

STATE OF NORTH DAKOTA
PUBLIC SERVICE COMMISSION

TransCanada Keystone Pipeline, : Case No.
LP, 30-Inch Oil Pipeline/ : PU-06-421
Cavalier to Sargent Counties :
Siting Application :

TRANSCRIPT OF
CONTINUED HEARING
(VOLUME IV)

Taken At
State Capitol
Bismarck, North Dakota
November 27 & 28, 2007

BEFORE THE HON. AL WAHL
-- ADMINISTRATIVE LAW JUDGE --

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COMMISSIONERS PRESENT:

COMMISSIONER SUSAN E. WEFALD, President
COMMISSIONER TONY CLARK
COMMISSIONER KEVIN CRAMER

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A P P E A R A N C E S (Continued)

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COMMISSION.

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1 (The following proceedings were had and
2 made of record herein, commencing at 8:06 a.m.,
3 Wednesday, the 28th day of November, 2007:)

4 JUDGE WAHL: The record will show that it
5 is a little after eight o'clock a.m. on November
6 28, 2007. This is day two of the further hearing
7 of an application of TransCanada Keystone Pipeline
8 for a waiver of time procedures and schedules and
9 consolidated applications for a certificate of
10 corridor compatibility and route permit for the
11 Keystone Pipeline. This is the North Dakota Public
12 Service Commission Case No. PU-06-41.

13 The record will further show that I am Al
14 Wahl, the administrative law judge, designated by
15 the Office of Administrative Hearings to act as the
16 hearing officer for the conduct of this hearing.

17 The record will show that the
18 commissioners are all present, Commission President
19 Susan Wefald, Commissioner Tony Clark, and
20 Commissioner Kevin Cramer.

21 TransCanada Keystone is present by
22 counsel. The intervenor, City of Fargo, is present
23 by counsel. All other intervenors are present by
24 counsel, and the Commission is represented by its
25 chief counsel and its staff for the further

1 hearing.

2 Before proceeding with this further
3 hearing, I'll ask the Commissioners for any
4 comments and directions. Commission President
5 Susan Wefald.

6 COMMISSIONER WEFALD: Good morning.
7 Looking forward to another good day of testimony.

8 JUDGE WAHL: Commissioner Clark.

9 COMMISSIONER CLARK: Just welcome. Good
10 morning.

11 JUDGE WAHL: And Commissioner Cramer.

12 COMMISSIONER CRAMER: Good morning.
13 Welcome, everyone.

14 JUDGE WAHL: Counsel, are there any
15 preliminary matters?

16 MR. JOHNSON: Just one housekeeping, Your
17 Honor.

18 JUDGE WAHL: Mr. Johnson.

19 MR. JOHNSON: Again, a housekeeping
20 matter. If you recall during the testimony
21 yesterday -- I won't even go over there and get
22 it -- we offered and it was received, Exhibit 13,
23 with the understanding that the large format would
24 be replaced with an 8-and-a-half-by-11. I've
25 presented that to Judge Wahl and copies to counsel

1 and to the Commissioners and just wanted to make a
2 record that we had done that replacement.

3 JUDGE WAHL: The exhibit has been
4 received. Any further preliminary matters? Mr.
5 Kelsch?

6 MR. KELSCH: No, Your Honor.

7 JUDGE WAHL: Ms. Linderman?

8 MS. LINDERMAN: No.

9 JUDGE WAHL: Mr. Binek?

10 MR. BINEK: No.

11 JUDGE WAHL: All right. Mr. Kelsch, when
12 you're ready.

13 MR. KELSCH: I would call as a rebuttal
14 witness Heidi Tillquist.

15 JUDGE WAHL: Ms. Tillquist, I have
16 personal knowledge that you are informed regarding
17 perjury.

18 (Witness sworn.)

19 JUDGE WAHL: Mr. Kelsch.

20 MR. KELSCH: Thank you, Your Honor.

21 **HEIDI TILLQUIST,**

22 having been first duly sworn, was examined and
23 testified as follows:

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DIRECT EXAMINATION

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BY MR. KELSCH:

Q. Ms. Tillquist, could you please state your name for the record?

A. Heidi Tillquist.

Q. And you testified in Bismarck here in September; right?

A. I did.

Q. And at that hearing I believe your resume was admitted as Exhibit T19; is that right?

A. That's correct.

Q. Could you briefly give, I guess, a very brief description of your experience in the pipeline business?

A. I've got 17 years of experience as a risk assessor and an environmental toxicologist. Worked on a number of pipelines, both refined, crude oil, and natural gas liquids and natural gas pipelines, and I've authored texts, including a report on the effects of crude oil in freshwater environments.

Q. Is your area of expertise in risk analysis for crude oil pipelines?

A. Yes.

Q. Now yesterday you were here for the testimony of Mr. Starke?

1 A. Yes, I was.

2 Q. Now, have -- have you had a chance to go
3 out and view the area where the Keystone Pipeline
4 proposed route crosses Mr. Starke's property?

5 A. Yes, I did.

6 Q. And when did you do that?

7 A. November 15th of this year, 2007.

8 Q. Okay. And Mr. Starke's testimony was
9 basically that if there would be a leak in the
10 pipeline on his property, the land generally sloped
11 towards the Sheyenne River; is that correct?

12 A. That's correct.

13 Q. Now, what from your viewing of the
14 property what -- what did you -- I guess, what did
15 you notice about that?

16 A. His property -- well, this picture --

17 Q. Okay. Yeah. Why don't I show you -- I
18 guess it's been marked as Keystone -- or
19 TransCanada 38. I'm showing you a hard copy and
20 then is that -- what does this picture represent?

21 A. This is a picture that I took on November
22 15th. This is looking west. It's about a
23 half-mile of -- it's south of I-94 looking directly
24 across Mr. Starke's property.

25 Q. Where are you -- did you take this

1 picture?

2 A. Yeah. I took this picture, and I am on
3 the -- it's kind of an elevated roadbed. So I'm on
4 top of the road.

5 Q. That would be a north/south roadbed?

6 A. Correct.

7 Q. And so does this represent Mr. Starke's
8 property as it appeared in November when you were
9 out there?

10 A. Yes.

11 MR. KELSCH: Okay. Your Honor, I would
12 move to admit Exhibit T38.

13 JUDGE WAHL: Mr. Johnson.

14 MR. JOHNSON: This will be Mr. Dingess's
15 witness.

16 JUDGE WAHL: Mr. Dingess.

17 MR. DINGESS: Just a question to get the
18 orientation. Is the -- then the horizon is looking
19 to the west?

20 THE WITNESS: Correct.

21 MR. DINGESS: Thank you.

22 MR. KELSCH: Ms. Tillquist, on here can
23 you see the --

24 JUDGE WAHL: Wait a minute, wait a minute.

25 MR. KELSCH: I'm sorry.

1 JUDGE WAHL: You're doing great, Mr.

2 Kelsch. Ms. Linderman?

3 MS. LINDERMAN: No objection.

4 JUDGE WAHL: Mr. Binek?

5 MR. BINEK: No objection.

6 JUDGE WAHL: Exhibit T38 is received.

7 Q. (MR. KELSCH CONTINUING) Ms. Tillquist,
8 can you see on Exhibit T38 where the Sheyenne
9 River -- or could you tell us where the Sheyenne
10 River would be located on this picture?

11 A. The Sheyenne River is basically -- it's
12 going to be right along the horizon. It's about
13 two-and-a-half, three miles away. So this is
14 looking towards Valley City as it drops off into --

15 Q. And where would the Keystone -- where is
16 the Keystone Pipeline route? Would that be on this
17 picture, as well?

18 A. That would be coming across. Excuse me if
19 I zap anybody with this. That would be right
20 through here.

21 Q. And that would be just not too far from
22 this fence --

23 A. Correct.

24 Q. -- in the foreground? Approximately how
25 many miles from the Keystone route to the river?

1 A. I haven't measured exactly, but I'd guess
2 it to be around two-and-a-half, three miles.

3 Q. Now, do you have an opinion as to whether
4 a leak in the pipeline could get to the Sheyenne
5 River on the Starke property?

6 A. Yeah. Having looked at this spot, it's
7 extremely flat. I actually stopped here because we
8 were -- there's an intermittent drainage that was
9 listed here. Part of the reason I went to the
10 entire area was to look and field verify these
11 intermittent streams, whether they could be viable
12 stream channels, so I stopped here specifically.
13 You can see there's just a little tiny swale right
14 there, and that was considered an intermittent
15 stream channel.

16 MR. DINGESS: I'm sorry. Could you show
17 that again?

18 THE WITNESS: Sure. That light spot, it's
19 right there. That's the stream channel. Looking
20 at this it's -- it's extremely flat. Based on my
21 experience and looking at places like Bemidji, oil
22 does not -- would not be able to move from this
23 location across a flat surface and get to the
24 Sheyenne River.

25 Q. (MR. KELSCH CONTINUING) Now did you have

1 the opportunity to view any other, I guess,
2 portions of the route in the Lake Ashtabula,
3 Sheyenne River area?

4 A. I did.

5 Q. Where did you -- where did you go?

6 A. I went roughly as far as like -- basically
7 from Cooperstown to the north all the way to just
8 above the Sheyenne River crossing, basically the
9 Little Yellowstone Park. Everybody's probably
10 familiar with that.

11 Q. Now in your testimony at the last hearing
12 in September you testified about risk analysis to
13 the Sheyenne River and Lake Ashtabula. When did
14 you first become aware of the City of Fargo's
15 concerns about potential risk impact to their water
16 supply?

17 A. Could you rephrase that? I'm sorry.

18 Q. When or how did you first become aware
19 that Fargo had a concern about potential risk from
20 the Keystone Pipeline to their water supply?

21 A. I was forwarded a letter from the mayor
22 expressing his concerns.

23 Q. Okay. Once you received that, did you --
24 what did you do?

25 A. Once we received that, we immediately

1 began looking to see if we could potentially impact
2 their water supply. What we had already done was
3 we had already looked at potential effects to water
4 supplies in Lake Ashtabula and on the Sheyenne
5 River more -- closer to the pipeline, so -- and
6 we'd already presented that information when we
7 testified last time, but basically I said, okay,
8 if -- if Fargo has a concern, can we take this
9 analysis and extrapolate and what would it do to
10 the City of Fargo?

11 Q. Did you prepare a risk analysis looking at
12 that potential risk to Fargo?

13 A. I did.

14 Q. I guess I would show you what's been
15 marked as Exhibit T39. Is T39 the -- your analysis
16 of the risk to Fargo?

17 A. Yes, it is.

18 Q. Now, could you briefly summarize what your
19 conclusions were as far as the risk -- the chance
20 or likelihood of a spill getting into Lake
21 Ashtabula or Sheyenne River?

22 A. We looked at a number -- if you remember
23 from my testimony before, we talked about a number
24 of different potential pathways for oil to get to
25 Lake Ashtabula and the Sheyenne River. All but

1 flowing stream channels were eliminated as viable
2 transport mechanisms. Based on --

3 Q. Why was that, just briefly?

4 A. Okay. Basically, crude oil would not have
5 the ability to flow overland sufficient distance,
6 like we saw on Mr. Starke's property. The terrain
7 is flat until it reaches actually the stream
8 channel itself. So the crude oil would not reach
9 the river via overland flow. Subsurface flow,
10 crude oil and its dissolved constituents do not
11 move that far, so that was eliminated as a viable
12 exposure route. Dry stream channels, again the
13 transport of crude oil would be limited. You'd
14 have adherence and penetration into soils so that
15 the crude oil does not go that far. So those were
16 eliminated as exposure routes.

17 The -- so that left us with flowing water.
18 Now, flowing water can facilitate the movement of
19 crude oil. So what we did then is we looked at the
20 Sheyenne River, Lake Ashtabula area and identified
21 viable stream channels where if a spill occurred, a
22 crude oil spill could potentially get into the
23 stream channel and be transported down towards the
24 lake. Now, it would take a large spill because it
25 has to get out of the trench and then have

1 sufficient volume then to get into the stream
2 channel. The stream channel would have to be
3 flowing if it's an intermittent stream channel, and
4 then it would have to have sufficient volume to
5 move on down the stream.

6 Q. Now, you said this is flat. Mr. Starke
7 testified yesterday that I think there was a 90-
8 some-foot elevation difference from the highest
9 point on his land to I think it was the river --
10 average flow of the river over that two-and-a-half,
11 maybe three miles. Is that -- do you consider that
12 flat?

13 A. I'll answer that with two different
14 things. First of all, if you took just those
15 numbers, the 97 feet over three miles, it's about a
16 half percent grade, so that's flat. But more to
17 the point is that that elevation change doesn't
18 happen until you hit the stream channel, the
19 Sheyenne River itself. So you've got basically a
20 flat terrace for two-and-a-half, three miles, and
21 then it drops right into the Sheyenne.

22 Q. A good portion of that 97 feet or 90-some
23 feet would be from the river bank down to the river
24 flow -- the river?

25 A. Yes.

1 Q. Okay. We were talking about the risk
2 analysis that you did before. What did you do
3 when -- to apply that to the City of Fargo? Did
4 you look at the City of Fargo's intake structure,
5 water system?

6 A. Yes. So what we did was we took our
7 analysis because, again, we'd already evaluated
8 risk to Lake Ashtabula and to the Sheyenne River.
9 So taking that information, we just kind of
10 supplemented and looked at where the City of Fargo
11 would take their water out and how -- how a
12 potential spill could possibly affect that.

13 Q. Do you know how far the Baldhill Dam is in
14 river miles to the Fargo intake?

15 A. 236 miles.

16 Q. Now, there was some testimony yesterday
17 that the crossing of the Sheyenne River is south of
18 the Baldhill Dam by a ways. Do you know how far it
19 is from the crossing of the Sheyenne River to the
20 intake of the -- of Fargo?

21 A. 209 miles.

22 Q. Okay. Thank you. So you checked -- you
23 checked that distance. What did you do next in
24 your analysis to assess the risk to Fargo's water
25 supply?

1 A. Do we want to go through those --

2 Q. Did you -- yeah. I'll show you -- I'll
3 give you both 42 and 43, but we'd look at T42
4 first. I don't think we're quite ready to offer
5 the other one yet. In reviewing your risk analysis
6 for Fargo, did you look at the -- I guess the risk
7 of the oil getting into Lake Ashtabula and then
8 getting to Fargo as one potential?

9 A. That was one potential way it could get
10 there.

11 Q. Is that Exhibit T42?

12 A. Yes, it is.

13 Q. Okay. Could you basically describe your
14 risk analysis as going through Lake Ashtabula?

15 A. Well, what T42 is is basically a bullet
16 point list of what's in this analysis. So it's
17 just an easier way to kind of step through it for
18 everybody. In Lake Ashtabula, as we talked in our
19 previous testimony, a pipeline release would have
20 to occur along 1.4 miles of pipeline that could
21 intersect with these intermittent streams.

22 Q. Ms. Tillquist, I hate to interrupt, but
23 you were saying 2.8 miles and now we're at 1.4.
24 Why?

25 A. Okay. The 1.4 miles comes from the

1 streams -- the intermittent streams that could
2 actually flow into Lake Ashtabula. There's another
3 1.4 miles that's associated downstream that could
4 get into the Sheyenne River.

5 Q. Okay. Thank you.

6 A. So again using the -- the exhibits we
7 submitted previously with exhibit -- I think it's
8 T23, which was the maps, and then the table, which
9 was T24, which is the table that shows these
10 intermittent stream crossings and things, so if we
11 had that 1.4 miles of intermittent streams, you can
12 calculate an occurrence frequency of a spill
13 occurring along those segments, and we estimate
14 that to be no more than once every 13,000 years.

15 In this area the intermittent streams are
16 the only -- again to reemphasize there, they're the
17 only potentially exposure routes. It's not the
18 overland flow, it's not subsurface. They have to
19 be flowing streams, so those intermittent streams
20 would have to be flowing at the time of occurrence,
21 and intermittent streams by definition are only
22 flowing 50 percent or less of the time.

23 If a spill were to occur, in order for it
24 to get it to Lake Ashtabula, it would have to be a
25 large spill, because again, it has to get out of

1 the pipeline trench and then you have surface and
2 then move towards the stream and then be capable of
3 moving downstream in sufficient volumes, and again,
4 there will be adherence along vegetation as it goes
5 downstream. The volume then would be reduced as
6 it's in transit. And if we look at this table from
7 T24, the -- the shortest -- the closest viable
8 stream to Baldhill Dam is 15 miles upstream. So --
9 and that -- the shortest transit time -- or transit
10 distance is 1.6 miles.

11 Any spill then that would reach Lake
12 Ashtabula -- if it got into Lake Ashtabula, what
13 would happen is that oil would again be floating
14 along the surface. Oil spreads at a rate between
15 600 and a thousand feet per minute. So assuming,
16 to be conservative, that it spread the fastest
17 rate, a thousand feet, to go that 15 miles from
18 that nearest stream to the Baldhill Dam would take
19 three days.

20 From a practical standpoint that provides
21 more than ample time for emergency response teams
22 to detect -- detect, because it's going to have to
23 be a large spill again, contain and clean up the
24 spill within Lake Ashtabula. Again, the oil would
25 be floating along the surface facilitating the

1 cleanup. I would note that the Baldhill Dam -- the
2 release from there is a bottom release reservoir,
3 so you've got the oil floating on the surface,
4 you've got the water coming out from the bottom.
5 City of Fargo would be noticed if there was a
6 spill, and that basically comes out of the
7 emergency response plan procedures.

8 Q. Would other -- other communities, I
9 assume, would --

10 A. And other communities, yes.

11 Q. -- would be also --

12 A. Communities all along the way, those would
13 all be listed within the emergency response plan
14 for an event such as this.

15 Q. I assume the Department of Health would
16 also be notified?

17 A. Yes. And if there's a visible sheen on
18 the water, EPA gets notified.

19 Q. Okay.

20 A. So in the unlikely event that the spill
21 happens, it's large enough, it gets downstream, the
22 stream is flowing, gets into Lake Ashtabula, again,
23 there's ample time to clean up, but --

24 Q. Ms. Tillquist, just for a layperson, you
25 said that the crude oil is floating on the surface.

1 Would the crude oil actually get over the dam or
2 get under the intake at the bottom of the dam to
3 actually get out into the Sheyenne River?

4 A. The crude oil would be floating, so it
5 would not be capable of going down and getting
6 through the subsurface outlet. That said, though,
7 crude oil -- as it's floating, there are components
8 within the crude oil that will start to dissolve
9 into -- into the water column. The ones we are
10 primarily concerned with are the BTEX compounds,
11 which is benzene, toluene, ethyl benzene, and
12 xylenes. Sorry. I lost my track here.

13 Q. So those are the things that could get
14 down into the water and then potentially get out of
15 the dam and into the Sheyenne River?

16 A. Yes. So those are the compounds we worry
17 about. So they could get into the water column.
18 Now those are all -- the rate at which this happens
19 is -- there's going to be evaporation occurring at
20 the same time, and evaporation -- when you look at
21 a crude oil spill, evaporation is a much more
22 important process for the fate of the crude oil
23 spill. It will -- it accounts for a lot of the
24 loss of crude oil. Just a lot of the lighter
25 weight components dissipate. So that will be

1 happening much more quickly and much more
2 efficiently than this dissolution process.

3 So while the crude oil has got out on to
4 the lake, you know, there will be containment.
5 This BTEX could only be happening where the crude
6 oil is in contact with the water and you would have
7 localized effects of that BTEX.

8 Q. Now the BTEX -- are they the lighter
9 components you talked about that are more apt to
10 evaporate?

11 A. They are more apt to volatilize.

12 Q. Now assuming that some of those BTEX
13 compounds did get out of the dam into the Sheyenne
14 River, could they get to travel the 236 miles to
15 Fargo?

16 A. That was actually -- you know, we wanted
17 to look at that. So we -- so the transit distances
18 for any of these residual BTEX that actually got
19 out, dissolved into the water and then managed to
20 get through the Baldhill Dam would have to travel
21 236 miles to reach Fargo. We heard yesterday
22 different estimates but basically 9 to 14 days at
23 normal flow, and what I'd like to do is provide --
24 or talk about a -- an EIS where a risk assessment
25 was done. It was the Longhorn Pipeline, which is

1 in Texas. They looked at a crude oil and gasoline
2 spill into the Colorado and -- well, Colorado River
3 and Onion Creek. They did a model that was
4 developed by the Army Corps of Engineers. This was
5 an EIS that was put together by the EPA.

6 In this model what they show -- well, let
7 me back up. The crude oil that they looked at in
8 this was comparable in many ways to the crude oil
9 Keystone would have as far as BTEX concentrations.
10 The BTEX in this crude oil was -- I'm sorry. It
11 wasn't BTEX. The benzene concentration was .14
12 percent. In our crude oil it would be .15 percent
13 as a maximum. So fairly comparable. It's a good
14 surrogate to look at just as an example of what
15 might happen.

16 So what they did in this analysis was they
17 looked at -- this model accounts for benzene
18 evaporating as well as its movement downstream. So
19 they calculate the -- the front of that and what
20 the concentrations are. What they found was that
21 at river flows that would be comparable to the
22 Sheyenne River, which was, you know, looking at the
23 average flows in the Sheyenne River, it's around
24 200 CFS. The flow on the Colorado River they had
25 an example at 200 CFS. The benzene concentration

1 by the time it reached 120 miles downstream, which
2 was their end point of their study, was below the
3 maximum contaminant level. So that's five parts
4 per billion. So we could assume that, you know --
5 so if it's 120 miles, it was below MCL, the maximum
6 contaminant level. Here we have to go 236 miles,
7 so we'll --

8 Q. Now in that Longhorn study was that
9 figuring just the BTEX components getting into the
10 river or was it actual crude oil getting into the
11 river?

12 A. It's the crude oil, itself, and then it's
13 the dissolution and the movement and the
14 evaporation that's associated with that crude oil.

15 Q. Do you recall how many barrels of crude
16 oil?

17 A. Oh, barrels? It was 2,000 barrels
18 actually entering the river.

19 Q. And then from that study does that --
20 applying it to this case, in your opinion, is there
21 a chance to the BTEX components to reach Fargo from
22 Lake Ashtabula?

23 A. Well, I guess I would add, too, that the
24 study did not even try to account for any
25 containment or cleanup. This is assuming that

1 whole 2,000 barrels was available the entire
2 distance. So, again, the chance of BTEX ever
3 reaching Fargo is highly improbable or nonexistent,
4 I would say. I mean, you'd have to again -- just
5 to reiterate again, I mean, you'd have to have a
6 large spill, it has to happen into these
7 intermediate tributaries that have to be flowing,
8 it has to go into Lake Ashtabula, it has to get all
9 the way down Baldhill Dam, the BTEX has got to get
10 out in sufficient quantities to get downstream 236
11 miles to reach Fargo at sufficient concentrations,
12 and I -- I don't see it happening.

13 Q. Now, one of the things that Fargo was
14 concerned about and we heard the testimony
15 yesterday was that the Sheyenne River is an
16 alternate -- or their alternate source of water,
17 the Red River is their main source, but if there's
18 a Thirties-type drought or if the Red River for
19 some reason wasn't available for them, I guess
20 mostly because of a potential drought, does that
21 impact -- if that scenario happened, does that
22 impact your risk analysis of the BTEX or getting
23 down there from Lake Ashtabula?

24 A. Yes, it would. During a drought the risk
25 would be further reduced because it's likely that

1 those intermittent streams, which are the viable
2 transport routes, would not likely be flowing
3 during a drought, but assuming they were from a
4 localized single storm event or something, even if
5 it got in again to Lake Ashtabula and then down in
6 to Sheyenne River, now the Sheyenne River during a
7 drought is going to have a reduced velocity, has
8 less stream flow, so it takes longer. Reduced
9 stream flow, because it takes longer, you're going
10 to increase your transit time, which means you have
11 even more time for that benzene to dissipate from
12 the water column. So -- and again, there's always
13 cleanup.

14 Q. So if it's a smaller volume in the river,
15 wouldn't that make the concentration greater of
16 BTEX or --

17 A. The BTEX concentration is going to -- it's
18 a rate constant and it's an amount how it can
19 spread across -- constant from the oil into the
20 water. It's actually -- the more overriding
21 principle is how long it's going to take to get
22 downstream.

23 Q. So the more time you have, the better?

24 A. Yeah.

25 MR. KELSCH: I would move to admit T42.

1 JUDGE WAHL: Mr. Dingess?

2 MR. DINGESS: No objection.

3 JUDGE WAHL: Ms. Linderman?

4 MS. LINDERMAN: No objection.

5 JUDGE WAHL: Mr. Binek?

6 MR. BINEK: No objection.

7 JUDGE WAHL: T42 is received.

8 MR. KELSCH: Thank you, Your Honor.

9 Q. (MR. KELSCH CONTINUING) Ms. Tillquist,
10 did you do the same analysis that you did in T42
11 for the risk of a spill getting into the Sheyenne
12 River?

13 A. Yes, I did.

14 Q. And is that the T43?

15 A. Yes, it is.

16 Q. Okay. I guess could you take us through
17 your analysis for the Sheyenne River?

18 A. All right. Again, the pipeline would have
19 to have a release along 1.4 miles of intermittent
20 or perennial streams. Those are the only potential
21 routes. Now, I'll point out that the -- because
22 this is kind of confusing to people -- the
23 frequency is actually lower here, and just to
24 clarify, that's because there's perennial stream
25 reaches so there is -- because there is water

1 flowing there constantly, you have a higher -- if a
2 spill occurred, there's a chance that it could get
3 into the water as opposed to an intermittent stream
4 where you don't have the water flowing half the
5 time. So it's just increased probabilities, so
6 your frequency actually drops down.

7 All right. For those intermittent streams
8 that would be in that 1.4 miles, again, they would
9 have to be flowing. That again occurs less than 50
10 percent of the time. The spill would have to be
11 large in order for it, again, to get out of the
12 trench, get into the stream, and then maintain
13 sufficient volume to get into -- there's a typo
14 there. That should be the Sheyenne River instead
15 of Lake Ashtabula.

16 COMMISSIONER WEFALD: Instead of Lake
17 Ashtabula.

18 THE WITNESS: Oops, am I supposed to write
19 on this?

20 JUDGE WAHL: Why don't you go ahead and --
21 why don't you do that, please, and we'll just show
22 that for the record as the exhibit as corrected,
23 please.

24 MR. KELSCH: Thank you, Your Honor.

25 THE WITNESS: Again, the volume's going to

1 be reduced during transit. Emergency response
2 would have the ability to detect the spill because
3 it's large, containment, cleanup. Again, the oil's
4 going to be floating along the surface, which would
5 facilitate cleanup. The city would be notified via
6 the emergency response procedures. The transit
7 distance again -- so again, the crude oil would be
8 contained. Any of the dissolved constituents that
9 came out and were mobilized -- they would have to
10 travel 209 miles from the spill location, the
11 Sheyenne River crossing, to get to Fargo, and what
12 I did is I interpolated -- if we said 9 to 12
13 days -- or 9 to 14 days based on 236 miles, that
14 equates to 8 to 12 days at normal flow for 209
15 miles. Then we go through the same discussion
16 about the Longhorn model and how it showed that
17 there was -- the BTEX concentrations dissipate and
18 the BTEX concentrations would be below the maximum
19 contaminant level before they reached Fargo.

20 Q. Ms. Tillquist, are you familiar with a
21 spill in Coffeyville?

22 A. Yes, I am.

23 Q. And perhaps you could just give the
24 general facts concerning that spill.

25 A. Coffeyville is in Kansas. There was a

1 flood event that a refinery spill -- they didn't
2 get a valve shut down in time and they released --
3 I think the grand total eventually turned out to be
4 1700 barrels. That -- and this -- I'm sorry. This
5 occurred -- I think it was just last summer. There
6 was a visible sheen on the water 26 miles
7 downstream. There was photographs of that. There
8 was a number of water treatment plants located
9 further downstream. The closest one was 100 miles
10 downstream.

11 EPA underwent a lot of testing of that
12 water. There was ten sampling locations downstream
13 because, again, there was a number of water
14 treatment plants. In no case did they detect --
15 the samples that they took were -- they were no
16 different than the water samples before the spill,
17 and they continually monitored it to see if that
18 pulse event came through, and it was -- they never
19 found any sign of contamination.

20 So, again, it reemphasizes that a spill
21 can occur and dissipate before it reaches a water
22 treatment plant 100 miles downstream, or in Fargo's
23 case, 236 miles downstream.

24 Q. Now that was in a flood situation?

25 A. Yes. So that would actually be -- it's

1 kind of a little bit counterintuitive. It actually
2 seems like it would be worse -- or, you know,
3 because it would dilute it -- I'm sorry -- but it's
4 actually worse because the transit time would be
5 increased so you get it there faster.

6 Q. Does that support your conclusion about
7 the risk to Fargo in this case?

8 A. Yes. It definitely supports -- you know,
9 here's an actual event that occurred and they were
10 unable to even detect anything downstream 100
11 miles. So, yeah, it's -- and it was crude oil, as
12 well. I'm sorry. I'm not sure if I mentioned
13 that.

14 Q. Thank you. Now as we talked about with
15 Lake Ashtabula's risk, does the -- a drought factor
16 into the risk from the Sheyenne River or affect the
17 risk from the Sheyenne, as well?

18 A. Yeah. For the very same reasons we talked
19 about before. So a drought would actually reduce
20 risk again because you've got the intermittent
21 streams that are not likely to be flowing, and then
22 the flow in the Sheyenne River would be reduced
23 slowing the velocity and therefore increasing the
24 transport time and thereby allowing the BTEX
25 compounds to dissipate.

1 Q. Do you have an opinion concerning the
2 potential risk of a leak that got into the Sheyenne
3 River or effect on the City of Fargo's water
4 supply?

5 A. We don't anticipate any effects to the
6 City of Fargo's water supply.

7 MR. KELSCH: I would move to admit T43.

8 JUDGE WAHL: Mr. Dingess.

9 MR. DINGESS: May I ask a couple of
10 questions, Your Honor?

11 JUDGE WAHL: You may.

12 MR. DINGESS: Thank you. Ms. Tillquist,
13 you had a correction here, I believe, from Lake
14 Ashtabula to the Sheyenne River on Exhibit T43 --

15 THE WITNESS: Correct.

16 MR. DINGESS: -- is that correct? What
17 was that? Just pulling something from one
18 document, using the Word program, pasting it onto
19 another?

20 THE WITNESS: Yeah. We were sitting there
21 and we were trying to -- what we were trying to do
22 is have the same flow so everybody could kind of
23 follow it, so we were trying to follow the same
24 format so everybody would understand it clearly.

25 MR. DINGESS: So it really wasn't an

1 independent analysis made of the Sheyenne. It was
2 cut and paste from another document?

3 THE WITNESS: No. This was an analysis --
4 we had an analysis for Lake Ashtabula and Sheyenne
5 River. It was one combined one. What we're doing
6 is we're splitting it in two separate sections
7 because Lake Ashtabula is a little bit different in
8 the way it would handle -- the way we could set up
9 containment and things as opposed to the Sheyenne
10 River, which was a flowing river system. So I
11 wanted to talk about it as two separate systems.
12 It was all part of a single analysis that was done.

13 MR. DINGESS: Thank you. I would not
14 object to the exhibit.

15 JUDGE WAHL: Ms. Linderman?

16 MS. LINDERMAN: No objection.

17 JUDGE WAHL: Mr. Binek?

18 MR. BINEK: I have no objection, but I do
19 have a question, if you could repeat again what the
20 correction was.

21 THE WITNESS: I'm sorry. Let's see. On
22 the T43, third bullet down, it says, and "maintain
23 volume to reach." Instead of Lake Ashtabula it
24 should be Sheyenne River.

25 MR. BINEK: Thank you.

1 JUDGE WAHL: Exhibit T43 as corrected to
2 strike Lake Ashtabula in the third bullet and
3 substitute Sheyenne River is received.

4 MR. KELSCH: Thank you, Your Honor.

5 Q. (MR. KELSCH CONTINUING) Ms. Tillquist, so
6 you did an independent analysis for the risks for
7 both Lake Ashtabula and Sheyenne River?

8 A. Yes.

9 Q. And when did you prepare these T42 and
10 T43?

11 A. About 10 or 11 last night. They're simply
12 talking points to help everybody understand what
13 this analysis, T39, basically talks about.

14 Q. And when did you actually do these risk
15 analyses, the actual work?

16 A. That again started right after we got that
17 letter from the -- well, let me backtrack. The
18 initial analysis on Lake Ashtabula and the Sheyenne
19 River were done months and months ago. To take it
20 and then look at the City of Fargo, we did that as
21 soon as we started hearing from the mayor of Fargo.

22 Q. Okay. Thank you. Then I guess moving
23 back to T39, basically T39 has the same information
24 as -- maybe a little bit more detail as T42 and
25 T43; is that correct?

1 A. That is correct.

2 Q. Now, did -- in part of your, I guess,
3 review of risks to the City of Fargo's water
4 supply, did you find that there are other petroleum
5 pipelines that either cross the Sheyenne River or
6 Lake Ashtabula or the Red River?

7 A. Yes. We did look at that and, yes, we did
8 find that there are multiple pipelines that cross
9 Lake Ashtabula, Sheyenne River, and the Red River.

10 Q. Okay. Are those contained in Table 1 on
11 page four of T39?

12 A. Yes, it is.

13 Q. Did you also obtain --

14 COMMISSIONER WEFALD: Do we have T39?

15 JUDGE WAHL: Yes, you do.

16 THE WITNESS: That's the report, the
17 analysis. It's page four of that.

18 COMMISSIONER WEFALD: Thank you.

19 Q. (MR. KELSCH CONTINUING) Did you also
20 obtain a map showing the location of, I guess,
21 these pipelines?

22 A. Yes, I did.

23 Q. I would show you what's been marked as
24 T44, and I believe that can go up on the screen, as
25 well. What does T44 show, Ms. Tillquist?

1 A. This is a map of eastern North Dakota
2 showing -- and I've got to point to it on the
3 screen, so again, if I hit somebody -- this is the
4 Sheyenne River coming down around. This is Fargo,
5 this is Lake Ashtabula area, and these -- oh, let
6 me back up. This is the Keystone Pipeline coming
7 down.

8 Q. The blue line would be the Keystone
9 Pipeline?

10 A. Yeah, it is blue. Yes. And then the
11 other lines are different pipelines that come in
12 across. I don't know if you want me to walk
13 through these. This is --

14 Q. The Cenex one, is that the one that there
15 was some testimony yesterday about crossing
16 underneath Lake Ashtabula?

17 A. Yes.

18 Q. And I think there was some mention about
19 the Magellan line. Does that cross the Red River?

20 A. Yes. There's actually two Magellan lines.
21 This is this one here and this one here, and they
22 actually come across here. So there's two Magellan
23 lines and --

24 Q. Does that south -- I guess it would be
25 southerly east/west Magellan line, does that cross

1 the Red River south of the Fargo -- Fargo's intake
2 on the Red River?

3 A. Yeah. There's actually three --

4 Q. Or upriver, I guess we should say.

5 A. Yeah. It's upstream of the intake. So
6 the Red River is along here, here's the pipelines,
7 and the intake is up in here.

8 Q. So how many of them -- how many pipelines
9 cross upstream of the Fargo's intake on the Red
10 River?

11 A. In that immediate area there's three.
12 There's also another one that's a crude oil
13 pipeline portal.

14 MR. KELSCH: I would move to admit T44.

15 JUDGE WAHL: Mr. Dingess.

16 MR. DINGESS: No objection to T44, sir.

17 JUDGE WAHL: Ms. Linderman?

18 MS. LINDERMAN: No objection.

19 JUDGE WAHL: Mr. Binek?

20 MR. BINEK: No objection.

21 JUDGE WAHL: T44 is received.

22 Q. (MR. KELSCH CONTINUING) What -- do you
23 have any other conclusions that you haven't already
24 given on T39 -- that you haven't given as to -- in
25 T42 and T43?

1 A. I guess the only thing I would pull out,
2 too, is just basically saying that the presence of
3 those existing pipelines and just as evidence that
4 the existing -- that pipelines can coexist with
5 water supplies without adversely affecting them.
6 Some of these pipelines have been around for
7 decades without adverse effects, and some of these
8 pipelines are carrying materials that contain a
9 higher BTEX concentration. So, you know, all those
10 factors combined, I think it's -- again, it
11 reemphasizes that these pipelines can coexist with
12 water supplies.

13 MR. KELSCH: I would move to admit T39.

14 JUDGE WAHL: Mr. Dingess?

15 MR. DINGESS: If I can have a moment, Your
16 Honor. I'll just ask on cross-examination. I'll
17 consent to the admission.

18 JUDGE WAHL: Ms. Linderman?

19 MS. LINDERMAN: No objection.

20 JUDGE WAHL: Mr. Binek?

21 MR. BINEK: No objection.

22 JUDGE WAHL: T39 is received.

23 Q. (MR. KELSCH CONTINUING) Ms. Tillquist,
24 can you clarify or is there a distinction between
25 risk -- we're talking a lot about risk -- and

1 consequence?

2 A. Well, it depends on how you want to define
3 things, but if you want to talk about frequency of
4 an event --

5 Q. Or consequence to the City of Fargo. Risk
6 to the City of Fargo, consequence to the City of
7 Fargo, or in this are they the same?

8 A. Well, you've got a risk -- a certain risk,
9 a certain probability that an event could happen,
10 and then you've got the consequence of what would
11 happen, what could happen, and I guess --

12 Q. If -- and maybe I could follow it up with
13 a question that may help. Have there been any
14 studies or examples that you're aware of where BTEX
15 would actually get into a river system and come by
16 the intake -- or, you know, be passing a public
17 water intake system and then what can happen or
18 what could be the consequence of that?

19 A. If you're talking about a front of the --
20 well, I'm not sure if I'm going down the right
21 road.

22 Q. Well, if there's a plume in the river,
23 say, for example. I understand your analysis that
24 it wouldn't get that far, but say there was a plume
25 in the Sheyenne River or the Red River that was

1 bypassing -- what would happen -- what would be the
2 consequence to the Fargo water supply system?

3 A. Well, again, going back to the Longhorn
4 analysis, what they did --

5 MR. DINGESS: Excuse me, Your Honor, I
6 would like to object here. We don't have a
7 foundation here that Ms. Tillquist is learned in
8 the treatment operations of the Fargo water supply
9 system, that she has experience in the design and
10 operation of water -- municipal water treatment
11 plants. I believe she testified that she's a risk
12 assessor, a pipeline specialist, and toxicologist,
13 and we don't think that there's proper foundation
14 been laid for this line of questioning. If they
15 have other expertise in this area, that should be
16 brought forward first.

17 JUDGE WAHL: Mr. Kelsch.

18 MR. KELSCH: Your Honor, we're not talking
19 about the treatment of this water. There was
20 testimony yesterday concerning the ability of Fargo
21 to -- upon receiving notice of a spill, to shut
22 down their water intakes, and this questioning of
23 this witness is just to talk about what could
24 happen or the consequence to wait for that plume to
25 go by the river.

1 JUDGE WAHL: I agree. The objection is
2 overruled.

3 THE WITNESS: Okay. So what would happen
4 is if the BTEX actually -- well, it was moving
5 downstream and there was a measurable quantity of
6 it, what you would see is you see a moving front.
7 So you'd have a leading edge and then it peaks and
8 then it drops off. What the -- again, this
9 Longhorn model did was they looked at this crude
10 oil, they looked at the benzene concentrations and
11 not only how it dissipated, but they looked at that
12 moving front, and at 120 miles downstream what they
13 found was that this -- no. I'm sorry. And this
14 was for gasoline because the gasoline had higher
15 concentration. What they found was that plume,
16 that pulse event that comes through, was a 15- to
17 20-hour event. So it's not like it was taking days
18 to get past a certain point. It would come by at a
19 peak event and then it moved on. And that's very
20 typical. That's kind of standard knowledge within
21 the environmental risk assessment.

22 Q. (MR. KELSCH CONTINUING) And they would
23 determine -- how would they determine that it's --
24 when it got there and then when it got by?

25 A. In practice what you would do is if an

1 event occurred, you would have -- again, everybody
2 would be notified, you know, Keystone would be
3 notifying all the downstream water users,
4 Department of Health would be notified, and again,
5 if a visible sheen is on the water, EPA is going to
6 be involved. So you're going to have a plethora of
7 people out there onsite monitoring this event.

8 What they will be doing, just like they
9 did in Coffeyville, is they're going to be sampling
10 water at certain intervals trying to see where that
11 BTEX front is, and so what they would do is they
12 would monitor its progress, and so -- specifically
13 now talking about the City of Fargo, they'd be
14 tracking that front as it came down, and if --
15 hypothetically, let's say, it did get there, what
16 would happen is then as it approached Fargo, they
17 would say, okay, it's getting close enough now,
18 let's shut it down -- shut down the water intake.
19 They would shut the intakes down; that plume would
20 pass; they're still monitoring so they know, okay,
21 it's starting to dissipate; and it wouldn't --
22 well, again, so they would -- as they're pulling
23 the samples, they would say, okay, the water is now
24 back to its original condition; it's safe to open
25 up the intakes.

1 Q. Okay. Thank you. Now yesterday you were
2 here in court what Mr. Koland was testifying, and
3 he wasn't, I guess, 100 percent sure on whether in
4 the Red River Valley water system draft EIS and
5 supplemental draft EIS whether the Cenex Pipeline
6 that crossed Lake Ashtabula was mentioned. Are you
7 familiar with the Red River Valley water system EIS
8 and draft EIS?

9 A. Yes, I am.

10 Q. Have you looked at that to see whether the
11 Cenex Pipeline or any other of these other
12 pipelines on Exhibit T44 are -- were mentioned?

13 A. I did look at that. These are voluminous
14 materials, so what I did is I did word searches in
15 the document. In the PDF version you can go
16 through and search, so what I did is I looked for a
17 number of key terms.

18 Q. What key terms did you look for?

19 A. Cenex, Keystone, pipe, pipelines, fuel,
20 crude, oil -- oil didn't work so well, because I
21 kept picking up things like soil and things like
22 that.

23 MS. LINDERMAN: Could I -- I have a quick
24 question. Is any part of the EIS going to be
25 entered into evidence as an exhibit, and if not, I

1 would kind of object to this as being hearsay and
2 bringing in documentation that's not being offered
3 into evidence.

4 JUDGE WAHL: The objection is overruled.

5 MR. KELSCH: You may continue.

6 THE WITNESS: Gasoline, a variety of
7 terms.

8 Q. (MR. KELSCH CONTINUING) From those
9 searches did you find any reference to any of these
10 pipelines in there?

11 A. I did not.

12 Q. Now, how many pipelines have you done risk
13 analyses for?

14 A. I have done risk assessments -- this type
15 of risk assessment on --

16 Q. For actually routing of pipelines, I guess
17 I'm talking about.

18 A. Well, I've done these risk assessments on
19 seven pipelines.

20 Q. And --

21 A. And that equates to about 4,000 miles.

22 Q. Okay. What's happened with those other
23 pipelines? Have they been approved by the
24 regulatory agencies?

25 A. Yes. They -- well, I'll say the seventh

1 one that I'm working on right now is Keystone, so
2 the other six have been approved.

3 Q. I'd like to show you another exhibit, 45,
4 T45. Ms. Tillquist, yesterday you were here when
5 Mr. Deutschman testified on likelihood of spill in
6 the 91 miles adjacent to Lake Ashtabula. I think
7 it's also in -- referenced in Fargo Exhibit 12-3.
8 Now, did you take Mr. Deutschman's risk analysis or
9 estimate of likelihood of spill, I guess I should
10 say, and apply it to those 2.8 miles that -- of
11 pipeline that could -- where the leak could
12 actually get to the Sheyenne River or Lake
13 Ashtabula?

14 A. Yes. What we did was assuming just for
15 the sake of argument that Mr. Deutschman's numbers
16 were valid -- and I -- honestly, I could not follow
17 his assessment. I didn't think there was -- I
18 didn't have sufficient information to make a
19 determination of how he did that. I couldn't
20 follow it.

21 Q. Let's -- why don't we talk about that for
22 a minute. Mr. -- and I'll probably get this wrong
23 because I always do, but Mr. Deutschman talked
24 about or used the stochastic method; is that right?

25 A. That's my understanding, yes.

1 Q. Okay. What method did you use for your
2 risk -- or likelihood of spill evaluation?

3 A. It would probably be classified as a
4 deterministic model.

5 Q. What -- in your opinion is using the
6 deterministic model a valid method for assessing
7 risk for crude oil pipelines?

8 A. Yes, it is.

9 Q. And in the other six pipeline evaluations
10 that you've done -- risk assessment evaluations
11 that you've done, what system did you use?

12 A. In all those cases we used a deterministic
13 assessment, and that was also reviewed by other
14 federal agencies, BLM, Fish & Wildlife Service,
15 Forest Service, and included the Office of Pipeline
16 Safety, or PHMSA as it's known now.

17 Q. And, again, talking about crude oil
18 pipelines, which method is state of the art, the
19 stochastic or the determinative?

20 A. The state of the practice I would say
21 is --

22 Q. State of practice, I guess.

23 A. -- this deterministic-type modeling.

24 Q. Now -- and as I understood from Mr.
25 Deutschman, he was using the DNV information. I

1 think that's in I-1, I believe, the DNV report.

2 A. The DNV report, that's my understanding.

3 Q. Which you used, as well.

4 A. Yes.

5 Q. So the base information supposedly was the
6 same.

7 A. Yes.

8 Q. It's just the different modeling.

9 A. That's my understanding, yes.

10 Q. In your opinion, which is more accurate as
11 far as assessing the likelihood of a spill?

12 A. I don't have -- I don't think I can answer
13 that because I don't think I have enough
14 information about his assessment. I don't
15 understand it, so it's -- I don't understand where
16 he came up with the numbers. There's some
17 underlying probability curves, how they're shaped,
18 and I think there was some confusion on some
19 points. So it's difficult to understand exactly if
20 the stochastic model that was used is appropriate,
21 but I would say the deterministic model, based on
22 my experience, is valid and has been used
23 previously and been approved.

24 Q. Now, what's the purpose of the T45 then?

25 A. What we did was we said, okay, let's --

1 let's assume for the sake of discussion that we use
2 the City of Fargo's numbers, how does that equate
3 to our assessment.

4 Q. And could you just kind of walk through
5 what -- what this shows?

6 A. Okay. So the City of Fargo -- they talked
7 about in that 91-mile segment in the Sheyenne
8 River/Lake Ashtabula area to be .023 annually, so
9 Exhibit F12-3. If you go back to the assessment
10 that we did before looking at again what is a
11 viable transport route, 91 miles is not -- not that
12 entire length is capable of a spill reaching the
13 river. Rather, again, not to beat a dead horse
14 here, but it only comes down to these stream
15 channels and if they are flowing that a spill could
16 be transported -- a large spill could be
17 transported that distance to reach the river. So
18 if you combine all of those -- and again, this
19 is -- is it F -- F24 is the table -- what you find
20 is the total --

21 Q. It would be T24?

22 A. T24. Okay. T24, the total miles of
23 stream channels -- the pipeline segments that could
24 get into those stream channels is 2.8 miles. So
25 instead of 91 miles we're looking at 2.8 miles. So

1 taking Fargo's numbers of .23 spills per year, what
2 I'm going to do is, first of all, get it to spills
3 per mile per year. So you divide it by 91, and
4 then you end up with this very small number,
5 .000253 spills per mile per year. You take that
6 number and you multiply it then by this 2.8 miles,
7 and that gives you the spills per year in this --
8 that could affect the Sheyenne area, and that
9 number is .000708 spills per year. To make this a
10 little bit easier to understand, we convert it into
11 an occurrence frequency so we can -- it has some --
12 we can relate to it. So you invert that number,
13 and then that would be comparable to one spill
14 every 1,412 years that would be capable of reaching
15 Lake Ashtabula.

16 MR. KELSCH: I would move to admit T45.

17 JUDGE WAHL: Mr. Dingess?

18 MR. DINGESS: No objection.

19 JUDGE WAHL: Ms. Linderman?

20 MS. LINDERMAN: No objection.

21 JUDGE WAHL: Mr. Binek?

22 MR. BINEK: No objection.

23 JUDGE WAHL: Exhibit T45 is received.

24 Q. (MR. KELSCH CONTINUING) Ms. Tillquist,
25 now as I understand, the City of Fargo's spill

1 likelihood, that's talking about any size spill
2 would be once every 1,412 years putting -- applying
3 it to the 2.8 miles; is that right?

4 A. That is correct.

5 Q. So I'm guessing there's some spills -- I
6 think your testimony was that it would have to be a
7 large spill to actually get there.

8 A. So again -- yeah. So large spills are a
9 smaller fraction of the total number of spills, so,
10 again, you would take the frequency of a large
11 spill, you know, and multiply the frequency times
12 this, and basically what it's going to make is that
13 number instead of 1400 years, it's going to become
14 even larger because it would require a large spill
15 of sufficient volume that could even get out of the
16 trench and into the streams and downstream.

17 Q. Now, I think there was a question
18 yesterday and maybe from one of the commissioners
19 about what's an acceptable risk, and these numbers
20 get awful big. What -- in your experience on these
21 other pipelines that you've worked on, what --
22 assuming there were some potential risks to various
23 other water supplies or whatever else, what were
24 the risks in those cases, if you can recall?

25 A. Looking at some of the other risk

1 assessments that we did that were approved, some of
2 the risk ranges were one spill every 344 years, one
3 spill every 833 years. Again, those were all pipes
4 that were approved. They're actually in operation.
5 One of them actually is built in, I would say, very
6 mountainous conditions and it's over a water
7 supply. So these are known risks and they were
8 deemed acceptable risks.

9 Q. Deemed acceptable by whom?

10 A. Federal agencies, the -- again, going back
11 to BLM, Forest Service, and then through the NEPA
12 process, basically Fish & Wildlife Service and a
13 number of other federal agencies.

14 Q. Now, when you're talking about that one
15 every 344 or one every 830-some years, is that
16 based on a per-mile basis or --

17 A. Yeah, that's a per-mile basis. So to make
18 this number that we talked about just a second ago,
19 this 1400 years, again, that was for 2.8 miles. So
20 if we want to have an equal comparison, we want to
21 compare it on a per-mile basis, so the City of
22 Fargo's number would result in a -- an event of 1
23 in 4,000 years. Keystone's numbers that we've
24 talked about previously, our risk is one in no more
25 than 9,000 years. So, again, acceptable risks.

1 Q. So where you've got the 1 in 9,000, you
2 were looking at your T24, the once every 5400 years
3 for the whole 2.8 miles and then dividing that by
4 2.8 miles?

5 A. That would be one way of calculating that,
6 I believe. I take that back because we did -- that
7 was the -- the 5400 years is based on intermittent
8 stream, so this is based on the overall spill
9 probability.

10 Q. Okay. Okay. In your experience and
11 opinion is the -- does the Keystone provide a risk
12 to -- or does it cause a risk to the City of
13 Fargo's water supply?

14 A. I do not believe so. The chance of a
15 spill again is so remote. The events that would
16 have to occur are -- to get that to happen are --
17 you know, there would have to be a series of very
18 unlikely events. Again, we've got containment,
19 cleanup, and then, again, ample time to control
20 that material, and then you've got the long
21 transport distance before it even reaches Fargo,
22 and assuming -- you know, even then, the City of
23 Fargo then would be able to shut down their intakes
24 while the plume passed.

25 MR. KELSCH: I have no further questions,

1 Your Honor.

2 JUDGE WAHL: Mr. Dingess.

3 MR. DINGESS: Thank you, Your Honor.

4 **CROSS-EXAMINATION**

5 **BY MR. DINGESS:**

6 Q. Ms. Tillquist, how long have you been
7 working on this Keystone Pipeline project?

8 A. Three, maybe four years. Three years.

9 Q. And does that -- is that three or four
10 years in North Dakota alone?

11 A. No. The project goes over a multitude of
12 states and we were -- yeah. So it's over North
13 Dakota and the other states.

14 Q. And how many other states?

15 A. Eight states.

16 Q. And any Canadian provinces?

17 A. We're not involved with that.

18 Q. Okay. So you've been working on this --
19 are you doing a similar sort of analysis in all
20 eight states?

21 A. We are working on that, yes.

22 Q. And does this occupy a significant
23 period -- a significant amount of your professional
24 time?

25 A. Absolutely. And personal time.

1 Q. All of it?

2 A. Yes.

3 Q. So this is pretty much all you've been
4 working on for the last three years?

5 A. No. I wouldn't say completely. There's
6 been a couple other projects that I've worked on,
7 but this is -- especially the last year or so it's
8 been almost exclusively.

9 Q. Almost exclusively. Thank you. Regarding
10 the picture that you've shown of Mr. Starke's
11 property, T38, do you have other pictures along the
12 Sheyenne River?

13 A. Yes, I do.

14 Q. Okay. Do you have any pictures that are
15 closer to the Sheyenne River of coulees, of areas
16 of these intermittent streams?

17 A. Yes. I actually went and I looked at a
18 lot of these -- if you -- looked at the stream
19 channels to see if they were viable transport
20 channels. So, yeah, as I went through -- basically
21 I was field-verifying whether they were or were not
22 viable channels.

23 Q. Do you have any with you today?

24 A. They are here, yes.

25 Q. Can you perhaps show them to us at a

1 break?

2 MR. KELSCH: I think that's beyond the
3 scope of the direct examination.

4 MR. DINGESS: Well, we'd be interested in
5 looking to see about the fall and see if there's a
6 depiction that shows steeper slopes.

7 THE WITNESS: I can tell you that the vast
8 majority of this whole, entire area is very similar
9 to what you see in that picture. There are -- with
10 the exception of a few spots -- and those again, we
11 located on these maps -- there are those areas that
12 have stream channels that have the potential.
13 Again, looking at those, they're not -- we've
14 worked on a lot steeper areas. There is some slope
15 to them. What happens in a lot of these is they
16 come along -- they tend to be small channels. A
17 lot of times they're grass-covered. They dump into
18 intermediate wetlands. They kind of pool along
19 before they finally reach the Sheyenne River or
20 Lake Ashtabula.

21 Q. Do you have pictures of those specific
22 places?

23 A. Yes, I do.

24 Q. Okay. Could you share shows with the
25 Commission then?

1 MR. KELSCH: Your Honor, I guess I would
2 object to this.

3 JUDGE WAHL: Yeah. Here's how this works,
4 I think, for me, is, Mr. Dingess, you will need at
5 some point -- I really don't want to hear that now,
6 but at a recess we can excuse the Commission and
7 you can make a motion to compel the production of
8 those documents, and we'll wrestle with that
9 then --

10 MR. DINGESS: Well, let's continue --

11 JUDGE WAHL: -- and then we'll decide how
12 we would handle that, if we would handle that, but
13 let's do the examination now and deal with that
14 later.

15 MR. DINGESS: Okay. We'll proceed and
16 decide if we need to do that later. Thank you.

17 Q. (MR. DINGESS CONTINUING) Ms. Tillquist,
18 the pipeline corridor, I believe, has been reduced
19 from -- in these administrative proceedings from
20 six miles to one mile?

21 A. I believe that is correct.

22 Q. Okay. Fargo has a concern that that may
23 have been done to reduce the focus on areas such as
24 the Sheyenne, Lake Ashtabula where they would be
25 encompassed within a larger corridor. What if the

1 corridor was widened, how would that change your --
2 your work that you've done here and the conclusions
3 that you've drawn?

4 A. I was not -- well, the corridor width
5 really does not affect my analysis at all. I'm not
6 looking at a specific corridor width when I'm doing
7 my risk analysis.

8 Q. So if a source is considered to be a
9 drinking water source and it lies outside the
10 corridor width, it's not considered by you?

11 A. I'm sorry. Say that again.

12 Q. I said if a source of water might be -- if
13 a water body might be considered a drinking water
14 source and it happens to lie outside of a corridor
15 width, will you consider it in your work?

16 A. I would differentiate my work as different
17 than the routing work. I'm talking specifically
18 about looking at water quality effects. The
19 routing, you know, looking at a corridor and
20 buffers and all those things was a different
21 process.

22 Q. Okay. I guess I'll take that answer. You
23 said that you started to investigate Fargo's water
24 rights after you received a letter from Fargo's
25 mayor?

1 A. I never evaluated Fargo's water rights. I
2 started looking at water quality concerns.

3 Q. So you don't know what water rights Fargo
4 has?

5 A. For my analysis it didn't matter if -- a
6 water right or not. I was looking at the water
7 quality that might be going past the City of Fargo
8 and their intakes.

9 Q. Does the State of North Dakota recognize
10 the Sheyenne River and Lake Ashtabula as a drinking
11 water source?

12 A. Does the State of North Dakota? Well, I
13 think the City of Fargo recognizes it as a back-up
14 water source.

15 Q. No. My question is: Does the State of
16 North Dakota recognize the Sheyenne River or Lake
17 Ashtabula as a drinking water source?

18 A. It would be a back-up water source.

19 Q. Is it recognized as a drinking water
20 source?

21 A. I couldn't speak for what North Dakota --
22 to my knowledge.

23 Q. Thank you. But part of your work here is
24 risk assessment; correct?

25 A. Yes.

1 Q. Okay. And you spoke a little bit about
2 intermittent stream channels. I believe you said
3 that intermittent stream channels can have water up
4 to 50 percent of the time?

5 A. That is the definition of an intermittent
6 stream channel.

7 Q. And that's the definition you work with?

8 A. Yes.

9 Q. Okay. You spoke a bit about
10 volatilization of components, that is oil
11 components, and does that -- when you are in a
12 water stream, does that -- is that dependent upon
13 travel time of that stream reaching from point A to
14 point B?

15 A. Yes. The volatilization of a compound,
16 such as BTEX -- it occurs at a rate, and so the
17 longer time you have, the more that can evaporate.

18 Q. I see. And I think you stated that when
19 you were considering travel times in the Sheyenne
20 River, you were using the -- an average flow of 200
21 CFS?

22 A. That was a value based off of USGS. What
23 we looked at for transit times was -- initially we
24 looked at a much shorter time, it was five days,
25 but based on yesterday's testimony they're saying

1 on average flow it was 9 to 14 days.

2 Q. Okay. And so if the river was flowing
3 more, say 5, 6,000 CFS, which is the capacity of
4 the stream, it would cut that travel time down?

5 A. Yes.

6 Q. And if during the Red River -- operations
7 of the Red River Valley water supply project, which
8 I believe you heard yesterday would be a source of
9 water supply to the City of Fargo, that there would
10 be increased flows in the Sheyenne River?

11 A. Yes.

12 Q. Shorter travel times?

13 A. If water's coming down the Sheyenne at an
14 elevated rate, yes.

15 Q. What is the composition of the contents of
16 the TransCanada Pipeline going to be?

17 MR. KELSCH: Objection. Beyond the scope
18 of direct examination of this witness.

19 MR. DINGESS: I believe the witness, Your
20 Honor, said that she was --

21 JUDGE WAHL: No, I don't think it is. The
22 objection is overruled.

23 THE WITNESS: Keystone Pipeline would
24 carry crude oil. Crude oil is -- it encompasses a
25 vast array of different types of materials, just

1 like there's a variety of different types of
2 gasoline. So crude oil is made up of a number of
3 compounds, hundreds and hundreds of compounds. The
4 information -- basically, it's diluted bitumen from
5 the Alberta tar sands, the oil sands, and then
6 there's synthetic crudes. That would be the
7 primary things that would be transported along this
8 pipeline.

9 Q. (MR. DINGESS CONTINUING) Okay. So it
10 would contain these lighter and volatile elements
11 that you've -- or volatile compounds you spoke of,
12 as well as heavier components?

13 A. Yes. The BTEX content of the highest BTEX
14 content in those that we -- those were less than
15 one percent of the total volume.

16 Q. Are there going to be specific mixes of
17 crude oil that will be allowed in this pipeline?

18 A. I'll speak to what I know. There are
19 certain tariffs that set limits on what can and
20 can't be transported, and my understanding is
21 they're basically based on the hydraulics of the
22 pipe.

23 Q. So within -- so would these tariffs then
24 control and place a limitation on high ends, low
25 ends of these components that'll go into this mix?

1 A. You're getting -- the tariffs are beyond
2 my real expertise.

3 Q. Okay. Will the heavy components of this
4 oil be considered a dense material?

5 A. Crude oil is composed of light weights
6 and -- well, again, it's a range of hydrocarbons,
7 so it would have high ends and low ends -- or light
8 weights and heavy weights.

9 Q. Okay. So what specific gravity? Ten,
10 less or more?

11 A. The API gravity, I believe, is -- I want
12 to say 19 -- I could probably look it up. I think
13 I -- I think it was given to you guys in discovery.
14 It will float. The API gravity of western crude
15 select, which is representative of a diluted
16 bitumen that would be transported, is 19.03. The
17 synthetic crude is 32.48. That means that those
18 crude oils are lighter than water so they would
19 float.

20 Q. Okay. So that would be a specific gravity
21 greater than ten?

22 A. Mm-hmm.

23 JUDGE WAHL: Your answer is yes?

24 THE WITNESS: Yes. I'm sorry. I do that.

25 JUDGE WAHL: That's all right. Everybody

1 does it.

2 Q. (MR. DINGESS CONTINUING) Let's turn a bit
3 to the Texas study that you referred to. I believe
4 it's T39. Excuse me.

5 JUDGE WAHL: Mr. Dingess, this appears to
6 me to be a transition, so it also would seem to me
7 to be a good time to break. Let's be in recess
8 until 9:40.

9 (Recess taken.)

10 JUDGE WAHL: Back on the record, Mr.
11 Dingess, when you're ready.

12 MR. DINGESS: Thank you, Your Honor.

13 Q. (MR. DINGESS CONTINUING) Ms. Tillquist,
14 I'd like to ask you some questions about the --
15 what I'll generically refer to as the Texas study
16 so that we're sure we're talking about the same
17 thing. Would that be the Technical Memorandum
18 Surface-Water Spill Modeling for the Longhorn
19 Partners Pipeline prepared in July 1999, R.J.
20 Brandes Company, Austin, Texas?

21 A. Yes, it is.

22 Q. And that's what you relied on -- or that's
23 what you spoke about in your previous testimony?

24 A. That's what I was speaking about earlier.
25 Yes.

1 Q. Okay. And you used this as a basis for
2 your testimony concerning your assessment here
3 regarding the Sheyenne River?

4 A. Yes and no. It was -- I had my original
5 assessment, which we had talked about in previous
6 testimony. What this was looking at was strictly
7 benzene transport down river within the Sheyenne
8 River.

9 Q. Okay. But you drew conclusions from this
10 report?

11 A. That and other sources, yeah.

12 Q. Okay. And I'm wondering about some things
13 regarding that report. Do you have that report
14 available with you at the stand?

15 A. I do.

16 Q. On page seven of the report, in the middle
17 of the page there's a paragraph that begins, "The
18 model is most effective."

19 A. Yes.

20 Q. Could you read that, please?

21 A. The model is most effective with
22 substances that have specific gravities less than
23 or equal to one, light liquids. Dense liquids,
24 specific gravity greater than one, are poorly
25 modeled because they tend to sink, have reduced

1 evaporative losses and interact with bottom
2 sediments. No dense liquids were modeled in this
3 study.

4 Q. And I believe you said the Keystone
5 Pipeline that's at issue here has specific
6 gravities that can be greater than ten -- or the
7 contents can be greater than ten?

8 A. You're confusing types of specific
9 gravity. The specific gravity they're referring to
10 here is different than API gravity. It's a
11 different scale. The specific gravity in this
12 scale -- when you talk about a specific gravity of
13 one being water, the Keystone Pipeline actually has
14 a value less than one.

15 Q. Will you convert these two different
16 gravities?

17 A. I cannot off the top of my head.

18 Q. Okay. So we don't know then if we have a
19 dense liquid or not; is that correct?

20 A. No. We do. The specific gravity based on
21 this scale I don't have the number off my head, but
22 I want to say it's like .8 something, so it's
23 lighter than water.

24 Q. But I asked you for specific gravity
25 earlier and --

1 A. Yes. And I provided you -- there's
2 different ways of measuring specific gravity. The
3 API is a different measure -- it's like Fahrenheit
4 and Celsius. They both measure temperature, but
5 they use different scales.

6 Q. But you gave me the API scale; correct?

7 A. Correct.

8 Q. Okay. Did you actually run a model to
9 predict the concentrations in Fargo of the
10 volatiles that you were discussing?

11 A. No, we did not. What we tried to do was
12 this model uses -- we tried to use some of the
13 information in here, the regression equation.
14 There were some errors in it. We contacted the
15 modeler, and it was -- we did not -- we aren't able
16 to use it. So the model -- that's the regression
17 equation that was derived out of the fundamental
18 model. The fundamental model requires many more
19 different parameter inputs, so to do that would
20 take quite a bit of time. So we did not have the
21 opportunity to run this model.

22 Q. Okay. Are the conditions different on the
23 Sheyenne than they would be in this Colorado River?

24 A. They would be different. It's -- let me
25 explain. The -- what they did in this study is

1 they evaluated a number of range of flows. So what
2 we were trying to do is looking at the Colorado
3 River when it's flow was in a -- the flow was
4 comparable to that of the Sheyenne under average
5 flow.

6 Q. Would you turn to page 25 of the report,
7 the Texas report?

8 A. Mm-hmm.

9 Q. Look at the paragraph in the middle of the
10 page.

11 A. Mm-hmm.

12 Q. In the last sentence of that paragraph
13 isn't it true that it states that the equations
14 generally fit the Colorado River well but need to
15 be adjusted for use in other locations?

16 A. Absolutely. And again, I would just come
17 back that we were using this as -- because we
18 couldn't go through a very complicated model, we're
19 using this as a tool to try to explain what would
20 happen and again validating it with other examples.

21 Q. In the last two weeks or so?

22 A. Yeah.

23 Q. Thank you. I believe you talked about the
24 Coffeyville spill; is that correct?

25 A. Yes.

1 Q. And is the City of Tulsa located
2 downstream from Coffeyville?

3 A. I would have to go back and look at -- I'm
4 not sure.

5 Q. Then do you know if the City of Tulsa had
6 to switch to alternate supplies or did switch to
7 alternate water supplies as a result of the
8 Coffeyville spill?

9 A. The information that I had from the EPA
10 was that the closest water supply was 100 miles
11 downstream. They tested there and there was no
12 exceedances of water quality standards. It was the
13 same as they were before, so if Tulsa -- I'm
14 presuming then would have to be located further
15 downstream if they are on that -- that stream --
16 then they wouldn't have seen anything.

17 Q. But Tulsa did switch to alternate water
18 supplies as a result of the Coffeyville spill. Are
19 you aware of that?

20 A. I am not aware of that.

21 Q. Okay. Now we talked a little bit about
22 your Exhibit T44.

23 A. Can you tell me which one that is?

24 Q. This is the --

25 A. Oh, okay.

1 Q. -- map that has the Cenex and Magellan
2 Pipeline in eastern North Dakota.

3 A. Mm-hmm.

4 Q. What are the sizes of each of those lines?

5 A. That is provided in T39. There's Table 1,
6 I believe it is, and that provides the pipeline
7 diameter of each of those pipes.

8 Q. Okay. And so the pipeline diameter of the
9 Cenex line is?

10 A. Eight inches.

11 Q. And the pipeline diameter of the Magellan?

12 A. Again, there's two. One is eight inches
13 and one is six inches.

14 Q. Okay. And what is the pipeline diameter
15 of the Keystone Pipeline?

16 A. 30.

17 Q. 30. And can you work out the volume
18 difference between an eight-inch pipeline per
19 linear foot and a 30-inch pipeline per linear foot?

20 A. Not off the top of my head.

21 Q. Would you believe it's 14 times?

22 A. I have no -- no way of affirming or
23 refuting that.

24 Q. Wouldn't it be the formula πR^2
25 times the length of the pipeline?

1 A. That sounds pretty reasonable, but I
2 don't -- I'm not an engineer that does pipeline
3 volumetric analysis.

4 Q. Would a 30-inch pipeline be substantially
5 larger in volume than an 8-inch pipeline?

6 A. I would say so, yeah.

7 Q. And what pressures do these pipelines
8 operate under?

9 A. I believe Keystone would operate at
10 maximum operating pressure of 1440. I believe most
11 of these pipelines are also high-pressure
12 pipelines.

13 Q. Don't you have a chart there you can
14 check?

15 A. I do not.

16 Q. And what are the contents of these
17 pipelines? What are they carrying?

18 A. Of these other pipelines?

19 Q. Yes.

20 A. Refined petroleum products, natural gas
21 liquids, crude oil.

22 Q. Okay. All right. And these pipelines are
23 already in existence?

24 A. Correct.

25 Q. And they -- do they present some risk to

1 spill or to rupture in their present location?

2 A. Pipelines -- there is a potential. It's a
3 small potential for any pipeline to break, so --

4 Q. And so if you have one pipeline, you have
5 a small potential; correct?

6 A. Yes.

7 Q. If you have two pipelines, then you have
8 perhaps a greater potential?

9 A. Perhaps, yeah.

10 Q. And with a third or additional pipelines
11 is the potential for a spill increasing?

12 A. Yes, it is. But they're also in -- well,
13 never mind.

14 Q. Now, I believe you talked a bit about risk
15 and consequences of a spill to the City of Fargo,
16 and you said it would -- you estimated it would be
17 a 15- to 20-hour event?

18 A. That was based on the Longhorn, as you're
19 referring to it, the Texas study.

20 Q. Okay. And would it be possible for the
21 event to be longer in duration?

22 A. I would -- my opinion is that there would
23 never be a BTEX front that would come past the City
24 of Fargo at all.

25 Q. So you're saying no danger at all to the

1 City of Fargo?

2 A. I do not see the potential for BTEX to get
3 downstream in sufficient quantities to exceed the
4 maximum contaminant level at Fargo.

5 Q. What about the heavier elements?

6 A. No.

7 Q. They'll never reach there?

8 A. No. No. Do you want me to expand on
9 that?

10 Q. I'll take your answer as it is. You
11 stated that you had -- that you were having trouble
12 with Mr. Deutschman, understanding his work.

13 A. Yes.

14 Q. And you said that you used a deterministic
15 model?

16 A. Yes.

17 Q. Or deterministic approach. Excuse me.

18 A. That's what -- yeah.

19 Q. Keystone followed a deterministic
20 approach.

21 A. Yeah.

22 Q. And that's to generate a single number?

23 A. Yes.

24 Q. Okay. And you disagree with what Mr.
25 Deutschman stated, that it is better to assess risk

1 through a -- a range?

2 A. I think there is times where a stochastic
3 model is appropriate and there's times where a
4 deterministic model is appropriate. It depends on
5 the information you have, the underlying data. I
6 think if you try to apply a stochastic model, when
7 you don't understand -- you don't have the basis,
8 the knowledge of the underlying probability curves,
9 it leads -- basically it's kind of an illusion of
10 technique -- and I'm not saying he did this, but
11 I'm just saying you're applying -- you're applying
12 some uncertainty, your lack of knowledge to the
13 curves, so you have an illusion that you're
14 actually creating something that's very
15 sophisticated when in reality you may not have the
16 information to support that.

17 Q. Is there anything in his testimony that
18 indicated that yesterday?

19 A. I think there was some confusion on some
20 parts that I indicated that again maybe there was
21 some misunderstandings that I don't think he quite
22 understood what was being done.

23 Q. Confusion on your part or his part?

24 A. I believe talking to a number of people,
25 including DNV that were listening in, there was --

1 it was the conclusion of people that it was his
2 misunderstanding of some of the information that
3 was in the DNV report that led to some
4 misapplications.

5 Q. What specific misapplication of
6 information?

7 A. My understanding -- and again, this is
8 talking to the DNV experts -- is that there is a --
9 there's a leak-detection curve in there and that
10 was being used to look at response times, and the
11 way it was being applied was incorrect.

12 Q. And how was it incorrectly applied?

13 A. You know, this is just getting further and
14 further beyond my expertise because this is really
15 DNV's analysis, and I don't feel comfortable being
16 able to respond clearly and concisely. I --

17 Q. But you said basically you don't trust his
18 work.

19 A. No. I said I don't understand what he
20 did.

21 Q. You don't understand the work, but you
22 don't know why you don't understand it.

23 A. I'm saying that a number of us sat down
24 last night and we tried to understand the premises
25 for how he had done his analysis, and he was saying

1 he had difficulty replicating the DNV assessment
2 and that there was a number of things that he was
3 trying to figure out. We were trying to do the
4 same thing with his assessment in a few hours,
5 trying to understand what he had done and how he
6 got the numbers. I would not be able to replicate
7 what he had done. I don't understand how he got
8 there. It's not saying that it was wrong or right.
9 I'm just saying I don't understand it, how he got
10 those numbers.

11 Q. Okay. Well, perhaps we might recall him
12 again to clarify for your sake. I believe you used
13 the term "risk acceptability."

14 A. We talked about what an acceptable risk
15 might be.

16 Q. Yes.

17 A. Okay.

18 Q. And would that not be dependent upon what
19 is acceptable in the eyes of a decisionmaker?

20 A. Absolutely.

21 Q. Okay. And would the folks that perhaps
22 were on a municipal water supply system have a
23 different view of risk compared with those that
24 might operate a conveyance that could pollute that
25 system?

1 A. You lost me in the last part of your
2 statement. The --

3 Q. Okay. I will restate that. Would --
4 those who operate a municipal water supply system
5 might have a different level of acceptability
6 regarding a risk than those who would operate a
7 conveyance system that might pollute the water
8 system?

9 MR. KELSCH: Your Honor, I would object to
10 that. That's calling for speculation on the part
11 of this witness.

12 JUDGE WAHL: I think it's a fair question
13 for an expert witness who evaluates risk, Mr.
14 Kelsch.

15 THE WITNESS: I guess -- I'm sorry. I'm
16 still not -- the conveyance system, are you
17 referring to --

18 Q. (MR. DINGESS CONTINUING) To a pipeline
19 perhaps carrying crude oil.

20 A. Okay. So are you saying that a municipal
21 water supply, the City of Fargo, would they have
22 maybe a different level of what would be acceptable
23 to them as opposed to Keystone? That's what you're
24 asking?

25 Q. Can you answer that question? Yes.

1 A. I would say yes, but let me qualify it
2 that the risks that we talked about were not -- the
3 acceptable risk levels were not decided by the
4 operators. These were decided by, again, state and
5 federal agencies that were involved in the
6 decisionmaking and included some potential impacts
7 for one of those to a drinking water source. So
8 it's definitely -- a decisionmaker weighs and
9 balances and it's their decision.

10 Q. And I believe you stated in the beginning
11 of your cross-examination here that you don't know
12 if the State of North Dakota lists the Sheyenne
13 River and Lake Ashtabula as a drinking water
14 source?

15 A. I can't confirm or deny that. Yeah.

16 Q. Okay. Thank you. Ms. Tillquist,
17 harkening back to our discussion about the contents
18 of crude oil, you said it contained a large variety
19 of compounds?

20 A. Mm-hmm.

21 JUDGE WAHL: Your answer is yes?

22 THE WITNESS: Oh, sorry. Yes.

23 Q. (MR. DINGESS CONTINUING) And is that true
24 of this synthetic crude that you say will be
25 shipped in the Keystone Pipeline?

1 A. Yes.

2 Q. Are there any naphthenic acids in the
3 synthetic crude or the crude oil that will be
4 shipped in the pipeline?

5 A. Naphthenic acids, yes.

6 Q. So those will be refined in Illinois or in
7 Oklahoma?

8 A. The naphthenic acids are basically present
9 in the bitumen. When they are extracted, you'd
10 have naphthenic acids in Alberta, and then the
11 refinery, when they receive it, they would have
12 naphthenic acids.

13 Q. Okay. And are they volatile like BTEX?

14 A. No.

15 MR. DINGESS: All right. Thank you. I
16 don't think I have any further questions.

17 JUDGE WAHL: Ms. Linderman.

18 MS. LINDERMAN: Thank you.

19 **CROSS-EXAMINATION**

20 **BY MS. LINDERMAN:**

21 Q. If we could go back for a bit to the first
22 part of your testimony regarding your observations
23 of Mr. Starke's property. Did you or do you know
24 of anybody from TransCanada who has a background in
25 hydrology who's examined his property?

1 A. Actually, we -- I have worked closely with
2 a gentleman who is a hydrologist, and he was
3 actually the one that helped me out on looking at
4 these stream channels and deciding what is a viable
5 stream channel and what is not. It was -- I
6 actually went out and field verified his work,
7 and --

8 Q. And -- I'm sorry. You can finish.

9 A. That's all right.

10 Q. What kind of a survey did you do? What
11 was the extent of the studies that you did of this
12 portion of the land?

13 A. Me, personally?

14 Q. Either you or with the assistance of this
15 hydrologist.

16 A. Specifically when we're looking at trying
17 to find viable transport routes, my
18 understanding -- and this was provided, I think,
19 in -- I'm not sure if it is in this risk assessment
20 that we provided here. What he did was looked at
21 GIS, first of all, and identified intermittent
22 stream channels that could be crossed by the
23 pipeline or were in close enough proximity that if
24 a spill occurred, that a spill might get into that
25 stream channel. Based on that then he looked at

1 that -- I think it's called TerraServer and Google
2 Earth and basically looked at these through aerial
3 photographs zooming in on these areas trying to
4 determine, if these were actual, viable transport
5 channels, did they have obstructions that would
6 prevent them from transporting a spill if it were
7 to occur downstream.

8 So he did his analysis, and then, again,
9 what I did is I went out and field verified those
10 locations to -- looking at the site, you know,
11 could a spill -- if it occurred at this location,
12 could it possibly get to the Sheyenne River or Lake
13 Ashtabula?

14 Q. Did you examine the characteristics of
15 water flowing across the property at times of
16 spring flooding or heavy rainfall?

17 A. I did not. I was there, again, in
18 November, but you can tell somewhat by the land use
19 patterns, I would suggest, that, you know, a lot of
20 these areas are going to be farmed that were not
21 viable. You can also look at, you know, are there
22 permanent wetlands there that would suggest that
23 there's water there constantly, is there a stream
24 channel there, is there vegetation in any way --
25 recurring vegetation that would indicate some sort

1 of water presence that might be there. Certainly
2 when you're looking over a very flat topography,
3 the farmer -- you can still see the furrows and a
4 lot of times the corn stalks still out there.
5 There was not flowing water there, you know, for
6 most of the year.

7 Q. Was this data examined historically over a
8 period of years to take into account fluctuating
9 weather patterns, use patterns, or was it limited
10 to a shorter period of time?

11 A. This was based on topography and
12 evaluation of the sites. We weren't looking at
13 again the stream flow. There's no stream flow data
14 for these sites because they're so small, and I
15 will also mention to you that we were looking --
16 I'm not sure if I said this -- at things that
17 obstructed -- so not only the ones he saw, but a
18 lot of places there is like elevated roads. So
19 you'll see on your -- on a map what indicates an
20 intermittent stream going across a road and going
21 on downstream, and when you actually traverse this
22 road, you might see, you know, a stream channel,
23 but there's no culvert. So if a spill occurred and
24 the pipeline was up here, which we found at times,
25 so it was on this side of this drainage, it would

1 have to come down and it would get hung up by this
2 road because there was no culverts to pass along
3 the oil in many cases.

4 Q. Would that --

5 A. So we looked at a number of things like
6 that.

7 Q. Would that lead to any subsurface movement
8 of water?

9 A. I would say that with time I suppose that
10 with enough water that, if the soils are permeable,
11 that the waters would get into the soils and there
12 could be movement of water across, but again, now
13 you're talking about trying to move crude oil and
14 its constituents and -- well, I'm going down that
15 road, but --

16 Q. We can get into more detail about crude
17 oil and components of crude oil moving, but I'm
18 just trying to address the drainage patterns of the
19 land to start with.

20 A. Okay.

21 Q. Is it the case that drainage patterns
22 across this property or other properties along this
23 area of the lake and the river can change with time
24 depending on weather conditions or how it's used by
25 landowners? And how is that taken into account in

1 your analysis?

2 A. What we did is we looked at the conditions
3 as they are now. Part of Keystone's ongoing
4 requirements is they have to continually evaluate
5 risk along their pipelines. So as land forms were
6 to change, they would continually have to evaluate
7 risks. So if suddenly a new area became a
8 potential risk area because of a transport route,
9 you know, they would be looking at that within
10 their -- well, within their risk management
11 process.

12 Q. In general, Mr. Starke's property maybe in
13 particular, by generally the land along Lake
14 Ashtabula, where does the water from that land
15 drain ultimately?

16 A. The land surrounding -- if I'm
17 understanding your question --

18 Q. Along the pipeline corridor, I'm sorry.
19 That's what I meant to specifically ask.

20 A. It depends. Portions of the pipeline
21 route through this area, there are some parts where
22 it drains into isolated wetlands. They don't
23 really drain -- there's no drainage leading to one
24 way or the other. There's others that would lead
25 into the Maple River drainage and there's some that

1 would lead into the Sheyenne.

2 Q. Okay. So some of them lead into the
3 Sheyenne. With the wetlands in terms of hydrology
4 are you able to speak to whether there's any
5 subsurface flow or interaction or hydraulic
6 interconnection between those?

7 A. Between the wetland -- so you're saying
8 wetland groundwater flow and then getting back into
9 a watershed, say, the Sheyenne or the Maple?

10 Q. Correct.

11 A. I would presume that would be true with
12 time. It depends, I would suppose, on the soil
13 conductivity and, you know, things like that. So I
14 can't answer that for certain.

15 Q. Okay. I think in your testimony when you
16 were discussing the risk associated with the spill,
17 you focused mostly on a large volume spill. If we
18 could, I'd like to focus on a smaller leak, maybe a
19 pinhole leak that would go undetected.

20 A. Okay.

21 Q. And to clarify, maybe a first question I
22 should ask, this pipeline is underground at this
23 point when it's passing by the lake?

24 A. Absolutely.

25 Q. Okay. If there is some kind of a pinhole

1 leak, this would be oil leaking into the soil
2 underneath the surface?

3 A. Correct.

4 Q. What would prevent this oil getting into
5 subsurface waters and remaining there for some
6 period of time?

7 MR. KELSCH: Your Honor, I'm going to
8 object to this line of questioning. The limited
9 scope of the purpose of this hearing is for the
10 impact of Keystone on Fargo and Fargo's water
11 supply, not potential oil getting into the ground
12 and staying there.

13 MS. LINDERMAN: I'm getting there in the
14 context of subsurface waters and how this land
15 drains, Your Honor.

16 JUDGE WAHL: Overruled. You may proceed.

17 THE WITNESS: Could you restate the
18 question?

19 Q. (MS. LINDERMAN CONTINUING) Possibly. If
20 this underground pipeline -- if there's some kind
21 of a pinhole leak that's slowly leaking into the
22 soil, is there a potential for that to stay there
23 some time and possibly interact with subsurface
24 waters?

25 A. Yes.

1 Q. And would the volatile compounds that
2 you've discussed, the BTEX compounds -- would those
3 dissolve into the subsurface waters the same as
4 they would into surface waters?

5 A. Yes. We actually talked about this -- the
6 subsurface transport as a mechanism, so we actually
7 did evaluate this exposure route for this entire
8 area.

9 Q. When you're discussing a slow leak that's
10 underground, wouldn't it be the case that there's a
11 significantly longer period of time that that could
12 go undetected?

13 A. For a pinhole leak I think there -- yes.

14 Q. I think maybe in previous testimony
15 exhibits offered by TransCanada -- I don't know if
16 it was you in particular, so maybe you can't speak
17 to this -- a period of 90 days was suggested for a
18 very small leak?

19 A. Yeah. Again, this is -- this is not my --
20 I think Brian Thomas has previously testified that,
21 you know, something that would be 90 days would
22 have to be just a pinhole-type leak because -- for
23 it to be not detected for that long.

24 Q. So these contaminants could potentially
25 get into subsurface waters and travel some distance

1 even if there weren't an oil spill flowing over the
2 surface?

3 A. I've testified previously on the
4 subsurface transport of crude oil and its dissolved
5 constituents and --

6 Q. How does that relate to your previous
7 testimony that you don't believe there is a very
8 great likelihood of any of these contaminants
9 reaching the lake, reaching Baldhill Dam and then
10 the Sheyenne River?

11 A. From subsurface transport from pinhole
12 leak?

13 Q. Assuming the maximum detection period of
14 90 days.

15 A. Let me give you an example of a spill
16 where a large volume of material got into Bemidji.
17 This was an oil spill -- crude oil spill. That oil
18 is actually in -- in the soil. It was there for a
19 while, and what happens is the dissolved
20 constituents -- well, the constituents -- the
21 lightweight constituents, the BTEX compounds, can
22 dissolve out of the oil and those will begin
23 migrating in the direction of the groundwater
24 movement, but again, then you start running into
25 natural attenuation which limits the dispersal of

1 these lightweight compounds.

2 Q. Have you studied as part your risk
3 analysis on this topic in particular the rate and
4 volume of subsurface water movement in times of
5 heavy spring floods or spring runoff, heavy
6 rainfall?

7 A. No, I have not looked in this area. No.

8 Q. Given the potential for contamination from
9 a subsurface leak, do you think that would be an
10 appropriate component of risk analysis?

11 A. What we looked at for subsurface transport
12 was we looked through the literature and looked at
13 the movement of groundwater -- sorry, BTEX
14 compounds in groundwater. Now I'm scratching my
15 head. I believe it was an EPA study that looked at
16 500 BTEX contamination sites and found that the
17 mobility of BTEX compounds was largely limited to
18 200 feet, 250 feet, somewhere in there. We'd have
19 to go back to my testimony before, but we're
20 talking hundreds of feet of movement, not miles and
21 miles from a pipeline to, say, Sheyenne. So we
22 eliminated that -- as a risk assessor we eliminated
23 that as a viable exposure route.

24 Q. Over what kind of a time period are you
25 talking about?

1 A. In the case of Bemidji it's moved, boy, I
2 want to say 100 yards in 20 years.

3 Q. Is that at all a product of soil type and
4 water flow in the area?

5 A. Yeah. They actually have very permeable
6 water -- or very permeable soils in that area, so
7 it's a function both of groundwater -- soil types,
8 the rate of groundwater movement, the volume of the
9 contamination that's there, and then the time and
10 the presence of these -- these bacteria that act in
11 natural attenuation. So, again, by looking at 500
12 different sites with this EPA study, that covers a
13 wide gamut of different environmental types.

14 Q. Have -- I mean, I'm still trying to
15 understand why this -- just a basic hydrological
16 study examining this risk wasn't done in this
17 particular geographic area given the fact that it
18 has unique topographical features, unique soil
19 types, unique precipitation patterns?

20 A. I wouldn't say that it has -- it's not a
21 unique area for topography. It's not unique in its
22 soil types. I think these types of areas are found
23 throughout the United States in, you know,
24 various -- where a lot of pipelines go across, and
25 I think there are -- every site is unique in its

1 own way, but there's nothing that stands out in
2 this area that would lead me to think that there's
3 something drastically different at this site that
4 would invalidate the application of a study at 500
5 sites or, you know -- yeah.

6 Q. But given the volume of water and the fact
7 that it's a water source for a major municipality,
8 why wouldn't it even be a small component of the
9 specific risk analysis that you did?

10 A. Because there is no chance of that
11 subsurface transport reaching the river, so it's
12 eliminated as a viable exposure route.

13 Q. Did you mean to say there's no chance or
14 there's a very small chance?

15 A. In my opinion, the chance of a subsurface
16 transport of dissolved constituents from this
17 pipeline traversing two, three miles wouldn't
18 happen.

19 Q. You understand there's a difference
20 between something being impossible and something
21 being improbable, and I'm trying to get at --

22 A. I would say that the probability --

23 Q. -- whether you're trying to say there's a
24 zero chance or a small chance.

25 A. -- is so extremely remote as to be

1 considered virtually negligible.

2 Q. How much time would it take in a risk
3 analysis to just look at this issue given the
4 resources that might be impacted by it?

5 A. I would say that it would take quite a
6 long time because you'd probably have to go and get
7 groundwater studies, looking at the movement, rate
8 of movement, soil conductivity. I mean, the more
9 sophisticated you want to make your model and try
10 to look at this, the longer it's going to take to
11 generate this information. I'm not sure that
12 information is available for this specific
13 location.

14 Q. How would you go about gathering it?

15 A. Gathering hydrological data for
16 groundwater movements beyond --

17 MR. KELSCH: Again, Your Honor, I'm going
18 to object to this line of questioning. I think
19 she's answered the question and testified that it
20 cannot get there, and that's the purpose of this --
21 of this hearing.

22 JUDGE WAHL: Well, but it's
23 cross-examination and it's within the scope.

24 But --

25 MS. LINDERMAN: I can move on.

1 JUDGE WAHL: Thank you, Ms. Linderman.
2 The objection is overruled with that promise.

3 MS. LINDERMAN: Thank you very much.

4 Q. (MS. LINDERMAN CONTINUING) Could you talk
5 to me a little bit about the emergency response
6 plan and the different agencies that would be
7 involved if there were some kind of an oil spill
8 along the pipeline on this part of the pipeline by
9 the lake or the Sheyenne River?

10 A. I will not go into detail because the
11 emergency response plan is not my forte. Brian
12 Thomas has already testified to the emergency
13 response plan. In general, though, as I mentioned
14 earlier, Keystone would be out there, Department of
15 Health, EPA could be out there. That's as far as
16 I'd feel comfortable to go.

17 Q. And what types of dangers or risks would
18 they be addressing?

19 A. I think the sampling methodology that they
20 would look at -- they'd be looking at probably
21 water contamination, they might be looking at air
22 quality, fire risk, but again, I mean, that's off
23 the top of my head and I --

24 Q. You would anticipate that water
25 contamination would be one of the issues that would

1 have to be examined in the event of an oil spill.
2 Would this just be on the lake if the spill were
3 near or into the lake or would it be all along the
4 Sheyenne River?

5 A. Let me rephrase your question so I can --
6 if a spill reached the water body, then they would
7 be testing for water quality. If it was, say,
8 closer, adjacent, they still may be doing that, as
9 well. If it's -- if there's no viable route to get
10 it -- a spill -- if they spill it 20 miles away
11 from a river and it's flat terrain, they're not
12 going to be monitoring that water there. You have
13 to -- when they decide what they're going to
14 monitor, a lot of times when the other agencies get
15 involved, it's in coordination and they look at
16 risks, and then collectively those decisions are
17 made of what should be sampled and how often and
18 what they're going to be looking for.

19 Q. And in the event of some kind of spill
20 that was in the vicinity of the Sheyenne River or
21 Lake Ashtabula, do you think -- as a risk analyst
22 would it be appropriate to notify the City of
23 Fargo?

24 A. I think that it would come down to the
25 emergency response plan and what they have in it,

1 and my understanding is that they would notify
2 downstream water users given the importance of the
3 city -- of the water to other cities, as well as
4 Fargo, those people are going to be notified.

5 Q. Has it been --

6 A. That would be my opinion. I don't know
7 what they have.

8 Q. Has it been your testimony that you think
9 there is virtually no risk to the City of Fargo if
10 there were the kind of spill that you discussed in
11 your testimony?

12 A. Yes.

13 Q. So what would be the purpose of notifying
14 them?

15 A. That's why I'm -- what they would probably
16 do is proactively do it. Again, you're not going
17 to notify -- well, no. Again, they will have a
18 list of downstream water users that they would
19 notify. How they choose to -- which ones they
20 would notify, again, that's getting into the
21 details of the emergency response plan which is
22 beyond my -- my knowledge.

23 Q. I guess what I'm curious about is if these
24 spills move only very slowly and the volatile
25 compounds move only very slowly, isn't it a waste

1 of time to notify downstream communities, or is
2 there, in fact, a level of risk that is of concern
3 to both TransCanada and these municipalities?

4 A. I think -- I think -- I'm talking as a
5 risk assessor, not as an emergency response
6 planner. I think it's always prudent to -- if
7 there's an event, to let people know within the
8 vicinity. I might be -- well, I'm not going to
9 draw an analogy.

10 Q. The analysis of risk to Fargo water supply
11 that was offered as Exhibit 39, was any part of
12 this analysis coordinated by or through the City of
13 Fargo?

14 A. Let me think here. No.

15 Q. Did you speak to anyone with their water
16 treatment facilities or in their water department
17 or their public health department in coming up with
18 this risk analysis?

19 A. With the City of Fargo --

20 Q. Yes.

21 A. -- no. No.

22 Q. And why wasn't this kind of a study done
23 prior to November of this year?

24 A. When we look at -- when we look at risk,
25 we look at the risk to these water bodies like Lake

1 Ashtabula and the Sheyenne River. There is other
2 communities along the route that also use water
3 from these sources. So when we conducted our
4 analysis of risk for Lake Ashtabula and the
5 Sheyenne River, we were evaluating risk in a more
6 localized sense. We didn't extend our focus 200
7 miles downstream. We were concentrating more on
8 those local communities and making sure that those
9 were protected.

10 Q. Would you say that mitigation and the
11 ability to mitigate is a function of a good risk
12 analysis?

13 A. Depends on what your --

14 Q. Well, let me be more specific.

15 A. Okay.

16 Q. Would it be relevant to your evaluation of
17 risk and whether risk was acceptable if you knew
18 and were familiar with, say, the City of Fargo's
19 capacity to respond to a catastrophic event on a
20 pipeline?

21 A. I'm sorry. Say that again.

22 Q. Talking about acceptability of risk, is
23 that analysis affected by your knowledge of the
24 City of Fargo's ability to respond to a
25 catastrophic event on a pipeline? And what would

1 happen in case of an emergency on their end?

2 A. My analysis, and strictly my analysis, is
3 based on water quality in the immediate area and
4 then downstream. It wasn't accounting for the
5 water treatment, you know, facilities as far as,
6 you know, their specific ability to treat or not
7 treat a material coming through. Our concern was
8 would a spill have the ability to affect water
9 quality at those intakes.

10 Q. Okay. You were present, I believe, for
11 the testimony that was offered yesterday regarding
12 how the City of Fargo relies on water supplies from
13 Lake Ashtabula and the Sheyenne River and sort of
14 the order of precedence for their various water
15 supplies, their primary supply being the Red River.
16 Given that, if there were contamination in Lake
17 Ashtabula in a time of drought, does that affect
18 your analysis of the risk to the water supply for
19 the City of Fargo if both the Sheyenne and the Red
20 River were low because of a drought period?

21 A. Yeah. Basically -- well, if you would
22 look at the ability of a drought to occur, which I
23 heard yesterday was a one in 100-year event, and
24 then combined that with our probability of a spill
25 happening and actually getting into Lake Ashtabula,

1 the Sheyenne River, I think that was 5400 years.
2 So you multiply that by a 100-year event, so now
3 you're looking at the coinciding of two events as
4 one-and-a-half-million years. So it's -- the
5 chances of those two events co-occurring using
6 those numbers would be very, very small.

7 Q. I think actually the evidence offered by
8 Fargo was that there are periods of low flow in the
9 Red River relatively more often than there is a
10 100-year drought. That's not the only time that
11 there is problems with water supply in both the
12 Sheyenne and the Red Rivers; isn't that correct?

13 A. I think that is true. Yeah.

14 Q. And when you're talking about a very low
15 probability event that could occur once in so many
16 years, I mean, there's a chance of it occurring
17 that often, but there's also a small chance that it
18 could occur more often than that; isn't that
19 correct?

20 A. I would say it depends on the parameters
21 that you put in to begin with, and what we did
22 is -- again using a deterministic rather than a
23 stochastic -- the way to effectively use a
24 deterministic model is to make conservative
25 assumptions so that you overestimate the risk. So

1 when we say a chance of a spill, we're saying no
2 more than 5400 years because we've already
3 incorporated a lot of assumptions to make it
4 conservative. So using the stochastic model we've
5 already shifted over our -- we're looking at one
6 end of that curve.

7 Q. When you talk about risk acceptability and
8 whether, I guess, maybe the risk to the City of
9 Fargo's water supply is important or treated with
10 importance in your analysis, is that a numerical
11 value that you put on risk acceptability, or are
12 you trying to get risk as small as possible?

13 A. Am I trying to get -- the risk is what the
14 risk is. The -- again, I think I'm missing your
15 question. I'm sorry.

16 Q. I guess I would assume that the
17 development process for this pipeline risk analysis
18 interacts with siting and routing and pipeline
19 design, and when we're talking specifically here
20 about routing, are you trying, when you do your
21 risk analyses and then modify your project, to
22 minimize risk are you trying to shoot for some
23 numerical value of risk?

24 A. We're not shooting for a single numerical
25 value. What we're looking for is routing, and

1 again, we're going to go onto the edge of my
2 expertise again, but routing is a weighing and
3 balancing of costs, benefits, you know, factors
4 that -- you know, when we look at routing a
5 pipeline near a water body, is this an acceptable
6 distance, is this a safe distance? That's when my
7 input is looked at, and we'll say, well, given the
8 topography, given all these other factors that
9 we've talked about in detail here, this seems to be
10 a reasonable route when we look at comparing other
11 different routing factors.

12 Q. When -- let's assume for the sake of this
13 next question that you're dealing with a situation
14 where there is a drought situation for Fargo and
15 the Red and the Sheyenne are both low and they're
16 having to rely on the water that's trapped behind
17 Baldhill Dam and Lake Ashtabula. There's some kind
18 of a spill, however unlikely that may be in your
19 analysis, that impacts the lake. If this is
20 impacting what has become for various reasons the
21 primary water supply of a large municipality, does
22 the level or severity of consequence affect your
23 risk analysis and how does it?

24 A. If you're asking if there would be -- if
25 you combined all of those events, would the

1 consequences -- is that what you're asking to
2 Fargo?

3 Q. The fact that the primary water source for
4 Fargo in this case would be impacted by a spill
5 into Lake Ashtabula, does that play into your risk
6 analysis in what you find to be an acceptable level
7 of risk?

8 A. Well, again, I'm sorry, but I guess I
9 still come back to if we're talking about an
10 acceptable level of risk, we're talking about how
11 do these factors interplay between the likelihood
12 of an event, the lack of probable events to the
13 City of Fargo, and then combining it with a drought
14 or an event where they have to switch water
15 supplies to the Sheyenne, again, it would be -- the
16 risk would be low. And again, even -- to play the
17 scenario out, even if a spill occurred and it got
18 into Lake Ashtabula, again, we already talked about
19 how drought would affect the flow regime and the
20 BTEX concentration would have longer time to get
21 out. You're also -- you know, well, it just -- I
22 mean --

23 Q. I guess I wasn't talking about, you know,
24 all of the -- the oil slick and the BTEX compounds
25 actually traveling to Fargo. I was talking about a

1 set of circumstances where the lake, itself, has
2 become a primary water supply upon which the city
3 relies and how that kind of impact would play into
4 a risk analysis and an analysis of risk
5 acceptability.

6 A. I really don't mean to be difficult, but
7 I'm still struggling to understand. So Lake
8 Ashtabula to be a primary water supply, it still
9 has to come down the Sheyenne River, so we're still
10 talking about all the things we just talked about
11 earlier.

12 Q. But if the contaminants were in the lake,
13 itself, how would they be prevented -- and that was
14 the water source for the city, what -- I guess I
15 don't -- wouldn't there be some requirement that it
16 be cleaned up or somehow mitigated before that
17 water is released to the city?

18 A. Well, first of all, the -- okay. So if a
19 spill happened and it were to be coming down and
20 get into Lake Ashtabula, again, you'd have
21 containment that would localize the effects of the
22 spill into a small region. They would be
23 testing -- you know, all these people that we
24 talked about earlier would be out there testing
25 water quality. Now if there was a release that

1 would have to go to Fargo, I mean, they're going to
2 be looking at the water quality. They are going to
3 be cleaning it up, they have to get it to certain
4 water quality standards, but if it were to be
5 released, you know, again, and if the benzene
6 concentrations were exceeding the MCL, then, again,
7 it has to be transported all that distance when all
8 these environmental fate and transport mechanisms
9 occur, and the City of Fargo would be notified, and
10 they would have a chance to be monitoring this
11 material as it came along so they would know if
12 that would exceed their water quality standards.

13 Q. But what is their -- I guess. Okay. We
14 can move on from that.

15 A. I'm sorry.

16 Q. If there's a possibility of mitigating
17 even a small risk to the city by moving the
18 pipeline several miles, do you think that is an
19 appropriate measure for TransCanada to consider?

20 A. I think that there is a lot of factors
21 that go into routing where a pipeline goes. What I
22 concern myself about is water quality issues.
23 There's a lot of other factors that are looked at.
24 Would it -- would it decrease -- I mean, you're
25 still going to be affecting some other watershed,

1 you're still going to have other things. So I
2 can't compare one route versus another without --
3 all I'm looking at is this one. You're saying
4 could moving it protect one -- the Sheyenne -- I'd
5 say there's so limited places where it could get in
6 and the chances are so improbable, but if you moved
7 it, in certain areas then are you creating a risk
8 for somebody else, and I don't have that
9 information to weigh and balance and try to form
10 that opinion.

11 Q. Has that analysis been done at all by
12 TransCanada or by yourself?

13 A. I believe when we talked in hearings past
14 they had looked at some route concepts. I just --
15 yeah. So I'm -- you'd have to look at previous
16 testimony because I can't speak to that.

17 Q. Wouldn't you say it would be appropriate
18 to do a risk analysis for each of the various
19 scenarios and then compare them in coming up with
20 these conclusions?

21 A. Risk assessment takes a while to do, and
22 they will -- as this process evolves they will be
23 looking at that. What we look at when we're
24 routing is a lot of these factors, but these very
25 detailed, specific analyses come up when we've got

1 specific issues and we'll be doing these things,
2 but it's -- this level of detail can't -- isn't
3 done when we're doing macro level routings. It's
4 done -- it's done subsequently.

5 Q. I guess why not? You were -- presumably
6 TransCanada is the one who chose the timing of this
7 application and their schedule that they would
8 prefer to see play out. Why can't these things be
9 done now or previous to now?

10 A. What TransCanada has done is they've
11 looked at routing based on a number of factors and
12 considerations, including my input on general risk
13 factors. It was my professional opinion that where
14 they put it was satisfactory, and having gone out
15 on a site visit, I'm even more convinced of that.
16 So it's kind of an iterative process as we go
17 through. It's -- it's never -- it's always being
18 done, you know, to some level, and then, again, to
19 address a specific issue like this, we want to make
20 sure we handle it in detail, but we're always
21 looking at these things at some degree or another.

22 Q. Is there a point at which you would
23 anticipate a comparative analysis of different
24 routes in this area being done?

25 A. I think that the alignment that Keystone

1 has submitted and is being looked at by the draft
2 EIS through the Department of State, they would be
3 the ones that would be looking at alternatives.

4 Q. So you're relying on the Department of
5 State to tell you whether you need to look at
6 alternatives?

7 A. No. The Department of State is required
8 under law to look at various alternatives.

9 Q. And if they don't?

10 A. That's -- that's -- I'm --

11 Q. That's their business?

12 A. No, ma'am. It's -- the Department of
13 State -- they go through a process and they -- one
14 of the things they have to look at is alternatives.

15 Q. As the constructors of this pipeline,
16 isn't TransCanada the one with the primary
17 responsibility to look at all of the alternatives
18 and all of the risks without being asked by a
19 government agency even?

20 A. I think routing is -- we weigh and balance
21 a number of different risks.

22 Q. Is there any intention on the part of
23 TransCanada to have formal consultations with the
24 City of Fargo on this particular issue?

25 A. Yeah. Actually, they -- they tried to

1 contact the City of Fargo and have meetings with
2 them prior to these hearings to discuss this.

3 Q. And what is the level of discussion that
4 you would anticipate? Is there going to be a
5 detailed analysis conducted jointly with the City
6 of Fargo of risk and --

7 MR. KELSCH: Your Honor, again, whether
8 Keystone is going to have meetings with the City of
9 Fargo or not I think is beyond the scope of this
10 hearing, and certainly I would object to that line
11 of questioning.

12 MS. LINDERMAN: I guess I've asked my
13 question. I was just trying to get at what level
14 of information they tend to gather, but I can move
15 on from that.

16 JUDGE WAHL: Please.

17 MR. DINGESS: Your Honor, I'd also add
18 that if we were conducting meetings, those would be
19 in the vein of settlement discussions and probably
20 not appropriate for these proceedings.

21 JUDGE WAHL: Well, I agree it's -- you're
22 pushing the envelope of the scope of the hearing,
23 Ms. Linderman. The objection is sustained.

24 Q. (MS. LINDERMAN CONTINUING) Are you at all
25 familiar with the design requirements that

1 TransCanada is contemplating with regard to the
2 pressure and thickness of the pipeline, and
3 particularly a waiver they've received when they're
4 operating the pipeline outside of high consequence
5 areas from the pipeline?

6 A. I would say I'm aware of it peripherally.

7 Q. How does that play into your risk analysis
8 in this particular portion of the pipeline?

9 A. The PHMSA waiver, the special permit,
10 basically is they have to have an equal level of
11 safety -- equal or greater in order to do this.
12 So -- so it doesn't affect my analysis; that the --
13 the analysis stands as it is.

14 Q. Is this portion of the pipeline being
15 treated as a high consequence area or is it subject
16 to the waiver?

17 A. I can't speak to what the waiver would be
18 as far as whether it's a high consequence area.
19 What you have to look at is it's not -- it's
20 whether a pipeline -- the pipeline could
21 contribute -- could affect a high consequence area.
22 There are high consequence areas -- and I've got to
23 be careful here because I can't -- they're
24 confidential where they are, and I will just say
25 that those have been evaluated and looked at as

1 part of this overall assessment. And I will just
2 say that this whole area -- there are protections
3 for this area. I think I can say that.

4 MS. LINDERMAN: I think those are all the
5 questions I have right now. Thank you very much.

6 JUDGE WAHL: Mr. Binek.

7 MR. BINEK: Thank you.

8 **CROSS-EXAMINATION**

9 **BY MR. BINEK:**

10 Q. First of all, I'd like to talk about a
11 comment that -- or a figure that was being used
12 regarding Mr. Starke's land, and I think that
13 the -- the drop in elevation was talked about as
14 being 97 feet. My recollection of the -- and I
15 don't have Mr. Starke's exhibit, but my
16 recollection is that the normal flow of the river
17 was at like about 1207 feet -- yeah, my
18 recollection was good -- 1207 feet, and he referred
19 to 1400 feet being in one of the contour lines
20 across his property. So if you subtract those, I
21 think you come up with 193 feet.

22 A. You are correct.

23 Q. Okay. Does that -- okay. You talked
24 about the -- the land, the slope of the land, and
25 you were talking about the drop of 97 feet. Does a

1 drop of 193 feet make any difference in your
2 evaluation of the likelihood of a spill on Mr.
3 Starke's land reaching the Sheyenne River?

4 A. Having been onsite and having looked at
5 it, no. Basically this land is exceptionally flat.
6 It's basically, again, a terrace until it reaches
7 that -- the river -- the Sheyenne River, itself,
8 where it drops down quite a bit. That's where
9 you're going to get that elevational change. The
10 remaining topography -- it's a flat terrace.

11 Q. And when you talk about a flat terrace,
12 it's not absolutely flat. There's some slope to
13 the land generally towards the Sheyenne River,
14 isn't there, if you look at the contour lines?

15 A. Very slight. Very slight.

16 Q. But it does slope. Generally, there's a
17 slope towards the Sheyenne River.

18 A. Generally, but again, what I'm looking at
19 is from a standpoint if a spill occurred, is there
20 sufficient slope or terrain features that could
21 facilitate the oil movement to the Sheyenne River,
22 and I'll give you a comparison. This site --
23 having gone to Bemidji and if you look at the
24 contours there and having been onsite, if anything,
25 Bemidji might be a little bit more -- have a little

1 bit more topography, but Bemidji -- the oil was
2 again moving, you know, 100 yards -- you know, the
3 spray zone was a few hundred yards. It was all in
4 a very small area, and that was 10,000 barrels
5 spilled. You put that footprint onto Mr. Starke's
6 land or any other -- or this area, it's so flat
7 it's not -- it would be -- I would expect it to be
8 similar or less than what they saw in Bemidji.

9 Q. I guess the point that I was trying to get
10 at is when you talk about it being flat, you don't
11 necessarily mean it's absolutely flat. There can
12 be some small slope.

13 A. I know of very few places in the world
14 where it's completely flat, level, uniform
15 everywhere, but it's darn close.

16 Q. Okay. I just wanted some clarification
17 there.

18 A. Yeah.

19 JUDGE WAHL: Ms. Tillquist, you're facing
20 a different direction and you're talking past your
21 microphone. Just move the microphone over and
22 you'll be fine.

23 THE WITNESS: Okay.

24 Q. (MR. BINEK CONTINUING) How many
25 intermittent streams are there along the pipeline

1 route that feed into Lake Ashtabula?

2 A. I believe there is -- the number of
3 intermittent perennial stream channels -- let me
4 repeat this -- that could go into Lake Ashtabula,
5 Sheyenne River I think we'd quantified those -- if
6 we counted up the red and blue lines on Exhibit
7 T23 -- yeah, T23 -- if you count up the red and
8 blue ones, I believe it's 22 intermittent and 1
9 perennial. Again, not all of those are viable
10 transport channels.

11 Q. Okay. And when you talk about I think
12 it's 1.4 miles -- pipeline miles that would be
13 affected by these intermittent streams going into
14 Lake Ashtabula, those are -- that 1.4 miles is not
15 one segment of the pipeline. It's --

16 A. It's scattered.

17 Q. -- it's small segments of the pipeline.

18 A. Correct.

19 JUDGE WAHL: I'm sorry, Ms. Tillquist.
20 You still --

21 THE WITNESS: Correct.

22 JUDGE WAHL: -- have to -- if you'd just
23 take that microphone and swing it around so it's
24 more in front of you --

25 COMMISSIONER CRAMER: You can just bend

1 it.

2 THE WITNESS: Or just bend it.

3 COMMISSIONER WEFALD: You can just turn
4 the head.

5 JUDGE WAHL: There you go. Now you've got
6 it. Thank you.

7 Q. (MR. BINEK CONTINUING) And how many
8 intermittent streams along the pipeline route flow
9 into the Sheyenne River.

10 A. Oh, I'm sorry. What I gave you was for
11 both, the Sheyenne and Lake Ashtabula. I'm sorry.
12 I misunderstood you.

13 Q. Okay. So what is the number for Ashtabula
14 and what is the number for Sheyenne?

15 A. Let me see if I can get that for you here.
16 Let me try again. What I'm counting -- my numbers
17 don't quite match up because it's all done here. I
18 think I had 14 intermittent streams that are
19 crossed by the Keystone route that appear to drain
20 into Lake Ashtabula.

21 Q. Okay. And so there would be then -- you
22 said there were a total of 22?

23 A. Do you want me to double-check that
24 because --

25 Q. Well, I'm just trying to figure out what

1 the number would be for the Sheyenne River.

2 A. I can't tell on some of these things
3 because my map is so small here. 17 -- what did I
4 tell you before on the other one?

5 Q. I thought it was 22.

6 A. 22 total and then the -- on the first one
7 was --

8 Q. 14 for Ashtabula, so that would be 8 for
9 Sheyenne, if my math is correct.

10 A. Yeah. I'd have to go back and look at
11 that because I know at one point I counted them up
12 on the bigger maps where I could actually see it a
13 little bit better.

14 Q. Those are --

15 A. But it's ballpark.

16 Q. Okay. And there's no perennial stream
17 running into Ashtabula; is that correct?

18 A. What's identified here are intermittent
19 streams.

20 Q. Okay. You said that there are one or more
21 perennial streams flowing into the Sheyenne River?

22 A. The Sheyenne River is the perennial
23 stream, and then what we did for our analysis is we
24 considered one intermittent stream a perennial just
25 for the risk assessment analysis since it is close

1 in proximity.

2 Q. Okay. And is that stream that's
3 considered perennial, does that flow into Ashtabula
4 or the Sheyenne River?

5 A. The stream that is perennial is the
6 Sheyenne.

7 Q. Oh. You talked about another one in close
8 proximity, I thought.

9 A. Oh, the one we just now --

10 Q. That's considered a perennial.

11 A. I treated an intermittent stream that was
12 adjacent to the Sheyenne, and it's at -- it's right
13 at the crossing. It's milepost 169. I treated it
14 as a perennial due to its proximity, but it is
15 still listed as an intermittent.

16 Q. And does that stream flow into the
17 Sheyenne?

18 A. Yes.

19 Q. Okay. I'm going to refer you to T44. Do
20 any of the existing pipelines shown on that exhibit
21 cross the -- cross the Sheyenne River south or
22 upstream from Fargo's intake on the Sheyenne River?

23 A. Do any of the pipelines -- say that again.
24 I'm sorry.

25 Q. The pipelines that you talked about on

1 T44, do any of those pipelines cross the Sheyenne
2 River south or upstream from Fargo's intake on the
3 Sheyenne River?

4 A. I lost you at the last part. Do any of
5 these pipelines cross the Sheyenne River in close
6 proximity to Fargo.

7 Q. Well, what I'm concerned about is whether
8 they cross upstream or downstream from Fargo's
9 intake on the Sheyenne River.

10 A. Oh, okay. The -- the pipeline at this
11 Magellan Pipeline is just north of I-94. The
12 intake for the Sheyenne River is three miles
13 downstream basically from that location. So
14 it's -- it's -- the intake is three miles upstream
15 of that location so the pipeline is downstream,
16 this Magellan Pipeline is. There are other
17 pipelines like this Dome Pipeline that are further
18 upstream, up in this area.

19 Q. Where is the Dome Pipeline? Oh, okay. I
20 see it.

21 A. The lime green.

22 Q. Okay. Fargo's witnesses spent
23 considerable time discussing problems that would
24 occur if crude oil entered the treatment plant. Is
25 it your testimony that even if there was a large

1 spill, crude oil is not going to reach the intake
2 on -- Fargo's intake on the Sheyenne River? I'm
3 talking about the crude oil that they were talking
4 about that would coat equipment and surfaces on the
5 intake or the pipeline or the treatment plant,
6 itself, and my question to you is: Is it your
7 testimony that if there is a spill, that crude oil
8 that would coat these surfaces will not reach the
9 Fargo's intake on the Sheyenne River?

10 A. That is correct.

11 MR. BINEK: One moment, please.

12 Q. (MR. BINEK CONTINUING) Mr. Schultz
13 testified for the City of Fargo to the social,
14 environmental and engineering categories or factors
15 that are weighted and compared when choosing
16 between alternatives for a route. For routing
17 decisions he gave greatest weight social factors,
18 next greatest weight to environmental factors.
19 Does TransCanada agree and use this priority of
20 weighting and choosing between route alternatives?

21 A. I wasn't -- I'm not sure I could speak to
22 what routing priorities there are. I guess my
23 expertise would be less in the routing than -- and
24 to these things. I certainly participated in those
25 discussions. I mean --

1 Q. So you don't know?

2 A. How they've prioritized them, I know there
3 was a number of factors looked at, and I guess I
4 would leave it to Mike Koski's testimony to talk
5 about the factors that were looked at.

6 Q. There was some discussion about the
7 special permit from PHMSA, and we understand that
8 TransCanada has obtained the permit that allowed
9 the operation of the Keystone Pipeline at 80
10 percent yield strength in rural areas, and you're
11 aware of the permit?

12 A. Yes, I am.

13 Q. Under this permit could the Keystone
14 Pipeline be designed with thinner wall pipe?

15 A. My understanding is that it could have
16 thinner wall pipe, but then they have to account
17 for that somehow, so they'd have to use -- I think
18 it's a stronger steel in order to compensate for
19 that, and then that I have got -- and again,
20 speaking not as the expert, but I think there's a
21 number of like 51 other stipulations that they have
22 to abide by to ensure that that -- they're, again,
23 operating at actually an equal or safer level.

24 Q. In the alternative could the Keystone
25 Pipeline be operated at higher pressure for a given

1 pipe wall thickness?

2 MR. KELSCH: Your Honor, I guess I'd
3 object. I think we're getting a little bit beyond
4 this witness's area of expertise and certainly her
5 testimony on direct examination.

6 MR. BINEK: Well, it was discussed with
7 her on cross-examination. I'm just exploring a
8 little bit further.

9 JUDGE WAHL: I agree. The objection is
10 overruled. You may proceed, Mr. Binek.

11 THE WITNESS: I -- I'll make it easy. I
12 don't know.

13 Q. (MR. BINEK CONTINUING) Okay. Have you
14 considered higher pressure, thinner wall pipe in
15 your risk analysis?

16 A. Again, the -- using the -- the waiver does
17 not change the overall safety, so it doesn't change
18 the risk assessment.

19 MR. BINEK: Okay. I have no further
20 questions.

21 JUDGE WAHL: Questions from the
22 Commission. Commissioner Cramer.

23 **EXAMINATION**

24 **BY COMMISSIONER CRAMER:**

25 Q. Ms. Tillquist, I just want to make sure

1 the record is very clear, and if it is already, I
2 want to make sure I'm very clear. On the use of
3 which gravity -- specific gravity versus American
4 Petroleum Institute gravity numbers, if I
5 understand it, API gravity of water is ten; is that
6 correct?

7 A. Yes.

8 Q. And any number higher than ten means that
9 product is lighter than water?

10 A. Correct.

11 Q. And so, I guess, I could explore further
12 what specific gravity is, but as long as we're
13 clear on that, I guess I don't need to necessarily
14 do that. Specific gravity, one is ten; is that not
15 right? The specific gravity of water is one?

16 A. Yes.

17 Q. All right. My only other question then
18 is: Of the six previous pipelines that you've
19 worked on, have any of them experienced leaks yet?

20 A. I don't -- I don't know the answer to
21 that. Not to my knowledge.

22 COMMISSIONER CRAMER: All right. I
23 have nothing further.

24 THE WITNESS: But I haven't researched it.

25 JUDGE WAHL: Commissioner Clark.

1 COMMISSIONER CLARK: I should ask perhaps
2 Mr. Kelsch first. Will there be witnesses offered
3 who are experts in the routing and pipeline design.

4 MR. KELSCH: Commissioner Clark, at this
5 point this is our -- tends to be our only rebuttal
6 witness.

7 COMMISSIONER CLARK: Okay. Well, then
8 I'll ask the question and you may not have the
9 answer to it, but we'll go from there.

10 **EXAMINATION**

11 **BY COMMISSIONER CLARK:**

12 Q. As I read the statute, one of the things
13 that the Commission is charged with from the
14 legislature is -- uses two words. One is that
15 however it's -- when we site a project, it has to
16 have minimal impact, and then later on it talks
17 about the Commission siting projects that minimize
18 the impact, and they're similar words, but to me
19 they mean two different things. I mean, minimal
20 seems to get to the acceptable level of risk, and I
21 think you've talked about that quite a bit and so
22 have Fargo witnesses, but minimize does seem to
23 indicate that the Commission is supposed to take
24 into consideration kind of a comparative risk where
25 you're looking at different alternatives and you're

1 picking the one that minimizes over the other
2 alternative the risk, and I guess I'll ask it maybe
3 in a different way. I think it's been touched on
4 here a little bit, but does it make sense to --
5 being that we have a number of political -- well, a
6 political subdivision, as well as a lot of other
7 groups, I mean, water users, folks like that
8 saying, look, we don't oppose the project, we just
9 want you to look at three to five miles a little
10 further east of here.

11 Does that -- given the statutory
12 obligation that the Commission has to minimize
13 risk, doesn't it make sense to at least take a look
14 at it, and have you been a part of any discussions
15 where at any point has Keystone sought to even take
16 a peek at what the route might look like three to
17 five miles east?

18 A. Yeah. Actually, I'm not sure if I
19 misspoke earlier. We did take a preliminary look
20 at some -- now that I think about it -- a route --
21 I think it was a Mr. Burchill had suggested a route
22 and we did look at that, and I believe that was
23 just a few miles. So if I misspoke earlier, I
24 apologize. But we did look at that, and, boy, now
25 I'm pressing back on my memory. That route was --

1 so it shifted it slightly, but then you have a
2 number of -- it significantly increased the number
3 of intermittent -- I'm not sure if it was
4 perennial -- but water bodies that would be
5 crossed, including intermittent streams and wetland
6 complexes. So you could have more problems than --
7 and we just didn't take it much further than that
8 because then it would drain into the Maple River
9 drainage. I mean, if you want to use Fargo's
10 analysis, then do we look at somebody 2- or 300
11 miles down on the Maple that leads into -- you
12 know, so the Maple leads into the Sheyenne that
13 leads into the Red, is there somebody further
14 downstream that could be affected?

15 You know, you're -- again, shifting a
16 route may or may not reduce your risks. It may
17 just shift them somewhere else. I think what you
18 can look at is that Keystone as an operator --
19 they've done -- you know, people like Meera Kothari
20 and Brian Thomas have talked in depth about all of
21 the operational and design features that go into
22 this pipeline that make it a truly modern pipeline
23 with a lot of ways that minimize the risk both,
24 again, from a design standpoint, and as Brian
25 Thomas did, from an operational standpoint.

1 Q. Well, the reason I ask about the routing
2 selection process is because I know earlier in one
3 of the hearings that we had there was discussion
4 about the Fordville aquifer, and in that case
5 TransCanada spoke with the State Health Department,
6 and the Health Department said, you know, we'd
7 really prefer -- given all the safety designs and
8 everything else that you've testified to, we'd
9 really prefer that it would be a little bit further
10 west in that case, and so TransCanada went ahead
11 and made that accommodation. I mean, here you've
12 got kind of a similar-type issue where you've got a
13 political subdivision, you've got water users
14 associations, folks who are involved with water
15 resource management saying can you push it a little
16 bit further this way, and, granted, there you ended
17 up with a few more wetland issues by pushing it
18 west, here you might east, and what I struggle with
19 is, you know, in seven years on the Commission and
20 dealt with a number of utility projects, and
21 typically utility companies, when they run into
22 significant opposition, they just kind of make it
23 go away by creating some sort of accommodation.
24 We've seen transmission lines and pipelines move
25 themselves just a little bit for far less critical

1 issues, I guess you'd say, or would at least on the
2 surface seem like far more minor issues than what
3 Fargo is bringing to our attention here. Why --
4 why doesn't TransCanada just make a calculation,
5 hey, we'll move it a little and --

6 A. I can't speak to TransCanada's --
7 COMMISSIONER CRAMER: Negotiations.

8 THE WITNESS: Yeah. But I will say
9 that you're also assuming --

10 Q. (COMMISSIONER CLARK CONTINUING) Right.
11 And having said that, I would direct that at a
12 different witness, but you're on the stand.

13 A. But, again, you're assuming that there
14 would be a significant impact, and that's why you
15 would have -- you'd be wanting to move it, and I
16 think what we've talked about repeatedly here is
17 that the chance of these events happening are, you
18 know, extremely remote. There's ways of dealing
19 with it, and I don't think it would impact the
20 resources that we're trying to protect. I mean,
21 that's my job, is trying to protect those, and I
22 think we're -- you know, you're assuming there's
23 impacts.

24 Q. And then just one last question, a little
25 bit different topic. On the Coffeyville, Kansas,

1 spill, was it a similar crude or a different crude
2 or is that not a relevant --

3 A. I do not know the answer to that.

4 Q. Okay. Could there be -- could the
5 composition of the crude make that comparison more
6 or less relevant?

7 A. In a general sense, no. I will -- let me
8 qualify. Crudes generally contain the same general
9 composition, so they will all have BTEX
10 concentrations, they will all have heavier weight
11 compounds. Do those -- the proportions of those
12 vary? Yes, they can. So could it affect -- could
13 it be different? Yes. In a general sense would I
14 expect different results? Probably not.

15 COMMISSIONER CLARK: That's all I have.

16 Thanks.

17 JUDGE WAHL: Commissioner Wefald.

18 COMMISSIONER WEFALD: Yes.

19 **EXAMINATION**

20 **BY COMMISSIONER WEFALD:**

21 Q. Yesterday TransCanada passed out an
22 exhibit, T40 and T41, and so my questions are going
23 to be based on that, and I just wondered if you
24 needed a copy of that before you.

25 A. That would be nice.

1 COMMISSIONER CRAMER: Your Honor, could we
2 take a five-minute recess, please?

3 JUDGE WAHL: We may. We'll be in recess
4 until a quarter after, till 11:15.

5 (Recess taken.)

6 JUDGE WAHL: All right. We are back on
7 the record. And we are recording, we're on the
8 record. Any further questions from the Commission?

9 COMMISSIONER WEFALD: Oh, yes. Yes.

10 JUDGE WAHL: Commissioner Wefald.

11 Q. (COMMISSIONER WEFALD CONTINUING) Did the
12 Federal Government require Keystone to do a risk
13 assessment for certain sections of the pipeline in
14 North Dakota because areas in North Dakota were
15 defined as high consequence areas?

16 A. A risk assessment is required for pipeline
17 segments that could affect HCAs. That has to be
18 done --

19 Q. HCAs?

20 A. I'm sorry. High consequence areas.
21 -- prior to the pipeline being put into operation
22 and then continuing afterwards. Keystone is doing
23 this proactively. We're already looking at that as
24 part our overall process.

25 Q. So was the answer --

1 A. The answer is yes.

2 Q. Yes. All right. On the bottom of Exhibit
3 T40 --

4 A. Yes.

5 Q. -- under section 195.452, "Pipeline
6 integrity management in high consequence areas."

7 A. Mm-hmm.

8 Q. I don't want to read all of Section A
9 that's under there, but it starts out -- I'm going
10 to read Section A. "Which pipelines are covered in
11 this section? This section applies to each
12 hazardous liquid pipeline and carbon dioxide
13 pipeline that could affect a high consequence area,
14 including any pipeline located in a high
15 consequence area unless the operator effectively
16 demonstrates by risk assessment that the pipeline
17 could not affect the area. (Appendix C of this
18 part provides guidance on determining if a pipeline
19 could affect a high consequence area.)"

20 My question is: Did Keystone and did you
21 specifically in your work on risk assessment -- did
22 you follow all of the guidelines that are included
23 in Appendix C?

24 A. Yes, I did.

25 Q. And when you did your risk assessment?

1 A. Mm-hmm.

2 Q. Would you just describe to us what are
3 some of those guidelines?

4 A. Basically what the procedure we're looking
5 at is you have to identify the -- what we call the
6 contributing pipeline segment, so what area of the
7 pipeline could affect a high consequence area
8 either through directly passing through it or by --
9 I'm sorry -- by directly passing through it, or if
10 there was a conduit to get to it, evaluating that
11 route. So that whole document -- it was quite a
12 detailed document -- was provided as a risk
13 assessment to the Department of State, and I think
14 it's public record. But we went through and
15 evaluated all the HCA areas and identified
16 contributing pipeline segments.

17 Q. Okay. So you followed -- but your answer
18 was, yes, you followed all of the guidelines that
19 the Federal Government has in place for a risk
20 assessment for high consequence areas?

21 A. I -- to the best of my knowledge, and
22 we're still -- it's still ongoing because it hasn't
23 been finalized for the Department of -- PHMSA for
24 submittal, so it hasn't been finalized, but we
25 are -- yeah, the Department of Transportation.

1 It's an ongoing thing, but we've largely looked at
2 that. Yes.

3 Q. When you prepared your risk assessment
4 that you prepared for this Commission, did it
5 include following all of the guidelines that are
6 included in Appendix C?

7 A. We used the same analyses and, you know, I
8 would say that they -- how do I put this
9 carefully -- that effects to high consequence areas
10 are one of the things that we would have had to
11 look at as part of the broader risk -- as the risk
12 assessment. What you're seeing is this part, but
13 there was a bigger part that incorporated HCAs.
14 That all was incorporated in it.

15 Q. Just one more time I'm going to try here.
16 In North Dakota we have some high consequence
17 areas.

18 A. Yep.

19 Q. All right. And when you prepared your
20 risk assessment just on those high consequence
21 areas that affect water resources -- on water
22 resources -- I'm not talking about other high
23 consequence areas -- just on water resources for
24 municipalities or for a town or whatever, did you
25 follow all of the guidelines that are included in

1 Appendix C?

2 A. Yes.

3 Q. Yes. Okay. On -- in those risk
4 assessments, when you prepared them in the
5 guidelines that the Federal Government has, do they
6 allow you an ability to use a choice of models for
7 your risk assessment or do they suggest only one
8 model?

9 A. The PHMSA does not specify how an operator
10 has to evaluate risk. It has to be -- how do I say
11 it? It has to be an acceptable model, but they
12 don't specify -- they don't provide any specificity
13 on what model they have to use. They leave it to
14 the operator to decide.

15 Q. What kinds of qualifications are in an
16 acceptable model or is that for you to determine?
17 Do they use those words "you can pick any
18 acceptable model" or --

19 A. Well, I think there's industry standards
20 as far as, you know, what -- standard practices,
21 and that's what we've been doing. PHMSA will
22 review, and if they find it deficient, they'll let
23 you know.

24 Q. And we use many models at the Commission
25 for different ratemaking types of proceedings, and

1 sometimes the Commission picks one model -- our
2 staff may pick a model, let's put it that way --
3 our staff may pick a model for certain issues and a
4 company -- let's say NSP or MDU or Otter Tail may
5 pick a different model, and then the Commission
6 needs to evaluate which model reflects which values
7 because sometimes there's values attached to
8 models -- modeling.

9 A. Right.

10 Q. Do -- would you say there's any -- what
11 specific -- do you have any specific values that
12 you would attach to the model that you have chosen?

13 A. Values to the model?

14 Q. When you're picking a model to choose,
15 what are the values that you're using as you make
16 that determination?

17 A. What we do is --

18 Q. Because I suppose your firm is responsible
19 for making that model choice, or does the company
20 say we want you to use this model?

21 A. The modeling choice -- there's, again,
22 kind of industry practice of how this is normally
23 done, and these are constantly evolving as we learn
24 more and more, but a lot of it comes down to
25 historical frequencies of failures and things like

1 that that's been used routinely; and, again,
2 companies like DNV actually work to derive these
3 statistics that are used industrywide.

4 Is the choice of one model versus another
5 more appropriate? It has to be -- PHMSA has got to
6 be the one that looks at it and says, you know,
7 you're not adequately evaluating risk or, yes, this
8 is acceptable, and these are -- by following
9 industry standards, you're basically -- standard
10 practices, you'll know you'll fall into the
11 acceptability criteria. Does that make sense?

12 Q. Yes.

13 A. Okay.

14 Q. How many miles of the pipeline area in
15 North Dakota are considered high consequence areas?

16 A. I believe that's -- I don't have that
17 number. We'd have to -- I think that's part of the
18 application or maybe there's been a data request.
19 I don't have that information.

20 Q. Has that already been submitted to the
21 Commission?

22 A. I can't speak knowledgeably to that. I
23 think it has, but I'm not sure.

24 Q. Well, if it hasn't already been submitted
25 to the Commission or can you just -- can the

1 company file a late-filed exhibit that would either
2 share where that information can be found in the
3 application or submit that information to the
4 Commission?

5 A. Yes.

6 MR. KELSCH: Yes.

7 JUDGE WAHL: Mr. Kelsch, for the record,
8 that will be T46, if my count is correct. T46, and
9 the title of the exhibit will be data what?

10 THE WITNESS: Quantification of high
11 consequence areas. Does that work?

12 JUDGE WAHL: Quantification of high
13 consequence areas.

14 THE WITNESS: Correct.

15 JUDGE WAHL: All right.

16 Q. (COMMISSIONER WEFALD CONTINUING) And then
17 I have just another question, and that relates to
18 the only 2.8 miles of pipeline segments of these 91
19 miles could contribute to a leak reaching Lake
20 Ashtabula and the Sheyenne River, and that's in
21 Exhibit T45.

22 A. Correct. Okay.

23 Q. How many -- of that 2.8 miles how many are
24 related to the Sheyenne River crossing?

25 A. .6.

1 Q. .6. So 2.2 are the amount of miles for 22
2 streambeds.

3 A. Intermittent.

4 Q. Intermittent and active streambeds?

5 A. The rest of them would be all
6 intermittent.

7 Q. All right. And so you allowed basically
8 one-tenth of a mile. Is that just a standard
9 calculation? Is that an average per streambed that
10 you cross?

11 A. No. There's -- I believe there's
12 two-tenths of a mile --

13 Q. I'm just wondering how you came up with
14 the 2.8 miles for the crossing of streambeds?

15 A. For each intermittent stream that we
16 crossed that was a viable channel, we looked at
17 terrain and tried to determine the width again of
18 using terrain what segment of pipe -- if a pipe --
19 if the pipe were to spill, what portion of that
20 pipe could actually result in a leak that could get
21 into that channel.

22 Q. So they're different widths?

23 A. For those intermittent streams, because
24 they all tend to be very small, we did look at them
25 independently. There's one that's, I think,

1 three-tenths, but the rest of them were two-tenths
2 of a mile.

3 Q. Two-tenths of a mile. Okay. Thank you.
4 But that doesn't add up. It doesn't add up then.
5 It should be more miles if it's two-tenths, because
6 I did a little calculation and have 22 and you
7 divide that by 2.2.

8 A. No. Okay. I'm sorry. The 22 is -- those
9 were all the intermittent streams. Now this is
10 T24. This is the table that we talked about in the
11 first hearing in September. Those are the stream
12 channels that are capable of actually transporting
13 to the Sheyenne River and Lake Ashtabula. Those
14 are the viable channels as opposed to all of the
15 channels that are there. Again, some of these
16 channels that are crossed are not viable transport
17 routes because you have a roadbed that goes across.
18 So if a spill occurred here, you know, it may enter
19 the channel that's coming here, but if you've got
20 the roadbed that's in the way of that channel,
21 there's no culvert, it would end up pooling behind
22 that roadbed and so you don't have a viable
23 transport.

24 Q. Okay. So some of the -- there's not a --
25 the 2.8 miles of pipeline segments that you

1 referred to in T45 does not include a segment of --
2 does not cover all 22 of the -- of the --

3 A. Intermittent stream crossings.

4 Q. -- intermittent stream beds.

5 A. No. If you look back at T23, these were
6 the maps that we looked at previously, the viable
7 stream channels that we looked at are the blue
8 stream channels. The ones that were in red are
9 stream channels that are not viable, and those
10 are -- both blue and red channels are actually what
11 I came out in November and I field verified.

12 COMMISSIONER WEFALD: Thank you. I
13 appreciate that.

14 JUDGE WAHL: Commissioner Clark.

15 **FURTHER EXAMINATION**

16 **BY COMMISSIONER CLARK:**

17 Q. I just have a follow-up question on this
18 route analysis issue because I'm still trying to
19 understand why it's preferable to kind of cling to
20 one specific route and slug it out through
21 litigation when it would appear that there might be
22 some accommodation that could be made. I had
23 mentioned that exploring the idea of a route a few
24 miles east, and I think the main thing that you had
25 responded with was that, well, it can put it into

1 other watersheds, perhaps more wetland areas, and I
2 think you mentioned the Maple River -- specifically
3 that it could get into the Maple River drainage
4 system. But as I look at the maps, it would appear
5 that even if you put it a little bit further east,
6 you're still further from the Maple than from the
7 Sheyenne, aren't you? I'm looking at T44.

8 A. I -- okay. Go ahead.

9 Q. And I don't have a sense of scale about
10 how far, you know, a few miles would put the line
11 exactly, but it's very close in some cases to the
12 Sheyenne -- I mean, three to five miles further
13 east pushes it towards the Maple, but does it -- it
14 still would appear just from a cursory review that
15 you're quite a bit further from the Maple than the
16 Sheyenne even at that point, aren't you?

17 A. You know, again, I don't have a sense of
18 scale here, either, and I think in some places you
19 may be closer and some places further away. I
20 guess I would go back to the fact that we did talk
21 to the Department of Health about the location of
22 this route and concerns about, you know, whether
23 they were concerned about the proximity to Lake
24 Ashtabula and the Sheyenne River. We talked about
25 that, and they were comfortable where our route

1 was.

2 Q. To follow up on that, what unit of the
3 Department of Health was it? Because as I
4 understand it, the Department of Health's analysis
5 related to subsurface water, for example, aquifers,
6 things like that.

7 A. I think there was testimony presented
8 earlier on that in September.

9 Q. Related to surface water?

10 A. Yeah. We went over this -- this analysis
11 and then the Department of Health got up and
12 testified about it.

13 Q. Were they opposed to a route that brought
14 it closer to the Maple?

15 A. I think if the route is safe where it's
16 at, there was no need to go look at another route.

17 Q. So there wasn't a preference that they
18 expressed either way?

19 A. I -- I don't recall.

20 COMMISSIONER CLARK: Okay. Thanks.

21 JUDGE WAHL: Any further questions from
22 the Commission? Mr. Kelsch, followup?

23 MR. KELSCH: Yes. Thank you, Your Honor.

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REDIRECT EXAMINATION

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BY MR. KELSCH:

Q. Ms. Tillquist, kind of in line with Commissioner Wefald's comments, on Exhibit T23 you talked about the red streams. Is that the why the red streams go from the pipeline and sort of end before they get to the river or does that mean that they don't actually -- they're not viable?

A. The red streams are indicative of stream channels that are not viable. The actual extent of them, how far that line goes away from the line, I don't know that they -- that the people that made this map actually were trying to say this is the location that it's no longer viable. I'm not sure that that was done.

Q. But that's the point.

A. Yeah. That's the point of it, though.

Q. Now considering Commissioner Clark's question about the route analysis, has Keystone had meetings with the Department of Health since Fargo's intervention concerning the location of the route?

A. Yes.

Q. Has the Department of Health -- are they okay with the route, where it is currently?

1 A. Yes.

2 Q. Now, the -- when you're looking at the
3 risk to Lake Ashtabula, Sheyenne River, or
4 particularly in this case the City of Fargo, is
5 there any risk to Lake Ashtabula, the Sheyenne
6 River, and the City of Fargo, in your opinion?

7 A. I think the chances of adverse effects to
8 the City of Fargo's water quality are nonexistent.

9 Q. So, in your opinion, is the current
10 Keystone -- is the current Keystone proposed route
11 safe?

12 A. Yes.

13 Q. If it's safe, do -- from a routing
14 standpoint do you then go to the next step to
15 determine whether another route -- whether you
16 should even consider another route?

17 A. My input to a routing process would be
18 this is safe, we wouldn't need to look at a
19 different route.

20 Q. Now, Commissioner Wefald had you look at
21 Exhibits 40 and 41. You were here yesterday when
22 one of Fargo's witnesses admitted that Lake
23 Ashtabula and the Sheyenne River were not defined
24 as a high consequence area under the Code of
25 Federal Regulations?

1 A. Yes, I was.

2 Q. And do you also agree with that
3 interpretation?

4 A. Yes, I do.

5 COMMISSIONER WEFALD: I have a question.
6 Can I ask one question?

7 JUDGE WAHL: You may.

8 COMMISSIONER WEFALD: Does that only
9 relate to the City of Fargo, though, that you
10 testified in that regard, or does that relate to
11 like, say, the City of Valley City uses that Lake
12 Ashtabula as a main water source and so, therefore,
13 it was a high consequence area?

14 JUDGE WAHL: Oh, let me see. Who is going
15 to answer that question? Can Fargo counsel respond
16 to that question? We really don't have anybody who
17 can answer that question, I don't think.

18 MR. KELSCH: Well, since we opened this up
19 for just Fargo --

20 JUDGE WAHL: I think, Commissioner, you're
21 going to have to trust your recollection.

22 COMMISSIONER WEFALD: Thank you.

23 JUDGE WAHL: I'm sorry. You're in a bit
24 of a situation as a juror would be. You're going
25 to have to do your best.

1 MR. DINGESS: Your Honor, we --

2 JUDGE WAHL: No. Let's move on. This is
3 not a good idea. Mr. Kelsch.

4 Q. (MR. KELSCH CONTINUING) Okay. Now, in
5 your risk analysis you were asked a question by Mr.
6 Dingess whether North Dakota listed Sheyenne River
7 or Lake Ashtabula as a drinking water source and
8 you indicated you weren't sure. I guess a couple
9 questions. Did you -- did that impact your risk
10 analysis on Lake Ashtabula or the Sheyenne River?

11 A. No, it did not.

12 Q. And does Keystone have a concern for water
13 quality, whether it's been listed by a state as a
14 drinking water source or not?

15 A. Yeah. That was my job, was to make sure
16 that the water quality was protected.

17 Q. Now there were some questions by Mr.
18 Dingess. He asked about the, I guess, consistency
19 of the crude oil that will be transported in the
20 Keystone Pipeline. Do you know, are there any
21 current pipelines in North Dakota that transport
22 this same type of crude oil?

23 A. Yes, there are.

24 Q. And what's that?

25 A. The Enbridge Pipeline.

1 Q. And that does cross part of North Dakota?

2 A. It crosses North Dakota, yeah, and it
3 contains the exact -- the same materials, same type
4 of crude oil.

5 Q. How common is this -- and I understand
6 there's different varieties of crude oil, but is
7 this -- the crude oil in general that Keystone will
8 be transporting, is that common to other crude oil
9 in other parts of the country or world?

10 A. The crude oils that are being transported
11 aren't unique in any sense that -- there's variety
12 among crude oils, but they share characteristics
13 that -- I mean, this crude oil is comparable to
14 many other ones, and those crudes are transported
15 throughout the U.S. -- thousands of miles of pipe
16 throughout the U.S.

17 Q. Now, going back to, I guess, one of the
18 questions by Commissioner Clark, he'd indicated
19 that Keystone had -- at the request of the
20 Department of Health had moved the pipeline from an
21 original route off of, I think, the Fordville
22 aquifer and further to the west. Do you remember
23 that testimony?

24 A. Yes, I do.

25 Q. And again, this may be a little

1 repetitive, but has the Department of Health asked
2 you to move the pipeline, are you aware, from its
3 current location in the Lake Ashtabula or Sheyenne
4 River area?

5 A. No.

6 Q. Now in a question from Mr. Dingess you
7 were talking about the BTEX compounds not being
8 able to go the 200-some miles to Fargo, and he
9 asked you a question about could heavier elements
10 get to Fargo, and I think you answered no and asked
11 to expound on that. Could you explain your reason
12 for that?

13 A. The reason I would say that they wouldn't
14 go there is the compounds that he's referring to
15 when a spill occurs, again, the crude as a whole is
16 lighter than water so that both light and
17 heavyweight compounds are going to float. There
18 would be sufficient time for emergency response to
19 contain and clean up this material before this
20 crude would ever move either through Lake Ashtabula
21 and/or down the Sheyenne River 236 miles, and
22 again, there is, you know, standards and
23 regulations that they would have to maintain to
24 make sure that that crude oil didn't get -- you
25 know, they contained it. So it's not going to get

1 that far.

2 Q. One of the questions from Mr. Dingess was
3 talking about risks from one pipeline maybe with a
4 risk of another pipeline added on top of it may
5 make an increased risk, at least to the City of
6 Fargo's water system standpoint. Given your risk
7 analysis of the impact on -- or potential impact of
8 Keystone on Fargo's water supply, does the Keystone
9 location increase that risk to the City of Fargo,
10 in your opinion?

11 A. I would say that because of all the
12 factors we talked about, that the risk that this
13 poses is, again, negligible, so it doesn't -- it
14 wouldn't add any cumulative risk to Fargo, itself.

15 Q. So the risk from the other pipelines on
16 T44, it wouldn't increase that risk?

17 A. It would not affect the City of Fargo's
18 water supply, so therefore -- yeah. In that term
19 that would not increase the risk there. That's
20 true. It would not increase the cumulative risk.

21 Q. Now, there was some questioning concerning
22 when you first looked at the risk to the City of
23 Fargo's water supply, and I think you testified
24 that didn't happen until after Keystone received
25 the letter from the mayor. Did you do a risk

1 analysis of the impact of Keystone to Lake
2 Ashtabula and Sheyenne River before that?

3 A. Yes. Again, that was an assessment we'd
4 been undertaking for quite a while, and that was
5 actually what we presented in the September
6 hearings.

7 Q. And so you were looking at -- or were you
8 looking at the, I guess, potential impact on water
9 quality to other municipalities maybe upstream from
10 Fargo?

11 A. Yeah. We were looking at water quality
12 impacts to municipalities that were much closer
13 than the City of Fargo.

14 Q. Now, Commissioner Clark asked the
15 question -- or was talking about the difference
16 between potentially minimal risk or minimizing
17 risk. In your opinion as a risk evaluator for
18 crude oil pipelines, does the proposed Keystone
19 route in the Sheyenne and Lake Ashtabula area -- I
20 mean, is there a difference, I guess, between those
21 two things given your risk analysis, if you can
22 say?

23 A. I'm really sorry. I lost you.

24 Q. I'm sorry. The -- Commissioner Clark's
25 question had to deal with minimizing or minimal

1 risks, and I guess given your risk analysis, in
2 your opinion, is there a difference in this case
3 looking at the impact to Fargo's water system?

4 A. I understand what he was suggesting, but,
5 I guess, ultimately this doesn't pose a risk to the
6 City of Fargo's water supply as we've been
7 discussing.

8 Q. Do you know whether anybody has actually
9 proposed a formal alternative route other than to
10 the preferred Keystone route that is before the
11 Commission today?

12 A. For this area, no, there has not been any
13 formal route at all.

14 MR. KELSCH: No further questions.

15 JUDGE WAHL: I suggest that we jump-start
16 on the lunch line. Let's be in recess until 12:30.

17 (Noon recess taken.)

18 JUDGE WAHL: All right. Your microphones
19 are on, we're -- the media is connected, and we are
20 on the record. Continuing then, Mr. Kelsch, as I
21 recall, you had completed.

22 MR. KELSCH: I completed.

23 JUDGE WAHL: All right. Mr. Dingess.

24 MR. DINGESS: Thank you, Your Honor.

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REXCROSS-EXAMINATION

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BY MR. DINGESS:

Q. Ms. Tillquist, there was some testimony on redirect about looking at some alternative -- perhaps maybe alternative might not be the correct word -- but another route regarding the pipeline near Lake Ashtabula; is that correct?

A. I've mentioned the Burchill -- suggestion that had been brought up by Mr. Burchill.

Q. Was that the subject of your company's Exhibit T12?

A. No. This was, I think, a data request response.

Q. What was the subject of T12? It seems to be talk about a rerouting or the Ashtabula reroute. I can provide you with a copy of this to refresh your recollection.

A. Please. I believe this is some information that Mike Koski spoke to in previous testimony.

Q. Okay. If you know, where it's talking about drinking water crossings, is that referring to any of these intermittent streams that lead to Lake Ashtabula?

A. I couldn't answer that for certain.

1 Q. Okay. All right. Thank you. You talked
2 about the multiplication of probabilities, I
3 believe, in some of your analysis where you had a
4 figure that was very high and then you multiplied
5 it and it was even higher. Do you recall that
6 testimony?

7 A. Yes, I do.

8 Q. And the probability of an event multiplied
9 by a 100-year flood put you in the half-million
10 range. One-and-a-half-million years, I think it
11 was.

12 A. Yeah, I think so.

13 Q. The probability -- or is the probability
14 of a 100-year flood and a spill event, are they
15 statistically co-related so that it is proper to
16 multiply those together?

17 A. I would say that what we were talking
18 about was a 100-year drought and a spill event. I
19 can't see how a drought would impact spill
20 frequencies, so I don't see any relationship
21 between a 100-year drought and a spill event, so I
22 would suggest that they would be independent.

23 Q. Okay. But isn't it statistically
24 appropriate then to -- well, let me strike that.
25 Let me go down a different line here. If you have

1 independent events such as the spill or a flood,
2 would that -- would it be appropriate to multiply
3 them together, the probabilities?

4 A. If they have independence -- if they are
5 not tied together -- it's kind of like rolling two
6 dice. So if you have a probability of -- yeah,
7 so --

8 Q. So if you had a probability of a flood
9 or -- excuse me, a spill, and some other variable
10 like human error, would it be appropriate to
11 multiply those together?

12 A. Human error related to what, sir?

13 Q. The operation of a pipeline facility.

14 A. Those -- if you're saying the human error
15 would be related to the spill, then I don't think
16 you would multiply those together.

17 Q. Okay. Would you consider them perhaps to
18 be independent?

19 A. They are -- if a -- if an operator has an
20 error and that leads to a spill, then they would
21 not be independent.

22 Q. You talked about the Coffeyville
23 situation, the spill at Coffeyville, and I believe
24 you said that it was because a valve was left open?

25 A. It was a refinery, yes, and they left a

1 valve open. It normally takes them 12 hours to
2 shut down.

3 Q. And it was left open because of a flooding
4 event?

5 A. Yeah. They did not have sufficient time
6 to close their valve apparently. That's -- again,
7 that's what I read on their website.

8 Q. Okay. These are two unrelated events. Is
9 it correct statistically to consider them together
10 or not?

11 A. Well, I guess, you're asking whether the
12 flood event -- I guess I'm seeing three different
13 things. You're asking is the flood event related
14 to the human error? What are you asking?

15 Q. Well, I'm trying to get to the likelihood
16 of this kind of an occurrence and what kind of a
17 number would you put on that as a risk analyzer --

18 A. I don't evaluate --

19 Q. -- prospectively, before it happened?

20 A. I don't evaluate -- I don't know what
21 the -- I don't evaluate risks at refineries.

22 Q. If you can't do it, that's fine.

23 A. Yeah.

24 MR. DINGESS: Okay. Thank you. Those are
25 all of my questions. Your Honor, counsel and I --

1 and I apologize for being late -- were discussing a
2 submission of a possible stipulated document within
3 a day or two to the Commission. We'd like to have
4 just a day or two to get precise language from the
5 State Health Department so that we could do that.
6 We'd have leave of the Commission that if we're
7 able to reach that accord, that we'd probably
8 submit it to the Commission.

9 JUDGE WAHL: Stipulation by counsel, among
10 the parties?

11 MR. KELSCH: Yes, Your Honor.

12 JUDGE WAHL: Including the intervenors?

13 MR. DINGESS: No. This would just be
14 between TransCanada and Fargo regarding the
15 language, although I could invite --

16 JUDGE WAHL: Well, I can tell you you're
17 going to have to explain to me a little bit how you
18 can leave out the intervenors from a stipulation.
19 I don't -- that's not going to work. So you're --

20 MR. DINGESS: I would then publish it to
21 the intervenors. What we have in mind is basically
22 a statement concerning what the stream
23 classifications are for Ashtabula and the Sheyenne
24 River.

25 JUDGE WAHL: Mr. Kelsch?

1 MR. KELSCH: I have no objection to that
2 and would stipulate to that.

3 JUDGE WAHL: And, Ms. Linderman, this is
4 all news to you, I'm sure, but at least you can
5 consider it. Fine. I will accept that as a late-
6 filed exhibit. Whose exhibit is it to be?

7 MR. DINGESS: It could be ours.

8 JUDGE WAHL: All right. So let's call
9 this -- my guess is Fargo -- where are we?

10 MR. JOHNSON: 14.

11 JUDGE WAHL: 14. Thank you. All right.
12 And this is going to be in -- a very short title,
13 Mr. Dingess.

14 MR. DINGESS: State stream classifications
15 for Lake Ashtabula and Sheyenne River.

16 JUDGE WAHL: All right. Now let's do it
17 this way: For the record, this will be Exhibit
18 F14, and with the understanding that the
19 intervenors will join. I mean, if you don't have
20 the intervenors, you don't have an exhibit. That's
21 what it amounts to. And there's a special problem
22 in this case, I remind counsel, that John Capp and
23 Janie Capp are -- have separate status as
24 intervenors. So please note that. I think if
25 you're going to have a stipulation, the way this

1 case developed you're going to have to have
2 yourself, Mr. Kelsch, Ms. Linderman, and both John
3 and Janie Capp.

4 MR. DINGESS: Your Honor, if they -- if we
5 offer them the time to review and comment and they
6 fail to comment, can we still submit?

7 JUDGE WAHL: No. Then it's no longer a
8 stipulation, in my view. Now argue with me, if you
9 like, but that's my view of a stipulation. That's
10 all parties, all counsel; otherwise you have a
11 cross-examination and a due process problem.

12 COMMISSIONER CRAMER: Your Honor, just for
13 what it's worth, I intended to request a document
14 that would verify the stream classifications myself
15 because I've been struggling a little bit with --
16 you know, we have one witness's word for it. And
17 so that is -- a late-filed exhibit, I was intending
18 to ask for it anyway, for whatever that's worth.

19 JUDGE WAHL: Where would that come from,
20 Commissioner? That's the problem.

21 COMMISSIONER CRAMER: Right. Quite
22 honestly, I probably would have asked for it in an
23 analysis by our staff.

24 JUDGE WAHL: Well, the stipulation will
25 solve your problem.

1 COMMISSIONER CRAMER: It will.

2 JUDGE WAHL: So let's hope that that's
3 forthcoming, and then, you know, Commissioner, it
4 seems to me if the stipulation fails for some
5 reason, I think it's within the Commission's
6 authority even posthearing to say, look, we want
7 this information, and then, of course, you're back
8 to the 28-32-25 process, but so what.

9 COMMISSIONER CRAMER: Right.

10 JUDGE WAHL: Okay. So the late-filed
11 exhibit, subject to those conditions, will be F14.
12 Anything further, Mr. Dingess?

13 MR. DINGESS: Nothing, sir.

14 JUDGE WAHL: Ms. Linderman, anything
15 further?

16 **RE-CROSS-EXAMINATION**

17 **BY MS. LINDERMAN:**

18 Q. I just have a couple of questions because
19 I wanted to follow up on some things that you said
20 in your testimony after I finished questioning you.
21 You discussed again the intermittent streams and
22 having to cross a roadbed maybe and being blocked
23 from getting into the river system that way.

24 A. Yes.

25 Q. Is -- have you actually observed having

1 water flow on these lands or know what the historic
2 water flow is to know that that's what would
3 happen, that it would just pool behind these
4 roadbeds, or is there another way for the land to
5 drain and is that something you even studied?

6 A. What I looked at, when I was traversing
7 this area, was visualizing if a spill of -- what I
8 was -- of a thousand barrels, which roughly is --
9 if you think about a swimming pool that you have in
10 your backyard, the ones that are like four-feet
11 tall and they're little circles, it's about a
12 thousand barrels -- actually, it's less than that,
13 but rough idea. So while I was out there I was
14 saying, okay, assuming this volume of crude -- but
15 let's think of it as water -- were to spill over
16 here where the pipeline is, could it feasibly get
17 downstream? Now I was looking at it from, first of
18 all, just the crude oil perspective and assuming
19 water volume that would be transporting it down if
20 it is -- it would take a large volume of water
21 flowing event to cap all of these roadbeds because
22 a lot of it -- again, you're spread out so you're
23 going to have to -- it's not just a little
24 restricted area in many spots. It's spread out so
25 you're going to have to have a large volume to get

1 up and over as well as laterally. Does that make
2 sense?

3 Q. I'm not understanding what you mean by
4 spread out. Do you mean the width of the roadbed?

5 A. Okay. Let's back up. Your question was
6 would the water over top of those roads -- do we
7 have evidence of that or knowledge of that? Is
8 that --

9 Q. Correct.

10 A. Okay. I do not, but it would take a --
11 there would be a lot of water there to do that.

12 Q. Okay. And then another question I had in
13 the same vein, have you mapped any underground
14 springs or underground channels that occur in this
15 area?

16 A. No.

17 Q. So that would be relatively different from
18 a spill having to flow through solid soil, wouldn't
19 it?

20 A. You still have the same -- I mean, in
21 order to have a channel or a spring, you're still
22 having permeable soils. First of all, with a
23 spring your contamination, if it hits that, it's
24 going to come up and not be carried out. If it's a
25 channel, yeah, you could have lateral transport,

1 but you're going to be within -- it's more
2 permeable soils, so you still have the same physics
3 that are occurring to this oil and its properties.
4 So we did not look at that.

5 Q. I guess I was talking about underground
6 springs and not necessarily springs that come to
7 the surface but may be flowing under the surface.
8 Doesn't that affect the probability numbers that
9 you're giving in terms of the number of
10 intermittent springs and channels that could
11 possibly carry a spill to the waterway?

12 A. It is a -- it was not looked at.

13 Q. Would it have an effect on your analysis
14 if you discovered there were a significant number
15 of springs or channels like this?

16 A. Only if there was a significant number of
17 them and only if they were heading in the right
18 direction, and I'd have to probably do some more
19 research to determine whether they have the
20 potential to transport crude oil or its
21 constituents large distances. Again, I would fall
22 back just from groundwater movement in general,
23 again, we've talked about that in detail.

24 Q. I just have one more question that I
25 wanted to cover. It's a little bit different

1 topic. I think you had given some testimony about
2 whether these water bodies were classified as
3 drinking water bodies and what effect that had in
4 your analysis in terms of water quality standards,
5 and if you could just repeat for me how you use
6 water quality standards generally when you're doing
7 risk analysis. Do you use different standards if
8 you know it's a drinking water body versus a water
9 body that's used for other purposes and not human
10 consumption?

11 A. We -- let me think for a second. When we
12 look at water quality, I guess I'm looking at water
13 quality from a broad-use standpoint and looking at
14 how it would affect a stream or a reservoir or
15 things in its entirety. When we get into specific
16 analyses such as the City of Fargo, that's when I
17 would get down to the specific levels of, you know,
18 well, what would happen -- you know, if we assume
19 all these things happened and got there, could the
20 benzene concentration be exceeded. So you're
21 drilling down a lot.

22 Q. I was just curious, I guess, what the
23 standard is you would use for this particular water
24 body. I mean, is your goal in alleviating risk or
25 avoiding risk trying to maintain a water body

1 that's fit for human consumption?

2 A. What we're trying to do is minimize the
3 risk of the pipeline to a water source. So we look
4 at it as, I guess, basically is the pipeline route
5 where it is sufficiently safe to protect the water
6 quality, and that incorporates again all the -- not
7 only the fate in transport, but it creates the
8 emergency response as kind of a whole, and then you
9 get down into what's an acceptable risk and, you
10 know -- and that's what we look at.

11 MS. LINDERMAN: Okay. Thank you. No more
12 questions.

13 JUDGE WAHL: Mr. Binek.

14 MR. BINEK: I have no questions.

15 JUDGE WAHL: Any further questions from
16 the Commission?

17 COMMISSIONER WEFALD: No.

18 JUDGE WAHL: Commissioner Clark.

19 **FURTHER EXAMINATION**

20 **BY COMMISSIONER CLARK:**

21 Q. Just very briefly to follow up on a
22 question that Mr. Kelsch had regarding the Health
23 Department testimony and the safety of the route,
24 and I think it gets back to the question that I'm
25 weighing in my own mind about is it a question of

1 just risk -- an acceptable risk versus comparative
2 risk, and I think Mr. Horner had said in response
3 to a question about the safety of the line -- and I
4 think it had to do with the Fordville aquifer --
5 that he said it's safe, but then he paused and but
6 it would be safer further to the west, which
7 implies that from a risk analysis standpoint it's
8 safe but it's not zero and it gets closer to zero
9 if you move it further away. Do you agree with
10 that and -- or would that be your analysis for this
11 Sheyenne/Ashtabula situation as well, that it's
12 safe, but it's safer if you move it further away?

13 A. I think I already testified to that, that
14 where it is is safe and, you know, moving it -- and
15 now we're talking about Fordville rather than the
16 Sheyenne, I understand, but I said what it was, was
17 it was incrementally safer. It -- it was -- it
18 wasn't like substantially different. So, I mean,
19 yeah, it did add, you know, some element of safety,
20 but it's an incremental change, not vastly
21 different.

22 COMMISSIONER CLARK: Okay. I just wanted
23 to clarify that. Thank you.

24 JUDGE WAHL: Anything further from the
25 Commission? Commissioner Cramer.

FURTHER EXAMINATION

BY COMMISSIONER CRAMER:

1 Q. Well, just following along on that since
2 we're using some scenarios from previous testimony,
3 is it true that TransCanada -- now I'm thinking
4 closer to Sheyenne, but it might have even been a
5 little further south yet. There was some issue
6 regarding -- might have been subsurface, but it
7 might have been that there was an Oakes aquifer and
8 another aquifer and the pipeline was moved at the
9 request, I think, of the Health Department because
10 it had to do with not only those two aquifers and
11 its proximity to them but also the types of soils,
12 gravel versus some siltier soils. So TransCanada
13 has -- do you recall that situation, first of all?

14 A. Yeah. It was the Fordville aquifer, I
15 think. It was actually --

16 Q. No. I was thinking one down by the Oakes
17 aquifer, as I recall, that there was maybe even a
18 more dramatic change as a result of work with the
19 Health Department. Do you recall that?

20 A. I'm sorry. I do not.

21 COMMISSIONER WEFALD: It was a different
22 issue.

23 COMMISSIONER CRAMER: I have nothing else.
24
25

1 COMMISSIONER WEFALD: Not water, I think.

2 JUDGE WAHL: Anything further from the
3 Commission? Anything further -- any followup, Mr.
4 Kelsch?

5 MR. KELSCH: Just one perhaps, Your Honor.

6 **REDIRECT EXAMINATION**

7 **BY MR. KELSCH:**

8 Q. Ms. Tillquist, do you recall -- I think it
9 was the Hecla sands reroute. Do you recall that
10 testimony?

11 A. Oh, okay.

12 Q. And I think that is in the southern part
13 of the state.

14 A. Yes.

15 Q. And was that -- did Keystone, if you know,
16 move the pipeline out of the Hecla sands area at
17 the request of the health department?

18 A. To be honest, I don't recall what
19 department it was that asked us to move, but I do
20 know that it was a request that was made and that
21 we moved it.

22 MR. KELSCH: Okay. I have no further
23 questions.

24 JUDGE WAHL: Mr. Dingess, anything
25 further.

1 **RE CROSS-EXAMINATION**2 **BY MR. DINGESS:**3 Q. It just occurred to me, where is the
4 Enbridge crude oil pipeline that you testified to
5 about earlier? Is that in the western part of the
6 state?

7 A. Pembina County, is my understanding.

8 MR. DINGESS: Thank you.

9 JUDGE WAHL: Anything further?

10 MR. DINGESS: Nothing. Thank you.

11 JUDGE WAHL: Ms. Linderman?

12 MS. LINDERMAN: Nothing further. Thank
13 you.

14 JUDGE WAHL: Mr. Binek, anything further?

15 MR. BINEK: Nothing further.

16 JUDGE WAHL: All right. I'm assuming --
17 any further questions from the Commission? Thank
18 you very much, Ms. Tillquist. Mr. Kelsch.19 MR. KELSCH: Keystone would rest, Your
20 Honor.

21 JUDGE WAHL: Oh, you're kidding.

22 MR. KELSCH: Do you want us to keep going?
23 You were surprised we got done early yesterday.24 JUDGE WAHL: I'm impressed, Mr. Kelsch.
25 You get a gold star -- you and your people get a

1 gold star for knowing when to quit, I guess. All
2 right. That's it. I don't see anything further
3 for the hearing. We'll discuss briefing. I'm
4 assuming --

5 COMMISSIONER WEFALD: We could have had an
6 hour lunch.

7 JUDGE WAHL: I'm assuming -- let's do it
8 this way: Mr. Kelsch, anything -- other than
9 briefing, which we'll deal with off the record,
10 anything further for the record?

11 MR. KELSCH: Nothing, Your Honor.

12 JUDGE WAHL: Mr. Dingess, anything further
13 for the record?

14 MR. DINGESS: No, sir.

15 JUDGE WAHL: Ms. Linderman, anything
16 further for the record?

17 MS. LINDERMAN: Nothing.

18 JUDGE WAHL: Mr. Binek, anything further
19 for the record?

20 MR. BINEK: No.

21 JUDGE WAHL: Commissioners, closing
22 comments. Commissioner Wefald.

23 COMMISSIONER WEFALD: Yes. Thank you.

24 It's been helpful to hear the questions and the
25 responses by the witnesses, and we'll look -- I'm

1 personally looking forward to any late-filed
2 exhibits that will be filed, to take a look at
3 those, as well, and to review the record in total
4 so that we're ready to make a good decision on this
5 case. Thank you.

6 JUDGE WAHL: Commissioner Clark.

7 COMMISSIONER CLARK: Just thank you for
8 all appearing and for supplementing our record.

9 JUDGE WAHL: Commissioner Cramer.

10 COMMISSIONER CRAMER: Thank you, everyone,
11 for appearing, for good testimony, interesting
12 testimony, occasionally spirited testimony, and
13 thank you to Fargo for -- for accommodating this
14 shorter than probably is the most beneficial to
15 you -- your time schedule. We know that you did a
16 lot of work in a short period of time and it took a
17 lot of people to do that, so we appreciate that a
18 great deal. And as I said yesterday, I guess, at
19 the meeting, the fact that we've extended the
20 deadline for a decision indefinitely does not mean
21 that it's open-ended forever. So we'll look
22 forward to a reasonable schedule of the rest of
23 this so that we can get to work and draw some
24 conclusion. Thank you.

25 JUDGE WAHL: All right. For the second

1 and hopefully last time, the hearing for Case No.
2 PU-06-421 is closed.

3 COMMISSIONER WEFALD: I have a question,
4 though. Wouldn't you -- are they going to be
5 filing any briefs or anything?

6 JUDGE WAHL: Yes, yes.

7 COMMISSIONER WEFALD: Are you going to do
8 that now?

9 JUDGE WAHL: Yes.

10 COMMISSIONER WEFALD: Okay. Thank you.

11 JUDGE WAHL: All right. Thank you all.
12 Counsel, stay fast, of course. I need you for a
13 while yet.

14 (Concluded at 12:57 p.m., the same day.)

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13 Bismarck, North Dakota, this 4th day of
14 December, 2007.

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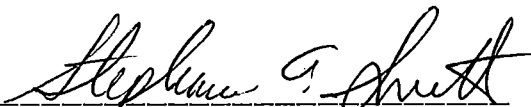
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6 shorthand the foregoing proceedings had and made of
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11 contain an accurate transcript of my shorthand
12 notes then and there taken.

13 Bismarck, North Dakota, this 4th day of
14 December, 2007.

15 

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17 Stephanie A. Smith
18 Registered Professional Reporter
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