New York City Department of Environmental Protection

Bureau of Water Supply

Evaluation of the Watershed Agricultural Program's BMP Prioritization Methodology, Summary of BMP Implementation Status, Review of Current Metrics, and Justification for Developing Fewer Than 50 New Whole Farm Plans

January 31, 2015

Prepared in accordance with Section 4.4 of the NYSDOH

Revised 2007 Filtration Avoidance Determination

Prepared by: DEP, Bureau of Water Supply

1. Introduction

The Watershed Agricultural Program (WAP) is a two-decade old pollution prevention partnership that supports the voluntary development of Whole Farm Plans (WFPs) and the voluntary implementation of best management practices (BMPs) by watershed farmers. The WAP is administered by the Watershed Agricultural Council (WAC) using core funds provided by DEP along with technical and financial assistance provided by the United States Department of Agriculture (USDA) through its Natural Resource Conservation Service (NRCS) and Farm Service Agency (FSA). The WAP is also supported by Delaware County Soil and Water Conservation District (SWCD) and Cornell Cooperative Extension (CCE).

The Revised 2007 Filtration Avoidance Determination (FAD) requires that DEP continue to implement the WAP and to submit a report in January 2015 that evaluates the WAP's BMP Prioritization Methodology, summarizes BMP implementation status, and reviews the adequacy of current metrics. This report also satisfies a related FAD deliverable, in which DEP may submit justification for developing fewer than 50 new WFPs during the period 2012-2017.

2. Summary of BMP Implementation Status

Through December 2013, the WAP has implemented a total of 6,147 BMPs on both large and small West of Hudson watershed farms at a total cost of $43.8 million (excluding staff costs and administrative expenses); these figures include 5,073 BMPs on large farms ($39.1 million) and 1,074 BMPs on small farms ($4.7 million). Historically over the past six years, the WAP has implemented an average of $2.5 million worth of BMPs annually, as documented in Figure 1. For the past three years, the annual BMP implementation cost has averaged a slightly lower $2.1 million, due primarily to an increase in lower cost BMPs being implemented as opposed to more expensive BMPs (such as manure storage facilities) that were implemented in greater numbers during 2009-2010 as a result of the WAP receiving an influx of federal funds through the USDA Agricultural Water Enhancement Program. Numerous factors affect the amount of BMP implementation that can be accomplished in a given year, such as the size and complexity of individual BMPs, routine weather conditions, extreme flooding events, contractor availability, farmer willingness to proceed with implementation, and availability of funds.

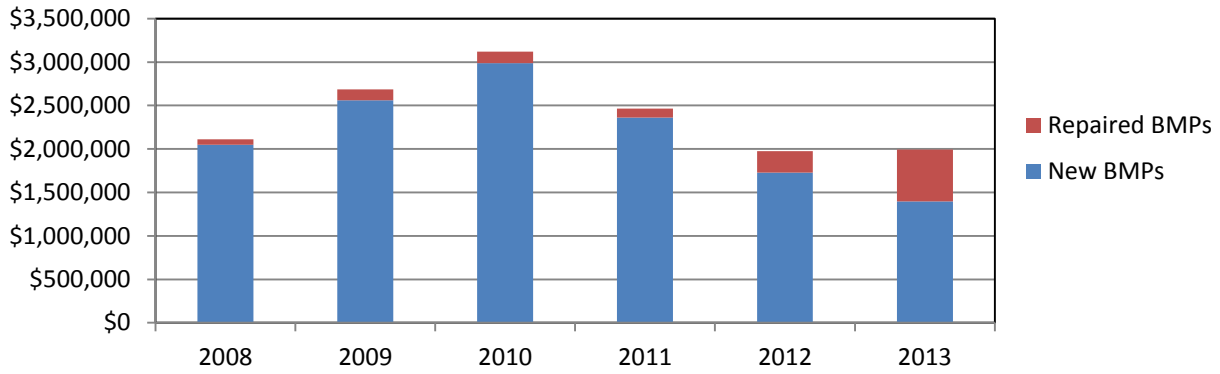

Figure 1. Annual cost of BMP implementation on West of Hudson farms, 2008-2013.

In order to understand the nuances of BMP implementation and the importance of prioritization, it is important to recognize that after two decades of pursuing aggressive planning goals, the WAP now manages a portfolio of 286 active WFPs on West of Hudson farms that exist in various stages of implementation. Every year, new WFPs are developed while existing WFPs are revised; this constant expansion of the WFP portfolio results in more BMPs being added to the WAP workload on a continual basis. More than $21 million worth of BMPs are currently identified in active WFPs on West of Hudson farms (see Table 2); this data is often referred to as the "BMP backlog" because of the WAP's capacity to implement only a portion of this workload every year. For example, if the WAP were to stop adding new BMPs to the workload through new WFPs or WFP revisions, it would take at least six years just to address the current "backlog" without even tackling the more than $3 million worth of BMPs that are generated each year due to WFP development and revisions.

Given its constantly expanding WFP portfolio and BMP "backlog," setting priorities for BMP implementation both between farms and within each WFP has been a longstanding goal of the WAP and was explicitly documented as a desired goal when DEP submitted its WAP Five-Year Plan in 2008. The workload begins when a team of planners works with each participant to identify all water quality concerns and prioritize these concerns within the WFP. All identified pollutant issues and recommended BMPs are then listed in one of the following twelve pollutant categories, listed in order of highest to lowest priority (note: as discussed in the next section, Pollutant Category V.2 – CREP & Riparian Buffers – was reorganized to become the highest priority beginning in 2011 as per the new BMP Prioritization Methodology):

I. Parasites and Phosphorous – Animal Waste Management
II. Pesticides – Storage Facilities, Mixing/Loading Areas
III. Phosphorous – Fertilizer Storage
IV. Parasites – Animal and Manure Management
V. Nutrient Management
V.2. Nutrient Management – CREP & Riparian Buffers
VI. Nutrients – Concentrated Sources
VII. Sediment – Diffuse
VIII. Sediment – Concentrated
IX. Pesticides – Field
X. Fuel Storage
XI. Other Materials

Prior to 1997, when large commercial farms were initially signing up for the WAP and the FAD goal was 85% participation, the WAP focused primarily on developing WFPs and identifying highest priority pollutant risks to be addressed with BMPs; as a result of this early planning focus, the implementation of WFPs started to lag which prompted the WAP to place greater emphasis on implementation. In 1998, two new metrics were developed to ensure WFPs would be implemented in a timely manner. One metric was "commenced implementation," which required at least one pollutant category BMP to be addressed. The second metric was "substantially implemented," which was defined when seven of the nine highest priority pollutant categories were addressed and the remaining two pollutant category BMPs were scheduled for implementation within two years.

For about four years (1998-2001), the WAP was able to achieve or exceed its metrics for both commenced implementation and substantially implemented (SI), which were subsequently codified in the 2002 FAD. However, beginning in 2002 the WAP started to fall short of its annual SI goal, and by 2003 the WAP was also falling short of its commenced implementation goal; these shortfalls continued for many years as the WAP struggled to balance an increasing workload that not only included developing, revising and implementing WFPs on the majority of large farms in the West of the Hudson watershed, but also the addition of an East of Hudson Program, Small Farms Program, Conservation Reserve Enhancement Program (CREP), and other important tasks such as annual status reviews and nutrient management planning. More recently, the WAP has increased its focus on repair/replacement of outdated or failing BMPs that are reaching or exceeding their designated lifespans in growing numbers every year.

When the WAP was assessed in 2006, DEP acknowledged that certain numeric metrics continued to be unmet but that the WAP remained successful in maintaining a steady rate of BMP implementation year after year. Subsequently, the commenced implementation metric was discontinued while a new metric was established requiring that 90% of all West of Hudson large farms achieve SI status by September 30, 2010. The WAP spent the next several years prioritizing BMP implementation to achieve the 90% SI metric by the required deadline. In December 2010, DEP and its partners evaluated the WAP and proposed a new BMP Prioritization Methodology that would replace the SI metric beginning in 2011.

2.1 Summary of the BMP Prioritization Methodology

For the past three years (2011-2013), the WAP has utilized a BMP Prioritization Methodology as the guiding tool for establishing annual BMP implementation priorities and workload assignments. The methodology relies on a risk-based framework for ranking farms using weighted criteria based on water quality risks and scheduling highest priority BMPs as identified in the twelve pollutant categories outlined in each WFP.

First, all BMPs listed in active WFPs are ranked based on pollutant category, with CREP and riparian buffer BMPs being the highest priority. The next three highest pollutant categories address storage concerns for manure, pesticides, and fertilizers (places where catastrophic failure can cause major water quality impairment); the fourth highest category addresses pathogen shedding from livestock and young stock; the fifth highest category addresses land application of nutrients; the sixth highest category addresses milk house waste, silage leachate, and manure from barnyards or livestock areas; the seventh and eighth highest categories address soil erosion from cropland and delivery of sediment to hydrologically sensitive areas; and the three lowest priority categories address field application of pesticides, fuel tank placement and containment, and issues not covered by other pollutant categories.

The WAP's BMP Prioritization Methodology creates an annual list of more than 1,500 BMPs ranked by priority pollutant category spanning all active participating large and small farms in the West of Hudson watershed. Table 1 documents that 1,661 BMPs totaling $21.3 million still remain to be implemented as of the end of 2014 despite the WAP achieving one of its highest BMP implementation rates in 2014 with approximately $3 million worth of BMPs implemented (final numbers were not yet available at the time of this report).

Table 1. Summary of viable BMPs remaining to be implemented in active WFPs through 2014.

	Pollutant Category (highest to lowest priority)	# BMPs	BMP Cost
V.2	Nutrient Management – CREP & Riparian Buffers	160	$570,120
I	Parasites and Phosphorus - Animal Waste Storage	131	$5,061,157
II	Pesticides - Storage Facilities, Mixing & Loading	2	$10,000
III	Phosphorus - Fertilizer Storage	0	$0
IV	Parasites - Animal & Manure Management	216	$4,777,889
V	Nutrient Management	554	$3,231,335
VI	Nutrients - Concentrated Sources	346	$6,627,153
VII	Sediment - Diffuse	68	$159,585
VIII	Sediment - Concentrated	80	$637,800
IX	Pesticides - Field & Animal Application	1	$15,000
X	Fuel Storage*	98	$163,725
XI	Other Materials	5	$35,200
	Total:	1,661	$21,288,965

** Note: 57 of these fuel storage BMPs have no planning estimate, so BMP costs would likely be higher.*

Next, all active participating large and small farms are ranked based on the risk of nutrients and pathogens moving off the farm using data derived from WFPs, nutrient management plans, and annual status reviews. Ranking criteria include animal density, soil phosphorus tests, presence of young stock, proximity of farm fields to water courses and distance of livestock housing facilities to water courses; these criteria are weighted and scored to achieve a list of ranked farms posing the greatest risk to water quality. This ranking of farms is then used to prioritize BMP implementation between farms so that highest priority pollutant categories are addressed on the highest priority farms first, followed by the next highest priority pollutant categories being addressed on the highest priority farms, and so forth. Often times, certain BMPs within a single WFP may be grouped together regardless of their individual priority because the grouping is needed to create a single conservation/management system or to achieve implementation efficiencies on a farm. In addition, failing BMPs that are causing or about to cause significant water quality issues are prioritized for implementation first regardless of their pollutant category; other BMPs where the existing design or construction has caused or is about to cause significant management issues for the farmer may also be elevated to a higher priority.

Every August, a team of WAP staff review all ranked BMPs while taking into account on-the-ground factors such as farmer readiness and BMP groupings or efficiencies. In September, WAP staff makes budget and workload recommendations to the WAC Agricultural Committee based on three core Implementation Areas: (1) CREP/Riparian Buffer BMPs; (2) BMP Repairs and Replacements; and (3) New Prioritized BMPs. When the WAC Agricultural Committee approves these recommendations, the BMP budget and workload becomes finalized for the following year which allows WAP staff to initiate BMP design. Once a BMP is included in the workload, it remains there until it's completed or deemed no longer necessary/viable; BMPs not completed within a particular year are rolled into the following year's workload.

Table 2 documents the annual BMP implementation workload since Prioritization began in 2011. It is worth noting that about $2 million worth of BMPs were rolled over from 2011 to 2012, about $1.5 million worth of BMPs were rolled over from 2012 to 2013, and about $1.4 million worth of BMPs were rolled over from 2013 to 2014. Part of the reason for this rollover, in addition to certain BMPs simply not being completed on time, is because each year the WAP

identifies up to $2 million worth of high priority BMPs for which engineering staff can initiate designs, which ensures that sufficient projects are ready to be contracted in the following year's construction season. The 2014 workload was unusually high because the WAP encumbered $1.3 million worth of BMPs at the end of 2013 as part of a DEP contract close-out process.

Table 2. Summary of the WAP's annual BMP Implementation Workload, 2011-2014.

Implementation Area	2011	2012	2013	2014
CREP & Riparian Buffer BMPs	$557,661	$396,515	$319,241	$728,380
Repair & Replacement BMPs	$150,000	$273,488	$360,638	$218,000
New Prioritized BMPs (I-XI)	$1,792,339	$2,189,565	$1,554,014	$2,723,500
Total Workload:	$2,500,000	$2,859,568	$2,233,893	$3,669,880
Actual Implementation:	$2,471,319	$1,973,540	$1,999,653	~$3,000,000

3. Evaluation of BMP Prioritization

Throughout 2014, DEP worked with all of the WAP partners to develop and implement a strategy for evaluating the BMP Prioritization Methodology. A Working Group was created that included WAC Board members and staff, along with staff from DEP, CCE, SWCD and NRCS. The agreed upon evaluation strategy included the following components:

1. Conduct an analysis of actual BMP implementation data from 2008-2013, which includes three years prior to the BMP Prioritization Methodology being adopted (2008-2010) and three years during which prioritization was used to develop the annual BMP workload (2011-2013).
2. Complete a survey of large and small farm WAP participants to determine their knowledge and satisfaction with the new BMP Prioritization Methodology and to assess BMP implementation concerns on their farms.
3. Review annual status reviews to ensure that high priority water quality issues and/or failing BMPs are being identified and addressed in a timely manner.

3.1 BMP Database Analysis

In order to understand how Prioritization has affected the proportion of BMPs implemented in various pollutant categories during the past three years (2011-2013) in comparison to the preceding three years (2008-2010), please refer to Figure 2. Pollutant categories II and III are not included because these BMPs address pesticide and fertilizer mixing and storage, which in the watershed are generally not major concerns given that most farmers hire professional pesticide applicators and don't store fertilizers on their farms. The minimal nature of pollutant categories II and III is further confirmed in Table 1 where no Pollutant Category III BMPs are identified and only two Pollutant Category II BMPs are identified at a total cost of $10,000.

Overall, the trends documented in Figure 2 show that BMP Prioritization is directing the WAP to implement higher priority BMPs that provide the greatest protection of water quality while ensuring that older and/or failing BMPs are repaired or replaced in a relatively timely manner. Prior to the adoption of Prioritization, the largest percentage of BMPs being implemented each year were in lower priority pollutant categories (V-XI); after Prioritization

was adopted, the percentage of BMPs being implemented in higher priority pollutant categories I and IV increased significantly. The data also show that CREP and riparian buffer BMPs have remained relatively constant during 2008-2013, averaging about 10% of all BMPs implemented by cost, while the percentage of BMP repair/replacement increased about six-fold.

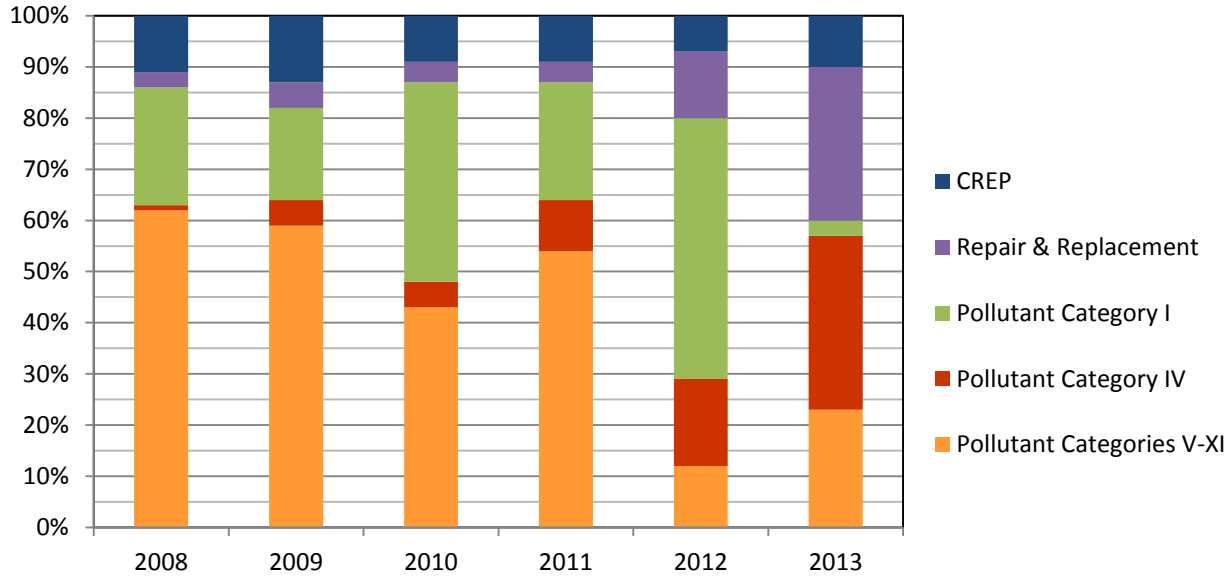

Figure 2. Percent distribution of BMP implementation and prioritization for 2008-2013.

3.2 Farmer Surveys

A farmer feedback survey was developed to assess the knowledge and satisfaction of WAP participants with regards to BMP implementation and prioritization. WAP staff organized three separate focus group meetings that were attended by 19 participants while 12 participants were randomly selected and contacted directly by members of the WAC Agricultural Committee to complete the survey. Despite its small sample size (31 farmers representing 11% of all active West of Hudson participants), the farmer survey revealed that respondents already possessed some knowledge of BMP Prioritization, but that it was helpful having Prioritization clearly explained. When asked to rank how well they understood BMP Prioritization before and after the focus group meetings using a scale of 1 to 5 (1 = "not understanding at all" and 5 = "understand completely"), the average response jumped from 2.8 (before) to 4.1 (after).

When asked if there was anything about BMP Prioritization that they still didn't understand, 68% of respondents replied no. Some participants requested clarification on the farm ranking criteria and how failing BMPs affect their priority status. When asked to rank their satisfaction with BMP implementation using a scale of 1 to 5 (1 = "not satisfied" and 5 = "very satisfied"), the majority responded positively with an average rating of 3.6. When asked whether BMP delays impacted their operations, slightly more than half indicated "yes" with barnyard issues, livestock fencing repairs and manure storage issues being cited most often. It was difficult to identify other trends from the limited amount of feedback, but it's worth noting that some farmers requested that the WAP place higher priority on dairy farms or farms that are

likely to stay around in the future and not go out of business, and some farmers recommended that the WAP focus more on large farms instead of small farms. The one consistent theme that most farmers expressed was a desire to see BMP implementation accelerated if possible.

3.3 Annual Status Reviews

The WAP conducts two types of WFP status reviews. During the Basic Status Review, conducted every year, WAP staff meets with participants to review their WFP and to determine if new environmental issues exist or if farm operational changes are planned. During the Comprehensive Status Review, conducted every four years or sooner if needed, WAP staff inspects all BMPs onsite, reviews all operation and maintenance agreements with the participant, and documents all maintenance issues with timelines to correct deficiencies.

It is important to recognize that annual status reviews are qualitative in nature, with planners documenting their observations and farmer feedback on a standardized form which is entered into the WAP database; as a result, it was not possible to generate quantitative data to support this evaluation. However, DEP did review a summary of all planner comments and farmer feedback gathered during the past three years and confirmed that annual status reviews continue to serve a critical function of identifying new or emerging water quality issues while also identifying failing or imminently failing BMPs that need to be repaired or replaced.

When new or emerging water quality issues are discovered that fall within the highest priority pollutant categories, this triggers a WFP revision which in turn allows new BMPs to be recommended and ranked using the BMP Prioritization Methodology. Similarly, when annual status reviews identify failing BMPs that are in need of immediate attention because they pose an imminent water quality risk, these BMPs tend to be bumped to the top of the prioritization list so that repairs or replacement can be made as quickly as possible. In this regard, DEP believes that annual status reviews continue to serve an important role by contributing to the WAP's ability to constantly monitor and prioritize BMP operation and maintenance activities.

3.4 BMP Prioritization Recommendations

Pursuant to this evaluation, DEP concludes that BMP Prioritization appears to be working as intended by allowing the WAP to identify and implement highest priority BMPs on farms posing the greatest risk to water quality. DEP also acknowledges that the WAP has accumulated a "backlog" of BMPs that exceeds the WAP's capacity to implement in a timely manner, and that a growing number of farmers are experiencing BMP delays which has the potential to strain participant relations, especially if failing BMPs are not repaired or replaced.

In DEP's opinion, an inherent tension exists with respect to BMP Prioritization which is worth discussing in the context of the WAP's workload and "backlog" of BMPs. On one hand, a growing number of farms are having WFPs developed or revised that are not being implemented in a reasonable timeframe while a growing number of older BMPs need repair or replacement; the latter issue is particularly important given that $44 million has already been invested in BMPs to improve agricultural infrastructure in the West of Hudson watershed. On the other hand, for Prioritization to work as designed requires that all issues and BMPs get identified,

knowing that Prioritization will be the tool for selecting an appropriate course of action. Thus, it is advantageous and actually necessary to have a "backlog" of BMPs from which to select the highest priority in a given year; the fact that certain BMPs or even certain farms continue to get bumped from year to year is simply a function of their lower risk to water quality given higher priority pollution issues. It is important to recognize that the primary goal of the WAP is to reduce the risk of agricultural pollution from impacting the City's water supply; the goal has never been to address every pollutant issue on every single farm, especially when individual farm conditions and the agricultural landscape as a whole are constantly in flux and given that the WAP is just one component of DEP's Long-Term Watershed Protection Strategy.

The above notwithstanding, DEP has consulted with the WAP partners to identify ways in which BMP Prioritization might be improved so that highest priority water quality issues continue to be addressed in a timely manner while balancing the need to maintain positive relations with program participants. Towards this end, the WAP has created a Working Group to explore implementing the following recommendations over the next several months:

- Revise the farm ranking criteria to give more weight to farms with larger number of livestock, which could be achieved by incorporating animal units into the farm ranking process that currently relies on animal density as criteria.
- Elevate certain BMPs in Pollutant Category VI to be a higher priority within the BMP Prioritization Methodology; this would address WAP staff observations that many concentrated nutrient sources such as barnyards and livestock feeding areas are located close to streams and offer minimal opportunity for runoff to be treated properly, especially when large numbers of livestock are present.
- Establish a fourth BMP funding category that includes farms waiting more than five years for implementation, and assign these farms a specific amount of funding during the annual workload development process so that fewer WAP participants are left waiting years for implementation. This option would not only address BMP delays but it could also improve farmer satisfaction, avoid future participant withdrawals, and maintain current high rates of voluntary participation.
- Continue to utilize annual status reviews as a tool for ensuring that implemented BMPs are working as designed, assessing farms for water quality issues or failing BMPs that need to be repaired or replaced, and remaining engaged with WAP participants. Consideration should be given to improving the qualitative aspect of annual status reviews to further improve the BMP prioritization process.
- Expand outreach efforts to ensure greater numbers of participants fully understand how the WAP makes decisions about BMP implementation and prioritization.

4. Adequacy of current WAP metrics

The 2007 FAD required DEP to review then-current WAP evaluation criteria with input from the WAC Advisory Committee and to submit an evaluation report in December 2010; that report proposed new metrics which were subsequently endorsed and codified in the Revised 2007 FAD. The WAP currently has the following FAD metrics:

1. Develop 50 new WFPs on large, small and East of Hudson farms;
2. Maintain at least 90% active large farm participation;
3. Conduct annual status reviews on 90% on all active WFPs (with a goal of 100%);

4. Maintain current nutrient management plans on 90% of active participating large farms;
5. Make the Nutrient Management Credit Program available to at least 100 farmers; and
6. Implement Precision Feed Management (PFM) on up to 60 eligible farms.

The 2010 WAP evaluation report highlighted a theme that DEP has advocated since submitting its WAP Five-Year Plan in 2008, at which time the WAP began to address BMP repair and replacement. DEP strongly believes that after two decades of expansion from a fledgling ten farm pilot program, the WAP has evolved into a mature successful program with high rates of participation and steady rates of implementation. However, the WAP represents just one individual component of a multi-faceted, multi-barrier, watershed-wide pollution prevention and remediation strategy that also includes other successful programs targeting streams, stormwater, wastewater, waterfowl, wetlands, forestry, invasive species, riparian buffers, and elements such as land acquisition, watershed regulations, water quality monitoring, and education/outreach. Most of these programs didn't exist when the WAP began in 1992, but two decades later the entire watershed is now being managed, conserved or protected through some aspect of DEP's Long-Term Watershed Protection Strategy. With this in mind, DEP has reviewed the adequacy of current WAP metrics and offers several recommendations.

4.1 Develop 50 new WFPs

From January 2012 through December 2014, the WAP has developed 33 WFPs towards achieving the FAD metric of 50, including two large farms, 18 small farms, and 13 East of Hudson farms. Fifteen large farms still decline to sign up for the WAP after two decades of attempted recruitment, which means these farms will continue to operate without a WFP into the foreseeable future regardless of their pollution issues or water quality risks.

On a cumulative basis to date, the WAP has developed 253 large WFPs (186 remain active), 113 small WFPs (100 remain active), and 75 East of Hudson WFPs (67 remain active); 20% of all 441 WFPs developed over the past two decades have become inactive with these farms having nearly $2.5 million worth of BMPs implemented. With particular regards to small farms and East of Hudson farms – two programs which were initiated after the original 85% participation goal for large West of Hudson farms was surpassed – the WAP has already developed WFPs covering a large majority of animal units on both types of farms, with new WFPs now being developed on small and East of Hudson farms that have animal units in the single digits as well as East of Hudson farms that are not located in FAD basins.

As stated earlier, constantly expanding the WFP portfolio creates a growing BMP workload that impacts the WAP's capacity to optimize resources to achieve maximum water quality benefits. Even with the ability to prioritize implementation, one concern repeatedly expressed by staff and participants involves the growing number of farms that experience BMP delays from one year to the next, which has the potential to create dissatisfaction and threaten the 90% participation metric (to be discussed later). In fact, many new WFPs are being approved when the likelihood of these farms having BMPs implemented within 2-3 years is unlikely; these WFPs will become outdated and have to be revised before BMP implementation can occur, which in DEP's opinion is not the most productive use of limited WAP resources.

The WAP is especially concerned about BMP implementation delays during the next few years as a result of CREP re-enrollment (CREP and riparian buffer BMPs are the highest priority). The anticipated wave of 144 potential CREP re-enrollment contracts during 2015-2019 will further compete for limited WAP resources with other important activities such as new WFP development, WFP revisions, BMP implementation, and annual status reviews. DEP believes that pursuing the development of 50 new WFPs that may or may not be implemented for several years will potentially divert WAP resources away from other priorities or emerging issues.

<u>Recommendation</u>: DEP recommends that the requirement to develop 50 new WFPs on large, small and East of Hudson farms be replaced with a reporting requirement on the number of new WFPs developed each year. This recommendation takes into account that the WAP has already developed 33 new WFPs in the last three years alone, which brings the current portfolio of active WFPs to 353 large, small and East of Hudson farms; developing an additional 17 WFPs to meet a numeric FAD metric while not necessarily producing measurable improvements in water quality will instead have the effect of expanding the portfolio of WFPs needing annual status reviews and eventual revisions while increasing the workload and causing further BMP delays on farms. DEP believes that after two decades of working with more than 350 active farms, the WAP has reached a point of maturity where developing new WFPs should become an internal programmatic decision as opposed to a required FAD metric.

4.2 Maintain 90% participation of large farms

Following the development of WFPs on the original ten pilot farms in 1994, one of the first numeric metrics established for the WAP was to achieve 85% voluntary participation of all large commercial farms in the West of Hudson watershed by 1997. At that time, the universe of large farms was 350, which meant the 85% participation goal was set at 297 farms; this original metric was achieved by the deadline and has been maintained ever since, with participation rates exceeding 90% for the past 15 years and hitting its highest level of 96% in 2010. Currently, the known universe of large West of Hudson farms is 211, of which 196 farms (93%) are WAP participants and 186 of these participants (95%) have WFPs.

Although DEP believes that high rates of participation is important, having to maintain 90% participation in the face of BMP delays and related challenges can limit the WAP's ability to remain flexible and responsive to shifting internal priorities. For example, at least 61 large farms and 44 small farms have not experienced implementation in the last six years, with farmers expressing frustration during routine interactions with WAP staff and as documented in their annual status reviews. On the flip side, these 105 farms represent only 2,814 animal units (about 17% of all animal units on participating large and small farms), with 44% having ten or less animal units; this data suggests that while Prioritization targets highest priority farms, it has a secondary effect of delaying BMP implementation on lesser priority farms.

One potential concern is that farmers waiting for BMP implementation may choose to withdraw from the WAP out of frustration or dissatisfaction. However, it is worth noting that only eight farms total (four large and four small) have actually withdrawn from the WAP during its two-decade history, while one large farm was suspended; for the eight participants who withdrew, only one farmer cited BMP implementation delays. Other reasons cited included

farmers moving out of the watershed, farmers retiring from farming, or farmers selling their livestock. This data suggests that while farmers may threaten to withdraw, the benefits they receive as participants likely outweigh their frustrations over BMP delays.

Looking to the future, DEP feels that maintaining 90% participation in a *voluntary* program is somewhat contradictory and less relevant as a FAD metric given the WAP's two-decade long successful track record. First, the universe of farms is constantly in flux, not only when farm operations change or farms become inactive, but also because new farms start up and/or small farms become large farms and vice versa; in this regard, trying to calculate participation rates within a particular demographic of large or small farms becomes more of an accounting exercise and less reflective of the WAP's actual accomplishments. In DEP's opinion, it is more important to recognize that the WAP is engaged with 286 active farms in the West of Hudson watershed and less important to distinguish whether these farms are large or small for the purpose of calculating an arbitrary participation rate.

Recommendation: DEP recommends that the 90% large farm participation metric be replaced with an annual reporting requirement for the number of active large, small and East of Hudson WAP participants in a given year; this would eliminate the need for the WAP to track small versus large farms for the purpose of achieving a numeric FAD metric and it will also provide the WAP with enhanced flexibility to internally address programmatic priorities such as maintaining good farmer relations across the watershed.

4.3 Conduct annual status reviews on 90% of all active WFPs

The WAP has conducted annual status reviews on more than 90% of all active WFPs (large, small and East of Hudson farms) since at least 2011 and DEP continues to support this metric given the importance of monitoring WFP maintenance and BMP status while remaining engaged with WAP participants on a regular basis. Annual status reviews remain an extremely useful tool for ensuring that implemented BMPs are working as designed while assessing farms for new water quality issues; annual status reviews also provide the WAP with a consistent opportunity to assess farmer satisfaction and gather feedback to improve the program.

Recommendation: DEP recommends that this metric remain unchanged.

4.4 Maintain nutrient management plans on 90% of all active participating large farms

Nutrient management planning continues to be an effective tool for improving the distribution of nutrients on farms and reducing the risk of excess nutrients entering watercourses. The WAP has exceeded this metric every year since 2011 and is on track to achieve this metric moving forward. However, similar to DEP's justification for developing fewer than 50 WFPs and moving away from a numeric participation metric for large farms only, DEP believes it would be advantageous for the WAP to continue nutrient management planning on all eligible participating farms without having to target a numeric FAD metric.

Recommendation: DEP recommends that the 90% nutrient management planning metric on large farms be replaced with an annual reporting requirement for the number of nutrient

management plans completed or updated on active large and small WAP participants in a given year; this would enhance the WAP's flexibility to internally address nutrient management planning priorities and to focus efforts on highest priority farms that need it most.

4.5 Make the Nutrient Management Credit Program available to 100 participants

The 2007 FAD required the WAP to expand its Nutrient Management Credit (NMC) Program to 80 farms in the Cannonsville basin; this metric was surpassed during 2007-2010, with a handful of farms outside the Cannonsville basin also being enrolled. In 2010, the WAP received federal grant funding through the Agricultural Water Enhancement Program to enroll 33 new farms in the NMC Program over a three-year period, which resulted in 91 participants in 2011, 102 participants in 2012, and 113 participants in 2013. The Revised 2007 FAD codified this expansion by requiring the WAP to make the NMC Program available to at least 100 watershed farmers (without any basin restrictions), with 115 farmers enrolled in 2014.

DEP believes that the NMC Program remains an important component of the WAP, since it focuses on high priority BMPs that address the important issues of nutrient management, manure spreading and record-keeping. Another positive aspect of the NMC Program is that it allows the WAP to work with some farmers who are not having BMP implementation or who possibly experienced BMP delays; in this regard, the NMC program offers benefits to a broad range of farms and allows the WAP to maintain positive relations among participants.

<u>Recommendation</u>: DEP recommends that this metric remain unchanged.

4.6 Implement Precision Feed Management (PFM) on up to 60 eligible farms

Pursuant to the Revised 2007 FAD, in September 2014 DEP submitted a proposal for implementing PFM on up to 60 eligible farms beginning in FY'16. To maximize water quality benefits, DEP proposed focusing PFM eligibility on farms located in the Cannonsville basin, which is similar to the approach initially used for the NMC Program and which aligns with a suggestions offered by the NYSDOH during the 2010 WAP evaluation, which was to consider prioritizing implementation based on specific water quality issues associated with individual reservoirs. The PFM proposal described a potential pool of 79 active dairy farms and 11 active beef farms; sixty-four of these farms (71%) are in the Cannonsville basin and they represent 74% of all animal units amongst the 90 potential participants. The proposal described a phased approach for enrolling up to 20 farms each year over a three-year period.

In October 2014, the FAD regulators approved DEP's proposal to implement PFM on up to 60 farms in the Cannonsville basin, noting that water quality benefits would be greatest in this basin compared to other reservoirs. DEP is currently working with WAC and CCE to flesh out PFM eligibility criteria, execute a WAC contract change order to fund and staff this new program, and to better assess and determine actual program participants.

<u>Recommendation</u>: DEP recommends that this metric remain unchanged while also recommending that any future decisions to implement PFM beyond the current three-year commitment take into account a cost/benefit evaluation of current program efforts.

5. Summary

This report satisfies the following FAD deliverables for the WAP: (1) summarize BMP implementation status; (2) evaluate the new BMP Prioritization Methodology; (3) review the adequacy of current WAP metrics; and (4) justify developing fewer than 50 new WFPs.

Overall, DEP feels that BMP Prioritization is serving its intended purpose by directing the WAP to implement BMPs that provide the greatest protection of water quality while ensuring that older/failing BMPs are repaired or replaced in a timely manner. DEP also feels that after two decades of pursuing aggressive FAD planning and implementation goals, it is increasingly important for the WAP to maintain positive participant relations in part by focusing on its current portfolio of WFPs and its existing "backlog" of BMPs. In this regard, DEP recommends potential revisions to the BMP Prioritization Methodology so that certain pollutant risks are elevated while a broader range of farms are able to receive some BMP implementation in a timelier manner. DEP also recommends that certain numeric FAD metrics be replaced with reporting requirements similar to other FAD programs, so that the WAP can become more responsiveness to internal issues and emerging priorities. After two decades of on-the-ground experience, the WAP is no longer a new or untested pilot program but rather a fully integrated component of DEP's comprehensive Long-Term Watershed Protection Strategy.