HALEY & ALDRICH, INC.
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Suite 450
Spokane, WA 99201
509.960.7447

TECHNICAL MEMORANDUM

April 10, 2025
File No. 0202349-002

TO: City of Liberty Lake
Luke Michels, P.E.

C: Central Valley School District; Attn: Jay Rowell
Washington State Department of Ecology; Attn: Ted Uecker

FROM: Haley & Aldrich, Inc.
Breeyn Greer, P.E., Senior Technical Specialist
John Haney, P.E., Senior Environmental Engineer

SUBJECT: Former Gun Club Cleanup Action

Dear Luke Michels:

Haley & Aldrich Inc. (Haley & Aldrich), acting on behalf of the Central Valley School District (CVSD), received your email inquiry regarding the Former Gun Club Cleanup, dated February 21, 2025. The Former Gun Club Cleanup action is permitted under City of Liberty Lake (City) Grading Permit GRD2023-0010, dated March 19, 2024, and Mitigated Determination of Non-Significance LUA2023-0046, dated March 1, 2024. Please see the City's comments listed below and our replies *in italics*.

1. **City Comment:** The [Stormwater Pollution Prevention Plan] provided by the contractor only calls for silt fence at the north end of the site around the repository. Although the site is relatively flat in undisturbed areas, there are very large stockpiles of soil around the perimeter of the site (not sure if they are contaminated or clean). I am concerned about erosion from the stockpiles spreading to the neighboring property from late winter/spring rains. The property to the east is owned by the school district, so I will leave it up to them on whether they would like silt fences placed along the east boundary. I am mostly concerned about the residential properties to the west of the site. Do you agree that silt fences should be installed along the western boundary of the site?

   Haley & Aldrich Reply: *The western property perimeter was monitored after the heavy rainfall on Sunday, February 23, 2025, and there was no evidence of offsite stormwater discharge to the west. We concur that offsite sediment discharge would not be tolerated, and, should additional silt fence be warranted in the future, it will be installed at that time.*

2. **City Comment:** I am concerned that there is no discharge for the composite drainage net. Typically, subsurface drainage systems have a pipe and discharge to a disposal location (drywell, infiltration trench, etc.). Based on the relatively shallow geomembrane and the lack of discharge, the cover soil will likely become completely saturated at times from irrigation, snow melt, and rain. This could essentially create an impermeable surface that will create stormwater runoff. The current plans only have a small swale on the west and northwest portions of the repository. My concern is that runoff from the other sides of the repository does not have a safe disposal area. Based on the Spokane Regional Stormwater Manual, could you please provide drainage calcs to show that water from a 10-year storm event will be contained, and that water from a 100-year storm event will have a safe overflow path (at minimum)?

   Haley & Aldrich Reply: *A hydrologic analysis of stormwater flow was conducted under the Spokane Regional Stormwater Manual[1] in response to this comment. The hydrologic analysis was completed for the northern portion of the repository (approximately 80,000 square feet) that drains to the north from the repository crown along alignment 2 shown on the Repository Final Grading Plan, Attachment A. The southern portion of the repository flows freely onto CVSD-owned property and is not at risk of leaving the site.*

   The SRSM specifies the Natural Resource Conservation Service (NRCS) Type 1A 24-hour design storm with the retention of runoff from the 10-year storm and safe conveyance of runoff from the 100-year storm. We modeled the runoff volume generated using the Curve Number Method in Hydraulic Modeling Software (HMS; Version 4.12) for a variety of potentially applicable curve numbers (74 = U.S. Department of Agriculture [USDA] Soil Type C grass, and 100 = smooth HDPE liner surface); see Attachment B. Conservative curve number 100 was ultimately utilized for design; curve number 100 translates precipitation directly to runoff and HMS modeling was not required. To retain the 10-year storm (395 cubic yards; Attachment C) in the infiltration swale, the swale was expanded along the north side of the repository, between the repository and the northern property line (see Attachment A). The expanded swale will retain greater than 400 cubic yards of stormwater. Safe conveyance of the 100-year storm (modeled at 553 cubic yards) will occur via overland flow in the vicinity.

3. **City Comment:** What compaction is specified for the backfill of excavations that are outside of the repository? Is this compaction sufficient for future building construction?

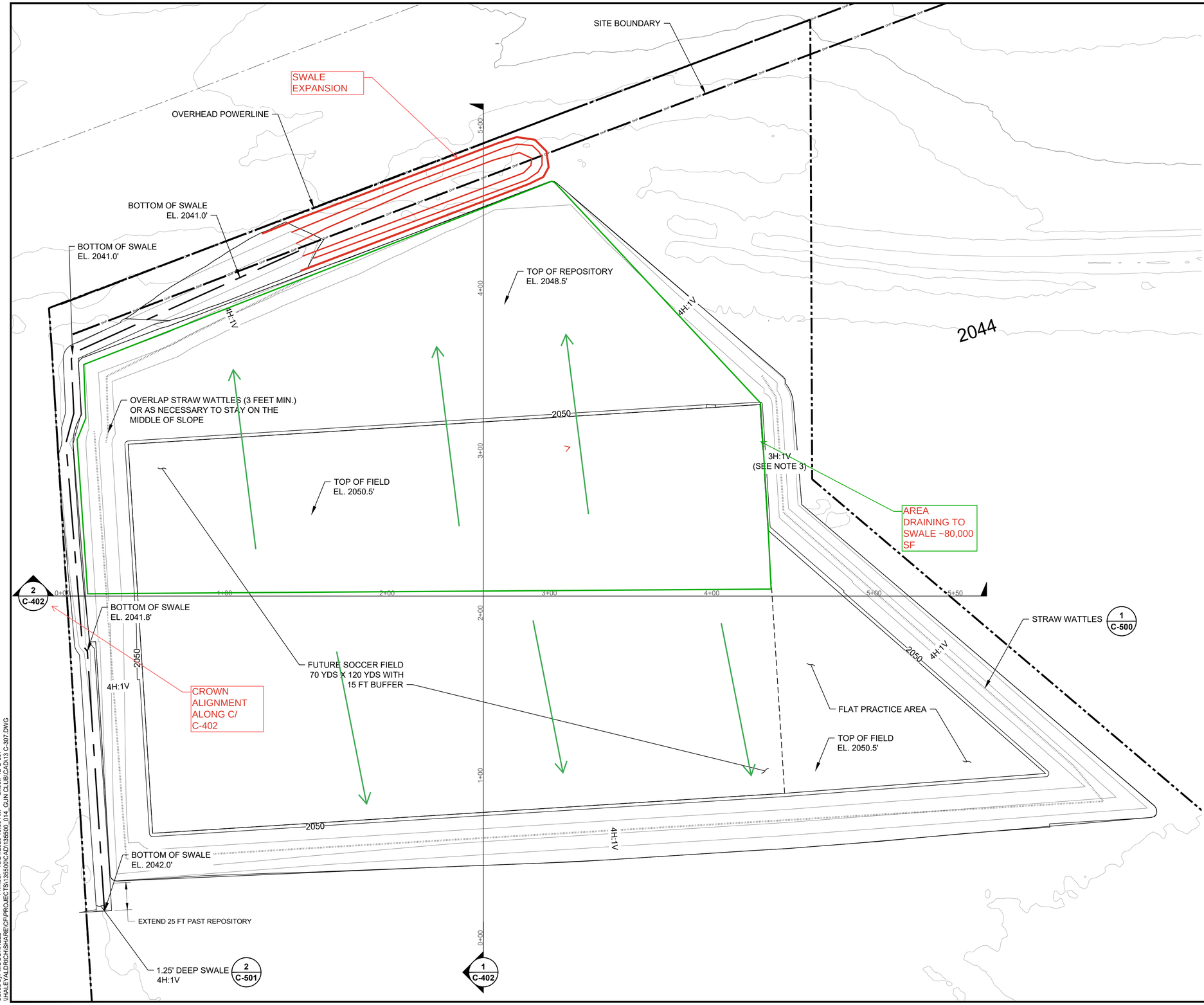
   Haley & Aldrich Reply: *The compaction specified for backfill outside of the repository is 90 percent maximum dry density in accordance with the International Building Code (ICB) Appendix J Section J107.5[2]. Future site use is to be determined by the future owner and compaction will be evaluated at that time. The future developer will likely conduct their own geotechnical evaluation as a component of due diligence in advance of purchase. We understand that City design standards call for 95 percent maximum dry density compaction, below public roadways, sidewalks, and curb and gutter. It will be the responsibility of the future developer to ensure that design standards are met on publicly-owned land.*

[1] Spokane County, City of Spokane, and City of Spokane Valley, 2008. "Spokane Regional Stormwater Manual," April.
[2] International Code Council (ICC), 2024. "2024 International Building Code."

Attachments:

A – Repository Final Grading Plan; Rev 1 Markup (C-307)
B – HMS Output Files for Curve Number 74
C – Hydrologic Volumetric Analysis

https://haleyaldrich.sharepoint.com/sites/CentralValleySchoolDistrict356/Shared Documents/0202349.Gun Club - Bid and Tech Support/-002 Construction Support/Communication/City of Liberty Lake/Final/2025_0410_HAI_CVSD_Memo Response to City of LL_F.docx



NOTES

1. MATERIAL SALVAGED FROM THE TOP 0.0 TO 0.5 FEET OF THE REPOSITORY EXCAVATION SHALL BE USED AS TOPSOIL IN THIS AREA AND IS EXPECTED TO COVER THE TOP 0.2 FEET OF DISTURBANCE.
2. TOPSOIL PLACEMENT OVER THE PROPOSED SOCCER FIELD AND PRACTICE AREA SHALL BE 0.3 FEET THICK WITH THE REMAINING TOPSOIL TO BE PLACED OVER THE SLOPES AND AREA NORTH OF THE PROPOSED SOCCER FIELD.
3. SIDE SLOPE TRANSITION FROM 4H:1V TO 3H:1V AT THE CORNER TO PROVIDE LARGE ENOUGH AREA FOR FUTURE SOCCER FIELD.
4. A SINGLE ROW OF STRAW WATTLES SHALL BE PLACED MIDDLE OF SLOPE ON CONTOUR BETWEEN THE CREST AND TOE OF THE REPOSITORY FILL SLOPE, OR TO THE BOTTOM OF SWALE AS SHOWN.

HALEY ALDRICH

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Project No.:	202349-001
Scale:	SHOWN
Date:	10/17/2023
Drawn By:	ZS/MO
Designed By:	BD
Checked By:	KH
Approved By:	JH/KH
Stamp:	

Rev.	Description	By	Date
1	ISSUED FOR ECOLOGY	BD	05/18/23
0	ISSUED FOR BID	BD	10/18/23

CVSD GUN CLUB
CLEANUP PROJECT

19615 E. SPRAGUE AVE. #9656
SPOKANE VALLEY,
WASHINGTON

REPOSITORY FINAL GRADING PLAN

C-307

Sheet: 12 of 21

Saved by: MOCONNELL Printed: 10/24/2023 10:00 AM Sheet: 12 C-307
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Project: Site Volume
Simulation Run: 010YR_24HR
Simulation Start: 31 December 2024, 24:00
Simulation End: 1 January 2025, 24:00

HMS Version: 4.12
Executed: 27 February 2025, 17:02

Global Parameter Summary - Subbasin

Area (MI2)

Element Name	Area (MI2)
Field	0

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number
Field	0	74

Transform: Scs

Element Name	Lag	Unitgraph Type
Field	10	Standard

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Field	0	0.04	01Jan2025, 08:55	0.35

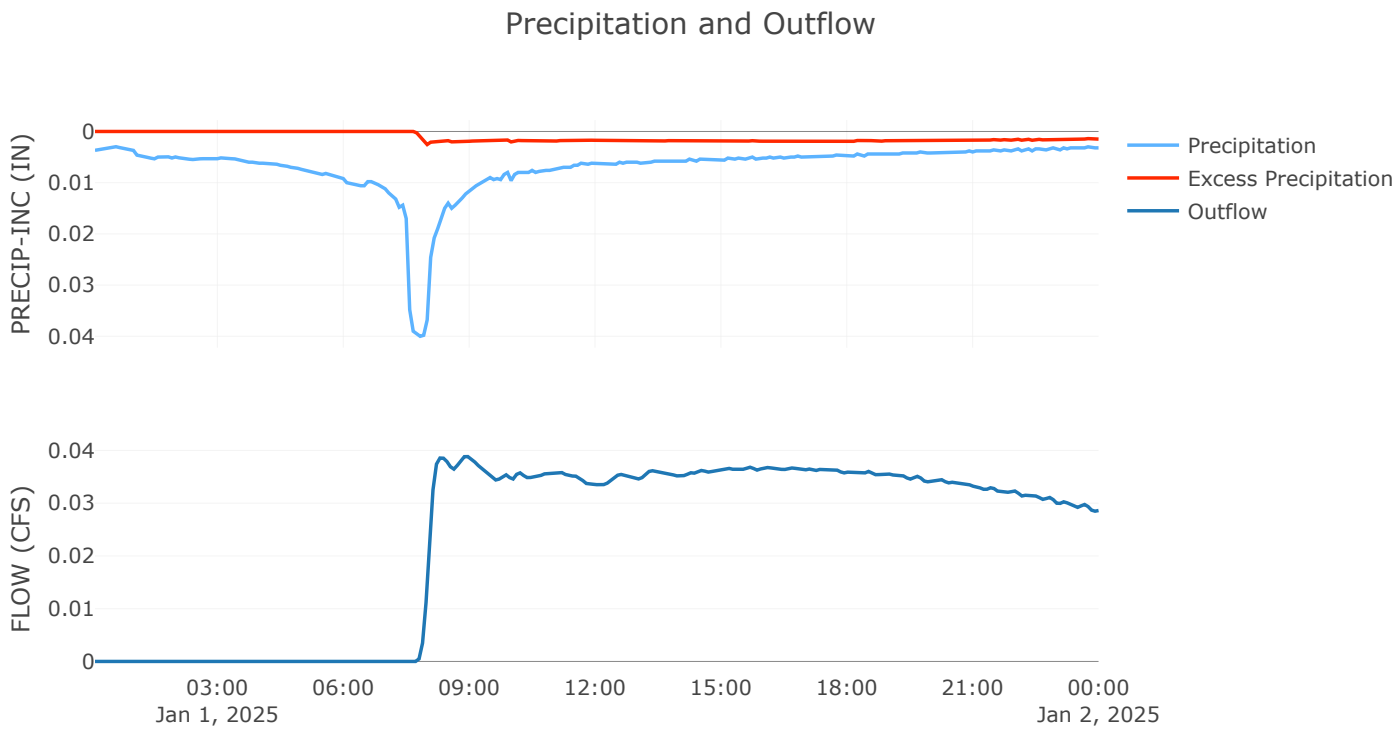
Subbasin: Field

Area (MI2) : 0

Loss Rate: Scs	
Percent Impervious Area	0
Curve Number	74

Transform: Scs	
Lag	10
Unitgraph Type	Standard

Results: Field	
Peak Discharge (CFS)	0.04
Time of Peak Discharge	01Jan2025, 08:55
Volume (IN)	0.35
Precipitation Volume (AC - FT)	0.27
Loss Volume (AC - FT)	0.22
Excess Volume (AC - FT)	0.05
Direct Runoff Volume (AC - FT)	0.05
Baseflow Volume (AC - FT)	0



Project: Site Volume
Simulation Run: 100YR_24HR
Simulation Start: 31 December 2024, 24:00
Simulation End: 1 January 2025, 24:00

HMS Version: 4.12
Executed: 27 February 2025, 17:02

Global Parameter Summary - Subbasin

Area (MI2)

Element Name	Area (MI2)
Field	0

Loss Rate: Scs

Element Name	Percent Impervious Area	Curve Number
Field	0	74

Transform: Scs

Element Name	Lag	Unitgraph Type
Field	10	Standard

Global Results Summary

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Field	0	0.24	01Jan2025, 08:05	0.9

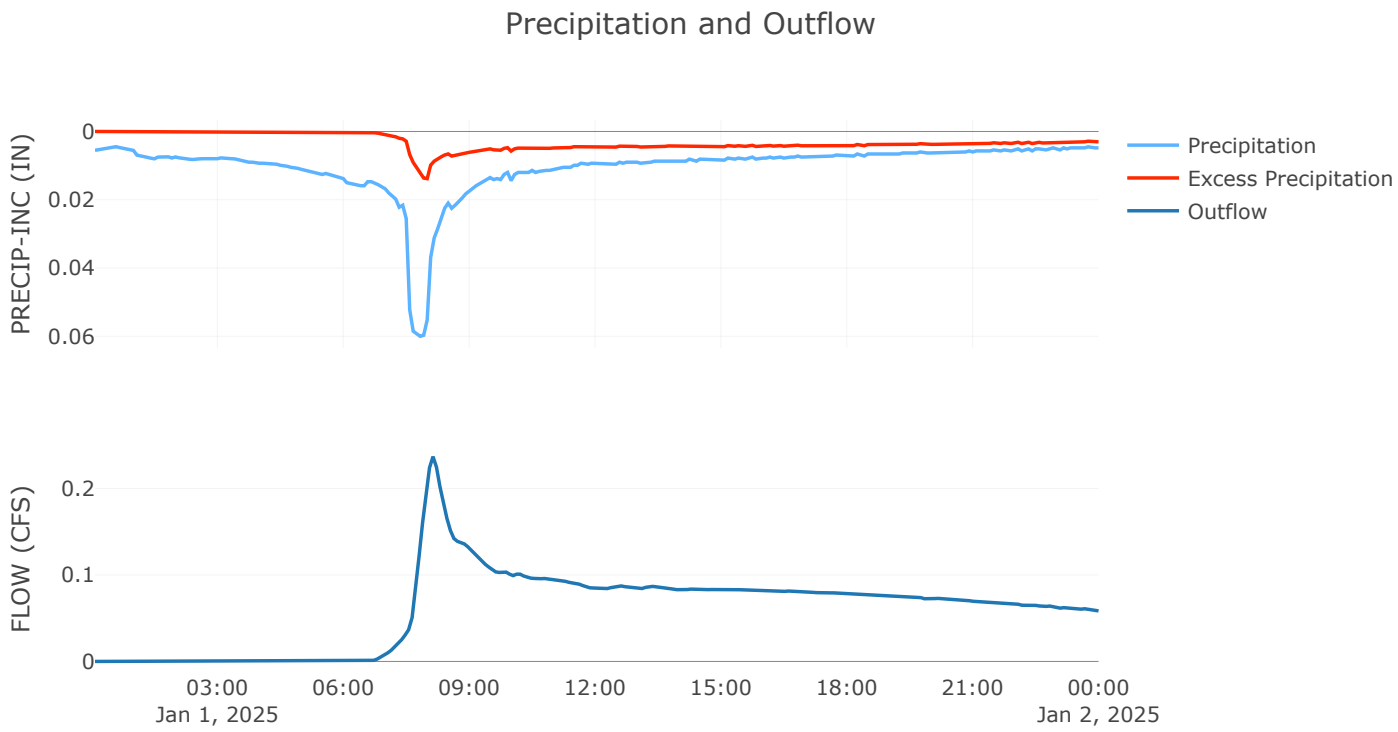
Subbasin: Field

Area (MI2) : 0

Loss Rate: Scs	
Percent Impervious Area	0
Curve Number	74

Transform: Scs	
Lag	10
Unitgraph Type	Standard

Results: Field	
Peak Discharge (CFS)	0.24
Time of Peak Discharge	01Jan2025, 08:05
Volume (IN)	0.9
Precipitation Volume (AC - FT)	0.4
Loss Volume (AC - FT)	0.28
Excess Volume (AC - FT)	0.12
Direct Runoff Volume (AC - FT)	0.12
Baseflow Volume (AC - FT)	0



Former Gun Club Stormwater Analysis

				Area	
Rational Method				80000	sf
	Q	**(CIA)/Kc**		0.0025	mi^2

Q	(cfs)	Return (i)		
I	(in/hr)	10	2	24-hr
A	(Ac)	100	3	24-hr
Kc	conversion factor 1			

Curve No			
74	Class C Grass	USDA Web Soil Survey	
61	No Runoff		
99	Parking Lot		

Hydraullic Modeling System (HMS) output

		Runoff Depth	**Volume**	**Volume**	
CN 74		(in)	(ft^3)	(CY)	
10	(yr)	0.35	2333	86	
100	(yr)	0.9	6000	222	
		Runoff Depth	**Storage**	**Volume**	**Volume**
CN 100		(in)	20% porosity	(ft^3)	(CY)
10	(yr)	2	0.13	10667	395
100	(yr)	2.8	0.19	14933	553

Current Swale Volume (CY)	240	
Approximate Addition (CY)	215	
Sum	455	> 395