



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Street address: 1111 E. Main Street, Suite 1400, Richmond, Virginia 23219

Mailing address: P.O. Box 1105, Richmond, Virginia 23218

www.deq.virginia.gov

Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

April 23, 2019

Mr. Michael Liberati
Corteva Agriscience
Agriculture Division of DowDuPont
Chestnut Run Plaza 715-236
Wilmington, DE 19805

VIA ELECTRONIC MAIL

**Re: 2018/2019 Constitution Park Bank Management Area - Leaf-off Maintenance Inspection
Area of Concern 4, Former DuPont Waynesboro Plant
Waynesboro, Virginia
EPA ID# VAD003114832**

Dear Mr. Liberati:

This letter acknowledges the receipt and review of the 2018/2019 Constitution Park Bank Management Area - Leaf-off Maintenance Inspection dated March 4, 2019, submitted to the Virginia Department of Environmental Quality, Office of Remediation Programs (Department) by AECOM on behalf of the E.I du Pont de Nemours and Company (DuPont).

The Department has no comments on the memorandum except to note that the Department is not yet in receipt of the corrective action memorandum that is being prepared to address several maintenance issues identified during the inspection in February 2019 and by the Department in October 2018.

If you have any questions, you may contact me at 703-583-3825 or by email at Kurt.Kochan@deq.virginia.gov.

Sincerely,

A handwritten signature in cursive script, appearing to read "Kurt W. Kochan".

Kurt W. Kochan
Corrective Action Project Manager
Office of Remediation Programs

cc: DuPont Waynesboro Correspondence File
Cameron Dixon, Josh Collins, AECOM

Memorandum

To	Michael Liberati, DuPont CRG Nancy Grosso, DuPont CRG	Page 1 of 2
CC	Cameron Dixon, AECOM Kristy Hoffman, AECOM	
Subject	2018/2019 Constitution Park BMA - Leaf-off Maintenance Inspection Former DuPont Waynesboro Site, Area of Concern 4	
From	Andrew Miano, AECOM Joshua Collins, AECOM	
Date	March 4, 2019	

This memorandum summarizes the 2018/2019 Leaf-off Maintenance Inspection (inspection) of the Constitution Park Bank Management Area (BMA) conducted February 4th 2019. The inspection was originally scheduled to be completed during the week of December 10, 2018; however, a winter storm followed by several weeks of high flow conditions prevented safe wading conditions. Inspection activities were conducted in compliance with the scope described in the Maintenance Plan included as Appendix M of the Basis of Design Report, Phase 1A BMAs, South River AOC 4 (Anchor QEA et al., 2016). The purpose of the post-construction inspection is to identify potential BMA maintenance needs, focusing on vegetative development, bank stability, and the integrity of the installed bank remediation features. Additional attachments to this memorandum include:

- Table 1 – Maintenance inspection log
- Appendix A - Photographic log
- Appendix B - Inspection Record Sheet

Findings

The results of the post-construction inspection were generally similar to the Spring 2018 event, with stable bank conditions present throughout the BMA. Several high discharge events prior to the fall inspection led to localized, small areas of torn erosion control fabric, exposed geocell, and minor erosion as noted in Table 1 and in the photographic log (Appendix A). A brief summary of findings is provided below; complete details of the maintenance inspection are included in Table 1.

Vegetation

- Healthy growth of planted native vegetation was noted throughout the BMA. Coverage by native plants has increased compared to previous inspections.
- Targeted invasive species management activities (i.e. herbicide applications) have been effective at reducing coverage of Japanese knotweed (*Fallopia japonica*) at the BMA.
- Replacement plantings will be installed upon successful control of invasive species. Tree and shrub plantings are currently planned for the Fall of 2019.

Stability

- River bank angles remained generally unchanged, and maintain a consistent bank angle throughout the BMA as constructed (Table 1);
- At monitoring stations 00 – 25' and 00 + 00' the toe of slope shows signs of heavy pedestrian foot traffic along the bottom of the bank;
- There was no evidence of “at-risk” trees (e.g. trees that may no longer be stable due to erosion).
- At monitoring stations 00 + 350' through 00 +450' small areas of erosion were present at the toe of the slope, associated with torn erosion control fabric and exposed geocell.

Installed Features

- Rock toe features were intact, with increased sediment deposition filling in the interstices;
- Large woody debris was stable, and anchor chains were intact;
- Coir logs were intact, but several areas of wear associated with foot traffic were noted along the toe of the slope;
- Erosion control fabric was mostly intact, but was exposed in several areas and torn near the toe of the slope between monitoring stations 00 + 350' and 00 +450';
- Installed geocell was intact, but was exposed in several areas near the toe of the slope between monitoring stations 00 + 350' and 00 +450'.

The maintenance inspection conducted at the Constitution Park BMA confirmed the integrity of the installed bank stabilization, but noted several small areas of erosion associated with torn fabric and exposed geocell. Corrective actions (e.g. backfilling, erosion control blanket repair, seeding) are required to prevent more extensive damage to the bank treatment while invasive species control activities are on-going. Native vegetation coverage is increasing along the BMA relative to coverage by Japanese knotweed due to an effective invasives management program that will continue throughout 2019. Vegetative growth will continue to be evaluated during the Spring 2019 post-construction inspection.

PATH FORWARD

The following maintenance activities are planned for the stabilized Constitution Park BMA based on the findings of the winter 2018/2019 leaf off inspection:

- Invasive species management (e.g. herbicide treatment) will continue in 2019 to enable replanting of native vegetation in Fall 2019.
- A corrective action memorandum is under preparation to address isolated areas of erosion associated with torn fabric and exposed geocell. It is anticipated that corrective actions will be implemented in March 2019.

REFERENCES

Anchor QEA, AECOM, and E.I. du Pont de Nemours and Company. 2016. Basis of Design Report, Phase 1A Bank Management Areas, South River Area of Concern 4. September 2016.

Table 1
Winter 2018/2019 Constitution Park BMA Leaf-off Maintenance Inspection
Former DuPont Waynesboro Site, Area of Concern 4

Station (ft) ¹	Undercutting				Exposed Roots			At Risk Trees			Installed Stabilization Features Intact						Local Scour			Overall Change Since Previous Inspection (Y/N)
	Approximate Bank Angle (Degrees)	Consistent Grade (Y/N) ²	Notes	Photo # (Appendix A)	Exposed Rbts (L/M/H) ³	Notes	Photo # (Appendix A)	At Risk Trees Present (Y/N + #) ⁴	Notes	Photo # (Appendix A)	Rock Toe/LWD (Y/N) ⁵	Geocell (Y/N) ⁶	Erosion Control Fabric (Y/N) ⁶	Notes	Photo # (Appendix A)	Scour Present (Y/N) ⁷	Notes	Photo # (Appendix A)		
00 - 25	30	N (see notes)	Lower bank; ~20 degrees Upper bank; ~55 degrees	1	L	No woody plant sadjacent to edge of water	1	N	No woody plant sadjacent to edge of water	1	NA	NA	NA		1	Y	Low presence of scour 5' upst ream of 00 - 25	1	Y	
00 + 00	40	N (see notes)	Lower bank; ~30 degrees Upper bank; ~55 degrees	2	NA	No woody plant sadjacent to edge of water; minimal vegetation present on bank	2	N	No woody plant sadjacent to edge of water	2	NA	Y	Y	Coir logs intact, some erosion control fabric is visible	2	N	Potential river access point observed; evidence of foot traffic along the toe of slope, along coir logs	2	Y	
00 + 50	45	Y		3	NA	No woody plant sadjacent to edge of water; 30-40% invasive species cover	3	N	No woody plant sadjacent to edge of water	3	NA	Y (exposed at tow of slope)	Y (exposed throughout)	Geocell intact, but beginning to be exposed near the toe of the slope	3	N	Evidence of foot traffic along the toe of slope	3	N	
00 + 100	40	N (see notes)	Lower bank ~10 degrees (rock toe); Upper bank ~45 degrees	4	NA	No woody plant sadjacent to edge of water	4,5,6	N	No at-risk trees present; no exposed roots	4,5,6	Y (rock toe)	Y	Y (exposed throughout)	Rock toe along bank and constructed river access steps intact	4,5,6	N	Sediment deposition adjacent to rock toe boulders	4,5,6	N	
00 + 150	45	N (see notes)	Lower bank <5 degrees (rock toe); Upper bank ~45 degrees	7	NA	Native vegetation predominantly present; no woody plant sadjacent to edge of water	7,8,9	N	No woody plant sadjacent to edge of water	7,8,9	Y (LWD and Rock toe)	Y	Y	Installed geocell and erosion control fabric intact	7,8,9	N	Silt filling in behind LWD and in boulders	7,8,9	N	
00 + 200	55	Y		10	NA	Patches of invasive vegetation present; no woody plant sadjacent to edge of water	10	N	No woody plant sadjacent to edge of water	10	NA	Y	Y (exposed throughout)	Installed coir logs, geocell and erosion fabric intact	10	N	Evidence of foot traffic along the toe of slope, along coir logs	10	N	
00 + 250	55	Y		11	NA	Patches of invasive vegetation present; no woody plant sadjacent to edge of water	11	N	No woody plant sadjacent to edge of water	11	NA	Y (geocell exposed at toe)	Y (exposed throughout)	Geocell intact; erosion control fabric exposed throughout; fabric torn at toe near exposed geocell	11,12	Y	Small patches of scour present around exposed geocell.	11,12	Y	
00 + 300	70	Y		13	NA	Minimal vegetation present; no woody plant sadjacent to edge of water	13	N	No exposed roots; no at-risk trees	13	NA	Y (geocell exposed at toe)	Y (exposed throughout)	Erosion control fabric exposed; geocell and installed coir logs intact.	13	N		13	Y	
00 + 350	70	Y		14	NA	Native vegetation present along top of bank with small patches of the invasive knotweed plant present	14	N	No woody plant sadjacent to edge of water	14	NA	Y (some geocell exposed below observation platform)	Y (exposed throughout)	Coir log 5' downst ream slightly loose and appears to have shifted; fabric torn at toe	14,15,16	Y	Installed coir logs intact; minimal scour at toe of slope	14,15,16	Y	
00 + 400	60	Y		17,18,19	NA	Predominantly native vegetation present; no woody plant sadjacent to edge of water	17,18,19	N	No exposed roots; no at-risk trees	17,18,19	NA	Y (exposed upst ream around black walnut and at toe of slope)	Y (60% exposed)	Limited geocell exposed around base of black walnut tree; erosion control fabric exposed throughout, particularly near bottom of bank; coir log may have shifted; tear in fabric along toe near exposed geocell	17,18,19	Y	Scour present along toe	17,18,19	Y	
00 + 450	50	Y		20	NA	Patches of native and invasive vegetation present; no woody plant sadjacent to edge of water	20	N	No exposed roots; no at-risk trees	20	NA	Y	Y (exposed throughout)	Erosion control fabric exposed throughout	20	Y	Minimal scour present near coir log	20	Y	
00 + 500	40	Y	Decreased vertical bank height (~6')	21	NA	Native vegetation predominantly present; no woody plant sadjacent to edge of water	21	N	No woody plant sadjacent to edge of water	21	NA	Y	Y (30% exposed)	Erosion fabric exposed near toe of bank	21	N		21	Y	
00 + 525	15	Y		22,23,24	NA	Scattered native vegetation; no woody plant sadjacent to edge of water	22,23,24	N	No woody plant sadjacent to edge of water	22,23,24	NA	Y (small amount exposed along coir log and edge of remediation)	Y (60% exposed)	Erosion control fabric exposed near toe of bank	22,23,24	N		22,23,24	Y	

Notes:

1. Inspection station is described as the distance (feet) upstream (-) or downstream (+) from the start of the BMA (00); example, Station 00 + 50' is 50 feet downstream from the start of the BMA
2. A significant deviation from continuous bank slope or break in grade may be used as an indicator of undercutting; consistent bank grade is evaluated as Y (yes) or N (no)
3. The extent to which roots are exposed may provide a relative measure of the magnitude of apparent erosion; extent of exposed roots is evaluated as L (low), M (moderate), H (high), or NA (not applicable- no exposed roots)
4. At-risk trees (i.e., trees that lean towards the river) typically have a greater potential to fall into the river, dislodge the bank soil and erosion-control products immediately around and above the tree; presence of at-risk trees is evaluated as Y (yes) or N (no)
5. Installed rock toe and large woody debris (LWD) features are monitored to ensure that they are anchored and determine whether material has sloughed, or been eroded, or moved downstream; these installed features are evaluated as Y (yes, intact), N (no, not intact), or NA (not applicable- no installed features to monitor)
6. Installed geocell and erosion control fabric are monitored to ensure that they are intact and determine whether material is exposed or visible; these installed features are evaluated as Y (yes, intact), N (no, not intact), or NA (not applicable- no installed features to monitor)
7. The presence of local scour is assessed at the toe and center of the bank, per inspection station, as well as approximately 25 feet upstream and downstream of the start and end of the BMA; the presence of scour is evaluated as Y (yes) or N (no)

Client Name: DuPont		Site Location: STM-01 (Constitution Park)	Project No. 60594243
Photo No. 1	Date: 2/04/2019		
Direction Photo Taken: West			
Description: Station 00 – 25' ~20 degree lower bank angle; ~55 degree upper bank angle; no at-risk trees present; both native and invasive vegetation present.			

Photo No. 2	Date: 2/04/2019	
Direction Photo Taken: West		
Description: Station 00 + 00' ~20 degree lower bank angle; ~55 degree upper bank angle; patches of invasive and native vegetation present; coir logs intact; no scour present; evidence of heavy foot traffic at base of bank and along coir logs.		

Client Name: DuPont		Site Location: STM-01 (Constitution Park)	Project No. 60594243
Photo No. 3	Date: 2/04/2019		
Direction Photo Taken: West			
Description: Station 00 + 50' ~45 degree consistent bank angle; no at-risk trees present; no exposed roots; coir logs intact; geocell intact and exposed near toe of slope; no scour present; evidence of foot traffic along toe of slope, along coir logs.			

Photo No. 4	Date: 2/04/2019	
Direction Photo Taken: West		
Description: Station 00 + 100' ~40 degree bank angle; no at-risk trees present; patches of invasive and native vegetation present; no exposed roots; no scour present; installed rock toe intact with evidence of sediment deposition; installed river access steps intact.		

Client Name: DuPont		Site Location: STM-01 (Constitution Park)	Project No. 60594243
Photo No. 5	Date: 2/04/2019		
Direction Photo Taken: Northwest			
Description: Station 00 + 100' Sediment deposition adjacent to rock toe boulders; invasive and native vegetation present.			

Photo No. 6	Date: 2/04/2019	
Direction Photo Taken: West		
Description: Station 00 + 100' Sedimentation near rock toe boulders, foot traffic evident above rock toe line, erosion control fabric exposed along upper portion of bank.		

Client Name: DuPont		Site Location: STM-01 (Constitution Park)	Project No. 60594243
Photo No. 7	Date: 2/04/2019		
Direction Photo Taken: West			
Description: Station 00 + 150' ~45 degree bank angle; no at-risk trees present; no exposed roots; no scour present; installed rock toe and large woody debris (LWD) intact; installed geocell and erosion control fabric intact; evidence of sediment deposition.			

Photo No. 8	Date: 2/04/2019	
Direction Photo Taken: Northwest		
Description: Station 00 + 150' Installed rock toe intact with evidence of sediment deposition; patches of the invasive Japanese knotweed present.		

Client Name: DuPont		Site Location: STM-01 (Constitution Park)	Project No. 60594243
Photo No. 9	Date: 2/04/2019		
Direction Photo Taken: Southwest			
Description: Station 00 + 150' Installed rock toe and LWD intact with evidence of sediment deposition.			

Photo No. 10	Date: 2/04/2019	
Direction Photo Taken: West		
Description: Station 00 + 200' ~55 degree consistent bank angle; patches of invasive vegetation present; no exposed roots; no scour present; exposed erosion control fabric; foot path present along coir logs; installed coir logs, geocell, and erosion fabric intact.		

Client Name: DuPont		Site Location: STM-01 (Constitution Park)	Project No. 60594243
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Photo No. 11	Date: 2/04/2019	
Direction Photo Taken: West		
Description: Station 00 + 250' ~55 degree consistent bank angle; no exposed roots; patches of invasive vegetation present; installed coir logs and geocell intact; geocell exposed at toe of slope; erosion control fabric exposed throughout with small torn patches at the bottom of the bank.		

Photo No. 12	Date: 2/04/2019	
Direction Photo Taken: West		
Description: Station 00 + 250' Evidence of foot traffic along coir logs; erosion control fabric torn at toe of slope where geocell is exposed. Small patches of scour present around exposed geocell.		

Client Name: DuPont		Site Location: STM-01 (Constitution Park)	Project No. 60594243
Photo No. 13	Date: 2/04/2019		
Direction Photo Taken: West			
Description: Station 00 + 300' ~70 degree consistent bank angle; no exposed roots; no at-risk trees; no scour present; minimal vegetation present; erosion control fabric exposed throughout; geocell and installed coir logs intact; geocell exposed near toe of slope.			

Photo No. 14	Date: 2/04/2019	
Direction Photo Taken: Northwest		
Description: Station 00 + 350' ~70 degree consistent bank angle; no exposed roots; no at-risk trees; vegetation present along top of bank; geocell and installed coir logs intact; erosion control fabric exposed throughout and torn near exposed geocell at toe of slope.		

Client Name: DuPont		Site Location: STM-01 (Constitution Park)	Project No. 60594243
Photo No. 15	Date: 2/04/2019		
Direction Photo Taken: Southwest			
Description: Station 00 + 350' Installed erosion control fabric exposed throughout; installed coir logs intact; minimal scour at toe upstream of 00 + 350'.			

Photo No. 16	Date: 2/04/2019	
Direction Photo Taken: Northwest		
Description: Station 00 + 350' Installed erosion control fabric exposed along toe of slope; installed coir logs intact, but showing signs of wear and potential for scour.		

Client Name: DuPont		Site Location: STM-01 (Constitution Park)	Project No. 60594243
Photo No. 17	Date: 2/04/2019		
Direction Photo Taken: West			
Description: Station 00 + 400' ~60 degree consistent bank angle; vegetation present at top of bank; no exposed roots; no at-risk trees; erosion control fabric exposed throughout and torn at toe of slope where geocell is exposed; some scour present along toe of slope near exposed geocell.			

Photo No. 18	Date: 2/04/2019	
Direction Photo Taken: Southwest		
Description: Station 00 + 400' Erosion control fabric exposed and torn near bottom of bank; geocell exposed; some scour present at toe of slope around exposed geocell; evidence of foot traffic along toe of slope; installed coir logs intact.		

Client Name: DuPont		Site Location: STM-01 (Constitution Park)	Project No. 60594243
Photo No. 19	Date: 2/04/2019		
Direction Photo Taken: Northwest			
Description: Station 00 + 400' Installed coir logs intact; limited geocell exposed around base of black walnut tree; erosion control fabric exposed near bottom of bank; some scour present upstream of 00+ 400' at toe of slope.			

Photo No. 20	Date: 2/04/2019	
Direction Photo Taken: West		
Description: Station 00 + 450' ~50 degree consistent bank angle; no exposed roots; no at-risk trees; some scour present along toe of slope; established herbaceous vegetation at top of bank; erosion control fabric exposed throughout.		

Client Name: DuPont		Site Location: STM-01 (Constitution Park)	Project No. 60594243
Photo No. 21	Date: 2/04/2019		
Direction Photo Taken: West			
Description: Station 00 + 500' ~40 degree consistent bank angle; no exposed roots; no at-risk trees; no scour present; native and invasive plants present; erosion fabric exposed near toe of bank.			

Photo No. 22	Date: 2/04/2019	
Direction Photo Taken: West		
Description: Station 00 + 525' ~15 degree consistent bank angle; no exposed roots; no at-risk trees; no scour present; majority of erosion control fabric exposed with scattered vegetation.		

Client Name: DuPont		Site Location: STM-01 (Constitution Park)	Project No. 60594243
Photo No. 23	Date: 2/04/2019		
Direction Photo Taken: Southwest			
Description: Station 00 + 525' No exposed roots; no at-risk trees; no scour present; limited areas of invasive vegetation present.			

Photo No. 24	Date: 2/04/2019	
Direction Photo Taken: Northwest		
Description: Station 00 + 525' No exposed roots; no at-risk trees; no scour present; majority of erosion control fabric exposed and not vegetated.		

Appendix B - Waynesboro Off-Site Cap Areas

Inspection Record Sheet

Maintenance Plan

Location and property owner name: Constitution Park BMA (STM-01)		
Item	Status/ Maintenance Needs	Repairs Needed?
Access Roads	NA	NA
Trails	Stairs and Greenway intact	1
Drainage Structures	Drainage Structures Intact	1
Outfall Structures	Outfall Structures Intact	1
Rip-Rap Protection	Rip-Rap Intact	1
Cap System Vegetative Cover	Replacement plantings will be installed upon successful control of invasive species. Tree and shrub plantings are currently planned for the Fall of 2019.	2
Cap System Geosynthetics	At monitoring stations 00 + 350' through 00 +450' small areas of erosion were present at the toe of the slope, associated with torn erosion control fabric and exposed geocell.	2
Cap System Slope Stability	Slope is generally consistent and stable	1
Cap System Subsidence	Slight subsidence near the uppermost section of the BMA associated with foot traffic at the toe of the slope	1
Fencing and Gates	Fencing intact	1

* 1. Functioning properly; no repairs needed

2. Repairs needed (describe why, what and where), but not time critical

3. Time critical repair needed (describe what and where)

** Yes/ No

Comments: small areas of new erosion and exposed geocell / erosion control fabric

Inspected by: Andrew Hally and Andrew Miano

Date: Feb 04 2019