Frank Coale, Ag Workgroup Chair
Mark Dubin, Ag Workgroup Coordinator

AG BMP IMPLEMENTATION VERIFICATION

Verification Steering Committee Meeting September 12, 2012

OBJECTIVES

- Develop an agricultural BMP verification protocol recommendation by January 2013 for partnership approval.
  - The Ag Workgroup (AgWG) is currently developing a verification matrix concept that could potentially provide the partnership with multiple verification options.
  - Determine relative data confidence levels for multiple verification options through the identification and use of supporting literature and guidance from regional and national verification experts.

Draft Agricultural Verification Protocol Concept

Chesapeake Bay Program Agriculture Workgroup (AgWG)

6/15/2012

Ag Protocol Category	BMP Inventory Assessment Method	Cost-Share Information				BMP Functionality Information					Verification Methodology	Verification Issues	Relative Cost	Relative Data Confidence	Relative Data Credit
		Federal Cost Share	State Cost Share	NGO Cost Share	Private Funded	Meets Specs	Functional Equivalent	Partially Effective	Not Effective	Installation Date			Low: < $1/acre Medium:$1 to $3/acre High: > $3/acre	Annual BMP / Structural BMP (5=maximum, 1=minimum)	Annual BMP / Structural BMP (% of Approved BMP Effectiveness Value)
On-farm Assessment	Farm inventory by trained federal, state, and/or county agency personnel.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Through on-site visit by trained personnel, collecting data, check databases, check on-farm records	Accredited data source through training/certification	High	5 / 5	
On-farm Assessment		Yes	Yes	Yes	Yes	Yes			Yes	Yes	Through on-site visit by trained personnel, collecting data, check databases, check on-farm records	Accredited data source through training/certification	High		

BMP Functionality Information

BMP Inventory Assessment Method	Cost-Share Information	Meets Specs	Functional Equivalent	Partially Effective	Not Effective	Installation Date	Relative Cost	Relative Data Confidence	Relative Data Credit
	Federal Cost Share						Low: < $1/acre Medium:$1 to $3/acre High: > $3/acre	Annual BMP / Structural BMP (5=maximum, 1=minimum)	Annual BMP / Structural BMP (% of Approved BMP Effectiveness Value)
Farm inventory by trained federal, state, and/or county agency personnel.	Yes						High	5 / 5	

OBJECTIVES

- Currently, options identified by the AgWG verification concept fall into five categories:
  - On-farm assessment by trained personnel;
  - Farmer self-assessment, with or without spot check by agency personnel;
  - Review of existing agency or on-farm records;
  - Statistical sampling; and
  - Remote sensing.

OBJECTIVES

- For each option, the AgWG is seeking available supporting documentation to determine relative data confidence values, Relative data credit values could potentially be correlated to the relative data confidence (the two rightmost columns in the draft data matrix).

- Why?
  - Relative data confidence can provide an indication of how reliable the data are (i.e., what is the level of assurance that the BMPs are implemented, maintained and operated to result in pollutant reductions of a specified magnitude).

  - Relative data credit is one option being considered that could provide the modeling response to varying data confidence levels.

OBJECTIVES

- In response to the recent AgWG request for assistance, Tetra Tech (Tt) is providing technical assistance to help obtain scientifically defensible verification references from which to support the verification concept and provide a basis for assigning relative values.

PROCESS

- Information search:
  - Peer-reviewed literature.
  - Agency literature.
  - CTIC's crop residue transect surveys.
  - NACD's draft verification protocols for non-cost-shared BMPs.
  - Recommended leads from partners and staff.

PROCESS

- Literature on BMP implementation verification is extremely limited (27 publications of interest).
- Interviews were essential.
  - Tt interviewed 19 professionals identified by the AgWG from August 2 to August 22, 2012.
  - Questionnaire sent in advance.
  - 1-hour call.
  - Confidential.
  - As of September 6, 2012 17 of 19 interviewees had reviewed and approved Tt's interview summary.
  - Interviews generated additional literature and experts to consider.

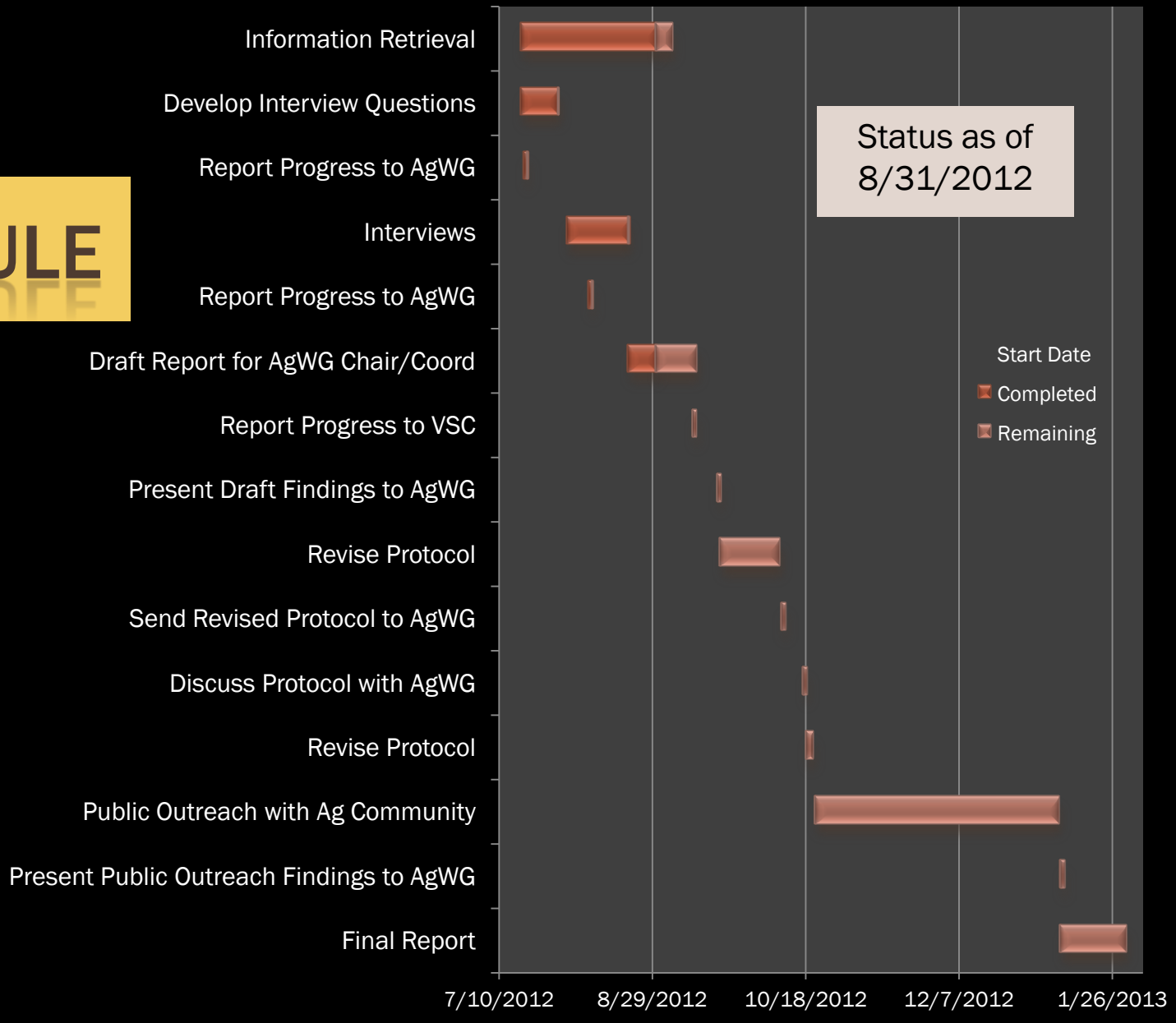
PROCESS

- Drafts of literature/interview summaries and verification protocol report to be presented to and discussed with the AgWG in concert with regularly scheduled meetings.
- Drafts to be revised between meetings and comment periods (see schedule).
- Finalized literature/interview summaries to incorporated into AgWG verification protocol report for supporting documentation.

PROCESS

- AgWG Chair/Coordinator to conduct public outreach period with agriculture community mid-to-late October through early January 2013.
- Findings of Tt search, public outreach and partnership comments to be incorporated into modified verification concept for AgWG review and approval by mid-January, 2013.
- Final AgWG verification protocol report with supporting Tt documentation by end of January, 2013.

SCHEDULE


Information Retrieval
Develop Interview Questions
Report Progress to AgWG
Interviews
Report Progress to AgWG
Draft Report for AgWG Chair/Coord
Report Progress to VSC
Present Draft Findings to AgWG
Revise Protocol
Send Revised Protocol to AgWG
Discuss Protocol with AgWG
Revise Protocol
Public Outreach with Ag Community
Present Public Outreach Findings to AgWG
Final Report
Status as of 8/31/2012
Start Date
Completed
Remaining
7/10/2012
8/29/2012
10/18/2012
12/7/2012
1/26/2013

PRELIMINARY FINDINGS FROM LITERATURE

- On-farm/trained personnel
  - MD
  - Water Stewardship, Inc. – VA, MD
  - Retrospective – Black Creek, IN (Bracmort et al. 2006)
- Farmer self-assessment/with or without check
  - MN – survey/selected field audits
  - Everglades – field verification of farmer-submitted BMP plans
  - FL – tracking filed NOI

PRELIMINARY FINDINGS FROM LITERATURE

- **Agency/On-farm records**
  - GA – ARS watershed BMP database from NRCS files and maps
  - MS – BMP database from EQIP, CRP records
- **Surveys and statistical sampling**
  - FL, VA, OK, Canada – farmer surveys
  - CEAP ARMS – NRI
  - CTIC tillage survey (roadside transect)
  - EPA Ag Tracking Guidance (2000) statistically rigorous

PRELIMINARY FINDINGS FROM LITERATURE

- Remote Sensing
  - CBW – cover cropping (Hively)
  - GA – satellite mapping of conservation tillage

PRELIMINARY FINDINGS FROM LITERATURE

- **Hybrid approaches can be robust**
  - IA – NRCS records, aerial photography, field-by-field drive-by (Tomer et al. 2008)
  - IN – Agency records, producer interviews, aerial photography → no one approach documented all BMPs (Grady et al. 2012)
- **Essentially no quantitative documentation of accuracy/confidence has been reported**
  - Exceptions: NASS, remote sensing, CTIC

PRELIMINARY FINDINGS FROM LITERATURE

- Verification of structural, annual, and management practices will likely require different methods, have different information content and accuracy.
- Hybrid approaches probably have best potential to provide complete and accurate information.

PRELIMINARY FINDINGS FROM LITERATURE

- **Studies show that BMP function cannot be assumed even if presence verified in records**
  - UT – 16% of "implemented" BMPs never installed; 20% abandoned(mostly management) (Jackson-Smith et al. 2010)
  - IN – 1/3 of BMPs no longer exist; remainder partially functional with efficiency << originally rated (Bracmort et al. 2006)
  - Concentrated flow significantly degrades performance of riparian buffers (Dosskey et al. 2002)
  - BMP reduction efficiencies are site specific, vary with topography, hydrology, land use → danger of assigning absolute values (Sharpley et al. 2009)

PRELIMINARY FINDINGS FROM INTERVIEWS

- All practices – c/s and non-c/s – should be subject to the same verification standards to get full credit.
- Incentives are important – Nutrient Trading and TMDL encourage effective verification.
- Conservation and ag professionals should play key roles; training 3rd parties can be effective.
- Farmer self-assessment may work, but clear definitions of BMPs are required.

PRELIMINARY FINDINGS FROM INTERVIEWS

- Mix of protocols required – large-scale practices like cover crops and tillage can be verified with statistical sampling and remote sensing, but verification of management must come from on-the-ground presence.
- All verification protocols must be scientifically and statistically defensible.

NEXT STEPS

- The next AgWG meeting scheduled for September 20th to consider Tetra Tech literature search and expert interview findings.
- The current draft agriculture verification concept will be discussed to identify potential modifications to reflect the supporting documentation.
- A revised draft concept will be developed utilizing the Tetra Tech findings and partnership comments for review during the October 11th AgWG meeting.

NEXT STEPS CONTINUED

- Informational meetings will be held directly with representatives of the Bay jurisdictions to discuss the revised draft agriculture verification concept.

- An informational webinar targeted towards agricultural commodity and advocacy organizations, and the agricultural community is being planned. It will provide information on the revised draft verification concept, address questions, and seek increased involvement in the process.

CONTACTS

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