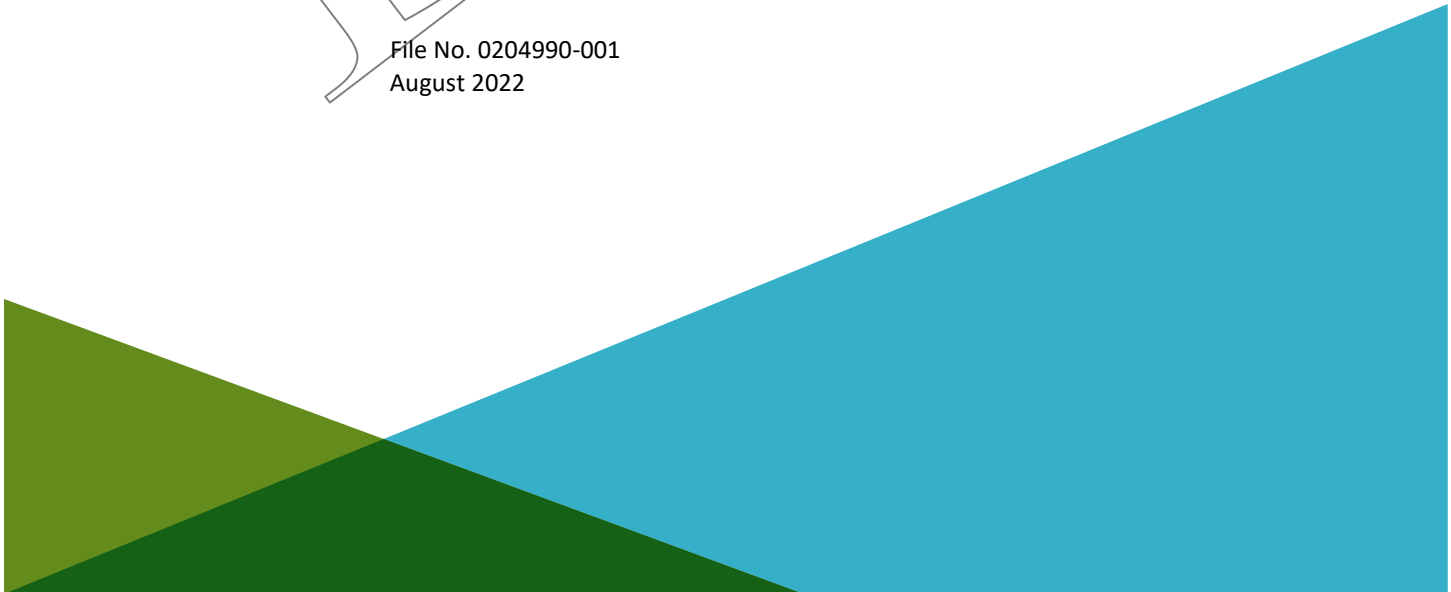
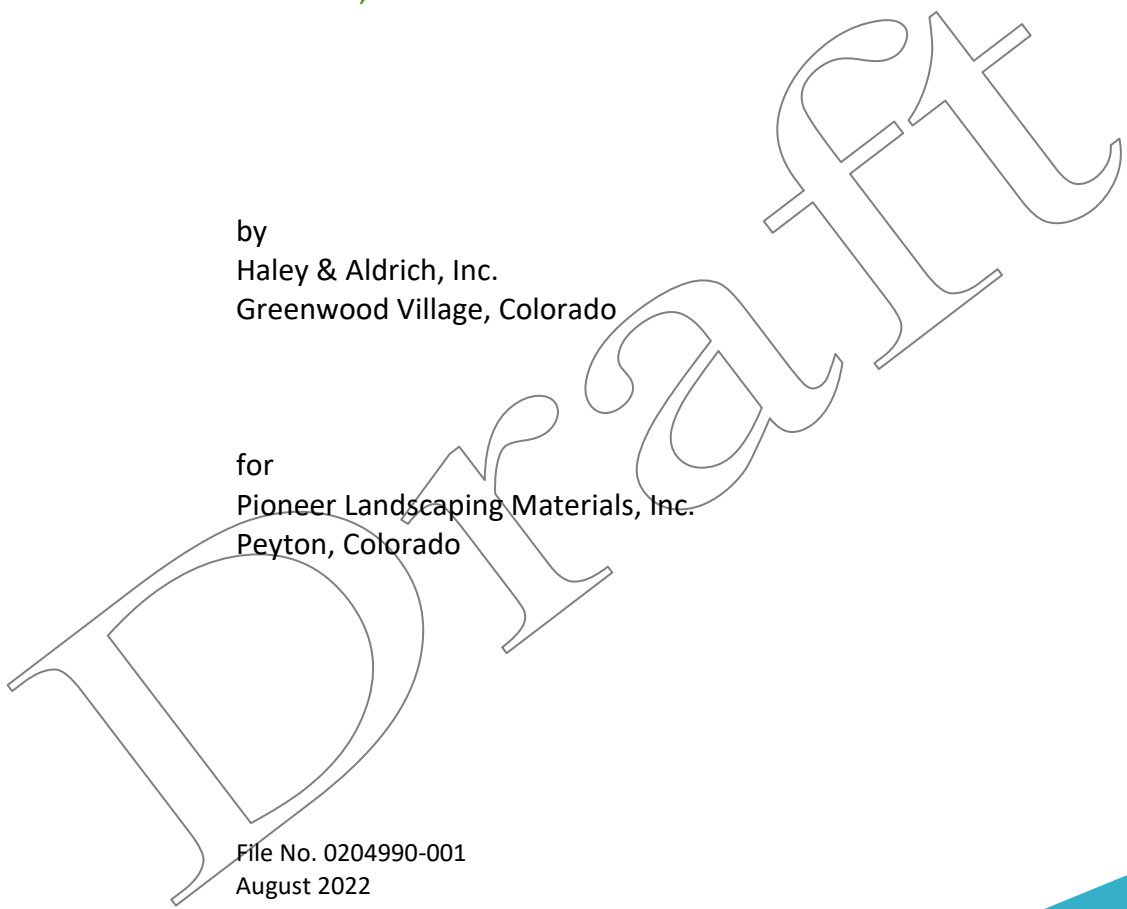


**REPORT ON  
EROSION AND STORMWATER QUALITY CONTROL PERMIT  
STORMWATER MANAGEMENT PLAN  
SOLBERG PIT  
PEYTON, COLORADO**

by  
Haley & Aldrich, Inc.  
Greenwood Village, Colorado

for  
Pioneer Landscaping Materials, Inc.  
Peyton, Colorado

File No. 0204990-001  
August 2022





HALEY & ALDRICH, INC.  
8101 E. Prentice Avenue  
Suite 600  
Greenwood Village, CO 80111  
720.616.4400

11 August 2022  
File No. 0204990-001

Pioneer Landscaping Materials, Inc.  
Solberg Aggregate Mine  
Peyton, Colorado 80831

Attention: Dr. Angela Bellantoni

Subject: Erosion and Stormwater Quality Control Permit  
Stormwater Management Plan  
Solberg Aggregate Mine  
Peyton, Colorado

Dear Dr. Bellantoni:

Haley & Aldrich, Inc., on behalf of Pioneer Landscaping Materials, Inc., is submitting this Stormwater Management Plan as part of the greater permit submittal for an existing sand and gravel mining operation in Peyton, Colorado. The enclosed Stormwater Management Plan presents our analysis of the potential pollutants of the site and best management practices in support of the El Paso County Erosion and Stormwater Quality Control Permit (ESQCP) submittal for the proposed expansion of the existing operation. Thank you for the opportunity to assist Pioneer Landscaping Materials, Inc. with this important project. Please direct any questions to Zach Smith at (720) 621-6536.

Sincerely yours,  
**HALEY & ALDRICH, INC.**

Zachary J. Smith, P.E. (CO)  
Senior Engineer

Christopher G. Langham, P.E. (AZ), CFM  
Technical Expert

Enclosures:  
Report on Stormwater Management Plan, Solberg Pit, Peyton Colorado

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**SIGNATURE PAGE FOR**

**REPORT ON  
STORMWATER MANAGEMENT PLAN  
SOLBERG PIT  
PEYTON, COLORADO**

**PREPARED FOR  
ROBERT SOLBERG  
SOLBERG GRAVEL LLC  
PEYTON, COLORADO**

**QUALIFIED STORMWATER MANAGER  
JASON ULMER  
PIONEER LANDSCAPING MATERIALS, INC.  
PEYTON, COLORADO**

**CONTRACTOR INFORMATION  
ANGELA BELLANTONI  
PIONEER LANDSCAPING MATERIALS, INC.  
PEYTON, COLORADO**

PREPARED BY:

---

Zachary J. Smith PE  
Senior Engineer  
Haley & Aldrich, Inc.

REVIEWED AND APPROVED BY:

---

Christopher G. Langham, P.E. (AZ), CFM  
Technical Expert  
Haley & Aldrich, Inc.

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B	FIRM Maps
C	Web Soils Survey
D	Maintenance and Inspection Reports
E	Modifications to the SWMP

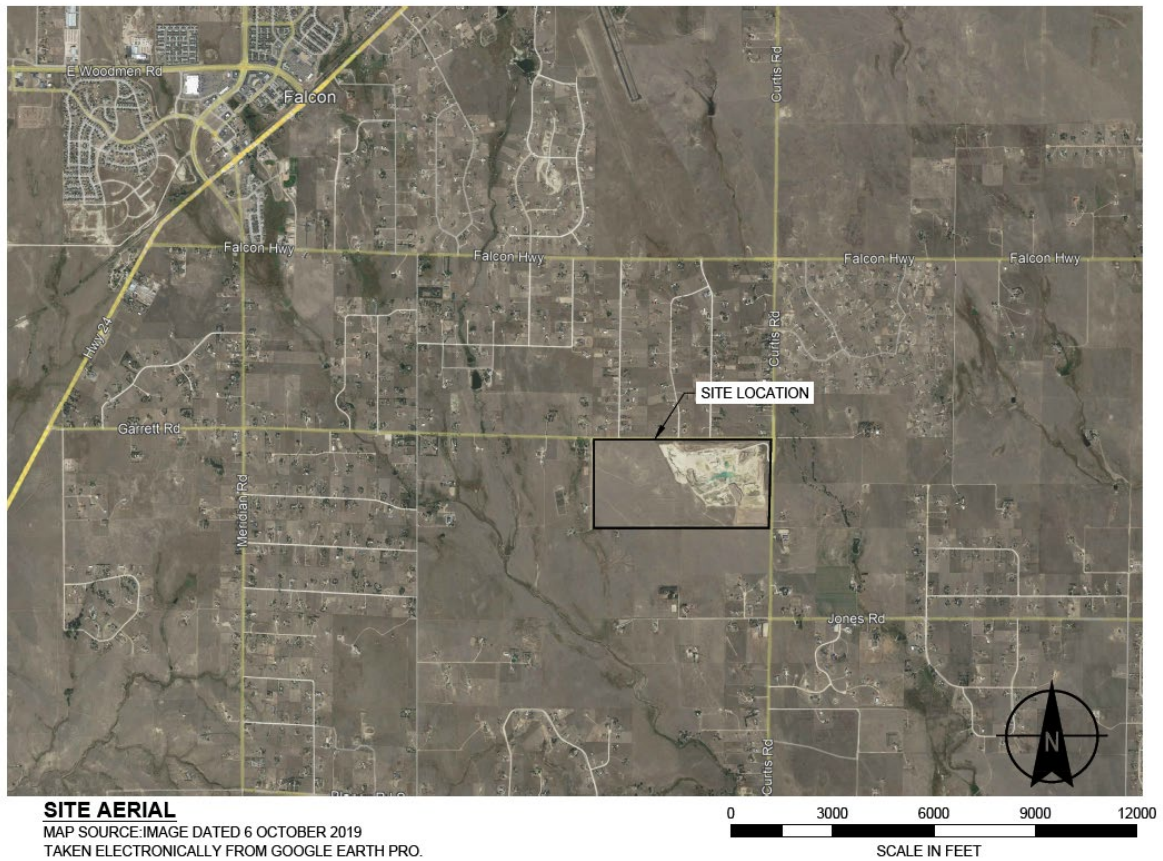
# 1. General Location and Description

## 1.1 LOCATION

The existing Pioneer Landscaping Materials, Inc. (Pioneer) Solberg Pit and proposed 79-acre expansion area (Site), adjoining the existing permitted acreage to the west, is located on private lands on Curtis Road in Peyton, Colorado. The Site is located in a rural portion of the County with surrounding land uses of ranches and low density homesites. No existing facilities exist near the Site. The mine entrance is located on Curtis Road south of Garrett Road. Other streets near the Site include Jones Road to the south and McCandlish Road, Renneberger Road, and Good Fortune Road to the north. The legal description of the Site is the west ½ of the northwest ¼ of Section 21, Township 13 South, Range 64 West of the 6th prime meridian in El Paso County, Colorado.

## 1.2 VICINITY MAP

A site vicinity map has been included below.



## **2. Site Conditions**

### **2.1 DESCRIPTION OF PROPERTY**

The existing construction materials mining operation has a permitted area of approximately 234 acres, and the proposed amendment area is approximately 79 acres, for a total area of approximately 313 acres. The area is composed of slightly rolling hills with an elevation range of 6,724 feet to 6,628 feet.

Mining at the Site began in 1982 and is considered an existing, legal, non-conforming land use. The plan of operations for the Site consists of excavating unconsolidated surficial materials down to a depth of approximately 35 feet below ground surface (bgs). Materials excavated from the pit area are taken to the processing plant. At the processing plant, the materials are washed and sorted to remove unwanted silts and clays and to separate out the sand and gravel. Sand and gravel separated during this process are dewatered and stockpiled. The stockpiled sand and gravel are then transported from the Site via haul truck.

Mining has occurred in the eastern portion of the Site and is gradually expanding towards the west. Site features include an existing quarry and associated processing, washing, and material stockpile areas. Operations areas include maintenance and fueling areas, truck scales and scale house, and multiple process water settling ponds.

### **2.2 VEGETATION**

The existing Site is currently a mining operation with onsite conditions consisting of little to no vegetation based on visual inspection and historical imagery.

### **2.3 DRAINAGE CHARACTERISTICS**

The Site is located within the Chico Creek (CH) drainage basin, and the current and expanded mine area is between two unnamed tributaries of the West Black Squirrel Creek (WS). The Site is in a rural portion of the county with widely spaced residential homes and farming/ranch land.

Current land use along the Site is rural, with surrounding properties shown on Drawing C-100 of the drawing set provided in Appendix A. The existing land use and proposed expansion is to be used for construction aggregate mining.

The Chico Creek drainage basin is about 736 square miles and is located in the southeastern portion of El Paso County and the northeastern portion of Pueblo County, east of the Fountain Creek Watershed. The Site is located in the Upper Black Squirrel Subbasin of the Chico Creek drainage basin. The upper Black Squirrel Subbasin is made up of many existing districts, developed areas, and rural/agricultural areas. The Upper Black Squirrel Subbasin is primarily a rural area, with a couple of small clusters of single-family homes.



Flow that exits the Site will ultimately enter the Black Squirrel Creek and drain into Chico Creek. Chico Creek then flows into the Arkansas River in Pueblo County. The upper and middle portions of Black Squirrel Creek are ephemeral streams that flow only in response to thunderstorms, snowmelt, and prolonged rainfall. There is perennial flow only along the lower portions of the creek.

The Site is located within a designated Federal Emergency Management Agency (FEMA) effective Zone A floodplain as identified on FEMA Flood Insurance Rate Map (FIRM) Nos. 08041C0562G, 08041C0564G, 08041C0566G, and 08041C0568G, all of which are dated 7 December 2018 (Appendix B). There are no creeks or stream crossings located within the project area.

## **2.4 PROPOSED SITE ACTIVITIES**

Proposed activities at the Site are limited to the mining of surficial materials and related mineral processing activities. These include the use of temporary structures, construction of haul roads, excavation of materials, and the processing and stockpiling of materials. Existing mining occurs on the eastern 234 acres of the Site. The proposed expansion of the Site includes a single 79-acre parcel to the west. In the expansion area surficial mining and related mineral processing activities will continue to occur.

At closure of the Site, final reclamation of the Site will occur. In accordance with the existing reclamation plan, the Site will be returned to a rangeland. The naturalized open space will be revegetated, and the drainages of the Site will be re-established. Pit slopes and other excavations at the Site are to be graded to a final reclamation slope of 3H:1V (Horizontal:Vertical) and re-vegetated to allow for long-term stormwater quality. The Site is not proposing any importation of inert backfill onsite.

## **2.5 ANTICIPATED SITE SCHEDULE**

The Site is an active mine site. Currently, mining operations are occurring in the existing Site boundary. Once approved, the mining operation is going to expand to the west. Mining operations are anticipated to continue for the next 20 years. Site reclamation and long-term stabilization will occur during the mining process. At the end of mining, the Site will be fully reclaimed and stabilized following the approved reclamation plan.

## **2.6 SOILS**

The ground cover at the Site consists of bare earth in the areas of mining disturbances and low-lying vegetation in the areas that have yet to be mined or are already reclaimed. The low-lying vegetation consists primarily of a mixture of grass and weeds, with the occasional low-growing brush. These areas would be considered herbaceous in good hydrologic condition, as defined in Soil Conservation Service TR-55 Table 2-2d.

The general soil conditions of the Site vary from group A to group B as defined by the U.S. Department of Agriculture Web Soil Survey (Appendix C). These soils are characterized as having a low to moderate runoff potential and moderate to high infiltration rate even when thoroughly wetted.

The Site has been evaluated for geological hazards based on mapping completed by the Colorado Geological Survey. Based on our evaluation of the existing hazard mapping, it was found that the Site has low to no risk of landslides, avalanches, rockfall, mudflows, or debris flows.

The mining of unconsolidated alluvial materials from open excavations does not pose any special geologic hazards aside from the possibility of localized slope failures due to over steepened pit faces. This potential risk is mitigated by the 3H:1V pit slope construction stipulated in the approved reclamation plan and frequent safety inspections by local regulators and the federal Mine Safety and Health Administration. Processed materials stockpiled on the property form natural slopes at the angle of repose of the materials that also do not pose any special geologic hazards. The soils at the Site, both native and stockpiled, will primarily contain sand and gravel. It is anticipated the sand and gravel materials have a low erosion potential up to a flow velocity of 3 feet per second (U.S. Army Engineer Research and Development Center, 2018). With proper placement of Best Management Practices (BMP) the soil erosion impacts on discharge are anticipated to be limited.

## **2.7 AREAS AND VOLUMES**

The existing construction materials mining operation has a permitted area of approximately 234 acres, and the proposed amendment area is approximately 79 acres, for a total area of approximately 313 acres. Over the remaining life of the mine, it is anticipated there will be approximately 10,470,000 cubic yards of cut and 490,000 cubic yards of fill.

### **3. Erosion and Sediment Control Measures**

The following Storm Water Management measures for the Site have been designed to safely manage sediment and erosion from stormwater. The Site will have an existing/interim design during mining and a post-mining reclamation design after regrading and revegetating the Site.

Existing surface drainage at the Site generally flows from the northwest to the southeast. Flow at the Site is kept separated between the unaffected stormwater, which is directed around the disturbed mining and processing areas, and stormwater that lands within the disturbed area. Stormwater that lands outside of the disturbed areas flows to the southeast in existing natural drainages. Stormwater that falls within the disturbed area infiltrates into the ground or is diverted to the sediment basin through the culvert and off site. Onsite operating ponds are connected in series and have an emergency spillway which directs flow to a sediment basin in the northeast corner of the Site, as shown in Appendix A. Mining operations including grading, hauling of soil, drainage, and final stabilization shall implement erosion and sediment control measures as described below.

Erosion and sediment control measures shall be implemented during mining of the Site. One mining entrance with vehicle tracking control (VTC) shall be in an effort to reduce off-site sediment tracking. The mining entrance is located on Curtis Road in the northeast portion of the Site boundary. Temporary soil stockpiles (SP) shall be protected from stormwater using perimeter controls to inhibit soil transport as well as at material storage areas. Portable toilets, if placed on site, shall be located on flat surfaces away from drainage paths, tied-down or staked-down, emptied regularly, and where possible, secondary containment pans shall be provided under the portable toilets. Reference the Storm Water Management Plan (SWMP) design set for locations and sizing of recommended erosion control measures.

Once mining at the Site has been completed the Site will be reclaimed and regraded in accordance with the existing reclamation plan. Once the Site has been reclaimed, the existing Site ponds will be removed, and two swales will be established to direct stormwater off the Site. The Site will be revegetated to with Natural Resource Conservation Service (NRCS) recommended and Colorado Division of Reclamation, Mining and Safety (DRMS) approved seed mix at the completion of the project. The final drainage plan for the Site has been provided in Appendix A.

All persons engaged in earth disturbances shall design, implement, and maintain acceptable soil erosion and sedimentation control measures, in conformance with the erosion and sediment control technical standards adopted by the County. Erosion and sediment control facilities, temporary and permanent, shall be installed before any earth disturbance operations take place. Earth disturbances shall be conducted in such a manner to effectively control runoff volumes, reduce accelerated soil erosion, sediment movement, and deposition off-site. Temporary soil erosion control facilities shall be removed, and earth disturbance areas graded and stabilized with permanent soil erosion control measures to match approved plans and specifications.

## 4. Pollution Prevention Standards

### 4.1 POTENTIAL SOURCES OF POLLUTION

**Table 4.1. Potential Sources of Pollution**

Source	Material or Chemical	Location*	Appropriate Control Measures
Loose soil exposed/disturbed during clearing, grubbing, and grading activities	Sediment	All areas within the Limits of Disturbance	As directed by Section 3 of this Storm Water Management Plan (SWMP)
Equipment fueling and maintenance areas	Metals, hydrocarbons, oils, and greases	Areas surrounding fuel tanks	Provide secondary containments, locate in upland areas. Repair leaking and broken hoses. If a spill occurs, use an onsite spill kit.
Vehicle Tracking and Sediment	Sediment, metals, hydrocarbons, oils, and greases	The entrance and exit of the site	As directed by Section 5.1 of this SWMP
Management of Contaminated Soils	Metals, hydrocarbons, oils, and greases	Areas surrounding fuel tanks	Provide secondary containments, locate in upland areas. Repair leaking and broken hoses.
Loading and Unloading Operations	Sediment	Areas surrounding loading operations	As directed by Section 3 of this SWMP
Dust Control	Dust	All areas within the Limits of Disturbance	As directed by Section 5.3 of this SWMP

Logs for the identification of pollutant sources are included in the Appendices for reference and use. Potential pollutant sources noted above shall be mitigated by use of BMPs.

The potential to contribute pollutants to stormwater discharges is not significant for most of the pollutants identified above, based on the following:

- The ability to schedule activities during dry weather;
- Existing Site topography;
- The ability to implement primary and secondary containment for product storage; and
- The ability to locate activities away from drainage ways.

### 4.2 SPILL PREVENTION AND RESPONSE

Prior to importing materials of pollution concern, as outlined in Section 4.1 (Potential Sources of Pollution) of this SWMP, assure that all proper protection and containment for these items are on site. Fuel and oils are to be installed in double-walled containment or have appropriate secondary containment. Upon import of each possible pollutant material, protection and containment will be installed and material protected as appropriate.

In the event of a leak or spill, the following steps would be taken:

1. Personnel would be mobilized to a leak or spill site and contain the spill by constructing a dike or emergency containment structure. Use of an absorbent may also be necessary.
2. Contents of a leaking container would be removed and placed in another tank.
3. All soil showing obvious signs of contamination will be excavated.
4. Depending on the type and extent of spill, testing with a photo-ionization meter for additional soil contamination, and excavation of any remaining contaminated soils will be performed.
5. If storage of contaminated soil is necessary; the soil shall be placed on an 8-mil plastic liner and covered with an 8-mil plastic liner.
6. The excavated area will be backfilled with clean soil.
7. Major spills will have soil samples taken and sent to a certified laboratory to ensure that all contamination has been removed.
8. Contaminated soils will be hauled by a standard triaxle (covered) or dump truck (covered) to a landfill authorized to take such material.
9. For contaminated soils identified as hazardous, arrangements will be made with a licensed hazardous waste hauler to transport the material to a registered landfill.

## **5. Best Management Practices for Stormwater Pollution Prevention**

### **5.1 VEHICLE TRACKING CONTROL**

The existing Site entrance is paved. A non-erosive means of access shall continue to be provided at road crossings and access driveway entrances. Access protection shall include the stabilized construction entrance option, to reduce tracking of sediment onto public roadways. Stabilized construction entrances has been installed prior to commencing mining traffic. The entrances shall be maintained and repaired, as necessary. Mud and dirt tracked onto the public roadway shall be cleaned daily and cleaned immediately in the instance of a potential safety issue to vehicles, pedestrians, or construction personnel. Location and installation details of the construction entrances are shown in the project drawings.

### **5.2 STOCKPILED MATERIALS**

Sediment or soil from the project Site shall be stockpiled within the mine site if necessary. Temporary SPs shall be protected from stormwater using perimeter control to inhibit soil transport as well as at material storage areas.

### **5.3 MINIMIZE DUST**

Dust control shall be accomplished on-site through watering only. Calcium chloride or other chemicals used for dust control will not be allowed. The contractor shall provide a positive means to prevent air-borne dust from being generated. At a minimum, water trucks should treat interior haul roads and exposed areas.

### **5.4 TOPSOIL**

Topsoil shall be stripped within the mining area and stockpiled in accordance with Section 5.3 above. Topsoil shall be excavated and removed in a manner that will minimize contamination with other soil horizons. Topsoil shall be stockpiled in a manner that prevents erosion and ponding of precipitation.

### **5.5 SEDIMENT BASIN**

A sediment basin shall be installed as shown on the plan set. A temporary sediment basin detains sediment-laden runoff long enough to allow much of the sediment to settle out. Sediment basins are constructed by excavation and/or by placing an earthen embankment across a low area or drainage swale. The basin should be designed to drain completely dry through a controlled outlet structure.

### **5.6 SITE STABILIZATION**

All disturbed areas shall be seeded with NRCS recommended and DRMS approved seed mix at the completion of the project. Site preparation, seedbed preparation, seeding, and mulching shall be completed in accordance with the recommended steps provided by El Paso County.

## **5.7 PORTABLE TOILETS**

Portable toilets shall be provided on-site as necessary for mining personnel. Portable toilets will be located a minimum of 10 feet from stormwater inlets and 50 feet from state waters. They will be secured at all four corners to prevent overturning and cleaned on a weekly basis. They will be inspected daily for spills.

## **5.8 WASTE MANAGEMENT AND DISPOSAL**

No solid materials are allowed to be discharged from the Site with stormwater. All solid waste must be collected and placed in containers. Containers shall be provided at all times to meet county requirements. The location of solid waste receptacle shall be located a minimum of 10 feet from stormwater inlets and 50 feet from state waters.

## **6. Inspection and Corrective Action**

### **6.1 INSPECTION PERSONNEL AND PROCEDURES**

The SWMP inspections shall be performed by a Qualified Inspector or a Qualified Professional, who is knowledgeable in the principles and practices of erosion and sediment controls and pollution prevention, who possesses the skills to assess conditions at the project Site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit. Inspectors must be familiar with the location, design specifications, maintenance procedures, and performance expectations of each BMP.

The SWMP self-monitoring inspections shall take place at a minimum of bi-weekly. Inspections shall also take place prior to any rain event and 8 hours after a rain event. The Owner shall be responsible for hiring and/or obtaining the services of Qualified Inspector or Professional to conduct the SWMP inspections as per the above requirements and time frame. Permittee or contractor shall produce written and signed inspection records for every inspection. The inspection reports shall be kept on-site.

Inspections shall continue through project completion until the Site is permanently stabilized and achieves minimum 70 percent vegetative coverage per square foot.

### **6.2 CORRECTIVE ACTION**

The Qualified Inspector shall prepare an inspection report after each inspection. Inspection reports shall be maintained on the construction site within the SWMP. A sample inspection report is included in Appendix D. At a minimum, the inspection report shall include and/or address: date and time of inspection; name/title of inspector; weather and soil conditions; runoff conditions; water body and discharge conditions; identify erosion and sediment control repair and maintenance required; replacement and modifications to erosion and sediment controls; description/sketch and size of current disturbed areas and stabilized areas; current phase of construction; identify all construction/practices not in accordance with the SWMP and technical standards; and digital photographs with date stamp.

Within 1 business day of the inspection, the Qualified Inspector shall notify the Owner/Operator and Contractor/Subcontractor of any corrective actions that need to be taken.

If BMPs selected are inadequate to control sediment and erosion, additional BMPs may be implemented during construction. Modifications made to the Erosion and Sediment Control Plan must be documented on the SWMP. Flow that exits the Site will ultimately enter the Black Squirrel Creek and drain into Chico Creek. A Modification Log is located in Appendix E.

Within 1 business day of notification from the Qualified Inspector, the Contractor/Subcontractor shall begin implementing the corrective actions and complete the corrective actions within a reasonable time frame.

All inspection reports are to be signed by the Qualified Inspector. Within 7 days of the inspection, photographs of the completion of the corrective action work shall be attached to the inspection report.



## **7. Terms and Conditions**

### **7.1 STORMWATER DISCHARGES**

The following limitations shall apply to discharges associated with mining activities:

- Stormwater discharges from mine activities shall not cause, have the reasonable potential to cause, or measurably contribute to an exceedance of any water quality standard, including narrative standards for water quality.
- Bulk storage structures for petroleum products and any other chemicals shall have secondary containment or equivalent adequate protection to contain all spills and prevent any spilled material from entering State Waters.
- All Site wastes must be properly managed to prevent potential pollution of State Waters. This permit does not authorize onsite waste disposal.
- All discharges must comply with the lawful requirements of federal agencies, municipalities, county, drainage districts, and other local agencies regarding any discharges of stormwater to storm drain systems or other water courses under their jurisdiction, including applicable requirements in municipal stormwater management programs developed to comply with the El Paso County Erosion and Stormwater Quality Control Permit. Discharges must comply with local stormwater management requirements, policies, or guidelines including erosion and sediment control.

### **7.2 ALLOWABLE NON-STORMWATER DISCHARGES**

Appropriate control measures shall be implemented to minimize erosion and sediment transport resulting from such discharges, and the non-stormwater components of the discharge and the control measure used identified in this SWMP. Allowable non-stormwater discharges, include the following:

- Uncontaminated condensate (external atmospheric condensation only) from air conditioners, coolers, and other compressors and from the outside storage of refrigerated gases or liquids.
- Landscape (including reclamation activities) watering, provided all pesticides, herbicides, and fertilizer have been applied in accordance with the approved labeling.
- Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility, but not intentional discharges from the cooling tower (e.g., “piped” cooling tower blow down or drain).

### **7.3 SWMP AVAILABILITY**

A copy of the SWMP and documentation of the inspection results must be provided upon request for a period of 3 years following the expiration or inactivation of permit coverage. These records must be available to the El Paso County and the U.S. Environmental Protection Agency upon request.

The SWMP Administrator is responsible for retaining a copy of the SWMP and provide the original to the owner/permittee upon inactivation of the permit.

#### 7.4 SWMP REVIEW/CHANGES

As the mining evolves and the Site changes over time, the implemented BMPs may need to be modified and adjusted. These adjustments are necessary to ensure that the potential pollutants are managed correctly. The operator shall amend the SWMP when there are changes in the design or operation of the Site that affect the BMPs. Additionally, if the SWMP and/or BMPs are found to be ineffective in controlling pollutants in stormwater discharges changes should be made to the SWMP.

## **8. Summary and Conclusions**

This SWMP has been developed for Pioneer Solberg Pit as part of the greater permit submittal package for the expansion of the Pioneer Solberg Quarry. Based on the information contained in this document, temporary erosion control measures and BMPs at the Site will capture and retain sediment-laden runoff prior to discharging off-site.

## References

1. El Paso County Drainage Criteria Manual (Volumes 1 and 2) and Engineering Criteria Manual, current editions.
2. Measuring Erosion Characteristics of Gravel Soils, U.S. Army Engineer Research and Development center, Vicksburg, Mississippi, October 2018.
3. Pikes Peak Area Water Quality Plan Chapter 21 Chico Creek Watershed, Pikes Peak Area Council of Governments. August 2020.
4. Soil Survey of El Paso County Area, Colorado, prepared by United States Department of Agriculture Soil Conservation Service, dated June 1981.
5. South Central Comprehensive Plan, El Paso County Land Use Department. 1988.
6. United States Geological Survey, 2011. Chico Creek, Geographics Names Information System. February.

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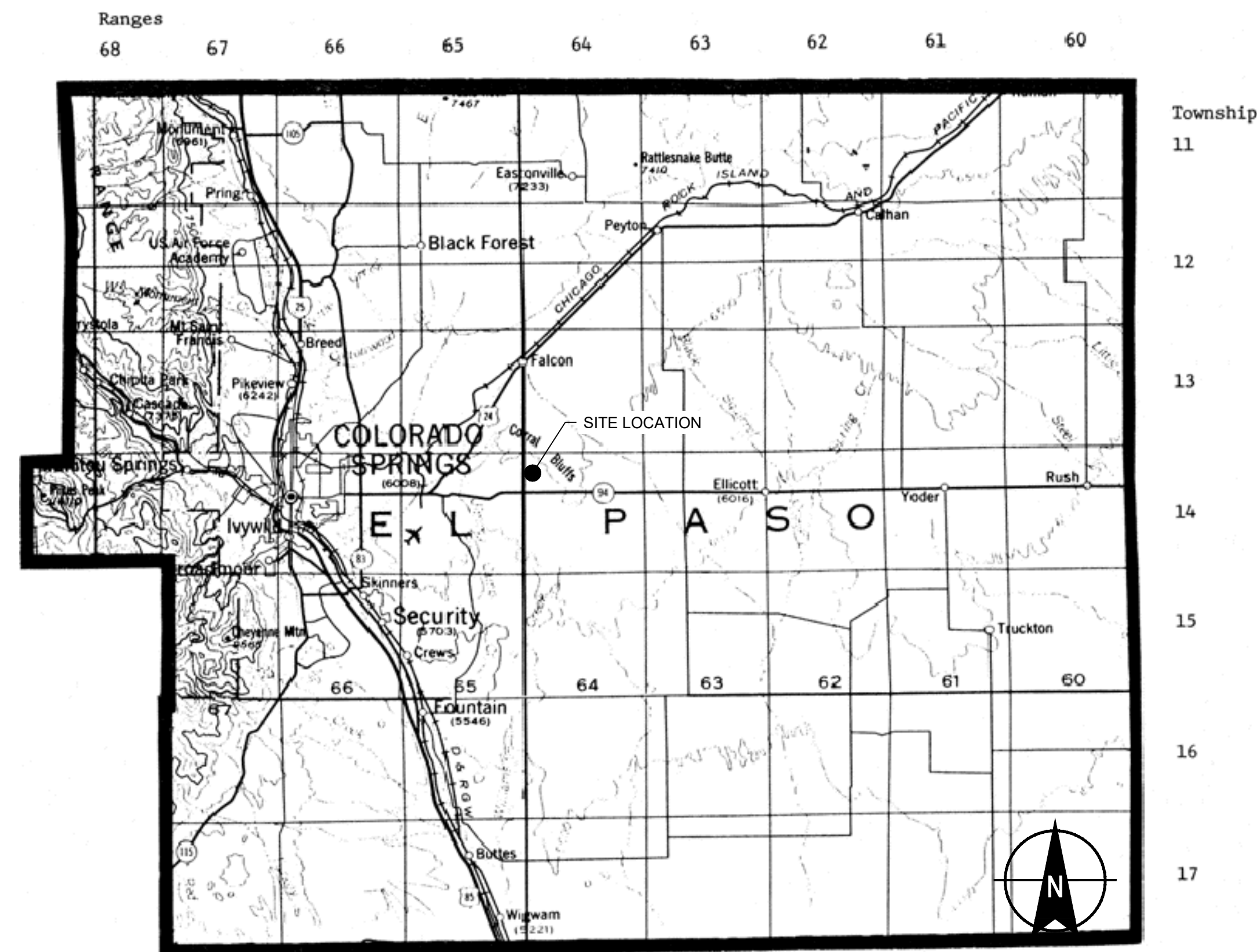
**APPENDIX A**  
**Storm Water Management Plan Drawings**

# PIONEER LANDSCAPING MATERIALS INC. SOLBERG PIT STORM WATER MANAGEMENT PLAN

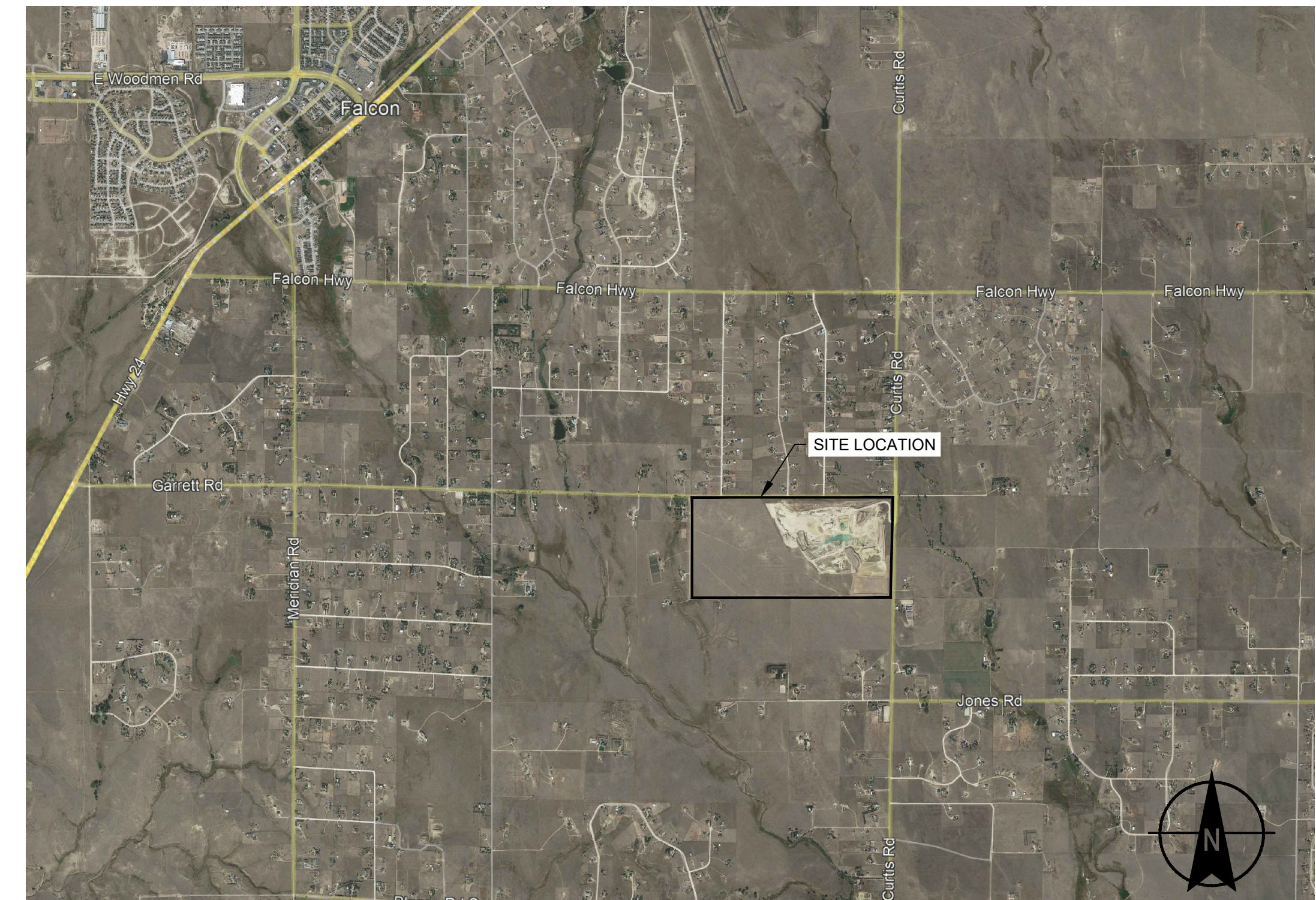
## 13745 GARRET ROAD PEYTON, COLORADO

**HALEY  
ALDRICH**

HALEY & ALDRICH, INC.  
8101 E Prentice Ave, Suite 600  
Greenwood Village, CO. 80111  
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www.haleyaldrich.com



**SITE LOCUS**  
TOPO SOURCE: EL PASO COUNTY MAP FROM COLORADO  
CEMETERY DIRECTORY (2021)



**SITE AERIAL**  
MAP SOURCE: IMAGE DATED 6 OCTOBER 2019  
TAKEN ELECTRONICALLY FROM GOOGLE EARTH PRO.

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SCALE IN FEET

### DRAWING INDEX

SHEET NO.	SHEET TITLE	DESCRIPTION
01	G-100	COVER SHEET
02	C-100	EXISTING/INTERIM GENERAL ARRANGEMENT
03	C-101	FINAL GRADING PLAN
04	C-300	BMPS (1 OF 5)
05	C-301	BMPS (2 OF 5)
06	C-302	BMPS (3 OF 5)
07	C-303	BMPS (4 OF 5)
08	C-304	BMPS (5 OF 5)

Project No.: 0204990  
Scale: SHOWN  
Date: AUGUST 2022  
Drawn By: JS  
Designed By: JS  
Checked By: CL  
Approved By: ZS



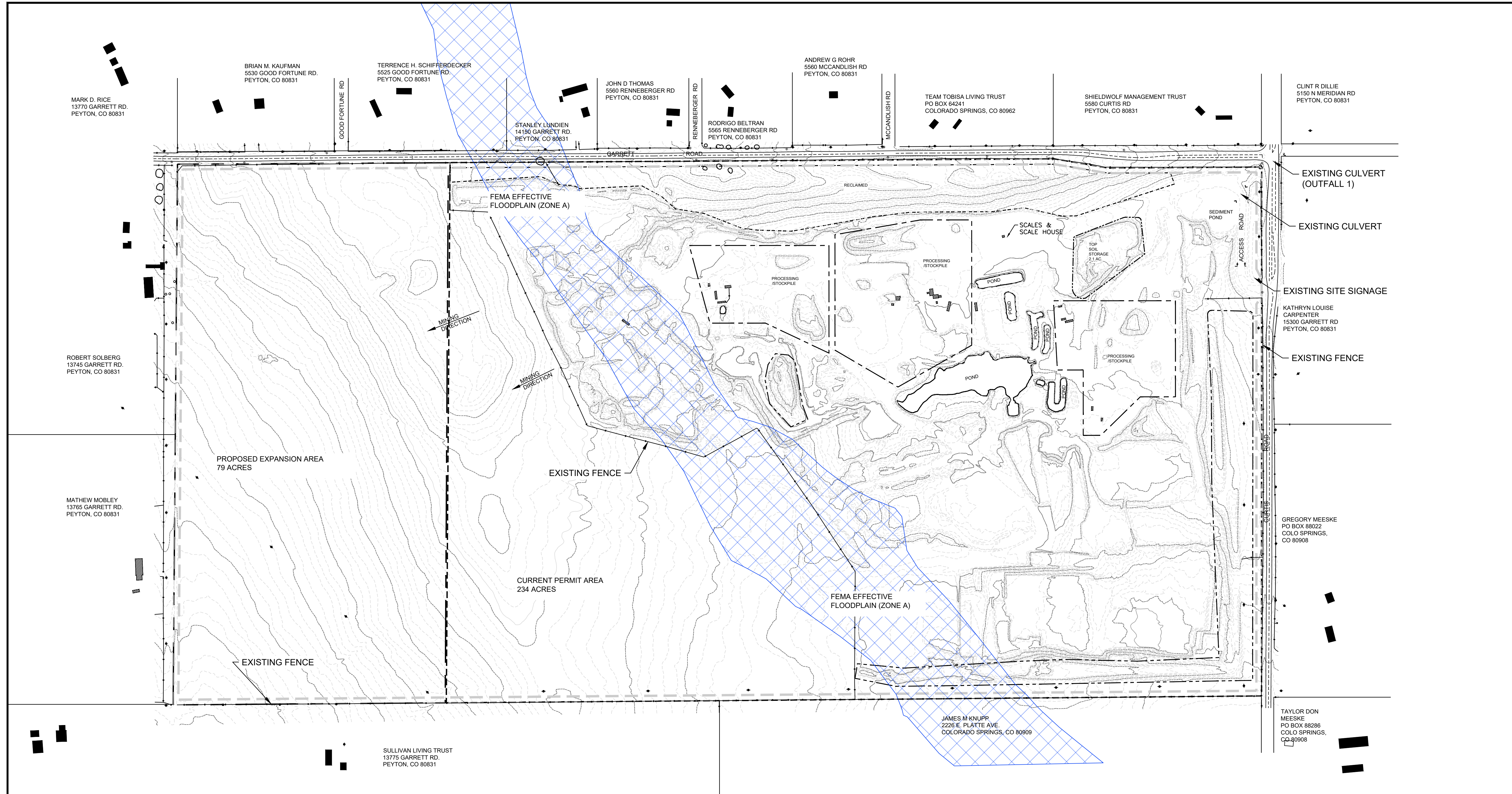
0	ISSUE FOR PERMIT	ZS	08/12/22
Rev.	Description	By	Date

STORM WATER MANAGEMENT PLAN  
PIONEER MATERIALS SOLBERG PIT  
13745 GARRET ROAD  
PEYTON, COLORADO

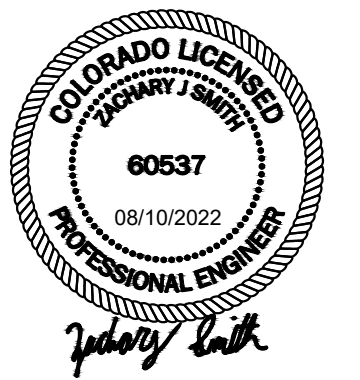
COVER SHEET

**G-100**

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Project No.:	0204990
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STORM WATER MANAGEMENT PLAN  
PIONEER MATERIALS SOLBERG PIT  
13745 GARRETT ROAD  
PEYTON, COLORADO

EXISTING/INTERIM  
GENERAL  
ARRANGEMENT

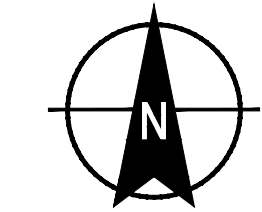
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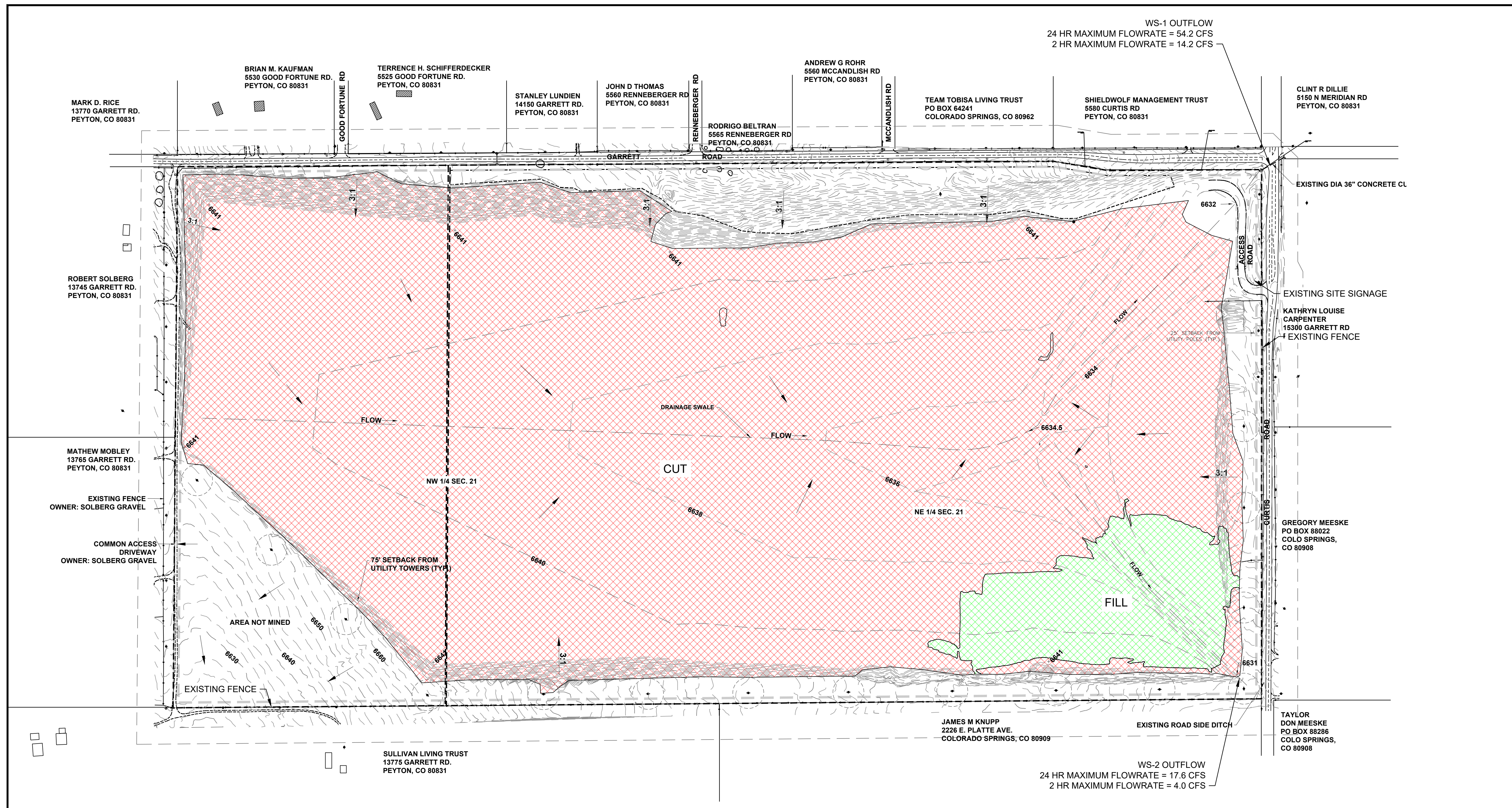
**NOTES**

- GENERAL ARRANGEMENT DEVELOPED FROM MAP AND AUTOCAD FILE MADE IN AMERICA BY LANDMARK MAPPING, LTD.
- EXISTING VEGETATION AT THE SITE IS LIMITED TO GRASS/WEEDS BEYOND THE EXISTING PIT AND HAS BEEN STRIPPED WITHIN THE PIT BOUNDARY.

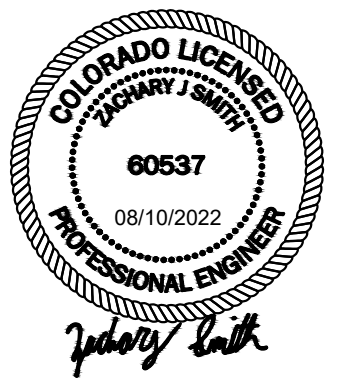
**LEGEND**

- CURRENT PERMIT BOUNDARY (234 ACRES)
- PROPOSED AMENDMENT BOUNDARY (80 ACRES)
- AFFECTED AREA BOUNDARY (305 ACRES)
- PROCESSING / STOCKPILE AREAS (23 ACRES)
- TOP SOIL STOCKPILE
- RECLAIMED AREA (16 ACRES)
- PONDS (3 ACRES APPROX.)
- █ EXISTING BUILDINGS
- ▨ FLOODPLAIN
- FIRE
- ◆ LPOLE
- MANHOLE
- SIGN
- ◆ UPOLE
- FENCE
- MISC
- TOWER PILE
- CULVERT
- ROCK
- IRRIGATION
- MAILBOX
- TREE
- † TRAFFIC
- RIP-RAP
- POLE-ANCHOR



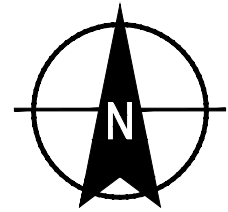


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- NOTES**
1. GENERAL ARRANGEMENT DEVELOPED FROM MAP AND AUTOCAD FILE MADE IN AMERICA BY LANDMARK MAPPING, LTD.
  2. EXISTING VEGETATION AT THE SITE IS LIMITED TO GRASS/WEEDS BEYOND THE EXISTING PIT AND HAS BEEN STRIPPED WITHIN THE PIT BOUNDARY.

- LEGEND**
- CURRENT PERMIT BOUNDARY (234 ACRES)
  - PROPOSED AMENDMENT BOUNDARY (79 ACRES)
  - AFFECTED AREA BOUNDARY (305 ACRES)
  - PREVIOUSLY RECLAIMED
  - EXISTING FENCE
  - APPROXIMATE CUT
  - APPROXIMATE FILL
  - TRANSMISSION POLES (NEXTERA ENERGY)
  - DISTRIBUTION POLES (MOUNTAIN VALLEY ELECTRIC)



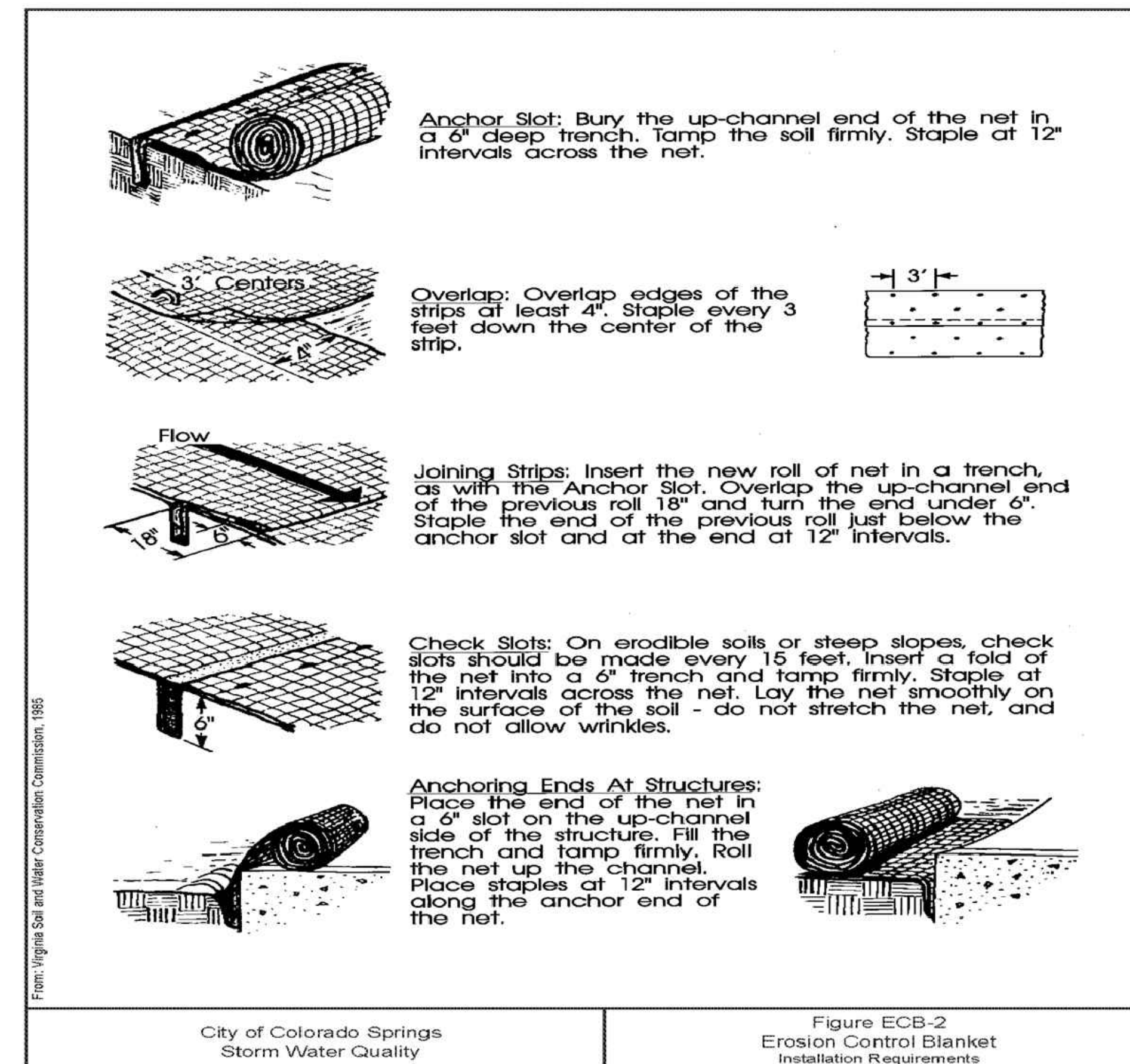
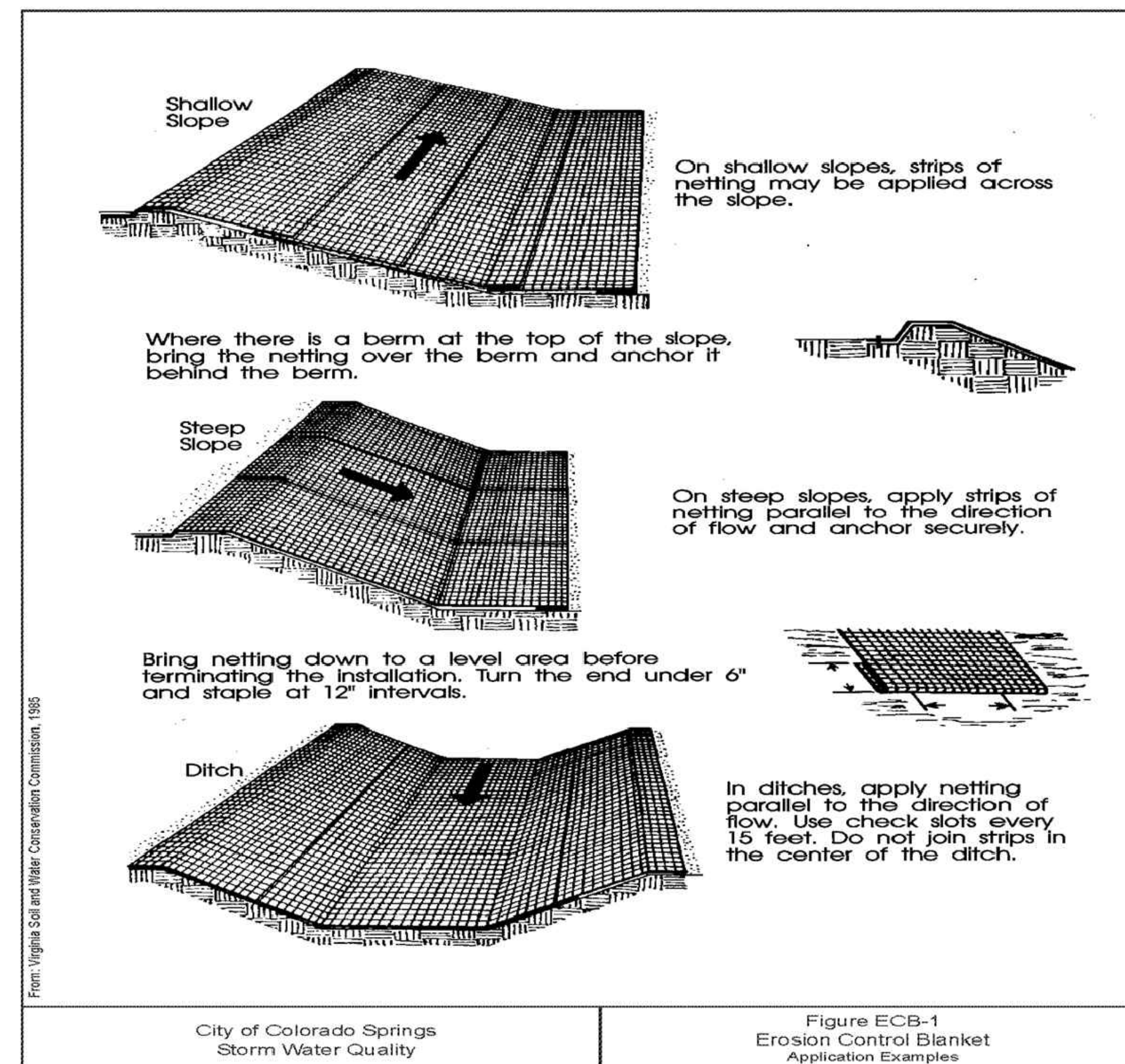
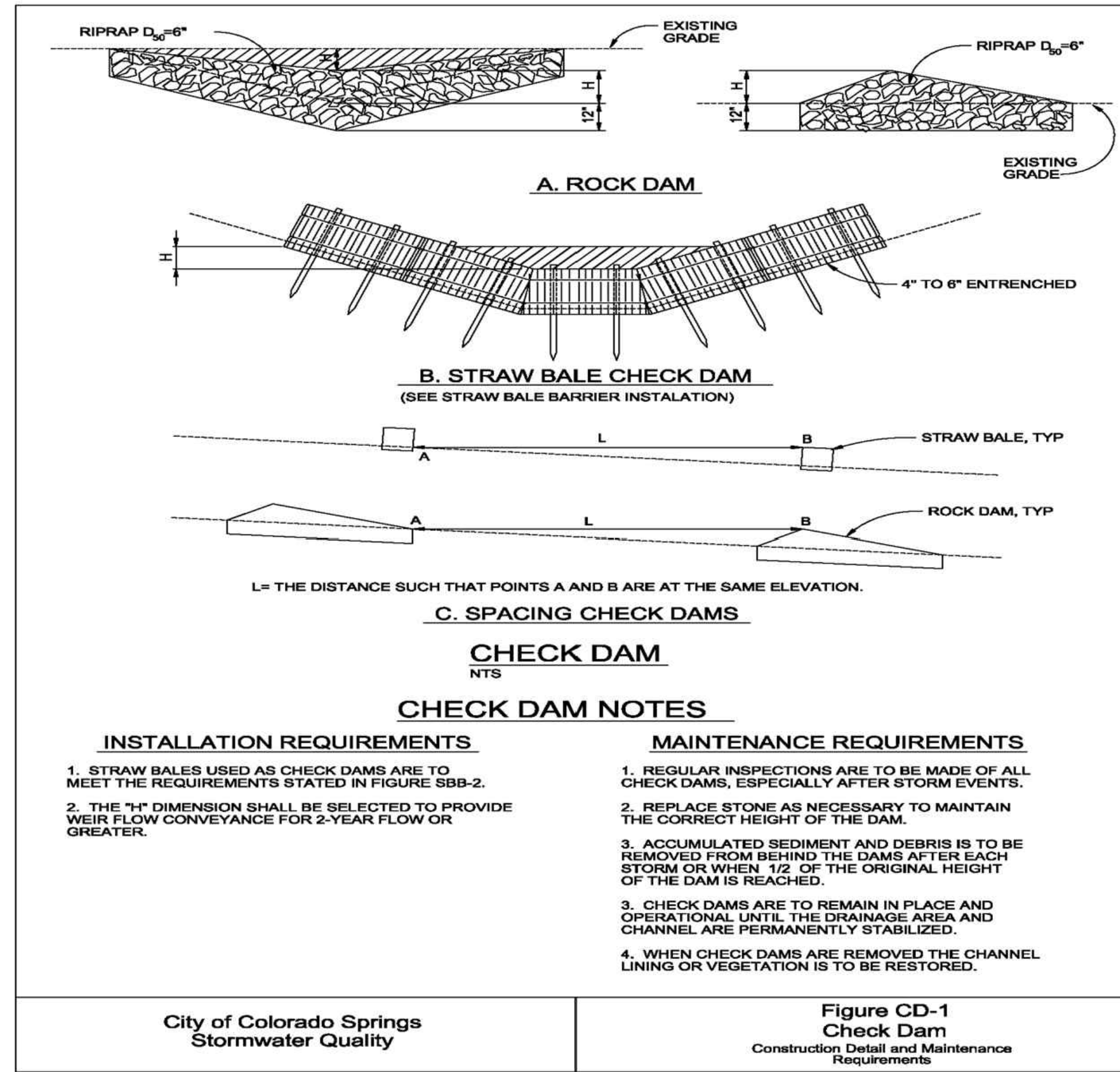
STORM WATER MANAGEMENT PLAN  
PIONEER MATERIALS SOLBERG PIT  
13745 GARRET ROAD  
PEYTON, COLORADO

**FINAL GRADING PLAN**

**C-101**  
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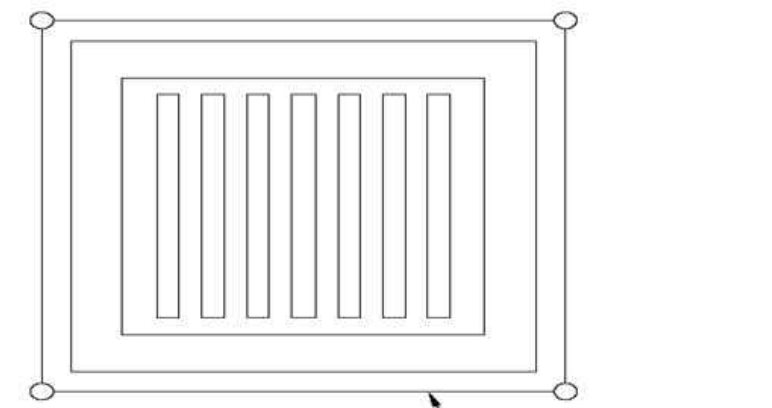
STORM WATER MANAGEMENT PLAN  
PIONEER MATERIALS SOLBERG PIT

13745 GARRET ROAD  
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BMPs (1 OF 5)

**C-200**

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**FILTER FABRIC INLET PROTECTION**  
NTS

**FILTER FABRIC INLET PROTECTION NOTES**

**INSTALLATION REQUIREMENTS**

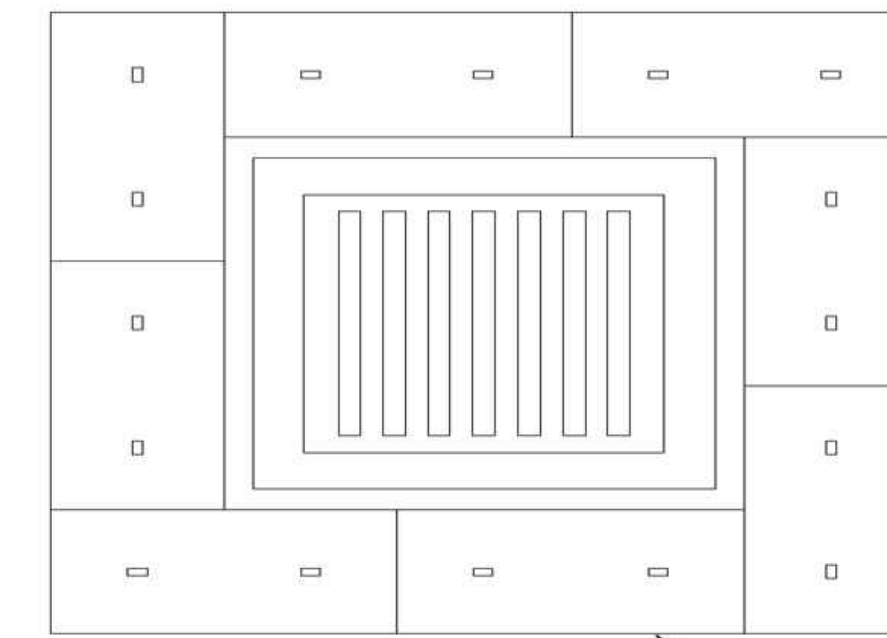
1. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF INLET.
2. SEE SILT FENCE FIGURE SF-2 FOR INSTALLATION REQUIREMENTS.
3. POSTS ARE TO BE PLACED AT EACH CORNER OF THE INLET AND AROUND THE EDGES AT A MAXIMUM SPACING OF 3 FEET.

**MAINTENANCE REQUIREMENTS**

1. CONTRACTOR SHALL INSPECT INLET PROTECTION IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED, COLLAPSED, UNENTRENCHED OR INEFFECTIVE INLET PROTECTION SHALL BE PROMPTLY REPAIRED OR REPLACED.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND FILTER FABRIC WHEN IT ACCUMULATES TO HALF THE EXPOSED GEOTEXTILE HEIGHT.
4. FILTER FABRIC PROTECTION SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED IN THE DRAINAGE AREA AS APPROVED BY THE CITY.

City of Colorado Springs  
Stormwater Quality

**Figure IP-1**  
Filter Fabric Inlet Protection  
Construction Detail and Maintenance Requirements



**STRAW BALE INLET PROTECTION**  
NTS

**STRAW BALE INLET PROTECTION NOTES**

**INSTALLATION REQUIREMENTS**

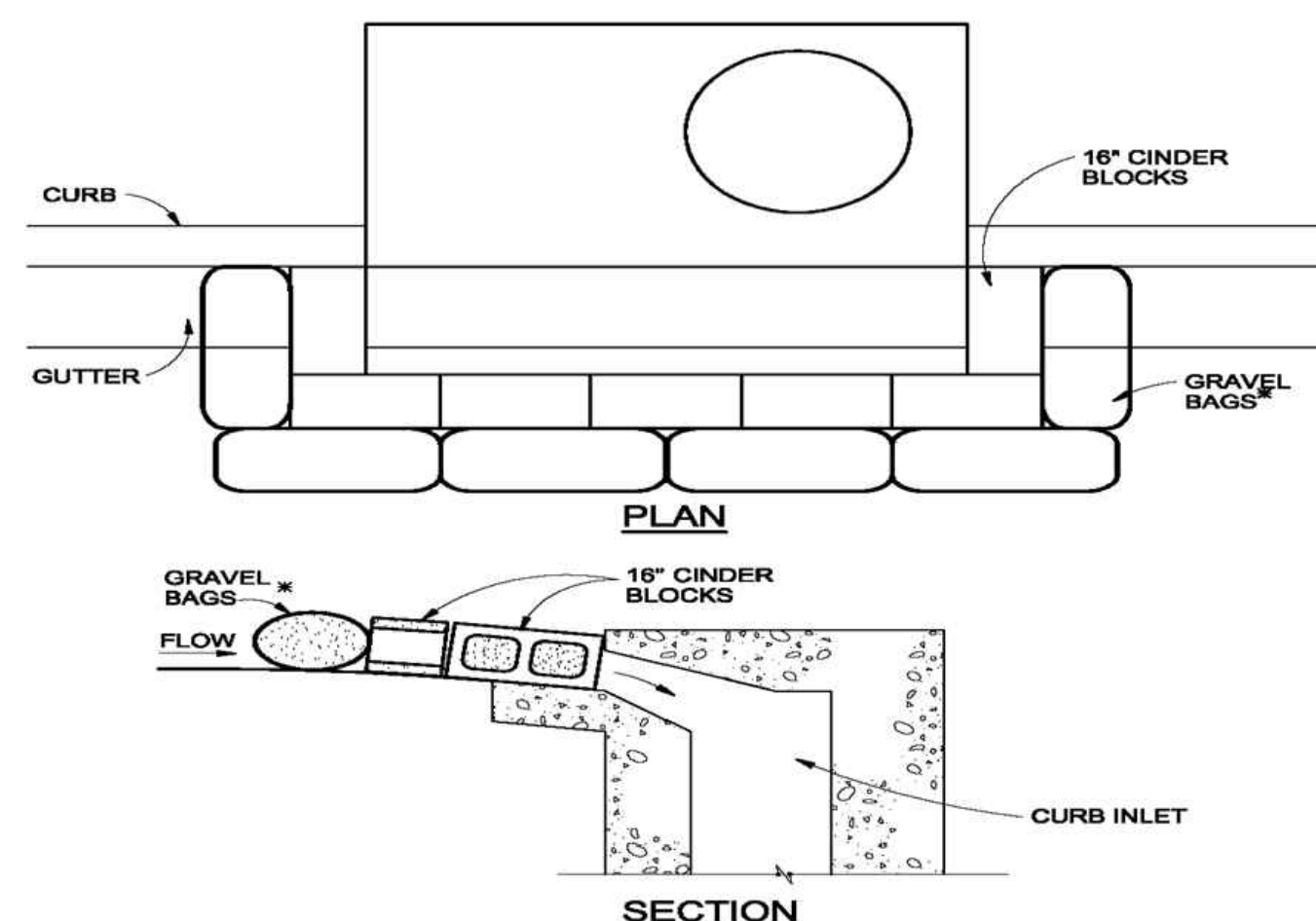
1. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF INLET.
2. BALES ARE TO BE PLACED IN A SINGLE ROW AROUND THE INLET WITH THE END OF THE BALES TIGHTLY ABUTTING ONE ANOTHER.
3. SEE STRAW BALE BARRIER FIGURE SBB-2 FOR INSTALLATION REQUIREMENTS.

**MAINTENANCE REQUIREMENTS**

1. CONTRACTOR SHALL INSPECT STRAW BALE INLET PROTECTION IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED OR INEFFECTIVE INLET PROTECTION SHALL PROMPTLY BE REPAIRED, REPLACING BALES IF NECESSARY, AND UNENTRENCHED BALES NEED TO BE REPAIRED WITH COMPACTED BACKFILL MATERIAL.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND STRAW BALES WHEN IT ACCUMULATES TO APPROXIMATELY 1/3 THE HEIGHT OF THE BARRIER.
4. INLET PROTECTION SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED WITHIN THE DRAINAGE AREA AS APPROVED BY THE CITY.

City of Colorado Springs  
Stormwater Quality

**Figure IP-2**  
Straw Bale Inlet Protection  
Construction Detail and Maintenance Requirements



**BLOCK AND GRAVEL BAG\*CURB INLET PROTECTION**  
NTS

**BLOCK AND GRAVEL BAG\*CURB INLET PROTECTION NOTES**

**INSTALLATION REQUIREMENTS**

1. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF INLET.
2. CONCRETE BLOCKS ARE TO BE LAID AROUND THE INLET IN A SINGLE ROW ON THEIR SIDES, ABUTTING ONE ANOTHER WITH THE OPEN ENDS OF THE BLOCK FACING OUTWARD.
3. GRAVEL BAGS ARE TO BE PLACED AROUND THE CONCRETE BLOCKS CLOSELY ABUTTING ONE ANOTHER SO THERE ARE NO GAPS.
4. GRAVEL BAGS ARE TO CONTAIN WASHED SAND OR GRAVEL APPROXIMATELY 3/4 INCH IN DIAMETER.
5. BAGS ARE TO BE MADE OF 1/4 INCH WIRE MESH (USED WITH GRAVEL ONLY) OR GEOTEXTILE.

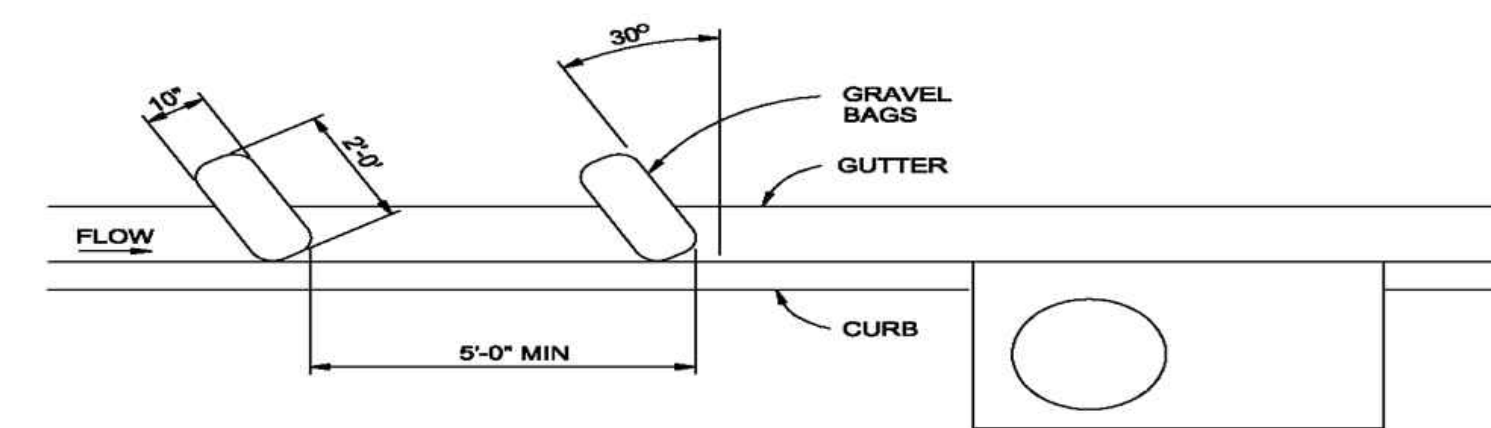
**MAINTENANCE REQUIREMENTS**

1. CONTRACTOR SHALL INSPECT INLET PROTECTION IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED OR INEFFECTIVE INLET PROTECTION SHALL PROMPTLY BE REPAIRED OR REPLACED.
3. SEDIMENT SHALL BE REMOVED WHEN SEDIMENT HAS ACCUMULATED TO APPROXIMATELY 1/2 THE DESIGN DEPTH OF THE TRAP.
4. INLET PROTECTION SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED WITHIN THE DRAINAGE AREA AS APPROVED BY THE CITY.

\* AN ALTERNATE 3/4" TO 1" GRAVEL FILTER OVER A WIRE SCREEN MAY BE USED IN PLACE OF GRAVEL BAGS. THE WIRE MESH SHALL EXTEND ABOVE THE TOP OF THE CONCRETE BLOCKS AND THE GRAVEL PLACED OVER THE WIRE SCREEN TO THE TOP OF THE CONCRETE BLOCKS.

City of Colorado Springs  
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**Figure IP-3**  
Block & Gravel Bag Curb Inlet Protection  
Construction Detail and Maintenance Requirements



**CURB SOCK INLET PROTECTION**  
NTS

**CURB SOCK INLET PROTECTION NOTES**

**INSTALLATION REQUIREMENTS**

1. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF INLET.
2. SOCK IS TO BE MADE OF 1/4 INCH WIRE MESH (USED WITH GRAVEL ONLY) OR GEOTEXTILE.
3. WASHED SAND OR GRAVEL 3/4 INCH TO 4 INCHES IN DIAMETER IS PLACED INSIDE THE SOCK.
4. PLACEMENT OF THE SOCK IS TO BE 30 DEGREES FROM PERPENDICULAR IN THE OPPOSITE DIRECTION OF FLOW.
5. SOCKS ARE TO BE FLUSH WITH THE CURB AND SPACED AT A MINIMUM 5 FEET APART.
6. AT LEAST 2 CURB SOCKS IN SERIES IS REQUIRED.

**MAINTENANCE REQUIREMENTS**

1. CONTRACTOR SHALL INSPECT INLET PROTECTION IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED OR INEFFECTIVE INLET PROTECTION SHALL PROMPTLY BE REPAIRED OR REPLACED.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND THE SOCK WHEN GUTTER WIDTH IS FILLED.
4. INLET PROTECTION SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED WITHIN THE DRAINAGE AREA AS APPROVED BY THE CITY.

City of Colorado Springs  
Stormwater Quality

**Figure IP-4**  
Curb Sock Inlet Protection  
Construction Detail and Maintenance Requirements

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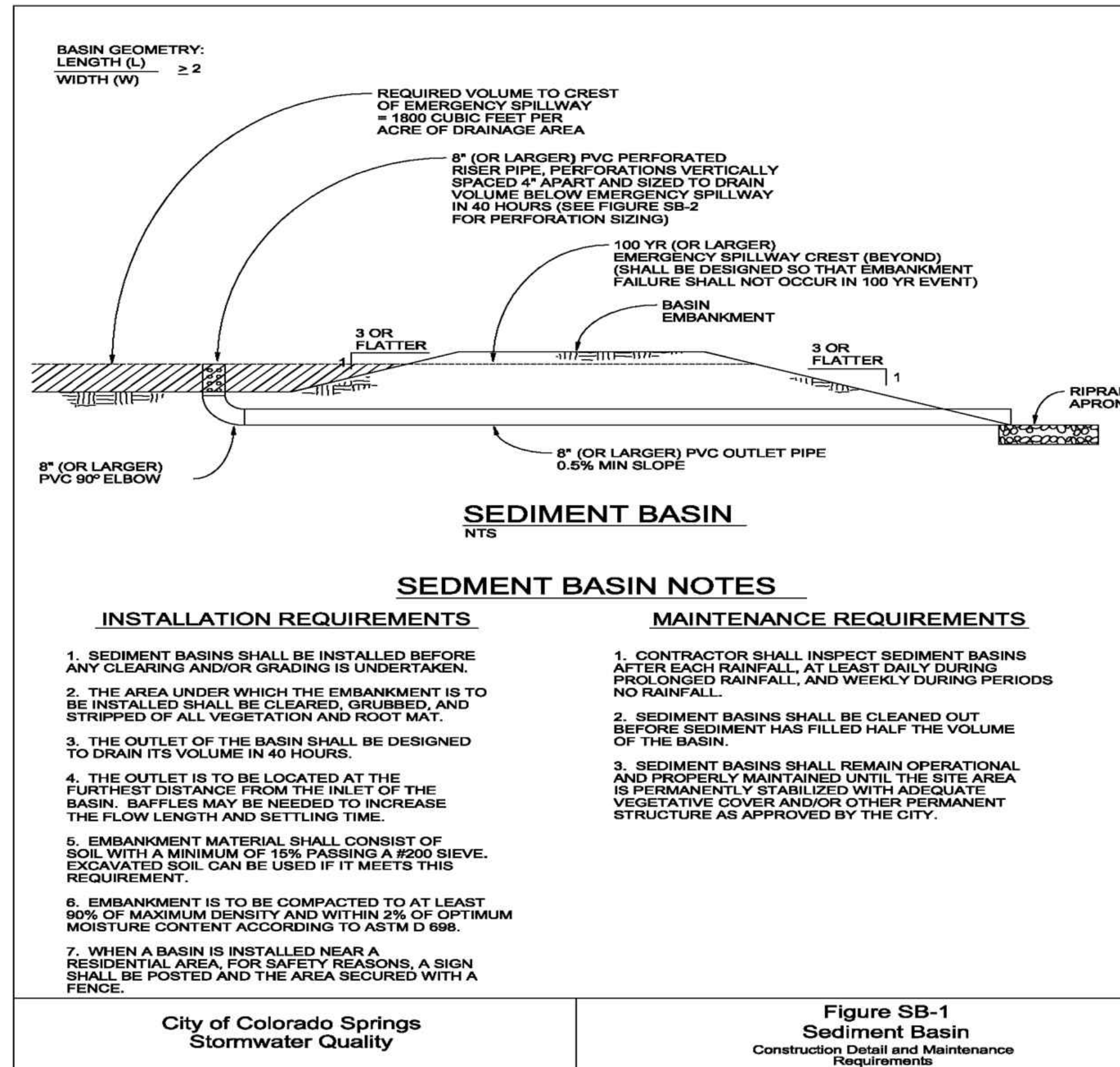

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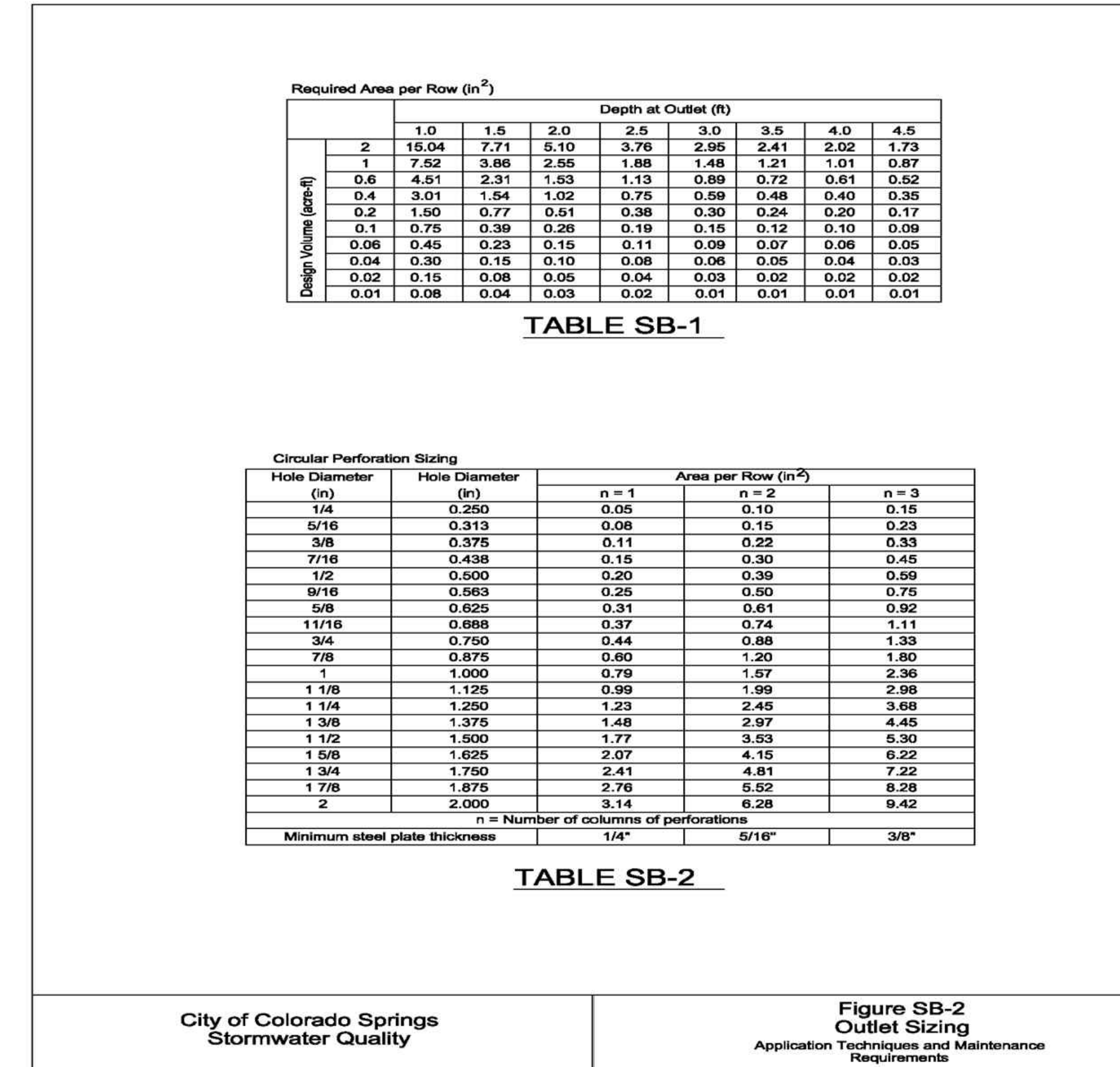
BMPs (2 OF 5)

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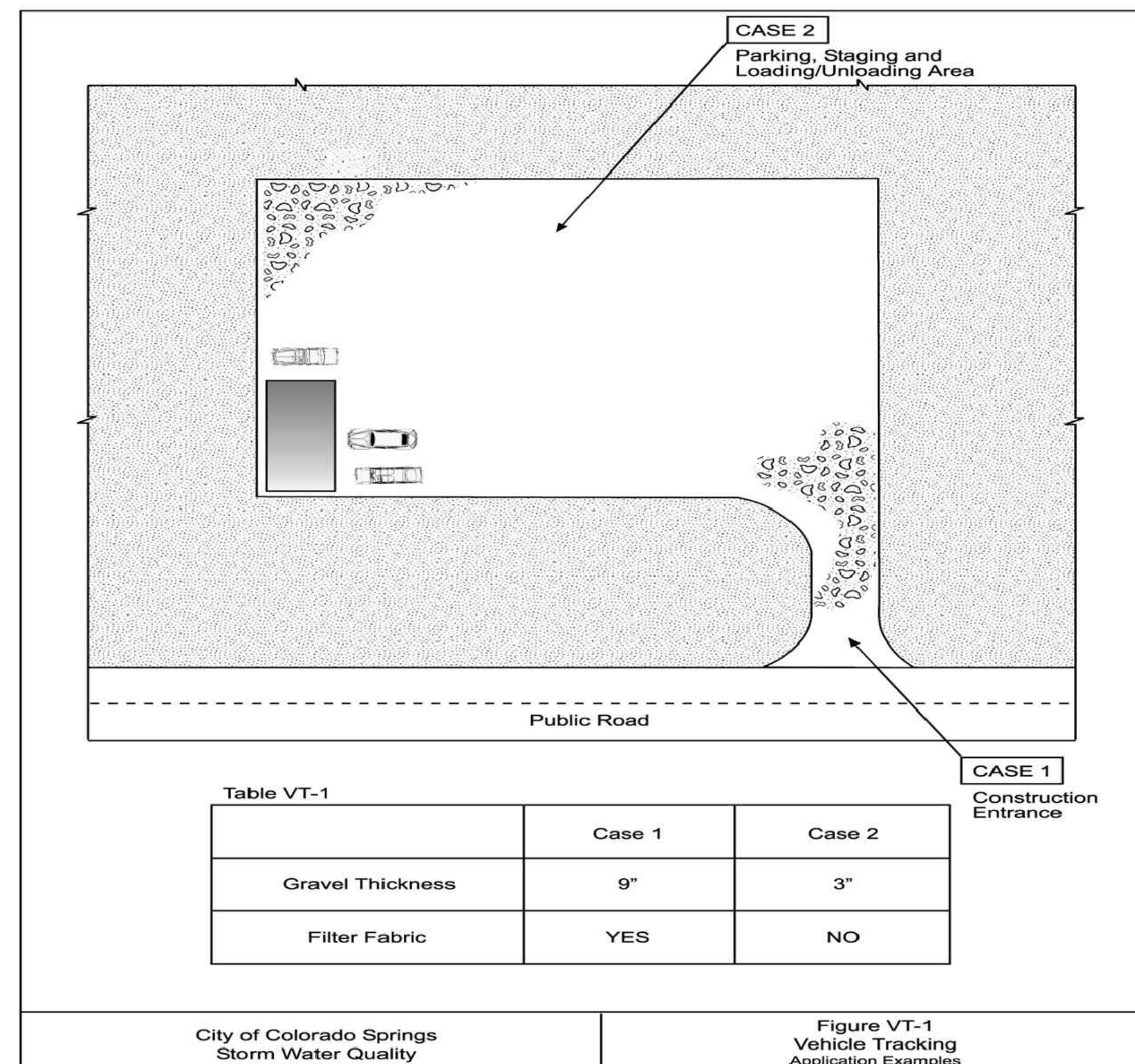
Sheet: 05 of 08



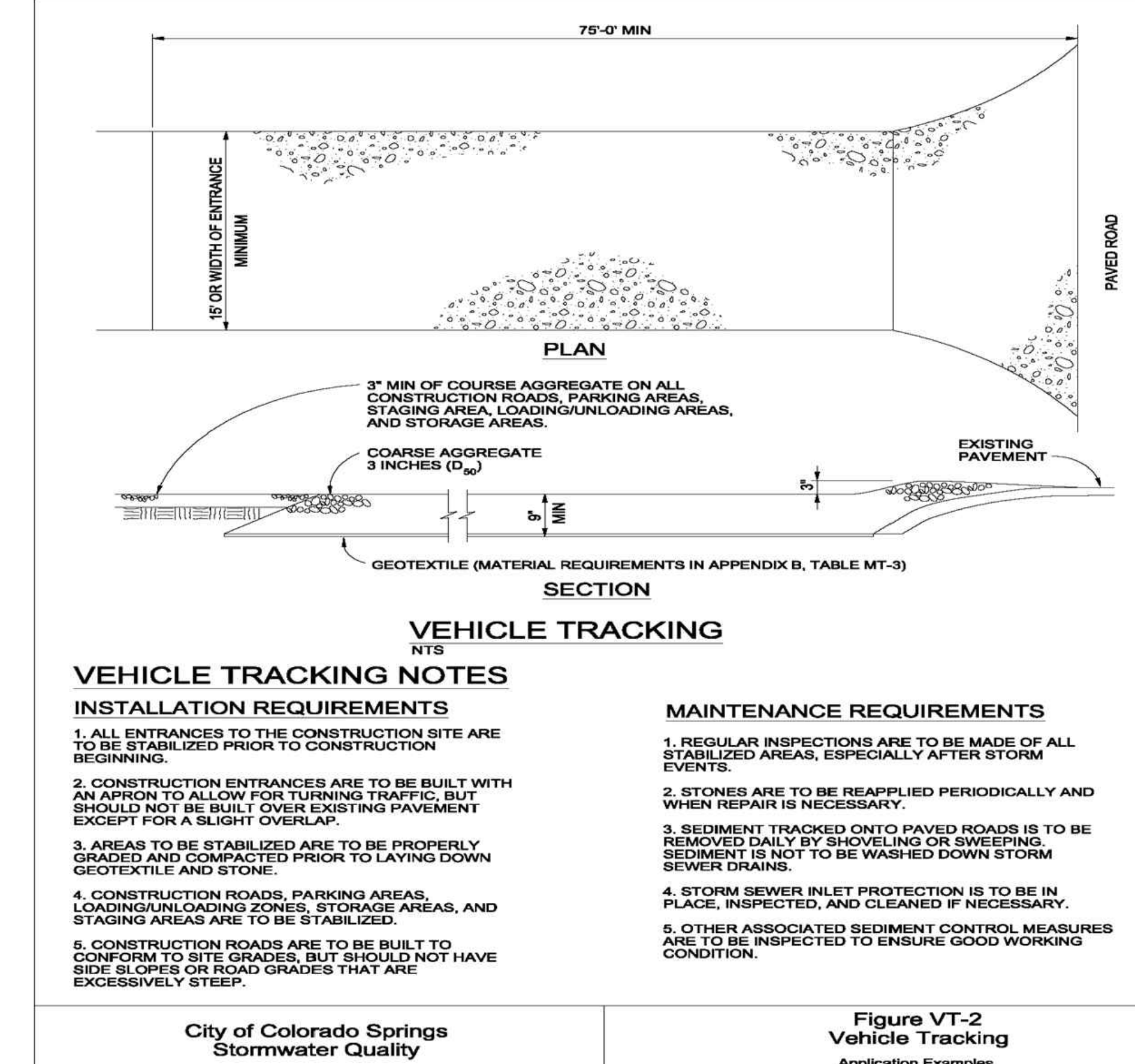
City of Colorado Springs Stormwater Quality  
Figure SB-1 Sediment Basin Construction Detail and Maintenance Requirements



City of Colorado Springs Stormwater Quality  
Figure SB-2 Outlet Sizing Application Techniques and Maintenance Requirements

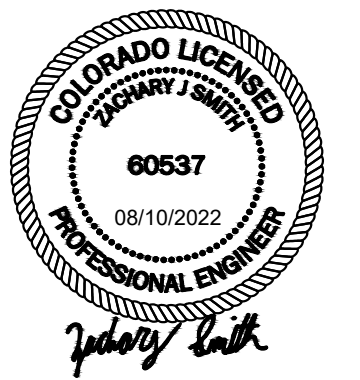


City of Colorado Springs Storm Water Quality  
Figure VT-1 Vehicle Tracking Application Examples



City of Colorado Springs Stormwater Quality  
Figure VT-2 Vehicle Tracking Application Examples

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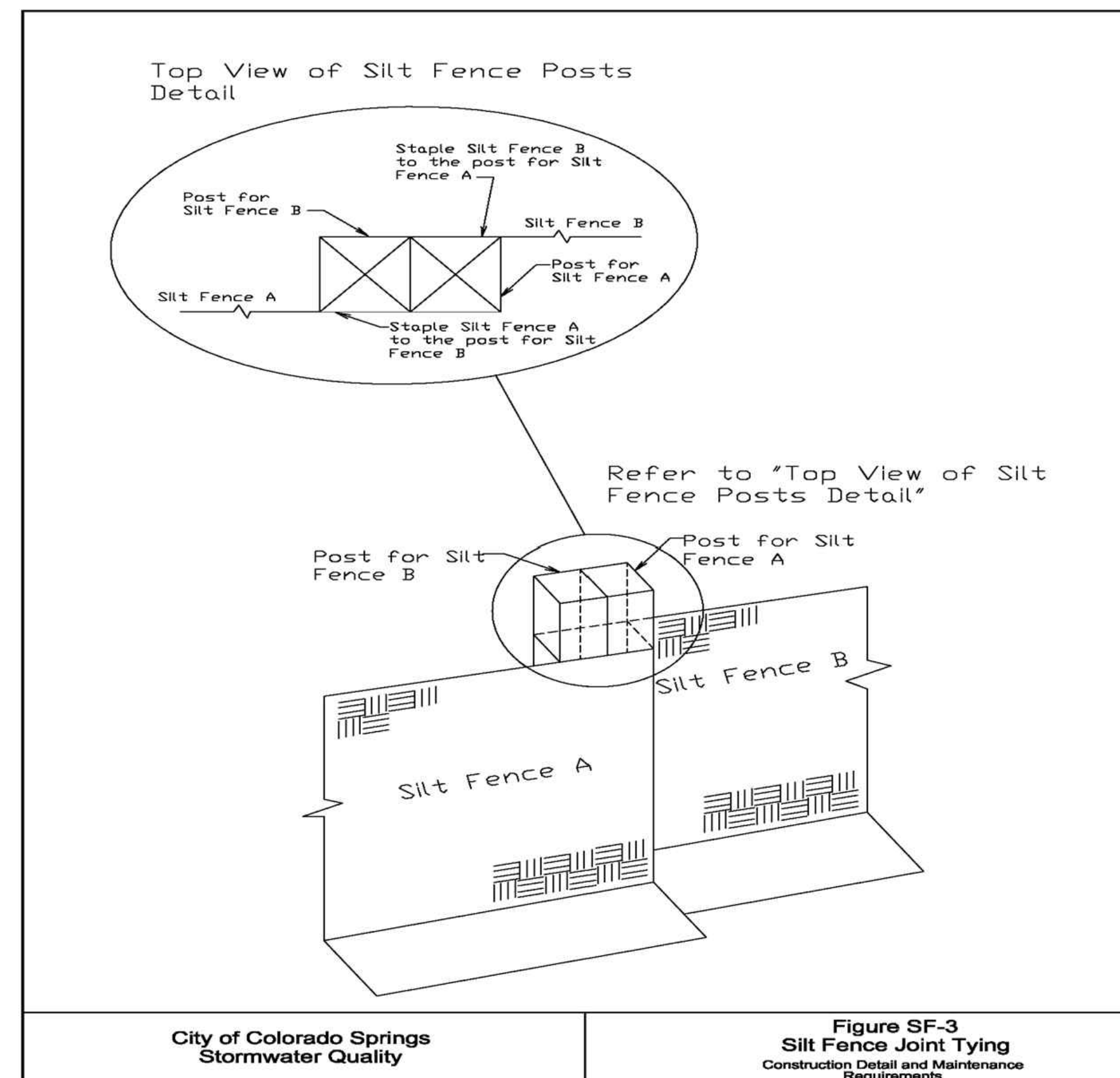
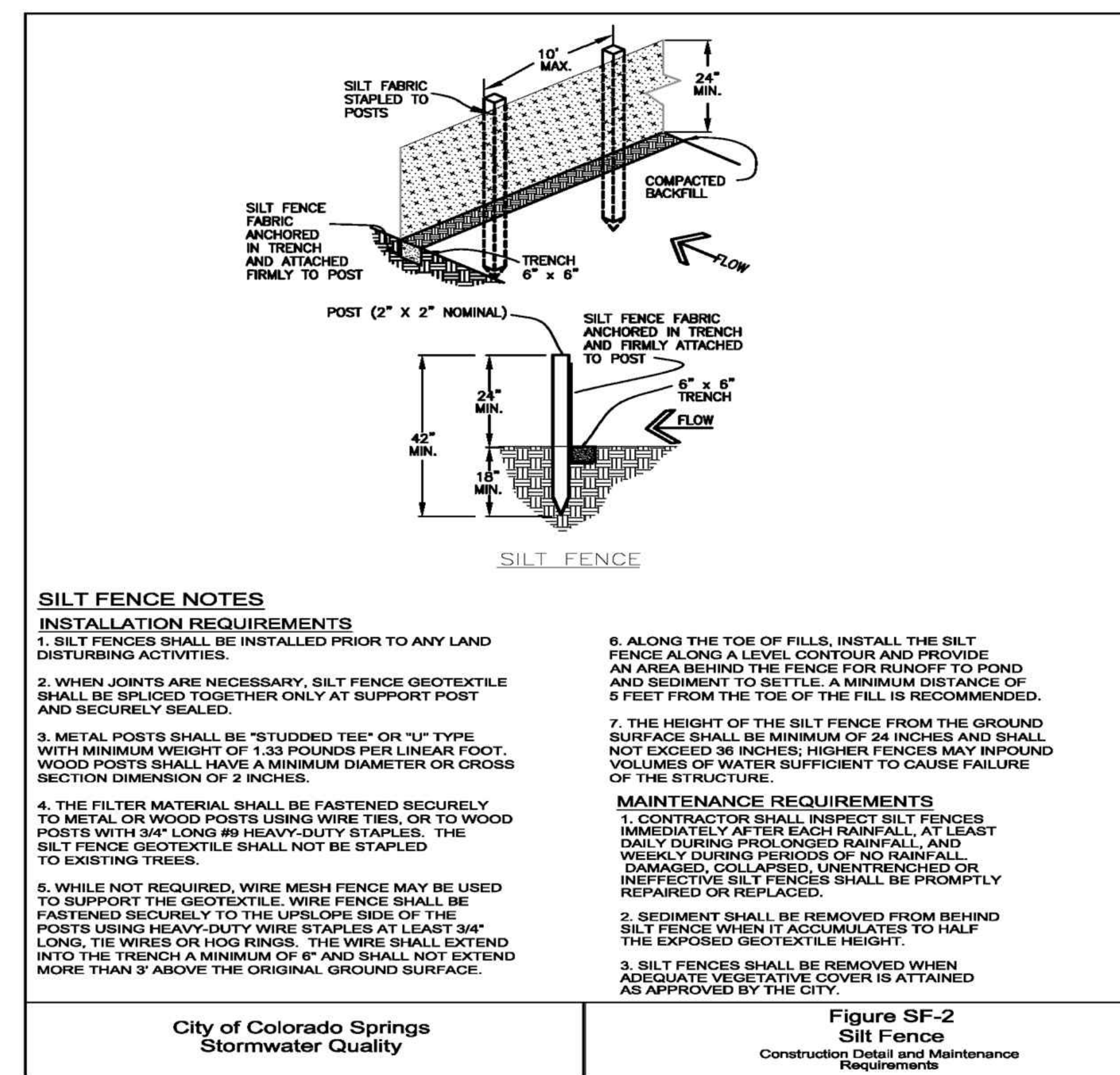
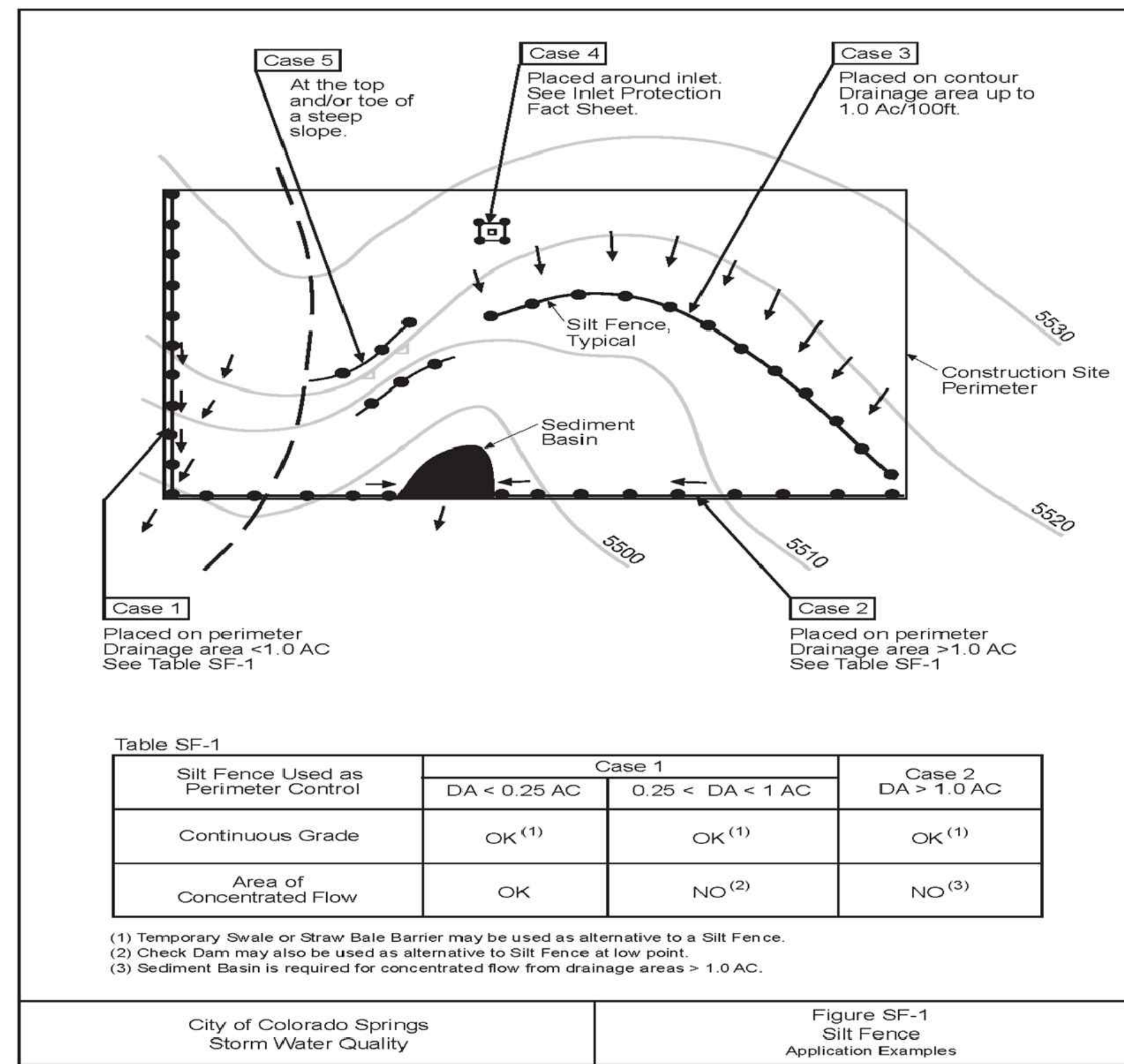


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STORM WATER MANAGEMENT PLAN  
PIONEER MATERIALS SOLBERG PIT  
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**RECOMMENDED ANNUAL GRASSES**

SPECIES (COMMON NAME)	GROWTH SEASON	SEEDING DATE	POUNDS OF PURE LIVE SEED (PLS) (PLS/ACRE)	PLANTING DEPTH (INCHES)
1. OATS	COOL	MARCH 16 - APRIL 30	35-50	1-2
2. SPRING WHEAT	COOL	MARCH 16 - APRIL 30	25-35	1-2
3. SPRING BARLEY	COOL	MARCH 16 - APRIL 30	25-35	1-2
4. ANNUAL RYEGRASS	COOL	MARCH 16 - JUNE 30	10-15	1/2
5. MILLET	WARM	MAY 16 - JULY 15	3-15	1/2-3/4
6. SUDANGRASS	WARM	MAY 16 - JULY 15	5-10	1/2-3/4
7. SORGHUM	WARM	MAY 16 - JULY 15	5-10	1/2-3/4
8. WINTER WHEAT	COOL	SEPTEMBER 1 - 30	20-35	1-2
9. WINTER BARLEY	COOL	SEPTEMBER 1 - 30	20-35	1-2
10. WINTER RYE	COOL	SEPTEMBER 1 - 30	20-35	1-2
11. TRITICALE	COOL	SEPTEMBER 1 - 30	25-40	1-2

THIS TABLE WAS TAKEN FROM UDFCD FOR RECOMMENDED ANNUAL GRASSES FOR THE DENVER METROPOLITAN AREA. THIS TABLE MAY BE USED UNLESS A SITE-SPECIFIC SEED MIX IS REQUESTED AND APPROVED.

TABLE TS-1

**TEMPORARY SEEDING NOTES**

**INSTALLATION REQUIREMENTS**

- DISTURBED AREAS ARE TO BE SEEDED WITHIN 21 DAYS AFTER CONSTRUCTION ACTIVITY OR GRADING ENDS IF SEASON ALLOWS.
- IF NECESSARY, SOIL IS TO BE CONDITIONED FOR PLANT GROWTH BY APPLYING TOPSOIL, FERTILIZER, OR LIME.
- SOIL IS TO BE TILLED IMMEDIATELY PRIOR TO APPLYING SEEDS. COMPACT SOILS ESPECIALLY NEED TO BE LOOSEND.
- SEEDBED DEPTH IS TO BE 4 INCHES FOR SLOPES FLATTER THAN 2:1, AND 1 INCH FOR SLOPES STEEPER THAN 2:1.
- ANNUAL GRASSES LISTED IN TABLE TS-1 ARE TO BE USED FOR TEMPORARY SEEDING. SEED MIXES ARE NOT TO CONTAIN ANY NOXIOUS WEED SEEDS INCLUDING RUSSIAN OR CANADIAN THISTLE, KNAPWEED, PURPLE LOOSESTRIPE, EUROPEAN BINDWEED, JOHNSON GRASS, AND LEAFY SPURGE.
- TABLE TS-1 ALSO PROVIDES REQUIREMENTS FOR SEEDING RATES, SEEDING DATES, AND PLANTING DEPTHS FOR THE APPROVED TYPES OF ANNUAL GRASSES.
- SEEDING IS TO BE APPLIED USING MECHANICAL TYPE DRILLS EXCEPT WHERE SLOPES ARE STEEP OR ACCESS IS LIMITED THEN HYDRAULIC SEEDING MAY BE USED.
- ALL SEEDED AREAS ARE TO BE MULCHED (SEE FACTSHEET ON MULCHING).
- IF HYDRAULIC SEEDING IS USED THEN HYDRAULIC MULCHING SHALL BE DONE SEPARATELY TO AVOID SEEDS BECOMING ENCAPSULATED IN THE MULCH.

**MAINTENANCE REQUIREMENTS**

- REGULAR INSPECTIONS ARE TO BE MADE OF ALL SEEDED AREAS TO ENSURE GROWTH.
- AREAS WHERE GROWTH IS NOT OCCURRING QUICKLY OR THE MULCH HAS BEEN REMOVED SHALL BE RE-SEEDED AS SOON AS POSSIBLE AND RE-MULCHED IF NEEDED.
- SEEDED AREAS ARE NOT TO BE DRIVEN OVER WITH CONSTRUCTION EQUIPMENT OR VEHICLES.

City of Colorado Springs  
Stormwater Quality

Figure TS-1  
Temporary Seeding  
Construction Detail and Maintenance  
Requirements

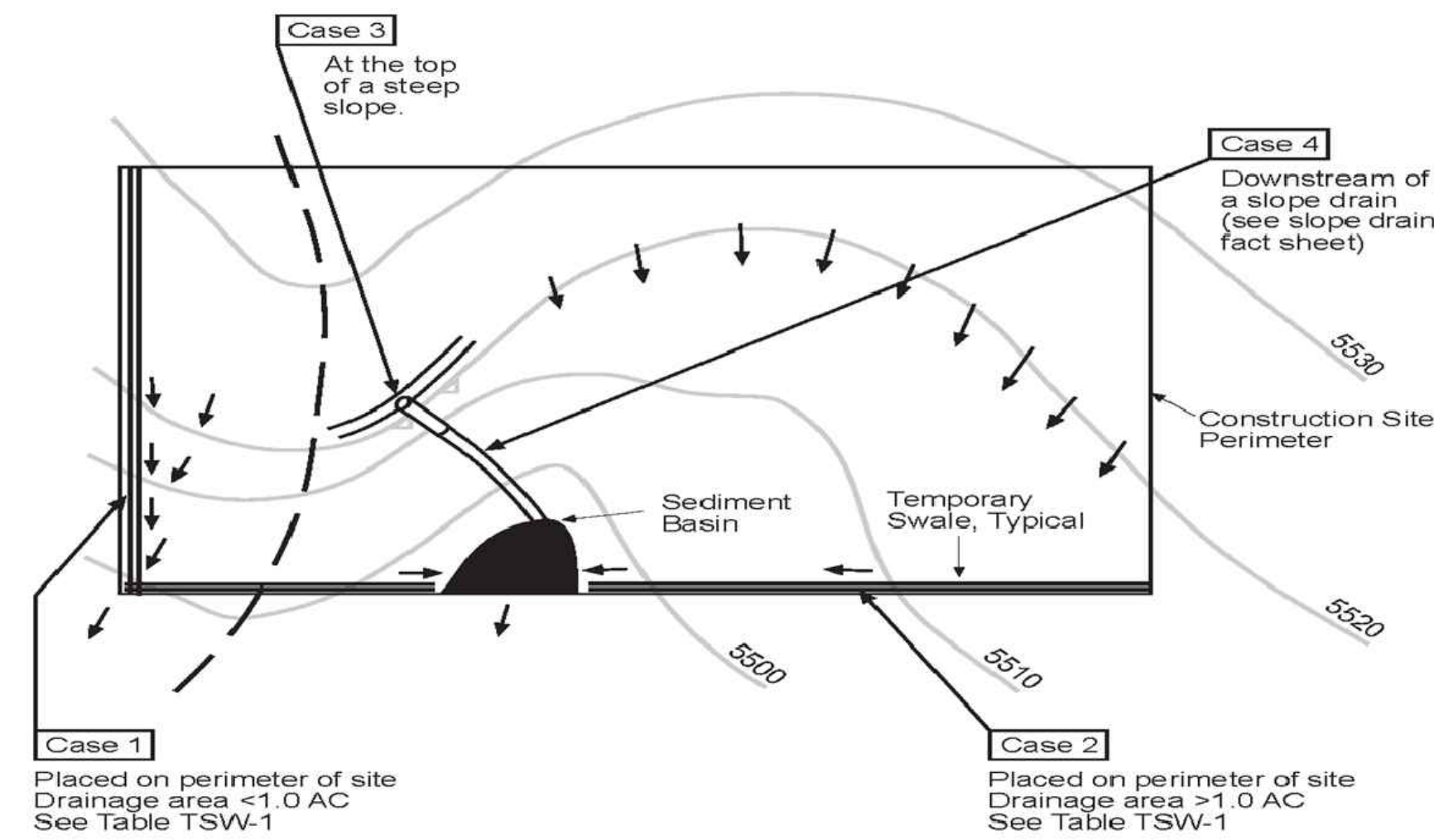


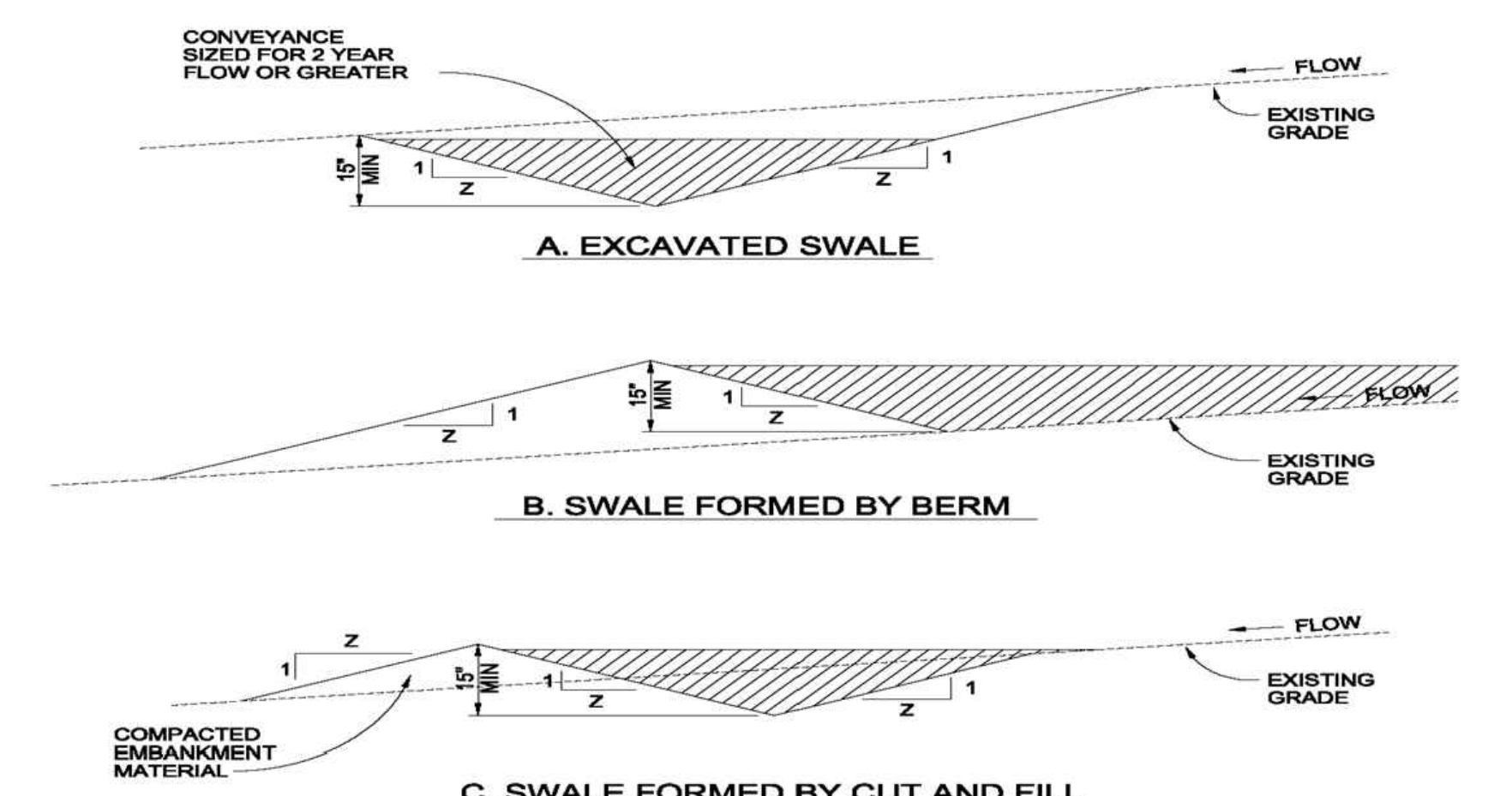
Table TSW-1

Temporary Swale Used as Perimeter Control	Case 1 DA < 1.0 AC	Case 2 DA > 1.0 AC
Continuous Grade	OK <sup>(1)</sup>	OK <sup>(1)</sup>
Area of Concentrated Flow	NO <sup>(3)</sup>	NO <sup>(2)</sup>

(1) Silt Fence or Straw Bale Barrier may be used as alternative to a Temporary Swale.  
(2) With Temporary Swales Sediment Basin is required for concentrated flow from drainage areas > 1.0 AC.  
(3) Check Dam is required at concentrated flow for drainage areas > 1.0 acres.

City of Colorado Springs  
Storm Water Quality

Figure TSW-1  
Temporary Swale  
Application Examples



**TEMPORARY SWALE**  
NTS

**INSTALLATION REQUIREMENTS**

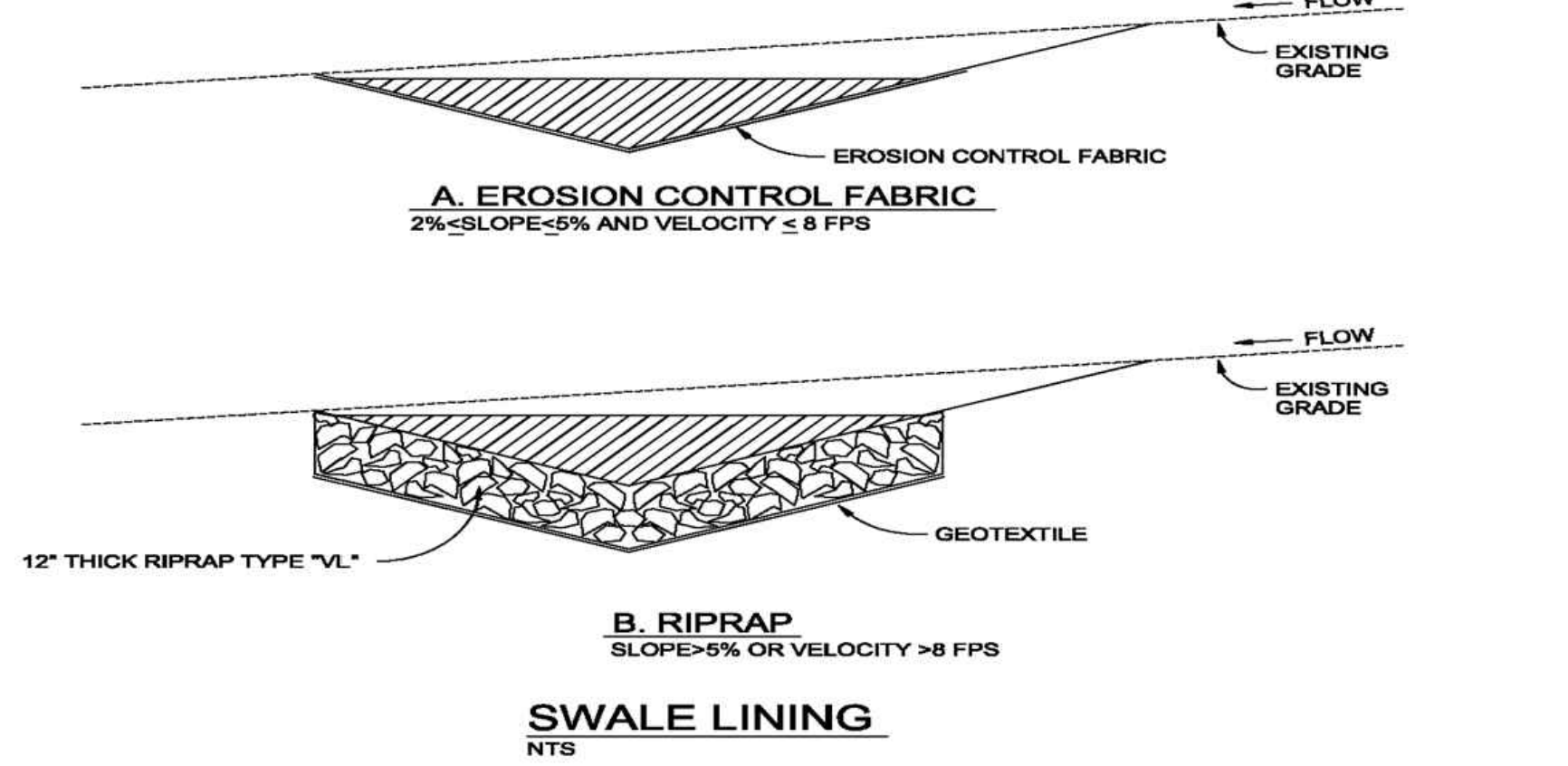
- TEMPORARY SWALES SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
- THE AREA UNDER WHICH THE EMBANKMENT IS TO BE INSTALLED SHALL BE CLEARED, GRUBBED, AND STRIPPED OF ALL VEGETATION AND ROOT MAT.
- EMBANKMENT MATERIAL SHALL CONSIST OF SOIL WITH A MINIMUM OF 15% PASSING A #200 SIEVE. EXCAVATED SOIL CAN BE USED IF IT MEETS THIS REQUIREMENT.
- EMBANKMENT IS TO BE COMPACTED TO AT LEAST 90% OF MAXIMUM DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT ACCORDING TO ASTM D 698.
- SWALES WITH SLOPE > 2% SHALL BE LINED, SEE FIGURE TSW-3.
- SWALES ARE TO DRAIN INTO A SEDIMENT BASIN OR OTHER STABILIZED OUTLET.
- Z SHALL BE 3 OR GREATER.

**MAINTENANCE REQUIREMENTS**

- CONTRACTOR SHALL INSPECT SWALES AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS OF NO RAINFALL.
- SWALES SHALL BE ROUTINELY CLEARED OF ANY DEBRIS OR ACCUMULATION OF SEDIMENT.
- ERODED SLOPES OR DAMAGED LININGS SHALL IMMEDIATELY BE REPAIRED.
- TEMPORARY SWALES SHALL REMAIN OPERATIONAL AND PROPERLY MAINTAINED UNTIL THE SITE AREA IS PERMANENTLY STABILIZED WITH ADEQUATE VEGETATIVE COVER AND/OR OTHER PERMANENT STRUCTURE AS APPROVED BY THE CITY.

City of Colorado Springs  
Stormwater Quality

Figure TSW-2  
Temporary Swale  
Construction Detail and Maintenance  
Requirements



**SWALE LINING NOTES**

**INSTALLATION REQUIREMENTS**

- REFER TO THE EROSION CONTROL BLANKETS FACTSHEET FOR PROPER INSTALLATION OF EROSION CONTROL FABRIC LINING.
- SWALES WITH EASILY ERODIBLE SOILS AND SLOPES LESS THAN 2% SHALL BE LINED WITH EROSION CONTROL FABRIC.
- VELOCITIES FOR EROSION CONTROL FABRICS SHALL NOT EXCEED 8 FPS. SWALES WITH VELOCITIES GREATER THAN 8 FPS SHALL BE LINED WITH RIP RAP.

**MAINTENANCE REQUIREMENTS**

- CONTRACTOR SHALL INSPECT SWALE LININGS AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL AND WEEKLY DURING PERIODS OF NO RAINFALL.
- DAMAGED LININGS SHALL IMMEDIATELY BE REPAIRED.
- REFER TO THE EROSION CONTROL BLANKETS FACTSHEET FOR PROPER MAINTENANCE.
- DISPLACED RIPRAP OR COARSE AGGREGATE IS TO BE REPLACED AS SOON AS POSSIBLE.
- SWALE LININGS ARE TO REMAIN IN PLACE AND BE PROPERLY MAINTAINED UNTIL THE TEMPORARY SWALE IS REMOVED.

City of Colorado Springs  
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Figure TSW-3  
Swale Linings  
Construction Detail and Maintenance  
Requirements

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**APPENDIX B**  
**FIRM Maps**

**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 (NAVD88). 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, NUNCS12  
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SSMC-3, #9202  
1315 East-West Highway  
Silver Spring, MD 20910-3282

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**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.

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**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.

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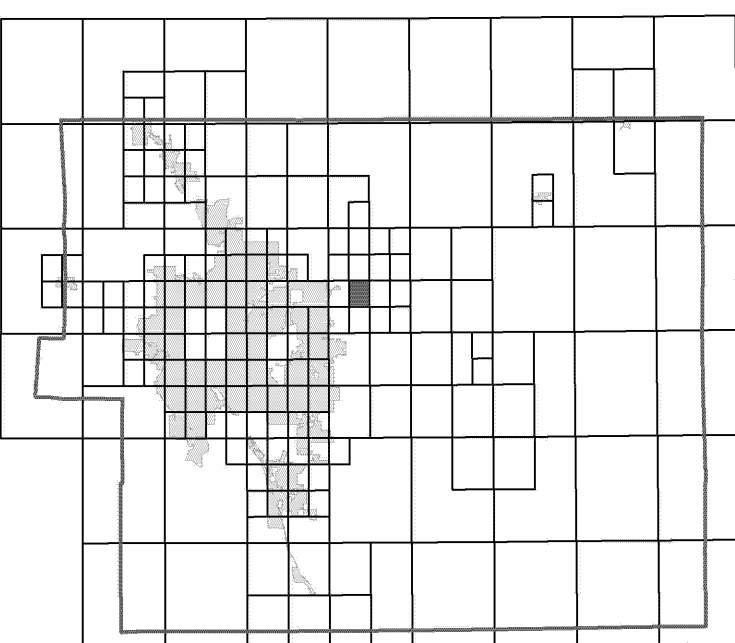
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If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/business/nfip>.

**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.



NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 13 SOUTH, RANGE 64 WEST.

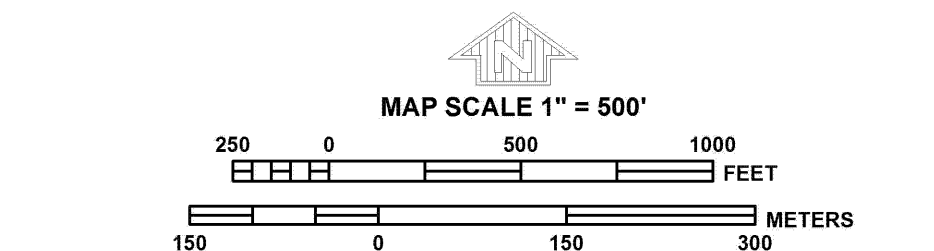
**LEGEND**

- 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.
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- 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.
- Base Flood Elevation line and value; elevation in feet\* (EL 987)

- \* Referenced to the North American Vertical Datum of 1988 (NAVD 88)
- Cross section line
- Transsect line
- 57° 07' 30.00" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4750000N 1000-meter Universal Transverse Mercator grid ticks, zone 13
- 6000000 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.



**PANEL 0562G**

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
**EL PASO COUNTY,**  
**COLORADO**  
**AND INCORPORATED AREAS**

**PANEL 562 OF 1300**  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:	COMMUNITY	NUMBER	PANEL	SUFFIX
	EL PASO COUNTY	08009	0562	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**  
**08041C0562G**

**MAP REVISED**  
**DECEMBER 7, 2018**  
Federal Emergency Management Agency

**NOTES TO USERS**

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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.

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Silver Spring, MD 20910-3282

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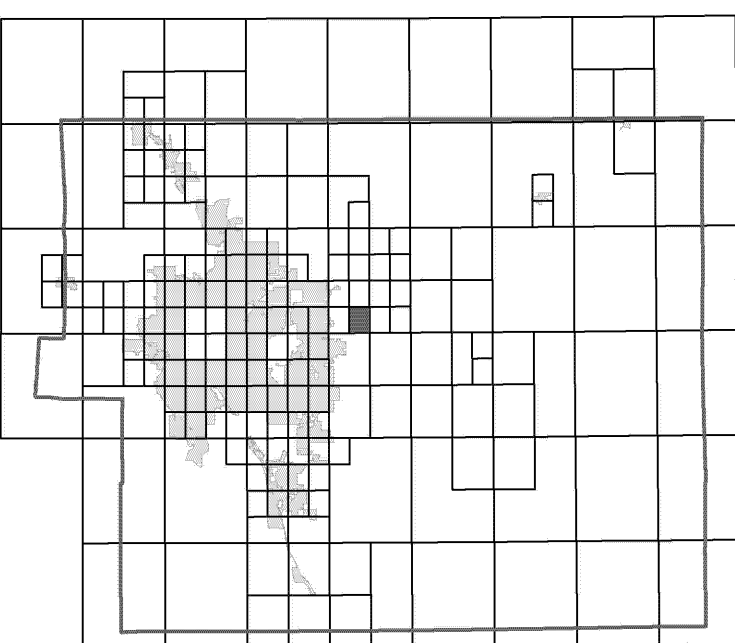
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**El Paso County Vertical Datum Offset Table**

Flooding Source	Vertical Datum Offset (ft)

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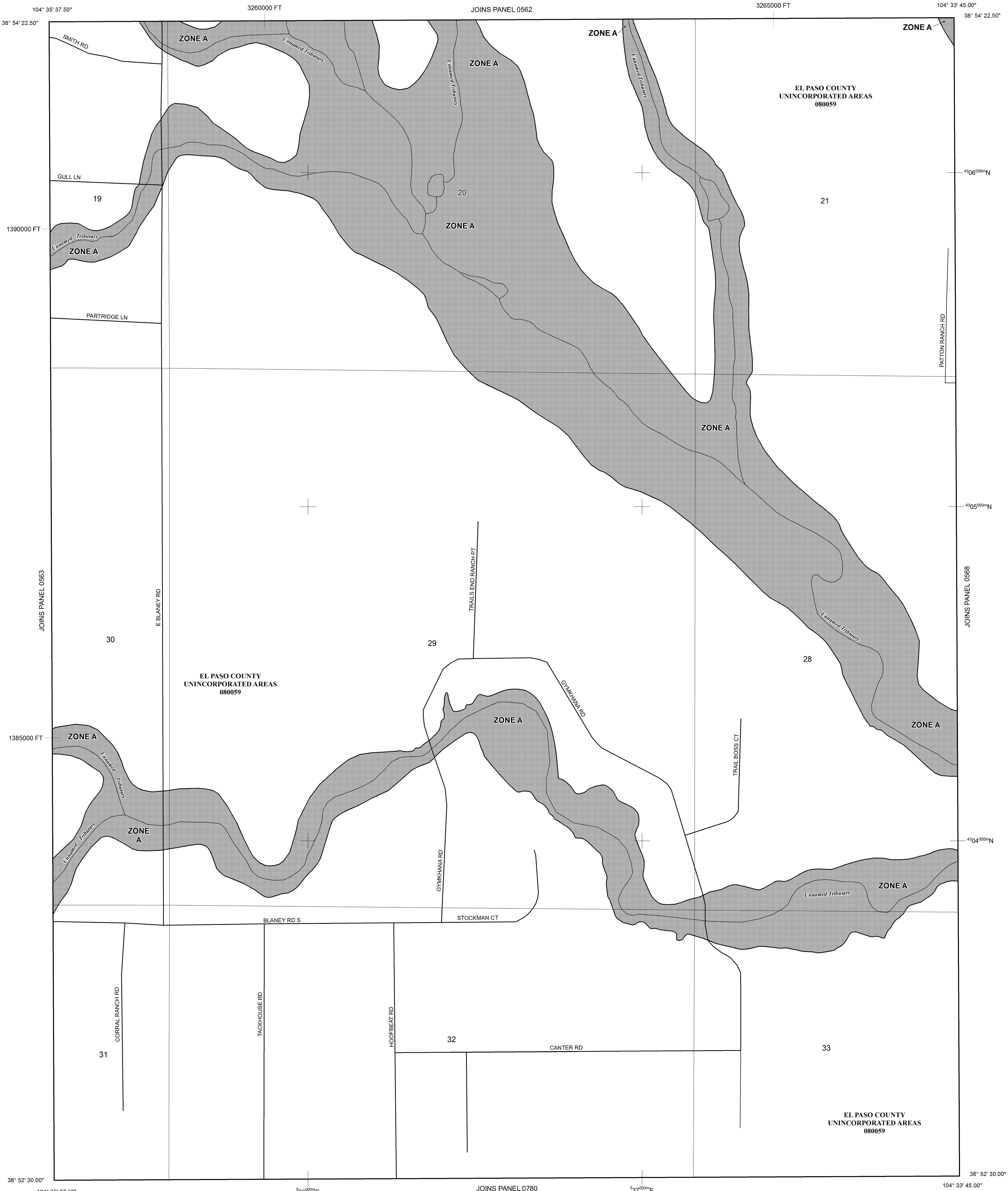
**Panel Location Map**



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NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 13 SOUTH, RANGE 64 WEST.

**LEGEND**

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

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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

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COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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- Zone D boundary
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Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

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)

Cross section line

Transsect line

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

1000-meter Universal Transverse Mercator grid ticks, zone 13

5000-foot grid ticks; Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection

Bench mark (see explanation in Notes to Users section of this FIRM panel)

River Mile

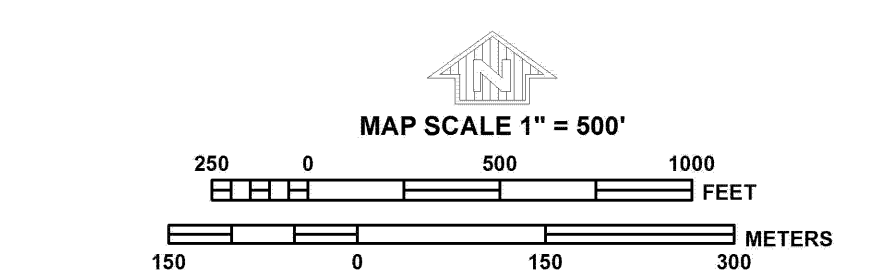
MAP REPOSITORIES  
Refer to Map Repositories list on Map Index

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.

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**NFIP** **PANEL 0564G**

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
**EL PASO COUNTY,**  
**COLORADO**  
**AND INCORPORATED AREAS**

**PANEL 564 OF 1300**  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:			
COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO COUNTY	080059	0564	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**  
**08041C0564G**

**MAP REVISED**  
**DECEMBER 7, 2018**  
Federal Emergency Management Agency



**NOTES TO USERS**

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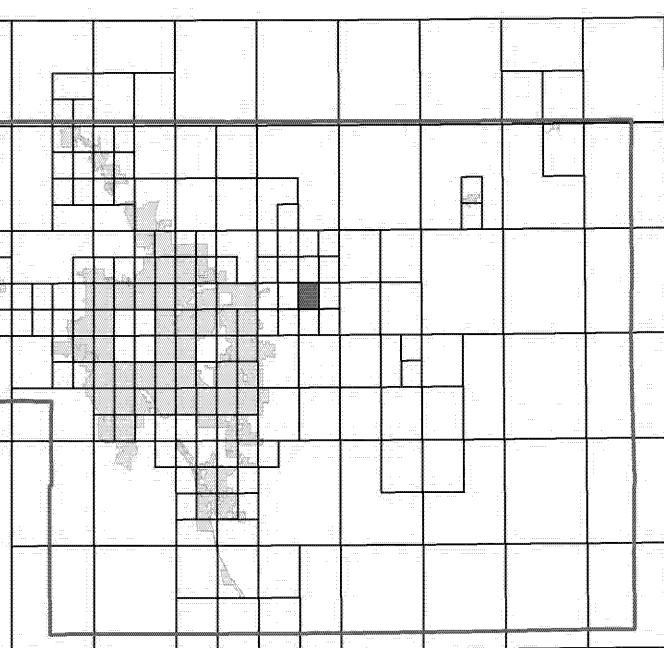
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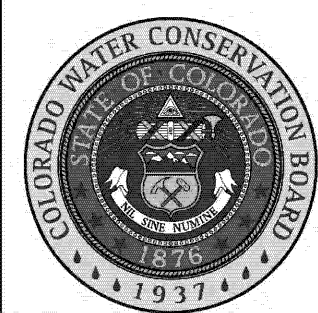
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Flooding Source	Vertical Datum Offset (ft)
REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY FOR STREAM BY STREAM VERTICAL DATUM CONVERSION INFORMATION	

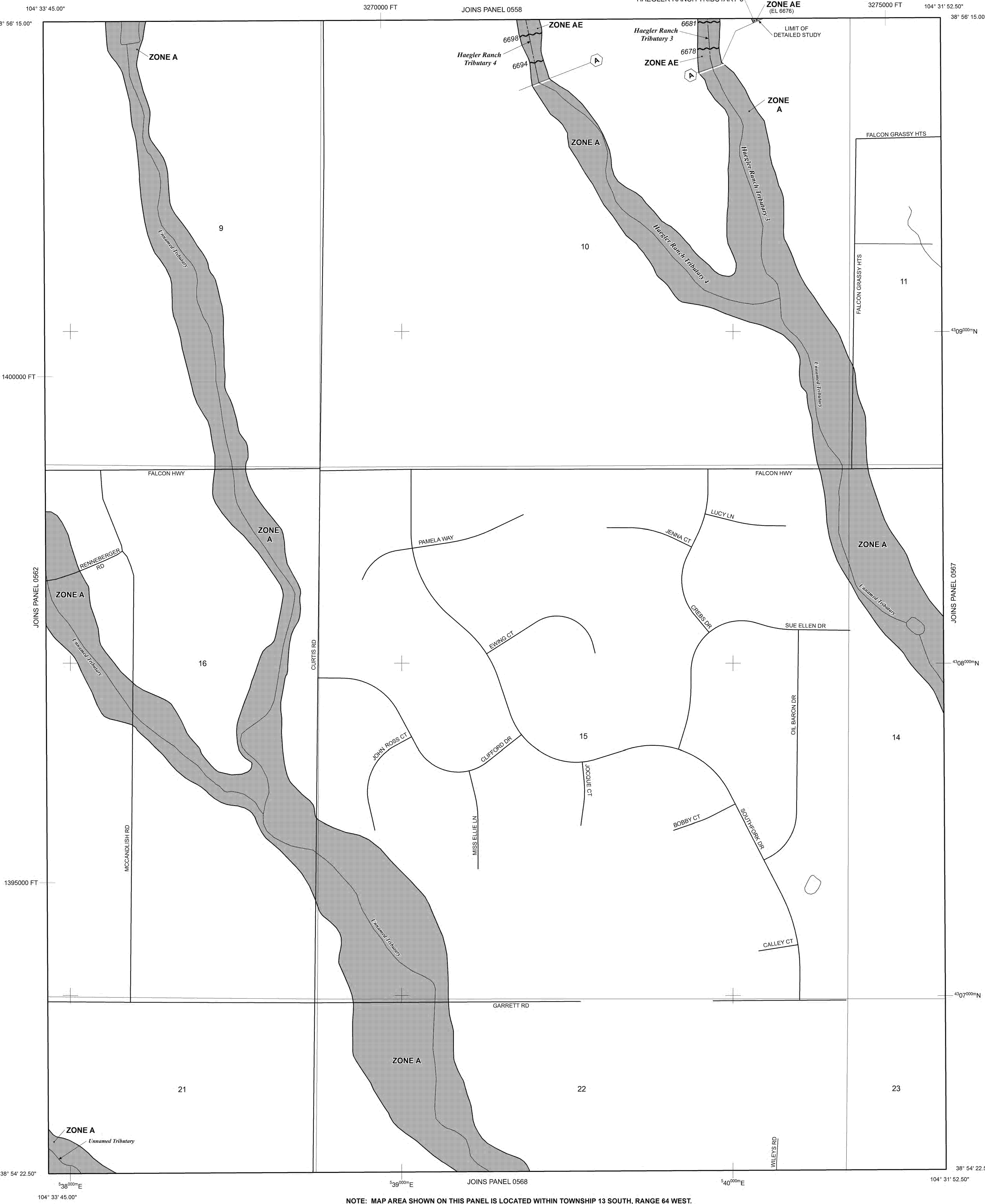
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\* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- Cross section line
- Transsect line

97° 07' 30.00" 32° 22' 30.00" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

4750000N 1000-meter Universal Transverse Mercator grid ticks, zone 13

6000000 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

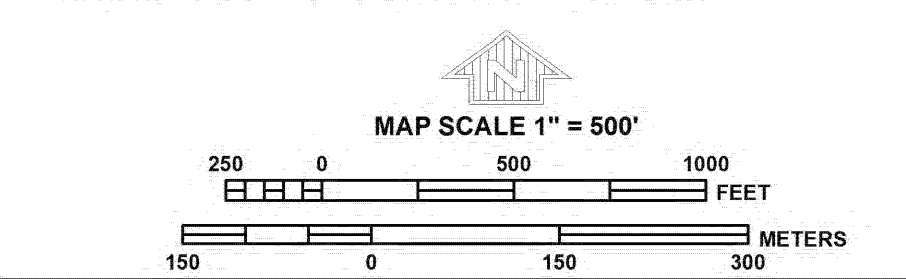
MAP REPOSITORIES Refer to Map Repositories list on Map Index

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.



**PANEL 0566G**

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
**EL PASO COUNTY, COLORADO**  
**AND INCORPORATED AREAS**

**PANEL 566 OF 1300**  
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:	COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO COUNTY		08029	0566	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**  
**08041C0566G**

**MAP REVISED**  
**DECEMBER 7, 2018**  
 Federal Emergency Management Agency

**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 (NAVD88). 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, NINGS12  
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, and Anderson Consulting Engineers, Inc. These data are current as of 2008.

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 (FIRM) 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/>.

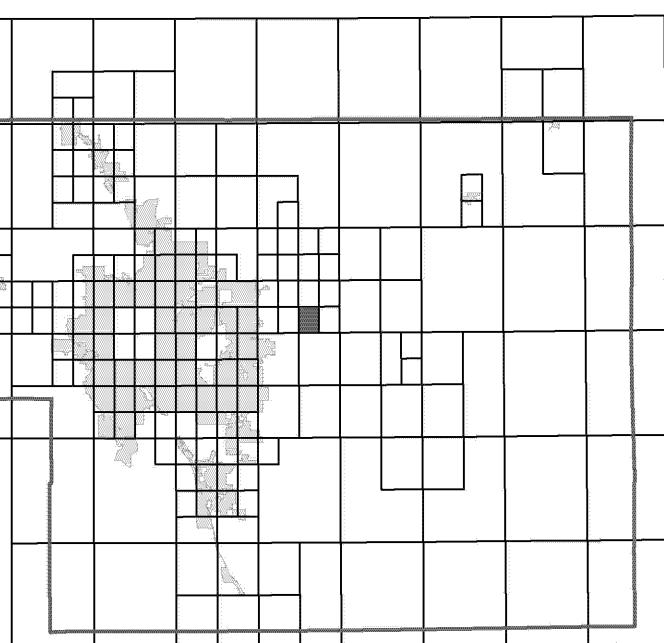
If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP (1-877-336-2627)** or visit the FEMA website at <http://www.fema.gov/business/nfp>.

**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

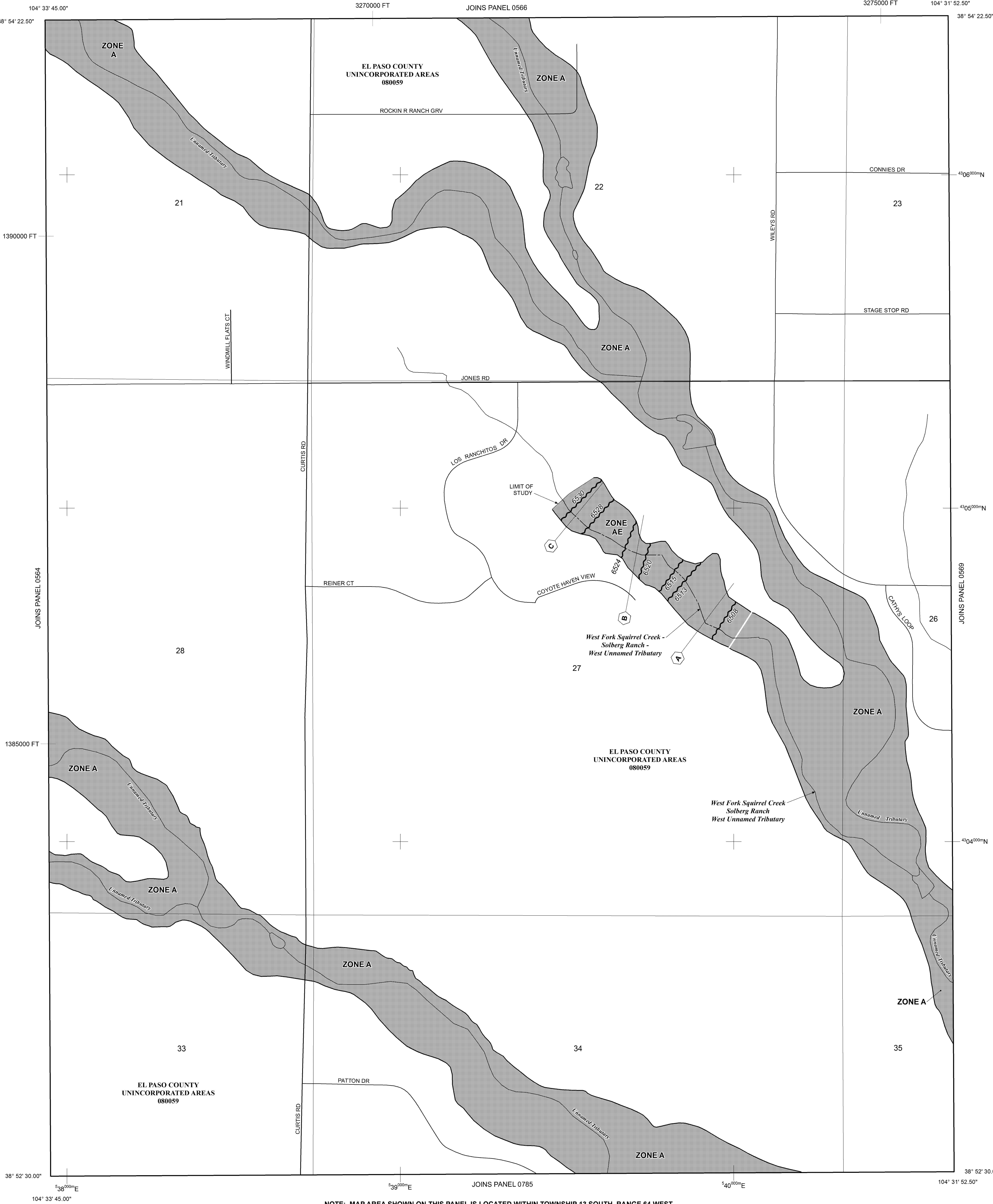
**Panel Location Map**



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.



NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 13 SOUTH, RANGE 64 WEST.

**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 equalled 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 Transsect line

97° 07' 30.00" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

4750000N 1000-meter Universal Transverse Mercator grid ticks, zone 13

6000000 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.

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MAP SCALE 1" = 500'

250 0 500 1000 FEET  
150 0 150 300 METERS

**NFIP** PANEL 0568G

**FIRM**  
FLOOD INSURANCE RATE MAP  
EL PASO COUNTY,  
COLORADO  
AND INCORPORATED AREAS

PANEL 568 OF 1300  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:  
COMMUNITY NUMBER PANEL SUFFIX  
EL PASO COUNTY 080059 0568 0

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**  
08041C0568G

**MAP REVISED**  
DECEMBER 7, 2018  
Federal Emergency Management Agency

**APPENDIX C**  
**Web Soils Survey**



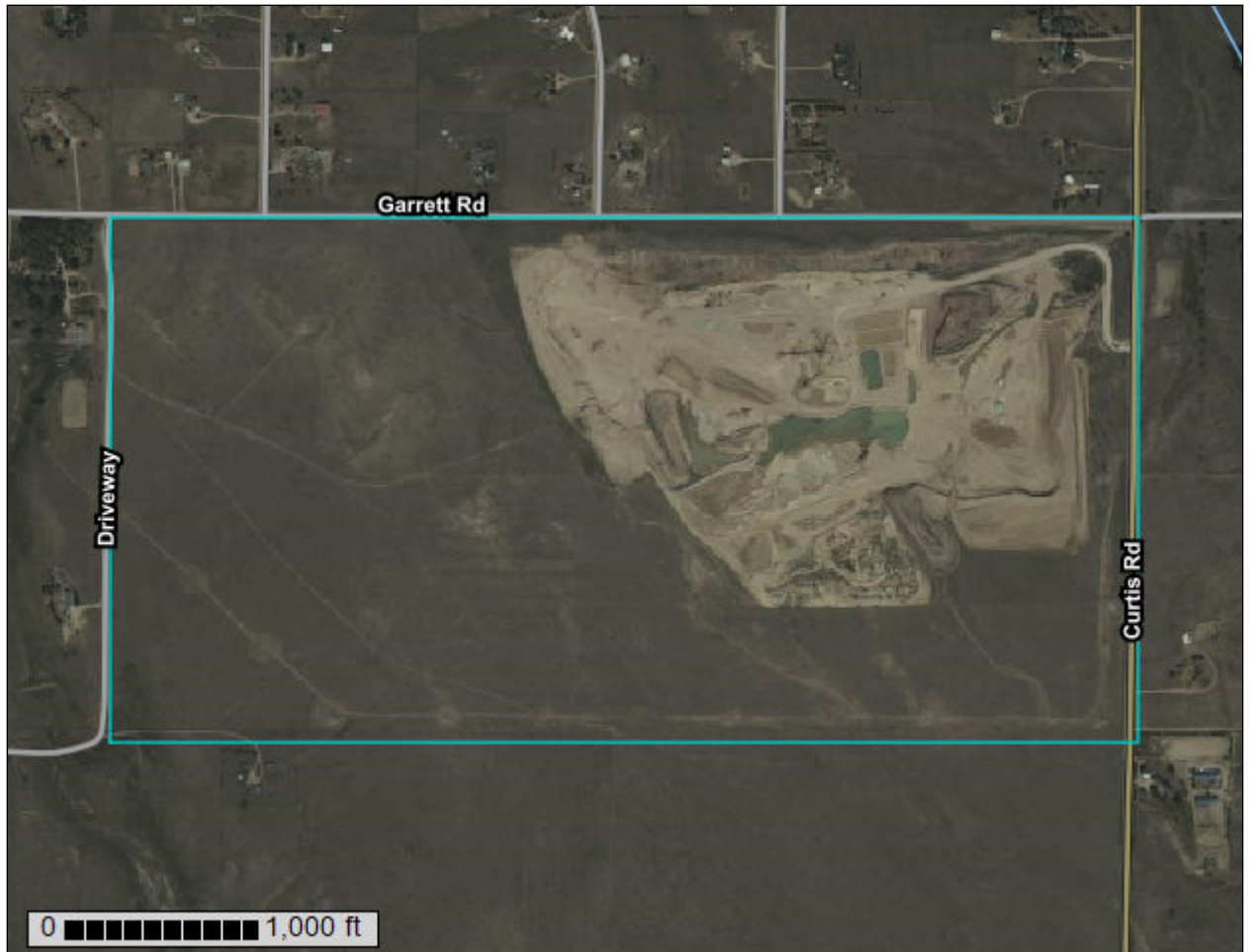
United States  
Department of  
Agriculture

**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



# Preface

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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](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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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# How Soil Surveys Are Made

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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



## Custom Soil Resource Report

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

## Custom Soil Resource Report

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

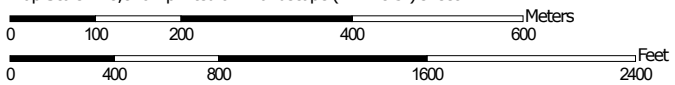
---

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: 1:8,840 if printed on A landscape (11" x 8.5") sheet.




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 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.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	141.3	43.2%
83	Stapleton sandy loam, 3 to 8 percent slopes	185.7	56.8%
<b>Totals for Area of Interest</b>		<b>327.0</b>	<b>100.0%</b>

## 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,

## Custom Soil Resource Report

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

### 8—Blakeland loamy sand, 1 to 9 percent slopes

#### Map Unit Setting

*National map unit symbol:* 369v  
*Elevation:* 4,600 to 5,800 feet  
*Mean annual precipitation:* 14 to 16 inches  
*Mean annual air temperature:* 46 to 48 degrees F  
*Frost-free period:* 125 to 145 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Blakeland and similar soils:* 98 percent  
*Minor components:* 2 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Blakeland

##### Setting

*Landform:* Hills, flats  
*Landform position (three-dimensional):* Side slope, talf  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Alluvium derived from sedimentary rock and/or eolian deposits derived from sedimentary rock

##### Typical profile

*A - 0 to 11 inches:* loamy sand  
*AC - 11 to 27 inches:* loamy sand  
*C - 27 to 60 inches:* sand

##### Properties and qualities

*Slope:* 1 to 9 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 to very high (5.95 to 19.98 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 5 percent  
*Available water supply, 0 to 60 inches:* Low (about 4.5 inches)

##### Interpretive groups

*Land capability classification (irrigated):* 3e  
*Land capability classification (nonirrigated):* 6e  
*Hydrologic Soil Group:* A  
*Ecological site:* R049XB210CO - Sandy Foothill  
*Hydric soil rating:* No

#### Minor Components

##### Other soils

*Percent of map unit:* 1 percent



*Hydric soil rating:* No

**Pleasant**

*Percent of map unit:* 1 percent

*Landform:* Depressions

*Hydric soil rating:* Yes

**83—Stapleton sandy loam, 3 to 8 percent slopes**

**Map Unit Setting**

*National map unit symbol:* 369z

*Elevation:* 6,500 to 7,300 feet

*Mean annual precipitation:* 14 to 16 inches

*Mean annual air temperature:* 46 to 48 degrees F

*Frost-free period:* 125 to 145 days

*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Stapleton and similar soils:* 97 percent

*Minor components:* 3 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Stapleton**

**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**

*A - 0 to 11 inches:* sandy loam

*Bw - 11 to 17 inches:* gravelly sandy loam

*C - 17 to 60 inches:* gravelly loamy sand

**Properties and qualities**

*Slope:* 3 to 8 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well 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 4.7 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 3e

## Custom Soil Resource Report

*Hydrologic Soil Group: B*

*Ecological site: R049XY214CO - Gravelly Foothill*

*Hydric soil rating: No*

### **Minor Components**

#### **Fluvaquentic haplaquolls**

*Percent of map unit: 1 percent*

*Landform: Swales*

*Hydric soil rating: Yes*

#### **Other soils**

*Percent of map unit: 1 percent*

*Hydric soil rating: No*

#### **Pleasant**

*Percent of map unit: 1 percent*

*Landform: Depressions*

*Hydric soil rating: Yes*

# **Soil Information for All Uses**

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## **Soil Properties and Qualities**

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

## **Soil Erosion Factors**

Soil Erosion Factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

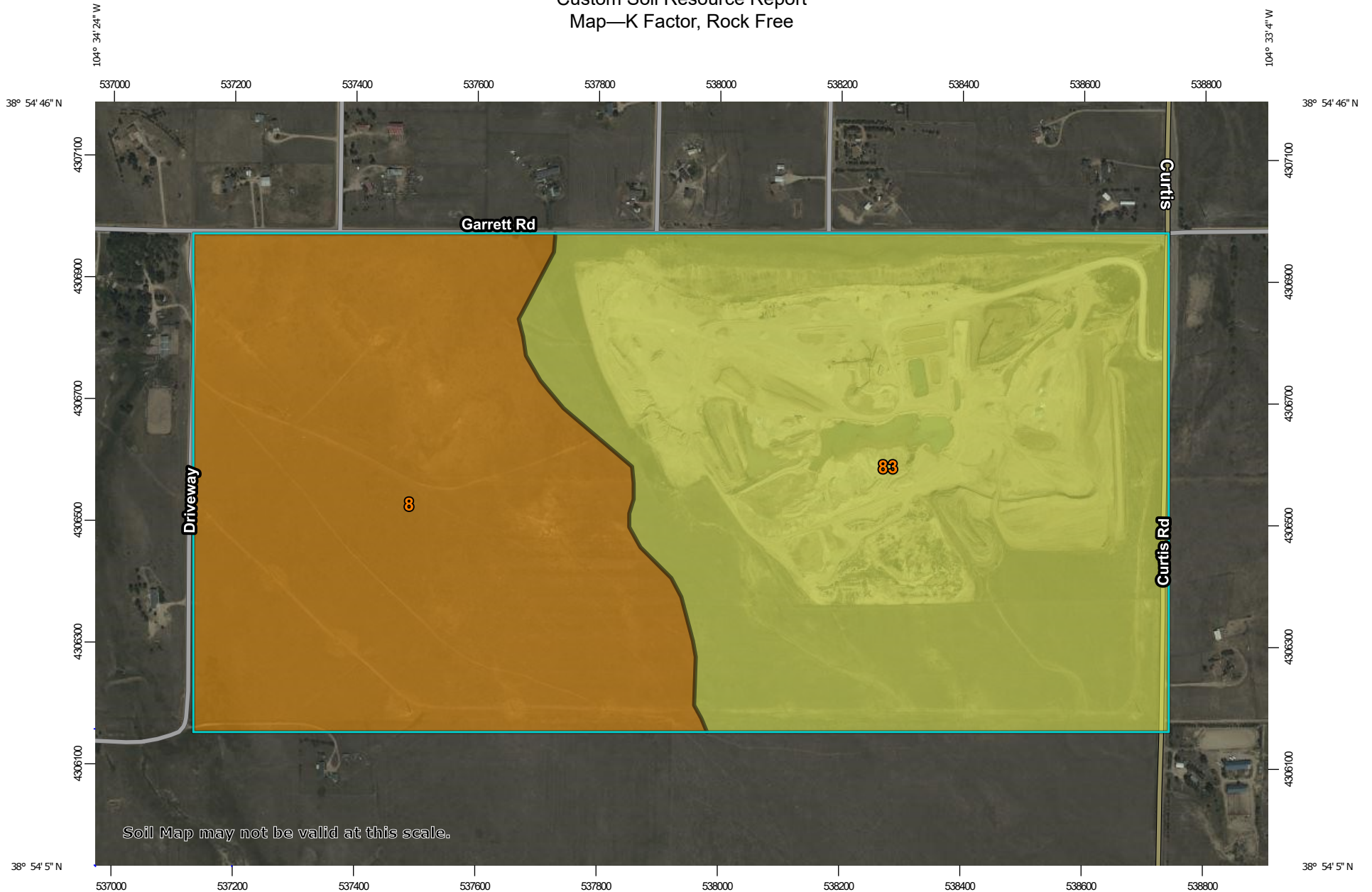
### **K Factor, Rock Free**

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

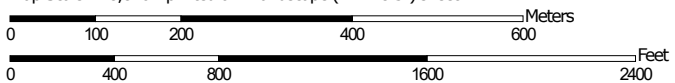
"Erosion factor K<sub>f</sub> (rock free)" indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Factor K does not apply to organic horizons and is not reported for those layers.

Custom Soil Resource Report  
Map—K Factor, Rock Free




Map Scale: 1:8,840 if printed on A landscape (11" x 8.5") sheet.



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 Rating Polygons**
















-  .02
-  .05
-  .10
-  .15
-  .17
-  .20
-  .24
-  .28
-  .32
-  .37
-  .43
-  .49
-  .55
-  .64
-  Not rated or not available

**Soil Rating Lines**








-  .02
-  .05
-  .10
-  .15
-  .17
-  .20

-  .24
-  .28
-  .32
-  .37
-  .43
-  .49
-  .55
-  .64
-  Not rated or not available

**Soil Rating Points**

-  .02
-  .05
-  .10
-  .15
-  .17
-  .20
-  .24
-  .28
-  .32
-  .37
-  .43
-  .49
-  .55
-  .64
-  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)

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 Survey Area Data: Version 19, Aug 31, 2021

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

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**Table—K Factor, Rock Free**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	.10	141.3	43.2%
83	Stapleton sandy loam, 3 to 8 percent slopes	.20	185.7	56.8%
<b>Totals for Area of Interest</b>			<b>327.0</b>	<b>100.0%</b>

**Rating Options—K Factor, Rock Free**

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher

*Layer Options (Horizon Aggregation Method):* Surface Layer (Not applicable)

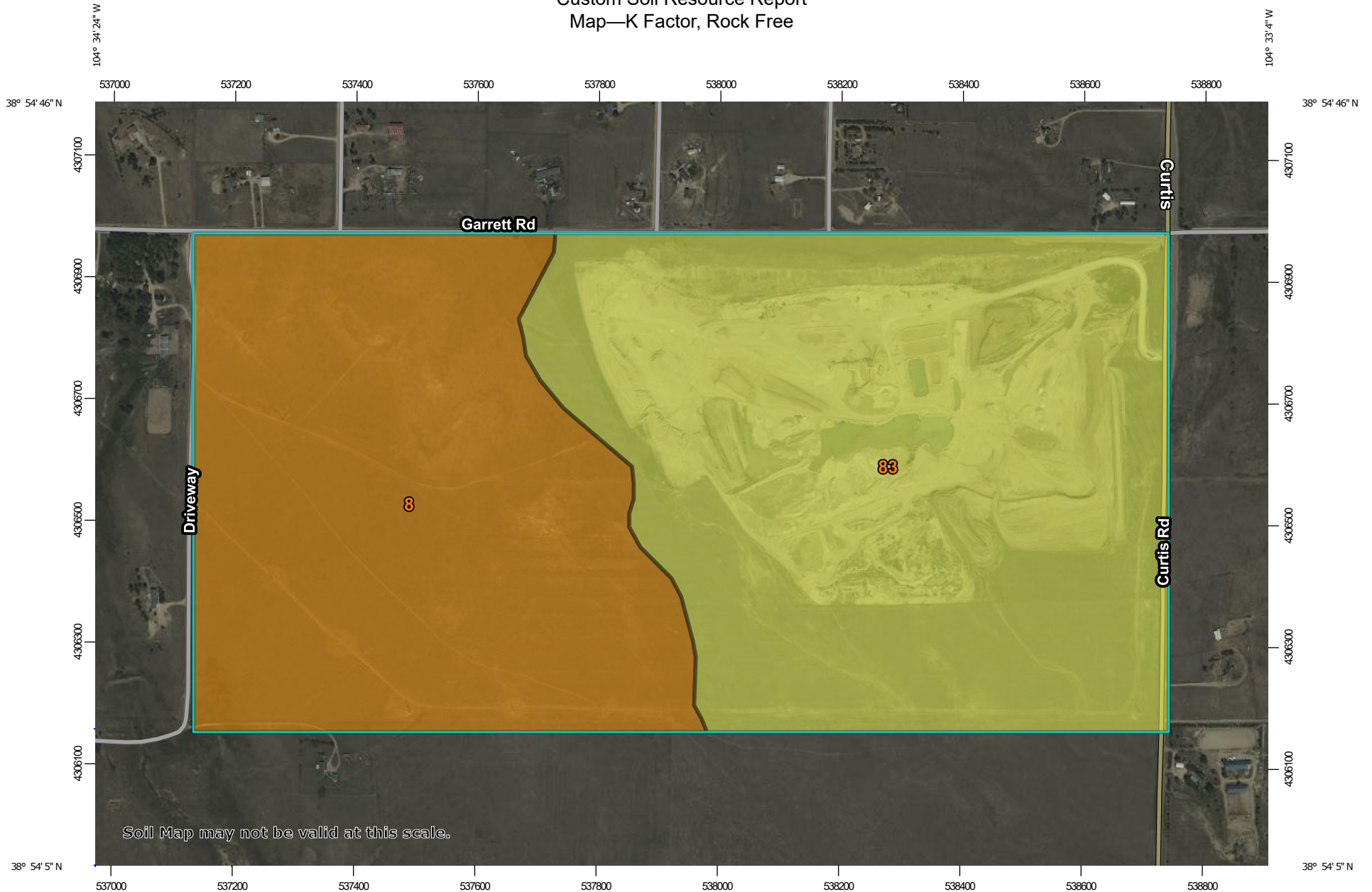
**K Factor, Rock Free**

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"Erosion factor Kf (rock free)" indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Factor K does not apply to organic horizons and is not reported for those layers.

Custom Soil Resource Report  
Map—K Factor, Rock Free



Soil Map may not be valid at this scale.

Map Scale: 1:8,840 if printed on A landscape (11" x 8.5") sheet.




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 Rating Polygons**
















-  .02
-  .05
-  .10
-  .15
-  .17
-  .20
-  .24
-  .28
-  .32
-  .37
-  .43
-  .49
-  .55
-  .64
-  Not rated or not available

**Soil Rating Lines**








-  .02
-  .05
-  .10
-  .15
-  .17
-  .20

-  .24
-  .28
-  .32
-  .37
-  .43
-  .49
-  .55
-  .64
-  Not rated or not available

**Soil Rating Points**

-  .02
-  .05
-  .10
-  .15
-  .17
-  .20
-  .24
-  .28
-  .32
-  .37
-  .43
-  .49
-  .55
-  .64
-  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.

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 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

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**Table—K Factor, Rock Free**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
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83	Stapleton sandy loam, 3 to 8 percent slopes	.20	185.7	56.8%
<b>Totals for Area of Interest</b>			<b>327.0</b>	<b>100.0%</b>

**Rating Options—K Factor, Rock Free**

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

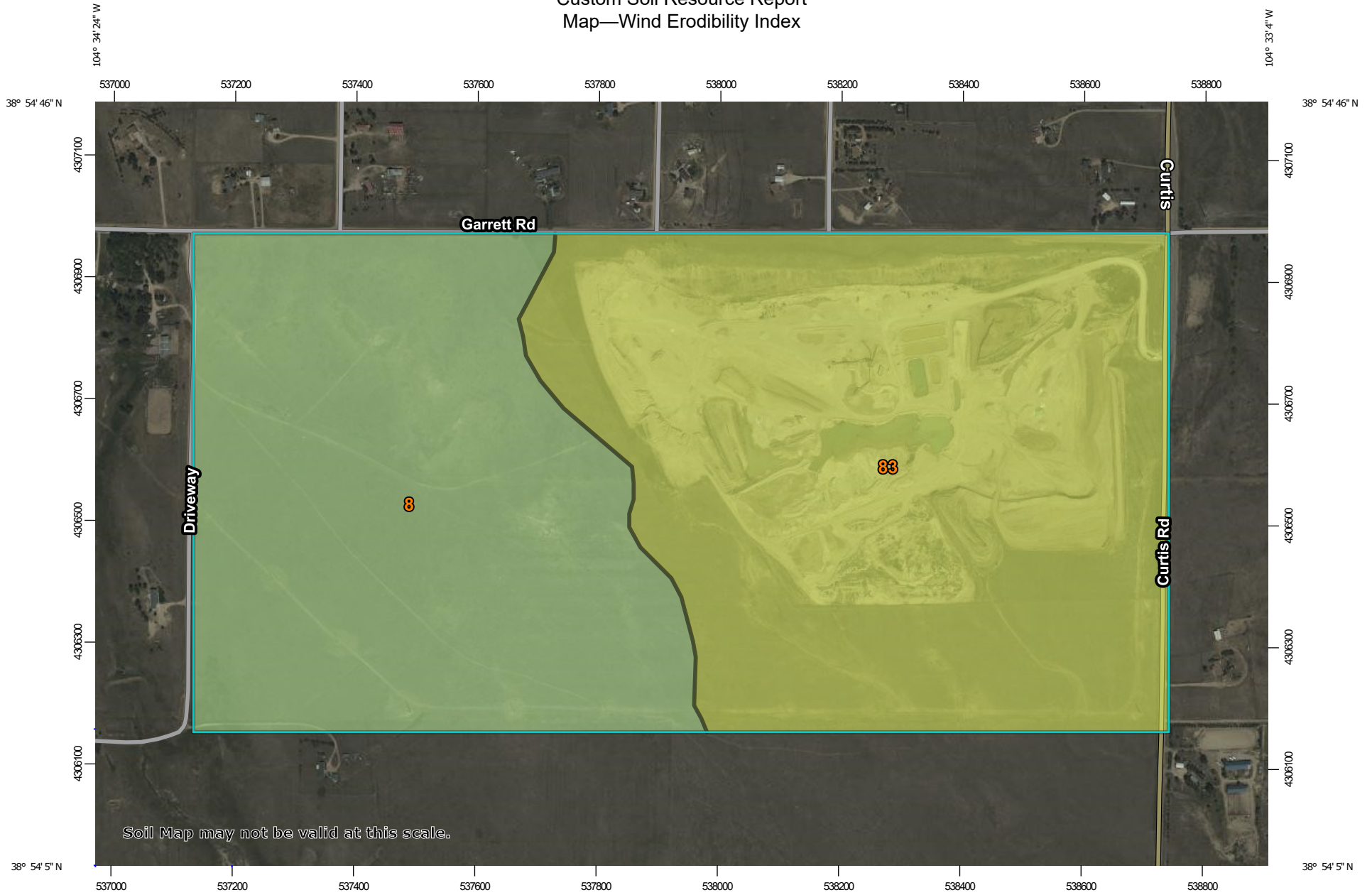
*Tie-break Rule:* Higher

*Layer Options (Horizon Aggregation Method):* Surface Layer (Not applicable)

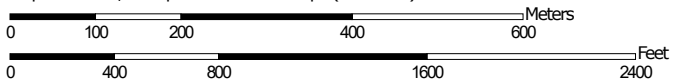
**Wind Erodibility Index**

The wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

# Custom Soil Resource Report Map—Wind Erodibility Index




Map Scale: 1:8,840 if printed on A landscape (11" x 8.5") sheet.



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 Rating Polygons**













-  0
-  38
-  48
-  56
-  86
-  134
-  160
-  180
-  220
-  250
-  310
-  Not rated or not available

**Soil Rating Lines**


-  0
-  38
-  48
-  56
-  86
-  134
-  160
-  180
-  220

-  250
-  310
-  Not rated or not available






**Soil Rating Points**

-  0
-  38
-  48
-  56
-  86
-  134
-  160
-  180
-  220
-  250
-  310
-  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.

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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)

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**Table—Wind Erodibility Index**

Map unit symbol	Map unit name	Rating (tons per acre per year)	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	134	141.3	43.2%
83	Stapleton sandy loam, 3 to 8 percent slopes	86	185.7	56.8%
<b>Totals for Area of Interest</b>			<b>327.0</b>	<b>100.0%</b>

**Rating Options—Wind Erodibility Index**

*Units of Measure:* tons per acre per year

*Aggregation Method:* Dominant Condition

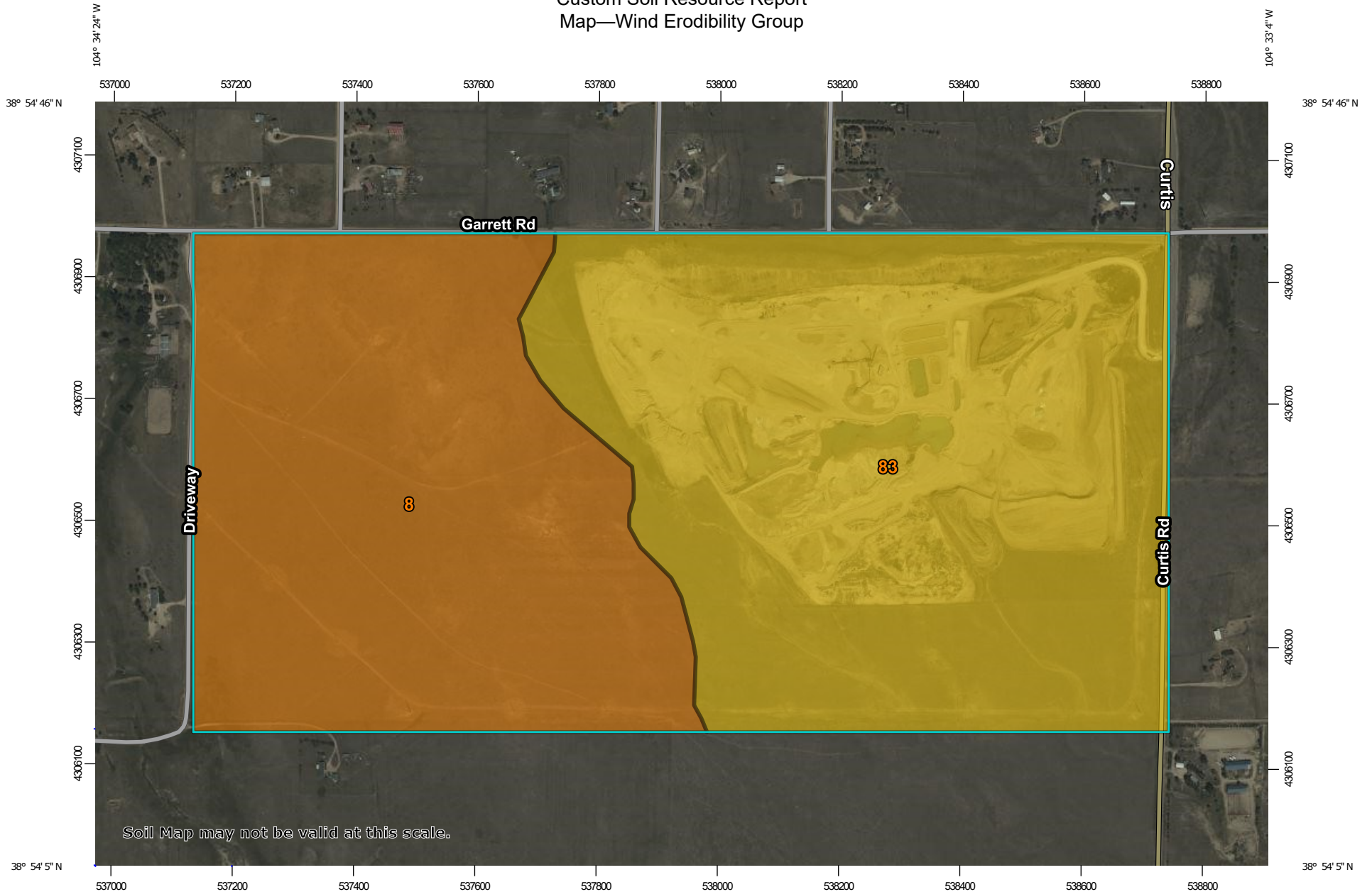
*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher

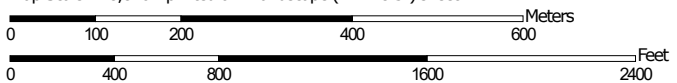
**Wind Erodibility Group**

A wind erodibility group (WEG) consists of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible.

# Custom Soil Resource Report Map—Wind Erodibility Group




Map Scale: 1:8,840 if printed on A landscape (11" x 8.5") sheet.













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 Rating Polygons**

	1
	2
	3
	4
	4L
	5
	6
	7
	8
	Not rated or not available


**Soil Rating Lines**

	1
	2
	3
	4
	4L
	5
	6
	7
	8
	Not rated or not available






**Soil Rating Points**

	1
	2
	3
	4
	4L
	5
	6
	7
	8
	Not rated or not available


**Water Features**

	Streams and Canals
---	--------------------

**Transportation**

	Rails
	Interstate Highways
	US Routes
	Major Roads
	Local Roads

**Background**

	Aerial Photography
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### MAP INFORMATION

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

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 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

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**Table—Wind Erodibility Group**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
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83	Stapleton sandy loam, 3 to 8 percent slopes	3	185.7	56.8%
<b>Totals for Area of Interest</b>			<b>327.0</b>	<b>100.0%</b>

**Rating Options—Wind Erodibility Group**

*Aggregation Method: Dominant Condition*

*Component Percent Cutoff: None Specified*

*Tie-break Rule: Lower*

# References

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- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
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- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2\\_053374](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374)
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>



## Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2\\_054242](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242)

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053624](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624)

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs142p2\\_052290.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf)

**APPENDIX D**  
**Maintenance and Inspection Reports**

## Comprehensive SWMP Inspection Report

Project: Solberg Gravel Pit  
 Company: Pioneer Sand Company Inc.  
 Address: 630 Plaza Drive Suite 150  
 Highlands Ranch, CO 80129

Permit No. COG501778  
 Weather: \_\_\_\_\_  
 Year/Quarter: 2020/1 2 3 4  
 Date/Time: \_\_\_\_\_

AREA INSPECTED	WITHIN COMPLIANCE		PROCEDURE TO BRING INTO COMPLIANCE
	Yes	No	
Vehicle Tracking Control			
Haul Routes/Travel Routes			
Active Mine Areas			
Processing Plant Area			
Product Stockpiles			
Settling Ponds			
Non-Stormwater Discharges			
Equipment Storage/Parking			
Maintenance Area			
Fuel Storage			
Other Fluids/Chemical Storage			
Reclamation Stockpiles			
Revegetated Areas			
Employee Parking Area			
Trash Receptacle (outdoor)			
Equipment Wash Area			
Perimeter Inspection			

### CERTIFICATION AND COMPLIANCE STATEMENT

In the judgment of either 1) the person conducting the site inspection, or 2) the permittee or duly authorized representative, the facility is in compliance with the terms and condition of the COG500000 Permit, with respect to Part I.J.2: O Yes O No "I certify that this report is true, accurate, and complete, to the best of my knowledge and belief."

**Inspector: Print name and title** \_\_\_\_\_

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Permittee or Duly Authorized Representative:**  
**Print name and title** \_\_\_\_\_

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**APPENDIX E**  
**Modifications to the SWMP**

