



Marcellus Matters EASE: Community Conversations Events

Summative Evaluation Report

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Prepared by:

Joe E. Heimlich, Ph.D.
Dolly Hayde, M.A.
Rena Youngs, M.A.
Rebecca Nall, B.S., B.A.

Prepared for:

Penn State University



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COSI | 333 West Broad Street | Columbus, Ohio 43215

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Background

Marcellus Matters: EASE

Marcellus Matters: Engaging Adults in Science and Energy (EASE) was a program of Penn State University's Marcellus Center for Outreach and Research (MCOR), in collaboration with other experts across the university. The first year of program activities took place in 2012, and the project continued through September 2016. EASE was a multidisciplinary initiative that provided adults in rural Pennsylvania with opportunities to increase their knowledge of science and energy systems and engage in scientific inquiry and investigation through the lens of natural gas development.

The present report addresses one of the four program activities, the Community Conversations program.

Community Conversations

The Community Conversations program was a series of events that featured theatrical performances and opportunities for dialogue between scientists and community members. Delivered five times over the course of two years, Community Conversations aimed to communicate science content, use art to highlight the complexity of shale gas development, and promote community engagement through both art and science.

A formative evaluation of the first two community conversation events was conducted to assess and compare the effectiveness of two different event and performance structures; the summative evaluation described here considers responses from those two events alongside three additional events as part of the cumulative data set. Both evaluation phases addressed the following questions:

To what extent and in what ways did audience members (and performers, and scientists) find that the "Community Conversations" event format...

- was effective at communicating about science?
- was effective at using art to highlight the complexity of gas drilling-related issues?
- was effective at fostering civil dialogue on issues related to shale gas development? (That is, did audience members report or indicate openness to dialogue?)
- demonstrated a "balance" between engagement with art and with science?

What aspects of the "Community Conversations" event, if any, garnered particularly strong short-term reactions from audience members?

Methods

Audience members were asked to complete a short written questionnaire at the end of each event, and the instrument was described to audience members by data collectors while being distributed.

During the formative stage of evaluation, a slightly longer version of the feedback form was used to help the team gather input from audiences that could directly inform the structure and content of the program. Where items matched on the summative stage instrument, data from the formative stage are included here for comparison over time. A full report that includes all data from the May 2012 and October 2012 events can be found online: [http://informal.science.org/evaluation/ic-000-000-007-629/Marcellus Matters EASE Community Conversations Formative Evaluation](http://informal.science.org/evaluation/ic-000-000-007-629/Marcellus_Matters_EASE_Community_Conversations_Formative_Evaluation)

Beginning with the October 2012 event, all Marcellus Matters team members who were present (including performers, scientists, and project coordinators) also completed open-ended written reflections in the days following the event. These reflections were analyzed inductively in order to identify key areas of consensus or disagreement and other patterns as they emerged in the text. As part of formative evaluation, these data were used to help the team adjust their approach in real time; this summative evaluation report uses the data to map success and change across the life of the project.

Description of Sample

Data for summative evaluation were collected at each of five events from a total of 64 adult respondents. The largest audience was for the October 2012 event (18 people), while the smallest audience was for the May 2014 event (6 people). Group-level information about audience members' ages and attendance patterns is included in Table 1.

Table 1. Audience characteristics

	Number of People	Percent of All Respondents (n=64)
18-65 years old	30	47%
Over 65 years old	26	41%
Attended with family members	23	36%
Attended alone	18	28%
Attended with one or more adults	17	27%
Attended with friends	11	17%
Attended with colleagues	5	8%
Attended with one or more children	1	2%

Among the audience members who provided demographic information, nearly half were under the age of 65. Attendees at the June 2013 and May 2014 events included proportionally more audience members over the age of 65, with 61% of the audience and 67%, respectively.

Audience members overall most frequently reported attending with family members, although the October 2012 event had a higher proportion of attendees reporting this (61%) than other individual events.

The May 2012 event had proportionally the most audience members (25%) who had attended with colleagues, and about half of the audience for the May 2014 event attended with friends. Proportionally more (about a third) of the audience members at the October 2012 and May 2014 events had attended with one or more other adults, and proportionally more respondents (39%) attended the June 2013 event alone.

Results

Audience Responses

Interest in the Event

When asked what made them want to attend the Community Conversations events, two-thirds of audience members reported an interest in learning more (66% of respondents). Only slightly less frequently, audience members (63%) indicated that they were interested in how Marcellus shale relates to the environment. About half of respondents reported that they were interested in how Marcellus shale relates to the economy, and 41% noted a specific interest in how Marcellus shale relates to their property. Just under a quarter of respondents reported an existing interest in theatrical performances. Figure 1 compares these interests at the group level across events.

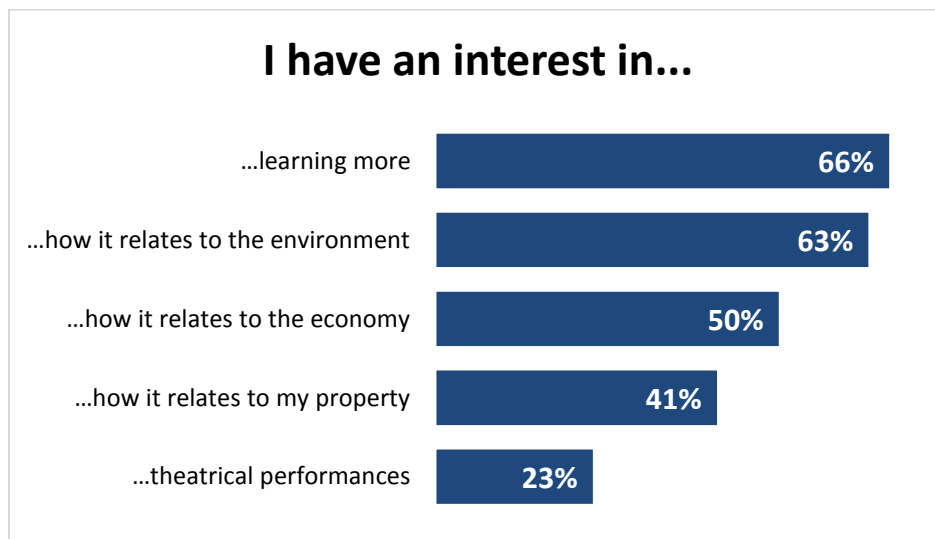


Figure 1. Interests contributing to audience members' attendance across all performances (n=64)

Note: Because respondents could select as many interests as applied to them, the sum of percentages will exceed 100%.

Openness to Dialogue

Audience members were also asked to rate their level of agreement with a series of statements related to civil dialogue around shale gas development. While there was majority agreement with each statement, the strength of respondents' agreement varied with each (see Figure 2 and Table 2). At the group level, respondents indicated the strongest agreement with statements valuing others' views. For example, the statement with the highest mean agreement rating was "I believe I

could learn from what other people have to say” (mean rating 6.24, with 81% of responses indicating strong agreement), and the second highest mean agreement was with the statement “I want to hear what other people have to say” (mean 5.90, with 67% strong agreement).

Meanwhile, respondents were less enthusiastic about actively contributing their own perspectives: the statement with weakest agreement at the group level was “I want to share my opinions with others” (mean rating 4.97 and 41% of responses indicating strong agreement). While constructive dialogue depends on acknowledging the complexity of an issue and uncertainty on some points, the relative hesitation of some audience members to contribute their own perspectives may mean that some audiences could benefit from additional encouragement to participate.

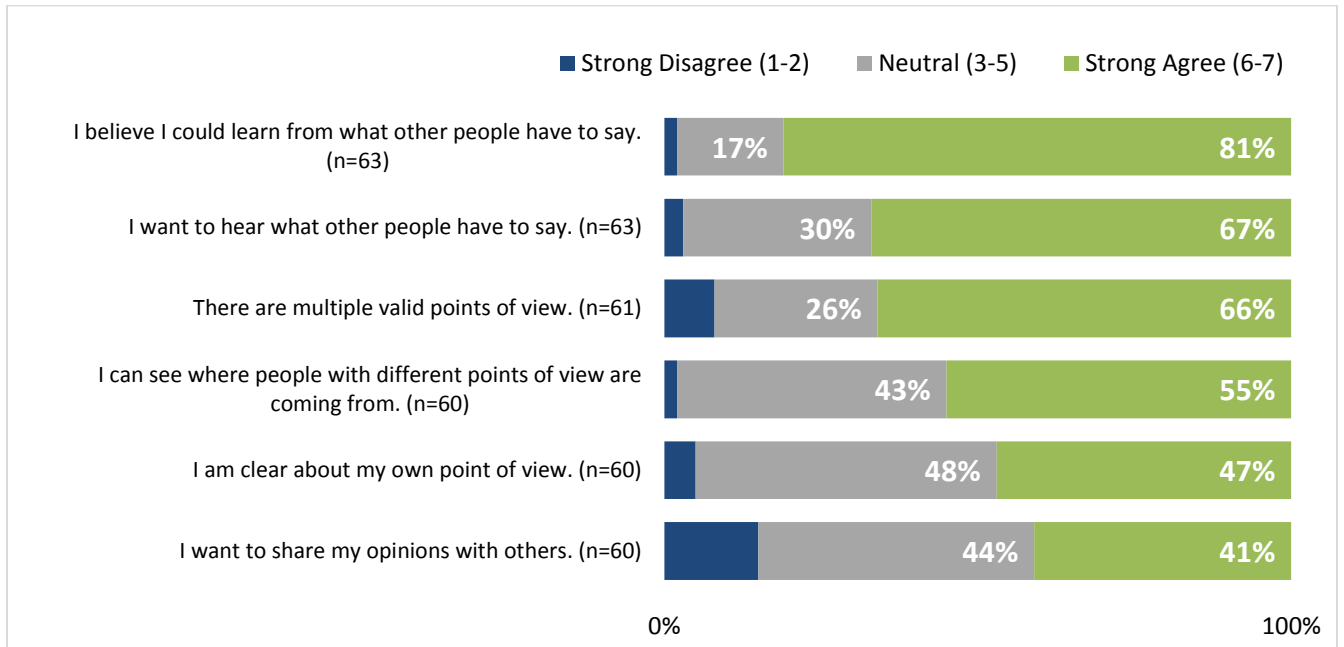


Figure 2. Group-level ratings of each dialogue-related statement across all events

Table 2. Mean ratings of dialogue-related statements overall

	Mean Rating	Standard Deviation
I believe I could learn from what other people have to say (n=63)	6.24	1.160
I want to hear what other people have to say (n=63)	5.90	1.376
I can see where people with different points of view are coming from (n=60)	5.58	1.279
There are multiple valid points of view (n=61)	5.57	1.648
I am clear about my own point of view (n=60)	5.32	1.479
I want to share my opinions with others (n=60)	4.97	1.804

Given that respondents participated in different experiences (including performances of different scripts) with sometimes very different audience dynamics, it is also illustrative to examine ratings for each individual event (Table 3). While the small and varying audience sizes limit the power of quantitative analyses of these data, the variation in responses across events does suggest some differences in the overall dynamic of each event.

For example, respondents at the last event in the series (May 2014) gave the highest mean ratings on items pertaining to diversity of perspective, with lower interest in sharing a specific perspective; this is consistent with the event dialogue itself, in which a small group of participants raised questions on a wide range of safety issues. In contrast, the second-to-last event (November 2013), which included a much more contentious dialogue involving an argument between activists, received the highest rating for certainty about respondents' own points of view. Finally, the second event (October 2012) received the highest mean agreement rating for the desire to listen to others *and* the desire to share personal opinions; this data point echoes team members' perceptions that the audience seemed particularly receptive to the program and accompanying dialogue.

Table 3. Mean ratings of dialogue-related statements by event

Please share the degree to which you agree with the following statements about your own views on natural gas drilling and the Marcellus shale gas play. Circling 1 (one) means “not at all” and 7 (seven) means “completely.”

	May 2012 (n=15)	October 2012 (n=18)	June 2013 (n=13)	November 2013 (n=11)	May 2014 (n=6)
I can see where people with different points of view are coming from	5.73	5.44	5.85	4.91	7
I want to hear what other people have to say	6.07	6.28	6.08	5.55	4.67
I am clear about my own point of view	4.79	5.39	5.46	6.00	4.50
There are multiple valid points of view	5.60	5.78	5.23	5.30	6.20
I want to share my opinions with others	4.93	5.56	4.46	4.90	4.25
I believe I could learn from what other people have to say	6.40	6.50	6.15	5.55	6.50

Reactions to the Events

People who attended the events were also asked to comment on their reactions to the event itself. Fourteen audience members responded to an item asking them to describe anything that had surprised them about the event; three left additional comments that did not respond directly to this item. For the purpose of analysis, all written responses were coded together to reflect qualitative feedback from 16 individuals.

The most frequent theme within these comments (5 respondents) pertained to the quality of interactions at the event; specifically, they referred to a positive tone or dynamic as part of the dialogue component. The next most frequent categories of response (with 3 respondents each) concerned the science of hydraulic fracturing or were general positive comments. Another two respondents voiced a specific concern related to shale gas development; in one case this related to environmental monitoring, and in the other it related to economic growth. Rarer responses (1 respondent each) pertained to the quality of the performance, the quality of the discussion segment (in terms of depth and content), and career opportunities. These data, along with the ratings data described above, suggest that while the specific circumstances of each event varied, the overall program structure was mostly successful in supporting space for positive dialogue.

Team Reflections

As part of formative evaluation, team members’ post-program reflections on each event were used to inform changes to the structure, content, and tone of the program. Because these data supported

changes to programming over time, team members continued this reflective exercise on paper during the summative evaluation phase, beginning with the October 2012 event. In addition to providing real-time information for the team, these data together also provide a record of how the team's perceptions, areas of consensus, and decision-making about Community Conversations changed over time.

Describing the Audience

The first thing team members were asked to comment on after each event was the audience. While team members were fairly consistent in using demographic descriptors like age and sex across events, other areas of description were more or less emphasized at different events. For example, proportionally more team members noted attendees' connections to the project (i.e., previous participation in project elements, especially the Community Science Volunteers course) at earlier events. At later events, which did not seem to include such heavy attendance from previous project participants, team members were more likely to comment on attendees' knowledge about and specific interests in energy issues. While comments about the number of people and whether or not attendees were from the local community were consistently included in team members' logs, audience size seemed to grow as a concern whereas observations about attendees' home communities seemed to decrease by the last event. These observations suggest that across events, audience members' prior knowledge of and interest in gas development likely contributed to their perceptions of the events. In addition, both the heavy presence of "known" participants early on and the relatively small audiences in later events underscored persistent challenges in publicity efforts related to Marcellus Matters activities in general, and the performance events in particular.

Audience Engagement: Perceived Success

Team members were also asked to weigh in on what they thought was the most engaging part of each event. Although at least one person at each event noted overall success, with "both parts" engaging the audience in different ways, this was more common at the October 2012 and June 2013 events than at the November 2013 and May 2014 events.

After the October event, two-thirds of the team members present commented that the performance and dialogue segments were equally engaging, with the remaining members highlighting the dialogue specifically. The June event showed less agreement among team members, with comments divided among the performance segment, the dialogue segment, and "both." However, in both the November and May events, the majority of the team highlighted the dialogue segment as most engaging. Praise for the performance was weakest overall: it was generally "appreciated" but was rarely highlighted. One possible reason for this is that the performance segment was consistently workshopped and prepared in advance, whereas dialogue was emergent in the context of each location, and so may have been more top-of-mind. Although certain components solidified and some team members were present for every event, there was also a great deal of variation in who was present. Therefore, as with the formative evaluation, the persistence of team members' individual agendas, understandings of the project, and criteria for project success were often clearer than the adoption of a unified set of goals and indicators across the whole team.

When asked if they noticed any unexpected audience reactions, team members responded to early events by focusing on similar topics; however, they sometimes reached opposing conclusions. Overall, team recall of surprising moments tended to concern audience engagement with the performance, but responses differed in degree: while some noted surprise at how actively the audience was engaged, others expected more engagement than they observed. Similarly, team

members seemed to have divergent expectations about humor in the early performances, with some individuals noting both more open laughter than expected, and others noting less of the same. As above, these differences likely reflect the different approaches to performances that emerged throughout the life of the project.

In reflections from the November 2013 event, nearly all team members expressed surprise at the dynamic of the dialogue event. However, this seemed more specific to disruptive audience members than the structure of the event itself, as evidenced by team observations that the audience appeared “much more hostile than we are used to” (Team Member Log). Other triangulated event data suggested that this was indeed a function of context, particularly given that a majority of team members indicated that they encountered nothing unexpected at the last event (May 2014).

Audience Engagement: Areas for Improvement

Team members gave fewer responses to the prompt about which elements of the event were “least engaging” than they did to other prompts. Direct responses to this prompt were most often related to “long sections” of the performance, but team members listed nothing just as frequently. This suggests that both the event itself and observable audience responses generally met the team’s expectations, even when those expectations varied from one respondent to another. An exception was the final (May 2014) event, where the component most frequently listed as “least engaging” among team members was a prototype animation for an educational video game (an element that was not an “official” segment of Community Conversations so much as an opportunity to gain informal feedback from a relevant audience for another segment of Marcellus Matters).

Importantly, neither major successes nor challenges consistently reflected clear consensus: the overall breadth of comments (concerning both the whole event structure and the life of the project) suggests that team members may have been inclined to perceive the event in different ways. While this does not itself indicate issues with the structure of the program, it does likely reflect the very different processes, disciplinary backgrounds, and roles of the team. When team members were asked to explain why they felt certain elements were most or least engaging, they tended to emphasize novelty of elements (e.g. video or animation) or concepts (i.e., blending art and science) after the June 2013 and May 2014 events. Reflective comments from other events tended to focus more on the perceived tone of the evening or the quality of the program, although the November 2013 event also included comments related to the audience’s perceived agendas.

Identifying Audience Takeaways

An area which did reflect greater consensus among team members pertained to what the audience seemed to “get” (i.e., understand or take away) from the event. For most of the Community Conversations events, the team agreed that participants appeared to understand and appreciate the goals of the event. (A key exception was the November 2013 event, in which disruptions from the audience appeared to overshadow this positive response and team members agreed that the audience did *not* “get it.”)

Less consistent were the moments when and ways in which team members perceived audience members as “getting it.” Following the two earliest events, most team members named overarching themes (i.e., risk, competing perspectives, and trust or uncertainty) as elements that felt resonant for the audience; however, team members varied in the types of evidence they used to explain their reasoning. While some team members noted callbacks during the group discussion (e.g., audience members’ using both the content of the performance and their own experiences to talk about risk),

others referred to observable behaviors during the performance itself, such as consistent “smiles, eye contact, [and] laughter” (Team Member Log). Additionally, one team member connected these behaviors to understanding that resulted from humor, observing that such an approach created space for exploration of ideas, rather than a purely emotional reaction. By the last Community Conversations event, team members noticed more connections between elements as moments when audience members seemed to understand and appreciate the event, and the sense of overall cohesiveness was much stronger. As one respondent wrote, “it seemed like the various ways the material was presented was helpful in providing different points of entry (Team Member Log)”

Change Over Time

Making Use of Feedback

Team members’ reflections on each event also included their input on how the program might be improved. While there was never complete consensus among team members on this point, there were clear emphases in shared concerns over time. During the earlier stages of the project (i.e., after the October 2012 and June 2013 events), the team commented more frequently on potential structural changes to the program or specific logistical concerns. While both of these events responded directly to the format and content of the performances, comments on the October 2012 event also focused on setup for the event and pre-program publicity.

In contrast, reflections on the November 2013 event—which included some disruptive behavior from a few attendees—were more focused on team members’ reactions to the audience and strategies for navigating difficult communicative situations. By the last event in the series, team members’ reflections overwhelmingly indicated that there was nothing they would have done differently; the only suggestions offered were related to publicity efforts, likely due to relatively low attendance.

An important success of the team logs was that team members’ suggestions for change generally seemed compatible and served to strengthen subsequent events. For example, early in the project, multiple team members pointed out technical and logistical issues (e.g., sound quality, group sizes for dialogues, etc.), which allowed the team to course-correct over time.

A perennial question throughout the life of the program pertained to the optimal combination of science content, affective connection and dialogue. Importantly, the scripted elements of Community Conversations used throughout the project were based on actual descriptions of issues related to shale gas development from people in the communities served by Marcellus EASE. By drawing on the lived experiences of community members, the team sought to introduce dialogue as an authentic opportunity to discuss community concerns. In the early stages of the program (e.g., the May 2012 event), performances were first perceived as emphasizing emotion to the detriment of teaching accurate scientific facts, then, after modifications (e.g., at the November 2012 event), to the detriment of emotional investment. In short, the team observed that by sharing local perceptions and experiences with less scientific context, the events risked perpetuating misconceptions about science; meanwhile, with less connection to authentic local concerns, the events lacked personal resonance. Team members responded by restructuring their approach for later events to blend communities’ own emotional touchstones with local commentary that emphasized uncertainty, not misconceptions.

Retrospective Discussions

In spring 2014, team members who wrote and performed the theatrical elements of Community Conversations were invited to participate in individual debriefing interviews to capture major takeaways from the program as a whole. These conversations involved discussions with four individual team members over the course of two days. A common theme in team comments was the persistent tension between a stated need to remain in the realm of the factual (in service of science learning outcomes) without including any element that “denies the perception of the community” or “the reality of others” (Team Interview). As a result, one team member observed that “Things each time were intentionally different,” in an effort to make Community Conversations “really about meeting the audience and finding out where they are” before sharing expertise and fostering dialogue (Team Interview). Integral to this goal was the idea of respecting audiences and valuing local knowledge: as one team member put it, “You don’t have to go that deep with these concerns. They live it. They get it” (Team Interview). Performers also saw an affordance of the program as helping team scientists respond effectively to community perceptions related to potential industry bias and/or agendas.

In a final group debrief, the project team as a whole was asked to outline what their goals had been for the Community Conversations program, what they felt participants had gained through the program, what they themselves would identify as major takeaways or lessons learned, and what they identified as the legacy of the program (Figure 3).



Figure 3. Team reflections on the Community Conversations program

Notably, project team members observed that the personnel who developed Community Conversations shared their expertise in community outreach, science communication, and public speaking to support the other work of the project. In addition to contributing to the Community Science Volunteers (CSV) course's discussions of communication, personnel led a team communication workshop (which directly influenced the adoption of new presentation styles in some CSV sessions), adapted a Community Conversations script for one of the MarcellusByDesign games, and participated as presenters in Penn State's Gallery Conversations program series. Ultimately, the role of Community Conversations in the larger Marcellus EASE project was viewed as a "grand collaboration" between performing arts and science: as one performer put it, "no one's done this before" (Team Interview).

Conclusions

Overall, the long-term collaborative process of developing, implementing, and refining the Community Conversations event structure demonstrated several major affordances of performance and narrative in fostering discussion about energy-related issues: piquing participants' interest in science, identifying and honoring emotional complexity in decision-making about energy, and fostering opportunities for respectful conversation between people with a range of perspectives.

Although at various points Community Conversations events emphasized either the inclusion of accurate artistic representations of local concerns *or* accurate scientific content, the team learned over time how to demonstrate balance between these twin concerns. Moving too strongly in the direction of either was perceived as undercutting the other, but in recognizing that these issues could be effectively framed as intertwined—not necessarily opposed—the team was able to refine the balance of artistic and scientific elements in a way that authentically highlighted the emotional and sociopolitical complexity of shale gas development without perpetuating scientific misconceptions. In considering what touchpoints seemed especially compelling, team reflections identified risk, competing perspectives, and trust or uncertainty as themes that seemed to resonate most with audiences.

Additionally, participant responses suggest that while the immediate reactions to each event varied according to audience concerns and the content of the event, the overall program structure was mostly successful in supporting space for positive dialogue. Notably, after they participated in Community Conversations, respondents generally indicated strong agreement with statements valuing others' views; meanwhile, their ratings were lowest for statements related to sharing their own perspectives. Meanwhile, two-thirds of respondents framed their interest in the event as connected to wanting to learn more. Taken together, these data suggest that while Community Conversations were effective at activating participant interest and providing a comfortable space to engage in complex discussions, some participants may have lacked firm stances and/or confidence in their own knowledge going into the experience.

Finally, an important takeaway from Community Conversations was other project team members' greater awareness of the affordances of communication theory and the power of personal narrative in public communication about science, both in the EASE project and beyond it. In addition to the programmatic elements of Community Conversations, the program team's contributions to the Community Science Volunteers (CSV) course's discussions of communication, a team communication workshop, and the MarcellusByDesign games underscored the project's legacy as an innovative collaboration between physical and natural sciences, social sciences, and performing arts.

Appendix A: Summative Evaluation Instruments

Audience Questionnaire

This event was a production of the Penn State University Marcellus Center for Outreach and Research, and is part of a project supported by the National Science Foundation. Sharing your thoughts will help us to better understand the impact of this event. Thank you for taking a moment to answer these brief questions.

Your age (circle one): under 18 18-65 over 65

The phrases below describe people who might attend this event about Marcellus Shale. Please circle all that apply to you today.

I attended today's event with...	I attended today's event because I have an interest in...
family members	How it relates to my property
friends	How it relates to the environment
colleagues	How it relates to the economy
one or more adults	Learning more
one or more children	Theatrical performances
alone	

Did you see or hear any things at this event that surprised you? If so, please list or describe them here.

*Please share the degree to which you agree with the following statements **about your own views** on natural gas drilling and the Marcellus shale gas play. Circling 1 (one) means "not at all" and 7 (seven) means "completely."*

I can see where people with different points of view are coming from	1	2	3	4	5	6	7
I want to hear what other people have to say	1	2	3	4	5	6	7
I am clear about my own point of view	1	2	3	4	5	6	7
There are multiple valid points of view	1	2	3	4	5	6	7
I want to share my opinions with others	1	2	3	4	5	6	7
I believe I could learn from what other people have to say	1	2	3	4	5	6	7

Team Log

Team Member's Log

Community Conversations

Marcellus Matters (EASE) Community Conversations

Name: _____

Role(s): _____

Performance Date & Time: _____

Performance Location: _____

What was the audience like? Provide some description of the participants, the location, and other relevant background information.

Of the different parts of the performance (including the concluding talkback / dialogue), which seemed to engage the audience the most?

Which seemed to engage the audience the least?

What do you think led to this?

Were there any points in the performance at which the audience responded in an unexpected way? What were they?

Did the audience seem to be 'getting' what we were trying to convey? Is this an overall sense, or were there specific moments & indicators of 'getting' it?

At which points in the performance did this happen?

Is there anything we could or should have done differently?

Appendix B: Audience Comments

In order to document audience members' short-term reactions to the performances, participants were asked to respond to the following item: **"Did you see or hear any things at this event that surprised you? If so, please list or describe them here."** All collected comments from the May 2012, October 2012, June 2013, November 2013, and May 2014 events are included below.

May 2012

"Loved/truly appreciated having elders - the wise farmers (husbands & wives) here. No one is going to know the land & its behavior over time then the elders of a community."

"that water could evaporate & leave residue in the form of dust."

"How it relates to transparency & opportunity for careers for our students." [written near interest in attending item]

"Surprised at the level of common viewpoints that were shared & the willingness of those gathered to want to work together to address the issues. Very positive"

October 2012

"great program"

June 2013

"Interactions of staff with attendees & discussion."

"The low number of water wells that are polluted due to gas drilling."

November 2013

"good dialogue--we need more"

"Lack of the usual polarization"

"The discussion was much different then topics in the plays. I was expecting something perfect."

"There was no point of view from those who are promoting the improvements of the local economy."

"Topics in scripts did not surprised me! However--enjoyed the skits! It was as tho' I sat in on locals talking/complaining about the gas uproar over last 2 + 3 years."

"Yes! The high level of the conversations--well informed"

May 2014

“Good job”

“I appreciated the open discussion.”