ACR Scientific Peer Review Process Comments for:

***Baseline Monitoring Methodology for the Conversion of High-Bleed Pneumatic Controllers in Oil and Natural Gas Systems* (August 2009)**

Submitted to Verdeo November 4, 2009

Summary by lead peer reviewer: This technology is proven to significantly reduce carbon emissions. Issues needing resolution in the technical document include the background, boundaries and data collected to establish a verifiable baseline and project accomplishment. The following briefly outlines how well the document satisfies the criteria in the American Carbon Registry™ Eligibility Rules and Criteria for GHG Project Registration and Offset Issuance. Following this is a detailed listing of critique comments on the Baseline Monitoring Methodology document (Document) from the scientific peer reviewers:

ACR Criteria Summary

A. Project Documentation
 Document is lacking in accurate expression of "how," "when," "monitoring parameters" and "report guidance"

B. Real
 This criterion can be satisfied.

C. Additional
 Insufficient guidance on common practice and financial

 a. Regulatory Surplus
  This can be satisfied: there is presently no mandatory requirement for this technology in the natural gas industry in the U.S.
 b. Common Practice
  This may be difficult as the technology has been available in the U.S. for 20 years, and the industry as a whole has made significant progress integrating this technology into new construction and retrofit.
 c. Implementation Barriers
  i. Financial
   In some sectors of the natural gas industry, there are no financial incentives to retrofit methane emissions reduction technologies
  ii. Technological
   There are some applications where this technology is not technically practical or recommended. The Document does not highlight these.
  iii. Institutional
   There are some institutional barriers on some sectors of the U.S. natural gas industry. The Document does not discuss these or provide guidance on identifying such barriers (e.g. Public Utility Commission agreements)

D. Direct Emissions
 This can be satisfied.

E. Project Action
This can be satisfied.

F. Title
This can be satisfied.

G. Approved Methods, Tools and Emissions Factors
Document provides insufficient guidance on emission factor development.

H. Project Baseline
Document provides insufficient discussion on this criteria, given the Additionality issues of common practice and financial. Guidance on boundaries is insufficient for establishing a baseline and project accomplishments as necessary for verification.

I. Permanent
Insufficient guidance on boundaries leaves the opportunity for back-sliding.

J. Net of Leakage
Document provides insufficient guidance on identifying and avoiding increased emissions directly associated with project deficiencies in operations and maintenance.

K. Crediting Period
Document is insufficient in addressing the "time" element of boundaries, which bear on financial additionality.

L. Independent Verification
This criterion can be satisfied provided several deficiencies in Document are corrected and project if fully defined and supported with baseline and project data.

M. Community and Environmental Impacts
Document is largely satisfactory, although additional guidance should be provided to clarify potential environmental and community impacts resulting from failure of project equipment (e.g. failure of low bleed control device leading to process upset).

Critique Comments on Baseline Monitoring Methodology Document

1. Page 3, Section 1.1, ¶ 2: Conversion of high-bleed controllers is not uncommon in the production sector of the oil & gas industry. If this paper has evidence that it is uncommon in other sectors, make that clear.

2. Page 3, footnote 1: The maximum bleed rate of a low-bleed controller is defined as 6 cubic feet per hour, not day.

3. Page 4, ¶ 2: "Any controller" cannot be converted from high-bleed to low-bleed. Certain control functions require the higher response time and valve actuation precision of high-bleed controllers (e.g. compressor recycle).

4. Page 4, Section 2.1, ¶ 1: Project boundaries need to be defined much more broadly for several reasons. First, a time element needs to be part of the boundary as economics and emissions are

dependent on the maintenance history of the replaced high-bleed device. All pneumatic controllers must be re-furbished periodically, depending on the service. For example, corrosive gas, such as production gas containing moisture, carbon dioxide and hydrogen sulfide will degrade the internals of a controller faster than pipeline quality gas. Toward the end of a devices "operable life" the bleed rate may increase and the cost of replacement should take into account avoided maintenance costs.

5. Page 4, Section 2.1, ¶ 2: The phrase "calculated at a production basin level" is too limiting. Since gas savings in production equate to gas sales revenues, the production sector will have a larger challenge in establishing financial additionality. Indeed, low-bleed devices and retrofits are often profitable, as evidenced by many conversions reported to the Natural Gas STAR voluntary methane emissions reduction program and the Lessons Learned study posted on the Gas STAR website: http://www.epa.gov/gasstar/documents/ll_pneumatics.pdf. Transmission and distribution sectors of the natural gas industry do not own the gas, and depending on the nature of their public utility commission agreement, may have no financial incentive to reduce lost and unaccounted for gas.

6. Page 5, ¶ 2: This is a totally insufficient statement to guide baseline determination. See further comments on Section 3.

7. Page 5, ¶ 3: This paragraph is totally insufficient guidance on addressing leakage. Some applications of low-bleed controllers have experienced performance problems partly due to improper installation and partly due to controller performance deficiencies leading to process upsets and methane gas emissions from over-pressure relief valves or gas well shut-in (leading in some cases to a need to blow a well to atmosphere or swab a well to re-establish gas flow). There is growing evidence that production separator and compressor scrubber dump valves performing sluggishly are causing gas blow-by to liquid tanks and very large (and heretofore unnoticed) emissions from the tank roof vent.

8. Page 6, ¶ 6 (last): Focus is on the "oil and gas production segment" only. High-bleed pneumatic controllers are common in the gas gathering/booster station part of the processing sector and in the transmission sector. These are more important than production in that the operator may not own the gas, and have agreements (e.g. public utility agreements) which require them to pass along to the customers all the emissions savings (i.e. reductions in lost and unaccounted for gas), thereby depriving the operator of financial incentive to reduce emissions. In production, the gas emissions reductions at the wellhead translate to more gas through the sales meter, and more revenue to the producer.

9. Page 7, ¶ 1: This paragraph displays a substantial distortion of the U.S. EPA National GHG Emissions Inventory of methane emissions from the petroleum and natural gas systems. EPA, in conjunction with the Gas Research Institute (GRI) contracted for a major, bottom-up analysis of methane emissions in the U.S. natural gas industry in 1992. Data was gathered in 1992 and the study was reported in 1996. The National Inventory methodology uses the emission factors developed for 1992 and projects the activity factors forward to each successive year using activity drivers. Activity drivers are industry statistics published each year that are considered indicative of the number of sources relative to that that statistic in the base year of 1992. Pneumatic devices are factored by a combination of number of wells and amount of gas production. The base 1992 survey data included high-bleed, low-bleed and no-bleed pneumatic devices, so it would be incorrect to project the number in 1992 to present assuming that they are all high-bleed devices. From these projections each year, the National Inventory deducts the emissions reductions reported by Natural

Gas STAR Partners, including the number of low-bleed retrofits. So the number of high-bleed pneumatic devices projected from 1992 to the 2007 U.S. Inventory published in 2009 would be lower by the number of low-bleed conversions reported between 1992 and 2007, certainly not the 546,206 devices represented in this paragraph.

The 2002 study by EPA of the share of the total population that is low-bleed devices referenced in footnote 4 on page 7 concluded that there were 66% low bleed and 34% high bleed. This study used anecdotal market share and sales data from pneumatic instrument vendors, which was not public information (as required for the National Inventory) and was not considered very accurate, so it is not used to factor the 2002 activity data underlying the Inventory projections. Therefore, the conclusion in the last sentence of this paragraph, that the number of high-bleed population in the United States is currently around 350,000 controllers is not supported by proper interpretation of the referenced source data. Furthermore, the conclusion in paragraph 2 on page 7, "that the market penetration rate for high-bleed conversions in the production sector remains low" is also not supported by the referenced sources.

Finally, in paragraph 4 on page 7, combining the Natural Gas STAR reported high-bleed conversions or replacements with the 350,000 erroneous estimate of high-bleed controllers mis-represents the fact that a large percentage of newly installed pneumatic devices that cannot be reported to Natural Gas STAR, but are inherent in the projection of 546,206 total pneumatic devices (also erroneous). Therefore, the conclusion that low-bleed conversions in the production sector is below 10% cannot be supported.

10. Page 8, ¶ 1: Another factor that may explain reluctance of operators to make conversions of high-bleed devices to low-bleed is the industry's "wait and see" attitude on U.S. GHG Emissions Reduction policy and law. There is anecdotal evidence that oil and gas operating companies do not trust that Congress will give them credit for the voluntary methane emission reductions reported to the EPA Natural Gas STAR Program.

11. Page 8, ¶ 4 and 5: In providing guidance on financial barriers, it is very important to represent the project boundaries completely. In addition to a spacial boundary around the oil and gas operations subject to the project (e.g. production field, gas transmission system), it is important to establish an expression of timeframe around the baseline because all pneumatic devices eventually require expensive refurbishing. As discussed in the Natural Gas STAR Lessons Learned study (reference 1 on page 3), pneumatic devices have an "economic life" approximated at 7 years. Avoidance of this refurbishment cost at the end of a devices "economic life" bears on the profitability of a retrofit to low-bleed.

12. Page 9, ¶ 3: This document should provide guidance on the institutional barriers that gas transmission and distribution companies face in public utility agreements. These agreements generally pass any savings associated with methane emission reductions (i.e. lost and unaccounted for) to the customers. If this guidance document is intended to apply only to oil and gas production, where savings in emissions directly translate to increased revenues from gas sales, then it is foregoing a major opportunity in gas transmission and distribution, and possibly also gas gathering/processing.

13. Page 9, Section 3.1: This baseline emissions methodology guidance is insufficient to avoid "gaming" of high-bleed devices. As stated in the Gas STAR Lessons Learned referenced in

footnote 1 on page 3, there are operational ways to reduce emission (which serve in the reverse as operational ways to increase emissions). For example, if the proportional band and reset functions of a controller are set very narrow and very fast, respectively, the device will actuate the valve much more frequently perhaps than necessary, increasing emissions. In a similar vein, increasing the pneumatic gas supply pressure increases the bleed rate.

14. Page 10, Equation 3: The factor (1-ATsj) is for one type of snap-action controller common in the oil and gas industry, such as on gas/liquid separators in production and scrubber dump valves in processing and transmission. There is another type, pilot operated, that do not bleed or vent gas when the process condition (e.g. liquid level) is above the activation set point and the valve is closed. This type sends a pneumatic gas signal to actuate the valve to the open position. The equations should embrace other types of snap-acting controllers.

15. Page 10, Equations 3 and 4: Factor "N" (number of manufacturers in the project) is defined but not used in the equations. Total baseline emissions should be calculated as a sum over each manufacturer, such as factoring for Ni where "i" represents each manufacturer. Further, "Oicont" needs further clarification for guidance.

16. Page 12, Section 3.2: The proper number of random samples should be a percentage of the total project population, not a fixed number such as 30.

17. Page 13, Section 3.3: The statement in the first sentence is true provided the project boundary is defined correctly (i.e. both spatially and chronologically). The conclusion that "replacement of pneumatic controllers from high-bleed to low-bleed affects no other part of the operation" is categorically untrue. Operators have complained that low-bleed devices plug-up more frequently and upset more frequently. There are proper installation approaches to avoiding such problems, but without employing such preventive measures, upsets and equipment shut-downs can and do occur. If a mature gas well, plagued by liquids loading, is shut-down unnecessarily, it may require procedures which vent a lot of gas to the atmosphere (e.g. swabbing) to re-establish flow. Tripping a compressor offline because a pneumatic controller fails or plugs will result in venting that compressor and potentially using pneumatic gas to re-start the compressor. Guidance should be provided on assessing the avoidance of such leakage issues.

18. Page 14, ¶ 1: It can NOT be concluded that there would be no leakage from this project activity as the document currently defines it.

19. Page 15, Table 4.0: More data would be required to properly and completely characterize the high-bleed baseline and low-bleed operating data. This would include data on the average period of high-bleed retrofit for the gas quality in the project basin, and the instrument settings, both actual and manufacturer's recommendations. A good verifier should be on the alert for "gaming" the emission reductions by setting the baseline at maximum emissions and the project at minimum emissions. While honest operators may not even think of such operational measures, a proper guidance document cannot take this for granted.

20. Page 15, Section 4.2: The table should include the element of time (equipment "economic life") to account for replacement or retrofit of a high-bleed device relative to its economic life. The avoided refurbishment cost will bear on project economics. The last cell in this table (top of page 16) should

have a place in the spreadsheet for each type of controller (continuous bleed, interrupted bleed, non-bleed, etc).

21. Page 16, Section 4.3, ¶ 1: Guidance document should consider a statistical selection of sample size based on project total population size.
22. Page 16, Section 4.3, Mello, Augusto2: specify a "durable" tag (e.g. stamped metal) that will survive many years of potential carbon crediting.

23. Page 17, Section 4.3.4: Guidance document should specify a statistical method for outliers. Not removing outliers has the same potential to distort the project emission reductions as removing all outliers.

24. Page 17, Section 4.4.1, ¶ 3: Not only should the response of the detector be checked, but the flow rate should be verified using a standard absolute volume measurement instrument such as a dry gas meter. A project description document validator may desire the high volume sampler calibration to be re-checked at the end of each day of measurements, in addition to first thing each day.

25. Page 18, bullet 2: May wish to recommend a minimum time, such as one or five minutes, for the gas measurement reading to stabilize.

26. Page 20: E_{TB} and E_{TI} need a time element (the project time period) expressed in data units, e.g. annual.

27. Page 21, top, right-hand table cell: Guidance document may want to reference National Institute of Standards and Technology (NIST) traceable calibration gases.

28. Page 23, Section 6.0: Guidance document should elaborate in "project will be monitored by the project proponent" to include exactly what data is monitored (e.g. how frequently, what data collected such as pneumatic gas pressure, instrument settings relative to baseline, upsets attributable to low-bleed device problems, emissions associated with recovering from upsets, corrective actions taken, document retention, etc).

29. Page 23, Section 7.0, ¶ 1: Last line is not necessarily true, and a guidance document should not reach conclusions that are subject to the project determinations. Proper guidance will avoid overstatement of claims.

30. Page 23, Section 7.0, ¶ 3: Other factors as stated above (e.g. equipment life, instrument settings) bear on uncertainty. Overall uncertainty can be assessed by the uncertainty of each element in a calculation; this should be referenced in the guidance document.

31. Page 24, Table 7-1: Operating parameters should be addressed in QA/QC Procedures for emission factors; how controllers are tagged should be added to number of replacement/retrofits; a general category on operating parameters, with an uncertainty of low/medium should be added to the table for those factors that may affect the emission factors.

32. Pages 29-30: Guidance document discusses confidence level in terms of 95%, but example in table on page 30 uses 99%. These should be consistent for recommended guidance.

ACR Scientific Peer Review Process Comments for:

***Baseline Monitoring Methodology for the Conversion of High-Bleed Pneumatic Controllers in Oil and Natural Gas Systems* (December 2009)**

Submitted to Verdeo January 6, 2010

Summary by lead peer reviewer: The revision of the Baseline Monitoring Methodology document, incorporating most of the peer review comments, is much improved. There are still a few important issues that this report of the scientific peer review team recommends resolving. The following briefly outlines these proposed edits such that the document satisfies the criteria in the American Carbon Registry™ Eligibility Rules and Criteria for GHG Project Registration and Offset Issuance. Comments and proposed edits are listed by page number, section, paragraph (¶), and line.

Critique Comments and Edits on Baseline Monitoring Methodology Document

1. Page 1, Section 1.1, ¶ 2: Revise second and third sentences as follows, "Before 1990, pneumatic controllers were designed with generally high bleed rates. Increasing awareness of the extent of wasted resources and potential environmental hazards resulting from higher bleed rates,…" This change is proposed for accuracy, given that the original 1996 GRI Study survey in 1992 found many pneumatic devices with no bleed or bleed rates meeting the EPA coined definition of "low-bleed." The term "low bleed" was not used in any part of the 1996 GRI Study report, suggesting that it was not a term defining particular design intent.

2. Page 5, ¶ 1, last sentence: This sentence makes it clear, per peer review comments, that the oil and gas industry sectors intended to be covered by this methodology are production and gas transmission. However, Table 2.1, CH4 emission Description, makes reference to production facilities, but makes no mention of transmission facilities. As the vast majority of pneumatic controllers are in transmission compressor stations, it makes sense to provide a description unique to them.

3. Page 5, ¶ 4: This paragraph slants the background toward focus ONLY on the emissions from pneumatic devices. The rebuttal to the Peer Review comments 7 and 28 suggest that "upsets" of the process are caused by factors independent of the pneumatic devises. This is a conclusion that a methodology should not assume. Rather, this document may make a point in the background that process upsets leading to emissions of GHG can be caused by many factors unrelated to pneumatic control devices, but the project data should document such upsets in the baseline and project, and draw conclusions as to the causes. This allows a verifier to ascertain with data and facts that the pneumatic devices are not the cause of upsets. There is growing data and anecdotal evidence that pneumatic device mal-functions lead to excessive emissions; however, it is unclear whether those malfunctions and emissions are caused uniquely by low bleed versus high bleed devices. The recent (2009) Texas Commission for Environmental Quality (TCEQ) study of production tank emissions and 2006 Houston Advanced Research Center (HARC) study on the same source both found about 50% of production tanks had emissions far exceeding flashing of gas from gas-oil separator conditions. While data was not gathered in either study to conclusively identify separator dump valve failure (stuck open, vortex, too low level setting) it is believed by industry experts that something like this is the cause of those excessive emissions. Natural Gas STAR transmission Partners have reported in technology transfer

workshops that they found excessive condensate tank emissions caused by scrubber dump valves sticking open and blowing high pressure gas through the dump valve in into the condensate tank. With this ample evidence that pneumatic control devices can be involved with excessive emissions outside the boundary of just the devices themselves, it makes sense that the document recognizes this issue and indicates how the project will establish evidence in the baseline and project that demonstrates that the choice of low bleed devices is NOT causing increased emissions.

4. Page 12, ¶ 1: The focus on a "basin-by-basin approach" is uniquely applicable to production. As it is made clear in the background that this methodology applies to transmission as well as production, there should be either a generalization of the approach or a companion paragraph dealing specifically with transmissions, as this paragraph deals with production. Given that gas gathering/booster stations are commonly controlled with natural gas powered pneumatic controllers, and they straddle the production, processing and transmission sectors of the industry, they should be called out as well.

5. Page 13, Section 3.1.1: An additional paragraph inserted at the end of this section, before Section 3.1.2, could describe differences in the above methodology as applied to gas gathering and transmission compressor stations, with particular focus on compressor scrubber dump valves.

6. Page 13, Section 3.1.2, ¶ 2: This paragraph is out of place; it belongs in the background section, not the quantification methodology section, as it provides no explanation of how to quantify emissions (rather, it continues a general theme of proselytizing in favor of the low emissions technology rather than demonstrating the low emissions with baseline and project collected data and analysis).

7. Page 15, ¶ 1-5: A methodology should not be drawing conclusions like these, preempting a verifier from arriving at such conclusions based on data and analyses comparing the background with the project. This reads like a PDD responding to issues of leakage rather than guidance as to what issues should be addressed: e.g. provide project evidence that pneumatic gas pressure does not increase as a result of conversion to low bleed, causing increased fugitives. Leakage discussion should point out other possible avenues for increased emissions, such as system upsets, etc, and require evidence in the baseline and project that such emissions are not caused by the project.

8. Page 16, Table 4.0: The column heading "Manufacturers Specifications" is not sufficient. This should be footnoted with specific data, such as pneumatic gas supply pressure. This same column should be reproduced in the "Retrofit info" heading, including similar footnoted manufacturer specifications. Alongside this manufacturer's recommended specification column should be actual field data on each instrument, showing actual operating data (i.e. actual supply gas pressure). This provides the verifier data on which to draw his opinion that the project is not gaming the emissions with too high supply gas pressure in the baseline and too low in the project. There should be other instrument parameters useful to a verifier, such as proportional band and low liquid level settings in the baseline and project provide the verifier evidence as to whether the pneumatic controller is being activated unnecessarily frequently in the baseline, or the liquid level in a scrubbers and separators are not set so low as to cause gas blow-by and excessive emissions elsewhere in the process.

9. Page 18, last paragraph in Procedure 3: The reference to "end-of-life" is probably not something that any operator would know. It would be better to refer to "instrument overhaul" (and define that term such that it applies to refurbishing the internal elements of the controller: o-rings, seals, needle valves,

orifices, etc; the parts that deteriorate in service and need periodic replacement). This document should require field data to be collected in the baseline that shows the frequency of such major overhauls and the last overhaul of each instrument in the baseline emission factor determination. This is important in that pneumatic device emissions (bleed rates) may be highest just before an overhaul, and the cost of such an overhaul can be avoided by making replacement at that time, slanting the economics if not accounted for.

10. Page 19, Section 4.3.5: There seems to be some mis-understanding of the review comments pertaining to pneumatic gas supply pressure and process pressure drop across the control valve. Supply gas pressure should be recorded and compared with manufacturer's specifications in the baseline and project data.

11. Page 21, top, right-hand table cell: Document may want to reference National Institute of Standards and Technology (NIST) traceable calibration gases.

12. Page 20, Section 4.4.3: This review opinion suggests adding another section to 4.0 Data Collection and Monitoring, outlining the use of calibrated bagging. The CDM Methodology Panel recently approved adding calibrated bagging to Approved Method 23 (AM0023), which applies to fugitive and vented emissions. This is a very inexpensive method that this reviewer recommends adding to this methodology. It is not a NECESSARY addition, but potentially useful.

13. Page 25, Section 6.0, ¶ 2: A methodology should indicate what data is to be collected and compared to provide evidence that something is or is not occurring. It is necessary to provide a verifier with field collected data in the baseline and project to draw his opinion.

14. Page 25, Section 7.0, ¶ 3: Recommend editing as follows: "These potential sources of uncertainty include, but are not limited to: emissions factors … in Table 7-1. Other factors as stated above (e.g. equipment overhaul frequency, instrument settings) …" [edits shown underlined].

15. Page 26, ¶ 1: Edit sentence as follows: "Operating outages in the baseline and the Project will be recorded, if and when they occur through the contribution …"

16. Page 26, Table 7-1: This table needs to be expanded with a section on "Instrument Parameters" to supplement the "Operating Parameters" section. The first "QA/QC Procedures Risk Mitigation" paragraph under Operating Parameters should be supplemented with paragraphs discussing Overhauls, Process Upsets with Frequency and Magnitude." The second paragraph presently under Operating Parameters should be included in the new Data Parameter section on Instrument Parameters, as Actuation Rate is an instrument setting parameter. This should be supplemented with other instrument parameters such as Proportional Band and Low Liquid Level in dump valves and liquid level controllers.

American Carbon Registry's Internal Review Comments on:

***Baseline Monitoring Methodology for the Conversion of High-Bleed Pneumatic Controllers in Oil and Natural Gas Systems* (December 2009)**

Submitted to Verdeo
January 6, 2010

Page	Comment
4	Under 1.2 Applicability, suggest adding a bullet to indicate this methodology is applicable to conversions of both snap-acting and throttle type high-bleed pneumatic controllers.
4	"The project boundaries will be confined to all conversions implemented by a single project entity in a contiguous time frame." Clarify wording: it is really by a single Project Proponent, correct, and in a continuous (how defined?) time frame. Not necessarily contiguous project area, unless very broadly defined.
5	As is clear on page 5 and elsewhere in the document, this methodology really addresses estimating emissions in both the baseline (high bleed) and project (conversion to low bleed) cases. The net emission reductions will be the difference between these, statistically sampled. Why then is the document titled only "*Baseline* Monitoring Methodology"?
5	Table suggests that CO_2 released along with natural gas generally constitutes only about 5% (by volume? By CO_2 equivalent, compared to methane? Should clarify). You do not explicitly say this is *de minimis.* Anyway perhaps better than claiming *de minimis* would be simply to say that ignoring CO_2 emitted along with natural gas is conservative, since there is less natural gas and therefore less CO_2 emitted in the project case than in the baseline case, but no credit is being claimed for this.
6	Can you add any detail on how it is possible to predict, without looking at each one, what proportion of controllers will have reached the end of their useful life before the end of the crediting period? And of those that are assumed to have reached the end of their useful life, are *all* conservatively assumed to be replaced by low-bleed controllers in the baseline, so no further credits?
6	"Project proponents utilizing this methodology should consult the latest version of the American Carbon Registry's Standard Technical Hybrid Additionality Test." Change wording to "…should consult the latest version of the American Carbon Registry's Technical Standard" (which includes the hybrid additionality test).
7	"The project proponent must demonstrate that there is no existing *or proposed* regulation..." ACR's regulatory surplus test does not include proposed regulations; a project activity need only be in excess of regulations currently in effect in order to pass this test. Of course at the time of applying to renew its crediting period, if regulations have changed, the activity may no longer be regulatory surplus and may not be eligible. But for now look only at current regulations.
7	The language addressing common practice in the industry is excellent overall. It may be useful to state up front, before getting into all the details, that: the penetration rate of replacement of high with low bleed controllers is believed to be less than 10%, based on information provided below…
8	Strongly suggest you delete the sentence "Furthermore, these operators are skeptical that they will receive credit for any voluntary emission reductions ahead of a resolution by the U.S. Congress." Part of the value of registering these reductions on ACR is that it will significantly increase the chances of early action recognition, and ACR is working hard to make that the case.

9	For meeting the implementation barriers component of the ACR's three-prong additionality test, financial (or possibly institutional) barriers seem the most likely pick. To strengthen the demonstration of financial barriers, two suggestions: • Methodology could include a comparison of IRR of the high- to low-bleed conversion with and without carbon credit revenues. • Methodology could more explicitly address why cost savings from reducing natural gas losses are not sufficient financial incentive for operators to be making these conversions. See for example the DOE article you attached, which talks about a payback period on the order of months, I believe only from the gas savings. Are the real barriers more institutional?
10	"Quantification of project emissions will require baseline emissions…" I think this is not what you mean. Rather, "Quantification of net emission reductions will be based on the difference between baseline and project emissions, both statistically sampled and estimated at the conservative end of the 95% confidence interval."
17	ACR Technical Standard states that non-forest projects will have a crediting period of 10 years or less. You are not explicit here about crediting period. You do discuss the verification interval (annual). For other project types, we are requiring that verification at least once every five years include a site visit. You could apply that here and say that once every five years, the verifier will visit sites to check performance of, and perhaps subsample, a portion of the converted controllers. Overall, I would like to see a little more clarity on exactly what the Project Proponent will measure (this is pretty clearly delineated in Appendix C) vs. what the verifier needs to measure (similar things but a subsample). Some of this may be more appropriate to your GHG Project Plan, than this methodology document.
25	I do not see why the number of pneumatic controllers replaced would be an uncertainty. Yes you may only sample a subset of those replaced, but surely you know how many were replaced.
26	Excellent to take the conservative approach of using the lower bound of the 95% confidence interval for baseline emissions, and the upper bound for project emissions. Both can of course be narrowed by more intensive sampling.
32	Here you could address more explicitly how stratification (e.g. by manufacturer and model) may be used to reduce the sample size required to achieve a targeted confidence interval.
33	In the last row of the table, where you give the upper and lower bounds of the 95% confidence interval, suggest saying "437 to 584" and "507 to 751" rather than using commas.
34	The wording is slightly imprecise. More samples do not really give "a higher baseline emissions estimate and a lower project emissions estimate" as you say here. Rather, more samples mean a smaller margin of error at 95% confidence, which means a higher lower bound for the baseline emissions and a lower upper bound for the project emissions, resulting in greater net emission reductions.