THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF SOUTH DAKOTA

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IN THE MATTER OF THE APPLICATION OF
TRANSCANADA KEYSTONE PIPELINE, LP FOR A PERMIT UNDER THE SOUTH DAKOTA ENERGY CONVERSION AND TRANSMISSION FACILITY ACT TO CONSTRUCT THE KEYSTONE PIPELINE PROJECT — HP07-001

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Transcript of Proceedings
December 4, 2007
Volume II, Pages 230-475

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BEFORE THE PUBLIC UTILITIES COMMISSION,
DUSTY JOHNSON, CHAIRMAN
GARY HANSON, VICE CHAIRMAN
STEVE KOLBECK, COMMISSIONER

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TRANSCRIPT OF PROCEEDINGS, held in the above-entitled matter, at the South Dakota State Capitol, Room 412, Pierre, South Dakota, on the 4th day of December 2007, commencing at 9 o'clock a.m.

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MR. SMITH: Good morning, everyone. The hearing in Docket HP07-001, Application of TransCanada Pipeline, LP for a permit to construct a pipeline in South Dakota is reconvened. It is 9 o'clock on Tuesday, December 4.

We left off last evening with Mr. L.A. "Buster" Gray on the witness stand. Interveners had finished their cross-examination, as I understand it, and at this point in time at least two of the Interveners -- I will at this point ask whether any other Interveners in the audience may have cross-examination questions for Mr. Gray.

Seeing no indication of that, staff, do you have cross-examination of Mr. Gray?

MS. SEMMLER: I do have one question, Mr. Gray.

CROSS-EXAMINATION

BY MS. SEMMLER:

Q. This goes to specifically the route changes that occurred. Now the biological studies and cultural studies, et cetera, were those done in such a way that the route changes all fall within those studies, or will updates be done to study the new areas?

A. Actually for -- on a case-by-case basis some of them will have to be updated, based on the part that we did the original survey of. And we will follow up with that. Some of these have likely already been done, but I can't identify which ones have or not.

MS. SEMMLER: Thank you.

MR. SMITH: Is that all you have? Commissioners, do you have questions for Mr. Gray?

COMMISSIONER KOLBECK: Mr. Gray, I just have a clarification question. When you spoke of bonding metal to metal pipes there was mention of water. That applies to every utility; correct? Telephone, power cables, anything like that?

Not necessarily the bonding, but you're aware of how to cross them? Do you keep a certain 3 feet above electrical cables? I would think electrical would be more of a hazard than water.

THE WITNESS: Actually our codes are 12-inch or 1-foot minimum clearance. And sometimes utilities ask us for a little bit more than that, and we'll typically comply with a request like that. But more of our concern is the metallic utility because of interference with the cathodic currents that Mr. Hohn brought up in it. But most others that don't have some type of electrical current are not as much of a concern relative to that cathodic protection.

COMMISSIONER KOLBECK: Most of my other concerns were dealt with in your prefiled testimony. The only thing, at 4 feet that's actually what I think the legal requirement for power is. So you're going to be on the same depth as they are.

Obviously it's easier to move an electrical cable 1 foot below or above you than it is to move your pipe; is that correct?

THE WITNESS: And actually that's one of the challenges we have in North and South Dakota, for that matter, with your frost depths and utilities at the depths they are and our 4 feet of cover. You know, we almost hit every one of them with a conflict.

And we have -- I guess it's our belief that the existing utility does have a senior right to our right for the position that they have and if worst comes to worst, we have to go beneath them. But we will meet with each utility to discuss the possibility of relocation of their utility at our expense. And that's a normal process to go through.

COMMISSIONER KOLBECK: Now I guess just to clarify, when you say 4 feet of cover there's 4 feet of dirt above the top of your pipe so the bottom of the pipe would be close to 6 feet in the ground; is that correct?

THE WITNESS: That's correct. 6 feet, 6 inches.

MR. SMITH: Commissioner Hanson? Commissioner Johnson?

CHAIRMAN JOHNSON: Yeah. Thank you, Mr. Smith. Mr. Gray, you spoke yesterday about 25 to 30 inspectors on a given spread; is that right?

THE WITNESS: That's right.

CHAIRMAN JOHNSON: You mentioned a couple or three environmental inspectors. Could you give us an idea of what the other personnel would be in that inspection crew?

THE WITNESS: Yes. Is that we generally classify inspectors -- there's a chief inspector, kind of the gentleman that's over the entire inspection crew that manages those efforts. But there will be a safety inspector. There will be what we call craft inspectors. And those are inspectors that follow things like the clearing of the right of way, grading, bending pipe.

But typically the inspector generally kind of takes on the name of the crew that he follows. So if it's bending, he's the bending inspector. If it's trenching, he's the trenching inspector per se in it.

And then we have welding and NDE oversight or inspection. And NDE is nondestructive examination. Whether it's radiography or whether it's ultrasonic inspection of the welds, we will have an audit to those particular operations as well. But we are required by our codes to visually inspect all welding operations as well.

So it's made up of quite a flavor of -- a number of flavors of types of inspectors.

CHAIRMAN JOHNSON: Well, and it seems to me that this question about quality control is an important one. Are there any industry best practices with regards to inspection of workmanship that will not be utilized on your work sight if the pipeline's approved?

THE WITNESS: And I want to be sure with the question

is you're -- you asked me were there things we would not do.

No. Absolutely the project will be inspected with the latest methods and technologies available to us to inspect on the particular pipeline.

You know, as you've heard from so many witnesses, I mean, quality just simply cannot be compromised in a facility like this.

CHAIRMAN JOHNSON: I think I -- and please correct me if I'm wrong, but I think I've heard you discuss rerouting line for environmental concerns, from concerns with regard to Hutterite colonies, with regard to local governments, and individual citizens.

I don't need an exact number unless you've got it but could you give us an idea of how many line changes have taken place since the first macro route was essentially put together?

THE WITNESS: In South Dakota or for the project or --

CHAIRMAN JOHNSON: In South Dakota. And, again, I'm sure a hard number could be tough to come up with, but could you give us a characterization?

THE WITNESS: I was trying to think in this particular list -- one moment, please.

(Witness examines document)

THE WITNESS: The list that Mr. Rasmussen and I went through yesterday has approximately 12 or 15 on here. And this was from April 27. I would venture to guess there's probably

another equivalent number of these. So I would guess 30 to 50. That would be my guess for the project.

For the project as a whole when I think about the numbers for the project as a whole, 30 to 50 for the geographic region we're in here would be in that range, I think.

CHAIRMAN JOHNSON: Okay. Thank you.

There was some discussion yesterday about the difference between a formal complaint and -- this wasn't a word that any witness used but an informal complaint.

How would you handle an informal complaint differently than a formal complaint?

THE WITNESS: For me personally I don't see a difference in the two. At the public meetings we had back in the summer I heard various at that meeting. I took all of those back to Kansas City and discussed them with my staff.

We took various actions concerning those staff with going back and contacting our supervisors and through our agents about the complaints we had heard and reinforced things we heard about pressuring people, threatening comments, and things which are not part of the practice that we condone.

And when I suggest that maybe the difference between a formal one would be we do actually have what we call an instance management type register where if a formal complaint, be it through a telephone call, be it through an e-mail to some of our sites, is done it's actually logged and tracked in it. So that

would be the only two differences that I would see.

But for me in managing the project I take both of them equally seriously.

CHAIRMAN JOHNSON: Mr. Gray, I'm thinking back to the four public comment hearings that the Commission held this summer. And it seems as though you and your colleagues were very busy during the breaks talking to lots of concerned citizens. Is it possible that --

(Discussion off the record)

CHAIRMAN JOHNSON: Approximately how many informal complaints from those public hearings did you need to take back to Kansas City to investigate?

THE WITNESS: As I remember, there was somewhere like 6 or 7 or 8, something in that range. I don't remember the specific ones other than I do remember Ms. Anderson's.

CHAIRMAN JOHNSON: Did you evaluate TransCanada's responses to each of those six or seven? I mean, did you make changes or have discussions or change instructions to contractors based on each of those? I mean, was each of those essentially addressed?

THE WITNESS: When I say they were addressed what I went back to is the ones that give me the most concern or one where we're accused or the complaint is not treating people with respect, not -- the threatening comments. Those are the ones that give me the most concerns.

In my experience in this industry we're going to experience landowners who simply do not want our pipeline project. We will experience landowners who can be quite emotional about that. And indeed it's something that we need to manage. But I have to try and separate those types of complaints from true complaints of threats or disrespect.

And that's not an easy task to do sometimes. But I do attempt to do that. And what we went back with was to reinforce that even though we have a schedule, we need to acquire right of way. Some of these complaints came in the springtime with farming operations where farmers are working in the field very long hours.

And we went back to say, look, we have to get the right of way acquired, but we have to have a balance between what's reasonable and not reasonable in a range of meetings with landowners that as much as we -- and that being one example, I guess.

The other being is that respect of comments about our project or -- and where people might would say, well, it's coming through anyway, you can't do anything about it. Those are just not condoned in what we do.

And I have to try and investigate them as best I can, and if necessary, we'll remove people from the project if I can get the factual information to allow me to do that.

But we took some actions. One was we had a training

session in July which was after the hearings -- the public comment meetings that one of the specific topics of that training session back to our agents was this issue on respect and pressure and eminent domain where we made another effort with all our agents that they fully understand.

We also -- we heard a complaint that we're all contractors, we're not TransCanada employees. And through that we established a person at TransCanada by the same of Sandra Roth who is a TransCanada employee, and we distributed a flyer to all people on our mailing list, landowners on our mailing list, identifying Ms. Roth as a contact person.

If they had a complaint about our agents, our agents' performance, that they could take those complaints directly to Ms. Roth. And that was distributed to all parties as well.

And then when I describe towards it is that we just reemphasize to all of our staff that if they heard a complaint, that they had to register it back with our office in Kansas City is that we could take a look at it.

CHAIRMAN JOHNSON: Was the contact number for Ms. Roth a toll-free number?

THE WITNESS: That's correct.

CHAIRMAN JOHNSON: Okay. To your knowledge did you or anybody under your direction receive a contact from local law enforcement or local prosecutors like state's attorneys with complaints regarding landowner treatment?

THE WITNESS: I have not in South Dakota. I have not. In South Dakota I have not. In North Dakota we have had one landowner who has issued a complaint like that.

CHAIRMAN JOHNSON: Thanks, Mr. Smith. That's all I have. Thanks, Mr. Gray.

MR. SMITH: Thank you. Commissioner Hanson, any questions?

COMMISSIONER HANSON: Thank you, Smith. Mr. Gray, appreciate your testimony. It's been very informative. And I appreciated the presentations that you made during the public meetings that we had as well.

I have just a few questions, one of which is pertaining to -- well, I'm mainly concerned about damage to the pipe, about whether it's construction or whether it's farmers or whatever and the potential for accidents with it.

Will you be doing any marking of the location of the pipe in addition to what is required by law?

THE WITNESS: I'm not sure that I -- as far as construction goes?

COMMISSIONER HANSON: Let me rephrase it. How easy or how hard will it be for someone to know where the pipe is?

THE WITNESS: Once the pipeline is installed is through the One-Call systems, but warning signs are put up at road crossings. Warning signs are put up typically at streams or fence lines and things where it won't obstruct the use of the

land.

And then through the One-Call system, people that are the excavators to contact the One-Call and the company to locate the facilities prior to any excavation.

COMMISSIONER HANSON: Certainly. The challenge, of course, is out in rural areas whether someone's going to make a One-Call if they're going to put down a fence post or something of that nature and possible erosion. You say signage is typically placed along those areas. Will that not be done universally?

THE WITNESS: Oh, it will be done universally. I'm sorry if I said it that way. The signage is a requirement of our codes.

COMMISSIONER HANSON: Will you have any above stream crossings?

THE WITNESS: No.

COMMISSIONER HANSON: I understand you are responsible for the information in Section 612 of the Application regarding the mitigation of impacts to agriculture cropland, grassland, rangeland, and irrigated land?

THE WITNESS: That's correct.

COMMISSIONER HANSON: Since this is going through a lot of farming operations, can you tell us, for instance, with cattle operations will there be temporary fencing put up so that the ranchers will not have challenges with their cattle entering

this area?

THE WITNESS: We would --

COMMISSIONER HANSON: I didn't notice that as I was reading through.

THE WITNESS: On a requested basis we would consider that. And I'll answer the question as to what my experience has been. But on a requested basis we would consider it. But actually constructing across pastures that have cattle present, we will typically use -- leave somewhat we call access across the right of way where we leave what we call hard plugs where we don't excavate or put spoil materials where cattle can move back and forth across the right of way. And those sections of pipe are put in by a special crew at a certain point in time.

But for our industry unless it's a very exotic cattle of some type that we typically will not fence it. Simply if a livestock animal is lost due to our construction, we would compensate for the damages for the loss of that particular animal in it. But that is typically how the industry has worked versus, say, temporary fencing off the right of way.

COMMISSIONER HANSON: So how do you secure the site in the evening hours when you're not working?

THE WITNESS: It is typically when I say not secured relative to cattle's ability to move around on the right of way.

COMMISSIONER HANSON: Okay. So I guess I'm not following how you keep cattle out of the work area, how you keep

them out of leaving the pasture. If you're excavating a 100-foot right of way, why wouldn't they just decide to go explore?

THE WITNESS: On fence lands we do what we call a gap in the fence for our crews to move through. And it's a temporary fence that is -- we call it a gap in the permanent fence with a temporary fencing that is put up and taken down as each crew goes through. So the limits of the pasture remain intact.

COMMISSIONER HANSON: Okay. So once you've trenched through that area you don't necessarily secure your entire site, but you secure the -- the former fenced area so that they cannot leave that particular -- they could still enter the work area?

THE WITNESS: That is correct.

COMMISSIONER HANSON: Okay. Thank you. And when you say you consider -- what would move you to fence an area?

THE WITNESS: I would suggest to you a very expensive, exotic species of either cattle or horses or something would move you towards the exposure of the loss of the animals. The cost would be so much greater than the fencing.

COMMISSIONER HANSON: Thank you very much, Mr. Gray. Thanks, Mr. Smith.

MR. SMITH: Are there other Commissioner questions? Seeing none, Mr. Koenecke, are you ready to proceed with any redirect?

MR. KOENECKE: We have nothing. Thank you, Mr. Smith.
MR. SMITH: Any questions following up on the Commissioner's cross-examination?
MR. RASMUSSEN: I have nothing further.
MR. SMITH: Mr. Gray, I think you're excused. Thank you very much.
COMMISSIONER HANSON: Forgive me. As I'm going through my notes here I did notice there was one last question. Do you know what the closest location that the pipeline is to residential or occupied buildings at the present time?
THE WITNESS: I believe the closest location's going to be the two hotels that were --
COMMISSIONER HANSON: In the Yankton area?
THE WITNESS: -- part of the testimony. I would have to check. I do not believe we're closer than 200 feet to a residence.
COMMISSIONER HANSON: All right. Thank you very much, sir. Thank you.
MR. SMITH: Commissioner Kolbeck.
COMMISSIONER KOLBECK: Could you remind me what the crop damage payback is on a yearly basis?
THE WITNESS: The compensation that we're doing for the -- is our program that we're offering landowners is 100 percent of the crop loss the first year, 75 percent of the crop loss the second year, and 50 percent of the crop loss the

third year.
And keeping in mind that the company's responsibility -- if there is diminished crop production past three years, we're still responsible for it. We just believe that after a three-year period that it will recover.
COMMISSIONER KOLBECK: Okay. Thank you.
MR. SMITH: Commissioners, are you done?
Apparently staff has a question.

RECROSS-EXAMINATION

BY MS. SEMMLER:

Q. I have a follow-up question regarding Commissioner Hanson's One-Call question.
How will you notify excavators of how large the pipe is? If it's marked in the middle, how will you notify of the outer edges?
A. I'm trying to think in terms of certainly our pipeline will be on record with the One-Call system as being a 30-inch crude oil pipeline in it. And if the question is relative to whatever planned activity there is, how far do we -- or what dimensions do we have to locate it, that's generally on an on-site discussion or request.
And, for example, if a utility was going to parallel us for even a mile, somebody was going to put a fiberoptic cable or something in in close proximity to us, we'd be required to locate our facility for that mile.

Q. The concern from some of our local excavators I guess is a lot of times when a utility is marked it's simply marked down the middle. If a landowner hires a fencing company, for example, to build a new fence and they call the One-Call system, it's usually marked down the middle of the line and the concern is the outer edges will be known so the contractor would know how large the underground facility is.
A. In the pipeline industry, we typically are going to stay and watch you excavate our pipeline. We're not going to leave like we understand a number of utilities will paint a mark on the ground or do something and leave while you excavate.
But in the pipeline industry we will not leave. We will stay present until our line's exposed as well as many times we'll stay present until you complete your work around it.
MR. SMITH: Mr. Hohn?

RECROSS-EXAMINATION

BY MR. HOHN:

Q. Mr. Gray, following that same line of questioning, when a utility, whatever type, let's say rural water line, would cross your system and a One-Call is called out, the lines are flagged -- and maybe this is an operational question but does your utility pothole that pipe so you can verify depth, or is that up to the utility that's crossing you?
A. Is my experience has been and my experience has been is that the utility crossing us, being the entity that would have

equipment present or the things that would be there that would do that under somewhat our direction or supervision. And typically we would -- as you described the word "potholing," we use that terminology is that literally we might -- according to various companies we would let you use mechanical equipment within a certain distance to our pipe, but then you'll have to hand excavate down to the utility.
Q. And also if instead of just exposing your pipe the utility elected to use a Vactor and pothole to find the top of your pipe and then bore under it, you would have someone there the entire time?
A. That's correct. Hydrovacing is another means of potholing.
Q. Yes. I had one follow-up, and I didn't ask this before. I apologize. But on page 6, I believe, of your direct testimony -- or, excuse me. 3. Page 3. You're talking about going through wet areas.
A. I've got page 3.
Q. It's part of item 8, your answer on 8. You state that when you go through a wet area, and I think this is -- I'm sorry. It's the rebuttal. I'm sorry. Page 3.
A. I have that now.
Q. Okay. Thank you. You're referring to crossing a wet area, and you mention that there may be a need to weight the pipe down with either cement saddle or cement bags to prevent floating; is that correct?

A. That is correct.
Q. And that's a common method going through wet areas?
A. It's a common method relative to when you say wet areas generally areas that have standing water. Not necessarily a wet area.
Q. You can dig through it, but there's ground water there?
A. But there's ground water typically.
Q. Now would the pipe in those areas still be 4 feet from the top of the pipe to the top of the soil?
A. Is with concrete coated pipe, which is a -- would be a few inches of coating we typically will have that depth of cover to the top of the -- of the concrete coating which is thicker than the pipe in it.

Concrete weights, if it's not an agriculture area, an actively cultivated area, we will typically have that covered to the pipe and the concrete weight, which may have, I don't know, for 30 inches I would guess an 8- to 10-inch crotch in the weight that 8 inches may protrude above the 4 feet of the pipe.

Q. So it's kind of like a saddle of cement sitting on the pipe?
A. That is exactly what it is.
Q. And so the clearance might not be exactly 4 feet, or how do you see that, I guess?
A. I guess I see the 4 feet being to the top of the pipe. And if the crotch of the weight is, say, 8 inches, then that would

extend above the pipe.
Q. And then just one last question. In relation to the depth again, 4 feet, 48 inches, your pipe is 30-inch so this will -- the bottom of the pipe will be somewhere at 6 feet?
A. 6 and a half to 7 feet.
Q. And you're aware -- are you aware, I guess, that rural water systems are buried at 6 and a half feet in South Dakota under USDA requirements?
A. I'm very much aware of the conflict that we're going to have with those utilities.
Q. At some of the public meetings -- in fact, I think at least one of the four that the PUC sponsored -- you mentioned that you would look at options for crossing water systems.

Your plan the way you explained it was when you got to that existing pipe that was there first, the rural water pipe, that your first initial thought would be to bend your pipe and go under; is that correct?
A. That is the first initial thought that I had, that's correct.
Q. Does it cost a lot to bend that big steel pipe?
A. The bending is not the -- is not the significant cost of crossing a utility. It is more the cost of what we call leaving a section of pipe out so that we don't break or interrupt the service of the utility that we're crossing.
Q. Mr. Gray, as the chief engineer on the project, would you

be willing to consider, look at, or entertain an option where your pipe continued straight over the rural water line and your company paid to lower the rural water line?
A. I think in my testimony yesterday I indicated that when utilities conflict, whether it's a legal basis or not, to me the existing utility has a senior right to my right. And I have to meet with that utility to resolve that conflict. And one of those options available to me is to request a relocation, per se, of the existing utility. Certainly when I request that, that would come at my expense to do such.

And we are in the process, particularly in North Dakota utilities, of kind of evaluating the water system conflicts or location conflicts. We have like -- like any company, we're trying to seek the most cost-efficient way to meet our objectives but yet honor the existence of the existing utility.

MR. HOHN: Thank you.
MR. SMITH: Commissioner Kolbeck.
COMMISSIONER KOLBECK: Yeah. Staff and I have been talking. South Dakota Webco (phonetic) we have 18 inches on each side of the flag. So if you were to mark your pipe 18 inches, there's 3 feet total. If someone was to go 3 feet, 6 inches, is that far enough away from your pipe?
THE WITNESS: Commissioner, maybe --
COMMISSIONER KOLBECK: Okay. You locate your pipelines. All right. That flag, from that flag -- correct me

if I'm wrong, Kara, but the legal requirement is you have 18 inches on each side of that flag that you need to honor. Okay. So that's a total of 3 feet wide from the flag in the middle. We've got 3 feet.

If someone went 20 inches on one side or the other of that flag, is that going to be too close? That's our concern.
THE WITNESS: I would suggest to you we're not going to let anybody -- that's too close for our concern of somebody working around our facility. And maybe my comment would be the statute that may be the minimum, but that may not be what we require.
COMMISSIONER KOLBECK: Okay. I think our concern is how closely in the future someone will be watching. And it's your assessment that you'll be watching very closely as to how --
THE WITNESS: Absolutely. And I might use more of a judgment is we have a 50-foot permanent easement. And let's assume we're in the middle of it. And 25 feet either side of it.

We're very interested in anything that's going on in that 50 feet, not just where our pipeline sits. And typically one of the functions of our patrolling operations is to look for unusual activity within that 50 feet. And we're going to dispatch somebody out to investigate it because we're worried about it.

COMMISSIONER KOLBECK: Okay. Thank you.
MR. SMITH: Further Commissioner questions? I think now you actually are excused, Mr. Gray. At least for the time being.
THE WITNESS: Thank you.
(The witness is excused)
MR. SMITH: My guess is it may not be your last appearance here. Thank you.
Mr. Koenecke, are you ready to call your next witness?
MR. KOENECKE: Mr. Smith, Mr. White will be taking our next witness.
MR. SMITH: Mr. White, please call your next witness.
MR. WHITE: Thank you, Mr. Smith. Keystone would call Meera Kothari to the stand.
(The witness is sworn by the court reporter)

DIRECT EXAMINATION

BY MR. WHITE:

Q. Good morning, Ms. Kothari.
A. Good morning.
Q. Would you state your name for the record, please.
A. Meera Kothari.
Q. And your business address?
A. 450 First Street Southwest, Calgary, Alberta, Canada.
Q. Thank you. Do you have before you what's been marked as Exhibit TC 6D? It would be your direct testimony.

A. I've just got to look for it here.
Q. It should be in your binder as well.
A. Yes. I do.
Q. Okay. And is that your prepared direct testimony that was filed in this proceeding?
A. It is.
Q. And did you prepare that testimony?
A. I have.
Q. And do you have any corrections or additions to make to that testimony?
A. I do.
Q. Okay. What would be the first correction that you would like to make?
A. I would like to add Section 2.2 of the Application.
Q. So you're responsible for Section 2.2 of the Application; is that correct?
A. That is correct.
Q. And you are also responsible for Section 2.2.1; is that correct?
A. That is correct. I'd like to make an addition to that section.
Q. And what would that be?
A. That would be to specify the grade of the pipeline as API 5L X70.
Q. Okay. Do you have any additional changes or corrections to your direct testimony?

A. No, I don't.
Q. And you have in front of you what's been marked as Exhibit TC 6R1, which would be your first rebuttal testimony?
A. Yes.
Q. And did you prepare that testimony?
A. I did.
Q. Do you have any changes or corrections to make to that testimony?
A. No, I don't. Thank you.
Q. And, finally, do you have in front of you what's been marked as Exhibit TC 6R2, your second piece of rebuttal testimony?
A. Yes.
Q. And did you prepare that testimony?
A. I did.
Q. Do you have any changes or corrections to make to that?
A. No, I don't.
Q. And if you were asked the questions today that are set forth in Exhibits TC 16, 6R1 and 6R2, would your answers be the same as the answers that are set forth in the prepared testimony?
A. Yes, they would.
MR. WHITE: Okay. I would move the admission of Exhibits 16, 6R1 and 6R2.

MR. SMITH: I think they've already been admitted, but what we will do is we'll acknowledge the corrections she's made to those in her testimony here.
Q. And, Ms. Kothari, I'd like to cover just a few issues with you that were raised at the hearing session yesterday.
I believe there was a question with respect to the certification of the mills where the pipe for the Keystone Pipeline will be fabricated. Are you familiar with that certification process?
A. Yes, I am.
Q. And are you involved in that process?
A. Yes, I am.
Q. Okay. And did you perform any due diligence with respect to the certification and qualification of the pipe mills where the Keystone Pipeline will be fabricated?
A. Yes, I did.
Q. And could you tell us which standards and specifications are required to be met by those pipe mills?
A. Yes. The pipe mills where Keystone will be obtaining its pipe from are required to meet the American Petroleum Institute Standard for line pipe, which is API 5L. In addition, the requirements are to meet the International Standards Organization, ISO 14001 and ISO 9001 standards in accordance with 49 CFR 195. And, lastly, the TransCanada specifications for line pipe.

Q. Okay. And in performing your due diligence with respect to those mills and their meeting those standards and qualifications, did you have occasion to visit those mills?

A. Yes, I did.

Q. Which mills did you visit?

A. I visited all three mills that the Keystone Pipeline will be obtaining, and that was Welspun, Anjar, India, OSM, Portland, and Berg Steel in Florida.

Q. And what was the purpose of those visits?

A. The purpose of the visit was to conduct a preproduction meeting with each of the mills. There are four main areas in which the discussion centered around.

Q. Okay. And having conducted the due diligence that you described, including the pipe mill visits, are you confident that each of the three mills that will be fabricating the pipe would be able to and will meet the requirements, standards, and specifications that you've described?

A. Yes, I am. In addition to the preproduction meetings that were -- that had occurred, TransCanada also prequalified these mills earlier on prior to deciding to actually award pipe supply to those mills. In addition to the prequalification that was conducted on the mills, prequalification was conducted on the steel suppliers to which would be supplying steel for actual pipe manufacture to those mills.

Q. Okay. Thank you. And I believe Mr. Hohn asked you a

question yesterday with regard to the potential for interference between the cathodic protection system of the Keystone Pipeline and the cathodic protection system that's used for ductile iron water utility lines.

Do you recall that testimony --

A. Yes.

Q. Or sorry. That question?

A. Yes, I do.

Q. And are there any steps that Keystone will undertake to ensure that such cathodic protection interference will not occur?

A. Yes.

Q. And could you describe those tests?

A. Yes, I can. Keystone will perform interference surveys and make adjustments to the cathodic protection system. This particular process is in accordance with the special permit requirements that Keystone has obtained. The surveys will be performed as the CP system is energized during construction and prior to commencing operations.

So this will essentially ensure that the Keystone Pipeline's cathodic protection system will not interfere with any foreign utility's CP system or vice versa.

Q. Okay. There were a few questions yesterday with regard to the fusion bond epoxy or the FBE coating that's being used for the Keystone Pipeline. Specifically I believe Commissioner

Hanson asked the question whether there had been any failures on pipelines coated with the FBE coating which may have been caused by external corrosion or other factors on TransCanada's system.

Have you had the opportunity to go back and review and provide an answer to that question?

A. Yes, I have.

Q. And what's the answer to the question?

A. There have been no failures on fusion bond epoxy coated pipelines on the TransCanada system. TransCanada has utilized fusion bond epoxy for over 28 years, and the coating technology is performing excellent.

Q. Okay. And could you briefly describe for us the process that is used at the factory for applying this fusion bond epoxy?

A. Yes, I can. The FBE is plant applied, and it is, in fact, a corrosion-inhibiting coating. The pipe is essentially sandblasted to a near white finish so it can obtain an anchor pattern. And that's something similar to if you were painting your fence where you would sand down your fence prior to painting.

The pipe is then run through a hydrochloric acid wash, and that is to remove any mill scale or any contaminants from the pipe prior to coating. It's then moved through a coating area where paint guns are pressurized with fusion bond powder, and the high pressurized powder is fused onto the pipeline and essentially fuses to the pipe instantly.

The pipe is then cooled to ensure that the coating is cured and then moved to another area where the coating is visually inspected and inspected with a holiday detector as Mr. Gray had described in the public hearings with his presentation on Holiday detection.

Any repairs are made to that coating, and then the pipe is released for transportation after that.

Once the pipe is transported to the stockpile yard, it is again visually inspected for any coating damage. And then lastly a final check is done to the coating using the same Holiday detection technology prior to lowering in and backfilling the pipeline.

Q. Thank you. And we had a question yesterday with respect to the coating that is applied to the welds that are performed in the field.

Can you describe the process by which the FBE coating is applied in the field to those welds?

A. Yes, I can. It's a similar process. The field joint coating is applied once two joints of pipe are welded together. The girth weld or the exposed area of bare metal is sandblasted again to a near white finish to get that same anchor pattern that we talked about earlier.

Two part liquid epoxy, which is a primer, and epoxy is mixed together and either brushed on with a roller or sprayed on with a spray gun. The coating thickness is then checked to

ensure that it meets specification and visually inspected to make sure that there is no damage to the coating.

Q. Thank you.

MR. WHITE: Mr. Smith, I'd like to mark one document as an exhibit. This would be Exhibit TC 11. Do you have that in front of you, Ms. Kothari?

A. Yes, I do.

Q. Would you describe that document?

A. It is the special permit from the Pipeline Hazardous Materials Safety Administration.

Q. Okay. And are you familiar with that document?

A. Yes, I am.

Q. And did you participate in the process by which that special permit was obtained?

A. I did.

MR. WHITE: I'd like to move the admission of TC 11. Copies of it are being distributed.

MR. SMITH: Any objection?

MR. RASMUSSEN: No.

MR. SMITH: I believe it's already in the record as an attachment to another testimony, but thank you.

MR. WHITE: So it will be easier to deal with --

MR. SMITH: Yes, it will. TC 11 is admitted.

Q. I'd like to ask you to describe just very briefly the process through which TransCanada applied for and received the

special permit from the Pipeline Hazardous Materials Safety Administration.

A. Okay. Subject to check, 49 USC 60118, the Pipeline Safety Act, allows TransCanada or any operator to apply for a special permit to the Code of Federal Regulation, which governs the hazardous pipelines to which they are subject to their code.

TransCanada applied for a special permit to 49 CFR 195.106, which is design pressure or design factor in determining the design pressure of the pipeline. TransCanada has pipelines operating using a .8 design factor on much of its system, and to ensure consistency with the overall Keystone Project, we wish to apply to the PHMSA for this particular special permit condition.

An Application was put forth to PHMSA and underwent a rigorous review by the technical committee at PHMSA along with a public comment period which allowed comments to be submitted and then evaluated by the technical committee as it related to the design and the Application for the special permit itself.

Q. And in approving the special permit or considering the special permit did PHMSA attach any conditions to the issuance of the permit?

A. Yes. PHMSA attached 51 conditions related to the design, construction, and operation of the Keystone Pipeline under the special permit requirement.

Q. And in issuing the special permit did PHMSA make any

specific findings?

A. Yes, they did. They made two specific findings.

Q. Could you describe the first finding?

A. Yes, I can. If you reference page 2 of the exhibit, the findings were, PHMSA finds that granting the special permit to Keystone to operate the crude oil pipeline at a pressure corresponding to a hoop stress of 80 percent SMYS is not inconsistent with public safety. And the, second, In doing so will provide a level of safety equal or greater to that which would be provided if the pipeline were operated under the existing regulation.

Q. Okay. Now does the special permit apply to each and every section of the Keystone Pipeline?

A. No, it does not.

Q. And are there any specific sections which are not covered by the special permit?

A. There's four categories which are not covered under the permit.

Q. Okay. What are those categories?

A. Commercially navigable waterways, population areas, highways, railroads, and road crossings, and the last category would be the pump station valve assemblies, pigging and measurement facilities.

Q. Okay. Could you just briefly tell us the reason that the commercially navigable waterways are not covered by the special

permit?

A. Yes. The requirement for thicker pipe in that area is due to stress factors in performing engineering and stress analysis calculations. It's not appropriate to use the thinner pipe at those particular areas due to stress concerns.

Q. And what would be the reason that the special permit does not apply to high population areas?

A. In the high population areas we like to mitigate the risk of third-party damage. And so, again, in that particular area to ensure appropriate levels of safety a thinner wall pipe would not be appropriate as a result of the ability to minimize those third-party damage potentials.

Q. And what would be the reason the special permit does not apply to highways, railroads, and road crossings?

A. It's a similar situation as the commercial navigable waterways in terms of stress and contractibility of the pipeline when installing those particular items.

In addition, with the railroad crossings, TransCanada along with the rest of the industry has moved away from casing railroad crossings as a result of previous incidents in industry where casings were causing corrosion between the carrier pipe and the casing themselves.

So in order to manage any external loading from railways and pipelines under the railway crossings, a thicker pipe is required to manage that external load.

Q. And then finally what would be the reason that special permit doesn't apply to pump stations, valves, pigging, and measurement facilities?

A. For the same reason again with the pump stations and the pigging and measurement and valve facilities there are considerations that are required in terms of thermal expansion and stress analysis, and for those reasons we look to use the thicker pipe as well.

Q. Just a few more follow-up questions. Yesterday there were questions about two pipeline indents that occurred on the TransCanada system in Canada. The first incident that was mentioned was an incident in Cabri, Saskatchewan.

Are you familiar with that incident?

A. Yes, I am.

Q. Could you briefly tell us what occurred?

A. In 1997 there was an external corrosion failure on a 1969 vintage 36-inch asphalt-coated pipeline.

Q. Okay. And since that incident occurred on that 1969 pipeline, have there been design changes that have been put in place by TransCanada to avoid the recurrence of such an incident?

A. Yes. In comparison to Keystone, Keystone will be using the fusion bond coating which I described earlier. This coating does not fail in a CP inhibiting manner so if there were to have any coating damage to the pipeline for whatever reason, cathodic

protection would still be able to penetrate and protect the coating and protect the steel beneath.

In addition to that, we've changed practices with respect to the installation of CP as well. Rather than installing cathodic protection up to one year after operations as currently stipulated by code, we choose to commission and energize the systems as part of construction.

Q. The second incident that was mentioned yesterday was an incident in Brookdale, Manitoba. Are you familiar with that incident?

A. Yes, I am.

Q. Could you briefly tell us what occurred in that incident?

A. Yes. The incident in Brookdale occurred in 2001. It was a different mechanism than the failure that occurred in Cabri. The mechanism was environmental, assisted cracking, or what's known in the pipeline industry as stress corrosion cracking.

The particular mode of failure was a crack that had progressed across the grain boundaries within the microstructure of the steel itself. The pipeline that failed was a 1970's vintage pipeline, again coated with asphalt.

Q. And was this a crude oil pipeline?

A. No. Both instances were natural gas pipelines.

Q. And have measures been put in place since the Brookdale incident to avoid the recurrence of that type of instance?

A. Yes. Specifically to Keystone, again, as I mentioned, the

failure mode was environmentally assisted cracking. The FBE coating removes any sort of penetration of the environment, whether it be soils or water. So if you remove the environment, you remove the ability to have any sort of cracking initiate on the steel itself.

Q. Okay. And were these two incidents posted on TransCanada's social responsibility website where leaks and spills are posted?

A. No, they were not.

Q. And why was that?

A. These particular incidents were classified as gas releases and not as spills. So the associated volume associated with the particular release was captured under the greenhouse gas emissions category and not the actual liquid spills category.

Q. And would these event have been posted otherwise?

A. They are posted in other areas on those websites under the news releases with respect to incidents, along with failure reports that are posted on the National Energy Board's website and the Transportation Safety Board of Canada's websites.

Q. Okay. And finally I'd just like to ask you whether Keystone in developing this project undertook a systematic review of the types of threats that might -- that the pipeline might face?

A. Yes, they did.

Q. And have you put in place safeguards to address each and every one of those threats?

A. Yes, I have. My testimony in reference to questions 25 through 32 of my direct testimony.

Q. Thank you.

A. I would like to actually add one other item, if that's possible. The failures that I just talked about at Cabri and Brookdale, pipelines are still the safest mode of transportation for crude oils, and natural gas safety measures are put in place to manage aging pipelines.

So I don't want to leave the Commission with the impression that older pipelines just because they are coated with asphalts or other types of coatings are unsafe pipelines. There are integrity management programs in place and maintenance programs in place to manage aging pipelines.

And so these occurrences while they seem quite, you know, fantastic in the fact that sometimes there's, you know, a fire or some sort of explosion associated with potentially certain types of failures on natural gas systems, that's not to say that they're not maintained and they're not a safe way to transport these commodities.

MR. WHITE: Thank you, Ms. Kothari. The witness is available for cross.

MR. SMITH: Mr. Rasmussen, do you have cross-examination?

MR. RASMUSSEN: Yes. Thank you.

CROSS-EXAMINATION

BY MR. RASMUSSEN:

Q. Ma'am, I'd like to start with your direct testimony. Looking at Paragraph 13 on page 3.

A. Yes.

Q. It says, The pipeline will be inspected aerially 26 times per year, not to exceed three weeks.

I'm not sure. What does that mean, the not to exceed three weeks part?

A. It's stipulated within the code that you are to inspect a pipeline aerially 26 times a year, which is biweekly not to exceed three weeks.

Q. Okay. But if you do it biweekly, you're not exceeding two weeks. That's what I don't understand.

A. Well, it's a range essentially.

Q. So it could be up to three weeks then?

A. Right.

Q. So it may be less than 26 times a year then?

A. It's an average of 26 times a year.

Q. Okay. The aerial inspection, what is that looking for?

A. Essentially you're looking for a couple of things. As Mr. Gray testified previously, you're looking for any third party related activity or encroachments near your pipeline. You're looking for any particular obstructions on your pipeline, and you're also looking for any potentials of leaks.

Q. Okay. A pinhole leak underground unless the oil's coming up through the ground, that would not be detected by an aerial inspection, would it?

A. No.

Q. Paragraph 19 refers to serious and major spills, critical spills. I take it the Cabri and Brookdale, was that the other one?

A. Yes.

Q. Those aren't included in this -- among the spills that are listed in this paragraph; is that right?

A. No. As I just mentioned, they're included in a separate category.

Q. Okay. Paragraph 21 talks about TransCanada's failures on crude oil pipeline. And it references an incident on the Platte Pipeline in 1996.

Can you tell me about what happened on that instance?

A. Yes. As Mr. Jones had testified earlier yesterday, TransCanada was a joint venture partner with Alberta Energy's Company, the Express Pipeline construction. With the construction of Express we also participated in upgrading the Platte Pipeline.

While TransCanada was not the operator of the Platte Pipeline, there was an incident that occurred in 1996 on the Platte Pipeline where an external corrosion failure occurred at a pump station facility on pump station piping.

Q. What type of coating was on that pipe?

A. I'm not sure.

Q. You mentioned that there's -- TransCanada's never had a failure with the fusion bond epoxy coating?

A. That's correct.

Q. Has any other pipeline had a failure with that type of coating?

A. Not to my knowledge.

Q. Paragraph 22, would be at the top of page 7, mentions that there's 6,364 miles of hydrocarbon pipeline in South Dakota and no crude oil pipelines currently operating in South Dakota; correct?

A. That's correct.

Q. What's the highest operating pressure of any of the hydrocarbon -- other hydrocarbon pipelines in South Dakota? Do you know?

A. I'm not sure.

Q. Do any of them have as high as 1,440 psi?

A. I'm not sure.

Q. Okay. What do you know about the pipeline failures in South Dakota that are referenced in paragraph 23 of your testimony?

A. I am aware of these failures as a result of statistics posted on the PHMSA website.

Q. Do you know any of the specifics regarding any of them?

A. Just the failure mode.

Q. And what was the -- what was the failure mode on those?

A. One was external corrosion, and the other two were third-party damage.

Q. It says there's five failures. Oh, two of them are natural gas pipelines -- oh, excuse me. There's five. What are the failures on the -- you said there's five of them in the last 10 years.

A. Yes. There were three on liquid on two on natural gas.

Q. Okay. And what were the cause of all five of those? Do you know?

A. I'm not sure about the natural gas ones.

Q. All right. The liquid, what type of liquid was involved?

A. Again, it was refined oil products.

Q. You describe the method by which the coating is applied in the field. There's always a chance for air when a human being is applying some sort of coating by hand, is there not, in the field like that?

A. I suppose. However, there are procedures in place to specifically manage the installation of that coating.

Q. And there were similar procedures in place for all the other pipelines that we've talked about where there's been external corrosion, there's been leaks. There were procedures in place when those pipelines were installed and manufactured, were there not?

A. I was not participating in any of those construction projects, but I suppose there were.

Q. Paragraph 31 on page 10 mentions that the -- there's a reduced likelihood of mechanical damage with the pipeline being buried with 4 feet of cover. And you state according to pipeline industry research it's reduced by 80 percent in undeveloped areas and 41 percent in developed areas.

Did I understand it's reduced by those percentages with the 4 feet of cover? Is that what that means?

A. That's right.

Q. So even though the likelihood is reduced, there still is some likelihood of mechanical damage occurring, though?

A. Yes. But this is in the absence of other measures that we talked about, such as One-Call, warning signs, public awareness programs. So it's focusing on just cover.

Q. Paragraph 33 and 34 of your testimony references the American Water Works Association study. You're familiar with that?

A. I am.

Q. Okay. And I believe a copy of that was actually submitted as an attachment to Ms. Tillquist's testimony?

A. I believe so.

Q. All right. There's both I guess what would appear to be a summary or abstract of the article and then the actual article that was submitted. Is that your understanding? Have you seen

that?

A. From what I'm aware of reading some of that, yes.

Q. Okay. In the abstract it's stated that these pollutants, referring to contaminating soil, but these pollutants from leaking storage tanks and contaminated soils can and have posed serious threats to the longevity and structural integrity of plastic pipes and elastomeric gaskets, which in turn can affect the water quality in the distribution system.

Do you disagree with that statement?

MR. WHITE: I'd like to ask if we're going to ask the witness about this abstract, can she have a copy in front of her so she can look at it?

MR. RASMUSSEN: Sure. I think Ms. Tillquist's testimony should be in front of you there.

A. I have it.

Q. 7R, I believe.

A. Okay.

Q. What I'm looking at is the -- let me see if you have the same thing I have. Okay. I've got the actual -- there's an abstract, though, that was also included that should be right in front of that or a summary.

A. Yeah.

Q. Okay. What I was reading from is the first page of that document under the heading background. Do you see that?

A. Yeah. I do.

Q. And what I read was the second -- or third sentence of that paragraph. Do you want a chance to read that?

A. I see the sentence you're referring to.

Q. Do you disagree with that in any way?

A. Keystone will not have any storage tanks in South Dakota.

Q. Okay. But there could be contaminated soils as a result of a leak?

A. I'd have to defer any contamination-related questions to Ms. Tillquist.

Q. Okay. Are you aware of what we've referred to as BTEX chemicals? Do you know what I'm talking about when I say that, benzene, toluene, et cetera?

A. I'm aware in the general sense, but, again, I would have to defer any toxicology-related questions to Ms. Tillquist.

Q. All right. Fair enough. So even though you cite, though, this study in your direct testimony, Ms. Tillquist would be the one that has the expertise in that area?

A. She has the expertise in the toxicology area, yes.

Q. Okay. The special permit that you talked about, which is Exhibit TC 11, you mentioned that at least one of the reasons for seeking that permit was to ensure consistency. And that would be consistency with the pipe that is used in Canada?

A. That's right.

Q. There isn't any difficulty, though -- if you were to use the .72 design factor in the United States portion of the

pipeline, that doesn't create any problems in hooking it up to the Canadian portion, does it?

A. No, it does not, but industry is moving in the direction where high-strength steels are capable of using this design factor that's proven with the move for the natural gas pipelines earlier on in the year to move to this design as well.

Q. Okay. But in the United States unless you get a special permit, you're still required to use the .72 design factor?

A. There are processes in place that are currently moving to change codes and standards.

Q. That hasn't happened yet, though, has it?

A. No.

Q. The 51 special conditions that are imposed, who monitors whether those -- all of those conditions are followed?

A. The regulator itself, the Pipeline Hazardous Materials Safety Administration.

Q. Are there inspectors from the PHMSA -- or, excuse me -- yeah, PHMSA out there at all times watching the installation of the pipe?

A. PHMSA reserves the right to audit and be on site during the construction of a pipeline.

Q. They reserve the right, but they're not necessarily there all the time?

A. No. But we have third-party inspectors who provide reports.

Q. Again, as we discussed yesterday, the primary reason for seeking the special permit was a financial one?
A. I wouldn't say that's the primary. There are several factors, as I described.
Q. Well, that's certainly one of the factors?
A. Yes. It's one of the factors.
Q. And when you go through a waterway or when you go under a roadway or go through a populated area you have to have the thicker pipe because it's safer?
A. From a design consideration there are stress implications so you would need to design with a thicker pipe.
Q. Because it's safer?
A. From a design standpoint as it relates to the specific installation in those areas, there are other design considerations that are required.
Q. If there is a problem with corrosion in a pipe, external corrosion, it would be more likely for the corrosion to go through the thinner pipe than through the thicker pipe, would it not?
A. Not necessarily.
Q. It wouldn't? It wouldn't go through quicker if it was a thinner pipe than it would be through a thicker pipe?
A. It would depend on the corrosion growth rate.
Q. Paragraph 42 you -- the question -- in your direct testimony the question written is, Would thicker pipe at foreign

pipeline crossings be an appropriate safeguard?
And foreign pipeline crossings would be any pipeline that's not the TransCanada Pipeline or the Keystone Pipeline; correct?
A. Yes.
Q. And your answer to that is that it would not be. But, again, the chance of a leak would be less if there was thicker pipe at any point along the pipeline, would it not?
A. There are a number of factors that are involved with the cause of corrosion and the chance of a leak. So I can't say that it would be.
Q. Everything else being equal, a thicker pipe would be less likely to leak than a thinner one?
A. No.
Q. Okay. Paragraph 46 of your direct testimony mentions the DNV report. And that was the report prepared by a risk management third-party group; is that right?
A. Yes.
Q. No one from DNV has been asked to testify on behalf of TransCanada; is that right?
A. That's right. No one has.
Q. Why is that?
MR. WHITE: Well, I'm going to object to that question. I think that's a legal strategy question rather than one for the witness to answer.
MR. SMITH: Sustained.

Q. Take a look at your first rebuttal testimony. It would be R1. Page 3, paragraph 10. Do you have that?
A. Yes.
Q. Okay. It mentions that Keystone has performed a preliminary surge analysis and intends to complete the detailed surge analysis later this year or early next year.
Is there any reason the detailed surge analysis can't be done at this point in time?
A. Yes. We are still finalizing design considerations on the facility side. So until those designs are in place along with the control system designs, this particular piece can't progress.
Q. What is a surge analysis?
A. It's an analysis that's performed to determine where particular sections of pipe may see increased transient activity or increased pressure activity.
Q. What's the potential danger of a surge?
A. The potential danger of a surge would be over pressure of the pipeline.
Q. Which could potentially cause a rupture?
A. It could cause abnormal operations.
Q. Would rupture be part of an abnormal operation?
A. It is a potential.
Q. What are other abnormal operations that would be impacted by a surge?

A. Equipment damage.
Q. Okay. Take a look at your second rebuttal testimony on paragraph 11 on page 4. Looking at the bottom of the page, the bottom of that paragraph, you wrote that, "Lastly, crude oil pipelines do not fail in the same manner as natural gas pipelines. Liquid pipelines carry crude oil as specified in Keystone's tariff and do not ignite in an explosion or fire as crude oil is not a compressible fluid."
Now we've all just heard recently about the explosion in Minnesota which was a crude oil pipeline; correct?
A. The details of what caused the explosion aren't public yet.
Q. That was a crude oil pipeline, though?
A. That was my understanding.
Q. And at least some sort of explosion or fire occurred?
MR. WHITE: I think the witness indicated she doesn't know the detail of that incident.
Q. Well, you've read the newspaper, haven't you?
A. Some articles, yes.
Q. You're aware there was a fire?
A. Yes. But we aren't aware of what caused the fire at this point in time.
Q. But it was a fire connected to a crude oil pipeline?
A. There was a fire as reported in the newspaper.
Q. And you can't explain why that happened?
A. No. I wasn't there.

Q. I asked Mr. Jones yesterday about the pipeline failures in the last five years that were referenced in the Interrogatory Answers, and he indicated you would be the one to testify about that.

Do you recall that testimony?

A. Yes, I do. Yep.

MR. SMITH: Reed, how much farther do you have to go? I'm thinking maybe we ought to take a break here before too long.

MR. RASMUSSEN: I've got about three or four more questions.

MR. SMITH: I'll take it after you're done if you prefer, but if we have a long way to go, I'd just as soon --

MR. RASMUSSEN: I'm about done.

MR. SMITH: Okay.

Q. I'm trying to find my list here. I'll get it here in a second.

Okay. Sorry for the delay here. We've got the Interrogatory Answer listed five -- or, excuse me, four failures in the past five years related to external corrosion, one of them being January 7, 2004.

What can you tell me about that incident?

A. That was a leak on a pipeline in Northern Alberta.

Q. Okay. And what was the cause of that leak?

A. External corrosion.

Q. All right. What sort of coating was on that pipe?

A. I do not recall, but it was not fusion bond epoxy.

Q. Okay. How long have you been using fusion bond epoxy?

A. Over 28 years.

Q. Okay. So this would have -- would have had to have been a pipe that would have been manufactured more than 28 years ago?

A. Yes.

Q. Can we assume that?

A. Yeah.

Q. Okay. Isn't it true that as pipe ages the statistics would show there's more of a chance for a leak, a 10 year old pipe is less likely to leak than a 25 year old pipe?

A. Statistics would indicate that.

Q. Okay. December 1 of '03, what can you tell me about that leak?

A. Again, it was an external corrosion failure. I believe this one was also on the Alberta system.

Q. And I think we established yesterday these are all natural gas pipelines?

A. That's right.

Q. September 2, '03, what about that one?

A. That one, again, pipeline in Alberta, external corrosion.

Q. Okay. How about October 18, '02?

A. That was, again, a leak on a pipeline in Alberta.

Q. External corrosion?

A. Yes. All of these incidents --

Q. Right. They were all -- I'm sorry. And then we have three of them related to third-party damage. December 23, '04, what happened with that one?

A. That was an excavation, a third-party excavation that had contacted the pipe and a delayed leak had occurred as a result of that contact.

Q. Okay. And do you know what caused the -- what sort of excavation it was or anything like that?

A. It was a backhoe trenching.

Q. And then September 7, '03, what about that one?

A. That was as well a backhoe trenching along the line.

Q. And then we have one, May 25, '07 in the United States. Where was that?

A. That was on the A&R Pipeline.

Q. Which is where?

A. It would have been one of the assets that was recently acquired last year. I'm not sure specifically where, but there was a report of third-party excavation on the system.

Q. Backhoe again?

A. Yep.

MR. RASMUSSEN: I think I'm done. I'll check my notes if I have anything else.

MR. SMITH: Thank you. Let's take about a 15-minute recess. We'll reconvene at 20 to.

(A short recess is taken)

MR. SMITH: We're back in session following a 15-minute recess. The hearing is reconvened following a short recess. It's about 20 to 11.

Meera Kothari is on the stand, and we're ready to resume cross-examination by Mr. -- Mr. Hohn, do you have questions of Ms. Kothari?

MR. HOHN: Yes, I do.

MR. SMITH: Please proceed.

MR. HOHN: Thank you.

CROSS-EXAMINATION

BY MR. HOHN:

Q. Ms. Kothari, the signage on your pipelines that are constructed in the rural areas, where does the sign occur? Is it near a section line if you're marking the pipe?

A. Mr. Gray responded to that in his previous testimony.

Q. Okay. And do you know how it's marked?

A. It would be at road crossings and other locations as such.

Q. And as far as the material itself, the pipe and then the bonded coating, can that be located in the field as part of a One-Call without any special equipment? Do you need special equipment to locate it?

A. You would need the survey plans and the equipment required to locate pipelines.

Q. But it wouldn't be anything different than any other gas or

petroleum pipeline?
A. Not to my understanding.
Q. Okay. Are there other pipelines operating in the United States as far as you know that move tar sands oil?
A. I'm aware of a few.
Q. Are any of them operating under the special permit that is being requested by TransCanada?
A. Keystone is the first.
Q. Keystone will be the first. In the United States?
A. Yes. The first in the United States.
Q. Are there pipelines operating like that in Canada other than TransCanada lines?
A. Yes. All pipelines in Canada as per CSA Z662 -- that's the pipeline code in Canada -- are allowed to operate using a .8 design factor.
Q. So in the United States TransCanada would be the first pipeline moving tar sands oil under this special permit as far as you know?
A. That is correct.
Q. And I believe there was earlier testimony from Mr. Jones that this would be the first -- or that, excuse me, I believe there was testimony from Mr. Jones that TransCanada does not operate or has not operated oil pipelines?
A. We currently do not operate any oil pipelines.
Q. Okay. So you'd be the first -- this would be your first

pipeline to move tar sands oil, and this would be the first use of the special permit in the United States?
A. It would be the first recent crude oil pipeline project to move tar sands oil with a special permit.
Q. In the United States?
A. That's right.
Q. Okay. On page 3 of your direct testimony, the first paragraph about 5 lines down you're describing the facilities, and I believe you mention there will be four valves -- four valves or check sets.
Would you describe what a check set is?
A. Yes. Code requirements require hazardous liquid pipelines to install a valve downstream of a major water body. What Keystone has done with their design is we are planning to install the check set which compromises of a check valve, which is a code requirement, in addition to a manual valve alongside the check. So the technical term is check set.
Q. So is that one pipe then? There's not two pipes beside each other? Is it all one valve, the check and the valve?
A. It's one assembly.
Q. One assembly. And for those who may not know what a check valve is, would you describe what the check valve is intended to do from an engineering standpoint?
A. It would be to eliminate any spill volume backflow into the river crossing in the event of leak or any other potential

requirement for isolation.
Q. So if the oil pipe is going under the River and then it's going up the slope, up the bank of the River, if there is a leak and the oil tries to come back, the check is going to stop the oil.
Would that be a fair description?
A. Yes.
Q. Can you explain how a smart pig or a cleaning device would go through if you have a check valve in that section of the River or pipe?
A. Yes. Our check valves are equipped with lock open mechanisms. So for a particular inspection run somebody would be dispatched out to open the check valves into the lock open position so that the in-line inspection tool would be able to pass without being damaged.
The pipeline is 100 percent pigable. So regardless of whatever valves are in place, the pigs are able to pass, but the check valves can sometimes cause damage to the in-line inspection tools that pass. And so this design feature allows for minimal damage to the tools.
Q. So is this -- the check, does it go up? Does it go up into a cavity or something to get out of the way of the flow? Or how do you get it out of the line?
A. The clapper would be turned into an open position.
Q. Is that something you could provide a drawing as part of

the file later that we could see?
MR. HOHN: That's a request, I guess.
MR. WHITE: Well, I'm not sure there was an answer to that. Is the Commission interested in seeing such a diagram?
MR. SMITH: Is it readily available? Is it something you could --
THE WITNESS: We would have to go back to the valve manufacturer to obtain the drawings. They're currently in draft at this point in time so I'm not sure as to the timeliness of being able to provide that information.
MR. WHITE: Strikes me that this might have been a discovery request prior to the hearing rather than in the midst of the hearing.
MR. SMITH: Is that an objection?
MR. WHITE: Yes.
MR. SMITH: I think I'll sustain the objection but with the understanding that if it becomes available just as an informational item to the Commission, I suppose we'd appreciate having it at our disposal.
THE WITNESS: Sure. I'll note that.
MR. SMITH: Thank you.
Q. On page 8 of your testimony, item 27, three lines from the bottom up in that paragraph the word "traceable."
A. Yes.
Q. Each piece of pipe is traceable. Each pipe joint is

traceable to the steel supplier.

How is the pipe traceable? What method is used to track or trace?

A. When the pipe comes in to the pipe mill it is numbered, whether it be the plate or the soil that is used to then form a joint of pipe. That joint of pipe is assigned a number in the mills management system, and that number is reconfirmed at each station to match the joint before any of the particular process that takes place at that station can occur.

After all the testing is done on that particular joint of pipe, what is called a mill certificate or a mill certification is produced with the joint number attached to it. The joint number is also stenciled on to the inside and the outside of the pipe when it is on the right of way. Again, the joint numbers are known and are recorded typically on the as-built alignment sheets.

Q. And if you were out in the field as an engineer inspecting, for example, how would that help you inspect or assure quality? What's the purpose of that step?

A. If for any reason there would be any damage sustained to that piece of pipe for whatever reason, for example, if there were a hydrostatic test failure, we would be able to trace the joint back to a particular production shift, a particular supplier of steel, and it assists in route cause analysis to determine if there was anything that went wrong.

Alongside as well, in operations through integrity management if we had to remove that joint of pipe for whatever reason, based on in-line inspection and repair or for whatever other reason, you would be able to trace that pipe back to determine what particular steel properties were assigned to that joint of pipe, who made it, when it was made, how it was made.

Q. And would that also allow you to track the pipe in terms of shipment, who shipped it, what company?

A. Yes. The stencil usually has the mill manufacturer's name and the requirements as set forth in API. There's specific marking requirements for the pipe as per the codes.

Q. And in that same sentence, "Each joint is traceable to the steel supplier." The next sentence, "The coating is inspected in the plant with stringent tolerance on roundness, nominal walk thickness."

What's the significance from an engineering standpoint of roundness?

A. The roundness tolerances, they're to ensure fit up when welding the joints in the field.

Q. If a pipe -- I think somewhere in your testimony we'll be getting to later, but you mentioned testing for oval or oblong-shaped or an odd-shaped. If it's not completely round, does that weaken the pipe?

A. No. Prior to operations a caliper tool is run through the pipeline to check for ovality, dense, or any other construction

damage. If the in-line inspection tool sees that construction damage, we're able to remove that joint of pipe prior to service.

Again, those operations are also performed in operations through the integrity management program as well.

Q. And on the same page 8, item 28, second line from the bottom, using ultrasonic inspection, how does that help you inspect the pipe for flaws?

A. There are various methods to inspect for flaws, gamma ray, x-ray, and ultrasonics being three of the types of nondestructive inspection techniques that are used to check for defects, welding defects.

Q. In that same sentence just the next two lines up, "Pipe joints which are susceptible to transportation fatigue (Joints that are stacked on the bottom)."

I assume you're talking about pipe that's been loaded on a ship or on a rail car or a truck that would be susceptible to fatigue. What would cause that kind of fatigue in terms of transportation?

A. It would be the transportation of the pipe itself. So --

Q. What would be the significance of the stacking causing fatigue?

A. Typically joints that are on the bottom of rail cars could be susceptible to propagation of small defects. And so in order to mitigate any sort of flaws introduced into the system, prior

to operations we check for the existence of those particular flaws once the pipe arrives at the stockpile site.

Q. Does TransCanada have any standard in terms of how they require their supplier to ship, package and ship?

A. Yes. We follow API 5L for ground and 5LW for water transport.

Q. And does that standard require a certain method of stacking pipe of this type?

A. Yes.

Q. Are you aware, if you're aware -- are you aware of any situation where the National Transportation Safety Board has identified a failure because of stacking?

A. Yes. There was one failure on the Enbridge pipeline a number of years ago as it related to transportation fatigue. As part of our review of the special permit with PHMSA a condition was introduced to mitigate and manage any threat as it relates to transportation fatigue by the Application of this particular MBT examination once the pipe arrives at the stock pipe site to ensure that no flaws as a result of transportation fatigue are introduced into the system.

Q. And do you recall what state that occurred in and what year, if you know?

A. I do not.

Q. Okay. On page 9, item 29, at about the middle of your response the words "a tariff specification," do you see that

section?
A. Yes.
Q. Would you explain what that sentence is saying regarding tariff -- what you mean by tariff, what that process means?
A. Yes. As Mr. Jones mentioned in his testimony yesterday, Keystone has a specific tariff or specification in place on the properties of the crude that are allowed to be transport within the Keystone system.

A specification of .5 percent solid and water by volume is the Keystone specification, which is half of the U.S. industry standard of 1 percent for solid and water by volume. So that's a specific tariff that we've introduced onto our system to manage such things as the likelihood of internal corrosion.
Q. And the next sentence, could you read the next sentence regarding dropout and then explain what you mean by that?
A. It's essentially for water to drop out of oil it needs to be -- it needs to be transported at a specific flow rate. Based on the analysis that Keystone has performed, the pipeline is being designed in a turbulent flow regime. Therefore, the likelihood of water dropout on the pipeline is very low and would require a very low flow rate to have standing water in the pipeline.

Again, once the pipeline would move back into a turbulent flow regime, that water would be swept away with the crude. So the likelihood again of any sort of water dropout that would

potentially cause internal corrosion is very minimal as a result of the design features of the pipeline.
Q. Is this pipeline designed, built, and installed on line and grade, survey line and grade?
A. Yes.
Q. So what that would mean is from various points you tell the contractor I want it to take a certain elevation from this point to that point, it should be flat between those points?
A. No. The pipeline is constructed to fit the contours of the terrain.
Q. Go ahead. I'm sorry.
A. Sorry.
Q. So it follows the terrain? It's not laid like a sewer line, for example, line and grade, gravity flow?
A. No.
Q. Okay. Is it possible depending on how the pipe is constructed either for a contractor to not do it the way you want it done or a problem in construction, soils and foundation of the soil, where you could have the pipe -- a belly in the pipe where water could settle out?
A. It's possible, but based on survey and construction plans, I think that would be taken into account.
Q. One last question on water falling out or settling out. Why is that signify if it does settle out and you get water in the bottom of that pipe? Can it corrode?

A. There's potential for corrosion.
Q. You've spoke a lot about the fusion bond on the outside of the pipe. Is there any coating on the inside of the pipe?
A. No. There's no coating on the inside of the pipe, but we manage internal corrosion in the methods that are outlined in the testimony with respect to tariffs, in-line inspection to look at corrosion defects.

There's other monitorings of commodities as it relates to product sampling, turbulent flow regime. So there's various other methods to mitigate and monitor and manage internal corrosion.
Q. So the internal pipe is a raw steel? There's no coating on it, paint or coating?
A. There's no coating on it.
Q. As an operational procedure to protect the pipe, is there any kind of treatment that's sent through the pipe periodically to protect against corrosion?
A. That is a possibility to use corrosion inhibitors.
Q. On the -- Mr. Rasmussen asked you a question about welding a joint and then painting or applying the FBE in the field, the fusion bond.

Is there any special precaution that would be taken if it were raining or misting and you were welding -- or you were coating the joint at a welded joint?
A. Yes. Those precautions would be taken into consideration.

Q. What kind of precautions could you take where you could paint in the rain?
A. You would tarp over that area.
Q. You'd build a little shed over the --
A. Yes.
Q. Is this -- is fusion bond susceptible to moisture? In other words, if there's too much humidity, you're applying this fusion bond in the field, not the factory but in the field, a contractor wants to get his work done and he's going to want to try to apply it, is there a risk of humidity affecting that coating?
A. There's specific application specifications and quality monitoring to ensure that the application is done as per specification. So if there was humidity and it didn't pass the quality inspection, then it would have to be redone.
Q. And how would they do that to redo? Would they sandblast and reapply?
A. Yes.
Q. And they'd do that in the field?
A. Yes.
Q. Okay. This might be an operational question, but if you know the answer, I'd like your comment. Regarding One-Call, the location of this pipe by One-Call, and you reference some of it in your testimony, do you know where the One-Call personnel for TransCanada would be dispatched out of?

Where would they originate?
A. I'm not sure but that would be developed as part of the operations. So it would be from a local regional office.
Q. So, for example, if the three employees located in Yankton were assigned that task, that could be one of the stations?
A. Again, I'm not exactly sure, but that's possible.
Q. Okay. On page 10, item 32 of your testimony, the first line in your answer you refer to a hydraulic event as characterized by overpressurizing the pipeline.
Go through the hydraulic event again if you would. What are the types of hydraulic events that could occur?
A. It would be an abnormal operation of a pipeline.
Q. And I believe you told Mr. Rasmussen that could be -- what were the things you stated previously? You stated a couple of things that could cause a hydraulic event.
An overpressurizing by a pump, is that a likely event?
A. That's a likely event or a potential that to cause one.
Q. Would failure of a SCADA system or something opening or closing too fast, could that cause a hydraulic event?
A. It's possible. But, again, SCADA systems are redundant and have backups. So SCADA systems typically wouldn't fail without having a backup system kick into place.
Q. Manmade equipment can fail, though. Isn't that a fair statement? It can fail. It's not, bullet proof, is it?
A. The Keystone Pipeline will have a redundant backup system

with this SCADA.
Q. Well, for example, we had an ice storm where power was out in the area where I live and work for 17 days. Your pump stations and SCADA systems out in the field monitoring points along the pipe, they have UPS systems according to the testimony, but the UPS system will not last indefinitely.
If there's a power outage, would the SCADA system work?
A. I defer all operational questions to Mr. Brian Thomas.
Q. Even in spite of the fact -- I respect that, and I will ask Mr. Thomas. The next sentence says, "This is avoided by the systems in place to monitor the pipeline known as SCADA systems."
It may not be avoidable. I guess is my question is, is it avoidable, and we'll defer to Mr. Thomas.
On page 11, item 34, the last large paragraph where you're referencing the impacts on plastic pipe. I think it's about six lines from the bottom, Reported permeation incidents on water mains. There were three gasoline, one chlorinated solvent, and two unknown for water pipelines.
Based on your review of that report or that study, were hydrocarbon or tar sand oils tested in this lab in this study?
MR. WHITE: I'm going to object to this question. I believe that the counsel for WEB Water has already cross-examined Ms. Kothari on the American Water Works Association study, and now we're getting duplicative questions

from another representative of WEB Water on the same issue. It seems like they're getting two bites at the apple here.
MR. SMITH: I'm going to overrule. Proceed, Curt. Keep it within bounds, please.
Q. To your knowledge was tar sands oil part of the American Water Works test?
A. The study tested gasoline.
Q. Okay. And one additional question on that same sentence. The next line, asphalt solvents were apparently part of that AWWA test. Asphalt and tar sands would not necessarily be the same.
A. No, they are not.
Q. Okay. On page 12, the second paragraph at the top it begins, The technical conclusion.
A. Yes.
Q. Is that PVC can be safely used in soils contaminated with gasoline regardless of contamination levels. PVC is highly resistant to permeation by benzene, toluene, and TCE in all but the most extreme conditions.
Based on your review of that American Water Works study, what would you describe as extreme condition, or what were they describing as extreme condition?
A. They did not denote an extreme condition.
Q. In your opinion as an engineer, do you believe an oil spill might be an extreme condition?

A. No.
Q. No. You don't think it would be?
A. No. The gasolines tested in this particular study carried far more increased levels of BTEX than crude oil that Keystone will be transporting.
So in my engineering opinion if the study states that regardless of contamination levels and particular to the products that were tested here and that the PVC was resistant to the contamination produced by gasoline which was in higher exceedance of chemical composition or compounds that are found in crude oils, then, yes, I would say that a crude oil spill would not be an extreme condition.
Q. Along those same lines, you were present when Mr. Jones testified, were you not?
A. Yes.
Q. Do you recall Mr. Rasmussen asking for a sample of tar sands oil to provide to American Water Works or some independent lab to test?
A. Yes.
Q. And do you remember his response?
A. Yes.
Q. What was it?
A. No.
Q. Okay. On the bottom -- you mentioned in your testimony in the questions you responded to for Mr. Rasmussen -- you said

there were third-party inspectors. Would you describe a third-party inspector?

A. Mr. Gray described the inspection, 25 to 30 inspectors that would be on site as part of his testimony.

Q. Yes. But the term "third party," does that mean they're not employed by TransCanada, they're contractors?

A. They're not direct employees of TransCanada.

Q. They're not direct employees, but they're supervised by someone from TransCanada?

A. Yes.

Q. On page 13 of your testimony, item 37, the last sentence referring to federal regulations allowing the pipe to exceed the maximum operating pressure by 10 percent. As a result of abnormal operation, such would be a reportable event.

So is that saying that the pipe can surge to 10 percent higher than 1,440?

A. In an abnormal operational event the pipeline can exceed the maximum operating pressure by 10 percent and would require a report to the Pipeline Hazardous Material & Safety Administration.

Q. And how would TransCanada know if there was a surge in the line and it exceeded the 1,440?

A. TransCanada has monitoring equipment in place in addition to the SCADA system to monitor the pressure in the pipeline.

Q. So that would be logged on a computer somewhere that's

monitoring the project and then when that was observed by staff, they would -- someone with TransCanada would report it?

A. Loosely, yes.

Q. Okay. That surge then with 10 percent would bring the pressure to 1,584; is that correct?

A. For a single abnormal operational event. It is not the pressure in the pipeline during normal operating conditions. The maximum operating pressure of the Keystone Pipeline is 1,440 psi.

Q. I understand. But in an abnormal situation it could surge to that pressure? You're allowed to have that kind of a surge without reporting?

A. The regulation stipulates that an exceedance of 10 percent must be reported to the regulator.

Q. Okay. Thank you. On that same page, 36, the last sentence, Lastly there is an economic benefit to the project by using the thinner pipe essentially. Is there a value calculated --

Do you know what the value is, the economic value or savings to TransCanada by going to thinner pipe?

A. The economic value on the raw steel itself is approximately 10 percent. These economic savings are passed on to the shipper and then indirectly ultimately to the consumer as Keystone is a regulated utility.

Q. Yes. Thank you. Can you take the 10 percent then and

convert it to dollars?

A. Not at this time. I don't have the information.

Q. But what you're saying -- let me see if I understood it correctly. What you were saying is it's 10 percent of the raw steel value because you still have to make a pipe and you still have to deliver it.

So it would just be on the raw material; is that correct?

A. It would be. However, there are 51 conditions in place as a result of this special permit so where you would have a savings of 10 percent on raw steel you do have additional costs to implement the conditions as stipulated in the special permit.

Q. So what you're saying is while it would be a savings in the raw material, there's going to be some additional costs, and so the net would not be 10 percent?

A. That's correct.

Q. On page 14, item 41, regarding casing, casing highways and roadways and railroads, putting your pipe through another pipe, your industry's finding that there's a risk of developing a corrosion by using a casing where you cross a road; is that correct?

A. Yes. There was two types of shorts with casing, electrolytic and mechanical shorts. So the industry's moved away from using casing designs.

Q. Well, for example, the South Dakota Highway Department

requires to case interstate highways for water lines. And the reason is if something leaks under the highway, it will come out either end.

MR. WHITE: Objection. Is this a question or testimony?

MR. HOHN: It's a question.

Q. My question is has the South Dakota Highway Department been asked to provide a modification for crossing highways that does not require casing?

A. You would have to ask Mr. Gray with respect to any discussions with the highway department. But from TransCanada's design standpoint, our preference and our urgence to the highway department or whoever that may be is that casings would not be recommended for crude oil pipelines or transmission pipelines as a result of the potential for corrosion.

Q. And if I heard you correctly, you stated that the thicker pipe under the highways provides the extra protection that a casing might provide or offsets what casing might provide?

A. The thicker provides for external load protection.

Q. Okay. On the bottom of page 15, item 46, the last paragraph deals with spill volumes, how they're calculated, and then the last sentence, Consequentially, procedures to reduce spill volume involving depressurization and drain down are not estimated or included.

Could you describe drain down?

A. It would be the remaining oil removed from the pipe prior to any physical stopping. But I would defer all questions to spill volume to Mr. Brian Thomas.

Q. Okay. Regarding the drain down, the reason you need to drain down possibly from an engineering standpoint you could address this. Does the pipeline need to be drained completely down to make a repair?

A. I would defer all questions to Mr. Brian Thomas with respect to oil spill and emergency response.

Q. What about depressurization? Same answer?

A. You'd have to speak with Mr. Thomas on emergency response and oil spills.

Q. Thank you. I want to just look at your -- one of your rebuttals.

On page 3 -- and I don't know which of these I have. It's in response to Dan Hannan and William Walsh?

A. R1.

Q. R1. Okay. And it's on page 3. Under item 8, the paragraph answering item 8. The second sentence, "Keystone will account for new HCAs as part of the annual reassessment and incorporate findings back into integrity management program to determine if further action is needed."

If you construct the pipeline and you do annual assessments and you identify an HCA that apparently either wasn't found when you built the line initially or you weren't aware of it or it's

developed since the pipeline was built, how would you -- what would you do -- what action could you take to respond to that and mitigate for that?

A. There are specific integrity management requirements as outlined in federal regulations. Particular HCAs are required to be inspected every five years. So there's more stringent guidelines around integrity management for the HCAs. For the Keystone Pipeline as a result of the special permits Keystone will be required to in-line inspect its pipeline within three years of operation, which is sooner than what would be required through the base regulation.

So that's essentially what this is referring to is the management of HCAs as it relates to integrity management programs.

Q. If, for example, consulting with state agencies or whatever agencies, federal agencies you'd need to consult with to determine an HCA under the federal regulation required the installation of a valve, would you shut the line down and cut a valve it in?

A. If the analysis deemed that necessary, then yes.

Q. What if the analysis determined that the HCA was missed during original construction and required -- the remedy or mitigation required a thicker pipe? You certainly couldn't go back and reinstall the pipe, could you?

A. The HCAs are determined by the Department of Transportation

and under the Pipeline and Hazardous Material Safety Administration. We are provided the data by PHMSA with respect to what HCAs are known and established. The Federal Government establishes what an HCA is.

Q. And an HCA map was filed as part of the project Application, was it not?

A. I believe so.

Q. Has that been submitted as an exhibit? Do you know?

A. I'm not sure.

MR. SMITH: Yes. It's part of Exhibit C, I think. Is that on your list? We can check if you want.

MR. HOHN: We don't need to check now. I just wanted to make sure it was presented.

MR. SMITH: It should be in the Exhibit C filing or admission.

MR. HOHN: That's all the questions. Thank you.

MR. SMITH: Are there questions from any of the other Interveners in attendance? Yes, sir.

Curt, do you want to defer your seat there, yield your seat?

Please identify yourself, sir. I don't know who you are so --

MR. MILLER: Mr. Smith, I'm Ed Miller.

MR. SMITH: Welcome, Mr. Miller.

MR. MILLER: Thank you. I just have a couple of

follow-up questions on the areas that Mr. Rasmussen was doing.

CROSS-EXAMINATION

BY MR. MILLER:

Q. In paragraph 19 on page 5, you have listed there these 576 spills that were on your website. You said in your answer you said that, Most importantly none of these spills represent pipeline operational leaks.

Could you explain to me what you mean by pipeline operational leaks, please.

A. Those were the events that Mr. Rasmussen had described with respect to Cabri and Brookdale.

Q. Okay. So are there incidents at all that involve pipeline operations that are included here?

A. These incidents reflect spills of a hydraulic oil nature, lube oil and glycol and other fuels that were spilled on the ground. TransCanada does not operate any liquid pipelines presently so it would not involve any pipeline related --

Q. None of these 576 spills are pipeline related at all?

A. They would be related in that if there was equipment that spilled liquids during pipeline construction, not physical operation of the pipeline.

Q. But not physical operation of the pipeline. Okay. All right. A little bit further down there in that paragraph you say our internal incident management process defines a spill. And then you have in each one of those a minor, serious, and

major. Each one of them is a spill or a release.

Could you tell me why these releases would not include like the Brookdale incident, for example?

A. Because the specific statistical data set refers to liquid spills.

Q. Okay.

A. The incidents at Cabri and Brookdale were natural gas.

Q. Okay. Do you have an incident management system that is for natural gas that would track those kind of incidents as well in the framework of a minor, serious, critical type framework?

A. Yes, we do.

Q. Okay. Could you tell me how many incidents there were listed on that system in terms of how many critical incidents there were?

A. I do not have that information presently.

Q. Okay. Could you tell me any of those, how many were major, for example?

A. All pipeline failure related incidents are deemed critical. And as discussed previously, we talked about four incidents that were external corrosion and three incidents that were third-party damage in previous testimony.

Q. Okay. And all of those are critical incidents?

A. That's correct.

Q. Okay. All right. You also had mentioned that you've been using this fusion bond epoxy for some 28 years?

A. That is correct.

Q. Now TransCanada owns the Foothills Pipeline system; is that correct?

A. Yes, it does.

Q. Okay. And was that system constructed using this fusion bond epoxy?

A. Portions of the Foothills Pipeline were constructed using the fusion bond epoxy.

Q. Okay. There was a major incident on that pipeline in 1994, I believe; is that correct?

A. I believe so.

Q. Okay. That pipeline was installed in 1982?

A. I don't know all the details of the Foothills Pipeline system.

Q. Okay. So you can't tell me if the construction of that pipeline used this fusion bond epoxy or not?

A. I'm aware that certain portions of that pipeline were fusion bond depending on which particular leg -- as Mr. Jones described, there are many legs of the Foothills Pipeline.

MR. MILLER: Okay. All right. I don't think I have anymore questions, Mr. Smith.

MR. SMITH: Thank you. Any other Interveners have questions?

Staff?

MS. SEMMLER: I do have one question.

CROSS-EXAMINATION

BY MS. SEMMLER:

Q. If I understood your prior testimony, portions of the pipe are not subject to the waiver request; is that correct?

A. Yes. That's right.

Q. Now looking specifically at the fracture control, number 4 within the waiver.

A. Uh-huh.

Q. Will that requirement apply to -- will you be applying that requirement to the entire pipe or just the portions that are subject to the waiver?

A. No. All portions of the pipeline will have fracture control. That is a TransCanada specification, and it is also a condition of the waiver. When pipe is fabricated it's difficult to exclude or include certain portions that would have fracture control and other portions that would not. So all pipes across the system will have fracture control properties.

MS. SEMMLER: Thank you.

MR. SMITH: Is that it?

Commissioners, questions for Ms. Kothari?

Commissioner Kolbeck.

COMMISSIONER KOLBECK: Yes. I guess the first one, when you spoke about visiting the three mills, is that typical in the industry, or is that something that Keystone does?

THE WITNESS: It's typical in the industry. I can't

speak for other companies, but TransCanada's practice for some 30 years now has been to conduct prequalification of not only its mills but all the suppliers that provide components to the pipeline for major components such as pipe and valves, fittings.

Preproduction meetings are scheduled prior to TransCanada's order being produced by the particular manufacturer.

COMMISSIONER KOLBECK: Okay. And is there a representative of TransCanada in India, say, or Oregon when your pipe is being made specifically?

THE WITNESS: Yes. TransCanada puts in place a quality surveillance program where we have inspectors in the mill that audit and oversee -- perform surveillance activities during all shifts of when TransCanada pipe is being produced.

COMMISSIONER KOLBECK: Okay. That's usually like an electrical company when they -- natural gas turbine is made they're actually at the site in the manufacturing plant during that, and you're saying that you do that?

THE WITNESS: That's right. The pipeline inspector's job in the mill is to audit and to observe the -- and ensure that the pipe mill is producing the pipe to our specification and according to its own manufacturing product specification and to report any noncompliance items in to TransCanada so that we can resolve it with the particular manufacturer and catch any issues prior to anything going out the door.

COMMISSIONER KOLBECK: Okay. The coating process you said is 28 years old?

THE WITNESS: This particular technology is 28 years performance in operations.

COMMISSIONER KOLBECK: Okay. And then a lot of the -- outside corrosion that has happened within over 30 years, the -- was this coating -- is this industry standard now because of the success, or is this considered to be the latest and greatest?

THE WITNESS: No. It's industry standard. Typically most new construction pipelines will be coated with fusion bond epoxy. TransCanada has performed a number of in-line inspection surveys on fusion bond coated pipelines to check the performance of the coating.

Once an in-line inspection is performed, correlation excavations have been performed to validate what the tool is reporting versus what's actually physically happening to the coating in the ground, and the performance has been quite excellent. There's been relatively no issue of corrosion or any issues on the coating. It's been very intact and maintaining the job it's supposed to be doing.

COMMISSIONER KOLBECK: Okay. Are all of the -- you call it fusion. I guess I'll call it a weld.

THE WITNESS: Yeah. Girth weld.

COMMISSIONER KOLBECK: Are all of your welds x-rayed?

THE WITNESS: Yes. For TransCanada we perform a

nonobstructive inspection of the 100 hundred percent of the welds. So there's different options available to the contractor to use, whether it's gamma ray or x-ray or ultrasonics, but all welds are 100 percent inspected after they're completed.

COMMISSIONER KOLBECK: Is there a file or copy of that? Is that kept somewhere?

THE WITNESS: Yes. That's right. That is kept.

COMMISSIONER KOLBECK: In TransCanada or at the Federal Government?

THE WITNESS: No. It's kept with TransCanada. Reports are submitted to PHMSA on the performance of what's happening out there during the construction.

COMMISSIONER KOLBECK: Okay. And the SCADA questions go to Brian?

THE WITNESS: Yes. Please refer all SCADA to Brian.

COMMISSIONER KOLBECK: You stated that 51 tons of force is what it would take to puncture the pipe. Am I stating it correctly?

THE WITNESS: Not exactly. What we were trying to outline with that particular piece of testimony was that industry -- pipeline industry has conducted research through the Pipeline Research Council International, which is an industry research group that many operators participate in.

In a survey that they had conducted they found 99 percent of all excavators in the United States did not have a

digging force which exceeded 40 tons. So what we were trying to do and as part of the waiver to PHMSA with respect to the design of the pipeline and ensuring that a thinner wall would not compromise any sort of safety as it related to puncture was to perform the calculations with respect to this particular design and to do a comparison of a .72 design factor versus a .8 design factor and what industry research has found to be the maximum capable digging force.

So, again, if you see that it's 40 tons as a maximum of an excavator in the U.S. and your pipe is able to withstand 51 tons, then you can certainly see that you're exceeding the requirements.

COMMISSIONER KOLBECK: And this pipe is capable of withstanding 51 tons?

THE WITNESS: That's right. The calculations were performed using the specifications of the pipeline.

COMMISSIONER KOLBECK: Okay. Could you give me an example of 51 tons of force?

THE WITNESS: Not particularly.

COMMISSIONER KOLBECK: Okay. I guess I'm looking for maybe a shotgun, a rifle. Could a rifle shoot through --

THE WITNESS: Again, I'm not sure. Specifically, this is related to the digging force of a backhoe, excavator, or whatever brand. Whether it's Caterpillar or any other brands, you can take the force exerted by the bucket and the tooth from

the bucket onto the surface of the pipe, and that force would need to exceed a certain amount to be able to actually puncture through the pipeline.

COMMISSIONER KOLBECK: Okay. Do you think there's someone who can give me an example of that how -- if we're talking about coal plant equipment or if we're talking about sewer installation equipment or --

THE WITNESS: I can take that away and try to get you an answer during the next break.

COMMISSIONER KOLBECK: I'd appreciate that. WEB Water uses certain backhoes. I worked for a telephone company. We used a different type of a backhoe. It's just something that would interest me on how big is 51 tons of force. Maybe give me an example.

THE WITNESS: Well, keeping in mind the biggest excavator in the study is whatever the biggest excavator is available in the U.S. industry currently on construction, and that excavator is only capable of a digging force of 40 tons for the biggest excavator. But I'll endeavor to try to get you an answer.

COMMISSIONER KOLBECK: Yeah. And I think that concludes -- okay. Yeah.

Actually, the records of the requirements that are met by the national and international standards at the pipe mills and then your representative, are those records are they kept

with TransCanada, or do they go to PHMSA too?

THE WITNESS: The API certification and the ISO certification are with the mill, and they're actually available on their websites. TransCanada gets a copy of these certifications from the mills as part of the preproduction meeting that I spoke of earlier.

And so that's all kept together in our files along with the manufacturer production specifications to which the pipe will be manufactured to.

COMMISSIONER KOLBECK: All right. Thank you.

MR. SMITH: Commissioner Hanson.

COMMISSIONER HANSON: Good morning, Ms. Kothari.

THE WITNESS: Good morning.

COMMISSIONER HANSON: I appreciate your testimony here today. I'm going to piggyback just a little bit on Commissioner Kolbeck's question because I know all three of us are very concerned about the potential leaks and the damage that could subsequently take place. My experience has been with utility failures has been most often it's been construction, third parties doing something, especially from an electrical standpoint, not so much from pipes out in rural areas.

We received -- and you were present at the public meetings. There was a lot of concern about some very large equipment out in the fields. And I was especially interested in the durability or the resistance of this pipeline. And as

Commissioner Kolbeck was asking questions on page 10, paragraph 31 of your direct testimony when you stated that it's 51 tons of force but I don't have anything to relate that to from a standpoint of what surface area is that over?

Is that per square inch? Is it a force pushing against the -- or lifting against a weld? What -- can you give us some idea of what that is?

THE WITNESS: Yeah. It would be a force against the pipe itself. And you have to look at the specific surface area. For this particular case study it was specific to a certain size of tooth on a particular piece of excavating equipment.

For heavy machinery that would pass over the pipeline itself, as we mentioned before in my first opening pieces of my testimony, the pipeline will be API 5L X70. So grade X70.

Now X70 inherently has design properties in terms of strength to withstand loading, external loads on top of the pipeline, such as machinery or highway loads and things of that nature. So from an external loading standpoint the pipeline is capable of withstanding that external load given the depth of cover, the soil cover, and then the external load of whatever machinery you would end up passing over the top of it.

If there were, you know, specific instances or special instances where a landowner or any other utility may not be certain that their equipment could pass over the pipeline safely, we have a process in place whereby they can contact

TransCanada, and we would conduct a stress analysis based on vehicle axial loading in terms of the number of wheels on the particular type of equipment and the size as it relates to the particular depth of cover in that area and the particular characteristics of the pipeline in that area to ensure that that piece of equipment could cross safely over top of the pipeline.

If it couldn't, we would put measures in place, whether it be a temporary bridge or if it was going to be repeat traffic, look at potentially a permanent crossing in that particular area.

COMMISSIONER HANSON: Thank you. Commissioner Kolbeck had mentioned shotgun rifle, and that hadn't even occurred to me. Will there be any -- probably should have since the Alaskan Pipeline has been punctured mainly by people with rifles.

Will any of this pipeline be above ground in South Dakota?

THE WITNESS: The only portion of the pipeline that would be above ground are the pump station itself, which would be a fenced area, or at the main line valve sites, which again would be a fenced area.

COMMISSIONER HANSON: Okay. And I guess we have to consider more now -- it's been said we are a target-rich environment from the standpoint of terrorism and such. Start to get concerned and try and explore the possibility -- we certainly can't place a national guards person every 100 yards

on a pipeline.

If someone were to fire a rifle at that type of an area, are you familiar enough with the construction and with the way it's going to be set up in a pump station, will a pipe be secure from that type of vandalism?

THE WITNESS: So what I can tell you is that TransCanada as part of its design process will be conducting a terrorism and security analysis. This is an API best practice document that was released, I believe, in 2005 subject to check. I'm not sure. But it's guidelines set forth by API with respect to security analysis for -- specifically for pipelines.

And so we would have to -- and we will be planning to perform that analysis to determine what additional security measures would be required at any of our stations, if any.

COMMISSIONER HANSON: Could you get that information to us from a standpoint -- it didn't occur to me until Commissioner Kolbeck asked the question so fault him for it, but I probably should have asked the question if it had occurred in the previous testimony. I would like to see -- I would be very interested to see that the pipe is completely secure from someone with a rifle shot, for instance.

The reason I -- as an aside, one of our analysts had a protective armor from Iraq from a friend or whatever, and he said, This is strong. It won't -- all of the hoopla of the strength of it. So I took it out and shot an ought 6, and it

went right through it.

And so I have this concern now always when I hear things that are impenetrable and we can rest assured that this will be taken care of. I'd really like to see that that is a secured area.

So if you'd provide that information to me, I'd appreciate that.

THE WITNESS: Sir, would you like a copy of the API security guidelines or --

COMMISSIONER HANSON: I actually would like to see the -- I assume you have -- they have construction plans for the facility. I'd like to see that there's no visible range to see the pipe.

THE WITNESS: Okay. I can look into that. I'm not specifically sure exactly --

COMMISSIONER HANSON: Sure. And I understand you're not the right person to ask that to.

THE WITNESS: We can take that away and look at that.

COMMISSIONER HANSON: The use of the 1.8 inch versus the 3.5-inch pipe is to protect the more sensitive areas, and you've touched on what those areas are.

Why, Ms. Kothari, would it not be required at crossings of potable water supply and pipelines?

THE WITNESS: At those particular locations we feel the design currently as is would not be conducive to requiring

thicker pipe. As Mr. Gray mentioned, if there were an existing utility at that particular location, we would typically go and pipeline underneath that particular utility.

As shown in some of the other statistics, while depth of cover increases over the pipeline, there would be less risk of excavation damage. So if, as was heard today, if the potable water utility was at 6 and a half feet and we were needing to trench further below that to under cross it, there would be a reduction in terms of excavation potential damage, as well as the fact that warning signs would be posted at all foreign utility crossings notifying persons that there were other lines present in that area along with the One-Call system as well.

So coupled with those mitigative measures, we feel it wouldn't be a requirement for a thicker wall pipe at those locations.

COMMISSIONER HANSON: Thank you. From your resume it appears that you're familiar with the stresses and challenges and joints on pipes and from your testimony.

You were here, I assume, during Robert Jones's testimony?

THE WITNESS: Yes, I was.

COMMISSIONER HANSON: When he stated a densitometer and replied to Commissioner Johnson's questions that they would not -- I understood him to say they were not going to be used on this pipeline, that they're not available and they would not be

used for checking it in South Dakota.

THE WITNESS: So densitometers specifically in South Dakota are not going to be installed at the pump station facilities. The densitometers will be installed at the terminal locations and at the injection point at Hardisty and Canada. And those are really the locations where they are necessary and where the information will be used to manage the pipeline system in those particular areas.

COMMISSIONER HANSON: So it does not give you pause or concern that there aren't any located in South Dakota?

THE WITNESS: There are no densitometers located at any of the pump stations at any of the states except for at the terminals themselves.

COMMISSIONER HANSON: You stated that pipelines are the safest mode of transportation for petroleum. And I don't disagree with that fact. I don't know it to be not true and certainly would seem to be true.

Do you have, however, any statistics or surveys or any information supporting that statement?

THE WITNESS: We have some information related to the amount of other types of transportation modes that would be required to transport the volume Keystone is proposing to transport.

And I guess inferring with respect to those particular statistics and vehicle accidents, I think one could put a

comparison together as to whether it was equally safe, less safe, or more safe than pipeline transportation failures.

COMMISSIONER HANSON: I remember some of the discussion on that at the public hearings. And I don't recall whether I read it in the prefiled testimony or not. However, I appreciate being directed to that information. And if it's in the prefiled testimony -- and I'd appreciate if you do have information showing statistics on transportation of petroleum products, safety, pipelines versus the other options that are available, I'd appreciate knowing that.

THE WITNESS: Okay.

COMMISSIONER HANSON: I think I just have a couple more questions. One is on the check valves I happen to have installed check valves and am quite familiar with them, and I'm surprised how many check valves there are.

I recognize that a remote controlled valve is something that I would really appreciate having from the standpoint of safety. However, there is a duration that it takes for an automatic valve to close.

Do you have an idea the length of that duration from the time that a leak is ascertained to the amount of time that communication has to be made to the amount of time that it takes for a valve to close?

THE WITNESS: Yes. It's approximately 10 minutes. And from the manufacturer's standpoint for the valves itself

it's about 3 minutes to close the valve. But Brian Thomas would be able to answer some more detailed responses with respect to emergency shutdown procedures.

COMMISSIONER HANSON: Check valves are instantaneous. The second the flow starts going back they just -- the flap closes.

THE WITNESS: That's right.

COMMISSIONER HANSON: Why not have check valves on all of the areas, including -- well, all 14 of the areas, including the areas that have the automatic valves?

THE WITNESS: I think that question would be best answered by Mr. Thomas.

COMMISSIONER HANSON: All right. I will ask him then.

I think that's all the questions I have. Thank you.

MR. SMITH: Commissioner Johnson.

CHAIRMAN JOHNSON: Yeah. Thanks. Ms. Kothari, in your direct testimony, page 9, item 29, you note that the pipeline is designed to operate in turbulent flow to minimize water dropout.

Can you help me understand a little better what would constitute turbulent flow?

THE WITNESS: It's particular to two fluid dynamics. And there's a specific calculation that can be done in terms of a Reynold's number or a number that would be a threshold for the particular design of the pipeline with the flow and taking into

account all the parameters.

If the flow rate is less than a specific value, you'd be looking at a laminate flow regime where as a result of the design for a pipeline in terms of batching different commodities, you would allow for mixing of different crudes together. So in order to maintain quality of the product, we need to keep the pipeline moving at a specific speed so that the crudes can stay intact. And as a result of that specific speed and that benefit from keeping the pipeline in turbulent flow, there would really be no chance for any sort of water to separate out of the crude itself.

CHAIRMAN JOHNSON: Well, and Mr. Hohn did ask some questions about if a belly developed in the pipe and there was some water dropout. I'm having a hard time understanding with the viscosity of crude, how would that not in all instances almost regardless of flow not sweep that water along with the thicker crude?

THE WITNESS: Yeah. And that's exactly what would occur. If you had a more synthetic type crude or lighter crude in your line and potentially you did have some water dropout, the next batch would pick it up, and it would move along with the next batch.

CHAIRMAN JOHNSON: In your testimony, though, you note the pipeline is designed to operate in turbulent flow to minimize water dropout. So that leads me to believe even given

a crude product water dropout is a possibility.

THE WITNESS: It's a possibility. If for whatever reason you have to slow the line down to conduct a maintenance further down the line or the line was shut down for whatever reason, you would have a standing product in the line, and the oil in the water would be able to separate.

So once the normal operation would resume, you would be able to move back into a turbulent flow regime.

CHAIRMAN JOHNSON: On the top of page 10 in response to item 30 of your direct testimony -- and you also mentioned this in your oral testimony that, When TransCanada has excavated pipe to validate FBE performance there has been no evidence of external corrosion.

I just wanted to verify that there's been no evidence?

THE WITNESS: No evidence. Essentially -- let me clarify. The internal inspection tool collects data, and a report is produced showing specific areas that may have metal loss in the pipeline. Upon excavation of that particular area and removal of that coating, there is no evidence that there is thinning of the wall in that particular location.

So, again, if you look at tool tolerances and the bounds that you put around tool tolerances, they can be calling features that are a little bit greater or a little bit less than what's specifically noted. So essentially on all the excavations I've personally been out on looking at fusion bond

the coating has been intact. There's been no evidence of surface rust or disbondment or peeling apart of the coating or damage to the coating that would allow for corrosion to start or surface rust to develop on that particular coating.

CHAIRMAN JOHNSON: You noted in your testimony that through the last 28 years -- or TransCanada has been putting FBE onto pipe for 28 years.

Do you know how many miles of pipe TransCanada currently operates with an FBE coating?

THE WITNESS: It's well over 1,000 miles of pipe. I'd have to go back and check, but --

CHAIRMAN JOHNSON: Well, and I certainly didn't need an exact. Are we talking about dozens or hundreds or thousands?

THE WITNESS: Thousands of miles.

CHAIRMAN JOHNSON: Again, in that same area of testimony in response to question 30, No evidence of external corrosion when FBE coated pipe has been excavated. How many sections of pipe are we talking about? How many instances is this -- you know, you've excavated two pieces of pipe and there hasn't been corrosion, or are we talking dozens?

THE WITNESS: Essentially what we do is we typically run in-line inspection tools in 300-mile sections, and so a report is generated for 300 miles. A number of our FBE lines which are longer than 300 miles -- 800 miles long have been in-line inspected, and discrete locations have been chosen all

over the particular pipeline from start to end to determine whether indications that were reported were, in fact, corrosion or if they were just, you know, small deviations in terms of tool tolerance for those particular defects.

CHAIRMAN JOHNSON: So and again I'm trying to look at, you know, a quantity trying to figure out what our sample size is, so to speak. And, again, I don't need an exact number.

THE WITNESS: I would say between 50 and 100 excavations.

CHAIRMAN JOHNSON: Would any questions on leak detection better be directed for Mr. Thomas?

THE WITNESS: That's right.

CHAIRMAN JOHNSON: Okay. We spoke earlier -- rather, you spoke earlier about external load. And I got the feeling that it was a more complex calculation than I'm probably going to ask you for, again, based on axles and distribution of weight.

But in general can you give me an idea of what typical external load would make you nervous or would make the Applicant nervous?

THE WITNESS: There's certain instances where, you know, if we had a reduced depth of cover over the line and we were looking to move a large piece of equipment depending on the grade of the pipe as well, you know, that would be some cause for concern.

But, as I mentioned previously, because of the particular nature of the strength of pipe that we're using on this project, inherently vehicular traffic and highway traffic and farm equipment traffic is relatively safe from external loading given the 4 foot depth of cover that we have.

Sometimes we run into the risk where potentially there may be too much depth of cover 5, 6, 8 foot of cover and equipment passing over, and there may be potentially too much stress at that location. So it swings both ways. So we have to pay attention to the particulars of the location where we're crossing in order to better understand the stresses in those locations.

But for an average of 4 feet of cover with this grade of pipe there should be no issues with respect to farm equipment crossing over the line.

CHAIRMAN JOHNSON: So under the scenario you described there would be no issues with farm equipment or machinery, would that include, you know, a large truck carrying a large amount of undried grain someplace?

I mean, maybe I'll tell you what I'm trying to get at, and you can help me understand. I'm trying to figure out whether through the normal operation of business practices in South Dakota if people are going to need to call TransCanada to have this complex analysis done.

THE WITNESS: They may have to call. The analysis is

usually turned around within a couple of days. We have a large engineering department at TransCanada that's dedicated to these types of issues. And so typically a lot of the -- the equipment that we talk about today it's been -- analysis has been performed on a lot of the equipment.

We have 40,000 landowners on our pipeline and a lot of them are farmers as well and so they do the same types of practices with grain trucks or other types of farming equipment. And we have catalogues with respect to the types of equipment and the axles. So there's a process in place.

I don't foresee that it would be, you know, something that would be a very, very frequent thing. But, you know, if you don't know, give us a call, and we'll be able to sort it out as we're new coming in through this area. So that's what I would suggest.

CHAIRMAN JOHNSON: This is a landowner education question so feel free to tell me to go fish. But as part of the Applicant's landowner education process do you give them an indication? Do you say if you're using machinery X, Y, or Z, no problem, but on the off chance if you've got machinery Z, call this number?

THE WITNESS: Absolutely. Public awareness programs are in place, and certainly if that's something that's -- as part of the process of coming down and talking to different landowners it's typically I believe on an annual basis or, you

know, thereabouts.

If that type of need is identified within the particular community, it wouldn't be difficult to be able to produce that information to make people aware because it's new to people.

CHAIRMAN JOHNSON: Okay. Thanks, Ms. Kothari. Mr. Smith, if I could just have a second to look over my notes, make sure I'm not forgetting anything.

MR. SMITH: Please do.

CHAIRMAN JOHNSON: We've heard you speak a little bit this morning about tons of digging force. And earlier you also spoke about the three failures caused to TransCanada pipelines because of third-party damage.

Do you happen to know how many tons of digging force the third parties that caused the damage to those three pipes would have had?

THE WITNESS: I'm not sure specifically, but what I do recall from those instances is it was repeated digging over the pipeline. So, you know, you hit something once but then repeated contact with the pipeline, which caused the failures.

So in two instances it was a small leak that had developed in the pipeline. In the third instance it was a larger hole in the pipeline. There were no fatalities or injuries in these three instances, and there was no ignition or fire in these three instances with those particular incidents.

CHAIRMAN JOHNSON: When you mentioned repeated contact, was this at the same -- the same event, the same incident, or was this over a duration of time?

THE WITNESS: No. It was the same incident. And I can't speculate because I wasn't there. But, you know, if for some reason the excavator wasn't aware there was a pipeline there and he thought it was a rock or something that was an obstruction on the land, then repeated contact is the report essentially describing the event.

CHAIRMAN JOHNSON: That's a big rock.

THE WITNESS: Yeah.

CHAIRMAN JOHNSON: Thanks, Ms. Kothari. Mr. Smith, I think that is all I have.

MR. SMITH: Thank you. Commissioner Hanson, follow-up question?

COMMISSIONER HANSON: Thank you. I placed some of the blame of one of my questions on Commissioner Kolbeck, and I'll place the blame of this question on Commissioner Johnson.

CHAIRMAN JOHNSON: It's never Commissioner Hanson's fault.

COMMISSIONER HANSON: Thank heavens. During harvest season there are a lot of trucks, a lot of trucks going to and from not just the fields, but to a particular field there are a lot of trucks. And there can be trucks hauling 10,000 bushels of corn.

Your question caused me some concern -- your answer to Commissioner Johnson's question caused me some concern when you said that they can just call and we'll let them know. But that's really impractical from a standpoint of the number of vehicles that are going to be driving on the roadways.

THE WITNESS: Uh-huh.

COMMISSIONER HANSON: And if the pipe cannot sustain that, then we have a problem.

Would you also provide, if it's not available to us, information showing that the pipe can, in fact, sustain such -- that's normal wear and tear. And I would be very interested in having that pointed out to us where that is in the prefiled testimony so that we can examine it.

But I understood that it was being constructed from a standpoint by putting on the thicker pipe in those areas that it could withstand what I would consider normal wear and tear. But if there are going to be challenges as a result of during harvest season, then we have to take a real serious look at that.

THE WITNESS: I don't anticipate there to be challenges from the calculations that have been performed. The line pipe and the design pipe for all wall thicknesses can sustain normal loads. What we can do is provide some information on that.

COMMISSIONER HANSON: I would assume that's a relative

term, though. Normal is normal on -- on my driveway. It's not normal on a rural driveway.

THE WITNESS: But, again, we do have rural landowners that are in those communities who do farming operations as well, and there hasn't been particular instances requiring any additional measures for this grade of pipe.

COMMISSIONER HANSON: Like I say, subsequent to your testimony if there's someone else in future testimony that can provide that information for us, I would appreciate having that.

THE WITNESS: Okay.

COMMISSIONER HANSON: Thank you.

MR. SMITH: Commissioner Kolbeck.

COMMISSIONER KOLBECK: Yeah. This might be for Buster actually, but I'm going to blame Commissioner Hanson because he made me think of it.

Is there any reason someone would sink down 4 feet and hit the pipe after the construction if they've never done it before the construction? In other words, after this pipeline goes through and the land is reclaimed as it's supposed to, is it more susceptible to anything? And, like I said, that might be more of a Buster question.

THE WITNESS: It might be more of a Buster question, but to my knowledge I don't believe so.

COMMISSIONER KOLBECK: Okay. So if I was hauling grain now and I've never sunk down 4 feet, there's a very good

chance that after the pipe goes through that I won't sink down 4 feet then; correct?

THE WITNESS: I believe so.

COMMISSIONER KOLBECK: The soil excavated --

THE WITNESS: I believe so. Again, we can ask Mr. Gray, but to my knowledge I don't believe so.

MR. SMITH: I want to ask you one question, and then we'll take a break. Just on the 51 tons, which it's designed to bear; is that correct? It's like a -- the strength of the pipe's ability to bear weight at any particular point? Is that what it is?

THE WITNESS: It's the puncture resistance to a particular type of puncture.

MR. SMITH: So that 51 tons doesn't have anything to do with its ability to bear weight like a highway load or farm --

THE WITNESS: No. That's inherently in the strength of the steel, which is grade X70.

MR. SMITH: Okay. And you don't know what that is. Because I was going to say at 51 tons if we're talking a puncture point, a semi truck would have to weigh -- I reckon have to weigh about 1.8 million pounds in order to possibly affect that pipe.

THE WITNESS: Yeah. So puncture again in the instance of a digging force with an excavator contacting the pipeline

would be an exertion of a digging force on the pipeline.

In terms of, again, an external load where vehicular traffic is passing over the pipeline with this grade of pipe, any common vehicular traffic, highway loads are acceptable passing over top of the pipeline.

MR. SMITH: Okay. Thank you. We'll take a recess until when, Commissioners?

CHAIRMAN JOHNSON: Commissioner Kolbeck said 1:15. That seems as good as any time to me.

MR. SMITH: Is that okay, everybody? We're in recess until 1:15.

(A lunch recess is taken)

MR. SMITH: Good afternoon, everybody. We've been in recess since a little after noon, and the hearing in HP07-001, TransCanada Keystone Pipeline, LLP (sic) is reconvened. We were taking testimony from Meera Kothari of TransCanada.

When we broke the Commissioners had, I think, concluded their questions, but I'm going to check again and see if you have any additional questions.

And they do not. So, Mr. White, redirect?

MR. WHITE: Yes, I do.

MR. SMITH: Please proceed.

REDIRECT EXAMINATION

BY MR. WHITE:

Q. Good afternoon, Ms. Kothari.

A. Good afternoon.

Q. I believe we had some questions this morning regarding the special permit, and I wanted to ask you what would be -- what would happen if Keystone were determined to have violated any of the conditions of the special permit?

A. If Keystone would have been determined to violate any conditions of the special permit, the permit would be revoked, and the pipeline pressure would be derated as such so that the design factor would return to .72.

Q. We had a question this morning regarding aerial surveillance, and I believe you indicated that aerial surveillance would not permit the direct detection of oil on the surface.

Would there be any other way of determining that there might be a small leak or a pinhole leak through the use of aerial surveillance?

A. Yes, there would. There are secondary characteristics associated with an oil leak or a pinhole leak. That would be vapors. So from the air dead vegetation or dying vegetation would be a secondary characteristic which would in turn allow for the detection of that leak.

Q. And over the break have you had an opportunity to determine how many miles of pipeline on the TransCanada system uses the fusion bond epoxy coating?

A. Yes, I have. The total number of miles on the TransCanada

system which is currently coated with the fusion bond epoxy is 9,042 miles.

Q. And there was a question this morning regarding the pipeline incident on the Foothills Pipeline. Have you had an opportunity to determine what coating was on that portion of the Foothills Pipeline?

A. Yes, I have. The Foothills Pipeline failure of 1994, the coating that was on that particular section that failed was double wrap tape.

Q. And there were a few questions this morning regarding densitometers. Can you tell me whether densitometers are a safety device?

A. No. Densitometers are not a safety device. They are a measurement device that is to be installed at metering terminals.

Q. There was a question this morning with regard to the potential for human error in the Application of the fusion bond epoxy in the field.

In the event that there was an instance of human error in that process, are there safety measures or checks in place that would deal with that?

A. Absolutely. Once the line is in operation, operators are required to have an integrity management program in place to manage the life cycle of their pipelines. If there were an occasion where human error was involved in construction, through

the use of the integrity management program with such particular integrity plans such as in-line inspection for the inspection of external and internal corrosion, dents, linear indications such as cracks, all of that would be found through the integrity management program by running these tools periodically as required by code in our special permit.

Once these inspection tools were run, data analysis is performed, and areas which require repair would be investigated and repaired accordingly.

Q. Okay. And if I could just refer you briefly to your direct testimony, Exhibit TC D6 and specifically page 15.

A. Yes.

Q. And do you see in question number 46, the second paragraph, the first line references to figure 1 and figure 2?

A. Yes.

Q. Are those figures the same figures that appear in Keystone's response to staff data request number 2-14?

A. Yes, they are.

Q. Thank you.

MR. WHITE: Mr. Smith, that's all the redirect I have. I guess I'd like to ask leave to the Commission there were two takeaway items that were presented to Ms. Kothari, the construction plans with respect to visible range to see the pipe and also the weight of the equipment that would require a call to TransCanada to perform an analysis before it could cross.

If we could have leave to present that information perhaps tomorrow after we've had a chance to do the research. Is that acceptable?

MR. SMITH: It is to me. Do the Commissioners have any objection to that?

CHAIRMAN JOHNSON: I wouldn't necessarily think it has to be tomorrow. Sooner is better, but I think we're going to be around for a while.

MR. WHITE: Understood. That's all we have.

MR. SMITH: Mr. White, can I ask you another question? Maybe it's my own set of things here, but are those figures, 1 and 2, have they been admitted? Are they in something that you've introduced?

MR. WHITE: They have not been admitted. And I understand that they will be --

MR. KOENECKE: If I can answer for Mr. White, they're referenced in Ms. Kothari's testimony which was admitted by stipulation so I believe they have been by reference, but if you disagree, please let me know.

MR. SMITH: I guess, well, let me ask you this: You know, in the data responses those -- I guess maybe you want to -- that first set of data responses, maybe that was just number 1. What's your understanding of the status of those?

MR. KOENECKE: It's the same as what I have just referenced. They have been referenced in testimony. Those data

responses have been adopted by the witnesses throughout their testimony in paragraphs and I believe they've been admitted in that fashion.

MR. RASMUSSEN: Can I inquire about that? I don't think those are on the website. The first set of data request responses are, but number 2 is not. So none of that stuff as referenced in here is on the PUC website.

MR. KOENECKE: I don't disagree with that.

MR. SMITH: We don't have them is the bottom line. Because the ones on the website is my understanding is that the company was intending to basically incorporate those as amendments to the Application.

But it might be better and you might give some thought as to whether you want to do an explicit introduction of those, offer those as exhibits.

MR. KOENECKE: We'll reconsider that then. Thank you.

MR. SMITH: Because we don't get data responses. We don't see those, other than those that were filed then as sort of addenda to the Application. And I think making sure that that's been clarified too as to what the status even of the number 1 responses is just a good housekeeping thing to do. Okay.

MR. WHITE: I apologize, Mr. Smith. I had one additional redirect question while we were having this discussion.

MR. SMITH: Go ahead.

Q. (BY MR. WHITE) There was a discussion this morning with regard to where on the pipeline system there would be above ground piping, and I believe you mentioned valve sites.

Is there some further clarification you might provide with respect to that answer?

A. Yes. All above ground piping at the valve sites is not under pressure. The valve is actually located below ground, and all that's above ground is the operator itself.

Q. And is that above ground equipment pressurized?

A. No, it's not. It is not pressurized above ground equipment at the valve sites.

MR. WHITE: Thank you. That's all the redirect.

COMMISSIONER HANSON: That's interesting.

MR. SMITH: Mr. Rasmussen.

MR. RASMUSSEN: Just a couple very quick.

RECROSS-EXAMINATION

BY MR. RASMUSSEN:

Q. There was discussion about the website where you have spill release information. Is there a distinction between a spill and a release?

A. There's a distinction between the commodity.

Q. How so?

A. The specific information presented and the testimony was related to liquid commodity. 576 spills that were specific to

the testimony.

Q. Okay. But that same paragraph talked about -- it's spill/release, did it not?

A. Release in the context of a liquid spill.

Q. Okay. What is a release in the context of a liquid spill? A release of what?

A. Of liquid from whatever containment it was in, whether it was, I don't know, a lube oil tank or whatever. Whatever container the liquid was in.

Q. Okay. So is there any distinction between a spill and a release, or is that the same thing?

A. In the context of the 576 spills it would be the same thing.

Q. Okay. One of the Commissioners asked you this morning about how much of the FBE pipe has been excavated to be examined, and have you found an exact number on that, or --

A. Yes. Actually as part of the checking that was done over the break with respect to the 9,042 miles of pipe, approximately 140 excavations have been performed to validate the FBE performance.

MR. RASMUSSEN: Thank you.

MR. SMITH: Is there other recross? Anyone else? Staff, do you have any additional?

MS. SEMMLER: Nothing. Thank you.

MR. SMITH: Commissioners, do you have any final

questions? Nothing?

Could I ask you one last question? On the 26 aerial flyovers a year and then you characterized that -- and I apologize for not doing this but we had lunch and I knew everybody wanted to get out of here. And you said that the 26 was an average.

And if I could try to get a clarification here, does that mean that you have a requirement of doing 26 per year but that the maximum duration between any two of those that occur within a year be no more than three weeks?

THE WITNESS: That's right. I apologize if I misspoke or it was unclear. The requirement is 26 times a year and exactly the duration could be pushed out but it must be done 26 times a year as per the code.

MR. SMITH: Okay. And one other last -- and you're probably not the person for this, but just in other things I have seen over -- I used to work for an environmental company for a long time, and I'm just wondering if there -- and you might not be the person, but in those aerial flyovers are there any techniques such as remote sensing techniques such as optical spectrum type of detection methods that can be used to detect the presence of organic-like aromatics in the right of way area that you're aware of?

THE WITNESS: There might be. I'd defer that to Mr. Brian Thomas or Ms. Heidi Tillquist.

MR. SMITH: Thank you.

MR. HOHN: I had just two quick questions I forgot to raise. I'm sorry.

RECROSS-EXAMINATION

BY MR. HOHN:

Q. With regard to the steel sheets that you mentioned that come into the plants regardless of where the plants are, for milling and for turning to make the pipe, where does that steel come from generally, or for these specific plants where does it come from, if you know?

A. There are many locations to which these particular coils and plates are available to.

Q. Does TransCanada have to then send someone to that plant to inspect?

A. We do a prequalification of that plant to ensure that the steel quality meets our specification and meets the API specification.

Q. So both TransCanada and the plant that's going to turn it into pipe for you have -- there are federal standards or standards you look to, and the plant providing the steel certifies the steel will meet that requirement?

A. Absolutely.

Q. Okay. The second question, does any of the raw steel come from this country, or does it come -- where are the primary sources for that raw steel?

A. There are, in fact, a number that do. The one that comes to mind is Mittal, which is located near the St. Louis Chicago area. So there is certainly an amount of the raw product that comes from the United States.

Q. With NAFDA, all the changes with NAFDA, are there steel mills outside of this country around the world? I assume there are.

A. There are a number of steel mills across the world, yes.

Q. In terms of the likely sources for the plants you mentioned, do you know what the sources are for those plants?

MR. WHITE: I think that question's been asked and answered.

MR. HOHN: Well, no.

Q. I'm saying specifically there's a lot of sources around the world. Is there specific sources that they rely on?

A. They're relying on whatever sources they can have -- make available to complete our order to the API specification and to our TransCanada specifications.

MR. HOHN: Thank you.

MR. SMITH: Any redirect following up on that?

MR. WHITE: None.

MR. SMITH: Thank you. Thank you, Ms. Kothari. You can step down.

THE WITNESS: Thank you very much.

(The witness is excused)

MR. SMITH: Mr. Koenecke, do you want to call your next witness?

MR. KOENECKE: We'll call Heidi Tillquist, please.

(The witness is sworn by the court reporter)

DIRECT EXAMINATION

BY MR. KOENECKE:

Q. Good afternoon, Ms. Tillquist. Would you state your name and address for the record, please.

A. Heidi Tillquist, 1601 Prospect Parkway, Fort Collins, Colorado 80525.

Q. Are you a contractor engaged by the Keystone Project?

A. Yes, I am.

Q. Can you tell me what areas of responsibility you have?

A. I am responsible for conducting risk assessment for the pipeline.

Q. And what's your experience in that regard?

A. I have worked for 17 years as an environmental toxicologist and risk assessor. I've worked on a number of pipeline projects including crude oil, natural gas liquids, refined products, natural gas. I've also authored documents including a document on the effects of crude oil spills on the fresh water environment.

Q. Did you file written testimony in this proceeding?

A. Yes, I did.

Q. And how many pieces of written testimony did you file?

A. I believe a total of three.
Q. You should see a stack there to your left. We'll look at the first is entitled Direct Testimony of Heidi Tillquist.
Do you find that?
A. I did.
Q. And is that your testimony in this matter?
A. It appears to be.
Q. Do you have any additions or corrections -- well, let's not go there. Do you have another packet of testimony?
A. Yes, I do.
Q. And what's that exhibit?
A. This is my rebuttal testimony.
Q. Is it -- what's it marked?
A. TC 7/R1.
Q. And do you find TC 7/R2 there?
A. I do.
MR. KOENECKE: Mr. Smith, yesterday in marking exhibits and introducing them we neglected to introduce the existence of TC 7/R2, which is Mrs. Tillquist's testimony dated the 26th, which was filed with the Commission and has been here and on the record but we simply did not admit that yesterday.
I'd ask if we could admit that through stipulation the same way we did through the remainder of the testimony and call it TC 7/R2. I have copies for anybody who needs one.
MR. SMITH: And the identification of that is her

surrebuttal?
MR. KOENECKE: It's rebuttal. Second piece of rebuttal.
MR. SMITH: Is there an objection?
MR. RASMUSSEN: No.
MS. SEMMLER: No.
MR. KOENECKE: We simply neglected to identify it yesterday in our list.
MR. SMITH: TC 7/R2 is admitted.
MR. KOENECKE: Thank you.
Q. Going back to TC 7R, have you noted any errors or corrections which need to be made in that document? Excuse me. 7D.
A. Thank you. In TC 7D I'd like to make a few corrections. On page 6, item 20 we talk about the size of a pipeline spill. My surrebuttal that was provided, TC 7/R2 actually provides a table, table 1 on page 2, and that actually provides the correct values for spill size.
Q. Do you have any other corrections?
A. Yes. Page 7, item 22, about two-thirds the way down through the paragraph. Should I just read through these numbers?
Q. I think that would be helpful, yes.
A. The original proposed route crosses approximately 20.2 miles of shallow aquifers --

Q. 20.2 instead of?
A. 20.2.
Q. Instead of 20.4?
A. Instead of 20.4. In the next line we talked about sandy soils occur along it says 21.6. That should be 22.1. The next line down -- am I going too fast? The next line down the reroute overlies 5.2. It should be 16.2. The next line down sandy soils occur along it says 11.2. That should be 18.3.
Q. Do you have any other corrections to your testimony?
A. Yes. One more. Page 9. The photo numbers got identified incorrectly. So the second paragraph, third line down we talk about photo 1. That's correct.
The next photo, photo 2, that's actually photo 4.
Q. 2 should be 4?
A. 2 should be 4. The next line down to the right says photo 3. That should be photo 2. The next line down it mentions photo 4. That's photo 3.
Four lines up from the bottom we talk about photo 4. That should be photo 3. Let me just double-check this last one. And then the last reference it says photo number 4 is the south pool area. That should be photo 5. And that is it.
Q. Am I to understand there's no more corrections?
A. That's correct.
Q. Very well. As a part of your work for Keystone have you evaluated the risks on the Keystone Project to ground water

resources in South Dakota?
A. Yes, I did.
Q. And how did you go about that?
A. When we look at ground water resources and the potential effects of a potential spill we look at a number of things. We look at where shallow aquifers -- vulnerable aquifers so those would be like shallow aquifers with sandy high permeability soils overlying them.
We look at where source water protection areas are so where are people actually withdrawing the water and using it. And then we also couple that with fate and transport of crude oil to try to determine if a spill happened would there be any effects.
Q. Did you say fate of crude oil?
A. Fate.
Q. Can you explain that?
A. Fate is basically if a substance gets out into the environment, it's how it interacts with the environment. So, you know, does it evaporate? Does it dissolve into water? Does it float? A number of different things like that.
Q. Did you examine the potential risk for a spill of shallow aquifers or source water protection areas or both?
A. Yes, I did.
Q. And can you summarize your findings?
A. Yes. What I'd like to do is step through some maps so we can kind of walk through these areas together. Do you want to

enter the maps, or should I step through them first?
Q. We've got a number of copies of an exhibit we've marked as 16, which I'll pass around at this time.
While we're waiting for your presentation to come up, I neglected to ask you before, in all respects otherwise in your direct and rebuttal testimony, if I asked you those same questions today, would your answers be the same?
A. Yes, they would.
Q. Thank you.
A. It's going to be a little difficult here. I'm going to try to walk through -- and it's going to -- the route through South Dakota we're going to talk about where the aquifers are, where the shallow source water protection areas are. And we'll look at how fate and -- can help determine whether there will be any effects.
This is a little hard to see. Working intermittently.
Q. Before we start I should ask you, can you tell us what Exhibit 16 is, TC 16? Do you have a paper copy?
A. I've got my copy. I should probably double-check it, though, please.
Yes. This is a copy of 10 maps that walk through the centerline through South Dakota looking at source water protection areas along the route.
We looked at a number of different resources in order to try to evaluate ground water effects. We looked at U.S.

Geological Survey data. We looked at the source water protection reports. We looked at cross-sections. We looked at -- we got information from South Dakota DENR for the source water protection areas. We had various discussions with the agency as well. So this is kind of a summary of the --
Q. I just wanted to ask before you start, so if I understand correctly, these are maps prepared under your direction?
A. Yes, they are.
MR. KOENECKE: I'd ask at this time that Exhibit TC 16 be admitted into evidence.
MR. SMITH: Is there objection?
MR. RASMUSSEN: That's not part of one of the other exhibits that have already been --
MR. KOENECKE: I don't believe it is, no.
MR. RASMUSSEN: It's something new? I just wanted to clarify that.
MR. KOENECKE: Yes. It's additive.
MR. RASMUSSEN: No objection.
MR. SMITH: Mr. Hohn or staff?
MR. HOHN: As far as I know, this is the first time we've seen this map; is that right?
MR. KOENECKE: I believe so.
MR. HOHN: I'd like to study it. I don't have any objection to it being placed in evidence, but I just wanted to clarify we've seen it for the first time.

MR. SMITH: Is that fair?
MR. KOENECKE: Perfectly.
MR. SMITH: And the exhibit was called TC 16; correct?
MR. KOENECKE: Correct.
MR. SMITH: TC 16 is admitted with that caveat, persons who are seeing it for the first time may have some follow up after they've had a chance to review the exhibit.
Is that fair.
MR. KOENECKE: Very well.
MR. SMITH: I'm going to make one note too for persons who might be listening on the internet. The PowerPoint that is appearing in this room you may access currently on the Commission's website, the same website that you're listening in on, just for your information.
CHAIRMAN JOHNSON: Will it be readily identifiable by its file name?
MR. SMITH: I don't know since I haven't seen it. What's it called?
CHAIRMAN JOHNSON: Well, we can proceed.
MR. SMITH: Okay. Please proceed, and we'll try to get that to them.
A. All right. So just to orient everybody, here is the border with North Dakota. This green line coming down is the Keystone centerline, and it's going to be hard for people looking at this to see but these yellow dots here are source water protection

areas.
Q. I should ask you further clarification on the record. Are you referring to the yellow dots in the middle of page 1 to the left of what's marked MP 227 and to the right of what's marked MP 228?
A. Yes. So those are source water protection areas near mile post 227 and mile post 228.
Q. And what are source water protection areas?
A. They are areas for protection of ground water resources that are used as public water supply.
Q. And did you determine where the source water protection areas are?
A. No. These are provided by South Dakota DENR.
Q. You obtained the information regarding the source water protection areas from the DENR?
A. Correct.
Q. Thank you.
A. We talked -- with specific regard to these particular source water protection areas, we actually sat down and had discussions with the DENR about these. We did find out that these particular ones are covered with 100 feet of overlying clays and tills.
Now to explain, if a spill occurred it would have a hard time -- clays and tills are not very permeable, very low permeability, so they would have to permeate through that till

in order to get to the aquifer. So having a 100-foot layer of tills and clays basically acts as protection to these source water areas. And they -- the South Dakota DENR were satisfied with where we were. They actually -- we talked -- you know, either if we went either way, either side of that, that actually posed more of a problem so actually the location where it's at offers protection to these deeper wells.

Q. And when you say these deeper wells you mean the ones we referenced?

A. Yes. The source water protection areas that we looked at, the two dots at mile post 227 and 228.

Q. Did you find source water protection areas at other places along the proposed route?

A. Yes, we did. I'll briefly mention this one. This is another source water area. It's about 4 miles off the route. Again, we're talking about an area not only that's separated from the pipeline by approximately 4 miles distance, but, again, separated from the -- the surface is separated from the aquifer by, again, silts and clays, 15 to 20 -- 50 feet deep.

So again that would act as protection as well as the distance that the oil would have to traverse to get to that location.

Just going down now through the different maps, map 2 we'll just kind of cruise on past this one. There's no source water protection areas within a 1-mile distance from this pipeline

either side. So that's map 2.

Map 3, same thing. There's no source water areas in this -- along this area.

CHAIRMAN JOHNSON: Ms. Tillquist, you said within 1 mile. I hate to interrupt. You said within 1 mile. I'm not seeing any yellow dots on map 2.

THE WITNESS: Correct. There are no source water protection areas within a mile either side of the pipeline.

MR. KOENECKE: If I could, Commissioner, I'll ask some clarifying questions.

Q. What data did you request from the South Dakota DENR in order to place yellow dots as we've discussed in the source water protection areas on this map?

A. What we requested -- because they didn't want to give us their entire database, they asked us for our centerline, and we asked for any source water protection areas within a mile distance of the route. So what they did is they provided us a shape file that located each of those source water protection areas.

The only exception to that is the one we just looked at on map 1 and that we just happened to have because that was along the original route before we rerouted the Hecla sand hills reroute. So that was the only other spot.

Q. So if I understand correctly, if someone had the entire database from the South Dakota DENR, these maps which are

approximately 15 miles in width might very well contain more source water protection areas?

A. That's correct.

Q. You asked for ones within a mile either side of the proposed route?

A. That's correct.

Q. Thank you.

A. All right. So now we're at the bottom of map 4 near the City of Carpenter. This yellow dot here is the source water area. Ground water in this area moves to the south and west. So if a spill were to occur from the pipeline, ground water movement would be moving the materials away from the source water area.

Further, there is 45 to 50 feet of clays and silts above the source water area. So, again, it provides protection for these ground water intakes.

Moving on, the next source water area is near Iroquois. This is located along the west bank of the South Pearl Creek. It's unclear where their aquifer -- their water actually comes from. It either comes from an ancient river channel or from the Dakota Niobrara Formation.

The river channel, if it was the ancient river channel, it would be overlaying with 25 to 30 feet of glacial till and clays. Looking at -- they had some well bore holes dug in the area. Looking at the lithology, the rocks and layers, basically

those indicate it's not likely to be an ancient stream channel that they're taking this from. There was not sufficient aquifer type material to make a viable aquifer.

So it's likely that it's not the river channel, an ancient river channel, but probably part of the Dakota formation, which would be greater than 100 feet deep under, again, tills and clays. So in either case they are covered by a significant level of tills and clays.

And then ground water movement through this area would be to the south and -- no. Sorry. Mostly to the west. Southwest.

The next map there is no source water protection areas identified in map 6. No source water protection areas on map 7, 8, or 9.

And now we get to Yankton. There are -- there's one source area here. This is a surface water intake for the City of Yankton. It's actually upstream of the pipeline crossing. So then in the case of a spill the product would be moving down and away. There is a source water protection area in a light industrial area. It's right where the water treatment plant is in Yankton.

In this area Keystone is actually collocated with the KANEB Pipelines so that -- yeah. That's where that one is. And then there's another inactive one. And I believe the other one is in here somewhere. And that's inactive.

And that covers the source water -- the public source water

protection areas.

Q. Can you tell me why you chose to ask for the source water protection areas within 1 mile of the pipeline?

A. Yes. If a spill were to occur, you have to have a spill that could penetrate into the soils. And once it starts moving into the soils, if an oil spill got into an aquifer, basically it would pool in the surface of the aquifer.

The oil itself stays pretty much right in the area of the source. But it's possible that with time what happens is these dissolve constituents can come out of the oil, and they can start migrating with the ground water.

The primary constituents that we worry about are called BTEX compounds, benzene, toluene, ethyl benzene, and xylenes. And we worry about those because they have high solubilities, and they have low water quality standards. So if we're going to have problems, it's going to be with those compounds.

So when you look at how far does BTEX travel away from the source, there's been a lot of research. Bemidji, the spill up in Bemidji, Minnesota is a place where they started looking at, but there's been a number of spill sites that have looked at this.

But what happens is BTEX concentrations undergo natural tenuation, which means basically the microbes in the area are degrading the BTEX. And if you can think of it as a kind of like a very steep hill, basically the concentrations are high at

the source and then what we do as toxicologists, we have little isopleth where you have per each magnitude as the BTEX is grading.

So maybe you have a high concentration at the center, but then it drops off very quickly. And what they're finding is in the majority of the cases the BTEX concentrations drop off dramatically, and we've got -- I think EPA found 75 percent of them -- this is in my direct testimony, but I believe it's 75 percent of the BTEX concentrations doesn't move more than 250 feet.

But, again, you're changing by orders of magnitude with just a little distance. So we're talking movement that's very, very short. So the idea that BTEX -- you know, the dissolve constituents within this crude oil could move a mile is unrealistic.

Basically that BTEX is going to be right around that oil spill. So that was why we set the distance at a mile. Because that is where we would encompass anything we would be concerned with.

Q. Thank you. Have you had occasion to learn about the Lewis & Clark Rural Water Project?

A. Yes. I do understand there's a water project that has a subsurface intake downstream of the pipeline along the Missouri River.

Q. And can you tell me how a spill in the Missouri River or

underneath the Missouri River at Yankton might affect that water source?

A. If a -- first of all, it's very unlikely that a spill would occur. But if a spill occurred, if there was a problem, a leak under the River itself, first of all, the pipeline's going to be directionally drilled under the Missouri River, which means directionally drilling it it's going to be minimally --

Buster Gray could probably speak better to this, but it's going to be 50 plus odd feet below the River so you've got quite a bit of overburden that it would actually have to leak through to get to the surface. So that's unlikely.

But, you know, if it occurred somewhere close to the River, got into the River, you know, let's talk about what happens if it got into the River.

What happens with the crude oil is it's lighter than water. It has a density that's lighter than water so it floats. So it would be moving along the surface. The surface water intake is subsurface. So you wouldn't have any fouling of the intake. So the crude oil itself wouldn't be an issue. You're also talking about, you know, we'd have containment that would control the crude oil spill.

The one thing we would worry about, though, is that again like we talked in the aquifer, as the crude oil is floating, they are dissolve constituents that with time can start dissolving out. Those dissolve constituents would have to then

get out of the oil and get down downstream and actually get into the intake. So they'd have to go all the way through the water column at sufficient concentrations to exceed the, MCL, maximum contaminant level. It's a drinking water standard.

The intake, it's my understanding it's actually in the stream bed itself. So now you're talking about penetration down and into the subsurface. It's highly unlikely that any BTEX could get into that.

But even if there was a concern that that was a potential to happen, what would happen is if a spill occurred, it got into the Missouri River, Keystone's notification program through their emergency response plan they would be notifying downstream water intake agencies. These agencies would be testing their water.

What happens is as a spill occurs you'll have a transient pulse of material coming on down so the water intake agencies would probably shut down their water as a precaution. The BTEX would move past, if there was any, and once they tested the water and insured it was safe for human consumption, they could reopen it.

So a lot of things would have to happen in order for it to create a scenario where it could possibly happen, and there's all sorts of safety things in place that would prevent any contamination of a drinking water source.

I guess the only thing I'd add to that too is this project,

the Lewis & Clark water supply project, was built with full knowledge that there are already existing pipelines at Yankton, the KANEB Pipelines. These are refined products which contain significantly more BTEX compounds. So they felt obviously comfortable with the presence of those pipelines that they could handle any sort of emergency that those might present.

Q. Thank you. There's been at least statements if not questions regarding whether a rural water system or rural water drinking pipeline or both constitutes a high consequence area.

Do you know whether they do?

A. I do not believe they do.

Q. And I'll show you what I've marked as Exhibit 17 and 18. I should say TC 17 and 18.

Can you tell me what Exhibit TC 17 is?

A. TC 17 is the federal regulations 49 CFR Part 195. What we're specifically looking at is 49 CFR Part 195.450, which are definitions for high consequence areas.

Q. Would you read those for us, please.

A. I'm going to -- I'm going to drop down into here where it -- it would be classified under Section 4. This is the only one that refers to waters so it would be any drinking water sources are considered -- not any. I'm sorry. For a drinking water source to be classified as an HCA it would fall under an unusually sensitive area. So then you get referred back to 49 CFR 195.6, which actually defines --

Q. And is that Exhibit 18?

A. That is Exhibit 18. Now under this one when we look at this they talk about drinking water sources. So in order for a drinking water source to be considered an unusually sensitive area, Part A-1 says that it would have to be a "water intake for community water system or a nontransient noncommunity water system that obtains its water supply primarily from surface water source and does not have an adequate alternative drinking water source."

So this one basically focuses in on the intake.

The second item, the next one is source water protection areas. This is what we were just talking about on these maps. For a CWS, community water system, and a noncommunity water system that obtains its water supply from a class 1 or class 2 aquifer and does not have an adequate alternative drinking water source where the State has not yet identified the source water protection area, the wellhead protection area will be used until the State has identified the source water protection area. So the rural water supply pipelines wouldn't fall under that.

And then the third item for drinking water is it would have to be a sole source aquifer recharge area where -- sole source aquifers in the karst area. So again these are protecting the sources of the water. They are not talking about the actual pipelines' delivery systems. It's the intakes or the source water protection areas or karst aquifer.

MR. KOENECKE: I'd ask to put Exhibits TC 17 and 18 into evidence.

MR. SMITH: I have 17. What is 18? I don't have that.

THE WITNESS: 18 is Part 195.6, unusually sensitive areas from the regulations.

MR. SMITH: Well, I'm not --

MR. GERDES: It's coming. It's coming.

MR. SMITH: I don't know that these need to be admitted into evidence because they happen to be law or rules, federal rules. But I think we can actually take judicial notice that these are what the rules are.

MR. KOENECKE: Then I'll ask that you do that.

MR. SMITH: I'm going to do that.

Q. Finally, Ms. Tillquist, I'll ask you you've been present and heard questions about the composition of the products the Keystone Pipeline will be transporting?

A. Yes, I have.

Q. What can you -- are you able to describe for us the composition of the oil, the crude oil product which would be in the pipeline?

A. Yes, I can.

Q. Would you go ahead and do that, please.

A. Basically the Keystone Pipeline would be transporting a number of -- a variety of different types of crudes. Those have

all been previously described in the risk assessment that was provided.

Keystone's crudes are -- I guess, you know, they're not unique. They're being transported by pipelines already by Enbridge, and in North Dakota there's the Express Pipeline. There's also very similar crudes that are being transported all over the U.S., thousands and thousands of miles of these types of similar crudes.

Crude oil in general is a -- it's a complex mixture of hydrocarbons consisting of hundreds upon hundreds of compounds. The Alberta oil sands, the oil that's derived from there has many characteristics that are similar to other oils, many that are from Venezuela, Russia, Nigeria, and California. So not many unique features.

Part of the thing that I did as part of my work was I was looking at the contents, and a lot of the information on the composition of the oil can be found on the crude oil monitor. There's a website. Do we -- it's www.crudemonitor.ca. It's a publicly available website, and it provides a lot of information on a variety of Canadian crude oils.

Talking with Keystone representatives, they said that they're going to be shipping a wide variety of materials, but this diluted bitumen -- they're going to be carrying two basic types of crude oil. One is diluted bitumen, and the other is synthetic crude.

Diluted bitumen, they said a good representative of that is Western Canadian Select. For the synthetic crude there's a Suncor Synthetic A. And those, again -- so you go to the crude monitor and it provides oil assay information. So you can go and see various characteristics of these oils.

I'm just going to talk briefly just about physical characteristics and some of the components of the oil. Basically both these oils are lighter than water. So, again, when we talk about the fate of oil if released into the environment and it did get into water, the water -- the oil would float on top of the water.

The constituents, again, it does -- as we have talked about, it does contain BTEX compounds. Again, these are the water soluble compounds that we have greatest concern about from a water quality standpoint. They're highly water soluble for benzene, and they have low water quality standards. So they are the ones we really worry about.

The content of BTEX in Western Canadian Select and Suncor, the total combined BTEX concentrations in either one of those are both less than 1 percent for BTEX. So significantly less than you might see in like refined products and things.

There has been some discussions about naphthenic acids. Crude oil from Canada does -- like all crude oils, does contain naphthenic acids. Crude oil from Alberta does have a higher concentration of naphthenic acids than some crude oils but not

nearly as high as others. Again, crude oil from California, Russia, Nigeria, all have higher naphthenic acid concentrations.

Naphthenic acids are soluble in water. They have a moderate toxicity, not nearly the level we look at for BTEX.

And then heavy metals. There's been discussions about, you know, what types of heavy metals in crude oils. They are -- the heavy metals are very characteristic of the geology they came from. The most common ones are calcium, aluminum, and magnesium. The heavy metals that are most abundant in crude oils are nickel and vanadium.

We're talking about -- let's see. Looking at my numbers here. The Western Canadian Select was 52 parts per million and 122 parts per million of vanadium. There's a variety of other types of heavy metals present in parts per million, parts per billion, depending on the metal itself.

There's mercury, but mercury is found in, again, all crude oils. And the crude oil out of Alberta is about 20 times -- well, it's orders of magnitude less than found in other crudes so it's actually very low mercury content.

Q. Excuse me. The mercury is 20 orders of magnitude less?

A. No. No. I'm sorry. It's orders of magnitude less. The median value for Alberta crudes was 1 part per billion. Other crudes from other locations were greater than 20 parts per billion. So at least 20 times.

Q. Do you understand that anything might be, or is going to be added to either WCS or Suncor?

A. Bitumen, when it first comes out of the ground, when it's diluted for transport they do add things to it, but that's already accounted for within the Western Canadian Select composition so the BTEX is already there. That's what they diluted it with.

Q. Will there be corrosion inhibitors or drag reducers or anything like that added to these compounds to move them through the pipeline?

A. There is the possibility of those.

Q. It's possible. Is it likely or not? Can you say?

A. I honestly don't know. I know that the drag reducing agents are a lot of times composed of the water, but, again, they can't exceed the tariff, which is sediment and water fraction can't be greater than .5 percent. So they have limitations.

So even though it -- it will help the flow, but I'm not sure if they're always going to use it or partial or whatever.

Q. Finally, did you have a chance to review Edward Miller's testimony regarding pipeline spill statistics?

A. Yes, I did.

Q. Did you find any noteworthy errors in his analysis?

A. Yes, I did. I was trying to reconstruct what Mr. Miller had done because I've worked with this database for years, and I

couldn't resolve the numbers.

What I found was Mr. Miller had based his analysis on the PHMSA database has summary sheets that show yearly averages, and what he did is he based his analysis on those yearly average summary sheets.

What he overlooked was that when there was reporting criteria that was less stringent from '86 to 2002. And then they changed the reporting criteria. They made it much more stringent. What PHMSA did in the summary data sheets just to keep everything consistent was they said they would keep -- they would stratify the data.

So basically they took only the larger spills and the more significant spill volumes, the more significant events, and that's what they presented in those summary tables just for consistency.

But it didn't incorporate the entire data set. Again, the data set now since 2002 actually incorporates spills of much smaller volume. So when we look at the entire data set, which is what we did, we came up with the numbers that I presented in my surrebuttal.

And as Mr. Miller suggested, it's really critical that you look at the entire database so you get an accurate view of what spill volumes actually are. So he -- basically what happened is he -- by using the summary statistics he overestimated the actual spill volumes and other things.

I'll just go on here for a second. When we look at the mean value, the average value of a spill, the number we came up with was 287 barrels. That's a mean value. There's another way of looking at the average value, and that's the median. Going back to basic statistics.

The median value means how many -- sorry. It's a value where 50 percent of the spill volume would be less and 50 percent would be more. Now the mean and the median are both measures of central tendency so they're both averages. But it's important to look at both numbers together.

I hope I'm not boring everybody. But when you see that the median and the mean are significantly different like we're seeing in this, what it's telling you is that the mean is being pulled to one side. It's skewing the data because you've got a few very large events that pull that mean value to one side.

And it's very important to look at both numbers and to understand both numbers that you've got a mean value of 287 barrels, which is -- to give you some sort of concept of what that would be, that's like your backyard pool, if you fill it half full, that's about 300 barrels.

The mean value of 3 barrels, that's about 125 gallons. So that's like a big -- you know those big salt water aquariums when you go to your dentist? That's about how big that is.

Q. Are you able to discuss the performance of crude oil pipelines relative to other pipelines in terms of safety, other

pipelines being perhaps those carrying natural gas?

A. Yeah. But there's been -- I have looked at the data myself, and there's been other studies that have looked at it. Historically, crude oil pipelines did have a poor safety record. But since the last five-year period they've been significantly declining. There's been a 57 percent reduction in the number of spills on crude oil pipelines.

Not only that, the volume has gone down I believe by over half. And a lot of that comes down to for crude oil pipelines is the improvement in corrosion detection and spill preventions. The data show that most of these spills -- again, we're talking about a median value of 3 barrels so most of the spills are going to be small, five barrels or less.

And, you know, it's these spills that when we talk about the significant spills that were listed on the PHMSA summary sheets, those spills of 50 barrels or less, those account for 98 percent of the volume. So that's where most of the volume of the spills come from.

I would just notice too that of all the spills, if you plot these, that 90 percent of the spills are going to be -- sorry. 90 percent of the spills are 300 barrels or less. So these very large spills we talk about sometimes of thousands and ten thousands of barrels are exceptionally rare events. They do happen, but they're rare.

Just to tie this back to many of the analyses that we did

for the risk assessment, I think it just reemphasizes where we looked at these larger spill events, we're trying to, again, provide a conservative assessment to provide a -- kind of a framework for people to understand worst case scenarios.

MR. SMITH: Mr. Koenecke, I'm going to butt in here a minute. I'm just wondering, are we plowing over ground that's already been covered in the prefiled?

MR. KOENECKE: I don't believe so. But, in any event, the witness is now available for cross, Mr. Smith.

MR. SMITH: Okay. Because I -- again, I told you I'm not a hard -- well, a hard-nose I better say but okay. We were going to try to hold the direct to a short summary. Thank you, though. I know some of that was responsive.

CHAIRMAN JOHNSON: Just another example of Mr. Smith's impeccable timing.

MR. SMITH: That's right. At least one of the Commissioners has asked to take a short break so we're going to do that. What's your pleasure? 10 minutes? That's a nice round number.

(A short recess is taken)

MR. SMITH: Are you done then, Mr. Koenecke, for now or follow ups?

MR. KOENECKE: One more if I could, Mr. Smith. I've handed out a document I've marked as TC 19. And I'll ask the witness a few questions about it and seek its introduction.

Q. Ms. Tillquist, do you have in front of you a document marked TC 19?

A. Yes, I do.

Q. And are you familiar with that document?

A. Yes, I am.

Q. Did you create that document?

A. Yes, I did.

Q. Can you tell us what it is?

A. This is a summary of the crude oil contents of the Keystone Pipeline. It's an overview of the types of crude that would be there. Breaks down by the various parameters we were just talking about. Just provides more detail.

Q. And I've provided that to Commissioners and parties, and I'd ask that it be admitted as evidence, TC 19.

MR. SMITH: Mr. Rasmussen?

MR. RASMUSSEN: All I would ask is when we bring up new exhibits during our presentation is TransCanada is as generous as we have been. I am not going to object.

MR. KOENECKE: Your generosity is noted. Thank you.

MR. SMITH: Well, I think we're noting it as well. And it appears to be the kind of exhibit we might want to have that information. So I think it's useful for us all.

CHAIRMAN JOHNSON: Mr. Smith, is your framework whether or not to allow late exhibits whether or not it's prejudicial to a party, or what should we have as our internal

measurement?

MR. SMITH: Well, I think that's true. But on the other hand, here again, Mr. Rasmussen has not objected so there's -- you know, I don't have much of a basis not to allow it.

CHAIRMAN JOHNSON: Okay.

MR. SMITH: Yeah. I think that's fair, and other things -- in all of these cases, you know, we do the prefile and we expect everybody to behave in good faith and I have no reason to believe that hasn't happened here.

I mean, as we go along through the live portion of the hearing things evolve. People testify to things, and areas of concern become emphasized that may not have been obvious from just the written documents. So I think some we have to accommodate, and we always have.

On every case we've ever had we allow -- there's always a significant amount of information that comes in via that process. And that's usually a good thing. That's, I guess, my take on it.

With that, Mr. Rasmussen, are you ready to begin your cross-examination?

MR. RASMUSSEN: Yes.

CROSS-EXAMINATION

BY MR. RASMUSSEN:

Q. Good afternoon.

A. Good afternoon.

Q. I want to start with just a few questions about your direct testimony.

A. Okay.

Q. Looking at paragraph 7 on page 2, you note that the proposed pipeline crosses near a water supply well in Marshall County and will cross an aquifer protection area in Kingsbury County.

Where did that -- the water supply well in Marshall County, that's one of them that is noted on the maps that were TC 16; is that right?

A. Yes. That's correct. So that was by mile post 227 and 228.

Q. And I believe that's a well by a Hutterite colony. Is that your understanding?

A. That is my understanding.

Q. The aquifer protection area in Kingsbury County, is that also shown on TC 16?

A. Oh, that's the exhibit?

Q. Yeah.

A. No. What it is is -- I take it back. I'm sorry. It is the Iroquois. So map 5, the source water area in Kingsbury County, is the Iroquois water supply that we discussed.

Q. Okay. Now you had a few other areas that are shown on the maps that are not referenced here in paragraph 7 of your direct

testimony; is that right?

A. That's correct. They were listed in -- just give me a second.

(Witness examines document)

A. There's a summary of areas on my rebuttal testimony, TC R1, page 4, table 1.

Q. What information was used to develop the direct testimony that was then subsequently supplemented?

A. That was our preliminary analysis, and we had done -- initially we had requested data on a more narrow corridor from the South Dakota DENR. We went back just to be very conservative and asked for a wider corridor just for the purposes of these hearings.

Q. And, again, that first time you asked for source water protection areas?

A. Yes.

Q. Maybe we should define exactly what a source water protection area is.

A. I believe that that is on the website for the State, but basically it's an area that looks at the recharge of an aquifer. It's protecting the water for a public water source, ground water source.

Q. Is a well on a farm, would that be a source water protection area if that was the water supply for the -- that particular location?

A. My understanding is that it would have to be a public water supply.

Q. Is the Hutterite colony a public water supply?

A. It's apparently considered a public water supply by South Dakota DENR.

Q. How does -- do you know how DENR determines where the public water supplies are -- or the source water -- whatever we were just talking about, where those locations are?

A. Yeah. I believe they provide their methodology on the internet, but I would not be able to speak to that in any detail.

Q. You didn't go beyond what information was available to attempt if there was other source water areas beyond what the DENR provided you that was referenced on these maps?

A. I also looked at high consequence areas as defined by the PHMSA. They were sent to us by the Department of Transportation. So those were also incorporated.

Q. The high consequence areas, there's a map that PHMSA has that was high consequence areas which would include source water areas; is that right, among other things?

A. Yes.

Q. And how did they come up with their -- their math that lists HCAs?

A. They come up with that list based on consultation with state and federal agencies. The state agencies are supposed to

provide the information to PHMSA. There's some interactions. They basically then take that information, and they disseminate to the pipeline operators.

Q. The pipeline goes by some other smaller towns. Raymond comes to mind, and I didn't see anything on the map for a source water protection area in Raymond.

Do you know why that would be?

A. I don't have a specific answer for that, no.

Q. Do you know if there is a public water supply in that locality?

A. I don't have an answer. I don't have any information to respond to that.

Q. I want to talk a little bit about HCAs.

A. Uh-huh.

Q. As you testified before, the Code of Federal Regulations with regard to water defines an HCA as a USA or unusually sensitive area; right?

A. Yeah.

Q. And we went through or you went through a little bit 49 CFR 195.6, which I think was marked as TC 18?

A. Correct.

Q. All right. And that defines a USA drinking water resource as a water intake for a community water system. That would be the first thing; right?

A. Correct.

Q. All right. And an example of that would be the water system by Iroquois or probably -- I guess the one by the Hutterite colony; is that right?

A. No.

Q. That's not right. Okay. Tell me why I'm wrong on that.

A. Those both were source water protection areas.

Q. I'm sorry. What's a community water system?

A. Water intake for community water system, give you an example of that would be like the source water area that we looked at for Yankton, the surface water intake.

Q. Okay. Were there any other community water systems along the pipeline route of which you're aware?

A. There are other ACAs, yes. There are ACAs -- let me qualify this. Let me think about this.

There are some along in the region.

Q. In South Dakota.

A. There's lots of HCAs, drinking water HCAs in north -- I'm sorry. South Dakota. I'm sorry. I'm not following what you're saying.

Q. Okay. Where are they listed then? Is there a place where we have all of these HCAs listed somewhere?

MR. KOENECKE: I'm going to object to the question to bring up the notion that HCAs as we've discussed many times are considered confidential material by Federal Government and we might be getting into areas which require the discussion of

sensitive information as delineated by federal agencies here.

MR. RASMUSSEN: Maybe I'm not making myself clear. I'm not asking about cultural sites or anything like that. I'm talking about water systems.

MR. KOENECKE: HCAs.

MR. RASMUSSEN: Yeah.

MR. KOENECKE: Which have been designated confidential by the pipeline authorities.

MR. RASMUSSEN: Well, I thought we had designated where those locations were. Maybe I'm wrong. That hasn't been done? Is that in the submission somewhere where all the HCA water systems are listed?

MR. KOENECKE: HCAs are in the submission. They were filed as confidential and had remained confidential. The source water protection areas are not the same thing we just discussed recently in Ms. Tillquist's testimony.

MR. RASMUSSEN: Well, that's what I'm trying to figure out is what all of these things are.

Q. You testified about an HCA being an unusually sensitive area, according to federal regulations?

A. Yes.

Q. How does that differ from -- or is a source water protection area also an HCA or not?

A. The definition defines a source water protection area as an HCA. But we're looking -- let me just state that there are

different -- you were talking about the source water protection area database derived from South Dakota DENR. And then you've got PHMSA, the database which is HCAs. So I've got to be real careful. There might be some overlay. I think I can say that.

Q. I mean, can you give me an idea how many HCA water sources there are along this pipeline in South Dakota?

A. I think the information that we have presented encapsulates the extent of the HCAs -- it would be a comparable data set.

Q. A comparable data set to what?

A. The HCAs designated by PHMSA -- I think what we've presented here today you'd have a good idea.

Q. Okay.

MR. KOENECKE: If we answer the question, we'll be delving into that area. If we have to clear the room and go into that mode -- your client got to look at the HCA maps and signed the confidentiality agreement. And if we want to go down that road, then we need to take those precautions, I think. I don't want this witness getting in trouble with the Federal Government.

MR. RASMUSSEN: Well, I don't either.

MR. SMITH: Can I ask one question myself about this, please.

MR. RASMUSSEN: Please.

MR. SMITH: I guess it's not clear to me and maybe you have a regulation or something, Mr. Koenecke, you could either

cite to me now or maybe later we could find it. But I guess it wasn't totally clear to me whether it was the actual identification of the HCA areas that's confidential or just those maps as some kind of a proprietary document, some kind of a licensed proprietary document.

Do you have any light to shed on that?

MR. KOENECKE: Perhaps, if you'd give me a minute to consult.

MR. SMITH: Okay. I don't know.

(Discussion off the record)

MR. KOENECKE: Mr. Smith, upon consultation, we've determined that it's our opinion, the Applicant's opinion, that the information on the maps is what's confidential, not the maps themselves. And that going further down this line of testimony might cause problems of the kind we've been essentially discussing here for some months, that the Federal Government considers these matters extremely sensitive and to remain confidential.

MR. SMITH: Commissioner Johnson.

CHAIRMAN JOHNSON: I'm probably outside of protocol here just a little bit so thanks for your indulgence. I do think Ms. Tillquist is right. We're talking about two data sets. There may be overlap.

The bottom line is DENR does not have the same confidential rules the Federal Government does.

THE WITNESS: That's my understanding.

CHAIRMAN JOHNSON: Maybe they're able to get at the information the federal government thinks is sensitive by the state data set as opposed to referring to the federal data set.

I'll tell you and Mr. Smith said the same thing. We don't understand why this HCA stuff is confidential, but the bottom line is it is and nobody here is going to break the federal rule.

Again, I'm outside of protocol, and if anybody takes an issue with what I said, let me know.

MR. RASMUSSEN: I guess my problem is this witness on her direct examination came in here and testified that rural water systems aren't HCAs. I think I should have a right to explore where she's come from on that subject.

CHAIRMAN JOHNSON: Absolutely. We need to explore all issues that you want to explore and are appropriate. It may be that we need to clear the room and shut off the internet and get to the facts we need to get to.

MR. RASMUSSEN: Well, I certainly don't have a need for her to identify places she's not supposed to be identifying but I am going to talk about HCAs and I guess if I get to a point they think room's got to be cleared, I guess we'll have to deal with that.

MR. KOENECKE: I thought we're there.

MR. SMITH: I don't think we get there until you're

asking her to identify explicit HCAs related to this project. And if we're at that point, then I do think to be precautionary -- again, I'm not -- I can't quite figure out what it is that the U.S. DOT is trying to do with that HCA map business, but I think we should err on the side of caution, and we can always later make the transcript and the tape of the proceeding public if we have to.

If we're getting to that point, Mr. Rasmussen, maybe we should go in camera here for a little while and get to the bottom of that just to err on the safe side.

COMMISSIONER KOLBECK: Can I, I guess -- this is my opinion. If Mr. Rasmussen wants to know the question if his client's aquifer's classified an HCA, if that's what you're getting at, then let's clear the room and continue on because I would consider that to be confidential.

MR. RASMUSSEN: That would be fine.

CHAIRMAN JOHNSON: And to me the discussion of -- in a general sense, what is an HCA, that's not confidential. What the federal rules say and how they're interpreted, that's not confidential. It's not site specific.

And I understand you want to err on the side of -- it's a good thing for General Counsel to want to err on keeping us safe. I think with this proceeding in particular unless we're pretty sure we're someplace we shouldn't be, I'd like to keep it open.

MR. SMITH: Well, I would too. That's why I'm saying if we're getting to the point of explicit designations of what the current HCAs are, then I think we're probably at that point. But if we're discussing -- honestly, if we're discussing why something isn't, I don't think that is protected.

MR. RASMUSSEN: And I think that's more where I'm going.

MR. SMITH: Okay. Well, until we get to what the HCA areas are that are delineated on those maps, I don't think we're there.

Q. I'll ask you this: Are any rural water systems listed on the maps as an HCA?

A. I would say that the transmission water mains and the system as per se, that is not listed. Whether they're intakes or they're wells, I'm not sure.

Q. You don't know that?

A. I do know that there are some -- no. I will -- no.

Q. There are none listed on the -- strike that. Are there any listed on the DENR map that we have as TC 16, the intakes for any rural water systems?

A. I don't think there are based on the locale. But I'm not sure. Not sure.

Q. Certainly the WEB Water line, which takes its water from the Missouri River, is not included as an HCA.

A. I don't know that.

Q. You don't know that?
A. It could be a -- where the intake structure would be could be --
Q. Oh, I'm sorry. Let me strike that. It's not listed as an HCA in connection of being anywhere near this proposed pipeline.
A. If you could identify where WEB's intake is, you're saying around the Missouri River?
Q. Out by Mobridge.
A. Could you show me on a map?
Q. In the middle of the state.
A. I thought you said it was along the Missouri River.
Q. It is. The Missouri River curls around.
A. Yeah.
Q. Okay.
A. Can you provide me a map number, please.
Q. No, I can't. It's not on any of your maps because it's nowhere near the pipeline.
A. Then I would not know whether there's a source water protection area because, again, we were looking at a corridor around it.
Q. Okay. Well, let me ask, you testified that -- I believe, and correct me if I'm wrong, that rural water system, just the pipeline itself would not be considered an HCA. Am I correct about that?
A. That is correct.

Q. Okay. And so again looking at the federal definition as we've established, an HCA is defined as a USA when it comes to water.
A. A USA is a type of HCA.
Q. Okay. And a USA in 195.6 is defined as the water intake for a community water system or, as they call it, a CWS?
A. Correct.
Q. Or a nontransient, noncommunity water system that obtains its water supply primarily from a surface water source and does not have an adequate alternative drinking water source.
What is the second half of that definition? What does that refer to?
A. The nontransient, noncommunity water?
Q. Right.
A. That's what you're asking?
Q. Uh-huh.
A. My understanding is -- let me put it this way. A transient, noncommunity water source I believe my understanding is that it's things like -- and, again -- well, it would be like a rest stop, things like that. It's people that are coming and going. It's not a public water supply for a stable population, I guess is the best way to explain it.
Q. That's a transient?
A. That would be a transient. So if it says it's a nontransient -- so it would be a stable noncommunity water

supply. So --
Q. Do you know what that is? Can you give me an example of one?
A. I believe that this would be things like there's a like -- I'm trying to think. Like a cafe or a public water supply that would be a public water supply source like that. So it's providing water for a community, but it's not --
MR. KOENECKE: Mr. Rasmussen, I note that there's a definition of nontransient noncommunity water system contained within the federal regulations. Would that help you?
I don't believe it's on a sheet that I've provided to you.
MR. RASMUSSEN: Actually I think it is.
THE WITNESS: It's a public water supply that serves at least 25 people or same persons over six months per year. So that would be schools, factories, hospitals that have their own water supply.
Q. Would the WEB Water system be a public water system that regularly serves at least 25 of the same persons over six months per year?
A. Yes. But it's not -- again, going back to the regulation, it has to be the water intake.
Q. No, it doesn't, does it? It says it can be the water intake for a community water system -- oh, I see. I apologize.
Okay. You're saying the water intake applies to both

community water system or nontransient, noncommunity water system. That's what you're saying.
A. That's what I'm saying.
Q. Looking again at the second page of the document right under the definition of a nontransient, noncommunity water system it defines a public water system. And that's a system that provides public water for human consumption through pipes or other constructed conveyances, et cetera.
Would you agree with me that the WEB Water system would fall within -- or any rural water system for that matter would fall within that definition?
A. I'm just reading through it.
Q. That's fine.
(Witness examines document)
A. Yes, it would.
Q. Going back to the first part of 195.6, go to A-2 where it talks about source water protection area for a CWS or an NTN CWS that obtains its water supply from a class 1 or 2-A aquifer and does not have an adequate alternate drinking water source and it says where a state has not identified the SWPA, the wellhead protection area will be used until the state has identified the SWPA.
Has South Dakota identified all source water protection areas?
A. I can't answer to this state. I know they provided us

source water protection areas.
Q. Just the ones you have listed on the map there; is that right?
A. Yes.
Q. Thank you. I think I'm done with that. I've got everybody confused enough.
You mentioned going back to your direct testimony then that the -- on paragraph 7 the pipeline corridor also passes through areas where shallow and surficial aquifers exist.
Did I pronounce that correctly?
A. Yes.
Q. What is a surficial aquifer?
A. A surficial aquifer is an aquifer that's usually touching the surface. A shallow aquifer is usually 50 feet or less, and a surficial aquifer touches the surface.
Q. And where are those areas?
A. There are shallow and surficial aquifers --
Q. I'm sorry. Go ahead.
A. Those areas are mapped -- the -- there are some in northeastern Marshall County. Again, we quantify these on GIS, but they're scattered throughout.
Q. Okay. Any particular additional protections taken when the pipe passes through those areas?
A. That would be a -- not to my knowledge.
Q. Paragraph 11 identifies two public water supplies. Are

those -- which -- are those the ones we already talked about? That would have been the Kingsbury County and the one in Marshall County?
A. Let me double-check, but I believe that's the case.
(Witness examines document)
A. That is correct.
Q. And actually are there more than -- we're aware of more of them now than just two?
A. In my rebuttal testimony that --
Q. Yeah. You identified some more; right?
You testified about several corrections that you made to your original testimony, and we've just talked about one of those. I don't think you mentioned that one initially. But you also mentioned you changed some numbers for -- that are on paragraph 20 and in paragraph 22; is that right?
A. Correct.
Q. What was the reason that the original report was incorrect with regard to those numbers?
A. With regard to -- paragraph 20 you're referring to, item 20, that was a number I had an assistant of mine calculate. When I went back and looked at the data to confirm these numbers what she had done was a -- the PHMSA database has -- they changed their reporting standard from the previous one.
They used to have only barrels reported. Now they're reporting barrels and gallons. She didn't notice that there was

two actual different units reported so she didn't convert gallons to barrels to make everything equal through the data. So that was the cause of that error.
The GIS numbers --
Q. Before you go on to the next one -- so you talked about Mr. Miller's calculations. I think you said he overstated it, and you initially would have understated it; correct?
A. No. Actually I --
Q. The average size of the pipeline spill being 12 barrels?
A. Again, there's two ways to report average size, median and mean. The median is actually less than this value. It's 3 barrels. The mean is 287. That's why, again, looking at one single number it's important to look at both of them in conjunction, and that's why I provided additional information.
Q. Okay. Then go ahead. You were going to talk about the change in paragraph 22.
A. 22 was I just had some -- the GIS staff look at this to confirm numbers because I wanted to make sure what I presented was, you know, accurate. And they -- basically there was some minor tweaks that had been done with the alignment plus there was an error, and so they gave me these correct values.
Q. Paragraph 16 references the spill frequency and spill volume analysis conducted by DNV, and you note that they are an independent firm recognized as an industry expert on spill frequency and volume assessments; correct?

A. Yes.
Q. I would like to have you take a look at that DNV report. Do you have that readily available to you?
A. I do not.
MR. KOENECKE: It's up there.
THE WITNESS: We'll have to find it.
Q. The DNV -- and I think we just said DNV is an independent company that was hired by Keystone to conduct this study; is that right?
A. Yes.
Q. Looking at page 4 of the report dated May 1, 2006, revision number 1, is that the one you have?
A. Yes.
Q. Page 4 there's a Table 3.1. It lists 17 factors that are identified as factors influencing pipeline spill initiation; is that right?
A. Yes.
Q. And it separates out six of those factors as being applicable, potentially applicable to the Keystone Pipeline; correct?
A. That's what the paragraph beneath it says.
Q. And those are corrosion, excavation damage, and I guess corrosion both external or internal corrosion, excavation damage, mechanical defect, a hydraulic or pressure surge event, flanged seal or fitting leak or a washout; correct?

A. That's correct.
Q. What's a washout?
A. A washout is when you have a -- an incised stream channel. It erodes, and the pipe is actually washed downstream or broken.
Q. And these were all recognized as potential problems that the TransCanada Pipeline could face; is that right?
A. They are potential causes of spills that could possibly affect the Keystone Pipeline.
Q. Okay. Turn to page 6, if you would, please. In the first paragraph, the third sentence it reads, Some leaks from small holes could occur for a long period of time and result in a large spill volume because they would not be detected as quickly as some leaks from larger holes; correct?
A. Correct.
Q. Do you agree with that statement?
A. Yes.
Q. Page 23 of the report, in the first paragraph there states that, Overall the likelihood of a leak greater than 50 barrels anywhere along the pipeline is estimated to be about 0.14 per year or once every seven years; correct?
A. That's what it says.
Q. In your direct testimony, and I think it's in paragraph 17, you state that DNV estimated the chance of a leak from Keystone Pipeline to be once every 7 to 11 years over the entire length of the pipeline.

Where do you get the 7 to 11 years figure?
A. The DNV did the analysis based on diluted bitumen and synthetic crude, two separate analysis, and then they looked at different throughput volumes where this is into the analysis. I'll have to look through here. Do you want me to look?
Q. Sure. If it's going to take a long time, I guess you could get -- if it's something readily available.
A. I would have to look through in detail, but that's where the number would come from.
Q. You say that number is in this particular report, though?
A. I believe it is, but I can't verify. I can't find it right at the moment.
Q. I guess I didn't see an 11-year number. And I'm not -- I'm not saying I couldn't miss something. I make mistakes too.
A. Give me a minute then, please.
Q. All right. Why don't you do that.
(Witness examines document)
A. Okay. Oh, I'm sorry. I might have to -- let me just check a number here, please.
Q. Sure.
(Witness examines document)
A. I need a calculator.
MR. SMITH: Sure. Do you need a short break?
THE WITNESS: That would be nice, if I could, just to verify a number before I say this is the number.

MR. SMITH: Are you okay with that, Reed, so she can --
MR. RASMUSSEN: That's fine.
MR. SMITH: Good. Do you want to take a little break?
THE WITNESS: Yes.
MR. SMITH: We're talking a couple three minutes, or are we talking a little longer than that?
THE WITNESS: It should be just a couple of minutes, please.
(A short recess is taken)
MR. SMITH: Okay. We're back on the record. Do you need to have Mr. Rasmussen repeat the question, or are you okay with where the record was?
A. I believe the answer is on the March 2007 DNV Report, page 23.
Q. Okay. I don't think I've seen that. It is apparently on file as part of Exhibit C. But in there it talks about 7 to 11 years as opposed to just 7 years? Is that my understanding?
A. Yes.
Q. All right. I can take a look at that. I'm sorry. You said what page again?
A. Page 23.
Q. All right. Thank you. Turning back then on continuing with the DNV report, back to page 19 of that, Table 5.2 discusses the detection and verification; correct?

A. Yes, it does.
Q. And that indicates for a leak less than 1.5 percent in below-ground pipe it could take up to 90 days to be detected; is that correct?
A. That's what the DNV base their analysis on. I think Brian Thomas will testify on the actual leak detection capabilities.
Q. Okay. All right. Looking again then at paragraph 17 of your direct testimony -- and that's the one where you mentioned the 7 to 11 years. But then in the last sentence of that paragraph you make use of the 7-year interval in reaching the opinion that that equates to a spill no more than once every 41 years at any one location in South Dakota; right?
A. Correct.
Q. Now that's obviously just a statistical analysis. It certainly could happen more frequently than once every 41 years?
A. There is the potential for it to do that. However, I think DNV used a lot of conservative assumptions so we're considering that would be no more than --
Q. Well, I know in Aberdeen this last May we had a 500-year flood, and we certainly can't be guaranteed we're not going to have another 500-year flood next year.
It could happen; right?
A. That would be the statistics.
Q. Even though it's once every 41 years, this pipeline's

supposed around for 50 years. So they're saying there's going to be at least one leak on the pipeline in South Dakota?

A. Again, what we're talking about is statistics, and statistics are expressions of probability. And, again, I've used the analogy -- I don't know if we want to go through my direct testimony. I think we talked about the analogy with the car insurance. I don't know if we want to go through that again.

Q. We can read it. Yeah. I know what you're talking about.

A. Okay.

Q. Sorry. Just a couple more questions on that DNV report. Put it away too soon.

Page 24.

MR. KOENECKE: Of which version, please?

MR. RASMUSSEN: The May '06 version.

MR. KOENECKE: Thank you.

Q. That indicates under the second paragraph below the graph that approximately 53.5 percent of the spills would be from pinholes; is that right?

A. That's what it says.

Q. And then going under -- in the next section, Section 6.2, in general reported incidents over decades provide a good basis for estimating spill volumes and frequencies for new pipelines. However, there are weaknesses in the use of that data. Small volume spills are significantly underreported; correct?

A. That's what it says. And, again, I would say that again we testified earlier about, you know, small volumes, the less than 50 barrels spills, you know, they are reported more frequently with the change in the PHMSA reporting criteria but they have been decreasing and the majority of the volume, 98 percent, is these larger spills, 50 barrels or more.

Q. And then it mentions extremely infrequent events may not have occurred during the period of data collection of incidents. What does that mean, if you know?

A. Let me just read it, but I think I do know.

Q. Okay.

(Witness examines document)

A. What I think DNV is saying in this case is that highly improbable events -- so a very large spill could -- may not have occurred during the period the data set -- the time period the data set was collected.

Q. Okay. I think I'm done with that then.

Paragraph 19 of your direct testimony on page 6, would be the top of page 6, states that Keystone will adopt a number of measures to minimize the chance for pipeline leak or spill. You've been here through the course of the testimony over the last couple of days; is that right?

A. I was here today. I was listening on the internet yesterday.

Q. Are there any measures to minimize leaks or spills that

you're aware of that haven't already been discussed by all the other witnesses that have testified?

A. I believe that a lot of them have been discussed. A lot of them are in the PHMSA waiver. I think there's a lot of things in the regulations, and I believe Brian Thomas will be coming up and talking about some other things too.

Q. Nothing pops out with you, though, that hasn't -- you know, that would fall into the category of a number of measures that you talk about in your direct testimony?

A. Nothing -- no.

Q. Paragraph 21 on page 6 says the majority of the pipeline, approximately 80 percent, is underlaid by low permeability soils.

Is that a reference to the entire pipeline or just the South Dakota section?

A. That is actually a reference to the entire pipeline.

Q. All right. Do you know what that number would be in South Dakota?

A. I don't have a percentage, but item number 22 talks about shallow aquifers, and then we talk about sandy soils.

I do have a number for collocated -- that's 8.15 miles. Now that doesn't necessarily equate to -- these are sandy soils so the surface soils, again, they might be combining layers between those. So it doesn't necessarily equate directly to the vulnerable aquifers.

Q. Paragraph 23 refers to a recent report evaluated over five sites with BTEX contamination. Is that report on file?

A. That actually says 500 sites.

Q. What did I say?

A. Five.

Q. I'm sorry.

A. That's all right. The citation when I came -- it came out of a Minnesota control agency that's on the web. There's also the U.S. EPA in 1999 published information on this. There's quite a number of references that go back to these studies. It's not filed on -- I don't think it's been filed with the Commission.

Q. Okay. This is just referring to one particular report, is it not, though, that statement?

A. Yes.

Q. Okay. And that report isn't on file, as far as you know?

A. That is my understanding.

Q. Page 9. It would be part of paragraph 26 refers to the Bemidji spill and notes that it was caused by defective pipe manufactured in the 1950s.

Do you know when the pipe that was involved in the more recent incident in Clearbrook, Minnesota was manufactured?

A. I do not.

Q. Just a couple questions about the American Water Works Association Study that you have attached to I think it's your

first rebuttal testimony. Is that right?
A. All right.
Q. There's both a study and then another document. Would this be called an abstract or a summary, that first document?
A. The first document is the website by the AWWA research foundation. And basically just provides an overview of the documents.
Q. Looking at that, the website from AWWA under the background section, it talks about pollutants from leaking storage tanks. And I understand we don't have any storage tanks involved, but if there were a leak of a substantial amount of product, would the soil be considered contaminated?
A. Yes, it would.
Q. And it states that the contaminated soils can and have posed serious threats to the longevity and structural integrity of plastic pipes and elastomeric gaskets, which in turn can affect the water quality in the distribution system.
Do you agree with that statement?
A. Yes. I would agree with it. However, that was the reason that they did this research. And what they have shown is when they talk about contaminated soils they're looking at -- what they were looking at was gasoline, benzene, toluene, TCE, those compounds.
They were looking at a variety of pipelines too. They were looking at polyethylene, polyvinyl carbonate, PVC, and ductile

iron. What they said was that some pipes -- the results, if you want to get back to what the results say, is basically P.E. pipe, polyethylene pipe, is not very good at protecting against contamination.
P.E. pipe is actually used -- it was another more -- out of the same group is .018 percent of all water mains are P.E. So it's not a commonly used water main.
For PVC pipe basically they said PVC pipe -- this is under the second page under PVC pipe says it's impervious to gasoline because there's basically not enough BTEX in the gasoline to swell the PVC and cause permeation. So the spills of benzene, toluene, and TC, now those would be the solvents. They would be isolated compounds. Those in direct contact with those solvents, that could permeate, but it would have to be the solvent itself or ground water concentrations greater than 60 percent maximum solubility.
So we actually talked to the author of the study, and he -- his results was in here -- what's in my testimony, basically gasoline is not going to cause a permeation of PVC pipe, what I learned, and the BTEX concentration in crude oil pipelines is significantly less than that in gasoline.
So, again, what I learned was that these studies are showing that something with concentrations of BTEX as well as crude oil would not be permeating PVC pipe or ductile iron.
Q. Do you know what type of pipe is used in the rural water

systems in South Dakota?
A. It would be secondhand knowledge from what I've heard. My understanding is that it's PVC pipe and ductile iron, but that wasn't firsthand knowledge.
Q. In the highlights on the web page mention that BTEX will permeate gaskets; is that right?
A. It can. It can permeate the gaskets. And so, again, having talked with the guy and reading this research, basically what he's saying is if you've got gasoline surrounding these pipes, that the gasoline can permeate through the normal gaskets that they use. But as long as the -- the recommendations of the American Water Works Association's Research Foundation is basically as long as you keep a minimum flow in there, you won't exceed the maximum contaminant level for these compounds.
If they were to stop the water, stagnate it, that was the only -- gasoline saturated ground water, that's when those could potentially pose a problem, but he said in what I read is basically this gasoline contamination surrounding the pipeline would have to be a very high-level contamination. And with BTEX concentrations in the crude oil being as low as they are, the expectation is that probably would not even be an effect. Especially, again, if you keep a minimum water flow, there would not be any issues.
They come down to the end and talk about their recommendations, and they say the gaskets that are already there

are satisfactory and other considerations, engineering considerations, other than permeation should be used to govern the material selection. They basically say that PVC pipe is suitable. And they also say -- I'm sorry. Here it is. Longstanding recommendations and practices for these pipes and gaskets in hydrocarbon contamination have been unnecessarily conservative.
Q. He also concludes on page 17 of the actual report that utilities prefer copper services in areas of known contamination, and replacement with copper was the corrective action for all reported permeation incidents involve domestic services?
A. Correct. That's for a service line, not a main distribution.
Q. Uh-huh. Okay.
A. I believe P.E. is used a lot more on service lines too.
Q. Was there any particular person that you dealt with at DENR?
A. I did not -- the people I was in charge of actually were the ones that actually consulted. I believe it was Brian Walsh and -- there was a second person that they had a conversation. I think actually a third person was brought in one conversation about the Marshall area because they wanted to make sure they got the right answer.
Q. Right answer to what?

A. We were concerned about where our pipeline was in relation to the source water areas, and we wanted to ensure these source water areas would be -- basically they were protected from a spill and that when we talked to them about these areas they talked to us about the overlying till, the depth of the actual well.

They actually went and looked at the bore logs to look at the lithology to ensure in the event of the spill again this would be low permeability soils, and the well depth was sufficient that they were comfortable where our pipeline was.

MR. RASMUSSEN: Thank you, ma'am. That's all I have.

MR. SMITH: Commissioners, do you want to proceed or take a break or forge ahead? Are you guys okay?

THE WITNESS: If we're going to go for a while, I would appreciate a break.

COMMISSIONER KOLBECK: We forgot to ask you.

THE WITNESS: I might be scooting out of here by myself then.

MR. SMITH: Are we okay with a short break? What do you want to take at this point? 10-minute break?

CHAIRMAN JOHNSON: We'll say 7 and mean 10.

MR. SMITH: All right. At this moment it is 25 to 4, if my eyesight serves me right. So about a quarter to we'll reconvene. Thank you, everyone.

(A short recess is taken)

MR. SMITH: Mr. Hohn, you have the floor.

MR. HOHN: Thank you.

CROSS-EXAMINATION

BY MR. HOHN:

Q. I have a few questions for you. On the well which you and Mr. Rasmussen were referring to as the Sunset Colony well -- it's on the first sheet of this handout you gave us today, TC 16. It's just west of MP 227?

A. Yes.

Q. How familiar are you with that well?

A. I do know some things about the general lithology in the area, the ground water movement.

Q. Do you know the depth of that well?

A. I know that was -- in the discussions that my company, ENSR, had with the South Dakota DENR, and that was part of the reason for their comfort. I don't recall what the depth was.

Q. Was that research done by others and then reported to you? Did you do it personally, or was that reported to you?

A. That was done by others and reported to me. Part of my job is to oversee their work and as a risk assessor I have to have knowledge of how -- a variety of things, including geology and aquifers and ground water movement in order to evaluate effects.

Q. On page 1 of your direct testimony you list yourself as an environmental toxicologist. Are you also a risk management assessment person?

A. I am a risk assessor. Environmental toxicologist and risk assessor.

Q. So would you be in the same league as DNV? I mean, would you say that you have the same qualifications as DNV, the risk management consulting?

A. We do different types of things. DNV specializes in pipeline risk assessment, yes, but they're doing failure analyses, spill volume assessment. They do a lot. The engineering, you know, the hydraulics, those types of things. I would say we compliment each other.

Q. Okay. Did you do any field assessment yourself from the North Dakota line to Yankton, go out in the field and do field assessment, or did you have other parties, either contract parties or employees, do that for you?

A. Both. I was in the field a little bit.

Q. A little bit. Define a little bit.

A. I was at the Yankton River crossing and the area around there.

Q. Was that in conjunction with a public meeting that was held there by the PUC?

A. No, it was not.

Q. So it was a separate visit?

A. It was a separate visit.

Q. What was the purpose of being at Yankton, that crossing, in terms of your trip?

A. We were looking at the site to determine if it was an appropriate crossing location. We were looking at the general lay of the land. You know, I was there with some engineers. They were looking at, you know, different things, and I was looking at, you know, environmental considerations.

Q. Sure. Were you specifically personally in Marshall County?

A. No, I was not.

Q. Day County?

A. No.

Q. Clark?

A. No.

Q. How many of the counties crossed by this pipeline have you personally been in?

A. Other than of the area around Yankton, that's where I've been.

Q. Yankton was the only county --

A. That's where I personally have been.

Q. Personally?

A. Yeah. Our representatives have been up and down the line.

Q. In terms of you personally as the lead environmental person or one of the lead people assessing the environmental impacts, the only county you've been in is Yankton that's crossed by this pipeline?

A. That's correct.

Q. Okay. I'm going to go through your direct testimony and

then go into the rebuttal. That way it will be easier to page through for everybody involved. And I don't have questions on a lot of it, but the things that Mr. Rasmussen brought up I'll try to not repeat with deference to Mr. White.

On page 2, item 7 in the third line of your answer, Shallow aquifers have the greatest potential, generally speaking, for sources of water. Since the pipeline would be buried at a shallow depth, it's unlikely the construction or operation of the pipeline will alter the water yield or supply used for drinking water purposes.

Are you testifying that that applies to Marshall County?

A. Yes.

Q. And how about Day County?

A. Yes.

Q. Clark?

A. Yes.

Q. Beadle?

A. Yes.

Q. Hanson?

A. Yes.

Q. I just want to make sure. Let's see. Turner, McCook?

A. I'm assuming you're going through all the counties that the pipeline crosses.

Q. And really there's no shallow water in any of those counties?

A. That's not what I'm saying.

Q. Well, let me reask the question then. Where the pipeline route goes in the counties where you personally haven't been, is there shallow water that your pipeline crosses? Yes or no?

A. Yes, there is.

Q. And what places would that be?

A. My understanding is the most -- the greatest concern is in the northwest corner of Marshall County. That's the area where the aquifers are the closest to the surface, and based on geological cross-sections plotting our line across these geological cross-sections which look at the lithology, the vast majority of the state is then covered by clays and tills that would have low permeability and prevent permeation of any spill if it were to occur.

Q. Excuse me, but we're not asking about the vast majority of the state. We're asking about the pipe route, either side of the pipe route.

A. I'm referring to the lithology --

Q. The rest of the pipe. So you're saying the shallow water not based on personal inspection but based on reports and logs and things you've seen, maybe field visits by others, you're basing your assumption that the only place there's shallow water is in Marshall County?

A. That is my -- yes.

Q. How shallow is shallow in Marshall County, based on what

you've heard from others?

A. I believe -- I think what we have said is that there's shallow and surficial aquifers in Marshall County in general. Again, a shallow aquifer would be 50 feet. And then a surficial aquifer could reach the surface.

Q. I'm looking at TC 16, and this is the map you handed out today.

A. Correct.

Q. And it's in evidence. The map, your map, your pipe is shown as a black line with MP 215, 216, that's the mile post; right?

A. It's green.

Q. I'm color blind. So black, green. The dark line with those numbers next to it.

A. That's it.

Q. So what's the source of base map that this was put on, if you know?

A. I believe it is a U.S.G.S. topographic map.

Q. So it's a Government map that's recognized in the industry as a base for this kind of purpose?

A. Yes.

Q. Okay. My eyesight is probably not as good as yours with your glasses and I don't have my bifocals with me but I can read parts of this and there's one section I want to draw your attention to.

If you look at the location near map page 227 or your first dot, the Sunset well is, and then if you go up to map 226 and 225, just straight up; right?

A. Uh-huh.

Q. Okay. Can we go one, two, three sections to the left? I assume those little squares are sections; correct?

A. Yes.

Q. What does it say in the center of that section?

A. I guess I'm on the wrong one. I don't see any writing in the one I'm looking at.

Q. Well, let's -- if you look right where we show map page 225 and then go one, two --

A. Two over?

Q. Yeah. See the one kind of lower to the left of you. What does that say there?

A. The one I have to turn sideways to read?

Q. Does that say flowing wells?

A. That's not what I was looking at.

Q. The text in blue on mine says, Flowing wells; is that correct?

A. What I'm seeing, flowing well is above 223.

Q. That's fine.

A. Okay.

Q. Is that what it says is flowing well?

A. That's what it says.

Q. Okay. Could we go one, two, three more to the left. What does that say? It's flowing well on mine. I don't know if you can read yours.

A. Can you show me?

Q. Yes. Do you want to --

A. I'd be happy to.

Q. -- step over here? We started here at Sunset. We went up two and then over, yes.

A. So flowing well. Okay.

Q. That says flowing well; right?

A. Correct.

Q. In fact, if you look at this map in this section, map 1 of 10 on T 16, there are flowing wells noted on this U.S. geological map in numerous places; is that right?

A. There is.

Q. That would indicate a shallow aquifer shallow enough that the water actually comes up out of the ground, wouldn't it?

A. Yes, it would. But there is also deeper aquifers where wells might be located out of.

Q. Okay. I guess if you look at map page 2, same question, now we're into Marshall County, Day County, the federal map we're looking at is the base map for what you use to show your pipe, it identifies flowing wells in various locations. The cluster that I'd refer your attention to would be where it says Groton on the left side of the map about halfway down one, two,

three sections up and four, there's three right there in those sections.

A. Yes. I see that.

Q. In order to have -- well, my question is that's a phenomenon of a flowing well, and I assume you've studied all of the reports on ground water in this area before you reached a conclusion, did you?

A. I would tell you that we did look at aquifers in the region. We had a hydrologist that specifically looked at these. Not specifically these wells but this whole area. Again, and we looked at the fate and transport of a crude oil spill. We didn't look at -- I can't say these three wells in particular, but we looked at mechanisms of how a hypothetical spill might affect something -- some ground water.

Q. And the conclusion? Your conclusion when you did that work?

A. The ground water in the areas along the pipeline for the vast majority of the route are protected by glacial till and clays. Again, that would have low permeability. So if a spill occurred again, it would have a hard time getting down to the aquifer.

The location of the public well source, again, we looked at those in relationship to the distances from the pipeline. And, again, if a spill were to release, how far can it be transported? So we looked at all of those different things.

With specific regard to northwest Marshall County, there is a -- again, this gets back to my direct testimony, but there is a hydraulic connection between this area and the James Aquifer, which is further over to the east.

But, again, a spill would have to happen and it would have to be traversing across the area to get to any water -- get into the James water supply -- James Aquifer water supply.

Q. When you say traversing, which direction would it have to traverse?

A. Well, the City of Britton is over to the south and east, and the ground water is moving to the north and east.

Q. And that is based on what information?

A. That is based on South Dakota U.S.G.S. data.

Q. A study of the ground water?

A. I believe it had a -- a hydrologist showed me a map that showed ground water directions through this area.

Q. And it was a U.S. geological study?

A. I'm believing it was the South Dakota Geological Service Maps.

Q. Do you know the year it was done or published?

A. I do not.

Q. I believe you've attended meetings, and if you've reviewed all the testimony you probably seen or reviewed the comments of David Wade, the manager of the rural water system at Britton?

A. Yes.

Q. Where is the City of Britton's well on this map that we're looking at, TC 16?

A. I do not have personal knowledge of where it is.

Q. Where is the BDM well on this map?

A. I don't have personal knowledge. My understanding -- well, I don't have personal knowledge.

Q. How do you know you're not impacting them?

A. It is not a source water area that is in close proximity. My understanding is that it's associated with the city of -- the town of Britton.

Again, the ground water, my understanding is it would be moving away. Again, the distance that it would have to traverse was looked at by our hydrologist. The fate and movement of this oil is unlikely to be transported any significant distance.

Q. Ma'am, I understand that you have a team of experts and technicians you work with and they gather the data, you analyze it, and then you're charged with presenting the testimony, but you're making representations here that some would question, and I guess did you personally look at that hydrology report and study it yourself?

A. I have seen it. I have a hydrologist that is very, very knowledgeable, and he has been trying to educate me so I have an understanding of it.

Q. Well, we're going to have a couple of hydrologists ourselves testifying, and will you be staying for the length of

the hearing?
A. Yes, I will.
Q. Okay. Page 5, on 17 -- and this may be repeating something Reed Rasmussen asked you, but it's got a -- the back of the question's a little different.
On that first paragraph there in 17, you're speaking about using the most frequent seven-year interval. This equates to a spill of no more than once every 41 years at any location along the 220 miles of pipeline in South Dakota.
That's your statement?
A. That's the statement.
Q. You're familiar or you heard people testify today about the tragic accident that occurred in Minnesota; correct? Did you hear that testimony?
A. Yes, I heard.
Q. Are you aware that -- have you read any of the newspapers or stories about that accident and what occurred and brought it to the point of a failure?
A. I have read articles about it on the internet.
Q. So have I. I guess the question is based on the news stories isn't it correct that there was a leak there within -- two leaks within one leak, a pinhole leak and then the failure?
A. That is not my understanding of the accident.
Q. Well, if I gave you a news clipping that said that, would you doubt it?

A. My understanding was there was a pinhole leak. They went it there to repair it, and it was -- again, this was the repair -- actually the -- again, we're getting a little bit out of my expertise, but basically when they were repairing it the failure was because of the repair itself, not because of the pinhole leak.
Q. Let me take it one step further then. The pipeline we're speaking of is the Enbridge Pipeline; is that correct?
A. I believe that would be correct.
Q. According to the previous witness, there was a failure on that pipeline also at Cohasset, Minnesota in 2003. I guess my question is, is Minnesota unlucky? Because they had two leaks within four or five years, and we're not going to have one here for once in 41 years according to you.
MR. KOENECKE: I'm going to object. This is a fishing expedition. It's based on hearsay and speculation and a number of objectionable grounds.
MR. SMITH: I think I'm going to sustain that.
MR. CURT HOHN: Okay.
Q. On page 7 on the top of item 22, second sentence in that paragraph, would you read that starting at however?
A. However, the Middle James, also known as the Brampton and Oakes Aquifers in Marshall and Brown Counties are shallow lake bed or buried channel aquifers with depth water generally less than 50 feet."

Q. Would you consider an aquifer of less than 50 feet shallow?
A. I believe that is the definition.
Q. And that -- that description would be the northeast part of Marshall County, would it not?
A. Northwest.
Q. Northwest. I'm sorry.
A. Yes.
Q. That's where your pipeline's going through; correct?
A. There is a portion of it that goes through that area.
Q. In fact, it goes through the whole west edge of Marshall County.
A. Yes. I believe that's true.
Q. On page 8, item 25 of your direct testimony, the first paragraph, could you read for us the last sentence of that first paragraph?
A. The ground water in the area is susceptible to contamination because the soils in this area are sandy (higher hydraulic capacity) and the ground water is shallow, ranging from 0 surface water to 35 below ground surface.
Q. You're referring there to the oil spill in Bemidji, Minnesota that was in 1979; is that right?
A. That is correct.
Q. So that aquifer was approximately 35 feet below the surface. The aquifer or the spill?
A. The aquifer, the ground water was 35.

Q. All right. And it was sandy soils; right?
A. Correct.
Q. Isn't that a fairly close description to what you've just described in the western part of Marshall County?
A. I believe it is.
Q. And you're putting an oil line through there.
A. Yes, we are.
Q. To your knowledge in the study that you did as an environmental scientist and the lead scientist or expert on this project, are there any farms in that area that have private wells that would draw water out of that shallow vein of sand?
A. I have no knowledge of that.
Q. Did you research that?
A. I did not.
Q. Did you check with the Department of Environment and Natural Resources to see if you can answer that question readily by some source of information?
A. I did not.
Q. Did you ask the Department of Water Rights whether they had water rights on wells, private wells in that area?
A. I did not.
Q. Is it -- so you're putting a pipeline within a mile of farm buildings and homes and Hutterite colonies and so forth; isn't that correct, livable structures?
A. Yes.

Q. Do you suppose those people might have a water source like a well, or how do they get their water? Would you assume?
A. That would be very -- that would be probable.
Q. Probable, meaning they get it from a well?
A. Yes.
Q. Page 10, item 28, in your answer, the third line down where it starts out the word "Keystone" it states that, Keystone had submitted a preliminary risk assessment and environmental consequence analysis to the Department of State.
Is that correct?
A. That's correct.
Q. Did that preliminary assessment change -- is that different than what we're looking at today I guess is what I'm saying. That must have been some months ago. That was in what, 2006?
MR. KOENECKE: I don't understand the question.
MR. HOHN: Well, let me restate the question.
Q. You submitted preliminary risk assessment and environmental consequences to the Department of State, State Department, and when was that, if you know?
A. I don't know the precise date. I want to say the -- well, I don't know the precise date.
Q. Approximate date that you did your work. Not when it was filed necessarily but when you did your work.
A. I believe there was -- I might not have the dates right, but I believe there was a preliminary assessment. I want to say

it was done like in March, and then there was a revision done in July.
Q. Of what year?
A. Of 2007.
Q. Excuse me?
A. 2007.
Q. 2007. Was anything filed in 2006 as far as you know?
A. The only thing I was hesitating before is I was trying to remember if that was March 2006 or 2007. I don't recollect. There has been two assessments that have been filed, a preliminary and then a final to the -- the final risk assessment for the Department of State.
Q. I guess the question -- those must be big deadline dates for you as a consultant working for this client just like this hearing would be so it's probably one of those things that's burned in your mind and you've blanked it out and I don't blame you, but the issue is at some point something was submitted to the State Department and now something has been submitted here to the PUC. There's been a gap of time --
A. Uh-huh.
Q. -- between those submittals. Has anything changed majorly in your assessment from the submission to the Department of State to the submission of this Commission?
MR. KOENECKE: Which submission from the Department of State?

MR. HOHN: It says that there was a preliminary risk assessment submitted to the State Department, and now there's information she's submitting to this body.
Q. My question is there was a gap of time. Has that changed from when you submitted the State Department data to what's been submitted to this body?
A. I would say, I mean, we continue to evolve and look at things. We have not updated the risk assessment, as we have discussed in multiple questions here in the rebuttal testimony and questions from everybody else. I mean, we're continually gathering data. It has not been updated.
We're really waiting for the final EIS so we would have a route, and then we can go back and do further evaluation.
Q. Okay. Thank you.
Let's move to your rebuttal testimony then. And I think I only have one. If you have more than one, we'll need to determine when it was signed. That's the first one. Okay. The one I have under item 3, your rebuttal was referenced to Dan Hannan, Bryan Murdock.
A. I see that.
Q. Is that the one you've got? Okay. I just want to make sure I have the right one. On that first page at the bottom, A, after item 4?
A. Yes.
Q. You refer to the last two sentences, Keystone will develop

and implement a risk-based integrity management system, INP.
When is that done? When is that completed as far as you know?
A. I would defer most of those questions back to Meera Kothari, but my understanding is that it needs to be in operation prior to the -- prior to the operation of the pipeline.
Q. This is your rebuttal testimony; right?
A. Uh-huh.
Q. So if you put it in writing and stated it, you wouldn't know the answer to that?
A. You're asking me for the precise time line of when Keystone is planning on doing that.
Q. Well, you made a statement that this risk-based integrity management program will be developed.
A. Yeah. They are required to by federal regulations.
Q. But you don't know exactly when?
A. I believe it is -- again I think -- no. I don't want to provide a date because I don't --
Q. Okay. And the methodology to assess and mitigate risks associated with all pipeline segments includes HCAs; right? Next page.
A. Yes. That's what it says.
Q. Page 2, if you go to the top of the page and look to the last sentence or two of that statement, if you want to just take

a minute to look at it, I want to ask you a question.
A. The first paragraph, last couple sentences?
Q. Top of page 2 four lines down where it says, As Keystone collects. If you want to just read that, and I'll ask you a question.
(Witness examines document)
A. Yes.
Q. I guess the question is this: How preliminary is the environmental information? Your Applicant that you work for is asking this Commission to grant a permit to build a 30-inch oil line, which is maybe not unusual for some areas, but for us it's unusual. How preliminary --
MR. KOENECKE: He continues to testify in his question. I object to that. Just ask the question.
Q. The question is this: How preliminary is the information at this point when your Applicant is asking for a permit to build?
A. I would say that having been involved with a number of different pipeline projects, the stage that Keystone is at is far beyond anything I have ever experienced. So I would say they're well beyond the norm for this stage of the process.
Q. On page 5 -- excuse me, page 2, item 5, Mr. Hannan's -- you're responding to Mr. Hannan who's an expert for the State.
A. Yes.
Q. In that answer one, two -- I guess it would be two lines

over to the right. Downstream proximity criteria. Distance selected for the preliminary risk assessment was 5 miles.
Mr. Hannan had a different number, offered a different number; is that correct?
A. Yes, he did.
Q. What was his number?
A. I believe my recollection was 20.
Q. 20. And what does that mean in terms of what he's saying and what you're saying? What does that mean? What are you saying? What's the difference between the two of you?
A. Well, I'm evaluating 5 miles downstream, and he's evaluating if a spill got into a flowing stream channel he wanted it evaluated to 20 miles. And it would be based -- ultimately it will be based on stream flow velocity and expected emergency response times.
Q. Okay. So he's saying he thinks it's 20 miles that the Applicant would need to respond to, you're saying 5?
A. I'm saying we use 5 miles as a preliminary assessment tool simply -- well, one of the reasons we used that is some of these streams are intermittent. Some of them are perennial. As a good rule of thumb it was just a distance we could look at to get a -- again, for NEPA processes and for these type of processes we're trying to show a range of a potential of effects.
Q. And the factor that's going to determine which of you are

right is the amount of water that might flow down a creek at any given time. Is that a good example or -- that's a question.
A. It will be a stream -- again, repeating what I just said, it will be the stream flow velocity, the presence of water in intermittent stream and the reaction capabilities of the emergency response team.
So, again, we'll have to be working back and forth with the emergency response team. Because to tell you the truth, it's not going to be probably a set distance. It's going to be working back and forth with the emergency response team saying, you know, this is the distance in these areas based on stream flow and, again, emergency response times.
Q. And so the coordinated effort would be you would try to -- based on what you've stated in your rebuttal or what Mr. Hannan had in his testimony you would develop a plan that would estimate where you would -- what locations you would try to catch this spill and contain it?
Is that what the objective is?
A. That would not be my job. I would be working in coordination with their emergency response team.
Q. But the overall objective of whoever all's working on it is to try to stop it before it goes too far? You're trying to catch the spill before moving?
A. Yeah. The idea would be to contain it as quickly as possible.

Q. Okay. Are you familiar with the elevations of the coteau hills through Marshall County?
A. I am familiar with the general topography.
Q. And this map, TC 16, stops at Britton. So you don't necessarily see the coteau in that map 1, do you, except in the very lower right corner, elevation change.
A. That would be correct.
Q. Can we go to the second page. And if you look at map page 2, what are we seeing in the lower sort of right-hand corner of that map?
A. That is the area you're referring to.
Q. The coteau?
A. Yeah.
Q. Which is a higher elevation than where your pipe is routed?
A. Yes.
Q. Do you know how much higher it is on average through those various -- I mean, what's the range? What's the highest elevation the coteau contributes to elevation in terms of draining through your area?
A. I would have to go through and look at the topography and look at the topo lines to determine that.
Q. Okay. Could we go to map page 3. We're just going down through your exhibit.
A. Yep.
Q. And the pipe now with all the MPs next to it is close to

the elevation there, isn't it, the elevation change?
A. It's close to the base of the foot of this, yes.
Q. That elevation change is higher than where the pipe is. You would assume?
A. That's my understanding, yes.
Q. Have you looked closely at any of these elevation changes before this?
A. I'm aware of this, yes.
Q. Okay. So I guess my question is all along here you'll see blue lines that indicate creeks and streams; correct?
A. Correct.
Q. Is it fair to say that the coteau is providing the water for those creeks and streams and the drop in elevation?
A. I would say runoff from the coteau.
Q. So the runoff of all of those blue lines across your black line, that's a point where a creek and stream is crossing the pipe multiple times in these three maps we looked at?
A. Yes.
Q. If there's a leak on the line, the pipeline?
A. Uh-huh.
Q. Anywhere along where one of those creeks or streams crosses, it has the potential for moving the water, drainage would have a potential for moving the oil, wouldn't it?
A. If the intermittent stream were flowing at the time and if the spill were large enough to get into the stream channel.

Q. Okay. Now if the oil leaks out of the pipe, and you're saying it won't go far, it sort of contains itself, it stays near the pipe, let's say that happened in November and in the spring there's a heavy snowpack in these hills and the creek starts running.
Can that move later as a delayed movement?
A. You're assuming that, again, a spill would occur. A spill would not be detected and remain there.
Q. Yes.
A. So those are your assumptions.
Q. Yes.
A. Could it then be mobilized if -- again, I would suggest that much of this may be in the trench. Anything that was above the surface might be mobilized by melt and runoff, yes.
Q. Because your pipe will cross these creeks, won't it?
A. Yes, it will. There would also be the opportunity for -- I would suggest also opportunity for detection by aerial patrol and those things too.
Q. I understand.
A. Okay.
Q. We can move on to just a couple of others that I have. On page 5 of item 10 again you're talking about HCA, and I'm not going to get into the super secrecy of HCA, but I just want to ask when you get in that last -- in your answer one, two, three, fourth line down -- or third line down, I'm sorry.

Keystone is responsible for considering the specific circumstances of their pipeline in the vicinity of HCAs and determining the analytical assumptions that are appropriate?
Did I read that right?
A. That is what it says.
Q. So you have the responsibility and apparently the authority to make that judgment?
A. We -- again --
MR. KOENECKE: I object. There's no foundation for her to determine the authority.
MR. HOHN: Well, she says they're responsible, and determining the analytical assumptions that are appropriate. So the pipeline does that on their own. And that's a question.
MR. SMITH: I guess I don't know whether it is or not. Do you know the answer to that?
THE WITNESS: I will tell you that that verbiage I believe is taken verbatim out of the Q and A frequently asked questions on the OPS integrity management website. I believe that's where it came from.
Q. Okay. Well, on the bottom of page 5 then just to follow up with that, read that last sentence for me, would you. My voice is kind of drying out here.
A. The last sentence of that paragraph starting "Keystone will"?
Q. Yes?

A. Keystone will incorporate streams, flow rates, and terrain to assure the analysis is reasonably conservative.
Is that the one you wanted read?
Q. And the rest of it.
A. PHMSA may review the technical basis for these assumptions during the integrity management inspections.
Q. Your environmental analysis looking at all of these creeks and just on these two pages they look like there's hundreds of them.
Did you analyze the flow on all of those to determine --
MR. KOENECKE: I do insist, Mr. Hearing Examiner, the testimony that's being offered during these questions really does need to stop. Let's have a question and not a -- we didn't need to hear there's been hundreds of streams. I don't know that that's been testified to anywhere today.
MR. HOHN: I'm looking at your exhibit.
MR. KOENECKE: When you're on the stand you'll have a chance to testify.
MR. HOHN: I understand.
Q. Heidi, would you look at page 1, 2, and 3.
MR. SMITH: I will sustain the objection in terms of the characterization of hundreds, but you may ask the question with respect to streams.
Q. Heidi, we've been looking at map pages 1, 2, and 3. I'm not going to ask you to estimate the number of creeks, but would

it be fair to say that there are a number of creeks on these three pages?

A. There are a number of creeks on these pages.

Q. And have these three pages, not the whole 220-mile route because if we looked at the rest of the map we might see something similar, but just these three.

In your analysis as the environmental agent or officer looking at this, expert, did you have the quantities of water coming down all of those creeks as you looked at the possible impact if there was an oil spill in this area?

A. Again, many of those would be intermittent streams so there probably isn't flow rate information available for many of those and -- yes.

Q. An intermittent stream can still create enough volume to create an issue near your line; is that correct?

A. That is correct.

Q. Page 6, under item 12, you're refuting or responding to rebutting the testimony of David Wade; is that correct?

A. That is correct.

Q. And he's the manager of the rural water system BDM Rural Water?

A. That is correct.

Q. And in your statement you said, Mr. Wade states that the right of way would pass -- does serve a recharge area for the -- serve as a recharge area for the James Aquifer. That's what he

stated and you're restating; is that right?

A. Yeah. That's what it says.

Q. Okay. Do you disagree with his assessment of how the aquifer that he manages and uses for a water source is recharged?

MR. KOENECKE: I object. Where is the testimony that he uses that for a water source?

MR. HOHN: She's responding to his testimony. She's rebutting his testimony is what I think she's doing in this statement.

MR. KOENECKE: There's no foundation for this question.

MR. HOHN: Well, let me back up and give you foundation.

Q. You reviewed David Wade's testimony; correct?

A. Yes.

Q. And what did Mr. Wade say about how his aquifer is recharged?

A. I would have to go and look through his testimony.

Q. I know it's been a while maybe since you looked at it. But based on what you've stated here in this paragraph, if you want to take a moment to read it, he's saying one thing and you're saying another; isn't that correct?

A. I think he's speaking in generalities, and I think what we're saying is where this pipeline is located having looked at

the location of it based on geological cross-sections, we have a more -- I guess he was looking at it as kind of macro level. We actually looked at that time here's our pipeline, let's look at the lithology, and this was the conclusion we reached.

Q. So yours is looking at it on that 100-foot corridor, your assessment, and he's looking at the overall system?

A. I think he's saying this is where it's coming from and what we're saying is that is the case but here's where we are based on the lithology and this is where we're talking about -- the subsequent testimony falls based on the -- again, the geological cross-sections that were looked at.

Q. Okay. Page 8 of your rebuttal. I guess it's the fourth paragraph down starting out with the words, "In summary."

A. Yes.

Q. Would you read that and then I want to ask you a question.

COMMISSIONER KOLBECK: Could she please not. I've read the testimony. I'm sorry. I don't understand -- why does she have to read her own testimony again?

MR. HOHN: All right.

Q. You've got a summary that states the outlying water supply pipes are not anticipated to be impacted; is that right, even if a spill near the water mains were to occur?

A. Correct.

Q. Based on -- what was your basis for that?

A. The previous several paragraphs in my analysis, my reading

of the research that was done by AWWA and my discussions with James Gaunt, the lead researcher of that project, that research group.

Q. Okay. The exhibit that's attached to this rebuttal. The American Water Works analysis, you have it there in front of you?

A. Yes.

Q. Did this study look at the effects of tar sands oil on plastic pipe?

A. No, it did not.

Q. And what petroleum products was it analyzing?

A. It was looking at gasoline, benzene, toluene, and TCE. Now with the exception of TCE, those are all compounds -- or the base compounds that he was concerned with are, again, the BTEX compounds which we talked about before, and it was looking at how fast those compounds would traverse into the PVC pipe and other types of pipe. And I did ask Mr. /TKPWAUPBT about the crude oil.

Q. Sure. And I think you stated earlier and it states in the report, this study, that if lines are kept flowing, if the water can be kept flowing in the plastic pipe --

A. Uh-huh.

Q. -- you can stay below the level of toxicity that is not allowed in water systems; is that correct?

A. It is below the MCL. It's not a toxicity value. It's a

drinking water standard.
Q. And the MCL, MCL means what?
A. Maximum contaminant level.
Q. Maximum contaminant level as long as you keep the water flowing?
A. It says with a minimal average flow, yeah, you can maintain -- assuming again -- so this is -- these pipes -- with the minimum average flow in heavily contaminated areas you can still maintain it below the BTEX MCL.
Q. Did you speak with Mr. Wade or any rural water system about whether they have lines that go stagnant at times?
A. I did not.
Q. If a water line, a service line to a home, was not being used at night, let's say from 10 p.m. to 6 in the morning, would that be stagnant, no water moving?
A. Yes, it would. But we're not -- this study again was talking about gasoline-saturated ground water. You know, again, we're talking about crude oil, which has a lot lower BTEX compound, which would not have nearly the impact.
Q. I understand. You submitted this as an exhibit; right?
A. Okay. That's fine.
Q. And what it's saying then essentially is if there's a line that goes stagnant and doesn't flow for a length of time, you can have a problem with that, it can penetrate the pipe and exceed the MCL? Is that what it's saying?

A. I think he's saying they had an eight-hour stagnation in the saturated ground water is the example they mentioned for gasketed pipe.
Q. Okay. I just had one last question on this, and maybe in the future there will be more. But I'm looking at the report you gave us, and I'm looking at page 5,000 of the study itself.
A. Yes.
Q. The initial document we were looking at was a summary?
A. No. It isn't. It is -- that summary page is the AWWRF has basically done a number of research studies of which this is one study. And this is the -- so they're coming out with a kind of overall summary document to provide guidance to water users.
Q. Okay. And this would be --
A. This is a key one of these.
Q. And this is the -- then we're into a full -- there's a full report near the end; right? Or attached. It isn't numbered but --
A. This is the -- this is one of their research papers, yes.
Q. So what I see is page 1, and at the top it says, Performance of plastic pipes.
A. Yep.
Q. So that's a full paper, a full report; right?
A. That is -- yeah. That is one of the papers, yeah.
Q. Okay. Could you go to page 9. There are two charts on that page. Two tables. What is that showing both for toluene

and TCE?
A. Let me just read through this. I just want to make sure I get this right for you.
Q. Sure.
(Witness examines document)
A. My understanding of this is this is basically showing permeation rates through PVC pipe for pure solutions of toluene and TCE.
Q. Okay. And then could you go to the next page, 10. And there is another graphic figure, 11, penetration distance.
Based on your review of this document, what do you think they're showing there?
A. They're showing how pure solvents can have a moving front through PVC pipe.
Q. Okay. And then the next page, 11, these all tie together. They tie with the wall thickness and in effect -- what are they showing there as far as you can tell in the summary on figure 11?
A. Figure 11 or page 11?
Q. Page 11, figure 12. I'm sorry.
A. Yeah. What that's showing is the movement, the moving front of toluene through PVC pipe when it is exposed to a pure concentration of toluene.
Q. Okay. I think that's -- yeah. Just let me check one last item here. Page 16 is three charts, and it relates to the same

issue. Figure 16, page 16, thickness of swollen layer for a 1-inch PVC pipe.
Based on your review of this document, what's being shown there?
A. This again is showing the distance of the moving front so how thick it is over time for 1-inch PVC pipe to solutions of either one of these compounds, toluene, benzene, or TCE in a saturated aqueous solution.
MR. HOHN: Okay. Thank you.
MR. SMITH: Staff? Other Interveners? Pardon me. Mr. Miller.

CROSS-EXAMINATION

BY MR. MILLER:
Q. I just have a couple of questions here. Ms. Tillquist, you said that you've been working with the PHMSA database for several years; is that correct?
A. Yes. Off and on, yes.
Q. And you stated that my analysis regarding my exhibits is incorrect?
A. I -- what I'm suggesting is that what you said -- the way you had presented it as that it incorporated data, what you had done was presented a summary -- used the summary data which was a portion of the PHMSA database.
Q. Okay. Now in your direct testimony you listed the average spill from the PHMSA database as 12 barrels; is that correct?

A. That's correct. And I corrected that at the beginning of today.
Q. Okay. And that correction was to what?
A. Went back to the surrebuttal testimony.
Q. Yes.
A. Do you want me to go through that table?
Q. Well, I guess I could -- you stated it was 287 barrels?
A. I believe the mean was 287, and the median is 3.
Q. Okay. So you changed it from 12 barrels to 287 barrels?
A. I would suggest that both values are appropriate for measures of average central tendencies.
Q. And how would the 12 barrels be correct?
A. It was not correct. That's why we fixed it.
Q. Okay. So when you said you meant both values, what did you mean by both values --
A. The table that we presented --
Q. Oh, okay.
A. -- presents both of those.

MR. MILLER: Okay. All right. I do have some other things, but I think they would be addressed under my own testimony so I have no further questions.

MR. SMITH: Okay. Thank you.

Staff, do you have any questions of Ms. Tillquist?

MS. SEMMLER: I do.

CROSS-EXAMINATION

BY MS. SEMMLER:

Q. Looking at your direct testimony on page 7, it's question number 22 in your answer --
A. Let me catch up to you.
Q. I'm sorry.
A. That's all right. Page 7, 22. Okay.
Q. Yep. You indicate a length of miles where you identified sandy soils. Just wondering how you estimated those particular miles? And I believe you did correct that number maybe. But just wondering your --
A. I'm not sure of the date source for those surface soils, how they came up with them. I'm not sure what the precise data source is. We could find that out for you, if you'd like.
Q. If you could find out.

THE WITNESS: Can you guys write that down for me, please.

MS. SEMMLER: And I have nothing further. Thank you.

MR. SMITH: Commissioner questions of Ms. Tillquist?

CHAIRMAN JOHNSON: Thank you, Mr. Smith.

We've heard you speak a little bit about the Bemidji oil spill today. You note in your direct testimony that over 20 years the BTEX had moved a total of 170 yards from the crude oil source.

Were there any other dissolved components or dissolved

constituents that went further than that? Do you know?

THE WITNESS: No. I don't know for certain, but typically benzene -- BTEX compounds are the most soluble, and they have the greatest mobility. That's typically why they're watching them.

CHAIRMAN JOHNSON: Page 9 of your testimony you note that with regard to photo 3, you corrected it to photo 3, and I'm looking about two-thirds of the way down the page here.

THE WITNESS: Uh-huh.

CHAIRMAN JOHNSON: If that area were to be actively remediated. Were there not requirements for all areas affected by that Bemidji spill to be remediated?

THE WITNESS: I'm not sure if I can answer that.

CHAIRMAN JOHNSON: Well, and I didn't lay any foundation for it.

THE WITNESS: Were there any requirements that -- I don't know. I don't have an answer.

CHAIRMAN JOHNSON: Okay. Do you know other than the environmental effects that you describe in your testimony with regard to Bemidji, do you know of any other effects in regards to humans or livestock or contamination of community water systems?

THE WITNESS: Bemidji was -- it's a state forest. One of the reasons they were looking at natural tenuation and things at the time this occurred it was not known that natural

tenuation worked as well as it did. And one of the reasons they didn't do a lot of stuff there is there was no immediate receptors in the area.

There is a lake that's -- I don't have these precise distances, but the ground water is moving towards that lake so they are monitoring that. But it was the absence of receptors that caused them to take the level of action that they did. Then the U.S.G.S. got involved and was monitoring it to see what was going on. So it's still an ongoing process.

CHAIRMAN JOHNSON: On the projects that you've worked on in your professional experience how typical has it been for pipelines to pass underneath streams or creeks?

THE WITNESS: It happens all the time. There's thousands and thousands of miles of pipe throughout the country. You can't route a pipe without crossing streams, perennial streams, intermittent streams, wetlands. You can't do it.

CHAIRMAN JOHNSON: Are there topographic or geological issues that play in Marshall or Day County that are unique or that you haven't seen in other projects that you've worked on?

THE WITNESS: No. Not at all. The areas that we're looking at -- no, they are not unique.

CHAIRMAN JOHNSON: Okay. That's all I have right now.

MR. SMITH: Other Commissioner questions?

COMMISSIONER KOLBECK: Yes. When you stated that oil is lighter than water, and the oil would actually come to the

surface, say it wasn't an aquifer or anything, it's always going to stay on the top of that water; is that correct?

Is there any situation where the oil would continue to dilute over time and contaminate an entire aquifer, or would it actually stay on the top?

THE WITNESS: In an aquifer what you'll have, again, is the oils floating at the surface. You've got the dissolved constituents. As the volume of oil decreases because of the loss of these lighter weight constituents, the residual oil that's there does become heavier.

There may be some over -- and now we're talking long periods of time. There may be some downward migration of the oil with time.

COMMISSIONER KOLBECK: Decades? Years?

THE WITNESS: Decades.

COMMISSIONER KOLBECK: Could you explain to me the -- 90 percent of the spills are how many barrels in the last -- could you explain that to me again?

THE WITNESS: Looking at the PHMSA database from 2002 to now, the 90 percent -- so it's kind of a cumulative probability curve. 90 percent of the spills recorded in that time period were 300 barrels or less.

COMMISSIONER KOLBECK: Okay. Okay. And this is where I think I got pretty confused here. Is the intake of a rural water system an HCA?

THE WITNESS: The intake for where they would get their water possibly could be. It's the intake that would be the protected area.

COMMISSIONER KOLBECK: Protected area.

THE WITNESS: It could be -- again, I'd have to look at the definition and see if it qualified based on the number of people and all of that, but my understanding, it is sufficient size. So the intake, where they got the water from, if it was surface water because that's where HCA would come into play -- so the surface water intake for a community water supply would be the HCA.

COMMISSIONER KOLBECK: Okay. And are -- wells on a farm is not considered a public water system, is it?

THE WITNESS: Correct.

COMMISSIONER KOLBECK: And then is a leak any spill? A drop? What constitutes actually a leak? For your studies in the environmental or risk assessment what constitutes a leak?

THE WITNESS: I guess the PHMSA database has certain reporting criteria. But, you know, I know Keystone considers -- I think Ms. Kothari said that any leak is what they're --

COMMISSIONER KOLBECK: Any time oil touches the ground it's a leak?

THE WITNESS: That's what they're reporting.

COMMISSIONER KOLBECK: Do you consider the South Dakota DENR a good source for the water sources compared

to other states that you've worked with, North Dakota, South Dakota, Nebraska?

THE WITNESS: Yes.

COMMISSIONER KOLBECK: Our state is very comparable? Our DENR is very comparable?

THE WITNESS: I would say, yes.

COMMISSIONER KOLBECK: If it wasn't, what measures would you take? I guess I'm looking for something above and beyond that TransCanada would do to protect South Dakota water.

THE WITNESS: Well, I think part of the federal regulations state that basically if TransCanada, you know, Keystone is aware of an area that would qualify as an HCA whether or not it was designated by South Dakota or whatever state they're in, it's their responsibility to incorporate that as an HCA into their integrity management plan within one year of that knowledge.

COMMISSIONER KOLBECK: All right. Thank you.

MR. SMITH: Commissioner Hanson.

COMMISSIONER HANSON: Thank you. Good afternoon. I think I just have about three or four questions. The first is on page 10 on paragraph 28 you gave an answer at the very beginning. You said pipelines are the safest, most reliable, and most efficient mode of transporting large volumes of crude oil.

With a previous witness I had asked for specific

information if it was available, and now I see it in your testimony. Do you have statistical information?

Not that I am questioning your expertise, but I'm certainly interested in seeing --

THE WITNESS: I think there's been quite a few groups that have looked at it. There's AOPL has a website that talks about that. I think PHMSA's website talks about it. I believe the National Transportation Safety Board probably has information on that. And there's a very really well done -- article done by the Allegro Energy Group that looked at that as well.

COMMISSIONER HANSON: Could you provide this Commission with that information? I would appreciate that very much.

MR. KOENECKE: Based on your previous request, Commissioner.

COMMISSIONER HANSON: It's in the works?

MR. KOENECKE: It is.

COMMISSIONER HANSON: All right. Thank you. Do you have experience with mitigation?

THE WITNESS: Some. It depends on I guess -- go ahead with your question.

COMMISSIONER HANSON: Well, your testimony somewhat skirts around and weaves through some of the challenges of a spill certainly and potentially that a failure would need to be

mitigated. And I have experience with two -- unfortunately, as an elected official two completely different types of failures, one of which was a gasoline, very large volume of gasoline. The other was oil, and it was still a large quantity but not huge. They were both mitigated completely differently.

THE WITNESS: Remediated? Is that what you're looking for?

COMMISSIONER HANSON: I'll say remediated because we still have wells that are examining the flow of the gasoline in the water supply.

THE WITNESS: Uh-huh.

COMMISSIONER HANSON: Although the oil was simply -- this oil was turned and aerated, a large volume, but some of it was taken away, but most of it was aerated.

Do you have enough familiarity with mitigation that you would know what would be done in a situation of this nature? I know we have information on that, but I'm curious from your standpoint.

THE WITNESS: You know, I'm not a -- I'm familiar with it, but that's not my expertise. I believe Brian Thomas who's coming up next maybe will talk more about it. But that's not my area of expertise.

COMMISSIONER HANSON: I appreciate your answering that way. I just wanted to see if I could --

THE WITNESS: I'd answer if I could.

COMMISSIONER HANSON: -- get some information. You had also testified that Lewis & Clark promoters were aware of the other petroleum pipeline crossings when they pursued the intake and that it was an acceptable risk to them. I believe you stated in the placement of their intake -- excuse me, they were aware of other crossings -- if I said other intakes -- other crossings when they chose the location for their intake.

Did you have any discussions with any of the Lewis & Clark folks?

THE WITNESS: Yeah. Perhaps I wasn't -- misspoke. They would -- I'm assuming they would have knowledge that those pipelines were there, that they would be upstream. I did not talk to them, but one would presume they'd be looking at those types of factors. But I did not talk to them. Those pipelines have been around for decades.

COMMISSIONER HANSON: All right. But could not there have also been a situation where there was no other place to go for water and so they had to go there for water?

THE WITNESS: Possibly. I don't know the answer to that.

COMMISSIONER HANSON: Okay. Thank you. Your first correction you made I missed as we were making the changes, and if it's not too inconvenient for you, rather than waiting -- I suppose one of my compatriots here could help me with that.

THE WITNESS: Page 6 of my direct testimony, item 20,

the third line from the bottom we talk about spill sizes. And all I would do is refer you as a correction back to my surrebuttal testimony, page 2, Table 1, and that provides statistics on spill volumes.

COMMISSIONER HANSON: Thank you very much. Appreciate that. That's all the questions I have.

MR. SMITH: Other Commissioner questions?

If not, I have a few for you, if I may.

THE WITNESS: Okay.

MR. SMITH: Turning to page 2 of your direct testimony, item 7. Mr. Hohn asked you some questions about that couple of paragraphs there.

THE WITNESS: Uh-huh.

MR. SMITH: And in the impression at least I got from his questions was he was attempting to imply that your testimony there related to water quality issues, somehow related to leaks or spills.

And my understanding of your testimony in those paragraphs, that these relate to hydrologic impacts from the pipeline and from, in particular, pipeline construction and then the existence of the pipeline within that shallow aquifer. At least Paragraph 1.

Is my understanding wrong?

THE WITNESS: You know, I think, we talked about the construction of the pipeline, the construction or its

presentation, the operation, would not alter water yield. So that's talking about the hydrology, and, yeah, we're not necessarily talking about -- we're not talking about the spill effects to that, not water quality issues.

MR. SMITH: This is just talking here about effects upon the actual ability of the aquifer to yield water.

THE WITNESS: Correct.

MR. SMITH: Okay. In the second paragraph there, there we're just talking about the kind of incidental construction things such as a leak from a fuel tank during the construction project.

THE WITNESS: That's right. That's during construction.

MR. SMITH: Thank you. Now going to the flowing well issue -- and I take it -- do you have any background at all in hydrology?

THE WITNESS: Minimal.

MR. SMITH: Minimal?

THE WITNESS: Yes.

MR. SMITH: Are you familiar with the term hydrostatic pressure or hydrostatic head?

THE WITNESS: Yes.

MR. SMITH: And would you explain what that is?

THE WITNESS: It is the pressure from the water. So for a flowing well the pressure would be forcing the water out

of the flowing well.
MR. SMITH: So by definition in order for a well to be flowing it must have -- be under a condition of hydrostatic pressure?
THE WITNESS: That was my understanding, yes.
MR. SMITH: Can that happen in an area where the water formation is right at the surface?
THE WITNESS: That would -- I don't understand how that could happen. My understanding is that it would probably be -- the pressure would become -- the water being present at pressure under depth.
MR. SMITH: And that requires there to be some form of gradient that pushes water within a confining layer in order to pressurize it.
THE WITNESS: That would be my understanding.
MR. SMITH: Did you have any -- did you have an occasion during your review of the hydrology analyses to take a look at those formations in this vicinity or in the pipeline in general that function under hydrostatic pressure?
Are you familiar with what those are?
THE WITNESS: I did not. I'm sorry.
MR. SMITH: Okay. Thank you.
With respect to -- you know, Mr. Hohn asked the questions about the presence of the coteau to the east of the town of Britton and really along much of the pipeline route at

least in the northern vicinity.
And that coteau is a feature that defines the upper end of the surficial gradient; right, in the project area?
THE WITNESS: Uh-huh.
MR. SMITH: And because of that, water flows from east to west throughout the entire area that we're talking about here.
THE WITNESS: I think that is correct, yes.
MR. SMITH: And is that the reason why in your rebuttal testimony and in discussing Mr. Wade and BDM and their particular water source, that whole phenomenon, is that why you made your determination that the risk to his particular wellhead is insignificant?
THE WITNESS: I believe that is coupled with the depth of the clay and till also in the area.
MR. SMITH: In looking at the data from -- and maybe there will be other witnesses that will deal with this, but in looking at these studies with the South Dakota Geological Survey, did your people have occasion to review the studies on the permeability characteristics of unoxidized till that occur in South Dakota?
THE WITNESS: Yes, they did.
MR. SMITH: And how would you characterize the results of those studies?
THE WITNESS: Unoxidized till is highly impermeable is

how it was described to me.
MR. SMITH: And in terms of the flow down from the coteau area or any other flow gradient, I guess, if you know -- if you don't then don't answer -- but does a particular -- a gradient across a particular reach of stream necessarily affect the velocity of that stream throughout the entire length of the stream?
THE WITNESS: I would think the gradient would affect it at that particular location.
MR. SMITH: I guess an example would be does the fact that an Arkansas River coming out of the Rocky --
(Discussion off the record)
(A short recess is taken)
MR. SMITH: We're going to reconvene, and I was in the process of asking you a question about the effect of gradient on areas that are significantly downstream. And I think I'm going to withdraw that. I think I was maybe -- maybe Arkansas is a little far from -- and so with that, I'll turn it over for redirect.
MR. KOENECKE: Thank you, Mr. Smith. We have no redirect.
MR. RASMUSSEN: Nothing further.
MR. SMITH: You're excused and may step down.
THE WITNESS: Thank you.
(The witness is excused)

CHAIRMAN JOHNSON: I'm glad we took that break.
MR. SMITH: Maybe it will let us regroup a little bit. I think maybe now we need to talk logistics a little bit, guys. Unless we're going to -- I'm assuming that Brian Thomas is going to be --
(Discussion off the record)
MR. SMITH: Due to witness conflicts and the fact that we didn't quite achieve as much in the last two days as we thought, the Applicant's case in chief, particularly the testimony of Brian Thomas, will commence tomorrow morning at 8:30. Tomorrow morning. Are we all on the same page with that?
And then we have individual Intervener testimony scheduled throughout much of the rest of the day. And either if we get time tomorrow, we have one witness for the staff, Brenda Winkler, who if we get available time tomorrow, we will attempt to take her tomorrow, and if we can't, then we will have to move her over to Thursday morning as she has a scheduling conflict.
And then the DENR folks and State witnesses have agreed that they're amenable to moving their appearances here back.
Is that a fair recitation?
MR. RASMUSSEN: I believe so.
MR. KOENECKE: Yes. Thank you.

MR. SMITH: Okay. With that, we will stand adjourned until 8:30 tomorrow morning. And thank you all.

(The proceedings are in recess at 5:30 p.m.)

STATE OF SOUTH DAKOTA)
:SS CERTIFICATE
COUNTY OF HUGHES)

I, CHERI MCCOMSEY WITTLER, a Registered Professional Reporter, Certified Realtime Reporter, and Notary Public in and for the State of South Dakota:

DO HEREBY CERTIFY that as the duly-appointed shorthand reporter, I took in shorthand the proceedings had in the above-entitled matter on the 4th day of December 2007, and that the attached is a true and correct transcription of the proceedings so taken.

Dated at Pierre, South Dakota this 2nd day of January 2008.

Cheri McComsey Wittler,
Notary Public
Registered Professional Reporter
Certified Realtime Reporter

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