Joint Permit Application

This is a joint application, and must be sent to all agencies (Corps, DSL, and DEQ). Alternative forms of permit applications may be acceptable; contact the Corps and DSL for more information.

Date Stamp

U.S. Army Corps of Engineers Portland District	Oregon Department of State Lands	Oregon Department of Environmental Quality
Action ID Number	Number	

(1) TYPE OF PERMIT(S) IF KNOWN (check all that apply)

Corps: ☐ Individual ☒ Nationwide No.: 14 ☐ Regional General Permit _____ ☐ Other (specify): _____

DSL: ☐ Individual ☐ GP Trans ☐ GP Min Wet ☐ GP Maint Dredge ☐ GP Ocean Energy ☒ No Permit ☐ Waiver

(2) APPLICANT AND LANDOWNER CONTACT INFORMATION

	Applicant	Property Owner (if different)	Authorized Agent (if applicable) ☑ Consultant ☐ Contractor
Name (Required)	Andrew Tiemann		Juniper Tagliabue
Business Name	DR Horton		Schott and Associates
Mailing Address 1	4380 SW Macadam Ave		PO Box 589
Mailing Address 2	Suite 200		
City, State, Zip	Portland, OR 97239		Aurora, OR 97002
Business Phone	503.721.2380		503.678.6007
Cell Phone	503.7520843		
Fax			
Email	aetiemann@drhorton.com		juniper@schottandassociates.com

(3) PROJECT INFORMATION

A. Provide the project location.

Project Name	Latitude & Longitude*
Meyer Farm Subdivision Phase 2	44.891826; -123.02974

Project Address / Location	City (nearest)	County
4540 Pringle Rd SE	Salem	Marion

Township	Range	Section	Quarter / Quarter	Tax Lot
8S	3W	11	BC	3000 (portion)

Brief Directions to the Site:
From Commercial St. SE go east on Hilfiker Lane SE. Site is north of Hilfiker Lane SE and east off 12th St SE.

B. What types of waterbodies or wetlands are present in your project area? (Check all that apply.)

☑ River / Stream ☐ Non-Tidal Wetland ☐ Lake / Reservoir / Pond

☐ Estuary or Tidal Wetland ☐ Other ☐ Pacific Ocean

Waterbody or Wetland Name**	River Mile	6th Field HUC Name	6th Field HUC (12 digits)
Stream 1		Croisan Creek-Willamette River	170900070301

* In decimal format (e.g., 44.9399, -123.0283)
** If there is no official name for the wetland or waterbody, create a unique name (such as "Wetland 1" or "Tributary A").

C. Indicate the project category. (Check all that apply.)		
☐ Commercial Development	☐ Industrial Development	☑ Residential Development
☐ Institutional Development	☐ Agricultural	☐ Recreational
☑ Transportation	☐ Restoration	☐ Bridge
☐ Dredging	☑ Utility lines	☐ Survey or Sampling
☐ In- or Over-Water Structure	☐ Maintenance	☐ Other:

(4) PROJECT DESCRIPTION

A. Summarize the overall project including work in areas both in and outside of waters or wetlands.

Proposed project consists of Phase 2 of a 138-lot subdivision to include residential streets, utilities, open space and water detention ponds. This Phase of the project will include 53 lots, residential streets including extension of Mandy Ave SE from the north, and stormwater infrastructure including stormwater facility west of Mandy Ave SE. Improvements to 12 St SE are required as a condition of development and will include street and sidewalk widening along the western property boundary. The northwest corner of the site will be retained in open space with the existing stream protected by a 50' buffer.

Impacts to the onsite stream are proposed for required improvements to 12th St SE. Proposed impacts will result in less than 50cy of fill in jurisdictional waters and no permit is required from DSL. A No State Permit letter is requested. Impacts are less than 0.5 acre and 300lf and no significant hydrological changes are anticipated. Proposed activities are not anticipated to result in loss of stream function. The project should qualify for a Nationwide 14 permit from the Corps.

B. Describe work within waters and wetlands.

Project will consist of consist of widening 12th Street SE to include sidewalk, culvert extension, and retaining wall. Work will consist of removing 20lf of an existing 24" culvert and connecting the remaining 10.5lf to a new storm manhole. The culvert will be replaced with a longer (43.1lf) 24" culvert and retaining wall. The new culvert will be located partially within the OWH. The culvert will be directed to outlet slightly south of the waterway boundary with a class 100 rip rap pad to be located at the outfall outside the OHW boundary. The rip rap pad will dissipate energy from water flowing through the culvert and natural grades will encourage sheet flow into the stream (See Sheet 3.2).

Project components within the waterway will include:

- 24" storm culvert replacement with 43.1-foot of 24" PVC culvert to be partially located within OWH. Total impact below OHW is:
  - 21.1 linear feet
  - 96sf fill area
  - 12cy fill volume

All impacts are permanent. No temporary or indirect impacts are proposed or anticipated.

C. Construction Methods. Describe how the removal and/or fill activities will be accomplished to minimize impacts to waters and wetlands.

Best management practices will be implemented as shown in the erosion control plan (Appendix A). Practices may include but are not limited to rocked construction entrance, sediment fencing, and inlet and outlet protection. All work will take place during the designated in water work period (July 1-Oct. 31) to minimize downstream erosion.

Beyond the new roadway, Stream 1 will be entirely avoided with a minimum 50 protective buffer and additional open space maintained around it.

(4) PROJECT DESCRIPTION (continued)

D. Describe source of fill material and disposal locations if known.

Culvert and clean sourced fill as determined by the contractor.

E. Construction timeline.

What is the estimated project start date? Spring 2023

What is the estimated project completion date? Fall 2024

Is any of the work underway or already complete? ☐ **Yes** ☑ **No**

If yes, please describe.

F. Removal Volumes and Dimensions NO REMOVAL PROPOSED

Wetland / Waterbody Name *	Removal Dimensions					Time Removal is to remain**	Material***
	Length (ft.)	Width (ft.)	Depth (ft.)	Area (sq.ft. or ac.)	Volume (c.y.)		
n/a							

G. Total Removal Volumes and Dimensions NO REMOVAL PROPOSED

Total Removal to Wetlands and Other Waters		Length (ft.)	Area (sq. ft or ac.)	Volume (c.y.)
Total Removal to Wetlands				
Total Removal Below Ordinary High Water				
Total Removal Below Highest Measured Tide				
Total Removal Below High Tide Line				
Total Removal Below Mean High Water Tidal Elevation				

H. Fill Volumes and Dimensions (if more than 7 impact sites, include a summary table as an attachment)

Wetland / Waterbody Name*	Fill Dimensions					Time Fill is to remain**	Material***
	Length (ft.)	Width (ft.)	Depth (ft.)	Area (sq. ft. or ac.)	Volume (c.y.)		
Stream 1	~21	~4	~4	96sf	12	Permanent	Culvert, Soil, rock, gravel

(4) PROJECT DESCRIPTION (CONTINUED)

I. Total Fill Volumes and Dimensions

Total Fill to Wetlands and Other Waters	Length (ft.)	Area (sq. ft or ac.)	Volume (c.y.)
Total Fill to Wetlands			
Total Fill Below Ordinary High Water		96sf	12cy
Total Fill Below Highest Measured Tide			
Total Fill Below High Tide Line			
Total Fill Below Mean High Water Tidal Elevation			

*If there is no official name for the wetland or waterbody, create a unique name (such as "Wetland 1" or "Tributary A").
**Indicate whether the proposed area of removal or fill is permanent or, if you are proposing temporary impacts, specify the days, months or years the fill or removal is to remain.
*** Example: soil, gravel, wood, concrete, pilings, rock etc.

(5) PROJECT PURPOSE AND NEED

Provide a statement of the purpose and need for the overall project.

The purpose of the proposed project is to provide residential homes in the Salem region. The need for the fill is improvement and widening of SE 12th St as required by the City. Improvement requires replacement of the existing culvert with a longer culvert and results in minor impacts to the onsite stream.

(6) DESCRIPTION OF RESOURCES IN PROJECT AREA

A. Describe the existing physical, chemical, and biological characteristics of each wetland or waterbody. Reference the wetland and waters delineation report if one is available. Include the list of items provided in the instructions.

One stream with a total area of 0.003ac onsite was identified in the northwest corner of the site.

Stream 1: An unnamed tributary to Pringle Creek flowed northeast across the northwestern corner of the site. The stream entered the site from a 24" culvert along the western boundary and extended beyond the northern site boundary into a storm sewer located just offsite. The stream channel was approximately 4-6 feet wide by less than one foot deep and contained a few inches of flowing water at the time of fieldwork. ODF stream mapping classifies this stream as small, seasonal, and nonfish-bearing. Based on the small size, shallow channel, relatively low flow observed during normal rainy season fieldwork, and presence of fish-passage barriers, the ODF classification was verified as accurate. Riparian vegetation was dominated by Himalayan blackberry (*Rubus armeniacus*; FAC) and English ivy (*Hedera helix*; NOL) with an overstory of Douglas fir (*Pseudotsuga menziesii*; FACU) and Oregon oak (*Quercus garryana*; FACU); no associated riparian wetlands were identified (SP1). The stream was assessed as a riverine flow through HGM class with a Cowardin class of intermittent riverine streambed (R4SB) aquatic habitat.

B. Describe the existing navigation, fishing and recreational use of the waterbody or wetland.

None.

(7) PROJECT SPECIFIC CRITERIA AND ALTERNATIVES ANALYSIS

Describe project-specific criteria necessary to achieve the project purpose. Describe alternative sites and project designs that were considered to avoid or minimize impacts to the waterbody or wetland.*

Site design included the onsite stream as a design constraint with a large open space area provided around the avoided waterway. However, City conditions for street upgrades require widening and sidewalk construction along the frontage of the development. Improvements were minimized to the extent possible with a retaining wall proposed rather than a graded slope in order to reduce overall impacts to the stream. A rip rap pad is proposed to be placed outside the stream allowing water to dissipate and overland flow to the stream without further impacts within the OHWM. Impacts are less than 50cy and are not regulated by DSL. Impacts are less than ½ acre or 300lf and the project should qualify for a Nationwide permit from the Corps.

(8) ADDITIONAL INFORMATION

Are there state or federally listed species on the project site?	☐ **Yes**	☒ **No**	☐ **Unknown**
Is the project site within designated or proposed critical habitat?	☐ **Yes**	☒ **No**	☐ **Unknown**
Is the project site within a national Wild and Scenic River ?	☐ **Yes**	☒ **No**	☐ **Unknown**
Is the project site within a State Scenic Waterway?	☐ **Yes**	☒ **No**	☐ **Unknown**
Is the project site within the 100-year floodplain?	☐ **Yes**	☒ **No**	☐ **Unknown**

If yes to any above, explain in Block 6 and describe measures to minimize adverse effects to those resources in Block 7.

Is the project site within the Territorial Sea Plan (TSP) Area?	☐ **Yes**	☒ **No**	☐ **Unknown**

If yes, attach TSP review as a separate document for DSL.

Is the project site within a designated Marine Reserve?	☐ **Yes**	☒ **No**	☐ **Unknown**

If yes, certain additional DSL restrictions will apply.

Will the overall project involve ground disturbance of one acre or more?	☒ **Yes**	☐ **No**	☐ **Unknown**

If yes, you may need a 1200-C permit from the Oregon Department of Environmental Quality (DEQ).

Is the fill or dredged material a carrier of contaminants from on-site or off-site spills?	☐ **Yes**	☒ **No**	☐ **Unknown**
Has the fill or dredged material been physically and/or chemically tested?	☐ **Yes**	☒ **No**	☐ **Unknown**

If yes, explain in Block 6 and provide references to any physical/chemical testing report(s).

Has a cultural resource (archaeological and/or built environment) survey been performed on the project area?	☐ **Yes**	☒ **No**	☐ **Unknown**
Do you have any additional archaeological or built environment documentation, or correspondence from tribes or the State Historic Preservation Office?	☐ **Yes**	☒ **No**	☐ **Unknown**

If yes, provide a copy of the survey and/or documentation of correspondence with this application to the Corps only. Do not describe any resources in this document. Do not provide the survey or documentation to DSL.

Is the project part of a DEQ Cleanup Site? No☒ Yes☐ Permit number _____

DEQ contact. _____

* Not required by the Corps for a complete application, but is necessary for individual permits before a permit decision can be rendered.

Will the project result in new impervious surfaces or the redevelopment of existing surfaces? Yes ☐ No ☐

If yes, the applicant must submit a post-construction stormwater management plan as part of this application to DEQ's 401 WQC program for review and approval, see https://www.oregon.gov/deq/FilterDocs/401wqcertPostCon.pdf

Identify any other federal agency that is funding, authorizing or implementing the project.

Agency Name	Contact Name	Phone Number	Most Recent Date of Contact

List other certificates or approvals/denials required or received from other federal, state or local agencies for work described in this application.

Agency	Certificate / approval / denial description	Date Applied
DEQ	401 WQ Certification	Concurrently with this application

Other DSL and/or Corps Actions Associated with this Site (Check all that apply.)

☐ Work proposed on or over lands owned by or leased from the Corps (may require authorization pursuant to 33 USC 408). These could include the federal navigation channel, structures, levees, real estate, dikes, dams, and other Corps projects.

☐ State owned waterway — DSL Waterway Lease #:

☐ Other Corps or DSL Permits — Corps # — DSL #

☐ Violation for Unauthorized Activity — Corps # — DSL #

☑ Wetland and Waters Delineation — Corps # NWP-2021-363 — DSL # 2021-0342

Submit the entire delineation report to the Corps; submit only the concurrence letter (if complete) and approved maps to DSL. If not previously submitted to DSL, send under a separate cover letter

(9) IMPACTS, RESTORATION/REHABILITATION, AND COMPENSATORY MITIGATION

A. Describe unavoidable environmental impacts that are likely to result from the proposed project. Include permanent, temporary, direct, and indirect impacts.

Proposed activity results in permanent and direct loss of 96sf and 12cy of Stream 1 for culvert replacement. Hydrologic functions will be maintained and no significant loss of function is anticipated from this activity. No temporary or indirect impacts are anticipated.

B. For temporary removal or fill or disturbance of vegetation in waterbodies, wetlands or riparian (i.e., streamside) areas, discuss how the site will be restored after construction to include the timeline for restoration.

n/a

Compensatory Mitigation

C. Proposed mitigation approach. Check all that apply:

☐ Permittee-responsible Onsite Mitigation

☐ Permittee-responsible Offsite mitigation

☐ Mitigation Bank or In-Lieu Fee Program

☐ Payment to Provide (not approved for use with Corps permits)

D. Provide a brief description of proposed mitigation approach and the rationale for choosing that approach. If you believe mitigation should not be required, explain why.

Project impacts are less than 1/10th of an acre and less than 300lf with no anticipated functional loss. No mitigation should be required.

Mitigation Bank / In-Lieu Fee Information:
Name of mitigation bank or in-lieu fee project:
Type and amount of credits to be purchased:

If you are proposing permittee-responsible mitigation, have you prepared a compensatory mitigation plan?
☐ Yes. Submit the plan with this application and complete the remainder of this section.
☐ No. A mitigation plan will need to be submitted (for DSL, this plan is required for a complete application).

Mitigation Location Information (Fill out only if permittee-responsible mitigation is proposed)

Mitigation Site Name/Legal Description	Mitigation Site Address	Tax Lot #
County	City	Latitude & Longitude (in DD.DDDD format)

Township	Range	Section	Quarter/Quarter

(10) ADJACENT PROPERTY OWNERS FOR PROJECT AND MITIGATION SITE

☐ **Pre-printed mailing labels of adjacent property owners attached**	**Project Site Adjacent Property Owners**	**Mitigation Site Adjacent Property Owners**

Contact Name
Address 1
Address 2
City, ST ZIP Code

Contact Name
Address 1
Address 2
City, ST ZIP Code

Contact Name
Address 1
Address 2
City, ST ZIP Code

(11) CITY/COUNTY PLANNING DEPARTMENT LAND USE AFFIDAVIT (TO BE COMPLETED BY LOCAL PLANNING OFFICIAL)

I have reviewed the project described in this application and have determined that:

- ☐ This project is not regulated by the comprehensive plan and land use regulations
- ☐ This project is consistent with the comprehensive plan and land use regulations
- ☐ This project is consistent with the comprehensive plan and land use regulations with the following:
  - ☐ Conditional Use Approval
  - ☐ Development Permit
  - ☐ Other Permit (explain in comment section below)
- ☐ This project is not currently consistent with the comprehensive plan and land use regulations. To be consistent requires:
  - ☐ Plan Amendment
  - ☐ Zone Change
  - ☐ Other Approval or Review (explain in comment section below)

An application or variance request has ☐ has not ☐ been filed for the approvals required above.

Local planning official name (print)	Title	City / County

Signature	Date

Comments:

(12) COASTAL ZONE CERTIFICATION

If the proposed activity described in your permit application is within the Oregon Coastal Zone, the following certification is required before your application can be processed. The signed statement will be forwarded to the Oregon Department of Land Conservation and Development (DLCD) for its concurrence or objection. For additional information on the Oregon Coastal Zone Management Program and consistency reviews of federally permitted projects, contact DLCD at 635 Capitol Street NE, Suite 150, Salem, Oregon 97301 or call 503-373-0050 or click here.

CERTIFICATION STATEMENT

I certify that, to the best of my knowledge and belief, the proposed activity described in this application complies with the approved Oregon Coastal Zone Management Program and will be completed in a manner consistent with the program.

Print /Type Applicant Name n/a	Title
Applicant Signature	Date

(13) SIGNATURES

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and, to the best of my knowledge and belief, this information is true, complete and accurate. I further certify that I possess the authority to undertake the proposed activities. By signing this application I consent to allow Corps or DSL staff to enter into the above-described property to inspect the project location and to determine compliance with an authorization, if granted. I hereby authorize the person identified in the authorized agent block below to act in my behalf as my agent in the processing of this application and to furnish supplemental information in support of this permit application. I understand that the granting of other permits by local, county, state or federal agencies does not release me from the requirement of obtaining the permits requested before commencing the project. I understand that payment of the required state processing fee does not guarantee permit issuance.

To be considered complete, the fee must accompany the application to DSL. The fee is not required for submittal of an application to the Corps.

Fee Amount Enclosed	$

Applicant Signature (required) must match the name in Block 2	
Print Name Andrew Tiemann	Title
Signature	Date

Authorized Agent Signature	
Print Name Juniper Tagliabue	Title Wetland Ecologist
Signature	Date

Landowner Signature(s)*	
Landowner of the Project Site (if different from applicant)	
Print Name	Title
Signature	Date
Landowner of the Mitigation Site (if different from applicant)	
Print Name	Title
Signature	Date

Department of State Lands, Property Manager (to be completed by DSL)

If the project is located on state-owned submerged and submersible lands, DSL staff will obtain a signature from the Land Management Division of DSL. A signature by DSL for activities proposed on state-owned submerged/submersible lands only grants the applicant consent to apply for a removal-fill permit. A signature for activities on state-owned submerged and submersible lands grants no other authority, express or implied and a separate proprietary authorization may be required.

Print Name	Title
Signature	Date

* Not required by the Corps.

(14) ATTACHMENTS

- ☒ Drawings
  - ☒ Location map with roads identified
  - ☐ U.S.G.S topographic map
  - ☒ Tax lot map
  - ☒ Site plan(s)
  - ☒ Plan view and cross section drawing(s)
  - ☒ Recent aerial photo
  - ☐ Project photos
  - ☒ Erosion and Pollution Control Plan(s), if applicable
  - ☒ DSL / Corps Wetland Concurrence letter and map, if approved and applicable
- ☐ Pre-printed labels for adjacent property owners (Required if more than 5)
- ☐ Incumbency Certificate if applicant is a partnership or corporation
- ☐ Restoration plan or rehabilitation plan for temporary impacts
- ☐ Mitigation plan
- ☐ Wetland functional assessments, if applicable
  - ☐ Cover Page
  - ☐ Score Sheets
  - ☐ ORWAP OR, F, T, & S forms
  - ☐ ORWAP Reports
  - ☐ Assessment Maps
  - ☐ ORWAP Reports: Soils, Topo, Assessment area, Contributing area
- ☐ Stream Functional Assessments, if applicable
  - ☐ Cover Page
  - ☐ Score Sheets
  - ☐ SFAM PA, PAA, & EAA forms
  - ☐ SFAM Report
  - ☐ Assessment Maps
    - ☐ Aerial Photo Site Map and Topo Site Map (Both maps should document the PA, PAA, & EAA)
- ☐ Compensatory Mitigation (CM) Eligibility & Accounting Worksheet
  - ☐ Matching Quickguide sheet(s)
  - ☐ CM Eligibility & Accounting sheet
- ☐ Alternatives analysis
- ☐ Biological assessment (if requested by the Corps project manager during pre-application coordination)
- ☒ Stormwater management plan (may be required by the Corps or DEQ)
- ☐ Other
  - ☐ Please describe:

For U.S. Army Corps of Engineers send application to:

USACE Portland District
ATTN: CENWP-ODG-P
PO Box 2946
Portland, OR 97208-2946
Phone: 503-808-4373
portlandpermits@usace.army.mil

Counties:
Baker, Benton, Clackamas, Clatsop, Columbia, Gilliam, Grant, Hood River, Jefferson, Lincoln, Linn, Malheur, Marion, Morrow, Multnomah, Polk, Sherman, Tillamook, Umatilla, Union, Wallowa, Wasco, Washington, Wheeler, Yamhill

U.S. Army Corps of Engineers
ATTN: CENWP-ODG-E
211 E. 7th AVE, Suite 105
Eugene, OR 97401-2722
Phone: 541-465-6868
portlandpermits@usace.army.mil

Counties:
Coos, Crook, Curry, Deschutes, Douglas, Jackson, Josephine, Harney, Klamath, Lake, Lane

For Department of State Lands send application to:

West of the Cascades:
Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
Phone: 503-986-5200

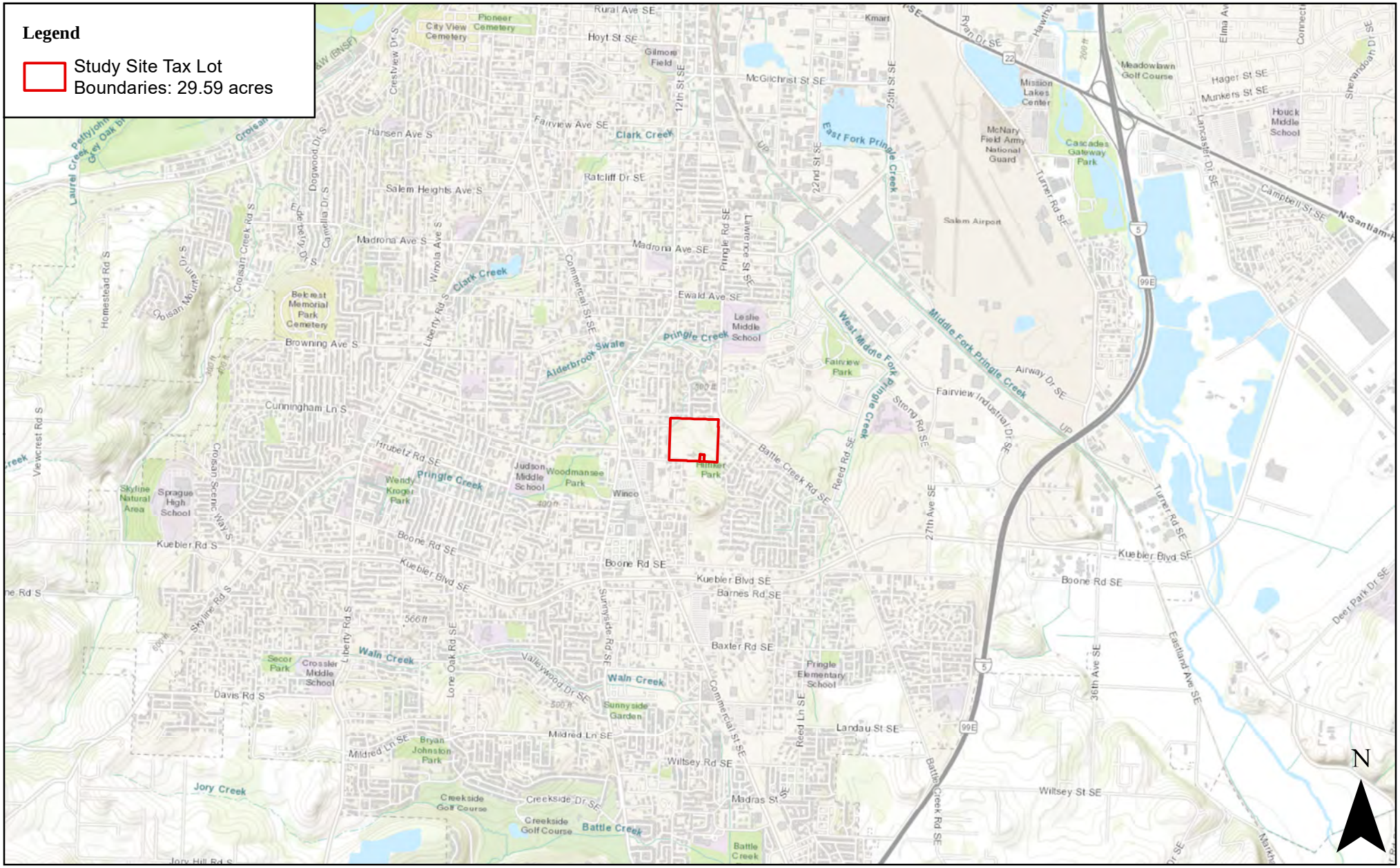
East of the Cascades:
Department of State Lands
1645 NE Forbes Road, Suite 112
Bend, Oregon 97701
Phone: 541-388-6112

For Department of Environmental Quality e-mail application to:

ATTN: DEQ 401 Certification Program
Water Quality
700 NE Multnomah St, Suite 600
Portland, OR 97232
401applications@deq.state.or.us

SCHOTT & ASSOCIATES
Ecologists & Wetlands Specialists
21018 NE Hwy 99E • P.O. Box 589 • Aurora, OR 97002 • (503) 678-6007 • FAX: (503) 678-6011

APPENDIX A:
SITE EXHIBITS



Date: 5/5/2021

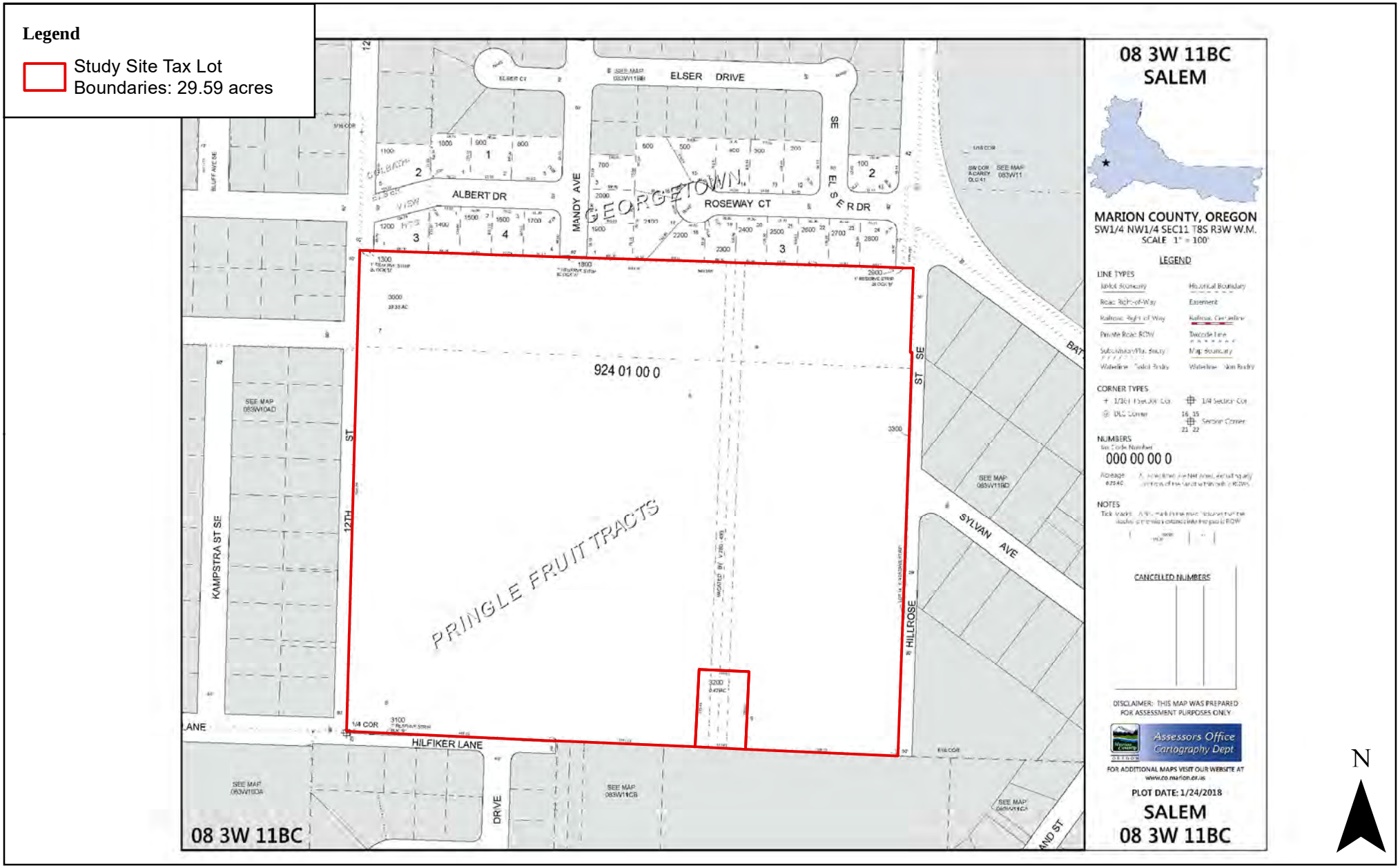
Data Source: ESRI, 2021; Marion County GIS Dept., 2021

Figure 1. Location Map

Pringle Road SE Project Site: S&A# 2851

0 1,000 2,000 4,000 Feet

SCHOTT & ASSOCIATES, Inc.



Date: 5/5/2021

Data Source: ESRI, 2021; Marion County GIS Dept., 2021

Figure 2. Marion County Tax Map - 083W11BC

Pringle Road SE Project Site: S&A# 2851

0 150 300 600 Feet

SCHOTT & ASSOCIATES, Inc.

Date: 10/4/2021

Data Source: ESRI, 2021; Marion County GIS Dept, 2021

Figure 5a. Recent Aerial Imagery - April 12, 2020

Pringle Road SE Project Site: S&A # 2851

0 100 200 400 Feet

SCHOTT & ASSOCIATES, Inc.

MEYER FARM SUBDIVISION

JPA PERMIT EXHIBITS - PHASE 2
TAXLOTS 3000 & 3002
TAXMAP 083W11BC
SW1/4 NW1/4 SEC 11 T8S R3S W.M.

PROJECT VICINITY MAP

NOT TO SCALE

N

PROJECT NO.	**0883-004**
ORIG. DATE:	**2/25/2022**
DRAWN BY:	**IJF**
SHEET No.	**1.0**

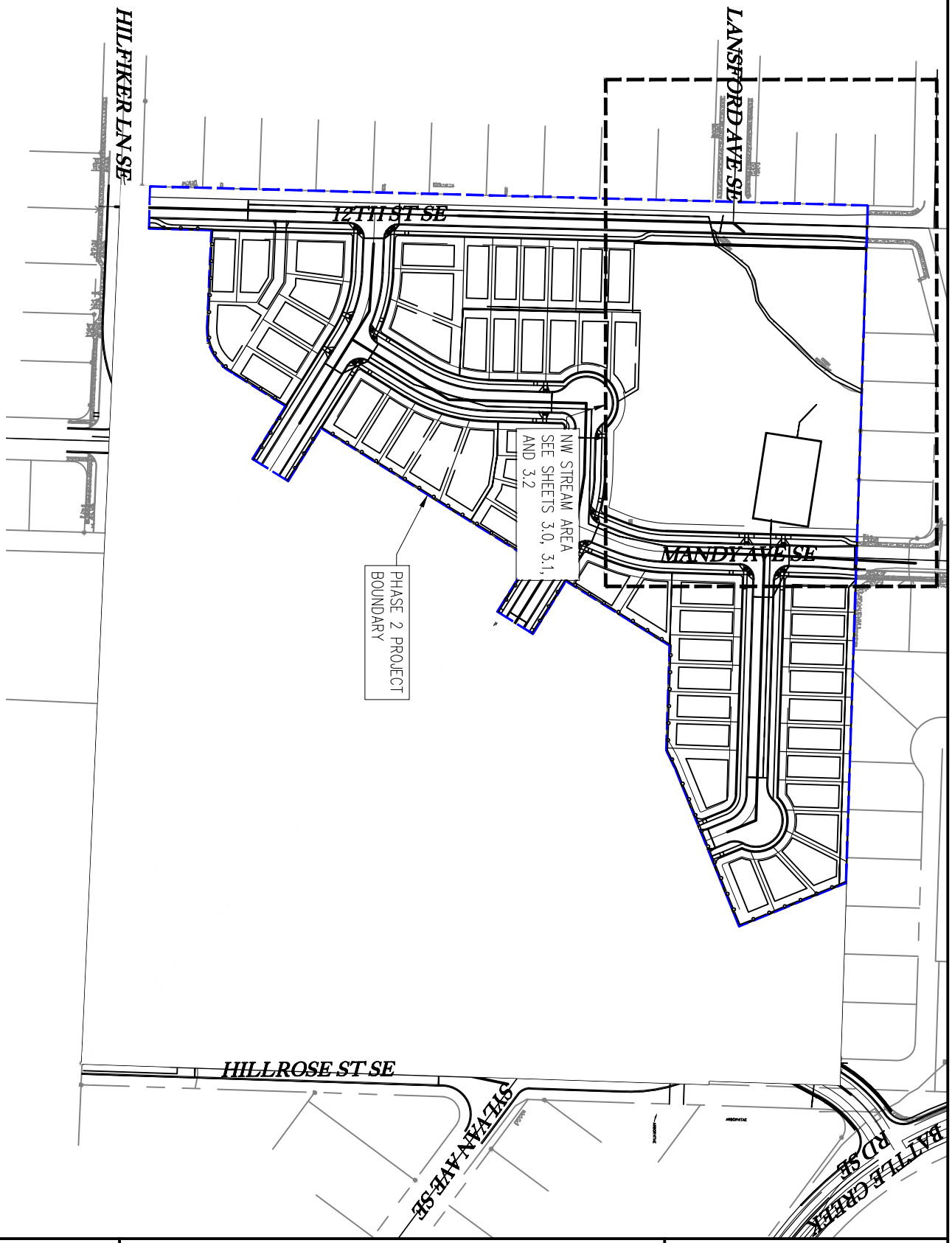
MEYER FARM

JPA PERMIT EXHIBITS - PHASE 2

CITY OF SALEM
MARION COUNTY, OREGON

EMERIO
ENGINEERING • SURVEYING • DESIGN
1500 VALLEY RIVER DRIVE, SUITE 100
EUGENE, OREGON 97401
TEL: (503) 746-8812
FAX: (503) 639-9592
www.emeriodesign.com

Plotted: 2/25/2022 – 10:45am, P:\0883-004 Meyer Farm – Salem\dwg\plan\Exhibits\JPA Permit Exhibits\0883-004 – Meyer Farm – JPA Exhibit PH2.dwg, Layout: JPA SH 1.0



PROJECT OVERVIEW MAP

SCALE: 1" = 200'

N

SCALE: 1" = 200'

200' 0 100' 200' 400'

PROJECT NO.	0883-004
ORIG. DATE:	2/25/2022
DRAWN BY:	IJF
SHEET No.	2.0

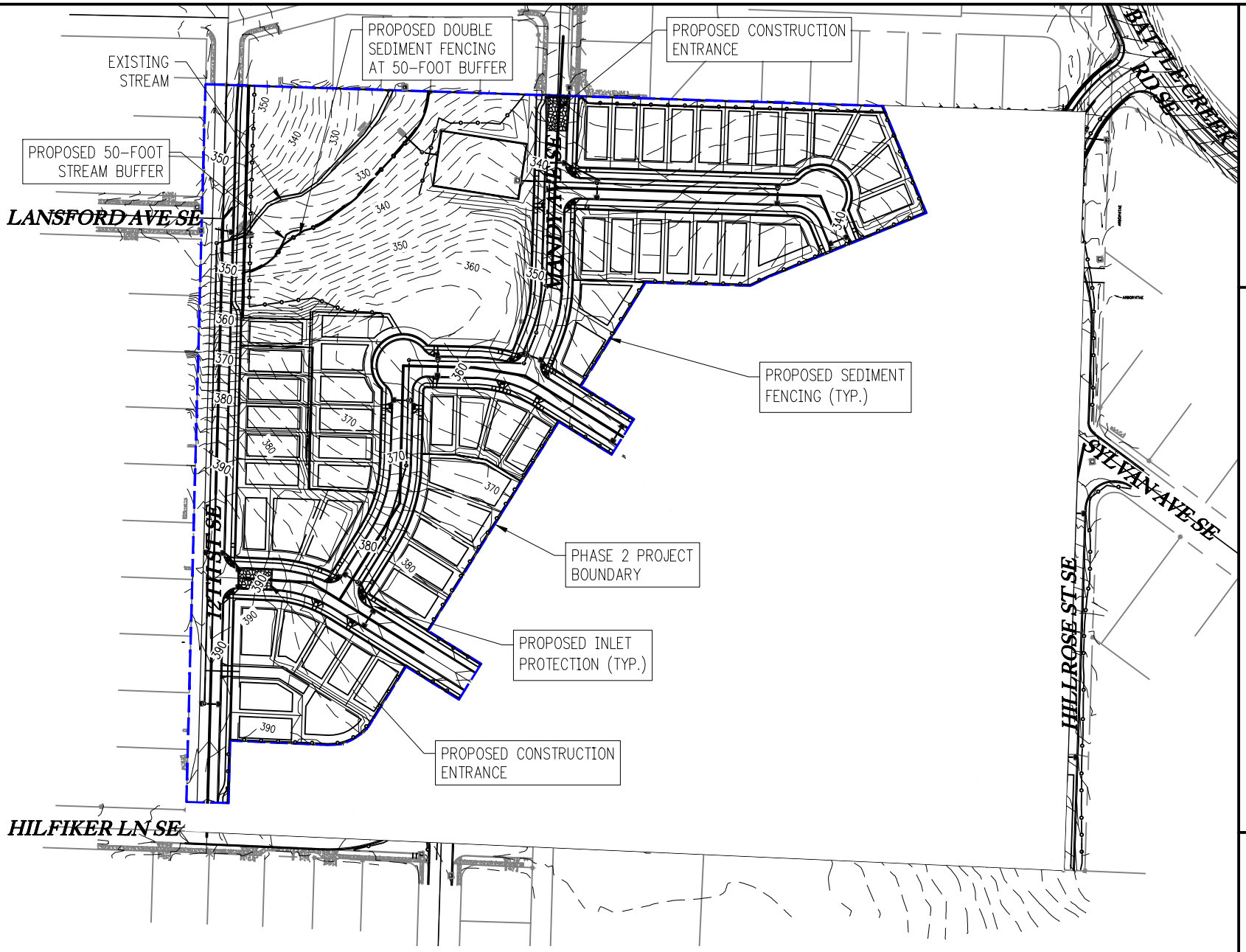
MEYER FARM

JPA PERMIT EXHIBITS - PHASE 2

CITY OF SALEM
MARION COUNTY, OREGON

EMERIO
ENGINEERING • SURVEYING • DESIGN
1500 VALLEY RIVER DRIVE, SUITE 100
EUGENE, OREGON 97401
TEL: (503) 746-8812
FAX: (503) 639-9592
www.emeriodesign.com

Plotted: 2/25/2022 – 10:45am, P:\0883-004 Meyer Farm – Salem\dwg\plan\Exhibits\JPA Permit Exhibits\0883-004 – Meyer Farm – JPA Exhibit PH2.dwg, Layout: JPA SH 2.0



OVERALL GRADING AND EROSION CONTROL PLAN

SCALE: 1" = 200'

EMERIO
ENGINEERING · SURVEYING · DESIGN
1500 VALLEY RIVER DRIVE, SUITE 100
EUGENE, OREGON 97401
TEL: (503) 746-8812
FAX: (503) 639-9592
www.emeriodesign.com

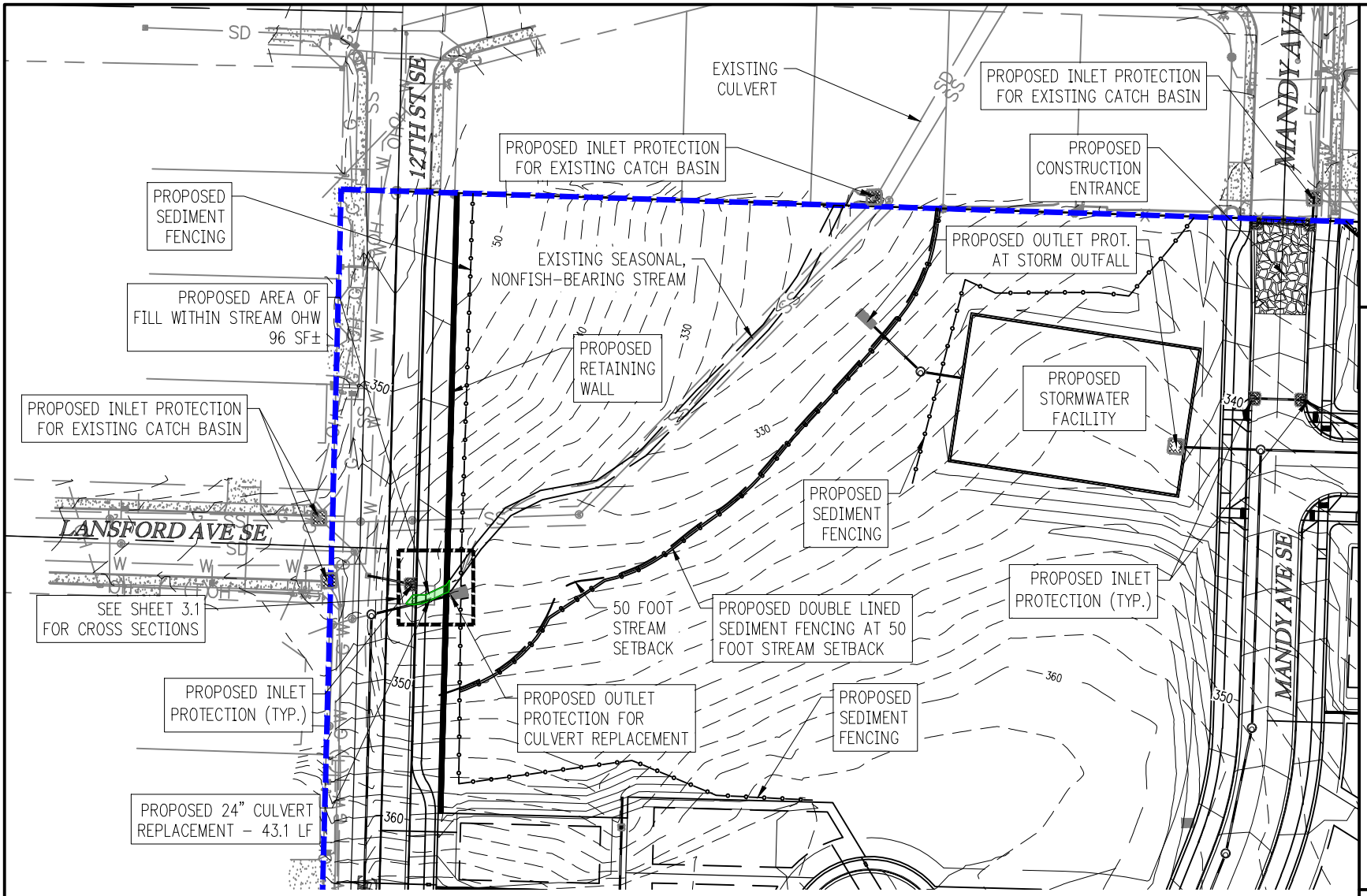
MEYER FARM

JPA PERMIT EXHIBITS - PHASE 2

CITY OF SALEM
MARION COUNTY, OREGON

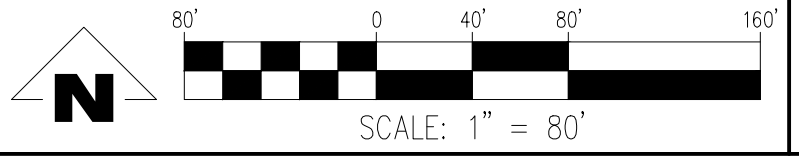
PROJECT NO.	0883-004
ORIG. DATE:	2/25/2022
DRAWN BY:	IJF
SHEET No.	2.1

Plotted: 2/25/2022 - 10:45am, P:\0883-004 Meyer Farm - Salem\dwg\plan\Exhibits\JPA Permit Exhibits\0883-004 - Meyer Farm - JPA Exhibit PH2.dwg, Layout: JPA SH 2.1



NW STREAM AREA OVERVIEW

SCALE: 1" = 80'



SCALE: 1" = 80'

EMERIO
ENGINEERING · SURVEYING · DESIGN
1500 VALLEY RIVER DRIVE, SUITE 100
EUGENE, OREGON 97401
TEL: (503) 746-8812
FAX: (503) 639-9592
www.emeriodesign.com

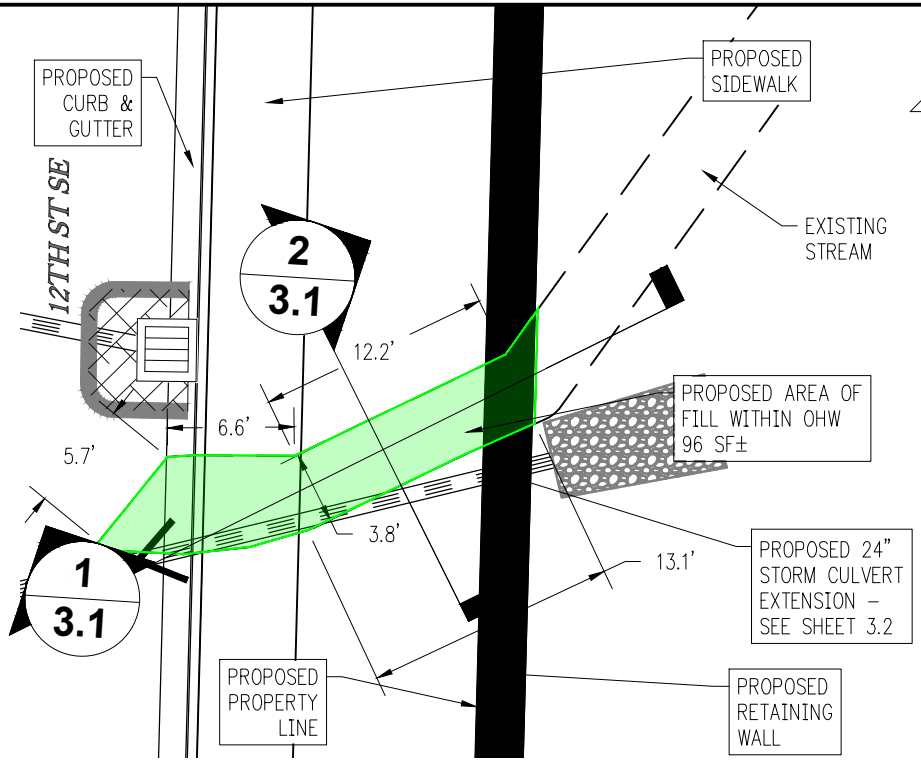
MEYER FARM

JPA PERMIT EXHIBITS - PHASE 2

CITY OF SALEM
MARION COUNTY, OREGON

PROJECT NO.	0883-004
ORIG. DATE:	2/25/2022
DRAWN BY:	IJF
SHEET No.	3.0

Plotted: 2/25/2022 – 10:46am, P:\0883-004 Meyer Farm – Salem\dwg\plan\Exhibits\JPA Permit Exhibits\0883-004 – Meyer Farm – JPA Exhibit PH2.dwg, Layout: JPA SH 3.0



STREAM PLAN

SCALE: 1" = 10'

10' 0 5' 10' 20'

SCALE: 1" = 10'

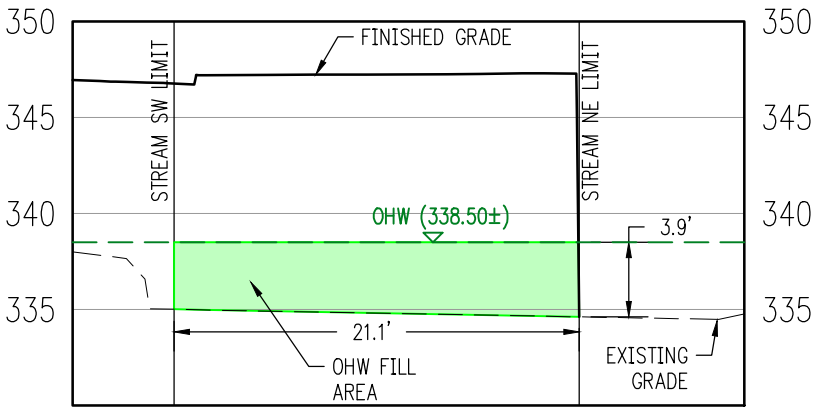
IMPROVEMENTS WITHIN OHW

ORDINARY HIGH WATER MARK (OHW) ELEV = 388.50±

IMPROVEMENT AREA = 96 SF±

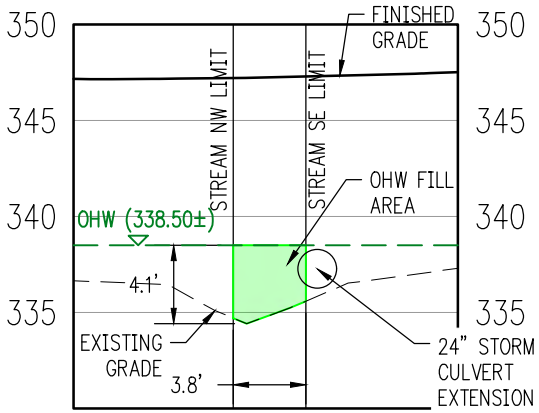
CUT BELOW OHW = 0 CY
FILL ABOVE OHW = 12 CY

NET EARTHWORK WITHIN OHW = 12 CY (FILL)



1 / 3.1 **SW-NE SECTION**

SCALE: 1" = 10' H, 1" = 10' V



2 / 3.1 **NW-SE SECTION**

SCALE: 1" = 10' H, 1" = 10' V

EMERIO
ENGINEERING · SURVEYING · DESIGN
1500 VALLEY RIVER DRIVE, SUITE 100
EUGENE, OREGON 97401
TEL: (503) 746-8812
FAX: (503) 639-9592
www.emeriodesign.com

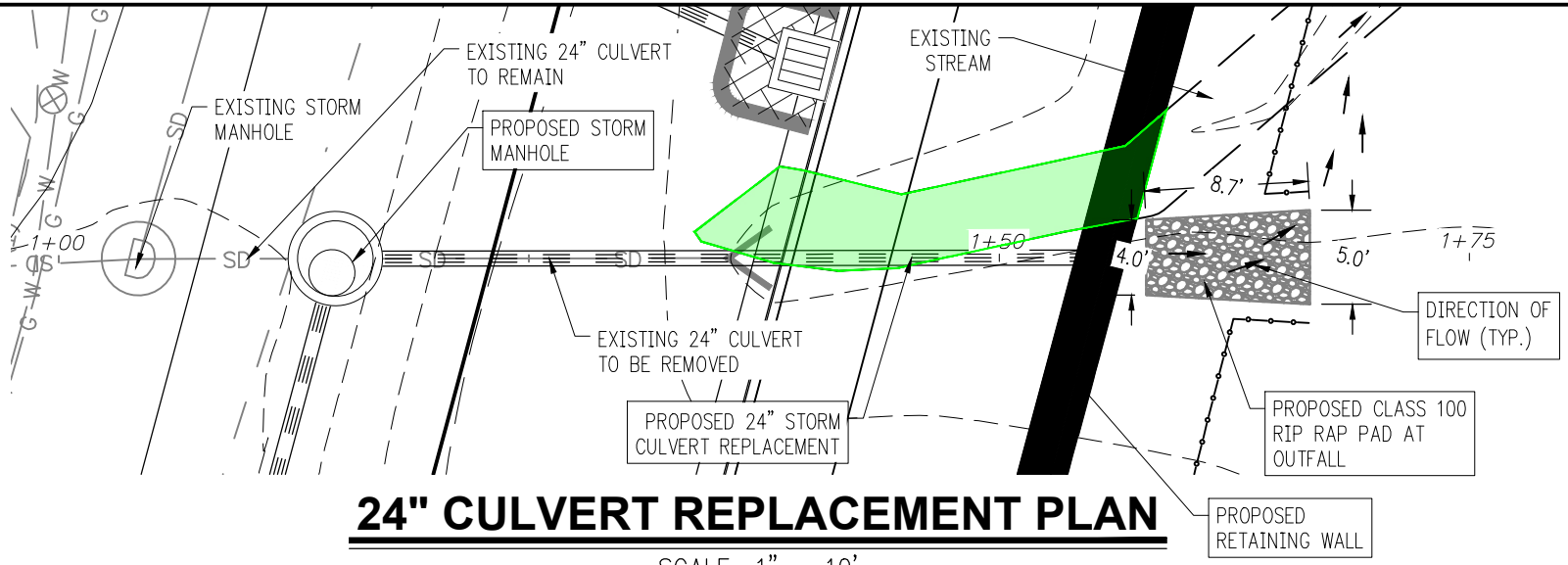
MEYER FARM

JPA PERMIT EXHIBITS - PHASE 2

CITY OF SALEM
MARION COUNTY, OREGON

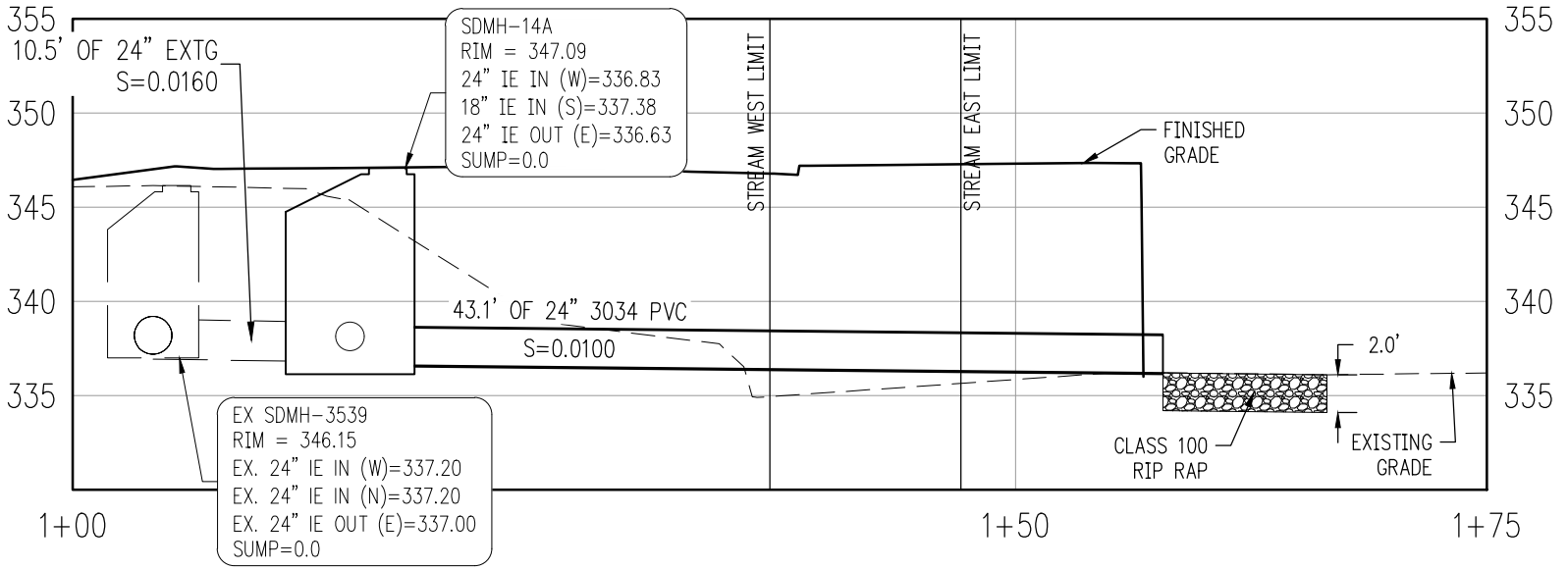
PROJECT NO.	0883-004
ORIG. DATE:	2/25/2022
DRAWN BY:	IJF
SHEET No.	3.1

Plotted: 2/25/2022 – 10:46am, P:\0883-004 Meyer Farm – Salem\dwg\plan\Exhibits\JPA Permit Exhibits\0883-004 – Meyer Farm – JPA Exhibit PH2.dwg, Layout: JPA SH 3.1



24" CULVERT REPLACEMENT PLAN

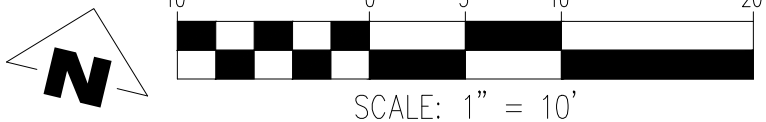
SCALE: 1" = 10'



24" CULVERT REPLACEMENT PROFILE

SCALE: 1" = 10' H, 1" = 10' V

NOTE: SEE SHEET 3.1 FOR EARTHWORK VOLUMES WITHIN STREAM BOUNDARY



SCALE: 1" = 10'

EMERIO
ENGINEERING · SURVEYING · DESIGN
1500 VALLEY RIVER DRIVE, SUITE 100
EUGENE, OREGON 97401
TEL: (503) 746-8812
FAX: (503) 639-9592
www.emeriodesign.com

MEYER FARM

JPA PERMIT EXHIBITS - PHASE 2

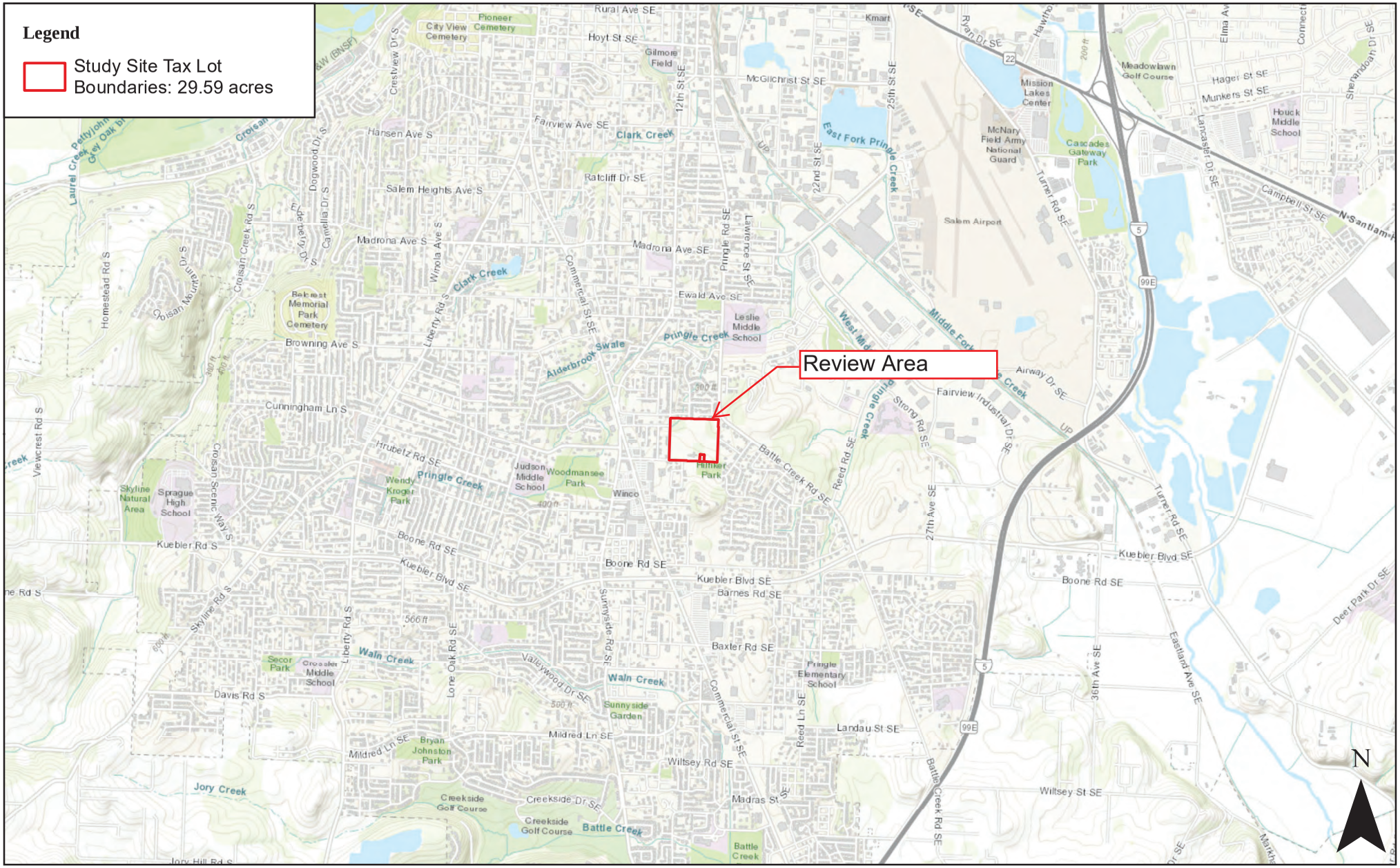
CITY OF SALEM
MARION COUNTY, OREGON

PROJECT NO.	0883-004
ORIG. DATE:	2/25/2022
DRAWN BY:	IJF
SHEET No.	3.2

Plotted: 2/25/2022 - 10:47am, P:\0883-004 Meyer Farm - Salem\dwg\plan\Exhibits\JPA Permit Exhibits\0883-004 - Meyer Farm - JPA Exhibit PH2.dwg, Layout: JPA SH 3.2

SCHOTT & ASSOCIATES
Ecologists & Wetlands Specialists
21018 NE Hwy 99E • P.O. Box 589 • Aurora, OR 97002 • (503) 678-6007 • FAX: (503) 678-6011

APPENDIX B:
DELINEATION CONCURRENCE



Date: 5/5/2021

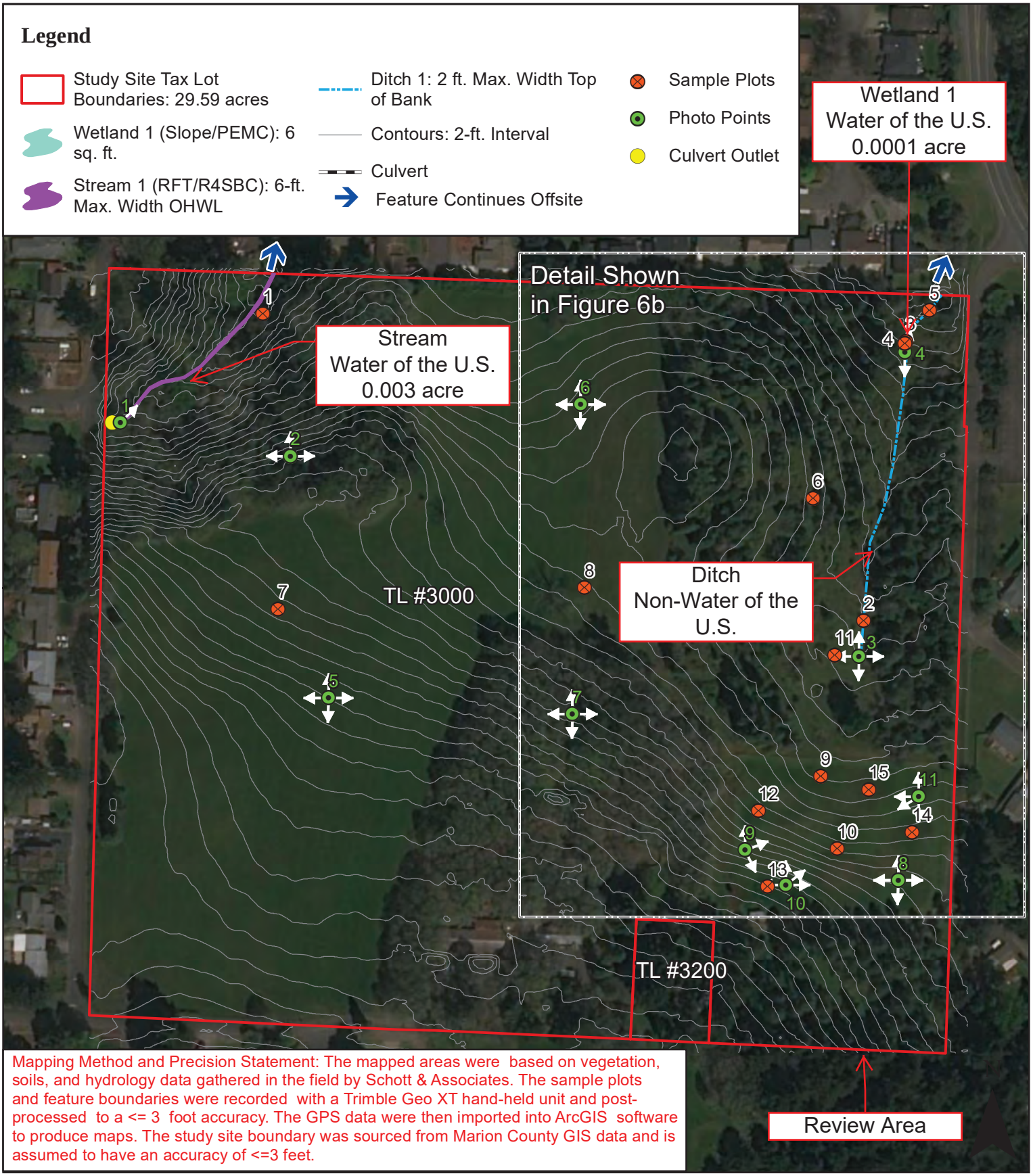
Data Source: ESRI, 2021; Marion County GIS Dept., 2021

Figure 1. Location Map

Pringle Road SE Project Site: S&A# 2851

0 1,000 2,000 4,000 Feet

SCHOTT & ASSOCIATES, Inc.



Mapping Method and Precision Statement: The mapped areas were based on vegetation, soils, and hydrology data gathered in the field by Schott & Associates. The sample plots and feature boundaries were recorded with a Trimble Geo XT hand-held unit and post-processed to a <= 3 foot accuracy. The GPS data were then imported into ArcGIS software to produce maps. The study site boundary was sourced from Marion County GIS data and is assumed to have an accuracy of <=3 feet.

Date: 10/4/2021

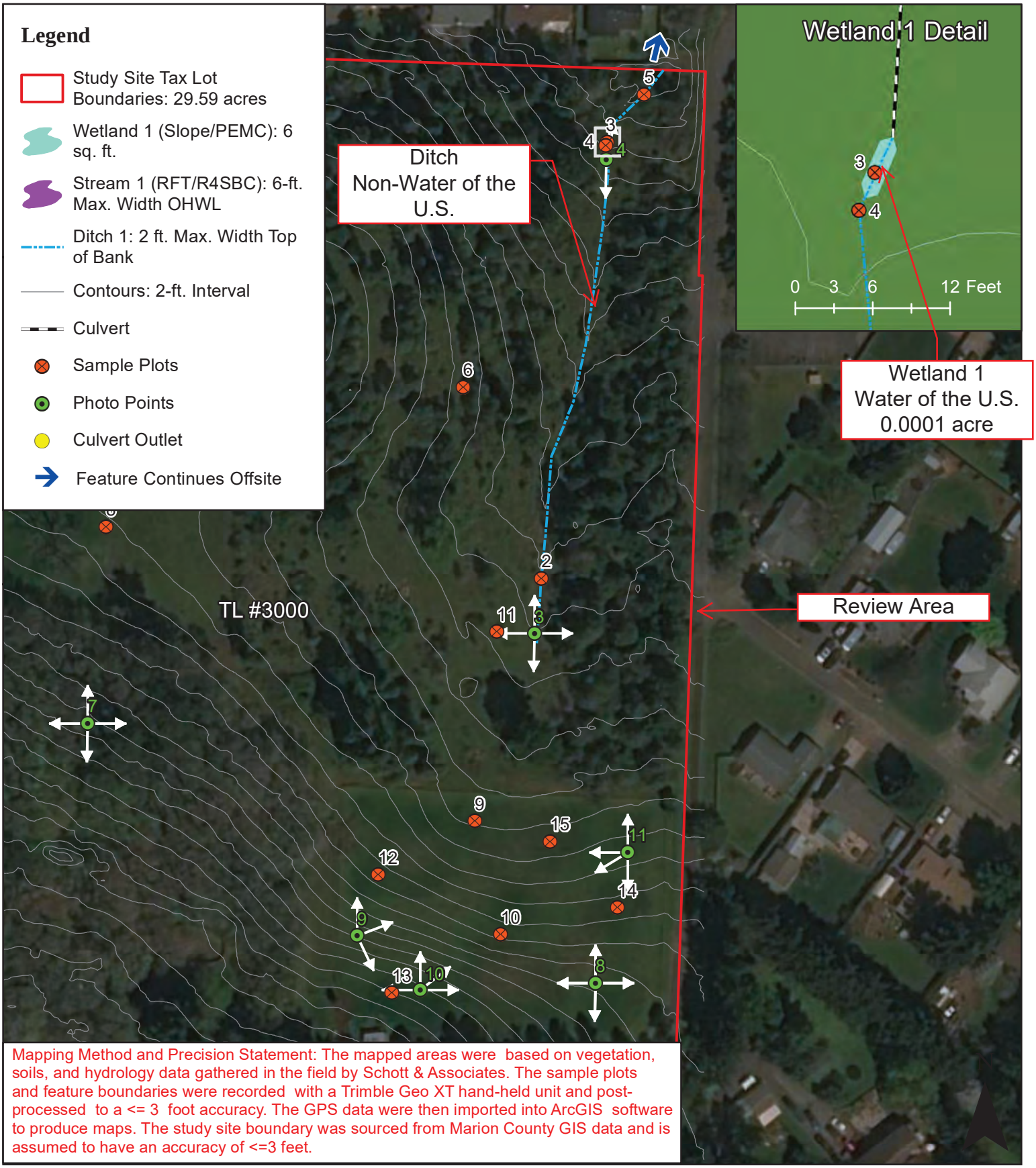
Data Source: ESRI, 2021; Marion County GIS Dept, 2021; DOGAMI, 2009

Figure 6a. Wetland Delineation Map - Overview

Pringle Road SE Project Site: S&A # 2851

0 100 200 400 Feet

SCHOTT & ASSOCIATES, Inc.



Date: 9/30/2021

Data Source: ESRI, 2021; Marion County GIS Dept, 2021; DOGAMI, 2009

Figure 6b. Wetland Delineation Map - Detail

Pringle Road SE Project Site: S&A # 2851

0 50 100 200 Feet

SCHOTT & ASSOCIATES, Inc.

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 27 December 2021

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: CENWP-ODG, Pringle Road SE, NWP-2021-363

C. PROJECT LOCATION AND BACKGROUND INFORMATION:
State: Oregon County/parish/borough: Marion City: Salem
Center coordinates of site (lat/long in degree decimal format): Lat. 44.892235° North, Long. -123.028079° West.
Universal Transverse Mercator:
Name of nearest waterbody: Pringle Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Willamette River
Name of watershed or Hydrologic Unit Code (HUC): Croisan Creek-Willamette River 170900070301
☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☒ Office (Desk) Determination. Date: 30 November 2021
☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are No** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]
☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are and Are Not** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☐ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☒ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs: Stream
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☒ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs: Wetland 1
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: linear feet: width (ft) and/or 0.003 acres.
      Wetlands: 0.0001 acres.

   c. **Limits (boundaries) of jurisdiction** based on: **1987 Delineation Manual.**
      Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
   Explain: **Ditch. See Section F below.** .

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW: .

Summarize rationale supporting determination: .

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: **Pick List**
Drainage area: **Pick List**
Average annual rainfall: inches
Average annual snowfall: inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☐ Tributary flows directly into TNW.
☐ Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW.
Project waters are **Pick List** river miles from RPW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Project waters are **Pick List** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: .

Identify flow route to TNW[5]: .
Tributary stream order, if known: .

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: **Pick List.**

Primary tributary substrate composition (check all that apply):

☐ Silts	☐ Sands	☐ Concrete
☐ Cobbles	☐ Gravel	☐ Muck
☐ Bedrock	☐ Vegetation. Type/% cover:	
☐ Other. Explain: .		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Pick List.** Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):

☐ clear, natural line impressed on the bank	☐ the presence of litter and debris
☐ changes in the character of soil	☐ destruction of terrestrial vegetation
☐ shelving	☐ the presence of wrack line
☐ vegetation matted down, bent, or absent	☐ sediment sorting
☐ leaf litter disturbed or washed away	☐ scour
☐ sediment deposition	☐ multiple observed or predicted flow events
☐ water staining	☐ abrupt change in plant community
☐ other (list):	

☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by:	☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects	☐ survey to available datum;
☐ fine shell or debris deposits (foreshore)	☐ physical markings;
☐ physical markings/characteristics	☐ vegetation lines/changes in vegetation types.
☐ tidal gauges	
☐ other (list):	

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width): .
- ☐ Wetland fringe. Characteristics: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain: .

Wetland quality. Explain: .

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: **Pick List**. Explain: .

Surface flow is**: Pick List**

Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .

- ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: .
  - ☐ Ecological connection. Explain: .
  - ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW.

Project waters are **Pick List** aerial (straight) miles from TNW.

Flow is from: **Pick List.**

Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .

Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width): .
- ☐ Vegetation type/percent cover. Explain: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **Pick List**

Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: Wetland 1 is a palustrine emergent wetland located in the northeastern portion of the Review Area. This wetland is located receives hydrology from a Ditch to the south (see Section F) in a shallow, concave surface and flows directly into a culvert. The Ditch continues to the northeast outside of the study area. The culvert is identified on the City of Salem's online stormwater map and flows due north until its intersection with another stormwater pipe at Suntree Drive SE. From there, the stormwater flows east and joins another stormwater pipe located below Suntree Court SE. The stormwater then flows generally north for about 1,000 linear feet until it discharges into Pringle Creek. Pringle Creek flows east and north for approximately 3.3 miles until it discharges into the Willamette Slough. The Willamette Slough is an oxbow feature which maintains a hydrologic surface connection with the Willamette River, a TNW. During the wet season, Wetland 1 would have a hydrologic connection to the Willamette River.

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**

☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:

☒ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: Stream - This stream appears on U.S. Geological Survey topographic maps dating back to 1969. Additionally, the stream appears well defined based on a review of the Oregon Department of Geology and Mineral Industries LIDAR. The wetland delineation report describes the stream as 4-6 feet wide and less than 1 foot deep with a few inches of flowing surface water visible in March 2021.

.

Provide estimates for jurisdictional waters in the review area (check all that apply):

☒ Tributary waters: **320** linear feet **5** width (ft).

☐ Other non-wetland waters: acres.

Identify type(s) of waters: .

3. Non-RPWs[8] that flow directly or indirectly into TNWs.

☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

☐ Tributary waters: linear feet width (ft).

☐ Other non-wetland waters: acres.

Identify type(s) of waters: **.**

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: **.**

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

☒ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: **0.0001** acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. Impoundments of jurisdictional waters.[9]

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

☐ Demonstrate that impoundment was created from "waters of the U.S.," or

☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or

☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

[8]See Footnote # 3.

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]

☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☒ Other: (explain, if not covered above): **Ditch excavated in uplands wholly draining uplands, with non-RPW flow.**

The Ditch is located in the northeastern quadrant of the Review Area. Based upon a review of remote resources and the wetland delineation materials, the Ditch drains wholly uplands and is constructed entirely within uplands. The Ditch does not exhibit any signs of relatively permanent flow nor wetland parameters. For that reason, the Ditch is not a water of the U.S.

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: *Jurisdictional Wetland Delineation Report for Pringle Road SE* by Schott & Associates, dated May 2021..
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☒ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study: .
☐ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.

[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

☐ USGS 8 and 12 digit HUC maps.
☒ U.S. Geological Survey map(s). Cite scale & quad name: Salem West, OR 1:24000.
☐ USDA Natural Resources Conservation Service Soil Survey. Citation: .
☒ National wetlands inventory map(s). Cite name: obtained from the Corps' eGIS Regulatory WebViewer on 30 November 2021.
☒ State/Local wetland inventory map(s): Salem/Keizer Local Wetland Inventory (October, 1999).
☐ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date): Orthophoto from Corps' eGIS WebViewer dated 2018 and retrieved 30 November 2021.
or ☒ Other (Name & Date): Site photographs provided within the wetland delineation.
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☒ Other information (please specify): Oregon Department of Geology and Mineral Industries (DOGAMI) LIDAR retrieved 30 November 2021. .

B. ADDITIONAL COMMENTS TO SUPPORT JD: On 6 December 2021, the Corps coordinated this JD with EPA Region 10. The Corps did not receive a response after 21 days and has assumed concurrence.

Oregon
Kate Brown, Governor

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 986-5200
FAX (503) 378-4844
www.oregon.gov/dsl

October 12, 2021

Marty Kehoe
11627 S. Summerville Ave.
Portland, OR 97210

Re: WD # 2021-0342 **Approved**
Wetland Delineation Report for the Pringle Road SE Subdivision
Marion County; T8S R3W S11BC TLs 3000 and 3200
Salem Local Wetlands Inventory, Wetland PC-Q

Dear Marty Kehoe:

The Department of State Lands has reviewed the wetland delineation report prepared by Schott & Associates for the site referenced above. Based upon the information presented in the report, and additional information submitted upon request, we concur with the wetland and waterway boundaries as mapped in Figure 6a and 6b of the report. Please replace all copies of the preliminary wetland maps with these final Department-approved maps.

Within the study area, one wetland (Wetland 1), one waterway (Stream 1) and one ditch (Ditch 1) were identified. Stream 1 is subject to the permit requirements of the state Removal-Fill Law. Under current regulations, a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in wetlands or below the ordinary high-water line (OHWL) of the waterway (or the 2-year recurrence interval flood elevation if OHWL cannot be determined). Wetland 1 and Ditch 1 are exempt per OAR 141-085-0515(8); therefore, they are not subject to current state Removal-Fill requirements.

This concurrence is for purposes of the state Removal-Fill Law only. We recommend that you attach a copy of this concurrence letter to any subsequent state permit application to speed application review. Federal, other state agencies, or local permit requirements may apply as well. The U.S. Army Corps of Engineers will determine jurisdiction under the Clean Water Act, which may require submittal of a complete Wetland Delineation Report.

Please be advised that state law establishes a preference for avoidance of wetland impacts. Because measures to avoid and minimize wetland impacts may include reconfiguring parcel layout and size or development design, we recommend that you work with Department staff on appropriate site design before completing the city or county land use approval process.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter unless new information necessitates a revision. Circumstances under which the Department may change a determination are found in OAR 141-090-0045 (available on our web site or upon request). In addition, laws enacted by the legislature and/or rules adopted by the Department may result in a change in jurisdiction; individuals and applicants are subject to the regulations that are in effect at the time of the removal-fill activity or complete permit application. The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within six months of the date of this letter.

Thank you for having the site evaluated. If you have any questions, please contact the Jurisdiction Coordinator for Marion County, Daniel Evans, PWS at (503) 986-5271.

Sincerely,

Peter Ryan, SPWS
Aquatic Resource Specialist

Enclosures

ec: Kim Biafora, Schott & Associates
Salem Planning Department (Maps enclosed for updating LWI)
Kinsey Friesen, Corps of Engineers
Carrie Landrum, DSL
City of Salem Public Works (pw-wetlands@cityofsalem.net)

WETLAND DELINEATION / DETERMINATION REPORT COVER FORM

Fully completed and signed report cover forms and applicable fees are required before report review timelines are initiated by the Department of State Lands. Make checks payable to the Oregon Department of State Lands. To pay fees by credit card, go online at: https://apps.oregon.gov/DSL/EPS/program?key=4.

Attach this completed and signed form to the front of an unbound report or include a hard copy with a digital version (single PDF file of the report cover form and report, minimum 300 dpi resolution) and submit to: **Oregon Department of State Lands, 775 Summer Street NE, Suite 100, Salem, OR 97301-1279.** A single PDF of the completed cover from and report may be e-mailed to: **Wetland_Delineation@dsl.state.or.us**. For submittal of PDF files larger than 10 MB, e-mail DSL instructions on how to access the file from your ftp or other file sharing website.

Contact and Authorization Information

☒ Applicant ☐ Owner Name, Firm and Address:

Marty Kehoe
11627 S. Summerville Ave
Portland, OR 97219

Business phone # (503) 970-1111
Mobile phone # (optional)
E-mail: Mkehoe03@gmail.com

☐ Authorized Legal Agent, Name and Address (if different):

Business phone #
Mobile phone # (optional)
E-mail:

I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact.

Typed/Printed Name: MARTY Kehoe **Signature:** [signature]
Date: 6-23-21 Special instructions regarding site access: ____

Project and Site Information

Project Name: Pringle Rd SE

Latitude: 44.891817° Longitude: -123.028036°
decimal degree - centroid of site or start & end points of linear project

Proposed Use:
Residential subdivison

Tax Map # 083W11BC
Tax Lot(s) 3000, 3200

Tax Map #
Tax Lot(s)

Project Street Address (or other descriptive location):
South of intersection of Hwy 20 and SE Kennel Rd

Township 8S Range 3W Section 11 QQ SW/NW
Use separate sheet for additional tax and location information

City: Salem County: Marion

Waterway: n/a River Mile:

Wetland Delineation Information

Wetland Consultant Name, Firm and Address:
Kim Biafora, Schott & Associates
21018 NE Hwy 99E
Aurora, OR 97002

Phone # (503) 678-6007
Mobile phone # (if applicable)
E-mail: kim@schottandassociates.com

The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.
Consultant Signature: Kim Biafora Date: 6/23/2021

Primary Contact for report review and site access is ☐ Consultant ☒ Applicant/Owner ☐ Authorized Agent

Wetland/Waters Present? ☐ Yes ☒ No Study Area size: 29.59 Total Wetland Acreage: 0.000 1

Check Applicable Boxes Below

☐ R-F permit application submitted
☐ Mitigation bank site
☐ Industrial Land Certification Program Site
☐ Wetland restoration/enhancement project (not mitigation)
☐ Previous delineation/application on parcel
If known, previous DSL # ____

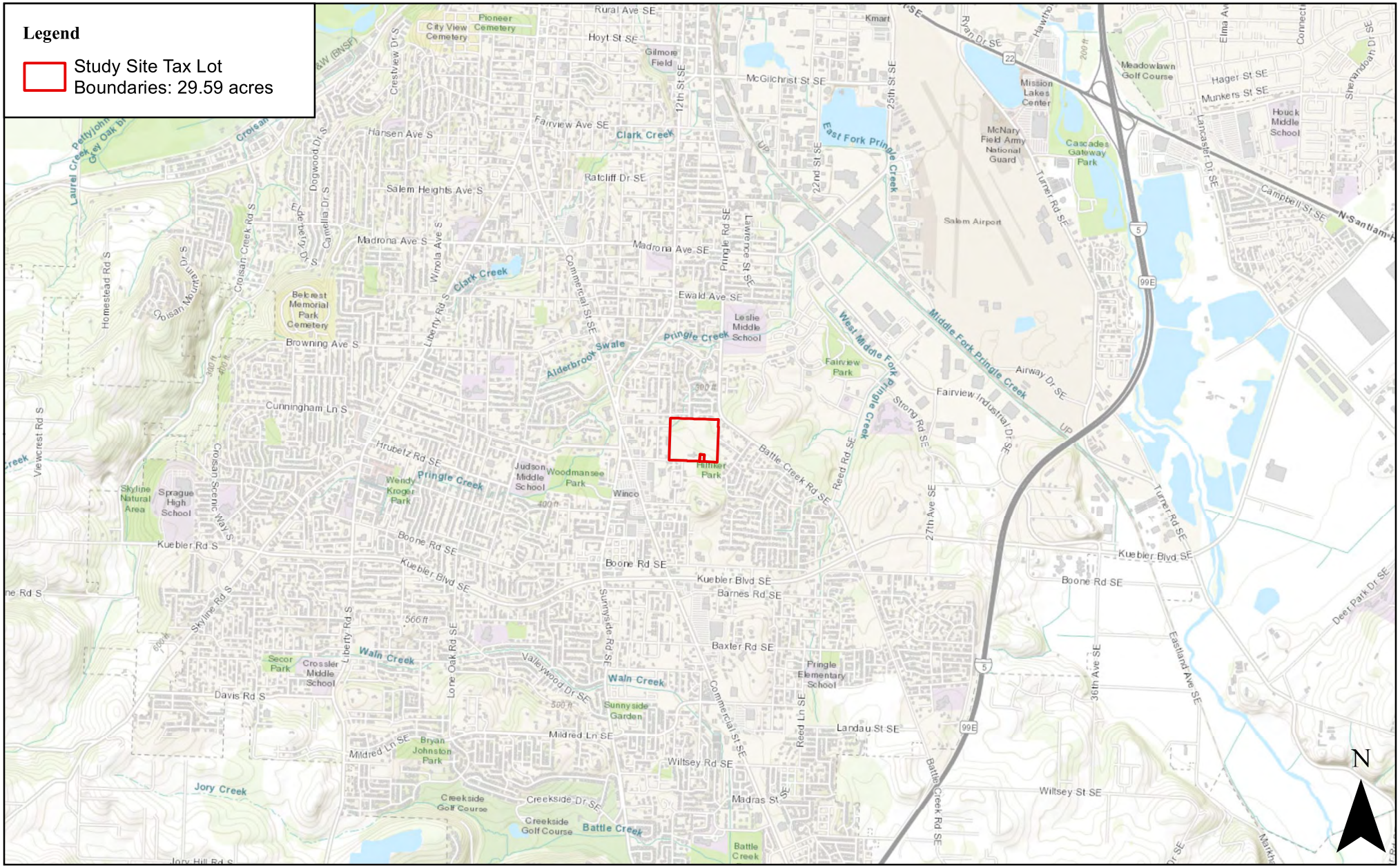
☐ Fee payment submitted $ ____
☐ Fee ($100) for resubmittal of rejected report
☐ Request for Reissuance. See eligibility criteria. (no fee)
DSL # ____ Expiration date ____

☒ LWI shows wetlands or waters on parcel
Wetland ID code PC-Q

For Office Use Only

DSL Reviewer: DE Fee Paid Date: ____/____/____ DSL WD # 2021-0342

Date Delineation Received: 06/23/2021 Scanned: ☐ Electronic: ☒ DSL App.# ____



Date: 5/5/2021

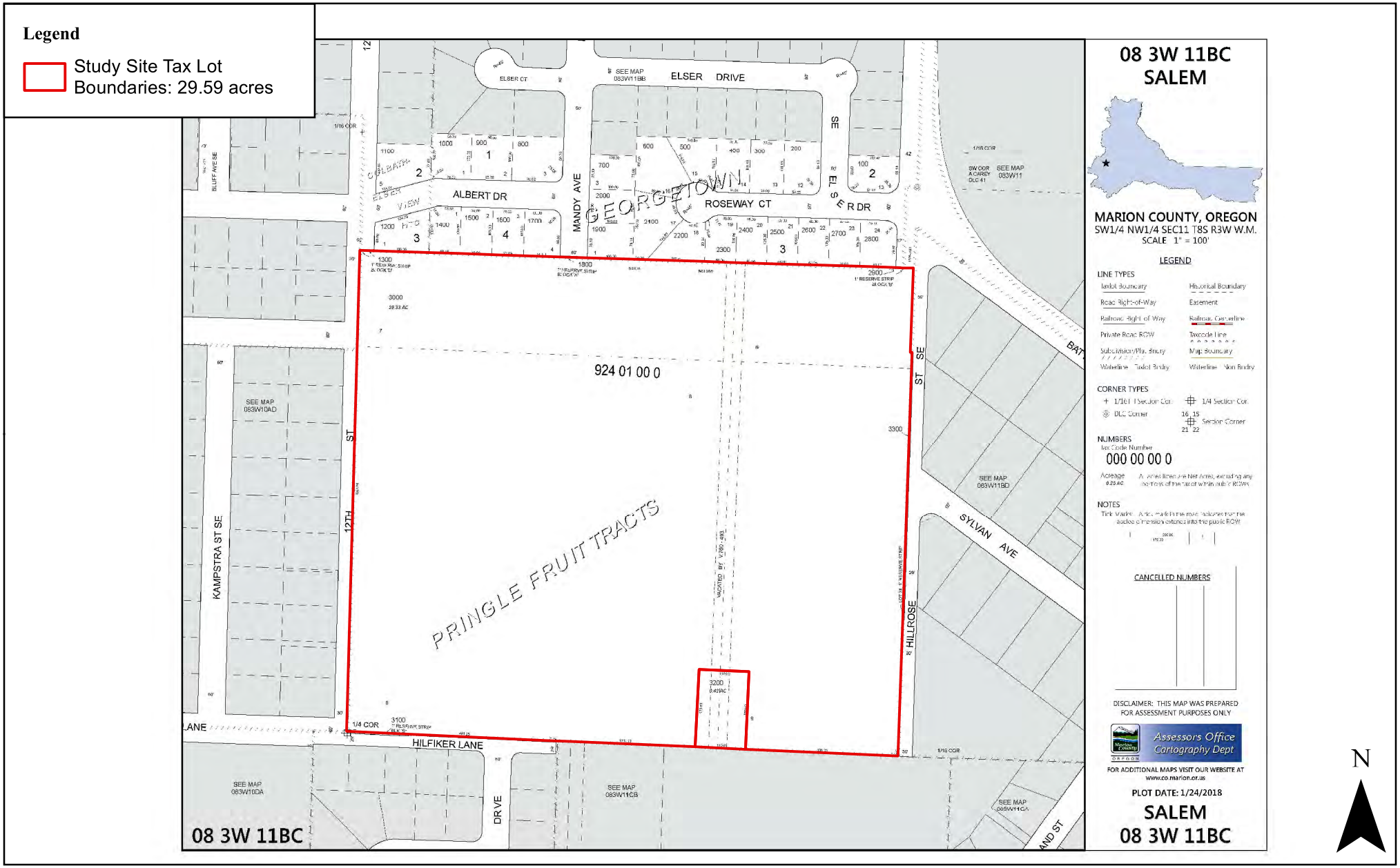
Data Source: ESRI, 2021; Marion County GIS Dept., 2021

Figure 1. Location Map

Pringle Road SE Project Site: S&A# 2851

0 1,000 2,000 4,000 Feet

SCHOTT & ASSOCIATES, Inc.



Date: 5/5/2021

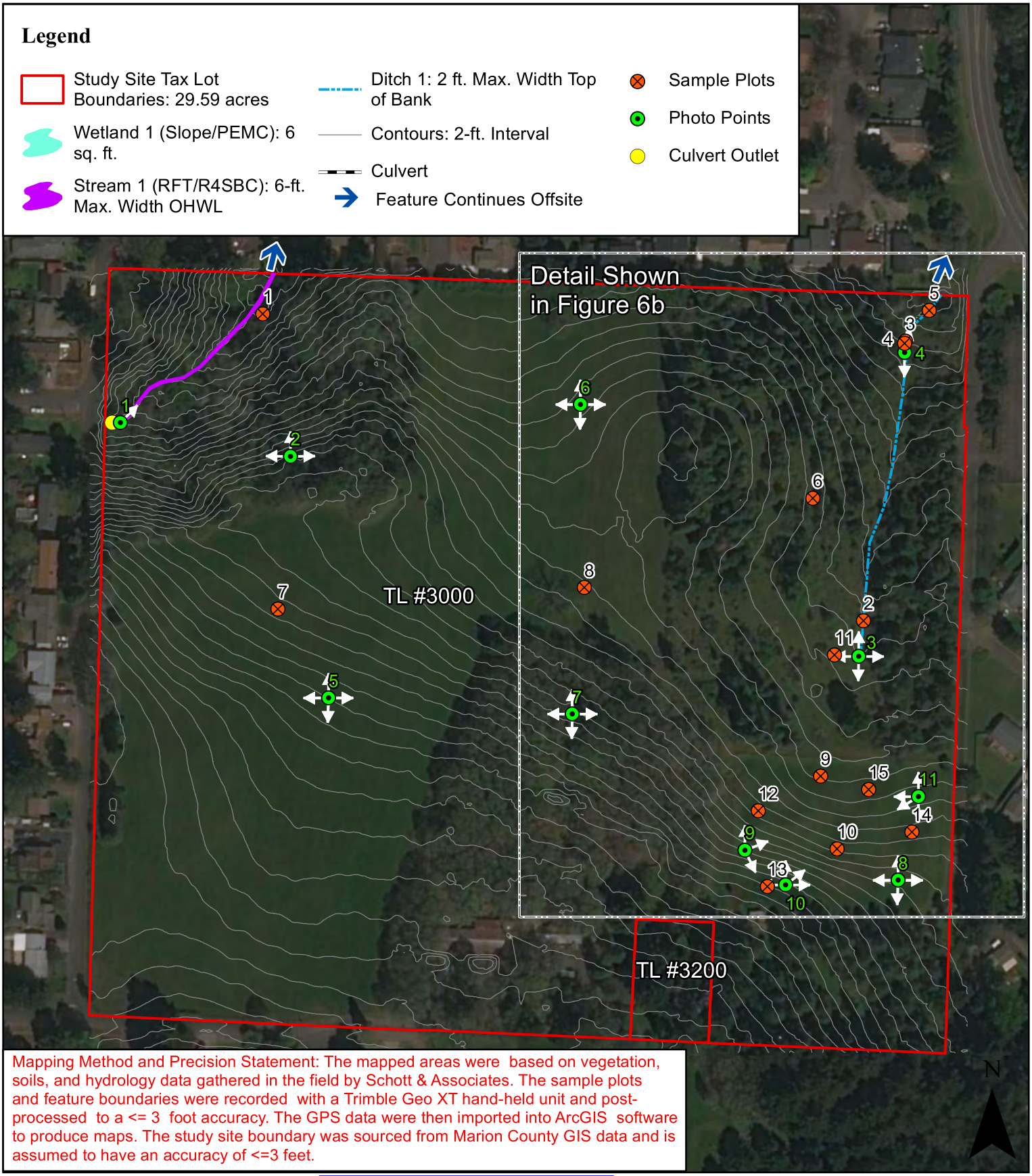
Data Source: ESRI, 2021; Marion County GIS Dept., 2021

Figure 2. Marion County Tax Map - 083W11BC

Pringle Road SE Project Site: S&A# 2851

0 150 300 600 Feet

SCHOTT & ASSOCIATES, Inc.



Mapping Method and Precision Statement: The mapped areas were based on vegetation, soils, and hydrology data gathered in the field by Schott & Associates. The sample plots and feature boundaries were recorded with a Trimble Geo XT hand-held unit and post-processed to a <= 3 foot accuracy. The GPS data were then imported into ArcGIS software to produce maps. The study site boundary was sourced from Marion County GIS data and is assumed to have an accuracy of <=3 feet.

Date: 9/30/2021

Data Source: ESRI, 2021; Marion County GIS Dept, 2021; DOGAMI, 2009

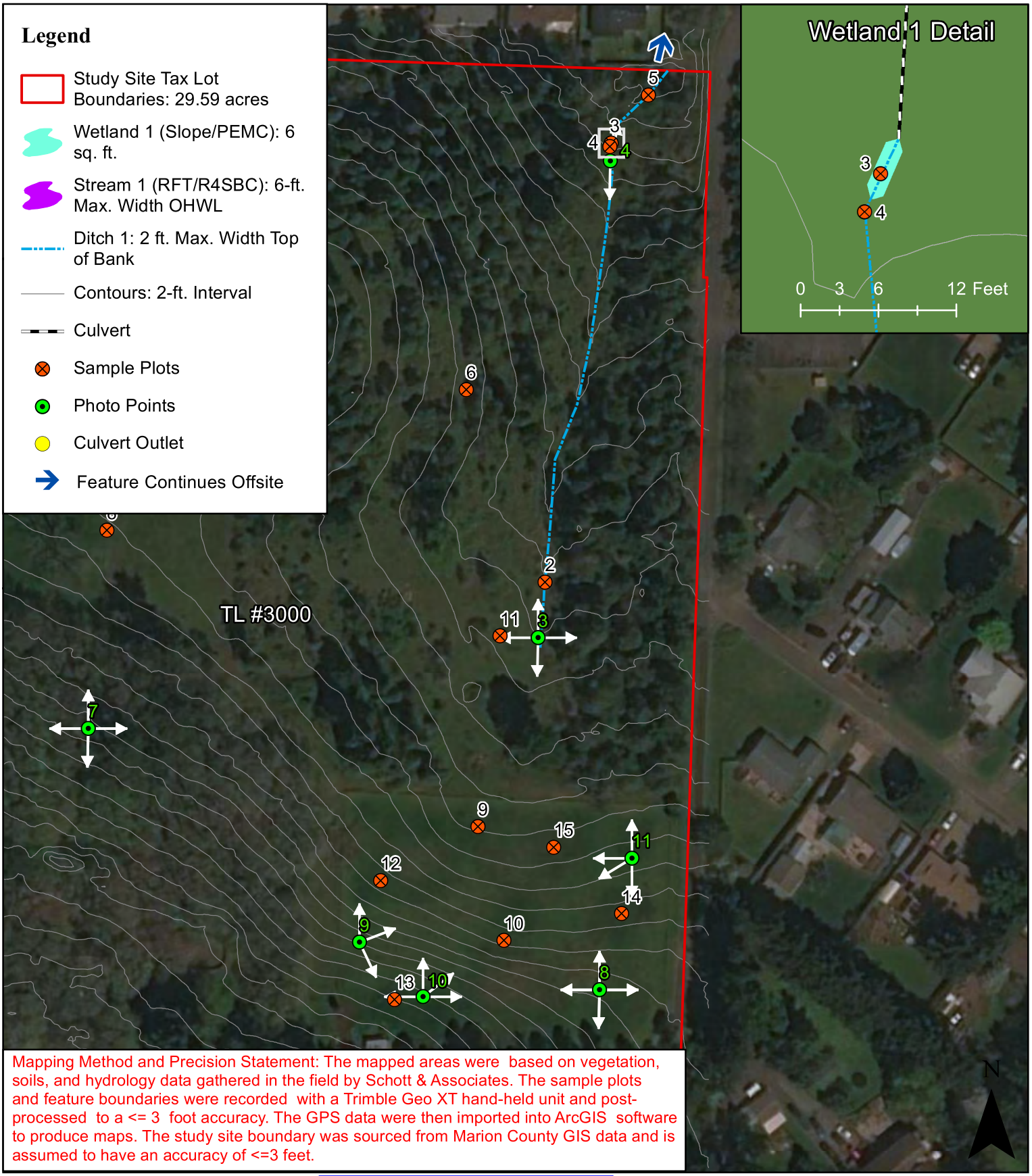
DSL WD # 2021-0342
Approval Issued 10/12/2021
Approval Expires 10/12/2026

Figure 6a. Wetland Delineation Map - Overview

Pringle Road SE Project Site: S&A # 2851

SCHOTT & ASSOCIATES, Inc.

0 100 200 400 Feet



Mapping Method and Precision Statement: The mapped areas were based on vegetation, soils, and hydrology data gathered in the field by Schott & Associates. The sample plots and feature boundaries were recorded with a Trimble Geo XT hand-held unit and post-processed to a <= 3 foot accuracy. The GPS data were then imported into ArcGIS software to produce maps. The study site boundary was sourced from Marion County GIS data and is assumed to have an accuracy of <=3 feet.

Date: 9/30/2021

Data Source: ESRI, 2021; Marion County GIS Dept, 2021; DOGAMI, 2009

DSL WD # 2021-0342
Approval Issued 10/12/2021
Approval Expires 10/12/2026

Figure 6b. Wetland Delineation Map - Detail

Pringle Road SE Project Site: S&A # 2851

0 50 100 200 Feet

SCHOTT & ASSOCIATES, Inc.

SCHOTT & ASSOCIATES
Ecologists & Wetlands Specialists
21018 NE Hwy 99E • P.O. Box 589 • Aurora, OR 97002 • (503) 678-6007 • FAX: (503) 678-6011

APPENDIX C:
STORMWATER MANAGEMENT PLAN

SLOPES for Stormwater, Transportation and Utilities

(NMFS# NWR-2013-10411)

Stormwater Information Form

If you are submitting a project that includes a stormwater plan for review under SLOPES for Stormwater, Transportation and Utilities please fill out the following cover sheet **to be included with** stormwater management plan, and any other supporting materials.

Also include a drawing of the stormwater treatment area including drainage areas, direction of flow, BMP locations and types, contributing areas, other drainage features, receiving water/location, etc.

	Project Information	
	Corps of Engineers permit #	
	Name of Project:	Meyer Farm Subdivision Phase 2
	Type of project (i.e., residential, commercial, industrial, or combination)	138-Lot Residential Subdivision
	Nearest receiving water occupied by ESA-listed species or designated critical habitat	Willamette River
	Lat/Long (DDD.dddd) of Project Location:	Lat 44.89176 / Long 123.0287
	Have you contacted anyone at NMFS regarding this project?	
	Applicant/Consultant name:	Juniper Tagliabue
	Applicant/Consultant email:	juniper@schottandassociates.com
	Stormwater Designer and/or Engineer Contact Information	
	Name:	Ian Feltis, PE
	Phone:	(541) 517-0082
	Email:	ian@emeriodesign.com
	Summary of Design Elements	
1.	24-hour design storm: 1.25 Inches	50%* of 2-yr, 24-hr storm fully treated: Yes (●) No ( ) If no, project may not meet the SLOPES programmatic criteria *May be greater than 50% - see PDC 36.e. for geographically based percentage
2.	2 year, 24 hour storm from NOAA Precipitation Atlas: http://www.nws.noaa.gov/ohd/hdsc/noaaatlas2.htm	2.5 Inches
3.	**Total** contributing impervious area including all contiguous surface (e.g. roads, driveways, parking lots, sidewalks, roofs, and similar surfaces)	5.2 Acres
	Proposed new	5.2 Acres
	Existing	0 Acres
	Acres of total impervious area 10.2 x 1.25 design storm = 20,793	ft^3 to be treated
4.	Peak discharge of design storm:	1.40 cfs
5.	Total stormwater to be treated:	20,793 ft^3 1.40 cfs
6.	Stormwater Design Manual Used and Year/Version: (example: City of Portland, Clean Water Services, King County, Western Washington) City of Salem Stormwater Design Handbook and 2016 City of Salem Department of Public Works Design Standards Describe which elements of your stormwater plan came from this manual: Design storms in excess of SLOPES, specifications for filtration facilities, specifications for detention/flow control facilities.	

7.	Have you treated all stormwater to the design storm within the contributing impervious area? Yes (●) No ( ) If no, why not and how will you offset the effects from remaining stormwater?
	Water Quality
8.	Low Impact Development methods incorporated? Yes ( ) No ( ) (e.g. site layout, vegetation and soil protection, reforestation, integrated management practices such as amended soils, bioretention, permeable pavement, rainwater collection, tree retention) Please describe: How much of total stormwater is treated using LID:
9.	Treatment train, including pretreatment and bioretention methods used to treat water quality: Filtration facility for the water quality event, treated like a large "filtration stormwater planter" per City of Salem standards. Why this treatment train was chosen for the project site: Treatment was chosen to meet the water quality standards outlined in the City of Salem stormwater code. Page in stormwater plan where more details can be found: 4.0, 4.1
	Water Quantity
10.	Does the project discharge directly into a major water body (see PDC 36.c.iii)? Yes ( ) No ( )
11.	Pre-development runoff rate (i.e., before human-induced changes to the unimproved property) 2-yr, 24-hour storm: 0.24 CFS 10-yr storm: 0.69 CFS Post-development runoff rate (i.e., after proposed developments) 2-yr, 24-hour storm: 0.07 CFS 10-yr storm: 0.62 CFS
	Post-development runoff rate must be less than or equal to pre-development runoff rate
12.	Methods used to treat water quantity: Filtration planter, large storage area sized to detain the 100-year storm event volume. Page in stormwater plan where more details can be found: 4.0,4.1

	Maintenance and Inspection Plan
13.	Have you included a stormwater maintenance plan with a description of the onsite stormwater system, inspection schedule and process, maintenance activities, legal and financial responsibility, and inspection and maintenance logs? Yes (●) No* ( ) *Projects cannot be submitted for review under SLOPES without a maintenance and inspection plan. Page in stormwater plan where plan can be found:
14.	Contact information for the party/parties that will be legally responsible for performing the inspections and maintenance or the stormwater facilities: Name: City of Salem Public Works Department Phone number: (503) 588-6211 Email: publicworks@cityofsalem.net Name: _____ Phone number: _____ Email: _____ Name: _____ Phone number: _____ Email: _____ Page in stormwater plan where more details can be found:

Stormwater Management Plan - Phase 2

MEYER FARM SUBDIVISION

STORMWATER MANAGEMENT PLAN - PHASE 2
TAXLOTS 3000 & 3002
TAXMAP 083W11BC
SW1/4 NW1/4 SEC 11 T8S R3S W.M.

PROJECT VICINITY MAP

NOT TO SCALE

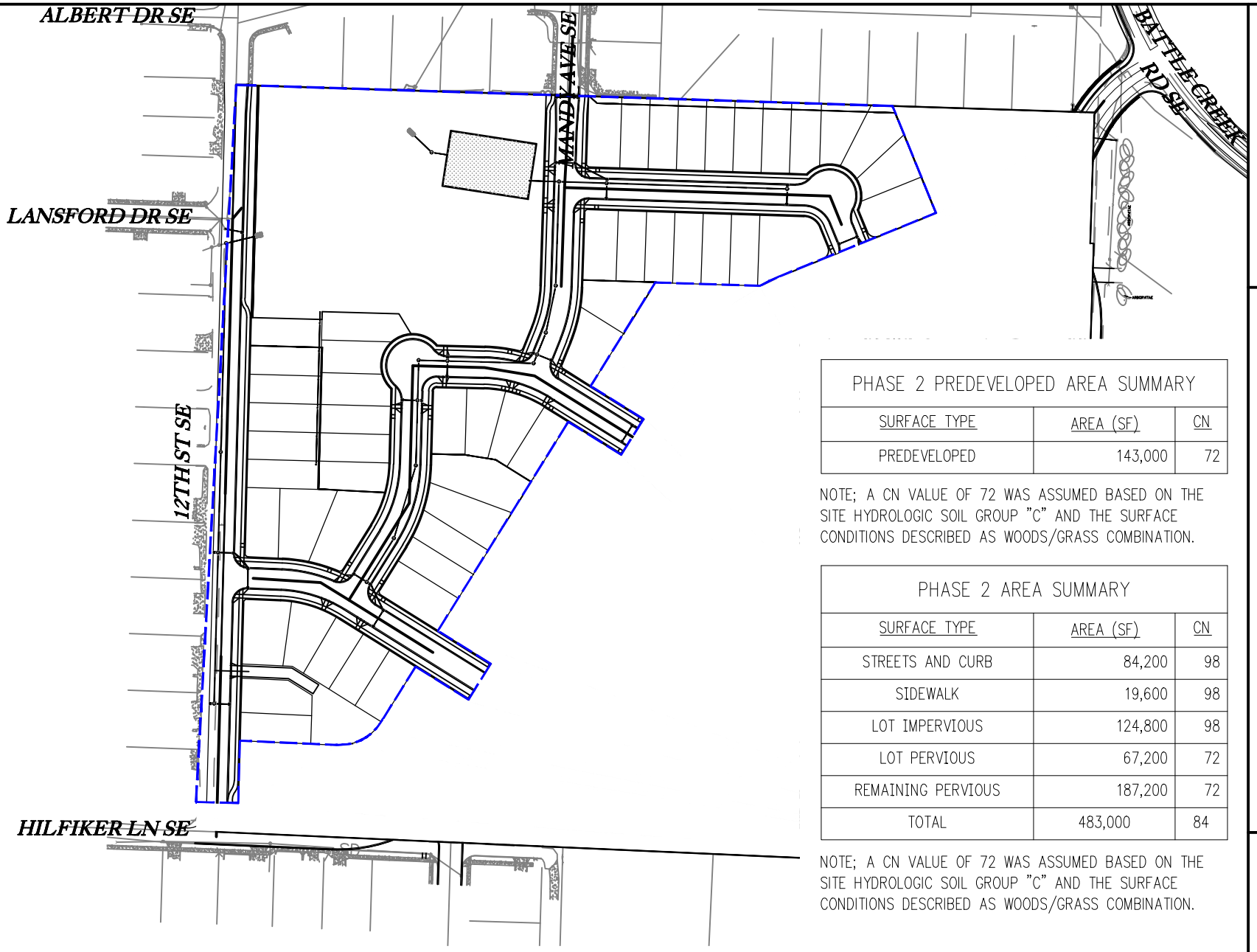
N

PROJECT NO.	**0883-004**
ORIG. DATE:	**2/24/2022**
DRAWN BY:	**IJF**
SHEET No.	**1.0**

MEYER FARM
SWMP - PHASE 2
CITY OF SALEM
MARION COUNTY, OREGON

EMERIO
ENGINEERING • SURVEYING • DESIGN
1500 VALLEY RIVER DRIVE, SUITE 100
EUGENE, OREGON 97401
TEL: (503) 746-8812
FAX: (503) 639-9592
www.emeriodesign.com

Plotted: 2/24/2022 – 10:17am, P:\0883-004 Meyer Farm – Salem\dwg\plan\Exhibits\SLOPES SWMP\Phase 2\0883-004 – Meyer Farm – SWMP PH 2.dwg, Layout: SWMP SH 1.0



PHASE 2 PREDEVELOPED AREA SUMMARY		
SURFACE TYPE	AREA (SF)	CN
PREDEVELOPED	143,000	72

NOTE; A CN VALUE OF 72 WAS ASSUMED BASED ON THE SITE HYDROLOGIC SOIL GROUP "C" AND THE SURFACE CONDITIONS DESCRIBED AS WOODS/GRASS COMBINATION.

PHASE 2 AREA SUMMARY		
SURFACE TYPE	AREA (SF)	CN
STREETS AND CURB	84,200	98
SIDEWALK	19,600	98
LOT IMPERVIOUS	124,800	98
LOT PERVIOUS	67,200	72
REMAINING PERVIOUS	187,200	72
TOTAL	483,000	84

NOTE; A CN VALUE OF 72 WAS ASSUMED BASED ON THE SITE HYDROLOGIC SOIL GROUP "C" AND THE SURFACE CONDITIONS DESCRIBED AS WOODS/GRASS COMBINATION.

PHASE 2 OVERVIEW AND AREA SUMMARY

SCALE: 1" = 200'

N

200' 0 100' 200' 400'

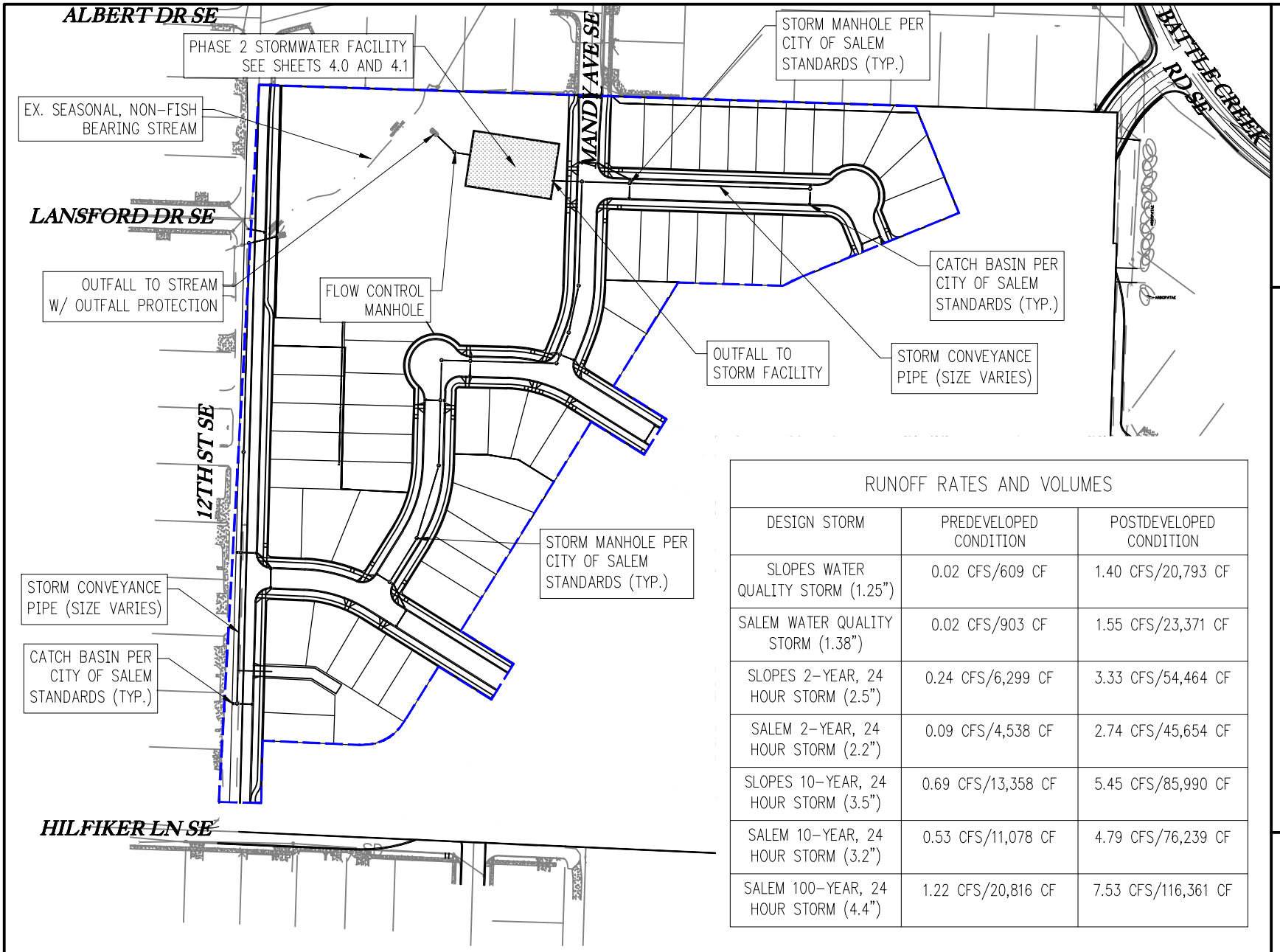
SCALE: 1" = 200'

EMERIO
ENGINEERING · SURVEYING · DESIGN
1500 VALLEY RIVER DRIVE, SUITE 100
EUGENE, OREGON 97401
TEL: (503) 746-8812
FAX: (503) 639-9592
www.emeriodesign.com

MEYER FARM
SWMP - PHASE 2
CITY OF SALEM
MARION COUNTY, OREGON

PROJECT NO. 0883-004
ORIG. DATE: 2/24/2022
DRAWN BY: IJF
SHEET No. 2.0

Plotted: 2/24/2022 - 10:20am, P:\0883-004 Meyer Farm - Salem\dwg\plan\Exhibits\SLOPES SWMP\Phase 2\0883-004 - Meyer Farm - SWMP PH 2.dwg, Layout: SWMP SH 2.0



RUNOFF RATES AND VOLUMES		
DESIGN STORM	PREDEVELOPED CONDITION	POSTDEVELOPED CONDITION
SLOPES WATER QUALITY STORM (1.25")	0.02 CFS/609 CF	1.40 CFS/20,793 CF
SALEM WATER QUALITY STORM (1.38")	0.02 CFS/903 CF	1.55 CFS/23,371 CF
SLOPES 2-YEAR, 24 HOUR STORM (2.5")	0.24 CFS/6,299 CF	3.33 CFS/54,464 CF
SALEM 2-YEAR, 24 HOUR STORM (2.2")	0.09 CFS/4,538 CF	2.74 CFS/45,654 CF
SLOPES 10-YEAR, 24 HOUR STORM (3.5")	0.69 CFS/13,358 CF	5.45 CFS/85,990 CF
SALEM 10-YEAR, 24 HOUR STORM (3.2")	0.53 CFS/11,078 CF	4.79 CFS/76,239 CF
SALEM 100-YEAR, 24 HOUR STORM (4.4")	1.22 CFS/20,816 CF	7.53 CFS/116,361 CF

STORMWATER MANAGEMENT PLAN OVERVIEW

SCALE: 1" = 200'

N

200' 0 100' 200' 400'

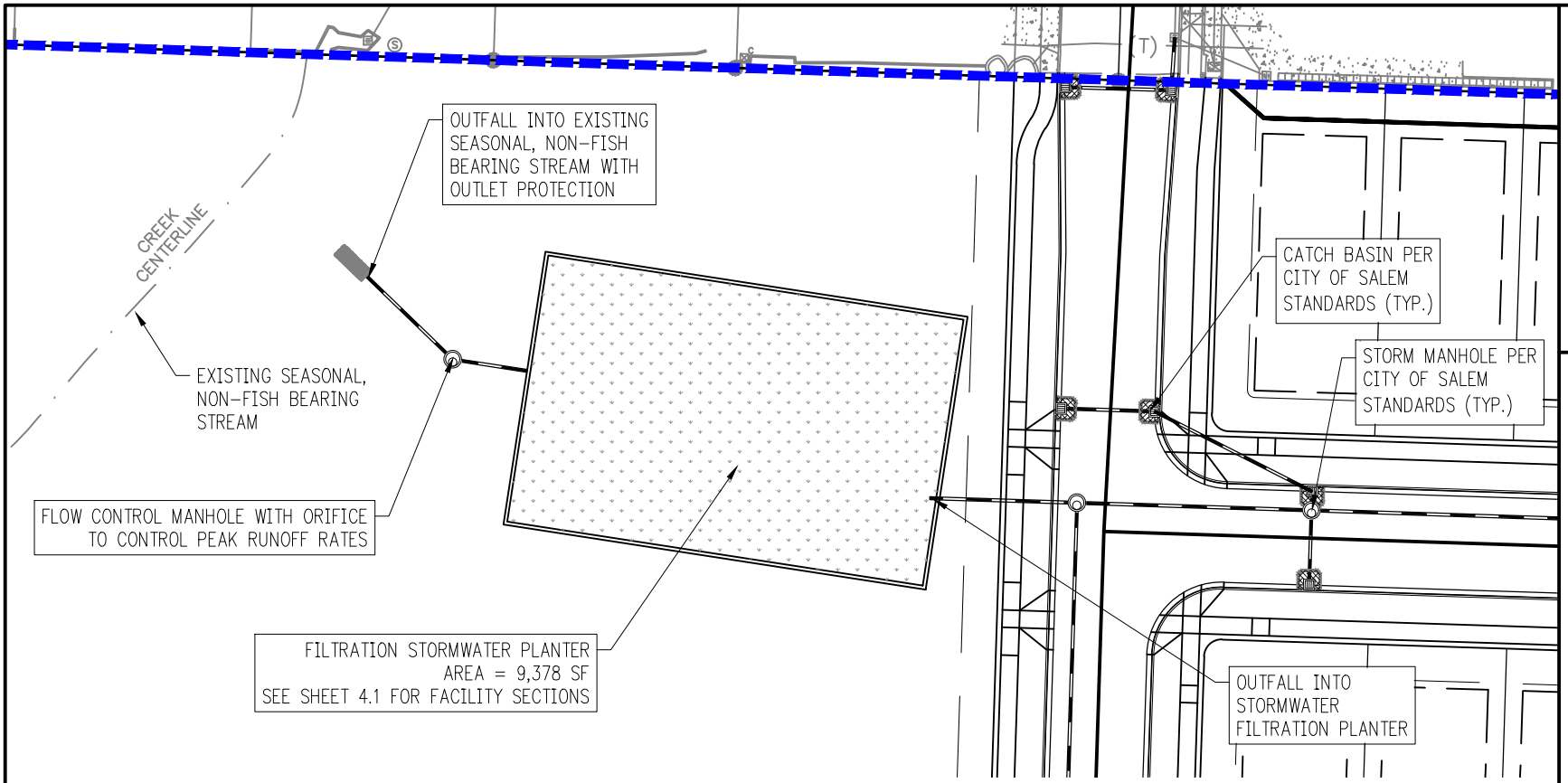
SCALE: 1" = 200'

EMERIO
ENGINEERING · SURVEYING · DESIGN
1500 VALLEY RIVER DRIVE, SUITE 100
EUGENE, OREGON 97401
TEL: (503) 746-8812
FAX: (503) 639-9592
www.emeriodesign.com

MEYER FARM
SWMP - PHASE 2
CITY OF SALEM
MARION COUNTY, OREGON

PROJECT NO. 0883-004
ORIG. DATE: 2/24/2022
DRAWN BY: IJF
SHEET No. 3.0

Plotted: 2/24/2022 - 10:21am, P:\0883-004 Meyer Farm - Salem\dwg\plan\Exhibits\SLOPES SWMP\Phase 2\0883-004 - Meyer Farm - SWMP PH 2.dwg, Layout: SWMP SH 3.0



STORMWATER FACILITY DETAILS

SCALE: 1" = 50'

PEAK RUNOFF RATES		
DESIGN STORM	PREDEVELOPED CONDITION	POSTDEVELOPED CONDITION
SLOPES 2-YEAR, 24 HOUR STORM (2.5")	0.21 CFS	0.07 CFS
SALEM 2-YEAR, 24 HOUR STORM (2.2")	0.09 CFS	0.07 CFS
SLOPES 10-YEAR, 24 HOUR STORM (3.5")	0.69 CFS	0.62 CFS
SALEM 10-YEAR, 24 HOUR STORM (3.2")	0.53 CFS	0.53 CFS
SALEM 100-YEAR, 24 HOUR STORM (4.4")	1.22 CFS	0.87 CFS

NOTE: STORMWATER FACILITY DESIGNED PER THE CITY OF SALEM STORMWATER DESIGN HANDBOOK AND THE 2016 CITY OF SALEM DEPARTMENT OF PUBLIC WORKS DESIGN STANDARDS FOR WATER QUALITY, FLOW CONTROL, AND CONVEYANCE.

SEE SHEETS 4.1 AND 4.2 FOR PLANTING REQUIREMENTS.

N

50' 0 25' 50' 100'

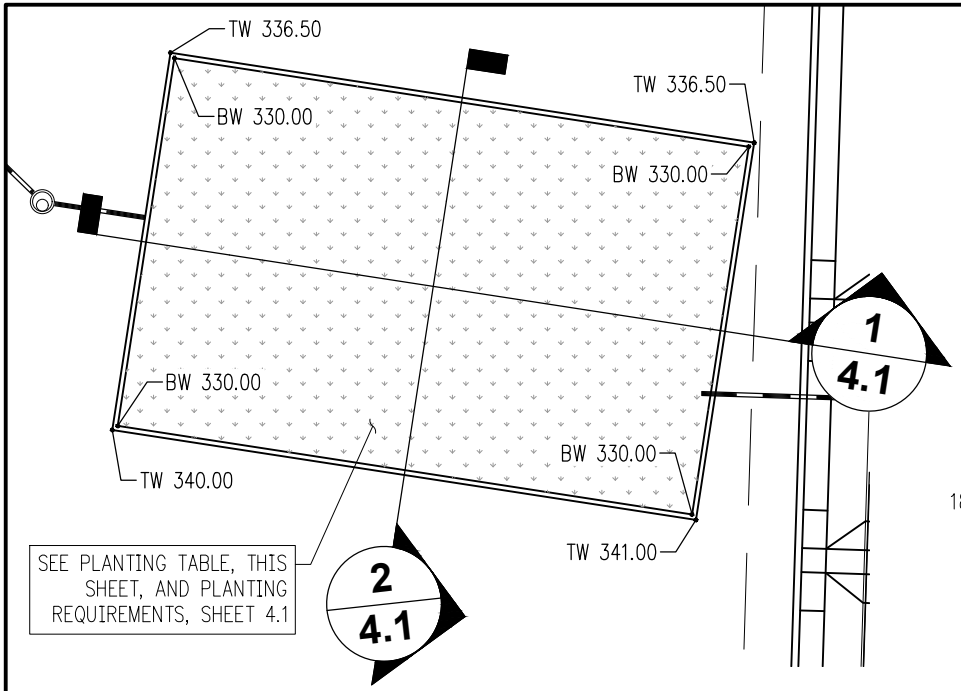
SCALE: 1" = 50'

EMERIO
ENGINEERING · SURVEYING · DESIGN
1500 VALLEY RIVER DRIVE, SUITE 100
EUGENE, OREGON 97401
TEL: (503) 746-8812
FAX: (503) 639-9592
www.emeriodesign.com

MEYER FARM
SWMP - PHASE 2
CITY OF SALEM
MARION COUNTY, OREGON

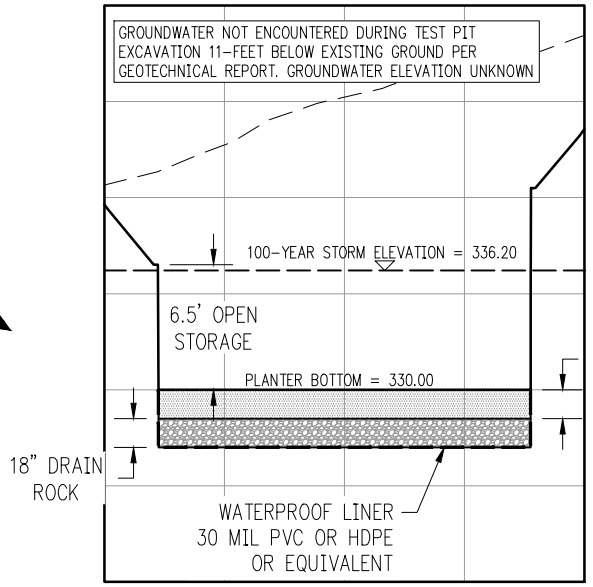
PROJECT NO. 0883-004
ORIG. DATE: 2/24/2022
DRAWN BY: IJF
SHEET No. 4.0

Plotted: 2/24/2022 - 10:21am, P:\0883-004 Meyer Farm - Salem\dwg\plan\Exhibits\SLOPES SWMP\Phase 2\0883-004 - Meyer Farm - SWMP PH 2.dwg, Layout: SWMP SH 4.0



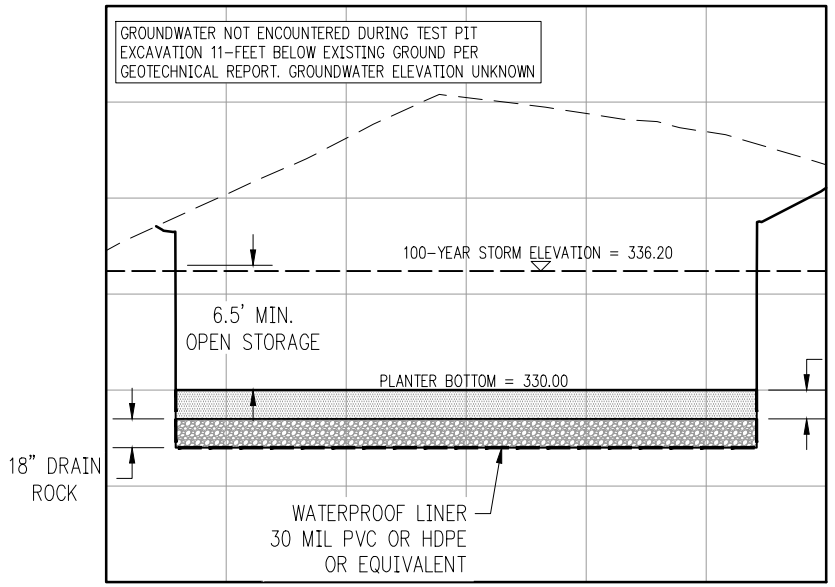
STORMWATER FACILITY PLAN

SCALE: 1" = 40'



2 / 4.1 **FACILITY SECTION 2**

SCALE: 1" = 40' H/1" = 10' V



1 / 4.1 **FACILITY SECTION 1**

SCALE: 1" = 40' H/1" = 10' V

PLANTING TABLE		
ZONE A AREA	PLANT COVERAGE	PLANTINGS
9,378 SF	9,378 SF	CAREX OBNUPTA (SLOUGH SEDGE) JUNCUS PATENS (SPREADING RUSH)

SEE SHEET 4.1 FOR PLANTING REQUIREMENTS PER THE CITY OF SALEM PUBLIC WORKS DESIGN STANDARDS.

NOTE: PLANTING TYPES AND QUANTITIES MAY BE REVISED AND ARE SUBJECT TO APPROVAL BY THE LANDSCAPING CONSULTANT, BUT SHALL MEET ALL REQUIREMENTS SET FORTH BY THE CITY OF SALEM PUBLIC WORKS DESIGN STANDARDS AND THE OREGON DEQ.

N

40' 0 20' 40' 80'

SCALE: 1" = 40'

EMERIO ENGINEERING · SURVEYING · DESIGN
1500 VALLEY RIVER DRIVE, SUITE 100
EUGENE, OREGON 97401
TEL: (503) 746-8812
FAX: (503) 639-9592
www.emeriodesign.com

MEYER FARM
SWMP - PHASE 2
CITY OF SALEM
MARION COUNTY, OREGON

PROJECT NO. 0883-004
ORIG. DATE: 2/24/2022
DRAWN BY: IJF
SHEET No. 4.1

Plotted: 2/24/2022 - 10:22am, P:\0883-004 Meyer Farm - Salem\dwg\plan\Exhibits\SLOPES SWMP\Phase 2\0883-004 - Meyer Farm - SWMP PH 2.dwg, Layout: SWMP SH 4.1

STORMWATER FACILITY PLANTING REQUIREMENTS (PER CITY OF SALEM PUBLIC DESIGN STANDARDS DIVISION 004, APPENDIX B)

(A) PLANTING ZONES

STORMWATER PLANTERS HAVE ONLY ONE PLANT ZONE. NATIVE PLANTS FOR PLANTERS ARE LISTED IN TABLE 4B-1.

(B) PLANTING REQUIREMENTS

(1) PLANTINGS SHALL BE SPACED EVENLY. USE THE SPACING IDENTIFIED IN TABLE 4B-1 FOR THE PLANTS SELECTED.

(2) PERENNIAL PLANTS AND BULBS MAY BE PLANTED THROUGHOUT PLANTERS TO ADD SEASONAL COLOR AND VARIABILITY.

(3) THE FOLLOWING PLANT QUANTITIES AND SIZES SHALL BE INSTALLED PER 100 SQUARE FEET OF SURFACE AREA:

(A) WOODY PLANTS

(i) FOUR LARGE SHRUBS/SMALL TREES: 3-GALLON CONTAINER OR EQUIVALENT.

(ii) SIX SHRUBS: 1-GALLON CONTAINER OR EQUIVALENT.

(B) GRASSES, HERBS, AND GROUND COVER

TABLE 4B-1	
CONTAINER SIZE	SPACING
PLUG (9 CUBIC INCH) 50 CELL TRAY, DEEP	9-INCH ON CENTER, TRI-SPACE
4-INCH POT	9-INCH ON CENTER, TRI-SPACE
1-GALLON CONTAINER	12-INCH ON CENTER, TRI-SPACE

(C) AT LEAST 75% OF THE FACILITY SHALL BE PLANTED WITH GRASSES, SEDGES, OR RUSHES. HERBS AND FORBS MAY COVER THE BALANCE OF THE FACILITY.

PLANT SCHEDULE

LIDA PLANTINGS:

CAREX OBNUPTA/SLOUGH SEDGE - ZONE A

JUNCUS PATENS/SPREADING RUSH - ZONE A

STORMWATER FACILITY NOTES

ZONE A - AREA OF THE FACILITY DEFINED AS THE BOTTOM OF THE FACILITY TO THE DESIGNATED HIGH WATER MARK. THIS AREA HAS WET TO MOIST SOILS AND PLANTS LOCATED HERE SHALL BE TOLERANT OF MILD INUNDATION.

SOILS - THE GROWING MEDIUM SHALL BE A MINIMUM OF 12 INCHES OF TOPSOIL OR THE SOIL SHALL BE AMENDED TO SUPPORT PLANT GROWTH. IMPORTED TOPSOIL SHALL BE A SANDY LOAM MIXED WITH COMPOST OR A SAND/SOIL/COMPOST BLEND. IT SHALL BE ROUGHLY ONE-THIRD COMPOST BY VOLUME, FREE DRAINING, AND SUPPORT PLANT GROWTH. THE COMPOST SHALL BE DERIVED FROM PLANT MATERIAL, ANIMAL WASTE IS NOT ALLOWED. THE GROWING MEDIUM SHALL BE 18 INCHES DEEP.

MULCH - WASHED PEA GRAVEL, APPLIED 2-3 INCHES THICK TO COVER ALL SOLID AREAS BETWEEN PLANTS.

EMERIO
ENGINEERING · SURVEYING · DESIGN
1500 VALLEY RIVER DRIVE, SUITE 100
EUGENE, OREGON 97401
TEL: (503) 746-8812
FAX: (503) 639-9592
www.emeriodesign.com

MEYER FARM
SWMP - PHASE 2
CITY OF SALEM
MARION COUNTY, OREGON

PROJECT NO. 0883-004
ORIG. DATE: 2/24/2022
DRAWN BY: IJF
SHEET No. 4.2

Operation and Maintenance Guides

13. Conveyance: Piped

Conveyance (pipes) system shall be routinely inspected and cleaned on a scheduled cycle.

Inspection should consist of cleaning main line followed by TV inspection. Manholes and catch basins should be visually inspected annually and cleaned when sediment has reached 12 inches in depth or 50 percent of capacity has been taken.

- □ Structural deficiencies shall be corrected upon discovery:
- □ If cracks exist, repair or replace structure.

Date: ____/____/_____ Inspector's Name: _____

Access to the conveyance system shall be safe and efficient. Egress and ingress routes shall be maintained to design standards. Roadways shall be maintained to accommodate size and weight of vehicles, if applicable.

- □ Obstacles preventing maintenance personnel and/or equipment access to the conveyance system shall be removed.
- □ Gravel or ground cover shall be added if erosion has occurred.

Inspection Comments: _____

_____

Spill prevention measures shall be exercised when handling substances that contaminate stormwater.

- □ Releases of pollutants shall be corrected as soon as identified.

Inspection Comments: _____

Debris and litter shall be removed to prevent clogging.

Inspection Comments: _____

_____

Training and/or written guidance information for operating and maintaining closed channel conveyance systems shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

Appendix B to 109-011 – Facility Maintenance Forms

5. Detention Basin

Detention basins are constructed ponds with temporary storage for the detention of large storm events. The stormwater is stored and released slowly over a matter of hours.

Inspections

All facility components and vegetation shall be inspected for proper operations and structural stability. *These inspections shall occur, at a minimum, quarterly for the first two years from the date of installation, and two times per year thereafter.* It is recommended that a visual inspection be made within 48 hours after each major storm event to ensure proper function. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

Date: ____/____/_____ Inspector's Name: _____

Inlet shall ensure unrestricted stormwater flow to the detention basin.

- □ Inlet pipe shall be kept clear at all times. Sources of sediment and debris shall be identified and corrected.
- □ Determine if pipe is in good condition:
- □ If more than 4 inches of settlement, add fill material and compact soils.
- □ If alignment is faulty, correct alignment.
- □ If cracks or openings exist indicated by evidence of erosion at leaks, repair or replace pipe as needed.

Inspection Comments: _____

_____

Forebay traps coarse sediments, reduces incoming velocity, and distributes runoff evenly over the detention basin. A minimum 1-foot freeboard shall be maintained.

- □ Sediment exceeding 3 inches in depth , or so thick as to damage or kill vegetation, shall be removed.
- □ Sediment accumulation shall be hand-removed with minimum damage to vegetation using proper erosion control measures.

Inspection Comments: _____

_____

Embankment, dikes, berms, and side slopes retain water in the detention basin.

- □ Slopes shall be stabilized using appropriate erosion control measures when soil is exposed or erosion channels are forming.
- □ Structural deficiencies shall be corrected upon discovery:
- □ If cracks exist, repair or replace structure.
- □ If erosion channels are forming, stabilize surface. Sources of erosion damage shall be identified and controlled.

Inspection Comments: _____

_____

Control devices (e.g., weirs, baffles, etc.) shall direct and reduce flow velocity. Structural deficiencies shall be corrected upon discovery:

- □ If cracks exist, repair or replace structure.

Inspection Comments: _____

_____

5. Detention Basin (continued)

Overflow structure conveys flow exceeding detention basin capacity to an approved stormwater receiving system.

- □ Overflow structure shall be kept clear at all times.
- □ Sources of erosion damage shall be identified and controlled when soil is exposed at the top of overflow structure or erosion channels are forming.
- □ Rocks or other armoring shall be replaced when only one layer of rock exists.

Inspection Comments: _____

_____

Sediment and debris management shall prevent loss of detention basin volume caused by sedimentation.

Detention basin shall be cleaned of sediment when 1 foot of sediment accumulates in the pond.

- □ Gauges located at the opposite ends of the detention basin shall be maintained to monitor sedimentation.
- □ Gauges shall be checked two times per year.
- □ Sources of restricted sediment or debris, such as discarded lawn clippings, shall be identified and prevented.
- □ Debris in quantities sufficient to inhibit operation shall be removed routinely, e.g., no less than quarterly or upon discovery.
- □ Litter shall be removed upon discovery.

Inspection Comments: _____

_____

Vegetation shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion. Proper horticultural practices, consistent with the maintenance of a stormwater quality facility, shall be employed to ensure that plants are vigorous and healthy.

- □ Mulch shall be replenished as needed, but not inhibiting water flow.
- □ Vegetation, large shrubs, or trees that limit access or interfere with planter operation shall be pruned or removed.
- □ Fallen leaves and debris from deciduous plant foliage shall be raked and removed.
- □ Nuisance or prohibited vegetation from the City of Salem Non-Native Invasive Plant list shall be removed when discovered. Invasive vegetation shall be removed immediately upon discovery.
- □ Dead vegetation shall be removed upon discovery.
- □ Vegetation shall be replaced within as soon as possible to maintain cover density and control erosion where soils are exposed.

Inspection Comments: _____

_____

Spill prevention measures shall be exercised when handling substances that can contaminate stormwater.

- □ Releases of pollutants shall be corrected as soon as identified.

Inspection Comments: _____

Training and/or written guidance information for operating and maintaining ponds shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

5. Detention Basin (continued)

Access to the detention basin shall be safe and efficient. Egress and ingress routes shall be maintained to design standards. Roadways shall be maintained to accommodate size and weight of vehicles, if applicable.

- □ Obstacles preventing maintenance personnel and/or equipment access to the detention basinshall be removed.
- □ Gravel or ground cover shall be added if erosion has occurred.

Inspection Comments: _____

_____

Nuisance insects and rodents shall not be harbored in the detention basin. Pest control measures shall be taken when nuisance insects/rodents are found to be present.

- □ Holes in the ground located in and around the infiltration basin shall be filled.

Inspection Comments: _____

_____

If used at this site, the following will be applicable:

Signage shall clearly convey information.

- □ Broken or defaced signs shall be replaced or repaired.

Fences shall be maintained to preserve their functionality and appearance.

- □ Collapsed fences shall be restored to an upright position.
- □ Jagged edges and damaged fences shall be repaired or replaced.

Inspection Comments: _____

_____

Appendix B to 109-011 – Facility Maintenance Forms

1. Stormwater Planter

Stormwater Planters are designed to allow runoff to filter through layers of topsoil (thus capturing pollutants) and then either infiltrate into the native soils (infiltration planter) or be collected in a pipe to be discharged off-site (filtration planter). The planter is sized to accept runoff and temporarily store the water in a reservoir on top of the soil. The filtration planter is designed with an impervious bottom or is placed on an impervious surface. Water should drain through the planter within 24 hours after a storm event.

Inspections

All facility components and vegetation shall be inspected for proper operations and structural stability. *These inspections shall occur, at a minimum, quarterly for the first two years from the date of installation, and two times per year thereafter.* It is recommended that a visual inspection be made within 48 hours after each major storm event to ensure proper function. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

Date: ____/____/_____ Inspector's Name: _____

Downspout from rooftop or sheet flow from paving allows unimpeded stormwater flow to the planter.

- □ Debris shall be removed routinely and upon discovery.
- □ Damaged pipe shall be repaired upon discovery.

Inspection Comments: _____

_____

Splash blocks prevent splashing against adjacent structures and convey water without disrupting media.

- □ Any deficiencies in structure such as cracking, rotting, and failure shall be repaired.

Inspection Comments: _____

_____

Planter reservoir receives and detains stormwater prior to infiltration. Water should drain from planter within 24 hours of storm event.

- □ Sources of clogging shall be identified and corrected.
- □ Topsoil may need to be amended with sand or compost, or replaced.

Inspection Comments: _____

_____

Amended soils consisting of sand, compost, drain rock, and topsoil shall allow stormwater to percolate uniformly through the planter.

- □ The planter shall be excavated and cleaned, and gravel or soil shall be replaced to correct low infiltration rates.
- □ Holes that are not consistent with the design and allow water to flow directly through the planter to the ground shall be plugged.
- □ Sediment accumulation shall be hand-removed with minimum damage to vegetation using proper erosion control measures. Sediment shall be removed if it is more than 4 inches thick or so thick as to damage or kill vegetation.
- □ Litter and debris shall be removed.

Inspection Comments: _____

_____

Appendix B to 109-011 – Facility Maintenance Forms

1. Stormwater Planter (continued)

Planter shall contain filter media and vegetation.

- □ Structural deficiencies in the planter including rot, cracks, and failure shall be repaired.

Inspection Comments: _____

Overflow pipe safely conveys flow exceeding reservoir capacity to an approved stormwater receiving system**.**

- □ Overflow pipe shall be kept clear at all times.
- □ Damaged pipe shall be repaired or replaced upon discovery.

Inspection Comments: _____

Vegetation shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion. Proper horticultural practices shall be employed to ensure plants are vigorous and healthy.

- □ Mulch shall be replenished as needed, but not inhibiting water flow.
- □ Vegetation, large shrubs, or trees that limit access or interfere with planter operation shall be pruned or removed.
- □ Fallen leaves and debris from deciduous plant foliage shall be raked and removed.
- □ Nuisance or prohibited vegetation from the City of Salem Non-Native Invasive Plant list shall be removed when discovered. Invasive vegetation shall be removed upon discovery.
- □ Dead vegetation shall be removed upon discovery.
- □ Vegetation shall be replaced as soon as possible to maintain cover density and control erosion where soils are exposed.

Inspection Comments: _____

Debris and litter shall be removed to ensure stormwater infiltration and to prevent clogging of overflow drains and interference with plant growth.

Inspection Comments: _____

Spill prevention measures shall be exercised when handling substances that contaminate stormwater.

- □ Releases of pollutants shall be corrected and reported to the City as soon as identified.

Inspection Comments: _____

Training and/or written guidance information for O&M of stormwater planters shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

Access to the stormwater planter shall be safe and efficient. Egress and ingress routes shall be maintained to design standards. Roadways shall be maintained to accommodate size and weight of vehicles, if applicable.

- □ Obstacles preventing maintenance personnel and/or equipment access to the stormwater planter shall be removed.
- □ Gravel or ground cover shall be added if erosion has occurred.

Inspection Comments: _____

Appendix B to 109-011 – Facility Maintenance Forms

1. Stormwater Planter (continued)

Nuisance insects and rodents shall not be harbored in the stormwater planter.

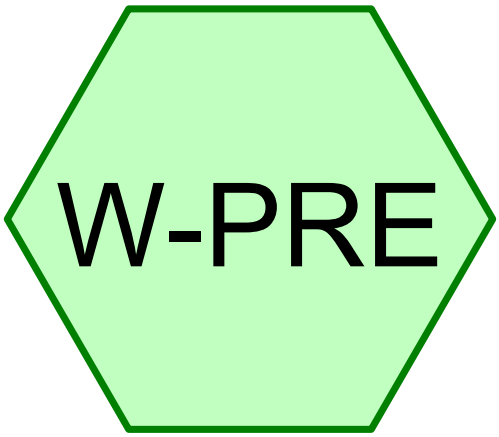
Pest control measures shall be taken when nuisance insects/rodents are found to be present.

- □ Holes in the ground located in and around the stormwater planter shall be filled and compacted.

Inspection Comments: _____

_____

Stormwater Calculations - Pre-Developed Condition



WEST - PREDEVELOPED

Subcat Reach Pond Link

Routing Diagram for 0742-003 - Meyer Farm - HydroCAD Model
Prepared by {enter your company name here}, Printed 2/24/2022

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
143,000	72	(W-PRE)
143,000	**72**	**TOTAL AREA**

Summary for Subcatchment W-PRE: WEST - PREDEVELOPED

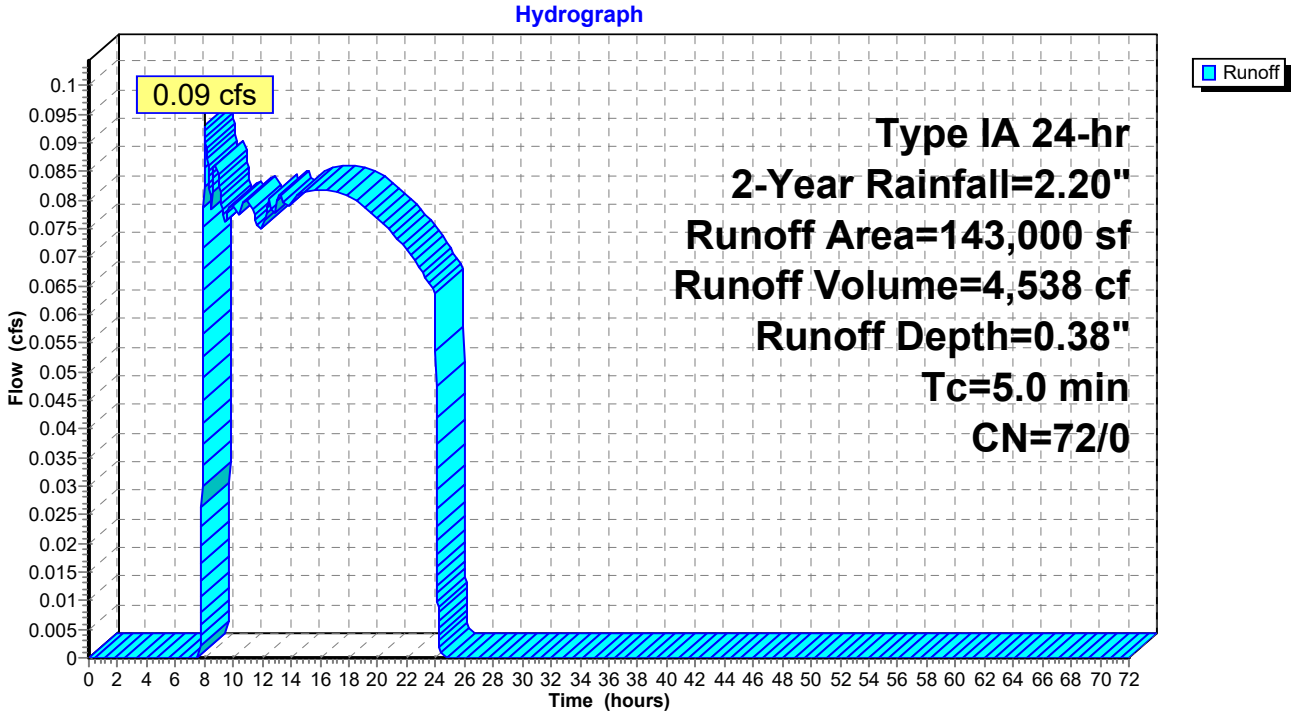
Runoff = 0.09 cfs @ 8.01 hrs, Volume= 4,538 cf, Depth= 0.38"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2-Year Rainfall=2.20"

	Area (sf)	CN	Description
*	143,000	72	
	143,000	72	100.00% Pervious Area

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

Subcatchment W-PRE: WEST - PREDEVELOPED



Summary for Subcatchment W-PRE: WEST - PREDEVELOPED

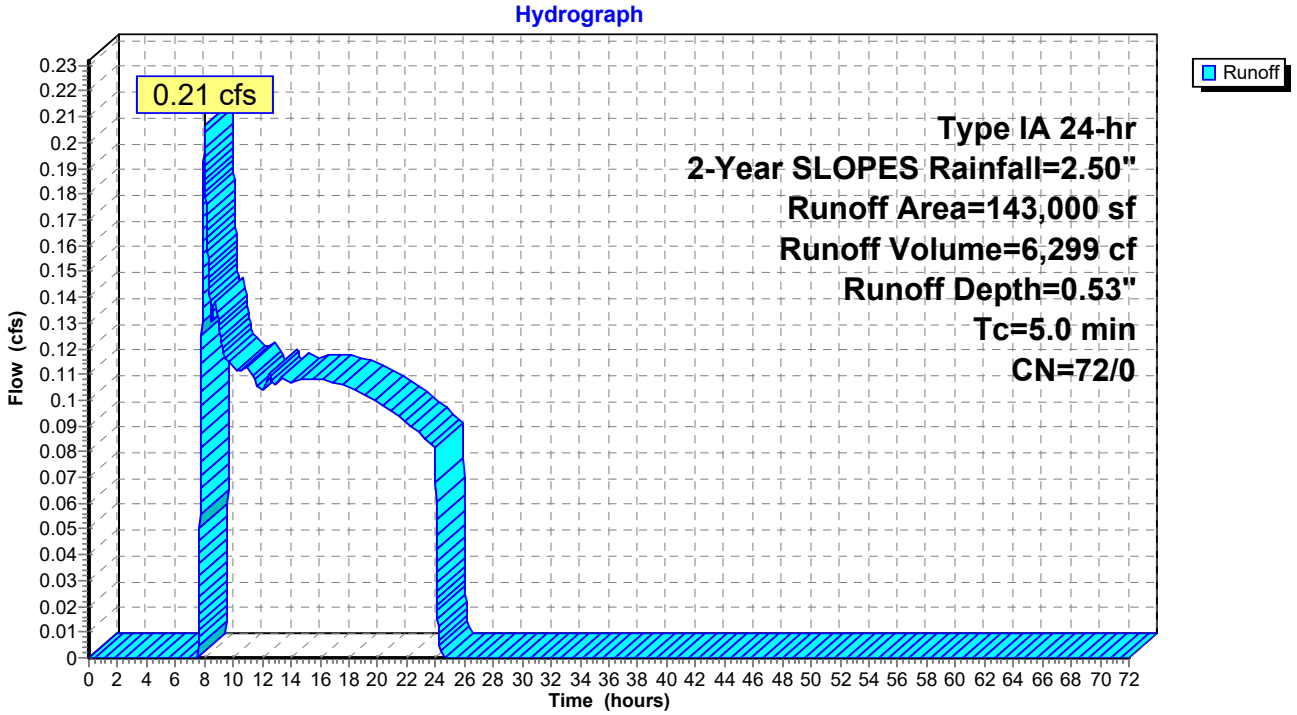
Runoff = 0.21 cfs @ 8.00 hrs, Volume= 6,299 cf, Depth= 0.53"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2-Year SLOPES Rainfall=2.50"

	Area (sf)	CN	Description
*	143,000	72	
	143,000	72	100.00% Pervious Area

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

Subcatchment W-PRE: WEST - PREDEVELOPED



Summary for Subcatchment W-PRE: WEST - PREDEVELOPED

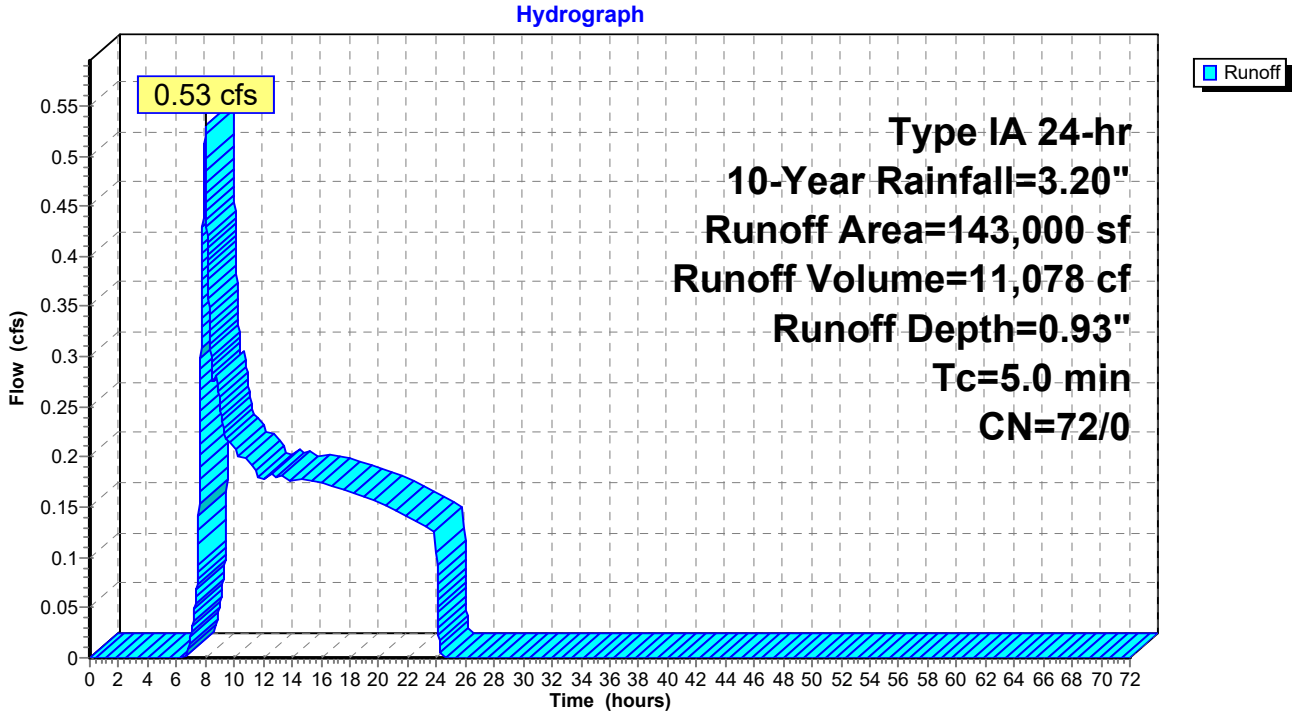
Runoff = 0.53 cfs @ 8.00 hrs, Volume= 11,078 cf, Depth= 0.93"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10-Year Rainfall=3.20"

	Area (sf)	CN	Description
*	143,000	72	
	143,000	72	100.00% Pervious Area

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

Subcatchment W-PRE: WEST - PREDEVELOPED



Summary for Subcatchment W-PRE: WEST - PREDEVELOPED

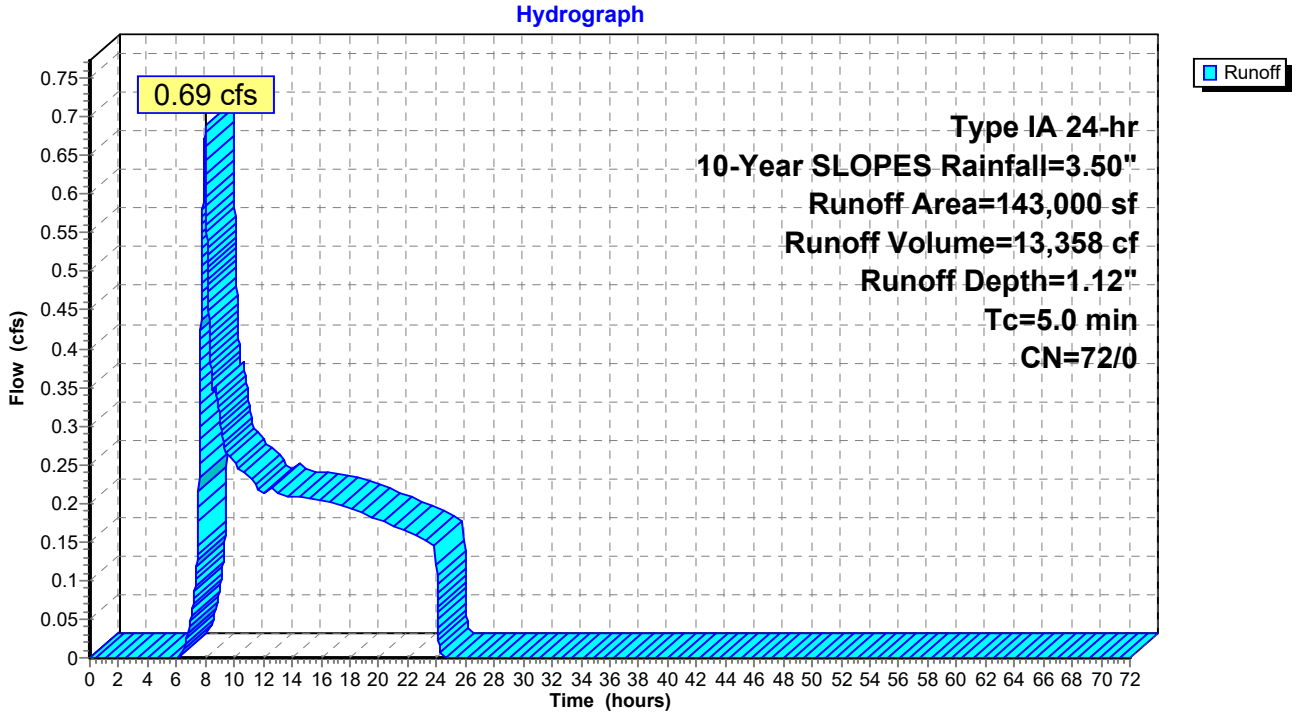
Runoff = 0.69 cfs @ 8.00 hrs, Volume= 13,358 cf, Depth= 1.12"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10-Year SLOPES Rainfall=3.50"

	Area (sf)	CN	Description
*	143,000	72	
	143,000	72	100.00% Pervious Area

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

Subcatchment W-PRE: WEST - PREDEVELOPED



Summary for Subcatchment W-PRE: WEST - PREDEVELOPED

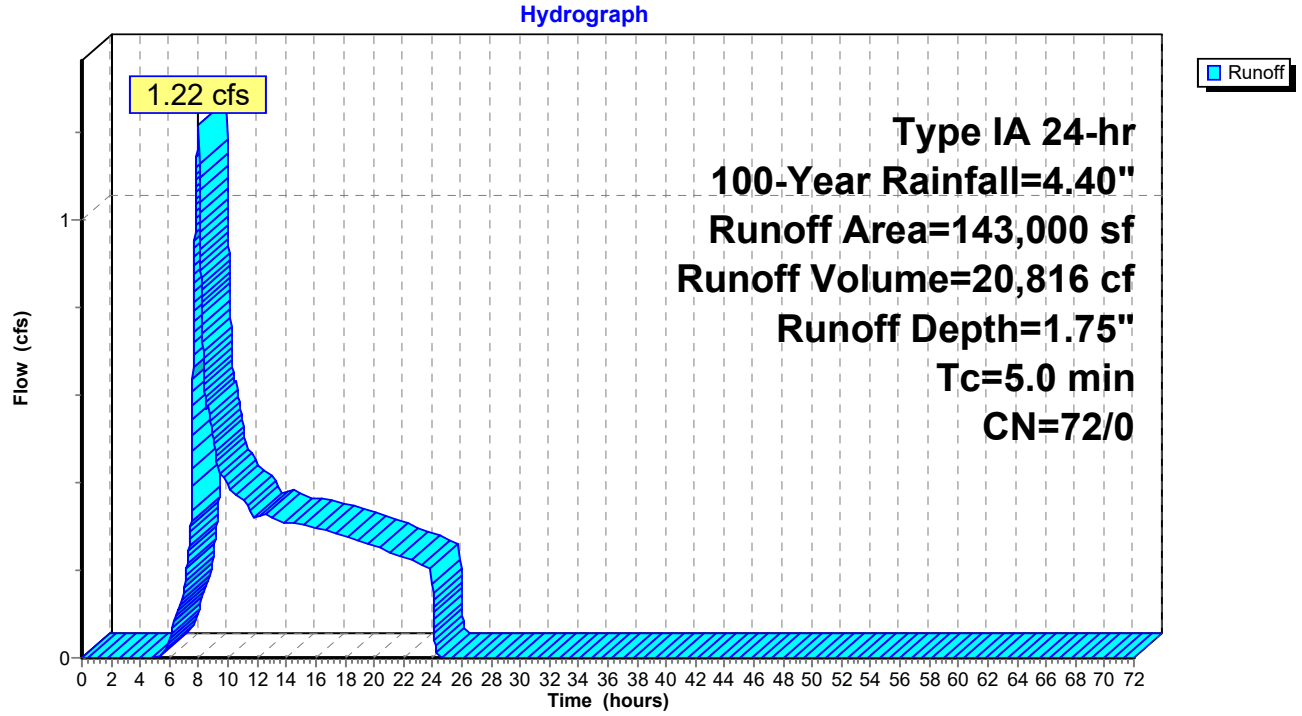
Runoff = 1.22 cfs @ 8.00 hrs, Volume= 20,816 cf, Depth= 1.75"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type IA 24-hr 100-Year Rainfall=4.40"

	Area (sf)	CN	Description
*	143,000	72	
	143,000	72	100.00% Pervious Area

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

Subcatchment W-PRE: WEST - PREDEVELOPED



Summary for Subcatchment W-PRE: WEST - PREDEVELOPED

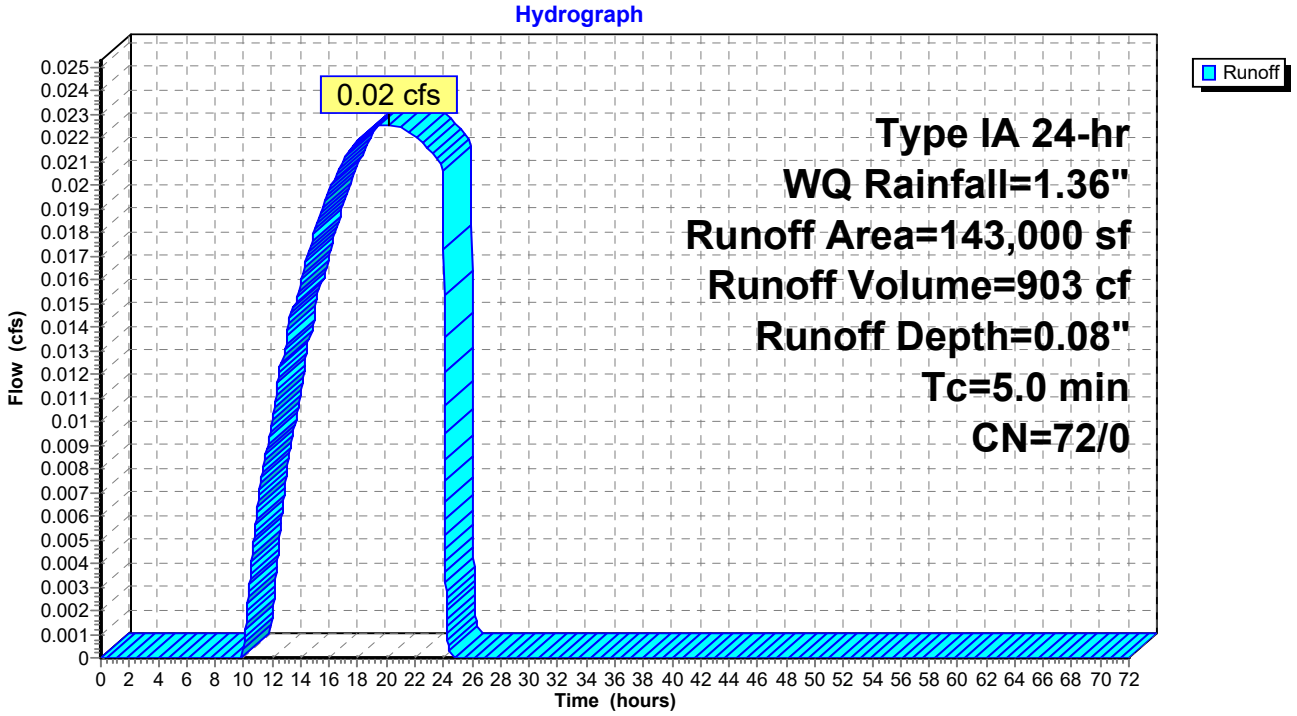
Runoff = 0.02 cfs @ 20.13 hrs, Volume= 903 cf, Depth= 0.08"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type IA 24-hr WQ Rainfall=1.36"

	Area (sf)	CN	Description
*	143,000	72	
	143,000	72	100.00% Pervious Area

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

Subcatchment W-PRE: WEST - PREDEVELOPED



Summary for Subcatchment W-PRE: WEST - PREDEVELOPED

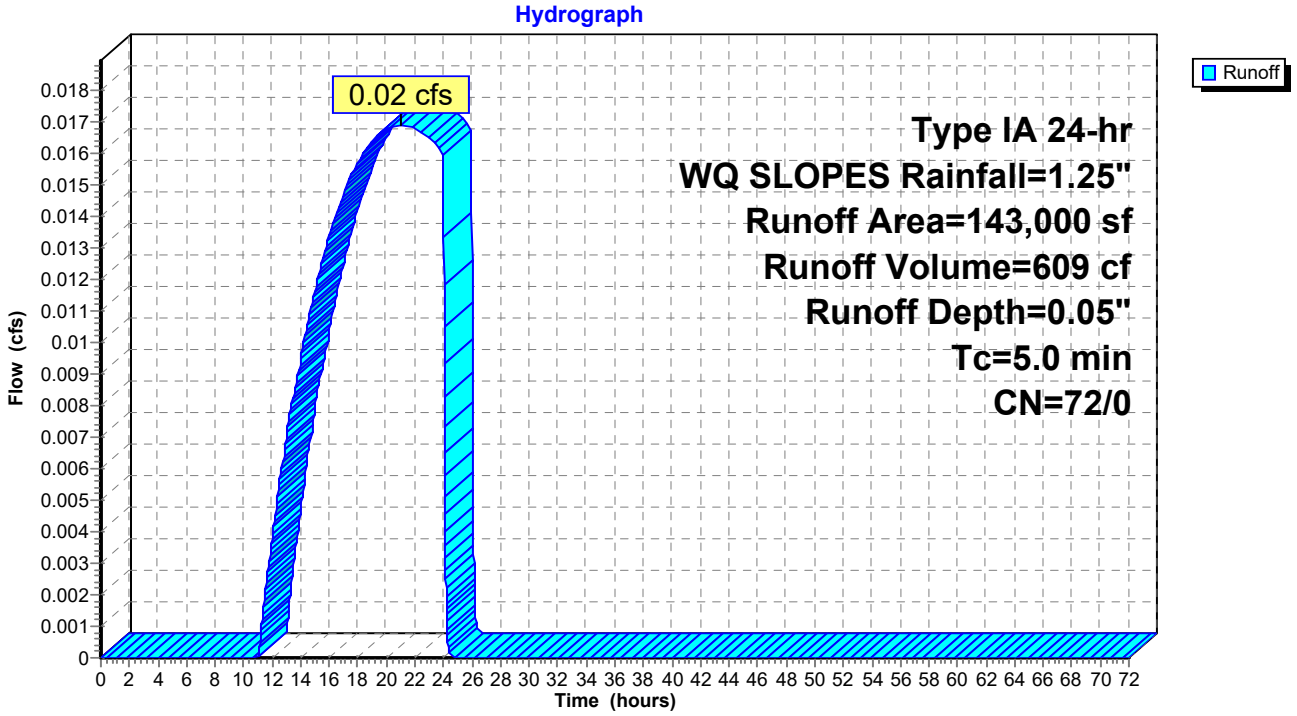
Runoff = 0.02 cfs @ 21.03 hrs, Volume= 609 cf, Depth= 0.05"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type IA 24-hr WQ SLOPES Rainfall=1.25"

	Area (sf)	CN	Description
*	143,000	72	
	143,000	72	100.00% Pervious Area

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

Subcatchment W-PRE: WEST - PREDEVELOPED



Stormwater Calculations - Post-Developed Condition

BASIN 2 - POST DEVELOPED

NW FILTRATION PLANTER (NEW)

Subcat Reach Pond Link

Routing Diagram for 0742-003 - Meyer Farm - HydroCAD Model
Prepared by {enter your company name here}, Printed 2/24/2022

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
124,800	98	Lot Impervious (65% total lot area) (2-POST)
67,200	72	Lot Pervious (2-POST)
187,200	72	Remaining Pervious (2-POST)
19,600	98	Sidewalk (2-POST)
84,200	98	Streets and Curb (2-POST)
483,000	**84**	**TOTAL AREA**

Summary for Subcatchment 2-POST: BASIN 2 - POST DEVELOPED

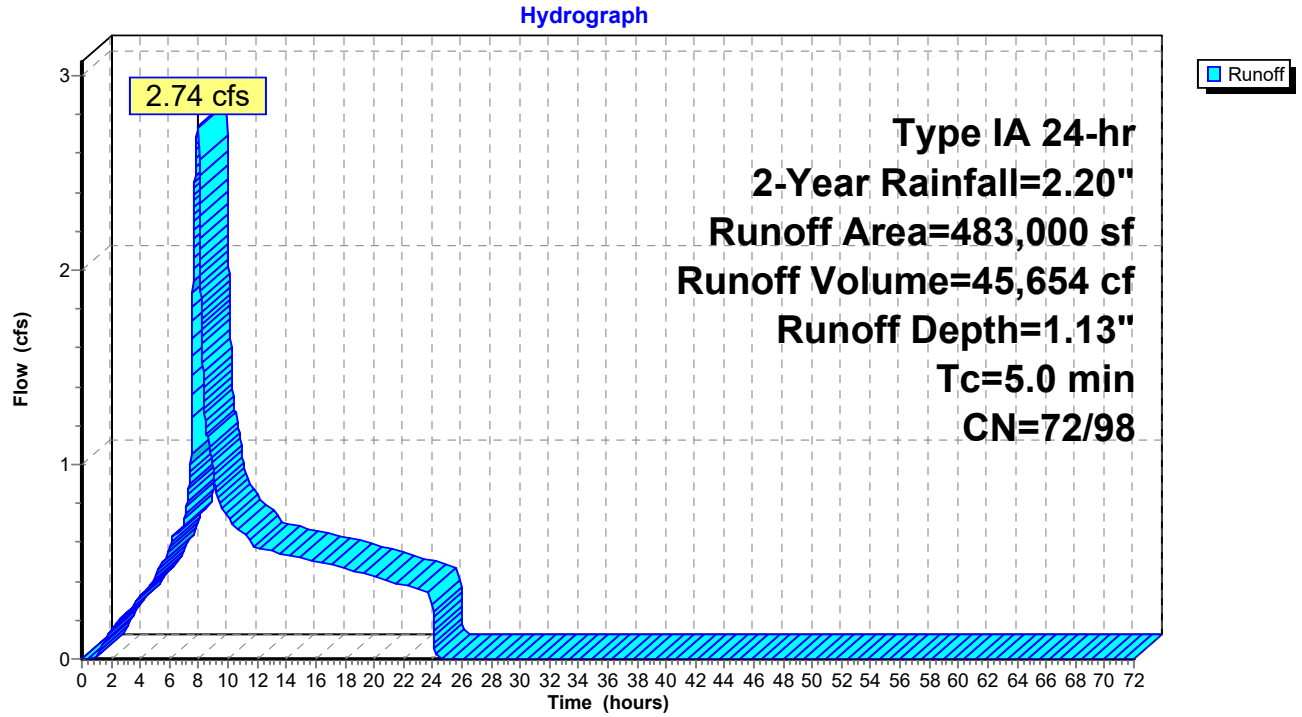
Runoff = 2.74 cfs @ 7.93 hrs, Volume= 45,654 cf, Depth= 1.13"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2-Year Rainfall=2.20"

	Area (sf)	CN	Description
*	84,200	98	Streets and Curb
*	19,600	98	Sidewalk
*	124,800	98	Lot Impervious (65% total lot area)
*	67,200	72	Lot Pervious
*	187,200	72	Remaining Pervious
	483,000	84	Weighted Average
	254,400	72	52.67% Pervious Area
	228,600	98	47.33% Impervious Area

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

Subcatchment 2-POST: BASIN 2 - POST DEVELOPED



Summary for Pond 2 FILT: NW FILTRATION PLANTER (NEW)

Inflow Area = 483,000 sf, 47.33% Impervious, Inflow Depth = 1.13" for 2-Year event
Inflow = 2.74 cfs @ 7.93 hrs, Volume= 45,654 cf
Outflow = 0.07 cfs @ 24.14 hrs, Volume= 13,970 cf, Atten= 98%, Lag= 972.5 min
Primary = 0.07 cfs @ 24.14 hrs, Volume= 13,970 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 102.43' @ 24.14 hrs Surf.Area= 28,131 sf Storage= 42,469 cf

Plug-Flow detention time= 2,068.8 min calculated for 13,970 cf (31% of inflow)
Center-of-Mass det. time= 1,718.7 min (2,443.3 - 724.5)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	60,951 cf	**6.5' Open Storage (Prismatic)**Listed below (Recalc)
#2	98.50'	14,066 cf	**18" Growing Medium (Prismatic)**Listed below (Recalc)
#3	97.00'	5,626 cf	**18" Drain Rock (Prismatic)**Listed below (Recalc) 14,066 cf Overall x 40.0% Voids
		80,642 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	9,377	0	0
106.50	9,377	60,951	60,951

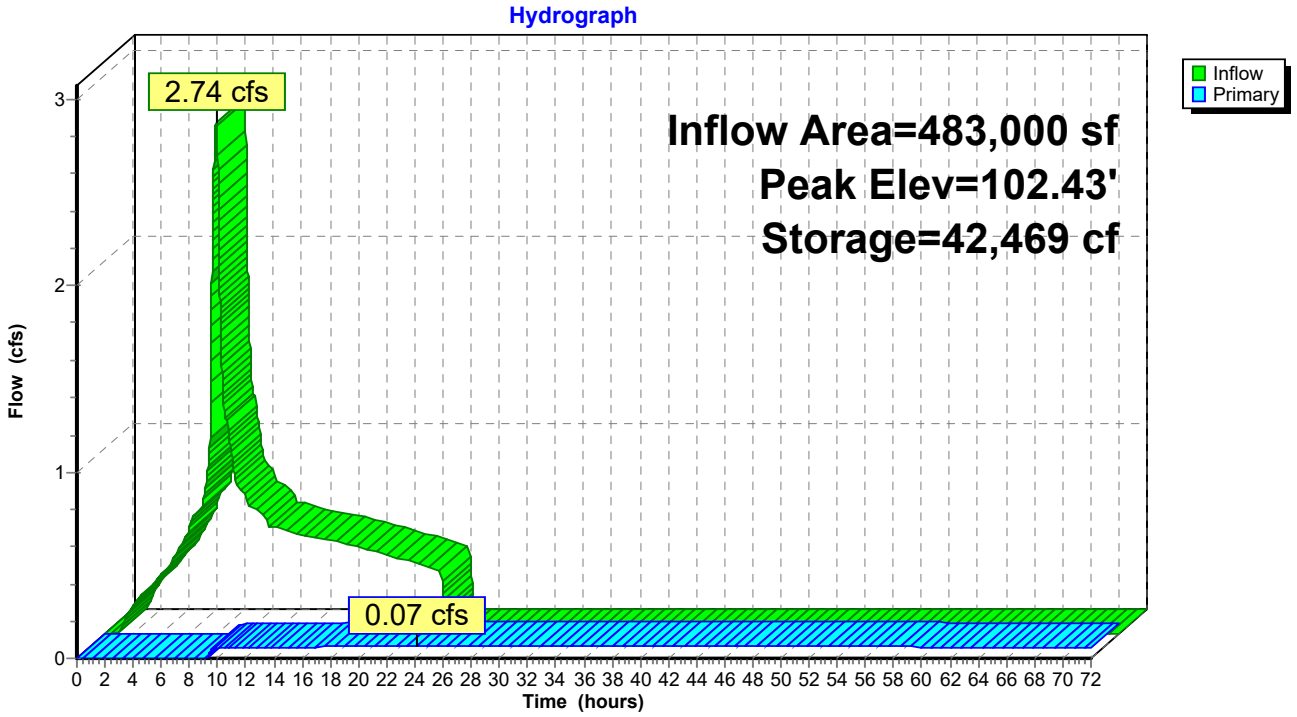
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.50	9,377	0	0
100.00	9,377	14,066	14,066

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	9,377	0	0
98.50	9,377	14,066	14,066

Device	Routing	Invert	Outlet Devices
#1	Primary	96.50'	**42.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.50' / 96.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 9.62 sf
#2	Device 3	98.50'	**2.000 in/hr Exfiltration over Surface area from 98.50' - 100.00'** Excluded Surface area = 18,754 sf
#3	Device 1	96.50'	**1.0" Horiz. Low Orifice** C= 0.620 Limited to weir flow at low heads
#4	Device 1	103.50'	**4.2" Horiz. Orifice/Grate** C= 0.620 Limited to weir flow at low heads

Primary OutFlow Max=0.07 cfs @ 24.14 hrs HW=102.43' (Free Discharge)
- **1=Culvert** (Passes 0.07 cfs of 91.38 cfs potential flow)
  - **3=Low Orifice** (Orifice Controls 0.07 cfs @ 12.12 fps)
    - **2=Exfiltration** (Passes 0.07 cfs of 0.43 cfs potential flow)
  - **4=Orifice/Grate** (Controls 0.00 cfs)

Pond 2 FILT: NW FILTRATION PLANTER (NEW)



Summary for Subcatchment 2-POST: BASIN 2 - POST DEVELOPED

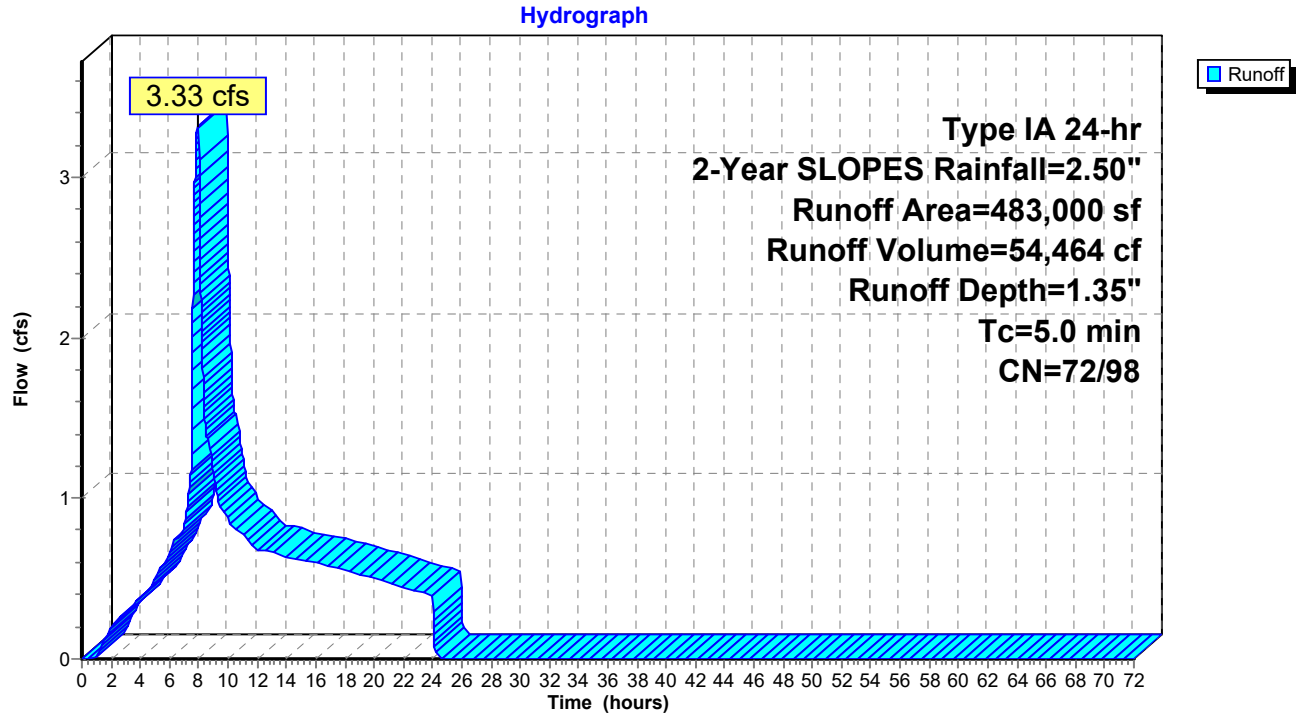
Runoff = 3.33 cfs @ 7.93 hrs, Volume= 54,464 cf, Depth= 1.35"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2-Year SLOPES Rainfall=2.50"

	Area (sf)	CN	Description
*	84,200	98	Streets and Curb
*	19,600	98	Sidewalk
*	124,800	98	Lot Impervious (65% total lot area)
*	67,200	72	Lot Pervious
*	187,200	72	Remaining Pervious
	483,000	84	Weighted Average
	254,400	72	52.67% Pervious Area
	228,600	98	47.33% Impervious Area

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

Subcatchment 2-POST: BASIN 2 - POST DEVELOPED



Summary for Pond 2 FILT: NW FILTRATION PLANTER (NEW)

Inflow Area = 483,000 sf, 47.33% Impervious, Inflow Depth = 1.35" for 2-Year SLOPES event
Inflow = 3.33 cfs @ 7.93 hrs, Volume= 54,464 cf
Outflow = 0.07 cfs @ 24.15 hrs, Volume= 15,181 cf, Atten= 98%, Lag= 973.0 min
Primary = 0.07 cfs @ 24.15 hrs, Volume= 15,181 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 103.33' @ 24.15 hrs Surf.Area= 28,131 sf Storage= 50,897 cf

Plug-Flow detention time= 2,064.3 min calculated for 15,179 cf (28% of inflow)
Center-of-Mass det. time= 1,703.6 min (2,427.1 - 723.5)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	60,951 cf	**6.5' Open Storage (Prismatic)**Listed below (Recalc)
#2	98.50'	14,066 cf	**18" Growing Medium (Prismatic)**Listed below (Recalc)
#3	97.00'	5,626 cf	**18" Drain Rock (Prismatic)**Listed below (Recalc) 14,066 cf Overall x 40.0% Voids
		80,642 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	9,377	0	0
106.50	9,377	60,951	60,951

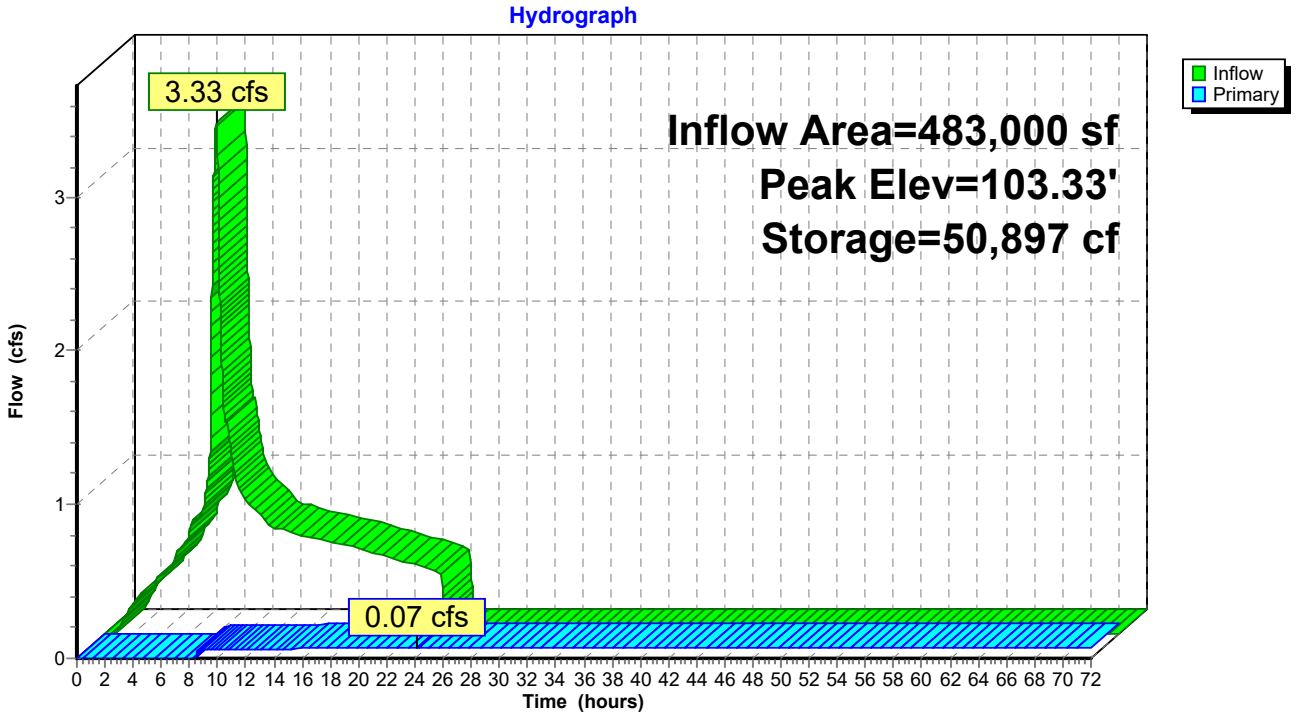
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.50	9,377	0	0
100.00	9,377	14,066	14,066

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	9,377	0	0
98.50	9,377	14,066	14,066

Device	Routing	Invert	Outlet Devices
#1	Primary	96.50'	**42.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.50' / 96.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 9.62 sf
#2	Device 3	98.50'	**2.000 in/hr Exfiltration over Surface area from 98.50' - 100.00'** Excluded Surface area = 18,754 sf
#3	Device 1	96.50'	**1.0" Horiz. Low Orifice** C= 0.620 Limited to weir flow at low heads
#4	Device 1	103.50'	**4.2" Horiz. Orifice/Grate** C= 0.620 Limited to weir flow at low heads

Primary OutFlow Max=0.07 cfs @ 24.15 hrs HW=103.33' (Free Discharge)
- **1=Culvert** (Passes 0.07 cfs of 104.39 cfs potential flow)
  - **3=Low Orifice** (Orifice Controls 0.07 cfs @ 13.00 fps)
    - **2=Exfiltration** (Passes 0.07 cfs of 0.43 cfs potential flow)
  - **4=Orifice/Grate** (Controls 0.00 cfs)

Pond 2 FILT: NW FILTRATION PLANTER (NEW)



Summary for Subcatchment 2-POST: BASIN 2 - POST DEVELOPED

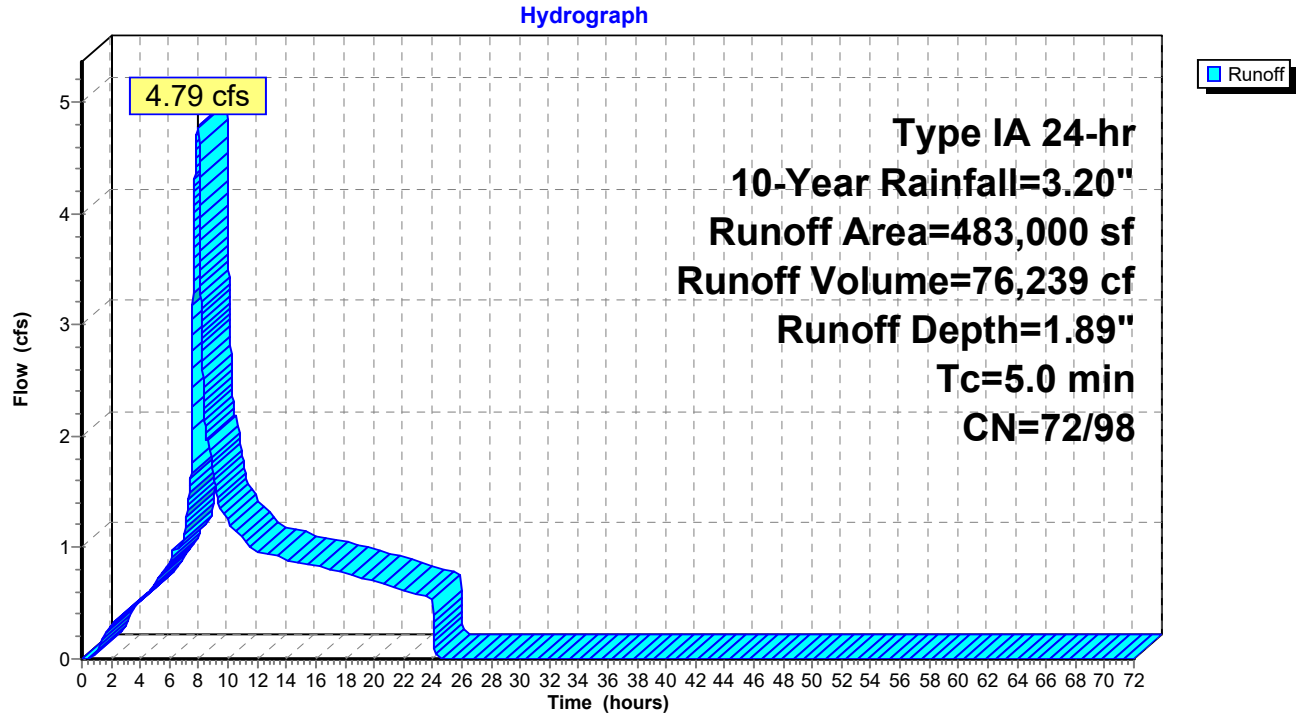
Runoff = 4.79 cfs @ 7.93 hrs, Volume= 76,239 cf, Depth= 1.89"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10-Year Rainfall=3.20"

	Area (sf)	CN	Description
*	84,200	98	Streets and Curb
*	19,600	98	Sidewalk
*	124,800	98	Lot Impervious (65% total lot area)
*	67,200	72	Lot Pervious
*	187,200	72	Remaining Pervious
	483,000	84	Weighted Average
	254,400	72	52.67% Pervious Area
	228,600	98	47.33% Impervious Area

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

Subcatchment 2-POST: BASIN 2 - POST DEVELOPED



Summary for Pond 2 FILT: NW FILTRATION PLANTER (NEW)

Inflow Area = 483,000 sf, 47.33% Impervious, Inflow Depth = 1.89" for 10-Year event
Inflow = 4.79 cfs @ 7.93 hrs, Volume= 76,239 cf
Outflow = 0.53 cfs @ 24.00 hrs, Volume= 33,694 cf, Atten= 89%, Lag= 964.7 min
Primary = 0.53 cfs @ 24.00 hrs, Volume= 33,694 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 104.39' @ 24.00 hrs Surf.Area= 28,131 sf Storage= 60,823 cf

Plug-Flow detention time= 1,425.6 min calculated for 33,689 cf (44% of inflow)
Center-of-Mass det. time= 1,124.4 min (1,844.6 - 720.2)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	60,951 cf	**6.5' Open Storage (Prismatic)**Listed below (Recalc)
#2	98.50'	14,066 cf	**18" Growing Medium (Prismatic)**Listed below (Recalc)
#3	97.00'	5,626 cf	**18" Drain Rock (Prismatic)**Listed below (Recalc) 14,066 cf Overall x 40.0% Voids
		80,642 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	9,377	0	0
106.50	9,377	60,951	60,951

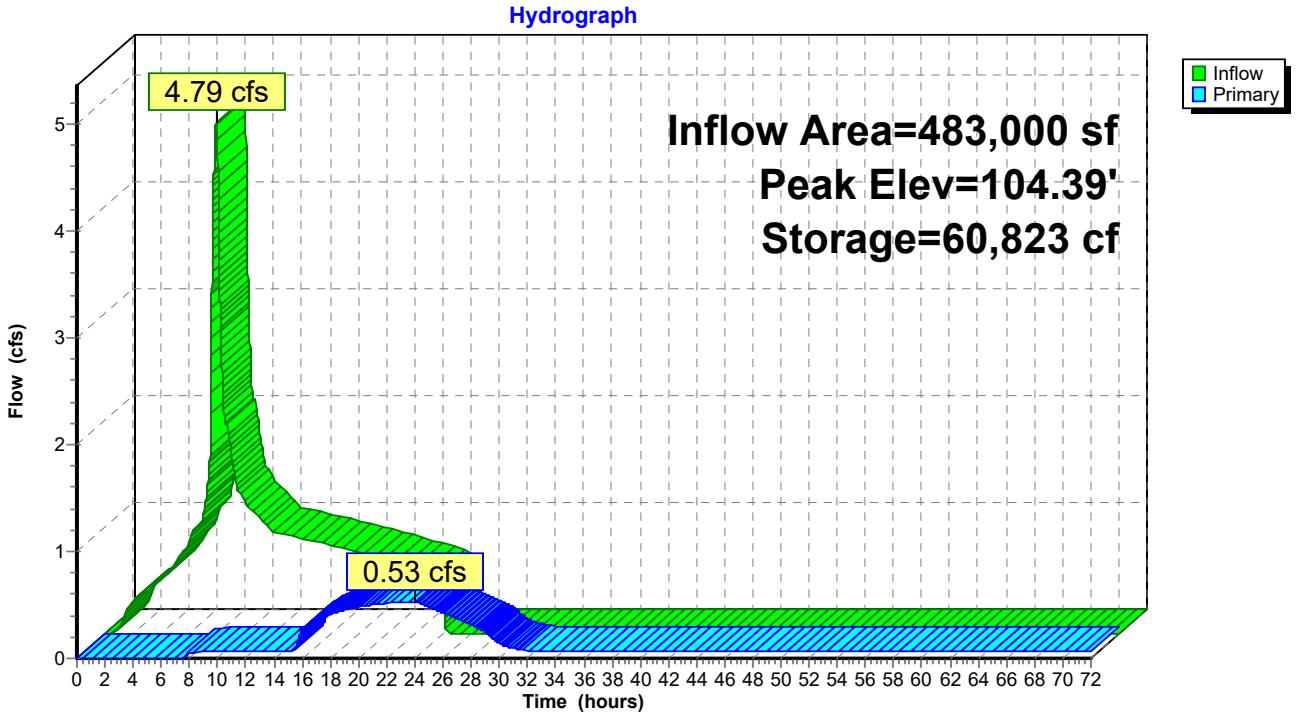
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.50	9,377	0	0
100.00	9,377	14,066	14,066

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	9,377	0	0
98.50	9,377	14,066	14,066

Device	Routing	Invert	Outlet Devices
#1	Primary	96.50'	**42.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.50' / 96.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 9.62 sf
#2	Device 3	98.50'	**2.000 in/hr Exfiltration over Surface area from 98.50' - 100.00'** Excluded Surface area = 18,754 sf
#3	Device 1	96.50'	**1.0" Horiz. Low Orifice** C= 0.620 Limited to weir flow at low heads
#4	Device 1	103.50'	**4.2" Horiz. Orifice/Grate** C= 0.620 Limited to weir flow at low heads

Primary OutFlow Max=0.53 cfs @ 24.00 hrs HW=104.39' (Free Discharge)
- **1=Culvert** (Passes 0.53 cfs of 114.76 cfs potential flow)
  - **3=Low Orifice** (Orifice Controls 0.08 cfs @ 13.97 fps)
    - **2=Exfiltration** (Passes 0.08 cfs of 0.43 cfs potential flow)
  - **4=Orifice/Grate** (Orifice Controls 0.45 cfs @ 4.68 fps)

Pond 2 FILT: NW FILTRATION PLANTER (NEW)



Summary for Subcatchment 2-POST: BASIN 2 - POST DEVELOPED

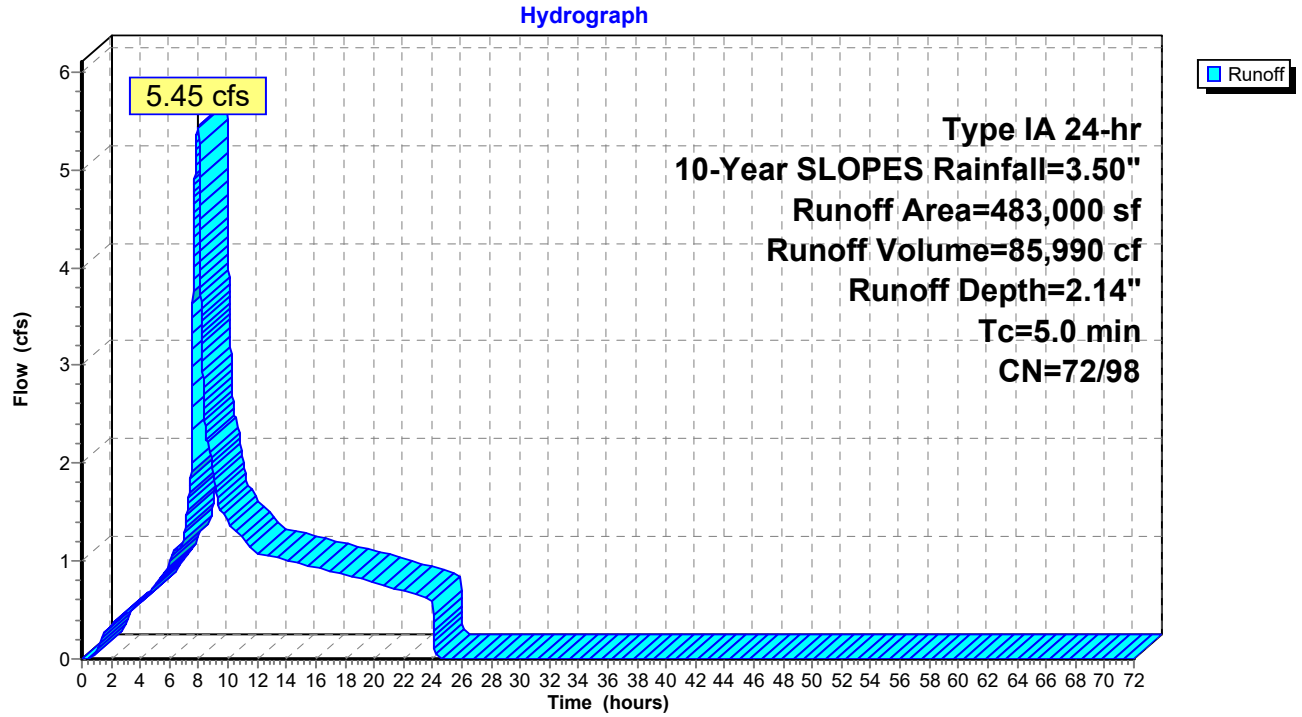
Runoff = 5.45 cfs @ 7.92 hrs, Volume= 85,990 cf, Depth= 2.14"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10-Year SLOPES Rainfall=3.50"

	Area (sf)	CN	Description
*	84,200	98	Streets and Curb
*	19,600	98	Sidewalk
*	124,800	98	Lot Impervious (65% total lot area)
*	67,200	72	Lot Pervious
*	187,200	72	Remaining Pervious
	483,000	84	Weighted Average
	254,400	72	52.67% Pervious Area
	228,600	98	47.33% Impervious Area

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

Subcatchment 2-POST: BASIN 2 - POST DEVELOPED



Summary for Pond 2 FILT: NW FILTRATION PLANTER (NEW)

Inflow Area = 483,000 sf, 47.33% Impervious, Inflow Depth = 2.14" for 10-Year SLOPES event
Inflow = 5.45 cfs @ 7.92 hrs, Volume= 85,990 cf
Outflow = 0.62 cfs @ 23.66 hrs, Volume= 43,017 cf, Atten= 89%, Lag= 943.9 min
Primary = 0.62 cfs @ 23.66 hrs, Volume= 43,017 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 104.78' @ 23.66 hrs Surf.Area= 28,131 sf Storage= 64,542 cf

Plug-Flow detention time= 1,283.8 min calculated for 43,017 cf (50% of inflow)
Center-of-Mass det. time= 1,005.0 min (1,723.6 - 718.7)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	60,951 cf	**6.5' Open Storage (Prismatic)**Listed below (Recalc)
#2	98.50'	14,066 cf	**18" Growing Medium (Prismatic)**Listed below (Recalc)
#3	97.00'	5,626 cf	**18" Drain Rock (Prismatic)**Listed below (Recalc) 14,066 cf Overall x 40.0% Voids
		80,642 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	9,377	0	0
106.50	9,377	60,951	60,951

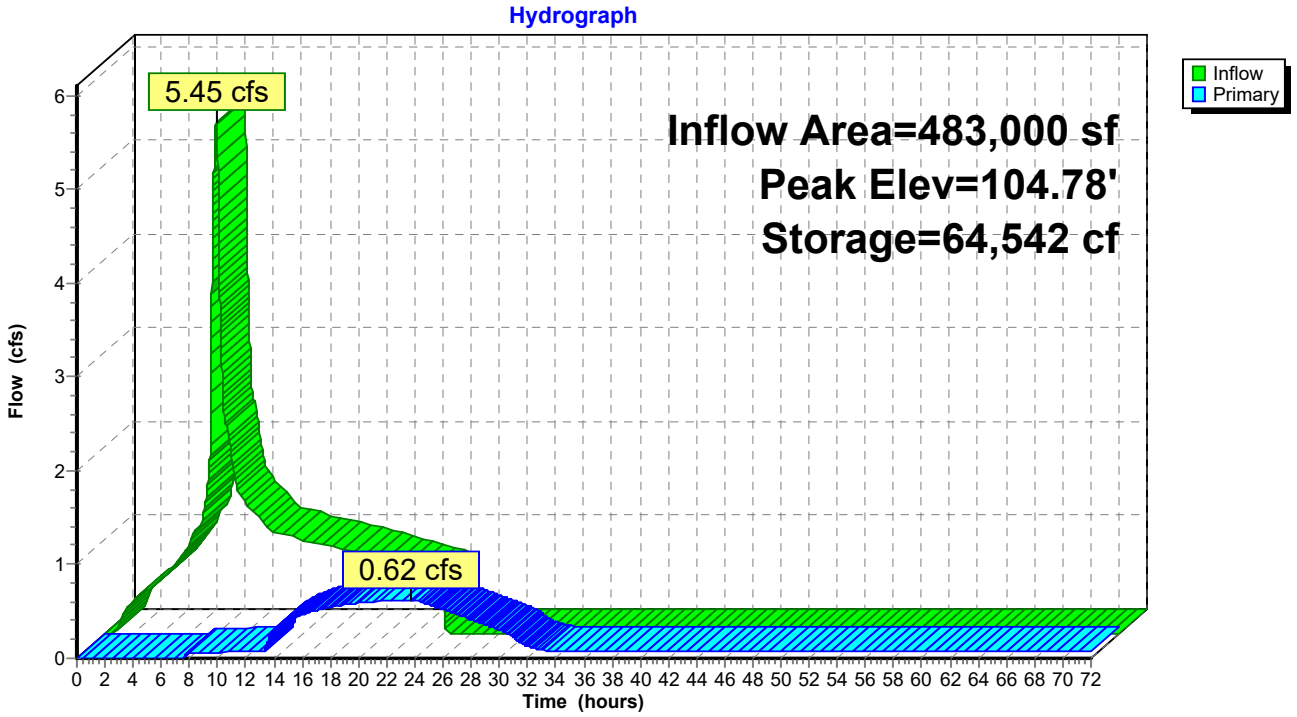
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.50	9,377	0	0
100.00	9,377	14,066	14,066

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	9,377	0	0
98.50	9,377	14,066	14,066

Device	Routing	Invert	Outlet Devices
#1	Primary	96.50'	**42.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.50' / 96.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 9.62 sf
#2	Device 3	98.50'	**2.000 in/hr Exfiltration over Surface area from 98.50' - 100.00'** Excluded Surface area = 18,754 sf
#3	Device 1	96.50'	**1.0" Horiz. Low Orifice** C= 0.620 Limited to weir flow at low heads
#4	Device 1	103.50'	**4.2" Horiz. Orifice/Grate** C= 0.620 Limited to weir flow at low heads

Primary OutFlow Max=0.62 cfs @ 23.66 hrs HW=104.78' (Free Discharge)
└**1=Culvert** (Passes 0.62 cfs of 118.41 cfs potential flow)
  └**3=Low Orifice** (Orifice Controls 0.08 cfs @ 14.32 fps)
    └**2=Exfiltration** (Passes 0.08 cfs of 0.43 cfs potential flow)
  └**4=Orifice/Grate** (Orifice Controls 0.54 cfs @ 5.64 fps)

Pond 2 FILT: NW FILTRATION PLANTER (NEW)



Summary for Subcatchment 2-POST: BASIN 2 - POST DEVELOPED

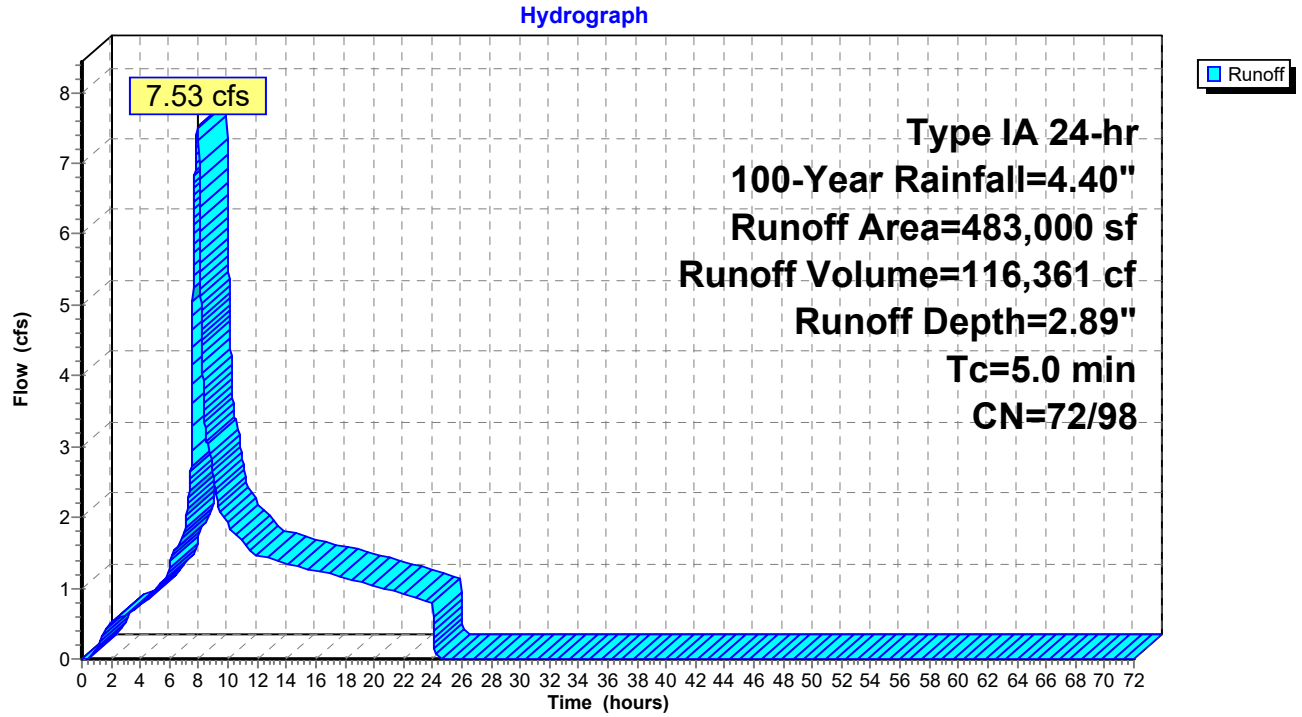
Runoff = 7.53 cfs @ 7.92 hrs, Volume= 116,361 cf, Depth= 2.89"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type IA 24-hr 100-Year Rainfall=4.40"

	Area (sf)	CN	Description
*	84,200	98	Streets and Curb
*	19,600	98	Sidewalk
*	124,800	98	Lot Impervious (65% total lot area)
*	67,200	72	Lot Pervious
*	187,200	72	Remaining Pervious
	483,000	84	Weighted Average
	254,400	72	52.67% Pervious Area
	228,600	98	47.33% Impervious Area

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

Subcatchment 2-POST: BASIN 2 - POST DEVELOPED



Summary for Pond 2 FILT: NW FILTRATION PLANTER (NEW)

Inflow Area = 483,000 sf, 47.33% Impervious, Inflow Depth = 2.89" for 100-Year event
Inflow = 7.53 cfs @ 7.92 hrs, Volume= 116,361 cf
Outflow = 0.87 cfs @ 22.81 hrs, Volume= 72,213 cf, Atten= 88%, Lag= 893.6 min
Primary = 0.87 cfs @ 22.81 hrs, Volume= 72,213 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 106.20' @ 22.81 hrs Surf.Area= 28,131 sf Storage= 77,812 cf

Plug-Flow detention time= 1,070.9 min calculated for 72,213 cf (62% of inflow)
Center-of-Mass det. time= 845.1 min (1,559.1 - 713.9)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	60,951 cf	**6.5' Open Storage (Prismatic)**Listed below (Recalc)
#2	98.50'	14,066 cf	**18" Growing Medium (Prismatic)**Listed below (Recalc)
#3	97.00'	5,626 cf	**18" Drain Rock (Prismatic)**Listed below (Recalc) 14,066 cf Overall x 40.0% Voids
		80,642 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	9,377	0	0
106.50	9,377	60,951	60,951

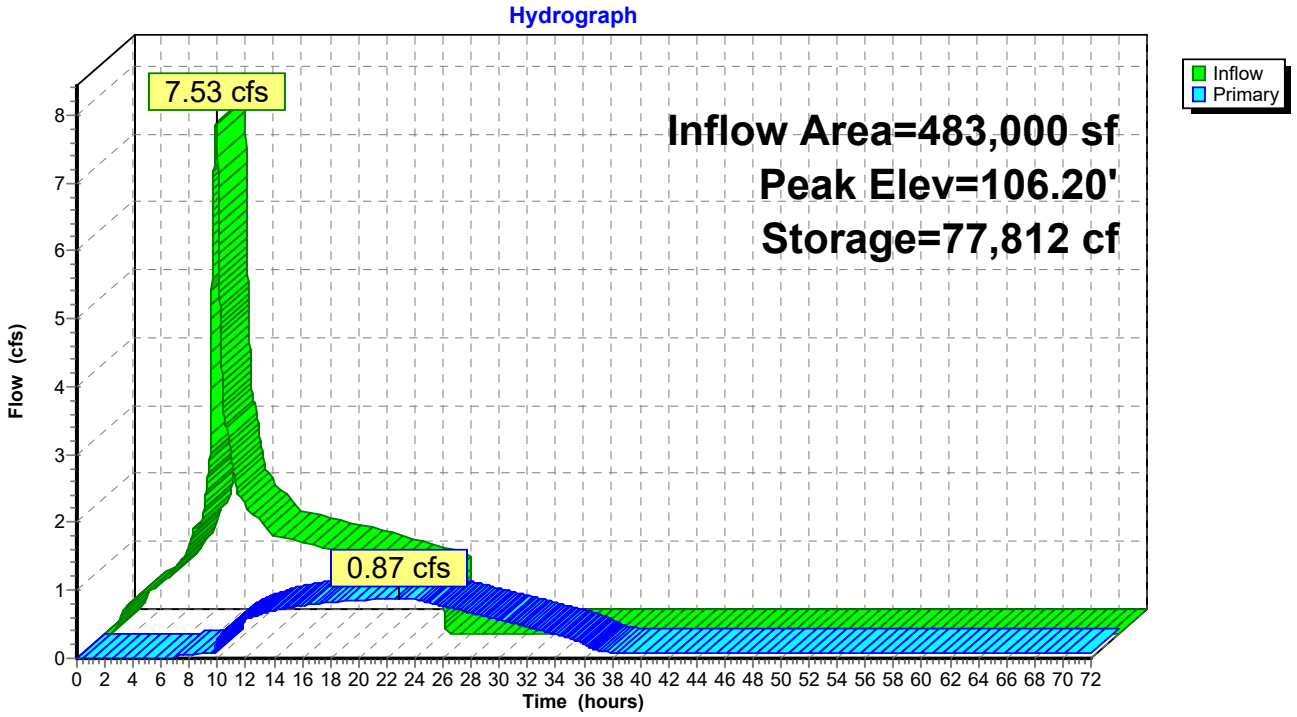
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.50	9,377	0	0
100.00	9,377	14,066	14,066

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	9,377	0	0
98.50	9,377	14,066	14,066

Device	Routing	Invert	Outlet Devices
#1	Primary	96.50'	**42.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.50' / 96.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 9.62 sf
#2	Device 3	98.50'	**2.000 in/hr Exfiltration over Surface area from 98.50' - 100.00'** Excluded Surface area = 18,754 sf
#3	Device 1	96.50'	**1.0" Horiz. Low Orifice** C= 0.620 Limited to weir flow at low heads
#4	Device 1	103.50'	**4.2" Horiz. Orifice/Grate** C= 0.620 Limited to weir flow at low heads

Primary OutFlow Max=0.87 cfs @ 22.81 hrs HW=106.20' (Free Discharge)
└**1=Culvert** (Passes 0.87 cfs of 130.60 cfs potential flow)
  └**3=Low Orifice** (Orifice Controls 0.08 cfs @ 15.49 fps)
    └**2=Exfiltration** (Passes 0.08 cfs of 0.43 cfs potential flow)
  └**4=Orifice/Grate** (Orifice Controls 0.79 cfs @ 8.17 fps)

Pond 2 FILT: NW FILTRATION PLANTER (NEW)



Summary for Subcatchment 2-POST: BASIN 2 - POST DEVELOPED

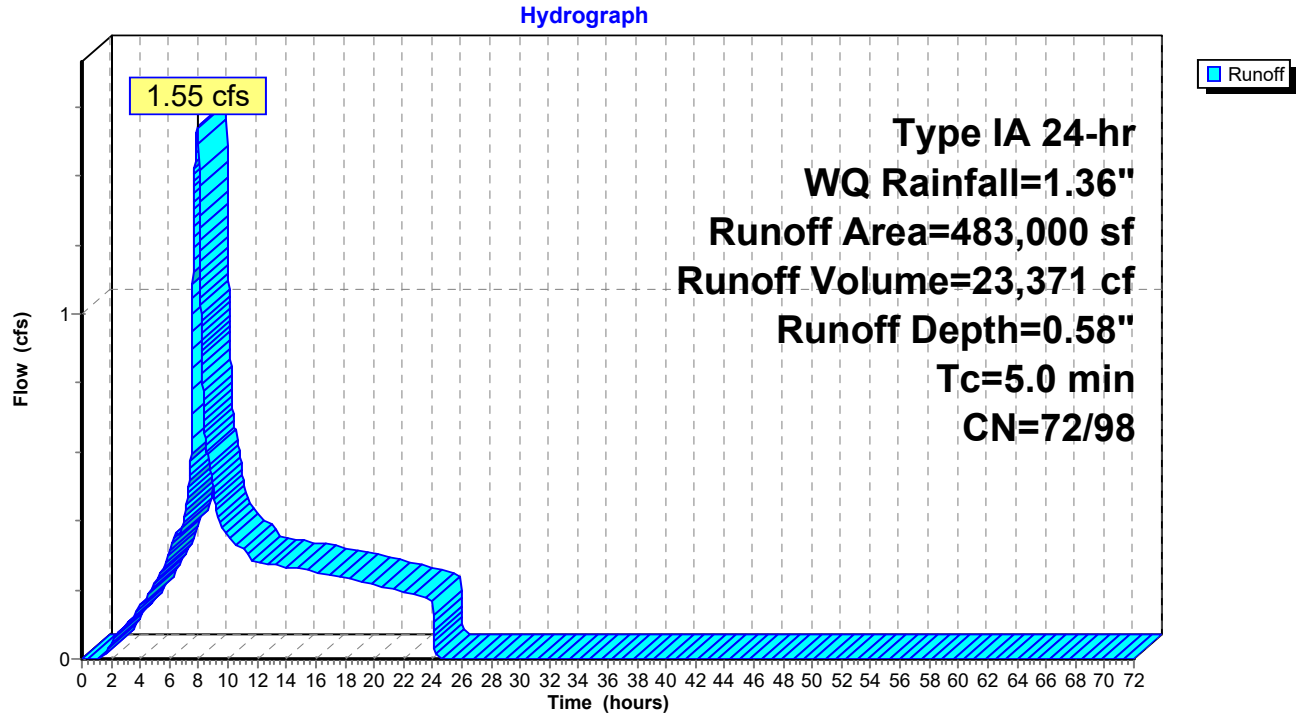
Runoff = 1.55 cfs @ 7.89 hrs, Volume= 23,371 cf, Depth= 0.58"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type IA 24-hr WQ Rainfall=1.36"

	Area (sf)	CN	Description
*	84,200	98	Streets and Curb
*	19,600	98	Sidewalk
*	124,800	98	Lot Impervious (65% total lot area)
*	67,200	72	Lot Pervious
*	187,200	72	Remaining Pervious
	483,000	84	Weighted Average
	254,400	72	52.67% Pervious Area
	228,600	98	47.33% Impervious Area

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

Subcatchment 2-POST: BASIN 2 - POST DEVELOPED



Summary for Pond 2 FILT: NW FILTRATION PLANTER (NEW)

Inflow Area = 483,000 sf, 47.33% Impervious, Inflow Depth = 0.58" for WQ event
Inflow = 1.55 cfs @ 7.89 hrs, Volume= 23,371 cf
Outflow = 0.05 cfs @ 24.10 hrs, Volume= 4,195 cf, Atten= 97%, Lag= 972.7 min
Primary = 0.05 cfs @ 24.10 hrs, Volume= 4,195 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 100.28' @ 24.10 hrs Surf.Area= 28,131 sf Storage= 22,343 cf

Plug-Flow detention time= 1,478.0 min calculated for 4,195 cf (18% of inflow)
Center-of-Mass det. time= 1,080.7 min (1,804.6 - 723.8)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	60,951 cf	**6.5' Open Storage (Prismatic)**Listed below (Recalc)
#2	98.50'	14,066 cf	**18" Growing Medium (Prismatic)**Listed below (Recalc)
#3	97.00'	5,626 cf	**18" Drain Rock (Prismatic)**Listed below (Recalc) 14,066 cf Overall x 40.0% Voids
		80,642 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	9,377	0	0
106.50	9,377	60,951	60,951

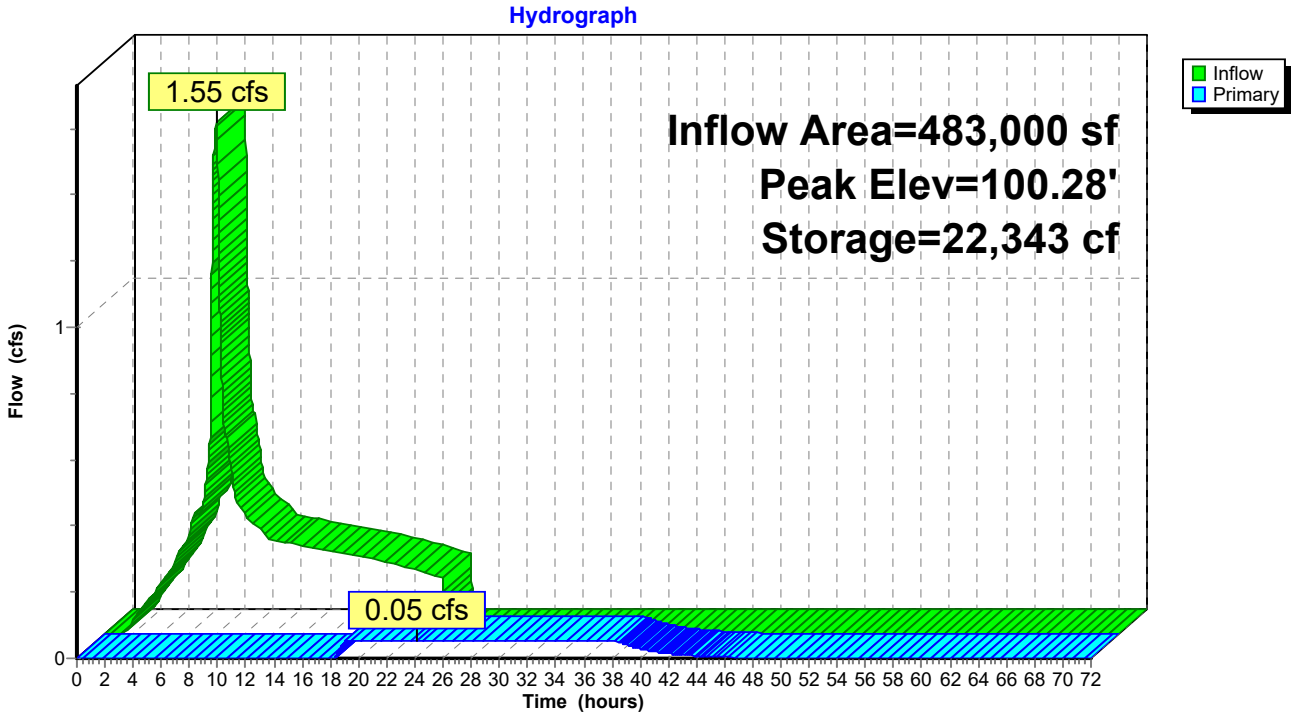
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.50	9,377	0	0
100.00	9,377	14,066	14,066

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	9,377	0	0
98.50	9,377	14,066	14,066

Device	Routing	Invert	Outlet Devices
#1	Primary	96.50'	**42.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.50' / 96.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 9.62 sf
#2	Device 3	98.50'	**2.000 in/hr Exfiltration over Surface area from 98.50' - 100.00'** Excluded Surface area = 18,754 sf
#3	Device 1	96.50'	**1.0" Horiz. Low Orifice** C= 0.620 Limited to weir flow at low heads
#4	Device 1	103.50'	**4.2" Horiz. Orifice/Grate** C= 0.620 Limited to weir flow at low heads

Primary OutFlow Max=0.05 cfs @ 24.10 hrs HW=100.28' (Free Discharge)
└**1=Culvert** (Passes 0.05 cfs of 57.65 cfs potential flow)
  └**3=Low Orifice** (Orifice Controls 0.05 cfs @ 9.68 fps)
    └**2=Exfiltration** (Passes 0.05 cfs of 0.43 cfs potential flow)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 2 FILT: NW FILTRATION PLANTER (NEW)



Summary for Subcatchment 2-POST: BASIN 2 - POST DEVELOPED

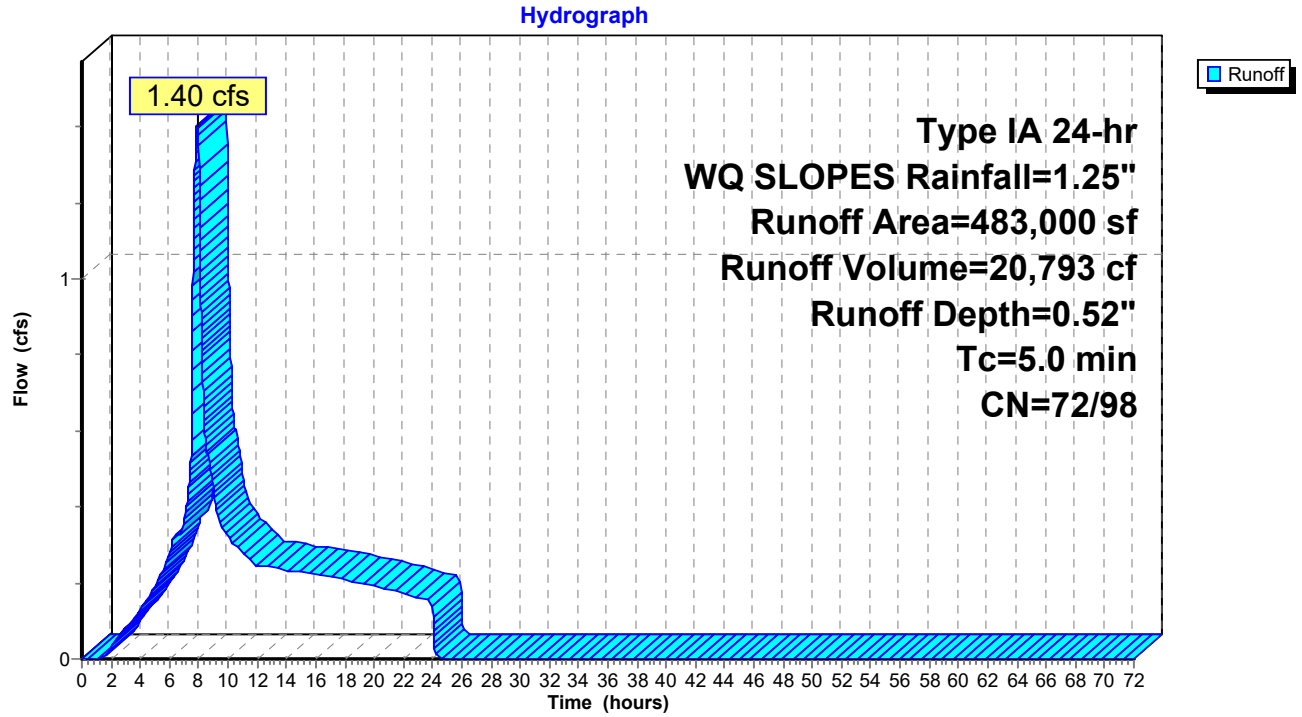
Runoff = 1.40 cfs @ 7.89 hrs, Volume= 20,793 cf, Depth= 0.52"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type IA 24-hr WQ SLOPES Rainfall=1.25"

	Area (sf)	CN	Description
*	84,200	98	Streets and Curb
*	19,600	98	Sidewalk
*	124,800	98	Lot Impervious (65% total lot area)
*	67,200	72	Lot Pervious
*	187,200	72	Remaining Pervious
	483,000	84	Weighted Average
	254,400	72	52.67% Pervious Area
	228,600	98	47.33% Impervious Area

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

Subcatchment 2-POST: BASIN 2 - POST DEVELOPED



Summary for Pond 2 FILT: NW FILTRATION PLANTER (NEW)

Inflow Area = 483,000 sf, 47.33% Impervious, Inflow Depth = 0.52" for WQ SLOPES event
Inflow = 1.40 cfs @ 7.89 hrs, Volume= 20,793 cf
Outflow = 0.05 cfs @ 24.10 hrs, Volume= 1,617 cf, Atten= 96%, Lag= 972.1 min
Primary = 0.05 cfs @ 24.10 hrs, Volume= 1,617 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 100.07' @ 24.10 hrs Surf.Area= 28,131 sf Storage= 20,359 cf

Plug-Flow detention time= 1,349.0 min calculated for 1,616 cf (8% of inflow)
Center-of-Mass det. time= 876.8 min (1,599.8 - 723.0)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	60,951 cf	**6.5' Open Storage (Prismatic)**Listed below (Recalc)
#2	98.50'	14,066 cf	**18" Growing Medium (Prismatic)**Listed below (Recalc)
#3	97.00'	5,626 cf	**18" Drain Rock (Prismatic)**Listed below (Recalc) 14,066 cf Overall x 40.0% Voids
		80,642 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	9,377	0	0
106.50	9,377	60,951	60,951

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.50	9,377	0	0
100.00	9,377	14,066	14,066

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.00	9,377	0	0
98.50	9,377	14,066	14,066

Device	Routing	Invert	Outlet Devices
#1	Primary	96.50'	**42.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.50' / 96.00' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 9.62 sf
#2	Device 3	98.50'	**2.000 in/hr Exfiltration over Surface area from 98.50' - 100.00'** Excluded Surface area = 18,754 sf
#3	Device 1	96.50'	**1.0" Horiz. Low Orifice** C= 0.620 Limited to weir flow at low heads
#4	Device 1	103.50'	**4.2" Horiz. Orifice/Grate** C= 0.620 Limited to weir flow at low heads

Primary OutFlow Max=0.05 cfs @ 24.10 hrs HW=100.07' (Free Discharge)
└**1=Culvert** (Passes 0.05 cfs of 53.47 cfs potential flow)
  └**3=Low Orifice** (Orifice Controls 0.05 cfs @ 9.40 fps)
    └**2=Exfiltration** (Passes 0.05 cfs of 0.43 cfs potential flow)
  └**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 2 FILT: NW FILTRATION PLANTER (NEW)