Guidelines for Determining Buffer Area/Average Buffer Width for Stream Exclusion BMPs

(updated 3/15/2021)

Link to FAQs

Purpose: In reviewing historic data in the AgBMP Tracking Module it has become apparent that different methodologies have been used to determine the *Total Buffer Area*, *Average Buffer Width* and *Area Where Grazing is Improved & Streambank Protected*. These different Measures are then entered into the AgBMP Tracking Module resulting in inconsistent data.

In addition, DCR recently asked the Chesapeake Bay Program (CBP) for clarification on what areas could be counted as buffer for reporting to the Chesapeake Bay Model. The CBP responded that all areas from which livestock are excluded regardless of their distance from the streambank should be counted as buffer being reported. It was also determined by the CBP that even areas that don't drain to the stream being protected (i.e. part of a field which drains away from the live water being buffered but from which livestock access is being controlled) can be counted as part of the buffer since there is a land use change occurring and livestock no longer have access to the stream from that area.

The intent of this document is to define the relevant terms and provide guidelines to ensure consistent program administration and reporting through the AgBMP Tracking Module. Note that these guidelines were updated on March 15, 2021 to remove the discussion regarding Buffer Area Eligible for Payment since the SL-6W and WP-2W specifications were revised for FY21 remove the language capping buffer area eligible for payment. For both of these BMPs specification and the estimated cost share payment calculation in the AgBMP Tracking Module only provides the buffer payment for the first 10 acres, but, the total buffer area should be entered. The Buffer Area Eligible for Payment measure is still required for SL-6W and WP-2W BMPs for FY21 and should match the Total Buffer Area. This measure will likely be removed for FY22.

General Definitions:

- ***Live Stream/Water*:** A creek, stream, river or other water feature which has surface flow, or creates a surface flow, for a substantial portion of the year. This includes waterbodies (e.g. ponds, wetlands, springs) that flow into creeks, streams, channels or Chesapeake Bay Preservation Act Resource Protection Areas (CBPA-RPA) during a substantial portion of the year. This also includes features that directly contribute to sub-surface waters (i.e. sensitive karst features).

  To address defined water quality problems, live stream(s)/water feature(s) require a *Minimum Exclusion Fence Setback* (defined below) to create a buffer per the chosen BMP specification. Isolated wet areas, seeps, ponds, etc., *without* connected surface flow to the main live stream(s)/water feature(s) being buffered do not require a *Minimum Fence Setback*. **Conservation field staff should use their best professional judgment determining what a live stream/water feature is in any given grazing unit and thereby which features do or do not require the *Minimum Fence Setback.***

- ***Length of Streambank Protection*:** This is the length of the streambank where the BMP is installed and the buffer is at least as wide as the required *Minimum Fence Setback*. The perimeter of *connected* live water features such as wetlands, springs, ponds, etc., with surface flow during a substantial portion of the year should be included in this length and the *Minimum Fence Setback* must be maintained. The perimeter of sensitive karst features should also be included and the *Minimum Fence Setback* must be maintained. If both sides of the linear streambank are being protected then this value should be doubled for that length. This length should be digitized as the *Bank Protected by*

Exclusion Measurement and/or the *Streambank and Shoreline Protection* component on the BMP Map in the AgBMP Tracking Module.

- ***Minimum Fence Setback* (new measure for stream exclusion practices):** This is the minimum distance the exclusion fence is set back from the live stream(s)/water feature(s). This distance drives the classification of the project as a Narrow or Wide version of the stream exclusion practices and determines the cost-share and buffer payment rates for those practices. This value can be ascertained in the field or by digitizing the *Total Buffer Area* (defined below) and then using the measure tool to determine the *Minimum Fence Setback* width at the narrowest point.

- ***Total Buffer Area*:** This is the entire area where livestock have been excluded. This includes the *Buffer Area Eligible for Payment* plus any buffer outside that area per the discussion in the purpose statement at the top of this document. Users should digitize this area using the Riparian Herbaceous Cover and Forested Buffer Established components on the BMP Map. This *Total Buffer Area* value should be included in the *Area where Grazing is Improved & Streambank Protected*. The sum of the *Grass Buffer Area* and *Forested Buffer Area* should equal this *Total Buffer Area*.

- ***Grass Buffer Area*:** Of the *Total Buffer Area*, this is the area where herbaceous cover currently exists (prior to exclusion) from which livestock are being excluded. This area should be digitized as the *Riparian Herbaceous Cover* component on the BMP Map.

- ***Forested Buffer Area*:** Of the *Total Buffer Area*, this is the area where a tree canopy currently exists (prior to exclusion) from which livestock is being excluded. If trees are being planted to create a forested buffer this would be documented with a FR-3 or VFR-3 practice and the buffer acres are recorded as G*rass Buffer Area* for the stream exclusion practice. This area should be digitized as the *Forested Buffer Established* component on the BMP Map.

- ***Average Buffer Width*:** The calculated average distance between the fence and the live stream(s)/water feature(s), CBPA-RPAs, and/or sensitive karst features which creates the *Total Buffer Area*. This value should generally be greater than the *Minimum Fence Setback*. An example of how to calculate this value is shown below.

- ***Area where Grazing is Improved & Streambank Protected*:** This value is the combination of the *Total Buffer Area* created by the stream exclusion practice and the pasture associated with the stream exclusion within the grazing unit. The area of the pasture should be determined through the Conservation Planning process.

AgBMP Tracking Module Components Associated with Buffers

The AgBMP Tracking Module allows users to digitize components to determine the values to be entered on the Measurements tab and the values needed to calculate the *Average Buffer Width*. In addition to the other component data that should be digitized, the three critical components important to buffer calculations are as follows:

- ***Bank Protected by Exclusion Measurement*** **(line):** Users can draw a line representing the streambank being protected by the exclusion practice. If both sides of a streambank are being protected by exclusion fencing then this value should be doubled for use in determining the *Average Buffer Width*. If a connected pond is being protected, users should draw a line around the banks of the pond (instead of drawing a polygon) so a length value is captured. Multiple line features can be digitized as necessary and the values totaled to determine total length.

- ***Riparian Herbaceous Cover*** **(polygon):** Users can digitize polygon(s) representing existing herbaceous cover between the *Bank Protected by Exclusion Measurement* feature(s) and the planned exclusion fence. The polygon(s) will be used to determine the area of the grass buffer that is eligible for payment. Multiple polygons can be digitized as necessary and the values totaled to determine total area.

- ***Forested Buffer Established*** **(polygon):** Users can digitize polygon(s) representing existing forested cover between the *Bank Protected by Exclusion Measurement* feature(s) and the planned exclusion fence. The polygon(s) will be used to determine the area of forested buffer that is eligible for payment. Multiple polygons can be digitized as necessary and the values totaled to determine total area.

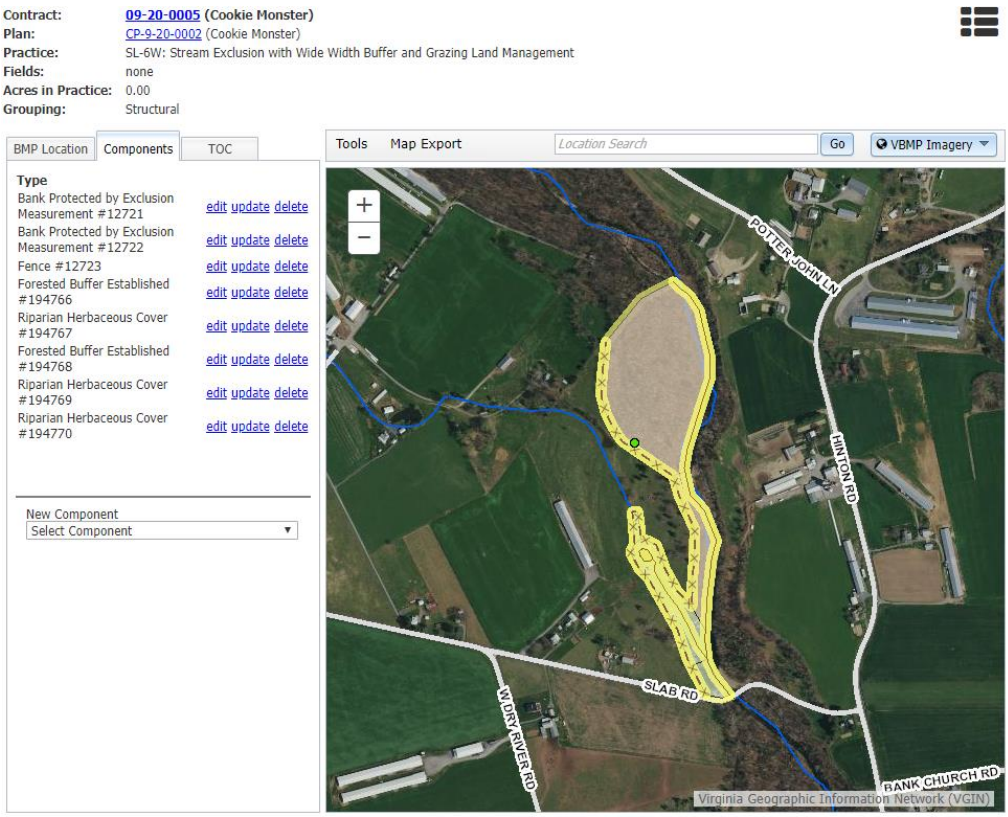
Using Bank Protected by Exclusion Measurement vs Streambank and Shoreline Protection Components for Measurements

Note that the *Streambank and Shoreline Protection* component, digitized as a line, can also be used to determine the length of bank being excluded instead of the *Bank Protected by Exclusion Measurement* component. The *Streambank and Shoreline Protection* component is based on the NRCS 580 specification which is considered to be ground disturbing. If the *Streambank and Shoreline Protection* component is used (i.e. a case where in addition to the exclusion fence the shoreline is also being stabilized) the resource review queries will be run against this component. If a combination of *Bank Protected by Exclusion Measurement* and *Streambank and Shoreline Protection* components are used in digitizing a BMP the total length should be used for entry on the Measurements tab and to calculate the Average Buffer Width.

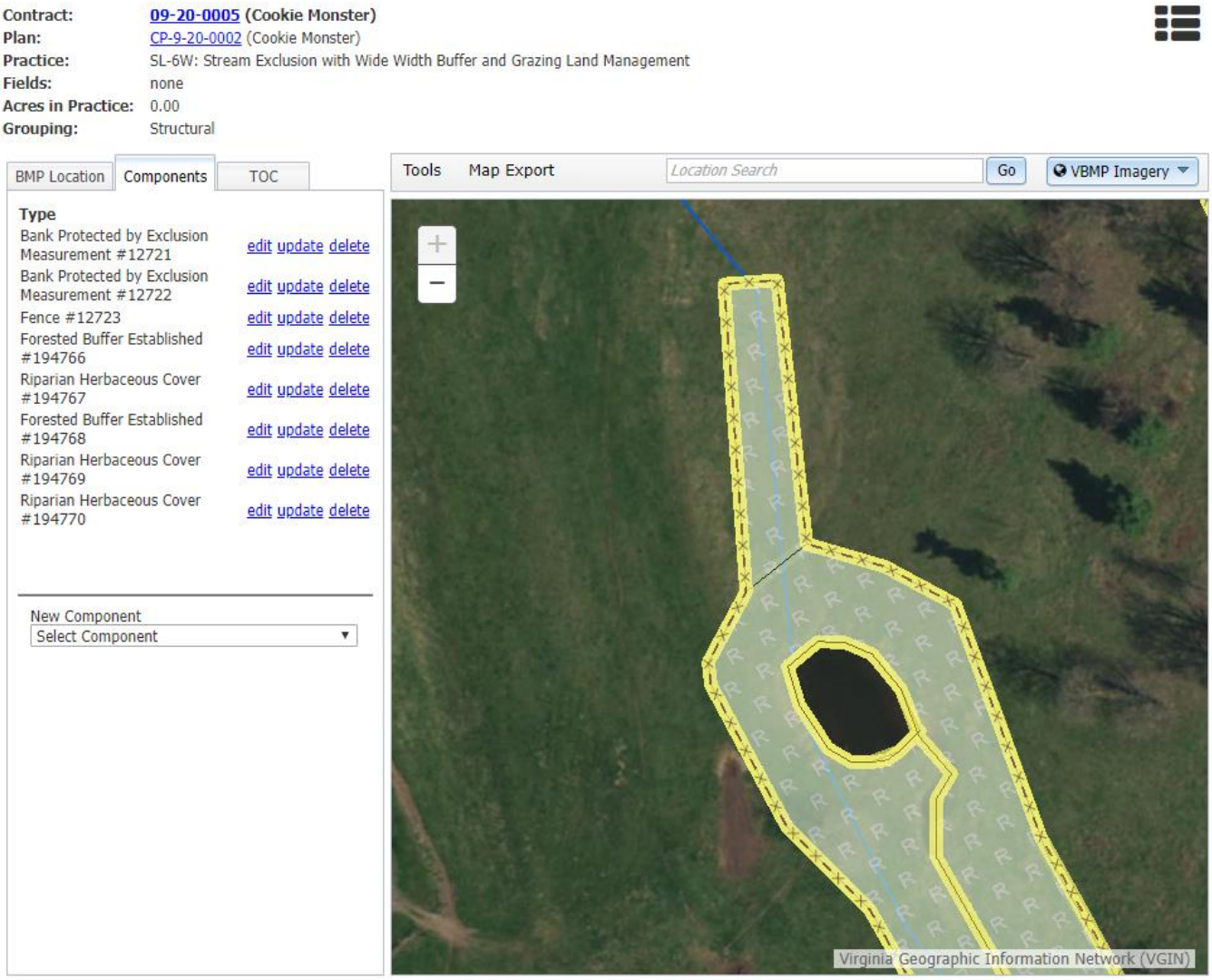
Calculating Buffer Measures for a BMP Instance Example

If users accurately digitize the two or three components listed above for the BMP, along with the pasture boundary in the Conservation Plan for the BMP instance, these values can be used for the calculations necessary to populate the Measurements tab in the AgBMP Tracking Module with accurate data.

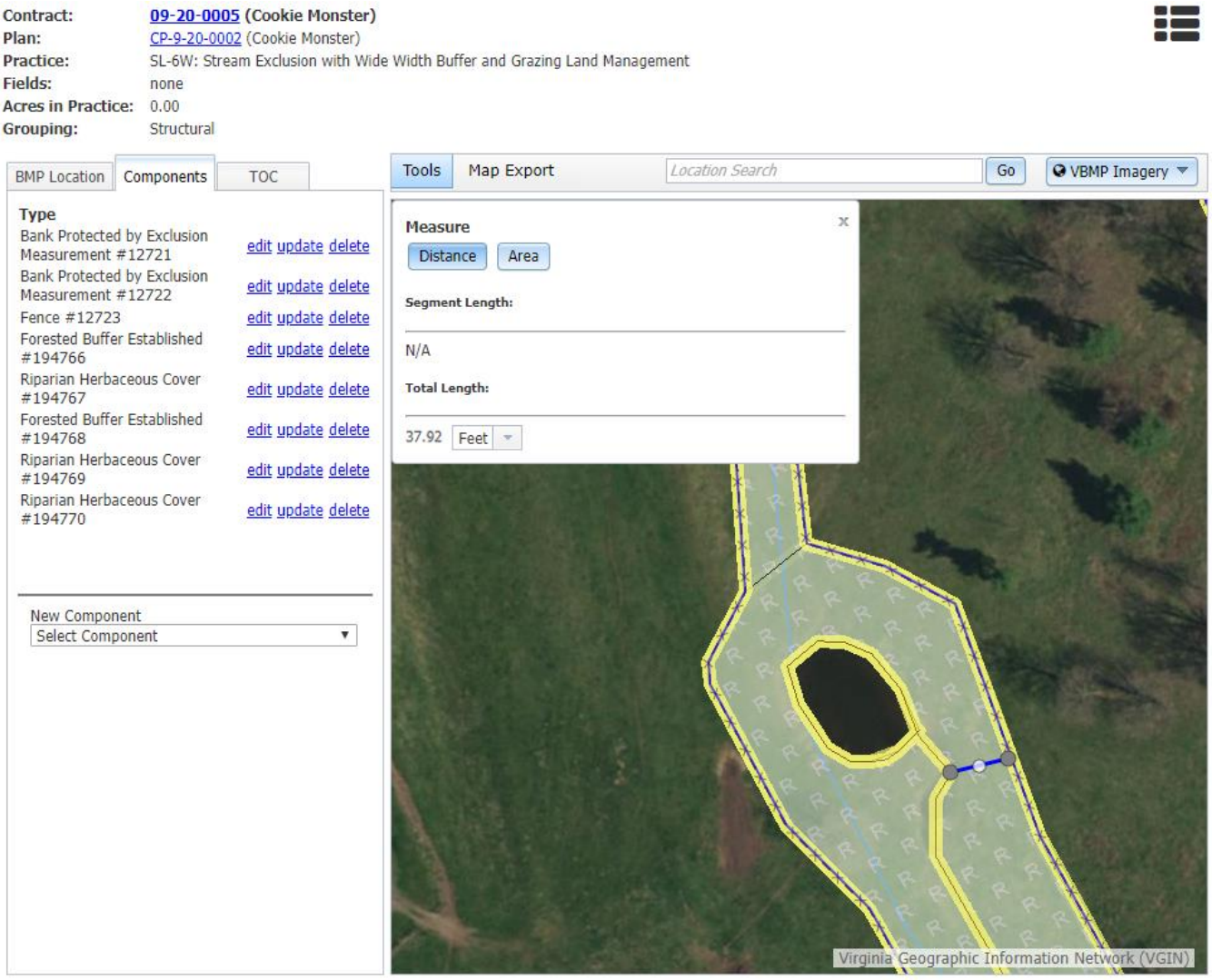
In this example, the *Bank Protected by Exclusion Measurement* component was digitized to capture the length of stream bank protections, including around the pond that had flow to the bigger stream. *The Riparian Herbaceous Cover* component was digitized to capture the areas where the exclusion project would create a grass buffer and the *Forested Buffer Established* component was digitized to capture the area where the exclusion project would create a forested buffer:



For sake of our example, the District found that the USGS topo map was inaccurate and noted in the field that the area north of the pond includes an isolated seep and not a connected *Live Stream/Water* per the guidance in this document; accordingly, this was not digitized as *Bank Protected by Exclusion Measurement*. However, the buffer was digitized for this area separately as it was fenced out as allowed by the VACS practice specification. Also note that there was a pond which the *Bank Protected by Exclusion Measurement* component was digitized around to capture an accurate length. Finally, note that the area of the pond was removed from the *Riparian Herbaceous Cover* component so the Cover area would be accurate:



The measure tool was then used to determine what the *Minimum Fence Setback* was and its actual value by measuring in several places until the smallest value was found. This value could also be obtained in the field during the Conservation Planning process. In this case that setback was approximately 38 feet.



Once the required components have been digitized, users can go to the Components tab in the AgBMP Tracking Module to review the values. Note that if multiple features are digitized for a single component, they are totaled at the top of this page. In this case, three (non-overlapping) polygons were digitized to represent the *Riparian Herbaceous Cover,* two polygons to represent the *Forested Buffer Established*, and two lines to represent the *Bank Protected by Exclusion Measurement*.

Also note that Computed and Actual values are returned. When users digitize features in the system, the Computed value is exactly what the GIS determines the size of the feature is based on what is digitized. This Computed value is automatically populated into the Actual value but users can, but are not required to, modify this actual value based on any ground truthing they conduct:

Contract: 09-20-0005 (Cookie Monster)
Plan: CP-9-20-0002 (Cookie Monster)
Practice: SL-6W: Stream Exclusion with Wide Width Buffer and Grazing Land Management
Fields: none
Acres in Practice: 0.00
Grouping: Structural

General
Farms And Fields
Measurements
Map BMP
Programs
CEF
Verifications
Spot Checks
Form Letters
Payments
Related Instances
Resource Concerns
Components
Attachments
Legacy Map

Save BMP

Export Bounding Box of Ground Disturbing Components

Linear Component Totals

Type	Planned	Computed	Actual Units
Bank Protected by Exclusion Measurement (2)	Yes	3531.85	3531.85 Feet
Fence (1)	Yes	3665.61	3331.78 Feet

Polygon Component Totals

Type	Planned	Computed	Actual Units
Forested Buffer Established (2)	Yes	13.50	13.50 Acres
Riparian Herbaceous Cover (3)	Yes	2.95	2.95 Acres

Components

<< Add Component >>

	Type	Required	Status	Calculated Measurement	Actual Measurement	
⊞	Bank Protected by Exclusion Measurement #12721	No	Planned	2605.730 feet	2605.730 feet	Delete
⊞	Bank Protected by Exclusion Measurement #12722	No	Planned	926.120 feet	926.120 feet	Delete
⊞	Fence #12723	Yes	Planned	3665.610 feet	3331.780 feet	Delete
⊞	Forested Buffer Established #194766	No	Planned	1.860 acres	1.860 acres	Delete
⊞	Forested Buffer Established #194768	No	Planned	11.640 acres	11.640 acres	Delete
⊞	Riparian Herbaceous Cover #194767	No	Planned	0.540 acres	0.540 acres	Delete
⊞	Riparian Herbaceous Cover #194769	No	Planned	2.270 acres	2.270 acres	Delete
⊞	Riparian Herbaceous Cover #194770	No	Planned	0.140 acres	0.140 acres	Delete

Based on this data:

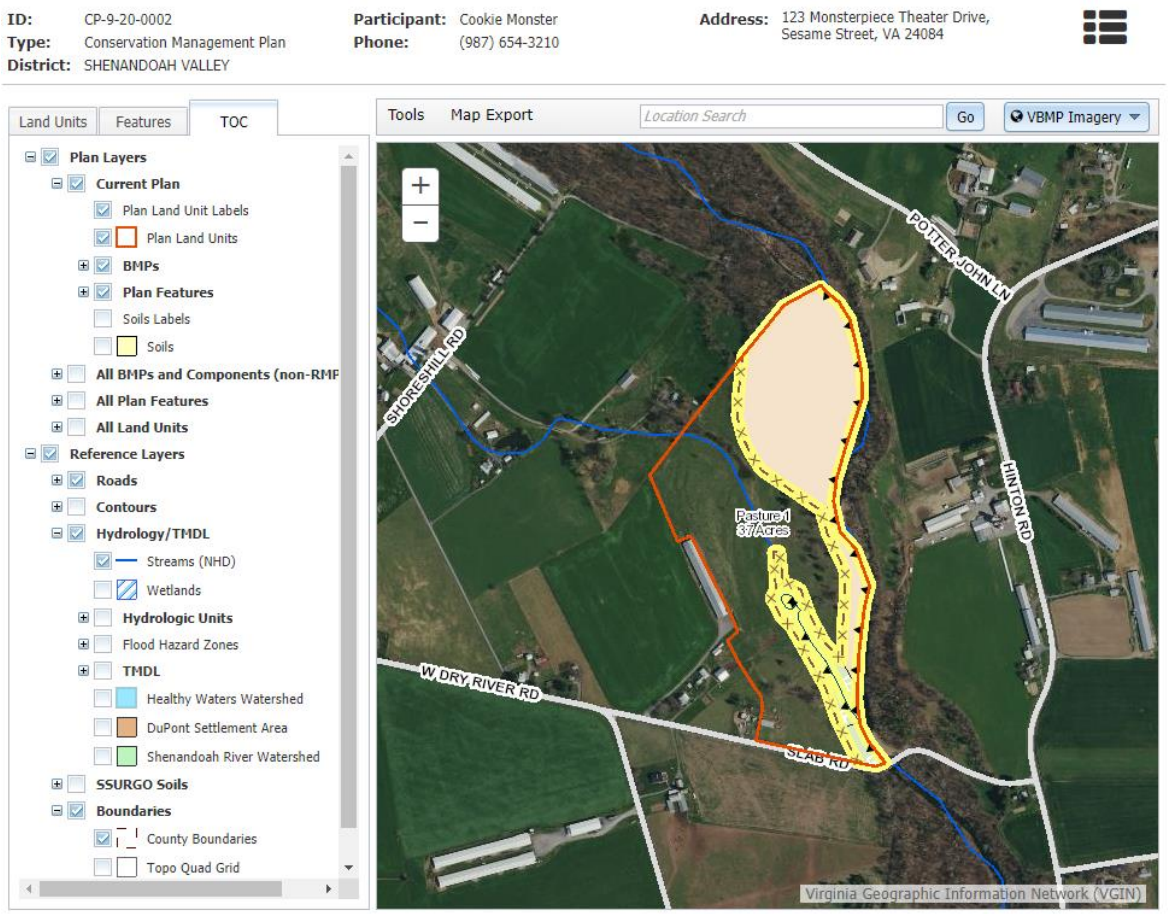
- The total mapped length of *Bank Protected by Exclusion Measurement* is 3531.85' total. **However, approximately 690' of the left stream fork was fenced on *both* sides and so an extra 690' should be added in for purposes of our calculations as we've actually protected approximately 4221.85'.**
- *Minimum Fence Setback* = 38' (rounded) using the measure tool (as measured on the map on the previous page of this document)
- *Total Buffer Area* = 16.45 acres (total of *Riparian Herbaceous Cover* + *Forest Buffer Established*)
- *Grass Buffer Area* = 2.95 acres (total *Riparian Herbaceous Cover*)
- *Forested Buffer Area* would be 13.5 acres (total *Forest Buffer Established*)

To calculate the *Average Buffer Width*, the 'full width' buffers on *Live Stream(s)/Water(s)* for the lines that were digitized for the *Bank Protected by Exclusion Measurement* should be used. In this example, the 0.54 acres of buffer that was digitized around the isolated seep to the north should be excluded from the buffer used in the calculation. To calculate the *Average Buffer Width*:

- Take the *Total Buffer Area* of 16.45 acres and subtract out the 0.54 acres from the isolated seep in order to get 15.91 buffer acres
- Multiply the buffer acres by the number of square feet in an acre (43,560) in order to calculate the *Total Buffer Area* in square feet units. In this case, the *Total Buffer Area* is approximately 693,039.6 square feet.
- Divide that number by the length of the *Bank Protected by Exclusion Measurement* (4221.85')

- Completing this calculation results in an *Average Buffer Width* of 164.16'.

Finally, to calculate the *Area where Grazing is Improved & Streambank Protected*, users can go to the map function in the Conservation Planning Module to draw and thereby calculate the area of the land unit treated by the BMP, which in this case is 37 acres. This value should be entered into the AgBMP Tracking Module.



Other Stream Exclusion BMP Frequently Asked Questions

- **Can a stream exclusion practice be used where the participant only controls one side of the live stream and cannot guarantee that livestock will not have access from the other side of the live stream into the buffer?** A stream exclusion BMP can only be installed where the integrity of the buffer can be guaranteed. If a participant only controls one side of stream, they are still eligible but are required to protect the buffer from grazing. This may mean that a 'top of bank' fence (on the participant's side) must be installed.

- **In a field where the participant controls both sides of the live stream, but fence is only needed on one side of the stream to prevent livestock access to the other side, how much buffer can be claimed on the side opposite the fencing?** The entire extent, up to the boundary of the field, can be claimed as buffer as long as there is no access for livestock from that side of the stream and the buffer on the other side of the stream meets the practice requirements.

- **When both sides of the stream are under the same ownership and livestock are accessing the stream from both sides but the two sides of the stream are in two separate fields, could the participant exclude one side as a SL-6W at 35' and the other side as a SL-6N at 10 or 25' and call this two separate instances?** Yes. Conservation Planning is conducted on a field by field basis as described under the *Rules*.

- **Buffer payments are capped per BMP Instance. Is there a problem with breaking a farm up into separate fields, and therefore, separate BMP instances in a single contract OR separate contracts altogether in order to max out the buffer payment multiple times?** Districts should not be breaking up farms in order to maximize buffer payments, but rather should focus on the least cost, technically feasible solution to solve the water quality problem. However, individual BMP instances can be planned on separate fields if appropriate using technical judgment. A single field should only have one single stream exclusion practice which would include a buffer payment only in the case of wide "W" variants.

- **If the water quality issues in several fields are addressed using a combination of BMPs (one per field) in one contract, do the lifespans have to match up?** Yes, for simplicities sake, the lifespans of stream exclusion practices within a contract should match up. For example, if there is a SL-6N planned in Field 1 and a SL-6W planned in Field 2, the farmer should select the 10 or 15 year option for both. However, Continuing Conservation Initiative (CCI) practices with their five year practice lifespan will be allowed to pick up voluntary work or existing streambank fences.

- **In a situation where both an SL-6N and SL-6W are next to each other and in the same contract, would the project be eligible for an SL-7 in a field (without a stream) as long as the SL-6W is adjacent to the SL-7 field and the pipeline actually goes to the SL-7 from the SL-6W field?** Yes. The SL-7 as approved for FY20 requires stream exclusion and a minimum 35 foot buffer.

- **In a scenario where a well is drilled in a location near power and the water source is not directly within a field boundary where stream exclusion practices are planned, how would you determine the cost-share rate on this well if it supplies both an SL-6W and SL-6N or if there is other variation in the rate?** Since the SL-6W with its wider buffer is the priority of the two, the District may cost-share on that portion of the system at the higher SL-6W rate. Obviously the well couldn't be paid for again in the SL-6N.

- **While some Districts have consistently used FSA field boundaries and numbers, other have gotten away from this standard. If a District does not use FSA fields are there other guidelines in determining the grazing units? For instance, if you have a square shaped farm with 150 acres and no cross fencing in continuous grazing with a stream on the property line of one side, could the whole farm be one big field or are there other limits that would govern this situation?** Districts are not required to use FSA's farm and tract numbers which can change through time, but the Conservation Plan should reflect current realities on the ground. In this particular case one field is present and only one stream exclusion practice can be applied regardless of how the 150 acre field is subdivided to create a rotational grazing system. Remember that VACS allows implementation on a field by field basis. What constitutes a field can be discerned by the District during the initial farm visit using his/her best professional judgment. Fields are typically defined by existing fences and by current use (forest, pasture, hay, annual crop). In designing a rotational system these fields can be cross-fenced to create various grazing paddocks. As a reminder, fields without live streams/water

features are not eligible for Stream Exclusion practices. Nonetheless, if such a field is planned for incorporation into a grazing system, the SL-7 can be considered.