LIONS DEN SUBDIVISION

FINAL DRAINAGE REPORT

Prepared for:

Lions Den Trust
13395 Voyager Parkway
Colorado Springs, CO 80921
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Prepared by:

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September 2026

Matrix Project No. 25.1729.001

PCD File No. SF2525

Engineer's Statement:

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the applicable master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.



Jesse Sullivan
Registered Professional Engineer
State of Colorado
No. 55600

Date

Owner/Developer's Statement:

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

Lions Den Trust.
Business Name

By: Eileen Marx

03 September 2026
Date

Title: Owner

Address: 13395 Voyager Parkway
Colorado Springs, CO 80921

El Paso County:

Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

Joshua Palmer, P.E.
County Engineer / ECM Administrator
Conditions:

Date

I. INTRODUCTION / SITE DESCRIPTION

a. GENERAL PROJECT DESCRIPTION

The Lions Den Subdivision site is located to the southwest of the intersection of Casey Lane and Shoup Road. The site is located as follows:

1. General Location: Northwest ¼ of Section 13, Township 12 South, Range 66 West of the 6th P.M. near the City of Colorado Springs, County of El Paso, State of Colorado.
2. Drainageway: The proposed development is located within the Kettle Creek Drainage Basin. The site drains southwest and into Kettle Creek located approximately 900 feet south of the site.
3. Surrounding Developments: The site is bordered on the west by open space. To the north is Shoup Road, to the east is Casey Lane and Pine Mountain Estates, and to the south is open space.
4. Area of Disturbance: The proposed development is expected to disturb a total area of approximately 0.2 acres for maintenance of a cul-de-sac at the end of Casey Lane to bring it back into compliance with the relevant County engineering/traffic criteria.
5. Vegetation: The proposed development site contains residential buildings, with the vegetation of the site consisting of trees, native grasses, and shrubs.

Refer to Appendix D for the Vicinity Map.

b. SOIL CONDITIONS

Soils can be classified in four different hydrologic groups, A, B, C, or D to help predict stormwater runoff rates. Hydrologic group "A" is characterized by deep, well-drained coarse-grained soils with a rapid infiltration rate when thoroughly wet and having a low runoff potential. Group "D" typically has a clay layer at or near to the surface, or a very shallow depth to impervious bedrock and has a very slow infiltration rate and a high runoff potential. See Soils Map, Appendix C. The following soil types are present in the Lions Den site:

Table 1.1 – NRCS Soil Survey for El Paso County

Soil ID Number	*Soil*	*Hydrologic Classification*	*Drainage Class*	*Percent of Site*
40	Kettle gravelly loamy sand, 3 to 8 % slopes	B	Somewhat excessively drained	47.7
41	Kettle gravelly loamy sand, 8 to 40 % slopes	B	Somewhat excessively drained	52.3

II. Hydrologic Methodology

This report has been prepared in accordance to the criteria set forth in the City of Colorado Springs and El Paso County DCM, El Paso County Engineering Criteria Manual (ECM) and El Paso County Resolutions 15-042 and 19-245. In addition to the DCM, the **Urban Storm Drainage Criteria Manuals, Volumes 1 through 3**, dated 2016 have been used to supplement the County's Criteria Manual.

i. UD Methods

The hydrology for this project uses the **Rational Method** as recommended by the Drainage Criteria Manual (DCM) for the minor and major storms. The Rational Method is used for drainage basins less than 100-acres in size. The Rational Method uses the following equation:

$$Q=C*i*A$$

Where:

Q	=	Maximum runoff rate in cubic feet per second (cfs)
C	=	Runoff coefficient
i	=	Average rainfall intensity (inches per hour)
A	=	Area of drainage sub-basin (acres)

Rational Method coefficients from 6-6 of the Drainage Criteria Manual for developed land were utilized in the Rational Method calculations. This method will be used primarily for sizing of storm sewer infrastructure. See Appendix B for more information.

Time of Concentration

The time of concentration consists of the initial time of overland flow and the travel time in a channel to the inlet or point of interest. A minimum time of concentrations of 5 minutes is utilized for urban areas. The Rational Calculation spreadsheet included in Appendix A shows an initial overland flow length, a channel or street flow length for each sub-basin, and also demonstrates the time of concentration calculations for initial (overland) and channel (or street) conditions. A maximum "True Initial" Flow Length of 300 feet will be used for pre-developed sub-basins and a maximum length of 100 feet will be used for Developed sub-basins for time of concentration calculations in compliance with the DCM.

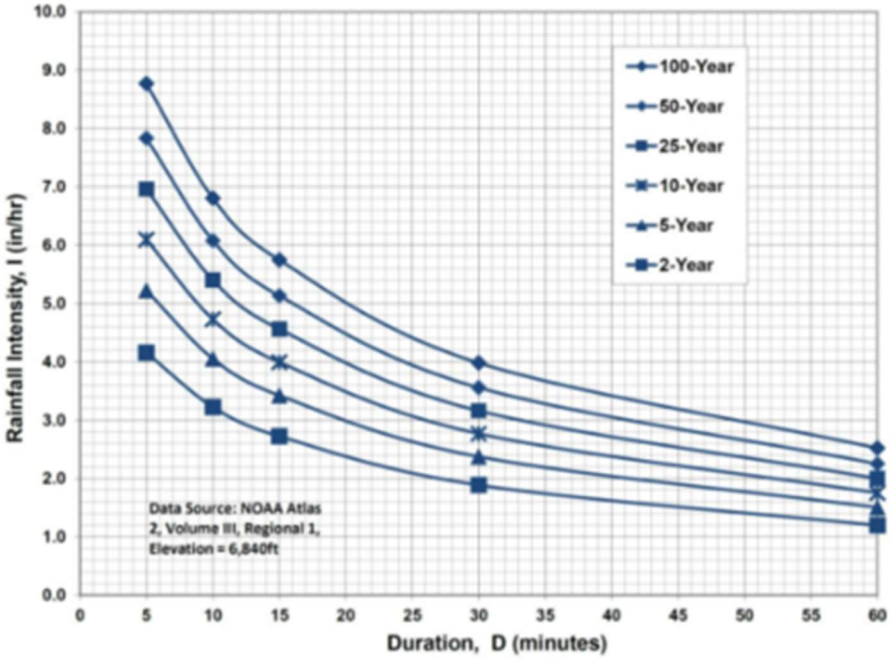
Rainfall Depths

Rainfall depths for the 1-hour storm duration were taken from the NOAA Atlas Precipitation Frequency Data Server set at the project site. A printout of the NOAA Atlas data is included in Appendix C.

Rainfall Intensity

The rainfall intensity equation for the Rational Method was taken from Drainage Criteria Manual Volume 1 Figure 6-5 shown below.

Figure 6-5. Colorado Springs Rainfall Intensity Duration Frequency



IDF Equations

$I_{100} = -2.52 \ln(D) + 12.735$

$I_{50} = -2.25 \ln(D) + 11.375$

$I_{25} = -2.00 \ln(D) + 10.111$

$I_{10} = -1.75 \ln(D) + 8.847$

$I_{5} = -1.50 \ln(D) + 7.583$

$I_{2} = -1.19 \ln(D) + 6.035$

Note: Values calculated by equations may not precisely duplicate values read from figure.

C-Factors

C-factors for the Rational Method are based on anticipated land use and are taken from Table 6-6 of the DCM (Included in Appendix B). The area which is to be redeveloped with the proposed school building has been modeled under the Commercial category. Paved areas are modeled under the Streets-Paved category, areas which will be future open spaces or detention facilities are modeled under the Parks and Cemeteries category. Undeveloped or predevelopment areas are model under Undeveloped Areas-Historic Flow Analysis—Greenbelts, Agriculture category. The El Paso County Engineering Criteria Manual (ECM) indicates 7% as a typical imperviousness of residential lots 5 acres and larger in size as shown in Table 3-1, below. Matrix used the 7% imperviousness value to derive proposed basin calculations.

Table 3-1
Typical Values of Percent Impervious

Type of Development	Percent Impervious
Commercial	95%
Industrial	85%
Multi-Family	65%
Single Family - 0.1377 acre lots (6,000 SF)	53%
Single-Family – 0.20 acre lots	43%
Single-Family – 0.25 acre lots	40%
Single-Family – 0.33 acre lots	30%
Single-Family – 0.5 acre lots	25%
Single-Family – 1.0 acre lots	20%
Single-Family – 2.5 acre lots	11%
Single-Family – 5 acre lots	7%

ii. HEC-HMS Methods

The DCM requires the use of the SCS Hydrograph Procedure to compute storm water runoff quantities when the drainage area is greater than 100 acres. This report uses HEC-HMS for the routing and analysis of the site conditions.

SCS Lag

The SCS lag calculations are completed as part of this report. Proposed development areas within the Lions Den Subdivision area are calculated based on the methodology indicated in the DCM Equations:

Lag Time:

$t_{lag} = 0.6 \cdot t_c$ (Eq. 6-13)

The Time of Concentration is the sum of overland flow time and the t_t values for the various consecutive flow segments:

$$t_c = t_i + t_{t1} + t_{t2} + t_{t3} \ldots t_{tm} \quad \text{(Eq. 6-14)}$$

Where:

t_c = time of concentration (hr)

t_i = overland (initial) flow time (hr)

t_{tm} = travel time for each flow segment (hr)

m = number of flow segments

Overland Flow:

$T_i = 0.007(n \cdot L)^{0.8} / (P_2)^{0.5} S^{0.4}$ (Eq. 6-15)

Where:

T_i = overland flow time (hr)

n = Manning's roughness coefficient L

= flow length (ft)

P_2 = 2-year, 24-hour rainfall (in)

S = slope of hydraulic grade line (ft/ft)

Concentrated Flow:

$T_t = L / (3600 \cdot V)$ (Eq. 6-16)

Where:

T_t = travel time (hr)

L = flow length (ft)

V = velocity (ft/s)

3,600 = conversion factor from seconds to hours

Runoff Analysis

The site has been analyzed using HEC-HMS and the NRCS SCS method. Print outs from each model can be found in Appendix A.

NRCS SCS curve numbers (CN) are taken from Table 6-10 of the DCM and weighted for each basin based on the soil and development types. As recommended in the DCM storms of 2-hour duration are used for the 5-year event. A 24-hour storm is used for the 100-year event. Lag times are calculated for the basins using the formulas from the DCM shown above.

III. PREVIOUS STUDIES

A previous Drainage Study for Pine Mountain Estates El Paso County, Colorado dated March 20, 1981 was used to determine the flows entering the Lions Den Subdivision via an existing 18-inch CMP culvert crossing Casey Lane near the existing cul-de-sac. Find previous drainage study and road plans in the Appendix C reference documents.

IV. EXISTING DRAINAGE CONDITIONS

The subject area is located within the Kettle Creek FOMO3000 watershed. Predevelopment conditions have been analyzed using both the Rational Method and the SCS Hydrograph method. The subject site is analyzed using Rational Method and offsite basin OS-1 is analyzed using HEC-HMS using the SCS method due to the tributary area exceeding 130 acres. Runoff generated on-site drains overland towards the tributary of Kettle Creek running through the existing site. There are offsite flows that enter the site. A delineation of the basin boundaries can be found in Appendix D in drainage maps DR-01 & DR-02. Runoff calculations can be found in Appendix A. The existing runoff design points are described below:

Design Point 1 (HMS Flows: Q_5 = 36.6 cfs, Q_{100} = 157.4 cfs) (sub-basin: OS-1; Area: 572.17 Ac.) (Slopes: 3.9% to 59.2%) This design point represents the runoff from sub-basin OS-1 that drains through the

existing private culvert that runs under Casey Lane. Stormwater generated within sub-basin OS-1 drains overland to the south before being collected in the existing culvert at DP-1.

Design Point 2 (Flows: Q_5 = 8.1 cfs, Q_{100} = 38.7 cfs) (sub-basin: OS-2; Area: 27.64 Ac.) (Slopes: 5% to 50%) This design point represents the existing low point north of the site. Stormwater runoff generated within sub-basin OS-2 drains overland to the south before being collected at the low point at DP-2. Stormwater collected at DP-2 will eventually overtop Shoup Road to the south and drain into the site.

Design Point 3 (Flows: Q_5 = 0.2 cfs, Q_{100} = 1.3 cfs) (sub-basin: EX-2; Area: 0.55 Ac.) (Slopes: 5% to 25%) This design point represents the runoff from sub-basin EX-2 that drains overland to the west and into the adjacent property. Stormwater flows exiting the site at DP-3 continue flowing south-west eventually draining into the Tributary of Kettle Creek.

Design Point 4 (Flows: Q_5 = 0.8 cfs, Q_{100} = 5.2 cfs) (sub-basin: EX-3; Area: 2.93 Ac.) (Slopes: 5% to 25%) This design point represents the runoff from sub-basin EX-3 that drains overland to the west and into the adjacent property. Stormwater flows exiting the site at DP-4 continue flowing south-west eventually draining into the Tributary of Kettle Creek.

Design Point 5 (Flows: Q_5 = 2.6 cfs, Q_{100} = 12.5 cfs) (sub-basin: OS-3; Area: 4.67 Ac.) (Slopes: 5% to 25%) This design point represents the runoff from sub-basin OS-3 that drains overland to the east and into the sub-basin EX-1. Stormwater flows entering the site at DP-5 continue flowing south-east eventually draining into the tributary to Kettle Creek at DP-6.

Design Point 6 (Flows: Q_5 = 52.0 cfs, Q_{100} = 238.4 cfs) (sub-basins: OS-1, OS-2, OS-3, EX-1; Area: 635.34 Ac.) (Slopes: 5% to 60%) This design point represents the runoff from the site that drains overland to the south and into the adjacent property. Stormwater flows exiting the site at DP-6 continue flowing south eventually draining into the Tributary of Kettle Creek.

V. PROPOSED DRAINAGE CONDITIONS

Post development conditions have been analyzed using both the Rational Method and the SCS Hydrograph method. In the proposed condition the existing cul-de-sac will be regraded to maintain its original design. No other improvements are proposed at this time. Runoff generated on-site drains overland and in Kettle Creek tributary to proposed location DP6 in the southern area of the site where drainageway exits the proposed site. There are offsite flows that drain into the site. A delineation of the basin boundaries can be found in drainage map DR03 in Appendix D. Runoff calculations can be found in Appendix A. The proposed runoff design points are described below:

Design Point 1 (HMS Flows: Q_5 = 36.6 cfs, Q_{100} = 157.4 cfs) (sub-basin: OS-1; Area: 572.17 Ac.) (Slopes: 3.9% to 59.2%) This design point represents the runoff from sub-basin OS-1 that drains through the existing private culvert that runs under Casey Lane. Stormwater generated within sub-basin OS-1 drains overland to the south before being collected in the existing culvert at DP-1.

Design Point 2 (Flows: Q_5 = 8.1 cfs, Q_{100} = 38.7 cfs) (sub-basin: OS-2; Area: 27.64 Ac.) (Slopes: 5% to 50%) This design point represents the existing low point north of the site. Stormwater runoff generated

within sub-basin OS-2 drains overland to the south before being collected at the low point at DP-2. Stormwater collected at DP-2 will eventually overtop Shoup Road to the south and drain into the site.

Design Point 3 (Flows: Q_5 = 0.3 cfs, Q_{100} = 1.5 cfs) (sub-basin: PR-2; Area: 0.55 Ac.) (Slopes: 5% to 25%) This design point represents the runoff from sub-basin PR-2 that drains overland to the west and into the adjacent property. Stormwater flows exiting the site at DP-3 continue flowing south-west eventually draining into the Tributary of Kettle Creek.

Design Point 4 (Flows: Q_5 = 1.2 cfs, Q_{100} = 5.8 cfs) (sub-basin: PR-3; Area: 2.93 Ac.) (Slopes: 5% to 25%) This design point represents the runoff from sub-basin PR-3 that drains overland to the west and into the adjacent property. Stormwater flows exiting the site at DP-4 continue flowing south-west eventually draining into the Tributary of Kettle Creek.

Design Point 5 (Flows: Q_5 = 2.6 cfs, Q_{100} = 12.5 cfs) (sub-basin: OS-3; Area: 4.67 Ac.) (Slopes: 5% to 25%) This design point represents the runoff from sub-basin OS-3 that drains overland to the east and into the sub-basin PR-1. Stormwater flows entering the site at DP-5 continue flowing south-east eventually draining into the tributary to Kettle Creek at DP-6.

Design Point 6 (Flows: Q_5 = 54.1 cfs, Q_{100} = 241.3 cfs) (sub-basins: OS-1, OS-2, OS-3, PR-1; Area: 635.34 Ac.) (Slopes: 5% to 60%) This design point represents the runoff from the site that drains overland to the south and into the adjacent property. Stormwater flows exiting the site at DP-6 continue flowing south eventually draining into the Tributary of Kettle Creek.

Hydraulic Analysis

b. Swale Analysis

Swale analysis was performed using Hydraflow Express. This tool helps analyze the flows within the proposed swale based on the cross section, and Mannings n value used for the swale. Mannings n value used for this swale is 0.10 because the drainageway is heavily wooded and this is the value used for channel flow in the Kettle Creek DBSP. The table below summarizes the 100-year flow within the existing drainageway running through the Lions Den Subdivision.

Swale Capacities						
Swale	***Armoring Type***	***Slope %***	***CHANNEL CAPACITY MAJOR STORM (cfs)***	***Q(100) TOTAL FLOW (cfs)***	***Q(100) VELOCTIY (FT/S)***	***Q100 Flow Depth (ft)***
Basin	Vegetation	4	**505**	241.3	5.12	**3.83**

Based on the section analyzed, the 100-year flow has a freeboard of approximately 15 ft in the existing drainageway running through the site.

VI. 4 STEP PROCESS

Per the DCM Volume 1 Update, Chapter 6, Section 7, The El Paso County Colorado Drainage Criteria Manual requires the Four Step Process for receiving water protection that focuses on reducing runoff volumes, treating the water quality capture volume (WQCV), stabilizing drainageways, and implementing long-term source controls. The four-step process does not apply to this development because there will be less than an acre of soil disturbance associated with this development.

VII. FLOODPLAIN STATEMENT

No portion of the site is located within a 100-year floodplain as determined by the Flood Insurance Rate Map (FIRM) number 08041C0315G effective date, December 7, 2018 (see Appendix C).

VIII. Drainage and Bridge Fees

The proposed development is located within the Kettle Creek Drainage Fee Basin and within previously platted land. The 2025 Drainage Basin Fees for the Kettle Creek Drainage Fee Basin are: $ 14,416 /impervious acre for the Drainage Fee. Because this is a large lot development the county allows for a 25% reduction in drainage fees due. This is reflected in the table below.

Lions Den Subdivision
Final Drainage Report
2025 Drainage and Bridge Fees

	Platted Area (Acres)	Imperviousness (%)	Platted Area (Imp. ac.)	Fee/ Imp. Acre	Fee Due	Drainage Fee Reduction	Fee Due at Platting
Drainage Fee	36.17	7.00	2.53	$14,416.00	$36,472.48	$9,118.12	$27,354.36
Bridge Fee	36.17	7.00	2.53	$0.00	$0.00	$0.00	$0.00
TOTAL							$27,354.36

IX. Summary

This final drainage report demonstrates that the proposed development associated with Lions Den Subdivision is in conformance with the El Paso County, DCM, ECM, and El paso County Resolutions 15-042 and 19-245. Increase in runoff will be negligible with the anticipated site runoff increasing from Q_5 = 52.0 cfs, Q_{100} = 238.4 cfs to Q_5 = 54.1 cfs, Q_{100} = 241.3 cfs an increase of only Q_5 = 2.1 cfs, Q_{100} = 2.9 cfs. These proposed improvements will not adversely affect downstream or surrounding developments. There is no known PDR or MDDP with which to comply. Additionally, the approved DBPS for Kettle Creek assumes 5-acre residential for this area in its calculations.

X. References

1. ***El Paso County and City of Colorado Springs Drainage Criteria Manual, Volume 1 & 2***, El Paso County, version October 31, 2018.
2. ***El Paso County Engineering Criteria Manual,*** El Paso County, Rev. December 2016
3. ***Web Soil Survey of El Paso County Area, Colorado. United States Department of Agriculture Soil Conservation Service***.
4. ***Flood Insurance Rate Maps for El Paso County, Colorado and Incorporated Areas, Panel 315 of 1300, Federal Emergency Management Agency***, Effective Date December 7, 2018.
5. ***Pine Mountain Estates FDR,*** by Cox Surveying Company, March 20, 1981.
6. ***Urban Storm Drainage Criteria Manual, Vol. 1-3*** by Urban Drainage and Flood Control District (UDFCD), January 2016

APPENDICES

APPENDIX A

HYDROLOGIC AND HYDRAULIC CALCULATIONS

Rational Method - Existing Conditions

Project Name:	LIONS DEN SUBDIVISION
Project Location:	12120 CASEY LANE
Designer	JTS
Notes:	PROPOSED AND EXISTING CONDITIONS

Average Channel Velocity	4.00	ft/s	(If specific channel vel is used, this will be ignored)
Average Slope for Initial Flow	0.07	ft/ft	(If Elevations are used, this will be ignored)

Channel Flow Type Key

Heavy Meadow	2
Tillage/Field	3
Short Pasture and Lawns	4
Nearly Bare Ground	5
Grassed Waterway	6
Paved Areas	7

		Area				Rational 'C' Values								Flow Lengths									Tc	Rainfall Intensity & Rational Flow Rate					HEC-HMS VALUES		
						0% Impervious			100% Impervious			Composite																				
Sub-basin	**Comments**	SF	acres	Sq. Mi.	Soil Group	C5	C100	Area (SF)	C5	C100	Area	C5	C100	Percent Impervious	Initial ft	True Initial Length ft	Channel ft	True Channel Length ft	Average (decimal) Slope	Initial Tc (min)	Average (%) Slope	Channel Flow Type (See Key above) Ground Type	Velocity (ft/s)	Channel Tc (min)	Total (min)	i5 in/hr	Q5 cfs	i100 in/hr	Q100 cfs	Q5 cfs	Q100 cfs	**Sub-basin**
OS-1		24923723	572.17	0.8940	B	0.08	0.35	23179062	0.90	0.96	1744661	0.14	0.39	7.00																**36.6**	**157.4**	***OS-1***
OS-2		1204014	27.64	0.0432	B	0.08	0.35	1119733	0.90	0.96	84281	0.14	0.39	7.00	300	300	2060	2060	0.05	17.21	5.3	4	1.61	21.30	38.51	2.11	**8.1**	3.53	**38.7**			***OS-2***
OS-3		203240	4.67	0.0073	B	0.08	0.35	189013	0.90	0.96	14227	0.14	0.39	7.00	300	300	0	0	0.22	10.76	21.7	4	3.26	0.00	10.75	4.02	**2.6**	6.75	**12.5**			***OS-3***
EX-1		1344504	30.87	0.0482	B	0.08	0.35	1317614	0.90	0.96	26890	0.10	0.36	2.00	300	300	2948	2948	0.04	19.71	4.0	4	1.40	35.10	54.80	1.58	**4.7**	2.65	**29.8**			***EX-1***
EX-2		24061	0.55	0.0009	B	0.08	0.35	23580	0.90	0.96	481	0.10	0.36	2.00	86	86	0	0	0.04	11.03	3.5	4	1.31	0.00	11.03	3.98	**0.2**	6.69	**1.3**			***EX-2***
EX-3		127765	2.93	0.0046	B	0.08	0.35	125210	0.90	0.96	2555	0.10	0.36	2.00	300	300	290	290	0.04	19.09	4.4	4	1.47	3.29	22.38	2.92	**0.8**	4.90	**5.2**			***EX-3***
EX-4		27469	0.63	0.0010	B	0.08	0.35	26920	0.90	0.96	549	0.10	0.36	2.00	250	250	0	0	0.10	13.09	10.4	4	2.26	0.00	13.08	3.73	**0.2**	6.26	**1.4**			***EX-4***
EX-5		5281	0.12	0.0002	B	0.08	0.35	5175	0.90	0.96	106	0.10	0.36	2.00	80	80	0	0	0.16	6.37	16.3	4	2.83	0.00	6.37	4.81	**0.1**	8.07	**0.4**			***EX-5***
DESIGN POINTS	***Sub-basins***																														***DESIGN POINTS***
1	***OS-1***	24923723	572.17	0.8940	B	0.08	0.35	23179062	0.90	0.96	1744661	0.14	0.39	7.00																**36.6**	**157.4**	***1***
2	***OS-2***	1204014	27.64	0.0432	B	0.08	0.35	1119733	0.90	0.96	84281	0.14	0.39	7.00	300	300	2060	2060	0.05	17.21	5.3	4	1.61	21.30	38.51	2.11	**8.1**	3.53	**38.7**			***2***
3	***EX-2***	24061	0.55	0.0009	B	0.08	0.35	23580	0.90	0.96	481	0.10	0.36	2.00	86	86	0	0	0.04	11.03	3.5	4	1.31	0.00	11.03	3.98	**0.2**	6.69	**1.3**			***3***
4	***EX-3***	127765	2.93	0.0046	B	0.08	0.35	125210	0.90	0.96	2555	0.10	0.36	2.00	300	300	290	290	0.04	19.09	4.4	4	1.47	3.29	22.38	2.92	**0.8**	4.90	**5.2**			***4***
5	***OS-3***	203240	4.67	0.0073	B	0.08	0.35	189013	0.90	0.96	14227	0.14	0.39	7.00	300	300	0	0	0.22	10.76	21.7	4	3.26	0.00	10.75	4.02	**2.6**	6.75	**12.5**			***5***
6	***OS-1, OS-2, OS-3, EX-1***	27675481	635.34	0.9927	B	0.08	0.35	25805423	0.90	0.96	1870058	0.14	0.39	6.76																**52.0**		**238.4**		***6***

Q5 HEC-HMS RESULTS FOR LIONS DEN PRE AND POST DEVELOPMENT CONDITIONS

Project: Lions Den Simulation Run: Q5

Start of Run: 01Jan2025, 00:00 Basin Model: EX and PR COND
End of Run: 02Jan2025, 00:01 Meteorologic Model: Q5
Compute Time: 19Dec2025, 14:55:12 Control Specifications: Control 1

Show Elements: Initial Selection Volume Units: IN ACRE-FT Sorting: Watershed Explorer

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Basin OS-1	0.9	36.6	1 January 2025, 13:03	0.19

Q100 HEC-HMS RESULTS FOR LIONS DEN PRE AND POST DEVELOPMENT CONDITIONS

Project: Lions Den Simulation Run: Q100-24 HR

Start of Run: 01Jan2025, 00:00 Basin Model: EX and PR COND
End of Run: 02Jan2025, 00:01 Meteorologic Model: Q100
Compute Time: 19Dec2025, 14:56:14 Control Specifications: Control 1

Show Elements: Initial Selection Volume Units: IN ACRE-FT Sorting: Watershed Explorer

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Basin OS-1	0.9	157.4	1 January 2025, 13:11	0.81

Rational Method - Proposed Conditions

Project Name:	LIONS DEN SUBDIVISION
Project Location:	12120 CASEY LANE
Designer	JTS
Notes:	Proposed Condition

Average Channel Velocity	4.00	ft/s	(If specific channel vel is used, this will be ignored)
Average Slope for Initial Flow	0.04	ft/ft	(If Elevations are used, this will be ignored)

Channel Flow Type Key

Heavy Meadow	2
Tillage/Field	3
Short Pasture and Lawns	4
Nearly Bare Ground	5
Grassed Waterway	6
Paved Areas	7

		Area				Rational 'C' Values									Flow Lengths								Tc	Rainfall Intensity & Rational Flow Rate				HEC-HMS VALUES		
						100%			0%																						
Sub-basin	**Comments**		acres	Sq. Mi.	Soil Group	100% Impervious C5	100% Impervious C100	100% Impervious Area (SF)	0% Impervious C5	0% Impervious C100	0% Impervious Area	Composite C5	Composite C100	Percent Impervious	Initial ft	True Initial Length ft	Channel ft	True Channel Length ft	Average (decimal) Slope	Initial Tc (min)	Average (%) Slope	Channel Flow Type (See Key above) Ground Type	Velocity (ft/s)	Channel Tc (min)	Total (min)	i5 in/hr	Q5 cfs	i100 in/hr	Q100 cfs	Q5 cfs	Q100 cfs	**Sub-basin**
OS-1		24923723	572.17	0.8940	B	0.90	0.96	1744661	0.08	0.35	23179062	0.14	0.39	7.00		0		0											**36.6**	**157.4**	***OS-1***
OS-2		1204014	27.64	0.0432	B	0.90	0.96	84281	0.08	0.35	1119733	0.14	0.39	7.00	300	300	2060	2060	0.05	17.21	5.3	4	1.61	21.30	38.51	2.11	**8.1**	3.53	**38.7**			***OS-2***
OS-3		203240	4.67	0.0073	B	0.90	0.96	14227	0.08	0.35	189013	0.14	0.39	7.00	300	300	0	0	0.22	10.76	21.7	4	3.26	0.00	10.75	4.02	**2.6**	6.75	**12.5**			***OS-3***
PR-1		1344504	30.87	0.0482	B	0.90	0.96	94115	0.08	0.35	1250389	0.14	0.39	7.00	300	300	2948	2948	0.04	18.91	4.0	4	1.40	35.10	54.00	1.60	**6.8**	2.68	**32.8**			***PR-1***
PR-2		24061	0.55	0.0009	B	0.90	0.96	1684	0.08	0.35	22377	0.14	0.39	7.00	86	300	0	0	0.04	10.58	3.5	4	1.31	0.00	10.58	4.04	**0.3**	6.79	**1.5**			***PR-2***
PR-3		127765	2.93	0.0046	B	0.90	0.96	8944	0.08	0.35	118822	0.14	0.39	7.00	300	300	290	290	0.04	18.31	4.4	4	1.47	3.29	21.60	2.97	**1.2**	4.99	**5.8**			***PR-3***
PR-4		27469	0.63	0.0010	B	0.90	0.96	1923	0.08	0.35	25546	0.14	0.39	7.00	250	300	0	0	0.10	12.55	10.4	4	2.26	0.00	12.55	3.79	**0.3**	6.36	**1.6**			***PR-4***
PR-5		5281	0.12	0.0002	B	0.90	0.96	370	0.08	0.35	4911	0.14	0.39	7.00	80	300	0	0	0.16	6.11	16.3	4	2.83	0.00	6.11	4.87	**0.1**	8.17	**0.4**			***PR-5***
DESIGN POINTS	***Sub-basins***															0		0													***DESIGN POINTS***
1	***OS-1***	24923723	572.17	0.8940	B	0.90	0.96	1744661	0.08	0.35	23179062	0.14	0.39	7.00		0		0											**36.6**	**157.4**	***1***
2	***OS-2***	1204014	27.64	0.0432	B	0.90	0.96	84281	0.08	0.35	1119733	0.14	0.39	7.00	300	300	2060	2060	0.05	17.21	5.3	4	1.61	21.30	38.51	2.11	**8.1**	3.53	**38.7**			***2***
3	***PR-2***	24061	0.55	0.0009	B	0.90	0.96	1684	0.08	0.35	22377	0.14	0.39	7.00	86	300	0	0	0.04	10.58	3.5	4	1.31	0.00	10.58	4.04	**0.3**	6.79	**1.5**			***3***
4	***PR-3***	127765	2.93	0.0046	B	0.90	0.96	8944	0.08	0.35	118822	0.14	0.39	7.00	300	300	290	290	0.04	18.31	4.4	4	1.47	3.29	21.60	2.97	**1.2**	4.99	**5.8**			***4***
5	***OS-3***	203240	4.67	0.0073	B	0.90	0.96	14227	0.08	0.35	189013	0.14	0.39	7.00	300	300	0	0	0.22	10.76	21.7	4	3.26	0.00	10.75	4.02	**2.6**	6.75	**12.5**			***5***
6	***OS-1, OS-2, OS-3, PR-1***	27675481	635.34	0.9927	B	0.90	0.96	1937284	0.08	0.35	25738197	0.14	0.39	7.00		0		0									**54.1**		**241.3**		***6***

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, Dec 22 2025

Existing Drainageway

User-defined

Invert Elev (ft)	= 7088.00
Slope (%)	= 4.00
N-Value	= 0.100

Calculations

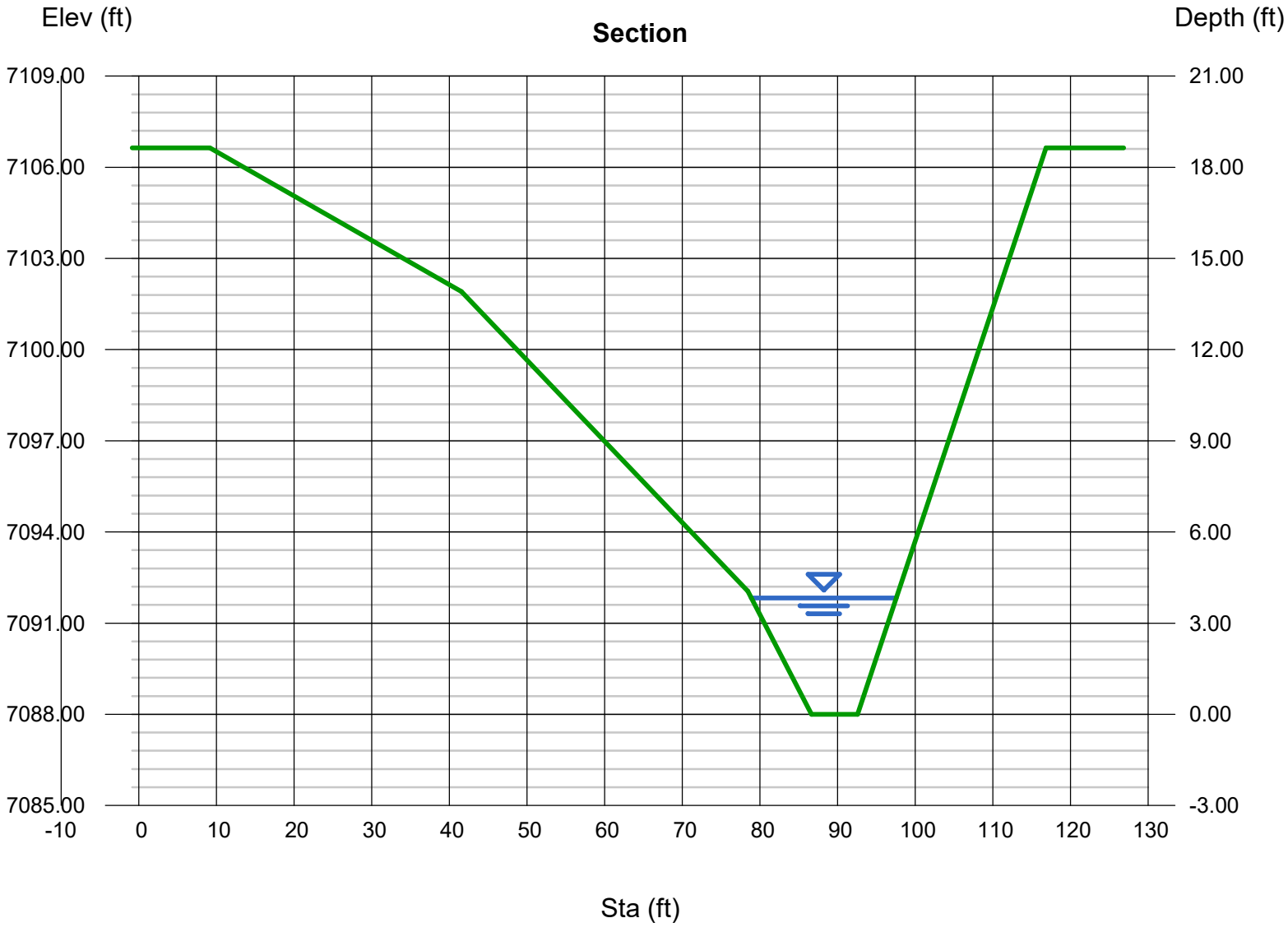
Compute by:	Known Q
Known Q (cfs)	= 241.30

Highlighted

Depth (ft)	= 3.83
Q (cfs)	= 241.30
Area (sqft)	= 47.13
Velocity (ft/s)	= 5.12
Wetted Perim (ft)	= 20.87
Crit Depth, Yc (ft)	= 2.85
Top Width (ft)	= 18.67
EGL (ft)	= 4.24

(Sta, El, n)-(Sta, El, n)...

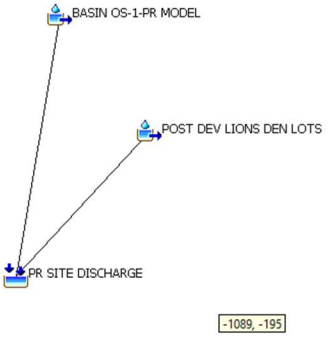
(9.16, 7106.64)-(41.56, 7101.91, 0.100)-(78.45, 7092.05, 0.100)-(86.64, 7088.00, 0.100)-(92.58, 7088.00, 0.100)-(116.84, 7106.64, 0.100)

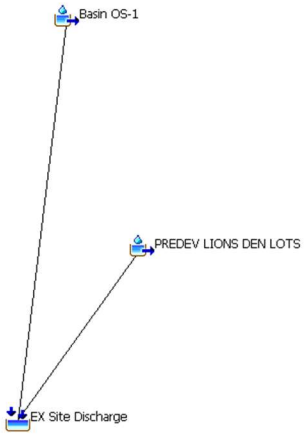


EXISTING & PROPOSED CONDITIONS - HEC-HMS Inputs

																Flow Lengths				INITIAL		CHANNEL					
																Initial	True Initial Length	Channel	True Channel Length	Average	Initial	Average	Velocity	Channel	Time of Concentration	Time of Concentration	Lag Time
Basins	Area (SF)	Area (AC)	Area (MI2)	Land Type	AREA (sq. ft.)	CN	%I	Land Type	AREA (sq. ft.)	CN	%I	Weighted CN	Weighted %I	Ia		ft	ft	ft	ft	Slope	Tt (hr)	Slope	(ft/s)	Tt (hr)	Tc (hr)	Tc (min)	t lag (min)
OS1	24923723	572.2	0.8940	Impervious	1744661	98	100%	Arid Range Land - Oak/Aspen Good	23179062	30	0%	34.76	7.0%	1.88		300	300	6792	6792	0.059	1.20	0.059	3.9	0.48	1.68	100.99	60.6

HEC-HMS MODEL SUMMARY





Basin Name: EX and PR COND
Element Name: Basin OS-1

Downstream:	EX Site Discharge
*Area (MI2)	0.894
Latitude Degrees:	
Longitude Degrees:	
Discretization Method:	--None---
Canopy Method:	--None--
Snow Method:	--None--
Surface Method:	--None--
Loss Method:	SCS Curve Number
Transform Method:	SCS Unit Hydrograph
Baseflow Method:	--None--

Basin Name: EX and PR COND
Element Name: Basin OS-1

Initial Abstraction (IN)	1.88
*Curve Number:	34.76
*Impervious (%)	7

Basin Name: EX and PR COND
Element Name: Basin OS-1

Graph Type:	Standard (PRF 484)
*Lag Time (MIN)	60.6

Basin Name: EX and PR COND
Element Name: BASIN OS-1-PR MODEL

Downstream:	PR SITE DISCHARGE
*Area (MI2)	0.894
Latitude Degrees:	
Longitude Degrees:	
Discretization Method:	--None---
Canopy Method:	--None--
Snow Method:	--None--
Surface Method:	--None--
Loss Method:	SCS Curve Number
Transform Method:	SCS Unit Hydrograph
Baseflow Method:	--None--

Basin Name: EX and PR COND
Element Name: BASIN OS-1-PR MODEL

Initial Abstraction (IN)	2.19
*Curve Number:	31.36
*Impervious (%)	2

Basin Name: EX and PR COND
Element Name: BASIN OS-1-PR MODEL

Graph Type:	Standard (PRF 484)
*Lag Time (MIN)	60.9

Project: Lions Den Simulation Run: Q5

Start of Run: 01Jan2025, 00:00
End of Run: 02Jan2025, 00:01
Compute Time: 19Dec2025, 14:55:12

Basin Model: EX and PR COND
Meteorologic Model: Q5
Control Specifications: Control 1

Show Elements: Initial Selection Volume Units: (•) IN ( ) ACRE-FT Sorting: Watershed Explorer

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Basin OS-1	0.9	36.6	1 January 2025, 13:03	0.19

Project: Lions Den Simulation Run: Q100-24 HR

Start of Run: 01Jan2025, 00:00
End of Run: 02Jan2025, 00:01
Compute Time: 19Dec2025, 14:56:14

Basin Model: EX and PR COND
Meteorologic Model: Q100
Control Specifications: Control 1

Show Elements: Initial Selection Volume Units: (•) IN ( ) ACRE-FT Sorting: Watershed Explorer

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Basin OS-1	0.9	157.4	1 January 2025, 13:11	0.81

APPENDIX B

STANDARD DESIGN CHARTS AND TABLES

Table 6-6. Runoff Coefficients for Rational Method
(Source: UDFCD 2001)

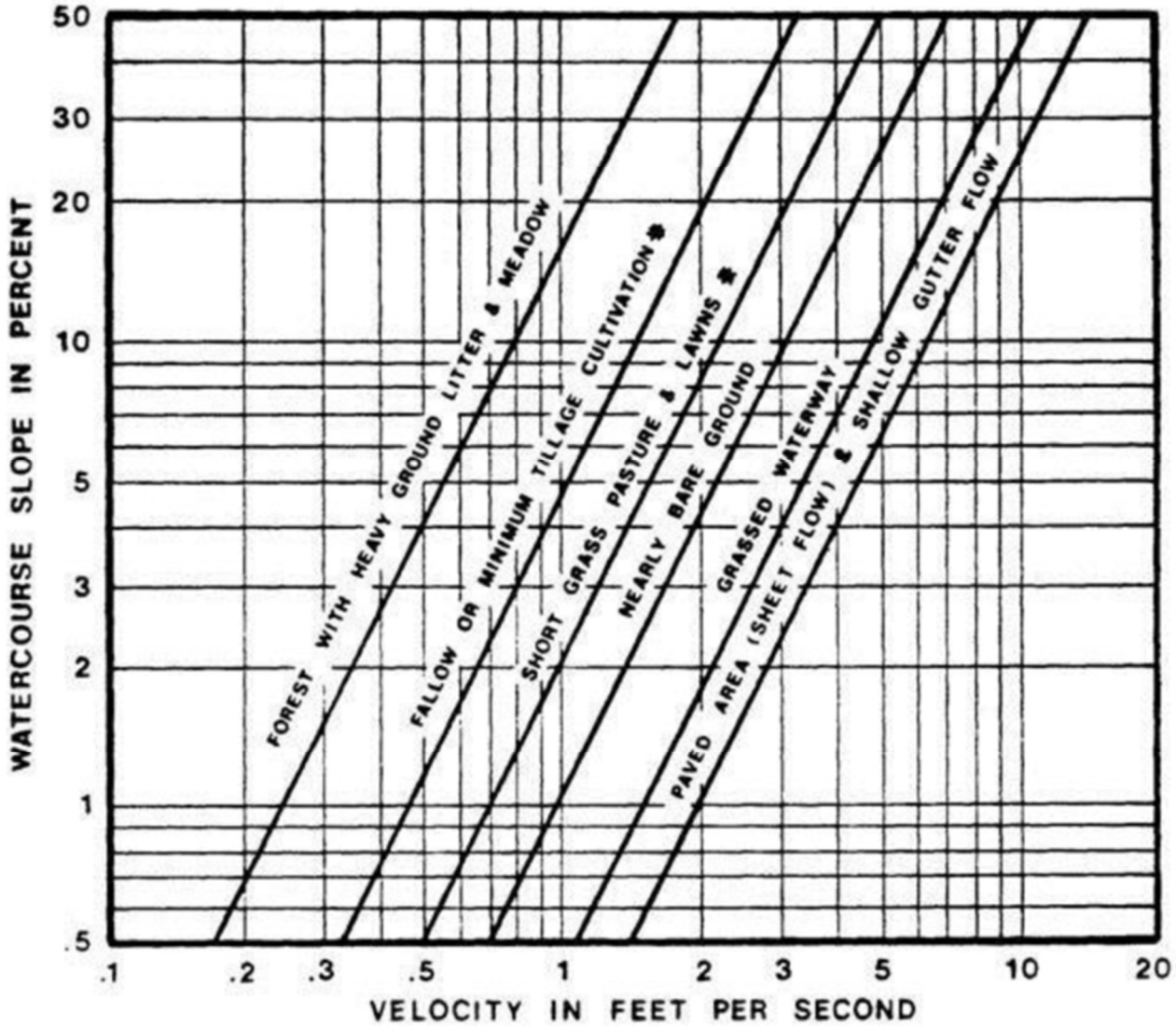
Land Use or Surface Characteristics	Percent Impervious	Runoff Coefficients											
		2-year		5-year		10-year		25-year		50-year		100-year	
		HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D
Business													
Commercial Areas	95	0.79	0.80	0.81	0.82	0.83	0.84	0.85	0.87	0.87	0.88	0.88	0.89
Neighborhood Areas	70	0.45	0.49	0.49	0.53	0.53	0.57	0.58	0.62	0.60	0.65	0.62	0.68
Residential													
1/8 Acre or less	65	0.41	0.45	0.45	0.49	0.49	0.54	0.54	0.59	0.57	0.62	0.59	0.65
1/4 Acre	40	0.23	0.28	0.30	0.35	0.36	0.42	0.42	0.50	0.46	0.54	0.50	0.58
1/3 Acre	30	0.18	0.22	0.25	0.30	0.32	0.38	0.39	0.47	0.43	0.52	0.47	0.57
1/2 Acre	25	0.15	0.20	0.22	0.28	0.30	0.36	0.37	0.46	0.41	0.51	0.46	0.56
1 Acre	20	0.12	0.17	0.20	0.26	0.27	0.34	0.35	0.44	0.40	0.50	0.44	0.55
Industrial													
Light Areas	80	0.57	0.60	0.59	0.63	0.63	0.66	0.66	0.70	0.68	0.72	0.70	0.74
Heavy Areas	90	0.71	0.73	0.73	0.75	0.75	0.77	0.78	0.80	0.80	0.82	0.81	0.83
Parks and Cemeteries	7	0.05	0.09	0.12	0.19	0.20	0.29	0.30	0.40	0.34	0.46	0.39	0.52
Playgrounds	13	0.07	0.13	0.16	0.23	0.24	0.31	0.32	0.42	0.37	0.48	0.41	0.54
Railroad Yard Areas	40	0.23	0.28	0.30	0.35	0.36	0.42	0.42	0.50	0.46	0.54	0.50	0.58
Undeveloped Areas													
Historic Flow Analysis--- Greenbelts, Agriculture	2	0.03	0.05	0.09	0.16	0.17	0.26	0.26	0.38	0.31	0.45	0.36	0.51
Pasture/Meadow	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50
Forest	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50
Exposed Rock	100	0.89	0.89	0.90	0.90	0.92	0.92	0.94	0.94	0.95	0.95	0.96	0.96
Offsite Flow Analysis (when landuse is undefined)	45	0.26	0.31	0.32	0.37	0.38	0.44	0.44	0.51	0.48	0.55	0.51	0.59
Streets													
Paved	100	0.89	0.89	0.90	0.90	0.92	0.92	0.94	0.94	0.95	0.95	0.96	0.96
Gravel	80	0.57	0.60	0.59	0.63	0.63	0.66	0.66	0.70	0.68	0.72	0.70	0.74
Drive and Walks	100	0.89	0.89	0.90	0.90	0.92	0.92	0.94	0.94	0.95	0.95	0.96	0.96
Roofs	90	0.71	0.73	0.73	0.75	0.75	0.77	0.78	0.80	0.80	0.82	0.81	0.83
Lawns	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50

3.2 Time of Concentration

One of the basic assumptions underlying the Rational Method is that runoff is a function of the average rainfall rate during the time required for water to flow from the hydraulically most remote part of the drainage area under consideration to the design point. However, in practice, the time of concentration can be an empirical value that results in reasonable and acceptable peak flow calculations.

For urban areas, the time of concentration (t_c) consists of an initial time or overland flow time (t_i) plus the travel time (t_t) in the storm sewer, paved gutter, roadside drainage ditch, or drainage channel. For non-urban areas, the time of concentration consists of an overland flow time (t_i) plus the time of travel in a concentrated form, such as a swale or drainageway. The travel portion (t_t) of the time of concentration can be estimated from the hydraulic properties of the storm sewer, gutter, swale, ditch, or drainageway. Initial time, on the other hand, will vary with surface slope, depression storage, surface cover, antecedent rainfall, and infiltration capacity of the soil, as well as distance of surface flow. The time of concentration is represented by Equation 6-7 for both urban and non-urban areas.

Figure 6-25. Estimate of Average Concentrated Shallow Flow



El Paso County Drainage Basin Fees

Resolution No. 24-436

Basin Number	Receiving Waters	Year Studied	Drainage Basin Name	2025 Drainage Fee (per Impervious Acre)	2025 Bridge Fee (per Impervious Acre)
Drainage Basins with DBPS's:					
CHMS0200	Chico Creek	2013	Haegler Ranch	$15,019	$2,217
CHWS1200	Chico Creek	2001	Bennett Ranch	$16,814	$6,450
CHWS1400	Chico Creek	2013	Falcon	$43,094	$5,920
FOFO2000	Fountain Creek	2001	West Fork Jimmy Camp Creek	$18,278	$5,408
FOFO2600	Fountain Creek	1991*	Big Johnson / Crews Gulch	$26,695	$3,447
FOFO2800	Fountain Creek	1988*	Widefield	$26,695	$0
FOFO2900	Fountain Creek	1988*	Security	$26,695	$0
FOFO3000	Fountain Creek	1991*	Windmill Gulch	$26,695	$400
FOFO3100 / FOFO3200	Fountain Creek	1988*	Carson Street / Little Johnson	$16,283	$0
FOFO3400	Fountain Creek	1984*	Peterson Field	$19,254	$1,460
FOFO3600	Fountain Creek	1991*	Fisher's Canyon	$26,695	$0
FOFO4000	Fountain Creek	1996	Sand Creek	$27,554	$11,270
FOFO4200	Fountain Creek	1977	Spring Creek	$13,845	$0
FOFO4600	Fountain Creek	1984*	Southwest Area	$26,695	$0
FOFO4800	Fountain Creek	1991	Bear Creek	$26,695	$1,460
FOFO5800	Fountain Creek	1964	Camp Creek	$2,958	$0
FOMO1000	Monument Creek	1981	Douglas Creek	$16,788	$371
FOMO1200	Monument Creek	1977	Templeton Gap	$17,234	$400
FOMO2000	Monument Creek	1971	Pulpit Rock	$8,852	$0
FOMO2200	Monument Creek	1994	Cottonwood Creek / S. Pine	$26,695	$1,460
FOMO2400	Monument Creek	1966	Dry Creek	$21,074	$763
FOMO3600	Monument Creek	1989*	Black Squirrel Creek	$12,120	$763
FOMO3700	Monument Creek	1987*	Middle Tributary	$22,276	$0
FOMO3800	Monument Creek	1987*	Monument Branch	$26,695	$0
FOMO4000	Monument Creek	1996	Smith Creek	$10,883	$1,460
FOMO4200	Monument Creek	1989*	Black Forest	$26,695	$727
FOMO5200	Monument Creek	1993*	Dirty Woman Creek	$26,695	$1,460
FOMO5300	Fountain Creek	1993*	Crystal Creek	$26,695	$1,460
Miscellaneous Drainage Basins: [1]					
CHBS0800	Chico Creek		Book Ranch	$25,048	$3,626
CHEC0400	Chico Creek		Upper East Chico	$13,646	$395
CHWS0200	Chico Creek		Telephone Exchange	$14,993	$351
CHWS0400	Chico Creek		Livestock Company	$24,696	$294
CHWS0600	Chico Creek		West Squirrel	$12,873	$5,342
CHWS0800	Chico Creek		Solberg Ranch	$26,695	$0
FOFO1200	Fountain Creek		Crooked Canyon	$8,059	$0
FOFO1400	Fountain Creek		Calhan Reservoir	$6,729	$392
FOFO1600	Fountain Creek		Sand Canyon	$4,862	$0
FOFO2000	Fountain Creek		Jimmy Camp Creek[3]	$26,695	$1,249
FOFO2200	Fountain Creek		Fort Carson	$21,074	$763
FOFO2700	Fountain Creek		West Little Johnson	$1,759	$0
FOFO3800	Fountain Creek		Stratton	$12,804	$573
FOFO5000	Fountain Creek		Midland	$21,074	$763
FOFO6000	Fountain Creek		Palmer Trail	$21,074	$763
FOFO6800	Fountain Creek		Black Canyon	$21,074	$763
FOMO4600	Monument Creek		Beaver Creek	$15,959	$0
FOMO3000	Monument Creek		Kettle Creek	$14,416	$0
FOMO3400	Monument Creek		Elkhorn	$2,422	$0
FOMO5000	Monument Creek		Monument Rock	$11,571	$0
FOMO5400	Monument Creek		Palmer Lake	$18,501	$0
FOMO5600	Monument Creek		Raspberry Mountain	$6,223	$0
PLPL0200	Monument Creek		Bald Mountain	$13,262	$0
Interim Drainage Basins: [2]					
FOFO1800	Fountain Creek		Little Fountain Creek	$3,413	$0
FOMO4400	Monument Creek		Jackson Creek	$10,566	$0
FOMO4800	Monument Creek		Teachout Creek	$7,337	$1,103

1. The miscellaneous drainage fee previous to September 1999 resolution was the average of all drainage fees for basins with Basin Planning Studies performed within the last 14 years.

2. Interim Drainage Fees are based upon draft Drainage Basin Planning Studies or the Drainage Basin Identification and Fee Estimation Report. (Best available information suitable for setting a fee.)

EPC Stormwater Management — *Joshua Palmer, P.E.*

APPENDIX C

REPORT REFERENCES

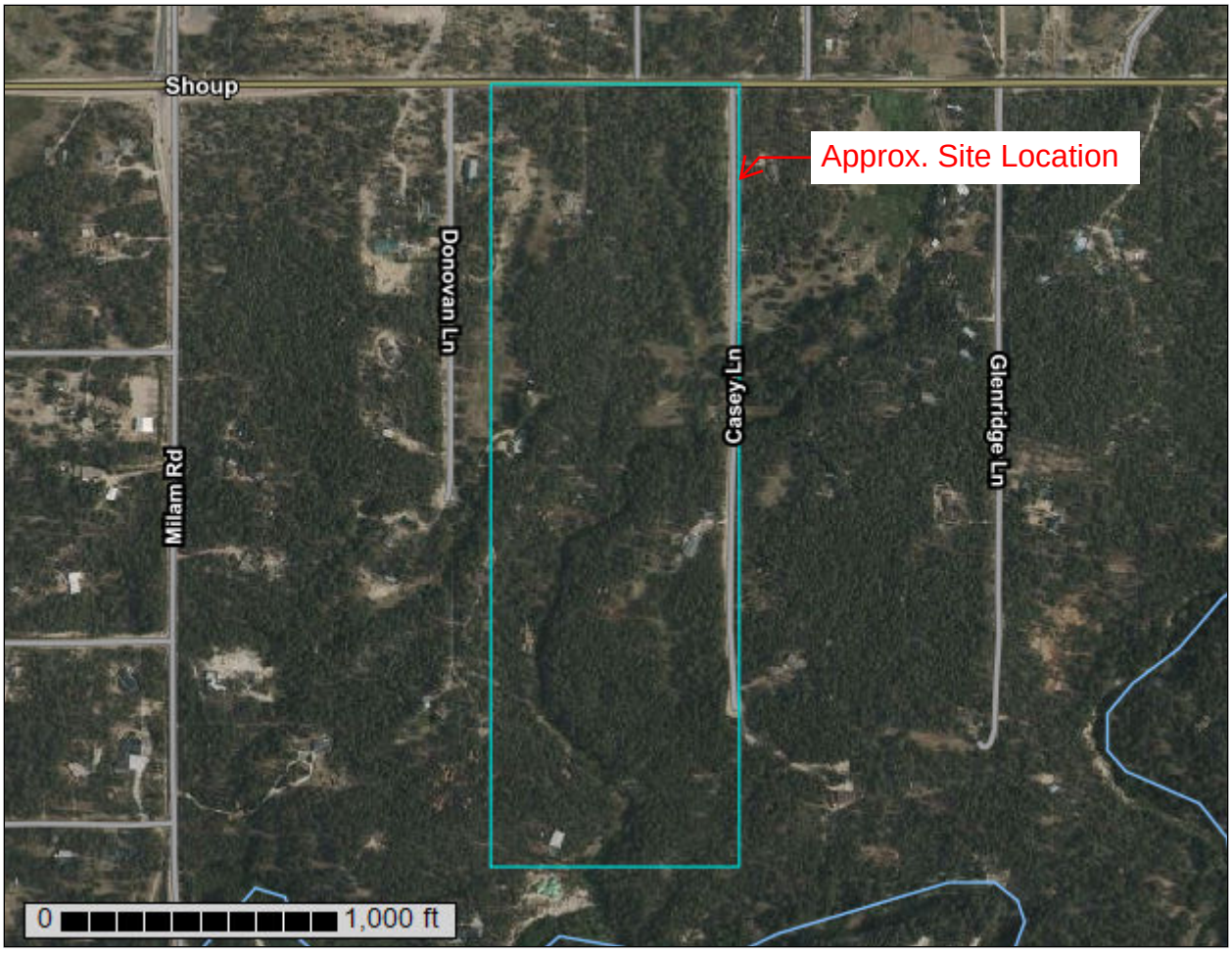
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for El Paso County Area, Colorado



July 2, 2025

Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

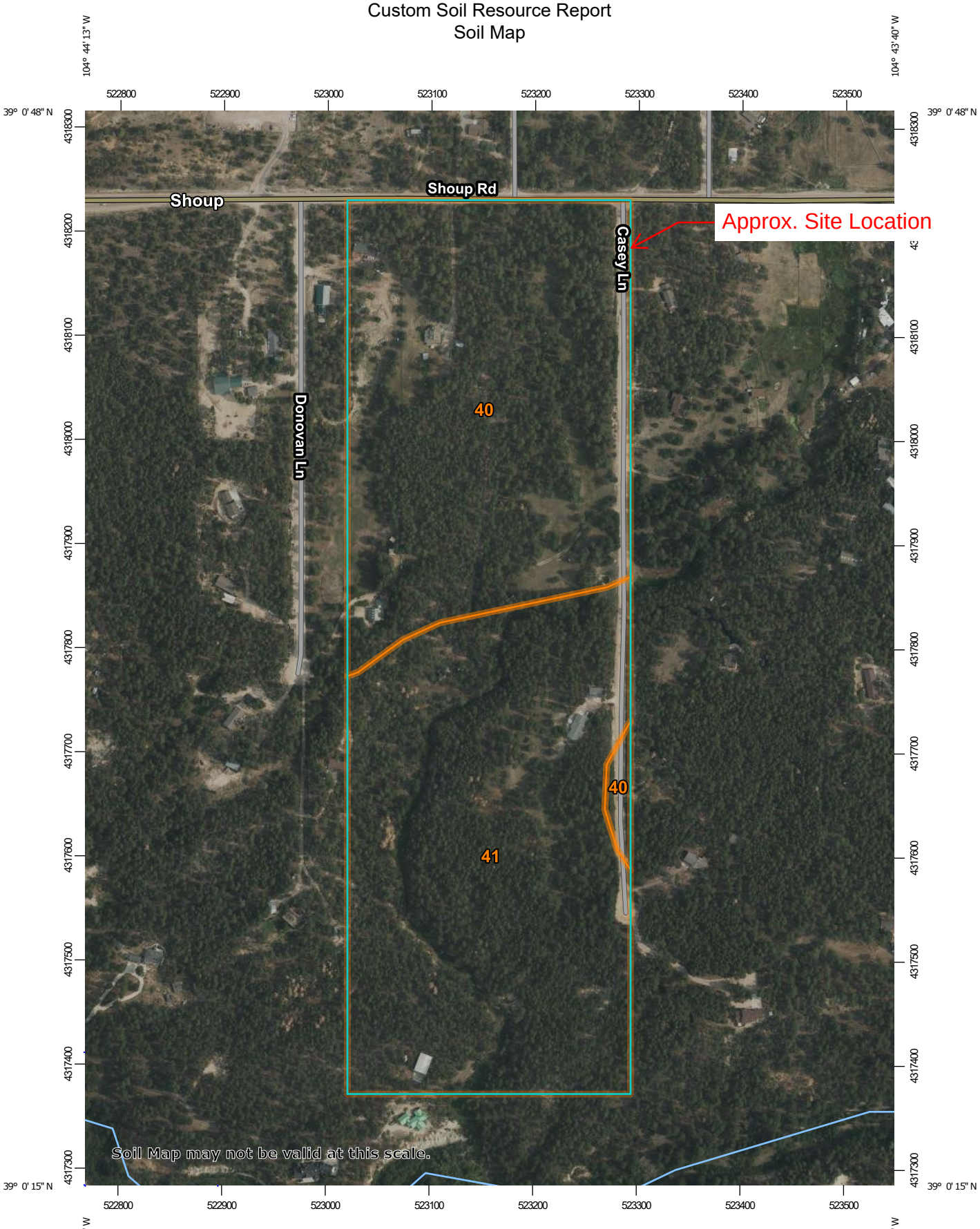
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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

Soil Map

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

Custom Soil Resource Report
Soil Map



Map Scale: 1:5,030 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

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

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 22, Sep 3, 2024

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

Date(s) aerial images were photographed: Jul 23, 2024—Aug 4, 2024

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
40	Kettle gravelly loamy sand, 3 to 8 percent slopes	27.7	47.7%
41	Kettle gravelly loamy sand, 8 to 40 percent slopes	30.5	52.3%
Totals for Area of Interest		**58.2**	**100.0%**

Map Unit Descriptions

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

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

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

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

onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

El Paso County Area, Colorado

40—Kettle gravelly loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 368g
Elevation: 7,000 to 7,700 feet
Farmland classification: Not prime farmland

Map Unit Composition

Kettle and similar soils: 85 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kettle

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from arkose

Typical profile

E - 0 to 16 inches: gravelly loamy sand
Bt - 16 to 40 inches: gravelly sandy loam
C - 40 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F048AY908CO - Mixed Conifer
Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Other soils

Percent of map unit:

Hydric soil rating: No

41—Kettle gravelly loamy sand, 8 to 40 percent slopes

Map Unit Setting

National map unit symbol: 368h
Elevation: 7,000 to 7,700 feet
Farmland classification: Not prime farmland

Map Unit Composition

Kettle and similar soils: 85 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kettle

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from arkose

Typical profile

E - 0 to 16 inches: gravelly loamy sand
Bt - 16 to 40 inches: gravelly sandy loam
C - 40 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 8 to 40 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: F048AY908CO - Mixed Conifer
Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit: 5 percent

Landform: Depressions
Hydric soil rating: Yes

Other soils

Percent of map unit:
Hydric soil rating: No

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NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the **North American Vertical Datum of 1988 (NAVD88)**. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was provided in digital format by El Paso County, Colorado Springs Utilities, City of Fountain, Bureau of Land Management, National Oceanic and Atmospheric Administration, United States Geological Survey, and Anderson Consulting Engineers, Inc. These data are current as of 2006.

This map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles and Floodway Data Tables if applicable, in the FIS report. As a result, the profile baselines may deviate significantly from the new base map channel representation and may appear outside of the floodplain.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact **FEMA Map Service Center** (MSC) via the FEMA Map Information eXchange (FMIX) 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The MSC may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

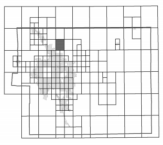
If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

El Paso County Vertical Datum Offset Table

Flooding Source	Vertical Datum Offset (ft)

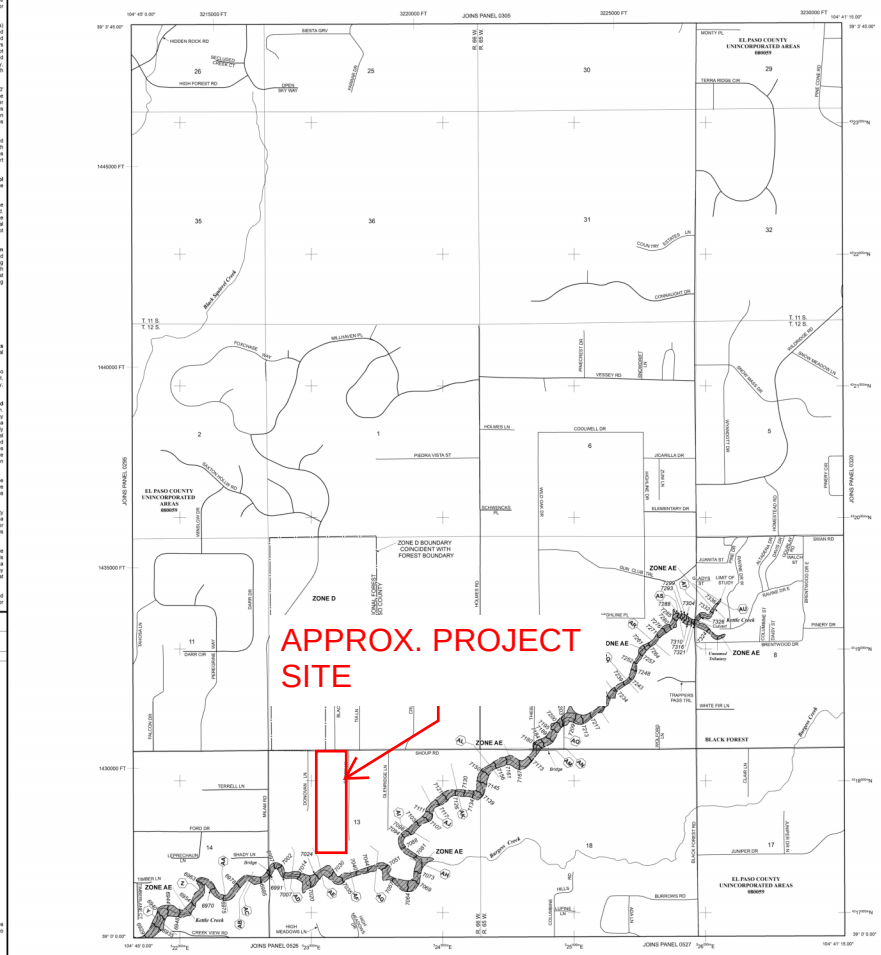
REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY FOR STREAM BY STREAM VERTICAL DATUM CONVERSION INFORMATION

Panel Location Map



This Digital Flood Insurance Rate Map (DFIRM) was produced through a Cooperating Technical Partner (CTP) agreement between the State of Colorado Water Conservation Board (CWCB) and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard information and resources are available from local communities and the Colorado Water Conservation Board.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area Formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D Boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

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

- A — A — Cross section line
- 23 — 23 — Transect line
- 87° 07' 30.00" / 32° 22' 30.00" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000 FT — 1000-meter Universal Transverse Mercator grid ticks, zone 13
- 4000000 FT — 5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

PANEL 0315G

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 315 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO COUNTY	080059	0315	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
08041C0315G

MAP REVISED
DECEMBER 7, 2018

Federal Emergency Management Agency

NOAA Atlas 14, Volume 8, Version 2
Location name: Colorado Springs, Colorado, USA*
Latitude: 39.0107°, Longitude: -104.7317°
Elevation: 7144 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.237** (0.195-0.289)	**0.290** (0.238-0.355)	**0.383** (0.313-0.470)	**0.464** (0.378-0.572)	**0.583** (0.460-0.750)	**0.680** (0.523-0.885)	**0.782** (0.579-1.04)	**0.891** (0.631-1.22)	**1.04** (0.708-1.46)	**1.16** (0.766-1.65)
10-min	**0.346** (0.285-0.424)	**0.425** (0.349-0.520)	**0.560** (0.459-0.688)	**0.679** (0.553-0.838)	**0.854** (0.674-1.10)	**0.996** (0.765-1.30)	**1.15** (0.848-1.53)	**1.30** (0.924-1.78)	**1.53** (1.04-2.14)	**1.70** (1.12-2.42)
15-min	**0.423** (0.348-0.517)	**0.518** (0.426-0.634)	**0.683** (0.559-0.838)	**0.828** (0.674-1.02)	**1.04** (0.822-1.34)	**1.22** (0.933-1.58)	**1.40** (1.04-1.86)	**1.59** (1.13-2.18)	**1.86** (1.26-2.62)	**2.08** (1.37-2.95)
30-min	**0.602** (0.496-0.737)	**0.738** (0.606-0.903)	**0.971** (0.795-1.19)	**1.18** (0.958-1.45)	**1.48** (1.17-1.90)	**1.72** (1.33-2.25)	**1.98** (1.47-2.64)	**2.26** (1.60-3.09)	**2.64** (1.80-3.71)	**2.95** (1.94-4.18)
60-min	**0.774** (0.637-0.947)	**0.930** (0.764-1.14)	**1.21** (0.991-1.48)	**1.47** (1.19-1.81)	**1.86** (1.47-2.40)	**2.18** (1.68-2.86)	**2.54** (1.88-3.40)	**2.92** (2.07-4.01)	**3.47** (2.36-4.89)	**3.91** (2.58-5.55)
2-hr	**0.946** (0.783-1.15)	**1.12** (0.927-1.36)	**1.45** (1.19-1.76)	**1.76** (1.44-2.15)	**2.23** (1.79-2.89)	**2.64** (2.05-3.44)	**3.09** (2.31-4.12)	**3.58** (2.56-4.90)	**4.29** (2.94-6.02)	**4.87** (3.23-6.87)
3-hr	**1.04** (0.868-1.26)	**1.22** (1.01-1.48)	**1.56** (1.29-1.89)	**1.89** (1.55-2.30)	**2.42** (1.95-3.13)	**2.88** (2.25-3.76)	**3.39** (2.56-4.53)	**3.96** (2.86-5.42)	**4.80** (3.31-6.73)	**5.49** (3.66-7.71)
6-hr	**1.23** (1.03-1.48)	**1.42** (1.18-1.70)	**1.79** (1.49-2.16)	**2.16** (1.79-2.62)	**2.78** (2.26-3.59)	**3.32** (2.62-4.32)	**3.94** (2.99-5.24)	**4.63** (3.36-6.31)	**5.65** (3.94-7.88)	**6.50** (4.37-9.08)
12-hr	**1.44** (1.21-1.72)	**1.67** (1.40-1.99)	**2.11** (1.76-2.52)	**2.54** (2.11-3.05)	**3.24** (2.65-4.14)	**3.86** (3.06-4.97)	**4.55** (3.48-5.99)	**5.32** (3.89-7.19)	**6.46** (4.52-8.94)	**7.40** (5.00-10.3)
24-hr	**1.69** (1.43-2.00)	**1.98** (1.67-2.34)	**2.51** (2.12-2.98)	**3.02** (2.52-3.60)	**3.80** (3.12-4.79)	**4.48** (3.56-5.69)	**5.21** (4.00-6.78)	**6.02** (4.42-8.04)	**7.19** (5.06-9.85)	**8.15** (5.55-11.2)
2-day	**1.97** (1.68-2.31)	**2.33** (1.98-2.75)	**2.98** (2.52-3.52)	**3.56** (3.00-4.22)	**4.42** (3.63-5.49)	**5.14** (4.11-6.46)	**5.91** (4.55-7.60)	**6.74** (4.96-8.89)	**7.90** (5.59-10.7)	**8.83** (6.06-12.1)
3-day	**2.17** (1.85-2.54)	**2.56** (2.18-3.00)	**3.25** (2.76-3.82)	**3.86** (3.27-4.56)	**4.78** (3.93-5.90)	**5.53** (4.43-6.90)	**6.33** (4.89-8.10)	**7.18** (5.31-9.44)	**8.39** (5.96-11.3)	**9.35** (6.44-12.7)
4-day	**2.33** (2.00-2.72)	**2.74** (2.34-3.20)	**3.45** (2.94-4.04)	**4.08** (3.46-4.81)	**5.03** (4.15-6.18)	**5.81** (4.66-7.23)	**6.63** (5.14-8.46)	**7.52** (5.58-9.85)	**8.76** (6.24-11.8)	**9.76** (6.74-13.3)
7-day	**2.75** (2.37-3.19)	**3.18** (2.73-3.69)	**3.93** (3.37-4.58)	**4.60** (3.92-5.39)	**5.61** (4.65-6.85)	**6.44** (5.20-7.96)	**7.32** (5.70-9.28)	**8.26** (6.16-10.8)	**9.59** (6.87-12.8)	**10.7** (7.41-14.4)
10-day	**3.11** (2.69-3.60)	**3.58** (3.08-4.14)	**4.38** (3.77-5.08)	**5.10** (4.36-5.94)	**6.16** (5.12-7.49)	**7.03** (5.70-8.66)	**7.96** (6.22-10.0)	**8.95** (6.70-11.6)	**10.3** (7.43-13.8)	**11.4** (7.98-15.4)
20-day	**4.16** (3.61-4.77)	**4.76** (4.14-5.47)	**5.79** (5.01-6.66)	**6.67** (5.74-7.71)	**7.93** (6.61-9.51)	**8.93** (7.26-10.9)	**9.97** (7.83-12.4)	**11.1** (8.32-14.2)	**12.5** (9.07-16.6)	**13.7** (9.64-18.3)
30-day	**5.02** (4.38-5.73)	**5.76** (5.02-6.58)	**6.98** (6.06-8.00)	**8.00** (6.90-9.21)	**9.42** (7.86-11.2)	**10.5** (8.58-12.7)	**11.6** (9.16-14.4)	**12.8** (9.64-16.3)	**14.3** (10.4-18.8)	**15.5** (10.9-20.6)
45-day	**6.10** (5.34-6.93)	**7.00** (6.12-7.97)	**8.46** (7.38-9.66)	**9.65** (8.37-11.1)	**11.3** (9.40-13.3)	**12.5** (10.2-14.9)	**13.7** (10.8-16.8)	**14.9** (11.2-18.8)	**16.4** (11.9-21.4)	**17.5** (12.4-23.3)
60-day	**7.01** (6.15-7.95)	**8.05** (7.06-9.14)	**9.71** (8.48-11.0)	**11.0** (9.59-12.6)	**12.8** (10.7-15.0)	**14.1** (11.5-16.8)	**15.3** (12.1-18.7)	**16.5** (12.5-20.8)	**18.1** (13.2-23.4)	**19.2** (13.6-25.4)

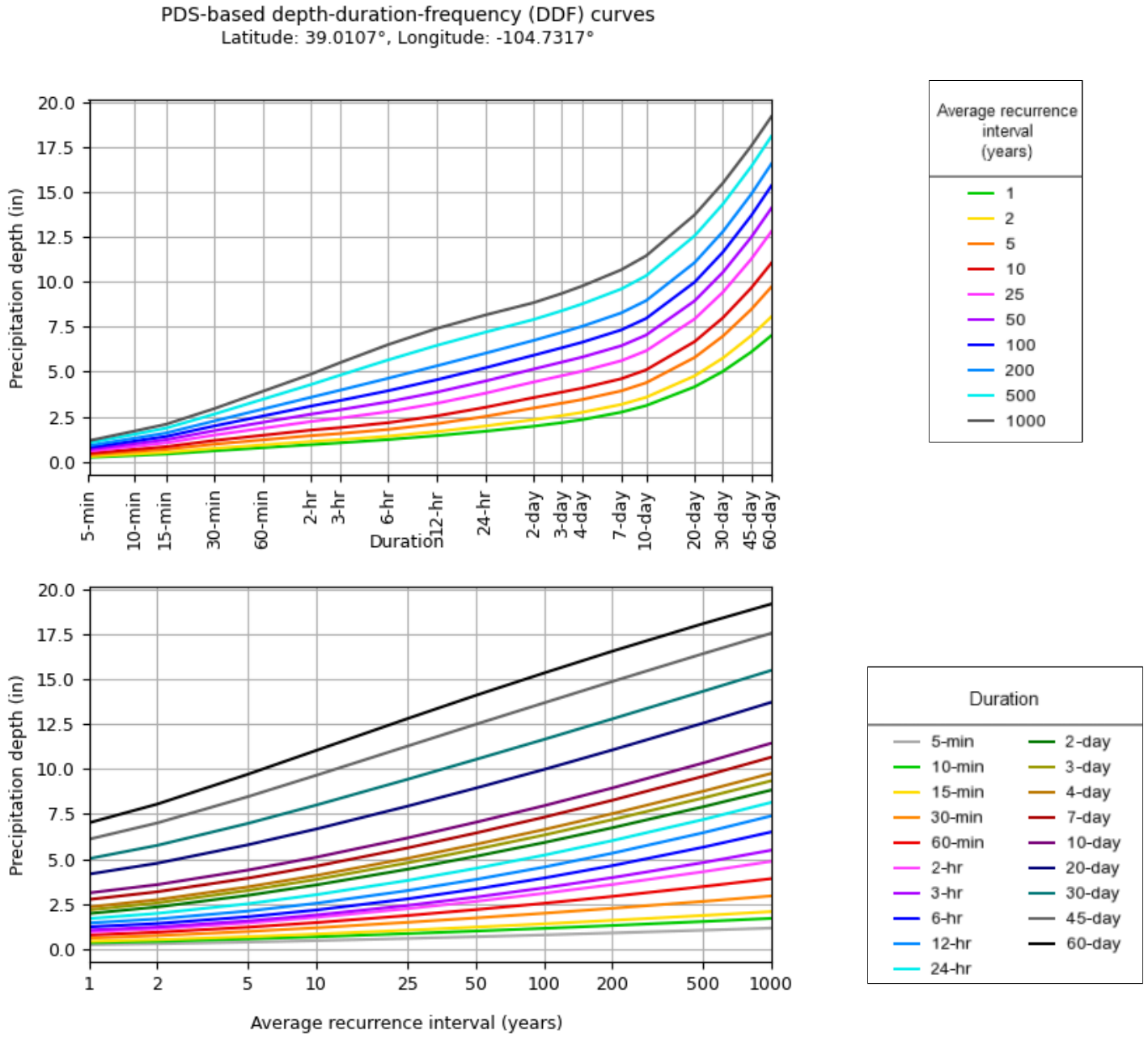
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical



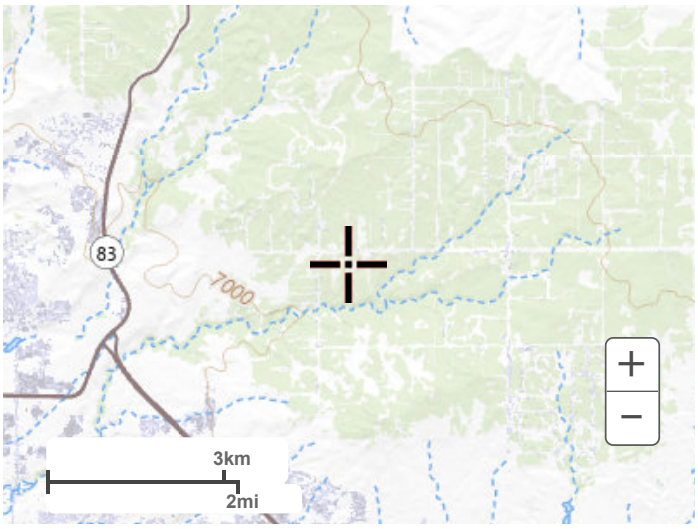
NOAA Atlas 14, Volume 8, Version 2

Created (GMT): Tue Jul 15 19:41:17 2025

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Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

PLAN
SURVEYED: BY
PLOTTED: DATE
NOTE BOOK: GRADES CHECKED:
NO. BY: STRUCTURE NOTATIONS (GREY):

SHOUP ROAD

LOT 1 | LOT 2 | LOT 3 | LOT 4 | LOT 5 | LOT 6 | LOT 7

25' RADIUS
10'x48' C.M.P. @ 2% Slope
378.00'
5+00
STA 8+30
1+00
CASEY LANE
S 0° 09' 09" E
200.00'
1+30
1+87 - 78"x48" C.M.P. @ 6%
STA 13+30
1st 90
378.00'
20+90
278.00'
21+66
1-18"x60' C.M.P. @ 8.43%
LOCATION OF CULVERT
110.00'
411.59
30'
30'
STA 22+18
EL=12.0
410.32'
STA 0+00
25' RADIUS
850'

NORTH
SCALE: HORIZ: 1" = 100'
VERT: 1" = 10'

PERMINENT SLOPE, DRAINAGE & MAINT. ESMT TO EL PASO CO.

NOTE:
1) ALL ROAD CONSTRUCTION WILL BE IN ACCORDANCE WITH EL PASO COUNTY STANDARDS.

TYPICAL ROAD SECTION
NO SCALE

14' | 6' | 3' | 12' | 12' | 3' | 6' | 14'
2% | 2%
'H' | 6:1 | 6:1 | 'H'
6" GRAVEL
35' | 35'
70' R.O.W.

NOTE: 'H' SLOPE HEIGHTS
0' TO 4' = 6:1
4' TO 8' = 4:1
8' TO 12' = 3:1
12' TO 18½' = 2:1

APPROVAL:
EL PASO COUNTY

BY: _____

DATE: _____

CASEY LANE
IN
PINE MOUNTAIN ESTATES

PREPARED BY:
COX SURVEYING CO.
9017 DELTA DR
COLORADO SPRING, CO.

DATE: 2/12/81 | DRAWN: P.P. | CHECKED: D.C.
FIELD: D.C. | FIELD BOOK: |

3) GUARD RAILS MAY BE REQUIRED AT TIME OF CONST.

EXISTING ELEVATIONS

866 | 80.2 | 77.6 | 66.5 | 66.4 | 64.3 | 55.4 | 47.4 | 32.3 | 22.4 | 21.2 | 12.0 | 08.1 | 04.6 | 48.4 | 41.3 | 39.5 | 34.1 | 26.9 | 24.5 | 18 | 09.7

PROFILE
SURVEYED: BY
PLOTTED: DATE
NOTE BOOK: GRADES CHECKED:
NO. BY: STRUCTURE NOTATIONS (GREY): D.C.

STA 0+00 EL=8350
STA 1+00 EL=8400
STA 2+00 EL=8450
STA 3+00 EL=8500
STA 4+00 EL=8550
STA 5+00 EL=8600
STA 6+00 EL=8650
STA 7+00 EL=8700
STA 8+00 EL=8750
STA 9+00 EL=8800
STA 10+00 EL=8850
STA 11+00 EL=8900
STA 12+00 EL=8950
STA 13+00 EL=9000
STA 14+00 EL=9050
STA 15+00 EL=9100
STA 16+00 EL=9150
STA 17+00 EL=9200
STA 18+00 EL=9250
STA 19+00 EL=9300
STA 20+00 EL=9350
STA 21+00 EL=9400
STA 22+00 EL=9450
STA 23+00 EL=9500

200' VC
-4.5%
E=76.8
200' VC (MOD 8.62)
STA 4+00 EL=8550
E=70.0 (MOD 70.62)
18"x60' RCP EL=8550.00 (MOD 8.43%)
-6.0%
500' VC
FLOWLINE MOD 12.5
E=22.5
INSTALL 1-78"x60' C.M.P. @ 6%
FLOWLINE MOD 23.5
E=36.2
350' VC
STA 13+30 EL=9000.00
STA 14+00 EL=9050.00
STA 15+00 EL=9100.00
STA 16+00 EL=9150.00
STA 17+00 EL=9200.00
STA 18+00 EL=9250.00
STA 19+00 EL=9300.00
STA 20+00 EL=9350.00
STA 21+00 EL=9400.00
STA 21+66 EL=9433.00
STA 22+00 EL=9450.00
STA 22+18 EL=9460.00
STA 23+00 EL=9500.00
PVC EL=9435.75
P.V.C. EL=9425 (MOD 9431)
100' VC
PVC EL=9426.75
INSTALL 1-18"x60' C.M.P. @ 8.43%

NOTE: CUT & FILL SLOPES TO BE TREATED WITH HYDRO-MULCH OR GRASS SEEDED.

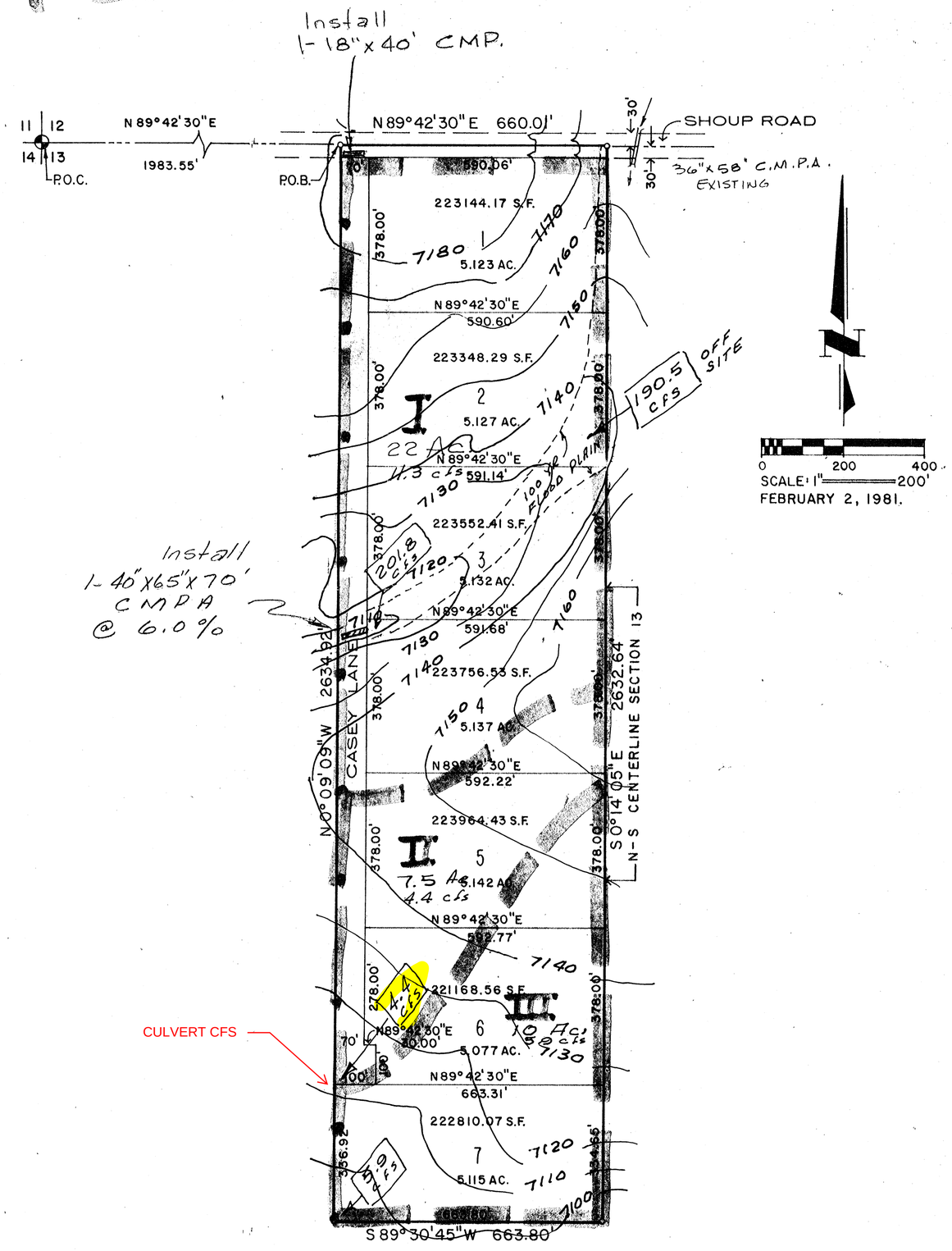
0+00 | 1 | 2 | 3 | 4 | 5+00 | 6 | 7 | 8 | 9 | 10+00 | 11 | 12 | 13 | 14 | 15+00 | 16 | 17 | 18 | 19 | 20+00 | 21 | 22 | 23

PILATE 1 - PLAN - PROFILE - F.A.S.
CLEARPRINT PAPER CO., S.F. CAL.
NO. 1000H-1

DRAINAGE PLAN

PINE MOUNTAIN ESTATES

A PORTION OF SECTION 13, T12S, R66W OF THE 6TH P.M., EL PASO COUNTY, COLORADO.



OWNERSHIP STATEMENT:

KNOW ALL MEN BY THE PRESENTS: THAT BHP INVESTMENTS, A LIMITED PARTNERSHIP, BY MARK L. BRADLEY AS GENERAL PARTNER BEING THE OWNERS OF THE FOLLOWING DESCRIBED TRACT OF LAND, TO WIT: THE EAST ONE-HALF (E 1/2) OF THE EAST ONE-HALF (E 1/2) OF THE NORTHWEST ONE-QUARTER (NW 1/4) OF SECTION 13, IN TOWNSHIP 12 SOUTH, RANGE 66 WEST, OF THE 6TH P.M., EL PASO COUNTY, COLORADO, MORE PARTICULARLY AS FOLLOWS; COMMENCING AT THE NORTHWEST CORNER OF SAID SECTION 13, (A 3/4 INCH REBAR); THENCE N 89°42'30"E ALONG THE NORTH LINE OF SAID SECTION 13, 1983.55 FEET TO THE NORTHWEST CORNER OF THE TRACT HEREIN DESCRIBED AND THE POINT OF BEGINNING OF SAID TRACT DESCRIPTION; THENCE THENCE N89°42'30"E ALONG THE AFORE SAID NORTH LINE 660.01 FEET TO THE NORTH ONE-QUARTER CORNER OF SAID SECTION 13; THENCE S00°14'05"E ALONG THE NORTH-SOUTH CENTER LINE OF SAID SECTION 13, 2632.64 FEET; THENCE S 89°30'45"W, ALONG THE EAST-WEST CENTER LINE OF SAID SECTION 13, 663.80 FEET; THENCE N 00°09'09"W, 2634.92 FEET TO THE POINT OF BEGINNING AND CONTAINING 40.021 ACRES OF LAND.

DEDICATION:

THE ABOVE OWNERS HAVE CAUSED SAID TRACT OF LAND TO BE PLATTED INTO LOTS, BLOCK STREET RIGHT OF WAY AND EASEMENTS AS SHOWN ON THE PLAT, WHICH PLAT SETS FORTH THE BOUNDARY AND DIMENSIONS THEREOF. SAID TRACT SO PLATTED SHALL BE KNOWN AS "PINE MOUNTAIN ESTATES", EL PASO COUNTY, COLORADO.

IN WITNESS WHEREOF:

THE AFOREMENTIONED HAVE EXECUTED THEIR PRESENTS THIS_____DAY OF_____A.D., 1981.

BHP INVESTMENTS, A LIMITED PARTNERSHIP

_____

MARK L. BRADLEY, GENERAL PARTNER

NOTARY STATEMENT:

STATE OF COLORADO)
COUNTY OF EL PASO) S.S.

THE ABOVE AND FOREGOING STATEMENT WAS ACKNOWLEDGED BEFORE ME THIS____DAY OF_____ A.D.,1981, BY MARK L. BRADLEY, GENERAL PARTNER.

WITNESS MY HAND AND OFFICIAL SEAL
MY COMMISSION EXPIRES _____

_____
NOTARY PUBLIC

CERTIFICATE OF SURVEY:

I, RICHARD COX, A REGISTERED LAND SURVEYOR IN THE STATE OF COLORADO, DO HEREBY CERTIFY THAT THE ACCOMPANYING PLAT HAS BEEN PREPARED IN ACCORDANCE WITH TITLE 38 OF THE COLORADO REVISED STATUTES 1973, AS AMENDED, AND THAT SAID PLAT DOES ACCURATELY SHOW THE DESCRIBED TRACT OF LAND AND THE SUBDIVISION THEREOF TO THE BEST OF MY KNOWLEDGE AND BELIEF.

_____
RICHARD COX, COLORADO R.L.S. NO. 7228

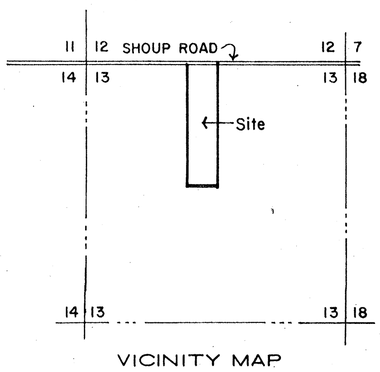
FILING APPROVALS:

APPROVED BY THE EL PASO COUNTY LAND USE DEPARTMENT THIS____DAY OF_____A.D., 1981.

_____
ADMINISTRATOR

APPROVED BY THE EL PASO COUNTY BOARD OF COUNTY COMMISSIONERS THIS____DAY OF_____ A.D., 1981.

_____
CHAIRMAN



VICINITY MAP

NOTES:

BEARING SHOWN HEREON ARE RELATIVE TO THE NORTH LINE OF SECTION 13, TOWNSHIP 12 SOUTH, RANGE 66 WEST OF THE 6TH P.M., WHICH IS ASSUMED TO BE N 89°42'30"E.

EASEMENTS:

SANITATION AND WATER NOTE:

CLERK AND RECORDERS CERTIFICATE:

STATE OF COLORADO)
COUNTY OF EL PASO) S.S.

I HEREBY CERTIFY THAT THIS INSTRUMENT WAS FILED FOR RECORD IN THE OFFICE OF THE CLERK AND RECORDER OF EL PASO COUNTY, COLORADO, THIS____DAY OF_____ A.D., 1981, AT_____ M., AND DULY RECORDED IN PLAT BOOK_____ AT PAGE_____.

RECEPTION NO. _____ ARDIS W. SCHMITT, RECORDER

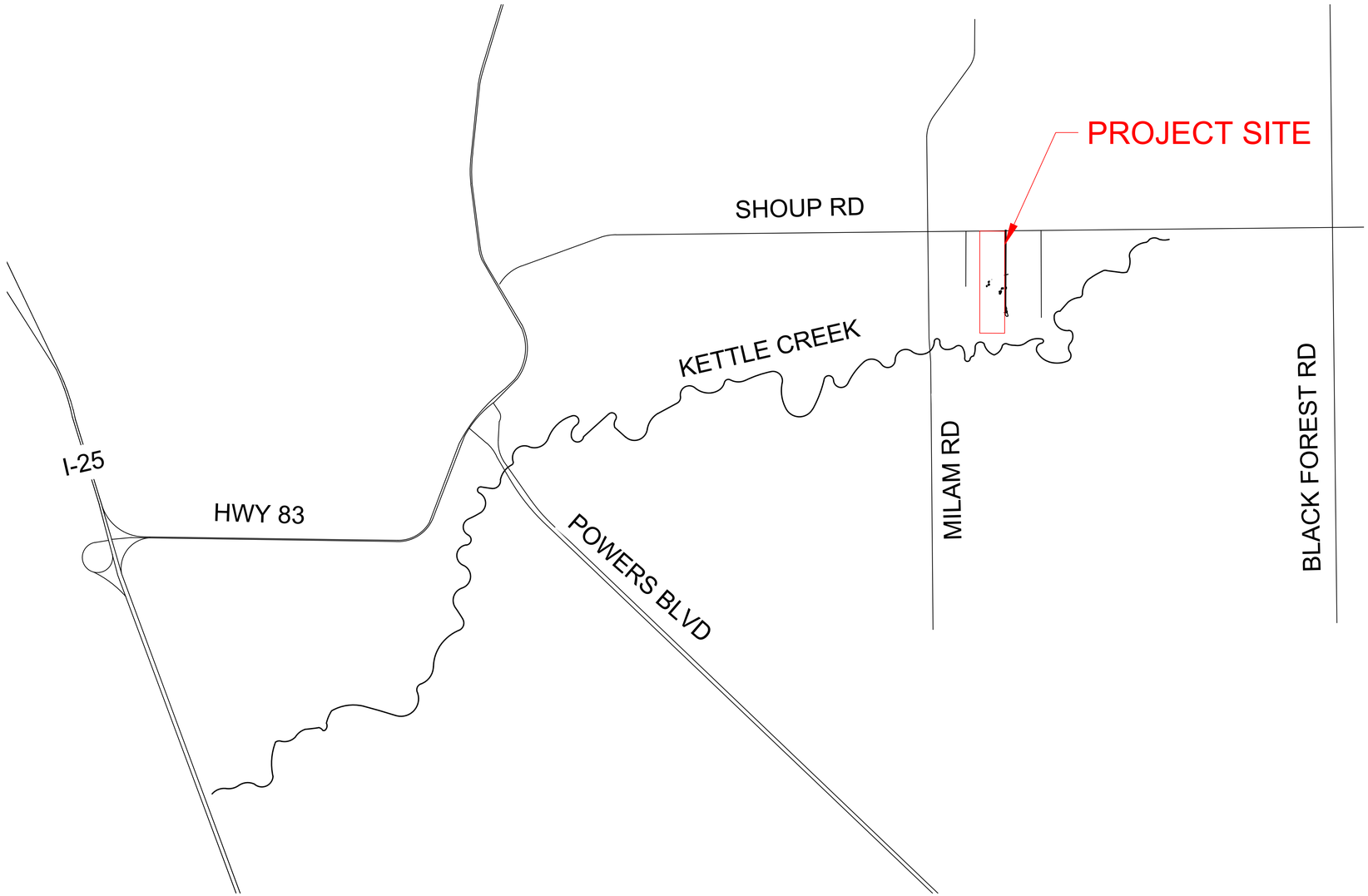
PARK FEE: _____

SCHOOL FEE: _____ BY: _____
DEPUTY

APPENDIX D

MAPS

Know what's below. Call before you dig.



N

VICINITY MAP

N.T.S.

REFERENCE DRAWINGS
X-1729 - EX SITE
X-MDG22x34

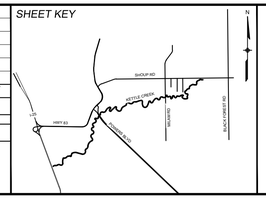
No.	DATE	DESCRIPTION	BY
##	##	##	##
##	##	##	##
##	##	##	##
##	##	##	##
##	##	##	##

REVISIONS

COMPUTER FILE MANAGEMENT

FILE NAME: S:\25.1729.001 Lions Den\200 Design\220 Drainage-WR\222 Reports\FDR\Report\VIcinity Map.dwg
CTB FILE: Matrix(black).ctb
PLOT DATE: July 18, 2025 12:58:16 PM
THIS DRAWING IS CURRENT AS OF PLOT DATE AND MAY BE SUBJECT TO CHANGE.

SHEET KEY



PREPARED BY:
Matrix
Excellence by Design

SEAL

PRELIMINARY
THIS DRAWING HAS NOT BEEN APPROVED BY GOVERNING AGENCIES AND IS SUBJECT TO CHANGE

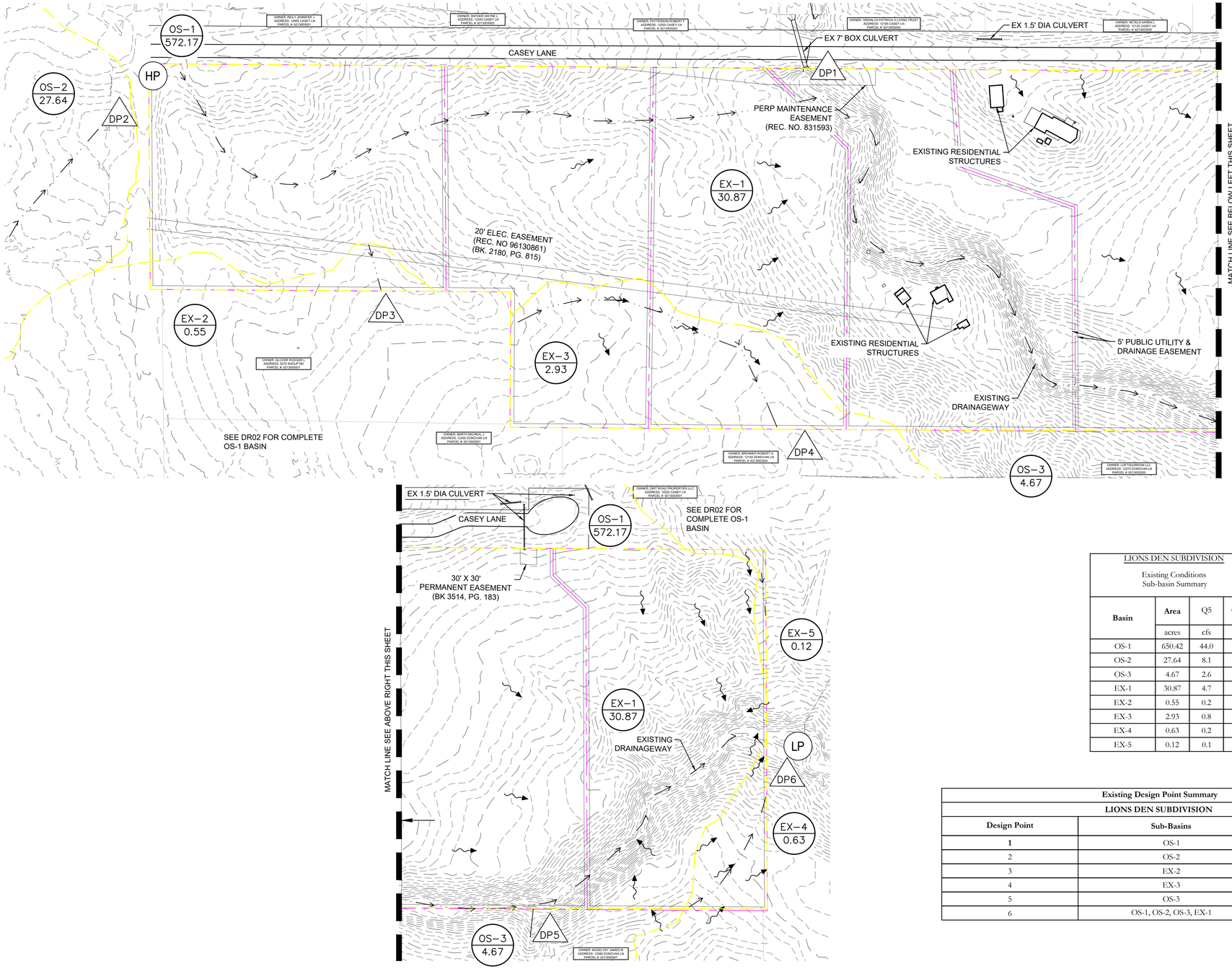
FOR AND ON BEHALF OF MATRIX DESIGN GROUP, INC.
PROJECT No. 25.1729.001

LIONS DEN SUBDIVISION

EL PASO COUNTY, COLORADO
FINAL DRAINAGE REPORT

VICINITY MAP

DESIGNED BY:	KGI	SCALE		DATE ISSUED:	JULY 2025	DRAWING No.
DRAWN BY:	KGI	HORIZ.	N/A			
CHECKED BY:	JTS	VERT.	N/A	SHEET	1 OF 1	MAP01



Know what's **below.** **Call** before you dig.

LEGEND

- PROPERTY BOUNDARY LINE
- ADJACENT PROPERTY LINE
- PROPOSED EASEMENT LINE
- EXISTING EASEMENT LINE
- 4000 / 4001 — EXISTING CONTOURS
- 1.8% — SLOPE ARROW
- HP / LP — HIGH POINT / LOW POINT
- EX DRAINAGE BASIN BOUNDARY LINE
- FLOW PATH
- X.X / X.X — SUB BASIN DESIGNATION / BASIN IDENTIFIER AND SIZE (AC) / SUB BASIN AREA (AC.)
- XXX — PROPOSED DESIGN POINT

LIONS DEN SUBDIVISION

Existing Conditions
Sub-basin Summary

Basin	Area	Q5	Q100
	acres	cfs	cfs
OS-1	650.42	44.0	195.2
OS-2	27.64	8.1	38.7
OS-3	4.67	2.6	12.5
EX-1	30.87	4.7	29.8
EX-2	0.55	0.2	1.3
EX-3	2.93	0.8	5.2
EX-4	0.63	0.2	1.4
EX-5	0.12	0.1	0.4

Existing Design Point Summary

LIONS DEN SUBDIVISION

Design Point	Sub-Basins	Total Area (ac.)	Q(5) (cfs)	Q(100) (cfs)
1	OS-1	572.17	36.6	157.4
2	OS-2	27.64	8.1	38.7
3	EX-2	0.55	0.2	1.3
4	EX-3	2.93	0.8	5.2
5	OS-3	4.67	2.6	12.5
6	OS-1, OS-2, OS-3, EX-1	635.34	52.0	238.4

N

GRAPHIC SCALE

100' 0' 100' 200'

(IN FEET)
1 inch = 100 ft.

REFERENCE DRAWINGS

X-1729- EX MAP
X-MDG22x34
X-1729 - EX SITE

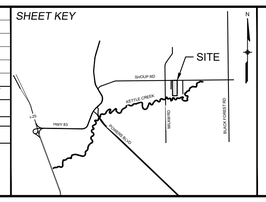
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REVISIONS

COMPUTER FILE MANAGEMENT

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CTB FILE: Matrix(black).ctb
PLOT DATE: December 22, 2025 2:02:07 PM
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SHEET KEY



PREPARED BY:
Matrix
Excellence by Design

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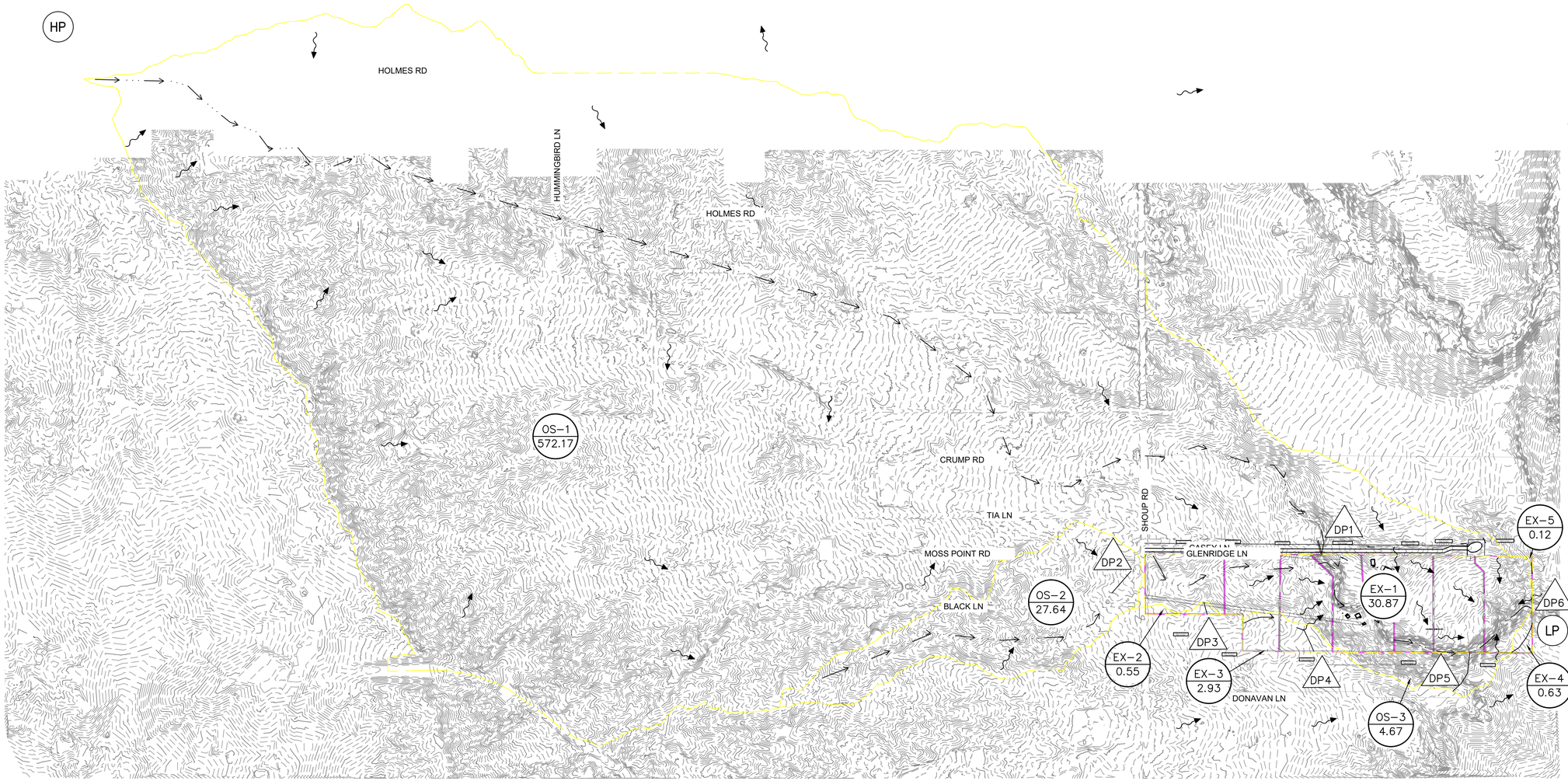
FOR AND ON BEHALF OF MATRIX DESIGN GROUP, INC.
PROJECT No. 25.1729.001

LIONS DEN SUBDIVISION

EL PASO COUNTY, COLORADO
FINAL DRAINAGE REPORT

EXISTING CONDITIONS DRAINAGE MAP

DESIGNED BY:	KGI	SCALE	DATE ISSUED:	DECEMBER 2025	DRAWING No.
DRAWN BY:	KGI	HORIZ. 1" - 100'			
CHECKED BY:	JTS	VERT. N/A	SHEET	1 OF 3	DR01



Know what's **below.** **Call** before you dig.

LEGEND

- PROPERTY BOUNDARY LINE
- ADJACENT PROPERTY LINE
- PROPOSED EASEMENT LINE
- EXISTING EASEMENT LINE
- 4000 / 4001 — EXISTING CONTOURS
- 1.8% — SLOPE ARROW
- HP / LP — HIGH POINT / LOW POINT
- EX DRAINAGE BASIN BOUNDARY LINE
- FLOW PATH
- SUB BASIN DESIGNATION / BASIN IDENTIFIER AND SIZE (AC) / SUB BASIN AREA (AC.)
- XXX — PROPOSED DESIGN POINT

LIONS DEN SUBDIVISION

Existing Conditions
Sub-basin Summary

Basin	Area	Q5	Q100
	acres	cfs	cfs
OS-1	650.42	44.0	195.2
OS-2	27.64	8.1	38.7
OS-3	4.67	2.6	12.5
EX-1	30.87	4.7	29.8
EX-2	0.55	0.2	1.3
EX-3	2.93	0.8	5.2
EX-4	0.63	0.2	1.4
EX-5	0.12	0.1	0.4

Existing Design Point Summary

LIONS DEN SUBDIVISION

Design Point	Sub-Basins	Total Area (ac.)	Q(5) (cfs)	Q(100) (cfs)
1	OS-1	572.17	36.6	157.4
2	OS-2	27.64	8.1	38.7
3	EX-2	0.55	0.2	1.3
4	EX-3	2.93	0.8	5.2
5	OS-3	4.67	2.6	12.5
6	OS-1, OS-2, OS-3, EX-1	635.34	52.0	238.4

N

GRAPHIC SCALE

400' 0' 400' 800'

(IN FEET)
1 inch = 400 ft.

REFERENCE DRAWINGS

X-1729- EX MAP
X-MDG22x34
X-1729 - EX SITE

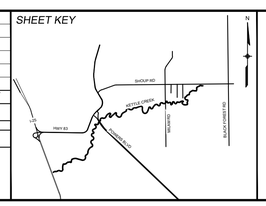
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REVISIONS

COMPUTER FILE MANAGEMENT

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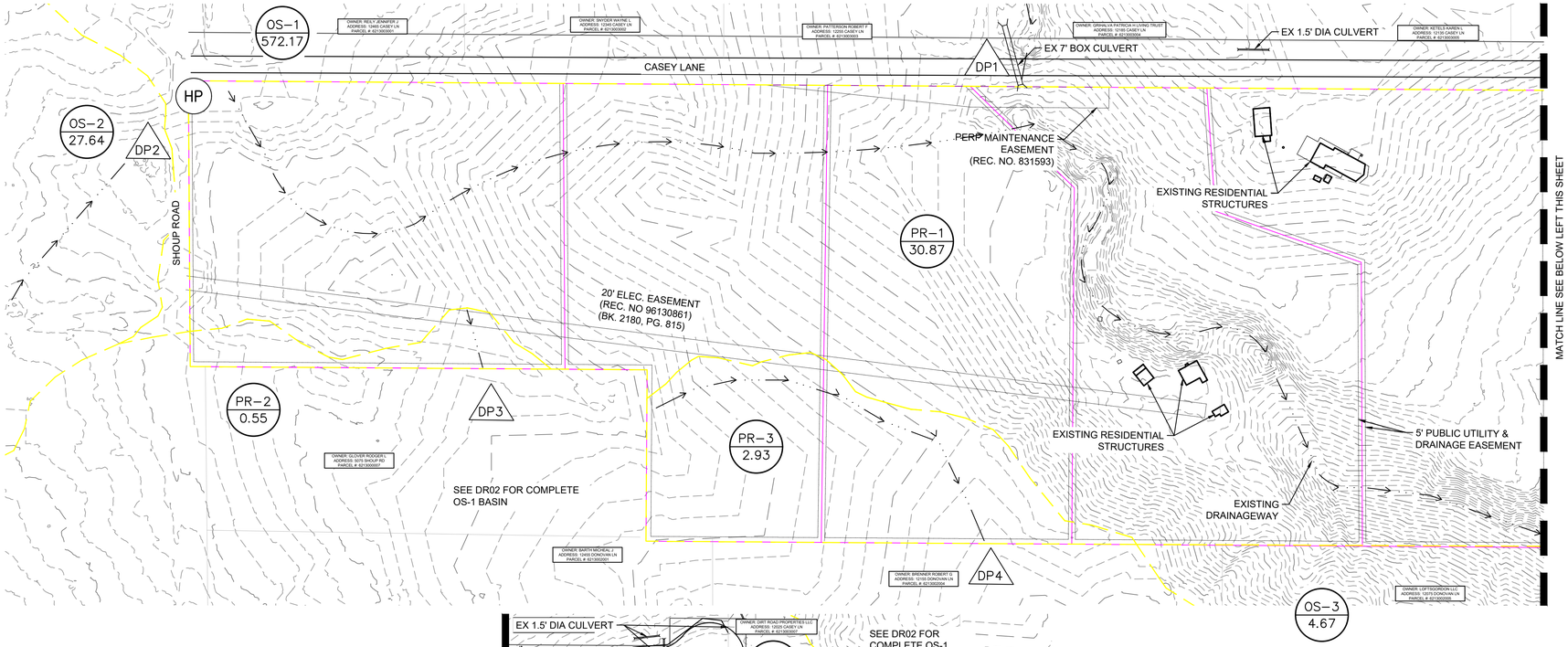
FOR AND ON BEHALF OF MATRIX DESIGN GROUP, INC.
PROJECT No. 25.1729.001

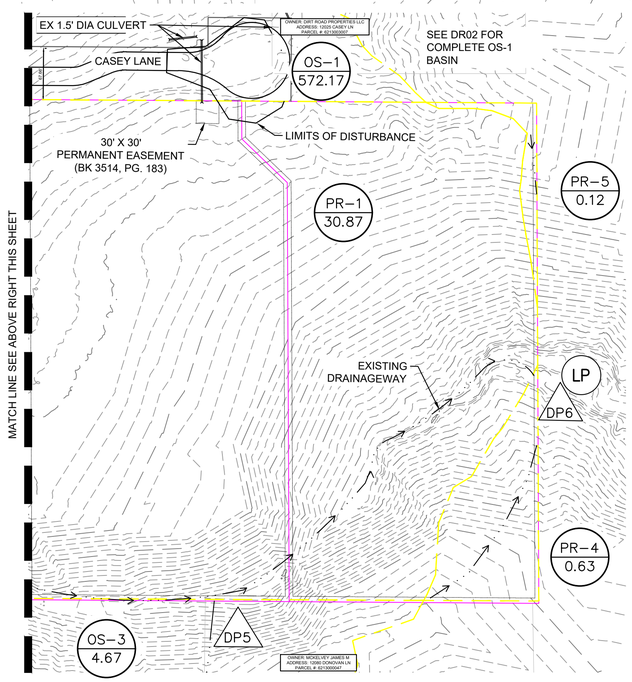
LIONS DEN SUBDIVISION

EL PASO COUNTY, COLORADO
FINAL DRAINAGE REPORT

EXISTING CONDITIONS DRAINAGE MAP

DESIGNED BY:	KGI	SCALE	DATE ISSUED:	DECEMBER 2025
DRAWN BY:	KGI	HORIZ. 1" - 100'	SHEET	2 OF 3
CHECKED BY:	JTS	VERT. N/A		DRAWING No. DR02





Know what's **below.** **Call** before you dig.

GRADING LEGEND

- PROPERTY BOUNDARY LINE
- ADJACENT PROPERTY LINE
- PROPOSED EASEMENT LINE
- EXISTING EASEMENT LINE
- PROPOSED CONTOURS (4000 / 4001)
- EXISTING CONTOURS (4000 / 4001)
- SLOPE ARROW (1.8%)
- HIGH POINT / LOW POINT (HP / LP)
- PR DRAINAGE BASIN BOUNDARY LINE
- FLOW PATH

SUB BASIN DESIGNATION
X.X
X.X
SUB BASIN AREA (AC.)
BASIN IDENTIFIER AND SIZE (AC)

XXX
PROPOSED DESIGN POINT

Proposed Design Point Summary

LIONS DEN SUBDIVISION

Design Point	Sub-Basins	Total Area (ac.)	Q(5) (cfs)	Q(100) (cfs)
1	OS-1	572.17	36.6	157.4
2	OS-2	27.64	8.1	38.7
3	PR-2	0.55	0.3	1.5
4	PR-3	2.93	1.2	5.8
5	OS-3	4.67	2.6	12.5
6	OS-1, OS-2, OS-3, PR-1	635.34	54.1	241.3

LIONS DEN SUBDIVISION

Proposed Conditions
Sub-basin Summary

Basin	Area	Q5	Q100
	acres	cfs	cfs
OS-1	572.17	36.6	157.4
OS-2	27.64	8.1	38.7
OS-3	4.67	2.6	12.5
PR-1	30.87	6.8	32.8
PR-2	0.55	0.3	1.5
PR-3	2.93	1.2	5.8
PR-4	0.63	0.3	1.6
PR-5	0.12	0.1	0.4

N

GRAPHIC SCALE

100' 0' 100' 200'

(IN FEET)
1 inch = 100 ft.

REFERENCE DRAWINGS

X-1729- EX MAP
X-MDG22x34
X-1729 - EX SITE
X-1729 - PR SITE

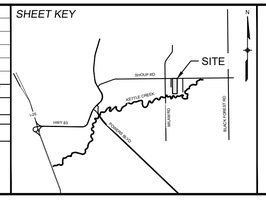
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REVISIONS

COMPUTER FILE MANAGEMENT

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FOR AND ON BEHALF OF MATRIX DESIGN GROUP, INC.
PROJECT No. 25.1729.001

LIONS DEN SUBDIVISION

EL PASO COUNTY, COLORADO
FINAL DRAINAGE REPORT

PROPOSED CONDITIONS DRAINAGE MAP

DESIGNED BY:	KGI	*SCALE*		*DATE ISSUED:*	DECEMBER 2025
DRAWN BY:	KGI	*HORIZ.*	1" - 100'	*SHEET*	3 *OF* 3
CHECKED BY:	JTS	*VERT.*	N/A	*DRAWING No.*	DR03