

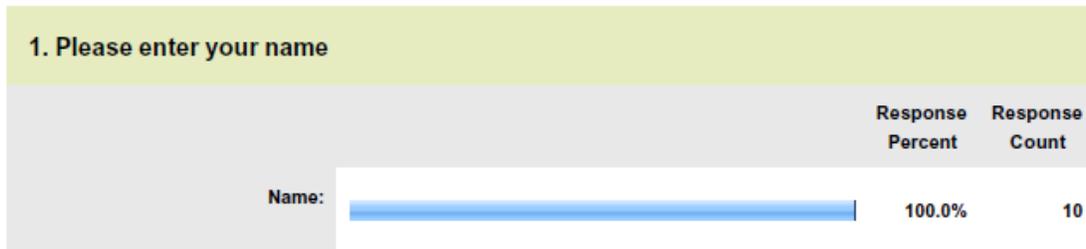
## Overview

In the fall of 2013, staff to the Marcellus Shale Safe Drilling Advisory Commission developed a survey to facilitate discussion about the draft Best Practices report at Commission meetings. In a non-binding, preliminary manner, Commissioners were asked to state whether they agreed or disagreed with each recommended best practice, and to indicate what changes they would suggest to the recommended best practices. The purpose of the survey was to help identify items that were the subject of disagreement among the Commissioners, so that discussions at meetings could be focused on them. Ten Commissioners ultimately filled out the survey. At the September 25, 2013, meeting, Dr. Christine Conn summarized the results. The results have been used by staff to help plan meetings agendas.

Survey Monkey, the internet tool that was used to administer the survey, provided a summary of the results. Staff added to the summary information to identify the responses of each Commissioner to the multiple choice questions. The augmented summary follows.

## SurveyMonkey Results

### Shale Best Practices - Part 1



Please enter your name
Shawn Bender
Steve Bunker
George C. Edwards
Peggy Jamison
Dominick Murray
James M. Raley
Bill Valentine
David A. Vanko
Nicholas E. Weber
Harry Weiss

## 2. Section III - The Comprehensive Gas Development Plan

		Response Percent	Response Count
Favor		30.0%	3
Favor with amendments		70.0%	7
Oppose		0.0%	0
Oppose with amendments		0.0%	0

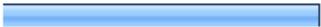
Section III - The Comprehensive Gas Development Plan		
Commissioner	Response	Comment
Bender	Favor with amendments	The concept of the CGDP has merit however, there should be a provision that would allow an operator to drill exploratory wells in a given area prior to developing the entire CGDP. The drilling of exploratory wells is a critical step in developing a CGDP. A consideration would be that these wells be restricted so that no more than 1 exploratory well would fall within any 2.5 mile radius (12,566 acres or approximately 20 drilling units). The sales and/or pipeline tie-in of any exploratory well would not be allowed until the CGDP for that area is completed.
Bunker	Favor	I think this is one of the most important recommendations in the report. The requirement for a CGDP could perhaps be relaxed for limited exploratory drilling.
Edwards	Favor with amendments	The concept of the CGDP has merit, however, there should be a provision that would allow an operator to drill an exploratory well in a given area prior to developing the entire CGDP. A consideration would be that these wells be restricted so that no more than one (1) exploratory well would fall within any 2.5 mile radius (12,566 acres or approximately 20 drilling units). The sales and/or pipeline tie-in of any exploratory well would not be allowed until the CGDP for that area is completed. Mr. Quiggley, from PA, stated that they have to do a full development plan on State land and not allow for exploratory well before hand. The difference between PA and MD is that in PA they are drilling all over the place and have a good idea if there is gas or not in a particular area, unlike MD.
Jamison	Favor with amendments	The concept of the CGDP has merit however; there should be a provision that would allow an operator to drill exploratory wells in a given area prior to developing the entire CGDP. The drilling of exploratory wells is a critical step in developing a CGDP. If the exploratory well is done and it is determined that this is not a good site for drilling, then there will be significant savings in staff time and expenses for the state and savings for the operator as well. A consideration would be that these wells be restricted so that no more than 1 exploratory well would fall within any 2.5 mile radius (12,566 acres or approximately 20 drilling units). The sales and/or pipeline tie-in of any exploratory well would not be allowed until the CGDP for that area is completed.
Murray	Favor	

Raley	Favor with amendments	The concept of the CGDP has merit however, there should be a provision that would allow an operator to drill exploratory wells in a given area prior to developing the entire CGDP. The drilling of exploratory wells is a critical step in developing a CGDP. A consideration would be that these wells be restricted so that no more than 1 exploratory well would fall within any 2.5 mile radius (12,566 acres or approximately 20 drilling units). The sales and/or pipeline tie-in of any exploratory well would not be allowed until the CGDP for that area is completed.
Valentine	Favor with amendments	Adjust setbacks Remove a few required data
Vanko	Favor	An excellent idea and a "gold standard" feature of Maryland's approach. The CGDP process need not be onerous or cumbersome. In that case the industry will welcome it.
Weber	Favor with amendments	The CGDP is acknowledged as a conceptual plan. It currently has no regulatory or statutory basis. Yet it is a premier player in the scheme of Best Practices presented by the Departments. On the surface, this planning aspect has some appeal. A major concern is whether the State can mandate this approach without adequate statutory support. Regulatory and judicial waivers of various parts of the plan could also jeopardize the process and lead to single well permitting activity that would bypass important aspects of the proposed planning process. In addition, statements like "Adhere to Departmental siting policies (to be developed) as a guide to pipeline development..." leaves a large void as to how siting will take place for well pads along with the required additional infrastructure parts of gathering lines as well as gas processing units and compressor stations to protect the environment, and people along with the mitigations and protections. Like so many other aspects of these gas development Best Practices, many specifics or even policy statements as guides for expected protections are largely lacking in this important conceptual outline. Mention is made of a Tool Box to aid the CGDP planning process, however, critical aspects are only hinted at in the outline. An Environmental Assessment (EA) is stated to be part of the process but appears to be conflicted by comments later that possibly other or additional EA requirements are included as part of the permitting process for the individual wells. In addition, MDE acknowledges that its current EA requirements are deficient and will be improved. Furthermore, DNR which is part of the EA review process currently requires an Environmental Impact Statement (EIS) for drilling on certain State lands. This is another example of an incomplete conflicted review process that needs resolution prior to Marcellus Shale gas development. A GIS map of the area that includes important information to be used for planning appears to be an integral part of the CGDP process. However, it has yet to be produced and its specific role to be laid out. Importantly for the GIS document and throughout the entire BP draft recommendations, no mention is made of the statutory protections such as denial of permit involving special natural resources afforded by the Maryland Environmental Code 14-108 available to the Departments as well as those available to DNR under 5-1702 An example of some additional regulatory

		<p>confusion in this conceptual outline revolves around a statement - "Sequence of well drilling over the lifetime of the plan that places priority on locating the first well pads in areas removed from sensitive natural resource values." Two questions arise - How would the Departments require such a sequence and Why would wells drilled later be any less important later than at an earlier time for a prioritization process for sensitive natural resources? Is there an expectation that sensitive natural resources will somehow become less sensitive later? It is important to note that without a risk analysis of the various Best Practice parts that comprise the CGDP process as well as those yet to be developed outlined above and for the ancillary infrastructure parts including gathering lines, gas processing units, and compressor stations, the CGDP concept on its surface is incomplete. Finally, the CGDP concept has not come under broad scrutiny by the public, the industry, or elected government representatives. In addition, the critical aspect of forced pooling that is necessary to optimize gas production and a critical aspect needed to encourage industry support is not a part of the concept except that the Departments say that it is not addressed at this time. Furthermore, the transfer of the conceptual BPs associated with CGDPs to BPs associated with single well development is not addressed, and their loss is not addressed, if the CGDP approach is not adopted.</p>
Weiss	Favor with amendments	<p>Should Maryland determine that it is in the best interests of the state and its people to permit unconventional drilling in the Marcellus formation, then everyone should agree that the drilling should take place in a manner that provides for the most efficient extraction of the resource while at the same time assuring that the environmental, social, and health impacts are minimized to the maximum extent practicable. I think this can be accomplished with or without a Comprehensive Development Plan requirement if the Departments simply apply, during the well-permitting process, the planning principles listed in the current draft of the BMP report at Section III(B) along with all the other command and control provisions of the BMP report (i.e., setbacks, well-casing standards etc). In fact, regardless of the existence of a CDP requirement, MDE's failure to apply the planning principles to permitting decisions would be inexcusable. All in all, I generally support the concept of CDP, particularly on large parcels of contiguous property, but I caution MDE that a workable CDP program will require a significant regulatory undertaking complete with harmonizing the various voices of many stakeholders in the process before it can be successfully rolled out. I also offer the following thoughts that might be considered during the harmonizing process: (a) Because it is not necessarily true that oil and gas companies will acquire, at least in the first instance, an amalgamation of the contiguous parcels of land for which a CDP would work best, application of a CDP requirement could result in interesting "cross-border" issues. For example, a producer with 500 acres leased adjacent to producer with 300 acres leased "goes first" with its CDP plan. Certainly because of the size of the parcels leased, there are limitations on what an approval CDP might look like. Moreover, because a CDP plan almost certainly must take into</p>

		<p>account activity on adjacent parcels whether the operator is the same or not, the holder of the 300-acre parcel almost certainly will find itself limited in what it can do because of the activity next door. (b) Also, one of the obstacles to the ability of individual prospective lessees to acquire an interest in contiguous blocks of land is the strong likelihood that individual landowners may refuse to lease their properties. This problem can become acute in a state like Maryland where there exists no ability of a producer to seek compulsory pooling of the oil and gas resource. The concept of forced pooling generally carries sinister connotations, but it exists in nearly all the oil and gas producing states for the purpose of guaranteeing the most efficient extraction of the resource. Sure, critics of compulsory pooling will note that the programs result in extraction companies spending less money (fewer rigs, fewer drill sites, reduction in infrastructure costs). But note that fewer rigs, fewer drill sites and more efficient infrastructure facilities should result in less impact on the land and thus less environmental impacts (note with or without a CDP requirement). Accordingly, if Maryland selects a mandatory CDP requirement, I believe that it should also consider a compulsory pooling requirement to assure that the state is getting the most out of the CDP requirement. (c) I do understand industry's criticism of the requirement as presently formulated which would require Companies to submit entire drilling plans before engaging in simpler exploratory drilling programs. Thus I propose that the Departments consider the option of submitting a separate exploratory drilling plan that could be converted to a production plan if and when the applicant wishes to bring the broader plan in for approval. (d) In the event that the CDP requirement does not become mandatory, there should be an incentive (i.e., priority or expedited review) for applicants to submit such plans for review.</p>
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**3. Section IV - Location Restrictions and Setbacks Concept that setback requirements shall apply to all gas development activities that result in permanent surface alteration that would negatively impact natural, cultural and historic resources.**

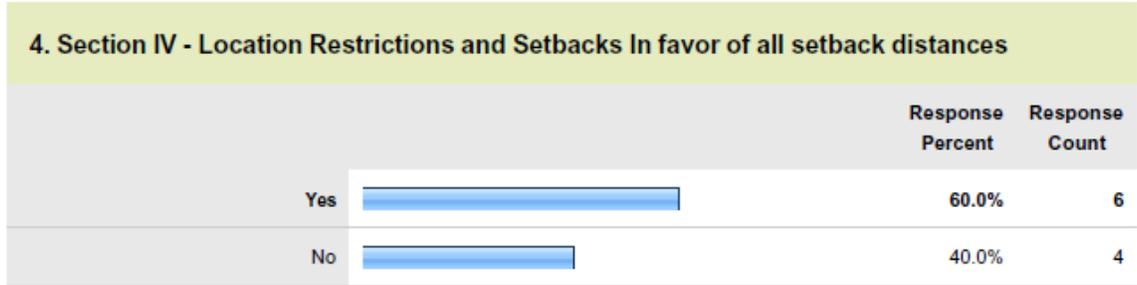
		Response Percent	Response Count
Favor		30.0%	3
Favor with amendments		60.0%	6
Oppose		10.0%	1
Oppose with amendments		0.0%	0

**Section IV - Location Restrictions and Setbacks**

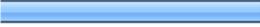
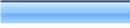
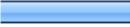
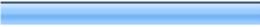
**Concept that setback requirements shall apply to all gas development activities that result in permanent surface alteration that would negatively impact natural, cultural and historic resources.**

<b>Commissioner</b>	<b>Response</b>	<b>Comment</b>
Bender	Favor with amendments	Location Setbacks: Existing regulation needs to be changed to allow wells in the same formation to be closer than 2,000 feet; multi-well drilling pads cannot exist with this regulation.
Bunker	Favor	
Edwards	Oppose	Existing regulation needs to be changed to allow wells in the same formation to be closer than 2,000 feet, multi-drillings pads can not exist with this regulation.
Jamison	Favor with amendments	Location Setbacks: Existing regulation needs to be changed to allow wells in the same formation to be closer than 2,000 feet; multi-well drilling pads cannot exist with this regulation.
Murray	Favor	
Raley	Favor with amendments	Location Setbacks: Existing regulation needs to be changed to allow wells in the same formation to be closer than 2,000 feet; multi-well drilling pads cannot exist with this regulation.
Valentine	Favor with amendments	setbacks should not be standard distances, but based on surrounding topography, geology, etc- site specific
Vanko	Favor	
Weber	Favor with amendments	Setbacks are distances in the BP Report from the well bore or well pad and as mentioned in the setback table from the disturbed area to water supplies or other important natural resources that need to be protected from contamination, damage, view, or other object in need of separation . Setbacks in the BP report (pp. 14-19) vary from 300 feet to 2000 feet. The most egregious recommended setbacks are 300 feet for - All cultural and historical sites, state, and federal parks, trails, wildlife management areas, scenic and wild rivers, and scenic byways and 600 feet for - Special conservation areas (e.g., irreplaceable natural areas, wildlands). These initial distances for parks, scenic and wild rivers wildlife management areas, senic byways and for special conservation areas are grossly inadequate and require reevaluation after a formal risk analysis has been completed. It is noted that the departments say that the setback - "may be expanded on a case by case basis, after DNR conducts a participatory GIS workshop; apply not just to drill pad locations but to all permanent surface infrastructure". This latter statement is encouraging with a GIS workshop scheduled in November. An example is the Savage River watershed which is unique and irreplaceable and contains natural areas that are unparalleled and unique for Eastern brook trout in the Southern Appalachian Mountains. Similar areas in Garrett and Allegany Counties are also a source of unique natural habitats that must be preserved and protected. In addition, nowhere in the BP draft report is the Maryland Code for the Environment, 14-108, mentioned or the significant provisions in the law that clearly point to denial of a permit for special natural areas of the state. The Departments must use existing statutory provisions to protect special and unique areas.

Weiss	Favor with amendments	<p>Overall, the concept of setbacks should be non-controversial. With respect to what should be the appropriate distances, I defer to Department and to experts in the field as may be informed by review and analysis of what works and does not work in other gas-producing jurisdictions. My suggestion for an amendment comes from my experience with environmental regulatory agencies in Maryland and elsewhere. Based on that, I strongly suggest that the Departments retain the flexibility to entertain applications to modify the setback distances in a couple of circumstances. First, distances could be reduced on a case by case basis where the applicant can show, or where developments in the oil and gas exploration have demonstrated, that the same level of safety could be achieved (i.e. through the use of innovative technology, improved drilling practices etc.). Likewise, the Department should have the ability to increase setback distances where circumstances dictate. I am sure that there could be circumstances where the proposed setback distances are not enough, and the Departments ought to have the ability to raise that concern when necessary. In summary, setbacks distances should not be based upon arbitrary conventions, but rather scientifically vetted, and demonstrated, performance standards. That way the Department may retain the flexibility within the regulatory process without having to consider new rulemaking every time there is a development in the drilling field.</p>
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**5. Section IV - Location Restrictions and Setbacks If you answered "No" to the previous question, please answer the following question In favor of all setback distances except:**

		Response Percent	Response Count
a) From aquatic habitat (300 ft.)		75.0%	3
b) From special conservation areas (600 feet unless the State adopts additional setbacks from specific outdoor recreational use areas through public workshop)		50.0%	2
c) From cultural and historical sites, state and federal parks, trails, wildlife management areas, wild and scenic rivers and scenic byways (300 ft.)		75.0%	3
d) From caves (1,000 ft.)		0.0%	0
e) From limestone outcrops (500 ft. on down dip side)		0.0%	0
f) From historic gas well (1320 ft.)		0.0%	0
g) From private drinking water well (1000 ft.)		75.0%	3
h) From public drinking water well (2,000 ft.)		25.0%	1
i) From boundary of the property on which the well is to be drilled (1,000 ft.)		50.0%	2
j) From surface water drinking water intake (2,000 feet upstream of surface water intake on a flowing stream and the edge of any drinking water reservoir)		25.0%	1
k) Distance between borehole and any occupied building (1,000 ft.)		25.0%	1
l) Distance between compressor station and any occupied building (1,000 ft.)		50.0%	2
m) From a school, church, wellhead protection area or an occupied dwelling (1,000 ft.)		25.0%	1

**Section IV - Location Restrictions and Setbacks**

**In favor of all setback distances**

<b>Commissioner</b>	<b>Response</b>	<b>If "No", indicate which setbacks are not favored</b>
Bender	Yes	
Bunker	Yes	
Edwards	No	i) From boundary of the property on which the well is to be drilled (1,000 ft.) k) Distance between borehole and any occupied building (1,000 ft.)
Jamison	Yes	
Murray	Yes	
Raley	Yes	
Valentine	No	a) From aquatic habitat (300 ft.) b) From special conservation areas (600 feet unless the State adopts additional setbacks from specific outdoor recreational use areas through public workshop) c) From cultural and historical sites, state and federal parks, trails, wildlife management areas, wild and scenic rivers and scenic byways (300 ft.) g) From private drinking water well (1000 ft.) h) From public drinking water well (2,000 ft.)  j) From surface water drinking water intake (2,000 feet upstream of surface water intake on a flowing stream and the edge of any drinking water reservoir) l) Distance between compressor station and any occupied building (1,000 ft.)
Vanko	No	a) From aquatic habitat (300 ft.) c) From cultural and historical sites, state and federal parks, trails, wildlife management areas, wild and scenic rivers and scenic byways (300 ft.) g) From private drinking water well (1000 ft.)
Weber	No	a) From aquatic habitat (300 ft.) b) From special conservation areas (600 feet unless the State adopts additional setbacks from specific outdoor recreational use areas through public workshop) c) From cultural and historical sites, state and federal parks, trails, wildlife management areas, wild and scenic rivers and scenic byways (300 ft.) g) From private drinking water well (1000 ft.) i) From boundary of the property on which the well is to be drilled (1,000 ft.) l) Distance between compressor station and any occupied building (1,000 ft.) m) From a school, church, wellhead protection area or an occupied dwelling (1,000 ft.)
Weiss	Yes	

**6. Section IV - Location Restrictions and Setbacks I favor different distances from those identified in the previous question (please specify)**

**Response  
Count**

7

<b>Section IV - Location Restrictions and Setbacks I favor different distances from those identified in the previous question (please specify)</b>	
<b>Commissioner</b>	<b>Comment</b>
Bender	
Bunker	I don't necessarily recommend different distances, but if the setbacks were put into permit requirements instead of into regulation, it would give MDE for flexibility to modify setbacks as conditions warrant or as new information comes available.
Edwards	Is the bore hole the vertical or the horizontal? If horizontal, I believe it needs to allow to get closer to property lines if person is not in the leasehold. PA and WV allow something like 350 ft. Maybe we could split the difference between PA and WV.
Jamison	
Murray	I also think that it makes sense to consider individual setbacks in the future for areas like Savage River State Forest.
Raley	
Valentine	site specific setbacks. Local terrain may shelter area from drilling area. aquifer types may require greater or lesser setbacks
Vanko	a) 600 ft c) 600 ft g) 2,000 ft
Weber	a) 1000' b) 2000' c) 2000' g) 2000' i) 2000' l) 2000' m) 2000'
Weiss	See comments to No. 3

**7. Section IV - Location Restrictions and Setbacks Additional setbacks should be adopted (please specify)**

**Response  
Count**

2

<b>Section IV - Location Restrictions and Setbacks Additional setbacks should be adopted (please specify)</b>	
<b>Commissioner</b>	<b>Comment</b>
Bender	
Bunker	
Edwards	
Jamison	
Murray	
Raley	
Valentine	
Vanko	

Weber	Additional restrictions should include denial of permits within 2000' of scenic and wild rivers and for special conservation areas (e.g., irreplaceable natural areas, wildlands). The Departments should use the statutory authority under 14-108 for these protections. In addition, no drilling pads or other gas related infrastructure should be permitted on slopes of 15 degrees or greater. The potential for spills into streams and other water routes is too great and significant to overlook this critical Best Practice. After this practice and its importance was discussed by the Advisory Commission, its omission is shocking and must be included. No drilling pads or other gas related infrastructure should be located within 600 feet of wetlands. No drilling pads or other gas related infrastructure should be located within the 100 year floodplain. No mention in these questions about Siting Best Practices which is part of Section IV. This is a surprising omission. In addition, the protections afforded by current anti-degradation regulations to tier II streams was not addressed in the draft recommendations and the Departments will consider whether additional anti-degradation regulations are necessary when that regulation is revised. This lack of explanation of protection Best Practices afforded by the current anti-degradation regulation is a significant oversight in the report by the Departments.
Weiss	See comment to No 3.

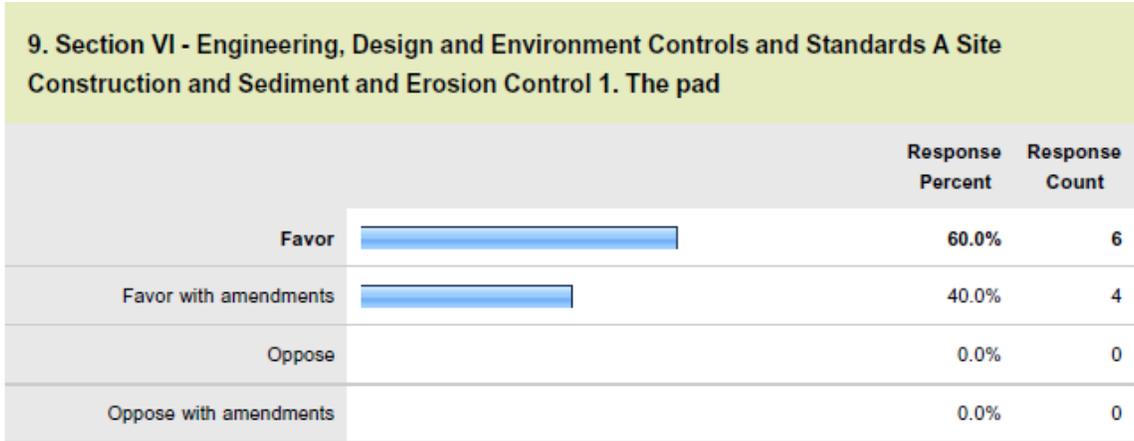
**8. Section V - Application for individual well: submission of plans that meet or exceed the regulatory standards and API normative elements**

		Response Percent	Response Count
Favor		90.0%	9
Favor with amendments		0.0%	0
Oppose		0.0%	0
Oppose with amendments		10.0%	1

**Section V - Application for individual well: submission of plans that meet or exceed the regulatory standards and API normative elements**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Oppose with amendments	The confusion over the lack of an up to date EA and what aspects of it will be required for both the CGDP and the individual well permits remains as a significant concern. A new EA is needed and required. In addition, it is clear that the regulations addressing the 25 items mentioned in the list for individual well permits have not been updated and rewritten. It is impossible to state that Best Practices dealing with the myriad of specific items that need to be addressed in the list of

		25 areas to be developed for Marcellus Shale Gas Development will be favorable in. It is difficult to see clearly reference or track Best Practices dealing with all 25 items in the plan.
Weiss	Favor	Such submissions should receive favorable and expedited treatment, but should still be subject to review pursuant to the planning principles underlying the CDP concept. The Commission has heard testimony from API and well completion experts to the effect that a one size fits all approach could result in inconsistent results in the field.



<b>Section VI - Engineering, Design and Environment Controls and Standards</b>		
<b>A. Site Construction and Sediment and Erosion Control 1. The pad</b>		
<b>Commissioner</b>	<b>Response</b>	<b>Comment</b>
Bender	Favor with amendments	Zero discharge should only apply to areas of the pad where drilling and HVHF contamination hazards exist and zero-discharge should only be mandatory during the presence of those hazards on location.
Bunker	Favor	
Edwards	Favor	
Jamison	Favor with amendments	The pad: Zero discharge should only apply to areas of the pad where drilling and HVHF contamination hazards exist and zero-discharge should only be mandatory during the presence of those hazards on location.
Murray	Favor	
Raley	Favor with amendments	Zero discharge should only apply to areas of the pad where drilling and HVHF contamination hazards exist and zero-discharge should only be mandatory during the presence of those hazards on location.
Valentine	Favor	
Vanko	Favor	Agree with the requirement that every pad be a “zero-discharge” pad that can handle major precipitation events.
Weber	Favor with amendments	This section begins with the acknowledgement the regulations at present are incomplete and do not address any requirements specific to oil and gas operations. This acknowledgement signals that the regulations must be updated and completed with actions needed to address modern gas and oil drilling operations. One item mentioned in this subsection deals with a requirement that the drilling pad must be surrounded by impermeable berms such that the pad

		can contain at least a volume of 2.7 inches of rainfall in a 24 hour period. This value is too small and should be increased. The NOAA Atlas 14, Volume 2, Version 3 Oakland 1 shows that the 2.7" value in 24 hours is likely to be reached within a 2 year period (2.66" upper 90% confidence interval) and will likely be achieved in any given year over a 2 day period (2.66" upper 90% confidence interval). The containable height for the berm should be at least 4 inches. This value should give significant protection for the 24 hour and 2 day periods and yield Average Recurrence Intervals of 10 years and 5 years, respectively. Given that Garrett County has the largest amount of snow in the State and amounts of several feet can accumulate over time, the Departments need to address how snowfall will be handled and cleared from a drilling site.
Weiss	Favor	

**10. Section VI - Engineering, Design and Environment Controls and Standards A Site Construction and Sediment and Erosion Control 2. Tanks and containers**

		Response Percent	Response Count
Favor		90.0%	9
Favor with amendments		10.0%	1
Oppose		0.0%	0
Oppose with amendments		0.0%	0

Section VI - Engineering, Design and Environment Controls and Standards A. Site Construction and Sediment and Erosion Control 2. Tanks and containers		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor with amendments	This section should include that the height of a continuous dike or wall surrounding must be capable of holding the entire contents of any tanks that are surrounded PLUS an amount of rain that may also fall. The additional height suggested is 4 inches as noted in the previous comment.
Weiss	Favor	

**11. Section VI - Engineering, Design and Environment Controls and Standards A Site Construction and Sediment and Erosion Control 3. Pits and ponds**

		Response Percent	Response Count
Favor		100.0%	10
Favor with amendments		0.0%	0
Oppose		0.0%	0
Oppose with amendments		0.0%	0

**Section VI - Engineering, Design and Environment Controls and Standards  
A. Site Construction and Sediment and Erosion Control 3. Pits and ponds**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	To hold fresh water only.
Weber	Favor	
Weiss	Favor	

**12. Section VI - Engineering, Design and Environment Controls and Standards A Site Construction and Sediment and Erosion Control 4. Pipelines**

		Response Percent	Response Count
Favor		60.0%	6
Favor with amendments		30.0%	3
Oppose		0.0%	0
Oppose with amendments		10.0%	1

**Section VI - Engineering, Design and Environment Controls and Standards**  
**A. Site Construction and Sediment and Erosion Control 4. Pipelines**

<b>Commissioner</b>	<b>Response</b>	<b>Comment</b>
Bender	Favor with amendments	This section warrants further collaboration and determination of oversight and potential legislative requirements due to the fact that current oversight rests with the PSC. The current regulations for wetlands, grading permits, stream crossings, etc. seem to adequately address surface disturbance issues on the part of MDE and DNR, however, where do the PSC and/or local agencies play a role in this process?
Bunker Edwards	Favor	
	Favor	This section warrants further collaboration and determination of oversight and potential legislative requirements due to the fact that current oversight rests with the PSC. The current regulations for wetlands, grading permits, stream crossings etc. seem adequate to address surface disturbances on the part of MDE and DNR, however, where do the PSC and/or local agencies play of role in this process.
Jamison	Favor with amendments	Pipeline: Because oversight for pipelines currently is under the PSC, there may need to be some sort of legislative change, if the state wants to take on the responsibility for pipeline oversight. The current regulations for wetlands, grading permits, stream crossings, etc. seem to adequately address surface disturbance issues on the part of MDE and DNR, however, where do the PSC and/or local agencies play a role in this process?
Murray	Favor	
Raley	Favor with amendments	This section warrants further collaboration and determination of oversight and potential legislative requirements due to the fact that current oversight rests with the PSC. The current regulations for wetlands, grading permits, stream crossings, etc. seem to adequately address surface disturbance issues on the part of MDE and DNR, however, where do the PSC and/or local agencies play a role in this process?
Valentine	Favor	
Vanko	Favor	We could benefit from having more stringent rules about gathering lines. These may be an important piece of "fugitive methane" puzzle - i.e., how much methane leaks into the atmosphere, and from where?
Weber	Oppose with amendments	The Departments openly state that the Maryland Public Service Commission (PSC) has not established any standards for the location, materials, construction, or testing of gathering lines and should be addressed by the PSC. This situation is totally unacceptable. The lack of acceptable standards and regulations must prevent gas development in Maryland from going forward. This lack of safety standards, their regulation, monitoring and enforcement of gathering lines is a large hole in protections that the citizens of Maryland expect and require. A bill to address this major shortcoming should be introduced and passed by the General Assembly and signed into law to address the serious lack of protection and safety needed for this critical aspect of gas development in Maryland. A major aspect of gathering lines must also include the significant surface disturbance that they cause. Fragmentation of forests is devastating to wildlife habitats. Consultation with the Nature Conservancy's objectives and solutions may yield useful

		approaches to the problems. The use of common and circumventing corridors as anticipated by a CGDP approach should yield protections.
Weiss	Favor	

**13. Section VI - Engineering, Design and Environment Controls and Standards A Site Construction and Sediment and Erosion Control 5. Road construction**

		Response Percent	Response Count
Favor		90.0%	9
Favor with amendments		10.0%	1
Oppose		0.0%	0
Oppose with amendments		0.0%	0

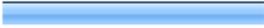
Section VI - Engineering, Design and Environment Controls and Standards A. Site Construction and Sediment and Erosion Control 5. Road construction		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor with amendments	The discussion of road construction is a general one that contains too many shoulds and insufficient musts. It is clear with such an approach that the highest amount of protection for the surrounding environment is negotiable and disconcerting. A comment in this section states that "The location of roads will be evaluated during the review of the Comprehensive Development Plan." There will be a significant and potential loss in the planning element if the CGDP approach is not approved or followed. It will be critical that the road planning aspects envisioned for the CGDP be transferred to the single well permitting process along with those involving the Environmental Assessment.
Weiss	Favor	

**14. Section VI - Engineering, Design and Environment Controls and Standards A Site Construction and Sediment and Erosion Control 6. Ancillary equipment**

		Response Percent	Response Count
Favor		80.0%	8
Favor with amendments		10.0%	1
Oppose		0.0%	0
Oppose with amendments		10.0%	1

Section VI - Engineering, Design and Environment Controls and Standards A. Site Construction and Sediment and Erosion Control 6. Ancillary equipment		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	This is probably part of existing regulations, but MDE should ensure proper disposal of fluids from glycol dehydrators
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor with amendments	no requirement for purely electric powered equipment
Vanko	Favor	
Weber	Oppose with amendments	Information regarding best practices for siting and construction of ancillary equipment is not found in these recommendations. This includes gathering and boosting stations, dehydrators and gas processing units as well as compressor stations. The bottom line is there is virtually nothing involving best practices for these ancillary units in terms of their regulation (siting, engineering or safety requirements). In addition, there is no indication of a notification procedure identified for property owners within a certain distance (1000') of the ancillary infrastructure. Again, large missing pieces in the Best Practices for the overall consideration of natural gas development in Maryland.
Weiss	Favor	

**15. Section VI - Engineering, Design and Environment Controls and Standards B  
Transportation Planning**

		Response Percent	Response Count
Favor		50.0%	5
Favor with amendments		50.0%	5
Oppose		0.0%	0
Oppose with amendments		0.0%	0

**Section VI - Engineering, Design and Environment Controls and Standards  
B. Transportation Planning**

Commissioner	Response	Comment
Bender	Favor with amendments	Transportation requirements should be consistent with the requirements of other local industry.
Bunker	Favor	
Edwards	Favor with amendments	Transportation requirements should be consistent with the requirements of other local industry.
Jamison	Favor with amendments	Transportation: Transportation requirements should be consistent with the requirements of other local industry.
Murray	Favor	It will be important to coordinate with both State and local governments on transportation routes.
Raley	Favor with amendments	Transportation requirements should be consistent with the requirements of other local industry.
Valentine	Favor	
Vanko	Favor	
Weber	Favor with amendments	The lack of readily identifying the acceptable BP recommendations from the UMCES-AL reports is a difficulty in clearly seeing all BP recommendations covered under a single topic here and throughout the entire document. The stress that such an approach has on a reader of the document is clearly not in the interest of transparency. Requiring GPS tracking systems on all trucks hauling liquid or solid wastes is an excellent requirement. However, the system should be real time and include a manifest system that identifies the operator's vehicle identification, driver, exact nature of the waste, the initiation location and time as well as the destination and destination receipt time of the load.
Weiss	Favor	

**16. Section VI - Engineering, Design and Environment Controls and Standards C. Water 1. Storage**

		Response Percent	Response Count
Favor		90.0%	9
Favor with amendments		10.0%	1
Oppose		0.0%	0
Oppose with amendments		0.0%	0

**Section VI - Engineering, Design and Environment Controls and Standards C. Water 1. Storage**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor with amendments	Look at dry fracking
Vanko	Favor	
Weber	Favor	
Weiss	Favor	

**17. Section VI - Engineering, Design and Environment Controls and Standards C Water 2. Water withdrawel**

		Response Percent	Response Count
Favor		80.0%	8
Favor with amendments		10.0%	1
Oppose		0.0%	0
Oppose with amendments		10.0%	1

**Section VI - Engineering, Design and Environment Controls and Standards C. Water 2. Water withdrawel**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	Water withdrawal permits should ensure that ecological flows are maintained to protect stream ecology and biota.
Edwards	Favor	
Jamison	Favor	

Murray	Favor	
Raley	Favor	
Valentine	Favor with amendments	Look at dry fracking
Vanko	Favor	
Weber	Oppose with amendments	Although the Department claims that they currently have sufficient regulatory authority to address water withdrawals, the specific need for large amounts of water 3 to 5 million gallons in a short time frame is not what they routinely handle. In addition, the permitting lead time is often extensive and will need to be shortened significantly. Because of the quantities and time frames, it makes sense to accept the UMCES-AL recommendation of using only water from reservoirs and rivers with substantial reserve capacity.
Weiss	Favor	

**18. Section VI - Engineering, Design and Environment Controls and Standards C Water 3. Water reuse**

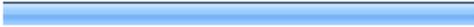
		Response Percent	Response Count
Favor		50.0%	5
Favor with amendments		50.0%	5
Oppose		0.0%	0
Oppose with amendments		0.0%	0

**Section VI - Engineering, Design and Environment Controls and Standards C. Water 3. Water reuse**

Commissioner	Response	Comment
Bender	Favor with amendments	While the 90% requirement for recycling seems reasonable and attainable, provisions should be made for allowing the operation of central processing if on-site processing is not practicable.
Bunker	Favor	
Edwards	Favor with amendments	While the 90% requirement for recycling seems reasonable and attainable, provisions should be made for allowing the operation of the central processing if on-site processing is not practical.
Jamison	Favor with amendments	Water Reuse: While the 90% requirement for recycling seems reasonable and attainable, provisions should be made for allowing the operation of central processing if on-site processing is not practicable.
Murray	Favor	
Raley	Favor with amendments	While the 90% requirement for recycling seems reasonable and attainable, provisions should be made for allowing the operation of central processing if on-site processing is not practicable.
Valentine	Favor with amendments	Look at dry fracking

Vanko	Favor	
Weber	Favor	
Weiss	Favor	

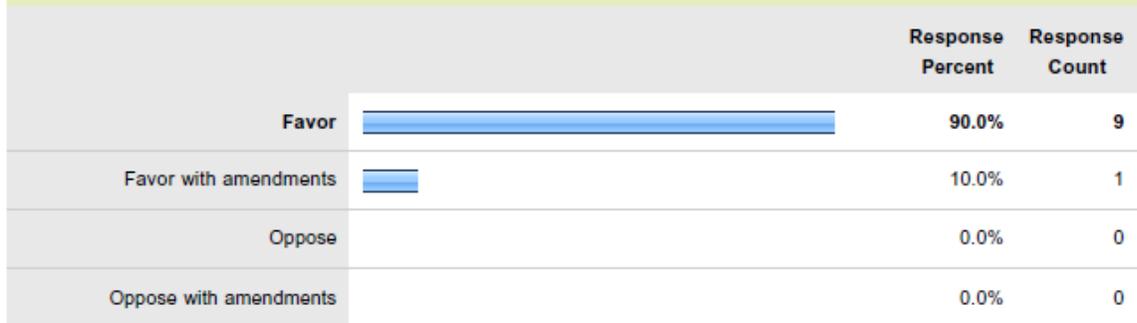
**19. Section VI - Engineering, Design and Environment Controls and Standards D Chemical Disclosure**

		Response Percent	Response Count
Favor		90.0%	9
Favor with amendments		0.0%	0
Oppose		0.0%	0
Oppose with amendments		10.0%	1

Section VI - Engineering, Design and Environment Controls and Standards D. Chemical Disclosure		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	Should this section include a provision that would allow MDE to prohibit any chemical that MDE considers an unacceptable risk to surface or groundwater.
Edwards	Favor	
Jamison	Favor	
Murray	Favor	This is a difficult issue and the recommendation strikes a fair balance.
Raley	Favor	
Valentine	Favor	
Vanko	Favor	Favor reluctantly - it is unfortunate that companies feel a need to withhold trade secrets. Is the minor "advantage" that the company retains worth the trouble? In a PR context, some companies are their own worst enemies.

Weber	Oppose with amendments	The path chosen by the Departments is one followed by some States that follows the disclosure approach used by OSHA. This limits the disclosure to MDE and only to health professional personnel and exposed persons and limits their disclosure rights. In addition, MDE proposes to only learn about the actual list of chemicals and amounts at the conclusion of well development. This is clearly not the “Gold Standard” that we have heard should be pursued in Maryland. It does not protect first responders at incidents involving a drilling operation and does not alert persons in the area adjacent to the operation. It also does not allow for air or water monitoring at or nearby the well site for critical components, if they were of concern. One understanding is that the OSHA standard applies to employees of companies not to passer byes. The OSHA standard may well apply to employees at the well site and is part of their work contract, but fails as to why the State should impose such a standard to persons not employed by the operator and who are or can be affected until after they may become affected. Full chemical disclosure at the time of drilling and fracking is the Gold Standard. Technology that uses tracer compounds should soon be available to uniquely identify each well drilling operation. This technology should be available and be required by the time drilling begins, if natural gas development comes to Maryland.
Weiss	Favor	

**20. Section VI - Engineering, Design and Environment Controls and Standards E Drilling 1. Use of electricity from the grid**



Section VI - Engineering, Design and Environment Controls and Standards E. Drilling 1. Use of electricity from the grid		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor with amendments	only where financially feasible, and where noise pollution would be a problem
Vanko	Favor	
Weber	Favor	
Weiss	Favor	

**21. Section VI - Engineering, Design and Environment Controls and Standards E Drilling 2.  
Initiation of drilling**

		Response Percent	Response Count
Favor		100.0%	10
Favor with amendments		0.0%	0
Oppose		0.0%	0
Oppose with amendments		0.0%	0

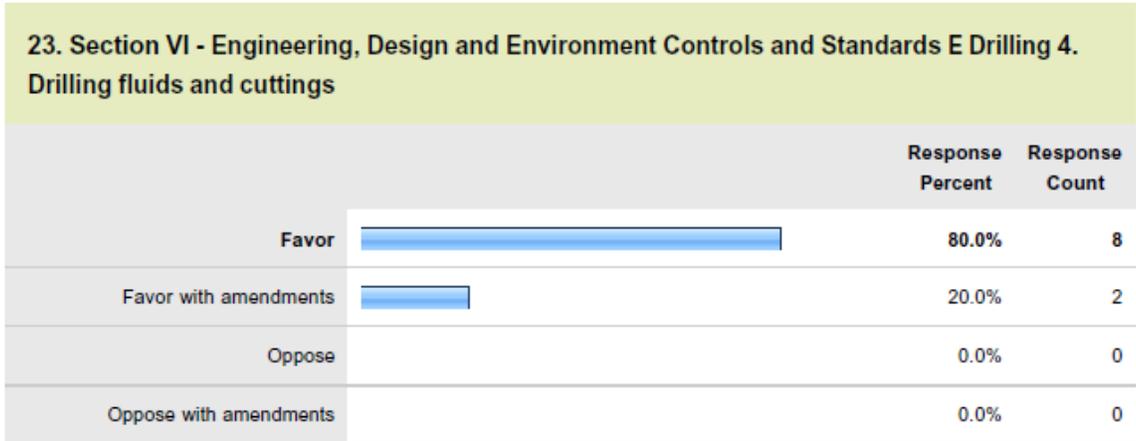
**Section VI - Engineering, Design and Environment Controls and Standards  
E. Drilling 2. Initiation of drilling**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	I think the timing of drilling recommendation is a little vague and may not be necessary for certain isolated drilling pads, but may be applicable to others.
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor	
Weiss	Favor	There should be minimum standards, however subject to the ability of the Departments to assure, for any given installation, that the proposed engineering work will meet appropriate performance standards: here that given the location of a particular well, that the risk that the well design would fail has been minimized to the best extent practicable and that were an accident to happen, that adequate measures are in place to efficiently ameliorate the impacts.

**22. Section VI - Engineering, Design and Environment Controls and Standards E Drilling 3.  
Pilot hole**

		Response Percent	Response Count
Favor		90.0%	9
Favor with amendments		10.0%	1
Oppose		0.0%	0
Oppose with amendments		0.0%	0

Section VI - Engineering, Design and Environment Controls and Standards E. Drilling 3. Pilot hole		
Commissioner	Response	Comment
Bender	Favor with amendments	<i>Comments not provided</i>
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor with amendments	<i>Comments not provided</i>
Valentine	Favor	
Vanko	Favor	
Weber	Favor	
Weiss	Favor	There should be minimum standards, however subject to the ability of the Departments to assure, for any given installation, that the proposed engineering work will meet appropriate performance standards: here that given the location of a particular well, that the risk that the well design would fail has been minimized to the best extent practicable and that were an accident to happen, that adequate measures are in place to efficiently ameliorate the impacts.



Section VI - Engineering, Design and Environment Controls and Standards E. Drilling 4. Drilling fluids and cuttings		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor with amendments	Not in favor of on-site disposal of cuttings. A secure and properly engineered landfill may be a better option.

Weber	Favor with amendments	Returned drilling fluid should only be disposed of as waste. Drilling mud and cuttings should only be disposed at approved landfills, if it meets those criteria and radioactivity limits as well.
Weiss	Favor	

**24. Section VI - Engineering, Design and Environment Controls and Standards E Drilling 5. Open hole logging**

		Response Percent	Response Count
	Favor	100.0%	10
	Favor with amendments	0.0%	0
	Oppose	0.0%	0
	Oppose with amendments	0.0%	0

Section VI - Engineering, Design and Environment Controls and Standards E. Drilling 5. Open hole logging		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor	
Weiss	Favor	

**1. Section VI - Engineering, Design and Environment Controls and Standards F Casing and Cement 1. Requirements for casing and cement**

		Response Percent	Response Count
Favor		90.0%	9
Favor with amendments		10.0%	1
Oppose		0.0%	0
Oppose with amendments		0.0%	0

Section VI - Engineering, Design and Environment Controls and Standards F. Casing and Cement 1. Requirements for casing and cement		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor with amendments	Regulations should include a confirmation for the time limit for cement curing due to the fact that a significant number of wells cementing and casing apparently fail and much of the failure is attributed to lack of observance of prescribed curing time frames. With up to 8% of Marcellus Shale wells in Pennsylvania failing with a couple of years of being drilled, all aspects of casing and cementing needs to be monitored closely. In support of reducing the failure rate, the use of reconditioned casings should not be approved.
Weiss	Favor	There should be minimum standards, however subject to the ability of the Departments to assure, for any given installation, that the proposed engineering work will meet appropriate performance standards: here that given the location of a particular well, that the risk that the well design would fail has been minimized to the best extent practicable and that were an accident to happen, that adequate measures are in place to efficiently ameliorate the impacts.

**2. Section VI - Engineering, Design and Environment Controls and Standards F Casing and cement 2. Isolation**

		Response Percent	Response Count
Favor		90.0%	9
Favor with amendments		10.0%	1
Oppose		0.0%	0
Oppose with amendments		0.0%	0

**Section VI - Engineering, Design and Environment Controls and Standards  
F. Casing and cement 2. Isolation**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor with amendments	A best practice should be to include a method for testing and adequately centering the production casing particularly in the horizontal section of the well. Because of failure incidence, the Department and the industry should focus on this area as one where the technology to provide continuous improvement should be constantly followed and embraced.
Weiss	Favor	There should be minimum standards, however subject to the ability of the Departments to assure, for any given installation, that the proposed engineering work will meet appropriate performance standards: here that given the location of a particular well, that the risk that the well design would fail has been minimized to the best extent practicable and that were an accident to happen, that adequate measures are in place to efficiently ameliorate the impacts.

**3. Section VI - Engineering, Design and Environment Controls and Standards F Casing and Cement 3. Case-hole logging, integrity testing and pressure testing**

		Response Percent	Response Count
Favor		90.0%	9
Favor with amendments		10.0%	1
Oppose		0.0%	0
Oppose with amendments		0.0%	0

Section VI - Engineering, Design and Environment Controls and Standards F. Casing and Cement 3. Case-hole logging, integrity testing and pressure testing		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor with amendments	Due to ongoing concerns with casing and cement, case-hole logging, integrity testing and pressure testing should be done annually as well as after another well is drilled and fractured on the same well pad.
Weiss	Favor	There should be minimum standards, however subject to the ability of the Departments to assure, for any given installation, that the proposed engineering work will meet appropriate performance standards: here that given the location of a particular well, that the risk that the well design would fail has been minimized to the best extent practicable and that were an accident to happen, that adequate measures are in place to efficiently ameliorate the impacts.

**4. Section VI - Engineering, Design and Environment Controls and Standards G Blowout Prevention**

		Response Percent	Response Count
Favor		100.0%	10
Favor with amendments		0.0%	0
Oppose		0.0%	0
Oppose with amendments		0.0%	0

**Section VI - Engineering, Design and Environment Controls and Standards  
G. Blowout Prevention**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor	
Weiss	Favor	

**5. Section VI - Engineering, Design and Environment Controls and Standards H Hydraulic Fracturing**

		Response Percent	Response Count
Favor		80.0%	8
Favor with amendments		10.0%	1
Oppose		0.0%	0
Oppose with amendments		10.0%	1

**Section VI - Engineering, Design and Environment Controls and Standards  
H. Hydraulic Fracturing**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	Should this section re-state the preference for the use of recycled frack water for subsequent frack jobs on a pad.
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor with amendments	Look at dry fracking methods
Vanko	Favor	

Weber	Oppose with amendments	It is understood that Maryland has not been directly exposed to this technology. However, it is inconceivable that the entire Section dealing with Hydraulic Fracturing is only four short paragraphs and deals only with timing recommendations, seismic testing along with recommendations to use low toxicity additives and to try and lower the water use. The only shall not involves the use of diesel fuel. Where are the many best practices to be used for the hydraulic fracturing process? It clearly has many important and sequenced steps. The lack of inclusion of any significant number of Best Practices on this pivotal piece of the natural gas development process is an example of how unprepared Maryland is for gas development. The Advisory Commission needs to be presented with Best Practices on this pivotal aspect of the gas production process and assurance that the Department is prepared to address it. Seismic testing information must be available to State regulators for each well drilled to determine the fracture area imposed by the fracturing activity at the time it is obtained and analyzed by the operator.
Weiss	Favor	There should be minimum standards, however subject to the ability of the Departments to assure, for any given installation, that the proposed engineering work will meet appropriate performance standards: here that given the location of a particular well, that the risk that the well design would fail has been minimized to the best extent practicable and that were an accident to happen, that adequate measures are in place to efficiently ameliorate the impacts.



Section VI - Engineering, Design and Environment Controls and Standards I. Flowback and Produced Water		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	

Weber	Favor with amendments	See comments on Wastewater Treatment and Disposal
Weiss	Favor	There should be minimum standards, however subject to the ability of the Departments to assure, for any given installation, that the proposed engineering work will meet appropriate performance standards: here that given the location of a particular well, that the risk that the well design would fail has been minimized to the best extent practicable and that were an accident to happen, that adequate measures are in place to efficiently ameliorate the impacts.

**7. Section VI - Engineering, Design and Environment Controls and Standards J Air Emissions 1. Green completion or reduced emissions completion**

		Response Percent	Response Count
	Favor	90.0%	9
	Favor with amendments	10.0%	1
	Oppose	0.0%	0
	Oppose with amendments	0.0%	0

**Section VI - Engineering, Design and Environment Controls and Standards J. Air Emissions 1. Green completion or reduced emissions completion**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor with amendments	Maryland has done much in announcing its intention to require green completions. However, only part of the EPA New Source Performance Standard (NSPS) is outlined in the Best Practice recommendations. Maryland must accept and require all parts of the proposed standard to be applied to gas development for maximum protections to our environment. These include gas bleed limits for pneumatic controllers, reduction requirements from storage vessels at the well site, and air toxic requirements from glycol dehydrators.
Weiss	Favor	

**8. Section VI - Engineering, Design and Environment Controls and Standards J Air Emissions 2. Flaring**

		Response Percent	Response Count
Favor		80.0%	8
Favor with amendments		20.0%	2
Oppose		0.0%	0
Oppose with amendments		0.0%	0

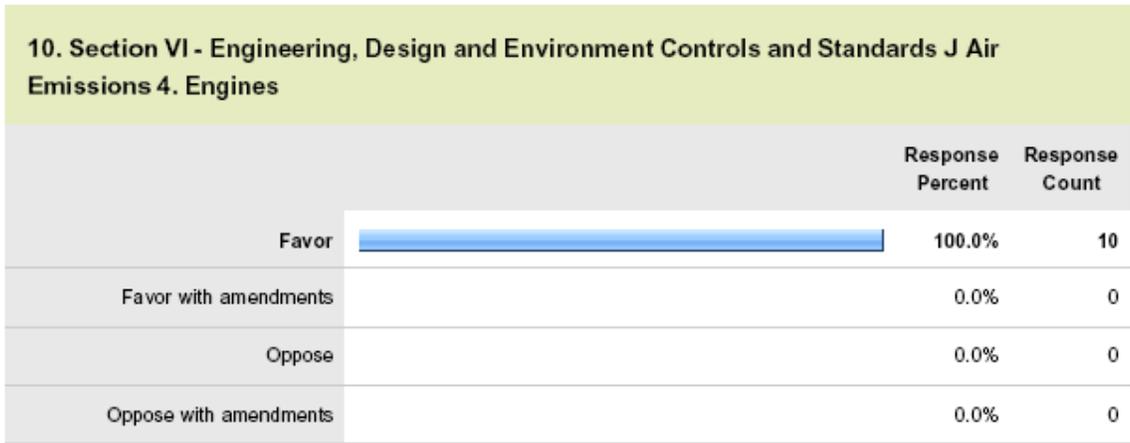
**Section VI - Engineering, Design and Environment Controls and Standards J. Air Emissions 2. Flaring**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor with amendments	with proper monitoring
Vanko	Favor	
Weber	Favor with amendments	Concerns include permitting flaring for up to 30 days which can be hazardous to nearby residents. In addition, flaring with no visible emissions appears to allow the possibility of flaring without adequate combustion and the escape of methane and other noxious components. Infrared analysis of the flaring activity must be done to confirm adequate destruction of flared components.
Weiss	Favor	

**9. Section VI - Engineering, Design and Environment Controls and Standards J Air Emissions 3. Electricity from the grid**

		Response Percent	Response Count
Favor		90.0%	9
Favor with amendments		10.0%	1
Oppose		0.0%	0
Oppose with amendments		0.0%	0

Section VI - Engineering, Design and Environment Controls and Standards J. Air Emissions 3. Electricity from the grid		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor with amendments	Only when financially feasible
Vanko	Favor	
Weber	Favor	
Weiss	Favor	



Section VI - Engineering, Design and Environment Controls and Standards J. Air Emissions 4. Engines		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor	
Weiss	Favor	

**11. Section VI - Engineering, Design and Environment Controls and Standards J Air Emissions 5. Storage tanks**

		Response Percent	Response Count
Favor		100.0%	10
Favor with amendments		0.0%	0
Oppose		0.0%	0
Oppose with amendments		0.0%	0

**Section VI - Engineering, Design and Environment Controls and Standards J. Air Emissions 5. Storage tanks**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor	
Weiss	Favor	

**12. Section VI - Engineering, Design and Environment Controls and Standards J Air Emissions 6. Natural Gas Star**

		Response Percent	Response Count
Favor		90.0%	9
Favor with amendments		10.0%	1
Oppose		0.0%	0
Oppose with amendments		0.0%	0

**Section VI - Engineering, Design and Environment Controls and Standards J. Air Emissions 6. Natural Gas Star**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	

Valentine	Favor	
Vanko	Favor	It is difficult to mandate a company's participation in a voluntary program.
Weber	Favor with amendments	Participation in EPA's Natural Gas STAR Program for all natural gas operators in Maryland must be a requirement for on continuous improvement to prevent leakage. A leakage prevention plan must be a requirement of all participants.
Weiss	Favor	

**13. Section VI - Engineering, Design and Environment Controls and Standards K Waste and Wastewater Treatment and Disposal**

		Response Percent	Response Count
Favor		80.0%	8
Favor with amendments		20.0%	2
Oppose		0.0%	0
Oppose with amendments		0.0%	0

**Section VI - Engineering, Design and Environment Controls and Standards K. Waste and Wastewater Treatment and Disposal**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor with amendments	dry fracking
Vanko	Favor	
Weber	Favor with amendments	MDE should require that POTW not accept any wastewater from gas exploration and development and proof that they have not accepted wastewater. Discharges of gas development wastewater should be prohibited until such time as they can be shown by an approved process to be safe. The requirement for records of disposal for all wastes from gas development that include drilling mud, cuttings, wastewater (flow back) and produced water go a long way to protect our environment and citizens. However, without a real time way of monitoring this disposal activity mere record keeping is ineffective at dealing with real time problems when they arise. A real time manifest process involving GPS tracking monitored by MDE is essential for real time protection. A recent journal article by Rozell and Reaven has determined that wastewater disposal is by far the highest risk pathway for water contamination by gas well development. See Risk Analysis vol. 32, No. 8, 2012, pp. 1382-1393.
Weiss	Favor	

**14. Section VI - Engineering, Design and Environment Controls and Standards L Leak Detection**

		Response Percent	Response Count
Favor		90.0%	9
Favor with amendments		10.0%	1
Oppose		0.0%	0
Oppose with amendments		0.0%	0

**Section VI - Engineering, Design and Environment Controls and Standards L. Leak Detection**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor with amendments	The draft recommended Best Practices state that .. “A methane leak detection and repair program must be established from wellhead to transmission line.” However, the next statement is questionable...”Permittees shall consider all recommended strategies identified in EPA’s Natural Gas STAR program for inclusion in a leak detection and repair program.” (emphasis added) The EPA leak detection and repair (LDAR) program has a guidance that includes 12 Best Practices. The LDAR best practices must be adopted, not considered, if Maryland is to meet its stated objectives of producing energy with a minimum of climate changing emissions when considering natural gas development in the mix of energy options.
Weiss	Favor	

**15. Section VI - Engineering, Design and Environment Controls and Standards M Light**

		Response Percent	Response Count
Favor		80.0%	8
Favor with amendments		20.0%	2
Oppose		0.0%	0
Oppose with amendments		0.0%	0

**Section VI - Engineering, Design and Environment Controls and Standards M. Light**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor with amendments	site specific requirements
Vanko	Favor	
Weber	Favor with amendments	The restricting recommendations minimize and downward direct light appear to deal with aquatic habitat within 1000 feet of the drill pads. The restrictions should also apply to persons and other land inhabitants within 1000 feet. A plan for light pollution reduction should be addressed and be part of every individual drilling plan as well as all other infrastructure activities whether in a construction or production phase.
Weiss	Favor	

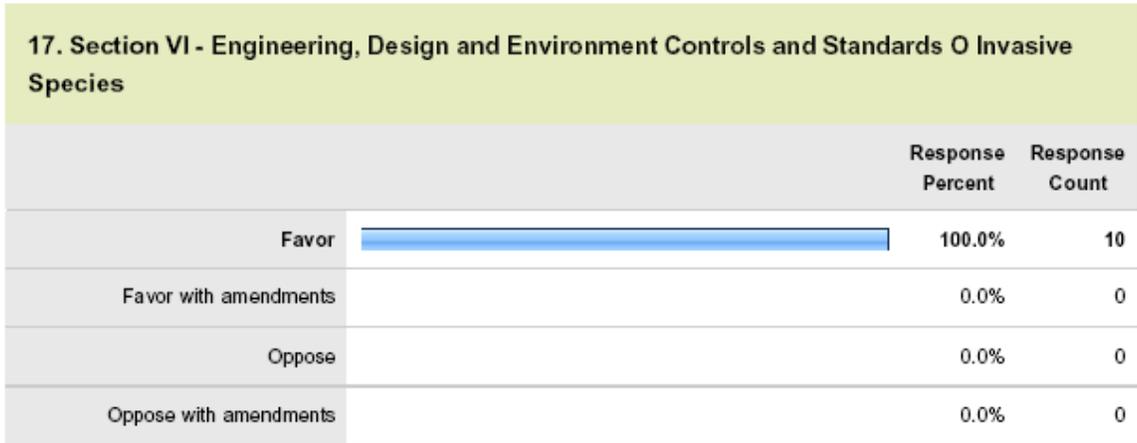
**16. Section VI - Engineering, Design and Environment Controls and Standards N. Noise**

		Response Percent	Response Count
Favor		80.0%	8
Favor with amendments		20.0%	2
Oppose		0.0%	0
Oppose with amendments		0.0%	0

**Section VI - Engineering, Design and Environment Controls and Standards N. Noise**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	

Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor with amendments	site specific requirements
Vanko	Favor	
Weber	Favor with amendments	While the standards set by the State seem adequate, it must be clear that the enforcement of the noise violations is a requirement. If local government will not agree to effectively monitor during important drilling and fracturing activities or other activities such as construction or operation of other infrastructure components, then the State must require the permittee to hire an independent contractor to do monitoring with reporting to the County, the operator, and State at periodic and specified times.
Weiss	Favor	



Section VI - Engineering, Design and Environment Controls and Standards O. Invasive Species		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor	
Weiss	Favor	

**18. Section VI - Engineering, Design and Environment Controls and Standards P Spill Prevention, Control and Countermeasures and Emergency Response**

		Response Percent	Response Count
Favor		90.0%	9
Favor with amendments		10.0%	1
Oppose		0.0%	0
Oppose with amendments		0.0%	0

Section VI - Engineering, Design and Environment Controls and Standards P. Spill Prevention, Control and Countermeasures and Emergency Response		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	

Weber	Favor with amendments	<p>This section appears to have contradictory language. In the first paragraph it states..” The Departments agree that each permittee must prepare a site-specific emergency response plan and that the permittee must provide a list of chemicals and corresponding Safety Data Sheets to first responders before beginning operations; however, the Departments do not agree that all the detailed information described above needs to be in the plan or submitted to MDE with the permit application.” This statement clearly turns into an agree but won’t agree to trade secret disclosure conflicts and is spelled out later in the section with the OSHA and worker right to know with a Safety Data Sheet on the type chemical or class of chemical approach again being touted as sufficient protection for first responders. I disagree. In addition, the section mentions.. “Spill Prevention, Control and Countermeasures Plans (SPCC Plans) are intended to prevent any discharge of oil.” These plans are clearly intended to not only address oil but should include all hazardous chemicals and hazardous situations that can arise at the site. This includes specially equipped and trained personnel who are not on the site with an availability of 24 hours. The time frame is too long and should be shortened to 12 hours or less considering that trained personnel should be available throughout the Marcellus Shale region. If such an emergency response does not exist in the region then states and industry operators should be responsible to make sure that such a response team is available in the region or can be available in 12 hours or less. In addition, Spill Cleanup Plans (SCPs) and Emergence Response Plans (ERPs) may be part of the SPCC plan, but warrant additional special consideration and specific add-ons that need to be available and developed for those particular parts that they play that involve accidents at or near the infrastructure of interest. In addition, no specific mention is made about contact with the Departments or most importantly with adjacent property owners. It is imperative that adjacent property owners be aware of appropriate SPPC or ERP plans for contact and their response in the event of a hazardous incident.</p>
Weiss	Favor	

19. Section VI - Engineering, Design and Environment Controls and Standards Q Site Security			
		Response Percent	Response Count
Favor		100.0%	10
Favor with amendments		0.0%	0
Oppose		0.0%	0
Oppose with amendments		0.0%	0

**Section VI - Engineering, Design and Environment Controls and Standards  
Q. Site Security**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor	
Weiss	Favor	

**20. Section VI - Engineering, Design and Environment Controls and Standards R Closure and Reclamation**



**Section VI - Engineering, Design and Environment Controls and Standards  
R. Closure and Reclamation**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor with amendments	Monitoring of the production site and ancillary infrastructure during and after closure and reclamation needs to include potentially impacted water and air resources long after the reclamation period. Since it is well known that plugging failures can and do occur and the history of upward migration incidents is still a short one, monitoring needs to continue for several decades. If not the industry, will the State be willing to continue this activity for decades?
Weiss	Favor	

**21. Section VII - Monitoring, Recordkeeping and Reporting A Two years pre-development baseline**

		Response Percent	Response Count
Favor		30.0%	3
Favor with amendments		60.0%	6
Oppose		10.0%	1
Oppose with amendments		0.0%	0

Section VII - Monitoring, Recordkeeping and Reporting A. Two years pre-development baseline		
Commissioner	Response	Comment
Bender	Favor with amendments	Once the baseline monitoring protocols are established, a provision should be put in place to allow baseline monitoring to commence in advance of the actual permitting process.
Bunker	Favor	It has been suggested that for watersheds where there is existing baseline data that the 2 year requirement might be relaxed.
Edwards	Favor with amendments	Once the baseline monitoring protocols are established, a provision should be put in place to allow baseline monitoring to commence in advance of the actual permitting process.
Jamison	Favor with amendments	Baseline: Once the baseline monitoring protocols are established, a provision should be put in place to allow baseline monitoring to commence in advance of the actual permitting process. This allows the operator to begin the baseline data collecting while moving through the permitting process.
Murray	Favor	
Raley	Favor with amendments	Once the baseline monitoring protocols are established, a provision should be put in place to allow baseline monitoring to commence in advance of the actual permitting process.
Valentine	Favor with amendments	site specific timelines
Vanko	Favor	The pre-development baseline data may not be adequately specified at this time. But this is addressed in the next section (VII-B).
Weber	Favor with amendments	Although the Departments state that baseline monitoring data is necessary, the aquatic resources, particularly living resources, are mentioned to be evaluated and the data are important. The statement should use the word mandatory not important. Otherwise the data will not be collected. Water (surface and ground), air, and soil testing are not specifically identified for 2 year testing, but must be included for mandatory testing as well. The lack of this specification is remarkable. A recommendation that was accepted by the Departments was to require pre and post well drilling testing by the operator of ground water of water wells and the results provided to MDE and the well owner. This is a favorable requirement. The use of an Environmental Impact Statement

		(EIS) process could more easily handle and track the needed monitoring data. Water testing should include isotope characterization of chloride, bromide, methane and possibly other elements. The isotope abundance of elements indicates the source of the contamination (Marcellus Shale or elsewhere) when detected. The isotope abundance found in Marcellus Shale elements is different from that found at later geologic ages and today.
Weiss	Oppose	I do not believe that I have been provided with a compelling rationale for the time period which seems somewhat arbitrary. Could be more, could be less, but in keeping with my earlier comments, this is another area where some flexibility ought to be allowed depending on circumstances in the field.

**22. Section VII - Monitoring, Recordkeeping and Reporting B State agencies will develop standards and protocols for baseline and environmental assessment monitoring, recordkeeping and reporting, and monitoring during operations at the site.**

		Response Percent	Response Count
Favor		90.0%	9
Favor with amendments		10.0%	1
Oppose		0.0%	0
Oppose with amendments		0.0%	0

<b>Section VII - Monitoring, Recordkeeping and Reporting</b>		
<b>B. State agencies will develop standards and protocols for baseline and environmental assessment monitoring, recordkeeping and reporting, and monitoring during operations at the site</b>		
<b>Commissioner</b>	<b>Response</b>	<b>Comment</b>
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	

Weber	Favor with amendments	This section is confusing in that it states ...” State agencies will develop standard protocols for baseline and environmental assessment monitoring, recordkeeping and reporting. In addition, the State agencies will develop standards for monitoring (WHAT - emphasis added) during operations at the site, including drilling, hydraulic fracturing, and production. In addition, it will be extremely important that citizens have an opportunity to comment on the protocols and equally important on the standards that will be included in them for the predrilling as well as post drilling monitoring of all monitored aspects - water (surface and ground), aquatic habitats and their living organisms as well as air and soil parameters. The isotope characterization mentioned in question 21 applies here as well.
Weiss	Favor	I am comfortable leaving the fine details of these areas to the Departments, but the quality of the result would be overshadowed without adequate resources to enforce the provisions and to use the data to consistently improve upon the then accepted performance standards of drilling and well operation.

**23. Section VII - Monitoring, Recordkeeping and Reporting C Information must be reported to the State**

		Response Percent	Response Count
Favor		80.0%	8
Favor with amendments		20.0%	2
Oppose		0.0%	0
Oppose with amendments		0.0%	0

Section VII - Monitoring, Recordkeeping and Reporting C. Information must be reported to the State		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor with amendments	and county
Vanko	Favor	
Weber	Favor with amendments	As mentioned in question 21 above, an EIS approach could more easily handle and track at least part of the needed data as well as additional well specific logs and engineering information.
Weiss	Favor	See comment to 22.

**24. Section VII - Monitoring, Recordkeeping and Reporting D State agencies will require more extensive testing of surface and groundwater parameters both randomly and in instances where elevated levels have been detected**

		Response Percent	Response Count
Favor		80.0%	8
Favor with amendments		20.0%	2
Oppose		0.0%	0
Oppose with amendments		0.0%	0

**Section VII - Monitoring, Recordkeeping and Reporting  
D. State agencies will require more extensive testing of surface and groundwater parameters both randomly and in instances where elevated levels have been detected**

Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor with amendments	As mentioned earlier in question 19 part 1, the State should require the use of tracers for drilling activity and these should be available by the time drilling, if it occurs, will begin in Maryland. In the meantime, the state should include the use of isotope characterization of chloride, bromide, as well as methane and others elements as dictated by protocols that shed light on the source of these contaminants found in water as mentioned in question 21.
Weiss	Favor with amendments	See comment to 22.

**25. Section VII - Monitoring, Recordkeeping and Reporting E Cuttings, flowback, treatment residue and equipment shall be tested for radioactivity and properly disposed of**

		Response Percent	Response Count
Favor		100.0%	10
Favor with amendments		0.0%	0
Oppose		0.0%	0
Oppose with amendments		0.0%	0

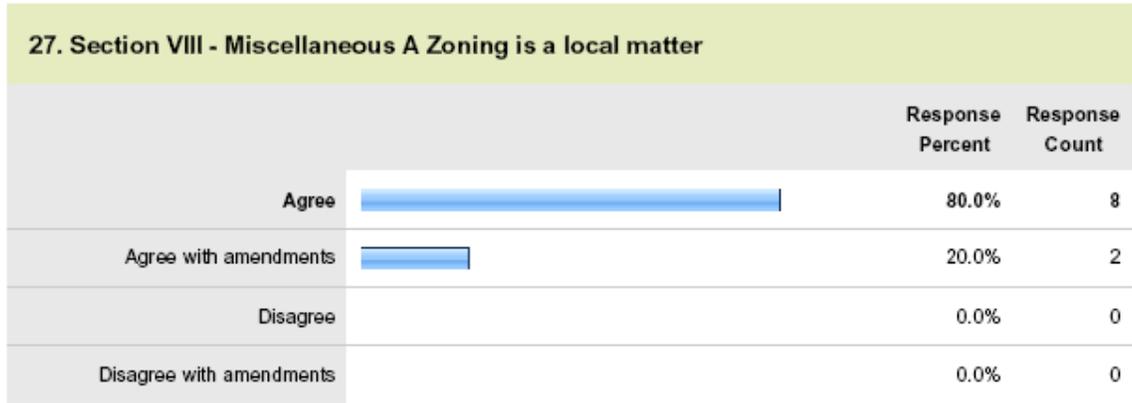
Section VII - Monitoring, Recordkeeping and Reporting		
E. Cuttings, flowback, treatment residue and equipment shall be tested for radioactivity and properly disposed of		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	
Raley	Favor	
Valentine	Favor	
Vanko	Favor	
Weber	Favor	
Weiss	Favor	See comment to 22.

**26. Section VII - Monitoring, Recordkeeping and Reporting F MDE will adopt a permit fee by regulation that is adequate to cover all the costs incurred by the State in connection with its gas well program**

		Response Percent	Response Count
Favor		80.0%	8
Favor with amendments		20.0%	2
Oppose		0.0%	0
Oppose with amendments		0.0%	0

Section VII - Monitoring, Recordkeeping and Reporting		
F. MDE will adopt a permit fee by regulation that is adequate to cover all the costs incurred by the State in connection with its gas well program		
Commissioner	Response	Comment
Bender	Favor	
Bunker	Favor	
Edwards	Favor	
Jamison	Favor	
Murray	Favor	This is extremely important.
Raley	Favor	
Valentine	Favor with amendments	County should be included
Vanko	Favor	

Weber	Favor with amendments	The lack of detail and vision needed to assess permit fees shown in the draft recommendations is problematic of the inevitable understaffing and lack of monitoring and enforcement likely to occur, if gas development occurs in Maryland. The Departments need to begin immediately by starting a process where all gas development activities are placed in a planning phase and where all aspects are identified and estimates of their financial and personnel costs can be developed. This approach should begin now and continue through regulation writing right up to permitting. Additional planning should also begin for enforcement details and a serious fine and legal structure should also begin to take shape.
Weiss	Favor	I am cautiously pessimistic that the state will be able to collect a fee sufficient to cover all the costs that the state should incur to ensure that any standard -- gold, platinum or copper -- is followed in a consistent and meaningful way.



Section VIII - Miscellaneous A. Zoning is a local matter		
Commissioner	Response	Comment
Bender	Agree	
Bunker	Agree	Agree, under present state law. These recommendations do provide a number of locational restrictions to protect the environment and public safety. It's really up to the counties to apply zoning to protect property values from the industrialization of residential and ag areas.
Edwards	Agree	
Jamison	Agree	
Murray	Agree	
Raley	Agree	
Valentine	Agree	
Vanko	Agree	
Weber	Agree with amendments	The lack of adequate land use zoning in Garrett County is well known. The goal is to get local citizens to understand their need to respond to this situation for their own protection and that of the County as well. Hopefully, local citizens can be motivated to respond and get the needed protections.

Weiss	Agree with amendments	There will need to be a discussion as to whether local requirements can trump state requirements, particularly where the local government seeks to regulate the operation of an oil and gas well versus the location of an oil and gas well. There will also need to be harmonization with any CDP requirement (a state-level requirement that would be very heavily zoning oriented).
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**28. Section VIII - Miscellaneous B Financial assurances have been addressed by SB 854 in 2013**

		Response Percent	Response Count
Agree		90.0%	9
Agree with amendments		0.0%	0
Disagree		10.0%	1
Disagree with amendments		0.0%	0

**Section VIII - Miscellaneous  
B Financial assurances have been addressed by SB 854 in 2013**

Commissioner	Response	Comment
Bender	Agree	
Bunker	Agree	
Edwards	Agree	
Jamison	Agree	
Murray	Agree	
Raley	Agree	
Valentine	Agree	
Vanko	Disagree	SB854 requires companies to secure bonding, general liability insurance, and environmental pollution insurance. However, the legislature has not yet enacted a separate commission recommendation - that there be a state severance tax, the purpose of which is to fund a Natural Gas Impact Fund. The maximum financial assurance will not be in place until an adequate severance tax bill is passed.
Weber	Agree	
Weiss	Agree	

**29. Section VIII - Miscellaneous C Forced pooling will not be considered at this time**

		Response Percent	Response Count
Agree		80.0%	8
Agree with amendments		0.0%	0
Disagree		10.0%	1
Disagree with amendments		10.0%	1

Section VIII - Miscellaneous C Forced pooling will not be considered at this time		
Commissioner	Response	Comment
Bender	Agree	
Bunker	Agree	I think that it's something that the General Assembly should address. There are advantages to forced pooling, but it could tie up the Commission in endless debate. It's probably best left to the legislature to initiate.
Edwards	Agree	
Jamison	Agree	
Murray	Agree	
Raley	Agree	
Valentine	Agree	
Vanko	Agree	
Weber	Disagree with amendments	Although forced pooling can be used to extract the maximum amount of gas by multiple wells emanating from a single well pad, it infringes on the rights of individual property owners and communities that may not want to participate. As such it should be addressed now and rejected on an individual rights basis.
Weiss	Disagree	See comments to No. 3 (CDP plan comments). Also, if the state chooses to go without a CDP requirement, Compulsory pooling could serve as a tool to assure that impacts are minimized (as a result of the need for less infrastructure, fewer well pads etc. to extract the resource). In fact, most would consider compulsory pooling part of the land use tool box to control willy nilly drilling and the impacts associated with the same. As such, I believe that if the BMP report does not include a recommendation that the Departments consider compulsory pooling, then it would be my strong suggestion that the issue be taken up before the Commission adjourns its proceedings.

**30. Provide any additional comments not addressed by the survey:**

	Response Count

Provide any additional comments not addressed by the survey	
Commissioner	Comment
Bender	Current state regulations restrict development to no more than 2% in high value watershed areas. This regulation could be expanded to include all areas with the following considerations: 1. Use of existing roads (both developed and undeveloped) and right-of-ways not be considered a factor in the calculation and that these are utilized for other purposes beyond gas development. 2. The reclamation of surface disturbances would be removed from said calculation upon approval of the appropriate state or local agency.
Bunker	
Edwards	Current State regulations restrict development to no more than 2% in high value watershed areas. This regulation could be expanded to include all areas with the following considerations: 1. Use of existing roadways (both developed and undeveloped) and right-of-ways not be considered a factor in the calculation and that these are utilized for other purposes beyond gas development. 2. The reclamation of surface disturbances would be removed from said calculation upon approval of the appropriate State or local agency.
Jamison	
Murray	
Raley	Current state regulations restrict development to no more than 2% in high value watershed areas. This regulation could be expanded to include all areas with the following considerations: 1. Use of existing roads (both developed and undeveloped) and right-of-ways not be considered a factor in the calculation and that these are utilized for other purposes beyond gas development. 2. The reclamation of surface disturbances would be removed from said calculation upon approval of the appropriate state or local agency.
Valentine	
Vanko	
Weber	The difficulty of identifying acceptable BP recommendations from the UMCES-AL report and readily paring them with the draft recommendation Best Practice document is difficult at best. A major problem exists to clearly grasp all pertinent Best Practice recommendations covered under a single topic section throughout the entire document. Although a companion document attempts to address the problem by showing the UMCES-AL document recommendations and pares them with the Best Practices Report document Sections, tracking agreed to best practice recommendations is difficult. The public would be better served if the report clearly addresses all accepted Best Practices under each section not through a referencing procedure which is backwards. Those best practices not accepted could also be commented upon. If insistence on the current approach of having a companion document is maintained, all UMCES-AL recommended BPs should be aligned with a specific section in the report as shown on the introductory line. In other words the companion document information should be reversed, i.e. BP report section on the left and adjoined by all relevant UMCES-AL BPs on the right. The stress that the current approach has on a reader of the report is clearly not in the interest of transparency. It is important to note that without a risk analysis of the various Best Practice parts that comprise the CGDP process as well as those yet to be developed for the ancillary infrastructure parts including gathering lines, gas processing units, and compressor stations, the CGDP concept on its surface is incomplete. A similar and equally important concern is that without risk analysis of all aspects of gas development and their components that comprise Marcellus Shale Gas Development in Maryland and without overlaying them with Best Practice recommendations, a final analysis of the determination of the adequacy of the BPs and whether any of the risks are unacceptable cannot be accomplished. Finally, the Best Practices report is clearly deficient in that it

	<p>does not address all aspects of Best Practices and only attempts a fraction of those needed prior to any gas exploration, development and production. As mentioned above, a risk analysis process is needed to further explore the sufficiency and adequacy of Best Practices and will also point to those which need to be improved by mitigation or further development. It is also very clear that many important aspects of gas development where whole lists of topics have yet to be explored by best practice efforts including hydraulic fracturing as an example have not been addressed. It is hoped that the many aspects yet to be addressed by Best Practices as well as the other topics in the Governor's Executive Order will be addressed in the final report due in August of 2014.</p>
Weiss	<p>Assuming again that the state determines that oil and gas exploration should be permitted, overall I believe that the best practices report and the recommendations contained therein provide Maryland with a blueprint for minimizing the risk of environmental harm while maximizing the economic benefit bound up in the shale formation. It is a difficult balance to strike, and I recognize that these recommendations are only the first step, to be augmented and further vetted during the regulatory rulemaking process. Like lawyers, the Commission could only recommend courses of action; clients, here the Departments, must make the wise and considered choices that will govern oil and gas exploration in the state. It is thus my sincere recommendation that the Departments be allocated the resources to not only make the right final choices, but to ensure that Maryland's new regulatory provisions are followed, and that the inevitable accidents be addressed immediately to minimize the risk of harm to the people and natural resources of the state. Without adequate staff (in terms of numbers and expertise), enforcement and inspection authority, and the ability to oversee an industry sprawling into some of the most prized areas of the state, I am concerned that the number of accidents will not be minimized, nor the impacts adequately addressed, which will result in the hard work of the Departments, Dr. Eshelman, and this commission being squandered. To that end I would like to personally recognize the achievement of the Departments, and Dr. Eshelman and his staff for making the issues perfectly clear, and the options understandable, not only for non-engineers like me, but for the people of Maryland who will benefit from the comprehensive nature of the study should drilling proceed. Accordingly, I believe that Maryland is on the way to achieving the gold standard provided that its leadership, not to mention industry, maintains the continuing commitment to prevent the standard from being tarnished.</p>

## Additional Commissioner Comments

The following comments were provided by two Commissioners in response to the Marcellus Shale Safe Drilling Initiative Study Part II Best Practices (August 2013).

### **Commissioner Jeffrey Kupfer:**

#### \*2. Section III

The concept of comprehensive planning is admirable; however, this particular proposal, if adopted as a regulatory requirement, is not workable and will not result in reasonable gas development. First - and as a general matter - until the "toolbox" is developed and the scope of Maryland's natural gas reserves is assessed, it seems premature for the state to require mandatory (versus voluntary) comprehensive planning. At this time, it would be more prudent to develop a voluntary program where there are clear incentives for an operator to undergo the burden of developing and submitting a comprehensive plan.

In terms of the specific proposal, the current requirements are both too detailed and too broad. It is not realistic for a company to produce an accurate five year plan for development -before they have even drilled and produced gas from an exploration well. Moreover, over a five year timeframe, as well results are assessed and technology advances, there will inevitably be modifications to the plan - such as different lateral lengths and drilling locations. Forcing a company to start again - to re-submit a new comprehensive plan and undergo a new public hearing process would be unduly burdensome and not result in any real environmental benefit. And it is not clear what type of development could continue to occur, if any, during the pendency of any plan modification.

Moreover, we all agree that impacts should be minimized. But the current language for state approval of the comprehensive plan - which says that "to the maximum extent practicable," the operator should avoid impacts and minimize unavoidable impacts - leaves significantly too much ambiguity. It is not clear what criteria the state will use to make that judgment and how the operator should try to balance the extra costs involved in mitigating impacts. Even for modifications that have no surface impact, like a change in the sequence of execution, the draft reads that the state "may" approve (rather than "shall" approve). It is always important to have clear regulatory rules and reliable criteria - and it is especially important when the operator is being forced to develop a long term plan with countless decisions.

Finally, there is a concern about the confidentiality of proprietary business information. This is not a static situation where an operator owns a large tract of land and is considering the best way to develop it. For the most part, there will be numerous land owners who have an interest, some of whom have leased their land and others who have not. There are countless private negotiations, for initial terms and renewal of drilling, gathering, and midstream rights. Forcing a company to outline its future development plans for that long of a time period -especially combined with the baseline monitoring requirement - will have significant commercial impacts and will unfairly impact the conduct of private business dealings. 2

### \*3-7. Section IV

I favor setback requirements with amendments. Without getting into specific distances at this time, I think it is important to remember that a longer setback is not always better. In arriving at the appropriate distances, there should be a clear understanding of the risks that will be mitigated and the benefits of the setback. Moreover, Marcellus infrastructure should not be treated any differently than other comparable infrastructure (e.g. for a recreational setback). I also support the report's recommendation to allow MDE to approve exceptions for good cause.

### \*9-10. Section VI

While it is appropriate to focus on the pad as the center of drilling activity, the requirement for a "zero discharge" pad should be revisited. It is not clear that mandating no discharge - including rainwater - from the entire pad will actually result in greater environmental protection. As for tanks and containers used for drilling and completions, there may be cases where it is appropriate for safety or other reasons to have an open top. Mandating a closed top for collecting flow-back water is overly restrictive.

### \*18. Water Reuse, Section VI

I very much support the concept of water reuse and recycle, and all things being equal, recycling on-site is preferable. However, there may be circumstances where it makes more sense to recycle water at a different, nearby location - and so there should be sufficient flexibility. Similarly, a 90% recycle target is fine, but depending on the operator's particular development circumstances (including whether they are a net water user), it may not be feasible (and it is unclear whether the language - which says "which shall not be less than 90%" - can accommodate those situations).

### \*20. Drilling, Section VI

It appears that MDE is not accepting the recommendation to mandate electrically powered equipment for drilling and completions, and instead is requiring that the operator provide a power plan that results in the "lowest practicable impact from the choice of energy source." I agree that moving away from on-site diesel engines makes sense, but the standard of "lowest practicable impact" is ambiguous, and thus not-workable. It is not clear which factors - economic, technical, greenhouse gas emissions, land disturbance - should be most important and how the Department will weigh them in approving a permit.

### \*45-46. Section VII

While I agree on the importance of baseline information, I am not convinced of the need for the broad scope of monitoring over a two year period before any activity can occur. It seems to me that this inquiry could be limited and/or shortened. Also, as the state develops protocols and guidelines, it is important to make sure that the natural gas industry is not treated differently than other development activities that could have a comparable impact - both in terms of the actual testing and who is responsible for the costs.

## **Commissioner Paul Roberts:**

Maryland's Department of the Environment and Department of Natural Resources are to be commended for creating an impressive framework for overhauling the state's outmoded natural gas-drilling regulatory code. Their collaboration with Keith Eshleman and Andrew Elmore from the University of Maryland's Center for Environmental Studies has produced a set of proposed Best Management Practices that will undoubtedly be widely consulted by regulators elsewhere.

Anyone reading the state's report will surely grasp the intellectual requirement needed to produce this work; the sheer number of details can leave one's head shaking. Commissioners can surely attest: this was hard work and we all appreciate the effort.

In my view, however, the proposal is not perfect and, given the subject – and the inherent risks and dangers associated with hydraulic fracturing – something as close to perfect as possible is absolutely required.

In two areas, I recommended substantive changes at the June 10, 2013, Governor's Commission meeting. This document not only restates the flaws I perceive and delineated at that meeting, but adds additional information.

I also appreciate that the agencies agreed with the criticism I voiced in April about controlled gas development plans, as proposed by Eshleman and Elmore – that a Gold Standard hardly glimmers if its voluntary. Making planned development mandatory was essential.

However, I question whether this approach will be undone by the agencies' failure in the draft report to set maximum surface development limits. As Eshleman-Elmore note: "Clustered well pad development can only be expected to reduce surface impacts if operators are held to" limits on overall development over time. In Pennsylvania state forests, they add, "newer leases hold operators to a maximum number of well pad locations, or total disturbance of a pre-defined acreage, whichever occurs first."

The agencies' draft BMPs, however, set limits on surface developments only in "high-value watersheds" of 2 percent.

They made the decision to cap development only in such watersheds, despite contradictory priorities stated in their own report. "By considering the entire project scope" of the projects, the report states, "responsible energy development could proceed while minimizing conflicts and addressing the concerns associated with maintaining the rural character of western Maryland..." Also: "Proactive, upfront planning at a landscape scale provides the framework for evaluating and minimizing cumulative impacts to the environmental, social, and economic fabric of western Maryland."

As I say, careful planning is hugely important, but without actual limits on surface development, the only outcome ensured is a methodical pace to what I believe will be huge holes in our region's forested ecosystems – the "lungs" of our area – and its overwhelmingly rural way of life. And with that destruction will also come a loss of western Maryland's rural heritage, for as

Eshleman-Elmore repeatedly note, the industrialization required for gas-drilling will be, at best, “semi-permanent.”

Whether anyone reading this is a whitewater enthusiast, camper, hiker, trout fisherwoman, bird-watcher, casual admirer of our mountains and pristine streams – or a permanent or part-time resident – I recommend they spend a few minutes researching activity at a modern gas well site, by now widely documented. To name only one obvious example, the proposed BMPs are likely to lead to regulations that allow a well to be drilled within 300 feet of a whitewater stream.

At the June 10 meeting, citing the agencies’ own stated priorities, I recommended that the 2 percent surface disturbance limit be applied to all land in the gas-play. I, however, did not fully study the implications of even this 2 percent cap (assuming the agencies had done so, for its recommendations in high-value watersheds). Upon further study after the meeting, though, I feel that even 2 percent is far too high a cap.

**This issue urgently needs to be revisited.**

As an example, take the roughly 15,000 acres (best estimate I could find on-line) in the Youghiogheny River Wild and Scenic Corridor in northwestern Garrett County. If an average well-site is, say, 8 acres, MDE/DNR would be prepared to allow more than 35 wells to be drilled within this corridor.

Alarmed at this arithmetic, I inquired further with the agencies on June 13 and 14. I was told that setting a cap is “not a decision to allow development up to that level,” because certain properties within state and federal parks, for example, would be off-limits to surface development, and additional acres could be protected through “set-backs” and features in the comprehensive gas development plan.

I do not consider this a satisfactory answer. The point is, however additional protections might be secured, these could amount to no more than incremental additions. Even half that number of wells, in any high-value watershed, could be expected to transform it. I dare say that if this level of development occurred within eyesight (or ear-shot) of a wilderness river, most people using that river would no longer consider themselves in a wilderness area.

Will they return? Will the river ultimately be safe? Will the ground-water that is part of the hydrologic system of that watershed – on which the people who live here depend in countless ways – be fully secure? These are among the pivotal questions that may only realistically be answered by 1) thoroughly calculating the risks (which has not been done by the commission or state agencies), then 2) setting a limit on total surface development, through an acreage calculation or through number of wells permitted (as in Pennsylvania’s state forest).

Finally, I would point that 1) Pennsylvania took this step for precisely the same reason – to have a shot at maintaining the remote, rugged quality of its state forests and 2) Eshleman-Elmore contains at least seven references to achieving a total impervious surface development (“pavement, buildings, gravel roads, well pads” associated with gas-drilling) of between 1 and 2 percent “for any watershed currently below this threshold,” which, means, virtually all of Garrett

County outside its municipalities. “*There is abundant scientific evidence that watershed impervious surface area is a robust indicator of cumulative impacts to watershed structure and functioning.*” (my emphasis)

The second area to address relates to set-backs. I believe bigger set-backs are needed in all areas if the goal is to maintain the county’s rural or wilderness flavor, but I specifically asked on June 10 that the proposed set-back from a residential water well be doubled to 2,000 feet – the same as from a municipal water supply – and I remain the only person in these proceedings who has produced any evidence publicly of why this distance is appropriate.

I urged that MDE/DNR accept the ruling of the Federal Energy Regulatory Commission, which in December 2012 mandated a 2,000-foot setback from a gas storage field owned by Dominion Transmission because “there has been no model developed... to predict the exact placement and path, width, length and height of a fracture and then to prove” with simulated seismic experiments “that the fractures were placed where predicted and extended only” as predicted.

To emphasize, FERC’s finding was based on staff research after Dominion’s lawyers argued for this setback in hearings. Given that the state produced not one bit of justification for a 1,000-foot setback, if it chooses not to extend it to 2,000 feet, everyone should be aware that Maryland disregarded evidence offered by the industry itself about the risks of drilling too close to resources that demand protection.

Again, I urge the state to abide by the FERC finding. We need a Golden Rule for the Gold Standard: what’s good-enough for industry ought to be good-enough for my neighbors and me. The surest way to avoid methane contamination of underground aquifers – the most widely documented problem associated with shale gas development – is to put the wells as far from water sources as the best science indicates is necessary.

Please: 80 percent of the county’s rural residents rely on well water; we need a 2,000 feet setback from residential water wells.