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# **PRELIMINARY DRAINAGE REPORT FOR TRIPLE H RANCH - PRELIMINARY PLAN**

Prepared for:

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Job No. 2604.00

PCD Project No. SP254



# PRELIMINARY DRAINAGE REPORT FOR TRIPLE H RANCH PRELIMINARY PLAN

## 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 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.

\_\_\_\_\_  
Marc A. Whorton Colorado P.E. #37155

\_\_\_\_\_  
Date

## OWNER'S/DEVELOPER'S STATEMENT:

I, the owner/developer, have read and will comply with all of the requirements specified in this drainage report and plan.

Business Name: P760 LAND, LLC

By: \_\_\_\_\_

Title: \_\_\_\_\_

Address: 13395 Voyager Pkwy., Suite 130

Colorado Springs, CO 80921

## 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.

\_\_\_\_\_  
Joshua J. Palmer, P.E.  
County Engineer, / ECM Administrator

\_\_\_\_\_  
Date

Conditions:





# **PRELIMINARY DRAINAGE REPORT FOR TRIPLE H RANCH PRELIMINARY PLAN**

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# **PRELIMINARY DRAINAGE REPORT FOR TRIPLE H RANCH PRELIMINARY PLAN**

## **PURPOSE**

The purpose of this Preliminary Drainage Report is to address on-site and off-site drainage patterns and identify specific drainage improvements and facilities required to minimize impacts to the adjacent properties.

## **GENERAL DESCRIPTION**

The Triple H Ranch Preliminary Plan is 752.68-acre site located in portions of sections 19 and 20, township 13 south, range 63 west of the sixth principal meridian. 244 rural residential 2.5-ac. lots are planned along with two park tracts, two pond tracts and a tract for a water tank/well site. The site is bounded on the north and east by unplatted rural property zoned A-35, to the west by Government lots owned by various individuals that remain rural undeveloped property zoned A-35 and to the south by existing Jones Road and an existing 40-ac. rural residential out parcel zoned A-35 with a current homestead owned by Russel and Loretta Branham. This existing residence accesses directly to Jones Road. The site lies within both the Gieck Ranch and Haegler Ranch Drainage Basins. This site was recently rezoned from A-35 to RR-2.5 approved by BOCC August 28, 2025 (P251).

The majority soil condition reflects Hydrologic Group “A” (Blakeland loamy sand - 8 and Truckton sandy loam – 95, 96 & 97) as determined by the “Web Soil Survey of El Paso County Area,” prepared by the Natural Resources Conservation Service (see map in Appendix). These type A soils exhibit a high to very high capacity to transmit water (5.95 to 19.98 in/hr. for soil type 8 and 2.0 to 6.0 in/hr. for soil types 95, 96 & 97). Given the proposed land use of rural residential, large lot (2.5 ac. min.), only roadways, sideroad/drainage ditches and stormwater quality/detention ponds are planned to be graded. No significant overlot grading within the lot areas will take place. Therefore, the pre-developed soils condition will remain in-tact for the majority of the site. As such, Type A soils are utilized for both pre-developed and developed site conditions.



## EXISTING DRAINAGE CONDITIONS

The Triple H Ranch property is located in the middle portion of Haegler Ranch Drainage Basin with the extreme northeast portion of the site within the Gieck Ranch Drainage Basin. The entire site generally drains in a southeast direction towards Jones Road along the south boundary. The entire site is covered with native grasses with no trees or other vegetation. There are fenced portions of the site being used for cattle grazing. Off-site flows come onto the property at the northwest corner from undeveloped property within the High Plains Ranch Sketch Plan, approved in 2008. However, no other planning or development has taken place on this adjacent property yet. There is about 136 feet of fall from the northwest portion to the southeast portion of the property but over a dozen low areas throughout the site that appear to have no gravity outfall. Given the well-draining Type A soils across the entire property, these areas show no signs of ponding water. This is consistent with the findings contained in the "Soil and Geology Study – Jones Road", prepared by RMG – Rocky Mountain Group dated September 2023 and recent update. Based on the bore logs contained within said report, no evidence of groundwater was found on-site.

The main stem channel within the Haegler Ranch Basin crosses the extreme southwest corner of the property at a low point in Jones Road. This channel is currently within an unstudied, Zone A FEMA 100-yr. floodplain (Map Panel 0590G) and crosses Jones Road with three 60" CMP culverts that appear to be in good condition. There are also multiple other low points along Jones Road further to the east adjacent to this property with various sized CMP and RCP culvert crossings, most of which are severely silted in and overgrown.

To our knowledge, this site has not been studied in any site-specific drainage report. Only the "Haegler Ranch Drainage Basin Planning Study", prepared for El Paso County by URS Corporation, approved June 2009 contains drainage information for this property. Reference the Appendix for excerpts from the DBPS that refer to this site and drainage crossings of Jones Road adjacent to the property. Several drainage facilities crossing Jones Road are discussed as reimbursable facilities. These will be further discussed later in this report.



The following descriptions represent both the off-site and on-site pre-developed drainage basins for the property all within the Haegler Ranch Drainage Basin:

**Basin EX-1 ( $Q_5 = 1.3$  cfs,  $Q_{100} = 8.3$  cfs)** consists of approximately 9.9 acres of off-site undeveloped property currently zoned A-35 that sheet flows in a southeasterly direction on-site directly into Basin EX-2. Upon any future development in this basin, these total pre-developed flows must be adhered to.

**Basin EX-2 ( $Q_5 = 6.3$  cfs,  $Q_{100} = 27.7$  cfs)** consists of approximately 64.1 acres of on-site property that sheet flows in a southeasterly direction towards Jones Road combined with the off-site flows from Basin EX-1. These combined flows sheet flow to a low point north of Jones Road shown as **Design Point E2 ( $Q_5 = 6.3$  cfs,  $Q_{100} = 34.0$  cfs)**. Based on current field conditions, no culvert crossing of Jones Road was found in this low area. It appears that the flows pond in this low area to a depth of about 12"-18" and then spill over the high point in the ditch and travel to the west into Basin EX-5 down the north side of Jones Road towards the existing channel.

**Basin EX-3 ( $Q_5 = 3.5$  cfs,  $Q_{100} = 18.1$  cfs)** consists of approximately 20.2 acres of on-site property that sheet flows in a southeasterly direction towards another low area on-site just north of Jones Road shown as **Design Point E3 ( $Q_5 = 3.5$  cfs,  $Q_{100} = 18.1$  cfs)**. Based on current field conditions, no culvert crossing of Jones Road could be located at this crossing. However, the DBPS shows a 15" RCP culvert crossing at this location. This crossing will be confirmed with Final Drainage Report. It appears that these pre-developed flows pond in this low area on-site approximately 150' north of Jones Road. No evidence of overtopping of Jones Road was found.

**Basin EX-4 ( $Q_5 = 0.3$  cfs,  $Q_{100} = 3.7$  cfs)** consists of approximately 1.3 acres of on-site property just west of the unplatted out parcel that sheet flows in a southerly direction towards Jones Road. The minor flows from this basin flow into the ditch along the north side of Jones Road and then east within Basin EX-10.

**Basin EX-5 ( $Q_5 = 3.6$  cfs,  $Q_{100} = 18.7$  cfs)** consists of approximately 21.9 acres of on-site property that sheet flows in a southwesterly direction directly into the creek that crosses the southwest corner of the property and Jones Road. This location is represented by **Design Point E1 ( $Q_5 = 3.6$  cfs,  $Q_{100} = 18.7$  cfs)**, which only accounts for the on-site flows entering the channel. This crossing of Jones Road is represented by Junction JHR0370 in the Haegler Ranch DBPS with a total flow of ( $Q_{100} = 2300$  cfs). (Reference the Off-site Drainage Map in the Appendix) Three 60" CMP culverts, that appear to be clean and in good working condition exist currently at this roadway crossing. The DBPS recommends multiple box culverts to be installed at this location which also appear to be a reimbursable expense within the basin.

**Basin EX-6 ( $Q_5 = 80.5$  cfs,  $Q_{100} = 211.7$  cfs)** consists of approximately 536 acres of tributary off-site property as found within basins HR0510, HR0520 and HR0530 in the Haegler Ranch DBPS. (Reference Off-site Drainage Map in Appendix) This area covers the very upper portion of the Haegler Ranch Drainage Basin. The off-site area appears to be partially developed with basins HR0510 and HR0520 and not developed in Basin HR0530. The DBPS analyzes this area as Reach T1. DBPS Junction JHR0520 represents the upstream off-site crossing of Murr Road as ( $Q_{100} = 200$  cfs). **Design Point E4 ( $Q_5 = 80.5$  cfs,  $Q_{100} = 211.7$  cfs)** represents the total off-site pre-developed flows entering the property at the northwest corner. Upon future development upstream, these total pre-developed flows must be adhered to.

**Basin EX-7 ( $Q_5 = 10.4$  cfs,  $Q_{100} = 43.8$  cfs)** consists of approximately 132.5 acres of tributary off-site property as found within basins HR0540 and HR0560 in the Haegler Ranch DBPS. (Reference Off-site Drainage Map in Appendix) This off-site area appears to not be developed yet even with a Sketch plan approved for this area as found by "High Plains Ranch Sketch Plan", approved in 2008. Upon future development in this basin, these total pre-developed flows must be adhered to. These off-site flows sheet flow on-site directly into Basin EX-8.

**Basin EX-9 ( $Q_5 = 2.0$  cfs,  $Q_{100} = 10.3$  cfs)** consists of approximately 9.7 acres of off-site property within the unplatted out parcel and found to be a contained within basin HR0570 in the Haegler

Ranch DBPS. (Reference Off-site Drainage Map in Appendix) This off-site area contains the northern portion of the existing homestead currently on this adjacent property. Upon any future development in this basin, these total pre-developed flows must be adhered to. These off-site flows sheet flow on-site directly into Basin EX-8.

The various off-site flows from Basins EX-6, EX-7 and EX-9 then travel in a southeasterly direction across the site within **Basin EX-8 ( $Q_5 = 34.4$  cfs,  $Q_{100} = 106.6$  cfs)**. This large on-site basin that makes up the major portion of the property combines with these off-site flows as they travel within a not-well defined corridor through multiple low areas. Again, this corridor is represented by Reach T1 in the DBPS and its length across the property is approximately 7800 LF to another low point at Jones Road represented by **Design Point E5 ( $Q_5 = 125.4$  cfs,  $Q_{100} = 360.4$  cfs)**. This crossing of Jones Road is represented by Junction JHR0570 in the Haegler Ranch DBPS with a total flow of ( $Q_{100} = 370$  cfs). (Reference the Off-site Drainage Map in the Appendix) Both Dual 24" CMP culverts and dual 24" RCP culverts, that appear to be almost completely silted in and overgrown exist currently at this roadway crossing. The DBPS recommends a box culvert to be installed at this location which also appears to be a reimbursable expense within the basin.

**Basin EX-10 ( $Q_5 = 6.2$  cfs,  $Q_{100} = 30.5$  cfs)** consists of approximately 30.3 acres of off-site property within the unplatted out parcel. This off-site area contains the major portion of the existing homestead currently on this adjacent property. Upon any future development in this basin, these total pre-developed flows must be adhered to. These off-site flows travel in a southeasterly direction towards the sideroad ditch along Jones Road and then on-site directly into Basin EX-11.

**Basin EX-11 ( $Q_5 = 2.0$  cfs,  $Q_{100} = 10.4$  cfs)** consists of approximately 8.2 acres of on-site property that sheet flows in a southeasterly direction towards another low point adjacent to Jones Road found as **Design Point E6 ( $Q_5 = 7.4$  cfs,  $Q_{100} = 42.7$  cfs)**. This Design Point represents the total pre-developed flows at this location from Basins EX-4, EX-10 and EX-11. An existing 18" RCP culvert, that appears to be severely silted in and overgrown was found at this road crossing.

However, the DBPS did not describe any culvert crossing at his location. This crossing will be confirmed with Final Drainage Report.

**Basin EX-12 ( $Q_5 = 0.5$  cfs,  $Q_{100} = 9.0$  cfs)** consists of approximately 6.5 acres of off-site undeveloped property currently zoned A-35 that sheet flows in a southeasterly direction on-site directly into Basin EX-13. Upon any future development in this basin, these total pre-developed flows must be adhered to.

**Basin EX-13 ( $Q_5 = 14.9$  cfs,  $Q_{100} = 48.8$  cfs).** This large on-site basin, of approximately 173.2 acres, consists of the eastern portion of the property that drains in a southeasterly direction towards Jones Road. This corridor length across the property is approximately 5700 LF towards **Design Point E7 ( $Q_5 = 14.9$  cfs,  $Q_{100} = 48.8$  cfs)** which includes off-site basin EX-12, on-site basin EX-13 along with multiple low points throughout this tributary area. At Design Point E7, the flows exit the property to the east, just north of Jones Road. This Design Point includes flows from off-site basins EX-12 and EX-18.

**Basin EX-18 ( $Q_5 = 0.1$  cfs,  $Q_{100} = 2.7$  cfs)** consists of approximately 1.7 acres of off-site undeveloped property currently zoned A-35 that sheet flows in a southwesterly direction on-site directly into Basin EX-13. Upon any future development in this basin, these total pre-developed flows must be adhered to.

The following descriptions represent both the off-site and on-site pre-developed drainage basins for the property all within the **Gieck Ranch Drainage Basin:**

**Basin EX-14 ( $Q_5 = 0.2$  cfs,  $Q_{100} = 3.6$  cfs)** consists of approximately 2.4 acres of off-site undeveloped property within the Gieck Ranch Drainage Basin that sheet flows in a southeasterly direction on-site directly into Basin EX-16. Upon any future development in this basin, these total pre-developed flows must be adhered to.

**Basin EX-16 ( $Q_5 = 1.1$  cfs,  $Q_{100} = 9.2$  cfs)** consists of approximately 14.0 acres of on-site property at the extreme northeast corner of the site. This area is also within the Gieck Ranch Drainage basin. The combined flows sheet flow in a southeasterly direction through several low points on-site towards **Design Point E10 ( $Q_5 = 1.1$  cfs,  $Q_{100} = 12.3$  cfs)**. At this location, the flows will exit the property along the east boundary.

**Basin EX-15 ( $Q_5 = 0.1$  cfs,  $Q_{100} = 2.6$  cfs)** consists of approximately 1.2 acres of on-site property again at the extreme northeast corner of the site. This area is also within the Gieck Ranch Drainage basin and sheet flows in an easterly direction towards **Design Point E11 ( $Q_5 = 0.1$  cfs,  $Q_{100} = 2.6$  cfs)**. At this location, the flows will exit the property along the east boundary.

**Basin EX-17 ( $Q_5 = 0.3$  cfs,  $Q_{100} = 6.1$  cfs)** consists of approximately 3.5 acres of on-site property along the eastern boundary. This area is within the Gieck Ranch Drainage basin and sheet flows in a southeasterly direction towards **Design Point E9 ( $Q_5 = 0.3$  cfs,  $Q_{100} = 6.1$  cfs)**. At this location, the flows will exit the property along the east boundary.

**Basin EX-19 ( $Q_5 = 0.3$  cfs,  $Q_{100} = 5.3$  cfs)** consists of approximately 3.8 acres of on-site property along the eastern boundary. This area is within the Gieck Ranch Drainage basin and sheet flows in a southeasterly direction towards **Design Point E8 ( $Q_5 = 0.3$  cfs,  $Q_{100} = 5.3$  cfs)**. At this location, the flows will exit the property along the east boundary.

## **PROPOSED DRAINAGE CONDITIONS**

Proposed development will consist of 244 large lot rural residential properties with a 2.5 ac. min. lot size. These lots will be accessed from public paved rural streets with roadside ditches. Development of these rural lots will be limited to roadways, ditches and building pads, conserving the natural feature areas. Individual home sites on these lots are to be left generally in their natural condition with minimal disturbance to existing conditions per individual lot construction.



Per the El Paso County ECM, Appendix I.7.1.B.5, rural lots of 2.5 ac. and larger are not required to provide Water Quality Capture Volume (WQCV). However, based on the current County/Urban Drainage stormwater quality standards, a WQCV component is automatically built into the UD Detention spreadsheet utilized in the detention basin design. Multiple proposed permanent detention/stormwater quality facilities will provide WQCV along with an Excess Urban Runoff Volume (EURV) in the lower portion of the facilities storage volume with an outlet control device. Frequent and infrequent inflows are released at rates approximating undeveloped conditions. This concept provides some mitigation of increased runoff volume by releasing a portion of the increased runoff at a low rate over an extended period of time, up to 72 hours. This means that frequent storms, smaller than the 2-year event, will be reduced to very low flows near or below the sediment carrying threshold value for downstream drainage ways. Also, by incorporating an outlet structure that limits the 100-year runoff to the undeveloped condition rate, the discharge hydrograph for storms between the 2 year and the 100-year event will approximate the hydrograph for the undeveloped conditions and will help effectively mitigate the effects of development. The following describes how this development proposes to handle both the off-site and on-site drainage conditions:

The following descriptions represent the proposed developed design points that are **tributary to Pond 1 West**:

**Design Point 1 ( $Q_5 = 3.6$  cfs,  $Q_{100} = 15.5$  cfs)** represents developed flows from Basin W-A (9.0 ac.) that sheet flow in a southerly direction towards Design Point 1. At this location, a future public culvert will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the anticipated future roadway tract and continue within the sideroad ditch along the west side of the road. Sizing of this facility will be provided in a future FDR.

**Design Point 2 ( $Q_5 = 3.9$  cfs,  $Q_{100} = 18.6$  cfs)** represents developed flows from Basin W-B (10.0 ac.) that sheet flow in a southwesterly direction towards the low point at Design Point 2. At this location, a public area inlet will be sized to completely accept both the 5-yr. and 100-yr.



developed flows. A public storm sewer will then convey these developed flows further west downstream towards Design Point 3. Sizing of these facilities will be provided in a future FDR.

**Design Point 3 ( $Q_5 = 14.6$  cfs,  $Q_{100} = 44.9$  cfs)** represents developed flows from Basin W-C (37.5 ac.) that sheet flow in a southerly direction towards the low point at Design Point 3. At this location, a public area inlet will be sized to completely accept both the 5-yr. and 100-yr. developed flows. A public storm sewer will then convey these developed flows along with the collected flows from DP-2 further south downstream and directly into the proposed Pond 1W. Sizing of these facilities will be provided in a future FDR.

**Design Point 4 ( $Q_5 = 23.9$  cfs,  $Q_{100} = 79.9$  cfs)** represents the total developed flows from Design Points 1-3 along with Basin W-D (15.4 ac.) that sheet flows into the sideroad ditch and then directly into Pond1W. The following represents the proposed **Pond 1W design**:  
(See MHFD-Detention Design Sheets in Appendix)

**Total Tributary acreage: 71.9 Ac.**

**0.402 Ac.-ft. WQCV required**

**0.171 Ac.-ft. EURV required**

**1.480 Ac.-ft. 100-yr. Storage**

**2.053 Ac.-ft. Total**

**Total In-flow:  $Q_5 = 23.9$  cfs,  $Q_{100} = 79.9$  cfs**

**Pond Design Release:  $Q_5 = 0.2$  cfs,  $Q_{100} = 37.6$  cfs**

**(Ownership and maintenance by the Triple H Ranch Metro District)**

**Design Point 5 ( $Q_5 = 0.2$  cfs,  $Q_{100} = 37.6$  cfs)** represents the proposed Pond 1W release into the existing sideroad ditch that then routes the flows directly into the adjacent creek. Ultimate creek crossing improvements are anticipated at Jones Road as described in the Haegler Ranch DBPS. These improvements will help facilitate a continued suitable outfall at this location.

**Basin W-F ( $Q_5 = 0.4$  cfs,  $Q_{100} = 3.5$  cfs)** is a 1.1 ac. basin that represents developed flows within the public Right-of-Way along the north side of Jones Road that are also currently directly tributary to the creek.

**Basin W-G ( $Q_5 = 7.6$  cfs,  $Q_{100} = 26.3$  cfs)** is a 21.9 ac. basin that represents the rear of lots 11-18 that sheet flow in a southwest direction into Tract A of Filing No. 1 that the existing creek flows through. This basin will continue to sheet flow directly into the creek. Per the El Paso County ECM, Appendix I.7.1.B.5, rural lots of 2.5 ac. and larger are not required to provide WQCV.

**Basin W-E ( $Q_5 = 3.9$  cfs,  $Q_{100} = 19.6$  cfs)** is a 11.0 ac. basin that represents developed flows from lots 47-50 that sheet flow in a southwest direction towards a low point along the north side of Jones Road. A proposed drainage easement will be provided within lots 49 and 50 as necessary to handle any stormwater ponding area. Again, per the El Paso County ECM, Appendix I.7.1.B.5, rural lots of 2.5 ac. and larger are not required to provide WQCV. An existing 15" RCP culvert crosses Jones Road at this location. This facility may be upsized and further analyzed in the FDR to help facilitate a continued suitable outfall at this location.

The following descriptions represent the proposed developed design points that are **tributary to Pond 1 East**:

As described in the existing conditions section of this report, Basin EX-6 is a 536 ac. off-site basin within the top portion of the Haegler Ranch Drainage Basin. **Design Point 16 ( $Q_5 = 95.8$  cfs,  $Q_{100} = 246.1$  cfs)** represents this off-site tributary area known as Reach T1 within the DBPS and enters the proposed site within Basin E-A at the northwest corner of the property. This development proposes to construct a diversion channel along the west boundary to convey these significant off-site flows around the property rather than through the proposed residential lots and public roads. This channel will be located within a public drainage easement on all proposed lots and will be maintained by the Triple H Ranch Metro District. (See

Channel Section in Appendix) **Design Point 17 ( $Q_5 = 65.1$  cfs,  $Q_{100} = 214.2$  cfs)** represents the total off-site pre-developed flows conveyed within the channel that directly enter the existing creek at the southwest corner of the property.

**Basin OS-3 ( $Q_5 = 0.2$  cfs,  $Q_{100} = 6.7$  cfs)** is a 3.1 ac. basin that represents off-site pre-developed flows from undeveloped property to the west. This tributary area sheet flows easterly onto the property directly into the proposed diversion channel.

**Basin OS-2 ( $Q_5 = 1.0$  cfs,  $Q_{100} = 13.7$  cfs)** is a 12.5 ac. basin that also represents off-site pre-developed flows from undeveloped property to the west. This tributary area sheet flows easterly onto the property directly into the proposed diversion channel.

**Basin OS-1 ( $Q_5 = 1.3$  cfs,  $Q_{100} = 8.3$  cfs)** is a 9.9 ac. basin that also represents off-site pre-developed flows from undeveloped property to the west. This tributary area sheet flows easterly onto the property directly into the proposed diversion channel.

**Design Point 6 ( $Q_5 = 0.8$  cfs,  $Q_{100} = 4.5$  cfs)** represents developed flows from Basin E-F (1.9 ac.) that sheet flow in an easterly direction towards Design Point 6. At this location, a proposed public culvert will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the south side of the road. Sizing of this facility will be provided in a future FDR.

**Design Point 7 ( $Q_5 = 2.9$  cfs,  $Q_{100} = 15.3$  cfs)** represents developed flows from Basin E-G (5.7 ac.) along with the ditch flows from DP-6 that sheet flow in a northeasterly direction towards the low point at Design Point 7. At this location, a proposed public culvert will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and be conveyed in a proposed ditch across lots 43 and 41 to the sideroad ditch and then towards DP-8. Sizing of these facilities will be provided in a future FDR.

**Design Point 8 ( $Q_5 = 10.8$  cfs,  $Q_{100} = 40.1$  cfs)** represents developed flows from Basin E-E (28.6 ac.) along with the previously described upstream flows that sheet flow in an easterly direction towards Design Point 8. At this location, multiple proposed public culverts will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the north side of the road. Sizing of these facilities will be provided in a future FDR.

**Design Point 9 ( $Q_5 = 0.9$  cfs,  $Q_{100} = 4.5$  cfs)** represents developed flows from Basin E-H (2.2 ac.) that sheet flow in an easterly direction towards Design Point 9. At this location, a proposed public culvert will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the south side of the road. Sizing of this facility will be provided in a future FDR.

**Design Point 10 ( $Q_5 = 3.9$  cfs,  $Q_{100} = 15.6$  cfs)** represents developed flows from Basin E-C (9.8 ac.) that sheet flow in an easterly direction towards Design Point 10. At this location, a proposed public culvert will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the north side of the road. Sizing of this facility will be provided in a future FDR.

**Design Point 11 ( $Q_5 = 3.5$  cfs,  $Q_{100} = 11.4$  cfs)** represents developed flows from Basin E-A (8.9 ac.) that sheet flow in a southerly direction towards Design Point 11. At this location, a proposed public culvert will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the east side of the road. Sizing of this facility will be provided in a future FDR.

**Design Point 12 ( $Q_5 = 8.4$  cfs,  $Q_{100} = 38.3$  cfs)** represents the off-site pre-developed flows from Basin OS-5 (106.6 ac.) that sheet flow in a southerly direction towards the property. This condition will remain until this adjacent property (High Plains Sketch Plan) is developed. At that

time, based on the Sketch Plan, it is anticipated that approximately 12.0 acres of large lot residential development will be tributary to this Design Point.

**Design Point 13 ( $Q_5 = 11.9$  cfs,  $Q_{100} = 48.1$  cfs)** represents developed flows from Basin E-B (12.3 ac.) along with the previously described off-site flows from DP-12 that sheet flow in a southerly direction towards Design Point 13. At this location, multiple proposed public culverts will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and then be conveyed in a ditch within a drainage easement across lots 26 and 31 (Filing 2) towards DP-15. Sizing of these facilities will be provided in a future FDR.

**Design Point 14 ( $Q_5 = 3.4$  cfs,  $Q_{100} = 12.4$  cfs)** represents developed flows from Basins TANK (1.9 ac.) and E-N (2.2 ac.) that sheet flow in a westerly direction towards the sideroad ditch and then south to Design Point 14. At this location, a proposed public culvert will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the southeast side of the road. Sizing of this facility will be provided in a future FDR.

**Design Point 15 ( $Q_5 = 23.0$  cfs,  $Q_{100} = 100.0$  cfs)** represents developed flows from Basin E-D (29.0 ac.) that sheet flow in a southerly direction along with ditch flows from the previously described Design Points 10-13 all towards Design Point 15. At this location, multiple proposed public culverts will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the north side of the road. Sizing of these facilities will be provided in a future FDR.

**Design Point 18 ( $Q_5 = 0.3$  cfs,  $Q_{100} = 5.8$  cfs)** represents the off-site pre-developed flows from Basin OS-6 (4.0 ac.) that sheet flow in a southeasterly direction directly onto the property. This condition will remain until this adjacent property (High Plains Sketch Plan) is developed. At that time, based on the Sketch Plan, it is anticipated that approximately the same acreage of large lot residential development will be tributary to this Design Point.

**Design Point 19 ( $Q_5 = 1.5$  cfs,  $Q_{100} = 15.2$  cfs)** represents the off-site pre-developed flows from Basin OS-7 (19.3 ac.) that sheet flow in a southerly direction towards the property. This condition will remain until this adjacent property (High Plains Sketch Plan) is developed. At that time, based on the Sketch Plan, it is anticipated that approximately 6.0 acres of large lot residential development will be tributary to this Design Point.

**Design Point 20 ( $Q_5 = 0.2$  cfs,  $Q_{100} = 5.5$  cfs)** represents the off-site pre-developed flows from Basin OS-8 (2.3 ac.) that sheet flow in a southeasterly direction directly onto the property. This condition will remain until this adjacent property (High Plains Sketch Plan) is developed. At that time, based on the Sketch Plan, it is anticipated that approximately the same acreage of large lot residential development will be tributary to this Design Point.

**Design Point 21 ( $Q_5 = 5.8$  cfs,  $Q_{100} = 22.2$  cfs)** represents developed flows from Basin E-O (16.4 ac.) that sheet flow in a southerly direction towards Design Point 21 along with the combined off-site flows previously described from DP-20. At this location, a proposed public culvert will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the north side of the road. Sizing of this facility will be provided in a future FDR.

**Design Point 22 ( $Q_5 = 14.0$  cfs,  $Q_{100} = 59.5$  cfs)** represents developed flows from Basin E-P (30.5 ac.) that sheet flow in a southeasterly direction towards Design Point 22 along with the previously described flows from Design Points 18-21. At this location, multiple proposed public culverts will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the north side of the road. Sizing of these facilities will be provided in a future FDR.

**Design Point 23 ( $Q_5 = 5.9$  cfs,  $Q_{100} = 20.3$  cfs)** represents developed flows from Basin E-I (13.7 ac.) that sheet flow in an easterly direction towards the low point at Design Point 23. At this location, a proposed public culvert will be sized to completely convey both the 5-yr. and 100-yr.

developed flows under the roadway and continue within a ditch across the park within Tract A (Filing 1) towards the sideroad ditch along Appaloosa Run Dr. Sizing of these facilities will be provided in a future FDR.

**Design Point 24 ( $Q_5 = 0.3$  cfs,  $Q_{100} = 2.5$  cfs)** represents developed flows from Basin E-J (0.68 ac.) that sheet flow in a northwesterly direction to Design Point 24. At this location, a proposed public culvert will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the east side of the road. Sizing of this facility will be provided in a future FDR.

**Design Point 25 ( $Q_5 = 13.9$  cfs,  $Q_{100} = 52.2$  cfs)** represents developed flows from Basins E-K (8.3 ac.) and E-L (25.1 ac.) that sheet flow to sideroad ditches and then towards Design Point 25 along with the previously described developed flows from Design Points 9, 23 and 24. At this location, multiple proposed public culverts will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the south side of the road. Sizing of these facilities will be provided in a future FDR.

**Design Point 26 ( $Q_5 = 0.2$  cfs,  $Q_{100} = 4.4$  cfs)** represents the off-site pre-developed flows from Basin OS-12 (2.9 ac.) that sheet flow in a northerly direction directly onto the property.

**Design Point 27 ( $Q_5 = 27.1$  cfs,  $Q_{100} = 101.0$  cfs)** represents developed flows from Basin E-S (26.5 ac.) and Basin E-Q (24.8 ac.) that sheet flow in a southerly direction towards Design Point 27 along with the combined off-site flows previously described from DP-22. At this location, multiple proposed public culverts will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the north side of the road. Sizing of these facilities will be provided in a future FDR.

**Design Point 28 ( $Q_5 = 31.1$  cfs,  $Q_{100} = 183.6$  cfs)** represents developed flows from Basin E-R (65.2 ac.) that sheet flow in a southerly direction towards Design Point 28 along with the



combined off-site flows previously described from Design Points 8 and 15. At this location, multiple proposed public culverts will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within a proposed channel across lots 26, 27 and 34 (Filing 1) that will convey these developed flows further downstream. Public drainage easements will be provided on these lots. Sizing of these facilities will be provided in a future FDR.

**Design Point 29 ( $Q_5 = 30.7$  cfs,  $Q_{100} = 109.3$  cfs)** represents developed flows from Basin E-T1 (9.8 ac.) that sheet flow in a southerly direction towards Design Point 29 along with the combined off-site flows previously described from Design Point 27. At this location, multiple proposed public culverts will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within a proposed channel across lots 26, 27 and 34 (Filing 1) that will convey these developed flows further downstream. Public drainage easements will be provided on these lots. Sizing of these facilities will be provided in a future FDR.

**Design Point 30 ( $Q_5 = 77.4$  cfs,  $Q_{100} = 225.1$  cfs)** represents the combined developed flows from Basin E-V (7.5 ac.), Basin E-M (19.0 ac.) along with the combined off-site flows previously described from Design Points 25, 26, 28 and 29. At this location, the developed flows exit the site and cross the corner of the adjacent property for only 200 feet and then enter the site again at Lot 26 (Filing 1).

**Design Point 31 ( $Q_5 = 78.8$  cfs,  $Q_{100} = 235.3$  cfs)** represents the combined developed flows that re-enter the site into Lot 26 (Filing 1) along with off-site sheet flows from Basin OS-13 (6.8 ac.). At this location, the proposed channel will be constructed across lots 26 and 27 (Filing 1) that will convey these developed flows further downstream. Public drainage easements will be provided on these lots. Sizing of this facility will be provided in a future FDR.

**Design Point 32 ( $Q_5 = 4.2$  cfs,  $Q_{100} = 15.6$  cfs)** represents developed flows from Basin E-T2 (10.7 ac.) that sheet flow in a southerly direction towards the low point at Design Point 32. At this location, the developed flows will be routed further east within the sideroad ditch towards Design Point 33.

**Design Point 33 ( $Q_5 = 9.4$  cfs,  $Q_{100} = 36.3$  cfs)** represents developed flows from Basin E-U (16.8 ac.) that sheet flow in a southerly direction towards the low point at Design Point 33. At this location, a proposed public culvert will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the west side of the road. Sizing of this facility will be provided in a future FDR.

**Design Point 34 ( $Q_5 = 88.4$  cfs,  $Q_{100} = 295.4$  cfs)** represents the developed flows from Basin E-X (6.7 ac.) along with the combined developed flows previously described from Design Points 31 and 33. At this location, the developed flows will be completely collected by a public storm system that will route the flows directly to the proposed Pond 1E. Sizing of this facility will be provided in a future FDR.

**Design Point 35 ( $Q_5 = 2.1$  cfs,  $Q_{100} = 9.3$  cfs)** represents the developed flows from Basin E-Y (5.3 ac.) that sheet flow in an easterly direction towards Design Point 35. At this location, the developed flows will be completely collected by a public storm system that will route the flows directly to the proposed Pond 1E. Sizing of this facility will be provided in a future FDR.

**Design Point 36 ( $Q_5 = 6.1$  cfs,  $Q_{100} = 33.5$  cfs)** represents the off-site pre-developed flows from Basin OS-14 (30.3 ac.) and Basin E-MM (1.3 ac.) that combine and sheet flow into the sideroad ditch along the north side of Jones Roads and then towards Design Point 36. At this location, the combined flows continue to travel in the sideroad ditch towards Design Point 37.

**Design Point 37 ( $Q_5 = 8.2$  cfs,  $Q_{100} = 43.9$  cfs)** represents the developed flows from Basin E-NN (8.3 ac.) along with the previously described flows from Design Point 36. At this location, the

combined flows are collected by a public storm system and routed directly into Pond 1E. Sizing of this facility will be provided in a future FDR. The existing 18" RCP culvert crossing Jones Road at this location will be further analyzed in the future FDR to maintain a suitable outfall at this location.

**Design Point 38 ( $Q_5 = 0.5$  cfs,  $Q_{100} = 9.0$  cfs)** represents the off-site pre-developed flows from Basin OS-9 (6.5 ac.) that sheet flow in a southeasterly direction directly onto the property. This condition will remain until this adjacent property (High Plains Sketch Plan) is developed. At that time, based on the Sketch Plan, it is anticipated that approximately the same acreage of large lot residential development will be tributary to this Design Point.

**Design Point 39 ( $Q_5 = 7.6$  cfs,  $Q_{100} = 25.4$  cfs)** represents developed flows from Basin E-AA (19.2 ac.) that sheet flow in a southeasterly direction towards Design Point 39 along with the combined off-site flows previously described from DP-38. At this location, a future public culvert will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the anticipated future roadway tract and continue within the sideroad ditch along the north side of the road. Sizing of this facility will be provided in a future FDR.

**Design Point 40 ( $Q_5 = 0.2$  cfs,  $Q_{100} = 3.6$  cfs)** represents the off-site pre-developed flows from Basin OS-10 (2.4 ac.) that sheet flow in a southeasterly direction directly onto the property. This condition will remain until this adjacent property (High Plains Sketch Plan) is developed. At that time, based on the Sketch Plan, it is anticipated that approximately the same acreage of large lot residential development will be tributary to this Design Point.

**Design Point 41 ( $Q_5 = 7.3$  cfs,  $Q_{100} = 29.0$  cfs)** represents developed flows from the northern portion of Basin E-DD (Approx. 6.5 ac.) that sheet flow in a southeasterly direction towards Design Point 41 along with the combined off-site flows previously described from Design Points 39 and 40. At this location, multiple proposed public culverts will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the

sideroad ditch along the west side of the road. Sizing of these facilities will be provided in a future FDR.

**Design Point 42 ( $Q_5 = 22.4$  cfs,  $Q_{100} = 69.0$  cfs)** represents developed flows from Basin E-BB (46.2 ac.) that sheet flow in a southerly direction towards the sideroad ditch and then conveyed along the north side of the roadway towards Design Point 42 along with the combined off-site flows previously described from Design Point 41. At this location, multiple proposed public culverts will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the west side of the road. Sizing of this facility will be provided in a future FDR.

**Design Point 43 ( $Q_5 = 6.6$  cfs,  $Q_{100} = 21.1$  cfs)** represents developed flows from Basin E-CC (16.9 ac.) that sheet flow in a southeasterly direction towards Design Point 43. At this location, a proposed public culvert will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the north side of the road. Sizing of this facility will be provided in a future FDR.

**Design Point 44 ( $Q_5 = 30.4$  cfs,  $Q_{100} = 106.0$  cfs)** represents developed flows from Basin E-EE (19.8 ac.) that sheet flow in a southeasterly direction towards the sideroad ditch and then to Design Point 44 along with the combined off-site flows previously described from Design Points 42 and 43. At this location, multiple proposed public culverts will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the west side of the road. Sizing of these facilities will be provided in a future FDR.

**Design Point 45 ( $Q_5 = 0.1$  cfs,  $Q_{100} = 2.7$  cfs)** represents the off-site pre-developed flows from Basin OS-11 (1.7 ac.) that sheet flow in a southwesterly direction directly onto the property.

**Design Point 46 ( $Q_5 = 32.3$  cfs,  $Q_{100} = 128.2$  cfs)** represents developed flows from Basin E-GG (24.0 ac.) that sheet flow in a southeasterly direction towards the sideroad ditch and then to Design Point 46 along with the combined off-site flows previously described from Design Point 44. At this location, multiple proposed public culverts will be sized to completely convey both the 5-yr. and 100-yr. developed flows under the roadway and continue within the sideroad ditch along the west side of the road. Sizing of these facilities will be provided in a future FDR.

**Design Point 47 ( $Q_5 = 8.2$  cfs,  $Q_{100} = 31.4$  cfs)** represents developed flows from Basin E-DD (17.5 ac.), Basin E-HH (21.0 ac.) that sheet flow in a southwesterly direction towards the sideroad ditch and then south to the low point at Design Point 47 along with the minor off-site flows previously described from Design Point 45. At this location, the developed flows will be completely collected by a public storm system that will route the flows directly to the proposed Pond 1E. Sizing of this facility will be provided in a future FDR.

**Design Point 48 ( $Q_5 = 41.5$  cfs,  $Q_{100} = 175.8$  cfs)** represents developed flows from Basin E-II (15.7 ac.) that sheet flow in an easterly direction towards the sideroad ditch and then south to the low point at Design Point 48 along with the developed flows previously described from Design Point 46. At this location, the developed flows will be completely collected by a public storm system that will route the flows directly to the proposed Pond 1E. Sizing of this facility will be provided in a future FDR.

**Basin E-Z ( $Q_5 = 7.5$  cfs,  $Q_{100} = 24.1$  cfs)** is a 21.4 ac. basin that sheet flows in a southerly direction directly into the proposed Pond 1E.

**Basin E-LL ( $Q_5 = 1.8$  cfs,  $Q_{100} = 9.0$  cfs)** is a 5.7 ac. basin that represents developed flows within the rear of Lots 6 and 7 (Filing 3) that sheet flow in a southerly direction towards the sideroad ditch along Jones Road. These flows will continue to be conveyed to the existing culvert crossings of Jones Road. Per the El Paso County ECM, Appendix I.7.1.B.5, rural lots of 2.5 ac.

and larger are not required to provide WQCV. The existing dual 24" culverts crossing Jones Road at this location will be further analyzed in the future FDR to maintain this suitable outfall.

**The following represents the total developed inflow to Pond 1E ( $Q_5 = 131.0$  cfs,  $Q_{100} = 526.6$  cfs) and the proposed Pond 1E design:**

(See MHFD-Detention Design Sheets in Appendix)

**Total Tributary acreage: 693.1 Ac.**

**3.870 Ac.-ft. WQCV required**

**1.649 Ac.-ft. EURV required**

**14.269 Ac.-ft. 100-yr. Storage**

**19.788 Ac.-ft. Total**

**Total In-flow:  $Q_5 = 131.0$  cfs,  $Q_{100} = 526.6$  cfs**

**Pond Design Release:  $Q_5 = 1.8$  cfs,  $Q_{100} = 164.5$  cfs**

**(Ownership and maintenance by the Triple H Ranch Metro District)**

The following descriptions represent the proposed developed design points

**Ranch Drainage Basin:**

A minor basin transfer of approximately 16.4 ac. from the Gieck Ranch basin into the Haegler Ranch basin is proposed due to the site layout and grading. (See Developed Drainage Map)

Provide State DWR  
input and  
concurrence as basin  
transfer per ECM is  
not permitted

**Basin E-JJ ( $Q_5 = 1.2$  cfs,  $Q_{100} = 6.3$  cfs)** is a 3.8 ac. basin that represents the rear of lots 13-18 (Filing 3) that will continue to sheet flow in a southeast direction off-site. Per the El Paso County ECM, Appendix I.7.1.B.5, rural lots of 2.5 ac. and larger are not required to provide WQCV. This proposed minor sheet flow off-site will not significantly affect this suitable outfall.

**Basin E-KK ( $Q_5 = 6.1$  cfs,  $Q_{100} = 20.5$  cfs)** is a 15.5 ac. basin that represents lots 7-14 (Filing 3) that will continue to sheet flow in a southeast direction off-site. Per the El Paso County ECM, Appendix I.7.1.B.5, rural lots of 2.5 ac. and larger are not required to provide WQCV. This proposed sheet flow off-site is well less than the pre-developed conditions at this location and thus will continue to be a suitable outfall.

**Basin E-FF ( $Q_5 = 1.1$  cfs,  $Q_{100} = 7.2$  cfs)** is a 3.5 ac. basin that represents lots 1-4 (Filing 4) that will continue to sheet flow in a southeast direction off-site. Per the El Paso County ECM, Appendix I.7.1.B.5, rural lots of 2.5 ac. and larger are not required to provide WQCV. This proposed minor sheet flow off-site will not significantly affect this suitable outfall.

**Basin E-OO ( $Q_5 = 0.1$  cfs,  $Q_{100} = 2.7$  cfs)** is a 1.2 ac. basin that represents the rear of Lot 6 (Filing 4) and will continue to sheet flow in an easterly direction off-site. Per the El Paso County ECM, Appendix I.7.1.B.5, rural lots of 2.5 ac. and larger are not required to provide WQCV. This proposed minor sheet flow off-site will not significantly affect this suitable outfall.

## **DETENTION / STORMWATER QUALITY FACILITIES**

As required, storm water quality measures will be utilized in order to reduce the amount of sediment, debris and pollutants that are allowed to be released downstream. These features include but are not limited to Pond 1W and Pond 1E (both owned and maintained by the Triple H Ranch Metropolitan District). These proposed facilities will provide a detention and Water Quality Capture Volume (WQCV) and Excess Urban Runoff Volume (EURV) in the lower portion of the facility storage volume that will release the more frequent storms at a slower rate to help minimize the effects of development of the property. The proposed facilities are to be private facilities with ownership and maintenance by the Triple H Ranch Metropolitan District. After completion of construction and upon the Board of County Commissioners acceptance, all the drainage facilities within the public Right-of-Way will be owned and maintained by El Paso County.

## DRAINAGE CRITERIA

Hydrologic calculations were performed using the City of Colorado Springs/El Paso County Drainage Criteria Manual, as revised in November 1991 and October 1994 with County adopted Chapter 6 and Section 3.2.1 of Chapter 13 of the City of Colorado Springs/El Paso County Drainage Criteria Manual as revised in May 2014. Per the ECM and the size of this proposed development, all off-site and on-site developed basin design was calculated using EPA SWMM Modeling as discussed in Chapter 6. Percent Impervious Area per Table 3-1 and imperviousness of the particular land use and the hydrologic soil type in accordance with Table 6-6. Point Precipitation Frequency Estimates determined from NOAA Atlas 14 for the specific site location. These 1-Hour rainfall depths then converted to 2-Hour Design Storms for a drainage basin area of 1-5 sq. mi. (See Appendix)

The City of Colorado Springs/El Paso County DCM requires the Four Step Process for receiving water protection that focuses on reducing runoff volumes, treating the water quality capture volume (WQCV), stabilizing drainage ways, and implementing long-term source controls. The Four Step Process pertains to management of smaller, frequently occurring storm events, as opposed to larger storms for which drainage and flood control infrastructure are sized. Implementation of these four steps helps to achieve storm water permit requirements.

This site adheres to this **Four Step Process** as follows:

1. **Employ Runoff Reduction Practices:** All proposed lot impervious area (roof tops, patios, etc.) will sheet flow across landscaped portions of the large lots (2.5 ac. min.) and through open space/park areas to slow runoff and increase time of concentration prior to being conveyed to the proposed public streets, sideroad ditches and detention facilities. This will minimize directly connected impervious areas within the project site. Final Drainage Report will provide further detail on basins that will be providing Runoff Reduction.



2. **Stabilize Drainageways:** After developed flows utilize the runoff reduction practices through these large lots, developed flows will travel via sideroad ditches and culverts within the public streets and eventually public storm systems. These collected flows are then routed directly to the proposed extended detention basins (full-spectrum facilities). Where developed flows are not able to be routed to public street, sheet flows will travel across landscaped rear yards and then through undeveloped property prior to being released off-site. Final Drainage Report will provide further detail on basins that will be providing Runoff Reduction.
3. **Provide Water Quality Capture Volume (WQCV):** Runoff from this development will be treated through capture and slow release of the WQCV and excess urban runoff volume (EURV) in the proposed Full-Spectrum permanent Extended Detention Basins designed per current El Paso County drainage criteria. For any area that is not able to be captured and routed to a permanent EDB, Runoff Reduction practices may be utilized. However, per the El Paso County ECM, Appendix I.7.1.B.5, rural lots of 2.5 ac. and larger are not required to provide WQCV. Final Drainage Report will provide further detail on basins that may be providing Runoff Reduction.
4. **Consider need for Industrial and Commercial BMPs:** No industrial or commercial uses are proposed within this development. However, a site-specific storm water quality and erosion control plan and narrative along with the grading and erosion control plan will be submitted with the future Final Plat submittal. Details such as site-specific sediment and erosion control construction BMP's as well as temporary and permanent BMP's will be detailed in this plan and narrative to protect receiving waters. BMP's will be constructed and maintained as the development has been graded and erosion control methods employed.

## **FLOODPLAIN STATEMENT**

A portion of this site is located within a floodplain as determined by the Flood Insurance Rate Maps (F.I.R.M.) Map Number 08041C0590G with effective date of December 7, 2018 (See Appendix).

## **DRAINAGE AND BRIDGE FEES**

The majority of this site lies within the **Haegler Ranch Drainage Basin** boundaries with just a small portion along the northeast corner and eastern edge within the **Gieck Ranch Drainage Basin**.

There is no final platting proposed at this time. Fees using the impervious acreage method approved by El Paso County will be defined in the future Final Drainage Report(s).

## **SUMMARY**

The proposed Triple H Ranch Preliminary Plan is within the Haegler Ranch and Gieck Ranch Drainage Basins. Recommendations are made within this report concerning necessary improvements that will be required as a result of development of this property. The points of storm water release from the proposed site are required to be at or below the calculated pre-developed flow quantities. The development of the proposed site does not significantly impact any downstream facility or property to an extent greater than that which currently exists in the pre-development conditions. All drainage facilities within this report were sized according to the Drainage Criteria Manuals and the full-spectrum storm water quality requirements.

PREPARED BY:

**Classic Consulting Engineers & Surveyors, LLC**

A handwritten signature in blue ink, appearing to read 'M. Whorton', with a long horizontal flourish extending to the right.

Marc A. Whorton, P.E.  
Project Manager

maw/260400 PDR.doc

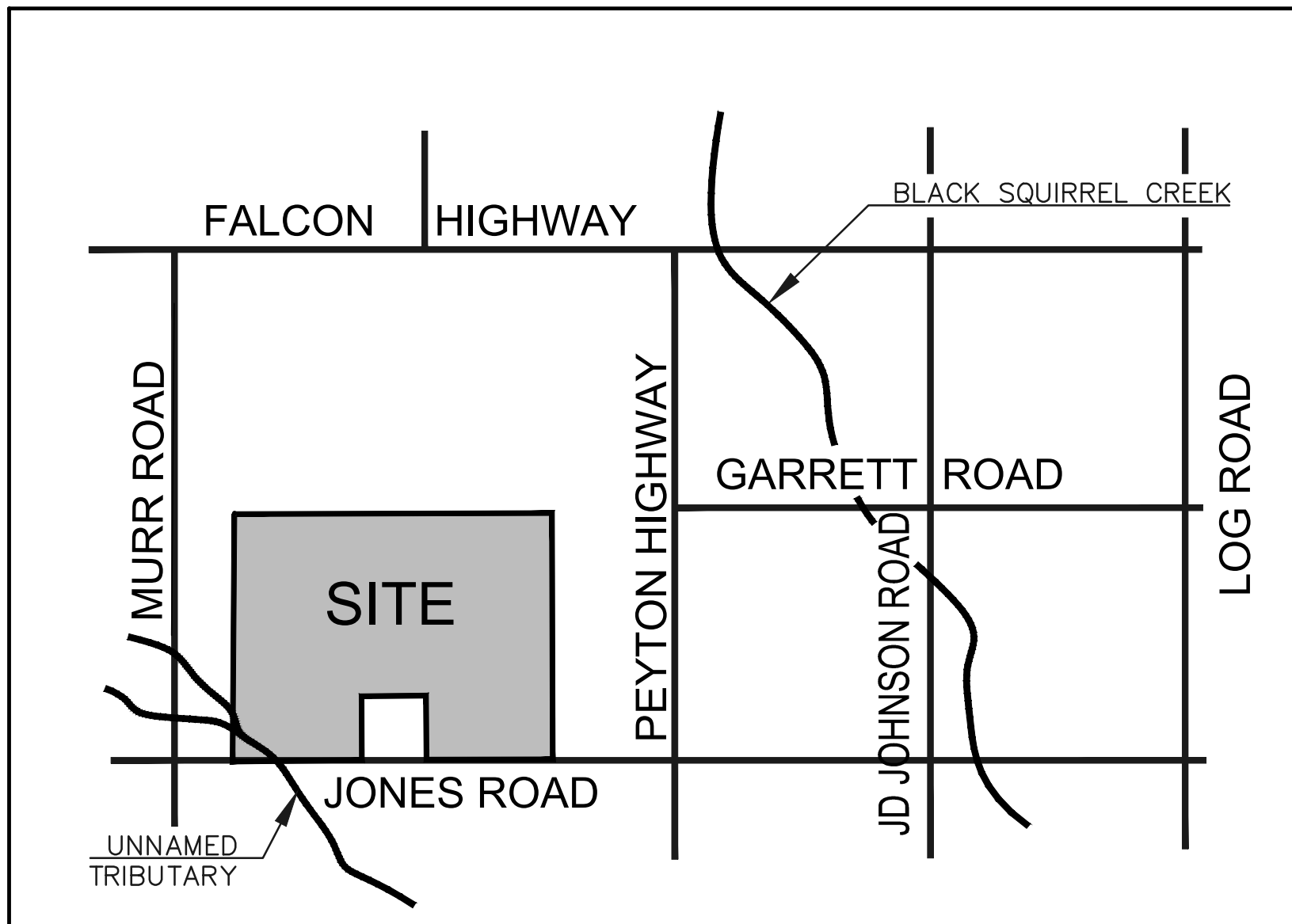


## REFERENCES

1. City of Colorado Springs/County of El Paso Drainage Criteria Manual as revised in November 1991 and October 1994 with County adopted Chapter 6 and Section 3.2.1 of Chapter 13 of the City of Colorado Springs/El Paso County Drainage Criteria Manual as revised in May 2014.
2. "Urban Storm Drainage Criteria Manual Volume 1, 2 & 3" Urban Drainage and Flood Control District, dated January 2016.
3. "General Drainage Report for High Plains Ranch" Kiowa Engineering Corporation, dated June 2008.
4. "Haegler Ranch Drainage Basin Planning Study", URS Corporation, dated May 2009.
5. "Gieck Ranch Drainage Basin Planning Study", Drexel, Barrell & Co., dated Feb. 2010

## APPENDIX

## VICINITY MAP



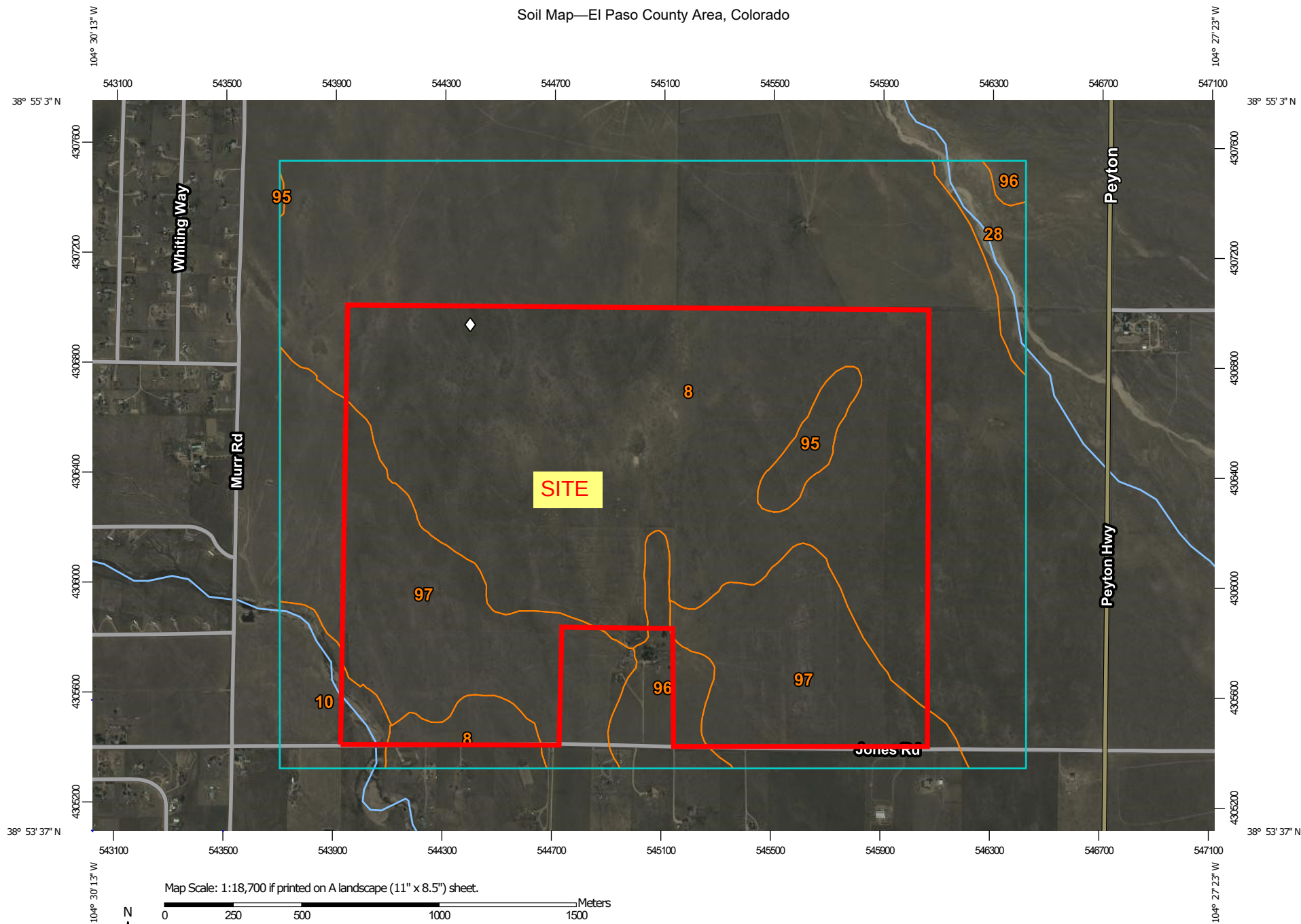
VICINITY MAP

N.T.S.

## **SOILS MAP (S.C.S SURVEY)**



# Soil Map—El Paso County Area, Colorado



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 21, Aug 24, 2023

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

Date(s) aerial images were photographed: Sep 11, 2018—Oct 20, 2018

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

## Map Unit Legend

| Map Unit Symbol                    | Map Unit Name                                     | Acres in AOI   | Percent of AOI |
|------------------------------------|---------------------------------------------------|----------------|----------------|
| 8                                  | Blakeland loamy sand, 1 to 9 percent slopes       | 1,026.5        | 68.7%          |
| 10                                 | Blendon sandy loam, 0 to 3 percent slopes         | 43.2           | 2.9%           |
| 28                                 | Ellicott loamy coarse sand, 0 to 5 percent slopes | 26.5           | 1.8%           |
| 95                                 | Truckton loamy sand, 1 to 9 percent slopes        | 19.7           | 1.3%           |
| 96                                 | Truckton sandy loam, 0 to 3 percent slopes        | 49.5           | 3.3%           |
| 97                                 | Truckton sandy loam, 3 to 9 percent slopes        | 329.8          | 22.1%          |
| <b>Totals for Area of Interest</b> |                                                   | <b>1,495.2</b> | <b>100.0%</b>  |

## El Paso County Area, Colorado

### 8—Blakeland loamy sand, 1 to 9 percent slopes

#### Map Unit Setting

*National map unit symbol:* 369v

*Elevation:* 4,600 to 5,800 feet

*Mean annual precipitation:* 14 to 16 inches

*Mean annual air temperature:* 46 to 48 degrees F

*Frost-free period:* 125 to 145 days

*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Blakeland and similar soils:* 98 percent

*Minor components:* 2 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Blakeland

##### Setting

*Landform:* Hills, flats

*Landform position (three-dimensional):* Side slope, tal

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Alluvium derived from sedimentary rock and/or  
eolian deposits derived from sedimentary rock

##### Typical profile

*A - 0 to 11 inches:* loamy sand

*AC - 11 to 27 inches:* loamy sand

*C - 27 to 60 inches:* sand

##### Properties and qualities

*Slope:* 1 to 9 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Somewhat excessively drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* High to  
very high (5.95 to 19.98 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum content:* 5 percent

*Available water supply, 0 to 60 inches:* Low (about 4.5 inches)

##### Interpretive groups

*Land capability classification (irrigated):* 3e

*Land capability classification (nonirrigated):* 6e

*Hydrologic Soil Group:* A

*Ecological site:* R049XB210CO - Sandy Foothill

*Hydric soil rating:* No

### **Minor Components**

#### **Other soils**

*Percent of map unit:* 1 percent

*Hydric soil rating:* No

#### **Pleasant**

*Percent of map unit:* 1 percent

*Landform:* Depressions

*Hydric soil rating:* Yes

## **Data Source Information**

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 21, Aug 24, 2023

## El Paso County Area, Colorado

### 10—Blendon sandy loam, 0 to 3 percent slopes

#### Map Unit Setting

*National map unit symbol:* 3671

*Elevation:* 6,000 to 6,800 feet

*Mean annual precipitation:* 14 to 16 inches

*Mean annual air temperature:* 46 to 48 degrees F

*Frost-free period:* 125 to 145 days

*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Blendon and similar soils:* 98 percent

*Minor components:* 2 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Blendon

##### Setting

*Landform:* Terraces, alluvial fans

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Sandy alluvium derived from arkose

##### Typical profile

*A - 0 to 10 inches:* sandy loam

*Bw - 10 to 36 inches:* sandy loam

*C - 36 to 60 inches:* gravelly sandy loam

##### Properties and qualities

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water*

*(Ksat):* Moderately high to high (0.60 to 2.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum content:* 2 percent

*Available water supply, 0 to 60 inches:* Moderate (about 6.2 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 3e

*Hydrologic Soil Group:* B

*Ecological site:* R049XB210CO - Sandy Foothill

*Hydric soil rating:* No

### **Minor Components**

#### **Other soils**

*Percent of map unit:* 1 percent

*Hydric soil rating:* No

#### **Pleasant**

*Percent of map unit:* 1 percent

*Landform:* Depressions

*Hydric soil rating:* Yes

## **Data Source Information**

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 21, Aug 24, 2023

## El Paso County Area, Colorado

### 95—Truckton loamy sand, 1 to 9 percent slopes

#### Map Unit Setting

*National map unit symbol:* 2yvrn

*Elevation:* 5,800 to 7,100 feet

*Mean annual precipitation:* 12 to 19 inches

*Mean annual air temperature:* 46 to 50 degrees F

*Frost-free period:* 90 to 155 days

*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Truckton and similar soils:* 87 percent

*Minor components:* 13 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Truckton

##### Setting

*Landform:* Fan remnants, interfluves

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Wind re-worked alluvium derived from arkose

##### Typical profile

*A - 0 to 4 inches:* loamy sand

*Bt1 - 4 to 12 inches:* sandy loam

*Bt2 - 12 to 19 inches:* sandy loam

*C - 19 to 80 inches:* sandy loam

##### Properties and qualities

*Slope:* 1 to 9 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* High  
(2.00 to 6.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum content:* 1 percent

*Maximum salinity:* Nonsaline to very slightly saline (0.1 to 2.0  
mmhos/cm)

*Available water supply, 0 to 60 inches:* Moderate (about 6.5  
inches)

##### Interpretive groups

*Land capability classification (irrigated):* 6e

*Land capability classification (nonirrigated):* 6e

*Hydrologic Soil Group:* A



*Ecological site:* R049XB210CO - Sandy Foothill  
*Hydric soil rating:* No

### **Minor Components**

#### **Blakeland**

*Percent of map unit:* 5 percent  
*Landform:* Hills, interfluves  
*Landform position (two-dimensional):* Shoulder, backslope, summit  
*Landform position (three-dimensional):* Side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex, linear  
*Ecological site:* R049XB210CO - Sandy Foothill  
*Hydric soil rating:* No

#### **Bresser**

*Percent of map unit:* 5 percent  
*Landform:* Terraces, interfluves  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Ecological site:* R049XB210CO - Sandy Foothill  
*Hydric soil rating:* No

#### **Urban land**

*Percent of map unit:* 2 percent  
*Hydric soil rating:* No

#### **Ellicott, occasionally flooded**

*Percent of map unit:* 1 percent  
*Landform:* Drainageways, flood plains  
*Down-slope shape:* Linear  
*Across-slope shape:* Concave, linear  
*Ecological site:* R067BY031CO - Sandy Bottomland  
*Hydric soil rating:* No

## **Data Source Information**

Soil Survey Area: El Paso County Area, Colorado  
Survey Area Data: Version 21, Aug 24, 2023

## El Paso County Area, Colorado

### 96—Truckton sandy loam, 0 to 3 percent slopes

#### Map Unit Setting

*National map unit symbol:* 2yvrd

*Elevation:* 5,400 to 7,000 feet

*Mean annual precipitation:* 14 to 23 inches

*Mean annual air temperature:* 45 to 52 degrees F

*Frost-free period:* 90 to 155 days

*Farmland classification:* Prime farmland if irrigated and the product of  
I (soil erodibility) x C (climate factor) does not exceed 60

#### Map Unit Composition

*Truckton and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of  
the mapunit.*

#### Description of Truckton

##### Setting

*Landform:* Interfluves, fan remnants

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Wind re-worked alluvium derived from arkose

##### Typical profile

*A - 0 to 4 inches:* sandy loam

*Bt1 - 4 to 12 inches:* sandy loam

*Bt2 - 12 to 19 inches:* sandy loam

*C - 19 to 80 inches:* sandy loam

##### Properties and qualities

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Runoff class:* Very low

*Capacity of the most limiting layer to transmit water (Ksat):* High  
(2.00 to 6.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum content:* 1 percent

*Maximum salinity:* Nonsaline to very slightly saline (0.1 to 2.0  
mmhos/cm)

*Available water supply, 0 to 60 inches:* Moderate (about 6.6  
inches)

##### Interpretive groups

*Land capability classification (irrigated):* 3e

*Land capability classification (nonirrigated):* 4e

*Hydrologic Soil Group:* A  
*Ecological site:* R049XB210CO - Sandy Foothill  
*Hydric soil rating:* No

### **Minor Components**

#### **Blakeland**

*Percent of map unit:* 5 percent  
*Landform:* Interfluves, hills  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Crest, side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex, linear  
*Ecological site:* R049XB210CO - Sandy Foothill  
*Hydric soil rating:* No

#### **Bresser**

*Percent of map unit:* 5 percent  
*Landform:* Interfluves, terraces  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Ecological site:* R049XB210CO - Sandy Foothill  
*Hydric soil rating:* No

#### **Pleasant, frequently ponded**

*Percent of map unit:* 2 percent  
*Landform:* Closed depressions  
*Down-slope shape:* Concave, linear  
*Across-slope shape:* Concave  
*Ecological site:* R067BY010CO - Closed Depression  
*Hydric soil rating:* Yes

#### **Urban land**

*Percent of map unit:* 2 percent  
*Hydric soil rating:* No

#### **Ellicott, occasionally flooded**

*Percent of map unit:* 1 percent  
*Landform:* Flood plains, drainageways  
*Down-slope shape:* Linear  
*Across-slope shape:* Concave, linear  
*Ecological site:* R067BY031CO - Sandy Bottomland  
*Hydric soil rating:* No

## **Data Source Information**

Soil Survey Area: El Paso County Area, Colorado  
Survey Area Data: Version 21, Aug 24, 2023

## El Paso County Area, Colorado

### 97—Truckton sandy loam, 3 to 9 percent slopes

#### Map Unit Setting

*National map unit symbol:* 2x0j2

*Elevation:* 5,300 to 6,850 feet

*Mean annual precipitation:* 14 to 19 inches

*Mean annual air temperature:* 48 to 52 degrees F

*Frost-free period:* 85 to 155 days

*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Truckton and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Truckton

##### Setting

*Landform:* Interfluves, hillslopes

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Re-worked alluvium derived from arkose

##### Typical profile

*A - 0 to 4 inches:* sandy loam

*Bt1 - 4 to 12 inches:* sandy loam

*Bt2 - 12 to 19 inches:* sandy loam

*C - 19 to 80 inches:* sandy loam

##### Properties and qualities

*Slope:* 3 to 9 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* High  
(2.00 to 6.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum content:* 1 percent

*Maximum salinity:* Nonsaline (0.1 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Moderate (about 6.6 inches)

##### Interpretive groups

*Land capability classification (irrigated):* 6e

*Land capability classification (nonirrigated):* 6e

*Hydrologic Soil Group:* A  
*Ecological site:* R049XB210CO - Sandy Foothill  
*Hydric soil rating:* No

### **Minor Components**

#### **Blakeland**

*Percent of map unit:* 8 percent  
*Landform:* Interfluves, hillslopes  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex, linear  
*Ecological site:* R049XB210CO - Sandy Foothill  
*Hydric soil rating:* No

#### **Bresser**

*Percent of map unit:* 7 percent  
*Landform:* Interfluves, low hills  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Base slope  
*Down-slope shape:* Concave, linear  
*Across-slope shape:* Concave, linear  
*Ecological site:* R049XB210CO - Sandy Foothill  
*Hydric soil rating:* No

## **Data Source Information**

Soil Survey Area: El Paso County Area, Colorado  
Survey Area Data: Version 21, Aug 24, 2023

**F.E.M.A. MAP**



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, 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, and Anderson Consulting Engineers, Inc. These data are current as of 2008.

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.

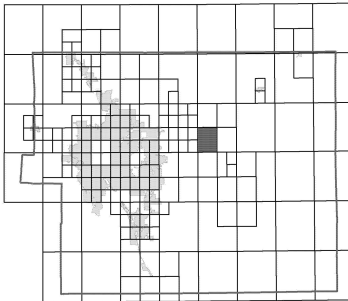
Contact **FEMA Map Service Center (MSC)** via the FEMA Map Information eXchange (FMIX) 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this 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/nfp>.

| 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

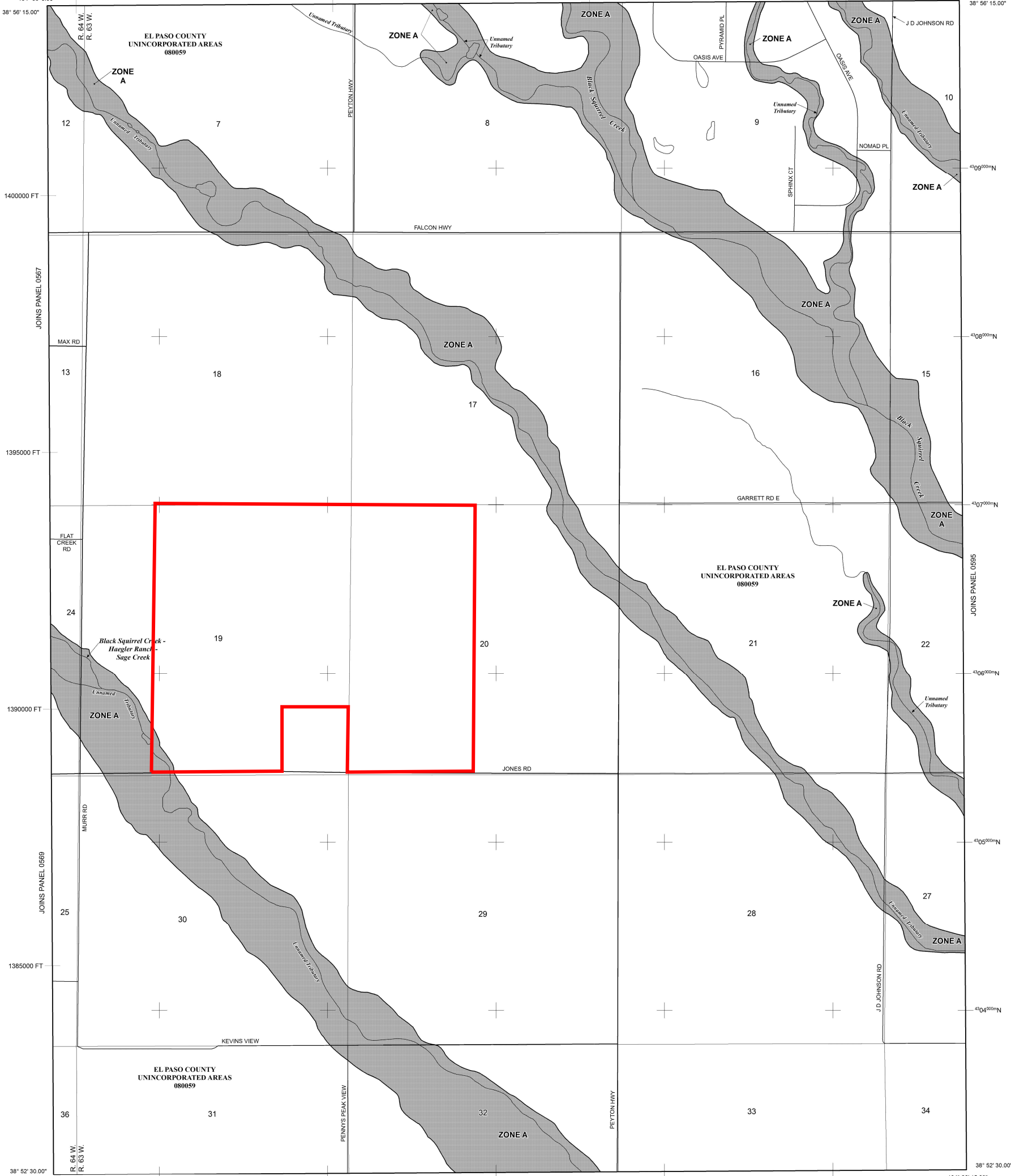
Panel Location Map



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.



- 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**

**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.

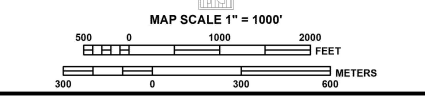
- Floodplain boundary
- Floodway boundary
- Zone D Boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Base Flood Elevation line and value; elevation in feet\*
- Base Flood Elevation value where uniform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

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

- A** Cross section line
- 23** Transsect line
- 97° 07' 30.00" 32° 22' 30.00" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000N 1000-meter Universal Transverse Mercator grid ticks, zone 13
- 6000000 FT 5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0503), 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 1-800-638-6626.



**NFIP** **PANEL 0590G**

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

**PANEL 590 OF 1300**  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

**CONTAINS:**

| COMMUNITY      | NUMBER | PANEL | SUFFIX |
|----------------|--------|-------|--------|
| EL PASO COUNTY | 080059 | 0590  | 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**  
**08041C0590G**

**MAP REVISION**



# National Flood Hazard Layer FIRMette



104°29'51"W 38°54'2"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

104°29'14"W 38°53'34"N

Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

|                             |  |                                                                                                                                                                   |
|-----------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SPECIAL FLOOD HAZARD AREAS  |  | Without Base Flood Elevation (BFE)<br>Zone A, V, A99                                                                                                              |
|                             |  | With BFE or Depth Zone AE, AO, AH, VE, AR                                                                                                                         |
|                             |  | Regulatory Floodway                                                                                                                                               |
| OTHER AREAS OF FLOOD HAZARD |  | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X |
|                             |  | Future Conditions 1% Annual Chance Flood Hazard Zone X                                                                                                            |
|                             |  | Area with Reduced Flood Risk due to Levee. See Notes. Zone X                                                                                                      |
|                             |  | Area with Flood Risk due to Levee Zone D                                                                                                                          |
| OTHER AREAS                 |  | NO SCREEN Area of Minimal Flood Hazard Zone X                                                                                                                     |
|                             |  | Effective LOMRs                                                                                                                                                   |
|                             |  | Area of Undetermined Flood Hazard Zone D                                                                                                                          |
| GENERAL STRUCTURES          |  | Channel, Culvert, or Storm Sewer                                                                                                                                  |
|                             |  | Levee, Dike, or Floodwall                                                                                                                                         |
| OTHER FEATURES              |  | 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation                                                                                                 |
|                             |  | 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation                                                                                                 |
|                             |  | Coastal Transect                                                                                                                                                  |
|                             |  | Base Flood Elevation Line (BFE)                                                                                                                                   |
|                             |  | Limit of Study                                                                                                                                                    |
|                             |  | Jurisdiction Boundary                                                                                                                                             |
| OTHER FEATURES              |  | Coastal Transect Baseline                                                                                                                                         |
|                             |  | Profile Baseline                                                                                                                                                  |
|                             |  | Hydrographic Feature                                                                                                                                              |
| MAP PANELS                  |  | Digital Data Available                                                                                                                                            |
|                             |  | No Digital Data Available                                                                                                                                         |
|                             |  | Unmapped                                                                                                                                                          |



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

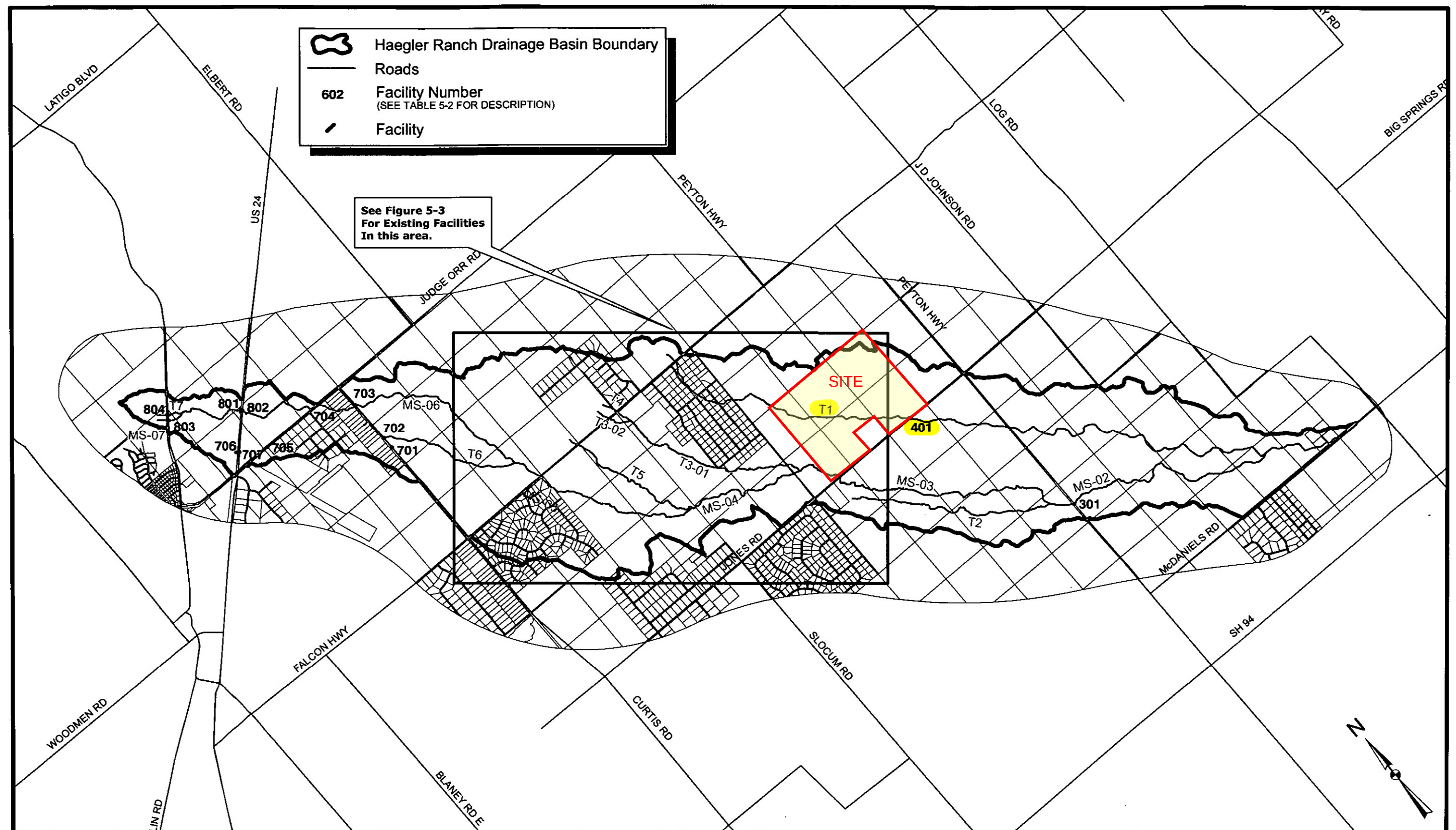
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **6/8/2023 at 12:19 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

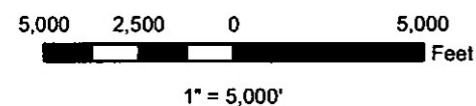
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



**REFERENCES FROM  
HAEGLER RANCH DBPS**



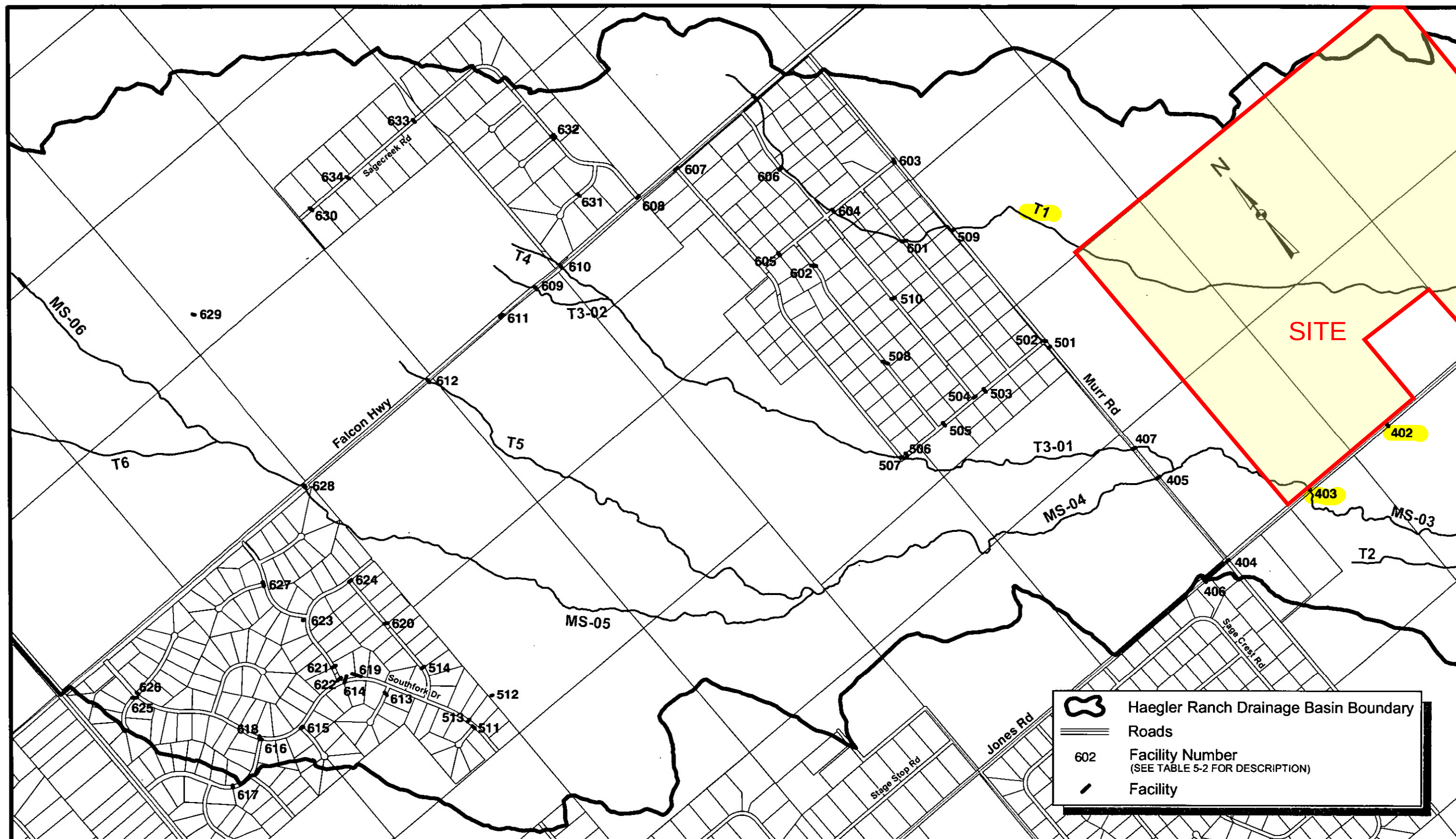
**URS**  
 9960 Federal Dr.  
 Suite 300  
 Colorado Springs, CO 80921  
 719.531.0001



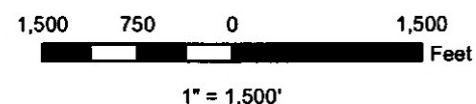
DATE: 09/08

**HAEGLER RANCH DRAINAGE BASIN**  
**FACILITY INVENTORY A**  
**FIGURE 5-2**





**URS**  
 9960 Federal Dr.  
 Suite 300  
 Colorado Springs, CO 80921  
 719.531.0001



DATE: 09/08

**HAEGLER RANCH DRAINAGE BASIN**  
**FACILITY INVENTORY B**  
**FIGURE 5-3**

Table C3  
Existing Condition Culvert Improvements Cost Estimate

| Facility Number | Road Crossing       | Channel             | Existing Size   | Existing 100-yr Flow (cfs) | Deficiency     | Necessary Facility for Existing 100-year Flow | Number of Culverts | Assumed Length (LF) | Unit Cost | End Section Unit Cost | Headwall Concrete (LF/HW) | Headwall Steel (LB/HW) | Wingwall Concrete (CY) | Wingwall Steel (tons) | Concrete Unit Cost \$/CY | Steel Unit Cost \$/ton | Total Cost |
|-----------------|---------------------|---------------------|-----------------|----------------------------|----------------|-----------------------------------------------|--------------------|---------------------|-----------|-----------------------|---------------------------|------------------------|------------------------|-----------------------|--------------------------|------------------------|------------|
| 301             | Peyton Highway      | Main Stem (MS-02)   | 2-33"X48" CMPs  | 2,500                      | Overtops       | 7-6'X6' RCBs                                  | 7                  | 90                  | \$475     |                       | 0.581                     | 151                    | 19.7                   | 774.4                 | \$435                    | \$1.1                  | \$314,535  |
| 401             | Jones Road          | Tributary 1 (T1)    | 2-24" CMPs      | 370                        | Overtops       | 6'X6' RCB                                     | 1                  | 90                  | \$475     |                       | 0.652                     | 169.4                  | 19.7                   | 774.4                 | \$435                    | \$1.1                  | \$53,111   |
| 403             | Jones Road          | Main Stem (MS-03)   | 3-60" CMPs      | 2,300                      | Overtops       | 6-6'X6' RCBs                                  | 6                  | 90                  | \$475     |                       | 0.581                     | 151                    | 19.7                   | 774.4                 | \$435                    | \$1.1                  | \$270,947  |
| 405             | Murr Road           | Main Stem (MS-04)   | 66" RCP         | 1,700                      | Overtops       | 5-6'X6' RCBs                                  | 5                  | 70                  | \$475     |                       | 0.652                     | 169.4                  | 19.7                   | 774.4                 | \$435                    | \$1.1                  | \$180,371  |
| 407             | Murr Road           | Tributary 3 (T3-01) | 66" RCP         | 670                        | Overtops       | 2-6'X6' RCBs                                  | 2                  | 70                  | \$475     |                       | 0.652                     | 169.4                  | 19.7                   | 774.4                 | \$435                    | \$1.1                  | \$77,801   |
| 507             | Peerless Farms Road | Tributary 3 (T3-01) | 60" CMP         | 600                        | Overtops       | 2-6'X6' RCBs                                  | 2                  | 110                 | \$475     |                       | 0.652                     | 169.4                  | 19.7                   | 774.4                 | \$435                    | \$1.1                  | \$115,801  |
| 509             | Murr Road           | Tributary 1 (T1)    | 2-15" RCPs      | 220                        | Overtops       | 66" RCP                                       | 1                  | 70                  | \$210     | \$2,300               |                           |                        |                        |                       |                          |                        | \$19,300   |
| 601             | Whiting Way         | Tributary 1 (T1)    | 24" CMP         | 220                        | Overtops       | 66" RCP                                       | 1                  | 90                  | \$210     | \$2,300               |                           |                        |                        |                       |                          |                        | \$23,500   |
| 604             | Max Road            | Tributary 1 (T1)    | 18" CMP         | 220                        | Overtops       | 66" RCP                                       | 1                  | 70                  | \$210     | \$2,300               |                           |                        |                        |                       |                          |                        | \$19,300   |
| 609             | Falcon Highway      | Tributary 3 (T3-02) | 18" CMP         | 180                        | Overtops       | 66" RCP                                       | 1                  | 100                 | \$210     | \$2,300               |                           |                        |                        |                       |                          |                        | \$25,600   |
| 610             | Falcon Highway      | Tributary 4 (T4)    | 24" CMP         | 200                        | Overtops       | 66" RCP                                       | 1                  | 90                  | \$210     | \$2,300               |                           |                        |                        |                       |                          |                        | \$23,500   |
| 612             | Falcon Highway      | Tributary 5 (T5)    | 24" CMP         | 150                        | Overtops       | 60" RCP                                       | 1                  | 90                  | \$185     | \$2,275               |                           |                        |                        |                       |                          |                        | \$21,200   |
| 628             | Falcon Highway      | Main Stem (MS-05)   | 2-60" CMPs      | 1,000                      | Overtops       | 3-6'X6' RCBs                                  | 3                  | 100                 | \$475     |                       | 0.652                     | 169.4                  | 19.7                   | 774.4                 | \$435                    | \$1.1                  | \$154,741  |
| 702             | Curtis Road         | Tributary 6 (T6)    | 36" CMP         | 120                        | Overtops       | 54" RCP                                       | 1                  | 130                 | \$145     | \$2,150               |                           |                        |                        |                       |                          |                        | \$23,150   |
| 703             | Curtis Road         | Main Stem (MS-06)   | 24" CMP         | 590                        | Overtops       | 2-6'X6' RCBs                                  | 2                  | 120                 | \$475     |                       | 0.652                     | 169.4                  | 19.7                   | 774.4                 | \$435                    | \$1.1                  | \$125,301  |
| 704             | Judge Orr Road      | Main Stem (MS-06)   | Blocked Culvert | 540                        | Overtops       | 2-72" RCPs                                    | 2                  | 160                 | \$230     | \$2,400               |                           |                        |                        |                       |                          |                        | \$83,200   |
| 801             | Pedestrian Bridge   | Main Stem (MS-06)   | Bridge          | 350                        | Meets Capacity | Existing Bridge                               |                    |                     |           |                       |                           |                        |                        |                       |                          |                        | \$0        |
| 802             | US24                | Main Stem (MS-06)   | 2-66" CMPs      | 350                        | Meets Capacity | Existing Culvert                              |                    |                     |           |                       |                           |                        |                        |                       |                          |                        | \$0        |
| 803             | Eastonville Road    | Main Stem (MS-07)   | 27"X21" CMP     | 25                         | Overtops       | 30" RCP                                       | 1                  | 110                 | \$68      | \$1,100               |                           |                        |                        |                       |                          |                        | \$9,680    |
| 804             | Eastonville Road    | Tributary 7 (T7)    | 18" CMP         | 99                         | Overtops       | 48" RCP                                       | 1                  | 100                 | \$110     | \$1,990               |                           |                        |                        |                       |                          |                        | \$14,980   |
| N/A             | Peyton Highway      | Tributary 1 (T1)    | No Culvert      | 500                        | Overtops       | 2-72" RCPs                                    | 2                  | 90                  | \$230     | \$2,400               |                           |                        |                        |                       |                          |                        | \$51,000   |
| N/A             | Falcon Highway      | Tributary 1 (T1)    | No Culvert      | 33                         | Overtops       | 36" RCP                                       | 1                  | 90                  | \$80      | \$1,275               |                           |                        |                        |                       |                          |                        | \$9,750    |

<sup>1</sup> Length is based on Future Land Use Road widths  
<sup>2</sup> Wingwalls assumed 15' long for calculations. Calculations based on CDOT cross sections.

|                              |             |
|------------------------------|-------------|
| Sub-Total                    | \$1,616,769 |
| 30% Construction Contingency | \$485,031   |
| 15% Engineering Contingency  | \$242,515   |
| Total                        | \$2,344,315 |



6.4. Cost Estimates

The regional and subregional detention alternatives have been evaluated by assembling necessary design requirements using the above criteria and estimating the capital cost of the improvements. Proposed improvements are separated into existing or future, depending on whether facilities are designed for the existing or future peak flow rates. Unit rates for all cost estimating are based on an average of the bid tabulations published by CDOT for 2006. These unit rates are presented in Table 6-11. Land acquisition costs were included only for the detention facilities in the alternatives analysis, because channel improvements would essentially be in floodplain areas not otherwise developable. Cost estimates are included in Appendix C.

Table 6-11 Unit Rates

| Item Number | Description                                          | Units | URS Estimated Unit Price |
|-------------|------------------------------------------------------|-------|--------------------------|
| 203-00010   | Unclassified Excavation (Complete In Place)          | CY    | \$7.00                   |
| 203-00060   | Embankment Material (Complete In Place)              | CY    | \$9.00                   |
| 207-00205   | Topsoil                                              | CY    | \$8.00                   |
| 212-00006   | Seeding (Native)                                     | ACRE  | \$580.00                 |
| 420-00100   | Geotextile (Erosion Control) (Class A)               | SY    | \$3.00                   |
| 506-00206   | Riprap (6 Inch)                                      | CY    | \$80.00                  |
| 506-00212   | Riprap (12 Inch)                                     | CY    | \$76.00                  |
| 506-00218   | Riprap (18 Inch)                                     | CY    | \$64.00                  |
| 507-00100   | Concrete Slope and Ditch Paving (Reinforced)         | CY    | \$300.00                 |
| 601-03030   | Concrete Class D (Box Culvert)                       | CY    | \$435.00                 |
| 602-00000   | Reinforcing Steel                                    | LB    | \$1.10                   |
| 603-01185   | 18 Inch Reinforced Concrete Pipe (Complete In Place) | LF    | \$48.00                  |
| 603-01245   | 24 Inch Reinforced Concrete Pipe (Complete In Place) | LF    | \$56.00                  |
| 603-01305   | 30 Inch Reinforced Concrete Pipe (Complete In Place) | LF    | \$68.00                  |
| 603-01365   | 36 Inch Reinforced Concrete Pipe (Complete In Place) | LF    | \$80.00                  |
| 603-01425   | 42 Inch Reinforced Concrete Pipe (Complete In Place) | LF    | \$100.00                 |
| 603-01485   | 48 Inch Reinforced Concrete Pipe (Complete In Place) | LF    | \$110.00                 |
| 603-01545   | 54 Inch Reinforced Concrete Pipe (Complete In Place) | LF    | \$145.00                 |
| 603-01605   | 60 Inch Reinforced Concrete Pipe (Complete In Place) | LF    | \$185.00                 |
| 603-01665   | 66 Inch Reinforced Concrete Pipe (Complete In Place) | LF    | \$210.00                 |
| 603-01725   | 72 Inch Reinforced Concrete Pipe (Complete In Place) | LF    | \$230.00                 |
| 603-05018   | 18 Inch Reinforced Concrete End Section              | EACH  | \$735.00                 |
| 603-05024   | 24 Inch Reinforced Concrete End Section              | EACH  | \$850.00                 |
| 603-05030   | 30 Inch Reinforced Concrete End Section              | EACH  | \$1,100.00               |
| 603-05036   | 36 Inch Reinforced Concrete End Section              | EACH  | \$1,275.00               |
| 603-05042   | 42 Inch Reinforced Concrete End Section              | EACH  | \$1,550.00               |
| 603-05048   | 48 Inch Reinforced Concrete End Section              | EACH  | \$1,990.00               |
| 603-05054   | 54 Inch Reinforced Concrete End Section              | EACH  | \$2,150.00               |
| 603-05060   | 60 Inch Reinforced Concrete End Section              | EACH  | \$2,275.00               |

| Item Number | Description                              | Units | URS Estimated Unit Price |
|-------------|------------------------------------------|-------|--------------------------|
| 603-05066   | 66 Inch Reinforced Concrete End Section  | EACH  | \$2,300.00               |
| 603-05072   | 72 Inch Reinforced Concrete End Section  | EACH  | \$2,400.00               |
| 603-70606   | 6x6 Foot Concrete Box Culvert (Precast)  | LF    | \$475.00                 |
| 603-70806   | 8x6 Foot Concrete Box Culvert (Precast)  | LF    | \$535.00                 |
| 603-71006   | 10x6 Foot Concrete Box Culvert (Precast) | LF    | \$570.00                 |
| N/A         | Land Acquisition                         | ACRE  | \$55,000                 |

Note: Land acquisition costs were provided by El Paso County

Cost estimates have been prepared for public roadway crossing facilities designed for existing peak flow rates and are shown in Table 6-12.

Table 6-12 Existing Conditions Roadway Crossing Deficiencies and Costs to Correct

| Facility Number              | Road Crossing       | Channel             | Necessary Facility | Cost        |
|------------------------------|---------------------|---------------------|--------------------|-------------|
| 301                          | Peyton Highway      | Main Stem (MS-02)   | 7-6' X6' RCBs      | \$314,535   |
| 401                          | Jones Road          | Tributary 1 (T1)    | 6' X6' RCB         | \$53,111    |
| 403                          | Jones Road          | Main Stem (MS-03)   | 6-6' X6' RCBs      | \$270,947   |
| 405                          | Murr Road           | Main Stem (MS-04)   | 5-6' X6' RCBs      | \$180,371   |
| 407                          | Murr Road           | Tributary 3 (T3-01) | 2-6' X6' RCBs      | \$77,801    |
| 507                          | Peerless Farms Road | Tributary 3 (T3-01) | 2-6' X6' RCBs      | \$115,801   |
| 509                          | Murr Road           | Tributary 1 (T1)    | 66" RCP            | \$19,300    |
| 601                          | Whiting Way         | Tributary 1 (T1)    | 66" RCP            | \$23,500    |
| 604                          | Max Road            | Tributary 1 (T1)    | 66" RCP            | \$19,300    |
| 609                          | Falcon Highway      | Tributary 3 (T3-02) | 66" RCP            | \$25,600    |
| 610                          | Falcon Highway      | Tributary 4 (T4)    | 66" RCP            | \$23,500    |
| 612                          | Falcon Highway      | Tributary 5 (T5)    | 60" RCP            | \$21,200    |
| 628                          | Falcon Highway      | Main Stem (MS-05)   | 3-6' X6' RCBs      | \$154,741   |
| 702                          | Curtis Road         | Tributary 6 (T6)    | 54" RCP            | \$23,150    |
| 703                          | Curtis Road         | Main Stem (MS-06)   | 2-6' X6' RCBs      | \$125,301   |
| 704                          | Judge Orr Road      | Main Stem (MS-06)   | 2-72" RCPs         | \$83,200    |
| 801                          | Pedestrian Bridge   | Main Stem (MS-06)   | Existing Bridge    | \$0         |
| 802                          | US24                | Main Stem (MS-06)   | Existing Culvert   | \$0         |
| 803                          | Eastonville Road    | Main Stem (MS-07)   | 30" RCP            | \$9,680     |
| 804                          | Eastonville Road    | Tributary 7 (T7)    | 48" RCP            | \$14,980    |
| N/A                          | Peyton Highway      | Tributary 1 (T1)    | 2-72" RCPs         | \$51,000    |
| N/A                          | Falcon Highway      | Tributary 1 (T1)    | 36" RCP            | \$9,750     |
| Sub-Total                    |                     |                     |                    | \$1,616,769 |
| 30% Construction Contingency |                     |                     |                    | \$485,031   |
| 15% Engineering Contingency  |                     |                     |                    | \$242,515   |
| Total                        |                     |                     |                    | \$2,344,315 |

(See Table C3 in Appendix C for details)



Table 6-16 Sub-Regional Detention Roadway Crossing Cost Estimate Summary

| Facility Number              | Road Crossing                | Channel             | Proposed 100-yr Flow (cfs) | Necessary Facility for Proposed 100-year Flow | Estimated Cost |
|------------------------------|------------------------------|---------------------|----------------------------|-----------------------------------------------|----------------|
| 301                          | Peyton Highway               | Main Stem (MS-02)   | 3,370                      | 9-6'X6' RCBs                                  | \$402,000      |
| 403                          | Jones Road                   | Main Stem (MS-03)   | 2,970                      | 8-6'X6' RCBs                                  | \$358,000      |
| 405                          | Murr Road                    | Main Stem (MS-04)   | 2,870                      | 8-6'X6' RCBs                                  | \$283,000      |
| 609                          | Falcon Highway               | Tributary 3 (T3-02) | 460                        | 2-6'X6' RCBs                                  | \$106,000      |
| N/A                          | Falcon Highway               | Tributary 1 (T1)    | 110                        | 2 - 36" RCP                                   | \$20,000       |
| 1001                         | Future Pastura Street        | Main Stem (MS-06)   | 610                        | 2-6'X6' RCBs                                  | \$107,000      |
| 1002                         | Future Arroyo Hondo Blvd. N. | Main Stem (MS-06)   | 610                        | 2-6'X6' RCBs                                  | \$87,000       |
| 1003                         | Future Arroyo Hondo Blvd. N. | Main Stem (MS-06)   | 530                        | 2-6'X6' RCBs                                  | \$87,000       |
| 1004                         | Future Pastura Street        | Tributary 6 (T6)    | 440                        | 2-66" RCPs                                    | \$43,000       |
| 1005                         | Future El Vado Road          | Tributary 6 (T6)    | 440                        | 2-66" RCPs                                    | \$43,000       |
| 1006                         | Future Socorro Trail         | Tributary 6 (T6)    | 440                        | 2-66" RCPs                                    | \$43,000       |
| Sub-Total                    |                              |                     |                            |                                               | \$1,582,000    |
| 30% Construction Contingency |                              |                     |                            |                                               | \$475,000      |
| 15% Engineering Contingency  |                              |                     |                            |                                               | \$237,000      |
| Total                        |                              |                     |                            |                                               | \$2,294,000    |

(See Tables C5 in Appendix C for details)

6.4.2. Detention Pond Costs

The cost of detention ponds, both regional and subregional, is based on the cubic yards of excavation, an estimated outlet structure, and the cost of the land required for the facility. These costs are presented in Table 6-17 and Table 6-18.

Table 6-17 Regional Detention Pond Cost Summary

| Facility    | Storage (AF) | Total Cost Including Construction and Engineering Contingencies |
|-------------|--------------|-----------------------------------------------------------------|
| RG-01 9.02  | 9.02         | \$542,000                                                       |
| RG-02 64.52 | 64.52        | \$4,053,000                                                     |
| RG-03 0.04  | 0.04         | \$146,000                                                       |
| RG-04 1.07  | 1.07         | \$160,000                                                       |
| RG-05 0.03  | 0.03         | \$146,000                                                       |
| Total       |              | \$5,048,000                                                     |

(See Tables C1 in Appendix C for details)

Table 6-18 Sub-Regional Detention Pond Cost Summary

| Facility | Storage (AF) | Total Cost Including Construction and Engineering Contingencies |
|----------|--------------|-----------------------------------------------------------------|
| SR-01    | 10           | \$899,000                                                       |
| SR-02    | 5            | \$640,000                                                       |
| SR-03    | 16           | \$868,000                                                       |
| SR-04    | 25           | \$1,453,000                                                     |
| SR-05    | 24           | \$1,557,000                                                     |
| SR-06    | 9            | \$547,000                                                       |
| SR-07    | 5            | \$524,000                                                       |
| SR-08    | 5            | \$326,000                                                       |
| SR-09    | 20           | \$861,000                                                       |
| SR-10    | 23           | \$1,069,000                                                     |
| SR-11    | 2            | \$182,000                                                       |
| SR-12    | 9            | \$477,000                                                       |
| SR-13    | 3            | \$376,000                                                       |
| Total    |              | \$9,780,000                                                     |

(See Table C1 in Appendix C for details)

6.4.3. Other Costs

Design Engineering costs are also included as 15% of the construction costs. Construction contingencies (30%) include such items as utility relocations, mobilization, temporary erosion control, and construction engineering.

6.4.4. Conceptual Alternative Costs

The total estimated capital costs for each alternative are based on the sum of the cost of the proposed facilities, plus costs for engineering and construction contingencies. These costs are listed in Table 6-19.

Table 6-19 Conceptual Alternative Costs

|                           | Regional Alternative | Subregional Alternative |
|---------------------------|----------------------|-------------------------|
| Detention Ponds           | \$5,048,000          | \$9,780,000             |
| Channel Improvements      | \$10,737,000         | \$2,110,000             |
| Drop Structures           | \$9,988,000          | \$3,442,000             |
| Roadway Crossing Culverts | \$2,307,000          | \$2,294,000             |
| Total                     | \$28,080,000         | \$17,627,000            |

Table 5-3 Existing Hydraulic Deficiencies

| Facility Number | Road Crossing       | Channel             | Existing Size   | Existing 100-yr Flow (cfs) | Deficiency |
|-----------------|---------------------|---------------------|-----------------|----------------------------|------------|
| 301             | Peyton Highway      | Main Stem (MS-02)   | 2-33"X48" CMPs  | 2,500                      | Overtops   |
| N/A             | Peyton Highway      | Tributary 1 (T1)    | No Culvert      | 500                        | Overtops   |
| 401             | Jones Road          | Tributary 1 (T1)    | 2-24" CMPs      | 370                        | Overtops   |
| 402             | Jones Road          | N/A                 | 15" RCP         | N/A                        | N/A        |
| 403             | Jones Road          | Main Stem (MS-03)   | 3-60" CMPs      | 2,300                      | Overtops   |
| 404             | Jones Road          | N/A                 | 18" CMP         | N/A                        | N/A        |
| 405             | Murr Road           | Main Stem (MS-04)   | 66" RCP         | 1,700                      | Overtops   |
| 406             | Jones Road          | N/A                 | 4.1' x 6.9' RCP | N/A                        | N/A        |
| 407             | Murr Road           | Tributary 3 (T3-01) | 66" RCP         | 670                        | Overtops   |
| 501             | Murr Road           | N/A                 | 2-14" RCP       | N/A                        | N/A        |
| 502             | Murr Road           | N/A                 | 2-18" CMP       | N/A                        | N/A        |
| 503             | Flat Creek Road     | N/A                 | 30" CMP         | N/A                        | N/A        |
| 504             | Flat Creek Road     | N/A                 | 18" CMP         | N/A                        | N/A        |
| 505             | Flat Creek Road     | N/A                 | 36" CMP         | N/A                        | N/A        |
| 506             | Flat Creek Road     | N/A                 | 60" CMP         | N/A                        | N/A        |
| 507             | Peerless Farms Road | Tributary 3 (T3-01) | 60" CMP         | 600                        | Overtops   |
| 508             | Whipsaw Road        | N/A                 | 30" CMP         | N/A                        | N/A        |
| 509             | Murr Road           | Tributary 1 (T1)    | 2-15" RCPs      | 220                        | Overtops   |
| 510             | Prospero Road       | N/A                 | 18" CMP         | N/A                        | N/A        |
| 511             | Southfork Dr        | N/A                 | 24" CMP         | N/A                        | N/A        |
| 512             | Falcon Grassy Hts   | N/A                 | 2-12" CMP       | N/A                        | N/A        |
| 513             | Southfork Dr        | N/A                 | 36" CMP         | N/A                        | N/A        |
| 514             | Oil Baron Dr        | N/A                 | 30" CMP         | N/A                        | N/A        |
| 601             | Whiting Way         | Tributary 1 (T1)    | 24" CMP         | 220                        | Overtops   |
| 602             | Whipsaw Road        | N/A                 | 24" CMP         | N/A                        | N/A        |
| 603             | Murr Road           | N/A                 | 24" CMP         | N/A                        | N/A        |
| 604             | Max Road            | Tributary 1 (T1)    | 18" CMP         | 220                        | Overtops   |
| 605             | Max Road            | N/A                 | 2-24" CMP       | N/A                        | N/A        |



**Table 7-4 Reimbursable Costs**

| <b>Reimbursable Culvert Improvements</b>   |                      |                          |                                  |                         |                    |
|--------------------------------------------|----------------------|--------------------------|----------------------------------|-------------------------|--------------------|
| <b>Culvert</b>                             | <b>Road Crossing</b> | <b>Channel</b>           | <b>Culvert Construction Cost</b> | <b>Contingency Cost</b> | <b>Total Cost</b>  |
| N/A                                        | Peyton Highway       | Tributary 1 (T1)         | \$51,000                         | \$22,950                | \$73,950           |
| N/A                                        | Falcon Highway       | Tributary 1 (T1)         | \$9,7580                         | \$4,388                 | \$14,138           |
| 301                                        | Peyton Highway       | Main Stem (MS-02)        | \$314,535                        | \$141,541               | \$456,076          |
| 401                                        | Jones Road           | Tributary 1 (T1)         | \$53,111                         | \$23,900                | \$77,011           |
| 403                                        | Jones Road           | Main Stem (MS-03)        | \$270,947                        | \$121,926               | \$392,874          |
| 405                                        | Murr Road            | Main Stem (MS-04)        | \$180,371                        | \$81,167                | \$261,538          |
| 407                                        | Murr Road            | Tributary 3 (T3-01)      | \$77,801                         | \$35,011                | \$112,812          |
| 507                                        | Peerless Farms Road  | Tributary 3 (T3-01)      | \$115,801                        | \$52,111                | \$167,912          |
| 509                                        | Murr Road            | Tributary 1 (T1)         | \$19,300                         | \$8,685                 | \$27,985           |
| 601                                        | Whiting Way          | Tributary 1 (T1)         | \$23,500                         | \$10,575                | \$34,075           |
| 604                                        | Max Road             | Tributary 1 (T1)         | \$19,300                         | \$8,685                 | \$27,985           |
| 609                                        | Falcon Highway       | Tributary 3 (T3-02)      | \$25,600                         | \$11,520                | \$37,120           |
| 610                                        | Falcon Highway       | Tributary 4 (T4)         | \$23,500                         | \$10,575                | \$34,075           |
| 612                                        | Falcon Highway       | Tributary 5 (T5)         | \$21,200                         | \$9,540                 | \$30,740           |
| 628                                        | Falcon Highway       | Main Stem (MS-05)        | \$154,741                        | \$69,633                | \$224,375          |
| 702                                        | Curtis Road          | Tributary 6 (T6)         | \$23,150                         | \$10,418                | \$33,568           |
| 703                                        | Curtis Road          | Main Stem (MS-06)        | \$125,301                        | \$56,386                | \$181,687          |
| 704                                        | Judge Orr Road       | Main Stem (MS-06)        | \$83,200                         | \$37,440                | \$120,640          |
| 803                                        | Eastonville Road     | Main Stem (MS-07)        | \$9,680                          | \$4,356                 | \$14,036           |
| 804                                        | Eastonville Road     | Tributary 7 (T7)         | \$14,980                         | \$6,741                 | \$21,721           |
| Subtotal Channel Costs                     |                      |                          |                                  |                         | \$2,344,315        |
| <b>Reimbursable Detention Improvements</b> |                      |                          |                                  |                         |                    |
| <b>Facility</b>                            | <b>Storage (AF)</b>  | <b>Construction Cost</b> | <b>Contingency Cost</b>          | <b>Total Cost</b>       |                    |
| SR-01                                      | 10                   | \$296,701                | \$133,516                        | \$430,217               |                    |
| SR-02                                      | 5                    | \$207,949                | \$93,577                         | \$301,525               |                    |
| SR-03                                      | 16                   | \$186,252                | \$83,814                         | \$270,066               |                    |
| SR-04                                      | 25                   | \$390,182                | \$175,582                        | \$565,764               |                    |
| SR-05                                      | 24                   | \$455,235                | \$204,856                        | \$660,091               |                    |
| SR-06                                      | 9                    | \$140,670                | \$63,301                         | \$203,971               |                    |
| SR-07                                      | 5                    | \$162,046                | \$72,921                         | \$234,967               |                    |
| SR-08                                      | 5                    | \$87,489                 | \$39,370                         | \$126,860               |                    |
| SR-09                                      | 20                   | \$188,250                | \$84,713                         | \$272,963               |                    |
| SR-10                                      | 23                   | \$331,635                | \$149,236                        | \$480,871               |                    |
| SR-11                                      | 2                    | \$56,880                 | \$25,596                         | \$82,476                |                    |
| SR-12                                      | 9                    | \$108,987                | \$49,044                         | \$158,031               |                    |
| SR-13                                      | 3                    | \$107,812                | \$48,515                         | \$156,327               |                    |
| Subtotal Detention Costs                   |                      |                          |                                  |                         | \$3,944,129        |
| <b>Total Reimbursable Cost</b>             |                      |                          |                                  |                         | <b>\$6,288,444</b> |



## HYDROLOGIC CALCULATIONS

# SWMM 5.1 Subcatchment Hydrology

## City of Colorado Springs Workshop

Instructors:

Derek Rapp, PE  
Ben Urbonas, PE, D.WRE

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### Primary Inputs to describe SWMM Subcatchments

| Subcatchment 2    |          |
|-------------------|----------|
| Property          | Value    |
| Name              | 2        |
| X-Coordinate      | 3933.419 |
| Y-Coordinate      | 4464.789 |
| Description       |          |
| Tag               |          |
| Rain-Gage         | *        |
| Outlet            |          |
| Area              | 5        |
| Width             | 500      |
| % Slope           | 0.5      |
| % Imperv          | 25       |
| N-Imperv          | 0.01     |
| N-Perv            | 0.1      |
| Dstore-Imperv     | 0.05     |
| Dstore-Perv       | 0.05     |
| %Zero-Imperv      | 25       |
| Subarea Routing   | OUTLET   |
| Percent Routed    | 100      |
| Infiltration Data | HORTON   |
| Groundwater       | NO       |
| Snow Pack         |          |
| LID Controls      | 0        |

Inputs and their corresponding table rows:

- Description (optional) → Description
- Tag (optional) → Tag
- Name of Rain Gage for this catchment → Rain-Gage
- Name of Junction intercepting runoff → Outlet
- Subcatchment area in acres → Area
- Subcatchment Width – very sensitive user-defined parameter → Width
- Subcatchment slope towards Width in % → % Slope
- Subcatchment Imperviousness in % → % Imperv
- Manning's  $n$  Impervious surfaces → N-Imperv
- Manning's  $n$  pervious surfaces → N-Perv
- Inches of Depression Storage - impervious surfaces → Dstore-Imperv
- Inches of Depression Storage - pervious surfaces → Dstore-Perv
- % of Impervious Subcatchment with zero Dstore → %Zero-Imperv
- Routed to Outlet, Pervious, Impervious Surface → Subarea Routing
- % of Subcatchment Routed → Percent Routed
- Horton's Model: defined under "Options – General". Define here Max & Min Infiltration Rate, Decay Coeff. Drying Time and Max. Volume → Infiltration Data
- Identifies previously defined LID Control for this Subcatchment (if used) → LID Controls

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## General Information

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## NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: CO

## Data description

Data type:  Units:  Time series type:

## Select location

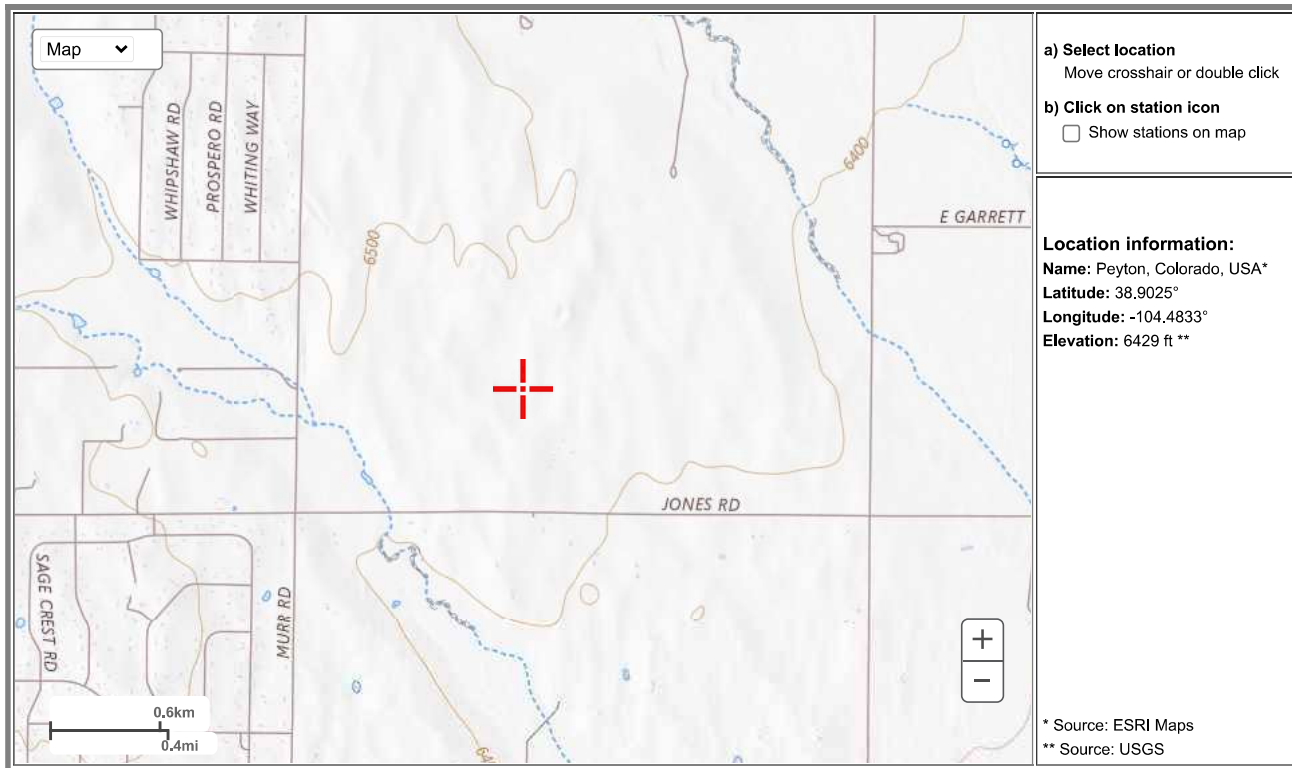
## 1) Manually:

a) By location (decimal degrees, use "-" for S and W): Latitude:  Longitude:

b) By station (list of CO stations):

c) By address

## 2) Use map:





NOAA Atlas 14, Volume 8, Version 2  
Location name: Peyton, Colorado, USA\*  
Latitude: 38.9025°, Longitude: -104.4833°  
Elevation: 6429 ft\*\*  
\* source: ESRI Maps  
\*\* source: USGS



## POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffrey Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

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### PF tabular

| PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) <sup>1</sup> |                                     |                        |                        |                        |                        |                        |                       |                       |                      |                      |
|----------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|-----------------------|----------------------|----------------------|
| Duration                                                                                                 | Average recurrence interval (years) |                        |                        |                        |                        |                        |                       |                       |                      |                      |
|                                                                                                          | 1                                   | 2                      | 5                      | 10                     | 25                     | 50                     | 100                   | 200                   | 500                  | 1000                 |
| 5-min                                                                                                    | 0.241<br>(0.193-0.304)              | 0.294<br>(0.235-0.371) | 0.386<br>(0.308-0.489) | 0.468<br>(0.371-0.594) | 0.587<br>(0.453-0.778) | 0.685<br>(0.515-0.916) | 0.787<br>(0.572-1.08) | 0.897<br>(0.625-1.26) | 1.05<br>(0.703-1.51) | 1.17<br>(0.763-1.70) |
| 10-min                                                                                                   | 0.353<br>(0.282-0.445)              | 0.431<br>(0.344-0.544) | 0.566<br>(0.451-0.716) | 0.685<br>(0.543-0.870) | 0.859<br>(0.663-1.14)  | 1.00<br>(0.754-1.34)   | 1.15<br>(0.838-1.58)  | 1.31<br>(0.915-1.84)  | 1.54<br>(1.03-2.21)  | 1.71<br>(1.12-2.49)  |
| 15-min                                                                                                   | 0.430<br>(0.344-0.543)              | 0.525<br>(0.420-0.663) | 0.690<br>(0.550-0.873) | 0.835<br>(0.662-1.06)  | 1.05<br>(0.808-1.39)   | 1.22<br>(0.919-1.64)   | 1.41<br>(1.02-1.92)   | 1.60<br>(1.12-2.25)   | 1.87<br>(1.26-2.69)  | 2.09<br>(1.36-3.03)  |
| 30-min                                                                                                   | 0.621<br>(0.497-0.784)              | 0.758<br>(0.606-0.957) | 0.994<br>(0.792-1.26)  | 1.20<br>(0.952-1.53)   | 1.51<br>(1.16-2.00)    | 1.76<br>(1.32-2.35)    | 2.02<br>(1.47-2.76)   | 2.30<br>(1.60-3.22)   | 2.69<br>(1.80-3.86)  | 3.00<br>(1.95-4.35)  |
| 60-min                                                                                                   | 0.797<br>(0.638-1.00)               | 0.963<br>(0.770-1.22)  | 1.26<br>(1.00-1.59)    | 1.52<br>(1.21-1.94)    | 1.92<br>(1.49-2.56)    | 2.26<br>(1.70-3.03)    | 2.61<br>(1.90-3.58)   | 3.00<br>(2.09-4.21)   | 3.54<br>(2.37-5.10)  | 3.97<br>(2.59-5.77)  |
| 2-hr                                                                                                     | 0.972<br>(0.783-1.22)               | 1.17<br>(0.940-1.46)   | 1.52<br>(1.22-1.91)    | 1.85<br>(1.47-2.33)    | 2.34<br>(1.83-3.10)    | 2.76<br>(2.09-3.68)    | 3.20<br>(2.35-4.38)   | 3.69<br>(2.60-5.17)   | 4.39<br>(2.97-6.29)  | 4.95<br>(3.25-7.14)  |
| 3-hr                                                                                                     | 1.06<br>(0.858-1.32)                | 1.26<br>(1.02-1.58)    | 1.64<br>(1.32-2.05)    | 1.99<br>(1.60-2.50)    | 2.54<br>(2.00-3.36)    | 3.01<br>(2.30-4.01)    | 3.52<br>(2.60-4.79)   | 4.08<br>(2.89-5.69)   | 4.88<br>(3.32-6.98)  | 5.53<br>(3.65-7.95)  |
| 6-hr                                                                                                     | 1.21<br>(0.985-1.49)                | 1.43<br>(1.16-1.77)    | 1.84<br>(1.50-2.29)    | 2.24<br>(1.81-2.79)    | 2.86<br>(2.27-3.77)    | 3.40<br>(2.62-4.51)    | 3.99<br>(2.97-5.41)   | 4.64<br>(3.32-6.45)   | 5.59<br>(3.84-7.95)  | 6.37<br>(4.24-9.08)  |
| 12-hr                                                                                                    | 1.36<br>(1.12-1.68)                 | 1.61<br>(1.32-1.98)    | 2.06<br>(1.69-2.54)    | 2.50<br>(2.03-3.08)    | 3.17<br>(2.53-4.14)    | 3.75<br>(2.91-4.93)    | 4.38<br>(3.29-5.90)   | 5.08<br>(3.66-7.01)   | 6.10<br>(4.22-8.61)  | 6.92<br>(4.64-9.82)  |
| 24-hr                                                                                                    | 1.55<br>(1.28-1.89)                 | 1.82<br>(1.50-2.21)    | 2.30<br>(1.90-2.82)    | 2.76<br>(2.26-3.39)    | 3.47<br>(2.79-4.48)    | 4.08<br>(3.18-5.31)    | 4.74<br>(3.58-6.31)   | 5.46<br>(3.96-7.46)   | 6.49<br>(4.53-9.10)  | 7.34<br>(4.96-10.3)  |
| 2-day                                                                                                    | 1.78<br>(1.48-2.15)                 | 2.07<br>(1.72-2.51)    | 2.60<br>(2.16-3.16)    | 3.10<br>(2.55-3.77)    | 3.85<br>(3.11-4.92)    | 4.49<br>(3.53-5.79)    | 5.18<br>(3.94-6.84)   | 5.93<br>(4.33-8.03)   | 7.00<br>(4.92-9.73)  | 7.87<br>(5.37-11.0)  |
| 3-day                                                                                                    | 1.94<br>(1.62-2.33)                 | 2.27<br>(1.90-2.73)    | 2.86<br>(2.38-3.45)    | 3.40<br>(2.81-4.12)    | 4.20<br>(3.40-5.34)    | 4.88<br>(3.85-6.26)    | 5.61<br>(4.28-7.36)   | 6.39<br>(4.68-8.61)   | 7.50<br>(5.29-10.4)  | 8.40<br>(5.75-11.7)  |
| 4-day                                                                                                    | 2.08<br>(1.75-2.50)                 | 2.44<br>(2.04-2.93)    | 3.07<br>(2.56-3.69)    | 3.64<br>(3.02-4.40)    | 4.49<br>(3.64-5.67)    | 5.20<br>(4.11-6.63)    | 5.95<br>(4.55-7.78)   | 6.76<br>(4.97-9.07)   | 7.90<br>(5.59-10.9)  | 8.82<br>(6.07-12.3)  |
| 7-day                                                                                                    | 2.47<br>(2.09-2.94)                 | 2.86<br>(2.41-3.41)    | 3.54<br>(2.98-4.23)    | 4.16<br>(3.47-4.99)    | 5.07<br>(4.14-6.36)    | 5.83<br>(4.64-7.39)    | 6.64<br>(5.11-8.62)   | 7.50<br>(5.55-10.0)   | 8.73<br>(6.22-12.0)  | 9.71<br>(6.72-13.4)  |
| 10-day                                                                                                   | 2.81<br>(2.38-3.33)                 | 3.23<br>(2.73-3.84)    | 3.97<br>(3.35-4.73)    | 4.63<br>(3.88-5.54)    | 5.61<br>(4.59-6.99)    | 6.41<br>(5.12-8.09)    | 7.26<br>(5.61-9.38)   | 8.17<br>(6.07-10.8)   | 9.45<br>(6.76-12.9)  | 10.5<br>(7.28-14.4)  |
| 20-day                                                                                                   | 3.70<br>(3.16-4.35)                 | 4.30<br>(3.66-5.06)    | 5.29<br>(4.49-6.24)    | 6.14<br>(5.18-7.27)    | 7.33<br>(6.01-9.00)    | 8.28<br>(6.64-10.3)    | 9.25<br>(7.18-11.8)   | 10.3<br>(7.66-13.4)   | 11.6<br>(8.36-15.7)  | 12.7<br>(8.90-17.4)  |
| 30-day                                                                                                   | 4.44<br>(3.80-5.20)                 | 5.17<br>(4.42-6.06)    | 6.36<br>(5.42-7.47)    | 7.34<br>(6.23-8.66)    | 8.70<br>(7.14-10.6)    | 9.74<br>(7.83-12.0)    | 10.8<br>(8.40-13.6)   | 11.8<br>(8.87-15.4)   | 13.2<br>(9.56-17.7)  | 14.3<br>(10.1-19.5)  |
| 45-day                                                                                                   | 5.40<br>(4.65-6.29)                 | 6.26<br>(5.38-7.30)    | 7.64<br>(6.54-8.93)    | 8.76<br>(7.46-10.3)    | 10.3<br>(8.44-12.4)    | 11.4<br>(9.18-14.0)    | 12.5<br>(9.75-15.7)   | 13.6<br>(10.2-17.6)   | 15.0<br>(10.9-19.9)  | 16.0<br>(11.4-21.7)  |
| 60-day                                                                                                   | 6.24<br>(5.38-7.24)                 | 7.18<br>(6.19-8.34)    | 8.68<br>(7.46-10.1)    | 9.87<br>(8.44-11.6)    | 11.5<br>(9.44-13.7)    | 12.6<br>(10.2-15.4)    | 13.8<br>(10.8-17.2)   | 14.9<br>(11.2-19.1)   | 16.2<br>(11.8-21.5)  | 17.2<br>(12.3-23.3)  |

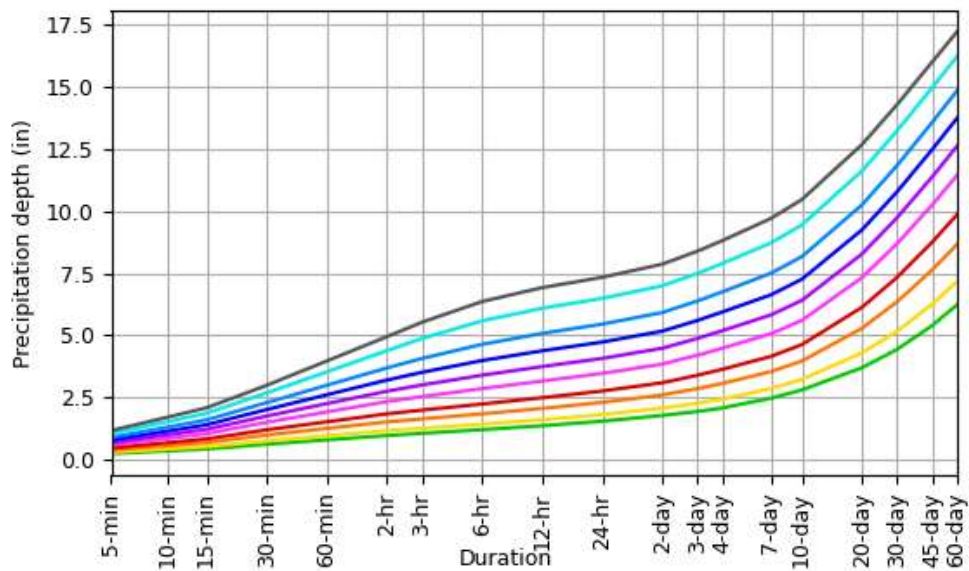
<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).  
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.  
Please refer to NOAA Atlas 14 document for more information.

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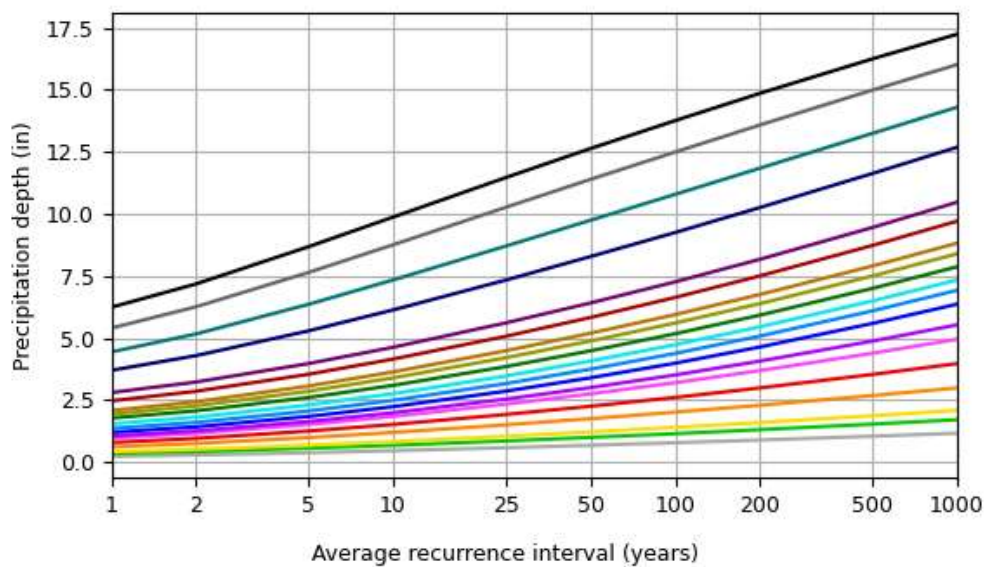
### PF graphical

## PDS-based depth-duration-frequency (DDF) curves

Latitude: 38.9025°, Longitude: -104.4833°



| Average recurrence interval (years) |
|-------------------------------------|
| 1                                   |
| 2                                   |
| 5                                   |
| 10                                  |
| 25                                  |
| 50                                  |
| 100                                 |
| 200                                 |
| 500                                 |
| 1000                                |



| Duration |        |
|----------|--------|
| 5-min    | 2-day  |
| 10-min   | 3-day  |
| 15-min   | 4-day  |
| 30-min   | 7-day  |
| 60-min   | 10-day |
| 2-hr     | 20-day |
| 3-hr     | 30-day |
| 6-hr     | 45-day |
| 12-hr    | 60-day |
| 24-hr    |        |

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## Maps & aerials

Small scale terrain



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Silver Spring, MD 20910  
Questions?: [HDSC.Questions@noaa.gov](mailto:HDSC.Questions@noaa.gov)

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## City of Colorado Springs **2-Hour Design Storms** (Cumulative Depth Distributions) (inches)

DCM Storm Depths - Inches

| Return Period | 1-Hour Depth | 6-Hour Depth | 24-Hour Depth |
|---------------|--------------|--------------|---------------|
| 2             | 0.963        | 1.7          | 2.1           |
| 5             | 1.26         | 2.1          | 2.7           |
| 10            | 1.52         | 2.4          | 3.2           |
| 25            | 1.92         | 2.9          | 3.6           |
| 50            | 2.26         | 3.2          | 4.2           |
| 100           | 2.61         | 3.5          | 4.6           |
| 500           | 3.54         | 5.95         | 7.34          |

Values from NOAA chart for site



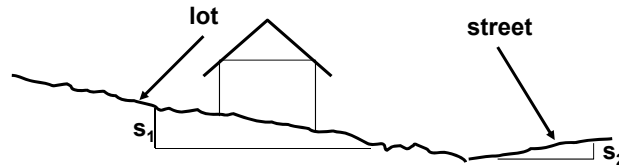
**Cumulative Rainfall Depths in Inches - 5-yr Storm**

| <b>Time<br/>Min.</b> | <b>Drainage Basin Area (square miles)</b> |                |                 |                  |                  |                  |                  |
|----------------------|-------------------------------------------|----------------|-----------------|------------------|------------------|------------------|------------------|
|                      | <b>0-1</b>                                | <b>&gt;1-5</b> | <b>&gt;5-10</b> | <b>&gt;10-15</b> | <b>&gt;15-20</b> | <b>&gt;20-40</b> | <b>&gt;40-60</b> |
| 0                    | 0.000                                     | 0.000          | 0.000           | 0.000            | 0.000            | 0.000            | 0.000            |
| 5                    | 0.018                                     | 0.018          | 0.018           | 0.018            | 0.019            | 0.019            | 0.021            |
| 10                   | 0.058                                     | 0.055          | 0.052           | 0.052            | 0.053            | 0.053            | 0.050            |
| 15                   | 0.100                                     | 0.096          | 0.093           | 0.093            | 0.092            | 0.088            | 0.086            |
| 20                   | 0.151                                     | 0.146          | 0.137           | 0.137            | 0.134            | 0.129            | 0.120            |
| 25                   | 0.226                                     | 0.222          | 0.213           | 0.212            | 0.205            | 0.198            | 0.185            |
| 30                   | 0.325                                     | 0.314          | 0.301           | 0.297            | 0.286            | 0.272            | 0.249            |
| 35                   | 0.530                                     | 0.499          | 0.446           | 0.412            | 0.387            | 0.348            | 0.305            |
| 40                   | 0.897                                     | 0.825          | 0.704           | 0.624            | 0.564            | 0.480            | 0.397            |
| 45                   | 1.038                                     | 0.953          | 0.803           | 0.706            | 0.638            | 0.532            | 0.435            |
| 50                   | 1.124                                     | 1.038          | 0.882           | 0.780            | 0.713            | 0.604            | 0.499            |
| 55                   | 1.178                                     | 1.091          | 0.932           | 0.829            | 0.757            | 0.645            | 0.539            |
| 60                   | 1.225                                     | 1.135          | 0.975           | 0.869            | 0.799            | 0.684            | 0.575            |
| 65                   | 1.265                                     | 1.177          | 1.016           | 0.903            | 0.833            | 0.718            | 0.607            |
| 70                   | 1.283                                     | 1.194          | 1.034           | 0.922            | 0.854            | 0.742            | 0.631            |
| 75                   | 1.298                                     | 1.212          | 1.052           | 0.940            | 0.872            | 0.760            | 0.649            |
| 80                   | 1.312                                     | 1.226          | 1.070           | 0.958            | 0.890            | 0.777            | 0.667            |
| 85                   | 1.326                                     | 1.240          | 1.087           | 0.975            | 0.907            | 0.795            | 0.684            |
| 90                   | 1.339                                     | 1.254          | 1.103           | 0.993            | 0.925            | 0.813            | 0.702            |
| 95                   | 1.351                                     | 1.268          | 1.116           | 1.011            | 0.942            | 0.830            | 0.719            |
| 100                  | 1.363                                     | 1.281          | 1.129           | 1.024            | 0.960            | 0.848            | 0.737            |
| 105                  | 1.375                                     | 1.293          | 1.143           | 1.038            | 0.974            | 0.866            | 0.755            |
| 110                  | 1.386                                     | 1.305          | 1.157           | 1.052            | 0.987            | 0.879            | 0.770            |
| 115                  | 1.397                                     | 1.317          | 1.171           | 1.066            | 1.000            | 0.893            | 0.784            |
| 120                  | 1.410                                     | 1.328          | 1.182           | 1.080            | 1.014            | 0.907            | 0.798            |

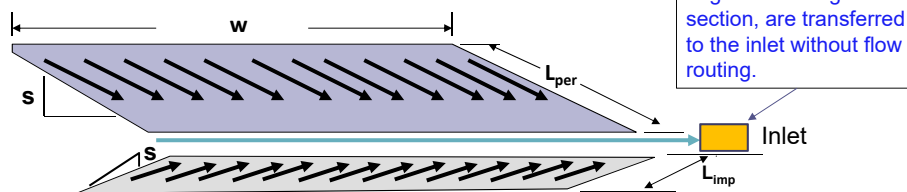
**Cumulative Rainfall Depths in Inches - 100-yr Storm**

| <b>Time<br/>Min.</b> | <b>Drainage Basin Area (square miles)</b> |                |                 |                  |                  |                  |                  |
|----------------------|-------------------------------------------|----------------|-----------------|------------------|------------------|------------------|------------------|
|                      | <b>0-1</b>                                | <b>&gt;1-5</b> | <b>&gt;5-10</b> | <b>&gt;10-15</b> | <b>&gt;15-20</b> | <b>&gt;20-40</b> | <b>&gt;40-60</b> |
| 0                    | 0.000                                     | 0.000          | 0.000           | 0.000            | 0.000            | 0.000            | 0.000            |
| 5                    | 0.037                                     | 0.037          | 0.037           | 0.037            | 0.039            | 0.039            | 0.044            |
| 10                   | 0.120                                     | 0.115          | 0.107           | 0.107            | 0.110            | 0.110            | 0.104            |
| 15                   | 0.206                                     | 0.198          | 0.193           | 0.193            | 0.191            | 0.183            | 0.177            |
| 20                   | 0.313                                     | 0.303          | 0.284           | 0.284            | 0.277            | 0.266            | 0.248            |
| 25                   | 0.467                                     | 0.459          | 0.441           | 0.438            | 0.425            | 0.410            | 0.384            |
| 30                   | 0.673                                     | 0.650          | 0.624           | 0.616            | 0.592            | 0.564            | 0.517            |
| 35                   | 1.099                                     | 1.034          | 0.924           | 0.853            | 0.801            | 0.720            | 0.632            |
| 40                   | 1.858                                     | 1.710          | 1.459           | 1.292            | 1.169            | 0.994            | 0.822            |
| 45                   | 2.151                                     | 1.973          | 1.663           | 1.462            | 1.321            | 1.101            | 0.900            |
| 50                   | 2.328                                     | 2.151          | 1.827           | 1.616            | 1.477            | 1.250            | 1.034            |
| 55                   | 2.440                                     | 2.260          | 1.931           | 1.717            | 1.569            | 1.336            | 1.117            |
| 60                   | 2.537                                     | 2.352          | 2.020           | 1.801            | 1.655            | 1.417            | 1.190            |
| 65                   | 2.620                                     | 2.438          | 2.104           | 1.871            | 1.725            | 1.488            | 1.258            |
| 70                   | 2.657                                     | 2.474          | 2.143           | 1.911            | 1.770            | 1.537            | 1.308            |
| 75                   | 2.688                                     | 2.511          | 2.179           | 1.947            | 1.806            | 1.574            | 1.344            |
| 80                   | 2.717                                     | 2.540          | 2.216           | 1.984            | 1.843            | 1.610            | 1.381            |
| 85                   | 2.746                                     | 2.568          | 2.252           | 2.020            | 1.879            | 1.647            | 1.417            |
| 90                   | 2.774                                     | 2.597          | 2.284           | 2.057            | 1.916            | 1.683            | 1.454            |
| 95                   | 2.798                                     | 2.626          | 2.312           | 2.093            | 1.952            | 1.720            | 1.490            |
| 100                  | 2.824                                     | 2.654          | 2.339           | 2.122            | 1.989            | 1.757            | 1.527            |
| 105                  | 2.848                                     | 2.678          | 2.367           | 2.151            | 2.018            | 1.793            | 1.563            |
| 110                  | 2.871                                     | 2.704          | 2.396           | 2.179            | 2.044            | 1.822            | 1.595            |
| 115                  | 2.894                                     | 2.727          | 2.425           | 2.208            | 2.072            | 1.850            | 1.623            |
| 120                  | 2.921                                     | 2.751          | 2.448           | 2.237            | 2.101            | 1.879            | 1.652            |

## Subcatchment Conceptual Model



Pervious and Impervious areas are processed independently and are then combined.  
Both have the same tributary width (W).



You can set them up as separate subcatchments.

## Width Parameter

## NEVER use default value

$$\text{Approx. Width} = (\text{Area}) \div (\text{Length})$$

Length = average overland sheet flow length of runoff

### **Suggested Rules of Thumb:**

**Undeveloped:**

- **Maximum length = 100- to 500-feet**

### **Residential Catchments:**

- **Maximum length = 100 to 300 feet**
- **back of lot to street gutter (100-175 ft)**

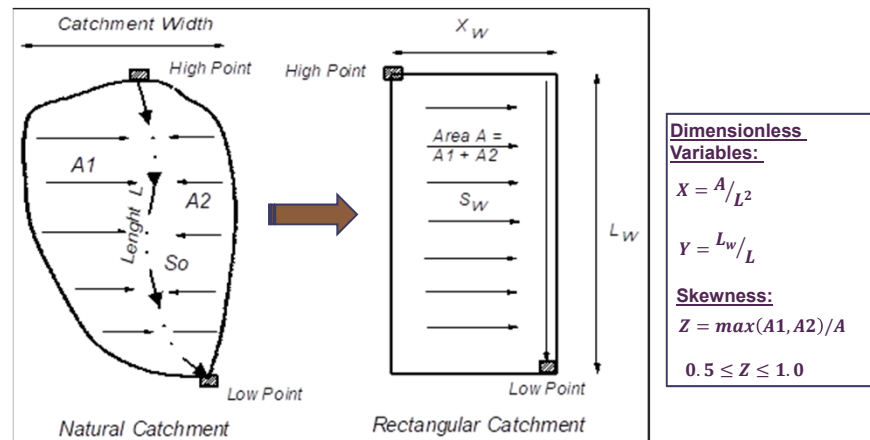
## Width Parameter



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## Transforming Subcatchment Shape to a Rectangle

Equations Suggested by Guo and Urbanas, 2009

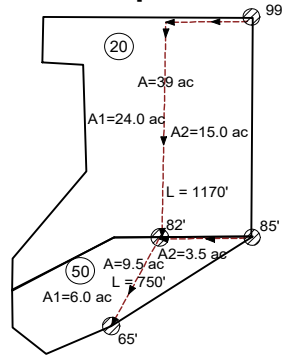


$$Y = \frac{L_w}{L} = (1.5 - Z)(2.286X - 0.286X^2) \Rightarrow \frac{L_w}{L} = (1.5 - Z) \left\{ 2.286 \left( \frac{A}{L^2} \right) - 0.286 \left( \frac{A}{L^2} \right)^2 \right\}$$

$$\frac{S_o}{S_w} = \left( \frac{X}{Y} + Y \right) \Rightarrow \frac{S_o}{S_w} = \frac{A}{LL_w} + \frac{L_w}{L}$$

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## Example for finding $L_w$ and $S_w$



### Variables for 20:

$$X = A/L^2 = 39 \times 43,560 / 1,170^2 = 1.24$$

$$Y = L_w/L = 2.12$$

$$Z = A^1/A = 24/39 = 0.62$$

$$S_o = 17/(1,170) = 0.0145 \text{ (1.45\%)}$$

$$X_w = A/L_w = 685 \text{ ft}$$

### Variables for 50:

$$X = A/L^2 = 9.5 \times 43,560 / 750^2 = 0.74$$

$$Y = L_w/L = 1.33$$

$$Z = A^1/A = 6/9.5 = 0.63$$

$$S_o = 20/(750) = 0.0267 \text{ (2.67\%)}$$

$$X_w = A/L_w = 416 \text{ ft}$$

$$L_w/L = (1.5 - Z) \left[ (2.286 \times A/L^2) - 0.286 (A/L^2)^2 \right] \quad [20]: \quad (1.5 - 0.62)(2.286 \times 1.24 - 0.286 \times 1.54) = 2.12$$

$$L_w/L = (1.5 - Z) \left[ (2.286 \times A/L^2) - 0.286 (A/L^2)^2 \right] \quad [50]: \quad (1.5 - 0.63)(2.286 \times 0.74 - 0.286 \times 0.55) = 1.33$$

$$L_w = (2.12 \times L) = (2.12 \times 1,170) = \mathbf{2,480 \text{ ft.}}$$

$$L_w = (1.33 \times L) = (1.33 \times 750) = \mathbf{995 \text{ ft.}}$$

$$[20]: \quad S_o/S_w = A/(LL_w) + L_w/L = 2.71 \quad S_w = S_o/2.71 = 1.45/2.71 = \mathbf{0.54\%}$$

$$[50]: \quad S_o/S_w = A/(LL_w) + L_w/L = 1.88 \quad S_w = S_o/1.88 = 2.67/1.88 = \mathbf{1.42\%}$$

# Percent Impervious

## Estimating/Measuring Percent Impervious:

- If site-specific information is not available, use land use classification
- Sometimes, site-specific impervious GIS layers are available

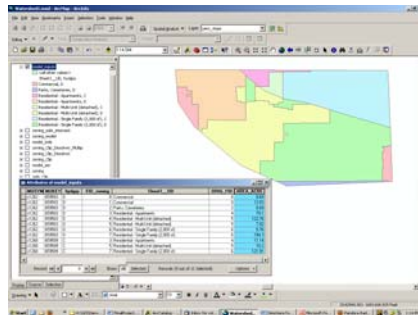


Table RO-3—Recommended Percentage Imperviousness Values

| Land Use or Surface Characteristics                | Percentage Imperviousness |
|----------------------------------------------------|---------------------------|
| <b>Business:</b>                                   |                           |
| Commercial areas                                   | 95                        |
| Neighborhood areas                                 | 85                        |
| <b>Residential:</b>                                |                           |
| Single-family                                      | *                         |
| Multi-unit (detached)                              | 60                        |
| Multi-unit (attached)                              | 75                        |
| Half-acre lot or larger                            | *                         |
| Apartments                                         | 80                        |
| <b>Industrial:</b>                                 |                           |
| Light areas                                        | 80                        |
| Heavy areas                                        | 90                        |
| Parks, cemeteries                                  | 5                         |
| Playgrounds                                        | 10                        |
| Schools                                            | 50                        |
| Railroad yard areas                                | 15                        |
| <b>Undeveloped Areas:</b>                          |                           |
| Historic flow analysis                             | 2                         |
| Greenbelts, agricultural                           | 2                         |
| Off-site flow analysis (when land use not defined) | 45                        |
| <b>Streets:</b>                                    |                           |
| Paved                                              | 100                       |
| Gravel (packed)                                    | 40                        |
| Drive and walks                                    | 90                        |
| Roofs                                              | 90                        |
| Lawns, sandy soil                                  | 0                         |
| Lawns, clayey soil                                 | 0                         |

\* See Figures RO-3 through RO-5 for percentage imperviousness.

Source: UDFCD Storm Drainage Criteria Manual

## City of Colorado Springs DCM - Manning's n

Table 6-11. Roughness Coefficients (Manning's n) for NRCS Overland Flow

| Surface description                                          | n <sup>1</sup> |
|--------------------------------------------------------------|----------------|
| Smooth surfaces (concrete, asphalt, gravel, bare soil, etc.) | 0.011          |
| Fallow (no residue)                                          | 0.05           |
| Cultivated Soils:                                            |                |
| Residue cover <20%                                           | 0.06           |
| Residue cover >20%                                           | 0.17           |
| Grass:                                                       |                |
| Short grass prairie                                          | 0.15           |
| Dense grasses <sup>2</sup>                                   | 0.24           |
| Bermuda grass                                                | 0.41           |
| Range (natural)                                              | 0.13           |
| Woods <sup>3</sup>                                           |                |
| Light underbrush                                             | 0.40           |
| Dense underbrush                                             | 0.80           |

**Table 3-1 Impervious area as a percentage of land use.**

| <b>Land Use</b>            | <b>Percent Impervious Area</b> |
|----------------------------|--------------------------------|
| Commercial                 | 56                             |
| Industrial                 | 76                             |
| High density residential   | 51                             |
| Medium density residential | 38                             |
| Low density residential    | 19                             |
| Institutional              | 34                             |
| Agricultural               | 2                              |
| Forest                     | 1.9                            |
| Open Urban Land            | 11                             |

As mentioned earlier, impervious areas in SWMM are hydraulically (directly) connected to the drainage system – called directly connected impervious areas (DCIA). For instance, if rooftops drain onto adjacent pervious lawn areas, they should not be treated as a hydraulically effective impervious area. Such areas are non-effective impervious areas (Doyle and Miller, 1980). On the other hand, if a driveway drains to a street and then to a stormwater inlet, the driveway would be considered hydraulically connected. Rooftops with downspouts connected directly to a sewer are clearly hydraulically connected. An example of careful measurements and statistics on imperviousness may be found in Field et al. (2000), Lee (2003), and Roy and Shuster (2007). Lee and Heaney (2003) provide detailed comparisons of imperviousness computations and their implications for modeling.

Should rooftops be treated as “pervious,” the real surrounding pervious area is subject to more incoming water than rainfall alone and thus might produce runoff sooner than if rainfall alone were considered. In the possible event that this effect is important (a judgment based on infiltration parameters) it can be modeled using the overland flow re-routing option discussed earlier in Section 3.7. For example, if disconnected rooftops comprised 25 percent of the total impervious area of a subcatchment (as opposed to the total DCIA) then one could tell SWMM that this percentage of impervious area should be internally routed onto the pervious sub-area of the subcatchment.

Another method of estimating the effective impervious area given measured data is to plot the runoff (in. or mm) vs. rainfall (in. or mm) for small storms. The slope of the regression line is a good estimate of the effective impervious area (Doyle and Miller, 1980).



**Table 3-5 Estimates of Manning's roughness coefficient for overland flow**

| Source                                                                                                          | Ground Cover                       | n     | Range       |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------|-------|-------------|
| Crawford and Linsley (1966) <sup>a</sup>                                                                        | Smooth asphalt                     | 0.01  |             |
|                                                                                                                 | Asphalt of concrete paving         | 0.014 |             |
|                                                                                                                 | Packed clay                        | 0.03  |             |
|                                                                                                                 | Light turf                         | 0.20  |             |
|                                                                                                                 | Dense turf                         | 0.35  |             |
|                                                                                                                 | Dense shrubbery and forest litter  | 0.4   |             |
| Engman (1986) <sup>b</sup>                                                                                      | Concrete or asphalt                | 0.011 | 0.010-0.013 |
|                                                                                                                 | Bare sand                          | 0.010 | 0.01-0.016  |
|                                                                                                                 | Graveled surface                   | 0.02  | 0.012-0.03  |
|                                                                                                                 | Bare clay-loam (eroded)            | 0.02  | 0.012-0.033 |
|                                                                                                                 | Range (natural)                    | 0.13  | 0.01-0.32   |
|                                                                                                                 | Bluegrass sod                      | 0.45  | 0.39-0.63   |
|                                                                                                                 | Short grass prairie                | 0.15  | 0.10-0.20   |
|                                                                                                                 | Bermuda grass                      | 0.41  | 0.30-0.48   |
| Yen (2001) <sup>c</sup>                                                                                         | Smooth asphalt pavement            | 0.012 | 0.010-0.015 |
|                                                                                                                 | Smooth impervious surface          | 0.013 | 0.011-0.015 |
|                                                                                                                 | Tar and sand pavement              | 0.014 | 0.012-0.016 |
|                                                                                                                 | Concrete pavement                  | 0.017 | 0.014-0.020 |
|                                                                                                                 | Rough impervious surface           | 0.019 | 0.015-0.023 |
|                                                                                                                 | Smooth bare packed soil            | 0.021 | 0.017-0.025 |
|                                                                                                                 | Moderate bare packed soil          | 0.030 | 0.025-0.035 |
|                                                                                                                 | Rough bare packed soil             | 0.038 | 0.032-0.045 |
|                                                                                                                 | Gravel soil                        | 0.032 | 0.025-0.045 |
|                                                                                                                 | Mowed poor grass                   | 0.038 | 0.030-0.045 |
|                                                                                                                 | Average grass, closely clipped sod | 0.050 | 0.040-0.060 |
|                                                                                                                 | Pasture                            | 0.055 | 0.040-0.070 |
|                                                                                                                 | Timberland                         | 0.090 | 0.060-0.120 |
|                                                                                                                 | Dense grass                        | 0.090 | 0.060-0.120 |
|                                                                                                                 | Shrubs and bushes                  | 0.120 | 0.080-0.180 |
|                                                                                                                 | Business land use                  | 0.022 | 0.014-0.035 |
|                                                                                                                 | Semi-business land use             | 0.035 | 0.022-0.050 |
|                                                                                                                 | Industrial land use                | 0.035 | 0.020-0.050 |
|                                                                                                                 | Dense residential land use         | 0.040 | 0.025-0.060 |
|                                                                                                                 | Suburban residential land use      | 0.055 | 0.030-0.080 |
|                                                                                                                 | Parks and lawns                    | 0.075 | 0.040-0.120 |
| <sup>a</sup> Obtained by calibration of Stanford Watershed Model.                                               |                                    |       |             |
| <sup>b</sup> Computed by Engman (1986) by kinematic wave and storage analysis of measured rainfall-runoff data. |                                    |       |             |
| <sup>c</sup> Computed on basis of kinematic wave analysis.                                                      |                                    |       |             |

## Recommend Adjusting Manning's $n$ Values for SWMM Sheet Flow Inputs

### “N-perv” and “N-imperv”

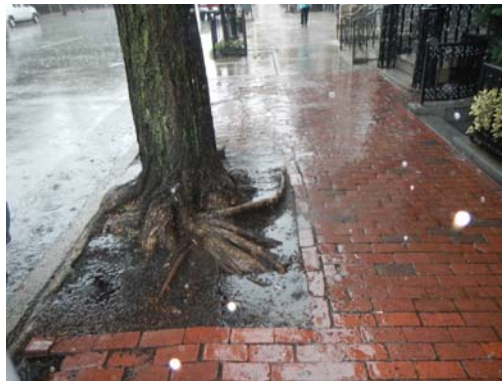
- Obtain from local design criteria, or Textbooks/Literature, or SWMM Help Menu.
- Recommend increasing recommended COS values of  $n$  for Smooth Surfaces (i.e., paved and fallow) by at least 25%

#### NOTE:

Table values in literature are for small roughness/depth ratios.  
Sheet flow has a very large roughness/depth ratio

## Depression Storage

- “Dstore-Imperv” and “Dstore-Perv”
- Represents surface storage that does not runoff
  - infiltrates or evaporates later



## Depression Storage

**Table RO-6—Typical Depression Losses for Various Land Covers**

(All Values in Inches. For use with the CUHP Method)

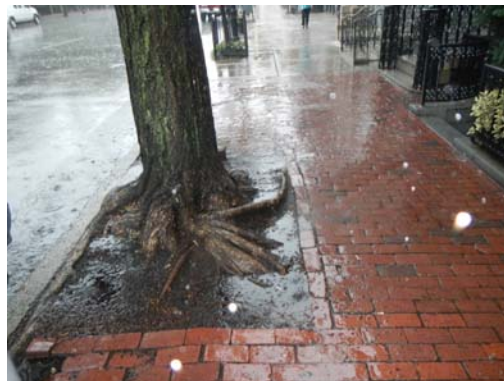
| Land Cover                   | Range in Depression (Retention) Losses | Recommended |
|------------------------------|----------------------------------------|-------------|
| Impervious:                  |                                        |             |
| Large paved areas            | 0.05 - 0.15                            | 0.1         |
| Roofs-flat                   | 0.1 - 0.3                              | 0.1         |
| Roofs-sloped                 | 0.05 - 0.1                             | 0.05        |
| Pervious:                    |                                        |             |
| Lawn grass                   | 0.2 - 0.5                              | 0.35        |
| Wooded areas and open fields | 0.2 - 0.6                              | 0.4         |

Source: UDFCD Storm Drainage Criteria Manual

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## %Zero-Imperv

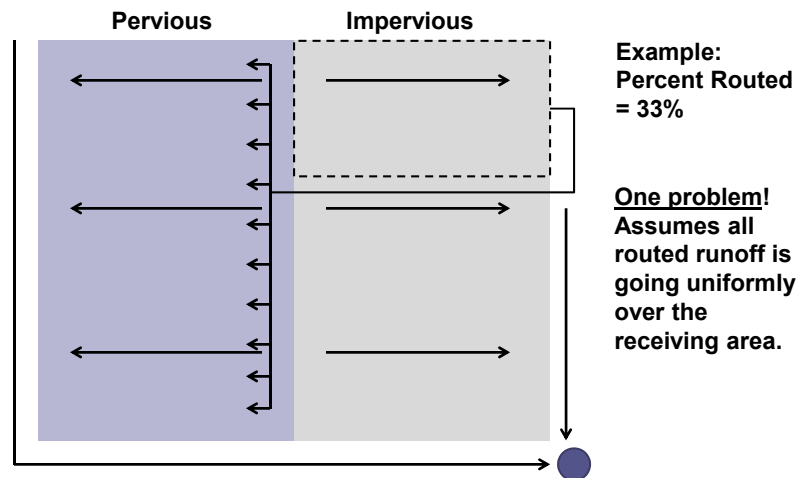
- Percentage of impervious area with “zero” depression storage
- Used as calibration factor to help match early part of hydrograph
- Default value = 25%



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## Subarea Routing and Percent Routed

- Pervious – routes some % of impervious to pervious (e.g. rooftop to lawn)



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## Subarea Routing and Percent Routed

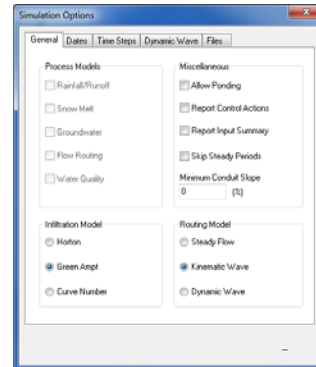
- Internal subcatchment routing (i.e. to how the runoff connects in the downstream system)
- 3 options
  - Outlet (default)
  - Impervious
  - Pervious

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# Infiltration

## Three Options:

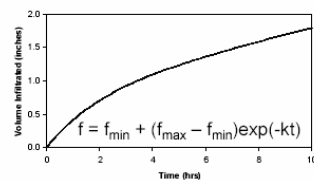
- Green - Ampt Method
- Horton's Method
- Curve Number (SCS) Method
  - Select the desired method in "Options-General" editor



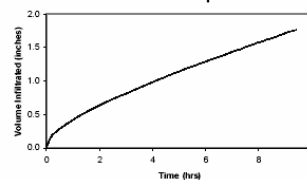
23

# Comparison of Infiltration Models

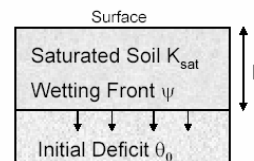
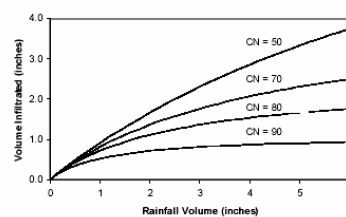
Horton:



Green-Ampt:

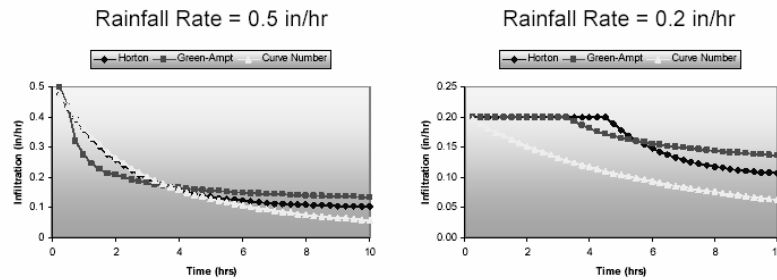


Curve Number:



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## Comparison of Infiltration Models



Horton Parameters:  $f_{\max} = 0.5$ ,  $f_{\min} = 0.1$ ,  $k = 0.5$   
 Green-Ampt Parameters:  $\Psi = 3.0$ ,  $K_{\text{sat}} = 0.1$ ,  $\theta_0 = 0.2$   
 Curve Number Parameters:  $CN = 80$

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## Infiltration Parameters

Horton's Infiltration Recommendations by MHFD  
 (formerly UDFCD) when Using Design Storms

Table RO-7—Recommended Horton's Equation Parameters

| NRCS Hydrologic<br>Soil Group | Infiltration (inches per hour) |              | Decay<br>Coefficient— $a$ |
|-------------------------------|--------------------------------|--------------|---------------------------|
|                               | Initial— $f_i$                 | Final— $f_o$ |                           |
| A                             | 5.0                            | 1.0          | 0.0007                    |
| B                             | 4.5                            | 0.6          | 0.0018                    |
| C                             | 3.0                            | 0.5          | 0.0018                    |
| D                             | 3.0                            | 0.5          | 0.0018                    |

Source: Urban Storm Drainage Criteria Manual (Referenced in COS DCM)

↑  
Units  
(inches/second)

Drying Time (days): time to recover full  
infiltration capacity

- Ignore for single storm analysis

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# Infiltration Parameters

## Horton's **Initial** Infiltration for Continuous Simulation

| Soil Type                                      | (in/hr) |
|------------------------------------------------|---------|
| Dry sandy soils with little or no vegetation   | 5.0     |
| Dry loam soils with little or no vegetation    | 3.0     |
| Dry clay soils with little or no vegetation    | 1.0     |
| Dry sandy soils with dense vegetation          | 10.0    |
| Dry loam soils with dense vegetation           | 6.0     |
| Dry clay soils with dense vegetation           | 2.0     |
| Moist sandy soils with little or no vegetation | 1.7     |
| Moist loam soils with little or no vegetation  | 1.0     |
| Moist clay soils with little or no vegetation  | 0.3     |
| Moist sandy soils with dense vegetation        | 3.3     |
| Moist loam soils with dense vegetation         | 2.0     |
| Moist clay soils with dense vegetation         | 0.7     |

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# Infiltration Parameters

## Horton's **Final** Infiltration for Continuous Simulation

| Soil Type                                                | Final Infiltration Rate |            |
|----------------------------------------------------------|-------------------------|------------|
|                                                          | (in/hr)                 | (mm/hr)    |
| Clay loam, silty clay loam, sandy clay, silty clay, clay | 0.01 - 0.08             | 0.25 - 2.0 |
| Sandy clay loam                                          | 0.06 - 0.12             | 1.57 - 3.1 |
| Silt loam, loam                                          | 0.15 - 0.30             | 3.8 - 7.6  |
| Sandy loam                                               | 0.43 - 0.86             | 11 - 22    |
| Loamy sand                                               | 1.2 - 2.4               | 30 - 60    |
| Sand, ,                                                  | 4.7 - 9.3               | 119 - 236  |

**Horton's Infiltration Decay Rate** (can vary a lot)

**Range:** 2/hr to 6/hr Units in SWMM (0.00056 to 0.00167/sec units in CUHP).

Little sensitivity in results when used with modified Horton's equation in performing continuous simulation whenever values larger than 3/hr are used. Thus, suggest a value 3/hr is appropriate for NRCS Hydrologic Soil Groups B, C and D, and a value of 2/hr for Soil Group A.

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## Drying Time (SWMM)

- Drying Time (days): time to recover full infiltration capacity
- Ignore for design storm and single-storm analysis

For Continuous Simulation:

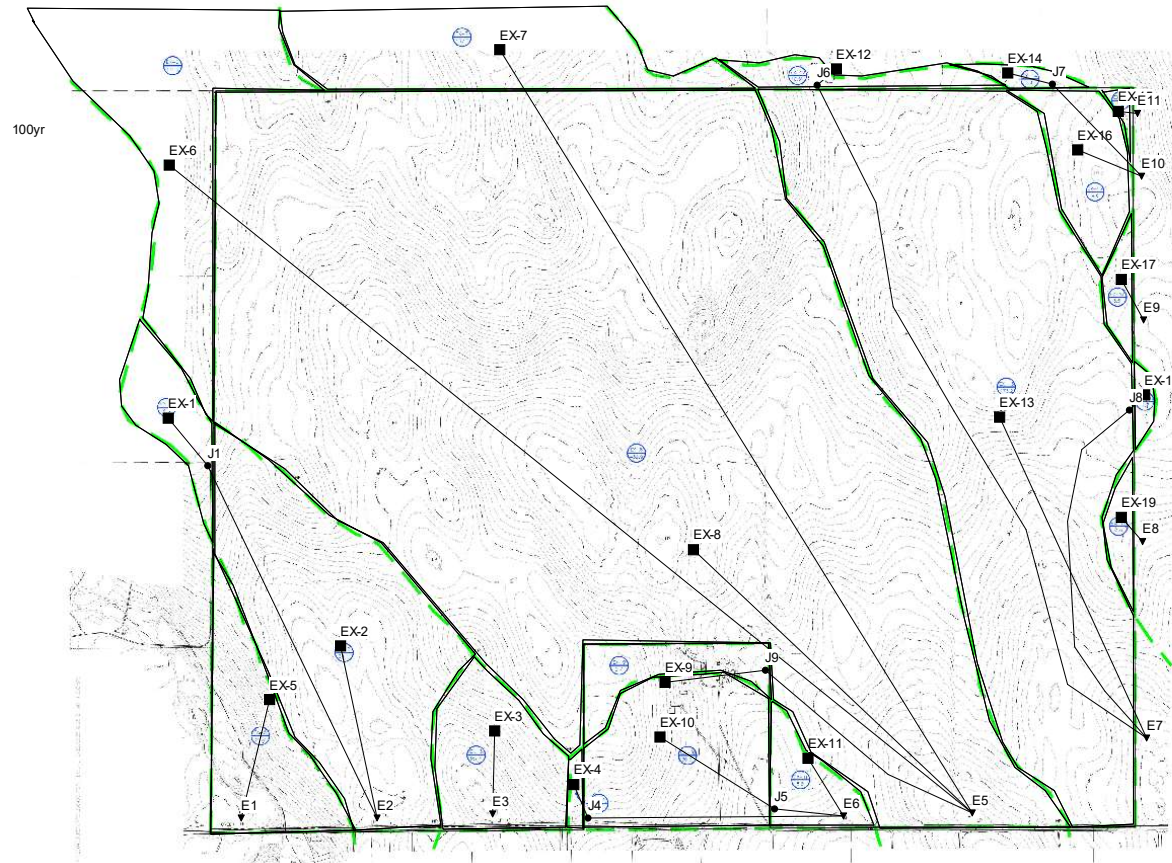
| Climate/Region                                 | Drying time in days<br>(typically used) |
|------------------------------------------------|-----------------------------------------|
| Arid regions                                   | 1 to 3 (2)                              |
| <b>Semi- Arid regions</b>                      | <b>2 to 5 (3)</b>                       |
| Midwest, East and SE USA                       | 3 to 8 (5 to 7)                         |
| Very Humid and prolonged precipitation regions | 7 to 14 (7 to10)                        |



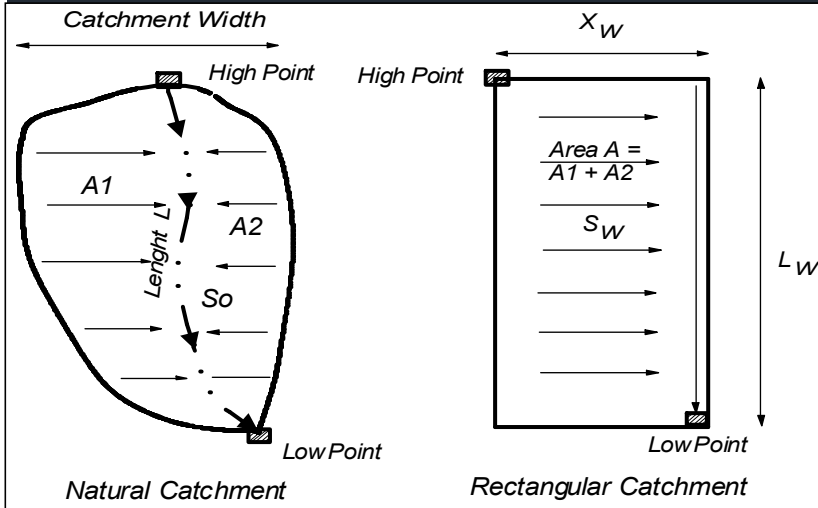
# TRIPLE H RANCH

## Pre-Developed Conditions

08/22/2025 00:15:00



## Convert Natural Catchment to a Rectangular Shape



|                     |         |
|---------------------|---------|
| Subcatchment Center | Z=0.5   |
| Side Collector      | Z=1     |
| Skewed Location     | 0.5<Z<1 |

### Dimensionless Variables

$$Y = \frac{L}{L_w}; \quad X = \frac{A}{L^2}$$

$$Y = (1.5 - Z)(2.286X - 0.286X^2)$$

$$\frac{L_w}{L} = (1.5 - Z)[2.286(\frac{A}{L^2}) - 0.286(\frac{A}{L^2})^2]$$

$$S_o/S_w = A/(LL_w) + L_w/L$$

$$X_w = A/L_w$$

| Subarea ID | Area acre | A1 acre | A2 acre | L ft  | High Pt Elev. ft | Low Pt Elev. ft | Z=A <sub>m</sub> /A | X=A/L <sup>2</sup> | Y=L <sub>w</sub> /L | L <sub>w</sub> ft | X <sub>w</sub> ft | S <sub>o</sub> % | S <sub>o</sub> /S <sub>w</sub> | S <sub>w</sub> % |
|------------|-----------|---------|---------|-------|------------------|-----------------|---------------------|--------------------|---------------------|-------------------|-------------------|------------------|--------------------------------|------------------|
| EX-1       | 9.90      | 5.00    | 4.90    | 1,200 | 6498.0           | 6484.0          | 0.51                | 0.30               | 0.66                | 787               | 548               | 1.17             | 1.11                           | 1.05             |
| EX-2       | 64.10     | 21.00   | 43.10   | 2,900 | 6484.0           | 6428.0          | 0.67                | 0.33               | 0.60                | 1,746             | 1,599             | 1.93             | 1.15                           | 1.67             |
| EX-3       | 20.20     | 5.00    | 15.20   | 1,200 | 6,472            | 6,428           | 0.75                | 0.61               | 0.96                | 1,157             | 760               | 3.67             | 1.60                           | 2.29             |
| EX-4       | 1.30      | 0.70    | 0.60    | 420   | 6,465            | 6,442           | 0.54                | 0.32               | 0.68                | 284               | 199               | 5.48             | 1.15                           | 4.76             |
| EX-5       | 21.90     | 7.00    | 14.90   | 1,350 | 6,452            | 6,410           | 0.68                | 0.52               | 0.92                | 1,237             | 771               | 3.11             | 1.49                           | 2.09             |
| EX-6       | 536.00    | 210.00  | 326.00  | 7,400 | 6,610            | 6,498           | 0.61                | 0.43               | 0.82                | 6,089             | 3,834             | 1.51             | 1.34                           | 1.13             |
| EX-7       | 132.50    | 60.00   | 72.50   | 3,940 | 6,560            | 6,500           | 0.55                | 0.37               | 0.77                | 3,042             | 1,897             | 1.52             | 1.25                           | 1.21             |
| EX-8       | 439.90    | 150.00  | 289.90  | 7,220 | 6,500            | 6,380           | 0.66                | 0.37               | 0.67                | 4,868             | 3,937             | 1.66             | 1.22                           | 1.36             |
| EX-9       | 9.70      | 3.50    | 6.20    | 1,500 | 6,467            | 6,417           | 0.64                | 0.19               | 0.36                | 541               | 781               | 3.33             | 0.88                           | 3.78             |
| EX-10      | 30.30     | 15.00   | 15.30   | 1,340 | 6,467            | 6,408           | 0.50                | 0.74               | 1.52                | 2,034             | 649               | 4.40             | 2.00                           | 2.20             |
| EX-11      | 8.20      | 2.00    | 6.20    | 540   | 6,415            | 6,398           | 0.76                | 1.22               | 1.76                | 952               | 375               | 3.15             | 2.46                           | 1.28             |
| EX-12      | 6.50      | 3.00    | 3.50    | 745   | 6,504            | 6,479           | 0.54                | 0.51               | 1.05                | 782               | 362               | 3.36             | 1.54                           | 2.19             |
| EX-13      | 173.20    | 43.20   | 130.00  | 5,700 | 6,479            | 6,382           | 0.75                | 0.23               | 0.39                | 2,202             | 3,427             | 1.70             | 0.99                           | 1.72             |
| EX-14      | 2.40      | 1.20    | 1.20    | 600   | 6,467            | 6,456           | 0.50                | 0.29               | 0.64                | 384               | 272               | 1.83             | 1.09                           | 1.68             |
| EX-15      | 1.20      | 0.40    | 0.80    | 200   | 6,452            | 6,446           | 0.67                | 1.31               | 2.08                | 416               | 126               | 3.00             | 2.71                           | 1.11             |
| EX-16      | 14.00     | 8.00    | 6.00    | 1,000 | 6,457            | 6,448           | 0.57                | 0.61               | 1.20                | 1,196             | 510               | 0.90             | 1.71                           | 0.53             |
| EX-17      | 3.50      | 1.70    | 1.80    | 250   | 6,452            | 6,442           | 0.51                | 2.44               | 3.82                | 955               | 160               | 4.00             | 4.46                           | 0.90             |
| EX-18      | 1.70      | 0.80    | 0.90    | 130   | 6,441            | 6,438           | 0.53                | 4.38               | 4.39                | 571               | 130               | 2.31             | 5.39                           | 0.43             |
| EX-19      | 3.80      | 2.20    | 1.60    | 670   | 6,432            | 6,416           | 0.58                | 0.37               | 0.74                | 496               | 334               | 2.39             | 1.24                           | 1.93             |

# TRIPLE H RANCH PRELIMINARY DRAINAGE REPORT

## (Predeveloped Conditions)

| SUBCATCHMENT INPUT DATA    |               |                      |                    |                |                              |                            |                                   |                                   |                                                  |                        |
|----------------------------|---------------|----------------------|--------------------|----------------|------------------------------|----------------------------|-----------------------------------|-----------------------------------|--------------------------------------------------|------------------------|
|                            |               |                      |                    |                |                              |                            | Depth of<br>Depression<br>Storage | Depth of<br>Depression<br>Storage | Imperv. Area<br>with no<br>Depression<br>Storage |                        |
| Subcatchment<br>Basin Name | Area<br>(Ac.) | Width<br>Lw<br>(Ft.) | Slope<br>Sw<br>(%) | Imperv.<br>(%) | Mannings N<br>(Imperv. Area) | Mannings N<br>(Perv. Area) | Imperv. Area<br>(in.)             | Perv. Area<br>(in.)               | Storage<br>(%)                                   | Infiltration<br>Method |
| EX-1                       | 9.9           | 787                  | 1.05               | 3.2            | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-2                       | 64.1          | 1746                 | 1.67               | 2.5            | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-3                       | 20.2          | 1157                 | 2.29               | 4.4            | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-4                       | 1.3           | 284                  | 4.76               | 6.5            | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-5                       | 21.9          | 1237                 | 2.09               | 4.2            | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-6                       | 536           | 6089                 | 1.13               | 4              | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-7                       | 132.5         | 3042                 | 1.21               | 2              | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-8                       | 439.9         | 4868                 | 1.36               | 2              | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-9                       | 9.7           | 541                  | 3.78               | 5.2            | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-10                      | 30.3          | 2034                 | 2.2                | 5.2            | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-11                      | 8.2           | 952                  | 1.28               | 6.2            | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-12                      | 6.5           | 782                  | 2.19               | 2              | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-13                      | 173.2         | 2202                 | 1.72               | 2.2            | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-14                      | 2.4           | 384                  | 1.68               | 2              | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-15                      | 1.2           | 416                  | 1.1                | 2              | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-16                      | 14            | 1196                 | 0.53               | 2              | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-17                      | 3.5           | 955                  | 0.9                | 2              | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-18                      | 1.7           | 571                  | 0.43               | 2              | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
| EX-19                      | 3.8           | 496                  | 1.93               | 2              | 0.014                        | 0.24                       | 0.10                              | 0.35                              | 25                                               | Horton                 |
|                            |               |                      |                    |                |                              |                            |                                   |                                   |                                                  |                        |

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)

TRIPLE H RANCH - 5-yr. Pre-Developed Conditions

\*\*\*\*\*  
NOTE: The summary statistics displayed in this report are  
based on results found at every computational time step,  
not just on results from each reporting time step.  
\*\*\*\*\*

\*\*\*\*\*  
Analysis Options

\*\*\*\*\*

Flow Units ..... CFS

Process Models:

Rainfall/Runoff ..... YES

RDII ..... NO

Snowmelt ..... NO

Groundwater ..... NO

Flow Routing ..... YES

Ponding Allowed ..... NO

Water Quality ..... NO

Infiltration Method ..... HORTON

Flow Routing Method ..... KINWAVE

Starting Date ..... 08/22/2025 00:00:00

Ending Date ..... 08/22/2025 06:00:00

Antecedent Dry Days ..... 0.0

Report Time Step ..... 00:15:00

Wet Time Step ..... 00:05:00

Dry Time Step ..... 01:00:00

Routing Time Step ..... 30.00 sec

| *****                      | Volume    | Depth  |
|----------------------------|-----------|--------|
| Runoff Quantity Continuity | acre-feet | inches |
| *****                      | -----     | -----  |
| Total Precipitation .....  | 163.820   | 1.328  |
| Evaporation Loss .....     | 0.000     | 0.000  |
| Infiltration Loss .....    | 158.812   | 1.287  |
| Surface Runoff .....       | 4.777     | 0.039  |
| Final Storage .....        | 0.275     | 0.002  |
| Continuity Error (%) ..... | -0.027    |        |

| *****                   | Volume    | Volume   |
|-------------------------|-----------|----------|
| Flow Routing Continuity | acre-feet | 10^6 gal |
| *****                   | -----     | -----    |

|                            |        |       |
|----------------------------|--------|-------|
| Dry Weather Inflow .....   | 0.000  | 0.000 |
| Wet Weather Inflow .....   | 4.777  | 1.557 |
| Groundwater Inflow .....   | 0.000  | 0.000 |
| RDII Inflow .....          | 0.000  | 0.000 |
| External Inflow .....      | 0.000  | 0.000 |
| External Outflow .....     | 4.821  | 1.571 |
| Flooding Loss .....        | 0.000  | 0.000 |
| Evaporation Loss .....     | 0.000  | 0.000 |
| Exfiltration Loss .....    | 0.000  | 0.000 |
| Initial Stored Volume .... | 0.000  | 0.000 |
| Final Stored Volume .....  | 0.004  | 0.001 |
| Continuity Error (%) ..... | -0.996 |       |

\*\*\*\*\*  
Highest Flow Instability Indexes  
\*\*\*\*\*

Link C4 (2)  
Link C9 (1)  
Link C1 (1)

\*\*\*\*\*  
Routing Time Step Summary  
\*\*\*\*\*

|                             |   |           |
|-----------------------------|---|-----------|
| Minimum Time Step           | : | 30.00 sec |
| Average Time Step           | : | 30.00 sec |
| Maximum Time Step           | : | 30.00 sec |
| Percent in Steady State     | : | 0.00      |
| Average Iterations per Step | : | 1.00      |
| Percent Not Converging      | : | 0.00      |

\*\*\*\*\*  
Subcatchment Runoff Summary  
\*\*\*\*\*

|              |        |        | Total  | Total | Total | Total | Total  |
|--------------|--------|--------|--------|-------|-------|-------|--------|
| Total        | Peak   | Runoff | Precip | Runon | Evap  | Infil | Runoff |
| Runoff       | Runoff | Coeff  |        |       |       |       |        |
| Subcatchment |        |        | in     | in    | in    | in    | in     |
| 10^6 gal     | CFS    |        |        |       |       |       |        |
| EX-1         |        |        | 1.33   | 0.00  | 0.00  | 1.28  | 0.04   |

|       |       |       |      |      |      |      |      |
|-------|-------|-------|------|------|------|------|------|
| 0.01  | 1.25  | 0.034 |      |      |      |      |      |
| EX-10 |       |       | 1.33 | 0.00 | 0.00 | 1.25 | 0.07 |
| 0.06  | 6.21  | 0.054 |      |      |      |      |      |
| EX-11 |       |       | 1.33 | 0.00 | 0.00 | 1.24 | 0.09 |
| 0.02  | 2.01  | 0.064 |      |      |      |      |      |
| EX-12 |       |       | 1.33 | 0.00 | 0.00 | 1.29 | 0.03 |
| 0.01  | 0.51  | 0.026 |      |      |      |      |      |
| EX-13 |       |       | 1.33 | 0.00 | 0.00 | 1.30 | 0.03 |
| 0.14  | 14.93 | 0.022 |      |      |      |      |      |
| EX-14 |       |       | 1.33 | 0.00 | 0.00 | 1.29 | 0.04 |
| 0.00  | 0.19  | 0.027 |      |      |      |      |      |
| EX-15 |       |       | 1.33 | 0.00 | 0.00 | 1.28 | 0.04 |
| 0.00  | 0.09  | 0.032 |      |      |      |      |      |
| EX-16 |       |       | 1.33 | 0.00 | 0.00 | 1.30 | 0.03 |
| 0.01  | 1.10  | 0.022 |      |      |      |      |      |
| EX-17 |       |       | 1.33 | 0.00 | 0.00 | 1.29 | 0.04 |
| 0.00  | 0.28  | 0.029 |      |      |      |      |      |
| EX-18 |       |       | 1.33 | 0.00 | 0.00 | 1.29 | 0.04 |
| 0.00  | 0.13  | 0.028 |      |      |      |      |      |
| EX-19 |       |       | 1.33 | 0.00 | 0.00 | 1.29 | 0.03 |
| 0.00  | 0.30  | 0.026 |      |      |      |      |      |
| EX-2  |       |       | 1.33 | 0.00 | 0.00 | 1.29 | 0.03 |
| 0.06  | 6.32  | 0.025 |      |      |      |      |      |
| EX-3  |       |       | 1.33 | 0.00 | 0.00 | 1.26 | 0.06 |
| 0.03  | 3.51  | 0.045 |      |      |      |      |      |
| EX-4  |       |       | 1.33 | 0.00 | 0.00 | 1.22 | 0.10 |
| 0.00  | 0.33  | 0.077 |      |      |      |      |      |
| EX-6  |       |       | 1.33 | 0.00 | 0.00 | 1.27 | 0.05 |
| 0.75  | 80.48 | 0.039 |      |      |      |      |      |
| EX-7  |       |       | 1.33 | 0.00 | 0.00 | 1.30 | 0.03 |
| 0.10  | 10.44 | 0.020 |      |      |      |      |      |
| EX-5  |       |       | 1.33 | 0.00 | 0.00 | 1.27 | 0.06 |
| 0.03  | 3.63  | 0.043 |      |      |      |      |      |
| EX-8  |       |       | 1.33 | 0.00 | 0.00 | 1.30 | 0.03 |
| 0.31  | 34.35 | 0.020 |      |      |      |      |      |
| EX-9  |       |       | 1.33 | 0.00 | 0.00 | 1.25 | 0.07 |
| 0.02  | 1.99  | 0.054 |      |      |      |      |      |

\*\*\*\*\*  
Node Depth Summary  
\*\*\*\*\*

| Node | Type     | Average<br>Depth<br>Feet | Maximum<br>Depth<br>Feet | Maximum<br>HGL<br>Feet | Time of Max<br>Occurrence<br>days hr:min | Reported<br>Max Depth<br>Feet |
|------|----------|--------------------------|--------------------------|------------------------|------------------------------------------|-------------------------------|
| J1   | JUNCTION | 0.06                     | 0.33                     | 6484.33                | 0 00:45                                  | 0.33                          |
| J4   | JUNCTION | 0.06                     | 0.32                     | 6442.32                | 0 00:45                                  | 0.32                          |

|     |          |      |      |         |   |       |      |
|-----|----------|------|------|---------|---|-------|------|
| J5  | JUNCTION | 0.17 | 1.00 | 6409.00 | 0 | 00:45 | 0.99 |
| J6  | JUNCTION | 0.05 | 0.24 | 6479.24 | 0 | 00:45 | 0.24 |
| J7  | JUNCTION | 0.04 | 0.19 | 6456.19 | 0 | 00:45 | 0.19 |
| J8  | JUNCTION | 0.03 | 0.15 | 6438.15 | 0 | 00:45 | 0.14 |
| J9  | JUNCTION | 0.07 | 0.39 | 6415.39 | 0 | 00:45 | 0.38 |
| E2  | OUTFALL  | 0.09 | 0.24 | 6430.24 | 0 | 01:15 | 0.24 |
| E3  | OUTFALL  | 0.00 | 0.00 | 6428.00 | 0 | 00:00 | 0.00 |
| E6  | OUTFALL  | 0.18 | 0.97 | 6398.97 | 0 | 00:47 | 0.88 |
| E5  | OUTFALL  | 0.09 | 0.30 | 6380.30 | 0 | 00:54 | 0.30 |
| E7  | OUTFALL  | 0.10 | 0.19 | 6382.19 | 0 | 01:25 | 0.19 |
| E1  | OUTFALL  | 0.00 | 0.00 | 6410.00 | 0 | 00:00 | 0.00 |
| E10 | OUTFALL  | 0.05 | 0.16 | 6448.16 | 0 | 01:15 | 0.16 |
| E9  | OUTFALL  | 0.00 | 0.00 | 6440.00 | 0 | 00:00 | 0.00 |
| E8  | OUTFALL  | 0.00 | 0.00 | 6418.00 | 0 | 00:00 | 0.00 |
| E11 | OUTFALL  | 0.00 | 0.00 | 6448.00 | 0 | 00:00 | 0.00 |

\*\*\*\*\*  
Node Inflow Summary  
\*\*\*\*\*

| Total Flow    |               | Maximum Lateral |            | Maximum Total |                    | Lateral Inflow |                 |
|---------------|---------------|-----------------|------------|---------------|--------------------|----------------|-----------------|
| Inflow Volume | Balance Error | Type            | Inflow CFS | Inflow CFS    | Time of Occurrence | Max hr:min     | Volume 10^6 gal |
| Node gal      | Percent       |                 |            |               | days               |                | 10^6            |
| J1            |               | JUNCTION        | 1.25       | 1.25          | 0                  | 00:45          | 0.0121          |
| 0.0121        | 0.000         |                 |            |               |                    |                |                 |
| J4            |               | JUNCTION        | 0.33       | 0.33          | 0                  | 00:45          | 0.00363         |
| 0.00363       | 0.000         |                 |            |               |                    |                |                 |
| J5            |               | JUNCTION        | 6.21       | 6.21          | 0                  | 00:45          | 0.0585          |
| 0.0585        | 0.000         |                 |            |               |                    |                |                 |
| J6            |               | JUNCTION        | 0.51       | 0.51          | 0                  | 00:45          | 0.00612         |
| 0.00612       | 0.000         |                 |            |               |                    |                |                 |
| J7            |               | JUNCTION        | 0.19       | 0.19          | 0                  | 00:45          | 0.00235         |
| 0.00235       | 0.000         |                 |            |               |                    |                |                 |
| J8            |               | JUNCTION        | 0.13       | 0.13          | 0                  | 00:45          | 0.00169         |
| 0.00169       | 0.000         |                 |            |               |                    |                |                 |
| J9            |               | JUNCTION        | 1.99       | 1.99          | 0                  | 00:45          | 0.0189          |
| 0.0189        | 0.000         |                 |            |               |                    |                |                 |
| E2            |               | OUTFALL         | 6.32       | 6.32          | 0                  | 00:45          | 0.0585          |

|         |       |         |        |        |         |         |
|---------|-------|---------|--------|--------|---------|---------|
| 0.0751  | 0.000 |         |        |        |         |         |
| E3      |       | OUTFALL | 3.51   | 3.51   | 0 00:45 | 0.0331  |
| 0.0331  | 0.000 |         |        |        |         |         |
| E6      |       | OUTFALL | 2.01   | 7.35   | 0 00:47 | 0.019   |
| 0.0815  | 0.000 |         |        |        |         |         |
| E5      |       | OUTFALL | 125.27 | 125.37 | 0 00:45 | 1.15    |
| 1.17    | 0.000 |         |        |        |         |         |
| E7      |       | OUTFALL | 14.93  | 14.93  | 0 00:45 | 0.135   |
| 0.151   | 0.000 |         |        |        |         |         |
| E1      |       | OUTFALL | 3.63   | 3.63   | 0 00:45 | 0.0343  |
| 0.0343  | 0.000 |         |        |        |         |         |
| E10     |       | OUTFALL | 1.10   | 1.11   | 0 00:45 | 0.0109  |
| 0.0135  | 0.000 |         |        |        |         |         |
| E9      |       | OUTFALL | 0.28   | 0.28   | 0 00:45 | 0.00364 |
| 0.00364 | 0.000 |         |        |        |         |         |
| E8      |       | OUTFALL | 0.30   | 0.30   | 0 00:45 | 0.0036  |
| 0.0036  | 0.000 |         |        |        |         |         |
| E11     |       | OUTFALL | 0.09   | 0.09   | 0 00:45 | 0.00138 |
| 0.00138 | 0.000 |         |        |        |         |         |

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Node Flooding Summary  
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No nodes were flooded.

\*\*\*\*\*  
Outfall Loading Summary  
\*\*\*\*\*

| Outfall Node | Flow<br>Freq<br>Pcnt | Avg<br>Flow<br>CFS | Max<br>Flow<br>CFS | Total<br>Volume<br>10^6 gal |
|--------------|----------------------|--------------------|--------------------|-----------------------------|
| E2           | 98.47                | 0.47               | 6.32               | 0.075                       |
| E3           | 43.19                | 0.47               | 3.51               | 0.033                       |
| E6           | 69.72                | 0.72               | 7.35               | 0.081                       |
| E5           | 98.47                | 7.38               | 125.37             | 1.173                       |
| E7           | 98.47                | 0.95               | 14.93              | 0.151                       |
| E1           | 43.47                | 0.49               | 3.63               | 0.034                       |
| E10          | 63.33                | 0.13               | 1.11               | 0.014                       |
| E9           | 34.31                | 0.07               | 0.28               | 0.004                       |
| E8           | 34.31                | 0.06               | 0.30               | 0.004                       |
| E11          | 33.33                | 0.03               | 0.09               | 0.001                       |
| System       | 61.71                | 10.77              | 162.19             | 1.571                       |



\*\*\*\*\*  
Link Flow Summary  
\*\*\*\*\*

| Link | Type    | Maximum<br> Flow <br>CFS | Time of Max<br>Occurrence<br>days hr:min | Maximum<br> Veloc <br>ft/sec | Max/<br>Full<br>Flow | Max/<br>Full<br>Depth |
|------|---------|--------------------------|------------------------------------------|------------------------------|----------------------|-----------------------|
| C1   | CONDUIT | 0.54                     | 0 01:15                                  | 1.85                         | 0.00                 | 0.12                  |
| C3   | CONDUIT | 0.17                     | 0 01:15                                  | 1.76                         | 0.00                 | 0.08                  |
| C4   | CONDUIT | 5.67                     | 0 00:47                                  | 2.59                         | 0.05                 | 0.32                  |
| C6   | CONDUIT | 0.12                     | 0 01:15                                  | 0.87                         | 0.00                 | 0.07                  |
| C7   | CONDUIT | 0.28                     | 0 01:25                                  | 2.15                         | 0.00                 | 0.08                  |
| C8   | CONDUIT | 0.08                     | 0 01:20                                  | 1.40                         | 0.00                 | 0.05                  |
| C9   | CONDUIT | 1.00                     | 0 00:54                                  | 1.60                         | 0.01                 | 0.15                  |

\*\*\*\*\*  
Conduit Surcharge Summary  
\*\*\*\*\*

No conduits were surcharged.

Analysis begun on: Tue Nov 25 10:44:02 2025  
Analysis ended on: Tue Nov 25 10:44:03 2025  
Total elapsed time: 00:00:01

## TRIPLE H RANCH - 5-yr. Pre-Developed Conditions

### Subcatchment Runoff Summary

| Subcatchment | Total<br>Precip<br>in | Total<br>Runon<br>in | Total<br>Evap<br>in | Total<br>Infil<br>in | Total<br>Runoff<br>in | Total<br>Runoff<br>10 <sup>6</sup> gal | Peak<br>Runoff<br>CFS | Runoff<br>Coeff |
|--------------|-----------------------|----------------------|---------------------|----------------------|-----------------------|----------------------------------------|-----------------------|-----------------|
| EX-1         | 1.33                  | 0.00                 | 0.00                | 1.28                 | 0.04                  | 0.01                                   | 1.25                  | 0.034           |
| EX-10        | 1.33                  | 0.00                 | 0.00                | 1.25                 | 0.07                  | 0.06                                   | 6.21                  | 0.054           |
| EX-11        | 1.33                  | 0.00                 | 0.00                | 1.24                 | 0.09                  | 0.02                                   | 2.01                  | 0.064           |
| EX-12        | 1.33                  | 0.00                 | 0.00                | 1.29                 | 0.03                  | 0.01                                   | 0.51                  | 0.026           |
| EX-13        | 1.33                  | 0.00                 | 0.00                | 1.30                 | 0.03                  | 0.14                                   | 14.93                 | 0.022           |
| EX-14        | 1.33                  | 0.00                 | 0.00                | 1.29                 | 0.04                  | 0.00                                   | 0.19                  | 0.027           |
| EX-15        | 1.33                  | 0.00                 | 0.00                | 1.28                 | 0.04                  | 0.00                                   | 0.09                  | 0.032           |
| EX-16        | 1.33                  | 0.00                 | 0.00                | 1.30                 | 0.03                  | 0.01                                   | 1.10                  | 0.022           |
| EX-17        | 1.33                  | 0.00                 | 0.00                | 1.29                 | 0.04                  | 0.00                                   | 0.28                  | 0.029           |
| EX-18        | 1.33                  | 0.00                 | 0.00                | 1.29                 | 0.04                  | 0.00                                   | 0.13                  | 0.028           |
| EX-19        | 1.33                  | 0.00                 | 0.00                | 1.29                 | 0.03                  | 0.00                                   | 0.30                  | 0.026           |
| EX-2         | 1.33                  | 0.00                 | 0.00                | 1.29                 | 0.03                  | 0.06                                   | 6.32                  | 0.025           |
| EX-3         | 1.33                  | 0.00                 | 0.00                | 1.26                 | 0.06                  | 0.03                                   | 3.51                  | 0.045           |
| EX-4         | 1.33                  | 0.00                 | 0.00                | 1.22                 | 0.10                  | 0.00                                   | 0.33                  | 0.077           |
| EX-6         | 1.33                  | 0.00                 | 0.00                | 1.27                 | 0.05                  | 0.75                                   | 80.48                 | 0.039           |
| EX-7         | 1.33                  | 0.00                 | 0.00                | 1.30                 | 0.03                  | 0.10                                   | 10.44                 | 0.020           |

### TRIPLE H RANCH - 5-yr. Pre-Developed Conditions

| Subcatchment | Total<br>Precip<br>in | Total<br>Runon<br>in | Total<br>Evap<br>in | Total<br>Infil<br>in | Total<br>Runoff<br>in | Total<br>Runoff<br>10 <sup>6</sup> gal | Peak<br>Runoff<br>CFS | Runoff<br>Coeff |
|--------------|-----------------------|----------------------|---------------------|----------------------|-----------------------|----------------------------------------|-----------------------|-----------------|
| EX-5         | 1.33                  | 0.00                 | 0.00                | 1.27                 | 0.06                  | 0.03                                   | 3.63                  | 0.043           |
| EX-8         | 1.33                  | 0.00                 | 0.00                | 1.30                 | 0.03                  | 0.31                                   | 34.35                 | 0.020           |
| EX-9         | 1.33                  | 0.00                 | 0.00                | 1.25                 | 0.07                  | 0.02                                   | 1.99                  | 0.054           |

## TRIPLE H RANCH - 5-yr. Pre-Developed Conditions

### Node Inflow Summary

| Node | Type     | Maximum<br>Lateral<br>Inflow<br>CFS | Maximum<br>Total<br>Inflow<br>CFS | Day of<br>Maximum<br>Inflow | Hour of<br>Maximum<br>Inflow | Lateral<br>Inflow<br>Volume<br>10 <sup>6</sup> gal | Total<br>Inflow<br>Volume<br>10 <sup>6</sup> gal | Flow<br>Balance<br>Error<br>Percent |
|------|----------|-------------------------------------|-----------------------------------|-----------------------------|------------------------------|----------------------------------------------------|--------------------------------------------------|-------------------------------------|
| J1   | JUNCTION | 1.25                                | 1.25                              | 0                           | 00:45                        | 0.0121                                             | 0.0121                                           | 0.000                               |
| J4   | JUNCTION | 0.33                                | 0.33                              | 0                           | 00:45                        | 0.00363                                            | 0.00363                                          | 0.000                               |
| J5   | JUNCTION | 6.21                                | 6.21                              | 0                           | 00:45                        | 0.0585                                             | 0.0585                                           | 0.000                               |
| J6   | JUNCTION | 0.51                                | 0.51                              | 0                           | 00:45                        | 0.00612                                            | 0.00612                                          | 0.000                               |
| J7   | JUNCTION | 0.19                                | 0.19                              | 0                           | 00:45                        | 0.00235                                            | 0.00235                                          | 0.000                               |
| J8   | JUNCTION | 0.13                                | 0.13                              | 0                           | 00:45                        | 0.00169                                            | 0.00169                                          | 0.000                               |
| J9   | JUNCTION | 1.99                                | 1.99                              | 0                           | 00:45                        | 0.0189                                             | 0.0189                                           | 0.000                               |
| E2   | OUTFALL  | 6.32                                | 6.32                              | 0                           | 00:45                        | 0.0585                                             | 0.0751                                           | 0.000                               |
| E3   | OUTFALL  | 3.51                                | 3.51                              | 0                           | 00:45                        | 0.0331                                             | 0.0331                                           | 0.000                               |
| E6   | OUTFALL  | 2.01                                | 7.35                              | 0                           | 00:47                        | 0.019                                              | 0.0815                                           | 0.000                               |
| E5   | OUTFALL  | 125.27                              | 125.37                            | 0                           | 00:45                        | 1.15                                               | 1.17                                             | 0.000                               |
| E7   | OUTFALL  | 14.93                               | 14.93                             | 0                           | 00:45                        | 0.135                                              | 0.151                                            | 0.000                               |
| E1   | OUTFALL  | 3.63                                | 3.63                              | 0                           | 00:45                        | 0.0343                                             | 0.0343                                           | 0.000                               |
| E10  | OUTFALL  | 1.10                                | 1.11                              | 0                           | 00:45                        | 0.0109                                             | 0.0135                                           | 0.000                               |
| E9   | OUTFALL  | 0.28                                | 0.28                              | 0                           | 00:45                        | 0.00364                                            | 0.00364                                          | 0.000                               |
| E8   | OUTFALL  | 0.30                                | 0.30                              | 0                           | 00:45                        | 0.0036                                             | 0.0036                                           | 0.000                               |

### TRIPLE H RANCH - 5-yr. Pre-Developed Conditions

| Node | Type    | Maximum<br>Lateral<br>Inflow<br>CFS | Maximum<br>Total<br>Inflow<br>CFS | Day of<br>Maximum<br>Inflow | Hour of<br>Maximum<br>Inflow | Lateral<br>Inflow<br>Volume<br>10 <sup>6</sup> gal | Total<br>Inflow<br>Volume<br>10 <sup>6</sup> gal | Flow<br>Balance<br>Error<br>Percent |
|------|---------|-------------------------------------|-----------------------------------|-----------------------------|------------------------------|----------------------------------------------------|--------------------------------------------------|-------------------------------------|
| E11  | OUTFALL | 0.09                                | 0.09                              | 0                           | 00:45                        | 0.00138                                            | 0.00138                                          | 0.000                               |

## TRIPLE H RANCH - 5-yr. Pre-Developed Conditions

### Outfall Loading Summary

| Outfall Node | Flow<br>Freq.<br>Pcnt. | Avg.<br>Flow<br>CFS | Max.<br>Flow<br>CFS | Total<br>Volume<br>10 <sup>6</sup> gal |
|--------------|------------------------|---------------------|---------------------|----------------------------------------|
| E2           | 98.47                  | 0.47                | 6.32                | 0.075                                  |
| E3           | 43.19                  | 0.47                | 3.51                | 0.033                                  |
| E6           | 69.72                  | 0.72                | 7.35                | 0.081                                  |
| E5           | 98.47                  | 7.38                | 125.37              | 1.173                                  |
| E7           | 98.47                  | 0.95                | 14.93               | 0.151                                  |
| E1           | 43.47                  | 0.49                | 3.63                | 0.034                                  |
| E10          | 63.33                  | 0.13                | 1.11                | 0.014                                  |
| E9           | 34.31                  | 0.07                | 0.28                | 0.004                                  |
| E8           | 34.31                  | 0.06                | 0.30                | 0.004                                  |
| E11          | 33.33                  | 0.03                | 0.09                | 0.001                                  |

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)

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TRIPLE H RANCH - 100-yr. Pre-Developed Conditions

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NOTE: The summary statistics displayed in this report are  
based on results found at every computational time step,  
not just on results from each reporting time step.  
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\*\*\*\*\*  
Analysis Options

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Flow Units ..... CFS

Process Models:

Rainfall/Runoff ..... YES

RDII ..... NO

Snowmelt ..... NO

Groundwater ..... NO

Flow Routing ..... YES

Ponding Allowed ..... NO

Water Quality ..... NO

Infiltration Method ..... HORTON

Flow Routing Method ..... KINWAVE

Starting Date ..... 08/22/2025 00:00:00

Ending Date ..... 08/22/2025 06:00:00

Antecedent Dry Days ..... 0.0

Report Time Step ..... 00:15:00

Wet Time Step ..... 00:05:00

Dry Time Step ..... 01:00:00

Routing Time Step ..... 30.00 sec

| *****                      | Volume    | Depth  |
|----------------------------|-----------|--------|
| Runoff Quantity Continuity | acre-feet | inches |
| *****                      | -----     | -----  |
| Total Precipitation .....  | 339.359   | 2.751  |
| Evaporation Loss .....     | 0.000     | 0.000  |
| Infiltration Loss .....    | 288.876   | 2.342  |
| Surface Runoff .....       | 50.433    | 0.409  |
| Final Storage .....        | 0.275     | 0.002  |
| Continuity Error (%) ..... | -0.066    |        |

| *****                   | Volume    | Volume   |
|-------------------------|-----------|----------|
| Flow Routing Continuity | acre-feet | 10^6 gal |
| *****                   | -----     | -----    |

|                            |        |        |
|----------------------------|--------|--------|
| Dry Weather Inflow .....   | 0.000  | 0.000  |
| Wet Weather Inflow .....   | 50.433 | 16.434 |
| Groundwater Inflow .....   | 0.000  | 0.000  |
| RDII Inflow .....          | 0.000  | 0.000  |
| External Inflow .....      | 0.000  | 0.000  |
| External Outflow .....     | 50.741 | 16.535 |
| Flooding Loss .....        | 0.000  | 0.000  |
| Evaporation Loss .....     | 0.000  | 0.000  |
| Exfiltration Loss .....    | 0.000  | 0.000  |
| Initial Stored Volume .... | 0.000  | 0.000  |
| Final Stored Volume .....  | 0.009  | 0.003  |
| Continuity Error (%) ..... | -0.629 |        |

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Highest Flow Instability Indexes

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Link C4 (2)

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Routing Time Step Summary

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|                             |   |           |
|-----------------------------|---|-----------|
| Minimum Time Step           | : | 30.00 sec |
| Average Time Step           | : | 30.00 sec |
| Maximum Time Step           | : | 30.00 sec |
| Percent in Steady State     | : | 0.00      |
| Average Iterations per Step | : | 1.04      |
| Percent Not Converging      | : | 0.00      |

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Subcatchment Runoff Summary

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|              |        |        | Total  | Total | Total | Total | Total  |
|--------------|--------|--------|--------|-------|-------|-------|--------|
| Total        | Peak   | Runoff | Precip | Runon | Evap  | Infil | Runoff |
| Runoff       | Runoff | Coeff  |        |       |       |       |        |
| Subcatchment |        |        | in     | in    | in    | in    | in     |
| 10^6 gal     | CFS    |        |        |       |       |       |        |
| -----        |        |        |        |       |       |       |        |
| EX-1         |        |        | 2.75   | 0.00  | 0.00  | 1.94  | 0.81   |
| 0.22         | 8.25   | 0.295  |        |       |       |       |        |
| EX-10        |        |        | 2.75   | 0.00  | 0.00  | 1.85  | 0.91   |



|       |        |       |      |      |      |      |      |
|-------|--------|-------|------|------|------|------|------|
| 0.75  | 30.53  | 0.330 |      |      |      |      |      |
| EX-11 |        |       | 2.75 | 0.00 | 0.00 | 1.76 | 1.00 |
| 0.22  | 10.35  | 0.362 |      |      |      |      |      |
| EX-12 |        |       | 2.75 | 0.00 | 0.00 | 1.78 | 0.98 |
| 0.17  | 9.02   | 0.357 |      |      |      |      |      |
| EX-13 |        |       | 2.75 | 0.00 | 0.00 | 2.38 | 0.37 |
| 1.73  | 48.78  | 0.134 |      |      |      |      |      |
| EX-14 |        |       | 2.75 | 0.00 | 0.00 | 1.75 | 1.01 |
| 0.07  | 3.64   | 0.368 |      |      |      |      |      |
| EX-15 |        |       | 2.75 | 0.00 | 0.00 | 1.65 | 1.11 |
| 0.04  | 2.58   | 0.405 |      |      |      |      |      |
| EX-16 |        |       | 2.75 | 0.00 | 0.00 | 2.04 | 0.71 |
| 0.27  | 9.19   | 0.258 |      |      |      |      |      |
| EX-17 |        |       | 2.75 | 0.00 | 0.00 | 1.71 | 1.06 |
| 0.10  | 6.14   | 0.384 |      |      |      |      |      |
| EX-18 |        |       | 2.75 | 0.00 | 0.00 | 1.74 | 1.03 |
| 0.05  | 2.68   | 0.373 |      |      |      |      |      |
| EX-19 |        |       | 2.75 | 0.00 | 0.00 | 1.77 | 0.99 |
| 0.10  | 5.33   | 0.358 |      |      |      |      |      |
| EX-2  |        |       | 2.75 | 0.00 | 0.00 | 2.19 | 0.56 |
| 0.98  | 27.69  | 0.204 |      |      |      |      |      |
| EX-3  |        |       | 2.75 | 0.00 | 0.00 | 1.90 | 0.85 |
| 0.47  | 18.10  | 0.311 |      |      |      |      |      |
| EX-4  |        |       | 2.75 | 0.00 | 0.00 | 1.54 | 1.23 |
| 0.04  | 3.69   | 0.446 |      |      |      |      |      |
| EX-6  |        |       | 2.75 | 0.00 | 0.00 | 2.40 | 0.35 |
| 5.11  | 211.67 | 0.128 |      |      |      |      |      |
| EX-7  |        |       | 2.75 | 0.00 | 0.00 | 2.29 | 0.46 |
| 1.66  | 43.83  | 0.168 |      |      |      |      |      |
| EX-5  |        |       | 2.75 | 0.00 | 0.00 | 1.92 | 0.83 |
| 0.50  | 18.73  | 0.303 |      |      |      |      |      |
| EX-8  |        |       | 2.75 | 0.00 | 0.00 | 2.44 | 0.31 |
| 3.71  | 106.57 | 0.113 |      |      |      |      |      |
| EX-9  |        |       | 2.75 | 0.00 | 0.00 | 1.82 | 0.93 |
| 0.24  | 10.29  | 0.338 |      |      |      |      |      |

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Node Depth Summary  
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| Node | Type     | Average<br>Depth<br>Feet | Maximum<br>Depth<br>Feet | Maximum<br>HGL<br>Feet | Time of Max<br>Occurrence<br>days hr:min | Reported<br>Max Depth<br>Feet |
|------|----------|--------------------------|--------------------------|------------------------|------------------------------------------|-------------------------------|
| J1   | JUNCTION | 0.19                     | 0.68                     | 6484.68                | 0 00:55                                  | 0.67                          |
| J4   | JUNCTION | 0.13                     | 0.80                     | 6442.80                | 0 00:45                                  | 0.77                          |
| J5   | JUNCTION | 0.47                     | 1.82                     | 6409.82                | 0 00:45                                  | 1.78                          |
| J6   | JUNCTION | 0.15                     | 0.71                     | 6479.71                | 0 00:55                                  | 0.69                          |

|     |          |      |      |         |   |       |      |
|-----|----------|------|------|---------|---|-------|------|
| J7  | JUNCTION | 0.12 | 0.57 | 6456.57 | 0 | 00:55 | 0.55 |
| J8  | JUNCTION | 0.09 | 0.45 | 6438.45 | 0 | 00:50 | 0.43 |
| J9  | JUNCTION | 0.18 | 0.72 | 6415.72 | 0 | 00:55 | 0.71 |
| E2  | OUTFALL  | 0.24 | 0.64 | 6430.64 | 0 | 01:19 | 0.64 |
| E3  | OUTFALL  | 0.00 | 0.00 | 6428.00 | 0 | 00:00 | 0.00 |
| E6  | OUTFALL  | 0.48 | 1.82 | 6399.82 | 0 | 00:56 | 1.80 |
| E5  | OUTFALL  | 0.21 | 0.70 | 6380.70 | 0 | 01:07 | 0.69 |
| E7  | OUTFALL  | 0.27 | 0.62 | 6382.62 | 0 | 01:25 | 0.62 |
| E1  | OUTFALL  | 0.00 | 0.00 | 6410.00 | 0 | 00:00 | 0.00 |
| E10 | OUTFALL  | 0.14 | 0.55 | 6448.55 | 0 | 01:04 | 0.54 |
| E9  | OUTFALL  | 0.00 | 0.00 | 6440.00 | 0 | 00:00 | 0.00 |
| E8  | OUTFALL  | 0.00 | 0.00 | 6418.00 | 0 | 00:00 | 0.00 |
| E11 | OUTFALL  | 0.00 | 0.00 | 6448.00 | 0 | 00:00 | 0.00 |

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Node Inflow Summary  
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| Total Flow    |               | Maximum Lateral |            | Maximum Total |                    | Lateral Inflow |                 |
|---------------|---------------|-----------------|------------|---------------|--------------------|----------------|-----------------|
| Inflow Volume | Balance Error | Type            | Inflow CFS | Inflow CFS    | Time of Occurrence | Max hr:min     | Volume 10^6 gal |
| Node gal      | Percent       |                 |            |               | days               |                | 10^6            |
| J1            |               | JUNCTION        | 8.25       | 8.25          | 0                  | 00:55          | 0.218           |
| 0.218         | 0.000         |                 |            |               |                    |                |                 |
| J4            |               | JUNCTION        | 3.69       | 3.69          | 0                  | 00:45          | 0.0433          |
| 0.0433        | 0.000         |                 |            |               |                    |                |                 |
| J5            |               | JUNCTION        | 30.53      | 30.53         | 0                  | 00:45          | 0.747           |
| 0.747         | 0.000         |                 |            |               |                    |                |                 |
| J6            |               | JUNCTION        | 9.02       | 9.02          | 0                  | 00:55          | 0.173           |
| 0.173         | 0.000         |                 |            |               |                    |                |                 |
| J7            |               | JUNCTION        | 3.64       | 3.64          | 0                  | 00:55          | 0.066           |
| 0.066         | 0.000         |                 |            |               |                    |                |                 |
| J8            |               | JUNCTION        | 2.68       | 2.68          | 0                  | 00:50          | 0.0473          |
| 0.0473        | 0.000         |                 |            |               |                    |                |                 |
| J9            |               | JUNCTION        | 10.29      | 10.29         | 0                  | 00:55          | 0.245           |
| 0.245         | 0.000         |                 |            |               |                    |                |                 |
| E2            |               | OUTFALL         | 27.69      | 34.00         | 0                  | 01:10          | 0.978           |
| 1.22          | 0.000         |                 |            |               |                    |                |                 |
| E3            |               | OUTFALL         | 18.10      | 18.10         | 0                  | 00:55          | 0.469           |

|        |       |         |        |        |         |        |
|--------|-------|---------|--------|--------|---------|--------|
| 0.469  | 0.000 |         |        |        |         |        |
| E6     |       | OUTFALL | 10.35  | 42.69  | 0 00:56 | 0.222  |
| 1.02   | 0.000 |         |        |        |         |        |
| E5     |       | OUTFALL | 360.28 | 360.44 | 0 00:45 | 10.5   |
| 10.7   | 0.000 |         |        |        |         |        |
| E7     |       | OUTFALL | 48.78  | 48.78  | 0 00:45 | 1.73   |
| 2.03   | 0.000 |         |        |        |         |        |
| E1     |       | OUTFALL | 18.73  | 18.73  | 0 00:55 | 0.496  |
| 0.496  | 0.000 |         |        |        |         |        |
| E10    |       | OUTFALL | 9.19   | 12.30  | 0 01:03 | 0.27   |
| 0.339  | 0.000 |         |        |        |         |        |
| E9     |       | OUTFALL | 6.14   | 6.14   | 0 00:50 | 0.1    |
| 0.1    | 0.000 |         |        |        |         |        |
| E8     |       | OUTFALL | 5.33   | 5.33   | 0 00:55 | 0.102  |
| 0.102  | 0.000 |         |        |        |         |        |
| E11    |       | OUTFALL | 2.58   | 2.58   | 0 00:50 | 0.0363 |
| 0.0363 | 0.000 |         |        |        |         |        |

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Node Flooding Summary  
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No nodes were flooded.

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Outfall Loading Summary  
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| Outfall Node | Flow<br>Freq<br>Pcnt | Avg<br>Flow<br>CFS | Max<br>Flow<br>CFS | Total<br>Volume<br>10 <sup>6</sup> gal |
|--------------|----------------------|--------------------|--------------------|----------------------------------------|
| E2           | 98.47                | 7.64               | 34.00              | 1.215                                  |
| E3           | 45.69                | 6.35               | 18.10              | 0.469                                  |
| E6           | 75.56                | 8.31               | 42.69              | 1.015                                  |
| E5           | 98.47                | 67.47              | 360.44             | 10.734                                 |
| E7           | 98.47                | 12.74              | 48.78              | 2.027                                  |
| E1           | 45.69                | 6.72               | 18.73              | 0.496                                  |
| E10          | 77.64                | 2.70               | 12.30              | 0.339                                  |
| E9           | 37.22                | 1.67               | 6.14               | 0.100                                  |
| E8           | 38.61                | 1.63               | 5.33               | 0.102                                  |
| E11          | 34.17                | 0.66               | 2.58               | 0.036                                  |
| System       | 65.00                | 115.89             | 523.57             | 16.533                                 |

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# Link Flow Summary

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| Link | Type    | Maximum<br> Flow <br>CFS | Time of Max<br>Occurrence |        | Maximum<br> Veloc <br>ft/sec | Max/<br>Full<br>Flow | Max/<br>Full<br>Depth |
|------|---------|--------------------------|---------------------------|--------|------------------------------|----------------------|-----------------------|
|      |         |                          | days                      | hr:min |                              |                      |                       |
| C1   | CONDUIT | 7.12                     | 0                         | 01:19  | 3.91                         | 0.05                 | 0.32                  |
| C3   | CONDUIT | 2.79                     | 0                         | 01:00  | 2.90                         | 0.02                 | 0.23                  |
| C4   | CONDUIT | 30.24                    | 0                         | 00:56  | 3.45                         | 0.26                 | 0.61                  |
| C6   | CONDUIT | 3.24                     | 0                         | 01:04  | 1.90                         | 0.03                 | 0.27                  |
| C7   | CONDUIT | 6.19                     | 0                         | 01:25  | 4.82                         | 0.04                 | 0.30                  |
| C8   | CONDUIT | 1.93                     | 0                         | 01:20  | 3.21                         | 0.01                 | 0.19                  |
| C9   | CONDUIT | 9.31                     | 0                         | 01:07  | 3.37                         | 0.06                 | 0.35                  |

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## Conduit Surge Summary

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No conduits were surcharged.

Analysis begun on: Fri Nov 21 14:02:05 2025

Analysis ended on: Fri Nov 21 14:02:05 2025

Total elapsed time: < 1 sec

## TRIPLE H RANCH - 100-yr. Pre-Developed Conditions

### Subcatchment Runoff Summary

| Subcatchment | Total<br>Precip<br>in | Total<br>Runon<br>in | Total<br>Evap<br>in | Total<br>Infil<br>in | Total<br>Runoff<br>in | Total<br>Runoff<br>10 <sup>6</sup> gal | Peak<br>Runoff<br>CFS | Runoff<br>Coeff |
|--------------|-----------------------|----------------------|---------------------|----------------------|-----------------------|----------------------------------------|-----------------------|-----------------|
| EX-1         | 2.75                  | 0.00                 | 0.00                | 1.94                 | 0.81                  | 0.22                                   | 8.25                  | 0.295           |
| EX-10        | 2.75                  | 0.00                 | 0.00                | 1.85                 | 0.91                  | 0.75                                   | 30.53                 | 0.330           |
| EX-11        | 2.75                  | 0.00                 | 0.00                | 1.76                 | 1.00                  | 0.22                                   | 10.35                 | 0.362           |
| EX-12        | 2.75                  | 0.00                 | 0.00                | 1.78                 | 0.98                  | 0.17                                   | 9.02                  | 0.357           |
| EX-13        | 2.75                  | 0.00                 | 0.00                | 2.38                 | 0.37                  | 1.73                                   | 48.78                 | 0.134           |
| EX-14        | 2.75                  | 0.00                 | 0.00                | 1.75                 | 1.01                  | 0.07                                   | 3.64                  | 0.368           |
| EX-15        | 2.75                  | 0.00                 | 0.00                | 1.65                 | 1.11                  | 0.04                                   | 2.58                  | 0.405           |
| EX-16        | 2.75                  | 0.00                 | 0.00                | 2.04                 | 0.71                  | 0.27                                   | 9.19                  | 0.258           |
| EX-17        | 2.75                  | 0.00                 | 0.00                | 1.71                 | 1.06                  | 0.10                                   | 6.14                  | 0.384           |
| EX-18        | 2.75                  | 0.00                 | 0.00                | 1.74                 | 1.03                  | 0.05                                   | 2.68                  | 0.373           |
| EX-19        | 2.75                  | 0.00                 | 0.00                | 1.77                 | 0.99                  | 0.10                                   | 5.33                  | 0.358           |
| EX-2         | 2.75                  | 0.00                 | 0.00                | 2.19                 | 0.56                  | 0.98                                   | 27.69                 | 0.204           |
| EX-3         | 2.75                  | 0.00                 | 0.00                | 1.90                 | 0.85                  | 0.47                                   | 18.10                 | 0.311           |
| EX-4         | 2.75                  | 0.00                 | 0.00                | 1.54                 | 1.23                  | 0.04                                   | 3.69                  | 0.446           |
| EX-6         | 2.75                  | 0.00                 | 0.00                | 2.40                 | 0.35                  | 5.11                                   | 211.67                | 0.128           |
| EX-7         | 2.75                  | 0.00                 | 0.00                | 2.29                 | 0.46                  | 1.66                                   | 43.83                 | 0.168           |

### TRIPLE H RANCH - 100-yr. Pre-Developed Conditions

| Subcatchment | Total<br>Precip<br>in | Total<br>Runon<br>in | Total<br>Evap<br>in | Total<br>Infil<br>in | Total<br>Runoff<br>in | Total<br>Runoff<br>10 <sup>6</sup> gal | Peak<br>Runoff<br>CFS | Runoff<br>Coeff |
|--------------|-----------------------|----------------------|---------------------|----------------------|-----------------------|----------------------------------------|-----------------------|-----------------|
| EX-5         | 2.75                  | 0.00                 | 0.00                | 1.92                 | 0.83                  | 0.50                                   | 18.73                 | 0.303           |
| EX-8         | 2.75                  | 0.00                 | 0.00                | 2.44                 | 0.31                  | 3.71                                   | 106.57                | 0.113           |
| EX-9         | 2.75                  | 0.00                 | 0.00                | 1.82                 | 0.93                  | 0.24                                   | 10.29                 | 0.338           |

## TRIPLE H RANCH - 100-yr. Pre-Developed Conditions

### Node Inflow Summary

| Node | Type     | Maximum<br>Lateral<br>Inflow<br>CFS | Maximum<br>Total<br>Inflow<br>CFS | Day of<br>Maximum<br>Inflow | Hour of<br>Maximum<br>Inflow | Lateral<br>Inflow<br>Volume<br>10^6 gal | Total<br>Inflow<br>Volume<br>10^6 gal | Flow<br>Balance<br>Error<br>Percent |
|------|----------|-------------------------------------|-----------------------------------|-----------------------------|------------------------------|-----------------------------------------|---------------------------------------|-------------------------------------|
| J1   | JUNCTION | 8.25                                | 8.25                              | 0                           | 00:55                        | 0.218                                   | 0.218                                 | 0.000                               |
| J4   | JUNCTION | 3.69                                | 3.69                              | 0                           | 00:45                        | 0.0433                                  | 0.0433                                | 0.000                               |
| J5   | JUNCTION | 30.53                               | 30.53                             | 0                           | 00:45                        | 0.747                                   | 0.747                                 | 0.000                               |
| J6   | JUNCTION | 9.02                                | 9.02                              | 0                           | 00:55                        | 0.173                                   | 0.173                                 | 0.000                               |
| J7   | JUNCTION | 3.64                                | 3.64                              | 0                           | 00:55                        | 0.066                                   | 0.066                                 | 0.000                               |
| J8   | JUNCTION | 2.68                                | 2.68                              | 0                           | 00:50                        | 0.0473                                  | 0.0473                                | 0.000                               |
| J9   | JUNCTION | 10.29                               | 10.29                             | 0                           | 00:55                        | 0.245                                   | 0.245                                 | 0.000                               |
| E2   | OUTFALL  | 27.69                               | 34.00                             | 0                           | 01:10                        | 0.978                                   | 1.22                                  | 0.000                               |
| E3   | OUTFALL  | 18.10                               | 18.10                             | 0                           | 00:55                        | 0.469                                   | 0.469                                 | 0.000                               |
| E6   | OUTFALL  | 10.35                               | 42.69                             | 0                           | 00:56                        | 0.222                                   | 1.02                                  | 0.000                               |
| E5   | OUTFALL  | 360.28                              | 360.44                            | 0                           | 00:45                        | 10.5                                    | 10.7                                  | 0.000                               |
| E7   | OUTFALL  | 48.78                               | 48.78                             | 0                           | 00:45                        | 1.73                                    | 2.03                                  | 0.000                               |
| E1   | OUTFALL  | 18.73                               | 18.73                             | 0                           | 00:55                        | 0.496                                   | 0.496                                 | 0.000                               |
| E10  | OUTFALL  | 9.19                                | 12.30                             | 0                           | 01:03                        | 0.27                                    | 0.339                                 | 0.000                               |
| E9   | OUTFALL  | 6.14                                | 6.14                              | 0                           | 00:50                        | 0.1                                     | 0.1                                   | 0.000                               |
| E8   | OUTFALL  | 5.33                                | 5.33                              | 0                           | 00:55                        | 0.102                                   | 0.102                                 | 0.000                               |

### TRIPLE H RANCH - 100-yr. Pre-Developed Conditions

| Node | Type    | Maximum<br>Lateral<br>Inflow<br>CFS | Maximum<br>Total<br>Inflow<br>CFS | Day of<br>Maximum<br>Inflow | Hour of<br>Maximum<br>Inflow | Lateral<br>Inflow<br>Volume<br>10^6 gal | Total<br>Inflow<br>Volume<br>10^6 gal | Flow<br>Balance<br>Error<br>Percent |
|------|---------|-------------------------------------|-----------------------------------|-----------------------------|------------------------------|-----------------------------------------|---------------------------------------|-------------------------------------|
| E11  | OUTFALL | 2.58                                | 2.58                              | 0                           | 00:50                        | 0.0363                                  | 0.0363                                | 0.000                               |



## TRIPLE H RANCH - 100-yr. Pre-Developed Conditions

Outfall Loading Summary

| Outfall Node | Flow<br>Freq.<br>Pcnt. | Avg.<br>Flow<br>CFS | Max.<br>Flow<br>CFS | Total<br>Volume<br>10^6 gal |
|--------------|------------------------|---------------------|---------------------|-----------------------------|
| E2           | 98.47                  | 7.64                | 34.00               | 1.215                       |
| E3           | 45.69                  | 6.35                | 18.10               | 0.469                       |
| E6           | 75.56                  | 8.31                | 42.69               | 1.015                       |
| E5           | 98.47                  | 67.47               | 360.44              | 10.734                      |
| E7           | 98.47                  | 12.74               | 48.78               | 2.027                       |
| E1           | 45.69                  | 6.72                | 18.73               | 0.496                       |
| E10          | 77.64                  | 2.70                | 12.30               | 0.339                       |
| E9           | 37.22                  | 1.67                | 6.14                | 0.100                       |
| E8           | 38.61                  | 1.63                | 5.33                | 0.102                       |
| E11          | 34.17                  | 0.66                | 2.58                | 0.036                       |

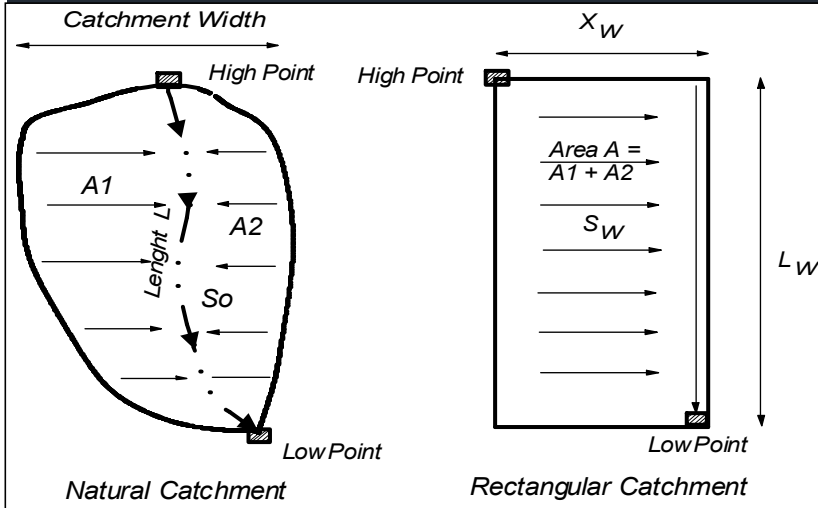
TRIPLE H RANCH

Developed Conditions

08/22/2025 00:15:00



## Convert Natural Catchment to a Rectangular Shape



|                     |         |
|---------------------|---------|
| Subcatchment Center | Z=0.5   |
| Side Collector      | Z=1     |
| Skewed Location     | 0.5<Z<1 |

### Dimensionless Variables

$$Y = \frac{L}{L_w}; \quad X = \frac{A}{L^2}$$

$$Y = (1.5 - Z)(2.286X - 0.286X^2)$$

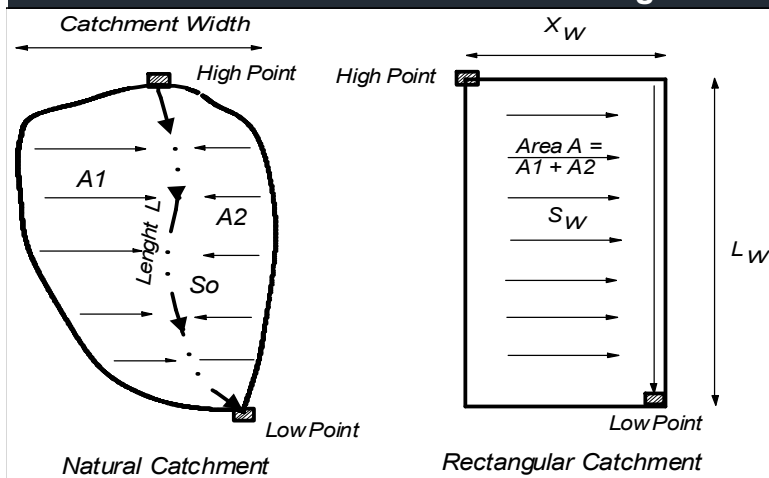
$$\frac{L_w}{L} = (1.5 - Z)[2.286(\frac{A}{L^2}) - 0.286(\frac{A}{L^2})^2]$$

$$S_o/S_w = A/(LL_w) + L_w/L$$

$$X_w = A/L_w$$

| Subarea ID | Area acre | A1 acre | A2 acre | L ft  | High Pt Elev. ft | Low Pt Elev. ft | Z=A <sub>m</sub> /A | X=A/L <sup>2</sup> | Y=L <sub>w</sub> /L | L <sub>w</sub> ft | X <sub>w</sub> ft | S <sub>o</sub> % | S <sub>o</sub> /S <sub>w</sub> | S <sub>w</sub> % |
|------------|-----------|---------|---------|-------|------------------|-----------------|---------------------|--------------------|---------------------|-------------------|-------------------|------------------|--------------------------------|------------------|
| OS-1       | 9.90      | 5.00    | 4.90    | 1,200 | 6498.0           | 6484.0          | 0.51                | 0.30               | 0.66                | 787               | 548               | 1.17             | 1.11                           | 1.05             |
| OS-2       | 12.50     | 8.75    | 3.75    | 630   | 6512.0           | 6488.0          | 0.70                | 1.37               | 2.08                | 1,309             | 416               | 3.81             | 2.74                           | 1.39             |
| OS-3       | 3.10      | 1.60    | 1.50    | 410   | 6,524            | 6,499           | 0.52                | 0.80               | 1.63                | 666               | 203               | 6.10             | 2.12                           | 2.88             |
| OS-4       | 520.40    | 210.00  | 310.40  | 7,400 | 6,610            | 6,498           | 0.60                | 0.41               | 0.81                | 6,000             | 3,778             | 1.51             | 1.32                           | 1.15             |
| OS-5       | 106.60    | 55.00   | 51.60   | 3,940 | 6,560            | 6,500           | 0.52                | 0.30               | 0.65                | 2,552             | 1,820             | 1.52             | 1.11                           | 1.37             |
| OS-6       | 4.00      | 2.50    | 1.50    | 615   | 6,517            | 6,499           | 0.63                | 0.46               | 0.87                | 534               | 326               | 2.93             | 1.40                           | 2.09             |
| OS-7       | 19.30     | 12.00   | 7.30    | 1,360 | 6,525            | 6,493           | 0.62                | 0.45               | 0.86                | 1,170             | 718               | 2.35             | 1.39                           | 1.69             |
| OS-8       | 2.30      | 1.10    | 1.20    | 200   | 6,516            | 6,500           | 0.52                | 2.50               | 3.85                | 769               | 130               | 8.00             | 4.50                           | 1.78             |
| OS-9       | 6.50      | 3.00    | 3.50    | 745   | 6,504            | 6,479           | 0.54                | 0.51               | 1.05                | 782               | 362               | 3.36             | 1.54                           | 2.19             |
| OS-10      | 2.40      | 1.20    | 1.20    | 600   | 6,467            | 6,456           | 0.50                | 0.29               | 0.64                | 384               | 272               | 1.83             | 1.09                           | 1.68             |
| OS-11      | 1.70      | 0.80    | 0.90    | 130   | 6,441            | 6,438           | 0.53                | 4.38               | 4.39                | 571               | 130               | 2.31             | 5.39                           | 0.43             |
| OS-12      | 2.90      | 1.60    | 1.30    | 440   | 6,467            | 6,458           | 0.55                | 0.65               | 1.30                | 572               | 221               | 2.05             | 1.80                           | 1.14             |
| OS-13      | 6.80      | 3.70    | 3.10    | 1,430 | 6,467            | 6,417           | 0.54                | 0.14               | 0.31                | 444               | 666               | 3.50             | 0.78                           | 4.50             |
| OS-14      | 30.30     | 15.00   | 15.30   | 1,340 | 6,467            | 6,408           | 0.50                | 0.74               | 1.52                | 2,034             | 649               | 4.40             | 2.00                           | 2.20             |

# Convert Natural Catchment to a Rectangular Shape



|                     |         |
|---------------------|---------|
| Subcatchment Center | Z=0.5   |
| Side Collector      | Z=1     |
| Skewed Location     | 0.5<Z<1 |

## Dimensionless Variables

$$Y = \frac{L}{L_w}; \quad X = \frac{A}{L^2}$$

$$Y = (1.5 - Z)(2.286X - 0.286X^2)$$

$$\frac{L_w}{L} = (1.5 - Z)[2.286(\frac{A}{L^2}) - 0.286(\frac{A}{L^2})^2]$$

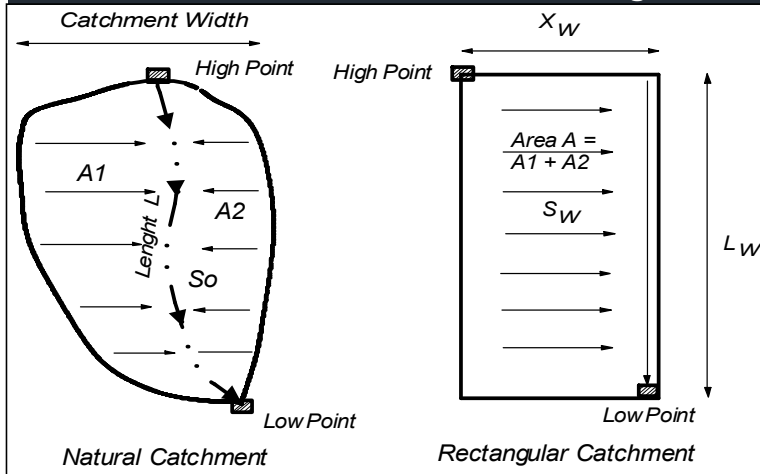
$$S_o/S_w = A/(LL_w) + L_w/L$$

$$X_w = A/L_w$$

| Subarea ID | Area acre | A1 acre | A2 acre | L ft  | High Pt Elev. ft | Low Pt Elev. ft | Z=A <sub>m</sub> /A | X=A/L <sup>2</sup> | Y=L <sub>w</sub> /L | L <sub>w</sub> ft | X <sub>w</sub> ft | So % | So/S <sub>w</sub> | S <sub>w</sub> % |
|------------|-----------|---------|---------|-------|------------------|-----------------|---------------------|--------------------|---------------------|-------------------|-------------------|------|-------------------|------------------|
| E-A        | 8.90      | 7.00    | 1.90    | 815   | 6498.0           | 6486.0          | 0.79                | 0.58               | 0.88                | 719               | 539               | 1.47 | 1.54              | 0.95             |
| E-B        | 12.30     | 7.90    | 4.40    | 490   | 6500.0           | 6493.0          | 0.64                | 2.23               | 3.15                | 1,545             | 347               | 1.43 | 3.86              | 0.37             |
| E-C        | 9.80      | 4.50    | 5.30    | 735   | 6,498            | 6,478           | 0.54                | 0.79               | 1.56                | 1,148             | 372               | 2.72 | 2.07              | 1.32             |
| E-D        | 29.00     | 15.00   | 14.00   | 1,160 | 6,494            | 6,452           | 0.52                | 0.94               | 1.86                | 2,159             | 585               | 3.62 | 2.37              | 1.53             |
| E-E        | 28.60     | 20.00   | 8.60    | 1,270 | 6,488            | 6,452           | 0.70                | 0.77               | 1.28                | 1,622             | 768               | 2.83 | 1.88              | 1.51             |
| E-F        | 1.90      | 0.60    | 1.30    | 420   | 6,490            | 6,475           | 0.68                | 0.47               | 0.82                | 346               | 239               | 3.57 | 1.39              | 2.56             |
| E-G        | 5.70      | 2.90    | 2.80    | 610   | 6,485            | 6,459           | 0.51                | 0.67               | 1.39                | 845               | 294               | 4.26 | 1.87              | 2.28             |
| E-H        | 2.20      | 0.60    | 1.60    | 450   | 6,462            | 6,450           | 0.73                | 0.47               | 0.79                | 354               | 271               | 2.67 | 1.39              | 1.92             |
| E-I        | 13.70     | 7.70    | 6.00    | 1,285 | 6,485            | 6,452           | 0.56                | 0.36               | 0.74                | 951               | 628               | 2.57 | 1.23              | 2.09             |
| E-J        | 0.68      | 0.40    | 0.28    | 250   | 6,473            | 6,460           | 0.59                | 0.47               | 0.93                | 232               | 128               | 5.20 | 1.44              | 3.61             |
| E-K        | 8.30      | 4.00    | 4.30    | 915   | 6,463            | 6,450           | 0.52                | 0.43               | 0.92                | 839               | 431               | 1.42 | 1.39              | 1.02             |
| E-L        | 25.10     | 8.00    | 17.10   | 1,500 | 6,463            | 6,426           | 0.68                | 0.49               | 0.85                | 1,281             | 853               | 2.47 | 1.42              | 1.73             |
| E-M        | 19.00     | 3.00    | 16.00   | 1,390 | 6,473            | 6,426           | 0.84                | 0.43               | 0.61                | 847               | 977               | 3.38 | 1.31              | 2.58             |
| E-N        | 2.20      | 0.70    | 1.50    | 585   | 6,514            | 6,500           | 0.68                | 0.28               | 0.51                | 296               | 324               | 2.39 | 1.06              | 2.26             |
| E-O        | 16.40     | 8.40    | 8.00    | 1,075 | 6,504            | 6,484           | 0.51                | 0.62               | 1.29                | 1,385             | 516               | 1.86 | 1.77              | 1.05             |
| E-P        | 30.50     | 20.00   | 10.50   | 2,010 | 6,513            | 6,466           | 0.66                | 0.33               | 0.61                | 1,223             | 1,086             | 2.34 | 1.15              | 2.04             |
| E-Q        | 24.80     | 8.80    | 16.00   | 1,530 | 6,503            | 6,466           | 0.65                | 0.46               | 0.85                | 1,300             | 831               | 2.42 | 1.39              | 1.74             |
| E-R        | 65.20     | 15.00   | 50.20   | 2,000 | 6,500            | 6,426           | 0.77                | 0.71               | 1.08                | 2,159             | 1,315             | 3.70 | 1.74              | 2.13             |
| E-S        | 26.50     | 16.50   | 10.00   | 1,340 | 6,485            | 6,440           | 0.62                | 0.64               | 1.19                | 1,589             | 727               | 3.36 | 1.73              | 1.94             |
| E-T1       | 9.80      | 5.00    | 4.80    | 1,700 | 6,450            | 6,424           | 0.51                | 0.15               | 0.33                | 558               | 765               | 1.53 | 0.78              | 1.97             |
| E-T2       | 10.70     | 6.70    | 4.00    | 1,080 | 6,447            | 6,418           | 0.63                | 0.40               | 0.76                | 819               | 569               | 2.69 | 1.29              | 2.09             |
| E-U        | 16.80     | 8.80    | 8.00    | 1,230 | 6,458            | 6,418           | 0.52                | 0.48               | 1.01                | 1,247             | 587               | 3.25 | 1.49              | 2.18             |
| E-V        | 7.50      | 4.50    | 3.00    | 940   | 6,450            | 6,419           | 0.60                | 0.37               | 0.73                | 682               | 479               | 3.30 | 1.24              | 2.67             |
| E-W        | 15.20     | 8.00    | 7.20    | 1,310 | 6,430            | 6,394           | 0.53                | 0.39               | 0.82                | 1,071             | 618               | 2.75 | 1.29              | 2.13             |
| E-X        | 6.70      | 3.50    | 3.20    | 740   | 6,417            | 6,394           | 0.52                | 0.53               | 1.11                | 823               | 355               | 3.11 | 1.59              | 1.95             |
| E-Y        | 5.30      | 1.30    | 4.00    | 605   | 6,415            | 6,394           | 0.75                | 0.63               | 0.99                | 599               | 386               | 3.47 | 1.63              | 2.13             |
| E-Z        | 21.40     | 6.40    | 15.00   | 1,650 | 6,422            | 6,383           | 0.70                | 0.34               | 0.60                | 988               | 944               | 2.36 | 1.17              | 2.02             |



## Convert Natural Catchment to a Rectangular Shape



|                     |         |
|---------------------|---------|
| Subcatchment Center | Z=0.5   |
| Side Collector      | Z=1     |
| Skewed Location     | 0.5<Z<1 |

### Dimensionless Variables

$$Y = \frac{L}{L_w}; \quad X = \frac{A}{L^2}$$

$$Y = (1.5 - Z)(2.286X - 0.286X^2)$$

$$\frac{L_w}{L} = (1.5 - Z)[2.286(\frac{A}{L^2}) - 0.286(\frac{A}{L^2})^2]$$

$$S_o/S_w = A/(LL_w) + L_w/L$$

$$X_w = A/L_w$$

| Subarea ID | Area acre | A1 acre | A2 acre | L ft  | High Pt Elev. ft | Low Pt Elev. ft | Z=Am/A | X=A/L <sup>2</sup> | Y=Lw/L | Lw ft | Xw ft | So % | So/Sw | Sw % |
|------------|-----------|---------|---------|-------|------------------|-----------------|--------|--------------------|--------|-------|-------|------|-------|------|
| E-AA       | 19.20     | 12.00   | 7.20    | 1,240 | 6479.0           | 6456.0          | 0.63   | 0.54               | 1.01   | 1,257 | 665   | 1.85 | 1.55  | 1.20 |
| E-BB       | 46.20     | 30.00   | 16.20   | 1,140 | 6499.0           | 6450.0          | 0.65   | 1.55               | 2.43   | 2,768 | 727   | 4.30 | 3.07  | 1.40 |
| E-CC       | 16.90     | 8.50    | 8.40    | 1,225 | 6,463            | 6,446           | 0.50   | 0.49               | 1.05   | 1,286 | 573   | 1.39 | 1.52  | 0.91 |
| E-DD       | 17.50     | 9.00    | 12.50   | 1,950 | 6,453            | 6,432           | 0.71   | 0.20               | 0.35   | 685   | 1,114 | 1.08 | 0.92  | 1.17 |
| E-EE       | 19.80     | 12.00   | 7.80    | 830   | 6,459            | 6,432           | 0.61   | 1.25               | 2.16   | 1,791 | 482   | 3.25 | 2.74  | 1.19 |
| E-FF       | 3.50      | 1.70    | 1.80    | 250   | 6,452            | 6,442           | 0.51   | 2.44               | 3.82   | 955   | 160   | 4.00 | 4.46  | 0.90 |
| E-GG       | 24.00     | 14.00   | 10.00   | 1,650 | 6,458            | 6,406           | 0.58   | 0.38               | 0.77   | 1,264 | 827   | 3.15 | 1.27  | 2.49 |
| E-HH       | 21.00     | 6.00    | 15.00   | 2,420 | 6,441            | 6,392           | 0.71   | 0.16               | 0.28   | 666   | 1,374 | 2.02 | 0.84  | 2.40 |
| E-II       | 15.70     | 10.00   | 5.70    | 1,070 | 6,422            | 6,392           | 0.64   | 0.60               | 1.09   | 1,167 | 586   | 2.80 | 1.64  | 1.71 |
| E-JJ       | 3.80      | 2.20    | 1.60    | 670   | 6,432            | 6,416           | 0.58   | 0.37               | 0.74   | 496   | 334   | 2.39 | 1.24  | 1.93 |
| E-KK       | 15.50     | 3.00    | 12.50   | 1,160 | 6,421            | 6,382           | 0.81   | 0.50               | 0.75   | 865   | 781   | 3.36 | 1.42  | 2.37 |
| E-LL       | 5.70      | 1.70    | 4.00    | 565   | 6,400            | 6,382           | 0.70   | 0.78               | 1.28   | 724   | 343   | 3.19 | 1.89  | 1.69 |
| E-MM       | 1.30      | 0.60    | 0.70    | 420   | 6,465            | 6,442           | 0.54   | 0.32               | 0.68   | 284   | 199   | 5.48 | 1.15  | 4.76 |
| E-NN       | 8.30      | 6.00    | 2.30    | 550   | 6,415            | 6,398           | 0.72   | 1.20               | 1.81   | 993   | 364   | 3.09 | 2.47  | 1.25 |
| E-OO       | 1.20      | 0.40    | 0.80    | 200   | 6,452            | 6,446           | 0.67   | 1.31               | 2.08   | 416   | 126   | 3.00 | 2.71  | 1.11 |
|            |           |         |         |       |                  |                 |        |                    |        |       |       |      |       |      |
| W-A        | 9.00      | 5.00    | 4.00    | 970   | 6,490            | 6,450           | 0.56   | 0.42               | 0.85   | 827   | 474   | 4.12 | 1.34  | 3.07 |
| W-B        | 10.00     | 6.50    | 3.50    | 675   | 6,473            | 6,430           | 0.65   | 0.96               | 1.64   | 1,104 | 395   | 6.37 | 2.22  | 2.87 |
| W-C        | 37.50     | 18.00   | 19.50   | 1,610 | 6,470            | 6,432           | 0.52   | 0.63               | 1.30   | 2,094 | 780   | 2.36 | 1.79  | 1.32 |
| W-D        | 15.40     | 7.00    | 8.40    | 2,240 | 6,464            | 6,426           | 0.55   | 0.13               | 0.29   | 643   | 1,044 | 1.70 | 0.75  | 2.25 |
| W-E        | 11.00     | 6.00    | 5.00    | 640   | 6,465            | 6,427           | 0.55   | 1.17               | 2.18   | 1,395 | 344   | 5.94 | 2.72  | 2.19 |
| W-F        | 1.10      | 0.70    | 0.40    | 430   | 6,440            | 6,428           | 0.64   | 0.26               | 0.50   | 213   | 225   | 2.79 | 1.02  | 2.74 |
|            |           |         |         |       |                  |                 |        |                    |        |       |       |      |       |      |
| TANK       | 1.90      | 0.95    | 0.95    | 185   | 6,515            | 6,510           | 0.50   | 2.42               | 3.86   | 713   | 116   | 2.70 | 4.48  | 0.60 |

# TRIPLE H RANCH PRELIMINARY DRAINAGE REPORT

## (Developed Conditions)

| SUBCATCHMENT INPUT DATA |       |             |             |         |                |              |                                   |                                   |                                       |              |
|-------------------------|-------|-------------|-------------|---------|----------------|--------------|-----------------------------------|-----------------------------------|---------------------------------------|--------------|
|                         |       |             |             |         |                |              | Depth of<br>Depression<br>Storage | Depth of<br>Depression<br>Storage | Imperv. Area<br>with no<br>Depression |              |
| Subcatchment            | Area  | Width<br>Lw | Slope<br>Sw | Imperv. | Mannings N     | Mannings N   | Imperv. Area                      | Perv. Area                        | Storage                               | Infiltration |
| Basin Name              | (Ac.) | (Ft.)       | (%)         | (%)     | (Imperv. Area) | (Perv. Area) | (in.)                             | (in.)                             | (%)                                   | Method       |
| OS-1                    | 9.9   | 787         | 1.05        | 3       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| OS-2                    | 12.5  | 1309        | 1.39        | 2       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| OS-3                    | 3.1   | 666         | 2.88        | 2       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| OS-4                    | 520.4 | 6000        | 1.15        | 5       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| OS-5                    | 106.6 | 2552        | 1.37        | 2       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| OS-6                    | 4.0   | 534         | 2.09        | 2       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| OS-7                    | 19.3  | 1170        | 1.69        | 2       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| OS-8                    | 2.3   | 769         | 1.78        | 2       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| OS-9                    | 6.5   | 782         | 2.19        | 2       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| OS-10                   | 2.4   | 384         | 1.68        | 2       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| OS-11                   | 1.7   | 571         | 0.43        | 2       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| OS-12                   | 2.9   | 572         | 1.14        | 2       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| OS-13                   | 6.8   | 444         | 4.50        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| OS-14                   | 30.3  | 2034        | 2.20        | 5       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-A                     | 8.9   | 719         | 0.95        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-B                     | 12.3  | 1545        | 0.37        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-C                     | 9.8   | 1148        | 1.32        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-D                     | 29.0  | 2159        | 1.53        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-E                     | 28.6  | 1622        | 1.51        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-F                     | 1.9   | 346         | 2.56        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-G                     | 5.7   | 845         | 2.28        | 11      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-H                     | 2.2   | 354         | 1.92        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-I                     | 13.7  | 951         | 2.09        | 11      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-J                     | 0.68  | 232         | 3.61        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-K                     | 8.3   | 839         | 1.02        | 6       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-L                     | 25.1  | 1281        | 1.73        | 9       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-M                     | 19.0  | 847         | 2.58        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |

# TRIPLE H RANCH PRELIMINARY DRAINAGE REPORT

## (Developed Conditions)

| SUBCATCHMENT INPUT DATA |       |             |             |         |                |              |                                   |                                   |                                       |              |
|-------------------------|-------|-------------|-------------|---------|----------------|--------------|-----------------------------------|-----------------------------------|---------------------------------------|--------------|
|                         |       |             |             |         |                |              | Depth of<br>Depression<br>Storage | Depth of<br>Depression<br>Storage | Imperv. Area<br>with no<br>Depression |              |
| Subcatchment            | Area  | Width<br>Lw | Slope<br>Sw | Imperv. | Mannings N     | Mannings N   | Imperv. Area                      | Perv. Area                        | Storage                               | Infiltration |
| Basin Name              | (Ac.) | (Ft.)       | (%)         | (%)     | (Imperv. Area) | (Perv. Area) | (in.)                             | (in.)                             | (%)                                   | Method       |
| E-N                     | 2.2   | 296         | 2.26        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-O                     | 16.4  | 1385        | 1.05        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-P                     | 30.5  | 1223        | 2.04        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-Q                     | 24.8  | 1300        | 1.74        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-R                     | 65.2  | 2159        | 2.13        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-S                     | 26.5  | 1589        | 1.94        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-T1                    | 9.8   | 558         | 1.97        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-T2                    | 10.7  | 819         | 2.09        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-U                     | 16.8  | 1247        | 2.18        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-V                     | 7.5   | 682         | 2.67        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-W                     | 15.2  | 1071        | 2.13        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-X                     | 6.7   | 823         | 1.95        | 11      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-Y                     | 5.3   | 599         | 2.13        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-Z                     | 21.4  | 988         | 2.02        | 9       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-AA                    | 19.2  | 1257        | 1.20        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-BB                    | 46.2  | 2768        | 1.40        | 11      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-CC                    | 16.9  | 1286        | 0.91        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-DD                    | 17.5  | 685         | 1.17        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-EE                    | 19.8  | 1791        | 1.19        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-FF                    | 3.5   | 955         | 0.90        | 8       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-GG                    | 24.0  | 1264        | 2.49        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-HH                    | 21.0  | 666         | 2.40        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-II                    | 15.7  | 1167        | 1.71        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-JJ                    | 3.8   | 496         | 1.93        | 8       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-KK                    | 15.5  | 865         | 2.37        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-LL                    | 5.7   | 724         | 1.69        | 8       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-MM                    | 1.3   | 284         | 4.76        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-NN                    | 8.3   | 993         | 1.25        | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| E-OO                    | 1.2   | 416         | 1.11        | 2       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |

# TRIPLE H RANCH PRELIMINARY DRAINAGE REPORT

## (Developed Conditions)

| SUBCATCHMENT INPUT DATA |       |       |       |         |                |              |                                   |                                   |                                       |              |
|-------------------------|-------|-------|-------|---------|----------------|--------------|-----------------------------------|-----------------------------------|---------------------------------------|--------------|
|                         |       |       |       |         |                |              | Depth of<br>Depression<br>Storage | Depth of<br>Depression<br>Storage | Imperv. Area<br>with no<br>Depression |              |
|                         |       | Width | Slope |         |                |              |                                   |                                   |                                       |              |
| Subcatchment            | Area  | Lw    | Sw    | Imperv. | Mannings N     | Mannings N   | Imperv. Area                      | Perv. Area                        | Storage                               | Infiltration |
| Basin Name              | (Ac.) | (Ft.) | (%)   | (%)     | (Imperv. Area) | (Perv. Area) | (in.)                             | (in.)                             | (%)                                   | Method       |
|                         |       |       |       |         |                |              |                                   |                                   |                                       |              |
|                         |       |       |       |         |                |              |                                   |                                   |                                       |              |
| W-A                     | 9.0   | 827   | 3.07  | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| W-B                     | 10.0  | 1104  | 2.87  | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| W-C                     | 37.5  | 2094  | 1.32  | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| W-D                     | 15.4  | 643   | 2.25  | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| W-E                     | 11.0  | 1395  | 2.19  | 9       | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
| W-F                     | 1.1   | 213   | 2.74  | 10      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |
|                         |       |       |       |         |                |              |                                   |                                   |                                       |              |
| TANK                    | 1.9   | 713   | 0.60  | 50      | 0.014          | 0.24         | 0.10                              | 0.35                              | 25                                    | Horton       |



EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)

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TRIPLE H RANCH - 5-yr. Developed Conditions

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Analysis Options

\*\*\*\*\*

Flow Units ..... CFS

Process Models:

Rainfall/Runoff ..... YES

RDII ..... NO

Snowmelt ..... NO

Groundwater ..... NO

Flow Routing ..... YES

Ponding Allowed ..... NO

Water Quality ..... NO

Infiltration Method ..... HORTON

Flow Routing Method ..... KINWAVE

Starting Date ..... 08/22/2025 00:00:00

Ending Date ..... 08/22/2025 06:00:00

Antecedent Dry Days ..... 0.0

Report Time Step ..... 00:15:00

Wet Time Step ..... 00:05:00

Dry Time Step ..... 01:00:00

Routing Time Step ..... 30.00 sec

\*\*\*\*\*

|                            | Volume    | Depth  |
|----------------------------|-----------|--------|
| Runoff Quantity Continuity | acre-feet | inches |
| *****                      | -----     | -----  |
| Total Precipitation .....  | 163.762   | 1.328  |
| Evaporation Loss .....     | 0.000     | 0.000  |
| Infiltration Loss .....    | 151.534   | 1.229  |
| Surface Runoff .....       | 11.662    | 0.095  |
| Final Storage .....        | 0.671     | 0.005  |
| Continuity Error (%) ..... | -0.064    |        |

\*\*\*\*\*

|                            | Volume    | Volume   |
|----------------------------|-----------|----------|
| Flow Routing Continuity    | acre-feet | 10^6 gal |
| *****                      | -----     | -----    |
| Dry Weather Inflow .....   | 0.000     | 0.000    |
| Wet Weather Inflow .....   | 11.662    | 3.800    |
| Groundwater Inflow .....   | 0.000     | 0.000    |
| RDII Inflow .....          | 0.000     | 0.000    |
| External Inflow .....      | 0.000     | 0.000    |
| External Outflow .....     | 11.779    | 3.838    |
| Flooding Loss .....        | 0.000     | 0.000    |
| Evaporation Loss .....     | 0.000     | 0.000    |
| Exfiltration Loss .....    | 0.000     | 0.000    |
| Initial Stored Volume .... | 0.000     | 0.000    |
| Final Stored Volume .....  | 0.043     | 0.014    |

Continuity Error (%) ..... -1.364

\*\*\*\*\*  
Highest Flow Instability Indexes  
\*\*\*\*\*

Link LW-2 (5)  
Link C35 (2)  
Link CW-3 (2)  
Link C108 (2)  
Link CE-28 (2)

\*\*\*\*\*  
Routing Time Step Summary  
\*\*\*\*\*

Minimum Time Step : 30.00 sec  
Average Time Step : 30.00 sec  
Maximum Time Step : 30.00 sec  
% of Time in Steady State : 0.00  
Average Iterations per Step : 1.22  
% of Steps Not Converging : 0.00

\*\*\*\*\*  
Subcatchment Runoff Summary  
\*\*\*\*\*

| -----        |              |        |          |        |        |       |
|--------------|--------------|--------|----------|--------|--------|-------|
| Imperv       | Perv         | Total  | Total    | Total  | Total  | Total |
| Runoff       | Runoff       | Total  | Total    | Peak   | Runoff |       |
| Subcatchment | Subcatchment | Precip | Runon    | Runoff | Evap   | Infil |
| in           | in           | Runoff | Runoff   | Runoff | Coeff  | in    |
| -----        |              |        |          |        |        |       |
|              |              | in     | 10^6 gal | in     | in     |       |
| E-A          |              | 1.33   | 0.00     | 0.00   |        | 1.19  |
| 0.13         | 0.00         | 0.13   | 0.03     | 3.49   | 0.098  |       |
| E-AA         |              | 1.33   | 0.00     | 0.00   |        | 1.19  |
| 0.13         | 0.00         | 0.13   | 0.07     | 7.51   | 0.098  |       |
| E-B          |              | 1.33   | 0.00     | 0.00   |        | 1.19  |
| 0.13         | 0.00         | 0.13   | 0.04     | 4.82   | 0.098  |       |
| E-BB         |              | 1.33   | 0.00     | 0.00   |        | 1.18  |
| 0.14         | 0.00         | 0.14   | 0.18     | 19.84  | 0.108  |       |
| E-C          |              | 1.33   | 0.00     | 0.00   |        | 1.19  |
| 0.13         | 0.01         | 0.13   | 0.04     | 3.86   | 0.101  |       |
| E-CC         |              | 1.33   | 0.00     | 0.00   |        | 1.19  |
| 0.13         | 0.00         | 0.13   | 0.06     | 6.62   | 0.098  |       |
| E-D          |              | 1.33   | 0.00     | 0.00   |        | 1.19  |
| 0.13         | 0.01         | 0.13   | 0.10     | 11.39  | 0.099  |       |
| E-DD         |              | 1.33   | 0.00     | 0.00   |        | 1.19  |
| 0.13         | 0.00         | 0.13   | 0.06     | 6.72   | 0.097  |       |

|      |      |      |      |       |       |      |
|------|------|------|------|-------|-------|------|
| E-E  |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.00 | 0.13 | 0.10 | 11.19 | 0.098 |      |
| E-EE |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.01 | 0.13 | 0.07 | 7.79  | 0.099 |      |
| E-F  |      |      | 1.33 | 0.00  | 0.00  | 1.18 |
| 0.13 | 0.01 | 0.14 | 0.01 | 0.75  | 0.106 |      |
| E-FF |      |      | 1.33 | 0.00  | 0.00  | 1.21 |
| 0.10 | 0.01 | 0.11 | 0.01 | 1.10  | 0.086 |      |
| E-G  |      |      | 1.33 | 0.00  | 0.00  | 1.17 |
| 0.14 | 0.01 | 0.15 | 0.02 | 2.47  | 0.113 |      |
| E-GG |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.00 | 0.13 | 0.09 | 9.42  | 0.099 |      |
| E-H  |      |      | 1.33 | 0.00  | 0.00  | 1.18 |
| 0.13 | 0.01 | 0.14 | 0.01 | 0.87  | 0.104 |      |
| E-HH |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.00 | 0.13 | 0.07 | 8.12  | 0.097 |      |
| E-I  |      |      | 1.33 | 0.00  | 0.00  | 1.18 |
| 0.14 | 0.01 | 0.14 | 0.05 | 5.92  | 0.109 |      |
| E-II |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.01 | 0.13 | 0.06 | 6.17  | 0.099 |      |
| E-J  |      |      | 1.33 | 0.00  | 0.00  | 1.17 |
| 0.13 | 0.03 | 0.15 | 0.00 | 0.27  | 0.114 |      |
| E-JJ |      |      | 1.33 | 0.00  | 0.00  | 1.21 |
| 0.10 | 0.01 | 0.11 | 0.01 | 1.20  | 0.083 |      |
| E-K  |      |      | 1.33 | 0.00  | 0.00  | 1.24 |
| 0.08 | 0.01 | 0.08 | 0.02 | 1.96  | 0.061 |      |
| E-KK |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.00 | 0.13 | 0.06 | 6.08  | 0.099 |      |
| E-L  |      |      | 1.33 | 0.00  | 0.00  | 1.20 |
| 0.11 | 0.00 | 0.12 | 0.08 | 8.85  | 0.088 |      |
| E-LL |      |      | 1.33 | 0.00  | 0.00  | 1.21 |
| 0.10 | 0.01 | 0.11 | 0.02 | 1.80  | 0.083 |      |
| E-M  |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.00 | 0.13 | 0.07 | 7.44  | 0.098 |      |
| E-N  |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.01 | 0.14 | 0.01 | 0.87  | 0.103 |      |
| E-O  |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.00 | 0.13 | 0.06 | 6.44  | 0.099 |      |
| E-P  |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.00 | 0.13 | 0.11 | 11.87 | 0.098 |      |
| E-Q  |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.00 | 0.13 | 0.09 | 9.70  | 0.098 |      |
| E-R  |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.00 | 0.13 | 0.23 | 25.21 | 0.097 |      |
| E-S  |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.00 | 0.13 | 0.09 | 10.40 | 0.099 |      |
| E-T1 |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.00 | 0.13 | 0.03 | 3.84  | 0.098 |      |
| E-U  |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.01 | 0.13 | 0.06 | 6.61  | 0.100 |      |
| E-V  |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.01 | 0.13 | 0.03 | 2.96  | 0.101 |      |
| E-W  |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13 | 0.01 | 0.13 | 0.05 | 5.98  | 0.099 |      |

|           |      |      |      |       |       |      |
|-----------|------|------|------|-------|-------|------|
| E-X       |      |      | 1.33 | 0.00  | 0.00  | 1.17 |
| 0.14      | 0.01 | 0.15 | 0.03 | 2.91  | 0.111 |      |
| W-G       |      |      | 1.33 | 0.00  | 0.00  | 1.20 |
| 0.11      | 0.00 | 0.12 | 0.07 | 7.57  | 0.089 |      |
| E-MM      |      |      | 1.33 | 0.00  | 0.00  | 1.18 |
| 0.13      | 0.02 | 0.15 | 0.01 | 0.51  | 0.110 |      |
| E-NN      |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13      | 0.01 | 0.13 | 0.03 | 3.27  | 0.100 |      |
| E-Y       |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13      | 0.01 | 0.13 | 0.02 | 2.09  | 0.102 |      |
| E-Z       |      |      | 1.33 | 0.00  | 0.00  | 1.20 |
| 0.11      | 0.00 | 0.12 | 0.07 | 7.54  | 0.088 |      |
| OS-1      |      |      | 1.33 | 0.00  | 0.00  | 1.28 |
| 0.04      | 0.00 | 0.04 | 0.01 | 1.25  | 0.034 |      |
| OS-10     |      |      | 1.33 | 0.00  | 0.00  | 1.29 |
| 0.03      | 0.01 | 0.04 | 0.00 | 0.19  | 0.027 |      |
| E-OO      |      |      | 1.33 | 0.00  | 0.00  | 1.28 |
| 0.03      | 0.02 | 0.04 | 0.00 | 0.09  | 0.032 |      |
| OS-11     |      |      | 1.33 | 0.00  | 0.00  | 1.29 |
| 0.03      | 0.01 | 0.04 | 0.00 | 0.13  | 0.028 |      |
| OS-12     |      |      | 1.33 | 0.00  | 0.00  | 1.29 |
| 0.03      | 0.01 | 0.04 | 0.00 | 0.23  | 0.027 |      |
| OS-13     |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13      | 0.01 | 0.13 | 0.02 | 2.68  | 0.101 |      |
| OS-14     |      |      | 1.33 | 0.00  | 0.00  | 1.26 |
| 0.06      | 0.01 | 0.07 | 0.06 | 5.97  | 0.052 |      |
| OS-2      |      |      | 1.33 | 0.00  | 0.00  | 1.29 |
| 0.03      | 0.01 | 0.03 | 0.01 | 0.99  | 0.024 |      |
| OS-3      |      |      | 1.33 | 0.00  | 0.00  | 1.28 |
| 0.03      | 0.02 | 0.04 | 0.00 | 0.24  | 0.032 |      |
| OS-4      |      |      | 1.33 | 0.00  | 0.00  | 1.26 |
| 0.06      | 0.00 | 0.06 | 0.90 | 95.82 | 0.048 |      |
| OS-5      |      |      | 1.33 | 0.00  | 0.00  | 1.30 |
| 0.03      | 0.00 | 0.03 | 0.08 | 8.40  | 0.020 |      |
| OS-6      |      |      | 1.33 | 0.00  | 0.00  | 1.29 |
| 0.03      | 0.01 | 0.04 | 0.00 | 0.32  | 0.027 |      |
| OS-7      |      |      | 1.33 | 0.00  | 0.00  | 1.30 |
| 0.03      | 0.00 | 0.03 | 0.02 | 1.52  | 0.022 |      |
| OS-8      |      |      | 1.33 | 0.00  | 0.00  | 1.28 |
| 0.03      | 0.02 | 0.05 | 0.00 | 0.18  | 0.034 |      |
| OS-9      |      |      | 1.33 | 0.00  | 0.00  | 1.29 |
| 0.03      | 0.01 | 0.03 | 0.01 | 0.51  | 0.026 |      |
| TANK-SITE |      |      | 1.33 | 0.00  | 0.00  | 0.65 |
| 0.63      | 0.01 | 0.64 | 0.03 | 3.70  | 0.485 |      |
| W-A       |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13      | 0.01 | 0.13 | 0.03 | 3.55  | 0.101 |      |
| W-B       |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13      | 0.01 | 0.14 | 0.04 | 3.94  | 0.102 |      |
| W-C       |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13      | 0.00 | 0.13 | 0.13 | 14.64 | 0.098 |      |
| W-D       |      |      | 1.33 | 0.00  | 0.00  | 1.19 |
| 0.13      | 0.00 | 0.13 | 0.05 | 6.01  | 0.098 |      |
| W-E       |      |      | 1.33 | 0.00  | 0.00  | 1.20 |
| 0.11      | 0.01 | 0.12 | 0.04 | 3.90  | 0.093 |      |

|      |      |      |      |      |       |      |
|------|------|------|------|------|-------|------|
| W-F  |      |      | 1.33 | 0.00 | 0.00  | 1.17 |
| 0.13 | 0.02 | 0.15 | 0.00 | 0.43 | 0.111 |      |
| E-T2 |      |      | 1.33 | 0.00 | 0.00  | 1.19 |
| 0.13 | 0.01 | 0.13 | 0.04 | 4.21 | 0.100 |      |

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Node Depth Summary  
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| Reported  |      | Average | Maximum | Maximum | Time of Max |
|-----------|------|---------|---------|---------|-------------|
| Max Depth |      | Depth   | Depth   | HGL     | Occurrence  |
| Node      | Type | Feet    | Feet    | Feet    | days hr:min |
| Feet      |      |         |         |         |             |

|       |          |      |      |         |         |
|-------|----------|------|------|---------|---------|
| DP-1  | JUNCTION | 0.07 | 0.57 | 6449.57 | 0 00:45 |
| 0.55  |          |      |      |         |         |
| JW3   | JUNCTION | 0.17 | 1.09 | 6483.09 | 0 00:55 |
| 1.00  |          |      |      |         |         |
| J-W3  | JUNCTION | 0.12 | 0.72 | 6448.72 | 0 00:45 |
| 0.71  |          |      |      |         |         |
| DP-3  | JUNCTION | 0.14 | 1.07 | 6434.07 | 0 00:45 |
| 1.04  |          |      |      |         |         |
| DP-2  | JUNCTION | 0.08 | 0.58 | 6436.58 | 0 00:45 |
| 0.57  |          |      |      |         |         |
| JW2   | JUNCTION | 0.16 | 1.21 | 6490.21 | 0 00:50 |
| 0.83  |          |      |      |         |         |
| DP-6  | JUNCTION | 0.04 | 0.30 | 6473.30 | 0 00:45 |
| 0.29  |          |      |      |         |         |
| J23   | JUNCTION | 0.14 | 0.80 | 6452.80 | 0 00:45 |
| 0.78  |          |      |      |         |         |
| DP-15 | JUNCTION | 0.17 | 0.83 | 6452.83 | 0 00:50 |
| 0.75  |          |      |      |         |         |
| DP-10 | JUNCTION | 0.08 | 0.63 | 6475.63 | 0 00:45 |
| 0.62  |          |      |      |         |         |
| JW1   | JUNCTION | 0.15 | 1.20 | 6494.20 | 0 00:47 |
| 1.04  |          |      |      |         |         |
| DP-16 | JUNCTION | 0.14 | 1.24 | 6498.24 | 0 00:45 |
| 1.21  |          |      |      |         |         |
| DP-11 | JUNCTION | 0.05 | 0.33 | 6485.83 | 0 00:45 |
| 0.33  |          |      |      |         |         |
| J29   | JUNCTION | 0.05 | 0.33 | 6472.33 | 0 00:46 |
| 0.32  |          |      |      |         |         |
| J30   | JUNCTION | 0.14 | 0.65 | 6474.65 | 0 00:46 |
| 0.63  |          |      |      |         |         |
| J31   | JUNCTION | 0.15 | 0.87 | 6451.87 | 0 00:48 |
| 0.80  |          |      |      |         |         |
| DP-7  | JUNCTION | 0.11 | 0.59 | 6460.59 | 0 00:45 |
| 0.58  |          |      |      |         |         |

|       |          |      |      |         |   |       |
|-------|----------|------|------|---------|---|-------|
| J33   | JUNCTION | 0.11 | 0.60 | 6459.60 | 0 | 00:48 |
| 0.55  |          |      |      |         |   |       |
| DP-23 | JUNCTION | 0.13 | 0.77 | 6453.77 | 0 | 00:45 |
| 0.76  |          |      |      |         |   |       |
| J35   | JUNCTION | 0.00 | 0.00 | 6480.00 | 0 | 00:00 |
| 0.00  |          |      |      |         |   |       |
| J36   | JUNCTION | 0.00 | 0.00 | 6479.00 | 0 | 00:00 |
| 0.00  |          |      |      |         |   |       |
| J38   | JUNCTION | 0.12 | 0.68 | 6485.18 | 0 | 00:46 |
| 0.67  |          |      |      |         |   |       |
| J39   | JUNCTION | 0.12 | 0.67 | 6481.67 | 0 | 00:47 |
| 0.60  |          |      |      |         |   |       |
| J40   | JUNCTION | 0.11 | 0.59 | 6480.59 | 0 | 00:49 |
| 0.48  |          |      |      |         |   |       |
| DP-12 | JUNCTION | 0.12 | 0.70 | 6500.70 | 0 | 00:45 |
| 0.69  |          |      |      |         |   |       |
| DP-13 | JUNCTION | 0.13 | 0.79 | 6494.79 | 0 | 00:46 |
| 0.75  |          |      |      |         |   |       |
| J43   | JUNCTION | 0.16 | 0.85 | 6493.85 | 0 | 00:46 |
| 0.82  |          |      |      |         |   |       |
| J44   | JUNCTION | 0.11 | 0.83 | 6451.83 | 0 | 00:46 |
| 0.77  |          |      |      |         |   |       |
| J45   | JUNCTION | 0.12 | 0.86 | 6450.86 | 0 | 00:49 |
| 0.74  |          |      |      |         |   |       |
| DP-9  | JUNCTION | 0.04 | 0.32 | 6449.32 | 0 | 00:45 |
| 0.32  |          |      |      |         |   |       |
| J47   | JUNCTION | 0.06 | 0.38 | 6448.38 | 0 | 00:46 |
| 0.37  |          |      |      |         |   |       |
| DP-8  | JUNCTION | 0.13 | 0.79 | 6449.79 | 0 | 00:50 |
| 0.59  |          |      |      |         |   |       |
| J49   | JUNCTION | 0.14 | 0.87 | 6448.87 | 0 | 00:51 |
| 0.72  |          |      |      |         |   |       |
| J50   | JUNCTION | 0.16 | 0.90 | 6504.90 | 0 | 00:45 |
| 0.89  |          |      |      |         |   |       |
| J51   | JUNCTION | 0.16 | 0.88 | 6504.38 | 0 | 00:47 |
| 0.81  |          |      |      |         |   |       |
| DP-14 | JUNCTION | 0.15 | 0.71 | 6500.71 | 0 | 00:51 |
| 0.55  |          |      |      |         |   |       |
| J53   | JUNCTION | 0.11 | 0.60 | 6499.60 | 0 | 00:51 |
| 0.46  |          |      |      |         |   |       |
| DP-18 | JUNCTION | 0.04 | 0.19 | 6498.19 | 0 | 00:45 |
| 0.18  |          |      |      |         |   |       |
| DP-21 | JUNCTION | 0.20 | 1.05 | 6484.05 | 0 | 00:48 |
| 0.93  |          |      |      |         |   |       |
| J56   | JUNCTION | 0.14 | 0.78 | 6482.78 | 0 | 00:48 |
| 0.65  |          |      |      |         |   |       |
| DP-22 | JUNCTION | 0.17 | 0.71 | 6465.71 | 0 | 00:51 |
| 0.68  |          |      |      |         |   |       |
| J58   | JUNCTION | 0.24 | 1.01 | 6465.01 | 0 | 00:46 |
| 0.99  |          |      |      |         |   |       |
| DP-20 | JUNCTION | 0.04 | 0.16 | 6500.16 | 0 | 00:45 |
| 0.16  |          |      |      |         |   |       |
| J61   | JUNCTION | 0.05 | 0.25 | 6485.25 | 0 | 01:01 |
| 0.25  |          |      |      |         |   |       |

|                    |          |      |      |         |   |       |
|--------------------|----------|------|------|---------|---|-------|
| J62                | JUNCTION | 0.20 | 1.09 | 6485.09 | 0 | 00:45 |
| 1.08               |          |      |      |         |   |       |
| DP-36              | JUNCTION | 0.14 | 0.77 | 6407.77 | 0 | 00:45 |
| 0.76               |          |      |      |         |   |       |
| J64                | JUNCTION | 0.05 | 0.28 | 6442.28 | 0 | 00:45 |
| 0.27               |          |      |      |         |   |       |
| DP-42              | JUNCTION | 0.22 | 0.96 | 6445.96 | 0 | 00:52 |
| 0.87               |          |      |      |         |   |       |
| DP-44              | JUNCTION | 0.15 | 0.88 | 6431.88 | 0 | 00:48 |
| 0.78               |          |      |      |         |   |       |
| DP-27              | JUNCTION | 0.26 | 0.96 | 6439.96 | 0 | 00:50 |
| 0.89               |          |      |      |         |   |       |
| DP-35              | JUNCTION | 0.04 | 0.29 | 6394.29 | 0 | 00:45 |
| 0.29               |          |      |      |         |   |       |
| DP-31              | JUNCTION | 0.26 | 1.32 | 6418.32 | 0 | 00:47 |
| 1.18               |          |      |      |         |   |       |
| DP-33              | JUNCTION | 0.14 | 0.76 | 6414.76 | 0 | 00:48 |
| 0.68               |          |      |      |         |   |       |
| DP-37              | JUNCTION | 0.15 | 0.75 | 6398.75 | 0 | 00:47 |
| 0.67               |          |      |      |         |   |       |
| DP-28              | JUNCTION | 0.23 | 0.84 | 6425.84 | 0 | 01:02 |
| 0.84               |          |      |      |         |   |       |
| DP-19              | JUNCTION | 0.07 | 0.40 | 6493.40 | 0 | 00:45 |
| 0.39               |          |      |      |         |   |       |
| J74                | JUNCTION | 0.08 | 0.44 | 6492.44 | 0 | 00:47 |
| 0.40               |          |      |      |         |   |       |
| J75                | JUNCTION | 0.15 | 0.84 | 6452.84 | 0 | 00:46 |
| 0.82               |          |      |      |         |   |       |
| J76                | JUNCTION | 0.16 | 0.79 | 6443.79 | 0 | 00:49 |
| 0.63               |          |      |      |         |   |       |
| DP-24              | JUNCTION | 0.05 | 0.24 | 6459.24 | 0 | 00:45 |
| 0.24               |          |      |      |         |   |       |
| J78                | JUNCTION | 0.04 | 0.24 | 6458.24 | 0 | 00:46 |
| 0.23               |          |      |      |         |   |       |
| DP-25              | JUNCTION | 0.14 | 0.85 | 6426.85 | 0 | 00:45 |
| 0.83               |          |      |      |         |   |       |
| J80                | JUNCTION | 0.25 | 1.24 | 6426.24 | 0 | 00:45 |
| 1.21               |          |      |      |         |   |       |
| J81                | JUNCTION | 0.28 | 1.24 | 6425.24 | 0 | 00:46 |
| 1.20               |          |      |      |         |   |       |
| DP-26              | JUNCTION | 0.03 | 0.13 | 6458.13 | 0 | 00:45 |
| 0.13               |          |      |      |         |   |       |
| DP-30              | JUNCTION | 0.26 | 1.32 | 6420.32 | 0 | 00:46 |
| 1.23               |          |      |      |         |   |       |
| J82                | JUNCTION | 0.20 | 0.91 | 6438.91 | 0 | 00:46 |
| 0.88               |          |      |      |         |   |       |
| DP-29              | JUNCTION | 0.21 | 1.03 | 6426.03 | 0 | 00:46 |
| 0.99               |          |      |      |         |   |       |
| DP-32              | JUNCTION | 0.14 | 0.80 | 6417.80 | 0 | 00:45 |
| 0.79               |          |      |      |         |   |       |
| DP-34              | JUNCTION | 0.37 | 1.61 | 6394.61 | 0 | 00:49 |
| 1.33               |          |      |      |         |   |       |
| POND1-E-OUTFALL-NW | JUNCTION | 0.50 | 1.70 | 6389.70 | 0 | 00:50 |
| 1.48               |          |      |      |         |   |       |

|                    |          |      |      |         |   |       |
|--------------------|----------|------|------|---------|---|-------|
| J84                | JUNCTION | 0.16 | 0.87 | 6413.87 | 0 | 00:46 |
| 0.85               |          |      |      |         |   |       |
| DP-38              | JUNCTION | 0.06 | 0.29 | 6479.29 | 0 | 00:45 |
| 0.29               |          |      |      |         |   |       |
| DP-40              | JUNCTION | 0.04 | 0.17 | 6456.17 | 0 | 00:45 |
| 0.17               |          |      |      |         |   |       |
| DP-39              | JUNCTION | 0.13 | 0.90 | 6453.90 | 0 | 00:45 |
| 0.88               |          |      |      |         |   |       |
| J86                | JUNCTION | 0.18 | 0.95 | 6452.95 | 0 | 00:45 |
| 0.94               |          |      |      |         |   |       |
| DP-41              | JUNCTION | 0.18 | 0.94 | 6450.94 | 0 | 00:47 |
| 0.88               |          |      |      |         |   |       |
| J88                | JUNCTION | 0.20 | 1.02 | 6450.02 | 0 | 00:47 |
| 0.94               |          |      |      |         |   |       |
| J89                | JUNCTION | 0.14 | 0.88 | 6444.88 | 0 | 00:45 |
| 0.86               |          |      |      |         |   |       |
| DP-43              | JUNCTION | 0.11 | 0.83 | 6445.83 | 0 | 00:45 |
| 0.81               |          |      |      |         |   |       |
| J91                | JUNCTION | 0.14 | 0.83 | 6444.83 | 0 | 00:45 |
| 0.81               |          |      |      |         |   |       |
| J92                | JUNCTION | 0.15 | 0.88 | 6430.88 | 0 | 00:48 |
| 0.77               |          |      |      |         |   |       |
| J93                | JUNCTION | 0.15 | 0.81 | 6445.81 | 0 | 00:45 |
| 0.80               |          |      |      |         |   |       |
| J94                | JUNCTION | 0.15 | 0.76 | 6430.76 | 0 | 00:49 |
| 0.63               |          |      |      |         |   |       |
| DP-46              | JUNCTION | 0.17 | 0.86 | 6404.86 | 0 | 00:51 |
| 0.71               |          |      |      |         |   |       |
| J96                | JUNCTION | 0.17 | 0.86 | 6403.86 | 0 | 00:51 |
| 0.70               |          |      |      |         |   |       |
| J97                | JUNCTION | 0.23 | 0.97 | 6403.97 | 0 | 00:45 |
| 0.95               |          |      |      |         |   |       |
| DP-48              | JUNCTION | 0.33 | 1.61 | 6393.61 | 0 | 00:54 |
| 1.46               |          |      |      |         |   |       |
| DP-47              | JUNCTION | 0.24 | 0.92 | 6393.92 | 0 | 00:55 |
| 0.88               |          |      |      |         |   |       |
| POND1-E-OUTFALL-NE | JUNCTION | 0.35 | 1.60 | 6389.60 | 0 | 00:55 |
| 1.49               |          |      |      |         |   |       |
| POND1-E-OUTFALL-SW | JUNCTION | 0.13 | 0.69 | 6388.69 | 0 | 00:47 |
| 0.66               |          |      |      |         |   |       |
| DP-45              | JUNCTION | 0.04 | 0.17 | 6438.17 | 0 | 00:45 |
| 0.17               |          |      |      |         |   |       |
| CREEK-OUTFALL-2    | OUTFALL  | 0.00 | 0.00 | 6414.00 | 0 | 00:00 |
| 0.00               |          |      |      |         |   |       |
| POND2-WEST         | OUTFALL  | 0.00 | 0.00 | 6429.00 | 0 | 00:00 |
| 0.00               |          |      |      |         |   |       |
| POND1-EAST         | OUTFALL  | 0.50 | 1.68 | 6387.68 | 0 | 00:51 |
| 1.49               |          |      |      |         |   |       |
| Out11              | OUTFALL  | 0.00 | 0.00 | 0.00    | 0 | 00:00 |
| 0.00               |          |      |      |         |   |       |
| Out13              | OUTFALL  | 0.00 | 0.00 | 0.00    | 0 | 00:00 |
| 0.00               |          |      |      |         |   |       |
| Out14              | OUTFALL  | 0.00 | 0.00 | 0.00    | 0 | 00:00 |
| 0.00               |          |      |      |         |   |       |



|                       |         |      |      |         |   |       |
|-----------------------|---------|------|------|---------|---|-------|
| Out15                 | OUTFALL | 0.00 | 0.00 | 0.00    | 0 | 00:00 |
| 0.00                  |         |      |      |         |   |       |
| Out16                 | OUTFALL | 0.00 | 0.00 | 0.00    | 0 | 00:00 |
| 0.00                  |         |      |      |         |   |       |
| DP-4-POND1-WEST       | OUTFALL | 0.20 | 1.06 | 6432.06 | 0 | 00:46 |
| 1.03                  |         |      |      |         |   |       |
| DP-17-CREEK-OUTFALL-1 | OUTFALL | 0.09 | 0.58 | 6418.58 | 0 | 01:00 |
| 0.58                  |         |      |      |         |   |       |

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Node Inflow Summary  
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|         |          |          | Maximum | Maximum |            |        |      |
|---------|----------|----------|---------|---------|------------|--------|------|
| Lateral | Total    | Flow     | Lateral | Total   | Time       | of Max |      |
| Inflow  | Inflow   | Balance  | Inflow  | Inflow  | Occurrence |        |      |
| Volume  | Volume   | Error    |         |         |            |        |      |
| Node    |          | Type     | CFS     | CFS     | days       | hr:min | 10^6 |
| gal     | 10^6 gal | Percent  |         |         |            |        |      |
| -----   |          |          |         |         |            |        |      |
| DP-1    |          | JUNCTION | 3.55    | 3.55    | 0          | 00:45  |      |
| 0.0329  | 0.0329   | 0.000    |         |         |            |        |      |
| JW3     |          | JUNCTION | 1.25    | 69.33   | 0          | 00:55  |      |
| 0.0121  | 0.951    | 0.000    |         |         |            |        |      |
| J-W3    |          | JUNCTION | 0.00    | 3.49    | 0          | 00:45  |      |
| 0       | 0.0329   | 0.000    |         |         |            |        |      |
| DP-3    |          | JUNCTION | 14.64   | 18.16   | 0          | 00:45  |      |
| 0.132   | 0.169    | 0.000    |         |         |            |        |      |
| DP-2    |          | JUNCTION | 3.94    | 3.94    | 0          | 00:45  |      |
| 0.0369  | 0.0369   | 0.000    |         |         |            |        |      |
| JW2     |          | JUNCTION | 0.99    | 83.29   | 0          | 00:50  |      |
| 0.0109  | 0.922    | 0.000    |         |         |            |        |      |
| DP-6    |          | JUNCTION | 0.75    | 0.75    | 0          | 00:45  |      |
| 0.00723 | 0.00723  | 0.000    |         |         |            |        |      |
| J23     |          | JUNCTION | 11.19   | 12.37   | 0          | 00:45  |      |
| 0.101   | 0.132    | 0.000    |         |         |            |        |      |
| DP-15   |          | JUNCTION | 11.39   | 23.04   | 0          | 00:47  |      |
| 0.103   | 0.292    | 0.000    |         |         |            |        |      |
| DP-10   |          | JUNCTION | 3.86    | 3.86    | 0          | 00:45  |      |
| 0.0355  | 0.0355   | 0.000    |         |         |            |        |      |
| JW1     |          | JUNCTION | 0.24    | 87.94   | 0          | 00:47  |      |
| 0.00358 | 0.908    | 0.000    |         |         |            |        |      |
| DP-16   |          | JUNCTION | 95.82   | 95.82   | 0          | 00:45  |      |
| 0.903   | 0.903    | 0.000    |         |         |            |        |      |
| DP-11   |          | JUNCTION | 3.49    | 3.49    | 0          | 00:45  |      |
| 0.0316  | 0.0316   | 0.000    |         |         |            |        |      |
| J29     |          | JUNCTION | 0.00    | 0.73    | 0          | 00:46  |      |
| 0       | 0.00721  | 0.000    |         |         |            |        |      |

|         |         |           |       |       |   |       |
|---------|---------|-----------|-------|-------|---|-------|
| J30     |         | JUNCTION  | 0.00  | 5.26  | 0 | 00:46 |
| 0       | 0.067   | 0.000     |       |       |   |       |
| J31     |         | JUNCTION  | 0.00  | 25.02 | 0 | 00:48 |
| 0       | 0.333   | 0.000     |       |       |   |       |
| DP-7    |         | JUNCTION  | 2.47  | 2.93  | 0 | 00:45 |
| 0.0232  | 0.0305  | 0.000     |       |       |   |       |
| J33     |         | JUNCTION  | 0.00  | 2.71  | 0 | 00:48 |
| 0       | 0.0305  | 0.000     |       |       |   |       |
| DP-23   |         | JUNCTION  | 5.92  | 5.92  | 0 | 00:45 |
| 0.0537  | 0.0537  | 0.000     |       |       |   |       |
| J35     |         | JUNCTION  | 0.00  | 0.00  | 0 | 00:00 |
| 0       | 0       | 0.000 gal |       |       |   |       |
| J36     |         | JUNCTION  | 0.00  | 0.00  | 0 | 00:00 |
| 0       | 0       | 0.000 gal |       |       |   |       |
| J38     |         | JUNCTION  | 0.00  | 3.42  | 0 | 00:46 |
| 0       | 0.0315  | 0.000     |       |       |   |       |
| J39     |         | JUNCTION  | 0.00  | 3.19  | 0 | 00:47 |
| 0       | 0.0316  | 0.000     |       |       |   |       |
| J40     |         | JUNCTION  | 0.00  | 3.09  | 0 | 00:49 |
| 0       | 0.0316  | 0.000     |       |       |   |       |
| DP-12   |         | JUNCTION  | 8.40  | 8.40  | 0 | 00:45 |
| 0.0778  | 0.0778  | 0.000     |       |       |   |       |
| DP-13   |         | JUNCTION  | 4.82  | 11.90 | 0 | 00:46 |
| 0.0436  | 0.122   | 0.000     |       |       |   |       |
| J43     |         | JUNCTION  | 0.00  | 11.86 | 0 | 00:46 |
| 0       | 0.121   | 0.000     |       |       |   |       |
| J44     |         | JUNCTION  | 0.00  | 11.83 | 0 | 00:46 |
| 0       | 0.132   | 0.000     |       |       |   |       |
| J45     |         | JUNCTION  | 0.00  | 24.85 | 0 | 00:49 |
| 0       | 0.333   | 0.000     |       |       |   |       |
| DP-9    |         | JUNCTION  | 0.87  | 0.87  | 0 | 00:45 |
| 0.00821 | 0.00821 | 0.000     |       |       |   |       |
| J47     |         | JUNCTION  | 0.00  | 0.85  | 0 | 00:46 |
| 0       | 0.00819 | 0.000     |       |       |   |       |
| DP-8    |         | JUNCTION  | 0.00  | 10.75 | 0 | 00:50 |
| 0       | 0.132   | 0.000     |       |       |   |       |
| J49     |         | JUNCTION  | 0.00  | 33.80 | 0 | 00:51 |
| 0       | 0.466   | 0.000     |       |       |   |       |
| J50     |         | JUNCTION  | 3.70  | 3.70  | 0 | 00:45 |
| 0.0332  | 0.0332  | 0.000     |       |       |   |       |
| J51     |         | JUNCTION  | 0.00  | 3.43  | 0 | 00:47 |
| 0       | 0.0332  | -0.000    |       |       |   |       |
| DP-14   |         | JUNCTION  | 0.87  | 3.44  | 0 | 00:51 |
| 0.00816 | 0.0415  | 0.000     |       |       |   |       |
| J53     |         | JUNCTION  | 0.00  | 3.43  | 0 | 00:51 |
| 0       | 0.0414  | 0.000     |       |       |   |       |
| DP-18   |         | JUNCTION  | 0.32  | 0.32  | 0 | 00:45 |
| 0.00384 | 0.00384 | 0.000     |       |       |   |       |
| DP-21   |         | JUNCTION  | 0.00  | 5.78  | 0 | 00:48 |
| 0       | 0.0613  | 0.000     |       |       |   |       |
| J56     |         | JUNCTION  | 0.00  | 5.78  | 0 | 00:48 |
| 0       | 0.0612  | -0.000    |       |       |   |       |
| DP-22   |         | JUNCTION  | 11.87 | 14.00 | 0 | 00:45 |
| 0.107   | 0.191   | 0.000     |       |       |   |       |

|         |         |          |       |       |   |       |
|---------|---------|----------|-------|-------|---|-------|
| J58     |         | JUNCTION | 0.00  | 13.76 | 0 | 00:46 |
| 0       | 0.19    | 0.000    |       |       |   |       |
| DP-20   |         | JUNCTION | 0.18  | 0.18  | 0 | 00:45 |
| 0.00284 | 0.00284 | 0.000    |       |       |   |       |
| J61     |         | JUNCTION | 0.00  | 0.17  | 0 | 01:01 |
| 0       | 0.00285 | 0.000    |       |       |   |       |
| J62     |         | JUNCTION | 6.44  | 6.48  | 0 | 00:45 |
| 0.0584  | 0.0613  | 0.000    |       |       |   |       |
| DP-36   |         | JUNCTION | 5.97  | 6.10  | 0 | 00:45 |
| 0.0565  | 0.0618  | 0.000    |       |       |   |       |
| J64     |         | JUNCTION | 0.51  | 0.51  | 0 | 00:45 |
| 0.00518 | 0.00518 | 0.000    |       |       |   |       |
| DP-42   |         | JUNCTION | 19.84 | 22.43 | 0 | 00:45 |
| 0.179   | 0.256   | 0.000    |       |       |   |       |
| DP-44   |         | JUNCTION | 7.79  | 30.37 | 0 | 00:48 |
| 0.0708  | 0.387   | 0.000    |       |       |   |       |
| DP-27   |         | JUNCTION | 20.10 | 27.09 | 0 | 00:45 |
| 0.182   | 0.373   | 0.000    |       |       |   |       |
| DP-35   |         | JUNCTION | 2.09  | 2.09  | 0 | 00:45 |
| 0.0194  | 0.0194  | 0.000    |       |       |   |       |
| DP-31   |         | JUNCTION | 2.68  | 78.75 | 0 | 00:47 |
| 0.0247  | 1.4     | 0.000    |       |       |   |       |
| DP-33   |         | JUNCTION | 6.61  | 9.42  | 0 | 00:45 |
| 0.0605  | 0.099   | 0.000    |       |       |   |       |
| DP-37   |         | JUNCTION | 3.27  | 8.22  | 0 | 00:46 |
| 0.0301  | 0.0919  | 0.000    |       |       |   |       |
| DP-28   |         | JUNCTION | 25.21 | 31.09 | 0 | 01:02 |
| 0.229   | 0.71    | 0.000    |       |       |   |       |
| DP-19   |         | JUNCTION | 1.52  | 1.52  | 0 | 00:45 |
| 0.0156  | 0.0156  | 0.000    |       |       |   |       |
| J74     |         | JUNCTION | 0.00  | 1.68  | 0 | 00:47 |
| 0       | 0.0194  | 0.000    |       |       |   |       |
| J75     |         | JUNCTION | 0.00  | 5.98  | 0 | 00:46 |
| 0       | 0.0565  | 0.000    |       |       |   |       |
| J76     |         | JUNCTION | 1.96  | 6.23  | 0 | 00:48 |
| 0.0183  | 0.0751  | 0.000    |       |       |   |       |
| DP-24   |         | JUNCTION | 0.27  | 0.27  | 0 | 00:45 |
| 0.0028  | 0.0028  | 0.000    |       |       |   |       |
| J78     |         | JUNCTION | 0.00  | 0.26  | 0 | 00:46 |
| 0       | 0.0028  | 0.000    |       |       |   |       |
| DP-25   |         | JUNCTION | 8.85  | 13.85 | 0 | 00:45 |
| 0.0801  | 0.164   | 0.000    |       |       |   |       |
| J80     |         | JUNCTION | 7.44  | 21.11 | 0 | 00:45 |
| 0.0673  | 0.234   | 0.000    |       |       |   |       |
| J81     |         | JUNCTION | 0.00  | 76.47 | 0 | 00:46 |
| 0       | 1.35    | 0.000    |       |       |   |       |
| DP-26   |         | JUNCTION | 0.23  | 0.23  | 0 | 00:45 |
| 0.00285 | 0.00285 | 0.000    |       |       |   |       |
| DP-30   |         | JUNCTION | 2.96  | 77.44 | 0 | 00:46 |
| 0.0273  | 1.38    | 0.000    |       |       |   |       |
| J82     |         | JUNCTION | 0.00  | 27.05 | 0 | 00:46 |
| 0       | 0.372   | 0.000    |       |       |   |       |
| DP-29   |         | JUNCTION | 3.84  | 30.67 | 0 | 00:46 |
| 0.0348  | 0.407   | 0.000    |       |       |   |       |

|                    |         |          |      |        |   |       |
|--------------------|---------|----------|------|--------|---|-------|
| DP-32              |         | JUNCTION | 4.21 | 4.21   | 0 | 00:45 |
| 0.0384             | 0.0384  | 0.000    |      |        |   |       |
| DP-34              |         | JUNCTION | 8.88 | 88.41  | 0 | 00:49 |
| 0.0814             | 1.58    | 0.000    |      |        |   |       |
| POND1-E-OUTFALL-NW |         | JUNCTION | 0.00 | 89.14  | 0 | 00:50 |
| 0                  | 1.6     | 0.000    |      |        |   |       |
| J84                |         | JUNCTION | 0.00 | 9.40   | 0 | 00:46 |
| 0                  | 0.0988  | 0.000    |      |        |   |       |
| DP-38              |         | JUNCTION | 0.51 | 0.51   | 0 | 00:45 |
| 0.00612            | 0.00612 | -0.000   |      |        |   |       |
| DP-40              |         | JUNCTION | 0.19 | 0.19   | 0 | 00:45 |
| 0.00235            | 0.00235 | 0.000    |      |        |   |       |
| DP-39              |         | JUNCTION | 7.51 | 7.62   | 0 | 00:45 |
| 0.068              | 0.0742  | 0.000    |      |        |   |       |
| J86                |         | JUNCTION | 0.00 | 7.49   | 0 | 00:45 |
| 0                  | 0.0741  | 0.000    |      |        |   |       |
| DP-41              |         | JUNCTION | 0.00 | 7.32   | 0 | 00:47 |
| 0                  | 0.0765  | 0.000    |      |        |   |       |
| J88                |         | JUNCTION | 0.00 | 7.33   | 0 | 00:47 |
| 0                  | 0.0764  | 0.000    |      |        |   |       |
| J89                |         | JUNCTION | 0.00 | 22.06  | 0 | 00:45 |
| 0                  | 0.256   | 0.000    |      |        |   |       |
| DP-43              |         | JUNCTION | 6.62 | 6.62   | 0 | 00:45 |
| 0.0599             | 0.0599  | 0.000    |      |        |   |       |
| J91                |         | JUNCTION | 0.00 | 6.52   | 0 | 00:45 |
| 0                  | 0.0598  | 0.000    |      |        |   |       |
| J92                |         | JUNCTION | 0.00 | 30.27  | 0 | 00:48 |
| 0                  | 0.387   | 0.000    |      |        |   |       |
| J93                |         | JUNCTION | 6.72 | 6.72   | 0 | 00:45 |
| 0.0612             | 0.0612  | 0.000    |      |        |   |       |
| J94                |         | JUNCTION | 0.00 | 5.67   | 0 | 00:49 |
| 0                  | 0.0614  | 0.000    |      |        |   |       |
| DP-46              |         | JUNCTION | 9.42 | 32.26  | 0 | 00:51 |
| 0.0853             | 0.473   | 0.000    |      |        |   |       |
| J96                |         | JUNCTION | 0.00 | 32.28  | 0 | 00:51 |
| 0                  | 0.472   | 0.000    |      |        |   |       |
| J97                |         | JUNCTION | 8.12 | 9.44   | 0 | 00:45 |
| 0.0737             | 0.137   | 0.000    |      |        |   |       |
| DP-48              |         | JUNCTION | 6.17 | 41.54  | 0 | 00:54 |
| 0.0561             | 0.665   | 0.000    |      |        |   |       |
| DP-47              |         | JUNCTION | 0.00 | 8.18   | 0 | 00:55 |
| 0                  | 0.137   | 0.000    |      |        |   |       |
| POND1-E-OUTFALL-NE |         | JUNCTION | 0.00 | 41.33  | 0 | 00:55 |
| 0                  | 0.663   | 0.000    |      |        |   |       |
| POND1-E-OUTFALL-SW |         | JUNCTION | 0.00 | 8.21   | 0 | 00:47 |
| 0                  | 0.0919  | 0.000    |      |        |   |       |
| DP-45              |         | JUNCTION | 0.13 | 0.13   | 0 | 00:45 |
| 0.00169            | 0.00169 | 0.000    |      |        |   |       |
| CREEK-OUTFALL-2    |         | OUTFALL  | 8.00 | 8.00   | 0 | 00:45 |
| 0.0732             | 0.0732  | 0.000    |      |        |   |       |
| POND2-WEST         |         | OUTFALL  | 3.90 | 3.90   | 0 | 00:45 |
| 0.0368             | 0.0368  | 0.000    |      |        |   |       |
| POND1-EAST         |         | OUTFALL  | 7.54 | 130.89 | 0 | 00:52 |
| 0.0682             | 2.42    | 0.000    |      |        |   |       |

|                       |         |         |      |       |   |       |
|-----------------------|---------|---------|------|-------|---|-------|
| Out11                 |         | OUTFALL | 6.08 | 6.08  | 0 | 00:45 |
| 0.0552                | 0.0552  | 0.000   |      |       |   |       |
| Out13                 |         | OUTFALL | 1.20 | 1.20  | 0 | 00:45 |
| 0.0114                | 0.0114  | 0.000   |      |       |   |       |
| Out14                 |         | OUTFALL | 1.80 | 1.80  | 0 | 00:45 |
| 0.017                 | 0.017   | 0.000   |      |       |   |       |
| Out15                 |         | OUTFALL | 1.10 | 1.10  | 0 | 00:45 |
| 0.0108                | 0.0108  | 0.000   |      |       |   |       |
| Out16                 |         | OUTFALL | 0.09 | 0.09  | 0 | 00:45 |
| 0.00139               | 0.00139 | 0.000   |      |       |   |       |
| DP-4-POND1-WEST       |         | OUTFALL | 6.01 | 23.92 | 0 | 00:46 |
| 0.0543                | 0.258   | 0.000   |      |       |   |       |
| DP-17-CREEK-OUTFALL-1 |         | OUTFALL | 0.00 | 65.08 | 0 | 01:00 |
| 0                     | 0.953   | 0.000   |      |       |   |       |

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Node Flooding Summary  
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No nodes were flooded.

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Outfall Loading Summary  
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| Outfall Node          | Flow<br>Freq<br>Pcnt | Avg<br>Flow<br>CFS | Max<br>Flow<br>CFS | Total<br>Volume<br>10^6 gal |
|-----------------------|----------------------|--------------------|--------------------|-----------------------------|
| CREEK-OUTFALL-2       | 55.69                | 0.81               | 8.00               | 0.073                       |
| POND2-WEST            | 43.47                | 0.52               | 3.90               | 0.037                       |
| POND1-EAST            | 98.47                | 15.22              | 130.89             | 2.421                       |
| Out11                 | 54.44                | 0.63               | 6.08               | 0.055                       |
| Out13                 | 38.75                | 0.18               | 1.20               | 0.011                       |
| Out14                 | 40.28                | 0.26               | 1.80               | 0.017                       |
| Out15                 | 37.50                | 0.18               | 1.10               | 0.011                       |
| Out16                 | 33.33                | 0.03               | 0.09               | 0.001                       |
| DP-4-POND1-WEST       | 98.47                | 1.62               | 23.92              | 0.258                       |
| DP-17-CREEK-OUTFALL-1 | 89.31                | 6.61               | 65.08              | 0.953                       |
| System                | 58.97                | 26.06              | 188.93             | 3.838                       |

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Link Flow Summary  
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| Max/ | Maximum | Time of Max | Maximum | Max/ |
|------|---------|-------------|---------|------|
|------|---------|-------------|---------|------|

| Full<br>Link<br>Depth | Type | Flow <br>CFS | Occurrence<br>days hr:min | Veloc <br>ft/sec | Full<br>Flow |
|-----------------------|------|--------------|---------------------------|------------------|--------------|
| -----                 |      |              |                           |                  |              |
| 0.23                  | CW-1 | CONDUIT      | 3.49 0 00:45              | 4.23             | 0.11         |
| 0.27                  | LW-2 | CONDUIT      | 1.81 0 00:56              | 2.08             | 0.03         |
| 0.15                  | CE-1 | CONDUIT      | 0.73 0 00:46              | 2.54             | 0.05         |
| 0.25                  | CE-4 | CONDUIT      | 3.80 0 00:45              | 3.97             | 0.14         |
| 0.15                  | LE-2 | CONDUIT      | 0.65 0 00:48              | 1.98             | 0.01         |
| 0.00                  | C25  | CONDUIT      | 0.00 0 00:00              | 0.00             | 0.00         |
| 0.31                  | C26  | CONDUIT      | 4.90 0 00:50              | 3.24             | 0.05         |
| 0.00                  | C27  | CONDUIT      | 0.00 0 00:00              | 0.00             | 0.00         |
| 0.28                  | CE-2 | CONDUIT      | 2.71 0 00:48              | 1.23             | 0.04         |
| 0.11                  | CE-5 | CONDUIT      | 3.42 0 00:46              | 2.73             | 0.03         |
| 0.33                  | C32  | CONDUIT      | 3.19 0 00:47              | 2.00             | 0.05         |
| 0.27                  | C33  | CONDUIT      | 3.09 0 00:49              | 1.45             | 0.05         |
| 0.29                  | C34  | CONDUIT      | 2.98 0 00:51              | 2.34             | 0.04         |
| 0.34                  | C35  | CONDUIT      | 7.76 0 00:47              | 2.51             | 0.06         |
| 0.32                  | CE-6 | CONDUIT      | 11.86 0 00:46             | 4.48             | 0.22         |
| 0.41                  | C37  | CONDUIT      | 11.01 0 00:50             | 4.55             | 0.10         |
| 0.23                  | CE-7 | CONDUIT      | 22.94 0 00:48             | 4.67             | 0.11         |
| 0.39                  | LE-4 | CONDUIT      | 11.83 0 00:46             | 1.91             | 0.14         |
| 0.39                  | LE-5 | CONDUIT      | 10.75 0 00:50             | 1.83             | 0.15         |
| 0.30                  | CE-3 | CONDUIT      | 10.76 0 00:50             | 4.35             | 0.20         |
| 0.16                  | CE-9 | CONDUIT      | 0.85 0 00:46              | 2.64             | 0.06         |
| 0.43                  | C43  | CONDUIT      | 24.85 0 00:49             | 2.15             | 0.20         |
| 0.37                  | C44  | CONDUIT      | 23.78 0 00:53             | 1.82             | 0.17         |
| 0.44                  | C45  | CONDUIT      | 3.43 0 00:47              | 1.22             | 0.11         |

|       |         |       |   |       |      |      |
|-------|---------|-------|---|-------|------|------|
| CE-8  | CONDUIT | 3.43  | 0 | 00:51 | 3.84 | 0.12 |
| 0.24  |         |       |   |       |      |      |
| C47   | CONDUIT | 3.08  | 0 | 00:51 | 1.75 | 0.06 |
| 0.35  |         |       |   |       |      |      |
| C48   | CONDUIT | 3.32  | 0 | 00:53 | 3.75 | 0.02 |
| 0.24  |         |       |   |       |      |      |
| CE-10 | CONDUIT | 5.78  | 0 | 00:48 | 4.44 | 0.21 |
| 0.31  |         |       |   |       |      |      |
| C50   | CONDUIT | 5.28  | 0 | 00:51 | 2.94 | 0.06 |
| 0.35  |         |       |   |       |      |      |
| CE-11 | CONDUIT | 13.76 | 0 | 00:46 | 4.19 | 0.17 |
| 0.28  |         |       |   |       |      |      |
| C52   | CONDUIT | 0.17  | 0 | 01:01 | 1.27 | 0.00 |
| 0.08  |         |       |   |       |      |      |
| C53   | CONDUIT | 0.16  | 0 | 01:05 | 0.72 | 0.00 |
| 0.12  |         |       |   |       |      |      |
| J63'  | CONDUIT | 5.78  | 0 | 00:48 | 1.55 | 0.18 |
| 0.52  |         |       |   |       |      |      |
| C55   | CONDUIT | 0.85  | 0 | 01:03 | 1.60 | 0.01 |
| 0.17  |         |       |   |       |      |      |
| C56   | CONDUIT | 0.36  | 0 | 00:50 | 2.01 | 0.00 |
| 0.12  |         |       |   |       |      |      |
| C57   | CONDUIT | 5.56  | 0 | 00:47 | 2.83 | 0.07 |
| 0.37  |         |       |   |       |      |      |
| C61   | CONDUIT | 11.79 | 0 | 00:50 | 3.45 | 0.14 |
| 0.47  |         |       |   |       |      |      |
| C70   | CONDUIT | 26.35 | 0 | 01:03 | 3.04 | 0.16 |
| 0.37  |         |       |   |       |      |      |
| CW-3  | CONDUIT | 3.78  | 0 | 00:46 | 4.68 | 0.11 |
| 0.23  |         |       |   |       |      |      |
| CW-4  | CONDUIT | 17.96 | 0 | 00:46 | 8.07 | 0.27 |
| 0.35  |         |       |   |       |      |      |
| LE-3  | CONDUIT | 2.52  | 0 | 00:51 | 2.01 | 0.04 |
| 0.29  |         |       |   |       |      |      |
| C72   | CONDUIT | 0.29  | 0 | 00:47 | 1.30 | 0.00 |
| 0.09  |         |       |   |       |      |      |
| C73   | CONDUIT | 1.39  | 0 | 00:47 | 1.04 | 0.01 |
| 0.19  |         |       |   |       |      |      |
| CE-13 | CONDUIT | 0.26  | 0 | 00:46 | 1.17 | 0.00 |
| 0.12  |         |       |   |       |      |      |
| C75   | CONDUIT | 0.24  | 0 | 00:49 | 1.35 | 0.00 |
| 0.11  |         |       |   |       |      |      |
| CE-12 | CONDUIT | 5.81  | 0 | 00:46 | 2.54 | 0.08 |
| 0.38  |         |       |   |       |      |      |
| C77   | CONDUIT | 5.10  | 0 | 00:49 | 2.52 | 0.08 |
| 0.38  |         |       |   |       |      |      |
| C78   | CONDUIT | 0.51  | 0 | 00:51 | 1.76 | 0.01 |
| 0.15  |         |       |   |       |      |      |
| C79   | CONDUIT | 6.23  | 0 | 00:49 | 7.46 | 0.02 |
| 0.23  |         |       |   |       |      |      |
| CE-14 | CONDUIT | 13.78 | 0 | 00:46 | 4.69 | 0.25 |
| 0.34  |         |       |   |       |      |      |
| C80   | CONDUIT | 0.19  | 0 | 00:50 | 1.58 | 0.00 |
| 0.06  |         |       |   |       |      |      |

|       |         |       |   |       |       |      |
|-------|---------|-------|---|-------|-------|------|
| C81   | CONDUIT | 21.08 | 0 | 00:46 | 3.46  | 0.28 |
| 0.62  |         |       |   |       |       |      |
| CE-16 | CONDUIT | 31.07 | 0 | 01:02 | 4.35  | 0.13 |
| 0.24  |         |       |   |       |       |      |
| C83   | CONDUIT | 74.83 | 0 | 00:46 | 4.44  | 0.35 |
| 0.58  |         |       |   |       |       |      |
| C84   | CONDUIT | 76.70 | 0 | 00:47 | 3.84  | 0.19 |
| 0.44  |         |       |   |       |       |      |
| CE-15 | CONDUIT | 27.05 | 0 | 00:46 | 4.97  | 0.20 |
| 0.30  |         |       |   |       |       |      |
| C86   | CONDUIT | 27.04 | 0 | 00:46 | 9.68  | 0.10 |
| 0.42  |         |       |   |       |       |      |
| CE-17 | CONDUIT | 30.63 | 0 | 00:46 | 4.77  | 0.25 |
| 0.34  |         |       |   |       |       |      |
| CE-19 | CONDUIT | 88.07 | 0 | 00:50 | 15.29 | 0.19 |
| 0.29  |         |       |   |       |       |      |
| CE-20 | CONDUIT | 2.05  | 0 | 00:45 | 7.40  | 0.05 |
| 0.15  |         |       |   |       |       |      |
| C89   | CONDUIT | 3.73  | 0 | 00:48 | 1.94  | 0.08 |
| 0.38  |         |       |   |       |       |      |
| C90   | CONDUIT | 8.61  | 0 | 00:50 | 3.45  | 0.10 |
| 0.41  |         |       |   |       |       |      |
| C91   | CONDUIT | 75.05 | 0 | 00:49 | 5.31  | 0.13 |
| 0.35  |         |       |   |       |       |      |
| CE-18 | CONDUIT | 9.40  | 0 | 00:46 | 4.19  | 0.17 |
| 0.28  |         |       |   |       |       |      |
| C92   | CONDUIT | 87.23 | 0 | 00:51 | 2.55  | 0.10 |
| 0.42  |         |       |   |       |       |      |
| C93   | CONDUIT | 0.34  | 0 | 00:50 | 1.96  | 0.00 |
| 0.12  |         |       |   |       |       |      |
| CE-22 | CONDUIT | 7.49  | 0 | 00:45 | 4.81  | 0.27 |
| 0.36  |         |       |   |       |       |      |
| C95   | CONDUIT | 0.15  | 0 | 00:50 | 1.00  | 0.00 |
| 0.08  |         |       |   |       |       |      |
| CE-23 | CONDUIT | 7.33  | 0 | 00:47 | 2.81  | 0.21 |
| 0.31  |         |       |   |       |       |      |
| C97   | CONDUIT | 7.20  | 0 | 00:47 | 2.14  | 0.13 |
| 0.47  |         |       |   |       |       |      |
| C98   | CONDUIT | 6.29  | 0 | 00:52 | 1.96  | 0.14 |
| 0.47  |         |       |   |       |       |      |
| CE-25 | CONDUIT | 6.52  | 0 | 00:45 | 4.61  | 0.24 |
| 0.33  |         |       |   |       |       |      |
| C100  | CONDUIT | 5.96  | 0 | 00:48 | 3.18  | 0.07 |
| 0.36  |         |       |   |       |       |      |
| CE-26 | CONDUIT | 30.27 | 0 | 00:48 | 4.38  | 0.19 |
| 0.29  |         |       |   |       |       |      |
| C102  | CONDUIT | 5.67  | 0 | 00:49 | 3.00  | 0.08 |
| 0.37  |         |       |   |       |       |      |
| C103  | CONDUIT | 19.39 | 0 | 00:49 | 3.25  | 0.15 |
| 0.39  |         |       |   |       |       |      |
| CE-24 | CONDUIT | 22.06 | 0 | 00:45 | 4.79  | 0.27 |
| 0.35  |         |       |   |       |       |      |
| C105  | CONDUIT | 28.50 | 0 | 00:51 | 3.93  | 0.11 |
| 0.30  |         |       |   |       |       |      |



|       |         |       |   |       |      |      |
|-------|---------|-------|---|-------|------|------|
| C106  | CONDUIT | 4.97  | 0 | 00:53 | 3.11 | 0.05 |
| 0.33  |         |       |   |       |      |      |
| CE-27 | CONDUIT | 32.28 | 0 | 00:51 | 4.80 | 0.18 |
| 0.29  |         |       |   |       |      |      |
| C107  | CONDUIT | 31.39 | 0 | 00:54 | 3.25 | 0.16 |
| 0.38  |         |       |   |       |      |      |
| C108  | CONDUIT | 8.18  | 0 | 00:55 | 2.58 | 0.13 |
| 0.46  |         |       |   |       |      |      |
| CE-28 | CONDUIT | 8.19  | 0 | 00:55 | 4.03 | 0.15 |
| 0.26  |         |       |   |       |      |      |
| CE-29 | CONDUIT | 41.33 | 0 | 00:55 | 8.17 | 0.27 |
| 0.36  |         |       |   |       |      |      |
| C110  | CONDUIT | 8.21  | 0 | 00:47 | 6.49 | 0.03 |
| 0.28  |         |       |   |       |      |      |
| C111  | CONDUIT | 41.06 | 0 | 00:57 | 2.30 | 0.04 |
| 0.30  |         |       |   |       |      |      |
| C112  | CONDUIT | 7.65  | 0 | 00:50 | 1.49 | 0.01 |
| 0.17  |         |       |   |       |      |      |
| C113  | CONDUIT | 0.08  | 0 | 01:15 | 1.79 | 0.00 |
| 0.07  |         |       |   |       |      |      |
| C1    | CONDUIT | 87.73 | 0 | 00:47 | 3.20 | 0.18 |
| 0.39  |         |       |   |       |      |      |
| C2    | CONDUIT | 82.76 | 0 | 00:50 | 3.10 | 0.18 |
| 0.38  |         |       |   |       |      |      |
| C3    | CONDUIT | 68.89 | 0 | 00:55 | 2.85 | 0.16 |
| 0.35  |         |       |   |       |      |      |
| C4    | CONDUIT | 65.08 | 0 | 01:00 | 5.23 | 0.05 |
| 0.19  |         |       |   |       |      |      |

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 Conduit Surcharge Summary  
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No conduits were surcharged.

Analysis begun on: Wed May 13 14:11:51 2026  
 Analysis ended on: Wed May 13 14:11:51 2026  
 Total elapsed time: < 1 sec

TRIPLE H RANCH - 5-yr. Developed Conditions

Subcatchment Runoff Summary

| Subcatchment | Total<br>Precip<br>in | Total<br>Runon<br>in | Total<br>Evap<br>in | Total<br>Infil<br>in | Imperv<br>Runoff<br>in | Perv<br>Runoff<br>in | Total<br>Runoff<br>in | Total<br>Runoff<br>10^6 gal | Peak<br>Runoff<br>CFS | Runoff<br>Coeff |
|--------------|-----------------------|----------------------|---------------------|----------------------|------------------------|----------------------|-----------------------|-----------------------------|-----------------------|-----------------|
| E-A          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.03                        | 3.49                  | 0.098           |
| E-AA         | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.07                        | 7.51                  | 0.098           |
| E-B          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.04                        | 4.82                  | 0.098           |
| E-BB         | 1.33                  | 0.00                 | 0.00                | 1.18                 | 0.14                   | 0.00                 | 0.14                  | 0.18                        | 19.84                 | 0.108           |
| E-C          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.01                 | 0.13                  | 0.04                        | 3.86                  | 0.101           |
| E-CC         | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.06                        | 6.62                  | 0.098           |
| E-D          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.01                 | 0.13                  | 0.10                        | 11.39                 | 0.099           |
| E-DD         | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.06                        | 6.72                  | 0.097           |
| E-E          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.10                        | 11.19                 | 0.098           |
| E-EE         | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.01                 | 0.13                  | 0.07                        | 7.79                  | 0.099           |
| E-F          | 1.33                  | 0.00                 | 0.00                | 1.18                 | 0.13                   | 0.01                 | 0.14                  | 0.01                        | 0.75                  | 0.106           |
| E-FF         | 1.33                  | 0.00                 | 0.00                | 1.21                 | 0.10                   | 0.01                 | 0.11                  | 0.01                        | 1.10                  | 0.086           |
| E-G          | 1.33                  | 0.00                 | 0.00                | 1.17                 | 0.14                   | 0.01                 | 0.15                  | 0.02                        | 2.47                  | 0.113           |
| E-GG         | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.09                        | 9.42                  | 0.099           |
| E-H          | 1.33                  | 0.00                 | 0.00                | 1.18                 | 0.13                   | 0.01                 | 0.14                  | 0.01                        | 0.87                  | 0.104           |
| E-HH         | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.07                        | 8.12                  | 0.097           |
| E-I          | 1.33                  | 0.00                 | 0.00                | 1.18                 | 0.14                   | 0.01                 | 0.14                  | 0.05                        | 5.92                  | 0.109           |
| E-II         | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.01                 | 0.13                  | 0.06                        | 6.17                  | 0.099           |
| E-J          | 1.33                  | 0.00                 | 0.00                | 1.17                 | 0.13                   | 0.03                 | 0.15                  | 0.00                        | 0.27                  | 0.114           |
| E-JJ         | 1.33                  | 0.00                 | 0.00                | 1.21                 | 0.10                   | 0.01                 | 0.11                  | 0.01                        | 1.20                  | 0.083           |
| E-K          | 1.33                  | 0.00                 | 0.00                | 1.24                 | 0.08                   | 0.01                 | 0.08                  | 0.02                        | 1.96                  | 0.061           |
| E-KK         | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.06                        | 6.08                  | 0.099           |
| E-L          | 1.33                  | 0.00                 | 0.00                | 1.20                 | 0.11                   | 0.00                 | 0.12                  | 0.08                        | 8.85                  | 0.088           |
| E-LL         | 1.33                  | 0.00                 | 0.00                | 1.21                 | 0.10                   | 0.01                 | 0.11                  | 0.02                        | 1.80                  | 0.083           |

TRIPLE H RANCH - 5-yr. Developed Conditions

| Subcatchment | Total<br>Precip<br>in | Total<br>Runon<br>in | Total<br>Evap<br>in | Total<br>Infil<br>in | Imperv<br>Runoff<br>in | Perv<br>Runoff<br>in | Total<br>Runoff<br>in | Total<br>Runoff<br>10^6 gal | Peak<br>Runoff<br>CFS | Runoff<br>Coeff |
|--------------|-----------------------|----------------------|---------------------|----------------------|------------------------|----------------------|-----------------------|-----------------------------|-----------------------|-----------------|
| E-M          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.07                        | 7.44                  | 0.098           |
| E-N          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.01                 | 0.14                  | 0.01                        | 0.87                  | 0.103           |
| E-O          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.06                        | 6.44                  | 0.099           |
| E-P          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.11                        | 11.87                 | 0.098           |
| E-Q          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.09                        | 9.70                  | 0.098           |
| E-R          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.23                        | 25.21                 | 0.097           |
| E-S          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.09                        | 10.40                 | 0.099           |
| E-T1         | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.03                        | 3.84                  | 0.098           |
| E-U          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.01                 | 0.13                  | 0.06                        | 6.61                  | 0.100           |
| E-V          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.01                 | 0.13                  | 0.03                        | 2.96                  | 0.101           |
| E-W          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.01                 | 0.13                  | 0.05                        | 5.98                  | 0.099           |
| E-X          | 1.33                  | 0.00                 | 0.00                | 1.17                 | 0.14                   | 0.01                 | 0.15                  | 0.03                        | 2.91                  | 0.111           |
| W-G          | 1.33                  | 0.00                 | 0.00                | 1.20                 | 0.11                   | 0.00                 | 0.12                  | 0.07                        | 7.57                  | 0.089           |
| E-MM         | 1.33                  | 0.00                 | 0.00                | 1.18                 | 0.13                   | 0.02                 | 0.15                  | 0.01                        | 0.51                  | 0.110           |
| E-NN         | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.01                 | 0.13                  | 0.03                        | 3.27                  | 0.100           |
| E-Y          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.01                 | 0.13                  | 0.02                        | 2.09                  | 0.102           |
| E-Z          | 1.33                  | 0.00                 | 0.00                | 1.20                 | 0.11                   | 0.00                 | 0.12                  | 0.07                        | 7.54                  | 0.088           |
| OS-1         | 1.33                  | 0.00                 | 0.00                | 1.28                 | 0.04                   | 0.00                 | 0.04                  | 0.01                        | 1.25                  | 0.034           |
| OS-10        | 1.33                  | 0.00                 | 0.00                | 1.29                 | 0.03                   | 0.01                 | 0.04                  | 0.00                        | 0.19                  | 0.027           |
| E-OO         | 1.33                  | 0.00                 | 0.00                | 1.28                 | 0.03                   | 0.02                 | 0.04                  | 0.00                        | 0.09                  | 0.032           |
| OS-11        | 1.33                  | 0.00                 | 0.00                | 1.29                 | 0.03                   | 0.01                 | 0.04                  | 0.00                        | 0.13                  | 0.028           |
| OS-12        | 1.33                  | 0.00                 | 0.00                | 1.29                 | 0.03                   | 0.01                 | 0.04                  | 0.00                        | 0.23                  | 0.027           |
| OS-13        | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.01                 | 0.13                  | 0.02                        | 2.68                  | 0.101           |
| OS-14        | 1.33                  | 0.00                 | 0.00                | 1.26                 | 0.06                   | 0.01                 | 0.07                  | 0.06                        | 5.97                  | 0.052           |
| OS-2         | 1.33                  | 0.00                 | 0.00                | 1.29                 | 0.03                   | 0.01                 | 0.03                  | 0.01                        | 0.99                  | 0.024           |

TRIPLE H RANCH - 5-yr. Developed Conditions

| Subcatchment | Total<br>Precip<br>in | Total<br>Runon<br>in | Total<br>Evap<br>in | Total<br>Infil<br>in | Imperv<br>Runoff<br>in | Perv<br>Runoff<br>in | Total<br>Runoff<br>in | Total<br>Runoff<br>10^6 gal | Peak<br>Runoff<br>CFS | Runoff<br>Coeff |
|--------------|-----------------------|----------------------|---------------------|----------------------|------------------------|----------------------|-----------------------|-----------------------------|-----------------------|-----------------|
| OS-3         | 1.33                  | 0.00                 | 0.00                | 1.28                 | 0.03                   | 0.02                 | 0.04                  | 0.00                        | 0.24                  | 0.032           |
| OS-4         | 1.33                  | 0.00                 | 0.00                | 1.26                 | 0.06                   | 0.00                 | 0.06                  | 0.90                        | 95.82                 | 0.048           |
| OS-5         | 1.33                  | 0.00                 | 0.00                | 1.30                 | 0.03                   | 0.00                 | 0.03                  | 0.08                        | 8.40                  | 0.020           |
| OS-6         | 1.33                  | 0.00                 | 0.00                | 1.29                 | 0.03                   | 0.01                 | 0.04                  | 0.00                        | 0.32                  | 0.027           |
| OS-7         | 1.33                  | 0.00                 | 0.00                | 1.30                 | 0.03                   | 0.00                 | 0.03                  | 0.02                        | 1.52                  | 0.022           |
| OS-8         | 1.33                  | 0.00                 | 0.00                | 1.28                 | 0.03                   | 0.02                 | 0.05                  | 0.00                        | 0.18                  | 0.034           |
| OS-9         | 1.33                  | 0.00                 | 0.00                | 1.29                 | 0.03                   | 0.01                 | 0.03                  | 0.01                        | 0.51                  | 0.026           |
| TANK-SITE    | 1.33                  | 0.00                 | 0.00                | 0.65                 | 0.63                   | 0.01                 | 0.64                  | 0.03                        | 3.70                  | 0.485           |
| W-A          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.01                 | 0.13                  | 0.03                        | 3.55                  | 0.101           |
| W-B          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.01                 | 0.14                  | 0.04                        | 3.94                  | 0.102           |
| W-C          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.13                        | 14.64                 | 0.098           |
| W-D          | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.00                 | 0.13                  | 0.05                        | 6.01                  | 0.098           |
| W-E          | 1.33                  | 0.00                 | 0.00                | 1.20                 | 0.11                   | 0.01                 | 0.12                  | 0.04                        | 3.90                  | 0.093           |
| W-F          | 1.33                  | 0.00                 | 0.00                | 1.17                 | 0.13                   | 0.02                 | 0.15                  | 0.00                        | 0.43                  | 0.111           |
| E-T2         | 1.33                  | 0.00                 | 0.00                | 1.19                 | 0.13                   | 0.01                 | 0.13                  | 0.04                        | 4.21                  | 0.100           |

TRIPLE H RANCH - 5-yr. Developed Conditions

Node Inflow Summary

| Node  | Type     | Maximum<br>Lateral<br>Inflow<br>CFS | Maximum<br>Total<br>Inflow<br>CFS | Day of<br>Maximum<br>Inflow | Hour of<br>Maximum<br>Inflow | Lateral<br>Inflow<br>Volume<br>10^6 gal | Total<br>Inflow<br>Volume<br>10^6 gal | Flow<br>Balance<br>Error<br>% |
|-------|----------|-------------------------------------|-----------------------------------|-----------------------------|------------------------------|-----------------------------------------|---------------------------------------|-------------------------------|
| DP-1  | JUNCTION | 3.55                                | 3.55                              | 0                           | 00:45                        | 0.0329                                  | 0.0329                                | 0.000                         |
| JW3   | JUNCTION | 1.25                                | 69.33                             | 0                           | 00:55                        | 0.0121                                  | 0.951                                 | 0.000                         |
| J-W3  | JUNCTION | 0.00                                | 3.49                              | 0                           | 00:45                        | 0                                       | 0.0329                                | 0.000                         |
| DP-3  | JUNCTION | 14.64                               | 18.16                             | 0                           | 00:45                        | 0.132                                   | 0.169                                 | 0.000                         |
| DP-2  | JUNCTION | 3.94                                | 3.94                              | 0                           | 00:45                        | 0.0369                                  | 0.0369                                | 0.000                         |
| JW2   | JUNCTION | 0.99                                | 83.29                             | 0                           | 00:50                        | 0.0109                                  | 0.922                                 | 0.000                         |
| DP-6  | JUNCTION | 0.75                                | 0.75                              | 0                           | 00:45                        | 0.00723                                 | 0.00723                               | 0.000                         |
| J23   | JUNCTION | 11.19                               | 12.37                             | 0                           | 00:45                        | 0.101                                   | 0.132                                 | 0.000                         |
| DP-15 | JUNCTION | 11.39                               | 23.04                             | 0                           | 00:47                        | 0.103                                   | 0.292                                 | 0.000                         |
| DP-10 | JUNCTION | 3.86                                | 3.86                              | 0                           | 00:45                        | 0.0355                                  | 0.0355                                | 0.000                         |
| JW1   | JUNCTION | 0.24                                | 87.94                             | 0                           | 00:47                        | 0.00358                                 | 0.908                                 | 0.000                         |
| DP-16 | JUNCTION | 95.82                               | 95.82                             | 0                           | 00:45                        | 0.903                                   | 0.903                                 | 0.000                         |
| DP-11 | JUNCTION | 3.49                                | 3.49                              | 0                           | 00:45                        | 0.0316                                  | 0.0316                                | 0.000                         |
| J29   | JUNCTION | 0.00                                | 0.73                              | 0                           | 00:46                        | 0                                       | 0.00721                               | 0.000                         |
| J30   | JUNCTION | 0.00                                | 5.26                              | 0                           | 00:46                        | 0                                       | 0.067                                 | 0.000                         |
| J31   | JUNCTION | 0.00                                | 25.02                             | 0                           | 00:48                        | 0                                       | 0.333                                 | 0.000                         |
| DP-7  | JUNCTION | 2.47                                | 2.93                              | 0                           | 00:45                        | 0.0232                                  | 0.0305                                | 0.000                         |
| J33   | JUNCTION | 0.00                                | 2.71                              | 0                           | 00:48                        | 0                                       | 0.0305                                | 0.000                         |
| DP-23 | JUNCTION | 5.92                                | 5.92                              | 0                           | 00:45                        | 0.0537                                  | 0.0537                                | 0.000                         |
| J35   | JUNCTION | 0.00                                | 0.00                              | 0                           | 00:00                        | 0                                       | 0                                     | 0.000                         |
| J36   | JUNCTION | 0.00                                | 0.00                              | 0                           | 00:00                        | 0                                       | 0                                     | 0.000                         |
| J38   | JUNCTION | 0.00                                | 3.42                              | 0                           | 00:46                        | 0                                       | 0.0315                                | 0.000                         |
| J39   | JUNCTION | 0.00                                | 3.19                              | 0                           | 00:47                        | 0                                       | 0.0316                                | 0.000                         |
| J40   | JUNCTION | 0.00                                | 3.09                              | 0                           | 00:49                        | 0                                       | 0.0316                                | 0.000                         |

### TRIPLE H RANCH - 5-yr. Developed Conditions

| Node  | Type     | Maximum<br>Lateral<br>Inflow<br>CFS | Maximum<br>Total<br>Inflow<br>CFS | Day of<br>Maximum<br>Inflow | Hour of<br>Maximum<br>Inflow | Lateral<br>Inflow<br>Volume<br>10^6 gal | Total<br>Inflow<br>Volume<br>10^6 gal | Flow<br>Balance<br>Error<br>% |
|-------|----------|-------------------------------------|-----------------------------------|-----------------------------|------------------------------|-----------------------------------------|---------------------------------------|-------------------------------|
| DP-12 | JUNCTION | 8.40                                | 8.40                              | 0                           | 00:45                        | 0.0778                                  | 0.0778                                | 0.000                         |
| DP-13 | JUNCTION | 4.82                                | 11.90                             | 0                           | 00:46                        | 0.0436                                  | 0.122                                 | 0.000                         |
| J43   | JUNCTION | 0.00                                | 11.86                             | 0                           | 00:46                        | 0                                       | 0.121                                 | 0.000                         |
| J44   | JUNCTION | 0.00                                | 11.83                             | 0                           | 00:46                        | 0                                       | 0.132                                 | 0.000                         |
| J45   | JUNCTION | 0.00                                | 24.85                             | 0                           | 00:49                        | 0                                       | 0.333                                 | 0.000                         |
| DP-9  | JUNCTION | 0.87                                | 0.87                              | 0                           | 00:45                        | 0.00821                                 | 0.00821                               | 0.000                         |
| J47   | JUNCTION | 0.00                                | 0.85                              | 0                           | 00:46                        | 0                                       | 0.00819                               | 0.000                         |
| DP-8  | JUNCTION | 0.00                                | 10.75                             | 0                           | 00:50                        | 0                                       | 0.132                                 | 0.000                         |
| J49   | JUNCTION | 0.00                                | 33.80                             | 0                           | 00:51                        | 0                                       | 0.466                                 | 0.000                         |
| J50   | JUNCTION | 3.70                                | 3.70                              | 0                           | 00:45                        | 0.0332                                  | 0.0332                                | 0.000                         |
| J51   | JUNCTION | 0.00                                | 3.43                              | 0                           | 00:47                        | 0                                       | 0.0332                                | -0.000                        |
| DP-14 | JUNCTION | 0.87                                | 3.44                              | 0                           | 00:51                        | 0.00816                                 | 0.0415                                | 0.000                         |
| J53   | JUNCTION | 0.00                                | 3.43                              | 0                           | 00:51                        | 0                                       | 0.0414                                | 0.000                         |
| DP-18 | JUNCTION | 0.32                                | 0.32                              | 0                           | 00:45                        | 0.00384                                 | 0.00384                               | 0.000                         |
| DP-21 | JUNCTION | 0.00                                | 5.78                              | 0                           | 00:48                        | 0                                       | 0.0613                                | 0.000                         |
| J56   | JUNCTION | 0.00                                | 5.78                              | 0                           | 00:48                        | 0                                       | 0.0612                                | -0.000                        |
| DP-22 | JUNCTION | 11.87                               | 14.00                             | 0                           | 00:45                        | 0.107                                   | 0.191                                 | 0.000                         |
| J58   | JUNCTION | 0.00                                | 13.76                             | 0                           | 00:46                        | 0                                       | 0.19                                  | 0.000                         |
| DP-20 | JUNCTION | 0.18                                | 0.18                              | 0                           | 00:45                        | 0.00284                                 | 0.00284                               | 0.000                         |
| J61   | JUNCTION | 0.00                                | 0.17                              | 0                           | 01:01                        | 0                                       | 0.00285                               | 0.000                         |
| J62   | JUNCTION | 6.44                                | 6.48                              | 0                           | 00:45                        | 0.0584                                  | 0.0613                                | 0.000                         |
| DP-36 | JUNCTION | 5.97                                | 6.10                              | 0                           | 00:45                        | 0.0565                                  | 0.0618                                | 0.000                         |
| J64   | JUNCTION | 0.51                                | 0.51                              | 0                           | 00:45                        | 0.00518                                 | 0.00518                               | 0.000                         |
| DP-42 | JUNCTION | 19.84                               | 22.43                             | 0                           | 00:45                        | 0.179                                   | 0.256                                 | 0.000                         |
| DP-44 | JUNCTION | 7.79                                | 30.37                             | 0                           | 00:48                        | 0.0708                                  | 0.387                                 | 0.000                         |



TRIPLE H RANCH - 5-yr. Developed Conditions

| Node            | Type     | Maximum<br>Lateral<br>Inflow<br>CFS | Maximum<br>Total<br>Inflow<br>CFS | Day of<br>Maximum<br>Inflow | Hour of<br>Maximum<br>Inflow | Lateral<br>Inflow<br>Volume<br>10^6 gal | Total<br>Inflow<br>Volume<br>10^6 gal | Flow<br>Balance<br>Error<br>% |
|-----------------|----------|-------------------------------------|-----------------------------------|-----------------------------|------------------------------|-----------------------------------------|---------------------------------------|-------------------------------|
| DP-27           | JUNCTION | 20.10                               | 27.09                             | 0                           | 00:45                        | 0.182                                   | 0.373                                 | 0.000                         |
| DP-35           | JUNCTION | 2.09                                | 2.09                              | 0                           | 00:45                        | 0.0194                                  | 0.0194                                | 0.000                         |
| DP-31           | JUNCTION | 2.68                                | 78.75                             | 0                           | 00:47                        | 0.0247                                  | 1.4                                   | 0.000                         |
| DP-33           | JUNCTION | 6.61                                | 9.42                              | 0                           | 00:45                        | 0.0605                                  | 0.099                                 | 0.000                         |
| DP-37           | JUNCTION | 3.27                                | 8.22                              | 0                           | 00:46                        | 0.0301                                  | 0.0919                                | 0.000                         |
| DP-28           | JUNCTION | 25.21                               | 31.09                             | 0                           | 01:02                        | 0.229                                   | 0.71                                  | 0.000                         |
| DP-19           | JUNCTION | 1.52                                | 1.52                              | 0                           | 00:45                        | 0.0156                                  | 0.0156                                | 0.000                         |
| J74             | JUNCTION | 0.00                                | 1.68                              | 0                           | 00:47                        | 0                                       | 0.0194                                | 0.000                         |
| J75             | JUNCTION | 0.00                                | 5.98                              | 0                           | 00:46                        | 0                                       | 0.0565                                | 0.000                         |
| J76             | JUNCTION | 1.96                                | 6.23                              | 0                           | 00:48                        | 0.0183                                  | 0.0751                                | 0.000                         |
| DP-24           | JUNCTION | 0.27                                | 0.27                              | 0                           | 00:45                        | 0.0028                                  | 0.0028                                | 0.000                         |
| J78             | JUNCTION | 0.00                                | 0.26                              | 0                           | 00:46                        | 0                                       | 0.0028                                | 0.000                         |
| DP-25           | JUNCTION | 8.85                                | 13.85                             | 0                           | 00:45                        | 0.0801                                  | 0.164                                 | 0.000                         |
| J80             | JUNCTION | 7.44                                | 21.11                             | 0                           | 00:45                        | 0.0673                                  | 0.234                                 | 0.000                         |
| J81             | JUNCTION | 0.00                                | 76.47                             | 0                           | 00:46                        | 0                                       | 1.35                                  | 0.000                         |
| DP-26           | JUNCTION | 0.23                                | 0.23                              | 0                           | 00:45                        | 0.00285                                 | 0.00285                               | 0.000                         |
| DP-30           | JUNCTION | 2.96                                | 77.44                             | 0                           | 00:46                        | 0.0273                                  | 1.38                                  | 0.000                         |
| J82             | JUNCTION | 0.00                                | 27.05                             | 0                           | 00:46                        | 0                                       | 0.372                                 | 0.000                         |
| DP-29           | JUNCTION | 3.84                                | 30.67                             | 0                           | 00:46                        | 0.0348                                  | 0.407                                 | 0.000                         |
| DP-32           | JUNCTION | 4.21                                | 4.21                              | 0                           | 00:45                        | 0.0384                                  | 0.0384                                | 0.000                         |
| DP-34           | JUNCTION | 8.88                                | 88.41                             | 0                           | 00:49                        | 0.0814                                  | 1.58                                  | 0.000                         |
| POND1-E-OUTFALL | JUNCTION | 0.00                                | 89.14                             | 0                           | 00:50                        | 0                                       | 1.6                                   | 0.000                         |
| J84             | JUNCTION | 0.00                                | 9.40                              | 0                           | 00:46                        | 0                                       | 0.0988                                | 0.000                         |
| DP-38           | JUNCTION | 0.51                                | 0.51                              | 0                           | 00:45                        | 0.00612                                 | 0.00612                               | -0.000                        |
| DP-40           | JUNCTION | 0.19                                | 0.19                              | 0                           | 00:45                        | 0.00235                                 | 0.00235                               | 0.000                         |

TRIPLE H RANCH - 5-yr. Developed Conditions

| Node            | Type     | Maximum<br>Lateral<br>Inflow<br>CFS | Maximum<br>Total<br>Inflow<br>CFS | Day of<br>Maximum<br>Inflow | Hour of<br>Maximum<br>Inflow | Lateral<br>Inflow<br>Volume<br>10^6 gal | Total<br>Inflow<br>Volume<br>10^6 gal | Flow<br>Balance<br>Error<br>% |
|-----------------|----------|-------------------------------------|-----------------------------------|-----------------------------|------------------------------|-----------------------------------------|---------------------------------------|-------------------------------|
| DP-39           | JUNCTION | 7.51                                | 7.62                              | 0                           | 00:45                        | 0.068                                   | 0.0742                                | 0.000                         |
| J86             | JUNCTION | 0.00                                | 7.49                              | 0                           | 00:45                        | 0                                       | 0.0741                                | 0.000                         |
| DP-41           | JUNCTION | 0.00                                | 7.32                              | 0                           | 00:47                        | 0                                       | 0.0765                                | 0.000                         |
| J88             | JUNCTION | 0.00                                | 7.33                              | 0                           | 00:47                        | 0                                       | 0.0764                                | 0.000                         |
| J89             | JUNCTION | 0.00                                | 22.06                             | 0                           | 00:45                        | 0                                       | 0.256                                 | 0.000                         |
| DP-43           | JUNCTION | 6.62                                | 6.62                              | 0                           | 00:45                        | 0.0599                                  | 0.0599                                | 0.000                         |
| J91             | JUNCTION | 0.00                                | 6.52                              | 0                           | 00:45                        | 0                                       | 0.0598                                | 0.000                         |
| J92             | JUNCTION | 0.00                                | 30.27                             | 0                           | 00:48                        | 0                                       | 0.387                                 | 0.000                         |
| J93             | JUNCTION | 6.72                                | 6.72                              | 0                           | 00:45                        | 0.0612                                  | 0.0612                                | 0.000                         |
| J94             | JUNCTION | 0.00                                | 5.67                              | 0                           | 00:49                        | 0                                       | 0.0614                                | 0.000                         |
| DP-46           | JUNCTION | 9.42                                | 32.26                             | 0                           | 00:51                        | 0.0853                                  | 0.473                                 | 0.000                         |
| J96             | JUNCTION | 0.00                                | 32.28                             | 0                           | 00:51                        | 0                                       | 0.472                                 | 0.000                         |
| J97             | JUNCTION | 8.12                                | 9.44                              | 0                           | 00:45                        | 0.0737                                  | 0.137                                 | 0.000                         |
| DP-48           | JUNCTION | 6.17                                | 41.54                             | 0                           | 00:54                        | 0.0561                                  | 0.665                                 | 0.000                         |
| DP-47           | JUNCTION | 0.00                                | 8.18                              | 0                           | 00:55                        | 0                                       | 0.137                                 | 0.000                         |
| POND1-E-OUTFALL | JUNCTION | 0.00                                | 41.33                             | 0                           | 00:55                        | 0                                       | 0.663                                 | 0.000                         |
| POND1-E-OUTFALL | JUNCTION | 0.00                                | 8.21                              | 0                           | 00:47                        | 0                                       | 0.0919                                | 0.000                         |
| DP-45           | JUNCTION | 0.13                                | 0.13                              | 0                           | 00:45                        | 0.00169                                 | 0.00169                               | 0.000                         |
| CREEK-OUTFALL   | OUTFALL  | 8.00                                | 8.00                              | 0                           | 00:45                        | 0.0732                                  | 0.0732                                | 0.000                         |
| POND2-WEST      | OUTFALL  | 3.90                                | 3.90                              | 0                           | 00:45                        | 0.0368                                  | 0.0368                                | 0.000                         |
| POND1-EAST      | OUTFALL  | 7.54                                | 130.89                            | 0                           | 00:52                        | 0.0682                                  | 2.42                                  | 0.000                         |
| Out11           | OUTFALL  | 6.08                                | 6.08                              | 0                           | 00:45                        | 0.0552                                  | 0.0552                                | 0.000                         |
| Out13           | OUTFALL  | 1.20                                | 1.20                              | 0                           | 00:45                        | 0.0114                                  | 0.0114                                | 0.000                         |
| Out14           | OUTFALL  | 1.80                                | 1.80                              | 0                           | 00:45                        | 0.017                                   | 0.017                                 | 0.000                         |
| Out15           | OUTFALL  | 1.10                                | 1.10                              | 0                           | 00:45                        | 0.0108                                  | 0.0108                                | 0.000                         |



TRIPLE H RANCH - 5-yr. Developed Conditions

| Node                | Type    | Maximum<br>Lateral<br>Inflow<br>CFS | Maximum<br>Total<br>Inflow<br>CFS | Day of<br>Maximum<br>Inflow | Hour of<br>Maximum<br>Inflow | Lateral<br>Inflow<br>Volume<br>10^6 gal | Total<br>Inflow<br>Volume<br>10^6 gal | Flow<br>Balance<br>Error<br>% |
|---------------------|---------|-------------------------------------|-----------------------------------|-----------------------------|------------------------------|-----------------------------------------|---------------------------------------|-------------------------------|
| Out16               | OUTFALL | 0.09                                | 0.09                              | 0                           | 00:45                        | 0.00139                                 | 0.00139                               | 0.000                         |
| DP-4-POND1-WEST     | OUTFALL | 6.01                                | 23.92                             | 0                           | 00:46                        | 0.0543                                  | 0.258                                 | 0.000                         |
| DP-17-CREEK-OUTFALL | OUTFALL | 0.00                                | 65.08                             | 0                           | 01:00                        | 0                                       | 0.953                                 | 0.000                         |

TRIPLE H RANCH - 5-yr. Developed Conditions

Outfall Loading Summary

| Outfall Node          | Flow<br>Frequency<br>% | Avgerage<br>Flow<br>CFS | Maximum<br>Flow<br>CFS | Total<br>Volume<br>10^6 gal |
|-----------------------|------------------------|-------------------------|------------------------|-----------------------------|
| CREEK-OUTFALL-2       | 55.69                  | 0.81                    | 8.00                   | 0.073                       |
| POND2-WEST            | 43.47                  | 0.52                    | 3.90                   | 0.037                       |
| POND1-EAST            | 98.47                  | 15.22                   | 130.89                 | 2.421                       |
| Out11                 | 54.44                  | 0.63                    | 6.08                   | 0.055                       |
| Out13                 | 38.75                  | 0.18                    | 1.20                   | 0.011                       |
| Out14                 | 40.28                  | 0.26                    | 1.80                   | 0.017                       |
| Out15                 | 37.50                  | 0.18                    | 1.10                   | 0.011                       |
| Out16                 | 33.33                  | 0.03                    | 0.09                   | 0.001                       |
| DP-4-POND1-WEST       | 98.47                  | 1.62                    | 23.92                  | 0.258                       |
| DP-17-CREEK-OUTFALL-1 | 89.11                  | 6.61                    | 65.08                  | 0.953                       |

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)

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TRIPLE H RANCH - 100-yr. Developed Conditions

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Analysis Options

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Flow Units ..... CFS

Process Models:

Rainfall/Runoff ..... YES

RDII ..... NO

Snowmelt ..... NO

Groundwater ..... NO

Flow Routing ..... YES

Ponding Allowed ..... NO

Water Quality ..... NO

Infiltration Method ..... HORTON

Flow Routing Method ..... KINWAVE

Starting Date ..... 08/22/2025 00:00:00

Ending Date ..... 08/22/2025 06:00:00

Antecedent Dry Days ..... 0.0

Report Time Step ..... 00:15:00

Wet Time Step ..... 00:05:00

Dry Time Step ..... 01:00:00

Routing Time Step ..... 30.00 sec

\*\*\*\*\*

|                            | Volume    | Depth  |
|----------------------------|-----------|--------|
| Runoff Quantity Continuity | acre-feet | inches |
| *****                      | -----     | -----  |
| Total Precipitation .....  | 339.240   | 2.751  |
| Evaporation Loss .....     | 0.000     | 0.000  |
| Infiltration Loss .....    | 250.641   | 2.033  |
| Surface Runoff .....       | 88.462    | 0.717  |
| Final Storage .....        | 0.671     | 0.005  |
| Continuity Error (%) ..... | -0.157    |        |

\*\*\*\*\*

|                            | Volume    | Volume   |
|----------------------------|-----------|----------|
| Flow Routing Continuity    | acre-feet | 10^6 gal |
| *****                      | -----     | -----    |
| Dry Weather Inflow .....   | 0.000     | 0.000    |
| Wet Weather Inflow .....   | 88.462    | 28.827   |
| Groundwater Inflow .....   | 0.000     | 0.000    |
| RDII Inflow .....          | 0.000     | 0.000    |
| External Inflow .....      | 0.000     | 0.000    |
| External Outflow .....     | 82.454    | 26.869   |
| Flooding Loss .....        | 6.229     | 2.030    |
| Evaporation Loss .....     | 0.000     | 0.000    |
| Exfiltration Loss .....    | 0.000     | 0.000    |
| Initial Stored Volume .... | 0.000     | 0.000    |
| Final Stored Volume .....  | 0.057     | 0.018    |

Continuity Error (%) ..... -0.314

\*\*\*\*\*  
Highest Flow Instability Indexes  
\*\*\*\*\*

Link CE-7 (2)  
Link C103 (2)  
Link CW-1 (1)  
Link CE-10 (1)  
Link J63' (1)

\*\*\*\*\*  
Routing Time Step Summary  
\*\*\*\*\*

Minimum Time Step : 30.00 sec  
Average Time Step : 30.00 sec  
Maximum Time Step : 30.00 sec  
% of Time in Steady State : 0.00  
Average Iterations per Step : 1.63  
% of Steps Not Converging : 0.00

\*\*\*\*\*  
Subcatchment Runoff Summary  
\*\*\*\*\*

| -----        |              |        |          |        |        |       |
|--------------|--------------|--------|----------|--------|--------|-------|
| Imperv       | Perv         | Total  | Total    | Total  | Total  | Total |
| Runoff       | Runoff       | Precip | Runon    | Peak   | Runoff | Infil |
| Subcatchment | Subcatchment | Runoff | Runoff   | Runoff | Evap   | in    |
| in           | in           | in     | 10^6 gal | in     | Coeff  | in    |
| -----        |              |        |          |        |        |       |
| E-A          |              | 2.75   | 0.00     | 0.00   |        | 1.80  |
| 0.27         | 0.68         | 0.95   | 0.23     | 11.41  | 0.347  |       |
| E-AA         |              | 2.75   | 0.00     | 0.00   |        | 1.82  |
| 0.27         | 0.66         | 0.93   | 0.48     | 23.83  | 0.338  |       |
| E-B          |              | 2.75   | 0.00     | 0.00   |        | 1.80  |
| 0.27         | 0.68         | 0.95   | 0.32     | 15.60  | 0.344  |       |
| E-BB         |              | 2.75   | 0.00     | 0.00   |        | 1.80  |
| 0.30         | 0.65         | 0.95   | 1.19     | 60.86  | 0.345  |       |
| E-C          |              | 2.75   | 0.00     | 0.00   |        | 1.67  |
| 0.27         | 0.81         | 1.08   | 0.29     | 15.56  | 0.392  |       |
| E-CC         |              | 2.75   | 0.00     | 0.00   |        | 1.82  |
| 0.27         | 0.66         | 0.93   | 0.43     | 21.06  | 0.339  |       |
| E-D          |              | 2.75   | 0.00     | 0.00   |        | 1.76  |
| 0.27         | 0.72         | 0.99   | 0.78     | 39.34  | 0.361  |       |
| E-DD         |              | 2.75   | 0.00     | 0.00   |        | 1.95  |
| 0.27         | 0.52         | 0.79   | 0.38     | 18.65  | 0.289  |       |

|      |      |      |      |       |       |      |
|------|------|------|------|-------|-------|------|
| E-E  |      |      | 2.75 | 0.00  | 0.00  | 1.83 |
| 0.27 | 0.65 | 0.92 | 0.72 | 35.17 | 0.335 |      |
| E-EE |      |      | 2.75 | 0.00  | 0.00  | 1.74 |
| 0.27 | 0.74 | 1.01 | 0.54 | 27.59 | 0.367 |      |
| E-F  |      |      | 2.75 | 0.00  | 0.00  | 1.54 |
| 0.27 | 0.95 | 1.22 | 0.06 | 4.47  | 0.444 |      |
| E-FF |      |      | 2.75 | 0.00  | 0.00  | 1.59 |
| 0.22 | 0.95 | 1.17 | 0.11 | 7.15  | 0.424 |      |
| E-G  |      |      | 2.75 | 0.00  | 0.00  | 1.56 |
| 0.30 | 0.90 | 1.20 | 0.19 | 12.08 | 0.435 |      |
| E-GG |      |      | 2.75 | 0.00  | 0.00  | 1.78 |
| 0.27 | 0.70 | 0.97 | 0.63 | 31.35 | 0.351 |      |
| E-H  |      |      | 2.75 | 0.00  | 0.00  | 1.58 |
| 0.27 | 0.91 | 1.18 | 0.07 | 4.48  | 0.428 |      |
| E-HH |      |      | 2.75 | 0.00  | 0.00  | 1.92 |
| 0.27 | 0.56 | 0.83 | 0.47 | 23.27 | 0.303 |      |
| E-I  |      |      | 2.75 | 0.00  | 0.00  | 1.72 |
| 0.30 | 0.74 | 1.03 | 0.38 | 20.33 | 0.376 |      |
| E-II |      |      | 2.75 | 0.00  | 0.00  | 1.75 |
| 0.27 | 0.74 | 1.00 | 0.43 | 21.75 | 0.365 |      |
| E-J  |      |      | 2.75 | 0.00  | 0.00  | 1.45 |
| 0.27 | 1.05 | 1.32 | 0.02 | 2.50  | 0.480 |      |
| E-JJ |      |      | 2.75 | 0.00  | 0.00  | 1.65 |
| 0.22 | 0.89 | 1.10 | 0.11 | 6.34  | 0.401 |      |
| E-K  |      |      | 2.75 | 0.00  | 0.00  | 1.82 |
| 0.16 | 0.77 | 0.93 | 0.21 | 9.02  | 0.339 |      |
| E-KK |      |      | 2.75 | 0.00  | 0.00  | 1.77 |
| 0.27 | 0.71 | 0.97 | 0.41 | 20.49 | 0.354 |      |
| E-L  |      |      | 2.75 | 0.00  | 0.00  | 1.86 |
| 0.24 | 0.65 | 0.89 | 0.61 | 28.46 | 0.324 |      |
| E-LL |      |      | 2.75 | 0.00  | 0.00  | 1.67 |
| 0.22 | 0.87 | 1.08 | 0.17 | 9.04  | 0.394 |      |
| E-M  |      |      | 2.75 | 0.00  | 0.00  | 1.82 |
| 0.27 | 0.66 | 0.93 | 0.48 | 23.57 | 0.338 |      |
| E-N  |      |      | 2.75 | 0.00  | 0.00  | 1.59 |
| 0.27 | 0.89 | 1.16 | 0.07 | 4.25  | 0.422 |      |
| E-O  |      |      | 2.75 | 0.00  | 0.00  | 1.77 |
| 0.27 | 0.71 | 0.98 | 0.43 | 21.74 | 0.355 |      |
| E-P  |      |      | 2.75 | 0.00  | 0.00  | 1.88 |
| 0.27 | 0.60 | 0.87 | 0.72 | 35.29 | 0.317 |      |
| E-Q  |      |      | 2.75 | 0.00  | 0.00  | 1.83 |
| 0.27 | 0.65 | 0.92 | 0.62 | 30.42 | 0.335 |      |
| E-R  |      |      | 2.75 | 0.00  | 0.00  | 1.92 |
| 0.27 | 0.56 | 0.83 | 1.47 | 71.91 | 0.301 |      |
| E-S  |      |      | 2.75 | 0.00  | 0.00  | 1.78 |
| 0.27 | 0.70 | 0.97 | 0.70 | 34.68 | 0.352 |      |
| E-T1 |      |      | 2.75 | 0.00  | 0.00  | 1.79 |
| 0.27 | 0.69 | 0.96 | 0.25 | 12.62 | 0.348 |      |
| E-U  |      |      | 2.75 | 0.00  | 0.00  | 1.72 |
| 0.27 | 0.76 | 1.03 | 0.47 | 24.42 | 0.376 |      |
| E-V  |      |      | 2.75 | 0.00  | 0.00  | 1.65 |
| 0.27 | 0.83 | 1.10 | 0.22 | 12.46 | 0.400 |      |
| E-W  |      |      | 2.75 | 0.00  | 0.00  | 1.73 |
| 0.27 | 0.75 | 1.02 | 0.42 | 21.53 | 0.370 |      |

|           |      |      |      |        |       |      |
|-----------|------|------|------|--------|-------|------|
| E-X       |      |      | 2.75 | 0.00   | 0.00  | 1.60 |
| 0.30      | 0.85 | 1.15 | 0.21 | 12.47  | 0.418 |      |
| W-G       |      |      | 2.75 | 0.00   | 0.00  | 1.80 |
| 0.24      | 0.70 | 0.95 | 0.55 | 26.27  | 0.344 |      |
| E-MM      |      |      | 2.75 | 0.00   | 0.00  | 1.48 |
| 0.27      | 1.02 | 1.29 | 0.05 | 4.03   | 0.468 |      |
| E-NN      |      |      | 2.75 | 0.00   | 0.00  | 1.67 |
| 0.27      | 0.81 | 1.08 | 0.24 | 13.14  | 0.392 |      |
| E-Y       |      |      | 2.75 | 0.00   | 0.00  | 1.63 |
| 0.27      | 0.85 | 1.12 | 0.16 | 9.25   | 0.408 |      |
| E-Z       |      |      | 2.75 | 0.00   | 0.00  | 1.86 |
| 0.24      | 0.64 | 0.88 | 0.51 | 24.08  | 0.321 |      |
| OS-1      |      |      | 2.75 | 0.00   | 0.00  | 1.94 |
| 0.09      | 0.73 | 0.81 | 0.22 | 8.25   | 0.295 |      |
| OS-10     |      |      | 2.75 | 0.00   | 0.00  | 1.75 |
| 0.05      | 0.96 | 1.01 | 0.07 | 3.64   | 0.368 |      |
| E-OO      |      |      | 2.75 | 0.00   | 0.00  | 1.65 |
| 0.05      | 1.06 | 1.11 | 0.04 | 2.59   | 0.405 |      |
| OS-11     |      |      | 2.75 | 0.00   | 0.00  | 1.74 |
| 0.05      | 0.97 | 1.03 | 0.05 | 2.68   | 0.373 |      |
| OS-12     |      |      | 2.75 | 0.00   | 0.00  | 1.74 |
| 0.05      | 0.96 | 1.02 | 0.08 | 4.43   | 0.370 |      |
| OS-13     |      |      | 2.75 | 0.00   | 0.00  | 1.67 |
| 0.27      | 0.82 | 1.09 | 0.20 | 10.94  | 0.395 |      |
| OS-14     |      |      | 2.75 | 0.00   | 0.00  | 1.85 |
| 0.13      | 0.77 | 0.90 | 0.74 | 30.26  | 0.329 |      |
| OS-2      |      |      | 2.75 | 0.00   | 0.00  | 1.86 |
| 0.05      | 0.84 | 0.90 | 0.30 | 13.70  | 0.325 |      |
| OS-3      |      |      | 2.75 | 0.00   | 0.00  | 1.65 |
| 0.05      | 1.06 | 1.11 | 0.09 | 6.69   | 0.405 |      |
| OS-4      |      |      | 2.75 | 0.00   | 0.00  | 2.37 |
| 0.13      | 0.25 | 0.38 | 5.40 | 246.13 | 0.139 |      |
| OS-5      |      |      | 2.75 | 0.00   | 0.00  | 2.26 |
| 0.05      | 0.43 | 0.49 | 1.41 | 38.26  | 0.178 |      |
| OS-6      |      |      | 2.75 | 0.00   | 0.00  | 1.76 |
| 0.05      | 0.94 | 1.00 | 0.11 | 5.82   | 0.363 |      |
| OS-7      |      |      | 2.75 | 0.00   | 0.00  | 1.98 |
| 0.05      | 0.72 | 0.78 | 0.41 | 15.24  | 0.282 |      |
| OS-8      |      |      | 2.75 | 0.00   | 0.00  | 1.63 |
| 0.05      | 1.09 | 1.14 | 0.07 | 5.51   | 0.415 |      |
| OS-9      |      |      | 2.75 | 0.00   | 0.00  | 1.78 |
| 0.05      | 0.93 | 0.98 | 0.17 | 9.02   | 0.357 |      |
| TANK-SITE |      |      | 2.75 | 0.00   | 0.00  | 0.82 |
| 1.35      | 0.57 | 1.92 | 0.10 | 10.33  | 0.696 |      |
| W-A       |      |      | 2.75 | 0.00   | 0.00  | 1.64 |
| 0.27      | 0.85 | 1.12 | 0.27 | 15.53  | 0.406 |      |
| W-B       |      |      | 2.75 | 0.00   | 0.00  | 1.61 |
| 0.27      | 0.88 | 1.15 | 0.31 | 18.58  | 0.417 |      |
| W-C       |      |      | 2.75 | 0.00   | 0.00  | 1.85 |
| 0.27      | 0.63 | 0.90 | 0.92 | 44.90  | 0.328 |      |
| W-D       |      |      | 2.75 | 0.00   | 0.00  | 1.85 |
| 0.27      | 0.63 | 0.90 | 0.37 | 18.30  | 0.325 |      |
| W-E       |      |      | 2.75 | 0.00   | 0.00  | 1.63 |
| 0.24      | 0.89 | 1.13 | 0.34 | 19.59  | 0.410 |      |

|      |      |      |      |       |       |      |
|------|------|------|------|-------|-------|------|
| W-F  |      |      | 2.75 | 0.00  | 0.00  | 1.47 |
| 0.27 | 1.02 | 1.29 | 0.04 | 3.51  | 0.470 |      |
| E-T2 |      |      | 2.75 | 0.00  | 0.00  | 1.72 |
| 0.27 | 0.77 | 1.04 | 0.30 | 15.61 | 0.376 |      |

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Node Depth Summary  
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| Reported  |          | Average | Maximum | Maximum | Time of Max |
|-----------|----------|---------|---------|---------|-------------|
| Max Depth |          | Depth   | Depth   | HGL     | Occurrence  |
| Node      | Type     | Feet    | Feet    | Feet    | days hr:min |
| Feet      |          |         |         |         |             |
| DP-1      | JUNCTION | 0.22    | 1.24    | 6450.24 | 0 00:45     |
| 1.19      |          |         |         |         |             |
| JW3       | JUNCTION | 0.55    | 2.04    | 6484.04 | 0 00:53     |
| 1.83      |          |         |         |         |             |
| J-W3      | JUNCTION | 0.27    | 1.25    | 6449.25 | 0 00:46     |
| 1.21      |          |         |         |         |             |
| DP-3      | JUNCTION | 0.42    | 2.27    | 6435.27 | 0 00:46     |
| 2.14      |          |         |         |         |             |
| DP-2      | JUNCTION | 0.22    | 1.33    | 6437.33 | 0 00:45     |
| 1.27      |          |         |         |         |             |
| JW2       | JUNCTION | 0.54    | 2.16    | 6491.16 | 0 00:49     |
| 1.70      |          |         |         |         |             |
| DP-6      | JUNCTION | 0.11    | 0.74    | 6473.74 | 0 00:45     |
| 0.71      |          |         |         |         |             |
| J23       | JUNCTION | 0.33    | 1.44    | 6453.44 | 0 00:49     |
| 1.37      |          |         |         |         |             |
| DP-15     | JUNCTION | 0.55    | 1.74    | 6453.74 | 0 00:51     |
| 1.70      |          |         |         |         |             |
| DP-10     | JUNCTION | 0.24    | 1.34    | 6476.34 | 0 00:45     |
| 1.29      |          |         |         |         |             |
| JW1       | JUNCTION | 0.50    | 2.07    | 6495.07 | 0 00:47     |
| 1.82      |          |         |         |         |             |
| DP-16     | JUNCTION | 0.49    | 2.09    | 6499.09 | 0 00:45     |
| 2.03      |          |         |         |         |             |
| DP-11     | JUNCTION | 0.13    | 0.59    | 6486.09 | 0 00:45     |
| 0.57      |          |         |         |         |             |
| J29       | JUNCTION | 0.12    | 0.74    | 6472.74 | 0 00:46     |
| 0.70      |          |         |         |         |             |
| J30       | JUNCTION | 0.31    | 1.34    | 6475.34 | 0 00:46     |
| 1.27      |          |         |         |         |             |
| J31       | JUNCTION | 0.51    | 1.91    | 6452.91 | 0 00:52     |
| 1.85      |          |         |         |         |             |
| DP-7      | JUNCTION | 0.22    | 1.09    | 6461.09 | 0 00:47     |
| 1.04      |          |         |         |         |             |

|       |          |      |      |         |   |       |
|-------|----------|------|------|---------|---|-------|
| J33   | JUNCTION | 0.24 | 1.15 | 6460.15 | 0 | 00:49 |
| 1.07  |          |      |      |         |   |       |
| DP-23 | JUNCTION | 0.29 | 1.22 | 6454.22 | 0 | 00:45 |
| 1.19  |          |      |      |         |   |       |
| J35   | JUNCTION | 0.00 | 0.00 | 6480.00 | 0 | 00:00 |
| 0.00  |          |      |      |         |   |       |
| J36   | JUNCTION | 0.00 | 0.00 | 6479.00 | 0 | 00:00 |
| 0.00  |          |      |      |         |   |       |
| J38   | JUNCTION | 0.27 | 1.07 | 6485.57 | 0 | 00:46 |
| 1.04  |          |      |      |         |   |       |
| J39   | JUNCTION | 0.27 | 1.05 | 6482.05 | 0 | 00:48 |
| 0.95  |          |      |      |         |   |       |
| J40   | JUNCTION | 0.25 | 0.95 | 6480.95 | 0 | 00:49 |
| 0.86  |          |      |      |         |   |       |
| DP-12 | JUNCTION | 0.44 | 1.24 | 6501.24 | 0 | 01:10 |
| 1.22  |          |      |      |         |   |       |
| DP-13 | JUNCTION | 0.54 | 1.81 | 6495.81 | 0 | 00:47 |
| 1.79  |          |      |      |         |   |       |
| J43   | JUNCTION | 0.56 | 1.81 | 6494.81 | 0 | 00:48 |
| 1.79  |          |      |      |         |   |       |
| J44   | JUNCTION | 0.34 | 1.52 | 6452.52 | 0 | 00:50 |
| 1.46  |          |      |      |         |   |       |
| J45   | JUNCTION | 0.50 | 1.91 | 6451.91 | 0 | 00:53 |
| 1.86  |          |      |      |         |   |       |
| DP-9  | JUNCTION | 0.12 | 0.74 | 6449.74 | 0 | 00:45 |
| 0.71  |          |      |      |         |   |       |
| J47   | JUNCTION | 0.14 | 0.74 | 6448.74 | 0 | 00:46 |
| 0.70  |          |      |      |         |   |       |
| DP-8  | JUNCTION | 0.36 | 1.58 | 6450.58 | 0 | 00:55 |
| 1.55  |          |      |      |         |   |       |
| J49   | JUNCTION | 0.49 | 1.91 | 6449.91 | 0 | 00:55 |
| 1.89  |          |      |      |         |   |       |
| J50   | JUNCTION | 0.23 | 1.33 | 6505.33 | 0 | 00:45 |
| 1.30  |          |      |      |         |   |       |
| J51   | JUNCTION | 0.23 | 1.29 | 6504.79 | 0 | 00:47 |
| 1.19  |          |      |      |         |   |       |
| DP-14 | JUNCTION | 0.22 | 1.18 | 6501.18 | 0 | 00:50 |
| 0.91  |          |      |      |         |   |       |
| J53   | JUNCTION | 0.20 | 1.18 | 6500.18 | 0 | 00:50 |
| 0.92  |          |      |      |         |   |       |
| DP-18 | JUNCTION | 0.12 | 0.56 | 6498.56 | 0 | 00:55 |
| 0.54  |          |      |      |         |   |       |
| DP-21 | JUNCTION | 0.45 | 1.74 | 6484.74 | 0 | 00:50 |
| 1.70  |          |      |      |         |   |       |
| J56   | JUNCTION | 0.37 | 1.70 | 6483.70 | 0 | 00:50 |
| 1.63  |          |      |      |         |   |       |
| DP-22 | JUNCTION | 0.46 | 1.57 | 6466.57 | 0 | 01:03 |
| 1.56  |          |      |      |         |   |       |
| J58   | JUNCTION | 0.58 | 1.76 | 6465.76 | 0 | 01:03 |
| 1.75  |          |      |      |         |   |       |
| DP-20 | JUNCTION | 0.10 | 0.58 | 6500.58 | 0 | 00:50 |
| 0.56  |          |      |      |         |   |       |
| J61   | JUNCTION | 0.15 | 0.92 | 6485.92 | 0 | 00:52 |
| 0.85  |          |      |      |         |   |       |



|                    |          |      |      |         |   |       |
|--------------------|----------|------|------|---------|---|-------|
| J62                | JUNCTION | 0.45 | 1.75 | 6485.75 | 0 | 00:48 |
| 1.69               |          |      |      |         |   |       |
| DP-36              | JUNCTION | 0.37 | 1.46 | 6408.46 | 0 | 00:55 |
| 1.43               |          |      |      |         |   |       |
| J64                | JUNCTION | 0.10 | 0.60 | 6442.60 | 0 | 00:45 |
| 0.58               |          |      |      |         |   |       |
| DP-42              | JUNCTION | 0.51 | 1.75 | 6446.75 | 0 | 00:55 |
| 1.71               |          |      |      |         |   |       |
| DP-44              | JUNCTION | 0.43 | 1.77 | 6432.77 | 0 | 00:50 |
| 1.74               |          |      |      |         |   |       |
| DP-27              | JUNCTION | 0.62 | 1.94 | 6440.94 | 0 | 01:03 |
| 1.93               |          |      |      |         |   |       |
| DP-35              | JUNCTION | 0.11 | 0.61 | 6394.61 | 0 | 00:45 |
| 0.59               |          |      |      |         |   |       |
| DP-31              | JUNCTION | 0.77 | 2.28 | 6419.28 | 0 | 00:46 |
| 2.27               |          |      |      |         |   |       |
| DP-33              | JUNCTION | 0.33 | 1.48 | 6415.48 | 0 | 00:47 |
| 1.36               |          |      |      |         |   |       |
| DP-37              | JUNCTION | 0.38 | 1.46 | 6399.46 | 0 | 00:56 |
| 1.44               |          |      |      |         |   |       |
| DP-28              | JUNCTION | 0.65 | 2.27 | 6427.27 | 0 | 01:04 |
| 2.20               |          |      |      |         |   |       |
| DP-19              | JUNCTION | 0.26 | 0.95 | 6493.95 | 0 | 00:55 |
| 0.95               |          |      |      |         |   |       |
| J74                | JUNCTION | 0.29 | 1.13 | 6493.13 | 0 | 00:57 |
| 1.12               |          |      |      |         |   |       |
| J75                | JUNCTION | 0.32 | 1.36 | 6453.36 | 0 | 00:46 |
| 1.30               |          |      |      |         |   |       |
| J76                | JUNCTION | 0.34 | 1.30 | 6444.30 | 0 | 00:50 |
| 1.23               |          |      |      |         |   |       |
| DP-24              | JUNCTION | 0.09 | 0.56 | 6459.56 | 0 | 00:45 |
| 0.54               |          |      |      |         |   |       |
| J78                | JUNCTION | 0.08 | 0.55 | 6458.55 | 0 | 00:46 |
| 0.52               |          |      |      |         |   |       |
| DP-25              | JUNCTION | 0.42 | 1.94 | 6427.94 | 0 | 00:49 |
| 1.81               |          |      |      |         |   |       |
| J80                | JUNCTION | 0.55 | 1.99 | 6426.99 | 0 | 00:48 |
| 1.92               |          |      |      |         |   |       |
| J81                | JUNCTION | 0.94 | 3.50 | 6427.50 | 0 | 00:45 |
| 3.50               |          |      |      |         |   |       |
| DP-26              | JUNCTION | 0.08 | 0.39 | 6458.39 | 0 | 00:55 |
| 0.38               |          |      |      |         |   |       |
| DP-30              | JUNCTION | 0.77 | 2.28 | 6421.28 | 0 | 00:45 |
| 2.27               |          |      |      |         |   |       |
| J82                | JUNCTION | 0.54 | 1.94 | 6439.94 | 0 | 01:03 |
| 1.93               |          |      |      |         |   |       |
| DP-29              | JUNCTION | 0.60 | 2.23 | 6427.23 | 0 | 01:03 |
| 2.23               |          |      |      |         |   |       |
| DP-32              | JUNCTION | 0.31 | 1.31 | 6418.31 | 0 | 00:45 |
| 1.27               |          |      |      |         |   |       |
| DP-34              | JUNCTION | 1.00 | 3.14 | 6396.14 | 0 | 00:50 |
| 3.08               |          |      |      |         |   |       |
| POND1-E-OUTFALL-NW | JUNCTION | 1.11 | 3.14 | 6391.14 | 0 | 00:50 |
| 3.08               |          |      |      |         |   |       |

|                    |          |      |      |         |   |       |
|--------------------|----------|------|------|---------|---|-------|
| J84                | JUNCTION | 0.36 | 1.48 | 6414.48 | 0 | 00:47 |
| 1.36               |          |      |      |         |   |       |
| DP-38              | JUNCTION | 0.18 | 0.86 | 6479.86 | 0 | 00:55 |
| 0.83               |          |      |      |         |   |       |
| DP-40              | JUNCTION | 0.11 | 0.52 | 6456.52 | 0 | 00:55 |
| 0.50               |          |      |      |         |   |       |
| DP-39              | JUNCTION | 0.42 | 1.90 | 6454.90 | 0 | 00:56 |
| 1.84               |          |      |      |         |   |       |
| J86                | JUNCTION | 0.45 | 1.90 | 6453.90 | 0 | 00:56 |
| 1.85               |          |      |      |         |   |       |
| DP-41              | JUNCTION | 0.44 | 1.74 | 6451.74 | 0 | 00:57 |
| 1.72               |          |      |      |         |   |       |
| J88                | JUNCTION | 0.47 | 1.74 | 6450.74 | 0 | 00:57 |
| 1.72               |          |      |      |         |   |       |
| J89                | JUNCTION | 0.41 | 1.75 | 6445.75 | 0 | 00:56 |
| 1.71               |          |      |      |         |   |       |
| DP-43              | JUNCTION | 0.32 | 1.64 | 6446.64 | 0 | 00:45 |
| 1.57               |          |      |      |         |   |       |
| J91                | JUNCTION | 0.34 | 1.62 | 6445.62 | 0 | 00:46 |
| 1.55               |          |      |      |         |   |       |
| J92                | JUNCTION | 0.43 | 1.77 | 6431.77 | 0 | 00:50 |
| 1.74               |          |      |      |         |   |       |
| J93                | JUNCTION | 0.32 | 1.19 | 6446.19 | 0 | 00:45 |
| 1.16               |          |      |      |         |   |       |
| J94                | JUNCTION | 0.33 | 1.12 | 6431.12 | 0 | 00:49 |
| 0.99               |          |      |      |         |   |       |
| DP-46              | JUNCTION | 0.47 | 1.88 | 6405.88 | 0 | 00:55 |
| 1.86               |          |      |      |         |   |       |
| J96                | JUNCTION | 0.47 | 1.88 | 6404.88 | 0 | 00:55 |
| 1.86               |          |      |      |         |   |       |
| J97                | JUNCTION | 0.50 | 1.53 | 6404.53 | 0 | 00:52 |
| 1.48               |          |      |      |         |   |       |
| DP-48              | JUNCTION | 0.99 | 4.50 | 6396.50 | 0 | 00:51 |
| 4.50               |          |      |      |         |   |       |
| DP-47              | JUNCTION | 0.51 | 1.53 | 6394.53 | 0 | 00:56 |
| 1.51               |          |      |      |         |   |       |
| POND1-E-OUTFALL-NE | JUNCTION | 1.00 | 4.50 | 6392.50 | 0 | 00:55 |
| 4.50               |          |      |      |         |   |       |
| POND1-E-OUTFALL-SW | JUNCTION | 0.34 | 1.30 | 6389.30 | 0 | 00:56 |
| 1.28               |          |      |      |         |   |       |
| DP-45              | JUNCTION | 0.11 | 0.53 | 6438.53 | 0 | 00:50 |
| 0.50               |          |      |      |         |   |       |
| CREEK-OUTFALL-2    | OUTFALL  | 0.00 | 0.00 | 6414.00 | 0 | 00:00 |
| 0.00               |          |      |      |         |   |       |
| POND2-WEST         | OUTFALL  | 0.00 | 0.00 | 6429.00 | 0 | 00:00 |
| 0.00               |          |      |      |         |   |       |
| POND1-EAST         | OUTFALL  | 1.04 | 2.68 | 6388.68 | 0 | 00:52 |
| 2.66               |          |      |      |         |   |       |
| Out11              | OUTFALL  | 0.00 | 0.00 | 0.00    | 0 | 00:00 |
| 0.00               |          |      |      |         |   |       |
| Out13              | OUTFALL  | 0.00 | 0.00 | 0.00    | 0 | 00:00 |
| 0.00               |          |      |      |         |   |       |
| Out14              | OUTFALL  | 0.00 | 0.00 | 0.00    | 0 | 00:00 |
| 0.00               |          |      |      |         |   |       |

|                       |         |      |      |         |   |       |
|-----------------------|---------|------|------|---------|---|-------|
| Out15                 | OUTFALL | 0.00 | 0.00 | 0.00    | 0 | 00:00 |
| 0.00                  |         |      |      |         |   |       |
| Out16                 | OUTFALL | 0.00 | 0.00 | 0.00    | 0 | 00:00 |
| 0.00                  |         |      |      |         |   |       |
| DP-4-POND1-WEST       | OUTFALL | 0.47 | 2.27 | 6433.27 | 0 | 00:46 |
| 2.08                  |         |      |      |         |   |       |
| DP-17-CREEK-OUTFALL-1 | OUTFALL | 0.31 | 1.15 | 6419.15 | 0 | 00:56 |
| 1.10                  |         |      |      |         |   |       |

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Node Inflow Summary  
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| Lateral | Total    | Flow     | Maximum | Maximum |             |      |
|---------|----------|----------|---------|---------|-------------|------|
| Inflow  | Inflow   | Balance  | Lateral | Total   | Time of Max |      |
| Volume  | Volume   | Error    | Inflow  | Inflow  | Occurrence  |      |
| Node    | Node     | Type     | CFS     | CFS     | days hr:min | 10^6 |
| gal     | 10^6 gal | Percent  |         |         |             |      |
| DP-1    |          | JUNCTION | 15.53   | 15.53   | 0 00:45     |      |
| 0.273   | 0.273    | 0.000    |         |         |             |      |
| JW3     |          | JUNCTION | 8.25    | 221.26  | 0 00:53     |      |
| 0.218   | 6.04     | -0.000   |         |         |             |      |
| J-W3    |          | JUNCTION | 0.00    | 15.46   | 0 00:46     |      |
| 0       | 0.273    | 0.000    |         |         |             |      |
| DP-3    |          | JUNCTION | 44.90   | 61.43   | 0 00:46     |      |
| 0.918   | 1.23     | 0.000    |         |         |             |      |
| DP-2    |          | JUNCTION | 18.58   | 18.58   | 0 00:45     |      |
| 0.311   | 0.311    | 0.000    |         |         |             |      |
| JW2     |          | JUNCTION | 13.70   | 238.03  | 0 00:49     |      |
| 0.304   | 5.8      | 0.000    |         |         |             |      |
| DP-6    |          | JUNCTION | 4.47    | 4.47    | 0 00:45     |      |
| 0.063   | 0.063    | 0.000    |         |         |             |      |
| J23     |          | JUNCTION | 35.17   | 40.41   | 0 00:49     |      |
| 0.716   | 0.965    | 0.000    |         |         |             |      |
| DP-15   |          | JUNCTION | 39.34   | 99.95   | 0 00:51     |      |
| 0.781   | 3.03     | 0.000    |         |         |             |      |
| DP-10   |          | JUNCTION | 15.56   | 15.56   | 0 00:45     |      |
| 0.287   | 0.287    | 0.000    |         |         |             |      |
| JW1     |          | JUNCTION | 6.69    | 235.40  | 0 00:47     |      |
| 0.0937  | 5.49     | 0.000    |         |         |             |      |
| DP-16   |          | JUNCTION | 246.13  | 246.13  | 0 00:45     |      |
| 5.4     | 5.4      | 0.000    |         |         |             |      |
| DP-11   |          | JUNCTION | 11.41   | 11.41   | 0 00:45     |      |
| 0.23    | 0.23     | 0.000    |         |         |             |      |
| J29     |          | JUNCTION | 0.00    | 4.47    | 0 00:46     |      |
| 0       | 0.0629   | 0.000    |         |         |             |      |

|        |        |           |       |        |   |       |
|--------|--------|-----------|-------|--------|---|-------|
| J30    |        | JUNCTION  | 0.00  | 23.45  | 0 | 00:50 |
| 0      | 0.517  | 0.000     |       |        |   |       |
| J31    |        | JUNCTION  | 0.00  | 111.98 | 0 | 00:52 |
| 0      | 3.19   | 0.000     |       |        |   |       |
| DP-7   |        | JUNCTION  | 12.08 | 15.27  | 0 | 00:47 |
| 0.185  | 0.248  | 0.000     |       |        |   |       |
| J33    |        | JUNCTION  | 0.00  | 15.07  | 0 | 00:49 |
| 0      | 0.248  | 0.000     |       |        |   |       |
| DP-23  |        | JUNCTION  | 20.33 | 20.33  | 0 | 00:45 |
| 0.385  | 0.385  | 0.000     |       |        |   |       |
| J35    |        | JUNCTION  | 0.00  | 0.00   | 0 | 00:00 |
| 0      | 0      | 0.000 gal |       |        |   |       |
| J36    |        | JUNCTION  | 0.00  | 0.00   | 0 | 00:00 |
| 0      | 0      | 0.000 gal |       |        |   |       |
| J38    |        | JUNCTION  | 0.00  | 11.32  | 0 | 00:46 |
| 0      | 0.23   | -0.000    |       |        |   |       |
| J39    |        | JUNCTION  | 0.00  | 10.61  | 0 | 00:48 |
| 0      | 0.23   | 0.000     |       |        |   |       |
| J40    |        | JUNCTION  | 0.00  | 10.47  | 0 | 00:49 |
| 0      | 0.23   | 0.000     |       |        |   |       |
| DP-12  |        | JUNCTION  | 38.26 | 38.26  | 0 | 01:10 |
| 1.41   | 1.41   | 0.000     |       |        |   |       |
| DP-13  |        | JUNCTION  | 15.60 | 48.12  | 0 | 00:47 |
| 0.316  | 1.73   | 0.000     |       |        |   |       |
| J43    |        | JUNCTION  | 0.00  | 48.10  | 0 | 00:48 |
| 0      | 1.73   | 0.000     |       |        |   |       |
| J44    |        | JUNCTION  | 0.00  | 40.33  | 0 | 00:50 |
| 0      | 0.965  | -0.000    |       |        |   |       |
| J45    |        | JUNCTION  | 0.00  | 111.90 | 0 | 00:53 |
| 0      | 3.19   | 0.000     |       |        |   |       |
| DP-9   |        | JUNCTION  | 4.48  | 4.48   | 0 | 00:45 |
| 0.0704 | 0.0704 | 0.000     |       |        |   |       |
| J47    |        | JUNCTION  | 0.00  | 4.47   | 0 | 00:46 |
| 0      | 0.0703 | 0.000     |       |        |   |       |
| DP-8   |        | JUNCTION  | 0.00  | 40.13  | 0 | 00:55 |
| 0      | 0.966  | 0.000     |       |        |   |       |
| J49    |        | JUNCTION  | 0.00  | 151.16 | 0 | 00:55 |
| 0      | 4.16   | 0.000     |       |        |   |       |
| J50    |        | JUNCTION  | 10.33 | 10.33  | 0 | 00:45 |
| 0.0988 | 0.0988 | 0.000     |       |        |   |       |
| J51    |        | JUNCTION  | 0.00  | 9.62   | 0 | 00:47 |
| 0      | 0.0989 | 0.000     |       |        |   |       |
| DP-14  |        | JUNCTION  | 4.25  | 12.44  | 0 | 00:50 |
| 0.0694 | 0.168  | 0.000     |       |        |   |       |
| J53    |        | JUNCTION  | 0.00  | 12.43  | 0 | 00:50 |
| 0      | 0.168  | 0.000     |       |        |   |       |
| DP-18  |        | JUNCTION  | 5.82  | 5.82   | 0 | 00:55 |
| 0.108  | 0.108  | 0.000     |       |        |   |       |
| DP-21  |        | JUNCTION  | 0.00  | 22.20  | 0 | 00:50 |
| 0      | 0.506  | 0.000     |       |        |   |       |
| J56    |        | JUNCTION  | 0.00  | 22.18  | 0 | 00:50 |
| 0      | 0.506  | 0.000     |       |        |   |       |
| DP-22  |        | JUNCTION  | 35.29 | 59.47  | 0 | 01:03 |
| 0.722  | 1.76   | 0.000     |       |        |   |       |

|        |        |          |       |        |   |       |
|--------|--------|----------|-------|--------|---|-------|
| J58    |        | JUNCTION | 0.00  | 59.47  | 0 | 01:03 |
| 0      | 1.76   | 0.000    |       |        |   |       |
| DP-20  |        | JUNCTION | 5.51  | 5.51   | 0 | 00:50 |
| 0.0713 | 0.0713 | 0.000    |       |        |   |       |
| J61    |        | JUNCTION | 0.00  | 5.45   | 0 | 00:52 |
| 0      | 0.0714 | 0.000    |       |        |   |       |
| J62    |        | JUNCTION | 21.74 | 22.56  | 0 | 00:48 |
| 0.435  | 0.506  | 0.000    |       |        |   |       |
| DP-36  |        | JUNCTION | 30.26 | 33.47  | 0 | 00:55 |
| 0.744  | 0.789  | 0.000    |       |        |   |       |
| J64    |        | JUNCTION | 4.03  | 4.03   | 0 | 00:45 |
| 0.0454 | 0.0454 | 0.000    |       |        |   |       |
| DP-42  |        | JUNCTION | 60.86 | 69.02  | 0 | 00:55 |
| 1.19   | 1.92   | 0.000    |       |        |   |       |
| DP-44  |        | JUNCTION | 27.59 | 106.04 | 0 | 00:50 |
| 0.542  | 2.89   | 0.000    |       |        |   |       |
| DP-27  |        | JUNCTION | 65.09 | 101.01 | 0 | 01:03 |
| 1.32   | 3.08   | 0.000    |       |        |   |       |
| DP-35  |        | JUNCTION | 9.25  | 9.25   | 0 | 00:45 |
| 0.161  | 0.161  | 0.000    |       |        |   |       |
| DP-31  |        | JUNCTION | 10.94 | 235.29 | 0 | 00:46 |
| 0.2    | 9.37   | 0.000    |       |        |   |       |
| DP-33  |        | JUNCTION | 24.42 | 36.34  | 0 | 00:47 |
| 0.471  | 0.772  | 0.000    |       |        |   |       |
| DP-37  |        | JUNCTION | 13.14 | 43.92  | 0 | 00:56 |
| 0.243  | 1.03   | 0.000    |       |        |   |       |
| DP-28  |        | JUNCTION | 71.91 | 183.60 | 0 | 01:04 |
| 1.47   | 5.64   | 0.000    |       |        |   |       |
| DP-19  |        | JUNCTION | 15.24 | 15.24  | 0 | 00:55 |
| 0.407  | 0.407  | 0.000    |       |        |   |       |
| J74    |        | JUNCTION | 0.00  | 20.91  | 0 | 00:57 |
| 0      | 0.515  | 0.000    |       |        |   |       |
| J75    |        | JUNCTION | 0.00  | 21.77  | 0 | 00:46 |
| 0      | 0.409  | 0.000    |       |        |   |       |
| J76    |        | JUNCTION | 9.02  | 27.72  | 0 | 00:50 |
| 0.21   | 0.619  | 0.000    |       |        |   |       |
| DP-24  |        | JUNCTION | 2.50  | 2.50   | 0 | 00:45 |
| 0.0244 | 0.0244 | 0.000    |       |        |   |       |
| J78    |        | JUNCTION | 0.00  | 2.48   | 0 | 00:46 |
| 0      | 0.0244 | 0.000    |       |        |   |       |
| DP-25  |        | JUNCTION | 28.46 | 52.22  | 0 | 00:49 |
| 0.607  | 1.3    | 0.000    |       |        |   |       |
| J80    |        | JUNCTION | 23.57 | 75.36  | 0 | 00:48 |
| 0.479  | 1.86   | 0.000    |       |        |   |       |
| J81    |        | JUNCTION | 0.00  | 357.53 | 0 | 01:03 |
| 0      | 10.8   | 0.000    |       |        |   |       |
| DP-26  |        | JUNCTION | 4.43  | 4.43   | 0 | 00:55 |
| 0.0801 | 0.0801 | 0.000    |       |        |   |       |
| DP-30  |        | JUNCTION | 12.46 | 225.07 | 0 | 00:45 |
| 0.224  | 9.17   | -0.000   |       |        |   |       |
| J82    |        | JUNCTION | 0.00  | 101.01 | 0 | 01:03 |
| 0      | 3.08   | 0.000    |       |        |   |       |
| DP-29  |        | JUNCTION | 12.62 | 109.34 | 0 | 01:03 |
| 0.255  | 3.33   | 0.000    |       |        |   |       |

|                    |        |          |       |        |   |       |
|--------------------|--------|----------|-------|--------|---|-------|
| DP-32              |        | JUNCTION | 15.61 | 15.61  | 0 | 00:45 |
| 0.301              | 0.301  | 0.000    |       |        |   |       |
| DP-34              |        | JUNCTION | 33.99 | 295.44 | 0 | 00:50 |
| 0.629              | 10.8   | 0.000    |       |        |   |       |
| POND1-E-OUTFALL-NW |        | JUNCTION | 0.00  | 303.60 | 0 | 00:50 |
| 0                  | 10.9   | 0.000    |       |        |   |       |
| J84                |        | JUNCTION | 0.00  | 36.29  | 0 | 00:47 |
| 0                  | 0.772  | 0.000    |       |        |   |       |
| DP-38              |        | JUNCTION | 9.02  | 9.02   | 0 | 00:55 |
| 0.173              | 0.173  | 0.000    |       |        |   |       |
| DP-40              |        | JUNCTION | 3.64  | 3.64   | 0 | 00:55 |
| 0.066              | 0.066  | 0.000    |       |        |   |       |
| DP-39              |        | JUNCTION | 23.83 | 25.42  | 0 | 00:56 |
| 0.485              | 0.659  | 0.000    |       |        |   |       |
| J86                |        | JUNCTION | 0.00  | 25.42  | 0 | 00:56 |
| 0                  | 0.659  | 0.000    |       |        |   |       |
| DP-41              |        | JUNCTION | 0.00  | 29.01  | 0 | 00:57 |
| 0                  | 0.725  | 0.000    |       |        |   |       |
| J88                |        | JUNCTION | 0.00  | 29.01  | 0 | 00:57 |
| 0                  | 0.724  | 0.000    |       |        |   |       |
| J89                |        | JUNCTION | 0.00  | 68.97  | 0 | 00:56 |
| 0                  | 1.91   | 0.000    |       |        |   |       |
| DP-43              |        | JUNCTION | 21.06 | 21.06  | 0 | 00:45 |
| 0.428              | 0.428  | 0.000    |       |        |   |       |
| J91                |        | JUNCTION | 0.00  | 20.83  | 0 | 00:46 |
| 0                  | 0.428  | 0.000    |       |        |   |       |
| J92                |        | JUNCTION | 0.00  | 106.06 | 0 | 00:50 |
| 0                  | 2.88   | 0.000    |       |        |   |       |
| J93                |        | JUNCTION | 18.65 | 18.65  | 0 | 00:45 |
| 0.377              | 0.377  | -0.000   |       |        |   |       |
| J94                |        | JUNCTION | 0.00  | 16.03  | 0 | 00:49 |
| 0                  | 0.378  | 0.000    |       |        |   |       |
| DP-46              |        | JUNCTION | 31.35 | 128.16 | 0 | 00:55 |
| 0.63               | 3.51   | -0.000   |       |        |   |       |
| J96                |        | JUNCTION | 0.00  | 128.15 | 0 | 00:55 |
| 0                  | 3.51   | -0.000   |       |        |   |       |
| J97                |        | JUNCTION | 23.27 | 31.90  | 0 | 00:52 |
| 0.475              | 0.901  | 0.000    |       |        |   |       |
| DP-48              |        | JUNCTION | 21.75 | 175.75 | 0 | 00:56 |
| 0.428              | 4.84   | 0.000    |       |        |   |       |
| DP-47              |        | JUNCTION | 0.00  | 31.38  | 0 | 00:56 |
| 0                  | 0.902  | 0.000    |       |        |   |       |
| POND1-E-OUTFALL-NE |        | JUNCTION | 0.00  | 164.30 | 0 | 00:54 |
| 0                  | 4.71   | 0.000    |       |        |   |       |
| POND1-E-OUTFALL-SW |        | JUNCTION | 0.00  | 43.90  | 0 | 00:56 |
| 0                  | 1.03   | 0.000    |       |        |   |       |
| DP-45              |        | JUNCTION | 2.68  | 2.68   | 0 | 00:50 |
| 0.0473             | 0.0473 | 0.000    |       |        |   |       |
| CREEK-OUTFALL-2    |        | OUTFALL  | 29.79 | 29.79  | 0 | 00:45 |
| 0.588              | 0.588  | 0.000    |       |        |   |       |
| POND2-WEST         |        | OUTFALL  | 19.59 | 19.59  | 0 | 00:45 |
| 0.337              | 0.337  | 0.000    |       |        |   |       |
| POND1-EAST         |        | OUTFALL  | 24.08 | 526.55 | 0 | 00:55 |
| 0.514              | 17.2   | 0.000    |       |        |   |       |

|                       |        |         |       |        |   |       |
|-----------------------|--------|---------|-------|--------|---|-------|
| Out11                 |        | OUTFALL | 20.49 | 20.49  | 0 | 00:45 |
| 0.41                  | 0.41   | 0.000   |       |        |   |       |
| Out13                 |        | OUTFALL | 6.34  | 6.34   | 0 | 00:45 |
| 0.114                 | 0.114  | 0.000   |       |        |   |       |
| Out14                 |        | OUTFALL | 9.04  | 9.04   | 0 | 00:45 |
| 0.168                 | 0.168  | 0.000   |       |        |   |       |
| Out15                 |        | OUTFALL | 7.15  | 7.15   | 0 | 00:45 |
| 0.111                 | 0.111  | 0.000   |       |        |   |       |
| Out16                 |        | OUTFALL | 2.59  | 2.59   | 0 | 00:50 |
| 0.0363                | 0.0363 | 0.000   |       |        |   |       |
| DP-4-POND1-WEST       |        | OUTFALL | 18.30 | 79.94  | 0 | 00:46 |
| 0.374                 | 1.88   | 0.000   |       |        |   |       |
| DP-17-CREEK-OUTFALL-1 |        | OUTFALL | 0.00  | 214.23 | 0 | 00:56 |
| 0                     | 6.04   | 0.000   |       |        |   |       |

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Node Flooding Summary  
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Flooding refers to all water that overflows a node, whether it ponds or not.

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|                 |         |         |             | Total         |
|-----------------|---------|---------|-------------|---------------|
| Maximum         |         | Maximum | Time of Max | Flood         |
| Ponded          |         |         |             |               |
| Volume          | Hours   | Rate    | Occurrence  | Volume        |
| Node            | Flooded | CFS     | days hr:min | 10^6 gal 1000 |
| ft <sup>3</sup> |         |         |             |               |
| -----           |         |         |             |               |
| ---             |         |         |             |               |
| J81             | 0.83    | 144.92  | 0 01:03     | 1.879         |
| 0.000           |         |         |             |               |
| DP-48           | 0.38    | 23.80   | 0 00:56     | 0.151         |
| 0.000           |         |         |             |               |

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Outfall Loading Summary  
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|                 | Flow  | Avg    | Max    | Total    |
|-----------------|-------|--------|--------|----------|
| Outfall Node    | Freq  | Flow   | Flow   | Volume   |
|                 | Pcnt  | CFS    | CFS    | 10^6 gal |
| -----           |       |        |        |          |
| CREEK-OUTFALL-2 | 56.39 | 6.46   | 29.79  | 0.588    |
| POND2-WEST      | 43.89 | 4.75   | 19.59  | 0.337    |
| POND1-EAST      | 98.47 | 108.01 | 526.55 | 17.184   |
| Out11           | 55.14 | 4.61   | 20.49  | 0.410    |
| Out13           | 39.17 | 1.80   | 6.34   | 0.114    |

|                       |       |       |        |       |
|-----------------------|-------|-------|--------|-------|
| Out14                 | 40.83 | 2.54  | 9.04   | 0.168 |
| Out15                 | 37.92 | 1.81  | 7.15   | 0.111 |
| Out16                 | 34.17 | 0.66  | 2.59   | 0.036 |
| DP-4-POND1-WEST       | 98.47 | 11.81 | 79.94  | 1.878 |
| DP-17-CREEK-OUTFALL-1 | 92.50 | 40.42 | 214.23 | 6.040 |

|        |       |        |        |        |
|--------|-------|--------|--------|--------|
| System | 59.69 | 182.85 | 884.62 | 26.867 |
|--------|-------|--------|--------|--------|

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Link Flow Summary  
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| Max/<br>Full<br>Link<br>Depth | Type    | Maximum<br> Flow <br>CFS | Time of Max<br>Occurrence<br>days hr:min | Maximum<br> Veloc <br>ft/sec | Max/<br>Full<br>Flow |
|-------------------------------|---------|--------------------------|------------------------------------------|------------------------------|----------------------|
| CW-1                          | CONDUIT | 15.46                    | 0 00:46                                  | 6.40                         | 0.49                 |
| LW-2                          | CONDUIT | 11.79                    | 0 01:02                                  | 3.58                         | 0.22                 |
| CE-1                          | CONDUIT | 4.47                     | 0 00:46                                  | 4.22                         | 0.29                 |
| CE-4                          | CONDUIT | 15.50                    | 0 00:46                                  | 5.80                         | 0.56                 |
| LE-2                          | CONDUIT | 4.15                     | 0 00:50                                  | 2.70                         | 0.04                 |
| C25                           | CONDUIT | 0.00                     | 0 00:00                                  | 0.00                         | 0.00                 |
| C26                           | CONDUIT | 23.19                    | 0 00:53                                  | 4.57                         | 0.22                 |
| C27                           | CONDUIT | 0.00                     | 0 00:00                                  | 0.00                         | 0.00                 |
| CE-2                          | CONDUIT | 15.07                    | 0 00:49                                  | 1.72                         | 0.20                 |
| CE-5                          | CONDUIT | 11.32                    | 0 00:46                                  | 3.88                         | 0.08                 |
| C32                           | CONDUIT | 10.61                    | 0 00:48                                  | 2.50                         | 0.18                 |
| C33                           | CONDUIT | 10.47                    | 0 00:49                                  | 1.91                         | 0.18                 |
| C34                           | CONDUIT | 10.26                    | 0 00:51                                  | 3.05                         | 0.13                 |
| C35                           | CONDUIT | 38.21                    | 0 01:11                                  | 3.35                         | 0.28                 |
| CE-6                          | CONDUIT | 48.10                    | 0 00:48                                  | 6.32                         | 0.87                 |



|       |         |        |   |       |       |      |
|-------|---------|--------|---|-------|-------|------|
| C37   | CONDUIT | 47.65  | 0 | 01:12 | 5.84  | 0.41 |
| 0.72  |         |        |   |       |       |      |
| CE-7  | CONDUIT | 99.97  | 0 | 00:51 | 7.00  | 0.49 |
| 0.50  |         |        |   |       |       |      |
| LE-4  | CONDUIT | 40.33  | 0 | 00:50 | 2.62  | 0.49 |
| 0.72  |         |        |   |       |       |      |
| LE-5  | CONDUIT | 40.13  | 0 | 00:55 | 2.42  | 0.55 |
| 0.76  |         |        |   |       |       |      |
| CE-3  | CONDUIT | 40.13  | 0 | 00:55 | 6.12  | 0.73 |
| 0.63  |         |        |   |       |       |      |
| CE-9  | CONDUIT | 4.47   | 0 | 00:46 | 4.22  | 0.29 |
| 0.37  |         |        |   |       |       |      |
| C43   | CONDUIT | 111.90 | 0 | 00:53 | 3.31  | 0.92 |
| 0.96  |         |        |   |       |       |      |
| C44   | CONDUIT | 111.04 | 0 | 00:55 | 2.85  | 0.80 |
| 0.88  |         |        |   |       |       |      |
| C45   | CONDUIT | 9.62   | 0 | 00:47 | 1.50  | 0.31 |
| 0.64  |         |        |   |       |       |      |
| CE-8  | CONDUIT | 12.43  | 0 | 00:50 | 5.47  | 0.45 |
| 0.47  |         |        |   |       |       |      |
| C47   | CONDUIT | 8.66   | 0 | 00:50 | 2.17  | 0.18 |
| 0.52  |         |        |   |       |       |      |
| C48   | CONDUIT | 12.18  | 0 | 00:52 | 5.04  | 0.08 |
| 0.39  |         |        |   |       |       |      |
| CE-10 | CONDUIT | 22.18  | 0 | 00:50 | 6.25  | 0.80 |
| 0.68  |         |        |   |       |       |      |
| C50   | CONDUIT | 22.03  | 0 | 00:58 | 3.82  | 0.26 |
| 0.60  |         |        |   |       |       |      |
| CE-11 | CONDUIT | 59.47  | 0 | 01:03 | 6.11  | 0.72 |
| 0.63  |         |        |   |       |       |      |
| C52   | CONDUIT | 5.45   | 0 | 00:52 | 2.19  | 0.04 |
| 0.29  |         |        |   |       |       |      |
| C53   | CONDUIT | 5.42   | 0 | 00:53 | 1.62  | 0.12 |
| 0.46  |         |        |   |       |       |      |
| J63'  | CONDUIT | 22.20  | 0 | 00:50 | 1.86  | 0.69 |
| 0.87  |         |        |   |       |       |      |
| C55   | CONDUIT | 19.29  | 0 | 01:14 | 2.59  | 0.20 |
| 0.54  |         |        |   |       |       |      |
| C56   | CONDUIT | 3.23   | 0 | 00:54 | 2.89  | 0.03 |
| 0.27  |         |        |   |       |       |      |
| C57   | CONDUIT | 33.32  | 0 | 00:56 | 3.93  | 0.43 |
| 0.73  |         |        |   |       |       |      |
| C61   | CONDUIT | 59.23  | 0 | 01:06 | 4.86  | 0.70 |
| 0.88  |         |        |   |       |       |      |
| C70   | CONDUIT | 142.88 | 0 | 01:05 | 4.50  | 0.86 |
| 0.93  |         |        |   |       |       |      |
| CW-3  | CONDUIT | 18.14  | 0 | 00:46 | 6.99  | 0.54 |
| 0.52  |         |        |   |       |       |      |
| CW-4  | CONDUIT | 61.49  | 0 | 00:46 | 10.73 | 0.92 |
| 0.76  |         |        |   |       |       |      |
| LE-3  | CONDUIT | 14.61  | 0 | 00:53 | 2.86  | 0.22 |
| 0.57  |         |        |   |       |       |      |
| C72   | CONDUIT | 5.82   | 0 | 00:56 | 2.53  | 0.03 |
| 0.28  |         |        |   |       |       |      |

|       |         |        |   |       |       |      |
|-------|---------|--------|---|-------|-------|------|
| C73   | CONDUIT | 15.15  | 0 | 00:57 | 1.68  | 0.14 |
| 0.48  |         |        |   |       |       |      |
| CE-13 | CONDUIT | 2.48   | 0 | 00:46 | 2.03  | 0.03 |
| 0.28  |         |        |   |       |       |      |
| C75   | CONDUIT | 2.28   | 0 | 00:49 | 2.11  | 0.03 |
| 0.26  |         |        |   |       |       |      |
| CE-12 | CONDUIT | 20.20  | 0 | 00:46 | 3.43  | 0.27 |
| 0.61  |         |        |   |       |       |      |
| C77   | CONDUIT | 19.35  | 0 | 00:50 | 2.95  | 0.32 |
| 0.65  |         |        |   |       |       |      |
| C78   | CONDUIT | 3.59   | 0 | 01:00 | 2.95  | 0.05 |
| 0.32  |         |        |   |       |       |      |
| C79   | CONDUIT | 27.71  | 0 | 00:50 | 10.83 | 0.09 |
| 0.40  |         |        |   |       |       |      |
| CE-14 | CONDUIT | 52.20  | 0 | 00:49 | 6.39  | 0.95 |
| 0.78  |         |        |   |       |       |      |
| C80   | CONDUIT | 4.44   | 0 | 00:56 | 2.95  | 0.01 |
| 0.20  |         |        |   |       |       |      |
| C81   | CONDUIT | 75.38  | 0 | 00:48 | 4.74  | 0.99 |
| 1.00  |         |        |   |       |       |      |
| CE-16 | CONDUIT | 183.56 | 0 | 01:04 | 6.96  | 0.75 |
| 0.65  |         |        |   |       |       |      |
| C83   | CONDUIT | 212.61 | 0 | 00:45 | 5.93  | 1.00 |
| 1.00  |         |        |   |       |       |      |
| C84   | CONDUIT | 224.69 | 0 | 00:46 | 5.16  | 0.57 |
| 0.76  |         |        |   |       |       |      |
| CE-15 | CONDUIT | 101.01 | 0 | 01:03 | 6.96  | 0.75 |
| 0.65  |         |        |   |       |       |      |
| C86   | CONDUIT | 101.01 | 0 | 01:03 | 13.45 | 0.36 |
| 0.69  |         |        |   |       |       |      |
| CE-17 | CONDUIT | 109.34 | 0 | 01:03 | 6.47  | 0.90 |
| 0.74  |         |        |   |       |       |      |
| CE-19 | CONDUIT | 295.54 | 0 | 00:50 | 21.06 | 0.62 |
| 0.57  |         |        |   |       |       |      |
| CE-20 | CONDUIT | 9.23   | 0 | 00:46 | 11.35 | 0.20 |
| 0.31  |         |        |   |       |       |      |
| C89   | CONDUIT | 14.23  | 0 | 00:49 | 2.30  | 0.29 |
| 0.63  |         |        |   |       |       |      |
| C90   | CONDUIT | 34.70  | 0 | 00:51 | 4.37  | 0.40 |
| 0.71  |         |        |   |       |       |      |
| C91   | CONDUIT | 232.85 | 0 | 00:50 | 7.03  | 0.39 |
| 0.63  |         |        |   |       |       |      |
| CE-18 | CONDUIT | 36.29  | 0 | 00:47 | 5.99  | 0.66 |
| 0.59  |         |        |   |       |       |      |
| C92   | CONDUIT | 302.55 | 0 | 00:52 | 3.36  | 0.35 |
| 0.67  |         |        |   |       |       |      |
| C93   | CONDUIT | 8.73   | 0 | 00:59 | 4.08  | 0.10 |
| 0.42  |         |        |   |       |       |      |
| CE-22 | CONDUIT | 25.42  | 0 | 00:56 | 6.37  | 0.92 |
| 0.76  |         |        |   |       |       |      |
| C95   | CONDUIT | 3.64   | 0 | 00:56 | 1.90  | 0.03 |
| 0.26  |         |        |   |       |       |      |
| CE-23 | CONDUIT | 29.01  | 0 | 00:57 | 3.97  | 0.83 |
| 0.70  |         |        |   |       |       |      |

|       |         |        |   |       |       |      |
|-------|---------|--------|---|-------|-------|------|
| C97   | CONDUIT | 25.38  | 0 | 00:57 | 2.79  | 0.47 |
| 0.75  |         |        |   |       |       |      |
| C98   | CONDUIT | 28.74  | 0 | 01:01 | 2.50  | 0.65 |
| 0.85  |         |        |   |       |       |      |
| CE-25 | CONDUIT | 20.83  | 0 | 00:46 | 6.21  | 0.76 |
| 0.65  |         |        |   |       |       |      |
| C100  | CONDUIT | 19.30  | 0 | 00:48 | 3.80  | 0.23 |
| 0.57  |         |        |   |       |       |      |
| CE-26 | CONDUIT | 106.06 | 0 | 00:50 | 6.09  | 0.66 |
| 0.59  |         |        |   |       |       |      |
| C102  | CONDUIT | 16.03  | 0 | 00:49 | 3.46  | 0.21 |
| 0.56  |         |        |   |       |       |      |
| C103  | CONDUIT | 68.67  | 0 | 00:58 | 4.25  | 0.53 |
| 0.74  |         |        |   |       |       |      |
| CE-24 | CONDUIT | 68.97  | 0 | 00:56 | 6.29  | 0.83 |
| 0.70  |         |        |   |       |       |      |
| C105  | CONDUIT | 105.07 | 0 | 00:58 | 5.62  | 0.40 |
| 0.62  |         |        |   |       |       |      |
| C106  | CONDUIT | 14.66  | 0 | 00:52 | 3.82  | 0.16 |
| 0.49  |         |        |   |       |       |      |
| CE-27 | CONDUIT | 128.15 | 0 | 00:55 | 6.89  | 0.71 |
| 0.63  |         |        |   |       |       |      |
| C107  | CONDUIT | 127.92 | 0 | 00:58 | 4.80  | 0.66 |
| 0.81  |         |        |   |       |       |      |
| C108  | CONDUIT | 31.38  | 0 | 00:56 | 3.42  | 0.49 |
| 0.76  |         |        |   |       |       |      |
| CE-28 | CONDUIT | 31.39  | 0 | 00:56 | 5.79  | 0.57 |
| 0.54  |         |        |   |       |       |      |
| CE-29 | CONDUIT | 164.30 | 0 | 00:54 | 11.20 | 1.08 |
| 1.00  |         |        |   |       |       |      |
| C110  | CONDUIT | 43.90  | 0 | 00:56 | 9.87  | 0.18 |
| 0.53  |         |        |   |       |       |      |
| C111  | CONDUIT | 164.44 | 0 | 00:55 | 3.30  | 0.16 |
| 0.50  |         |        |   |       |       |      |
| C112  | CONDUIT | 43.79  | 0 | 00:58 | 2.09  | 0.05 |
| 0.32  |         |        |   |       |       |      |
| C113  | CONDUIT | 2.48   | 0 | 01:01 | 3.61  | 0.03 |
| 0.25  |         |        |   |       |       |      |
| C1    | CONDUIT | 228.97 | 0 | 00:47 | 4.21  | 0.47 |
| 0.67  |         |        |   |       |       |      |
| C2    | CONDUIT | 225.56 | 0 | 00:49 | 4.13  | 0.48 |
| 0.67  |         |        |   |       |       |      |
| C3    | CONDUIT | 213.24 | 0 | 00:53 | 3.89  | 0.48 |
| 0.67  |         |        |   |       |       |      |
| C4    | CONDUIT | 214.23 | 0 | 00:56 | 7.72  | 0.17 |
| 0.38  |         |        |   |       |       |      |

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 Conduit Surcharge Summary  
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| Hours    |         | Hours Full |          |          | Hours       |
|----------|---------|------------|----------|----------|-------------|
|          |         | -----      |          |          | Above Full  |
| Capacity | Conduit | Both Ends  | Upstream | Dnstream | Normal Flow |
| Limited  |         | -----      |          |          |             |
| -----    |         |            |          |          |             |
|          | C83     | 0.83       | 0.83     | 0.83     | 0.01        |
| 0.83     |         |            |          |          |             |
|          | CE-29   | 0.38       | 0.38     | 0.38     | 0.11        |
| 0.38     |         |            |          |          |             |

Analysis begun on: Wed May 13 14:23:17 2026  
 Analysis ended on: Wed May 13 14:23:17 2026  
 Total elapsed time: < 1 sec

TRIPLE H RANCH - 100-yr. Developed Conditions

Subcatchment Runoff Summary

| Subcatchment | Total<br>Precip<br>in | Total<br>Runon<br>in | Total<br>Evap<br>in | Total<br>Infil<br>in | Imperv<br>Runoff<br>in | Perv<br>Runoff<br>in | Total<br>Runoff<br>in | Total<br>Runoff<br>10^6 gal | Peak<br>Runoff<br>CFS | Runoff<br>Coeff |
|--------------|-----------------------|----------------------|---------------------|----------------------|------------------------|----------------------|-----------------------|-----------------------------|-----------------------|-----------------|
| E-A          | 2.75                  | 0.00                 | 0.00                | 1.80                 | 0.27                   | 0.68                 | 0.95                  | 0.23                        | 11.41                 | 0.347           |
| E-AA         | 2.75                  | 0.00                 | 0.00                | 1.82                 | 0.27                   | 0.66                 | 0.93                  | 0.48                        | 23.83                 | 0.338           |
| E-B          | 2.75                  | 0.00                 | 0.00                | 1.80                 | 0.27                   | 0.68                 | 0.95                  | 0.32                        | 15.60                 | 0.344           |
| E-BB         | 2.75                  | 0.00                 | 0.00                | 1.80                 | 0.30                   | 0.65                 | 0.95                  | 1.19                        | 60.86                 | 0.345           |
| E-C          | 2.75                  | 0.00                 | 0.00                | 1.67                 | 0.27                   | 0.81                 | 1.08                  | 0.29                        | 15.56                 | 0.392           |
| E-CC         | 2.75                  | 0.00                 | 0.00                | 1.82                 | 0.27                   | 0.66                 | 0.93                  | 0.43                        | 21.06                 | 0.339           |
| E-D          | 2.75                  | 0.00                 | 0.00                | 1.76                 | 0.27                   | 0.72                 | 0.99                  | 0.78                        | 39.34                 | 0.361           |
| E-DD         | 2.75                  | 0.00                 | 0.00                | 1.95                 | 0.27                   | 0.52                 | 0.79                  | 0.38                        | 18.65                 | 0.289           |
| E-E          | 2.75                  | 0.00                 | 0.00                | 1.83                 | 0.27                   | 0.65                 | 0.92                  | 0.72                        | 35.17                 | 0.335           |
| E-EE         | 2.75                  | 0.00                 | 0.00                | 1.74                 | 0.27                   | 0.74                 | 1.01                  | 0.54                        | 27.59                 | 0.367           |
| E-F          | 2.75                  | 0.00                 | 0.00                | 1.54                 | 0.27                   | 0.95                 | 1.22                  | 0.06                        | 4.47                  | 0.444           |
| E-FF         | 2.75                  | 0.00                 | 0.00                | 1.59                 | 0.22                   | 0.95                 | 1.17                  | 0.11                        | 7.15                  | 0.424           |
| E-G          | 2.75                  | 0.00                 | 0.00                | 1.56                 | 0.30                   | 0.90                 | 1.20                  | 0.19                        | 12.08                 | 0.435           |
| E-GG         | 2.75                  | 0.00                 | 0.00                | 1.78                 | 0.27                   | 0.70                 | 0.97                  | 0.63                        | 31.35                 | 0.351           |
| E-H          | 2.75                  | 0.00                 | 0.00                | 1.58                 | 0.27                   | 0.91                 | 1.18                  | 0.07                        | 4.48                  | 0.428           |
| E-HH         | 2.75                  | 0.00                 | 0.00                | 1.92                 | 0.27                   | 0.56                 | 0.83                  | 0.47                        | 23.27                 | 0.303           |
| E-I          | 2.75                  | 0.00                 | 0.00                | 1.72                 | 0.30                   | 0.74                 | 1.03                  | 0.38                        | 20.33                 | 0.376           |
| E-II         | 2.75                  | 0.00                 | 0.00                | 1.75                 | 0.27                   | 0.74                 | 1.00                  | 0.43                        | 21.75                 | 0.365           |
| E-J          | 2.75                  | 0.00                 | 0.00                | 1.45                 | 0.27                   | 1.05                 | 1.32                  | 0.02                        | 2.50                  | 0.480           |
| E-JJ         | 2.75                  | 0.00                 | 0.00                | 1.65                 | 0.22                   | 0.89                 | 1.10                  | 0.11                        | 6.34                  | 0.401           |
| E-K          | 2.75                  | 0.00                 | 0.00                | 1.82                 | 0.16                   | 0.77                 | 0.93                  | 0.21                        | 9.02                  | 0.339           |
| E-KK         | 2.75                  | 0.00                 | 0.00                | 1.77                 | 0.27                   | 0.71                 | 0.97                  | 0.41                        | 20.49                 | 0.354           |
| E-L          | 2.75                  | 0.00                 | 0.00                | 1.86                 | 0.24                   | 0.65                 | 0.89                  | 0.61                        | 28.46                 | 0.324           |
| E-LL         | 2.75                  | 0.00                 | 0.00                | 1.67                 | 0.22                   | 0.87                 | 1.08                  | 0.17                        | 9.04                  | 0.394           |

**TRIPLE H RANCH - 100-yr. Developed Conditions**

| Subcatchment | Total<br>Precip<br>in | Total<br>Runon<br>in | Total<br>Evap<br>in | Total<br>Infil<br>in | Imperv<br>Runoff<br>in | Perv<br>Runoff<br>in | Total<br>Runoff<br>in | Total<br>Runoff<br>10^6 gal | Peak<br>Runoff<br>CFS | Runoff<br>Coeff |
|--------------|-----------------------|----------------------|---------------------|----------------------|------------------------|----------------------|-----------------------|-----------------------------|-----------------------|-----------------|
| E-M          | 2.75                  | 0.00                 | 0.00                | 1.82                 | 0.27                   | 0.66                 | 0.93                  | 0.48                        | 23.57                 | 0.338           |
| E-N          | 2.75                  | 0.00                 | 0.00                | 1.59                 | 0.27                   | 0.89                 | 1.16                  | 0.07                        | 4.25                  | 0.422           |
| E-O          | 2.75                  | 0.00                 | 0.00                | 1.77                 | 0.27                   | 0.71                 | 0.98                  | 0.43                        | 21.74                 | 0.355           |
| E-P          | 2.75                  | 0.00                 | 0.00                | 1.88                 | 0.27                   | 0.60                 | 0.87                  | 0.72                        | 35.29                 | 0.317           |
| E-Q          | 2.75                  | 0.00                 | 0.00                | 1.83                 | 0.27                   | 0.65                 | 0.92                  | 0.62                        | 30.42                 | 0.335           |
| E-R          | 2.75                  | 0.00                 | 0.00                | 1.92                 | 0.27                   | 0.56                 | 0.83                  | 1.47                        | 71.91                 | 0.301           |
| E-S          | 2.75                  | 0.00                 | 0.00                | 1.78                 | 0.27                   | 0.70                 | 0.97                  | 0.70                        | 34.68                 | 0.352           |
| E-T1         | 2.75                  | 0.00                 | 0.00                | 1.79                 | 0.27                   | 0.69                 | 0.96                  | 0.25                        | 12.62                 | 0.348           |
| E-U          | 2.75                  | 0.00                 | 0.00                | 1.72                 | 0.27                   | 0.76                 | 1.03                  | 0.47                        | 24.42                 | 0.376           |
| E-V          | 2.75                  | 0.00                 | 0.00                | 1.65                 | 0.27                   | 0.83                 | 1.10                  | 0.22                        | 12.46                 | 0.400           |
| E-W          | 2.75                  | 0.00                 | 0.00                | 1.73                 | 0.27                   | 0.75                 | 1.02                  | 0.42                        | 21.53                 | 0.370           |
| E-X          | 2.75                  | 0.00                 | 0.00                | 1.60                 | 0.30                   | 0.85                 | 1.15                  | 0.21                        | 12.47                 | 0.418           |
| W-G          | 2.75                  | 0.00                 | 0.00                | 1.80                 | 0.24                   | 0.70                 | 0.95                  | 0.55                        | 26.27                 | 0.344           |
| E-MM         | 2.75                  | 0.00                 | 0.00                | 1.48                 | 0.27                   | 1.02                 | 1.29                  | 0.05                        | 4.03                  | 0.468           |
| E-NN         | 2.75                  | 0.00                 | 0.00                | 1.67                 | 0.27                   | 0.81                 | 1.08                  | 0.24                        | 13.14                 | 0.392           |
| E-Y          | 2.75                  | 0.00                 | 0.00                | 1.63                 | 0.27                   | 0.85                 | 1.12                  | 0.16                        | 9.25                  | 0.408           |
| E-Z          | 2.75                  | 0.00                 | 0.00                | 1.86                 | 0.24                   | 0.64                 | 0.88                  | 0.51                        | 24.08                 | 0.321           |
| OS-1         | 2.75                  | 0.00                 | 0.00                | 1.94                 | 0.09                   | 0.73                 | 0.81                  | 0.22                        | 8.25                  | 0.295           |
| OS-10        | 2.75                  | 0.00                 | 0.00                | 1.75                 | 0.05                   | 0.96                 | 1.01                  | 0.07                        | 3.64                  | 0.368           |
| E-OO         | 2.75                  | 0.00                 | 0.00                | 1.65                 | 0.05                   | 1.06                 | 1.11                  | 0.04                        | 2.59                  | 0.405           |
| OS-11        | 2.75                  | 0.00                 | 0.00                | 1.74                 | 0.05                   | 0.97                 | 1.03                  | 0.05                        | 2.68                  | 0.373           |
| OS-12        | 2.75                  | 0.00                 | 0.00                | 1.74                 | 0.05                   | 0.96                 | 1.02                  | 0.08                        | 4.43                  | 0.370           |
| OS-13        | 2.75                  | 0.00                 | 0.00                | 1.67                 | 0.27                   | 0.82                 | 1.09                  | 0.20                        | 10.94                 | 0.395           |
| OS-14        | 2.75                  | 0.00                 | 0.00                | 1.85                 | 0.13                   | 0.77                 | 0.90                  | 0.74                        | 30.26                 | 0.329           |
| OS-2         | 2.75                  | 0.00                 | 0.00                | 1.86                 | 0.05                   | 0.84                 | 0.90                  | 0.30                        | 13.70                 | 0.325           |

TRIPLE H RANCH - 100-yr. Developed Conditions

| Subcatchment | Total<br>Precip<br>in | Total<br>Runon<br>in | Total<br>Evap<br>in | Total<br>Infil<br>in | Imperv<br>Runoff<br>in | Perv<br>Runoff<br>in | Total<br>Runoff<br>in | Total<br>Runoff<br>10^6 gal | Peak<br>Runoff<br>CFS | Runoff<br>Coeff |
|--------------|-----------------------|----------------------|---------------------|----------------------|------------------------|----------------------|-----------------------|-----------------------------|-----------------------|-----------------|
| OS-3         | 2.75                  | 0.00                 | 0.00                | 1.65                 | 0.05                   | 1.06                 | 1.11                  | 0.09                        | 6.69                  | 0.405           |
| OS-4         | 2.75                  | 0.00                 | 0.00                | 2.37                 | 0.13                   | 0.25                 | 0.38                  | 5.40                        | 246.13                | 0.139           |
| OS-5         | 2.75                  | 0.00                 | 0.00                | 2.26                 | 0.05                   | 0.43                 | 0.49                  | 1.41                        | 38.26                 | 0.178           |
| OS-6         | 2.75                  | 0.00                 | 0.00                | 1.76                 | 0.05                   | 0.94                 | 1.00                  | 0.11                        | 5.82                  | 0.363           |
| OS-7         | 2.75                  | 0.00                 | 0.00                | 1.98                 | 0.05                   | 0.72                 | 0.78                  | 0.41                        | 15.24                 | 0.282           |
| OS-8         | 2.75                  | 0.00                 | 0.00                | 1.63                 | 0.05                   | 1.09                 | 1.14                  | 0.07                        | 5.51                  | 0.415           |
| OS-9         | 2.75                  | 0.00                 | 0.00                | 1.78                 | 0.05                   | 0.93                 | 0.98                  | 0.17                        | 9.02                  | 0.357           |
| TANK-SITE    | 2.75                  | 0.00                 | 0.00                | 0.82                 | 1.35                   | 0.57                 | 1.92                  | 0.10                        | 10.33                 | 0.696           |
| W-A          | 2.75                  | 0.00                 | 0.00                | 1.64                 | 0.27                   | 0.85                 | 1.12                  | 0.27                        | 15.53                 | 0.406           |
| W-B          | 2.75                  | 0.00                 | 0.00                | 1.61                 | 0.27                   | 0.88                 | 1.15                  | 0.31                        | 18.58                 | 0.417           |
| W-C          | 2.75                  | 0.00                 | 0.00                | 1.85                 | 0.27                   | 0.63                 | 0.90                  | 0.92                        | 44.90                 | 0.328           |
| W-D          | 2.75                  | 0.00                 | 0.00                | 1.85                 | 0.27                   | 0.63                 | 0.90                  | 0.37                        | 18.30                 | 0.325           |
| W-E          | 2.75                  | 0.00                 | 0.00                | 1.63                 | 0.24                   | 0.89                 | 1.13                  | 0.34                        | 19.59                 | 0.410           |
| W-F          | 2.75                  | 0.00                 | 0.00                | 1.47                 | 0.27                   | 1.02                 | 1.29                  | 0.04                        | 3.51                  | 0.470           |
| E-T2         | 2.75                  | 0.00                 | 0.00                | 1.72                 | 0.27                   | 0.77                 | 1.04                  | 0.30                        | 15.61                 | 0.376           |

TRIPLE H RANCH - 100-yr. Developed Conditions

Node Inflow Summary

| Node  | Type     | Maximum<br>Lateral<br>Inflow<br>CFS | Maximum<br>Total<br>Inflow<br>CFS | Day of<br>Maximum<br>Inflow | Hour of<br>Maximum<br>Inflow | Lateral<br>Inflow<br>Volume<br>10^6 gal | Total<br>Inflow<br>Volume<br>10^6 gal | Flow<br>Balance<br>Error<br>% |
|-------|----------|-------------------------------------|-----------------------------------|-----------------------------|------------------------------|-----------------------------------------|---------------------------------------|-------------------------------|
| DP-1  | JUNCTION | 15.53                               | 15.53                             | 0                           | 00:45                        | 0.273                                   | 0.273                                 | 0.000                         |
| JW3   | JUNCTION | 8.25                                | 221.26                            | 0                           | 00:53                        | 0.218                                   | 6.04                                  | -0.000                        |
| J-W3  | JUNCTION | 0.00                                | 15.46                             | 0                           | 00:46                        | 0                                       | 0.273                                 | 0.000                         |
| DP-3  | JUNCTION | 44.90                               | 61.43                             | 0                           | 00:46                        | 0.918                                   | 1.23                                  | 0.000                         |
| DP-2  | JUNCTION | 18.58                               | 18.58                             | 0                           | 00:45                        | 0.311                                   | 0.311                                 | 0.000                         |
| JW2   | JUNCTION | 13.70                               | 238.03                            | 0                           | 00:49                        | 0.304                                   | 5.8                                   | 0.000                         |
| DP-6  | JUNCTION | 4.47                                | 4.47                              | 0                           | 00:45                        | 0.063                                   | 0.063                                 | 0.000                         |
| J23   | JUNCTION | 35.17                               | 40.41                             | 0                           | 00:49                        | 0.716                                   | 0.965                                 | 0.000                         |
| DP-15 | JUNCTION | 39.34                               | 99.95                             | 0                           | 00:51                        | 0.781                                   | 3.03                                  | 0.000                         |
| DP-10 | JUNCTION | 15.56                               | 15.56                             | 0                           | 00:45                        | 0.287                                   | 0.287                                 | 0.000                         |
| JW1   | JUNCTION | 6.69                                | 235.40                            | 0                           | 00:47                        | 0.0937                                  | 5.49                                  | 0.000                         |
| DP-16 | JUNCTION | 246.13                              | 246.13                            | 0                           | 00:45                        | 5.4                                     | 5.4                                   | 0.000                         |
| DP-11 | JUNCTION | 11.41                               | 11.41                             | 0                           | 00:45                        | 0.23                                    | 0.23                                  | 0.000                         |
| J29   | JUNCTION | 0.00                                | 4.47                              | 0                           | 00:46                        | 0                                       | 0.0629                                | 0.000                         |
| J30   | JUNCTION | 0.00                                | 23.45                             | 0                           | 00:50                        | 0                                       | 0.517                                 | 0.000                         |
| J31   | JUNCTION | 0.00                                | 111.98                            | 0                           | 00:52                        | 0                                       | 3.19                                  | 0.000                         |
| DP-7  | JUNCTION | 12.08                               | 15.27                             | 0                           | 00:47                        | 0.185                                   | 0.248                                 | 0.000                         |
| J33   | JUNCTION | 0.00                                | 15.07                             | 0                           | 00:49                        | 0                                       | 0.248                                 | 0.000                         |
| DP-23 | JUNCTION | 20.33                               | 20.33                             | 0                           | 00:45                        | 0.385                                   | 0.385                                 | 0.000                         |
| J35   | JUNCTION | 0.00                                | 0.00                              | 0                           | 00:00                        | 0                                       | 0                                     | 0.000                         |
| J36   | JUNCTION | 0.00                                | 0.00                              | 0                           | 00:00                        | 0                                       | 0                                     | 0.000                         |
| J38   | JUNCTION | 0.00                                | 11.32                             | 0                           | 00:46                        | 0                                       | 0.23                                  | -0.000                        |
| J39   | JUNCTION | 0.00                                | 10.61                             | 0                           | 00:48                        | 0                                       | 0.23                                  | 0.000                         |
| J40   | JUNCTION | 0.00                                | 10.47                             | 0                           | 00:49                        | 0                                       | 0.23                                  | 0.000                         |



TRIPLE H RANCH - 100-yr. Developed Conditions

| Node  | Type     | Maximum<br>Lateral<br>Inflow<br>CFS | Maximum<br>Total<br>Inflow<br>CFS | Day of<br>Maximum<br>Inflow | Hour of<br>Maximum<br>Inflow | Lateral<br>Inflow<br>Volume<br>10^6 gal | Total<br>Inflow<br>Volume<br>10^6 gal | Flow<br>Balance<br>Error<br>% |
|-------|----------|-------------------------------------|-----------------------------------|-----------------------------|------------------------------|-----------------------------------------|---------------------------------------|-------------------------------|
| DP-12 | JUNCTION | 38.26                               | 38.26                             | 0                           | 01:10                        | 1.41                                    | 1.41                                  | 0.000                         |
| DP-13 | JUNCTION | 15.60                               | 48.12                             | 0                           | 00:47                        | 0.316                                   | 1.73                                  | 0.000                         |
| J43   | JUNCTION | 0.00                                | 48.10                             | 0                           | 00:48                        | 0                                       | 1.73                                  | 0.000                         |
| J44   | JUNCTION | 0.00                                | 40.33                             | 0                           | 00:50                        | 0                                       | 0.965                                 | -0.000                        |
| J45   | JUNCTION | 0.00                                | 111.90                            | 0                           | 00:53                        | 0                                       | 3.19                                  | 0.000                         |
| DP-9  | JUNCTION | 4.48                                | 4.48                              | 0                           | 00:45                        | 0.0704                                  | 0.0704                                | 0.000                         |
| J47   | JUNCTION | 0.00                                | 4.47                              | 0                           | 00:46                        | 0                                       | 0.0703                                | 0.000                         |
| DP-8  | JUNCTION | 0.00                                | 40.13                             | 0                           | 00:55                        | 0                                       | 0.966                                 | 0.000                         |
| J49   | JUNCTION | 0.00                                | 151.16                            | 0                           | 00:55                        | 0                                       | 4.16                                  | 0.000                         |
| J50   | JUNCTION | 10.33                               | 10.33                             | 0                           | 00:45                        | 0.0988                                  | 0.0988                                | 0.000                         |
| J51   | JUNCTION | 0.00                                | 9.62                              | 0                           | 00:47                        | 0                                       | 0.0989                                | 0.000                         |
| DP-14 | JUNCTION | 4.25                                | 12.44                             | 0                           | 00:50                        | 0.0694                                  | 0.168                                 | 0.000                         |
| J53   | JUNCTION | 0.00                                | 12.43                             | 0                           | 00:50                        | 0                                       | 0.168                                 | 0.000                         |
| DP-18 | JUNCTION | 5.82                                | 5.82                              | 0                           | 00:55                        | 0.108                                   | 0.108                                 | 0.000                         |
| DP-21 | JUNCTION | 0.00                                | 22.20                             | 0                           | 00:50                        | 0                                       | 0.506                                 | 0.000                         |
| J56   | JUNCTION | 0.00                                | 22.18                             | 0                           | 00:50                        | 0                                       | 0.506                                 | 0.000                         |
| DP-22 | JUNCTION | 35.29                               | 59.47                             | 0                           | 01:03                        | 0.722                                   | 1.76                                  | 0.000                         |
| J58   | JUNCTION | 0.00                                | 59.47                             | 0                           | 01:03                        | 0                                       | 1.76                                  | 0.000                         |
| DP-20 | JUNCTION | 5.51                                | 5.51                              | 0                           | 00:50                        | 0.0713                                  | 0.0713                                | 0.000                         |
| J61   | JUNCTION | 0.00                                | 5.45                              | 0                           | 00:52                        | 0                                       | 0.0714                                | 0.000                         |
| J62   | JUNCTION | 21.74                               | 22.56                             | 0                           | 00:48                        | 0.435                                   | 0.506                                 | 0.000                         |
| DP-36 | JUNCTION | 30.26                               | 33.47                             | 0                           | 00:55                        | 0.744                                   | 0.789                                 | 0.000                         |
| J64   | JUNCTION | 4.03                                | 4.03                              | 0                           | 00:45                        | 0.0454                                  | 0.0454                                | 0.000                         |
| DP-42 | JUNCTION | 60.86                               | 69.02                             | 0                           | 00:55                        | 1.19                                    | 1.92                                  | 0.000                         |
| DP-44 | JUNCTION | 27.59                               | 106.04                            | 0                           | 00:50                        | 0.542                                   | 2.89                                  | 0.000                         |

TRIPLE H RANCH - 100-yr. Developed Conditions

| Node            | Type     | Maximum<br>Lateral<br>Inflow<br>CFS | Maximum<br>Total<br>Inflow<br>CFS | Day of<br>Maximum<br>Inflow | Hour of<br>Maximum<br>Inflow | Lateral<br>Inflow<br>Volume<br>10^6 gal | Total<br>Inflow<br>Volume<br>10^6 gal | Flow<br>Balance<br>Error<br>% |
|-----------------|----------|-------------------------------------|-----------------------------------|-----------------------------|------------------------------|-----------------------------------------|---------------------------------------|-------------------------------|
| DP-27           | JUNCTION | 65.09                               | 101.01                            | 0                           | 01:03                        | 1.32                                    | 3.08                                  | 0.000                         |
| DP-35           | JUNCTION | 9.25                                | 9.25                              | 0                           | 00:45                        | 0.161                                   | 0.161                                 | 0.000                         |
| DP-31           | JUNCTION | 10.94                               | 235.29                            | 0                           | 00:46                        | 0.2                                     | 9.37                                  | 0.000                         |
| DP-33           | JUNCTION | 24.42                               | 36.34                             | 0                           | 00:47                        | 0.471                                   | 0.772                                 | 0.000                         |
| DP-37           | JUNCTION | 13.14                               | 43.92                             | 0                           | 00:56                        | 0.243                                   | 1.03                                  | 0.000                         |
| DP-28           | JUNCTION | 71.91                               | 183.60                            | 0                           | 01:04                        | 1.47                                    | 5.64                                  | 0.000                         |
| DP-19           | JUNCTION | 15.24                               | 15.24                             | 0                           | 00:55                        | 0.407                                   | 0.407                                 | 0.000                         |
| J74             | JUNCTION | 0.00                                | 20.91                             | 0                           | 00:57                        | 0                                       | 0.515                                 | 0.000                         |
| J75             | JUNCTION | 0.00                                | 21.77                             | 0                           | 00:46                        | 0                                       | 0.409                                 | 0.000                         |
| J76             | JUNCTION | 9.02                                | 27.72                             | 0                           | 00:50                        | 0.21                                    | 0.619                                 | 0.000                         |
| DP-24           | JUNCTION | 2.50                                | 2.50                              | 0                           | 00:45                        | 0.0244                                  | 0.0244                                | 0.000                         |
| J78             | JUNCTION | 0.00                                | 2.48                              | 0                           | 00:46                        | 0                                       | 0.0244                                | 0.000                         |
| DP-25           | JUNCTION | 28.46                               | 52.22                             | 0                           | 00:49                        | 0.607                                   | 1.3                                   | 0.000                         |
| J80             | JUNCTION | 23.57                               | 75.36                             | 0                           | 00:48                        | 0.479                                   | 1.86                                  | 0.000                         |
| J81             | JUNCTION | 0.00                                | 357.53                            | 0                           | 01:03                        | 0                                       | 10.8                                  | 0.000                         |
| DP-26           | JUNCTION | 4.43                                | 4.43                              | 0                           | 00:55                        | 0.0801                                  | 0.0801                                | 0.000                         |
| DP-30           | JUNCTION | 12.46                               | 225.07                            | 0                           | 00:45                        | 0.224                                   | 9.17                                  | -0.000                        |
| J82             | JUNCTION | 0.00                                | 101.01                            | 0                           | 01:03                        | 0                                       | 3.08                                  | 0.000                         |
| DP-29           | JUNCTION | 12.62                               | 109.34                            | 0                           | 01:03                        | 0.255                                   | 3.33                                  | 0.000                         |
| DP-32           | JUNCTION | 15.61                               | 15.61                             | 0                           | 00:45                        | 0.301                                   | 0.301                                 | 0.000                         |
| DP-34           | JUNCTION | 33.99                               | 295.44                            | 0                           | 00:50                        | 0.629                                   | 10.8                                  | 0.000                         |
| POND1-E-OUTFALL | JUNCTION | 0.00                                | 303.60                            | 0                           | 00:50                        | 0                                       | 10.9                                  | 0.000                         |
| J84             | JUNCTION | 0.00                                | 36.29                             | 0                           | 00:47                        | 0                                       | 0.772                                 | 0.000                         |
| DP-38           | JUNCTION | 9.02                                | 9.02                              | 0                           | 00:55                        | 0.173                                   | 0.173                                 | 0.000                         |
| DP-40           | JUNCTION | 3.64                                | 3.64                              | 0                           | 00:55                        | 0.066                                   | 0.066                                 | 0.000                         |

TRIPLE H RANCH - 100-yr. Developed Conditions

| Node            | Type     | Maximum<br>Lateral<br>Inflow<br>CFS | Maximum<br>Total<br>Inflow<br>CFS | Day of<br>Maximum<br>Inflow | Hour of<br>Maximum<br>Inflow | Lateral<br>Inflow<br>Volume<br>10^6 gal | Total<br>Inflow<br>Volume<br>10^6 gal | Flow<br>Balance<br>Error<br>% |
|-----------------|----------|-------------------------------------|-----------------------------------|-----------------------------|------------------------------|-----------------------------------------|---------------------------------------|-------------------------------|
| DP-39           | JUNCTION | 23.83                               | 25.42                             | 0                           | 00:56                        | 0.485                                   | 0.659                                 | 0.000                         |
| J86             | JUNCTION | 0.00                                | 25.42                             | 0                           | 00:56                        | 0                                       | 0.659                                 | 0.000                         |
| DP-41           | JUNCTION | 0.00                                | 29.01                             | 0                           | 00:57                        | 0                                       | 0.725                                 | 0.000                         |
| J88             | JUNCTION | 0.00                                | 29.01                             | 0                           | 00:57                        | 0                                       | 0.724                                 | 0.000                         |
| J89             | JUNCTION | 0.00                                | 68.97                             | 0                           | 00:56                        | 0                                       | 1.91                                  | 0.000                         |
| DP-43           | JUNCTION | 21.06                               | 21.06                             | 0                           | 00:45                        | 0.428                                   | 0.428                                 | 0.000                         |
| J91             | JUNCTION | 0.00                                | 20.83                             | 0                           | 00:46                        | 0                                       | 0.428                                 | 0.000                         |
| J92             | JUNCTION | 0.00                                | 106.06                            | 0                           | 00:50                        | 0                                       | 2.88                                  | 0.000                         |
| J93             | JUNCTION | 18.65                               | 18.65                             | 0                           | 00:45                        | 0.377                                   | 0.377                                 | -0.000                        |
| J94             | JUNCTION | 0.00                                | 16.03                             | 0                           | 00:49                        | 0                                       | 0.378                                 | 0.000                         |
| DP-46           | JUNCTION | 31.35                               | 128.16                            | 0                           | 00:55                        | 0.63                                    | 3.51                                  | -0.000                        |
| J96             | JUNCTION | 0.00                                | 128.15                            | 0                           | 00:55                        | 0                                       | 3.51                                  | -0.000                        |
| J97             | JUNCTION | 23.27                               | 31.90                             | 0                           | 00:52                        | 0.475                                   | 0.901                                 | 0.000                         |
| DP-48           | JUNCTION | 21.75                               | 175.75                            | 0                           | 00:56                        | 0.428                                   | 4.84                                  | 0.000                         |
| DP-47           | JUNCTION | 0.00                                | 31.38                             | 0                           | 00:56                        | 0                                       | 0.902                                 | 0.000                         |
| POND1-E-OUTFALL | JUNCTION | 0.00                                | 164.30                            | 0                           | 00:54                        | 0                                       | 4.71                                  | 0.000                         |
| POND1-E-OUTFALL | JUNCTION | 0.00                                | 43.90                             | 0                           | 00:56                        | 0                                       | 1.03                                  | 0.000                         |
| DP-45           | JUNCTION | 2.68                                | 2.68                              | 0                           | 00:50                        | 0.0473                                  | 0.0473                                | 0.000                         |
| CREEK-OUTFALL   | OUTFALL  | 29.79                               | 29.79                             | 0                           | 00:45                        | 0.588                                   | 0.588                                 | 0.000                         |
| POND2-WEST      | OUTFALL  | 19.59                               | 19.59                             | 0                           | 00:45                        | 0.337                                   | 0.337                                 | 0.000                         |
| POND1-EAST      | OUTFALL  | 24.08                               | 526.55                            | 0                           | 00:55                        | 0.514                                   | 17.2                                  | 0.000                         |
| Out11           | OUTFALL  | 20.49                               | 20.49                             | 0                           | 00:45                        | 0.41                                    | 0.41                                  | 0.000                         |
| Out13           | OUTFALL  | 6.34                                | 6.34                              | 0                           | 00:45                        | 0.114                                   | 0.114                                 | 0.000                         |
| Out14           | OUTFALL  | 9.04                                | 9.04                              | 0                           | 00:45                        | 0.168                                   | 0.168                                 | 0.000                         |
| Out15           | OUTFALL  | 7.15                                | 7.15                              | 0                           | 00:45                        | 0.111                                   | 0.111                                 | 0.000                         |

TRIPLE H RANCH - 100-yr. Developed Conditions

| Node                | Type    | Maximum<br>Lateral<br>Inflow<br>CFS | Maximum<br>Total<br>Inflow<br>CFS | Day of<br>Maximum<br>Inflow | Hour of<br>Maximum<br>Inflow | Lateral<br>Inflow<br>Volume<br>10^6 gal | Total<br>Inflow<br>Volume<br>10^6 gal | Flow<br>Balance<br>Error<br>% |
|---------------------|---------|-------------------------------------|-----------------------------------|-----------------------------|------------------------------|-----------------------------------------|---------------------------------------|-------------------------------|
| Out16               | OUTFALL | 2.59                                | 2.59                              | 0                           | 00:50                        | 0.0363                                  | 0.0363                                | 0.000                         |
| DP-4-POND1-WEST     | OUTFALL | 18.30                               | 79.94                             | 0                           | 00:46                        | 0.374                                   | 1.88                                  | 0.000                         |
| DP-17-CREEK-OUTFALL | OUTFALL | 0.00                                | 214.23                            | 0                           | 00:56                        | 0                                       | 6.04                                  | 0.000                         |

TRIPLE H RANCH - 100-yr. Developed Conditions

Outfall Loading Summary

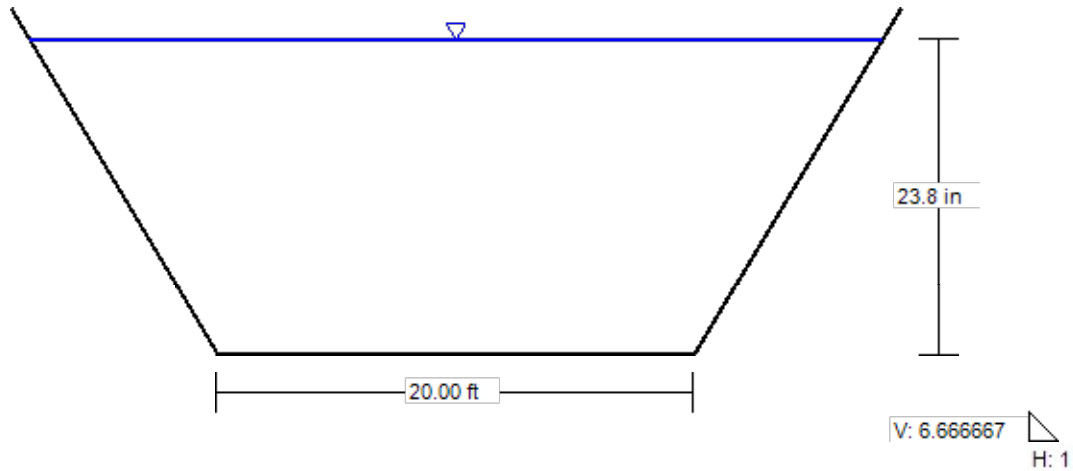
| Outfall Node          | Flow<br>Frequency<br>% | Avgerage<br>Flow<br>CFS | Maximum<br>Flow<br>CFS | Total<br>Volume<br>10^6 gal |
|-----------------------|------------------------|-------------------------|------------------------|-----------------------------|
| CREEK-OUTFALL-2       | 56.39                  | 6.46                    | 29.79                  | 0.588                       |
| POND2-WEST            | 43.89                  | 4.75                    | 19.59                  | 0.337                       |
| POND1-EAST            | 98.47                  | 108.01                  | 526.55                 | 17.184                      |
| Out11                 | 55.14                  | 4.61                    | 20.49                  | 0.410                       |
| Out13                 | 39.17                  | 1.80                    | 6.34                   | 0.114                       |
| Out14                 | 40.83                  | 2.54                    | 9.04                   | 0.168                       |
| Out15                 | 37.92                  | 1.81                    | 7.15                   | 0.111                       |
| Out16                 | 34.17                  | 0.66                    | 2.59                   | 0.036                       |
| DP-4-POND1-WEST       | 98.47                  | 11.81                   | 79.94                  | 1.878                       |
| DP-17-CREEK-OUTFALL-2 | 92.50                  | 40.42                   | 214.23                 | 6.040                       |

## Diversion Channel

|                       |                      |
|-----------------------|----------------------|
| Project Description   |                      |
| Friction Method       | Manning Formula      |
| Solve For             | Normal Depth         |
| Input Data            |                      |
| Roughness Coefficient | 0.035                |
| Channel Slope         | 0.005 ft/ft          |
| Left Side Slope       | 4.000 H:V            |
| Right Side Slope      | 4.000 H:V            |
| Bottom Width          | 20.00 ft             |
| Discharge             | 220.00 cfs           |
| Results               |                      |
| Normal Depth          | 23.8 in              |
| Flow Area             | 55.4 ft <sup>2</sup> |
| Wetted Perimeter      | 36.3 ft              |
| Hydraulic Radius      | 18.3 in              |
| Top Width             | 35.86 ft             |
| Critical Depth        | 16.9 in              |
| Critical Slope        | 0.017 ft/ft          |
| Velocity              | 3.97 ft/s            |
| Velocity Head         | 0.25 ft              |
| Specific Energy       | 2.23 ft              |
| Froude Number         | 0.564                |
| 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          | 23.8 in              |
| Critical Depth        | 16.9 in              |
| Channel Slope         | 0.005 ft/ft          |
| Critical Slope        | 0.017 ft/ft          |

## Diversion Channel

| Project Description   |              |
|-----------------------|--------------|
| Friction Method       | Manning      |
|                       | Formula      |
| Solve For             | Normal Depth |
| Input Data            |              |
| Roughness Coefficient | 0.035        |
| Channel Slope         | 0.005 ft/ft  |
| Normal Depth          | 23.8 in      |
| Left Side Slope       | 4.000 H:V    |
| Right Side Slope      | 4.000 H:V    |
| Bottom Width          | 20.00 ft     |
| Discharge             | 220.00 cfs   |





## STORMWATER QUALITY CALCULATIONS

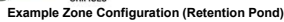


## EFFECTIVE IMPERVIOUSNESS - POND 1 West

| Basin        | Acreage     | Imp. %       |
|--------------|-------------|--------------|
| W-A          | 9.0         | 10.0%        |
| W-B          | 10.0        | 10.0%        |
| W-C          | 37.5        | 10.0%        |
| W-D          | 15.4        | 10.0%        |
| <b>Total</b> | <b>71.9</b> | <b>10.0%</b> |

*MHFD-Detention, Version 4.07 (June 2025)*

**Basin ID:** POND 1 WEST



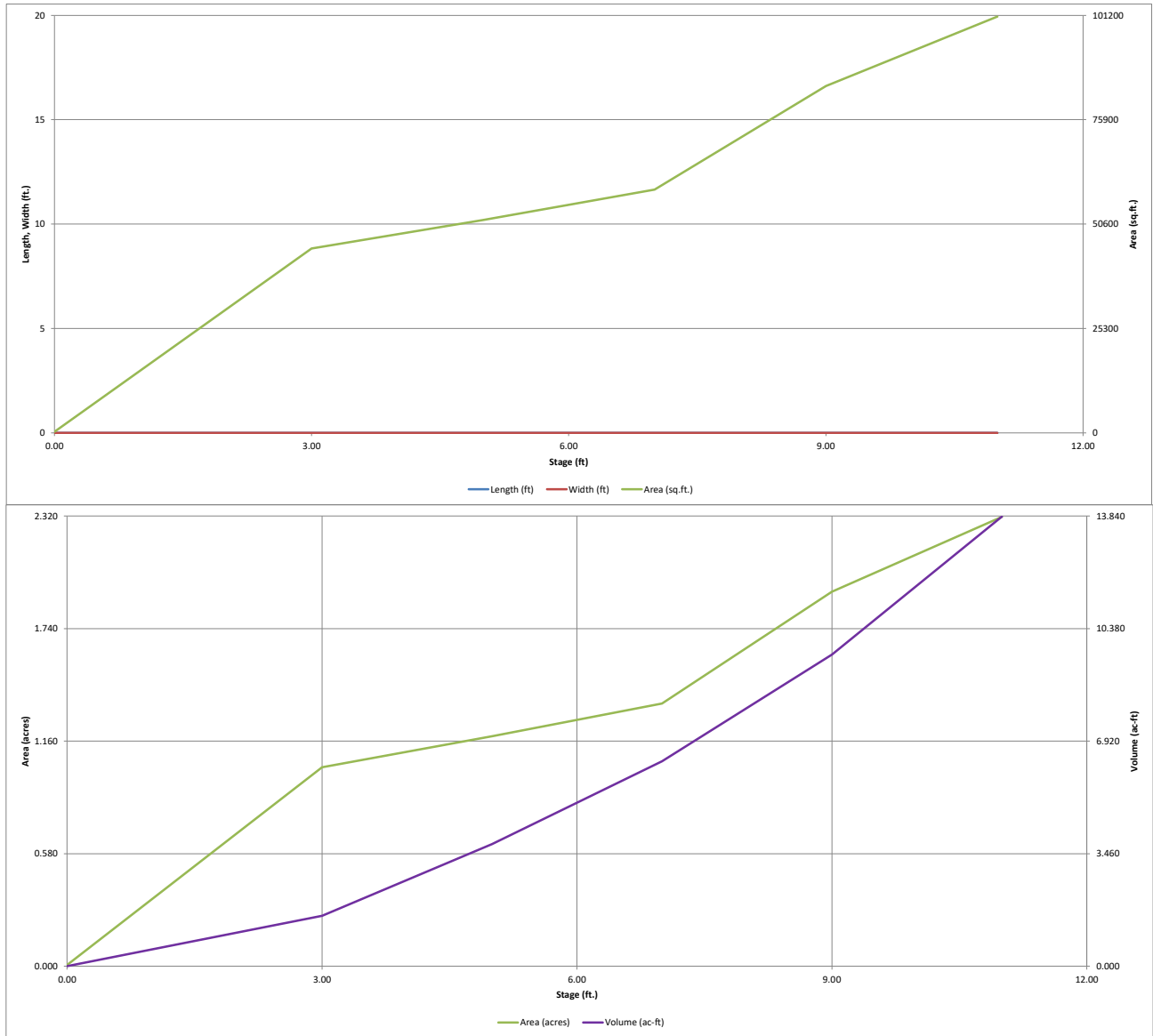
|      |           |
|------|-----------|
|      | acre-feet |
|      | acre-feet |
| 0.96 | inches    |
| 1.26 | inches    |
| 1.52 | inches    |
| 1.92 | inches    |
| 2.26 | inches    |
| 2.61 | inches    |
| 3.54 | inches    |

|                                               |   |      |                 |
|-----------------------------------------------|---|------|-----------------|
| Initial Surcharge Area ( $A_{ISV}$ )          | = | user | ft <sup>2</sup> |
| Surcharge Volume Length ( $L_{ISV}$ )         | = | user | ft              |
| Surcharge Volume Width ( $W_{ISV}$ )          | = | user | ft              |
| Depth of Basin Floor ( $H_{LFLOOR}$ )         | = | user | ft              |
| Length of Basin Floor ( $L_{LFLOOR}$ )        | = | user | ft              |
| Width of Basin Floor ( $W_{LFLOOR}$ )         | = | user | ft              |
| Area of Basin Floor ( $A_{LFLOOR}$ )          | = | user | ft <sup>2</sup> |
| Volume of Basin Floor ( $V_{LFLOOR}$ )        | = | user | ft <sup>3</sup> |
| 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 <sup>2</sup> |
| Volume of Main Basin ( $V_{MAIN}$ )           | = | user | ft <sup>3</sup> |
| Calculated Total Basin Volume ( $V_{TOTAL}$ ) | = | user | acre-feet       |

5/13/2026, 3:33 PM

# DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.07 (June 2025)

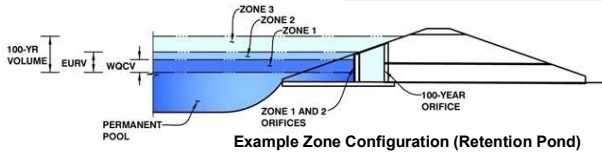


# DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.07 (June 2025)

Project: **TRIPLE H RANCH PRELIMINARY PLAN - PDR**

Basin ID: **POND 1 WEST**



Example Zone Configuration (Retention Pond)

|                   | Estimated Stage (ft) | Estimated Volume (ac-ft) | Outlet Type          |
|-------------------|----------------------|--------------------------|----------------------|
| Zone 1 (WQCV)     | 1.52                 | 0.402                    | Orifice Plate        |
| Zone 2 (EURV)     | 1.82                 | 0.171                    | Orifice Plate        |
| Zone 3 (100-year) | 3.49                 | 1.480                    | Weir&Pipe (Restrict) |
| Total (all zones) |                      | 2.053                    |                      |

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration SCM)

Underdrain Orifice Invert Depth =  ft (distance below the filtration media surface)  
Underdrain Orifice Diameter =  inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =  ft<sup>2</sup>  
Underdrain Orifice Centroid =  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 SCM)

Centroid of Lowest Orifice =  ft (relative to basin bottom at Stage = 0 ft)  
Depth at top of Zone using Orifice Plate =  ft (relative to basin bottom at Stage = 0 ft)  
Orifice Plate: Orifice Vertical Spacing =  inches  
Orifice Plate: Orifice Area per Row =  sq. inches

Calculated Parameters for Plate

WQ Orifice Area per Row =  ft<sup>2</sup>  
Elliptical Half-Width =  feet  
Elliptical Slot Centroid =  feet  
Elliptical Slot Area =  ft<sup>2</sup>

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             | 0.70             | 1.40             |                  |                  |                  |                  |                  |
| Orifice Area (sq. inches)      | 2.00             | 2.84             | 2.84             |                  |                  |                  |                  |                  |

|                                | 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)

Invert of Vertical Orifice =  ft (relative to basin bottom at Stage = 0 ft)  
Depth at top of Zone using Vertical Orifice =  ft (relative to basin bottom at Stage = 0 ft)  
Vertical Orifice Diameter =  inches

Calculated Parameters for Vertical Orifice

Vertical Orifice Area =  ft<sup>2</sup>  
Vertical Orifice Centroid =  feet

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir and No Outlet Pipe)

Overflow Weir Front Edge Height, H<sub>o</sub> =  ft (relative to basin bottom at Stage = 0 ft)  
Overflow Weir Front Edge Length =  feet  
Overflow Weir Grate Slope =  H:V  
Horiz. Length of Weir Sides =  feet  
Overflow Grate Type =   
Debris Clogging % =  %

Calculated Parameters for Overflow Weir

Height of Grate Upper Edge, H<sub>u</sub> =  feet  
Overflow Weir Slope Length =  feet  
Grate Open Area / 100-yr Orifice Area =   
Overflow Grate Open Area w/o Debris =  ft<sup>2</sup>  
Overflow Grate Open Area w/ Debris =  ft<sup>2</sup>

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

Depth to Invert of Outlet Pipe =  ft (distance below basin bottom at Stage = 0 ft)  
Outlet Pipe Diameter =  inches  
Restrictor Plate Height Above Pipe Invert =  inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

Outlet Orifice Area =  ft<sup>2</sup>  
Outlet Orifice Centroid =  feet  
Half-Central Angle of Restrictor Plate on Pipe =  radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage =  ft (relative to basin bottom at Stage = 0 ft)  
Spillway Crest Length =  feet  
Spillway End Slopes =  H:V  
Freeboard above Max Water Surface =  feet

Calculated Parameters for Spillway

Spillway Design Flow Depth =  feet  
Stage at Top of Freeboard =  feet  
Basin Area at Top of Freeboard =  acres  
Basin Volume at Top of Freeboard =  acre-ft

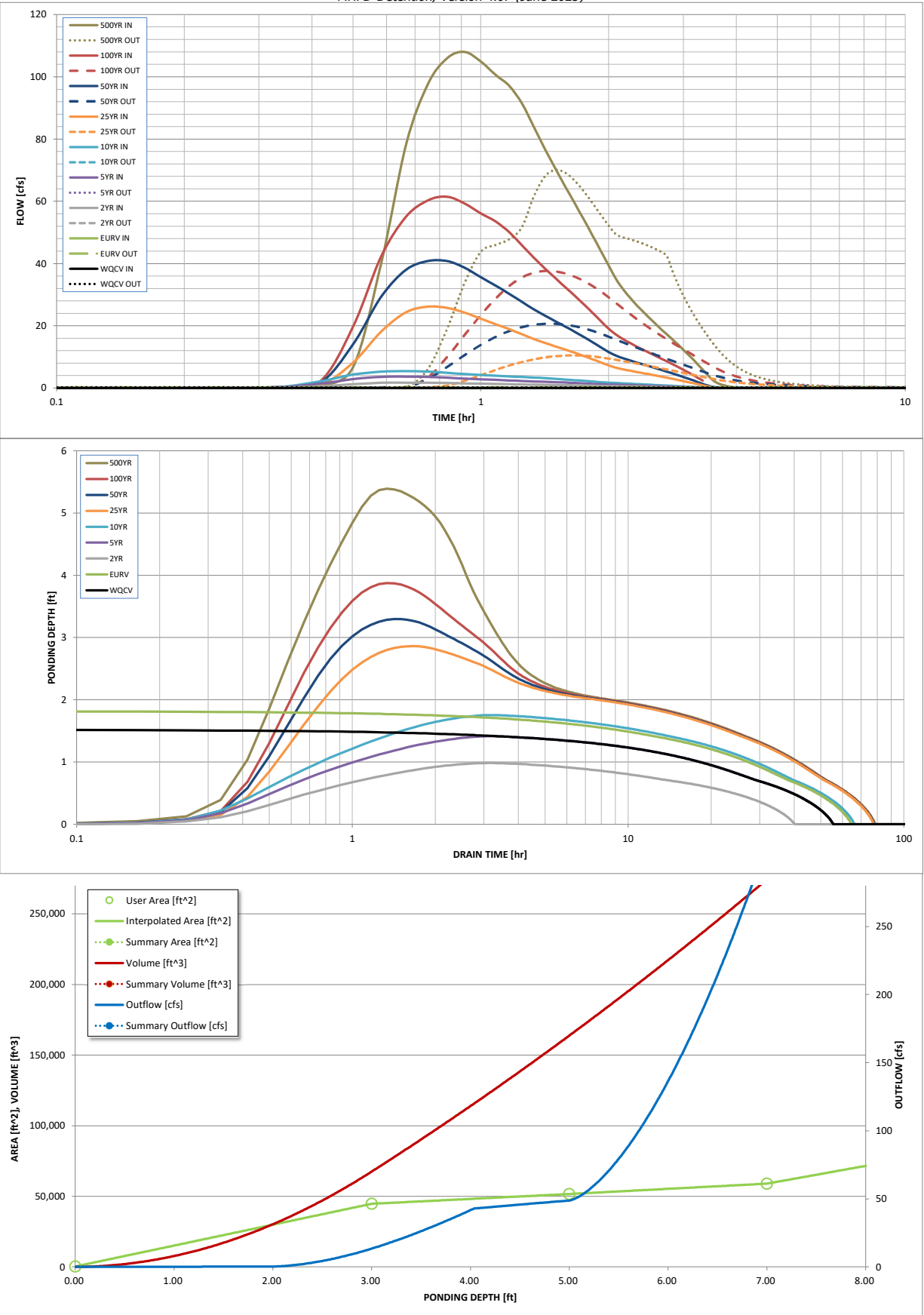
Routed Hydrograph Results

The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

|                                                 | WQCV  | EURV  | 2 Year | 5 Year | 10 Year | 25 Year         | 50 Year         | 100 Year        | 500 Year |
|-------------------------------------------------|-------|-------|--------|--------|---------|-----------------|-----------------|-----------------|----------|
| Design Storm Return Period =                    | N/A   | N/A   | 0.96   | 1.26   | 1.52    | 1.92            | 2.26            | 2.61            | 3.54     |
| One-Hour Rainfall Depth (in) =                  | 0.402 | 0.573 | 0.196  | 0.385  | 0.585   | 2.531           | 4.036           | 6.385           | 11.618   |
| CUHP Runoff Volume (acre-ft) =                  | N/A   | N/A   | 0.196  | 0.385  | 0.585   | 2.531           | 4.036           | 6.385           | 11.618   |
| Inflow Hydrograph Volume (acre-ft) =            | N/A   | N/A   | 0.8    | 1.8    | 2.6     | 22.5            | 37.1            | 57.6            | 103.7    |
| CUHP Predevelopment Peak Q (cfs) =              | N/A   | N/A   |        |        |         |                 |                 |                 |          |
| OPTIONAL Override Predevelopment Peak Q (cfs) = | N/A   | N/A   |        |        |         |                 |                 |                 |          |
| Predevelopment Unit Peak Flow, q (cfs/acre) =   | N/A   | N/A   | 0.01   | 0.02   | 0.04    | 0.31            | 0.52            | 0.80            | 1.44     |
| Peak Inflow Q (cfs) =                           | N/A   | N/A   | 1.7    | 3.7    | 5.4     | 26.1            | 40.8            | 61.5            | 108.0    |
| Peak Outflow Q (cfs) =                          | 0.2   | 0.3   | 0.1    | 0.2    | 0.2     | 10.5            | 20.6            | 37.6            | 70.1     |
| Ratio Peak Outflow to Predevelopment Q =        | N/A   | N/A   | N/A    | 0.1    | 0.1     | 0.5             | 0.6             | 0.7             | 0.7      |
| Structure Controlling Flow =                    | Plate | Plate | Plate  | Plate  | Plate   | Overflow Weir 1 | Overflow Weir 1 | Overflow Weir 1 | Spillway |
| Max Velocity through Grate 1 (fps) =            | N/A   | N/A   | N/A    | N/A    | N/A     | 0.5             | 1.0             | 1.9             | 2.6      |
| 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) =    | 49    | 57    | 37     | 50     | 58      | 55              | 47              | 40              | 27       |
| Time to Drain 99% of Inflow Volume (hours) =    | 53    | 61    | 39     | 53     | 63      | 67              | 63              | 58              | 48       |
| Maximum Ponding Depth (ft) =                    | 1.52  | 1.82  | 0.98   | 1.41   | 1.75    | 2.86            | 3.30            | 3.88            | 5.39     |
| Area at Maximum Ponding Depth (acres) =         | 0.52  | 0.63  | 0.34   | 0.49   | 0.60    | 0.98            | 1.05            | 1.10            | 1.22     |
| Maximum Volume Stored (acre-ft) =               | 0.403 | 0.575 | 0.170  | 0.347  | 0.532   | 1.409           | 1.850           | 2.472           | 4.229    |

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.07 (June 2025)



| 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.

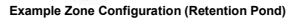
|               | SOURCE  | CUHP       | CUHP       | CUHP         | CUHP         | CUHP          | CUHP          | CUHP          | CUHP           | CUHP           |
|---------------|---------|------------|------------|--------------|--------------|---------------|---------------|---------------|----------------|----------------|
| 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          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 0:05:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 0:10:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.01          | 0.00           | 0.03           |
|               | 0:15:00 | 0          | 0.00       | 0.03         | 0.06         | 0.08          | 0.06          | 0.09          | 0.09           | 0.17           |
|               | 0:20:00 | 0          | 0.00       | 0.16         | 0.24         | 0.30          | 0.22          | 0.29          | 0.31           | 0.68           |
|               | 0:25:00 | 0          | 0.00       | 0.53         | 1.37         | 2.13          | 0.93          | 1.55          | 1.96           | 6.68           |
|               | 0:30:00 | 0          | 0.00       | 1.23         | 2.89         | 4.33          | 8.18          | 14.06         | 19.67          | 40.50          |
|               | 0:35:00 | 0          | 0.00       | 1.68         | 3.60         | 5.26          | 18.24         | 29.48         | 42.49          | 78.28          |
|               | 0:40:00 | 0          | 0.00       | 1.74         | 3.68         | 5.41          | 24.38         | 38.02         | 55.05          | 97.61          |
|               | 0:45:00 | 0          | 0.00       | 1.71         | 3.55         | 5.26          | 26.12         | 40.82         | 60.29          | 105.98         |
|               | 0:50:00 | 0          | 0.00       | 1.61         | 3.30         | 4.90          | 25.72         | 40.77         | 61.48          | 108.00         |
|               | 0:55:00 | 0          | 0.00       | 1.49         | 3.04         | 4.51          | 24.21         | 38.64         | 59.26          | 104.87         |
|               | 1:00:00 | 0          | 0.00       | 1.40         | 2.82         | 4.21          | 22.24         | 35.61         | 56.11          | 100.61         |
|               | 1:05:00 | 0          | 0.00       | 1.32         | 2.62         | 3.96          | 20.52         | 32.90         | 53.53          | 97.13          |
|               | 1:10:00 | 0          | 0.00       | 1.23         | 2.44         | 3.73          | 18.90         | 30.29         | 50.11          | 91.44          |
|               | 1:15:00 | 0          | 0.00       | 1.15         | 2.26         | 3.55          | 17.27         | 27.68         | 45.89          | 83.95          |
|               | 1:20:00 | 0          | 0.00       | 1.08         | 2.12         | 3.38          | 15.76         | 25.29         | 41.90          | 76.83          |
|               | 1:25:00 | 0          | 0.00       | 1.03         | 2.00         | 3.17          | 14.49         | 23.27         | 38.42          | 70.47          |
|               | 1:30:00 | 0          | 0.00       | 0.97         | 1.88         | 2.96          | 13.38         | 21.45         | 35.27          | 64.61          |
|               | 1:35:00 | 0          | 0.00       | 0.92         | 1.76         | 2.74          | 12.33         | 19.72         | 32.34          | 59.18          |
|               | 1:40:00 | 0          | 0.00       | 0.86         | 1.63         | 2.52          | 11.29         | 18.04         | 29.57          | 54.04          |
|               | 1:45:00 | 0          | 0.00       | 0.81         | 1.49         | 2.31          | 10.28         | 16.39         | 26.86          | 49.05          |
|               | 1:50:00 | 0          | 0.00       | 0.75         | 1.36         | 2.10          | 9.27          | 14.76         | 24.20          | 44.18          |
|               | 1:55:00 | 0          | 0.00       | 0.69         | 1.23         | 1.90          | 8.27          | 13.15         | 21.60          | 39.44          |
|               | 2:00:00 | 0          | 0.00       | 0.64         | 1.13         | 1.75          | 7.29          | 11.58         | 19.09          | 34.98          |
|               | 2:05:00 | 0          | 0.00       | 0.59         | 1.06         | 1.63          | 6.54          | 10.42         | 17.17          | 31.62          |
|               | 2:10:00 | 0          | 0.00       | 0.55         | 0.98         | 1.51          | 6.00          | 9.55          | 15.70          | 28.93          |
|               | 2:15:00 | 0          | 0.00       | 0.51         | 0.91         | 1.40          | 5.56          | 8.83          | 14.44          | 26.56          |
|               | 2:20:00 | 0          | 0.00       | 0.46         | 0.83         | 1.28          | 5.15          | 8.17          | 13.31          | 24.42          |
|               | 2:25:00 | 0          | 0.00       | 0.43         | 0.77         | 1.18          | 4.77          | 7.56          | 12.26          | 22.43          |
|               | 2:30:00 | 0          | 0.00       | 0.39         | 0.70         | 1.07          | 4.39          | 6.96          | 11.26          | 20.57          |
|               | 2:35:00 | 0          | 0.00       | 0.35         | 0.64         | 0.97          | 4.02          | 6.38          | 10.31          | 18.81          |
|               | 2:40:00 | 0          | 0.00       | 0.32         | 0.57         | 0.88          | 3.66          | 5.81          | 9.41           | 17.17          |
|               | 2:45:00 | 0          | 0.00       | 0.29         | 0.51         | 0.78          | 3.31          | 5.24          | 8.53           | 15.55          |
|               | 2:50:00 | 0          | 0.00       | 0.26         | 0.45         | 0.70          | 2.95          | 4.68          | 7.65           | 13.94          |
|               | 2:55:00 | 0          | 0.00       | 0.23         | 0.40         | 0.61          | 2.60          | 4.12          | 6.77           | 12.34          |
|               | 3:00:00 | 0          | 0.00       | 0.20         | 0.34         | 0.52          | 2.25          | 3.57          | 5.89           | 10.73          |
|               | 3:05:00 | 0          | 0.00       | 0.17         | 0.28         | 0.44          | 1.90          | 3.01          | 5.01           | 9.13           |
|               | 3:10:00 | 0          | 0.00       | 0.14         | 0.23         | 0.36          | 1.56          | 2.46          | 4.14           | 7.53           |
|               | 3:15:00 | 0          | 0.00       | 0.11         | 0.18         | 0.27          | 1.21          | 1.90          | 3.26           | 5.94           |
|               | 3:20:00 | 0          | 0.00       | 0.08         | 0.12         | 0.20          | 0.87          | 1.35          | 2.40           | 4.35           |
|               | 3:25:00 | 0          | 0.00       | 0.06         | 0.09         | 0.14          | 0.53          | 0.82          | 1.55           | 2.86           |
|               | 3:30:00 | 0          | 0.00       | 0.05         | 0.07         | 0.11          | 0.29          | 0.46          | 0.94           | 1.84           |
|               | 3:35:00 | 0          | 0.00       | 0.04         | 0.06         | 0.09          | 0.16          | 0.27          | 0.60           | 1.23           |
|               | 3:40:00 | 0          | 0.00       | 0.04         | 0.05         | 0.08          | 0.11          | 0.17          | 0.39           | 0.82           |
|               | 3:45:00 | 0          | 0.00       | 0.03         | 0.04         | 0.07          | 0.08          | 0.12          | 0.25           | 0.54           |
|               | 3:50:00 | 0          | 0.00       | 0.03         | 0.04         | 0.06          | 0.06          | 0.08          | 0.16           | 0.33           |
|               | 3:55:00 | 0          | 0.00       | 0.02         | 0.03         | 0.04          | 0.05          | 0.06          | 0.09           | 0.19           |
|               | 4:00:00 | 0          | 0.00       | 0.02         | 0.02         | 0.04          | 0.03          | 0.04          | 0.05           | 0.10           |
|               | 4:05:00 | 0          | 0.00       | 0.02         | 0.02         | 0.03          | 0.03          | 0.03          | 0.03           | 0.06           |
|               | 4:10:00 | 0          | 0.00       | 0.01         | 0.02         | 0.02          | 0.02          | 0.03          | 0.02           | 0.05           |
|               | 4:15:00 | 0          | 0.00       | 0.01         | 0.01         | 0.02          | 0.02          | 0.02          | 0.02           | 0.04           |
|               | 4:20:00 | 0          | 0.00       | 0.01         | 0.01         | 0.01          | 0.01          | 0.02          | 0.01           | 0.03           |
|               | 4:25:00 | 0          | 0.00       | 0.01         | 0.01         | 0.01          | 0.01          | 0.01          | 0.01           | 0.02           |
|               | 4:30:00 | 0          | 0.00       | 0.00         | 0.01         | 0.01          | 0.01          | 0.01          | 0.01           | 0.02           |
|               | 4:35:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.01          | 0.01          | 0.01           | 0.01           |
|               | 4:40:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.01           |
|               | 4:45:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 4:50:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 4:55:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:00:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:05:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:10:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:15:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:20:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:25:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:30:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:35:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:40:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:45:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:50:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:55:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 6:00:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |

## EFFECTIVE IMPERVIOUSNESS - POND 1 East

| Basin        | Acreage      | Imp. %       |
|--------------|--------------|--------------|
| OS-4         | 2.0          | 2.0%         |
| OS-5         | 12.0         | 2.0%         |
| OS-6         | 4.0          | 2.0%         |
| OS-7         | 6.0          | 2.0%         |
| OS-8         | 2.3          | 2.0%         |
| OS-9         | 6.5          | 2.0%         |
| OS-10        | 2.4          | 2.0%         |
| OS-11        | 1.7          | 2.0%         |
| OS-12        | 2.9          | 2.0%         |
| OS-13        | 6.8          | 11.0%        |
| OS-14        | 30.3         | 5.0%         |
| E-A          | 8.9          | 2.0%         |
| E-B          | 12.3         | 11.0%        |
| E-C          | 9.8          | 11.0%        |
| E-D          | 29.0         | 11.0%        |
| E-E          | 28.6         | 11.0%        |
| E-F          | 1.9          | 11.0%        |
| E-G          | 5.7          | 11.0%        |
| E-H          | 2.2          | 11.0%        |
| E-I          | 13.7         | 11.0%        |
| E-J          | 0.68         | 11.0%        |
| E-K          | 8.3          | 6.0%         |
| E-L          | 25.1         | 9.0%         |
| E-M          | 19.0         | 11.0%        |
| E-N          | 2.2          | 11.0%        |
| E-O          | 16.4         | 11.0%        |
| E-P          | 30.5         | 11.0%        |
| E-Q          | 24.8         | 11.0%        |
| E-R          | 65.2         | 11.0%        |
| E-S          | 26.5         | 11.0%        |
| E-T1         | 9.8          | 11.0%        |
| E-T2         | 10.7         | 11.0%        |
| E-U          | 16.8         | 11.0%        |
| E-V          | 7.5          | 11.0%        |
| E-W          | 15.2         | 11.0%        |
| E-X          | 6.7          | 11.0%        |
| E-Y          | 5.3          | 11.0%        |
| E-Z          | 21.4         | 9.0%         |
| E-AA         | 19.2         | 11.0%        |
| E-BB         | 46.2         | 11.0%        |
| E-CC         | 16.9         | 11.0%        |
| E-DD         | 17.5         | 11.0%        |
| E-EE         | 19.8         | 11.0%        |
| E-GG         | 24.0         | 11.0%        |
| E-HH         | 21.0         | 11.0%        |
| E-II         | 15.7         | 11.0%        |
| E-MM         | 1.3          | 11.0%        |
| E-NN         | 8.3          | 11.0%        |
| TANK         | 1.9          | 50.0%        |
| <b>Total</b> | <b>692.9</b> | <b>10.0%</b> |

*MHFD-Detention, Version 4.07 (June 2025)*

Basin ID: POND 1 EAST



**Area > 1 sq.mi. for WQ Facility**

|                                        |         |           |
|----------------------------------------|---------|-----------|
| Water Quality Capture Volume (WQCV) =  | 3.869   | acre-feet |
| Excess Urban Runoff Volume (EURV) =    | 5.517   | acre-feet |
| 2-yr Runoff Volume (P1 = 0.96 in.) =   | 1.885   | acre-feet |
| 5-yr Runoff Volume (P1 = 1.26 in.) =   | 3.708   | acre-feet |
| 10-yr Runoff Volume (P1 = 1.52 in.) =  | 5.637   | acre-feet |
| 25-yr Runoff Volume (P1 = 1.92 in.) =  | 24.379  | acre-feet |
| 50-yr Runoff Volume (P1 = 2.26 in.) =  | 38.876  | acre-feet |
| 100-yr Runoff Volume (P1 = 2.61 in.) = | 61.505  | acre-feet |
| 500-yr Runoff Volume (P1 = 3.54 in.) = | 111.907 | acre-feet |
| Approximate 2-yr Detention Volume =    | 2.737   | acre-feet |
| Approximate 5-yr Detention Volume =    | 4.105   | acre-feet |
| Approximate 10-yr Detention Volume =   | 6.878   | acre-feet |
| Approximate 25-yr Detention Volume =   | 10.458  | acre-feet |
| Approximate 50-yr Detention Volume =   | 13.024  | acre-feet |
| Approximate 100-yr Detention Volume =  | 19.782  | acre-feet |

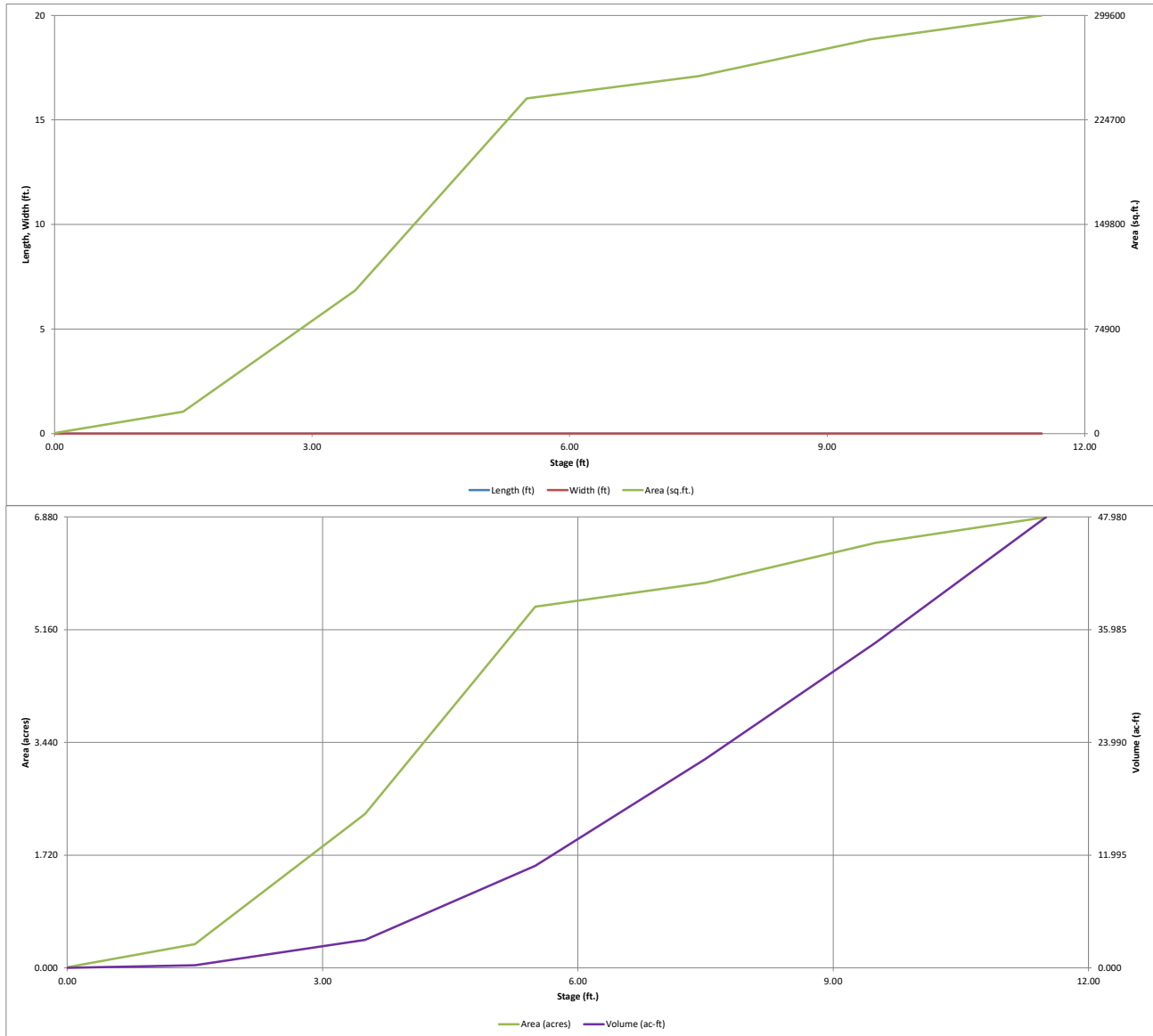
|                                               |   |      |                 |
|-----------------------------------------------|---|------|-----------------|
| Initial Surcharge Area ( $A_{ISV}$ )          | = | user | ft <sup>2</sup> |
| Surcharge Volume Length ( $L_{ISV}$ )         | = | user | ft              |
| 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 <sup>2</sup> |
| Volume of Basin Floor ( $V_{FLOOR}$ )         | = | user | ft <sup>3</sup> |
| 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 <sup>2</sup> |
| Volume of Main Basin ( $V_{MAIN}$ )           | = | user | ft <sup>3</sup> |
| Calculated Total Basin Volume ( $V_{TOTAL}$ ) | = | user | acre-feet       |

[illegible]



# DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.07 (June 2025)

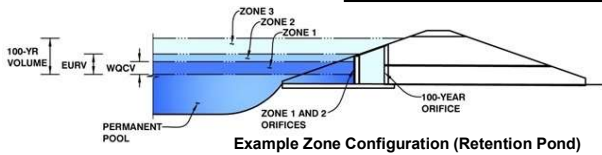


# DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.07 (June 2025)

Project: **TRIPLE H RANCH PRELIMINARY PLAN - PDR**

Basin ID: **POND 1 EAST**



Example Zone Configuration (Retention Pond)

|                   | Estimated Stage (ft) | Estimated Volume (ac-ft) | Outlet Type          |
|-------------------|----------------------|--------------------------|----------------------|
| Zone 1 (WQCV)     | 3.84                 | 3.869                    | Orifice Plate        |
| Zone 2 (EURV)     | 4.34                 | 1.648                    | Orifice Plate        |
| Zone 3 (100-year) | 7.08                 | 14.265                   | Weir&Pipe (Restrict) |
| Total (all zones) |                      | 19.782                   |                      |

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration SCM)

Underdrain Orifice Invert Depth =  ft (distance below the filtration media surface)  
Underdrain Orifice Diameter =  inches

Calculated Parameters for Underdrain  
Underdrain Orifice Area =  ft<sup>2</sup>  
Underdrain Orifice Centroid =  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 SCM)

Centroid of Lowest Orifice =  0.00 ft (relative to basin bottom at Stage = 0 ft)  
Depth at top of Zone using Orifice Plate =  4.50 ft (relative to basin bottom at Stage = 0 ft)  
Orifice Plate: Orifice Vertical Spacing =  10.80 inches  
Orifice Plate: Orifice Area per Row =  N/A sq. inches

Calculated Parameters for Plate  
WQ Orifice Area per Row =  N/A ft<sup>2</sup>  
Elliptical Half-Width =  N/A feet  
Elliptical Slot Centroid =  N/A feet  
Elliptical Slot Area =  N/A ft<sup>2</sup>

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             | 0.90             | 1.80             | 2.70             | 3.60             |                  |                  |                  |
| Orifice Area (sq. inches)      | 8.00             | 9.16             | 9.16             | 9.16             | 9.16             |                  |                  |                  |

|                                | 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)

Invert of Vertical Orifice =  Not Selected  Not Selected ft (relative to basin bottom at Stage = 0 ft)  
Depth at top of Zone using Vertical Orifice =  Not Selected  Not Selected ft (relative to basin bottom at Stage = 0 ft)  
Vertical Orifice Diameter =  Not Selected  Not Selected inches

Calculated Parameters for Vertical Orifice  
Vertical Orifice Area =  Not Selected  Not Selected ft<sup>2</sup>  
Vertical Orifice Centroid =  Not Selected  Not Selected feet

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir and No Outlet Pipe)

Overflow Weir Front Edge Height, H<sub>o</sub> =  Zone 3 Weir  Not Selected ft (relative to basin bottom at Stage = 0 ft)  
Overflow Weir Front Edge Length =  24.00  Not Selected feet  
Overflow Weir Grate Slope =  4.00  Not Selected H:V  
Horiz. Length of Weir Sides =  4.00  Not Selected feet  
Overflow Grate Type =  Close Mesh Grate  Not Selected  
Debris Clogging % =  50%  Not Selected %

Calculated Parameters for Overflow Weir  
Height of Grate Upper Edge, H<sub>u</sub> =  5.50  Not Selected feet  
Overflow Weir Slope Length =  4.12  Not Selected feet  
Grate Open Area / 100-yr Orifice Area =  6.54  Not Selected  
Overflow Grate Open Area w/o Debris =  78.27  Not Selected ft<sup>2</sup>  
Overflow Grate Open Area w/ Debris =  39.14  Not Selected ft<sup>2</sup>

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

Depth to Invert of Outlet Pipe =  Zone 3 Restrictor  Not Selected ft (distance below basin bottom at Stage = 0 ft)  
Outlet Pipe Diameter =  54.00  Not Selected inches  
Restrictor Plate Height Above Pipe Invert =  38.00  Not Selected inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate  
Outlet Orifice Area =  11.96  Not Selected ft<sup>2</sup>  
Outlet Orifice Centroid =  1.77  Not Selected feet  
Half-Central Angle of Restrictor Plate on Pipe =  1.99  Not Selected radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage =  9.50 ft (relative to basin bottom at Stage = 0 ft)  
Spillway Crest Length =  170.00 feet  
Spillway End Slopes =  3.00 H:V  
Freeboard above Max Water Surface =  1.00 feet

Calculated Parameters for Spillway  
Spillway Design Flow Depth =  1.02 feet  
Stage at Top of Freeboard =  11.52 feet  
Basin Area at Top of Freeboard =  6.88 acres  
Basin Volume at Top of Freeboard =  47.96 acre-ft

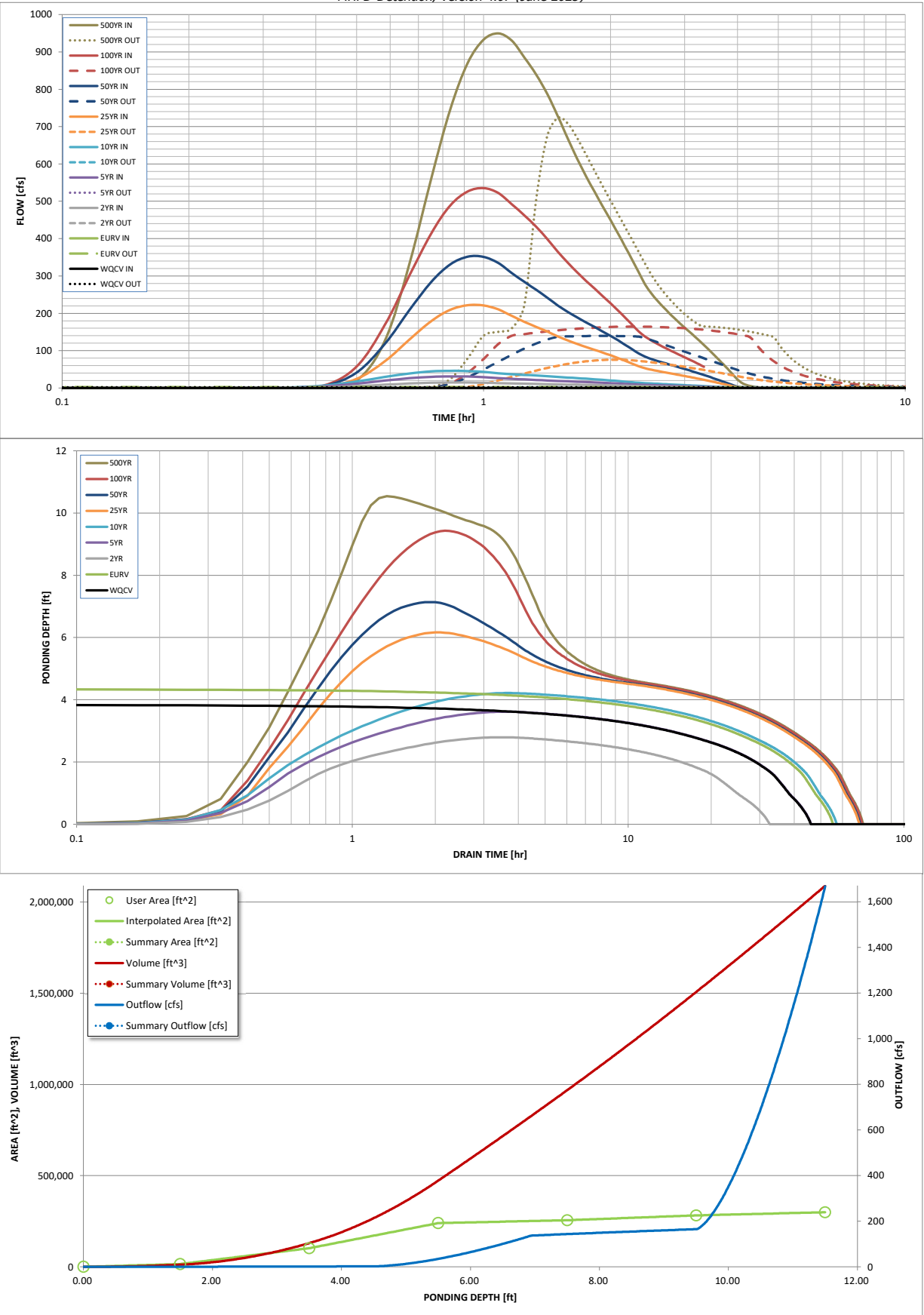
## Routed Hydrograph Results

The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

|                                                 | WQCV  | EURV  | 2 Year | 5 Year | 10 Year | 25 Year         | 50 Year        | 100 Year       | 500 Year |
|-------------------------------------------------|-------|-------|--------|--------|---------|-----------------|----------------|----------------|----------|
| Design Storm Return Period =                    | N/A   | N/A   | 0.96   | 1.26   | 1.52    | 1.92            | 2.26           | 2.61           | 3.54     |
| One-Hour Rainfall Depth (in) =                  | N/A   | N/A   | 0.96   | 1.26   | 1.52    | 1.92            | 2.26           | 2.61           | 3.54     |
| CUHP Runoff Volume (acre-ft) =                  | 3.869 | 5.517 | 1.885  | 3.708  | 5.637   | 24.379          | 38.876         | 61.505         | 111.907  |
| Inflow Hydrograph Volume (acre-ft) =            | N/A   | N/A   | 1.885  | 3.708  | 5.637   | 24.379          | 38.876         | 61.505         | 111.907  |
| CUHP Predevelopment Peak Q (cfs) =              | N/A   | N/A   | 6.6    | 14.8   | 22.4    | 191.0           | 319.5          | 500.7          | 911.8    |
| OPTIONAL Override Predevelopment Peak Q (cfs) = | N/A   | N/A   |        |        |         |                 |                | 370.0          |          |
| Predevelopment Unit Peak Flow, q (cfs/acre) =   | N/A   | N/A   | 0.01   | 0.02   | 0.03    | 0.28            | 0.46           | 0.53           | 1.32     |
| Peak Inflow Q (cfs) =                           | N/A   | N/A   | 14.8   | 31.2   | 46.1    | 222.0           | 351.5          | 535.4          | 949.4    |
| Peak Outflow Q (cfs) =                          | 2.0   | 2.3   | 1.3    | 1.8    | 2.2     | 76.0            | 139.6          | 164.5          | 723.3    |
| Ratio Peak Outflow to Predevelopment Q =        | N/A   | N/A   | N/A    | 0.1    | 0.1     | 0.4             | 0.4            | 0.4            | 0.8      |
| Structure Controlling Flow =                    | Plate | Plate | Plate  | Plate  | Plate   | Overflow Weir 1 | Outlet Plate 1 | Outlet Plate 1 | Spillway |
| Max Velocity through Grate 1 (fps) =            | N/A   | N/A   | N/A    | N/A    | N/A     | 0.9             | 1.7            | 2.0            | 2.2      |
| 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) =    | 39    | 47    | 28     | 39     | 48      | 50              | 45             | 40             | 28       |
| Time to Drain 99% of Inflow Volume (hours) =    | 43    | 51    | 31     | 43     | 53      | 58              | 56             | 53             | 47       |
| Maximum Ponding Depth (ft) =                    | 3.84  | 4.34  | 2.80   | 3.62   | 4.22    | 6.16            | 7.14           | 9.43           | 10.54    |
| Area at Maximum Ponding Depth (acres) =         | 2.89  | 3.68  | 1.64   | 2.53   | 3.47    | 5.63            | 5.81           | 6.46           | 6.69     |
| Maximum Volume Stored (acre-ft) =               | 3.883 | 5.525 | 1.573  | 3.260  | 5.060   | 14.533          | 20.082         | 34.085         | 41.385   |

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.07 (June 2025)



|                             |        |             |              |
|-----------------------------|--------|-------------|--------------|
| 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          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 0:05:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 0:10:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.02          | 0.01           | 0.08           |
|               | 0:15:00 | 0          | 0.00       | 0.07         | 0.15         | 0.20          | 0.16          | 0.26          | 0.25           | 0.54           |
|               | 0:20:00 | 0          | 0.00       | 0.47         | 0.76         | 0.99          | 0.75          | 1.01          | 1.08           | 2.32           |
|               | 0:25:00 | 0          | 0.00       | 1.81         | 4.26         | 6.49          | 3.15          | 5.01          | 6.17           | 19.82          |
|               | 0:30:00 | 0          | 0.00       | 4.88         | 11.53        | 17.54         | 24.34         | 41.61         | 57.60          | 126.48         |
|               | 0:35:00 | 0          | 0.00       | 8.75         | 19.81        | 29.64         | 71.57         | 118.46        | 169.06         | 331.20         |
|               | 0:40:00 | 0          | 0.00       | 11.98        | 26.26        | 38.97         | 129.54        | 208.27        | 300.27         | 557.95         |
|               | 0:45:00 | 0          | 0.00       | 13.98        | 29.99        | 44.38         | 178.59        | 283.13        | 412.72         | 745.82         |
|               | 0:50:00 | 0          | 0.00       | 14.83        | 31.21        | 46.12         | 209.41        | 330.91        | 488.69         | 869.97         |
|               | 0:55:00 | 0          | 0.00       | 14.77        | 30.71        | 45.43         | 221.95        | 351.48        | 526.45         | 932.68         |
|               | 1:00:00 | 0          | 0.00       | 14.18        | 29.07        | 43.03         | 221.10        | 351.32        | 535.39         | 949.38         |
|               | 1:05:00 | 0          | 0.00       | 13.23        | 26.56        | 39.49         | 210.40        | 334.85        | 522.08         | 929.90         |
|               | 1:10:00 | 0          | 0.00       | 12.24        | 24.56        | 37.02         | 193.03        | 307.92        | 492.06         | 885.28         |
|               | 1:15:00 | 0          | 0.00       | 11.60        | 23.07        | 35.19         | 177.35        | 284.33        | 462.34         | 839.31         |
|               | 1:20:00 | 0          | 0.00       | 10.93        | 21.60        | 33.39         | 163.78        | 262.81        | 431.78         | 787.18         |
|               | 1:25:00 | 0          | 0.00       | 10.27        | 20.12        | 31.44         | 151.10        | 242.07        | 398.86         | 728.45         |
|               | 1:30:00 | 0          | 0.00       | 9.66         | 18.84        | 29.65         | 138.24        | 221.24        | 365.21         | 667.95         |
|               | 1:35:00 | 0          | 0.00       | 9.19         | 17.85        | 28.08         | 127.20        | 203.81        | 335.66         | 614.75         |
|               | 1:40:00 | 0          | 0.00       | 8.79         | 16.95        | 26.53         | 118.06        | 189.12        | 310.15         | 567.88         |
|               | 1:45:00 | 0          | 0.00       | 8.40         | 16.04        | 24.95         | 110.04        | 175.94        | 287.27         | 525.44         |
|               | 1:50:00 | 0          | 0.00       | 8.01         | 15.09        | 23.37         | 102.43        | 163.43        | 266.41         | 486.79         |
|               | 1:55:00 | 0          | 0.00       | 7.61         | 14.13        | 21.80         | 94.98         | 151.35        | 246.35         | 449.68         |
|               | 2:00:00 | 0          | 0.00       | 7.16         | 13.15        | 20.26         | 87.65         | 139.51        | 226.80         | 413.71         |
|               | 2:05:00 | 0          | 0.00       | 6.67         | 12.13        | 18.65         | 80.30         | 127.68        | 207.58         | 378.50         |
|               | 2:10:00 | 0          | 0.00       | 6.13         | 11.06        | 16.99         | 72.93         | 115.83        | 188.69         | 344.04         |
|               | 2:15:00 | 0          | 0.00       | 5.58         | 9.97         | 15.30         | 65.53         | 103.97        | 169.89         | 309.78         |
|               | 2:20:00 | 0          | 0.00       | 5.07         | 9.11         | 14.03         | 58.25         | 92.39         | 151.50         | 277.13         |
|               | 2:25:00 | 0          | 0.00       | 4.69         | 8.47         | 13.05         | 52.80         | 84.07         | 137.82         | 253.24         |
|               | 2:30:00 | 0          | 0.00       | 4.36         | 7.91         | 12.17         | 48.88         | 77.83         | 127.32         | 234.02         |
|               | 2:35:00 | 0          | 0.00       | 4.06         | 7.37         | 11.33         | 45.74         | 72.69         | 118.28         | 217.08         |
|               | 2:40:00 | 0          | 0.00       | 3.77         | 6.86         | 10.53         | 42.80         | 67.92         | 110.16         | 201.73         |
|               | 2:45:00 | 0          | 0.00       | 3.50         | 6.38         | 9.77          | 40.04         | 63.54         | 102.65         | 187.56         |
|               | 2:50:00 | 0          | 0.00       | 3.23         | 5.91         | 9.03          | 37.34         | 59.26         | 95.47          | 174.16         |
|               | 2:55:00 | 0          | 0.00       | 2.99         | 5.45         | 8.32          | 34.69         | 55.05         | 88.65          | 161.56         |
|               | 3:00:00 | 0          | 0.00       | 2.75         | 5.00         | 7.63          | 32.10         | 50.93         | 82.20          | 149.79         |
|               | 3:05:00 | 0          | 0.00       | 2.52         | 4.57         | 6.97          | 29.54         | 46.85         | 75.82          | 138.12         |
|               | 3:10:00 | 0          | 0.00       | 2.29         | 4.15         | 6.33          | 27.00         | 42.82         | 69.47          | 126.54         |
|               | 3:15:00 | 0          | 0.00       | 2.07         | 3.73         | 5.71          | 24.46         | 38.79         | 63.14          | 114.96         |
|               | 3:20:00 | 0          | 0.00       | 1.85         | 3.32         | 5.10          | 21.94         | 34.78         | 56.80          | 103.40         |
|               | 3:25:00 | 0          | 0.00       | 1.64         | 2.92         | 4.49          | 19.42         | 30.77         | 50.48          | 91.86          |
|               | 3:30:00 | 0          | 0.00       | 1.43         | 2.52         | 3.88          | 16.91         | 26.77         | 44.16          | 80.32          |
|               | 3:35:00 | 0          | 0.00       | 1.22         | 2.13         | 3.29          | 14.40         | 22.77         | 37.85          | 68.80          |
|               | 3:40:00 | 0          | 0.00       | 1.02         | 1.74         | 2.70          | 11.90         | 18.79         | 31.55          | 57.30          |
|               | 3:45:00 | 0          | 0.00       | 0.83         | 1.36         | 2.12          | 9.41          | 14.81         | 25.26          | 45.82          |
|               | 3:50:00 | 0          | 0.00       | 0.64         | 0.99         | 1.56          | 6.93          | 10.86         | 18.99          | 34.40          |
|               | 3:55:00 | 0          | 0.00       | 0.48         | 0.67         | 1.08          | 4.50          | 6.99          | 12.83          | 23.40          |
|               | 4:00:00 | 0          | 0.00       | 0.36         | 0.50         | 0.84          | 2.45          | 3.84          | 7.78           | 14.89          |
|               | 4:05:00 | 0          | 0.00       | 0.31         | 0.43         | 0.70          | 1.36          | 2.21          | 4.88           | 9.89           |
|               | 4:10:00 | 0          | 0.00       | 0.27         | 0.37         | 0.60          | 0.87          | 1.39          | 3.18           | 6.65           |
|               | 4:15:00 | 0          | 0.00       | 0.23         | 0.32         | 0.50          | 0.64          | 0.94          | 2.05           | 4.36           |
|               | 4:20:00 | 0          | 0.00       | 0.20         | 0.27         | 0.42          | 0.47          | 0.65          | 1.30           | 2.74           |
|               | 4:25:00 | 0          | 0.00       | 0.17         | 0.23         | 0.35          | 0.36          | 0.48          | 0.78           | 1.61           |
|               | 4:30:00 | 0          | 0.00       | 0.14         | 0.19         | 0.28          | 0.27          | 0.35          | 0.42           | 0.85           |
|               | 4:35:00 | 0          | 0.00       | 0.12         | 0.15         | 0.22          | 0.21          | 0.26          | 0.24           | 0.49           |
|               | 4:40:00 | 0          | 0.00       | 0.09         | 0.12         | 0.17          | 0.16          | 0.20          | 0.19           | 0.37           |
|               | 4:45:00 | 0          | 0.00       | 0.08         | 0.10         | 0.13          | 0.13          | 0.15          | 0.15           | 0.29           |
|               | 4:50:00 | 0          | 0.00       | 0.06         | 0.08         | 0.10          | 0.10          | 0.12          | 0.12           | 0.23           |
|               | 4:55:00 | 0          | 0.00       | 0.04         | 0.06         | 0.08          | 0.08          | 0.09          | 0.09           | 0.18           |
|               | 5:00:00 | 0          | 0.00       | 0.03         | 0.04         | 0.06          | 0.06          | 0.07          | 0.07           | 0.13           |
|               | 5:05:00 | 0          | 0.00       | 0.02         | 0.03         | 0.04          | 0.04          | 0.05          | 0.05           | 0.09           |
|               | 5:10:00 | 0          | 0.00       | 0.01         | 0.02         | 0.02          | 0.03          | 0.03          | 0.03           | 0.06           |
|               | 5:15:00 | 0          | 0.00       | 0.01         | 0.01         | 0.01          | 0.02          | 0.02          | 0.02           | 0.03           |
|               | 5:20:00 | 0          | 0.00       | 0.00         | 0.01         | 0.01          | 0.01          | 0.01          | 0.01           | 0.02           |
|               | 5:25:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:30:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:35:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:40:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:45:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:50:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 5:55:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |
|               | 6:00:00 | 0          | 0.00       | 0.00         | 0.00         | 0.00          | 0.00          | 0.00          | 0.00           | 0.00           |

## **DRAINAGE MAPS**



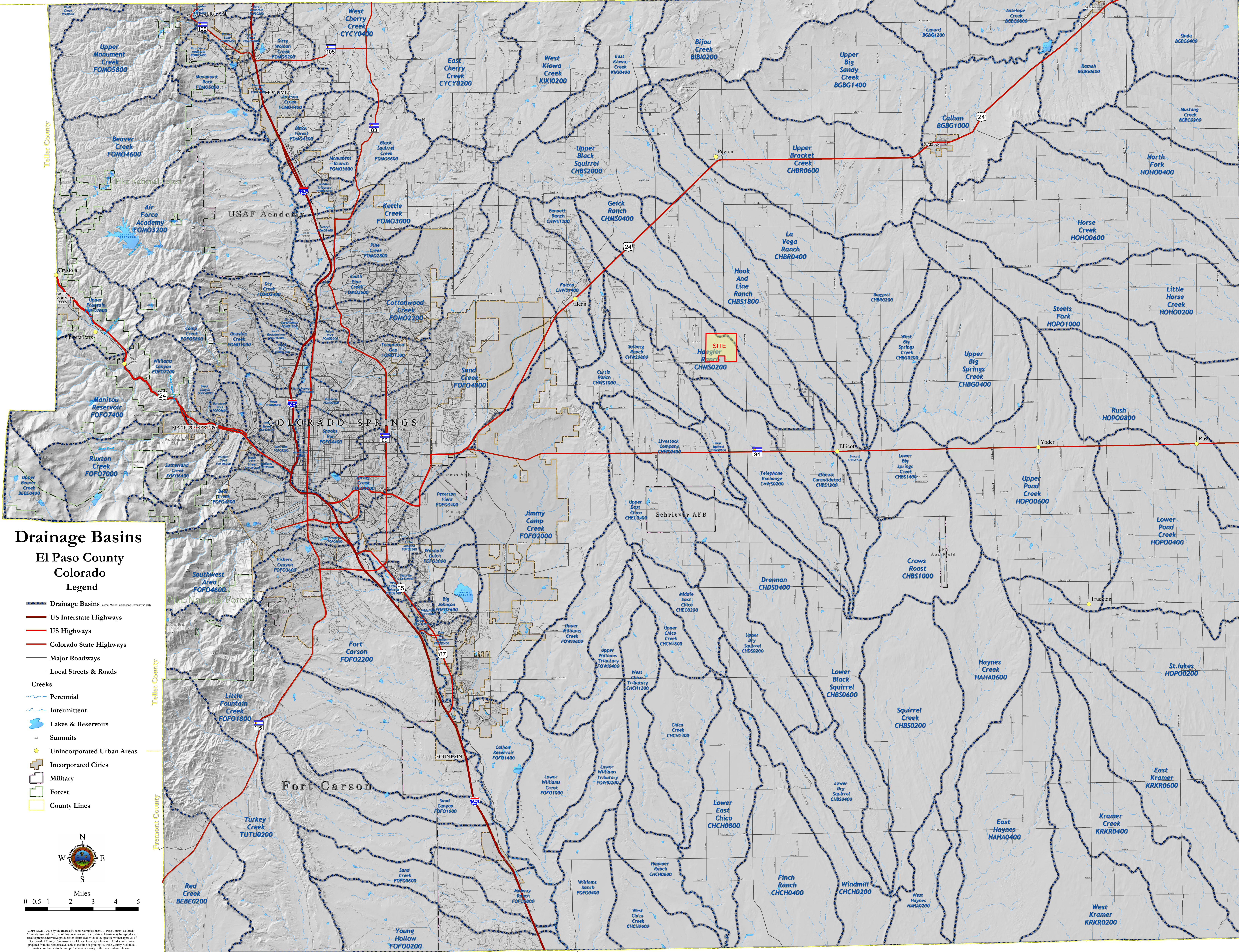
Douglas County

Elbert County

Elbert County

Lincoln County

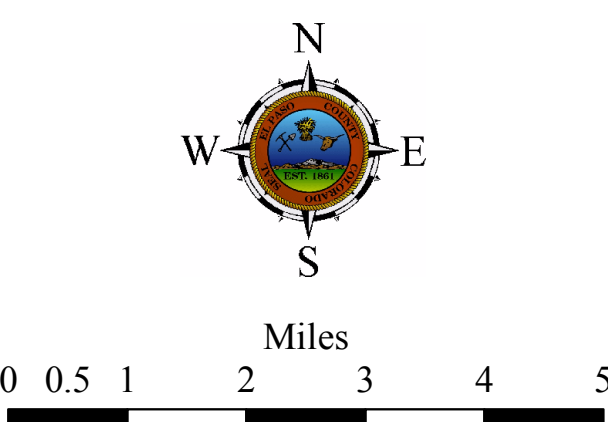
Pueblo County



## Drainage Basins

El Paso County  
Colorado  
Legend

- Drainage Basins (Source: Muter Engineering Company 1988)
- US Interstate Highways
- US Highways
- Colorado State Highways
- Major Roadways
- Local Streets & Roads
- Creeks
  - Perennial
  - Intermittent
- Lakes & Reservoirs
- Summits
- Unincorporated Urban Areas
- Incorporated Cities
- Military
- Forest
- County Lines

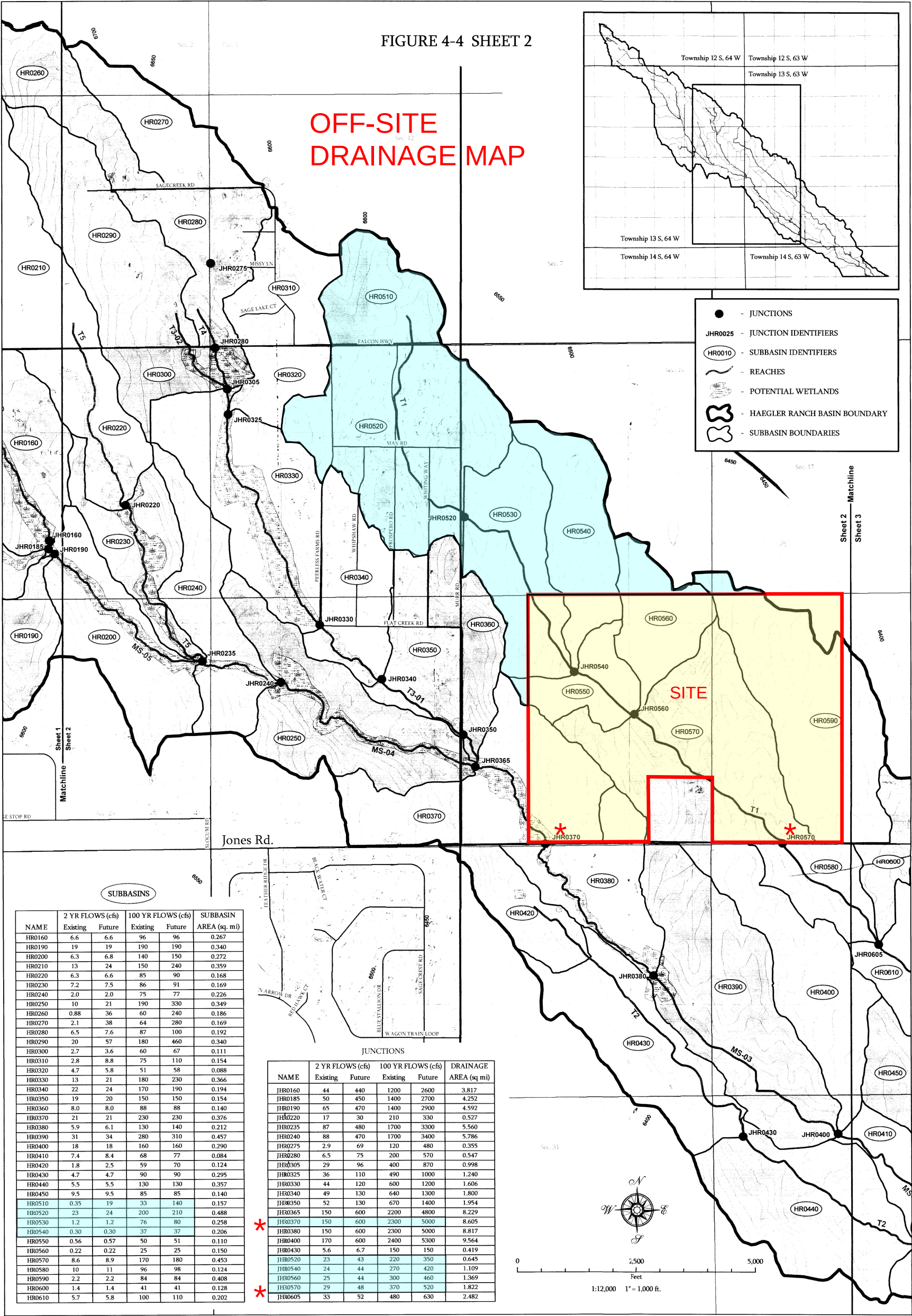


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FIGURE 4-4 SHEET 2

OFF-SITE  
DRAINAGE MAP



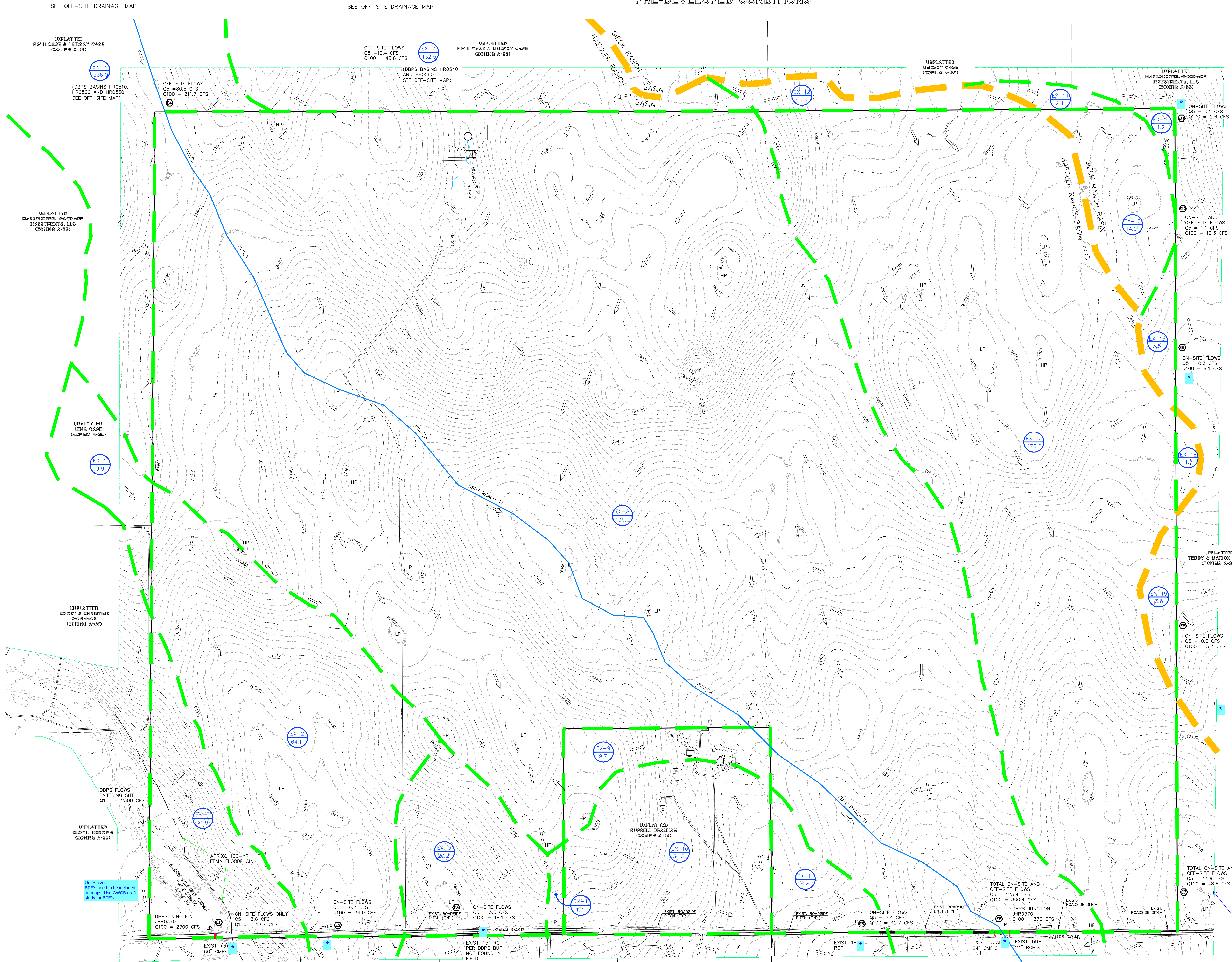
URS

HAEGLER RANCH DRAINAGE BASIN  
EXISTING AND FUTURE CONDITIONS HYDROLOGIC MODEL



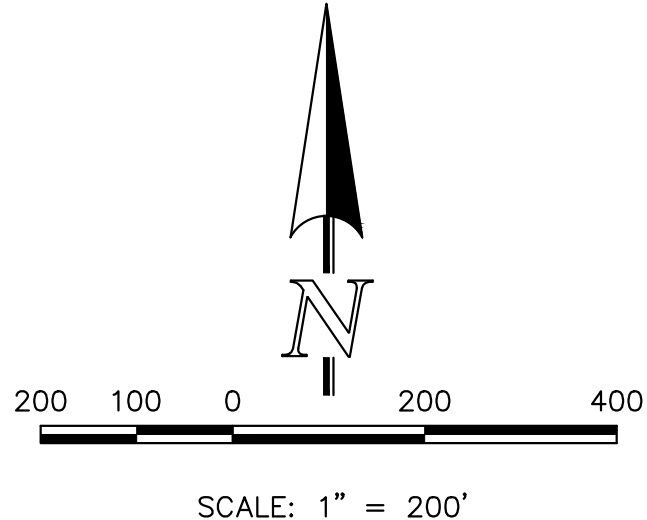
# TRIPLE H RANCH - PRELIMINARY PLAN

## PRELIMINARY DRAINAGE REPORT PRE-DEVELOPED CONDITIONS



| SUBCATCHMENT OUTPUT FLOW DATA |       |       |       |         |           |             |  |
|-------------------------------|-------|-------|-------|---------|-----------|-------------|--|
| Subcatchment                  | Area  | Width | Slope | Imperv. | 5-YR. Pre | 100-YR. Pre |  |
| Basin Name                    | (Ac.) | (Ft.) | (%)   | (%)     | (cfs)     | (cfs)       |  |
| EX-1                          | 9.9   | 787   | 1.05  | 3.2     | 1.3       | 8.3         |  |
| EX-2                          | 64.1  | 1746  | 1.87  | 2.5     | 6.3       | 27.7        |  |
| EX-3                          | 20.2  | 1157  | 2.29  | 4.4     | 3.5       | 18.1        |  |
| EX-4                          | 1.3   | 284   | 4.76  | 6.5     | 0.3       | 3.7         |  |
| EX-5                          | 21.9  | 1237  | 2.09  | 4.2     | 3.6       | 18.7        |  |
| EX-6                          | 526   | 6089  | 1.13  | 4       | 80.5      | 211.7       |  |
| EX-7                          | 132.5 | 3042  | 1.21  | 2       | 10.4      | 43.8        |  |
| EX-8                          | 439.9 | 4568  | 1.36  | 2       | 34.4      | 106.6       |  |
| EX-9                          | 9.7   | 541   | 3.78  | 5.2     | 2.0       | 10.3        |  |
| EX-10                         | 30.3  | 2034  | 2.2   | 5.2     | 6.2       | 30.5        |  |
| EX-11                         | 8.2   | 952   | 1.28  | 6.2     | 2.0       | 10.4        |  |
| EX-12                         | 6.5   | 782   | 2.19  | 2       | 0.5       | 9.0         |  |
| EX-13                         | 173.2 | 2202  | 1.72  | 2.2     | 14.9      | 48.8        |  |
| EX-14                         | 2.4   | 384   | 1.68  | 2       | 0.2       | 3.6         |  |
| EX-15                         | 1.2   | 416   | 1.1   | 2       | 0.1       | 2.6         |  |
| EX-16                         | 14    | 1196  | 0.53  | 2       | 1.1       | 9.2         |  |
| EX-17                         | 3.5   | 955   | 0.9   | 2       | 0.3       | 6.1         |  |
| EX-18                         | 1.7   | 571   | 0.43  | 2       | 0.1       | 2.7         |  |
| EX-19                         | 3.8   | 496   | 1.93  | 2       | 0.3       | 5.3         |  |

| DESIGN POINT FLOW DATA |           |             |
|------------------------|-----------|-------------|
| Design Point           | 5-YR. Pre | 100-YR. Pre |
| (cfs)                  | (cfs)     | (cfs)       |
| E1                     | 3.6       | 18.7        |
| E2                     | 6.3       | 34.0        |
| E3                     | 3.5       | 18.1        |
| E4                     | 80.5      | 211.7       |
| E5                     | 125.4     | 360.4       |
| E6                     | 7.4       | 42.7        |
| E7                     | 14.9      | 48.8        |
| E8                     | 0.3       | 5.3         |
| E9                     | 0.3       | 6.1         |
| E10                    | 1.1       | 12.3        |
| E11                    | 0.1       | 2.6         |



| DESCRIPTION                | LEGEND | SYMBOL |
|----------------------------|--------|--------|
| EXISTING GROUND CONTOUR    |        | 6910   |
| PROPOSED FINISHED CONTOUR  |        | 6910   |
| SUB-BASIN BOUNDARY         |        |        |
| DESIGN POINT               |        |        |
| BASIN IDENTIFIER           |        |        |
| EXISTING DIRECTION OF FLOW |        |        |
| EXISTING STORM SEWER       |        |        |
| DBPS REACH T1              |        |        |

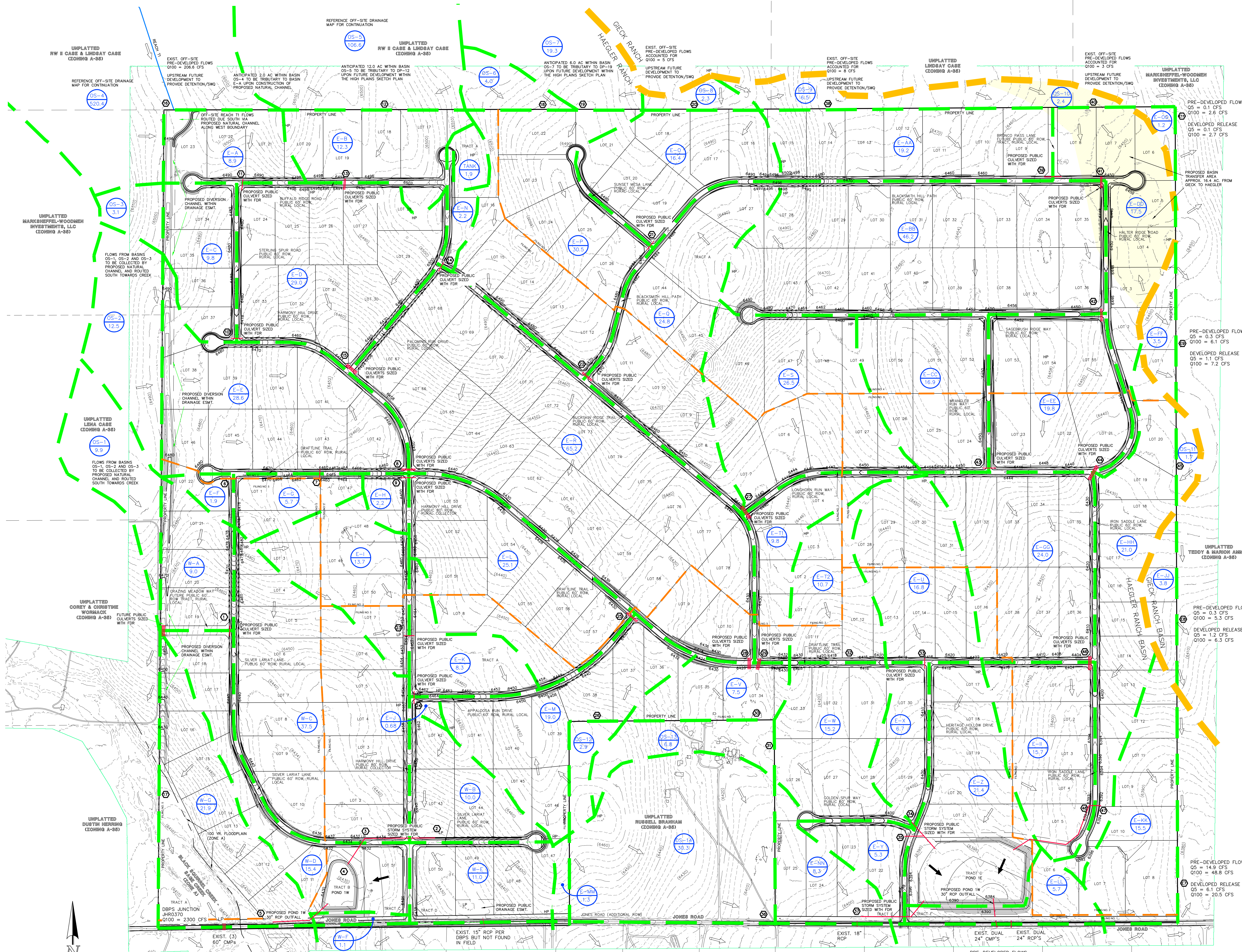
Unresolved  
Need to show how flows  
are being conveyed offsite  
(all locations) & discuss  
suitable outfalls within  
report (See areas  
designated with Y)



# TRIPLE H RANCH

## PRELIMINARY DRAINAGE REPORT

### DEVELOPED CONDITIONS



| Subcatchment Output Flow Data |             |                |             |                 |                    |       |
|-------------------------------|-------------|----------------|-------------|-----------------|--------------------|-------|
| Subcatchment Area (Ac.)       | Width (ft.) | Slope (ft./mi) | Imperv. (%) | 5Yr. Dev. (cfs) | 100-Yr. Dev. (cfs) |       |
| Basin Name                    | (Ac.)       | (ft.)          | (mi)        | (cfs)           | (cfs)              |       |
| OS-1                          | 6.9         | 787            | 1.05        | 3               | 1.3                | 8.3   |
| OS-2                          | 12.5        | 1067           | 1.30        | 2               | 1.0                | 13.17 |
| OS-3                          | 3.1         | 666            | 2.88        | 2               | 0.2                | 6.7   |
| OS-4                          | 520.4       | 6000           | 1.15        | 5               | 95.8               | 246.  |
| OS-5                          | 106.5       | 2552           | 1.37        | 2               | 8.4                | 38.3  |
| OS-6                          | 4.0         | 656            | 2.09        | 2               | 0.3                | 5.8   |
| OS-7                          | 10.3        | 1170           | 1.69        | 2               | 1.5                | 15.2  |
| OS-8                          | 2.3         | 769            | 2.18        | 2               | 0.2                | 5.0   |
| OS-9                          | 5.5         | 782            | 1.79        | 2               | 0.5                | 9.5   |
| OS-10                         | 2.4         | 1020           | 1.88        | 2               | 0.2                | 3.8   |
| OS-11                         | 1.7         | 571            | 0.43        | 2               | 0.1                | 2.7   |
| OS-12                         | 2.9         | 572            | 1.14        | 2               | 0.2                | 4.4   |
| OS-13                         | 6.8         | 444            | 2.20        | 5               | 2.7                | 10.9  |
| OS-14                         | 30.3        | 2034           | 2.50        | 10              | 6.0                | 30.5  |
| E-A                           | 8.9         | 719            | 0.95        | 10              | 3.5                | 11.4  |
| E-B                           | 12.3        | 1545           | 0.37        | 10              | 4.8                | 15.6  |
| E-C                           | 9.8         | 1460           | 1.12        | 10              | 3.9                | 15.6  |
| E-D                           | 28.0        | 2159           | 1.53        | 10              | 11.4               | 39.3  |
| E-E                           | 28.6        | 1822           | 1.51        | 10              | 11.2               | 35.2  |
| E-F                           | 1.9         | 546            | 2.56        | 10              | 0.6                | 4.5   |
| E-G                           | 5.7         | 57             | 2.28        | 11              | 2.5                | 12.1  |
| E-H                           | 2.2         | 354            | 1.92        | 10              | 0.9                | 4.5   |
| E-I                           | 1.3         | 951            | 2.91        | 11              | 0.9                | 20.3  |
| E-J                           | 0.68        | 232            | 3.61        | 10              | 5.3                | 20.5  |
| E-K                           | 8.3         | 1102           | 0.82        | 10              | 8.0                | 9.0   |
| E-L                           | 25.1        | 1281           | 1.73        | 9               | 8.9                | 28.5  |
| E-M                           | 19.0        | 847            | 2.58        | 10              | 7.4                | 23.6  |
| E-N                           | 2.2         | 296            | 2.26        | 10              | 0.3                | 4.3   |
| E-O                           | 16.4        | 1385           | 1.05        | 10              | 8.4                | 21.2  |
| E-P                           | 30.5        | 1223           | 2.04        | 10              | 11.9               | 35.3  |
| E-Q                           | 24.8        | 1300           | 1.74        | 10              | 9.7                | 30.4  |
| E-R                           | 65.2        | 2491           | 2.13        | 10              | 25.2               | 71.9  |
| E-S                           | 26.5        | 1593           | 1.94        | 10              | 10.4               | 34.7  |
| E-T                           | 1.8         | 558            | 1.57        | 10              | 3.8                | 12.6  |
| E-U                           | 10.7        | 819            | 2.09        | 10              | 4.2                | 15.6  |
| E-V                           | 16.8        | 1247           | 2.18        | 10              | 6.6                | 24.4  |
| E-W                           | 7.5         | 682            | 2.07        | 10              | 3.0                | 12.5  |
| E-X                           | 15.2        | 1071           | 2.13        | 10              | 6.0                | 21.5  |
| E-Y                           | 6.7         | 823            | 1.95        | 11              | 2.9                | 12.5  |
| E-Z                           | 5.3         | 97             | 1.13        | 10              | 2.1                | 8.3   |
| E-AA                          | 21.4        | 988            | 2.02        | 9               | 7.5                | 24.1  |
| E-AB                          | 19.2        | 1257           | 1.20        | 10              | 7.5                | 23.8  |
| E-AC                          | 46.2        | 2768           | 1.40        | 11              | 19.8               | 60.9  |
| E-AD                          | 16.9        | 1047           | 0.91        | 10              | 6.6                | 21.1  |
| E-AE                          | 17.5        | 685            | 1.97        | 10              | 6.7                | 18.7  |
| E-AD                          | 19.8        | 1791           | 1.19        | 10              | 7.8                | 27.6  |
| E-AG                          | 3.5         | 955            | 0.90        | 8               | 1.1                | 7.2   |
| E-AH                          | 24.0        | 1264           | 2.40        | 10              | 9.4                | 31.4  |
| E-AI                          | 21.0        | 696            | 2.40        | 10              | 8.1                | 23.3  |
| E-AJ                          | 15.7        | 1167           | 1.71        | 10              | 6.2                | 21.8  |
| E-AK                          | 3.8         | 496            | 1.93        | 8               | 1.2                | 6.3   |
| E-AL                          | 6.8         | 1042           | 2.37        | 10              | 6.1                | 20.5  |
| E-ALL                         | 5.7         | 724            | 1.69        | 8               | 1.8                | 9.0   |
| E-AM                          | 1.3         | 284            | 4.78        | 8               | 0.5                | 4.0   |
| E-AN                          | 8.3         | 993            | 1.25        | 10              | 3.3                | 19.1  |
| E-AO                          | 1.2         | 416            | 1.11        | 2               | 0.1                | 2.6   |
| W-A                           | 9.0         | 827            | 3.07        | 10              | 3.6                | 15.5  |
| W-B                           | 10.0        | 1104           | 2.87        | 10              | 3.9                | 18.6  |
| W-C                           | 57.5        | 1064           | 1.32        | 10              | 14.5               | 44.8  |
| W-D                           | 15.4        | 643            | 2.25        | 10              | 6.0                | 18.3  |
| W-E                           | 11.0        | 1395           | 2.19        | 9               | 3.9                | 19.6  |
| W-F                           | 1.1         | 213            | 2.74        | 10              | 0.4                | 3.5   |
| TANK                          | 1.9         | 713            | 0.60        | 50              | 3.7                | 10.3  |

| DESIGN POINT FLOW DATA |                 |                   |
|------------------------|-----------------|-------------------|
| Design Point           | 5-YR. DEB (cfs) | 100-YR. DEB (cfs) |
| 2                      | 3.6             | 15.5              |
| 3                      | 3.9             | 16.6              |
| 4                      | 13.2            | 61.4              |
| 4 (Pond IW)            | 2.9             | 79.9              |
| 5                      | 0.2             | 37.6              |
| 6                      | 0.8             | 4.5               |
| 7                      | 2.9             | 15.3              |
| 8                      | 10.8            | 40.1              |
| 9                      | 0.9             | 4.5               |
| 10                     | 3.9             | 15.6              |
| 11                     | 3.5             | 11.4              |
| 12                     | 8.4             | 38.3              |
| 13                     | 11.9            | 48.1              |
| 14                     | 3.4             | 12.4              |
| 15                     | 23.0            | 100.0             |
| 16                     | 95.8            | 246.1             |
| 17                     | 65.1            | 214.2             |
| 18                     | 0.3             | 5.8               |
| 19                     | 1.5             | 15.2              |
| 20                     | 0.2             | 5.5               |
| 21                     | 5.8             | 22.2              |
| 22                     | 14.0            | 59.5              |
| 23                     | 5.9             | 20.3              |
| 24                     | 0.3             | 2.5               |
| 25                     | 13.9            | 52.2              |
| 26                     | 0.2             | 1.0               |
| 27                     | 27.1            | 44.4              |
| 28                     | 31.1            | 63.6              |
| 29                     | 30.7            | 109.3             |
| 30                     | 77.4            | 225.1             |
| 31                     | 78.8            | 235.3             |
| 32                     | 4.2             | 15.8              |
| 33                     | 9.4             | 36.3              |
| 34                     | 88.4            | 295.4             |
| 35                     | 2.1             | 9.3               |
| 36                     | 6.1             | 33.5              |
| 37                     | 8.2             | 43.9              |
| 38                     | 0.5             | 9.0               |
| 39                     | 7.6             | 25.4              |
| 40                     | 0.2             | 3.6               |
| 41                     | 7.3             | 29.0              |
| 42                     | 22.4            | 69.0              |
| 43                     | 6.6             | 21.1              |
| 44                     | 30.4            | 106.0             |
| 45                     | 0.1             | 2.7               |
| 46                     | 32.3            | 128.2             |
| 47                     | 8.2             | 31.4              |
| 48                     | 41.5            | 175.4             |
| Pond IE                | 13.10           | 526.6             |

| DESCRIPTION                | LEGEND | SYMBOL |
|----------------------------|--------|--------|
| EXISTING GROUND CONTOUR    |        | 6910   |
| PROPOSED FINISHED CONTOUR  |        | 6910   |
| SUB-BASIN BOUNDARY         |        |        |
| DESIGN POINT               |        |        |
| BASIN IDENTIFIER           |        | BB     |
| AREA IN ACRES              |        | 10.0   |
| EXISTING DIRECTION OF FLOW |        |        |
| EXISTING STORM SEWER       |        |        |



Callout (1)

Unresolved:  
Need to show how flows are being conveyed  
offsite (all locations) & discuss suitable outfalls  
within report (See areas designated with \*)

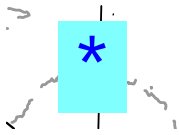
Provide State DWR input and concurrence as basin transfer per ECM is not permitted

\*

\*

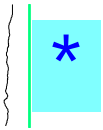
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**Date:** 7/2/2026 2:43:06 PM  
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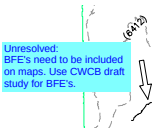
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Unresolved:  
BFE's need to be included  
on maps. Use CWCB draft  
study for BFE's.

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Unresolved:  
BFE's need to be included on maps. Use CWCB  
draft study for BFE's.