

# Buffer Zone Guidance

for the NPDES General Permit for Storm Water Discharges  
from Construction Activities (SCR100000)



D H E C



PROMOTE PROTECT PROSPER

South Carolina Department of Health  
and Environmental Control

[www.scdhec.gov](http://www.scdhec.gov)

CR-010475 8/2012

**Buffer Zone Guidance**  
For The  
2012 NPDES General Permit for  
Storm Water Discharges from Construction Activities (SCR100000)

**SC DHEC - Bureau of Water**

**September 2012**

## **GUIDANCE SUMMARY**

The following buffer zone guidance was developed as a supplemental response to comments received on SC DHEC's Draft Construction Permit, released on October 14 2011, and as an aid for Stormwater Pollution Prevention Plan (SWPPP) preparers and review agencies. With this guidance, both the developing and regulatory communities should be equipped with the necessary information on what the **Buffer Zone Management Requirements** are and how to develop a SWPPP that is in compliance with these buffer zone requirements listed in the 2012 NPDES General Permit for Storm Water Discharges from Construction Activities (**2012 CGP**). The table provided below summarizes the **Buffer Zone Management Requirements** found in *Section 3.2.4.C* of the 2012 CGP.

**Table 1: Summary of 3.2.4.C - Buffer Zone Management Requirements**

<b>Buffer Zone Requirement</b>	<b>Runoff Discharges To...</b>	<b>Required Width is...</b>	<b>This Requirement must be met...</b>	<b>Are Compliance Options Available?</b>
<b>Natural Buffer</b>	Surface Waters	30 feet	During Construction	Yes
<b>Extended Natural Buffer</b>	Sensitive and Impaired Surface Waters	45 feet	During Construction	Yes
<b>Velocity Dissipation</b>	A Buffer Zone	As necessary to provide non-point source runoff.	Whenever a buffer is required.	No
<b>Local Ordinances</b>	Surface Waters Receiving Runoff from construction activities located within a MS4*	35 feet or more. Widths vary based on the MS4*.	During Construction and/or Post-Construction based on the MS4*.	Compliance Options Vary based on the MS4*.

\*MS4 - Municipal Separate Storm Sewer System. [Click here](#) for more information on MS4s.

This guidance document also provides an in-depth overview of the regulations supporting the inclusion of buffer zone requirements within the 2012 CGP, the terminology used by the 2012 CGP and other terms applicable to buffer zones, the multiple compliance options and when these compliance options may be implemented, the types of projects exempt from buffer requirements, the maintenance of buffers, and a few other issues brought to the SC DHEC's attention during the development of the 2012 CGP.

In closure, the guidance document contains a series of examples that address a handful of possible circumstances that may arise when designing and/or implementing a buffer zone that accepts stormwater discharges from construction activities. These examples include the identification of the required buffer zone type, the placement and use of velocity dissipation, reduction of buffer widths through the provided compliance options, pre-developed areas, instances with no pre-existing vegetation, and recommendations associated with the establishment of permanent buffer zones.

With the provided information, SWPPP preparers and reviewers should be equipped with an ample resource to aid in the development of a site-specific SWPPP that is in compliance with the 2012 CGP's **Buffer Zone Management Requirements**.

## **CONTENTS**

<b>1. REGULATORY BACKGROUND .....</b>	<b>6</b>
1.1 THE CONSTRUCTION & DEVELOPMENT RULE (C&D RULE).....	6
1.2 SC WATER POLLUTION CONTROL PERMITS ACT .....	6
1.3 SC LOCAL GOVERNMENT COMPREHENSIVE PLANNING ENABLING ACT .....	7
<b>2. BUFFER TERMINOLOGY .....</b>	<b>7</b>
2.1 BUFFER ZONES .....	8
2.1.1. NATURAL BUFFERS .....	9
2.1.2. EXTENDED NATURAL BUFFERS .....	9
2.1.3. RIPARIAN BUFFERS.....	10
2.2 TYPES OF WATERS.....	11
2.2.1. SURFACE WATERS .....	11
2.2.2. JURISDICTIONAL WATERS.....	12
2.2.3. IMPAIRED & SENSITIVE WATERS.....	13
<b>3. BUFFER ZONE MANAGEMENT REQUIREMENTS .....</b>	<b>14</b>
3.1 30-FT, NATURAL BUFFER .....	14
3.2 45-FT, EXTENDED NATURAL BUFFER .....	15
3.3 VELOCITY DISSIPATION INTO BUFFERS.....	16
3.4 LOCAL BUFFER REQUIREMENTS.....	16
<b>4. BUFFER ZONE MANAGEMENT COMPLIANCE OPTIONS.....</b>	<b>17</b>
4.1 COMPLIANCE OPTION A – PROVIDE THE ENTIRE BUFFER ZONE.....	17
4.2 COMPLIANCE OPTION B – REDUCTION OF THE BUFFER ZONE .....	18
4.3 COMPLIANCE OPTION C – ELIMINATION OF THE BUFFER ZONE.....	19
4.4 COMPLIANCE OPTIONS AND LOCAL BUFFER REQUIREMENTS.....	20
<b>5. SELECTING THE APPROPRIATE COMPLIANCE ALTERNATIVE .....</b>	<b>21</b>
5.1 EXCEPTIONS.....	21
5.1.1. NO DISCHARGES TO SURFACE WATERS.....	22
5.1.2. PRE-EXISTING DEVELOPMENT .....	23
5.1.3. NON-JURISDICTIONAL WATERS.....	23
5.1.4. COASTAL CONVEYANCES.....	24
5.1.5. SPECIAL CIRCUMSTANCES.....	24
5.2 EXEMPTIONS.....	24
<b>6. BUFFER MAINTENANCE .....</b>	<b>26</b>
6.1 FLAGGING.....	26
6.2 SEDIMENT REMOVAL.....	27
6.3 UP-KEEPING BMPs DISCHARGING TO BUFFER.....	27

<b>7. ADDITIONAL BUFFER ISSUES.....</b>	<b>27</b>
7.1 TAKINGS .....	27
7.2 PRE-EXISTING STRUCTURE MAINTENANCE .....	28
7.3 COASTAL BUFFERS.....	28
<b>8. BUFFER DESIGN EXAMPLES .....</b>	<b>28</b>
8.1 NATURAL BUFFERS.....	29
8.2 EXTENDED NATURAL BUFFERS.....	30
8.3 VELOCITY DISSIPATION LOCATED WITHIN BUFFER ZONE .....	31
8.4 COMPLIANCE OPTION A - PROVIDE THE ENTIRE BUFFER WIDTH.....	32
8.5 COMPLIANCE OPTION B - REDUCTION OF THE BUFFER WIDTH .....	33
8.6 COMPLIANCE OPTION C - ELIMINATION OF THE BUFFER ZONE .....	34
8.7 PROJECT EXEMPTED FROM BUFFER REQUIREMENTS .....	35
8.8 ESTABLISHING A PERMANENT BUFFER.....	35
<b>9. REFERENCES.....</b>	<b>37</b>

## **1 REGULATORY BACKGROUND**

There are a handful of regulatory requirements that either lead to or support the inclusion of the **Buffer Zone Management Requirements**, with the most prominent reason being the [Construction & Development \(C&D\) Rule](#) that was released in December of 2009. Brief summaries of the C&D Rule and other regulations that support the inclusion of these buffer zone requirements within the 2012 CGP have been included in the subsequent sections.

### **1.1 THE CONSTRUCTION & DEVELOPMENT RULE (C&D RULE)**

On December 1, 2009, EPA promulgated its latest regulations addressing stormwater discharges from construction activities. Contained in this rulemaking, known as the **Construction and Development Rule** or "**C&D rule**", are effluent limitation guidelines (ELGs) and a set of Non-Numeric Effluent Limitations. It is within the Non-Numeric Effluent Limitations where the use of a natural buffer was referred, as shown below.

"Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration, unless infeasible."

- Federal Register / Vol 74, No. 229/ Tuesday December 1, 2009 - Section X.B.1.a.vi

The inclusion of natural buffers to minimize the discharge of sediment and other pollutants from construction activities was just one in a list of many Non-Numeric Effluent Limitations for any construction site disturbing 1 acre or more. It is also noted within the C&D Rule that "*a permitting authority may choose to require additional or more stringent non-numeric effluent limitations in its individual or general NPDES permits for discharges associated with construction activities*" (Federal Register, Vol 74, No.229 - Section X.B), granting permitting authorities, such as SC DHEC, the ability to develop a set of buffer zone requirements is suitable for that authority's jurisdiction.

For this reason, SC DHEC deemed it necessary to expand upon the language provided in the Federal Register to help identify where to apply temporary buffer zones by defining key such as natural buffers and surface waters. This language also helps identify the required minimum width of the provided buffer zones, and how to document, implement, and maintain buffer zones within a SWPPP in order to show that a construction site's buffer zone is in compliance with the Non-Numeric Effluent Limitations.

### **1.2 SC WATER POLLUTION CONTROL PERMITS**

Although the requirement of providing natural buffers around surface waters is not directly stated in **SC Water Pollution Control Permits**, [R.61-9](#), there is a provision which allows SC DHEC to include the application of buffer setbacks around surface waters. This provision includes a set of factors, including adjacent land usage and runoff prevention, which may be use in the establishment of buffer setbacks to protect both public health and the environment. The referenced provision within this set of regulations is as follows:

"The Department may establish in permits the application buffer setbacks for property boundaries, roadways, residential developments, dwellings, water wells, drainageways, and surface water as deemed necessary to protect public health and the environment. Factors taken into consideration in the establishment of setbacks would indicate sludge application method, adjacent

land usage, public access, aerosols, runoff prevention, and adjacent groundwater usage."

**- Water Pollution Control Permits - General Requirements - R.61.9 - 503.12.(I)**

In addition to [R.61-9](#), the **Stormwater Management and Sediment Reduction Act of 1994**, which lead to the promulgation of **R.72-300 - Standards for Stormwater Management and Sediment Reduction** - may also be used as a reference that grants the authority for the inclusion of buffer zone requirements based on the provision listed below.

"Specific requirements for the erosion and sediment control portion of the stormwater management and sediment control plan approval process include, but are not limited to, the following items. The appropriate plan approval agency may modify the following items for a specific project or type of project."

**- Standards for Stormwater Management and Sediment Reduction - R.72-307.B**

This provision allows the plan approval agency to modify the provided list of specific requirements that are included in the erosion and sediment control portion of the stormwater management and sediment control plan (commonly referred to as the SWPPP).

### **1.3 SC LOCAL GOVERNMENT COMPREHENSIVE PLANNING ENABLING ACT**

The **South Carolina Local Government Comprehensive Planning Enabling Act of 1994** is yet another set of rules and regulations that allows regulatory agencies, in this case local governments, to set buffer provisions within their zoning ordinances and other land use ordinances. Again this act does not mandate the use of buffers, but it does grants the authority for local regulatory agencies to include buffer protection as necessary. The referenced provision within this set of regulations is as follows:

"When the local planning commission has prepared and recommended and the governing body has adopted at least the land use element of the comprehensive plan as set forth in this chapter, the governing body of a municipality or county may adopt a zoning ordinance to help implement the comprehensive plan. The zoning ordinance shall create zoning districts of such number, shape, and size as the governing authority determines to be best suited to carry out the purposes of this chapter. Within each district the governing body may regulate:

(6) other aspects of the site plan including, but not limited to, tree preservation, landscaping, **buffers**, lighting, and curb cuts; and"

**- Section 6-29-720.A and Section 6-29-720.A.(6)**

## **2 BUFFER TERMINOLOGY**

The **2012 Construction General Permit (CGP)** uses permit-specific and other established buffer zone terms to identify the type of buffers to be applied, the circumstances that require buffers, and the types of waters that determine the minimal buffer width. For this reason, it was deemed beneficial to provide the

following guidance on the key terms that are used within the **Buffer Zone Management Requirements** to establish a buffer zone during construction.

## 2.1 BUFFER ZONES

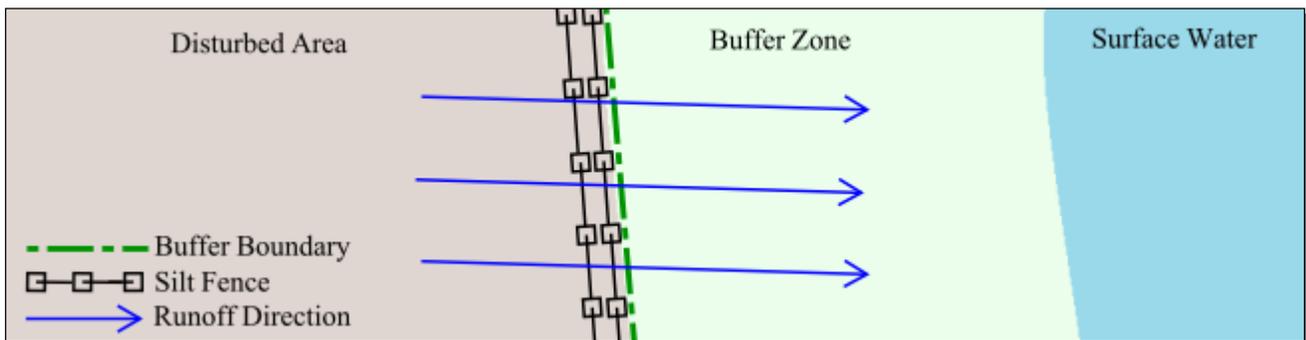
To begin the discussion of the key terms used within the **Buffer Zone Management Requirements**, it was necessary to analyze the definition of a buffer zone to see if it meets the intentions of why these requirements were to be included. This definition is as follows:

*"A strip of dense undisturbed perennial native vegetation, either original or reestablished, surrounding streams and rivers, ponds and lakes, wetlands, seeps, or other Waters of the U.S. within which construction activities are restricted. Buffer Zones are established for the primary purpose of protecting water quality and maintaining a healthy aquatic ecosystem in receiving waters. Buffer zones are most effective when stormwater runoff is flowing into and through the buffer zone as shallow sheet flow, rather than in concentrated form such as in channels, gullies, or wet weather conveyances. Therefore, it is critical that the design of any development include management practices, to the maximum extent practical, that will result in stormwater runoff flowing into and through the buffer zone as shallow sheet flow. Buffer zones are established for the primary purpose of protecting water quality and maintaining a healthy aquatic ecosystem in receiving waters."*

- Appendix A of the 2012 CGP

The provided definition cites a very broad description of indigenously vegetated areas, adjacent to surface waters, that persist through construction activities and into post-construction as a permanent measure to control water quality. As written the Buffer Zone definition goes beyond the scope of the **Buffer Zone Management Requirements**, and was creating confusion on when a buffer zone needs to be applied when the Draft CGP was released to the public.

Figure 2.1: Buffer Zone as a Permanent Water Quality BMP



It was for this reason that additional buffer terms were established within the **2012 CGP** to better convey the scope of the **Buffer Zone Management Requirements**. These terms are **Natural Buffers** and **Extended Natural Buffers**, which are defined in the following sections. (The term **Riparian Buffers** is also discussed below to identify recommendations for buffers zone provided to meet permanent water quality requirements.)

### 2.1.1 NATURAL BUFFERS

The **2012 CGP** requires that construction activities discharging stormwater runoff into surface waters must provide an **undisturbed** buffer zone between all land-disturbing activities and surface waters until final stabilization has been reached on all disturbed areas. Simply put, buffer zones must be provided around surface waters **only** during construction. Using the buffer zone definition discussed above in *Section 2.1* above, one may believe that these buffers are to be provided as a both a temporary and permanent water quality control rather than just as a temporary control.

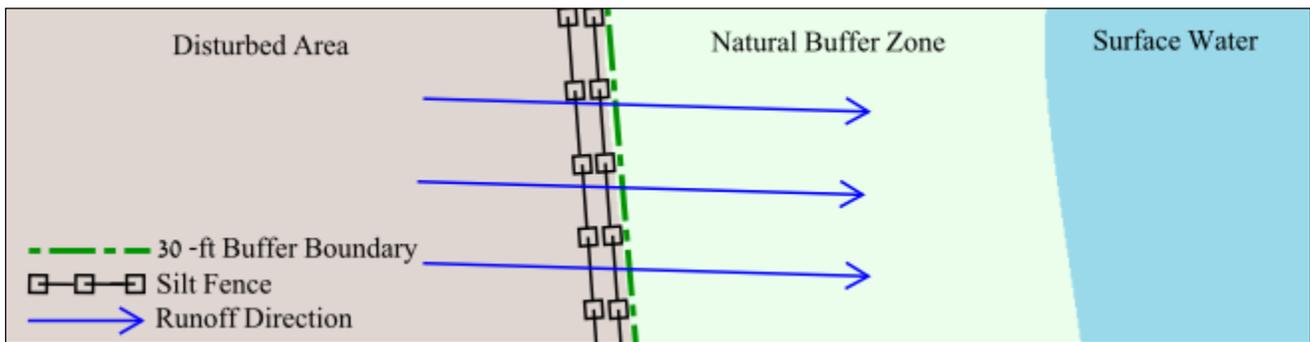
To avoid any confusion on when the **2012 CGP** requires the use of a buffer zone, the term "**Natural Buffer**" was established. The Natural Buffer definition is as follows:

"An area, strip, or plot of undisturbed land cover consisting of vegetation (e.g., grass, brush, trees, foliage) adjacent to surface waters that is utilized to provide secondary water quality control for stormwater discharges from adjacent land-disturbing activities. These vegetated areas are not to be altered in any way, shape, form or fashion unless it is to establish a permanent buffer and, if so, not until the contributing disturbed areas have reached final stabilization."

- Appendix A of the 2012 CGP

A **Natural Buffer** should be limited to the pre-existing vegetative cover of the land. It is not necessary to engineer a vegetated buffer area where vegetation is lacking. In circumstances where no pre-existing vegetation is evident, buffer zone width reduction or elimination of a **Natural Buffer** may be granted through one of the compliance options provided in the **2012 CGP**. See **Section 4 - Buffer Zone Management Compliance Options** of this guidance for more information on these compliance options.

Figure 2.1.1: A Natural Buffer, shown with a 30-ft width, provided as a temporary Water Quality BMP



### 2.1.2 EXTENDED NATURAL BUFFERS

Another permit-specific term that was established for the **Buffer Zone Management Requirements** is "**Extended Natural Buffers**". The main differences between Natural Buffers and **Extended Natural Buffers** are that the latter discharges into a Sensitive or Impaired surface water and that they typically have a wider buffer width.

The definition of **Extended Natural Buffers** is as follows:

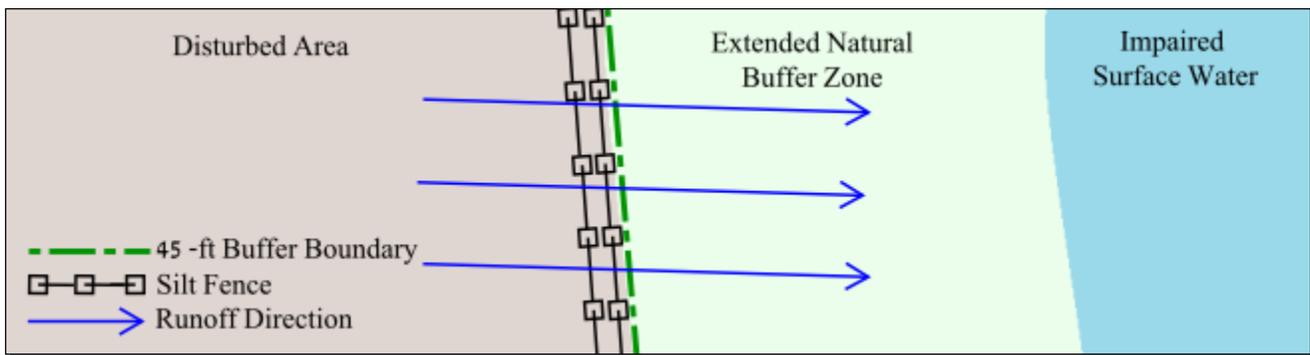
"An area, strip, or plot of undisturbed land cover consisting of vegetation (e.g., grass, brush, trees, foliage) adjacent to either Sensitive or Impaired surface

waters that is utilized to provide secondary water quality control for stormwater discharges from adjacent land-disturbing activities. These vegetated areas are not to be altered in any way, shape, form or fashion unless it is to establish a permanent buffer and, if so, not until the contributing disturbed areas have reached final stabilization. The minimum width of an Extended Natural Buffer is typically greater than the width required for Natural Buffers."

- Appendix A of the 2012 CGP

Similar to Natural Buffers, **Extended Natural Buffers** are not intended to treat stormwater runoff from land-disturbing activities that were not first treated by the required erosion prevention and sediment control BMPs at a construction site.

Figure 2.1.2: An Extended Natural Buffer, with a 45-ft width, provided as a temporary Water Quality BMP



### 2.1.3 RIPARIAN BUFFERS

Another term that will be beneficial to discuss is **Riparian Buffers**. The definition for this term is as follows:

"A permanent area, strip, or plot of undisturbed, naturally vegetated and/or engineered land cover consisting of vegetation (e.g., grass, brush, trees, foliage) adjacent to surface waters that is utilized to provide water quality control for post-construction stormwater discharges. These buffers may be designed to provide many water quality benefits including, but not limited to, water quality protection, wildlife habitat preservation and flood mitigation."

- Appendix A of the 2012 CGP

A Natural or Extended Natural Buffer will be considered a **Riparian Buffer** if it is to exist post-construction to meet permanent water quality requirements. For example, if a buffer zone is to be used to treat portions of stormwater runoff in lieu of being treated through a structural BMP such as a detention pond.

**Riparian Buffers** will generally need to be much wider than a Natural Buffer and, in most cases, will need to be engineered and then established once construction activities have been completed. It may also be beneficial, if not necessary, to expand the provided buffer zone width of either a Natural Buffer or an Extended Natural Buffer during construction to match the width of a proposed Riparian Buffer.

Just remember that **Riparian Buffers** are not required by the **2012 CGP** and that this information has only been provided for those who wish to extend the use of the required temporary buffer zones into post-construction conditions.

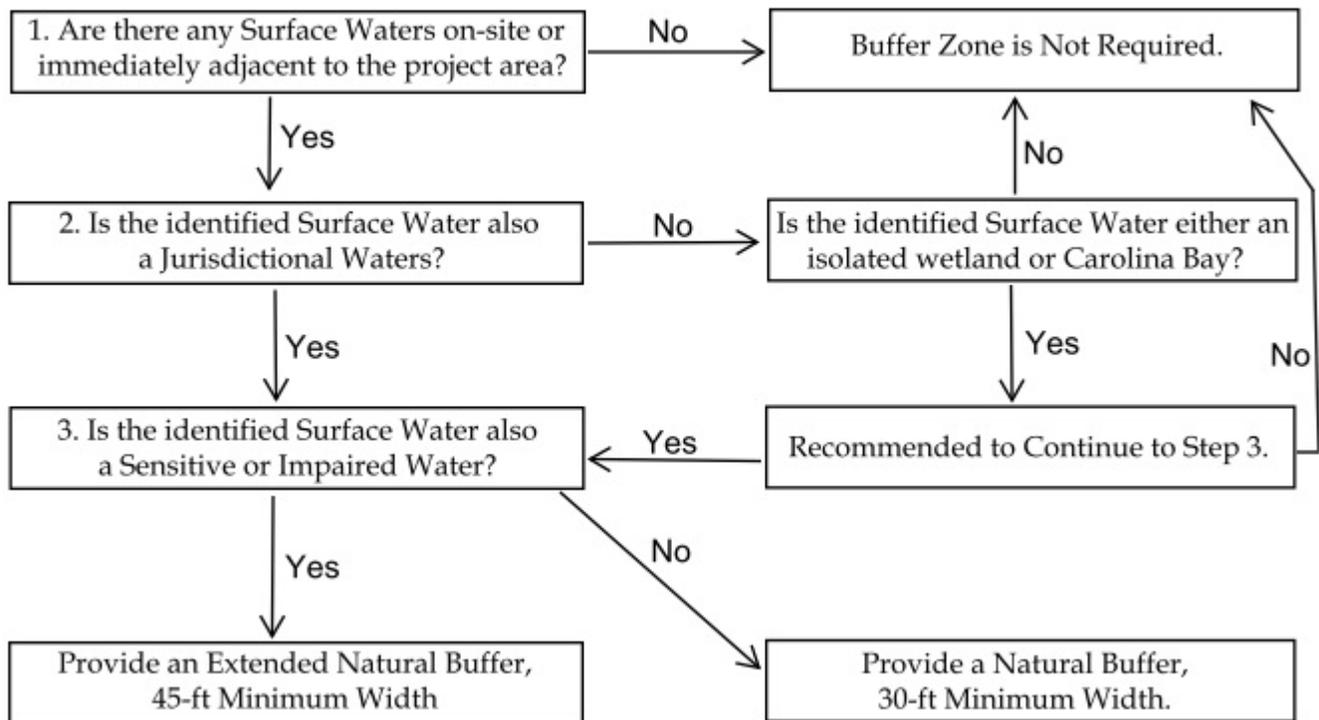
## 2.2 TYPES OF WATERS

Another important question that required clarification was on how to identify the types of waters that the **Buffer Zone Management Requirements** applied to. Many definitions, as well as variations of definitions, were considered during the development of the buffer requirement. In the end, the following four terms were selected: **Surface Waters, Jurisdictional Waters, Impaired Waters, and Sensitive Waters**. All of which are used to determine when the buffer requirements are applicable.

Using these terms, a flow chart has been developed to help SWPPP preparers and reviewers identify where the **Buffer Zone Management Requirements** apply. This flow chart, the **Buffer Zone Applicability Flow Chart**, is shown below.

Figure 2.1.2: Buffer Zone Applicability Flow Chart

### Buffer Zone Applicability Flow Chart



Please see the following sections for the definitions of the cited above. If the identified water body cannot be defined as any of these terms then the **Buffer Zone Management Requirements** do not apply to the adjacent water body.

### 2.2.1 SURFACE WATERS

One of the first questions to ask when determining the applicability of the **Buffer Zone Management Requirements** is whether or not the adjacent water body would meet the definition of **Surface Waters**. To answer this question, the following definition of **Surface Waters** is to be consulted:

“Any waters collecting on the ground and exposed to atmospheric air where the source of the water is groundwater, stormwater runoff, atmospheric water,

or a combination of these listed sources. This would include water collecting on the ground as in a stream, river, wetland, bay, ocean, sound, pond, spring, creek, estuary, marsh, inlet, canal, or another similar impoundment. All types of wetlands would meet this definition, even if the wetland area is only saturated for short periods throughout the year."

- Appendix A of the 2012 CGP

The term **Surface Waters** is used to identify any impoundment of water that the **Buffer Zone Management Requirements** were intended to protect. As mentioned in the definition, the scope of surface waters will also include any wetland area, even those wetlands that do not have a standing pool of water year round. It is for this reason that qualified wetland scientists properly identify all wetland areas, even if initial site visits show no signs of impounded water in suspected wetland locations.

### **2.2.2 JURISDICTIONAL WATERS**

After determining if the water body can be classified as a Surface Water, the next question to ask is whether or not the surface water meets the definition of **Jurisdictional Waters**. (Note: Non-jurisdictional waters are listed as one of the Exceptions in the **Buffer Zone Management Requirements**, which may allow for the reduction or elimination of a buffer zone.) A permit-specific definition for "**Jurisdictional Waters**" was developed to aid in determining if a buffer zone is required, and this definition is as follows:

"Any surface waters that may be classified as a navigable water, as defined by this permit, or any surface waters, including wetlands and tributaries, that may have the ability to affect the water quality of any downstream navigable waters to which a surface water's discharges ultimately reaches."

- Appendix A of the 2012 CGP

This definition would exclude upland-dug ponds, detention and retention basins, treatment works' ponds, isolated wetlands, Carolina Bays, and any surface water that is isolated from downstream water bodies. Surface waters would be considered "Jurisdictional" if it has the potential to impact the water quality of downstream waters through overland discharges that were not released from a controlled outlet structure during either normal conditions or during/after a storm event.

A simple procedure to determine if identified surface waters are "jurisdictional" is to use the [Map of Navigable Waters Of South Carolina](#), provided by SC DHEC. If discharges from the adjacent surface waters will eventually reach one of the Navigable Waters, outlined and bolded in blue, then these surface waters would be considered "jurisdictional" and would required a buffer zone. As for the area along the coastline that is not indicated on the navigable waters map, each surface water should be assumed to be jurisdictional. Then if a reduction or elimination of a Buffer Zone is desired, pursue Compliance Option B or C. (See **Section 4 - Buffer Zone Management Compliance Options.**)

As for isolated wetlands and similar surface waters (e.g., Carolina Bays), it is highly recommended to provide buffer zones to protect these wildlife habitats. The flow chart provided in **Section 2.2 - Types of Waters** includes an additional step requesting to provide buffer zones around these surface waters even though they do not classified as **Jurisdictional Waters**.

As a reminder, determining if surface water are "jurisdictional" in order to verify if the **Buffer Zone Management Requirements** are applicable is completely different from the Jurisdictional Determination (JD) performed by the USACOE. These JDs could be use to show that buffer zone are applicable, but it is not necessary to request a JD from the USACOE in order to determine if buffer zone are applicable. The USACOE only needs to be consulted if impacts are proposed within any Waters of the State.

### **2.2.3 IMPAIRED & SENSITIVE WATERS**

After it is determined that a buffer zone is required, the following definitions should be consulted to determine if an **Extended Natural Buffer**, which increases the minimum buffer zone width from 30-ft to 45-ft, will need to be provided. This extended buffer zone width will need to be provided if the adjacent surface water is impaired or is classified as an environmentally sensitive water.

To determine if a surface water would require an **Extended Natural Buffer** use the **Sensitive Waters**, which is as follows:

“Any surface water that has been classified by a regulatory agency as one or more of the following types of waters: Trout Waters, Outstanding Resource Water, and/or a Shellfish Harvesting Water.”

- Appendix A of the 2012 CGP

To determine if a surface water would require an **Extended Natural Buffer** use the **Impaired Waters** definition, which is as follows:

“Any surface water that has been listed on the most current 303(d) & TMDLS list for a sediment or sediment-related pollutant. These listed pollutants include Total Nitrogen, Total Phosphorus, Turbidity, BIO-Macroinvertebrates, Chlorophyll-a, and Fecal Coliform in Shellfish Harvesting Waters.”

- Appendix A of the 2012 CGP

If either of the two definitions identified above applies to the adjacent surface water, than an **Extended Natural Buffer** will need to be provided, which consists of a minimum buffer width of 45-ft.

For more information on impairments and environmentally sensitive waters consult the following SC DHEC webpage, <http://www.scdhec.gov/environment/water/tmdl/index.htm>, or review the water quality standards listed in South Carolina Regulations [R.61-68 - Water Classifications and Standards](#) and [R.61.69 - Classified Waters](#).

### 3 BUFFER ZONE MANAGEMENT REQUIREMENTS

The 2012 CGP includes a section of regulations specifically included to provide a buffer zone around surface waters adjacent to construction activities. This set of regulations is commonly referred to as the **Buffer Zone Management Requirements**, and are to be implemented state-wide at any construction site, which are subject to the 2012 CGP and that discharge to an immediately adjacent or on-site surface.

The Buffer Zone Management section cites four buffer requirements along with three compliance options. This section of the guidance will address the buffer zone requirements and the next section, Section 4, will address the buffer zone compliance options.

Two of these requirements identify the parameters, specifically the minimum buffer width, to be provided. The third requirement addresses how runoff should be directed into these buffer zones, while the fourth requirement allows local buffer ordinances to take precedence when more stringent. Each of these buffer zone requirements are to be addressed in the SWPPP, approved during plan review, and then implemented at the construction site. The following sections discuss each of these requirements in more detail.

#### 3.1 30-FT, NATURAL BUFFER

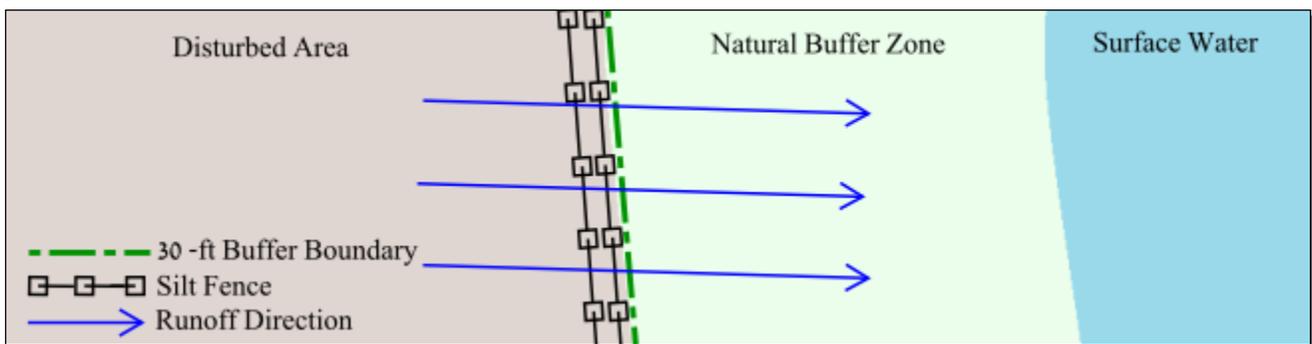
When a construction site is required to provide a buffer zone and the adjacent surface waters are **not** classified as either Sensitive or Impaired Waters, a **Natural Buffer** must be provided with a **minimum width of 30 feet**. The language for this requirement is as follows:

**"30-foot, Natural Buffer. Provide and maintain, at a minimum, a 30-foot undisturbed buffer during construction. This Natural Buffer should be located between the surface water and the outermost sediment and erosion controls at the construction site."**

- Section 3.2.4.C.I.(a) of the 2012 CGP

This 30-ft buffer zone may not be used as the primary treatment for stormwater runoff from the construction site, and prior to construction stormwater discharges being released into the buffer zone; the runoff must be treated by the construction site's BMPs.

Figure 3.1: 30-ft, Natural Buffer



All **Natural Buffers** must be provided and maintained until final stabilization has been reached, unless provisions have been included in the approved SWPPP that cite otherwise. Under approved conditions, work may be allowed within the buffer zone to provide velocity dissipation or when all disturbed areas discharging to the buffer area have reached final stabilization. (See **Section 5.1.1 - Special Circumstances** for more details.)

The minimum buffer zone width may be reduced if approved by the permitting authority. It is also recommended to provide a width greater than 30 feet where applicable, especially to surface waters that reside in urbanized areas and when the buffer zone is to be provided as a riparian buffer after construction activities have been completed.

### 3.2 45-ft, EXTENDED NATURAL BUFFER

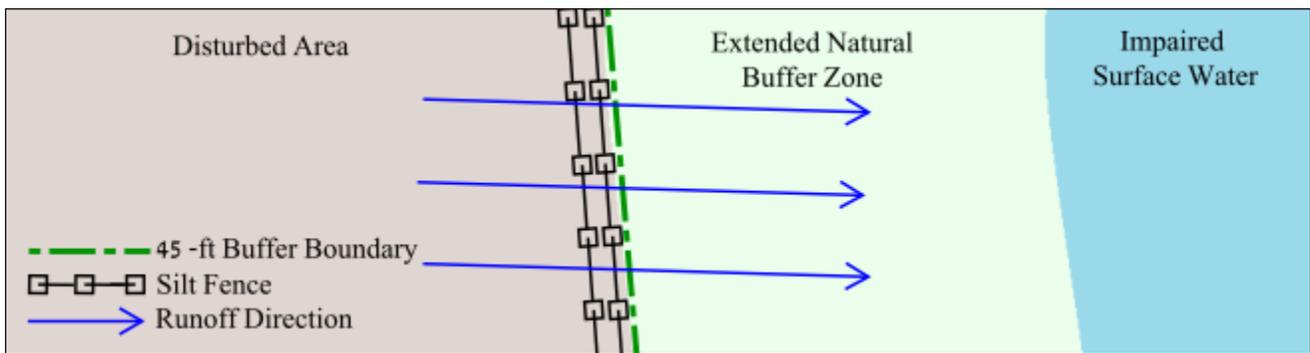
When a construction site is required to provide a buffer zone and the immediately adjacent or on-site surface waters **are** classified as either Sensitive or Impaired Waters, a **Extended Natural Buffer** must be provided with a **minimum width of 45 feet**. The language for this requirement is as follows:

**"45-foot, Extended Natural Buffer around Sensitive and Impaired Waters. Provide and maintain, at a minimum, a 45-foot undisturbed buffer during construction where the surface waters are either classified as Sensitive and/or Impaired Waters. This Extended Natural Buffer should be located between the surface water and the outermost sediment and erosion controls at the construction site."**

- Section 3.2.4.C.I.(b) of the 2012 CGP

As mentioned in the Extended Natural Buffer definition, the 45-ft buffer zone may not be used as the primary treatment for stormwater runoff from the construction site, and prior to construction stormwater discharges being released into the buffer zone; the runoff must be treated by the construction site's BMPs.

Figure 3.1: 45-ft, Extended Natural Buffer



The 45-ft buffer zone must also be provided and maintained until final stabilization is reached, unless provisions have been included in the approved SWPPP that cite otherwise. Under approved conditions, work may be allowed within the buffer zone to provide velocity dissipation or when all disturbed areas discharging to the buffer area have reached final stabilization. (See **Section 5.1.1 - Special Circumstances** for more details.)

The minimum buffer zone width may be reduced if approved by the permitting authority. It is also recommended to provide a width greater than 45 feet where applicable, especially to surface waters that reside in urbanized areas and when the buffer zone is to be provided as a riparian buffer after construction activities have been completed.

### 3.3 VELOCITY DISSIPATION INTO BUFFERS

The Buffer Zone Management Requirements states that all construction stormwater discharges into a buffer zone should be non-channelized and non-concentrated to prevent erosion within the buffer. This must be accomplished after stormwater runoff is first treated by the construction site's sediment and erosion control BMPs. The use of **velocity dissipation** measures, such as level spreaders and plunge pools, adjacent to or within a buffer zone may be necessary to meet this requirement.

The **Velocity Dissipation Requirements** language is as follows:

**"Velocity Dissipation Requirements.** All discharges into a buffer zone should be non-channelized and non-concentrated to prevent erosion, and must first be treated by the construction site's sediment and erosion controls. Buffer zone widths may be reduced to accommodate velocity dissipation measures."

- Section 3.2.4.C.I.(c) of the 2012 CGP

Portions of the buffer zone may be used for the placement of any velocity dissipation measure necessary to meet this requirement. The amount of buffer zone utilized to provide velocity dissipation should be kept to a minimum, and the associated disturbance should not exceed the area required to install the necessary controls. The permitting authority must first approve all velocity dissipation controls that are proposed within a buffer zone.

If the approved, site-specific SWPPP does not show the location of velocity dissipation measures within a buffer zone, then these BMPs **may not be installed within a buffer zone**.

### 3.4 LOCAL BUFFER REQUIREMENTS

When the construction site is located within a MS4's jurisdiction or another local government, as in a county or municipality, the provided buffer zone must meet all local buffer requirements and ordinances, where more restrictive. In addition to any requirements that are more restrictive, all mechanisms use by the local government or MS4s to either reduce or eliminate the buffer zone width or any other buffer zone parameter (e.g., duration of use, vegetation, discharge velocity) may be utilized as long as the provision listed under Compliance Options B and C are met. (See **Section 4 - Compliance Options** for more details.)

The **Local Buffer Requirements** language is as follows:

**"Additional Local Requirements, where applicable.** The provided buffer zone should meet any local requirements, if more restrictive. Local Requirements may allow for the mechanisms that would affect the width or other parameter of a buffer zone given that, in the event that the buffer zone width is less than the required 30-ft or 45-ft width, the requirements in Compliance Options in 3.2.4.C.II.(b) and 3.2.4.C.II.(c) are met."

- Section 3.2.4.C.I.(d) of the 2012 CGP

## **4 BUFFER ZONE MANAGEMENT COMPLIANCE OPTIONS**

Whether the construction site is required to provide an Extended or Natural Buffer, the 2012 CGP provides three options that may be addressed within a SWPPP to bring a construction site into compliance with the **Buffer Zone Management Requirements**. These three options allow the SWPPP Preparer to provide either the entire buffer zone width, a reduced buffer zone width, or to eliminate the use of a buffer zone entirely. Any option that reduces the buffer width below the minimum required length would need to provide additional SWPPP documentation.

The next few sections provide details for each **Compliance Option**, including checklists to verify that the construction site complies with the **2012 CGP** and guidance on the documentation to include in the SWPPP for the selected compliance option.

### **4.1 COMPLIANCE OPTION A – PROVIDING THE ENTIRE BUFFER ZONE**

For the majority of construction sites, Option A will be the most viable and straightforward option available to provide a buffer zone around surface waters. **Compliance Option A** contains the least amount of documentation within the SWPPP and leaves nothing up to interpretation (as far as buffer zone widths go), which may lead to both simpler SWPPP designs and expedited reviews times; not to mention simpler implementation at the construction site.

Selecting Compliance Option A will require the SWPPP to include a "**Buffer Zone Narrative**" and a "**Buffer Zone Maintenance Plan**". The narrative should simply state that a buffer zone with a specified width (either greater than or equal to 30-ft/45-ft) will be provided around the adjacent surface waters, and that this buffer zone should be established prior to implementing any land-disturbing activities. Any other details pertinent to ensure that the buffer zone is provided and maintained should also be included in the narrative.

The **Buffer Zone Maintenance Plan** should include a list of inspection and maintenance procedures to provide instructions on how to maintain the provided buffer zone until the construction site has reached final stabilization. It is recommended to provide this maintenance plan in list format. Please see **Section 6 - Buffer Maintenance** for guidance on recommended maintenance procedures.

To aid both SWPPP designers and reviewers, the following checklist may be used to ensure that all necessary requirements have been provided for construction sites pursuing **Compliance Option A**:

#### **Buffer Zone Compliance Option A – Checklist**

- Buffer Zone Width meets or surpasses minimum (30-ft or 45-ft) width.**
- Buffer Zone Narrative included in SWPPP.**
- Buffer Zone Maintenance Plan included in SWPPP or within Construction Site Plans.**
- Buffer Zone identified as a BMP on sediment and erosion control plan sheets.**
- Buffer Zone Note stating, "that the buffer is to be maintained until Final Stabilization is reached" within the Construction Site Plans.**

Buffer zones under **Compliance Option A** will also need to be identified on the sediment and erosion control plan sheets within the construction site plans. Please see Section **3.2.4.C.II.(a)** of the 2012 CGP for the exact language provided for this option, and for an example on how to address this Compliance Option A see the Buffer Design Example in **Section 8.3**.

## 4.2 COMPLIANCE OPTION B – REDUCTION OF THE BUFFER ZONE

Circumstances will arise where construction sites will not be capable of providing the entire width of a buffer zone due to existing conditions or due to other unforeseen circumstances. It is for these reasons that **Compliance Option B** was provided. Under this option, the SWPPP may call for a reduced buffer zone width as long as the additional documentation and measures, listed below, are provided. Any construction sites selecting this option must also meet one of the circumstances listed in **Section 3.2.4.C.III** of the 2012 CGP or have this option approved by the plan review entity.

In addition to a **Buffer Zone Narrative** and **Buffer Zone Maintenance Plan**, Compliance Option B also requires that the construction site plans include a **Buffer Zone Plan Sheet**, which is an additional plan sheet that specifically addresses the location of the buffer zone. This plan sheet should contain an outline of the provided buffer zones, show the BMPs discharging into the buffer zones, and include an itemized buffer zone sequence that addresses the management (e.g., installation, maintenance, and removal) of the buffer zone as land-disturbing activities are implemented and completed at the construction site.

The **Buffer Zone Maintenance Plan** must also include a list of BMPs to be maintained. These BMPs should include all proposed sediment and erosion controls bordering and/or discharging into the buffer zone. The **Buffer Zone Narrative** will also need to include a statement detailing why the buffer zone width is being reduced.

To aid both SWPPP designers and reviewers, the following checklist may be used to ensure that all necessary requirements have been provided for construction site pursuing Compliance Option B:

### **Buffer Zone Compliance Option B – Checklist**

- Buffer Zone Width is less than minimum (30-ft or 45-ft).**
- Buffer Zone Narrative included in SWPPP.**
  - Statement detailing why Buffer Zone width is reduced.**
- Buffer Zone & BMP Maintenance Plan included in SWPPP or within Construction Site Plans.**
- Buffer Zone Identified as a BMP on sediment and erosion control plan sheets.**
- Buffer Zone Plan Sheet provided with outlined boundaries and sequence of implementation.**
  - Outlined and/or Hatched Buffer Zone Boundaries.**
  - Sequence of Buffer Zone Implementation.**
  - BMPs adjacent to buffer zone shown.**
- Buffer Zone Note stating that that buffer is to be maintained until Final Stabilization is reached within the Construction Site Plans.**

Buffer zones under **Compliance Option B** will also need to be identified on the sediment and erosion control plan sheets within the construction site plans. Please see Section **3.2.4.C.II.(b)** of the 2012 CGP for the exact language provided for this option, and for an example on how to address this Compliance Option B see the Buffer Design Example in **Section 8.4**.

### 4.3 COMPLIANCE OPTION C - ELIMINATION OF THE BUFFER ZONE

The third and final option available for construction sites subject to the **Buffer Zone Management Requirements** may allow for the elimination of the entire buffer width. This option, **Compliance Option C**, may be allowed if all the additional documentation and measures, as mentioned below, are provided within the SWPPP, and that the construction sites meets one of the circumstances listed in **Section 3.2.4.C.III** of the 2012 CGP. Plan review entities may allow other circumstances not listed as an Exception as long as all items in the **Compliance Option C - Checklist** are received and the lack of a buffer zone will not jeopardize the water quality of the adjacent surface waters.

**Compliance Option C** still requires that a **Buffer Zone Narrative** be included with in the SWPPP but this narrative will have to **justify** why a buffer zone will not be provided, and that details the scope of all BMPs provided to treat stormwater runoff discharging into the adjacent surface waters.

This option also requires the submittal of a **Surface Water Protection Plan Sheet**, supporting calculations, and a **Temporary BMP Maintenance Agreement** that is signed by the Primary Permittee.

#### **Buffer Zone Option C – Checklist**

- A Buffer Zone, of any width, will not to be provided.**
- Buffer Zone Narrative included in SWPPP that contains the following:**
  - Justification of Buffer Zone Removal.**
  - Scope of BMPs used in lieu of providing a Buffer Zone**
- Temporary BMP Maintenance Plan included in SWPPP. (Signed by Primary Permittee)**
- Supporting BMPs & Calculations that includes the following:**
  - Additional BMPs and control measures (e.g., treatment trains, erosion prevention measures)**
  - Sediment Control BMPs capable of provided 80% trapping efficiencies.**
- Surface Water Protection Plan Sheet that contains the following:**
  - Outlined Boundaries of Surface Waters.**
  - Best Management Practice (BMP) Locations.**
  - Surface Water Protection Sequence**

As for the **Surface Water Protection Plan Sheet**, this should contain an outline/delineation of the adjacent waters, locations of the BMPs discharging into or adjacent to the surface waters, and include an itemized surface water protection sequence that addresses the management (e.g., installation, maintenance, and removal) of all the identified BMPs as land-disturbing activities are implemented and completed at the construction site. This plan sheet should be a separate plan sheet in addition to the standard erosion and sediment control plan sheets.

Buffer zones under **Compliance Option C** will also need to be identified on the sediment and erosion control plan sheets within the construction site plans. Please see Section **3.2.4.C.II.(c)** of the 2012 CGP for the exact language provided for this option, and for an example on how to address this Compliance Option C see the Buffer Design Example in **Section 8.5**.

#### **4.4 COMPLIANCE OPTIONS AND LOCAL BUFFER REQUIREMENTS**

All identified Compliance Options remain applicable for construction sites located within MS4s or other local government whose buffer zone ordinances and requirements are either non-existent or not as restrictive as the **Buffer Zone Management Requirements** listed in the 2012 CGP. For MS4s and other local governments whose buffer zones are more restrictive, the local requirements are to be addressed as each of these plan review entities deems appropriated to bring a construction site into compliance with their program.

In any event where a MS4's or a local government's buffer zone ordinances and requirements allow for the buffer zone width to be reduce under the 2012 CGP's minimum buffer width of 30-ft/45-ft the compliance requirements for **Compliance Option B** must be met. If a buffer zone is to be eliminated under similar circumstances, then the compliance requirements under **Compliance Option C** must be met.

## **5 SELECTING THE APPROPRIATE COMPLIANCE OPTIONS**

The following sections have been provided to aid SWPPP preparers and reviewers with determining which compliance option is best suited or is applicable at a construction site. To determine the appropriate compliance option, the existing land cover adjacent to surface waters should be evaluated. If the existing land cover includes ample vegetation, then chances are that **Compliance Option A**, providing the entire buffer zone width, will need to be the compliance option selected.

**Compliance Option B** and **Compliance Option C** are more feasible choices when the existing vegetation within a buffer zone is either non-existent, due to previous development, or is too scarce to provide any additional water quality benefit. Other circumstances, which allow for the selection of these compliance options, may be applicable to a construction site. Please see **Sections 5.1 - Exceptions** for more information on these circumstances.

Overall, both the SWPPP preparer and reviewer will need to work together to determine the best option for each construction site. If a case can be made for the reduction or elimination of a buffer zone, approval may be granted as long as all requirements for **Compliance Option B and C** are received. Buffer Zones should not be reduced or eliminated due to meet a preliminary design or due to financial constraints. This decision should be based on whether or not the buffer zone, as it exists prior to construction, has the ability to provide water quality protection during construction.

### **5.1 EXCEPTIONS**

The **Buffer Zone Management Requirements** include a set of **Exceptions** that may allow for buffer zone width reductions, the elimination of buffer zone, and for construction within a buffer zone after final stabilization measures have been implemented. These exceptions generally describe circumstances that inhibit the desired functions of the provided buffer zone.

These **Exceptions** also include circumstances where no discharges are directed towards the surface waters, when the surface waters are non-jurisdictional, areas of pre-existing development, and where work is associated in or around coastal conveyance structures. Table 5.1, outlining circumstance for **Compliance Options B and Compliance Option C**, has been provided on the following page, and a few common questions about these Exceptions have also been provided below. Additional information on each of the listed **Exceptions** in **Section 3.2.4.C.III of the CGP** has been provided in **Section 5.1.1** through **Section 5.1.5** of this guidance document.

#### **What if a circumstance is not specifically listed under Exceptions?**

If the circumstance at a construction site is not listed under Exceptions, and the SWPPP preparer can justify that the existing conditions at this site would inhibit a buffer zone or sections of a buffer zone from providing any additional water quality benefits, then the SWPPP preparer may request that the SWPPP pursue either Compliance Option B or C. The SWPPP preparer would need to provide all required documentation for the desired compliance option. The plan review entity would then make a decision to approve or deny the buffer zone reduction or elimination request.

#### **May work within a buffer zone be conducted after final stabilization has been reached?**

Yes, work within a buffer zone can be conducted once all areas upstream of the provided buffer have had final stabilization measures implemented. This work should be shown as a final step or phase of a construction project. Sediment and Erosion Control BMPs will still need to be implemented for any work within a buffer. Depending on the scope of the work, a separate plan sheet may be required.

**Table 5.1: Compliance Option B and Option C Examples**

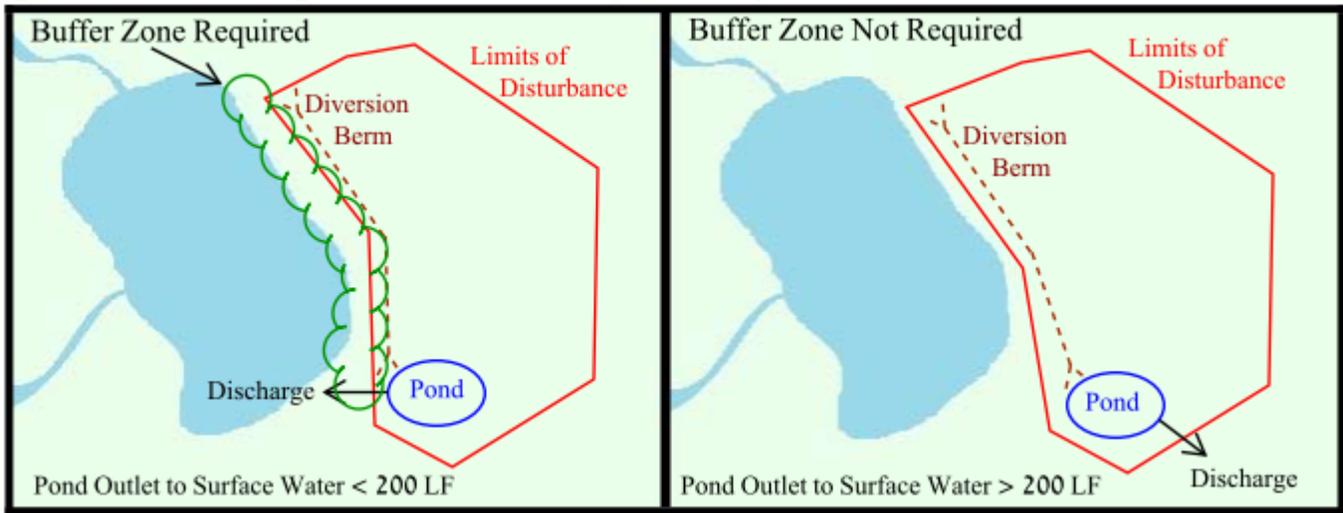
Option B - Qualifying Exceptions	Option C - Qualifying Exceptions
<p><b>Pre-Existing Development</b> - If development has previously occurred within the buffer zone, only the area that has not yet been developed would need to be provided as the buffer zone.</p>	<p><b>Pre-Existing Development</b> - Where the entire area that would be designated, as the buffer zone, has previously been disturbed/developed, and no undisturbed areas of vegetation exist.</p>
<p><b>Lack of Existing Vegetation</b> - Circumstances where portions of the existing vegetation coverage is too scarce to provide any additional water quality benefits. Areas of vegetation that provide enough cover will still need to be designated as a buffer zone.</p>	<p><b>Lack of Existing Vegetation</b> - Circumstances where the existing vegetation coverage is too scarce to provide any additional water quality benefits.</p>
<p><b>No Discharge to Surface Waters</b> - Whether existing conditions or temporary diversions prohibits any discharge from reaching surface waters.</p>	<p><b>No Discharge to Surface Waters</b> - Whether existing conditions or permanent diversions prohibits any discharge from reaching surface waters.</p>
<p><b>Non-Jurisdictional Waters</b> - Where surface waters are not jurisdictional. Buffer Zones are still recommended for non-jurisdictional waters that provided habitats for wildlife.</p>	<p><b>Non-Jurisdictional Waters</b> - Where surface waters are not jurisdictional. Buffer Zones still recommended for non-jurisdictional waters that provided habitats for wildlife.</p>
<p><b>Coastal Conveyance Structures</b> - Constructed conveyance structures and channels deemed jurisdictional that are located within the Coastal Counties. Buffer Zones still recommended where possible.</p>	<p><b>Coastal Conveyance Structures</b> - Constructed conveyance structures and channels deemed jurisdictional that are located within the Coastal Counties. Buffer Zones still recommended where possible.</p>
<p><b>Special Circumstances</b> - Any other circumstances that limits the water quality protection capabilities of small sections of a buffer zone. These circumstances would have to be approved by the plan reviewer as an acceptable Compliance Option B circumstance.</p>	<p><b>Special Circumstances</b> - Any other circumstances that limits the water quality protection capabilities of a buffer zone. These circumstances would have to be approved by the plan reviewer as an acceptable Compliance Option C circumstance.</p>

### 5.1.1 NO DISCHARGES TO SURFACE WATERS

Circumstances that prevent stormwater runoff from discharging into adjacent surface waters at a construction site may allow for the SWPPP preparer to either reduce the buffer width or eliminate the need for buffer zone in it's entirety. Whether the buffer zone is reduced or eliminated should be a decision made during the SWPPP approval process. The scope of the construction project and the state of the surface waters should be taken into account prior to selection **Compliance Option B/C**.

Under most circumstances, no buffer zone will be required especially if runoff is prevented from discharging into the adjacent surface waters in pre-existing conditions. The use of a buffer zone may also be eliminated if diversion BMPs (e.g., earthen berms, vegetated swales) are constructed prior to any other land-disturbing activities, and that these constructed conveyance BMPs are capable of diverting stormwater runoff away from the surface waters. This diverted runoff must be discharged towards an outfall that is not immediately adjacent to a surface water (approximately 200 LF from the surface) and that releases the discharge as a non-point source. An example of when buffer zones would be required and would not be required under these particular circumstances is shown on **Figure 5.1.1** on the following page.

Figure 5.1.1: No Discharge to Surface Water Exception Example



Circumstances where diversions are used to direct stormwater runoff into a constructed BMP (e.g., sediment basins, sediment traps) that discharge directly into adjacent surface waters will not be allowed to use this **Exception** to reduce the buffer width or eliminate the buffer zone.

### 5.1.2 PRE-EXISTING DEVELOPMENT

Another circumstance that may allow for the reduction or elimination of the **Buffer Zone Management Requirements** is the location of any pre-existing development within the area that would be designated as the buffer zone.

There are basically two circumstances that may arise in areas where pre-existing development has occurred. The first circumstance would be where the entire area adjacent to surface waters has been completely disturbed prior to planning of the new project and where no natural vegetation exists. Under this circumstance the buffer zone would not need to be provided, as long as all requirements of **Compliance Option C** are provided.

As for the second circumstance, only portions of the area adjacent to surface waters have been previously disturbed. Portions of the disturbed area may contain impervious areas, but the majority of this area is now or still vegetated. Under this circumstance the buffer zone would not need to be provided within all vegetated areas, as long as all requirements of **Compliance Option B** are provided.

### 5.1.3 NON-JURISDICTIONAL WATERS

Another qualifying circumstance for both Compliance Options B and C is if the surface water is a non-jurisdictional water, meaning that the surface water does not meet the “Jurisdictional Waters” definition provided in **Appendix A of the 2012 CGP**. Discharges to non-jurisdictional waters may either reduce the Buffer Zone width (**Compliance Option B**) or may eliminate the use of a Buffer Zone in its entirety (**Compliance Option C**).

In the event that the adjacent surface water is either an isolated wetland or a Carolina Bay, it is strongly recommended that the entire buffer zone width be provided. Both of these types of surface waters may be worth protecting since they are believed to provide amplitudes of wildlife habitats and other water quality benefits to the surrounding areas.

More information on this subject is provided in **Section 2.2.2 - Jurisdictional Waters** of this guidance document.

#### **5.1.4 COASTAL CONVEYANCE STRUCTURES**

The next qualifying circumstance under the **Exceptions** category are construction sites which are located in one of the eight **Coastal Counties** (Charleston, Berkeley, Dorchester, Georgetown, Horry, Jasper, Beaufort, and Colleton Counties), and that contain existing structures or channels that were built to transport runoff to adjacent surface waters. These conveyance structures were included as **Exceptions** due to comments received during the Public Notice of the 2012 CGP. These comments expressed concern that having to provide buffer zones around these conveyance structures, which are often considered jurisdictional surface waters, would limit the ability to develop a site due to the abundance of these conveyances.

Each site will need to be evaluated individually to determine which compliance option best suits the proposed construction activities. When construction activities are discharging to smaller or newly construction conveyance structures, where vegetation has not yet been firmly established and that discharge into downstream surface waters that are within close proximity to the construction activities, then **Compliance Option B** should be selected. This will provide additional water quality protection for those downstream surface waters.

When construction activities are discharging to a conveyance structure that has established abundant, standing vegetation, and that discharge into downstream surface waters that are not within close proximity (greater than 200 LF) to the construction activities, then **Compliance Option C** may be selected. Where possible, in both of the above circumstances, **Compliance Option A** is always recommended.

A few additional tips for determining which compliance option is best suited for a construction site is to seek out any old construction plans that may have been associated with the conveyance structure in question to determine the limits of the constructed conveyance, and to have a qualified individual perform a preliminary inspection of the conveyance structure to determine if water quality protection would be beneficial to these areas.

#### **5.1.5 SPECIAL CIRCUMSTANCES**

There will always be circumstances that arise which are unforeseen when regulatory requirements are set. For this reason, the Buffer **Zone Management Requirements** included provisions to allow entities conducting the plan reviews to approve other circumstances where buffer zones may need to be reduced or eliminated.

Buffer Zones should be required when water quality protection is crucial to the nearest surface waters receiving discharges from construction activities, and where the secondary sediment control may be necessary even after treatment by required sediment controls, typically where the drainage area to these BMPs are very large and/or are mass graded.

If a case can be made that a specific circumstance would either not benefit from a buffer zone or can provide ample water quality protection without a buffer zone, the plan reviewer may allow for the selection of Compliance Option B or C. In any case where the plan reviewer is unsure, SC DHEC may be contacted for guidance.

#### **5.2 EXEMPTIONS**

There are a few circumstances where the SWPPP will not have to comply with any of the **Buffer Zone Management Requirements**. These circumstances are listed within the 2012 CGP as **Exemptions**, and if a construction site meets one of the listed circumstances, no additional documentation, as outlined for

any of the compliance options, will be required to be included within the SWPPP. All land-disturbing activities that qualify as an **Exemption** are listed in Table 5.2 below.

**Table 5.2: Buffer Zone Management Exemptions**

<b>Exemptions for the Buffer Zone Management Requirements</b>
<b>Construction of Water Crossings</b> - Land-disturbing activities associated with the construction of water crossings within surface waters and the adjacent buffer zone.
<b>Construction of Water Dependent Structures and Water Access Areas</b> - Land-disturbing activities associated with the construction of piers, boat ramps, trails, and other water dependent structures & access areas within surface waters and the adjacent buffer zone.
<b>Habitat Restoration Projects</b> - Land-disturbing activities associated with the rehabilitation of streamside habitats.
<b>Construction Activities Associated with Impacts to Surface Waters</b> – Land-disturbing activities associated with construction activities that impact surface waters.
<b>Construction Activities Associated with Linear Projects</b> - Land-disturbing activities associated with the construction projects that are linear in nature, which may consists solely of either roadways and/or utilities (such as roads that are not part of a development and utility construction including electrical power lines, gas lines, main sewer trunk lines, and water distribution lines that are not part of a development).
<b>Construction Activities Associated with Maintenance of Existing Structures</b> - Land-disturbing activities associated with maintenance and repair of existing structures located within a buffer zone.
<b>Construction Sites Covered Under the 2006 CGP</b> - All projects that were previously covered under the 2006 Construction General Permit for Stormwater Discharges associated with Large and Small Construction Activities are not required to comply with the Buffer Zone Management Requirements. The approved SWPPPs for these projects will not have to be updated to meet this requirement unless the Primary Permittee specifically requires that the Buffer Zone Management Requirements to be met.

For each of the listed **Exemptions**, the SWPPP must limit the area of disturbance to the minimum area needed to complete the proposed work and to access to the area of disturbance. Vegetation in the areas outside of the shown limits of disturbance should be preserved.

If other land-disturbing activities are proposed in addition to the work associated with any of the listed **Exemptions**, then the **Buffer Zone Management Requirements** will apply to the areas associated with those additional land-disturbing activities.

## 6 MAINTENANCE

In addition to providing a buffer zone, the **Buffer Zone Management Requirements** also state that all provided buffer zones should be properly maintained throughout the duration of all land-disturbing activities until final stabilization has been reached on all areas discharging to the buffer zone. To do this both the buffer zone and the BMPs discharging to the buffer zone must be maintained to ensure that the provided buffer is capable of achieving maximum pollutant removal.

Proper maintenance of a buffer zone begins with the **Flagging** of the area that has been designated as the buffer zone within in the approved SWPPP, and then continues with the installation of the perimeter and initial sediment control BMPs that will be treating stormwater runoff prior to being release within a buffer zone. All velocity dissipation BMPs should also be installed at this time to prevent any scouring of the buffer.

Once the buffer zone has been flagged and all of the site's primary BMPs have been installed, inspections should be conducted no less than once per week to verify that each BMP and the buffer zone is functioning as designed. The buffer zone should be check for any accumulated sediment and, if found, the sediment should be removed without damaging the existing vegetation to the best extent possible. Any sediment impacts may negate the water quality benefits the buffer zone is providing.

In reference to maintenance procedures, Compliance Option B/C also requires that the SWPPP include either a **Buffer Zone Maintenance Plan** or a **Temporary BMP Maintenance Plan**. Each of these maintenance plans should begin with flagging of the buffer zone, when applicable, and then continue with the installation of the initial/primary BMPs at the site. The plans should then go on to detail specific maintenance issues or steps to be taken as the construction activities at the site progress. These details should include up-keeping measures and sediment removal within both the buffer zone and adjacent BMPs.

The following sections discuss the importance of **Flagging**, **Sediment Removal**, and **Up-Keeping the BMPs** in respect to proper Buffer Zone Maintenance. However, the full scope of buffer zone and BMP maintenance is not discussed. Please consult DHEC BMP Handbook or other buffer zone and BMP documents when developing a site-specific maintenance plan for additional information.

### 6.1 FLAGGING

Proper buffer zone maintenance starts with the preliminary efforts of **Flagging**, which should be the first step of any **Buffer Zone Maintenance Plan**. The process of Flagging is usually conducted by marking the proposed buffer zone with a bright color ribbon, tied around trees, bushes, and other vegetation. Using a bright orange fence, typically utilized for tree protection, or safety fences can also be used to accomplish the process of flagging. Any Flagging procedures should be conducted prior to any clearing and grading work to prevent accidental clearing of a proposed buffer zone, and the existence of the selected flagging method should be inspected and maintained until the end of the construction project.

Properly flagging a buffer zone will help with another important part of the maintenance plan, which is sediment impacts and removal. By identifying the area required to be inspected, the flagging will also keep each individual on the construction site aware of the location the buffer zone.

## 6.2 SEDIMENT REMOVAL

Another important portion of a proper **Buffer Zone Maintenance Plan** is to perform weekly inspection, at a minimum, along the entire length of a provided buffer zone to check for any sediment accumulated within the buffer area. Sediment will need to be removed when the existing vegetation begins to become covered and is no longer capable of filtering any stormwater runoff from the adjacent construction activities.

When and if sediment impacts a buffer zone, measures should be taking to remove the sediment to the best extent possible and the source of the sediment impact should be identified. The source of the sediment (e.g., BMPs, unapproved disturbed areas) should then be altered or repaired to prevent any further sediment impacts. If the sediment impact has completely destroyed the existing vegetation, silt fence, another sediment control BMP, or a combination of sediment and erosion control BMPs should be utilized to protect areas of existing vegetation within the buffer.

As maintenance work is conducting within or along the buffer zone, those responsible for this work should document any sediment impacts within the SWPPP's Maintenance Records. This may help troubleshoot any repeat sediment impacts.

Overall, ensuring that the buffer zone and adjacent BMPs are not inundated with sediment may allow the buffer zone to provide the intended water quality benefits.

## 6.3 UP-KEEPING BMPs DISCHARGING TO BUFFERS

Building on the importance of sediment removal within a buffer zone, maintaining the BMPs discharging into buffer zones to ensure that the BMPs are functioning as designed is another important portion of a proper maintenance plan. Again, inspection of these BMPs should be conducted on a weekly basis and any repairs should be made as quickly as possible. Doing so will help keep sediment out of the buffer zone, preserving the function of these buffer zones.

Each BMP discharging into the buffer zone will require different types of maintenance activities, which vary from the removal of accumulated sediment to the replacement of the BMP. When preparing a **Temporary BMP Maintenance Plan**, the [SC DHEC BMP Handbook](#) should be consulted when formulating the maintenance plan for each BMP.

## 7 ADDITIONAL BUFFER ZONE ISSUES

The following sections were included to address comments received during the Public Notice and Request for Comments on the 2012 CGP. The issues of the required buffer zones being considered a "takings", the maintenance/repair of existing structures within a buffer zone, and how the buffer zones will be applicable in the Coastal Zone are the primary comments addressed.

For information on other comments received in respect to buffer zones can be found in the [Response to Comments on the 2012 CGP](#), which may be found on the [DHEC Stormwater Webpage](#).

### 7.1 TAKINGS

A number of comments were received that posed the question of whether or not the inclusion of the Buffer Zone Management Requirements qualified as a "**Takings**", which is considered to be any regulation that strips the land owner of ownership of a portion of land identified by said regulation without accommodating the owner for the land or removing the owner from the title of the property.

The initial language in the released "Draft 2012 CGP" could have been interpreted to the extend where the required buffer zone could have been considered a "**Takings**"; due to such words as buffer zone

preservation and the lack of clearly identifying that the buffer zone was only to be provided as a temporary BMP measure. Since the Department has received these comments, the entire section on the **Buffer Zone Management Requirements** has been rewritten to include language that clearly states that the buffer zones are to be used as temporary BMPs. This language also gives the option to allow for construction within the required buffer zone both during construction and after construction, provided certain precautions are taken.

## 7.2 PRE-EXISTING STRUCTURE MAINTENANCE

Another comment received was the concern that ongoing repair and maintenance of existing structures (e.g., detention basins, drainage ditches, and energy dissipaters) would be required to meet the **Buffer Zone Management Requirements**, which is not the case. No buffer zones will need to be provided as long as disturbance consists solely of maintenance and/or ongoing repairs, and the structures are not being completely rebuilt to address new development discharging to the structures.

Originally repairs and maintenance were not specifically listed as an Exemption to the **Buffer Zone Management Requirements**, but since receiving comments the language has been revised to include repairs and maintenance of exiting structures as an Exemption. More information on **Exemptions** can be found in **Section 5.2** of this guidance document.

## 7.3 COASTAL BUFFER ZONES

The final comment that this guidance document will address is the applicability of buffer zones in the coastal area with respect to constructed conveyance structures, including ditches and channels. This is due to the fact that within the **Coastal Zone** there is a large likelihood that proposed construction activities will need to release stormwater runoff into a constructed or proposed conveyance structure prior to such discharges are received by downstream surface waters.

For this reason, an **Exception** was added to the **Buffer Zone Management Requirements** to allow for the reduction or elimination of a buffer zone under these circumstances. This exception allows the SWPPP preparer to pursue **Compliance Option B/C**. Both the SWPPP preparer and the SWPPP reviewer will have to use their best engineering judgments when selecting the compliance option best suited for the construction site. For more guidance on the **Exception**, see **Section 5.1.4** of this guidance document.

## 8 BUFFER ZONE DESIGN EXAMPLES

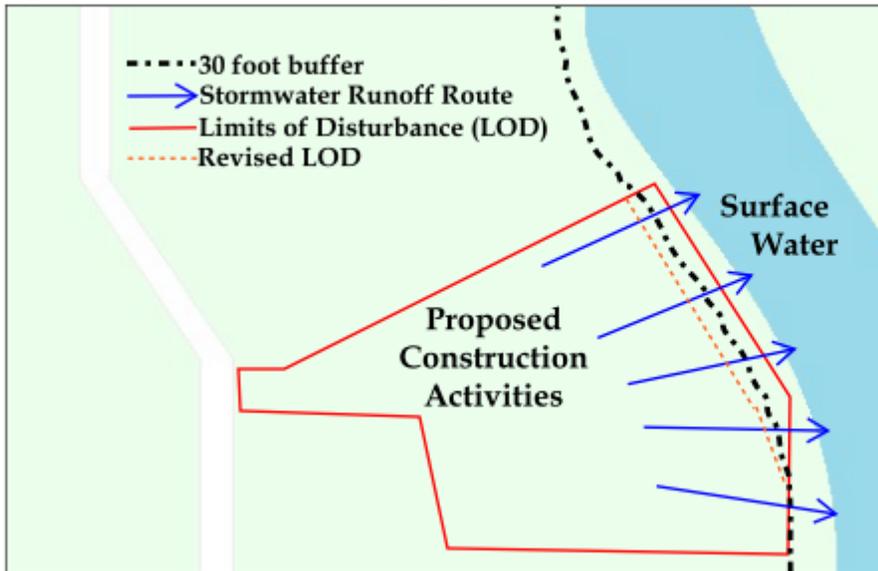
As a SWPPP preparer enters the design phase of a construction project, the preparer must first be capable of properly identifying if the **Buffer Zone Management Requirements** apply to the new project. If they do apply, the preparer must also be able to determine the required width and other parameters that the buffer zone must be designed to meet.

The following section provides some basic insight on how to identify if a buffer zone applies and, if so, what the minimal buffer width would be. Each section includes an example that includes the details of the circumstances, what buffer zone requirement applies, and how to address these requirements within a SWPPP.

## 8.1 30-FT NATURAL BUFFER REQUIRED (EXAMPLE 1)

In **Figure 8.1**, the Limits of Disturbance (LOD) for a construction site has been outlined (solid red line) prior to determining any applicable **Buffer Zone Management Requirements**. Noticing that the site's stormwater runoff is discharged into adjacent surface waters, it will be necessary to determine the required type of buffer zone, either an **Extended Natural Buffer** or a **Natural Buffer**, if any.

**Figure 8.1: 30-ft, Natural Buffer Required**



### **Buffer Zone Checks**

- Are Surface Waters immediately adjacent or on-site?
- Is the identified Surface Waters also a Jurisdictional Waters?
- Is the identified Surface Water also a Sensitive/Impaired Water?

To determine if any buffer zone requirements apply to this construction site, the SWPPP preparer should go through the list of checks outlined in the **Buffer Zone Applicability Procedure** listed in **Section 2.2** of this guidance. (A shorten version of this procedure is listed on the right of the **Figure 8.1.1** as Buffer Zone Checks.) Once the applicable requirements are determined, the SWPPP designer can revise the LOD to provide the necessary buffer zone widths if the initial LOD is within the required buffer zone.

From the checks, the SWPPP preparer would determine that a 30-ft **Natural Buffer** would need to be provided for this specific construction site. In order to meet this requirement the LOD will need to be altered in order to provide the appropriate buffer zone width. The revised LOD, which is shown as a dashed orange line, portrays the revised LOD. Additionally, the SWPPP preparer will want to check to see if any local ordinances apply, which in this circumstance none do.

Since the construction site is located on undeveloped land, and no other exceptions or exemptions apply to this construction site, **Compliance Option A** must be selected.

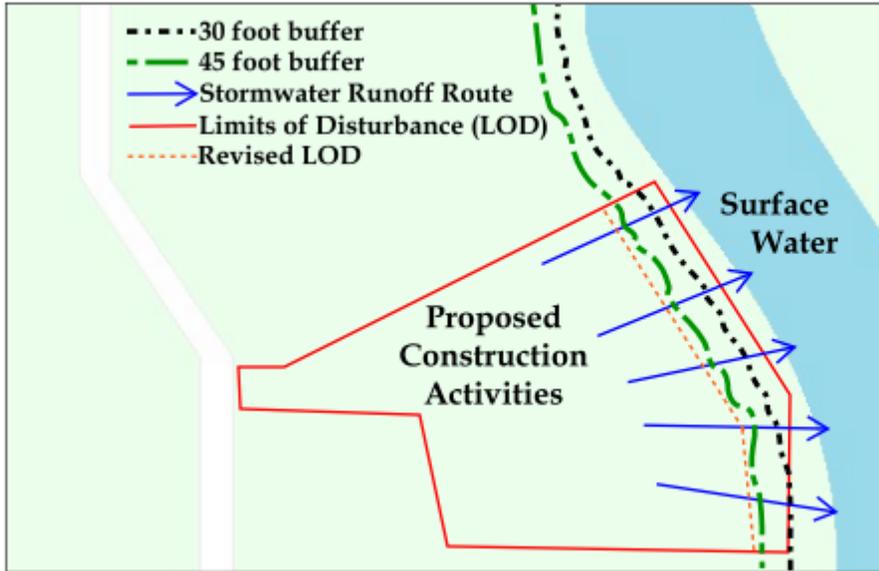
### **Meeting the Buffer Zone Management Requirements**

- A 30-ft, **Natural Buffer** will need to be provided along the Surface Water.
- The Proposed Limits of Disturbance will have to be revised to provide the 30-ft buffer zone.
- Discharge locations will need to be located outside of the buffer zone and be equipped with ample velocity dissipation.
- Check to verify if any local buffer zone ordinances are applicable at this location.
- Provide the necessary documentation within the SWPPP and Construction Site Plans to meet **Compliance Option A**.

## 8.2 45-FT EXTENDED NATURAL BUFFER REQUIRED (EXAMPLE 2)

In **Figure 8.2**, the Limits of Disturbance (LOD) for a construction site has been outlined (solid red line) prior to determining any applicable **Buffer Zone Management Requirements**. Noticing that the site's stormwater runoff is discharged into adjacent surface waters, it will be necessary to determine the required type of buffer zone, either an **Extended Natural Buffer** or a **Natural Buffer**, if any.

**Figure 8.2: 45-ft, Extended Natural Buffer Required**



### Buffer Zone Checks

- Are Surface Waters immediately adjacent or on-site?
- Is the identified Surface Waters also a Jurisdictional Waters?
- Is the identified Surface Water also a Sensitive/Impaired Water?

To determine if any buffer zone requirements apply to this construction site, the SWPPP preparer should go through the list of checks outlined in the **Buffer Zone Applicability Procedure** listed in **Section 2.2** of this guidance. (A shorten version of this procedure is listed on the right of the **Figure 8.1.1** as Buffer Zone Checks.) Once the applicable requirements are determined, the SWPPP designer can revise the LOD to provide the necessary buffer zone widths if the initial LOD is within the required buffer zone.

From the checks, the SWPPP preparer would determine that a 45-ft **Extended Natural Buffer** would need to be provided for this specific construction site. In order to meet this requirement the LOD will need to be altered in order to provide the appropriate buffer zone width. The revised LOD, which is shown as a dashed orange line, portrays the revised LOD. Additionally, the SWPPP preparer will want to check to see if any local ordinances apply, which in this circumstance none do.

Since the construction site is located on undeveloped land, and no other exceptions or exemptions apply to this construction site, **Compliance Option A** must be selected.

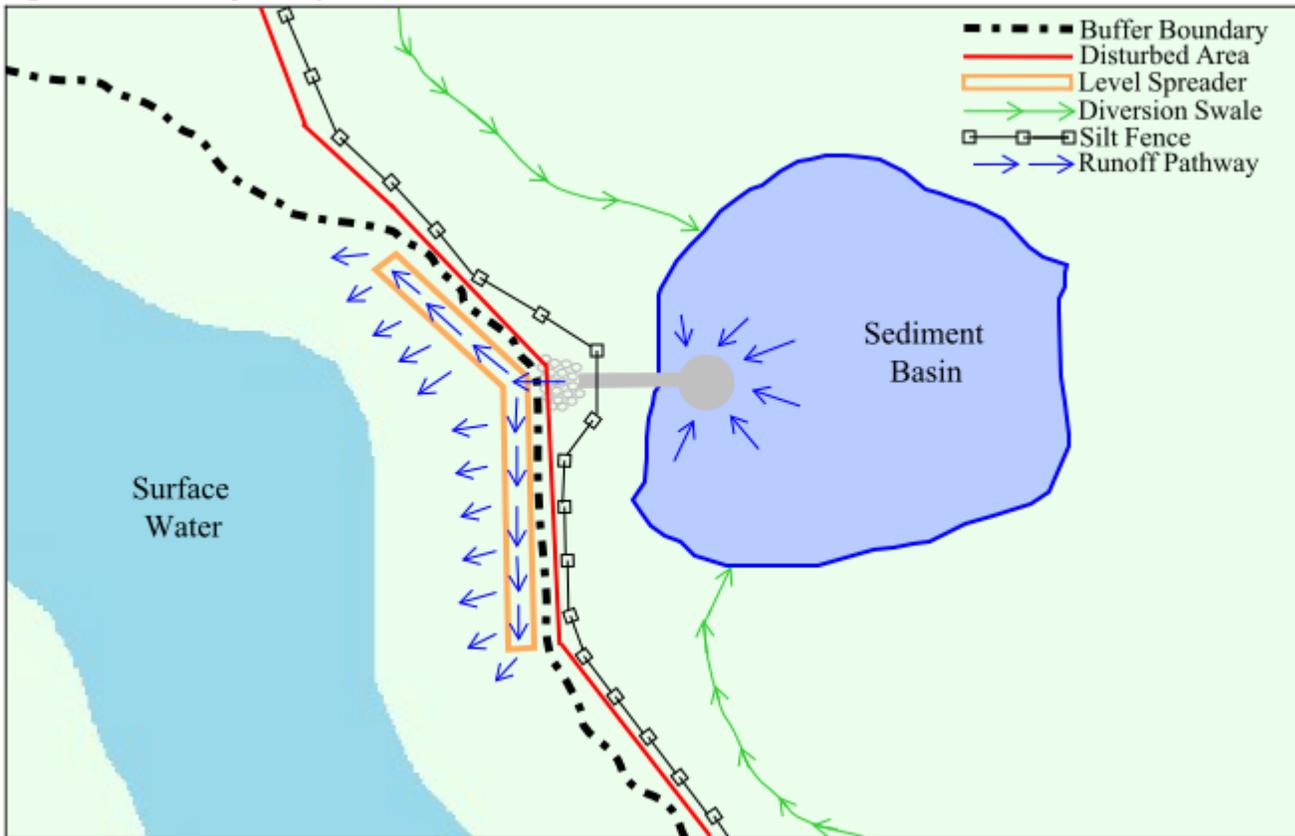
### Meeting the Buffer Zone Management Requirements

- A 45-ft, **Extended Natural Buffer** will need to be provided along the Surface water.
- The Proposed Limits of Disturbance will have to be revised to provide the 45-ft buffer zone.
- Discharge locations will need to be located outside of the buffer zone and be equipped with ample velocity dissipation.
- Check to verify if any local buffer zone ordinances are applicable at this location.
- Provide the necessary documentation within the SWPPP and Construction Site Plans to meet **Compliance Option A**.

### 8.3 VELOCITY DISSIPATION WITHIN A BUFFER ZONE (EXAMPLE 3)

As shown in **Figure 8.3**, a 45-ft Buffer Zone was determined to be required using the **Buffer Zone Applicability Flow Chart** (See **Section 2.2**) due to the adjacent surface water meeting both the jurisdictional waters and impaired waters definitions. The proposed design calls for a sediment basin, which discharges directly into the buffer zone, in order to treat the surface runoff during construction. The requirement of the buffer zone has limited the space for this sediment basin; especially if the proposed design is to meet the Velocity Dissipation Requirement, *Section 3.2.4.C.1.(c)* of the 2012 CGP.

**Figure 8.3: Velocity Dissipation within a Buffer Zone**



A few designs to incorporate the velocity dissipation within the Limits of Disturbances were approached, but none provided feasible options. Fortunately, the **Buffer Zone Management Requirements** allow for the placement of velocity dissipation measures within the provided Buffer Zone.

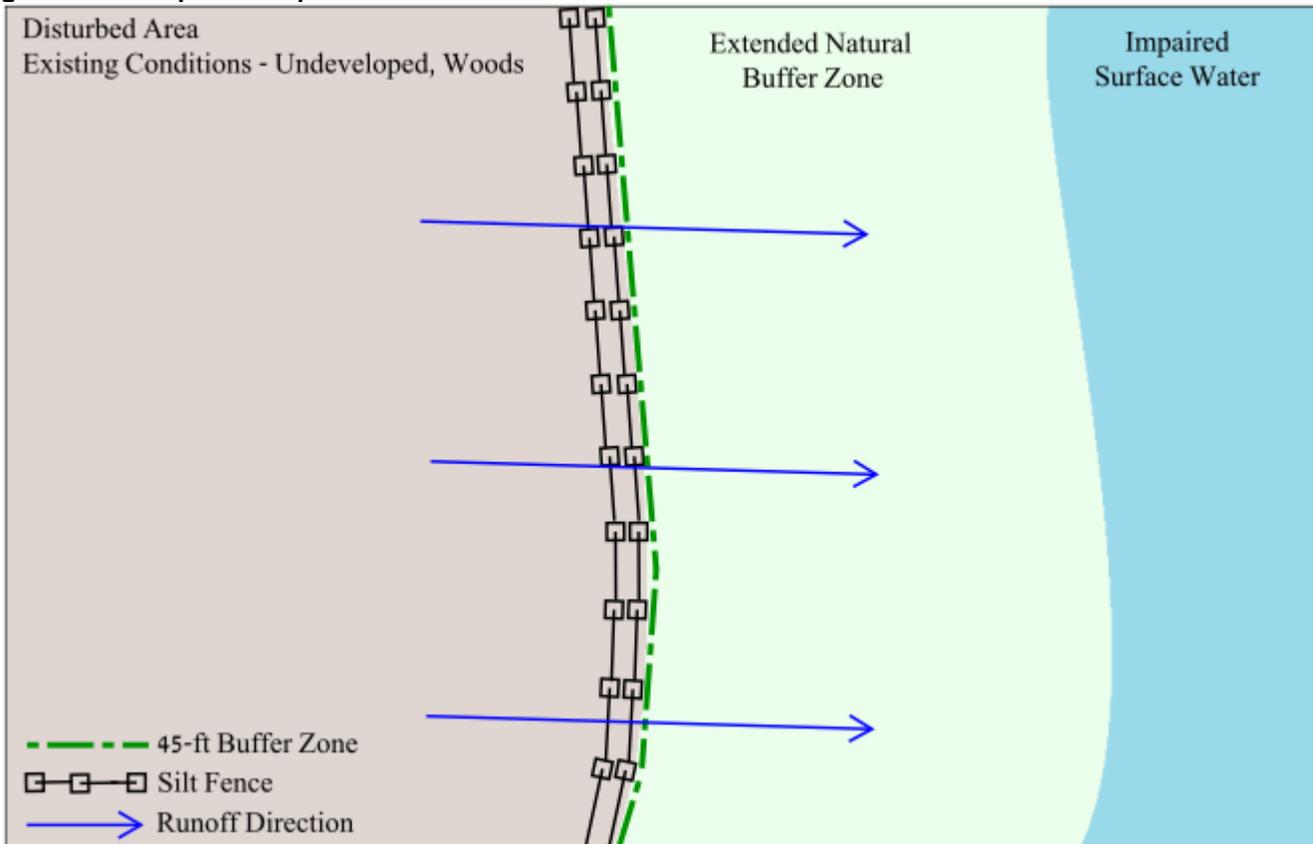
To meet this requirement, the SWPPP preparer proposed the use of a level spreader within the buffer zone along the Limits of Disturbance, as shown above. The SWPPP must indicate, within the **Buffer Zone Narrative**, that the work within the buffer zone is to be limited to the area required to install the level spreader, and that the level spreader must be installed and operational prior to the sediment basin being placed in operation.

As long as the 45-ft buffer width is applied along the remainder of the disturbed area, then **Compliance Option A** would be selected and a **Buffer Zone Narrative** & a **Buffer Maintenance Plan** would be included in the SWPPP. It is recommended to include a **Buffer Zone Plan Sheet**, as required by Compliance Option B, and that the maintenance of the velocity dissipation BMP be included in the SWPPP.

## 8.4 COMPLIANCE OPTION A (EXAMPLE 4)

As shown in **Figure 8.4**, an **Extended Natural Buffer** was determined to be required using the **Buffer Zone Applicability Flow Chart** (See **Section 2.2**) due to the identified surface water meeting both the jurisdictional waters and impaired waters definitions. The existing conditions for this proposed construction site is an **undeveloped parcel of land with a dense consistency of vegetation of mainly trees and underbrush**. **Compliance Option A**, which requires the entire 45-ft buffer width, will need to be selected since there are no exceptions or exemptions that applied to this construction site. The image below provides an example of this circumstance.

**Figure 8.4: Compliance Option A**



To meet the requirements of **Compliance Option A**, the SWPPP will need to be provided with a **Buffer Zone Narrative** and a **Buffer Zone Maintenance Plan**. The narrative will need to identify the surface water and buffer zone location, the buffer width, when the buffer is to be applied, any adjacent BMPs used in conjunction with the buffer zone, and includes a reference to the maintenance plan.

As for the provided **Buffer Zone Maintenance Plan**, it should contain information on when to flag the limits of the buffer zone, a weekly inspections/maintenance checklist, and when the buffer zone is no longer required. This will make available both the responsibilities of those performing maintenance and when inspections are required for these buffer zones.

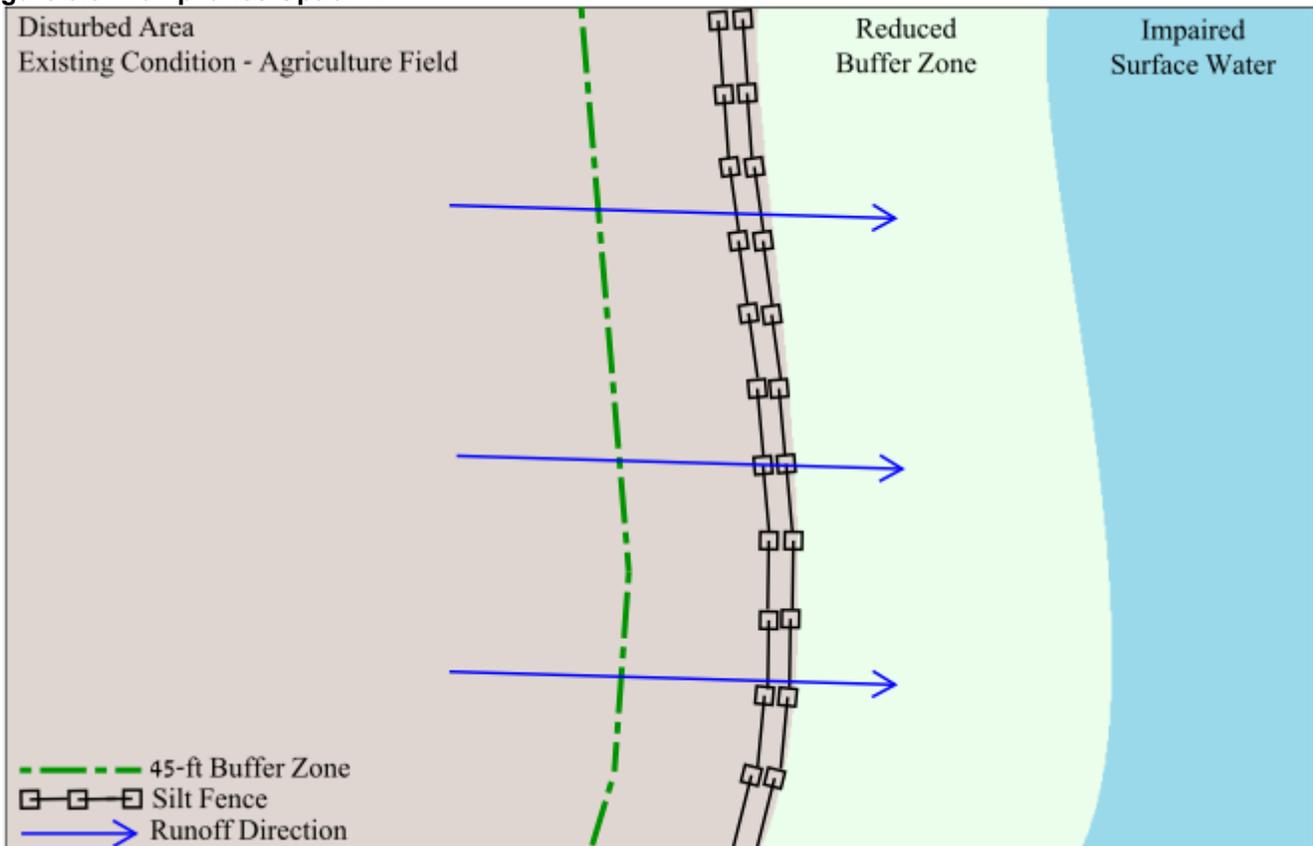
In addition to those two SWPPP documentations, the construction site plans must show the location of the required buffer zone as it would for any other proposed BMP control. The plans should also reference the management of the buffer zone within the construction sequence.

## 8.5 COMPLIANCE OPTION B (EXAMPLE 5)

As shown in **Figure 8.5**, an **Extended Natural Buffer** was determined to be required using the **Buffer Zone Applicability Flow Chart** (See **Section 2.2**) due to the identified surface water meeting both the jurisdictional waters and impaired waters definitions. The existing conditions for this proposed construction site is an abandoned parcel of land that was once used for agricultural purposes. **Most of the land remains tilled, with very light vegetation except for about 25-LF along the surface water, which has dense vegetation consisting of mainly trees and underbrush.**

This circumstance would be an ideal example of a SWPPP that may select **Compliance Option B**, which allows for a reduction of the 45-ft buffer width. Selecting this option would allow the buffer zone width to be reduced down to 25-ft, which is the length of the existing dense vegetation along the surface water.

**Figure 8.5: Compliance Option B**



To meet the requirements of **Compliance Option B**, the SWPPP will need to be provided with a **Buffer Zone Narrative**, a **Buffer Zone Plan Sheet** and a **Buffer & BMP Maintenance Plan**. The narrative will need to identify the surface water and buffer zone location, the buffer width, when the buffer is to be applied, any adjacent BMPs used in conjunction with the buffer zone, why the buffer zone width is being reduced, and includes a reference to the maintenance plan.

As for the provided **Buffer & BMP Maintenance Plan**, it should contain information on all required maintenance procedures of both the buffer zone and BMPs discharging to the buffer zone. A routine inspection timeframe should also be supplied to ensure that the proper maintenance activities are completed when required. The construction site plans must include a **Buffer Zone Plan Sheet** that shows

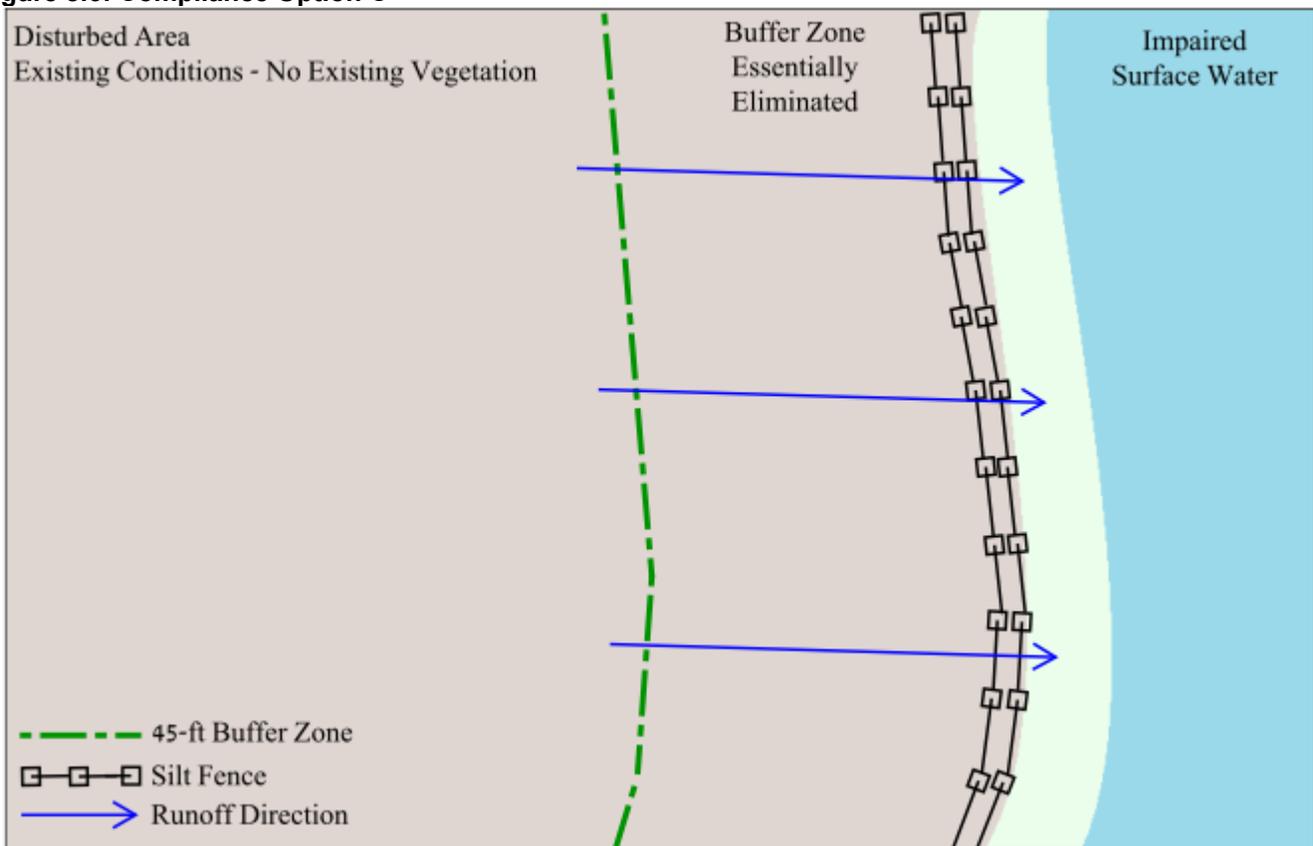
the location of the required buffer zone as it would for any other proposed BMP control. This plan sheet should also include a Buffer Sequence that addressed the management of the buffer zone.

## 8.6 COMPLIANCE OPTION C (EXAMPLE 6)

As shown in **Figure 8.6**, an **Extended Natural Buffer** was determined to be required using the **Buffer Zone Applicability Flow Chart** (See **Section 2.2**) due to the identified surface water meeting both the jurisdictional waters and impaired waters definitions. The existing conditions for this proposed construction site is *an abandoned parcel of land that was once used for agricultural purposes. Most of the land remains tilled, with very light vegetation except for about 5-feet along the surface water, which has dense vegetation consisting of mainly trees and underbrush.*

This circumstance would be an ideal example of a SWPPP that may select **Compliance Option C**, which allows for the elimination of the 45-ft buffer width. Under this option, no buffer zone is required and construction activities can be conducted within the buffer zone area.

**Figure 8.6: Compliance Option C**



To meet the requirements of **Compliance Option C**, the SWPPP will need to be provided with a **Buffer Zone Narrative**, a **Surface Water Protection Plan Sheet**, **Supporting Calculations**, and a **Temporary BMP Maintenance Plan**. The narrative will need to identify the surface water location, any adjacent BMPs discharging to the surface water, and why the buffer zone is not being provided, and includes a reference to the BMP maintenance plan and Surface Water Protection Plan Sheet.

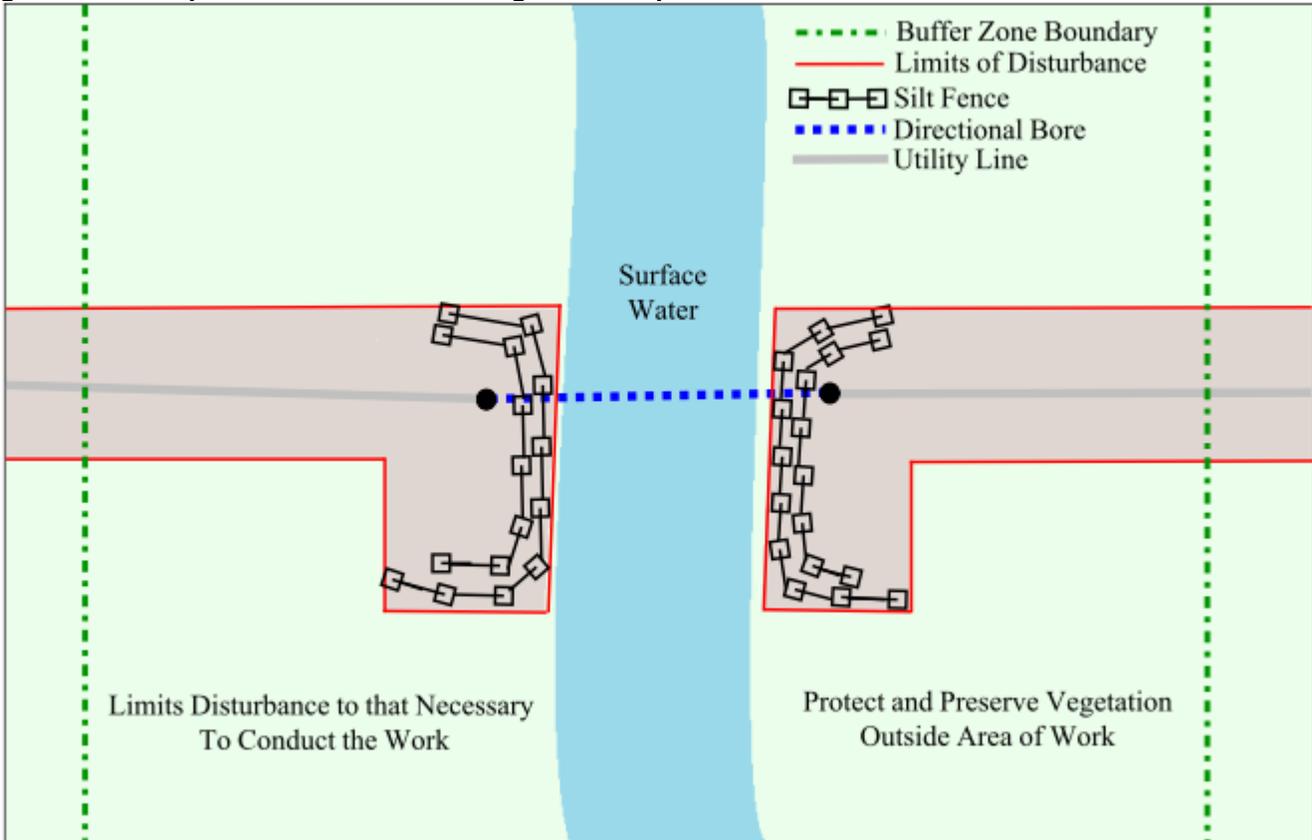
The construction site plans must include a **Surface Water Zone Plan Sheet** that shows the location of all BMPs discharging to the surface waters, and an itemized sequence addresses the management of these control measures.

As for the **Temporary BMP Maintenance Plan**, it should contain information on all required maintenance procedures of all BMPs discharging to the buffer zone, and should be signed by the Primary Permittee. In addition to this document, the SWPPP must provide **Supporting Calculations** of any BMP discharging to the surface water to show that they are capable of providing an 80% Trapping Efficiency.

### 8.7 PROJECT EXEMPTED FROM BUFFER REQUIREMENTS (EXAMPLE 7)

**Figure 8.7** is an example of a type of construction activity that is exempted from meeting any of the Buffer Zone Management Requirements. The work shown is of a utility main crossing of surface waters.

**Figure 8.7: Exempt from Buffer Zone Management Requirements**



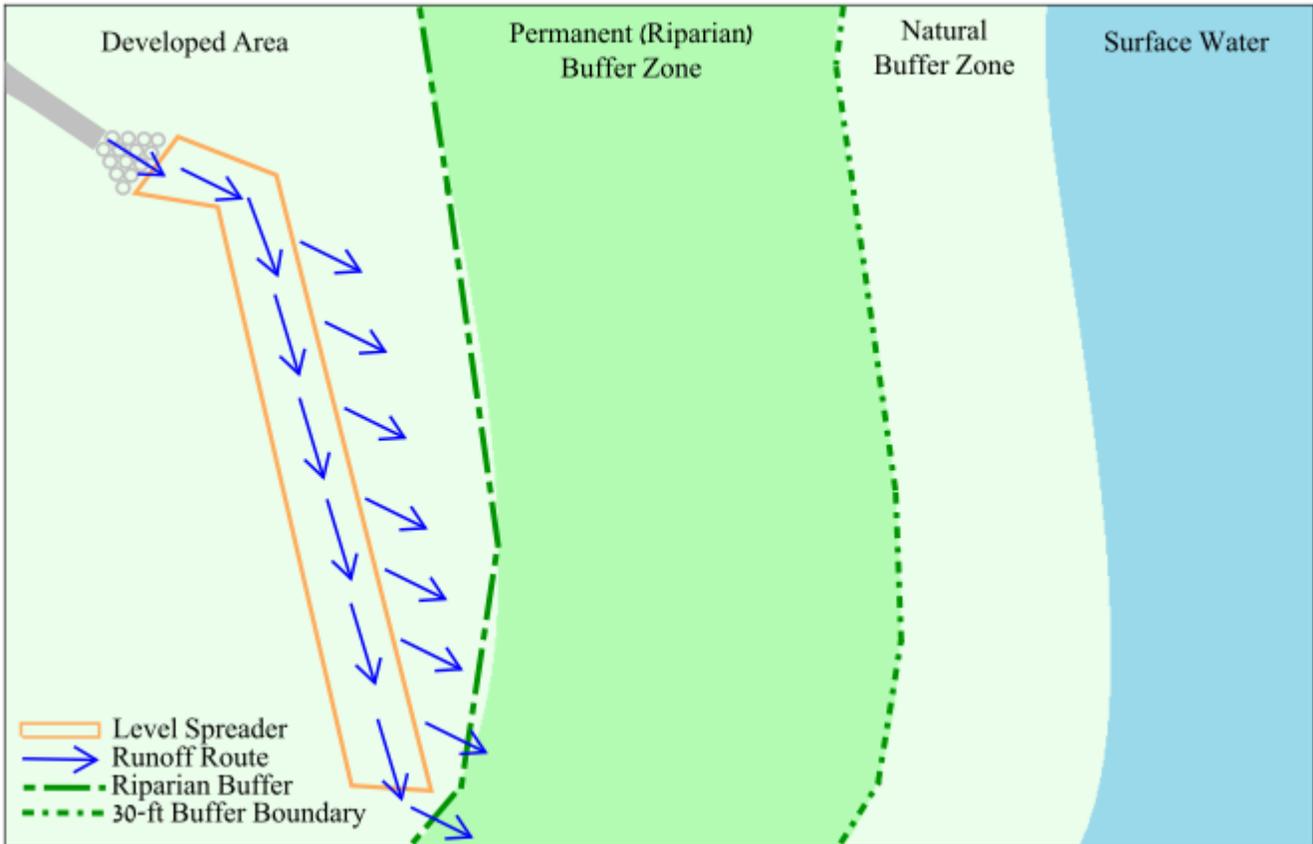
As with any exemption, the SWPPP will not have to include any of the required documentation from any of the Compliance Options. The SWPPP should clearly state that this work is exempt from **the Buffer Zone Management Requirements**, that the disturbed area should be limited to that necessary to conduct the proposed work, and that all vegetation outside the disturbed area is to be protected and preserved to the best extent possible.

### 8.8 ESTABLISHING A PERMANENT (RIPARIAN) BUFFER (EXAMPLE 8)

The final example, **See Figure 8.8**, was included to indicate that buffer zone widths may need to be extended passed the minimum, required width when the buffer zone is intended to provide post-construction water quality benefits, that is when the buffer zone is to remain after construction as a **Riparian Buffer**.

Under these circumstances, it is recommended that the entire buffer area required post-construction for the **Riparian Buffer** be provided during construction in lieu of the providing only the buffer zone width required by either the **Buffer Zone Management Requirements**. This can be beneficial, especially when the area required for the **Riparian Buffer** has an existing cover of dense vegetation and when the disturbance of this area would require the re-establishment of dense vegetation.

**Figure 8.8: Working with Riparian Buffers**



## 9 REFERENCES

1. Center for Environmental Policy Institute of Public Affairs (2000). *Final report of the statewide task force on riparian forest buffers*. Columbia, SC: University of South Carolina.
2. Connecticut Department of Environmental Protection (n.d.). *Tidal wetlands buffers guidance document*. Hartford, CT: Author.
3. South Carolina Department of Health and Environmental Control (SC DHEC) (n.d.). *Vegetated Riparian Buffers and Buffer Ordinances*. Columbia, SC: Author.
4. United States Army Corps of Engineers. (n.d.). Explanation of some commonly used terms. Retrieved May 15, 2012 from <http://www.sac.usace.army.mil/permits/apply-br.html>.
5. United States Department of Agriculture (USDA) Forest Service (1998). *Chesapeake Bay Riparian Handbook: A guide for establishing and maintaining riparian forest buffers*. Annapolis, MD: Author.
6. United States Environmental Protection Agency (USEPA) (2009). "Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category." *Federal Register* 74:62996 (01 December 2009), 40 C.F.R. pt. 450.
7. United States Environmental Protection Agency (USEPA) (2012). *National pollutant discharge elimination system general permit for discharges from construction activities*. Washington, D.C.: Author.
8. Wenger, S.J (1999). *A review of the scientific literature on riparian buffer width, extent and vegetation*. Athens: Institute of Ecology Office for Public Service and Outreach, University of Georgia.
9. Wegner, S. J., & Fowler, L. (2000). *Protecting stream and river corridors - Creating effective local riparian buffer ordinances*. Athens: Carl Vinson Institute of Government, University of Georgia.