

Carrie Kline: Okay. This is running well. Thank you, Professor Collins, for devoting time, rather last minute, to talk with us about your research. I am Carrie Kline. Here with my husband and partner, Michael Kline, Talking Across the Lines. Would you introduce yourself, say, "My name is?"

Alan Collins: My name is Alan Collins. I'm a professor in Agricultural and Resource Economics at West Virginia University.

CK: And your date of birth for some perspective?

AC: 1/11/57.

CK: 1/11/57?

AC: Yes.

CK: Great. Just also for the sake of a bit of background, tell us a little bit about your people and where you were raised.

AC: My people. [laughter] Okay. I was raised mostly in the Western United States. So, my father worked for the Bureau of Land Management. He was stationed, for most of his career, in Phoenix, Arizona. So, that's where I grew up most of my youth. But I also lived in California, New Mexico, and Virginia. So, we moved quite a few places. I went to college at University of Arizona in Tucson and got a degree in Natural Resource Economics. Then I got masters and PhDs at Utah State University and Oregon State University, respectively. So, I've dealt with a lot of issues in terms of natural resources and natural resource use. I have come back here to West Virginia and been on the faculty since 1989. Since that time, I've dealt primarily with water quality. But other resources, I've looked at agriculture and management of poultry manure as a water quality influence. I've done some studies on recycling and looking at that particular issue. Then, of course, with the Marcellus shale gas boom or expansion here in this state. One of the issues that interested me was the issue of split estates and how that's...

CK: Of what? I am sorry.

AC: Of split estates. Of how those particular landowners are treated in the process of extraction of natural gas.

CK: Split estates.

AC: Yes.

CK: The term means?

AC: Oh, the term, okay. We're going to define that. The term means that the ownership of the surface rights to land has been separated from the ownership of the mineral rights to land. So, here in our country, if you're familiar with land ownership, we are I guess fortunate enough to be

able to own all the rights to land, which would include the land itself and mineral rights below it. Other developed countries and other countries around the world buy the surface, but typically, the government would retain ownership of the mineral rights. So, here in this country, we're able, as private citizens, to own both. However, in many cases here in West Virginia as well as the Appalachian region, those rights over the years have been separated. In other words, previous owners for legal or semi-legal reasons, a separation occurred. So, one of the things I wanted to study here in dealing with this newly found resource or newly exploited resource of Marcellus natural gas was how split estate owners – in other words, those people that just owned the surface – how they perceived the drilling process versus people that owned – or surface owners that own both surface and mineral rights together. So, that was the basis of my study, is to look at those two groups and try to decipher some of the differences of their perceptions of natural gas drilling and the process of that.

CK: Great. Well, how did you go about that?

AC: [laughter] A survey. I do a lot of survey research. One way we figure out what's going on in the world is to talk to people. Communicate, I guess, would be more appropriate because these were mail surveys. So, there were a couple different data sources that are available. One data source is from the West Virginia Geologic and Economic Surveys. They have a database of all completed Marcellus shale gas wells. That's online. So, that particular database has the owner of the land, the owner of the mineral rights, and the drill. So, you can go through that database and figure out who owns the minerals, and are they the same individuals as the surface owner? So, we could separate out that data based upon what we thought were split estates going into the research, and what we thought were non-split estates. In other words, fee simple. That's when you own both mineral and surface rights. Then we excluded from that database, of course, when the drillers owned all three. We weren't going to survey them and ask them their perceptions [laughter] of the drilling because, of course, you know the answer they would give us. So, what we were focusing on was, primarily, individuals or families or trusts, things that looked like it was a small group of individuals that were being affected by the drilling. So, we stayed away from large organizations, like Boy Scouts or churches, or municipalities that would own land and perhaps own mineral rights. We didn't want to survey them. We wanted to survey individuals and families.

CK: It is sort of fifty-fifty or?

AC: Sorry?

CK: Sort of fifty-fifty, the two groups then?

AC: Well, no. That's not what the data had. [laughter]

CK: I mean, who were you looking? You divided between people who own the mineral rights equally with people who did not in terms of households? Or how did you set it up?

AC: Okay. Well, we divided into two groups. One group was a group of wells. These are completed Marcellus wells that were on property that we believe were split estates based upon

this database. That's one group. The other group was fee simple, which the mineral right and the surface owner were identified to be the same individual. Now, again, this is a database. So, we hadn't talked to anybody yet. We just divided that up into two groups. So, that particular database had just under a thousand observations. Two thirds of those were split estates. So, one of the talking points, I guess, I would say today is that split estates are not an unusual occurrence. In other words, it was fairly frequent to have a split estate. But again, we took a database that excluded drillers, excluded large organizations that were owning land. So, we just looked at situations that individuals or families might find themselves in if they have a parcel of land and there might be a Marcellus shale gas well drilled on that property. That's what we're interested in.

CK: You said earlier that the estates were split for either legal or semi-legal reasons? [laughter]

AC: Well, how much time do we have? [laughter] We could go into a very long explanation of how the surface and the mineral rights were separated. That was most often done years ago. Some of the legal reasons would be, there's a family, let's say, an elderly couple living on a parcel of land. They have both the mineral and surface rights. They may give the surface rights to one set of children and the mineral rights to another set of children. So, there could be separations that are perfectly logical and legal. Over time, then those mineral rights may be transferred down to other individuals or sold by the descendants of that original couple. That's a perfectly legal reason. Another legal reason is that certainly – and I don't have much documentation in West Virginia. But Kentucky has done a good job of documenting the sale of the separation of surface from mineral rights by the sale of individuals. Individuals would sell their surface rights because, of course, they didn't believe that it was worth very much, and it also gave them some capital. They could expand their farm or do other activities on the surface of the land. So, those are perfectly legitimate reasons to separate rights. Then there are some less than legitimate reasons. I guess in my paper here, I took the term robber barons. So, that was not an unusual occurrence in this part of the world, particularly in West Virginia, where we were separated from Virginia back during the Civil War. So, land ownership claims were a little fuzzy after – well, I'm not sure after the war, but during that time period of the late nineteenth century. So, what people would do, people from outside of West Virginia would come in and claim large tracks of land. In claiming that, they would then go to the current people that resided on the land and say, "Look, I'll give up my claim if you give me the timber or give me the mineral rights." So, that's the example of less than ethical legal separation. So, those separations did occur, but it was under duress situations. Again, this is historical. I'm an ag/economist. I'm not a historian. So, what you do in the research is try and get some background, which is, why is split estates of importance to our current citizens of the state? It's important because a lot of tracks of land that you would want to buy in West Virginia do not have the mineral rights associated with them. It affects the current owners who had nothing gained by and have shown no improvement from the split that occurred decades or maybe even hundreds of years ago. So, that's sort of some background about why split estates are important and why, from a societal standpoint, we should be concerned about it. What was my original question [laughter] had to do [laughter] with how do we do this research? So, we got this database, split estates and then fee simple estates. However, we didn't have any way to contact these people, and who these people are. We contacted only the surface owners. So, I had to go down to Charleston and the Office of the Oil and Gas in the Division of Environmental Protection – or excuse me. It's Department of

Environmental Protection, I believe. They have all the information about the permits that are associated with these completed Marcellus shale gas wells. So, I had to go through all the permits, get the mailing addresses of the surface owner. Now, again, there's some interpretation that goes on here. Sometimes, there's one surface owner. It's not a problem. Sometimes, I've seen as many as 256 surface owners [laughter] where you've kept dividing up the land among different generations. So, there always wasn't some interpretation of what's going on here. So, anyways, I got mailing addresses. I did not get for all – I said there was somewhat under a thousand wells that we had covered. I got just under five hundred mailing addresses. Now, that included situations where there were multiple wells on property. So, that represents something like about seven hundred wells were represented in my database.

CK: That included split estates and fee simple?

AC: Again, it's that same ratio. So, I tried to stick with that ratio of two-thirds split estates, one-thirds fee simple. Now, again, I want to emphasize that that breakdown is a representative of smaller, family-owned type properties. The larger properties, you may have a different mix of what's split and fee simple. So, created a mail survey. I'm not sure how familiar you are with mail surveys. But of course, you just don't write a few questions and send it out in the mail. There's a process involved. That process involves creating a survey, getting some feedback from other researchers that have expertise in this area, and then also doing what we call a pretest. So, I sent out that survey to an initial small group of landowners, asked if I can call them up and go through the survey with them. So, that's part of the process – getting feedback on your questions. Do you understand this? Are you interpreting this the way that I meant it to be? So, that was part of the – it's called a pre-testing process.

CK: So, the survey was to be verbal?

AC: Only the pre-test was verbal. Okay? So, the pre-test was verbal. The main vehicle of responding to the survey was through the mail. Though, the way I structured this, it's called a hybrid survey. In other words, I allowed people to answer by mail or to also answer by going online. So, there was an online version, you could answer the survey as well. I'm not sure how familiar you are with West Virginia, but from my experience in surveying – and again, we're talking about, in my sample, mainly rural West Virginians because these are completed Marcellus gas wells. They don't occur in the cities. They occur in the rural areas. So, most rural West Virginians either do not have good access or do not do the internet very well. So, out of my sample, my response of about 140, only thirty were online. The rest were via mail.

CK: A hundred and forty out of...

AC: Well, okay, let's go back. I got 140 survey responses, which is pretty good because I'll tell you that the database that our Office of Oil and Gas maintains is not real good. About 481 mailing addresses, one-fourth of those twenty-five percent came back as undeliverable. Now, why are they undeliverable? I don't know. Was it a bad mailing address? I'm not sure. Was it some of these people are moving away because of the oil and gas drilling? I don't know. Someone brought that up in a presentation. Well, maybe you got a bad response. You got so many coming back because they're no longer living there. Again, our database goes from 2004

or '05, up to 2012 of completed gas wells. So, during that time period, people can move away. If oil and gas drilling is a factor in that in terms of people moving away, I don't know. I guess I could go back and look and see whether those were split or fee simples of the 125. I always get a new idea when I talk to people [laughter] about how to approach the research. But anyways, a larger proportion than I've ever had in any other research project of the original survey sample got sent back to me. In other words, I couldn't contact these people. I had their mailing address and it came back as undeliverable. So, I don't know what the cause is, whether it's bad mailing addresses, whether it's actual factors in the oil and gas drilling. I don't know. We try to answer questions in research, but, of course, we come up with some more questions [laughter] at the end of the research. So, anyways, I mailed out a survey and then accumulated those results both in forms that the general public can digest as well as academic form. So, part of what we are paid for is to publish in academic journals. What I've done so far is given a paper presentation at a professional conference where we took the data that we had and looked at what we call regression models. So, what we're trying to do is explain three factors that we got from our survey data. One factor is whether a respondent identified a problem with the drilling or not. So, about forty percent of our samples said, "There were no problems with the drilling." So, they didn't identify any of a list of about twenty-five problems or so that we gave people in the survey. So, we gave them a chance to check off one of twenty-five items. Some people said, "No. None of these problems existed." They also had an opportunity to write in problems that we didn't identify. So, there was other categories. So, about forty percent of the sample. Now, as you well imagine, when you're dealing with fee simple versus split estates, people with split estates were more likely to identify problems. That came about in that particular regression model, that whether the well was located on a split estate was significant in explaining whether the surface owner would identify a problem or not. So, that was an important variable in explaining that identification, but not the only important variable. So, the other important variables were if a neighbor complained. So, that's one of the questions we asked. So, if a neighbor complained, then the owner of the land was much more likely to say, "There's going to be a problem with the oil and gas drilling." Neighbor and residents. In other words, if somebody lived on the property, then much more likely to complain or have a problem with the drilling. So, that was one thing that we explained with our particular progression model. Another thing we explained is the number of problems. In that case, the split estates was not an important variable in explaining the number of problems that people identified, but what was is horizontal drilling. In other words, if the well was a horizontal drilled well, then the surface owners were identifying more problems. On average, about three more problems than a non-horizontal well. Now, you're familiar with that process, right? Or do we need to go through horizontal drilling?

CK: Well, I guess I thought that was the contemporary method.

AC: That is the contemporary method. But again, our database was from 2004 to 2012. So, the first four or five years of drilling, most of the Marcellus formation wells were just vertical. It went straight down. Didn't go horizontal, just straight down.

CK: Why not distinguish for us then a little bit just for the record?

AC: Okay. Well, again, traditional drilling methods are, you drill a hole straight down. Most times, there is some type of pressurized fluid or fracturing going on, even with vertical wells.

But that's a vertical well. Just straight down. All right. Well, most of us are familiar with that type of technology. That was the dominant technology that was used until the last decade or so. Even on our database, most of the wells that were drilled into the Marcellus formation were vertical wells. They were not horizontal wells. Now, horizontal wells have come on, certainly, recently within the last five years. That's the dominant technology now where most drilling that will go on will go straight down, but then curve through the formation and do fracturing up to a mile away from the original well. So, there is a much greater amount of activity that goes on on the surface. Water, trucks, the pressure of the sand. There's a lot more of what I call industrial scale activity that goes on, on the surface with a horizontal well than a vertical well. Though, vertical wells do have some type of fracturing going on as well, but not to the extent of a horizontal well. So, back to our model. Our model said, okay. We have our survey respondents, who are surface owners. They were identifying problems with the drilling and fracturing. An individual that had a Marcellus horizontal well on their property was much more likely to identify more problems than the one that wasn't. That's the good thing about our database and going into this research that I didn't realize we'd have, but we did have is we had a good mixture of both horizontal wells and non-horizontal wells. So, we can say horizontal wells do cause more problems than previously vertical wells that were drilled. So, we explained whether a surface owner was going to identify a problem. We explained how many problems they'll identify, and the last one is satisfaction. In other words, we asked a question about, "Are you satisfied with the outcome of the drilling?" I'm trying to remember the percentage of our toll database that was satisfied. Let's see if I got that in my paper. [laughter] Off the top of my head, I'm not going to be able to remember that one. Okay. All right. About forty-three percent of our entire sample identified that they were satisfied with the outcome of the drilling and fracturing process. So, that's not an unusual occurrence. Of our entire database, forty-three percent – just a little bit more. So, it's 42.9, we're satisfied, 43.6 were unsatisfied or dissatisfied.

CK: What does it mean to be satisfied if you do not own the minerals? [laughter]

AC: So, let's back up here. Okay. We surveyed surface owners. Some of them own the minerals. Some of them didn't own the minerals. Even some of the people that have a surface right and didn't own the minerals are still satisfied. Now, it's a small group. Based upon the split estates, only twenty-nine percent of those that we surveyed that were in a split estate situation were satisfied or identified either somewhat are very satisfied with the outcome. Now, you ask, how can you be satisfied? A couple different ways. One way is you can receive what we call non-monetary compensation. So, drilling companies will build roads into areas. Sometimes, that is roads, with cooperation of the landowner, are where they want them to be. You have a road into your property you didn't have before, you may be very satisfied with that. Another situation is that – and to my understanding, this does not happen with the horizontal wells, but did with the vertical wells. Another situation is that drilling companies would often give gas rights. In other words, they would allow the residents on the property to have all the natural gas they wanted for free. So, a portion of our sample did have the gas rights. Even though they didn't have the mineral rights, they were allowed free gas, it's called. Those people that received good roads or free gas were very pleased with – or more likely to be pleased with the outcome of the drilling than those people that didn't get [laughter] good roads or agree to road positioning as well as did not get free gas.

CK: I guess I should not be assuming that just because you did own the minerals, you would be satisfied either.

AC: That's correct. So, even our fee simple, they own the mineral rights. Twenty percent were dissatisfied. So, just because you own the minerals and sign a lease, doesn't mean our oil and gas drilling company is going to do the job that you are satisfied with. Certainly, there are outcomes of cooperation, of location, of erosion, or leakage from storage, water or fluid storage facilities. So, there's all sorts of happenings that could occur to lead to dissatisfaction.

CK: Did you say leakage?

AC: Yes, leakage. Particularly in the horizontal wells, there's a lot of water involved. So, another factor in our models that came out in explaining problems was whether there was a pond associated to store water. If there's a pond on the property – in other words, they established not only the well pad, but the pond – let's see. Was it the number or the identification? I think it was the number problems was more frequent on pond. No. Actually, it was the identification of a problem. So, if there was a pond on the property – in other words, they established some water-holding facility on the property that you and I, walking along, will see that's a pond. If that was built, then our surface owners were more likely to say, "There's a problem that went on." You can understand why. You create a structure that has water in it. Many times, that water is not good quality because you're bringing up the wastewater. There's leakage. There's erosion. There's all sorts of things that go on with surface water activity.

CK: What is wastewater you are talking about?

AC: Well, of course, in the drilling process – again, I'm an agriculture economist. So, one of the caveats on that statement I should have signed is I'm going to describe processes where I'm not expert. So, you are in this process of trying to bring up the natural gas, fracturing the layer of shale. That fracturing involves water under pressure, water mixed with sand, mixed with assortment of chemicals. Again, those chemicals are the concern of both people on the surface as well as, maybe over time, what's going to happen to those chemicals. We don't know. So, anyways, you're under pressure. You're sending down a lot of water. Millions of gallons of water under pressure to fracture the shale. You expect gas to come up. Well, gas doesn't come up by itself. Some of the water comes up as well. So, it not only has the chemicals that you put into it, but it also has whatever material. There's materials in the shale and some of them are radioactive. Some of them are – the water coming up has quite a few, what's called total dissolved solids. It's a lot of...

CK: Of what?

AC: TDS, total dissolved solids. So, it's in fluid or in solution, materials that we really don't want to drink and we don't want on our surface water. [laughter] So, the total dissolved solids, for example, the maximum we allow our surface water is five hundred milligrams per liter. These waste fluids happen in the thousands and tens of thousands milligrams per liter. So, it's not just a little bit over our quality standards. [laughter] It's a lot. So, these are waste waters that need to be properly disposed of. So, the point being that if you're storing them on site in a pond

[laughter], the surface owners are much more likely to say that a problem has been identified in the drilling.

CK: So, in some cases, it was leaking into what sort of...

AC: Well, certainly, people that describe problems in the surveys that I received back, some people describe leakage problems of those ponds, into surface water. Where does the water go that leaks out of a pond? It travels to small tributary streams and get into the surface water. So, I am not aware to what extent that happens. Certainly, that's not a subject area that I address directly in my research. But that's one of the problems or issues that arises when you deal with oil and gas drilling, particularly horizontal drilling into the Marcellus shale gas layer. It requires a lot of water and some things got to be done without water. One of the less expensive ways is to store it in a pond on site. More expensive way is they have these shipping containers on site. You can store it there, but that tends to be more expensive than establishing ponds.

CK: What about the source of the water then?

AC: Well, that's another area of my research. We didn't go into that in this particular study. But most of the water used in Marcellus horizontal well drilling comes from surface water. So, they will tap into the surface of a stream or river, some lakes. But lakes are not particularly prevalent in West Virginia. So, like eighty to ninety percent of the water comes from surface water. The rest is purchased or – what are the other categories? Purchased is the next second largest. Then I don't remember the other categories. But most water comes from surface water, rivers and streams used in Marcellus gas. The second largest category, which is fairly much smaller, is purchased water. They will purchase it from a public water utility.

CK: So, is that regulated then, the drawing out of water from the rivers and streams?

AC: We're getting off topic here. [laughter]

CK: Oh, okay. Well, I will let you...

AC: Yes. I will tell that. I mean, that's something that I've not really looked at. Yes, it is regulated. If I own a piece of property that's next to a stream, under West Virginia water law, I'm allowed to pull water from that stream. So, if you're an oil driller, you would need to come onto my property. You could do that, but you need to have my permission to do that. I can only withdraw as much water as is reasonable, as well as I can only withdraw water that doesn't harm my downstream users. So, downstream users have recourse if I as an owner of land withdraw too much water. Now, again, I'm unfamiliar if that's been a problem or what issues have occurred in terms of water withdrawals and surface water, whether that's caused problems or not.

CK: Well, maybe more about, why did you do this survey? What were you wondering about and what did you find?

AC: Well, again, the simple question was, do split estate owners – surface owners that do not own the mineral rights, do they perceive oil and gas drilling differently from the fee simple



owners? That was the simple question. The reason I undertook that is just reading through news reports, seeing issues that people had with oil and gas drilling. In some of those news reports, it was declaring, well, these people didn't have the mineral rights. They just owned the surface. That led to the question, well, if you looked overall, looked over fee simple, looked over split estates, looked over different situations of drilling, different sized properties, different types of development, ponds versus no ponds, if you looked over all different types of factors, does that split estate factor explain the perceptions in terms of problems with the drilling? Yes, it does. I mean, it does explain that surface owners with a split estate are more likely to perceive if a problem occurs with oil and gas drilling.

CK: So, what did you find?

AC: Well, that's what I found. [laughter] I found that they do. In other words, it's an important factor. In other words, split estate's an important factor in surface owners' perceiving problems of oil and gas drilling. It's not the most important though. There are other important factors. The neighbor is an important factor. If the neighbor has problems with the drilling, then you're more likely to say there's problems as a surface owner. Or, if you live on the property, that's another important factor. If the property's occupied, then there's more likely to be problems identified than if there's not anybody living on the property.

CK: Maybe we could return to that preliminary sampling that you did and just how you got going with the research and what you asked folks then once you – you said you interviewed folks and got permission whether you could call them and...

AC: Oh, okay. Well, I realize you do a lot of oral [laughter] research, and that's part of our research as well. That's part of the process of developing a survey. So, that's not unusual to this particular study. In most correctly done or properly done surveys, there will be a component where there's some either face-to-face or over telephone communication with potential respondents, finding out how they interpret the questions that you've written, whether their answers are making sense whether, how people are answering. So, if you write a question and everyone gives you the same answer on your pretest, you wonder, "Do I really want to ask my general population that question? Because I've gotten the same answer from everybody? Why is that?" So, if everyone tells you the same thing, then research wise, that doesn't really tell you much because everybody says the same thing. So, anyway, the point is, that's a component of the research process, is what we call a pretesting of the survey instrument. Now, the survey instrument I developed – since this type of research, as far as I know, no researcher has ever looked at this issue of how surface owners perceive problems with oil and gas and how that differs between fee simple and split estates. Since no one has ever done that, I was writing this on my own, based upon – from the newspapers. Or, if you're familiar with the Sierra Club, they send out almost a weekly email about issues that goes on with oil and gas drilling. Just reading through various problems that people have had with oil and gas drilling. That's how I came up with a list of potential categories of problems there are in – or potential problems that exist in oil and gas drilling. So, I...

CK: What was the list?

AC: The list. All right. I mean, you could read through the list yourself. You want me to...

CK: It is great to flip pages, but I will ask you to not talk while you are flipping.

AC: Okay.

CK: Since this is oral.

AC: I will flip [laughter] and then talk.

CK: Okay.

AC: Okay. So, what we did – and again, this is what we asked people to self-identify categories of problems. So, there are twenty-two of them and not including the three others. So, when you write surveys, particularly a mail survey, you give people opportunity to tell you things that you didn't think of beforehand. One of the things I didn't think of beforehand too much is erosion. Quite a few people identified that as a major problem with oil and gas drilling, is erosion, whether it be the roads or the well pads themselves. Anyways, we identified three separate categories of potential problems or issues with drilling. One was environmental in nature. So, that included like air pollution or bearing of hazardous waste or polluted water or spills of the fracture water. Another category we had was withdrawal of water from streams and rivers. Very few people indicated that was a problem. So, in what we talked about earlier, that's one indication that that's not been a major issue. So, there were environmental problems or issues we identified. The next category was financial problems or issues. This included animal health or agriculture production problems, damages to homes or structures from shaking and vibrations. The other one was land surface damages from the well pad or access roads. Another financial problem as a category was not enough money included in the lease compensation. So, they could check that. I think about thirty to forty percent of the respondents indicated that was a problem.

CK: Not enough money?

AC: Not enough money included in the lease compensation. So, I think I have a quote in this summary that one individual says, "No matter how much money they give you, it's not enough in terms of what happens at the end in terms of the damages and so forth." So, not enough money, like I just mentioned, was a financial issue or problem that we identified as a category. Property value declined is another one that some people were identifying that as an issue. That if you had this drilling activity going on in your property, they may have used a parcel of that property that either you intended to develop for home site at some point in time. Now, your property may not be worth much or anything at all. So, the last one in terms of financial was difficulty in getting a mortgage loan or property insurance. Not many people checked that one as a problem. So, we had environmental problems and financial problems. Then we had sort of a mix of catchall category of health, safety, and quality of life. This included things like contaminated water supply at the home itself, human health problems, length of time for construction, cooperation of the drilling company, location of the well pad, noise pollution, odor problems, road damages, truck traffic. So, all the things that would degrade your quality – or potentially could degrade

your quality of life in a broad sense.

CK: They could add to that then?

AC: Well, each of these three separate categories had an other. So, you could add others. Some people added a lot of others. [laughter] One person sent two-page, single-spaced description of various issues that went on with the drilling process. So, again, we asked people to fill out a survey. We're not rewarding them in any way. So, we appreciate whatever information they're giving us. So, some people were telling us a whole lot. Some people skipped through this and said there were no problems at all, and I was completely satisfied.

CK: Well, since this is an oral project, maybe you could summarize the findings in an oral manner.

AC: Okay. I gave you some of the findings in terms of the split estates and how that influences the number of problems. Another issue in terms of findings would be dissatisfaction. Dissatisfaction from the surface owners' perspective is accentuated by, the more problems they identify, the more dissatisfied they are. That's not too unusual finding. But what's important to reduce dissatisfaction were these non-monetary compensations. So, if there was free gas or the surface owner was pleased with the location of the road, and that helped them quite a bit, then they were less likely to be dissatisfied. So, the non-monetary compensation is an important aspect to surface owners of keeping them somewhat satisfied with the process. I say somewhat because if you don't own the mineral rights, I guess my own personal inclination is maybe the best you could do is neutral out of this whole process. In other words, mineral right owners are the dominant right. In other words, they have the right to come in and extract the minerals. So, if you just own the surface, if you can sort of break even in a sense of what's the cost versus what's the gains, if you can break even to be neutral, that may be the best we can do. So, in terms of how we looked at our data, that's how we were categorizing people. People were dissatisfied or they were satisfied or neutral, thinking that split estate owners, that may be the highest they're going to ever get, is neutral. This research, in another summary, has some policy implications. So, one of the things we're trying to point out is that other states have expanded a set of rights that are given to surface owners. So, in West Virginia, in terms of what your rights are for a surface owner, you have the right to comment – thirty-day comment period – on the permit from the DEP. But there's no requirement that they come to an agreement with you. So, there are agreements – surface use agreements, no objection of drilling agreements. But there's no requirement here in our state that the driller come to agreement with a surface owner before proceeding. In other states, there are more incentives for the driller to come to agreement with the surface owner. So, for example, in New Mexico, there's a financial incentive for the drillers to come to agreement with the surface owners. If the driller does not come to some agreement on how to use the surface to extract the minerals, there is, I believe, a higher bond required by the state. So, the state says, "You come to agreement with the surface owner, we'll lower your bond that you're reset for you to drill. If you do not come to agreement, we're going to increase that bond." So, there's a financial incentive for the drillers to work it out with a surface owner on how to do this. Also, in New Mexico, the drillers are required to give the surface owners a detailed description. One, there's a thirty-day notice before drilling. So, before any actual activity, the driller has to notify the surface owners in the state of New Mexico. That's not the

case in West Virginia. They could show up [laughter] and start drilling, and you would not know about it. So...

CK: I am sorry there was a big bang. Say that again. [laughter]

AC: Okay. [laughter] Again, this would be not a very –in my mind – well-managed operation. But the drillers, conceivably, could show up on your property one morning and start drilling and start – well, actually they'd have started constructing the drill pad before they would start drilling. But that could conceivably happen without the surface owner knowing anything about it. I say conceivably because that would not be a good process to happen. But there's no requirement in law that surface owners be notified. Well, excuse me. There is a requirement in law that they are sent a letter about the permit happening, but there's no timeframe. You could receive a letter about the permit. Then the permit has a period of time within which you can drill, and you don't know when they're going to show up. There's no requirement that they tell you, that the driller tells the surface owner when the drilling is going to proceed. So, anyways, New Mexico has that protection for surface owners. They have protection of a thirty-day notice. They have protection of financial incentive for the driller to come to agreement with the surface owner. There is a requirement that the driller provide the surface owner with enough detail about their activities that the surface owner knows what's going to happen. In other words, they can see what changes or damages are going to occur. So, in this particular requirement, you'd have to say where the drill pad's going to go, where the roads are going to happen, et cetera. No such requirement in our state. Now, again, part of the motivation of this research is to say, "Well, this is how we regulate oil and gas, is at the state level here." Maybe we should have these protections for the citizens of West Virginia. We do have a strong sense of property and individualism in our state. Yet, somehow, we turn the other eye when we deal with those individuals that have split estates. They have, suddenly, less control over what happens on their property if someone comes in and wants to extract minerals. Maybe they should have somewhat equal to non-split estate or fee simple. I guess I'll leave it at that. Any other questions

Michael Kline: Would you mind, terribly, discussing your exchange with – was it Ken Ward who wrote the newspaper article that you referred to when we came in? Can you comment about the newspaper article and how it has been received?

AC: I have not read the newspaper article yet. [laughter]

MK: Oh, you have not seen it yet?

AC: Again, Ken Ward called me yesterday. He had been talking to a member of the SORO Organization, Surface Owners' Rights Organization. Are you familiar with that organization?

CK: A little bit.

AC: Okay. That's another good source of information in terms of surface owners. So, anyways, Ken Ward was talking to an individual from that organization who I've been in communication with. They reviewed the survey and took a look at what I was doing and gave some suggestions about particular questions that I might ask. I've also worked with them, giving them results and

giving them some additional data analysis that they requested. They have some questions about the efficacy of the setback limits. So, I went back in the data. There's some setback limits in the law now. You can't drill within a certain number of feet of property, of residences, or wells, et cetera. So, to answer your question, Ken Ward got the information that I did my research from the SORO. He called yesterday afternoon, asked me a few questions in general about the research, and I assume he wrote an article about it. So, [laughter] I guess I'll have to read that article in the Charles...

MK: But you have already heard from the industry this morning about the article.

AC: Well, they act fast [laughter] I guess. [laughter]

CK: Who is that?

AC: This was a representative from the West Virginia Oil and Gas Association. So, they asked, "Can we have a copy of your research?" So, I guess, just like I would send you, I will send them a copy of what I've done.

MK: My last question would be, if a professor at WVU conducts research that suggests that different policies would be in order or appropriate, how is that communicated to the people who make the policies?

AC: Well, that's a good question. There are various means of communication. What we're going to do here, a standard policy, is put out a press release and then have – I've given you a six-page summary, which is geared toward a general public audience. So, that six-page summary will be on the web – on our website at the college. So, that's how we distribute information. Again, I'm going to talk broadly and then narrow it down to this particular case. Broadly, we would work with interest groups or other groups that were interested in changing policy as researchers. They would either look at our information, ask us for more information, or we might work with them to create a policy paper or something like that. So, that's the broad answer to your question. The narrow answer is, I've worked with SORO, and like I indicated, the Surface Owners' Rights Organization. They've been advocating increased protection for surface owners for many years and have not been successful at making much changes. Of course, there were changes in the recent legislation of 2011, December, where the setback limits were established and so forth. But again, that didn't give anything in terms of additional notice of when the drilling's going to start or the protections that are in place in Mexico, for example. So, that particular piece of legislation that was passed by the legislature in 2011 expanded rights a little, but as not as much as other states have put in place rights for surface owners.

MK: What is the state with a plan that you are pleased with?

AC: Well, from what I know, again, I've not done extensive research on the rights that exist. It's a state-by-state issue. So, states, those are the governmental level where rights are protected of property owners.

MK: Are there any states that are doing it right, do you think? You mentioned Mexico...

AC: Well, New Mexico and Colorado are the two states that have expanded the rights of surface owners in a way that it makes sense. As a driller, you should come in and work with a surface owner to get their approval about what's going to happen.

CK: The Colorado model?

AC: I'm not as familiar with exactly. I'm very familiar with the New Mexico model.

CK: Okay. So, you were saying? I did not mean to interrupt you.

AC: Yes. That's what I'm familiar with. So, I'll stick with what I'm familiar with. But I am aware, based upon literature, that Colorado has also passed. It's called a Surface Owner Protection Act, is the commonly given name. All these legislations have a name to them. So, that's what this piece of legislation's name is. I would point out one of the aspects of what's happening in Colorado and New Mexico that's different from West Virginia is Colorado and New Mexico have large portions of lands that the owner of the surface is a private individual. The owner of the mineral rights is the federal government. So, [laughter] this could be almost viewed as the state government protecting the surface owners from our federal government. So, one could take that view of why those states have a little more advanced than we do. So, anyways, they have surface owner protections. West Virginia has a much lower level of surface owner protection. There are some. I mean, another protection, there's a minimum of \$2,500 that you get. If they come and drill a well on your property, you get \$2,500. Again, that's a minimum. But that's to cover your loss in – you're paying property taxes because of a loss in property values. That didn't come out right. [laughter] That's to compensate you for paying property taxes when your property value may go down. But \$2,500 is not much. [laughter] I mean, that's something, but it's not much.

MK: Have you been able to determine why West Virginia has this harder line approach or more pro-industry approach? Have you been able to determine any of that?

AC: I will send you down to the people at SORO [laughter] who have been struggling with this issue for many years. They can give you a much better explanation about the approach. I will say, again, I've had several meetings with them – the people at SORO. They have indicated to me that they've gone to the legislator since 2008, I believe, requesting increased, protect this – essentially, the package is called a Surface Owners' Rights protection. They've been requesting that of the legislature for five, six years now. They've almost moved off that topic to something else. Right now, they're trying to push consolidating. In other words, bringing together surface with mineral rights. What happens, these mineral rights, sometimes they go up for sale at county courthouses because the taxes aren't paid. This is a right. At some counties, they're taxed. Oftentimes, they're not paid. The problem is that surface owner has no idea they're going up for sale. So, they're not notified. So, [laughter] unless they keep a close eye on sheriff's sales, they have no idea that they even have the opportunity to unify surface and mineral rights.

CK: But with horizontal drilling – or I guess there was a question of, I think they called it pooling here, which they do in other places, can you not wind up under somebody else's place?

AC: All right. Well, again, we're deviating from my research a little bit. I'll discuss pooling real briefly. I'm not an expert on pooling. Pooling, of course, you own the mineral rights in pooling. Pooling says, "I'm trying as a driller, trying to get together enough mineral rights to drill in one particular area. So, with this horizontal drilling, I can go up to a mile." So, conceivably, one drill pad could cover one square mile of mineral rights. The attempt to do pooling is, if you have one person with mineral rights on ten acres of that 640 acres' square mile, I, as a driller, can't drill that part of the property or that part of the area because one person refuses to lease me his or her mineral rights. So, pooling is this attempt to bring in multiple owners of mineral rights into one agreement, even if the mineral right holder does not agree to it. Now, as you can see, [laughter] mineral right holders aren't really happy with that possibility. So, we do not have forced pooling here in this state. Now, the issue that's pertinent to surface owners that, again, SORO is actively involved in – and I bring this up in my paper – is that there is currently a case before the West Virginia Supreme Court, and it's a trespass case. Are you familiar with this case?

MK: No.

AC: Okay. It's a case down in Marion County where a farmer owns like 130 acres or so. He did not own the mineral rights. This particular individual acknowledges that the drilling company has every right to come in and extract gas from his property. In other words, underneath his 130 acres or so. But what he has objected to is the driller coming in and extracting minerals from the adjacent properties. In other words, when a driller wants to drill 640 acres, sometimes they're not all one property. Sometimes they're multiple property owners and multiple mineral holders. So, the surface owner of the 130 acres is claiming, "You will be trespassing on my property if you pull gas from the adjoining property to extract on my property." No ruling has been made on this. So, the drilling, of course, has not proceeded because the property owner is claiming trespass. If this ruling did come down in the favor of the surface owner, that does, within the context of Marcellus and horizontal drilling, potentially expand the rights of the surface owners. Now, that doesn't always apply. Sometimes, if I'm the owner of a big surface property and I don't have mineral rights, that doesn't necessarily help me. But if I'm a small holder of land, like a hundred acres or so, that gives them a lot of protection. Because I'm presuming that it's less attractive to drill Marcellus gas under a hundred acres than it is under six hundred acres or a thousand acres or much larger properties.

MK: This has been very interesting. I am anxious to read, in detail, your report.

AC: Okay. Good. Now, are you going to talk to individuals that have had experiences? I assume that's a major part of your process.

MK: To get as wide a spectrum as possible.

CK: Yes. Do you have suggestions? I do not know if that is, Professor, within your realm.

AC: Well, as a researcher, I am obligated not to reveal the people that were part of this survey. I can certainly point you to the databases – the West Virginia Geologic and Economic Survey

database is online. It can give you names of people. Certainly, there are individuals that responded to my survey that if you wanted to draft a letter, for example, I would send it to them and they could contact you. If you wanted to go ahead and do that, I'd be more than happy to send a letter that you drafted to the respondents to my survey saying, "This is" – however you want to introduce yourselves. So, that's not a problem. There's not that many. So, I can do that without a problem. But I just can't give you their names and addresses because we do obligate ourselves and our research to confidentiality. So, I can't reveal, unless – well, again, if you want to draft a letter, I could send it to them. That's not revealing who they were unless they chose to do so by contacting you.

CK: Thanks. Are there any particular examples or statements that you might want to pull out from the survey to share in this oral fashion since our research will [laughter] remain oral?

AC: Well, I'm going to pass on that only because there is something written there, but I think it's better in the words of the people that experience it.

CK: Do you want to read it?

AC: [laughter] Well, I can read it, but I'd rather have them. I mean, I have summarized. Again, some of my summaries have been toned down a little bit [laughter] in terms of, you can't say some words in academic publication that some words were on the survey. So, I think if you're going to do an oral history or oral type of research, you probably should talk to the people themselves. I will give you, as a researcher, an overview, a broad sense of different groups. One individual that had an experience can't necessarily speak for a group. Essentially, I'm trying to speak across different experiences with, in my case, looking at this issue of split estates. I mean, that was my main thrust of my survey. So, I'll speak as the group, but for individuals, I'm sure you'll get lots of stories about issues. I encourage you to look at a range of experiences. I mean, certainly, one can find a lot of – I would call it misconduct on the part of drilling companies. But there are also some experiences that people wrote out saying, "This was a wonderful experience. These people treated me fairly. I'm more than pleased with the outcome." So, there are a range of experiences out there.

MK: What about voices from the industry itself? Can you suggest anybody there? That is going to be the most difficult...

AC: [laughter]

MK: I would imagine the most difficult perspective to record.

AC: Well, I don't have any particular names to give you off the top of my head. Ideally, the people to talk to would be what – and this is a very gender specific – what they're call a landman. Why they call them landman is just a tradition. Maybe that'll be changed one of these days. But those are the individuals that go around doing negotiation with surface owners and mineral right holders. So, whether there's a professional association of landmen representative here in the state, or whether there's a landman supervisor that would talk to you, certainly, that would be some individual that I think would be interesting to employ in your various oral history here.



CK: Just as a little bit more background, what kind of research projects were you doing before you chose this one? You mentioned something about water. You study resource management?

AC: Well, I'm in the Division of Resource Management. I guess this topic came up – again, it was self-funded. So, I paid for all this out of my own research money that I had at the university. So, this was not sponsored by oil and gas industry. It was not sponsored by environmental group. I've been interested in energy issues a long time. I did do a study looking at wind versus coal development in the southern part of the state. So, I'm interested in a broad range of natural resource issues, energy being one of them. This particular study came up at a time where I was winding down quite a few research projects. So, I didn't have anything else coming up. It's been very difficult to get research funding these days. So, this was a project that could be done with a relatively small amount of money that addressed an issue that I think the citizens of West Virginia need to have addressed. So, I think it's useful to have this type of research out there. Particularly, from the standpoint that once you get into it, you find out, "Well, not just one or two split estates occur. This is a fairly widespread phenomenon, particularly among smaller landholders." So, it struck me as an issue that was pertinent to our current development of this resource. I'm certainly not against developing Marcellus shale gas. I, as a homeowner, use natural gas to heat my home. I've been pleased with the outcome of the last few years of declining prices and my natural gas bill has gone down. So, I can't say I've benefited personally from this extraction. So, the point is that if you're going to extract resources, maybe we should do that somewhat fairly among society. Burdening surface owners that have had little to gain and a lot to lose by extracting resources doesn't seem to me to be particularly fair how we decide to make decisions on resource extraction. So...

MK: Thank you very much.

AC: I guess that was the answer to the question. [laughter]

CK: No, that was very well said.

AC: Okay.

CK: The only thing that has been in my mind – final query – is, when you think about literacy rates in the state and whatnot, how you decided to deal with a paper survey and what different results there would be, or was that a decision as opposed to phone or in person?

AC: That was a financial decision. It's a lot cheaper to mail out. You're right. You do, even the best you can, attempt to write surveys that would be amenable to an eighth grade or high-school level education, you are going to exclude a segment of the population that just doesn't feel comfortable communicating in the written language. I'm on the board of literacy volunteers here in town. So, I deal with adult literacy issues all the time. So, I'm cognizant of that. But you have to say, "Do we want to know something and be perfect? Or, do we want to know something and be less than perfect in how we go about collecting information?" Of course, my contact information is on everything we send out. So, I did not have anyone specifically contact me and say, "I cannot fill this out because of whatever issue." Well, I did have some people

contacting me and say, "The survey can't be filled out because it's addressed to an elderly mother or father who just can't fill it out." So, certainly, I've had that happen. But people that have literacy problems don't really want anyone else to know that. So, that's something that is an unknown. Why do people not respond? Didn't have time? Didn't care? It wasn't a problem? Or actually, in this case, I'm taking a lot of time because I do have to go here sometimes [laughter] soon. But in this case, it was unusual because typically, people that care the most are going to answer the survey. In this case, people that care the most, there's a segment of them that chose not to answer the survey. They actually communicated with me saying, "This survey brought up some memories, some past experiences that I don't care to relive. So, I'm not going to answer your survey." Or, the alternative to that is, "I'm now in legal [laughter] proceedings. I discussed this with my lawyer, and he advised me not to respond to the survey." So, in this case, the underrepresentation may have come from those that were in – well, I'm not sure they were all split estates – but were disadvantaged by the drilling. So, if anything, we were underrepresented then, from my perception.

CK: Very interesting. Thank you so much for all this time.

MK: Thank you for your time. We appreciate.

AC: No problem. I hope it helps.

[end of transcript]