EXHIBIT LIST FOR SUB 2025-001/EA 2025-007
Preliminary Plat of Cottonwood Run

			DATED
Planning Commission Memo Exhibit List -November 4, 2025			
PCM 1 Includes:	PCM 1.1	Staff Report	October 20, 2025
	PCM 1.2	Site Map	April 28, 2025
	PCM 1.3	Notice of Public Hearing	October 17, 2025
		APPLICATION SUBMITTAL	
	PCM 1.4	Preliminary Plat Application	April 24, 2025
	PCM 1.5	Pre Plat map	April 24, 2025
	PCM 1.6	Title Report	April 24, 2025
	PCM 1.7	BFHD Letter	April 24, 2025
	PCM 1.8	Hydrology Report	April 24, 2025
	PCM 1.9	Water Purveyor approval	April 24, 2025
	PCM 1.10	SUB 2025-001/EA 2025-007 Hold Letter	May 23, 2025
		SEPA INFORMATION	
	PCM 1.11	Environmental Checklist EA 2025-007	April 24, 2025
	PCM 1.12	Notice of Application	April 28, 2025
	PCM 1.13	Mitigated Determination of Non-Significance	October 2, 2025
	PCM 1.14	MDNS Conditions and Mitigation Measures	October 2, 2025
	PCM 1.15	Critical Areas Report	September 16, 2025
		COMMENTS	
	PCM 1.16	Public Comment	May 9, 2025
	PCM 1.17	Benton County Public works EA 2025-007 Comment	May 20, 2025
	PCM 1.18	Benton County Public Works SUB 2025-001 Comment	May 30, 2025
	PCM 1.19	Department of Ecology-Comment with conditions	May 19, 2025
	PCM 1.20	Department of Ecology- Comment with Satisfying Conditions	September 23, 2025
	PCM 1.21	Washington State Department of Transportation	May 19, 2025
	PCM 1.22	Kennewick Irrigation District	May 20, 2025
	PCM 1.23	Benton PUD	May 7, 2025
	PCM 1.24	Benton County GIS	October 14, 2025
	PCM 1.25	Benton County Fire Marshal	October 15, 2025
Planning Commission Heairng Exhibit List -November 4, 2025			
PCH 1 Includes:	PCH 1.1		
	PCH 1.2		
	PCH 1.3		
	PCH 1.4		
	PCH 1.5		
Board of County Commissioners Memo Exhibit List - DATE			
BCCM 1 Includes:	BCCM 1.1		
	BCCM 1.2		
	BCCM 1.3		
	BCCM 1.4		

The Exhibit Numbers are found in the Top Right Hand Corner of each document.
PCM = Planning Commission Memo Exhibits
PCH = Planning Commission Hearing Exhibits
BCCM = County Commissioner Memo Exhibits

Community Development Department
102206 East Wiser Parkway
Kennewick, WA 99338

Planning Division
(509) 786-5612
Planning.department@co.benton.wa.us

PCM 1.1

STAFF REPORT TO THE
BENTON COUNTY PLANNING COMMISSION

FILE NO:	SUB 2025-001 – Preliminary Plat of Cottonwood Run
MEMO DATE:	October 27, 2025
HEARING DATE:	November 4, 2025
APPLICANT:	Ira Hickman 72609 E. Sundown PR SE Kennewick, WA 99338
OWNER:	Ira Hickman 72609 E. Sundown PR SE Kennewick, WA 99338
LOCATION:	The project is in the Kennewick area of unincorporated Benton County, directly east of Kash Loop and south of Abigail Place. The parcel is legally described as Section 14, Township 08 North, Range 28 East, W.M., Lot 24 of Cottonwood Estate. Parcel number 1-1488-202-0000-025.
PROPERTY SIZE:	19.78 acres
LAND USE:	Undeveloped
COMP PLAN:	Rural Transition
ZONING:	Rural Lands One Acre District (RL-1)
STAFF RECOMMENDATION:	Planning Division staff recommends that the Planning Commission forward to the Board of County Commissioners a positive recommendation to approve the Preliminary Plat of Cottonwood Run subject to the seven (7) findings of fact and nineteen (19) conditions of approval.

APPLICATION DESCRIPTION:

The applicant has submitted a preliminary plat application (PCM 1.4), known as Cottonwood Run, and associated plat map (PCM 1.5) to subdivide approximately 19.78 acres into 12 residential lots. The land is zoned Rural Lands One Acre District.

The average lot size of the development is 1.43 acres, with the largest lot in the development being 2.37 acres and the smallest lot being 1.00 acres. The lots are proposed to be served by new public roads, potable water from a Group A water system known as BC Water Co. LLC, and individual on-site septic systems. The proposal also includes relocation of an existing drainage easement on the property.

The site is generally located west of Badger Road and east of the Cottonwood Drive, and more specifically is directly east of Kash Loop and south of Abigail Place. The parcel is legally described as Section 14, Township 08 North, Range 28 East, W.M., Lot 24 of Cottonwood Estate. Parcel number 1-1488-202-0000-025.

PUBLIC NOTICE:

1. The application for SUB 2025-001 was submitted to the Benton County Planning Division on April 24, 2025.
2. The application was declared complete for processing on April 24, 2025.
3. The application documents were distributed to reviewing agencies on April 28, 2025.
4. After receiving notification from the Washington State Department of Ecology that a critical areas report would be required, the applications SUB 2025-001 and EA 2025-007 were placed on hold on May 23, 2025, to provide the applicant with additional time to submit the required report.
5. Legal notification for the Planning Commission public hearing was published on October 22, 2025, in the Prosser Record Bulletin.
6. Notice of the Planning Commission public hearing was emailed/mailed to property owners of record within 300 feet of the proposal on October 20, 2025.
7. An Environmental Checklist (EA 2025-007) was submitted on April 24, 2025, and a Mitigated Determination of Non-Significance (MDNS) was issued on October 2, 2025, with a 14-day comment period.
8. The Planning Commission public hearing is scheduled for November 4, 2025.

APPLICABLE STANDARDS/ORDINANCES:

1. Comprehensive Plan: Benton County Comprehensive Plan.
2. SEPA: BCC, Title 6, Chapter 6.35 Environmental Policy.
3. Subdivision Code: BCC, Title 9, Subdivision Regulations.
4. Zoning Code: BCC, Title 11, Zoning Regulations.
5. Critical Area Ord.: BCC, Title 15, Critical Areas- BCC 15.02 - 15.14.
6. RCW 58.17: Plats and Subdivisions.
7. Planning Commission/Open Record Hearing:

   Pursuant to BCC 9.05.070, an open record hearing on the proposed subdivision shall be held before the Planning Commission. The Planning Commission shall consider all relevant information, including but not limited to:

   a. The staff report by the Planning Division,
   b. Any written comments or concerns expressed by other reviewing agencies,
   c. Oral and written testimony from persons present at the hearing; and

   If the Planning Commission finds that additional information is needed, the Planning Commission may continue the hearing for up to thirty-five (35) days or such longer period as agreed to by the applicant and direct that the additional information be gathered.

AGENCY COMMENTS:

1. Benton County Planning Division: See the suggested findings of fact and conditions of approval for the Planning Division's comments and requirements.
2. Benton County Public Works Department: See comments dated May 30, 2025 (PCM 1.17).
3. Benton County Fire Marshal: See comments dated October 15, 2025 (PCM 1.25).
4. Benton County GIS: See comments dated October 15, 2025 (PCM 1.24).
5. Benton PUD: See comments dated May 7, 2025 (PCM 1.23).
6. Benton Franklin Health District: See comments dated April 3, 2025 (PCM 1.7).
7. Washington State Department of Ecology: See comments dated May 19, 2025 (PCM 1.19)

CRITERIA FOR FINDINGS OF FACT:

1. Pursuant to **BCC 9.05.080, Consideration of Preliminary Subdivision**, the Benton County Planning Commission, after conducting an open record hearing and considering all information presented, shall forward a recommendation to the Board of County Commissioners regarding whether the preliminary plat be approved, approved with conditions, or denied as proposed. Prior to making any recommendation, the Planning Commission shall make the following written findings:
    a. That the proposed subdivision conforms to the Benton County Comprehensive Plan, any applicable zoning requirements and other applicable land use controls;
    b. That the County Engineer, or designee, has provided a written representation that the proposed subdivision provides adequate means of access and conformance with the road and drainage requirements of Benton County;
    c. That the proposed subdivision meets the requirements of BCC 9.05;
    d. That the public interest will be served by the proposed division and dedication;
    e. That appropriate provisions are made for the public health, safety, and general welfare, for open spaces, drainage ways, streets or roads, alleys, other public ways, transit stops, potable water, sanitary wastes, parks and recreation, playgrounds, schools, school grounds, and sidewalks;
    f. That the Benton-Franklin Health District has reviewed the proposed subdivision for compliance with their rules and regulations and has not expressed objection to the proposed subdivision; and
    g. If any portion of the proposed subdivision is located within an irrigation district, that the applicant has complied with RCW 58.17.310 as it now exists or is hereafter amended.
2. **RCW 58.17.110 (1)(2)(3).** Approval or disapproval of subdivision - factors to be considered-conditions of approval.

RECOMMENDATION:

The Benton County Planning Division recommends that the Planning Commission forward a **recommendation of approval** to the Benton County Board of Commissioners for application SUB 2025-001 with the following suggested findings of fact and motion.

SUGGESTED FINDINGS OF FACT:

1. The proposed subdivision (PCM 1.4, application and PCM 1.5, preliminary plat map) conforms to the Benton County Comprehensive Plan, any applicable zoning requirements and other applicable land use controls;
    a. The proposed use is in conformance with the intent of the Comprehensive Plan based on the following facts:
        i. The Benton County Comprehensive Plan designates this area as Rural Transition. The property's zoning designation is Rural Lands One Acre District (RL-1). The preliminary plat complies with the minimum lot size and minimum average lot width required for the RL-1 Zoning District;
        ii. The 19.78-acre site is bordered on all sides by land zoned Rural Lands One Acre District.
        iii. This development proposal complies with the RL-1 District's purpose statement in BCC 11.09.010 - Rural Lands One Acre District (RL-1). The purpose of the Rural Lands One Acre District (RL-1) is to provide for the appropriate development within areas where past actions have created smaller parcel sizes than generally allowed in the Rural Lands Five Acre District (RL-5) or that are adjacent to Urban Growth Areas (UGAs) given that these areas are considered limited areas of more intensive rural development as allowed under RCW 36.70A.070.
        iv. The average lot size of the development is 1.43 acres, with the largest lot in the development being 2.37 acres and the smallest lot being 1.00 acres.
        v. This development is consistent with the required minimum lot size and density standards contained in the Benton County Zoning Ordinance; and
        vi. The creation of 12 residential lots in the RL-1 Zoning District furthers the implementation of the Benton County Comprehensive Plan.
    b. The proposed plat is consistent with the applicable zoning requirements of the Benton County Code, Title 11, based on the following facts:
        i. The property is zoned Rural Lands One Acre District (RL-1). The preliminary plat complies with the minimum lot size and minimum average lot width required for the RL-1 Zoning District.
    c. The proposed subdivision does comply with the requirements of the Benton County Code, Title 9, Subdivision Regulations;
        i. The proposed subdivision complies with the purpose and preliminary plat requirements included in BCC 9.05 Subdivision - Preliminary Plat.
    d. The proposed subdivision complies with the Benton County Critical Area Ordinance BCC Title 15.
        i. Upon completion of a review of BCC Title 15 and the Benton County Critical Area Maps, steep slopes, a minor drainage, priority habitat and species were identified on the property.
        ii. Upon completion of a review of BCC Title 15 and the Benton County Critical Area Maps, the applicant has provided a Critical Areas Report dated September 9, 2025, by GG Environmental, LLC to address potential development impacts to parcel.
        iii. The proposed plat is not located in a special flood hazard area as identified on the Federal Emergency Management Agency Flood Insurance Rate Maps and BCC 3.26.

e. The requirements of the State Environmental Policy Act have been met based on the following:

i. The proposed subdivision has been reviewed under the requirements of BCC Title 6, Chapter 6.35 and the State Environmental Policy Act.

ii. During the SEPA comment period the following comments were received:

1. Kennewick Irrigation District shall review, and approval of grading and construction plans is required to allow KID to ensure road crossings over the East Badger Drain maintain adequate flows. Such review and approval will be coordinated as part of the County's review and Preliminary Plat approval process.
    a. KID requests the developer design the crossing for the 100-year storm event.
    b. Design considerations for proposed sanitary sewer infrastructure within this development shall include the potential for sewer effluent leakage and seepage into the East Badger Drain, and mitigation measures to prevent such.
    c. The East Badger Drain is connected to waters of the United States. Mitigation to prevent storm water from entering the East Badger Drain from the subject development is required.
        i. Stormwater systems for the project shall be designed to retain, at minimum, a 100-year storm event above the East Badger Drain.
2. Benton County Public Works Department's required a mitigation fee of three thousand five hundred dollars ($3,500) per lot which must either be paid up front by the developer as a condition of plat approval or adding a note to the final plat that indicates this fee will be due prior to the issuance of any building permit for lots within the subdivision.
3. The Planning Division required the following per the Critical Area Report:
    a. Per Section 5, Project Impacts, it was identified that the East Badger Drain will be realigned in several locations.
        i. The applicant shall obtain written approval by KID on the proposed realignment.
        ii. The applicant shall obtain a Subdivision Vacation from the Planning Division for the proposed alterations to the drainage easement.
    b. Per Section 6, Proposed Mitigation, 22.29 acres of mitigation is proposed for impacts to shrubsteppe by the submittal of an in-lieu fee to the Benton Conservation District.
        i. The applicant shall provide the Planning Division that the in-lieu fee has been paid to the Benton Conservation District prior to final plat approval.
        ii. The applicant shall place the following note on the final plat:
            1. To ensure no net loss of shrubsteppe habitat functions and values from the development of this parcel, an in-lieu fee for 22.29 acres of shrubsteppe mitigation has been paid to the Benton Conservation District for offsite perpetual preservation.
    c. Per Section 6, Proposed Mitigation, the applicant shall place a note on the final plat to identify migratory bird avoidance.
        i. To avoid impacts to migratory birds, any vegetation removal shall occur outside the February 1 – July 31 nesting window. Any vegetation removal

for this development shall only be permitted to occur between August 1 and January 31.

iii. A MDNS (PCM 1.14) was issued for the project on October 2, 2025.

2. The County Engineer has provided a written representation that the proposed subdivision provides adequate means of access and conformance with the road and drainage requirements of Benton County;
   a. Reference the Benton County Public Works Department comments as it relates to stormwater and drainage easements (PCM 1.17);
   b. See the requirements for stormwater and drainage as outlined in the Preliminary Hydrology Report dated April 24, 2025 and prepared by PBS/Apex Companies, LLC.
3. The proposed subdivision meets the requirements BCC 9 Subdivision Regulations;
   a. The proposed subdivision complies with the purpose and preliminary plat requirements included in BCC 9.05 Subdivision- Preliminary Plat;
4. The public interest will be served by the proposed division and dedication;
   a. The creation of 12 residential lots in the RL-1 Zoning District furthers the implementation of the Benton County Comprehensive Plan; and
   b. Benton County standards are to be complied with, including the construction and dedication of the new public roads.
5. Appropriate provisions are made for the public health, safety, and general welfare, for open spaces, drainage ways, streets or roads, alleys, other public ways, transit stops, potable water, sanitary wastes, parks and recreation, playgrounds, schools, school grounds, and sidewalks;
   a. Appropriate provisions have been made for the public health and safety based on the following facts:
      i. The applicant has proposed that the preliminary plat be served by BC Water Co., LLC for potable and irrigation water and sanitary services are provided by individual septic systems;
      ii. The Benton Franklin Health District has reviewed the preliminary plat and finds that it generally meets their standards for plats utilizing on-site sewage disposal systems and a public water supply provided the requirements found within their comment letter dated April 3, 2025, are met; and
      iii. The Benton County Fire Marshal has required a water system to be installed for the development.
   b. Appropriate provisions have been made for open spaces based on the following facts:
      i. The proposed subdivision does not contain land to be designated for open space, however there is public open space land located in close proximity to the south of the proposed development.
   c. Appropriate provisions have been made for drainage ways based on the following facts:
      i. PBS/Apex Companies, LLC prepared a preliminary stormwater drainage report for the applicants of Cottonwood Run dated April 24, 2025 (PCM 1.8). The report discusses the provisions made for both offsite and onsite stormwater as it relates to this property and the proposed development;
         1. A final stormwater drainage report is required; and

ii. Reference the Benton County Public Works Department comments as it relates to stormwater and drainage easements (PCM 1.17).

d. Appropriate provisions have been made for streets or roads, alleys, and other public ways based on the following facts:

i. The public interest will be served by the proposed division and dedication as the Benton County Public Works Department's Road standards are to be complied with including the construction and dedication of new public roads; and

ii. Reference the Benton County Public Works Department (PCM 1.17) comments as it relates to road and mitigation requirements.

e. Appropriate provisions have been made for transit stops based on the following facts:

i. Ben Franklin Transit did not comment on transit service for the proposed development. The proposed plat and surrounding area are not served by public transit.

f. Adequate provisions have been made for potable water supplies based on the following facts:

i. The project is located in the Lower Yakima Watershed, WRIA 37;

ii. Potable water is proposed to be served by BC Water Co., LLC. The public water system has submitted comments stating that it has sufficient capacity within the water distribution system to provide these services; and

iii. The Benton Franklin Health District has no objections to potable water being served by a public water supply.

g. Adequate provisions have been made for sanitary waste based on the following facts:

i. The Benton Franklin Health District has no objections to individual septic systems which are proposed to serve the lots.

h. Adequate provisions have been made for parks, recreation, and playgrounds based on the following facts:

i. The proposed subdivision does not contain land to be designated for parks or recreation. The Benton County Code does not require park dedications. However, there is public open space land located in close proximity to the proposed development.

i. Appropriate provisions have been made for schools and school grounds and for sidewalks and other planning features that assure safe walking conditions for students who only walk to and from school based on the following facts:

i. The proposed plat is within the Kennewick School District. The School District did not provide comments on this proposal as to whether there are adequate provisions to assure safe walking conditions for students who walk to and from school or waiting for school buses.

6. The applicable water/sanitary system agency has reviewed the proposed subdivision for compliance with its rules and regulations and has not expressed objection to the proposed subdivision; and

a. The Benton Franklin Health District has reviewed the application and indicated that it has no objection to the proposed lots connecting a public water supply and onsite sewage disposal systems.

b. BC Water Co., LLC has reviewed the application and indicated that it has no objection to the

proposed lots connecting to BC Water Co. potable water.

7. This plat is within the Kennewick Irrigation District however, irrigation water is proposed to be served by a private water system, BC Water Co., LLC, and the applicant has complied with RCW 58.17.310 as it now exists or is hereafter amended.

SUGGESTED CONDITIONS OF APPROVAL:

1. Applicant shall meet and comply with the requirements of the **Benton County Public Works Department**, including the following:
    a. The developer shall provide a complete set of engineered construction drawings for review and approval by the County and associated utilities. The drawings shall contain all appropriate information listed on the attached Minimum Plan Requirements. Grading plan will include grading to shape any drainage easements to route and fully contain all runoff based upon the 100-year storm within the easement limits. All plans and associated reports shall be prepared by a Professional Engineer licensed to practice in the State of Washington
    b. All construction shall be in accordance with the most current WSDOT Standard Specifications for Road, Bridge and Municipal Construction, applicable Benton County Standard Plans and the requirements of the County Engineer
    c. All roads within this plat shall have a paved width of 24 feet with a minimum 2-foot gravel shoulder. Roadways shall be designed for a minimum 25 mile per hour design speed
    d. The pavement return radius at all intersections shall be a minimum of 35 feet
    e. All stormwater from the roadways shall be contained on the plat and shall utilize surface infiltration (ditches, swales, ponds) for detention. The developer shall have an infiltration test performed at each proposed detention area. Tests shall be done with an infiltrometer using the falling head or constant head method. Other methods of infiltration rate determination shall be approved by the County.
    f. All signage including but not limited to stop signs, speed limit signs and street name signs shall be installed by the developer in accordance with Benton County Standard Plans
    g. All new power, telephone, cable TV and irrigation shall be installed outside of the County right of way in the appropriate easements. Domestic water piping may be installed within the County right of way in accordance with a valid franchise agreement.
    h. Survey monuments, with cases and covers per Benton County Standard R-14B, shall be placed at all road intersections, points of curvature, points of tangency, centers of cul-de-sacs, section corners and quarter corners. All monuments shall be set by a Professional Land Surveyor licensed to practice in the state of Washington
    i. Access on lot 7 and 8 is restricted to the shared 40-foot easement, show driveway on plat using Benton County Standard R-4 using the urban local access cross section.
    j. Provide crossing over drainage easement on lot 7 and 8 to include required culverts.
    k. Show driveways for lot 11 on face of plat and show additional dwelling on lot 11.
    l. Provide paved driveway following Benton County standard plan R-3, for additional dwelling on lot 11 off of new road connecting to Kash Loop.
    m. Label new road connecting to Kash Loop.

n. Pursuant to Benton County Code 9.09.030(I) sight distance calculations shall be done utilizing the WSDOT Design Manual for all intersections and driveways within the project. Dedication of additional right of way may be required to encompass clear vision triangles.

o. Remove temporary turnaround in easement AF# 2022-037575 in lot 7 and 8 of Cottonwood Creek Phase 4. Restore ditches and shoulder to county standards.

p. If present restore landscaping and approaches on lot 7 and 8 of Cottonwood Creek Phase 4.

q. Dedicate 60' of right of way to Benton County for road purposes. (The plan shows 30 feet each side of centerline with no description of what the 30 feet is for).

r. After final approval of the road construction, one full size Mylar of the record drawings shall be provided to Public Works.

s. The 26-foot private access & utility easement on lot 7 must be relocated. The county will not approve two culvert crossings and approaches that close together. A 26-foot easement is also not wide enough to accommodate the required approach for access easements.

t. Add the following notes to the face of the final plat

i. Benton County is not responsible for the maintenance or upkeep of any stormwater retention facility or drainage easements. All such maintenance and upkeep are the responsibility of the underlying property owner.

ii. Prior to the construction of any driveway or the issuance of any building permit for any lot within this subdivision the property owner shall obtain a Road Approach Permit from the Benton County Public Works Department and install the required temporary construction access.

iii. No trees, shrubs, weeds, fencing or other obstructions more than 24 inches in height are permitted within Benton County right of way.

iv. Property owners that install grass, curbing, rock mulch or other landscaping within the County right of way do so at their own risk. The County will not repair or replace damaged landscaping due to construction or maintenance operations.

v. All lots within this subdivision are subject to a three thousand five hundred ($3,500) traffic mitigation fee. Such fee shall be due and payable prior to issuance of any Building Permit or Road Approach Permit.

vi. Access to lot 7 and 8 is restricted to the shared 40-foot easement.

vii. The underlying property owners of lot 7 and 8 shall be responsible for the maintenance of culverts on the shared 40-foot easement.

viii. Road approaches in this subdivision do not require culverts.

u. For more information, please contact Shane Elledge at 509-786-5611 or richard.elledge@co.benton.wa.us.

2. Applicant shall meet and comply with the requirements of the **Benton Franklin Health District**. The BFHD has reviewed the above referenced proposal and finds that the plat generally meets their requirements for plats utilizing on-site sewage disposal systems and a public water supply provided:

a. All lots within the plat must have a minimum of 0.5 acres of gross and 10,000 useable land area.

b. All wells within 150 feet of this plat must be shown on the plat map.

c. Prior to final approval, a long plat final review fee (Code 54.37 for $200) must be submitted to this office for the final walk-through review of the plat for compliance with Benton-Franklin Health Department Rules and Regulations No. 2, and WAC 246-272A, and for the issuance of appropriate comments to the Benton County Planning Department.

d. Prior to final approval, this office must be given the opportunity to review the final plat for compliance with Benton-Franklin Health Department Rules and Regulations No. 2, and WAC 246-272, and issue appropriate comments to the Benton County Planning Department.

e. Please contact Bridget Kelsay at (509) 460-4316 for more information.

3. Applicant shall meet and comply with the requirements of the **Benton PUD** including the following:
   a. The new road extension looks to have pole in middle of road. How far does pole need relocated? Might need to install poles each side of road for span lengths. This is a main power feeder line.
   b. Developer needs to provide CAD file of lot layout to get into BPUD map and have BPUD do a power layout design.
   c. Developer will need to reach out to BPUD with developer contact info on where to send developers packet and fees for power portion of project.
   d. For more information, please contact Chad Brooks at 509-582-1233.

4. Applicant shall meet and comply with the requirements of the **Benton County Fire Marshal** including the following Benton County Code:
   a. 3.18.030 PROCEDURE FOR COMPLIANCE. The following shall be required for all subdivisions, short plat subdivisions, Manufactured Home/FAS parks, recreational vehicle parks, and commercial and industrial areas not exempt under the provisions of BCC 3.18.025:
      i. Subdivisions:
         - Prior to preliminary plat approval, the applicant shall submit to the Benton County Fire Marshal a letter from the water purveyor addressing its willingness and ability to satisfy the requirements of this chapter.
         - Prior to final plat approval, the following shall be required:
            a. Water system plans and specifications which comply with these regulations must be designed and stamped by a registered, professional engineer licensed in the State of Washington. Said plans shall be signed by the purveyor and shall be filed with the Benton County Fire Marshal and the Department of Health.
            b. Water system plans shall be approved in writing by the Benton County Fire Marshal.
            c. The approved water system shall be installed prior to final plat approval, or a statement shall be placed on the plat indicating no building or Manufactured Home/FAS installation permit will be issued until the water system is installed, operating and approved.
            d. Two (2) copies of the "as built" drawings must be filed with the Benton County Fire Marshal.
         - When the distribution system is installed, said installation must be under the direction of a registered, professional engineer licensed in the State of Washington who shall certify the construction of the system is in accordance with the approved design.

- Written approval from the Benton County Fire Marshal that the system is operating to specifications shall be submitted.

b. In addition to the above requirements the installation of the water system shall comply with Benton County Code 3.18.035, 3.18.036, 3.18.037, 3.18.38, 3.18.039 and 3.18.040

c. Please contact the Benton County Fire Marshal, Gary Tiplady, at (509) 735-3500 or Gary.Tiplady@co.benton.wa.us for more information.

5. Applicant shall meet and comply with the requirements of **Benton County GIS**, including the following:

a. Please add the following addresses to each lot:

Lot 1: T13995 S ABIGAIL PL, Kennewick, WA 99338

Lot 2: T13879 S ABIGAIL PL, Kennewick, WA 99338

Lot 3: T13763 S ABIGAIL PL, Kennewick, WA 99338

Lot 4: T13647 S ABIGAIL PL, Kennewick, WA 99338

Lot 5: T13531 S ABIGAIL PL, Kennewick, WA 99338

Lot 6: T13415 S ABIGAIL PL, Kennewick, WA 99338

Lot 7: T13342 S ABIGAIL PL, Kennewick, WA 99338

Lot 8: T13452 S ABIGAIL PL, Kennewick, WA 99338

Lot 9: T13562 S ABIGAIL PL, Kennewick, WA 99338

Lot 10: T13672 S ABIGAIL PL, Kennewick, WA 99338

Lot 11: 103228 E KASH LP, Kennewick, WA 99338

103394 E KASH LP, Kennewick, WA 99338 (Subject to change upon road name)

Lot 12: 13892 S ABIGAIL PL, Kennewick, WA 99338

Please note that three proposed names will be needed for the currently undesignated portion of the roadway.

b. For more information, please contact Benton County GIS at (509) 786-5485.

6. Applicant shall meet and comply with the requirements of the **Benton County Planning Division**, including the following:

a. The applicant shall meet and comply with the SEPA Determination for this application, including the MDNS with mitigation/conditions issued by the Planning Division on October 10, 2025 (PCM 1.10).

i. Meet and comply with the Benton County Planning Division requirement of compliance with all critical area requirements of the Benton County Planning and Building Divisions for all associated building permits.

ii. Meet and comply with KID's requirements:

- KID review and approval of grading and construction plans is required to allow KID to ensure road crossings over the East Badger Drain maintain adequate flows. Such review and approval will be coordinated as part of the County's review and Preliminary Plat approval process.
- KID requests the developer design the crossing for the 100-year storm event.

- Design considerations for proposed sanitary sewer infrastructure within this development shall include the potential for sewer effluent leakage and seepage into the East Badger Drain, and mitigation measures to prevent such.
- The East Badger Drain is connected to waters of the United States. Mitigation to prevent storm water from entering the East Badger Drain from the subject development is required.
    a. Stormwater systems for the project shall be designed to retain, at minimum, a 100-year storm event above the East Badger Drain.

iii. Meet and comply with the Benton County Public Works Department's requirement of providing a mitigation fee of three thousand five hundred dollars ($3,500) per lot which must either be paid up front by the developer as a condition of plat approval or adding a note to the final plat that indicates this fee will be due prior to the issuance of any building permit for lots within the subdivision.

iv. Meet and comply with the Benton County Planning Division requirements:

- Per Section 5, Project Impacts, it was identified that the East Badger Drain will be realigned in several locations.
    a. The applicant shall obtain written approval by KID on the proposed realignment.
    b. The applicant shall obtain a Subdivision Vacation from the Planning Division for the proposed alterations to the drainage easement.
- Per Section 6, Proposed Mitigation, 22.29 acres of mitigation is proposed for impacts to shrubsteppe by the submittal of an in-lieu fee to the Benton Conservation District.
    a. The applicant shall provide the Planning Division that the in-lieu fee has been paid to the Benton Conservation District prior to final plat approval.
    b. The applicant shall place the following note on the final plat: To ensure no net loss of shrubsteppe habitat functions and values from the development of this parcel, an in-lieu fee for 22.29 acres of shrubsteppe mitigation has been paid to the Benton Conservation District for offsite perpetual preservation.
    c. Per Section 6, Proposed Mitigation, the applicant shall place a note on the final plat to identify migratory bird avoidance: To avoid impacts to migratory birds, any vegetation removal shall occur outside the February 1 – July 31 nesting window. Any vegetation removal for this development shall only be permitted to occur between August 1 and January 31.

b. The applicant shall meet and comply with the recommended design and project compliance for stormwater as identified in the Preliminary Storm Drainage Report prepared by PBS/Apex Companies, LLC dated April 24, 2025 (PCM 1.8). Including but not limited to: A final stormwater drainage report is required to be submitted with the final plat.

c. Please show and label any areas within the plat with slopes over 15%.

d. Add building setback envelopes to Lots 3, 4, 6, and 9.

e. Per Benton County Code 9.09.010(d)(2) new private road easements are not permissible within new a subdivision. Please remove the 26' private access easement to benefit parcels J and K.

f. At the time of platting, the intent of the 40'x140' shared access is to be a shared driveway access point for Lots 7 and 8 due to the drainage.

g. Please label the dashed line that runs north to south through Lots 9, 10 and 11 and west to east on Lots 3 and 11.

h. Remove the label reference to "future short plat" on the parcels south of the subject property.

i. Add the developer/owners address and phone number to the plat map.

7. Please include the following notes on the final plat:
   a. During construction on each property, all construction debris shall be maintained on-site and properly disposed of. Dust control measures including an adequate water supply shall be provided.
   b. Address numbers [noted in brackets] are subject to change until the exact location of access onto the short plat is determined.
   c. The utility easements shown hereon are hereby granted for the use, access and maintenance by the platted property's current utility provider. Said utility easements are for the use, access and maintenance of electric power, telephone, cable and any other defined utilities to and or through said tract.
   d. Potable and irrigation water are provided by BC Water Co., LLC for this plat.
   e. Prior to the granting of a building or factory assembled (FAS) permit for each lot by the County, the applicant for a building or FAS permit must provide evidence of potable water from BC Water Co., LLC.
   f. Address numbers [noted in brackets] are subject to change until the exact location of access onto the short plat is determined.
   g. It is expressly declared and understood that Benton County has no duty, obligation or responsibility for the construction, upkeep, maintenance or repair of storm drainage facilities or drainage easements.
   h. To ensure no net loss of shrubsteppe habitat functions and values from the development of this parcel, an in-lieu fee for 22.29 acres of shrubsteppe mitigation has been paid to the Benton Conservation District for offsite perpetual preservation.
   i. To avoid impacts to migratory birds, any vegetation removal shall occur outside the February 1 – July 31 nesting window. Any vegetation removal for this development shall only be permitted to occur between August 1 and January 31.

8. Please include a signature block for the following:
   a. County Engineer
   b. County Assessor
   c. County Treasurer
   d. Chairman of County Planning Commission
   e. Chairman of the Board of County Commissioners
   f. Benton Franklin Health District
   g. BC Water Co., LLC
   h. Kennewick Irrigation District
   i. Benton PUD
   j. Owners' certificate
   k. Notary block

9. Please submit a copy of the complete field and computation notes with the final plat.

10. Preliminary plat approval shall be effective for 5 (five) years from the date of Board of County Commissioner approval. Exceptions shall comply and approved subject to the provisions of BCC 9.05.110 (e) as currently existing or hereafter amended.

11. Any amendments to an approved preliminary plat must be completed in accordance with BCC 9.05.140 as currently existing or hereafter amended.

12. Prior to the final plat being reviewed for final approval, the requirements of the Benton County Planning Division, Benton County Fire Marshal, Benton County Engineer, Benton Franklin Health District, and other commenting agencies and conditions shall be met and complied with.

13. Final Plat applications shall be submitted to the Planning Division. An applicant shall submit a final plat application that follows BCC 9.07 - Final Plat standards and requirements, as currently existing or hereafter amended.

14. All lots in the final plat shall meet the design standards for final plat approval as specified in Benton County Code 9.09 - Design and Improvements, as currently existing or hereafter amended, and meet all of the zoning requirements as specified in Benton County Code, Title 11 - Zoning, as currently existing or hereafter amended.

15. The location and size of all irrigation and utility easements necessary for electric power, telephone service, water, sewer and cable TV are to be coordinated with the proper utilities and/or reviewing agencies and shown on the final plat. The developer will need to open the utility trenches, including road crossings, based on individual utility requirements and specifications.

16. Address numbers shall be coordinated with the County GIS Department and placed on the final plat. Addresses [noted in brackets] are subject to change until the exact location of the dwelling and access onto the plat is determined.

17. The applicant shall coordinate with the Post Office regarding centralized box unit (CBU) locations for the development, if necessary.

18. All of the statements that are required to be on the notes of the plat shall be either: 1) recorded as a restrictive covenant on each applicable parcel with the County Auditor, or 2) described in detail in the developer's covenants that are recorded and provided to each lot owner, prospective landowner, and the Planning Division at the time of final plat approval and recording.

19. That the preliminary plat is modified in all necessary respects so that the final plat will reflect the requirements of approval. If the final plat will be in conflict with any of the conditions of approval as adopted by the Planning Commission as a result of the modifications, then the final plat must be reviewed by the Planning Commission at a public meeting for approval prior to sending the final plat to the Board of County Commissioners.

SUGGESTED MOTION:

The Planning Commission forward a **recommendation of approval** to the Benton County Board of Commissioners for application SUB 2025-001, subject to the seven (7) findings of fact and nineteen (19) conditions of approval as stated in the staff memo dated October 17, 2025, which includes the preliminary plat approval for 12 residential lots together with the relocation of an existing drainage easement and that the Chairman, in conjunction with the Secretary of the Planning Commission, prepare and adopt written findings and conclusions reflecting the commission's recommendation for approval that articulate and are consistent with the findings, conclusions and recommendations made by the Planning Commission tonight.

SUB 2025-001 Preliminary Plat Site Map

PCM 1.2

4/28/2025, 10:39:45 AM

1:9,028

0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Road_Centerlines

Paved County Road

Private County Road

Community Development Department
102206 East Wiser Parkway
Kennewick, WA 99338

Planning Division
(509) 786-5612
planning.department@co.benton.wa.us

NOTICE OF PUBLIC HEARING

NOTICE OF HEARING before the Benton County Planning Commission in the matter of County Planning at a regular meeting on November 4, 2025, at 6:00 p.m. in person and digital attendance located at 7122 W. Okanogan Place, Building E. Room 303 Commissioners' Hearing Room, 3rd Floor Kennewick, WA.

NOTICE IS HEREBY GIVEN that public comment will be taken on the following proposed application before the Planning Commission at this meeting:

SUB 2025-001 - The Preliminary Plat of Cottonwood Run by Ira Hickman for the subdivision of 19.78 acres into 12 lots with an average lot size of 1.43 acres together with the relocation of an existing drainage easement on the property. The project is in the Kennewick area of unincorporated Benton County, directly east of Kash Loop and south of Abigail Place. The parcel is legally described as Lot 24 of Cottonwood Estate in Section 14, Township 08 North, Range 28 East, W.M., parcel number 1-1488-202-0000-025.

NOTICE IS FURTHER GIVEN that the proposed subdivision application has been reviewed under the requirements of the State Environmental Policy Act and Mitigated Determination of Non-Significance (MDNS) was issued for EA 2025-007 on October 2, 2025. Accordingly, an Environmental Impact Statement was not required for these proposals. Any comments regarding these determinations and the environmental impacts of the proposals can be made at the Planning Commission Hearing or in writing to the Benton County Planning Division by 3 p.m. on Friday, October 31, 2025.

At this hearing, the Planning Commission may recommend approval or disapproval of the proposals to the Benton County Board of Commissioners. All parties concerned may present any support or objections for the application. Information concerning the application on virtual attendance options can be obtained from the Benton County Planning Division, by calling 786-5612 or by visiting www.tinyurl.com/BCPublicNotice.

Dated this 15th day of October 2025.

Martin Sheeran, Chairman
Benton County Planning Commission

Greg Wendt, Community Development Director
Benton County Planning Division

Publish, October 22, 2025

PCM 1.4

Community Development Department
Prosser Office: 620 Market Street, 1st Floor
Kennewick Office: 102206 East Wiser Parkway
www.bentoncountywa.gov

Planning Division
(509) 786-5612
Planning.department@co.benton.wa.us
102206 E Wiser Parkway, Kennewick, WA 99338

PRELIMINARY PLAT INFORMATION

WHAT IS THE DIFFERENCE BETWEEN A PRELIMINARY PLAT AND A SUBDIVISION?

A subdivision is the land use process that provides general approval of the division or re-division of land into 5 or more lots, tracts, parcels, sites, or divisions for the purpose of sale, lease, or transfer of ownership or development. A preliminary plat is the drawing (map) of a proposed subdivision showing the layout of lots, streets, utilities, and other elements of a subdivision.

THE PROCESS

A Preliminary Plat normally involves having a pre-application meeting with County Planning Staff to discuss the application, answer questions, and resolve any issues at the front end of the process. After a completed Preliminary Plat application has been submitted, the application will be reviewed by staff and a letter of completion will be sent to the applicant. An Environmental Checklist application must be submitted concurrently with the Preliminary Plat application. During the review period, local and state agencies are notified of the proposed plat and given the opportunity to review the proposal and submit comments and/or requirements. A notice of application will be published in the local newspaper and sent to the owners of neighboring property within 300 feet of the subject property. After the 14-day comment period has expired for the notice of application, a threshold determination can be made for the Environmental Checklist application.

A public hearing will then be conducted, at which time the application will be heard by the Benton County Planning Commission and the public will have an opportunity to comment on the proposal. The Planning Commission will review all of the information submitted and make a recommendation to the Board of County Commissioners to either approve, approve with conditions, or deny the application. The Board of County Commissioners will then make a final determination regarding the approval/denial of the application during a closed record hearing.

CRITERIA FOR APPROVAL

Prior to making any recommendation for approval, the Planning Commission shall make the following written findings:

1. That the proposed subdivision conforms with the Benton County Comprehensive Plan, any applicable zoning requirements and other applicable land use controls;
2. That the County Engineer, or designee, has provided a written representation that the proposed subdivision provides adequate means of access and conformance with the road and drainage requirements of Benton County;
3. That the proposed subdivision meets the requirements of BCC 9.05;
4. That the public interest will be served by the proposed division and dedication;
5. That appropriate provisions are made for the public health, safety, and general welfare, for open spaces, drainage ways, streets or roads, alleys, other public ways, transit stops, potable water, sanitary wastes, parks and recreation, playgrounds, schools, schoolgrounds, and sidewalks;
6. That the Benton-Franklin Health District has reviewed the proposed subdivision for compliance with its rules and regulations and has not expressed objection to the proposed subdivision; and,
7. If any portion of the proposed subdivision is located within an irrigation district and that the applicant has complied with RCW 58.17.310 as it now exists or is hereafter amended.

APPEALS

Any decision is appealable under the terms and conditions as set forth in State law.

EXPIRATION

Preliminary plats approved on or after January 1, 2015 shall be valid for a period of five (5) years from the date of approval by the Benton County Board of Commissioners.

Community Development Department
Prosser Office: 620 Market Street, 1st Floor
Kennewick Office: 102206 East Wiser Parkway
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Planning Division
(509) 786-5612
Planning.department@co.benton.wa.us
102206 E Wiser Parkway, Kennewick, WA 99338

PRELIMINARY PLAT CHECKLIST

Applicant	Staff	
☒	☐	**Completed Preliminary Plat Application** – must include signatures of all parties with ownership interest. Incomplete applications will not be accepted.
☒	☐	**Preliminary Plat Map** – Prepared by a licensed Washington State Land Surveyor. Plat map requirements can be found in Benton County Code 9.05.060. **Forty (40) full sized copies**, **one (1) reduced copy** measuring no larger than 11" x 17", and **an electronic copy (PDF)** of the preliminary plat are required with the application submission.
☒	☐	**Recent Title Report** – No more than two months old, a copy of the title report shall show the names of anyone with ownership interest in the land being subdivided and any easements on the property.
☒	☐	**Benton-Franklin Heath District Letter** – Written verification from the Benton-Franklin Health District that the applicant has provided all necessary information to enable the Health District to review and make recommendations on the proposed site.
☒	☐	**Hydrology Report** – A preliminary report with information required by the Benton County Road Department. Hydraulic calculations shall be based on the Stormwater Manual for Eastern Washington using a minimum of a 25-year return frequency storm event.
☒	☐	**$1000.00 + $50 per lot Preliminary Plat Fee** – The fee must be paid at the time of application submittal, cash or checks accepted. Checks made payable to the ***Benton County Treasurer.*** All application fees are non-refundable.
☒	☐	**$500.00 Environmental Checklist Fee** – Environmental Checklist application (SEPA) must be submitted concurrently with the Preliminary Plat application.
☒	☐	**Written approval** to supply the appropriate service from a city or water purveyor if the property is to be served by a public water supply and/or sewer system.

Please note: For properties within one hundred and fifty (150) feet of a hazardous product transmission pipeline, written documentation that the owner/operator of the pipeline has been contacted by the applicant and is aware of the proposed project.

Please contact the following departments/agencies to ensure your proposal will be in compliance with their regulations for platting property in Benton County:

Benton-Franklin Health District
7102 West Okanogan Place
Kennewick, WA 99336
(509) 460-4205

Benton County Public Works Department
620 Market Street
Prosser, WA 99350
(509) 786-5611

OR

102206 E Wiser Parkway
Kennewick, WA 99338
(509) 735-3084

Any information submitted to the Benton County Planning Division is subject to public records disclosure law for the State of Washington (RCW Chapter 42.17) and all other applicable law that may require the release of the documents to the public.

COTTONWOOD RUN

Community Development Department
Prosser Office: 620 Market Street, 1st Floor
Kennewick Office: 102206 East Wiser Parkway
www.bentoncountywa.gov

Planning Division
(509) 786-5612
Planning.department@co.benton.wa.us
102206 E Wiser Parkway, Kennewick, WA 99338

PRELIMINARY PLAT APPLICATION

Application No. _____

APPLICANT INFORMATION

Please check the box indicating primary contact person for this application

☐ **Applicant/Agent:** Ira Hickman
Mailing Address: 72609 E SUNDOWN PR SE City: Kennewick
State: WA ZIP: 99338 Phone: (509) 430-6288 Work: _____
Email Address: apcconstruction@msn.com
Signature: _____ Date: 8/26/24

☐ **Property Owner(s)** *(if different)*: _____
Mailing Address: _____ City: _____
State: ____ ZIP: _____ Phone: _____ Work: _____
Email Address: _____
Signature: _____ Date: _____
Signature: _____ Date: _____

**If there are additional owners please copy this section, sign, and attach to the application*

☐ **Land Surveyor:** Stratton Surveying & Mapping, P.C.
Mailing Address: 313 N. Morain Street City: Kennewick
State: WA ZIP: 99336 Phone: _____ Work: 509-735-7364
Email Address: stratton@strattonsurvey.com

If the property is owned by a corporation, trust, partnership or LLC please complete the entity signature block below showing that the person signing has the authority to sign on behalf of the company.

ENTITY SIGNATURE BLOCK

If the applicant or legal owner of the property is a corporation, partnership, trust or LLC use the following signature block.

Applicant/Legal Owner: _____

Officer name: _____

Title: _____

Signature: _____ Date: _____

THE ABOVE SIGNED OFFICER OF _____ *(name of entity)*
WARRANTS AND REPRESENTS THAT ALL NECESSARY LEGAL AND CORPORATE ACTIONS HAVE BEEN DULY UNDERTAKEN TO PERMIT _____ *(name of applicant)* TO SUBMIT THIS APPLICATION AND THAT THE ABOVE SIGNED OFFICER HAS BEEN DULY AUTHORIZED AND INSTRUCTED TO EXECUTE THIS APPLICATION.

Any information submitted to the Benton County Planning Division is subject to public records disclosure law for the State of Washington (RCW Chapter 42.17) and all other applicable law that may require the release of the documents to the public.

PARCEL INFORMATION

1. **Subject property address:** 103394 Kash Loop

   City: Kennewick **State:** WA **ZIP:** 99338

2. **Parcel number:** 1 □ 1488 □ 202 □ 0000 □ 024 **3. Acreage** 19.78

4. **Present use of property:** Vacant Land

5. **Proposed name of subdivision:** Cottonwood Run

6. **Number of lots:** 12 **Smallest lot area:** 1.00 **Average lot area:** 1.43

7. **Length of public streets:** 1,744 ft. **Total acreage of public streets:** 2.52

8. **Will this plat be finalized in phases?** ☐ Yes ☒ No *If yes, how many phases?* _____
   **Please include a phasing plan with the application.*

9. **Access:** ☒ County Road ☐ State Road/Highway ☐ Private Road

10. **Utilities:** *Power:* ☒ Benton PUD ☐ Benton REA

    Sewer: ☒ Septic Tank ☐ City Sewer: *(Provider)* _____

    Water: ☐ Individual Wells ☐ One well serving 2-4 lots ☐ One well serving 5+ lots

    ☒ Private System *(Provider & Address)* BC Water Co. 22307 Cottonwood Dr.

    ☐ City System *(Provider)* _____

    Gas: ☐ No ☐ Yes: *(Provider)* _____

    Cable: ☐ No ☐ Yes: *(Provider)* _____

    Phone: ☐ No ☒ Yes: *(Provider)* _____

    Irrigation: ☐ No ☒ Private ☐ District: *(Provider)* BC Water Co. 22307 Cottonwood Dr.

    School District: Kennewick

11. **Additional comments or information:** _____

_____

_____

_____

(FOR STAFF USE ONLY) *Access: Y N* *Application Complete: Y N*

Critical Areas: N Y: _____ *Zoning:* _____

Reviewed by: _____ *Date:* _____

Any information submitted to the Benton County Planning Division is subject to public records disclosure law for the State of Washington (RCW Chapter 42.17) and all other applicable law that may require the release of the documents to the public.

COTTONWOOD RUN

PRELIMINARY PLAT

NW 1/4 OF SEC. 14, T.08N., R.28E., W.M.,
BENTON COUNTY, WASHINGTON

VICINITY SKETCH

NOT TO SCALE

10 11
15 14
FOUND CASED
ALUM. CAP LS14120
C.O.R. PNT 2256

11
14
FOUND WSRS
BRASS CAP

N88°35'05"E 2666.46'

N29°17'31"E 17.84'

N00°19'33"E 154.78'

N66°04'00"E 270.45'

S88°35'05"W 299.18'

N01°25'01"W 223.79'

S00°19'33"E 423.00'

S00°19'33"E 212'

N88°35'05"E 507.61'
(S89°27'41"W)

(S89°27'41"W)
N88°35'05"E 639.28'

(N30°10'07"E)
N29°17'31"E 349.02'

S29°17'31"W 1577.41'

N29°17'31"E 349.15'

N57°45'32"W 199.46'

S88°35'00"W 136.48'

L=117.49'
R=200.00'

L=87.85'
R=600.00'

L=168.57'
R=600.00'

C6 L=20.04' R=100.00'

N17°48'25"E 462.37'

R65' TEMP TURNAROUND ESMT AF#2022-037575

5' IRR ESMT

10' IRR EASMT

COTTONWOOD CREEK PHASE 4

TRACT B CWC HOA

LOT 5

LOT 6 COTTONWOOD ESTATES

LOT 7

LOT 8

LOT 17

LOT 18 COTTONWOOD ESTATES

LOT 19

LOT 20

LOT 1 1.04 ACRES

LOT 2 1.05 ACRES

LOT 3 1.01 ACRES

LOT 4 1.00 ACRES

LOT 5 1.18 ACRES

LOT 6 1.01 ACRES

LOT 7 1.86 ACRES

LOT 8 1.89 ACRES

LOT 9 1.21 ACRES

LOT 10 1.34 ACRES

LOT 11 2.27 ACRES

LOT 12 2.37 ACRES

ABIGAIL PL

KASH LOOP

5' IRR ESMT COTTONWOOD ESTATES

EDGE OF LANDSCAPING

100' CREEK BUFFER PER COTTONWOOD ESTATES AS SHOWN APPROXIMATE THEREON

0' UTIL ESMT COTTONWOOD ESTATES

10' WATERLINE ESMT COTTONWOOD ESTATES

10' UTIL ESMT

5' IRR ESMT

10' IRR ESMT UTIL ESMT

40'X140' SHARED ACCESS ESMT

26' PRIVATE ACCESS & UTIL ESMT BENEFITS PARCELS J & K

PROPOSED 26' PRIVATE ACCESS & UTIL ESMT

PARCEL K RS1-5596

PARCEL J

FUTURE SHORT PLAT

MAIL KIOSK

BNSF RAILWAY

BADGER ROAD

FOUND 5/8" REBAR 0.3'E

WORLEY 0.7'W

LOT 3 SP1-3087

LOT 4 SP1-3087

LOT 4 SP1-2827

LS13352

AAD

RHS

DCI

LINE TABLE		
LINE	LENGTH	DIRECTION
L1	17.84	N29°17'31"E

CURVE TABLE					
CURVE	LENGTH	RADIUS	Δ	CH DIREC.	CHORD
C1	79.94	130.00	35°13'54"	N19°01'58"W	78.68
C2	130.28	130.00	57°25'16"	N27°17'36"E	124.90
C3	157.08	100.00	90°00'06"	N43°35'02"E	141.42
C4	157.08	100.00	89°59'54"	N46°24'58"W	141.42
C5	260.76	4096.58	3°38'50"	N31°05'49"E	260.72
C6	20.04	100.00	11°29'06"	S23°32'58"W	20.01

NOTES

LOTS
NUMBER OF LOTS: 12 LOTS
LOT SIZE SMALLEST: LOT 4, 1.0 ACRE
LOT SIZE LARGEST: LOT 12, 2.37 ACRES
LOT SIZE AVERAGE: 1.43 ACRES
TOTAL PLAT ACREAGE: 19.78 ACRES

ROADS
ROAD LINEAR FEET: 1744 FEET
ROAD AREA: 2.52 ACRES

ZONING
RL-1
-MINIMUM PARCEL SIZE ONE 1 ACRE/ 43,560 SF
-LOT WIDTH, EACH PARCEL SHALL HAVE AN AVERAGE LOT WIDTH OF NOT LESS THAN NINETY (90) FEET. PER BCC CHAPTER 11.14

UTILITIES
WATER: BADGER WATER
POWER: BENTON PUD
TELEPHONE: CHARTER
SEWER: ON-SITE
GAS: CNG

DEVELOPER/OWNER
IRA HICKMAN

LEGEND

- ● = FOUND AS INDICATED
- AAD ● = FOUND 5/8" REBAR W/ ORANGE PLASTIC CAP MARKED "STRATTON AAD 38021"
- RHS ● = FOUND 5/8" REBAR W/ YELLOW PLASTIC CAP MARKED "STRATTON 14120"
- DCI ● = FOUND 5/8" REBAR W/ BLUE PLASTIC CAP MARKED "STRATTON DCI 46886"
- AAD ⊕ = FOUND 5/8" REBAR LS 38021
- (XXXX) = RECORD DIMENSION PLAT OF COTTONWOOD ESTATES
- CWC = COTTONWOOD CREEK
- IRR = IRRIGATION
- UTIL = UTILITY
- ESMT = EASEMENT
- ⧗ = IRRIGATION VALVE
- IRR-BOO = IRRIGATION VALVE
- IM□ = IRRIGATION METER
- = POWER POLE W/ GUY WIRE
- = POWER TRANSFORMER
- TEL PED□ = TELEPHONE PEDESTAL
- BOO = WATER BLOW-OFF
- = WATER FIRE HYDRANT
- SPIGOT⧗ = WATER SPIGOT
- WV⧗ = WATER VALVE
- WM□ = WATER METER
- = FENCE
- = EASEMENT
- = PROPERTY BOUNDARY
- = CENTERLINE
- OP OP = POWER LINE OVERHEAD
- ST ST = STORM LINE
- = ASPHALT
- = BUILDING
- = SLOPES EXCEEDING 15%

SCALE 1" = 80'

0 80 160 240

BASIS OF BEARING
WA STATE GRID
NAD83 PER C.O.R. CONTROL FILE

BASIS OF ELEVATION
CITY OF RICHLAND CONTROL FILE
PNT NO.2252
NAVD 88 DATUM
ELEV=601.42

EQUIPMENT USED
A THREE-SECOND TOTAL STATION
SPECTRA PRECISION RTK GPS

HORIZONTAL CONTROL

WASHINGTON STATE SOUTH ZONE, US SURVEY FEET, NAD 83(11). PER THE CITY OF RICHLAND CONTROL FILE, GPS TIES WERE MADE TO 2252, 2253 AND 2256 CONTROL POINTS. PROJECTED TO GROUND AT POINT 2256

GROUND DISTANCES ARE SHOWN HEREON.

SURVEYOR NOTES

1. THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THIS SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. LOCATIONS OF SAID UTILITIES WERE DERIVED FROM FIELD ASBUILT OBSERVATIONS.

2. THE CONTOURS SHOWN WERE DERIVED FROM DIRECT FIELD OBSERVATIONS. ACCURACY OF SHOWN CONTOURS MEET OR EXCEED THE US NATIONAL MAP ACCURACY STANDARDS, OF ONE-HALF THE CONTOUR INTERVAL.

3. THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A CURRENT TITLE REPORT. THEREFORE STRATTON SURVEYING AND MAPPING PC MAKES NO GUARANTEE THAT ALL ITEMS OF RECORD AFFECTING THE PROPERTY ARE SHOWN HEREON.

5. THIS IS A TOPOGRAPHIC MAP. THIS IS NOT A BOUNDARY SURVEY AND IS ONLY INTENDED TO DEPICT THOSE TOPOGRAPHIC FEATURES OR IMPROVEMENTS SHOWN HEREON. THE PROPERTY LINES SHOWN ARE RECORD LINES AND ARE ONLY SHOWN FOR GRAPHICAL REFERENCE.

6. THE PURPOSE OF THIS TOPOGRAPHIC SURVEY IS FOR THE USE AND AID IN THE DESIGN OF A PRELIMINARY PLAT.

7. FIELD WORK COMPLETED 12/01/23, ADDITIONAL WORK 07/12/24.

DEREK C. INGALSBE
STATE OF WASHINGTON
46886
REGISTERED
PROFESSIONAL LAND SURVEYOR

4/22/25

INDEX

¼ ¼	SEC	T.	R.
▩	14	08N	28E

TOPOGRAPHIC SURVEY FOR
HICKMAN

STRATTON SURVEYING & MAPPING P.C.
313 NORTH MORAIN STREET
KENNEWICK, WA 99336
(509) 735-7364
www.strattonsurvey.com

6304PP1.DWG	© 2025
DATE: 04/22/25	SHT. 1 OF 2
DRAWN BY: DCI	JOB # 6304

BENTON-FRANKLIN TITLE COMPANY
510 N. COLORADO ST., STE B
KENNEWICK, WA 99336 Phone: 509-783-0661 Fax: 509-783-2256

SUBDIVISION GUARANTEE

SCHEDULE A

Office File Number	Policy Number	Date of Policy	Amount of Insurance	Premium
BF20826 Ref. No.:	**SGW-08006914**	**February 10, 2025** at **8:00 AM**	**$350.00**	**$350.00**

NAME OF ASSURED:

PBS

THE ASSURANCES REFERRED TO ON THE FACE PAGE ARE:

THAT, ACCORDING TO THOSE PUBLIC RECORDS WHICH, CONSTRUCTIVE NOTICE OF MATTERS RELATIVE TO THE DESCRIPTION OF WHICH IS FULLY SET FORTH IN UNDER THE RECORDING LAWS, IMPART FOLLOWING DESCRIBED REAL PROPERTY:

SEE ATTACHED EXHIBIT "A"

TITLE TO SAID REAL PROPERTY IS VESTED IN:

Ira Hickman

SUBJECT TO THE MATTERS SHOWN BELOW UNDER EXCEPTIONS, WHICH EXCEPTIONS ARE NOT NECESSARILY SHOWN IN THE ORDER OF THEIR PRIORITY.

EXCEPTIONS:

1. GENERAL TAXES AND ASSESSMENTS, IF ANY, NO SEARCH HAVING BEEN MADE THEREOF; ALSO, TAXES OR ASSESSMENTS WHICH ARE NOT SHOWN AS EXISTING LIENS BY THE RECORDS OF ANY TAXING AUTHORITY THAT LEVIES TAXES OR ASSESSMENTS ON REAL PROPERTY OR BY THE PUBLIC RECORDS.

2. UNPATENTED MINING CLAIMS, RESERVATIONS OR EXCEPTIONS IN THE UNITED STATES PATENTS OR IN ACTS AUTHORIZING THE ISSUANCE THEREOF; WATER RIGHTS, CLAIMS OR TITLE TO WATER.

3. TITLE TO ANY PROPERTY BEYOND THE LINES OF THE REAL PROPERTY EXPRESSLY DESCRIBED HEREIN, OR TITLE TO STREETS, ROADS, AVENUES, LANES, WAYS OR WATERWAYS ON WHICH SUCH REAL PROPERTY ABUTS, OR THE RIGHT TO MAINTAIN THEREIN VAULTS, TUNNELS, RAMPS, OR ANY OTHER STRUCTURE OR IMPROVEMENT; OR ANY RIGHTS OR EASEMENTS THEREIN UNLESS SUCH PROPERTY, RIGHTS OR EASEMENTS ARE EXPRESSLY AND SPECIFICALLY SET FORTH IN SAID DESCRIPTION.

Policy Number: **SGW-08006914**

ADDITIONAL EXCEPTIONS:

1. GENERAL TAXES FOR 2025 IN THE ORIGINAL AMOUNT OF $8,828.25. TAX ACCOUNT NO. 1-1488-202-0000-024. (FIRST HALF TAXES ARE DELINQUENT MAY 1. LAST HALF TAXES ARE DELINQUENT NOVEMBER 1.)

2. LIABILITY TO FUTURE ASSESSMENT BY KENNEWICK IRRIGATION DISTRICT, NONE NOW DUE AND PAYABLE.

3. MATTERS SHOWN ON RECORD SURVEY NO. 188 AND NO. 5596.

4. EASEMENTS DELINEATED ON THE FACE OF SAID COTTONWOOD ESTATES PLAT.

5. NOTES AS CONTAINED ON THE FACE OF SAID COTTONWOOD ESTATES PLAT.

6. COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT;
   AUDITOR'S FILE NO.: 897951

   SAID COVENANTS, CONDITIONS AND RESTRICTIONS HAVE BEEN MODIFIED BY INSTRUMENT:
   AUDITOR'S FILE NO.: 84-487

7. RESERVATION OF GAS, OIL, AND MINERAL RIGHTS AS CONTAINED IN DEED RECORDED UNDER AUDITOR'S FILE NO. 89-4523.

   NOTE: THIS POLICY DOES NOT INCLUDE PRESENT OWNERSHIP OR ENCUMBRANCES OF THE RESERVED MINERAL ESTATE.

8. MUTUAL AGREEMENT AND WELL OWNERSHIP AND THE TERMS AND CONDITIONS THEREOF:
   BETWEEN: BRET L. BAUDER, ET AL.
   RECORDED: July 11, 1996
   AUDITOR'S FILE NO.: 96-17112

9. RIGHT OF WAY EASEMENT, INCLUDING THE TERMS, COVENANTS AND PROVISIONS THEREOF, FOR ELECTRIC TRANSMISSION AND/OR DISTRIBUTION LINE, TOGETHER WITH NECESSARY APPURTENANCES, AS GRANTED BY INSTRUMENT:
   RECORDED: October 21, 2004
   AUDITOR'S FILE NO.: 2004-037396
   IN FAVOR OF: PUBLIC UTILITY DISTRICT NO. 1 OF BENTON COUNTY

10. RIGHT OF WAY EASEMENT, INCLUDING THE TERMS, COVENANTS AND PROVISIONS THEREOF, FOR ELECTRIC TRANSMISSION AND/OR DISTRIBUTION LINE, TOGETHER WITH NECESSARY APPURTENANCES, AS GRANTED BY INSTRUMENT:
    RECORDED: October 21, 2004
    AUDITOR'S FILE NO.: 2004-037395
    IN FAVOR OF: PUBLIC UTILITY DISTRICT NO. 1 OF BENTON COUNTY

11. COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT;
    AUDITOR'S FILE NO.: 2012-023162

    SAID COVENANTS, CONDITIONS AND RESTRICTIONS HAVE BEEN MODIFIED BY INSTRUMENT:
    AUDITOR'S FILE NO.: 2013-005572

12. TERMS AND CONDITIONS CONTAINED IN ORDER OF PARTITION ENTERED IN BENTON COUNTY SUPERIOR COURT CAUSE NO. 20-2-01494-03 INCLUDING THOSE INSTRUMENTS RECORDED UNDER AUDITOR'S FILE NO. 2022-017251 AND 2024-023405.

13. AGREEMENT AND THE TERMS AND CONDITIONS THEREOF:
    BETWEEN: IRA HICKMAN AND BENTON COUNTY
    REGARDING: DETACHED ACCESSORY DWELLING UNIT
    RECORDED: May 24, 2023
    AUDITOR'S FILE NO.: 2023-010076

14. RIGHT, TITLE AND INTEREST OF LESLIE HICKMAN AS DISCLOSED BY INSTRUMENT RECORDED UNDER AUDITOR'S FILE NO. 2022-017251.

15. PENDENCY OF BENTON COUNTY SUPERIOR COURT CAUSE NO. 24-3-00960-03;
    FILED: December 23, 2024
    PETITIONER: IRA HICKMAN
    RESPONDENT: LESLIE HICKMAN
    ACTION FOR: DISSOLUTION OF MARRIAGE
    ATTORNEY: JILLIAN HARLINGTON

END OF SCHEDULE A EXCEPTIONS.

NOTES:

AT THE REQUEST OF THE ASSURED THE FOLLOWING INFORMATION IS PROVIDED:

a. THE ADDRESS OF THE SUBJECT PROPERTY IS:
103394 E. KASH LOOP
KENNEWICK, WA 99338

b. ACCORDING TO THE RECORDS OF BENTON COUNTY ASSESSOR, THE CURRENT VALUE OF SAID PREMISES IS AS FOLLOWS:

TAX ACCOUNT NO.:	1-1488-202-0000-024
LAND:	$247,870.00
IMPROVEMENTS:	$731,080.00
TOTAL:	$978,950.00

c. THE FOLLOWING ABBREVIATED LEGAL DESCRIPTION IS PROVIDED AS A COURTESY TO ENABLE THE DOCUMENT PREPARER TO CONFORM WITH THE REQUIREMENTS OF RCW 65.04.045, PERTAINING TO STANDARDIZATION OF RECORDED DOCUMENTS.

ABBREVIATED LEGAL DESCRIPTION: PTN LOT 24, COTTONWOOD ESTATES

a. THE LEGAL DESCRIPTION SUBMITTED HAS BEEN MODIFIED AS SET FORTH HEREIN TO COMPLY WITH THE RECORD AND THE PRESUMED INTENTION OF THE PARTIES TO THE TRANSACTION. THE SAME SHOULD BE EXAMINED AND APPROVED BY SAID PARTIES PRIOR TO CLOSING.

b. THE FORTHCOMING TAX PARCEL NOS. WILL BE 1-1488-202-0000-025 AND 1-1488-202-0000-027.

Benton Franklin Title Company

Privacy Policy Notice

PURPOSE OF THIS NOTICE

Title V of the Gramm-Leach-Bliley Act (GLBA) generally prohibits any financial institution, directly or through its affiliates, from sharing nonpublic personal information about you with a nonaffiliated third party unless the institution provides you with a notice of its privacy policies and practices, such as the type of information that it collects about you and the categories of persons or entities to whom it may be disclosed. In compliance with the GLBA, we are providing you with this document, which notifies you of the privacy policies and practices of **Benton Franklin Title Company**

We may collect nonpublic personal information about you from the following sources:

Information we receive from you such as on applications or other forms.
Information about your transactions we secure from our files, or from [our affiliates or] others.
Information we receive from a consumer reporting agency.
Information that we receive from others involved in your transaction, such as the real estate agent or lender.

Unless it is specifically stated otherwise in an amended Privacy Policy Notice, no additional nonpublic personal information will be collected about you.

We may disclose any of the above information that we collect about our customers or former customers to our affiliates as permitted by law.

WE DO NOT DISCLOSE ANY NONPUBLIC PERSONAL INFORMATION ABOUT YOU WITH ANYONE FOR ANY PURPOSE THAT IS NOT SPECIFICALLY PERMITTED BY LAW.

We restrict access to nonpublic personal information about you to those employees who need to know that information in order to provide products or services to you. We maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard your nonpublic personal information.

ORT 287-C 5/07/01

EXHIBIT "A"

Lot 24, COTTONWOOD ESTATES, according to the plat thereof recorded in Volume 15 of Plats, Page 444, records of Benton County, Washington;
EXCEPT the South 300.08 feet of the North 1656.32 feet thereof.

PCM 1.7

RECEIVED

APR 2 4 2025

Benton Co. Planning Division

PUBLIC HEALTH

Prevent • Promote • Protect

BENTON-FRANKLIN HEALTH DISTRICT

April 3, 2025

Ira Hickman
103228 Kash Loop
Kennewick, WA 99338

Re: Review of Plat for Ira Hickman, located at Kash Loop, Kennewick
Parcel ID# 1-1488-202-0000-025
Applicant: Ira Hickman

Dear Mr. Hickman:

This department has completed a preliminary review of the above referenced property in accordance with our current land development policies and requirements for new subdivisions. Our findings are listed below.

1. There are 12 proposed lots.
2. Proposed land use is for single family dwellings.
3. All proposed lots are on a public water supply.
4. Soil test holes excavated throughout the property show Type 5 soils throughout the zone of treatment.

These findings indicate the above referenced plat generally meets our requirements for plats utilizing on-site sewage disposal systems and a public water supply provided:

1. All lots within the plat must have a minimum of 0.5 acres of gross *and* 10,000 square feet useable land area.
2. All wells within 150 feet of this plat must be shown on the plat map.
3. Prior to final approval, a long plat final review fee (Code 54.37 for $200) must be submitted to this office for the final walk-through review of the plat for compliance with Benton-Franklin Health Department Rules and Regulations No. 2, and WAC 246-272A, and for the issuance of appropriate comments to the Franklin County Planning Department.

7102 W. Okanogan Place
Kennewick, WA 99336
Office: (509) 460-4200

412 W. Clark
Pasco, WA 99301
Office: (509) 547-9737

4. Prior to final approval, this office must be given the opportunity to review the final plat for compliance with Benton-Franklin Health Department Rules and Regulations No. 2, and WAC 246-272, and issue appropriate comments to the Franklin County Planning Department.

Our general recommendation is based upon present known site conditions and does not guarantee the granting of on-site sewage disposal system permits. Our approval of any lot within this plat may be contingent upon that lot passing additional soil inspections/test holes and or other requirements at a later date. Should adverse site conditions be revealed at a later date, the Health Department reserves the right to impose restrictions or deny the issuance of any on-site sewage disposal permits.

The preceding recommendation shall be valid for a period not to exceed 12 months from this date and will be deemed null and void should this proposal not be developed by April 3, 2026

In an effort to promote active lifestyles, we would encourage you to consider and include the development of safe bicycle paths, the adoption of zoning rules favoring sidewalks in residential and commercial areas, traffic-free areas and traffic patterns that encourage people to walk, measures to ensure safe streets, and incentives to encourage the public to use mass transit rather than private cars, in this and in all future developments within the City of Kennewick.

If you have any questions, please contact me at 509-460-4316.

Sincerely,

Bridget Kelsay
Environmental Health Specialist I

PCM 1.8

RECEIVED

APR 24 2025

Benton County
Planning Division

PBS
AN APEX COMPANY

April 24, 2025

Matt Rassmussen, P.E.
Benton County
102206 Wiser Pkwy
Kennewick, Washington 99338

Re: Preliminary Hydrology Report
Cottonwood Run Preliminary Plat
Kennewick, Washington
PBS Project 66560.000

Dear Mr. Rasmussen

This report includes the preliminary storm design and Hydrology Report for the Cottonwood Run residential subdivision located in Badger Canyon, just south of the I-82 and Badger Canyon Road interchange and west of the BNSF Railway.

The site is currently vacant and consists of native shrubs, weeds, and grasses. A natural drainage channel with an existing 100' buffer passes through the site of this project. The channel size and slope will remain largely unaffected by this project as the 1 acre lots provide ample building space outside the buffer setbacks.
The project seeks to develop the site into a residential subdivision with local roadways, and public and private utility extensions. No offsite improvements are anticipated at this time.

PRELIMINARY STORM DRAINAGE DESIGN

Existing Soil Conditions

The site currently slopes at varying percentages from 1-15% toward the Badger Canyon Drainage Ditch.
Per the USDA NRCS Web Soil Survey data found online, the on-site soils are classified as Esquatzel fine sandy loam, Esquatzel silt loam, and Hazel loamy fine sand, with a Hydrologic Soil Group (HSG) B and C rating, organic matter content rating at 0.25 – 0.68, cation exchange capacity rating at 7.5 meq/100g, and a saturated hydraulic conductivity rating of 9.0-27 µm/sec. The saturated hydraulic conductivity value converts to approximately 1.27 – 3.8 inches/hour. This information is generally consistent with the soil information found in Phase 4 of Cottonwood Creek. Phase 4 used an infiltration rate of 2.25 in/hour, so this exfiltration rate will be used for the preliminary design at Cottonwood Run.

Core Elements

This project shall seek to adhere to the eight Core Elements in the stormwater Management Manual for Eastern Washington (SWMMEW).

Preliminary Stormwater Design

The project consists of construction two public roads. The road section consists of 24' wide paved road section with 1 foot wide gravel shoulders and grass or rock lined ditches on both sides of the roads. The rock lined ditches shall be a depth of 2' with a fore slope of 4:1 and varying backslopes.

Basins

Analysis of the stormwater for this project included the review of 14 on-site basins and 1 off-site basins. Each of these basins have the potential to discharge runoff to the Cottonwood Run Plat.

1. Onsite Bain are the basins within the project. The roadway section through the project is a standard crown section, sloping 2% from the centerline of the road to each ditch. Runoff from the lots and road will be collected in the roadside ditches on either side of the road and will then be infiltrated in the roadside ditches.
2. Offsite Basin 2 – consists of runoff that is collected into the Badger Creek from surrounding off-site areas upstream of the site; this basin boundary and estimated runoff was determined by USGS StreamStats data and using SCS runoff estimates for the same drainage basin.

Stormwater management will consist of two facilities.
Facility #1: The swales will have berms created in the roadside ditched at each property driveway will hold and infiltrate runoff from the roads and lots within the plot.

Facility #2: The second proposed facility is roadside swales along Road A (east / west road) to collect and infiltrate runoff prior to the runoff being discharged to the Badger Drain.
The proposed infiltration swales will be used to control runoff so that the mitigated site runoff rate and volume will be equal to or less than the natural state runoff.

On-site Stormwater System and Modeling Results

A 100-year rainfall event was used to size the roadside swales to contain the on-site runoff. HydroCAD 10.20 and associated calculations for runoff and runoff volumes were utilized to determine roadway runoff and required retention/infiltration facility sizing. The roadside ditches have been designed to provide runoff rate control and volume control for stormwater before it leaves the site. The ditches will have a V-bottom, 4:1 side slopes and have a total depth of 2 feet. The driveways will create the swale for each lot. Below is a summary of curve number values used in the preliminary storm modeling:
Impervious Roadway: CN = 98
Pervious Lot Frontage (>75% Grass cover, Good, HSG C) CN = 74
Stormwater analysis and required swales have been summarized in Table 1 for the on-site drainage basins.

Table 1: On-site Mitigated Conditions, Stormwater Runoff Results, 100-year Storm

Basin	Description	Imp Area (sf)	Pervious Area (sf)	Peak Volume (cf)	Proposed Length of Ditch	Maximum Ponded Depth (ft)
1	Lot 1	42,164	5,185	202	105	0.68
2	Lot 2	42,655	6,137	171	195	0.46
3	Lot 3	41,192	6,782	166	245	0.41
4	Lot 4	40,411	6,976	168	250	0.41
5	Lot 5	48,494	8,461	218	260	0.46
6	Lot 6	41,092	4,011	263	100	0.79
7	Lot 7	71,082	3,900	554	46	1.59
8	Lot 8	79,537	2,643	351	149	0.76
9	Lot 9	49,772	5,262	193	148	0.57
10	Lot 10	55,257	6,397	271	124	0.73

Basin	Description	Imp Area (sf)	Pervious Area (sf)	Peak Volume (cf)	Proposed Length of Ditch	Maximum Ponded Depth (ft)
11	Lot 11	93,358	8,089	914	54	1.89
12	Lot 12	99,991	11,274	331	432	0.44
13	E-W Road (south)	0	6,481	120	180	0.41
14	E-W Road (north)	0	6,573	122	180	0.41

Badger Drain Culvert

The culvert crossings for the Badger Drain should be sized to convey the 25-year storm, considering the large basin that potentially contributes runoff. Three different methods were used to determine the estimated 25-year storm flow that is tributary to the culvert. The first method was the use of USGS StreamStat to determine the basin area and estimated flow. StreamStats estimate the flow at 503 cfs for the 25-year storm. However, StreamStats used a basin area of approximately 22 square miles to calculate this flow.

The minimum basin area StreamStats had for the basin was 0.42 sq mi. so the average basin area was used to calculate the stormwater flow using the SCS TR-20 Runoff calculation method and the SBUH Type 1A storm calculation method.

A time of concentration for the basin was calculated to be 203 minutes, based on overland flow path approximately 30,800' in length with a slope of 0.32 percent. The slope was determined using the elevation change of 99 ft. within the drainage basin along Badger Road. Table 2, below, summarizes the various modeling results. (See Figures for Culvert calculations).

Table 2: Culvert Basin Modeling Results

Method	Basin Size	25-yr, 24-Hour flow
USGS Stream Stats (full Area)	14,067 acres	503 cfs
SCS TR-20 (min area)	270 acres	6.01 cfs
SCS TR-20 (Avg area)	7,170 acres	**159.52 cfs**
SCS TR-20 (Full area)	14,067 acres	312.97 cfs
SBUH Type 1A storm (Avg Area)	7,170 acres	152.81 cfs

As evident in Table 2, different modeling methods provide different flow rates. Since Benton County requires stormwater calculations to be analyzed using the SCS Type 1A storm method, the design flow rate of the culvert is calculated to be 159.52 cfs. The proposed culvert is 2-48" diameter CMP with a calculated capacity of 177 cfs prior to overtopping. The computed average depth in the culvert at peak flow is 2.97 ft.

CONCLUSION

Based on preliminary model and analysis, the proposed systems and on-site soils are expected to provide storage and treatment of stormwater for the given storm events as required by Benton County and the Stormwater Management Manual for Eastern Washinton (SWMMEW).

The proposed 2-48" culverts are designed using engineering judgement to estimate a reasonable peak flow within the existing channel. It should be noted that Kennewick Irrigation District wastewater runoff contributed

significantly to historic flow rates in the existing Badger drainage channel. Over the past 15 years, the District has made substantial water conservation improvements that have greatly reduced the potential runoff in this basin. Land development has also diverted or blocked historic flow paths to this project location.

Please feel free to contact me at 509.521.1325 or kevin.barney@pbsusa.com with any questions or comments,

Sincerely,

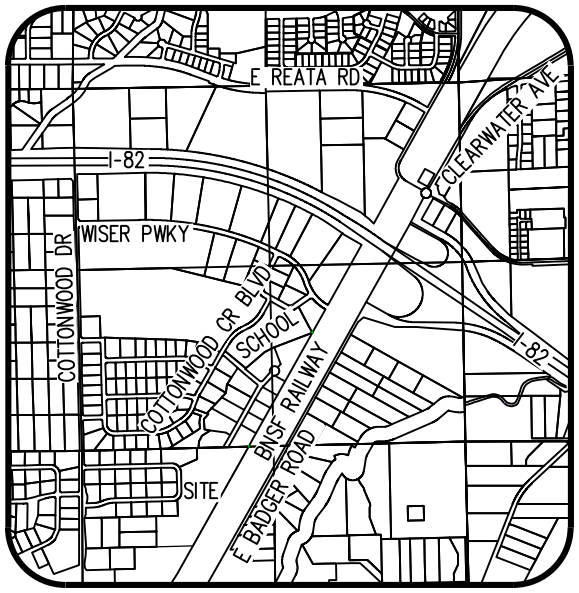
Kevin W. Barney

Kevin Barney, PE
Senior Civil Engineer

Attachment(s): Figures
amn:KWB:

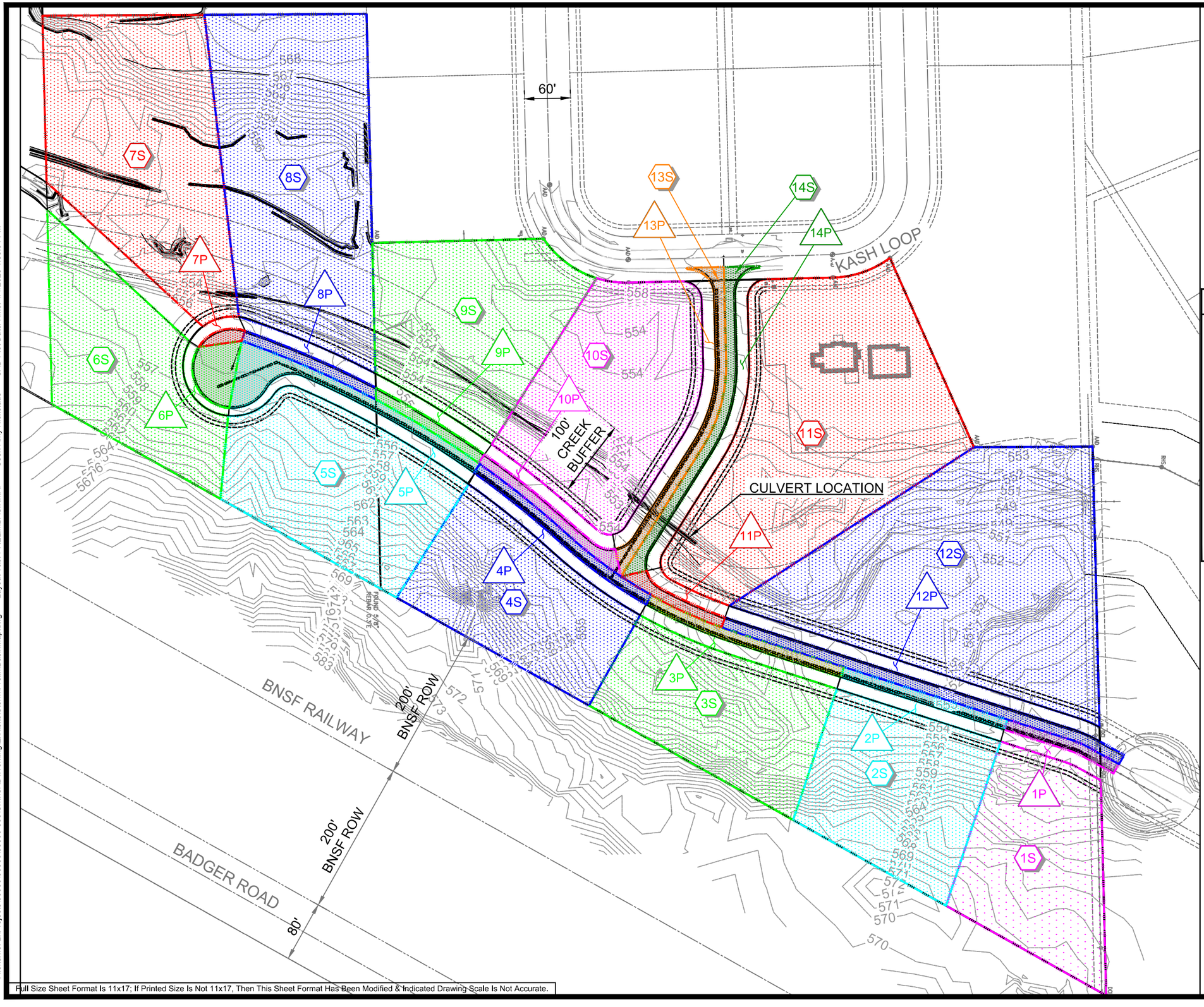
Figures

Vicinity Map
Basin Map
NRCS Soil Report
StreamStats Report
HydroCAD Report



VICINITY MAP

NOT TO SCALE



Scale 1" = 125'

0 62.5 125 250

LEGEND

EXTG GROUND CONTOUR	530
FINISH GRADE CONTOUR	530
PROPOSED DRYWELL	
PROPOSED CATCH BASIN	
PROPOSED FLOW	
PROPOSED SUB-CATCHMENT	1
PROPOSED PONDS (IN HYDROCAD)	2
BASIN RUNOFF AREA	

PBS Engineering and Environmental Inc.
400 Bradley Blvd, Ste 106
Richland, WA 99352
509.942.1600
pbsusa.com

PBS

PRELIMINARY BASIN MAP FOR:

COTTONWOOD CREEK PH 5

A SITE LOCATED IN BENTON COUNTY, WASHINGTON

DESIGNED:	AMN
CHECKED:	KWB
DATE	APRIL 2025
SHEET ID	FIG 1
	1 / 1

Full Size Sheet Format Is 11x17; If Printed Size Is Not 11x17, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.

Filename: L:\Projects\66000\66560\66560-000\Civil\CAD\Working\Exhibits\Storm\PrelimBasinMap.dwg Layout Tab: PRELIMBASINMAP User: Amy Nickolaus CAD Plot Date/Time: 4/1/2025 1:55:34 PM

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Benton County Area, Washington

Cottonwood Creek

April 1, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (Cottonwood Creek)

Map Scale: 1:3,070 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

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 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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: Benton County Area, Washington
Survey Area Data: Version 20, Aug 27, 2024

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

Date(s) aerial images were photographed: Jun 26, 2022—Jun 27, 2022

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 (Cottonwood Creek)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
EsA	Esquatzel fine sandy loam, 0 to 2 percent slopes	8.2	46.5%
HeA	Hezel loamy fine sand, 0 to 2 percent slopes	0.3	1.8%
HeD	Hezel loamy fine sand, 2 to 15 percent slopes	7.5	42.5%
KeA	Kennewick silt loam, 0 to 2 percent slopes	1.5	8.4%
WfD2	Warden very fine sandy loam, 8 to 15 percent slopes, eroded	0.1	0.8%
Totals for Area of Interest		**17.7**	**100.0%**

Map Unit Descriptions (Cottonwood Creek)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Benton County Area, Washington

EsA—Esquatzel fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2bc1
Elevation: 300 to 2,900 feet
Mean annual precipitation: 6 to 12 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 130 to 200 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Esquatzel and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Esquatzel

Setting

Landform: Flood plains
Parent material: Alluvium

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 44 inches: silt loam
H3 - 44 to 60 inches: stratified very fine sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R007XY930WA - Loamy Bottom
Hydric soil rating: No

HeA—Hezel loamy fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2bcg

Elevation: 400 to 2,500 feet
Mean annual precipitation: 6 to 10 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 150 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Hezel and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hezel

Setting
Landform: Terraces
Parent material: Eolian sands over silty lacustrine deposits

Typical profile
H1 - 0 to 3 inches: loamy fine sand
H2 - 3 to 16 inches: loamy fine sand
H3 - 16 to 60 inches: stratified fine sandy loam to silt loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups
Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R007XY140WA - Sands
Hydric soil rating: No

HeD—Hezel loamy fine sand, 2 to 15 percent slopes

Map Unit Setting
National map unit symbol: 2bch
Elevation: 400 to 2,500 feet
Mean annual precipitation: 6 to 10 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 150 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hezel and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hezel

Setting

Landform: Terraces
Parent material: Eolian sands over silty lacustrine deposits

Typical profile

H1 - 0 to 3 inches: loamy fine sand
H2 - 3 to 16 inches: loamy fine sand
H3 - 16 to 60 inches: stratified fine sandy loam to silt loam

Properties and qualities

Slope: 2 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R007XY140WA - Sands
Hydric soil rating: No

KeA—Kennewick silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2bck
Elevation: 300 to 1,500 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 130 to 210 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Kennewick and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kennewick

Setting

Landform: Terraces
Parent material: Lacustrine deposits

Typical profile

H1 - 0 to 12 inches: silt loam
H2 - 12 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R007XY193WA - Calcareous Loam
Hydric soil rating: No

WfD2—Warden very fine sandy loam, 8 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2bfv
Elevation: 600 to 1,300 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 200 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Warden and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Warden

Setting

Landform: Terraces
Parent material: Loess over lacustrine deposits

Typical profile

H1 - 0 to 4 inches: very fine sandy loam

H2 - 4 to 14 inches: silt loam
H3 - 14 to 60 inches: stratified very fine sandy loam to silt loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R007XY130WA - Loamy
Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Chemical Properties

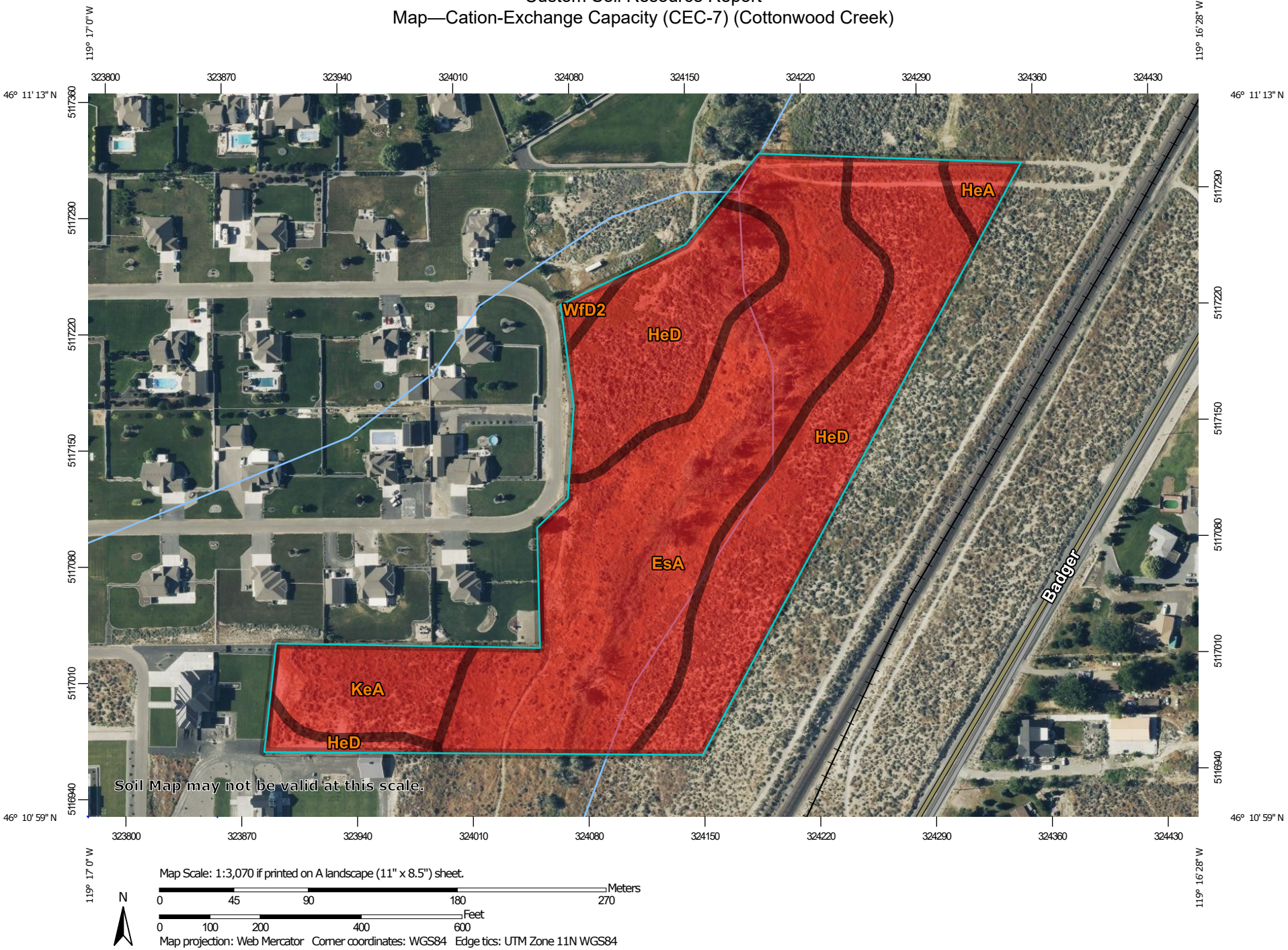
Soil Chemical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil chemical properties include pH, cation exchange capacity, calcium carbonate, gypsum, and electrical conductivity.

Cation-Exchange Capacity (CEC-7) (Cottonwood Creek)

Cation-exchange capacity (CEC-7) is the total amount of extractable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Cation-Exchange Capacity (CEC-7) (Cottonwood Creek)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

= 7.5

Not rated or not available

Soil Rating Lines

= 7.5

Not rated or not available

Soil Rating Points

= 7.5

Not rated or not available

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 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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: Benton County Area, Washington
Survey Area Data: Version 20, Aug 27, 2024

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

Date(s) aerial images were photographed: Jun 26, 2022—Jun 27, 2022

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.

Table—Cation-Exchange Capacity (CEC-7) (Cottonwood Creek)

Map unit symbol	Map unit name	Rating (milliequivalents per 100 grams)	Acres in AOI	Percent of AOI
EsA	Esquatzel fine sandy loam, 0 to 2 percent slopes	7.5	8.2	46.5%
HeA	Hezel loamy fine sand, 0 to 2 percent slopes	7.5	0.3	1.8%
HeD	Hezel loamy fine sand, 2 to 15 percent slopes	7.5	7.5	42.5%
KeA	Kennewick silt loam, 0 to 2 percent slopes	7.5	1.5	8.4%
WfD2	Warden very fine sandy loam, 8 to 15 percent slopes, eroded	7.5	0.1	0.8%
Totals for Area of Interest			**17.7**	**100.0%**

Rating Options—Cation-Exchange Capacity (CEC-7) (Cottonwood Creek)

Units of Measure: milliequivalents per 100 grams

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

Soil Physical Properties

Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

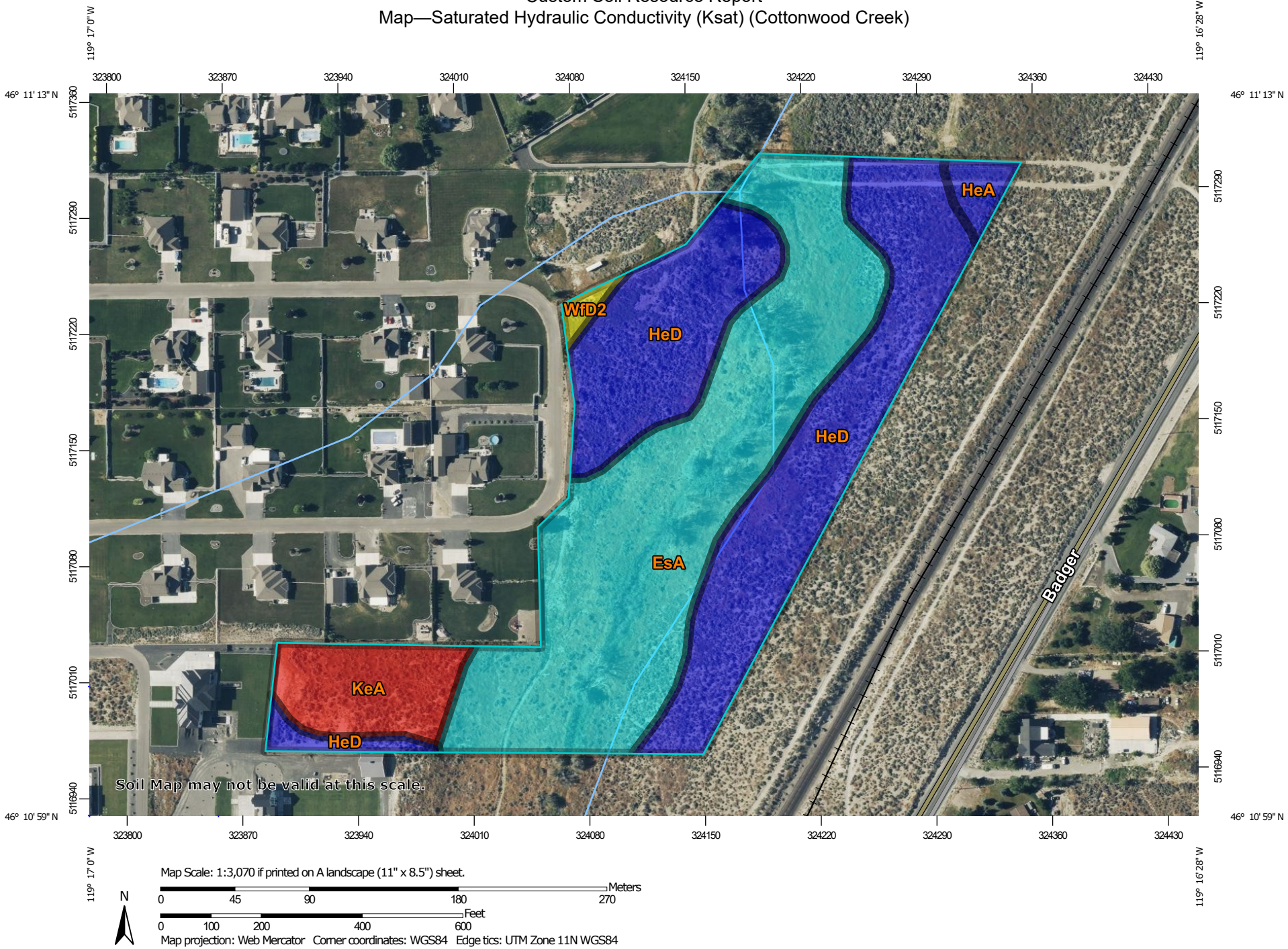
Saturated Hydraulic Conductivity (Ksat) (Cottonwood Creek)

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Custom Soil Resource Report
Map—Saturated Hydraulic Conductivity (Ksat) (Cottonwood Creek)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- <= 4.1842
- > 4.1842 and <= 9.0000
- > 9.0000 and <= 12.5000
- > 12.5000 and <= 27.0066
- Not rated or not available

Soil Rating Lines
- <= 4.1842
- > 4.1842 and <= 9.0000
- > 9.0000 and <= 12.5000
- > 12.5000 and <= 27.0066
- Not rated or not available

Soil Rating Points
- <= 4.1842
- > 4.1842 and <= 9.0000
- > 9.0000 and <= 12.5000
- > 12.5000 and <= 27.0066
- Not rated or not available

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 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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.

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Soil Survey Area: Benton County Area, Washington
Survey Area Data: Version 20, Aug 27, 2024

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

Date(s) aerial images were photographed: Jun 26, 2022—Jun 27, 2022

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.

Table—Saturated Hydraulic Conductivity (Ksat) (Cottonwood Creek)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
EsA	Esquatzel fine sandy loam, 0 to 2 percent slopes	12.5000	8.2	46.5%
HeA	Hezel loamy fine sand, 0 to 2 percent slopes	27.0066	0.3	1.8%
HeD	Hezel loamy fine sand, 2 to 15 percent slopes	27.0066	7.5	42.5%
KeA	Kennewick silt loam, 0 to 2 percent slopes	4.1842	1.5	8.4%
WfD2	Warden very fine sandy loam, 8 to 15 percent slopes, eroded	9.0000	0.1	0.8%
Totals for Area of Interest			**17.7**	**100.0%**

Rating Options—Saturated Hydraulic Conductivity (Ksat) (Cottonwood Creek)

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

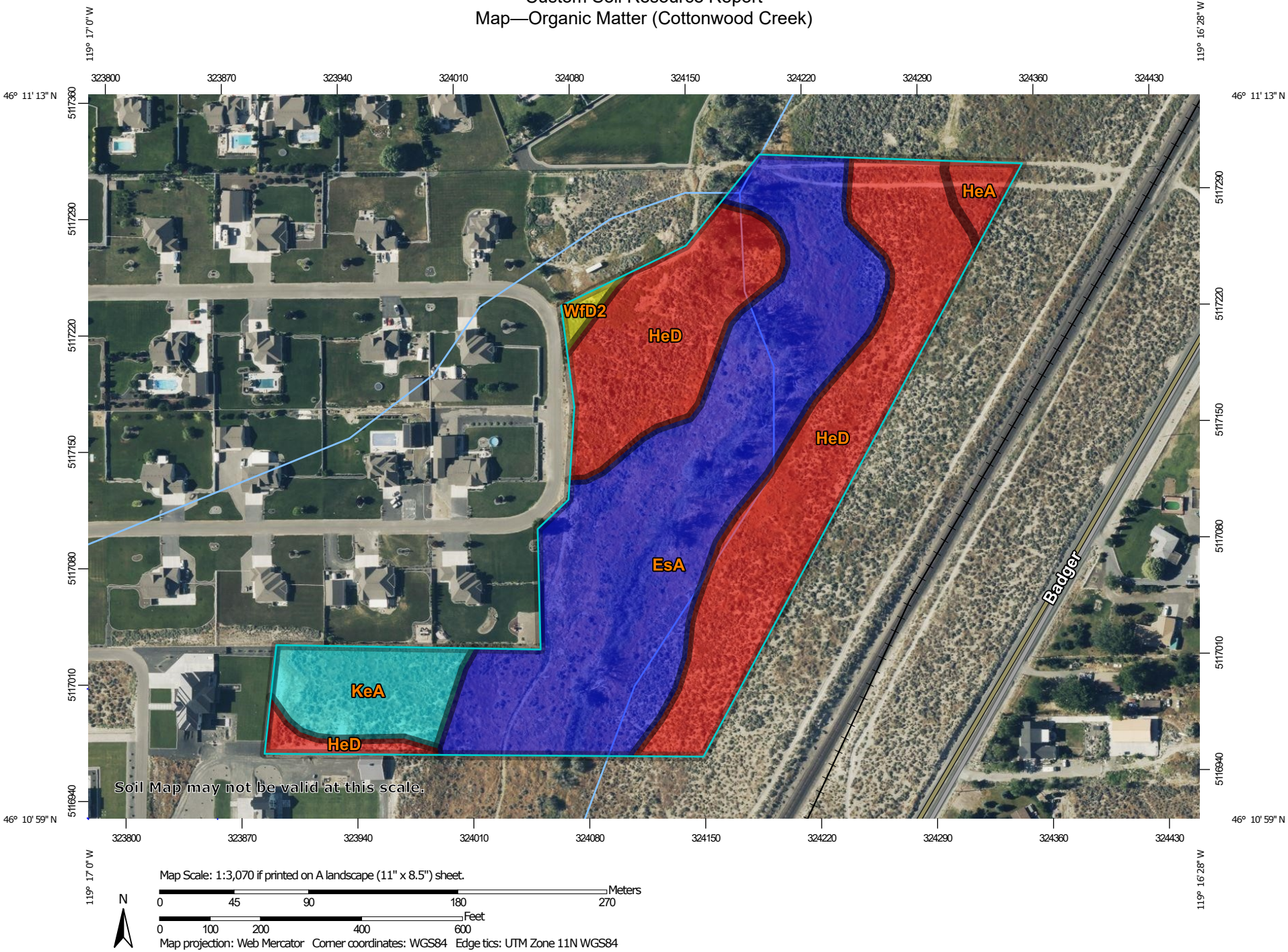
Organic Matter (Cottonwood Creek)

Organic matter is the plant and animal residue in the soil at various stages of decomposition. The estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms. An irregular distribution of organic carbon with depth may indicate different episodes of soil deposition or soil formation. Soils that are very high in organic matter have poor engineering properties and subside upon drying.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Organic Matter (Cottonwood Creek)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- <= 0.25
- > 0.25 and <= 0.33
- > 0.33 and <= 0.35
- > 0.35 and <= 0.68
- Not rated or not available

Soil Rating Lines
- <= 0.25
- > 0.25 and <= 0.33
- > 0.33 and <= 0.35
- > 0.35 and <= 0.68
- Not rated or not available

Soil Rating Points
- <= 0.25
- > 0.25 and <= 0.33
- > 0.33 and <= 0.35
- > 0.35 and <= 0.68
- Not rated or not available

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 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Survey Area Data: Version 20, Aug 27, 2024

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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.

Table—Organic Matter (Cottonwood Creek)

Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
EsA	Esquatzel fine sandy loam, 0 to 2 percent slopes	0.68	8.2	46.5%
HeA	Hezel loamy fine sand, 0 to 2 percent slopes	0.25	0.3	1.8%
HeD	Hezel loamy fine sand, 2 to 15 percent slopes	0.25	7.5	42.5%
KeA	Kennewick silt loam, 0 to 2 percent slopes	0.35	1.5	8.4%
WfD2	Warden very fine sandy loam, 8 to 15 percent slopes, eroded	0.33	0.1	0.8%
Totals for Area of Interest			**17.7**	**100.0%**

Rating Options—Organic Matter (Cottonwood Creek)

Units of Measure: percent

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Cottonwood Creek)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

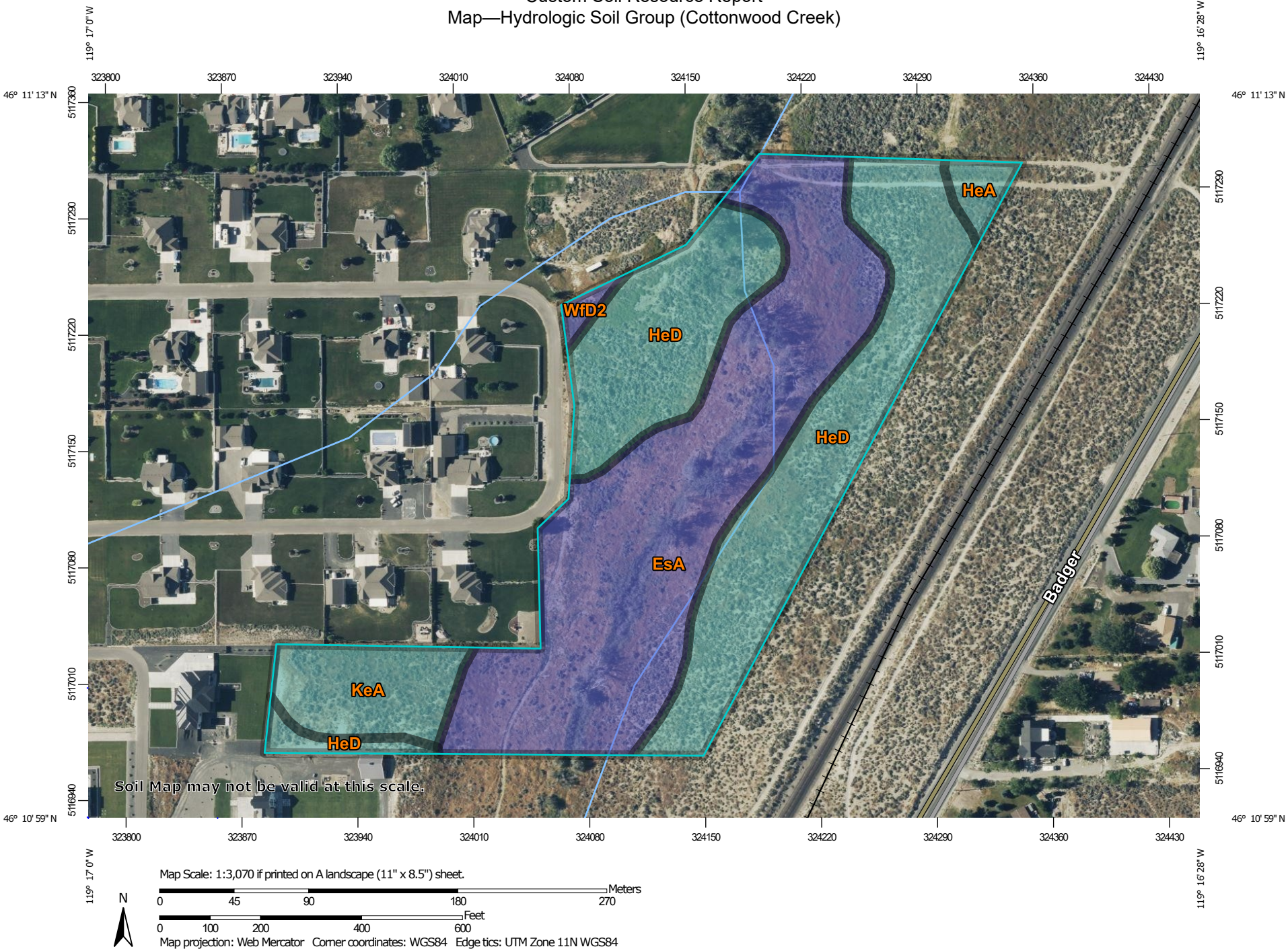
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group (Cottonwood Creek)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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: Benton County Area, Washington
Survey Area Data: Version 20, Aug 27, 2024

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

Date(s) aerial images were photographed: Jun 26, 2022—Jun 27, 2022

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.

Table—Hydrologic Soil Group (Cottonwood Creek)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
EsA	Esquatzel fine sandy loam, 0 to 2 percent slopes	B	8.2	46.5%
HeA	Hezel loamy fine sand, 0 to 2 percent slopes	C	0.3	1.8%
HeD	Hezel loamy fine sand, 2 to 15 percent slopes	C	7.5	42.5%
KeA	Kennewick silt loam, 0 to 2 percent slopes	C	1.5	8.4%
WfD2	Warden very fine sandy loam, 8 to 15 percent slopes, eroded	B	0.1	0.8%
Totals for Area of Interest			**17.7**	**100.0%**

Rating Options—Hydrologic Soil Group (Cottonwood Creek)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

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United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

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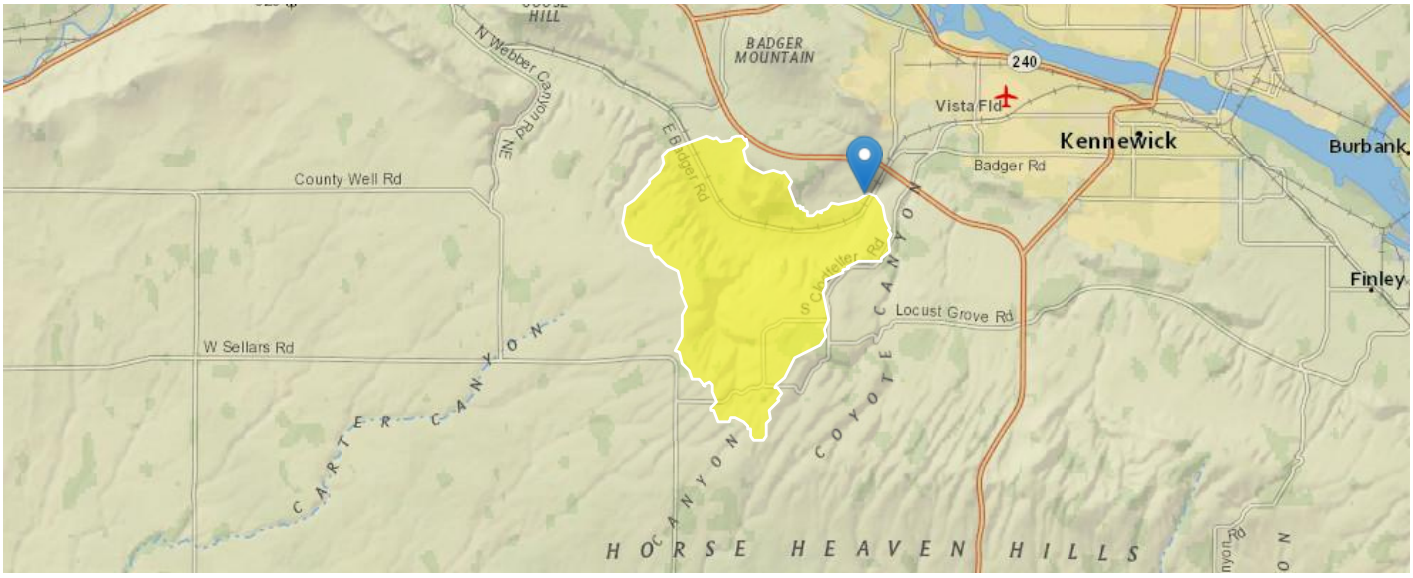
United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Cottonwood Creek Ph 5 - StreamStats Report

Region ID: WA
Workspace ID: WA20250401202656803000
Clicked Point (Latitude, Longitude): 46.18552, -119.27826
Time: 2025-04-01 13:27:26 -0700



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLDEM30M	Mean basin slope computed from 30 m DEM	11.6	percent
CANOPY_PCT	Percentage of drainage area covered by canopy as described in OK SIR 2009_5267	0.001	percent
DRNAREA	Area that drains to a point on a stream	21.98	square miles
ELEV	Mean Basin Elevation	1230	feet
ELEVMAX	Maximum basin elevation	1940	feet
MINBELEV	Minimum basin elevation	552	feet
NFSL30	North-Facing Slopes Greater Than 30 Percent	2.23	percent
PRECIP	Mean Annual Precipitation	9.9	inches
PRECPRIS10	Basin average mean annual precipitation for 1981 to 2010 from PRISM	9.25	inches
RELIEF	Maximum - minimum elevation	1390	feet
SLOP30_30M	Percent area with slopes greater than 30 percent from 30-meter DEM.	6.36	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Region 2 2016 5118]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
CANOPY_PCT	Percent Area Under Canopy	0.001	percent	0	81.8
DRNAREA	Drainage Area	21.98	square miles	0.42	1330

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
PRECPRIS10	Mean Annual Precip PRISM 1981 2010	9.25	inches	8.86	84.2

Peak-Flow Statistics Flow Report [Peak Region 2 2016 5118]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU	ASEp
50-percent AEP flood	37.2	ft^3/s	11.6	119	77.2
20-percent AEP flood	130	ft^3/s	44.6	379	69.1
10-percent AEP flood	251	ft^3/s	82.6	763	72.2
4-percent AEP flood	503	ft^3/s	148	1700	81.2
2-percent AEP flood	788	ft^3/s	212	2930	89.2
1-percent AEP flood	1170	ft^3/s	288	4750	96.9
0.5-percent AEP flood	1690	ft^3/s	380	7520	106
0.2-percent AEP flood	2620	ft^3/s	521	13200	120

Peak-Flow Statistics Citations

Mastin, M.C., Konrad, C.P., Veilleux, A.G., and Tecca, A.E.,2016, Magnitude, frequency, and trends of floods at gaged and ungaged sites in Washington, based on data through water year 2014 (ver 1.1, October 2016): U.S. Geological Survey Scientific Investigations Report 2016–5118, 70 p. (http://dx.doi.org/10.3133/sir20165118)

Bankfull Statistics

Bankfull Statistics Parameters [Intermontane Plateau D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	21.98	square miles	3.62934	7579.9152

Bankfull Statistics Parameters [Columbia Plateau P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	21.98	square miles	17.698824	7579.957671

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	21.98	square miles	0.07722	59927.7393

Bankfull Statistics Parameters [West Int Basin Range CastroJackson 2001]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	21.98	square miles	17.7	8080

Bankfull Statistics Flow Report [Intermontane Plateau D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	19.5	ft
Bieger_D_channel_depth	0.868	ft
Bieger_D_channel_cross_sectional_area	15.7	ft^2

Bankfull Statistics Flow Report [Columbia Plateau P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	15.4	ft
Bieger_P_channel_depth	1.76	ft
Bieger_P_channel_cross_sectional_area	14.8	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	36.7	ft
Bieger_USA_channel_depth	2.33	ft
Bieger_USA_channel_cross_sectional_area	90.7	ft^2

Bankfull Statistics Flow Report [West Int Basin Range CastroJackson 2001]

Statistic	Value	Unit
Bankfull Width	15.8	ft
Bankfull Depth	1.66	ft
Bankfull Area	21.5	ft^2
Bankfull Streamflow	141	ft^3/s

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bieger_D_channel_width	19.5	ft
Bieger_D_channel_depth	0.868	ft
Bieger_D_channel_cross_sectional_area	15.7	ft^2
Bieger_P_channel_width	15.4	ft
Bieger_P_channel_depth	1.76	ft
Bieger_P_channel_cross_sectional_area	14.8	ft^2
Bieger_USA_channel_width	36.7	ft
Bieger_USA_channel_depth	2.33	ft
Bieger_USA_channel_cross_sectional_area	90.7	ft^2
Bankfull Width	15.8	ft
Bankfull Depth	1.66	ft
Bankfull Area	21.5	ft^2
Bankfull Streamflow	141	ft^3/s

Bankfull Statistics Citations

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDFCoverPages)

Castro, J.M, and Jackson, P.L.Castro, J.M, and Jackson, P.L., 2001, Bankfull Discharge Recurrence Intervals and Regional Hydraulic Geometery Relationships: Patterns in the Pacific Northwest, USA, Journal of the American Water Resources Association, Volume 37, No. 5, 14 p. (https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1752-1688.2001.tb03636.x)

Maximum Probable Flood Statistics

Maximum Probable Flood Statistics Parameters [Crippen Bue Region 15]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	21.98	square miles	0.1	20

Maximum Probable Flood Statistics Disclaimers [Crippen Bue Region 15]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Maximum Probable Flood Statistics Flow Report [Crippen Bue Region 15]

Statistic	Value	Unit
Maximum Flood Crippen Bue Regional	86200	ft^3/s

Maximum Probable Flood Statistics Citations

Crippen, J.R. and Bue, Conrad D.1977, Maximum Floodflows in the Conterminous United States, Geological Survey Water-Supply Paper 1887, 52p. (https://pubs.usgs.gov/wsp/1887/report.pdf)

NHD Features of Delineated Basin

NHD Streams Intersecting Basin Delineation Boundary

This functionality attempts to find the stream name at the delineation point. The name of the nearest intersecting National Hydrography Dataset (NHD) stream is selected by default to appear in the report above. NHD streams do not correspond to the StreamStats stream grid and may not be accurate. If you would like a different stream to appear in the above section, please make a selection below.

Watershed Boundary Dataset (WBD) HUC 8 Intersecting Basin Delineation Boundary

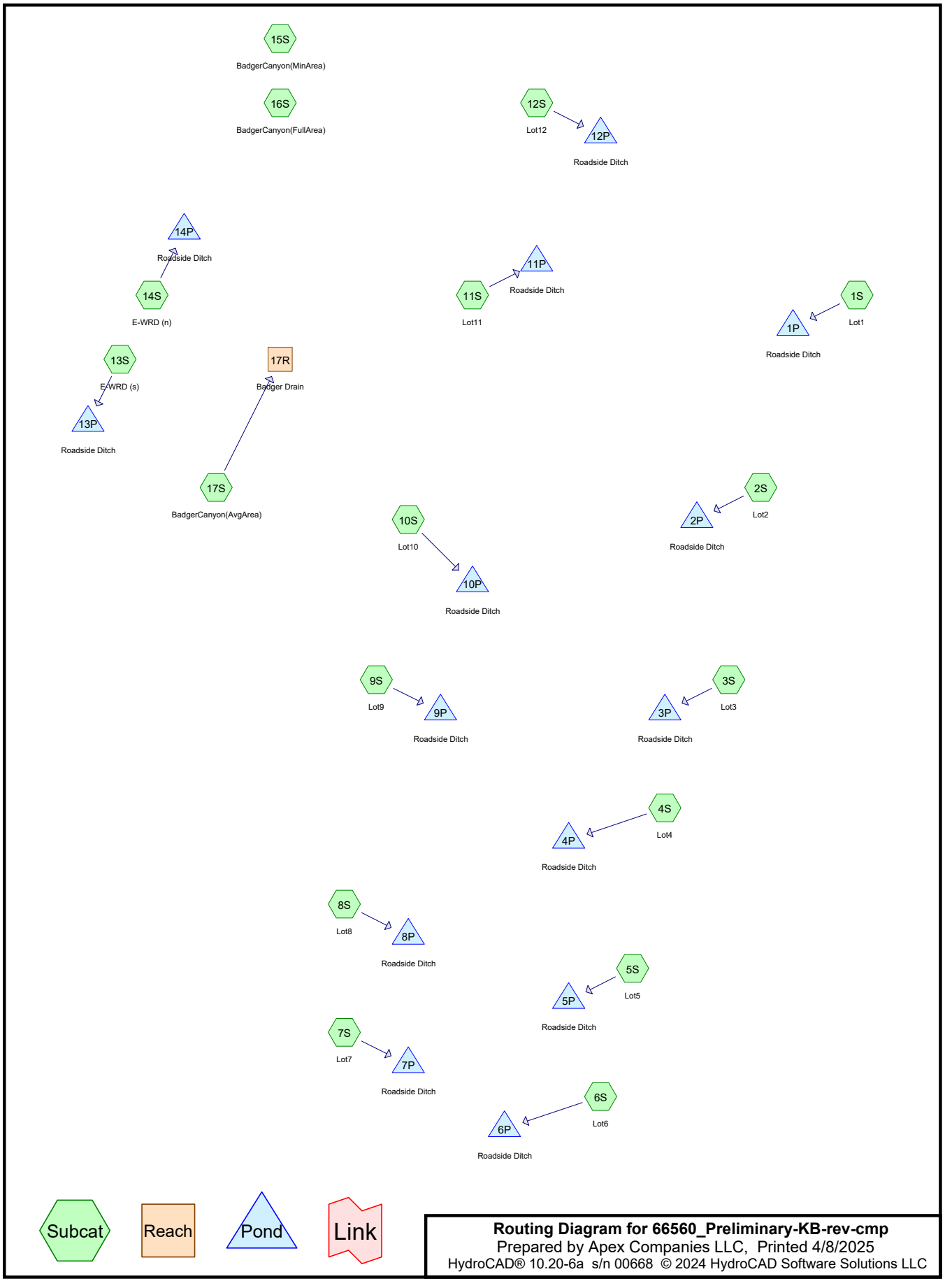
This functionality attempts to find the intersecting HUC 8 of the delineated watershed. HUC boundaries do not correspond to the StreamStats data and may not be accurate.

No WBD HUC8s intersect the delineated basin.

NHD Hydrologic Features Citations

U.S. Geological Survey, 2022, USGS TNM - National Hydrography Dataset, accessed July 21, 2022 at URL https://hydro.nationalmap.gov/arcgis/rest/services/nhd/MapServer/6. (https://hydro.nationalmap.gov/arcgis/rest/services/nhd/MapServer/6) U.S. Geological Survey, 2022, USGS TNM - National Hydrography Dataset, accessed July 21, 2022 at URL https://hydro.nationalmap.gov/arcgis/rest/services/wbd/MapServer/4. (https://hydro.nationalmap.gov/arcgis/rest/services/wbd/MapServer/4)

Application Version: 4.28.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1



Routing Diagram for 66560_Preliminary-KB-rev-cmp
Prepared by Apex Companies LLC, Printed 4/8/2025

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	IA 25-YR	Type IA 24-hr		Default	24.00	1	1.70	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
936,844,920	79	50-75% Grass cover, Fair, HSG C (15S, 16S, 17S)
705,005	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S)
39,000	98	Pervious (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S)
42,117	98	Road (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S)
6,481	98	Road S (13S)
6,573	98	Road n (14S)
937,644,096	**79**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
937,549,925	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 15S, 16S, 17S
0	HSG D	
94,171	Other	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S
937,644,096		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
0	0	936,844,920	0	0	936,844,920	50-75% Grass cover, Fair	
0	0	705,005	0	0	705,005	>75% Grass cover, Good	
0	0	0	0	39,000	39,000	Pervious	
0	0	0	0	42,117	42,117	Road	
0	0	0	0	6,481	6,481	Road S	
0	0	0	0	6,573	6,573	Road n	
0	**0**	**937,549,925**	**0**	**94,171**	**937,644,096**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	17R	1.00	0.21	88.0	0.0090	0.020	0.0	48.0	0.0	

Time span=0.00-96.00 hrs, dt=0.03 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Lot1 Runoff Area=47,349 sf 10.95% Impervious Runoff Depth=0.30"
Tc=5.0 min CN=77 Runoff=0.03 cfs 1,173 cf

Subcatchment2S: Lot2 Runoff Area=48,792 sf 12.58% Impervious Runoff Depth=0.30"
Tc=5.0 min CN=77 Runoff=0.03 cfs 1,209 cf

Subcatchment3S: Lot3 Runoff Area=47,974 sf 14.14% Impervious Runoff Depth=0.30"
Tc=5.0 min CN=77 Runoff=0.03 cfs 1,188 cf

Subcatchment4S: Lot4 Runoff Area=47,387 sf 14.72% Impervious Runoff Depth=0.33"
Tc=5.0 min CN=78 Runoff=0.04 cfs 1,288 cf

Subcatchment5S: Lot5 Runoff Area=56,955 sf 14.86% Impervious Runoff Depth=0.33"
Tc=5.0 min CN=78 Runoff=0.05 cfs 1,548 cf

Subcatchment6S: Lot6 Runoff Area=48,103 sf 14.57% Impervious Runoff Depth=0.30"
Tc=5.0 min CN=77 Runoff=0.03 cfs 1,192 cf

Subcatchment7S: Lot7 Runoff Area=74,982 sf 5.20% Impervious Runoff Depth=0.24"
Tc=5.0 min CN=75 Runoff=0.03 cfs 1,528 cf

Subcatchment8S: Lot8 Runoff Area=85,180 sf 6.62% Impervious Runoff Depth=0.27"
Tc=5.0 min CN=76 Runoff=0.04 cfs 1,917 cf

Subcatchment9S: Lot9 Runoff Area=55,034 sf 9.56% Impervious Runoff Depth=0.27"
Tc=5.0 min CN=76 Runoff=0.02 cfs 1,239 cf

Subcatchment10S: Lot10 Runoff Area=61,654 sf 10.38% Impervious Runoff Depth=0.27"
Tc=5.0 min CN=76 Runoff=0.03 cfs 1,388 cf

Subcatchment11S: Lot11 Runoff Area=101,447 sf 7.97% Impervious Runoff Depth=0.27"
Tc=5.0 min CN=76 Runoff=0.04 cfs 2,283 cf

Subcatchment12S: Lot12 Runoff Area=111,265 sf 10.13% Impervious Runoff Depth=0.27"
Tc=5.0 min CN=76 Runoff=0.05 cfs 2,504 cf

Subcatchment13S: E-WRD (s) Runoff Area=6,481 sf 100.00% Impervious Runoff Depth=1.48"
Tc=5.0 min CN=98 Runoff=0.06 cfs 798 cf

Subcatchment14S: E-WRD (n) Runoff Area=6,573 sf 100.00% Impervious Runoff Depth=1.48"
Tc=5.0 min CN=98 Runoff=0.06 cfs 809 cf

Subcatchment15S: Runoff Area=270.000 ac 0.00% Impervious Runoff Depth=0.36"
Tc=203.0 min CN=79 Runoff=6.01 cfs 349,630 cf

Subcatchment16S: Runoff Area=14,067.000 ac 0.00% Impervious Runoff Depth=0.36"
Tc=203.0 min CN=79 Runoff=312.97 cfs 18,215,717 cf

Subcatchment17S: Runoff Area=7,170.000 ac 0.00% Impervious Runoff Depth=0.36"
Tc=203.0 min CN=79 Runoff=159.52 cfs 9,284,616 cf

Reach 17R: Badger Drain Avg. Flow Depth=2.97' Max Vel=7.97 fps Inflow=159.52 cfs 9,284,616 cf
48.0" Round Pipe x 2.00 n=0.020 L=88.0' S=0.0090 '/' Capacity=176.93 cfs Outflow=159.52 cfs 9,284,616 cf

Pond 1P: Roadside Ditch Peak Elev=0.46' Storage=90 cf Inflow=0.03 cfs 1,173 cf
Outflow=0.02 cfs 1,173 cf

Pond 2P: Roadside Ditch Peak Elev=0.26' Storage=54 cf Inflow=0.03 cfs 1,209 cf
Outflow=0.02 cfs 1,209 cf

Pond 3P: Roadside Ditch Peak Elev=0.21' Storage=42 cf Inflow=0.03 cfs 1,188 cf
Outflow=0.02 cfs 1,188 cf

Pond 4P: Roadside Ditch Peak Elev=0.22' Storage=47 cf Inflow=0.04 cfs 1,288 cf
Outflow=0.02 cfs 1,288 cf

Pond 5P: Roadside Ditch Peak Elev=0.25' Storage=65 cf Inflow=0.05 cfs 1,548 cf
Outflow=0.03 cfs 1,548 cf

Pond 6P: Roadside Ditch Peak Elev=0.49' Storage=97 cf Inflow=0.03 cfs 1,192 cf
Outflow=0.02 cfs 1,192 cf

Pond 7P: Roadside Ditch Peak Elev=1.16' Storage=279 cf Inflow=0.03 cfs 1,528 cf
Outflow=0.03 cfs 1,528 cf

Pond 8P: Roadside Ditch Peak Elev=0.54' Storage=177 cf Inflow=0.04 cfs 1,917 cf
Outflow=0.03 cfs 1,917 cf

Pond 9P: Roadside Ditch Peak Elev=0.36' Storage=77 cf Inflow=0.02 cfs 1,239 cf
Outflow=0.02 cfs 1,239 cf

Pond 10P: Roadside Ditch Peak Elev=0.47' Storage=112 cf Inflow=0.03 cfs 1,388 cf
Outflow=0.03 cfs 1,388 cf

Pond 11P: Roadside Ditch Peak Elev=1.40' Storage=480 cf Inflow=0.04 cfs 2,283 cf
Outflow=0.04 cfs 2,283 cf

Pond 12P: Roadside Ditch Peak Elev=0.25' Storage=111 cf Inflow=0.05 cfs 2,504 cf
Outflow=0.05 cfs 2,504 cf

Pond 13P: Roadside Ditch Peak Elev=0.36' Storage=93 cf Inflow=0.06 cfs 798 cf
Outflow=0.03 cfs 798 cf

Pond 14P: Roadside Ditch Peak Elev=0.36' Storage=95 cf Inflow=0.06 cfs 809 cf
Outflow=0.03 cfs 809 cf

Total Runoff Area = 937,644,096 sf Runoff Volume = 27,870,027 cf Average Runoff Depth = 0.36"
99.99% Pervious = 937,549,925 sf 0.01% Impervious = 94,171 sf

Summary for Subcatchment 1S: Lot1

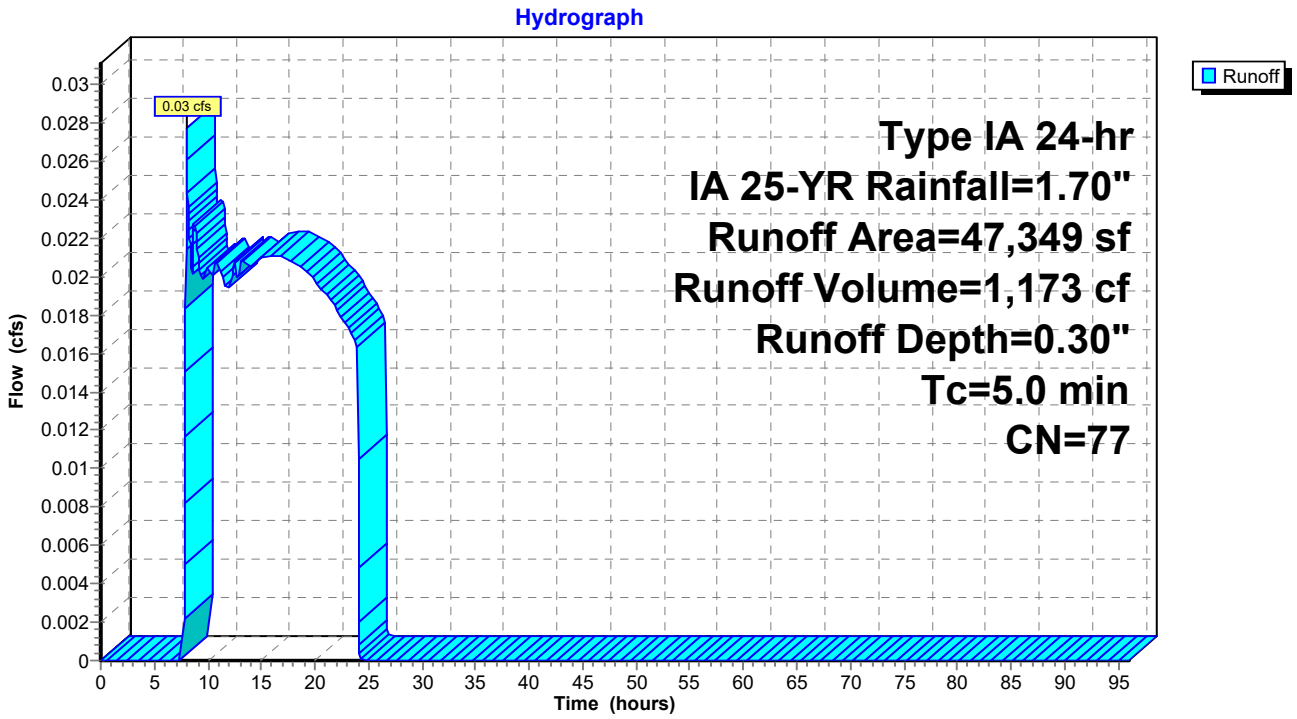
Runoff = 0.03 cfs @ 8.04 hrs, Volume= 1,173 cf, Depth= 0.30"
Routed to Pond 1P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

	Area (sf)	CN	Description
	42,164	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	2,185	98	Road
	47,349	77	Weighted Average
	42,164	74	89.05% Pervious Area
	5,185	98	10.95% Impervious Area

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

Subcatchment 1S: Lot1



Summary for Subcatchment 2S: Lot2

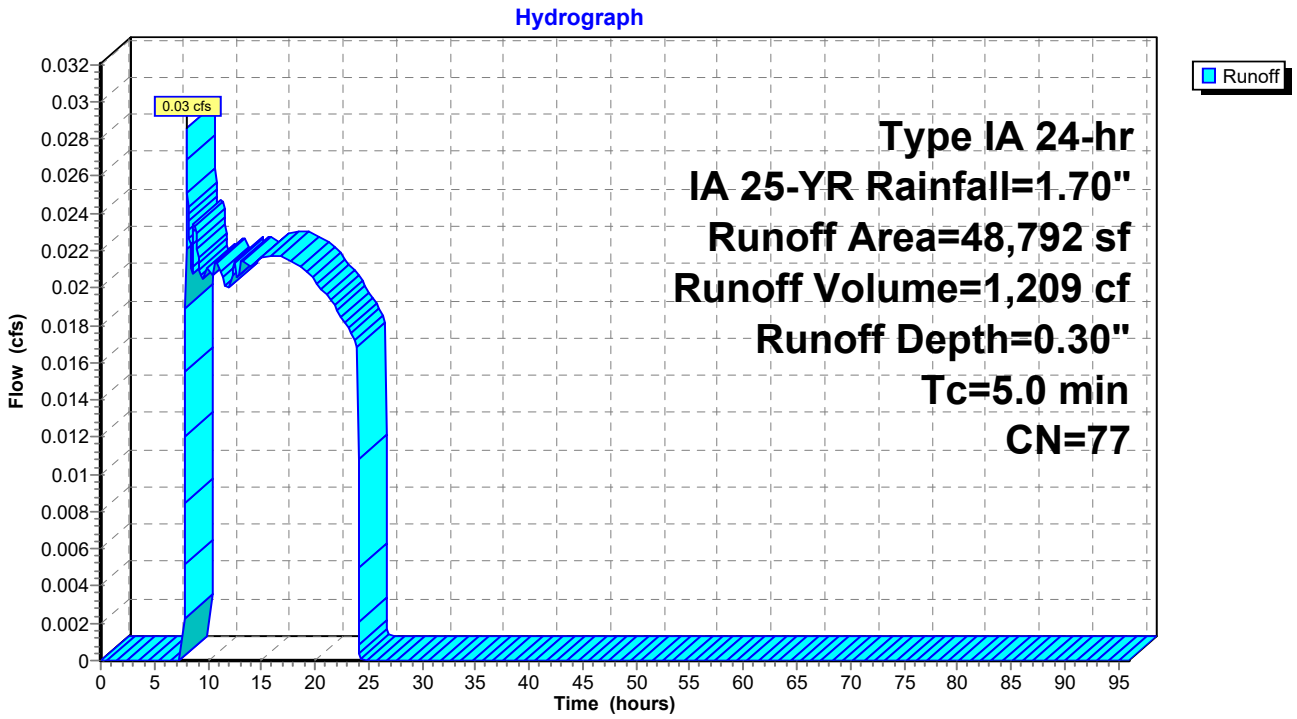
Runoff = 0.03 cfs @ 8.04 hrs, Volume= 1,209 cf, Depth= 0.30"
Routed to Pond 2P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

	Area (sf)	CN	Description
	42,655	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	3,137	98	Road
	48,792	77	Weighted Average
	42,655	74	87.42% Pervious Area
	6,137	98	12.58% Impervious Area

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

Subcatchment 2S: Lot2



Summary for Subcatchment 3S: Lot3

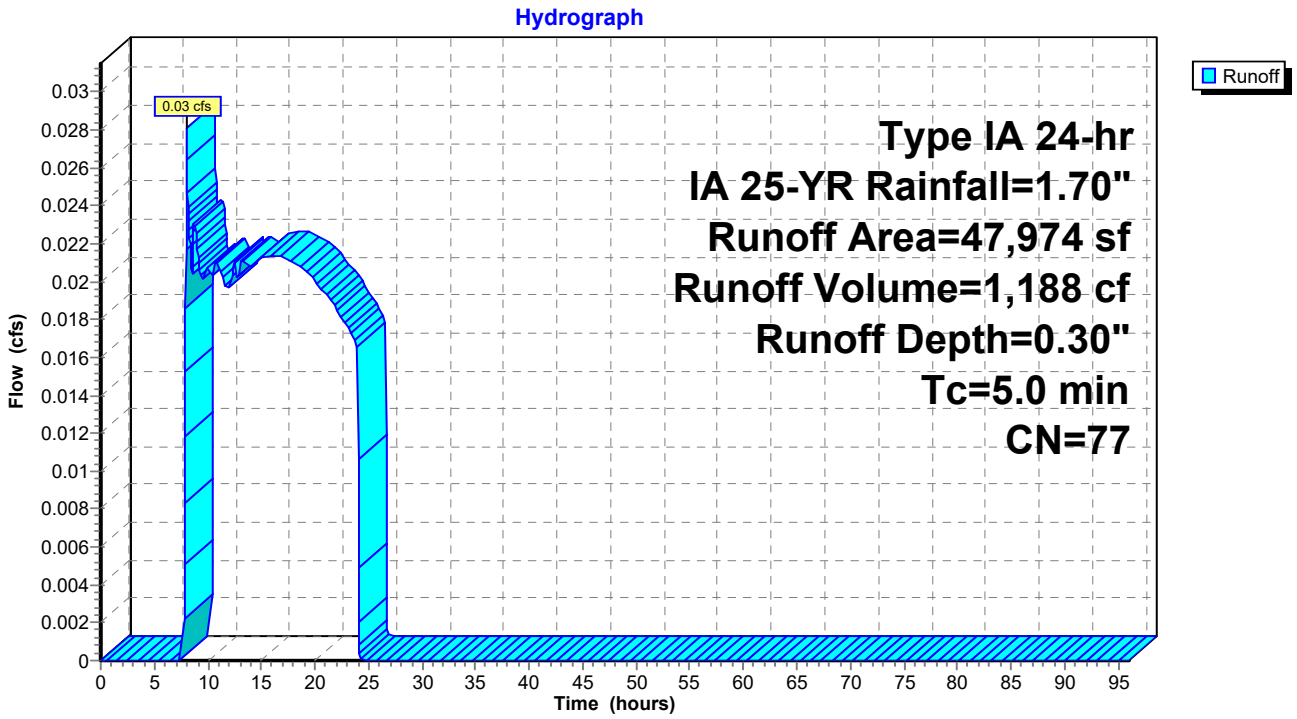
Runoff = 0.03 cfs @ 8.04 hrs, Volume= 1,188 cf, Depth= 0.30"
Routed to Pond 3P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

	Area (sf)	CN	Description
	41,192	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	3,782	98	Road
	47,974	77	Weighted Average
	41,192	74	85.86% Pervious Area
	6,782	98	14.14% Impervious Area

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

Subcatchment 3S: Lot3



Summary for Subcatchment 4S: Lot4

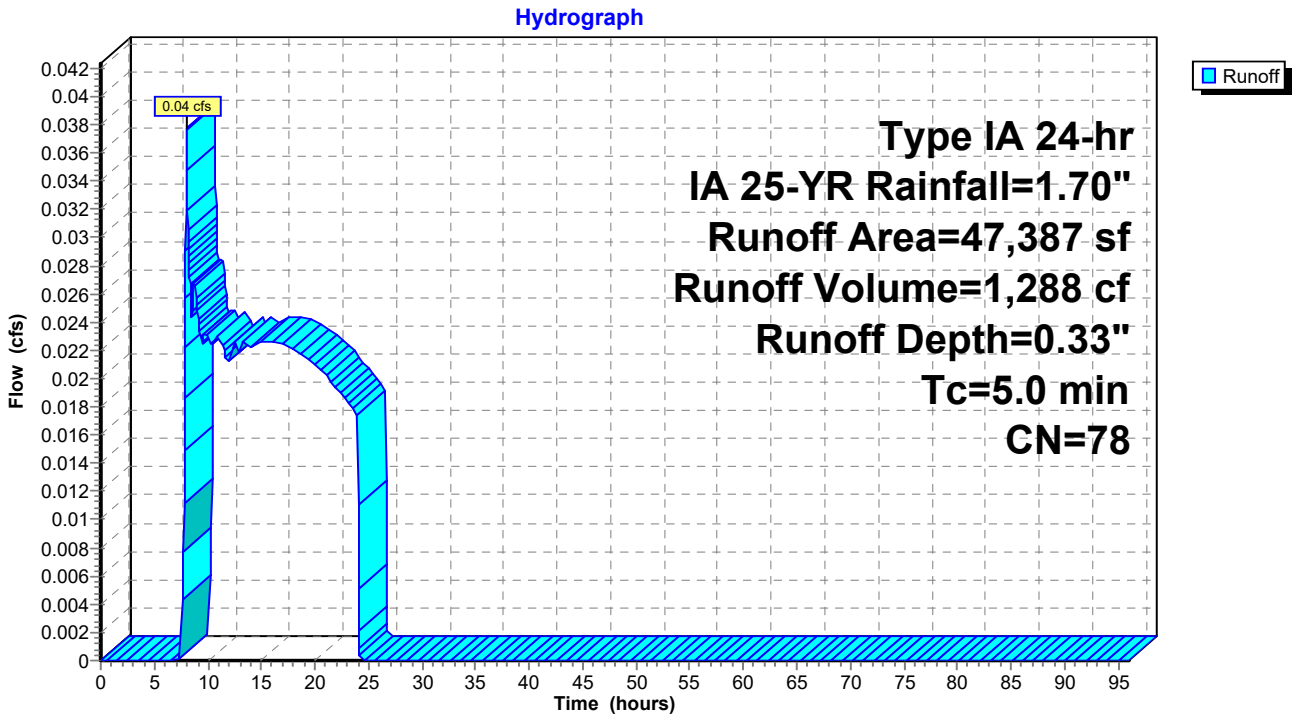
Runoff = 0.04 cfs @ 8.03 hrs, Volume= 1,288 cf, Depth= 0.33"
Routed to Pond 4P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

	Area (sf)	CN	Description
	40,411	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	3,976	98	Road
	47,387	78	Weighted Average
	40,411	74	85.28% Pervious Area
	6,976	98	14.72% Impervious Area

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

Subcatchment 4S: Lot4



Summary for Subcatchment 5S: Lot5

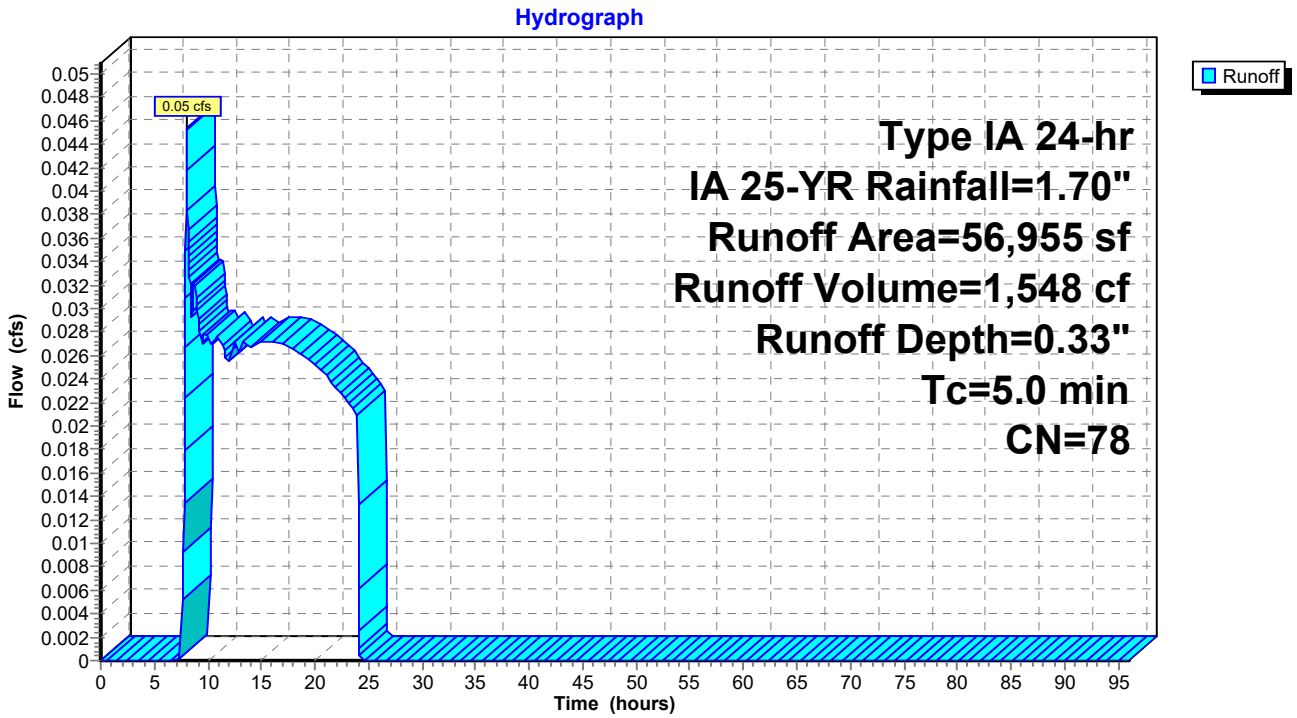
Runoff = 0.05 cfs @ 8.03 hrs, Volume= 1,548 cf, Depth= 0.33"
Routed to Pond 5P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

	Area (sf)	CN	Description
	48,494	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	5,461	98	Road
	56,955	78	Weighted Average
	48,494	74	85.14% Pervious Area
	8,461	98	14.86% Impervious Area

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

Subcatchment 5S: Lot5



Summary for Subcatchment 6S: Lot6

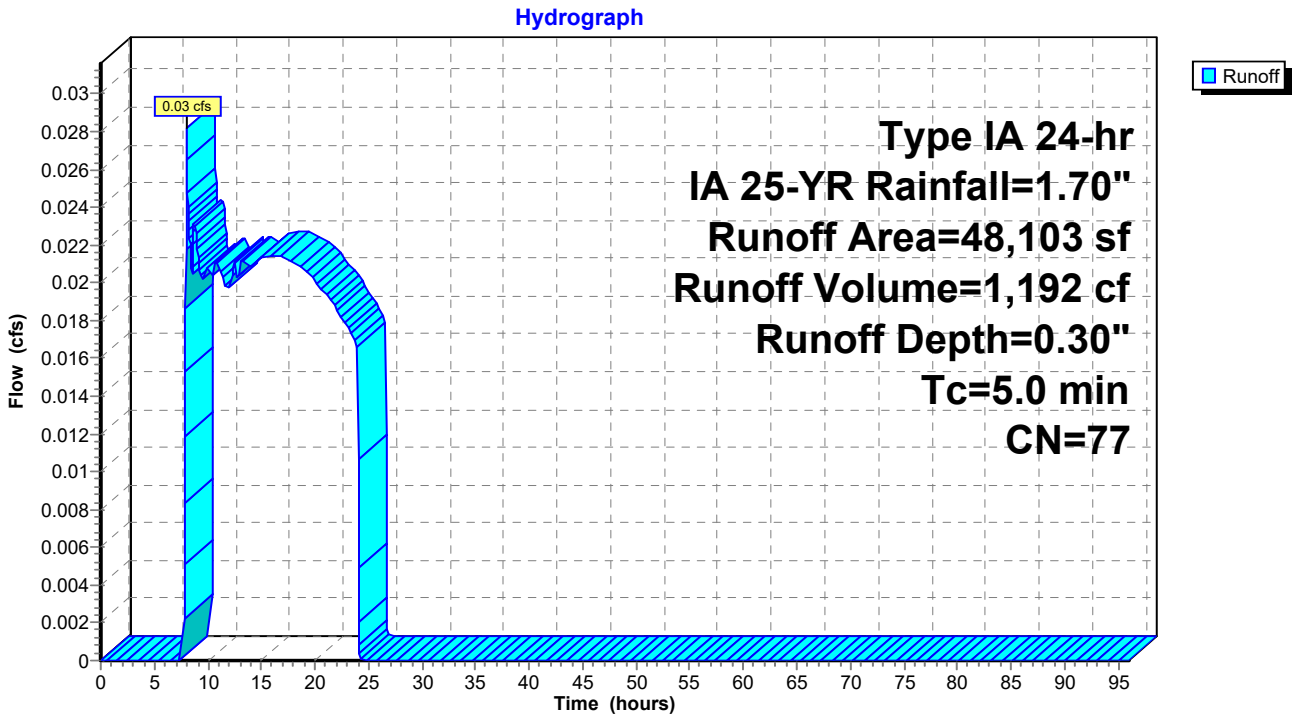
Runoff = 0.03 cfs @ 8.04 hrs, Volume= 1,192 cf, Depth= 0.30"
Routed to Pond 6P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

	Area (sf)	CN	Description
	41,092	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	4,011	98	Road
	48,103	77	Weighted Average
	41,092	74	85.43% Pervious Area
	7,011	98	14.57% Impervious Area

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

Subcatchment 6S: Lot6



Summary for Subcatchment 7S: Lot7

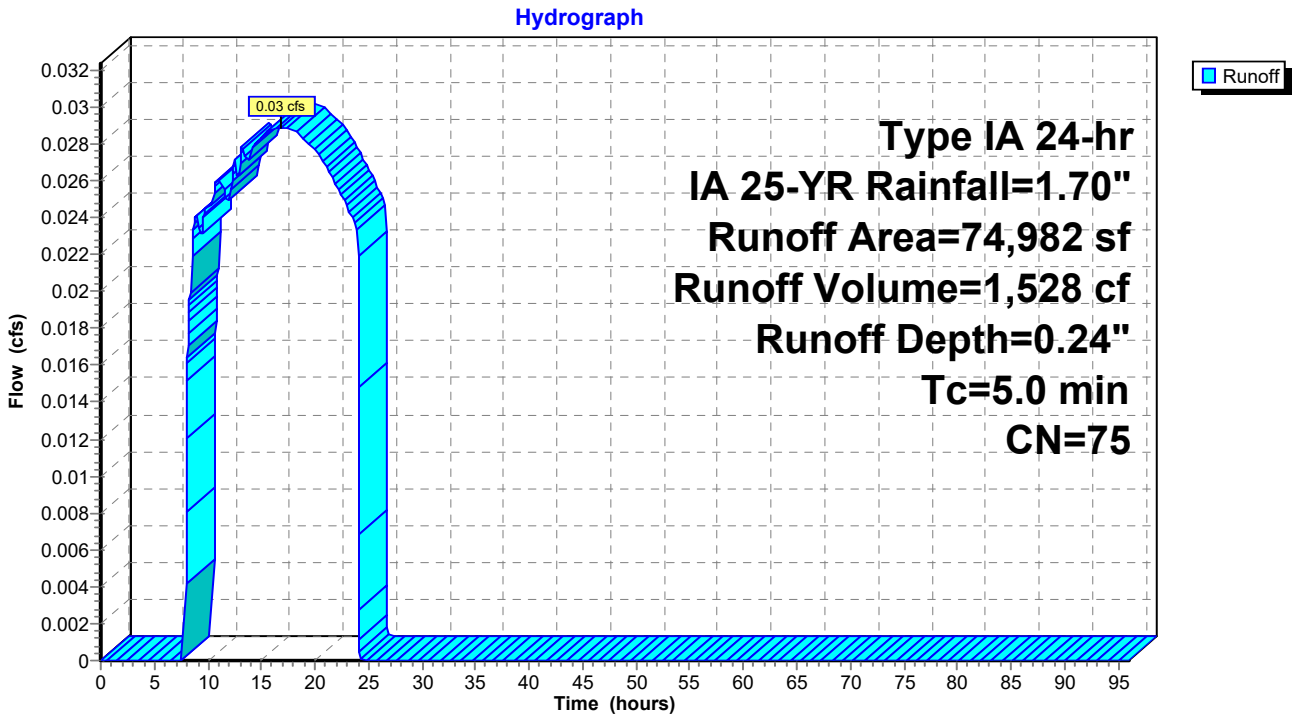
Runoff = 0.03 cfs @ 16.85 hrs, Volume= 1,528 cf, Depth= 0.24"
Routed to Pond 7P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

	Area (sf)	CN	Description
	71,082	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	900	98	Road
	74,982	75	Weighted Average
	71,082	74	94.80% Pervious Area
	3,900	98	5.20% Impervious Area

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

Subcatchment 7S: Lot7



Summary for Subcatchment 8S: Lot8

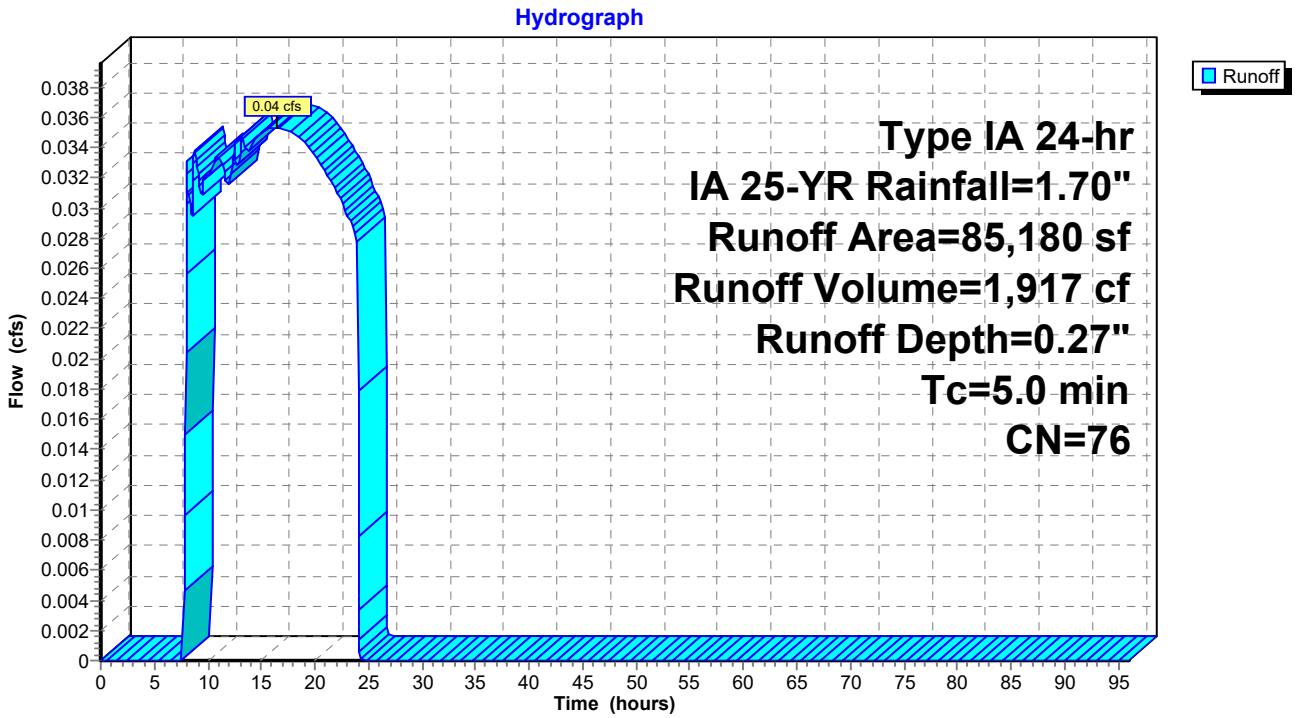
Runoff = 0.04 cfs @ 16.45 hrs, Volume= 1,917 cf, Depth= 0.27"
Routed to Pond 8P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

	Area (sf)	CN	Description
	79,537	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	2,643	98	Road
	85,180	76	Weighted Average
	79,537	74	93.38% Pervious Area
	5,643	98	6.62% Impervious Area

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

Subcatchment 8S: Lot8



Summary for Subcatchment 9S: Lot9

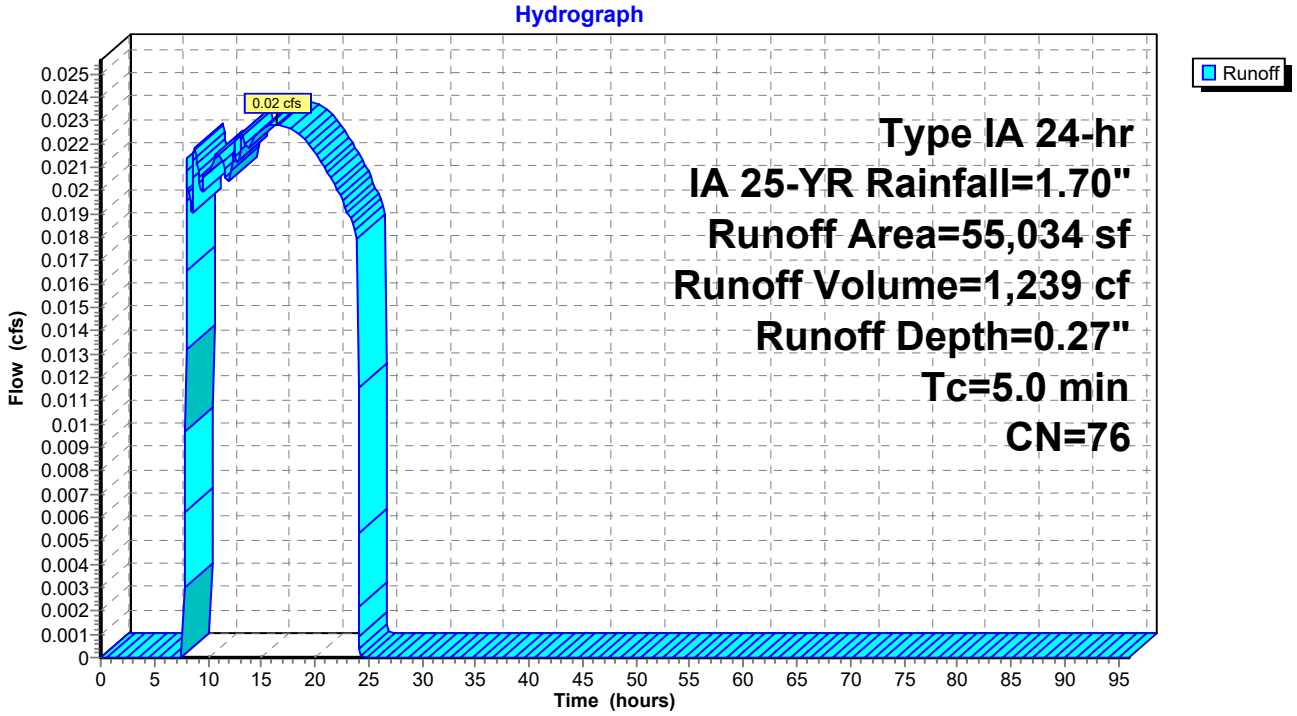
Runoff = 0.02 cfs @ 16.45 hrs, Volume= 1,239 cf, Depth= 0.27"
Routed to Pond 9P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

	Area (sf)	CN	Description
	49,772	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	2,262	98	Road
	55,034	76	Weighted Average
	49,772	74	90.44% Pervious Area
	5,262	98	9.56% Impervious Area

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

Subcatchment 9S: Lot9



Summary for Subcatchment 10S: Lot10

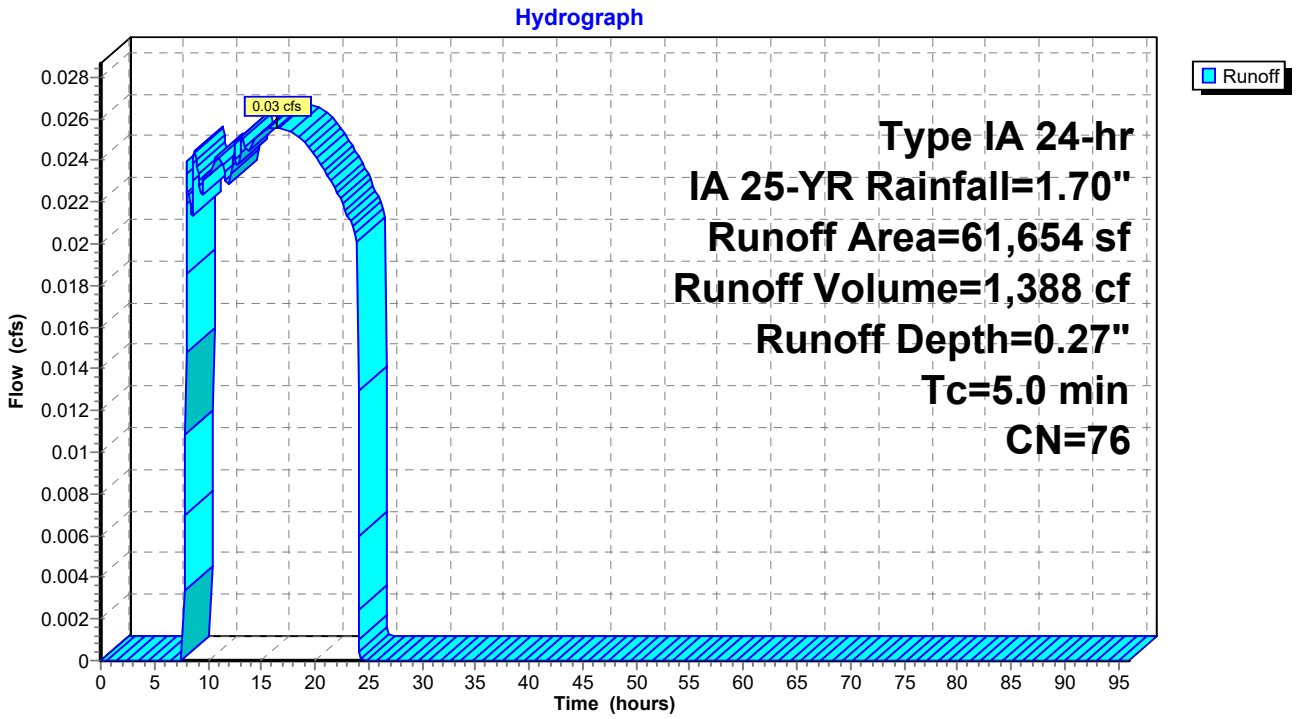
Runoff = 0.03 cfs @ 16.45 hrs, Volume= 1,388 cf, Depth= 0.27"
Routed to Pond 10P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

	Area (sf)	CN	Description
	55,257	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	3,397	98	Road
	61,654	76	Weighted Average
	55,257	74	89.62% Pervious Area
	6,397	98	10.38% Impervious Area

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

Subcatchment 10S: Lot10



Summary for Subcatchment 11S: Lot11

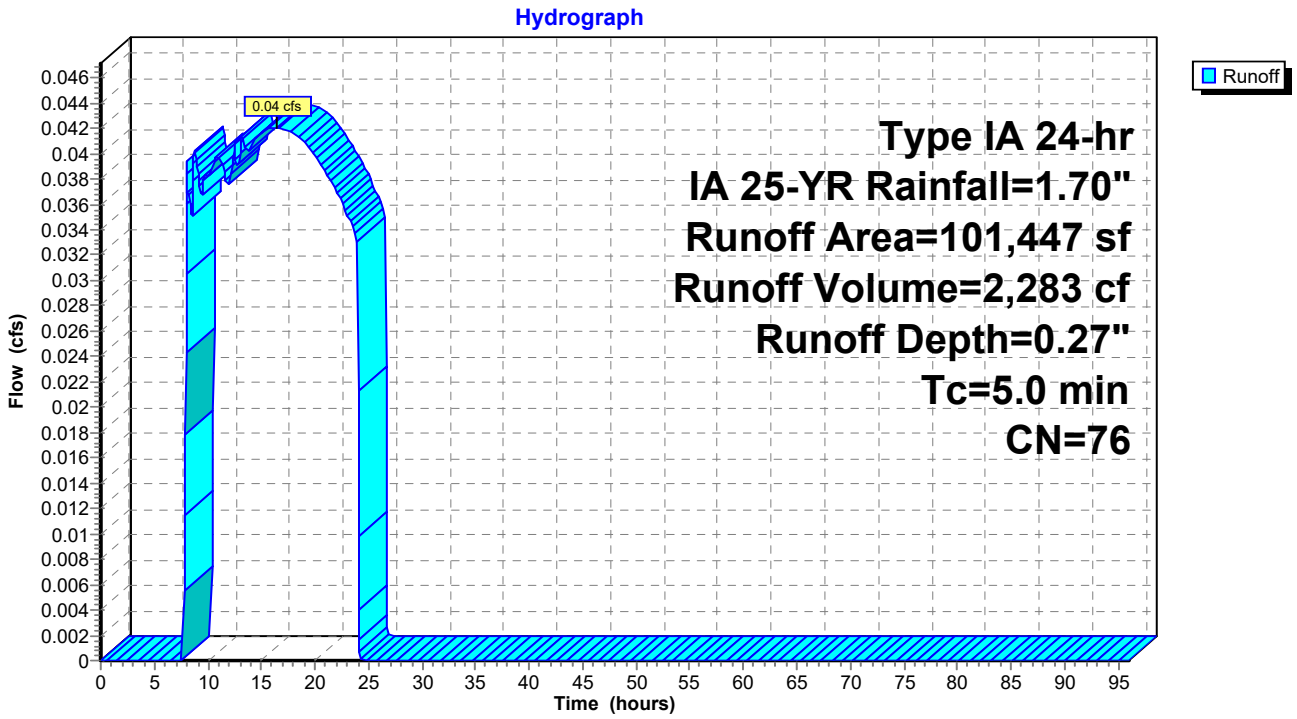
Runoff = 0.04 cfs @ 16.45 hrs, Volume= 2,283 cf, Depth= 0.27"
Routed to Pond 11P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

	Area (sf)	CN	Description
	93,358	74	>75% Grass cover, Good, HSG C
*	6,000	98	Pervious
*	2,089	98	Road
	101,447	76	Weighted Average
	93,358	74	92.03% Pervious Area
	8,089	98	7.97% Impervious Area

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

Subcatchment 11S: Lot11



Summary for Subcatchment 12S: Lot12

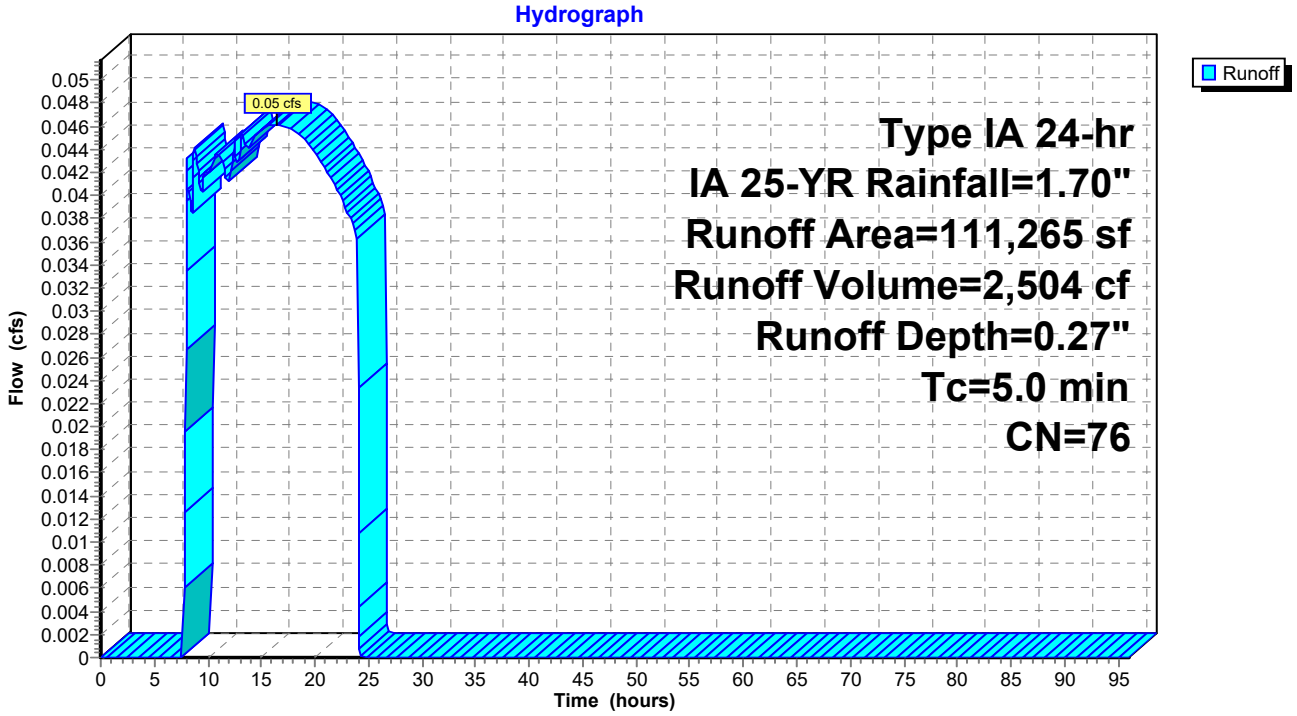
Runoff = 0.05 cfs @ 16.45 hrs, Volume= 2,504 cf, Depth= 0.27"
Routed to Pond 12P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

	Area (sf)	CN	Description
	99,991	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	8,274	98	Road
	111,265	76	Weighted Average
	99,991	74	89.87% Pervious Area
	11,274	98	10.13% Impervious Area

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

Subcatchment 12S: Lot12



Summary for Subcatchment 13S: E-WRD (s)

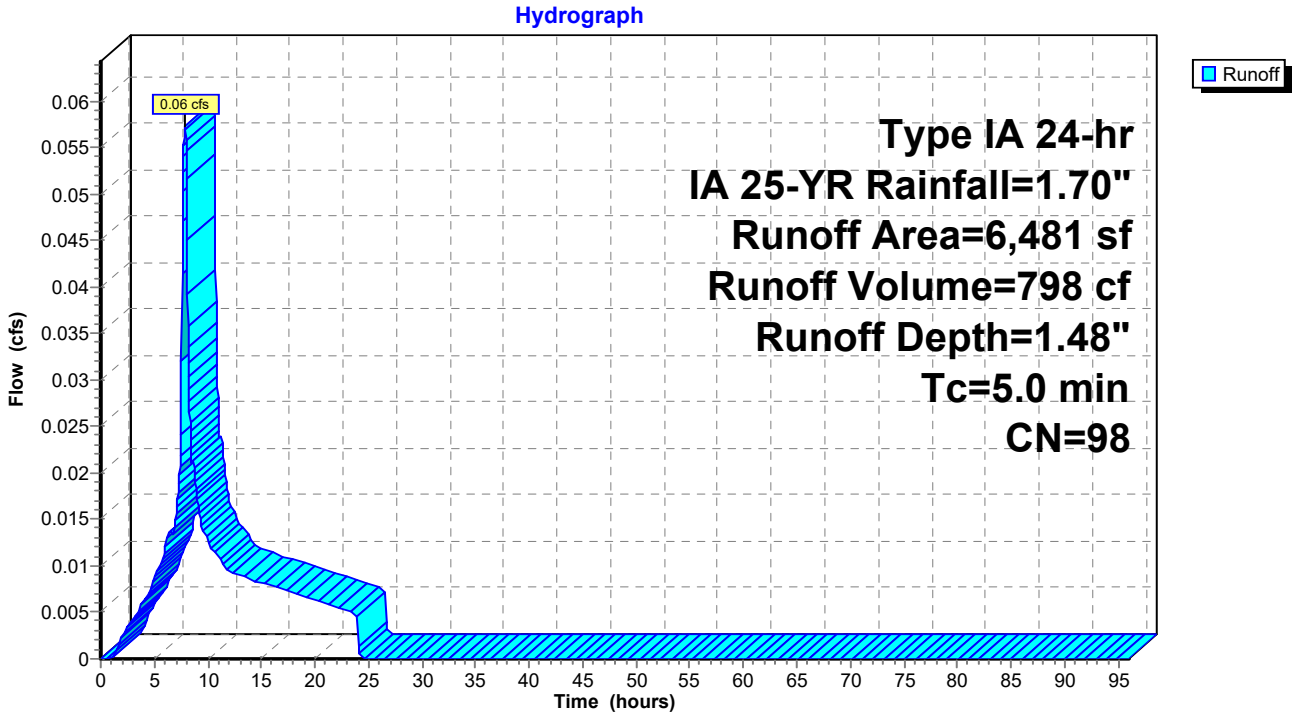
Runoff = 0.06 cfs @ 7.87 hrs, Volume= 798 cf, Depth= 1.48"
Routed to Pond 13P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

	Area (sf)	CN	Description
*	6,481	98	Road S
	6,481	98	100.00% Impervious Area

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

Subcatchment 13S: E-WRD (s)



Summary for Subcatchment 14S: E-WRD (n)

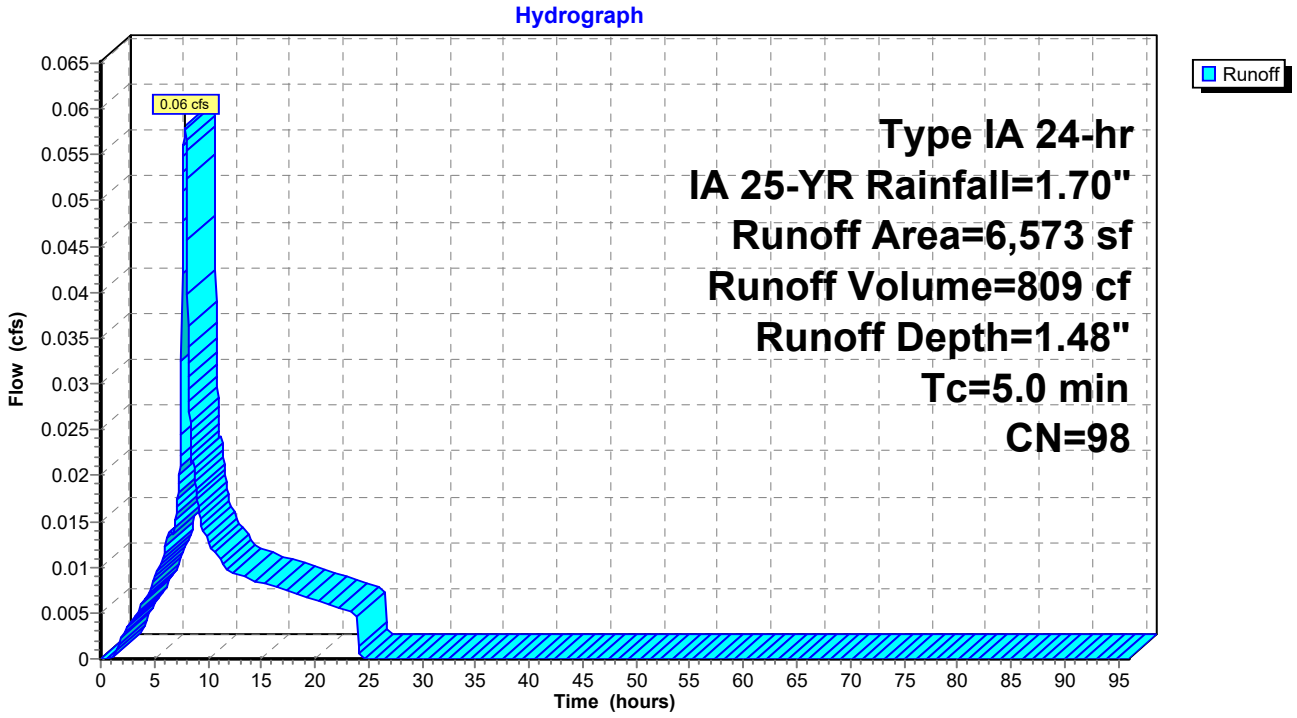
Runoff = 0.06 cfs @ 7.87 hrs, Volume= 809 cf, Depth= 1.48"
Routed to Pond 14P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

	Area (sf)	CN	Description
*	6,573	98	Road n
	6,573	98	100.00% Impervious Area

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

Subcatchment 14S: E-WRD (n)



Summary for Subcatchment 15S: BadgerCanyon(MinArea)

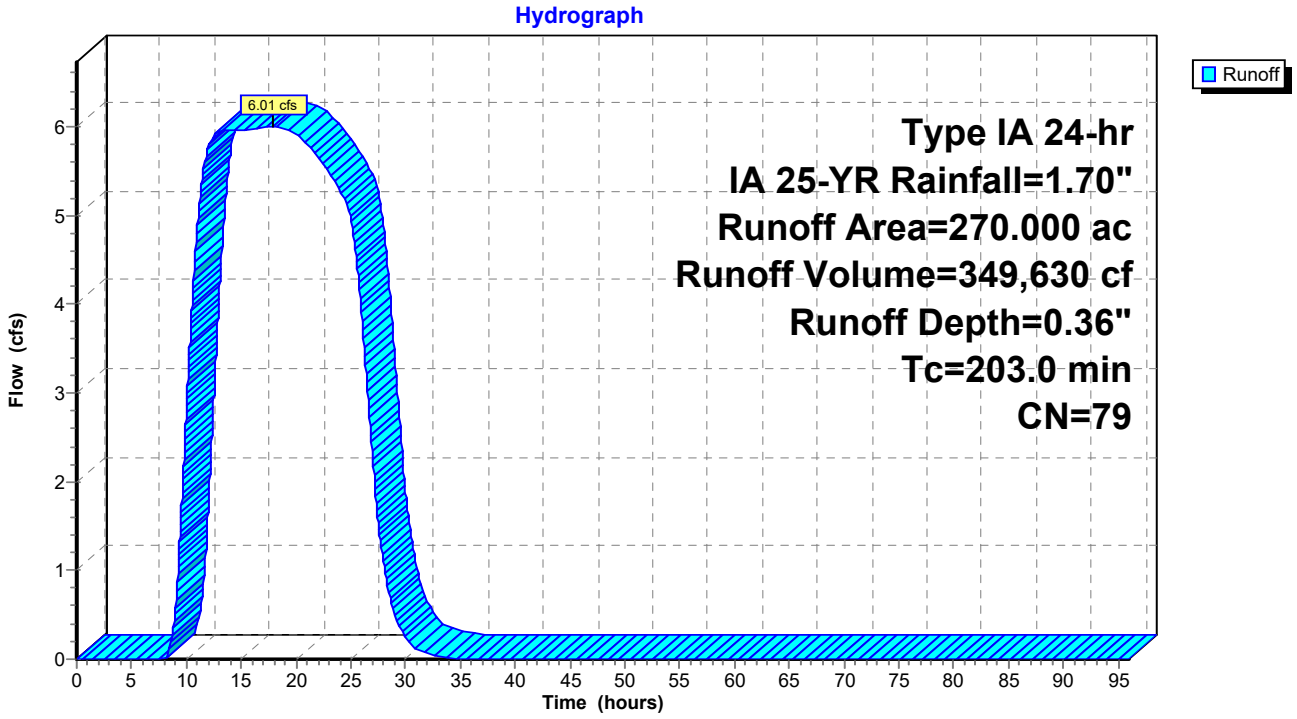
Runoff = 6.01 cfs @ 17.82 hrs, Volume= 349,630 cf, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

Area (ac)	CN	Description
270.000	79	50-75% Grass cover, Fair, HSG C
270.000	79	100.00% Pervious Area

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

Subcatchment 15S: BadgerCanyon(MinArea)



Summary for Subcatchment 16S: BadgerCanyon(FullArea)

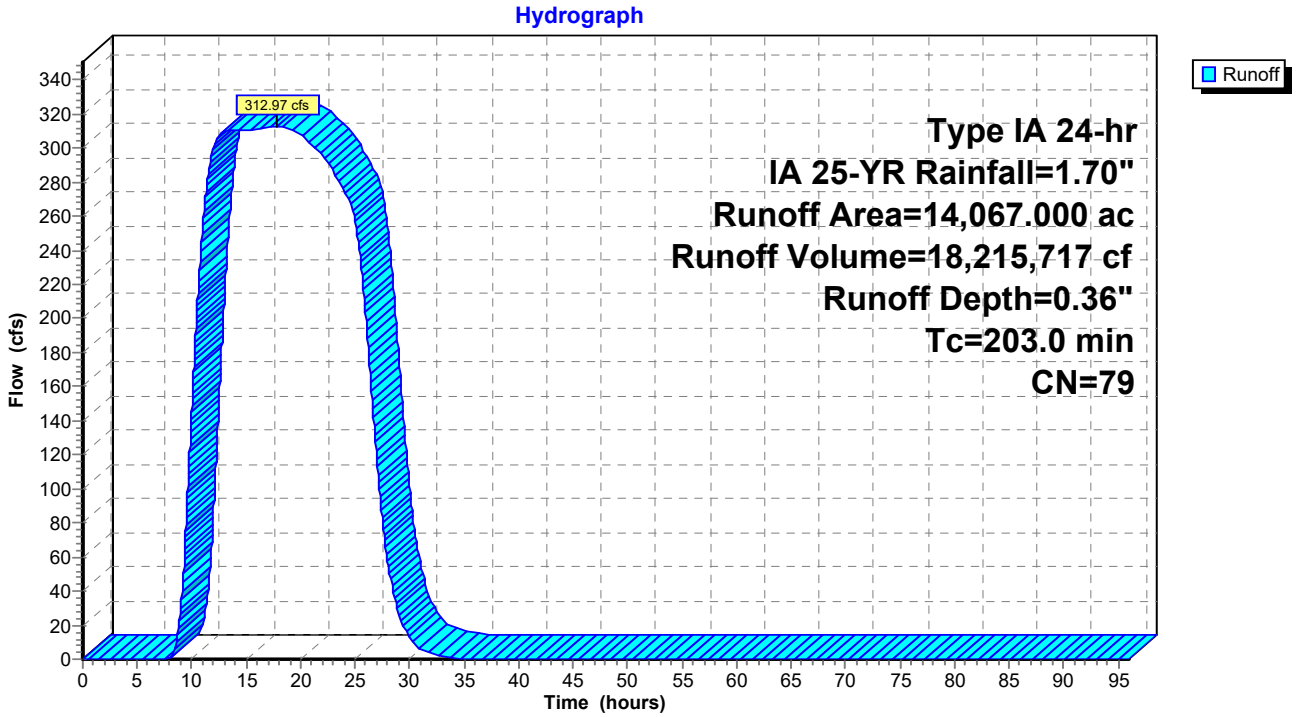
Runoff = 312.97 cfs @ 17.82 hrs, Volume= 18,215,717 cf, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

Area (ac)	CN	Description
14,067.000	79	50-75% Grass cover, Fair, HSG C
14,067.000	79	100.00% Pervious Area

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

Subcatchment 16S: BadgerCanyon(FullArea)



Summary for Subcatchment 17S: BadgerCanyon(AvgArea)

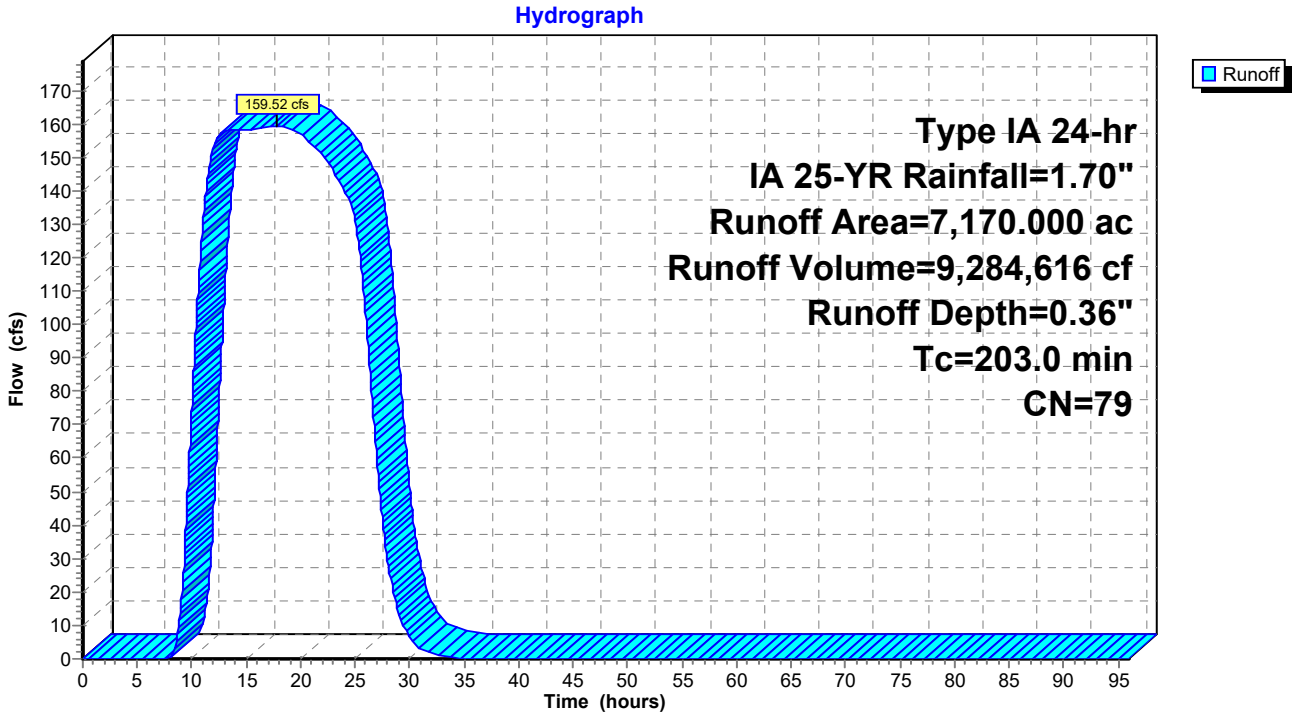
Runoff = 159.52 cfs @ 17.82 hrs, Volume= 9,284,616 cf, Depth= 0.36"
Routed to Reach 17R : Badger Drain

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 25-YR Rainfall=1.70"

Area (ac)	CN	Description
7,170.000	79	50-75% Grass cover, Fair, HSG C
7,170.000	79	100.00% Pervious Area

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

Subcatchment 17S: BadgerCanyon(AvgArea)



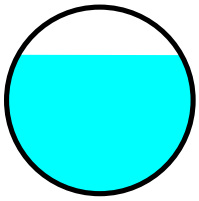
Summary for Reach 17R: Badger Drain

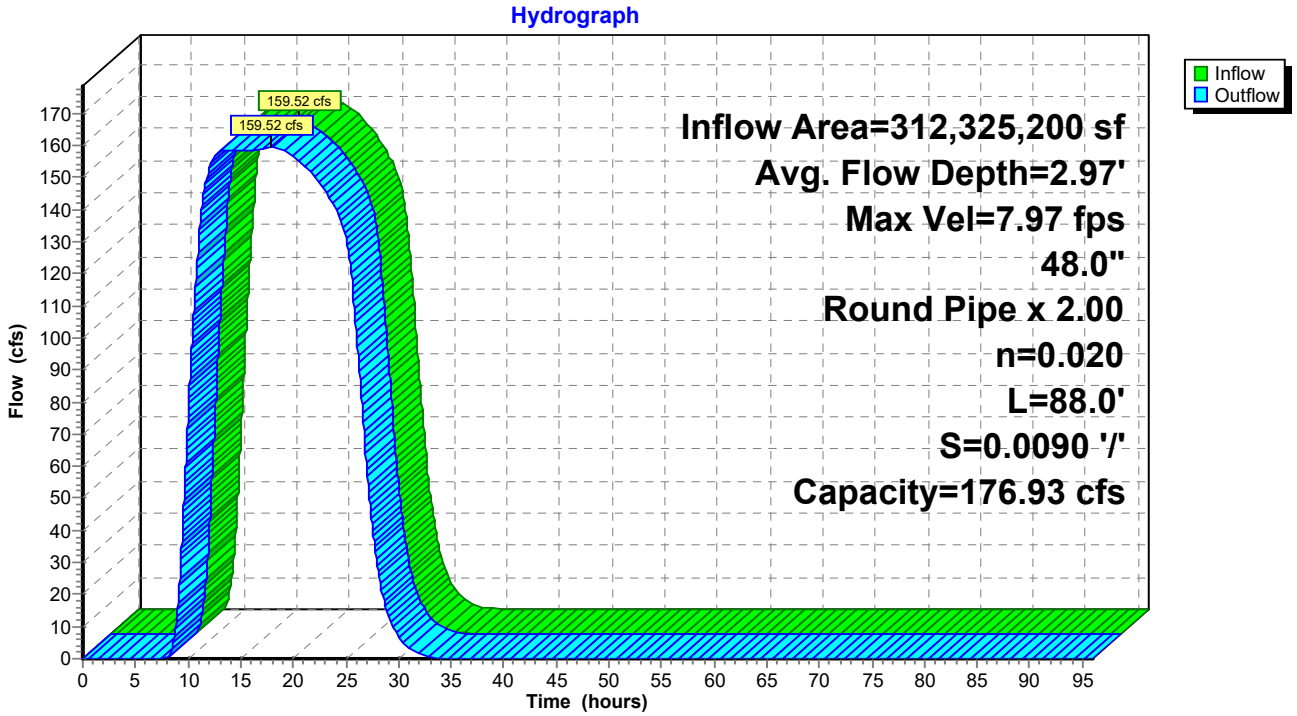
Inflow Area = 312,325,200 sf, 0.00% Impervious, Inflow Depth = 0.36" for IA 25-YR event
Inflow = 159.52 cfs @ 17.82 hrs, Volume= 9,284,616 cf
Outflow = 159.52 cfs @ 17.82 hrs, Volume= 9,284,616 cf, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Max. Velocity= 7.97 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 5.90 fps, Avg. Travel Time= 0.2 min

Peak Storage= 1,762 cf @ 17.82 hrs
Average Depth at Peak Storage= 2.97' , Surface Width= 6.99'
Bank-Full Depth= 4.00' Flow Area= 25.1 sf, Capacity= 176.93 cfs

A factor of 2.00 has been applied to the storage and discharge capacity
48.0" Round Pipe
n= 0.020
Length= 88.0' Slope= 0.0090 '/'
Inlet Invert= 1.00', Outlet Invert= 0.21'





Summary for Pond 1P: Roadside Ditch

Inflow Area = 47,349 sf, 10.95% Impervious, Inflow Depth = 0.30" for IA 25-YR event
Inflow = 0.03 cfs @ 8.04 hrs, Volume= 1,173 cf
Outflow = 0.02 cfs @ 17.98 hrs, Volume= 1,173 cf, Atten= 25%, Lag= 596.9 min
Discarded = 0.02 cfs @ 17.98 hrs, Volume= 1,173 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.46' @ 17.98 hrs Surf.Area= 399 sf Storage= 90 cf

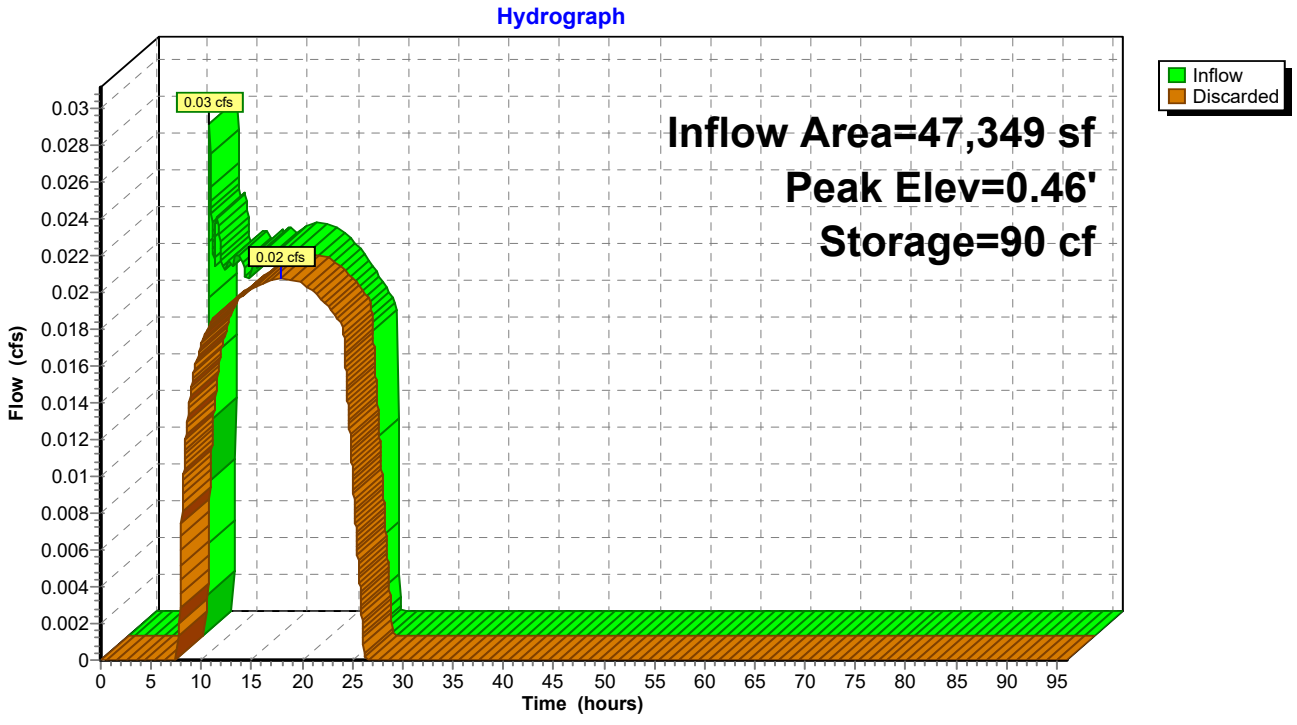
Plug-Flow detention time= 66.0 min calculated for 1,173 cf (100% of inflow)
Center-of-Mass det. time= 66.0 min (1,010.0 - 944.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,851 cf	**105.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 17.98 hrs HW=0.46' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond 1P: Roadside Ditch



Summary for Pond 2P: Roadside Ditch

Inflow Area = 48,792 sf, 12.58% Impervious, Inflow Depth = 0.30" for IA 25-YR event
Inflow = 0.03 cfs @ 8.04 hrs, Volume= 1,209 cf
Outflow = 0.02 cfs @ 17.28 hrs, Volume= 1,209 cf, Atten= 25%, Lag= 554.5 min
Discarded = 0.02 cfs @ 17.28 hrs, Volume= 1,209 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.26' @ 17.28 hrs Surf.Area= 415 sf Storage= 54 cf

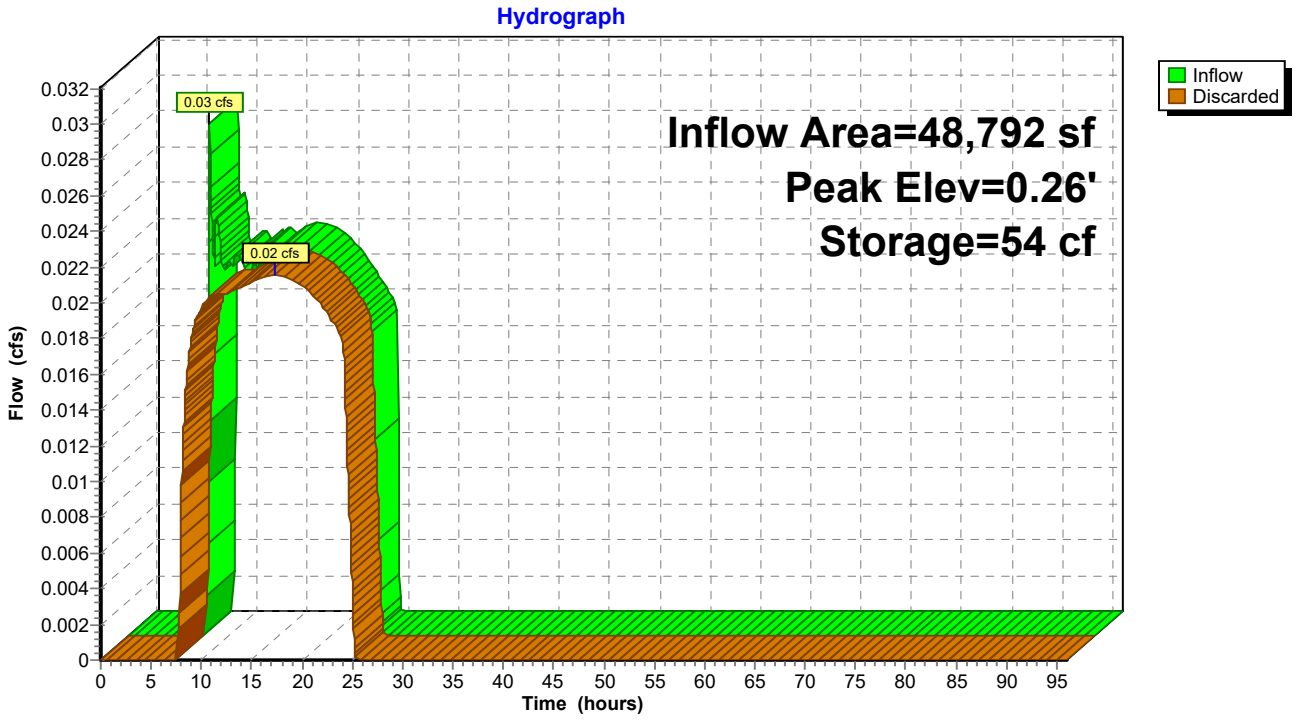
Plug-Flow detention time= 38.9 min calculated for 1,208 cf (100% of inflow)
Center-of-Mass det. time= 38.9 min (982.9 - 944.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	3,291 cf	**195.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 17.28 hrs HW=0.26' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond 2P: Roadside Ditch



Summary for Pond 3P: Roadside Ditch

Inflow Area = 47,974 sf, 14.14% Impervious, Inflow Depth = 0.30" for IA 25-YR event
Inflow = 0.03 cfs @ 8.04 hrs, Volume= 1,188 cf
Outflow = 0.02 cfs @ 17.08 hrs, Volume= 1,188 cf, Atten= 24%, Lag= 542.5 min
Discarded = 0.02 cfs @ 17.08 hrs, Volume= 1,188 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.21' @ 17.08 hrs Surf.Area= 409 sf Storage= 42 cf

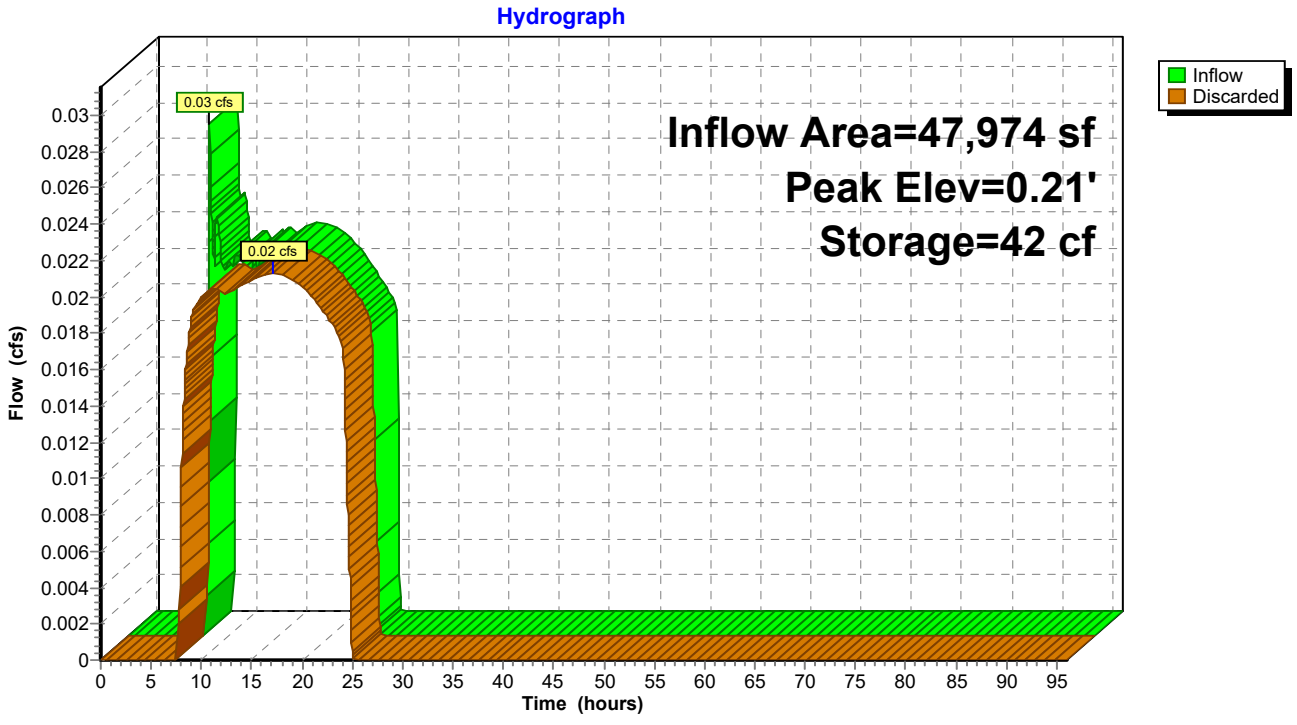
Plug-Flow detention time= 30.9 min calculated for 1,188 cf (100% of inflow)
Center-of-Mass det. time= 30.9 min (974.9 - 944.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	4,091 cf	**245.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 17.08 hrs HW=0.21' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond 3P: Roadside Ditch



Summary for Pond 4P: Roadside Ditch

Inflow Area = 47,387 sf, 14.72% Impervious, Inflow Depth = 0.33" for IA 25-YR event
Inflow = 0.04 cfs @ 8.03 hrs, Volume= 1,288 cf
Outflow = 0.02 cfs @ 11.05 hrs, Volume= 1,288 cf, Atten= 40%, Lag= 181.2 min
Discarded = 0.02 cfs @ 11.05 hrs, Volume= 1,288 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.22' @ 11.05 hrs Surf.Area= 437 sf Storage= 47 cf

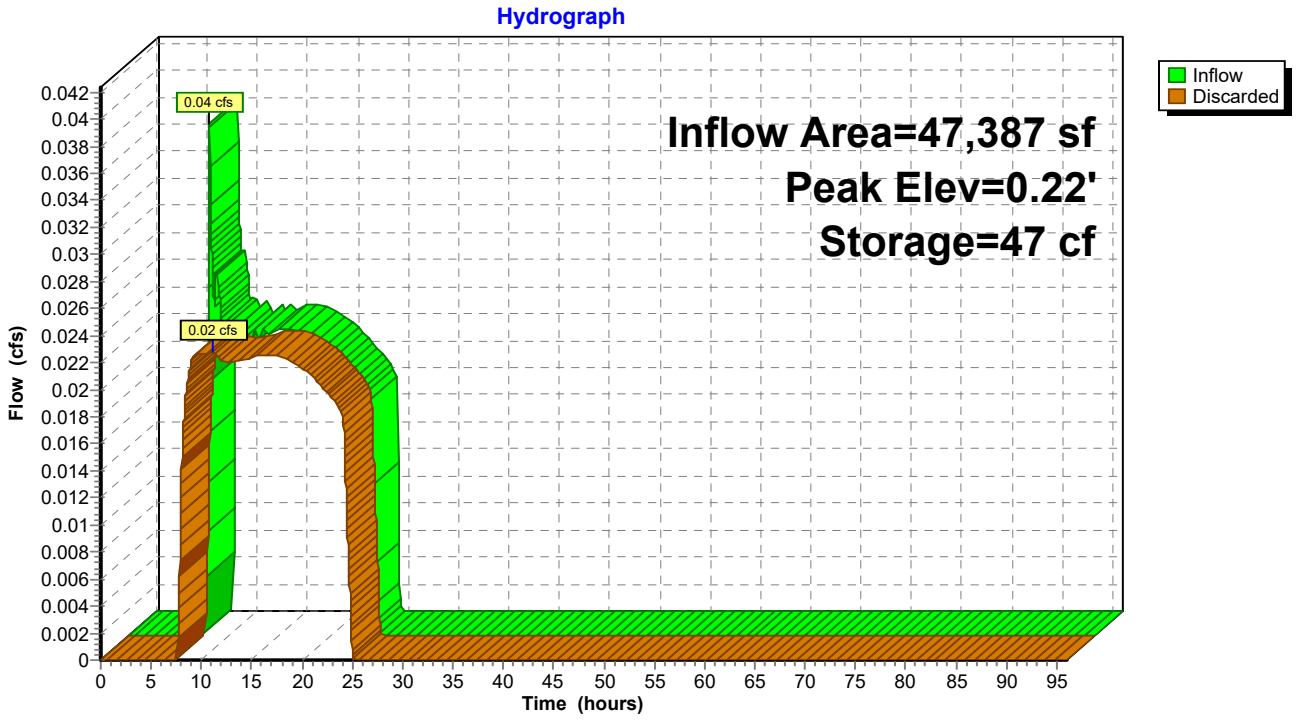
Plug-Flow detention time= 32.6 min calculated for 1,287 cf (100% of inflow)
Center-of-Mass det. time= 32.6 min (964.5 - 931.9)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	4,171 cf	**250.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 11.05 hrs HW=0.22' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond 4P: Roadside Ditch



Summary for Pond 5P: Roadside Ditch

Inflow Area = 56,955 sf, 14.86% Impervious, Inflow Depth = 0.33" for IA 25-YR event
Inflow = 0.05 cfs @ 8.03 hrs, Volume= 1,548 cf
Outflow = 0.03 cfs @ 11.17 hrs, Volume= 1,548 cf, Atten= 40%, Lag= 188.2 min
Discarded = 0.03 cfs @ 11.17 hrs, Volume= 1,548 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.25' @ 11.17 hrs Surf.Area= 521 sf Storage= 65 cf

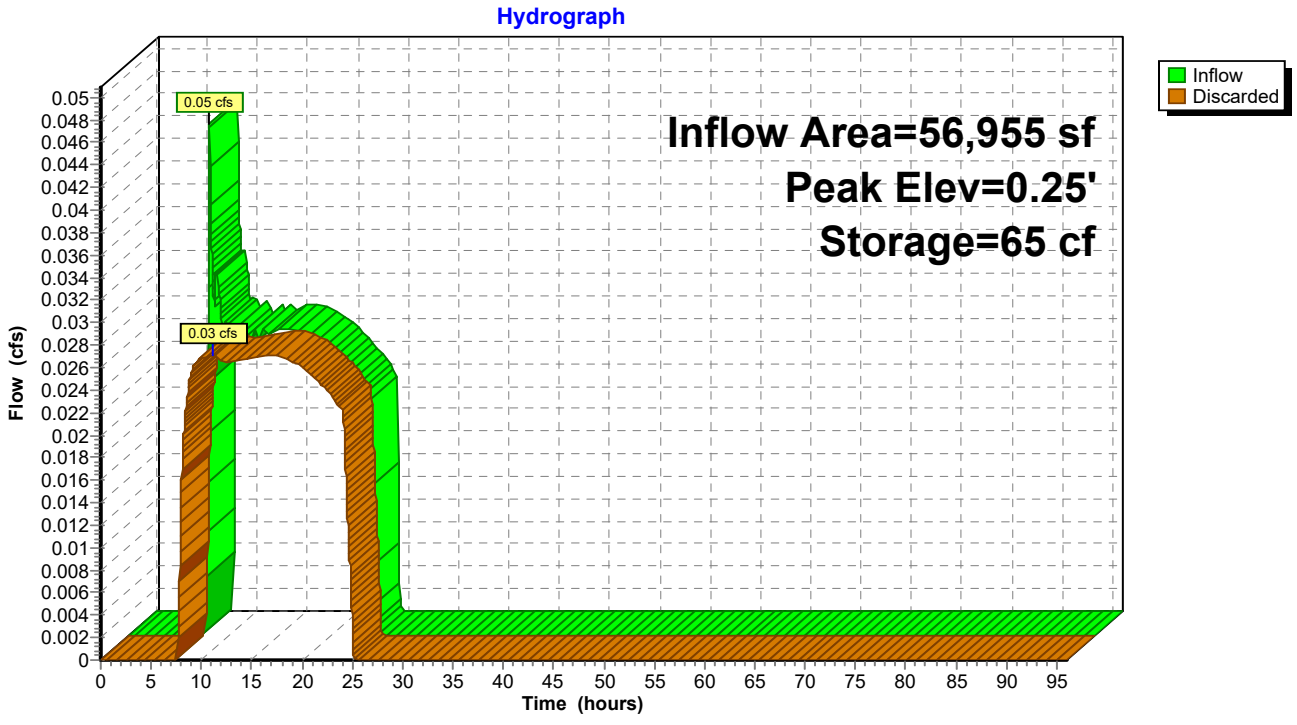
Plug-Flow detention time= 37.4 min calculated for 1,547 cf (100% of inflow)
Center-of-Mass det. time= 37.4 min (969.3 - 931.9)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	4,331 cf	**260.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.17 hrs HW=0.25' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Pond 5P: Roadside Ditch



Summary for Pond 6P: Roadside Ditch

Inflow Area = 48,103 sf, 14.57% Impervious, Inflow Depth = 0.30" for IA 25-YR event
Inflow = 0.03 cfs @ 8.04 hrs, Volume= 1,192 cf
Outflow = 0.02 cfs @ 18.10 hrs, Volume= 1,192 cf, Atten= 25%, Lag= 603.6 min
Discarded = 0.02 cfs @ 18.10 hrs, Volume= 1,192 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.49' @ 18.10 hrs Surf.Area= 404 sf Storage= 97 cf

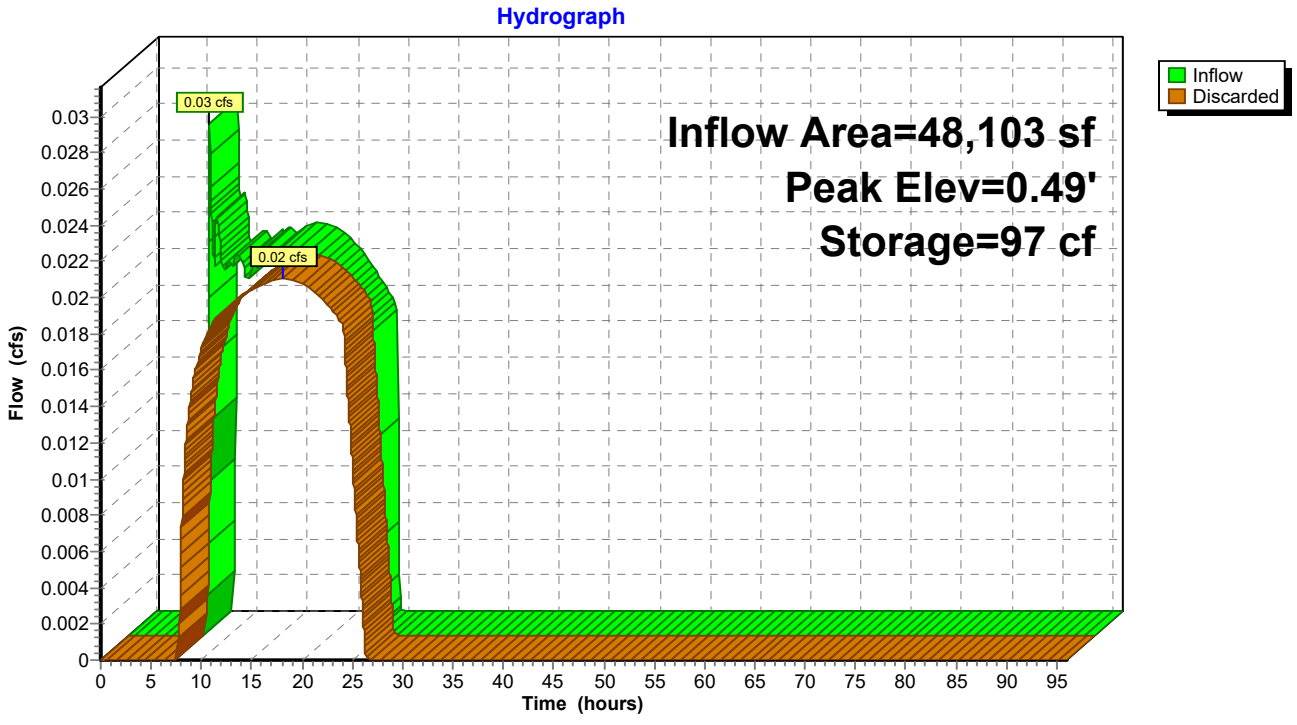
Plug-Flow detention time= 69.7 min calculated for 1,191 cf (100% of inflow)
Center-of-Mass det. time= 69.8 min (1,013.8 - 944.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,771 cf	**100.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 18.10 hrs HW=0.49' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond 6P: Roadside Ditch



Summary for Pond 7P: Roadside Ditch

Inflow Area = 74,982 sf, 5.20% Impervious, Inflow Depth = 0.24" for IA 25-YR event
Inflow = 0.03 cfs @ 16.85 hrs, Volume= 1,528 cf
Outflow = 0.03 cfs @ 21.18 hrs, Volume= 1,528 cf, Atten= 8%, Lag= 260.0 min
Discarded = 0.03 cfs @ 21.18 hrs, Volume= 1,528 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1.16' @ 21.18 hrs Surf.Area= 511 sf Storage= 279 cf

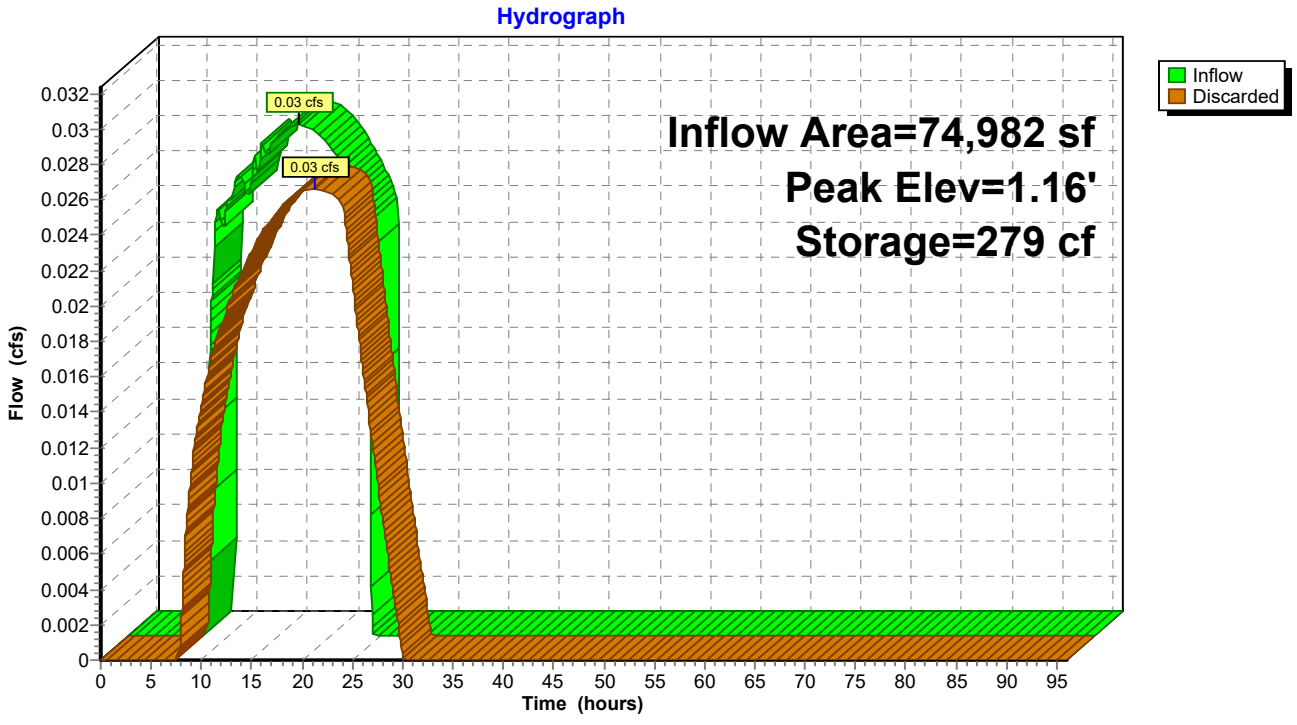
Plug-Flow detention time= 148.9 min calculated for 1,527 cf (100% of inflow)
Center-of-Mass det. time= 149.0 min (1,118.6 - 969.6)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	907 cf	**46.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 21.18 hrs HW=1.16' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Pond 7P: Roadside Ditch



Summary for Pond 8P: Roadside Ditch

Inflow Area = 85,180 sf, 6.62% Impervious, Inflow Depth = 0.27" for IA 25-YR event
Inflow = 0.04 cfs @ 16.45 hrs, Volume= 1,917 cf
Outflow = 0.03 cfs @ 18.85 hrs, Volume= 1,917 cf, Atten= 3%, Lag= 144.5 min
Discarded = 0.03 cfs @ 18.85 hrs, Volume= 1,917 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.54' @ 18.85 hrs Surf.Area= 661 sf Storage= 177 cf

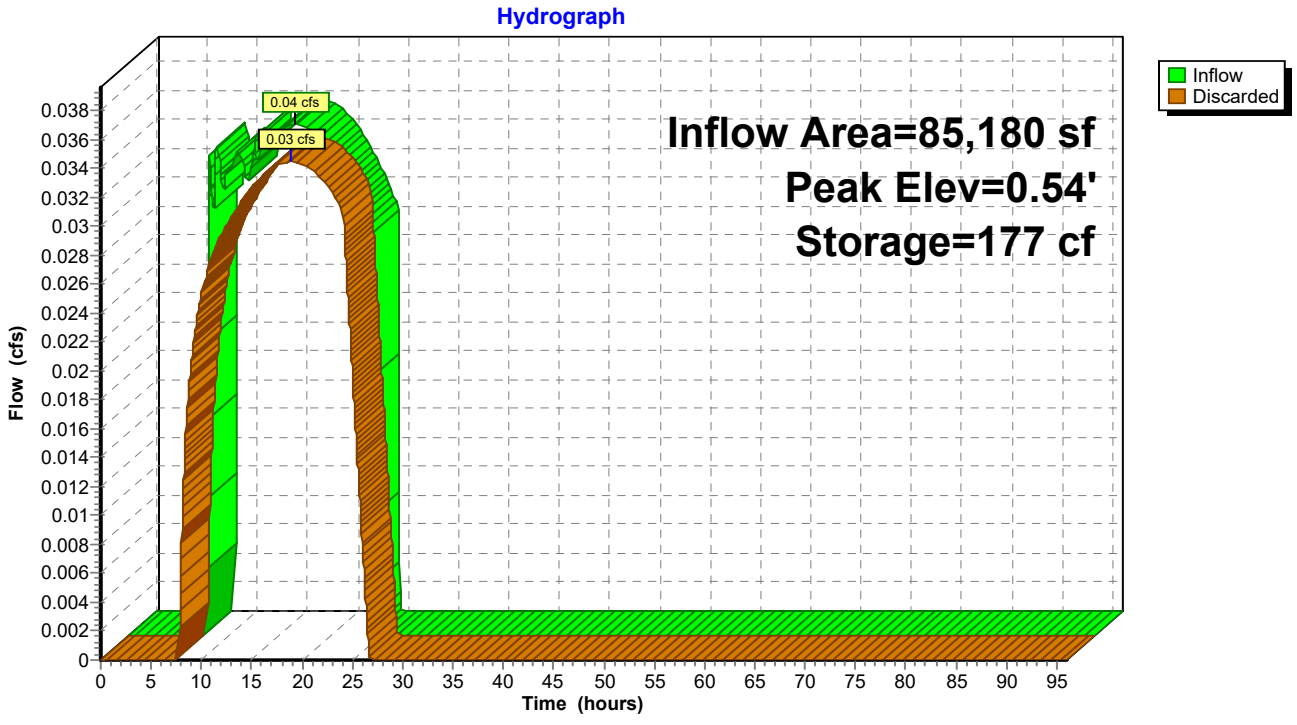
Plug-Flow detention time= 76.1 min calculated for 1,917 cf (100% of inflow)
Center-of-Mass det. time= 76.1 min (1,032.7 - 956.6)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	2,555 cf	**149.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 18.85 hrs HW=0.54' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Pond 8P: Roadside Ditch



Summary for Pond 9P: Roadside Ditch

Inflow Area = 55,034 sf, 9.56% Impervious, Inflow Depth = 0.27" for IA 25-YR event
Inflow = 0.02 cfs @ 16.45 hrs, Volume= 1,239 cf
Outflow = 0.02 cfs @ 18.13 hrs, Volume= 1,239 cf, Atten= 1%, Lag= 101.0 min
Discarded = 0.02 cfs @ 18.13 hrs, Volume= 1,239 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.36' @ 18.13 hrs Surf.Area= 433 sf Storage= 77 cf

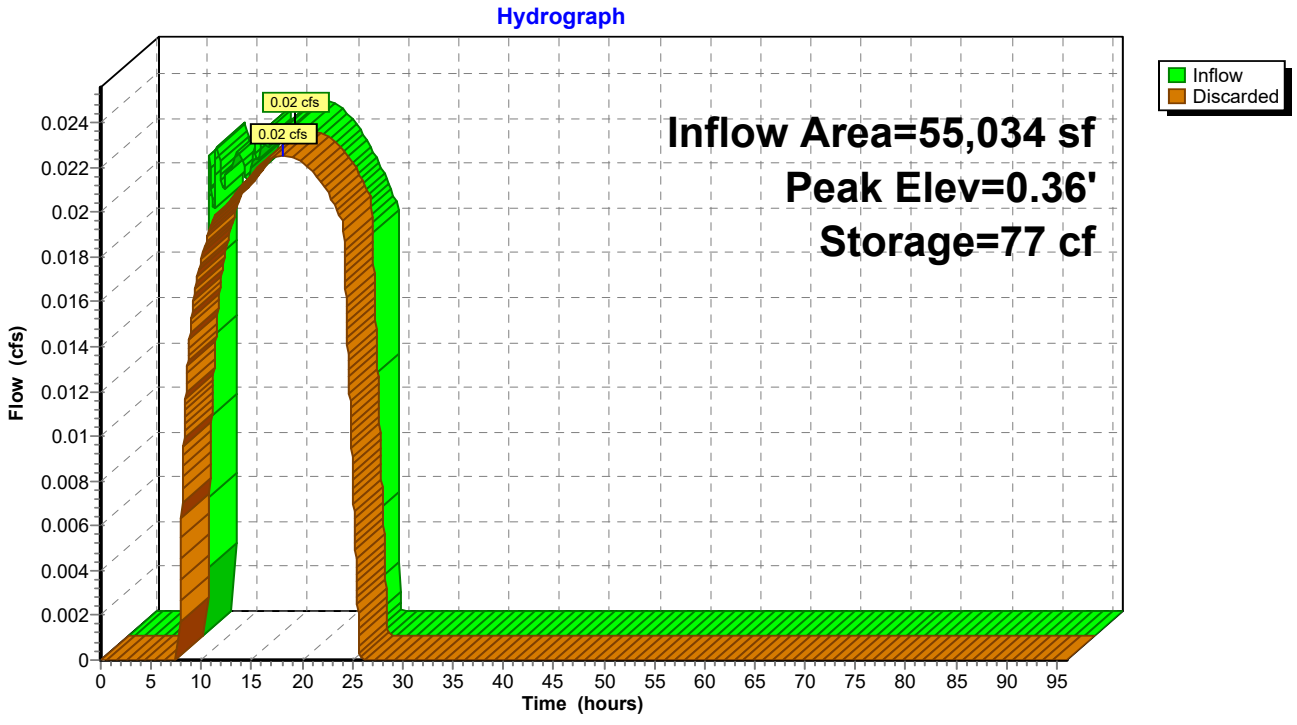
Plug-Flow detention time= 51.6 min calculated for 1,239 cf (100% of inflow)
Center-of-Mass det. time= 51.6 min (1,008.2 - 956.6)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	2,539 cf	**148.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 18.13 hrs HW=0.36' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond 9P: Roadside Ditch



Summary for Pond 10P: Roadside Ditch

Inflow Area = 61,654 sf, 10.38% Impervious, Inflow Depth = 0.27" for IA 25-YR event
Inflow = 0.03 cfs @ 16.45 hrs, Volume= 1,388 cf
Outflow = 0.03 cfs @ 18.58 hrs, Volume= 1,388 cf, Atten= 2%, Lag= 128.1 min
Discarded = 0.03 cfs @ 18.58 hrs, Volume= 1,388 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.47' @ 18.58 hrs Surf.Area= 481 sf Storage= 112 cf

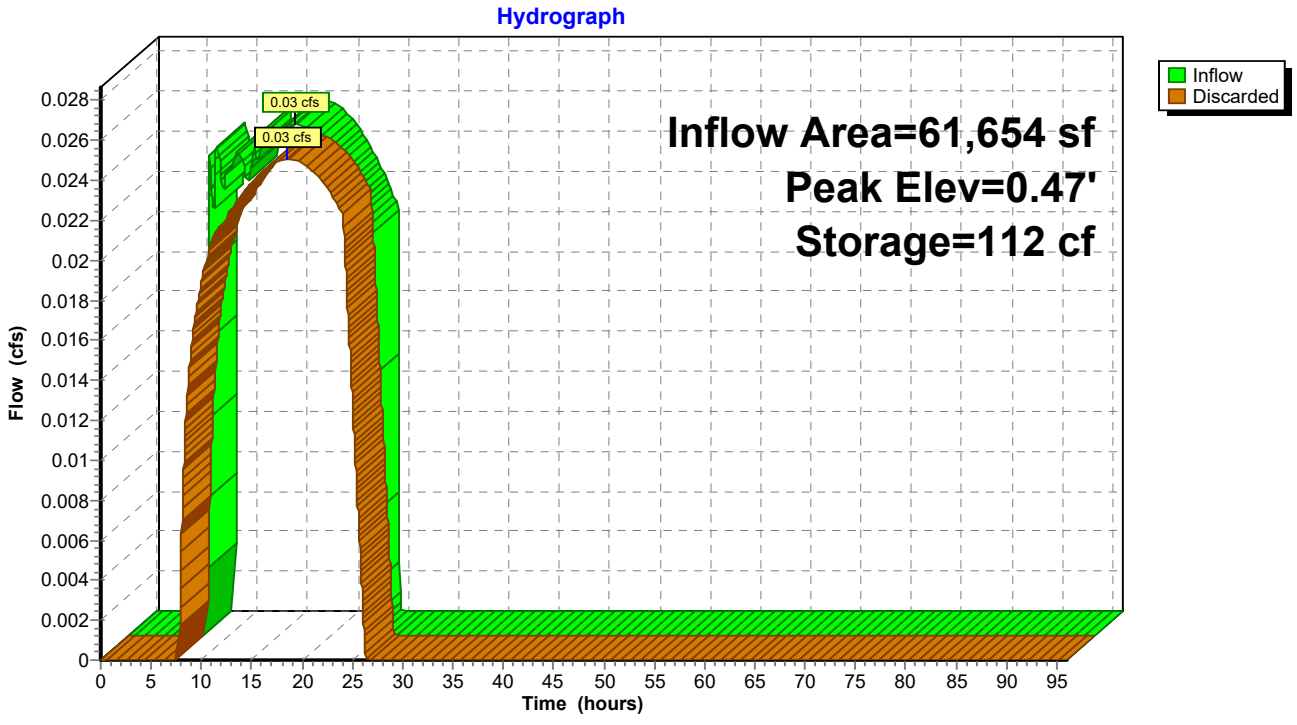
Plug-Flow detention time= 66.9 min calculated for 1,387 cf (100% of inflow)
Center-of-Mass det. time= 66.9 min (1,023.5 - 956.6)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	2,155 cf	**124.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 18.58 hrs HW=0.47' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Pond 10P: Roadside Ditch



Summary for Pond 11P: Roadside Ditch

Inflow Area = 101,447 sf, 7.97% Impervious, Inflow Depth = 0.27" for IA 25-YR event
Inflow = 0.04 cfs @ 16.45 hrs, Volume= 2,283 cf
Outflow = 0.04 cfs @ 21.40 hrs, Volume= 2,283 cf, Atten= 10%, Lag= 297.3 min
Discarded = 0.04 cfs @ 21.40 hrs, Volume= 2,283 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1.40' @ 21.40 hrs Surf.Area= 729 sf Storage= 480 cf

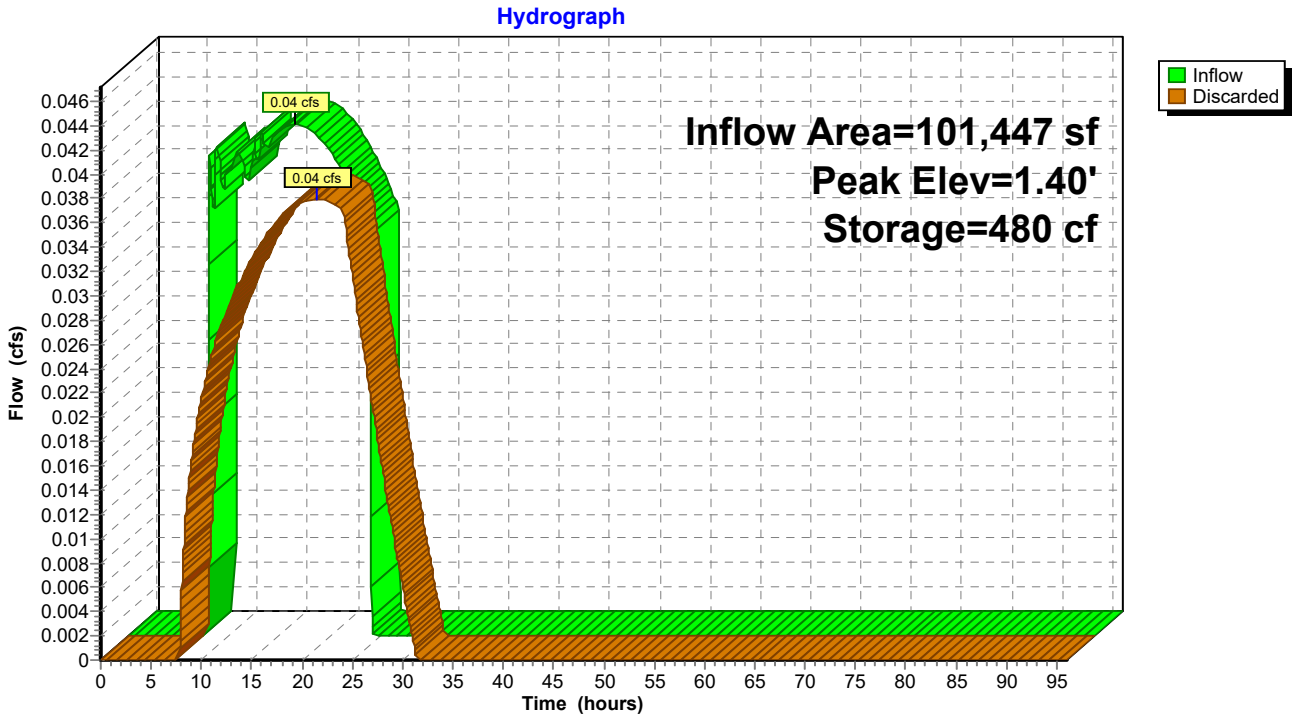
Plug-Flow detention time= 178.9 min calculated for 2,283 cf (100% of inflow)
Center-of-Mass det. time= 179.0 min (1,135.5 - 956.6)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,035 cf	**54.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 21.40 hrs HW=1.40' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond 11P: Roadside Ditch



Summary for Pond 12P: Roadside Ditch

Inflow Area = 111,265 sf, 10.13% Impervious, Inflow Depth = 0.27" for IA 25-YR event
Inflow = 0.05 cfs @ 16.45 hrs, Volume= 2,504 cf
Outflow = 0.05 cfs @ 17.71 hrs, Volume= 2,504 cf, Atten= 1%, Lag= 75.8 min
Discarded = 0.05 cfs @ 17.71 hrs, Volume= 2,504 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.25' @ 17.71 hrs Surf.Area= 880 sf Storage= 111 cf

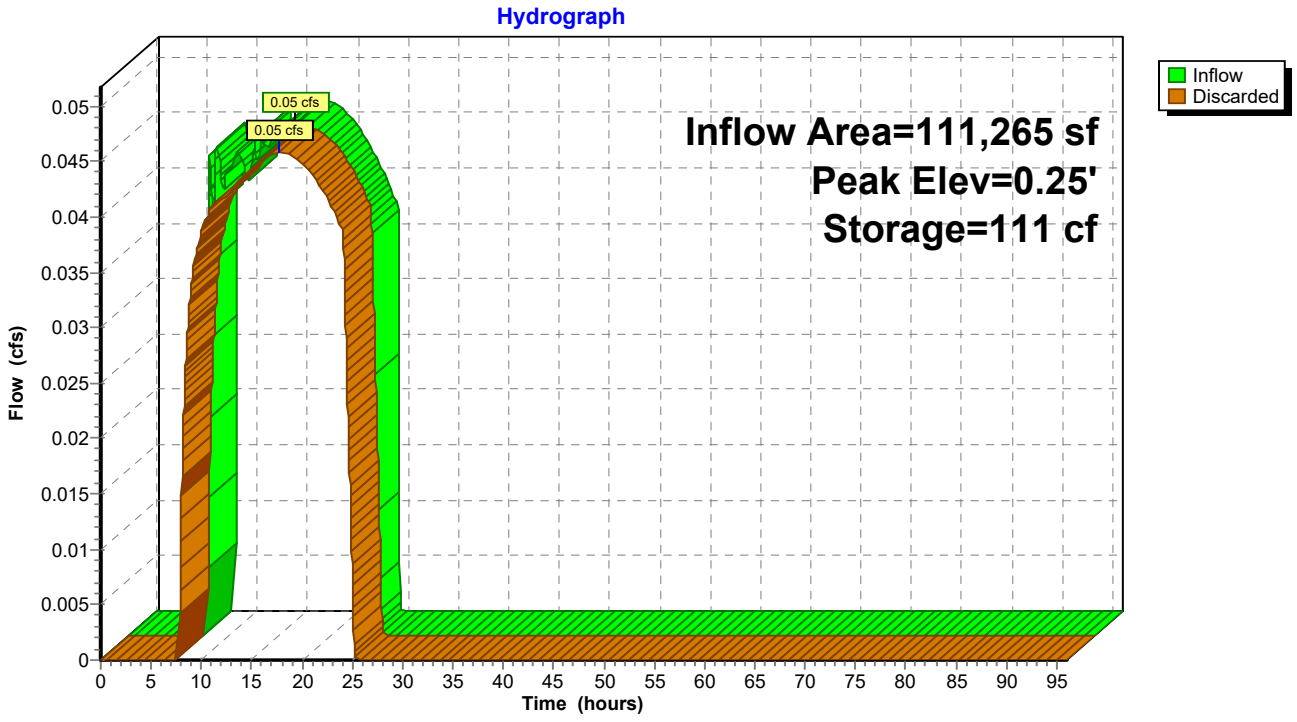
Plug-Flow detention time= 37.0 min calculated for 2,504 cf (100% of inflow)
Center-of-Mass det. time= 37.0 min (993.6 - 956.6)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	7,083 cf	**432.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 17.71 hrs HW=0.25' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.05 cfs)

Pond 12P: Roadside Ditch



Summary for Pond 13P: Roadside Ditch

Inflow Area = 6,481 sf,100.00% Impervious, Inflow Depth = 1.48" for IA 25-YR event
Inflow = 0.06 cfs @ 7.87 hrs, Volume= 798 cf
Outflow = 0.03 cfs @ 8.29 hrs, Volume= 798 cf, Atten= 52%, Lag= 25.4 min
Discarded = 0.03 cfs @ 8.29 hrs, Volume= 798 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.36' @ 8.29 hrs Surf.Area= 524 sf Storage= 93 cf

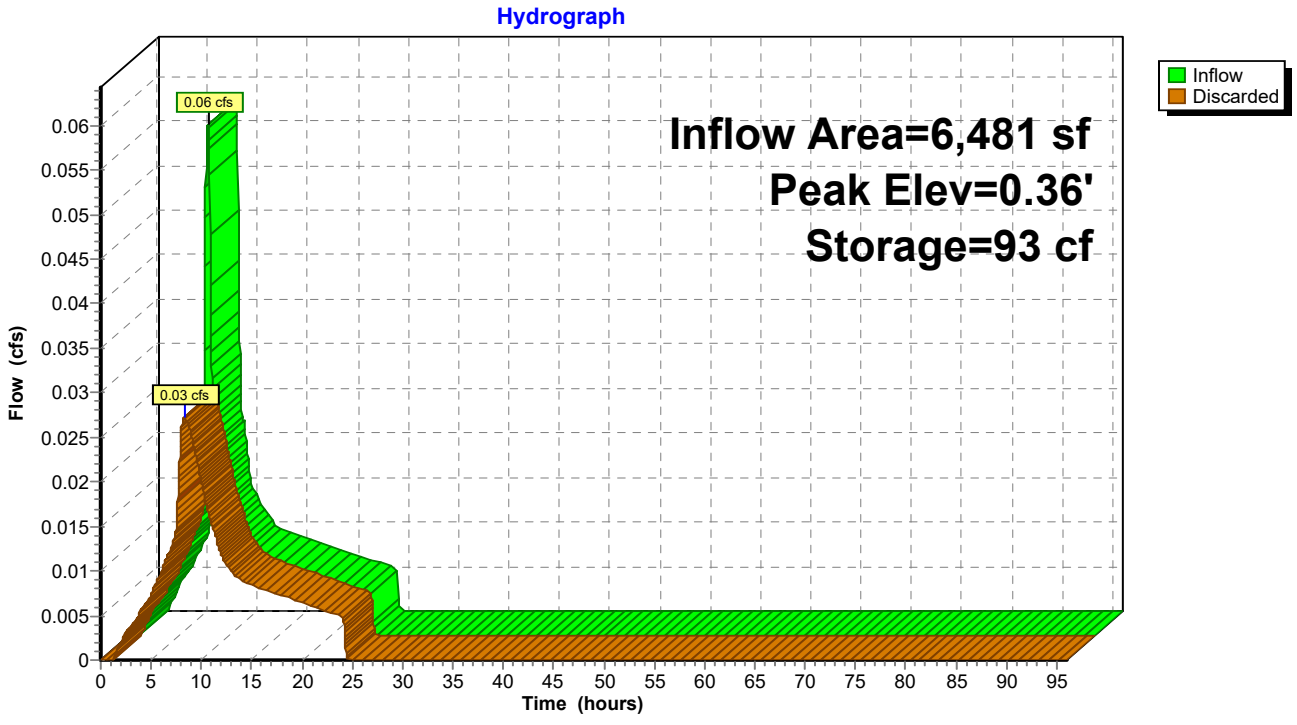
Plug-Flow detention time= 28.3 min calculated for 798 cf (100% of inflow)
Center-of-Mass det. time= 28.3 min (714.5 - 686.2)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	3,051 cf	**180.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 8.29 hrs HW=0.36' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Pond 13P: Roadside Ditch



Summary for Pond 14P: Roadside Ditch

Inflow Area = 6,573 sf,100.00% Impervious, Inflow Depth = 1.48" for IA 25-YR event
Inflow = 0.06 cfs @ 7.87 hrs, Volume= 809 cf
Outflow = 0.03 cfs @ 8.29 hrs, Volume= 809 cf, Atten= 53%, Lag= 25.6 min
Discarded = 0.03 cfs @ 8.29 hrs, Volume= 809 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.36' @ 8.29 hrs Surf.Area= 529 sf Storage= 95 cf

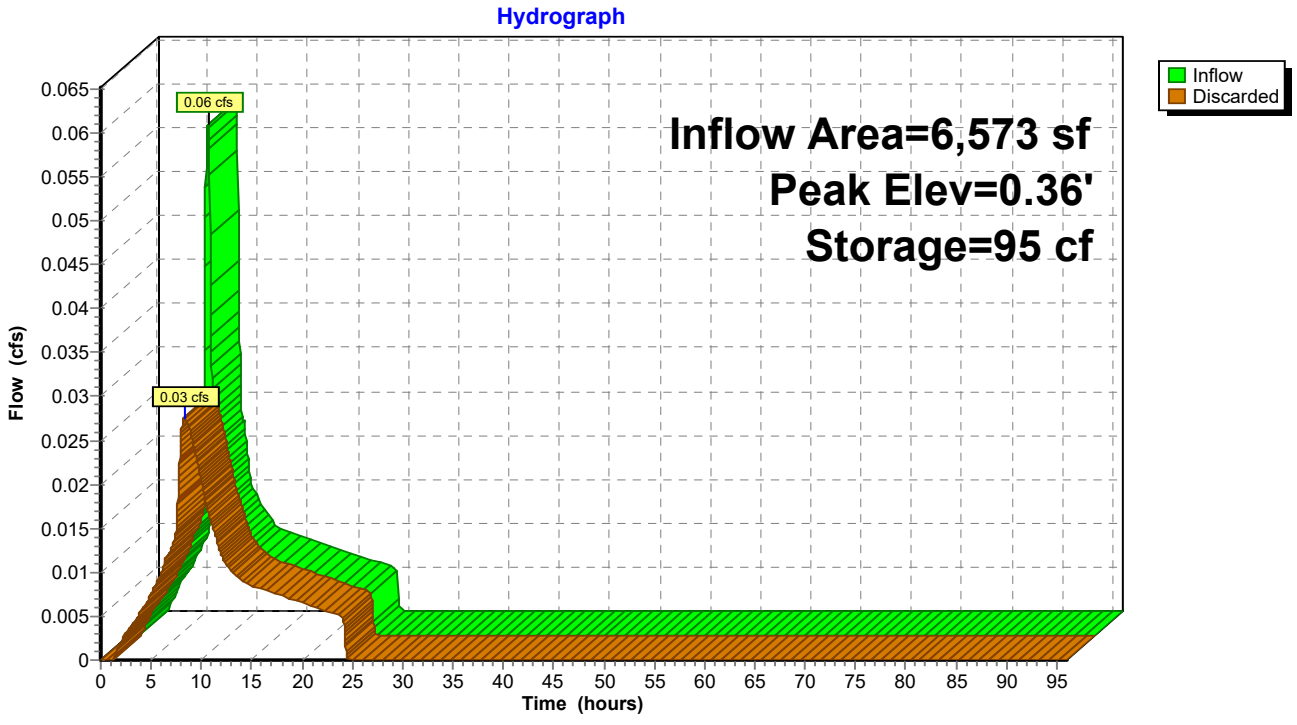
Plug-Flow detention time= 28.7 min calculated for 809 cf (100% of inflow)
Center-of-Mass det. time= 28.7 min (714.9 - 686.2)

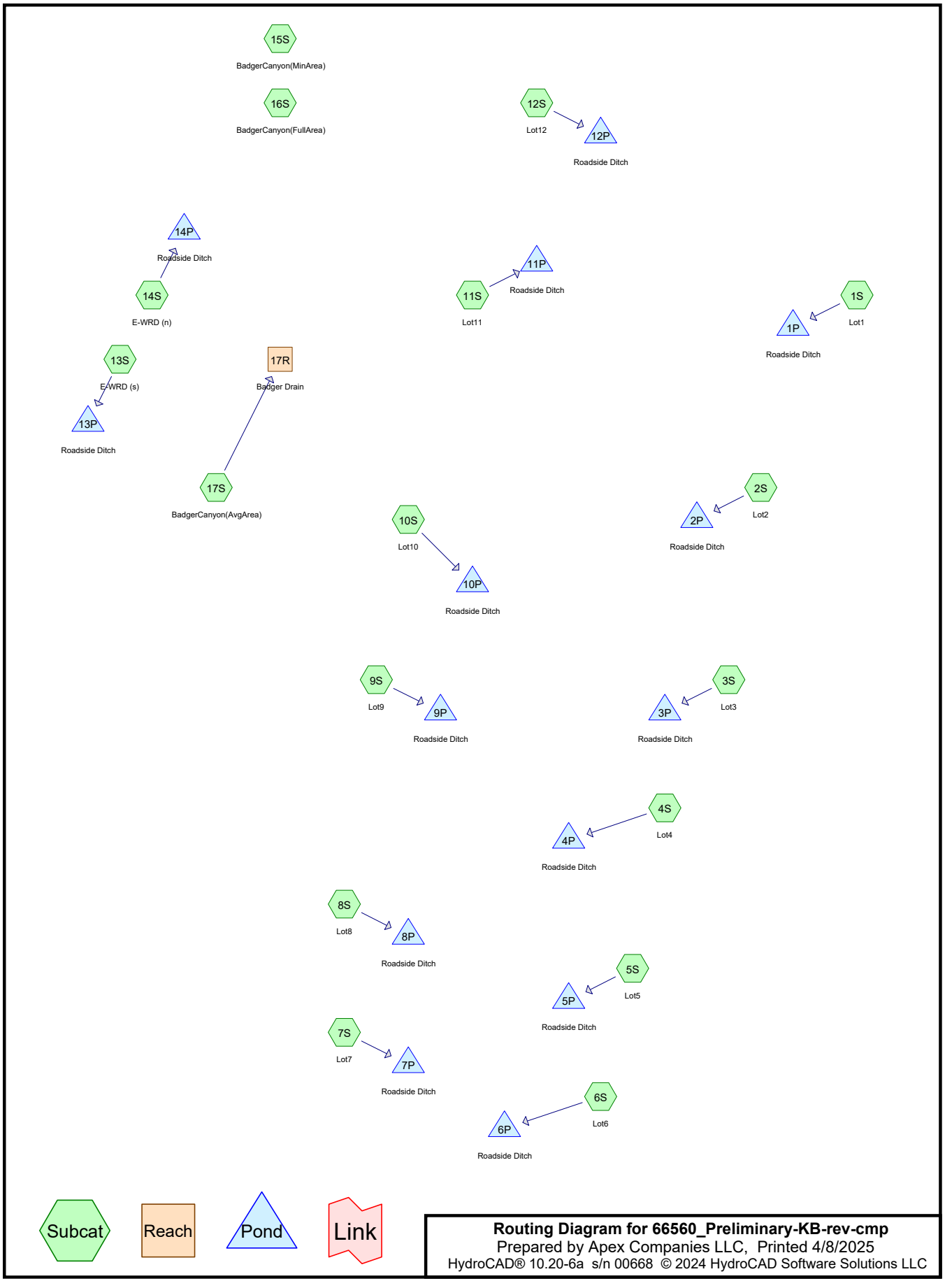
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	3,051 cf	**180.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 8.29 hrs HW=0.36' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Pond 14P: Roadside Ditch





Routing Diagram for 66560_Preliminary-KB-rev-cmp
Prepared by Apex Companies LLC, Printed 4/8/2025

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
936,844,920	79	50-75% Grass cover, Fair, HSG C (15S, 16S, 17S)
705,005	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S)
39,000	98	Pervious (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S)
42,117	98	Road (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S)
6,481	98	Road S (13S)
6,573	98	Road n (14S)
937,644,096	**79**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
937,549,925	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 15S, 16S, 17S
0	HSG D	
94,171	Other	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S
937,644,096		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
0	0	936,844,920	0	0	936,844,920	50-75% Grass cover, Fair	
0	0	705,005	0	0	705,005	>75% Grass cover, Good	
0	0	0	0	39,000	39,000	Pervious	
0	0	0	0	42,117	42,117	Road	
0	0	0	0	6,481	6,481	Road S	
0	0	0	0	6,573	6,573	Road n	
0	**0**	**937,549,925**	**0**	**94,171**	**937,644,096**	**TOTAL AREA**	

Time span=0.00-96.00 hrs, dt=0.03 hrs, 3201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Lot1 Runoff Area=47,349 sf 10.95% Impervious Runoff Depth=0.45"
Tc=5.0 min CN=77 Runoff=0.07 cfs 1,768 cf

Subcatchment2S: Lot2 Runoff Area=48,792 sf 12.58% Impervious Runoff Depth=0.45"
Tc=5.0 min CN=77 Runoff=0.07 cfs 1,822 cf

Subcatchment3S: Lot3 Runoff Area=47,974 sf 14.14% Impervious Runoff Depth=0.45"
Tc=5.0 min CN=77 Runoff=0.07 cfs 1,792 cf

Subcatchment4S: Lot4 Runoff Area=47,387 sf 14.72% Impervious Runoff Depth=0.48"
Tc=5.0 min CN=78 Runoff=0.08 cfs 1,913 cf

Subcatchment5S: Lot5 Runoff Area=56,955 sf 14.86% Impervious Runoff Depth=0.48"
Tc=5.0 min CN=78 Runoff=0.10 cfs 2,299 cf

Subcatchment6S: Lot6 Runoff Area=48,103 sf 14.57% Impervious Runoff Depth=0.45"
Tc=5.0 min CN=77 Runoff=0.07 cfs 1,797 cf

Subcatchment7S: Lot7 Runoff Area=74,982 sf 5.20% Impervious Runoff Depth=0.38"
Tc=5.0 min CN=75 Runoff=0.07 cfs 2,380 cf

Subcatchment8S: Lot8 Runoff Area=85,180 sf 6.62% Impervious Runoff Depth=0.41"
Tc=5.0 min CN=76 Runoff=0.10 cfs 2,937 cf

Subcatchment9S: Lot9 Runoff Area=55,034 sf 9.56% Impervious Runoff Depth=0.41"
Tc=5.0 min CN=76 Runoff=0.06 cfs 1,897 cf

Subcatchment10S: Lot10 Runoff Area=61,654 sf 10.38% Impervious Runoff Depth=0.41"
Tc=5.0 min CN=76 Runoff=0.07 cfs 2,126 cf

Subcatchment11S: Lot11 Runoff Area=101,447 sf 7.97% Impervious Runoff Depth=0.41"
Tc=5.0 min CN=76 Runoff=0.12 cfs 3,497 cf

Subcatchment12S: Lot12 Runoff Area=111,265 sf 10.13% Impervious Runoff Depth=0.41"
Tc=5.0 min CN=76 Runoff=0.13 cfs 3,836 cf

Subcatchment13S: E-WRD (s) Runoff Area=6,481 sf 100.00% Impervious Runoff Depth=1.77"
Tc=5.0 min CN=98 Runoff=0.07 cfs 958 cf

Subcatchment14S: E-WRD (n) Runoff Area=6,573 sf 100.00% Impervious Runoff Depth=1.77"
Tc=5.0 min CN=98 Runoff=0.07 cfs 972 cf

Subcatchment15S: Runoff Area=270.000 ac 0.00% Impervious Runoff Depth=0.52"
Tc=203.0 min CN=79 Runoff=9.50 cfs 512,085 cf

Subcatchment16S: Runoff Area=14,067.000 ac 0.00% Impervious Runoff Depth=0.52"
Tc=203.0 min CN=79 Runoff=494.75 cfs 26,679,605 cf

Subcatchment17S: Runoff Area=7,170.000 ac 0.00% Impervious Runoff Depth=0.52"
Tc=203.0 min CN=79 Runoff=252.17 cfs 13,598,690 cf

Reach 17R: Badger Drain Avg. Flow Depth=4.00' Max Vel=8.03 fps Inflow=252.17 cfs 13,598,690 cf
48.0" Round Pipe x 2.00 n=0.020 L=88.0' S=0.0090 '/' Capacity=176.93 cfs Outflow=190.29 cfs 13,598,690 cf

Pond 1P: Roadside Ditch Peak Elev=0.65' Storage=181 cf Inflow=0.07 cfs 1,768 cf
Outflow=0.03 cfs 1,768 cf

Pond 2P: Roadside Ditch Peak Elev=0.39' Storage=121 cf Inflow=0.07 cfs 1,822 cf
Outflow=0.03 cfs 1,822 cf

Pond 3P: Roadside Ditch Peak Elev=0.32' Storage=101 cf Inflow=0.07 cfs 1,792 cf
Outflow=0.03 cfs 1,792 cf

Pond 4P: Roadside Ditch Peak Elev=0.35' Storage=120 cf Inflow=0.08 cfs 1,913 cf
Outflow=0.04 cfs 1,913 cf

Pond 5P: Roadside Ditch Peak Elev=0.39' Storage=158 cf Inflow=0.10 cfs 2,299 cf
Outflow=0.04 cfs 2,299 cf

Pond 6P: Roadside Ditch Peak Elev=0.68' Storage=194 cf Inflow=0.07 cfs 1,797 cf
Outflow=0.03 cfs 1,797 cf

Pond 7P: Roadside Ditch Peak Elev=1.55' Storage=522 cf Inflow=0.07 cfs 2,380 cf
Outflow=0.04 cfs 2,380 cf

Pond 8P: Roadside Ditch Peak Elev=0.76' Storage=355 cf Inflow=0.10 cfs 2,937 cf
Outflow=0.05 cfs 2,937 cf

Pond 9P: Roadside Ditch Peak Elev=0.51' Storage=158 cf Inflow=0.06 cfs 1,897 cf
Outflow=0.03 cfs 1,897 cf

Pond 10P: Roadside Ditch Peak Elev=0.67' Storage=227 cf Inflow=0.07 cfs 2,126 cf
Outflow=0.04 cfs 2,126 cf

Pond 11P: Roadside Ditch Peak Elev=1.85' Storage=875 cf Inflow=0.12 cfs 3,497 cf
Outflow=0.05 cfs 3,497 cf

Pond 12P: Roadside Ditch Peak Elev=0.37' Storage=235 cf Inflow=0.13 cfs 3,836 cf
Outflow=0.07 cfs 3,836 cf

Pond 13P: Roadside Ditch Peak Elev=0.41' Storage=120 cf Inflow=0.07 cfs 958 cf
Outflow=0.03 cfs 958 cf

Pond 14P: Roadside Ditch Peak Elev=0.41' Storage=122 cf Inflow=0.07 cfs 972 cf
Outflow=0.03 cfs 972 cf

Total Runoff Area = 937,644,096 sf Runoff Volume = 40,820,374 cf Average Runoff Depth = 0.52"
99.99% Pervious = 937,549,925 sf 0.01% Impervious = 94,171 sf

Summary for Subcatchment 1S: Lot1

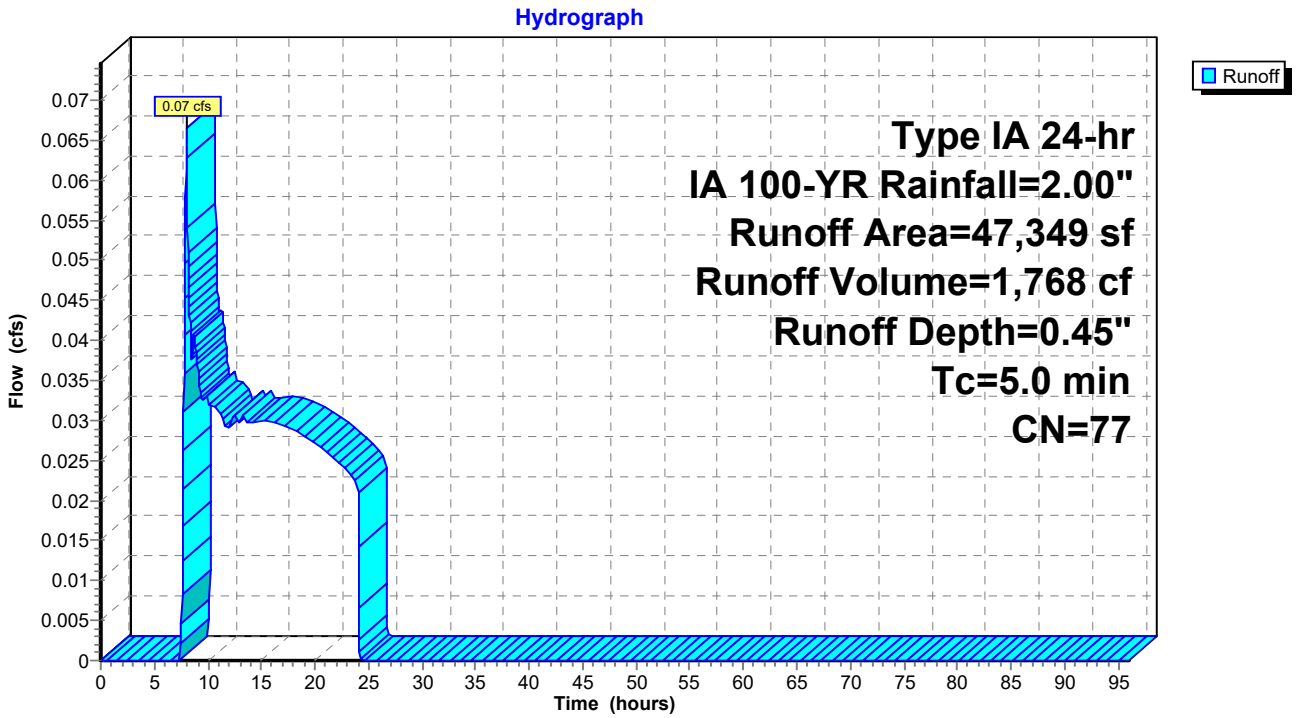
Runoff = 0.07 cfs @ 8.02 hrs, Volume= 1,768 cf, Depth= 0.45"
Routed to Pond 1P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 100-YR Rainfall=2.00"

	Area (sf)	CN	Description
	42,164	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	2,185	98	Road
	47,349	77	Weighted Average
	42,164	74	89.05% Pervious Area
	5,185	98	10.95% Impervious Area

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

Subcatchment 1S: Lot1



Summary for Subcatchment 2S: Lot2

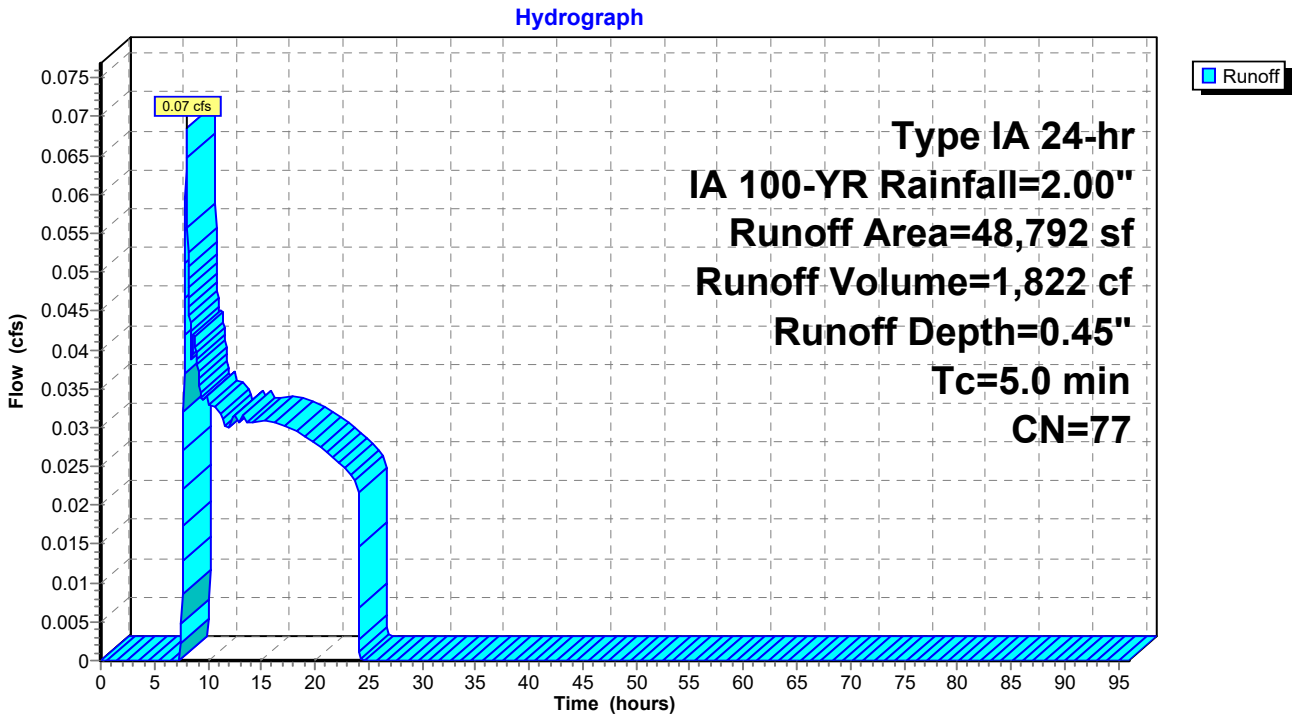
Runoff = 0.07 cfs @ 8.02 hrs, Volume= 1,822 cf, Depth= 0.45"
Routed to Pond 2P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 100-YR Rainfall=2.00"

	Area (sf)	CN	Description
	42,655	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	3,137	98	Road
	48,792	77	Weighted Average
	42,655	74	87.42% Pervious Area
	6,137	98	12.58% Impervious Area

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

Subcatchment 2S: Lot2



Summary for Subcatchment 3S: Lot3

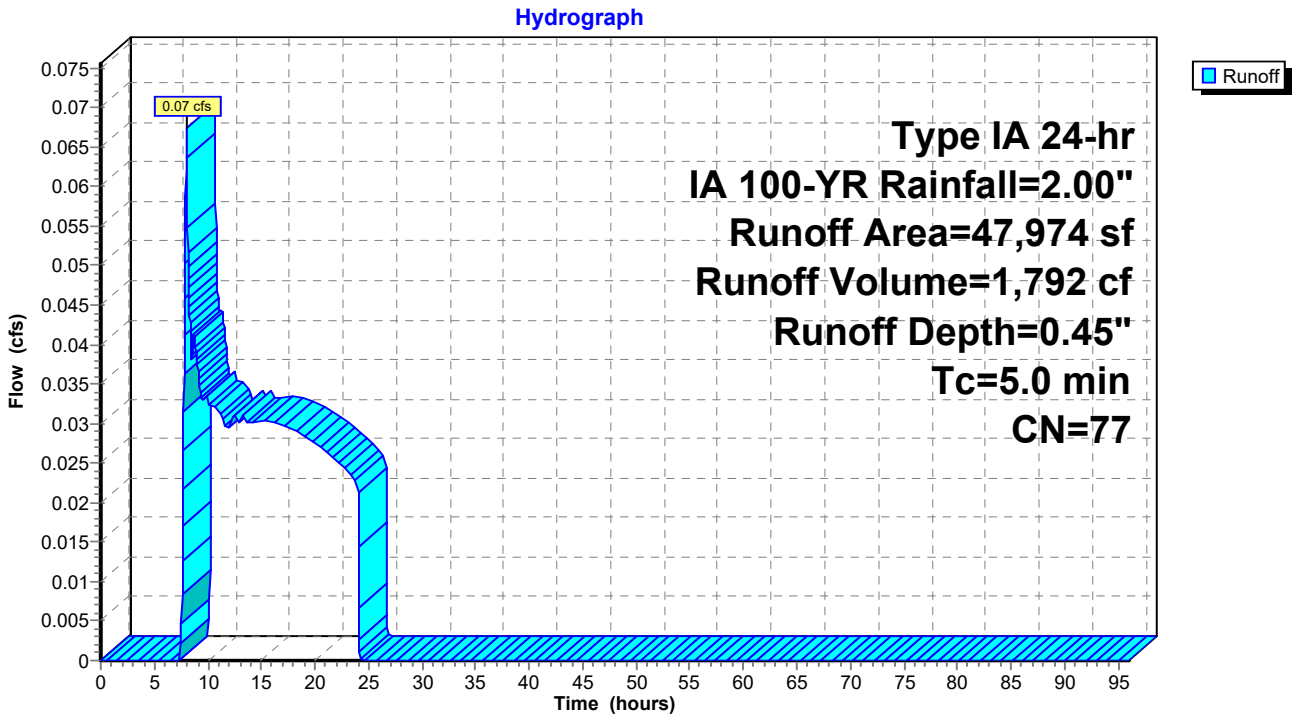
Runoff = 0.07 cfs @ 8.02 hrs, Volume= 1,792 cf, Depth= 0.45"
Routed to Pond 3P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 100-YR Rainfall=2.00"

	Area (sf)	CN	Description
	41,192	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	3,782	98	Road
	47,974	77	Weighted Average
	41,192	74	85.86% Pervious Area
	6,782	98	14.14% Impervious Area

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

Subcatchment 3S: Lot3



Summary for Subcatchment 4S: Lot4

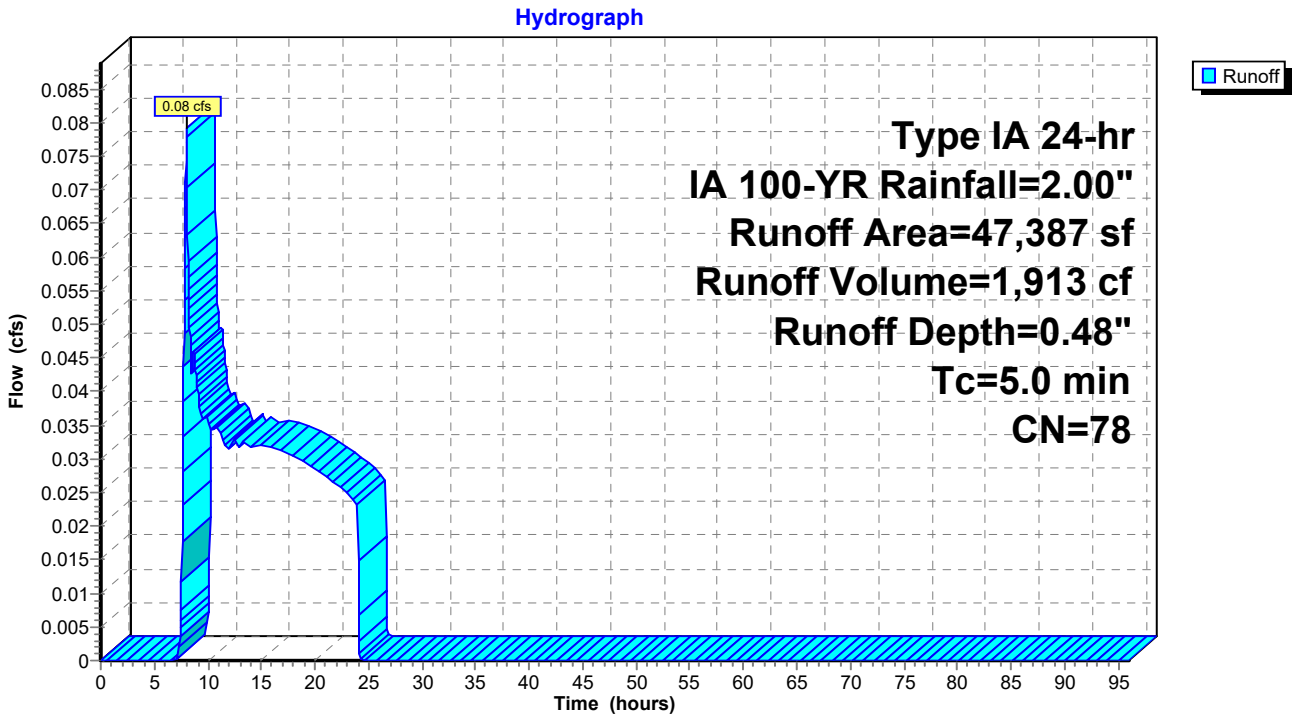
Runoff = 0.08 cfs @ 8.01 hrs, Volume= 1,913 cf, Depth= 0.48"
Routed to Pond 4P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 100-YR Rainfall=2.00"

	Area (sf)	CN	Description
	40,411	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	3,976	98	Road
	47,387	78	Weighted Average
	40,411	74	85.28% Pervious Area
	6,976	98	14.72% Impervious Area

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

Subcatchment 4S: Lot4



Summary for Subcatchment 5S: Lot5

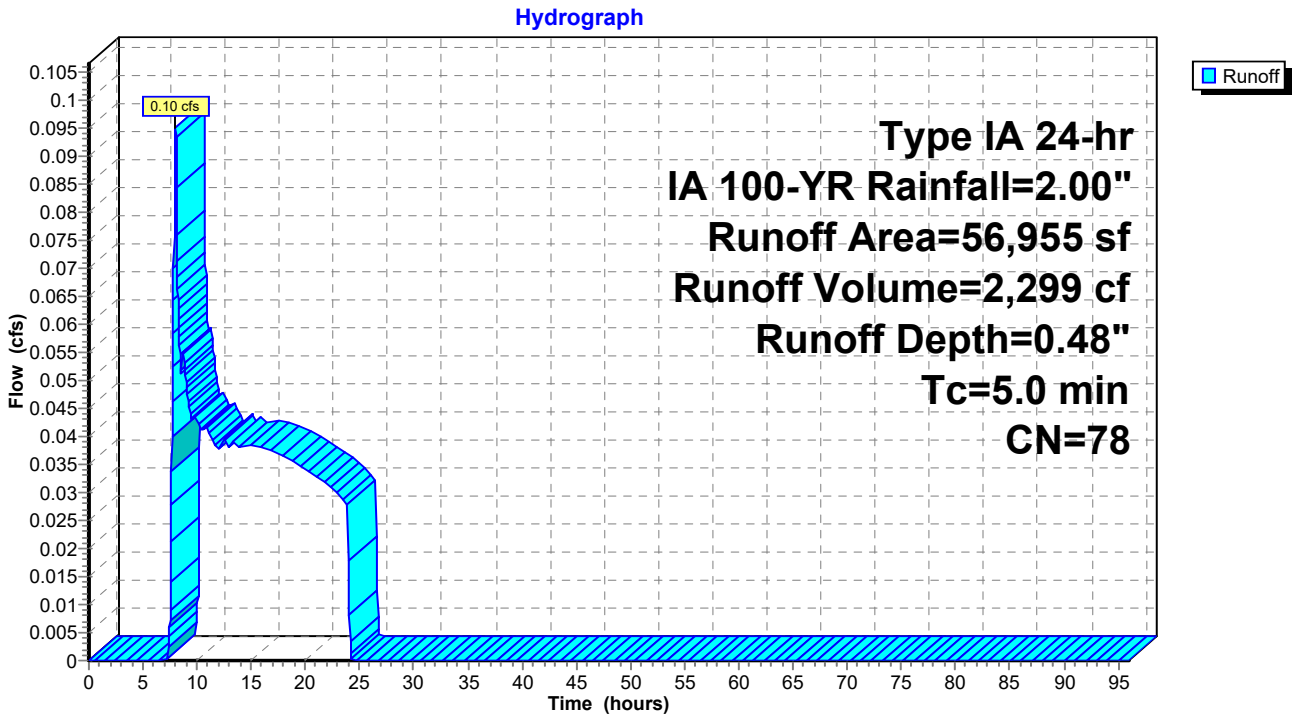
Runoff = 0.10 cfs @ 8.01 hrs, Volume= 2,299 cf, Depth= 0.48"
Routed to Pond 5P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 100-YR Rainfall=2.00"

	Area (sf)	CN	Description
	48,494	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	5,461	98	Road
	56,955	78	Weighted Average
	48,494	74	85.14% Pervious Area
	8,461	98	14.86% Impervious Area

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

Subcatchment 5S: Lot5



Summary for Subcatchment 6S: Lot6

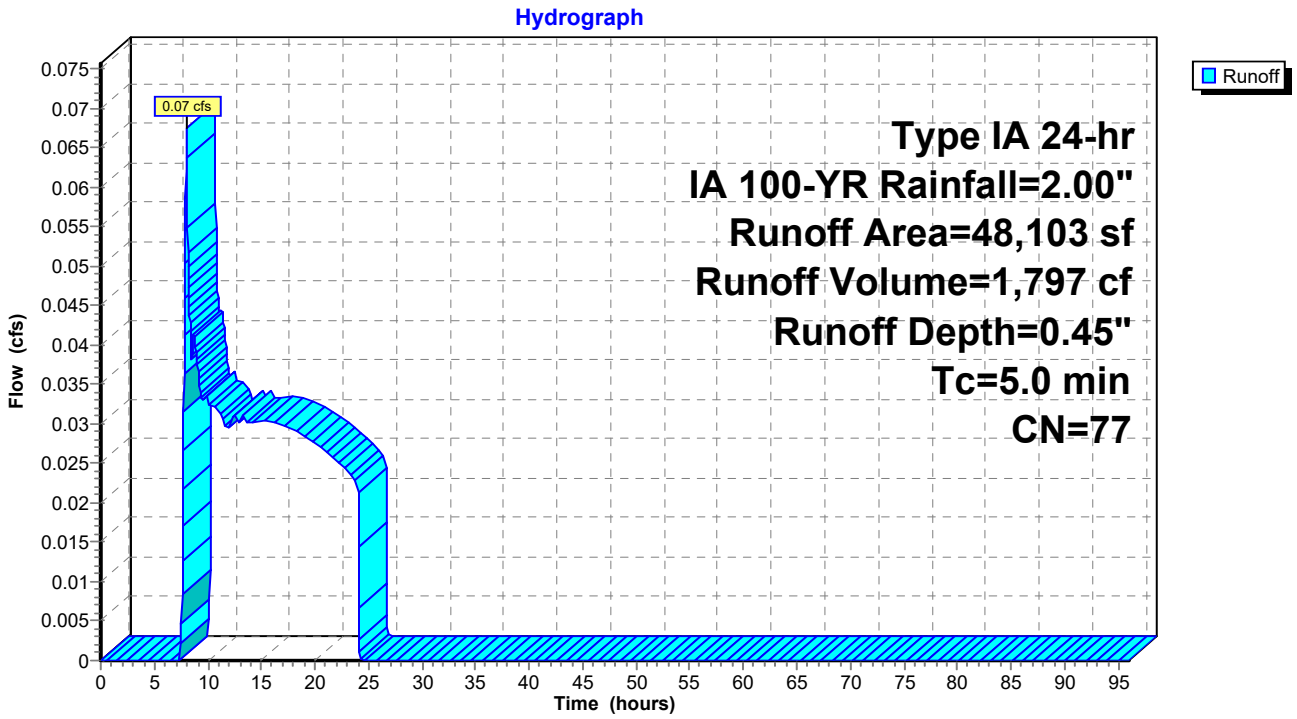
Runoff = 0.07 cfs @ 8.02 hrs, Volume= 1,797 cf, Depth= 0.45"
Routed to Pond 6P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 100-YR Rainfall=2.00"

	Area (sf)	CN	Description
	41,092	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	4,011	98	Road
	48,103	77	Weighted Average
	41,092	74	85.43% Pervious Area
	7,011	98	14.57% Impervious Area

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

Subcatchment 6S: Lot6



Summary for Subcatchment 7S: Lot7

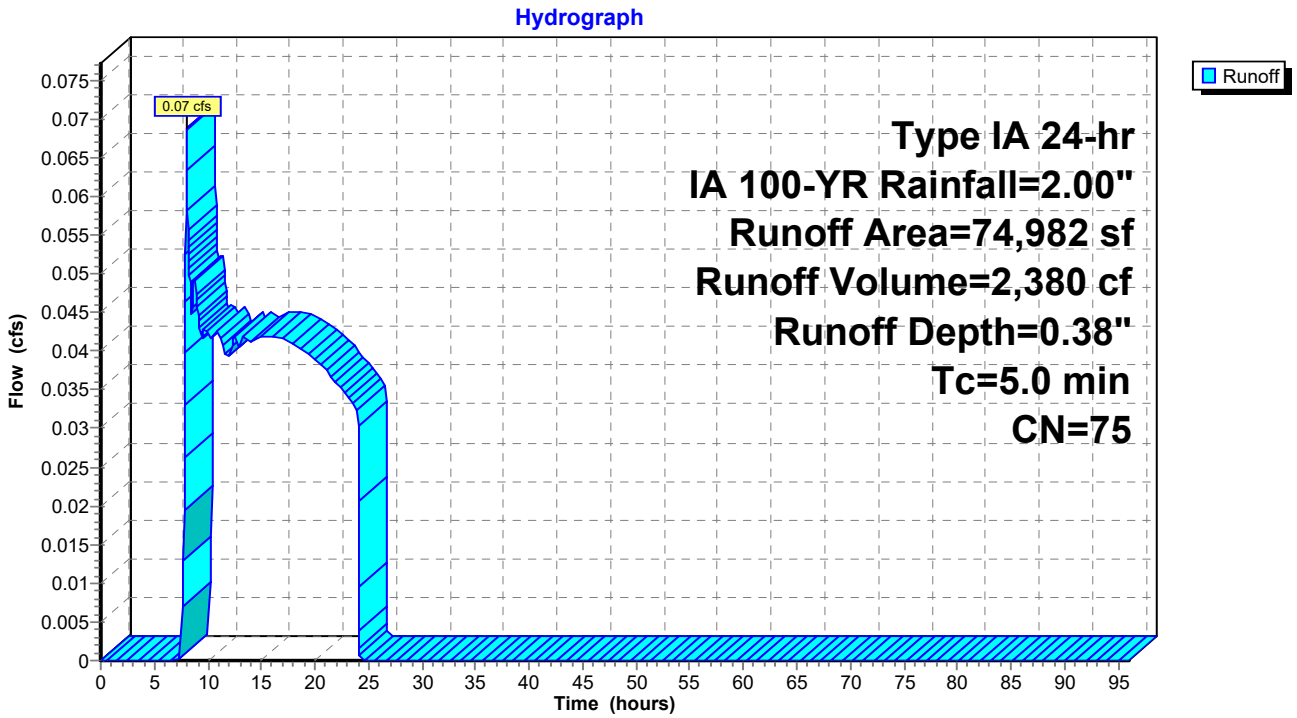
Runoff = 0.07 cfs @ 8.03 hrs, Volume= 2,380 cf, Depth= 0.38"
Routed to Pond 7P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 100-YR Rainfall=2.00"

	Area (sf)	CN	Description
	71,082	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	900	98	Road
	74,982	75	Weighted Average
	71,082	74	94.80% Pervious Area
	3,900	98	5.20% Impervious Area

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

Subcatchment 7S: Lot7



Summary for Subcatchment 8S: Lot8

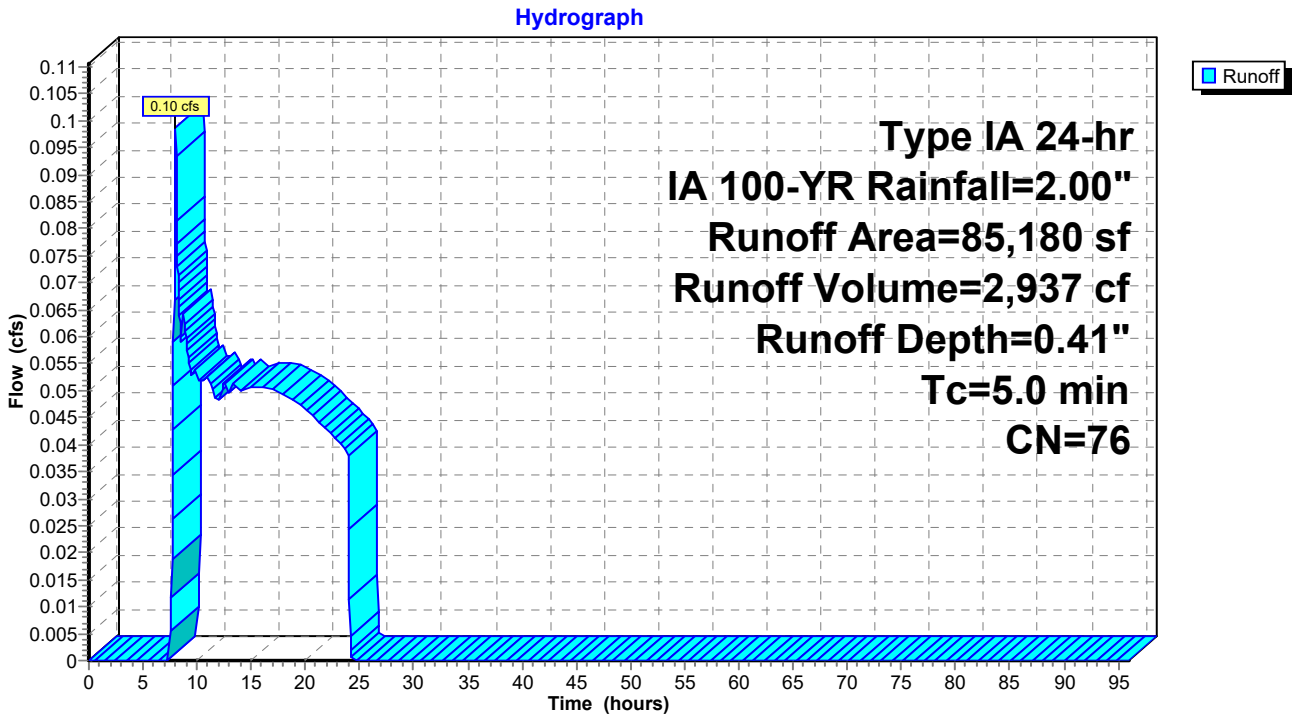
Runoff = 0.10 cfs @ 8.03 hrs, Volume= 2,937 cf, Depth= 0.41"
Routed to Pond 8P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 100-YR Rainfall=2.00"

	Area (sf)	CN	Description
	79,537	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	2,643	98	Road
	85,180	76	Weighted Average
	79,537	74	93.38% Pervious Area
	5,643	98	6.62% Impervious Area

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

Subcatchment 8S: Lot8



Summary for Subcatchment 9S: Lot9

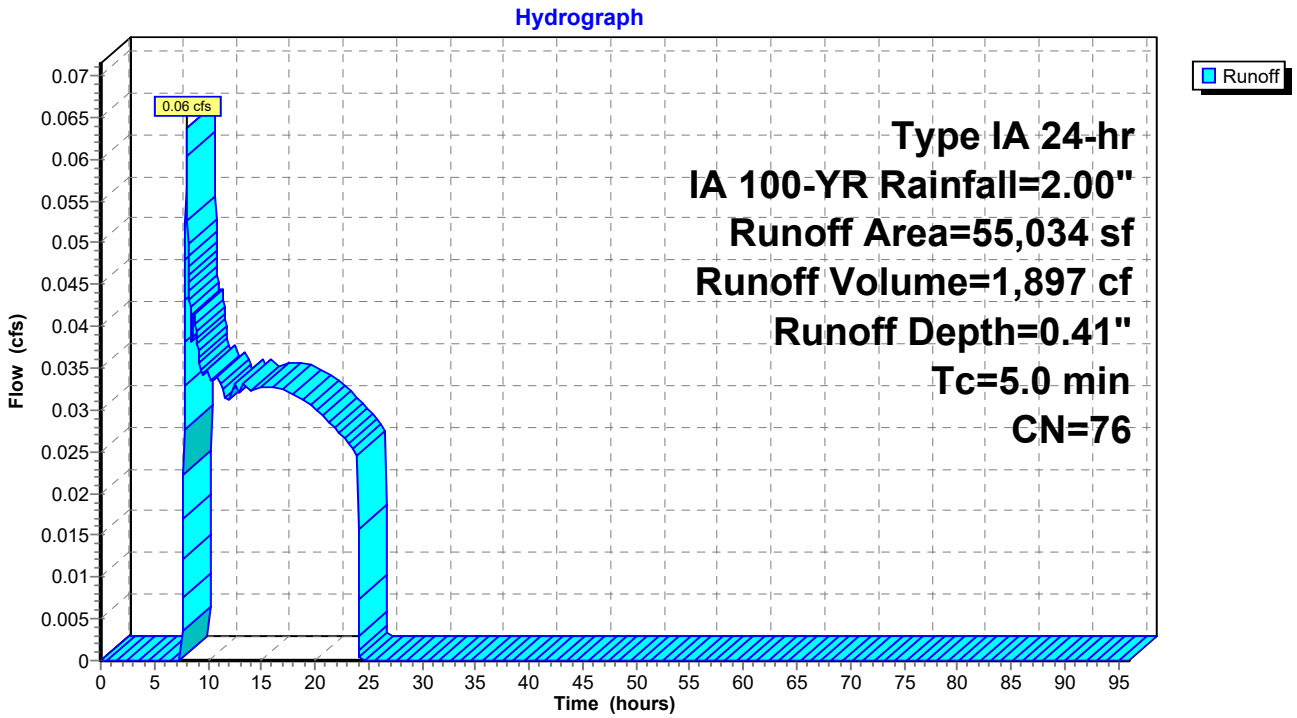
Runoff = 0.06 cfs @ 8.03 hrs, Volume= 1,897 cf, Depth= 0.41"
Routed to Pond 9P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 100-YR Rainfall=2.00"

	Area (sf)	CN	Description
	49,772	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	2,262	98	Road
	55,034	76	Weighted Average
	49,772	74	90.44% Pervious Area
	5,262	98	9.56% Impervious Area

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

Subcatchment 9S: Lot9



Summary for Subcatchment 10S: Lot10

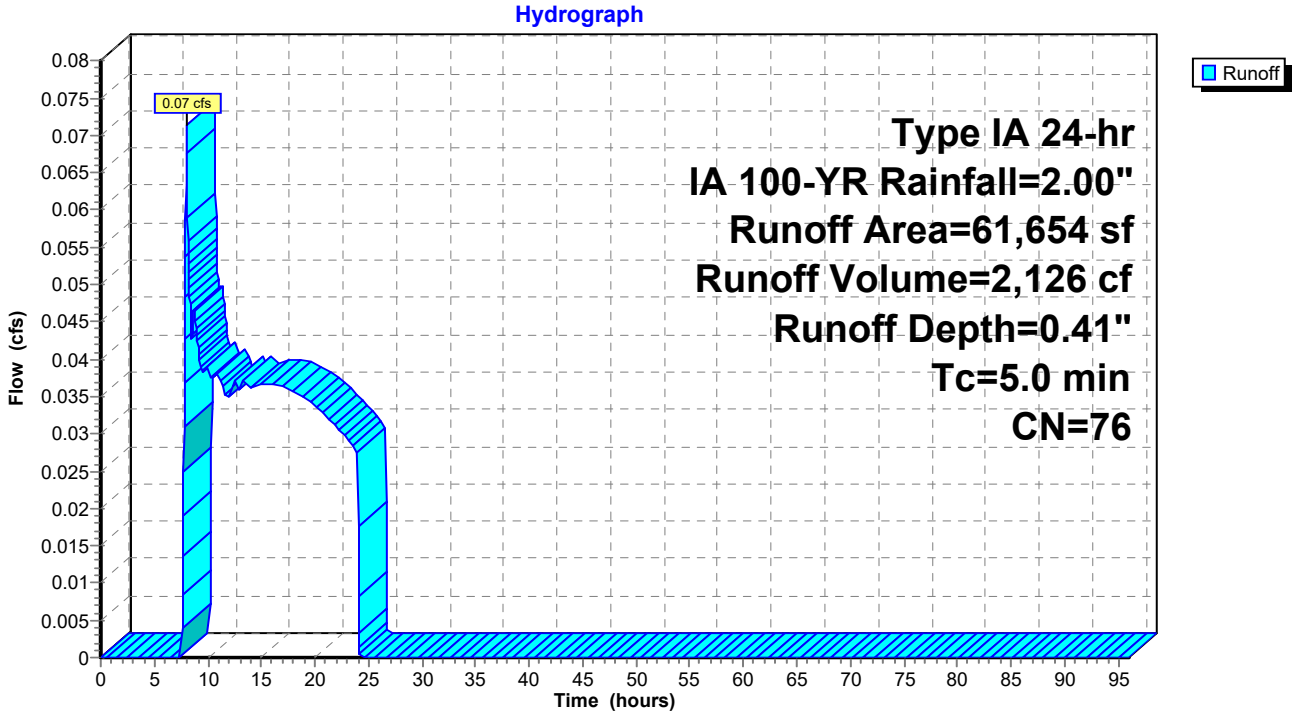
Runoff = 0.07 cfs @ 8.03 hrs, Volume= 2,126 cf, Depth= 0.41"
Routed to Pond 10P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 100-YR Rainfall=2.00"

	Area (sf)	CN	Description
	55,257	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	3,397	98	Road
	61,654	76	Weighted Average
	55,257	74	89.62% Pervious Area
	6,397	98	10.38% Impervious Area

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

Subcatchment 10S: Lot10



Summary for Subcatchment 11S: Lot11

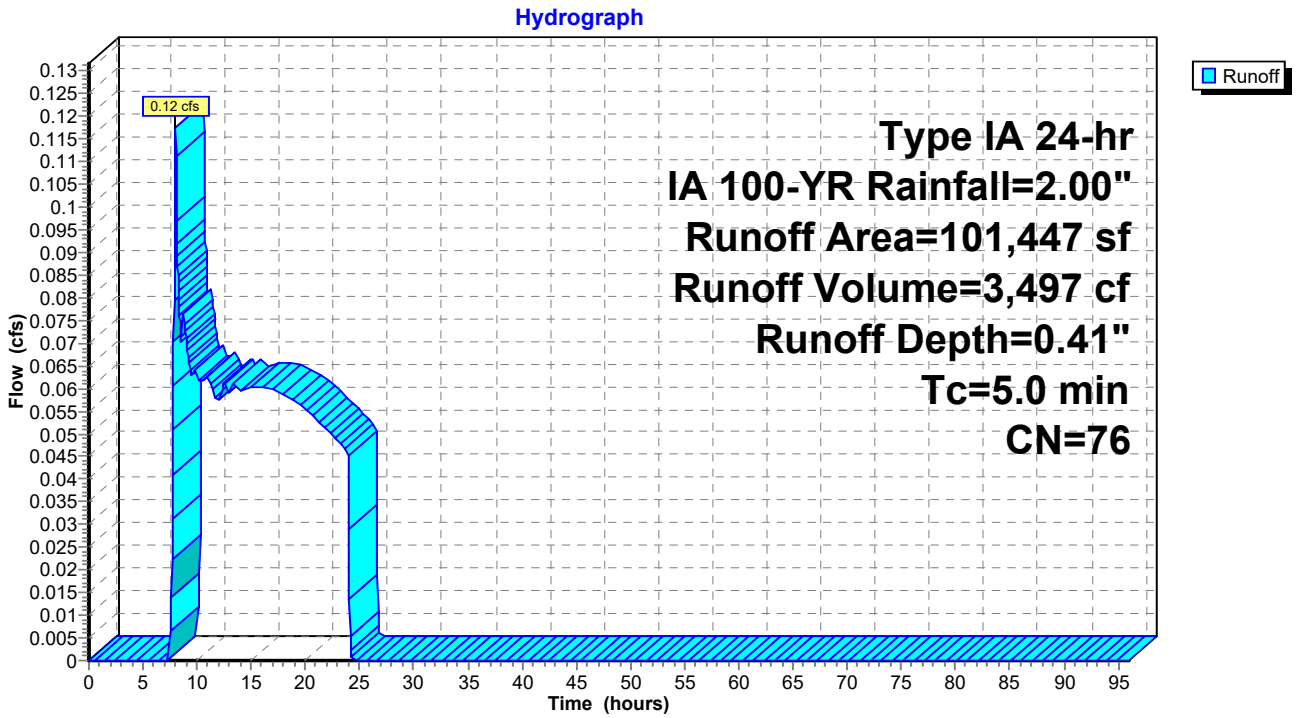
Runoff = 0.12 cfs @ 8.03 hrs, Volume= 3,497 cf, Depth= 0.41"
Routed to Pond 11P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 100-YR Rainfall=2.00"

	Area (sf)	CN	Description
	93,358	74	>75% Grass cover, Good, HSG C
*	6,000	98	Pervious
*	2,089	98	Road
	101,447	76	Weighted Average
	93,358	74	92.03% Pervious Area
	8,089	98	7.97% Impervious Area

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

Subcatchment 11S: Lot11



Summary for Subcatchment 12S: Lot12

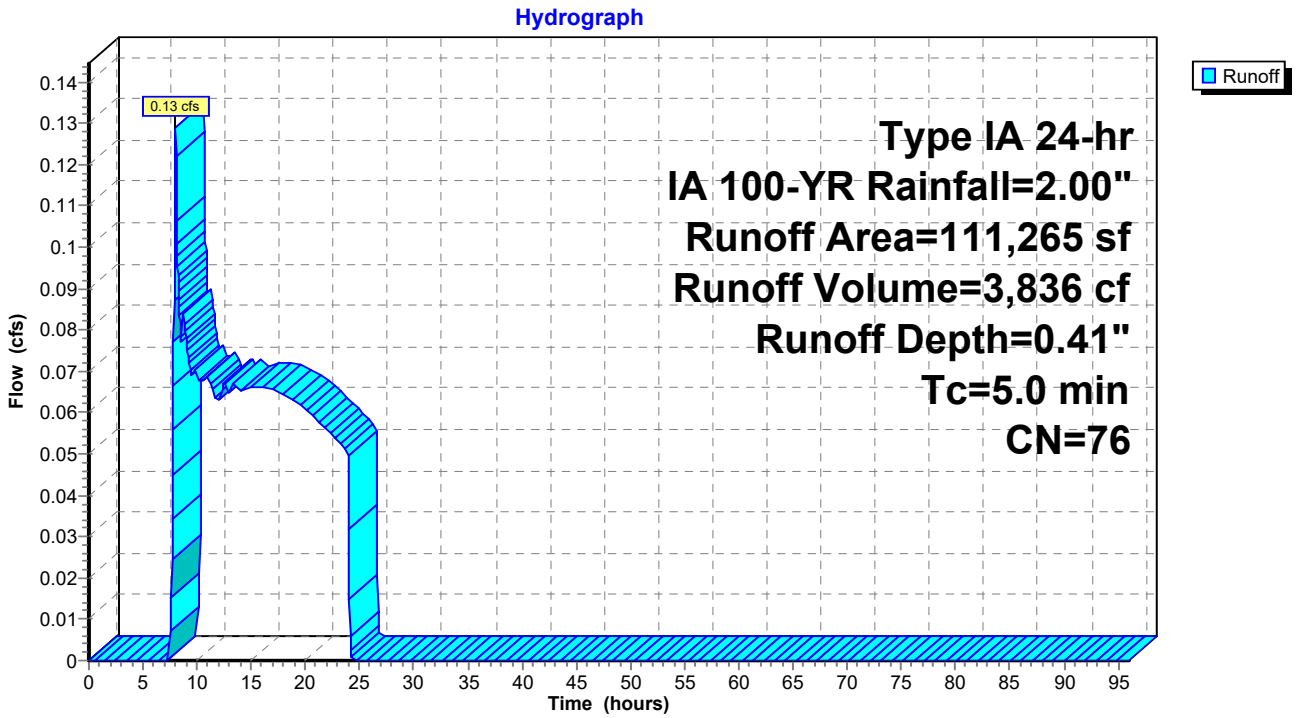
Runoff = 0.13 cfs @ 8.03 hrs, Volume= 3,836 cf, Depth= 0.41"
Routed to Pond 12P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 100-YR Rainfall=2.00"

	Area (sf)	CN	Description
	99,991	74	>75% Grass cover, Good, HSG C
*	3,000	98	Pervious
*	8,274	98	Road
	111,265	76	Weighted Average
	99,991	74	89.87% Pervious Area
	11,274	98	10.13% Impervious Area

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

Subcatchment 12S: Lot12



Summary for Subcatchment 13S: E-WRD (s)

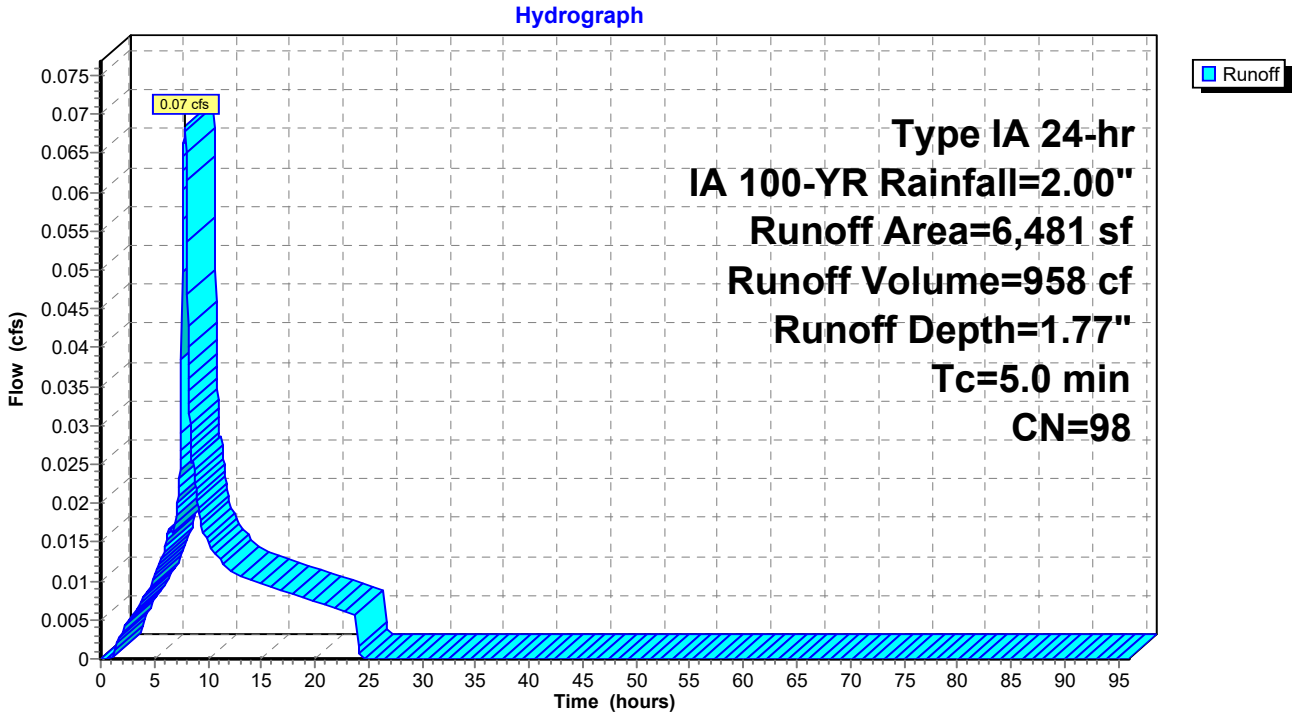
Runoff = 0.07 cfs @ 7.86 hrs, Volume= 958 cf, Depth= 1.77"
Routed to Pond 13P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 100-YR Rainfall=2.00"

	Area (sf)	CN	Description
*	6,481	98	Road S
	6,481	98	100.00% Impervious Area

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

Subcatchment 13S: E-WRD (s)



Summary for Subcatchment 14S: E-WRD (n)

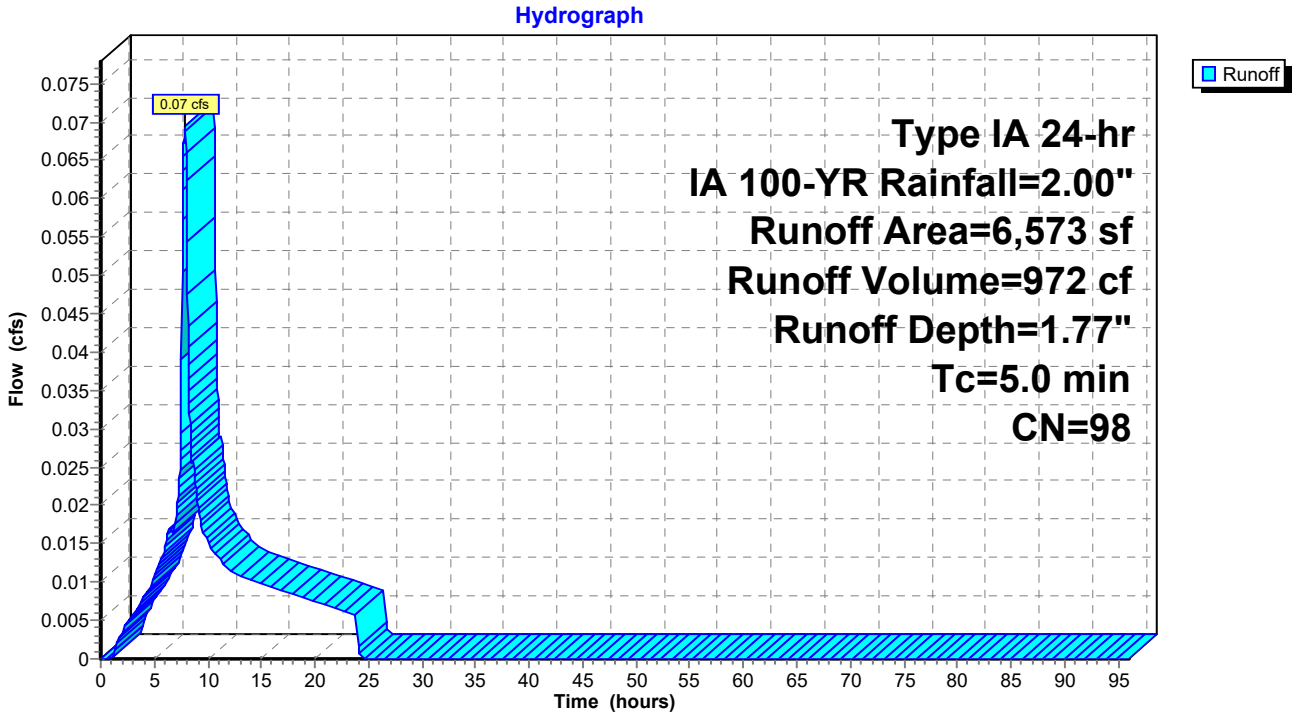
Runoff = 0.07 cfs @ 7.86 hrs, Volume= 972 cf, Depth= 1.77"
Routed to Pond 14P : Roadside Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 100-YR Rainfall=2.00"

	Area (sf)	CN	Description
*	6,573	98	Road n
	6,573	98	100.00% Impervious Area

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

Subcatchment 14S: E-WRD (n)



Summary for Subcatchment 15S: BadgerCanyon(MinArea)

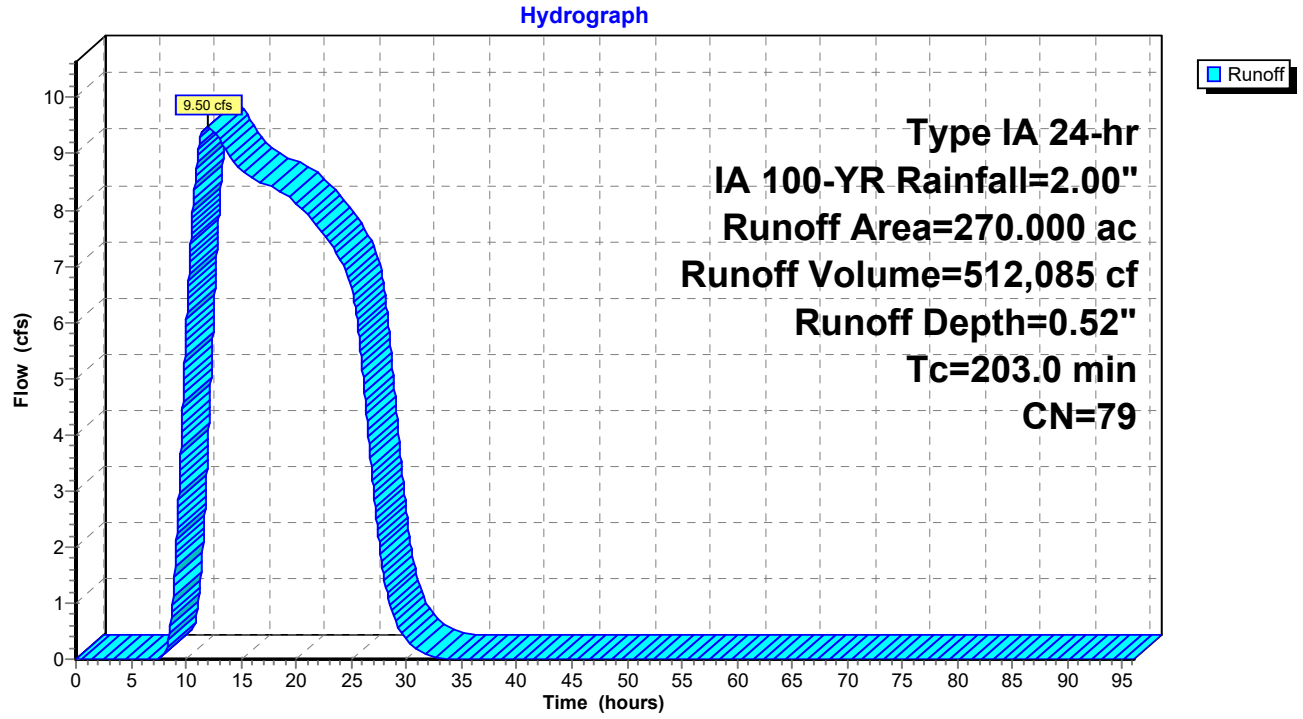
Runoff = 9.50 cfs @ 11.95 hrs, Volume= 512,085 cf, Depth= 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 100-YR Rainfall=2.00"

Area (ac)	CN	Description
270.000	79	50-75% Grass cover, Fair, HSG C
270.000	79	100.00% Pervious Area

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

Subcatchment 15S: BadgerCanyon(MinArea)



Summary for Subcatchment 16S: BadgerCanyon(FullArea)

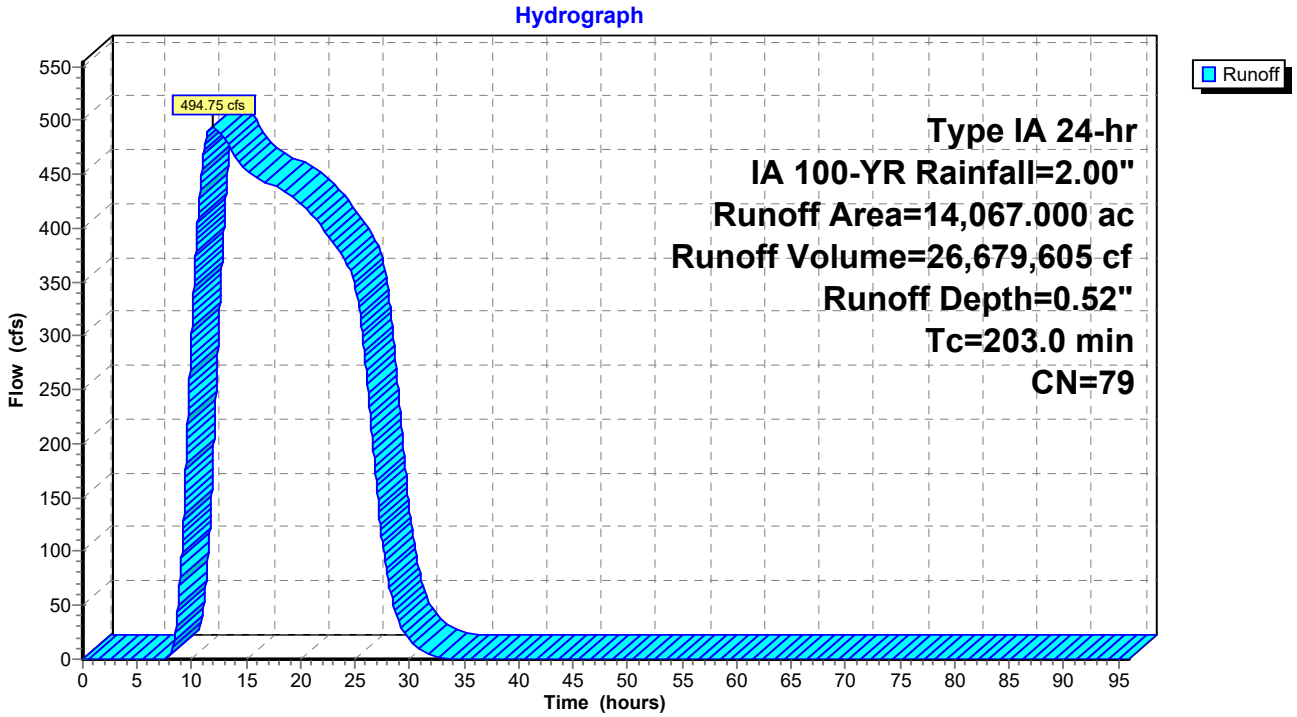
Runoff = 494.75 cfs @ 11.95 hrs, Volume= 26,679,605 cf, Depth= 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Type IA 24-hr IA 100-YR Rainfall=2.00"

Area (ac)	CN	Description
14,067.000	79	50-75% Grass cover, Fair, HSG C
14,067.000	79	100.00% Pervious Area

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

Subcatchment 16S: BadgerCanyon(FullArea)



Summary for Pond 1P: Roadside Ditch

Inflow Area = 47,349 sf, 10.95% Impervious, Inflow Depth = 0.45" for IA 100-YR event
Inflow = 0.07 cfs @ 8.02 hrs, Volume= 1,768 cf
Outflow = 0.03 cfs @ 16.68 hrs, Volume= 1,768 cf, Atten= 55%, Lag= 519.9 min
Discarded = 0.03 cfs @ 16.68 hrs, Volume= 1,768 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.65' @ 16.68 hrs Surf.Area= 569 sf Storage= 181 cf

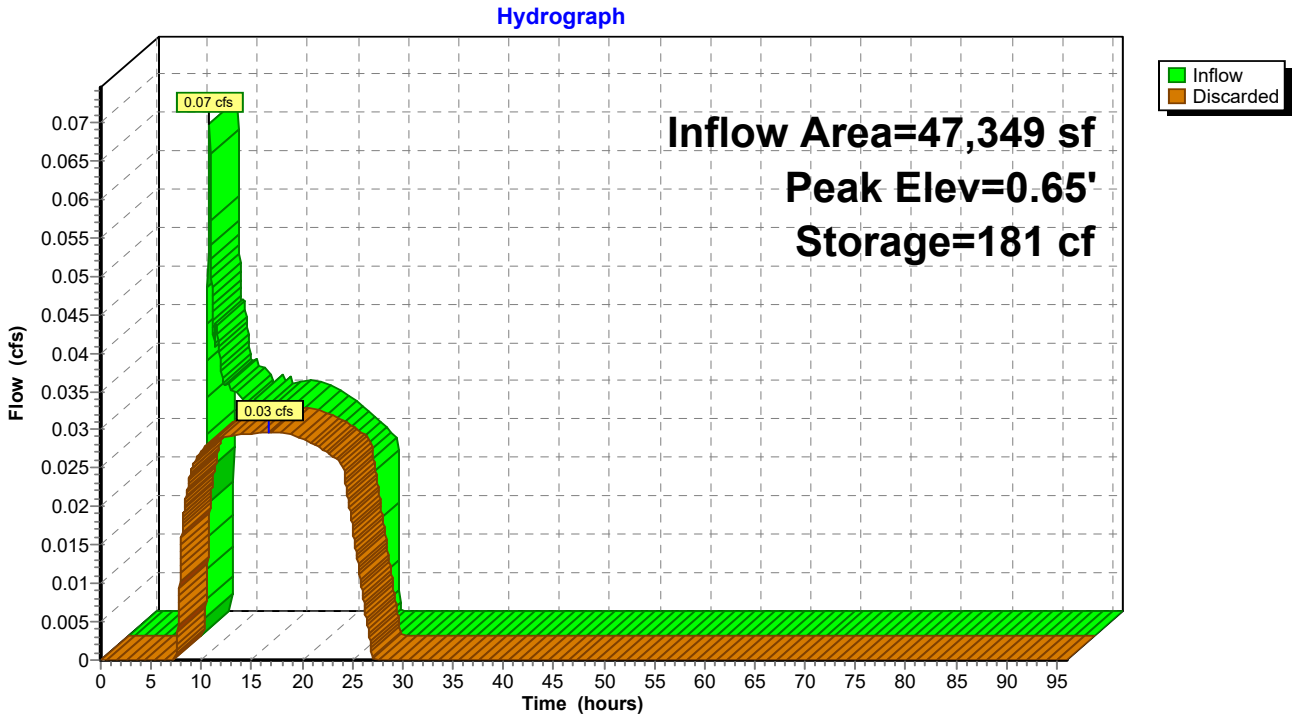
Plug-Flow detention time= 93.6 min calculated for 1,768 cf (100% of inflow)
Center-of-Mass det. time= 93.7 min (1,005.2 - 911.5)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,851 cf	**105.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 16.68 hrs HW=0.65' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Pond 1P: Roadside Ditch



Summary for Pond 2P: Roadside Ditch

Inflow Area = 48,792 sf, 12.58% Impervious, Inflow Depth = 0.45" for IA 100-YR event
Inflow = 0.07 cfs @ 8.02 hrs, Volume= 1,822 cf
Outflow = 0.03 cfs @ 11.09 hrs, Volume= 1,822 cf, Atten= 53%, Lag= 184.0 min
Discarded = 0.03 cfs @ 11.09 hrs, Volume= 1,822 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.39' @ 11.09 hrs Surf.Area= 621 sf Storage= 121 cf

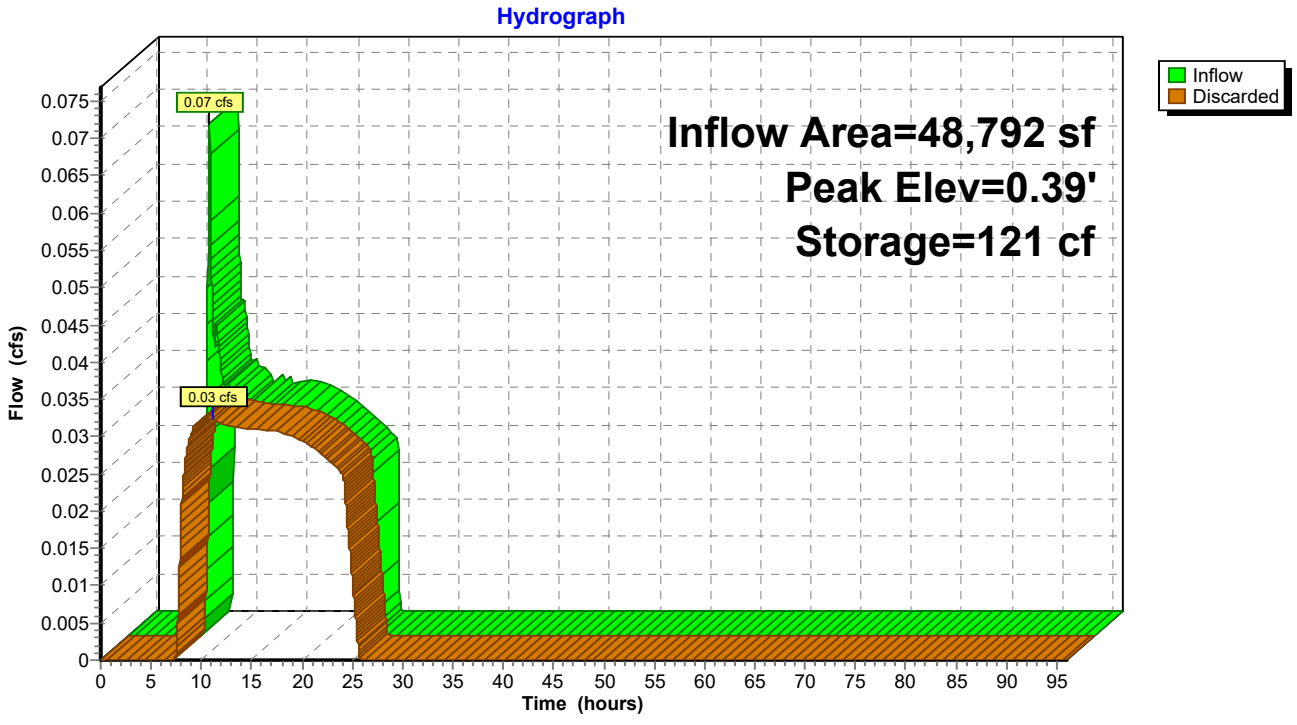
Plug-Flow detention time= 56.8 min calculated for 1,822 cf (100% of inflow)
Center-of-Mass det. time= 56.8 min (968.3 - 911.5)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	3,291 cf	**195.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.09 hrs HW=0.39' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Pond 2P: Roadside Ditch



Summary for Pond 3P: Roadside Ditch

Inflow Area = 47,974 sf, 14.14% Impervious, Inflow Depth = 0.45" for IA 100-YR event
Inflow = 0.07 cfs @ 8.02 hrs, Volume= 1,792 cf
Outflow = 0.03 cfs @ 10.02 hrs, Volume= 1,792 cf, Atten= 51%, Lag= 119.8 min
Discarded = 0.03 cfs @ 10.02 hrs, Volume= 1,792 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.32' @ 10.02 hrs Surf.Area= 633 sf Storage= 101 cf

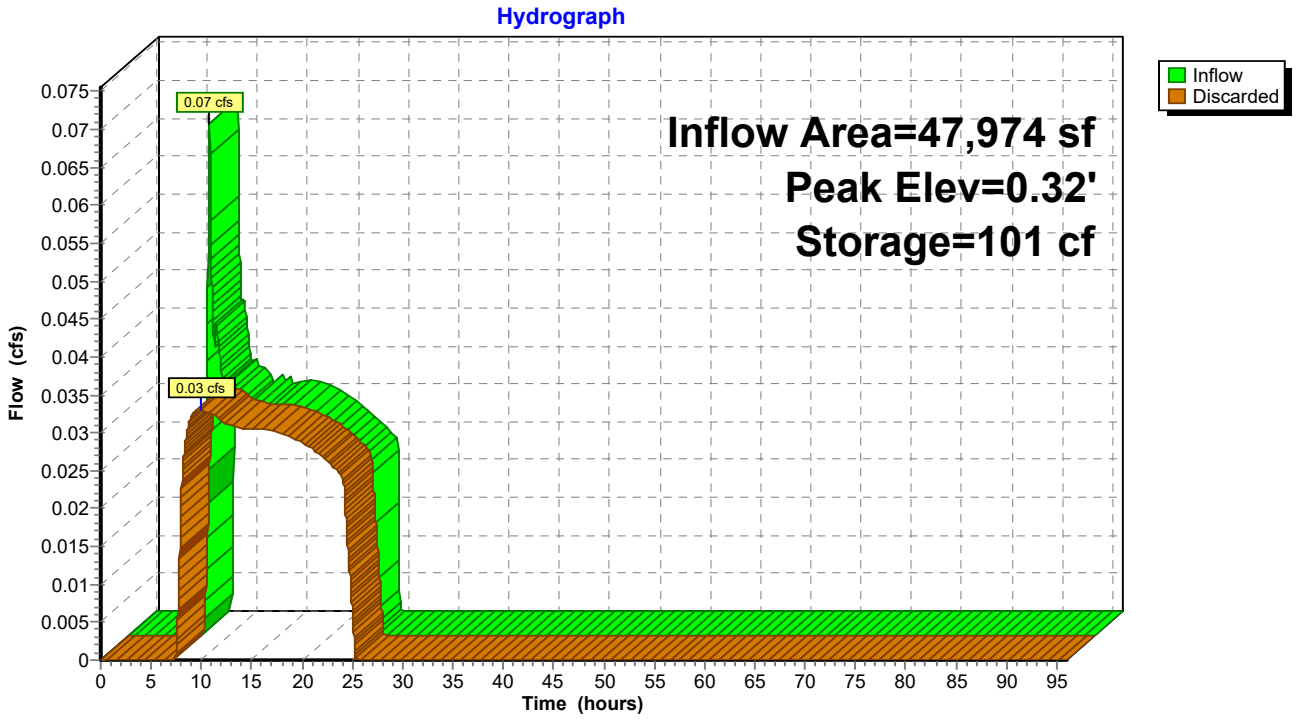
Plug-Flow detention time= 45.4 min calculated for 1,791 cf (100% of inflow)
Center-of-Mass det. time= 45.4 min (956.9 - 911.5)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	4,091 cf	**245.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 10.02 hrs HW=0.32' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Pond 3P: Roadside Ditch



Summary for Pond 4P: Roadside Ditch

Inflow Area = 47,387 sf, 14.72% Impervious, Inflow Depth = 0.48" for IA 100-YR event
Inflow = 0.08 cfs @ 8.01 hrs, Volume= 1,913 cf
Outflow = 0.04 cfs @ 9.37 hrs, Volume= 1,913 cf, Atten= 54%, Lag= 81.3 min
Discarded = 0.04 cfs @ 9.37 hrs, Volume= 1,913 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.35' @ 9.37 hrs Surf.Area= 699 sf Storage= 120 cf

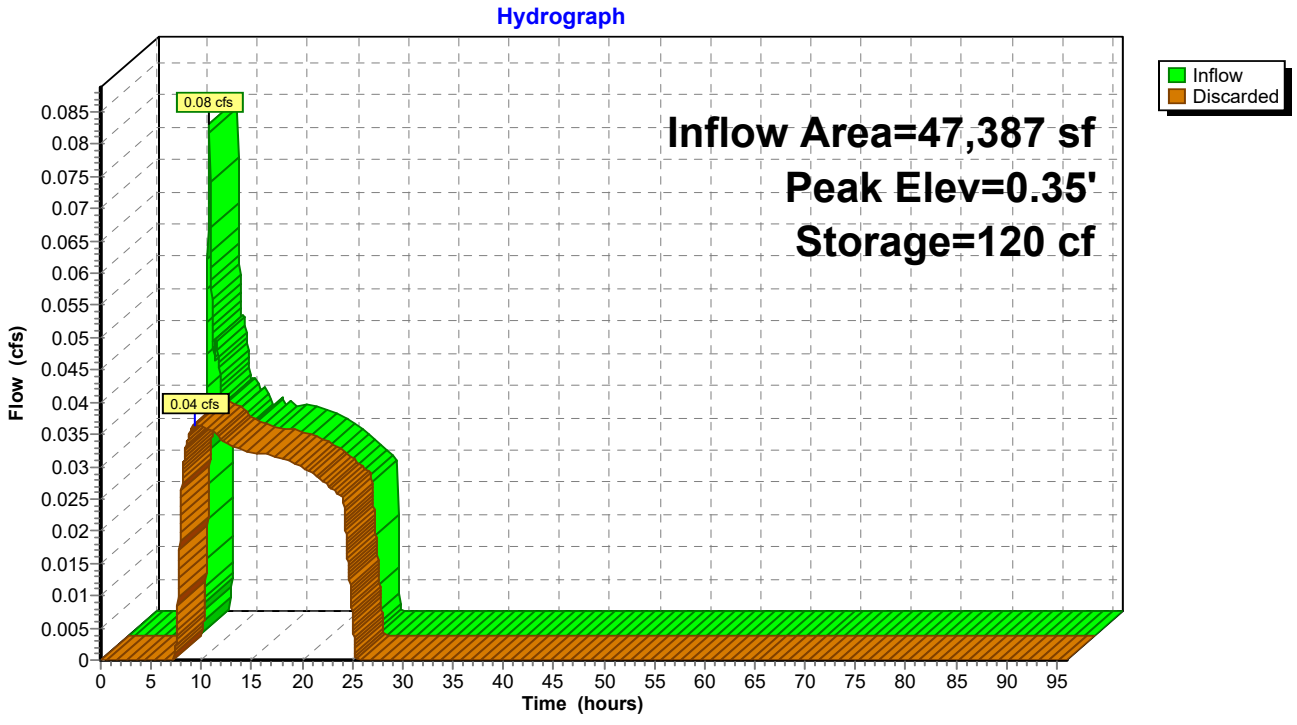
Plug-Flow detention time= 47.4 min calculated for 1,912 cf (100% of inflow)
Center-of-Mass det. time= 47.4 min (948.7 - 901.3)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	4,171 cf	**250.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 9.37 hrs HW=0.35' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond 4P: Roadside Ditch



Summary for Pond 5P: Roadside Ditch

Inflow Area = 56,955 sf, 14.86% Impervious, Inflow Depth = 0.48" for IA 100-YR event
Inflow = 0.10 cfs @ 8.01 hrs, Volume= 2,299 cf
Outflow = 0.04 cfs @ 10.04 hrs, Volume= 2,299 cf, Atten= 55%, Lag= 121.9 min
Discarded = 0.04 cfs @ 10.04 hrs, Volume= 2,299 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.39' @ 10.04 hrs Surf.Area= 816 sf Storage= 158 cf

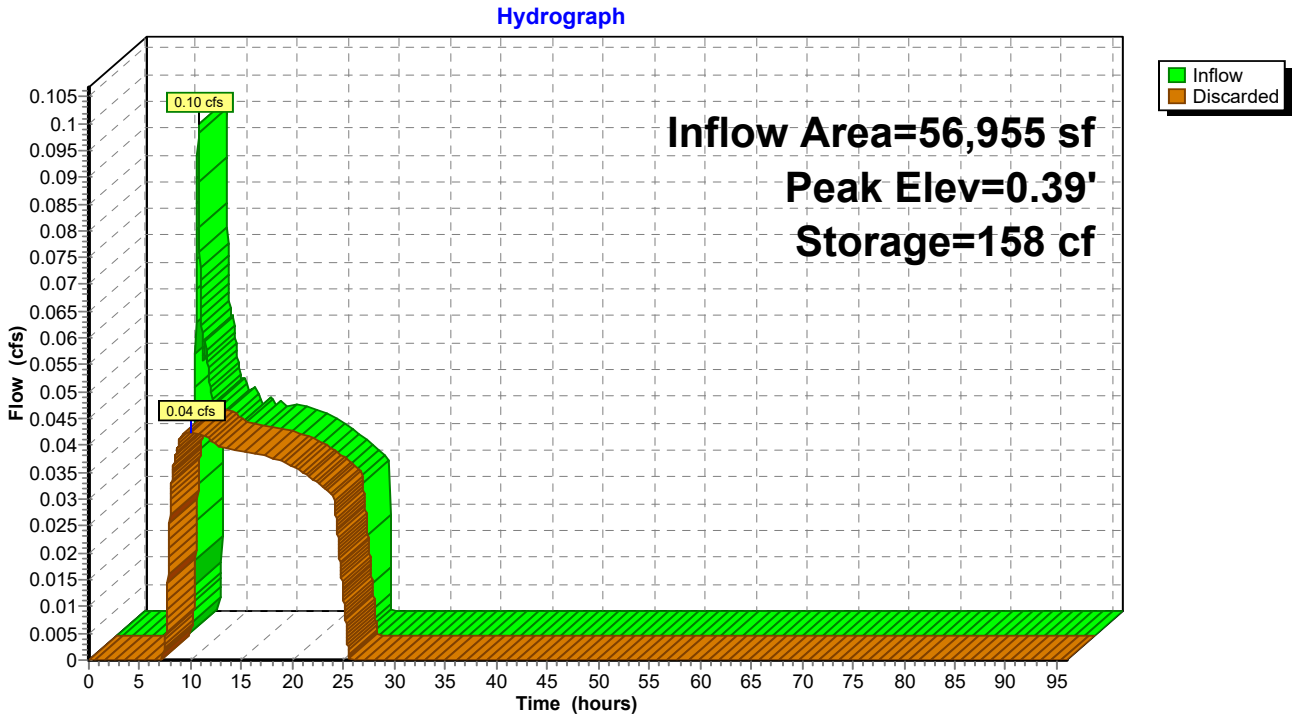
Plug-Flow detention time= 54.2 min calculated for 2,298 cf (100% of inflow)
Center-of-Mass det. time= 54.2 min (955.5 - 901.3)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	4,331 cf	**260.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 10.04 hrs HW=0.39' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond 5P: Roadside Ditch



Summary for Pond 6P: Roadside Ditch

Inflow Area = 48,103 sf, 14.57% Impervious, Inflow Depth = 0.45" for IA 100-YR event
Inflow = 0.07 cfs @ 8.02 hrs, Volume= 1,797 cf
Outflow = 0.03 cfs @ 16.88 hrs, Volume= 1,797 cf, Atten= 56%, Lag= 531.9 min
Discarded = 0.03 cfs @ 16.88 hrs, Volume= 1,797 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.68' @ 16.88 hrs Surf.Area= 577 sf Storage= 194 cf

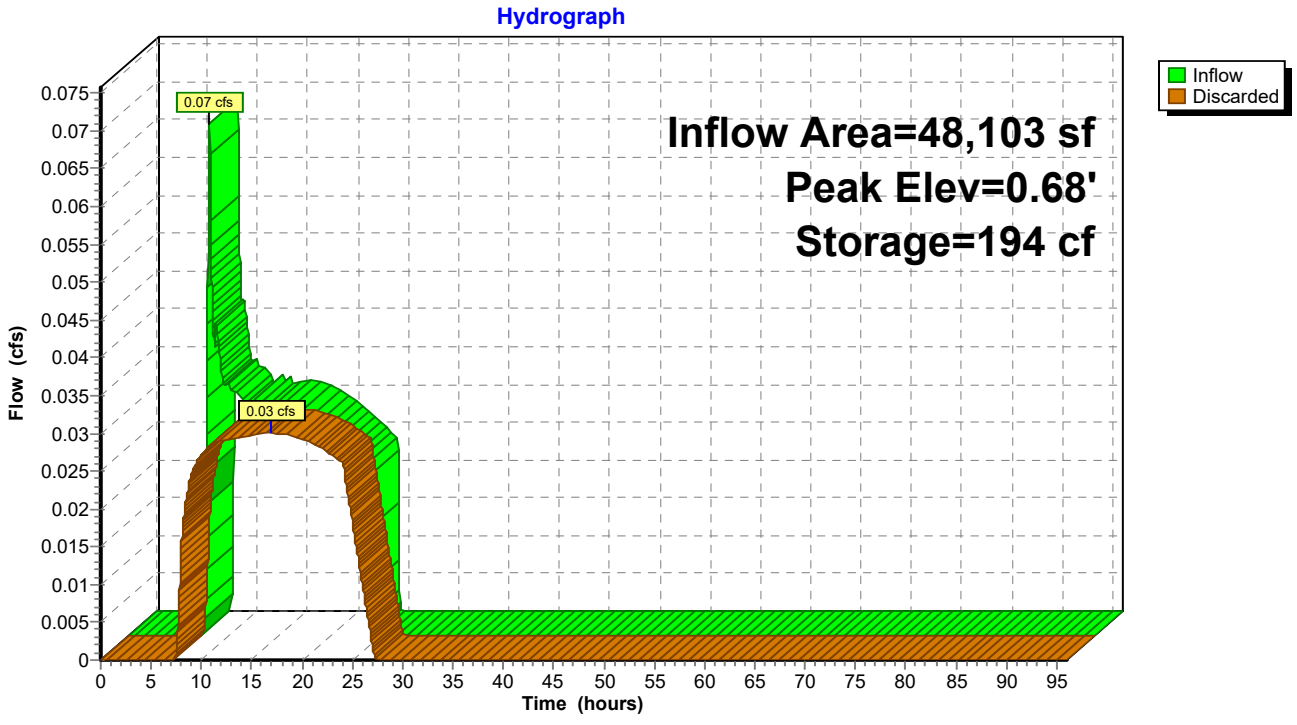
Plug-Flow detention time= 98.6 min calculated for 1,797 cf (100% of inflow)
Center-of-Mass det. time= 98.6 min (1,010.1 - 911.5)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,771 cf	**100.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 16.88 hrs HW=0.68' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Pond 6P: Roadside Ditch



Summary for Pond 7P: Roadside Ditch

Inflow Area = 74,982 sf, 5.20% Impervious, Inflow Depth = 0.38" for IA 100-YR event
Inflow = 0.07 cfs @ 8.03 hrs, Volume= 2,380 cf
Outflow = 0.04 cfs @ 20.83 hrs, Volume= 2,380 cf, Atten= 45%, Lag= 768.0 min
Discarded = 0.04 cfs @ 20.83 hrs, Volume= 2,380 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1.55' @ 20.83 hrs Surf.Area= 725 sf Storage= 522 cf

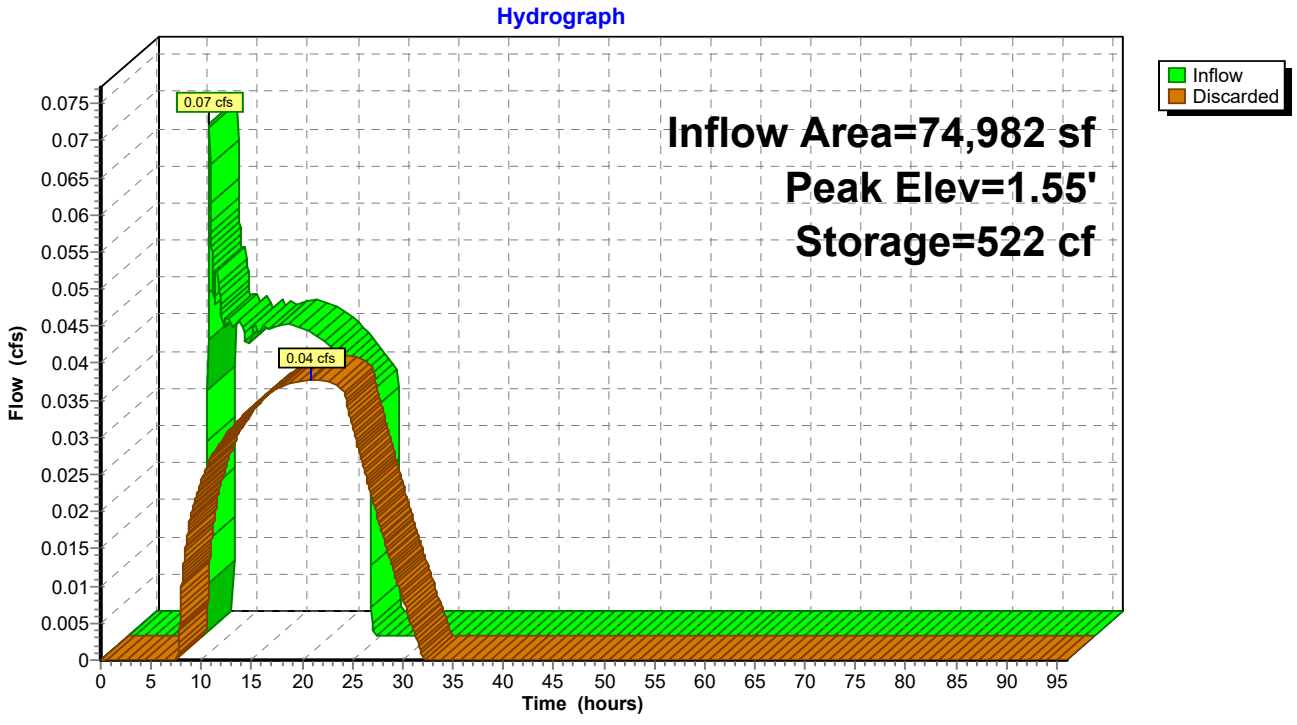
Plug-Flow detention time= 198.5 min calculated for 2,380 cf (100% of inflow)
Center-of-Mass det. time= 198.6 min (1,131.4 - 932.8)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	907 cf	**46.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 20.83 hrs HW=1.55' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond 7P: Roadside Ditch



Summary for Pond 8P: Roadside Ditch

Inflow Area = 85,180 sf, 6.62% Impervious, Inflow Depth = 0.41" for IA 100-YR event
Inflow = 0.10 cfs @ 8.03 hrs, Volume= 2,937 cf
Outflow = 0.05 cfs @ 18.04 hrs, Volume= 2,937 cf, Atten= 50%, Lag= 601.1 min
Discarded = 0.05 cfs @ 18.04 hrs, Volume= 2,937 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.76' @ 18.04 hrs Surf.Area= 945 sf Storage= 355 cf

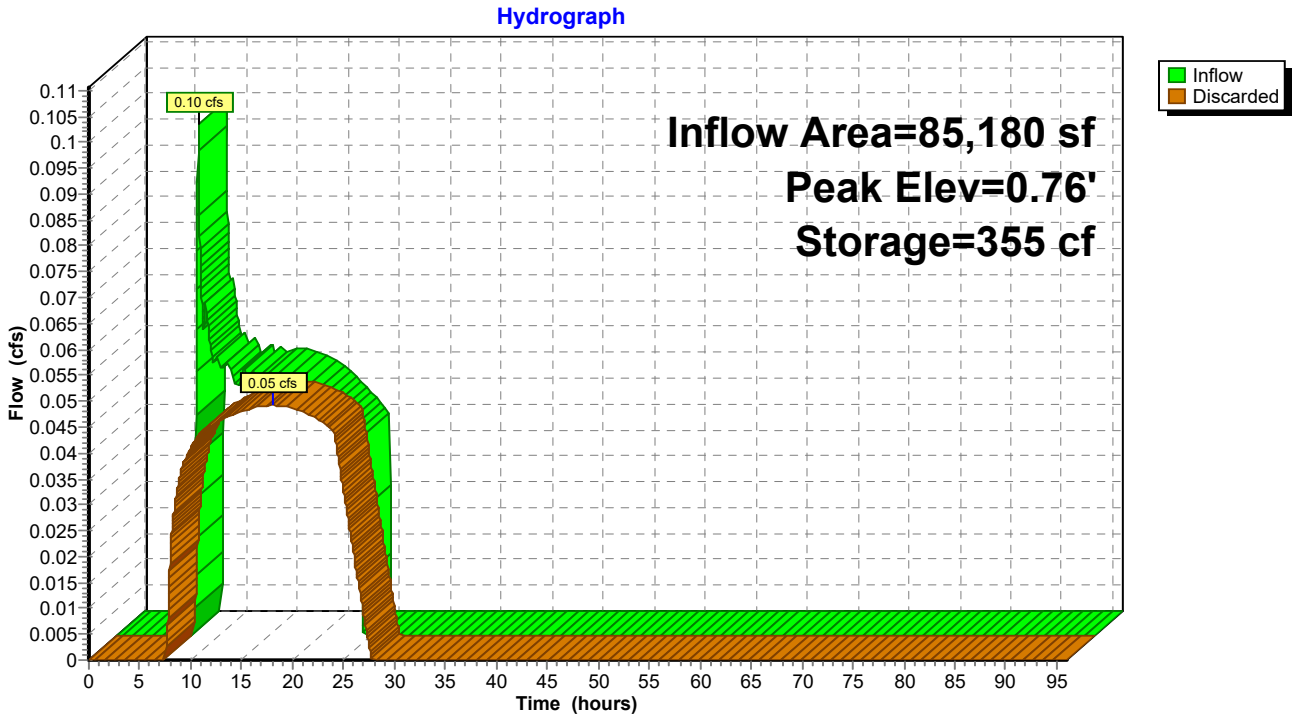
Plug-Flow detention time= 108.6 min calculated for 2,937 cf (100% of inflow)
Center-of-Mass det. time= 108.6 min (1,030.6 - 922.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	2,555 cf	**149.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 18.04 hrs HW=0.76' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.05 cfs)

Pond 8P: Roadside Ditch



Summary for Pond 9P: Roadside Ditch

Inflow Area = 55,034 sf, 9.56% Impervious, Inflow Depth = 0.41" for IA 100-YR event
Inflow = 0.06 cfs @ 8.03 hrs, Volume= 1,897 cf
Outflow = 0.03 cfs @ 16.94 hrs, Volume= 1,897 cf, Atten= 49%, Lag= 534.8 min
Discarded = 0.03 cfs @ 16.94 hrs, Volume= 1,897 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.51' @ 16.94 hrs Surf.Area= 623 sf Storage= 158 cf

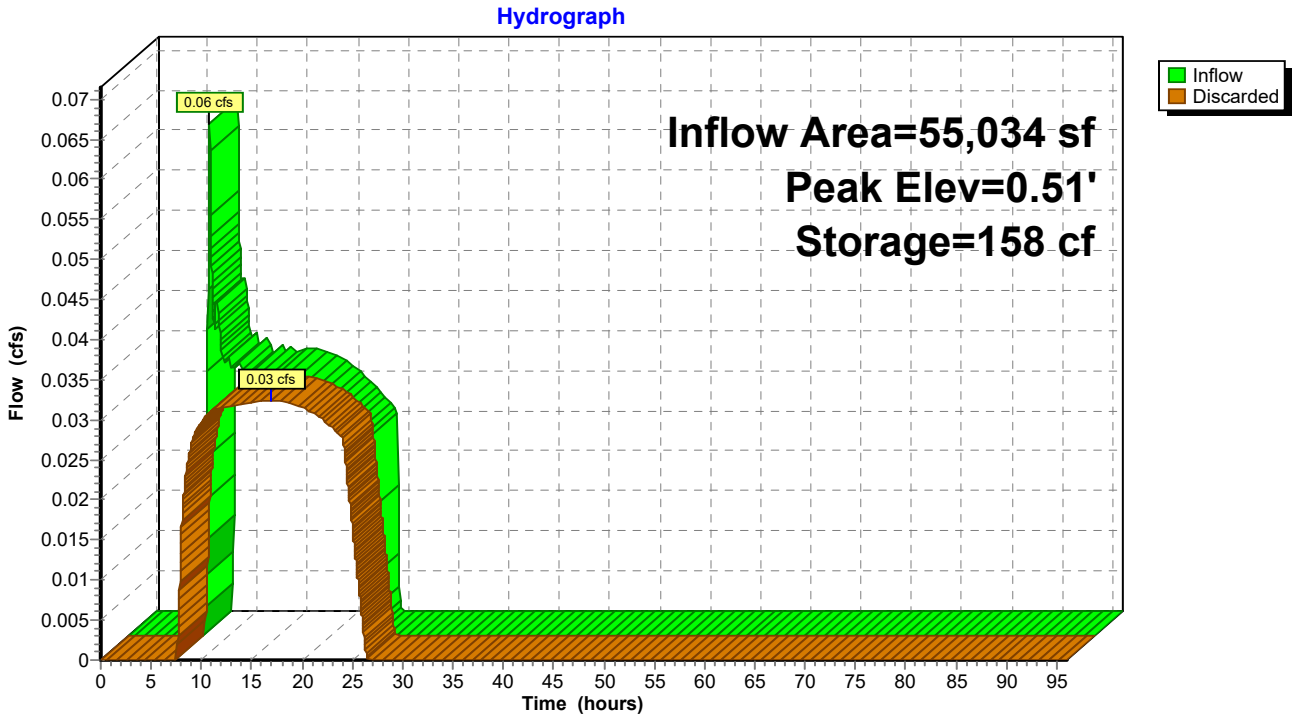
Plug-Flow detention time= 75.0 min calculated for 1,897 cf (100% of inflow)
Center-of-Mass det. time= 75.0 min (997.0 - 922.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	2,539 cf	**148.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 16.94 hrs HW=0.51' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Pond 9P: Roadside Ditch



Summary for Pond 10P: Roadside Ditch

Inflow Area = 61,654 sf, 10.38% Impervious, Inflow Depth = 0.41" for IA 100-YR event
Inflow = 0.07 cfs @ 8.03 hrs, Volume= 2,126 cf
Outflow = 0.04 cfs @ 17.62 hrs, Volume= 2,126 cf, Atten= 50%, Lag= 575.8 min
Discarded = 0.04 cfs @ 17.62 hrs, Volume= 2,126 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.67' @ 17.62 hrs Surf.Area= 690 sf Storage= 227 cf

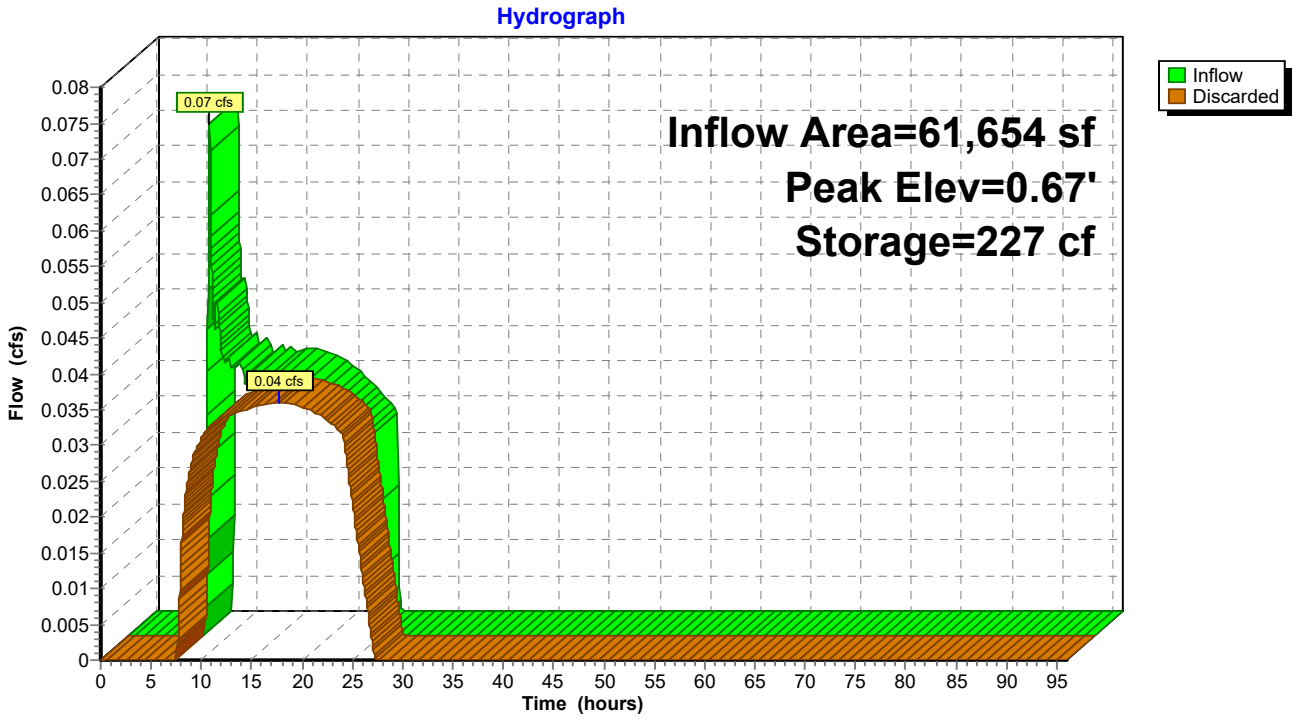
Plug-Flow detention time= 95.9 min calculated for 2,126 cf (100% of inflow)
Center-of-Mass det. time= 95.9 min (1,017.9 - 922.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	2,155 cf	**124.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 17.62 hrs HW=0.67' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.04 cfs)

Pond 10P: Roadside Ditch



Summary for Pond 11P: Roadside Ditch

Inflow Area = 101,447 sf, 7.97% Impervious, Inflow Depth = 0.41" for IA 100-YR event
Inflow = 0.12 cfs @ 8.03 hrs, Volume= 3,497 cf
Outflow = 0.05 cfs @ 21.15 hrs, Volume= 3,497 cf, Atten= 55%, Lag= 787.2 min
Discarded = 0.05 cfs @ 21.15 hrs, Volume= 3,497 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 1.85' @ 21.15 hrs Surf.Area= 1,018 sf Storage= 875 cf

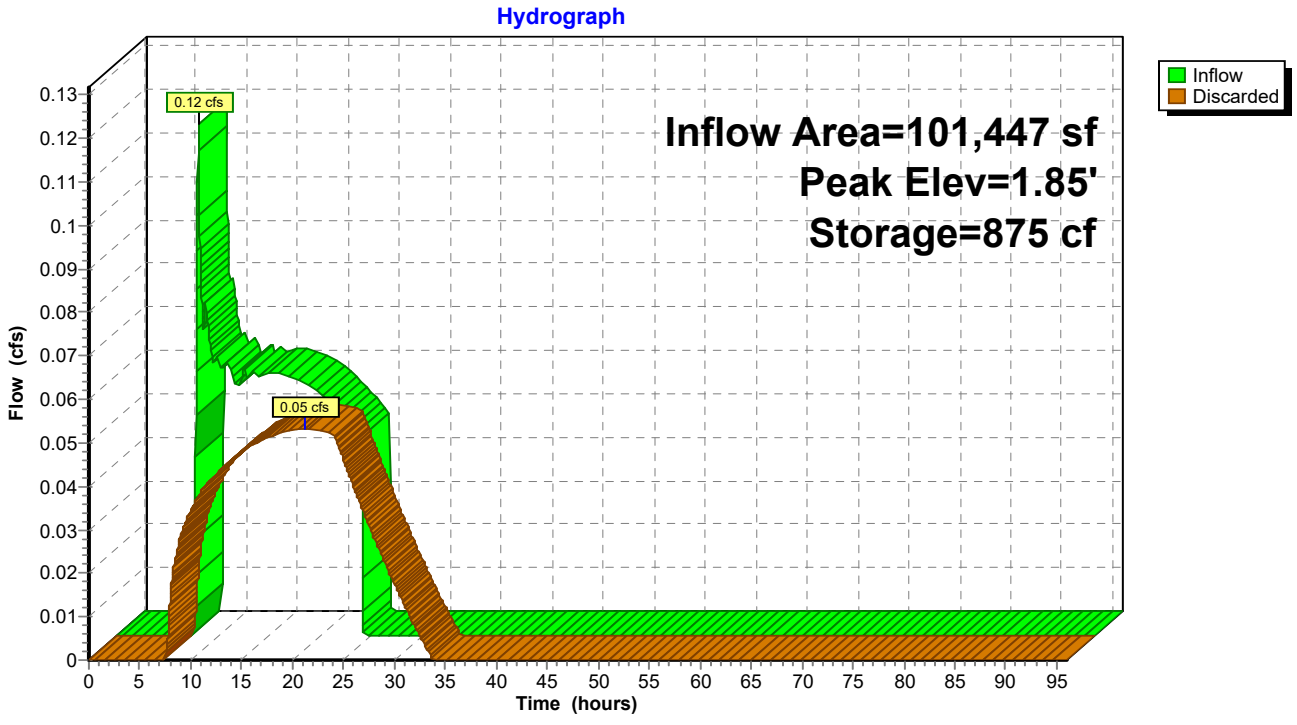
Plug-Flow detention time= 234.7 min calculated for 3,496 cf (100% of inflow)
Center-of-Mass det. time= 234.8 min (1,156.8 - 922.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	1,035 cf	**54.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 21.15 hrs HW=1.85' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.05 cfs)

Pond 11P: Roadside Ditch



Summary for Pond 12P: Roadside Ditch

Inflow Area = 111,265 sf, 10.13% Impervious, Inflow Depth = 0.41" for IA 100-YR event
Inflow = 0.13 cfs @ 8.03 hrs, Volume= 3,836 cf
Outflow = 0.07 cfs @ 11.33 hrs, Volume= 3,836 cf, Atten= 48%, Lag= 198.0 min
Discarded = 0.07 cfs @ 11.33 hrs, Volume= 3,836 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.37' @ 11.33 hrs Surf.Area= 1,279 sf Storage= 235 cf

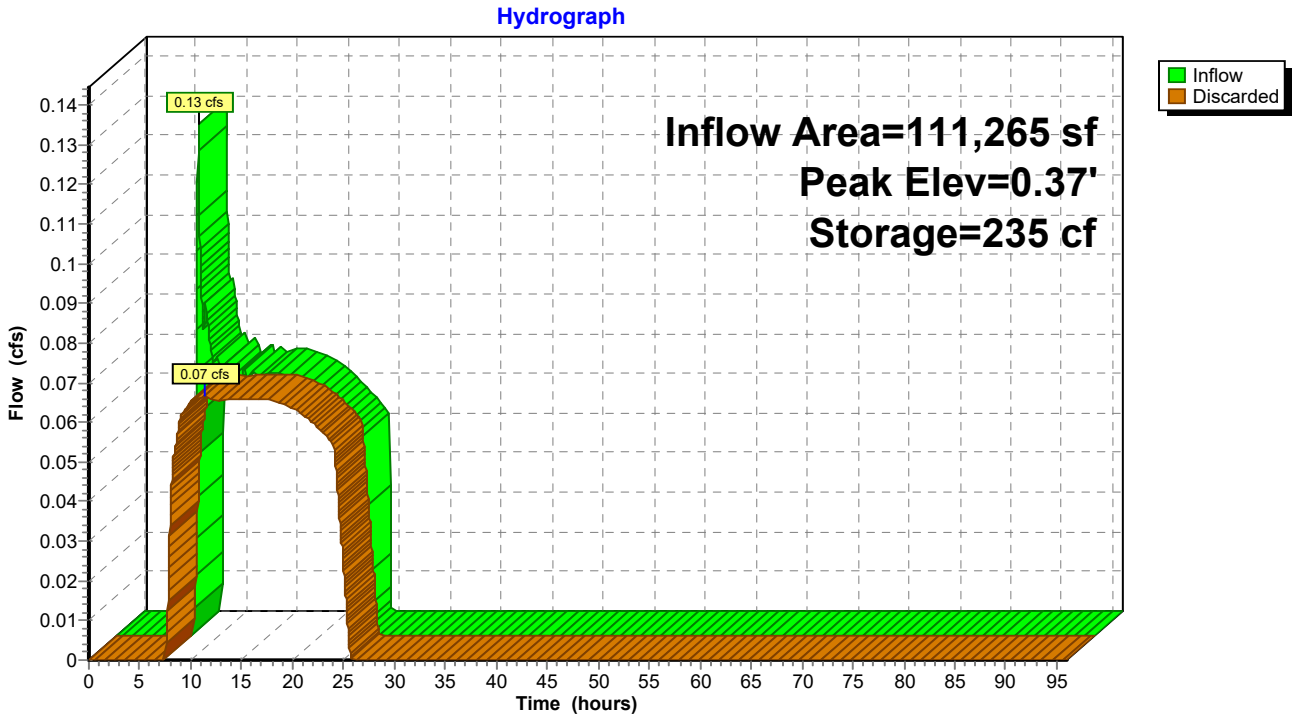
Plug-Flow detention time= 54.7 min calculated for 3,835 cf (100% of inflow)
Center-of-Mass det. time= 54.7 min (976.7 - 922.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	7,083 cf	**432.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.07 cfs @ 11.33 hrs HW=0.37' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.07 cfs)

Pond 12P: Roadside Ditch



Summary for Pond 13P: Roadside Ditch

Inflow Area = 6,481 sf,100.00% Impervious, Inflow Depth = 1.77" for IA 100-YR event
Inflow = 0.07 cfs @ 7.86 hrs, Volume= 958 cf
Outflow = 0.03 cfs @ 8.32 hrs, Volume= 958 cf, Atten= 55%, Lag= 27.6 min
Discarded = 0.03 cfs @ 8.32 hrs, Volume= 958 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.41' @ 8.32 hrs Surf.Area= 595 sf Storage= 120 cf

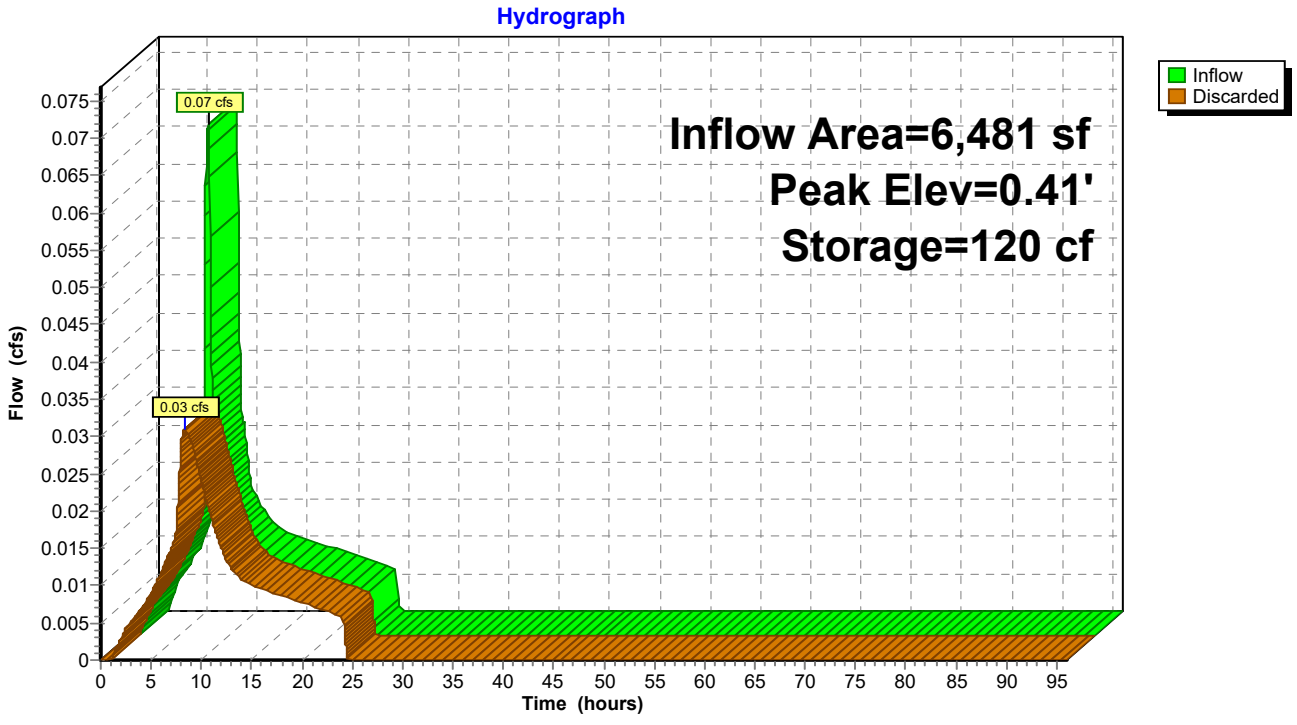
Plug-Flow detention time= 33.1 min calculated for 958 cf (100% of inflow)
Center-of-Mass det. time= 33.1 min (712.9 - 679.8)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	3,051 cf	**180.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 8.32 hrs HW=0.41' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Pond 13P: Roadside Ditch



Summary for Pond 14P: Roadside Ditch

Inflow Area = 6,573 sf,100.00% Impervious, Inflow Depth = 1.77" for IA 100-YR event
Inflow = 0.07 cfs @ 7.86 hrs, Volume= 972 cf
Outflow = 0.03 cfs @ 8.33 hrs, Volume= 972 cf, Atten= 55%, Lag= 27.8 min
Discarded = 0.03 cfs @ 8.33 hrs, Volume= 972 cf

Routing by Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.03 hrs
Peak Elev= 0.41' @ 8.33 hrs Surf.Area= 601 sf Storage= 122 cf

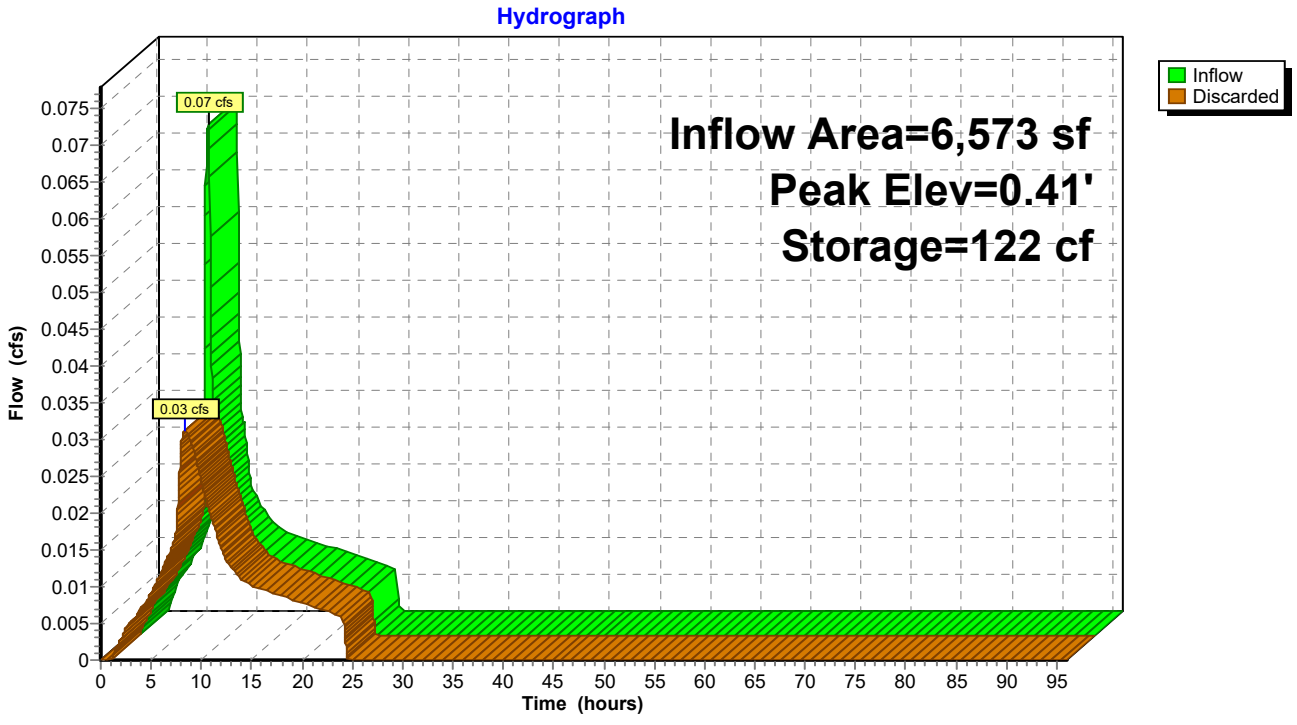
Plug-Flow detention time= 33.6 min calculated for 972 cf (100% of inflow)
Center-of-Mass det. time= 33.6 min (713.3 - 679.8)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	3,051 cf	**180.00'L x 2.00'H Prismatoid Z=4.0**

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 8.33 hrs HW=0.41' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Pond 14P: Roadside Ditch



Ira Hickman

PCM 1.9

March 12, 2025

To whom it may concern

BC Water Co LLC has the water available for this project and has worked out an agreement to supply domestic water and irrigation water. He purchased water rights and has given them to BC Water Co LLC to be able to supply irrigation water to the project.

Sincerely

Clayne Wiser

BC Water Co LLC

22307 S Cottonwood Dr

Kennewick, WA 99338

509-521-2282

PCM 1.10

Community Development Department
Prosser Office: 620 Market Street, 1st Floor
Kennewick Office: 102206 East Wiser Parkway
www.bentoncountywa.gov

Planning Division
(509) 786-5612
Planning.department@co.benton.wa.us
102206 East Wiser Parkway, Kennewick, WA 99338

May 23, 2025

Ira Hickman
103228 Kash Loop
Kennewick, WA 99338

Via Email: apcconstruction@msn.com

RE: Written Notification of Application Hold for Additional Processing Time
EA 2025-007 and SUB 2025-001 – Preliminary Plat of Cottonwood Run

Dear Mr. Hickman,

During the review of your applications (EA 2025-007 and SUB 2025-001) for a preliminary plat of 19.78 acres the Department of Ecology submitted comments on May 19, 2025, requesting a professional wetland delineation survey of the project area be conducted.

To provide you with time to hire a professional to conduct the survey to meet the requirements of the Department of Ecology, the Planning Division will place your above-mentioned applications on hold for six (6) months from the date of this letter. This will allow you the necessary time to provide us with the wetland delineation survey requested. When the Ecology has provided the Planning Division verification that their requirements have been met, the County's environmental determination of file EA 2025-007 can be made.

If you have any questions regarding this matter, please do not hesitate to contact the Planning Division at 509-786-5612 or Planning.department@co.benton.wa.us.

Sincerely,

Michelle Mercer, Planning Manager
Benton County Planning Division

Attachment: Department of Ecology Comment Letter

PCM 1.11

RECEIVED

APR 24 2025

Benton County
Planning Division

COTTONWOOD RUN

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization, or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. **You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown.** You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to **all parts of your proposal,** even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for lead agencies

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B, plus the Supplemental Sheet for Nonproject Actions (Part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in "Part B: Environmental Elements" that do not contribute meaningfully to the analysis of the proposal.

A. Background Find help answering background questions

1. **Name of proposed project, if applicable:** Cottonwood Run

2. **Name of applicant:** Ira Hickman

3. **Address and phone number of applicant and contact person:**

   72609 E SUNDOWN PR SE KENNEWICK, WA 99338, (509) 430-6288

4. **Date checklist prepared:**

   08/23/2024

5. **Agency requesting checklist:**

   Benton County Planning Dept.

6. **Proposed timing or schedule (including phasing, if applicable):**

   Spring 2025

7. **Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.**

   None currently.

8. **List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.**

   None

9. **Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.**

   No.

10. **List any government approvals or permits that will be needed for your proposal, if known.**

    Benton-Franklin Health District Letter

12. Give a brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

Residential subdivision of 19.78 acre parcel to include 12 lots and dedication of road rights of way to Benton County. All lots are over 1 acre in size as required to meet Benton-Franklin Health District and county zoning regulations.

13. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The proposed project is located at 103394 Kash Loop in the NW 1/4 of Section 14, T.08N., R.28E., WM., Benton County Washington.
The eastern site boundary abuts an existing BNSF Railway right of way.
Access to the site will be from Kash Loop and Abigail Place, which are served via Cottonwood Drive and Cottonwood Creek Blvd., respectively.

B. Environmental Elements

1. Earth Find help answering earth questions

a. General description of the site:

The site is 19.78 acres of undeveloped land zoned RL-1, with the exception of an existing home and accessory dwelling unit located on proposed lot 11.

Circle or highlight one: Flat, rolling, hilly, steep slopes, mountainous, other:

Site includes rolling terrain gradually sloping from south to north.

b. What is the steepest slope on the site (approximate percent slope)?

Approximately 8%

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them, and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

Warden Silt Loam (WdB)

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Site grading will involve excavating and backfilling native materials on-site.

f. Could erosion occur because of clearing, construction, or use? If so, generally describe.

Typical erosion may occur until site is fully developed/

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Estimate 10%

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any.

All disturbed area to be hydroseeded at completion of grading.

2. Air Find help answering air questions

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Construction equipment during grading and development. Typical auto emissions at full development.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No

c. Proposed measures to reduce or control emissions or other impacts to air, if any.

Dust control measures will be implemented in accordance with recommendations by the Department of Ecology. Measures include, but are not limited to, watering, lowering speed limit of construction vehicles, and reducing the amount of dust-generating activities on windy days.

3. Water Find help answering water questions

a. Surface Water: Find help answering surface water questions

1. **Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.**

No.

2. **Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.**

No.

3. **Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.**

None.

4. **Will the proposal require surface water withdrawals or diversions? Give a general description, purpose, and approximate quantities if known.**

No.

5. **Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.**

No.

6. **Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.**

No.

b. Ground Water: Find help answering ground water questions

1. **Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give a general description, purpose, and approximate quantities if known.**

No water to be withdrawn. Storm drainage runoff will infiltrate into ground at full development.

2. **Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (domestic sewage; industrial, containing the following chemicals…; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.**

Domestic sewage for each lot will include conventional septic tanks and drainfields.

c. Water Runoff (including stormwater):

1. **Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.**

Storm drainage runoff will infiltrate into ground at full development.

2. **Could waste materials enter ground or surface waters? If so, generally describe.**

No.

3. **Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.**

No.

4. **Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any.**

Storm drainage runoff will infiltrate into ground at full development.

4. Plants Find help answering plants questions

a. Check the types of vegetation found on the site:

- ☒ **deciduous tree: alder, maple, aspen, other**
- ☐ **evergreen tree: fir, cedar, pine, other**
- ☒ **shrubs**
- ☒ **grass**
- ☐ **pasture**
- ☐ **crop or grain**
- ☐ **orchards, vineyards, or other permanent crops.**
- ☐ **wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other**
- ☐ **water plants: water lily, eelgrass, milfoil, other**
- ☒ **other types of vegetation**

b. What kind and amount of vegetation will be removed or altered?

Native sage brush and grasses will be removed for grading and development.

c. List threatened and endangered species known to be on or near the site.

None.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any.

Future development will include landscaping

e. List all noxious weeds and invasive species known to be on or near the site.

None.

5. Animals Find help answering animal questions

a. List any birds and other animals that have been observed on or near the site or are known to be on or near the site.

Examples include:

- **Birds: hawk, heron, eagle, songbirds, other:** Hawks, song birds
- **Mammals: deer, bear, elk, beaver, other:** Coyotes, mice & rabbits
- **Fish: bass, salmon, trout, herring, shellfish, other:**

b. List any threatened and endangered species known to be on or near the site.

None.

c. Is the site part of a migration route? If so, explain.

Kennewick is in the Pacific Flyway.

d. Proposed measures to preserve or enhance wildlife, if any.

None.

e. List any invasive animal species known to be on or near the site.

None.

6. Energy and Natural Resources Find help answering energy and natural resource questions

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Electricity & Gas at full development.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any.

Energy efficient appliances at full development.

7. Environmental Health Find help with answering environmental health questions

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur because of this proposal? If so, describe.

No.

1. Describe any known or possible contamination at the site from present or past uses.

Site shows no evidence of potential contamination.

a. Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

None

b. Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

Fuel for construction equipment may be stored on-site

c. Describe special emergency services that might be required.

The site will use the typical emergency services provided through Benton County.

d. Proposed measures to reduce or control environmental health hazards, if any.

Fuel for construction vehicles will be handled properly to prevent spills.

b. Noise

1. **What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?**

   The BNSF operates the adjacent railway, but this will not affect the proposal.

2. **What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site)?**

   Typical noise from construction vehicles during construction, automobiles at full development.

3. **Proposed measures to reduce or control noise impacts, if any.**

   None.

8. Land and Shoreline Use Find help answering land and shoreline use questions

a. **What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.**

   Property is zoned for Residential, Low Density, not less than 1 acre in size. Adjacent properties will not be affected by this proposal.

b. **Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses because of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?**

   No

   1. **Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how?**

      No.

c. **Describe any structures on the site.**

   None.

d. **Will any structures be demolished? If so, what?**

   No.

e. **What is the current zoning classification of the site?**

   Rural Lands One Acre District (RL-1)

f. **What is the current comprehensive plan designation of the site?**

   Rural Lands

g. If applicable, what is the current shoreline master program designation of the site?

N/A.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

No.

i. Approximately how many people would reside or work in the completed project?

None.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any.

None.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any.

County Zoning requirements.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any.

None.

9. Housing Find help answering housing questions

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

12 middle income housing parcels

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None.

c. Proposed measures to reduce or control housing impacts, if any.

None.

10. Aesthetics Find help answering aesthetics questions

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

25 ft

b. What views in the immediate vicinity would be altered or obstructed?

None.

c. Proposed measures to reduce or control aesthetic impacts, if any.

None

11. Light and Glare Find help answering light and glare questions

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Minimum site illumination is planned per code

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

c. What existing off-site sources of light or glare may affect your proposal?

None.

d. Proposed measures to reduce or control light and glare impacts, if any.

None.

12. Recreation Find help answering recreation questions

a. What designated and informal recreational opportunities are in the immediate vicinity?

Hiking trails

b. Would the proposed project displace any existing recreational uses? If so, describe.

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any.

None.

13. Historic and Cultural Preservation Find help answering historic and cultural preservation questions

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.

No.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

No.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

None.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

None.

14. Transportation Find help with answering transportation questions

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

Cottonwood Drive & Cottonwood Creek Blvd provide public access to the development

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

No

c. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle, or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

No.

d. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

BNSF Railway is located adjacent to the eastern site boundary

e. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

estimate 105 trips per day with peak volumes occuring between 4-6 pm, 11 SF homes, ITE

f. Will the proposal interfere with, affect, or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No.

g. Proposed measures to reduce or control transportation impacts, if any.

None.

15. Public Services Find help answering public service questions

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

Slight increase in all public services at full development.

b. Proposed measures to reduce or control direct impacts on public services, if any.

None.

16. Utilities Find help answering utilities questions

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other:

Sewer, water, gas, power & communications.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Water - BC Water, Sewer - Septic, Elec - BPUD, Comm - Charter, Irrig - BC Water

C. Signature Find help about who should sign

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

X

SEPA Responsible Offical

Type name of signee: Ira Hickman

Position and agency/organization: Owner/ APC Services

Date submitted: 08/23/2024

D. Supplemental sheet for nonproject actions Find help for the nonproject actions worksheet

IT IS NOT REQUIRED to use this section for project actions.

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. **How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?**

    - **Proposed measures to avoid or reduce such increases are:**

2. **How would the proposal be likely to affect plants, animals, fish, or marine life?**

    - **Proposed measures to protect or conserve plants, animals, fish, or marine life are:**

3. **How would the proposal be likely to deplete energy or natural resources?**

    - **Proposed measures to protect or conserve energy and natural resources are:**

4. **How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection, such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?**

    - **Proposed measures to protect such resources or to avoid or reduce impacts are:**

5. **How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?**

    - **Proposed measures to avoid or reduce shoreline and land use impacts are:**

6. **How would the proposal be likely to increase demands on transportation or public services and utilities?**

    - **Proposed measures to reduce or respond to such demand(s) are:**

7. **Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.**

Community Development Department
Prosser Office: 620 Market Street, 1st Floor
Kennewick Office: 102206 East Wiser Parkway
www.bentoncountywa.gov

Planning Division
(509) 786-5612
Planning.department@co.benton.wa.us
102206 East Wiser Parkway, Kennewick, WA 99338

Notice of Application
(Optional DNS Process)

Benton County has received a Preliminary Plat Application and Environmental Checklist for the following project:

The Preliminary Plat of Cottonwood Run - a subdivision of 19.78 acres into 12 lots with an average lot size of 1.43.

Project Location:
The project is in the Kennewick area of unincorporated Benton County, directly east of Kash Loop and south of Abigail Place. The parcel is legally described as Section 14, Township 08 North, Range 28 East, W.M., Lot 24 of Cottonwood Estate. Parcel number 1-1488-202-0000-025.

Agency Contact:
Michelle Mercer, Planning Manager, Benton County Planning Division
Planning.Department@co.benton.wa.us
Phone Number: (509) 786-5612

Project Applicant:
Ira Hickman
72609 E. Sundown PR SE
Kennewick, WA 99338

Agency File Number:
EA 2025-007/ SUB 2025-001

Date of permit application:	April 24, 2025
Date of determination of completeness:	April 24, 2025
Date of Notice of Application:	April 28, 2025
Notice of Application Publication Date:	May 7, 2025
Comment due date:	May 21, 2025

SEPA Environmental Review: The Benton County Planning Division has reviewed the proposed project for probable adverse environmental impacts and expects to issue a Determination of Non-Significance (DNS) or Mitigated Determination of Non-Significance (MDNS). The proposal may include mitigation measures under applicable codes, and the project review process may incorporate or require mitigation measures regardless of whether an EIS is prepared. The optional DNS process in WAC 197-11-355 is being used. This may be your only opportunity to comment on the environmental impacts of the proposed project.

Agencies, tribes, and the public are encouraged to review and comment on the proposed project and its probable environmental impacts. Comments must be submitted by the due date noted above (14 days from date of publication) to the Benton County Planning Division, 102206 E Wiser Parkway, Kennewick, WA 99338. Any information submitted to Benton County is subject to the public records disclosure law for the State of Washington (RCW Chapter 42.17) and all other applicable law that may require the release of the documents to the public.

This project does require an open record hearing before the Benton County Planning Commission. A copy of the subsequent threshold determination and any other information concerning this action may be obtained by contacting the Benton County Planning Division at 102206 E Wiser Parkway, Kennewick, WA or (509) 786-5612.

Preliminary Development Regulations and Existing Environmental Documents: To evaluate the impacts of the proposed project, the following may be used for mitigation, consistency, and the development of findings and conclusions:

Regulations of Benton County including the Benton County Comprehensive Plan, BCC Title 3 Building, Fire, and Road Standards, BCC Title 6.35 SEPA, BCC Title 11 Zoning, and BCC Title 15 Critical Area Ordinance;

Regulations of the Washington State Department of Fish and Wildlife, Washington State Department of Ecology, and Washington State Department of Natural Resources;

Regulations of the Benton-Franklin Health District; and SEPA Environmental Checklist; and

Other required agency evaluations, approvals, permits, and mitigation as necessary.

Required Permits:
Benton County Building Division Grading Permit, other forms, reports, or approvals as necessary.

Required Studies:
Preliminary hydrology report.

Dated this 28th day of April, 2025, at Kennewick, Washington.

Michelle Mercer – Planning Manager
Benton County Community Development Department

Community Development Department
102206 East Wiser Parkway
Kennewick, WA 99338

Planning Division
(509) 786-5612
Planning.department@co.benton.wa.us

PCM 1.13

MITIGATED DETERMINATION OF NON-SIGNIFICANCE

File No.: EA 2025-007

Proponent: Ira Hickman
103228 Kash Loop
Kennewick, WA 99338

Benton County has received a permit application for the following project:
The Preliminary Plat of Cottonwood Run, a subdivision of 19.78 acres into 12 residential lots with an average lot size of 1.43 acres.

Project Location:
The project is located in the Kennewick area of unincorporated Benton County east of Kash Loop and south of Abigail Place in Section 14, Township 08 North, Range 28 East, W. M., parcel number 114882020000025.

Jurisdiction: Benton County, Washington.

Lead Agency: Benton County Planning Division.

Threshold Determination: The lead agency for this proposal has determined that it will not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c), provided that the following measures are taken to mitigate potential adverse impacts. Substantive authority to require mitigation is derived from WAC 197-11-660 and Benton County Code, Chapter 6.35.120. The decision was made after review of a completed environmental checklist; comments received from various agencies and other information on file with the lead agency. This information is available to the public on request.

Conditions/Mitigating Measures: See attached conditions. Benton County has received timely comments and determined that such conditions are necessary to mitigate specific adverse impacts.

Appeals: You may appeal this determination to the Benton County Planning Division at 102206 E Wiser Parkway, Kennewick, WA 99338, no later than **October 16, 2025**, by written notice. The fee for a threshold determination appeal is $800.00. An appeal of the determination must be made in writing to the Benton County Planning Division and a public hearing will be scheduled and the appellant will be notified of the date, time, and place. You should be prepared to make specific factual objections. Contact the Planning Division to read or ask about the procedures for SEPA appeals.

SEPA Responsible Official: Michelle L. Mercer
Position/Title: Planning Manager
Address: 102206 E Wiser Parkway, Kennewick, WA 99338.

Date: October 2, 2025

Michelle L. Mercer, Planning Manager
Benton County Community Development Department

Community Development Department
102206 East Wiser Parkway
Kennewick, WA 99338

Planning Division
(509) 786-5612
Planning.department@co.benton.wa.us

MDNS CONDITIONS AND MITIGATION MEASURES

FILE NO.: EA 2025-007 - Preliminary Plat of Cottonwood Run

APPLICANT: Ira Hickman
103228 Kash Loop
Kennewick, WA 99338

The environment threshold determination and conditions are based on an analysis of information contained in the file and the following documents.

1. Benton County, BCC Title 6.35 Environmental Policy (SEPA);
2. Benton County, BCC Title 11, Zoning;
3. Benton County Comprehensive Plan;
4. Benton County, BCC Title 15 Critical Area Ordinance;
5. Benton County, BCC Title 3 Building Code, Fire Code, and Road Standards; and
6. Regulations of the Washington State Department of Fish and Wildlife, Department of Ecology, Department of Natural Resources, and Department of Archaeology and Historic Preservation.

FINDINGS:

1. Location:
   a. The project is located in the Kennewick area of unincorporated Benton County east of Kash Loop and south of Abigail Place in Section 14, Township 08 North, Range 28 East, W. M., parcel number 114882020000025.
2. Scope of work:
   a. The applicant is proposing a subdivision of 19.78 acres into 12 residential lots with an average lot size of 1.43 acres to be known as the Preliminary Plat of Cottonwood Run.
3. The applicant submitted the following materials for the SEPA review process:
   a. SEPA Environmental Checklist dated April 10, 2025.
   b. Preliminary Hydrology Report dated April 24, 2025.
   c. Critical Areas Report dated September 16, 2025.
4. Benton County, BCC Title 11, Zoning:
   a. The zoning designation for the project area is Rural Lands One Acre (RL-1). This zoning district has a minimum lot size of one acre; and
   b. Subdivisions with a minimum lot size of one acre are an allowed use in the RL-1 Zoning District.
5. Benton County Comprehensive Plan:
   a. The project area is designated Rural Transition in the Benton County Comprehensive Plan.
6. Benton County, BCC Title 15, Critical Area Ordinance:
   a. Upon completion of a review of BCC Title 15 and the Benton County Critical Area Maps, the project site contains the following critical areas:
   b. Wetlands: Minor drainage.
   c. Critical Aquifer Recharge Area: None identified.

d. Fish and Wildlife Habitat Conservation Area: Ferruginous Hawk Breeding Habitat, Shrubsteppe.
e. Frequently Flooded Areas: None identified.
f. Geologically Hazardous Areas: Slopes greater that 15%.

7. The following comments were submitted by the WA State Department of Ecology on May 19, 2025:
   a. Shorelands and Environmental Assistance Program
      i. Aerial and street view photos, the National Wetland Inventory, and the National Hydrography indicate that wetlands or other aquatic resources may be present on the site. A qualified professional should survey the site and determine if wetlands or other aquatic resource protected by local Critical Area Ordinances, state and federal laws are present. If present, a mitigation plan that demonstrates how development will avoid, minimize, and mitigate impacts to the critical areas should be developed. Please reach out to Ryan Anderson at Ryan.Anderson@ecy.wa.gov if you have any questions.
   b. Water Quality Program
      i. Project with Potential to Discharge Off-Site:
         1. If your project anticipates disturbing ground with the potential for stormwater discharge off-site, the NPDES Construction Stormwater General Permit is recommended. This permit requires that the SEPA checklist fully disclose anticipated activities including building, road construction and utility placements. Obtaining a permit may take 38-60 days.
         2. The permit requires that a Stormwater Pollution Prevention Plan (Erosion Sediment Control Plan) shall be prepared and implemented for all permitted construction sites. These control measures must be able to prevent soil from being carried into surface water and storm drains by stormwater runoff. Permit coverage and erosion control measures must be in place prior to any clearing, grading, or construction.
         3. In the event that an unpermitted Stormwater discharge does occur off-site, it is a violation of Chapter 90.48 RCW, Water Pollution Control and is subject to enforcement action.
         4. More information on the stormwater program may be found on Ecology's stormwater website. Please submit an application or contact Lloyd Stevens Jr. at the Dept. of Ecology, (509) 571-3866, with questions about this permit.

8. The following comments were submitted by the WA State Department of Ecology on September 23, 2025:
   a. The Critical Areas Report dated September 9, 2025, resolves any wetland concerns.

9. The following comment was received by the WA Department of Transportation on May 19, 2025:
   a. The subject property is in the vicinity of Interstate 82 (I-82) and the Badger Road (Exit 109) interchange. In this location, Exit 109 is the primary point of access to I-82 and surrounding communities. As such, WSDOT anticipates that the majority of vehicle trips generated by this proposal will utilize the interchange. In order to mitigate this project's impacts to I-82, we recommend the proponent contribute towards the county's planned improvements to Badger Road at the interchange, in proportion to their impact.
   b. Thank you for the opportunity to review and comment on this proposal. If you have any questions regarding this letter, please contact Jacob Prilucik at (509) 577-1635.

10. The following comment was received by the Kennewick Irrigation District on May 20, 2025:
    a. Pursuant to RCW 58.17.310(1), KID would like to inform the County of the following information regarding the effect of the proposed preliminary plat upon the structural integrity (including lateral support) of KID' s facilities, other risk exposures, and the safety of the public and irrigation district, and related conditions of approval that KID deems to be necessary as a result:

i. KID requests the following in relation to the East Badger Drain:
    1. KID review and approval of grading and construction plans is required to allow KID to ensure road crossings over the East Badger Drain maintain adequate flows. Such review and approval will be coordinated as part of the County's review and Preliminary Plat approval process.
        a. KID requests the developer design the crossing for the 100-year storm event.
    2. Design considerations for proposed sanitary sewer infrastructure within this development shall include the potential for sewer effluent leakage and seepage into the East Badger Drain, and mitigation measures to prevent such.
    3. The East Badger Drain is connected to waters of the United States. Mitigation to prevent storm water from entering the East Badger Drain from the subject development is required.
        a. Stormwater systems for the project shall be designed to retain, at minimum, a 100-year storm event above the East Badger Drain.

11. The following comment was submitted by the Benton County Public Works Department on May 20, 2025:
    a. The Badger Canyon area has seen substantial growth over the past several years and has potential for a significant number of new homes to be added. With each new home comes additional traffic on roads serving the area. Roads seeing the most impact in this area are Dallas Road, Badger Road, Sagebrush Road, Cottonwood Drive, Wiser Parkway, Bermuda Road and Reata Road. Certain intersections, such as Wiser Parkway and Badger Road are already seeing levels of service below County minimums during peak traffic times.
    b. The Benton County Road Department has defined a geographic area bounded by Dallas Road on the west, the Kennewick Irrigation District main canal on the south and east and the City limits of Kennewick and Richland on the north as an area likely to contribute significant vehicles trips to impacted roads. This area will be defined on the Benton County GIS mapping system maintained for the Road Department. Within this area there is potential for over 800 new lots to be created based on estimated amounts of undeveloped land and current zoning. With an average daily trip generation of 9.57 for each single-family home there is potential to have an additional 7656 vehicle trips added to impacted roadways on full build out. The impacted roads in this area will be unable to accommodate this additional traffic without significant upgrades to the existing transportation system.
    c. Within this area the County has identified multiple projects that will be needed in order to accommodate future traffic volumes. Projects range from simple shoulder and lane widening to the addition of dedicated turn lanes to the installation of roundabouts or traffic signals and construction of new collector roadways. The approximate cost of making the necessary improvements is estimated to be in excess of $3,000,000.
    d. Without additional funding sources it is impossible for the County to make the necessary improvements. It is also unreasonable for the public to fund improvements driven by private development. Therefore, developers in this area must pay for the cost of the improvements demanded by their development. Since no single development in the area will be the sole contributor of traffic volumes that would create a nexus to require any one improvement on its own it is most equitable to distribute the cost across all potential developments. Based on the anticipated number of lots potentially able to be created and the total cost of the necessary improvements a mitigation fee of three thousand five hundred dollars ($3,500) per lot created by any subdivision must be paid by the developer. The developer shall have the option of paying this fee up front as a condition of plat approval or adding a note to the final plat that indicates this

fee will be due prior to the issuance of any building permit for lots within the subdivision.

e. The County shall use all mitigation fees collected for traffic capacity improvements that directly benefit the defined area only. Collected fees may be used to fund a project in its entirety or to leverage additional state or federal grant funds for the necessary improvements. The fees will not expire, and the County may bank fees in order to fund necessary projects.

12. The following are the Benton County Planning Division's comments:

a. The applicant shall contact Per the Critical Areas Report dated September 9, 2025, the following shall be met by the applicant:

i. Per Section 5, Project Impacts, it was identified that the East Badger Drain will be realigned in several locations.

1. The applicant shall obtain approval by KID on the proposed realignment.
2. The applicant shall work the Planning Division to obtain a Subdivision Vacation for proposed alterations to the drainage easement.

ii. Per Section 6, Proposed Mitigation, 22.29 acres of mitigation is proposed for impacts to shrubsteppe by submitting an in-lieu fee to the Benton Conservation District.

1. The applicant shall provide the Planning Division that the in-lieu fee has been submitted to the Benton Conservation District prior to final plat approval.

iii. Per Section 6, Proposed Mitigation, the applicant shall place a note on the final plat to identify migratory bird avoidance.

1. To avoid impacts to migratory birds, any vegetation removal shall occur outside the February 1 – July 31 nesting window. Any vegetation removal for this development shall only be permitted to occur between August 1 and January 31.

b. For more information, please contact the Planning Division at (509) 786-5612.

CONDITIONS:

The applicant is responsible for providing the Planning Division with verification and approval of any listed conditions. The applicant shall meet and comply with the following mitigating conditions for this Mitigated Determination of Non-Significance (MDNS).

1. Meet and comply with the Benton County Planning Division requirement of compliance with all critical area requirements of the Benton County Planning and Building Divisions for all associated building permits.

2. Meet and comply with KID's requirements:

a. KID review and approval of grading and construction plans is required to allow KID to ensure road crossings over the East Badger Drain maintain adequate flows. Such review and approval will be coordinated as part of the County's review and Preliminary Plat approval process.

i. KID requests the developer design the crossing for the 100-year storm event.

b. Design considerations for proposed sanitary sewer infrastructure within this development shall include the potential for sewer effluent leakage and seepage into the East Badger Drain, and mitigation measures to prevent such.

c. The East Badger Drain is connected to waters of the United States. Mitigation to prevent storm water from entering the East Badger Drain from the subject development is required.

i. Stormwater systems for the project shall be designed to retain, at minimum, a 100-year storm event above the East Badger Drain.

3. Meet and comply with the Benton County Public Works Department's requirement of providing a mitigation fee of three thousand five hundred dollars ($3,500) per lot which must either be paid up front by the developer as a condition of plat approval or adding a note to the final plat that indicates

this fee will be due prior to the issuance of any building permit for lots within the subdivision.

4. Meet and comply with the Benton County Planning Division requirements:
    a. Per Section 5, Project Impacts, it was identified that the East Badger Drain will be realigned in several locations.
        i. The applicant shall obtain written approval by KID on the proposed realignment.
        ii. The applicant shall obtain a Subdivision Vacation from the Planning Division for the proposed alterations to the drainage easement.
    b. Per Section 6, Proposed Mitigation, 22.29 acres of mitigation is proposed for impacts to shrubsteppe by the submittal of an in-lieu fee to the Benton Conservation District.
        i. The applicant shall provide the Planning Division that the in-lieu fee has been paid to the Benton Conservation District prior to final plat approval.
        ii. The applicant shall place the following note on the final plat:
            1. To ensure no net loss of shrubsteppe habitat functions and values from the development of this parcel, an in-lieu fee for 22.29 acres of shrubsteppe mitigation has been paid to the Benton Conservation District for offsite perpetual preservation.
    c. Per Section 6, Proposed Mitigation, the applicant shall place a note on the final plat to identify migratory bird avoidance.
        i. To avoid impacts to migratory birds, any vegetation removal shall occur outside the February 1 – July 31 nesting window. Any vegetation removal for this development shall only be permitted to occur between August 1 and January 31.

PCM 1.15

CRITICAL AREAS REPORT

Fish and Wildlife Habitat Conservation Areas, Wetlands, Frequently Flooded Areas

Parcel 114882020000025 (19.75 ac)
103228 Kash Loop. Kennewick.
Benton County, Washington

Prepared for:

Ira Hickman
APC Construction Services
103228 Kash Loop
Kennewick, WA 99338

Prepared by:

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September 9, 2025

GG Environmental, LLC
WETLANDS • FISH • WILDLIFE

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Executive Summary

Mr. Ira Hickman is the owner of Benton County parcel 114882020000025 (19.75 ac) (parcel), situs address 103228 Kash Loop Kennewick, WA 99338. Located west of East Badger Road, East of Cottonwood Drive, and south of Abigail Place, the parcel lies within unincorporated Benton County. Mr. Hickman intends to divide the parcel into 12 lots for residential development (project).

To ensure the project complies with Benton County Code (BCC), Mr. Hickman retained GG Environmental, LLC (Geoffrey Gray, MA, PWS) (GG) to complete a critical areas field investigation, as required under BCC Chapter 9.05.090, and critical areas report consistent with BCC Sections 15.02.190 and 15.14.030. The following critical areas addressed in this report, and the BCC chapters under which they are regulated, include: *Fish and Wildlife Habitat Conservation Areas* (BCC Chapter 15.14), *Wetlands* (BCC Chapter 15.04), and *Frequently Flooded Areas* (BCC Chapter 15.08).

Fieldwork was completed within the parcel by GG on August 7, 2025, and all areas within 300 feet (ft)[1] of the parcel boundary were assessed from within the parcel interior, from publicly-accessible areas, and/or in reference to historic satellite imagery.

An unnamed intermittent stream is mapped within the parcel by the USGS[2] National Hydrography Dataset. This stream is characterized as *Riverine* by the National Wetlands Inventory (NWI), *Type U (unknown)* by the Department of Natural Resources (DNR) and *Minor Drainage* by Benton County. The Kennewick Irrigation District (KID) identifies this stream as the East Badger ("West Fork Amon") Drain (drain). GG observed the drain to be dry, with no evidence of recent surface or hyporheic flows. The aggregate data strongly suggest that the drain is no longer active, under normal climatic conditions, within the reach. As such, it is recommended that the Client contact the county to determine what level of regulation (including buffer offset, if any), would apply to the drain.

No wetlands are present within the study area nor is the FEMA 100-year floodplain mapped in the project vicinity.

According to the Washington Department of Fish and Wildlife, the parcel occurs near the following Priority Habitats and Species: (1) shrubsteppe, (2) black-tailed jackrabbit, (3) Townsend's ground squirrel, and (4) ferruginous hawk.

Sandy, sloped portions of the parcel support 10.83 acres (ac) of shrubsteppe exhibiting characteristics consistent with the shrubsteppe definition by Azerrad et al. (2011). The lowest elevations along the drain are relatively flat and loamy, supporting 1.21 ac of mixed rabbitbrush (gray, green) scattered amongst dense non-native annual weeds. Within the weediest portions of the site (with the lowest shrub densities), approximately 120 individual native shrubs were documented, totaling 0.05 ac.

[1] Consistent with BCC 15.02.070(1)(iii)
[2] United States Geological Survey

Black-tailed jackrabbits were documented onsite. No evidence was observed to indicate the presence of Townsend's ground squirrel or use by ferruginous hawk.

Development of the project would result in the permanent removal of 10.83 acres (ac) of shrubsteppe, 1.21 ac of rabbitbrush, and 0.05 ac of mixed, scattered individual native shrubs. To mitigate for this impact, it is proposed to submit an in-lieu fee to the Benton County Conservation District to fund offsite perpetual preservation of 22.29 ac of shrubsteppe in Benton County.

To avoid impacts to migratory birds, vegetation removal shall be scheduled to occur outside the February 1 – July 31 nesting window (i.e., vegetation removal shall be scheduled to take place between August 1 and January 31).

Table of Contents

Figures

Tables

Appendices

Acronyms and Abbreviations

ac	acre acres
BCC	Benton County Code
Corps	United States Army Corps of Engineers
County	Benton County
DNR	Department of Natural Resources
FEMA	Federal Emergency Management Agency
ft	foot, feet
GIS	Geographic Information System
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HUC	Hydrologic Unit Code
in	inch, inches
LRR	Land Resource Region
MLRA	Major Land Resource Area
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	Ordinary high water mark
PWS	Professional Wetland Scientist
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WGS84	World Geodetic System 1984
WRIA	Water Resource Inventory Area

1. Introduction

Mr. Ira Hickman is the owner of Benton County parcel 114882020000025 (19.75 ac) (parcel), situs address 103228 Kash Loop Kennewick, WA 99338. Located west of East Badger Road, East of Cottonwood Drive, and south of Abigail Place, the parcel lies within unincorporated Benton County (**Figure 1**). Mr. Hickman intends to divide the parcel into 12 lots for residential development (project).

To ensure the project complies with Benton County Code (BCC), Mr. Hickman retained GG Environmental, LLC (Geoffrey Gray, MA, PWS) to complete a critical areas field investigation, as required under BCC Chapter 9.05.090, and critical areas report consistent with BCC Sections 15.02.190 and 15.14.030. The following critical areas addressed in this report, and the BCC chapters under which they are regulated, include: *Fish and Wildlife Habitat Conservation Areas* (BCC Chapter 15.14), *Wetlands* (BCC Chapter 15.04), and *Frequently Flooded Areas* (BCC Chapter 15.08).

The approximate geospatial center of the parcel is latitude 46°11'1.16" North, longitude 119°16'46.51" West (WGS84) (Google 2025). Elevation ranges from approximately 550 to 565 feet (ft) (Free Map Tools 2025).

The parcel also occurs within USDA Land Resource Region (LRR) B and USDA Major Land Resource Area "Columbia Basin" (NRCS 2006), Water Resource Inventory Area (WRIA) 37 (Lower Yakima), and Coyote Canyon subwatershed (12th Hydrologic Unit Code 170300031204).

2. Methods

An overview of the methods employed to determine the status of critical areas within the study area is presented in this section.

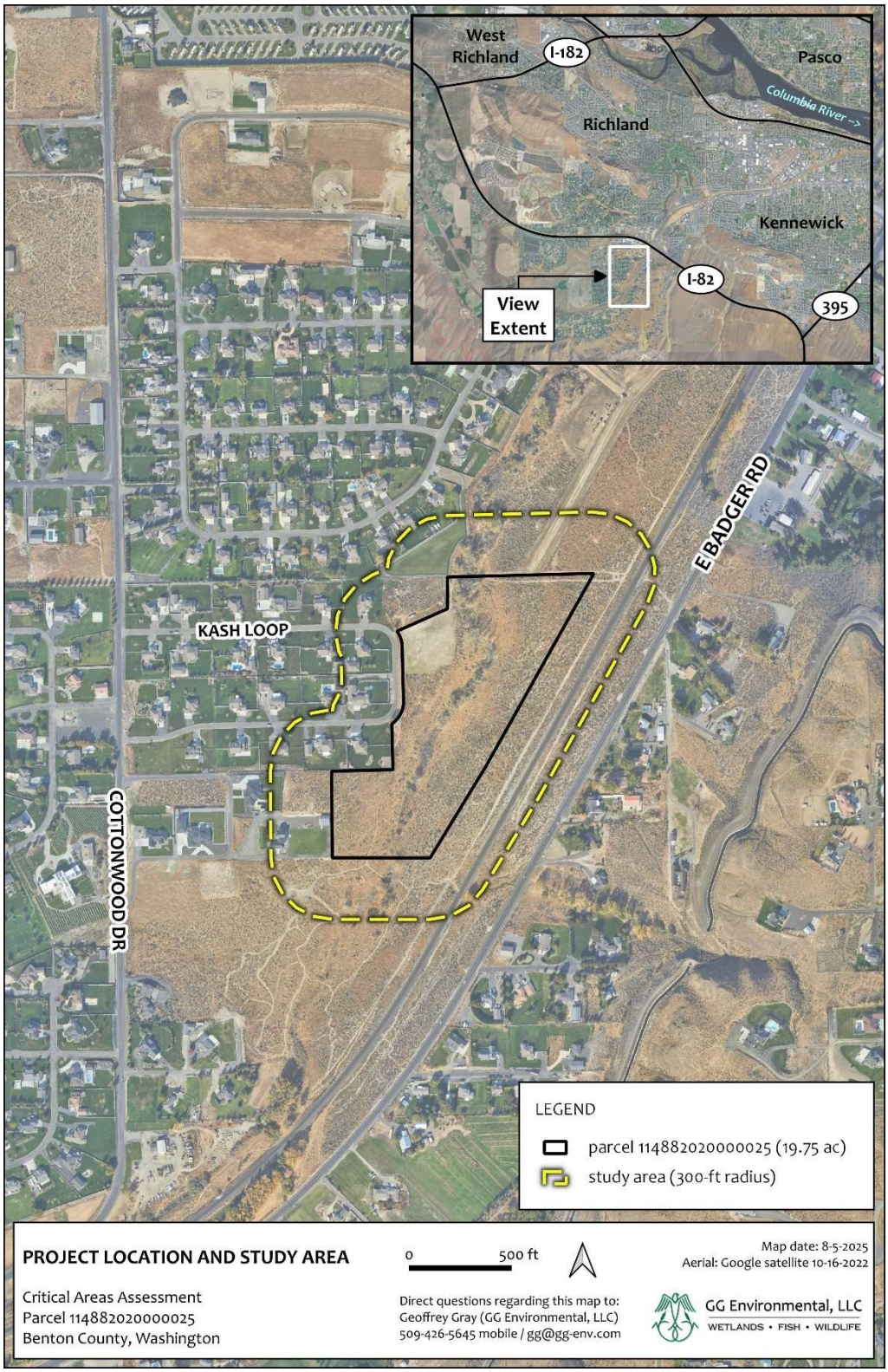
2.1. Background Data

The following sources were referenced for existing data on vegetation, topography, land use history, wetlands, streams, FEMA[3] floodplain, county code, sensitive habitats, and sensitive species:

- National Wetlands Inventory (NWI) (USFWS 2025) (**Appendix A**).
- Benton County mapped potential wetlands (Benton County 2025a).
- Benton County mapped streams (Benton County 2025a) (**Appendix B**).
- Benton County mapped 100-year FEMA floodplain (Benton County 2025a).

[3] Federal Emergency Management Agency

Figure 1. Project Location and Study Area



- Historic United States Geological Survey (USGS) topographic maps (USGS 2025a).
- NRCS mapped soil units (NRCS 2025b) (**Appendix C**).
- USGS National Hydrography Dataset (USGS 2025b).
- DNR stream type (DNR 2025a)
- Agricultural Applied Climate Information System (NRCS 2025a) (**Appendix D**).
- Historic aerial photography: 1955 (CWU 2025) and 1985-2025 (Google 2025).
- 2020 LIDAR[4] (DNR 2025b).
- Washington Natural Heritage Program (DNR 2025c).
- Priority Habitats and Species (PHS) (WDFW 2025a).
- Benton County Code – Critical Areas Ordinance (Benton County 2025b).

2.2. Field Investigation

For critical area reporting, the BCC requires all adjacent areas within 300 ft of the parcel boundaries to be evaluated[5] (**Figure 1**) which incorporates the lesser survey area radius required for wetlands.[6]

Fieldwork was completed on August 7, 2025 by GG Environmental, LLC (Geoffrey Gray, MA, PWS) (GG). The parcel was traversed on foot while surrounding adjacent zones were observed from within the parcel interior, from publicly-accessible areas, and/or in reference to historic satellite imagery. A total of 36 georeferenced photos were taken across the parcel in order to document vegetation and terrain. Representative photos are included in **Appendix E**.

Shrubsteppe quality and function was evaluated in reference to the definition of shrubsteppe by WDFW (2025b) and as cited in Azarrad et al. (2011). For streams, GG investigated the East Badger Drain (drain) while following ordinary high water mark (OHWM) guidance issued by Ecology (2016). The presence of wetlands was evaluated in reference to routine methods described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (Corps 2008). Plants were identified by scientific name and wetland indicator statuses determined per the National Wetland Plant List (Corps 2020). The presence of the FEMA 100-year floodplain was assessed in reference to critical areas mapping provided by Benton County (Benton County 2025a).

2.3. Geospatial Documentation

Key features were geospatially surveyed in the field with a Motorola G Stylus mobile phone, running the Mapit Spatial GIS application paired via Bluetooth® with a Juniper Systems Geode™ Multi-Global Navigation Satellite System (Multi-GNSS) receiver capable of sub-meter horizontal accuracy.[7]

[4] Light Detection and Ranging
[5] BCC 15.02.070(1)(iii)
[6] BCC 15.04.030(b)(2)
[7] Horizontal accuracy is typically 8-12 inches with good satellite coverage and open sky.

3. Existing Conditions

The baseline status of the parcel, supported by publicly-available science and the August 7, 2025 field survey, is described in this section.

3.1. Land Management

According to historic aerial imagery, the parcel has remained largely unmodified since at least 1955 (CWU 2025, Google 2025) while adjacent lands have been increasingly filled in by development. Within a 1-kilometer (0.62-mile) radius, the landscape is dominated by high-density residential (~25%), rural residential (~35%), and transportation corridors (~10%). Undeveloped (non-irrigated) acreage (~30%) is largely vegetated with native shrubs and annual grasses.

3.2. Soils and Topography

Eight (8) soil units are mapped by the Natural Resources Conservation Service (NRCS) within the study area (NRCS 2025b) including Esquatzel fine sandy loam, Esquatzel silt loam, Hezel loamy fine sand, Kennewick silt loam, Quincy loamy sand, and Warden very fine sandy loam. None of these units are characterized as a hydric soil. All are described as *well-drained* to *excessively drained*, with depth to groundwater exceeding 80 inches (in), with no flooding or ponding.

The parcel is located at the bottom of Badger Coulee with elevation ranging from approximately 550 to 565 ft (**Figure 2**). The east and west sides of the parcel are slightly raised, comprised of undulating Hezel loamy fine sand. The drain bisects the parcel along its relatively flat bottom, mapped as Esquatzel sandy loam and Esquatzel silt loam.

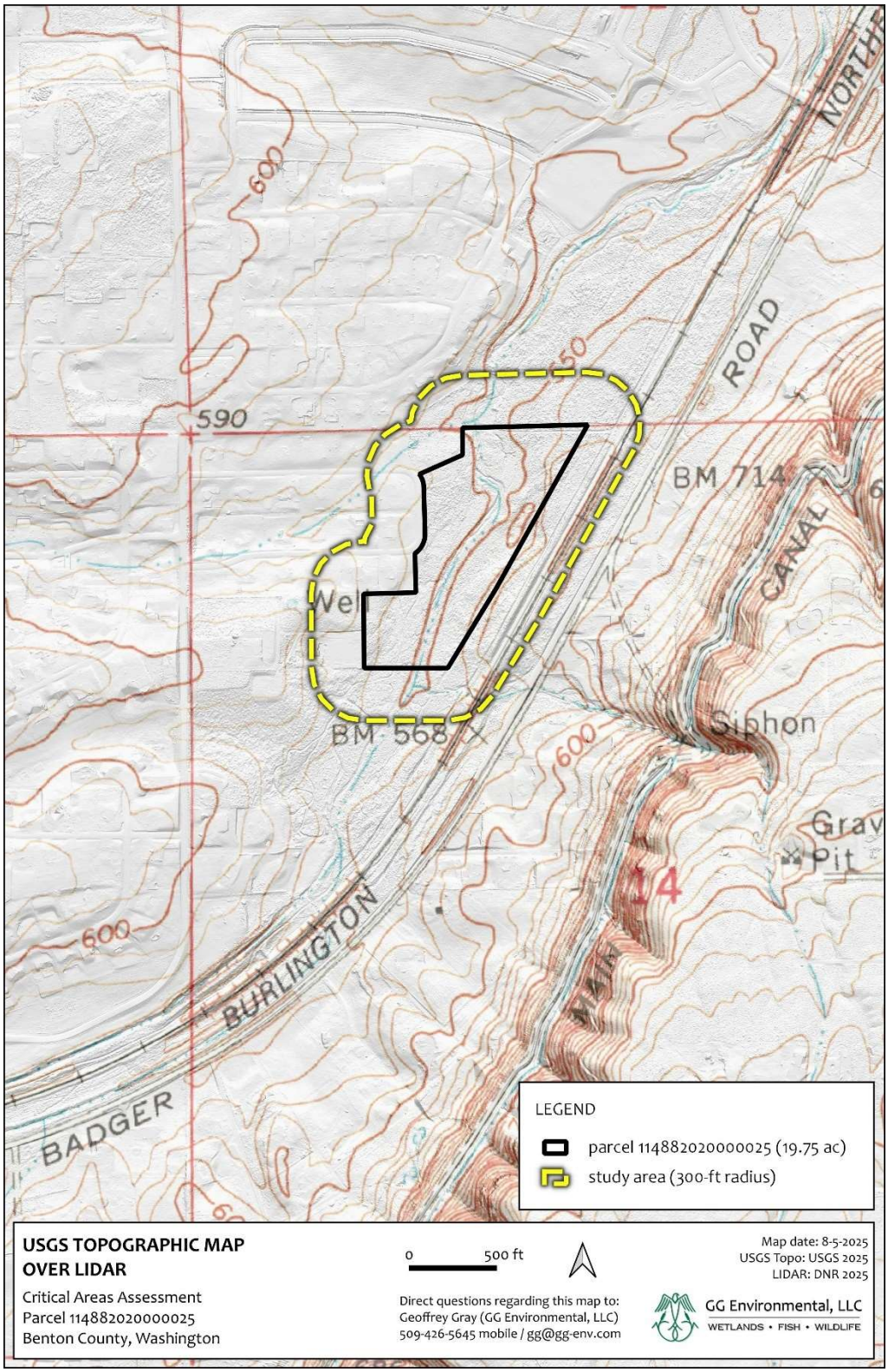
3.3. Precipitation and Hydrology

Chapter 19 of the Engineering Field Handbook (NRCS 2015) was referenced in determining that precipitation that fell within three months of fieldwork was drier than normal (30-year average). The WETS table for Kennewick documents an annual average of 7.96 in (NRCS 2025a), with only 3.58 in falling during the growing season. No rain fell within the prior 10 days of fieldwork.

3.4. Growing Season

According to Climate Analysis for Wetlands Tables (WETS) (NRCS 2025a), the growing season (28 °F or greater) at the nearest AgACIS station (Kennewick) demonstrates a 70 percent probability of occurring between March 10 and November 19 (254 days) and 50 percent between March 19 and November 10 (236 days). The wetland evaluation was completed during the growing season.

Figure 2. USGS topographic map over 2020 LIDAR



3.5. Vegetation

The property supports shrubsteppe, exhibiting characteristics consistent with the shrubsteppe definition by Azerrad et al (2011), dominated by big sagebrush (*Artemisia tridentata*) with subdominants including yellow rabbitbrush (*Ericameria nauseosa),* green rabbitbrush (*Chrysothamnus viscidiflorus*), and spiny hopsage (*Grayia spinosa*). Primarily rooted upon elevated, sandier soils, shrubsteppe exhibits a relatively-open and sandy substory, with relatively low cover of non-native grasses or weeds. Cryptobiotic crust was observed in patches throughout. The lowest topographic elevations along the drain are relatively flat and loamy, supporting scattered and mixed rabbitbrush amongst heavy cover of non-native annual weeds, dominated by tall tumble mustard (*Sisymbrium altissimum*) and cheatgrass (*Bromus tectorum*).

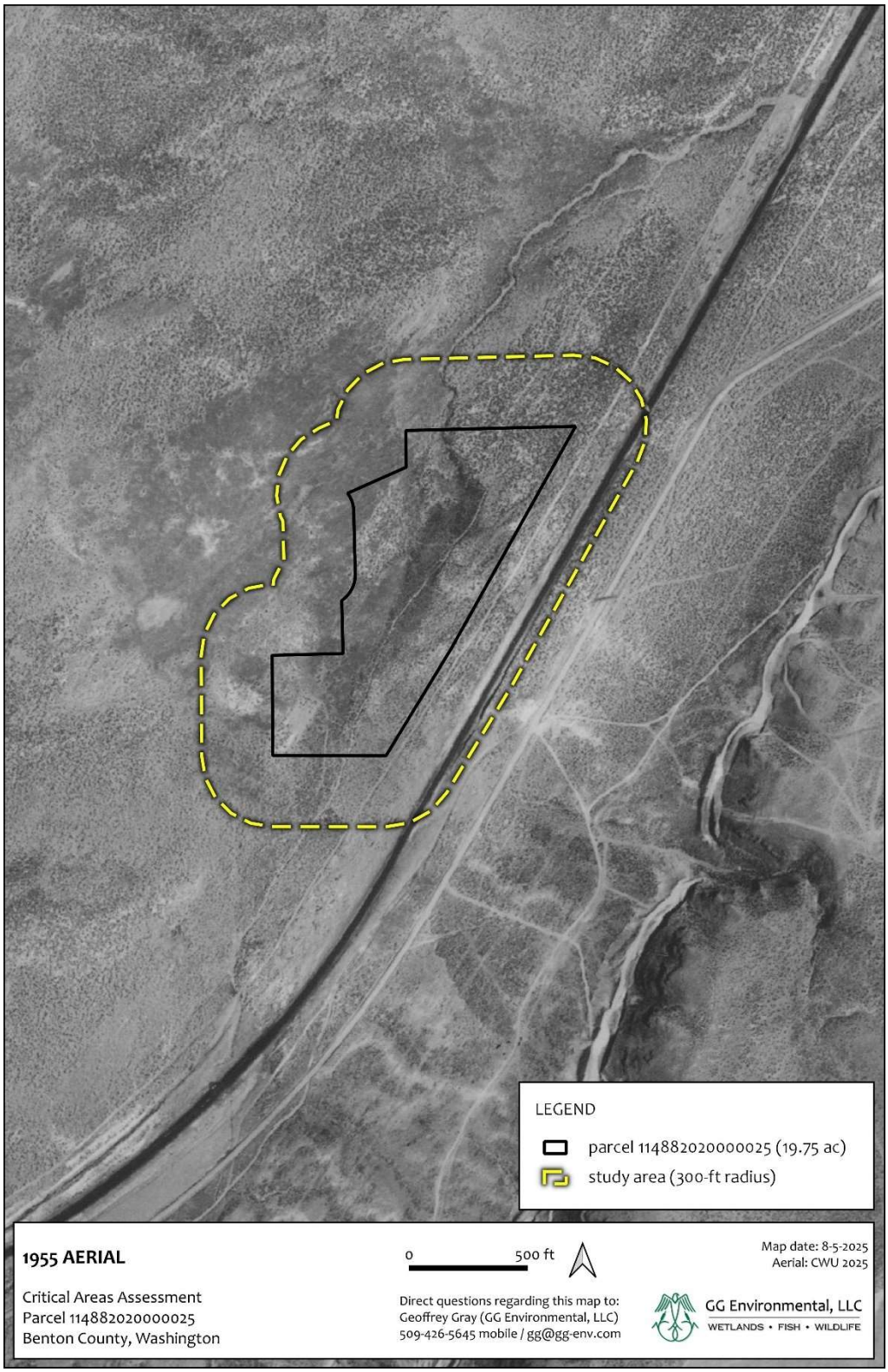
3.6. Streams

The National Hydrography Dataset (NHD) (USGS 2025b), maps an unnamed intermittent stream within the parcel, as illustrated in the USGS topographic map (**Figure 2**). This stream is characterized as *Riverine* by the NWI, *Type U* (unknown) by the DNR, and *Minor Drainage* by Benton County.

The Kennewick Irrigation District (KID) identifies this stream as the East Badger ("West Fork Amon") Drain, an irrigation ditch constructed through uplands in the 1950s. It argues that the irrigation ditch is not a Waters of the United States subject to 404 permitting (KID 2025, **Appendix F**).

According to KID, prior to the application of irrigation water in Badger Coulee, the presence of any water in what is now the drain would have been ephemeral in nature and the result of a sustained and voluminous precipitation event, such as rain-on-snow. The drainage was a dry wash (**Figure 3**) in an arid desert that receives an average of seven inches of precipitation in a year. At present, any water present in the drain would be KID irrigation return flows. Furthermore, even when some irrigation return flow may be present in parts of the drain during the irrigation season, there are hydrological breaks in which surface water is not present. There is no direct connection to perennial waters located further downstream.

Figure 3. 1955 Aerial



4. Findings

4.1. FEMA Floodplain

According to Benton County (Benton County 2025a), no FEMA 100-year floodplain is mapped in the parcel vicinity. As such, the project does not occur within a frequently flooded area.

4.2. Wetlands

Wetlands are *those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas* (Environmental Laboratory 1987). A wetland exhibits three indicators: wetland vegetation, hydrology during the growing season, and hydric soil.

GG observed no evidence of recent surface or hyporheic flows nor the presence of wetland hydrology or hydric soil indicators. As such, the project will not affect wetlands. Two representative photos of the channel bottom are included in **Appendix E** (photo points 18 and 36).

4.3. Fish and Wildlife Habitat Conservation Areas

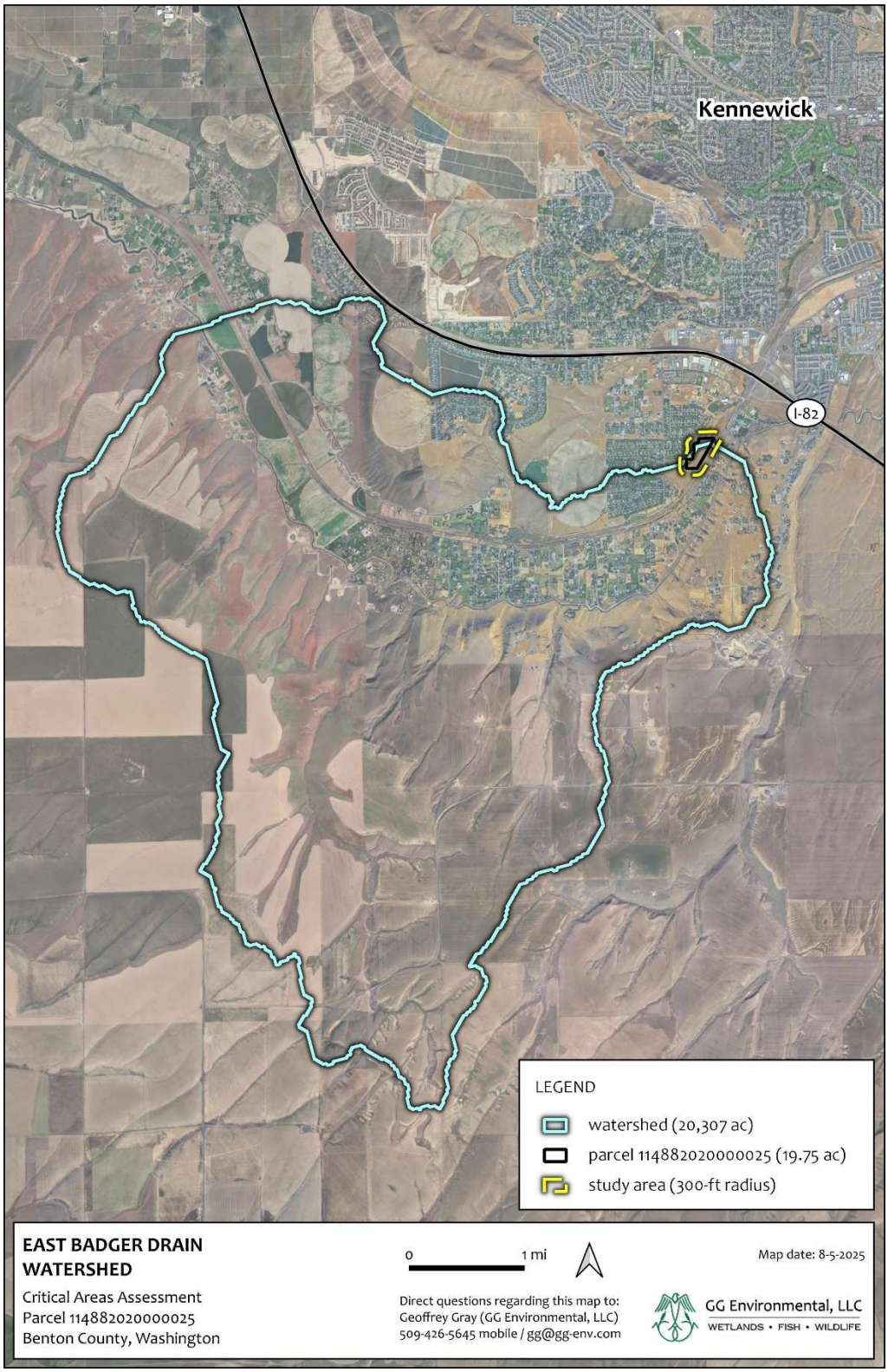
The parcel vicinity is mapped by the Washington Department of Fish and Wildlife (WDFW 2025a) as occurring near the following Priority Habitats and Species (PHS): (1) shrubsteppe, (2) black-tailed jackrabbit, (3) Townsend's ground squirrel, and (4) ferruginous hawk. The East Badger Drain, evaluated as a potential stream, is also covered in this section.

4.3.1. Streams

The East Badger Drain was evaluated as a potential stream for the presence of a bed, bank, channel, and/or ordinary high water mark (OWHM), following guidance issued by Ecology (2016). The USGS maps the contributing basin (watershed) at 20,307 ac (USGS 2025c) (**Figure 4**), most of which is comprised of dryland wheat above the south rim of Badger Coulee. Given the amount of development within the coulee bottom, including roads, rural residential development, a railroad, and irrigated pastureland, it is unknown how much runoff is channeled through the parcel's drain reach under normal climatic conditions. Historic satellite imagery does not show surface flow within the drain in the parcel vicinity. Lush green vegetation along the drain, an indicator of surface or hyporheic flow, is last evident in 2013.

GG observed no evidence of recent surface or hyporheic flows. Vegetation was extremely dry as were soils within the drain bottom. Many trees, especially cottonwoods, have died, presumably due to lack of moisture. The aggregate science strongly suggest that the drain is no longer active, under normal climatic conditions, within the reach. As such, it is recommended that the Client contact the county to determine what level of regulation (including buffer offset, if any) would apply to the drain.

Figure 4. East Badger Drain watershed



4.3.2. Shrubsteppe

Shrubsteppe is defined by WDFW, as cited in Azarrad et al. (2011), as a non-forested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs. Although big sagebrush is the most widespread shrubsteppe shrub, other dominant (or co-dominant) shrubs include antelope bitterbrush, three-tip sagebrush, scabland sagebrush, and dwarf sagebrush. Dominant bunchgrasses include (but are not limited to) Idaho fescue, bluebunch wheatgrass, Sandberg bluegrass, Thurber's needlegrass, and needle-and-thread. Sites can also have a layer of algae, mosses, or lichens. In areas with greater precipitation or on soils with higher moisture-holding capacity, shrubsteppe can also support a dense layer of forbs (i.e., broadleaf herbaceous flora). Shrubsteppe contains various habitat features, including diverse topography, riparian areas, and canyons. Another important component is habitat quality (i.e., degree to which a tract resembles a site potential natural community), which may be influenced by soil condition and erosion as well as the distribution, coverage, and vigor of native shrubs, forbs, and grasses. At some more disturbed sites, non-natives such as cheatgrass or crested wheatgrass may be co-dominant species. Fire disturbance is an ecological component of shrubsteppe. Shrubsteppe disturbed by fire may lack the aforementioned vegetative components during periods of post-fire recovery.

Although shrub canopy cover can be as high as 60%, less disturbed habitat typically has a canopy between 5% and 30%. In areas of higher precipitation, shrub cover is lower while grasses and forbs are more prevalent. Healthy shrubsteppe supports a soil surface layer of cryptobiotic crust. Comprised of a complex and fragile community of blue-green algae, bacteria, fungi, lichens, or mosses, these crusts form in the spaces between perennial bunchgrasses, forbs, and shrubs. Soil crusts benefits habitat by locking in soil moisture, reducing erosion, and by increasing the soil's nutrients and productivity. They also help prevent the establishment and spread of invasive plants such as cheatgrass.

Shrubsteppe Assessment: The parcel supports 10.83 ac of shrubsteppe (**Figure 5**) and 1.21 ac dominated by rabbitbrush and non-native, annual weeds. An additional 0.05 ac of scattered, individual native shrubs was documented amongst the most weedy, disturbed areas (120 shrubs with an average canopy diameter estimated at five (5) ft).

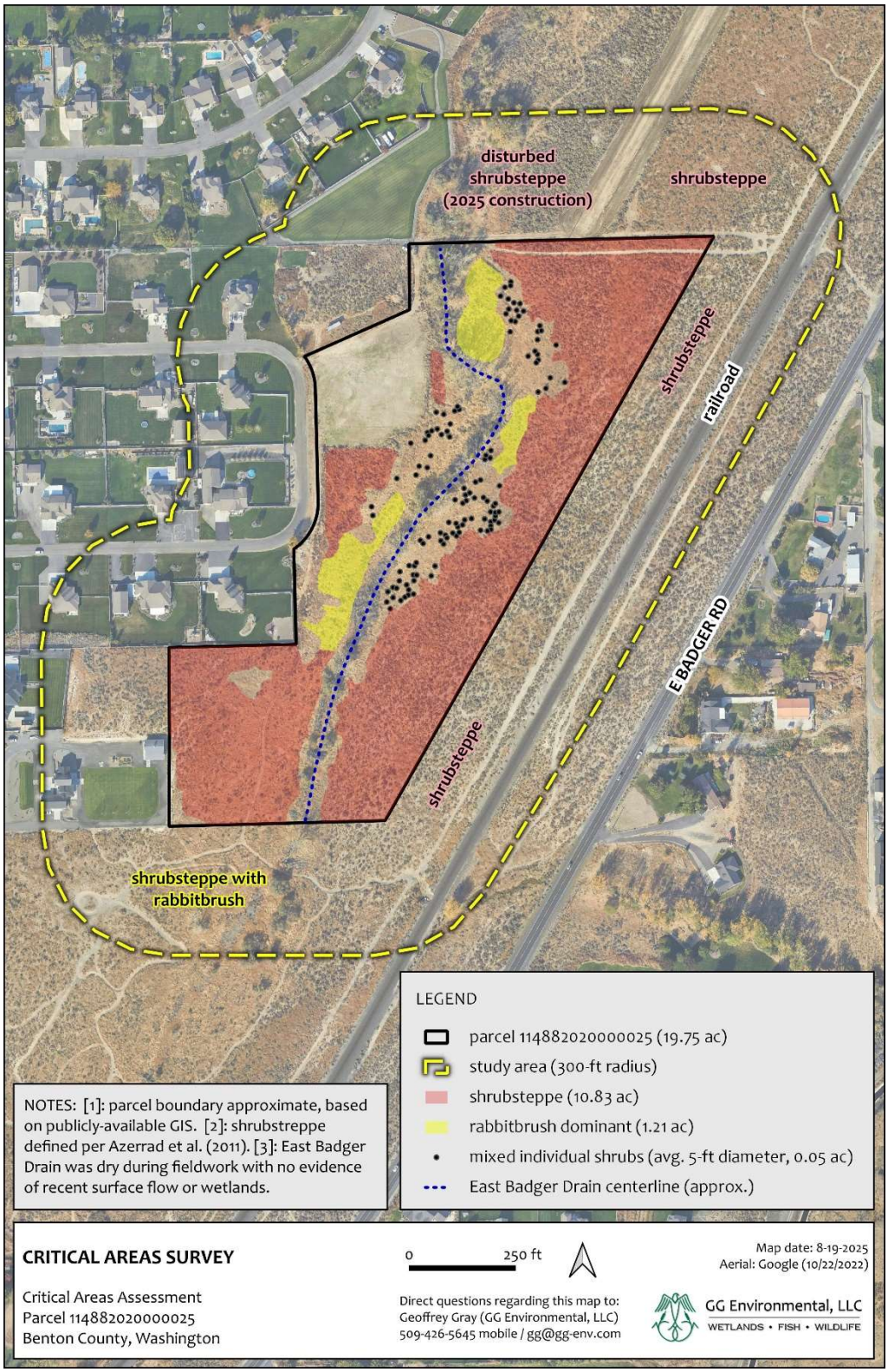
No native bunchgrasses were observed within the parcel but cryptobiotic crust is associated with sandy soils within shrubsteppe. Non-native cheatgrass and tall tumble mustard are dominants in the understory, especially in the loamy bottomland.

4.3.3. Black-tailed jackrabbit

Life history obtained from WDFW 2025c.

In central Washington, east of the Cascade Mountains, black-tailed jackrabbit (*Lepus californicus*) (State Candidate) distribution is concentrated in the semi-arid Columbia Plateau shrubsteppe and grassland habitats, and extends south into Oregon. Areas used include habitats dominated by sagebrush and rabbitbrush, as well as areas of mixed grassland and shrub. Black-tailed jackrabbits tend to occupy areas with more shrubs and less grass than white-tailed jackrabbits. The black-tailed jackrabbit is one of three species of hare in Washington. The other two species are the white-tailed

Figure 5. Critical Areas Investigation



jackrabbit and snowshoe hare. Hares differ from rabbits in that young are born fully furred with their eyes open, and they can hop within hours of their birth. Predators known to prey on black-tailed jackrabbits include coyotes, badgers, bobcats, golden eagles, several species of hawk, owls, rattlesnakes, and gopher snakes.

Determination: Numerous fecal pellets were observed throughout the parcel, of widely-varying diameters, suggesting the presence of both the introduced Eastern cottontail (*Sylvilagus floridanus*) and black-tailed jackrabbit. Although no cottontails were observed, GG noted two mature black-tailed jackrabbits in the field. Mr. Hickman, a local resident, mentioned that jackrabbits are numerous in the area and they graze the grass of local manicured lawns.

4.3.4. Townsend's ground squirrel

Life history obtained from WDFW 2025d.

The Townsend's ground squirrel (*Urocitellus townsendii townsendii*) (State Candidate) is only found in Washington in the Columbia Basin west of the Columbia River in Klickitat, Benton, Yakima, and Kittitas counties. A burrowing species, it is found primarily in small to fairly large colonies, but can also occur solitarily. The squirrels historically occurred primarily in native shrubsteppe, grasslands, and large patches of sagebrush at the lower edges of forest. A variety of human-modified habitats are now also occupied, including pastures, abandoned fields, orchards, vineyards, hop fields, canal banks, and sites adjacent to irrigated fields and springs. Occupied sites must have ample soil depths to provide space for burrow construction. The squirrels are active for only four to five months, spending the rest of the year hibernating. Adults emerge from hibernation from January to February and mate soon after. Litters average about eight pups and first appear above ground in March to April. Adults and juveniles consume large amounts of food before hibernation in an effort to gain adequate fat reserves to survive through hibernation. Animals enter hibernation in May and June. Burrows provide safety from predators, shelter from bad weather, protection for raising young, and a stable environment for hibernation. Diet is broad and comprised mainly of grasses, forbs, and seeds. American badgers, raptors, and snakes are the most important predators.

Determination: No squirrels of any kind were observed nor any burrows capable of supporting squirrels. Although Townsend's ground squirrels are known to tolerate human noise and visual disturbance if substantial habitat is available, the encroachment of the parcel by development, predation pressure by coyotes (scat observed), and surrounding human disturbance makes squirrel presence unlikely.

4.3.5. Ferruginous hawk

Life history obtained from Richardson et al. 1999.

In Washington, the ferruginous hawk (*Buteo regalis*) (State Endangered) frequents shrub-steppe in the channeled scablands and juniper-savannah areas of the Columbia Basin. Landscapes comprised primarily of shrubsteppe, native prairie, hayland, and pasture are favored for nesting, while cropland is avoided. Most nests are found in areas with a high proportion of grassland, shrubland, and juniper forest and a low proportion of wheatland. Ferruginous hawk populations decline consistently once cultivated land exceeds 30% of the area. In Washington, this species nest on rock outcrops, steep low

cliffs, ledges on hills, in some canyons, in isolated trees, and on powerline towers or other artificial structures. Sensitive to disturbance, pairs may abandon nests even when mildly disturbed during nest building or incubation. Rather than becoming acclimated to repeated disturbance, ferruginous hawks become sensitized, flush at greater distances, and typically nest farther from human habitations than closely related raptor species. Preying on small- to medium-size mammals and, to a lesser extent, snakes, birds, and insects, northern pocket gophers appear to dominate the diet.

Determination: Although the survey area exhibits some foraging habitat value for ferruginous hawks due to presence of undeveloped shrubsteppe, the shrubsteppe is small, fragmented, and subject to disturbance in the form of rural development, high-density residential housing, agriculture, transportation corridors, and anthropogenic activity. Although the vicinity likely supports prey species (gophers, voles, mice, snakes, cottontail rabbits, and black-tailed hares), it provides insignificant foraging habitat acreage in the context of larger expanses of alternative, less-disturbed habitat. Given the aversion of ferruginous hawk to human disturbance, this species is unlikely to be affected by the project.

5. Project Impacts

5.1. Frequently Flooded Areas, Wetlands

No FEMA 100-year floodplain is mapped in the parcel vicinity nor are wetlands present. As such, no impact to these critical areas would be incurred by the project.

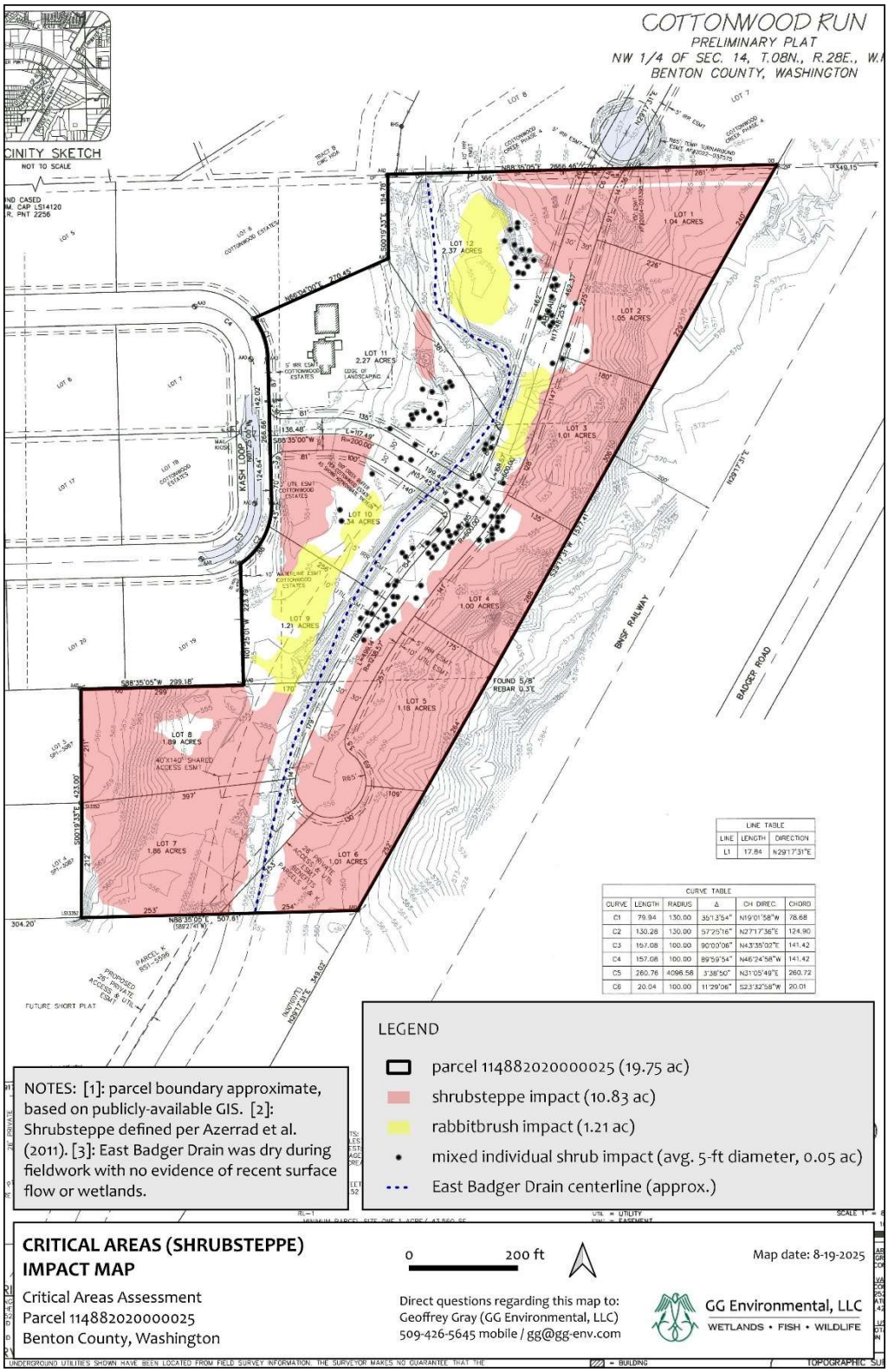
5.2. Streams

The East Badger Drain channel will be largely avoided during construction but realigned in several locations to match proposed development. It is recommended that Mr. Hickman contact the county to determine what level of regulation (including buffer offset, if any) would apply to the drain.

5.3. Shrubsteppe

In developmental planning for the parcel, shrubsteppe avoidance, minimization, and mitigation measures, consistent with the BCC 15.02.220 were considered for implementation. Given the baseline fragmentation of shrubsteppe by existing residential and transportation corridors, as well as continued and rapid development in the vicinity, any shrubsteppe potentially preserved within the parcel boundary would become increasingly fragmented and serve as a perpetual maintenance burden and fire risk. As such, it is proposed to develop the entire parcel acreage, resulting in the removal of 10.83 ac of shrubsteppe, 1.21 ac of rabbitbrush, and 0.05 ac of scattered, mixed native shrubs (**Figure 6**).

Figure 6. Shrubsteppe Impact



6. Proposed Mitigation

The following mitigation is proposed to ensure that the project does not result in net loss of shrubsteppe habitat functions and values per BCC 15.14.040(a). On-site shrubsteppe preservation was considered, but for the reasons outlined in **Section 5.3**, this option is deemed impracticable.

6.1. Offsite shrubsteppe preservation via in-lieu fee

To mitigate for the shrubsteppe impact, it is proposed to submit an in-lieu fee to the Benton County Conservation District for the offsite perpetual preservation of 22.29 acres of shrubsteppe in Benton County. The total acreage to be preserved is calculated based on observed shrub community functional diversity onsite, contrasted to the description of climax shrubsteppe by Azarrad et al. (2011) and WDFW (2025b) (**Table 1**).

Table 1. Shrub Community Impacts and Proposed Mitigation

Parcel 114882020000025 (19.75 ac)	Shrubsteppe			Rabbitbrush + scattered, mixed native shrubs			Total Mitigation (ac)
	Impact (ac)	Mitigation ratio	Mitigation (ac)	Impact (ac)	Mitigation ratio	Mitigation (ac)	
	10.83	2 : 1	21.66	1.26	0.5 : 1	0.63	22.29

6.1.1. Shrub community functional diversity

Rabbitbrush is fast-growing and is described by the United States Forest Service (USFS) as an early seral species that rapidly invades and colonizes disturbed sites (USFS 2025). In associations where it is a part of the shrubsteppe climax community, it increases with overgrazing and will invade into associations where it is not part of the climax community (Form 6B of Rocchio et al. 2024). It is neither identified as a component of a mature shrubsteppe climax community by Azarrad et al. (2011) nor is it highlighted as a keystone species of healthy shrubsteppe by WDFW (2025b). As such, areas dominated by rabbitbrush do not reflect similar functions and values to that of climax shrubsteppe, as defined.

As such, it is proposed that the shrub community onsite be divided into shrubsteppe (big-sagebrush dominant) (10.83 ac) and rabbitbrush (rabbitbrush dominant (1.21 ac), plus the minor acreage of scattered, mixed native shrubs (0.05 ac)). The mitigation ratio proposed for the impact to shrubsteppe (10.83 ac) is 2:1 following recommendations by Rocchio et al. 2011. However, for the impact to rabbitbrush + mixed native shrubs (1.26 ac), a reduced ratio of 0.5:1 is proposed. As such, the total impact of 12.09 ac is to be mitigated, in-kind and off-site, via the perpetual preservation of 22.29 ac of shrubsteppe in Benton County, financed via in-lieu fee through the Benton County Conservation District.

6.2. Migratory Bird Avoidance

To avoid impacts to migratory birds, vegetation removal shall be scheduled to occur outside the February 1 – July 31 nesting window (i.e., vegetation removal shall be scheduled to take place between August 1 and January 31.

7. Consultant Qualifications

Geoffrey Gray is a professional biologist and wetland scientist whose 28-year career has provided him with a unique breadth of experience that can readily assist you in moving your project forward.

Investing eight years in higher education, he earned a Bachelor's Degree in Business Management and a Master's degree in Biology from California State University at Fresno.

Geoffrey has earned 12.4 credit hours of certified professional wetland training, including completion of the *38-hour Army Corps of Engineers (Corps) Wetland Delineation and Management Training Program*, as well as Corps *Advanced Wetland Delineation ,* Corps *Delineation Manual Regional Supplements*, Washington State Department of Ecology (Ecology) *2014 Wetland Rating System*, Ecology *Credit-Debit Method for Estimating Mitigation Needs*, Ecology *Selecting Wetland Mitigation Sites Using a Watershed Approach*, and multiple courses in wetland plant identification.

Continuously employed as a wetland, fish, and wildlife biologist since 1997, while serving tenures in field research, a large environmental consulting firm, state agencies in both California and Washington, and as an independent environmental consultant, Geoff's resume includes 20 years of full-time duty as a wetland biologist, with experience ranging from the unique vernal pool wetland habitats of California's Central Valley to the diverse wetlands of Eastern Washington State, stretching from the Cascade crest to Idaho.

Spanning his career, Geoff has performed hundreds of wetland delineations and has managed 35 wetland mitigation/riparian restoration sites. As a fish and wildlife biologist, he has evaluated over 600 projects for compliance under the Endangered Species Act, including 128 federal consultations.

Geoff founded GG Environmental, LLC in 2015, and serves a diverse palette of clients including salmonid habitat restoration groups, private landowners, land developers, Yakama Nation, commercial enterprises, state agencies, and local governments who need assistance in overcoming the challenges of Critical Areas/Shorelines permitting and Endangered Species Act consultation.

A professional-level GPS/GIS user for 27 years, Geoff employs cutting-edge GPS technology in the field and is proficient in GIS mapping with ArcGIS and QGIS.

Certified as a Professional Wetland Scientist by the Society of Wetland Scientists, Geoff's work is performed to the highest standards and is fully insured.

8. References

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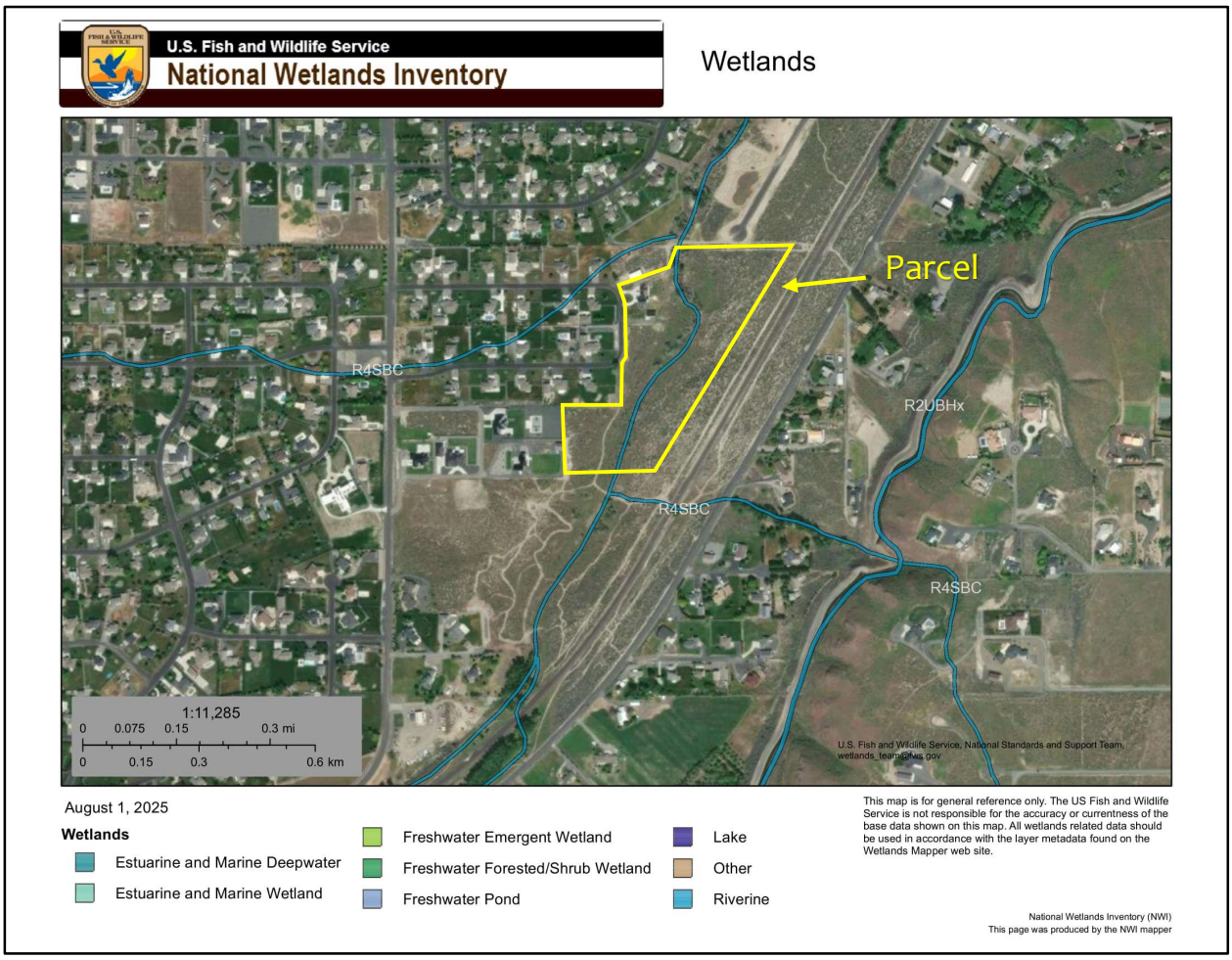
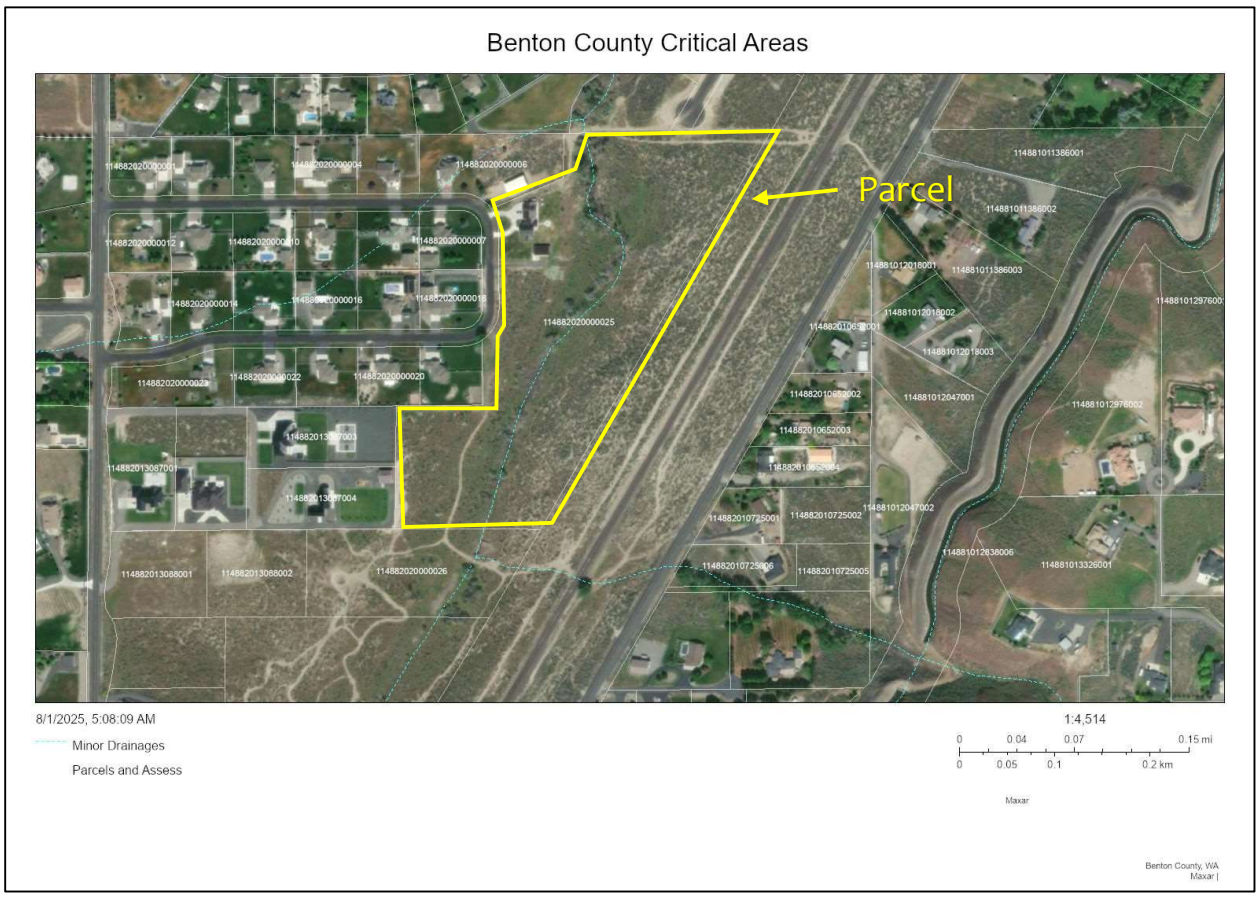
Appendix A. National Wetlands Inventory

No mapped potential wetlands. Mapped "riverine" stream present.



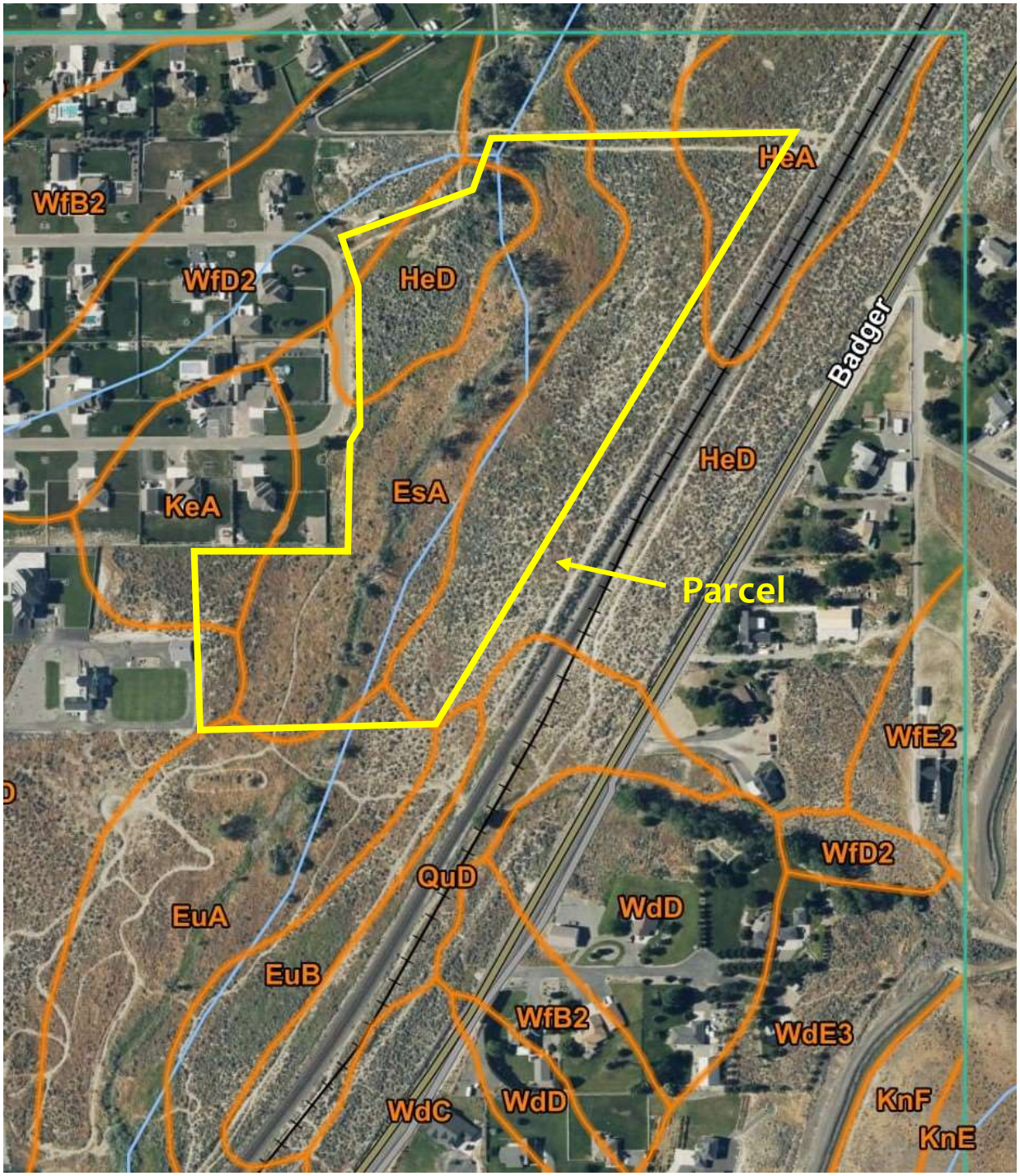
Appendix B. Benton County Critical Areas

No mapped potential wetlands or FEMA floodplain. Mapped "minor drainage" present.



Appendix C. NRCS Mapped Soils

Eight (8) soil units are mapped within the parcel boundary (highlighted in yellow on the next page). None of the soil units are characterized as hydric soils.



Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
EsA	Esquatzel fine sandy loam, 0 to 2 percent slopes	12.3	8.0%
EuA	Esquatzel silt loam, 0 to 2 percent slopes	11.1	7.2%
EuB	Esquatzel silt loam, 2 to 5 percent slopes	4.2	2.7%
HeA	Hezel loamy fine sand, 0 to 2 percent slopes	6.3	4.1%
HeD	Hezel loamy fine sand, 2 to 15 percent slopes	57.6	37.4%
KeA	Kennewick silt loam, 0 to 2 percent slopes	5.0	3.3%
KnE	Kiona very stony silt loam, 0 to 30 percent slopes	0.5	0.3%
KnF	Kiona very stony silt loam, 30 to 65 percent slopes	1.7	1.1%
QuD	Quincy loamy sand, 2 to 15 percent slopes	6.7	4.4%
WdC	Warden silt loam, 5 to 8 percent slopes	3.5	2.3%
WdD	Warden silt loam, 8 to 15 percent slopes	9.2	5.9%
WdE3	Warden silt loam, 15 to 30 percent slopes, severely eroded	6.7	4.4%
WfB2	Warden very fine sandy loam, 2 to 8 percent slopes, eroded	13.7	8.9%
WfD2	Warden very fine sandy loam, 8 to 15 percent slopes, eroded	12.9	8.4%
WfE2	Warden very fine sandy loam, 15 to 30 percent slopes, eroded	2.7	1.7%
Totals for Area of Interest		**154.2**	**100.0%**

Appendix D. Climate (WETS Table)

Precipitation Analysis

Precipitation analysis per NRCS[8]. All data were obtained from the AgACIS weather station at the Kennewick[9], Benton County. Fieldwork was completed on August 7, 2025.

Drier than normal climatic conditions prevailed the previous three months prior to fieldwork (May through July). No rain falling the prior 10 days of fieldwork.

		Long-term rainfall records[1] (inches)			WETS Station: KENNEWICK, WA				
	Month	3 yrs. in 10 less than	Average	3 yrs. in 10 more than	Total Rainfall Obs.[2]	Condition dry, wet, normal[3]	Condition Value	Month weight value[4]	Product of previous two columns
1st prior month	Jul	0.10	0.24	0.27	0	Dry	1	3	3
2nd prior month	Jun	0.22	0.40	0.48	0	Dry	1	2	2
3rd prior month	May	0.36	0.67	0.81	1.37	Wet	3	1	3
								Sum	**8**[5]

[1] WETS table; [2]Accumulated Daily Precipitation; [3] WETS table "30% more than and 30% less than values ere referenced to compare recorded rainfall to statistically-normal precipitation; [4] Value: Dry = 1; Normal = 2; Wet = 3;
[5] 6-9: drier than normal, 10-14: normal, 15-18: wetter than normal.

Date (2025)	Precipitation Total (inches)[1,2]
July 29 – August 7	0

[1] WETS table – Daily Data for a Month
[1] WETS table – Monthly Total Precipitation.

[8] Natural Resources Conservation Service. 2015. Hydrology Tools for Wetland Identification and Analysis. Chapter 19 in Part 650 Engineering Field Handbook. Pages 19-85 through 19-89. US. Department of Agriculture, NRCS. Available at: https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=37808.wba
[9] AgACIS station: Kennewick. Benton County (FIPS 53005). https://agacis.rcc-acis.org/?fips=53005.

Appendix E. Photo Points

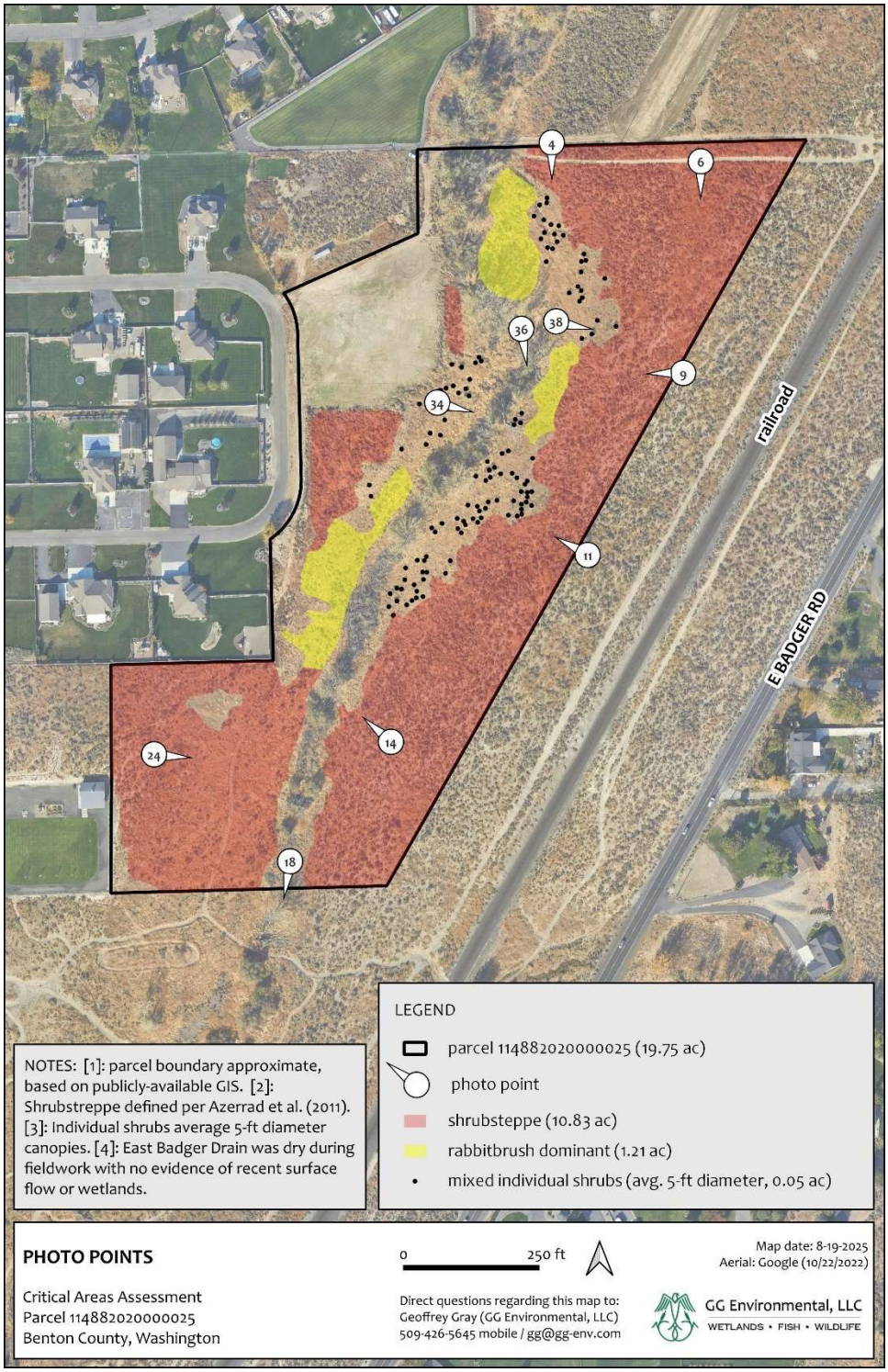


Photo Point 4. Rabbitbrush-dominant zone with dense weeds. View toward S.

Photo Point 6. Shrubsteppe. View toward S.

Photo Point 9. Shrubsteppe. View toward W.

Photo Point 11. Shrubsteppe. View toward NW.

Photo Point 14. Shrubsteppe. View toward NW.

Photo Point 18. East Badger Drain relict channel. View toward S.

Photo Point 24. Shrubsteppe (less dense with more weeds). View toward E.

Photo Point 34. Dense weeds with sparse mixed shrubs. View toward E.

Photo Point 36. East Badger Drain relict channel bottom. View toward S.

Photo Point 38. Rabbitbrush-dominant zone (sparse shrubs) next to shrubsteppe. View toward E.

Appendix F. KID Preliminary Plat Comment Letter

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Planning Division

Agency File Number: EA 2025-007/SUB 2025-001

Applicant: Ira Hickman

Section 14, Township 08 North, Range 28 East, W.M., Lot 24

Parcel Number 1-1488-202-0000-025

05/07/2025

Michelle Mercer,

I would like to express the concern for more development along the Railroad tracks, an old natural drainage and previous water way for animal habitat for this possible new development. The area of concern has been an area of abundant animals from Hawks, Great Horn Owls, Barred Owls, Quail, Ground Squirrel, Cotton Tail Rabbits and the endangered Black tailed Jack rabbits.

This area is frequently used as a walk way for all people in the surrounding area and would limit anyone from the occasional walk and seeing wildlife in this area that everyone has grown accustomed too. Please reconsider allowing more development of this land locked area and keep as is in a natural state.

Just like we saw the flood in this area from a large snow melt off on 12/27/23 and how the landscape of houses yards, fences caused damage to surrounding homes, yards, septic systems and shops. This area was used as a large water collection from the West hills melt. The 100 yr flood path travels NE down Kash Loop to this area.

Please consider NO NEW DEVELOPMENT on KASH LOOP.

Thank You

BENTON COUNTY WA

PUBLIC WORKS DEPARTMENT

TO: PLANNING DEPARTMENT

FROM: SHANE ELLEDGE

CC: CRISTINA WOODS

DATE: MAY 20, 2025

SUBJECT: COMMENTS – SEPA, EA 2025-007 COTTONWOOD RUN

The Badger Canyon area has seen substantial growth over the past several years and has potential for a significant number of new homes to be added. With each new home comes additional traffic on roads serving the area. Roads seeing the most impact in this area are Dallas Road, Badger Road, Sagebrush Road, Cottonwood Drive, Wiser Parkway, Bermuda Road and Reata Road. Certain intersections, such as Wiser Parkway and Badger Road are already seeing levels of service below County minimums during peak traffic times.

The Benton County Road Department has defined a geographic area bounded by Dallas Road on the west, the Kennewick Irrigation District main canal on the south and east and the City limits of Kennewick and Richland on the north as an area likely to contribute significant vehicles trips to impacted roads. This area will be defined on the Benton County GIS mapping system maintained for the Road Department. Within this area there is potential for over 800 new lots to be created based on estimated amounts of undeveloped land and current zoning. With an average daily trip generation of 9.57 for each single-family home there is potential to have an additional 7656 vehicle trips added to impacted roadways on full build out. The impacted roads in this area will be unable to accommodate this additional traffic without significant upgrades to the existing transportation system.

Within this area the County has identified multiple projects that will be needed in order to accommodate future traffic volumes. Projects range from simple shoulder and lane widening to the addition of dedicated turn lanes to the installation of roundabouts or traffic signals and construction of new collector roadways. The approximate cost of making the necessary improvements is estimated to be in excess of $3,000,000.

Without additional funding sources it is impossible for the County to make the necessary improvements. It is also unreasonable for the public to fund improvements driven by private development. Therefore, developers in this area must pay for the cost of the improvements demanded by their development. Since no single development in the area will be the sole contributor of traffic volumes that would create a nexus to require any

one improvement on its own it is most equitable to distribute the cost across all potential developments. Based on the anticipated number of lots potentially able to be created and the total cost of the necessary improvements a mitigation fee of three thousand five hundred dollars ($3,500) per lot created by any subdivision must be paid by the developer. The developer shall have the option of paying this fee up front as a condition of plat approval or adding a note to the final plat that indicates this fee will be due prior to the issuance of any building permit for lots within the subdivision.

The County shall use all mitigation fees collected for traffic capacity improvements that directly benefit the defined area only. Collected fees may be used to fund a project in its entirety or to leverage additional state or federal grant funds for the necessary improvements. The fees will not expire, and the County may bank fees in order to fund necessary projects.

BENTON COUNTY WA
PUBLIC WORKS DEPARTMENT

TO: PLANNING DEPARTMENT

FROM: SHANE ELLEDGE

DATE: 5/30/2025

SUBJECT: PRELIMINARY PLAT – SUB 2025-001 COTTONWOOD RUN

Please add the following as conditions of final approval for the above reference plat:

1. The developer shall provide a complete set of engineered construction drawings for review and approval by the County and associated utilities. The drawings shall contain all appropriate information listed on the attached Minimum Plan Requirements. Grading plan will include grading to shape any drainage easements to route and fully contain all runoff based upon the 100-year storm within the easement limits. All plans and associated reports shall be prepared by a Professional Engineer licensed to practice in the State of Washington

2. All construction shall be in accordance with the most current WSDOT Standard Specifications for Road, Bridge and Municipal Construction, applicable Benton County Standard Plans and the requirements of the County Engineer

3. All roads within this plat shall have a paved width of 24 feet with a minimum 2-foot gravel shoulder. Roadways shall be designed for a minimum 25 mile per hour design speed

4. The pavement return radius at all intersections shall be a minimum of 35 feet

5. All stormwater from the roadways shall be contained on the plat and shall utilize surface infiltration (ditches, swales, ponds) for detention. The developer shall have an infiltration test performed at each proposed detention area. Tests shall be done with an infiltrometer using the falling head or constant head method. Other methods of infiltration rate determination shall be approved by the County.

6. All signage including but not limited to stop signs, speed limit signs and street name signs shall be installed by the developer in accordance with Benton County Standard Plans

7. All new power, telephone, cable TV and irrigation shall be installed outside of the County right of way in the appropriate easements. Domestic water piping may be installed within the County right of way in accordance with a valid franchise agreement.

8. Survey monuments, with cases and covers per Benton County Standard R-14B, shall be placed at all road intersections, points of curvature, points of tangency, centers of cul-de-sacs, section corners and quarter corners. All monuments shall be set by a Professional Land Surveyor licensed to practice in the state of Washington

9. Access on lot 7 and 8 is restricted to the shared 40-foot easement, show driveway on plat using Benton County Standard R-4 using the urban local access cross section.

10. Provide crossing over drainage easement on lot 7 and 8 to include required culverts.

11. Show driveways for lot 11 on face of plat and show additional dwelling on lot 11.

12. Provide paved driveway following Benton County standard plan R-3, for additional dwelling on lot 11 off of new road connecting to Kash Loop.

13. Label new road connecting to Kash Loop.

14. Pursuant to Benton County Code 9.09.030(l) sight distance calculations shall be done utilizing the WSDOT Design Manual for all intersections and driveways within the project. Dedication of additional right of way may be required to encompass clear vision triangles.

15. Remove temporary turnaround in easement AF# 2022-037575 in lot 7 and 8 of Cottonwood Creek Phase 4. Restore ditches and shoulder to county standards.

16. If present restore landscaping and approaches on lot 7 and 8 of Cottonwood Creek Phase 4.

17. Dedicate 60’ of right of way to Benton County for road purposes. (The plan shows 30 feet each side of centerline with no description of what the 30 feet is for)

18. After final approval of the road construction, one full size Mylar of the record drawings shall be provided to Public Works.

19. The 26-foot private access & utility easement on lot 7 must be relocated. The county will not approve two culvert crossings and approaches that close together. A 26-foot easement is also not wide enough to accommodate the required approach for access easements.

Add the following notes to the face of the final plat

1. Benton County is not responsible for the maintenance or upkeep of any stormwater retention facility or drainage easements. All such maintenance and upkeep are the responsibility of the underlying property owner.

2. Prior to the construction of any driveway or the issuance of any building permit for any lot within this subdivision the property owner shall obtain a Road Approach Permit from the Benton County Public Works Department and install the required temporary construction access.

3. No trees, shrubs, weeds, fencing or other obstructions more than 24 inches in height are permitted within Benton County right of way.

4. Property owners that install grass, curbing, rock mulch or other landscaping within the County right of way do so at their own risk. The County will not repair or replace damaged landscaping due to construction or maintenance operations.

5. All lots within this subdivision are subject to a three thousand five hundred ($3,500) traffic mitigation fee. Such fee shall be due and payable prior to issuance of any Building Permit or Road Approach Permit.

6. Access to lot 7 and 8 is restricted to the shared 40-foot easement.

7. The underlying property owners of lot 7 and 8 shall be responsible for the maintenance of culverts on the shared 40-foot easement.

8. Road approaches in this subdivision do not require culverts.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Central Region Office
1250 West Alder St., Union Gap, WA 98903-0009 • 509-575-2490

May 19, 2025

Michelle Mercer
Benton County Planning Division
102206 E Wiser Parkway
Kennewick, WA 99338

RE: 202501729; EA 2025-007

Dear Michelle Mercer:

Thank you for the opportunity to comment during the Optional Determination of Nonsignificance process for Cottonwood Run. We have reviewed the documents and have the following comments.

Shorelands and Environmental Assistance Program

Aerial and street view photos, the National Wetland Inventory, and the National Hydrography indicate that wetlands or other aquatic resources may be present on the site. A qualified professional should survey the site and determine if wetlands or other aquatic resource protected by local Critical Area Ordinances, state and federal laws are present. If present, a mitigation plan that demonstrates how development will avoid, minimize, and mitigate impacts to the critical areas should be developed. Please reach out to Ryan Anderson at Ryan.Anderson@ecy.wa.gov if you have any questions.

Water Quality Program

Project with Potential to Discharge Off-Site

If your project anticipates disturbing ground with the potential for stormwater discharge off-site, the NPDES Construction Stormwater General Permit is recommended. This permit requires that the SEPA checklist fully disclose anticipated activities including building, road construction and utility placements. Obtaining a permit may take 38-60 days.

The permit requires that a Stormwater Pollution Prevention Plan (Erosion Sediment Control Plan) shall be prepared and implemented for all permitted construction sites. These control measures must be able to prevent soil from being carried into surface water and storm drains

by stormwater runoff. Permit coverage and erosion control measures must be in place prior to any clearing, grading, or construction.

In the event that an unpermitted Stormwater discharge does occur off-site, it is a violation of Chapter 90.48 RCW, Water Pollution Control and is subject to enforcement action.

More information on the stormwater program may be found on Ecology's stormwater website. Please submit an application or contact **Lloyd Stevens Jr.** at the Dept. of Ecology, (509)571-3866, with questions about this permit.

Sincerely,

Amber Johnson
SEPA Coordinator
Central Region Office
509-723-5677
crosepa@ecy.wa.gov

Brittany Merrill

From: Anderson, Ryan (ECY) <rand461@ECY.WA.GOV>
Sent: Tuesday, September 23, 2025 2:38 PM
To: ECY RE CRO SEPA Coordinator; Stevens Jr, Lloyd (ECY)
Cc: Brittany Merrill
Subject: [EXTERNAL] RE: 202501729 Comments for EA 2025-007

Thanks Amber, the attached Critical Areas Report resolves any of my concerns related to wetlands. Thank you, Ryan

Ryan Anderson (he/him)
Washington Department of Ecology
Shorelands, Wetlands, and Federal Permit Coordinator
(509)379-1917

From: ECY RE CRO SEPA Coordinator <crosepa@ecy.wa.gov>
Sent: Tuesday, September 23, 2025 1:41 PM
To: Anderson, Ryan (ECY) <rand461@ECY.WA.GOV>; Stevens Jr, Lloyd (ECY) <llst461@ECY.WA.GOV>
Cc: Brittany.Merrill@co.benton.wa.us
Subject: FW: 202501729 Comments for EA 2025-007

Hi Ryan,
When I reached out last week I don't believe the attachments forwarded and your email was incomplete on the original chain. Can you please verify with Brittany if your comment on SEPA 202501729 (ECY link) is satisfied with the attached report?
Thank you!

Amber Johnson (she/her)
SEPA/ERTS Coordinator
Department of Ecology, Central Region Office
Ph. 509-723-5677

From: Brittany Merrill <Brittany.Merrill@co.benton.wa.us>
Sent: Wednesday, September 17, 2025 11:04 AM
To: ECY RE CRO SEPA Coordinator <crosepa@ecy.wa.gov>; ryan.anderson@ecy.wa; Stevens Jr, Lloyd (ECY) <llst461@ECY.WA.GOV>
Subject: RE: 202501729 Comments for EA 2025-007

External Email

Please see the attached documents regarding EA 2025-007. If you have any questions, please let our department know. Thank you

Brittany Merrill
Office Assistant II
Community Development Dept.
Planning Division
102206 E. Wiser Parkway
Kennewick WA 99338
Phone: (509)786-5612 Ex. 3007
Brittany.Merrill@co.benton.wa.us

From: Planning Department <Planning.Department@co.benton.wa.us>
Sent: Monday, May 19, 2025 4:47 PM
To: Brittany Merrill <Brittany.Merrill@co.benton.wa.us>
Subject: FW: 202501729 Comments for EA 2025-007

Nikki Relyea
Permit Technician
Benton County Community Development Department
Planning Division
Nikki.Relyea@co.benton.wa.us
Planning.Department@co.benton.wa.us
(509) 786-5612

From: ECY RE CRO SEPA Coordinator <crosepa@ecy.wa.gov>
Sent: Monday, May 19, 2025 4:35 PM
To: Planning Department <Planning.Department@co.benton.wa.us>
Subject: [EXTERNAL] 202501729 Comments for EA 2025-007

Greetings,

Attached is the Department of Ecology comment letter for Cottonwood Run.

Please share these comments with the applicant.

Thank you,

Amber Johnson (she/her)
SEPA/ERTS Coordinator
Department of Ecology, Central Region Office
Ph. 509-723-5677

Washington State Department of Transportation

South Central Region
2809 Rudkin Road
Union Gap, WA 98903-1648
509-577-1600 / FAX: 509-577-1603
TTY: 1-800-833-6388
www.wsdot.wa.gov

May 19, 2025

Benton County Planning Division
P.O. Box 910
Prosser, WA 99350

Attn: Michelle Mercer, Planning Manager

RE: 2025-001EA 2025-007_Cotton Wood Run Preliminary Plat
I-82 Exit 109 (Badger Rd) vicinity

We have reviewed the proposed project and have the following comments.

The subject property is in the vicinity of Interstate 82 (I-82) and the Badger Road (Exit 109) interchange. In this location, Exit 109 is the primary point of access to I-82 and surrounding communities. As such, WSDOT anticipates that the majority of vehicle trips generated by this proposal will utilize the interchange. In order to mitigate this project's impacts to I-82, we recommend the proponent contribute towards the county's planned improvements to Badger Road at the interchange, in proportion to their impact.

Thank you for the opportunity to review and comment on this proposal. If you have any questions regarding this letter, please contact Jacob Prilucik at (509) 577-1635.

Sincerely,

Stephen P. (Phil) Nugent
Region Planning Manager

SPN: jjp/akh

cc: SR 82, File #2025_082_005

2015 South Ely Street
Kennewick, WA 99337
Customer Service 509-586-9111
Business 509-586-6012
FAX 509-586-7663
www.kid.org

May 20, 2025

Brittany Merrill, Office Assistant II
Benton County Community Development Department - Planning Division
102206 E. Wiser Parkway
Kennewick WA 99338

Subject: Review Comments for Preliminary Plat for Cottonwood Run (SUB 2025-001)

Dear Ms. Merrill:

This letter provides Kennewick Irrigation District (KID) review comments for the Preliminary Plat of Cottonwood Run (SUB 2025-001) submitted by Ira Hickman ("Applicant")[1] to divide a 19.75-acre parcel into 12 lots. The property is located at 103394 Kash Loop, Kennewick, in the Northwest Quarter of Section 14, Township 8 North, Range 28 East, W.M. The parent parcel(s) are listed as follows:

- Parcel #: 114882020000025 (19.75 **non-irrigable** acres)

The property identified on the proposed Preliminary plat is located within the boundaries of KID. The property within this Preliminary plat is not classified as irrigable land. Accordingly, KID provides the following comments to be included as required conditions of approval by the legislative authority under RCW 58.17.310(2):

1) *The plat shall include the following irrigation easements consistent with KID requirements:*
   a. *On all lots within the plat, dedicate to KID an irrigation easement 10 feet in width, or five (5) feet in width if adjacent to a utility easement, located along the road frontage or access easements of each lot. An irrigation easement may be included within the 'sidewalk and utility' easement if one is proposed, denoting the easement as a "Sidewalk, Utility, and Irrigation Easement."*
   b. *Dedicate to KID an irrigation drainageway easement 100-feet in width over the drainage channel.*
      i. *Include the following Irrigation Drainageway Easement Notes on the face of the plat:*

         1. *IRRIGATION DRAINAGE WAY EASEMENT NOTES:*
         IRRIGATION DRAINAGE WAY EASEMENTS ARE CREATED FOR THE CONVEYANCE OF IRRIGATION DRAINAGE FLOWS (INCLUDING OFF-SITE FLOWS) AND CANNOT BE RE-ROUTED OR ABANDONED WITHOUT THE APPROVAL OF THE KENNEWICK IRRIGATION DISTRICT ("KID").

         THE UNDERLYING PROPERTY OWNER(S) SHALL BE RESPONSIBLE FOR IRRIGATION DRAINAGE WAY EASEMENTS AND DRAINAGE OR

[1] Reference to the "Applicant" throughout this comment letter shall refer to the property owner and/or developer of the proposed plat.

IRRIGATION DRAINAGE FACILITIES CONTAINED WITHIN THESE EASEMENTS. THE PROPERTY OWNER(S) SHALL BE RESPONSIBLE FOR ALL REPAIR AND PROPER MAINTENANCE WITHIN THEIR RESPECTIVE PROPERTY BOUNDARIES ASSOCIATED WITH IRRIGATION DRAINAGE MANAGEMENT. IRRIGATION DRAINAGE WAY EASEMENTS CONFORM TO NATURAL OR MAN-MADE WATER COURSES. THESE WATER COURSES WILL REQUIRE PERIODIC MAINTENANCE TO MAINTAIN THEIR FUNCTION.

IF THE IRRIGATION DRAINAGE WAY EASEMENTS ARE NOT ADEQUATELY MAINTAINED BY THE PROPERTY OWNER(S), KID SHALL HAVE THE AUTHORITY TO ENTER THE PROPERTY, PROVIDE THE NECESSARY MAINTENANCE AND REPAIRS, AND PASS ON ALL COSTS ASSOCIATED WITH SAID MAINTENANCE AND/OR REPAIR TO THE UNDERLYING LAND OWNER.

THE DRAINAGE WAY SHALL NOT BE IMPEDED OR CONSTRICTED OR THE FLOW OF WATER BE BLOCKED IN ANY IRRIGATION DRAINAGE WAY EASEMENT. NO FENCING SHALL BE ALLOWED WITHIN AN IRRIGATION DRAINAGE WAY EASEMENT, EXCEPT ALONG THE BOUNDARY OF SUCH EASEMENT, APPROXIMATELY PARALLEL WITH THE ANTICIPATED FLOW.

2) *KID asserts rights to recapture artificially stored groundwater within KID Boundaries, particularly within the Pasco Gravel units' groundwater aquifer.* ***KID opposes the use of domestic wells drilled within the Badger Coulee shallow aquifer.*** *KID is confident that its position regarding the artificially stored groundwater in the perched aquifer is supported by the facts and the law. A RH2 Engineering report titled, "Badger Coulee Recapture of Artificially-stored Project Water Report", clearly states that the Pasco Gravels aquifer is artificially stored water which KID asserts rights to recapture.*
   a. *KID understands the existing potable water distribution system well is drilled into the lower aquifer and does not impact the Badger Coulee shallow aquifer. Use of the existing well for domestic water is uncontested by KID.*

In addition, pursuant to RCW 58.17.310 (1), KID would like to inform the County of the following information regarding the effect of the proposed preliminary plat upon the structural integrity (including lateral support) of KID's facilities, other risk exposures, and the safety of the public and irrigation district, and related conditions of approval that KID deems to be necessary as a result:

3) *The East Badger ("West Fork Amon") Drain runs longitudinally through the subject property. It is the position of KID that (a) the East Badger Drain is not a water of the United States and is not within the jurisdiction of the Clean Water Act (CWA); and, alternatively, (b) the proposed construction of an engineered crossing in the East Badger Drain by a private developer is exempt from 404 permitting as a construction activity in an irrigation ditch that will not cause a change in the use of the East Badger Drain.*

To: scott@bentonone.org; Chad Brooks <brooksc@bentonpud.org>; Kennewick Irrigation District - Application and SEPA Review (development@kid.org) <development@kid.org>; PUBLICWORKS <PublicWorks@co.benton.wa.us>; Benton Clean Air Agency - Tyler Thompson <tyler.thompson@bentoncleanair.org>; Benton Clean Air Agency - Robin Priddy <robin.priddy@bentoncleanair.org>; SEPA@bfhd.wa.gov; SEPAregister@ecy.wa.gov; Futurewise - Tim Trohimovich <tim@futurewise.org>; Sepa.reviewteam@doh.wa.gov; Kim Lettrick <k.lettrick@bces.wa.gov>; Susan.M.Adsitt@usps.gov; Kassandra.A.Hernandez@usps.gov; Segregations <segregations@co.benton.wa.us>; Gary Tiplady <Gary.Tiplady@co.benton.wa.us>; WasteWaterMgmt@doh.wa.gov; US Army Corps of Engineers - Real Estate Division <cenww-re@usace.army.mil>; Kennewick Irrigation District - Application and SEPA Review (development@kid.org) <development@kid.org>; kyle.mccauley@cngc.com; troy.maikis@dfw.wa.gov; clayne@bcwaterco.com; Benton Franklin Council of Governments-SEPA (zratkai@bfcog.us) <zratkai@bfcog.us>; scplanning@wsdot.wa.gov
Subject: [E] SUB 2025-001/EA 2025-007

[EXTERNAL EMAIL]

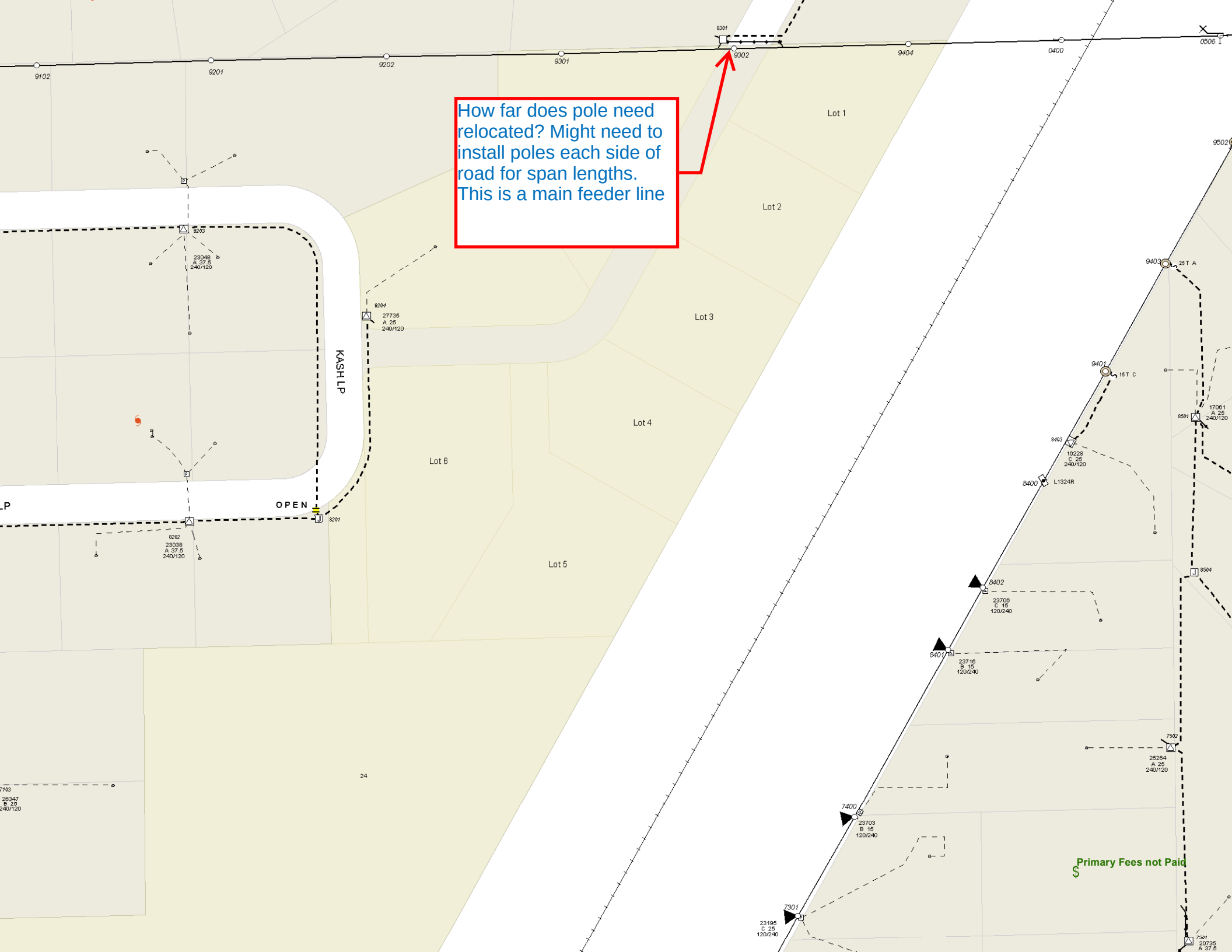
Good afternoon,

The Benton County Planning Department has prepared a Notice of Application in accordance with the State Environmental Policy Act Regulation. This NOA for Project #EA 2025-007 is for Cottonwood Run, who is proposing to subdivide 19.78 acres into 12 lots with an average lot size of 1.43. The project is in the Kennewick area of unincorporated Benton County, directly east of Kash Loop and south of Abigail Place. The parcel is legally described as Section 14, Township 08 North, Range 28 East, W.M., Lot 24 of Cottonwood Estate. Parcel number 1-1488-202-0000-025.

It is being circulated for review by all agencies with jurisdiction. We appreciate your review of the proposal and return comments no later than ***May 21, 2025 .*** This proposal will not be acted on or before that time.

All necessary documents regarding the proposed project can be found utilizing the link below:
https://apps.ecology.wa.gov/separ/Main/SEPA/Record.aspx?SEPANumber=202501729

Brittany Merrill
Office Assistant II
Community Development Dept.
Planning Division
102206 E. Wiser Parkway
Kennewick WA 99338
Phone: (509)786-5612 Ex. 3007
Brittany.Merrill@co.benton.wa.us


How far does pole need relocated? Might need to install poles each side of road for span lengths. This is a main feeder line
KASH LP
OPEN
Lot 1
Lot 2
Lot 3
Lot 4
Lot 5
Lot 6
24
Primary Fees not Paid

a. *The East Badger Drain is Not a Water of the United States*

i. *It is the position of KID that the East Badger Drain is an irrigation ditch that is not a water of the United States. The East Badger Drain was constructed in the 1950s as a part of the drainage system for the Kennewick Division of the United States Bureau of Reclamation (Reclamation). Prior to the application of irrigation water to the lands in Badger Coulee, the presence of any water in what is now the East Badger Drain would have been ephemeral in nature and in response to a sustained and voluminous precipitation event, such as rain-on-snow. It was a dry wash in an arid desert that receives on average 7-inches of precipitation in a year. Today, to the extent that any flows are present in the East Badger Drain, they are KID irrigation return flows. Furthermore, even when some irrigation return flows are present in parts of the East Badger Drain during irrigation season, there are hydrological breaks in which surface water is not present. There is no direct connection to perennial waters located further downstream.*

ii. *In their proposed revised definition of the "Waters of the United States", the U.S. Army Corps of Engineers and the Environmental Protection Agency (the "agencies") state the following:*

> *The preamble to the 1986 regulations explains that ''[n]on-tidal drainage and irrigation ditches excavated on dry land'' are generally not considered ''waters of the United States.'' 51 FR 41217. The agencies shifted this approach slightly in the Rapanos Guidance and explained that ''ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water are generally not waters of the United States.'' Rapanos Guidance at 11–12. The agencies explained that these features are generally not considered ''waters of the United States'' ''because they are not tributaries or they do not have a significant nexus to downstream traditional navigable waters.'' Id.*
>
> *The agencies intend to continue implementing the approach to ditches described in the Rapanos Guidance. This approach is more consistent with the relatively permanent standard than the approach in the preamble to the 1986 regulations. Consistent with previous practice, ditches constructed wholly in uplands and draining only uplands with ephemeral flow would generally not be considered ''waters of the United States.''*
>
> *Revised Definition of the "Waters of the United States", 86 Fed. Reg. 69,433 (December 7, 2021).*

iii. *KID's approach to the East Badger Drain aligns with the agencies Rapanos guidance. The East Badger Drain is a ditch "excavated wholly in and draining only uplands and . . . do[es] not carry a relatively permanent flow of water. . . ".*

b. *The Construction of an Engineered Crossing Does Not Convert the Use of the East Badger Drain*

i. *Even if the East Badger Drain were erroneously considered a water of the United States, the proposed construction of an engineered crossing in the East Badger Drain is exempt from 404 permitting as a construction activity in an irrigation ditch that will not cause a change in the use of the East Badger Drain.*

ii. *As it is reflected in the Joint Memorandum to the Field Between the U.S. Department of the Army, Corps of Engineers and the U.S. Environmental Protection Agency Concerning Exempt Construction or Maintenance of Irrigation Ditches and Exempt Maintenance of Drainage Ditches under Section 404 of the Clean Water Act (July 24, 2020), 404(f) has a recapture provision that is designed to override the permitting exemptions in section 404(f)(1).*

It states the following:

> *Any discharge of dredged or fill material into the navigable waters incidental to any* ***activity having as its purpose bringing an area of the navigable waters into a use to which it was not previously subject, where the flow or circulation of navigable waters may be impaired or the reach of such waters be reduced,*** *shall be required to have a permit under this section.*
>
> *33 U.S.C. 1344(f)(2) (emphasis added).*

iii. *The construction of an engineered crossing will not be bringing an area of navigable waters into a use to which it was not previously subject. The East Badger Drain will remain a drain. Water, if present, will continue to flow through it. Furthermore, the flow of any waters present in the drain will not be impaired and the reach of those waters will not be reduced because of the construction of an engineered crossing. If anything results from the construction of an engineered crossing, it would be the increased reach of any irrigation return waters present in the drain.*

iv. *The recapture provision in 404(f) is particularly concerned with the conversion of waters into dry land and the blockage of waters. Senator Muskie, one of the primary sponsors of the CWA, explained the scope and intention of the recapture provision:*

> *New subsection 404(f) provides that Federal permits will not be required for those narrowly defined activities that cause little or no adverse effects either individually or cumulatively. While it is understood that some of these activities may necessarily result in incidental filling and minor harm to aquatic resources, the exemptions do not apply to discharges that convert extensive areas of water into dry land or impede circulation or reduce the reach or size of the water body.*

A Legislative History of the Clean Water Act of 1977: A Continuation of the Legislative History of the Water Pollution Control Act, at 474 (1978).

v. *The construction of an engineered crossing will not "convert extensive areas of water into dry land or impede circulation or reduce the reach or size" of any waters in the East Badger Drain.*

c. *Conclusion*
   i. *The East Badger Drain is not a water of the United States subject to 404 permitting.*

   ii. *In addition, standard maintenance and construction activities in and around irrigation ditches have and continue to be exempt from the Clean Water Act. Thus, even if the East Badger Drain was erroneously considered a water of the United States, the construction of an engineered crossing in an irrigation ditch such as East Badger Drain constitutes a standard construction activity that is not subject to the recapture provision of 33 U.S.C. 1344(f)(2).*

4) *KID requests the following in relation to the East Badger Drain:*
   a. *KID review and approval of grading and construction plans is required to allow KID to ensure road crossings over the East Badger Drain maintain adequate flows. Such review and approval will be coordinated as part of the County's review and Preliminary Plat approval process.*
      i. *KID requests the developer design the crossing for the 100-year storm event.*
   b. *Design considerations for proposed sanitary sewer infrastructure within this development shall include the potential for sewer effluent leakage and seepage into the East Badger Drain, and mitigation measures to prevent such.*
   c. *The East Badger Drain is connected to waters of the United States. Mitigation to prevent storm water from entering the East Badger Drain from the subject development is required.*
      i. *Stormwater systems for the project shall be designed to retain, at minimum, a 100-year storm event above the East Badger Drain.*

Finally, KID requests the following additional conditions of Preliminary Plat approval:

5) *The following fees for review must be paid prior to KID signature on the Final Plat:*
   a. *A Preliminary Plat review fee (at the time of application, fee is **$175.00**).*
   b. *Fees are subject to change and depend on the date the Final Plat is submitted for final approval.*

6) *Please include the following irrigation title block on future final plats related to the proposed preliminary plat:*
   a. *I HEREBY CERTIFY THAT THE PROPERTY DESCRIBED HEREON IS LOCATED WITHIN THE BOUNDARIES OF THE KENNEWICK IRRIGATION DISTRICT BUT THAT THIS PROPERTY IS NOT CLASSIFIED AS IRRIGABLE LAND AND IS NOT ENTITLED TO IRRIGATION WATER UNDER THE EXISTING OPERATING RULES*

AND REGULATIONS OF THIS DISTRICT. I FURTHER CERTIFY THAT THE IRRIGATION EASEMENTS SHOWN ON THIS PRELIMINARY PLAT ARE ADEQUATE TO SERVE ALL LOTS SHOWN HEREON PER THE REQUIREMENTS OF RCW 58.17.310.

7) *All subdivisions of land are required to be approved by the KID Board of Directors during a KID Board Meeting. KID Board Meetings are regularly scheduled on the first and third Tuesdays of each month. All conditions must be completed prior to submittal to KID for final approval. The submittal for final approval must be received by KID a minimum of one week prior to a regularly scheduled Board Meeting to be considered at that meeting.*

If you have any questions regarding these comments, please contact me at the address/phone number listed above.

Sincerely,

Ben Woodard, P.E.
Engineering & Operations Manager

cc: LB\correspondence\File: [14-8-28]
Applicant via mail – ATTN: Ira Hickman, 72609 E Sundown PR SE, Kennewick, WA 99338

Brittany Merrill

From: Planning Department
Sent: Wednesday, May 7, 2025 2:48 PM
To: Brittany Merrill
Subject: FW: [E] SUB 2025-001/EA 2025-007
Attachments: Benton PUD Power Map.pdf

Nikki Relyea
Permit Technician
Benton County Community Development Department
Planning Division
Nikki.Relyea@co.benton.wa.us
Planning.Department@co.benton.wa.us
(509) 786-5612

From: Chad Brooks <brooksc@bentonpud.org>
Sent: Wednesday, May 7, 2025 2:35 PM
To: Planning Department <Planning.Department@co.benton.wa.us>
Subject: [EXTERNAL] RE: [E] SUB 2025-001/EA 2025-007

New road extension looks to have pole in middle of road. How far does pole need relocated? Might need to install poles each side of road for span lengths. This is a main power feeder line. Developer needs to provide CAD file to get lots into Benton PUD map for power layout design. Attached is BPUD power map of area.

Thank you

Chad Brooks
Distribution Design Tech II
Benton PUD
Email: brooksc@bentonpud.org
Main # (509)582-2175
Direct # (509)582-1233
My Hours Mon-Thur 6:30am-5pm
Benton PUD offices closed on Fridays

From: Planning Department <Planning.Department@co.benton.wa.us>
Sent: Monday, April 28, 2025 3:37 PM

Brittany Merrill

From: GIS
Sent: Tuesday, October 14, 2025 1:54 PM
To: Brittany Merrill; Gary Tiplady; GIS
Subject: RE: SUB 2025-001/EA 2025-007
Attachments: EA 2025-007 Cottonwood Run Plat Map.pdf

Good afternoon,

Lot 1: T13995 S ABIGAIL PL, Kennewick, WA 99338
Lot 2: T13879 S ABIGAIL PL, Kennewick, WA 99338
Lot 3: T13763 S ABIGAIL PL, Kennewick, WA 99338
Lot 4: T13647 S ABIGAIL PL, Kennewick, WA 99338
Lot 5: T13531 S ABIGAIL PL, Kennewick, WA 99338
Lot 6: T13415 S ABIGAIL PL, Kennewick, WA 99338
Lot 7: T13342 S ABIGAIL PL, Kennewick, WA 99338
Lot 8: T13452 S ABIGAIL PL, Kennewick, WA 99338
Lot 9: T13562 S ABIGAIL PL, Kennewick, WA 99338
Lot 10: T13672 S ABIGAIL PL, Kennewick, WA 99338
Lot 11:
103228 E KASH LP, Kennewick, WA 99338
103394 E KASH LP, Kennewick, WA 99338 (Subject to change upon road name)

Lot 12: 13892 S ABIGAIL PL, Kennewick, WA 99338

Please note that three proposed names will be needed for the currently undesignated portion of the roadway.

Let me know if you'll have any questions or comments.

Kind regards,

Jesus Godines
GIS Analyst
Benton County Information Technology
Office: (509) 786-5485

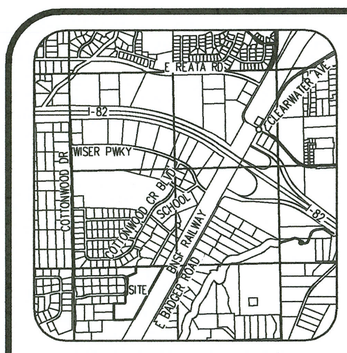
From: Brittany Merrill <Brittany.Merrill@co.benton.wa.us>
Sent: Friday, October 10, 2025 1:13 PM
To: Gary Tiplady <Gary.Tiplady@co.benton.wa.us>; GIS <GIS@co.benton.wa.us>
Subject: FW: SUB 2025-001/EA 2025-007

Please provide your comment to the Planning Division ASAP. Thank you

COTTONWOOD RUN

PRELIMINARY PLAT

NW 1/4 OF SEC. 14, T.08N., R.28E., W.M.,
BENTON COUNTY, WASHINGTON



VICINITY SKETCH

NOT TO SCALE

10 11
15 14
FOUND CASED
ALUM. CAP LS14120
C.O.R. PNT 2256

11
14
FOUND WSRS
BRASS CAP

LOT 5
LOT 6
COTTONWOOD ESTATES
TRACT B
CWC HOA
LOT 8
LOT 7
COTTONWOOD CREEK PHASE 4
LOT 17
LOT 18
COTTONWOOD ESTATES
LOT 20
LOT 19
LOT 3
SP1-3087
LOT 4
SP1-3087
LOT 4
SP1-2827

RHS
AAD
DCI
OP
OF

N88°35'05"E 2666.46'
S00°19'33"E 154.78'
N66°04'00"E 270.45'
N29°17'31"E
5' IRR ESMT
10' IRR ESMT
R65' TEMP TURNAROUND ESMT AF#2022-037575
C6 L=20.04' R=100.00'
14°36'
30' ESMT AF#2004-037395
366'
281'
349.15'
91'
30'
30'
226'
240'
462'
ABIGAIL PL
N17°48'25"E 462.37'
LOT 12
2.37 ACRES
LOT 1
1.04 ACRES
LOT 2
1.05 ACRES
LOT 3
1.01 ACRES
LOT 4
1.00 ACRES
LOT 5
1.18 ACRES
LOT 6
1.01 ACRES
LOT 7
1.86 ACRES
LOT 8
1.89 ACRES
LOT 9
1.21 ACRES
LOT 10
1.34 ACRES
LOT 11
2.27 ACRES
229'
180'
306'
200'
135'
288'
252'
397'
423.00'
S00°19'33"E
212'
211'
N01°25'01"W 223.79'
S88°35'05"W 299.18'
299'
170'
179'
175'
257'
264'
109'
130'
69'
R65'
14'
76'
N29°17'31"E 1577.41'
S29°17'31"W
BNSF RAILWAY
BADGER ROAD
EDGE OF LANDSCAPING
5' IRR ESMT COTTONWOOD ESTATES
10' WATERLINE ESMT COTTONWOOD ESTATES
10' UTIL ESMT
5' IRR ESMT
10' UTIL ESMT
5' IRR ESMT
10' UTIL ESMT
0' UTIL ESMT COTTONWOOD ESTATES
100' CREEK BUFFER PER COTTONWOOD ESTATES AS SHOWN APPROXIMATE THEREON
40'X140' SHARED ACCESS ESMT
MAIL KIOSK
KASH LOOP
N01°25'00"W 266.66'
142.02'
124.64'
87'
81'
135'
136.48'
S88°35'00"W
L=117.49'
R=200.00'
143'
199.46'
N57°45'32"W
140'
100'
81'
39'
30'
70'
43'
38'
L=87.85'
R=600.00'
L=168.57'
R=600.00'
84'
128'
20'
26' PRIVATE ACCESS & UTIL ESMT BENEFITS PARCELS J & K
253'
254'
N88°35'05"E 507.61'
(S89°27'41"W)
'05"W 304.20'
7'41"W)
PARCEL K
RS1-5596
PROPOSED 26' PRIVATE ACCESS & UTIL ESMT
FUTURE SHORT PLAT
(N30°10'07"E)
N29°17'31"E 349.02'
(S89°27'41"W)
N88°35'05"E 639.28'
917.60'
PROPOSED 26' PRIVATE ACCESS & UTIL ESMT
PARCEL J
FUTURE SHORT PLAT
93.15'
C5
35.61'
WORLEY
0.7'W

LINE TABLE		
LINE	LENGTH	DIRECTION
L1	17.84	N29°17'31"E

CURVE TABLE					
CURVE	LENGTH	RADIUS	Δ	CH DIREC.	CHORD
C1	79.94	130.00	35°13'54"	N19°01'58"W	78.68
C2	130.28	130.00	57°25'16"	N27°17'36"E	124.90
C3	157.08	100.00	90°00'06"	N43°35'02"E	141.42
C4	157.08	100.00	89°59'54"	N46°24'58"W	141.42
C5	260.76	4096.58	3°38'50"	N31°05'49"E	260.72
C6	20.04	100.00	11°29'06"	S23°32'58"W	20.01

NOTES

LOTS
NUMBER OF LOTS: 12 LOTS
LOT SIZE SMALLEST: LOT 4, 1.0 ACRE
LOT SIZE LARGEST: LOT 12, 2.37 ACRES
LOT SIZE AVERAGE: 1.43 ACRES
TOTAL PLAT ACREAGE: 19.78 ACRES

ROADS
ROAD LINEAR FEET: 1744 FEET
ROAD AREA: 2.52 ACRES

ZONING
RL-1
-MINIMUM PARCEL SIZE ONE 1 ACRE/ 43,560 SF
-LOT WIDTH, EACH PARCEL SHALL HAVE AN AVERAGE LOT WIDTH OF NOT LESS THAN NINETY (90) FEET. PER BCC CHAPTER 11.14

UTILITIES
WATER: BADGER WATER
POWER: BENTON PUD
TELEPHONE: CHARTER
SEWER: ON-SITE
GAS: CNG

DEVELOPER/OWNER
IRA HICKMAN

LEGEND

- ● = FOUND AS INDICATED
- AAD ● = FOUND 5/8" REBAR W/ ORANGE PLASTIC CAP MARKED "STRATTON AAD 38021"
- RHS ● = FOUND 5/8" REBAR W/ YELLOW PLASTIC CAP MARKED "STRATTON 14120"
- DCI ● = FOUND 5/8" REBAR W/ BLUE PLASTIC CAP MARKED "STRATTON DCI 46886"
- AAD ⊕ = FOUND 5/8" REBAR LS 38021
- (XXXX) = RECORD DIMENSION PLAT OF COTTONWOOD ESTATES
- CWC = COTTONWOOD CREEK
- IRR = IRRIGATION
- UTIL = UTILITY
- ESMT = EASEMENT
- ⧗ = IRRIGATION VALVE
- IRR-BOO = IRRIGATION VALVE
- IM□ = IRRIGATION METER
- = POWER POLE W/ GUY WIRE
- = POWER TRANSFORMER
- TEL PED□ = TELEPHONE PEDESTAL
- BOO = WATER BLOW-OFF
- = WATER FIRE HYDRANT
- SPIGOT⧗ = WATER SPIGOT
- WV⧗ = WATER VALVE
- WM□ = WATER METER
- = FENCE
- = EASEMENT
- = PROPERTY BOUNDARY
- = CENTERLINE
- OP OP = POWER LINE OVERHEAD
- ST ST = STORM LINE
- = ASPHALT
- = BUILDING
- = SLOPES EXCEEDING 15%

SCALE 1" = 80'

0 80 160 240

BASIS OF BEARING
WA STATE GRID
NAD83 PER C.O.R. CONTROL FILE

BASIS OF ELEVATION
CITY OF RICHLAND CONTROL FILE
PNT NO.2252
NAVD 88 DATUM
ELEV=601.42

EQUIPMENT USED
A THREE-SECOND TOTAL STATION
SPECTRA PRECISION RTK GPS

HORIZONTAL CONTROL

WASHINGTON STATE SOUTH ZONE, US SURVEY FEET, NAD 83(11). PER THE CITY OF RICHLAND CONTROL FILE, GPS TIES WERE MADE TO 2252, 2253 AND 2256 CONTROL POINTS. PROJECTED TO GROUND AT POINT 2256

GROUND DISTANCES ARE SHOWN HEREON.

SURVEYOR NOTES

1. THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THIS SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. LOCATIONS OF SAID UTILITIES WERE DERIVED FROM FIELD ASBUILT OBSERVATIONS.

2. THE CONTOURS SHOWN WERE DERIVED FROM DIRECT FIELD OBSERVATIONS. ACCURACY OF SHOWN CONTOURS MEET OR EXCEED THE US NATIONAL MAP ACCURACY STANDARDS, OF ONE-HALF THE CONTOUR INTERVAL.

3. THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A CURRENT TITLE REPORT. THEREFORE STRATTON SURVEYING AND MAPPING PC MAKES NO GUARANTEE THAT ALL ITEMS OF RECORD AFFECTING THE PROPERTY ARE SHOWN HEREON.

5. THIS IS A TOPOGRAPHIC MAP. THIS IS NOT A BOUNDARY SURVEY AND IS ONLY INTENDED TO DEPICT THOSE TOPOGRAPHIC FEATURES OR IMPROVEMENTS SHOWN HEREON. THE PROPERTY LINES SHOWN ARE RECORD LINES AND ARE ONLY SHOWN FOR GRAPHICAL REFERENCE.

6. THE PURPOSE OF THIS TOPOGRAPHIC SURVEY IS FOR THE USE AND AID IN THE DESIGN OF A PRELIMINARY PLAT.

7. FIELD WORK COMPLETED 12/01/23, ADDITIONAL WORK 07/12/24.

DEREK C. INGALSBE
STATE OF WASHINGTON
46886
REGISTERED
PROFESSIONAL LAND SURVEYOR
4/22/25

INDEX

¼ ¼	SEC	T.	R.
▩	14	08N	28E

TOPOGRAPHIC SURVEY FOR
HICKMAN

STRATTON SURVEYING & MAPPING P.C.
313 NORTH MORAIN STREET
KENNEWICK, WA 99336
(509) 735-7364
www.strattonsurvey.com

6304PP1.DWG	© 2025
DATE: 04/22/25	SHT. 1 OF 2
DRAWN BY: DCI	JOB # 6304

Community Development
Building Division
102206 E. Wiser Parkway
Kennewick, WA 99338

Fire Marshal
Clark A. Posey
(509) 735-3500
Clark.Posey@co.benton.wa.us

Fire Marshal Review and Comment for the Preliminary Plat of Cottonwood Run SUB 2025-001, EA 2025-007

The development will include underground utilities, paved streets, and development-wide stormwater management and disposal. Typical residences will consist of single-or two-story, wood frame structures with concrete slab-on grade or crawl space foundations.

The following Benton County Codes shall apply:

3.18.030 PROCEDURE FOR COMPLIANCE. The following shall be required for all subdivisions, short plat subdivisions, Manufactured Home/FAS parks, recreational vehicle parks, and commercial and industrial areas not exempt under the provisions of BCC 3.18.025:

(a) Subdivisions:

(1) Prior to preliminary plat approval, the applicant shall submit to the Benton County Fire Marshal a letter from the water purveyor addressing its willingness and ability to satisfy the requirements of this chapter.

(2) Prior to final plat approval, the following shall be required:

(i) Water system plans and specifications which comply with these regulations must be designed and stamped by a registered, professional engineer licensed in the State of Washington. Said plans shall be signed by the purveyor and shall be filed with the Benton County Fire Marshal and the Department of Health.
(ii) Water system plans shall be approved in writing by the Benton County Fire Marshal.
(iii) The approved water system shall be installed prior to final plat approval or a statement shall be placed on the plat indicating no building or Manufactured Home/FAS installation permit will be issued until the water system is installed, operating, and approved.
(iv)Two (2) copies of the "as built" drawings must be filed with the Benton County Fire Marshal.

(3) When the distribution system is installed, said installation must be under the direction of a registered, professional engineer licensed in the State of Washington who shall certify the construction of the system is in accordance with the approved design.

(4) Written approval from the Benton County Fire Marshal that the system is operating to specifications shall be submitted.

3.18.036 WATER SYSTEM REQUIREMENTS--FIRE HYDRANTS--GENERAL STANDARDS. Fire hydrants shall meet the following standards.

(a) Fire hydrants shall conform to current A.W.W.A. Specifications for traffic model fire hydrants, 150 psi working pressure, 300 pounds hydrostatic test, 1 - 5 1/4" main valve opening, 1 - 4 ▪ " NST pumper port that is fitted, when required by the respective Fire District, with a Storz adapter that complies with the Fire District requirements, two (2) - 2 ▪ " NST hose port, and one (1)- ▪ " pentagon operating nut - open left. Compression type opens against pressure main valve and will remain closed should the hydrant be broken off by a traffic accident. Hydrant shoe or inlet may be flanged, AC pipe or mechanical joint. Hydrant to be furnished with two (2) drain ports to insure rapid and complete drainage of hydrant barrel to eliminate all danger to damage by freezing.

(b) There shall be an auxiliary gate valve installed to permit the repair and replacement of the hydrants without disruption of water service. Gate valves shall be in conformance with the latest specifications of A.W.W.A. and be iron body, bronze mounted with two (2) inch square operating nuts that open left. End styles shall be flanged, mechanical joint or ring tight. Valve boxes shall be sliding type with pick type lids.

(c) Hydrants shall stand plumb and be set to the finished grade. The bottom of the lowest outlet of the hydrant shall be no less than twenty-four (24) inches above the grade. There shall be thirty-six (36) inches of clear area about the hydrant for operation of a hydrant wrench on the outlets and on the control valve. The pumper port shall face the street. Where the street cannot be clearly defined or recognized, the port shall face the most likely route of approach and the location of the fire truck while pumping, as determined by the Benton County Fire Marshal.

(d) Hydrants shall not be obstructed by any structure or vegetation, or have the visibility impaired for fifty (50) feet in the direction of vehicular approach to the hydrant.

(e) Hydrants are to be accessible for fire department pumpers.

(f) Fire hydrants subject to vehicle damage (i.e., those located in parking lots) shall be adequately protected.

(g) All hydrants shall be subject to testing and inspection by the Benton County Fire Marshal, subject to reasonable notice and scheduling with the purveyor.

3.18.037 WATER SYSTEM REQUIREMENTS--FIRE HYDRANTS--LOCATION AND SPACING. (a) Location of hydrants shall be determined by the Benton County Fire Marshal. (b) The location of all water mains, fire hydrants, and valves to be installed shall be properly and accurately marked on identifiable plans or drawings. Two (2) copies of all plans or drawings shall be furnished to the Benton County Fire Marshal.

(c) Fire hydrant spacing. The table below specifies the maximum permissible spacing between hydrants:

Type of Development	**Hydrant Spacing****
Subdivisions, short plat subdivisions limited to one (1) family dwellings	600 Feet
Multiple family dwellings Eight (8) or less units per acre	600 Feet
Manufactured Home/FAS parks and recreational vehicle parks	600 Feet
Multiple family dwellings –	

Nine (9) or more units per acre, commercial, industrial, hospitals, schools	300 Feet

**Spacing shall be measured along the pathway which a fire department would have to route a fire hose. This pathway shall be as determined by the Benton County Fire Marshal.

3.18.038 WATER SYSTEM REQUIREMENTS--FIRE HYDRANTS-- MAINTENANCE.

(a) The Fire Marshal may, after notifying purveyor, test hydrants for flow capability.

(b) Purveyor will maintain working parts of hydrants above ground, including keeping brush and other physical obstructions from blocking access to, or operation of, hydrants.

(c) The Fire Marshal may check operation of hydrants and notify purveyor of any malfunction or leaking which will require correction.

(d) Purveyor will notify the Fire Marshal of any hydrant installation. Said notification will state whether or not they have minimum fire flow.

(e) Purveyor will respond as expeditiously as possible when notified of a malfunction of a hydrant and will affect repair in a workmanlike manner.

WATER SYSTEM REQUIREMENTS--MINIMUM FIRE FLOW REQUIREMENTS.

(a) The minimum fire flow requirements for single family residences shall be five hundred (500) gallons per minute for 30 minutes at 20 psi residual pressure at all hydrants.

(b) The minimum fire flow for duplexes, multiple family residences, commercial, industrial, schools, hospitals, etc. will be determined by the Benton County Fire Marshal or designee. The Fire Marshal or designee may refer to NFPA 1142 Standard on Water Supplies for Suburban and Rural Fire Fighting and other pertinent information in making such determination.

PURVEYOR REQUIREMENTS. All purveyors shall continuously supply water at or above the minimum flow requirements specified herein; provided that the purveyor need not comply with these requirements in the event of vandalism, acts of God, loss of power and temporary shutdown for repairs and/or replacement. The Benton County Fire Marshal shall be notified by the purveyor at least twenty-four (24) hours prior to any shutdown for repairs and/or replacement.

Gary Tiplady
Benton County Fire Marshal