

Assessment, verification and continuous improvement to achieve TMDL WIP Targets

Virginia Resource Management Plan
Regulatory Advisory Panel
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Our Mission:

A science-based nonprofit working to strengthen private and public sector efforts to reduce nutrient pollution of rivers, lakes and coastal waters

Our work relative to the VA RMP

- On-farm assessment and verification of conservation implementation*
- Identification of opportunities and issues to enhance on-farm conservation relative to TMDL WIP (recommendations)*
- Quantitative estimates of impact of existing and recommended practices and systems based on CBP WSM loads*
- Development of Continuous Improvement Program to achieve WIP
 - biennial agreement and add practices to achieve WIP in 4-6 “CIP cycles”**
- Biennial assessment of progress towards agreed implementation*



Creating a statewide (basinwide?) model for achieving WIP targets: What we have done so far?

- **2009:** Beta test in Shenandoah Valley to develop process
 - Completed 33 beta test farms; starting 2 year reviews
- **2010-11:** Pilot project in Shenandoah Valley to verify process developed during Beta test on 50 additional farms
- **2010+:** Farm to Table: Testing/adapting approach on ~30 direct marketing farms
- **2011+:** Muddy Creek Project: Enroll 75%+ of ag land and animals in WSI program and monitor (with VA Tech) to determine long term changes in wq
- **2011+:** Scaling up approach: 40 new farms in Tidewater and Accomack County to adapt approach to “all” major cropping systems in VA and most in CB w/s
- **2011+:** Assisting small dairies in implementation needs to meet WIP goals
- **2010-12+:** Running scenarios for all NFWF final proposals and running scenarios provided by EPA Enforcement Division following inspections of Pa and VA farms to determine impacts of BMP/management changes



A-V-CI

Assessment, Verification and Continuous Improvement to meet TMDL WIP Targets

- Assess current implementation, issues and opportunities
- Verify/document existing water quality practices
- Identify and document issues, opportunities and challenges
- Estimate impacts of current management and BMPs
- Identify “issues” that need addressing and potential new practices
- Develop initial CIP to move farm towards WIP targets
- **Provide quantitative estimates of reductions from existing and recommended BMPs using WSI Nutrient Load Estimator (NLE)**
- **Send farmers to project partners -NRCS, SCD, Ext, Crop Advisors, etc**



Water Stewardship's Approach

- Farm enrollment; sign confidentiality agreement
- Pre-visit information compilation
- On-site assessment for BMP verification, opportunities & issues
- Develop draft CIP with potential new BMPs/management changes
- Use Nutrient Load Estimator (post processor for EPA WSM landuse loads) to estimate “No BMP”, Existing and CIP loads
- CIP delivery, practice selection and sign-off by farmer
- Try to get at least one third of additional needed reduction in first cycle and plan to achieve target in 4-6 CIP cycles





What makes this unique/innovative?

- Independent third party accountability
- Whole farm systems approach to water quality protection
- Farmers seem more willing to have private sector “auditor”
- Farmer participates ; selects practices based on recommendations
- Incremental approach; recurring review of existing/new practices
 - Consistency with statutory requirements
- **Quantitative estimate of reductions toward farm level target**
- **The Continuous Improvement Program**



CONTINUOUS IMPROVEMENT PLAN DEVELOPED FOR DAIRY FARM

The load reductions listed in this document are estimates of the annual edge of stream load reduction that would occur when a practice was implemented on your farm compared to existing conditions (which include existing BMPs and assume that the conservation baseline practices have been implemented). *When the CIP practices are incorporated into the farm load calculations, the reductions from the resulting multi-BMP scenario will likely be lower than if the individual CIP practice reductions were simply added together. This is due to the sequencing and interaction between BMPs that occurs in a multi-BMP scenario.*

No BMP farm load: 13,868 lbs N 739 lbs P

Existing farm load: 12,741 lbs N 649 lbs P

(8% N reduction, 12% P reduction achieved from the No BMP load)

VA Tributary Strategy load needed to achieve a 55% load reduction:

6,240 lbs N 333 lbs P

#1 Practice to be Implemented

Get an updated NMP and implement nutrient management recommendations

Impact: If a Nutrient Management Plan is implemented, it would result in a reduction of approximately 1,321 lbs N and 46 lbs P

Implementation date: 2011-2013

Notes _____

#2 Practice to be Implemented

Install gutter on heifer barn to avoid runoff into bare lot

Impact: If confinement area water management is implemented on facilities, the reduction would be lbs 71 N and 3 lbs P

Implementation date: 2011-2013

Notes _____

#3 Practice to be Implemented

Install an additional dry pack barn to avoid denuded pasture for milking herd & heifers

Impact: If a covered loafing area is installed for 75 cows, the reduction would be 82 lbs N and 5 lbs P

Implementation Date: 2011

Notes _____

#4 Practice to be Implemented

Discontinue fall manure application to small grain silage

•Use as true cover crop



#8 Practice to be Implemented **Rental Lands / Purchasing New Lands**

Impact: Will be property dependent. In decision process for new rental lands or purchasing of new lands, consider the existence of *verifiable* conservation practices that will reduce nutrient losses. Also, check P status of any lands; aim to have soils < 281 ppm (562 lbs/A) P(Mehlich III).

Implementation date: **Ongoing**

Notes _____

In summary, if all of the CIP practices are implemented the farm loadings and reductions would be as follows:

CIP Scenario load: 8,976 lbs N 367 lbs P
(35% N reduction and 50% P reduction achieved from the No BMP load)

For further information contact:	Dale Gardner with Water Stewardship	540-246-2839
	Local NRCS Office for technical assistance	540-433-2853
	Local Va DCR Office for technical assistance	540-433-2853

I agree to work toward the following practices #____, #____, #____, #____, #____, #____, #____ and #____ as presented in this Plan and will partner with Water Stewardship, Inc. to implement the Plan.

_____ (Farm Owner/Operator) _____ (Date)

_____ (WSI Staff Member) _____ (Date)

Additional Notes: (Optional)





Nutrient Load Estimator (NLE) Results: Scenario Comparison

Animals

Animal Type	Number	Confinement Fraction	Denuded Pasture Fraction
Dairy Cows	75	0.7	0.3
Dairy Heifers	65	0.5	0.5

Landuse Acres

Landuse	No BMP Acres	Existing Acres	CIP Acres
Row Crops	133	0	0
Row Crops- Low Till	0	132.3	0
Row Crops w/ Nutrient Mgmt- Low Till	0	0	132.3
Unfertilized Grass	0	1	0.9
TOTAL	160.2	160.2	160.2





Existing Landuse Change and Efficiency BMPs

BMP	Landuse	Amount Submitted	Amount Credited
Conservation Tillage	Row Crops	133 acres	133 acres
Grass Buffers (Agriculture)	Row Crops- Low Till	0.7 acres	0.7 acres

CIP Landuse Change and Efficiency BMPs

BMP	Landuse	Amount Submitted	Amount Credited
Conservation Tillage	Row Crops	133 acres	133 acres
Nutrient Management	Row Crops- Low Till	133 acres	133 acres
Grass Buffers (Agriculture)	Row Crops w/ Nutrient Mgmt- Low Till	0.7 acres	0.7 acres
Commodity Cover Crop- Standard Other Barley	Row Crops w/ Nutrient Mgmt- Low Till	133 acres	132.3 acres
Continuous No-Till	Row Crops w/ Nutrient Mgmt- Low Till	133 acres	132.3 acres





Existing Animal BMPs

BMP	BMP Location	Animal	Time Confined	Amount Submitted	Amount Credited	Unit
Mortality Management	Animal Confinement Area	Dairy Cows	0.7	75	75	Total flock or herd size

CIP Animal BMPs

BMP	BMP Location	Animal	Time Confined	Amount Submitted	Amount Credited	Unit
Covered Feeding Area and Pasture Management	Denuded Pasture	Dairy Cows	0.7	75	75	Animals
Covered Feeding Area and Pasture Management	Denuded Pasture	Dairy Heifers	0.5	65	65	Animals
Mortality Management	Animal Confinement Area	Dairy Cows	0.7	75	75	Total flock or herd size





Edge of Stream Nutrient Loads

No BMP N Load (lbs/yr)	Existing N Load (lbs/yr)	CIP N Load (lbs/yr)	No BMP P Load (lbs/yr)	Existing P Load (lbs/yr)	CIP P Load (lbs/yr)
13,867.8	12,740.8	8,976.3	739.0	649.4	366.7

Load Reduction Percentages from No BMP Load – Edge of Stream

Existing N Load (%)	CIP No Load (%)	Existing P Load (%)	CIP P Load (%)
8.1	35.3	12.1	50.4

(We are evaluating moving toward a
“WIP Farm Load” based on state Ph. 2 WIPs)



Pilot Program Results: No BMP to Existing

Average Percentage Reduction

Farm Type	# of Farms	Total Nitrogen	Total Phosphorous
Beef	7	22% (9-42%)	38% (11-51%)
Beef-Poultry	13	17% (6-34%)	26% (12-49%)
Dairy	21	17% (5-36%)	26% (8-48%)
Dairy-Beef	2	18% (9-27%)	21% (21-21%)
		15% (14-15%)	20% (18-22%)
Poultry	5	14% (8-19%)	19% (12-26%)
ALL	50	17% (5-42%)	26% (8-51%)



Pilot Program Results: No BMP to CIP

Average Percentage Reduction

Farm Type	# of Farms	Total Nitrogen	Total Phosphorous
Beef	7	31%	51%
Beef-Poultry	13	26%	45%
Dairy	21	34%	46%
Dairy-Beef	2	28%	40%
Dairy-Poultry	2	34%	52%
Poultry	5	31%	46%
ALL	50	31%	47%





Third Party Verification - A Farmer's Perspective

Anthony Beery

Beery Farms Inc.

Mt. Crawford, VA

July 19, 2011

**As presented at The International Soil
and Water Conservation Society Meetings
July 19, 2011, Washington, DC**

Why do we need Third Party Verification?

- Decrease Nutrient Losses through a Systematic Approach
- Provide assurance to government and/or consumers of applied conservation practices
- Improve Farmers viability and profitability



Advantages of 3PV over Regs

- Positive steps vs. coerced “improvements”
- Real world solutions vs. mandated goals
- Greater flexibility to maximize resources available
- Income producing potential



Why I Chose to Participate

- 3PV will provide better results than regulation
- Encourages conservation, while providing a verifiable system
- Potentially permits consumers to participate via product purchases
- More flexibility for producer



Observations

- 1. Substantial existing practice implementation but not at levels expected by TMDL WIPs**
- 2. Needed reductions achievable on most farms, but:**
 - Need alternative uses of manure**
 - Will require widespread BMP implementation**
 - May require some changes in cropping systems and limited, strategic land retirement (~5-10%)**
 - Hardest for animal agriculture but hard for all**
- 3. Local, state and CBP BMP definitions and expectations vary**
- 4. Practices need to match “efficiency definitions” of efficiencies need to be adjusted**



Value of Assessment, Verification & Continuous Improvement

- 1. Concept of private sector, third party confidential assessment resonates well with farmers**
- 2. Provides incremental continuous improvement with defined targets and quantitative assessment of recommended practices**
- 3. Biennial review & update of CIP allows farmer to “transition to success”**
- 4. Third party assessment, verification and continuous improvement can provide “reasonable assurance”**



Closing Thoughts

- **Beta and pilot programs well accepted by SV Farmers**
- **Recruiting new farmers and business for SCDs, NRCS, Ext.**
- **A-V-CI process/protocols can (and will) be used or adapted by other public or private organizations**
- **Provides a farmer based, structured approach to achieve WIP goals over time, with recurring assessment and adaptive management to meet WIP goals**
- **Whole farm continuous improvement approach is critical regardless of statutory nature of program**

