STORMWATER MANAGEMENT PLAN

MONUMENT HILL BUSINESS CENTER

LOT 3, GREATER EUROPE MISSION SUBDIVISION FILING NO. 1

1945 Deer Creek Road
El Paso County, Colorado

PREPARED FOR OWNER/DEVELOPER/SWMP ADMINISTRATOR:

SIEVERS BUSINESS CENTER, LLC
16152 Old Forest Point, Unit2-202
Monument, CO 80132
Phone:
Contact: Stan Sievers
Email: stansrco@aol.com

PREPARED BY:

KELLY DEVELOPMENT SERVICES, LLC
9301 Scrub Oak Drive
Lone Tree, Colorado 80124
Phone: 303-888-6338
Contact: Greg Kelly, PE
Email: greg@kellydev.com

CONTRACTOR:

TBD

September 20, 2017

PCD Project No. PPR-17-007

ENGINEERS CERTIFICATION:

This Stormwater Management Plan for Monument Hill Business Center was prepared by me (or under my direct supervision) in accordance with the provisions of El Paso County and the State of Colorado.

_____

Greg S. Kelly
Colorado Registered Engineer No. 15813

Table of Contents

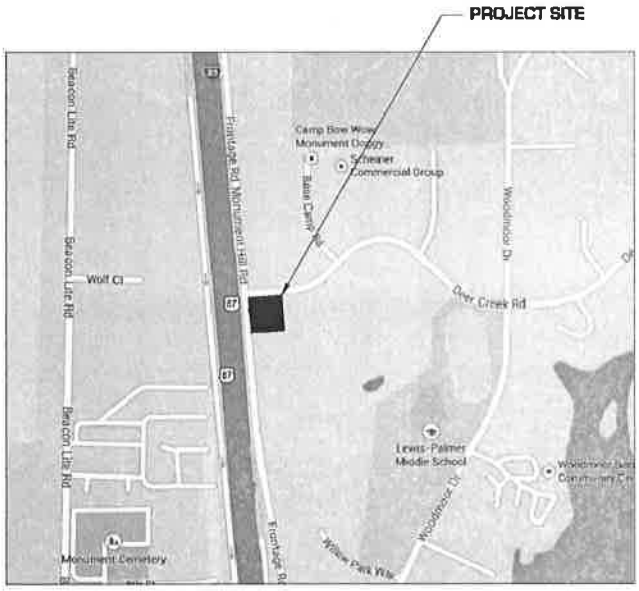
STORMWATER MANAGEMENT PLAN

Project Location

The Monument Hill Business Center project is located at the northeast corner of the intersection of Monument Hill Road and Deer Creek Road in El Paso County, Colorado. The site address is 1945 Deer Creek Road. The site is located within the Southwest Quarter of Section 11, Township 11 South, Range 67 West of the 6th P. M., County of El Paso, State of Colorado. These property is platted as Lot 3, Greater Europe Missions Subdivision Filing No. 1.

The site is 3.27 acres bounded on the north by Deer Creek Road; on the east by an RV and Self-Storage facility on Lot18A, Woodmoor Business Technological Park 3; to the south by a church on Lot 20A Woodmoor Business Technological Park Filing No. 1A; and to the west by Monument Hill Road.

Vicinity Map



VICINITY MAP

Project Description

The nature and purpose of the land disturbing activities are for the development OF a small office/warehouse facility consisting of two buildings of 14,000 SF and 17,500 SF with access drives, parking spaces and landscaped areas.

Existing Site Conditions

The site is currently vacant and is approximately 95% covered by native grasses and weeds. The ground surface slopes to the southwest at approximately a 2 to 3 percent slope. There are no

wetlands or non-stormwater discharges on the site.

Receiving Waters

The receiving waters for stormwater runoff is the Crystal Creek tributary to Monument Creek. The site is not located within a floodplain as shown on the FEMA FIRM Map No. 08041CO276F dated March 17, 1997. The site is located within unshaded Zone X. This zone is described as "Areas determined to be outside the 0.2% annual chance floodplain". The on-site stormwater detention /water quality pond discharges to an existing storm sewer flow westerly under Monument Hill Road and Interstate 25.

Adjacent Areas

The site slopes to the southwest onto Monument Hill Road and to adjacent property to the south that contains a church and parking lots.

Soils

The soil is classified as Tomah-Crowfoot loamy sands, which are considered as Hydrologic Soil Type B. The soil is well drained with a low runoff class, thus the erosion potential is slight to moderate.

Runoff Coefficients

The existing runoff coefficient is 0.35 for the 100-year event. The developed runoff coefficient for the 100-year storm will be 0.76

Potential Pollutants

Once constructed, there are no significant potential pollutants anticipated to be stored on the site. The self-storage facility prohibits any type of chemicals, fuels, hazardous materials, etc. from being stored on-site.

During construction, potential pollutants that could be encountered include, but are not limited to vehicle fueling, concrete waste, form oil, paints and stains, sediment, trash, portable toilet waste, etc.

Soils Borings/Test and Groundwater

Soils borings and tests were conducted in December 2016 by Kleinfelder. There were no contaminated materials discovered that would require remediation and disposal. Groundwater was not encountered during the exploration to the maximum depth of 21 feet.

Area and Earthwork Volumes

The site is 3.27 acres. The area of disturbance is 3.32 acres, slightly larger than the site due to the need for some off-site grading at the entrance from Monument Hill Road.

Erosion Control Measures Implementation

Prior to any earth moving or construction activities, the following BMP will be installed:

- Construction Fence
- Silt Fence

- Vehicle Tracking Control
- Sediment Basin
- Diversion Ditches
- Curb Socks
- Stabilized Staging Area
- Concrete Washout Area
- Check Dam

All of these sediment control measures should minimize any sediment from leaving the site. Should some sediment enter the existing access drives south of the site, off-site curb socks should minimize any sediment reaching the existing storm sewer system.

Once these measures are in place, earthwork operations will commence. Upon completion of the earthwork, utility installation will start. During all phases of construction, especially after rainfall events, the BMPs will be inspected and maintained. Maintenance of the BMPs is discussion further on in this report.

Upon completion of the utility installation, the following BMPs will be installed:

- Inlet protection

All of the BMPs listed above will remain in place until completion of construction and final stabilization, with the exception of the sediment basin, which will be removed for site final grading and paving.

Good housekeeping management practices shall be followed by the contractor to prevent pollution associated with solid, liquid and hazardous construction related materials and wastes. These practices should include:

- Provide for waste management – Designate waste/trash collection areas on site. Locate these areas away from streets, gutters and storm inlets. Segregate and provide for proper disposal options for hazardous materials waste. Empty waste containers before they are full.
- Clean up litter and trash on a daily basis.
- Provide convenient, well-maintained and properly located toilet facilities away from gutter and inlets. Tie down or stake down portable toilets. Assure frequent pump-out of those facilities.
- Provide secondary containment for fuels, paints and stains, hazardous and toxic material wastes.
- Establish proper equipment and vehicle fueling and maintenance procedures.
- Establish proper building material handling and staging areas.
- Minimize the excess use of water on-site during construction. Any allowable non-stormwater discharge of water should be routed to the BMPs.
- Develop a spill prevention and response plan. A spill response plan is included in Appendix A of this report. This plan was adopted from a City of Aurora standard procedure.

Schedule

The following is an anticipated schedule for the project:

Install Initial BMPs	June, 2017
Start Site Grading	June, 2017
Complete Site Grading	August, 2017
Start Utility Installation	August, 2017
Complete Utility Installation	October, 2017
Install Inlet Protection BMP	October, 2017
Start Building Construction	October, 2017
Remove Sediment Basin	February, 2018
Start Site Paving	February, 2018
Final Site Stabilization	March. 2018
Remove BMPs	March, 2018

Permanent Stabilization

The majority of the site will consist of buildings and concrete pavement. Permanent stabilization will consist of the site paving, permanent seeding and landscaping.

Inspection and Maintenance

The following inspection and maintenance procedures shall be used for each BMP:

Construction Fence – Inspect on a daily basis. Inspect within 24 hours of a storm. Repair or replace damage such as rips and sags. Construction fence shall remain in place until final stabilization is approved.

Silt Fence - Inspect on a daily basis. Inspect within 24 hours of a storm. Repair or replace damage such as rips and sags. Remove sediment accumulation upstream of the silt fence when the accumulation is approximately 6". Silt fence shall remain in place until final stabilization is approved.

Vehicle Tracking Control – Inspect on a daily basis. Replace rock and regrade as needed to maintain a consistent depth. Remove sediment tracked onto paved access road throughout the day and at the end of the day by sweeping and shoveling. Vehicle tracking control shall remain in place until site paving is complete.

Stabilized Staging Area – Inspect on a daily basis. Replace rock and regrade as necessary if rutting occurs or underlying subgrade is exposed. Stabilized staging area shall remain in place until final site paving is complete.

Concrete Washout Area – Inspect on a daily basis. The Concrete washout area shall be repaired, cleaned or enlarged as necessary to maintain capacity for concrete waste. Concrete materials, accumulated in pit, shall be removed once the they have reached a depth of 2". Concrete washout water, wasted pieces of concrete and all other debris in the pit shall be transported

from the job site in a water-tight container and disposed of properly in accordance with local requirements. The concrete washout area shall remain in place until all concrete for the project is placed.

Inlet Protection – Inspect daily. Sediment accumulation upstream of inlet protection shall be removed as necessary to maintain BMP effectiveness, typically when the accumulation reaches one-half of the height of the cinder block/rock sock protection. Inlet protection shall be removed upon approval of final stabilization.

Rock Sock – Inspect daily. Replace rock socks that become heavily soiled or damaged. Sediment accumulated upstream of rock socks shall be removed as needed to maintain the functionality of the BMP or when the depth of accumulation is approximately one-half of the height of the rock sock.

Sediment Basin – Inspect on a weekly basis and as soon as possible (minimum within 24 hours) of any rainfall event. Inspect daily during periods of prolonged rainfall. Accumulated sediment shall be removed before the sediment reaches one-half of the basin volume. The sediment basin shall remain in place until final site paving is complete.

SWMP Plan Revisions

Typically, the SWMP plan is considered a work in progress or a "living" document. The contractor will mark up the SWMP Plan in the field with any revisions, additions or deletions to the plan as they occur. The contractor will review the updated plan with the county inspector during their dite visits.

Conclusion

This Stormwater Management Plan for the Monument Hill Business Center site is in conformance to Engineering Criteria Manual, standards and practices established by El Paso County.

APPENDIX A

SPILL RESPONSE PLAN

Spill Response Plan

Upon detection of any spill, the first action to be taken is to ensure personal safety. All possible ignition sources, including running engines, electrical equipment (including cellular telephones, etc.), or other hazards will be immediately turned off or removed from the area. The extent of the spill and the nature of the spilled material will be evaluated to determine if remedial actions could result in any health hazards, escalation of the spill, or further damage that would intensify the problem. If such conditions exist, a designated employee will oversee the area of the spill and the construction Permittee will be notified immediately.

The source of the spill will be identified and if possible the flow of pollutants stopped if it can be done safely. However, no one should attend to the source or begin cleanup of the spill until ALL emergency priorities (fire, injuries, etc.) have been addressed.

Small Spills

Small spills (usually <5 gallons) consist of minor quantities of gasoline, oil, anti-freeze, or other materials that can be cleaned up by a single employee using readily available materials. The following procedures should be used for clean-up of small spills:

a. Ensure personal safety, evaluate the spill, and if possible, stop the flow of pollutants.
b. Contain the spread of the spill using absorbents, portable berms, sandbags, or other available measures.
c. Spread absorbent materials on the area to soak up as much of the liquid as possible and to prevent infiltration into the soil.
d. Once the liquids have been absorbed, remove all absorbents from the spill and place the materials in a suitable storage container. On paved areas, wipe any remaining liquids from the surface and place the materials in a storage container. Do not spray or wash down the area using water. For open soil areas, excavate any contaminated soil as soon as possible and place the soil in a suitable storage container. All materials will then be transported off-site for disposal.
e. If immediate transfer and storage of the contaminated soil is not practical, excavate and place the contaminated soil on a double thickness sheet of 3-mil or higher polyethylene film. In addition, a small berm should be formed around the outer edges of the soil stockpile, underneath the polyethylene film, to ensure that contaminants are not washed from the site during precipitation events and that materials do not seep through the berm.
f. Record all significant facts and information about the spill, including the following:
    - Type of pollutant
    - Location
    - Apparent source
    - Estimated volume
    - Time of discovery
    - Actions taken to clean up spill
g. Notify the Permittee of the spill and provide the information from Item #6. The Permitte will then contact the City of Colorado Springs Erosion Control Staff.

Medium to Large Spills

Medium to large spills consist of larger quantities of materials (usually >5 – 25 gallons) that are used on site that cannot be controlled by a single employee. Generally, a number of facility personnel will be needed to control the spill and a response may require the suspension of other facility activities.

The following procedure shall be used for the cleanup of medium to large spills:

a. Ensure personal safety, evaluate the spill, and if possible, stop the flow of pollutants.
b. Immediately dispatch a front-end loader or similar equipment to the spill and construct a berm or berms down gradient of the spill to minimize the spread of potential pollutants. On paved surfaces, portable berms, sandbags, booms, or other measures will be used to control the lateral spread of the pollutants.
c. When the spread of the spill has been laterally contained, contact the Permittee or designated facility employee and provide them information on the location, type, and amount of spilled material, and a briefing on the extent of the spread and measures undertaken to contain the contaminants.
d. Depending on the nature of the spill, mobilize additional resources as needed to contain the contaminants.
e. Cleanup will commence when the lateral spread has been contained and the notification to the Permittee has been made.
f. Freestanding liquid will be bailed or pumped into 55-gallon storage drums, steel tanks, or other suitable storage containers. When all the liquid has been removed from the pavement or soil layer, absorbents will be applied to the surface and transferred to the storage containers when they have soaked up as much of the spill as possible.
g. On paved surfaces, the remaining contaminants will be removed to the extent possible, with rags, sweeping, or similar measures. The area of the spill will not be sprayed or washed down using water. Any contaminant soaked materials will be placed into the storage containers with the other absorbents.
h. The remaining contaminated soils will be excavated and loaded into a dump truck(s) for disposal off-site at a designated facility. If transport off-site is not immediately available, the remaining soils will be stockpiled on a double thickness sheet of 3-mil or higher polyethylene film. In addition, a small berm will be formed around the outer edges of the soil stockpile, underneath the polyethylene film, to ensure that contaminants are not washed from the site during precipitation and do not seep through the berm.
i. Record all significant facts and information about the spill, including the following:
    - Type of pollutant
    - Location
    - Apparent source
    - Estimated volume
    - Time of discovery
    - Actions taken to clean up spill

APPENDIX A

SPILL RESPONSE PLAN

Spill Response Plan

Upon detection of any spill, the first action to be taken is to ensure personal safety. All possible ignition sources, including running engines, electrical equipment (including cellular telephones, etc.), or other hazards will be immediately turned off or removed from the area. The extent of the spill and the nature of the spilled material will be evaluated to determine if remedial actions could result in any health hazards, escalation of the spill, or further damage that would intensify the problem. If such conditions exist, a designated employee will oversee the area of the spill and the construction Permittee will be notified immediately.

The source of the spill will be identified and if possible the flow of pollutants stopped if it can be done safely. However, no one should attend to the source or begin cleanup of the spill until ALL emergency priorities (fire, injuries, etc.) have been addressed.

Small Spills

Small spills (usually <5 gallons) consist of minor quantities of gasoline, oil, anti-freeze, or other materials that can be cleaned up by a single employee using readily available materials. The following procedures should be used for clean-up of small spills:

a. Ensure personal safety, evaluate the spill, and if possible, stop the flow of pollutants.
b. Contain the spread of the spill using absorbents, portable berms, sandbags, or other available measures.
c. Spread absorbent materials on the area to soak up as much of the liquid as possible and to prevent infiltration into the soil.
d. Once the liquids have been absorbed, remove all absorbents from the spill and place the materials in a suitable storage container. On paved areas, wipe any remaining liquids from the surface and place the materials in a storage container. Do not spray or wash down the area using water. For open soil areas, excavate any contaminated soil as soon as possible and place the soil in a suitable storage container. All materials will then be transported off-site for disposal.
e. If immediate transfer and storage of the contaminated soil is not practical, excavate and place the contaminated soil on a double thickness sheet of 3-mil or higher polyethylene film. In addition, a small berm should be formed around the outer edges of the soil stockpile, underneath the polyethylene film, to ensure that contaminants are not washed from the site during precipitation events and that materials do not seep through the berm.
f. Record all significant facts and information about the spill, including the following:
    - Type of pollutant
    - Location
    - Apparent source
    - Estimated volume
    - Time of discovery
    - Actions taken to clean up spill
g. Notify the Permittee of the spill and provide the information from Item #6. The Permitte will then contact the City of Colorado Springs Erosion Control Staff.

Medium to Large Spills

Medium to large spills consist of larger quantities of materials (usually >5 – 25 gallons) that are used on site that cannot be controlled by a single employee. Generally, a number of facility personnel will be needed to control the spill and a response may require the suspension of other facility activities.

The following procedure shall be used for the cleanup of medium to large spills:

a. Ensure personal safety, evaluate the spill, and if possible, stop the flow of pollutants.
b. Immediately dispatch a front-end loader or similar equipment to the spill and construct a berm or berms down gradient of the spill to minimize the spread of potential pollutants. On paved surfaces, portable berms, sandbags, booms, or other measures will be used to control the lateral spread of the pollutants.
c. When the spread of the spill has been laterally contained, contact the Permittee or designated facility employee and provide them information on the location, type, and amount of spilled material, and a briefing on the extent of the spread and measures undertaken to contain the contaminants.
d. Depending on the nature of the spill, mobilize additional resources as needed to contain the contaminants.
e. Cleanup will commence when the lateral spread has been contained and the notification to the Permittee has been made.
f. Freestanding liquid will be bailed or pumped into 55-gallon storage drums, steel tanks, or other suitable storage containers. When all the liquid has been removed from the pavement or soil layer, absorbents will be applied to the surface and transferred to the storage containers when they have soaked up as much of the spill as possible.
g. On paved surfaces, the remaining contaminants will be removed to the extent possible, with rags, sweeping, or similar measures. The area of the spill will not be sprayed or washed down using water. Any contaminant soaked materials will be placed into the storage containers with the other absorbents.
h. The remaining contaminated soils will be excavated and loaded into a dump truck(s) for disposal off-site at a designated facility. If transport off-site is not immediately available, the remaining soils will be stockpiled on a double thickness sheet of 3-mil or higher polyethylene film. In addition, a small berm will be formed around the outer edges of the soil stockpile, underneath the polyethylene film, to ensure that contaminants are not washed from the site during precipitation and do not seep through the berm.
i. Record all significant facts and information about the spill, including the following:
    - Type of pollutant
    - Location
    - Apparent source
    - Estimated volume
    - Time of discovery
    - Actions taken to clean up spill

j. Provide the Permittee (or designated employee) with the information from Item #9. The Permittee will then contact the City of Colorado Springs Flow Control Center.

NOTIFICATION

Notification to the Colorado Department of Public Health & Environment (CDPHE) and the City of Colorado Springs is required if there is any release or suspected release of any substance, including oil or other substances that spill into or threaten State waters. Unless otherwise noted, notifications are to be made by the Permittee and only after emergency responses related to the release have been implemented. This will prevent misinformation and assures that notifications are properly conducted. The notification requirements are as follows:

1. Spills into/or Threatens State Waters: Immediate notification is required for releases that occur beneath the surface of the land or impact or threaten waters of the State of threaten the public health and welfare. Notifications that will be made are:
   a. For any substance, regardless of quantity, contact CDPHE at 1-877-518-5608. State as follows:
      a) Give your name.
      b) Give location of spill (name of city).
      c) Describe the nature of the spill, type of products, and estimate size of spill.
      d) Describe type of action taken thus far, type of assistance or equipment needed.
   b. For any quantity of oil or other fluids, call the National Response Center at 1-800-424-8802. State as follows:
      a) Give your name.
      b) Give location of spill (name of city and state).
      c) Describe the nature of the spill, type of product, and estimate size of spill.
      d) Describe type of action taken thus far, type of assistance or equipment needed.
2. Reportable Quantity Spill on Land Surface: Immediate notification is required of a release upon the land surface of an oil in quantity that exceeds 25 gallons, or of a hazardous substance that equals or exceeds 10 pounds or its reportable quantity under Section 101(14) of the Comprehensive Environmental Response, Compensation Liability Act (CERCLA) of 1980 as amended (40 CFR Part 302) and Section 329 (3) of the Emergency Planning and Community Right to Know Act of 1986 (40 CFR Part 355) whichever is less. This requirement does apply at a minimum to the substances listed in Table A below.

TABLE A

Substances Requiring Notification

SUBSTANCE	REPORTABLE QUANTITY
Motor Oil	25 Gallons
Hydraulic Oil	25 Gallons
Gasoline/Diesel Fuel	25 Gallons

The notification procedures to be followed are:

a) Give your name.
b) Give location of spill (name of city and state).
c) Describe nature of the spill, type of product, and estimate size of spill.
d) Describe type of action taken thus far, type of assistance or equipment needed.

3. Notification is not required for release of oil upon the land surface of 25 gallons or less that will not constitute a threat to public health and welfare, the environmental or a threat of entering the waters of the State.

4. Notification, as required in paragraphs 1 and 2 above, will be made to the CDPHE using the 24-hour telephone number to report environmental spills. All information known about the release at the time of discovery is to be included, such as the time of occurrence, quantity and type of material, location and any corrective or clean-up actions presently being taken. Table B lists these phone numbers.

SPILL RESPONSE CONTACTS

TABLE B

Emergency Notification Contacts

Name/Agency	Number
City of Colorado Springs Fire Department	911
City of Colorado Springs Police Department	911
Ambulance	911
Hospital	911
National Response Center	1-800-424-8802
CDPHE – Report Environmental Spills (24 hrs/day)	1-877-518-5608
El Paso County – Stormwater Inspections	719-520-6879
Colorado Emergency Planning Committee Also contact Permittee and Owner	303-273-1622

It is the responsibility of the Permittee to contact the City of Colorado Springs, CDPHE, and/or the National Response Center.

- The National Response Center is to be contacted when a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR 110, 4- DFR 117, or 40 CFR 302 occurs during a 24-hour period.

- Notification to the CDPHE and COA is required if there is any release or suspected release of any material, including oil or hazardous substances that spill into or threaten state waters.

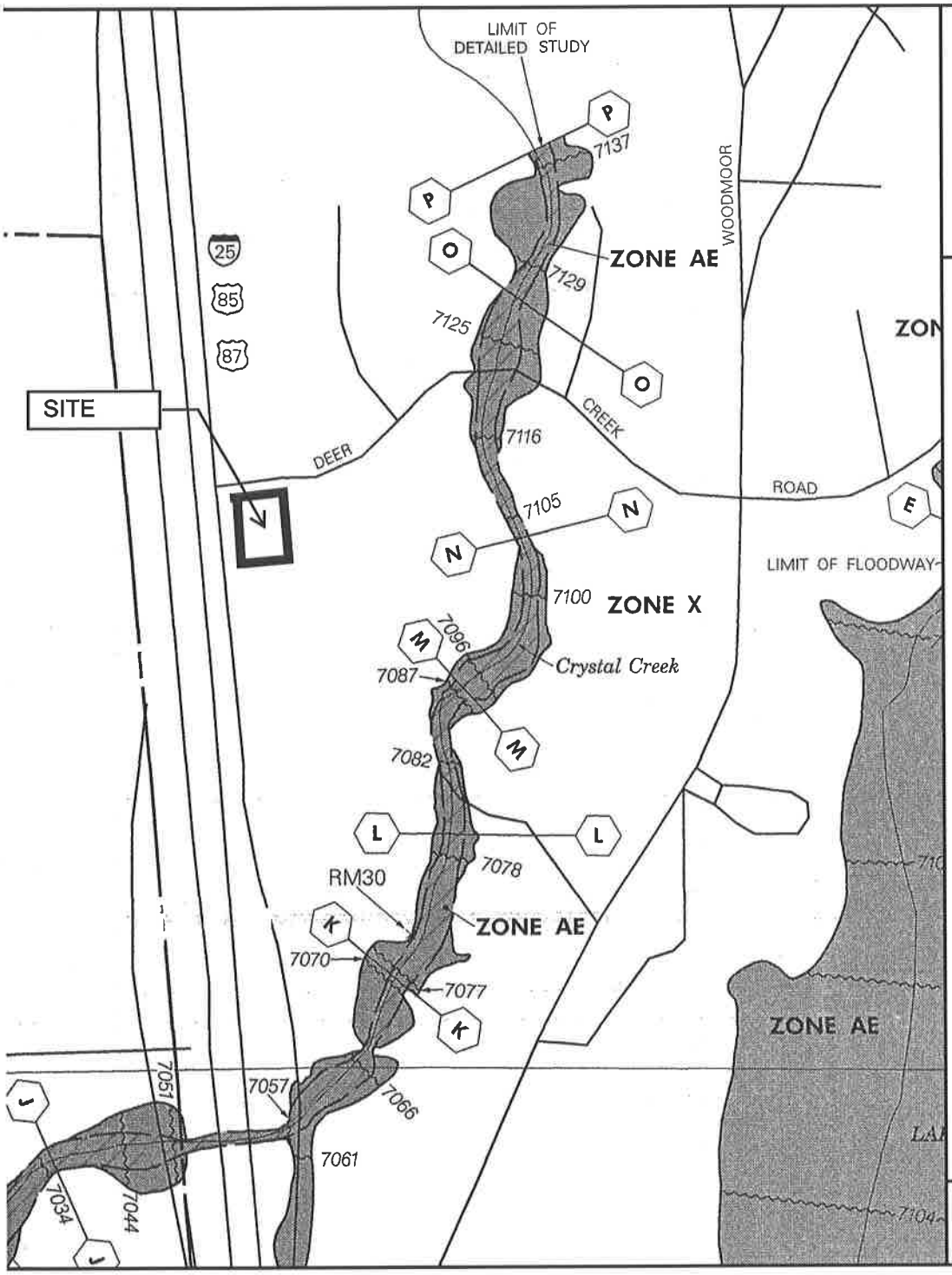
REPORTS

The CDPHE and COA require written notification of a spill or discharge of oil or other substance that may cause pollution of the waters of the State of Colorado. A written report must be submitted to the Water Quality Control District (WQCD) and the COA Erosion Control Staff within five days after becoming aware of the spill or discharge.

The CDPHE and COA require a written final report within 15 days for all releases of an oil or hazardous substance that require implementation of a contingency plan. The CDPHE and COA may also require additional reports on the status of the clean up until any required remedial action has been complete.

Written notification of reports must contain at a minimum:

1. Date, time, and duration of the release.
2. Location of the release.
3. Person or persons causing and responsible for the release.
4. Type and amount of oil or substance released.
5. Cause of the release.
6. Environmental damage caused by the release.
7. Actions taken to respond, contain, and clean up the release.
8. Location and method of ultimate disposal of the oil or other fluids.
9. Actions taken to prevent a reoccurrence of the release.
10. Any known or anticipated acute or chronic health risks associated with the release.



APPROXIMATE SCALE IN FEET

500 0 500

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

EL PASO COUNTY,
COLORADO AND
INCORPORATED AREAS

PANEL 276 OF 1300

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO COUNTY, UNINCORPORATED AREAS	080059	0276	F
MONUMENT, TOWN OF	080064	0276	F
PALMER LAKE, TOWN OF	080065	0276	F

MAP NUMBER
08041C0276 F

EFFECTIVE DATE:
MARCH 17, 1997

Federal Emergency Management Agency

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for El Paso County Area, Colorado

February 13, 2017

Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

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

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

Soil Map

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

Custom Soil Resource Report
Soil Map

Map Scale: 1:936 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 45 90 180 270

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 14, Sep 23, 2016

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

Date(s) aerial images were photographed: Apr 15, 2011—Sep 22, 2011

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

Map Unit Legend

El Paso County Area, Colorado (CO625)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
71	Pring coarse sandy loam, 3 to 8 percent slopes	0.0	0.4%
92	Tomah-Crowfoot loamy sands, 3 to 8 percent slopes	3.2	99.6%
Totals for Area of Interest		**3.3**	**100.0%**

Map Unit Descriptions

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

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

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

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

development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

El Paso County Area, Colorado

71—Pring coarse sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369k
Elevation: 6,800 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Pring and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pring

Setting

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

Typical profile

A - 0 to 14 inches: coarse sandy loam
C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Loamy Park (R048AY222CO)
Hydric soil rating: No

Minor Components

Pleasant

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

Other soils

Percent of map unit:
Hydric soil rating: No

92—Tomah-Crowfoot loamy sands, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 36b9
Elevation: 7,300 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Tomah and similar soils: 50 percent
Crowfoot and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tomah

Setting

Landform: Alluvial fans, hills
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from arkose and/or residuum weathered from arkose

Typical profile

A - 0 to 10 inches: loamy sand
E - 10 to 22 inches: coarse sand
C - 48 to 60 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
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
Available water storage in profile: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Sandy Divide (R049BY216CO)
Hydric soil rating: No

Description of Crowfoot

Setting

Landform: Alluvial fans, hills

Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 12 inches: loamy sand
E - 12 to 23 inches: sand
Bt - 23 to 36 inches: sandy clay loam
C - 36 to 60 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
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
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Sandy Divide (R049BY216CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

Pleasant

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