374	0.48341	19:18	2.54418	4.33453
7:24	0.28933	0.49294	19:24	2.54812	4.34125
7:30	0.29498	0.50255	19:30	2.55201	4.34787
7:36	0.30067	0.51226	19:36	2.55582	4.35436
7:42	0.30642	0.52205	19:42	2.55957	4.36075
7:48	0.31223	0.53194	19:48	2.56325	4.36701
7:54	0.31809	0.54193	19:54	2.56686	4.37317
8:00	0.324	0.552	20:00	2.5704	4.3792
8:06	0.33008	0.56235	20:06	2.57391	4.38518
8:12	0.33642	0.57316	20:12	2.57739	4.39111
8:18	0.34304	0.58443	20:18	2.58088	4.39705
8:24	0.34992	0.59616	20:24	2.58433	4.40294
8:30	0.35708	0.60835	20:30	2.58779	4.40882
8:36	0.3645	0.621	20:36	2.59122	4.41467
8:42	0.3722	0.63411	20:42	2.59465	4.42051
8:48	0.38016	0.64768	20:48	2.59805	4.4263
8:54	0.3884	0.66171	20:54	2.60145	4.4321
9:00	0.3969	0.6762	21:00	2.60483	4.43785
9:06	0.40554	0.69092	21:06	2.6082	4.4436
9:12	0.41418	0.70564	21:12	2.61155	4.4493
9:18	0.42282	0.72036	21:18	2.6149	4.45501
9:24	0.43146	0.73508	21:24	2.61822	4.46067
9:30	0.4401	0.7498	21:30	2.62154	4.46632
9:36	0.44896	0.76489	21:36	2.62483	4.47194
9:42	0.45824	0.78071	21:42	2.62813	4.47755
9:48	0.46796	0.79727	21:48	2.63139	4.48311
9:54	0.47812	0.81457	21:54	2.63466	4.48868
10:00	0.4887	0.8326	22:00	2.6379	4.4942
10:06	0.49982	0.85155	22:06	2.64114	4.49972
10:12	0.5116	0.87161	22:12	2.64435	4.50519
10:18	0.52402	0.89277	22:18	2.64757	4.51067
10:24	0.53708	0.91503	22:24	2.65075	4.5161
10:30	0.5508	0.9384	22:30	2.65394	4.52152
10:36	0.56538	0.96324	22:36	2.6571	4.52691
10:42	0.58104	0.98992	22:42	2.66026	4.53229
10:48	0.59778	1.01844	22:48	2.66339	4.53762
10:54	0.6156	1.0488	22:54	2.66652	4.54296
11:00	0.6345	1.081	23:00	2.66963	4.54825
11:06	0.65524	1.11633	23:06	2.67273	4.55354
11:12	0.67856	1.15607	23:12	2.67581	4.55878
11:18	0.70448	1.20023	23:18	2.67889	4.56403
11:24	0.733	1.24881	23:24	2.68194	4.56923
11:30	0.7641	1.3018	23:30	2.68499	4.57442
11:36	0.82847	1.41146	23:36	2.68801	4.57958
11:42	0.95677	1.63006	23:42	2.69104	4.58473
11:48	1.16313	1.98163	23:48	2.69403	4.58983
11:54	1.53322	2.61216	23:54	2.69703	4.59494
			24:00:00	2.7	4.6

4.3 INITIAL ABSTRACTION CALCULATIONS

Ia = 0.1[(1000/CN) - 10]

Existing Sub-Basin Initial Abstraction Summary		
Sub-Basin	Curve Number	Initial Abstraction
A	61.83	0.617
Ba	60.34	0.657
Bb	69.79	0.433
Ca	60	0.667
Cb	68.7	0.456
Da	60	0.667
Db	60	0.667
Dc	67.7	0.477
Ea	60	0.667
Eb	67.2	0.488
F	69	0.449
G	74.5	0.342
H	71.76	0.394
I	79	0.266
J	69.5	0.439
K	76	0.316

Proposed Sub-Basin Initial Abstraction Summary		
Sub-Basin	Curve Number	Initial Abstraction
A1	60.36	0.657
A2	66	0.515
A3	76.5	0.307
B1	60.34	0.657
B2	64	0.563
B3	65.1	0.536
B4	68.5	0.460
C1	60	0.667
C2	60	0.667
C3	64	0.563
C4	65	0.538
D1.1	60	0.667
D1.2	60	0.667
D2	64.75	0.544
D3	64	0.563
D4	64	0.563
D5	67.2	0.488
D6	61.65	0.622
E0	60	0.667
E1.1	76	0.316
E1.2	62	0.613
E2	64	0.563
E3	64	0.563
E4	64	0.563
E5	64	0.563
E6	62.4	0.603
E7	62	0.613
F1	60.4	0.656
G1	66	0.515
G2	72.7	0.376
H1	70.8	0.412
H2	67.2	0.488
H3	66	0.515
H4	73.75	0.356
H5	74.8	0.337
H6	66.6	0.502
H7	70.5	0.418
H8	74.55	0.341
H9	70.8	0.412
I1	72	0.389
I2	72	0.389
J1	69.5	0.439
K1	76	0.316

4.4 TIME OF CONCENTRATION CALCULATIONS

Subbasin : Ea

Input Data

Area (ac) 37.90
Weighted Curve Number 60.00
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	37.90	B	60.00
Composite Area & Weighted CN	37.90		60.00

Time of Concentration

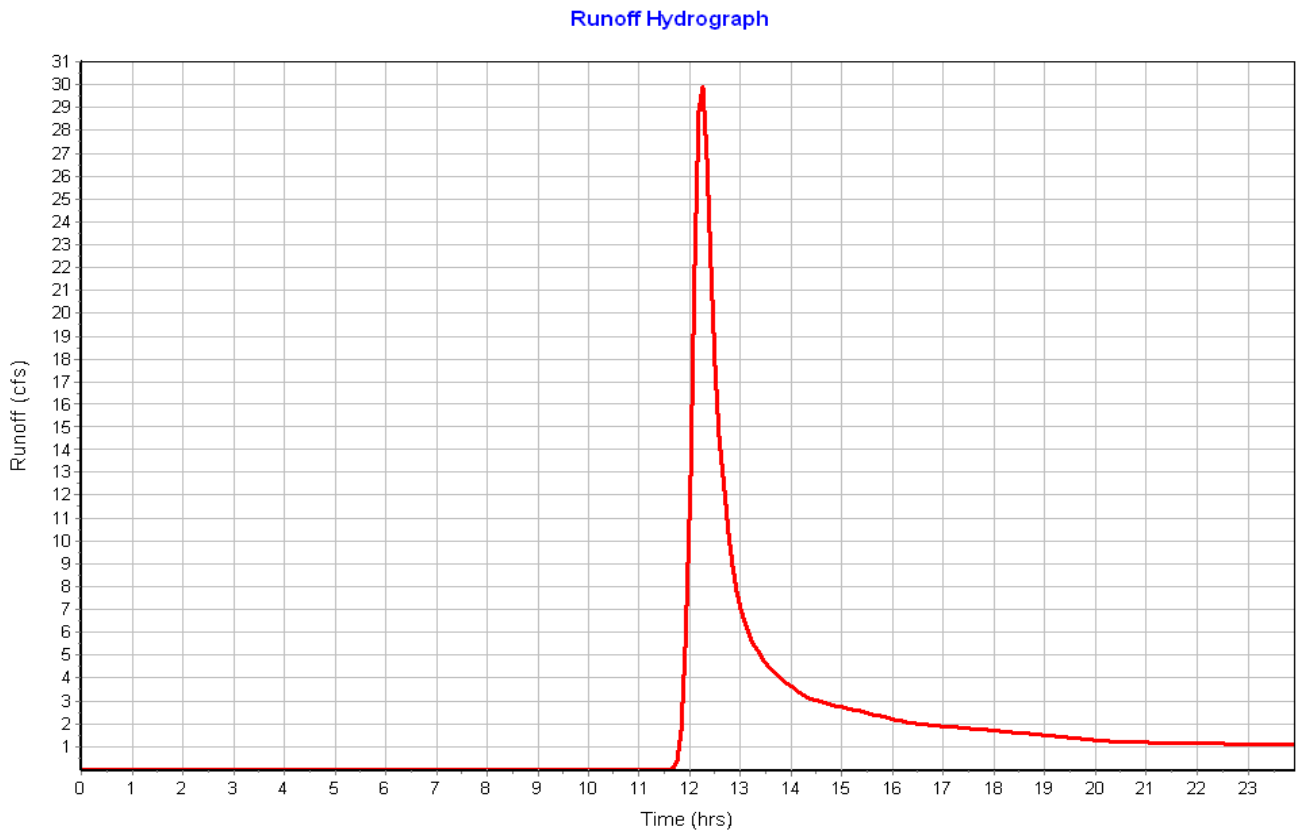
Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	4.9	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	1.11	0.00	0.00
Computed Flow Time (min) :	7.51	0.00	0.00

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1227	0.00	0.00
Channel Slope (%) :	4.9	0.00	0.00
Cross Section Area (ft^2) :	36	0.00	0.00
Wetted Perimeter (ft) :	24.74	0.00	0.00
Velocity (ft/sec) :	10.59	0.00	0.00
Computed Flow Time (min) :	1.93	0.00	0.00

Total TOC (min) 30.50

Subbasin : Ea


Runoff Hydrograph
Runoff (cfs)
Time (hrs)
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

Subbasin : Eb

Input Data

Area (ac) 74.60
Weighted Curve Number 67.20
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	91.84	B	69.00
5 Acre Lots, 7% Impervious	22.96	B	60.00
Composite Area & Weighted CN	114.80		67.20

Time of Concentration

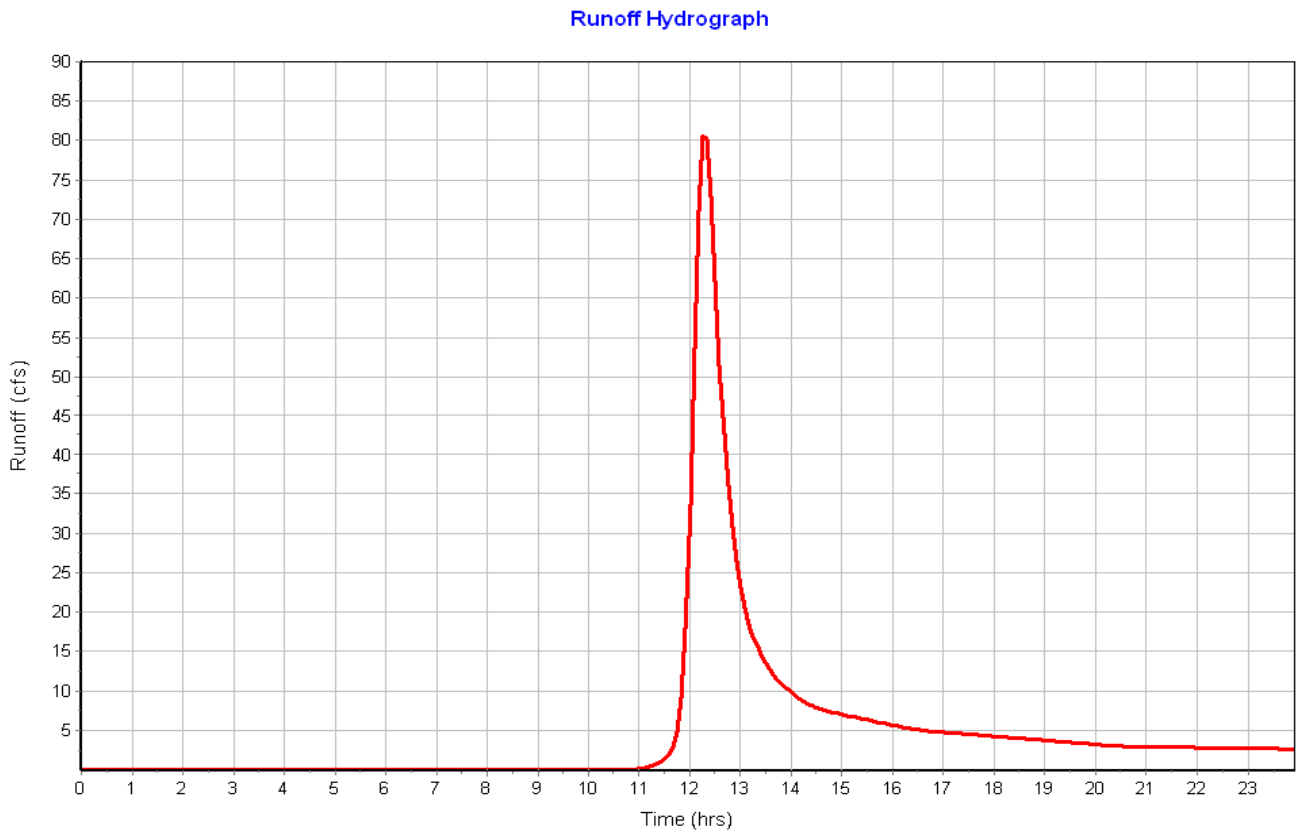
Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2.00	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.36	0.00	0.00
Computed Flow Time (min) :	12.25	0.00	0.00

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	2766	0.00	0.00
Channel Slope (%) :	3.8	0.00	0.00
Cross Section Area (ft^2) :	36	0.00	0.00
Wetted Perimeter (ft) :	24.74	0.00	0.00
Velocity (ft/sec) :	9.32	0.00	0.00
Computed Flow Time (min) :	4.94	0.00	0.00

Total TOC (min) 38.26

Subbasin : Eb


Runoff Hydrograph
Runoff (cfs)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
Time (hrs)

Subbasin : F

Input Data

Area (ac) 44.50
Weighted Curve Number 69.00
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Pasture, grassland, or range, Fair	44.50	B	69.00
Composite Area & Weighted CN	44.50		69.00

Time of Concentration

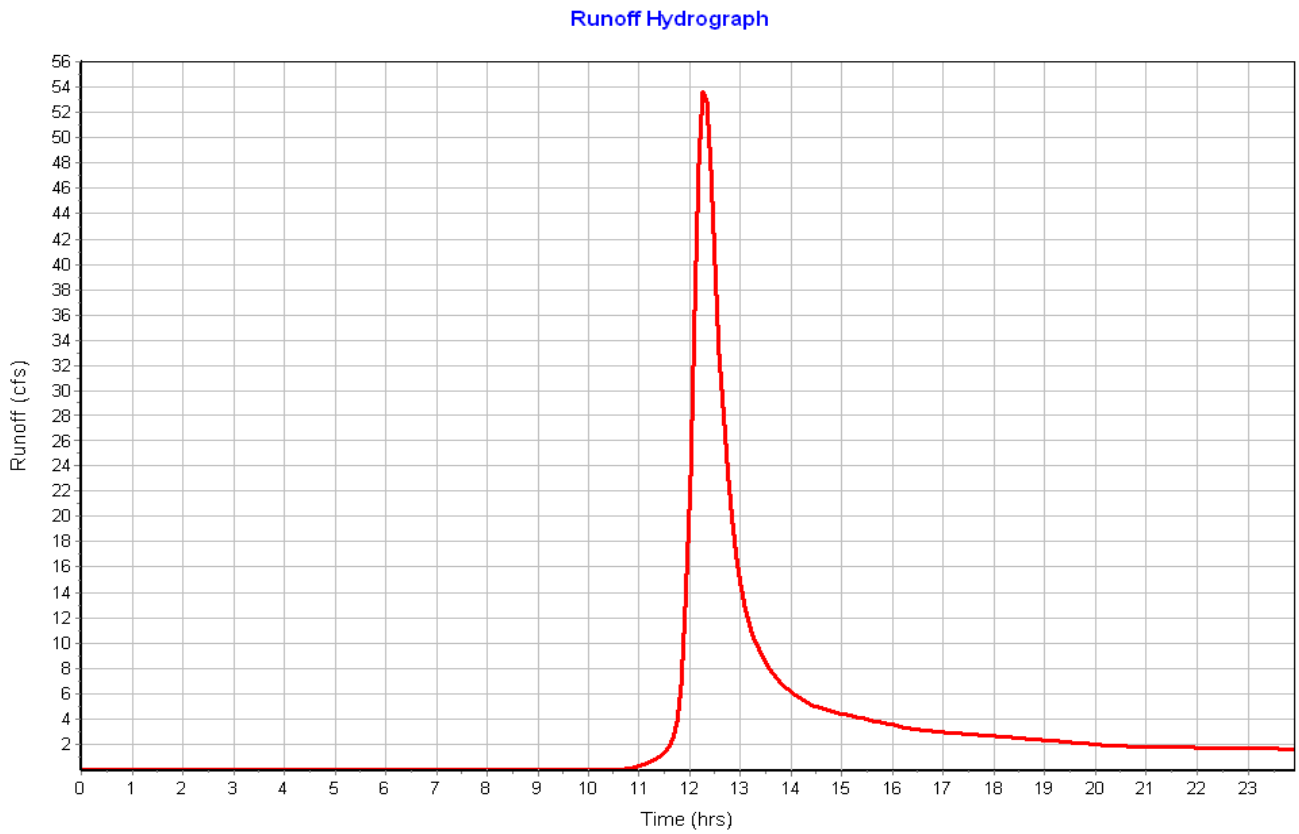
Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.25	0.00	0.00
Computed Flow Time (min) :	13.33	0.00	0.00

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1707	0.00	0.00
Channel Slope (%) :	3.2	0.00	0.00
Cross Section Area (ft^2) :	36	0.00	0.00
Wetted Perimeter (ft) :	24.74	0.00	0.00
Velocity (ft/sec) :	8.56	0.00	0.00
Computed Flow Time (min) :	3.32	0.00	0.00

Total TOC (min) 37.72

Subbasin : F


Runoff Hydrograph
Runoff (cfs)
Time (hrs)
56
54
52
50
48
46
44
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

Subbasin : D1.2

Input Data

Area (ac) 49.90
Weighted Curve Number 60.00
Rain Gage ID ..... Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	49.90	B	60.00
Composite Area & Weighted CN	49.90		60.00

Time of Concentration

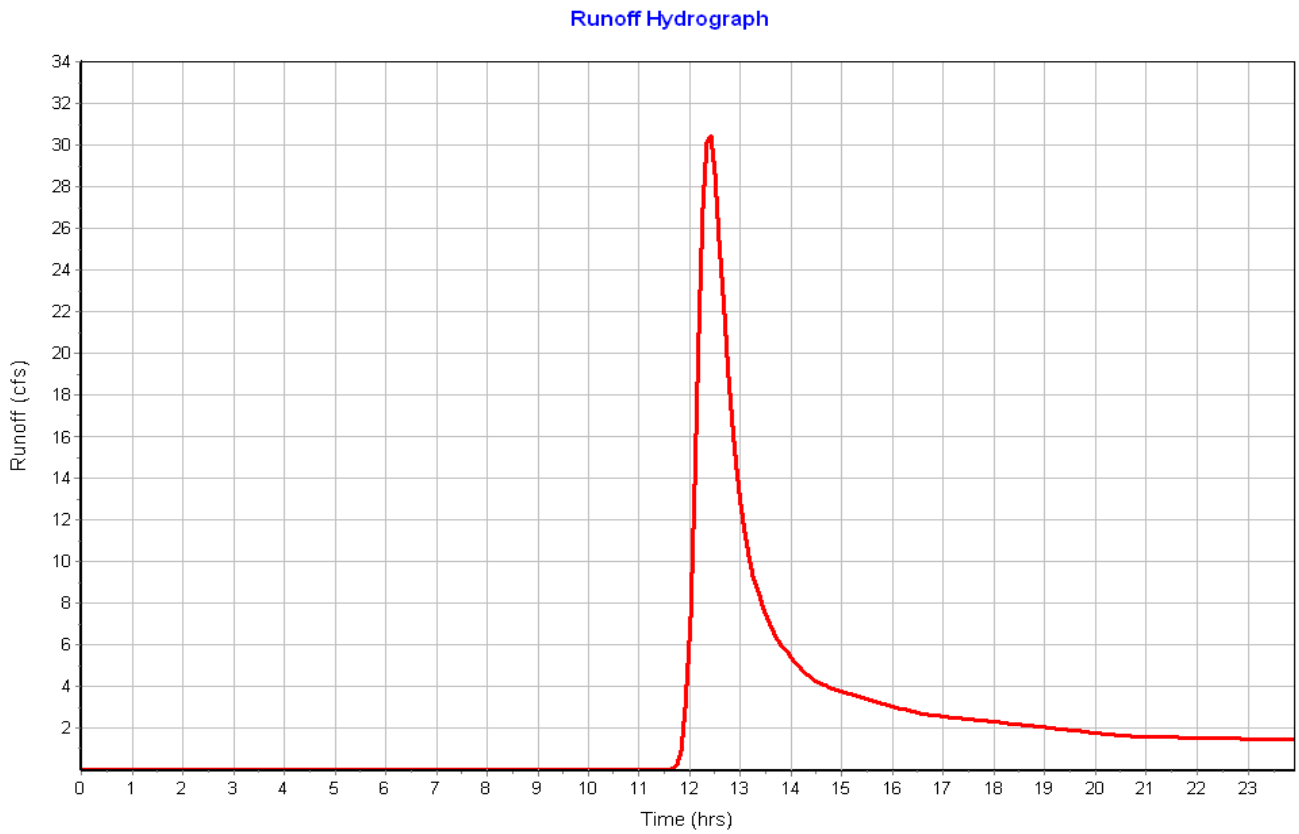
Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.48	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	0.79	0.00	0.00
Computed Flow Time (min) :	21.10	0.00	0.00

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	922	0.00	0.00
Channel Slope (%) :	2.48	0.00	0.00
Cross Section Area (ft^2) :	36	0.00	0.00
Wetted Perimeter (ft) :	24.74	0.00	0.00
Velocity (ft/sec) :	7.53	0.00	0.00
Computed Flow Time (min) :	2.04	0.00	0.00

Total TOC (min) 44.20

Subbasin : D1.2



Subbasin : D3

Input Data

Area (ac) 41.20
Weighted Curve Number 64.00
Rain Gage ID ..... Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	41.20	B	64.00
Composite Area & Weighted CN	41.20		64.00

Time of Concentration

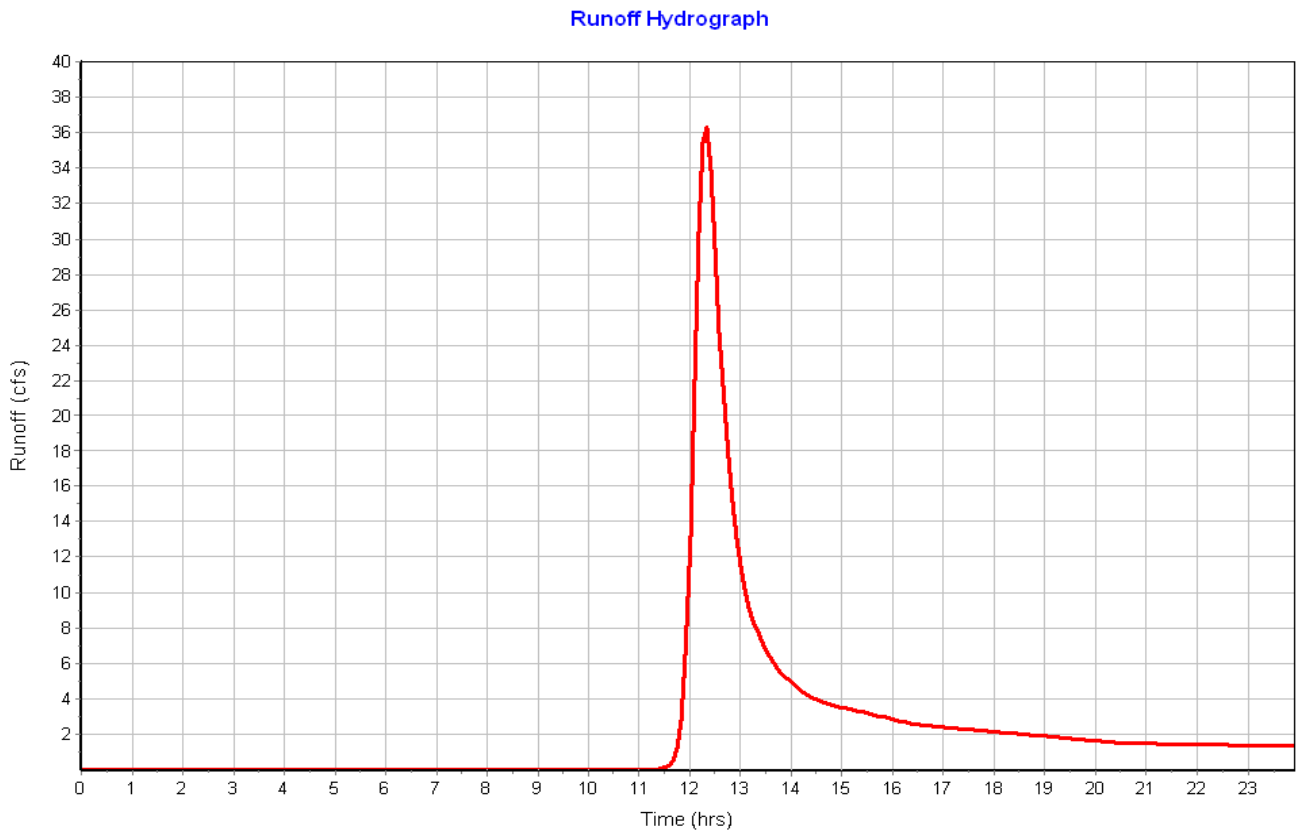
Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.06	0.00	0.00
Computed Flow Time (min) :	15.72	0.00	0.00

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	1128	0.00	0.00
Channel Slope (%) :	2.3	0.00	0.00
Cross Section Area (ft^2) :	36	0.00	0.00
Wetted Perimeter (ft) :	24.74	0.00	0.00
Velocity (ft/sec) :	7.25	0.00	0.00
Computed Flow Time (min) :	2.59	0.00	0.00

Total TOC (min) 39.37

Subbasin : D3


Runoff Hydrograph
Runoff (cfs)
Time (hrs)
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

Subbasin : D4

Input Data

Area (ac) 34.30
Weighted Curve Number 64.00
Rain Gage ID ..... Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	34.30	B	64.00
Composite Area & Weighted CN	34.30		64.00

Time of Concentration

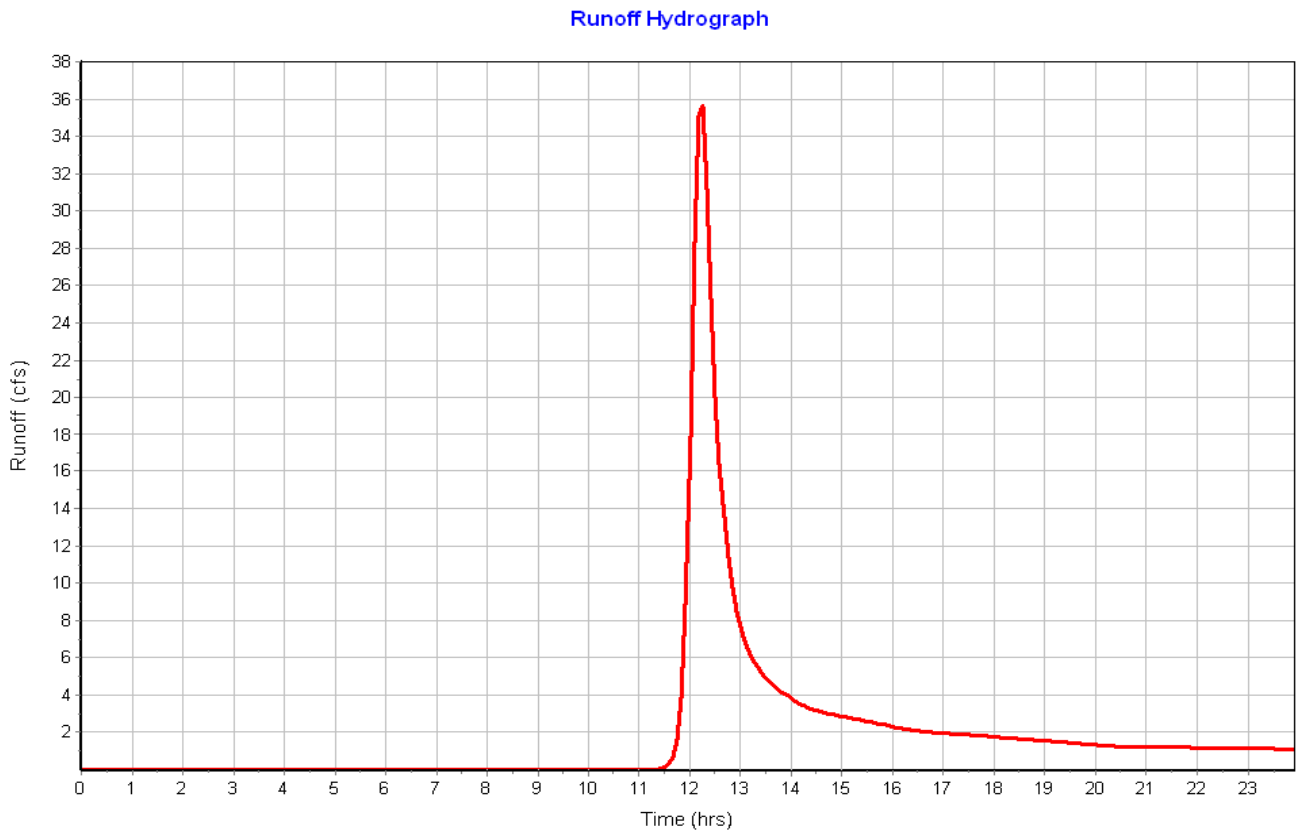
Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	2.3	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.06	0.00	0.00
Computed Flow Time (min) :	7.86	0.00	0.00

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	658	0.00	0.00
Channel Slope (%) :	2.3	0.00	0.00
Cross Section Area (ft^2) :	36	0.00	0.00
Wetted Perimeter (ft) :	24.74	0.00	0.00
Velocity (ft/sec) :	7.25	0.00	0.00
Computed Flow Time (min) :	1.51	0.00	0.00

Total TOC (min) 30.43

Subbasin : D4


Runoff Hydrograph
Runoff (cfs)
Time (hrs)
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

Subbasin : E0

Input Data

Area (ac) 37.90
Weighted Curve Number 60.00
Rain Gage ID ..... Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	37.90	B	60.00
Composite Area & Weighted CN	37.90		60.00

Time of Concentration

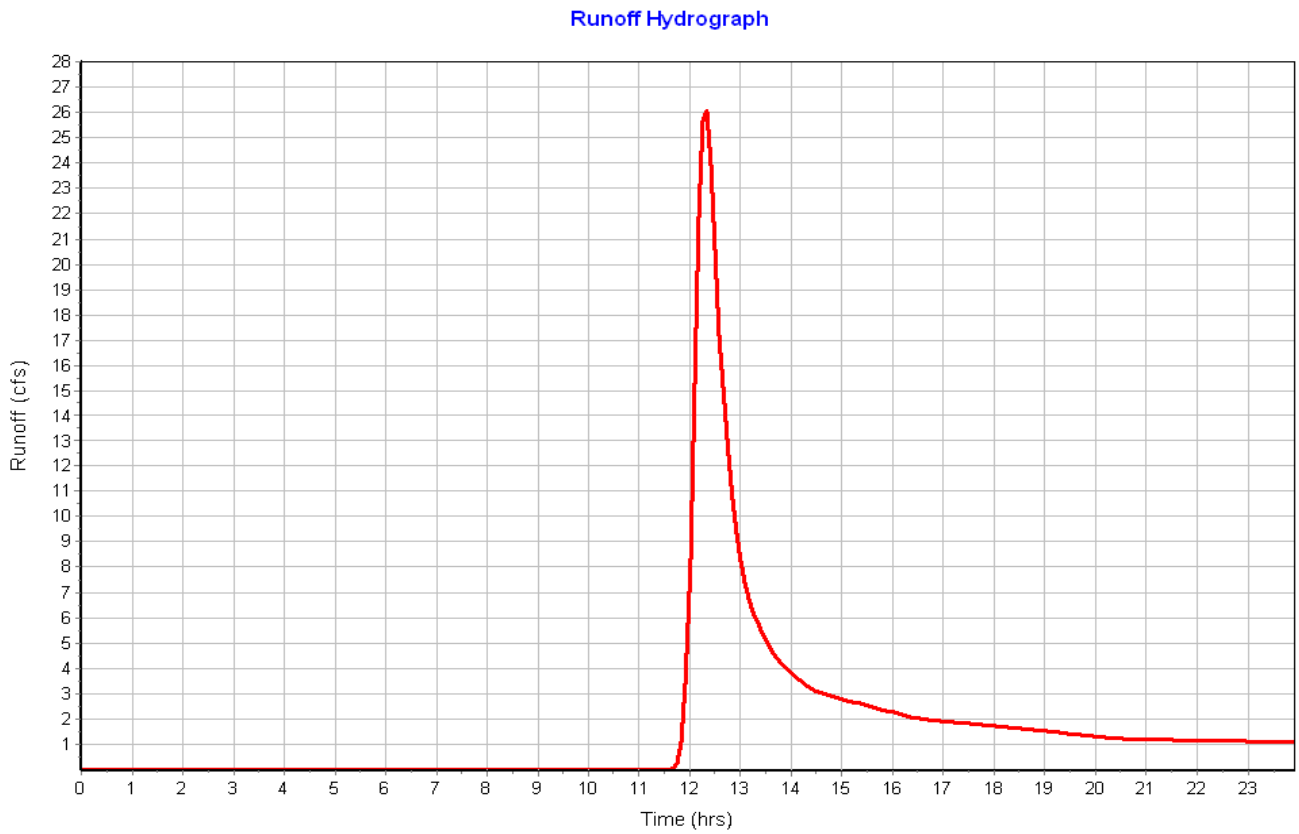
Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	4.9	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	1.11	0.00	0.00
Computed Flow Time (min) :	15.02	0.00	0.00

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	748	0.00	0.00
Channel Slope (%) :	4.9	0.00	0.00
Cross Section Area (ft^2) :	36	0.00	0.00
Wetted Perimeter (ft) :	24.74	0.00	0.00
Velocity (ft/sec) :	10.59	0.00	0.00
Computed Flow Time (min) :	1.18	0.00	0.00

Total TOC (min) 37.25

Subbasin : E0


Runoff Hydrograph
Runoff (cfs)
Time (hrs)
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

Subbasin : E1.1

Input Data

Area (ac) 7.90
Weighted Curve Number 76.00
Rain Gage ID ..... Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
Woods, Fair	3.95	B	60.00
Urban commercial, 85% imp	3.95	B	92.00
Composite Area & Weighted CN	7.90		76.00

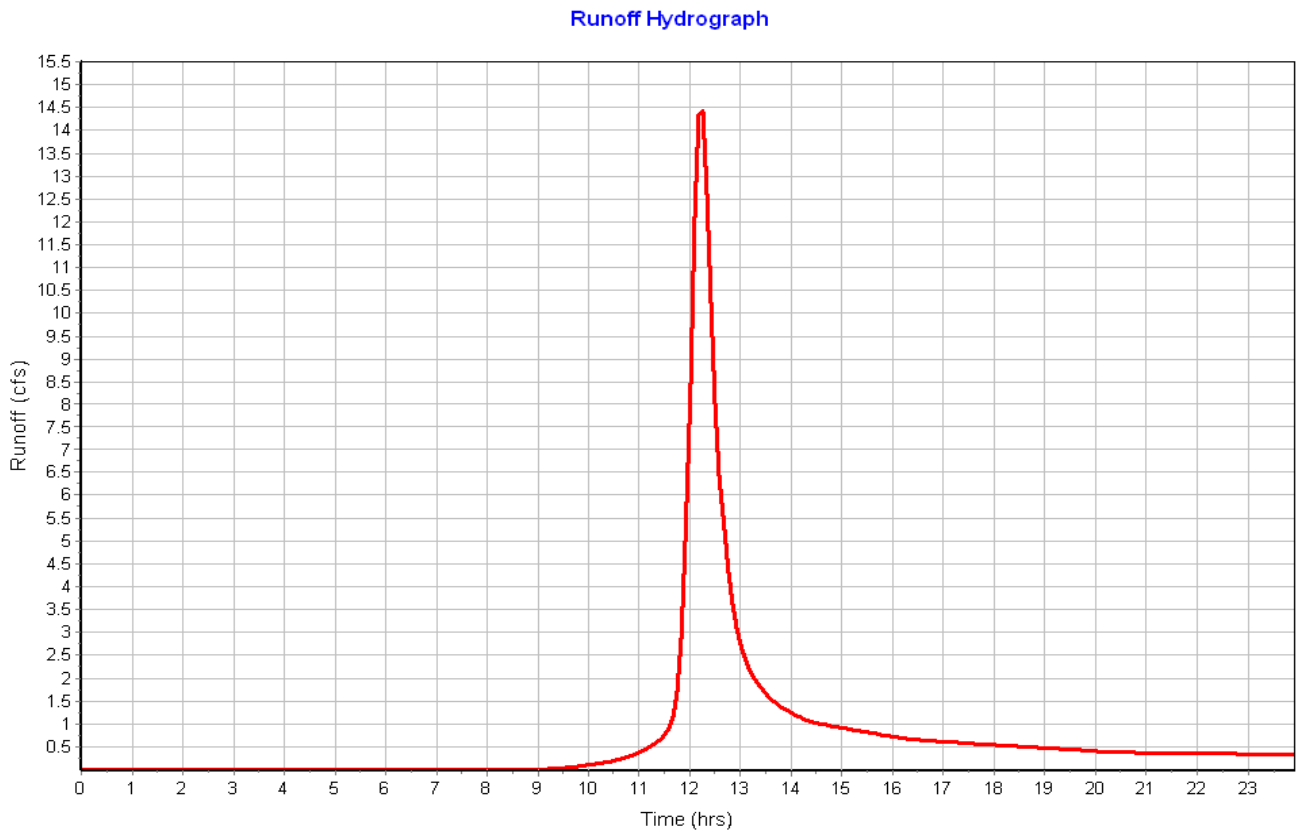
Time of Concentration

Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.1	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	583	0.00	0.00
Slope (%) :	3.17	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	0.89	0.00	0.00
Computed Flow Time (min) :	10.92	0.00	0.00

Total TOC (min) 31.98

Subbasin : E1.1



Subbasin : E1.2

Input Data

Area (ac) 16.30
Weighted Curve Number 62.00
Rain Gage ID ..... Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	8.15	B	60.00
2.5 Acre Lots, 11% Impervious	8.15	B	64.00
Composite Area & Weighted CN	16.30		62.00

Time of Concentration

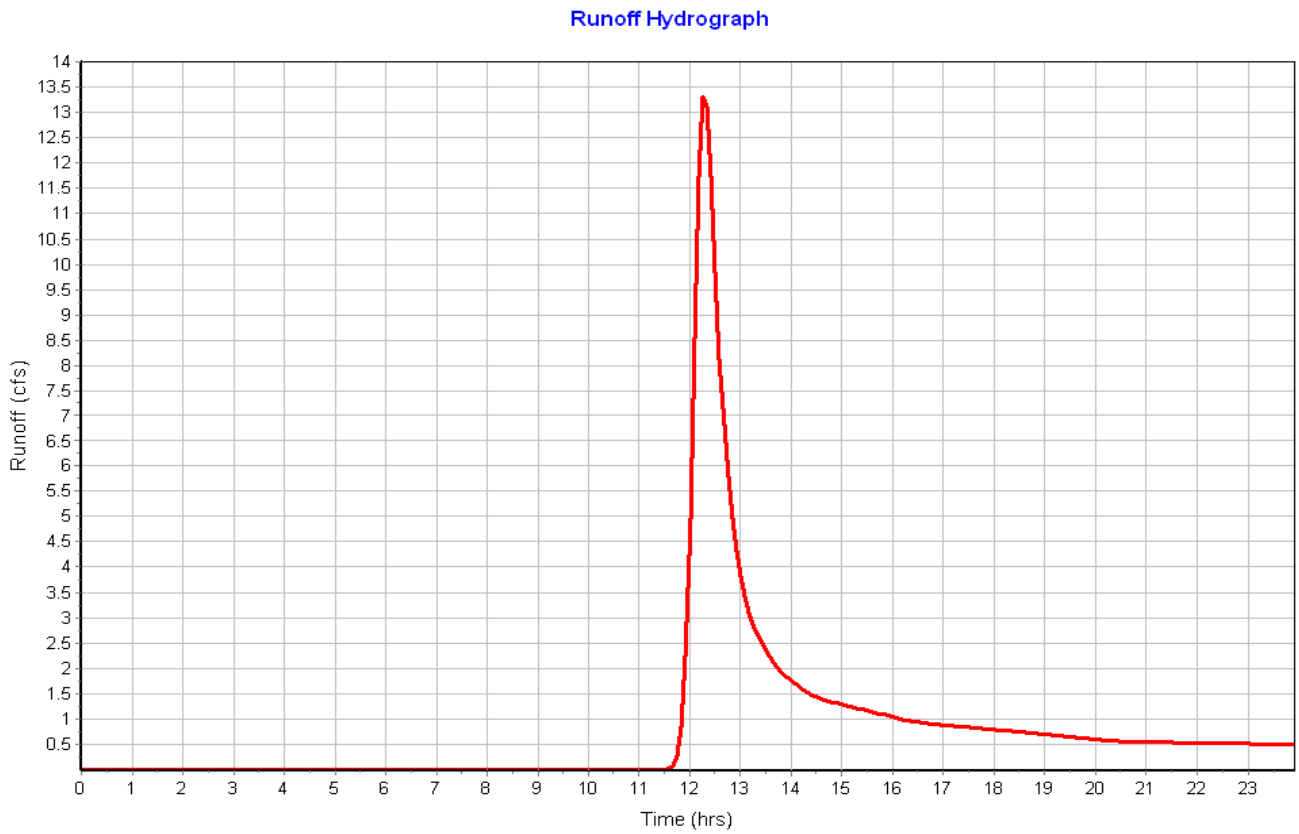
Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	2.7	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.15	0.00	0.00
Computed Flow Time (min) :	14.49	0.00	0.00

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	228	0.00	0.00
Channel Slope (%) :	2.7	0.00	0.00
Cross Section Area (ft^2) :	36	0.00	0.00
Wetted Perimeter (ft) :	24.74	0.00	0.00
Velocity (ft/sec) :	7.86	0.00	0.00
Computed Flow Time (min) :	0.48	0.00	0.00

Total TOC (min) 36.03

Subbasin : E1.2



Subbasin : E2

Input Data

Area (ac) 2.60
Weighted Curve Number 64.00
Rain Gage ID ..... Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	2.60	B	64.00
Composite Area & Weighted CN	2.60		64.00

Time of Concentration

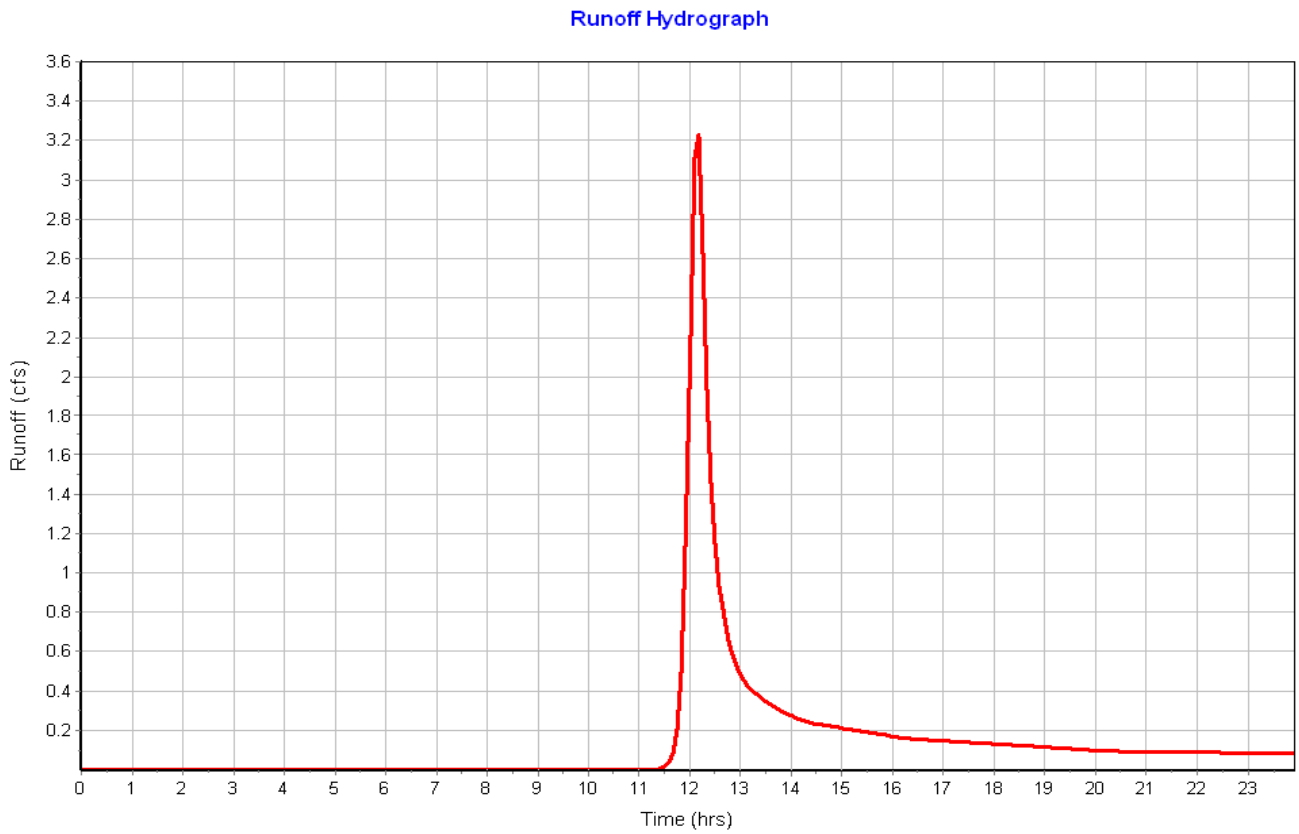
Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	100	0.00	0.00
Slope (%) :	5.4	0.00	0.00
Surface Type :	Woodland	Unpaved	Unpaved
Velocity (ft/sec) :	1.16	0.00	0.00
Computed Flow Time (min) :	1.44	0.00	0.00

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	101	0.00	0.00
Channel Slope (%) :	5.4	0.00	0.00
Cross Section Area (ft^2) :	36	0.00	0.00
Wetted Perimeter (ft) :	24.74	0.00	0.00
Velocity (ft/sec) :	11.12	0.00	0.00
Computed Flow Time (min) :	0.15	0.00	0.00

Total TOC (min) 22.65

Subbasin : E2


Runoff Hydrograph
Runoff (cfs)
3.6
3.4
3.2
3
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time (hrs)

Subbasin : E3

Input Data

Area (ac) 19.80
Weighted Curve Number 64.00
Rain Gage ID ..... Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	19.80	B	64.00
Composite Area & Weighted CN	19.80		64.00

Time of Concentration

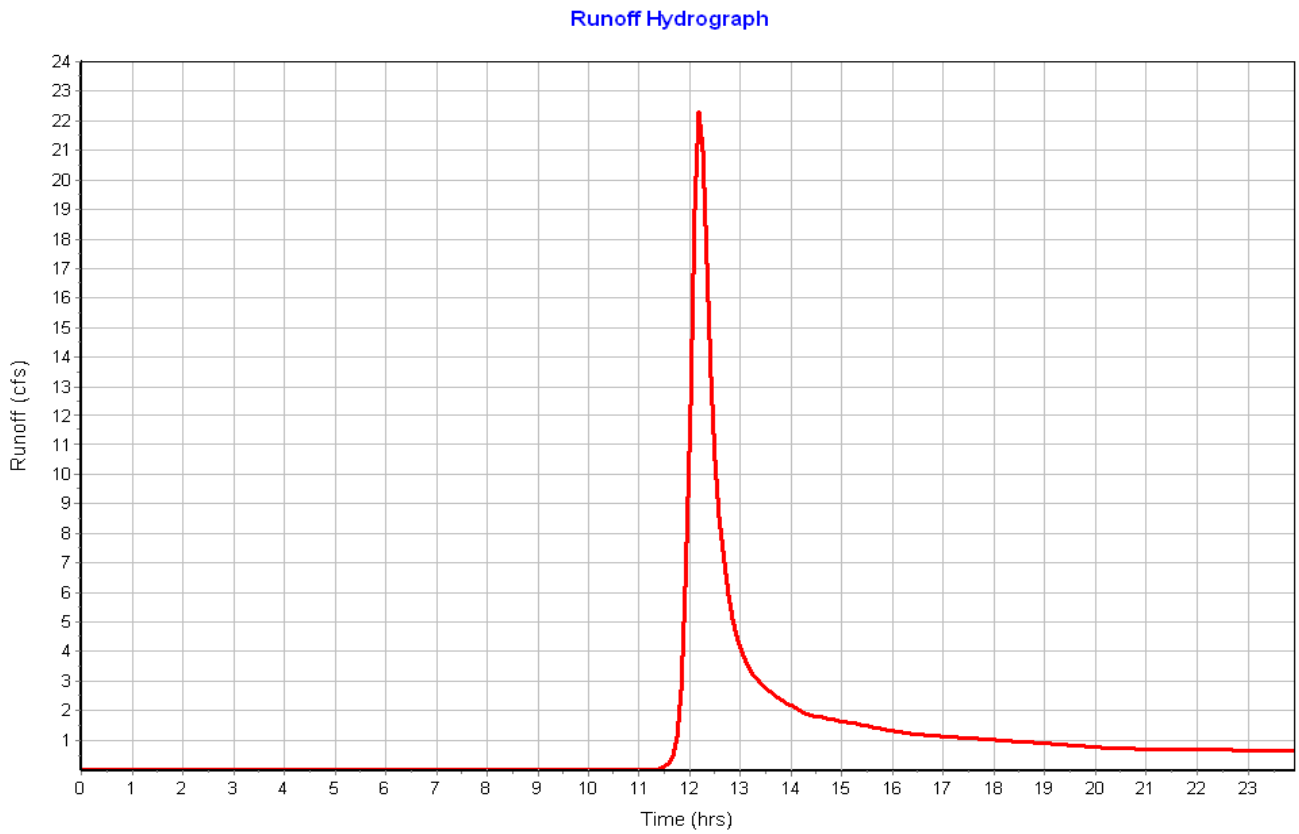
Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	4.6	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.50	0.00	0.00
Computed Flow Time (min) :	5.56	0.00	0.00

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	453	0.00	0.00
Channel Slope (%) :	4.6	0.00	0.00
Cross Section Area (ft^2) :	36	0.00	0.00
Wetted Perimeter (ft) :	24.74	0.00	0.00
Velocity (ft/sec) :	10.26	0.00	0.00
Computed Flow Time (min) :	0.74	0.00	0.00

Total TOC (min) 27.35

Subbasin : E3


Runoff Hydrograph
Runoff (cfs)
Time (hrs)
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1
2
3
4
5
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12
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21
22
23

Subbasin : E4

Input Data

Area (ac) 18.20
Weighted Curve Number 64.00
Rain Gage ID ..... Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	18.20	B	64.00
Composite Area & Weighted CN	18.20		64.00

Time of Concentration

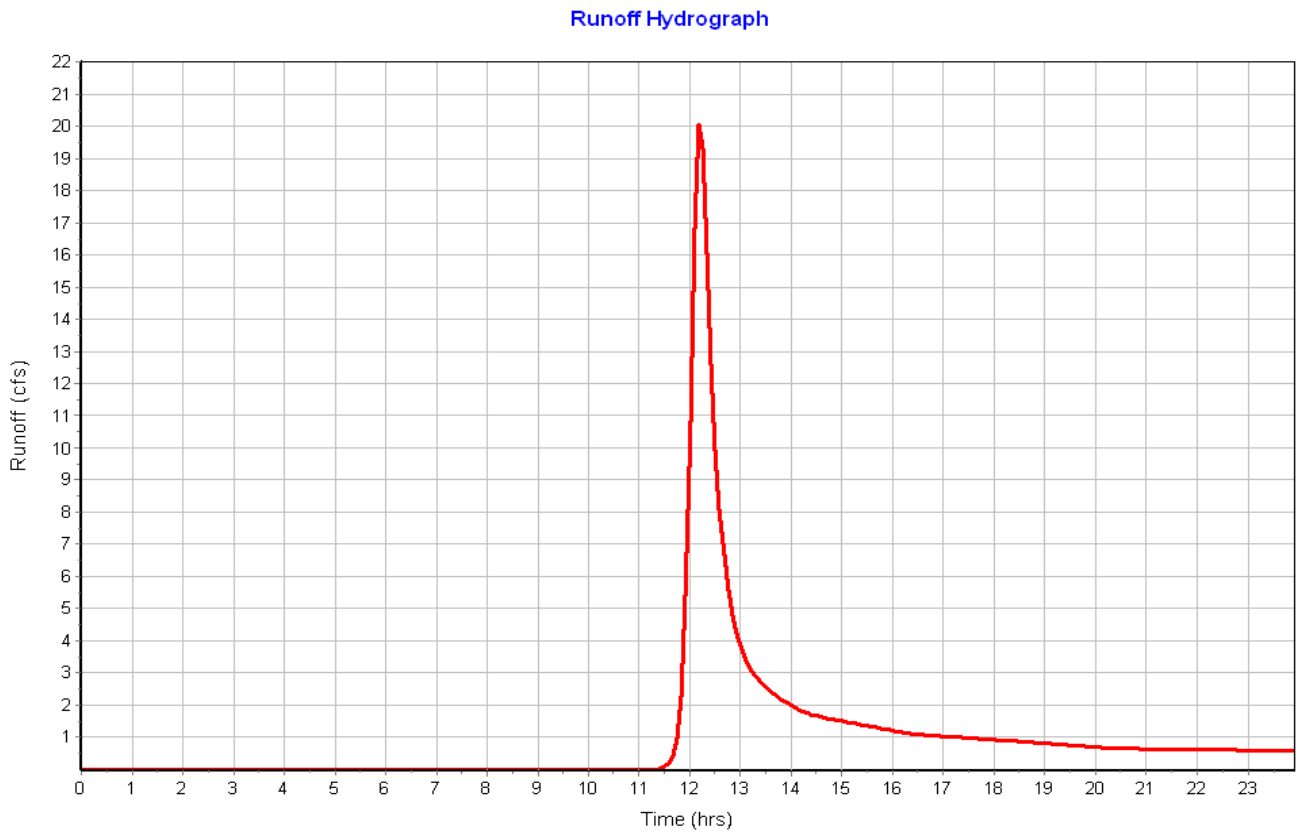
Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	3.8	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.36	0.00	0.00
Computed Flow Time (min) :	6.13	0.00	0.00

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	528	0.00	0.00
Channel Slope (%) :	3.8	0.00	0.00
Cross Section Area (ft^2) :	36	0.00	0.00
Wetted Perimeter (ft) :	24.74	0.00	0.00
Velocity (ft/sec) :	9.32	0.00	0.00
Computed Flow Time (min) :	0.94	0.00	0.00

Total TOC (min) 28.13

Subbasin : E4


Runoff Hydrograph
Runoff (cfs)
Time (hrs)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Subbasin : E5

Input Data

Area (ac) 13.50
Weighted Curve Number 64.00
Rain Gage ID ..... Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	13.50	B	64.00
Composite Area & Weighted CN	13.50		64.00

Time of Concentration

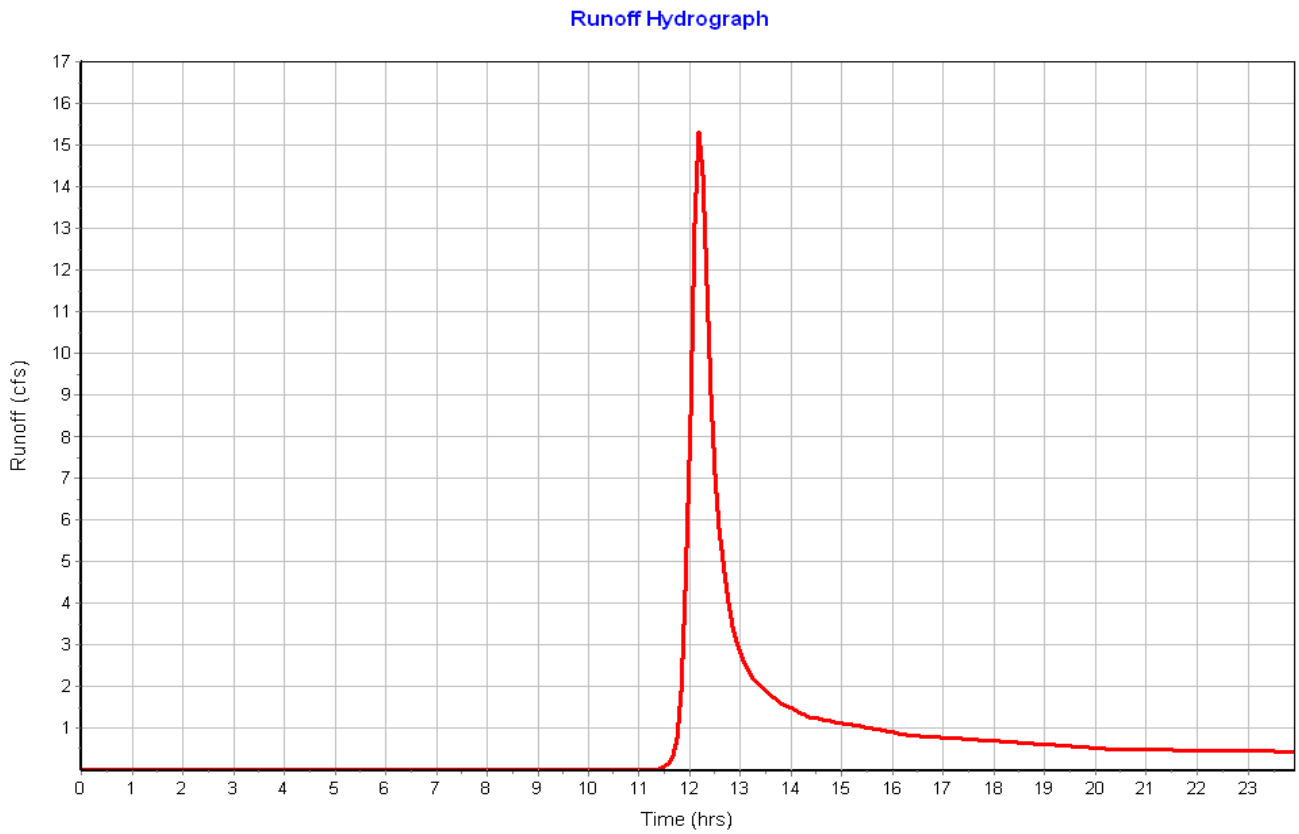
Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	4.7	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.52	0.00	0.00
Computed Flow Time (min) :	5.48	0.00	0.00

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	335	0.00	0.00
Channel Slope (%) :	4.7	0.00	0.00
Cross Section Area (ft^2) :	36	0.00	0.00
Wetted Perimeter (ft) :	24.74	0.00	0.00
Velocity (ft/sec) :	10.37	0.00	0.00
Computed Flow Time (min) :	0.54	0.00	0.00

Total TOC (min) 27.08

Subbasin : E5


Runoff Hydrograph
Runoff (cfs)
Time (hrs)
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

Subbasin : E6

Input Data

Area (ac) 28.90
Weighted Curve Number 62.40
Rain Gage ID ..... Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
2.5 Acre Lots, 11% Impervious	8.67	B	64.00
5 Acre Lots, 7% Impervious	18.79	B	60.00
Pasture, grassland, or range, Fair	1.45	D	84.00
Composite Area & Weighted CN	28.91		62.40

Time of Concentration

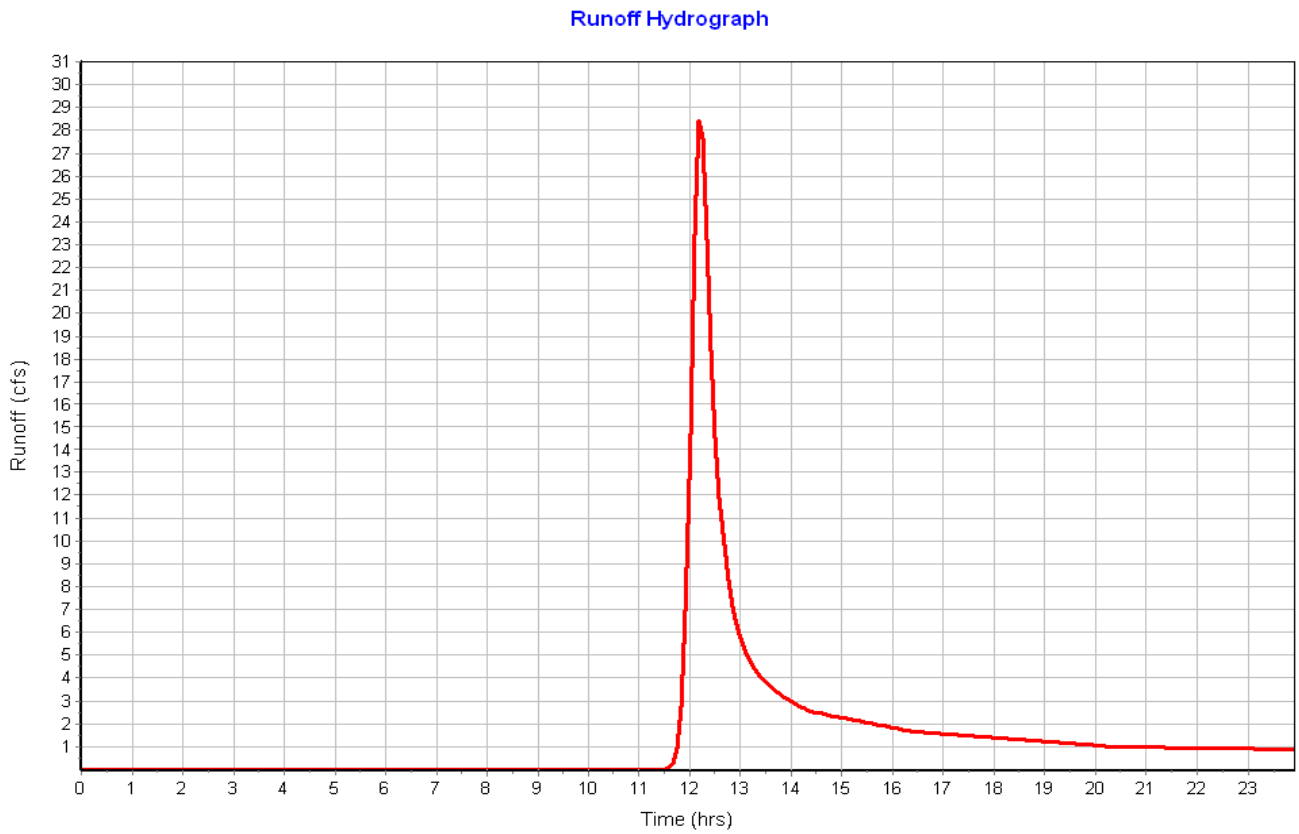
Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	500	0.00	0.00
Slope (%) :	4.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.43	0.00	0.00
Computed Flow Time (min) :	5.83	0.00	0.00

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	859	0.00	0.00
Channel Slope (%) :	4.2	0.00	0.00
Cross Section Area (ft^2) :	36	0.00	0.00
Wetted Perimeter (ft) :	24.74	0.00	0.00
Velocity (ft/sec) :	9.80	0.00	0.00
Computed Flow Time (min) :	1.46	0.00	0.00

Total TOC (min) 28.35

Subbasin : E6



Subbasin : E7

Input Data

Area (ac) 9.80
Weighted Curve Number 62.00
Rain Gage ID ..... Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	4.90	B	60.00
2.5 Acre Lots, 11% Impervious	4.90	B	64.00
Composite Area & Weighted CN	9.80		62.00

Time of Concentration

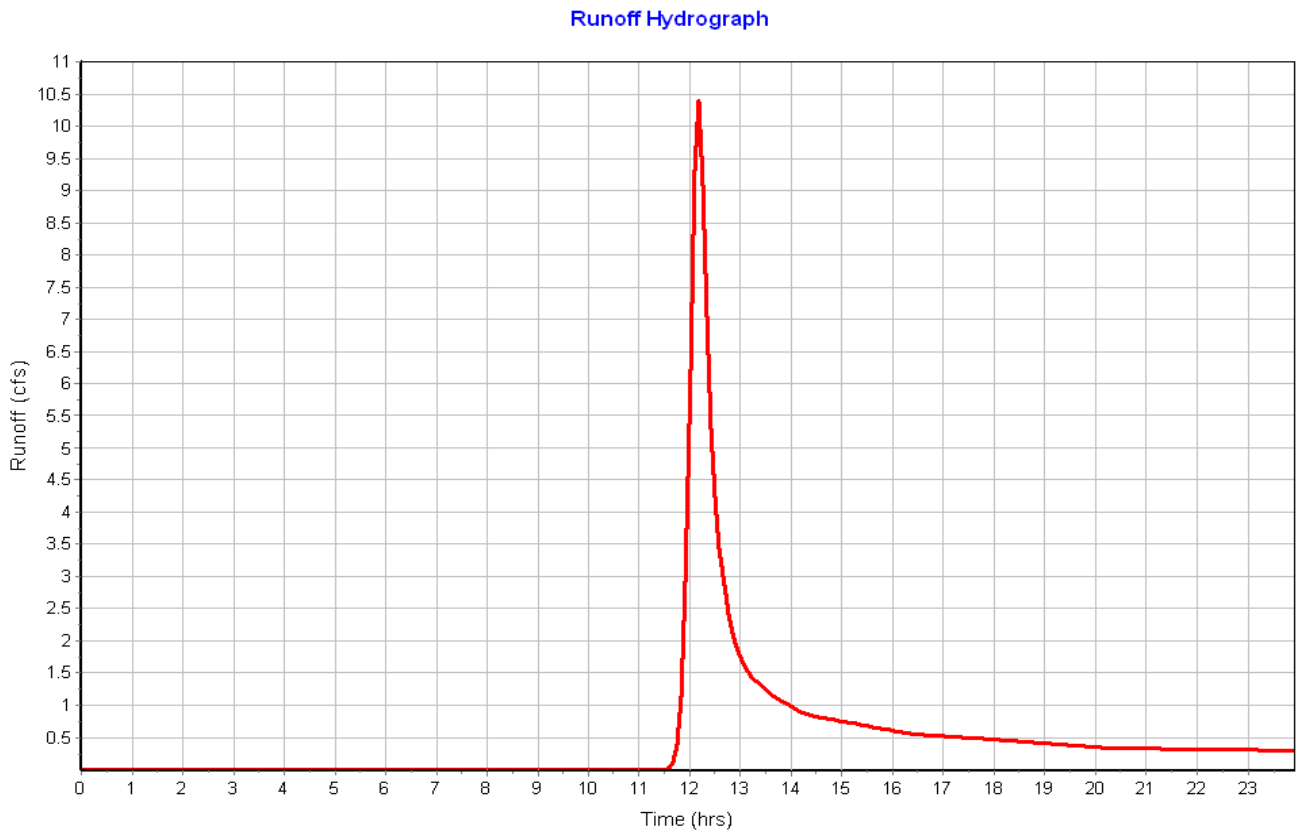
Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	200	0.00	0.00
Slope (%) :	3.5	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.31	0.00	0.00
Computed Flow Time (min) :	2.54	0.00	0.00

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	474	0.00	0.00
Channel Slope (%) :	3.5	0.00	0.00
Cross Section Area (ft^2) :	36	0.00	0.00
Wetted Perimeter (ft) :	24.74	0.00	0.00
Velocity (ft/sec) :	8.95	0.00	0.00
Computed Flow Time (min) :	0.88	0.00	0.00

Total TOC (min) 24.49

Subbasin : E7


Runoff Hydrograph
Runoff (cfs)
Time (hrs)
11
10.5
10
9.5
9
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

Subbasin : F1

Input Data

Area (ac) 42.90
Weighted Curve Number 60.40
Rain Gage ID ..... Rain Gage-1

Composite Curve Number

Soil/Surface Description	Area (acres)	Soil Group	Curve Number
5 Acre Lots, 7% Impervious	38.61	B	60.00
2.5 Acre Lots, 11% Impervious	4.29	B	64.00
Composite Area & Weighted CN	42.90		60.40

Time of Concentration

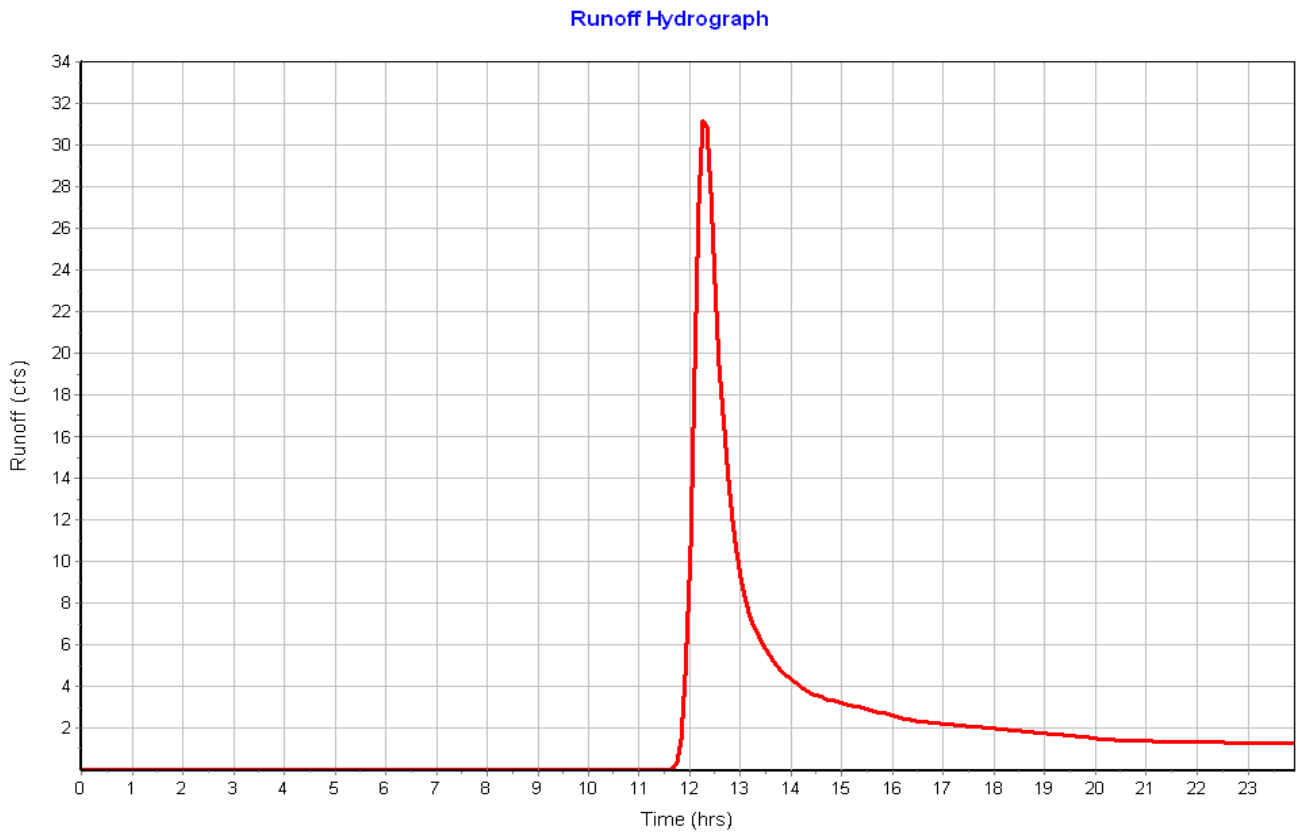
Sheet Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.1	0.00	0.00
Flow Length (ft) :	300	0.00	0.00
Slope (%) :	2	0.00	0.00
2 yr, 24 hr Rainfall (in) :	2.10	0.00	0.00
Velocity (ft/sec) :	0.24	0.00	0.00
Computed Flow Time (min) :	21.06	0.00	0.00

Shallow Concentrated Flow Computations	Flowpath A	Flowpath B	Flowpath C
Flow Length (ft) :	1000	0.00	0.00
Slope (%) :	3.2	0.00	0.00
Surface Type :	Grass pasture	Unpaved	Unpaved
Velocity (ft/sec) :	1.25	0.00	0.00
Computed Flow Time (min) :	13.33	0.00	0.00

Channel Flow Computations	Flowpath A	Flowpath B	Flowpath C
Manning's Roughness :	.04	0.00	0.00
Flow Length (ft) :	745	0.00	0.00
Channel Slope (%) :	3.2	0.00	0.00
Cross Section Area (ft^2) :	36	0.00	0.00
Wetted Perimeter (ft) :	24.74	0.00	0.00
Velocity (ft/sec) :	8.56	0.00	0.00
Computed Flow Time (min) :	1.45	0.00	0.00

Total TOC (min) 35.84

Subbasin : F1


Runoff Hydrograph
Runoff (cfs)
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
Time (hrs)

4.5 BASIN INPUT DETAILS

HEC - HMS Existing Sub-Basin Input Summary							
Sub-Basin	Area (sq. mi.)	Initial Storage (%)	Max. Storage (in)	Initial Abstraction	Curve Number	Impervious (%)	Lag Time (min)
A	1.4303	5	0.035	0.617	61.8	6.55	31.80
Ba	5.9948	5	0.035	0.657	60.3	7.00	53.74
Bb	0.1572	5	0.035	0.433	69.8	2.00	24.00
Ca	0.2542	5	0.035	0.667	60.0	7.00	22.32
Cb	0.1094	5	0.035	0.456	68.7	2.00	22.45
Da	0.2520	5	0.035	0.667	60.0	7.00	22.19
Db	0.0780	5	0.035	0.667	60.0	7.00	26.52
Dc	0.3902	5	0.035	0.477	67.7	2.00	24.56
Ea	0.0592	5	0.035	0.667	60.0	7.00	18.30
Eb	0.1166	5	0.035	0.488	67.2	3.00	22.96
F	0.0695	5	0.035	0.449	69.0	2.00	22.63
G	0.1681	5	0.035	0.342	74.5	2.00	20.36
H	0.1903	5	0.035	0.394	71.8	2.00	20.19
I	0.0586	5	0.035	0.266	79.0	2.00	19.08
J	0.0158	5	0.035	0.439	69.5	7.00	13.75
K	0.0278	5	0.035	0.316	76.0	7.00	14.46

HEC - HMS Proposed Sub-Basin Input Summary							
Sub-Basin	Area (sq. mi.)	Initial Storage (%)	Max. Storage (in)	Initial Abstraction	Curve Number	Impervious (%)	Lag Time (min)
A1	1.3529	5	0.035	0.657	60.4	7.0	34.58
A2	0.0578	5	0.035	0.515	66.0	7.0	22.45
A3	0.0648	5	0.035	0.307	76.5	4.5	20.30
B1	5.9948	5	0.035	0.657	60.3	7.0	50.28
B2	0.0205	5	0.035	0.563	64.0	11.0	14.67
B3	0.0858	5	0.035	0.536	65.1	7.0	23.61
B4	0.0648	5	0.035	0.460	68.5	7.0	23.71
C1	0.2542	5	0.035	0.667	60.0	7.0	22.32
C2	0.0350	5	0.035	0.667	60.0	7.0	19.57
C3	0.0252	5	0.035	0.563	64.0	11.0	17.03
C4	0.0372	5	0.035	0.538	65.0	4.5	24.68
D1.1	0.2520	5	0.035	0.667	60.0	7.0	22.19
D1.2	0.0780	5	0.035	0.667	60.0	7.0	26.52
D2	0.1073	5	0.035	0.544	64.8	9.0	20.89
D3	0.0644	5	0.035	0.563	64.0	11.0	23.62
D4	0.0536	5	0.035	0.563	64.0	11.0	18.26
D5	0.0200	5	0.035	0.488	67.2	3.0	18.32
D6	0.0653	5	0.035	0.622	61.7	6.0	23.80
E0	0.0592	5	0.035	0.667	60.0	7.0	22.35
E1.1	0.0123	5	0.035	0.316	76.0	44.0	19.19
E1.2	0.0255	5	0.035	0.613	62.0	9.0	21.61
E2	0.0041	5	0.035	0.563	64.0	11.0	13.59
E3	0.0309	5	0.035	0.563	64.0	11.0	16.41
E4	0.0284	5	0.035	0.563	64.0	11.0	16.88
E5	0.0211	5	0.035	0.563	64.0	11.0	16.25
E6	0.0452	5	0.035	0.603	62.4	9.0	17.01
E7	0.0153	5	0.035	0.613	62.0	9.0	14.69
F1	0.0670	5	0.035	0.656	60.4	7.5	21.50
G1	0.0394	5	0.035	0.515	66.0	4.5	16.08
G2	0.0331	5	0.035	0.376	72.7	3.0	20.62
H1	0.0217	5	0.035	0.412	70.8	7.0	16.17
H2	0.0611	5	0.035	0.488	67.2	7.0	19.80
H3	0.0091	5	0.035	0.515	66.0	9.0	14.39
H4	0.0423	5	0.035	0.356	73.8	6.0	20.17
H5	0.0316	5	0.035	0.337	74.8	5.0	19.44
H6	0.0494	5	0.035	0.502	66.6	3.0	21.35
H7	0.0403	5	0.035	0.418	70.5	5.0	18.53
H8	0.0133	5	0.035	0.341	74.6	4.0	15.29
H9	0.0108	5	0.035	0.412	70.8	7.0	14.43
I1	0.0106	5	0.035	0.389	72.0	7.0	14.35
I2	0.0231	5	0.035	0.389	72.0	7.0	14.15
J1	0.0158	5	0.035	0.439	69.5	7.0	13.76
K1	0.0278	5	0.035	0.316	76.0	7.0	14.46

4.6 REACH INPUT DETAILS

Reach Summary Table - 5 Year Existing Conditions				
Reach Name	Drainage Area (sq. m	Peak Discharge (cfs)	Time of Peak	Volume (in)
1	5.9948	271.40	26Feb2019, 12:50	0.19
2	7.9459	348.70	26Feb2019, 12:46	0.19
3	9.0245	397.40	26Feb2019, 12:40	0.18
4	9.0245	397.20	26Feb2019, 12:46	0.18
5	9.3284	408.60	26Feb2019, 12:44	0.18
6	0.2542	20.20	26Feb2019, 12:22	0.19
7	0.2520	20.00	26Feb2019, 12:28	0.19
8	0.0780	5.60	26Feb2019, 12:30	0.19
9	0.0592	5.00	26Feb2019, 12:36	0.19

Reach Summary Table - 100 Year Existing Conditions				
Reach Name	Drainage Area (sq. m	Peak Discharge (cfs)	Time of Peak	Volume (in)
1	5.9948	1448.60	26Feb2019, 12:50	0.63
2	7.9459	1964.00	26Feb2019, 12:42	0.64
3	9.0245	2352.60	26Feb2019, 12:36	0.67
4	9.0245	2351.60	26Feb2019, 12:38	0.67
5	9.3284	2470.00	26Feb2019, 12:36	0.68
6	0.2542	127.50	26Feb2019, 12:22	0.62
7	0.2520	126.30	26Feb2019, 12:26	0.62
8	0.0780	34.00	26Feb2019, 12:28	0.62
9	0.0592	34.30	26Feb2019, 12:28	0.62

Reach Summary Table - 5 Year Proposed Conditions				
Reach Name	Drainage Area (sq. mi.)	Peak Discharge (cfs)	Time of Peak	Volume (in)
BOX CULVERT 1	7.9557	376.70	26Feb2019, 12:42	0.19
BOX CULV 2	8.9615	424.90	26Feb2019, 12:48	0.19
CLV E4	0.0634	9.20	26Feb2019, 12:12	0.30
CULV B2	0.0205	3.30	26Feb2019, 12:06	0.30
CULV C2	0.2892	23.40	26Feb2019, 12:16	0.19
CULV C3	0.3144	26.10	26Feb2019, 12:18	0.20
CULV D2	0.3594	31.20	26Feb2019, 12:18	0.21
CULV D3	0.1423	13.10	26Feb2019, 12:20	0.24
CULV D4	0.1959	18.60	26Feb2019, 12:18	0.25
CULV E1.2	0.0970	7.70	26Feb2019, 12:26	0.35
CULV E2	0.0041	0.70	26Feb2019, 12:06	0.30
CULV E5	0.0211	3.20	26Feb2019, 12:08	0.30
CULV H2	0.0611	5.30	26Feb2019, 12:12	0.19
CULV H3	0.0091	1.20	26Feb2019, 12:06	0.24
CULV I1	0.0106	3.30	26Feb2019, 12:10	0.31
CULV-E3	0.0350	5.30	26Feb2019, 12:10	0.30
EX CULV C1	0.2542	20.70	26Feb2019, 12:14	0.19
EX CULV D1.1	0.2520	20.60	26Feb2019, 12:14	0.19
EX CULV D1.2	0.0780	5.70	26Feb2019, 12:18	0.19
EX CULV E0	0.0592	4.80	26Feb2019, 12:14	0.19
OUT 2	0.0445	9.50	26Feb2019, 12:24	0.30
OUT-1	9.2839	444.50	26Feb2019, 12:50	0.20
REACH A1	1.3529	83.10	26Feb2019, 12:32	0.19
Reach H7	0.0494	9.20	26Feb2019, 12:14	0.23
Reach-A2	0.0648	22.70	26Feb2019, 12:16	0.35
Reach-B1	5.9948	284.50	26Feb2019, 12:46	0.19
Reach-B2	0.0205	3.20	26Feb2019, 12:14	0.30
Reach-B3	6.0806	286.80	26Feb2019, 12:50	0.19
Reach-B4-3	0.3144	26.10	26Feb2019, 12:18	0.20
Reach-C1	0.2542	20.60	26Feb2019, 12:18	0.19
Reach-C2	0.2892	23.40	26Feb2019, 12:20	0.19
Reach-D1.1	0.2520	20.60	26Feb2019, 12:20	0.19
Reach-D3	0.0780	5.70	26Feb2019, 12:24	0.19
Reach-D4	0.1423	13.10	26Feb2019, 12:24	0.24
Reach-D5	0.3594	31.10	26Feb2019, 12:22	0.21
Reach-D6	0.1959	18.60	26Feb2019, 12:24	0.25
Reach-E1.1	0.0592	4.70	26Feb2019, 12:24	0.19
Reach-E1.2	0.0716	6.30	26Feb2019, 12:40	0.38
Reach-E3	0.0041	0.70	26Feb2019, 12:14	0.30
Reach-E4	0.0350	5.20	26Feb2019, 12:14	0.30
Reach-E6	0.0211	3.20	26Feb2019, 12:14	0.30
Reach-E6-2	0.2428	18.50	26Feb2019, 12:34	0.29
Reach-E7	0.0634	9.10	26Feb2019, 12:16	0.30
Reach-F1	0.0970	7.70	26Feb2019, 12:30	0.35
Reach-F1-2	0.1641	12.40	26Feb2019, 12:34	0.29
Reach-G2	0.0394	2.50	26Feb2019, 12:14	0.12
Reach-H4	0.0217	5.40	26Feb2019, 12:16	0.29
Reach-H6	0.0611	5.30	26Feb2019, 12:14	0.19
Reach-H7-1	0.0091	1.20	26Feb2019, 12:12	0.24
Reach-H9	0.0338	10.30	26Feb2019, 12:12	0.31
Reach-I2-1	0.0106	3.30	26Feb2019, 12:12	0.31
Reach-P3	0.2613	21.30	26Feb2019, 12:28	0.23
Reach-1	7.9557	376.70	26Feb2019, 12:44	0.19
Reach-2	8.1295	388.30	26Feb2019, 12:46	0.19
Reach-3	8.5404	405.10	26Feb2019, 12:46	0.19
Reach-4	8.6509	408.80	26Feb2019, 12:48	0.19
Reach-5	8.9615	424.80	26Feb2019, 12:48	0.19
Reach-6 Kiowa Outfall	9.3284	447.40	26Feb2019, 12:48	0.20

Reach Summary Table - 100 Year Proposed Conditions				
Reach Name	Drainage Area (sq. mi.)	Peak Discharge (cfs)	Time of Peak	Volume (in)
BOX CULVERT 1	7.9557	2062.20	26Feb2019, 12:40	0.65
BOX CULV 2	8.9615	2321.10	26Feb2019, 12:44	0.67
CLV E4	0.0634	55.70	26Feb2019, 12:12	0.93
CULV B2	0.0205	19.90	26Feb2019, 12:08	0.94
CULV C2	0.2892	145.80	26Feb2019, 12:18	0.63
CULV C3	0.3144	162.10	26Feb2019, 12:18	0.65
CULV D2	0.3594	203.70	26Feb2019, 12:18	0.70
CULV D3	0.1423	75.70	26Feb2019, 12:20	0.76
CULV D4	0.1959	108.50	26Feb2019, 12:20	0.81
CULV E1.2	0.0970	24.20	26Feb2019, 12:20	0.95
CULV E2	0.0041	4.10	26Feb2019, 12:08	0.94
CULV E5	0.0211	19.20	26Feb2019, 12:10	0.94
CULV H2	0.0611	53.60	26Feb2019, 12:14	0.92
CULV H3	0.0091	9.60	26Feb2019, 12:08	0.94
CULV I1	0.0106	14.60	26Feb2019, 12:08	1.20
CULV-E3	0.0350	31.80	26Feb2019, 12:10	0.93
EX CULV C1	0.2542	127.70	26Feb2019, 12:16	0.63
EX CULV D1.1	0.2520	127.20	26Feb2019, 12:16	0.63
EX CULV D1.2	0.0780	34.00	26Feb2019, 12:20	0.63
EX CULV E0	0.0592	29.70	26Feb2019, 12:16	0.63
OUT 2	0.0445	28.80	26Feb2019, 12:26	1.17
OUT-1	9.2839	2413.10	26Feb2019, 12:44	0.68
REACH A1	1.3529	480.90	26Feb2019, 12:32	0.63
Reach H7	0.0494	52.20	26Feb2019, 12:12	1.00
Reach-A2	0.0648	85.30	26Feb2019, 12:14	1.77
Reach-B1	5.9948	1537.10	26Feb2019, 12:46	0.63
Reach-B2	0.0205	19.80	26Feb2019, 12:14	0.93
Reach-B3	6.0806	1552.00	26Feb2019, 12:48	0.64
Reach-B4-3	0.3144	161.70	26Feb2019, 12:18	0.65
Reach-C1	0.2542	127.70	26Feb2019, 12:18	0.63
Reach-C2	0.2892	145.80	26Feb2019, 12:20	0.63
Reach-D1.1	0.2520	126.70	26Feb2019, 12:20	0.62
Reach-D3	0.0780	33.90	26Feb2019, 12:24	0.62
Reach-D4	0.1423	75.40	26Feb2019, 12:24	0.76
Reach-D5	0.3594	203.10	26Feb2019, 12:20	0.70
Reach-D6	0.1959	108.50	26Feb2019, 12:22	0.81
Reach-E1.1	0.0592	29.70	26Feb2019, 12:22	0.62
Reach-E1.2	0.0716	14.10	26Feb2019, 12:50	1.02
Reach-E3	0.0041	4.10	26Feb2019, 12:12	0.93
Reach-E4	0.0350	31.70	26Feb2019, 12:14	0.93
Reach-E6	0.0211	19.00	26Feb2019, 12:12	0.93
Reach-E6-2	0.2428	103.80	26Feb2019, 12:26	0.85
Reach-E7	0.0634	55.70	26Feb2019, 12:14	0.93
Reach-F1	0.0970	24.10	26Feb2019, 12:22	0.95
Reach-F1-2	0.1641	58.40	26Feb2019, 12:28	0.83
Reach-G2	0.0394	36.00	26Feb2019, 12:12	0.76
Reach-H4	0.0217	26.10	26Feb2019, 12:12	1.11
Reach-H6	0.0611	53.40	26Feb2019, 12:14	0.92
Reach-H7-1	0.0091	9.60	26Feb2019, 12:12	0.94
Reach-H9	0.0338	46.50	26Feb2019, 12:10	1.20
Reach-I2-1	0.0106	14.50	26Feb2019, 12:10	1.20
Reach-P3	0.2613	95.50	26Feb2019, 12:36	0.76
Reach-1	7.9557	2061.70	26Feb2019, 12:42	0.65
Reach-2	8.1295	2100.20	26Feb2019, 12:44	0.66
Reach-3	8.5404	2195.30	26Feb2019, 12:42	0.66
Reach-4	8.6509	2219.80	26Feb2019, 12:44	0.67
Reach-5	8.9615	2320.80	26Feb2019, 12:44	0.67
Reach-6 Kiowa Outfall	9.3284	2437.30	26Feb2019, 12:44	0.68

4.7 DETENTION POND SUMMARY

DETENTION POND WORKSHEET

CALCULATED BY: JP
CHECKED BY:

PROJECT: Winsome Subdivision
MAJOR BASIN: West Kiowa Creek

JOB NO: **48157**
LOCATION: **Monument, CO**

				IMPERVIOUS FACTOR						SOIL				WATERSHED				CALCULATIONS		
LOCATION	**DESIGN POINT**	**BASIN**	**AREA (Acres)**	**5 ACRE LOT (7%)**	**2.5 ACRE LOT (11%)**	**OPEN SPACE (2%)**	**COMMERCIAL (85%)**	**TOTAL % CHECK**	**WEIGHTED IMPERVIOUSNESS**	**SOIL GROUP A %**	**SOIL GROUP B %**	**SOIL GROUP C/D %**	**TOTAL % CHECK**	**WATERSHED LENGTH**	**WATERSHED HIGH POINT**	**WATERSHED LOW POINT**	**WATERSHED SLOPE**	**100-YEAR REQUIRED VOLUME (AC-FT)**	**PROPOSED VOLUME**	**PEAK OUTFLOW VS PREDEVELOPED FLOW RATIO**
POND 1	P1	G1	25.2	70%	0%	30%	0%	100%	6%	0%	0%	100%	100%							
		G2	21.2	90%	0%	10%	0%	100%	7%	0%	0%	100%	100%							
		H1	13.9	100%	0%	0%	0%	100%	7%	0%	10%	90%	100%							
		H4	27.1	70%	0%	30%	0%	100%	6%	0%	0%	100%	100%							
			87.4						6.0%	0.0%	1.6%	98.4%	100%	3,246	7,465	7,317	0.046	2.6	7.9	0.32
POND 2	P2	H2	31.9	100%	0%	0%	0%	100%	7%	0%	70%	30%	100%							
		H5	20.2	70%	0%	30%	0%	100%	6%	0%	0%	100%	100%							
		H6	31.6	35%	0%	65%	0%	100%	4%	0%	0%	100%	100%							
			83.7						5.4%	0%	27%	73%	100%	2,628	7,444	7,305	0.053	2.3	7.2	0.33
POND 3	P3	D1.2	49.9	100%	0%	0%	0%	100%	7%	0.0%	100.0%	0.0%	100%							
		D3	41.2	0%	10%	90%	0%	100%	3%	0.0%	100.0%	0.0%	100%							
		D4	34.3	0%	100%	0%	0%	100%	11%	0.0%	100.0%	0.0%	100%							
		D6	41.8	80%	0%	20%	0%	100%	6%	0.0%	90.0%	10.0%	100%							
			167.2						6.6%	0.0%	97.5%	2.5%	100%	6,480	7,480	7,292	0.029	5.1	6.9	0.74
POND 4	P4	I1	6.8	100%	0%	0%	0%	100%	7%	0%	0%	100%	100%							
		I2	14.8	100%	0%	0%	0%	100%	7%	0%	0%	100%	100%							
		H9	6.9	100%	0%	0%	0%	100%	7%	0%	20%	80%	100%							
			28.5						7.0%	0.0%	4.8%	95.2%	100%	1,895	7,388	7,322	0.035	0.9	1.3	0.69
POND 5	P5	E1.2	16.3	50%	50%	0%	0%	100%	9%	0%	100%	0%	100%							
		E2	2.6	0%	100%	0%	0%	100%	11%	0%	100%	0%	100%							
		E3	19.8	0%	100%	0%	0%	100%	11%	0%	100%	0%	100%							
		E4	18.2	0%	100%	0%	0%	100%	11%	0%	100%	0%	100%							
		E5	13.5	0%	100%	0%	0%	100%	11%	0%	100%	0%	100%							
		E6	28.9	70%	20%	10%	0%	100%	7%	0%	90%	10%	100%							
		E7	9.8	0%	100%	0%	0%	100%	11%	0%	100%	0%	100%							
		F1	42.9	100%	0%	0%	0%	100%	7%	0%	100%	0%	100%							
			152.0						9.0%	0.0%	98.1%	1.9%	100%	4,755	7,427	7,295	0.028	5.3	9.7	0.55
POND 6	P6	E0	37.9	100%	0%	0%	0%	100%	7%	0%	100%	0%	100%							
		E1.1	7.9	0%	0%	50%	50%	100%	50%	0%	100%	0%	100%							
			45.8						14.5%	0.0%	100%	0%	100%	2,615	7,480	7,404	0.029	2.0	3.8	0.53

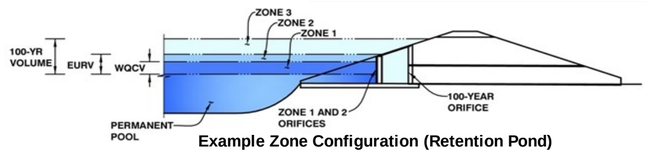
4.8 UD DETENTION CALCULATIONS

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Winsome

Basin ID: Pond 5



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type = **EDB**
Watershed Area = 152.00 acres
Watershed Length = 4,755 ft
Watershed Slope = 0.028 ft/ft
Watershed Imperviousness = 9.00% percent
Percentage Hydrologic Soil Group A = 0.0% percent
Percentage Hydrologic Soil Group B = 98.1% percent
Percentage Hydrologic Soil Groups C/D = 1.9% percent
Desired WQCV Drain Time = 40.0 hours
Location for 1-hr Rainfall Depths = User Input

			Optional User Override 1-hr Precipitation	
Water Quality Capture Volume (WQCV) =	0.776	acre-feet		
Excess Urban Runoff Volume (EURV) =	1.272	acre-feet		
2-yr Runoff Volume (P1 = 1.19 in.) =	0.869	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	1.380	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	3.301	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	9.051	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	12.642	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	17.330	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 0 in.) =	0.000	acre-feet		inches
Approximate 2-yr Detention Volume =	0.807	acre-feet		
Approximate 5-yr Detention Volume =	1.293	acre-feet		
Approximate 10-yr Detention Volume =	2.779	acre-feet		
Approximate 25-yr Detention Volume =	3.933	acre-feet		
Approximate 50-yr Detention Volume =	4.100	acre-feet		
Approximate 100-yr Detention Volume =	5.340	acre-feet		

Stage-Storage Calculation

Zone 1 Volume (WQCV) = 0.776 acre-feet
Zone 2 Volume (EURV - Zone 1) = 0.497 acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) = 4.067 acre-feet
Total Detention Basin Volume = 5.340 acre-feet
Initial Surcharge Volume (ISV) = user ft^3
Initial Surcharge Depth (ISD) = user ft
Total Available Detention Depth (H_{total}) = user ft
Depth of Trickle Channel (H_{TC}) = user ft
Slope of Trickle Channel (S_{TC}) = user ft/ft
Slopes of Main Basin Sides (S_{main}) = user H:V
Basin Length-to-Width Ratio ($R_{L/W}$) = user

Initial Surcharge Area (A_{ISV}) = user ft^2
Surcharge Volume Length (L_{ISV}) = user ft
Surcharge Volume Width (W_{ISV}) = user ft
Depth of Basin Floor (H_{FLOOR}) = user ft
Length of Basin Floor (L_{FLOOR}) = user ft
Width of Basin Floor (W_{FLOOR}) = user ft
Area of Basin Floor (A_{FLOOR}) = user ft^2
Volume of Basin Floor (V_{FLOOR}) = user ft^3
Depth of Main Basin (H_{MAIN}) = user ft
Length of Main Basin (L_{MAIN}) = user ft
Width of Main Basin (W_{MAIN}) = user ft
Area of Main Basin (A_{MAIN}) = user ft^2
Volume of Main Basin (V_{MAIN}) = user ft^3
Calculated Total Basin Volume (V_{total}) = **user** acre-feet

Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	56,000	1.286		
	--	6.00	--	--	--	68,000	1.561	372,000	8.540
	--	8.00	--	--	--	72,000	1.653	512,000	11.754
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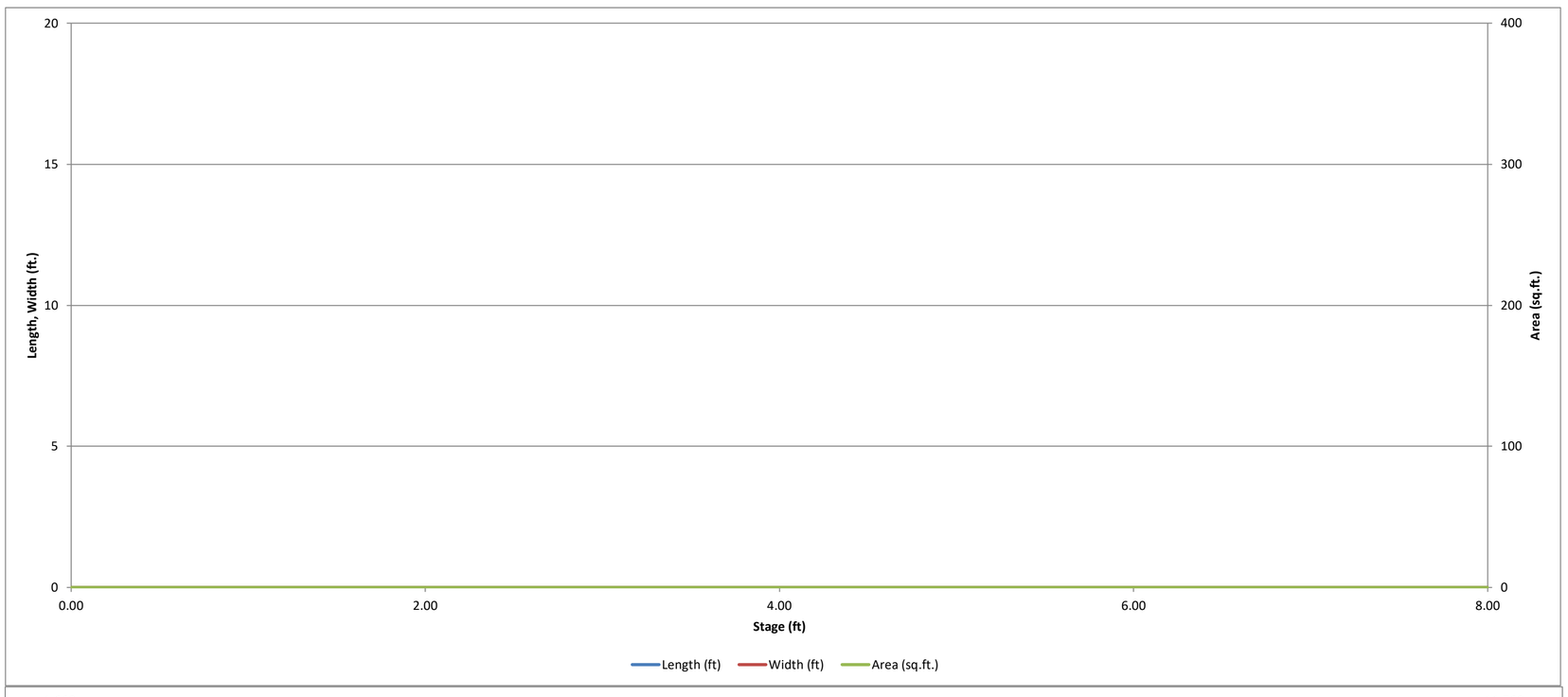
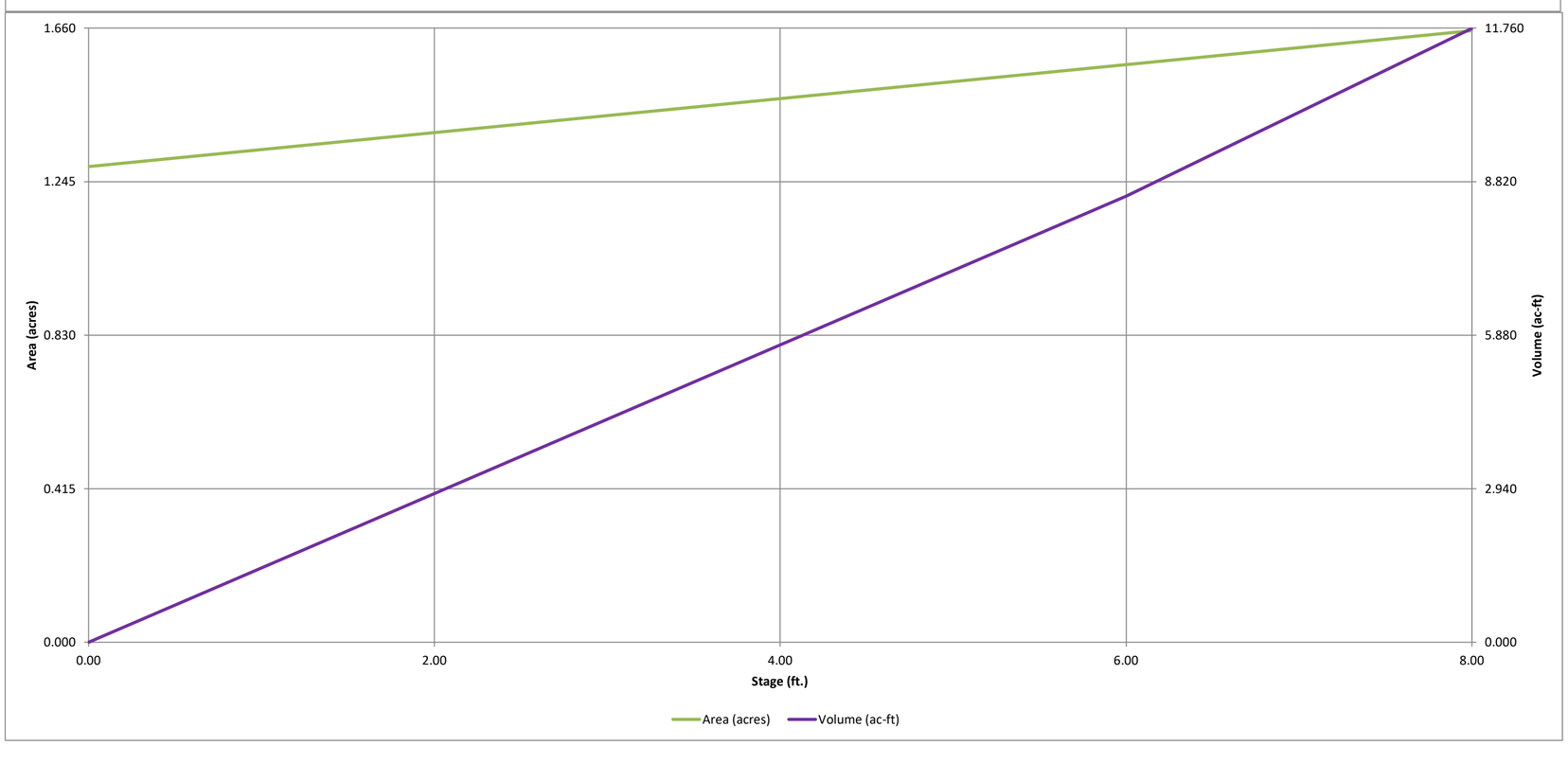
DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)



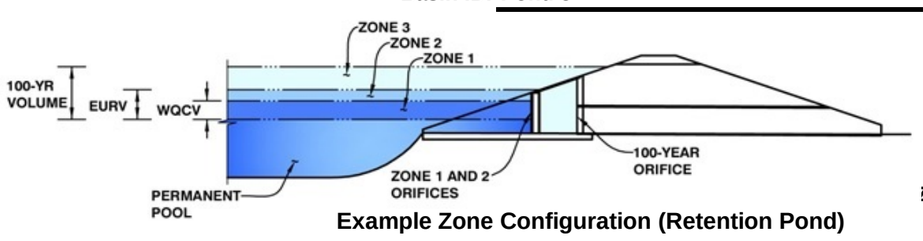


Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Winsome

Basin ID: Pond 5



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	0.60	0.776	Orifice Plate
Zone 2 (EURV)	0.98	0.497	Circular Orifice
Zone 3 (100-year)	3.89	4.067	Weir&Pipe (Circular)
		5.340	Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	N/A	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft^2
Underdrain Orifice Centroid =	N/A	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	1.01	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	2.10	inches
Orifice Plate: Orifice Area per Row =	14.92	sq. inches (use rectangular openings)

Calculated Parameters for Plate

WQ Orifice Area per Row =	1.036E-01	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.34	0.67					
Orifice Area (sq. inches)	14.92	14.92	14.92					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Zone 2 Circular	Not Selected	
Invert of Vertical Orifice =	0.52	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	0.85	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	28.00	N/A	inches

Calculated Parameters for Vertical Orifice

	Zone 2 Circular	Not Selected	
Vertical Orifice Area =	4.28	N/A	ft^2
Vertical Orifice Centroid =	1.17	N/A	feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	3.00	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	8.00	N/A	feet
Overflow Weir Slope =	3.00	N/A	H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =	4.00	N/A	feet
Overflow Grate Open Area % =	85%	N/A	%, grate open area/total area
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	4.33	N/A	feet
Over Flow Weir Slope Length =	4.22	N/A	feet
Grate Open Area / 100-yr Orifice Area =	2.28	N/A	should be $\geq$ 4
Overflow Grate Open Area w/o Debris =	28.67	N/A	ft^2
Overflow Grate Open Area w/ Debris =	14.34	N/A	ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	0.00	N/A	ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =	48.00	N/A	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Circular	Not Selected	
Outlet Orifice Area =	12.57	N/A	ft^2
Outlet Orifice Centroid =	2.00	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	6.00	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	81.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

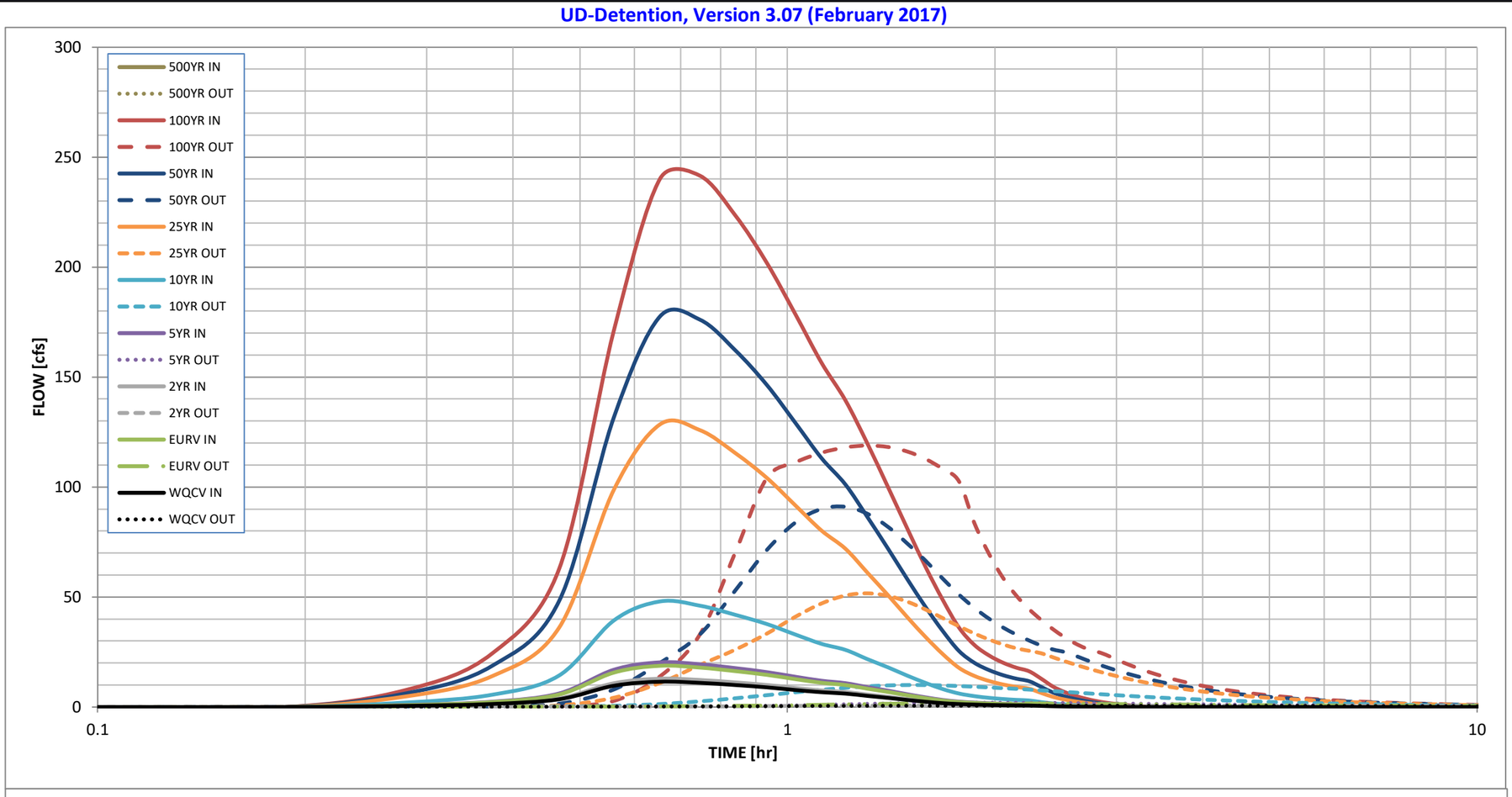
Spillway Design Flow Depth=	0.97	feet
Stage at Top of Freeboard =	7.97	feet
Basin Area at Top of Freeboard =	1.65	acres

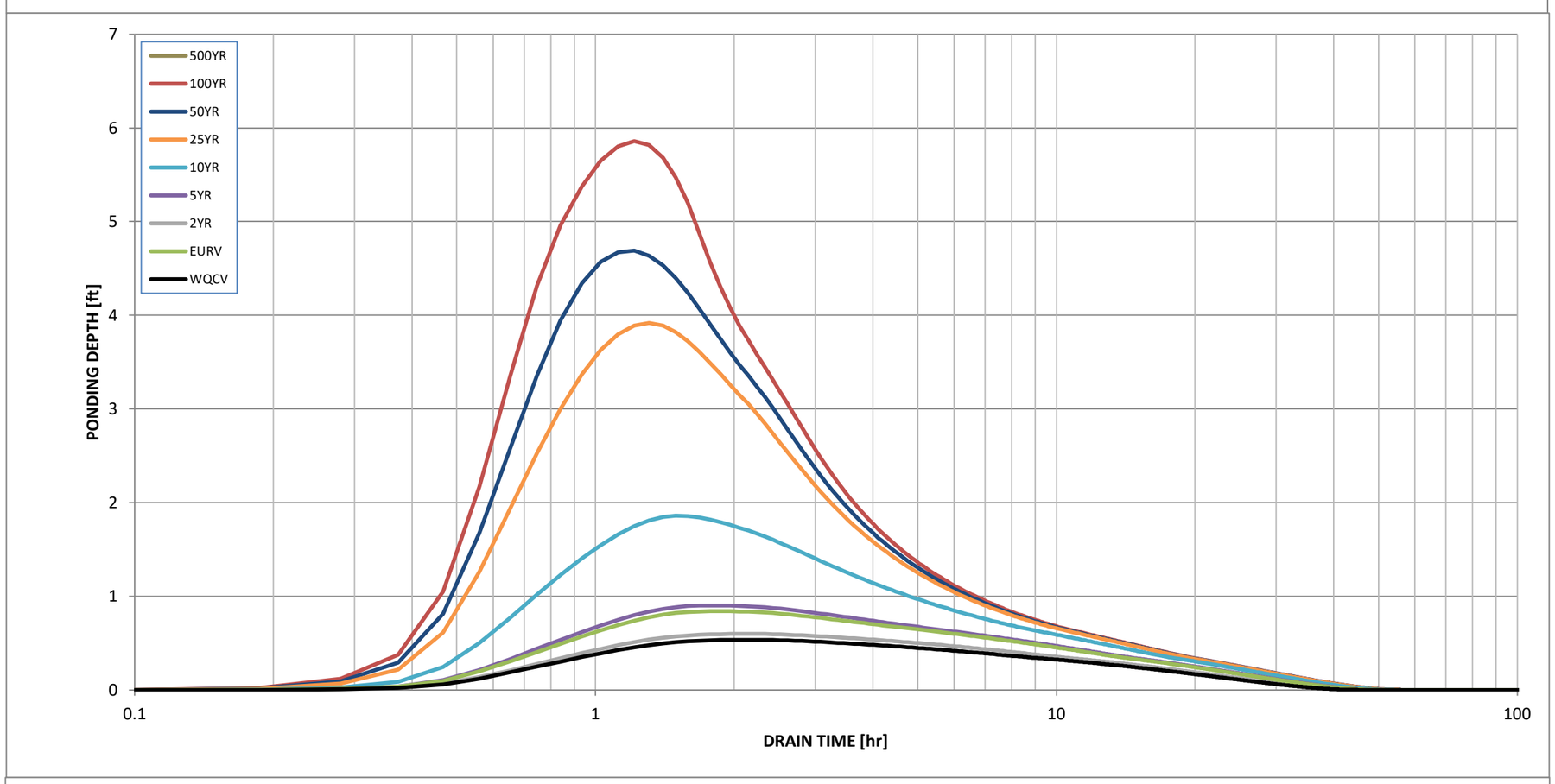
Routed Hydrograph Results

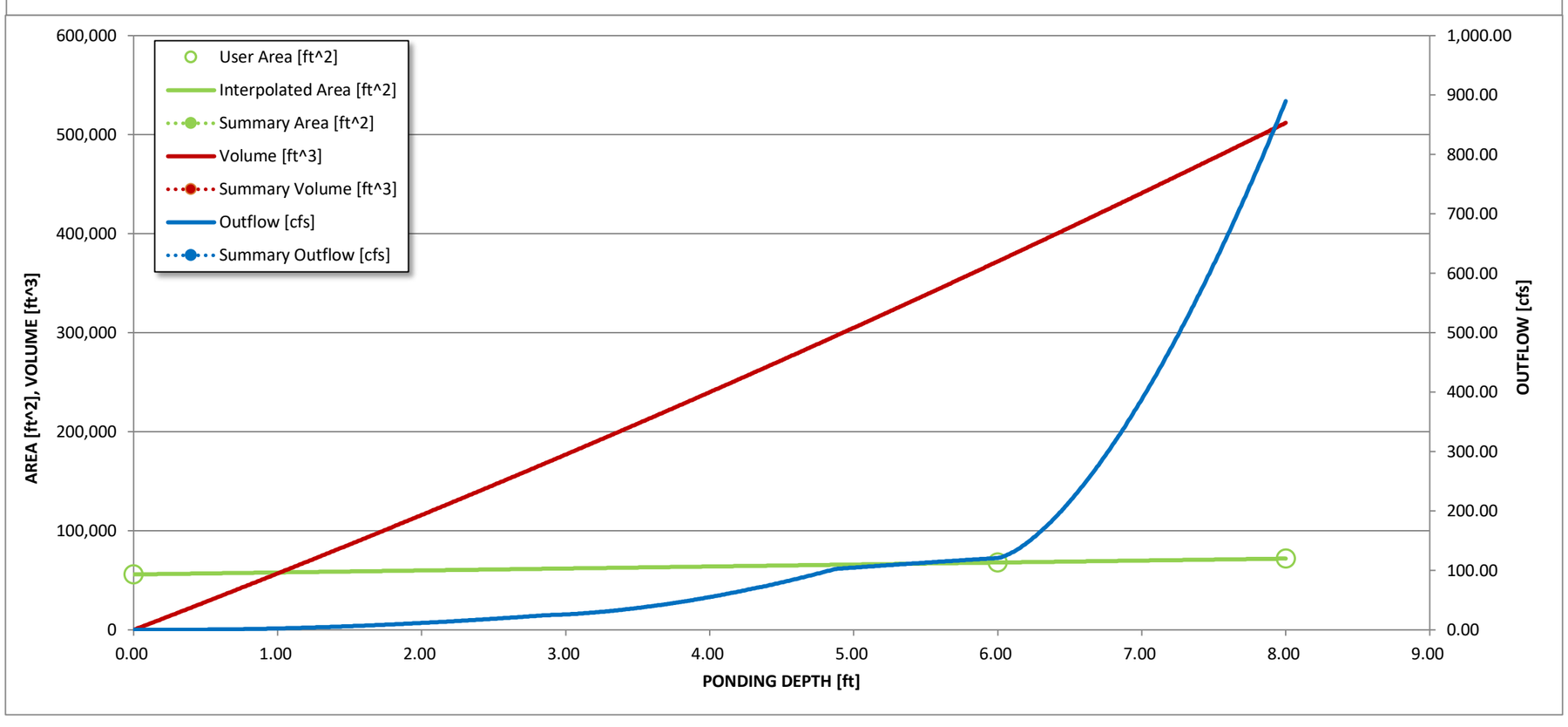
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	1.19	1.50	1.75	2.00	2.25	2.52	0.00
Calculated Runoff Volume (acre-ft) =	0.776	1.272	0.869	1.380	3.301	9.051	12.642	17.330	0.000
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.776	1.273	0.870	1.382	3.303	9.053	12.652	17.338	#N/A
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.01	0.02	0.17	0.58	0.80	1.08	0.00
Predevelopment Peak Q (cfs) =	0.0	0.0	1.6	3.0	26.1	88.1	121.9	164.8	0.0
Peak Inflow Q (cfs) =	11.5	18.7	12.9	20.3	48.0	128.5	177.5	241.5	#N/A
Peak Outflow Q (cfs) =	0.6	1.6	0.7	1.9	10.0	51.7	91.0	118.9	#N/A
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.7	0.4	0.6	0.7	0.7	#N/A
Structure Controlling Flow =	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Overflow Grate 1	Overflow Grate 1	Outlet Plate 1	#N/A
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	0.6	1.8	2.6	#N/A
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#N/A
Time to Drain 97% of Inflow Volume (hours) =	37	40	39	40	37	27	22	18	#N/A
Time to Drain 99% of Inflow Volume (hours) =	**41**	45	42	45	45	40	37	34	#N/A
Maximum Ponding Depth (ft) =	0.54	0.84	0.60	0.90	1.86	3.92	4.69	5.86	#N/A
Area at Maximum Ponding Depth (acres) =	1.31	1.32	1.31	1.33	1.37	1.47	1.50	1.55	#N/A
Maximum Volume Stored (acre-ft) =	0.688	1.096	0.766	1.176	2.457	5.378	6.519	8.306	#N/A

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)







S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

Detention Basin Outlet Structure Design

Outflow Hydrograph Workbook Filename:

Storm Inflow Hydrographs **UD-Detention, Version 3.07 (February 2017)**

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

	SOURCE	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	#N/A
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.60 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	0:05:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
Hydrograph	0:11:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
Constant	0:16:48	0.51	0.82	0.57	0.88	2.02	4.81	6.20	7.75	#N/A
0.894	0:22:24	1.37	2.21	1.53	2.40	5.58	14.05	18.75	24.39	#N/A
	0:28:00	3.51	5.69	3.92	6.16	14.33	36.08	48.20	62.79	#N/A
	0:33:36	9.65	15.62	10.78	16.91	39.30	98.66	131.55	170.98	#N/A
	0:39:12	11.48	18.73	12.85	20.30	47.98	128.45	177.53	240.08	#N/A
	0:44:48	10.96	17.91	12.28	19.42	46.05	125.86	176.07	241.53	#N/A
	0:50:24	9.98	16.30	11.18	17.68	41.91	115.45	162.19	223.54	#N/A
	0:56:00	8.92	14.61	10.00	15.85	37.72	104.17	146.44	201.94	#N/A
	1:01:36	7.71	12.66	8.65	13.74	32.94	91.66	129.19	178.61	#N/A
	1:07:12	6.72	11.01	7.53	11.95	28.72	80.25	113.20	156.58	#N/A
	1:12:48	6.09	9.98	6.82	10.83	25.96	71.97	101.17	139.44	#N/A
	1:18:24	5.03	8.29	5.65	9.00	21.72	60.98	86.24	119.60	#N/A
	1:24:00	4.12	6.81	4.62	7.40	17.97	50.71	71.82	99.73	#N/A
	1:29:36	3.18	5.31	3.58	5.77	14.19	40.68	57.92	80.85	#N/A
	1:35:12	2.37	4.00	2.68	4.37	10.92	31.73	45.34	63.52	#N/A
	1:40:48	1.72	2.92	1.93	3.18	8.12	24.00	34.47	48.59	#N/A
	1:46:24	1.33	2.23	1.49	2.43	6.11	17.77	25.43	36.05	#N/A
	1:52:00	1.09	1.83	1.23	1.99	4.93	14.11	20.07	28.18	#N/A
	1:57:36	0.93	1.55	1.04	1.68	4.16	11.83	16.77	23.42	#N/A
	2:03:12	0.81	1.35	0.91	1.47	3.62	10.24	14.48	20.15	#N/A
	2:08:48	0.73	1.22	0.82	1.32	3.24	9.12	12.87	17.87	#N/A
	2:14:24	0.67	1.12	0.76	1.22	2.97	8.32	11.73	16.24	#N/A
	2:20:00	0.49	0.82	0.55	0.90	2.20	6.37	9.12	12.84	#N/A
	2:25:36	0.36	0.60	0.41	0.65	1.60	4.59	6.57	9.26	#N/A
	2:31:12	0.27	0.44	0.30	0.48	1.18	3.41	4.87	6.86	#N/A
	2:36:48	0.20	0.33	0.22	0.36	0.88	2.53	3.62	5.09	#N/A
	2:42:24	0.14	0.24	0.16	0.26	0.64	1.87	2.68	3.77	#N/A
	2:48:00	0.10	0.17	0.11	0.18	0.46	1.35	1.94	2.74	#N/A
	2:53:36	0.07	0.12	0.08	0.13	0.33	0.98	1.40	1.98	#N/A
	2:59:12	0.05	0.08	0.05	0.09	0.23	0.69	1.00	1.43	#N/A
	3:04:48	0.03	0.05	0.03	0.05	0.15	0.46	0.67	0.97	#N/A
	3:10:24	0.01	0.03	0.02	0.03	0.08	0.27	0.40	0.59	#N/A
	3:16:00	0.00	0.01	0.01	0.01	0.04	0.13	0.20	0.31	#N/A
	3:21:36	0.00	0.00	0.00	0.00	0.01	0.04	0.07	0.12	#N/A
	3:27:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	#N/A
	3:32:48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	3:38:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	3:44:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	3:49:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	3:55:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:00:48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:06:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:12:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:17:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:23:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:28:48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:34:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:45:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:51:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:56:48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:02:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:08:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:13:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:19:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:24:48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:30:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:36:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:41:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:47:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:52:48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:58:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	6:04:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	6:09:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	6:15:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	6:20:48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	6:26:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	6:32:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	6:37:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	6:43:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.

The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

Stage - Storage Description	Stage [ft]	Area [ft^2]	Area [acres]	Volume [ft^3]	Volume [ac-ft]	Total Outflow [cfs]

For best results, include the stages of all grade slope changes (e.g. ISV and Floor) from the S-A-V table on Sheet 'Basin'.

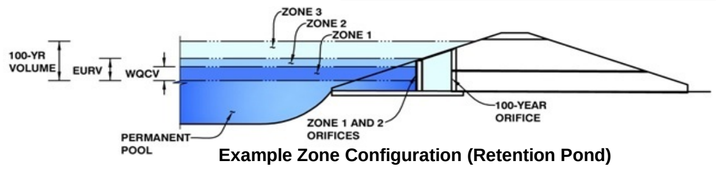
Also include the inverts of all outlets (e.g. vertical orifice, overflow grate, and spillway, where applicable).

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Winsome

Basin ID: Pond 6



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	**EDB**			
Watershed Area =	45.80	acres		
Watershed Length =	2,615	ft		
Watershed Slope =	0.029	ft/ft		
Watershed Imperviousness =	14.50%	percent		
Percentage Hydrologic Soil Group A =	0.0%	percent		
Percentage Hydrologic Soil Group B =	100.0%	percent		
Percentage Hydrologic Soil Groups C/D =	0.0%	percent		
Desired WQCV Drain Time =	40.0	hours		
Location for 1-hr Rainfall Depths =	User Input	70.7		
Water Quality Capture Volume (WQCV) =	0.347	acre-feet	Optional User Override 1-hr Precipitation	
Excess Urban Runoff Volume (EURV) =	0.643	acre-feet		
2-yr Runoff Volume (P1 = 1.19 in.) =	0.459	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	0.692	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	1.342	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	3.035	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	4.104	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	5.502	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 0 in.) =	0.000	acre-feet		inches
Approximate 2-yr Detention Volume =	0.427	acre-feet		
Approximate 5-yr Detention Volume =	0.649	acre-feet		
Approximate 10-yr Detention Volume =	1.163	acre-feet		
Approximate 25-yr Detention Volume =	1.524	acre-feet		
Approximate 50-yr Detention Volume =	1.606	acre-feet		
Approximate 100-yr Detention Volume =	2.026	acre-feet		

Stage-Storage Calculation

Zone 1 Volume (WQCV) =	0.347	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.296	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	1.383	acre-feet
Total Detention Basin Volume =	2.026	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	

Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	26,000	0.597		
Spillway Invert	--	5.50	--	--	--	37,000	0.849	173,250	3.977
Freeboard	--	7.50	--	--	--	41,000	0.941	251,250	5.768
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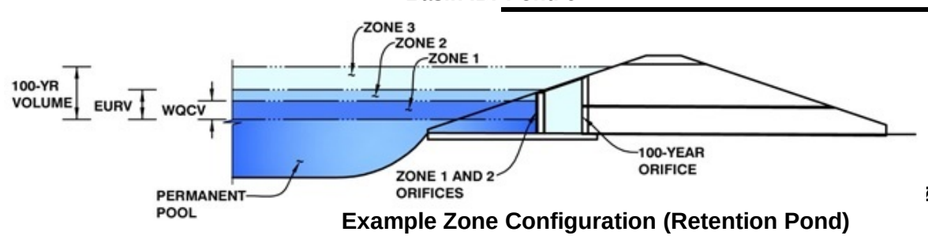
Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Winsome

Basin ID: Pond 6



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	0.57	0.347	Orifice Plate
Zone 2 (EURV)	1.04	0.296	Circular Orifice
Zone 3 (100-year)	3.04	1.383	Weir&Pipe (Circular)
		2.026	Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	N/A	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft^2
Underdrain Orifice Centroid =	N/A	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	1.04	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	3.20	inches
Orifice Plate: Orifice Area per Row =	6.00	sq. inches (use rectangular openings)

Calculated Parameters for Plate

WQ Orifice Area per Row =	4.167E-02	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.35	0.69					
Orifice Area (sq. inches)	6.00	6.00	6.00					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Zone 2 Circular	Not Selected	
Invert of Vertical Orifice =	0.73	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	1.32	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	12.00	N/A	inches

Calculated Parameters for Vertical Orifice

	Zone 2 Circular	Not Selected	
Vertical Orifice Area =	0.79	N/A	ft^2
Vertical Orifice Centroid =	0.50	N/A	feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	2.00	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	4.00	N/A	feet
Overflow Weir Slope =	3.00	N/A	H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =	4.00	N/A	feet
Overflow Grate Open Area % =	85%	N/A	%, grate open area/total area
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	3.33	N/A	feet
Over Flow Weir Slope Length =	4.22	N/A	feet
Grate Open Area / 100-yr Orifice Area =	8.11	N/A	should be $\geq$ 4
Overflow Grate Open Area w/o Debris =	14.34	N/A	ft^2
Overflow Grate Open Area w/ Debris =	7.17	N/A	ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	0.00	N/A	ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =	18.00	N/A	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Circular	Not Selected	
Outlet Orifice Area =	1.77	N/A	ft^2
Outlet Orifice Centroid =	0.75	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	5.50	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	26.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

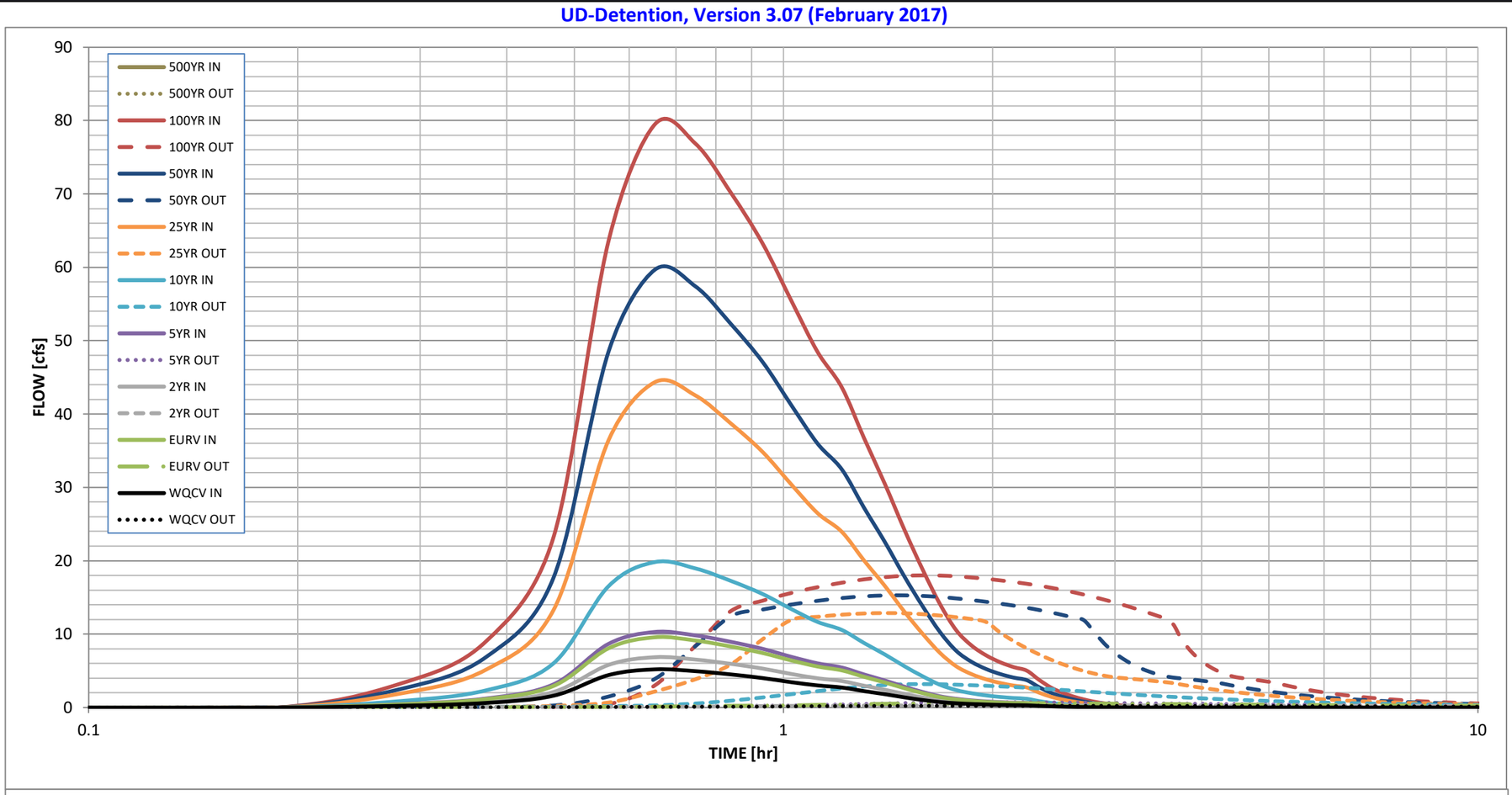
Spillway Design Flow Depth=	0.94	feet
Stage at Top of Freeboard =	7.44	feet
Basin Area at Top of Freeboard =	0.94	acres

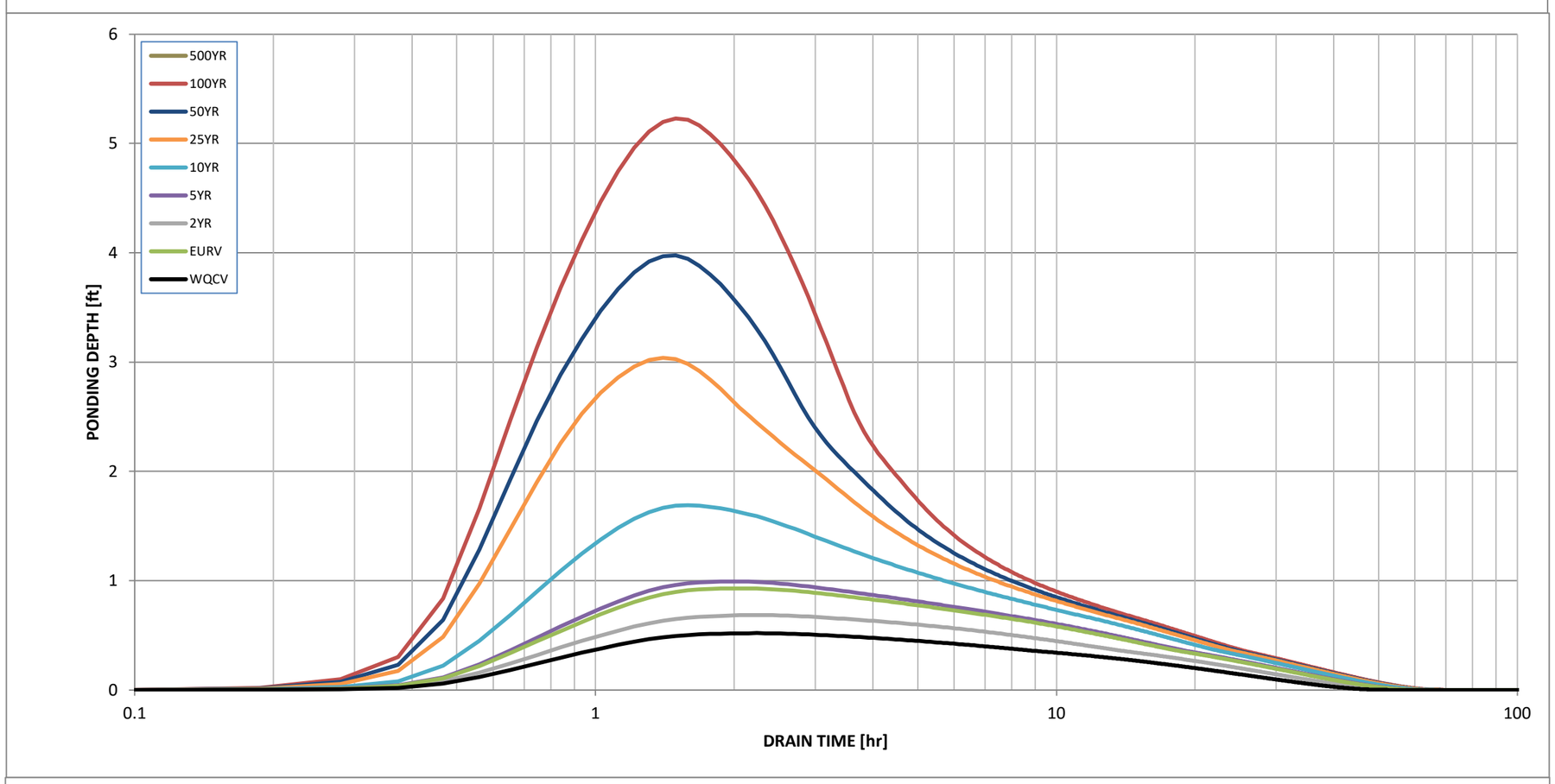
Routed Hydrograph Results

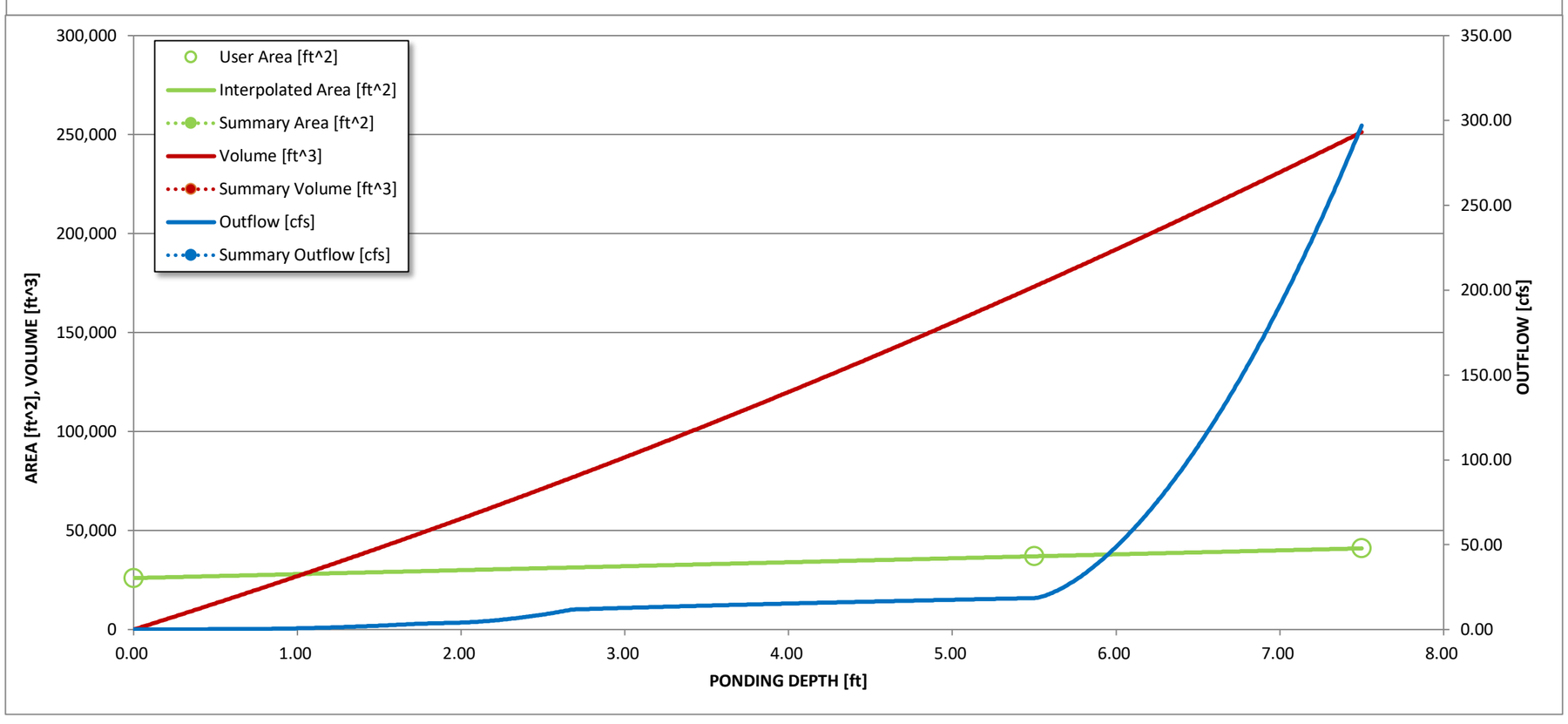
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	1.19	1.50	1.75	2.00	2.25	2.52	0.00
Calculated Runoff Volume (acre-ft) =	0.347	0.643	0.459	0.692	1.342	3.035	4.104	5.502	0.000
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.348	0.645	0.461	0.695	1.349	3.049	4.124	5.529	#N/A
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.01	0.02	0.17	0.58	0.80	1.09	0.00
Predevelopment Peak Q (cfs) =	0.0	0.0	0.5	0.8	7.8	26.6	36.8	49.8	0.0
Peak Inflow Q (cfs) =	5.2	9.6	6.9	10.3	19.8	44.3	59.7	79.5	#N/A
Peak Outflow Q (cfs) =	0.2	0.6	0.3	0.7	3.2	12.9	15.3	18.0	#N/A
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.9	0.4	0.5	0.4	0.4	#N/A
Structure Controlling Flow =	Plate	Vertical Orifice 1	Plate	Vertical Orifice 1	Vertical Orifice 1	Outlet Plate 1	Outlet Plate 1	Outlet Plate 1	#N/A
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	0.5	0.5	0.6	#N/A
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#N/A
Time to Drain 97% of Inflow Volume (hours) =	43	49	47	49	47	40	36	31	#N/A
Time to Drain 99% of Inflow Volume (hours) =	**47**	55	51	55	55	51	49	47	#N/A
Maximum Ponding Depth (ft) =	0.52	0.93	0.69	0.99	1.69	3.04	3.98	5.23	#N/A
Area at Maximum Ponding Depth (acres) =	0.62	0.64	0.63	0.64	0.67	0.74	0.78	0.84	#N/A
Maximum Volume Stored (acre-ft) =	0.317	0.575	0.416	0.613	1.074	2.019	2.731	3.750	#N/A

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)







S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

Detention Basin Outlet Structure Design

Outflow Hydrograph Workbook Filename: .\P6 - Outflow Hydrographs.xlsx

Storm Inflow Hydrographs **UD-Detention, Version 3.07 (February 2017)**

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

User-Defined	SOURCE	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	#N/A
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.60 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	0:05:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
Hydrograph	0:11:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
Constant	0:16:48	0.23	0.42	0.31	0.46	0.86	1.88	2.48	3.21	#N/A
0.897	0:22:24	0.62	1.14	0.82	1.23	2.34	5.17	6.89	9.03	#N/A
	0:28:00	1.61	2.93	2.11	3.15	6.02	13.27	17.68	23.20	#N/A
	0:33:36	4.42	8.06	5.80	8.67	16.52	36.40	48.48	63.55	#N/A
	0:39:12	5.20	9.57	6.86	10.30	19.82	44.35	59.68	79.50	#N/A
	0:44:48	4.95	9.13	6.54	9.83	18.96	42.54	57.41	76.87	#N/A
	0:50:24	4.51	8.31	5.95	8.95	17.26	38.71	52.28	70.17	#N/A
	0:56:00	4.01	7.43	5.30	8.00	15.47	34.83	47.10	63.24	#N/A
	1:01:36	3.45	6.41	4.57	6.91	13.41	30.39	41.20	55.44	#N/A
	1:07:12	3.01	5.59	3.98	6.02	11.66	26.48	35.96	48.46	#N/A
	1:12:48	2.73	5.06	3.61	5.45	10.58	23.96	32.47	43.65	#N/A
	1:18:24	2.24	4.18	2.97	4.50	8.79	20.03	27.21	36.70	#N/A
	1:24:00	1.82	3.41	2.42	3.68	7.22	16.56	22.54	30.46	#N/A
	1:29:36	1.38	2.63	1.85	2.84	5.63	13.06	17.86	24.24	#N/A
	1:35:12	1.02	1.96	1.37	2.11	4.25	10.04	13.79	18.80	#N/A
	1:40:48	0.74	1.42	1.00	1.53	3.10	7.45	10.30	14.11	#N/A
	1:46:24	0.58	1.10	0.77	1.18	2.37	5.62	7.72	10.53	#N/A
	1:52:00	0.48	0.90	0.64	0.97	1.94	4.54	6.21	8.43	#N/A
	1:57:36	0.41	0.77	0.54	0.83	1.64	3.82	5.23	7.09	#N/A
	2:03:12	0.36	0.67	0.48	0.73	1.44	3.33	4.55	6.15	#N/A
	2:08:48	0.32	0.61	0.43	0.65	1.29	2.99	4.07	5.50	#N/A
	2:14:24	0.30	0.56	0.40	0.60	1.19	2.74	3.73	5.03	#N/A
	2:20:00	0.22	0.41	0.29	0.44	0.87	2.03	2.78	3.78	#N/A
	2:25:36	0.16	0.30	0.21	0.32	0.64	1.47	2.01	2.73	#N/A
	2:31:12	0.12	0.22	0.16	0.24	0.47	1.09	1.49	2.02	#N/A
	2:36:48	0.09	0.16	0.11	0.18	0.35	0.81	1.11	1.50	#N/A
	2:42:24	0.06	0.12	0.08	0.13	0.25	0.59	0.81	1.10	#N/A
	2:48:00	0.04	0.08	0.06	0.09	0.18	0.42	0.58	0.80	#N/A
	2:53:36	0.03	0.06	0.04	0.06	0.13	0.31	0.42	0.58	#N/A
	2:59:12	0.02	0.04	0.03	0.04	0.09	0.21	0.29	0.41	#N/A
	3:04:48	0.01	0.02	0.02	0.02	0.05	0.14	0.19	0.26	#N/A
	3:10:24	0.01	0.01	0.01	0.01	0.03	0.08	0.11	0.15	#N/A
	3:16:00	0.00	0.00	0.00	0.00	0.01	0.03	0.05	0.07	#N/A
	3:21:36	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	#N/A
	3:27:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	3:32:48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	3:38:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	3:44:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	3:49:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	3:55:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:00:48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:06:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:12:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:17:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:23:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:28:48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:34:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:45:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:51:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	4:56:48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:02:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:08:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:13:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:19:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:24:48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:30:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:36:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:41:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:47:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:52:48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	5:58:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	6:04:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	6:09:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	6:15:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	6:20:48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	6:26:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	6:32:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	6:37:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	6:43:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.

The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

Stage - Storage Description	Stage [ft]	Area [ft^2]	Area [acres]	Volume [ft^3]	Volume [ac-ft]	Total Outflow [cfs]

For best results, include the stages of all grade slope changes (e.g. ISV and Floor) from the S-A-V table on Sheet 'Basin'.

Also include the inverts of all outlets (e.g. vertical orifice, overflow grate, and spillway, where applicable).

UD-Detention Outflow Hydrographs

Pond 6 Outlet Hydrograph

		WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Time [hr]	Time [min]	Outflow2 - [cfs]	Outflow2 - [cfs]	Outflow2 - [cfs]	Outflow2 - [cfs]	Outflow2 - [cfs]	Outflow2 - [cfs]	Outflow2 - [cfs]	Outflow2 - [cfs]	Outflow2 - [cfs]
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
0.09	5.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
0.19	11.20	0.00	0.01	0.00	0.01	0.01	0.02	0.02	0.03	#N/A
0.28	16.80	0.01	0.02	0.02	0.02	0.03	0.05	0.06	0.06	#N/A
0.37	22.40	0.03	0.04	0.03	0.04	0.06	0.08	0.10	0.11	#N/A
0.47	28.00	0.05	0.07	0.06	0.07	0.09	0.21	0.27	0.45	#N/A
0.56	33.60	0.07	0.09	0.08	0.10	0.20	0.67	1.49	3.03	#N/A
0.65	39.20	0.09	0.12	0.10	0.14	0.28	2.18	3.91	8.39	#N/A
0.75	44.80	0.10	0.20	0.11	0.21	0.54	3.84	8.34	13.14	#N/A
0.84	50.40	0.11	0.23	0.16	0.25	0.93	5.87	12.43	14.55	#N/A
0.93	56.00	0.12	0.26	0.20	0.28	1.37	9.30	13.35	15.61	#N/A
1.03	61.60	0.16	0.29	0.22	0.35	1.82	11.95	14.03	16.40	#N/A
1.12	67.20	0.18	0.36	0.24	0.41	2.23	12.36	14.54	17.01	#N/A
1.21	72.80	0.19	0.41	0.25	0.48	2.59	12.65	14.91	17.46	#N/A
1.31	78.40	0.21	0.46	0.26	0.55	2.87	12.82	15.15	17.77	#N/A
1.40	84.00	0.21	0.50	0.27	0.61	3.06	12.87	15.27	17.94	#N/A
1.49	89.60	0.22	0.54	0.27	0.65	3.16	12.84	15.28	18.01	#N/A
1.59	95.20	0.22	0.56	0.28	0.68	3.19	12.72	15.21	17.98	#N/A
1.68	100.80	0.22	0.57	0.28	0.69	3.17	12.53	15.06	17.88	#N/A
1.77	106.40	0.22	0.58	0.28	0.70	3.11	12.30	14.87	17.72	#N/A
1.87	112.00	0.23	0.59	0.28	0.71	3.04	12.05	14.64	17.53	#N/A
1.96	117.60	0.23	0.59	0.28	0.71	2.96	11.63	14.40	17.32	#N/A
2.05	123.20	0.23	0.59	0.28	0.71	2.87	10.18	14.15	17.10	#N/A
2.15	128.80	0.23	0.59	0.28	0.70	2.79	9.03	13.88	16.86	#N/A
2.24	134.40	0.23	0.59	0.28	0.70	2.70	8.08	13.60	16.61	#N/A
2.33	140.00	0.23	0.58	0.28	0.69	2.60	7.24	13.29	16.33	#N/A
2.43	145.60	0.23	0.58	0.28	0.68	2.50	6.53	12.96	16.03	#N/A
2.52	151.20	0.23	0.57	0.28	0.67	2.40	5.92	12.62	15.71	#N/A
2.61	156.80	0.23	0.56	0.28	0.66	2.30	5.41	12.27	15.39	#N/A
2.71	162.40	0.22	0.55	0.28	0.65	2.20	4.98	11.90	15.05	#N/A
2.80	168.00	0.22	0.54	0.28	0.63	2.10	4.63	10.32	14.71	#N/A
2.89	173.60	0.22	0.53	0.28	0.62	2.01	4.34	8.77	14.35	#N/A
2.99	179.20	0.22	0.52	0.28	0.61	1.93	4.13	7.58	13.99	#N/A
3.08	184.80	0.22	0.51	0.28	0.60	1.85	4.01	6.66	13.63	#N/A
3.17	190.40	0.22	0.50	0.28	0.58	1.77	3.90	5.94	13.26	#N/A
3.27	196.00	0.22	0.50	0.27	0.57	1.70	3.79	5.36	12.88	#N/A
3.36	201.60	0.22	0.49	0.27	0.56	1.63	3.68	4.90	12.50	#N/A
3.45	207.20	0.22	0.48	0.27	0.55	1.56	3.57	4.54	12.12	#N/A
3.55	212.80	0.22	0.47	0.27	0.54	1.50	3.46	4.26	11.35	#N/A
3.64	218.40	0.21	0.46	0.27	0.53	1.45	3.32	4.08	9.47	#N/A
3.73	224.00	0.21	0.46	0.27	0.52	1.39	3.14	3.97	8.08	#N/A
3.83	229.60	0.21	0.45	0.27	0.51	1.34	2.97	3.86	7.03	#N/A
3.92	235.20	0.21	0.44	0.27	0.50	1.29	2.81	3.75	6.21	#N/A
4.01	240.80	0.21	0.43	0.27	0.49	1.25	2.67	3.64	5.58	#N/A
4.11	246.40	0.21	0.43	0.27	0.48	1.20	2.53	3.53	5.07	#N/A
4.20	252.00	0.21	0.42	0.26	0.47	1.16	2.41	3.41	4.67	#N/A
4.29	257.60	0.21	0.42	0.26	0.47	1.13	2.29	3.25	4.36	#N/A
4.39	263.20	0.21	0.41	0.26	0.46	1.09	2.19	3.07	4.14	#N/A
4.48	268.80	0.20	0.40	0.26	0.45	1.05	2.09	2.90	4.01	#N/A
4.57	274.40	0.20	0.40	0.26	0.44	1.02	1.99	2.75	3.90	#N/A
4.67	280.00	0.20	0.39	0.26	0.44	0.99	1.91	2.61	3.79	#N/A
4.76	285.60	0.20	0.39	0.26	0.43	0.96	1.82	2.48	3.68	#N/A
4.85	291.20	0.20	0.38	0.26	0.42	0.93	1.75	2.36	3.57	#N/A
4.95	296.80	0.20	0.38	0.26	0.42	0.90	1.68	2.25	3.46	#N/A
5.04	302.40	0.20	0.37	0.25	0.41	0.88	1.61	2.14	3.32	#N/A
5.13	308.00	0.20	0.37	0.25	0.41	0.85	1.54	2.05	3.14	#N/A
5.23	313.60	0.19	0.36	0.25	0.40	0.83	1.48	1.96	2.97	#N/A
5.32	319.20	0.19	0.36	0.25	0.40	0.81	1.43	1.87	2.81	#N/A
5.41	324.80	0.19	0.36	0.25	0.39	0.79	1.38	1.79	2.67	#N/A
5.51	330.40	0.19	0.35	0.25	0.39	0.77	1.33	1.72	2.53	#N/A
5.60	336.00	0.19	0.35	0.25	0.38	0.75	1.28	1.65	2.41	#N/A
5.69	341.60	0.19	0.35	0.25	0.38	0.73	1.23	1.58	2.29	#N/A
5.79	347.20	0.19	0.34	0.25	0.37	0.71	1.19	1.52	2.19	#N/A
5.88	352.80	0.19	0.34	0.25	0.37	0.69	1.15	1.46	2.09	#N/A
5.97	358.40	0.19	0.33	0.24	0.36	0.68	1.11	1.41	1.99	#N/A
6.07	364.00	0.18	0.33	0.24	0.36	0.66	1.08	1.36	1.90	#N/A
6.16	369.60	0.18	0.33	0.24	0.35	0.65	1.04	1.31	1.82	#N/A
6.25	375.20	0.18	0.32	0.24	0.35	0.63	1.01	1.26	1.75	#N/A
6.35	380.80	0.18	0.32	0.24	0.35	0.62	0.98	1.22	1.67	#N/A
6.44	386.40	0.18	0.32	0.24	0.34	0.60	0.95	1.18	1.61	#N/A
6.53	392.00	0.18	0.31	0.24	0.34	0.59	0.92	1.14	1.54	#N/A
6.63	397.60	0.18	0.31	0.24	0.34	0.58	0.90	1.10	1.48	#N/A
6.72	403.20	0.18	0.30	0.24	0.33	0.57	0.87	1.06	1.43	#N/A
6.81	408.80	0.17	0.29	0.23	0.33	0.56	0.85	1.03	1.38	#N/A
6.91	414.40	0.17	0.29	0.23	0.33	0.55	0.82	1.00	1.33	#N/A
7.00	420.00	0.17	0.28	0.23	0.32	0.53	0.80	0.97	1.28	#N/A
7.09	425.60	0.17	0.28	0.23	0.32	0.52	0.78	0.94	1.23	#N/A
7.19	431.20	0.17	0.28	0.23	0.32	0.51	0.76	0.91	1.19	#N/A

Pond 5 (Offset 28 min, approximated to 26.76 min)

Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs	25 Year [cfs	50 Year [cfs	100 Year [cfs
5.60									
Hydrograph Constant 0.89									
	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
	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.51	0.82	0.57	0.88	2.02	4.81	6.20	7.75
	0.02	1.37	2.21	1.53	2.40	5.58	14.05	18.75	24.39
	0.02	3.51	5.69	3.92	6.16	14.33	36.08	48.20	62.79
	0.02	9.65	15.62	10.78	16.91	39.30	98.66	131.55	170.98
	0.03	11.48	18.73	12.85	20.30	47.98	128.45	177.53	240.08
	0.03	10.96	17.91	12.28	19.42	46.05	125.86	176.07	241.53
	0.04	9.98	16.30	11.18	17.68	41.91	115.45	162.19	223.54
	0.04	8.92	14.61	10.00	15.85	37.72	104.17	146.44	201.94
	0.04	7.71	12.66	8.65	13.74	32.94	91.66	129.19	178.61
	0.05	6.72	11.01	7.53	11.95	28.72	80.25	113.20	156.58
	0.05	6.09	9.98	6.82	10.83	25.96	71.97	101.17	139.44
	0.05	5.03	8.29	5.65	9.00	21.72	60.98	86.24	119.60
	0.06	4.12	6.81	4.62	7.40	17.97	50.71	71.82	99.73
	0.06	3.18	5.31	3.58	5.77	14.19	40.68	57.92	80.85
	0.07	2.37	4.00	2.68	4.37	10.92	31.73	45.34	63.52
	0.07	1.72	2.92	1.93	3.18	8.12	24.00	34.47	48.59
	0.07	1.33	2.23	1.49	2.43	6.11	17.77	25.43	36.05
	0.08	1.09	1.83	1.23	1.99	4.93	14.11	20.07	28.18
	0.08	0.93	1.55	1.04	1.68	4.16	11.83	16.77	23.42
	0.09	0.81	1.35	0.91	1.47	3.62	10.24	14.48	20.15
	0.09	0.73	1.22	0.82	1.32	3.24	9.12	12.87	17.87
	0.09	0.67	1.12	0.76	1.22	2.97	8.32	11.73	16.24
	0.10	0.49	0.82	0.55	0.90	2.20	6.37	9.12	12.84
	0.10	0.36	0.60	0.41	0.65	1.60	4.59	6.57	9.26
	0.11	0.27	0.44	0.30	0.48	1.18	3.41	4.87	6.86
	0.11	0.20	0.33	0.22	0.36	0.88	2.53	3.62	5.09
	0.11	0.14	0.24	0.16	0.26	0.64	1.87	2.68	3.77
	0.12	0.10	0.17	0.11	0.18	0.46	1.35	1.94	2.74
	0.12	0.07	0.12	0.08	0.13	0.33	0.98	1.40	1.98
	0.12	0.05	0.08	0.05	0.09	0.23	0.69	1.00	1.43
	0.13	0.03	0.05	0.03	0.05	0.15	0.46	0.67	0.97
	0.13	0.01	0.03	0.02	0.03	0.08	0.27	0.40	0.59
	0.14	0.00	0.01	0.01	0.01	0.04	0.13	0.20	0.31
	0.14	0.00	0.00	0.00	0.00	0.01	0.04	0.07	0.12
	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

P5 w/ P6 Outlet (manual hydrograph)

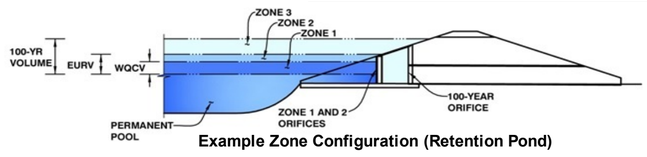
WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.01	0.00	0.01	0.01	0.02	0.02	0.03
0.01	0.02	0.02	0.02	0.03	0.05	0.06	0.06
0.03	0.04	0.03	0.04	0.06	0.08	0.10	0.11
0.56	0.88	0.62	0.95	2.12	5.02	6.47	8.19
1.44	2.31	1.61	2.50	5.78	14.72	20.24	27.41
3.60	5.80	4.02	6.30	14.61	38.27	52.11	71.18
9.75	15.82	10.90	17.12	39.84	102.50	139.89	184.12
11.59	18.96	13.02	20.55	48.91	134.32	189.97	254.63
11.08	18.17	12.47	19.69	47.43	135.16	189.43	257.14
10.14	16.59	11.40	18.02	43.72	127.40	176.22	239.94
9.10	14.96	10.23	16.26	39.95	116.53	160.98	218.95
7.91	13.07	8.90	14.23	35.53	104.31	144.11	196.07
6.92	11.47	7.79	12.50	31.59	93.06	128.35	174.35
6.30	10.49	7.09	11.44	29.02	84.84	116.44	157.39
5.25	8.83	5.92	9.65	24.88	73.81	101.52	137.61
4.34	7.37	4.90	8.08	21.16	63.43	87.03	117.72
3.40	5.88	3.85	6.46	17.36	53.21	72.97	98.72
2.60	4.59	2.96	5.07	14.03	44.03	60.21	81.24
1.94	3.50	2.21	3.89	11.16	36.05	49.11	66.13
1.55	2.82	1.77	3.14	9.07	29.40	39.84	53.37
1.32	2.42	1.51	2.70	7.81	24.30	34.22	45.28
1.15	2.14	1.32	2.39	6.94	20.86	30.65	40.28
1.04	1.94	1.20	2.17	6.32	18.31	28.07	36.75
0.96	1.80	1.10	2.02	5.84	16.36	26.16	34.20
0.90	1.70	1.04	1.90	5.47	14.85	24.69	32.27
0.72	1.39	0.84	1.57	4.60	12.29	21.74	28.55
0.59	1.16	0.69	1.31	3.89	10.00	18.83	24.65
0.49	0.99	0.58	1.13	3.38	8.39	16.78	21.91
0.42	0.87	0.50	0.99	2.98	7.16	13.94	19.79
0.36	0.77	0.44	0.88	2.65	6.21	11.45	18.12
0.32	0.69	0.39	0.79	2.39	5.48	9.53	16.73
0.29	0.63	0.36	0.73	2.18	4.99	8.07	15.61
0.27	0.59	0.33	0.67	2.00	4.60	6.94	14.69
0.25	0.55	0.31	0.63	1.84	4.25	6.03	13.85
0.23	0.51	0.29	0.59	1.71	3.96	5.31	13.09
0.22	0.49	0.28	0.56	1.60	3.71	4.74	12.43
0.22	0.47	0.27	0.54	1.51	3.50	4.33	11.47
0.21	0.46	0.27	0.53	1.45	3.32	4.08	9.48
0.21	0.46	0.27	0.52	1.39	3.14	3.97	8.08
0.21	0.45	0.27	0.51	1.34	2.97	3.86	7.03
0.21	0.44	0.27	0.50	1.29	2.81	3.75	6.21
0.21	0.43	0.27	0.49	1.25	2.67	3.64	5.58
0.21	0.43	0.27	0.48	1.20	2.53	3.53	5.07
0.21	0.42	0.26	0.47	1.16	2.41	3.41	4.67
0.21	0.42	0.26	0.47	1.13	2.29	3.25	4.36
0.21	0.41	0.26	0.46	1.09	2.19	3.07	4.14
0.20	0.40	0.26	0.45	1.05	2.09	2.90	4.01
0.20	0.40	0.26	0.44	1.02	1.99	2.75	3.90
0.20	0.39	0.26	0.44	0.99	1.91	2.61	3.79
0.20	0.39	0.26	0.43	0.96	1.82	2.48	3.68
0.20	0.38	0.26	0.42	0.93	1.75	2.36	3.57
0.20	0.38	0.26	0.42	0.90	1.68	2.25	3.46
0.20	0.37	0.25	0.41	0.88	1.61	2.14	3.32
0.20	0.37	0.25	0.41	0.85	1.54	2.05	3.14
0.19	0.36	0.25	0.40	0.83	1.48	1.96	2.97
0.19	0.36	0.25	0.40	0.81	1.43	1.87	2.81
0.19	0.36	0.25	0.39	0.79	1.38	1.79	2.67
0.19	0.35	0.25	0.39	0.77	1.33	1.72	2.53
0.19	0.35	0.25	0.38	0.75	1.28	1.65	2.41
0.19	0.35	0.25	0.38	0.73	1.23	1.58	2.29
0.19	0.34	0.25	0.37	0.71	1.19	1.52	2.19
0.19	0.34	0.25	0.37	0.69	1.15	1.46	2.09
0.19	0.33	0.24	0.36	0.68	1.11	1.41	1.99
0.18	0.33	0.24	0.36	0.66	1.08	1.36	1.90
0.18	0.33	0.24	0.35	0.65	1.04	1.31	1.82
0.18	0.32	0.24	0.35	0.63	1.01	1.26	1.75
0.18	0.32	0.24	0.35	0.62	0.98	1.22	1.67
0.18	0.32	0.24	0.34	0.60	0.95	1.18	1.61
0.18	0.31	0.24	0.34	0.59	0.92	1.14	1.54
0.18	0.31	0.24	0.34	0.58	0.90	1.10	1.48
0.18	0.30	0.24	0.33	0.57	0.87	1.06	1.43
0.17	0.29	0.23	0.33	0.56	0.85	1.03	1.38
0.17	0.29	0.23	0.33	0.55	0.82	1.00	1.33

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Winsome

Basin ID: P5 w/ P6 Outlet (manual hydrograph)



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type = **EDB**
Watershed Area = 152.00 acres
Watershed Length = 4,755 ft
Watershed Slope = 0.028 ft/ft
Watershed Imperviousness = 9.00% percent
Percentage Hydrologic Soil Group A = 0.0% percent
Percentage Hydrologic Soil Group B = 98.1% percent
Percentage Hydrologic Soil Groups C/D = 1.9% percent
Desired WQCV Drain Time = 40.0 hours
Location for 1-hr Rainfall Depths = User Input
Water Quality Capture Volume (WQCV) = 0.776 acre-feet
Excess Urban Runoff Volume (EURV) = 1.272 acre-feet

Optional User Override 1-hr Precipitation

2-yr Runoff Volume (P1 = 1.19 in.) = 0.869 acre-feet 1.19 inches
5-yr Runoff Volume (P1 = 1.5 in.) = 1.380 acre-feet 1.50 inches
10-yr Runoff Volume (P1 = 1.75 in.) = 3.301 acre-feet 1.75 inches
25-yr Runoff Volume (P1 = 2 in.) = 9.051 acre-feet 2.00 inches
50-yr Runoff Volume (P1 = 2.25 in.) = 12.642 acre-feet 2.25 inches
100-yr Runoff Volume (P1 = 2.52 in.) = 17.330 acre-feet 2.52 inches
500-yr Runoff Volume (P1 = 0 in.) = 0.000 acre-feet inches
Approximate 2-yr Detention Volume = 0.807 acre-feet
Approximate 5-yr Detention Volume = 1.293 acre-feet
Approximate 10-yr Detention Volume = 2.779 acre-feet
Approximate 25-yr Detention Volume = 3.933 acre-feet
Approximate 50-yr Detention Volume = 4.100 acre-feet
Approximate 100-yr Detention Volume = 5.340 acre-feet

Stage-Storage Calculation

Zone 1 Volume (WQCV) = 0.776 acre-feet
Zone 2 Volume (EURV - Zone 1) = 0.497 acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) = 4.067 acre-feet
Total Detention Basin Volume = 5.340 acre-feet
Initial Surcharge Volume (ISV) = user ft^3
Initial Surcharge Depth (ISD) = user ft
Total Available Detention Depth (H_{total}) = user ft
Depth of Trickle Channel (H_{TC}) = user ft
Slope of Trickle Channel (S_{TC}) = user ft/ft
Slopes of Main Basin Sides (S_{main}) = user H:V
Basin Length-to-Width Ratio ($R_{L/W}$) = user

Initial Surcharge Area (A_{ISV}) = user ft^2
Surcharge Volume Length (L_{ISV}) = user ft
Surcharge Volume Width (W_{ISV}) = user ft
Depth of Basin Floor (H_{FLOOR}) = user ft
Length of Basin Floor (L_{FLOOR}) = user ft
Width of Basin Floor (W_{FLOOR}) = user ft
Area of Basin Floor (A_{FLOOR}) = user ft^2
Volume of Basin Floor (V_{FLOOR}) = user ft^3
Depth of Main Basin (H_{MAIN}) = user ft
Length of Main Basin (L_{MAIN}) = user ft
Width of Main Basin (W_{MAIN}) = user ft
Area of Main Basin (A_{MAIN}) = user ft^2
Volume of Main Basin (V_{MAIN}) = user ft^3
Calculated Total Basin Volume (V_{total}) = **user** acre-feet

Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	65,000	1.492		
Spillway	--	6.00	--	--	--	77,000	1.768	426,000	9.780
Freeboard	--	8.00	--	--	--	81,000	1.860	584,000	13.407
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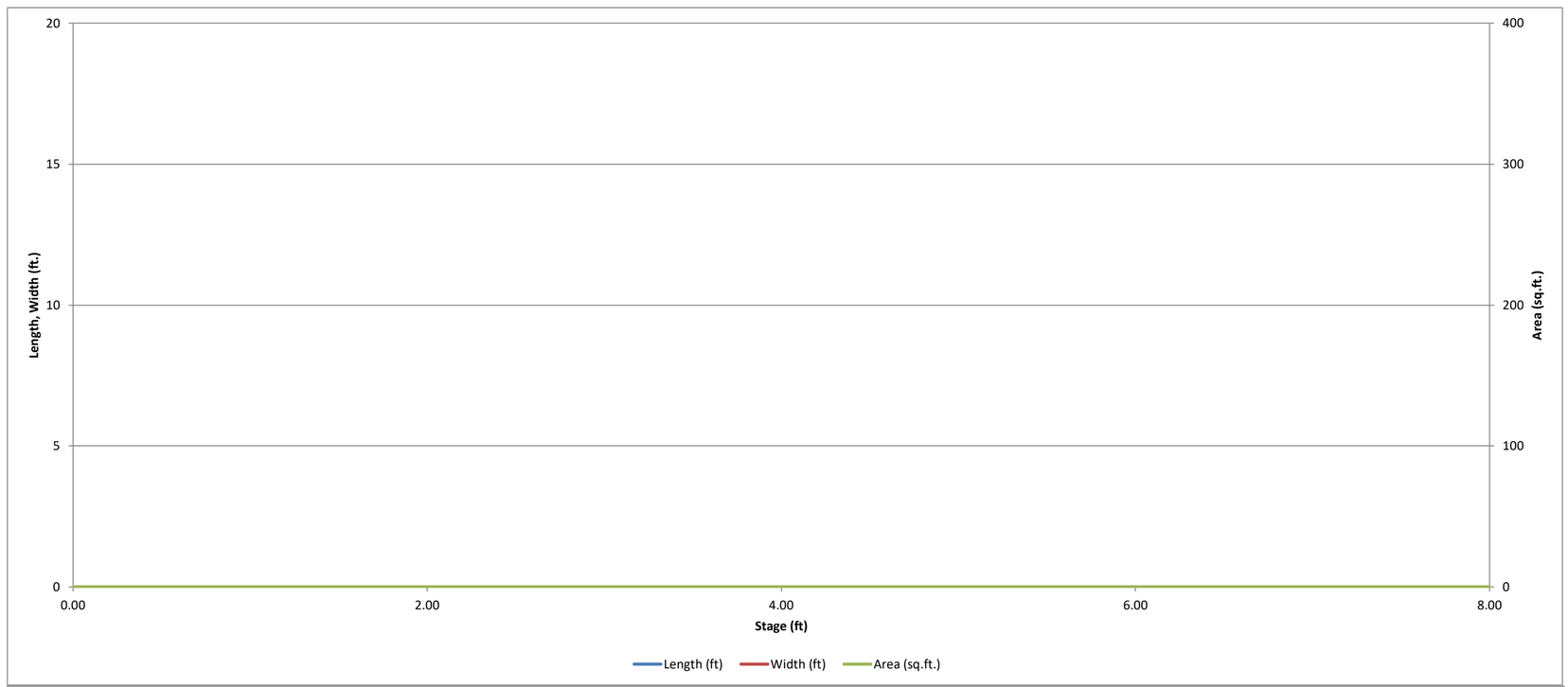
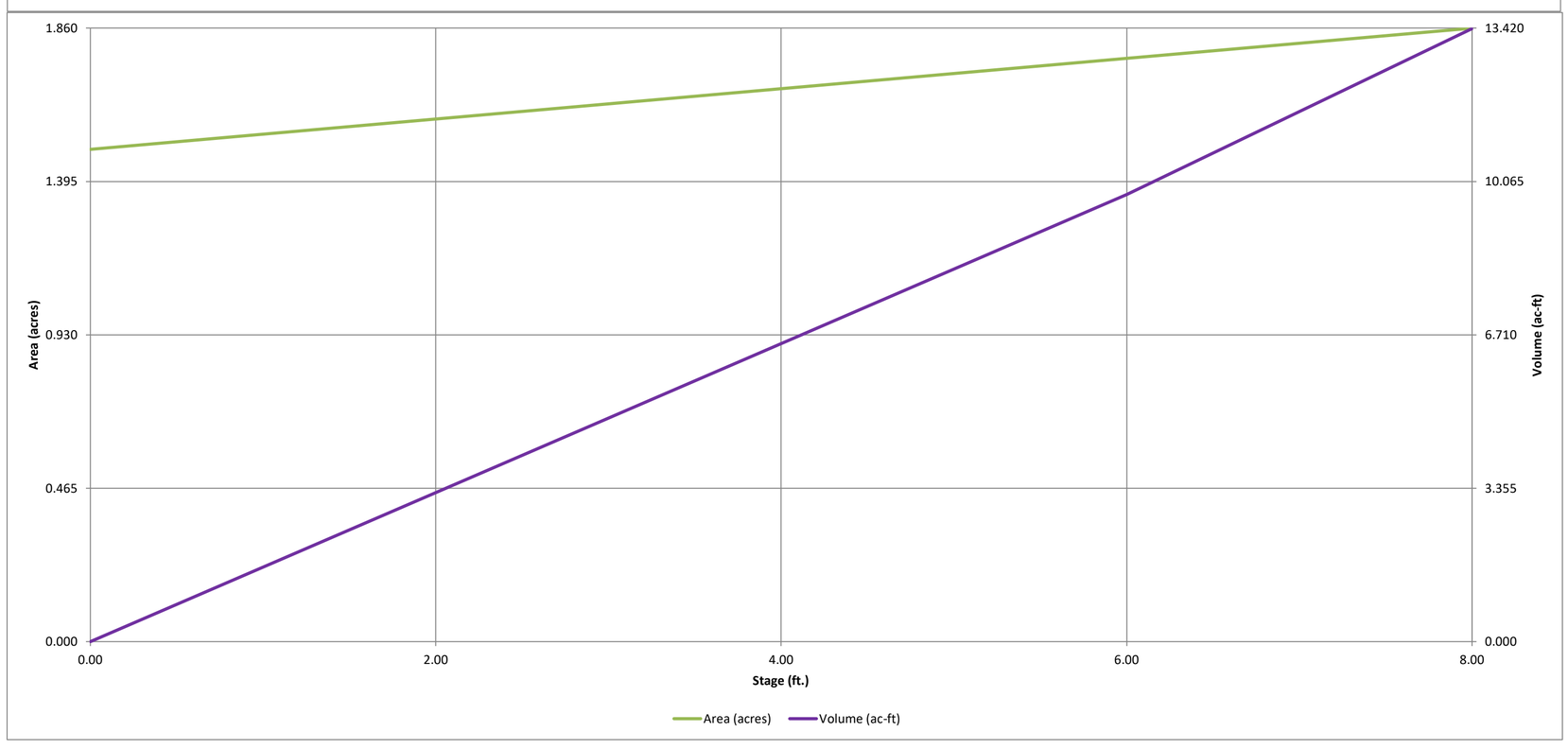
DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)



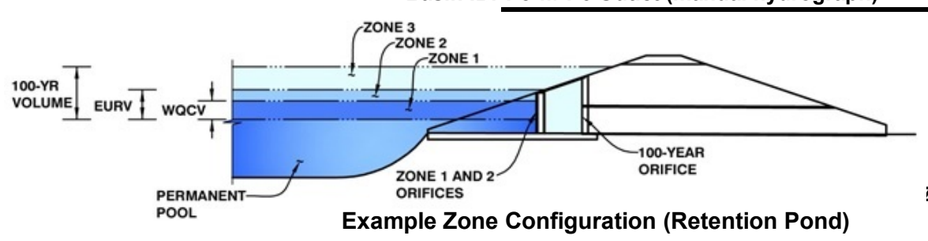


Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Winsome

Basin ID: P5 w/ P6 Outlet (manual hydrograph)



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	0.52	0.776	Orifice Plate
Zone 2 (EURV)	0.85	0.497	Circular Orifice
Zone 3 (100-year)	3.41	4.067	Weir&Pipe (Circular)
		5.340	Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	N/A	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft^2
Underdrain Orifice Centroid =	N/A	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	0.85	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	3.20	inches
Orifice Plate: Orifice Area per Row =	16.00	sq. inches (use rectangular openings)

Calculated Parameters for Plate

WQ Orifice Area per Row =	1.111E-01	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.30	0.60					
Orifice Area (sq. inches)	16.00	16.00	16.00					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Zone 2 Circular	Not Selected	
Invert of Vertical Orifice =	0.49	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	0.79	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	30.00	N/A	inches

Calculated Parameters for Vertical Orifice

	Zone 2 Circular	Not Selected	
Vertical Orifice Area =	4.91	N/A	ft^2
Vertical Orifice Centroid =	1.25	N/A	feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	3.00	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	8.00	N/A	feet
Overflow Weir Slope =	3.00	N/A	H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =	4.00	N/A	feet
Overflow Grate Open Area % =	85%	N/A	%, grate open area/total area
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	4.33	N/A	feet
Over Flow Weir Slope Length =	4.22	N/A	feet
Grate Open Area / 100-yr Orifice Area =	2.28	N/A	should be $\geq$ 4
Overflow Grate Open Area w/o Debris =	28.67	N/A	ft^2
Overflow Grate Open Area w/ Debris =	14.34	N/A	ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	0.00	N/A	ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =	48.00	N/A	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Circular	Not Selected	
Outlet Orifice Area =	12.57	N/A	ft^2
Outlet Orifice Centroid =	2.00	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	6.00	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	86.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

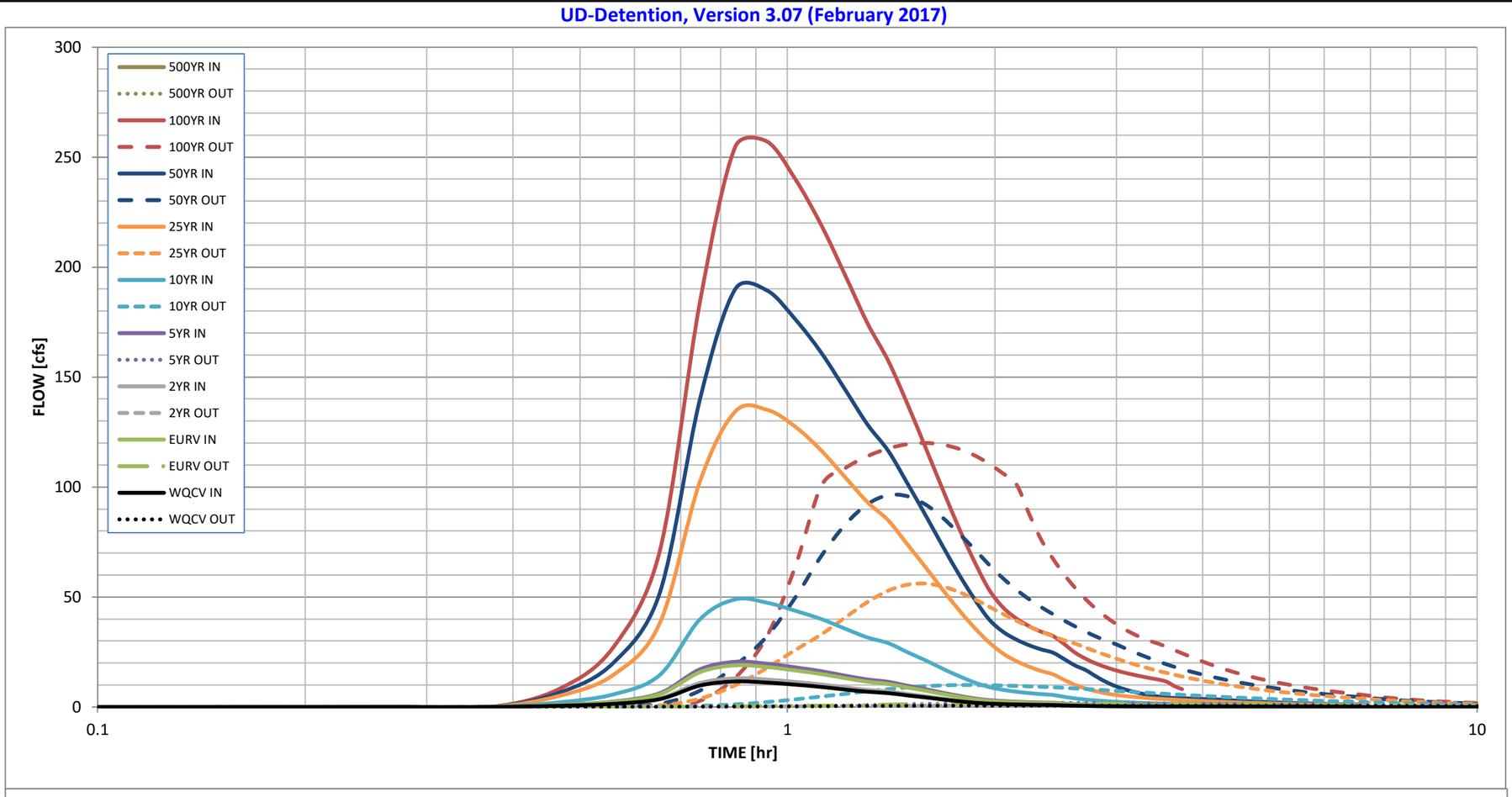
Spillway Design Flow Depth=	0.97	feet
Stage at Top of Freeboard =	7.97	feet
Basin Area at Top of Freeboard =	1.86	acres

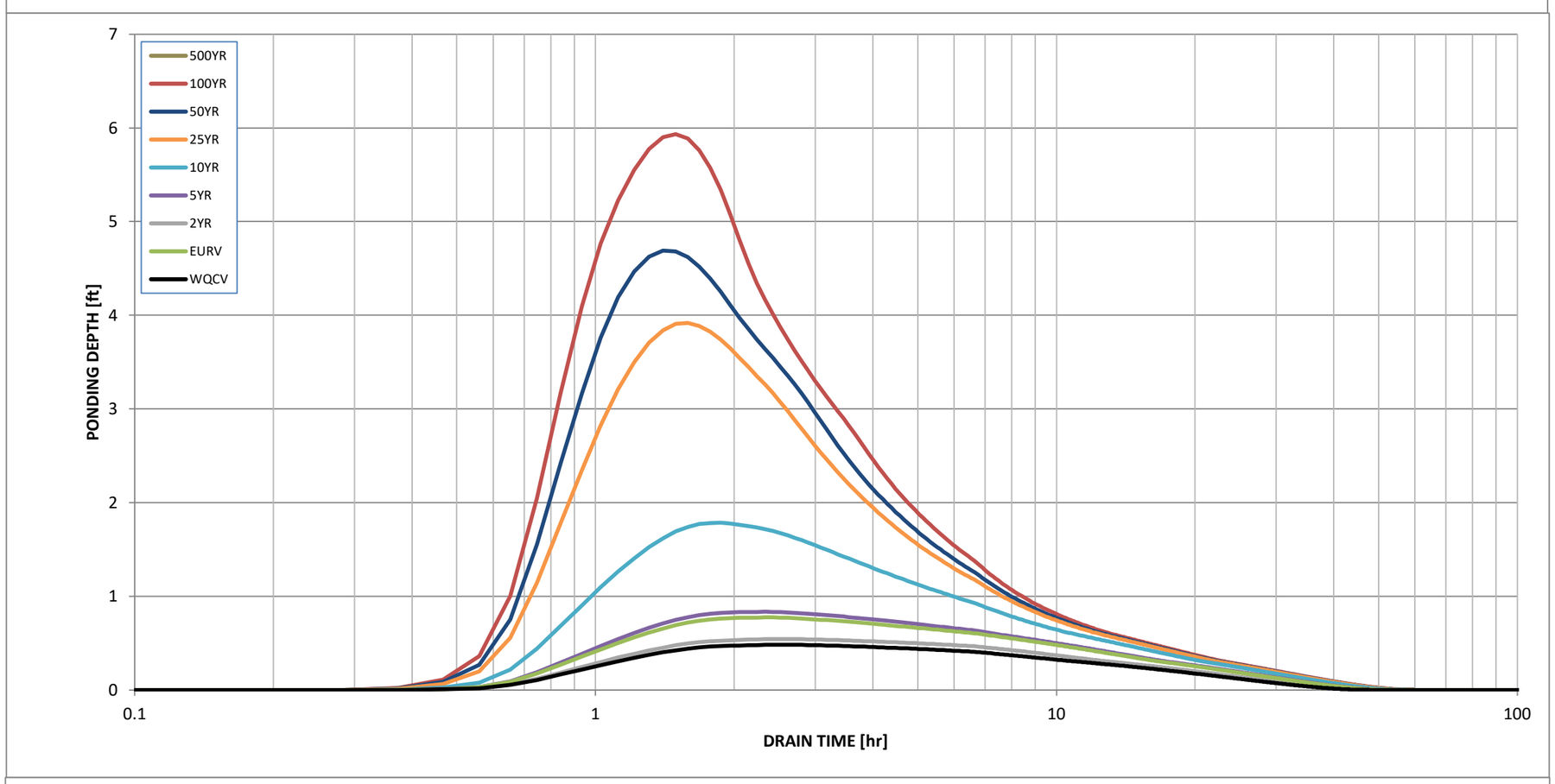
Routed Hydrograph Results

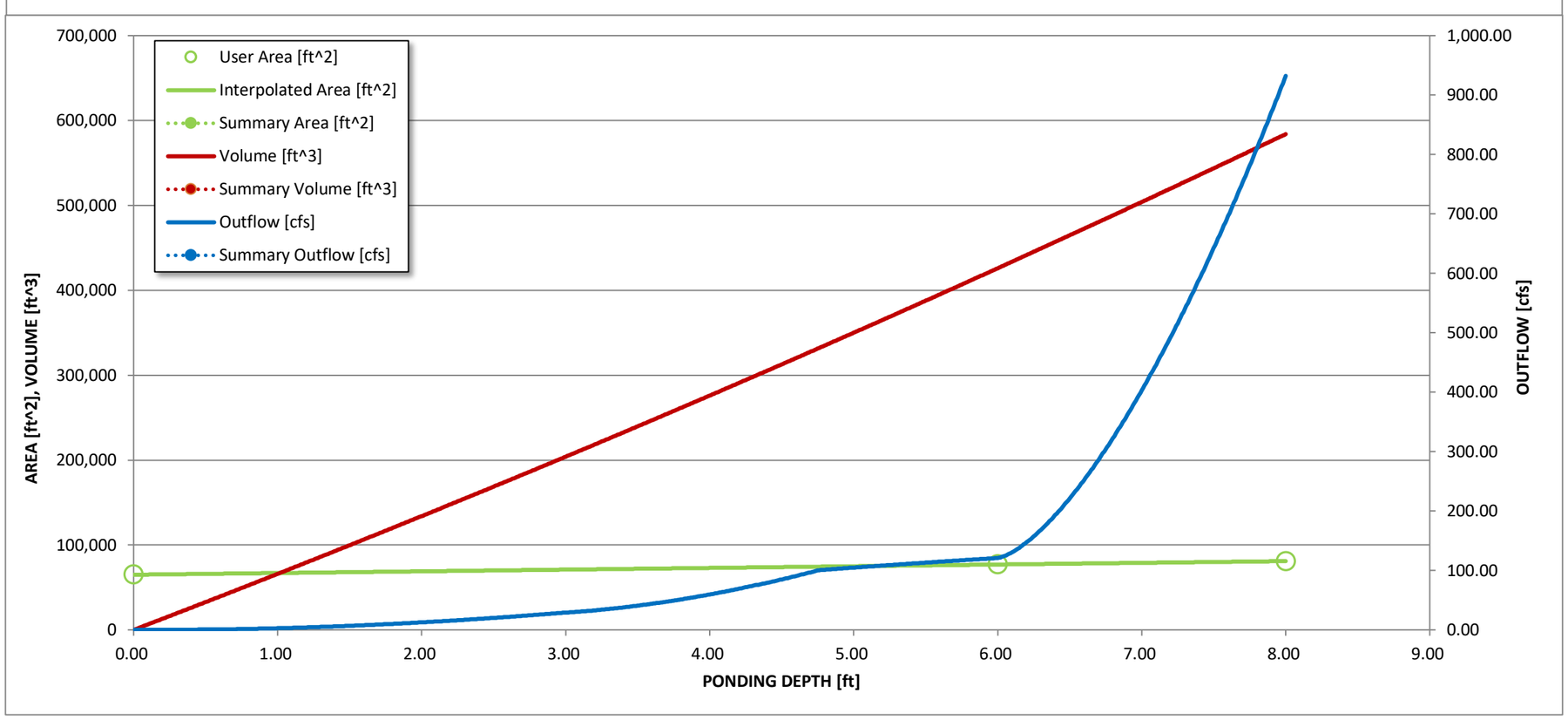
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	1.19	1.50	1.75	2.00	2.25	2.52	0.00
Calculated Runoff Volume (acre-ft) =	0.776	1.272	0.869	1.380	3.301	9.051	12.642	17.330	0.000
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.879	1.492	1.001	1.632	4.087	11.443	16.069	22.082	#N/A
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.01	0.02	0.17	0.58	0.80	1.08	0.00
Predevelopment Peak Q (cfs) =	0.0	0.0	1.6	3.0	26.1	88.1	121.9	164.8	0.0
Peak Inflow Q (cfs) =	11.6	19.0	13.0	20.6	48.9	135.2	190.0	257.1	#N/A
Peak Outflow Q (cfs) =	0.6	1.6	0.7	1.9	10.0	56.1	96.3	120.0	#N/A
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.6	0.4	0.6	0.8	0.7	#N/A
Structure Controlling Flow =	Plate	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Overflow Grate 1	Overflow Grate 1	Outlet Plate 1	#N/A
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	0.6	1.8	2.4	#N/A
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#N/A
Time to Drain 97% of Inflow Volume (hours) =	40	43	41	43	39	27	22	18	#N/A
Time to Drain 99% of Inflow Volume (hours) =	**44**	47	45	48	47	41	38	35	#N/A
Maximum Ponding Depth (ft) =	0.48	0.77	0.54	0.83	1.78	3.92	4.69	5.93	#N/A
Area at Maximum Ponding Depth (acres) =	1.51	1.53	1.52	1.53	1.57	1.67	1.71	1.76	#N/A
Maximum Volume Stored (acre-ft) =	0.722	1.163	0.812	1.254	2.729	6.185	7.503	9.656	#N/A

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)







S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

Detention Basin Outlet Structure Design

Outflow Hydrograph Workbook Filename:

Storm Inflow Hydrographs **UD-Detention, Version 3.07 (February 2017)**

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

	SOURCE	USER	USER	USER	USER	USER	USER	USER	USER	#N/A
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.60 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
	0:05:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	#N/A
Hydrograph	0:11:12	0.00	0.01	0.00	0.01	0.01	0.02	0.02	0.03	#N/A
Constant	0:16:48	0.01	0.02	0.02	0.02	0.03	0.05	0.06	0.06	#N/A
0.894	0:22:24	0.03	0.04	0.03	0.04	0.06	0.08	0.10	0.11	#N/A
	0:28:00	0.56	0.88	0.62	0.95	2.12	5.02	6.47	8.19	#N/A
	0:33:36	1.44	2.31	1.61	2.50	5.78	14.72	20.24	27.41	#N/A
	0:39:12	3.60	5.80	4.02	6.30	14.61	38.27	52.11	71.18	#N/A
	0:44:48	9.75	15.82	10.90	17.12	39.84	102.50	139.89	184.12	#N/A
	0:50:24	11.59	18.96	13.02	20.55	48.91	134.32	189.97	254.63	#N/A
	0:56:00	11.08	18.17	12.47	19.69	47.43	135.16	189.43	257.14	#N/A
	1:01:36	10.14	16.59	11.40	18.02	43.72	127.40	176.22	239.94	#N/A
	1:07:12	9.10	14.96	10.23	16.26	39.95	116.53	160.98	218.95	#N/A
	1:12:48	7.91	13.07	8.90	14.23	35.53	104.31	144.11	196.07	#N/A
	1:18:24	6.92	11.47	7.79	12.50	31.59	93.06	128.35	174.35	#N/A
	1:24:00	6.30	10.49	7.09	11.44	29.02	84.84	116.44	157.39	#N/A
	1:29:36	5.25	8.83	5.92	9.65	24.88	73.81	101.52	137.61	#N/A
	1:35:12	4.34	7.37	4.90	8.08	21.16	63.43	87.03	117.72	#N/A
	1:40:48	3.40	5.88	3.85	6.46	17.36	53.21	72.97	98.72	#N/A
	1:46:24	2.60	4.59	2.96	5.07	14.03	44.03	60.21	81.24	#N/A
	1:52:00	1.94	3.50	2.21	3.89	11.16	36.05	49.11	66.13	#N/A
	1:57:36	1.55	2.82	1.77	3.14	9.07	29.40	39.84	53.37	#N/A
	2:03:12	1.32	2.42	1.51	2.70	7.81	24.30	34.22	45.28	#N/A
	2:08:48	1.15	2.14	1.32	2.39	6.94	20.86	30.65	40.28	#N/A
	2:14:24	1.04	1.94	1.20	2.17	6.32	18.31	28.07	36.75	#N/A
	2:20:00	0.96	1.80	1.10	2.02	5.84	16.36	26.16	34.20	#N/A
	2:25:36	0.90	1.70	1.04	1.90	5.47	14.85	24.69	32.27	#N/A
	2:31:12	0.72	1.39	0.84	1.57	4.60	12.29	21.74	28.55	#N/A
	2:36:48	0.59	1.16	0.69	1.31	3.89	10.00	18.83	24.65	#N/A
	2:42:24	0.49	0.99	0.58	1.13	3.38	8.39	16.78	21.91	#N/A
	2:48:00	0.42	0.87	0.50	0.99	2.98	7.16	13.94	19.79	#N/A
	2:53:36	0.36	0.77	0.44	0.88	2.65	6.21	11.45	18.12	#N/A
	2:59:12	0.32	0.69	0.39	0.79	2.39	5.48	9.53	16.73	#N/A
	3:04:48	0.29	0.63	0.36	0.73	2.18	4.99	8.07	15.61	#N/A
	3:10:24	0.27	0.59	0.33	0.67	2.00	4.60	6.94	14.69	#N/A
	3:16:00	0.25	0.55	0.31	0.63	1.84	4.25	6.03	13.85	#N/A
	3:21:36	0.23	0.51	0.29	0.59	1.71	3.96	5.31	13.09	#N/A
	3:27:12	0.22	0.49	0.28	0.56	1.60	3.71	4.74	12.43	#N/A
	3:32:48	0.22	0.47	0.27	0.54	1.51	3.50	4.33	11.47	#N/A
	3:38:24	0.21	0.46	0.27	0.53	1.45	3.32	4.08	9.48	#N/A
	3:44:00	0.21	0.46	0.27	0.52	1.39	3.14	3.97	8.08	#N/A
	3:49:36	0.21	0.45	0.27	0.51	1.34	2.97	3.86	7.03	#N/A
	3:55:12	0.21	0.44	0.27	0.50	1.29	2.81	3.75	6.21	#N/A
	4:00:48	0.21	0.43	0.27	0.49	1.25	2.67	3.64	5.58	#N/A
	4:06:24	0.21	0.43	0.27	0.48	1.20	2.53	3.53	5.07	#N/A
	4:12:00	0.21	0.42	0.26	0.47	1.16	2.41	3.41	4.67	#N/A
	4:17:36	0.21	0.42	0.26	0.47	1.13	2.29	3.25	4.36	#N/A
	4:23:12	0.21	0.41	0.26	0.46	1.09	2.19	3.07	4.14	#N/A
	4:28:48	0.20	0.40	0.26	0.45	1.05	2.09	2.90	4.01	#N/A
	4:34:24	0.20	0.40	0.26	0.44	1.02	1.99	2.75	3.90	#N/A
	4:40:00	0.20	0.39	0.26	0.44	0.99	1.91	2.61	3.79	#N/A
	4:45:36	0.20	0.39	0.26	0.43	0.96	1.82	2.48	3.68	#N/A
	4:51:12	0.20	0.38	0.26	0.42	0.93	1.75	2.36	3.57	#N/A
	4:56:48	0.20	0.38	0.26	0.42	0.90	1.68	2.25	3.46	#N/A
	5:02:24	0.20	0.37	0.25	0.41	0.88	1.61	2.14	3.32	#N/A
	5:08:00	0.20	0.37	0.25	0.41	0.85	1.54	2.05	3.14	#N/A
	5:13:36	0.19	0.36	0.25	0.40	0.83	1.48	1.96	2.97	#N/A
	5:19:12	0.19	0.36	0.25	0.40	0.81	1.43	1.87	2.81	#N/A
	5:24:48	0.19	0.36	0.25	0.39	0.79	1.38	1.79	2.67	#N/A
	5:30:24	0.19	0.35	0.25	0.39	0.77	1.33	1.72	2.53	#N/A
	5:36:00	0.19	0.35	0.25	0.38	0.75	1.28	1.65	2.41	#N/A
	5:41:36	0.19	0.35	0.25	0.38	0.73	1.23	1.58	2.29	#N/A
	5:47:12	0.19	0.34	0.25	0.37	0.71	1.19	1.52	2.19	#N/A
	5:52:48	0.19	0.34	0.25	0.37	0.69	1.15	1.46	2.09	#N/A
	5:58:24	0.19	0.33	0.24	0.36	0.68	1.11	1.41	1.99	#N/A
	6:04:00	0.18	0.33	0.24	0.36	0.66	1.08	1.36	1.90	#N/A
	6:09:36	0.18	0.33	0.24	0.35	0.65	1.04	1.31	1.82	#N/A
	6:15:12	0.18	0.32	0.24	0.35	0.63	1.01	1.26	1.75	#N/A
	6:20:48	0.18	0.32	0.24	0.35	0.62	0.98	1.22	1.67	#N/A
	6:26:24	0.18	0.32	0.24	0.34	0.60	0.95	1.18	1.61	#N/A
	6:32:00	0.18	0.31	0.24	0.34	0.59	0.92	1.14	1.54	#N/A
	6:37:36	0.18	0.31	0.24	0.34	0.58	0.90	1.10	1.48	#N/A
	6:43:12	0.18	0.30	0.24	0.33	0.57	0.87	1.06	1.43	#N/A

5.1 BASIN RUNOFF SUMMARY

5-yr Existing				
Basin	Area	Peak Q	Time of Peak	Volume (In)
A	1.4303	87.10	26Feb2019, 12:24	0.18
Ba	5.9948	271.50	26Feb2019, 12:46	0.19
Bb	0.1572	19.20	26Feb2019, 12:20	0.14
Ca	0.2542	20.70	26Feb2019, 12:14	0.19
Cb	0.1094	9.90	26Feb2019, 12:18	0.11
Da	0.2520	20.60	26Feb2019, 12:14	0.19
Db	0.0780	5.70	26Feb2019, 12:18	0.19
Dc	0.3902	28.10	26Feb2019, 12:20	0.10
Ea	0.0592	5.40	26Feb2019, 12:10	0.19
Eb	0.1166	4.00	26Feb2019, 12:14	0.08
F	0.0695	6.60	26Feb2019, 12:18	0.11
G	0.1681	45.30	26Feb2019, 12:14	0.24
H	0.1903	34.80	26Feb2019, 12:16	0.17
I	0.0586	26.40	26Feb2019, 12:14	0.37
J	0.0158	3.40	26Feb2019, 12:10	0.25
K	0.0278	12.90	26Feb2019, 12:08	0.40

100-yr Existing				
Basin	Area	Peak Q	Time of Peak	Volume (In)
A	1.4303	585.90	26Feb2019, 12:26	0.65
Ba	5.9948	1448.90	26Feb2019, 12:48	0.63
Bb	0.1572	127.70	26Feb2019, 12:18	0.86
Ca	0.2542	127.80	26Feb2019, 12:16	0.63
Cb	0.1094	88.00	26Feb2019, 12:16	0.79
Da	0.2520	127.30	26Feb2019, 12:16	0.63
Db	0.0780	34.10	26Feb2019, 12:20	0.63
Dc	0.3902	275.70	26Feb2019, 12:18	0.74
Ea	0.0592	34.80	26Feb2019, 12:12	0.63
Eb	0.1166	85.80	26Feb2019, 12:16	0.76
F	0.0695	56.60	26Feb2019, 12:16	0.81
G	0.1681	199.00	26Feb2019, 12:14	1.42
H	0.1903	197.20	26Feb2019, 12:14	1.00
I	0.0586	88.50	26Feb2019, 12:12	2.03
J	0.0158	19.90	26Feb2019, 12:08	1.03
K	0.0278	45.10	26Feb2019, 12:08	1.78

5-yr Proposed				
Basin	Area	Peak Q	Time of Peak	Volume (In)
A1	1.3529	83.30	26Feb2019, 12:26	0.19
A2	0.0578	4.70	26Feb2019, 12:14	0.19
A3	0.0648	22.80	26Feb2019, 12:14	0.35
B1	5.9948	284.70	26Feb2019, 12:42	0.19
B2	0.0205	3.30	26Feb2019, 12:06	0.30
B3	0.0858	6.70	26Feb2019, 12:16	0.19
B4	0.0648	8.80	26Feb2019, 12:18	0.24
C1	0.2542	20.70	26Feb2019, 12:14	0.19
C2	0.0350	3.10	26Feb2019, 12:12	0.19
C3	0.0252	3.70	26Feb2019, 12:08	0.30
C4	0.0372	1.80	26Feb2019, 12:16	0.12
D1.1	0.2520	20.60	26Feb2019, 12:14	0.19
D1.2	0.0780	5.70	26Feb2019, 12:18	0.19
D2	0.1073	11.70	26Feb2019, 12:12	0.24
D3	0.0644	7.90	26Feb2019, 12:16	0.30
D4	0.0536	7.70	26Feb2019, 12:10	0.30
D5	0.0200	0.80	26Feb2019, 12:10	0.08
D6	0.0653	4.40	26Feb2019, 12:16	0.16
E0	0.0592	4.80	26Feb2019, 12:14	0.19
E1.1	0.0123	9.00	26Feb2019, 12:12	1.32
E1.2	0.0255	2.70	26Feb2019, 12:14	0.24
E2	0.0041	0.70	26Feb2019, 12:06	0.30
E3	0.0309	4.70	26Feb2019, 12:08	0.30
E4	0.0284	4.20	26Feb2019, 12:08	0.30
E5	0.0211	3.20	26Feb2019, 12:08	0.30
E6	0.0452	5.50	26Feb2019, 12:08	0.24
E7	0.0153	2.00	26Feb2019, 12:06	0.24
F1	0.0670	6.00	26Feb2019, 12:14	0.20
G1	0.0394	2.50	26Feb2019, 12:08	0.12
G2	0.0331	7.60	26Feb2019, 12:16	0.23
H1	0.0217	5.50	26Feb2019, 12:12	0.29
H2	0.0611	5.30	26Feb2019, 12:12	0.19
H3	0.0091	1.20	26Feb2019, 12:06	0.24
H4	0.0423	12.30	26Feb2019, 12:14	0.33
H5	0.0316	10.10	26Feb2019, 12:14	0.32
H6	0.0494	1.80	26Feb2019, 12:12	0.08
H7	0.0403	8.10	26Feb2019, 12:14	0.23
H8	0.0133	4.90	26Feb2019, 12:10	0.29
H9	0.0108	2.90	26Feb2019, 12:10	0.29
I1	0.0106	3.30	26Feb2019, 12:10	0.31
I2	0.0231	7.20	26Feb2019, 12:10	0.31
J1	0.0158	3.40	26Feb2019, 12:10	0.25
K1	0.0278	12.90	26Feb2019, 12:08	0.40

100-yr Proposed				
Basin	Area	Peak Q	Time of Peak	Volume (In)
A1	1.3529	481.80	26Feb2019, 12:28	0.63
A2	0.0578	43.40	26Feb2019, 12:16	0.86
A3	0.0648	85.40	26Feb2019, 12:14	1.77
B1	5.9948	1537.40	26Feb2019, 12:44	0.63
B2	0.0205	19.90	26Feb2019, 12:08	0.94
B3	0.0858	57.90	26Feb2019, 12:18	0.81
B4	0.0648	53.10	26Feb2019, 12:18	0.98
C1	0.2542	127.80	26Feb2019, 12:16	0.63
C2	0.0350	19.50	26Feb2019, 12:14	0.63
C3	0.0252	22.10	26Feb2019, 12:10	0.94
C4	0.0372	22.90	26Feb2019, 12:18	0.71
D1.1	0.2520	127.30	26Feb2019, 12:16	0.63
D1.2	0.0780	34.10	26Feb2019, 12:20	0.63
D2	0.1073	81.30	26Feb2019, 12:14	0.88
D3	0.0644	44.20	26Feb2019, 12:16	0.94
D4	0.0536	44.80	26Feb2019, 12:12	0.94
D5	0.0200	17.50	26Feb2019, 12:12	0.76
D6	0.0653	33.20	26Feb2019, 12:18	0.62
E0	0.0592	29.70	26Feb2019, 12:16	0.63
E1.1	0.0123	20.70	26Feb2019, 12:12	2.90
E1.2	0.0255	15.50	26Feb2019, 12:16	0.76
E2	0.0041	4.20	26Feb2019, 12:08	0.94
E3	0.0309	27.90	26Feb2019, 12:10	0.94
E4	0.0284	25.10	26Feb2019, 12:10	0.94
E5	0.0211	19.20	26Feb2019, 12:10	0.94
E6	0.0452	34.40	26Feb2019, 12:10	0.79
E7	0.0153	12.30	26Feb2019, 12:08	0.76
F1	0.0670	36.00	26Feb2019, 12:16	0.66
G1	0.0394	36.30	26Feb2019, 12:10	0.76
G2	0.0331	35.90	26Feb2019, 12:14	1.11
H1	0.0217	26.20	26Feb2019, 12:10	1.11
H2	0.0611	53.60	26Feb2019, 12:14	0.92
H3	0.0091	9.60	26Feb2019, 12:08	0.94
H4	0.0423	50.20	26Feb2019, 12:14	1.44
H5	0.0316	40.00	26Feb2019, 12:12	1.55
H6	0.0494	37.10	26Feb2019, 12:16	0.73
H7	0.0403	42.80	26Feb2019, 12:12	1.01
H8	0.0133	19.30	26Feb2019, 12:08	1.49
H9	0.0108	14.00	26Feb2019, 12:08	1.11
I1	0.0106	14.70	26Feb2019, 12:08	1.20
I2	0.0231	32.20	26Feb2019, 12:08	1.20
J1	0.0158	19.90	26Feb2019, 12:08	1.03
K1	0.0278	45.10	26Feb2019, 12:08	1.78

5.2 CONVEYANCE REACH SUMMARY

Reach Summary Table - 5 Year Existing Conditions				
Reach Name	Drainage Area (sq. mi.)	Peak Discharge (cfs)	Time of Peak	Volume (in)
1	5.9948	271.40	26Feb2019, 12:50	0.19
2	7.9459	348.70	26Feb2019, 12:46	0.19
3	9.0245	397.40	26Feb2019, 12:40	0.18
4	9.0245	397.20	26Feb2019, 12:46	0.18
5	9.3284	408.60	26Feb2019, 12:44	0.18
6	0.2542	20.20	26Feb2019, 12:22	0.19
7	0.2520	20.00	26Feb2019, 12:28	0.19
8	0.0780	5.60	26Feb2019, 12:30	0.19
9	0.0592	5.00	26Feb2019, 12:36	0.19

Reach Summary Table - 100 Year Existing Conditions				
Reach Name	Drainage Area (sq. mi.)	Peak Discharge (cfs)	Time of Peak	Volume (in)
1	5.9948	1448.60	26Feb2019, 12:50	0.63
2	7.9459	1964.00	26Feb2019, 12:42	0.64
3	9.0245	2352.60	26Feb2019, 12:36	0.67
4	9.0245	2351.60	26Feb2019, 12:38	0.67
5	9.3284	2470.00	26Feb2019, 12:36	0.68
6	0.2542	127.50	26Feb2019, 12:22	0.62
7	0.2520	126.30	26Feb2019, 12:26	0.62
8	0.0780	34.00	26Feb2019, 12:28	0.62
9	0.0592	34.30	26Feb2019, 12:28	0.62

Reach Summary Table - 5 Year Proposed Conditions				
Reach Name	Drainage Area (sq. mi.)	Peak Discharge (cfs)	Time of Peak	Volume (in)
BOX CULVERT 1	7.9557	376.70	26Feb2019, 12:42	0.19
BOX CULV 2	8.9615	424.90	26Feb2019, 12:48	0.19
CLV E4	0.0634	9.20	26Feb2019, 12:12	0.30
CULV B2	0.0205	3.30	26Feb2019, 12:06	0.30
CULV C2	0.2892	23.40	26Feb2019, 12:16	0.19
CULV C3	0.3144	26.10	26Feb2019, 12:18	0.20
CULV D2	0.3594	31.20	26Feb2019, 12:18	0.21
CULV D3	0.1423	13.10	26Feb2019, 12:20	0.24
CULV D4	0.1959	18.60	26Feb2019, 12:18	0.25
CULV E1.2	0.0970	7.70	26Feb2019, 12:26	0.35
CULV E2	0.0041	0.70	26Feb2019, 12:06	0.30
CULV E5	0.0211	3.20	26Feb2019, 12:08	0.30
CULV H2	0.0611	5.30	26Feb2019, 12:12	0.19
CULV H3	0.0091	1.20	26Feb2019, 12:06	0.24
CULV I1	0.0106	3.30	26Feb2019, 12:10	0.31
CULV-E3	0.0350	5.30	26Feb2019, 12:10	0.30
EX CULV C1	0.2542	20.70	26Feb2019, 12:14	0.19
EX CULV D1.1	0.2520	20.60	26Feb2019, 12:14	0.19
EX CULV D1.2	0.0780	5.70	26Feb2019, 12:18	0.19
EX CULV E0	0.0592	4.80	26Feb2019, 12:14	0.19
OUT 2	0.0445	9.50	26Feb2019, 12:24	0.30
OUT-1	9.2839	444.50	26Feb2019, 12:50	0.20
REACH A1	1.3529	83.10	26Feb2019, 12:32	0.19
Reach H7	0.0494	9.20	26Feb2019, 12:14	0.23
Reach-A2	0.0648	22.70	26Feb2019, 12:16	0.35
Reach-B1	5.9948	284.50	26Feb2019, 12:46	0.19
Reach-B2	0.0205	3.20	26Feb2019, 12:14	0.30
Reach-B3	6.0806	286.80	26Feb2019, 12:50	0.19
Reach-B4-3	0.3144	26.10	26Feb2019, 12:18	0.20
Reach-C1	0.2542	20.60	26Feb2019, 12:18	0.19
Reach-C2	0.2892	23.40	26Feb2019, 12:20	0.19
Reach-D1.1	0.2520	20.60	26Feb2019, 12:20	0.19
Reach-D3	0.0780	5.70	26Feb2019, 12:24	0.19
Reach-D4	0.1423	13.10	26Feb2019, 12:24	0.24
Reach-D5	0.3594	31.10	26Feb2019, 12:22	0.21
Reach-D6	0.1959	18.60	26Feb2019, 12:24	0.25
Reach-E1.1	0.0592	4.70	26Feb2019, 12:24	0.19
Reach-E1.2	0.0716	6.30	26Feb2019, 12:40	0.38
Reach-E3	0.0041	0.70	26Feb2019, 12:14	0.30
Reach-E4	0.0350	5.20	26Feb2019, 12:14	0.30
Reach-E6	0.0211	3.20	26Feb2019, 12:14	0.30
Reach-E6-2	0.2428	18.50	26Feb2019, 12:34	0.29
Reach-E7	0.0634	9.10	26Feb2019, 12:16	0.30
Reach-F1	0.0970	7.70	26Feb2019, 12:30	0.35
Reach-F1-2	0.1641	12.40	26Feb2019, 12:34	0.29
Reach-G2	0.0394	2.50	26Feb2019, 12:14	0.12
Reach-H4	0.0217	5.40	26Feb2019, 12:16	0.29
Reach-H6	0.0611	5.30	26Feb2019, 12:14	0.19
Reach-H7-1	0.0091	1.20	26Feb2019, 12:12	0.24
Reach-H9	0.0338	10.30	26Feb2019, 12:12	0.31
Reach-I2-1	0.0106	3.30	26Feb2019, 12:12	0.31
Reach-P3	0.2613	21.30	26Feb2019, 12:28	0.23
Reach-1	7.9557	376.70	26Feb2019, 12:44	0.19
Reach-2	8.1295	388.30	26Feb2019, 12:46	0.19
Reach-3	8.5404	405.10	26Feb2019, 12:46	0.19
Reach-4	8.6509	408.80	26Feb2019, 12:48	0.19
Reach-5	8.9615	424.80	26Feb2019, 12:48	0.19
Reach-6 Kiowa Outfall	9.3284	447.40	26Feb2019, 12:48	0.20

Reach Summary Table - 100 Year Proposed Conditions				
Reach Name	Drainage Area (sq. mi.)	Peak Discharge (cfs)	Time of Peak	Volume (in)
BOX CULVERT 1	7.9557	2062.20	26Feb2019, 12:40	0.65
BOX CULV 2	8.9615	2321.10	26Feb2019, 12:44	0.67
CLV E4	0.0634	55.70	26Feb2019, 12:12	0.93
CULV B2	0.0205	19.90	26Feb2019, 12:08	0.94
CULV C2	0.2892	145.80	26Feb2019, 12:18	0.63
CULV C3	0.3144	162.10	26Feb2019, 12:18	0.65
CULV D2	0.3594	203.70	26Feb2019, 12:18	0.70
CULV D3	0.1423	75.70	26Feb2019, 12:20	0.76
CULV D4	0.1959	108.50	26Feb2019, 12:20	0.81
CULV E1.2	0.0970	24.20	26Feb2019, 12:20	0.95
CULV E2	0.0041	4.10	26Feb2019, 12:08	0.94
CULV E5	0.0211	19.20	26Feb2019, 12:10	0.94
CULV H2	0.0611	53.60	26Feb2019, 12:14	0.92
CULV H3	0.0091	9.60	26Feb2019, 12:08	0.94
CULV I1	0.0106	14.60	26Feb2019, 12:08	1.20
CULV-E3	0.0350	31.80	26Feb2019, 12:10	0.93
EX CULV C1	0.2542	127.70	26Feb2019, 12:16	0.63
EX CULV D1.1	0.2520	127.20	26Feb2019, 12:16	0.63
EX CULV D1.2	0.0780	34.00	26Feb2019, 12:20	0.63
EX CULV E0	0.0592	29.70	26Feb2019, 12:16	0.63
OUT 2	0.0445	28.80	26Feb2019, 12:26	1.17
OUT-1	9.2839	2413.10	26Feb2019, 12:44	0.68
REACH A1	1.3529	480.90	26Feb2019, 12:32	0.63
Reach H7	0.0494	52.20	26Feb2019, 12:12	1.00
Reach-A2	0.0648	85.30	26Feb2019, 12:14	1.77
Reach-B1	5.9948	1537.10	26Feb2019, 12:46	0.63
Reach-B2	0.0205	19.80	26Feb2019, 12:14	0.93
Reach-B3	6.0806	1552.00	26Feb2019, 12:48	0.64
Reach-B4-3	0.3144	161.70	26Feb2019, 12:18	0.65
Reach-C1	0.2542	127.70	26Feb2019, 12:18	0.63
Reach-C2	0.2892	145.80	26Feb2019, 12:20	0.63
Reach-D1.1	0.2520	126.70	26Feb2019, 12:20	0.62
Reach-D3	0.0780	33.90	26Feb2019, 12:24	0.62
Reach-D4	0.1423	75.40	26Feb2019, 12:24	0.76
Reach-D5	0.3594	203.10	26Feb2019, 12:20	0.70
Reach-D6	0.1959	108.50	26Feb2019, 12:22	0.81
Reach-E1.1	0.0592	29.70	26Feb2019, 12:22	0.62
Reach-E1.2	0.0716	14.10	26Feb2019, 12:50	1.02
Reach-E3	0.0041	4.10	26Feb2019, 12:12	0.93
Reach-E4	0.0350	31.70	26Feb2019, 12:14	0.93
Reach-E6	0.0211	19.00	26Feb2019, 12:12	0.93
Reach-E6-2	0.2428	103.80	26Feb2019, 12:26	0.85
Reach-E7	0.0634	55.70	26Feb2019, 12:14	0.93
Reach-F1	0.0970	24.10	26Feb2019, 12:22	0.95
Reach-F1-2	0.1641	58.40	26Feb2019, 12:28	0.83
Reach-G2	0.0394	36.00	26Feb2019, 12:12	0.76
Reach-H4	0.0217	26.10	26Feb2019, 12:12	1.11
Reach-H6	0.0611	53.40	26Feb2019, 12:14	0.92
Reach-H7-1	0.0091	9.60	26Feb2019, 12:12	0.94
Reach-H9	0.0338	46.50	26Feb2019, 12:10	1.20
Reach-I2-1	0.0106	14.50	26Feb2019, 12:10	1.20
Reach-P3	0.2613	95.50	26Feb2019, 12:36	0.76
Reach-1	7.9557	2061.70	26Feb2019, 12:42	0.65
Reach-2	8.1295	2100.20	26Feb2019, 12:44	0.66
Reach-3	8.5404	2195.30	26Feb2019, 12:42	0.66
Reach-4	8.6509	2219.80	26Feb2019, 12:44	0.67
Reach-5	8.9615	2320.80	26Feb2019, 12:44	0.67
Reach-6 Kiowa Outfall	9.3284	2437.30	26Feb2019, 12:44	0.68

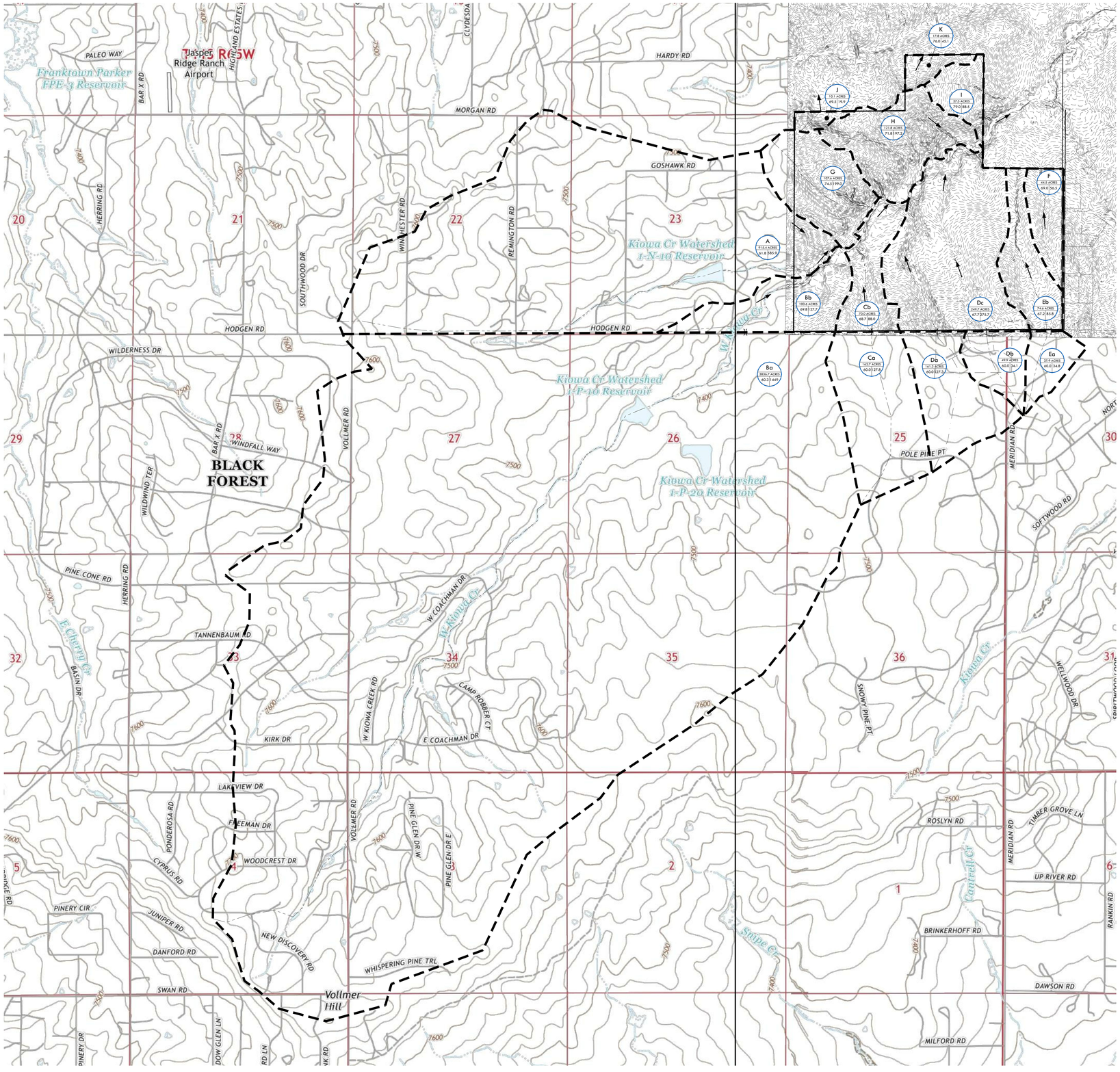
10.0 DRAINAGE PLANS

PRELIMINARY PLAN SET

WINSOME SUBDIVISION

A PARCEL OF PROPERTY LOCATED IN SECTIONS 13 & 24, TOWNSHIP 11 SOUTH, RANGE 65 WEST OF THE 6TH P.M. AND IN THE WEST HALF OF THE WEST HALF OF SECTION 19, TOWNSHIP 11 SOUTH, RANGE 64 WEST OF THE 6TH P.M., COUNTY OF EL PASO, STATE OF COLORADO

0' 1000' 2000'



EXISTING STORMWATER RUNOFF TABLE

BASIN	BASIN AREA (ACRES)	CURVE NUMBER	Q_{100}
A	915.4	61.8	585.9
Ba	3836.7	60.3	1448.9
Bb	100.6	69.8	127.7
Ca	162.7	60.0	127.8
Cb	70.0	68.7	88.0
Da	161.3	60.0	127.3
Db	49.9	60.0	34.1
Dc	249.7	67.7	275.7
Ea	37.9	60.0	34.8
Eb	74.6	67.2	85.8
F	44.5	69.0	56.6
G	107.6	74.5	199.0
H	121.8	71.8	197.2
I	37.5	79.0	88.5
J	10.1	69.5	19.9
K	17.8	76.0	45.1
	5998.1		

Drainage map to remain

LEGEND

- PROPERTY BOUNDARY LINE
- 5540 EXISTING CONTOUR
- DRAINAGE BASIN BOUNDARY
- DRAINAGE BASIN FLOW PATH
- A — BASIN NAME
- 4.09 ACRES — DRAINAGE BASIN SIZE
- 4.73 | 14.05 — 100-YEAR RUNOFF / CURVE NUMBER
- FLOW ARROWS

PCD FILE NO SP-18-006

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COLORADO LICENSED
NICK PAUL PETRONIS
5/16/19
43911
Professional Engineer
5/16/2019

EXISTING DRAINAGE PLAN - OVERALL

SITE: 17480 MERIDIAN ROAD
ELBERT, COLORADO 80106

FOR: PT MCCUNE, LLC
1864 WOODMORE DR, SUITE 100
MONUMENT, COLORADO 80132

NO.	REVISIONS
1	1/11/19 PRELIMINARY RESUBMITTAL
2	3/8/19 PRELIMINARY RESUBMITTAL
3	4/11/19 PRELIMINARY RESUBMITTAL
4	5/10/19 PRELIMINARY RESUBMITTAL
5	
6	
7	
8	
9	
10	

DATE: 1/11/19
DRAWN BY: JCP
CHECKED BY: LPV
JOB #: 49388

C1.1

PRELIMINARY PLAN SET

WINSOME SUBDIVISION

A PARCEL OF PROPERTY LOCATED IN SECTIONS 13 & 24, TOWNSHIP 11 SOUTH, RANGE 65 WEST OF THE 6TH P.M. AND IN THE WEST HALF OF THE WEST HALF OF SECTION 19, TOWNSHIP 11 SOUTH, RANGE 64 WEST OF THE 6TH P.M., COUNTY OF EL PASO, STATE OF COLORADO

0' 200' 2000'

COLORADO 811 — KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

E1 MAIN OUTFALL+E5+E6+E7 Q5=408.6CFS Q100=2470.0CFS

E2 OFFSITE FLOW Q5=3.4CFS Q100=19.9CFS

E3 OFFSITE FLOW Q5=12.9CFS Q100=45.1CFS

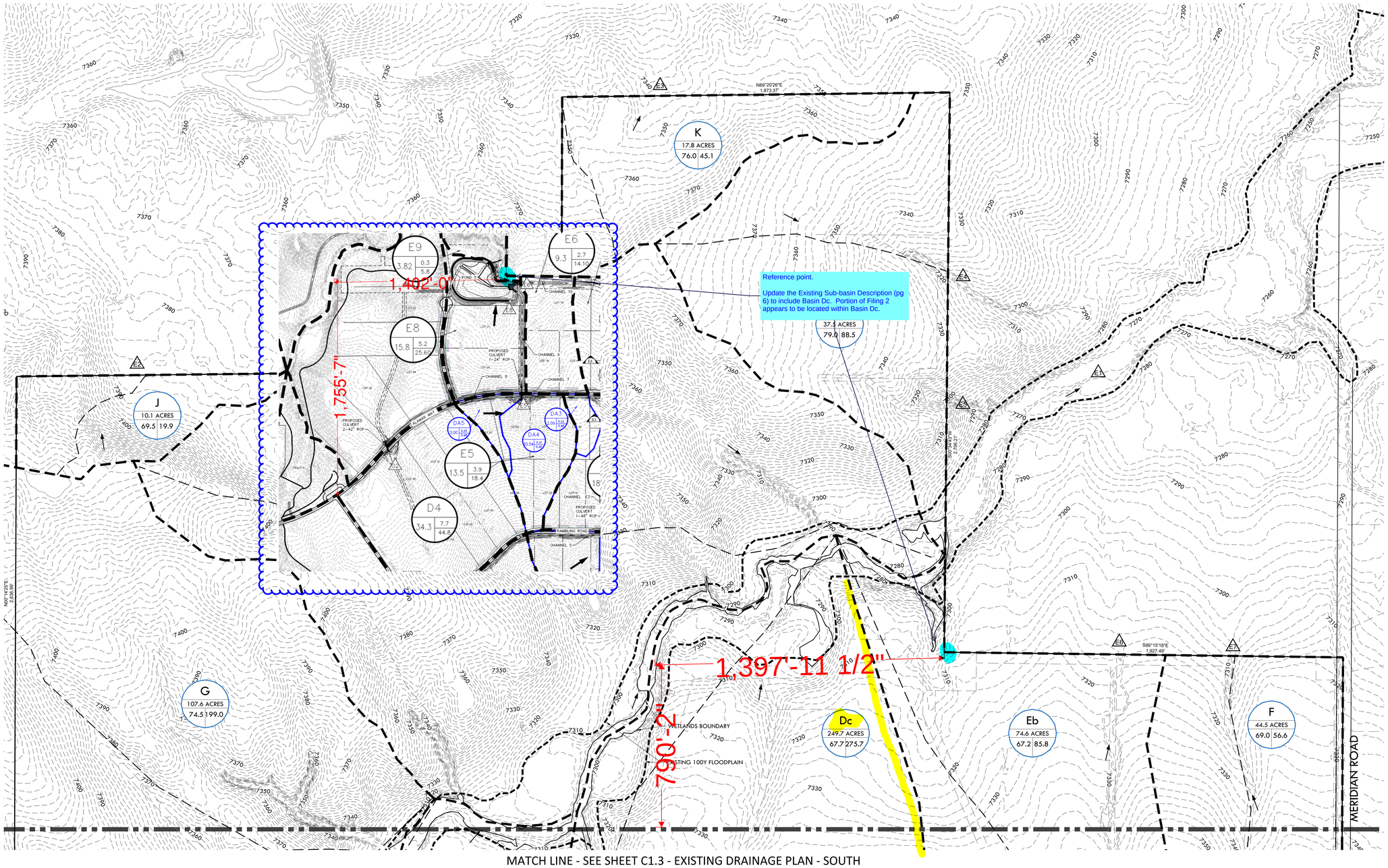
E4 + E5 OFFSITE FLOW Q5=26.4CFS Q100=88.5CFS

E6 OFFSITE FLOW Q5=9.4CFS Q100=85.8CFS

E7 OFFSITE FLOW Q5=6.6CFS Q100=56.6CFS

NOTES:

1. EXISTING FLOODPLAIN AS SHOWN BASED ON FIRM MAP #08041C0350G PANEL 350 REVISED 12/7/2018, GENERATED BY GRAPHICAL OVERLAY.



MATCH LINE - SEE SHEET C1.3 - EXISTING DRAINAGE PLAN - SOUTH

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COLORADO LICENSED PROFESSIONAL ENGINEER 5/16/19 43911

EXISTING DRAINAGE PLAN - NORTH

SITE: 17480 MERIDIAN ROAD
ELBERT, COLORADO 80106

FOR: PT MCCUNE, LLC
1864 WOODMORE DR, SUITE 100
MONUMENT, COLORADO 80132

NO.	REVISIONS
1	1/11/19 PRELIMINARY RESUBMITTAL
2	3/8/19 PRELIMINARY RESUBMITTAL
3	4/11/19 PRELIMINARY RESUBMITTAL
4	5/10/19 PRELIMINARY RESUBMITTAL
5	
6	
7	
8	
9	
10	

DATE: 1/11/19
DRAWN BY: JCP
CHECKED BY: LPV
JOB #: 49388

C1.2

PCD FILE NO SP-18-006

P:\Shared\Projects\49000-49999\49300-49399\49388.McCune Ranch\06-Engineering\Vertex Drawings\PD\49388-PD-Drainage_Existing - ZOOM.dwg
Thursday, May 16, 2019 1:31:20 PM

PRELIMINARY PLAN SET

WINSOME SUBDIVISION

A PARCEL OF PROPERTY LOCATED IN SECTIONS 13 & 24, TOWNSHIP 11 SOUTH, RANGE 65 WEST OF THE 6TH P.M. AND IN THE WEST HALF OF THE WEST HALF OF SECTION 19, TOWNSHIP 11 SOUTH, RANGE 64 WEST OF THE 6TH P.M., COUNTY OF EL PASO, STATE OF COLORADO

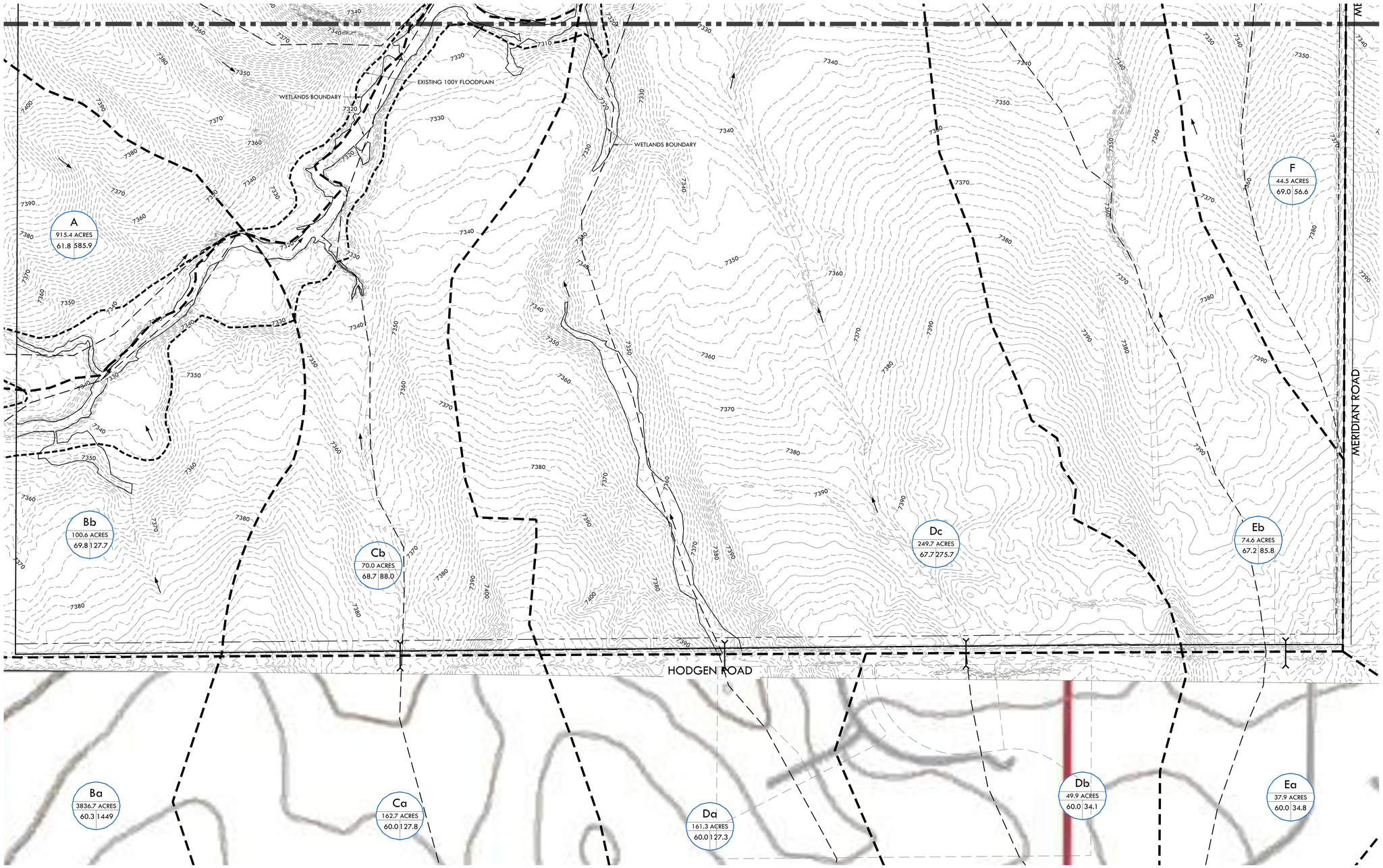
0' 200' 400'

NOTES:

1. EXISTING FLOODPLAIN AS SHOWN BASED ON FIRM MAP #08041C0350G
NERATED BY GRAPHICAL OVERLAY.

Drainage map to remain

MATCH LINE - SEE SHEET C1.2 - EXISTING DRAINAGE PLAN - NORTH



PCD FILE NO SP-18-006

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5/16/19
43911

EXISTING DRAINAGE PLAN - SOUTH

SITE: 17480 MERIDIAN ROAD
ELBERT, COLORADO 80106

FOR: PT MCCUNE, LLC
1864 WOODMORE DR, SUITE 100
MONUMENT, COLORADO 80132

NO.	REVISIONS
1	1/11/19 PRELIMINARY RESUBMITTAL
2	3/8/19 PRELIMINARY RESUBMITTAL
3	4/11/19 PRELIMINARY RESUBMITTAL
4	5/10/19 PRELIMINARY RESUBMITTAL
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DATE: 1/11/19
DRAWN BY: JCP
CHECKED BY: LPV
JOB #: 49388

C1.3

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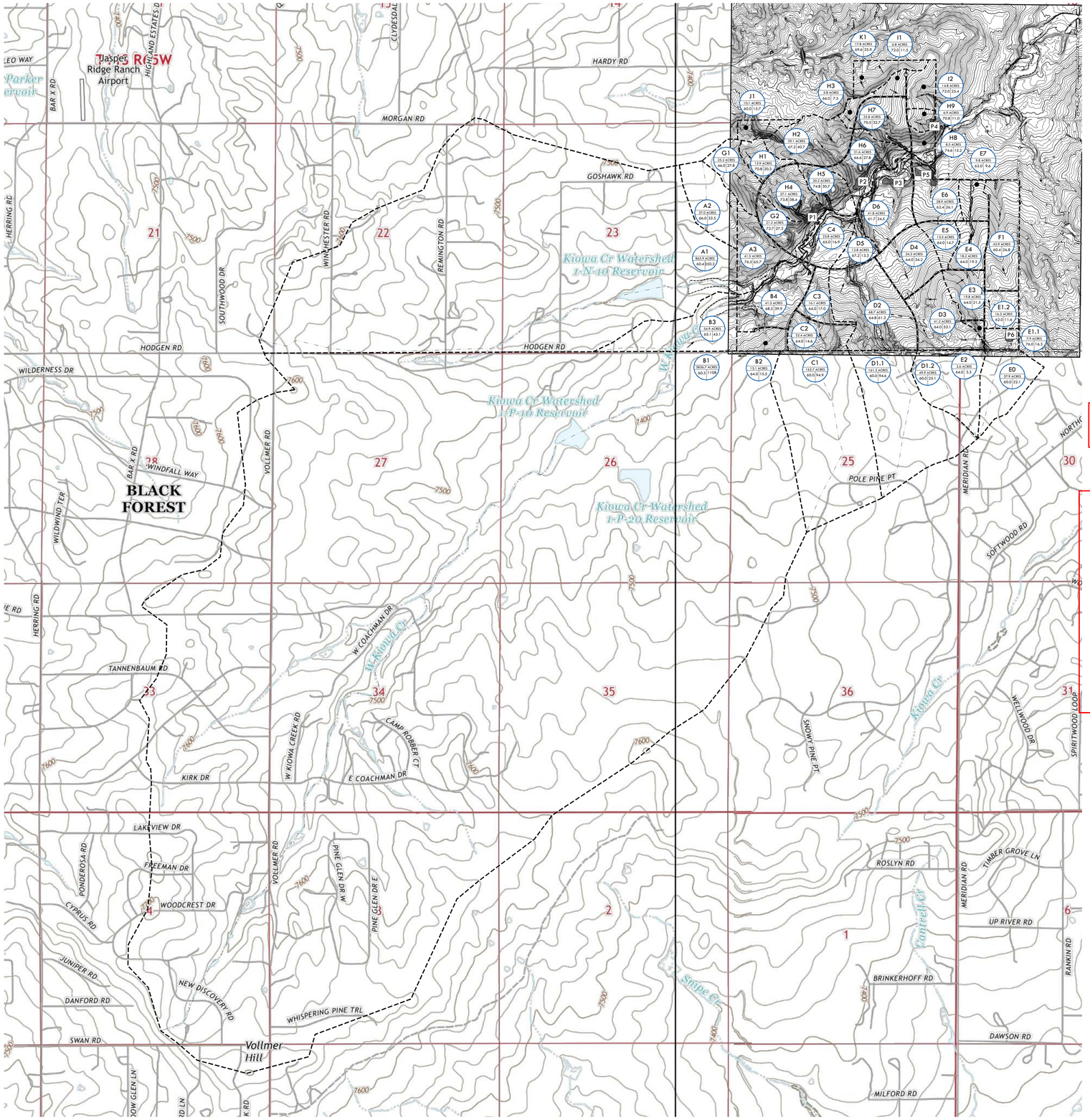
PRELIMINARY PLAN SET

WINSOME SUBDIVISION

A PARCEL OF PROPERTY LOCATED IN SECTIONS 13 & 24, TOWNSHIP 11 SOUTH, RANGE 65 WEST OF THE 6TH P.M. AND IN THE WEST HALF OF THE WEST HALF OF SECTION 19, TOWNSHIP 11 SOUTH, RANGE 64 WEST OF THE 6TH P.M., COUNTY OF EL PASO, STATE OF COLORADO



PROPOSED STORMWATER RUNOFF

BASIN	BASIN AREA (ACRES)	CURVE NUMBER	Q_{100}
A1	865.9	60.4	350.3
A2	37.0	66.0	32.5
A3	41.5	76.5	65.7
B1	3836.7	60.3	1107.9
B2	13.1	64.0	15.5
B3	54.9	65.1	43.1
B4	41.5	68.5	39.9
C1	162.7	60.0	94.9
C2	22.4	64.0	14.6
C3	16.1	64.0	17.0
C4	23.8	65.0	16.9
D1.1	161.3	60.0	94.6
D1.2	49.9	60.0	25.1
D2	68.7	64.8	61.3
D3	41.2	64.0	33.1
D4	34.3	64.0	34.2
D5	12.8	67.2	13.3
D6	41.8	61.7	24.5
E0	37.9	60.0	22.1
E1.1	7.9	76.0	16.3
E1.2	16.3	62.0	11.6
E2	2.6	64.0	3.3
E3	19.8	64.0	21.5
E4	18.2	64.0	19.3
E5	13.5	64.0	14.7
E6	28.9	62.4	26.1
E7	9.8	62.0	9.6
F1	42.9	60.4	26.8
G1	25.2	66.0	27.8
G2	21.2	72.7	27.3
H1	13.9	70.8	20.3
H2	39.1	67.2	40.7
H3	5.8	66.0	7.5
H4	27.1	73.8	38.4
H5	20.2	74.8	30.7
H6	31.6	66.6	27.8
H7	25.8	70.5	32.7
H8	8.5	74.6	15.2
H9	6.9	70.8	11.0
I1	6.8	72.0	11.5
I2	14.8	72.0	25.4
J1	10.1	69.5	15.7
K1	17.8	76.0	35.9
	5998.2		

DETENTION POND SUMMARY

POND NUMBER	PROPOSED VOLUME	FLOW EXITING POND
1	8.0 AC-FT	31.9 CFS
2	7.4 AC-FT	35.1 CFS
3	7.1 AC-FT	126.8 CFS
4	1.5 AC-FT	30.6 CFS
5	9.7 AC-FT	120.0 CFS
6	4.0 AC-FT	18.0 CFS

LEGEND

- PROPERTY BOUNDARY LINE
- 5540 PROPOSED CONTOUR
- 5540 EXISTING CONTOUR
- DRAINAGE BASIN BOUNDARY
- DRAINAGE BASIN FLOW PATH

A — BASIN NAME
4.09 ACRES — DRAINAGE BASIN SIZE
4.73 | 14.05 — 100-YEAR RUNOFF; CURVE NUMBER
FLOW ARROWS

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COLORADO LICENSED
PAUL T. MCCUNE
5/16/19
43911
Professional Engineer

PROPOSED DRAINAGE PLAN - OVERALL

SITE: 17480 MERIDIAN ROAD
ELBERT, COLORADO 80106

FOR: PT MCCUNE, LLC
1864 WOODMORE DR, SUITE 100
MONUMENT, COLORADO 80132

NO.	REVISIONS
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JOB #: 49388

C2.1

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PRELIMINARY PLAN SET

WINSOME SUBDIVISION

A PARCEL OF PROPERTY LOCATED IN SECTIONS 13 & 24, TOWNSHIP 11 SOUTH, RANGE 65 WEST OF THE 6TH P.M. AND IN THE WEST HALF OF THE WEST HALF OF SECTION 19, TOWNSHIP 11 SOUTH, RANGE 64 WEST OF THE 6TH P.M., COUNTY OF EL PASO, STATE OF COLORADO

0' 200' 400'

COLORADO 811 — KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

P1 OUTFALL Q5=1.5CFS Q100=31.9CFS

P2 OUTFALL Q5=0.9CFS Q100=35.1CFS

P3 OUTFALL Q5=1.4CFS Q100=126.8CFS

P4 OUTFALL Q5=1.3CFS Q100=30.6CFS

P5 OUTFALL Q5=1.9CFS Q100=120.0CFS

P6 OUTFALL Q5=0.7CFS Q100=18.0CFS

1 MAIN OUTFALL Q5=447.4CFS Q100=2437.3CFS

2 OFFSITE FLOW Q5=3.1CFS Q100=19.9CFS

3 OFFSITE FLOW Q5=12.9CFS Q100=45.1CFS

4 OFFSITE FLOW DIRECTED TO POND P4

5 P4 OUTFALL Q5=1.3CFS Q100=30.6CFS

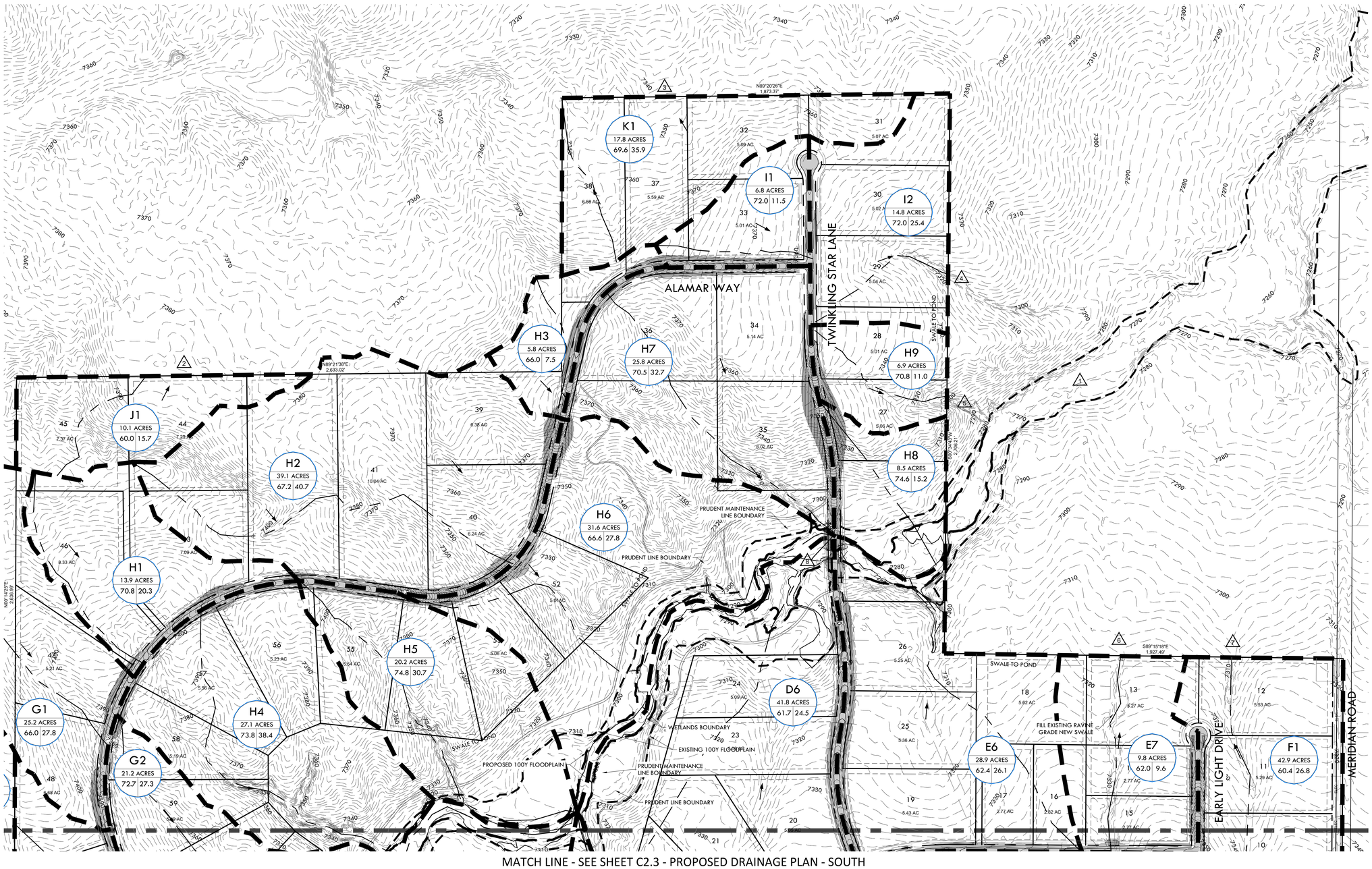
6 OFFSITE FLOW DIRECTED TO POND P5

7 OFFSITE FLOW DIRECTED TO POND P5

8 BOX CULVERT 2 Q100=2321.1CFS

NOTES:

1. EXISTING FLOODPLAIN AS SHOWN BASED ON FIRM MAP #08041C0350G PANEL 350 REVISED 12/7/2018, GENERATED BY GRAPHICAL OVERLAY.



MATCH LINE - SEE SHEET C2.3 - PROPOSED DRAINAGE PLAN - SOUTH

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COLORADO LICENSED 5/16/19 43911 PROFESSIONAL ENGINEER

PROPOSED DRAINAGE PLAN - NORTH

SITE: 17480 MERIDIAN ROAD
ELBERT, COLORADO 80106

FOR: PT MCCUNE, LLC
1864 WOODMORE DR, SUITE 100
MONUMENT, COLORADO 80132

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CHECKED BY: LPV
JOB #: 49388

C2.2

PCD FILE NO SP-18-006

PRELIMINARY PLAN SET

WINSOME SUBDIVISION

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0' 200' 400'

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P2 OUTFALL Q5=0.9CFS Q100=35.1CFS

P3 OUTFALL Q5=1.4CFS Q100=126.8CFS

P4 OUTFALL Q5=1.3CFS Q100=30.6CFS

P5 OUTFALL Q5=1.9CFS Q100=120.0CFS

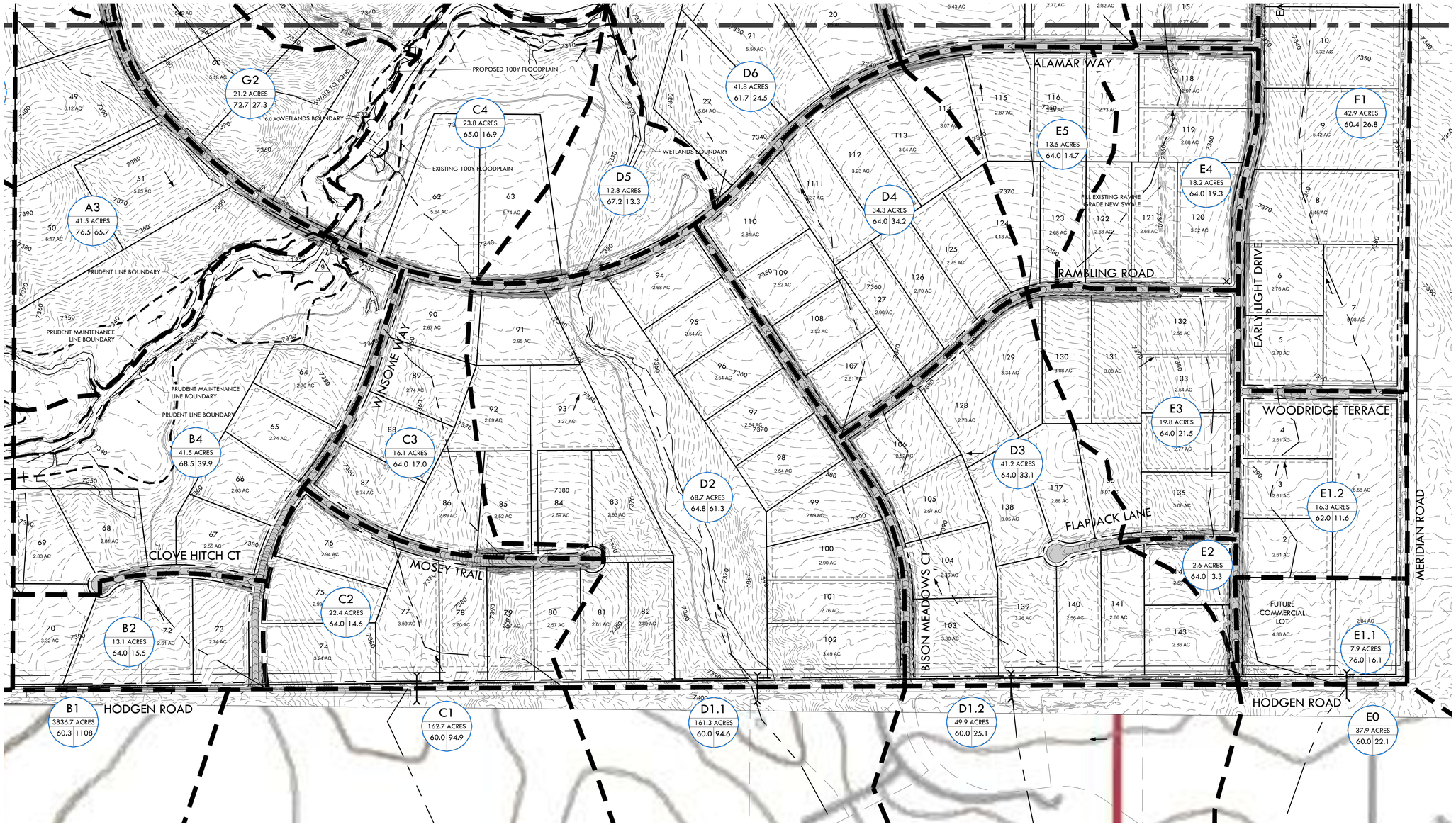
P6 OUTFALL Q5=0.7CFS Q100=18.0CFS

9 BOX CULVERT 1 Q100=2062.2CFS

NOTES:

1. EXISTING FLOODPLAIN AS SHOWN BASED ON FIRM MAP #08041C0350G PANEL 350 REVISED 12/7/2018, GENERATED BY GRAPHICAL OVERLAY.

MATCH LINE - SEE SHEET C2.2 - PROPOSED DRAINAGE PLAN - NORTH



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