

DRAINAGE REPORT

***SITE PLAN
B & H FUEL STORAGE TANK FARM
HUDSON, NH***

Prepared by: Edward N. Herbert Assoc. Inc.
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EDWARD N. HERBERT ASSOCIATES INC.

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EDWARD N. HERBERT ASSOCIATES INC.

1.0 INTRODUCTION

ENH Inc. has conducted a hydrologic analysis of a 2.48 acre developed site in Hudson, NH. The existing lot is wooded in nature, with a drainage swale along the west side of the property which overtime has converted to a wetland. The proposal for this site is to construct a fuel storage facility in the upland area of the site. The proposed development will have an impervious area of about 0.8 acres when complete

This parcel has one existing drainage areas as shown on the enclosed existing area map. The existing area will be divided into two, one for the development and the second for the undisturbed area.

The analysis shows that with the mitigation measures proposed the development of the site will have minimal impact on the site.

2.0 DRAINAGE ANALYSIS

A comprehensive hydrologic study of this site has been performed utilizing nationally recognized runoff estimating techniques developed by the USDA, Soil Conservation Service (SCS). The technique and runoff models are described in various publications and references as follows:

“New Hampshire Stormwater Management Manual handbook”

“Open-Channel Hydraulics” Chow.

“Stormwater Modeling System” HydroCAD

2.1 DRAINAGE DESIGN PARAMETERS

A brief review of the procedures and parameters used in the drainage study follows:

2.1.1 Watersheds

Watersheds have been delineated using an on-site topographic survey by ENH Inc.

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2.1.2 Soils

The soils analyzed for the overall watershed was provided by Gove Environmental Inc. The following summaries were the soils found;

Mapping Unit	NRCS Soil Group
221	Canton
321	Newfields
421	Newfields Variant
521	Ridgebury

2.1.3 Rainfall Data

24-hour storm distribution values were obtained from Northeast Regional Climate Center Extreme Precipitation estimates (inches). The analysis has been performed for the 2, 10, 25, and 50-year storm frequencies.

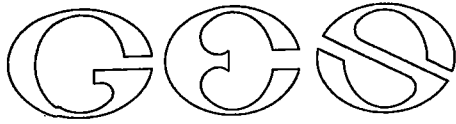
2.1.4 Runoff Curve Numbers

The SCS runoff curve numbers were used and summarized within each subcatchment drainage summary and data sheets.

2.2 EXISTING AND PROPOSED CONDITIONS

	Node	
Storm Event	1E	
2 year	0.14 cfs (0.040 af)	
10 year	1.2 cfs	
25 year	2.4 cfs	
50 year	3.7 cfs	

	Node	
Storm Event	1S	
2 year	0.15 cfs (0.03 af)	
10 year	0.9 cfs	
25 year	2.0 cfs	
50 year	3.6 cfs	



SOIL SURVEY REPORT
Constitution Drive
Hudson

1. MAPPING STANDARDS

Site-Specific Soil Mapping Standards for New Hampshire and Vermont. SSSNNE Special Publication No. 3, Version 5.0, December 2017. This map product is within the technical standards of the National Cooperative Soil Survey. It is a special product, intended for the site-specific soil survey. It was produced by a professional soil scientist and is not a product of the USDA Natural Resource Conservation Service.

2. DATE SOIL MAP PRODUCED
September 20, 2020

3. GEOGRAPHIC LOCATION AND SIZE OF SITE
The portion of the properties mapped consists of approximately 2.5 acres of mixed woods and open shrub vegetation. A wetland associated with an intermittent stream exists on the western portion of the property parallel to Wall Street

4. PURPOSE OF THE SOIL MAP
The preparation of this map was requested by Edward N. Herbert & Associates, Inc. to meet the requirements of the Town of Hudson.

SOIL IDENTIFICATION LEGEND

HISS SYMBOL	NRCS SYMBOL	SOIL TAXONOMIC NAME
221	42	Canton
321	444	Newfields
421	921	Newfields Variant
521	656/P	Ridgebury

SOIL MAP UNIT DESCRIPTIONS

42 The Canton series consists of very deep, well drained soils formed in a loamy mantle underlain by sandy till. They are on nearly level to very steep moraines, hills, and ridges. Slope ranges from 0 to 45 percent.

444 The Newfields series consists of very deep, moderately well poorly drained soils formed in a loamy mantle underlain by sandy till on upland hills, moraines, till plains, and mountain side slopes.

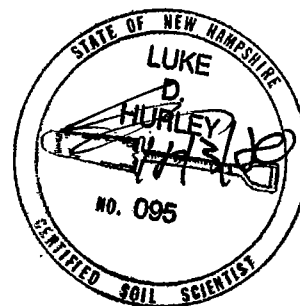
- 921 The Newfields variant series consists of very deep, somewhat poorly drained soils formed in a loamy mantle underlain by sandy till on upland hills, moraines, till plains, and mountain side slopes.
- 656 The Ridgebury series consists of very deep, somewhat poorly and poorly drained soils formed in lodgment till derived mainly from granite, gneiss and/or schist. They are commonly shallow to a densic contact. They are nearly level to gently sloping soils in depressions in uplands. They also occur in drainageways in uplands, in toeslope positions of hills, drumlins, and ground moraines, and in till plains.

5. RESPONSIBLE SOIL SCIENTIST
Luke D. Hurley, C.S.S.

6. OTHER DISTINGUISHING FEATURES OF SITE
No distinguishing features were noted.

7. MAXIMUM SIZE OF LIMITING INCLUSIONS
No limiting inclusions were mapped

8. SPECIAL FEATURE SYMBOLS
No special feature symbols were used.



Millis	39																		
Canton	42	2.0	6.00	20.0	B	2	Loose till, sandy textures	meso	loamy over sandy	no									
Montauk	44	0.6	0.06	0.6	C	3	Firm, platy, sandy till	meso	loamy	no									
Henniker	46	0.6	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	no									
Madawaska,	48	0.6	6.00	20.0	B	3	Outwash and Stream	frigid	loamy over sandy	yes									
Whitman	49	0.0	0.00	0.2	D	6	Firm, platy, loamy till	meso	loamy	no									
Hermon	55	2.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes									
Becket	56	0.6	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes									
Waumbeck	58	2.0	6.00	20.0	B	3	Loose till, sandy textures	frigid	sandy-skeletal.	yes									
Charlton	62	0.6	0.60	6.0	B	2	Loose till, loamy textures	meso	loamy	no									
Paxton	66	0.6	0.00	0.2	C	3	Firm, platy, loamy till	meso	loamy	no									
Sutton	68	0.6	0.60	6.0	B	2	Loose till, loamy textures	meso	loamy	no									
Berkshire	72	0.6	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes									
Marlow	76	0.6	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes									
Peru	78	0.6	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes									
Thordike	84	0.6	0.60	2.0	C/D	4	Friable till, silty, schist &	frigid	loamy-skeletal	yes									
Hollis	86	0.6	0.60	6.0	C/D	4	Loose till, bedrock	meso	loamy	no									
Winnecook	88	0.6	0.60	2.0	C	4	Friable till, silty, schist &	frigid	loamy-skeletal	yes									
Chatfield	89	0.6	0.60	6.0	B	4	Loose till, bedrock	meso	loamy	no									
Hogback	91	2.0	2.00	6.0	C	4	Loose till, bedrock	frigid	loamy	yes									
Lyman	92	2.0	2.00	6.0	A/D	4	Loose till, bedrock	frigid	loamy	yes									
Woodstock	93	2.0	2.00	6.0	C/D	4	Loose till, bedrock	frigid	loamy	no									
Rawsonville	98	0.6	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes									
Tunbridge	99	0.6	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes									

Sorted by Numerical Legend

t B and C horizons

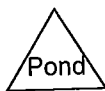
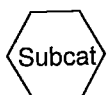
SSSNE Special pub no. 5

Soil Series	legend	Ksat low -	Ksat	Ksat	Ksat	Hyd.	Group	Land Form	Tem	Soil Textures	Spod
Ondawa	101	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no
Sunday	102	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottomland)	frigid	sandy	no
Winooski	103	0.6	6.0	0.60	6.0	B	3	Flood Plain (Bottom Land)	meso	silty	no
Podunk	104	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	frigid	loamy	no



E1

.14, 1.18, 2.39, 3.65



B&H OIL EX R0

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
84,615	55	Woods, Good, HSG B (E1)
14,585	70	Woods, Good, HSG C (E1)
99,200	57	TOTAL AREA

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
84,615	HSG B	E1
14,585	HSG C	E1
0	HSG D	
0	Other	
99,200		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchm Numbers
0	84,615	14,585	0	0	99,200	Woods, Good	E 1
0	84,615	14,585	0	0	99,200	TOTAL AREA	

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B & H Oil Hudson 24-hr S1 2-yr Rainfall=2.96"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E1: E1

Runoff Area=99,200 sf 0.00% Impervious Runoff Depth=0.23"
Flow Length=406' Tc=13.0 min CN=57 Runoff=0.14 cfs 1,936 cf

Total Runoff Area = 99,200 sf Runoff Volume = 1,936 cf Average Runoff Depth = 0.23"
100.00% Pervious = 99,200 sf 0.00% Impervious = 0 sf

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B & H Oil Hudson 24-hr S1 2-yr Rainfall=2.96"

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Summary for Subcatchment E1: E1

Runoff = 0.14 cfs @ 12.47 hrs, Volume= 1,936 cf, Depth= 0.23"

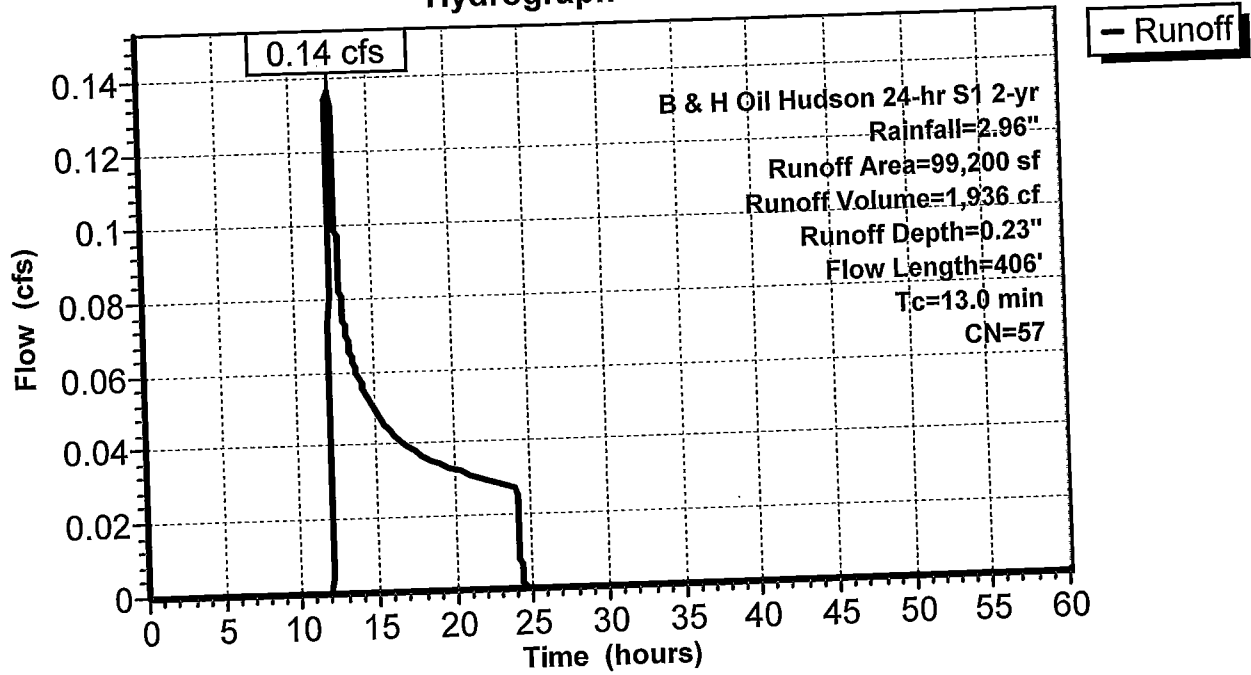
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 B & H Oil Hudson 24-hr S1 2-yr Rainfall=2.96"

Area (sf)	CN	Description
62,974	55	Woods, Good, HSG B
21,641	55	Woods, Good, HSG B
10,425	70	Woods, Good, HSG C
4,160	70	Woods, Good, HSG C
99,200	57	Weighted Average
99,200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	20	0.0720	0.20		Sheet Flow, 298.2-292.8 Grass: Short n= 0.150 P2= 2.96"
8.3	55	0.0720	0.11		Sheet Flow, 298.2-292.8 Woods: Light underbrush n= 0.400 P2= 2.96"
1.9	158	0.0790	1.41		Shallow Concentrated Flow, Travel to swale 292.8-280.3 Woodland Kv= 5.0 fps
1.1	173	0.0320	2.59	3.10	Parabolic Channel, 280.3-274.8 W=6.00' D=0.30' Area=1.2 sf Perim=6.0' n= 0.035 Earth, dense weeds
13.0	406	Total			

Subcatchment E1: E1

Hydrograph



B&H OIL EX R0

B & H Oil Hudson 24-hr S1 10-yr Rainfall=4.48"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E1: E1

Runoff Area=99,200 sf 0.00% Impervious Runoff Depth=0.84"

Flow Length=406' Tc=13.0 min CN=57 Runoff=1.18 cfs 6,940 cf

Total Runoff Area = 99,200 sf Runoff Volume = 6,940 cf Average Runoff Depth = 0.84"

100.00% Pervious = 99,200 sf 0.00% Impervious = 0 sf

Summary for Subcatchment E1: E1

Runoff = 1.18 cfs @ 12.16 hrs, Volume= 6,940 cf, Depth= 0.84"

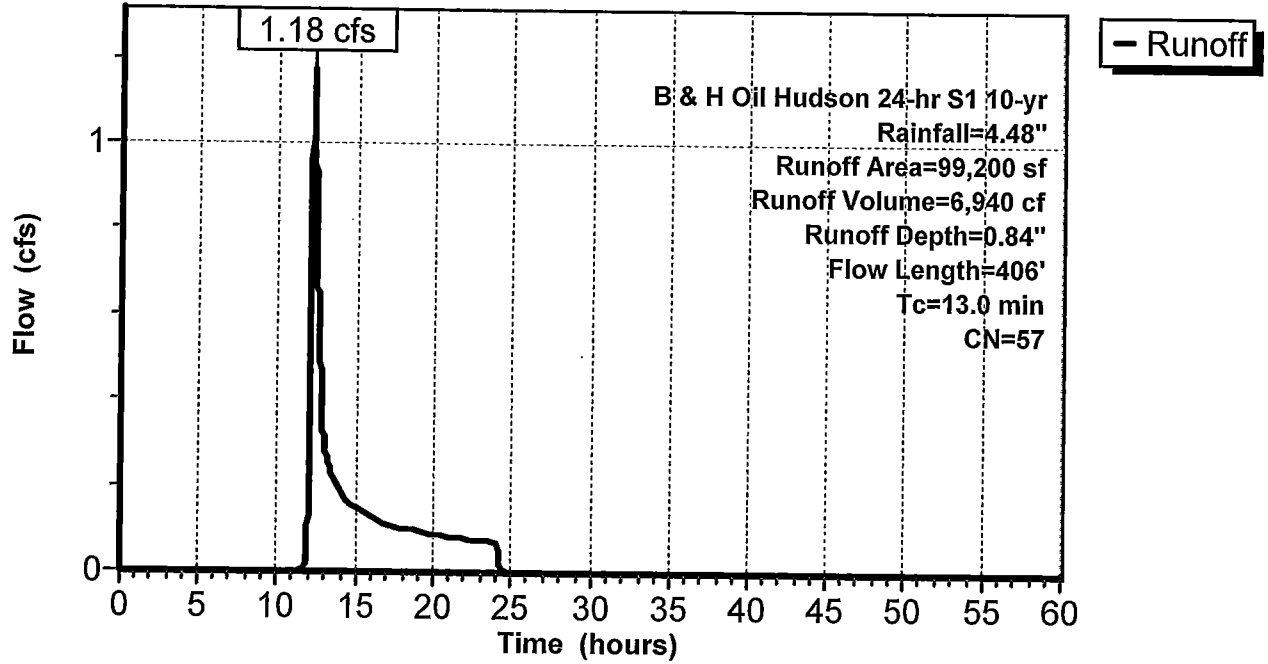
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 B & H Oil Hudson 24-hr S1 10-yr Rainfall=4.48"

Area (sf)	CN	Description
62,974	55	Woods, Good, HSG B
21,641	55	Woods, Good, HSG B
10,425	70	Woods, Good, HSG C
4,160	70	Woods, Good, HSG C
99,200	57	Weighted Average
99,200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	20	0.0720	0.20		Sheet Flow, 298.2-292.8 Grass: Short n= 0.150 P2= 2.96"
8.3	55	0.0720	0.11		Sheet Flow, 298.2-292.8 Woods: Light underbrush n= 0.400 P2= 2.96"
1.9	158	0.0790	1.41		Shallow Concentrated Flow, Travel to swale 292.8-280.3 Woodland Kv= 5.0 fps
1.1	173	0.0320	2.59	3.10	Parabolic Channel, 280.3-274.8 W=6.00' D=0.30' Area=1.2 sf Perim=6.0' n= 0.035 Earth, dense weeds
13.0	406	Total			

Subcatchment E1: E1

Hydrograph



B&H OIL EX R0

B & H Oil Hudson 24-hr S1 25-yr Rainfall=5.68"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E1: E1

Runoff Area=99,200 sf 0.00% Impervious Runoff Depth=1.49"
Flow Length=406' Tc=13.0 min .CN=57 Runoff=2.38 cfs 12,278 cf

Total Runoff Area = 99,200 sf Runoff Volume = 12,278 cf Average Runoff Depth = 1.49"
100.00% Pervious = 99,200 sf 0.00% Impervious = 0 sf

Summary for Subcatchment E1: E1

Runoff = 2.38 cfs @ 12.15 hrs, Volume= 12,278 cf, Depth= 1.49"

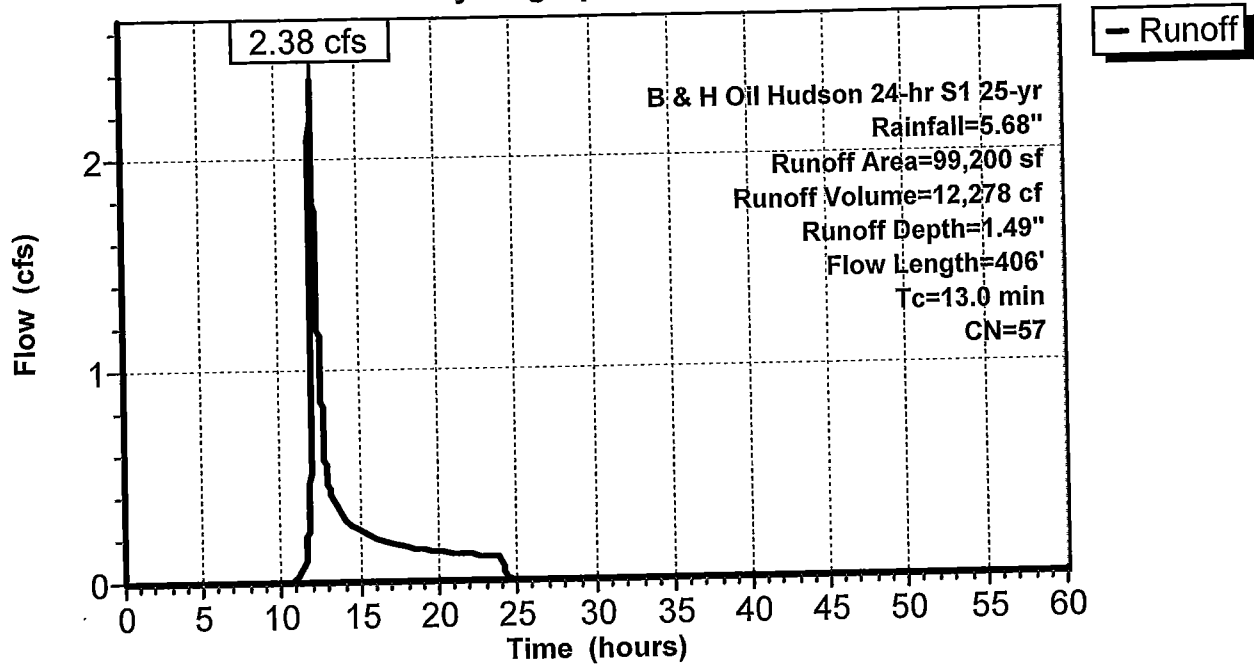
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 B & H Oil Hudson 24-hr S1 25-yr Rainfall=5.68"

Area (sf)	CN	Description
62,974	55	Woods, Good, HSG B
21,641	55	Woods, Good, HSG B
10,425	70	Woods, Good, HSG C
4,160	70	Woods, Good, HSG C
99,200	57	Weighted Average
99,200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	20	0.0720	0.20		Sheet Flow, 298.2-292.8 Grass: Short n= 0.150 P2= 2.96"
8.3	55	0.0720	0.11		Sheet Flow, 298.2-292.8 Woods: Light underbrush n= 0.400 P2= 2.96"
1.9	158	0.0790	1.41		Shallow Concentrated Flow, Travel to swale 292.8-280.3 Woodland Kv= 5.0 fps
1.1	173	0.0320	2.59	3.10	Parabolic Channel, 280.3-274.8 W=6.00' D=0.30' Area=1.2 sf Perim=6.0' n= 0.035 Earth, dense weeds
13.0	406	Total			

Subcatchment E1: E1

Hydrograph



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B & H Oil Hudson 24-hr S1 50-yr Rainfall=6.79"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E1: E1

Runoff Area=99,200 sf 0.00% Impervious Runoff Depth=2.17"
Flow Length=406' Tc=13.0 min CN=57 Runoff=3.65 cfs 17,978 cf

Total Runoff Area = 99,200 sf Runoff Volume = 17,978 cf Average Runoff Depth = 2.17"
100.00% Pervious = 99,200 sf 0.00% Impervious = 0 sf

Summary for Subcatchment E1: E1

Runoff = 3.65 cfs @ 12.14 hrs, Volume= 17,978 cf, Depth= 2.17"

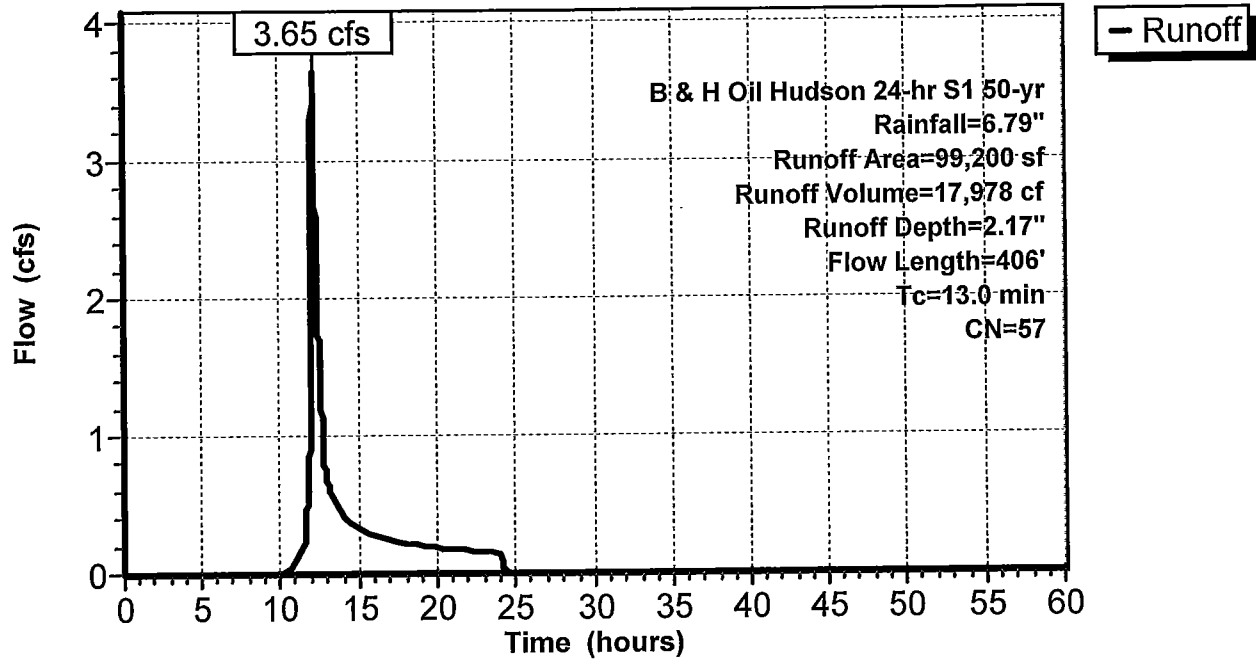
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 B & H Oil Hudson 24-hr S1 50-yr Rainfall=6.79"

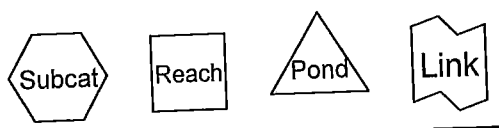
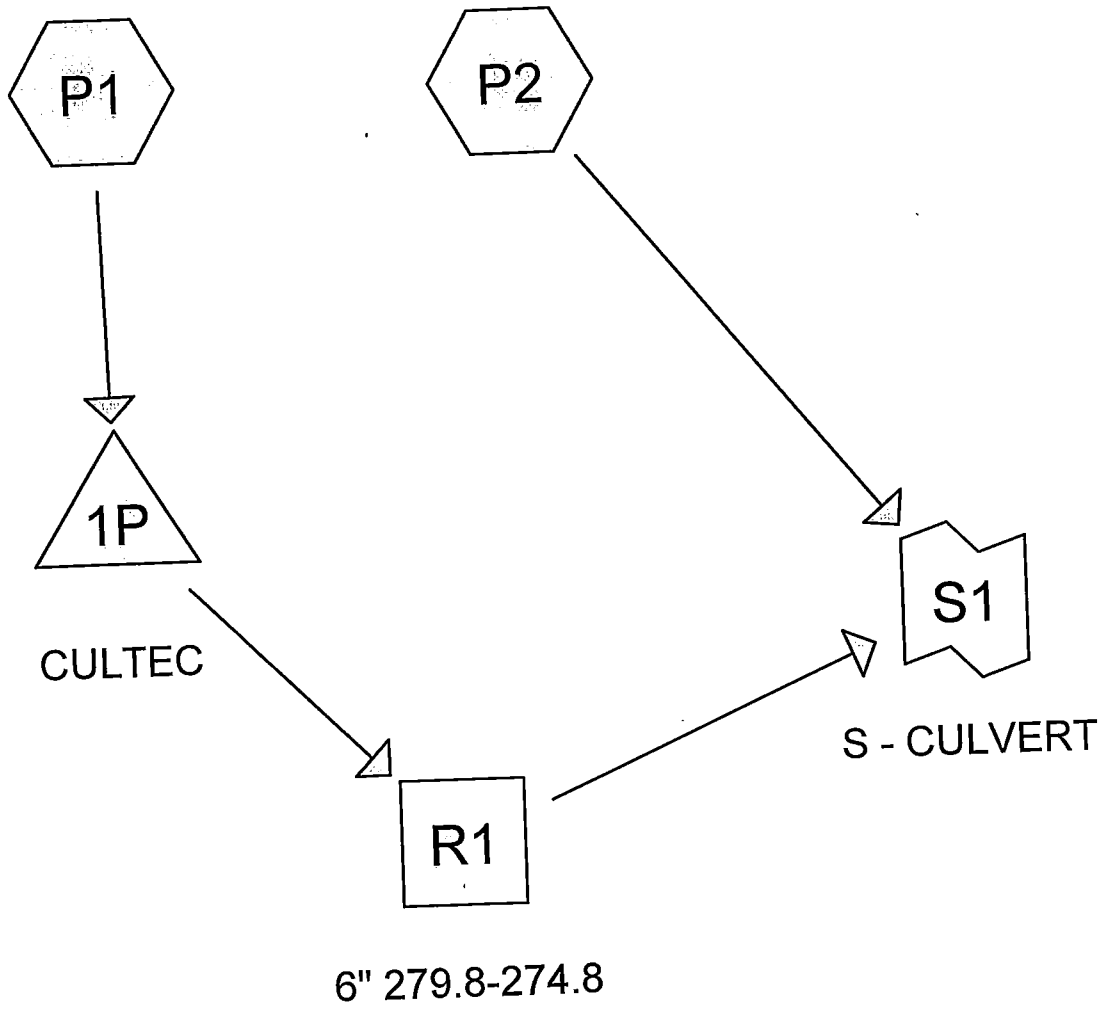
Area (sf)	CN	Description
62,974	55	Woods, Good, HSG B
21,641	55	Woods, Good, HSG B
10,425	70	Woods, Good, HSG C
4,160	70	Woods, Good, HSG C
99,200	57	Weighted Average
99,200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	20	0.0720	0.20		Sheet Flow, 298.2-292.8 Grass: Short n= 0.150 P2= 2.96"
8.3	55	0.0720	0.11		Sheet Flow, 298.2-292.8 Woods: Light underbrush n= 0.400 P2= 2.96"
1.9	158	0.0790	1.41		Shallow Concentrated Flow, Travel to swale 292.8-280.3 Woodland Kv= 5.0 fps
1.1	173	0.0320	2.59	3.10	Parabolic Channel, 280.3-274.8 W=6.00' D=0.30' Area=1.2 sf Perim=6.0' n= 0.035 Earth, dense weeds
13.0	406	Total			

Subcatchment E1: E1

Hydrograph





Routing Diagram for B&H OIL PROP R0
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B&H OIL PROP R0

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
14,224	61	>75% Grass cover, Good, HSG B (P1, P2)
35,664	98	Paved parking, HSG B (P1)
34,747	55	Woods, Good, HSG B (P1, P2)
14,585	70	Woods, Good, HSG C (P2)
99,220	74	TOTAL AREA

B&H OIL PROP R0

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
84,635	HSG B	P1, P2
14,585	HSG C	P2
0	HSG D	
0	Other	
99,220		TOTAL AREA

B&H OIL PROP R0

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	14,224	0	0	0	14,224	>75% Grass cover, Good
0	35,664	0	0	0	35,664	Paved parking
0	34,747	14,585	0	0	49,332	Woods, Good
0	84,635	14,585	0	0	99,220	TOTAL AREA

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	288.93	279.80	70.0	0.1304	0.011	6.0	0.0	0.0

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B & H Oil Hudson 24-hr S1 2-yr Rainfall=2.96"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P1: Runoff Area=44,276 sf 80.55% Impervious Runoff Depth=2.03"
Tc=6.0 min CN=91 Runoff=2.57 cfs 7,505 cf

Subcatchment P2: Runoff Area=54,944 sf 0.00% Impervious Runoff Depth=0.32"
Flow Length=163' Tc=12.1 min CN=60 Runoff=0.15 cfs 1,461 cf

Reach R1: 6" 279.8-274.8 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf
n=0.040 L=140.0' S=0.0357 '/ Capacity=9.60 cfs Outflow=0.00 cfs 0 cf

Pond 1P: CULTEC Peak Elev=287.75' Storage=4,592 cf Inflow=2.57 cfs 7,505 cf
Discarded=0.05 cfs 7,505 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 7,505 cf

Link S1: S - CULVERT Inflow=0.15 cfs 1,461 cf
Primary=0.15 cfs 1,461 cf

Total Runoff Area = 99,220 sf Runoff Volume = 8,965 cf Average Runoff Depth = 1.08"
64.06% Pervious = 63,556 sf 35.94% Impervious = 35,664 sf

B&H OIL PROP R0

B & H Oil Hudson 24-hr S1 2-yr Rainfall=2.96"

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Summary for Subcatchment P1:

Runoff = 2.57 cfs @ 12.04 hrs, Volume= 7,505 cf, Depth= 2.03"

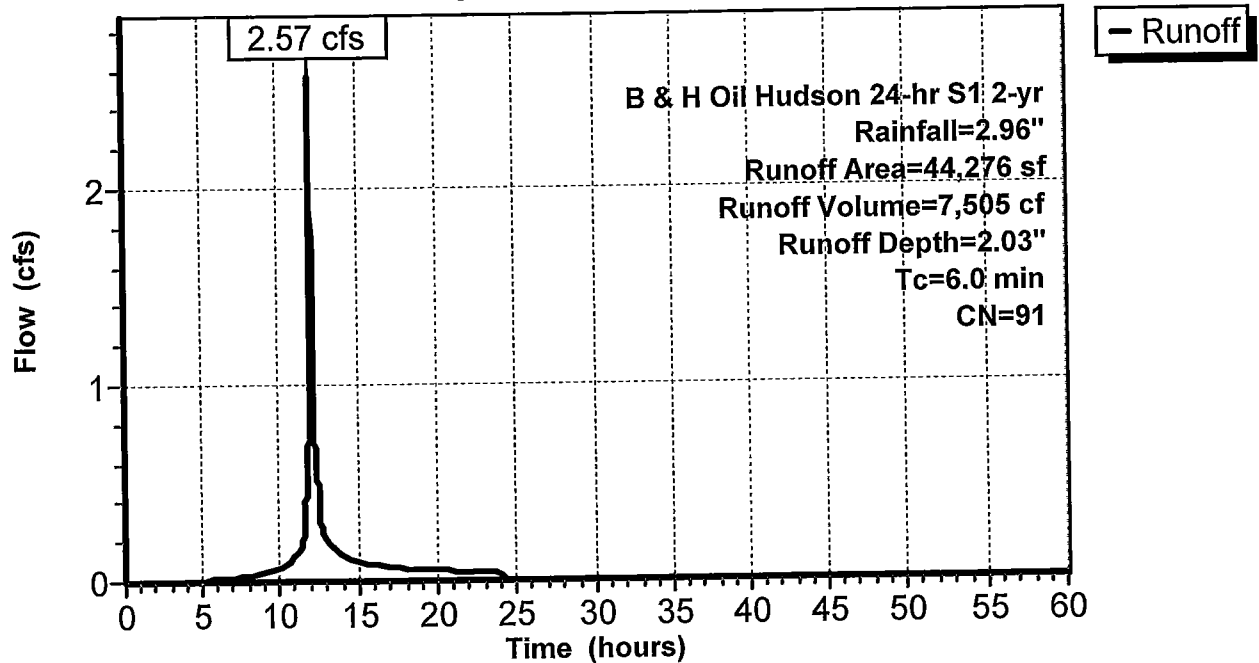
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 B & H Oil Hudson 24-hr S1 2-yr Rainfall=2.96"

Area (sf)	CN	Description
35,664	98	Paved parking, HSG B
6,619	61	>75% Grass cover, Good, HSG B
1,993	55	Woods, Good, HSG B
44,276	91	Weighted Average
8,612		19.45% Pervious Area
35,664		80.55% Impervious Area

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

Subcatchment P1:

Hydrograph



Summary for Subcatchment P2:

Runoff = 0.15 cfs @ 12.22 hrs, Volume= 1,461 cf, Depth= 0.32"

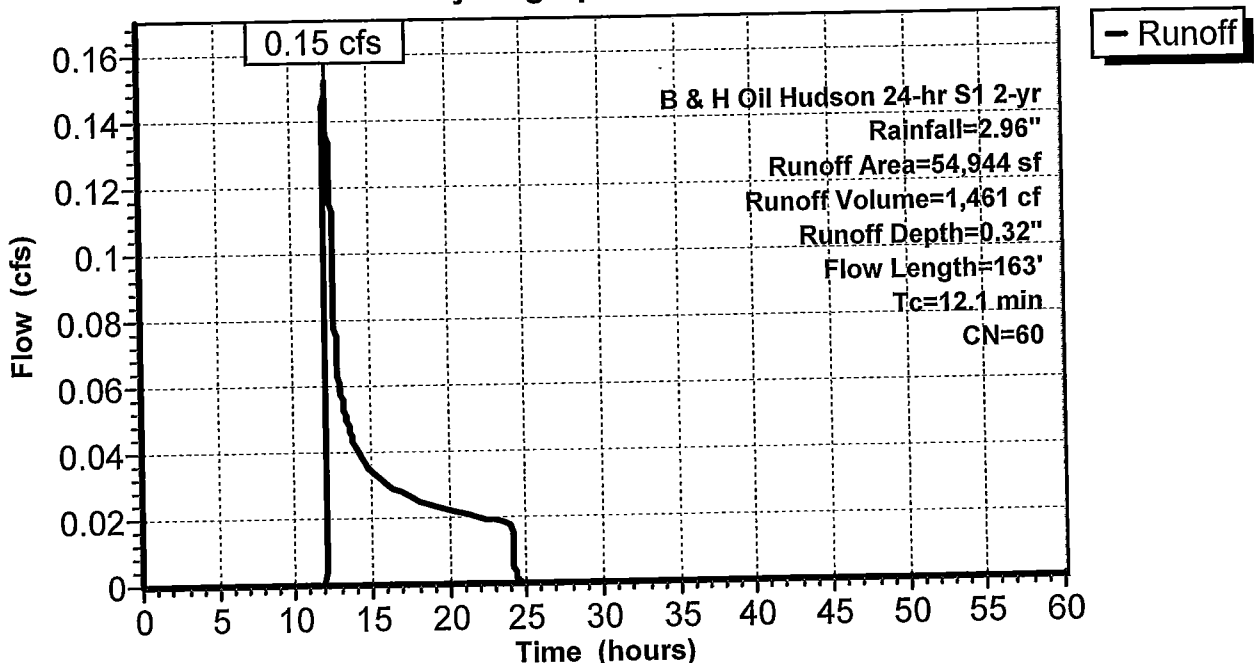
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 B & H Oil Hudson 24-hr S1 2-yr Rainfall=2.96"

Area (sf)	CN	Description
7,605	61	>75% Grass cover, Good, HSG B
32,754	55	Woods, Good, HSG B
10,425	70	Woods, Good, HSG C
4,160	70	Woods, Good, HSG C
54,944	60	Weighted Average
54,944		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	32	0.3300	0.40		Sheet Flow, Grass: Short n= 0.150 P2= 2.96"
9.1	43	0.0350	0.08		Sheet Flow, 279-277.5 Woods: Light underbrush n= 0.400 P2= 2.96"
1.7	88	0.0307	0.88		Shallow Concentrated Flow, 277.5-274.8 Woodland Kv= 5.0 fps
12.1	163	Total			

Subcatchment P2:

Hydrograph



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B & H Oil Hudson 24-hr S1 2-yr Rainfall=2.96"

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Summary for Reach R1: 6" 279.8-274.8

Inflow Area = 44,276 sf, 80.55% Impervious, Inflow Depth = 0.00" for 2-yr event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 0.30' Flow Area= 4.0 sf, Capacity= 9.60 cfs

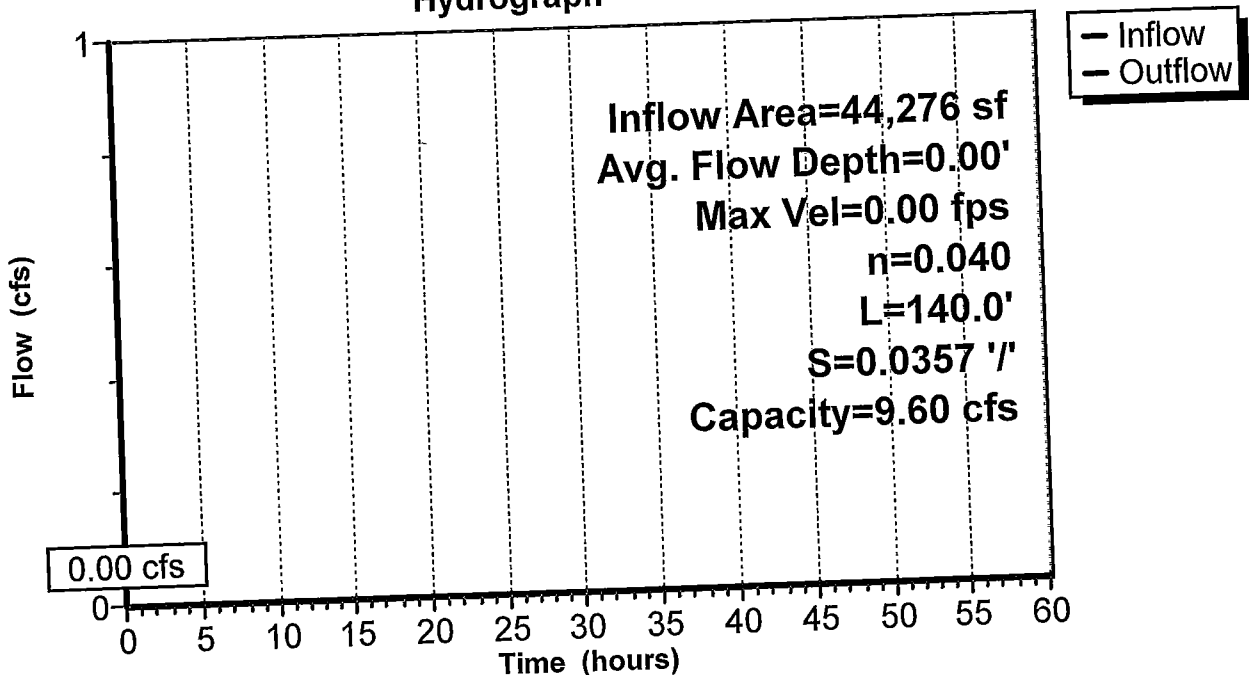
20.00' x 0.30' deep Parabolic Channel, n= 0.040
 Length= 140.0' Slope= 0.0357 '/'
 Inlet Invert= 279.80', Outlet Invert= 274.80'



‡

Reach R1: 6" 279.8-274.8

Hydrograph



B&H OIL PROP R0

B & H Oil Hudson 24-hr S1 2-yr Rainfall=2.96"

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Summary for Pond 1P: CULTEC

Inflow Area = 44,276 sf, 80.55% Impervious, Inflow Depth = 2.03" for 2-yr event
 Inflow = 2.57 cfs @ 12.04 hrs, Volume= 7,505 cf
 Outflow = 0.05 cfs @ 9.90 hrs, Volume= 7,505 cf, Atten= 98%, Lag= 0.0 min
 Discarded = 0.05 cfs @ 9.90 hrs, Volume= 7,505 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 287.75' @ 19.52 hrs Surf.Area= 2,263 sf Storage= 4,592 cf

Plug-Flow detention time= 850.0 min calculated for 7,505 cf (100% of inflow)
 Center-of-Mass det. time= 849.9 min (1,669.6 - 819.7)

Volume	Invert	Avail. Storage	Storage Description
#1	284.98'	4,235 cf	Cultec R-902HD x 65 Inside #2 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 5 Rows of 13 Chambers Cap Storage= +2.8 cf x 2 x 5 rows = 27.6 cf
#2	284.98'	4,643 cf	39.50"W x 57.30"L x 7.00'H PrismaToid 15,843 cf Overall - 4,235 cf Embedded = 11,608 cf x 40.0% Voids
		8,879 cf	Total Available Storage

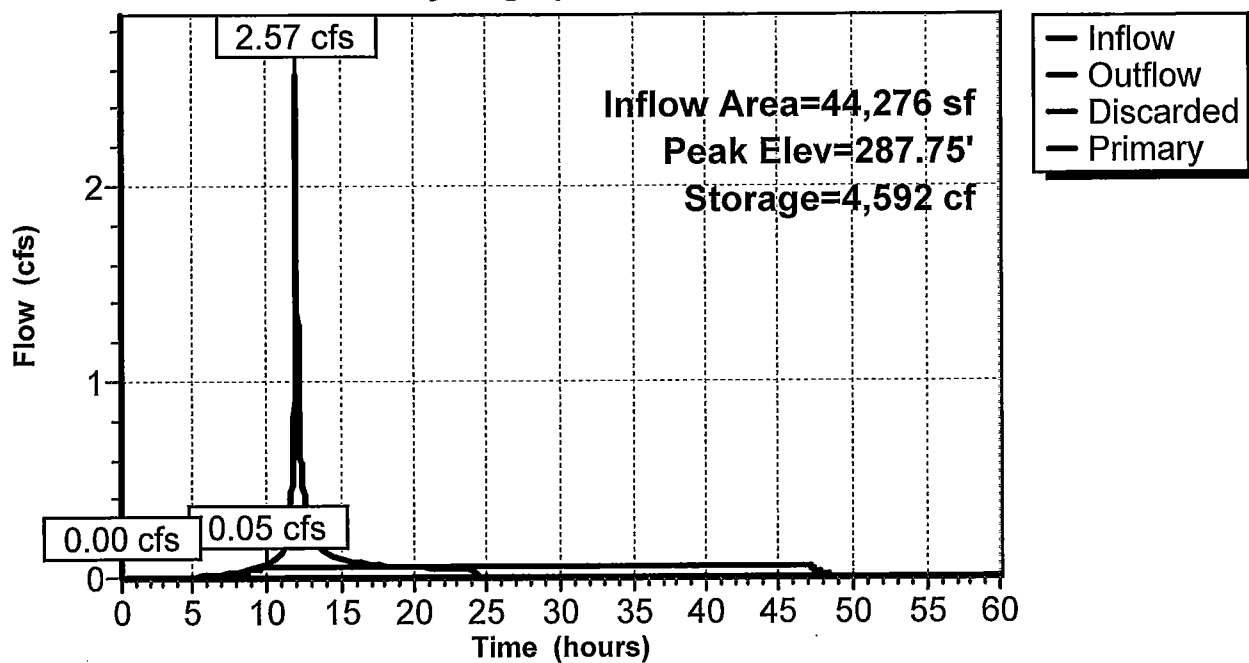
Device	Routing	Invert	Outlet Devices
#1	Discarded	284.98'	1.000 in/hr Exfiltration over Surface area
#2	Primary	288.93'	6.0" Round Culvert L= 70.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 288.93' / 279.80' S= 0.1304 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Discarded OutFlow Max=0.05 cfs @ 9.90 hrs HW=285.05' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=284.98' (Free Discharge)
 ↑2=Culvert (Controls 0.00 cfs)

Pond 1P: CULTEC

Hydrograph



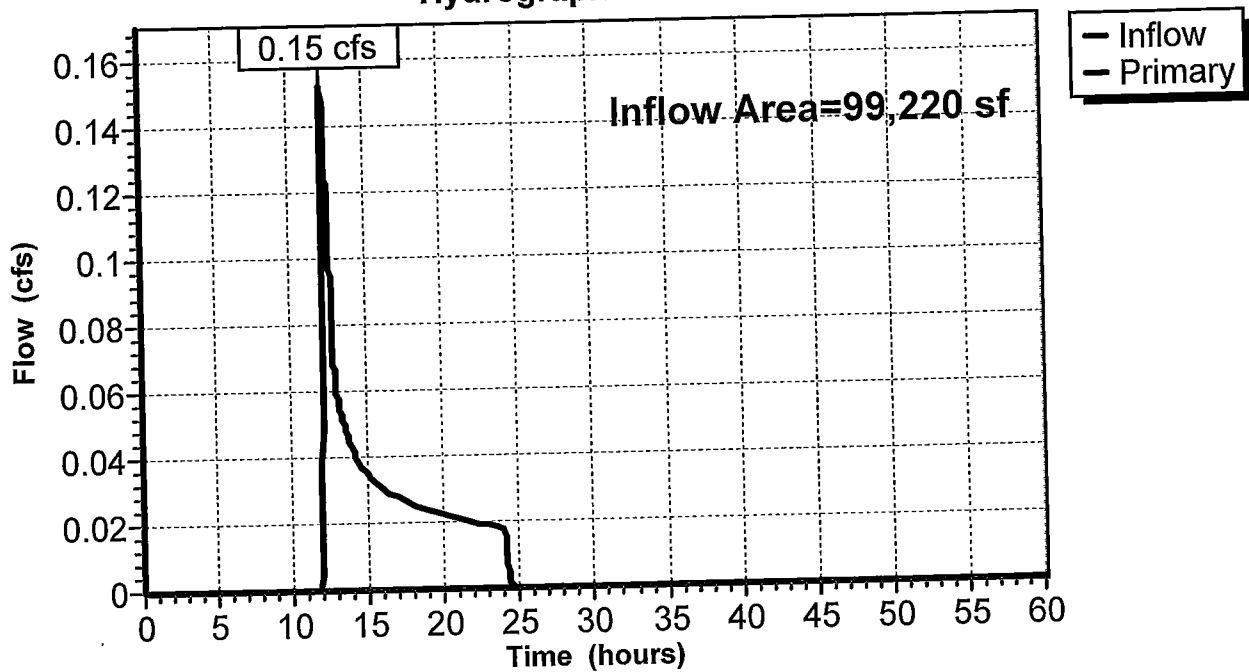
Summary for Link S1: S - CULVERT

Inflow Area = 99,220 sf, 35.94% Impervious, Inflow Depth = 0.18" for 2-yr event
Inflow = 0.15 cfs @ 12.22 hrs, Volume= 1,461 cf
Primary = 0.15 cfs @ 12.22 hrs, Volume= 1,461 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link S1: S - CULVERT

Hydrograph



B&H OIL PROP R0*B & H Oil Hudson 24-hr S1 10-yr Rainfall=4.48"*

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P1: Runoff Area=44,276 sf 80.55% Impervious Runoff Depth=3.48"
Tc=6.0 min CN=91 Runoff=3.92 cfs 12,835 cf

Subcatchment P2: Runoff Area=54,944 sf 0.00% Impervious Runoff Depth=1.01"
Flow Length=163' Tc=12.1 min CN=60 Runoff=0.90 cfs 4,620 cf

Reach R1: 6" 279.8-274.8 Avg. Flow Depth=0.06' Max Vel=0.85 fps Inflow=0.32 cfs 3,199 cf
n=0.040 L=140.0' S=0.0357 '/' Capacity=9.60 cfs Outflow=0.32 cfs 3,199 cf

Pond 1P: CULTEC Peak Elev=289.30' Storage=6,454 cf Inflow=3.92 cfs 12,835 cf
Discarded=0.05 cfs 9,636 cf Primary=0.32 cfs 3,199 cf Outflow=0.38 cfs 12,835 cf

Link S1: S - CULVERT Inflow=0.90 cfs 7,819 cf
Primary=0.90 cfs 7,819 cf

Total Runoff Area = 99,220 sf Runoff Volume = 17,455 cf Average Runoff Depth = 2.11"
64.06% Pervious = 63,556 sf 35.94% Impervious = 35,664 sf

B&H OIL PROP R0

B & H Oil Hudson 24-hr S1 10-yr Rainfall=4.48"

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Summary for Subcatchment P1:

Runoff = 3.92 cfs @ 12.04 hrs, Volume= 12,835 cf, Depth= 3.48"

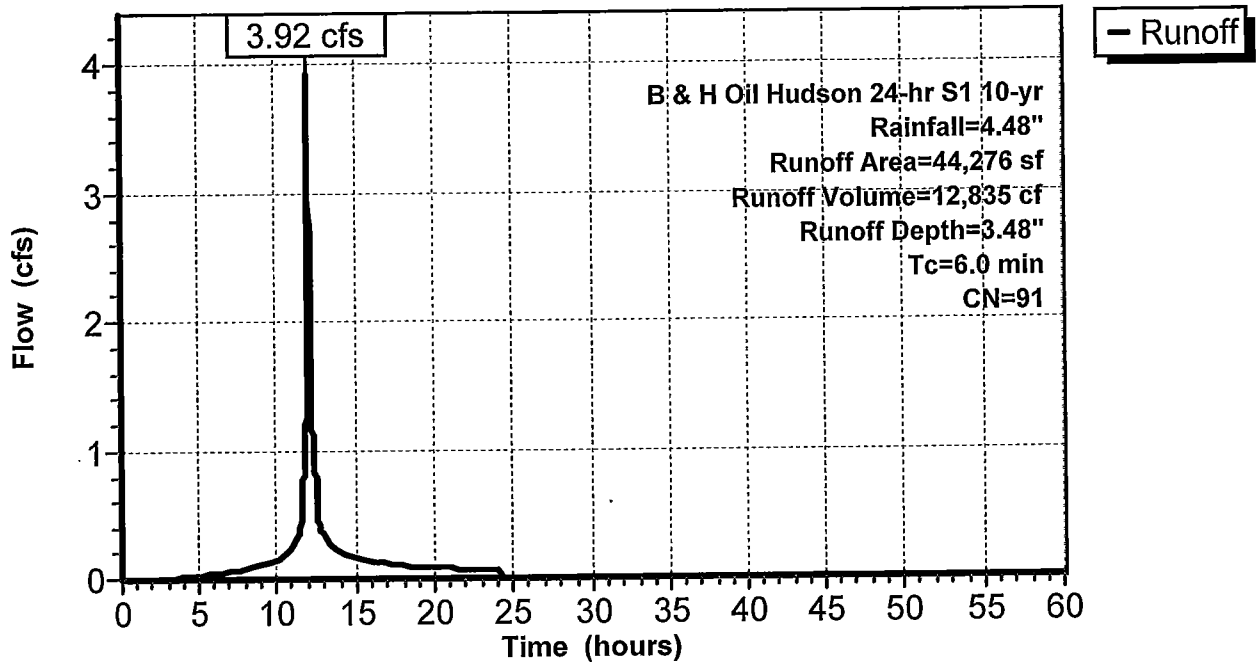
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 B & H Oil Hudson 24-hr S1 10-yr Rainfall=4.48"

Area (sf)	CN	Description
35,664	98	Paved parking, HSG B
6,619	61	>75% Grass cover, Good, HSG B
1,993	55	Woods, Good, HSG B
44,276	91	Weighted Average
8,612		19.45% Pervious Area
35,664		80.55% Impervious Area

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

Subcatchment P1:

Hydrograph



B&H OIL PROP R0

B & H Oil Hudson 24-hr S1 10-yr Rainfall=4.48"

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Summary for Subcatchment P2:

Runoff = 0.90 cfs @ 12.14 hrs, Volume= 4,620 cf, Depth= 1.01"

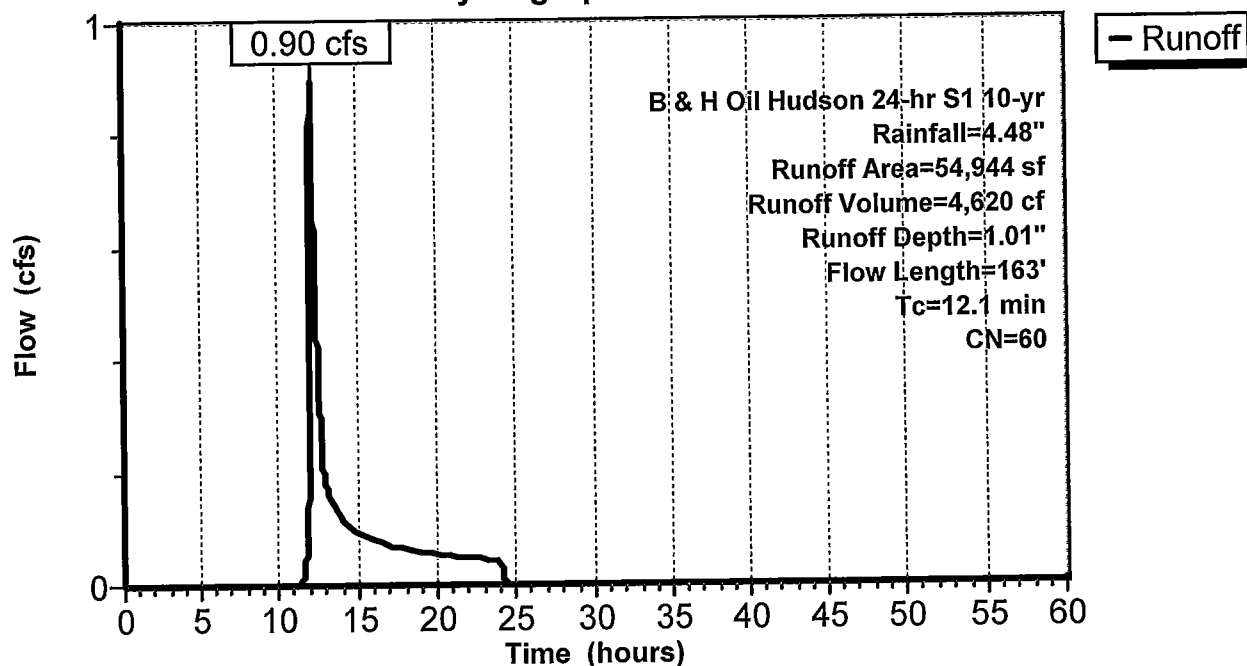
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 B & H Oil Hudson 24-hr S1 10-yr Rainfall=4.48"

Area (sf)	CN	Description
7,605	61	>75% Grass cover, Good, HSG B
32,754	55	Woods, Good, HSG B
10,425	70	Woods, Good, HSG C
4,160	70	Woods, Good, HSG C
54,944	60	Weighted Average
54,944		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	32	0.3300	0.40		Sheet Flow, Grass: Short n= 0.150 P2= 2.96"
9.1	43	0.0350	0.08		Sheet Flow, 279-277.5 Woods: Light underbrush n= 0.400 P2= 2.96"
1.7	88	0.0307	0.88		Shallow Concentrated Flow, 277.5-274.8 Woodland Kv= 5.0 fps
12.1	163	Total			

Subcatchment P2:

Hydrograph



Summary for Reach R1: 6" 279.8-274.8

[79] Warning: Submerged Pond 1P Primary device # 2 OUTLET by 0.06'

Inflow Area =	44,276 sf, 80.55% Impervious,	Inflow Depth =	0.87" for 10-yr event
Inflow =	0.32 cfs @ 12.83 hrs, Volume=		3,199 cf
Outflow =	0.32 cfs @ 12.91 hrs, Volume=		3,199 cf, Atten= 0%, Lag= 5.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Max. Velocity= 0.85 fps, Min. Travel Time= 2.8 min
 Avg. Velocity = 0.45 fps, Avg. Travel Time= 5.2 min

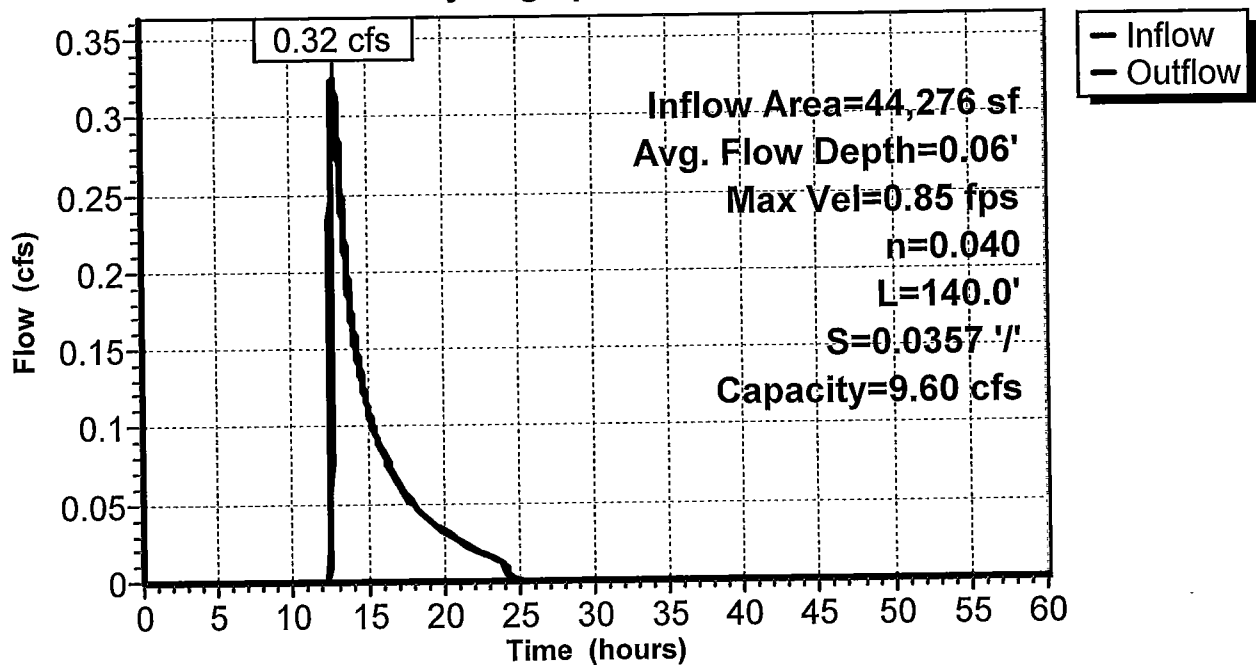
Peak Storage= 54 cf @ 12.87 hrs
 Average Depth at Peak Storage= 0.06'
 Bank-Full Depth= 0.30' Flow Area= 4.0 sf, Capacity= 9.60 cfs

20.00' x 0.30' deep Parabolic Channel, n= 0.040
 Length= 140.0' Slope= 0.0357 '/'
 Inlet Invert= 279.80', Outlet Invert= 274.80'



Reach R1: 6" 279.8-274.8

Hydrograph



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B & H Oil Hudson 24-hr S1 10-yr Rainfall=4.48"

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Summary for Pond 1P: CULTEC

Inflow Area = 44,276 sf, 80.55% Impervious, Inflow Depth = 3.48" for 10-yr event
 Inflow = 3.92 cfs @ 12.04 hrs, Volume= 12,835 cf
 Outflow = 0.38 cfs @ 12.83 hrs, Volume= 12,835 cf, Atten= 90%, Lag= 47.6 min
 Discarded = 0.05 cfs @ 7.60 hrs, Volume= 9,636 cf
 Primary = 0.32 cfs @ 12.83 hrs, Volume= 3,199 cf

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 289.30' @ 12.83 hrs Surf.Area= 2,263 sf Storage= 6,454 cf

Plug-Flow detention time= 836.4 min calculated for 12,833 cf (100% of inflow)
 Center-of-Mass det. time= 836.6 min (1,638.3 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1	284.98'	4,235 cf	Cultec R-902HD x 65 Inside #2 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 5 Rows of 13 Chambers Cap Storage= +2.8 cf x 2 x 5 rows = 27.6 cf
#2	284.98'	4,643 cf	39.50'W x 57.30'L x 7.00'H Prismatic 15,843 cf Overall - 4,235 cf Embedded = 11,608 cf x 40.0% Voids
		8,879 cf	Total Available Storage

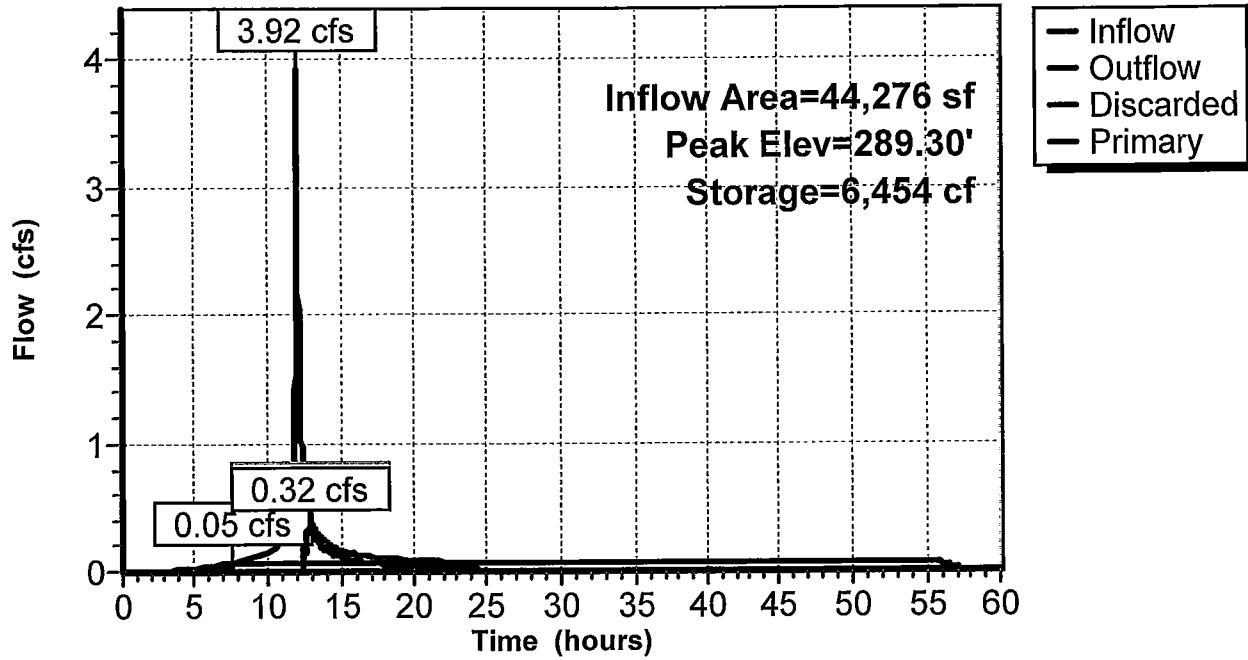
Device	Routing	Invert	Outlet Devices
#1	Discarded	284.98'	1.000 in/hr Exfiltration over Surface area
#2	Primary	288.93'	6.0" Round Culvert L= 70.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 288.93' / 279.80' S= 0.1304 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Discarded OutFlow Max=0.05 cfs @ 7.60 hrs HW=285.05' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.32 cfs @ 12.83 hrs HW=289.30' (Free Discharge)
 ↑2=Culvert (Inlet Controls 0.32 cfs @ 2.08 fps)

Pond 1P: CULTEC

Hydrograph



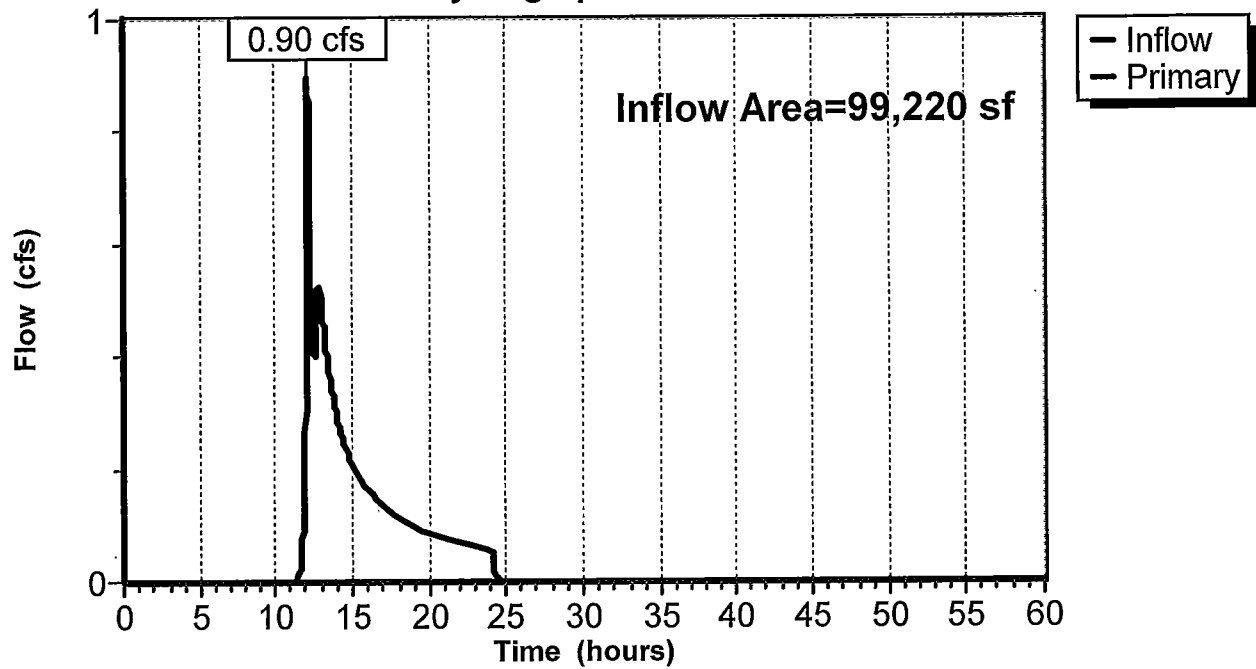
Summary for Link S1: S - CULVERT

Inflow Area = 99,220 sf, 35.94% Impervious, Inflow Depth = 0.95" for 10-yr event
Inflow = 0.90 cfs @ 12.14 hrs, Volume= 7,819 cf
Primary = 0.90 cfs @ 12.14 hrs, Volume= 7,819 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link S1: S - CULVERT

Hydrograph



B&H OIL PROP R0

B & H Oil Hudson 24-hr S1 25-yr Rainfall=5.68"

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P1: Runoff Area=44,276 sf 80.55% Impervious Runoff Depth=4.64"
Tc=6.0 min CN=91 Runoff=4.92 cfs 17,136 cf

Subcatchment P2: Runoff Area=54,944 sf 0.00% Impervious Runoff Depth=1.72"
Flow Length=163' Tc=12.1 min CN=60 Runoff=1.64 cfs 7,855 cf

Reach R1: 6" 279.8-274.8 Avg. Flow Depth=0.11' Max Vel=1.20 fps Inflow=1.02 cfs 7,251 cf
n=0.040 L=140.0' S=0.0357 '/' Capacity=9.60 cfs Outflow=1.02 cfs 7,251 cf

Pond 1P: CULTEC Peak Elev=290.35' Storage=7,402 cf Inflow=4.92 cfs 17,136 cf
Discarded=0.05 cfs 9,884 cf Primary=1.02 cfs 7,251 cf Outflow=1.07 cfs 17,136 cf

Link S1: S - CULVERT Inflow=2.01 cfs 15,106 cf
Primary=2.01 cfs 15,106 cf

Total Runoff Area = 99,220 sf Runoff Volume = 24,991 cf Average Runoff Depth = 3.02"
64.06% Pervious = 63,556 sf 35.94% Impervious = 35,664 sf

Summary for Subcatchment P1:

Runoff = 4.92 cfs @ 12.04 hrs, Volume= 17,136 cf, Depth= 4.64"

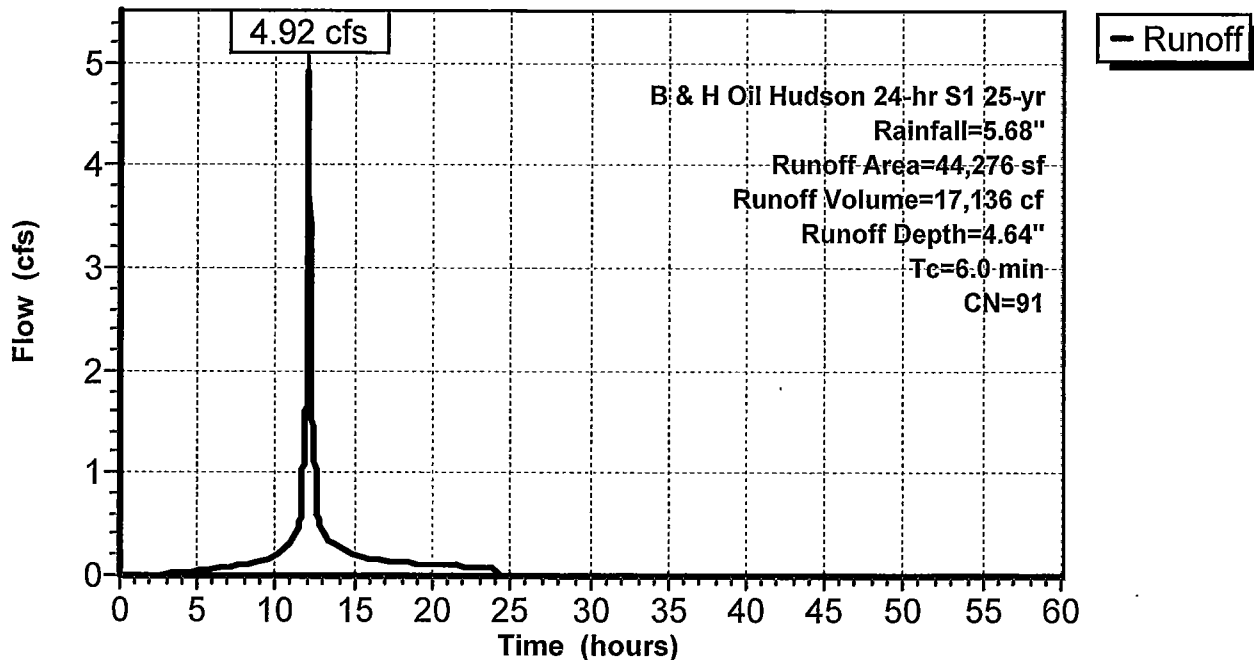
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 B & H Oil Hudson 24-hr S1 25-yr Rainfall=5.68"

Area (sf)	CN	Description
35,664	98	Paved parking, HSG B
6,619	61	>75% Grass cover, Good, HSG B
1,993	55	Woods, Good, HSG B
44,276	91	Weighted Average
8,612		19.45% Pervious Area
35,664		80.55% Impervious Area

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

Subcatchment P1:

Hydrograph



B&H OIL PROP R0

B & H Oil Hudson 24-hr S1 25-yr Rainfall=5.68"

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Summary for Subcatchment P2:

Runoff = 1.64 cfs @ 12.13 hrs, Volume= 7,855 cf, Depth= 1.72"

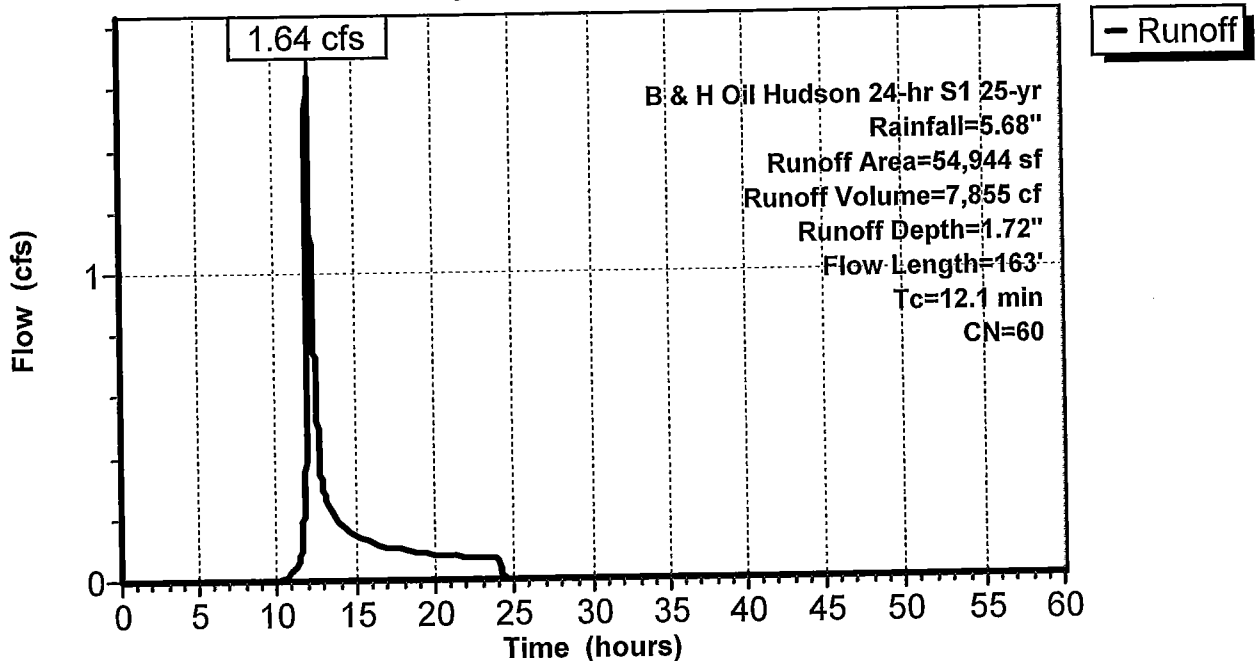
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 B & H Oil Hudson 24-hr S1 25-yr Rainfall=5.68"

Area (sf)	CN	Description
7,605	61	>75% Grass cover, Good, HSG B
32,754	55	Woods, Good, HSG B
10,425	70	Woods, Good, HSG C
4,160	70	Woods, Good, HSG C
54,944	60	Weighted Average
54,944		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	32	0.3300	0.40		Sheet Flow, Grass: Short n= 0.150 P2= 2.96"
9.1	43	0.0350	0.08		Sheet Flow, 279-277.5 Woods: Light underbrush n= 0.400 P2= 2.96"
1.7	88	0.0307	0.88		Shallow Concentrated Flow, 277.5-274.8 Woodland Kv= 5.0 fps
12.1	163	Total			

Subcatchment P2:

Hydrograph



Summary for Reach R1: 6" 279.8-274.8

[79] Warning: Submerged Pond 1P Primary device # 2 OUTLET by 0.11'

Inflow Area = 44,276 sf, 80.55% Impervious, Inflow Depth = 1.97" for 25-yr event
 Inflow = 1.02 cfs @ 12.48 hrs, Volume= 7,251 cf
 Outflow = 1.02 cfs @ 12.54 hrs, Volume= 7,251 cf, Atten= 0%, Lag= 3.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.20 fps, Min. Travel Time= 1.9 min
 Avg. Velocity = 0.55 fps, Avg. Travel Time= 4.3 min

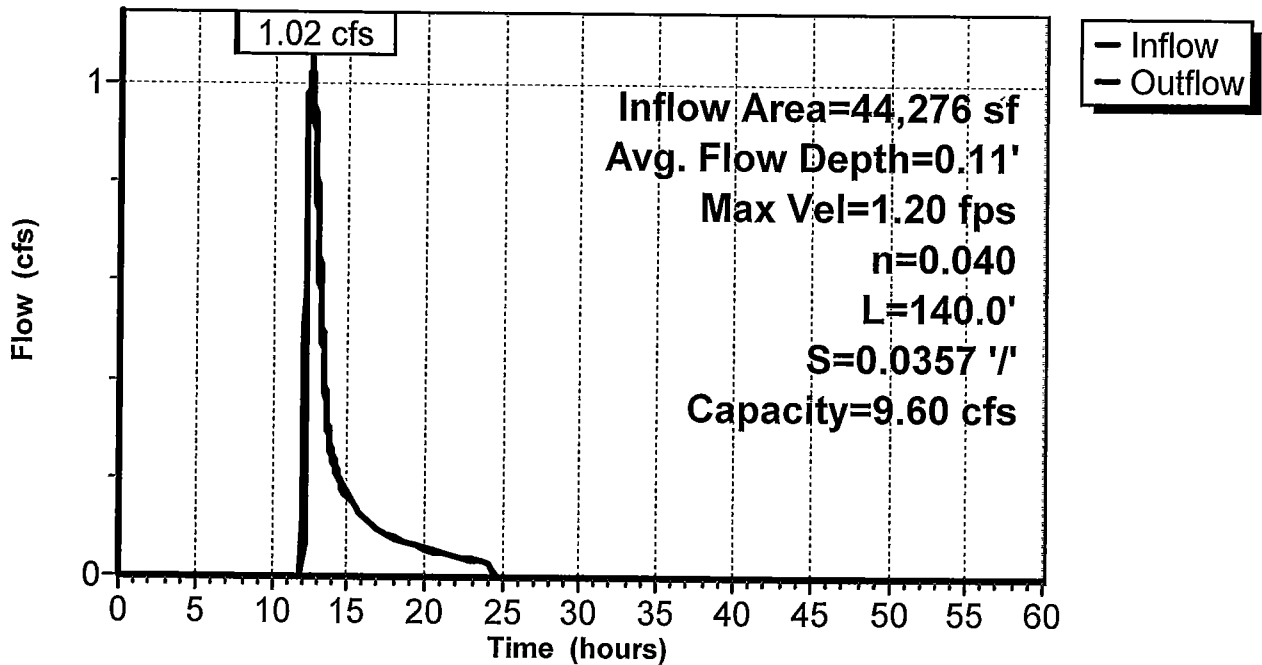
Peak Storage= 119 cf @ 12.50 hrs
 Average Depth at Peak Storage= 0.11'
 Bank-Full Depth= 0.30' Flow Area= 4.0 sf, Capacity= 9.60 cfs

20.00' x 0.30' deep Parabolic Channel, n= 0.040
 Length= 140.0' Slope= 0.0357 '/
 Inlet Invert= 279.80', Outlet Invert= 274.80'



Reach R1: 6" 279.8-274.8

Hydrograph



B&H OIL PROP R0*B & H Oil Hudson 24-hr S1 25-yr Rainfall=5.68"*

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Summary for Pond 1P: CULTEC

Inflow Area = 44,276 sf, 80.55% Impervious, Inflow Depth = 4.64" for 25-yr event
 Inflow = 4.92 cfs @ 12.04 hrs, Volume= 17,136 cf
 Outflow = 1.07 cfs @ 12.48 hrs, Volume= 17,136 cf, Atten= 78%, Lag= 26.7 min
 Discarded = 0.05 cfs @ 6.11 hrs, Volume= 9,884 cf
 Primary = 1.02 cfs @ 12.48 hrs, Volume= 7,251 cf

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 290.35' @ 12.48 hrs Surf.Area= 2,263 sf Storage= 7,402 cf

Plug-Flow detention time= 644.8 min calculated for 17,133 cf (100% of inflow)
 Center-of-Mass det. time= 645.1 min (1,437.2 - 792.2)

Volume	Invert	Avail.Storage	Storage Description
#1	284.98'	4,235 cf	Cultec R-902HD x 65 Inside #2 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 5 Rows of 13 Chambers Cap Storage= +2.8 cf x 2 x 5 rows = 27.6 cf
#2	284.98'	4,643 cf	39.50'W x 57.30'L x 7.00'H Prismaoid 15,843 cf Overall - 4,235 cf Embedded = 11,608 cf x 40.0% Voids
		8,879 cf	Total Available Storage

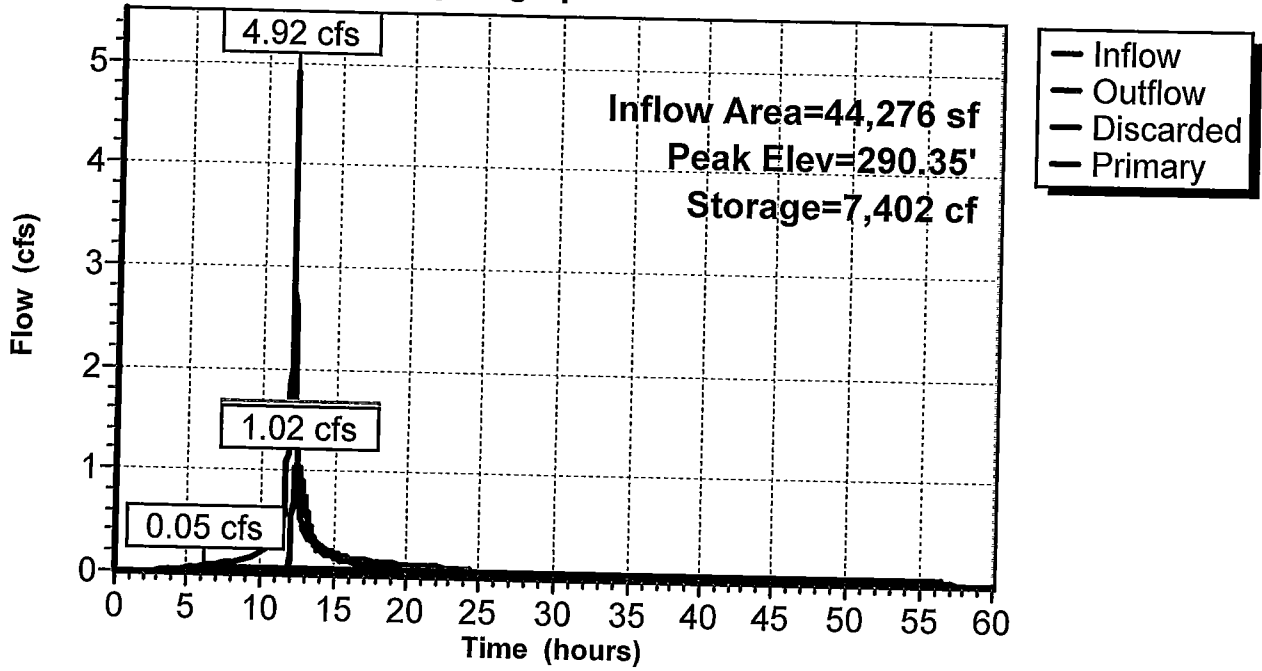
Device	Routing	Invert	Outlet Devices
#1	Discarded	284.98'	1.000 in/hr Exfiltration over Surface area
#2	Primary	288.93'	6.0" Round Culvert L= 70.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 288.93' / 279.80' S= 0.1304 '/' Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Discarded OutFlow Max=0.05 cfs @ 6.11 hrs HW=285.05' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=1.02 cfs @ 12.48 hrs HW=290.35' (Free Discharge)
 ↑2=Culvert (Inlet Controls 1.02 cfs @ 5.21 fps)

Pond 1P: CULTEC

Hydrograph



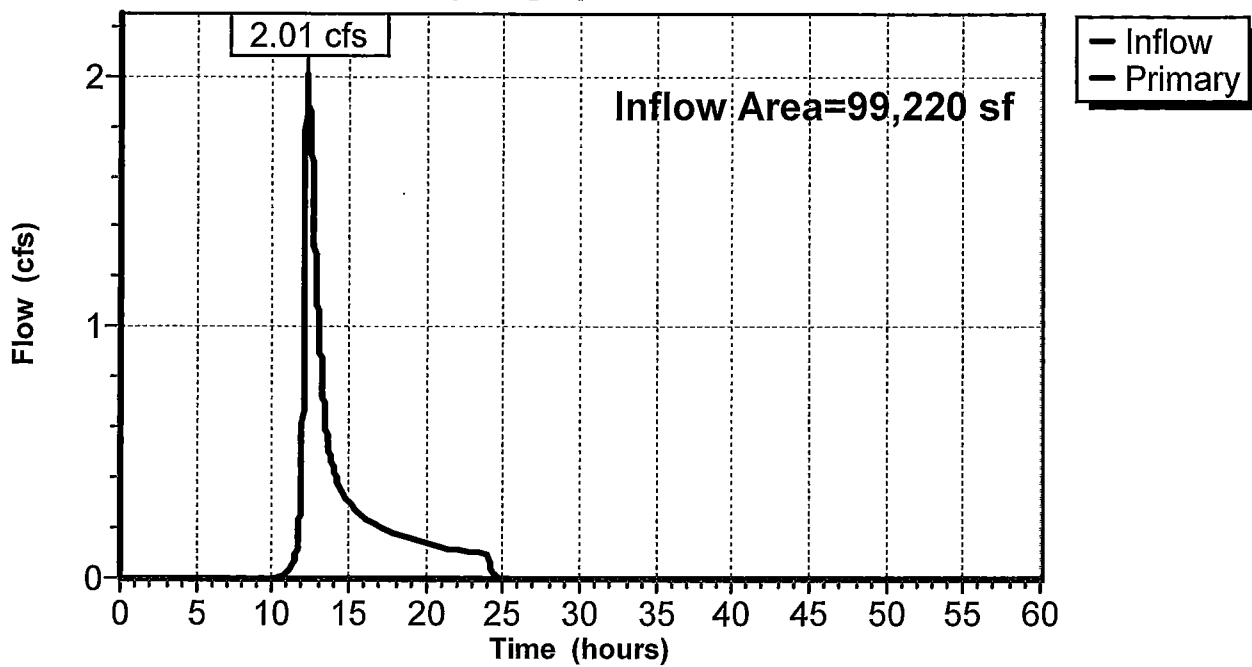
Summary for Link S1: S - CULVERT

Inflow Area = 99,220 sf, 35.94% Impervious, Inflow Depth = 1.83" for 25-yr event
Inflow = 2.01 cfs @ 12.25 hrs, Volume= 15,106 cf
Primary = 2.01 cfs @ 12.25 hrs, Volume= 15,106 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link S1: S - CULVERT

Hydrograph



B&H OIL PROP R0

B & H Oil Hudson 24-hr S1 50-yr Rainfall=6.79"

Prepared by {enter your company name here}

Printed 12/2/2020

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Time span=0.00-60.00 hrs, dt=0.01 hrs, 6001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P1: Runoff Area=44,276 sf 80.55% Impervious Runoff Depth=5.73"
Tc=6.0 min CN=91 Runoff=5.87 cfs 21,150 cf

Subcatchment P2: Runoff Area=54,944 sf 0.00% Impervious Runoff Depth=2.46"
Flow Length=163' Tc=12.1 min CN=60 Runoff=2.41 cfs 11,245 cf

Reach R1: 6" 279.8-274.8 Avg. Flow Depth=0.13' Max Vel=1.36 fps Inflow=1.53 cfs 11,108 cf
n=0.040 L=140.0' S=0.0357 '/' Capacity=9.60 cfs Outflow=1.53 cfs 11,108 cf

Pond 1P: CULTEC Peak Elev=291.79' Storage=8,711 cf Inflow=5.87 cfs 21,150 cf
Discarded=0.05 cfs 10,042 cf Primary=1.53 cfs 11,108 cf Outflow=1.58 cfs 21,150 cf

Link S1: S - CULVERT Inflow=3.57 cfs 22,353 cf
Primary=3.57 cfs 22,353 cf

Total Runoff Area = 99,220 sf Runoff Volume = 32,395 cf Average Runoff Depth = 3.92"
64.06% Pervious = 63,556 sf 35.94% Impervious = 35,664 sf

Summary for Subcatchment P1:

Runoff = 5.87 cfs @ 12.04 hrs, Volume= 21,150 cf, Depth= 5.73"

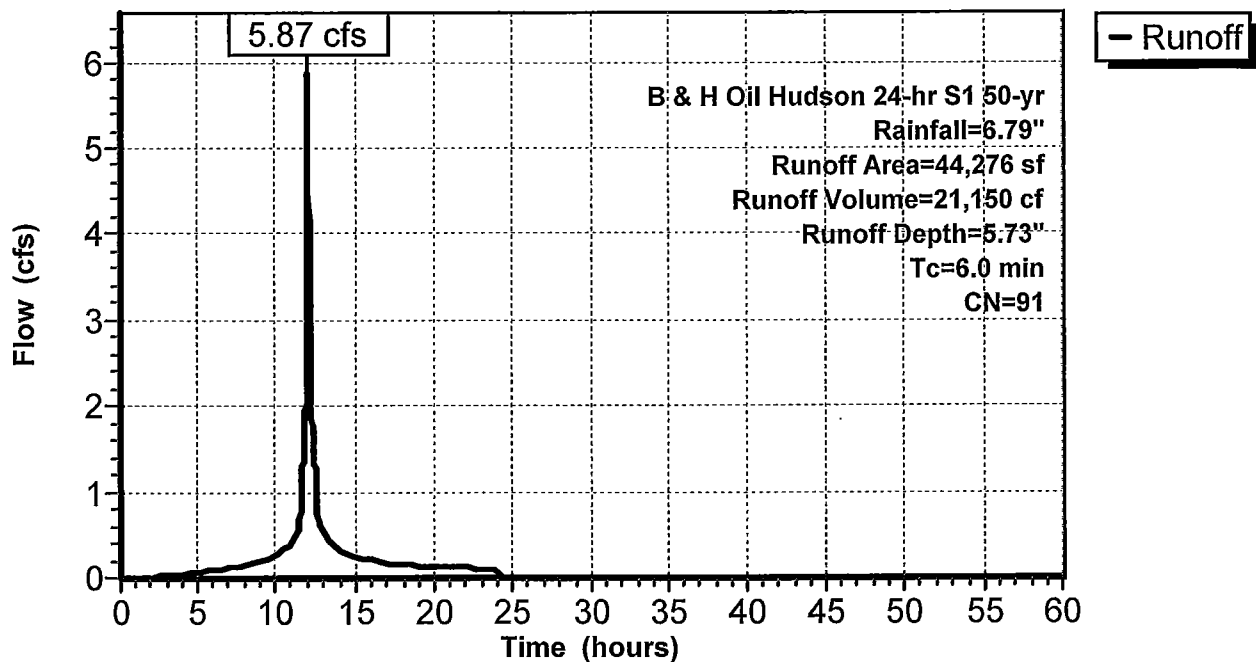
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 B & H Oil Hudson 24-hr S1 50-yr Rainfall=6.79"

Area (sf)	CN	Description
35,664	98	Paved parking, HSG B
6,619	61	>75% Grass cover, Good, HSG B
1,993	55	Woods, Good, HSG B
44,276	91	Weighted Average
8,612		19.45% Pervious Area
35,664		80.55% Impervious Area

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

Subcatchment P1:

Hydrograph



Summary for Subcatchment P2:

Runoff = 2.41 cfs @ 12.13 hrs, Volume= 11,245 cf, Depth= 2.46"

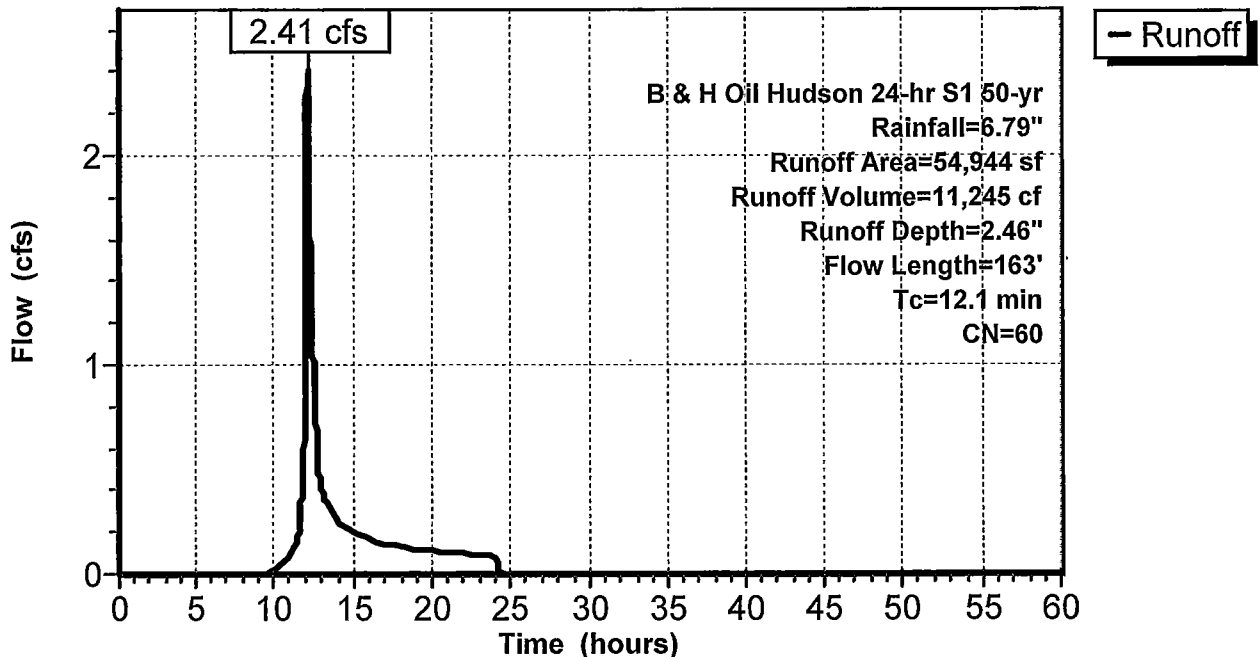
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 B & H Oil Hudson 24-hr S1 50-yr Rainfall=6.79"

Area (sf)	CN	Description
7,605	61	>75% Grass cover, Good, HSG B
32,754	55	Woods, Good, HSG B
10,425	70	Woods, Good, HSG C
4,160	70	Woods, Good, HSG C
54,944	60	Weighted Average
54,944		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	32	0.3300	0.40		Sheet Flow, Grass: Short n= 0.150 P2= 2.96"
9.1	43	0.0350	0.08		Sheet Flow, 279-277.5 Woods: Light underbrush n= 0.400 P2= 2.96"
1.7	88	0.0307	0.88		Shallow Concentrated Flow, 277.5-274.8 Woodland Kv= 5.0 fps
12.1	163	Total			

Subcatchment P2:

Hydrograph



Summary for Reach R1: 6" 279.8-274.8

[79] Warning: Submerged Pond 1P Primary device # 2 OUTLET by 0.13'

Inflow Area =	44,276 sf, 80.55% Impervious,	Inflow Depth = 3.01"	for 50-yr event
Inflow =	1.53 cfs @ 12.35 hrs,	Volume=	11,108 cf
Outflow =	1.53 cfs @ 12.40 hrs,	Volume=	11,108 cf, Atten= 0%, Lag= 2.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Max. Velocity= 1.36 fps, Min. Travel Time= 1.7 min
 Avg. Velocity = 0.61 fps, Avg. Travel Time= 3.8 min

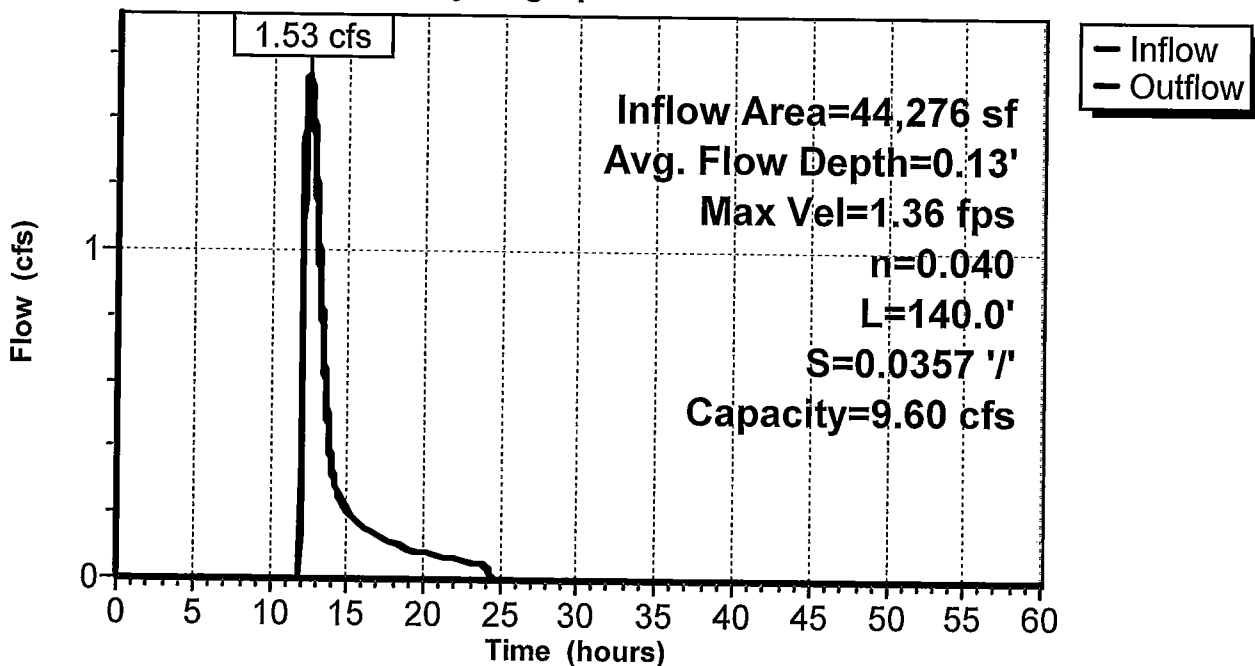
Peak Storage= 157 cf @ 12.37 hrs
 Average Depth at Peak Storage= 0.13'
 Bank-Full Depth= 0.30' Flow Area= 4.0 sf, Capacity= 9.60 cfs

20.00' x 0.30' deep Parabolic Channel, n= 0.040
 Length= 140.0' Slope= 0.0357 '/'
 Inlet Invert= 279.80', Outlet Invert= 274.80'



Reach R1: 6" 279.8-274.8

Hydrograph



B&H OIL PROP R0

B & H Oil Hudson 24-hr S1 50-yr Rainfall=6.79"

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Printed 12/2/2020

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Summary for Pond 1P: CULTEC

Inflow Area = 44,276 sf, 80.55% Impervious, Inflow Depth = 5.73" for 50-yr event
 Inflow = 5.87 cfs @ 12.04 hrs, Volume= 21,150 cf
 Outflow = 1.58 cfs @ 12.35 hrs, Volume= 21,150 cf, Atten= 73%, Lag= 19.0 min
 Discarded = 0.05 cfs @ 5.06 hrs, Volume= 10,042 cf
 Primary = 1.53 cfs @ 12.35 hrs, Volume= 11,108 cf

Routing by Stor-Ind method, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs
 Peak Elev= 291.79' @ 12.35 hrs Surf.Area= 2,263 sf Storage= 8,711 cf

Plug-Flow detention time= 538.0 min calculated for 21,150 cf (100% of inflow)
 Center-of-Mass det. time= 538.0 min (1,323.4 - 785.4)

Volume	Invert	Avail.Storage	Storage Description
#1	284.98'	4,235 cf	Cultec R-902HD x 65 Inside #2 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 5 Rows of 13 Chambers Cap Storage= +2.8 cf x 2 x 5 rows = 27.6 cf
#2	284.98'	4,643 cf	39.50"W x 57.30'L x 7.00'H Prismaoid 15,843 cf Overall - 4,235 cf Embedded = 11,608 cf x 40.0% Voids
		8,879 cf	Total Available Storage

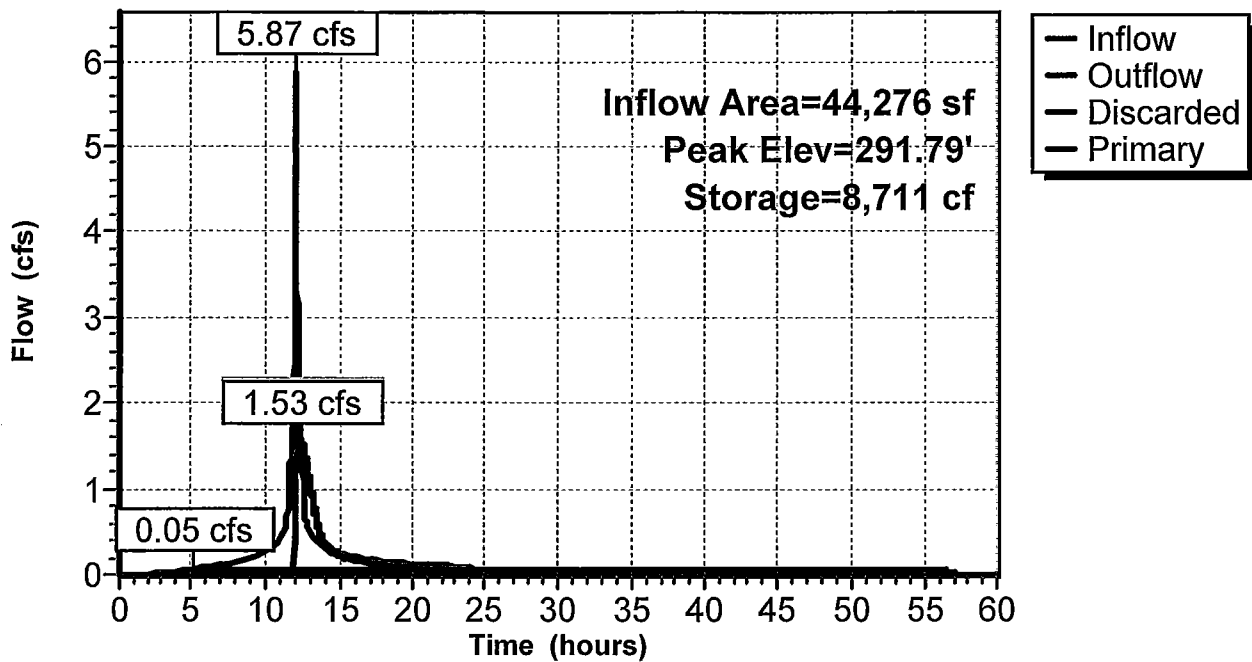
Device	Routing	Invert	Outlet Devices
#1	Discarded	284.98'	1.000 in/hr Exfiltration over Surface area
#2	Primary	288.93'	6.0" Round Culvert L= 70.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 288.93' / 279.80' S= 0.1304 '/ Cc= 0.900 n= 0.011, Flow Area= 0.20 sf

Discarded OutFlow Max=0.05 cfs @ 5.06 hrs HW=285.05' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=1.53 cfs @ 12.35 hrs HW=291.79' (Free Discharge)
 ↑ **2=Culvert** (Inlet Controls 1.53 cfs @ 7.79 fps)

Pond 1P: CULTEC

Hydrograph



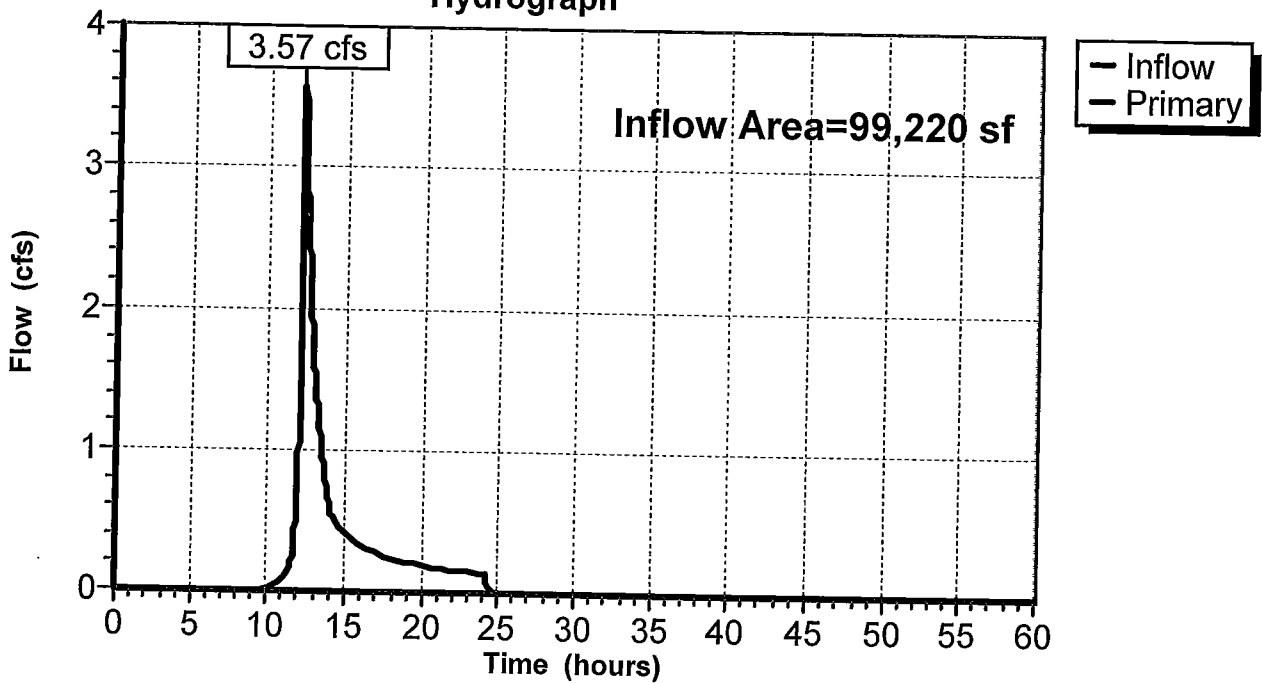
Summary for Link S1: S - CULVERT

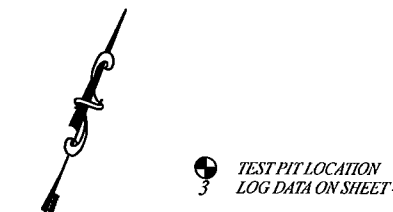
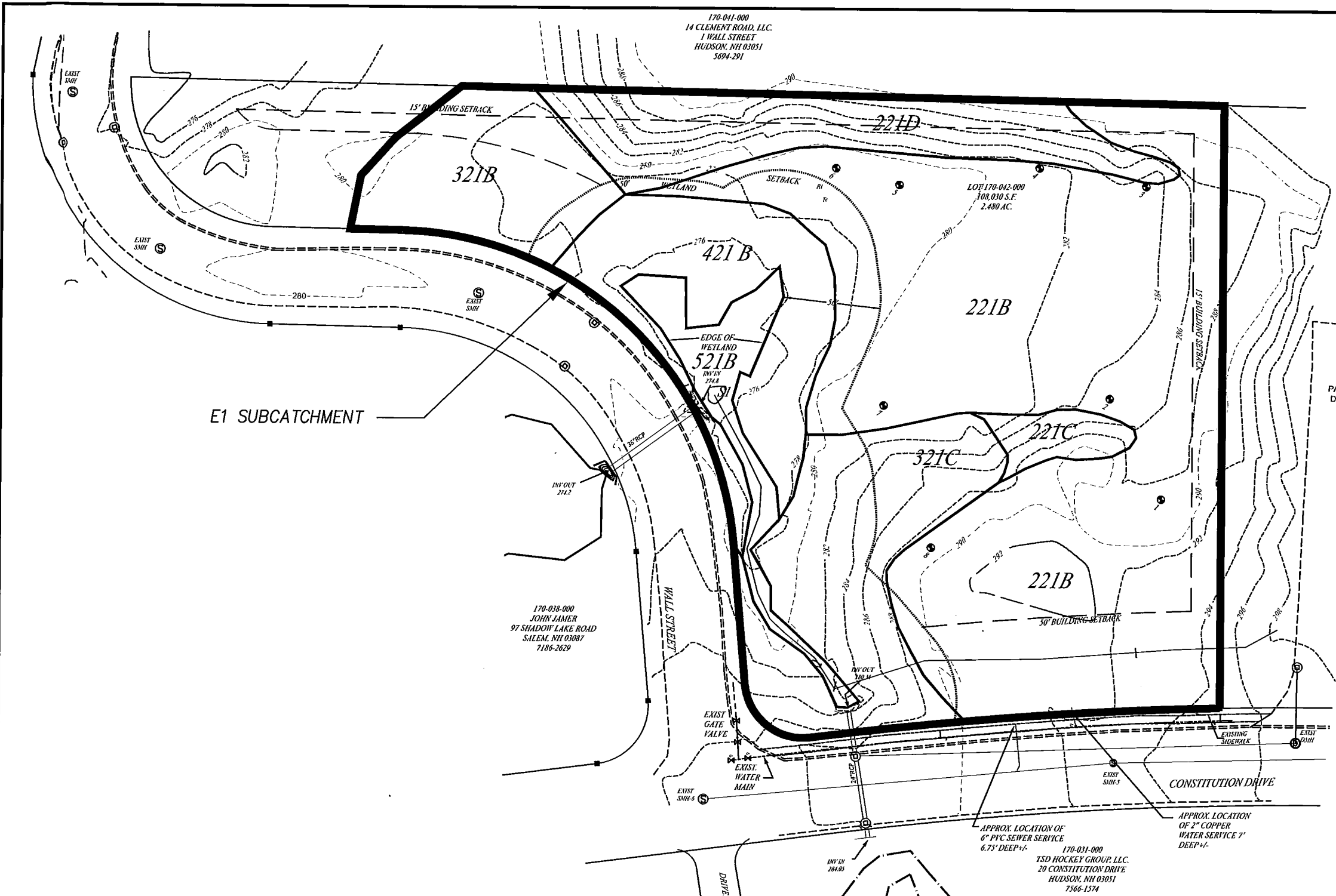
Inflow Area = 99,220 sf, 35.94% Impervious, Inflow Depth = 2.70" for 50-yr event
Inflow = 3.57 cfs @ 12.16 hrs, Volume= 22,353 cf
Primary = 3.57 cfs @ 12.16 hrs, Volume= 22,353 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-60.00 hrs, dt= 0.01 hrs

Link S1: S - CULVERT

Hydrograph





SOIL MAPPED BY GOVE ENVIRONMENTAL SERVICES, INC. 9-20-20

MAPPING STANDARDS

SITE-SPECIFIC SOIL MAPPING STANDARDS OF NEW HAMPSHIRE AND VERMONT. SSSNNE SPECIAL PUBLICATION NO. 3, VERSION 5.0, DECEMBER 2017. THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PRODUCT, INTENDED FOR THE SITE-SPECIFIC SOIL SURVEY. IT WAS PRODUCED BY A PROFESSIONAL SOIL SCIENTIST AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCE CONSERVATION SERVICE.

HISS SYMBOL	NRCS SYMBOL	SOIL TAXONOMIC NAME	AREA S.F.
221	42	CANTON	62,974
321		NEWFIELDS	30,473
421	921	NEWFIELDS VARIANT	10,425
521	656P	RIDGEBURY	4,160

APPROVED BY THE HUDSON PLANNING BOARD

DATE OF MEETING: _____

PLANNING BOARD CHAIRMAN: _____ SIGNATURE DATE: _____

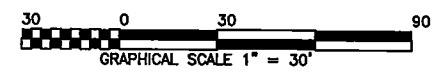
SECRETARY: _____ SIGNATURE DATE: _____

SITE PLANS ARE VALID FOR ONE YEAR FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES ONE YEAR FROM DATE OF APPROVAL.

DEVELOPER SIGNATURE: _____ DATE: _____

RALPH GLYNN
B & H OIL CO.



REVISIONS:

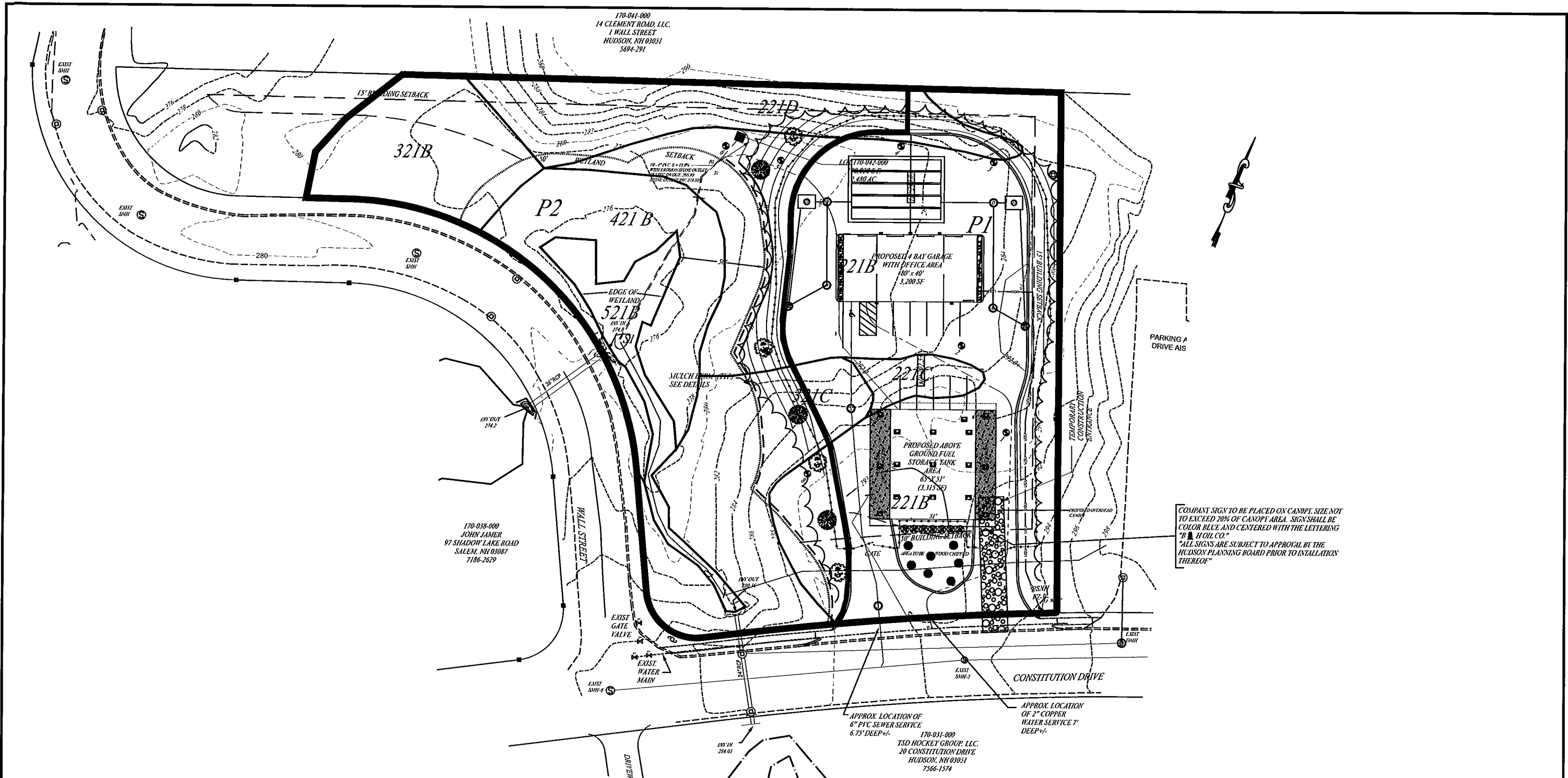
EXISTING SUBCATCHMENT

SITE PLAN
 MAP 170 / LOT 042-000
 19 CONSTITUTION DRIVE
 HUDSON, NH

PREPARED FOR:
 B & H OIL COMPANY, INC.
 6 STARWOOD DRIVE
 HAMPSTEAD, NH 03841

SCALE: 1" = 30' DATE: NOVEMBER, 2020

EDWARD N. HERBERT ASSOC., INC
LAND SURVEYORS - CIVIL ENGINEERS
 1 FROST ROAD WINDHAM, NH 03087 (603) 432-2462



COMPANY SIGN TO BE PLACED ON CANOPY. SIZE NOT TO EXCEED 20% OF CANOPY AREA. SIGN SHALL BE COLOR BLUE AND CENTERED WITH THE LETTERING "B & H OIL CO."
 ALL SIGNS ARE SUBJECT TO APPROVAL BY THE HUDSON PLANNING BOARD PRIOR TO INSTALLATION THEREOF

APPROVED BY THE HUDSON PLANNING BOARD

DATE OF MEETING: _____

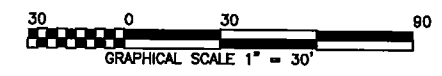
PLANNING BOARD CHAIRMAN: _____ SIGNATURE DATE: _____

SECRETARY: _____ SIGNATURE DATE: _____

SITE PLANS ARE VALID FOR ONE YEAR FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES ONE YEAR FROM DATE OF APPROVAL.

DEVELOPER SIGNATURE: RALPH GILLYN DATE: _____
 B & H OIL CO.



REVISIONS:

PROPOSED SUBCATCHMENT

SITE PLAN
 MAP 170 / LOT 042-000
 19 CONSTITUTION DRIVE
 HUDSON, NH

PREPARED FOR:
 B & H OIL COMPANY, INC.
 6 STARWOOD DRIVE
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