

# FINAL DRAINAGE REPORT

**ORTON PIT  
17710 CO115  
El Paso County, Colorado 80926**

Please add PCD File No. CDR2211

Prepared For:  
**Castle Rock Construction Co. of Colorado LLC**  
6374 South Racine Circle  
Centennial, Colorado 80111

Prepared By:  
**Baseline Engineering Corporation**  
1046 Elkton Drive  
Colorado Springs, Colorado 80907

Steven Baggs, PE

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**Date: July 12, 2022**

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July 12, 2022

El Paso County  
Planning and Community Development  
2880 International Circle, Suite 110  
Colorado Springs, Colorado 80910

Re: Final Drainage Report  
For Orton Borrow Pit  
Located on 17710 CO115  
El Paso County, CO 80926

To Whom It May Concern:

Transmitted herewith is the Final Drainage Report for the Orton Borrow Pit, located on an unplatted parcel addressed 17710 CO115 Colorado Springs, El Paso County, Colorado 80926. The Orton Borrow Pit is approximately 10 acres and located on the property's southeastern corner. The site is currently zoned RR-5 with an existing residence, and a historic borrow pit. The purpose of the proposed borrow pit on the southern edge of El Paso County is to provide earthen fill for CDOT Project 22903 on SH115. The proposed pit would expand a historic pit from the original construction of SH115 and only be permitted/used for this one Project (less than 2 years). We would therefore like to submit for a special use permit through El Paso County in accordance with section 5.2.34(C) of the Counties land development code.

This drainage analysis was prepared in accordance with the most current El Paso County Drainage Criteria Manual. If there are any comments or questions regarding any part of this drainage analysis, please contact the undersigned.

Very truly yours,

**BASELINE ENGINEERING CORP.**

Sean P Callahan, E.I.

Reviewed by:  
Steven G. Baggs, P.E.

## Certification Statements

### 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.

\_\_\_\_\_  
Steven G Baggs, P.E. Colorado 26020

### Developer's Statement

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

Name of Developer: \_\_\_\_\_

Authorized Signature/Date: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

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.

### El Paso County Certification

Filed in accordance with Section 51.1 of the El Paso Land Development Code as amended.

\_\_\_\_\_  
Director of Public Works

\_\_\_\_\_  
Date

Please revise to  
Joshua Palmer  
County Engineer /  
ECM Administrator



## 1) General Location and Description

### a) Location

This Final Drainage Report has been prepared for Orton Borrow Pit, located on an unplatted parcel addressed 17710 CO115 Colorado Springs, El Paso County, Colorado 80926. The property is bound to the North by two rural residential properties (RR-5), the East by CO115 Right-of-Way, the South by vacant land, and the West by vacant land on the West limits of El Paso County.

The site is located within the NW  $\frac{1}{4}$  of the NW  $\frac{1}{4}$  of Section 18, Township 17 S, Range 67 West of the 6<sup>th</sup> Principal Meridian.

There is a historic borrow pit from the original construction of SH115 and an existing residential building on the property. There are no major drainageways adjacent to the site.

There are no existing platted developments adjacent to the site.

### b) Description of Property

For the purposes of this report “the site” will refer to the Orton Borrow Pit site, which is approximately 10 acres of disturbed area. The entirety of the property the Orton Borrow Pit site is located on encompasses 93.75 acres.

The proposed Orton Borrow Pit portion of the site consists of a historic borrow pit and undeveloped land covered by native grasses, trees, and weeds.

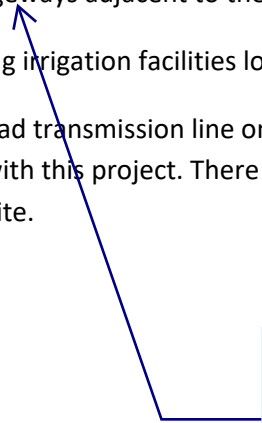
The existing site drains from the Northwest to the Southeast primarily at slopes between 0-3% into an existing depression on the Northeast side of CO-115.

The soil type at the site was identified as Satanta Loam, with slopes ranging from 0-3%, and a hydrologic soil grouping of “B”. Soils associated with hydrologic soil group B have a moderate infiltration rate when thoroughly wet. These are moderately deep, well-draining soils with a moderate rate of water transmission.

There are no major drainageways adjacent to the site

There are no known existing irrigation facilities located on the site.

There is an existing overhead transmission line on the eastern boundary of the site. The transmission line will not be disturbed with this project. There are no other known utilities or encumbrances on the borrow pit portion of the site.



There is a FEMA floodplain (zone A) on the parcel, northeast of the site. Please be sure to mention this in your narrative.

Per ECM 3.2.8.E and Ch6 of 2014 City of Colorado Springs drainage criteria manual adopted by the County in 2015, the storm events are the 5yr and 100 yr storm. You may change this IF you like.

## 2) Drainage Basins and Sub-Basins

### a) Major Basin Descriptions

This project is within the Red Creek Drainage Basin. Stormwater from this site drains from the Northwest to the Southeast into an existing depression on the Northeast side of CO-115. The immediate receiving water for the site is Red Creek, with the ultimate receiving water being the Arkansas River (COARUA14d\_C).

According to the FEMA Flood Insurance Rate Map (FIRM) Panel No. 08041C1125G, effective 12/07/2018, this site is located within an area of minimal flood hazard (Zone X). Refer to the appendix for FIRM Map.

The Red Creek Drainage Basin generally drains south, until its confluence with the Arkansas River approximately 14 miles south of the borrow pit site.

There are no known irrigation facilities or other obstructions which could influence or be influenced by the local drainage patterns.

### b) Sub-basin Descriptions

An Existing Conditions Drainage Plan has been included in the Appendix of this report. A description of the existing subbasins is as follows:

Please also provide the cumulative flows at DP1 (basin E1+E2)

shouldn't this be DP2

**Subbasin E1** (10.26 acres) consists of the entirety of the disturbed area for the borrow pit site. This subbasin drains from the Northwest to the Southeast generally at slopes between 0-3% into an existing depression from a historic borrow pit on the Northeast side of CO-115 at DP1. Stormwater infiltrates into soils at the existing depression in existing conditions. The determined existing runoff quantities from subbasin E1 draining to DP1 are  $Q_{10}=5.06$  cfs and  $Q_{100}=16.26$  cfs in the minor and major storms.

**Subbasin E2** (26.40 acres) consists of an undeveloped offsite area tributary to the existing borrow pit. This subbasin drains from the Northwest to the Southeast generally at slopes between 3-4% into the west edge of basins E1/P1. Ultimately drainage to the existing depression from a historic borrow pit on the Northeast side of CO-115 at DP1. Stormwater infiltrates into soils at the existing depression in existing conditions. The determined existing runoff quantities from subbasin E1 draining to DP1 are  $Q_{10}=8.98$  cfs and  $Q_{100}=28.51$  cfs in the minor and major storms.

E2

A Proposed Conditions Drainage Plan has been included in the Appendix of this report. A description of the proposed subbasins is as follows:

**Subbasin P1** (10.26 acres) consists of the entirety of the disturbed area for the borrow pit site. This subbasin will maintain existing drainage patterns. The proposed subbasin drains from the Northwest to the Southeast generally at slopes between 0-3% into an existing depression from a historic borrow pit on the Northeast side of CO-115 at DP1. Stormwater infiltrates into soils at the existing depression in existing conditions. The determined existing runoff quantities from subbasin P1 draining to DP1 are  $Q_{10}=5.06$  cfs and  $Q_{100}=16.26$  cfs in the minor and major storms.

Other than Subbasin E2,

Please address whether the 100 yr runoff is contained within the existing depression or will it over top into the existing Hwy 115 ditch. Please coordinate with CDOT regarding concerns of flows entering the Hwy ditch and provide discussion in your narrative regarding the results of the coordination with CDOT. Additionally, coordinate/contact the CO state engineer in regards to the holding of water in the depression and include any feedback in your report. Does the runoff infiltrate within the time frame indicated by state statutes (72 hrs and 120 hrs per senate bill 15-212, CRS 37-92-602(8))?

### 3) Drainage Design Criteria

#### a) Development Criteria Reference

This drainage analysis has been prepared in accordance with the current El Paso County Drainage Criteria Manual Volumes 1 & 2.

This site is located within the Red Creek Drainage Basin (BEBE0200). There are no previous drainage studies completed for this project site.

Please also identify that there are no associated drainage fees for this basin.

#### b) Hydrologic Criteria

The design rainfall depths for the site were determined from the NOAA Atlas 14, Volume 8, Version 2. Design rainfall depths have been included in the appendix of this report.

The Rational Method was used to determine developed flow volumes for historic and developed conditions. The Rational Formula is  $Q = CiA$ , where  $Q$ , the maximum rate of runoff is equal to the runoff coefficient  $C$ , times the rainfall intensity ( $I$ ), times the area ( $A$ ).

The minor and major design storms were analyzed as the 10-yr and 100-yr storm events in this report. A summary of calculated direct runoff flows has been provided below, refer to the Appendix for additional rational calculations.

There were no detention discharge or storage calculation methods required for this report.

### 4) Drainage Facility Design

#### a) General Concept

The proposed drainage patterns of the site will maintain the existing drainage patterns. The site drains from Northwest to the Southeast into a historic borrow pit from the original construction of SH115 at DP1. Stormwater infiltrates into soils at the existing depression in existing conditions and will continue to after operation of the proposed borrow pit is completed. This project will expand the historic pit from its original construction to provide earthen fill for CDOT Project 22903 on SH115 and only be permitted/used for this one Project (less than 2 years). This project will not have a negative impact on downstream drainageways.

Subbasin E2 contributes off-site runoff to the proposed borrow pit disturbed area. The borrow pit will be expanded with a berm around its top of slope to help prevent erosion of the slopes from drainage during borrow pit operations. Upon final stabilization of the site, the berm will be removed and runoff will continue to flow in its historic patterns. Runoff that currently enters the historic borrow pit will continue to flow to the exiting borrow pit depression as the pit is expanded. There will be no change to the amount of runoff capture at the existing borrow pit depression.

**Four Step Process:** The four-step process for minimizing adverse impacts of urbanization must be applied to all new or redevelopment projects for which construction activities disturb greater than or

Both sites are excluded from needing WQ treatment per the exclusion in ECM Appendix I.E.4.a.i.G. So revise this Step accordingly. And unless you are going to provide infiltration calcs (as required per WQ exclusion F), just remove infiltration related text from here.

equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. The four steps have been applied to this site as follows:

Step 1: Reduce runoff by disconnecting impervious area, eliminating “unnecessary” impervious area and encouraging infiltration into soils that are suitable

The stormwater management for the Orton Borrow Pit does employ runoff reduction practices. No impervious area will be added during operations of the borrow pit. The UD-BMP IRF spreadsheet was prepared for this project and is included in the Hydrologic Calculations section of the Appendix.

Please revise the statement as there are no fees for this basin.

Step 2: Treat and slowly release the WQCV

Water quality capture volume treatment is accomplished for this project through infiltration of stormwater at the existing depression, which is a historic borrow pit from the original construction of SH115. Stormwater drains to this low point in existing conditions and will continue to after operation of the proposed borrow pit is completed.

Does the site have water rights to hold water? Or will it infiltrate quick enough to meet state req's? Discuss. Also see Daniels comment at the bottom of pg 6 above.

Step 3: Stabilize stream channels

All new and re-development projects are required to construct or participate in the funding of channel stabilization measures. **Drainage basin fees paid, at the time of platting, go towards channel stabilization within the drainage basin.** There are no major drainage ways that are adjacent to the site. Impacts on downstream drainageways will not occur as no impervious area will be added to the site and runoff is contained on-site. Runoff from the site is conveyed via sheet flow to a historic depression from the original construction of SH115. Stormwater infiltrates into soils at the existing depression. The site is not being platted with this project and drainage basin fees will not be required.

Step 4: Implement source controls

This development will implement a Stormwater Management Plan utilizing construction control measures, proper housekeeping practices, and spill containment procedures. There are no outdoor storage of contaminants or outside pollutant sources anticipated at this site.

### b) Specific Details

Below is a summary of the existing and proposed direct runoff summaries for the disturbed area of the borrow pit. Rational calculations have been provided in the appendix of this report.

**Table 1. Subbasin Direct Runoff Summary**

DIRECT RUNOFF SUMMARY										
BASIN LABEL	DESIGN POINT	AREA	Imp.	C10	C100	LOCAL (CFS)		ACCUMULATIVE (CFS)		Notes
						Q5	Q100	Q5	Q100	
E1	1	10.26	2%	0.17	0.36	5.06	16.26			
E2	2	26.40	2%	0.17	0.36	8.98	28.51			
P1	1	10.26	2%	0.17	0.36	5.06	16.26			

See comment on drainage map DNG02 and GEC Plan sht GEC3 about concentrated flows routed around site via proposed earth dike. Revise this text as needed. Will these flows still be routed to the historic borrow pit depression? Now that the flows are concentrated, what will happen when the dike ends at the SW corner of the site? Consider need for erosion protection at this transition location.

There are no drainage impacts on downstream facilities as no impervious area will be added and runoff is contained on-site. Runoff from the site is conveyed via sheet flow to a historic depression from the original construction of SH115. Stormwater will continue to infiltrate into soils at the existing depression as in historic conditions.

The purpose of the proposed borrow pit is to provide earthen fill for CDOT Project 22903 on SH115. The proposed pit would expand a historic pit from the original construction of SH115 and only be permitted/used for this one Project (less than 2 years).

The existing borrow pit creates a depression on the east edge of the site and the west side of SH115. There is no known outfall for this low point and stormwater will infiltrate into soils on site.

There are no known environmental or drainage issues existing on site.

Maintenance for the site will be provided off of the proposed haul road for the pit.

Please indicate whether this access will be developed with an impervious surface material. If so then please account for it in your design.

There is no permanent detention structure proposed with this project. Temporary erosion control CM's will be in place prior to final stabilization of the site. Grading and Erosion Control Plans for the site will be submitted separately.

There are no public or private drainage facilities proposed for this project. A cost estimate for Grading/Erosion Control including construction CM's is not included with this report but will be included on the Grading and Erosion Control Plan for this site and will be submitted separately. Suitable financial assurances for grading and erosion control will be a requirement of that plan.

The site is not being platted with this project, therefore there are no drainage or bridge fees are required.

### c) Other Government Agency Requirements

#### Federal Emergency Management Agency (FEMA)

According to the FEMA Flood Insurance Rate Map (FIRM) Panel No. 08041C1125G, effective 12/07/2018, this site is located within an area of minimal flood hazard (Zone X). A copy of a portion of the appropriate FIRM panel is included in the Appendix.

#### Army Corps of Engineers (COE)

N/A

#### Colorado State Engineer

N/A

#### Colorado Water Conservation Board (CWCB)

N/A

Please see comment above at the bottom of page 6 and provide any requirements from the state engineer in regards to water rights.

**Others**

N/A

Please see comment above at the bottom of page 6 and provided any info from your coordination with CDOT.

## **Drawings/Appendix**

**A. General Location (Vicinity) Map**

**B. Hydrologic Calculations**

**C. Drainage Plans**

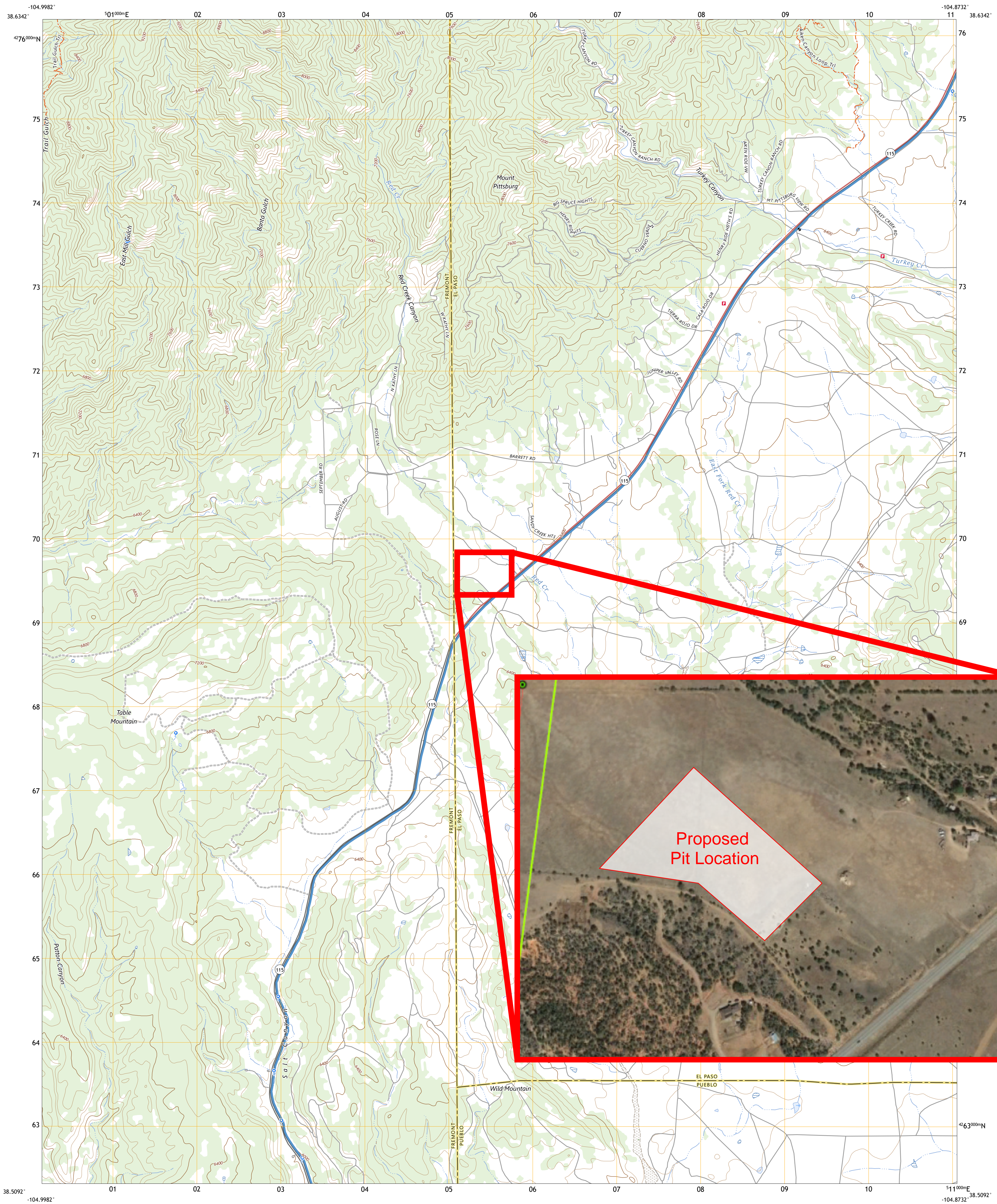


***APPENDIX A***



# Orton Pit Vicinity Map

7.5-MINUTE TOPO 2 QUADRANGLE  
 Custom Extent  
 7.5-MINUTE TOPO

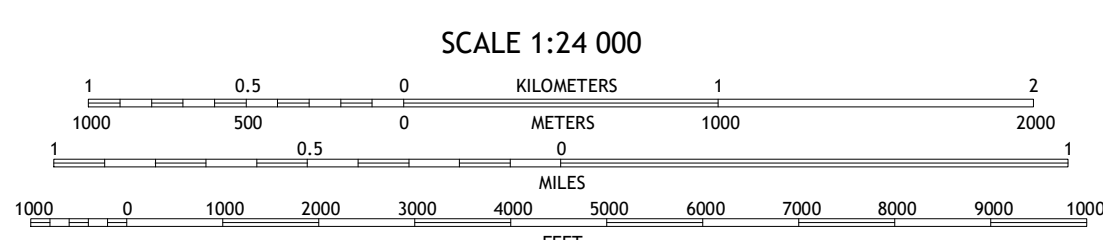
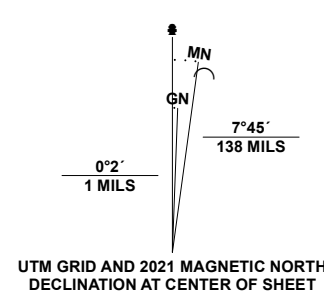


Produced by the United States Geological Survey

North American Datum of 1983 (NAD83)  
 World Geodetic System of 1984 (WGS84), Projection and  
 1 000 meter grid/Universal Transverse Mercator, Zone 13S  
 Data is provided by The National Map (TNM), is the best available at the time of map  
 generation, and includes data content from supporting themes of Elevation,  
 Hydrography, Geographic Names, Boundaries, Transportation, Structures, Land Cover,  
 and Orthimagery. Refer to associated Federal Geographic Data Committee (FGDC)  
 Metadata for additional source data information.

This map is not a legal document. Boundaries may be generalized for this map scale.  
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 were collected and some data may no longer represent actual surface conditions.

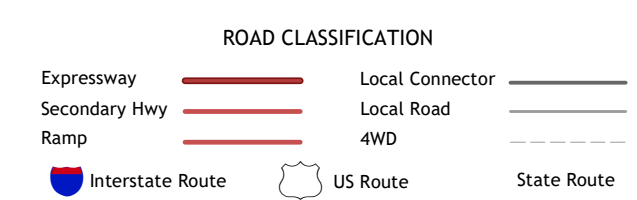
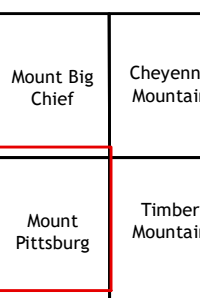
Learn About The National Map: <https://nationalmap.gov>



CONTOUR INTERVAL 80 FEET  
 NORTH AMERICAN VERTICAL DATUM OF 1988  
 CONTOUR SMOOTHNESS - Medium

COLORADO

QUADRANGLE LOCATION



7.5-MINUTE TOPO 2, CO  
 2022

ADJOINING QUADRANGLES



***APPENDIX B***



**NOAA Atlas 14, Volume 8, Version 2**  
**Location name: Colorado, USA\***  
**Latitude: 38.5744°, Longitude: -104.9385°**  
**Elevation: 6466.82 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 & aeriels](#)

**PF tabular**

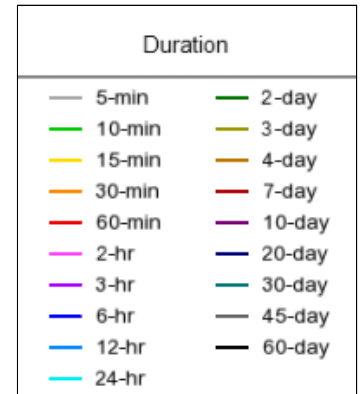
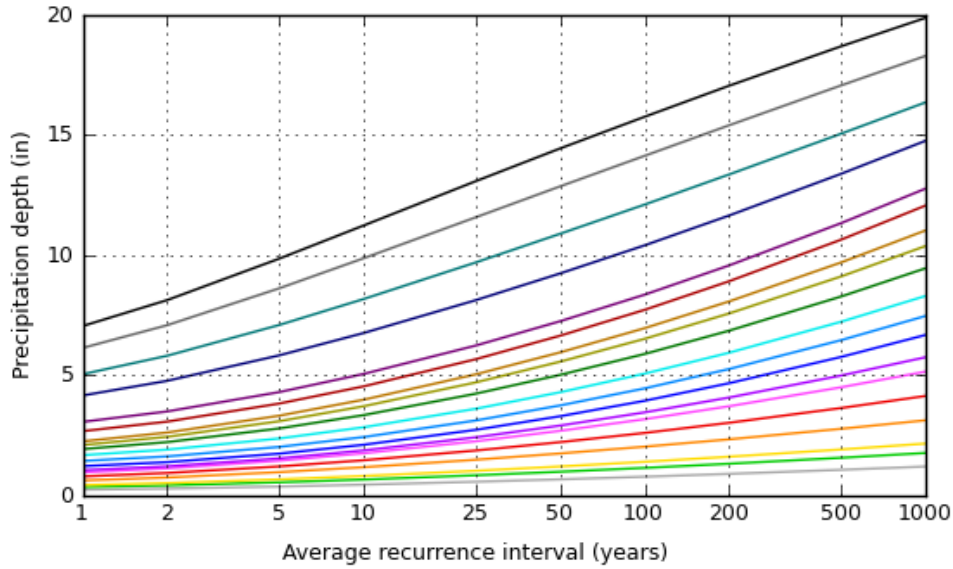
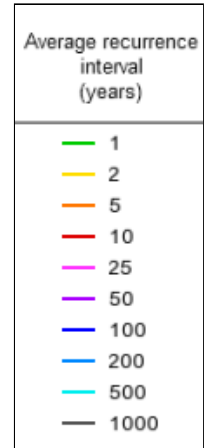
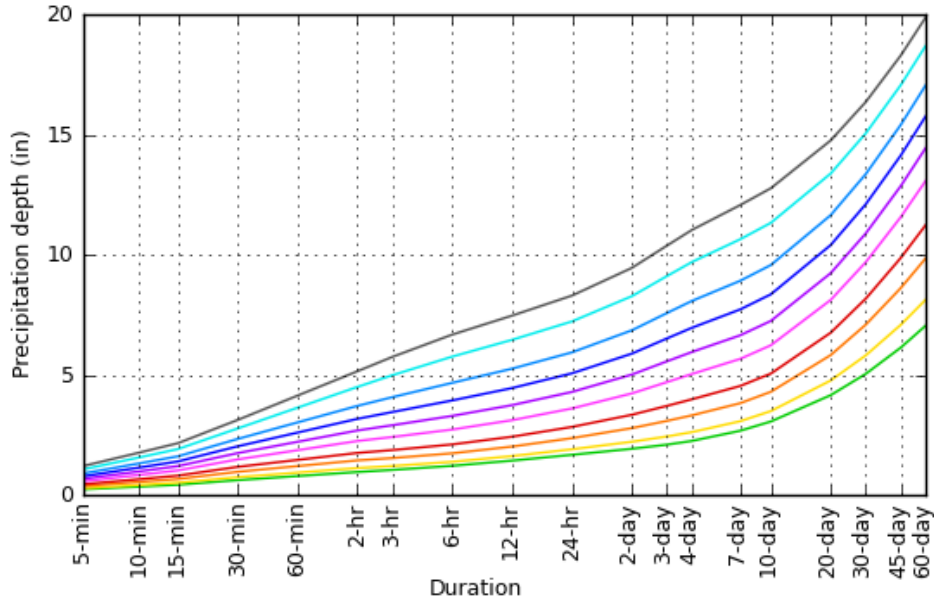
<b>PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)<sup>1</sup></b>										
<b>Duration</b>	<b>Average recurrence interval (years)</b>									
	<b>1</b>	<b>2</b>	<b>5</b>	<b>10</b>	<b>25</b>	<b>50</b>	<b>100</b>	<b>200</b>	<b>500</b>	<b>1000</b>
<b>5-min</b>	<b>0.247</b> (0.195-0.313)	<b>0.294</b> (0.232-0.373)	<b>0.380</b> (0.299-0.484)	<b>0.459</b> (0.359-0.588)	<b>0.579</b> (0.442-0.788)	<b>0.680</b> (0.504-0.939)	<b>0.789</b> (0.563-1.12)	<b>0.908</b> (0.619-1.34)	<b>1.08</b> (0.704-1.64)	<b>1.21</b> (0.768-1.87)
<b>10-min</b>	<b>0.361</b> (0.286-0.458)	<b>0.431</b> (0.340-0.547)	<b>0.557</b> (0.438-0.709)	<b>0.672</b> (0.526-0.861)	<b>0.848</b> (0.647-1.15)	<b>0.996</b> (0.738-1.38)	<b>1.16</b> (0.825-1.65)	<b>1.33</b> (0.907-1.96)	<b>1.58</b> (1.03-2.40)	<b>1.78</b> (1.13-2.74)
<b>15-min</b>	<b>0.440</b> (0.348-0.558)	<b>0.526</b> (0.415-0.667)	<b>0.679</b> (0.534-0.865)	<b>0.820</b> (0.641-1.05)	<b>1.03</b> (0.789-1.41)	<b>1.22</b> (0.900-1.68)	<b>1.41</b> (1.00-2.01)	<b>1.62</b> (1.11-2.39)	<b>1.92</b> (1.26-2.93)	<b>2.17</b> (1.37-3.34)
<b>30-min</b>	<b>0.632</b> (0.500-0.801)	<b>0.756</b> (0.597-0.959)	<b>0.979</b> (0.771-1.25)	<b>1.18</b> (0.926-1.52)	<b>1.49</b> (1.14-2.03)	<b>1.76</b> (1.30-2.42)	<b>2.04</b> (1.45-2.90)	<b>2.34</b> (1.60-3.46)	<b>2.78</b> (1.82-4.24)	<b>3.14</b> (1.99-4.83)
<b>60-min</b>	<b>0.801</b> (0.634-1.01)	<b>0.945</b> (0.747-1.20)	<b>1.22</b> (0.957-1.55)	<b>1.47</b> (1.15-1.89)	<b>1.88</b> (1.44-2.57)	<b>2.23</b> (1.65-3.09)	<b>2.61</b> (1.87-3.73)	<b>3.03</b> (2.07-4.49)	<b>3.64</b> (2.39-5.57)	<b>4.15</b> (2.63-6.39)
<b>2-hr</b>	<b>0.970</b> (0.773-1.22)	<b>1.14</b> (0.903-1.43)	<b>1.45</b> (1.15-1.83)	<b>1.76</b> (1.39-2.24)	<b>2.26</b> (1.75-3.08)	<b>2.70</b> (2.02-3.72)	<b>3.18</b> (2.30-4.52)	<b>3.72</b> (2.57-5.47)	<b>4.51</b> (2.99-6.84)	<b>5.16</b> (3.30-7.88)
<b>3-hr</b>	<b>1.06</b> (0.845-1.32)	<b>1.22</b> (0.975-1.53)	<b>1.55</b> (1.23-1.95)	<b>1.88</b> (1.49-2.38)	<b>2.43</b> (1.90-3.31)	<b>2.92</b> (2.20-4.02)	<b>3.46</b> (2.52-4.92)	<b>4.08</b> (2.84-5.99)	<b>5.00</b> (3.33-7.56)	<b>5.76</b> (3.70-8.75)
<b>6-hr</b>	<b>1.23</b> (0.990-1.52)	<b>1.40</b> (1.12-1.73)	<b>1.75</b> (1.40-2.18)	<b>2.12</b> (1.69-2.65)	<b>2.74</b> (2.16-3.72)	<b>3.30</b> (2.52-4.53)	<b>3.95</b> (2.90-5.57)	<b>4.68</b> (3.29-6.81)	<b>5.77</b> (3.89-8.66)	<b>6.68</b> (4.35-10.1)
<b>12-hr</b>	<b>1.44</b> (1.17-1.78)	<b>1.63</b> (1.32-2.01)	<b>2.03</b> (1.64-2.51)	<b>2.44</b> (1.96-3.03)	<b>3.13</b> (2.49-4.20)	<b>3.75</b> (2.89-5.09)	<b>4.46</b> (3.31-6.23)	<b>5.27</b> (3.74-7.60)	<b>6.47</b> (4.41-9.62)	<b>7.47</b> (4.91-11.1)
<b>24-hr</b>	<b>1.69</b> (1.38-2.06)	<b>1.92</b> (1.56-2.34)	<b>2.38</b> (1.94-2.91)	<b>2.85</b> (2.30-3.51)	<b>3.61</b> (2.89-4.79)	<b>4.30</b> (3.33-5.76)	<b>5.07</b> (3.79-7.00)	<b>5.95</b> (4.26-8.47)	<b>7.23</b> (4.97-10.6)	<b>8.31</b> (5.52-12.3)
<b>2-day</b>	<b>1.94</b> (1.60-2.34)	<b>2.23</b> (1.84-2.70)	<b>2.80</b> (2.29-3.39)	<b>3.35</b> (2.73-4.09)	<b>4.24</b> (3.41-5.55)	<b>5.02</b> (3.92-6.65)	<b>5.89</b> (4.44-8.03)	<b>6.86</b> (4.96-9.66)	<b>8.28</b> (5.75-12.0)	<b>9.46</b> (6.35-13.8)
<b>3-day</b>	<b>2.11</b> (1.75-2.53)	<b>2.45</b> (2.02-2.95)	<b>3.10</b> (2.55-3.74)	<b>3.72</b> (3.05-4.52)	<b>4.71</b> (3.80-6.12)	<b>5.57</b> (4.37-7.32)	<b>6.52</b> (4.94-8.83)	<b>7.58</b> (5.50-10.6)	<b>9.11</b> (6.36-13.2)	<b>10.4</b> (7.01-15.1)
<b>4-day</b>	<b>2.26</b> (1.88-2.71)	<b>2.63</b> (2.18-3.15)	<b>3.32</b> (2.75-4.00)	<b>3.99</b> (3.28-4.83)	<b>5.04</b> (4.08-6.52)	<b>5.96</b> (4.68-7.80)	<b>6.96</b> (5.29-9.39)	<b>8.08</b> (5.89-11.3)	<b>9.70</b> (6.80-13.9)	<b>11.0</b> (7.48-16.0)
<b>7-day</b>	<b>2.68</b> (2.24-3.19)	<b>3.08</b> (2.57-3.67)	<b>3.83</b> (3.19-4.58)	<b>4.55</b> (3.76-5.46)	<b>5.67</b> (4.62-7.27)	<b>6.65</b> (5.26-8.63)	<b>7.73</b> (5.91-10.3)	<b>8.92</b> (6.55-12.3)	<b>10.6</b> (7.52-15.2)	<b>12.1</b> (8.26-17.3)
<b>10-day</b>	<b>3.07</b> (2.58-3.64)	<b>3.50</b> (2.94-4.15)	<b>4.31</b> (3.60-5.12)	<b>5.06</b> (4.21-6.06)	<b>6.24</b> (5.09-7.93)	<b>7.25</b> (5.76-9.34)	<b>8.36</b> (6.42-11.1)	<b>9.57</b> (7.06-13.1)	<b>11.3</b> (8.05-16.1)	<b>12.8</b> (8.79-18.3)
<b>20-day</b>	<b>4.17</b> (3.52-4.89)	<b>4.78</b> (4.04-5.61)	<b>5.83</b> (4.91-6.88)	<b>6.76</b> (5.67-8.02)	<b>8.13</b> (6.63-10.1)	<b>9.24</b> (7.37-11.7)	<b>10.4</b> (8.03-13.6)	<b>11.7</b> (8.65-15.7)	<b>13.4</b> (9.57-18.7)	<b>14.8</b> (10.3-20.9)
<b>30-day</b>	<b>5.05</b> (4.29-5.90)	<b>5.82</b> (4.94-6.80)	<b>7.10</b> (6.00-8.32)	<b>8.18</b> (6.88-9.64)	<b>9.69</b> (7.92-11.9)	<b>10.9</b> (8.70-13.6)	<b>12.1</b> (9.37-15.6)	<b>13.4</b> (9.95-17.8)	<b>15.0</b> (10.8-20.8)	<b>16.4</b> (11.5-23.0)
<b>45-day</b>	<b>6.14</b> (5.24-7.14)	<b>7.09</b> (6.05-8.24)	<b>8.62</b> (7.33-10.1)	<b>9.87</b> (8.35-11.6)	<b>11.6</b> (9.46-14.1)	<b>12.9</b> (10.3-15.9)	<b>14.1</b> (11.0-18.0)	<b>15.4</b> (11.5-20.4)	<b>17.1</b> (12.3-23.3)	<b>18.3</b> (12.9-25.6)
<b>60-day</b>	<b>7.05</b> (6.04-8.16)	<b>8.13</b> (6.96-9.42)	<b>9.85</b> (8.40-11.5)	<b>11.2</b> (9.53-13.1)	<b>13.1</b> (10.7-15.8)	<b>14.4</b> (11.6-17.8)	<b>15.8</b> (12.3-20.0)	<b>17.0</b> (12.8-22.4)	<b>18.7</b> (13.5-25.4)	<b>19.9</b> (14.1-27.7)

<sup>1</sup> 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**

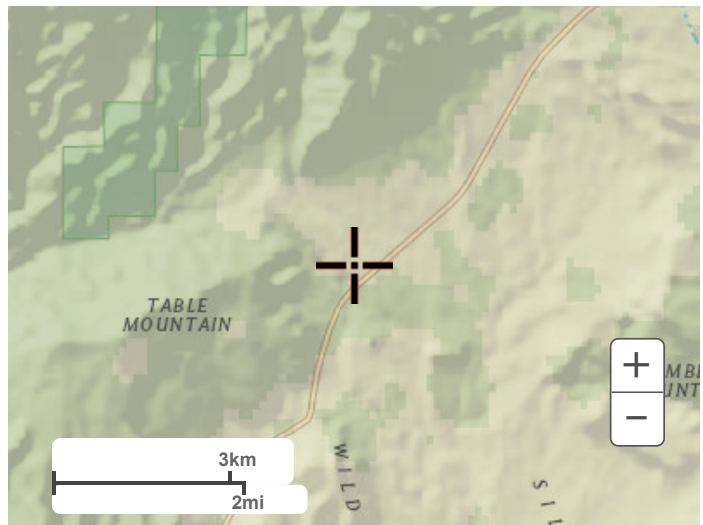
PDS-based depth-duration-frequency (DDF) curves  
 Latitude: 38.5744°, Longitude: -104.9385°



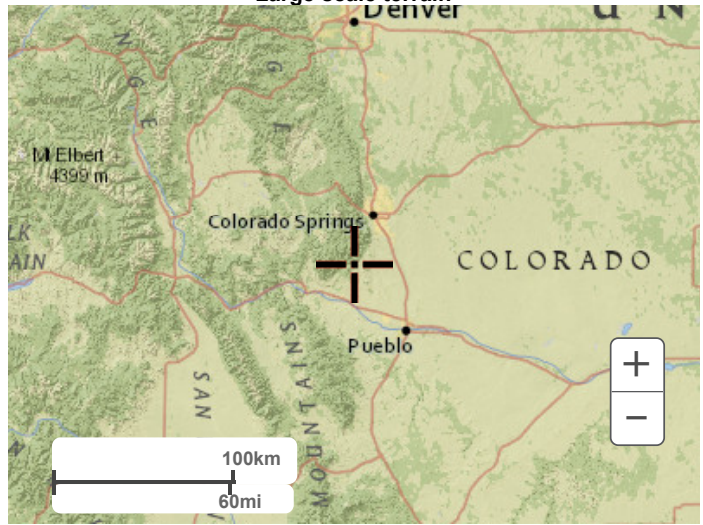
[Back to Top](#)

**Maps & aerials**

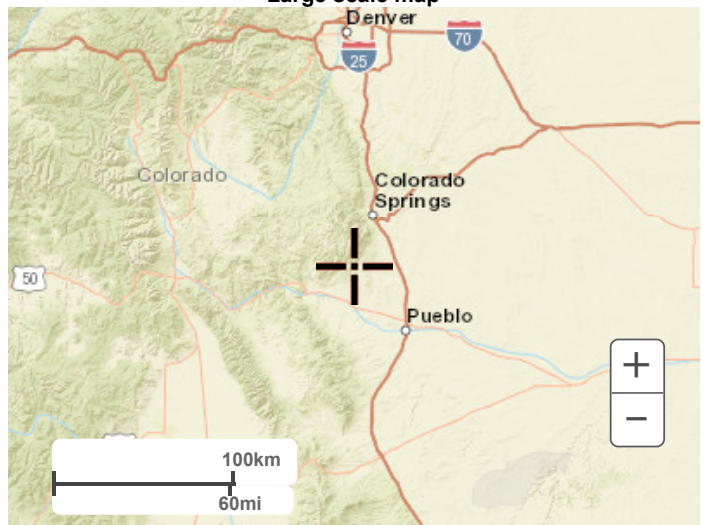
**Small scale terrain**



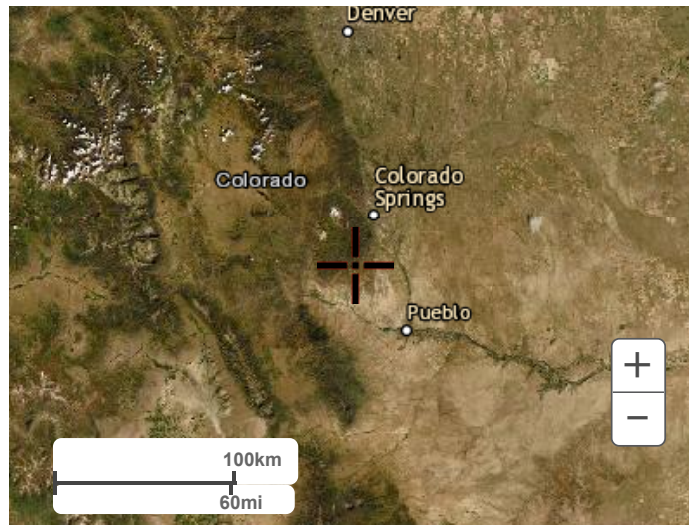
Large scale terrain



Large scale map



Large scale aerial



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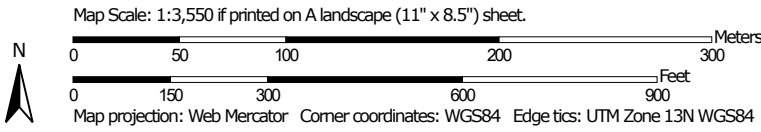
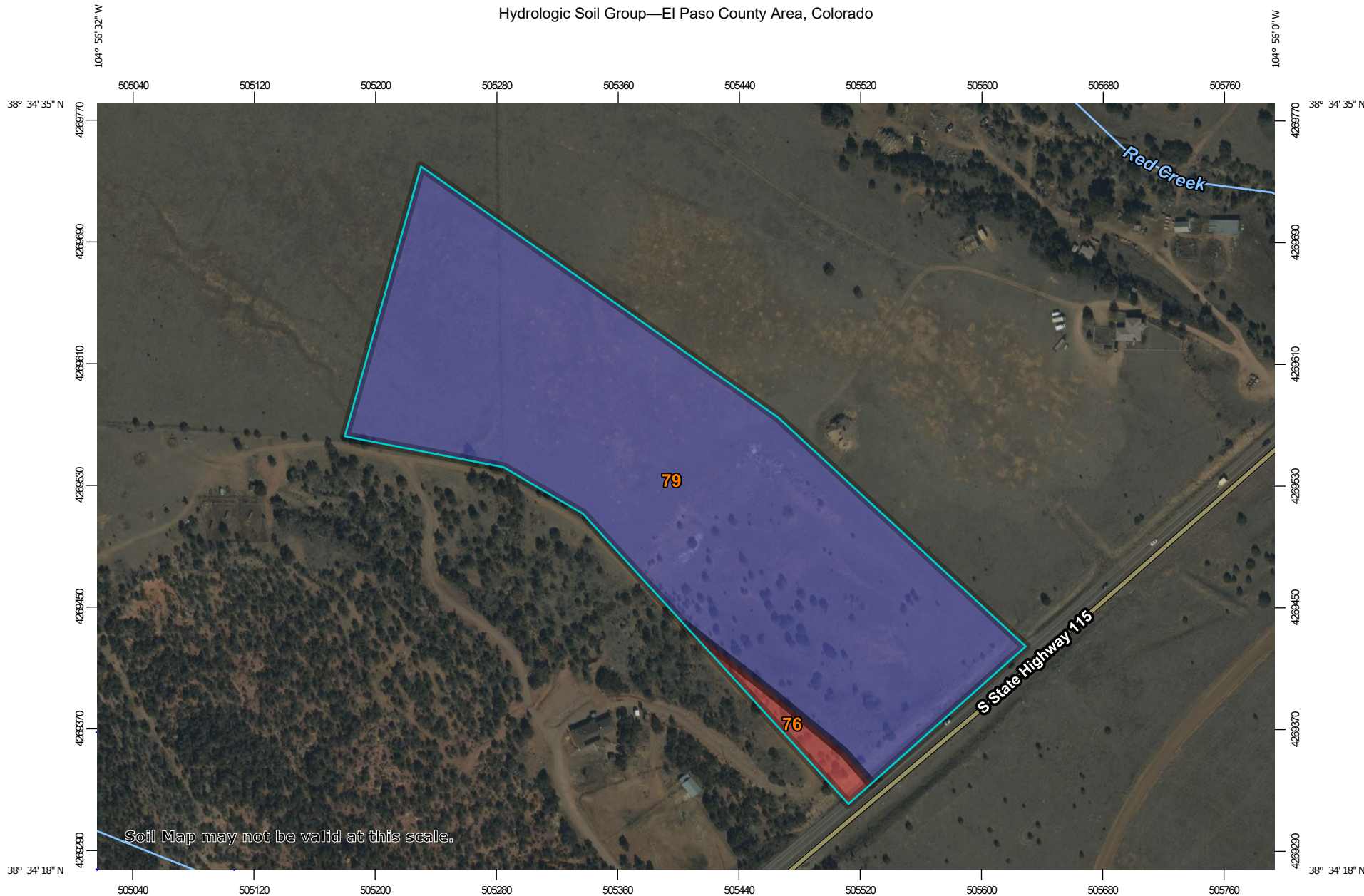
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[US Department of Commerce](#)  
[National Oceanic and Atmospheric Administration](#)  
[National Weather Service](#)  
[National Water Center](#)  
1325 East West Highway  
Silver Spring, MD 20910  
Questions?: [HDSC.Questions@noaa.gov](mailto:HDSC.Questions@noaa.gov)

[Disclaimer](#)



Hydrologic Soil Group—El Paso County Area, Colorado



### MAP LEGEND

**Area of Interest (AOI)**









 Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**





-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available

**Soil Rating Lines**

-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available

**Soil Rating Points**

-  A
-  A/D
-  B
-  B/D

-  C
-  C/D
-  D
-  Not rated or not available


**Water Features**

 Streams and Canals

**Transportation**

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

**Background**

 Aerial Photography

### MAP INFORMATION

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

**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 19, Aug 31, 2021

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

Date(s) aerial images were photographed: Sep 11, 2018—Oct 20, 2018

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.



## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
76	Rizozo-Neville complex, 3 to 30 percent slopes	D	0.5	3.0%
79	Satanta loam, 0 to 3 percent slopes	B	16.2	97.0%
<b>Totals for Area of Interest</b>			<b>16.7</b>	<b>100.0%</b>

### Description

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

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

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

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

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

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

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

### Rating Options

*Aggregation Method:* Dominant Condition

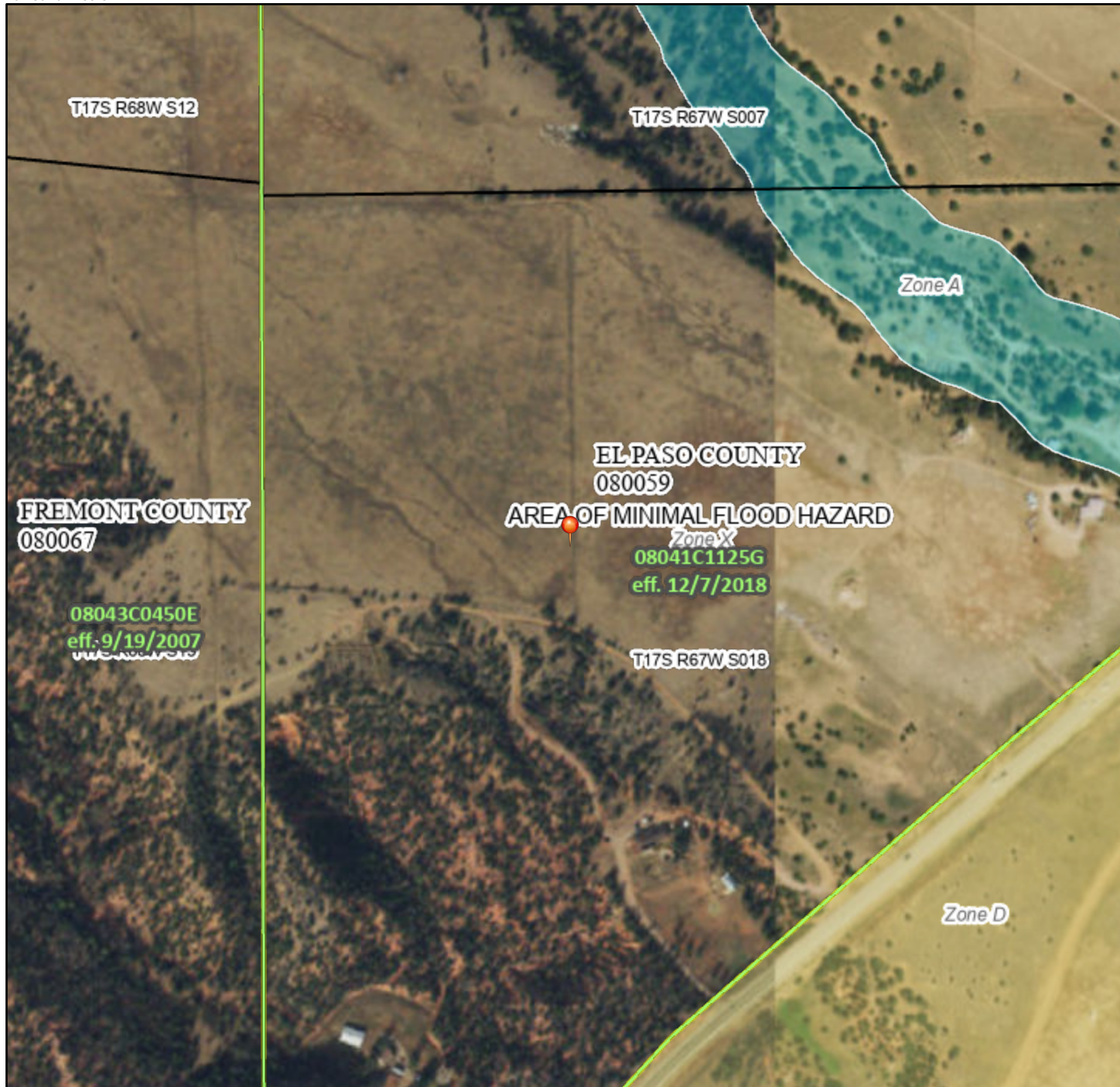
*Component Percent Cutoff: None Specified*

*Tie-break Rule: Higher*

# National Flood Hazard Layer FIRMMette



104°56'40"W 38°34'44"N



Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) Zone A, V, A99	With BFE or Depth Zone AE, AO, AH, VE, AR
	Regulatory Floodway	

OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
	Future Conditions 1% Annual Chance Flood Hazard Zone X
	Area with Reduced Flood Risk due to Levee. See Notes. Zone X
	Area with Flood Risk due to Levee Zone D

OTHER AREAS	NO SCREEN Area of Minimal Flood Hazard Zone X
	Effective LOMRs
	Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall

OTHER FEATURES	Cross Sections with 1% Annual Chance Water Surface Elevation
	20.2
	17.5
	Coastal Transect
	Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature

MAP PANELS	Digital Data Available
	No Digital Data Available
	Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/20/2022 at 11:41 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.





Engineering · Planning · Surveying

PROJECT: ORTON PIT SITE  
 JOB NO.: 35059  
 CALC. BY: SPC  
 DATE: 7/6/2022

= FORMULA CELLS  
 = USER INPUT CELLS

Project Location	
User Input	▼

**IDF Rainfall Data**

D	P <sub>1</sub> : 1-hour Rainfall Depths (inches)	
	Minor Storm	Major Storm
	10-Year	100-Year
Minutes	<b>1.47</b>	<b>2.61</b>
5	6.00	9.00
10	4.60	7.00
20	3.45	5.20
30	2.75	4.15
40	2.25	3.50
50	1.90	3.00
60	1.75	2.15

Intensity values interpolated from Figure 5-1 in the EPC DCM Vol I.  
 I = rainfall intensity (inches per hour)  
 P<sub>1</sub> = 1-hour point rainfall depth (inches)  
 D = storm duration (minutes)

The County adopted Ch6 of the 2014 City of Colorado springs Drainage Criteria manual. Please be sure to use and reference that rainfall data

Reference:

- 1) El Paso County - Drainage Criteria Manual Volume I, Revised 1987
- 2) Rainfall depths determined via the NOAA Atlas 14, Volume 8, Version 2  
[https://hdsc.nws.noaa.gov/hdsc/pfds/pfds\\_map\\_cont.html?bkmrk=co](https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=co)

PROJECT: ORTON PIT SITE  
 JOB NO.: 35059  
 CALC. BY: SPC  
 DATE: 7/6/2022

= FORMULA CELLS  
 = USER INPUT CELLS

**Runoff Coefficients & Impervious Values for Rational Method - per CS DCM Vol I, Table 6-6.**

	Impervious Percentage	C <sub>2</sub>	C <sub>5</sub>	C <sub>10</sub>	C <sub>25</sub>	C <sub>50</sub>	C <sub>100</sub>
UA- Historic Flow Analysis -- Greenbelts	2%	0.03	0.09	0.17	0.26	0.31	0.36
Land Use	0%	0.00	0.00	0.00	0.00	0.00	0.00
Land Use	0%	0.00	0.00	0.00	0.00	0.00	0.00
Land Use	0%	0.00	0.00	0.00	0.00	0.00	0.00

	Impervious Percentage	C <sub>2</sub>	C <sub>5</sub>	C <sub>10</sub>	C <sub>25</sub>	C <sub>50</sub>	C <sub>100</sub>
Land Use	0%	0.00	0.00	0.00	0.00	0.00	0.00
Land Use	0%	0.00	0.00	0.00	0.00	0.00	0.00
Land Use	0%	0.00	0.00	0.00	0.00	0.00	0.00
Land Use	0%	0.00	0.00	0.00	0.00	0.00	0.00

Hydrologic Soil Group

A or B

**PROPOSED COMPOSITE IMPERVIOUSNESS**

Basin	Area (ac)	Weighted Impervious and C Values							Areas (ac)							
		Imp.	C <sub>2</sub>	C <sub>5</sub>	C <sub>10</sub>	C <sub>25</sub>	C <sub>50</sub>	C <sub>100</sub>	UA- Historic Flow Analysis -- Greenbelts, Agriculture	Land Use	Land Use	Land Use	Land Use	Land Use	Land Use	Land Use
<b>Existing Conditions Subbasins</b>																
E1	10.26	2%	0.03	0.09	0.17	0.26	0.31	0.36	10.26							
E2	26.40	2%	0.03	0.09	0.17	0.26	0.31	0.36	26.40							

PROJECT: ORTON PIT SITE  
 JOB NO.: 35059  
 CALC. BY: SPC  
 DATE: 7/6/2022

= FORMULA CELLS  
 = USER INPUT CELLS



**Runoff Coefficients & Impervious Values for Rational Method - per CS DCM Vol I, Table 6-6.**

	Impervious Percentage	C <sub>2</sub>	C <sub>5</sub>	C <sub>10</sub>	C <sub>25</sub>	C <sub>50</sub>	C <sub>100</sub>
UA- Historic Flow Analysis -- Greenbelts	2%	0.03	0.09	0.17	0.26	0.31	0.36
Land Use	0%	0.00	0.00	0.00	0.00	0.00	0.00
Land Use	0%	0.00	0.00	0.00	0.00	0.00	0.00
Land Use	0%	0.00	0.00	0.00	0.00	0.00	0.00

	Impervious Percentage	C <sub>2</sub>	C <sub>5</sub>	C <sub>10</sub>	C <sub>25</sub>	C <sub>50</sub>	C <sub>100</sub>
Land Use	0%	0.00	0.00	0.00	0.00	0.00	0.00
Land Use	0%	0.00	0.00	0.00	0.00	0.00	0.00
Land Use	0%	0.00	0.00	0.00	0.00	0.00	0.00
Land Use	0%	0.00	0.00	0.00	0.00	0.00	0.00

Hydrologic Soil Group

A or B

**PROPOSED COMPOSITE IMPERVIOUSNESS**

Basin	Area (ac)	Weighted Impervious and C Values							Areas (ac)							
		Imp.	C <sub>2</sub>	C <sub>5</sub>	C <sub>10</sub>	C <sub>25</sub>	C <sub>50</sub>	C <sub>100</sub>	UA- Historic Flow Analysis -- Greenbelts, Agriculture	Land Use	Land Use	Land Use	Land Use	Land Use	Land Use	Land Use
<b>Proposed Conditions Subbasins</b>																
P1	10.26	2%	0.03	0.09	0.17	0.26	0.31	0.36	10.26							

**STANDARD FORM SF-1**  
**TIME OF CONCENTRATION SUMMARY**

Project: **ORTON PIT SITE**  
Job No.: **35059**  
Checked By: **SGB**

Calculated By: **SPC**  
Date: **7/6/2022**

SUB-BASIN DATA				INITIAL/OVERLAND TIME (t <sub>i</sub> )			TRAVEL TIME (t <sub>t</sub> )					t <sub>c</sub> CHECK (URBANIZED BASINS)				FINAL t <sub>c</sub>	REMARKS
Basin	i	C <sub>s</sub>	AREA	LENGTH	SLOPE	t <sub>i</sub>	LENGTH	C <sub>v</sub>	SLOPE	VEL.	t <sub>t</sub>	COMP.	TOT. LENGTH	S <sub>o</sub>	tc (Equation 6-7)		
(1)	(2)	(3)	Ac (4)	Ft (5)	% (6)	Min (7)	Ft (8)		% (9)	FPS (10)	Min (11)	t <sub>c</sub> (12)	Ft (13)	% (14)	Min (15)	Min (16)	
<b>Existing Conditions Subbasins</b>																	
E1	0.02	0.09	10.26	100	3.5	12.06	1,030	5	5.2	1.14	15.06	27.1	1,130	5.05	34.7	27.12	
E2	0.02	0.09	26.40	100	3.8	11.74	2,484	5	3.8	0.97	42.48	54.2	2,584	3.80	49.5	49.47	
<b>Proposed Conditions Subbasins</b>																	
P1	0.02	0.09	10.26	100	7.7	9.29	1,096	5	4.2	1.02	17.83	27.1	1,196	4.49	35.8	27.12	

$$t_c = t_i + t_t$$

$$t_t = \frac{0.395(1.1 - C_s) \sqrt{L}}{(S_o)^{0.33}}$$

$$V = C_v * S_w^{0.5}$$

Heavy meadow	2.5
Tillage/Field	5
Riprap (not buried)*	6.5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

\*For buried riprap, select C<sub>v</sub> value based on type of vegetative cover.

= FORMULA CELLS  
 = USER INPUT CELLS



Calculated By: SPC  
 Date: 7/6/2022  
 Checked By: SGB  
 10-Year  
 1-hour rainfall= 1.47

**STANDARD FORM SF-2**  
 STORM DRAINAGE SYSTEM DESIGN  
 (RATIONAL METHOD PROCEDURE)

Project: ORTON PIT SITE  
 Job No.: 35059  
 Design Storm: 10-Year

= FORMULA CELLS  
 = USER INPUT CELLS

BASIN	DIRECT RUNOFF								TOTAL RUNOFF				STREET		PIPE			LENGTH (FT)	VELOCITY (FPS)	t <sub>c</sub> (MIN)	REMARKS
	DESIGN POINT	AREA DESIGN	AREA (AC)	RUNOFF COEFF	t <sub>c</sub> (MIN)	C * A (AC)	I (IN/HR)	Q (CFS)	t <sub>c</sub> (MIN)	S (C * A) (CA)	I (IN/HR)	Q (CFS)	SLOPE (%)	STREET FLOW	DESIGN FLOW (CFS)	SLOPE (%)	PIPE DIAM. (IN.)				
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
<b>Existing Conditions Subbasins</b>																					
E1	1		10.26	0.17	27.1	1.75	2.90	<b>5.06</b>													
E2	2		26.40	0.17	49.5	4.49	2.00	<b>8.98</b>													
<b>Proposed Conditions Subbasins</b>																					
P1	1		10.26	0.17	27.1	1.75	2.90	<b>5.06</b>													



Calculated By: SPC  
 Date: 7/6/2022  
 Checked By: SGB  
 100-Year  
 1-hour rainfall= 2.61

**STANDARD FORM SF-2**  
 STORM DRAINAGE SYSTEM DESIGN  
 (RATIONAL METHOD PROCEDURE)

Project: ORTON PIT SITE  
 Job No.: 35059  
 Design Storm: 100-Year

= FORMULA CELLS  
 = USER INPUT CELLS

BASIN	DIRECT RUNOFF								TOTAL RUNOFF				STREET		PIPE			LENGTH (FT)	VELOCITY (FPS)	t (MIN)	REMARKS
	DESIGN POINT	AREA DESIGN	AREA (AC)	RUNOFF COEFF	t <sub>c</sub> (MIN)	C * A (AC)	I (IN/HR)	Q (CFS)	t <sub>c</sub> (MIN)	S (C * A) (CA)	I (IN/HR)	Q (CFS)	SLOPE (%)	STREET FLOW	DESIGN FLOW (CFS)	SLOPE (%)	PIPE DIAM. (IN.)				
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
<b>Existing Conditions Subbasins</b>																					
E1	1		10.26	0.36	27.1	3.70	4.40	16.26													
E2	2		26.40	0.36	49.5	9.50	3.00	28.51													
<b>Proposed Conditions Subbasins</b>																					
P1	1		10.26	0.36	27.1	3.70	4.40	16.26													

PROJECT: ORTON PIT SITE  
 JOB NO.: 35059  
 CALC. BY: SPC  
 DATE: 7/6/2022



DIRECT RUNOFF SUMMARY										
BASIN LABEL	DESIGN POINT	AREA [ac]	Imp. %	C10	C100	LOCAL (CFS)		ACCUMULATIVE (CFS)		Notes
						Q10	Q100	Q10	Q100	
Existing Subbasins										
E1	1	10.26	2%	0.17	0.36	5.06	16.26			
E2	2	26.40	2%	0.17	0.36	8.98	28.51			
Proposed Subbasins										
P1	1	10.26	2%	0.17	0.36	5.06	16.26			

## Site-Level Low Impact Development (LID) Design Effective Impervious Calculator

### LID Credit by Impervious Reduction Factor (IRF) Method

UD-BMP (Version 3.06, November 2016)

	User Input	
	Calculated cells	
***Design Storm: 1-Hour Rain Depth	WQCV Event	0.02 inches
***Minor Storm: 1-Hour Rain Depth	5-Year Event	1.22 inches
***Major Storm: 1-Hour Rain Depth	100-Year Event	2.61 inches
Optional User Defined Storm (CUHP) NOAA 1 Hour Rainfall Depth and Frequency for User Defined Storm	CUHP	
	100-Year Event	2.61
Max Intensity for Optional User Defined Storm	2.60478	

**Designer:** SPC  
**Company:** Baseline Engineering Corp  
**Date:** June 27, 2022  
**Project:** Orton Pit  
**Location:** El Paso County

**SITE INFORMATION (USER-INPUT)**

Sub-basin Identifier	P1														
Receiving Pervious Area Soil Type	Loam														
Total Area (ac., Sum of DCIA, UIA, RPA, & SPA)	10.26														
Directly Connected Impervious Area (DCIA, acres)	0.00														
Unconnected Impervious Area (UIA, acres)	0.00														
Receiving Pervious Area (RPA, acres)	0.00														
Separate Pervious Area (SPA, acres)	10.26														
RPA Treatment Type: Conveyance (C), Volume (V), or Permeable Pavement (PP)	C														

**CALCULATED RESULTS (OUTPUT)**

Total Calculated Area (ac, check against input)	10.260														
Directly Connected Impervious Area (DCIA, %)	0.0%														
Unconnected Impervious Area (UIA, %)	0.0%														
Receiving Pervious Area (RPA, %)	0.0%														
Separate Pervious Area (SPA, %)	100.0%														
A <sub>R</sub> (RPA / UIA)	0.000														
I <sub>a</sub> Check	1.000														
f / I for WQCV Event:	28.7														
f / I for 5-Year Event:	0.4														
f / I for 100-Year Event:	0.2														
<b>f / I for Optional User Defined Storm CUHP:</b>	<b>0.18</b>														
IRF for WQCV Event:	1.00														
IRF for 5-Year Event:	1.00														
IRF for 100-Year Event:	1.00														
<b>IRF for Optional User Defined Storm CUHP:</b>	<b>1.00</b>														
Total Site Imperviousness: I <sub>total</sub>	0.0%														
Effective Imperviousness for WQCV Event:	0.0%														
Effective Imperviousness for 5-Year Event:	0.0%														
Effective Imperviousness for 100-Year Event:	0.0%														
<b>Effective Imperviousness for Optional User Defined Storm CUHP:</b>	<b>0.0%</b>														

**LID / EFFECTIVE IMPERVIOUSNESS CREDITS**

WQCV Event CREDIT: Reduce Detention By:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
This line only for 10-Year Event	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
100-Year Event CREDIT** : Reduce Detention By:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>User Defined CUHP CREDIT: Reduce Detention By:</b>	<b>0.0%</b>														

<b>Total Site Imperviousness:</b>	<b>0.0%</b>
<b>Total Site Effective Imperviousness for WQCV Event:</b>	<b>0.0%</b>
<b>Total Site Effective Imperviousness for 5-Year Event:</b>	<b>0.0%</b>
<b>Total Site Effective Imperviousness for 100-Year Event:</b>	<b>0.0%</b>
<b>Total Site Effective Imperviousness for Optional User Defined Storm CUHP:</b>	<b>0.0%</b>

Notes:

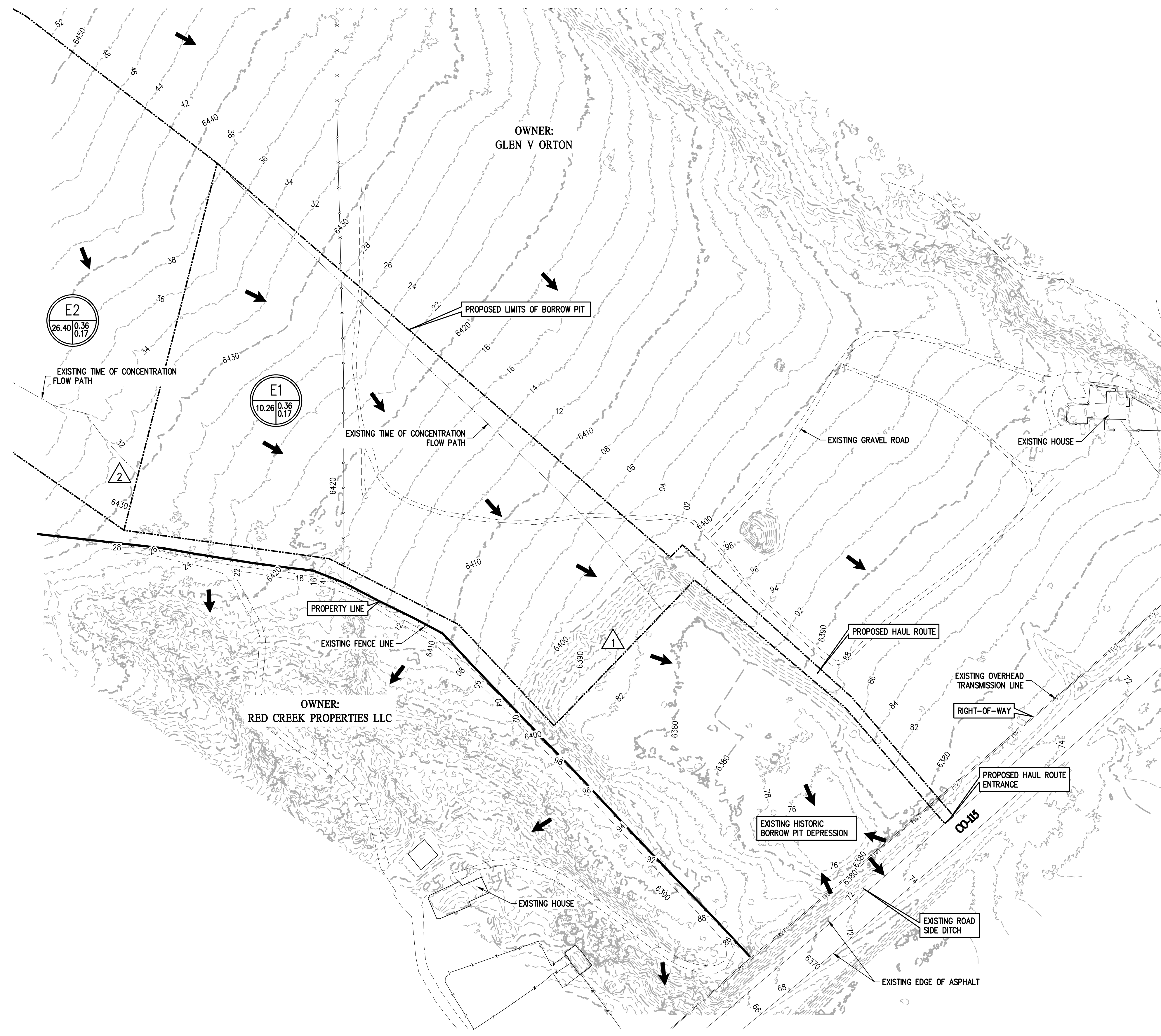
- \* Use Green-Ampt average infiltration rate values from Table 3-3.
- \*\* Flood control detention volume credits based on empirical equations from Storage Chapter of USDCM.
- \*\*\* Method assumes that 1-hour rainfall depth is equivalent to 1-hour intensity for calculation purposed



***APPENDIX C***



R:\35059 Orton Pit Drainage Report\Drawings\Drawings\Drainage Plans.dwg, 7/12/2022 12:51:14 PM, Sean Callahan



**LEGEND**

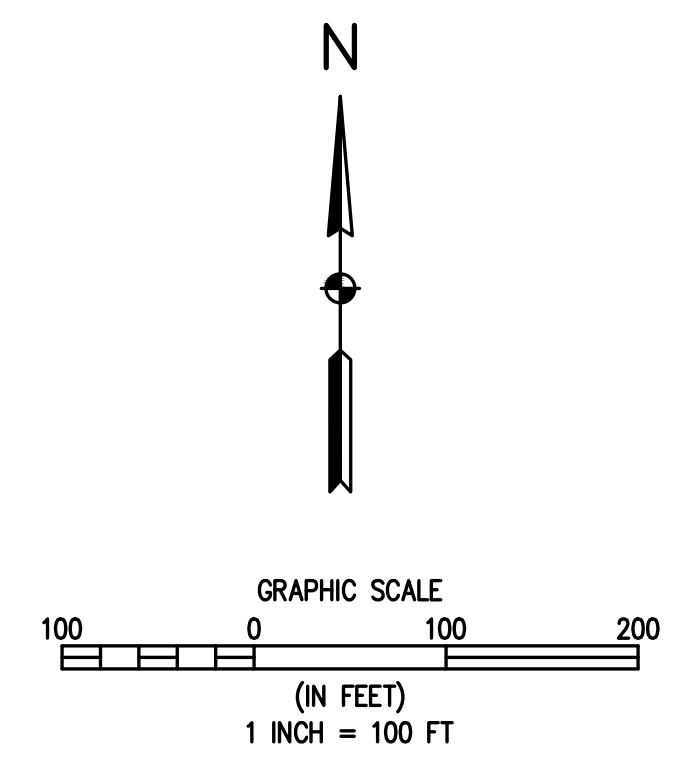
EXISTING LINETYPES	PROPOSED LINETYPES	
---	---	PROPERTY BOUNDARY
---	---	RIGHT-OF-WAY
- - - 81 - - -	- - - 81 - - -	MINOR CONTOUR (2' INTERVAL)
- - - 5280 - - -	- - - 5280 - - -	MAJOR CONTOUR (10' INTERVAL)
---	---	EDGE OF ASPHALT
---	---	EDGE OF GRAVEL
---	---	WIRE FENCE
---	---	DRAINAGE BASIN
---	---	HIGH VOLTAGE TRANSMISSION

EXISTING SYMBOLS	PROPOSED SYMBOLS	
▶ 3:1	▶ 3:1	NOMINAL SLOPE ON CUT OR FILL
→	→	FLOW DIRECTION, TYPICALLY ON PAVED SURFACES
△ 0	△ 0	DESIGN POINT DESIGNATION
○ A	○ A	A = BASIN ID
○ B	○ B	B = BASIN AREA (ACRES)
○ C	○ C	C = 100YR COEFFICIENT
○ D	○ D	D = 10YR COEFFICIENT

DIRECT RUNOFF SUMMARY										
BASIN LABEL	DESIGN POINT	AREA [ac]	Imp. %	C10	C100	LOCAL (CFS)		ACCUMULATIVE (CFS)		Notes
						Q10	Q100	Q10	Q100	
Existing Subbasins										
E1	1	10.26	2%	0.17	0.36	5.06	16.26			
E2	2	26.40	2%	0.17	0.36	8.98	28.51			

Please also show the cumulative flows entering the depression

EL PASO COUNTY NOTE:  
CITY/COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH CITY/COUNTY DESIGN CRITERIA. THE CITY/COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE CITY/COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.



DESIGNED BY	DATE	PREPARED BY	REVISION DESCRIPTION
SPC			
SPC			
SPC			
SPC			

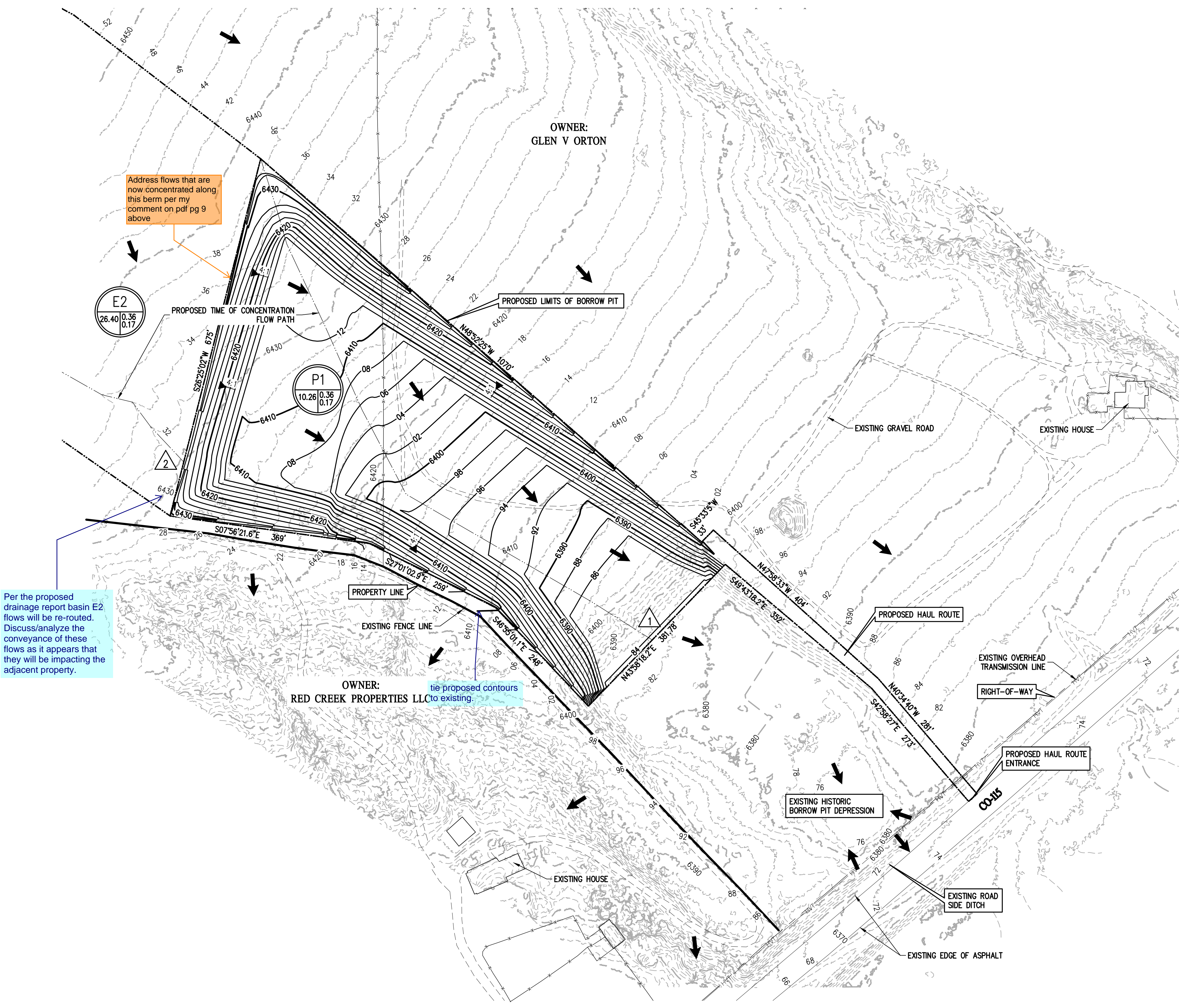
**CASTLE ROCK CONSTRUCTION COMPANY**  
UNINCORPORATED  
EL PASO COUNTY  
ORTON PIT SITE  
17710 COLO 115  
EXISTING CONDITIONS DRAINAGE PLAN

FOR AND ON BEHALF OF  
BASELINE CORPORATION

INITIAL SUBMITTAL 07/12/22  
DRAWING SIZE 24" X 36"  
SURVEY FIRM SURVEY DATE  
JOB NO. 35059  
DRAWING NAME 35059 - Drainage Plans.dwg  
SHEET 01 OF 02  
DNG01



R:\35059 Orton Pit Drainage Report\Drawings\Drawings\Drainage Plans.dwg, 7/12/2022 12:51:19 PM, Sean Callahan



Address flows that are now concentrated along this berm per my comment on pdf pg 9 above

Per the proposed drainage report basin E2 flows will be re-routed. Discuss/analyze the conveyance of these flows as it appears that they will be impacting the adjacent property.

tie proposed contours to existing.

Please also show the cumulative flows entering the depression

**LEGEND**

EXISTING LINETYPES	PROPOSED LINETYPES	
---	---	PROPERTY BOUNDARY
---	---	RIGHT-OF-WAY
81	81	MINOR CONTOUR (2' INTERVAL)
5280	5280	MAJOR CONTOUR (10' INTERVAL)
---	---	EDGE OF ASPHALT
---	---	EDGE OF GRAVEL
---	---	WIRE FENCE
---	---	DRAINAGE BASIN
---	---	HVT
---	---	HVT

- EXISTING SYMBOLS: 3:1 NOMINAL SLOPE ON CUT OR FILL  
 FLOW DIRECTION, TYPICALLY ON PAVED SURFACES  
 DESIGN POINT DESIGNATION  
 A = BASIN ID  
 B = BASIN AREA (ACRES)  
 C = 100YR COEFFICIENT  
 D = 10YR COEFFICIENT

DIRECT RUNOFF SUMMARY										
BASIN LABEL	DESIGN POINT	AREA [ac]	Imp. %	C10	C100	LOCAL (CFS)		ACCUMULATIVE (CFS)		Notes
						Q10	Q100	Q10	Q100	
Proposed Subbasins										
E2	2	26.40	2%	0.17	0.36	8.98	28.51			
P1	1	10.26	2%	0.17	0.36	5.06	16.26			

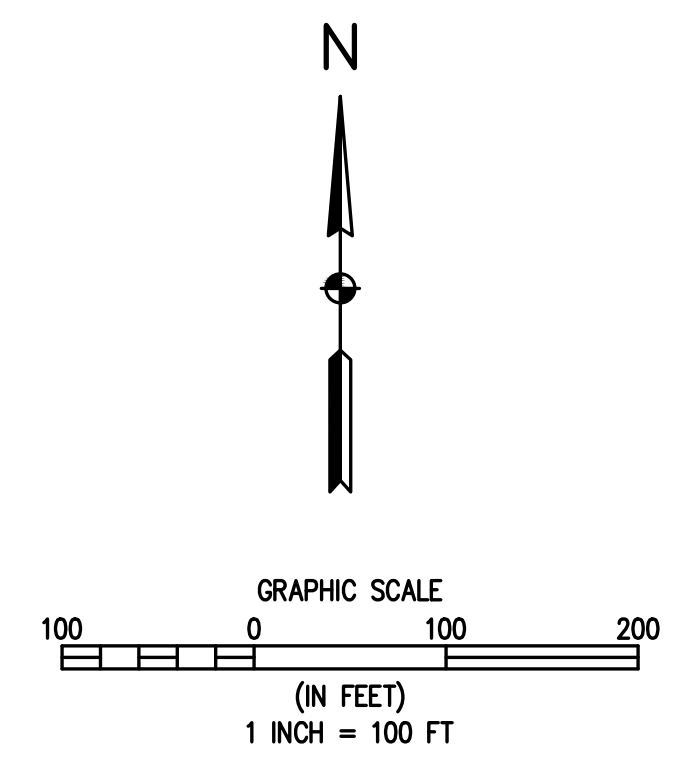
DESIGNED BY	DATE	PREPARED BY	REVISION DESCRIPTION
SPC			
SPC			
SPC			

**CASTLE ROCK CONSTRUCTION COMPANY**  
UNINCORPORATED  
EL PASO COUNTY  
ORTON PIT SITE  
17710 COLO 115  
PROPOSED DRAINAGE PLAN

FOR AND ON BEHALF OF  
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INITIAL SUBMITTAL 07/12/22  
DRAWING SIZE 24" X 36"  
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JOB NO. 35059  
DRAWING NAME 35059 - Drainage Plans.dwg  
SHEET 02 OF 02  
DNG02

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Office (303) 688-6611  
Fax (303) 688-6685

6374 S. Racine Circle, Centennial, Colorado 80111

[www.castlerockconstructionco.com](http://www.castlerockconstructionco.com)

May 23, 2022

El Paso County Planning and  
Community Development Department  
2880 International Circle, Suite 110  
Colorado Springs, CO 80910

Re: Drainage Report for Golden Eagle Ranch Plant Site

To Whom it Concerns,

Per the GEC plan, drainage patterns will be changed as the runoff will be re-routed around the plant site. Please submit a drainage report for the batch plant site per DCM ch4.

Castle Rock Construction Company of Colorado, LLC. will not be adding or removing any drainage features on this parcel of land. We plan to strip and stockpile all top soil from the 10- acre location without adjusting the drainage features in place. This top soil will be used as perimeter control during the plant operations. Once plant operations have been completed for the CDOT SH 115 project, all un-used aggregates and materials imported throughout the project will be removed leaving the native soil. Then the land will be restored back to the same elevations and slopes as it began.

Thank you for your assistance.

Sincerely,

Richard Timian  
General Superintendent