Report of the Agricultural Loading Rate Review Subgroup
Thomas Jordan, SERC
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The Agricultural Loading Rate work group was formed to help provide estimates of loading rates from various agricultural land types for use in Phase 6.0 of the Chesapeake Bay Watershed model.

We first met on March 25, 2015, to examine information on loading rates in published studies reviewed by Tetra Tech (TT) and in unpublished studies compiled by Sally Szydlowski of Water Stewardship. The TT review includes a summary document reporting mean loading rates gleaned from the published studies, but before accepting these rates, we examined the database on the studies that TT assembled in a spreadsheet.

We were concerned by some aspects of the TT review. TT noted that loading rates seemed to rise sharply in reports published after 1995 and therefore chose to ignore reports from before 1995. This concerned us because we could not understand why the rates would rise suddenly in 1995. TT attempted to adjust loading rates if BMPs were present to estimate the loading without BMPs. We wanted to understand how this was done. Some of the studies were from regions distant and different from the Chesapeake watershed. We felt that such studies should probably be excluded when estimating loading rates for the Chesapeake watershed. Some of the loading rates in the TT review were from models and some were based on measurements. We wanted to examine those based on measurements first.

After our initial meeting, Gary Shenk examined the TT review and noted that only 4 of the 76 studies cited were within the Bay watershed, used measurements rather than modeling, and did not attempt to adjust for BMP effects. Those 4 studies were for corn and corn rotations. Only 12 of the 76 studies were in the Bay watershed but there may be applicable information in studies outside of the Bay watershed but in comparable regions.

In a subsequent phone conference March 31, 2015, the work group discussed short-term and long-term approaches to obtaining the best estimates of agricultural nutrient loading.

The short-term plan would address the immediate need of the modelers to have estimates of relative loading rates for various agricultural land types by April 17th. This would rely on best professional judgment from experts within the work group who would rely on their own knowledge and information assembled by TT and Water Stewardship. Phase 5.3.2 loadings may in some cases be a useful starting reference point. Different members of the work group will focus on different crop types and on surface runoff loads or subsurface leaching loads (primarily nitrate leaching) according to expertise. We will set loading rates relative to corn grown for grain without manure applications. There is more information on loadings for this crop type than for others. Also, this type of corn crop is likely to be a major source of agricultural nutrients released from the Bay watershed. We recognize that loadings of some agricultural land types such as pasture may be very variable and poorly understood. Also, an understanding of nutrient sinks in riparian zones and wetlands will be crucial to understanding delivery of agricultural nutrient loads.

The group worked toward the short-term goal in a meeting on April 10th. Gene Yagow, Curt Dell, and Jack Meisinger presented data summaries and preliminary loading ratios relative to corn. The group

began filling out a table of loading ratios for all phase 6 crop types. Meetings are scheduled for April 16th and 17th to complete this task.

The long-term plan would replace the short-term estimates with better founded estimates by late summer 2015, which should still allow incorporation into the Phase 6.0 beta model. If another literature review is contracted, the review should be carried out with oversight of a group such as our working group, which would provide guidance in the search and selection of relevant literature or unpublished information. EPA funding has been provided to help support this long-term effort.

Subgroup Participants

Name	Affiliation	Email	Phone
Tom Jordan, Chair	SERC	jordanth@si.edu	(443) 482-2209
Jack Meisinger	ARS	John.Meisinger@ars.usda.gov	(301) 504-5276
Ken Staver	UMD	kstaver@umd.edu	(410) 827-8056 ext.111
Wade Thomason	VT	wthomaso@vt.edu	540-231-2988
Doug Beegle	PSU	dbb@psu.edu	(814) 863-1016
John Spargo	PSU	jts29@psu.edu	(814) 865-9155
Greg Albrecht	NYS-DAM	greg.albrecht@agriculture.ny.gov	(607) 330-1242
Gene Yagow	VT	eyagow@vt.edu	(540) 231-2538
Jim Cropper	NEPC	jbcropper@yahoo.com	(336) 855-7594
Curt Dell	ARS	curtis.dell@ars.usda.gov	(814) 863-0984
Don Weller	SERC	wellerd@si.edu	(443) 482-2214
Technical Support Staff			
Gary Shenk	EPA	gshenk@chesapeakebay.net	(410) 267-5745
Matt Johnston	UMD	mjohnston@chesapeakebay.net	(410) 267-5707
Mark Dubin	UMD	mdubin@chesapeakebay.net	(410) 267-9833
Emma Giese	CRC	egiese@chesapeakebay.net	(410) 295-1380
Sally Szydlowski	WS	sallyb@waterstewardshipinc.org	(443) 699-5173
Olivia Devereux	Tt	olivia@devereuxconsulting.com	(301) 325-7449
Rich Batiuk	EPA	batiuk.richard@epa.gov	(410) 267-5731