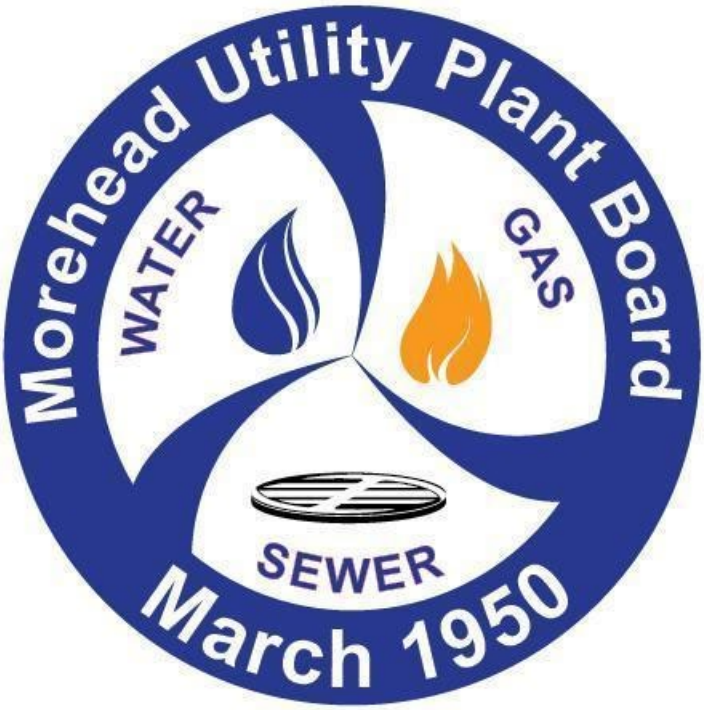
MOREHEAD UTILITY PLANT BOARD

STORMWATER MANAGEMENT MANUAL

for

MUPB UTILITIES



MOREHEAD UTILITY PLANT BOARD
135 South Wilson Avenue
Morehead, KY 40351
September 2022

Approved by City of Morehead ***Date:_____***
Approved by MUPB ***Date:_____***

SECTION 1

1.1 PURPOSE

The Clean Water Act (CWA) was passed in 1972 to help protect and restore the waters in our Nation's streams, rivers, and lakes. In the early 1990s, Phase I of the National Pollutant Discharge Elimination System (NPDES), under authority of the CWA, was passed to regulate stormwater management in large urban areas. Phase II regulations were developed and passed near the turn of the century requiring medium size cities meeting a certain population density and other criteria to develop stormwater initiatives to address pollution associated with urban runoff. Currently, the City of Morehead (CITY) has not been classified as a Phase II City but has appointed the Morehead Utility Plant Board (MUPB) as their agent for stormwater management. The City has determined that it is in their best interest to make preparations for becoming a Phase II City.

The thought behind the Phase II program is that urban runoff is a chief cause of stream impairment, and that urban runoff can be managed in large part by effectively addressing a few key areas; educating and involving the public on the impacts of urban runoff and how the public can help, managing the storm sewer infrastructure and addressing illicit discharges (discharge of pollution / polluted runoff), implementation of local regulatory authority, development of best management practices (BMPs) for construction and post- construction, and environmentally sensitive and responsible municipal operations.

The KY Division of Water issued the statewide construction stormwater general permit, KYR10, in August 2009. This permit regulates stormwater discharges from construction sites that disturb an acre or more or less than an acre if part of a larger common plan of development. MUPB's stormwater management program incorporates the requirements of KYR10.

MUPB has prepared this manual, which contains the regulations and specifications for Stormwater Management in the MUPB service area, to address both Water Quality and Water Quantity. Section 2 will outline the Water Quality aspect of the program, detailing requirements for surface water protection during both the construction process and for post development efforts. Design requirements for Water Quantity control and stormwater conveyance are detailed in Section 3.

1.2 GOALS OF THE PROGRAM

In support of the information provided in the City of Morehead Code of Ordinances **Chapter 55** (Appendix A), goals of the stormwater management program are to provide protection of the health, safety, and general welfare of the Public and protection of the waterways within and downstream of the MUPB service area by:

- Setting requirements for managing the quality of stormwater discharged to the storm water system by controlling the contribution of pollutants associated with development and redevelopment activity.
- Setting requirements to maintain or reduce the rate of stormwater runoff from developed/redeveloped properties.
- Adoption of regulations for stormwater conveyance systems (ie storm pipe, culverts, channels, etc)
- Developing regulations that work to identify and eliminate activities that contribute illicit discharge to the stormwater system.
- Implement a system of minimum control measures (MCM)
    - Public Education and Outreach
    - Public Participation
    - Illicit Discharge Detection and Elimination
    - Management of Construction Site Runoff
    - Management of Post Construction Site Runoff
    - Good Housekeeping in Municipal Operations

SECTION 2
BMP MANUAL

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2.1 REGULATIONS

The City of Morehead has appointed the Morehead Utility Plant Board (MUPB) as their agent to oversee the maintenance of existing stormwater infrastructure and the regulation of future development with respect to stormwater. While currently the City of Morehead (CITY) has not been classified as a Phase II City, the CITY has adopted ordinances and regulations in accordance with the NPDES Phase II requirements.

One of the requirements of the Phase II program is to develop a construction site runoff control program for new developments and redevelopments affecting one acre or more. The CITY's Stormwater Ordinance was developed in an effort to comply with this requirement. It parallels KDOW's stormwater general permit for construction activities, called KYR10, as well as the requirements within KYG20 (Appendix L). Additionally, the CITY's ordinance addresses water quality and erosion control measures for new development and redevelopment of nonresidential projects less than 1 ac in disturbed areas.

This section describes the water quality regulations supporting MUPB's stormwater management program. It establishes the baseline requirements. See Appendix A for the City of Morehead Ordinances and Appendix B for MUPB's Stormwater Service Area Mapping.

2.2 WATER QUALITY PROTECTION

The Morehead Utility Plant Board (MUPB) requires a Land Disturbance Permit (LDP) for most types of construction. MUPB requires two levels of LDPs based on the type and size of the project. A Type 1 LDP is for all nonresidential projects that are new development or for all nonresidential redevelopment projects that disturb more than 5,000 sf but less than 1 ac, provided the site isn't part of a larger development. The Type 2 LDP is for development/redevelopment projects that disturb greater than 1 ac or are part of a larger development. MUPB may also require projects that drain to environmentally sensitive areas to obtain a Type 2 LDP and follow a plan meeting the Type 2 requirements.

Applications for Type 1 and Type 2 LDPs can be found in Appendix D. When preparing the plans for the LDP, a licensed professional engineer should determine the best practices to protect the environment from the potential impacts from construction sites by selecting source control and sediment containment practices.

Proper site planning and Best Management Practices (BMP) selection are critical

to the success of water quality protection plans. Refer to Best Management Practices (BMPs) for Controlling Erosion, Sediment, and Pollutant Runoff from Construction Sites prepared by the University of Kentucky Transportation Center for Technical Specifications for BMP guidelines (Section 4).

https://eec.ky.gov/Environmental-Protection/Forms%20Library/09BMPManual_Final.pdf

2.2.1. Type 1 Land Disturbance Permit

Type 1 LDPs require the design engineer to prepare a water quality protection plan called an Erosion Protection and Sediment Control plan (EPSC) prepared by a licensed professional engineer..

EPSC plans must incorporate the following concepts:

- Construction entrance to control sediment leaving the site
- Plan to phase disturbance to minimize exposed soil
- Sediment control measures for sheet flow measures (e.g. silt fence)
- Temporary stabilization of an area when construction ceases for 14 days
- Permanent stabilization of areas when grade work is complete
- Sediment control measures for concentrated flow measures (e.g. rock check dams)
- Inlet protection for storm sewers and culverts
- Maintenance & Inspection criteria of erosion protection and sediment control BMPs

EPSC plans must be reviewed and approved by MUPB and the applicable fees must be received by MUPB prior to any land disturbing activity on the site.

2.2.2. Type 2 Land Disturbance Permit

Type 2 LDPs require a water quality protection plan called a Stormwater Pollution Protection Plan (SWPPP) prepared by a licensed professional engineer. SWPPPs should be prepared in compliance with KPDES Phase II regulations including:

- Vicinity map showing project location
- Location of all lots and proposed site improvements (roads, utilities, structures, etc.)
- 100-year floodplain and floodway limits
- Locations, size, and dimensions of proposed stormwater systems (pipes, swales, channels, etc.)
- Offsite construction activities (utility connections, etc.)
- Current Zoning
- Existing site topography (minimum 1' interval)
- Proposed final topography (minimum 1' interval)
- Existing vegetative cover
- Proposed vegetative cover
- Location of soil stockpiles and/or borrow/disposal areas
- Narrative describing the nature and purpose the project
- Notation of any State or Federal water quality permits
- Specific points where the stormwater discharge will leave the site
- Location and name of all wetlands, lakes, sinkholes, and watercourses on or adjacent to the site
- Identification of all receiving waters
- Identification of potential discharges to groundwater (abandoned wells, sinkholes, etc.)
- 100-year floodplain and floodway limits
- Pre- and post-construction estimate of peak runoff (per Stormwater Design Procedures)
- Adjacent land use, including upstream watershed
- Locations and approximate boundaries of all disturbed areas (construction limits)
- Soils map including soil descriptions and limitations
- Locations, size, and dimensions of proposed stormwater systems (pipes, swales, channels, etc.)
- Location of soil stockpiles and/or borrow/disposal areas
- Signed statement by owner or authorized agent that all land disturbing activities will be done pursuant to the approved City of Morehead Ordinance governing stormwater.
- Sequence describing stormwater quality measure implementation relative to land disturbance activities
- Stable construction exit locations and specifications (at all points of ingress and egress)

- Sediment control measures for sheet flow areasSediment control measures for concentrated flow areas
- Storm sewer inlet protection measures locations and specificationsRunoff control measures (diversions, rock, check dams, slope drains, etc.)
- Stormwater outlet protection specifications
- Grade stabilization structure location specifications
- Location, dimensions, specifications, and construction details of each stormwater quality measure
- Temporary surface stabilization methods appropriate for each season (include sequencing)
- Permanent surface stabilization specifications (include sequencing)
- Computations to support sediment control designs
- Kentucky Licensed Professional Engineer's seal

Modifications to the plan shall be processed and accepted or denied in the same manner as the review and issuance of the original permit application and may be authorized by MUPB by written authorization to the permittee, and shall include:

- Major amendments of the EPSC or SWPPP plan require an engineer’s signature and shall be submitted to MUPB for acceptance prior to completion.
- Field modifications of a minor nature shall be noted and dated on the EPSC or SWPPP record drawings and available for review and acceptance by MUPB within 14 calendar days after changes have been made in the field.

More information on SWPPP preparation requirements can be found in Appendix D. SWPPP plans must be reviewed and approved by MUPB prior to any land disturbing activity on the site.

2.2.3. Maintenance

All construction site BMPs require ongoing maintenance. At a minimum, sediment should be removed from the sediment storage area when the storage area is a third full. However, the contractor should demonstrate sound judgment and maintain the structures more frequently if necessary.

For Type 2 LDPs an inspection and maintenance strategy should include the following:

- Verify that sediment-laden stormwater flows to temporary sediment traps, basins or other sediment control devices.
- Runoff from undisturbed areas should be directed around disturbed areas and not directed into sediment control devices.
- Protect all existing or newly installed storm drainage structures from sediment clogging by providing inlet protection for area drains and curb inlets. Stormwater inlet protection can utilize sand bags, sediment traps, or other similar devices.
- Excavate permanent stormwater detention ponds early in the project, use them as sedimentation ponds during construction, remove accumulated sediment, and landscape the ponds when the upstream drainage area is stabilized.
- Inspect temporary sediment barriers such as silt fences, rock filters, and continuous berms after every rainfall. These barriers should only be used in areas where sheet flow runoff occurs. They are ineffective if the runoff is concentrated into rill or gully flow.
- Internal outlets must also be protected to reduce scour from high velocity flows leaving pipes or other drainage facilities.
- Protect sinkholes, drywells, yard inlets and other internal drainage features from sediment with inlet protection.
- A copy of the approved Erosion Prevention and Sediment Control Plan shall be maintained at the project site at all times during construction or shall be made available to the MUPB upon request.
- Prior to commencing land-disturbing activities in any area not on the approved erosion prevention and sediment control plan, the contractor shall submit a supplementary plan to MUPB for review and approval
- During dewatering operations water must be pumped

through an appropriate filtering device. MUPB may suspend dewatering operations if pollution is observed.

- The contractor shall inspect all erosion and sediment control devices at least once a week or at least once every fourteen calendar days and within 24 hours after any storm event 0.5 inch or greater. The contractor shall perform any repairs or maintenance prior to the next storm event or as soon as practicable in order to ensure effective erosion and sediment control.
- The contractor shall maintain a record of all inspections and maintenance activities. See Appendix E for inspection forms. This record shall be made available to MUPB upon request.
- Runoff sediment and construction waste from construction sites and parking areas shall not leave the site.
- Any sediments or other materials which are tracked off the site shall be removed immediately.

2.2.4. EPSC Qualified Contractor

MUPB requires that a Contractor who has been trained and certified in maintaining erosion prevention and sediment control install, inspect, and maintain the water quality protection BMPs on a site during the construction process for both Type 1 and Type 2 LDP. MUPB considers a Contractor to be EPSC Qualified when that Contractor has completed training conducted by an MUPB representative relative to installing, cleaning, monitoring, reporting, and closing out a site in compliance with the approved permit plan. An EPSC Qualified Contractor shall be responsible for overseeing the implementation and maintenance of all aspects of the plan and performing inspections. For both Type 1 and Type 2 LDP applications, a qualified contractor must be identified. The following information must be submitted with the application:

- Qualified Contractor's name, company name, address, phone number, and certification number.
- A statement signed by the contractor certifying that he/she will be the person responsible for the installation, inspection and maintenance of water quality BMP measures on the site and will be

the point of contact for MUPB regarding questions or concerns related to water quality for the permitted site. (Appendix F)

On projects where numerous grading or site contractors are likely to be working, a representative of the contractor responsible for overseeing the initial grading and installation of initial EPSC practices must be identified as the EPSC Qualified Contractor when the LDP application is submitted to MUPB for review and approval. However, prior to obtaining any permits, the applicant must identify any new EPSC Qualified Contractor(s) for the individual lot(s) or certify that the overall SWPPP for the development will be followed and that the EPSC Qualified Contractor for the overall development will also serve as the EPSC Qualified Contractor for the individual lot.

In addition to the regular site inspection that will be conducted by the EPSC Qualified Contractor, MUPB or its designated agent shall make inspections as deemed necessary to ensure the conditions of the EPSC/SWPPP are being properly implemented and maintained during construction. If minimum requirements for the EPSC/SWPPP are not met, the permittee shall be notified and enforcement actions shall be taken. See Appendix F for inspector forms.

In order to ensure that all practices are compliant during the construct period, a pre-construction meeting shall occur between MUPB, the Owner, and the EPSC Qualified Contractor. It is the responsibility of the EPSC Qualified Contractor to arrange this meeting. This meeting should take place after the Notice to Proceed, but prior to the mobilization of equipment. Grading on the site will not be permitted until this meeting has occurred.

2.2.5. Post Construction Water Quality

Development and redevelopment projects have the potential to increase impervious area and therefore alter the hydrologic response of local watersheds and increase stormwater runoff rates and volumes, and have the potential to increase flooding, stream channel erosion, and sediment transport and deposition.

Stormwater runoff from developed sites contributes to increased quantities of water-borne pollutants. Stormwater runoff, soil erosion and nonpoint source pollution can be controlled and minimized through the regulations

of stormwater runoff from development sites. The goal is to maintain or improve the quality of all streams within the MUPB service area to meet their designated use. Receiving waters are protected through the stormwater runoff quality controls in this section and the stormwater runoff quantity controls (Section 3).

In developing the post construction stormwater quality program, MUPB considered numerous factors related to the environment and the type of development common within the MUPB service area. It is the goal of MUPB to protect surface and shallow subsurface drainages while minimizing flooding and maintenance needs. To that end, MUPB's post construction stormwater quality program has been built on the following premises:

- The Kentucky Division of Water's 2016 Integrated Report, 305 (b) addressed the waters in the City of Morehead. Triplett Creek is listed as having Impaired use of Aquatic Life (nonsupport) with pollutants of concern being nutrient/eutrophication biological indicators; sedimentation/siltation; organic enrichment (sewage) biological indicators; and fecal coliform with suspected sources of unspecified urban runoff; storm sewers; agriculture; highway/road/bridges (new construction); impacts of hydro structure flow regulation/modification and point source discharges. Christy Creek is listed as Impaired use of Aquatic Life (partial support) with pollutants of concern being sedimentation/siltation with suspected sources being non-irrigated crop production. Dry Creek is listed as Impaired use of Aquatic Life (partial support) with pollutants of concern being nutrient/eutrophication biological indicators; sedimentation/siltation and organic enrichment sewage) biological indicators with suspected source highway/road/bridge runoff (non-construction related); urban stormwater and runoff/ storm sewers. Currently, there are no TMDL Reports for any of the impaired streams.
- MUPB must develop a locally derived water-quality treatment standard that states the water quality of stormwater produced from the 80th percentile rain event shall be addressed with best management measures that are built and maintained to treat, filter, flocculate, infiltrate, screen, evapo-transpire, harvest, and reuse stormwater runoff, or otherwise manage the runoff for all new and

redeveloped sites. (The 80% rain event is based on past rainfall data and will continually change with future rain events; however, it is not anticipated to vary drastically from one year to another.)

- Post construction water quality BMP's shall be designed to remove pollutants and reduce runoff volume. Some land uses produce higher concentrations of certain pollutants such as hydrocarbons or heavy metals, than those normally found in urban areas. These areas will be reviewed for effective removal of the particular pollutant which they discharge. Effective removal will be that which existed prior to development.
- MUPB determined that the stormwater quality treatment goal of 80% TSS removal of the average annual post- development pollutant load constitutes maximum extent practicable (MEP).
- Low impact development principles are encouraged. Examples included in Appendix K.
- Multi-purpose BMPs are encouraged. For example, bioretention facilities can serve landscaping and stormwater quality treatment requirements, and stormwater detention facilities can be included in a treatment train to meet both stormwater quantity and quality requirements.

2.2.5.1. Stormwater Quality BMP

2.2.5.1.1. Water Quality Volume Criteria

In preparation for compliance to KPES Phase II MS4 regulations, MUPB has developed water quality treatment standards for new development and redevelopment projects that disturb one or more acres of land, or areas less than one acre that are part of a larger common plan of development. The following outlines the water quality treatment standard for each of these stormwater runoff producing activities.

New Development Projects: Based on the 80th percentile precipitation event, the runoff produced from the first 1 inch of rainfall must be passed through a water quality BMP before being discharged from the site.

Redevelopment Projects: Redevelopment standards shall apply to parcels that were previously developed (e.g., contained structures or parking lots), where one acre or more of land will be disturbed, or areas less than one acre that are part of a larger common plan of development. Developers have three options for redevelopment projects:

- Reduce the existing impervious area by 20 percent (based on historical maps or other documentation provided by the developer)
- For projects with no increase in impervious area, Developers shall implement stormwater quality BMPs for 20 percent of the site's impervious area
- For projects with a net increase in impervious area, stormwater quality BMPs shall be required for 20 percent of the existing impervious area plus 100 percent of the net increase in impervious area.

Post-construction stormwater runoff controls include a variety of water quality BMPs such as Infiltration practices, media filters, and water reuse. Refer to the Kentucky Transportation Cabinet Stormwater Post-Construction Best Management Practices Menu for specifications for acceptable post-construction BMPs.

https://transportation.ky.gov/EnvironmentalAnalysis/Memos/KYTC%20Post%20Construction%20BMP%20Menu.pdf

2.2.5.1.2. Structural Stormwater Quality Treatment Design

Stormwater quality treatment for MUPB is defined as a goal of 80% total suspended solids (TSS) removal of the average annual post-development load. All stormwater BMPs shall be designed in a manner to minimize the need for maintenance and reduce the chances of failure, while maintaining the required function. MUPB's stormwater quality program requires new development and redevelopment to treat the runoff from up to the 80th percentile rain event in Morehead to a load reduction goal of 80% of the average annual post-development total suspended solids (TSS) based upon

data in the Nationwide Urban Runoff Program. Treatment may be achieved using a single treatment method or by using a treatment train. A treatment train achieves 80% removal of TSS by combining multiple treatment techniques (traditional or LID) in-line to compound the TSS removal.

Permanent BMPs should be proposed by the developer early in the planning stage of a project. For most projects, there will be no single BMP which addresses all the long-term stormwater quality problems. Instead, a multi-level strategy will be worked out which incorporates source controls, a series of on-site treatment controls, and community-wide treatment controls.

The Water Quality Volume (WQv) equation establishes the volume that must be treated. The WQv is storage required to capture and treat stormwater runoff from 80% of the average annual rainfall, which is considered the "first flush". The 80th percentile storm event in MUPB is 0.6 inches. All storms greater than 0.6 inches must be routed in a non-erosive manner through the water quality treatment device or routed around it.

Water Quality Volume Calculation

$$WQv = [P\ Rv)(A)]/12$$

Where,
P is the 80th percentile rainfall in inches, (in the case of MUPB, 0.6 inches);
Rv is the volumetric runoff coefficient, which is:
Rv = 0.05 + 0.009(I), where I is the percent impervious cover; and
A = the area in square feet

2.2.5.1.3. Proprietary Stormwater Treatment Devices

All treatment devices designed for stormwater quality must be approved by MUPB prior to installing them. Many manufactured stormwater treatment devices are available to treat stormwater runoff. However, some of these BMPs do not have established pollutant removal data based on standardized testing methods.

MUPB considers proprietary BMPs as Limited Application BMPs because of a lack of historic pollutant removal data or because of high maintenance requirements.

Proprietary devices must be approved before they can be considered for use in MUPB. Manufacturers' claims for BMP performance must be verified through data that is obtained in independent third-party testing.

MUPB recognizes two levels of treatments:

A. Pretreatment. Pretreatment devices do not meet the full 80% TSS reduction goal; however, they can be used in a treatment train approach with other BMPs to fully meet the treatment goal.

B. Full Treatment. Manufactured treatment devices that show thorough testing that they meet the full 80% TSS reduction goal are considered full treatment devices. If the manufactured treatment device is a flow-based device, the peak flow rate for the TSS reduction must be provided and cannot be exceeded in the design.

2.2.5.1.4. Bonds for Stormwater Management BMPs

The purpose of a bond is to ensure that the person(s) responsible for completing the land disturbing activities and/or construction work do so in a manner consistent with the design plans of MUPB's standards. The bond provides assurance that MUPB will be reimbursed if it must assume the costs of corrective measures and/or work not completed by the responsible person(s) according to the required specifications and approved plans.

2.2.5.1.5. As-built Certifications and Inspections

In an effort to ensure that water quality management BMPs approved by MUPB are installed and maintained according to plan, MUPB requires certifications of the correct initial installation of BMPs, referred to as as-built certifications, **as well as an annual certification of ongoing maintenance and operation of each BMP.** This section describes the as-built certification requirements.

Prior to obtaining a Bond Release, two (2) complete copies of as-built drawings and one digital copy with the appropriate professional certifications must be provided to MUPB for approval. As-built certification, signed by a licensed professional engineer, must state that the BMP(s) are constructed as shown and that they will perform as approved.

The as-built drawings must reflect the "as- constructed" condition of the development, and must include sufficient information to demonstrate conformance with the approved stormwater management plan. Variations to the approved plan shall be clearly designated. MUPB has the authority to request the submission of additional information with the as- built plan as necessary to allow a thorough review of the as-constructed conditions. Omission of any required items shall render the plans incomplete, and they will be returned to the applicant, or their engineer, so that they may be completed. As-built certification checklists are provided in Appendix G and must be completed and submitted with the as-built certification.

2.2.5.1.6. Operation and Maintenance Plan

Stormwater Water Quality BMPs installed for development and redevelopment projects, outside of single family residential, shall be privately maintained by the Owner or assigned responsible party. An Operation and Maintenance (O&M) plan shall be recorded with the property. The Plan must contain enough information to locate the BMPs and perform inspections to document the functionality of the BMP perpetually. This information must then be recorded with the Rowan County Clerk's Office and tracked with the property so future property owners will be made aware of the locations of the BMPs and the requirement to perform inspections.

A draft final O&M Plan must be submitted with the construction plans for review. Once the plans are finalized and approved by MUPB, the BMPs have been constructed, and the as-built certification has been completed, The O&M Plan must be recorded and submitted with the as-built certification. MUPB will record the O&M plan after collecting the recording fee.

The O&M Plan shall contain the following elements:

- An Inspection and Maintenance Agreement signed by the developer or BMP owner that states that the owner is responsible for maintaining the BMP perpetually and performing inspections.
- A BMP location map clearly indicating the locations of all stormwater BMPs, drainage easements, access easements, roadways, and stormwater system components as they relate to the stormwater BMPs.
- Schematics for each BMP which should be detailed enough to allow for future inspections of the BMP(s) and stormwater system. If more than one BMP is on the project site, schematics of each BMP must be provided.
- Inspection and maintenance templates for each type of BMP or approved equivalent shall be completed.
- The Annual BMP report template, or the approved equivalent, which must be used by the BMP owner for the annual inspection of the BMP(s).

Templates and examples of these components can be found in Appendix H. All components must be included in the O&M Plan that is recorded with the Rowan County Clerk's Office.

Stormwater Water Quality BMPs installed for development and redevelopment of single family residential developments shall be installed in the public right-of-way or an easement for maintenance by MUPB. Detention/Retention ponds installed for water quantity control shall be installed on individual, dedicated lots for maintenance by MUPB. Easements shall be included to allow access for maintenance.

2.2.5.1.7. Alternative Water Quality Plan

For projects determined by MUPB to be unable to meet the water quality treatment standard or detention requirements, such as those with limited surface area, setbacks, or due to the natural or existing physical characteristics of a site, the following alternatives may be considered at the discretion of MUPB:

- Off-Site Mitigation – The off-site mitigation option entails implementing measures to enhance infiltration/evapotranspiration/reuse that may be implemented at another location in the same watershed as the original project. If it can be demonstrated that the proposed development is not likely to impair attainment, provisions may be made to manage stormwater by an off-site facility. The off-site facility is required to be designed and adequately sized to provide a level of stormwater control that is equal to or greater than that which would be afforded by on-site practices. Additionally, there must be a legally obligated entity responsible for long-term operation and maintenance of the stormwater practice proposed.
- Payment-in-lieu – Solely at the discretion of MUPB, there may be situations in which MUPB waives all or part of the minimum stormwater management post construction requirements in exchange for a monetary or property contribution. MUPB will use these contributions for a stormwater capital project or an off-site stormwater management facility deemed to be a greater benefit to the community. Contribution shall be made by the Developer prior to the approval of the Development Plan.

SECTION 3
STORMWATER DESIGN MANUAL

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SECTION 3

3.1. INTRODUCTION

3.1.1. Background

The City of Morehead (CITY) and their agent, the Morehead Utility Plant Board (MUPB), have established design criteria for the design and implementation of stormwater facilities in new development or redevelopment projects within the MUPB service area. The purpose of these standards is to provide a common set of guidelines that will produce consistency in design for stormwater facilities constructed either publicly or privately. This is necessary because in some cases MUPB becomes ultimately responsible for maintenance and operation of stormwater infrastructure that was originally intended for private ownership. This document is intended to be revised in the future as the need for new regulations arises and as development continues to progress.

These standards serve as a guideline for routine development. MUPB may at any time require additional analysis or additional infrastructure, or may deviate from these guidelines in special circumstances. This applies especially to development adjacent to streams, sinkholes, bodies of water or development in or immediately upstream of known problem areas. Additionally, MUPB may initiate a "fee in lieu of" program where it will be advantageous and in the public's best interest to share the cost of constructing regional stormwater infrastructure.

These standards also develop a standard procedure for the submission of engineering plans and calculations for review by MUPB and will establish a methodology aimed at ensuring uniform quality of design and construction.

3.1.2. Ownership and Maintenance of Drainage Easements

Drainage easements contain stormwater channels, pipes, stormwater storage areas/facilities, and post-construction stormwater BMPs, as well as access rights for maintenance of such facilities. No channel alteration or construction that would obstruct the flow of stormwater or prevent maintenance is allowed within the drainage easement. There shall be no storage or disposal of grass clippings, trash, debris, or other potential obstructions that may wash into stormwater channels or other stormwater management facilities. The property owner is responsible for mowing and maintenance on all public drainage system easements on private property. Additionally, property owners shall not construct anything in the public

drainage system, including the natural waterways, in the MUPB Service Area adjoining their property that will impede the flow of water.

3.1.3. Additional Permits

In addition to permits that are required by MUPB, the Kentucky Division of Water (KDOW) and the United States Army Corps of Engineers (USACE) also require permits for construction that occurs within or adjacent to designated waterways and/or floodplain areas. Required permits may include:

3.1.3.1. Floodplain Construction Permits

A Floodplain Construction Permit is required from KDOW of the Environmental and Public Protection Cabinet prior to the construction, reconstruction, relocation, or improvement of any dam, embankment, levee, dike, bridge, fill, cut, or other obstructions across or along any stream or in the floodway of any stream. Permits are required for any such activity in designated 100-year floodplains or areas known to be flood-prone. A permit from the KDOW is also required to deposit or cause to be deposited any matter that will in any way restrict or disturb the flow of water in the channel or in the floodway of any stream.

3.1.3.2. KDOW Permit

In addition, a KDOW permit is required prior to the construction of structures qualifying as dams. A structure is defined by KDOW as a dam if the vertical distance from the downstream toe to the crest of the embankment is 25 feet or greater, or if the structure has the potential for impounding, either temporarily or permanently, 50 acre feet or more, measured to the crest of the embankment. Impoundment structures of lesser size may also warrant permitting by KDOW if downstream hazard conditions warrant such consideration.

3.1.3.3. 401 and 404 Permits

KDOW has another permitting program (Section 401 permit) related to construction that impacts the stream channel and areas below the ordinary high water level or in wetlands. KDOW administers regulations and requirements for projects that impact these waters.

Additionally, the United States Army Corps of Engineers (USACE) has requirements for projects that impact waters of the United States, including wetlands, Section 404 permit.

The Developer is responsible for determining which permits are required, submitting the application(s) to the governing agency, and providing evidence of permit issuance to MUPB.

3.2. DESIGN OF STORMWATER APPURTENANCES

3.2.1. Design Storms

Drainage within the MUPB Service Area shall be designed to adequately handle the runoff from storms having various frequencies of occurrence from different types of development in accordance with the following general categories. To ensure the adequacy of the storm drainage system, the following minimum design storms shall be used.

- The 10-Year Storm shall be used for all storm sewer inlets and closed pipe systems. The 100-year Storm shall be used as a Check Storm to ensure against flooding or surcharging per Section 3.4.

- The 100-Year Storm shall be used for all open channels. Channel linings should be designed to control the erosive flows resulting from the 100-Year Storm Event; as outlined in Section 3.5.

- The 2-, 10-, 25- and 100-Year Storms shall be used to calculate pre- and post-development runoff from a site for detention and retention basins, as outlined in Section 3.3. Additionally, the 100-year Storm shall be used to check detention, retention, or sediment control basins to ensure against flooding or discharge.

- The 100-Year Storm shall be used in the design of all culverts and bridge structures; as outlined in Section 3.6.

- The 100-Year Storm shall be used in the design of flood control facilities. The 100-Year Storm shall be used in comparison with established flood elevations from property owners, observations, Kentucky Transportation Cabinet (KYTC) drainage folder data, Federal Emergency Management Agency (FEMA) maps and other viable records to minimize the impacts of flooding and stormwater.

- Additional controls or localized discharge restrictions may be placed on specific sites, as deemed necessary by MUPB. For example, sites

with pre-existing downstream drainage or flooding issues may require additional controls as determined by MUPB.

Table 3.2.1 Minimum Design Storm Applications

Storm Frequency	Stormwater Facility						
	Floodplains	Detention Ponds	Inlets	Storm Sewers	Culverts & Bridges	Constructed Channels	Sediment Basins
2		●					
10		●	●	●		●	●
25		●					
100	●	●	●	●	●	●	●

3.2.2. Runoff Computation Methods

Numerous methods of rainfall-runoff computation are available on which the design of storm drainage and flood control systems may be based. The Rational Method and the Soil Conservation Service (SCS) hydrologic methods (available in TR-20, TR-55 and HEC-HMS) are accepted as adequate for determining peak runoff rates for drainage areas totaling 100 acres or less.

For larger drainage systems, the SCS hydrologic methods or the United States Geological Survey (USGS) Regional Method of the Kentucky Transportation Cabinet, Department of Highways shall be used to determine peak runoff rates. The method of analysis must remain consistent when drainage areas are combined. The method, which applies to the largest combined drainage area should be used.

3.2.3. Rational Method

For areas less than 100 acres, the Rational Method may be used to calculate peak discharge rates, but shall not be used to calculate the volume of stormwater runoff or develop runoff hydrographs.

$$Q = CiA$$

where: Q = peak runoff quantity in cubic feet per second;

C = runoff coefficient

i = average intensity of precipitation in inches per hour

A = watershed area in acres

Table 3.2.2 Design Storm Rainfall Intensity

Time of Concentration* (minutes)	Intensity (inches/hour)						
	1-yr	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
5	4.48	5.32	6.35	7.15	8.14	8.94	9.7
10	3.49	4.16	4.94	5.54	6.26	6.82	7.34
15	2.86	3.40	4.06	4.56	5.17	5.64	6.08
30	1.9	2.29	2.79	3.18	3.67	4.05	4.93
60	1.16	1.41	1.76	2.03	2.39	2.68	2.97

Source: NOAA Atlas 14, Volume 2, Version 3: Point Precipitation Frequency Estimator for Morehead Kentucky

Table 3.2.3 Rational Method Runoff Coefficients for Composite Analysis

Runoff Coefficients for Rational Formula	
Type of Drainage Area	**Runoff Coefficient, C**
Business:	
Downtown areas	0.70-0.95
Neighborhood areas	0.50-0.70
Residential:	
Single-family areas	0.30-0.50
Multi-units, detached	0.40-0.60
Multi-units, attached	0.60-0.75
Suburban	0.25-0.40
Apartment dwelling areas	0.50-0.70
Industrial	
Light areas	0.50-0.80
Heavy areas	0.60-0.90
Parks, Cemeteries	0.10-0.25
Playgrounds	0.20-0.40
Railroad yard areas	0.20-0.40
Unimproved areas	0.10-0.30
Lawns	
Sandy soil flat, <2%	0.05-0.10
Sandy soil average, 2% - 7%	0.10-0.15
Sandy soil steep, >7%	0.15-0.20
Heavy soil flat, <2%	0.13-0.17
Heavy soil average, 2% - 7%	0.18-0.22
Heavy soil steep, >7%	0.25-0.35
Streets	
Asphalt	0.70-0.95

Concrete	0.80-0.95
Brick	0.70-0.85
Drives and Walks	0.80-0.95
Roofs	0.75-0.95

3.2.4. NRCS Unit Hydrograph Method

The Natural Resources Conservation Service (NRCS) Unit Hydrograph Method is based on a 24-hour storm event. For Kentucky a Type II time distribution shall be used. NRCS was formerly known as the Soil Conservation Service (SCS). Some publications still refer to this method as the SCS method, however both acronyms refer to the same method.

Table 3.2.4 24-Hour Precipitation Depths

STORM FREQUENCY	24-HR RAINFALL DEPTH (IN)
2-YR	**2.95**
10-YR	**4.09**
25-YR	**4.82**
100-YR	**6.02**

Table values from the NOAA Atlas 14, Volume 2, Version 3: Point Precipitation Frequency Estimator for Kentucky, Morehead Station ID: 15-5555.

Table 3.2.5 Curve Numbers

Land Use	Percent Impervious	Hydrologic Soil Group			
		A	B	C	D
Urban Areas					
Parking Lots, Roofs, Driveways, and Streets	100	98	98	98	98
Commercial Development	85	89	92	94	95
Industrial Development	72	81	88	91	93
Residential Development					
⅛ acre lots or less	65	77	85	90	92
¼ acre lots	38	61	75	83	87
⅓ acre lots	30	57	72	81	86
½ acre lots	25	54	70	80	85
1 acre lots	20	51	68	79	84
Pervious Areas					
Lawns, Parks, Golf Courses, Cemeteries, etc.	-	39	61	74	80
Pasture for Grazing (not mowed)	-	39	61	74	80
Meadows (mowed for hay)	-	30	58	71	78
Brushy Areas	-	30	48	65	73
Woods	-	30	55	70	77

Source: USDA Natural Resource Conservation Service

Table 3.2.6 SCS Hydrologic Group for Rowan County Soils

Map Unit Name	Map Unit Symbol	SCS Hydrologic Soil Group
Allegheny loam, 2 to 6 percent slopes	AlB	B
Allegheny loam, 6 to 12 percent slopes	AlC	B
Allegheny loam, 12to 20 percent slopes	AlD	B
Berks silt loam	BeF	B
Bonnie silt loam	Bo	A
Chavies fine sandy loam, acid variant, 0 to 6 percent slopes	ChB	A
Clifty silt loam	Ck	A
Cotaco fine sandy loam, neutral variant, 2 to 6 percent slopes	CoB	B/D
Cranston gravelly silt loam, 2 to 6 percent slopes	CrB	A
Cranston gravelly silt loam, 6 to 12 percent slopes	CrC	A
Cranston gravelly silt loam, 12 to 20 percent slopes	CrD	A
Cranston gravelly silt loam, 20 to 30 percent slopes	CrE	A
Cranston gravelly silt loam, 30 to 60 percent slopes	CrF	A
Cuba silt loam	Cu	B
Donahue rocky sandy loam, 6 to 20 percent slopes (caneyville)	DoD	C
Donahue rocky sandy loam, 20 to 40 percent slopes (caneyville)	DoF	C
Gilpin silt loam, 6 to 12 percent	GlC	C
Gilpin silt loam, 12 to 20 percent	GlD	C
Hartsells fine sandy loam, 6 to 12 percent slopes (lily)	HaC	B
Hartsells fine sandy loam, 12 to 20 percent slopes (lily)	HaC	B
Johnsburg silt loam	Jo	C/D
Latham silt loam, 6 to 12 percent slopes	LaC	D
Latham silt loam, 12 to 20 percent slopes	LaD	D
Latham silt loam, 20 to 30 percent slopes	LaE	D
Latham-Shelocta silt loams, 12 to 20 percent slopes	LsD	D
Latham-Shelocta silt loams, 20 to 30 percent slopes	LsE	D
Latham-Shelocta silt loams, 30 to 50 percent slopes	LeF	D
Monongahela fine sandy loam, 2 to 6 percent slopes	MoB	C/D
Morehead silt loam	Mp	B/D
Mullins silt loam	Mr	D
Muse silt loam, 2 to 6 percent slopes	MsB	C
Muse silt loam, 6 to 12 percent slopes	MsC	C
Muse silt loam, 12 to 20 percent slopes	MsD	C
Muse silt loam, 20 to 30 percent slopes	MsE	C
Muse-Trappist stony silt loams	MtF	C
Pope fine sandy loam	Po	A
Pope gravelly fine sandy loam, 0 to 2 percent slopes, occasionally flooded	Pp	A
Renox gravelly fine sandy loam, 2 to 6 percent slopes	ReB	B
Renox gravelly fine sandy loam, 6 to 12 percent slopes	ReC	B
Rigley gravelly fine sandy loam, 2 to 6 percent slopes	RgB	A
Rigley gravelly fine sandy loam, 6 to 12 percent slopes	RgC	A
Rigley gravelly fine sandy loam, 12 to 20 percent slopes	RgD	A
Rigley gravelly fine sandy loam, 20 to 30 percent slopes	RgE	A
Rigley stony fine sandy loam, 30 to 60 percent slopes	RlF	A
Rigley-Donahue complex, 6 to 20 percent slopes	RoD	A
Rigley-Donahue complex, 20 to 30 percent slopes	RoE	A
Rigley-Donahue complex, 30 to 60 percent slopes	RoF	A
Skidmore gravelly fine sandy loam	Sd	A
Steinsburg-Ramsey rocky sandy loams, 6 to 20 percent slopes	SrD	B
Steinsburg-Ramsey rocky sandy loams, 20 to 40 percent slopes	SrF	B
Stendal silt loam	St	B/D
Stendal fine sandy loam, neutral variant (pope)	Sv	A/D
Tilsit silt loam, 2 to 6 percent slopes - residual & alluvial landforms	TlB	D

Tilsit silt loam, 6 to 12 percent slopes - residual & alluvial landforms	TIC	D
Whitley silt loam, 6 to 12 percent slopes	WhC	B
Whitley silt loam, 12 to 20 percent slopes (wernock)	WhD	C
Whitley silt loam, terrace, 0 to 2 percent slopes	WtA	B
Whitley silt loam, terrace, 2 to 6 percent slopes	WtB	B
Whitley silt loam, terrace, 6 to 12 percent slopes	WtB	B

Source: USDA Web Soil Survey

3.3. WATER QUANTITY DESIGN CRITERIA

In order to minimize runoff damage to downstream properties, sediment pollution of public and private waters, and hydraulic overloading of existing drainage facilities, the peak stormwater discharge rates from a land disturbing activity or development and redevelopment activities after development **shall not exceed** the peak pre-development discharge rates.

3.3.1. New Development Projects

Stormwater runoff control facilities shall be required on new development projects to reduce the peak flows to pre-development levels. MUPB may require additional detention where necessary to mitigate existing downstream flooding problems. Detention/retention facilities may be designed and implemented for each individual site, but the use of regional facilities is encouraged. Detention facilities shall be designed so that no water will remain standing in the pond area during dry weather or that standing water in retention facilities will not be allowed to stagnate and present health hazards. MUPB reserves the right to waive detention/retention requirements if doing so allows stormwater runoff to enter the existing waterway prior to peak flow conditions, lessening downstream effects.

3.3.2. Redevelopment Projects

Redevelopment standards shall apply to parcels that were previously developed (e.g., contained structures and/or parking lots) where the increase in impervious area is greater than 1000 sf. Increase in impervious area shall be calculated as cumulative, beginning with the adoption of this manual. For these projects, peak flow rates shall be less than or equal to the peak flow prior to redevelopment. Additionally, discharge location and direction shall match prior conditions.

3.3.3. Detention/Retention Design Methods

An accepted method that generates an inflow/outflow hydrograph such as the SCS method or Modified Rational Method shall be used. It is required that a computer program be used to develop these hydrographs. All documentation shall be submitted for review by MUPB.

3.3.4. Pre- and Post Development Runoff Control

The pre-development site runoff rate and the post development site runoff rate shall be calculated for the 2, 10, 25 and 100-Year Storm frequencies. The entire acreage contributing to the runoff shall be included in the calculations. The entire acreage contributing to the runoff shall be included in the calculations. The post-development peak runoff rate shall be equal to or less than the pre-development peak runoff rate at any point of discharge for the ultimate development. The results shall be summarized in a table in the stormwater report.

3.3.5. Storage Volume and Design Discharge

The peak discharge from the storage facility shall be controlled by an outlet structure designed to limit post development flows for the 2-, 10-, 25- and 100-Year Storm Events to the corresponding pre-development peak discharge flow rates for the 2-, 10-, 25- and 100-Year Storm Events. Volume of the storage facility shall be of adequate size as to allow the outlet structure to control the flow rate for each storm event. The outlet structure (including the emergency spillway) shall be sized to accommodate a flow equal to the 100-year storm post development discharge. The lowest orifice in the outlet structure shall have a trash rack or other acceptable technique installed to prevent clogging.

3.3.6. Basin Design Standards

These standards apply to permanent and temporary stormwater runoff, sediment and debris basins formed by an embankment or excavation. These standards are limited to the installation of basins on sites where failure of the structure will not result in loss of life, damage to adjacent properties, or interruption of use or service of public utilities; the area draining to the structure does not exceed 200 acres; and the water surface at the crest of the emergency spillway does not exceed five acres. Basins with dams that qualify as KDOW hazard rated structures Class A, B, or C require more stringent design criteria and will be considered on a case by case basis by MUPB.

- All basins shall be designed and built with side-slopes no greater than 3:1 (3 feet horizontal per 1 foot vertical).

- Fencing may be required by MUPB when the location of the detention area is not easily observed or the side slopes of the basin are steeper than 4:1 (4 feet horizontal per 1 foot vertical).
- Detention basins shall have a minimum 1 percent bottom drainage slope. For detention basins with bottom slopes less than 2 percent, a concrete channel is required. Detention basins shall be fully discharged within 24 hours of the end of the storm event.
- Stage, storage, discharge, and routing calculations for the 2-, 10-, 25- and 100-Year discharges must be submitted for review.
- The outlet structure may be a combination of pipes, weirs, orifices and drop inlets, but the outlet pipe from the structure through the dam shall be at least 15 inches in diameter to facilitate maintenance. The outlet pipe shall be high density polyethylene pipe (HPDE), dual wall polypropylene pipe (PP), reinforced concrete pipe (RCP), or polyvinyl chloride (PVC)
- The engineer is required to include anti-seep collars where the spillway barrel passes through the embankment, baffles, and outlet protection.
- The dam crest elevation shall not be less than one foot above the highest water surface elevation during the 100-Year event.
- Provide an emergency spillway sized to discharge the peak runoff from the 100-Year Storm assuming the principal spillway is clogged, without overtopping the dam crest.
- Spillways shall be protected from erosion and shall employ energy dissipation, if necessary. Discharge velocities must be controlled to a level that prevents the erosion at the end of the outlet pipe or in the subsequent channel.
- Stabilize earthen embankments immediately with temporary or permanent vegetation in accordance with requirements of the Kentucky BMP Manual for Construction Activities.
- Access for maintenance activities shall be provided from public or private right-of-way by establishing a drainage easement. Design the access to be at least 10 feet wide. Access way shall connect to the embankment so that equipment can access the top of the embankment on a slope not steeper than 5:1 (h:v).
- Detention or retention basins shall not be constructed or utilize storage volume in public right-of-way.

3.3.7. Stormwater Runoff Control Maintenance Responsibility

Maintenance of detention/retention structures shall remain the responsibility of the property owner or designated responsible entity for all development/redevelopment projects with the exception of single family residential development. These stormwater runoff control facilities shall be

maintained in order to function according to its design and purpose. Maintenance responsibility and maintenance provisions for the facility shall be noted on the stormwater management plan and included in the Operations and Maintenance Agreement found in Appendix I of this Manual.

The location of the facility shall be shown on the Final Plat or Final Development Plan. Maintenance necessary to maintain the function of detention facilities include:

- Frequent removal of accumulated solids, debris, and litter from the detention/retention area, especially from the low flow channel.
- Accumulated sediments should be removed at regular intervals, usually once every two to five years depending on the contributing drainage area and land use. For retention basins, remove sediment when approximately 10 to 20 percent of the system's storage volume has been lost.
- Removal of debris from vegetated areas to prevent damage to vegetation and to maintain visual appearance.
- Removal of debris from the bottom of the basin to reduce clogging of outlet structures, trash racks, and other mechanical components.
- Mowing.
- Removal of vegetation, such as small trees, which can damage the embankment.
- Structural repairs to inlets, outlets, or discharge structure, including the emergency spillway.
- Vegetative stabilization of eroding sides or bottom.
- Repairs to the dam, embankment, or slopes to prevent erosion or piping.
- Monitor channel erosion in downstream conveyances.
- Repairs to fences, if applicable.

Maintenance of the stormwater runoff control facilities for single family residential developments shall be performed by MUPB. Access for maintenance activities shall be provided from public or private right-of-way by establishing a drainage easement. Design the access to be at least 10 feet wide. Access way shall connect to the embankment so that equipment can access the top of the embankment on a slope not steeper than 5:1 (h:v). The access easement shall cover the entire stormwater runoff control facility leaving enough room around the top of bank for maintenance equipment.

3.4. STORM SEWER SYSTEM DESIGN CRITERIA

Proposed storm sewer systems that are located within the public right-of-way or systems within drainage easements in the MUPB service area must adhere to the following guidelines:

- Proposed storm sewer pipes shall be high density polyethylene pipe (HPDE), dual wall polypropylene pipe (PP), reinforced concrete pipe (RCP), or polyvinyl chloride (PVC) that adhere to the following design criteria and installed per KYTC Standard Specification and Drawings.
- Minimum pipe diameter for proposed lines is 18 inches.
- Space storm sewer structures no more than 300 feet apart for pipes 48-inch diameter or less, and no more than 400 feet apart for pipes 54-inch diameter or larger.
- Bedding details and joint specifications are to be provided with all construction drawings and shall comply with manufacturer's recommendations.
- A storm sewer structure must be placed at the following locations:
    - where the proposed storm sewer extends beyond the maximum length
    - where there is a change in horizontal or vertical alignment where the pipe material changes
    - at the beginning and ending points for proposed storm lines
- Proposed systems are to be designed to handle the 10-Year Storm event capacity with the HGL below the crown of pipe. Flow interception for structures must be based on bypass conditions. No proposed system will be permitted to surcharge in the 100-Year Storm event.
- Engineers are to design storm sewers to prevent the 100-Year Storm event from crossing roadway crowns for local and continuous streets.
- Curb inlets are to be spaced on grade to limit spread of water to 6 feet from the edge of roadway pavement for widths of 24 feet or greater, excluding curb and gutter. Spread calculations are to be based on an intensity of four (4) inches/hour. For roadway pavement widths less than 24 feet, a minimum of 6 feet of the vehicular travel lane must be free of spread of water. MUPB may require a reduction in allowable spread based on traffic volume and speed limit.
- 100-Year water surface elevations are to be determined for all proposed storm sewer structures, including headwalls and surface inlets.
- In residential subdivisions that include curb and gutter as part of their roadway design, proposed storm lines that leave the street right-of-way are to be daylighted at the rear lot line.
- Overflow swales are to be provided at sag locations in commercial and residential subdivisions with appropriate easements and restrictions on the Final Subdivision Plat. Overflow swales shall be designed to carry the 100-year Storm in the event of a storm sewer blockage.

- Private systems are allowed to discharge stormwater into the City's storm sewer system only after the proper water quality, quantity and recharge treatments have been met.
- Design shall be completed and sealed by a professional engineer licensed in Kentucky
- MUPB must approve the types of structures proposed for stormwater systems in the right-of-way or within drainage easements. Structures are to include access for maintenance and inspection.

3.5. CULVERT AND BRIDGE DESIGN CRITERIA

Proposed channel and stream crossings are to include a means to convey the 100-year flow. Culverts are typically used in situations where drainage ways do not have any base flows associated with them. Head conditions occur on the upstream side to force the peak flow through the structure(s). Proposed culverts are to be designed so that the 100-year water surface elevation is a minimum of one foot below the overtopping elevation of any embankment, road, ditch, etc. Bridge structures are to be used at creek and stream crossings where base flow conditions do exist (base flow being defined as water being present in channel and stream areas during dry weather conditions). These structures are to be designed to convey the 100-year flow rate unimpeded, and allow the 100-year water surface elevation to be one foot below the bottom of the bridge superstructure. After construction, the stamping professional engineer shall inspect and certify all bridges as required in the stormwater management plan. Prior to plan approval all permits are to be obtained from USACE and/or KDOW, if applicable, and provided to the MUPB.

Other design considerations that apply to culverts and bridges are listed in the following:

- Live load considerations for anticipated construction traffic, fire service vehicles, refuse trucks, commercial vehicles, etc.
- Public protection for pedestrian and bicycle traffic, if applicable.
- Headwalls for the upstream and downstream sides of proposed culverts. Fences or railing are to be provided for headwall that are for 30-inch lines or greater.
- Railing design for bridges.
- End treatments for culverts to minimize erosion and sediment transport.
- Scouring protection for bridge piers and abutments.
- Fish passage

- Streambank stabilization designs for backwater areas and accelerated flows downstream.
- Design shall be completed and sealed by a professional engineer licensed in Kentucky

3.6. OPEN CHANNEL DESIGN

3.6.1. Design Standards

The objective of open channel flow design is: (a) to determine a channel slope and size that will have sufficient capacity to prevent undue flooding damage during the anticipated peak runoff period; and (b) to determine the degree of protection based on stream velocity to prevent erosion in the drainage channel. Existing drainage channels, which will remain undisturbed, shall not be required to be reconstructed unless additional capacity and stabilization is required. Developments that use open channels to convey runoff must adhere to the following guidelines:

- Convey the 100-year Storm Event.
- Designs not to exceed the channel lining's critical shear force and permissible velocity in the 100-year Storm Event.
- Select the appropriate roughness values for proposed channels.
- Provide any armoring needed for hydraulic jump and bend conditions.
- Earthen channel side slopes shall be no steeper than 2:1. Open channels with lining shall have a maximum gradient on side slopes of 3:1.
- Design velocities should generally be greater than 1.5 feet per second to avoid excessive deposition of sediments. When flat slopes are unavoidable, concrete paving should be used to accelerate runoff.
- Design shall be completed and sealed by a professional engineer licensed in Kentucky

Erosion shall be controlled by limiting velocities, changing the channel lining or reshaping the channel to spread the flow of runoff. Methods of controlling erosion in open channels include the following: (1) grass covers or sod; (2) aggregate channel lining; (3) geo-textile turf reinforcement mats (TRMs) and (4) concrete. Channel linings should be designed to control erosive flows resulting from the 100-Year Storm Event. The design of channel linings should meet both the velocity and shear stress requirements. MUPB will consider required maintenance when approving the method of channel lining.

Constructed channels in residential areas that receive runoff from a storm sewer or culvert shall be designed with a low flow channel constructed of permanent turf reinforcement, permeable pavers, or articulated blocks to prevent erosion. Concrete low flow channels may only be used if the above methods are not sufficient to prevent erosion. The low flow channel shall be designed to carry the 10-Year Storm.

3.6.2. Manning's Equation

Use Manning Equation to design open channels.

$$Q=(1.49/n)AR^{2/3}S^{1/2}$$

Q=discharge, cfs
n = Manning's roughness coefficient (Table 3.6.1)
A = cross-sectional area of flow, ft^2
R = hydraulic radius = A/P, ft
P = wetted perimeter, ft
S = channel slope, ft/ft

Table 3.6.1 Manning's n for Constructed Channels

LINING TYPE	MANNING'S n
Concrete	0.013
Grouted Stone	0.030
Stone Masonry	0.032
Bare Soil	0.020
Rock Cut	0.035

Jute Net	0.022
Straw with Net	0.033
Curled Wood Mat	0.035
Class I Channel Lining	0.060
Class II Channel Lining	0.050
Grass	0.045
Streams	0.045
Floodplains	
Pasture, no brush	0.035
Brush	0.10
Trees	0.120

3.7 SUBMITTALS AND DOCUMENTATION

3.7.1 Requirements

All projects presented to MUPB for review involving construction of stormwater infrastructure shall incorporate the following information. Submitted documentation will generally be in the form of an organized notebook with a list of attachments and labeled dividers.

3.7.2 Summation Sheet

The Stormwater Plan submittal checklist, Appendix J. The certification shall be signed and sealed by a Licensed Engineer.

3.7.3 Hydrologic Information

- List of assumptions
- Computer Model Input/Output Summary Sheets
- 36"x 24" Plan View showing location of all sub-basins
- A table showing Drainage Area, Time of Concentration (Tc), Impervious Percentage, Curve Number (CN), and Peak Runoff Rate for each sub-basin.
- Expected future level of development in upstream watersheds

3.7.4 Inlets, Storm Sewers, and Manholes

- List of assumptions
- Computer Model Input/Output Summary Sheets or hand computations
- Plan View showing the following:
    - Drainage areas
    - Street Layout, lot boundaries
    - Catch basins with type, station and offset, invert elevation
    - Pipes with size, type, slope
    - Manholes with size and type, station and offset
    - Headwalls with type, invert elevation
    - Utilities
    - Flow arrows
    - Existing and proposed 2-foot contours
    - Floodplain, Floodway extents where applicable
    - Details
- Profile showing the following:
    - Underground Utility Crossings
    - Existing and proposed ground surfaces
    - Curb inlets with type and elevation
    - Manholes with type and elevation
    - Pipes with size, slope, type, class, length
    - Headwall type and elevations
    - Proposed peak flow
    - Hydraulic grade line

3.7.5 Culverts and Bridges

- List of assumptions
- Copies of computer summary sheets
- Allowable headwater and minimum top of roadway elevation
- Culvert performance curves and type of control
- Outlet erosion control/energy dissipation measures

3.7.6 Constructed Channels

- List of assumptions
- Profiles showing channel invert, 100-year water surface, and velocity
- Cross-sections used for capacity determination and location
- Design analysis for channel lining stability
- Energy dissipation design and calculations
- Copies of computer analysis

3.7.7 Detention Ponds

- Plan view showing 1-foot contours, utilities, and principal/emergency spillways
- Design calculations
- Drainage area map
- Embankment cross section
- Top of embankment and peak stage elevations
- Principal spillway details
- Emergency Spillway Details

3.7.8 Record Drawings

Record drawings shall be submitted at the end of construction. A list of all deviations from approved construction plans, with explanation of each, will be submitted with the record drawings. Record drawings shall be completed and sealed by a professional engineer and a professional surveyor licensed in Kentucky

APPENDIX A

STORMWATER ORDINANCES

CHAPTER 55: STORMWATER MANAGEMENT

Section

§ 55.01 GENERAL PROVISIONS.

(A) Authority and other laws.

(1) This chapter is adopted by the Morehead, Kentucky City Council under the authority of Chapter 100 and shall be administered by the Morehead Utility Plant (MUPB) and any other city department deemed appropriate. These departments shall be referred to as the "Approving Agency", "Issuing Authority" and "Enforcement Agency".

(2) This chapter is adopted pursuant to the powers granted and limitations imposed by the Federal Clean Water Act, and in particular those parts that authorize local governments to require any state or federal department or agency to comply with all local water pollution control requirements.

(3) This chapter shall be construed to ensure consistency with requirements of the Clean Water Act, the Kentucky Pollutant Discharge Elimination System (KPDES), and acts amendatory thereof or any other applicable regulations.

(4) The standards and requirements set forth herein and promulgated pursuant to this chapter are minimum standards. This chapter does not intend nor imply that compliance by any person, company, developer, or any other entity will ensure that there will be no contamination, pollution, or discharge of pollutants into the MUPB Service Area stormwater system or waters of the Commonwealth.

(5) All proposed connections to City of Morehead utilities, including the stormwater system, must be approved, in writing, by the Morehead Utility Plant Board acting as the utility management agency for the city.

(6) In their interpretation and other application, the provisions of this chapter shall be held to be minimum requirements. Whenever the requirements of this chapter are at variance with the requirements of the City of Morehead Ordinances and Regulations, MUPB regulations or other city, state and federal lawfully adopted rules, regulations, ordinances or resolutions, the most restrictive, or that imposing the higher standards shall govern.

(B) Purpose. The requirements set forth in this chapter are intended to protect the general health, safety, and welfare of the citizens of the City of Morehead, and more specifically:

(1) To protect and enhance the water quality of water courses and water bodies in a manner pursuant to and consistent with the Federal Clean Water Act by addressing stormwater runoff from new development projects and existing developments that discharge into the MUPB Service Area stormwater system and waters of the Commonwealth;

(2) To establish legal authority to carry out all inspection, surveillance and monitoring, and enforcement procedures necessary ensure compliance with this chapter; and

(3) To provide a source of revenues to carry out all inspection, surveillance, monitoring and enforcement.

(C) Severability clause. Should any section or provision of this chapter be declared by the courts to be unconstitutional or invalid, such decision shall not affect the validity of these regulations as a whole, or any part thereof other than the part so declared to be unconstitutional or invalid.

(Ord. 26:2019, passed 7-8-19; Am. Ord. 09:2024, passed 5-3-24)

§ 55.02 ILLICIT DISCHARGE CONTROL.

(A) Purpose. The requirements set forth in this chapter are intended to:

(1) Prohibit illicit discharges and connections to the MUPB Service Area stormwater system;

(2) Regulate the contribution of pollutants to stormwater discharges to the MUPB Service Area stormwater system from by any user.

(B) Prohibition of discharges.

(1) No person, company, developer or any other entity shall discharge or cause to be discharged into the MUPB Service Area stormwater system, community waters or waters of the Commonwealth any hazardous materials, including but

not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than stormwater. The commencement conduct or continuance of any illegal discharge is prohibited.

(2) The construction, use, maintenance or continued existence of illicit connections to the storm drain system is prohibited. This prohibition includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practice applicable at the time of connection.

(3) No person shall throw, deposit, leave, maintain, keep, or permit to be thrown, deposited, left, or maintained, in or upon a public or private property, driveway, parking area, street, alley, sidewalk, component of the MUPB Service Area stormwater system, community waters or waters of the Commonwealth, any refuse, rubbish, garbage, litter, or other discarded or abandoned objects, articles, and accumulations, so that the same may cause or contribute to pollution. Wastes deposited in streets in proper waste receptacles for the purposes of collection are exempted from this prohibition.

(C) Permitted discharges.

(1) (a) A discharge or flow of fire protection water that does not contain oil or hazardous substances or materials that the fire code requires to be contained and treated prior to discharge;

(b) A discharge or flow from lawn watering, or landscape irrigation;

(c) A discharge or flow from a diverted stream flow or natural spring;

(d) Uncontaminated discharge or flow from a foundation drain, crawl space pump or footing drain;

(e) A discharge or flow from air conditioning condensation;

(f) A discharge or flow from individual residential car washing;

(g) A discharge or flow from a riparian habitat or wetland;

(h) A discharge or flow resulting from street washing or cosmetic cleaning that is not contaminated with any soap, detergent, degreaser, solvent, emulsifier, dispersant, or any other harmful cleaning substance;

(i) Dechlorinated drainage from a private residential swimming pool containing no harmful quantities of chlorine or other chemicals;

(j) A discharge or flow from any other water source not containing pollutants; and

(k) Upon verbal notification to the Enforcement Agency and prior to time of the test, a discharge or flow from dye testing.

(2) No discharge or flow available under Article 1.2 will be permitted if it has been determined by the Enforcement Agency to be a source of a pollutant or pollutants to the MUPB Service Area stormwater system, community waters or waters of the Commonwealth. Written notice of such determination shall be provided by the Enforcement Agency to the discharger.

(D) Other discharges. The prohibition of discharges or flows shall not apply to any non-stormwater discharges permitted under a National Pollutant Discharge Elimination (NPDES) permit, waiver, or waste discharge order issued to the discharger and administered by the Kentucky Division of Water under the authority of the Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

(E) Stormwater discharge permit. Any person, company, developer or any other entity subject to a construction activity NPDES stormwater discharge permit or erosion protection and sediment control permit shall comply with all provisions of such permits. Proof of compliance with such permits may be required in a form acceptable to the Enforcement Agency.

(F) Rules and regulations.

(1) Elimination of illegal discharges. Notwithstanding the requirements of this chapter herein, the Enforcement Agency may require by written notice that a person responsible for an illegal discharge immediately, or by a specified date, discontinue the discharge and, if necessary, take measures to eliminate the source of the discharge to prevent the occurrence of future illegal discharges.

(2) Remediation. Whenever the Enforcement Agency finds that a discharge of pollutants is taking place or has occurred which will result in or has resulted in pollution of stormwater entering the MUPB Service Area stormwater system, community waters, or waters of the Commonwealth, the Enforcement Agency may require by written notice to the owner of the premises and/or the responsible person that the pollution be remediated and the affected property restored within a specified time.

(3) Monitoring and analyses. The Enforcement Agency may require by written notice of requirement that any person engaged in any activity and/or owning or operating any facility which may cause or contribute to stormwater pollution, illegal discharges, and/or non-stormwater discharges to the MUPB Service Area stormwater system, community waters, or waters of the Commonwealth system, to undertake at said person's expense such monitoring and analyses by a state certified laboratory and furnish such reports to the Enforcement Agency as deemed necessary to determine compliance with this chapter.

(4) Notification of spills. Notwithstanding other requirements of local, state and federal law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected release of pollutants or hazardous materials which are resulting or may result in illegal discharges to the MUPB Service Area stormwater system, community waters or waters of the Commonwealth from said facility, said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of a hazardous material said person shall immediately notify emergency response officials of the occurrence via emergency dispatch services (911). In the event of a release of non-hazardous materials, said person shall notify the Enforcement Agency in person or by phone or facsimile no later than 5:00 p.m. of the next business day. Notifications shall be confirmed by written notice addressed and mailed to the Enforcement Agency within three (3) business days of the notice.

(G) Inspection and monitoring.

(1) Inspection. Whenever the Enforcement Agency has cause to believe that there exists, or potentially exists, any condition which constitutes a violation of this chapter, the Enforcement Agency may enter the suspect property, MUPB Service Area stormwater system, community waters and waters of the Commonwealth at all reasonable times to inspect the same. If it is determined an illegal discharge emanates from private premises, the owner or operator of the premises will be notified in accordance with the provisions of this chapter. Copies of records of stormwater compliance shall be provided to the Enforcement Agency.

(2) Sampling devices and testing. During any inspection as provided herein, the Enforcement Agency may take any samples and perform any testing deemed necessary to aid in the pursuit of the inquiry or to record site activities. The cost of all testing may be passed on to the owner or operator of the premises where the illegal discharge emanates.

(H) Enforcement.

(1) Notice of violation.

(a) Whenever the Enforcement Agency finds that a person, company, developer or any other entity has violated a prohibition or failed to meet a requirement of this chapter, the Enforcement Agency may order compliance by written Notice of Violation to the responsible entity. Such notice may require without limitation:

1. The performance of monitoring, analyses by a state certified laboratory, and reporting;

2. The elimination of illicit connections or discharges; that violating discharges, practices, or operations shall cease and desist;

3. The abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected property;

4. Payment of a fine to cover administrative and remediation costs of the Enforcement Agency, if not remedied; and

5. The implementation of source control or treatment best management practices;

(b) If abatement of a violation and/or restoration of affected property are required, the notice shall set forth a deadline within which such remediation or restoration must be completed. Said notice shall further advise that, should the violator fail to remediate or restore within the established deadline, the work will be done by the Enforcement Agency or a contractor designated by the Enforcement Agency and the expense thereof shall be charged to the violator.

(2) Charging cost of abatement/liens. Within thirty (30) days after abatement of the nuisance by the Enforcement Agency, the Enforcement Agency shall notify the property owner of the premises of the cost of abatement, including administrative costs. If the amount due is not paid within ten (10) days, the MUPB Clerk shall enter the amount due on the tax roll and collect as a special assessment against the property and shall constitute a lien on the property.

(3) Urgency abatement. The Enforcement Agency is authorized to require immediate abatement of any violation of this chapter that constitutes an immediate threat to the health, safety or well-being of the public. If any such violation is not abated immediately as directed by the Enforcement Agency, MUPB is authorized to enter onto private property and to take any and all measures required to remediate the violation. Any expense related to such remediation undertaken by MUPB shall be fully reimbursed by the property owner and/or responsible party.

(4) Acts potentially resulting in a violation of the Federal Clean Water Act. Any person who violates any provision of this chapter or any provision of any permit issued by the Morehead Utility Plant Board or City of Morehead may also be in violation of the Clean Water Act and may be subject to the sanctions of those acts including civil and criminal penalties. Any enforcement action authorized under this chapter shall also include written notice to the violator of such potential liability.

(Ord. 26:2019, passed 7-8-19; Am. Ord. 09:2024, passed 5-3-24)

§ 55.03 EROSION PROTECTION AND SEDIMENT CONTROL.

(A) Purpose. The requirements set forth in this chapter are intended to:

(1) Control or eliminate soil erosion and sedimentation from construction site stormwater runoff related to land disturbing activities within the limits of the MUPB Service Area stormwater system;

(2) Control or eliminate waste from construction site operators that may cause adverse impacts to water quality.

(B) Land disturbance activity.

(1) Any activity disturbing more than five thousand (5,000) square feet of soil will require a land disturbance permit (LDP). A Type 1 LDP is required for activities that disturb more than five thousand (5,000) square feet but less than one (1) acre, provided the site isn't part of a larger development. The Type 2 LDP is for development/redevelopment projects that disturb greater than one (1) acre or are part of a larger development. MUPB may also require projects that drain to environmentally sensitive areas to obtain a Type 2 LDP and follow a plan meeting the Type 2 requirements.

(2) Unless determined to be a problem, the following activities are exempt from obtaining a land disturbance permit and the provisions of this chapter:

(a) Emergencies posing an immediate danger to life or property, substantial flood or fire hazards, or natural resources;

(b) Underground utility repairs in paved areas, home gardens, minor repairs, maintenance work, installation of fence, sign, telephone, and electric poles and other kinds of posts or poles;

(c) Agricultural operations required to adopt and implement an individual agriculture water quality plan pursuant to the requirements set forth in the Kentucky Agriculture Water Quality Act (KRS Chapter 224); and

(d) Usual and customary site investigations, such as geotechnical explorations, clearing for surveying work, monitoring wells and archaeological explorations, which are undertaken prior to submittal of an application for a preliminary subdivision plat.

(e) Building improvements on existing residential dwellings (garages, additions, porches, etc.).

(3) The Issuing Authority may on a project-by-project basis exempt other minor land disturbance activities not specifically identified in the exemptions above.

(4) Land disturbance activities on individual lots or parcels that are part of a larger common plan of development are also subject to the provisions of this chapter. In this situation, if the individual lot or parcel owner is different than the permittee of the larger common plan of development, the individual lot or parcel owner (i.e. builder) is responsible for complying with the provisions of these regulations and is required to obtain a land disturbance permit. The permittee of the larger plan of development is also responsible for maintaining the conditions of the approved LDP for land disturbance activity on the individual lot or parcel until eighty percent (80%) build-out of the development is reached.

(C) EPSC requirements.

(1) Plan requirements. Sites where land disturbance activities are proposed will require a land disturbance permit with the appropriate site construction water quality protection plan approved by the Issuing Authority. These plans shall be prepared by a licensed engineer, drawn to an appropriate scale (as determined by MUPB) and shall include sufficient information to evaluate the environmental characteristics of the affected areas, the potential impacts of the proposed grading on water resources, and measures proposed to minimize soil erosion and off-site sedimentation. The owner/developer/contractor shall perform all clearing, grading, drainage, construction, and development in strict accordance with the approved plan and these regulations.

(2) Design requirements. The design, testing, installation, and maintenance of erosion protection and sediment control operations and facilities and site waste management shall adhere to the criteria, standards and specifications as set forth in the most recent version of the MUPB Stormwater Management Manual, as adopted by the Morehead Utility Plant Board and City of Morehead.

(D) Land disturbance permit. See § 55.05 for land disturbance permit requirements and review procedures.

(E) Inspections.

(1) The MUPB Stormwater Department or its duly authorized representatives shall make inspections of land disturbing activities subject to this chapter. Officers and staff of these various departments shall provide periodic inspections at various stages of construction.

(2) To ensure compliance with the approved LDP plan and to examine field practices to determine if control measures are adequate, authorized inspectors of the MUPB shall have the power to inspect any land disturbing activity and to review the records of all inspections, repairs and modifications made by the permittee.

(3) The permittee shall be self-policing and shall provide inspections, at a minimum, at the following stages:

(a) Completion of perimeter erosion and sediment controls;

(b) Completion of clearing and grading;

(c) Installation of temporary erosion controls;

(d) Completion of final grading and ground stabilization;

(e) At least every seven (7) days after areas have been temporarily or permanently stabilized; and

(f) Within twenty-four (24) hours of a rain event one- half (0.5) inches or greater.

(4) MUPB may increase or decrease the number of required inspections as deemed necessary to ensure an effective stormwater protection plan and shall have the right to enter the property of the permittee without notice.

(5) The permittee shall prepare an inspection report after each inspection and shall keep copies at the job site at all times. At a minimum the inspection report shall include the date, time of day, name of the person conducting the inspection, company represented, scope of the inspection, major observations relating to the stormwater protection plan and BMPs installed, and subsequent changes. A copy of each inspection report shall be filed with the Issuing Authority. The Issuing Authority has the right to make regular inspections to ensure the validity of the inspection reports.

(6) The permittee shall be self-policing and shall correct or remedy any stormwater protection plan measures that are not effective or functioning properly at all times during the various phases of construction.

(F) Enforcement.

(1) A fully qualified administrative official designated by the MUPB shall enforce these regulations. This official may be from the MUPB Stormwater Department or other duly authorized representative. A stop-work order may be posted for the entire project or any specified part thereof if any of the following conditions exist:

(a) Any land disturbance activity regulated under this chapter is being undertaken without a land disturbance permit.

(b) The LDP stormwater protection plan is not being fully implemented.

(c) Any of the conditions of the LDP stormwater protection plan are not being met.

(d) LDP stormwater protection plan is determined to be ineffective.

(2) For the purposes of this section, a stop-work order is validly posted by posting a copy of the stop-work order on the site of the land disturbing activity in reasonable proximity to a location where the land disturbing activity is taking place. Additionally, a copy of the order, in the case of work for which there is a land disturbance permit, shall be mailed by first class mail, postage pre-paid, to the address listed by the permittee on the land disturbance permit. In the case of work for which there is no authorized land disturbance permit, a copy of the order shall be mailed to the person listed as the landowner of the property.

(3) If the permittee does not cease the activity or comply with the stormwater protection plan or land disturbance permit conditions within five (5) days of posting the stop-work order, the administrative official may revoke the land disturbance permit.

(4) If the landowner or developer where no land disturbance permit has been issued does not cease the land disturbance activity, the administrative official may request MUPB's legal counsel to obtain injunctive relief.

(5) The administrative official may retract the revocation of the land disturbance permit if the land disturbance activity and site is brought into compliance with these regulations.

(6) If the public health, safety and nuisance is at stake time is of the essence to perform any remedial clean-up work or other work to bring the site into compliance with these regulations. In this situation, the Issuing Authority may begin the work immediately without notice of intent and bill the cost of such work to the permittee or landowner in violation. Example of this type of work may include cleaning of mud, silt and sediment and other debris from public streets and drainage systems.

(7) Any permittee, person, firm, corporation or agency acting as principal, agent, employee or otherwise, who fails to comply with the provisions of this chapter shall be guilty of a misdemeanor and upon conviction thereof shall be punishable by a fine of not less than one hundred fifty dollars ($150.00) and not more than ten thousand dollars ($10,000.00), or by imprisonment for not more than ninety (90) days, or both, for each separate offense. Each day there is a violation of any part of this regulation shall constitute a separate offense.

(8) If the permittee, landowner or developer fails to pay the amount due for the remedial clean-up work or any other work to bring the site into compliance with these regulations, MUPB shall have a lien upon the property where the land disturbance activity and subsequent violation occurred for the amount due which shall accrue interest at the rate of six percent (6%) per annum and/or MUPB may include the amount due on the utility bill of the permittee, landowner or developer.

(Ord. 26:2019, passed 7-8-19; Am. Ord. 09:2024, passed 5-3-24)

§ 55.04 POST-CONSTRUCTION STORMWATER MANAGEMENT.

(A) Purpose.

(1) The requirements set forth in this chapter are intended to:

(a) Develop and implement strategies which include a combination of structural and/or non-structural best management practices (BMPs) that prevent or minimize water quality impacts from developments in the City of Morehead or MUPB Stormwater Service Area; and

(b) To ensure adequate long-term operation and maintenance of BMPs.

(2) The primary objective of this chapter and the MUPB Stormwater Program is to maintain after development, predevelopment stormwater runoff characteristics; reduce stream bank and channel erosion, reduce siltation and

sedimentation in the community waters and waters of the Commonwealth and lower the discharge of pollutants from impervious areas.

(B) Application. This chapter may apply to the development or redevelopment of land for residential, commercial, industrial, or institutional use, but does not apply to agricultural land management practices. Exemption of agricultural land management practices does not apply to illicit discharges.

(C) Implementation of BMPs.

(1) The Approving Agency, Morehead Utility Plant Board, is responsible for the implementation and enforcement of this chapter and the Stormwater Management Program for the City of Morehead.

(2) The Approving Agency shall consider for implementation, but not be limited to the following:

(a) Establishing policies, procedures, standards and criteria relating to stormwater runoff quality and quantity;

(b) Creating a stormwater management guidance design manual and standards for development and redevelopment projects that address quantitative controls for increased volume and rate of surface runoff and qualitative controls that reduce or eliminate pollutants carried by runoff;

(c) Creating an ordinance to address illicit discharges;

(d) Creating an ordinance to address erosion protection and sediment control from construction site runoff related to land disturbing activities;

(e) Establishing design criteria and standards for construction site waste control and erosion protection and sediment control related to land disturbance activities; and

(f) Providing erosion protection and sediment control training for city and Approving Agency staff.

(D) Stormwater management requirements.

(1) As the Approving Agency, Morehead Utility Plant Board has developed a Stormwater Management Manual to provide requirements and guidance of stormwater BMPs installation and maintenance.

(2) The design of structural BMPs shall be by a professional engineer licensed to practice in the Commonwealth of Kentucky and be approved by the Approving Agency.

(3) The stormwater BMPs shall become a part of the development's site plan and may include the BMPs identified below.

(E) Stormwater control. Stormwater control BMPs shall be utilized to address runoff volume and rate, and remove pollutants. These BMPs may include detention facilities, extended detention basins, retention facilities, hydrodynamic separators, first flush basins, infiltration trenches and drain fields.

(F) Stream corridor protection. Stream corridor protection BMPs shall be utilized to protect designated streams and waterways through conservation methods. These methods may include buffer strips, greenways, vegetated channels, stream bank stabilization and restoration.

(G) Impervious area runoff controls. Impervious area runoff controls shall be utilized to address high levels of runoff quantity and quality associated with high-density developments. These controls may include preservation of open space, minimizing impervious surfaces, porous pavement, utilization of grass swales instead of curb and gutter, reduced pavement widths and similar measures.

(H) Discharge controls. Discharge control BMPs shall be utilized to provide flow attenuation for post-development runoff. These BMPs may include detention facilities, extended detention basins, retention facilities and artificial wetlands.

(I) Retrofit improvements. If a new development or redevelopment project is upstream of a water quality impaired waterway or upstream of the MUPB Service Area, community water or waters of the Commonwealth that has exceeded its hydraulic capacity, the Approving Agency, at its discretion, may require the design and implementation of a retrofit improvement involving stormwater controls or discharge controls at a downstream location in an existing area.

(J) Stormwater improvement fee. The Approving Agency, at its discretion, may require the developer of a new development or redevelopment project pay a stormwater improvement fee of equal value in lieu of the installation of stormwater BMP improvements.

(Ord. 26:2019, passed 7-8-19; Am. Ord. 09:2024, passed 5-3-24)

§ 55.05 PERMITTING AND PLAN REVIEW PROCEDURES.

(A) Land disturbance permit submittal requirements.

(1) Land disturbance activities subject to the provisions of §55.03 shall not take place without an authorized land disturbance permit.

(2) The applicant's submittal for a land disturbance permit shall include at a minimum the permit application, water quality protection plan (either an erosion control and sediment protection plan for LDP 1 or a stormwater pollution prevention

plan for LDP 2), and plan review fee. The permit review fee is in addition to any other required application or plan review fees. A written application from the landowner and/or developer of the land disturbance site, or his/her authorized representative, in the form prescribed by this chapter, shall be required for each land disturbance permit.

(3) (a) Plan review fees for the review of stormwater related plans is hereby established as follows:

Residential Developments	
Residential Developments	
1 to 4 lots	$350
5 to 25 lots	$500
26 to 75 lots	$1,000
76 to 150 lots	$1,500
150 or more lots	$2,500
Commercial Developments	
Up to 5.0 acres	$500
5.1 to 10.0 acres	$1,200
10.1 to 25.0 acres	$2,000
25.1 or more acres	$2,500

(b) Plan review fees for the review of land disturbance related plans is hereby established as follows:

400 sf to 5,000 sf	$100
LDP 1 (5,000 sf to 1 ac)	$300
LDP 2 (1 ac or more)	$500

(c) The plan review and construction site inspection fee may be adjusted from time to time by ordinance.

(d) Some projects may require MUPB's engineering consultant to perform a review of the submitted documents. In addition to the set fees, the applicant shall be responsible for reimbursing MUPB for any additional fees incurred from this review.

(e) Resubmission of plans with significant revisions by the applicant may require additional fees

(B) Land disturbance permit application form.

(1) The following information is required on the application:

(a) Name, address, and telephone number of landowner/developer.

(b) Name, address, and telephone number of applicant, if different than landowner/developer.

(c) Name(s), address(es), and telephone number(s) of any and all contractors, subcontractors or persons actually doing the land disturbing or land filling activities and their respective tasks.

(d) Name, address, and telephone number of the person responsible for the preparation of the final plat and site drawings (roadways, grading and drainage, utilities, etc.).

(e) Name, address, and telephone number of the person responsible for the preparation of the water quality protection plan.

(f) Address of site.

(g) Date of the application.

(h) Signature(s) of the landowner(s)/developer(s) of the site or an authorized representative.

(2) The information required for this permit application form may be modified as needed by the Issuing Authority.

(C) General permit. Complying with the provisions of this chapter and an issued land disturbance permit does not exempt the permittee from obtaining coverage from the Kentucky Division of Water (KDOW) under the KPDES stormwater general permit for storm discharges related to construction activities that disturb one (1) acre or more. The permittee is still required to obtain coverage under the KPDES stormwater general permit and shall provide a copy of the notice of intent filed with KDOW to the Issuing Authority.

(D) Land disturbance permit review and approval process. The Issuing Authority will review each application for a land disturbance permit to determine its conformance with the provisions of this chapter. Within thirty (30) calendar days after receiving a complete application, water quality protection plan, and permit review fee, the Issuing Authority shall, in writing:

(1) Approve the application and the water quality protection plan and issue the land disturbance permit;

(2) Approve the application and the water quality protection plan subject to such reasonable conditions as may be necessary to secure substantially the objectives of these regulations, and issue the land disturbance permit subject to these conditions; or

(3) Disapprove the permit application and the water quality protection plan, indicating the reason(s) and procedure for submitting a revised application and/or submission.

(4) The thirty (30) day review period shall begin anew for resubmittals that were previously submitted and determined to be incomplete or disapproved.

(E) Stormwater BMP plan review requirements. On development or redevelopment projects where the Approving Agency has determined stormwater BMPs are required, the developer shall submit plans of the proposed BMPs prepared by a licensed engineer. The plans shall be drawn to an appropriate scale and shall include plan and profile views, sections, details, notes and other information necessary for the installation of the BMP.

(F) Stormwater BMP plan review and approval process.

(1) The Approving Agency will review the stormwater BMP plan to determine its conformance with the provisions of this chapter. Within thirty (30) calendar days after receiving the plans and plan review fee, the Approving Agency shall, in writing:

(a) Approve the plans;

(b) Approve the plans subject to such reasonable conditions as may be necessary to secure substantially the objectives of this chapter, and approve the plans subject to these conditions; or

(c) Disapprove the plans, indicating the reason(s) and procedure for submitting a revised plan.

(2) The thirty (30) day review period shall begin anew for resubmittals that were previously submitted and determined to be incomplete or disapproved.

(G) As-built drawing requirements.

(1) Prior to the final release of any bonds or other fiscal security that may be required for new developments or redevelopment projects or prior to the issuance of a certificate of occupancy, the project developer and/or contractor shall submit to the Approving Agency as-builts of the newly constructed site improvements and stormwater facilities.

(2) The as-built condition of these stormwater facilities and other site improvements shall be certified by a professional engineer and must be reviewed and approved by the approving agency. As-builts shall be provided in both paper copy and electronic format, in a version acceptable to the Approving Agency.

(3) If it is determined that the information provided in the as-built drawings or certification of the site improvements and stormwater facilities do not meet or exceed the Stormwater Management Program for the City of Morehead, the Approving Agency reserves the right to withhold any bond, fiscal security or certification of occupancy, until such time the deficiency is corrected.

(Ord. 26:2019, passed 7-8-19; Am. Ord. 09:2024, passed 5-3-24)

§ 55.06 STORMWATER UTILITY FEE.

(A) Mandatory participation. The owner(s) of all houses, buildings, or properties with structures situated within the city, is (are) hereby required to participate in the Stormwater Program as a means for MUPB to generate revenue to administer and enforce the MUPB stormwater management program.

(B) Purpose of fee. This subchapter provides for the recovery of costs from users of the MUPB stormwater management program for the implementation of the program established herein and for other costs associated with the installation, monitoring and treating of stormwater and the stormwater system. The applicable charges and fees shall be as set forth herein.

(C) Charges and fees. The following schedule fee schedule shall apply to each property with at least one structure in the MUPB Stormwater Program service area. This fee shall be known as the Stormwater Management Fee (SMF) and is based on the number of ISUs on the property.

Customer	***ISU (sf)***	***Monthly Fee***
Residential*	2,500	$2.16 flat rate
Commercial**	2,500	$2.43 per ISU
Industrial	2,500	$2.70 per ISU
*Includes all single-family residences (PVA parcels) with at least one structure regardless of parcel size **Includes all commercial businesses, shopping centers, duplexes, multi-unit apartments, storage facilities, hospitals, schools, universities, etc.		

(D) Enforcement of fees.

(1) MUPB, through the General Manager or his/her designee, to ensure compliance with this chapter, and as permitted through 40 CFR Subchapter N, and 401 KAR 5:057, may take the following enforcement steps against users in noncompliance with the chapter. The remedies available include injunctive relief, civil and criminal penalties, immediate discontinuance of discharges and/or water service and the publishing of the list of users in noncompliance annually. The enforcement authority shall be vested in the General Manager or his/her designee.

(2) In the event of termination of service, the user shall pay MUPB for all costs incurred to perform the disconnection and reconnection of service plus fifteen percent (15%) administrative costs prior to the service being restored. If actual costs cannot be determined, the costs shall be estimated by the General Superintendent.

(3) The enforcement actions and remedies provided for in this chapter are not exclusive. The General Manager may take any, all, or combination of these actions against a noncompliant user. Further, the General Manager is empowered to take more than one enforcement action against any noncompliant user.

(Ord. 26:2019, passed 7-8-19; Am. Ord. 09:2023, passed 5-8-23; Am. Ord. 09:2024, passed 5-3-24)

§ 55.07 DEFINITIONS.

For the purposes of this chapter, the following terms, phrases, words, and their derivatives shall have the meaning stated below.

"APPLICANT." The landowner or developer who submits an application to the MUPB for a land disturbance permit pursuant to this chapter.

"APPROVING AGENCY." The Morehead Utility Plant Board, its General Manager and any other MUPB Stormwater Department official deemed appropriate, responsible for review and approval of stormwater management plans.

"AS-BUILTS." Construction drawings or plans that have been updated to show actual constructed locations of roadways, storm and sanitary sewers, culverts, catch basins, manholes, headwalls, swales and other infrastructure improvements. As-built information may include but not be limited to pipe size and material, horizontal and vertical locations of pipelines rim and invert elevations of manhole and catch basin structures, angles and offsets, and roadway and pipe slopes.

"BEDROCK." In place solid rock.

"BEST MANAGEMENT PRACTICES (BMP)." A technique or series of techniques, structural or nonstructural, which are proven to be effective in reducing pollutants in stormwater, controlling runoff, erosion and sedimentation and mitigate flooding.

"BORROW." Earth material acquired from an off-site location for use in grading on a site.

"CLEARING AND GRUBBING." The cutting and removal of trees, shrubs, bushes, windfalls and other vegetation including removal of stumps, roots, and other remains in the designated areas.

"COMMUNITY WATERS." Any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wetland, wells and other bodies of surface or subsurface water, natural or artificial, lying within or forming a part of the boundaries of the City of Morehead.

"CONTRACTOR." A person who contracts with the permittee, landowner, developer, or another contractor (i.e. subcontractor) to undertake any or all the land disturbance activities covered by this chapter.

"CO-PERMITTEE." Any person, other than the permittee, including but not limited to a developer or contractor who has or represents financial or operational control over the land disturbing activity.

"DETENTION FACILITY." A temporary or permanent natural or manmade structure that provides for the temporary storage of stormwater runoff which is designed so as not to create a permanent pool of water.

"DEVELOPER." Any person, firm, corporation, sole proprietorship, partnership, state agency, or political subdivision thereof engaged in a land disturbance activity and/or in the development or re-development of property.

"DRAINAGE AREA." That area-contributing runoff to a single point measured in a horizontal plane, which is enclosed by a ridgeline.

"ENFORCEMENT AGENCY." The Morehead Utility Plant Board, its General Manager and any other MUPB Stormwater Department official deemed appropriate and their authorized designated to enforce this chapter.

"ENGINEER." A professional engineer licensed in the Commonwealth of Kentucky to practice in the field of civil works.

"EPSC (EROSION PROTECTION AND SEDIMENT CONTROL)." The prevention of soil erosion and control of solid material during land disturbing activity to prevent its transport out of the disturbed area by means of air, water, gravity, or ice.

"EPSC PLAN." A detailed plan which includes a set of best management practices or equivalent measures designed to control surface runoff and erosion and to retain sediment on a specific development site or parcel of land during the period in which pre-construction and construction related land disturbances, fills, and soil storage occur, and before final

improvements are completed, all in accordance with this chapter.

"EROSION." The wearing away of the ground surface as a result of the movement of wind, water, ice, and/or land disturbance activities.

"EROSION CONTROL INSPECTOR." A person designated by the Issuing Authority who has attended an MUPB sponsored or approved training course in EPSC.

"EXISTING GRADE." The grade prior to grading.

"EXTENDED DETENTION." A stormwater design feature that provides gradual release of a volume of water in order to increase settling of pollutants and protect downstream channels from frequent storm events.

"FINISH GRADE." The final grade of the site, which conforms to the approved plan.

"FLOODPLAIN." The one hundred (100) year floodplain which is that area adjoining a watercourse which could be inundated by a flood that has a one (1) percent chance of being equaled or exceeded in any given year and is delineated on the Federal Emergency Management Agency Floodway Maps.

"FLOW ATTENUATION." Prolonging the flow time of runoff to reduce the peak discharge.

"GENERAL PERMIT." A KPDES stormwater general permit for stormwater discharges related to construction activities that disturb one (1) acre or more. Coverage under this general stormwater permit is obtained by filing a Notice of Intent (NOI) with the Kentucky Division of Water.

"HAZARDOUS MATERIALS." Any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, biological or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

"ILLEGAL DISCHARGE." Direct or indirect non-stormwater substance, including silt or sediment, or hazardous material disposed, deposited, spilled, poured, injected, seeped, dumped, leaked, or placed by any means, intentionally or unintentionally, into the waters of the MUPB Service Area, community waters, waters of the Commonwealth, or any area draining directly or indirectly into the waters of the MUPB Service Area, except as exempted in this chapter.

"ILLICIT CONNECTION." Defined as any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the waters of the MUPB Service Area. Included are conveyances which allow any non-stormwater discharge including sewage, process wastewater, and wash water to enter the storm drain system and any connections to the storm drain system from indoor drains and sinks, regardless of whether said drain or connection had previously allowed, permitted, or approved.

"IMPERVIOUS SURFACE UNIT." Defined as a two thousand five hundred (2,500) square foot average area per residential unit in which rainwater will not easily percolate into the ground. Commercial and industrial properties may consist of multiple ISUs.

"INFILTRATION." The passage or movement of water into the soil surface.

"INSPECTOR." A person designated by the Enforcement Agency who has attended an MUPB sponsored or approved training course in detection of illicit discharges.

"ISSUING AUTHORITY." The Morehead Utility Plant Board.

"ISU." Impervious surface unit (See above definition IMPERVIOUS SURFACE UNIT).

"KPDES." Kentucky Pollutant Discharge Elimination System.

"LAND DISTURBANCE ACTIVITY." Any land change that may result in soil erosion from wind, water and/or ice and the movement of sediments into or upon waters, lands, or rights-of-way within the City of Morehead, including but not limited to building demolition, clearing and grubbing, grading, excavating, transporting and filling of land.

"LAND DISTURBANCE PERMIT (LDP)." A permit required by this chapter for land disturbance activities per the MUPB Stormwater Management Manual.

"MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4)." A conveyance, or system of conveyances including roads with drainage systems, municipal and county streets, catch basins, curbs, gutters, ditches, man-made channels, and storm drains designed or used for collecting or conveying stormwater. Sanitary and combined sewers are not included in the definition of the municipal separate storm sewer system.

"NON-STORMWATER DISCHARGE." Any discharge to the waters of the MUPB Service Area, community waters or waters of the Commonwealth that is not composed solely of stormwater except as permitted by this chapter.

"OUTFALL." The point of discharge to any watercourse from a public or private stormwater drainage system.

"PERMITTEE." The applicant in whose name a valid land disturbance permit is duly issued pursuant to this chapter and his/her agents, employees, and others acting under his/her direction.

"POLLUTANT." Anything, which causes or contributes to pollution. Pollutants may include, but are not limited to: paints,

varnishes, and solvents; oil and other automotive fluids; silt and sediments; floatables, pesticides, herbicides, and fertilizers; hazardous substances; sewage, animal wastes, fecal coliform and pathogens; dissolved and particulate metals; non-hazardous liquids; and yard wastes, refuse, construction debris, rubbish, garbage, litter, or other discarded or abandoned objects and accumulations.

"PREMISES." The area of land, site, grounds, property on which the illegal discharge emanates.

"REDEVELOPMENT." Any construction, alteration, or improvement involving land disturbance performed on sites where existing land use is commercial, industrial, institutional, or multifamily residential.

"RETENTION FACILITY." A temporary or permanent natural or manmade structure that provides for the storage of stormwater runoff by means of a permanent pool of water.

"RETROFITTING." The construction of a structural BMP in a previously developed area or the modification of an existing structural BMP, to improve water quality and reduce flow rate and volume over current conditions.

"ROUGH GRADE." The stage at which the grade approximately conforms to the approved plan.

"RUNOFF." Rainfall, snowmelt, or irrigation water flowing over the ground surface.

"SEDIMENT." Soils or other surficial materials transported or deposited by the action of wind, water, ice, or gravity as a product of erosion.

"SEDIMENTATION." The process or action of depositing sediment that is determined to have been caused by erosion.

"SITE." The entire area of land on which the land disturbance activity is proposed in the land disturbance permit application.

"SITE PLAN." A plan or set of plans showing the details of any land disturbance activity of a site including but not limited to the construction of: structures, open and enclosed drainage facilities, stormwater management facilities, parking lots, driveways, curbs, pavements, sidewalks, bike paths, recreational facilities, ground covers, plantings, and landscaping.

"SITE WASTE." Waste from the construction site such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary wastes.

"SLOPE." The incline of a ground surface expressed as a ratio of horizontal distance to vertical distance.

"SOIL." Naturally occurring surficial deposits overlying bedrock.

"STRIPPING." Any activity which removes or significantly disturbs the vegetative surface cover including clearing, grubbing of stumps and root mat, and topsoil removal.

"STORMWATER DESIGN STANDARDS." The MUPB stormwater design standards, latest version that serves as the official guide for stormwater design principles, methods and practices.

"STORMWATER MANAGEMENT." For:

(1) Quantitative control, a system of vegetative and structural measures that control the increased volume and rate of surface runoff caused by manmade changes to the land; and

(2) Qualitative control, a system of vegetative, structural, and other measures that reduce or eliminate pollutants that might otherwise be carried by surface runoff.

"STORMWATER MANAGEMENT FEE (SMF)." Or stormwater utility fee (SUF) is a MUPB utility charge developer from an ISU map to fund the stormwater program.

"TOPSOIL." The upper layer of soil.

"UTILITY." The owner/operator of any underground facility including an underground line, facility, system, and its appurtenances used to produce, store, convey, transmit, or distribute communications, data, electricity, power, heat, gas, oil, petroleum products, potable water, stormwater, steam, sewage and other similar substances.

"WATERCOURSE." Any natural or improved stream, river, creek, ditch, channel, canal, conduit, gutter, culvert, drain, gully, swale, or wash in which waters flow either continuously or intermittently.

"WATERS OF THE COMMONWEALTH." Any surface watercourses and water bodies including all natural waterways and definite channels and depressions in the earth that may carry water, even though such waterways may only carry water during rains and storms and may not carry stormwater at and during all times and seasons.

"WATERSHED." A region draining to a specific river, river system, or body of water.

"WETLANDS." A lowland area such as a marsh, that is saturated with moisture, as defined in Sec. 404, Federal Water Pollution Control Act Amendments of 1987.

APPENDIX B

MUPB STORMWATER SERVICE AREA

APPENDIX C

DEFINITIONS

DEFINITIONS

As soon as practicable shall mean when site at the earliest possible time when external factors such as inclement weather would not prevent completion of the task

Authorized Enforcement Agency shall mean the City of Morehead via their agent, Morehead Utility Plant Board (MUPB), Code Enforcement Department, or other designee(s).

Bankfull Elevation shall mean the water level, or stage, at which the stream, river, or lake is at the top of its banks and any further rise would result in water moving into the floodplain.

Best Management Practice (BMP) shall mean a measure that is implemented to protect water quality and reduce the potential for pollution associated with stormwater runoff. These could include schedules of activities, prohibitions of practices, general good housekeeping practices, pollution prevention and educational practices, maintenance procedures and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, any natural drainage crevice, karst feature, ditch, known subterranean water channel, closed systems or catch basins, or conveyance. BMPs also include treatment practices, operating procedures and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

Blue Line Streams shall mean streams that are represented on the most recent version of the United States Department of the Interior Geological Survey 1:24,000 USGS quadrangle maps.

Buffer Zone shall mean the area defined from the bankfull elevation extending toward a construction activity that shall be protected from disturbance.

Channel shall mean a natural or constructed/manmade watercourse with definite bed and banks to confine and conduct continuously or periodically flowing water. Channel flow is that water which is flowing within the limits of the defined channel.

Clean Water Act (CWA) shall mean those Federal regulations (33 U.S.C - 1251 et seq. and any subsequent amendments thereto) that prohibit the discharge of pollutants to waters of the United States unless such discharge is in accordance with an approved National Pollutant Discharge Elimination System (NPDES) permit.

Clearing shall mean any activity that removes vegetative surface cover.

Construction Activity shall mean any activities that disturb the existing surface conditions. Such activities include, but are not limited to, clearing and grubbing, grading, excavating and demolition.

Conveyance shall include, but not be limited to, any of the following: blue line streams, channel, drainage basin, drainage way, drainage/dry well, ephemeral stream, flood plain,

karst feature, public storm drain, storm drainage system, waterbody, watercourse or waterway.

Critical Area shall mean a site difficult to stabilize due to exposed subsoil, steep slope, extent of exposure or other conditions.

Critical Flood Area shall mean a watershed that has a FEMA Zone "A," or "AE" within the site or a location of historical flooding of roads or structures.

Detention shall mean the temporary delay of storm runoff prior to discharge into receiving waters.

Detention Facility shall mean any structure which is designed to collect and store surface water for subsequent gradual discharge.

Developer shall mean any individual, firm, corporation, Limited Liability Company, association, partnership, trust or other business entity involved in commencing proceedings to affect development of land for developers or others.

Drainage Basin shall mean a storage area to collect stormwater.

Drainage Way shall mean any channel that conveys surface runoff throughout the site.

Drainage/Dry Well shall mean a bored, drilled, driven, dug, or naturally occurring shaft or hole with a depth greater than the largest surface dimension; used to drain surface fluid, primarily storm water runoff, into a subsurface formation.

Ephemeral Stream shall mean a stream or part of a stream that flows only in direct response to precipitation or snowmelt. Its channel is above the water table at all times.

Impervious Surface Unit (ISU) shall mean the basic unit for the computation of storm water service fees. All single-family dwelling units are considered one (1) ISU regardless of the actual lot or structure size and are considered to have an average impervious area of two thousand five hundred (2,500) square feet. Impervious Surface Units greater than one (1) are expressed in whole numbers without fractional values. Impervious area determinations are rounded to the nearest whole number.

Erosion shall mean the wearing away of land surface by the action of wind, water, gravity, ice, or any combination of those forces.

Erosion Prevention Sediment Control Plan (EPSC) shall mean a set of plans prepared by or under the direction of a licensed professional engineer detailing the specific measures and sequencing to be used to control sediment and erosion on a development site during and after construction. For this manual, an EPSC is for use with a Type 1 Land Disturbance Permit.

Excavation shall mean any portion of land surface or area from which earth has been removed or will be removed; the depth below original ground surface to remaining surface.

Excess Stormwater Runoff shall mean that portion of storm water which exceeds the safe storm drainage capacity of storm sewers or natural drainage channels serving a specific watershed.

Existing Grade shall mean the slope or elevation of existing ground surface prior to cutting or filling.

Fill shall mean the portion of land surface to area to which soil, rock, or other materials have been or will be added; height above original ground surface after the material has been or will be added.

Finished Grade shall mean the final slope or elevation of the ground surface after cutting or filling.

Floodplain shall mean the relatively flat or lowland area adjoining a river, stream, watercourse, lake, or other body of standing water, which has been or may be covered temporarily by floodwater. For purposes of this ordinance, the flood plain is defined as the area encompassed by a 100-year storm having a one percent chance of being equaled or exceeded in any given year.

Grading shall mean any stripping, cutting, filling, or stockpiling of earth or land, including the land in its cut or filled condition, to create new grades.

Hazardous Materials shall mean any material, including any substance, waste or combination thereof which because of its quantity, concentration, physical, chemical or infectious characteristics may cause or significantly contribute to a potential hazard to human health or safety, property, or the environment when improperly treated, stored, transported, disposed of or otherwise managed.

Illegal Discharge shall mean any direct or indirect non-storm water discharge to the MS4, or conveyance, except as exempted in paragraph herein below.

Illicit Connections shall mean any of the following:

a. Any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the MS4 or conveyance. This includes, but is not limited to, any conveyances which allow any non-storm water discharge, including sewage, processed wastewater and wash water to enter the MS4 or conveyance.

b. Any connections to the MS4 or conveyance, regardless of whether said connection had been previously allowed, permitted or approved by MUPB or any drain or connection from a commercial or industrial land use to the MS4 or conveyance which has not been documented in plans, maps or equivalent records and approved by the authorized enforcement agency.

Impervious Surface shall mean a term applied to any ground or structural surface that water cannot penetrate through or which water penetrates with great difficulty.

Industrial Activity shall mean activities subject to NPDES Industrial Permits as defined in 40 CFR, Section 122.26 (b)(14).

Karst Feature shall mean any cave, sinkhole, sinking stream, bluehole, crevice, spring, lost river, karst window or any other geologic feature associated with karst terrain.

Kentucky Division of Water (KYDOW) General Permit (KGP) shall mean an agreement between the regulating authority and the Permittee, which specifies conservation practices that shall be implemented in the construction of activities specified in the terms and conditions of the general permit.

Land Disturbance shall mean the purposeful act of clearing, grubbing, excavating, or grading; disrupting ground surface by or for construction activities, including construction access/road, staging, and storage sites producing significant areas of exposed soil and soil piles.

Land Disturbance Permit shall mean a permit required by the Morehead Utility Plant Board for land disturbance activities. Defined within this Manual as Type 1 or a Type 2 permit.

MS4 (Municipal Separate Storm Sewer System) shall mean any physical inlet, natural or manmade, conveyance, storage basins or outfalls in which storm water is induced, conveyed, stored or discharged.

National Pollutant Discharge Elimination Systems (NPDES) shall mean EPA's program to control the discharge of pollutants to waters of the United States. NPDES is a part of the Federal CWA, which requires point and non-point source dischargers to obtain permits. These permits are referred to as NPDES permits.

Non-Stormwater Discharge shall mean any discharge to the MS4 or any conveyance that is not composed entirely of naturally occurring storm water.

Notice of Intent (NOI) shall mean a formal notice to the EPA or a state agency having delegated NPDES authority that a construction project seeking coverage under a General Permit is about to begin.

Notice of Termination (NOT) shall mean a formal notice to the KYDOW having delegated NPDES authority that a construction project is complete and seeking release for the EPSC and the State General Permit.

Overland Flow shall mean surface runoff flowing over the land surface towards the MS4 or a conveyance.

Perimeter Control shall mean a barrier that prevents sediment from leaving a site by filtering sediment-laden runoff or diverting it to a sediment trap or basin.

Permit Phasing shall mean clearing a parcel of land in distinct phases, with the stabilization of each phase completed before the clearing of the next commences.

Permittee shall mean the "Person Responsible for the Land Disturbing Activity."

Person shall mean any individual, association, organization, partnership, firm, corporation or other entity recognized by law.

Pollutant shall mean anything that causes or contributes to a violation of applicable water quality standards. Pollutants may include, but are not limited to, paints, varnishes, solvents, oil or other automotive fluids, non-hazardous liquid and solid wastes, yard wastes, refuse, rubbish, garbage, litter or other discarded or abandoned objects and accumulations, sediment and detergents so that same may cause or contribute to pollution. Pollutants may also include, but are not limited to, floatables, pesticides, herbicides, and fertilizers, hazardous substances and wastes, sewage, fecal coliform and pathogens, dissolved and particulate metals, animal wastes, wastes and residues that result from constructing a building or structure, and noxious or offensive matter of any kind.

Premises shall mean any building, lot, parcel of land, easement or portion of land, whether improved or unimproved, including adjacent sidewalks and parking strips.

Protected Channel shall mean a channel which receives storm water discharge and which is paved, rip-raped, or otherwise improved by addition of man-made materials so as to reduce the potential for erosions.

Public Storm Drain shall mean the drain system provided by and maintained by the Morehead Utility Plant Board that is designed to help convey naturally occurring storm water runoff. It also provides inlets for water to travel to holding areas attempting to remove excessive water from streets and other areas.

Qualified Contractor shall mean a person who has received Erosion Prevention and Sediment Control (EPSC) training from the Morehead Utility Plant Board relative to installing, cleaning, monitoring, reporting, and closing out a site in compliance with an approved EPSC.

Safe Storm Drainage Capacity shall mean the quantity of storm water runoff that can be transported by a channel or conduit without having the water surface rise above the top of the channel or conduit.

Sediment shall mean solid material, both mineral and organic, that in suspension is being transported or has been moved from its site of origin by air, water, or gravity as a product of erosion.

Sediment Control shall mean measures that prevent eroded soil or other material from leaving the site.

Site shall mean a parcel of land or a contiguous combination thereof, where grading work is performed as a single unified operation subject to erosion of sedimentation as a result of cutting, filling, grading, or other disturbance of the soil.

Stabilization shall mean the use of practices that prevent exposed soil from eroding or establishment of vegetative cover (80% coverage or better).

Start of Construction shall mean the first land-disturbing activity associated with a development, including land preparation such as clearing, grading, filling; installation of streets and walkways; excavation for basements, footings, piers, or foundations; erection of temporary forms; and installation of accessory buildings such as garages.

Storm Drainage System shall mean drainage facilities by which storm water is collected and/or conveyed, including but not limited to, any roads with drainage systems, municipal streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detention basins, natural and human-made or altered drainage channels, reservoirs, drain wells, karst feature or other conveyance.

Stormwater shall mean any surface flow, runoff, ponding or drainage from any form of precipitation.

Stormwater Runoff shall mean water that results from precipitation, which is not absorbed by the soil or vegetation or evaporated, and which flows over the ground surface or is collected in channels or conduits.

Stormwater Management Plan (SWMP) shall mean a plan that is based on hydrologic and hydraulic calculations to determine flood stage and required improvement to minimize impacts by development. This plan shall also include details regarding the post development stormwater protection BMPs installation, operation, and maintenance.

Stormwater Pollution Prevention Plan (SWPPP) shall mean a plan required by storm water regulations or permits that includes site map(s), an identification of construction/contractor activities that could cause pollutants in the storm water, and a description of measures or practices to control these pollutants. This is synonymous with the term "BMP Plan" used in the KYDOW General Permit. For this manual, an EPSC is for use with a Type 1 Land Disturbance Permit.

Stormwater Runoff Release Rate shall mean the rate at which storm water runoff is released from dominant to servient land.

Temporary Protection shall mean short-term stabilization of erosive sediment producing areas.

Utility General Permit shall mean the agreement between the MS4 Municipality and the local municipal separate storm sewer system utilities stating that Phase II regulations shall be applied and implemented.

Vegetative Protection shall mean stabilization of erosive or sediment producing areas by covering the soil with any of the following materials: permanent seeding for long-term vegetative cover, short-term seeding for temporary vegetative cover, sodding, producing areas covered with a turf of perennial sod-forming grass, tree planting, or other planting.

Wastewater shall mean any water or other liquid, other than naturally occurring storm water discharged from premises.

Watercourse shall mean any body of water or conveyance, including but not limited to lakes, ponds, rivers, creeks, streams, karst features, drainage basins or bodies of water delineated by the CIty of Morehead.

Waterway shall mean a channel that directs surface runoff to a watercourse or conveyance.

Watershed shall mean the land area from which surface runoff drains into a stream channel, system of stream channels or karst feature.

ABBREVIATIONS/ACRONYMS

ADT	Average Daily Traffic
ARAP	Aquatic Resource Alteration Permit
BFM	Bonded Fiber Matrix
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
BS	Bank Stabilization
BZ	Buffer Zones
CB	Continuous Berms
CD	Check Dams
CL	Channel Lining
COS	Chemical Oxygen Demand
CRS	Construction Road Stabilization
DB	Detention Basin
DO	Dissolved Oxygen
EPA	Environmental Protection Agency
EPP	Erosion Prevention Practices
EPSC	Erosion Prevention and Sediment Control
G	Geotextiles
GHP	Good Housekeeping Practices
HAZWOPER	Hazardous Waste Operations and Emergency Response
KDOW	Kentucky Division of Water
KDWM	Kentucky Division of Waste Management
KUB	Kentucky Utilities Board
M	Mulching
MS4	Municipal Separate Storm Sewer System
MSD	Marine Sanitation Device
MSDS	Material Safety Data Sheet
N and M	Nets and Mats

NPDES	National Pollution Discharge Elimination System
OSDS	On-Site Disposal System
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyl
PE	Professional Engineer
PPE	Personal Protective Equipment
PS	Permanent Seeding
RH	Residential Homeowners
RR	Rip-rap
SBCCI	Southern Building Code Congress International, Inc.
SCE	Stabilized Construction Entrance
SEDCAD	Software for Design of Stormwater, Erosion, and Sediment Control Systems
SF	Silt Fence
SF-LD	Light Duty Silt Fence
SF-HD	Heavy Duty Silt Fence
SMP	Sediment Management Practices
SO	Sodding
SPCC	Spill Prevention Control and Countermeasure

APPENDIX D

STANDARD EPSC PLAN

LD Permit #_____

TYPE I LAND DISTURBANCE PERMIT APPLICATION
MOREHEAD UTILITY PLANT BOARD

Note: The application form and supporting documentation must be completed in its entirety and delivered to MUPB, to begin the review process. The omission of required items may be cause for rejection of the submittal without review.

Project Name: _____
Project Address: _____
Subdivision Name/Lot No.: _____
Total Area of Project Site (Acres): _____ Total Area of Land Disturbance Activities (SF): ____

Property Owner:_____ Contact Person: _____
Mailing Address: _____
Telephone: _____ Fax: _____
Mobile: _____ E-mail Address: _____

Qualified Contractor Company Name: _____
Contact Person: _____ E-mail Address: _____
Mailing Address: _____
Telephone: _____ Mobile: _____

I hereby certify that all clearing, grading, construction, or development will conform to City of Morehead Ordinances and MUPB Stormwater Management Practices regulations and I have received and reviewed the Schematic Erosion Prevention and Sediment Control Plan and Standard BMP Details for stormwater quality control measures for small sites.

_____ _____
Owner or Authorized Agent Date

All construction activities require the following control measures:

- ➢ Stable construction exit at all points of entrance and egress
- ➢ Sediment control measures for sheet flow measures (e.g. silt fence)
- ➢ Sediment control measures for concentrated flow measures (e.g. rock check dams)
- ➢ Storm sewer inlet protection

_____ _____
Approved By: Morehead Utility Plant Board Date

LD Permit #_____

TYPE 2 LAND DISTURBANCE PERMIT APPLICATION
MOREHEAD UTILITY PLANT BOARD

Note: The application form and supporting documentation must be completed in its entirety and delivered to MUPB, to begin the review process. The omission of required items may be cause for rejection of the submittal without review.

Project Name: _____
Project Address: _____
Subdivision Name/Lot No.: _____
Total Area of Project Site (Acres): _____ Total Area of Land Disturbance Activities (SF): _____

Property Owner:_____ Contact Person: _____
E-mail Address: _____ Telephone/Mobile: _____
Mailing Address: _____

Developer :_____ Contact Person: _____
E-mail Address: _____ Telephone/Mobile: _____
Mailing Address: _____

Qualified Contractor Company Name: _____
Contact Person: _____ E-mail Address: _____
Mailing Address: _____
Telephone: _____ Mobile: _____

Design Engineer: _____ Firm: _____
E-mail Address: _____ Telephone/Mobile: _____
Mailing Address: _____

I hereby certify that all clearing, grading, construction, or development will conform to City of Morehead Ordinances and MUPB Stormwater Management regulations.

_____ _____
Owner or Authorized Agent Date

_____ _____
Approved By: Morehead Utility Plant Board Date

TYPE 2 LAND DISTURBANCE PERMIT APPLICATION

Construction Plan Elements

•	Vicinity map showing project location	•	Current Zoning
•	Location of all lots and proposed site improvements (roads, utilities, structures, etc.)	•	Location of soil stockpiles and/or borrow/disposal areas
•	Existing vegetative cover	•	Proposed vegetative cover
•	Locations, size, and dimensions of proposed stormwater systems (pipes, swales, channels, etc.)	•	Offsite construction activities (utility connections, etc.)
•	Existing site topography (minimum 2' interval)	•	Proposed final topography (minimum 2' interval)
•	100-year floodplain and floodway limits		

SWPP Plan Elements

•	Narrative describing the nature and purpose the project	•	Vicinity map showing project location
•	Notation of any State or Federal water quality permits	•	Specific points where the stormwater discharge will leave the site
•	Sequence describing stormwater quality measure implementation relative to land disturbance activities	•	Stable construction exit locations and specifications (at all points of ingress and egress)
•	Location and name of all wetlands, lakes, sinkholes, and watercourses on or adjacent to the site	•	Sediment control measures for sheet flow areas
		•	Sediment control measures for concentrated flow areas
•	Identification of all receiving waters	•	Storm sewer inlet protection measure locations and specifications
•	Identification of potential discharges to groundwater (abandoned wells, sinkholes, etc.)	•	Runoff control measures (diversions, rock, check dams, slope drains, etc.)
•	Pre- and post-construction estimate of peak runoff (per Stormwater Design Standards)	•	Stormwater outlet protection specifications
		•	Grade stabilization structure location specifications

•	Adjacent landuse, including upstream watershed	•	Location, dimensions, specifications, and construction details of each stormwater quality measure
•	Locations and approximate boundaries of all disturbed areas (construction limits)		
•	Soils map including soil descriptions and limitations	•	Temporary surface stabilization methods appropriate for each season (include sequencing)
•	Locations, size, and dimensions of proposed stormwater systems (pipes, swales, channels, etc.)	•	Permanent surface stabilization specifications (include sequencing)
•	Location of soil stockpiles and/or borrow/disposal areas	•	Computations to support sediment control designs
•	Signed statement by owner or authorized agent that all land disturbing activities will be done pursuant to the approved Chapter 53 Erosion and Sediment Control Measures Ordinance.	•	Kentucky Licensed Professional Engineer's seal

APPENDIX E

EXAMPLE INSPECTION REPORTS

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, those persons directly responsible for gathering the information, the information submitted 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, including the possibility of fine and imprisonment for knowing violations.

Signature:_____Date:_____

CONTRACTOR'S CERTIFICATION

I certify under penalty of law that I understand the terms and conditions of the approved Land Disturbance Permit and the MUPB Stormwater Management Manual that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

Name: _____

Title: _____

Responsible for: _____

Company Name: _____

Address: _____

_____

Phone: _____

Kentucky Erosion and Sediment Control Permit Compliance Inspection Report

General Site Information

Company:	**Permit No:**
Site:	**Date:**

Permit Compliance Information	Yes	No
Copy of permit kept on site		
Copy of Best Management Practices (BMP) Plan kept on site		
Site specific description of project timing/phasing and implementaton		
Adequate site map showing:		
Drainage patterns indicated on plan		
Receiving waters (stream, river, lake, wetland, etc.) named		
Approximate slopes after major grading		
Area of soil disturbance		
Undisturbed areas and vegetative buffer zones		
Location of structural and non-structural controls (BMPs)		
Areas where stabilization practices are to be employed		
Storm water discharge locations		

Specific Site Information:	
Name of receiving stream:	
Total area of site:	
Area disturbed:	

Inspection Results:

Inspection Criteria: Satisfactory, Marginal, Unsatisfactory	S	M	U	NA
Condition of receiving stream				
Is BMP Plan adequately implemented?				
Timely seeding and mulching				
Revegetation on cut/fill/cleared ares				
Condition of slope areas				

Inspection Criteria: Satisfactory, Marginal, Unsatisfactory	S	M	U	NA
Structural Controls				
Drainage ditch protection/liners installed				
Inlet protection for curb drains, etc.				
Outlet protection-no erosion or scour				
Silt fencs below bare soil areas				
Rock check dams in ditches				
Sediment traps/ponds maintained				
Other Controls				
Other Controls				
Secondary containment for fuel; maintenance area designated				
Proper disposal of concrete wastes; wash in designated area				
Other (non-storm water discharge, etc.)				
Off-site tracking of sediment prevented				
Compliance with State and Local Regulations				
Waste, fertilizer, paint, pesticide/herbicide storage and disposal				
Proper sewage management				
Operation and Maintenance of BMPs				
Maintenance plan incorporated into wtitten BMP plan				
Maintenance plan followed				
Maintenance documented				
Inspections done as required and documented				
Inspection reports completed and maintained on site, in file				
Contractor Certification on file				
Plan Certification on file				

Comments:

_____

_____

_____

_____

Inspector's Signature: _____

APPENDIX F

EPSC QUALIFIED INSPECTOR FORMS

EPSC Contractor Qualifications

Description

The Stormwater Ordinance adopted by the City of Morehead establishes conditions whereas a Land Disturbance Permit (LDP) is required. Land clearing, construction, or development that affects more than 5000 sf shall require a Type 1 or Type 2 LDP. Furthermore it requires that the permit application shall include a statement that the work shall be in accordance with the approved LDP and that an EPSC qualified contractor shall be responsible for implementing and maintaining all aspects of the plan.

The Morehead Utility Plant Board has been appointed by the City of Morehead to act as its agent in matters related to stormwater runoff and water quality within the MUPB service area. MUPB has established in the Stormwater Management Manual that an 'EPSC Qualified Contractor' is a person who has received training, conducted by MUPB, in the installation, inspection, and maintenance of erosion and sediment control BMPs.

Qualified Contractor Substitution Procedures

MUPB recognizes that contractors for a site may change over time for various reasons. When the EPSC Qualified Contractor for a site changes, it is the responsibility of the existing EPSC Qualified Contractor for a permitted site to notify MUPB of the change in writing.

On projects where numerous grading or site contractors are likely to be working, a representative of the contractor responsible for overseeing the initial grading and installation of initial EPSC practices must be identified as the EPSC Qualified Contractor when the LDP application is submitted to MUPB for review and approval. However, prior to obtaining any permits, the applicant must identify any new EPSC Qualified Contractor(s) for the individual lot(s) or certify that the overall SWPPP for the development will be followed and that the EPSC Qualified Contractor for the overall development will also serve as the EPSC Qualified Contractor for the individual lot.

Responsibilities of EPSC Qualified Contractors

Qualified Contractors are responsible for the following relative to erosion and sediment control for projects within the MUPB's jurisdiction:

1. Understand when a LDP is required by MUPB and inform developers prior to beginning land-disturbing activities of the requirement for a plan.
2. Arrange a pre-construction meeting with the Owner, MUPB, and the EPSC Qualified Contractor prior to any site disturbance in order to review requirements and insure compliance with the approved permit.
3. Install or oversee the installation of erosion prevention and sediment control Best Management Practices (BMPs) before land disturbing activities begin.
4. Inspect site controls every 7 calendar days or every 14 calendar days and before and after storm events producing ½ inch or more of precipitation. Document the findings of the site inspections, inform the developer of the findings, and maintain inspection documentation for the permitted site.

5. Keep the Erosion Protection and Sediment Control plan (Type 1 LDP) or Stormwater Pollution Prevention Plan (Type 2 LDP) up to date, denoting any changes made in the field.
6. Act as the site contact for MUPB regarding the EPSC plan, relaying information to the permit holder from MUPB.
7. Inform MUPB in writing of Qualified Contractor substitutions, deletions and/or additions.

EPSC Qualified Contractor Agreement Form

Contractor Information

Name: _____

Address: _____

City: _____ State: Zip: _____

Telephone: _____

Training Completion Date:

Site Information

Site Description:

_____

_____

_____

I certify, under penalty of law, that I understand and agree to comply with the terms and conditions of the Land Disturbance Permit issued for the referenced project. I acknowledge that failure to comply with the conditions of the permit may, per the Ordinance, result in:

- Issuance of a stop work order until the site,
- Revocation of the LDP,
- Remediation by MUPB to bring the site into permit compliance, and/or
- Misdemeanor charges and subsequent fines

I further acknowledge responsibility for any costs, fees, or fines that may result from failure to maintain compliance to the conditions of the approved Land Disturbance Permit.

Contractor Signature: _____ Date: _____

Permit Number (if subdivision, give name): _____

Change of EPSC Qualified Contractor Agreement Form

Project Name/Permit No. _____

Current EPSC Qualified Contractor Information

Name: _____

Address: _____

City: _____ State: Zip: _____

Telephone: _____

Training Completion Date: _____

Signature: _____

Date: _____

New/Additional EPSC Qualified Contractor Information

Name: _____

Address: _____

City: _____ State: Zip: _____

Telephone: _____

Training Completion Date: _____

Signature: _____

Date: _____

APPENDIX G

SWQMP CHECKLISTS

Procedure

The Operation and Maintenance (O&M) Plan for each site must be finalized prior to final SWMP approval. It is recommended that the designer/developer submit the O&M plan once MUPB has completed their review of the SWMP to prevent multiple submittals of the O&M Plan. It is likely that the SWMP will be modified or revised during the review process. Note that the O&M Plan must be recorded with the deed to ensure the information about the PTPs and maintenance requirements is transferred along with the property.

Contents

All permanent treatment practices must be maintained perpetually. To facilitate the long-term maintenance and functionality of the practices, MUPB requires the developer to prepare an Operation and Maintenance (O&M) Plan for each site and requires that the landowner perform an annual inspection of the facility. A template for the inspection is included with the O&M Plan, and the O&M Plan must be recorded with the deed.

1. **Completed Operation and Maintenance Agreement**

2. **Location map.** The location map should show the locations of all permanent stormwater management treatment practices and easements. This map should be specific and clear enough for a landowner to identify the practice on the property.

3. **Schematics for the PTP.** These schematics must show the general BMP depth, length, inlets and outlets. For bioretention areas, the schematics should note that the mulch, planting media and vegetation are all components of the PTP. Underdrains must be clearly noted as well. For measures with observation wells, locations of the observation wells must be identified. Pretreatment components must also be identified on the schematics. Note that the schematic is not required to be surveyed.

4. **Template inspection reports**. Each PTP has a template inspection report. The template inspection report must be included in the O&M plan. If the PTP is a proprietary or non-standard practice, the developer/designer is required to provide an inspection report that covers basic maintenance needs with maintenance frequency. The manufacturer of the practice can provide this information. An inspection report for each type of PTP on the project must be included.

5. **Annual inspection report**

STORMWATER RETENTION/DETENTION POND

Inspection Checklist for BMP Owners

Site Name: _____

BMP Number: _____

Owner Change since last inspection? Y or N

Owner Name _____

Address_____

Phone Number _____

Location: _____

Inspection Date:_____

Time:_____

Inspector:_____

Weather Conditions: _____

Was flow observed: If so, what was the appearance of the water (i.e. color, sheen, estimated flow rate, etc.)? _____

Maintenance Item	Inspected? (Y/N)	Maintenance needed? (Y/N)	Comments
Embankment and Emergency Spillway (Inspect annually and after significant rainfall)			
Spillway Type (circle): Reinforced Concrete, Corrugated Pipe, Masonry, other _____			
1. Vegetation			
2. Erosion on Embankment			
3. Animal burrows			
4. Cracking, bulging, or sliding of dam			
A. Location			
B. Describe			
5. Drains Clear and Functioning			
6. Leaks or seeps on embankment			
A. Location			
B. Describe			
7.Slope Protection Failure			
8. Emergency spillway clear of obstructions			
9. Other (Describe)			

Maintenance Item	Inspected? (Y/N)	Maintenance needed? (Y/N)	Comments	
Riser and Principal Spillway (Inspect Annually)				
Spillway Type (circle): Reinforced Concrete, Corrugated Pipe, Masonry, other _____				
1. Low flow orifice blocked				
2. Trash rack				
A. Debris removal needed				
B. Corrosion noted				
3. Excessive sediment buildup in riser				
4. Concrete/masonry condition				
A. Cracks or displacement				
B. Spalling				
C. Metal Pipe Condition				
D. Control Valve Operation				
E. Pond Drain Valve Operation				
F. Outfall channels functioning				
G. Other (describe)				
Permanent Pool (Inspect monthly)				
1.Undesirable vegetative growth				
2. Floatable debris removal needed				
3. Visible Pollution				
4. Shoreline erosion				
5. Other (describe)				
Sediment Forebays				
1. Sediment deposition noted				
2. Sediment cleanout needed (over 505 full)				
Other (Inspect monthly)				
1. Erosion at outfalls into pond				
2. Headwalls and end walls				
3. Encroachment into pond or easement area				
4. Complaints from residents				
5. Public hazards (describe)				
6. Needs to be mowed				
7. Other vegetation needs to be removed				

Note: if any inspection items were checked “yes” for maintenance needed, list maintenance actions and dates completed below.

Maintenance Action Needed	Date Due	Completed? Y/N

Inspector signature: _____

STORMWATER WETLAND

Inspection Checklist for BMP Owners

Site Name: _____

BMP Number: _____

Owner Change since last inspection? Y or N

Owner Name _____

Address_____

Phone Number _____

Location: _____

Inspection Date:_____

Time:_____

Inspector:_____

Weather Conditions: _____

Was flow observed: If so, what was the appearance of the water (i.e. color, sheen, estimated flow rate, etc.)? _____

Maintenance Item	Inspected? (Y/N)	Maintenance needed? (Y/N)	Comments
Embankment and Emergency Spillway (Inspect annually and after significant rainfall)			
Spillway Type (circle): Reinforced Concrete, Corrugated Pipe, Masonry, other _____			
1. Vegetation			
2. Erosion on Embankment			
3. Animal burrows			
4. Cracking, bulging, or sliding of dam			
A. Location			
B. Describe			
5. Drains Clear and Functioning			
6. Leaks or seeps on embankment			
A. Location			
B. Describe			
7.Slope Protection Failure			
8. Emergency spillway clear of obstructions			
9. Other (Describe)			

Maintenance Item	Inspected? (Y/N)	Maintenance needed? (Y/N)	Comments	
Riser and Principal Spillway (Inspect Annually)				
Spillway Type (circle): Reinforced Concrete, Corrugated Pipe, Masonry, other _____				
1. Low flow orifice blocked				
2. Trash rack				
A. Debris removal needed				
B. Corrosion noted				
3. Excessive sediment buildup in riser				
4. Concrete/masonry condition				
A. Cracks or displacement				
B. Spalling				
C. Metal Pipe Condition				
D. Control Valve Operation				
E. Pond Drain Valve Operation				
F. Outfall channels functioning				
G. Other (describe)				
Permanent Pool (Inspect monthly)				
1.Undesirable vegetative growth				
2. Floatable debris removal needed				
3. Visible Pollution				
4. Shoreline erosion				
5. Other (describe)				
Sediment Forebays				
1. Sediment deposition noted				
2. Sediment cleanout needed (over 505 full)				
Other (Inspect monthly)				
1. Erosion at outfalls into pond				
2. Headwalls and end walls				
3. Encroachment into pond or easement area				
4. Complaints from residents				
5. Public hazards (describe)				
6. Needs to be mowed				
7. Other vegetation needs to be removed				

Note: if any inspection items were checked “yes” for maintenance needed, list maintenance actions and dates completed below.

Maintenance Action Needed	Date Due	Completed? Y/N

Inspector signature: _____

STORMWATER BIORETENTION

Inspection Checklist for BMP Owners

Site Name: _____

BMP Number: _____ Owner Change since last inspection? Y or N

Owner Name _____
Address_____
Phone Number _____
Location: _____

Inspection Date:_____ Time:_____

Inspector:_____
Weather Conditions: _____
Was flow observed: If so, what was the appearance of the water (i.e. color, sheen, estimated flow rate, etc.)? _____

Maintenance Item	Inspected? (Y/N)	Maintenance needed? (Y/N)	Comments
Treatment Area (Inspect after significant rainfall)			
1. Evidence of drainage (Is water ponding less than 24 hrs after rain event?)			
2. Signs of erosion noted (in contributing watershed or in bioretention area?)			
3. Mulch condition – thin or decomposing?			
4. Sediment deposits noted in the treatment area?			
5. Vegetation condition			
6. Overflow spillway in good condition?			
7. Other (describe)			

Note: if any inspection items were checked “yes” for maintenance needed, list maintenance actions and dates completed below.

Maintenance Action Needed	Date Due	Completed? Y/N

Inspector signature: _____

STORMWATER OPEN CHANNEL CONVEYANCE SYSTEM

Inspection Checklist for BMP Owners

Site Name: _____

BMP Number: _____ Channel Type: _____

Owner Change since last inspection? Y or N

Owner Name _____
Address_____
Phone Number _____
Location: _____

Inspection Date:_____ Time:_____

Inspector:_____
Weather Conditions: _____
Was flow observed: If so, what was the appearance of the water (i.e. color, sheen, estimated flow rate, etc.)? _____

Maintenance Item	Inspected? (Y/N)	Maintenance needed? (Y/N)	Comments
Channel treatment area (Inspect after significant rainfall)			
1. Evidence of trash/debris build up?			
2. Signs of erosion noted in channel			
3. Evidence of ponding			
A. In dry swale, more than 12 hrs			
B. In wet swale, more than 48 hrs			
4. Vegetation in good condition?			
Spillway systems (Inspect annually)			
1. Dry Swale – outlet of underdrain stabilized?			
2. Wet Swale - Check dam(s) in good condition?			
3. Other (specify)			

Note: if any inspection items were checked “yes” for maintenance needed, list maintenance actions and dates completed below.

Maintenance Action Needed	Date Due	Completed? Y/N

Inspector signature: _____

STORMWATER INFILTRATION TRENCH

Inspection Checklist for BMP Owners

Site Name: _____

BMP Number: _____ Owner Change since last inspection? Y or N

Owner Name _____
Address_____
Phone Number _____
Location: _____

Inspection Date:_____ Time:_____

Inspector:_____
Weather Conditions: _____
Was flow observed: If so, what was the appearance of the water (i.e. color, sheen, estimated flow rate, etc.)? _____

Maintenance Item	Inspected? (Y/N)	Maintenance needed? (Y/N)	Comments
Treatment area (Inspect after significant rainfall)			
1. Treatment area – free of debris/trash?			
2. Treatment area – free of erosion?			
3. Contributing watershed – stabilized?			
4. Treatment area – water ponding for more than 24 hrs?			
5. Observation well(s) – water within 1 foot of bottom of trench/basin?			
6. Signs of subsurface collapse in the treatment area?			
7. Other (describe)			

Note: if any inspection items were checked “yes” for maintenance needed, list maintenance actions and dates completed below.

Maintenance Action Needed	Date Due	Completed? Y/N

Inspector signature: _____

STORMWATER MANUFACTURED BMP

Inspection Checklist for BMP Owners

Site Name: _____

BMP Product Name: _____

BMP Number: _____ Owner Change since last inspection? Y or N

Owner Name: _____
Address: _____
Phone Number: _____
Location: _____

Inspection Date: _____ Time: _____

Inspector: _____
Weather Conditions: _____
Was flow observed: If so, what was the appearance of the water (i.e. color, sheen, estimated flow rate, etc.)? _____

NOTE: The Maintenance Plan Items must be determined by manufacturer's recommendations & submitted to MUPB for approval with the maintenance agreement.

Maintenance Item	Inspected? (Y/N)	Maintenance needed? (Y/N)	Comments

Note: if any inspection items were checked "yes" for maintenance needed, list maintenance actions and dates completed below.

Inspector signature: _____

APPENDIX H

EXAMPLE O & M PLAN

STORMWATER MANAGEMENT/BMP FACILITIES OPERATION AND MAINTENANCE AGREEMENT

THIS AGREEMENT, made and entered into this ____ day of _____, 20____, by and between (Insert Full Name of Owner) _____ hereinafter called the "Landowner", and the Morehead Utility Plant Board, hereinafter called "MUPB".

WITNESSETH, that WHEREAS, the Landowner is the owner of certain real property described as (Rowan County tax map/Parcel Identification Number) _____ as recorded by deed in the land of records of Rowan County, Kentucky, Deep Book _____ Page _____, hereinafter called the "Property".

WHEREAS, the Landowner is proceeding to build on and develop property; and

WHEREAS, the Site Plan/Subdivision Plat known as _____ (Name of Plan/Development), hereinafter called the "Plan", which is expressly made a part hereof, as approved or to be approved by MUPB and the City of Morehead, provides for detention and/or treatment of stormwater within the confines of the property; and

WHEREAS, MUPB and the Landowner, its successors and assigns, agree that the health, safety, and welfare of the residents of the City of Morehead require that on-site stormwater management/BMP facilities be constructed and maintained on the Property; and

WHEREAS, MUPB requires that on-site stormwater management/BMP facilities, as shown on the Plan, be constructed and adequately maintained by the Landowner, its successors and assigns, including any homeowners association.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The on-site stormwater management/BMP facilities shall be constructed by the Landowner, its successors and assigns, in accordance with the plans and specifications identified in the Plan.
2. The Landowner, its successors and assigns, shall adequately maintain the stormwater/BMP facilities. This includes all pipes and channels built to

convey stormwater to the facility, as well as structures, improvements, and vegetation provided to control the quantity and quality of the stormwater. Adequate maintenance is herein defined as good working condition so that these facilities are performing their design functions. The Annual Inspection Report is to be used to establish if the working conditions of the facility is acceptable to MUPB.

3. The Landowner, its successors and assigns, shall inspect the stormwater management/BMP facility and submit an inspection report annually. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection shall cover the entire facilities, berms, outlet structure, pond areas, access roads, etc. Deficiencies shall be noted in the inspection report.
4. The Landowner, its successors and assigns, hereby grant permission to the MUPB, its authorized agents and employees, to enter upon the Property and to inspect the stormwater management/BMP facilities whenever MUPB deems necessary. The purpose of inspection is to follow-up on reported deficiencies and/or to respond to citizen complaints. MUPB shall provide the Landowner, its successors and assigns, copies of the inspection findings and a directive to commence with the repairs if necessary.
5. In the event the Landowner, its successors and assigns, fails to maintain the stormwater management/BMP facilities in good working condition acceptable to the MUPB, MUPB may enter upon the Property and take whatever steps necessary to correct deficiencies identified in the inspection report and to charge the costs of such repairs to the Landowner, its successors and assigns. This provision shall not be construed to allow MUPB to erect any structure of permanent nature on the land of the Landowner outside of the easement for the stormwater management/BMP facilities. It is expressly understood and agreed that the MUPB is under no obligation to routinely maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on MUPB.
6. The Landowner, its successors and assigns, will perform the work necessary to keep these facilities in good working order as appropriate. In the event a maintenance schedule for the stormwater management/BMP facilities (including sediment removal) is outlined on the approved plans, the schedule will be followed.
7. In the event MUPB, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner, its

successors and assigns, shall reimburse MUPB upon demand, within thirty (30) days of receipt thereof for all actual costs incurred by MUPB hereunder.

8. This Agreement imposes no liability of any kind whatsoever on MUPB and the Landowner agrees to hold MUPB harmless from any liability in the event the stormwater management/BMP facilities fail to operate properly.
9. This Agreement shall be recorded among the land records of Rowan County, Kentucky, and shall constitute a covenant running with the land, and shall be binding on the Landowner, its administrators, executors, assigns, heirs and any other successors in interests, including any homeowners association.

WITNESS the following signatures and seals:

_____

Company/Corporation/Partnerships Name (Seal)

By:_____

_____

(Type Name)

_____

(Type Title)

STATE OF KENTUCKY

COUNTY OF ROWAN

The foregoing agreement was acknowledged before me the _____day of _____. 20____,

by

_____

_____

NOTARY PUBLIC

My Commission Expires: _____

Improvement Plan Submittal Checklist

The items below shall be submitted to the Morehead Utility Plant Board along with the plans and specifications. Submitted documentation will generally be in the form of an organized notebook with a list of attachments and labeled dividers. If any item on this checklist is not applicable to a particular submittal, a sheet of paper with an explanation of the absence of that item shall be included in place of the omitted item. This checklist, signed and stamped by a professional civil engineer, will be included in the front of the submittal notebook.

- Design plan set including site plan,grading plan, erosion/sediment control plan, drainage plan, utility plan, and relevant detail sheets.
- Pre/post development runoff documentation
- Post development floodplain and analysis, if applicable
- Design documentation for all stormwater appurtenances
- List of all local, state, and federal permits that have, or will, be obtained.

I hereby certify that the improvements plans, calculations, and other documents submitted herein have been prepared in accordance with the City of Morehead, MUPB, and/or Kentucky Division of Water regulations and ordinances in effect at the time of submission.

Signature and Registration Number

Date