

GRADING, EROSION, AND SEDIMENT CONTROL (GESc) REPORT

Xcel Tline: Pathways Segment 5 Arapahoe County Build

**0.3 mile southwest of intersection of E Quincy Ave and S Harvest Rd
to 0.1 miles west of intersection of Co Rd 129 and County Line Rd
Arapahoe County, Colorado 80016**

**Arapahoe County Case No. LE25-003 ASI25-001
SEMSWA Case No. DPR25-00034**

Prepared for:



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March 2026

This Grading, Erosion and Sediment Control (GESC) document has been placed in the project file for this project and appears to fulfill the latest version of the Grading, Erosion and Sediment Control Manual. Additional grading, erosion and sediment Control Measures may be required of the owner or his/her agents, due to unforeseen erosion problems or if the submitted plan does not function as intended. The requirements of this GESC document shall run with the land and be the obligation of the land owner, or his/her designated representative(s) until such time as the plan is properly completed, modified or voided.

LANDOWNER CERTIFICATION STATEMENT

I hereby certify that the Grading, Erosion, and Sediment Control Measures for the Xcel Tline: Pathways Segment 5 Arapahoe County Build shall be constructed according to the design presented in this document. I understand that additional erosion control, sediment control and water quality enhancing measures may be required of the owner and his or her agents due to unforeseen pollutant discharges or if the submitted plan does not function as intended. The requirements of the plan shall be the obligation of the land owner and/or his successors or heirs; until such time as the plan is properly completed, modified or voided.

Owner or Authorized Agent

Chad Campbell

Authorized Signature



PROFESSIONAL ENGINEERING CERTIFICATION STATEMENT

I hereby attest that this Grading, Erosion, and Sediment Control (GESC) Document for the Xcel Tline: Pathways Segment 5 Arapahoe County Build has been prepared by me or under my direct supervision, and to the best of my knowledge and ability has been prepared in accordance with the latest version of the GESC Manual. The signature and stamp affixed hereon certifies that this GESC document was prepared in accordance with the required regulations and criteria; however, the stamp and signature does not certify or guarantee future performance of the execution of the plan by the contractor. The contractor is responsible for executing the construction work according to the information set forth in the plan and in accordance with all applicable requirements.

Registered Professional Engineer

Brian Brown

State of Colorado No.

41644



03/04/2026

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Tab 1

Introduction
Site Description

INTRODUCTION

This is a Grading, Erosion, and Sediment Control (GESC) Plan for the Xcel Tline: Pathways Segment 5 Arapahoe County Build Project being conducted by Public Service Company of Colorado (PSCo), a Colorado corporation and an Xcel Energy Company. This document has been developed as defined in the Colorado Discharge Permit System (CDPS) *General Permit for Stormwater Discharges Associated with Construction Activity* (Permit No. COR400000, effective April 1, 2019, modification effective February 1, 2021) authorizing stormwater discharges from construction activities that result in a total land disturbance of one acre or greater or if a project is less than an acre but part of a larger common plan of development. This GESC was developed to meet Arapahoe County (the County) requirements.

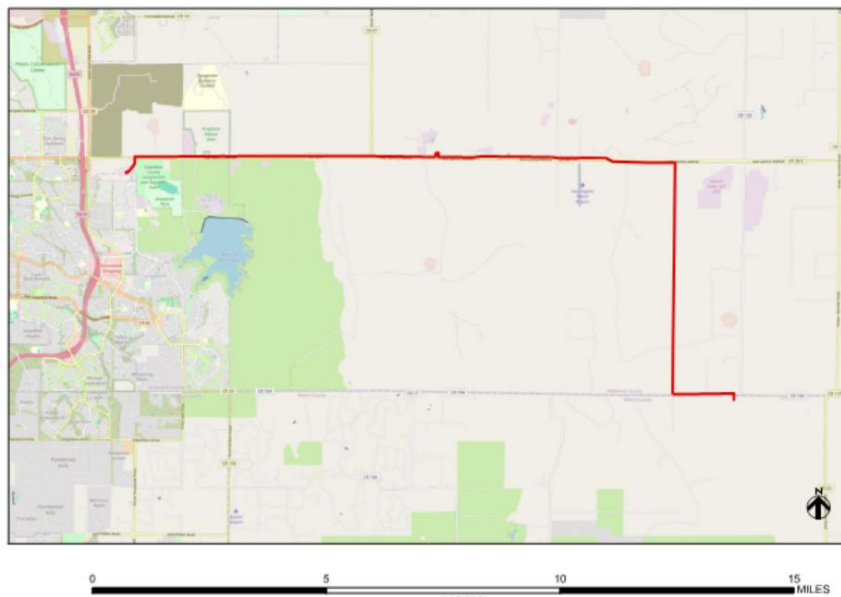
This GESC was prepared in accordance with good engineering, hydrologic and pollution control practices. Changes or additions may be required to address changes in conditions at the project. If such changes are made, this GESC will be updated accordingly, and revisions documented in the GESC. If significant changes become necessary, such as an increase in disturbance area or location of work, the GESC will be amended, and the County will review the proposed modifications.

SITE DESCRIPTION (§I.C.2.a.vii)

a) Nature of the Construction Activity at the Site:

This GESC covers linear construction activities associated with the installation of approximately 18 linear miles of a new double-circuit 345kV electric transmission line. This GESC covers one segment of the line that spans from the Harvest Mile Substation in Arapahoe County to the proposed Sandstone Substation in Pueblo County. This transmission line build is a part of the larger Xcel Pathways project.

The build begins at the Harvest Mile Substation, located 0.32 mile southeast of the intersection of E Quincy Avenue and S Harvest Road, and ends at structure 593, located near the intersection of County Road 129 and County Line Road. The approximate center of the Project is located at 39°38'16.74"N, 104°33'33.26"W. A vicinity map of the Project is provided below:



The build will include the installation of 110 structures. Foundation diameters will range from 5.5 feet to 10.5 feet, depending on the geotechnical conditions and the structural loading. Access and haul routes will be from existing county roads, dirt packed roads, drive and crush access within the right-of-way, and improved access within the right-of-way. Additional improvements and grading will include excavation around the structure locations, minimal access grading, crane pad grading, and pull pad grading. All earthwork will be balanced on site, and there is no planned export or import of materials.

Materials will be stored at a temporary staging area (staging yard) located off of Quincy Avenue and South County Road 129, approximately 1.1 miles east from proposed structure 630. This yard is permitted separately from the Project.

After construction, disturbed areas will be stabilized with seed and mulch. Other allowed/permitted arrangements will be made given the use of the area and return to agricultural use. The erosion control contractor will maintain and inspect control measures until all areas are stabilized; in some cases, this may require multiple growing seasons to re-establish vegetation. Once areas are stabilized, the erosion control contractor will remove all temporary, non-biodegradable control measures in preparation for permit closeout by PSCo.

b) The Proposed Sequence for Major Activities:

Estimated Project Start Date:	February 2026
Estimated End of Construction Date:	December 2026
Estimated Final Stabilization Date:	May 2028

The following subsection describes the phasing/sequencing of the project as well as the control measures selected for each phase. Specific locations of the control measures are indicated on the Site Maps, provided in Tab 2. Installation, implementation, and maintenance specifications for each control are included in Tab 6 or are shown on the Site Maps. Tab 4 describes the potential pollutants for the project for which these controls were selected, and Tab 5 provides descriptions of the control measures.

Minimize Disturbed Area and Protect Natural Features:

The project will be phased to the extent practical to limit the amount of disturbed area that is exposed at any given time. Control measure phasing is critical to stormwater management. Control measure implementation will be coordinated with the various stages of construction. Controls that manage erosion and sediment transport from initial site activities will be installed prior to earth-disturbing activities. As work progresses and additional areas are disturbed, controls targeted for erosion and sediment transport will be implemented prior to the start of earth-disturbing activities in those areas. As portions of the site are completed and previously disturbed areas are stabilized or the control measure(s) are no longer needed, they will be removed. The actual schedule for installation of each of these phases is documented by the installation and removal dates for associated control measures on the Site Maps.

Permanent or temporary soil erosion control measures for all disturbed land area and soil stockpiles, will be implemented as soon as practicable after the final earth disturbance has been completed. When it is not possible to permanently stabilize a disturbed area after an earth disturbance has been completed or where significant earth disturbance activity ceases for more than 14 days, temporary erosion control measures will be implemented as soon as practicable, and no more than 14 days after construction activity has temporarily or permanently ceased.

Project Phase	Controls to be Implemented During Each Phase
Pre-Disturbance/Site Preparation	• Develop GESC based on site visit and anticipated disturbances. • Establish disturbance areas with perimeter controls (as needed), spoil pile areas, and vehicle tracking control (VTC). Determine haul routes/areas that will undergo repeated disturbance. • Limit access to areas that are not to be disturbed and protect existing vegetation.
Construction	• Unless infeasible, strip and segregate topsoil (where present) for use in final restoration efforts. • Mobilize control measures to work area. • Excavate pole holes, locate stockpiles in areas with perimeter control or install down-gradient protection. • Install new poles. Utilize concrete washout as required for concrete foundations if it becomes applicable. • Pile excess spoils in a conical manner around the base of pole to allow for settling over time and to ensure water sheds from the pole outward. • Install conductor wire/move conductor wire from existing poles to new poles. Tension line. • Monitor pulling sites for disturbances and install CMs as necessary. CMs not likely required at pull sites given limited use. • Protect and repair CMs as necessary. • Perform street sweeping as needed.
Interim Stabilization	• Leave disturbed areas in surface roughened condition once work in an area is complete. Surface roughen, or otherwise stabilize, within 14 days of area becoming inactive. • Remove temporary control measures where appropriate. • Replace topsoil layer, if revegetation is the final form of stabilization, prior to implementing final stabilization.
Final Stabilization	• Perform seeding and mulching per seed mix and application rates defined in Tab 14 of this report. • Monitor regrowth of vegetation, irrigate and re-seed if necessary. • If area is to be returned to landowner for agricultural management, surface roughen. • Remove all non-biodegradable temporary controls once required vegetative cover is reached. • Close permits as applicable.

c) Disturbed Area:

1. Total area of construction site: 326 AC
2. Total area of disturbance: 66 AC

d) Existing Soil Data:

The United States Department of Agriculture Natural Resources Conservation Services (NRCS) Web Soil Survey provides information for soil types and properties for the site. Due to the long linear nature of this site, soil properties vary. See Tab 14 for the Web Soil Survey results for a wholistic review of soil characteristics and properties.

Hydrologic properties, wind erodibility, and sheet/rill erosion potential are discussed below. Control measures were prescribed based on information made available by the NRCS.

Hydrologic soil groups describe runoff potential and infiltration properties of soils and range from A to D. Group A soils have high infiltration rates and low runoff potential. Group D soils have slow infiltration and high runoff potential.

A K factor rates the susceptibility of soils to sheet and rill erosion by water. K factors range from 0.02 to 0.69; with all other factors equal, higher K values indicate higher susceptibility to sheet and rill erosion. Wind erodibility ratings range from 1 to 8, with 1 being the most susceptible to wind erosion.

Transmission Line

Primary soils include Renohill-Little-Thedalund complex, Renohill-Buick loams, and Fondis silt loam. The NRCS primarily categorizes on-site soils with either C or D hydrologic soil group, indicating a slower infiltration rate and higher runoff potential. Soils in the project area K factor values primarily categorized as 0.32 or 0.37; indicating a moderate to low susceptibility to sheet rill and erosion. Most soils within the limits of construction range from 3 to 6, indicating a moderate to low susceptibility to wind erosion.

e) Existing Vegetation:

Vegetated areas along the project composed of sporadic vegetative cover primarily consisting of native grasses and shrubs. Due to the linear nature of the site, the project areas have various levels of disturbance. Vegetation density observed during site visits ranged from 0 – 100% and was determined on a site assessment conducted in October 2023.

Due to the site's current and ongoing development and agricultural use, pre-construction vegetative cover may not accurately reflect pre-disturbance vegetation densities. Therefore, vegetative coverage required for final stabilization should be based on the highest densities per area observed at the site. Revegetation of disturbed areas on crop land may be modified based on landowner/operator wishes. The remainder of the areas will be revegetated based on native background vegetation densities.

Pre-construction photos of the project area are documented in Tab 11.

HDR did observe wetland areas during the site visit and wetlands within the project area were identified by Tetra Tech. These wetlands are identified in the Site Maps in Tab 2. Construction will work to minimize impacts to wetlands by avoiding the areas or using control measures when avoidance is not feasible. See Site Maps in Tab 2 for associated control measures.

f) Allowable Non-Stormwater Discharges (Also Discussed in §I.A.1.b):

Except as provided in the paragraphs below, all discharges that occur during the life of this project will be composed entirely of stormwater associated with construction activity.

The Colorado Discharge Permit System (CDPS) General Permit allows the following non-stormwater discharges in combination with stormwater discharges associated with construction sites, provided that the non-stormwater component of the discharge is identified in the GESC and if they have appropriate controls measures in accordance with §I.B.1 of the CDPS General Permit:

- Discharges from uncontaminated natural springs that do not originate from an area of land disturbance.
- Discharges to the ground of concrete washout water associated with the washing of concrete tools and concrete mixer chutes are allowed under this GESC, provided that: the washout water is confined in a concrete washout area and does not leave the site as surface runoff or reach receiving waters, and does not contaminate groundwater. Controls for concrete washout water from washing tools and chutes if applicable to the project are illustrated in Site Maps (Tab 2). Concrete on-site waste disposal is not authorized by this permit except in accordance with Part I.B.1.a.ii(b) of COR4000000. See Tab 7, Section d for additional information on concrete washout requirements.
- Emergency fire-fighting discharges that occur during the active emergency response.
- Discharges of landscape irrigation return flow.
- Discharges from diversions of state waters within the permitted site.

Low Risk Discharges may be authorized under the Water Quality Control Division's Low Risk Guidance Document which requires that these discharges are applied to land and that the following conditions are met:

- The water source must be uncontaminated groundwater or groundwater mixed with stormwater, no chemicals may be added, and there can't be a visible sheen.
- The groundwater cannot leave the operational control of the site and the landowner must give permission to allow dewatering.
- The discharge **cannot** enter waters of the State or other water conveyance systems.
- Control measures must be used to prevent erosion, ponding, or runoff.

Discharges of material other than stormwater must either be addressed in a separate Colorado Discharge Permit System (CDPS) permit issued for that discharge or by the Water Quality Control Division's Low Risk Discharge Guidance document. If there are any additional permits associated with this project, a copy is retained in Tab 12.

g) Receiving Waters:

1. *Names of immediate receiving water(s) on site and the ultimate receiving water. If the stormwater discharge is to a municipal separate storm sewer system, provide the name of the entity owning that system:*

The nearest receiving waterbodies are the following: Murphy Creek, Senac Creek Tributary, the Senac Creek, Black Shack Creek West Tributary, the Black Shack Creek, the Coal Creek, Box Elder Creek, Tributary to the South Platte River, and multiple Tributaries to the Kiowa Creek. The ultimate receiving waterbodies are the South Platte River.

2. *Is a receiving water within the limits of construction?*

Yes, there are multiple immediate receiving waterbodies within the limits of construction. a 50-ft pre-existing vegetation buffer will be maintained in areas where feasible. Additional CMs such as SCL will also be used to prevent pollutants from entering waterbodies.

Describe the existing drainage patterns found at the site. If construction activities will permanently alter the existing drainage patterns, describe the new drainage patterns that will exist upon completion of construction.

Onsite drainage varies throughout the site; however, the project will not alter the drainage patterns onsite.

3. *Is the immediate receiving water (classified stream segment or ultimate receiving water) listed as impaired? If yes, does it have an approved TMDL?*

The following immediate receiving waterbodies are listed as impaired:

- Murphy Creek – 303(d) listed for E. coli (May–October) and dissolved selenium.
- Senac Creek – 303(d) listed for E. coli (May–October) and dissolved selenium.
- Black Shack Creek – 303(d) listed for E. coli (May–October) and dissolved selenium.
- Coal Creek – 303(d) listed for E. coli (May–October) and dissolved selenium.
- Box Elder Creek – 303(d) listed for dissolved cadmium and M&E listed for dissolved oxygen.
- All mapped tributaries to the Kiowa Creek – 303(d) listed for dissolved oxygen and macroinvertebrates.

The following immediate receiving waterbodies are not listed as impaired:

- Senac Creek Tributary
- Black Shack Creek West Tributary
- Tributary to the South Platte River

The waterbodies do not have an approved TMDL.

4. *Is the immediate receiving water (classified stream segment or ultimate receiving water) listed as an Outstanding Water (website <https://www.colorado.gov/pacific/cdphe/clean-water-gis-maps>) ?*

No

5. *Does the receiving water have any known additional monitoring or sampling requirements?*

No

h) Stream Crossings:

1. *Are there any stream crossings located within the limits of construction?*

The Murphy Creek, Black Shack Creek West Tributary, Black Shack Creek, the Senac Creek, the Coal Creek, Box Elder Creek, and Tributaries to the Kiowa Creek are located within the limits of construction.

Tab 2

Site Map

SITE MAP (§I.C.2.a.viii)

The GESD will include a legible site map(s), showing the entire site, identifying:

- a) Construction site boundaries,
- b) Flow arrows that depict stormwater flow directions on-site and runoff direction,
- c) All areas of ground disturbance including areas of borrow and fill,
- d) Areas used for storage of soil,
- e) Locations of all waste accumulation areas, including areas for liquid, concrete, masonry, and asphalt,
- f) Locations of dedicated asphalt, concrete batch plants and masonry mixing stations,
- g) Locations of all structural control measures,
- h) Locations of all non-structural control measures, as applicable,
- i) Locations of springs, streams, wetlands and other state waters including areas that require pre-existing vegetation be maintained within 50 feet of a receiving water, where determined feasible in accordance with Part I.B.1.a.i.(d), and
- j) Locations of all stream crossings located within the construction boundary.

Many of these items will be illustrated on the Site Map prior to starting construction; however, other items such as stockpile locations, waste locations, parking and staging may be added or modified during construction. Any modifications associated with control measures will also be redlined in the field. Site maps are intended to be living documents modified in the field as needed.

Tab 3

Contact Information and Qualified GESC Manager

QUALIFIED GESC MANAGER (§I.C.2.a.i)

The PSCo Qualified GESC Manager is responsible for overseeing and working with the PSCo Construction Project Manager/Construction Supervisor assigning PSCo personnel, consultants, and/or contractors to aid in the development, implementation, maintenance, and revisions to the GESC. PSCo's Qualified Stormwater Manager, who oversees stormwater compliance for the company, works with the PSCo Construction Program Manager/Construction Supervisor to designate a site-specific Qualified Stormwater Manager for each project who is responsible for day-to-day GESC compliance at the site and is often the GESC inspector. Additional team members include: the GESC Designer and Control Measure Installer all of whom are qualified stormwater professionals.

CONTACT INFORMATION

PSCo is typically the Project Owner and Operator. PSCo may also have construction contractor(s) and/or subcontractors; however, PSCo is in charge of overseeing and directing work related to GESC compliance. Contractors and subcontractors are also given trainings by PSCo Environmental Services on GESC compliance even though third-party specialist are typically hired to perform inspections and install control measures. Contact information for Qualified GESC Managers and other responsible parties are provided below.

PSCo Environmental Services (Qualified GESC Manager):

Name: Tensy Thatcher
Title: Environmental Analyst
Address: 3500 Blake Street, Floor 3
Denver, CO 80205
Phone: 970-903-0595
Email: Tensy.C.Thatcher@xcelenergy.com

Project Manager(s)/Construction Supervisor (Part of the GESC Management Team):

Name: Sascha Archie
Title: Project Manager
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Denver, CO 80205
Phone: 718-869-4118
Email: Sascha.w.archie@xcelenergy.com

GESC and Erosion and Sediment Control Plan (ESC) Prepared by (Part of GESC Manager Team):

Name: Brian Brown
Company: HDR Engineering, Inc.
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Denver, CO 80202
Phone: (970) 416-4404
Email: brian.brown@hdrinc.com

Project Construction Contact:

Name: Stephan Grenier, Construction Manager
Company: Public Service Company of Colorado (PSCo)
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Phone: 812-746-7011
Email: stephan.grenier@xcelenergy.com

GESC Inspector (Site-Specific Qualified GESC Manager):

Name: TBD
Company: CMS Environmental Solutions
Address: 5231 S. Quebec St, Greenwood Village, CO 80111
Phone: TBD
Email: TBD

Control Measure Implementation (Part of the GESC Management Team):

Name: Daniel Ridenour, Environmental Supervisor
Company: Quanta Infrastructure Solutions Group, LLC
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Denver, CO 80265
Phone: 361-944-4062
Email: daniel.ridenour@quantaisg.com

*This document will be redlined in the field if personnel change during the course of the Project.
Add an additional page if needed.

Tab 4

Potential Sources of Pollution

IDENTIFICATION OF POTENTIAL SOURCES OF POLLUTION (§I.C.2.a.v)

The following potential sources of pollutants and activities have been evaluated for their ability to impact stormwater discharges. If the potential source exists at the site, the control measures used to manage that source are listed in this section and are illustrated in the Site Maps in Tab 2.

POTENTIAL SOURCE OF POLLUTANT	POTENTIAL WITH THIS PROJECT? YES NO		ACTIVITIES ASSOCIATED WITH THIS POLLUTION SOURCE AND CONTROL MEASURES SELECTED TO CONTROL THE SOURCE
<i>All disturbed and stored soils:</i> <i>Stockpiled soils (i.e., topsoil, embankments, spoils, etc.)</i> <i>Disturbed soils (exposed areas, staging areas, parking, etc.)</i>	Y		Activities associated with this pollution source are the earth-disturbing activities during all phases of construction activities, including but not limited to excavating, grading, backfilling, landscaping, etc. <u>Control Measures:</u> Sediment control and stockpile containment may include usage of sediment control logs, sweeping, vehicle tracking control (VTC), and other proprietary control measures (i.e., Big Red Bag, Dandy Recyclers, etc.). Erosion control may include surface roughening, mulch/mulch tackifier application, seeding and mulching. Additionally, temporary stabilization will be implemented for earth-disturbing activities that have permanently or temporarily ceased for more than 14 calendar days. Temporary stabilization methods may include, but are not limited to, tarps, soil tackifier, and hydroseed or mulch and/or surface roughening. Administrative controls may include phased construction to reduce the amount of open area at any given time and limiting the number of stockpiles.
<i>Vehicle tracking of sediment:</i>	Y		The activity associated with this pollution source is the movement of vehicles from disturbed areas to paved streets during all phases of construction activities. <u>Control Measures:</u> Sediment control may include VTCs (rock, geotextiles, mud mats, and/or other proprietary products) and street sweeping. If necessary, use construction fencing to limit entry and exit points and establish perimeter control. Access may also be limited during muddy conditions if feasible with the construction activities and schedule.
<i>Management of contaminated soils</i>		N	No known contaminated soils exist on site. If contaminated soils are encountered, all activity will be stopped until the situation can be assessed. The Project Manager will be contacted for further direction. See Contaminated Soil Process Fact Sheet at the end of Tab 7.
<i>Loading and unloading operations</i>	Y		Activities associated with this pollution source are potential spills during delivery and unloading of materials within the transmission line easement during all phases of construction activity.

POTENTIAL SOURCE OF POLLUTANT	POTENTIAL WITH THIS PROJECT? YES NO	ACTIVITIES ASSOCIATED WITH THIS POLLUTION SOURCE AND CONTROL MEASURES SELECTED TO CONTROL THE SOURCE
		<u>Control Measures:</u> Loading and unloading operations should occur within the disturbance limits and should be limited to designated material storage and staging areas wherever feasible. Administrative controls may include materials management practices, good housekeeping practices, personnel training, providing spill kits where needed, and minimizing the number of areas where loading and unloading occur. The Project Manager will be contacted immediately for all spills.
<i>Outdoor storage activities (including erodible building materials, fertilizers, chemicals, etc.)</i>	Y	Activities associated with this pollution source are storage of material in the transmission line easement and the potential for spills and leaks from these materials. <u>Control Measures:</u> Containment of the storage may include installation of silt fence, sediment control logs, temporary berms, etc. Storage of petroleum products or other liquid chemicals in quantities of 55 gallons or more must have secondary containment, or equivalent protection. This potential pollutant source along with several others (vehicle and equipment maintenance and fueling, sanitary waste and other waste handling) constitute the materials handling procedures and controls for the project which are detailed in Tab 7. Administrative controls may include materials management practices (such as covering chemicals and materials to prevent contact with stormwater where practicable, storing materials in proper containers with appropriate labeling, and only keeping limited supplies onsite), personnel training, and providing spill kits where needed. The Project Manager will be contacted immediately for all spills.
<i>Vehicle and equipment maintenance and fueling</i>	Y	Potential pollution sources include fuels, oils, antifreeze, and other liquids associated with equipment performance. Fueling of equipment or vehicles and equipment repair may occur during all phases of construction activity. This project anticipates using mobile 5-gallon fuel tanks to refuel equipment and having fueling offsite at the designated staging area. <u>Control Measures:</u> Limit areas where fueling and equipment maintenance activities occur at the site. Spill kits should be staged where fueling is conducted. Use plastic sheeting, drip pans, dirt berms and other measures to contain fluids. Clean up and dispose of spilled material immediately. Do not store 5-gallon fuel tanks within the right-of-way when feasible. Administrative controls may include materials management practices, personnel training, and providing spill kits in vehicle maintenance areas. The Project Manager will be contacted immediately for all spills.

POTENTIAL SOURCE OF POLLUTANT	POTENTIAL WITH THIS PROJECT?	YES	NO	ACTIVITIES ASSOCIATED WITH THIS POLLUTION SOURCE AND CONTROL MEASURES SELECTED TO CONTROL THE SOURCE
<i>Significant dust or particulate generating processes (e.g., saw cutting material, including dust)</i>	Y			Activities associated with this pollution source are the earth-disturbing activities during all phases of construction activities, including but not limited to excavating, grading, backfilling, etc. There is also the potential for wind to transport dust from disturbed areas including access roads. <u>Control Measures:</u> Limit earth-disturbing activities to the extent feasible. Water disturbed areas and roads as needed during construction, use palliatives to control dust, install interim stabilization measures such as surface roughening, final stabilization, and other effective means.
<i>Routine maintenance activities involving fertilizers, pesticides, detergents, fuels, solvents, oils, etc.</i>	Y			Activities associated with this pollution source are limited due to the short-term nature of utility installation activities. Fueling and maintenance activities involving vehicles and equipment and the potential for use of fuels, oils, solvents, etc., are discussed above. Seeding operations typically occur during the final phase of the project and may involve use of fertilizers and tackifiers, as needed. Fertilizers are typically brought to the site by a seeding contractor during seeding operations and any remaining material is removed from the site by the contractor. Pesticides are not planned to be used at this site. <u>Control Measures:</u> Liquids should be stored in secondary containment. Administrative controls may include materials management practices (such as covering chemicals and materials to prevent contact with stormwater where practicable, storing materials in proper containers with appropriate labeling, and only keeping limited supplies onsite), personnel training in proper use, and storage of materials.
<i>On-site waste management practices (waste piles, liquid wastes, dumpsters, etc.)</i>	Y			Activities associated with this pollution source are generation of waste materials during all phases of construction activities, such as debris and waste concrete. <u>Control Measures:</u> Designated waste receptacles will be utilized. A concrete washout area will be used to manage concrete washout waste (see next pollutant source in this table).
<i>Concrete truck/equipment washing, including the concrete truck chute and associated fixtures and equipment</i>	Y			Activities associated with this pollution source are concrete pours that include but are not limited to pouring transmission pole foundations. <u>Control Measures:</u> Dedicated concrete washout areas that are clearly marked and maintained. Where applicable, urban mobile concrete washout structures may be used.
<i>Dedicated asphalt, concrete batch plants and masonry mixing stations</i>			N	No dedicated asphalt, concrete batch plants, or masonry mixing stations are planned for this site.
<i>Non-industrial waste</i>				Activities associated with this potential pollutant source

POTENTIAL SOURCE OF POLLUTANT	POTENTIAL WITH THIS PROJECT? YES NO	ACTIVITIES ASSOCIATED WITH THIS POLLUTION SOURCE AND CONTROL MEASURES SELECTED TO CONTROL THE SOURCE
<i>sources worker trash and portable toilets</i>	Y	include the generation of non-industrial waste such as discarded building materials, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality. <u>Control Measures:</u> Good housekeeping practices will be implemented, and trash will be collected in vehicles and disposed of offsite or in waste containers. If applicable, portable toilets should be properly anchored down and located away from the storm sewer system or waterways.
<i>Other areas or procedures where potential spills can occur</i>	Y	Damaged or broken controls measures can act as a pollutant source. Control measures are inspected and if any are damaged, they are noted as such and repaired or removed. If any materials from the controls have been released, they are properly cleaned up and disposed of.

Tab 5

Effluent Limitations – Control Measures for Stormwater Pollution
Prevention

CONTROL MEASURES USED TO MEET EFFLUENT LIMITATIONS (§I.B.1.a.i and §I.C.2.a.v)

a) Structural Control Measures:

Structural control measures are those physical structures implemented at the site to minimize erosion and sediment transport. Most structural control measures tend to be sediment controls. The structural control measures that are planned to be used for the project are described below. Specific locations for control measures implemented at the site are indicated on the Site Maps, provided in Tab 2. Installation and maintenance details for these control measures are in Tab 6 or are provided with the Site Maps.

Stormwater runoff from all disturbed areas and soil storage areas for which permanent or temporary stabilization is not implemented, will flow to at least one control measure to minimize sediment in the discharge. This may be accomplished through filtering, settling, or staining. The control must contain or filter flows in order to prevent the bypass of flows without treatment and must be appropriate for stormwater runoff from disturbed areas and for expected flow rate, duration, and flow conditions.

One goal of a GESG is to allow for field fitting of control measures based on site-specific conditions that may favor use of one control measure over another. Each structural control measure listed below contains a brief list of other control measures that may be substituted, based on site specific conditions.

Perimeter Control:

Perimeter controls serve as erosion and sediment controls and, when appropriate, access control. At downgradient locations, perimeter controls will be installed where overland sheet flow has the potential to leave the site. In upgradient areas perimeter control may be added to define project boundaries, limit on-site flows or protect off-site features. Such controls should be suitable to the application. Perimeter control may consist of any number of control measures, including, but not limited to earthen berms, sediment control logs, silt fence, etc. Perimeter controls will be used around bore holes, trenches, and other locations where sediment is exposed and may accumulate. Perimeter controls will remain in place until areas upgradient of controls are stabilized. Perimeter controls will be inspected for proper installation, structural integrity and accumulated sediment. Maintenance may include repairing or replacing damaged sections and removing accumulated sediment.

Vehicle Tracking Control (VTC):

Vehicle tracking control will be implemented to minimize vehicle tracking of sediment from disturbed areas per (§I.B.1.a.i.a) and may consist of an excavated area with a geotextile liner and gravel, metal grate, asphalt/concrete “rumble strip”, or other proprietary products. VTCs are designed to cause soil to vibrate off equipment and vehicles as they transition from disturbed soils to paved areas and should drain to a control measure. The VTC will remain in place until access to the areas used by the control are no longer needed. Designated points of ingress and egress, where traffic transitions from a stabilized road surface (e.g., gravel or pavement) to disturbed soil, are likely to need vehicle tracking control or these areas must drain to a control that meets the requirements of (§I.B.1.a.i.b). VTCs may be moved or eliminated (if no longer needed) as on-site conditions and activities change. VTCs will be inspected for depth of gravel/rock, presence of excess soil, proper usage and the overall general condition. The most common maintenance items include the removal of accumulated soil and addition of gravel/rock.

In vegetated areas where access is anticipated to be minimal, turf mats or cattle guards, or proprietary products such as mud mats may be installed primarily to protect vegetation and provide a stabilized entrance. These materials will be inspected for damage and will be maintained as needed.

Sediment Control Log:

A sediment control log consists of a net or geotextile fabric filled with straw, excelsior, wood mulch, or other fillers. Sediment control log applications include, but are not limited to, slope stabilization, perimeter control, check dams in swales, back of curb protection and temporary secondary containment for

stockpiles, materials storage, or masonry. Sediment control logs reduce water velocity allowing sediment to accumulate on the upgradient side of the log. The basic installation for a net wrapped sediment control log is to prepare a shallow trench and secure the log in the trench using a stake or landscape pin. Logs should be installed based on the manufacturer's directions. Logs should be inspected for proper installation, structural integrity and sediment accumulation. A log that has been flattened out of round may not need to be replaced if they remain sufficient to function appropriately on the upgradient side of the log. Maintenance may include repairing or replacing damaged logs and removing accumulated sediment as specified by the control measure detail.

Construction Fencing/Construction Markers (CF/CMK):

Construction fencing and/or construction markers will be utilized to delineate the limits of disturbance and may consist of orange plastic fencing, rope and t-posts, spray paint, staking, or other alternative markers as appropriate to site conditions and constraints. In some cases, perimeter sediment control measures may also double as a construction marker. CF/CMK is used to delineate where disturbances are permitted and to restrict access to unpermitted areas, especially sensitive areas that are not within the limits of disturbance. CF/CMK will be installed as needed prior to mobilization to a given area on the Project and will remain in place where needed until final stabilization measures have been implemented. CF/CMK will be inspected for damage that renders the CM ineffective such as torn plastic fencing, severed ropes, or removed stakes. Maintenance may include repairing or replacing damaged or removed CF/CMK.

Additional control measures may be added as site conditions change and will be identified in the GESC prior to installation.

b) Non-Structural Control Measures:

Non-structural control measures are those practices which, when implemented, will minimize erosion and sediment or other pollutant transport. Practices implemented at this site include interim stabilization practices, permanent stabilization practices (see Tab 8), and site-specific scheduling for implementation of the practices, as well as site management practices, preventative maintenance, and personnel training. The potential non-structural control measures for the project are described below. Specific locations for control measure implementation at the site are indicated on the Site Map, provided in Tab 2. Tab 6 provides the installation details for each control measure identified.

Crimp Mulch:

Crimp mulching uses hay or straw material that is machine crimped into the soil to provide stability. Crimp mulch may be used on its own as a temporary soil stabilization method, or in conjunction with seeding for final stabilization. Crimp mulch functions as a soil stabilizer by decreasing the velocity of sheet flow. Mulch may be hay or cereal grain straw. Mulch will likely be crimped into the soil using either a drill seeder or notched disk plow to the minimum depth of two inches and a maximum depth of four inches. To maximize effectiveness crimping equipment must run parallel to the contours of the land. Crimp mulch may not be appropriate for slopes that are equal to or greater than 3:1 or in areas with hard or rocky soil in which the crimper cannot penetrate. Inspections should look for areas where mulch is missing, thin or for areas where erosion has occurred. Maintenance items may include re-grading as necessary and reapplying as appropriate.

Seed and Stabilization (Temporary and Permanent Ground Cover):

Seeding involves the mechanical or hand application of specific seed mixes appropriate for the site location and soil type. Seeding provides plant growth to stabilize the soil reducing the likelihood of erosion or sediment transport. As soon as practical, after the completion of construction activities, soil should be properly prepared and seeded. The choice of seed mix will dictate application rates and methods. Seeding should always be accompanied by an additional control measure, such as mulching or tackifying, to protect the seed and soil from erosion during the germination and growth process. Seed areas will be inspected to ensure that the soil stabilization method (e.g., surface roughening, crimp mulch, etc.) was applied correctly and has not been compromised. The area will also be inspected for erosion and/or

sediment deposition. Maintenance items may include re-grading and seeding bare or areas of thin vegetative growth and/or adding additional control measures as appropriate. If seeding cannot be accomplished due to seasonal or other constraints, temporary stabilization, such as mulch and mulch tackifier will be used. Additional discussion concerning temporary stabilization may be found in Section c in this Tab.

Street Sweeping:

Soils deposited on paved surfaces will be swept or cleaned as needed to reduce the potential of sediment transport and tracking. Sweeping operations consist of scraping large quantities of sediment from pavement and/or sweeping, via hand or mechanical means to remove as much deposited sediment as possible. All streets within and immediately surrounding a construction site will be cleaned of earth material when sediment has been deposited on the roadway and is being tracked off site. Scraped or swept material will not be deposited in the storm sewer. Sweeping and vacuuming may not be effective when soil is wet or muddy.

Surface Roughening:

Surface roughening consists of grooves or tracks installed in the soil surface, along the contours (not up and down the slope which promotes erosion). This is a temporary soil stabilization technique that works well in areas that will remain inactive for a short time. Surface roughening works by reducing water velocity and promoting infiltration, thus decreasing the potential for erosion to occur. Any disturbed areas with no construction activity planned for longer than 14 days may be surface roughened. This may include areas where scheduling prevents the immediate implementation of final stabilization practices, the sides of stockpiles or other slopes. Surface roughening may be applied by creating a continuous furrow along the contours. This can be done with the teeth on a loader bucket, ripping, disking or plowing equipment. Surface roughening can also be created by running tracked equipment up and down the slope creating track marks along the contour. Inspection of surface roughened areas would include proper implementation, structural integrity and areas of erosion or sediment accumulation. Maintenance for surface roughening may include re-applying the technique or installation of new or additional control measures.

Protection of Pre-existing Vegetation:

Protection of existing vegetation on a construction site can be accomplished through installation of a construction fence around the area requiring protection. In cases where upgradient areas are disturbed, it may also be necessary to install perimeter controls to minimize sediment loading to sensitive areas such as wetlands. Existing vegetation may be designated for protection to maintain a stable surface cover as part of construction phasing, or vegetation may be protected in areas designated to remain in natural condition under post-development conditions (e.g., wetlands, mature trees, riparian areas, open space). A 50 horizontal foot buffer of pre-existing vegetation or equivalent controls must be maintained between work areas and receiving waters unless infeasible. Maintenance may include removing sediment by hand, replacing construction fence or other plastic fencing used to limit access. If any damage were to occur to a vegetative buffer, a new or additional control measure should be considered and the GESD will be updated to document as to why the vegetation could not be left undisturbed.

Vegetation & Topography (VT):

In limited disturbance areas, not installing a control measure (CM) may be the best approach to minimize sediment transport off site. This is based on the concept that shallow overland flow may pick-up and transport sediment that is then dropped out within a vegetative buffer and installation of a downgradient physical CM is an unnecessary effort, expense, and disturbance that increases the amount of site restoration. VT as a CM was developed using a two-dimensional physically based and spatially distributed computer model with the following inputs and assumptions:

- Input – Site grade slopes. Assumption - Site grade slopes 10% or less allow shallow overland flow.
- Input - Vegetation cover density (surface roughness) represented by Mannings 'n'.
- Input - Rainfall event specific to the project site for ECM design, typically a 5-year 30-minute storm.

- Input - Hydrologic Soil Group (HSG) for the disturbance and buffer area, typically obtained from the National Resource Conservation Service Web Soil Survey, online.
- Assumption - No upgradient or disturbance area concentrated flow paths through construction site.
- Assumption – 80% sediment removal, typical of sediment reduction targets for physical CMs is acceptable.
- Assumption - No construction traffic or disturbance activity within the vegetation buffer
- Requirement - The required vegetation buffer must be in the construction project limits and controlled by PSCo via written agreement with landowner, ownership, or easement).

The inputs above (vegetation cover, slope, soil type, and rainfall) can be conservatively collapsed into a simple table showing that for a given rainfall, the four different soil types (HSG A to D) require four different minimum vegetation buffer lengths for sediment to settle out of the stormwater sheet flow. This vegetation buffer distance table is to be referenced by field crews and used in combination with the HSG data provided on the GESC drawings. The rainfall and soil data will be specific to each project.

The VT will have to be inspected to verify that sediment is not being transported beyond the buffer or project control area. In the event that the VT CM is not providing the level of sediment settling necessary, physical CMs may need to be installed or practices upgradient of the VT buffer modified. It is expected that the thin layer of sediment deposited in the VT buffer should not be removed. All control measure type modifications and movement are to be noted on the GESC Site Maps. A comprehensive design guideline, citing good engineering, hydrologic, and pollutant control practices, principles and criteria is contained in the control measures details located in Tab 2 or 6.

Wind Erosion Control:

Wind erosion and dust control may be necessary if wind is transporting soil within or off site. Wind erosion control functions to stabilize the soil surface reducing the potential for wind erosion. Wind erosion control consists of applying water and/or other dust palliatives as necessary to prevent or alleviate erosion by the forces of wind. Covering of small stockpiles or areas is an alternative to applying water or other dust palliatives. If needed, a soil tackifier can be applied to control wind erosion. Disturbed areas should be inspected for obvious signs of wind erosion and control measures implemented, if needed. Areas with wind erosion controls in place should be inspected for structural integrity and coverage, and repaired or replaced as appropriate.

Training:

Employees and the contractor will be trained on good housekeeping, the proper use and storage of materials, and site management practices. PSCo construction supervisors and project managers participate in stormwater training on the company's learning management system. Additionally, lead stormwater management supervisors have given trainings to multiple companies that work frequently for PSCo.

PSCo also requires all of its GESC developers, erosion control measure installers, and stormwater inspectors to hold either a CISEC or CPESC certification or are in training for either of these two certifications.

Site Management Practices:

Good housekeeping will be used to keep potential areas where pollutants exist clean and orderly. Containers, drums, and bags will be stored away from direct traffic routes to reduce the risk of accidental spills. Stack containers according to manufacturer's instructions to avoid damaging the containers from improper weight distribution. Containers will be stored on pallets or similar devices to prevent corrosion of containers that results from containers coming in contact with moisture on the ground. Liquids will be stored within curbed areas or secondary containment.

c) Other Specific Control Measures Used to meet Effluent Limitations (§I.B.1.a.i and ii):

Additional specific controls that must meet the following requirements:

- Soil Compaction – Soil compaction must be minimized for areas where infiltration control measures will occur or where final stabilization will be achieved through vegetative cover.
- Topsoil Preservation – Unless infeasible, topsoil will be preserved for those areas of a site that will utilize vegetative final stabilization. Topsoil preservation measures may include the following:
 - Limit construction disturbance areas, including those used for access by installing construction fence or other means to limit impacts to existing topsoil.
 - In areas of grading or excavation, strip and segregate topsoil separately from other excavated materials.
 - In areas with construction traffic where topsoil is likely to mix with subsoil, strip and stockpile topsoil.
- Minimize Disturbances – Disturbances will be minimized to the extent feasible, especially on steep slopes.
- Temporary Stabilization – Temporary stabilization must be implemented for earth-disturbing activities on any portion of the site where earth-disturbing construction activity has permanently ceased, or temporarily ceased for more than 14 calendar days. Temporary stabilization methods may include, but are not limited to, tarps, soil tackifier, and hydroseed and although not specifically outlined in the permit may also include temporary hard surfaces. The permittee may exceed the 14-day schedule when either the function of the specific area of the site requires it to remain disturbed, or, physical characteristics of the terrain and climate prevent stabilization. The GESC must document the constraints necessitating the alternative schedule, provide the alternate stabilization schedule, and identify all locations where the alternative schedule is applicable on the Site Maps.

Other controls related to final stabilization, bulk storage, materials management, and corrective actions and releases are covered in other sections of this GESC.

d) Documented Use Agreement (§I.C.2.a.vi):

All control measures planned for the PSCo project are within the project limits/construction limits. (Note: There may be nearby control measures installed for another project; however, they are not being utilized by PSCo as a control measure)

Tab 6

Control Measure Specifications and Maintenance Requirements
(See Standard Notes and Details on Sheets 12 through 15 of GESC Plans)

Tab 7

Materials Handling, Waste Management and Disposal, and Spill
Prevention and Response Plan

MATERIALS HANDLING (§I.C.2.a.iv)

Consistent with the permit requirements, all potential pollutants other than sediment will be handled and disposed of in a manner that does not cause contamination of stormwater. Non-sediment pollutants that may be present during construction activities include, but are not limited to:

- Exposed storage of building materials,
- Petroleum products including fuel, lubricants, hydraulic fluids, and form oil (this includes storage, leaks, and fueling),
- Fertilizers or chemicals,
- Trash and equipment maintenance, and
- Concrete, mortar, or similar products

If these materials are used, then the following practices will be implemented. These materials, and other materials used during construction with the potential to impact stormwater, will be stored, managed, used, and disposed of in a manner that minimizes the potential for releases to the environment and especially into the stormwater system. Several of these activities and their controls are also described in Tab 4 as potential sources of pollution.

a) Vehicle Maintenance:

Vehicles entering the construction site should be properly maintained to prevent spills or leaks of hazardous fluids that would be exposed to stormwater. Vehicles used on-site will be inspected for leaks. Leaking vehicles will not be allowed to stay on-site or will use drip pans until the leak is repaired. The vehicle operator will be responsible for any necessary clean up. Vehicles will not be parked in or near retention areas, natural drainage areas or surface waters. Drip pans will be used for secondary protection of on-site vehicles, if necessary. Maintenance and fueling areas, if needed, will be indicated on the Site Map. A spill kit will be available on site to clean up any spills or leaks.

b) Stockpiles:

Different types of earth material may need to be stockpiled on the job site during the earth moving activities. All stockpiles will have erosion and/or sediment control measures implemented around the toe of the pile or will be located within an area with perimeter controls.

c) Solid Waste:

Large amounts of solid waste are not anticipated to be generated during this project. The majority of solid waste will be collected in worker vehicles, removed from site, and properly disposed of. If larger quantities are generated than can be handled by individuals on site, then dumpsters will be provided in convenient, level locations away from traffic areas, storm drains, drainage areas, or retention areas. A licensed company will be contracted to empty the dumpsters, as needed. The site project managers will be responsible for monitoring the site to ensure that all site personnel and subcontractors use the proper waste disposal practices and facilities.

d) Concrete Washout Activities:

A concrete washout is designed to capture wastewater and waste products resulting from the cleaning of concrete and masonry equipment and is the main control measure for concrete washout waste. A concrete washout may not be necessary if all washout operations are performed off-site. If a concrete washout is needed, it will be installed or provided prior to any construction activities that include the handling of materials containing cement (e.g., concrete, masonry, etc.). Concrete washouts may include small excavations located near the point of concrete masonry placement, geotextile bags, watertight

vessels such as, small dumpsters, buckets, or a mobile disposal unit, etc. Concrete washouts require appropriate access control, tracking and containment. Signs should be placed at the washout area and elsewhere, as necessary, to clearly indicate the location of the concrete washout. If needed, the designated washout facility or facilities will be installed on site and the locations added to the Site Map. Concrete washouts are not planned for use at the Project. If concrete pouring becomes necessary, concrete washouts will be installed on site and location noted on the Site Map.

Maintenance may include the removal and proper disposal of excess material, cleaning or replacing the tracking material and general structural integrity of the installation, as needed. Concrete washouts will be cleaned of excess water and solids on a regular basis to maintain the proper function of the control measure. The hardened concrete and/or excess wash water will be hauled away by an approved contractor to a designated facility designed to receive such materials.

No concrete waste will be discharged directly onto the ground without a containment feature and the washing activities cannot contribute pollutants to stormwater runoff. Discharges that may reach groundwater must flow through soil that has buffering capacity prior to reaching groundwater as necessary to meet the effluent limitations of the permit. Concrete washout water will not be discharged to state surface waters or to storm sewer systems. If unlined pits are used to contain concrete washout water, the following management practices must be implemented:

- The washout site must be temporary (less than 1 year),
- The washout site may not be located in an area where shallow groundwater may be present, such as near natural drainages, springs, or wetlands, and
- Upon termination of use of the washout site, accumulated solid waste, including concrete waste and any contaminated soils, must be removed from the site to prevent on-site disposal of solid waste.

e) Portable Sanitary Facilities:

Portable sanitary facility locations will be evaluated in the field and the most appropriate locations determined. Some factors that may influence the location will be access, convenience, level ground, traffic patterns, curb flowlines, paved surfaces, storm drains, and waterways or other stormwater conveyance areas. A licensed company will be hired to maintain and clean the units, inspect for any deficiencies, and keep the units in good working order. Portable sanitary facilities will be adequately anchored to prevent tipping over.

SPILL PREVENTION AND RESPONSE PLAN (§I.C.2.a.ii)

a) Spill Prevention:

The contractors on site will take all measures necessary to prevent spills that could impact stormwater. This includes, but is not limited to:

- Proper storage of all materials and chemicals,
- Proper maintenance and protection of all containers, and
- Proper handing/dispensing materials and chemicals.

Bulk storage, 55 gallons or greater, for petroleum products and other liquid chemicals will have secondary containment, or equivalent protection, in order to contain spills and to prevent spilled material from entering state waters.

b) Spill Response Procedures and Notifications:

Spill response procedures are outlined in Environmental Directive for Contractors, a copy of which is at the end of this tab. Additional contacts are listed below.

Contacts and Notifications for Spills or Releases:

Xcel Environmental Group – 303-571-7100

(Xcel Environmental will make all necessary notifications to regulatory agencies including CDPHE.)

Local Emergency Number – 911

CDPHE – 1-877-518-5608

NRC – 1-800-424-8802

Contaminated Soil Process

Soils contaminated with hazardous materials or wastes can be encountered during installation of new electric or gas underground services and while maintaining existing services. This fact sheet outlines the process by which crews and planners should respond to contaminated soil.

How to Determine if Contaminated Soil is Present

- Contaminated soil may exhibit staining or unusual odors.
- Contaminated soil may be encountered in industrial areas, landfills or other areas of known environmental impacts like underground storage tanks from gas station operations, or associated with buried containers.



What to do if you encounter contaminated soil during work
Stop work and contact Environmental Services**

Pre-Planning Process

For project work in the design phase where there is a potential to encounter contamination – near by gas/fueling stations, industrial areas, landfills, railroads, or known, or potential areas of contamination

- Contact Environmental Services to assist in the site assessment and characterization process to evaluate and determine the need to address potential contamination, and health and safety needs.
- Each group has different criteria that need to be considered
- Environmental – Ensure regulatory compliance and protection of public health and the environment, to minimize Company liability
- Industrial Hygiene and Safety – worker protection driven by OSHA regulations

Resources on XpressNet

- Industrial Hygiene webpage HAZWOPER resources and HAZWOPER written program and Environmental Pages ('All Media Checklist')
- http://xpressnet/Safety/Workplace_Safety/Programs_G_-_O/Industrial_Hygiene_Program

For guidance/assistance when encountering contaminated soils contact Environmental Services on call #:

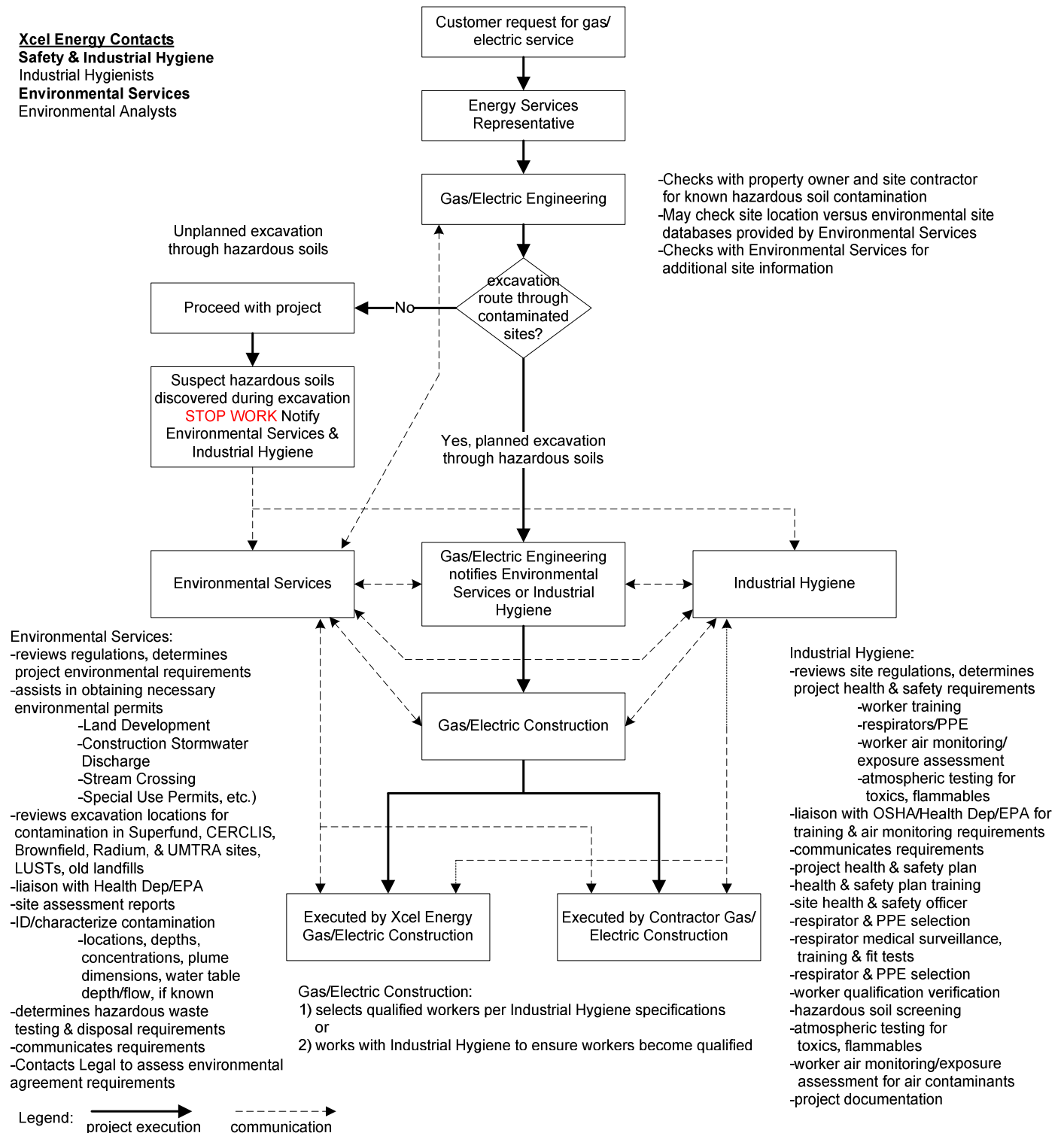
NSP - (612) 330-7873, PSCO - (303) 571-7100, SPS - (806) 674-1890

*****Environmental Services will contact Industrial Hygiene and Safety***

Industrial Hygiene and Environmental Services Support Activities for Utility Excavation at Hazardous Waste Sites and other Contaminated Soils

Periodically, gas and electric service installations involve excavation in areas of soil contaminated by hazardous substances or other pollutants. Areas of known contamination include Superfund, CERCLIS, Brownfield, Radium, and UMTRA sites, leaking underground storage tanks (LUSTs), and old landfills. These sites were historically contaminated with industrial wastes including petroleum, solvents, lead, asbestos, radioactive radium and uranium mine tailings, and flammable methane gas from organic decomposition. Contaminated soils may also be encountered during excavation in areas not previously known to be contaminated. Soil contaminants may present hazards to workers in the form of toxic dust and vapor inhalation or skin exposures, and flammable atmospheres in excavations where hot work must be conducted for service installation tie-ins.

Xcel Energy Contacts Safety & Industrial Hygiene Industrial Hygienists Environmental Services Environmental Analysts





ENV 8.150 G01 Rev 3.2 Environmental Directives For Contractors

Xcel Energy Environmental Services
November 3, 2022

Xcel Energy Environmental Directives for Suppliers

Supplier has entered into one or more contracts (the “Contract”) with Xcel Energy Inc., or its subsidiaries or affiliates (referred to herein as “Xcel Energy”). As provided in the Contract, Supplier must comply with all applicable provisions of Xcel Energy's plant, Project, facility or Site policies and procedures, including but not limited to any instructions and procedures pertaining to plant or facility Site security, industrial safety, environmental directives, work authorization, equipment control and hazardous materials. As such, Supplier must comply with these Environmental Directives for Suppliers (“Directives”).

Xcel Energy expects Supplier to support environmental compliance through its own policies and procedures, maintain all compliance, ensure the protection of human health and the environment, and to promote Xcel Energy's reputation as an environmental leader in the communities Xcel Energy serves. Supplier should consider energy efficiency, pollution prevention, conservation, and performing operations in an environmentally responsible manner in all decision-making and work activities. Supplier must communicate these same values and requirements to its employees and subcontractors.

The information in these Directives does not supersede any specific requirements listed in the Contract. Supplier is required to comply with all federal, state, and local laws, regulations, and requirements and any additional requirements or policies that may be required by Xcel Energy for the specific work at issue in the Contract. The subject areas listed in these Directives are not meant to provide an exhaustive list or complete summary of the types of safety, environmental or other concerns that Supplier must consider. Supplier is an independent Supplier. By providing these Directives to Supplier, Xcel Energy in no way assumes any of the duties, obligations, or liabilities attributed to Supplier under the Supplier or any **obligations that Supplier** must comply with federal, state, and local laws, regulations, and requirements to the extent there is a conflict between these Directives and the Contract, the Contract shall control.

The Xcel Energy Contract Manager will identify the appropriate Xcel Energy Environmental Services (XEES) staff to serve as the contact(s) for the project. XEES staff may be located in one of Xcel Energy's Corporate offices, a field office or service center, or at a power plant. Due to the complexity of some activities and the regulations, Supplier may have contact with more than one Xcel Energy “Subject Matter Expert” during performance of a Contract. Environmental and emergency contact numbers are listed at the end of these Directives for any inquires or notifications Supplier may have.

Adherence to these Directives does not constitute completion of Supplier's obligations under Xcel Energy's Supplier Safety Program or Safety Program requirements identified by Xcel Energy's Corporate Safety Department. Supplier is responsible for meeting all applicable safety requirements, including, but not limited to, the appropriate use of Personal Protective Equipment.

Supplier's Responsibilities

A. Planning

Planning includes everything that happens before a Supplier begins work in the field. Supplier is tasked with several activities during this planning phase of work. The scope of work developed for various projects will determine the level of involvement and define roles and responsibilities for each contract and/or project. During the planning stages of a project, the Supplier should review all applicable laws, rules, regulations, permit requirements, and site-specific conditions that may impact or apply to the work. Supplier should also prepare for any spills, leaks, or accidents (or any unforeseen project emergency) that could occur during project implementation, so that Supplier is prepared to implement the appropriate response measures. Further details are provided below regarding spill response and reporting procedures. Before starting work, Supplier should identify an Emergency Coordinator and know the work location (the physical address where Supplier will be working) in the event an emergency arises. Before starting work, Supplier must also contact the XEES representative that has been designated as the representative for the project to discuss steps the Supplier is taking to ensure all activities are compliant with applicable environmental laws and regulations.

B. Hazard Analysis

Many activities performed by Supplier may be in or near areas that are contaminated or that were previously contaminated and have been remediated. To the extent practical, these areas should be identified in advance to avoid problem and delays caused by unforeseen site conditions. Supplier should conduct an appropriate site hazard analyses or undertake appropriate environmental due diligence prior to commencement of the work. Supplier should also have contingency plans in place in the event hazards are encountered. **When unexpected contamination is discovered in the field - stop work, and immediately provide notification to your Xcel Energy Contract Manager and XEES representative** to coordinate any immediate response actions and/or agency reporting. See further information below regarding spill response and reporting procedures.

C. Permitting

Permits apply to specific activities at specific locations and may have requirements that are more stringent than environmental laws and regulations. Supplier is responsible for identifying all necessary permits for Supplier work affecting Xcel Energy facilities or operations. Notwithstanding anything to the contrary set forth in the Contract, before starting work, Supplier must contact the designated XEES representative for the project to discuss whether Supplier or Xcel Energy will be the named applicant on the permit and whether the Supplier or Xcel Energy will be responsible for conducting permit research or preparing the permit application. Xcel Energy must be involved with any communications with regulatory agencies or made aware of any such communications prior to Supplier outreach to the regulatory agencies. Communication with regulatory agencies for Xcel Energy must include XEES and not be performed by the Supplier without XEES presence or permission. This includes permit discussions, application submittals, negotiation on permit conditions, and/or permit agreements. Supplier bears the responsibility for compliance with the permit terms and specified actions, limitations, notifications, and reporting requirements for Supplier's and its Subcontractor's activities. Failure to comply may subject the Supplier to significant fines and penalties as well as to project delays and potential shutdowns.

D. Chemical Control

Supplier must review, approve, and track all chemicals used while working on Xcel Energy projects. This helps ensure that employees and Suppliers are not exposed to overly hazardous products, Safety Data Sheets (SDSs) are available for each product, and information for all required agency reporting is available. When selecting chemicals for use, Supplier should consider reducing disposal costs, reducing safety risks, buying only quantities needed to do the job, storing chemicals properly, checking expiration dates, and considering alternative products that may be an appropriate less-hazardous option. Supplier is responsible for ensuring that chemicals are used in accordance with all labels. Supplier must remove all unused chemicals and products at the completion of each job and as specified in the Contract. Supplier is not to abandon unused products at any Xcel Energy facility or jobsite.

Unless Supplier receives permission from XEES, Supplier will not use products containing chemicals present on Xcel Energy's Targeted Ingredients List and Supplier will not use products that it knows, or should know, contains Per and Polyfluoroalkyl Substances (also referred to as PFAS or PFCs) including PFOA, PFOS, GenX and other replacement PFAS. The listing of a chemical on the Targeted Ingredients List indicates that its use is restricted. This means that specific requirements must be met in order to use the product in a manner that complies with the applicable regulations. Xcel Energy's Targeted Ingredients List can be found in Appendix D of Xcel Energy's Chemical Hazard Communication Program or can be obtained from XEES or the designated Contract Manager upon Supplier's request. If the Supplier desires to use a chemical or product that contains PFAS or is on the Targeted Ingredient List, before using the chemical or product Supplier must provide documentation to XEES explaining why the use of the product or chemical is necessary and why chemical alternatives that are not on the Targeted Ingredients List with a lower overall risk are not suitable for the specified application, as well as any other information that Xcel Energy may reasonably request, such as any safety precautions Supplier intends to adopt. Proposed restricted chemicals cannot be used until permission to proceed has been given by XEES. By giving permission to proceed with the use of a chemical or product, Xcel Energy in no way assumes any of the duties, obligations, or liabilities attributed to Supplier under the Contract and in no way is endorsing the use of the chemical for any particular application.

E. Protected Species

Supplier must follow all requirements associated with Protected Species. Protected Species means all plants and animals that are listed as a threatened or endangered species under the Endangered Species Act, or are otherwise protected under federal, state or local laws and may include birds, animals, plants, or fish, as well as their nests and habitat. Supplier is responsible for knowing if its work is being performed in an area where Protected Species may be present. Supplier must adhere to all requirements for working in areas with Protected Species and/or habitat and must not remove or destroy an active nest of a Protected Species. Any incident involving death, injury or removal of a Protected Species or an active nest shall be immediately reported to XEES. Supplier should assume that all birds are a Protected Species and shall confer with XEES for determination of the bird's status as a Protected Species.

F. Waste

Supplier must comply with all applicable regulatory requirements, as well as Xcel Energy policies, for waste handling, including, but not limited to, hazardous wastes, universal wastes,

solid wastes, and special wastes. Supplier must coordinate closely with its Xcel Energy Contract Manager as well as directly with XEES. Supplier requirements include the following:

- Correctly identify wastes by type and keep wastes separate, accumulate wastes in appropriate containers, label all containers according to XEES requirements or the appropriate regulations, and conduct inspections as required.
- Store wastes only in areas that have been approved by the Xcel Energy Contract Manager or XEES. Storage areas for liquid wastes shall not be adjacent to storm intercepts, wetlands or surface waters. Storage areas must be inspected at least monthly.
- Supplier should segregate scrap metals and other recyclable wastes. Supplier must contact Xcel Energy Contract Manager for handling instructions if not previously arranged.
- Supplier may be responsible for handling and disposal of non-hazardous refuse (construction and demolition debris, scrap lumber, office waste, etc.). All such disposal must be at an appropriately permitted landfill.
- Supplier is responsible for notifying Xcel Energy Contract Manager and coordinating with XEES all handling and disposal of Hazardous, Universal, and/or special wastes.
- Supplier shall use waste vendors on Xcel Energy's Approved Vendor List when feasible. Supplier shall provide XEES with 30 days' advanced notice if it intends to use a vendor that is not on the Approved Vendor List. Supplier may obtain Xcel Energy's Approved Vendor List form from the designated Xcel Energy Contract Manager.

Note that many Supplier-generated wastes are specific to a particular project and must be managed as specified in the Contract. Supplier should consider, and use commercially reasonable efforts to:

- Use nonhazardous materials instead of hazardous materials
- Reduce waste generation
- Recycle and reuse materials rather than dispose

G. Electrical Equipment (Oil-Filled)

Transformers, capacitors, and other electrical equipment often contain oil. The oil in this equipment may contain polychlorinated biphenyls (PCBs). PCBs are highly regulated, and the Supplier must know the regulations associated with PCB management. Supplier shall immediately alert the Contract Manager or XEES representative of any spills or releases from oil-filled electrical equipment. See further information below regarding spill response and reporting procedures. Supplier crews should assume that electrical equipment contains PCB in regulated concentrations until it is determined that it does not contain PCBs in regulated concentrations (i.e., known to be <50 ppm.) The Supplier is to deliver electrical equipment to the designated service center or disposal outlet as specified by the Contract.

H. Gas Pipeline and Gas Liquids Management

Gas liquids (gas condensate) are defined as liquid hydrocarbons that condense from natural gas because of changes in temperature, pressure, and/or flow. Xcel Energy has specific requirements identified in the Gas Standards Manual (in addition to applicable Federal, State, and other requirements) concerning handling of gas liquids. These requirements are available to the Supplier upon request. Prior to any gas work, removing gas liquids from the system, or performing work that may result in the removal of such from the system, Supplier must

coordinate activities with its Xcel Energy Contract Manager, site manager, and XEES. Supplier must assume that PCBs are present in the gas liquids, the liquids are ignitable, and pipe wrap coatings have asbestos unless and until it is verified that these conditions are not present. When gas liquids are present within these systems, samples must be collected for analysis and proper disposal.

I. Tank Management

Supplier is expected to comply with all applicable federal, state and local regulations and requirements for aboveground and underground storage tanks. Most States and localities have adopted regulations for tanks that, while similar to Federal regulations, may be different and more stringent. Local requirements may include the Uniform Fire Code or National Fire Protection Agency (NFPA) guidelines. Supplier must be aware of local requirements and contact the Fire Marshall, fire department, or appropriate local response agency as necessary, specified in the Contract or agreed upon with XEES. In addition, Xcel Energy may impose certain requirements for tanks above and beyond these regulations due to various circumstances. These requirements will be noted prior to contracting and will not supersede Contract conditions. Additionally, Supplier must follow all applicable Spill Prevention Control and Countermeasures (SPCC) requirements associated with any tank activities. Prior to installing a new tank, modifying an existing tank, adding materials, or performing maintenance, the Supplier must contact the Contract Manager or XEES representative to discuss steps Supplier has taken to ensure all applicable requirements have been met. These requirements can also include unique site-specific requirements for hazardous materials and tanks. In the event of a release to the environment of any regulated substance, Supplier must perform cleanup activities associated with the spill. See further information below regarding spill response and reporting procedures.

J. Demolition Activities

Supplier shall conduct a building hazard assessment prior to demolishing any building at Xcel Energy facilities. This assessment shall be conducted by a qualified professional as defined by the regulatory body governing such activities. Assessments shall include a determination as to whether regulated materials, including, but not limited to, lead, asbestos, or radioactive sources exist. These regulated materials must be properly managed prior to the demolition of the building.

K. Storm Water Management

Supplier is expected to comply with all applicable regulations, requirements, plans, and permits for the management of industrial and construction storm water. Supplier is responsible for ensuring that activities including but not limited to material handling and storage, maintenance and cleaning, construction, industrial processing and other operations occur in a manner consistent with the site's or facility's existing industrial or construction storm water management plan (SWMP). Supplier is responsible for controlling runoff from areas affected by its work to prevent the discharge of pollutants into nearby waterbodies or indirectly via storm sewer systems. Supplier shall complete routine site inspections of the worksite on a schedule consistent with the site's existing SWMP. Supplier is responsible for taking immediate corrective action on identified deficiencies associated with its storm water control measures.

Many states and localities have adopted industrial and construction storm water regulations that are consistent with, but more stringent than the federal requirements. If not specified in the

Contract, Supplier is responsible for working with its Xcel Energy Contract Manager, site manager, and XEES to define who is responsible for obtaining construction storm water permit coverage for the proposed activity, paying permitting fees, submitting the Notice of Intent, installing and inspecting the best management practices (BMPs) and completing the Notice of Termination. Unless specified otherwise in the Contract, the Supplier is responsible for temporary stabilization of the site until final restoration is completed. Supplier is expected to immediately report uncontrolled releases or damages to BMPs to the Xcel Energy Contract Manager.

L. Dewatering Activities

Dewatering activities need to be addressed as project planning is occurring. Supplier is responsible for contacting its Xcel Energy Contract Manager, site manager, and XEES in advance of dewatering activities to ensure that the proper authorizations are obtained. XEES is responsible for evaluating treatment options and assessing whether a dewatering permit is necessary, and if so, obtaining the permit. The Supplier is responsible for ensuring that the required sampling intervals are met, when applicable. Supplier is responsible for coordinating dewatering events with its Xcel Energy Contract Manager, site manager, and XEES to ensure that the required sampling can be arranged.

M. Other Common Substances and Hazards

Supplier understands that the project site may currently or historically have been used for electric or gas gathering, storage, transmission, distribution, or related facilities. Natural gas facilities may now transport and may continue to transport natural gas at significant pressures. Electric facilities may now transmit and may continue to transmit electric current at significant voltages, and conductors on electric lines may not be insulated. Power may have been generated historically or may currently be generated onsite by various means, including for example, nuclear, coal, wind, solar, hydro, gas or other means. Supplier may encounter hazardous or other regulated materials, including, but not limited to, petroleum, volatile organic compounds, coal ash, oil, lead, asbestos, naturally occurring radioactive materials, radioactive sources, or PCBs. Supplier must take necessary precautions for ensuring its work is performed safely and in compliance with all applicable laws and regulations with respect to these potential site conditions.

N. Spill Response and Reporting

Spill Prevention. Supplier must become familiar with Xcel Energy facility formal spill response plans and procedures. If a spill plan is not required or does not exist (as is often the case for non-Xcel Energy locations or Rights-of-Way), Supplier must still be prepared to take appropriate prevention and response measures. Supplier should have spill response kits and Personal Protective Equipment readily available on site to respond to spills.

- Good spill prevention measures should be implemented including, for example, good housekeeping – work area should be cleaned up immediately after the completion of jobs, minimize amount of chemicals in storage, etc.
- Store chemicals properly – store in fireproof cabinets or in designated areas, store drums away from traffic and run-off or sewers/waterways, keep drums closed, etc.
- Storage areas should be inspected on a regular basis to identify containers that may be in poor condition or leaking.
- Absorbent materials/pads should be available during all handling and transfer operations.

- Properly labeled drip pans should be in place when dispensing products from drums.
- Pump connections and hoses should be inspected for integrity and proper connection prior to each use.
- All chemicals or oil transfer operations must be continuously monitored to prevent overflow and spills.
- Know location of spills kits – replace any items used.

Spill Response. Supplier personnel performing an emergency response must be trained appropriately and cleanup spills, even small spills, immediately. Supplier must (1) protect its employees, subcontractors, and the public, and (2) protect the environment if a spill occurs. If a spill occurs, Supplier must evacuate the area if necessary and appropriate. The Supplier must ensure that all persons are kept away from the area of contamination until additional assistance arrives. In addition, to the extent that it is safe, the Supplier must make every effort to prevent the spread of contamination. Containing the flow of liquids, preventing contamination from entering a sewer or waterway, and preventing physical contact with the spilled material are all important.

Spill Reporting. There are federal, state, and local spill reporting laws that may apply in the event of a spill and Supplier may be responsible for spill reporting to federal, state, or local agencies. If it is an emergency, call “911” first to activate fire, police, or medical personnel as required. Next, notify the facility emergency number, if applicable. Finally, the Supplier must promptly notify the Xcel Energy Contract Manager and call the appropriate XEES emergency contact number identified below in Section P so that Xcel Energy can coordinate with the Supplier all spill reporting and communications with regulatory agencies and third parties about the spill. In the event of a chemical release or if a spill might reach or has reached water, a sewer, food, feed, garden, residential property, or school, or has otherwise gone off-site, contact XEES *immediately (e.g., within 15 minutes of the spill)*. If the Supplier activity identifies a potential historical release, work must be immediately stopped in the affected area to determine appropriate next steps. Upon identification of potential historical releases, Supplier shall immediately contact Xcel Energy Contract Manager and appropriate XEES staff. Once notified of a current or historic spill, Xcel Energy may decide to independently report the spill in addition to, or in lieu of, the Supplier. However, the Supplier remains responsible for all spill reporting obligations it may also have under applicable laws and regulations. Supplier shall make best efforts to coordinate with Xcel Energy on any communications to regulatory agencies and third parties about the spill, and Supplier shall keep Xcel Energy informed of all such communications.

O. Regulatory Inspections

Supplier shall notify the project manager and/or XEES when an authorized environmental governmental agency staff member is on site. Notice shall be provided as soon as the Supplier is aware that such a site visit or inspection will occur. XEES shall be provided the opportunity to participate in any scheduled site visit. Supplier will cooperate with authorized inspections at the direction of the XEES representative. Supplier will be prepared for inspections. Supplier must all ensure that records and documentation are kept up to date, and if appropriate or required by law, kept on site. Supplier will maintain good housekeeping practices for the work area. If agency sampling is planned, XEES staff will determine whether it is appropriate to take split samples and if so, who will take the samples.

P. Environmental and Emergency Contacts

ENVIRONMENTAL SERVICES EMERGENCY CONTACT NUMBERS				
	Colorado	Texas New Mexico Oklahoma	Minnesota South Dakota North Dakota	Wisconsin Michigan
Emergency Phone / Pager:	(303) 571-7100	(806) 674-1890	Spill Hotline	Spill Hotline
24 Hour Hotline:	(800) 541-0918	If no answer leave message with Name, Phone, Location, and Nature of Emergency. You will be contacted as soon as possible.	(612) 330-5972 (24 hrs.)	(715) 577-0003
General Office Number:	(303) 294-2213	(806) 378-2196	(612) 330-7873	(715) 737-1346

Tab 8

Final Stabilization and Long-Term Stormwater Management

FINAL STABILIZATION AND LONG-TERM STORMWATER MANAGEMENT (§I.B.1.a.iii and §I.C.2.a.ix)

a) Description of Final Stabilization Practices:

Upon completion of earth-disturbing activities, the site will be restored with vegetation in areas that currently have vegetation and with hard surfaces in areas that are currently paved, graveled, or otherwise hard surfaced. Disturbed areas of private land will be restored with landscaping to match the original landscaping or as agreed to by the landowner. For disturbed areas that will be stabilized with vegetation, final stabilization will consist of seeding in combination with another stabilization measure, such as crimp mulching, and/or installation of rolled erosion control products as appropriate for the site slope. Stabilization must be implemented within 14 days of achieving final grade or temporary stabilization measures must be employed. Areas where stabilization measures have been employed will be inspected and maintained until final stabilization is achieved.

The Site Map (Tab 2) will be updated to indicate which control measures will be used at specific locations during final stabilization. The Site Map is a dynamic document changing with field conditions. Proposed control measures are initially placed on the Site Map and then it is updated in the field to reflect changes as the project moves forward and final stabilization measures occur. In some cases, several maps are prepared indicating initial, interim and final control measures. Final stabilization for disturbed areas within roadways or road shoulders will be to return areas to their original condition – compacted with applicable re-installation of rock or gravel materials or paved with asphalt or concrete.

b) Final Stabilization Methods:

Final stabilization includes those measures taken to control pollutants in stormwater after soil disturbing activities are complete. Practices implemented to achieve final stabilization include:

- Seed mix selection and application methods,
- Soil preparation and possible amendment of the soil prior to seed application,
- Use of salvaged topsoil preserved during construction,
- Soil stabilization methods (e.g., crimped mulch or rolled erosion control products),
- Permanent pavement, hardscaping, xeriscape, stabilized driving surfaces, and other alternative stabilization practices as applicable,
- Maintenance of appropriate erosion and sediment control measures until final stabilization is achieved, and
- Removal of temporary control measures once work is completed and final stabilization achieved.

c) Seed Mixes and Application Rate:

The Arapahoe County seed mix and application rate for the Project is included in the Grading, Erosion, and Sediment Control Standard Notes and Details of the Site Maps (Tab 2).

d) Final Stabilization Achievement:

Final stabilization is achieved when construction activities at the site have been completed, permanent stabilization has been installed in all areas and has met the thresholds described below, and temporary control measures are removed. Areas being stabilized with a vegetative cover must have evenly distributed perennial vegetation. The vegetation coverage must be, at a minimum, equal to 70 percent of what would have been provided by native vegetation in a local, undisturbed area or adequate reference site. Areas not stabilized with vegetative cover must receive equivalent permanent, physical erosion reduction methods. When final stabilization is achieved, temporary erosion and sediment control measures will be removed.

e) Long-Term Stormwater Management:

Long-term stormwater management for this project will be restoring the site to pre-condition conditions. There are no anticipated post-construction detention or water quality control measures that will be installed as part of this project.

Tab 9

Inspections and Maintenance

Inspection Frequency
Inspection Scope
Blank Inspection Report

INSPECTIONS AND MAINTENANCE (§I.D.1 through 5 and §I.B.1.b and c)

a) Inspection Frequency (§1.D.2):

The site will be inspected thoroughly by a Qualified GESC Manager at one of the following frequencies:

- At least one inspection every 7 calendar days. Or
- At least one inspection every 14 calendar days, if post-storm event inspections are conducted within 24 hours after the end of any precipitation or snowmelt event that causes surface erosion. Post-storm inspections may be used to fulfill the 14-day routine inspection requirement. The first site inspection should start within 7 calendar days of the commencement of construction activities. Or
- An alternate schedule approved by the CDPHE Water Quality Control Division.

b) Reduced Inspection Frequency (§I.D.4):

The site will be inspected thoroughly by a qualified GESC manager at the following reduced frequencies when one of the following conditions exists:

- Post-Storm Inspections at Temporarily Idle Sites – For permittees choosing to combine 14-day inspections and post-storm event inspections, if no construction activities will occur following a storm event, post-storm event inspections must be conducted prior to re-commencing construction activities, but no later than 72 hours following the storm event. The delay of any post-storm event inspection must be documented in the inspection record. Routine inspections must still be conducted at least every 14 calendar days.
- Inspections at Completed Sites/Areas – When the site, or portions of a site are awaiting establishment of a vegetative ground cover and final stabilization, the permittee must conduct a thorough inspection of the stormwater management system at least once every 30 days. Post-storm event inspections are not required under this schedule. This reduced inspection schedule is allowed if all of the following criteria are met:
 - All construction activities resulting in ground disturbance are complete,
 - All activities required for final stabilization, in accordance with the GESC, have been completed, with the exception of the application of seed that has not occurred due to seasonal conditions or the necessity for additional seed application to augment previous efforts, and
 - The GESC has been amended to locate those areas to be inspected in accordance with the reduced schedule allowed for in this paragraph.
- Winter Conditions Inspections Exclusion – Inspections are not required for sites that meet all of the following conditions: construction activities are temporarily halted, snow cover exists over the entire site for an extended period, and melting conditions posing a risk of surface erosion do not exist. This inspection exception is applicable only during the period where melting conditions do not exist, and applies to the routine 7-day, 14-day and monthly inspections, as well as the post-storm-event inspections. When this inspection exclusion is implemented, the following information must be documented and retained:
 - Dates when snow cover existed,
 - Date when construction activities ceased, and
 - Date melting conditions began.

c) Inspection Scope (§I.D.5):

1) Areas to be Inspected (§I.D.5.a):

The following items will be examined for evidence of, or the potential for, pollutants leaving the construction site boundaries, entering the stormwater drainage system, or discharging to state waters during the inspection and reported on the inspection reports (§I.D.5.a):

- Construction site perimeter,
- All disturbed areas,
- Designated haul routes,
- Material and/or waste storage areas that are exposed to precipitation,
- Locations where stormwater has the potential to discharge offsite, and
- Locations where vehicles access the site.

All erosion and sediment control practices identified in the GESC will be evaluated to ensure that they are maintained and operating correctly.

2) *Inspection Requirements (§I.D.5.b):*

- Visually verify whether all implemented control measures are in effective operational condition and are working as designed in their specifications to minimize pollutant discharges.
- Determine if there are new potential sources of pollutants.
- Assess the adequacy of control measures at the site to identify areas requiring new or modified control measures to minimize pollutant discharges.
- Identify all areas of non-compliance with the permit requirements and, if necessary, implement corrective action in accordance with the permit.

3) *Inspection Report (§I.D.5.c):*

The inspection report form is located at the end of the tab. Inspection reports must identify any incidents of non-compliance with the terms and conditions of the general permit. The inspection record will note evidence of, or the potential for, pollutants leaving the construction site boundaries, entering the stormwater drainage system, or discharging to state waters. Inspection records must be retained for three years from the expiration or inactivation of permit coverage. However, PSCo's internal policy requires all records associated with this permit to be maintained for 10 years.

The inspection report will include:

- The inspection date,
- Name(s) and title(s) of personnel making the inspection,
- Weather conditions at time of inspection,
- Phase of construction at time of inspection,
- Estimated acreage of disturbance at time of inspection,
- Location(s) of discharges of sediment or other pollutants from the site,
- Location(s) of control measures that are still operating but need to be maintained,
- Location(s) of control measures that failed to operate as designed or proved inadequate for a particular location,
- Location(s) where additional control measures are needed that were not in place at the time of inspection,
- Description of the minimum inspection frequency utilized when conducting each inspection,
- Deviations from the minimum inspection schedule, and
- After adequate corrective action(s) have been taken, or where a report does not identify any incidents requiring corrective action, the report will contain a signed statement

indicating the site is in compliance with the permit to the best of the signer's knowledge and belief.

d) Control Measure Maintenance (§I.B.1.b):

All erosion and sediment control practices and other protective measures identified in the GESC will be maintained in effective operating condition. Control measures that are not adequately maintained in accordance with good engineering, hydrologic and pollution control practices are considered to be no longer operating effectively and will be modified or replaced. Control measures implemented at the site must be adequately designed and maintained to provide control for potential pollutant sources associated with the construction activity to prevent pollution or degradation of state waters. Observations leading to the required maintenance of control measures can be made during a site inspection, or during general observations of site conditions. The necessary repairs or modifications to a control measure requiring routine maintenance must be conducted to maintain an effective operating condition. Maintenance of control measures will occur anytime that the condition of the control measure or the accumulation of sediment or debris adversely impacts the functioning of the control measure.

e) Corrective Actions/Replacement and Failed Control Measures (§I.B.1.c):

Adequate site assessment will be performed as part of comprehensive inspection and maintenance procedures, to assess the adequacy of control measures at the site, and the necessity of changes to those control measures to ensure continued effective performance. Where site assessment results in the determination that new or replacement control measures are necessary, the control measures will be installed or maintained in accordance with this GESC. Where control measures have failed, resulting in noncompliance, they will be addressed as soon as possible, immediately in most cases, to minimize the discharge of pollutants. When new control measures are installed or control measures are replaced, the GESC will be updated. If a control cannot be repaired or installed immediately a statement of why this could not occur will be added to the GESC along with a proposed schedule. If any unauthorized release or discharge has occurred, it will be cleaned up to minimize discharges in subsequent storm events.

CONSTRUCTION STORMWATER INSPECTION REPORT				
Project Name:		Project Location (i.e. address, cross streets):		
Xcel Project Manager/Construction Supervisor:		Xcel Onsite QC Inspector (if applicable):		
Construction Contractor Supervisor/Foreman:		Qualified Stormwater Manager:		
Stormwater Inspector – Alternate SW Manager (name & title)		Control Measure/BMP Installation Contractor:		
Is the Inspector a Qualified Stormwater Manager? ☐ Yes ☐ No				
Date of Inspection:	NPDES/CDPS Certification #:	Local/MS4/GESC Permit #:		
Inspection Start Time:		Inspection Stop Time:		
Current weather at time of inspection:				
Phase of Construction ☐ Pre-Construction ☐ Initial ☐ Interim ☐ Final/Waiting for Growth ☐ Permit Closeout				
Estimated Acreage of Disturbance at time of Inspection:				
Type of Inspection ☐ Routine 7 day Inspection. At least one inspection every 7 calendar days (note that local MS4 may still require post storm inspections). ☐ Routine 14 day Inspection. At least one inspection every 14 calendar days, if post-storm event inspections are conducted within 24 hours after the end of any precipitation or snowmelt event that causes surface erosion. Post-storm inspections may be used to fulfill the 14-day routine inspection requirement. ☐ Inspection for Discharges to Outstanding Waters. (Permittees must conduct site inspections at least once every 7 calendar days for sites that discharge to a water body designated as an Outstanding Water by the Water Quality Control Commission). ☐ Runoff Event (Post-storm event inspections must be conducted within 24 hours after the end of any precipitation or snowmelt event with potential to cause surface erosion. If no construction activities will occur following a storm event, post-storm event inspections will be conducted prior to re-commencing construction activities, but no later than 72 hours following the storm event). Storm Start Date: _____ Storm Stop Date: _____ Approximate Amount: _____ ☐ Inspections at Completed Sites/Areas. When the site or portions of a site are awaiting establishment of a vegetative ground cover and final stabilization, the permittee must conduct a thorough inspection of the stormwater management system at least once every 30 days . (Post-storm event inspections are not required under this schedule but the local MS4 may still require post storm inspections). ☐ Winter Conditions Inspections Exclusion. Inspections are not required for sites that meet all of the following conditions: construction activities are temporarily halted, snow cover exists over the entire site for an extended period, and melting conditions posing a risk of surface erosion do not exist. This inspection exception is applicable only during the period where melting conditions do not exist, and applies to the routine 7-day, 14-day and monthly inspections, as well as the post-storm-event inspections. When this inspection exclusion is implemented, the following information must be documented: dates when snow cover existed, date when construction activities ceased, and date melting conditions began. ☐ Other: ☐ When site conditions make the schedule required in this section impractical, the permittee may petition the Division to grant an alternate inspection schedule. The alternative inspection schedule may not be implemented prior to written approval by the division and incorporation into the SWMP. The primary Qualified Stormwater Manager must approve any schedule deviations and subsequent petition to the Division.				
SWMP Management				
	Yes	No	N/A	Comments
Is the Permit(s) (Federal, State and/or Local/MS4/GESC) retained in the SWMP Notebook?	☐	☐	☐	
Is the SWMP Notebook located onsite? If not, provide a copy of documentation that was submitted requesting and granting alternate location?	☐	☐	☐	Location of SWMP
Is a site specific EPA SPCC Plan included in the SWMP (applies to bulk storage of hydrocarbon products greater than 1,320 gallons)?	☐	☐	☐	
Are changes to the SWMP Documents noted (i.e. new or altered narratives, control measure details, site map updates, haul roads/routes, access points, etc)?	☐	☐	☐	
Are inspection reports retained in the SWMP Notebook?	☐	☐	☐	
Are corrective actions/maintenance items from previous inspection complete (if not show items on page 2)?	☐	☐	☐	
Are there any new potential sources of pollutants onsite?	☐	☐	☐	

CONSTRUCTION SITE ASSESSMENT *off site Pollutant Discharges are a violation of the Permit and Reason for Stop Work*****

When conducting a site inspection, the following areas, if applicable, must be inspected for evidence of, or the potential for, pollutants leaving the construction site boundaries, entering the stormwater drainage system, or discharging to state waters: construction site perimeter, all disturbed areas, designated haul routes, material and waste storage areas exposed to precipitation, locations where stormwater has the potential to discharge offsite, and locations where vehicles exit the site.

The permittee must ensure all control measures remain in effective operating condition and are working as designed in their specifications to minimize pollutant discharges. Determine if there are new potential sources of pollutants. Assess the adequacy of control measures at the site to identify areas requiring new or modified control measures to minimize pollutant discharges. Identify all areas of non-compliance with the permit requirements and, if necessary, implement corrective actions.

Control Measures must be maintained in accordance with good engineering, hydrologic and pollution control practices. Control Measure Requiring Routine Maintenance is defined as any control measure that is still operating in accordance with its design and the requirements of this permit, but requires maintenance to prevent a breach of the control measure. See also inadequate control measure.

The permittee must assess the adequacy of control measures at the site, and the need for changes to those control measures to ensure continued effective performance. When an inadequate control measure is identified (i.e., new or replacement control measures become necessary), the following corrective action requirements apply. The permittee is in noncompliance with the permit until the inadequate control measure is replaced or corrected and returned to effective operating condition in compliance. If the inadequate control measure results in noncompliance that meets the conditions of Part II.L., the permittee must also meet the requirements of that section. Inadequate Control Measure is defined as any control measure that is not designed or implemented in accordance with the requirements of the permit and/or any control measure that is not implemented to operate in accordance with its design.

If a new control measures is needed the inspector must determine if that new control measure is categorized as “inadequate or maintenance” based on the definitions above.

All control measures identified in the SWMP shall be evaluated to ensure that they are maintained and operating correctly. Identify the condition of the control measure as either inadequate or in need of maintenance as defined above. Continuous and proactive maintenance is required on all Control Measures. Control Measures that are not operating effectively, have proven to be inadequate, or failed must be addressed as soon as possible, immediate in most cases.

[illegible]

CONSTRUCTION SITE ASSESSMENT *off site Pollutant Discharges are a violation of the Permit and Reason for Stop Work*****

- (a) Is there evidence of discharge of sediment or other pollutants from the site? ☐ Yes ☐ No

*If yes, explain the location of discharge and the corrective actions in the Construction Site Assessment section or General Notes

- (b) Has sediment or other pollutants discharging from the site reached state waters or municipal separate storm sewer system? ☐ Yes ☐ No

*If yes, contact Xcel Energy's Environmental Services (303)294-2189. No individual shall notify local or State offices on Xcel Energy's behalf.

INSPECTION CERTIFICATION

I certify this inspection is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information.

Qualified Stormwater Manager/Inspector (Name, Title, Company & Signature)

Date:

COMPLIANCE CERTIFICATON

I verify that, to the best of my knowledge and belief, all corrective action and maintenance items identified during the inspection are complete, and the site is currently in compliance with the permit.

Qualified Stormwater Manager/Designee (Name, Title, Company & Signature)

Date:

Tab 10

Pre-Construction Photos

	
01. View of STR 696 facing W; Harvest Mile Sub in background.	02. STR 696; 80% vegetative cover.
	
03. Berm adjacent to STR 696; view facing N.	04. STR 695 located in agriculturally managed field; view facing NE.

	
05. STR 694; view facing N.	06. STR 691; view facing E. Grading of side slope from existing drive needed to access ROW
	
07. View from existing drive to ROW access for STRs 692. View facing N. STR 692 to be located in left frame of photo.	08. View from existing drive to ROW access for STRs 691; view facing N. Grading of side slope from existing drive needed to access ROW

	
09. STR 689; view facing NE. Access within ROW from W.	10. Culvert and road base approach needed at access from Quincy Ave to ROW between STR 688 and 687. View facing E.
	
11. STR 688; view facing N.	12. STR 688; 0% pre-existing vegetative cover.



13. Access to STR 686; view facing N.



14. STR 686; view facing NW.



15. STR 682; 65% pre-existing vegetative cover.



16. STR 682; view facing E.



17. Drive and crush access to STR 678; view facing NE.



18. STR 678; view facing E.



19. STR 678; 10% pre-existing vegetative cover.



20. STR 675; view facing NE.



21. STR 672; 60% pre-existing vegetative cover.



22. Existing two-track access to STR 672; view facing W.



23. STR 664; view facing E.



24. STR 664; 70% pre-existing vegetative cover.



25. STR 657; view facing E.



26. Potential access to STR 657 from W; view facing SE.



27. STR 641A; view facing S.



28. STR 641; 100% pre-existing vegetative cover.



29. STR 605; view facing N.



30. STR 601 view facing N.



31. Access to STR 593; view facing N.

Tab 11

Inspection Reports

Tab 12

Miscellaneous

Engineering Cost Estimate
GESD Report and Plans Checklist
Web Soil Survey

Arapahoe County GESC Permit

Engineer's Cost Estimate Spreadsheet for Initial and Interim BMPs

Note: *Initial* and *Interim* BMPs shall be added together for the Cost Estimate

Project Name: Xcel Tline: Pathways Segment 5 Arapahoe County Build

Date: 2/27/2026

BMP No.	BMP	ID	Unit	Installation Unit Cost	Initial / Interim Quantity	Initial / Interim Cost
1	Check Dam	CD	LF	\$ 24.00		\$ -
2	Compost Blanket	CB	SF	\$ 0.36		\$ -
3	Compost Filter Berm	CFB	LF	\$ 2.00		\$ -
4	Concrete Washout Area	CWA	EA	\$ 100.00	110	\$ 11,000.00
5	Construction Fence	CF	LF	\$ 2.00		\$ -
6	Construction Markers	CM	LF	\$ 0.20		\$ -
7	Curb Sock	CS	LF	\$ 16.00		\$ -
8	Dewatering	DW	EA	\$ 600.00		\$ -
9	Diversion Ditch (2-yr flow less than 10 cfs)	DD	LF	\$ 1.60		\$ -
	(2-yr flow greater than 10 cfs)	DD	LF	\$ 3.00		\$ -
10	Erosion Control Blanket	ECB	SY	\$ 5.00		\$ -
11	Flexible Growth Medium	FGM	SY	\$ -		\$ -
12	Inlet Protection	IP	EA	\$ 200.00		\$ -
13	Reinforced Check Dam	RCD	LF	\$ 36.00		\$ -
14	Reinforced Rock Berm	RRB	LF	\$ 9.00		\$ -
15	RRB for Culvert Protection	RRC	LF	\$ 9.00		\$ -
16	Sediment Basin	SB	AC	\$ 1,000.00		\$ -
17	Sediment Control Log	SCL	LF	\$ 2.00	8795	\$ 17,590.00
18	Sediment Trap	ST	EA	\$ 600.00		\$ -
19	Seeding & Mulching (Less than 10 Acres)	SM	AC	\$ 2,500.00		\$ -
	(Greater than 10 Acres)	SM	AC	\$ 1,500.00		\$ -
20	Silt Fence	SF	LF	\$ 2.00		\$ -
21	Stabilized Staging Area	SSA	SY	\$ 2.00		\$ -
22	Surface Roughening	SR	AC	\$ 600.00		\$ -
23	Temporary Slope Drain	TSD	LF	\$ 30.00		\$ -
24	Temporary Stream Crossing (2-yr flow less than 10 cfs)	TSC	EA	\$ 1,000.00		\$ -
	(2-yr flow greater than 10 cfs)	TSC	EA	\$ 2,000.00		\$ -
25	Terracing	TER		\$ -		\$ -
26	Vehicle Tracking Control	VTC	EA	\$ 1,000.00	42	\$ 42,000.00
27	VTC with Wheel Wash	WW	EA	\$ 1,500.00		\$ -
28	Mobilization (required on all projects)	MB	LS	\$ 5,000.00	1	\$ 5,000.00
29	Pond Maintenance/Sediment Removal (Based on area tributary to the pond)	PM	AC	\$ 1,000.00		\$ -
30	Street Maintenance (Based on lane miles of streets within project and frontage)	SM	LM	\$ 500.00	13	\$ 6,500.00
31	Other: _____			\$ -		\$ -
Total Cost of Initial and Interim BMPs						\$ 82,090.00

Arapahoe County GESC Permit

Engineer's Cost Estimate Spreadsheet for Initial and Interim BMPs

Note: *Initial* and *Interim* BMPs shall be added together for the Cost Estimate

Project Name: Xcel Tline: Pathways Segment 5 Arapahoe County Build

Date: 2/27/2026

Agreed and Accepted By:

Applicant/Developer:

By: Public Service Company of Colorado (PSCo)

Name: Chad Campbell



Title: Environmental Services Manager

Date: 2/27/2026

Engineer for Applicant:

By: HDR Engineering, Inc.

Name: Brian Brown

Title: Project Manager, Civil Engineer, P.E.

Date: 2/27/2026



03/04/2026

Case Engineer:

By:  _____

Name: Sue Liu

Title: Engineer III

Date: 3-9-2026

Arapahoe County GESC Permit

Engineer's Cost Estimate Spreadsheet for Final BMPs

Project Name: Xcel Tline: Pathways Segment 5 Arapahoe County Build

Date: 2/27/2026

BMP No.	BMP	ID	Unit	Installation Unit Cost	Initial / Interim Quantity	Initial / Interim Cost
1	Check Dam	CD	LF	\$ 24.00		\$ -
2	Compost Blanket	CB	SF	\$ 0.36		\$ -
3	Compost Filter Berm	CFB	LF	\$ 2.00		\$ -
4	Concrete Washout Area	CWA	EA	\$ 100.00		\$ -
5	Construction Fence	CF	LF	\$ 2.00		\$ -
6	Construction Markers	CM	LF	\$ 0.20		\$ -
7	Curb Sock	CS	LF	\$ 16.00		\$ -
8	Dewatering	DW	EA	\$ 600.00		\$ -
9	Diversion Ditch (2-yr flow less than 10 cfs)	DD	LF	\$ 1.60		\$ -
	(2-yr flow greater than 10 cfs)	DD	LF	\$ 3.00		\$ -
10	Erosion Control Blanket	ECB	SY	\$ 5.00		\$ -
11	Flexible Growth Medium	FGM	SY	\$ -		\$ -
12	Inlet Protection	IP	EA	\$ 200.00		\$ -
13	Reinforced Check Dam	RCD	LF	\$ 36.00		\$ -
14	Reinforced Rock Berm	RRB	LF	\$ 9.00		\$ -
15	RRB for Culvert Protection	RRC	LF	\$ 9.00		\$ -
16	Sediment Basin	SB	AC	\$ 1,000.00		\$ -
17	Sediment Control Log	SCL	LF	\$ 2.00	8795	\$ 17,590.00
18	Sediment Trap	ST	EA	\$ 600.00		\$ -
19	Seeding & Mulching (Less than 10 Acres)	SM	AC	\$ 2,500.00		\$ -
	(Greater than 10 Acres)	SM	AC	\$ 1,500.00	66	\$ 99,000.00
20	Silt Fence	SF	LF	\$ 2.00		\$ -
21	Stabilized Staging Area	SSA	SY	\$ 2.00		\$ -
22	Surface Roughening	SR	AC	\$ 600.00		\$ -
23	Temporary Slope Drain	TSD	LF	\$ 30.00		\$ -
24	Temporary Stream Crossing (2-yr flow less than 10 cfs)	TSC	EA	\$ 1,000.00		\$ -
	(2-yr flow greater than 10 cfs)	TSC	EA	\$ 2,000.00		\$ -
25	Terracing	TER		\$ -		\$ -
26	Vehicle Tracking Control	VTC	EA	\$ 1,000.00		\$ -
27	VTC with Wheel Wash	WW	EA	\$ 1,500.00		\$ -
28	Mobilization (required on all projects)	MB	LS	\$ 5,000.00	1	\$ 5,000.00
29	Pond Maintenance/Sediment Removal (Based on area tributary to the pond)	PM	AC	\$ 1,000.00		\$ -
30	Street Maintenance (Based on lane miles of streets within project and frontage)	SM	LM	\$ 500.00		\$ -
31	Other: _____			\$ -		\$ -
Total Cost of Final BMPs						\$ 121,590.00

Arapahoe County GESC Permit
Engineer's Cost Estimate Spreadsheet for Final BMPs

Project Name: Xcel Tline: Pathways Segment 5 Arapahoe County Build

Date: 2/27/2026

Agreed and Accepted By:

Applicant/Developer:

By: Public Service Company of Colorado (PSCo)

Name: Chad Campbell



Title: Environmental Services Manager

Date: 2/27/2026

Engineer for Applicant:

By: HDR Engineering, Inc.

Name: Brian Brown

Title: Project Manager, Civil Engineer, P.E.

Date: 2/27/2026



Case Engineer:

By:  _____

03/04/2026

Name: Sue Liu

Title: Engineer III

Date: 3-9-2026

Appendix E: GESC Plan and Report Checklist



This checklist must be filled out and included in the Appendix of the GESC Report

Revised February 2019

Yes	No	N/A	GESC Requirements
I. GESC REPORT			
A. COVER PAGE			
X			1. Project name and complete address
X			2. Contact information of the applicant
X			3. Contact information of the Professional Engineer preparing (or supervising the preparation of) the GESC Documents
B. SIGNATURE PAGE			
1. The following note (above Certification Statements)			
X			"This <i>Grading, Erosion and Sediment Control (GESC)</i> document has been placed in the project file for this project and appears to fulfill the latest version of the <i>Grading, Erosion and Sediment Control Manual</i>. Additional grading, erosion and sediment Control Measures may be required of the owner or his/her agents, due to unforeseen erosion problems or if the submitted plan does not function as intended. The requirements of this GESC document shall run with the land and be the obligation of the land owner, or his/her designated representative(s) until such time as the plan is properly completed, modified or voided."
2. Landowner Certification Statement (For landowner/ authorized agent acknowledging the review and acceptance of responsibility)			
X			"I hereby certify that the Grading, Erosion, and Sediment Control Measures for (Name of Subdivision/Development/address) shall be constructed according to the design presented in this document. I understand that additional erosion control, sediment control and water quality enhancing measures may be required of the owner and his or her agents due to unforeseen pollutant discharges or if the submitted plan does not function as intended. The requirements of the plan shall be the obligation of the land owner and/or his successors or heirs; until such time as the plan is properly completed, modified or voided." Owner or Authorized Agent _____ Authorized Signature _____
3. Professional Engineer Certification Statement (for the professional engineer acknowledging responsibility for the preparation of the GESC documents)			
X			"I hereby attest that this Grading, Erosion, and Sediment Control (GESC) document for (name of subdivision/development) has been prepared by me or under my direct supervision, and to the best of my knowledge and ability has been prepared in accordance with the latest version of the GESC Manual. The signature and stamp affixed hereon certifies that this GESC document was prepared in accordance with the required regulations and criteria; however, the stamp and signature does not certify or guarantee future performance of the execution of the plan by the contractor. The contractor is responsible for executing the

Appendix E: GESC Plan and Report Checklist



This checklist must be filled out and included in the Appendix of the GESC Report

Revised February 2019

Yes	No	N/A	GESC Requirements
X			construction work according to the information set forth in the plan and in accordance with all applicable requirements.” Registered Professional Engineer _____ State of Colorado No. _____ Affix Seal w/date
			C. GESC REPORT
			1. Project Description
X			a. Describe the nature and purpose of the land disturbing activity
X			b. Total area of the site
X			c. Total area of disturbance
X			d. Project location – including township, range, section and quarter-section (or the latitude and longitude of the approximate center of the project)
X			e. Vicinity Map
			2. Existing Site Conditions
X			a. Description of the existing topography, vegetation and drainage (Pictures of the existing vegetation are encouraged)
X			b. Description of any wetlands on the site
X			c. Description of any other unique features of the property.
X			3. Adjacent Areas - Description of neighboring areas such as streams, lakes, Floodplain, residential areas, roads, etc., which might be affected by the land disturbance.
X			4. Soils - A <u>brief</u> description of the soils on the site including information on soil type and names, mapping unit, erodibility, permeability, hydrologic soil group, depth, texture, and soil structure. This information may be obtained from the soil report for the site or the applicable Soil Survey prepared by the Natural Resources Conservation Service (NRCS). Include relevant portions of soil report or NRCS Soil Survey in an appendix.
			5. Area and Volumes
X			a. An estimate of the quantity (in cubic yards) of excavation and fill involved (attempting to achieve an earthwork balance)
X			b. Haul road information
X			c. Surface area (in acres) of the proposed disturbance
			6. Control Measures – A summary of the Control Measures selected, designed, installed, implemented and maintained on site, including the timing of installation and removal.
X			a. All sediment and erosion Control Measures as shown on GESC Plans.
X			b. Land disturbance and storage of soils
X			c. Vehicle Tracking
X			d. Loading and unloading operations

Appendix E: GESC Plan and Report Checklist



This checklist must be filled out and included in the Appendix of the GESC Report

Revised February 2019

Yes	No	N/A	GESC Requirements
X			e. Outdoor storage or construction site materials, building materials, fertilizers, and chemicals
X			f. Bulk storage of materials
X			g. Vehicle and equipment maintenance and fueling
X			h. Significant dust or particulate generating processes
X			i. Routine maintenance activities involving fertilizers, pesticides, detergents, fuels, solvents and oils
X			j. Concrete truck chute and associated fixtures and equipment washing
X			k. Dedicated asphalt and concrete batch plants
X			l. Other areas or operations where spills can occur
X			m. Other non-stormwater discharges including construction dewatering not covered under the Construction Dewatering Discharges General Permit and wash water that may contribute pollutants to the MS4
X			7. Permanent Stabilization - A brief description, including applicable specifications, of how the site will be stabilized after construction is complete
X			8. Stormwater Management Considerations - Explain how stormwater runoff from and through the site will be handled during construction
X			9. Maintenance - Any special maintenance requirements over and above what is identified in the Standard Notes and Details.
			10. Calculations – include in an appendix
		X	a. Sediment Basin Design Calculations
		X	b. Diversion Ditch Calculations
		X	c. Erosion Control Blanket/Matting selection
			D. ENGINEERS COST ESTIMATE
X			A GESC Engineer's Cost Estimate, for Initial/Interim and Final GESC stages, including anticipated maintenance during the construction phase, shall be submitted in the GESC Report. Units shall be consistent between cost estimate and plans. <u>Unit costs used to develop probable erosion and sediment control costs shall be those shown in the spreadsheet and shall not be modified.</u>
			E. GESC PLAN AND REPORT CHECKLIST
X			A copy of this GESC Plan and Report Checklist must be completely filled out, signed by the designer, and submitted with the GESC Report.

Appendix E: GESC Plan and Report Checklist



This checklist must be filled out and included in the Appendix of the GESC Report

Revised February 2019

Yes	No	N/A	GESC Requirements
II. GESC PLANS (shall be a stand-alone document and not included in the Construction Drawings)			
			A. GESC PLAN COVER SHEET
X			1. Name of Project/Site Name
X			2. Project Address
X			3. Owner Contact Information (Name, Company, Address, Phone)
X			4. Engineer Contact Information (Name, Company, Address, Phone)
X			5. Plan Sheet Index
X			6. Case Number(s) in the lower left-hand corner
X			7. The following note: <i>"This Grading, Erosion and Sediment Control (GESC) document has been placed in the project file for this project and appears to fulfill the latest version of the Grading, Erosion and Sediment Control Manual. Additional grading, erosion and sediment Control Measures may be required of the owner or his/her agents, due to unforeseen erosion problems or if the submitted plan does not function as intended. The requirements of this GESC document shall run with the land and be the obligation of the land owner, or his/her designated representative(s) until such time as the plan is properly completed, modified or voided."</i>
X			8. GESC Drawing Design Engineer's signature block with name, date, and Professional Engineer registration number. Signature block shall include the following certification statement: <i>"I hereby attest that this Grading, Erosion, and Sediment Control (GESC) document for (name of subdivision/development) has been prepared by me or under my direct supervision, and to the best of my knowledge and ability has been prepared in accordance with the latest version of the GESC Manual. The signature and stamp affixed hereon certifies that this GESC document was prepared in accordance with the required regulations and criteria; however, the stamp and signature does not certify or guarantee future performance of the execution of the plan by the Contractor. The Contractor is responsible for executing the construction work according to the information set forth in the plan and in accordance with all applicable requirements."</i> Registered Professional Engineer _____ State of Colorado No. _____ Affix Seal w/date
X			9. Landowner/authorized agent acknowledging GESC review and the acceptance of GESC responsibility. Signature block shall include the following certification statement: <i>"I hereby certify that the Grading, Erosion, and Sediment Control Measures for (Name of Subdivision/Development) shall be constructed according to the design presented in this document. I understand that additional</i>

Appendix E: GESC Plan and Report Checklist



This checklist must be filled out and included in the Appendix of the GESC Report

Revised February 2019

Yes	No	N/A	GESC Requirements
X			erosion control, sediment control and water quality enhancing measures may be required of the owner and his or her agents due to unforeseen pollutant discharges or if the submitted plan does not function as intended. The requirements of the plan shall be the obligation of the land owner and/or his successors or heirs; until such time as the plan is properly completed, modified or voided.” Owner or Authorized Agent _____ Authorized Signature _____ Date _____
X			10. Approval Block (see Appendix G) 4.5” x 5.5”
X			11. General Location Map at a Scale of 1-inch to 1000-feet to 8000-feet indicating:
X			a. General vicinity of the site location
X			b. Major roadway names and drainageways
X			c. North arrow and scale
			B. GESC DRAWING INDEX SHEET
		X	For projects that require multiple plan-view sheets to adequately show the project area (based on the specified scale ranges), a single plan-view sheet shall be provided at a scale appropriate to show the entire site on one sheet. Areas of coverage of the multiple blow-up sheets are to be indicated as rectangles on the index sheet.
			C. INITIAL GESC DRAWING
			This plan sheet shall provide grading, erosion and sediment Control Measures for the initial clearing, grubbing and preparation of a project. At a minimum, it shall contain:
X			1. Property lines, adjacent roads and drainageways
X			2. Existing and proposed easements
X			3. Existing topography at one- or two-foot contour intervals, extending a minimum of 100 feet beyond the property line or the limits of construction if the project goes beyond property lines
X			4. Labeled location of any existing structures or hydrologic features within the mapping boundary
X			5. Flow arrows
X			6. Labeled floodplain delineation including Control Measures to delineate and protect floodplain (e.g. construction fence, construction markers, wire-backed silt fence)
X			7. North arrow and scale
X			8. Approval Block (see Appendix G) 4.5” x 2”
X			9. Limits of construction encompassing all areas of work access points, storage and staging areas, borrow areas, stockpiles, construction trailer, and utility tie-in location in on-site and off-site locations.
X			10. Stream corridors and other resource areas to be preserved and all other areas outside the limits of construction shall be lightly shaded to clearly show area not to be disturbed

Vicinity map scale at 1:90,000 due to linear nature of project (1:8,000 would produce 6 additional 36x24 sheets)

Appendix E: GESC Plan and Report Checklist



This checklist must be filled out and included in the Appendix of the GESC Report

Revised February 2019

Yes	No	N/A	GESC Requirements
			11. Location of stockpiles, including topsoil, imported aggregates, and excess material
		X	12. Location of storage and staging areas for equipment, equipment maintenance, fuel, lubricant, chemical (and other materials) and waste storage
		X	13. Location of borrow or disposal areas
X			14. Location of temporary roads, including haul roads
X			15. Location, map symbol, and letter callouts of all initial erosion and sediment Control Measures
X			16. Location, map symbol, and letter callouts of Vehicle Tracking Control(s) (VTC)
		X	17. Location, map symbol, and letter callouts of Concrete Washout Area(s) (CWA)
		X	18. Location, map symbol, and letter callouts of dedicated asphalt and concrete batch plants.
		X	19. Locations of other areas or operations where spills can occur – Refer to Chapter 10.
		X	20. Location, map symbol, and letter callouts for any anticipated Dewatering (DW) activities. Note: Dewatering of groundwater is covered by State permits. The Permittee is responsible for obtaining and complying with State-issued permits
X			21. Information to be specified for each Control Measure, such as type and dimensions as called for in Chapter 11 of the GESC Manual.
			22. The following notes:
X			a. Appropriate Control Measures must be implemented prior to the start of land disturbance activity, must control potential pollutants during each phase of construction, and must be continued through final stabilization. Appropriate structural and non-structural Control Measures must be maintained in operational condition.
X			b. See Standard Notes and Details (Sheet 1) for legend of Control Measures names and symbols.
X			c. Any Control Measures shown that require grading, (e.g. sediment basins, sediment traps, concrete washout areas, etc.), shall not be placed until after the pre-construction meeting and issuance of the GESC permit, but must be fully functional prior to any large-scale grading. The initial plan illustrates existing conditions. No proposed infrastructure is shown.

Slight modification to note on sheets as planset shows existing conditions as well as proposed infrastructure.

D. INTERIM GESC DRAWING			
This plan sheet shows Control Measures to control grading, erosion and sediment during the initial over lot grading, site construction and site re-vegetation process. The Interim GESC Plan shall show all the information included on the Initial GESC Plan, as noted below. At a minimum, it shall contain the following information:			

Appendix E: GESC Plan and Report Checklist



This checklist must be filled out and included in the Appendix of the GESC Report

Revised February 2019

Yes	No	N/A	GESC Requirements
		X	1. Existing topography and location of all existing erosion and sediment Control Measures on site, as shown on the Initial GESC Plan shall be screened/shaded back.
		X	2. Dimension and quantity information for Initial stage Control Measures shall not be shown.
X			3. Items from the Initial GESC Plan (except #20 and #21).
X			4. Proposed topography at one- or two-foot contour intervals, showing elevations, dimensions, locations, and slope of all proposed grading with flow arrows.
		X	5. Outlines of cut and fill areas. Summary of cut and fill volumes. If export occurs, note location where export will likely be transported to. Separate cut/fill sheet is permissible.
X			6. Location of all interim erosion and sediment Control Measures designed in conjunction with the proposed site topography and implementing the Control Measures installed in the Initial GESC Plan.
X			7. Locations of all improvements, drainage features and facilities, and other permanent features to be constructed in connection with, or as a part of, the proposed work, per approved plat or land use plan.
			8. The following notes:
X			a. Appropriate Control Measures must be implemented prior to the start of land disturbance activity, must control potential pollutants during each phase of construction, and must be continued through final stabilization. Appropriate structural and non-structural Control Measures must be maintained in operational condition.
X			b. See Standard Notes and Details (Sheet 1) for legend of names and symbols.
		X	c. Screened/shaded back Control Measures were installed in the Initial stage and shall be left in place in the Interim stage unless otherwise noted.
X			d. Control Measures, including seeding and mulching of disturbed areas, must be completed within 14 days, if the area will remain undisturbed for a period greater than 30 days.
X			e. All proposed slopes on this plan have a maximum slope of 3:1. Any slopes between 3:1 and 4:1 will require the use of erosion control blankets or flexible growth medium, as approved by the GESC Inspector.
		X	f. See Construction Plans for details of permanent drainage facilities such as detention facilities, water quality facilities, culverts, storm drains, and inlet and outlet protection.
		X	g. If site runoff enters the post-construction permanent Control Measure(s), sediment contamination of the materials may result in the post-construction permanent Control Measures(s) having to be reconstructed in its entirety. (Where applicable) Removal of sediment basin on site shall only occur after <u>all</u> areas tributary to

Appendix E: GESC Plan and Report Checklist



This checklist must be filled out and included in the Appendix of the GESC Report

Revised February 2019

Yes	No	N/A	GESC Requirements
		X	the sediment basin have been stabilized. Removal must be approved by the GESC Inspector.
			E. FINAL GESC DRAWING
This plan sheet shows controls for final completion of the site. The Final GESC Plan shall include all information shown on the Initial and Interim Plans, as noted below. At a minimum, this plan sheet shall contain the following information:			
		X	1. Existing topography in areas of proposed contours need not be shown.
		X	2. Existing Initial and Interim Control Measures shall be shown, (screened/shaded back) . Dimension and quantity information shall not be shown for Initial and Interim Control Measures except for Control Measures to remain during final stabilization.
X			3. Directional flow arrows on all drainage features.
X			4. Items from the Interim GESC Plan (except #5 and #8).
X			5. Label all Initial or Interim Control Measures (e.g. SSA, VTC, DW, etc.) that are to be removed and any resulting disturbed areas to be stabilized.
X			6. Location of all Final erosion and sediment Control Measures (including seeding and mulching of any areas not stabilized in the Interim Plan), permanent landscaping, and any Control Measures necessary to minimize the movement of sediment off site until permanent vegetation can be established.
		X	7. Show and label areas of sod and permanent landscaping classifications per approved land use plan.
			8. The following notes:
X			a. Appropriate Control Measures must be implemented prior to the start of land disturbance activity, must control potential pollutants during each phase of construction, and must be continued through final stabilization. Appropriate structural and non-structural Control Measures must be maintained in operational condition.
X			b. See Standard Notes and Details (Sheet 1) for legend of names and symbols.
		X	c. Screened/shaded back Control Measures were installed in the Initial or Interim stage and, unless otherwise indicated, shall be left in place until approved by the GESC Inspector.
X			d. All Interim Control Measures, including seeding and mulching or disturbed areas, must be completed within 14 days if the areas will remain undisturbed for a period greater than 30 days.
X			e. All proposed slopes on this plan have a maximum slope of 3:1. Any slopes between 3:1 and 4:1 will require the use of erosion control blankets or flexible growth medium, as approved by the GESC Inspector
		X	f. See Construction Plans for details of permanent drainage facilities such as detention facilities, water quality facilities, culverts, storm drains, and inlet and outlet protection.

Appendix E: GESC Plan and Report Checklist



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Revised February 2019

Yes	No	N/A	GESC Requirements
		X	g. Acceptance of the post-construction permanent Control Measures will not occur until all tributary areas to the permanent Control Measures are final stabilized.
X			F. GESC PLAN - STANDARD NOTES AND DETAILS
A copy of the GESC Plan - Standard Notes and Details (included in Appendix F) shall be bound into each set of GESC Plans.			

Signature of Designer



United States
Department of
Agriculture

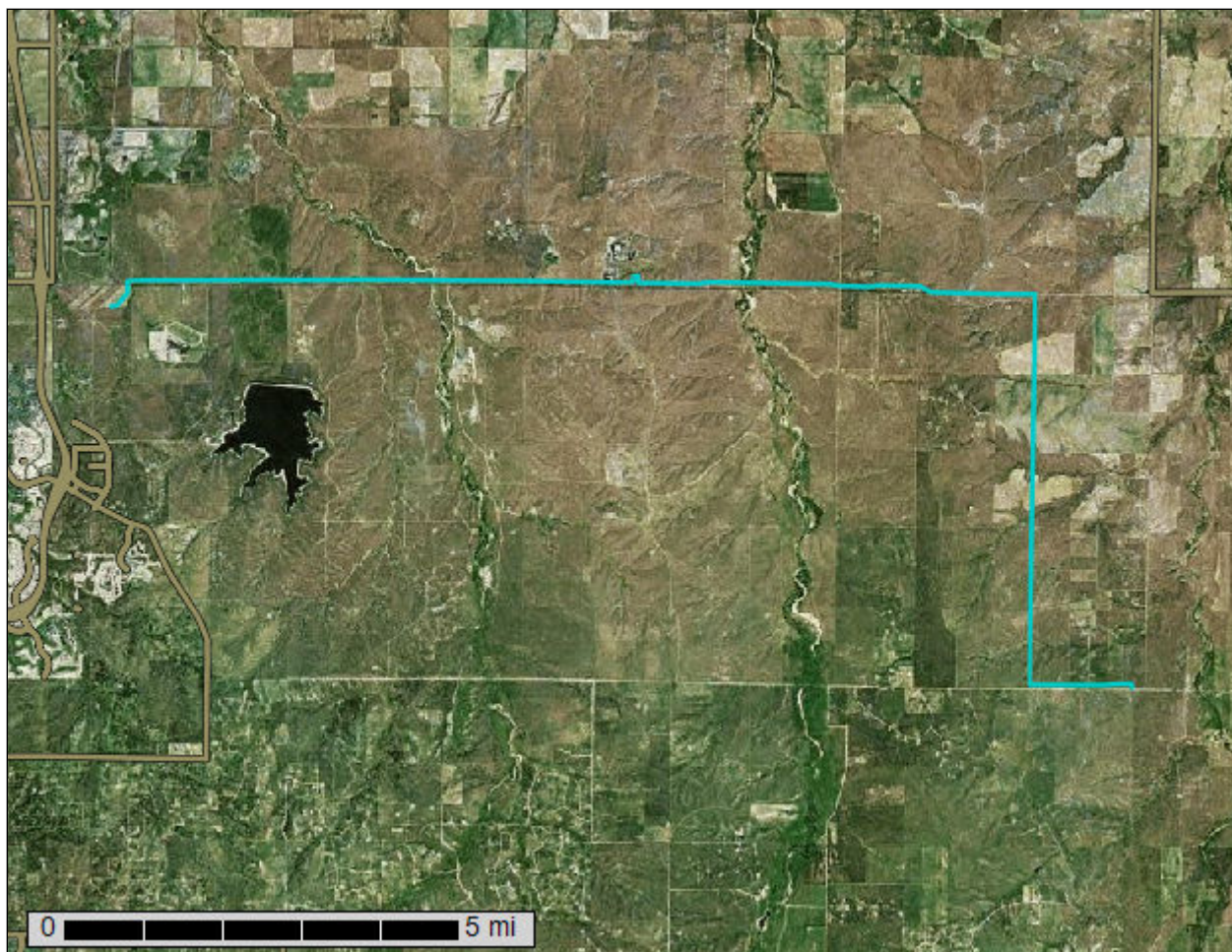
NRCS

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 Arapahoe County, Colorado; and Elbert County, Colorado, Western Part

**Xcel Tline: PWAY Segment 5
Arapahoe County Build**



Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

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

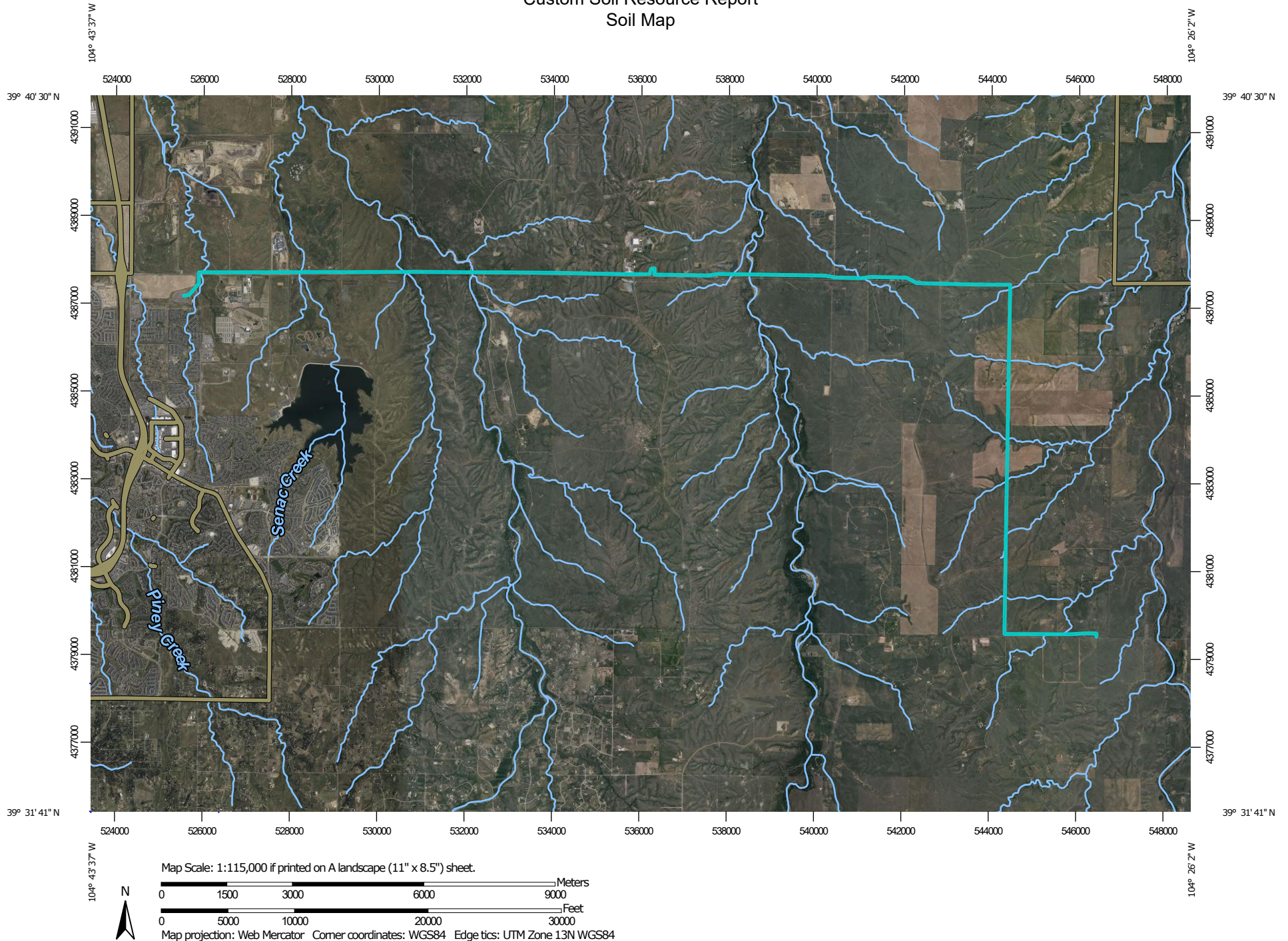
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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

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



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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 scales ranging from 1:20,000 to 1:24,000.

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: Arapahoe County, Colorado

Survey Area Data: Version 20, Aug 29, 2024

Soil Survey Area: Elbert County, Colorado, Western Part

Survey Area Data: Version 20, Aug 29, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Jun 9, 2021—Sep 1, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

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
AdC	Adena-Colby silt loams, 1 to 5 percent slopes	9.9	3.0%
BkB	Beckton loam, 0 to 3 percent slopes	1.5	0.4%
BsB	Bresser sandy loam, terrace, 0 to 3 percent slopes	6.9	2.0%
BvC	Bresser-Truckton sandy loams, 3 to 5 percent slopes	20.2	6.0%
BvE	Bresser-Truckton sandy loams, 5 to 20 percent slopes	25.4	7.6%
BxC	Buick loam, 3 to 5 percent slopes	11.5	3.4%
BxD	Buick loam, 5 to 9 percent slopes	4.6	1.4%
FdB	Fondis silt loam, 1 to 3 percent slopes	9.3	2.8%
FdC	Fondis silt loam, 3 to 5 percent slopes	31.8	9.5%
FoC	Fondis-Colby silt loams, 3 to 5 percent slopes	11.2	3.3%
Gr	Gravelly land	7.8	2.3%
HIB	Heldt clay, 0 to 3 percent slopes	0.0	0.0%
LcD	Litle silty clay loam, 1 to 9 percent slopes	5.3	1.6%
Lv	Loamy alluvial land	6.8	2.0%
NIB	Nunn loam, 1 to 3 percent slopes	1.0	0.3%
NrB	Nunn-Bresser-Ascalon complex, 0 to 3 percent slopes	18.0	5.4%
RhD	Renohill-Buick loams, 3 to 9 percent slopes	53.8	16.0%
RhE	Renohill-Buick loams, 9 to 20 percent slopes	4.8	1.4%
RID	Renohill-Litle clay loams, 3 to 9 percent slopes	6.3	1.9%
RtE	Renohill-Litle-Thedalund complex, 9 to 30 percent slopes	77.8	23.1%
Su	Sandy alluvial land	3.0	0.9%
Tc	Terrace escarpments	1.1	0.3%
TrC	Truckton loamy sand, 3 to 5 percent slopes	3.8	1.1%

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Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
TrD	Truckton loamy sand, 5 to 9 percent slopes	3.6	1.1%
WrB	Weld-Deertrail silt loams, 0 to 3 percent slopes	10.9	3.2%
Subtotals for Soil Survey Area		336.2	99.9%
Totals for Area of Interest		336.4	100.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
38	Renohill clay loam, 4 to 8 percent slopes	0.1	0.0%
Subtotals for Soil Survey Area		0.1	0.0%
Totals for Area of Interest		336.4	100.0%

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

Arapahoe County, Colorado

AdC—Adena-Colby silt loams, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 34xn

Elevation: 4,700 to 6,200 feet

Mean annual precipitation: 12 to 16 inches

Mean annual air temperature: 46 to 55 degrees F

Frost-free period: 120 to 170 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Adena and similar soils: 65 percent

Colby and similar soils: 25 percent

Minor components: 10 percent

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

Description of Adena

Setting

Landform: Hills, drainageways

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Eolian deposits

Typical profile

H1 - 0 to 2 inches: silt loam

H2 - 2 to 19 inches: clay loam

H3 - 19 to 60 inches: loam

Properties and qualities

Slope: 1 to 5 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): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: R067BY002CO - Loamy Plains

Hydric soil rating: No

Description of Colby

Setting

Landform: Hills

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Fine-loamy eolian deposits and/or fine-silty eolian deposits

Typical profile

H1 - 0 to 4 inches: silt loam

H2 - 4 to 60 inches: silt loam

Properties and qualities

Slope: 1 to 5 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): Moderately high to high
(0.57 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 20 percent

Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3c

Hydrologic Soil Group: B

Ecological site: R067BY002CO - Loamy Plains

Hydric soil rating: No

Minor Components

Weld

Percent of map unit: 7 percent

Hydric soil rating: No

Loamy alluvial land

Percent of map unit: 3 percent

Hydric soil rating: No

BkB—Beckton loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 34xv

Elevation: 3,500 to 5,500 feet

Mean annual precipitation: 14 to 16 inches

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Mean annual air temperature: 48 to 50 degrees F

Frost-free period: 150 to 170 days

Farmland classification: Not prime farmland

Map Unit Composition

Beckton and similar soils: 80 percent

Minor components: 20 percent

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

Description of Beckton

Setting

Landform: Stream terraces, drainageways, flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

H1 - 0 to 6 inches: loam

H2 - 6 to 14 inches: clay loam

H3 - 14 to 23 inches: silty clay loam

H4 - 23 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 48 to 72 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Gypsum, maximum content: 1 percent

Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum: 30.0

Available water supply, 0 to 60 inches: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: C

Ecological site: R067BY033CO - Salt Flat

Hydric soil rating: No

Minor Components

Nunn

Percent of map unit: 10 percent

Hydric soil rating: No

Heldt

Percent of map unit: 10 percent

Hydric soil rating: No

BsB—Bresser sandy loam, terrace, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 34y1

Elevation: 5,300 to 6,800 feet

Mean annual precipitation: 12 to 15 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 135 to 155 days

Farmland classification: Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

Map Unit Composition

Bresser, terrace, and similar soils: 80 percent

Minor components: 20 percent

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

Description of Bresser, Terrace

Setting

Landform: Stream terraces, drainageways

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Noncalcareous sandy alluvium and/or noncalcareous sandy eolian deposits

Typical profile

H1 - 0 to 6 inches: sandy loam

H2 - 6 to 21 inches: sandy clay loam

H3 - 21 to 28 inches: gravelly sandy loam

H4 - 28 to 60 inches: gravelly loamy coarse sand

Properties and qualities

Slope: 0 to 3 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): Moderately high to high (0.57 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 4c

Hydrologic Soil Group: B

Ecological site: R049XB210CO - Sandy Foothill

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Hydric soil rating: No

Minor Components

Bijou

Percent of map unit: 8 percent

Hydric soil rating: No

Olney

Percent of map unit: 7 percent

Hydric soil rating: No

Nunn

Percent of map unit: 5 percent

Hydric soil rating: No

BvC—Bresser-Truckton sandy loams, 3 to 5 percent slopes

Map Unit Setting

National map unit symbol: 34y5

Elevation: 4,500 to 6,800 feet

Mean annual precipitation: 12 to 18 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 125 to 180 days

Farmland classification: Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

Map Unit Composition

Bresser and similar soils: 55 percent

Truckton and similar soils: 30 percent

Minor components: 15 percent

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

Description of Bresser

Setting

Landform: Stream terraces, drainageways, playas

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Noncalcareous sandy alluvium and/or noncalcareous sandy eolian deposits

Typical profile

H1 - 0 to 6 inches: sandy loam

H2 - 6 to 26 inches: sandy clay loam

H3 - 26 to 32 inches: gravelly sandy loam

H4 - 32 to 60 inches: gravelly loamy coarse sand

Properties and qualities

Slope: 3 to 5 percent

Depth to restrictive feature: More than 80 inches

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Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Ecological site: R049XB210CO - Sandy Foothill

Hydric soil rating: No

Description of Truckton

Setting

Landform: Ridges

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Eolian deposits

Typical profile

H1 - 0 to 5 inches: sandy loam

H2 - 5 to 20 inches: sandy loam

H3 - 20 to 60 inches: sandy loam

Properties and qualities

Slope: 3 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 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 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: A

Ecological site: R049XB210CO - Sandy Foothill

Hydric soil rating: No

Minor Components

Nunn

Percent of map unit: 8 percent

Hydric soil rating: No

Ascalon

Percent of map unit: 7 percent

Hydric soil rating: No

BvE—Bresser-Truckton sandy loams, 5 to 20 percent slopes

Map Unit Setting

National map unit symbol: 34y6
Elevation: 4,500 to 6,800 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 125 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Bresser and similar soils: 50 percent
Truckton and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bresser

Setting

Landform: Stream terraces, drainageways
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Noncalcareous sandy alluvium and/or noncalcareous sandy eolian deposits

Typical profile

H1 - 0 to 5 inches: sandy loam
H2 - 5 to 16 inches: sandy clay loam
H3 - 16 to 28 inches: gravelly sandy loam
H4 - 28 to 60 inches: gravelly loamy coarse sand

Properties and qualities

Slope: 5 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B

Custom Soil Resource Report

Ecological site: R049XB210CO - Sandy Foothill

Hydric soil rating: No

Description of Truckton

Setting

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Eolian deposits

Typical profile

H1 - 0 to 5 inches: sandy loam

H2 - 5 to 17 inches: sandy loam

H3 - 17 to 60 inches: sandy loam

Properties and qualities

Slope: 5 to 20 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 (1.98 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 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: A

Ecological site: R049XB210CO - Sandy Foothill

Hydric soil rating: No

Minor Components

Ascalon

Percent of map unit: 10 percent

Hydric soil rating: No

Nunn

Percent of map unit: 5 percent

Hydric soil rating: No

BxC—Buick loam, 3 to 5 percent slopes

Map Unit Setting

National map unit symbol: 34y8

Elevation: 4,700 to 6,200 feet

Mean annual precipitation: 14 to 16 inches

Mean annual air temperature: 45 to 46 degrees F

Custom Soil Resource Report

Frost-free period: 150 to 170 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Buick and similar soils: 85 percent

Minor components: 15 percent

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

Description of Buick

Setting

Landform: Hills, drainageways

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Head slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium and/or eolian deposits

Typical profile

H1 - 0 to 6 inches: loam

H2 - 6 to 22 inches: clay loam

H3 - 22 to 60 inches: sandy clay loam

Properties and qualities

Slope: 3 to 5 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): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3c

Hydrologic Soil Group: C

Ecological site: R049XB202CO - Loamy Foothill

Hydric soil rating: No

Minor Components

Renohill

Percent of map unit: 5 percent

Hydric soil rating: No

Weld

Percent of map unit: 5 percent

Hydric soil rating: No

Colby

Percent of map unit: 5 percent

Hydric soil rating: No

BxD—Buick loam, 5 to 9 percent slopes

Map Unit Setting

National map unit symbol: 34y9
Elevation: 4,700 to 6,200 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 45 to 46 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Buick and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Buick

Setting

Landform: Hills, drainageways
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and/or eolian deposits

Typical profile

H1 - 0 to 5 inches: loam
H2 - 5 to 19 inches: clay loam
H3 - 19 to 60 inches: sandy clay loam

Properties and qualities

Slope: 5 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Ecological site: R049XB202CO - Loamy Foothill
Hydric soil rating: No

Minor Components

Colby

Percent of map unit: 10 percent
Hydric soil rating: No

Renohill

Percent of map unit: 10 percent
Hydric soil rating: No

FdB—Fondis silt loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 34yh
Elevation: 4,700 to 6,200 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Fondis and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fondis

Setting

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty and/or loamy

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 27 inches: clay
H3 - 27 to 60 inches: clay loam

Properties and qualities

Slope: 1 to 3 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): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3c

Hydrologic Soil Group: C

Ecological site: R049XB202CO - Loamy Foothill

Hydric soil rating: No

Minor Components

Weld

Percent of map unit: 10 percent

Hydric soil rating: No

Buick

Percent of map unit: 5 percent

Hydric soil rating: No

FdC—Fondis silt loam, 3 to 5 percent slopes

Map Unit Setting

National map unit symbol: 34yj

Elevation: 4,700 to 6,200 feet

Mean annual precipitation: 14 to 16 inches

Mean annual air temperature: 48 to 52 degrees F

Frost-free period: 150 to 170 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Fondis and similar soils: 85 percent

Minor components: 15 percent

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

Description of Fondis

Setting

Landform: Drainageways

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loamy and/or silty

Typical profile

H1 - 0 to 6 inches: silt loam

H2 - 6 to 24 inches: clay

H3 - 24 to 32 inches: silty clay loam

H4 - 32 to 46 inches: loam

H5 - 46 to 84 inches: clay loam

Properties and qualities

Slope: 3 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Custom Soil Resource Report

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Available water supply, 0 to 60 inches: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3c

Hydrologic Soil Group: C

Ecological site: R049XB202CO - Loamy Foothill

Hydric soil rating: No

Minor Components

Weld

Percent of map unit: 8 percent

Hydric soil rating: No

Buick

Percent of map unit: 7 percent

Hydric soil rating: No

FoC—Fondis-Colby silt loams, 3 to 5 percent slopes

Map Unit Setting

National map unit symbol: 34yl

Elevation: 4,700 to 6,200 feet

Mean annual precipitation: 12 to 16 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 150 to 170 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Fondis and similar soils: 65 percent

Colby and similar soils: 25 percent

Minor components: 10 percent

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

Description of Fondis

Setting

Landform: Drainageways

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Silty and/or loamy

Custom Soil Resource Report

Typical profile

H1 - 0 to 5 inches: silt loam
H2 - 5 to 17 inches: clay
H3 - 17 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 5 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): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 10.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: C
Ecological site: R049XB202CO - Loamy Foothill
Hydric soil rating: No

Description of Colby

Setting

Landform: Ridges
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy eolian deposits and/or fine-silty eolian deposits

Typical profile

H1 - 0 to 4 inches: silt loam
H2 - 4 to 60 inches: silt loam

Properties and qualities

Slope: 3 to 5 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): Moderately high to high (0.57 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: B
Ecological site: R049XB202CO - Loamy Foothill
Hydric soil rating: No

Minor Components

Weld

Percent of map unit: 6 percent

Hydric soil rating: No

Ft collins

Percent of map unit: 4 percent

Hydric soil rating: No

Gr—Gravelly land

Map Unit Setting

National map unit symbol: 34yn

Elevation: 4,700 to 6,200 feet

Mean annual precipitation: 12 to 14 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 150 to 170 days

Farmland classification: Not prime farmland

Map Unit Composition

Gravelly land: 83 percent

Minor components: 17 percent

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

Description of Gravelly Land

Setting

Landform: Hills, drainageways

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy or gravelly loamy

Typical profile

H1 - 0 to 4 inches: very gravelly sandy loam

H2 - 4 to 60 inches: very gravelly sand

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: A

Hydric soil rating: No

Minor Components

Thedalund

Percent of map unit: 10 percent

Hydric soil rating: No

Ascalon

Percent of map unit: 7 percent

Hydric soil rating: No

HIB—Heldt clay, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 34yp

Elevation: 4,000 to 6,200 feet

Mean annual precipitation: 11 to 15 inches

Mean annual air temperature: 46 to 59 degrees F

Frost-free period: 110 to 150 days

Farmland classification: Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

Map Unit Composition

Heldt and similar soils: 90 percent

Minor components: 10 percent

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

Description of Heldt

Setting

Landform: Stream terraces, drainageways, flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Eolian deposits

Typical profile

H1 - 0 to 4 inches: clay

H2 - 4 to 60 inches: clay

Properties and qualities

Slope: 0 to 3 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): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Gypsum, maximum content: 1 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 10.0

Available water supply, 0 to 60 inches: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3c

Hydrologic Soil Group: C

Ecological site: R067BY042CO - Clayey Plains

Hydric soil rating: No

Minor Components

Nunn

Percent of map unit: 7 percent

Hydric soil rating: No

Beckton

Percent of map unit: 3 percent

Hydric soil rating: No

LcD—Litle silty clay loam, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: 34yr

Elevation: 4,700 to 6,200 feet

Mean annual precipitation: 13 to 15 inches

Mean annual air temperature: 48 to 52 degrees F

Frost-free period: 150 to 170 days

Farmland classification: Not prime farmland

Map Unit Composition

Litle and similar soils: 77 percent

Minor components: 23 percent

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

Description of Litle

Setting

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Eolian deposits

Typical profile

H1 - 0 to 3 inches: silty clay loam

H2 - 3 to 39 inches: silty clay

H3 - 39 to 43 inches: weathered bedrock

Properties and qualities

Slope: 1 to 9 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Custom Soil Resource Report

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: R067BY047CO - Alkaline Plains
Hydric soil rating: No

Minor Components

Renohill

Percent of map unit: 10 percent
Hydric soil rating: No

Samsil

Percent of map unit: 10 percent
Hydric soil rating: No

Buick

Percent of map unit: 3 percent
Hydric soil rating: No

Lv—Loamy alluvial land

Map Unit Setting

National map unit symbol: 34yt
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 11 to 15 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Loamy alluvial land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Loamy Alluvial Land

Setting

Landform: Streams, drainageways, flood plains
Down-slope shape: Linear
Across-slope shape: Linear

Custom Soil Resource Report

Parent material: Loamy alluvium

Typical profile

H1 - 0 to 6 inches: loam

H2 - 6 to 60 inches: stratified loam to clay loam

Properties and qualities

Slope: 0 to 3 percent

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.20 to 2.00 in/hr)

Frequency of flooding: Occasional

Calcium carbonate, maximum content: 15 percent

Gypsum, maximum content: 1 percent

Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): 2w

Land capability classification (nonirrigated): 6w

Hydrologic Soil Group: B

Ecological site: R067BY036CO - Overflow

Hydric soil rating: No

Minor Components

Nunn

Percent of map unit: 10 percent

Hydric soil rating: No

Satanta

Percent of map unit: 5 percent

Landform: Paleoterraces

Hydric soil rating: No

NIB—Nunn loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tln2

Elevation: 3,900 to 6,250 feet

Mean annual precipitation: 13 to 16 inches

Mean annual air temperature: 46 to 54 degrees F

Frost-free period: 135 to 160 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Nunn and similar soils: 85 percent

Minor components: 15 percent

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

Description of Nunn

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Pleistocene aged alluvium and/or eolian deposits

Typical profile

Ap - 0 to 6 inches: loam
Bt1 - 6 to 10 inches: clay loam
Bt2 - 10 to 26 inches: clay loam
Btk - 26 to 31 inches: clay loam
Bk1 - 31 to 47 inches: loam
Bk2 - 47 to 80 inches: loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 7 percent
Maximum salinity: Nonsaline (0.1 to 1.0 mmhos/cm)
Sodium adsorption ratio, maximum: 0.5
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Minor Components

Wages

Percent of map unit: 8 percent
Landform: Terraces, alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Fort collins

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Custom Soil Resource Report

Ecological site: R067BY002CO - Loamy Plains

Hydric soil rating: No

Haverson, very rarely flooded

Percent of map unit: 2 percent

Landform: Terraces, drainageways, alluvial fans

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear, concave

Ecological site: R067BY036CO - Overflow

Hydric soil rating: No

NrB—Nunn-Bresser-Ascalon complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 34yw

Elevation: 4,500 to 6,800 feet

Mean annual precipitation: 12 to 18 inches

Mean annual air temperature: 46 to 57 degrees F

Frost-free period: 115 to 180 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Nunn and similar soils: 40 percent

Bresser and similar soils: 25 percent

Ascalon and similar soils: 20 percent

Minor components: 15 percent

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

Description of Nunn

Setting

Landform: Stream terraces, streams, playas

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Eolian deposits

Typical profile

H1 - 0 to 8 inches: loam

H2 - 8 to 28 inches: clay

H3 - 28 to 60 inches: sandy clay loam

Properties and qualities

Slope: 0 to 3 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): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Custom Soil Resource Report

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: C
Ecological site: R049XB202CO - Loamy Foothill
Hydric soil rating: No

Description of Bresser

Setting

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Noncalcareous sandy alluvium and/or noncalcareous sandy eolian deposits

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 26 inches: sandy clay loam
H3 - 26 to 60 inches: gravelly loamy coarse sand

Properties and qualities

Slope: 0 to 3 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): Moderately high to high (0.57 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R049XB202CO - Loamy Foothill
Hydric soil rating: No

Description of Ascalon

Setting

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Reworked by wind outwash

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 17 inches: sandy clay loam
H3 - 17 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 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): Moderately high to high
(0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R049XB202CO - Loamy Foothill
Hydric soil rating: No

Minor Components

Olney

Percent of map unit: 10 percent
Hydric soil rating: No

Aquic ustochrepts

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

RhD—Renohill-Buick loams, 3 to 9 percent slopes

Map Unit Setting

National map unit symbol: 34z0
Elevation: 3,600 to 6,200 feet
Mean annual precipitation: 11 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Renohill and similar soils: 65 percent
Buick and similar soils: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Renohill

Setting

Landform: Drainageways
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loam silty and clayey alluvium

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 18 inches: clay
H3 - 18 to 30 inches: clay loam
H4 - 30 to 34 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 9 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Description of Buick

Setting

Landform: Ridges
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and/or eolian deposits

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 20 inches: clay loam
H3 - 20 to 60 inches: sandy clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Custom Soil Resource Report

Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Minor Components

Fondis

Percent of map unit: 5 percent
Hydric soil rating: No

Litle

Percent of map unit: 5 percent
Hydric soil rating: No

RhE—Renohill-Buick loams, 9 to 20 percent slopes

Map Unit Setting

National map unit symbol: 34z1
Elevation: 3,600 to 6,200 feet
Mean annual precipitation: 11 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Renohill and similar soils: 67 percent
Buick and similar soils: 20 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Renohill

Setting

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clay loamy alluvium

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 14 inches: clay
H3 - 14 to 26 inches: clay loam
H4 - 26 to 30 inches: unweathered bedrock

Properties and qualities

Slope: 9 to 20 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R067BY008CO - Loamy Slopes
Hydric soil rating: No

Description of Buick

Setting

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and/or eolian deposits

Typical profile

H1 - 0 to 5 inches: loam
H2 - 5 to 22 inches: clay loam
H3 - 22 to 60 inches: sandy clay loam

Properties and qualities

Slope: 5 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Ecological site: R067BY008CO - Loamy Slopes
Hydric soil rating: No

Minor Components

Litle

Percent of map unit: 10 percent

Hydric soil rating: No

Fondis

Percent of map unit: 3 percent

Hydric soil rating: No

RID—Renohill-Litle clay loams, 3 to 9 percent slopes

Map Unit Setting

National map unit symbol: 34z3

Elevation: 3,600 to 6,200 feet

Mean annual precipitation: 11 to 16 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 100 to 170 days

Farmland classification: Not prime farmland

Map Unit Composition

Renohill and similar soils: 50 percent

Litle and similar soils: 40 percent

Minor components: 10 percent

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

Description of Renohill

Setting

Landform: Drainageways

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loam clayey alluvium

Typical profile

H1 - 0 to 5 inches: clay loam

H2 - 5 to 19 inches: clay

H3 - 19 to 26 inches: clay loam

H4 - 26 to 30 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 9 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Ecological site: R049XB208CO - Clayey Foothill

Hydric soil rating: No

Description of Litle

Setting

Landform: Knobs

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Eolian deposits

Typical profile

H1 - 0 to 3 inches: clay loam

H2 - 3 to 39 inches: silty clay

H3 - 39 to 43 inches: weathered bedrock

Properties and qualities

Slope: 3 to 9 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Gypsum, maximum content: 2 percent

Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum: 5.0

Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Ecological site: R049XB208CO - Clayey Foothill

Hydric soil rating: No

Minor Components

Buick

Percent of map unit: 5 percent

Hydric soil rating: No

Fondis

Percent of map unit: 3 percent

Hydric soil rating: No

Samsil

Percent of map unit: 2 percent

Hydric soil rating: No

RtE—Renohill-Litle-Thedalund complex, 9 to 30 percent slopes

Map Unit Setting

National map unit symbol: 34z4
Elevation: 3,600 to 6,200 feet
Mean annual precipitation: 11 to 16 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 100 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Renohill and similar soils: 40 percent
Litle and similar soils: 32 percent
Thedalund and similar soils: 20 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Renohill

Setting

Landform: Drainageways
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loam clayey

Typical profile

H1 - 0 to 3 inches: loam
H2 - 3 to 15 inches: clay
H3 - 15 to 24 inches: clay loam
H4 - 24 to 28 inches: unweathered bedrock

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D

Custom Soil Resource Report

Ecological site: R049XB208CO - Clayey Foothill

Hydric soil rating: No

Description of Litle

Setting

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Eolian deposits

Typical profile

H1 - 0 to 3 inches: silty clay loam

H2 - 3 to 30 inches: silty clay

H3 - 30 to 34 inches: weathered bedrock

Properties and qualities

Slope: 5 to 9 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Gypsum, maximum content: 2 percent

Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum: 5.0

Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Ecological site: R049XB208CO - Clayey Foothill

Hydric soil rating: No

Description of Thedalund

Setting

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Interbedded residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 5 inches: clay loam

H2 - 5 to 23 inches: loam

H3 - 23 to 27 inches: weathered bedrock

Properties and qualities

Slope: 9 to 30 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)

Depth to water table: More than 80 inches

Custom Soil Resource Report

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Minor Components

Buick

Percent of map unit: 5 percent
Hydric soil rating: No

Tassel

Percent of map unit: 3 percent
Hydric soil rating: No

Su—Sandy alluvial land

Map Unit Setting

National map unit symbol: 34zc
Elevation: 2,500 to 4,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 110 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Sandy alluvial land: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sandy Alluvial Land

Setting

Landform: Drainageways, streams
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium and/or loamy alluvium

Typical profile

H1 - 0 to 10 inches: sand
H2 - 10 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent

Drainage class: Somewhat excessively drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Frequency of flooding: Frequent

Calcium carbonate, maximum content: 10 percent

Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6w

Hydrologic Soil Group: A

Hydric soil rating: No

Minor Components

Bresser

Percent of map unit: 5 percent

Hydric soil rating: No

Tc—Terrace escarpments

Map Unit Setting

National map unit symbol: 34zj

Elevation: 3,500 to 6,500 feet

Mean annual precipitation: 12 to 15 inches

Mean annual air temperature: 46 to 55 degrees F

Frost-free period: 120 to 150 days

Farmland classification: Not prime farmland

Map Unit Composition

Terrace escarpments: 100 percent

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

Description of Terrace Escarpments

Setting

Landform: Terraces, streams, drainageways, cliffs

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Calcareous, stratified clayey and/or stratified, calcareous sandy

Typical profile

H1 - 0 to 3 inches: variable

H2 - 3 to 19 inches: gravelly sandy loam

H3 - 19 to 24 inches: weathered bedrock

Properties and qualities

Slope: 10 to 60 percent

Custom Soil Resource Report

Depth to restrictive feature: 10 to 30 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high
(0.06 to 2.00 in/hr)
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Hydric soil rating: No

TrC—Truckton loamy sand, 3 to 5 percent slopes

Map Unit Setting

National map unit symbol: 31gry
Elevation: 4,200 to 5,600 feet
Mean annual precipitation: 12 to 17 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 125 to 155 days

Map Unit Composition

Truckton and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Truckton

Setting

Landform: Hills
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Wind re-worked alluvium derived from arkose

Typical profile

A - 0 to 6 inches: loamy sand
Bt1 - 6 to 10 inches: sandy loam
Bt2 - 10 to 16 inches: sandy loam
C - 16 to 80 inches: loamy coarse sand

Properties and qualities

Slope: 3 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.13 to 7.09 in/hr)

Custom Soil Resource Report

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.1 to 2.0 mmhos/cm)
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: R067BY024CO - Sandy Plains
Hydric soil rating: No

Minor Components

Vona

Percent of map unit: 8 percent
Landform: Hills, dunes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: R067BY024CO - Sandy Plains
Hydric soil rating: No

Valent

Percent of map unit: 5 percent
Landform: Dunes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: R067BY015CO - Deep Sand
Hydric soil rating: No

Blakeland

Percent of map unit: 3 percent
Landform: Hills, interfluves
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: R067BY015CO - Deep Sand
Hydric soil rating: No

Bresser

Percent of map unit: 2 percent
Landform: Interfluves
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY024CO - Sandy Plains
Hydric soil rating: No

Urban land

Percent of map unit: 2 percent
Hydric soil rating: No

TrD—Truckton loamy sand, 5 to 9 percent slopes

Map Unit Setting

National map unit symbol: 31gjz
Elevation: 4,200 to 5,600 feet
Mean annual precipitation: 12 to 17 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 125 to 155 days

Map Unit Composition

Truckton and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Truckton

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Wind re-worked alluvium derived from arkose

Typical profile

A - 0 to 6 inches: loamy sand
Bt1 - 6 to 10 inches: sandy loam
Bt2 - 10 to 16 inches: sandy loam
C - 16 to 80 inches: loamy coarse sand

Properties and qualities

Slope: 5 to 9 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 (2.13 to 7.09 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.1 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R067BY015CO - Deep Sand
Hydric soil rating: No

Minor Components

Valent

Percent of map unit: 8 percent
Landform: Dunes
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: R067BY015CO - Deep Sand
Hydric soil rating: No

Vona

Percent of map unit: 7 percent
Landform: Hills, dunes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: R067BY015CO - Deep Sand
Hydric soil rating: No

Blakeland

Percent of map unit: 2 percent
Landform: Hills, interfluves
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: R067BY015CO - Deep Sand
Hydric soil rating: No

Urban land

Percent of map unit: 2 percent
Hydric soil rating: No

Bresser

Percent of map unit: 1 percent
Landform: Interfluves
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY024CO - Sandy Plains
Hydric soil rating: No

WrB—Weld-Deertrail silt loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 34zv
Elevation: 3,600 to 6,200 feet
Mean annual precipitation: 13 to 17 inches

Custom Soil Resource Report

Mean annual air temperature: 46 to 55 degrees F

Frost-free period: 100 to 170 days

Farmland classification: Not prime farmland

Map Unit Composition

Weld and similar soils: 60 percent

Deertrail and similar soils: 25 percent

Minor components: 15 percent

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

Description of Weld

Setting

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loam silty and clayey eolian deposits

Typical profile

H1 - 0 to 5 inches: silt loam

H2 - 5 to 14 inches: silty clay

H3 - 14 to 26 inches: silty clay loam

H4 - 26 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 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): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 6 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3c

Hydrologic Soil Group: C

Ecological site: R067BY002CO - Loamy Plains

Hydric soil rating: No

Description of Deertrail

Setting

Landform: Depressions

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

H1 - 0 to 2 inches: silt loam

H2 - 2 to 9 inches: clay

H3 - 9 to 12 inches: silty clay

H4 - 12 to 32 inches: silty clay loam

H5 - 32 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 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): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 35.0
Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: R067BY047CO - Alkaline Plains
Hydric soil rating: No

Minor Components

Heldt

Percent of map unit: 7 percent
Hydric soil rating: No

Colby

Percent of map unit: 6 percent
Hydric soil rating: No

Adena

Percent of map unit: 2 percent
Hydric soil rating: No

Elbert County, Colorado, Western Part

38—Renohill clay loam, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: jnk_v

Elevation: 5,300 to 6,400 feet

Mean annual precipitation: 14 to 17 inches

Farmland classification: Not prime farmland

Map Unit Composition

Renohill and similar soils: 80 percent

Minor components: 20 percent

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

Description of Renohill

Setting

Landform: Hills, ridges

Landform position (three-dimensional): Side slope, crest

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 2 inches: clay loam

H2 - 2 to 14 inches: clay

H3 - 14 to 24 inches: clay loam

H4 - 24 to 28 inches: unweathered bedrock

Properties and qualities

Slope: 4 to 8 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (K_{sat}): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: R049XB208CO - Clayey Foothill

Hydric soil rating: No

Minor Components

Kutch

Percent of map unit: 6 percent

Hydric soil rating: No

Custom Soil Resource Report

Cushman

Percent of map unit: 6 percent

Hydric soil rating: No

Wiley

Percent of map unit: 5 percent

Hydric soil rating: No

Baca

Percent of map unit: 3 percent

Hydric soil rating: No

Soil Information for All Uses

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.

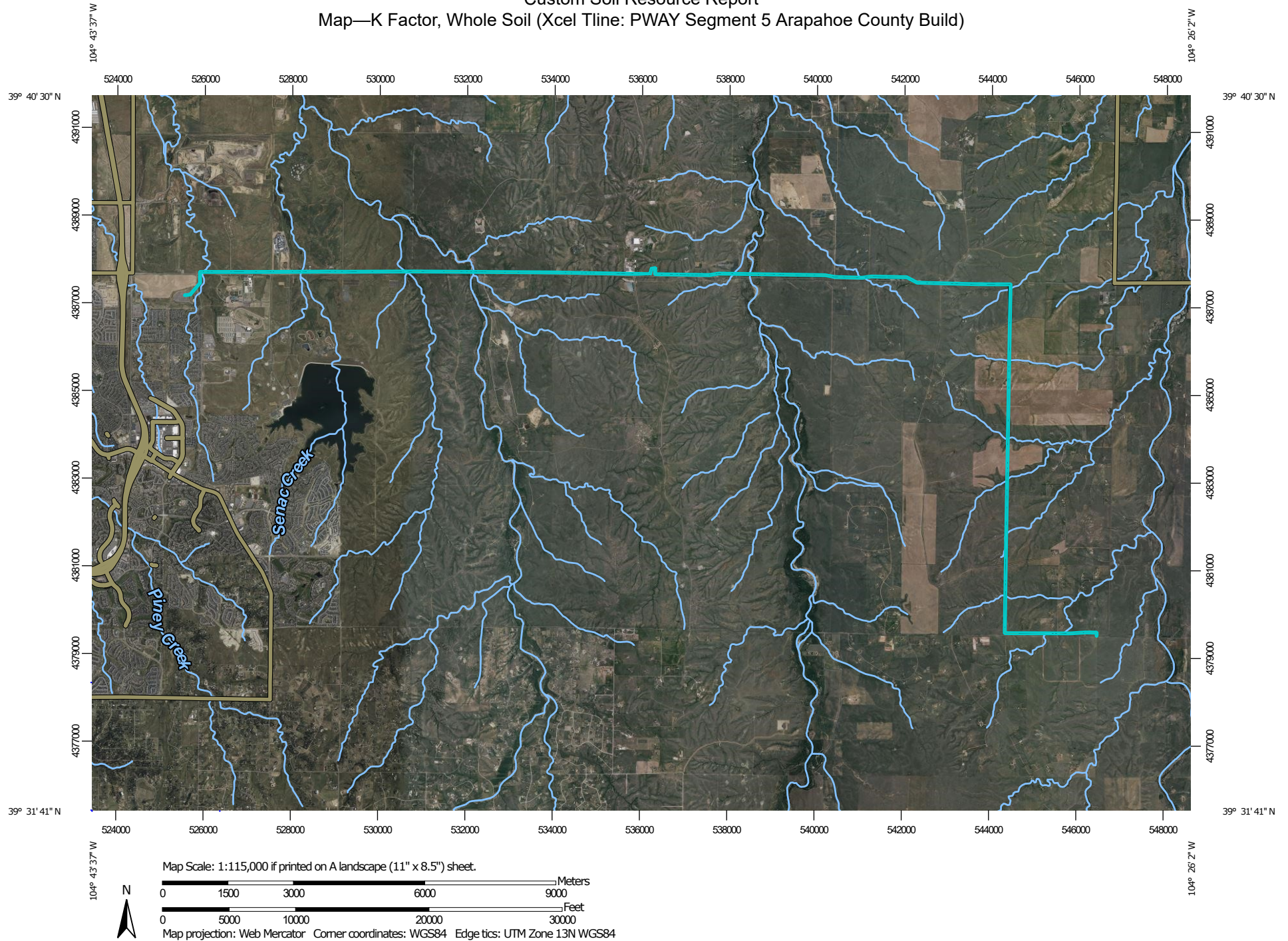
K Factor, Whole Soil (Xcel Tline: PWAY Segment 5 Arapahoe County Build)

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 Kw (whole soil)" indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

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

Custom Soil Resource Report
 Map—K Factor, Whole Soil (Xcel Tline: PWAY Segment 5 Arapahoe County Build)



Custom Soil Resource Report

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
	Rails
	Interstate Highways
	US Routes
	Major Roads
	Local Roads
	Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:24,000.

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: Arapahoe County, Colorado
Survey Area Data: Version 20, Aug 29, 2024

Soil Survey Area: Elbert County, Colorado, Western Part
Survey Area Data: Version 20, Aug 29, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Jun 9, 2021—Sep 1, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

**Table—K Factor, Whole Soil (Xcel Tline: PWAY Segment 5
Arapahoe County Build)**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AdC	Adena-Colby silt loams, 1 to 5 percent slopes	.37	9.9	3.0%
BkB	Beckton loam, 0 to 3 percent slopes	.37	1.5	0.4%
BsB	Bresser sandy loam, terrace, 0 to 3 percent slopes	.15	6.9	2.0%
BvC	Bresser-Truckton sandy loams, 3 to 5 percent slopes	.15	20.2	6.0%
BvE	Bresser-Truckton sandy loams, 5 to 20 percent slopes	.15	25.4	7.6%
BxC	Buick loam, 3 to 5 percent slopes	.49	11.5	3.4%
BxD	Buick loam, 5 to 9 percent slopes	.49	4.6	1.4%
FdB	Fondis silt loam, 1 to 3 percent slopes	.37	9.3	2.8%
FdC	Fondis silt loam, 3 to 5 percent slopes	.37	31.8	9.5%
FoC	Fondis-Colby silt loams, 3 to 5 percent slopes	.37	11.2	3.3%
Gr	Gravelly land	.10	7.8	2.3%
HIB	Heldt clay, 0 to 3 percent slopes	.17	0.0	0.0%
LcD	Litle silty clay loam, 1 to 9 percent slopes	.32	5.3	1.6%
Lv	Loamy alluvial land	.37	6.8	2.0%
NIB	Nunn loam, 1 to 3 percent slopes	.43	1.0	0.3%
NrB	Nunn-Bresser-Ascalon complex, 0 to 3 percent slopes	.32	18.0	5.4%
RhD	Renohill-Buick loams, 3 to 9 percent slopes	.32	53.8	16.0%
RhE	Renohill-Buick loams, 9 to 20 percent slopes	.32	4.8	1.4%
RID	Renohill-Litle clay loams, 3 to 9 percent slopes	.28	6.3	1.9%
RtE	Renohill-Litle-Thedalund complex, 9 to 30 percent slopes	.32	77.8	23.1%
Su	Sandy alluvial land	.10	3.0	0.9%
Tc	Terrace escarpments	.20	1.1	0.3%

Custom Soil Resource Report

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
TrC	Truckton loamy sand, 3 to 5 percent slopes	.17	3.8	1.1%
TrD	Truckton loamy sand, 5 to 9 percent slopes	.17	3.6	1.1%
WrB	Weld-Deertrail silt loams, 0 to 3 percent slopes	.32	10.9	3.2%
Subtotals for Soil Survey Area			336.2	99.9%
Totals for Area of Interest			336.4	100.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
38	Renohill clay loam, 4 to 8 percent slopes	.20	0.1	0.0%
Subtotals for Soil Survey Area			0.1	0.0%
Totals for Area of Interest			336.4	100.0%

Rating Options—K Factor, Whole Soil (Xcel Tline: PWAY Segment 5 Arapahoe County Build)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

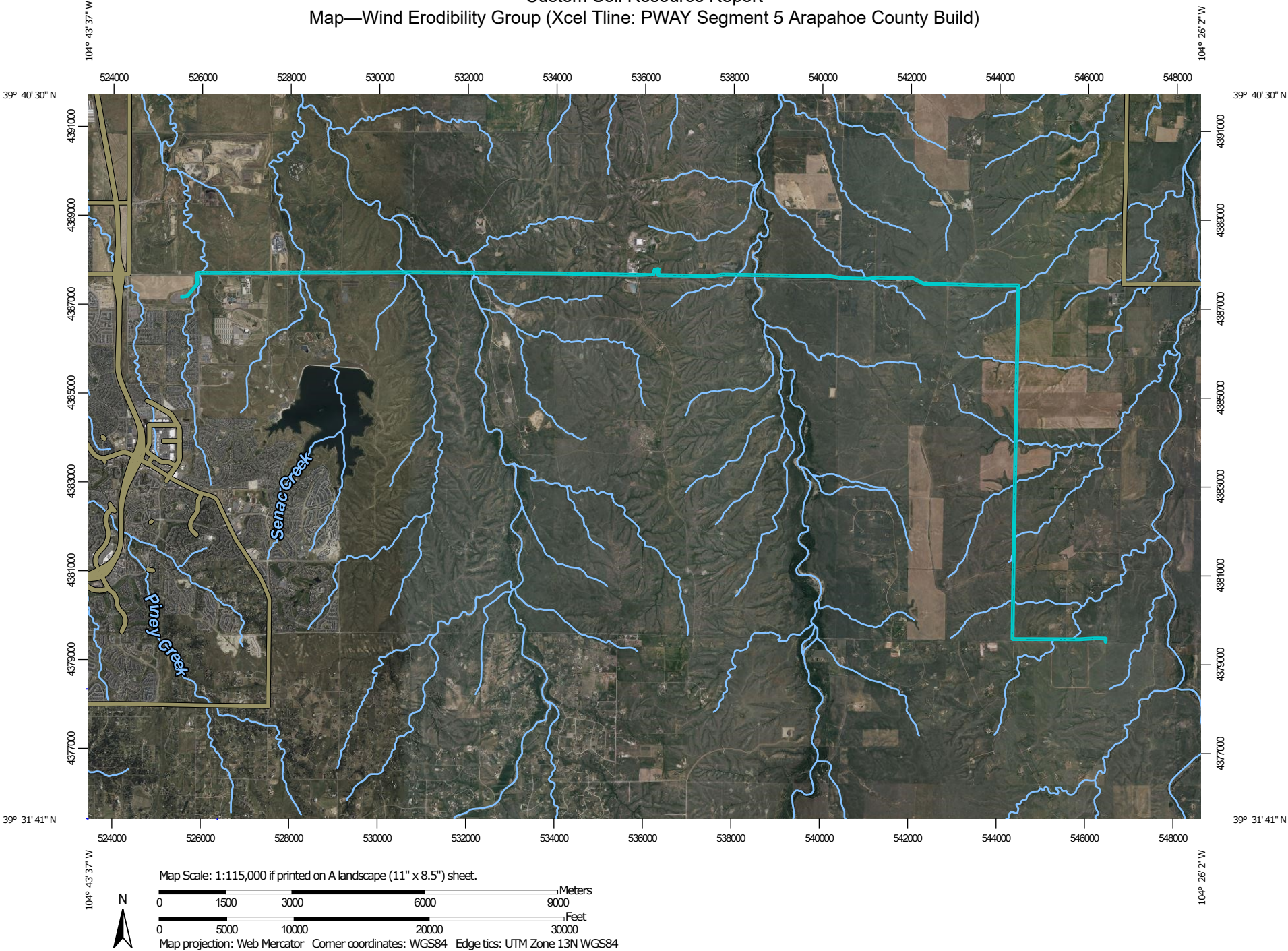
Tie-break Rule: Higher

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

Wind Erodibility Group (Xcel Tline: PWAY Segment 5 Arapahoe County Build)

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 (Xcel Tline: PWAY Segment 5 Arapahoe County Build)



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

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:24,000.

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: Arapahoe County, Colorado

Survey Area Data: Version 20, Aug 29, 2024

Soil Survey Area: Elbert County, Colorado, Western Part

Survey Area Data: Version 20, Aug 29, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Jun 9, 2021—Sep 1, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

**Table—Wind Erodibility Group (Xcel Tline: PWAY Segment 5
Arapahoe County Build)**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AdC	Adena-Colby silt loams, 1 to 5 percent slopes	6	9.9	3.0%
BkB	Beckton loam, 0 to 3 percent slopes	5	1.5	0.4%
BsB	Bresser sandy loam, terrace, 0 to 3 percent slopes	3	6.9	2.0%
BvC	Bresser-Truckton sandy loams, 3 to 5 percent slopes	3	20.2	6.0%
BvE	Bresser-Truckton sandy loams, 5 to 20 percent slopes	3	25.4	7.6%
BxC	Buick loam, 3 to 5 percent slopes	5	11.5	3.4%
BxD	Buick loam, 5 to 9 percent slopes	5	4.6	1.4%
FdB	Fondis silt loam, 1 to 3 percent slopes	6	9.3	2.8%
FdC	Fondis silt loam, 3 to 5 percent slopes	6	31.8	9.5%
FoC	Fondis-Colby silt loams, 3 to 5 percent slopes	6	11.2	3.3%
Gr	Gravelly land	8	7.8	2.3%
HIB	Heldt clay, 0 to 3 percent slopes	4	0.0	0.0%
LcD	Litle silty clay loam, 1 to 9 percent slopes	6	5.3	1.6%
Lv	Loamy alluvial land	5	6.8	2.0%
NIB	Nunn loam, 1 to 3 percent slopes	5	1.0	0.3%
NrB	Nunn-Bresser-Ascalon complex, 0 to 3 percent slopes	3	18.0	5.4%
RhD	Renohill-Buick loams, 3 to 9 percent slopes	6	53.8	16.0%
RhE	Renohill-Buick loams, 9 to 20 percent slopes	6	4.8	1.4%
RID	Renohill-Litle clay loams, 3 to 9 percent slopes	6	6.3	1.9%
RtE	Renohill-Litle-Thedalund complex, 9 to 30 percent slopes	6	77.8	23.1%
Su	Sandy alluvial land	1	3.0	0.9%
Tc	Terrace escarpments	3	1.1	0.3%

Custom Soil Resource Report

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
TrC	Truckton loamy sand, 3 to 5 percent slopes	2	3.8	1.1%
TrD	Truckton loamy sand, 5 to 9 percent slopes	2	3.6	1.1%
WrB	Weld-Deertrail silt loams, 0 to 3 percent slopes	6	10.9	3.2%
Subtotals for Soil Survey Area			336.2	99.9%
Totals for Area of Interest			336.4	100.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
38	Renohill clay loam, 4 to 8 percent slopes	6	0.1	0.0%
Subtotals for Soil Survey Area			0.1	0.0%
Totals for Area of Interest			336.4	100.0%

Rating Options—Wind Erodibility Group (Xcel Tline: PWAY Segment 5 Arapahoe County Build)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Xcel Tline: PWAY Segment 5 Arapahoe County Build)

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

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

Custom Soil Resource Report

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

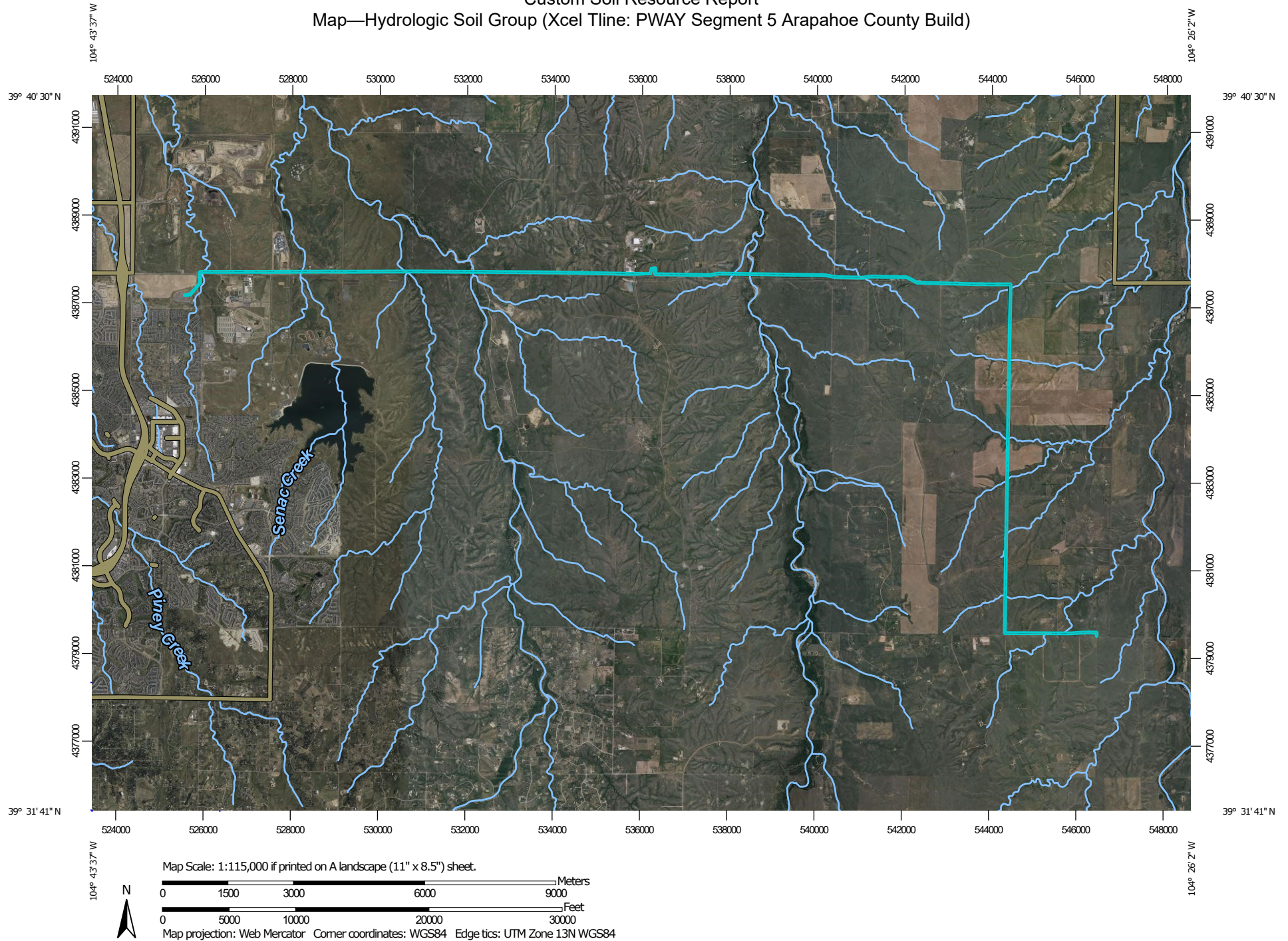
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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

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

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

Custom Soil Resource Report
Map—Hydrologic Soil Group (Xcel Tline: PWAY Segment 5 Arapahoe County Build)



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:24,000.

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: Arapahoe County, Colorado

Survey Area Data: Version 20, Aug 29, 2024

Soil Survey Area: Elbert County, Colorado, Western Part

Survey Area Data: Version 20, Aug 29, 2024

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Jun 9, 2021—Sep 1, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

**Table—Hydrologic Soil Group (Xcel Tline: PWAY Segment 5
Arapahoe County Build)**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AdC	Adena-Colby silt loams, 1 to 5 percent slopes	C	9.9	3.0%
BkB	Beckton loam, 0 to 3 percent slopes	C	1.5	0.4%
BsB	Bresser sandy loam, terrace, 0 to 3 percent slopes	B	6.9	2.0%
BvC	Bresser-Truckton sandy loams, 3 to 5 percent slopes	B	20.2	6.0%
BvE	Bresser-Truckton sandy loams, 5 to 20 percent slopes	B	25.4	7.6%
BxC	Buick loam, 3 to 5 percent slopes	C	11.5	3.4%
BxD	Buick loam, 5 to 9 percent slopes	C	4.6	1.4%
FdB	Fondis silt loam, 1 to 3 percent slopes	C	9.3	2.8%
FdC	Fondis silt loam, 3 to 5 percent slopes	C	31.8	9.5%
FoC	Fondis-Colby silt loams, 3 to 5 percent slopes	C	11.2	3.3%
Gr	Gravelly land	A	7.8	2.3%
HIB	Heldt clay, 0 to 3 percent slopes	C	0.0	0.0%
LcD	Litle silty clay loam, 1 to 9 percent slopes	D	5.3	1.6%
Lv	Loamy alluvial land	B	6.8	2.0%
NIB	Nunn loam, 1 to 3 percent slopes	C	1.0	0.3%
NrB	Nunn-Bresser-Ascalon complex, 0 to 3 percent slopes	B	18.0	5.4%
RhD	Renohill-Buick loams, 3 to 9 percent slopes	D	53.8	16.0%
RhE	Renohill-Buick loams, 9 to 20 percent slopes	D	4.8	1.4%
RID	Renohill-Litle clay loams, 3 to 9 percent slopes	D	6.3	1.9%
RtE	Renohill-Litle-Thedalund complex, 9 to 30 percent slopes	D	77.8	23.1%
Su	Sandy alluvial land	A	3.0	0.9%
Tc	Terrace escarpments	D	1.1	0.3%

Custom Soil Resource Report

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
TrC	Truckton loamy sand, 3 to 5 percent slopes	A	3.8	1.1%
TrD	Truckton loamy sand, 5 to 9 percent slopes	A	3.6	1.1%
WrB	Weld-Deertrail silt loams, 0 to 3 percent slopes	C	10.9	3.2%
Subtotals for Soil Survey Area			336.2	99.9%
Totals for Area of Interest			336.4	100.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
38	Renohill clay loam, 4 to 8 percent slopes	C	0.1	0.0%
Subtotals for Soil Survey Area			0.1	0.0%
Totals for Area of Interest			336.4	100.0%

Rating Options—Hydrologic Soil Group (Xcel Tline: PWAY Segment 5 Arapahoe County Build)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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