

STORMWATER MANAGEMENT PLAN

for

BLACK FOREST OFFICE The North Half of the NE Quarter of the SE Quarter of Section 7 Township 12 South, Range 65 West of the 6th P.M. County of El Paso, State of Colorado 12740 Black Forest Road Colorado Springs, Colorado 80908

Item Numbers refer to SWMP Checklist

Item 1. Add Qualified Stormwater Manager and Contractor Information to cover/title sheet. If unknown, add a placeholder to be updated prior to the pre-construction meeting:

QUALIFIED STORMWATER MANAGER

Name: _____ Company: _____ Address: _____

CONTRACTOR

Name:		
Company:		
Address:		

2N Civil Job No. 19015 September 11, 2020

PREPARED FOR: Black Forest, LLC 8655 Table Butte Road Colorado Springs, Colorado 80908-1224

Engineer: 2N Civil, LLC 6 Inverness Court East, Suite 125 Englewood, Colorado 80112 Contact: Ryan Eichele, PE, Project Manager Todd West, PE Project Engineer



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APPENDIX A

Vicinity Map Inspection Form Template

Include the approved GEC Plans as an Appendix



INTRODUCTION

This report is a Stormwater Management Plan (SWMP) for the project named **Black Forest Office** and has been prepared to meet the regulatory requirements of the Colorado Department of Health, Water Quality Control Division in compliance with the provisions of the Water Quality Control Act, and the Federal Water Pollution Control Act.

SITE DESCRIPTION

Location

The Black Hills Office property, addressed as 12740 Black Hills Road, is the north half of the Northeast Quarter of the Southeast Quarter of Section 7, Township 12 South, Range 65 West of the 6th Principle Meridian, County of El Paso, State of Colorado. Black Forest Road bounds the site on the east. Rural Residential development (Zoning RR-5) surrounds the site on the north, south, and west. An existing asphalt and gravel road provides access to the vacant parcel.

Existing Site Conditions

The subject property contains approximately 4.83 acres. Sparse ground cover consists of native weeds with a few trees at the northeast corner of the site. A shallow ridgeline divides the site, directing the east portion of the site to the north, and the west portion of the site to the west.

There are no major drainage ways or irrigation facilities on the site.

Proposed Improvements

The development will consist of a single story 4,400 sf office building with a full, walk-out basement of equal size with a 3,250-sf studio/shop building on the 4.77 acres. The office building will house the Owner's corporate functions for Metal Roof Innovations, Ltd. company (strategic planning, accounting, sales/marketing management).

sales/marketing management). Item 5. Include the estimated area to undergo disturbance.

An existing barn (currently under construction) was permitted under the A-5 zoning. Construction began in the spring of 2020. The barn will be re-purposed in use as a studio/shop to supplement the corporate functions. No manufacturing, warehousing, shipping, wholesale or retail sales will take place at this facility.

Drainage Basins

Existing Conditions

The site historically drains north and west. The development of the site will occur on the upper portion of the lot, with the majority of the new impervious areas directed to a proposed detention facility that will intercept flow prior to discharge to the west.

Proposed Conditions

The development will implement Full Spectrum Detention (FSD) utilizing an Extended Detention Basin (EDB) to capture and treat runoff from the developed areas prior to discharge downstream. This design considers the water quality capture volume (WQCV), excess urban runoff volume (EURV), and 100-year



the basin was studied in 2015

detention volume. Flow will be conveyed by curb and gutter to a storm inlet and reinforced concrete pipe to the pond, and grasses swales.

Description of Construction Activity

The project consists of the site being over-lot graded, utility installation, construction of a buildings and parking garage, and landscaping.

Sequence for Major Activities

Item 9. Include a description of existing vegetation at the site and percent ground cover and method used to determine ground cover

The project will follow standard construction sequences, i.e., clearing and grubbing, rough grading, utility installation, final grading, asphalt paving, building construction, final pavement lift, and landscaping.

Existing Soils

The National Resources Conservation Service Web Soil Survey classifies the in situ soils as Hydrologic Group B, which exhibit a moderate infiltration rate when thoroughly wet.

Non-Storm Water Components of Discharge

It is not anticipated that there will not be any non-storm water discharge from this development.

Receiving Waters

The site is tributary to the upper reach of Kettle Creek drainage basin (FOM 03000), that flows from north to south approximately 1,500 feet west of the site. This basin is an unstudied basin included in the El Paso County drainage basin fee program. Based on the FEMA Map No. 08041C0315G with an effective date of 12/07/18 (included in the Appendix) the site is located within Zone X, areas of minimal flood hazard. No portion of the site is located within the 100 year floodplain. The upper reach of the Kettle Creek basin is sparsely developed and includes single family homes on large acreages.

SWMP Administrator Change to "Qualified Stormwater Manager" or "QSM"

The SWMP administrator is responsible for developing, implementing, maintaining, and revising the SWMP. The activities and responsibilities of the Administrator shall address all aspects of the facility's SWMP and include, but are not limited to inspections, conducting any training required in implementing this SWMP, and providing any spill notifications to the appropriate authorities.

The SWMP Administrator for the	Black Forest Office project is:
Responsible Person (Title):	
Currently Held By (Person):	
Telephone:	
Email Address:	
Organization:	
Mailing Address:	

Item 21. Add text stating that the SWMP should be viewed as a "living document" that is continuously being reviewed and modified as a part of the overall process of evaluating and managing stormwater quality issues at the site. The Qualified Stormwater Manager shall amend the SWMP when there is a change in design, construction, operation or maintenance of the site which would require the implementation of new or revised BMPs or if the SWMP proves to be ineffective in achieving the general objectives of controlling pollutants in stormwater discharges associated with construction activity or when BMPs are no longer necessary and are removed.



If additional personnel will be performing specific tasks other than the SWMP Administrator (i.e. DMR Cognizant Official, Inspection Contact, etc.), they shall be noted here along with their specific responsibility (use additional pages as necessary):

Responsible Person (Title):	 Responsibility:
Currently Held By (Person):	
Telephone:	
Email Address:	
Organization:	
Mailing Address:	
Responsible Person (Title):	 Responsibility:
Currently Held By (Person):	
Telephone:	
Email Address:	
Organization:	
Mailing Address:	

This SWMP was prepared by 2N Civil, LLC as an authorized agent on behalf of the Permittee. 2N Civil, LLC is not responsible for administering this Stormwater Management Plan.

Name:	2N Civil, LLC
Contact	Todd West, PE
Address:	6 Inverness Court East, Suite 125
	Englewood, Colorado 80112
Telephone No:	303-925-0544

Potential Pollution Sources

An occasional spill while refueling equipment could occur at any location within the site. In addition to routine equipment maintenance, asphalt paving and concrete casting may cause pollutants to enter storm water runoff. These types of pollution shall be cleaned up immediately and disposed of as required using spill containment kits to meet local, state and federal guidelines. The contractor may be required to develop a Spill Plan if certain types and quantities of materials are used at a site.

Effective spill control includes both spill prevention and spill response measures and depends on proper employee training for spill response measures and may also include structural spill containment. Contractors shall use secondary containment measures around supplies stored outside to help reduce the



likelihood of a spill or leak reaching the storm sewer system. Structural spill containment measures typically include temporary or permanent curbs or berms that surround a potential spill site. Berms may be constructed of concrete, earthen material, metal, synthetic liners, or other material that will safely contain the spill.

Equipment and/or vehicle washing is not permitted on the site. Concrete equipment may use the concrete washout area prior to departure from the site. Waste material generated during construction that could produce contaminated runoff if precipitation occurs should be covered or removed from the site. Trash and/or garbage shall be contained daily.

During the seeding phase, fertilizer storage may be present onsite. Fertilizer shall be covered or otherwise protected so that it cannot contaminate the site in a precipitation event. A more detailed explanation of Materials Handling and Spill Prevention follows this section.

MATERIALS HANDLING AND SPILL PREVENTION

The following chart identifies the potential pollutant sources for this site and provides instruction to the contractor on how each source will be handled during construction.

Material/ Potential Pollutant Source	Comments
Solvents	Solvents need to be stored in leak-proof, tamper-proof containers and removed from the site when not in use.
Stains, Paints	Paints and stains may be stored inside the structure or within the Stabilized Staging Area. The contractor shall remove waste paints and stains from the site.
Fuels / Refueling of Equipment	On site fuel storage will not be required for this project. Occasional refueling of equipment will occur via a mobile fuel truck, and should take place away from storm or sanitary inlets and take place during dry weather, if possible.
Trash Containers	Trash containers shall be enclosed (lids) and emptied as needed. Dumpsters shall be placed inside the Limits of Construction.
Paving	Excess chemicals from paving shall be removed. Paving operations should not be performed immediately before an anticipated major storm event.
Concrete Curing Compound	Contractor shall remove remaining compound from site.
Concrete and Mortar Wash Waters	Concrete and mortar washout will use the designated concrete washout area.
Concrete Truck	All concrete washouts shall occur at the designated Concrete Washout Area (CWA) as shown on the SWMP Plan.

Item 12. Note that this project does not anticipate utilizing batch plants in the SWMP text



Sanitary Waste Management	Portable toilets may be contained within the Limits of Construction. Licensed sanitary services will ensure facilities are in working order at all times. Portable toilets will be secured at all four corners to prevent overturning. Portable toilets are not to be placed in any drainageway and at least 10' from the curb line and 50' from any storm inlet.
Sediment	Erosion from areas where soil is disturbed due to construction has a high potential of sediment and suspended solids transport. Sediment and erosion control measures including VTC, perimeter controls, Sediment Control Logs, and inlet protection, are included in this SWMP Plan and Report.
Soil and Material Stockpiles	Silt fencing shall be placed around the entire perimeter of the stockpile area to prevent sediment transport. The area shall be seeded and mulched once the stockpile area is no longer required.
Loading and Unloading Operations	Loading and unloading operations, as well as deliveries, shall be managed in such a way as to reduce tracking and moving materials that can contribute to pollutant transport.

Cleaning and fueling of machinery should take place in areas away from streams, storm or sanitary inlets and take place during dry weather, if possible. In fueling areas, spills shall be cleaned up with absorbents. In the event of a chemical spill, measures should be taken to ensure that water quality is not threatened. Medium to large sized spills shall immediately be contained with absorbents and inflatable berms. Spills or accidents shall be immediately reported to the SWMP Administrator and depending on the nature of the spill involved, the Fire Department, the Colorado Department of Health, El Paso County, downstream users, or other agencies may need to be notified. The SWMP Administrator shall log such events in the job's Log Book.

The contractor will be responsible for the fueling of his equipment and vehicle maintenance to ensure that the introduction of pollutants to the environment is extremely limited. The contractor is responsible for providing a Materials Handling guide to ensure compliance with CDPHE WQCD standards.

The storage of any chemicals, fuels, or other hazardous materials on site will not be permitted. If such storage is required, the SWMP Administrator shall be notified and this report revised to ensure compliance with the standards.

All chemical substances located on site shall be clearly identified and MSD sheets readily available.

BMPs FOR STORM WATER POLLUTION PREVENTION

All erosion control practices shall conform to the applicable El Paso County standards, the Colorado Department of Public Health and Environment Water Quality Control Division, and Urban Drainage and Flood Control District (UDFCD) standards. The contractor shall strictly adhere to the BMP details published



by El Paso County and/or UDFCD. Any BMP measures not specifically detailed by the City or UDFCD shall be submitted for review and approval of the City.

The BMPs outlined below apply to one or more of the following construction phases: initial stage, the interim stage, and the final stage. The initial BMPs shall be installed at the outset of construction, prior to any land disturbance activities. Initial controls are placed on existing grades, but shall be based in part on proposed grading operations. The interim BMPs shall be installed during overlot grading, and road paving / concrete flatwork. Final stage BMPs shall be installed as one of the last steps in the construction process. At the completion of construction, the temporary BMPs will be removed. Figure 1 illustrates the project BMP schedule.

Initial Stage

At the initial stage, silt fence (SF), also known as sediment control fence, and vehicle tracking control (VTC) shall be installed. Silt fencing is a temporary sediment barrier consisting of a filter fabric stretched across and attached to supporting posts. The bottom of the fence is entrenched into the soil per the detail included in the SWMP. Silt fence is required along the toe of the proposed fill slopes where sheet flow of storm water may occur. Silt fence shall be placed parallel to the contour at the base of a disturbed area to filter runoff. The fence shall be broken up into overlapping sections so that it can be placed along the contour and prevent a blow out of the fence due to the water not being able to escape during large rainfall events. Each end of the section should be turned upslope. Prior to construction activities, vehicle tracking control shall be located at each entrance/exit to the site's internal drive that will be used by construction traffic to reduce the potential of mud and dirt being carried offsite. Vehicle tracking control is a constructed stone stabilized pad of at least fifty (50) feet in length and is composed of coarse-aggregate rock to remove debris from the tires of the construction vehicles. If debris does get carried onto a public road, it shall be removed by the end of the day and transported to a controlled sediment disposal area. Water shall not be used as a means of cleaning the road. Instead, a street sweeping mechanism shall be used to collect the material and disposed of in accordance with applicable WQCD standards.

Sediment control logs (SCL) shall be placed in the existing/proposed swales, perpendicular to the flowline, to reduce the velocity of concentrated flow and trap sediment prior to discharge downstream. The SCL is a linear roll made of natural materials such as straw, coconut fiber, or other fibrous materials trenched into the ground and held with a wooden stake.

Interim Stage

Several BMPs are installed during the interim stage. Additional silt fence shall be installed following the clearing and grubbing work as needed to control erosion and filter runoff.

Sediment control logs shall be promptly placed after construction of the shallow swale along the base of the slope of the track and field. The SCL shall be installed immediately following the shaping of the ditches and shall be maintained in good working order until the final vegetation or landscaping is established. Inlet protection (IP) shall be used on all operable inlets during construction to protect sediment-laden runoff from entering the storm drainage system. Rock berms will be used to protect the inlets. Rip rap outlet protection will be provided for all culverts and areas of concentrated flow to prevent erosion and scour.



Seeding and mulching (SM) will be applied to stabilize the exposed soils on all disturbed areas not covered by pavement or buildings. Refer to the landscape plans prepared by PWN Architects regarding specific seed mixes and/or materials to be installed on pervious surfaces.

A stabilized staging area (SSA) will be used for the construction trailer, parking, storage, and loading and unloading. The staging area will be placed near the site entrance on the existing asphalt play court. This location will serve to reduce the likelihood that vehicles frequently entering the site will come into contact any mud and disturbed earth that will take place over the remainder of the project area.

A Concrete Washout Area (CWA) shall be utilized to receive wash water from washing of tools and concrete mix chutes, masonry operations, liquid concrete waste from dump trucks, mobile batch mixers, or pump trucks. The concrete wash area is a shallow excavation with a small perimeter berm to isolate concrete truck washout operations. The washout area shall be combined with a vehicle tracking control pad to control tracking of mud. Surface discharge of concrete washout water from the construction site is strictly prohibited.

Final Stage

During the final stage, seeding and mulching will be utilized in areas of disturbed soil not covered by pavement or play pits, and where intermediate stage seeding has not already sufficiently covered. The combined use of these BMPs will serve to protect against wind erosion and as the native grass cover becomes established, provide long term stabilization of exposed soils. The seeding will also act to help reduce problems with invasive weeds. Permanent landscaping will be the final step in soil stabilization.

Anticipated Timing/Phasing Schedule

Project start date is planned for Spring 2021 Initial phase – Spring 2021 (2 day duration) Interim phase – June 2021 (9 month duration) Final phase, project completion – Spring 2022

BMP Schedule

		PROJECT STAGE	
	INITIAL	INTERIM	FINAL
	At outset of construction, prior to any land disturbance activities	During clearing and grubbing, earthwork operations	During last steps of construction process for long-term stabilization
ВМР			
Silt Fence		MAINTAINED	TO BE REMOVED
Vehicle Tracking Control		MAINTAINFD	TO BE REMOVED
Sediment Control Logs		MAINTAINED	TO BE REMOVED
Inlet Protection			TO BE REMOVED



Seeding and Mulching	TO REMAIN
Stabilized Staging Area	TO BE REMOVED
Concrete Washout Area	TO BE REMOVED
Permanent Landscaping	

Figure 1 – Project BMP Schedule

FINAL STABILIZATION AND LONG TERM STORMWATER MANAGEMENT

Finally Stabilized means that all ground surface disturbing activities at the site have been completed, and all disturbed areas have been either built on, paved, or a uniform vegetative cover has been established with an individual plant density of at least 70 percent of pre-disturbance levels, or equivalent permanent, physical erosion reduction methods have been employed. Re-seeding alone **does not** qualify.

An Extended Detention Basin will be installed to mitigate sediment and pollutant transfer to the receiving waters under developed conditions. The contractor will be responsible for any re-excavation of sediment and debris that collects in the basin depression required to ensure that the basin meets the design grades following construction. The storm lines shall also be cleaned and free of sediment once the site becomes stabilized. Item 26. Add a note stating that this project does not rely on control measures owned or operated by another entity.

Prior to the inactivation of the permit, the bottom of the basin must be stabilized and sediment shall be removed from the site's drainage system. Any sediment that collects in existing swales during construction operations shall be removed as part of the completion of the project to ensure that they function as designed.

Temporary erosion control measures consisting of silt fencing and inlet protection shall be removed from the site only after vegetative cover has been established as outlined above. Any remaining soil stockpiles will be seeded to prevent water and wind erosion. All streets, inlets, and drainage features shall be cleaned of sediment and debris following substantial completion. The site shall be cleaned up and any areas disturbed as a result of the BMP removal shall be seeded and mulched.

Permanent erosion control measures such as erosion control blanket shall be inspected and repaired if necessary. Erosion control logs placed in ditches may remain if it is the opinion of the designated SWMP Administrator that the logs are of continued effectiveness in slowing sediment transport in the roadside ditches.

OTHER CONTROLS

The potential for other pollution sources is small compared to sediment transport. The stabilized staging area (SSA) will need to be defined and then graded so that runoff will be contained and filtered. Any waste material found on-site generated by construction will be disposed of in a manner as to not cause pollutants in storm water discharges. In the event that waste is to be stored on-site, it shall be in an area



located a minimum of 100 feet from all drainage courses whenever possible. Whenever waste is not stored in a non-porous container, it shall be in an area enclosed by a 12-inch high compacted earthen ridge. If the enclosed waste area is located on porous soil, the area shall be covered with a non-porous lining to prevent soil contamination. Whenever precipitation is predicted, the waste shall be covered with a non-porous cover and anchored on all sides to prevent its removal by wind in order to prevent precipitation from leaching out potential pollutants from the waste.

INSPECTION AND MAINTENANCE

Inspections will be conducted at least every 14 days, and after any precipitation or snowmelt event, hydrant testing, or any other event that could cause surface erosion. Inspections will also be conducted on a weekly basis or as weather dictates for disturbed areas that exceed a 4:1 slope. All equipment, sediment and erosion control methods and site areas shall be identified and examined during inspections. In addition, a SWMP Log Book or accurate records are required during the construction processes. The Log Book shall include records of spills, leaks, along with the time/date, weather conditions, etc. The Log should also contain, but not be limited to, contacts with regulatory agencies and personnel, notes of employee activities, maintenance and repair of stormwater management controls, preventative maintenance activities, and inspection activities.

A sample Log Book template has been included in the Appendix for use by the SWMP Administrator. Additional information such as dated photographs, field notes, and drawings/maps shall be included where appropriate.

Inspections that indicate deficiencies of erosion control BMPs that are designated on the SWMP plan shall be corrected as soon as possible by the site superintendent and/or construction manager. Corrective measures that are undertaken shall be re-inspected to ensure the deficiency has been properly corrected.

Inspection and maintenance procedures for the BMPs presented in this report are included below:

Silt Fence (SF) Maintenance Requirements:

The SWMP Administrator shall inspect silt fence daily and during and after any storm event and make repairs or clean out as necessary.

Sediment accumulated upstream of silt fence shall be removed when the upstream sediment reaches a depth of 6-inches.

Vehicle Tracking Control (VTC) Maintenance Requirements:

The GESC Manager shall inspect the VTC daily and during and after any storm event.

Concrete Washout Area (CWA). Maintenance Requirements:

Vehicle Tracking Control is required at the access point to the concrete washout area.

Inspect weekly and during and after any storm event. The concrete washout area shall be repaired and enlarged or cleaned out as necessary to maintain capacity for wasted concrete.

At the end of construction, all concrete shall be removed from the site and disposed of at an approved waste site.



Inlet Protection (IP) Maintenance Requirements:

The SWMP Administrator shall inspect inlet protection weekly and during and after any storm event and make repairs or clean out as necessary. More frequent inspections and repairs shall be required during winter conditions due to freeze/thaw problems.

Inlet protection is to remain in place until the upstream disturbed area is stabilized.

Sediment accumulated upstream of IP shall be removed when the sediment depth upstream of filter is within 5 inches of the crest.

Sediment Control Log (SCL) Maintenance Requirements:

The sediment control log shall be trenched into the ground a minimum of 2 inches.

The SWMP Administrator shall inspect sediment control logs daily and during and after any storm event and make repairs or clean out as necessary.

Seeding (SE) and Mulching (MU) Maintenance Requirements:

Seeded and mulched areas shall be inspected for required coverage monthly for a period of two years following initial seeding. Repairs and re-seeding and mulching shall be undertaken after the first growing season for any areas failing to meet the required vegetation coverage.

Stabilized Staging Area (SSA) Maintenance Requirements:

Stabilized staging area shall be inspected weekly and during and after any storm event and repaired (by adding more granular material if the SSA extends beyond the existing paved sport court) or enlarged as necessary.

Street Maintenance (SM). Street Maintenance consists of cleaning mud and other debris which is tracked onto the roadway at a construction site. Removing all tracked mud from the streets reduces or eliminates sediment transport to downstream structures.

Street Maintenance (SM) Maintenance Requirements:

Streets shall be free of mud and debris throughout the life of the project.

Any mud tracked onto the street shall be cleaned using a vacuum type street sweeper, a brush-type street sweeper with dust control, or manually using shovels and brooms.

Streets shall not be washed with water at any time.

The GESC Manager shall inspect streets on a daily basis. The GESC Manager shall complete inspections hourly after a storm event and cleanup sediment as necessary.



REFERENCES

- 1. Colorado Discharge Permit System, Stormwater Discharges Associated with Construction Activity; Stormwater Management Plan (SWMP) – General Requirements, July 2012.
- 2. City of Colorado Springs Drainage Criteria Manual, Volume 2, November 1, 2002.
- 3. *Urban Drainage Criteria Manuals Volumes I-II*, 2001, *Volume III* 2010, Urban Drainage and Flood Control District.



APPENDIX A



EROSION & SEDIMENT CONTROL MEASURES ACTIVE SITE INSPECTION REPORT

Project Name:		
Project Address/Location:		
Date:	Time:	Temp:
Weather (rain, snow, cloudy, wind	y, etc.):	
Contact:		
Inspection by:		Item 25. Add a signature line for QSM

Construction	Construction Sequence			
Activities	Today	Planned for This Week	Planned for Next Week	
Grading				
Excavation				
Utility Construction				
Foundations				
Structural Work				
Asphalt Paving				
Landscaping				

Erosion & Sediment Control Measures						
BMP	To Be	Good Condition	Requires	Needs Replacement	Per	Comments
	Constructed	(Functioning)	Maintenance	(Not Functional)	SWPPP	
Seed / Sod						
Mulch						
Surface Roughenin						
Erosion Blanket						
Diversion						
Swale / Berm						
Slope Drain						
Check Dams						
Outlet Protection						
Sediment Basin						
Silt Fence						
Straw Bales						
Vehicle Tracking						
Pad						
Inlet Protection						
Street Sweeping						

Required Compliance Action: