



Rattlesnake Run Watershed Assessment Report



April 2017

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Acknowledgements

A special thanks to the farmers for their time to participate in this project and their environmental stewardship.

This project was conducted by the United States Environmental Protection Agency, Region 3's (EPA) Concentrated Animal Feeding Operation (CAFO) Team with technical support from EPA's contractor, Tetra Tech, Inc.

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Contents

Acknowledgements.....	ii
List of Abbreviations	iv
I. Executive Summary.....	1
II. Background	3
a. Purpose of the AFO Watershed Assessments	4
b. Watershed and AFO Selection Process.....	6
III. Rattlesnake Run Watershed	8
IV. Collaboration with State and Local Partners	9
V. Observations Related to Agriculture-related Regulatory Programs	9
a. Pennsylvania’s NPDES CAFO Permit Program.....	10
b. Pennsylvania’s Nutrient Management Program	10
c. Pennsylvania’s Manure Management Program	11
d. Pennsylvania’s Agricultural Erosion and Sediment Control Program	12
VI. Observations Related to Rattlesnake Run and Chesapeake Bay TMDL BMPs	13
a. Background	13
b. Observations	13
VII. Conclusions.....	15
Appendix A: Sample AFO Farm Visit Checklist	

List of Abbreviations

AFO	Animal Feeding Operation
Ag E&S	Agriculture Erosion & Sediment
ACA	Animal Concentration Area
AHUA	Animal Heavy Use Area
BMP	Best Management Practices
CAO	Concentrated Animal Operation
CAFO	Concentrated Animal Feeding Operation
CBIG	Chesapeake Bay Implementation Grant
CBRAP	Chesapeake Bay Regulatory and Accountability Program
CCCD	Chester County Conservation District
ChWA	Chester Water Authority
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CSP	Conservation Stewardship Program
CWA	Clean Water Act
E&S	Erosion and Sediment Control
EPA	United States Environmental Protection Agency, Region 3
EQIP	Environmental Quality Incentives Program
LA	Load Allocation
MMP	Manure Management Plan
MMM	Manure Management Manual
NMP	Nutrient Management Plan
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
PADEP	Pennsylvania Department of Environmental Protection
QAPP	Quality Assurance Project Plan
RCPP	Regional Conservation Partnership Program
REAP	Resources Enhancement and Protection Program
SAP	Sampling and Analysis Plan
SCC	State Conservation Commission
SOP	Standard Operating Procedures
TMDL	Total Maximum Daily Load
USDA	United States Department of Agriculture
VAO	Voluntary Agricultural Operation
WIP	Watershed Implementation Plan
WLA	Waste Load Allocation

I. Executive Summary

In 2016, the United States Environmental Protection Agency, Region 3 (EPA) assessed seven farms in Pennsylvania's Rattlesnake Run watershed to review how effective Pennsylvania's agricultural programs are in protecting local waterways from runoff from animal feeding operations (AFOs). This watershed-based AFO assessment reviewed: 1) on the ground effectiveness of, and compliance with state or federal requirements for minimizing nitrogen, phosphorus, and sediment concentrations in runoff; and, 2) the implementation of various agricultural conservation practices commonly referred to as best management practices (BMPs) relevant to improving water quality at the farm level. This assessment is based on interviews with the farmers, on-farm visual observations, and reviews of farm plans to determine if the plans are consistent with current operations and activities on the agriculture operation as reported and observed. Due to the seasonal nature of some BMPs, this assessment did not field verify the extent of implementation of every practice identified in the plans or reported by the farmer.

Rattlesnake Run is in Chester County, Pennsylvania and is in the Susquehanna River Basin which drains to the Chesapeake Bay. Rattlesnake Run is a headwater tributary of Octoraro Creek. The Rattlesnake Run watershed is 2.62 square miles, and in 2006 Pennsylvania identified the entire watershed as impaired for siltation based on water quality monitoring¹ and biological surveys of the aquatic life. The Pennsylvania Department of Environmental Protection (PADEP) identified agriculture as one of the primary sources of excessive sediment in the basin, and the source of nutrient loads in Rattlesnake Run. PADEP listed Rattlesnake Run on the 303(d) list in 2006, with a proposed Total Maximum Daily Load (TMDL) completion date set for 2019. The Chesapeake Bay TMDL (Bay TMDL) also calls for nutrient and sediment reductions from sources in Pennsylvania's portion of the Chesapeake Bay watershed, which includes Rattlesnake Run.

In this assessment, EPA pursued a watershed-based approach in this sediment-impaired tributary in order to assess compliance with state regulations, the extent the numerous Pennsylvania programs intersect to drive and support BMP implementation on those farms, and how those BMPs line up with Pennsylvania's Chesapeake Bay Watershed Implementation Plan (WIP). In May 2016, EPA visited and assessed seven farms, which included dairy and cattle operations to evaluate how the state regulatory programs, policies, and historic compliance assurance resources (e.g. farm visits by Conservation Districts) translate to implementation of on-the-ground practices to protect both local and Chesapeake Bay water quality. Water quality improvements are not solely the result of state actions and/or requirements, but improvements also rely on the day-to-day decisions of individual farmers to ultimately implement these practices, with or without technical and financial assistance.

For the agriculture sector, protection of local waterways depends on local farmers implementing suitable BMPs, whether required or voluntary. Pennsylvania has four regulatory programs that are applicable to farms: The National Pollutant Discharge Elimination System (NPDES) Concentrated Animal Feeding Operation (CAFO) permit program, the Pennsylvania Nutrient Management (NM) Program, the Manure Management Program, and the Agriculture Erosion

¹ [2016 Integrated Water Quality Report DRAFT TMDL Appendix H](#)

and Sediment Control (Ag E&S) Program. The State Conservation Commission has delegated authority to the Chester County Conservation District (CCCD) for the administration of the Act 38 Nutrient Management Program and PA DEP has delegated authority to the CCCD for administration of the Manure Management and Agricultural Erosion and Sediment Control Programs. The State Conservation Commission (SCC) is responsible for enforcing the NM program in Chester County. Pennsylvania also has various programs to provide technical and financial assistance to farmers to enhance environmental stewardship, such as the Growing Greener Program and Pennsylvania Resources Enhancement and Protection Program (REAP). In addition, farmers can receive federal funding from programs such as the United States Department of Agriculture (USDA) Farm Bill programs and EPA's Clean Water Act (CWA) Sections 117 and 319 grant programs. These programs, along with others, are vital to the success of protecting and restoring local waterways and ultimately the Chesapeake Bay.

All farms in Pennsylvania that land apply manure are required to have one of two types of written plans for managing the storage, handling, and land application of nutrients, namely Nitrogen and Phosphorus. Pennsylvania's CAFO NPDES and Act 38 Nutrient Management Programs require the implementation of an approved Nutrient Management Plan (NMP); farms which do not meet the criteria for the CAFO or Act 38 programs are required to have a Manure Management Plan. In addition, all farms that disturb 5,000 square feet or more of land by plowing or tilling or maintaining animal heavy use areas are required to have an Agriculture Erosion and Sediment Control Plan (Ag E&S Plan) or a comparable USDA Natural Resource Conservation Service (NRCS) Soil Conservation Plan meeting the requirements of 25 Pa. Code § 102.4(a).

This report aggregates the findings at the seven assessed farms and does not identify any of the farms by name. Specific observations made during the assessment include the following:

No Active Pollution Events Observed on any Animal Feeding Operations

- At the time of the inspections, there were no active pollution events and no observed discharges from any of the farms.

No CAFOs or Farms Regulated under Pennsylvania's Nutrient Management Program

- There were no CAFOs or farms regulated under Pennsylvania's NM program in the watershed.

Animal Feeding Operations (AFOs) – No AFOs Fully Met Regulatory Requirements

- None of the seven farms had an administratively complete MMP.
- Four of the seven farms had Manure Management Manuals, but the farms did not complete all the required information regarding their operation and therefore did not have administratively complete MMPs. Three of the seven farms had NMPs as early as 1998 that were outdated and were not consistent with current operations.
- None of the seven farms had Ag E&S Plans. Six of the seven farms had Soil Conservation Plans developed as early as 1994, but they were not consistent with current operations or administratively complete.

BMPs – Many operations are implementing priority practices and more can be done

- Stream fencing and buffers were observed being implemented on five of the seven farms with an average buffer width of 35 feet.
- Two of the seven farms had more than six months' manure storage;
- Five of the seven farms reported applying manure on cropland during the winter², including three farms that applied solid manure and two farms that applied liquid manure.
- Field practices such as cover crops and conservation tillage were reported on six and four of the farms, respectively.
- All of the six farms implementing cover crops reported applying manure on the cover crop.

II. Background

This watershed assessment is part of the U.S. Environmental Protection Agency's (EPA's) broader activities working with states to strengthen their animal agriculture programs to improve local water quality and advance the restoration and protection efforts of the Chesapeake Bay watershed. EPA has oversight authority of the National Pollutant Discharge Elimination System (NPDES) Program, which regulates concentrated animal feeding operations (CAFOs). EPA also has oversight of the Chesapeake Bay TMDL, which addresses tidal Bay impairments caused by excess nitrogen, phosphorus and sediment. The Bay TMDL is supported by state Watershed Implementation Plans (WIPs) that set forth the pollution control measures needed to fully restore the Chesapeake Bay and its tidal rivers for various sectors including agriculture.

Pennsylvania's Phase I and Phase II WIPs promote implementation of both regulatory and voluntary programs that implement a broad suite of agricultural conservation practices to reduce nutrient and sediment loads from agricultural cropland and animal production operations. Key practices include animal waste storage facilities, stream buffers, stream fencing, cover crops, nutrient management, conservation tillage, and land retirement.

According to the Chesapeake Bay Program Partnership Decision Support Tools 2015 progress scenario, agricultural lands account for 22 percent of the Bay watershed, making agriculture one of the largest land uses in the area, and second only to forested and open wooded areas (64 percent). The 64,000 square mile Chesapeake Bay watershed has more than 87,000 farm operations and 6 million acres of cropland. Agriculture is the largest single source of nitrogen, phosphorus, and sediment loading to the Bay. Out of the total amount of loading of pollutants delivered to the Bay, agricultural activities are responsible for approximately 45 percent of nitrogen loads, about 55 percent of phosphorus loads, and 60 percent of sediment loads.

Of the agricultural nutrient and sediment loadings to the Bay from all Bay jurisdictions, Pennsylvania's agricultural sector accounts for an estimated 58 percent of the total nitrogen, 30 percent of the total phosphorus, and 33 percent of the total sediment delivered to the Bay (Chesapeake Bay Program suite of modeling tools 2015 Progress scenario). Among all the jurisdictions' agricultural sectors, Pennsylvania's agricultural sector ranks first in nitrogen

² In Pennsylvania, winter is defined as meeting any one of the following: a. the date includes or is between December 15 to February 28, or b. the ground is frozen more than 4 inches, or c. the ground is snow covered.

loadings and second in phosphorus and sediment loadings to the Bay. Agriculture is the largest source in Pennsylvania of nitrogen, phosphorus and sediment loading to the Bay.

In response to EPA's elevated oversight of the Agriculture section and in an effort to enhance Pennsylvania's progress in meeting the Chesapeake Bay TMDL goals, on January 21, 2016 Pennsylvania released the "Strategy to Enhance Pennsylvania's Chesapeake Bay Restoration Effort" (Restoration Strategy) outlining near-term actions that Pennsylvania can take to get back on track to further progress on meeting the Chesapeake Bay TMDL goals. The Restoration Strategy details Pennsylvania's commitment to increasing compliance with state agricultural regulations and to improve tracking of non-cost shared agricultural conservation practices. These commitments are memorialized in Pennsylvania's 2016-2017 milestones. Additional commitments from the Restoration Strategy include improving implementation reporting and data tracking systems, creating a Chesapeake Bay Office, obtaining additional resources to improve water quality and to identify legislative, programmatic or regulatory changes necessary to meet the pollution reduction goals by 2025. In addition, for state FY17, PADEP contracted with 28 of 37 Chesapeake Bay watershed county conservation districts to conduct on-site inspections to assess compliance with the nutrient and erosion control planning obligations of the farm community in Pennsylvania and create a "culture of compliance".

EPA has authority to oversee and evaluate state NPDES permit programs to ensure compliance with the CWA, including whether CAFO regulations are implemented appropriately in the state. CAFOs are a subset of animal feeding operations (AFOs). Both AFOs and CAFOs fall within the agricultural sector. EPA's oversight may include assessments of animal agriculture operations to see whether those facilities meet the federal regulatory thresholds to qualify as CAFOs. In addition, EPA has authority to determine if AFOs should be designated as CAFOs due to their impact on receiving waters. These AFO reviews are part of EPA's ongoing regulatory oversight activities to ensure compliance with the CWA and to assess the effectiveness of state programs in addressing agricultural impacts upon receiving waters. The scope of this assessment focused on animal agriculture and did not evaluate the contribution of non-animal agricultural activities (e.g., row crops, orchards, etc.).

This sub-watershed assessment is being conducted as part of EPA's oversight responsibilities under the Bay TMDL to ensure Pennsylvania's progress towards achieving its agriculture WIP commitments to reduce nitrogen, phosphorus, and sediment consistent with the Chesapeake Bay TMDL goals. Consistent with those regulatory oversight activities, in a May 29, 2013 modification to the EPA and Chesapeake Bay Foundation Settlement Agreement, EPA agreed to undertake AFO reviews in four sub-watersheds throughout the Chesapeake Bay basin over four years, starting in 2013. The Rattlesnake Run watershed is the fourth of the four sub-watershed assessments conducted under the settlement agreement. This is the second sub-watershed assessment conducted in Pennsylvania due to the elevated oversight levels assigned to the Agriculture Sector.

a. Purpose of the AFO Watershed Assessments

The purpose of this AFO watershed assessment is to assess compliance of farms with applicable state and federal requirements for minimizing nitrogen, phosphorus, and sediment runoff to surface waters; document the implementation of agricultural conservation practices by farmers; and evaluate how well the PADEP, the State Conservation Commission (SCC), and the Chester

County Conservation District (CCCD) are ensuring compliance at these farms through their respective roles and authorities. The farm visits provided EPA with insight into what types of programs Pennsylvania is implementing and the farm community's understanding of the regulatory requirements.

PADEP's mission is "to protect Pennsylvania's air, land and water from pollution and to provide for the health and safety of its citizens through a cleaner environment." EPA has delegated authority to PADEP to administer the federal NPDES CAFO program. PADEP also administers its own state programs to regulate agricultural animal production operations under the Pennsylvania Clean Streams Law. Pennsylvania's agriculture programs include, but are not limited to, the Agriculture Erosion and Sediment Control (Ag E&S) program, the Manure Management Program, the Nutrient Management Program, and the Pennsylvania National Pollutant Discharge Elimination System (NPDES) CAFO permit program. The effective implementation of these federal and state programs is the main focus of this assessment.

County conservation districts (CCDs) are essential to the implementation of Pennsylvania's agriculture-related regulatory programs and installation of agricultural conservation practices by farmers. Specifically, delegated CCDs review nutrient management plans (NMPs) for compliance with Act 38, assist PADEP's implementation of the Manure Management Program, and conduct annual on-farm status reviews of all concentrated animal operations (CAOs) with approved NMPs. CCDs conduct status reviews of voluntary agricultural operations (VAOs) once every three years. The CCDs also investigate complaints and instances of nutrient management non-compliance under a delegation agreement with the SCC and DEP. Under the new Restoration Strategy, 28 CCDs have agreed to assist PADEP in inspecting 10 percent of all farms annually for compliance with state regulations. CCCD, under contract, has agreed to assist PADEP in conducting on-site inspections under the new Restoration Strategy.

PADEP is responsible for administration of the E&S program under 25 Pa. Code § 102. It requires the implementation and maintenance of E&S BMPs to minimize the potential for accelerated erosion and sedimentation. Written Ag E&S Plans are required for agricultural plowing or tilling activities and animal heavy use areas that disturb 5,000 square feet or more (approximately 1/10 an acre). When an agricultural operation does not have an Ag E&S Plan available for review at the time of an on-site inspection, PADEP is the agency responsible for E&S compliance and enforcement activities in Chester County.

PADEP is responsible for the administration of the Manure Management Program under 25 Pa. Code §91.36(b). PADEP oversees the implementation of the Manure Management Program by providing technical and administrative support, programmatic guidance, and providing the Manure Management Manual to farm operators, program participants, CCD staff and boards, and other interested parties. Every farm in Pennsylvania that land applies manure or agricultural process wastewater, regardless of size, is required to have either a permit or approval from PA DEP, unless the operator can demonstrate the land application follows current standards for development and implementation of a plan to manage nutrients for water quality protection. The land application must either meet the current standards in the Manure Management Manual or be in accordance with an approved Act 38 nutrient management plan. PADEP is the agency responsible for manure management program compliance and enforcement activities and the SCC is responsible for Act 38 enforcement and compliance activities. CCCD, through their

nutrient management delegation agreement, assumes a role in education, outreach, and complaint investigations.

As Pennsylvania's designated lead for point and nonpoint source pollution, PADEP acquires and disburses various federal, state and nonprofit grant funds. Grant programs include EPA Clean Water Act (CWA) Section 319 grants, EPA CWA Section 117 Chesapeake Bay Implementation Grant (CBIG) program, EPA CWA Section 117 Chesapeake Bay Regulatory and Accountability Program (CBRAP), and Pennsylvania's Growing Greener program.

Other programs available to Pennsylvania farmers that provide financial assistance for BMP implementation include, but are not limited to:

- The Pennsylvania Resources Enhancement and Protection Program (REAP), which has provided nearly \$95 million in state tax credits to farmers that have agreed to implement certain conservation best management practices (BMPs) and/or implement no-till systems through the purchase of no-till equipment.
- The Pennsylvania Infrastructure Investment Authority PennVest funding, which has given \$33.7 million in loans and grants for agriculture-related non-point source projects since July 2010. Of this \$33.7 million, \$15 million went to a large manure technology projects.

In addition, there are several federal programs administered through USDA to help provide financial and technical assistance for agricultural conservation practice implementation such as: Environmental Quality Incentives Program (EQIP); Regional Conservation Partnership Program (RCPP); Conservation Reserve Program (CRP); Conservation Reserve Enhancement Program (CREP); and, Conservation Stewardship Program (CSP).

On October 4, 2016, EPA, USDA and Pennsylvania pledged an additional \$28.8 million investment to accelerate progress toward the nutrient reduction goals in Pennsylvania's Chesapeake Bay Watershed Implementation Plan. The additional funding will help to reduce nutrient loadings to local waters and the Chesapeake Bay by implementing more priority agricultural conservation practices in priority watersheds, building more technical assistance to help farmers implement the practices, and leveraging innovative partnerships, private capital, and markets to supplement the benefits of state and federal investments. This additional funding will accelerate nutrient reductions in Pennsylvania and serve as a stepping stone to the Commonwealth's longer-term plan for meeting its 2025 goals.

b. Watershed and AFO Selection Process

In the Chesapeake Bay watershed, there are several geographic areas that have large numbers of livestock operations. EPA conducted four AFO sub-watershed assessments in the Chesapeake Bay watershed between 2013 and 2016 and for these assessments EPA decided to focus primarily on dairies and cattle. Dairy and cattle operations were selected since most dairy operations under 200 animals and cattle operations under 300 animals in the Chesapeake Bay watershed are not subject to permitting under the federal NPDES CAFO program due to size and design. The geographic areas with the largest numbers of dairy cattle are southern New York, south-central Pennsylvania, western Maryland, and the Shenandoah Valley.

In 2016, EPA chose to conduct a second AFO watershed review in south-central Pennsylvania where there is a significant concentration of dairy cows (explained in **Figure 1**) and farms that produce more manure nutrients (nitrogen and phosphorus) than can be applied to the land without accumulating nutrients in the soil. South-central Pennsylvania has an imbalance in the assimilative capacity and the quantity of manure nutrients produced on farms.³

EPA identified all 12-digit HUC watersheds in Pennsylvania within the Chesapeake Bay watershed. Starting with this list of 791 watersheds, EPA identified watersheds that had at least four AFOs within watersheds whose surface waters were identified as impaired on Pennsylvania's 303(d) list, were a headwater stream, and were located entirely in Pennsylvania. After using these criteria to narrow down the number of watersheds to 198, EPA assessed stream flow, drainage patterns, presence of livestock at farms, presence of BMPs such as stream fencing, and distance from farms to streams that resulted in 12 watersheds.

Of those 12 watersheds, Rattlesnake Run watershed was chosen for this review because it is an impaired water body for siltation due to agricultural sources and it has a number of AFOs (and therefore significant manure generation) located close to surface waters with the potential for having a water quality-related impact. The AFOs in the watershed are mostly dairy and cattle operations. EPA's goal was to visit and assess all seven of the individual AFOs in the Rattlesnake Run watershed.

³ Kellogg, Lander, Moffitt, and Gollehon authored [USDA Manure Nutrients Relative to the Capacity of Cropland and Pastureland to Assimilate Nutrients: Spatial and Temporal Trends for the United States](#)

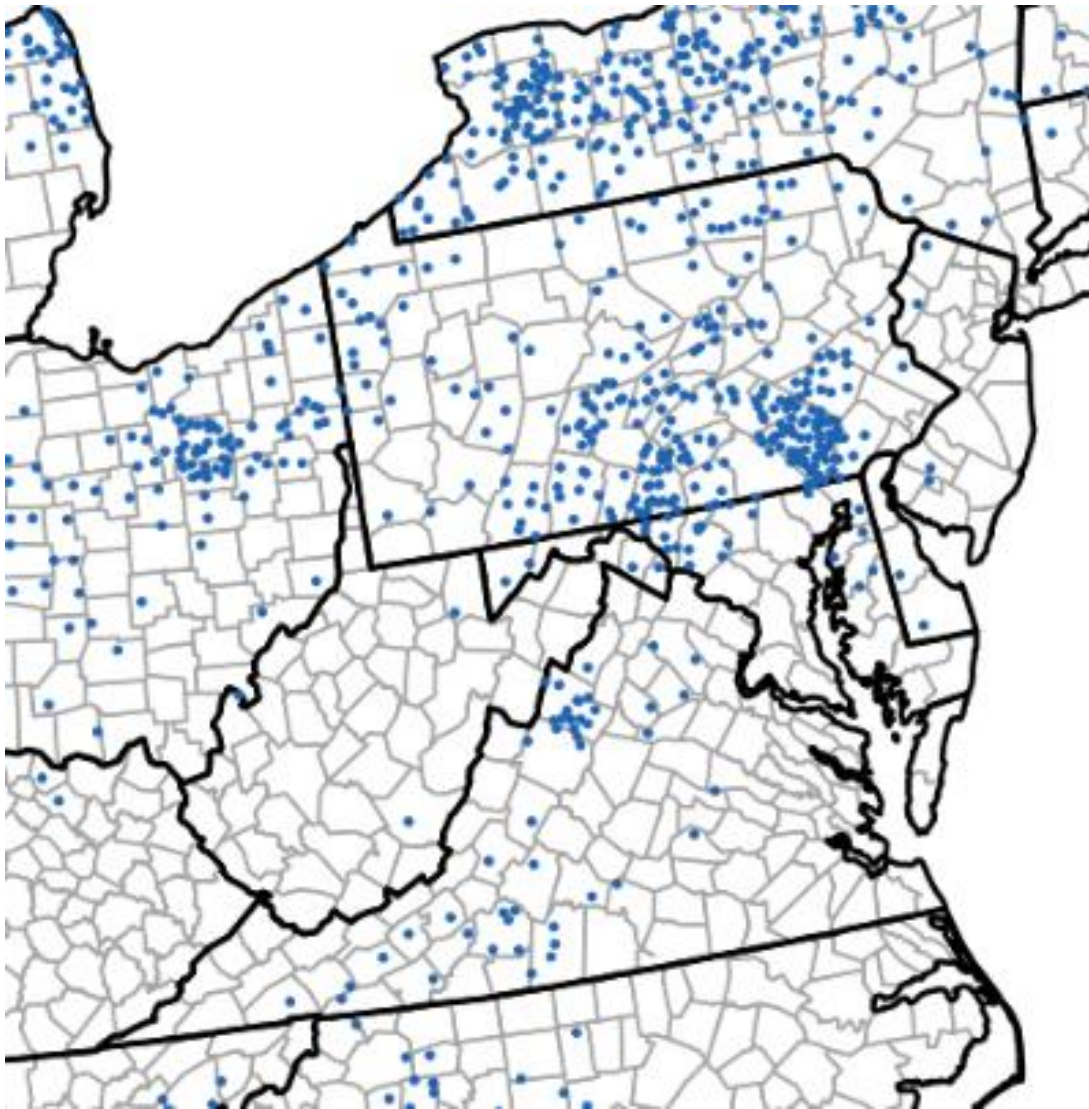


Figure 1: Milk Cow Inventories, 2012 (1 dot = 2,000 cows). Source: USDA 2012 Ag Census

III. Rattlesnake Run Watershed

The Rattlesnake Run watershed is a headwater tributary of Muddy Run. Muddy Run is a tributary of Octoraro Creek (Hydrologic Unit Code [HUC]-8: 02050306), which is a tributary of the Susquehanna River (HUC-6: 02050305) entering the river right below the Conowingo Dam. The Susquehanna River empties into the northern end of the Chesapeake Bay at Havre de Grace, Maryland, providing about half of the Bay's freshwater inflow. The Pennsylvania portion of the Octoraro Creek watershed covers approximately 175.6 square miles. There are two branches of the Octoraro Creek, the West Branch and East Branch. The headwaters of the East Branch Octoraro Creek are located along the eastern edge of Lancaster County, in Sadsbury Township, and generally flows south on the Lancaster/Chester County border until it meets the West Branch to form the Octoraro Reservoir. The major tributaries to East Branch Octoraro Creek include Leech, Muddy, Coopers, Bells, Knight, Valley, and Williams Runs and Valley and Pine Creeks. The East Branch Octoraro Creek contains approximately 154.4 stream miles and flows through predominately agricultural land. Octoraro Creek is dammed at the confluence of the branches and Chester Water Authority operates a surface water intake from the reservoir.

Land use in the Rattlesnake Run watershed is dominated by agriculture with approximately 72.6 percent of land in the watershed in cropland, hayland and pasture. Approximately 8.3 percent of land area is urban/suburban (e.g., residential, mixed and turfgrass), and 17.2 percent of the watershed remains forested.⁴

In addition to surface water impacts, agricultural runoff and other non-point source pollution from farms (both Plain Sect and non-Plain Sect) can have a significant impact on drinking water resources in the Octoraro Watershed. The largest water supplier in the watershed, Chester Water Authority (ChWA), cites elevated nitrates, ammonia, total organic carbon, and sediment as some of the major impacts associated with local agricultural activity. In March 2015, ChWA was forced to close drinking water reservoir intakes due to heavy manure runoff from nearby agricultural areas. In addition, while ChWA uses surface water as a source, many residents in the watershed likely utilize private wells as a drinking water source. For these reasons, encouraging the use of agricultural Best Management Practices (BMPs) through compliance with state and federal regulations is critical to protecting both surface and groundwater drinking water resources.

IV. Collaboration with State and Local Partners

Both PADEP and CCCD provided valuable support for EPA's watershed assessment. PADEP reviewed this report for accuracy. PADEP accompanied EPA on one farm visit and CCCD accompanied EPA on all seven farm visits.

V. Observations Related to Agriculture-related Regulatory Programs

For this AFO assessment, EPA collected information on seven farms through farm visits which were scheduled with the owners in advance. From May 10-13, 2016, EPA visited and assessed seven farms in the Rattlesnake Run watershed. An EPA AFO On-Site Assessment Form was utilized to ensure that similar information was collected at each of the farms and a sample form is included in Appendix A. The information gathered from interviews with the farmers and review of the farm plans was used to evaluate compliance with state or federal requirements for minimizing nitrogen, phosphorus, and sediment in runoff as well as the implementation of best management practices (BMPs) relevant to improving water quality at the farm level. This assessment did not field verify the extent of implementation of all BMPs identified in the plans or reported by the farmer. In addition, EPA used portions of PADEP's Standard Operating Procedure (SOP) Chesapeake Bay Agricultural Inspection Program, SOP No. BCW-INSP-018 (Final May 27, 2016)⁵ to evaluate the completeness of the various required farm plans provided on-site.

All of the seven farms are AFOs and confine the animals for more than 45 days a year. The seven farms included six dairy operations and one heifer operation. Rattlesnake Run flows through the property of five of the seven farms. The following sections describe the applicability of Pennsylvania's various agriculture-related regulatory programs to those seven farms.

⁴ [NLCD 2011 Land Cover \(2011 Edition, amended 2014\) – National Geospatial Data Asset \(NGDA\) Land Use Cover \(R version 3.3.2\)](#)

⁵ [PADEP Standard Operating Procedures for Chesapeake Bay Agricultural Inspection Program](#)

a. Pennsylvania's NPDES CAFO Permit Program

Requirements: In Pennsylvania, a CAFO is defined as a CAO with greater than 300 animal equivalent units (AEUs)⁶, any agricultural operation with greater than 1,000 AEUs, or any agricultural operation defined as a large CAFO under 40 CFR 122.23(b)(4). An operation that meets the state definition of a CAFO must obtain and comply with a CAFO NPDES permit. Pennsylvania's CAFO definition is broader in scope than the federal definition as it includes CAOs with greater than 300 AEUs. A Pennsylvania CAFO permit requires the implementation of an Act 38 NMP. Facilities covered by CAFO permits in Pennsylvania must meet the state's regulatory requirements for nutrient management, manure storage⁷, and erosion and sediment control as well as all federal NPDES CAFO regulatory requirements. CAFOs covered under a NPDES permit are required to be inspected once every five years.

Observations: At the time of EPA's farm visit, the six dairy farms were observed having fewer than 200 mature dairy cows and did not require coverage under the NPDES CAFO permit program. The reported number of mature dairy cows at each farm ranged from 26 to 130 head, with an average of around 63 mature dairy cows. Average total herd size reported at each of the six dairy operations was around 101 head.

At the time of EPA's farm visit, the heifer farm reported having fewer than 300 cattle⁸, did not have greater than 300 AEUs, and did not require coverage under the NPDES CAFO permit program. The total reported herd size at the heifer cattle AFO was 65 head.

b. Pennsylvania's Nutrient Management Program

Requirements: The Commonwealth's 25 Pa. Code Chapter 83 regulations set forth the requirements for its Nutrient Management (NM) Program. In Pennsylvania, a concentrated animal operation (CAO) is defined as a livestock or poultry farming operation that has more than eight total animal equivalent units (AEUs) and exceeds 2 AEUs of live animal weight, on an annualized basis, per acre suitable for manure application. CAOs are required to implement an NMP written by a certified nutrient management specialist and approved by a CCD or SCC pursuant to the 2005 revisions to Act 38. An operation not otherwise subject to Act 38 may volunteer to participate under Act 38 as a voluntary agricultural operation (VAO) and submit an NMP, but is not required to do so by law.

Observations: At the time of EPA's farm visits, none of the seven farms reported exceeding 2,000 pounds of live animal weight per acre suitable for manure application and were therefore not regulated under Pennsylvania's NM program.

⁶ 1 animal equivalent unit (AEU) = 1,000 lbs. of live weight of livestock or poultry animals, on an annualized basis

⁷ 25 Pa. Code Chapter 91.36(a) requires that a manure storage facility shall be designed, constructed, operated and maintained in accordance with current engineering and agronomic practices to ensure that the facility is structurally sound, water-tight, and located and sized properly, to prevent pollution of surface water and groundwater, including design to prevent discharges to surface waters during a storm up to and including a 25-year/24-hour storm.

⁸ Based on the federal definition of a medium CAFO

c. Pennsylvania's Manure Management Program

Requirements: Pennsylvania's 25 Pa. Code Chapter 91.36(b) regarding the land application of animal manure and agricultural process wastewater for non-CAFOs/non-CAOs states that the land application of animal manures and agricultural process wastewater requires a permit or approval from the Department, unless the operator can demonstrate that the land application follows current standards for development and implementation of a plan to manage nutrients for water quality protection, including a calculation of proper levels and methods of nitrogen and phosphorus application, accounting for nutrients in the manure and residing in the soil. The Manure Management Manual (MMM) contains current standards for development and implementation of a plan to manage nutrients for water quality protection which can be used to comply with these requirements. The MMM also includes a template manure management plan (MMP) that may be used to meet Pennsylvania's requirements to have a plan meeting current standards. However, an acceptable manure management plan does not need to use this template, but must meet the standards set in the MMM. The manure management manual also discusses winter spreading requirements, including setbacks and the maximum amount that may be applied. A written MMP includes requirements for how manure and agricultural process wastewater may be applied by various types of equipment and/or directly by animals on pastures and in animal concentration areas (ACAs). If a non-CAO and non-CAFO animal operation has an Act 38 NMP (e.g., a voluntary agricultural operation) or a Natural Resource Conservation Service (NRCS) comprehensive nutrient management plan (CNMP), such a plan would satisfy the Commonwealth's requirements for an MMP for that operation as long as the plan still reflects current farming practices. There is currently no legal requirement for an MMP to be reviewed or approved by a regulatory authority. MMPs must be available on the farming operation at all times for review upon request.

Observations: Of the seven farms assessed, all seven reported land applying manure or agricultural process wastewater, were not otherwise regulated as CAFOs or CAOs, and were required to have MMPs. At the time of EPA's farm visits, the manure management plan status of the operations was:

1. Three of the seven farms had started to fill out a copy of the Manure Management Manual's plan template days before EPA's visit but these MMPs were incomplete. They did not have up-to-date maps, did not account for all sources of manure used on the farm operation, and did not describe ACAs and BMPs used to treat runoff. One of these three farms had been visited by the CCCD as part of Pennsylvania's 2014-2015 Chesapeake Bay TMDL milestone commitment for Conservation Districts to visit 100 farm operations to inform them of the state regulatory requirements.
2. An additional three farms had NMPs; however, two of the farms had NMPs developed in 1998 and 2004 which is prior to the 2005 revisions to Act 38, and none of the three NMPs reflected the current conditions of the operations (e.g. farm maps were outdated). All of the farms did not have all the required components of an MMP.
3. One of the seven farms had not developed an MMP, even though the farmer attended MMP training in 2015 provided by CCCD, and had a copy of the Manure Management Manual (MMM).

Five of the seven farms reported applying manure during the winter on frozen and/or snow covered ground. Three of these five farms reported spreading only solid manure during winter.

The other two of the five reported spreading liquid manure during winter. These two farms had two and two and a half months of liquid manure storage capacity, respectively. While winter spreading of manure is not prohibited by Pennsylvania's regulations, this is not a preferred approach due to the potential for increased nutrient losses to surface waters.

d. Pennsylvania's Agricultural Erosion and Sediment Control Program

Requirements: Anyone in Pennsylvania conducting plowing or tilling activities or with animal heavy use areas (AHUAs) that disturb 5,000 square feet (464.5 square meters) of land or more is required to have a written plan to implement and maintain erosion and sediment control BMPs to minimize the potential for accelerated erosion and sedimentation. On November 19, 2010, Pa. Code Chapter 102 regulations were revised to require AHUAs to be covered by an Agriculture Erosion and Sediment control (Ag E&S) plan or conservation plan⁹. Additionally, a written Ag E&S Plan, consistent with the current site conditions and activities, is required to meet the requirements of 25 Pa. Code Chapter 102 including:

- Limiting the soil loss from accelerated erosion to the soil loss tolerance (T) over the planned crop rotation;
- Implementing additional BMPs to minimize accelerated erosion and sedimentation for agricultural plowing and tilling activities that will occur on fields with less than 25 percent plant cover or crop residue cover and within 100 feet of a river, or perennial or intermittent stream;
- Identifying BMPs to minimize accelerated erosion and sedimentation for AHUAs;
- Plan maps that show the location of farm features including surface waters, drainage patterns, field and property boundaries, buildings and farm structures, AHUAs, roads and crossroads, BMPs; soils maps; and a description of BMPs including AHUA practices, tillage systems, schedules and crop rotations; and
- A plan implementation schedule.

Based upon PADEP regulations and guidelines, the farmer may use an NRCS Soil Conservation Plan to satisfy this requirement as long as it meets the requirements in 25 Pa. Code § 102.4(a)(4)-(6).

Observations: Of the seven farms assessed, six farms reported to plow and/or till more than 5,000 sq. ft. of land and all seven farms have AHUAs. The area of cropland plowed and/or tilled by the six farms ranged from 43 to 185 acres. The average acres plowed and/or tilled were approximately 90 acres. The one farm that has an AHUA, but does no plowing or tilling, disturbs approximately 12 acres and therefore is also required to have an Ag E&S Plan since the AHUA disturbs more than 5,000 square feet. Therefore, according to the regulations, all of the farms need Ag E&S Plans.

At the time of EPA's farm visits, none of the farms had Ag E&S Plans. Per state regulations, the farmer may implement an NRCS Soil Conservation Plan to satisfy this requirement if certain areas such as soil loss and animal heavy use areas are addressed. Six of the seven farms had NRCS Soil Conservation Plans; however, all of them were developed prior to 2010 when Pa.

⁹ [Penn State Extension's Pennsylvania Nutrient Management Program: The Basics of Agricultural Erosion and Sedimentation Requirements](#)

Code Chapter 102 regulations were revised, and did not meet the current regulations to account for AHUAs, and were not consistent with the current conditions and activities on the agricultural operation. One of the NRCS Soil Conservation Plans evaluated soil loss tolerance (T) over the planned crop rotation, but did not address AHUAs.

VI. Observations Related to Rattlesnake Run and Chesapeake Bay TMDL BMPs

a. Background

Rattlesnake Run was listed as impaired for siltation due to agriculture for 2.37 miles. Pennsylvania identified the entire Rattlesnake Run watershed as impaired for siltation based on chemical sampling and biological surveys of the aquatic life. The Pennsylvania Department of Environmental Protection (PADEP) identified agriculture as one of the primary sources of excessive sediment in the basin, and the source of nutrient loads in Rattlesnake Run. PADEP listed Rattlesnake Run on the 303(d) list in 2006, with a proposed TMDL completion date set for 2019. A draft TMDL for Octoraro Creek watershed was developed and made available for review and comment in 2013 but has not been approved.

For the purposes of this assessment, EPA focused on a collection of BMPs required under Pennsylvania's various agriculture-related regulatory programs as well as agricultural practices in the Pennsylvania Watershed Implementation Plan (WIP) for the Chesapeake Bay TMDL that, when implemented, would achieve a significant portion of PA's nutrient and sediment reduction goals for animal agriculture. These include: 1) Soil Conservation Plans; 2) Nutrient Management; 3) Manure Management; 4) Animal Waste Management Systems; 5) Barnyard Runoff Control; 6) Stream Access Control with Fencing; 7) Forest and Grass Buffers; 8) Cover Crops; 9) Conservation Tillage; and 10) Conservation Easements. Some of the BMPs were reported by the farmer and others were observed during the farm visits.

b. Observations

In regards to the ten main BMPs in Pennsylvania's Watershed Implementation Plan, none of the seven farms assessed had Soil Conservation Plans that met NRCS technical standards or were consistent with the current conditions and activities on the agricultural operation. None of the seven farms were implementing current NMPs or administratively complete MMPs that followed Act 38 or the standards in the Manure Management Manual, respectively. In contrast, five of the seven farmers reported implementing Animal Waste Management Systems with at least six months of liquid manure storage. All seven farms were observed implementing some form of Barnyard Runoff Controls. Four of the seven farms were observed implementing stream fencing and five of the seven farms were implementing buffers within Rattlesnake Run watershed with an average width of 35 feet. Six of the seven farmers reported implementing field practices such as cover crops and four of the seven farmers reported implementing conservation tillage. Of the farmers that reported implementing cover crops, all of them were applying manure on the cover crop.¹⁰ Table 1 identifies the BMPs observed across all the assessed farms and where BMP implementation could be improved or increased to achieve water quality goals.

¹⁰ Currently, the CBP Watershed Model (Phase 5.3.2) does not provide a nutrient reduction credit for traditional cover crops receiving additional nutrients in the fall or spring or for commodity cover crops receiving additional nutrients before March 1st.

Table 1: Implementation of BMPs¹¹ at the Seven Assessed Farms

Best Management Practice (BMP)	# of farms with BMP	Potential to increase BMP implementation at farms
Soil Conservation Plans	0 farms	Six of the seven farms had Soil Conservation Plans that had been developed between 1994 and 2009. However, none of these six farms had soil conservation plans consistent with the current conditions and activities on the agricultural operation. One farm did not have a Soil Conservation Plan.
Nutrient Management	0 farms	Three of the seven farms had NMPs. Two of the farms had an NMP developed prior to the 2005 revisions to Act 38, and none of the three farms had current, approved Act 38 NMPs consistent with the current operations (or administratively complete MMPs developed by a certified nutrient management planner that may qualify as an NMP). Four farms did not have NMPs.
Manure Management	0 farms	Four of the seven farms had received Manure Management Manuals to use to develop MMPs. However, these four farms did not develop current or complete MMPs that followed the standards in the Manure Management Manual. These farms need to improve recording keeping and ensure plans are current.
Animal Waste Management Systems	7 farms	All seven farms had Animal Waste Management Systems. Two of the seven farms had at least six months' liquid manure storage capacity. One of the seven farms had between five and six months of liquid manure storage. Three of the seven farms had between two and three months' liquid manure storage capacity. One of the seven farms had an unknown liquid manure storage capacity. Two farms with three months or less of liquid manure storage spread manure in winter and could increase liquid manure storage capacity.
Barnyard Runoff Control	7 farms	All seven farms had gutters and downspouts on the buildings to some extent to divert clean water away from manure, feed, and bedding exposed to precipitation.
Stream Access Control with Fencing	3 farms	Rattlesnake Run flows through five of the seven farm properties. Of those five, it was observed that one farm fenced 100 percent of the stream on their property, another farm fenced 95 percent of the stream on their property, and a third fenced off the stream to some extent. The latter two farms could increase their implementation levels to 100 percent. One additional farm did not have any stream fencing and the addition of fencing in the area of pastured

¹¹ BMP definitions can be found under Source Data of the [Chesapeake Assessment Scenario Tool \(CAST\) Documentation Resources](#)

Best Management Practice (BMP)	# of farms with BMP	Potential to increase BMP implementation at farms
		animals could benefit water quality. The fifth farm did not pasture his animals next to the stream.
Forest and Grass Buffers	5 farms	Rattlesnake Run flows through five of the seven farm properties. Each of the five farms were observed having vegetated buffers on either cropland or pasture fields. Some buffers were as small as 10 feet and could be increased in size in the future.
Cover Crops	6 farms	Six of the seven farms reported implementing cover crops. Four of the six reported implementing cover crops on 100 percent of non-hayfields; the remaining two reported implementing cover crops at 46 and 57 percent of non-hayfields and could increase implementation levels. All six farms that implement cover crops reported that they apply manure to the cover crops.
Conservation Tillage	4 farms	Four of the seven farms reported implementing conservation tillage. Two of these four reported implementing conservation tillage on 100 percent of non-hayfields; for the other two farms, one reported 87 percent and the other 75 percent implementation and both could increase implementation levels. Three additional farms reported they were not implementing conservation tillage and could do so in the future.
Conservation Easements	5 farms	Five of the seven farms have permanently preserved all or portions of their farms for agricultural production through the Pennsylvania Department of Agriculture's Pennsylvania Agricultural Conservation Easement Purchase Program.

VII. Conclusions

None of the farms had developed Ag E&S Plans. Six farms had developed NRCS soil conservation plans that could be used to meet Pennsylvania's Ag E&S Plan requirement, however all six soil conservation plans were not consistent with the current conditions and activities on the agricultural operation. These six soil conservation plans were written as early as 1994. Ag E&S Plans and NRCS soil conservation plans are critical because of the need for Pennsylvania to address to impacts of erosion and sedimentation from farm fields and animal heavy use areas, which is the second leading cause of impairment of streams in this Commonwealth. Agricultural animal heavy use areas can be a significant source of this sediment and can negatively affect downstream uses. The Ag E&S Plan is the most appropriate mechanism to address the control of accelerated erosion from these areas. The BMPs identified in the Ag E&S Plan to address the resource concerns on a specific farm are the same BMPs needed to achieve local and Chesapeake Bay TMDL reduction goals.

None of the seven farms had developed administratively complete MMPs that followed the standards in the Manure Management Manual. Four farms had copies of the Manure Management Manual; however, these four farms did not develop current or complete MMPs that followed the standards in the Manure Management Manual. PADEP's Manure Management Manual identifies the preferred practices to comply with Pa. Code § 91.36. This required BMP, if implemented across Pennsylvania's portion of the Chesapeake Bay watershed, has been calculated to provide the greatest potential to reduce pollutants from agricultural lands. Development and implementation of an MMP, following the technical guide, helps a farmer make informed decisions regarding the source, rate, time, and placement of manure applied on their land which will likely minimize nitrogen, phosphorus and sediment runoff in the watershed in addition to benefitting the farmer by optimizing the utilization of manure nutrients.

With regard to Pennsylvania's oversight of the seven assessed farms, PA DEP had not visited any of the sites, while CCCD had visited three. One of the farms had attended an MMP session in 2015 provided by the CCCD and had a copy of the Manure Management Manual (MMM) but still had not developed an MMP. One of the three farms that had started filling out the MMM's template plan had been visited by the CCCD as part of the Pennsylvania 2014-2015 Chesapeake Bay TMDL milestone commitment for Conservation Districts to visit 100 farm operations to inform them of the state regulatory requirements. One of the three farms with an NMP developed prior to 2005 was visited by the CCCD as part of the 100 informational visits and was provided with the MMM, but did not complete it.

Five of the seven farms were in the Chester County Agricultural Preservation Program. Three of those five farms reported being visited by CCCD to determine compliance with the agricultural conservation easements. This program oversight activity offers the opportunity for PA to check farmers' implementation of required farm plans, since meeting regulatory requirements is a condition of initial and continued program participation.

With regard to BMP implementation at the seven farms, this assessment did not field verify if the practices the farmer reported were being implemented; however, this assessment did evaluate if the practices were in accordance with Pa. Code Chapter 102 regulations that were revised in 2010 as well as other applicable technical standards. This assessment was based on interviews with the farmers and observations of whether the farm plans were consistent with the current conditions and activities on the agricultural operation. Two field conservation practices, cover crops and conservation tillage, were reported being implemented at six (6) and four (4) of the farms, respectively

Of the five farms that Rattlesnake Run flows through, stream access control was observed being implemented at various levels on three of them. Buffers, either on cropland or pasture, were implemented on both sides of Rattlesnake Run on all five farms that Rattlesnake Run flowed through. The reported average width of the buffer was 35 feet.

Five of the seven farms reported applying solid or liquid manure during the winter on frozen and/or snow covered ground due to limited manure storage capacity. Three of these five farms reported spreading solid manure only during winter. The other two reported spreading liquid manure during winter. These two farms had two and two and a half months of liquid manure storage capacity, respectively. While winter spreading of manure is not prohibited by Pennsylvania's regulations, this is not a preferred approach due to the potential for increased

nutrient losses to surface waters. EPA maintains that the application of manure on frozen or snow covered fields does not constitute the agronomic application of nutrients. For example, EPA NPDES regulations require that manure is applied only at agronomic rates, which does not occur on frozen or snow covered ground.

All seven farms had raw materials, products, or byproducts including manure, feed, milk, or bedding exposed to precipitation. Roof gutters and downspouts were installed on the buildings around concrete barnyards at all seven farms to direct clean water away from manure.

The development and implementation of written Ag E&S Plans and MMPs can assist a farmer in selecting both structural and non-structural BMPs to implement, which minimizes the amount of nitrogen, phosphorus and sediment entering streams and ultimately helps maintain and restore local and regional water quality. As part of Pennsylvania's Restoration Strategy for the Chesapeake Bay, Pennsylvania developed a new compliance assurance program focused on ensuring farmers have required management plans. The first phase focuses on whether farms have the required plans and the second phase will focus on whether the plans are being implemented based on observations and information gathered through farmer interviews. EPA will continue to conduct compliance assurance and TMDL oversight activities in Pennsylvania with the goal of ensuring Pennsylvania achieves the pollutant reduction and water quality goals at the local and regional level as identified in the respective TMDLs.

Appendix A

Sample AFO Farm Visit Checklist

This checklist was used to collect information such as the owner/operator, animal inventory, farm management documentation, management of sources of nutrients and an inventory of BMPs.

PENNSYLVANIA AFO ON-SITE ASSESSMENT FORM

Form to be completed by EPA authorized personnel

Date: _____ Time In: _____ (AM PM) Time Out: _____ (AM PM)

Weather: _____

Were Biosecurity Measures Implemented in Addition to EPA Protocols? *Yes No*

Additional Measures Taken: _____

Photos Taken: *Yes (see Photo Log) No*

Samples Taken: *Yes (see Lab Results) No*

EPA Inspector(s): _____

Contractor(s): _____

PADEP Staff: _____

SCC/PDA Staff: _____

CD Staff: _____

Other Participants: _____

Person(s) Interviewed: _____

Farm Name (if any): _____

Farm Address _____

GPS coordinates (entrance) Latitude: _____ Longitude: _____

Owner/Operator Information

Owner(s) Name: _____

Operator(s): _____

Phone: _____ *home work cell fax na*

Phone: _____ *home work cell fax na*

Email Address: _____

Owner Address: _____

Operator Address: _____

Mailing Address: _____

Farm History

Yes No Has the farm been visited by PADEP? Date: _____

Yes No Has the farm been visited by CD, SCC or NRCS? Date: _____

Animal Inventory

Animal Type	Current No.	Weight	Animal Type	Current No.	Weight
Milking Cows			Beef Cattle		
Dry Cows			Swine		
Heifers >1 yr			Horses		
Heifers <1 yr			Mules		
Calves <2 mos			Broilers/Layers		
Bulls			Other		

Overview of Business Information

Livestock Type: Dairy Beef Swine Layer Broilers Turkey Other: _____

Number of days animals are stabled/confined and fed/maintained over any 12-month period.

_____ 45 Days or More _____ Less than 45 Days

Integrator/Company: _____

of employees _____ Hours of operation _____

Production Level (i.e. gals/day of milk, flocks/year): _____

CAFO/CAO/AFO Status

- Concentrated Animal Feeding Operation (CAFO)
- Concentrated Animal Operation (CAO)¹²
- Volunteer Animal Operation (VAO)
- Animal Feeding Operation (AFO)¹³
- None of the Above

Farm Management Documents and Plans

- PA CAFO Permit Coverage (Permit No. _____ and Date _____)
- Agriculture Erosion & Sediment Control Plan (Ag. E&S Plan)
(Date _____, Author _____)
- Manure Management Plan (MMP)
(Date _____, Author _____)
- Nutrient Management Plan (NMP)
(Date _____, Author _____)
 - Private Certified Nutrient Management Planner
 - Soil & Water Conservation District
 - Pennsylvania Cooperative Extension
 - Other: _____
- NRCS Comprehensive Nutrient Management Plan (CNMP)
(Date _____, Author _____)
- NRCS Conservation Plan
(Date _____, Author _____)
- Other Farm Management Plan(s) _____

¹² CAOs are defined as agricultural operations where the animal density of all livestock on the farm exceeds 2 animal equivalent units (AEUs) per acre on an annualized basis. AEUs for each type of animal = [average number of animals on a typical day that the animals are there × animal weight (lb) ÷ 1,000] × [number of days the animals are on the operation per year ÷ 365].

¹³ AFO means a lot or facility where animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

Cropland/Pasture/Field Management

Own: Total _____ ac Crops: _____ ac Pasture: _____ ac Production Area: _____ ac

Rented: Total _____ ac Crops: _____ ac Pasture: _____ ac

Rented From: _____

Crops Grown:	<input type="checkbox"/> Corn	_____ ac	Receive manure?	<i>Yes</i>	<i>No</i>
	<input type="checkbox"/> Soybean	_____ ac	Receive manure?	<i>Yes</i>	<i>No</i>
	<input type="checkbox"/> Alfalfa	_____ ac	Receive manure?	<i>Yes</i>	<i>No</i>
	<input type="checkbox"/> Other(s) (_____)	_____ ac	Receive manure?	<i>Yes</i>	<i>No</i>

Crop Rotation: _____

Regular Soils Tests: *Yes* *No* Each field tested once every 1 2 3 4 5 yrs

Date of last soil test: _____ Laboratory results available for onsite review: *Yes* *No*

Notes: _____

Nutrient Sources

Yes *No* Does the farm's NMP account for all sources of manure?

Yes *No* Does the farm export manure?

Annual amount of imported manure: _____ %/gal/tons

Yes *No* Does the farm import manure?

Annual amount of imported manure: _____ %/gal/tons

Source of imported manure? _____

Yes *No* Does the farm use inorganic Fertilizer?

Type/Product: _____

Yes *No* Does the farm use biosolids?

Source: _____

Annual amount of biosolids used: _____

Yes *No* Does the farm use irrigation?

Yes *No* Is manure spread on pastures?

Pasture acres receiving manure: _____ acres

Yes *No* Does the farm spread manure during the winter¹⁴?

If yes, when was the last time: _____

If yes, which crops receive manure: _____

If yes, which fields receive manure: _____

Why does winter application of manure occur? _____

¹⁴ Winter is defined as: December 15 – February 28, or Ground is frozen 4 inches or deeper, or Ground is snow covered.

Raw Materials Management

Type of feed produced on farm: _____

Type of feed imported to farm: _____

Type of feed storage: _____

Yes No Is feed formulation managed to reduce nutrient content in manure?

Yes No Is stored feed exposed to precipitation?

Yes No Is silage Leachate present?

Yes No Is bedding material exposed to precipitation?

Wastewater Management

How is milk house/parlor washwater handled?

Mortality Management

Method of Disposal (select all that apply)	Routine Mortality	Catastrophic Mortality	Comments
Compost in compost shed	<input type="checkbox"/>	<input type="checkbox"/>	
Compost in manure shed	<input type="checkbox"/>	<input type="checkbox"/>	
Outdoor composting	<input type="checkbox"/>	<input type="checkbox"/>	
Burial	<input type="checkbox"/>	<input type="checkbox"/>	
Incineration	<input type="checkbox"/>	<input type="checkbox"/>	
Rendering	<input type="checkbox"/>	<input type="checkbox"/>	
Other (describe):	<input type="checkbox"/>	<input type="checkbox"/>	

Surface Water and Stormwater Management (use Site Maps to identify location)

Yes No Is surface water present on the farm? Name: _____
Location: _____

Yes No Are man-made ditches, flushing systems, or other similar man-made devices present?
Location: _____

Yes No Does stormwater come into contact with any raw materials, products, or byproducts including manure, litter, feed, milk, eggs or bedding?
Location: _____

Yes No Does surface water come into direct contact with the animals confined in the operation?
Location: _____

Yes No Are animal concentration areas (ACA) and/or animal heavy use areas (AHUA) present?
Location: _____

Notes: _____

Best Management Practices

Yes No Does the farm implement conservation tillage (No-Till/Low Till)?
Type: _____
Implementation Level: _____ ac / %

Yes No Does the farm plant cover crops?
Current year implementation level: _____ ac
Typical year implementation level: _____ ac
Type of cover crop: _____
Does cover crop receive manure? *Yes No*
Amount of manure applied to cover crops: _____ gal/tons

Yes No Does the farm implement livestock stream exclusion practices? (if applicable)
Implementation Level: _____ ft
Are stream banks are fenced on both sides of stream? *Yes No*

Yes No Does the farm implement vegetated buffers on cropland? (if applicable)
Implementation Level: _____ ft
Average width of buffer: _____ ft
Minimum width of buffer: _____ ft *Maximum* width of buffer: _____ ft

Yes No Does the farm implement vegetated buffers on pasture? (if applicable)
Implementation Level: _____ ft
Average width of buffer: _____ ft
Minimum width of buffer: _____ ft *Maximum* width of buffer: _____ ft

Yes No Do buildings/structures around the barnyard have operational gutters and downspouts?

Yes No Is the farm in any preservation program?
Name: _____
Acres in Program: _____

Notes: _____

Manure Storage(s)

Storage 1: _____

Type (ex. earthen, HDPE-lined earthen, concrete): _____

Dimensions: _____ Capacity: _____ gals _____ *months or days*

Age/Date Built: _____

Freeboard maintained (inches): _____ Lining: _____

Did farm use any government cost-share funding? *Yes No* Program: _____

Input Sources (manure, washwater, rainwater): _____

How often is manure tested? Never Once every 1 2 3 4 5 years Not Routinely

Date of last manure test: _____

Storage 2: _____

Type (ex. earthen, HDPE-lined earthen, concrete): _____

Dimensions: _____ Capacity: _____ gals _____ *months or days*

Age/Date Built: _____

Freeboard maintained (inches): _____ Lining: _____

Did farm use any government cost-share funding? *Yes No* Program: _____

Input Sources (manure, washwater, rainwater): _____

How often is manure tested? Never Once every 1 2 3 4 5 years Not Routinely

Date of last manure test: _____

Storage 3: _____

Type (ex. earthen, HDPE-lined earthen, concrete): _____

Dimensions: _____ Capacity: _____ gals _____ *months or days*

Age/Date Built: _____ Freeboard maintained (inches): _____

Did farm use any government cost-share funding? *Yes No* Program: _____

Input Sources (manure, washwater, rainwater): _____

How often is manure tested? Never Once every 1 2 3 4 5 years Not Routinely

Date of last manure test: _____

Notes: _____

Animal Confinement Area Worksheet

Animal Confinement Area <i>(Barn, Freestall Barn, Lot, Loafing Area, Parlor, Pasture)</i>	Livestock Description	Materials Entering Area	Materials Leaving Area
Location: _____	Livestock present: _____	<input type="checkbox"/> Manure	<input type="checkbox"/> No materials collected/stored
<i>Access To Stream</i> <input type="checkbox"/> Yes <input type="checkbox"/> No	Capacity: Current:	<input type="checkbox"/> Bedding (Type _____)	<input type="checkbox"/> Manure scraped/stacked/stored _____
<i>Covered</i> <input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No	Present _____ hrs / day	<input type="checkbox"/> Rainwater	<input type="checkbox"/> Runoff/ Process wastewater _____
<i>Impervious Surface</i> <input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No	Present _____ months / year	<input type="checkbox"/> Other (_____)	<input type="checkbox"/> Other (_____)
Location: _____	Livestock present: _____	<input type="checkbox"/> Manure	<input type="checkbox"/> No materials collected/stored
<i>Access To Stream</i> <input type="checkbox"/> Yes <input type="checkbox"/> No	Capacity: Current:	<input type="checkbox"/> Bedding (Type _____)	<input type="checkbox"/> Manure scraped/stacked/stored _____
<i>Covered</i> <input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No	Present _____ hrs / day	<input type="checkbox"/> Rainwater	<input type="checkbox"/> Runoff/ Process wastewater _____
<i>Impervious Surface</i> <input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No	Present _____ months / year	<input type="checkbox"/> Other (_____)	<input type="checkbox"/> Other (_____)
Location: _____	Livestock present: _____	<input type="checkbox"/> Manure	<input type="checkbox"/> No materials collected/stored
<i>Access To Stream</i> <input type="checkbox"/> Yes <input type="checkbox"/> No	Capacity: Current:	<input type="checkbox"/> Bedding (Type _____)	<input type="checkbox"/> Manure scraped/stacked/stored _____
<i>Covered</i> <input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No	Present _____ hrs / day	<input type="checkbox"/> Rainwater	<input type="checkbox"/> Runoff/ Process wastewater _____
<i>Impervious Surface</i> <input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No	Present _____ months / year	<input type="checkbox"/> Other (_____)	<input type="checkbox"/> Other (_____)
Location: _____	Livestock present: _____	<input type="checkbox"/> Manure	<input type="checkbox"/> No materials collected/stored
<i>Access To Stream</i> <input type="checkbox"/> Yes <input type="checkbox"/> No	Capacity: Current:	<input type="checkbox"/> Bedding (Type _____)	<input type="checkbox"/> Manure scraped/stacked/stored _____
<i>Covered</i> <input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No	Present _____ hrs / day	<input type="checkbox"/> Rainwater	<input type="checkbox"/> Runoff/ Process wastewater _____
<i>Impervious Surface</i> <input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No	Present _____ months / year	<input type="checkbox"/> Other (_____)	<input type="checkbox"/> Other (_____)

Animal Confinement Area <i>(Barn, Freestall Barn, Lot, Loafing Area, Parlor, Pasture)</i>	Livestock Description	Materials Entering Area	Materials Leaving Area
Location: _____	Livestock present: _____	<input type="checkbox"/> Manure	<input type="checkbox"/> No materials collected/stored
<i>Access To Stream</i> <input type="checkbox"/> Yes <input type="checkbox"/> No	Capacity: Current:	<input type="checkbox"/> Bedding (Type _____)	<input type="checkbox"/> Manure scraped/stacked/stored _____
<i>Covered</i> <input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No	Present _____ hrs / day	<input type="checkbox"/> Rainwater	<input type="checkbox"/> Runoff/ Process wastewater _____
<i>Impervious Surface</i> <input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No	Present _____ months / year	<input type="checkbox"/> Other (_____)	<input type="checkbox"/> Other (_____)

Location: _____	Livestock present: _____	<input type="checkbox"/> Manure	<input type="checkbox"/> No materials collected/stored
<i>Access To Stream</i> <input type="checkbox"/> Yes <input type="checkbox"/> No	Capacity: Current:	<input type="checkbox"/> Bedding (Type _____)	<input type="checkbox"/> Manure scraped/stacked/stored _____
<i>Covered</i> <input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No	Present _____ hrs / day	<input type="checkbox"/> Rainwater	<input type="checkbox"/> Runoff/ Process wastewater _____
<i>Impervious Surface</i> <input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No	Present _____ months / year	<input type="checkbox"/> Other (_____)	<input type="checkbox"/> Other (_____)

Location: _____	Livestock present: _____	<input type="checkbox"/> Manure	<input type="checkbox"/> No materials collected/stored
<i>Access To Stream</i> <input type="checkbox"/> Yes <input type="checkbox"/> No	Capacity: Current:	<input type="checkbox"/> Bedding (Type _____)	<input type="checkbox"/> Manure scraped/stacked/stored _____
<i>Covered</i> <input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No	Present _____ hrs / day	<input type="checkbox"/> Rainwater	<input type="checkbox"/> Runoff/ Process wastewater _____
<i>Impervious Surface</i> <input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No	Present _____ months / year	<input type="checkbox"/> Other (_____)	<input type="checkbox"/> Other (_____)

Location: _____	Livestock present: _____	<input type="checkbox"/> Manure	<input type="checkbox"/> No materials collected/stored
<i>Access To Stream</i> <input type="checkbox"/> Yes <input type="checkbox"/> No	Capacity: Current:	<input type="checkbox"/> Bedding (Type _____)	<input type="checkbox"/> Manure scraped/stacked/stored _____
<i>Covered</i> <input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No	Present _____ hrs / day	<input type="checkbox"/> Rainwater	<input type="checkbox"/> Runoff/ Process wastewater _____
<i>Impervious Surface</i> <input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No	Present _____ months / year	<input type="checkbox"/> Other (_____)	<input type="checkbox"/> Other (_____)

PENNSYLVANIA AFO ON-SITE ASSESSMENT FORM
Erosion and Sediment Control/NRCS Conservation Plan Review
Supplement

Yes No NA Does the farm have an ESC Plan or NRCS Conservation Plan? (circle one)

Yes No ? Does the plan contain maps that show the location of features including surface waters of this Commonwealth, and drainage patterns, field and property boundaries, buildings and farm structures, animal heavy use areas, roads and crossroads, and BMPs; soils maps; and a description of BMPs including animal heavy use area practices and procedures, tillage systems, schedules, and crop rotations?

Yes No ? Is the plan consistent with the current conditions and activities on the agricultural operation?

Yes No ? Does the plan contain an implementation schedule?

Yes No ? Are the BMPs being implemented according to the schedule?

Yes No ? Are the BMPs in the schedule being operated and maintained?

Yes No ? Does the plan have and is the farmer implementing additional BMPs to minimize accelerated erosion and sedimentation for agricultural plowing and tilling activities that will occur on fields with less than 25% plant cover or crop residue cover and within 100 feet of a river, or perennial or intermittent stream?

List Practices

Yes No ? Does the plan identify BMPs to minimize accelerated erosion and sedimentation for animal heavy use areas?

List Practices

Yes No ? Does the plan, at a minimum, limit soil loss from accelerated erosion to the soil loss tolerance (T) over the planned crop rotation?

Notes
