

**KEYSTONE XL PIPELINE:
EXAMINING SCIENTIFIC AND
ENVIRONMENTAL ISSUES**

HEARING
BEFORE THE
SUBCOMMITTEE ON ENVIRONMENT
JOINT WITH THE
SUBCOMMITTEE ON ENERGY
COMMITTEE ON SCIENCE, SPACE, AND
TECHNOLOGY
HOUSE OF REPRESENTATIVES
ONE HUNDRED THIRTEENTH CONGRESS

FIRST SESSION

TUESDAY, MAY 7, 2013

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CONTENTS

Tuesday, May 7, 2013

Witness List	Page 2
Hearing Charter	3

Opening Statements

Statement by Representative Chris Stewart, Chairman, Subcommittee on Environment, Committee on Science, Space, and Technology, U.S. House of Representatives	9
Written Statement	10
Statement by Representative Suzanne Bonamici, Ranking Minority Member, Subcommittee on Environment, Committee on Science, Space, and Technology, U.S. House of Representatives	11
Written Statement	12
Statement by Representative Lamar S. Smith, Chairman, Committee on Science, Space, and Technology, U.S. House of Representatives	13
Written Statement	14
Statement by Representative Eric Swalwell, Ranking Minority Member, Subcommittee on Energy, Committee on Science, Space, and Technology, U.S. House of Representatives	14
Written Statement	15
Statement by Representative Cynthia Lummis, Chairwoman, Subcommittee on Energy, Committee on Science, Space, and Technology, U.S. House of Representatives	70
Written Statement	71

Witnesses:

Mr. Lynn Helms, Director, Department of Mineral Resources, North Dakota Industrial Commission	
Oral Statement	16
Written Statement	18
Mr. Brigham A. McCown, Principal and Managing Director, United Transportation Advisors, LLC	
Oral Statement	23
Written Statement	25
Mr. Anthony Swift, Attorney, International Program, Natural Resources Defense Council	
Oral Statement	42
Written Statement	44
Mr. Paul Knappenberger, Assistant Director, Center for the Study of Science, Cato Institute	
Oral Statement	59
Written Statement	61
Discussion	70

Appendix I: Answers to Post-Hearing Questions

Mr. Lynn Helms, Director, Department of Mineral Resources, North Dakota Industrial Commission	91
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IV

	Page
Mr. Brigham A. McCown, Principal and Managing Director, United Transportation Advisors, LLC	96
Mr. Paul Knappenberger, Assistant Director, Center for the Study of Science, Cato Institute	102

**KEYSTONE XL PIPELINE:
EXAMINING SCIENTIFIC AND
ENVIRONMENTAL ISSUES**

TUESDAY, MAY 7, 2013

HOUSE OF REPRESENTATIVES,
JOINT HEARING WITH THE SUBCOMMITTEE ON
ENVIRONMENT AND THE SUBCOMMITTEE ON ENVIRONMENT
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Subcommittees met, pursuant to call, at 10:03 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Chris Stewart [Chairman of the Subcommittee on Environment] presiding.

LAMAR S. SMITH, Texas
CHAIRMAN

EDDIE BERNICE JOHNSON, Texas
RANKING MEMBER

Congress of the United States
House of Representatives

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

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Subcommittee on Environment
And
Subcommittee on Energy

Keystone XL Pipeline: Examining Scientific and Environmental Issues

Tuesday, May 7, 2013
10:00 a.m. – 12:00 p.m.
2318 Rayburn House Office Building

Witnesses

Mr. Lynn Helms, Director, Department of Mineral Resources, North Dakota Industrial Commission

Mr. Brigham A. McCown, Principal and Managing Director, United Transportation Advisors LLC

Mr. Anthony Swift, Attorney, International Program, Natural Resources Defense Council

Mr. Paul “Chip” Knappenberger, Assistant Director, Center for the Study of Science, Cato Institute

**U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
SUBCOMMITTEE ON ENVIRONMENT
SUBCOMMITTEE ON ENERGY**

HEARING CHARTER

Keystone XL Pipeline: Examining Scientific and Environmental Issues

Tuesday, May 7, 2013
10:00 a.m. – 12:00 p.m.
2318 Rayburn House Office Building

PURPOSE

On Tuesday, May 7 at 10:00 a.m. in Room 2318 of the Rayburn House Office Building, the Subcommittee on Environment and the Subcommittee on Energy of the Committee on Science, Space and Technology will hold a hearing entitled *Keystone XL Pipeline: Examining Scientific and Environmental Issues*. The purpose of this hearing is to examine the scientific and environmental aspects of the Keystone XL Pipeline, with a focus on the State Department's recently released Supplemental Draft Environmental Impact Statement.

WITNESS LIST

- **Mr. Lynn Helms**, Director, Department of Mineral Resources, North Dakota Industrial Commission
- **Mr. Brigham A. McCown**, Principal and Managing Director, United Transportation Advisors LLC
- **Mr. Anthony Swift**, Attorney, International Program, Natural Resources Defense Council
- **Mr. Paul "Chip" Knappenberger**, Assistant Director, Center for the Study of Science, Cato Institute

BACKGROUND

History

In 2008, TransCanada announced the Keystone XL pipeline expansion project, which would deliver Canadian oil sands to the Texas Gulf Coast refining complex in Nederland, Texas. The proposed project is 875 miles long, and would allow the transport of up to 830,000 barrels per day of crude oil from Alberta and the Bakken shale.¹ Because the proposed project crosses an

¹ U.S. Department of State. Executive Summary--Draft Supplemental Environmental Impact Statement. Keystone XL Project. Accessible at: <http://keystonepipeline-xl.state.gov/draftseis/index.htm>

international boundary, it is subject to the requirements of Executive Order 13337², which requires the Secretary of State to determine if a project is in the “national interest” before a Presidential Permit can be granted.

The TransCanada Corporation submitted an application for the Presidential Permit in September 2008, and the State Department conducted an extensive environmental review called an Environmental Impact Statement (EIS). In April 2010, the State Department’s draft EIS was released, which found that the project would have “no significant impacts to most resources along the proposed route”.³ The Department took public comment on the draft EIS, and released a final version in August 2011, which supported approval of the project.

However, in January 2012, President Obama announced that he would reject the construction of the pipeline in its current form, calling for a “full assessment of the pipeline’s impact, especially the health and safety of the American people, as well as our environment.”⁴ The following month, TransCanada announced it would split the pipeline into two projects, and proceeded with plans to construct the Southern segment from Cushing, Oklahoma to the Gulf Coast, referred to as the Gulf Coast Project. In May 2012, TransCanada submitted a new Presidential Permit Application for the remaining international half of the pipeline, from the Canadian border to Steele City, Nebraska.⁵

Re-Route

The Presidential Permit application submitted in May 2012 included a new route through Nebraska that avoided the ecologically sensitive Sand Hills region and alleviated concerns regarding the Ogallala aquifer.⁶ The Nebraska Department of Environmental Quality conducted an analysis of the new route, and concluded that the pipeline could be built and operated safely. The State of Nebraska approved the revised route in January of this year, and Governor Dave Heineman sent a letter to President Obama and Secretary Clinton that summarized the findings of the DEQ report and expressed this approval.⁷

Current Status

On March 1st, the State Department released its Draft Supplemental Environmental Impact Statement (SEIS), which built and expanded on the 2011 Final Environmental Impact Statement and included analysis of the new route through Nebraska.⁸ The expanded analysis considered economic effects, impacts from potential releases or spills, impacts related to climate change, and cumulative effects from the proposed project in combination with other projects. The State Department also re-examined and expanded evaluation of project alternatives.

² <http://www.gpo.gov/fdsys/pkg/WCPD-2004-05-10/pdf/WCPD-2004-05-10-Pg723.pdf>

³ U.S. Department of State. Final Draft Environmental Impact Statement, Section 3.15 Environmental Analysis. Summary of Findings. Accessible at: <http://keystonepipeline-xl.state.gov/documents/organization/182070.pdf>

⁴ Statement by the President on the Keystone XL Pipeline, January 18, 2012. Accessible at:

<http://www.whitehouse.gov/the-press-office/2012/01/18/statement-president-keystone-xl-pipeline>

⁵ TransCanada Keystone XL Timeline. Accessible at:

http://www.transcanada.com/social/responsibility/2011/keystone_xl/timeline/

⁶ New Keystone XL Pipeline Application: <http://www.keystonepipeline-xl.state.gov/>

⁷ Letter from Governor Dave Heineman to President Barack Obama, Secretary Hillary Rodham Clinton, January 22, 2013. Accessible at: http://www.governor.nebraska.gov/news/2013/01/docs/0122_Pipeline_Approval.pdf

⁸ <http://www.state.gov/r/pa/prs/ps/2013/03/205548.htm>

including other possibilities for crude oil transport such as rail. The release of the SEIS was noticed in the Federal Register on March 27th, which specified that the 45 day public comment period began on March 8th.⁹

Several key findings from the Draft SEIS:

- **Environmental Impacts:** “The analyses of potential impacts associated with construction and normal operation of the proposed Project suggest that there would be no significant impacts to most resources along the proposed Project route [assuming Keystone complies with all laws and required conditions and measures].”
- **Market Analysis:** “The 2011 FEIS concluded that the project is unlikely to significantly affect the rates of extraction in the oil sands or in US refining activities. Changes in the petroleum markets since 2011 are not anticipated to alter the outlook for the crude oil market in a manner that would lead to a change in the key conclusions reached in the 2011 FEIS.”
- **Potential Releases:** “Comparison of incident data from Alberta pipeline systems with data from U.S. pipeline systems indicates that Alberta pipelines that have likely shipped diluted bitumen (dilbit), synthetic crude oil (SCO), or Bakken shale oil are not more prone to failure than other pipeline systems carrying conventional crude oils.”
- **Indirect Cumulative Impacts and Life-Cycle GHG Emissions:** “It is unlikely that the proposed Project construction would have a substantial impact on the rate of WCSB [Western Canada Sedimentary Basin] oil sands development. Even when considering the incremental cost of non-pipeline transport options, should the proposed Project be denied, a 0.4 to 0.6 percent reduction in WCSB production could occur by 2030, and should both the proposed Project and all other proposed pipeline projects not be built, a 2 to 4 percent decrease in WCSB oil sands production could occur by 2030.”
- **No Action Alternative:** “Given that production of WCSB and Bakken crude oil will proceed with or without the proposed Project, the denial of a Presidential Permit would likely result in actions by other firms in the United States (and global) petroleum market, such as use of alternative modes to transport WCSB and Bakken crude oil.”

On April 22nd, the public comment period on the Draft SEIS closed, and the State Department will now review the comments and make revisions before publishing a final SEIS.¹⁰ After publication of the final document, the State Department will consult with other agencies before determining whether or not issuing a Presidential Permit is in the national interest. This decision, referred to as the National Interest Determination (NID), requires consideration of many factors, including energy security, environmental, cultural, and economic impacts, foreign policy, and compliance with federal regulations. The Department has stated it intends to provide additional opportunity for public comment during the NID period.

⁹ Federal Register Volume 78, Number 59, Wednesday, March 27, 2013. Accessible at: <http://www.gpo.gov/fdsys/pkg/FR-2013-03-27/html/2013-07072.htm>

¹⁰ U.S. Department of State, Keystone XL Pipeline Project, Project Information. Accessible at: <http://www.keystonepipeline-xl.state.gov/>

Following the National Interest Determination, EO 13337 requires the Secretary of State to issue or deny the permit in accordance with the NID, unless notified by another cabinet official that they disagree with the proposed determination and request the Secretary to refer the application to the President. In the event of such a disagreement, the Secretary of State is required to consult with the official who expressed it, and refer the application to the President for consideration and a final decision.¹¹

Additional Reading:

- U.S. Department of State, Executive Summary—Draft Supplemental Environmental Impact Statement for the Keystone XL Project, March 2013. Accessible at: <http://keystonepipeline-xl.state.gov/documents/organization/205719.pdf>
- IHS CERA, The Role of the Canadian Oil Sands in the U.S. Market: Energy Security, Changing Supply Trends, and the Keystone XL Pipeline, Special Report. Accessible at: <http://a1024.g.akamai.net/f/1024/13859/1d/ihsgroup.download.akamai.com/13859/ihs/cera/The-Role-of-the-Canadian-Oils-Sands-in-the-US-Market.pdf>
- Keystone XL Timeline: See Appendix 1.

¹¹ <http://www.gpo.gov/fdsys/pkg/FR-2004-05-05/pdf/04-10378.pdf>

Appendix I. Keystone XL Timeline¹²

- **September 19, 2008:** TransCanada submits an application to the State Department for a Presidential Permit for the Keystone XL pipeline. The State Department announced it will conduct an Environmental Impact Statement (EIS).
- **January –June 2009:** The State Department conducts 20 “scoping” meetings in communities along the proposed route to explore issues to be examined in the EIS, and consults with federal and state agencies and Native American tribes impacted by the pipeline.
- **April 2010:** The State Department issues its Draft Environmental Impact Statement, and opens a 45 day public comment period, which will later be extended. The Draft EIS finds that the project would have “limited adverse environmental impacts during both construction and operation.”
- **April-September 2010:** The State Department solicits comments on the proposed project, and twice extends the public comment period on the Draft EIS.
- **October 2010:** When asked, Secretary of State Clinton says we [State Department] are “inclined to approve” the Keystone XL project.
- **January 2011:** TransCanada agrees to 57 additional safety features requested by the State Department and the Pipeline and Hazardous Materials Safety Administration relating to the construction, operation, and design of the pipeline.
- **April 2011:** The State Department releases a Supplemental Draft EIS, which it notes “does not alter the conclusions” of the draft issued a year previous.
- **April-June 2011:** Public comment period for the Supplemental Draft EIS
- **August 2011:** The State Department releases its Final EIS, which supports moving forward with the pipeline. It also opens a 90 day review period.
- **August-October 2011:** The State Department conducts its National Interest Determination, and solicits public comment and holds meetings in six states and the District of Columbia.
- **November 2011:** The State Department suspends the permitted process for Keystone XL until the re-route to avoid the Sand Hills region in Nebraska is complete. TransCanada works with the state of Nebraska to identify an alternative route, and Nebraska codifies a

¹² Information included in this timeline was gathered from several sources and existing timelines. Sources include timelines from the State Department, the Congressional Research Service, the Heritage Foundation, and TransCanada.

process for approval of the route, which involved the state's Department of Environmental Quality.

- **December 2011:** The House and Senate approve and the President signs the payroll tax bill, which requires the President approve or deny the Keystone XL permit within 60 days.
- **January 2012:** In response to the 60 day requirement included in Pl.112-78, President Obama announces he will not approve the construction of the Keystone XL Pipeline in its current form, but will allow TransCanada to re-apply for a Presidential Permit.
- **February 2012:** TransCanada announces it is dividing the Keystone XL project into two parts. The lower half of the project, from Cushing, Oklahoma, to the Gulf, does not cross an international border and thus does not require an international permit.
- **March 2012:** President Obama states his support for the Gulf Coast Project and that he will expedite the permitting.
 - Construction of the Gulf Coast Project proceeds.
- **April 2012:** TransCanada submits a re-route of the pipeline to the state of Nebraska for review.
- **May 2012:** TransCanada submits a new Presidential Permit application to the State Department for the Keystone XL pipeline project running from the U.S.-Canada border in Montana to Steele City, Nebraska.
- **June 2012:** The State Department publishes a Notice of Intent to prepare a Supplemental EIS for the second Keystone XL Presidential Permit application.
- **January 2013:** Governor Dave Heineman gives notice of Nebraska's approval of the reroute through Nebraska.
- **March 2013:** The State Department issues its draft Supplemental EIS (SEIS) for the Keystone XL permit application, which includes the re-route through Nebraska. The findings in the SEIS build upon and largely confirm those in the FEIS issued in August of 2011.
 - **March 8-April 22nd:** 45 day public comment period on the SEIS.

Chairman STEWART. Good morning. The joint hearing on the Subcommittee on Environment and the Subcommittee on Energy will come to order. Welcome to today's joint hearing entitled "Keystone XL Pipeline: Examination of Scientific and Environmental Issues." In front of each Member are packets containing the written testimony, biographies, and truth-in-testimony disclosures for today's witnesses.

Before we get started, and since this is a joint hearing involving two Subcommittees, I wanted to explain how we will operate procedurally, so all Members will understand how the question-and-answer period will be handled. As always, we will alternate between the majority and minority Members. After first recognizing the Chair and Ranking Members of the Environment and Energy Subcommittees, we will then recognize those Members present at the gavel in order of seniority on the Full Committee, and those coming in after the gavel will be recognized in order of arrival.

And I now recognize myself for five minutes for my opening statement.

I would like to thank the witnesses for being with us today. We appreciate your service and the sacrifice you made, and we look forward to hearing for you—from you.

The subject of today's hearing, construction of the XL pipeline, is of profound economic and national security interest. The proposed pipeline has been under continuous review for more than four years. Now, let's think about that for a moment. More than four years, that is about the length of time it took the United States to fight and win World War II. You can complete a university degree in four years. A large portion of the transcontinental railroad was built in four years. You can do a lot of things in four years. The only thing we can't do is get this Administration to make a decision about building a much-needed pipeline.

During the past four years, as this project has been studied, we have learned that the pipeline is safe and environmentally sound. We also know it will create jobs and it promotes energy security. In fact, in 2010, then-Secretary of State Clinton signaled as much when she said that the State Department was likely to approve the project. That, of course, sparked an outcry from the Administration's environmental allies, resulting in politically driven delay and additional review, all of which came at considerable expense and further loss of economic opportunity.

The comment period on the State Department's most recent Draft Supplemental Environmental Impact Statement, or SEIS, closed just months—for last month. In that report, the State Department found that the proposed project is safe. It uses state-of-the-art materials, coating, construction practices, and monitoring systems. The State Department SEIS goes on to say that the pipeline would be one of the safest pipelines ever built or operated.

In regard to its effects on the environment, the Department found "that there would be no significant impacts." And because the project will have little or no impact on oil sands production—the Canadian oil will be brought to market whether or not the Keystone pipeline is built—effects on carbon emissions would be negligible.

And while the EPA claims that over a 50-year period the additional emissions would create as much as 935 million metric tons of greenhouse gases, this is far less than one percent of global emissions. As Paul Knappenberger of the Cato Institute will tell us today, even using EPA's worst-case scenario assumptions, the effect of the pipeline would only increase the rate of warming by an imperceptible 1/100,000 of a degree per year.

In regard to jobs, the State Department estimates that the pipeline would have significant positive socioeconomic impacts in the form of local employment, increased tax revenue, ancillary business development, and increased spending by workers on goods and services. As the Department states in the SEIS, "the proposed project would potentially support approximately 42,100 average annual jobs across the United States. This employment would potentially translate to approximately \$2.05 billion in earnings."

And there is also this important point: the President frequently urges us to reduce our reliance on foreign oil from unstable, undemocratic regimes that are unfriendly to the U.S. interests. As a former Air Force pilot, I have personal knowledge of how important it is to reduce our reliance on sources of energy that emanate from instable and unpredictable areas of the world. If you want to enhance our national security while decreasing the need to put our sons and daughters in harm's way in far-off regions of the world, then build the Keystone pipeline.

Finally, building the pipeline will allow us to increase our trading relationships with Canada, a stable and friendly democracy with whom we share a long and peaceful border.

In short, the pipeline is in the national interest. There is no logical reason not to allow it to move forward.

I now recognize the gentlelady from Oregon, the Ranking Member, Ms. Bonamici, for her opening statement.

[The prepared statement of Mr. Stewart follows:]

PREPARED STATEMENT OF ENVIRONMENT SUBCOMMITTEE CHAIRMAN CHRIS STEWART

The subject of today's hearing, construction of the XL pipeline, is of profound economic and national security interest.

The proposed pipeline has been under continuous review for more than four years. Let's think about that for a moment. More than four years. That's about the length of time it took for the United States to fight and win WW II. You can complete a university degree in four years. A large portion of the transcontinental railroad was built in four years. We can do a lot of things in four years. The only thing we can't do is to get this Administration to make a decision about building a much-needed pipeline.

During the past four years, as the project has been studied, we have learned that the pipeline is safe and environmentally sound. We also know it will create jobs and that it promotes energy security. In fact, in 2010, then-Secretary of State Clinton signaled as much when she said that the State Department was likely to approve the project. That, of course, sparked an outcry from the Administration's environmental allies, resulting in politically driven delay, and additional review—all of which came at considerable expense and further loss of economic opportunity.

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And while the Environmental Protection Agency claims that over a 50-year period, the additional emissions “could be as much as 935 million metric tons” of greenhouse gases, this is far less than one percent of global emissions. As Paul Knappenberger of the Cato Institute will tell us today, even using EPA’s worst-case scenario assumptions, the effect of the pipeline would only increase the rate of warming by an imperceptible one one-hundred-thousandth of a degree per year.

In regard to jobs, the State Department estimates that the pipeline would have significant positive socioeconomic impacts in the form of local employment, increased tax revenues, ancillary business development, and increased spending by workers on goods and services.

As the Department states in the SEIS, “the proposed Project would potentially support approximately 42,100 average annual jobs across the United States . . . This employment would potentially translate to approximately \$2.05 billion in earnings.”

And there is also this important point: the President frequently urges us to reduce our reliance on foreign oil from unstable, undemocratic regimes that are unfriendly to U.S. interests. As a former Air Force pilot, I have personal knowledge of how important it is to reduce our reliance on sources of energy that emanate from unstable and unpredictable areas of the world. If you want to enhance our national security, while decreasing the need to put our sons and daughters in harm’s way in far-off regions of the world, then build the Keystone pipeline.

Finally, building the pipeline will allow us to increase our trading relationship with Canada, a stable and friendly democracy with whom we share a long and peaceful border.

In short, the pipeline is in the national interest. There is no logical reason not to allow it to move forward.

I now recognize the gentlelady from Oregon, Ranking Member Bonamici, for her opening statement.

Ms. BONAMICI. Thank you very much, Chairman Stewart. I don’t see Chairwoman Lummis.

I want to welcome our witnesses and thank you all for participating in today’s hearing about the Keystone XL pipeline. The discussion we are having here today is important because the Keystone pipeline project heightens and highlights an issue that this Committee has been debating for a long time: climate change caused by human activity. There has been disagreement with colleagues across the aisle regarding the human role in the changing climate. For that reason, I was pleased a few weeks ago when the Subcommittee on the Environment held a climate change hearing in which all of the witnesses agreed in their testimony that global warming is happening, humans are contributing to it, and the country must take action to address it.

This is relevant to today’s hearing because the Keystone XL pipeline showcases our continued dependence on fossil fuels, the use of which contributes greatly to anthropogenic climate change. I am pleased that this hearing will also address potential negative impacts of the pipeline on those living and working along the proposed pipeline route, including those engaged in agricultural activities.

I am glad that the witnesses will also be discussing the pipeline’s impact on land use and that they will discuss potential threats that large-scale pipeline projects can pose to fragile water resources.

Also significant are local concerns about the cleanup of potential spills from the pipeline. I joined many of my colleagues who know that we must be thoughtful and informed before we give the go-ahead to traverse the thousands of miles of the American country-

side with new infrastructure for an old energy source. According to the State Department's Draft Environmental Impact Statement, the Keystone XL pipeline will bring thousands of temporary construction jobs and positively impact local economies at a time when our country is navigating through a slow economic recovery. These short-term benefits to our economy should not be overlooked, but they should be considered alongside with the substantial environmental and safety challenges presented by the pipeline, including the potentially disastrous impact on the local economy if they still were to occur.

That happened not too long ago in Michigan. A pipeline transporting oil from Canada to the United States' destinations ruptured and spilled about 800,000 gallons of crude oil into the Kalamazoo River. Now, three years later, cleanup is yet to be completed because of the difficult task of getting the heavy oil sands out from the river floor where much of it remains submerged. The EPA recently recommended that the State Department take a closer look at how spills of oil sands may require different response actions or equipment from response actions for conventional oil spills. That is why Congress requested that the National Academy of Sciences study this type of oil, and it is my hope that we will soon know more about what differences exist between oil sands and conventional crudes.

In closing, although I would never claim to speak for all the Democrats about the Keystone project specifically, we do all agree that our country must set ambitious goals to combat anthropogenic climate change. Fossil fuels will continue to play a role in powering our economy for the foreseeable future, but we must also invest more in renewable energy as a 21st century solution to combat climate change, boost our job markets, and reduce our dependence on fossil fuels over the long term. I look forward to hearing the witnesses' perspectives on the environmental and safety issues associated with that project.

And with that, Mr. Chairman, I yield back.

[The prepared statement of Ms. Bonamici follows:]

PREPARED STATEMENT OF ENVIRONMENT SUBCOMMITTEE RANKING MEMBER SUZANNE BONAMICI

Thank you, Chairman Stewart and Chairwoman Lummis. I want to welcome our witnesses and thank you all for participating in today's hearing about the Keystone XL Pipeline. The discussion we are having today is important because the Keystone pipeline project highlights an issue that this Committee has been debating for a long time: climate change caused by human activity. There has been disagreement with colleagues across the aisle regarding the human role in the changing climate. For that reason, I was pleased two weeks ago when the Subcommittee on the Environment held a climate change hearing in which all the witnesses agreed in their testimony that global warming is happening, humans are contributing to it, and the country must take action to address it.

This is relevant to today's hearing because the Keystone XL Pipeline showcases our continued dependence on fossil fuels, the use of which contributes greatly to anthropogenic climate change. I am pleased that this hearing will also address potential negative impacts of the pipeline on those living and working along the proposed pipeline route, including those engaged in agricultural activities. I'm glad that the witnesses will also be discussing the pipeline's impact on land use and that they will discuss potential threats that large-scale pipeline projects can pose to fragile water resources. Also significant are local concerns about the clean-up of potential spills from the pipeline. I join many of my colleagues who know that we must be

thoughtful and informed before we give the go-ahead to traverse thousands of miles of the American countryside with new infrastructure for an old energy source.

According to the State Department's Draft Environmental Impact Statement, the Keystone XL Pipeline will bring thousands of temporary construction jobs and positively impact local economies at a time when our country is navigating through a slow economic recovery. These short-term benefits to our economy should not be overlooked, but they should be considered alongside the substantial environmental and safety challenges presented by the pipeline, including the potentially disastrous impact on the local economy if a spill were to occur.

That happened not too long ago in Michigan. A pipeline transporting oil from Canada to U.S. destinations ruptured and spilled 800,000 gallons of crude oil into the Kalamazoo River. Now, three years later, cleanup has yet to be completed because of the difficult task of getting the heavy oil sands out from the river floor where much of it remains submerged. The EPA recently recommended that the State Department take a closer look at how spills of oil sands may require different response actions or equipment from response actions for conventional oil spills. That's why Congress requested that the National Academy of Sciences study this type of oil, and it is my hope that we will soon know more about what differences exist between oil sands and conventional crudes.

In closing, although I would never claim to speak for all Democrats on the Keystone project specifically, we do all agree that our country must set ambitious goals to combat anthropogenic climate change. Fossil fuels will continue to play a role in powering our economy for the foreseeable future, but we must also invest more in renewable energy as the 21st century solution to combat climate change, boost our job markets, and reduce our dependence on fossil fuels over the long term. I look forward to hearing the witnesses' perspectives on the environmental and safety issues associated with this project. And with that, Mr. Chairman, I yield back.

Chairman STEWART. I thank you, Ms. Bonamici.

Noting that the Chair of the Subcommittee on Energy, Mrs. Lummis, is on her way but not here yet, we will now turn to the Full Committee Chair, Mr. Smith.

Chairman SMITH. Thank you, Mr. Chairman.

In December 2008, then-President-elect Obama announced a massive new economic stimulus proposal, which he said would focus on "shovel-ready" construction projects. Less than three months earlier, TransCanada submitted to the Federal Government what might be considered the epitome of all shovel-ready projects: the request to build a 1,700 mile Keystone pipeline from Alberta to the Texas Gulf. Four-and-a-half years have passed since the President made "shovel-ready" part of the political discussion.

Today, TransCanada still waits for the Federal Government to decide whether allowing the company to create more than 40,000 jobs building a pipeline to deliver oil from an ally is in our national interest. Many Americans would consider such a decision to be simple, but the Federal Government has required millions of dollars, years of study, and thousands of pages of reports. Fortunately, the end is in sight. In the coming months, the Obama Administration will decide the future of the pipeline.

Today, we will discuss the scientific and environmental factors at the center of the debate that surrounds this decision. Ultimately, there are two major concerns in this debate: (1) whether we have the ability to construct and operate the pipeline safely, and (2) whether the pipeline's construction will contribute significantly to climate change. On both of these questions, extensive analysis undertaken by the State Department has affirmed the safety and environmental soundness of the project. For example, with respect to greenhouse gas emissions, the worst-case scenario projected that approval of the pipeline could result in a U.S. annual carbon dioxide emissions increase of only 12/1000 of one percent.

The Keystone pipeline creates jobs and enhances our energy independence with minimal impact on the environment. This project, which is been thoroughly evaluated, should be approved immediately. I hope today's discussion will provide Members a useful scientific and environmental background for decision making as we move to consider legislation regarding Keystone on the House floor later this month.

Thank you, Mr. Chairman, and I will yield back.
[The prepared statement of Mr. Smith follows:]

PREPARED STATEMENT OF FULL COMMITTEE CHAIRMAN LAMAR S. SMITH

In December 2008, then-President-elect Obama announced a massive new economic stimulus proposal, which he said would focus on "shovel-ready" construction projects. Less than three months earlier, TransCanada submitted to the Federal Government what might be considered the epitome of all shovel-ready projects: a request to build the 1,700-mile Keystone Pipeline from Alberta to the Texas Gulf.

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Thank you, and I yield back.

Chairman STEWART. Thank you, Mr. Smith.

The Chair now recognizes the Ranking Member of the Subcommittee on Energy, Mr. Swalwell.

Mr. SWALWELL. Thank you, Chairman Stewart and Chairwoman Lummis, for holding this hearing today. I also want to thank our witnesses for being here, and I do appreciate the opportunity to examine the costs and benefits of this project in greater detail.

And Chairman Stewart, you did point out the length of time it has taken, which I do appreciate. We want to move projects along as quickly as possible. But I do think when you are dealing with so many miles, almost 1,000 miles with this particular project, it is in our interest to make sure that we get it right because, although it has taken four years to look at this project, it could take only a matter of seconds to cause devastating consequences to our environment, our Earth, and people around the pipeline. And I think it is worth making sure that we get it right.

And I will take the opportunity to point out that it has been over two months now that we have been waiting for a Secretary of Energy to be approved by the Senate, and that confirmation of Ernest

Moniz has been held up in the Senate and has been blocked by one individual. So I am also frustrated about how long it takes for things to happen. I think it is an antiquated, bizarre system where one individual can block a Secretary from being approved, and that individual, the Secretary of Energy, would play a prominent and important role in this project and other renewable projects. So I hope that the Senate starts to move along this nominee so that we can get to work and see what this project's impact will continue to be, and I am in favor of moving things along as well.

I also think it has been pretty clear and I have made it known from this position that I believe in a balanced, all-of-the-above approach when it comes to our energy production, but when it comes to determining whether we should approve a project as large and long-lasting as a pipeline that would transport 830,000 barrels of tar sands oil from Canada to the Gulf Coast every day, I want to make sure that we have a full and clear understanding of the total number of U.S. jobs we can expect the Keystone XL pipeline to create, the impacts on climate change, and the chances and consequences of a major spill.

I always have said that if we can make it safe, we should make it happen. If we find we can't make it safe, we should find ways to make it happen. And ultimately, if there is no way to make it environmentally safe, then I don't think we should make it happen. I also think that if we are looking forward and we are looking at that pie chart of where our energy supply is coming from, it is in our best interest to continue to expand the part of the chart that comes from renewables, which, right now, I believe is too small and there is a lot greater potential for us to expand that part of the chart, which I also believe and history has shown can create made-in-America jobs, just as many jobs as the Keystone pipeline would create.

So I look forward to discussing these important issues with you today. And with that, I yield back the balance of my time.

[The prepared statement of Mr. Swalwell follows:]

PREPARED STATEMENT OF RANKING MEMBER OF THE COMMITTEE ON ENERGY ERIC SWALWELL

Thank you, Chairman Stewart and Chairwoman Lummis, for holding this hearing today, and I also want to thank the witnesses for being here. I appreciate the opportunity to examine the costs and benefits of this controversial project in greater detail.

I agree with those who say we need an "all-of-the-above" approach to energy production. But when it comes to determining whether we should approve a project as large and long-lasting as a pipeline that would transport 830,000 barrels of tar sands oil from Canada to the Gulf Coast every day, I want to make sure that we all have a clear understanding of the total number of U.S. jobs we'd expect the Keystone XL Pipeline to create, the impacts on climate change, and the chances and consequences of a major spill.

I look forward to discussing these important issues with each of you today. With that, I yield back the balance of my time.

Chairman STEWART. Thank you. Thank you, Mr. Swalwell.

We will—it is now time to introduce the members of our panel today and once again with our gratitude for you being here. It takes me a little bit to introduce them because they are very distinguished with long resumes.

Our first witness is Mr. Lynn Helms, the Director of the Department of Mineral Resources, the North Dakota Industrial Commission. Previously, he has worked as a Production Engineer, a Reservoir Engineer, and an Asset Team Leader on projects in Abu Dhabi, Alaska, North Dakota, Texas, and Wyoming.

Our second witness is Mr. Brigham A. McCown, the Principal and Managing Director of United Transportation Advisors. Mr. McCown has over 25 years of executive, legal, and operations management experience in areas pertaining to energy, transportation, and the environment. He most recently served as the first acting Administrator of the Pipeline and Hazardous Materials Safety Administration at the U.S. Department of Transportation.

Our third witness is Mr. Anthony Swift, an attorney for the International Program at the Natural Resources Defense Council. Prior to working at the NRDC, Anthony worked as a Policy Analyst for the Department of Transportation where he worked on alternative fuels, efficiency standards, and a National Environmental Policy Act review process.

And our final witness today is Mr. Paul “Chip” Knappenberger, the Assistant Director at the Center for the Study of Science at the Cato Institute. Mr. Knappenberger has over 25 years of experience in climate research and public outreach, including 13 years with the Virginia State Climatology Office and 17 years as a Research Coordinator for the New Hope Environmental Services, Incorporated.

As our witnesses should know, spoken testimony is limited to five minutes each, after which Members of the Committee have five minutes each to ask questions. Your written testimony will be included in the record of the hearing.

And I now recognize our first witness, Mr. Helms, for five minutes.

**STATEMENT OF MR. LYNN HELMS, DIRECTOR,
DEPARTMENT OF MINERAL RESOURCES,
NORTH DAKOTA INDUSTRIAL COMMISSION**

Mr. HELMS. Good morning, Mr. Chairman and Members of the Committee. Thank you for the invitation to speak to the Committee on Science, Space, and Technology. I love that title. We try to do our things in North Dakota on a science basis. We try—this one obviously the science is in, and now we are into the political phase of the Keystone XL pipeline.

Why does North Dakota have a stake in this? North Dakota is the home of the Bakken, as you well know, the largest unconventional resource discovered in the United States of America. We are currently producing 780,000 barrels of oil per day. We have a commitment to place 60,000 barrels of oil per day on Keystone XL the day that it opens, and that can be expanded to 100,000 barrels a day. That was a tough negotiation with TransCanada to get that on ramp in our neighbor in Baker, Montana.

The shortfall in pipeline capacity out of the State of North Dakota has resulted in a very disrupted transportation system, and you see that on page two of my testimony. Seventy-one percent of

our oil now moves out of the State by rail. And I personally authored a paper in 2006 that said I couldn't believe that would ever happen. It was uneconomic, it was too expensive, it didn't make sense, it was impractical, but 71 percent of our crude oil now moves by rail out of the State of North Dakota.

In addition to that, 10,000 barrels a day gets trucked into Canada to find a pipeline and another 35,000 barrels travels by semi back into North Dakota to reach those rail facilities to move out of the State, so it's a very disrupted system that we have in North Dakota.

What does Keystone mean to western North Dakota? It would mean 300 to 500 less long-haul truck trips per day from oil and gas wells to rail stations in western North Dakota. Now, our figures show that those trucks emit 2.9 times the greenhouse gases, they commit three to four times the number of spills that a pipeline does. They produce dust; they produce accidents. So Keystone XL, for every year that it is in service, it is going to reduce North Dakota's greenhouse gas emissions by almost one million kilograms per day. It is going to reduce oil spills by 60 to 80 per year. It is going to reduce traffic fatalities by three to six and injury accidents by 85 to 100.

So let's turn that around. For every year the Keystone is delayed, we emit one million kilograms per day of greenhouse gases that could not be emitted. We suffer 60 to 80 oil spills per year that don't have to happen, three to six people die on North Dakota highways unnecessarily, and 85 to 150 people suffer serious traffic injuries, and that doesn't need to happen.

I took a look at the SEIS. The spill frequency and impact analysis are consistent with our experience in North Dakota with pipeline construction and what we have seen. The greenhouse gas evaluation is consistent with North Dakota's experience. As I stated, I co-authored a paper in 2006 that was pretty dismissive of rail transportation for Bakken crude oil, and yet, changes in the market, changes in rail efficiency, and people being innovative in the way they move crude oil now puts 71 percent of our oil on the rails.

One last thing: my experience with Keystone XL goes a little bit beyond the borders of North Dakota. My family lives in Harding County, South Dakota. They built a brand-new school based on the property taxes the Keystone XL is expected to pay. My sister-in-law is a teacher in that school. My son-in-law is a farmer in York County, Nebraska. Keystone XL will go right across 1/4 of his land. We have had lots of discussions about it. He has no qualms about it. He irrigates out of the Ogallala aquifer, and he is completely prepared for the pipeline to transverse his farmland.

So we believe in the State of North Dakota that it is time to build Keystone XL. I yield the remainder of my time for questions. Thank you, Mr. Chairman.

[The prepared statement of Mr. Helms follows:]

**Congress of the United States
House of Representatives
Committee on Science, Space, and Technology
Subcommittee on Energy
And
Subcommittee on Environment
May 7, 2013
Room 2318 Rayburn House Office Building, Washington, DC**

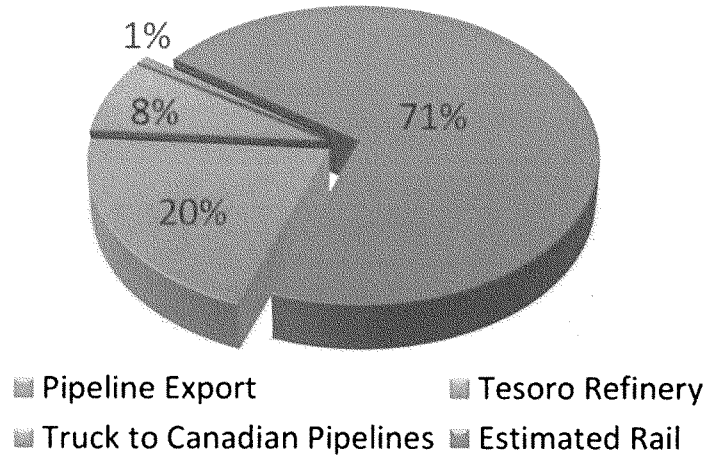
**Testimony by Lynn D. Helms, Director
North Dakota Industrial Commission
Department of Mineral Resources**

The Bakken Formation is a large unconventional resource that underlies most of the western portion of the state of North Dakota and eastern Montana. The United States Geological Survey stated in their April 2013 report that it is the largest continuous resource they have assessed in the lower 48 states.

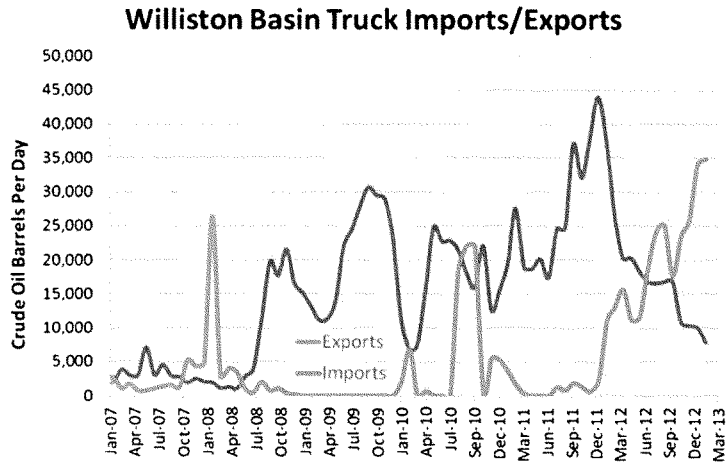
Production from Bakken development has moved North Dakota from number eight to number two among US states in daily production at almost 780,000 barrels of oil per day. Achieving those production levels has required significant increases in pipeline, natural gas processing, electric generation and transmission, refining, highway, and housing capacity.

Major shortfalls in pipeline capacity have resulted in a very unbalanced transportation market as can be seen in the following charts. Lack of pipeline capacity in the midcontinent has led to much higher oil prices on the coasts and shifted the normal transportation mode away from pipelines, to higher risk and impact alternatives; such as rail and truck.

Estimated Williston Basin Oil Transportation



Currently, 5,000 to 10,000 barrels of sour North Dakota crude are being trucked into Canada to access pipelines serving the best markets for that type of oil while 35,000 barrels per day is being trucked into North Dakota to access rail transportation loading facilities serving the best markets for that type of oil.



Keystone XL has signed up over 60,000 barrels per day of Bakken crude to transport from Baker to Guernsey and has committed to carry 100,000 barrels per day. Currently, that production is being trucked from the wells to rail facilities. This is the equivalent of 50 long haul truck loads for each 10,000 barrels. Once Keystone XL is in place, those trucked barrels will most likely be connected to a gathering system that will deliver them to Keystone XL. Approval of Keystone XL will cause two things to happen: 1) 300 – 500 truck-loads per day will be taken off North Dakota highways and 2) there will be 1 - 2 less trains per day leaving North Dakota.

Our calculations show that green-house gas emissions from rail transportation are 1.8 times and from truck transportation are 2.9 times the emissions from pipeline transportation. In addition, oil spills from truck transportation occur at 3 - 4 times the rate of spills from pipelines. Approval of the Keystone XL pipeline will result in 450,000- 950,000 Kg/day less green-house gas emissions in North Dakota as well as significant decreases in dust and 60 – 80 fewer spills per year.

In the five years from 2006-2011 the number of crashes involving semi-trucks has risen substantially. Fatal crashes have more than doubled, injury crashes have more than tripled, and property damage crashes have doubled. The rate of fatal crashes has remained constant at 1.4 and injury crashes at 40 per 100 million miles driven. Approval of the Keystone XL pipeline is expected to reduce highway fatalities in North Dakota by 3 to 6 per year and injury crashes by 85 to 150 annually.

The findings of the State Department Supplemental Environmental Impact Statement (SEIS) regarding spill frequency and impacts are consistent with our experience regulating oil reporting and reclamation in North Dakota.

The findings of the State Department Supplemental Environmental Impact Statement (SEIS) regarding potential green-house gas emissions from rail transportation of oil sands production to markets is consistent with our experience in North Dakota. In 2006, I co-authored an analysis of Williston Basin Crude Oil Bottlenecks that concluded transportation by rail would be an inefficient, uneconomic, short term solution. As shown by the current North Dakota oil transportation breakdown the size of the resource, changing markets, and innovations in the rail transportation industry have resulted in just the opposite.

Lynn D. Helms

Director, North Dakota Department of Mineral Resources

His work in the oil industry has taken Lynn Helms all over the world. Most recently, Lynn has served as Director of the North Dakota Industrial Commission Oil & Gas Division since July 1998 and Director of the Department of Mineral Resources since it was formed in July 2005. Before moving to Bismarck to work in state government, he worked as a production engineer, reservoir engineer, and asset team leader on projects in Abu Dhabi, Alaska, Arkansas, Louisiana, Mississippi, Montana, New Mexico, North Dakota, Texas, and Wyoming. Lynn earned his Bachelor of Science Degree in Engineering from South Dakota School of Mines and Technology. When he's not working Lynn enjoys spending his free time with his wife, college-aged children, and his four horses.

Chairman STEWART. Thank you, Mr. Helms.
Mr. McCown.

**STATEMENT OF MR. BRIGHAM A. MCCOWN,
PRINCIPAL AND MANAGING DIRECTOR,
UNITED TRANSPORTATION ADVISORS, LLC**

Mr. MCCOWN. Chairman Stewart, Ranking Member Bonamici, Chairman Lummis, and Ranking Member Swalwell, thank you—and distinguished Members, thank you for the invitation to be here today to testify at this joint hearing on Keystone XL.

You know, this process is important and, I think, even crucial to better understanding the role that pipelines play in our everyday lives. The Pipeline and Hazardous Materials Safety Administration, an agency within the USDOT, is responsible for overseeing the safe and secure movement of over one million hazardous material shipments each and every day by air, by land, by sea, by rail, and yes, by pipeline. You know, and at no point in our Nation's history has the role and future of our national pipeline infrastructure been subject to more careful review and scrutiny.

We have 2.6 million miles of pipeline in this country and that is enough to circle the Earth 100 times. And we have, for close to half a century, transported the lion's share of our Nation's energy supplies via pipeline. And for most of that time, our underground energy highways, if you will, have remained out of sight and out of mind. That, of course, is no longer the case, given the heated debate surrounding the approval of the remaining portion of the Keystone pipeline system. Last year, pipelines transported 11.3 billion barrels of crude—that is B as in billion—barrels of crude and refined products. Of that amount, pipeline operators safely transported these supplies 99.999952 percent of the time. Yes, pipeline releases can and do occur, but we also have to understand that the goal of our robust and mature pipeline safety regulations is zero accidents, zero releases. And when a pipeline upset does occur, comprehensive federal regulations exist to minimize the consequences of any such releases.

That record is strong and even getting better. In fact, thanks to strong government oversight by PHMSA, new technologies, and a shared approach to risk management by all stakeholders, pipeline accidents continue to decline. Over the last decade, pipeline spills have decreased—the number—by 59 percent and total volume of releases has decreased by 43 percent even as the overall production has increased, both the mileage of active pipelines and the freight tons shipped by them. I think this is an extraordinary figure when you consider that pipelines transport almost 2/3 of all the energy supplies consumed in our country each year.

Although the Draft EIS dedicates 200 pages to the rail alternative, Federal Government statistics on accident data reveal that pipelines are approximately 4-1/2 times safer than rail and 64 times safer than commercial motor vehicle if you look at freight tons shipped. To take it a step further, on a per-ton-mile basis, those figures translate that pipelines are over five times safer than

rail and almost 500 times safer than commercial motor vehicles or trucks.

Pipelines are also unique in that they are the only transportation system we have that does not require a round-trip to load and deliver supplies. Rail and truck have their place as an integral component of a tightly interwoven supply-chain system. That said, pipelines represent the best when it comes to hauling large volumes of energy products over great distances.

Critics of Keystone are quick to highlight the claim that oil sands resources like those transported by Keystone are more corrosive than traditional crude oil, thus, more likely to spill. This is simply not true. The Federal Government has not documented a single instance where the release of oil sands crude was caused by internal corrosion of the pipeline. The characteristics of diluted oil sands crude are similar to conventional crude and, in fact, Canadian diluted bitumen, sometimes called dilbit, is actually less corrosive than oil from Mexico, Colombia, and even California.

While opponents claim the opposite, no studies have validated such an assumption. While it may be tempting and politically expedient to point to corrosiveness as something to be feared, the fact that it makes for a good talking point doesn't make it true. Scrutiny is, of course, welcome and a warranted thing, but in the face of this analysis, it is of utmost importance that we as a Nation recognize the indispensable role that pipelines play. Let there be no mistake, energy plays a crucial role in our Nation's economy, and energy security depends on important infrastructure projects like Keystone.

Thank you, Mr. Chairman.

[The prepared statement of Mr. McCown follows:]



UNITED TRANSPORTATION ADVISORS, LLC

**Hearing: Keystone XL Pipeline:
Examination of Scientific
and Environmental Issues**

**Before the Subcommittee on Energy,
and Subcommittee on Environment
Committee on Science, Space and Technology
United States House of Representatives**

**Written Statement of Brigham A. McCown
Former Acting Administrator & Deputy Administrator
Pipeline & Hazardous Materials Safety Administration
U.S. Department of Transportation**

**Expected Delivery 10:00 A.M. EDT
May 7, 2013**

**STATEMENT OF BRIGHAM A. MCCOWN
FORMER ACTING ADMINISTRATOR / DEPUTY ADMINISTRATOR
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
BEFORE THE
SUBCOMMITTEE ON ENERGY & SUBCOMMITTEE ON ENVIRONMENT
COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY
UNITED STATES HOUSE OF REPRESENTATIVES**

May 7, 2013

I. Introduction

Good morning. Thank you for the invitation to testify today at this joint hearing of the Subcommittees on Energy and Environment of the Science, Space and Technology Committee regarding the *Keystone XL Pipeline: Examination of Scientific and Environmental Issues*.

This is an important hearing, and an opportunity for us to explore and discuss pipeline safety, especially as it applies to the proposed Keystone pipeline expansion project. I commend the Committee for dedicating time and resources to this important issue. Today we stand at a crossroads in our national energy policy. The question before us is whether the proposed expansion project is in our national interest and the outcome of that decision will impact America's energy future, our competitiveness, and energy security for decades to come.

My transportation safety perspective is based upon real life experiences in both the public and private sectors. My testimony today will focus on my belief that building the remaining portion of the Keystone pipeline system is, for many reasons, clearly within the national interest of the United States – and based on the available information and plans for construction, the completed Keystone system would be the safest pipeline ever built in this country, if not in the entire world.

II. OVERVIEW

Today, I am pleased to offer several observations concerning the approval process for the Keystone XL expansion project. At the outset, I note that the Keystone Pipeline System is a series of pipelines designed to transport Canadian and U.S. crude oil to American refineries in the Midwest and to the Gulf Coast. When completed, this entire system would represent a state-of-the-art pipeline system capable of delivering over 1.1 million barrels of oil per day to U.S. refineries. A staggering figure when one considers that in February of this year, the United States imported 579,000 barrels per day from Venezuela and 1.0 million barrels of oil per day from Saudi Arabia.¹ The pipeline system itself represents a tangible asset with an estimated value of approximately \$12 billion.²

While I will limit my prepared testimony to discussing matters pertaining to transportation safety, the following points are worthy of recognition.

- **The Keystone Pipeline System Has Already Been Largely Approved and Built.**
 - Three of the Four Phases of Keystone have already been approved.
 - Two of the Three Phases are already operational.
 - Phase Three will become operational by the end of 2013.

- **Pipelines Are The Safest Form of Transportation, Bar None.**
 - While all modes of transportation are relatively safe, pipelines are the preferred method for transporting large volumes of energy products.
 - The Department of State (DOS) studies have confirmed existing data that “spills associated with the proposed Project that enter the environment are expected to be rare and relatively small.” (4.16-6)

¹ Source: U.S. Energy Information Administration.

² Source: TransCanada.

- **Keystone is the Safest Pipeline Ever Proposed & Built.**
 - The Department of State correctly concludes “the incorporation of the 57 Special Conditions will result in the project having a degree of safety over any other typically constructed domestic oil pipeline system.” (4.13-64)

- **Despite Claims To The Contrary, Oil Sands Crude Is No Different Than Other Conventional Heavy Crude Oils.**
 - Multiple studies by Canadian, British and American entities have all concluded that Canadian dilbit mixtures have similar, and in some cases even a lower corrosivity score than crude oils from Mexico, Columbia, and California.³
 - Crude derived from oil sands has been transported by pipeline since 1968⁴.
 - Diluted bitumen has been transported for over 25 years.
 - U.S. Government safety data has not found a single instance of a pipeline release (spill) caused by internal corrosion from Dilbit⁵.

- **Canada’s Oil Sands Will Continue to be Developed.**
 - Despite the growth of U.S. oil production, the Canadian oil sands will play a critical role in supplying the U.S. energy demand.
 - Rail and vessel currently assist pipelines in bringing oil to markets and that trend will continue.

³ See Alberta Innovates Technology Futures, “Comparison of the Corrosivity of Dilbit and Conventional Crude” September 2011; Battelle Memorial Institute, “Diluted Bitumen-Derived Crude Oil: Relative Pipeline Impacts” July 20, 2012; CEPA & Penspen Integrity, “Dilbit Corrosivity” February 21, 2013.

⁴ Id.

⁵ Id. See also, Lidiak P, “Diluted Bitumen; What it is, pipeline transportation and impact on pipelines” Presentation to TRB Panel, July, 2012.

- **Environmental Concerns Concerning Phase Four Have Already Been Thoroughly Vetted and Addressed**
 - Threats to Ogallala Aquifer are misplaced. Pipelines have safely transported crude and refined products over the aquifer since at least 1953.
 - Multiple environmental studies by U.S. Government and University of Nebraska experts have all concluded the pipeline will not threaten the ecological stability of the region.
 - Executive Order 13337 was intended to expedite, not hinder cross-border permits.

III. The Keystone Pipeline System

In order to fully appreciate the magnitude of this debate, as well as the fact that we are all discussing a significant infrastructure project that has largely already been approved and built, please allow me to describe the various components making up the Keystone Pipeline System.

Phase One

Known simply as Keystone, the original pipeline was proposed in 2005, approved by the National Energy Board of Canada in 2007, and was granted a Presidential Permit on March 17, 2008. Keystone began commercial operation in June of 2010. This 1,853 mile initial 30" pipeline carries 435,000 barrels per day of Canadian crude from Hardisty, Alberta. The line travels east in Canada until its southerly turn takes Keystone through the eastern third of North and South Dakota and Nebraska where it passes just west of Lincoln, Nebraska. The line then continues to Steele City, Nebraska where it turns east, passing through Missouri just North of St. Louis before ending at Patoka, Illinois.

Phase Two

The "Keystone Cushing Extension" linked Steele City, Nebraska to Cushing, Oklahoma. That 298 mile 36" portion was completed in late 2010 and made

operational in February of 2011. With this addition, the commercial design of Keystone was increased to 591,000 barrels per day.

Phase Three

Commonly referred to as the "southern portion of Keystone XL" and officially known as the "Gulf Coast Expansion Project," this 435 mile 36" pipeline will link Texas refineries with storage facilities in Cushing, Oklahoma. This portion is currently under construction, and is expected to become operational by the end of 2013.

Phase Four

The entire current debate centers on the final Keystone proposal. This last piece of the Keystone Pipeline System requires a Presidential Permit due to the border crossing between the United States and Canada. This phase requires 327 miles of new construction in Canada and 852 miles of new construction in the United States. The proposed 36" line would extend through Montana and South Dakota where it would provide access to U.S. Bakken crude before ending in Steele City, Nebraska.⁶

IV. Pipeline Safety

Pipelines are very much like our nation's highways, or perhaps more accurately described by a Congressional Committee as being the "arteries of the Nation's energy infrastructure, as well as the safest and least costly ways to transport energy products. . . [and] provide the resources needed for national defense, to heat and cool our homes, generate power for business, and fuel an unparalleled transportation system."⁷

Transportation Secretary Norman Mineta (D-CA), who I had the pleasure of serving, went even further when he described pipelines as "the unsung heroes of our

⁶ Phase Four also includes a 46.7 mile pipeline between refineries in the Houston, Texas area.

⁷ H.R. Rep. No. 109-717, at 5 (2006); See also, PHMSA at <http://1.usa.gov/13XAlj3>

economy."⁸ Pipelines have been the preferred mode of transportation for energy products since the early 1900s.

In a sense, pipelines make our current way of life possible as they transport 70% of all hydrocarbon sources of energy used in our country. It is not a stretch therefore to suggest that pipelines really are the very lifeblood of the American economy, and without them, the quality of life we are accustomed to, simply would not exist.

Totalling a little over 2.6 million miles, the U.S. has more pipelines than any other country in the world. The Pipeline and Hazardous Materials Safety Administration (PHMSA) is the federal agency responsible for overseeing the safe and secure movement of approximately two-thirds of all energy products consumed in this country each and every day. The men and women of PHMSA are dedicated, hard-working professionals who oversee a robust regulatory and enforcement agency along with PHMSA's state partners. They are up to the challenge of regulating a very complex transportation system.

No Safer Alternative

As stated above, pipelines are clearly the safest and most cost-effective means to transport the extraordinary volumes of natural gas and hazardous liquid products that fuel our economy. Not only are they safe and cost-effective, pipelines are efficient. They often provide the most direct routes, and they do so without adding to congestion on our highways or rail lines.

To better illustrate this fact, take a major East Coast airport and remove the pipeline supplying that facility. To deliver the comparative volume of jet fuel would take a constant line of tanker trucks, about 750 per day, loading up and moving out every two minutes, 24 hours a day, seven days a week. The railroad-equivalent of this single pipeline would be a train of seventy-five 2,000-barrel tank rail cars every

⁸ Secretary Norman Y. Mineta speech during the 3rd Annual Pipeline Legal Issues and Policy Roundtable, Annapolis, Maryland, July 2005.

day.”⁹ The alternative mode becomes even more daunting when one considers that pipelines are the only mode of transportation that does not require repositioning of tanker cars or trucks. In order to keep the logistical lines open therefore would require double to triple the necessary assets mentioned above in order to create a round-trip logistical system. The most recent SEIS referenced several no-action alternatives. One of these options was transporting the oil by rail, or rail and tanker. Prior to discussing each mode as an alternative, it is first worth mentioning that all forms of transportation: pipeline, rail and commercial motor vehicles are safe, and each has a specific role in a robust logistics system.

That said, however, substantially increasing the freight requirements by any other mode in lieu of pipeline transport would have a significant negative impact on the transportation system. For these reasons, none of the other modes can effectively and efficiently carry out the duties performed by pipelines.

With respect to rail, even assuming for arguments sake that rail could in fact handle the tonnage requirements between the specific points serviced by Keystone¹⁰, rail falls short in comparison. Similarly, cargo vessel traffic on navigable waterways is also an untenable alternative, although it should be noted that some Canadian product is currently finding its way to market via barge. Finally, transport by motor carrier is also untenable.

Pipelines are the safest mode of transport based on ton-miles of freight, on a per-mile basis or by total crude shipped.

Based on total accidents per billion ton-miles shipped, an accident is 530% more likely to occur when shipped by rail, 1330% more likely when shipped by vessel, and 49,590% more likely when shipped by truck.

⁹ <http://1.usa.gov/107yA7Y>

¹⁰ The State Department draft assumes rail is capable of handling the capacity issue based on 2011 studies. The freight capacity analysis of rail is however much more complex. It is doubtful rail could adequately service the requirements from point to point.

Second, although rail has seen a recent resurgence, it is not an economically viable option. In the EIS, the State Department included an estimate of rail prices compared to the cost of pipeline export. Pipeline cost is approx. \$7/bbl. while actual rail cost is \$31/bbl. Third, rail causes much more harm to the environment than pipelines. It was estimated in the EIS, rail would cause 8% more greenhouse gas per year than the XL pipeline. Addendums "(A)" and "(B)" to my testimony contain additional statistical data for comparison purposes.

V. Keystone Pipeline Safety

Keystone is implementing state-of-the-art safety requirements and guidelines in materials, coatings, construction practices and monitoring systems, especially for the crossings of roads, highways and railroads, all of which adds to the unparalleled safety of the Keystone system.

It should be noted that the "DOS, in consultation with PHMSA, has determined that incorporation of those [57 Special Permit] conditions would result in a project that would have a degree of safety over any other typically constructed domestic oil pipeline system." (4.13-64)

For spill and leak prevention efforts, Keystone is taking significant steps to maximize safety, and I concur with the DOS findings that "(s)pills associated with the proposed Project that enter the environment are expected to be rare and relatively small." (4.16-6)

Without belaboring the point, Keystone has incorporated significant safety protocols, which are not always found on other pipelines. These include mitigation and quality control improvements covering everything from pipe production, construction practices, operations, maintenance, damage prevention and emergency response.

Aside from numerous federal studies attesting to the safety of Keystone, a thorough review of the planned safety provisions built into the pipeline's construction, operation, and monitoring, provides assurances Keystone will, and is, operating safely and it is my personal opinion that the Keystone XL pipeline's design provides an excellent example of world-class safety protocol.

VI. Keystone Studies

Since TransCanada filed for a Presidential Permit with the U.S. Department of State in 2008 to construct the Keystone Pipeline expansion project, the federal government has undertaken a thorough and rigorous risk assessment for this project as guided by Executive Order 13337. That Executive Order, issued by President George W. Bush was intended "to expedite reviews of permits as necessary to accelerate the completion of energy production and transmission projects. . . connecting the United States with a foreign country...."¹¹

The State Department issued its first Environmental Impact Statement (EIS) in August 2011 in accordance with National Environment Policy Act of 1972 (NEPA). Following revisions to a portion of the initial approved route in Nebraska, a Supplemental Environmental Impact Statement (SEIS) was issued on March 1st, 2013.

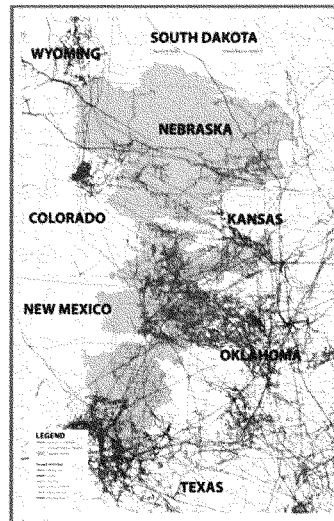
From both a safety and NEPA point of view, it is not possible to suggest that this has not been the most scrutinized, and carefully reviewed pipeline project in our nation's history.

Concerns for the Ogallala Aquifer

In Section 3.3 of the EIS, the DOS finds that Keystone is unlikely to adversely impact any groundwater or surface water resources.

¹¹ Executive Order 13337, 69 Fed. Reg. 25299 (issued April 30, 2004).

In Section 4.3.5, DOS concludes that construction of the connected projects will have minimal impact provided normal construction and operational practices are followed. DOS finds that - "(t)housands of miles of pipeline carrying crude and refined products traverse throughout the region where the Ogallala Aquifer is present. Pipelines installed within the last 10 to 15 years are all generally constructed and operated under similar regulatory and engineering procedures and design as would be required of the Keystone XL pipeline." (3.3-5)



The main safety concern that has been voiced by some, is the potential of Keystone XL to endanger the Ogallala Aquifer, which provides regional public water supply and irrigation water. What is puzzling about this apprehension, though, is that many other oil and natural gas pipelines currently traverse the Ogallala Aquifer. In fact, as the map here below demonstrates, there are thousands of miles of pipeline already crossing the aquifer, and have done so safely for nearly half a century.

Decades of experience and review demonstrate that the risk to the environment and public health from our nation's million miles of pipelines is minimal. That said PHMSA regulations specifically address environmentally sensitive areas and require heightened standards. Please keep in mind that our country's pipelines live in harmony with the environment. The Trans-Alaska system has been safely transporting oil above environmentally sensitive areas for decades. Pipelines in the

marshes of Louisiana and across sensitive areas of Florida are examples of pipeline co-existing in the environment in which we live.

PHMSA environmental regulations also take into account areas containing critically imperiled, endangered or threatened species as well as ecological areas utilized during assemblage or migratory periods. These factors and more are considered during the design and operational phase of a pipeline and moreover, continue to be considered during the pipeline's entire lifecycle.

VII. Conclusion

Pipelines are our local, interstate and international energy highways, delivering almost two-thirds of all energy products used in the U.S. each year. Keystone will only make our national energy highway that much stronger. Furthermore, this project would be privately, not publicly, funded, providing direct stimulation to our economy without spending federal funds, and without adding to our deficit.

After reviewing this project and consulting with my former colleagues at PHMSA, I am confident that, if approved, this pipeline will offer a level of protection above what the law requires and I am satisfied this pipeline will improve the security, welfare and safety of our nation as a whole.

Addendum-A

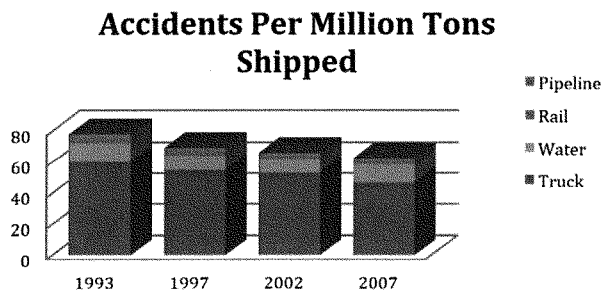
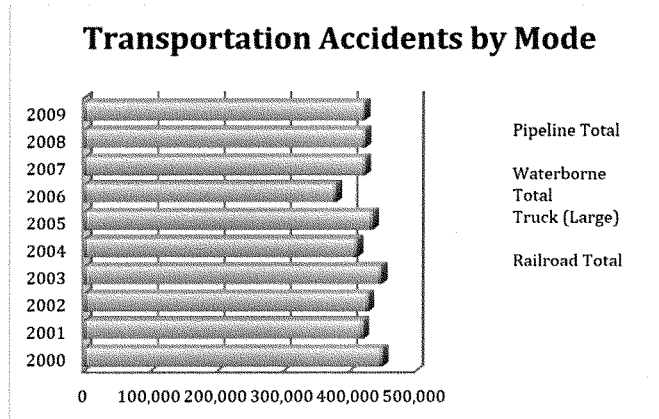
TONS SHIPPED	Accidents per tons shipped	
Truck	64x	6400%
Rail	4.4x	440%
Water	13x	1300%
Pipeline		
TON-MILES	Accidents per ton-mile	
Truck	496x	49600%
Rail	5.3x	530%
Water	13.3x	1330%
Pipeline		

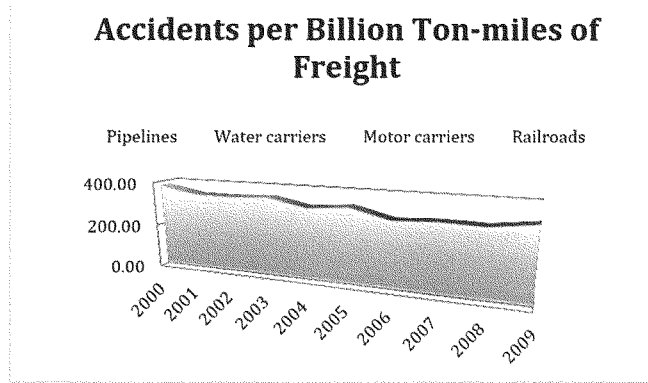
	Accidents per tons shipped	
Truck	64x	6400%
Rail	4.4x	440%
Water	13x	1300%
Pipeline	1x	n/a
TON-MILES	Accidents per ton-mile	
Truck	496x	49600%
Rail	5.3x	530%
Water	13.3x	1330%
Pipeline	1x	n/a

Crude Oil and Petroleum Products Transported in the United States by Mode (billions)



- Pipeline
- Water Carriers
- Motor Carriers
- Railroads





Addendum-B

Table 1-61M: Crude Oil and Petroleum Products Transported in the United States by Mode (billions)

Table 1-61 Ton-Miles of Petroleum	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Combined crude and petroleum products, total	873.3	869.8	884.6	883.3	902.5	908.0	855.4	835.4	(R) 857.9	810.0
Pipelines*	577.3	576.1	586.2	590.2	599.6	607.5	581.3	557.7	(R) 605.7	568.4
Water carriers	244.4	244.0	227.6	240.1	246.9	240.5	213.1	216.0	194.0	186.8
Motor carriers	31.3	30.6	30.6	33.2	34.4	34.8	35.2	35.2	35.1	33.9
Railroads	20.3	18.9	20.2	19.8	21.6	23.2	25.8	26.6	23.0	20.9

Table 1-50: U.S. Ton-Miles of Freight (BTS Special Tabulation) (Billions)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Pipelines	928	910	932	925	937	939	907	904	954	910
Domestic water transportation	646	622	612	626	621	591	562	553	520	477
Truck	1193	1213	1245	1265	1281	1291	1291	1404	1429	1321
Railroad	1546	1599	1606	1604	1684	1733	1806	1820	1730	1582

Table 2-3: Transportation Accidents by Mode

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Pipelines, total	380	341	344	373	(R) 473	721	(R) 842	615	(R) 863	629
Waterborne, total	5,403	4,958	6,008	5,163	4,962	4,977	4,598	4,884	4,798	4,458
Truck, large	437,861	429,372	416,477	436,161	399,156	423,016	367,920	412,852	412,852	412,852
Railroad, total ¹	6,485	6,260	5,815	5,998	6,470	6,332	(R) 5,940	5,471	(R) 4,910	(R) 3,841

Accidents per Billion Ton-miles of Freight

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Pipelines*	0.41	0.37	0.39	0.73	0.72	0.77	0.71	0.68	0.70	0.68
Water carriers	8.4	8.0	9.8	8.5	8.0	8.4	8.2	8.5	9.1	9.3
Motor carriers	367	337	334	345	312	328	285	294	289	319
Railroads	4.2	3.9	3.8	3.7	3.8	3.7	3.2	3.0	2.8	2.4

BRIGHAM A. MCCOWN



Mr. McCown serves as energy transportation infrastructure counsel to both public and private sector clients. Mr. McCown has accumulated over 25 years of executive, legal and operations management experience in areas pertaining to energy, transportation, homeland security and the environment.

He most recently served as the Nation's energy transportation safety chief as the first acting administrator / interim chief executive officer and full-time deputy administrator / chief operating officer of the Pipeline and Hazardous Materials Safety Administration (PHMSA) at the U.S. Department of Transportation in Washington, DC. In that role, Mr. McCown was responsible for the federal government's oversight of the one million hazardous materials shipments transported in commerce daily across the country by all modes of transportation, including pipeline. During his tenure, he was responsible for coordinating the federal government's response to the largest oil spill on Alaska's North Slope, oversaw restoration of critical national energy infrastructure following Hurricanes Katrina and Rita and helped draft the pipeline reauthorization law commonly referred to as the PIPES Act.

Mr. McCown previously served as the Federal Motor Carrier Safety Administration's (FMCSA) first general counsel where he was responsible for direct legal oversight of the trucking, motor coach and moving industries. His work included directly authoring many of the current safety regulations, including those pertaining to hours-of-service, driver qualifications and training and the agency's compliance review and civil enforcement proceedings. Additionally, Mr. McCown was responsible for implementing the surface provisions of the NAFTA, for representing the agency before legislative and judicial bodies, advised the agency's administrator on all legal and enforcement policy issues, and defending the agency in all litigation including appearances before the United States Supreme Court in the landmark environmental law case *U.S. Department of Transportation v. Public Citizen*, 124 S.Ct. 2204, 159 L.Ed.2d 60 (2004).

In the private sector Mr. McCown has been a member of both international and national law firms and his background includes extensive litigation expertise defending clients throughout all phases of administrative, trial and appellate proceedings. He is a frequent CLE lecturer and published legal author, a contributor to National Journal and Forbes, and is also regularly quoted by the press in stories concerning energy and transportation policy.

A native of Ironton, Ohio, Mr. McCown graduated from Miami University with a degree in Diplomacy & Foreign Affairs. He is also a retired Naval Aviator, having served on active duty with the U.S. Navy during Operations Desert Storm, Support Democracy (Haiti), and Unified Assistance (SE Asia Tsunami).

Chairman STEWART. Thank you, Mr. McCown.
Mr. Smith? I am sorry, Mr. Swift.

**STATEMENT OF MR. ANTHONY SWIFT,
ATTORNEY, INTERNATIONAL PROGRAM,
NATURAL RESOURCES DEFENSE COUNCIL**

Mr. SWIFT. Thank you. Thank you for today's opportunity to testify on the environmental issues associated with the Keystone XL tar sands pipeline. My name is Anthony Swift. I am an Energy Policy Analyst with the Natural Resources Defense Council. NRDC is a national, nonprofit organization dedicated to protecting public health and the environment.

Keystone XL would transport tar sands crude, primarily in the form of deluded bitumen through the United States to the Gulf Coast where the State Department forecasts most of it will be refined and exported internationally. Diluted bitumen is a mixture of bitumen tar sands, which is heavier than water and too thick to move by pipeline and light volatile natural gas liquids. Tar sands of diluted bitumen differ substantially from the lighter conventional crude historically moved on the U.S. pipeline system. Pipelines moving thick, diluted bitumen operate at higher temperatures than pipelines moving less viscous, lighter crudes.

In the United States, the only area with history moving heavy crudes with similarities to tar sands is a small network of pipelines in California. Studies of California's pipeline system show that the higher a pipeline's operating temperature, the higher its spill risk. Pipelines operating at temperatures above 100 degrees Fahrenheit spilled up to 23 times more often due to external corrosion than conventional pipelines. The State Department's Draft Environmental Review estimated that Keystone XL would operate at between 130 and 150 degrees Fahrenheit.

The U.S. pipeline system may already be showing the strain of moving tar sands. The first imports of diluted bitumen came from pipelines in northern Midwest in the late 1990s and have increased exponentially since then. Accident reports show that the northern Midwestern States moving the largest volumes of diluted bitumen for the longest period of time spilled 3.6 times more crude per mile than the national average over the last three years. The Enbridge mainline, the first pipeline to move significant volumes of diluted bitumen into the United States, spilled nearly a million gallons into the Kalamazoo River in 2010 after a rupture caused by external corrosion and stress corrosion cracking. In March, the Pegasus pipeline spilled over 200,000 gallons of tar sands crude into the suburban Arkansas community of Mayflower. This week, another spill on the same pipeline was discovered in Missouri.

We have seen with recent pipelines that special conditions do not translate—necessarily translate to safer pipelines. TransCanada's Keystone I and Bison pipelines are examples. Though both carry special conditions, the first leaked 14 times in its first year and the second exploded.

In addition to the risk of ruptures, investigators have shown major gaps in leak-detection technology and regulations. These

gaps are most apparent with high-capacity pipelines like Keystone XL. According to State, Keystone XL's real timely detection system cannot detect leaks smaller than half-a-million gallons a day. Once spilled, tar sands diluted bitumen has proven significantly more damaging and difficult to clean than conventional crude, particularly in water bodies. After nearly three years and \$1 billion have been spent cleaning the Kalamazoo tar sands spill, over 38 miles of that river are still contaminated with tar sands. Spill responders have found that conventional methods prove ineffective for containing and cleaning tar sands spills.

In addition to the risk of spills, Keystone XL is a lynchpin for tar sands expansion and the climate emissions associated with it. Without Keystone XL, tar sands production growth will take a substantially reduced trajectory. North Dakota producers have found rail to be feasible and, in many cases, preferable as a transportation option. Late last year, a 200,000-barrel-a-day pipeline proposal was canceled due to lack of interest by North Dakota producers using rail. There is a litany of reasons why rail isn't feasible to supply tar sands production growth.

The lack of alternatives for Keystone XL has been observed by tar sands producers themselves, the financial industry, and Canada's own Natural Resources Minister. The impact of—tar sands would have on U.S. climate emissions is substantial. The Keystone XL tar sands pipeline would, if approved, be responsible for at least 181 million metric tons of carbon dioxide each year, comparable to the tailpipe emissions for more than 37 million cars or 51 coal-fired power plants.

The significance of these emissions to global climate change can be summed up in this way: if you find your house is on fire, the question of how much gasoline you would have to pour on the fire to really make a difference given its size is a wrong one to ask, at least if your goal is to put the fire out. Tar sands are significantly more carbon-intensive than conventional crude, and the choice to replace our conventional fuel stock with tar sands is the wrong one if we are serious about addressing climate change. Simply stated, the Keystone XL pipeline is not in the Nation's interest.

NRDC thanks you for the opportunity to present its views, and I would be pleased to answer any questions you may have.

[The prepared statement of Mr. Swift follows:]



**Testimony of
Anthony Swift
Policy and Energy Analyst, International Program
Natural Resources Defense Council**

Before the

**Joint Subcommittee on Energy and Environment
Committee on Science, Space, and Technology
United States House of Representatives
May 7, 2013**



**Testimony to the House of Representative’s Committee on Science, Space, and
Technology’s joint Energy and Environment Subcommittee entitled:
“Keystone XL Pipeline: Examination of Scientific and Environmental Issues”
May 7, 2013**

Chairmen Loomis and Stewart, Ranking Members Bonamici and Swalwell and members of the Committee, thank you for today’s opportunity to testify on the scientific and environmental issues associated with the Keystone XL pipeline. My name is Anthony Swift. I am a policy analyst for the Natural Resources Defense Council (NRDC). NRDC is a national, nonprofit organization of scientists, lawyers and environmental specialists dedicated to protecting public health and the environment. Founded in 1970, NRDC has more than 1.2 million members and online activists worldwide, serviced from offices in New York, Washington, Los Angeles, San Francisco, Chicago, and Beijing.

Keystone XL presents unresolved pipeline safety issues

In early 2011, NRDC raised concerns that an influx of tar sands on the U.S. pipeline network posed greater risks to pipeline integrity, challenges for leak detection systems and significantly increased impacts to sensitive water resources when spilled.¹ Observing a lack of due diligence by industry as it flooded the aging U.S. pipeline system with thick, heavy diluted bitumen tar sands and proposed a major expansion of tar sands transport on new pipelines like Keystone XL. NRDC called on government regulators to identify risks associated with tar sands pipelines and develop safety regulations to address those risks.² Since then, evidence has continued accumulate confirming many of the concerns raised by NRDC – information showing that pipelines moving tar sands are more likely to leak, that leak detection systems are unlikely to detect tar sands

¹ NRDC, Tar Sands Pipeline Safety Risks, February 2011, <http://www.nrdc.org/energy/tarsandssafetyrisks.asp>.

² Id.

spills when they happen, that tar sands spills are significantly more damaging than conventional spills, and that conventional spills response measures are inadequate for containing and cleaning tar sands spills.³

Pipelines in the U.S. with longest history moving tar sands diluted bitumen also have worst spill record.

Diluted bitumen has only been moved on the U.S. pipeline system since the late 90s and federal regulators still don't provide data with the specificity to evaluate the safety record of pipelines moving tar sands. But a close look at pipeline incident data from states in the northern Midwest, which have seen the greatest volumes of tar sands diluted bitumen over the longest time period, is alarming. Pipelines in North Dakota, Minnesota, Wisconsin and Michigan spilled 3.6 times as much crude per mile than the national average between 2010 and 2012.⁴

High temperature tar sands pipelines are at greater risk of leaks.

Tar sands pipelines operate at higher temperatures than conventional pipelines and high temperature pipelines are more likely to spill due to external corrosion. We know that high temperature pipelines are more likely to rupture due to external corrosion because a small network of pipelines in southern California has provided us with an on point case study. Pipelines serving the Kern River field in California have transported thick heavy crudes to nearby refineries for several decades. In a ten year study of its pipeline network, California regulators found:

³ Pipeline and Hazardous Materials Safety Administration (PHMSA), Leak Detection Study – DTPH56-11-D-000001, December 10, 2012, <http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Press%20Release%20Files/Leak%20Detection%20Study.pdf>; Elizabeth McGowan, Lisa Song, The Dilbit Disaster: Inside The Biggest Oil Spill You've Never Heard Of, InsideClimate News, July 26, 2012, <http://insideclimatenews.org/news/20120626/dilbit-diluted-bitumen-enbridge-kalamazoo-river-marshall-michigan-oil-spill-6b-pipeline-epa>; Anthony Swift, Kalamazoo One Year Later: Anatomy of a Tar Sands Spill, July 26, 2011, http://switchboard.nrdc.org/blogs/aswift/kalamazoo_one_year_later_anato.html.

⁴ North Dakota, Minnesota, Wisconsin, and Michigan have 6,416 miles of crude pipeline, or about 12.1 percent of the U.S. total. PHMSA. State Mileage by Commodity Statistics. 2013. primis.phmsa.dot.gov/comm/reports/safety/MI_detail1.html?nocache=8335#_OuterPanel_tab_4. Meanwhile, between 2007 and 2010 pipelines in North Dakota, Minnesota, Wisconsin, and Michigan spilled 27,911 barrels of crude in underground leaks, or 40.2% of the 63,987 barrels of crude spilled in the United States from 2010-12. Pipeline and Hazardous Safety Materials Administration (PHMSA), Data and Statistics, Crude pipelines 2010-2012, <http://www.phmsa.dot.gov/pipeline/library/data-stats>.

“Operating temperature had a significant effect on leak incident rates. Generally, the higher the operating temperature, the higher the resulting incident rate.” California State Fire Marshalls, Pipeline Risk Assessment, 1993.⁵

The California study took into account other factors and found that regardless of pipeline age, coating, or pipeline materials, pipelines with higher temperatures had more spills due to external corrosion.⁶ This study showed that pipelines operating above 100°F were had a higher incidence of ruptures due to external corrosion.⁷ Pipelines operating at in the range of 130°F to 159°F were nearly 24 times more likely to leak due to external corrosion and six times more likely to leak from any cause than pipelines operating under 70°F.⁸ In its draft Supplemental Environmental Impact Statement (SEIS), State indicated that Keystone XL will operate at a temperature range between 130°F and 150°F.⁹

This is not a new issue. Enbridge’s tar sands spill into the Kalamazoo River in 2010, resulting in the largest and most expensive onshore pipeline accident in U.S. history, was caused by external corrosion.¹⁰ Moreover, much of Enbridge’s line 6B, which was one of the first pipelines to move significant volumes of tar sands diluted bitumen into the United States, had to be replaced due to hundreds of corrosion abnormalities. NRDC highlighted the risk of external corrosion on high temperature diluted bitumen tar sands pipelines in comments to U.S. pipeline regulators in early 2011.¹¹ And yet, industry’s silence on the general risk of high temperature tar sands pipelines and external corrosion speaks volumes.

⁵ California State Fire Marshalls, Pipeline Risk Assessment, 1993. Pg. 68, <http://osfm.fire.ca.gov/pipeline/pdf/publication/pipelinerriskassessment.pdf>

⁶ Id.

⁷ Id.

⁸ Id.

⁹ State Department, Keystone XL Draft Supplemental Environmental Impact Statement, May 1, 2013, 4.13-22 <http://keystonepipeline-xl.state.gov/documents/organization/205621.pdf>.

¹⁰ National Transportation Safety Board, Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release, July 10, 2012, http://www.ntsb.gov/news/events/2012/marshall_mi/index.html.

¹¹ Natural Resources Defense Council et. al., Comments to the Office of Pipeline Safety In response to the Advanced Notice of Proposed Rulemaking Titled “Safety of On-Shore Hazardous Liquid Pipelines”, February 18, 2011, <http://switchboard.nrdc.org/blogs/sclefkowitz/NRDC%20et%20al%20Comments%20Proposed%20Rulemaking%20On-Shore%20Hazardous%20Liquid%20Pipelines%20Feb%2018%202011%20rev.pdf>.

Leak detection systems miss 19 out of 20 spills.

In *Tar Sands Safety Risks*, NRDC identified a higher risk of false alarms for leak detection systems in pipelines moving diluted bitumen tar sands.¹² And indeed, the National Transportation Safety Board's investigation of the Kalamazoo tar sands spill found that a seventeen hour delay from the time of the rupture and their final shutoff of the pipeline was due to the belief by Enbridge's control center that the leak detection system was giving a false alarm.¹³

However, several new reports suggest that pipeline leak detection systems are far blunter instruments than many operators care to admit. An investigation of pipeline accident reports from the last ten years shows that leak detection systems miss 19 out of 20 spills.¹⁴ This problem isn't limited to small spills – these systems also miss 4 out of 5 spills greater than 42,000 bpd.¹⁵ A Congressionally mandated study of leak detection systems by federal regulators at the Pipeline and Hazardous Materials Safety Administration identified major gaps in leak detection systems and U.S. regulations.¹⁶

Communities have a right to be concerned by the poor state of leak detection technology as they face industry proposals to move tar sands in new or aging pipelines - particularly ones that transverse sensitive water resource.

Tar sands diluted bitumen spills are more damaging and difficult to clean.

The 2010 Enbridge tar sands spill into the Kalamazoo River highlighted an industry that was unprepared to address the unique challenges associated with tar sands diluted bitumen spills. Nearly three years after Enbridge spilled a million gallons of tar sands crude into the Kalamazoo

¹² NRDC, *Tar Sands Pipeline Safety Risks*, February 2011, <http://www.nrdc.org/energy/tarsandssafetyrisks.asp>.

¹³ National Transportation Safety Board, *Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release*, July 10, 2012, http://www.nts.gov/news/events/2012/marshall_mi/index.html.

¹⁴ Lisa Song, *Few Oil Pipeline Spills Detected by Much-Touted Sensors*, *InsideClimate News*, Sept. 19, 2012, <http://www.bloomberg.com/news/2012-09-19/oil-pipeline-spills-go-undetected-by-much-touted-sensors.html>.

¹⁵ *Id.*

¹⁶ Pipeline and Hazardous Materials Safety Administration (PHMSA), *Leak Detection Study – DTPH56-11-D-000001*, December 10, 2012, <http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Press%20Release%20Files/Leak%20Detection%20Study.pdf>.

River watershed and almost a billion dollars has been spent on cleanup, and 38 miles of that river are still contaminated.¹⁷

Tar sands diluted bitumen is a mixture of very light petrochemicals and very heavy bitumen. Once spilled in a waterbody, the light petrochemicals – including toxins such as benzene and toluene - gas off, leaving the heavy bitumen to sink.¹⁸ During the Enbridge tar sands spill in Kalamazoo, Michigan, significant volumes of heavy crude sank below the water's surface and traveled along the river bed.¹⁹ EPA's on-site spill coordinator Mark Durno described the unique nature of the spill:

“Where we thought we might be winding down our piece of the response, we're actually ramping back up. The submerged oil is a real story -- it's a real eye-opener. ... In larger spills we've dealt with before, we haven't seen nearly this footprint of submerged oil, if we've seen any at all.”²⁰

In another interview, Mr. Durno observed:

“This was the first time the EPA or anyone has done a submerged cleanup of this magnitude. I would never have expected... that we would have spent two or three times longer working on the submerged oil than surface oil. I don't think anyone at the EPA anticipated that, I don't think anyone at the state level anticipated that, I don't think anyone in industry anticipated that.”²¹

¹⁷ EPA, In the Matter of Enbridge Energy et. al., Order for Removal Under Section 311(c) of the Clean Water Act, October 3, 2012, <http://www.epa.gov/enbridgespill/pdfs/20121003-proposed-order-for-removal.pdf>.

¹⁸ Lisa Song, A Dilbit Primer: How It's Different from Conventional Oil, InsideClimate News, June 26, 2012, <http://insideclimatenews.org/news/20120626/dilbit-primer-diluted-bitumen-conventional-oil-tar-sands-Alberta-Kalamazoo-Keystone-XL-Enbridge>.

¹⁹ Elizabeth McGowan, Lisa Song, The Dilbit Disaster: Inside The Biggest Oil Spill You've Never Heard Of, InsideClimate News, July 26, 2012, <http://insideclimatenews.org/news/20120626/dilbit-diluted-bitumen-enbridge-kalamazoo-river-marshall-michigan-oil-spill-6b-pipeline-epa>.

²⁰ Anthony Swift, Kalamazoo One Year Later: Anatomy of a Tar Sands Spill, July 26, 2011, http://switchboard.nrdc.org/blogs/aswift/kalamazoo_one_year_later_anato.html.

²¹ Mitchell Anderson, Spill from Hell, The Tyee, March 5, 2012, <http://thetyee.ca/News/2012/03/05/Diluted-Bitumen/>.

One could argue that companies planning to move billions of barrels of tar sands across sensitive water resources by pipeline should have done due diligence before moving ahead. It is much harder to defend the fact that over two years after the Kalamazoo tar sands spill, neither industry nor regulators have evaluated the risks posed by diluted bitumen spills to the environment or developed measures to mitigate those risks.

Conventional spill response methods have proven ineffective for tar sands diluted bitumen spills.

During the Kalamazoo tar sands spill, conventional cleanup methods failed, and in some cases made the spill worse.²² EPA officials were forced to improvise, using extreme measures to recover oil from riverbeds and the nearby Morrow Lake.²³ The spill cleanup continues, but now EPA officials have focused on ensure new areas are not contaminated, concluding that it would be too damaging to fully clean the nearly 40 miles of the Kalamazoo River that are already contaminated by tar sands.²⁴

Over two years ago, NRDC called for an evaluation of the risks of tar sands spills and improved spill response planning for diluted bitumen spills in close consultation with local emergency response teams and community. Unfortunately, neither regulators nor industry has made progress in evaluating or addressing the risks caused by tar sands spills. The extent of damage done to the region's watershed may not be known for years to come. Michigan State University Biologist Stephen Hamilton concluded:

²² Lisa Song, Cleanup of 2010 Mich. Dilbit Spill Aims to Stop Spread of Submerged Oil, InsideClimate News, March 27, 2013, <http://insideclimatenews.org/news/20130327/cleanup-2010-mich-dilbit-spill-aims-stop-spread-submerged-oil>.

²³ Anthony Swift, Kalamazoo One Year Later: Anatomy of a Tar Sands Spill, July 26, 2011, http://switchboard.nrdc.org/blogs/aswift/kalamazoo_one_year_later_anato.html.

²⁴ EPA, In the Matter of Enbridge Energy et. al., Order for Removal Under Section 311(c) of the Clean Water Act, October 3, 2012, <http://www.epa.gov/enbridgespill/pdfs/20121003-proposed-order-for-removal.pdf>.

"This kind of crude oil is a complex mix of hundreds of compounds—some known to be toxic—that has not been studied much. We just don't understand the consequences well enough."²⁵

Keystone XL is critical for tar sands expansion and associated climate emissions

The Keystone XL tar sands pipeline is a lynchpin for the expansion of the tar sands bitumen production in Canada. On this point, market analysts, voices in the Albertan tar sands industry, and the environmental community agree. Industry's plan to triple tar sands production by 2030, and the significant environmental impacts associated with that plan, cannot take place without the approval of the Keystone XL tar sands pipeline as a major avenue to the needed new markets for tar sands crude.²⁶

Alternative pipeline and rail tar sands transportation proposals will not allow for the same level of tar sands production expansion and the associated climate emissions as the Keystone XL pipeline. As analysts at the CIBC bank in Canada have observed, tar sands oil producers in Alberta need every proposed tar sands infrastructure project – including Keystone XL - to move forward in order to meet industry production expansion goals.²⁷ For the following reasons, many of these proposed tar sands transportation projects are unlikely to move forward.

Pipelines to the west and east coasts are stalled by entrenched public and First Nations opposition.²⁸ Many of these proposals will require the use of aging pipelines to move tar sands through communities and sensitive watersheds.²⁹ After the rupture of the Pegasus pipeline in the

²⁵ David Hasemeyer, EPA Worries Dilbit Still a Threat to Kalamazoo River, More Than 2 Years After Spill, InsideClimate News, October 12, 2012, <http://insideclimatenews.org/news/20121011/epa-dilbit-enbridge-6b-pipeline-kalamazoo-river-cleanup-tar-sands-oil-sands-keystone-xl-landowners-environment?page=3>.

²⁶ Canadian Association of Petroleum Producers (CAPP), Crude Oil, Forecasts, Markets and Pipelines, June 2012, pg. 38, <http://www.capp.ca/forecast/Pages/default.aspx>.

²⁷ Vanderklippe, Nathan. "Glut of Cheap Crude Raise Doubts Over Oil Sands Expansion." *Globe and Mail* 17 August 2012. <http://www.theglobeandmail.com/globe-investor/pipelines-glut-of-cheap-crude-raise-doubts-over-oil-sands-expansion/article4485891/>.

²⁸ Nathan Lemphers, The Climate Impacts of the Proposed Keystone XL Oilsands Pipeline, January 17, 2013, pgs. 8-9, <http://www.pembina.org/pub/2407>.

²⁹ The proposed reversal of the Portland Montreal pipeline through New England and TransCanada's conversion of its natural gas pipeline system through its east coast both require the use of pipeline systems which are over fifty years old.

Arkansas community of Mayflower, the risks of these projects is becoming more apparent to the communities they would cross.

In its most recent draft supplemental environmental impact statement, while the State Department acknowledged that tar sands is significantly more carbon intensive over its lifecycle than conventional crude, the agency mistakenly suggested that rail could provide an economically feasible alternative to Keystone XL.³⁰

The State Department made the prediction that tar sands by rail was on the verge of rapid expansion in 2011.³¹ State's forecast proved inaccurate then and its 2013 forecast on the viability of rail continues to be substantively flawed.

A recent investigation by Reuters has debunked the State Department's argument that industry's expansion plan for tar sands production, and the substantial climate emissions associated with it, can be fueled by rail if Keystone XL is rejected.³² Reaching out to many of the same industry sources the State Department cited in its draft Supplemental Environmental Impact Statement (SEIS), the Reuters investigation demonstrates the errors in State's analysis that led it to dramatically overstate the potential of rail to move tar sands.³³

State's prediction that 200,000 bpd of heavy Canadian tar sands would reach the Gulf by rail by the end of the year was based on a misinterpretation of industry data, according to the sources that State cited. As the Reuters story reported:

“The State Department report cites two industry studies to predict that 200,000 barrels a day or more of Canadian heavy crude oil will reach Gulf Coast refiners by train by the

³⁰ The State Department found that the crudes expected to be transported on Keystone XL were likely to be up to 19 percent more greenhouse gas intensive on a well-to-wheel basis when compared to reference crudes. State Department, Draft Supplemental Environmental Impact Statement, Appendix W: Life Cycle Greenhouse Gas Emissions of Petroleum Products from WCSB Oil Sands Crudes Compared with Reference Crudes, pg. 60, March 1, 2013, <http://keystonepipeline-xl.state.gov/documents/organization/205563.pdf>.

³¹ EnSys, Keystone XL - No Expansion Update, August 12, 2011, pgs. 52-53, 75, www.keystonepipeline-xl.state.gov/documents/organization/182263.pdf.

³² Patrick Ruckers, Analysis: Oil-by-train may not be substitute for Keystone pipeline, Reuters, April 18, 2013 <http://www.reuters.com/article/2013/04/18/us-usa-keystone-railroads-idUSBRE93H07120130418>.

³³ Patrick Ruckers, Analysis: Oil-by-train may not be substitute for Keystone pipeline, Reuters, April 18, 2013 <http://www.reuters.com/article/2013/04/18/us-usa-keystone-railroads-idUSBRE93H07120130418>.

end of this year. Officials used that figure to bolster their argument that the oil industry has already decided rail is a good option for moving oil sands crude. 'Limitations on pipeline transport would force more crude oil to be transported via other modes of transportation, such as rail, which would probably (but not certainly) be more expensive,' the State Department said."³⁴

The report goes on to show that State's industry sources disagree:

"But one of the sources for the 200,000 barrels per day estimate, Calgary investment bank Peters & Co, says its forecast was misunderstood as being for just Gulf Coast-bound oil when it included shipments to Eastern Canada and other refiners. 'We haven't tracked exactly where those barrels are going,' said Tyler Reardon, a spokesman for Peters & Co."³⁵

Where that 200,000 bpd is likely to go and whether its light or heavy is very important. Keystone XL would bring heavy tar sands from northern Alberta to the Gulf Coast where refineries have the equipment to handle heavy crude. Refineries in the East Coast of the United States and Canada only have a very limited capacity to process heavy crude – totaling less than a quarter of the potential volume of Keystone XL.

The key question is whether it's economically feasible to move heavy tar sands crude to the Gulf Coast refineries by rail. The answer appears be no. In a year when Gulf Coast prices for heavy Canadian tar sands were up to \$50 a barrel higher than those in the Midwest, heavy Canadian crude movements to the Gulf by rail only increased from 15,000 bpd to 25,000 bpd between 2011 and 2012 – still a fraction of a percent of total production.³⁶

The relative lack of tar sands crude moving by rail contrasts with a significant increase in the movement of light crude from North Dakota by rail. From 2009 to 2013, transport of oil by rail

³⁴ Id.

³⁵ Id.

³⁶ Id.

in North Dakota increased from a few thousand barrels a day to over half a million.³⁷ In January 2013, over two thirds of light crude produced in North Dakota was transported to refineries by rail.³⁸ As they turned to rail, domestic light oil producers have even rejected major pipeline proposals – including Oenok’s 200,000 barrel per day Bakken pipeline.³⁹ When analysts talk about the upsurge of rail transport in the United States and southern Canada, this is what they’re referring to – an enormous expansion of light crude from the Bakken.

There are two major reasons why tar sands producers haven’t turned to rail to move their product to market. First, it is significantly more expensive for them to do so, and second, they have significantly tighter profit margins than Bakken producers.

Tar sands diluted bitumen is significantly more expensive to move by rail than Bakken light crude. There are a number of reasons for this:

The tar sands are about 1,000 miles farther away from refinery markets than the Bakken oil fields.

Trains moving light crude can carry nearly 30% more crude than trains moving heavy tar sands diluted bitumen.⁴⁰

Moving tar sands requires specialized rail offloading terminals, onloading terminals and heated rail cars.⁴¹

All of these factors increase the cost of moving a barrel of tar sands to Gulf Coast refineries. Shipping a barrel of tar sands diluted bitumen to the Gulf is currently costing tar sands producers \$31 a barrel.⁴² Moving it by pipeline only costs \$8 to \$9.50 a barrel.⁴³

³⁷ North Dakota Pipeline Authority, U.S. Williston Basin Rail Export Estimates, April 1, 2013, <http://ndpipelines.files.wordpress.com/2012/04/ndpa-website-data13.xlsx>.

³⁸ Justin Miller, Wayzata firm to expand N.D. rail terminal for Bakken crude oil, Star Tribune, March 15, 2013, <http://www.startribune.com/business/198551531.html?refer=v>.

³⁹ Chicago Tribune, Oenok Update 1: Cancels 200,000 bpd Bakken Project, Nov. 1, 2012, http://articles.chicagotribune.com/2012-11-27/news/sns-rt-oneok-bakkenpipeline-update-111e8mrbzd-20121127_1_overland-pass-pipeline-bakken-crude-express-pipeline-oneok-partners-lp.

⁴⁰ Light crude train cars can move up to 700 barrels while heavy train cars can only move 550 barrels. Doug Wilkins, Integrated Midstream Solutions, TD Securities ‘Crude By Rail Forum, pg. 11, October 2, 2012.

⁴¹ *Id.*

Tar sands producers also have much tighter margins than conventional Bakken producers. Tar sands crude is a lower value commodity than Bakken light crude. In addition, it has significantly higher production prices. With breakeven production costs ranging from \$60 a barrel to over \$100 a barrel – and increasing by each year – new tar sands projects cannot profitably bear significantly greater transportation costs associated with rail.⁴⁴

The fact that the rejection of Keystone XL would reduce tar sands production is acknowledged by Canadian officials. Joe Oliver, Canada's Natural Resources Minister, recently observed that costs and logistical challenges make moving tar sands by rail a poor choice for producers, noting that a rejection of Keystone XL would put a dent in tar sands production.⁴⁵

Market analysis by The Goodman Group (TGG) also identified fundamental flaws in the analysis that led State to conclude that Keystone XL would have limited impact on tar sands production and the climate impacts associated with it.⁴⁶ TGG concluded that State's draft environmental review "is deeply flawed and not a sound basis for decision-making."⁴⁷ Based on its analysis, TGG concludes "that KXL, and specifically its impact on tar sands logistics costs and crude prices, will have a significant impact on tar sands expansion under a very broad range of conditions and assumptions."⁴⁸ TGG stated that a conservative and credible estimate of Keystone

⁴² Nicole Mordant, Analysis: Crude-by-rail carves out long-term North American niche, Reuters, Nov. 4, 2012, <http://www.reuters.com/article/2012/11/04/us-railways-oil-northamerica-idUSBRE8A30AX20121104>.

⁴³ State Department, Supplemental EIS, Market Analysis, 1.4-49, 50, March 1, 2013.

⁴⁴ Energy Conservation Resources Board, ST98-2012 Alberta's Energy Reserves 2011 and Supply/Demand Outlook 2012–2021, pg. 3-30, June 2012; Pembina Institute: January 28, 2013 "Beneath the Surface" Report (Pg. 57) <http://www.pembina.org/pub/2404>; Katusa, Marin. "Oil Price Differentials: Caught Between the Sands and the Pipelines." *Forbes* 6 June 2012. Web. <http://www.forbes.com/sites/energysource/2012/06/21/oil-price-differentials-caught-between-the-sands-and-the-pipelines/3/>

⁴⁵ Patrick Ruckers, Crude-by-rail no substitute for Keystone XL – Energy Minister, Reuters, April 24, 2013, <http://www.reuters.com/article/2013/04/24/usa-keystone-rail-idUSL2N0DB23P20130424>.

⁴⁶ Ian Goodman, Report evaluating the adequacy of the Keystone XL (KXL) Draft Supplemental Environmental Impact Statement (DSEIS) Market Analysis, April 22, 2013, Section 7.0, <http://switchboard.nrdc.org/blogs/aswift/Comments%20of%20Sierra%20Club%2C%20et.%20al.%2C%20on%20the%20Keystone%20XL%20DSEIS.4.22.13.pdf>.

⁴⁷ Ian Goodman, Report evaluating the adequacy of the Keystone XL (KXL) Draft Supplemental Environmental Impact Statement (DSEIS) Market Analysis, April 22, 2013, Section 7.0, <http://switchboard.nrdc.org/blogs/aswift/Comments%20of%20Sierra%20Club%2C%20et.%20al.%2C%20on%20the%20Keystone%20XL%20DSEIS.4.22.13.pdf>.

⁴⁸ *Id.*

XL's impact on tar sands expansion would be 830,000 bpd based on its evaluation of current market conditions.⁴⁹

Keystone XL is a linchpin for tar sands production and associated climate emissions

Infrastructure is needed for tar sands expansion, and it is clear to most observers that the permit decision for Keystone XL plays a critical role in the future of tar sands production and the greenhouse gas emissions associated with it. The Keystone XL tar sands pipeline is a fundamental element in the oil industry's plan to triple production of tar sands oil from 2 million barrels per day (bpd) to 6 million bpd by 2030, and in the longer term to hike production to more than 9 million bpd.⁵⁰ The U.S. decision on whether to approve the Keystone XL pipeline will have a direct bearing on whether the tar sands industry can attain those goals, with their attendant increases in carbon pollution. Keystone XL would lock the U.S. into a long-term commitment to an energy infrastructure that relies on dirty oil.

Producing tar sands generates at least three times as much carbon as conventional crude. The Environmental Protection Agency (EPA) estimates that simply replacing the conventional crude with tar sands from Keystone XL would increase U.S. carbon emissions by as much as 935 million metric tons CO₂e during the pipeline's 50 year lifespan.⁵¹ A recent report evaluating the project's total carbon emissions shows that Keystone XL would be responsible for at least 181 million metric tons of carbon dioxide c CO₂e of emissions each year, comparable to the tailpipe emissions from more than 37.7 million cars or 51 coal-fired power plants.⁵² The first step in addressing climate change is to stop making the problem worse – and that means rejecting the Keystone XL tar sands pipeline and the higher carbon emissions associated with it.

⁴⁹ *Id.*

⁵⁰ NRDC, *Climate Impacts from the Keystone XL Tar Sands Pipeline*, February 8, 2013, <http://switchboard.nrdc.org/blogs/ddroitsch/FINAL%20NRDC%20Keystone%20XL%20climate%20impacts%20memo%20Feb%208%202013.pdf>.

⁵¹ Cynthia Giles, Environmental Protection Agency, April 22, 2013, <http://epa.gov/compliance/nepa/keystone-xl-project-epa-comment-letter-20130056.pdf>.

⁵² Oil Change International, *Cooking the Books: How the State Department Analysis Ignores the True Climate Impacts of the Keystone XL Pipeline*, April 16, 2013, <http://priceofoil.org/2013/04/16/cooking-the-books-the-true-climate-impact-of-keystone-xl/>.

The substantial risks of the Keystone XL tar sands pipeline outweigh its marginal benefits. Keystone XL would enable a substantial expansion of tar sands expansion and substantial climate pollution associated with it. The pipeline would endanger critical jobs on ranches and farms in the Great Plains states in order to transport tar sands to the Gulf Coast where it can be refined and exported. In exchange for 35 permanent jobs, Keystone XL would pose a permanent risk to American communities, sensitive water resources and agricultural industry.⁵³ We need to protect those jobs, not put them at risk of the kind of tar sands blowout that has poisoned nearly 40 miles of the Kalamazoo River in Michigan or the recent spill in Arkansas, which sent up to 420,000 gallons of tar sands oil flowing through the community of Mayflower.⁵⁴

The Keystone XL tar sands pipeline would undermine U.S. efforts to reduce its carbon emissions, threaten communities and sensitive water resources, and increase refinery emissions in the Gulf Coast in order to provide tar sands producers a means of exporting their product on the international market. This tradeoff is not in the nation's interest. TransCanada's application to build the Keystone XL pipeline should be rejected.

⁵³ State Department, Draft Supplemental Impact Statement Executive Summary, pg. 13-14, March 1, 2013.

⁵⁴ National Response Center, Report 104298, March 30, 2013, http://www.nrc.uscg.mil/reports/rwservlet?standard_web+inc_seq=1042498.

Anthony Swift, Energy and Policy Analyst, Natural Resources Defense Council Biography

Anthony Swift, Attorney at the Natural Resources Defense Council (NRDC), works for NRDC's International program on a variety of energy related issues relating to subsidies, petroleum markets, import and export issues, federal environmental review processes, pipeline regulatory issues and carbon intensive transportation fuels. He also works with U.S. and international coalitions opposing the expansion of tar sands production and proposals to build the Keystone XL, Northern Gateway and Trailbreaker tar sands pipelines. Anthony has testified before the U.S. House of Representatives' Energy & Power subcommittee on pipeline safety oversight and transportation constraints for tar sands, Canada's National Energy Board (NEB) on Enbridge's Northern Gateway pipeline proposal, the Nebraska Senate on pipeline siting issues, and the National Academy of Sciences on risks posed by diluted bitumen to pipelines. Prior to working at NRDC, Anthony worked as a policy analyst for the Department of Transportation where he worked on alternative fuels, efficiency standards and the National Environmental Policy Act review process. He has a law degree from the University of Pennsylvania and a B.A. in Biology and Political Science from Austin College.

Chairman STEWART. Thank you, Mr. Swift.
And now, our final witness, Mr. Knappenberger.

**STATEMENT OF MR. PAUL KNAPPENBERGER,
ASSISTANT DIRECTOR, CENTER FOR THE
STUDY OF SCIENCE, CATO INSTITUTE**

Mr. KNAPPENBERGER. Good morning. Chairman Stewart, Chairwoman Lummis, and other distinguished Members of the Subcommittee, I thank you for the opportunity to offer testimony this morning. I am Paul Knappenberger, Assistant Director of the Center for the Study of Science at the Cato Institute, a nonprofit, nonpartisan public policy research Institute located here in Washington, D.C.

Before I begin my testimony, I would like to make clear that my comments are solely my own and do not represent any official position of the Cato Institute.

Climate change results from a variety of factors, both human and natural. The primary concern raised over the pipeline involves the carbon dioxide emissions that will result from the production and use of the oil that the pipeline will carry. In its Supplemental Environmental Draft—Environmental Impact Statement, the State Department finds—and I think that there is broad agreement on this point—that a barrel of oil produced from the Canadian tar sands carries about a 17 percent carbon dioxide emissions premium compared to the average barrel of oil finding its way into the U.S. market.

Now, the disagreement between the State Department, the Environmental Protection Agency, and several environmental groups involves how many new carbon dioxide emissions this 17 percent premium results in when it is applied to the 830,000 barrels of oil that the pipeline will carry each day. The State Department concludes that the economy of the tar sands is such that it will come to market one way or another whether or not the Keystone XL pipeline is ever built. It thus finds virtually no additional carbon dioxide emissions resulting from the project.

The EPA contends that the State Department is too quick to reach such a conclusion. The EPA argues that without the pipeline, much of the oil will remain in the ground, and thus, while the existence of the pipeline won't result in more oil being used in the United States, it will result in a 17 percent emissions premium on the pipeline's portion of that oil. The EPA gives this extra amount as 18.7 million metric tons of carbon dioxide per year.

And several environmental organizations take the viewpoint that while the pipeline may not increase the amount of oil used in the United States, the oil that it displaces from the U.S. market will be consumed by other countries as the global demand for oil continues to grow. They calculate that the pipeline will result in about 181 million metric tons of additional carbon dioxide each year.

So in these terms, the differences among the groups appear large and contentious, and much of the protestation involving the Keystone XL pipeline focuses on these emissions numbers. But these protests are largely misplaced. It is imperative to keep in mind

that the endgame is climate change, and carbon dioxide emissions are not climate change. They influence climate change but they are not a measure of it. Therefore, before any type of assessment as to the potential climate impact of the pipeline can be made, it is essential to translate carbon dioxide emissions into some sort of climate unit, like the global average temperature change. In other words, how much global warming will the pipeline produce? Isn't that what everyone wants to know?

Now, why is it then that such numbers are absent in the discussions of the impacts of the pipeline? It is not as if there is no good way of calculating them. This is precisely what climate models are designed to do. Climate models emulate the Earth's climate system and allow researchers to change various influences upon it, such as adding additional carbon dioxide emissions, and then seeing what happens in the computer simulations.

So why haven't they been applied to predict the climate impact of the pipeline? Because if they were, the answer would be exceedingly tiny. For example, using a climate model emulator that was developed under support of the EPA, I find that in the case of the State Department's analysis, as there are very few additional carbon dioxide emissions resulting from the pipeline, there are essentially—there is essentially no associated climate change. Under the EPA's assumptions, the average temperature rise works out to less than 0.00001 degree C per year. That is 1/100,000 of a degree.

And even under the assumption that all the Keystone XL oil was additional oil in the global supply, the extra warming is still less than 1/10,000 of a degree per year. In other words, if the pipeline were to operate at full capacity for the next 1,000 years, it would raise the global average temperature by less than 1/10 of a degree.

It is this kind of information, not information on carbon dioxide emissions, that is required to properly assess the climate change aspect of this or any other proposed project or regulation. In these terms, the difference between the State Department's Environmental Impact Statement and those of its critics all but vanished. No matter whose carbon dioxide emissions estimate is used, the climate impact of the oil transported by the pipeline is too small to measure or carry any physical significance. In deciding the fate of the Keystone XL pipeline, it is important not to let symbolism cloud these facts.

Thank you very much.

[The prepared statement of Mr. Knappenberger follows:]

WRITTEN STATEMENT OF

PAUL C. KNAPPENBERGER

ASSISTANT DIRECTOR
CENTER FOR THE STUDY OF SCIENCE
CATO INSTITUTE
WASHINGTON, DC

JOINT HEARING ON

KEYSTONE XL PIPELINE:
EXAMINATION OF SCIENTIFIC AND ENVIRONMENTAL ISSUES

BEFORE THE
U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
SUBCOMMITTEE ON ENERGY
AND
SUBCOMMITTEE ON THE ENVIRONMENT

MAY 7, 2013

I am Paul C. Knappenberger, Assistant Director of the Center for the Study of Science at the Cato Institute, a nonprofit, non-partisan public policy research institute located here in Washington DC, and Cato is my sole source of employment income. Before I begin my testimony, I would like to make clear that my comments are solely my own and do not represent any official position of the Cato Institute.

For the past 25 years, I've conducted research on topics of climate and climate change including hurricanes, heat-related mortality, and temperature trends as well as worked to quantify the projections of human-caused climate change.

This last topic, specifically how it relates to the proposed Keystone XL pipeline, will be the subject of my testimony.

When I refer to climate change in these remarks, I am specifically referring to that climate change which may occur as a result of human emissions of greenhouse gases, primarily carbon dioxide. Climate change may (and does) occur from other influences as well, both human and natural. But the primary concern raised over the Keystone XL pipeline involves the carbon dioxide emissions resulting from the burning of the oil that the pipeline will carry. So it is the potential climate change from these emissions that will be focus of my testimony.

In its Draft Environmental Impacts Statement (DEIS), the State Department has done a good job in quantifying the extra emissions that result from the extraction, transportation, refining, and eventual end use of the oil which will be transported by the Keystone XL pipeline. They find, and I think that there is broad agreement on this point, that a barrel of oil produced from the Canadian tar sands has about a 17 percent carbon dioxide emissions premium compared to the average barrel of oil finding its way into the U.S. market.

The emissions premium primarily arises from the relatively energy-intensive manner in which tar sands oil is currently extracted. In the DEIS, the State Department points out that this emissions premium may well shrink over time as new extraction methodologies are developed, as extraction in other regions, such as Saudi Arabia, becomes more energy intensive, or depending on the type of oil that is ultimately displaced by the oil carried by the Keystone XL pipeline.

The disagreement between the State Department, the Environmental Protection Agency, and several environmental groups, involves how many new carbon dioxide emissions this current 17 percent per barrel premium results in when applied to the 830,000 barrels of oil that the Keystone XL pipeline will carry each day when operating at full capacity.

The State Department concludes that the demand for the tar sands oil is great enough that it will come to market whether or not the Keystone XL pipeline is ever built. It thus finds very few additional carbon dioxide emissions resulting from the pipeline project—somewhere in the range of an additional 0.1 to 5.3 million metric tons of carbon dioxide emissions per year over the case where the pipeline is not built.

The EPA contends that the State Department is too quick to come to such a conclusion. The EPA suggests that without the pipeline, much of that oil will remain in the ground. Therefore, if the pipeline were to be built, oil would be produced from the tar sands to meet its capacity. While this won't result in more oil being used in the U.S., it will result in a 17 percent carbon dioxide emissions premium applied to the 830,000 barrels per day of delivered oil. The EPA cites an extra 18.7 million metric tons of carbon dioxide emissions per year over the situation of no pipeline.

Several environmental organizations take the view that while the Keystone XL pipeline may not increase the amount of oil used in the U.S., the oil that it displaces from the U.S. market will be consumed by other countries as the global demand for oil continues to grow. Thus, they calculate the full emissions from the 830,000 barrels per day plus the 17 percent emissions premium, and arrive at an additional 181 million metric tons of carbon dioxide emissions per year resulting from the existence of the Keystone XL pipeline.

In terms of carbon dioxide emissions, these differences may appear large and contentious, and, in fact, much of the protestation involving the Keystone XL pipeline focuses on these emissions numbers.

But, these protests are largely misplaced.

It is very important to keep in mind that the end game is climate change and the potential need of climate change mitigation. *Carbon dioxide emissions are not climate change.* They influence climate change, but they are not a measure of it.

Therefore, before any type of assessment as to the potential climate impact of the Keystone XL pipeline can be made, it is essential to translate the additional carbon dioxide emissions that may result from it into climate units—such as the global average temperature. In other words, how much global warming will the Keystone XL pipeline produce?

Isn't that what everyone wants to know?

Why is it then, that such numbers are never given?

It is not as if there is no good way of calculating them—that is precisely what climate models are designed to do. These complex computer programs emulate the earth's climate system and allow researchers to change various influences upon it—such as adding additional carbon dioxide emissions—and seeing what the end effect is. These climate models produce the projections of future climate change from human activities that we are all familiar with using precisely this methodology.

General circulation climate models are very complex and computational expensive to run (both in time and money) and as a result have not been used to generate the global temperature effects of the Keystone XL pipeline.

However, in lieu of running a full climate model, climate model emulators have been developed which can run on a desktop computer. One such program is MAGICC, the Model for the Assessment of Greenhouse-gas Induced Climate Change. MAGICC is a climate model simulator developed by scientists at the U.S. National Center for Atmospheric Research under funding by the U.S. Environmental Protection Agency and other organizations. MAGICC is itself a collection of simple gas-cycle, climate, and ice-melt models that is designed to produce an output that emulates the output one gets from much more complex climate models. MAGICC can produce in seconds, on a personal computer, results that complex climate models take weeks to produce running on the world's fastest supercomputers. MAGICC doesn't provide the breadth of output or level of detail that fully resolved climate models do, but instead simulates the general, broader aspects of climate change such as the global average temperature.

Moreover, MAGICC was developed, according to MAGICC's website, "to compare the global-mean temperature and sea level implications of two different emissions scenarios." So, using MAGICC to compare the climate change that is projected to result from the different Keystone XL pipeline carbon dioxide emissions scenarios fits precisely into the program's designed purpose.

Using MAGICC, I (and anyone else) can calculate the potential impact of the Keystone XL pipeline on the global average temperature based on the various carbon dioxide emissions estimates, and produce results very similar to ones that would be achieved by using a full climate model.

In the base case, I run MAGICC using a mid-range, business-as-usual future emissions scenario as defined by the IPCC (SRES A1B). To examine the climate change impact using the EPA's Keystone XL carbon dioxide emissions scenario, I add 18.7 million metric tons per year to the global carbon dioxide mission total each year beginning in the year 2010 and continuing through the year 2100. To assess impact of the emissions scenario preferred by some environmental organizations, I add 181 million metric tons of additional carbon dioxide emissions to the global total beginning in 2010 and extending through 2100.

When running MAGICC as described, I find that no matter how the additional carbon dioxide emissions are calculated, the Keystone XL pipeline has an exceedingly and inconsequentially small impact on projected the course of global temperature.

In the case of the State Department's analysis, as there are very few additional carbon dioxide emissions, there is essentially no associated change in the global climate. The change in global average temperature resulting from the EPA's additional 18.7 million metric tons of carbon dioxide emissions per year from the Keystone XL pipeline, would be about 0.00001°C per year—that is one one-hundred thousandths of a degree. The 181 million metric tons per year from the assumption that all Keystone XL oil is additional oil in the global supply would result in about 0.0001°C of annual warming—one ten-thousandths of a degree.

In other words, if the Keystone XL pipeline were to operate at full capacity until the end of this century, it would, worst case, raise the global average surface temperature by about 1/100th of a

degree Celsius. So after nearly 100 years of full operation, *the Keystone XL's impact on the climate would be inconsequential and unmeasurable.*

And even these tiny numbers are probably overestimates. In calculating them, I used the MAGICC default value for the magnitude of the earth's equilibrium climate sensitivity. A value, 3°C, that was based on the assessment of the equilibrium climate sensitivity given by the Intergovernmental Panel on Climate Change (IPCC). The equilibrium climate sensitivity is the amount that the earth's surface temperature will rise from a doubling of the pre-industrial atmospheric concentration of carbon dioxide. As such, it is probably the most important factor in determining whether or not we need to "do something" to attempt to mitigate future climate change. The lower the climate sensitivity, the less the temperature rise from human carbon dioxide emissions, and the lower the urgency to try to reduce them. If the sensitivity is low enough, carbon dioxide emissions confer a net benefit.

And despite common claims that the "science is settled" when it comes to global warming, we are still learning more and more about the earth complex climate system—and the more we learn, the less responsive it seems that the earth's average temperature is to human carbon dioxide emissions.

For example, the observed lack of statistically significant temperature rise over the past 16 years (and counting), is strong indication that climate models have a tendency to overestimate the amount of warming resulting from human greenhouse gas emissions (Figure 1).

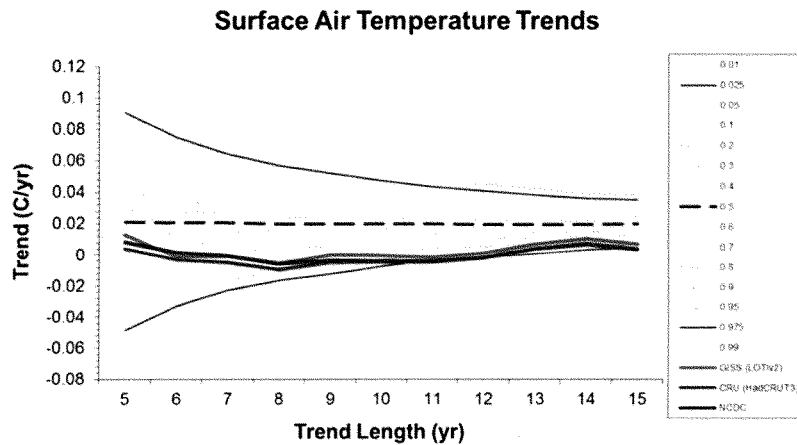


Figure 1. Current (ending in December 2012) trends in three observed global surface temperature records of length 5 to 15 years (colored lines) set against the probability (grey lines) derived from the complete collection of climate model runs used in the IPCC Fourth Assessment Report under the SRES A1B emissions scenario (Knappenberger and Michaels., 2013).

I was involved in research that we published more than a decade ago pointing out that global temperatures were not rising as fast as climate model expectations (Michaels et al., 2002), and increasingly, there is a growing acknowledgement of this fact.

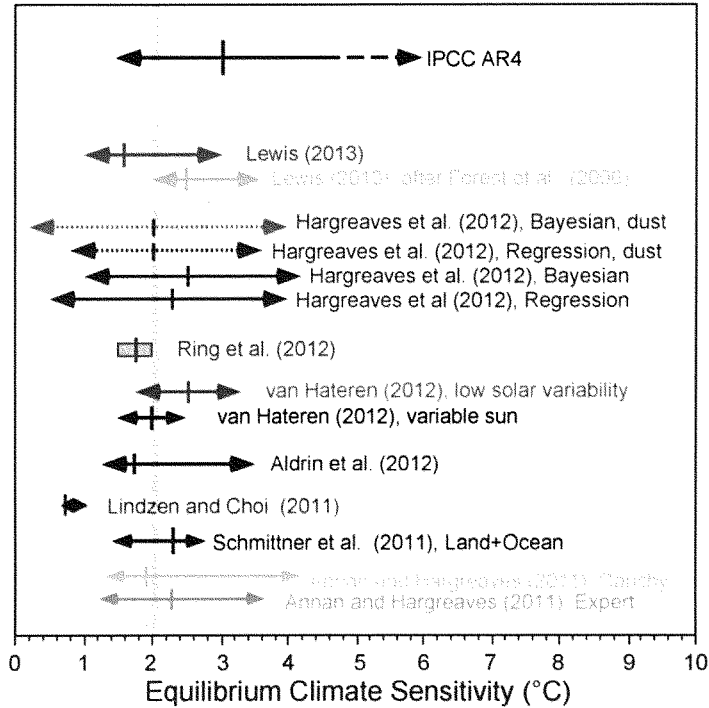


Figure 2. Climate sensitivity estimates from new research published since 2010 (colored, compared with the range given in the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) (black). The arrows indicate the 5 to 95% confidence bounds for each estimate along with the best estimate (median of each probability density function; or the mean of multiple estimates; colored vertical line). Ring et al. (2012) present four estimates of the climate sensitivity and the red box encompasses those estimates. The right-hand side of the IPCC AR4 range is dotted to indicate that the IPCC does not actually state the value for the upper 95% confidence bound of their estimate and the left-hand arrow only extends to the 10% lower bound as the 5% lower bound is not given. The light grey vertical bar is the mean of the 14 best estimates from the new findings. The IPCC's "best estimate" (3.0°C) is 50% greater than the mean of recent estimates (2.0°C).

Over the past three years, a collection of findings in the peer-reviewed scientific literature has suggested that the IPCC's best estimate of the equilibrium climate sensitivity is likely too high by nearly 50 percent. Instead of the IPCC's 3.0°C, the new findings are indicating a value close to 2.0°C (see Figure 2).

Rerunning the MAGICC climate model simulator with an equilibrium climate sensitivity setting of 2.0°C, instead of the 3.0°C default value, drops the calculated warming impact from the Keystone XL pipeline by about 30 percent.

It is this information, not the information on carbon dioxide emissions that is required to properly assess the climate change aspect of the environmental impact of the Keystone XL pipeline.

In these terms, the difference between the State Department's Environmental Impact Statement and those of its critics all but vanish.

No matter whose carbon dioxide emissions estimate is used to calculate it, the climate impact of the oil carried by the Keystone XL pipeline is too small to measure or carry any physical significance.

In deciding the fate of the Keystone XL pipeline, it is important not to let symbolism cloud these facts.

References:

Aldrin, M., et al., 2012. Bayesian estimation of climate sensitivity based on a simple climate model fitted to observations of hemispheric temperature and global ocean heat content. *Environmetrics*, doi: 10.1002/env.2140.

Annan, J.D., and J.C Hargreaves, 2011. On the generation and interpretation of probabilistic estimates of climate sensitivity. *Climatic Change*, **104**, 324-436.

Hargreaves, J.C., et al., 2012. Can the Last Glacial Maximum constrain climate sensitivity? *Geophysical Research Letters*, **39**, L24702, doi: 10.1029/2012GL053872

Intergovernmental Panel on Climate Change, 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Solomon, S., et al. (eds). Cambridge University Press, Cambridge, 996pp.

Knappenberger, P.C., and P.J. Michaels, 2013. Policy Implications of Climate Models on the Verge of Failure. American Geophysical Union Science Policy Conference. Washington, DC, June 24-26, 2013, submitted.

Lewis, N. 2013. An objective Bayesian, improved approach for applying optimal fingerprint techniques to estimate climate sensitivity. *Journal of Climate*, doi: 10.1175/JCLI-D-12-00473.1.

- Lindzen, R.S., and Y-S. Choi, 2011. On the observational determination of climate sensitivity and its implications. *Asia-Pacific Journal of Atmospheric Science*, **47**, 377-390.
- Michaels, P.J., Knappenberger, P.C., Frauenfeld, O.W., and R.E. Davis. 2002. Revised 21st century temperature projections. *Climate Research*, **23**, 1-9.
- Ring, M.J., et al., 2012. Causes of the global warming observed since the 19th century. *Atmospheric and Climate Sciences*, **2**, 401-415, doi: 10.4236/acs.2012.24035.
- Schmittner, A., et al. 2011. Climate sensitivity estimated from temperature reconstructions of the Last Glacial Maximum. *Science*, **334**, 1385-1388, doi: 10.1126/science.1203513.
- Wigley, T.M.L., et al. MAGICC/SCENGEN v5.3. Model for the Assessment of Greenhouse-gas Induced Climate Change/A Regional Climate Scenario Generator. <http://www.cgd.ucar.edu/cas/wigley/magicc/>
- van Hateren, J.H., 2012. A fractal climate response function can simulate global average temperature trends of the modern era and the past millennium. *Climate Dynamics*, doi: 10.1007/s00382-012-1375-3.

Short Narrative Biography

Paul C. "Chip" Knappenberger is the assistant director of the Center for the Study of Science at the Cato Institute, and coordinates the scientific and outreach activities for the Center. He has over 25 years of experience in climate research and public outreach, including 13 years with the Virginia State Climatology Office and 17 years as the Research Coordinator for New Hope Environmental Services, Inc. Chip has published numerous papers in the major atmospheric science journals on global warming, hurricanes, precipitation changes, weather and mortality, and Greenland ice melt, among many other areas.

He holds an M.S. and B.A. degrees in Environmental Sciences from the University of Virginia.

Chairman STEWART. Thank you, Mr. Knappenberger.

To all the witnesses, thank you again for your testimony, for your expertise.

I would remind the Members that when we do ask our questions, Committee rules limit the questioning to five minutes. And we look forward to asking and prodding you a little bit on that, but before we do, we are going to back up just a little bit and with agreement with the Ranking Minority Member, we are going to go to the Chairwoman of the Subcommittee on Energy, Mrs. Lummis, and allow her to provide her opening statement.

Mrs. LUMMIS. Well, thank you, Chairman Stewart. And I apologize for my conflicting meetings this morning. And thank you for allowing me to join you late. I was over at the Natural Resources Committee.

This is such an important subject for our country, and so I really want to thank you for scheduling this hearing on the science and technical issues related to the Keystone XL pipeline, which falls squarely within the jurisdiction of this Committee. And I want to thank the witnesses for being here today as well.

As we all know, the energy landscape is changing dramatically. We have gone in the United States from being a net importer to a net exporter of petroleum products. At the same time, we have gone from being a net exporter of food to a net importer, so lots of things changing in our country. We have now become a global leader in natural gas production and are expected to lead in oil production by the end of the decade. Instead of building import terminals for LNG, we are modifying these facilities to export our abundant natural gas. And we have countries all over the world that would be so happy to receive our abundant natural gas resources.

And despite these changes, the Keystone XL pipeline languishes. Now, this project would allow us to decrease our reliance on unfriendly sources of oil and increase our trade relationship with Canada. Approval of the pipeline would also carry Bakken crude being produced in North Dakota. I deeply appreciate the comments of our witness, Mr. Helms, on that subject earlier.

The pipeline offers a safe and permanent solution to alleviate the bottleneck of U.S. crude oil in the midcontinent. In fact, it is the safest solution that exists. And I can say that as a person who grew up and still ranch next to an oil refinery. And we have lots of problems with the oil refinery, and I am grateful for RCRA and other environmental laws and for environmental regulators that help us regulate our neighborly relationship with a refinery. The pipelines have never been the problem. The pipelines have been the safest part of that operation.

The State Department, in fact, has concluded that the Keystone XL pipeline, with its 57 extra safety features, would have a degree of safety over any other domestic pipeline. Yet this Administration persists in stopping the project, saying in 2012 that a deadline requiring the President to approve or deny the pipeline "prevented a full assessment of the pipeline's impact." Now, this was after thousands of pages of analysis and tens of thousands of public comments over a four-year period.

Now, we have had another year and another report, still no response from the Administration other than to stall the project to

death. Now, that is not too surprising to some of us, because we are finally of the realization that all-of-the-above to this President must mean something other than hydrocarbons. But I don't understand how the President can claim to be committed to job creation and economic growth and still obstruct this project because it would support both. According to the State Department, the project would support over 42,000 jobs and result in \$2 billion in the pockets of hard-working Americans. That would be such a shot in the arm to our economic recovery.

And that is just beginning. Direct expenditures on construction and materials could amount to \$3.3 billion, and sales and use tax could generate another \$65 million in revenue for States, not to mention the positive impact that trade with Canada has on our U.S. economy. According to the U.S. Census Bureau, for every dollar the United States spends on Canadian goods and services, Canada spends approximately 89 cents on U.S. goods and services.

So this testimony today is deeply appreciated. It is very helpful. It is going to be very interesting for us to have the opportunity to quiz you about the very disparate conclusions that you have drawn and expressed in your opening statements, but I do want to thank you, Mr. Chairman, for allowing me to present opening remarks.

And I yield back.

[The prepared statement of Mrs. Lummis follows:]

PREPARED STATEMENT OF CHAIRWOMAN OF THE ENERGY SUBCOMMITTEE CYNTHIA LUMMIS

Good morning and welcome to today's hearing, "Keystone XL Pipeline: Examination of Scientific and Technical Issues." I want to thank Chairman Stewart for holding this hearing with me on such an important and pressing issue. I also want to thank the witnesses for being here today, and I look forward to their testimony.

In the last few years, the U.S. energy landscape has changed dramatically. We have gone from a net importer to a net exporter of petroleum products; we have become the global leader in natural gas production and are expected to lead in oil production by the end of the decade. Instead of building import terminals for LNG, we are modifying these facilities to export our abundant natural gas resources.

Despite these changes, one issue has remained stagnant over the last four years, and that is the approval of the Keystone XL Pipeline. This project would allow us to decrease our reliance on unstable or unfriendly sources of oil and increase our trading relationship with Canada, a friendly, democratic, and stable ally. Approval of the pipeline would also facilitate our own oil development, as the pipeline would also carry Bakken crude being produced in North Dakota.

In addition to increasing our energy security, the pipeline offers a safe and permanent solution to alleviate the bottleneck of U.S. crude oil in the midcontinent. In fact, it's the safest solution that exists. The State Department concluded Keystone XL, with its 57 extra safety features, would have a degree of safety over any other domestic pipeline. Yet President Obama has slow-walked the project, saying in 2012 that a deadline requiring him to approve or deny the pipeline "prevented a full assessment of the pipeline's impact." This was after thousands of pages of analysis and tens of thousands of public comments over a four-year period.

Another year and another report later, the Administration has yet to approve the project. That the Administration would slow-walk a project that supports fossil fuels is perhaps no surprise to some of us. However, what I cannot understand is how the President can rhetorically claim to be committed to job creation and economic growth, and in practice obstruct a project that would support both. According to the State Department, the project would support over 42,000 jobs and result in two billion dollars in the pockets of hardworking Americans. This would represent a significant contribution to our slow economic recovery.

And that is just the beginning. Direct expenditures on construction and materials could amount to \$3.3 billion dollars, and sales and use taxes could generate another \$65 billion dollars in revenue for the affected States. Yet another often-overlooked

economic benefit is the positive impact that trade with Canada has on the U.S. economy—trade with Canada benefits the U.S. economy more than trade with any other nation in the world. According to the U.S. Census Bureau, for every dollar the U.S. spends on Canadian goods and services, Canada spends approximately 89 cents on U.S. goods and services. I hope this Administration realizes that actions speak louder than words. To voice support for job creation and economic growth is one thing; to actually do something about it is another. I hope the President will prioritize action over empty rhetoric and approve the project as soon as possible. We have waited long enough.

Thank you, Mr. Chairman. I yield back.

Chairman STEWART. Thank you, Ms. Chairwoman.

If there are other Members who wish to submit additional opening statements, your statements will be added to the record at this point.

And now, we come to the questioning of the panel, and as all of us look forward to this, I recognize myself for five minutes for my questions.

You know, I have to say, just as an aside, this problem puzzles me. It seems to me that this is something that there should be broad and bipartisan support for. That the objections to the pipeline are a great example of straining at a gnat and swallowing a camel, I just think you have to work—you have got to work hard to find real objections to this project.

And I understand the keys are, you know, can we operate it safely and is it going to increase CO₂ emissions in a meaningful way? And I think that you have done a great job of answering those questions. And when you weigh that against the—you know, the cost-benefit analysis of the economic impacts and the national security interests, again, it is difficult for me to understand why this is not an easy decision and, frankly, a decision that should have been made, well, sometime ago, certainly within the last four years.

The environmental groups rest their opposition on the proposed project on the assumption that it will contribute to climate change, and I think there are two false assumptions here. One of them is very meaningful to me as a former business owner, the presumption that in the absence of the pipeline, this natural resource will remain in the ground, and I just can't imagine an economic analysis or an economic model that would prove that. I mean it would work against everyone's self-interest that are involved in this project to say that, well, they can't pipe it; therefore, they are going to leave it.

And the second one would be that the emissions from the sands production would have a significant impact on climate change, which is what many of you have addressed here today. I guess I would ask maybe Mr. Helms or maybe, you know, other members of the panel if you want, Mr. McCown or Mr. Knappenberger, if you want to jump in on this. And you have answered it on some level already but I would like to go into just a little more detail, first, your opinion on the first presumption that is this oil would remain in the ground if we are not able to pipe it. Mr. Helms, you look anxious to answer this.

Mr. HELMS. Thank you, Chairman Stewart. I am anxious to answer it because people believe that the Bakken crude oil would remain in the ground in the absence of pipeline transportation, but the fact is that innovations in transportation systems and innovations in markets seeking the ideal market for the crude oil that

was tailored to the crude oil led to an abundance of rail transportation out of North Dakota. So, as I stated, 71 percent of our crude oil now moves by rail in the absence of pipelines. I think it is a faulty presumption that the oil will stay in the ground in the absence of Keystone XL pipeline. I think innovations will be put in place by industry to move that oil some other way—

Chairman STEWART. And in this case—

Mr. HELMS [continuing]. And those ways will be less safe and more environmentally risky.

Chairman STEWART. And that is what I was going to re-emphasize. In this case, the options are much, much worse than having a pipeline.

Mr. HELMS. That is right.

Chairman STEWART. Yes. Any other comments then?

Mr. MCCOWN. Now, Mr. Chairman, I was just going to echo those comments that, you know, this oil will find its way to the market, and it is already flowing through other pipelines. It is traveling by barge down the Mississippi River. Those efforts will continue, so it is in our interest to make sure it is transported as safely as possible, and that is with a brand-new, state-of-the-art pipeline.

Chairman STEWART. To the—to other world markets, and the Pacific Rim, for example, isn't it safe to say that our standards on air quality and other environmental thresholds are more stringent than if this oil were refined in India or China?

Mr. MCCOWN. Absolutely. And, you know, the EPA is not in China yet to my knowledge.

Chairman STEWART. Yes. So if you are interested in global climate change and recognize that this is a global market and a global problem, wouldn't you be advocating for this product to be refining here in the United States where we have very strict refining standards?

Mr. MCCOWN. Absolutely. And that is my argument as well, that, you know, this displaces oil from less stable nations, it displaces oil that is being brought in from overseas, and I think you have made a critical point on not only the emissions but also on the energy security component as well.

Chairman STEWART. Okay. All right. Thank you. Thank you for your responses.

And I now recognize Ms. Bonamici for her five minutes.

Ms. BONAMICI. Thank you very much, Mr. Chairman.

Just in response to your comments, Mr. Chairman, I do want to point out that the president of Canadian Natural Resources Limited recently said long term we do need Keystone to be able to grow the volumes in Canada. So I just wanted to point that out, that there will be growth because of the Keystone pipeline and we would need to keep that in mind.

Mr. Swift, in your testimony you talked about the number of permanent jobs that are anticipated from the Keystone XL pipeline, and there is no question that there will be several thousand temporary construction jobs, no doubt about that, but in terms of permanent jobs, you mentioned—

Mr. SWIFT. The State Department estimated that there would be 35 permanent jobs.

Ms. BONAMICI. Thirty-five jobs. And just to put that in perspective, the Congressional Budget Office estimated that there will be 750,000 jobs lost because of sequestration, so I just want to put that in perspective. We are talking about 35 permanent jobs.

In your testimony, Mr. Swift, as well as in the EPA's April 22, 2013, letter to the State Department commenting on the Draft Environmental Impact Statement, there is a brief but, I think, a significant discussion regarding the Enbridge spill at the Kalamazoo River in Michigan and what has been learned so far about spills of oil sands or diluted bitumen into water bodies. And the EPA expressed its concern about the Keystone project by suggesting on page three of the letter, "spills of diluted bitumen, dilbit, may require different response actions or equipment from response actions for conventional oil spills."

They go on to suggest that the State Department address this in greater detail and they state on page four of the letter that dredging of the bottom sediments was determined to be the best way to clean up the Kalamazoo River, which three years later they are still working on. But if you read the EPA's response in its entirety—and I certainly don't want to speak for them because they are not here—the letter seems to suggest a concern that we may not know enough about how to clean up this material. So are you aware of any other best practices for cleanup of diluted bitumen besides dredging the river, or are you aware of whether the State Department discussed any alternatives in the Draft Environmental Impact Statement for best practices of cleanup of diluted bitumen?

Mr. SWIFT. The State Department recognized that the Kalamazoo spill poses unique risks that conventional practices had been inadequate to contain and remediate the spill, but they made the point that they were looking toward future innovations to be able to deal with tar sands spill. And unfortunately, those innovations haven't happened. We are no further now than we were in 2010 when it comes to dealing with diluted bitumen tar sands. And the problem there is that, you know, once you have a release in a water body, the bitumen is heavier than water. It sinks into the water column. And most conventional practices rely on the idea that oil will float on the water's surface.

Ms. BONAMICI. All right. Thank you. And also, Mr. Swift, as I mentioned in the opening statement, we had a hearing a couple weeks ago in the Environment Subcommittee on relevant issues related to climate change. We had Dr. Bill Chameides here, a well-respected atmospheric scientist who studies global warming and climate change, and he is suggesting an iterative risk-management approach, meaning that we must constantly reevaluate whether we are making the right decisions to address climate change as we learn more as technologies change.

And we have heard today from some of the witnesses who now say that Keystone XL will not matter much to the amount of global greenhouse gas emissions. However, each new project, without strong controls, will add more greenhouse gases into our atmosphere. So will you provide your views on how the Keystone XL project would affect global greenhouse gas emissions given that we estimate that the substance transported by Keystone is 17 percent more greenhouse gas-intensive than conventional crudes?

Mr. SWIFT. Well, so EPA estimates that it would add, you know, a billion metric—a million metric tons of carbon in the atmosphere over its lifetime just simply by replacing tar sands—or conventional crude with tar sands at the Gulf Coast. One of the important things to recognize is here we have a project in which you can map—and, you know, my—Chip would agree that you can actually determine an impact on global temperatures from building this pipeline. And in the scheme of climate change where one degree Celsius is the difference between significant environmental changes that have significant impacts on how we are able to live our lives in the future, a little bit over the top makes a big difference when it comes to whether we reach our climate goals or not.

Ms. BONAMICI. Thank you. And just in my remaining few seconds, I would like to hear from each witness quickly, please. I have heard that building the Keystone XL might actually increase gas prices in the Midwest. Is that correct?

Mr. SWIFT. I will say that TransCanada noted that building Keystone XL would increase oil prices in the Midwest. And one of the tar sands producers, the President of Cenovus, noted that the lack of pipelines from Alberta was constituting a subsidy to U.S. energy consumers of over \$30 billion a year.

Ms. BONAMICI. I am sorry. My time is expired. I yelled back. Thank you, Mr. Chairman.

Chairman STEWART. Did any of the others want to address that last question? She left it open for any of you.

Mr. MCCOWN. I will just mention that because of the constraints, there is a discount on crude but the refining margin is greater, but that doesn't necessarily translate into cheaper retail prices. So the refining margins may decrease once Keystone, but I don't see a direct impact to added retail price at the pump.

Chairman STEWART. Okay. All right. Thank you. I would just note quickly if you are unemployed right now and hoping for a job, having a job to only last two or three years is not a bad deal when you are looking at that or nothing.

Mrs. Lummis, the Chairwoman of the Subcommittee on Energy.

Mrs. LUMMIS. Thank you, Mr. Chairman.

Mr. McCown, some of the opponents of the project have argued against a piece of infrastructure, pipeline, that is widely used in the United States. I would like to know if you agree that oil sands pose greater risks for pipeline integrity.

Mr. MCCOWN. I do not believe that they do. Canada has been transporting this type of crude since 1968. The United States has about ten years of experience transporting this crude. The Integrity Management Program for pipeline safety has come a long way—a long way in the last decade to now where corrosion is no longer the leading cause of pipeline accidents. Serious pipeline accidents are caused by third-party damage. That being said, there are multiple studies out on dilbit corrosivity. I have several of them here. Each one of them says, you know, pipeline steel wet by oil does not corrode. The pH values of the dilbit do not contribute to stress corrosion cracking, which is what Mr. Swift was talking about, so long as a different epoxies are used, different type of bonding materials, which we are going to see in this pipeline.

So, you know, this oil has been transported safely for a very long time, and, you know, have there been spills that have been referenced? Yes, but it is a little bit of a leap to then say then they must because to because of this type of oil. In fact, like I said, we know that most pipeline accidents are not caused by the pipelines themselves.

Mrs. LUMMIS. Follow-up question: the State Department's assessment was that the possibility for spills is rare and relatively small. Do you agree with the State Department's assessment, and do you know what they base their conclusions on?

Mr. McCOWN. I do agree. I mean, they based their conclusions on the review of the pipeline process and the pipeline design specs, which it is my understanding the State Department was aided significantly by the USDOT, who are the pipeline experts and—in assessing this pipeline. You know, the 57 special conditions frankly, you know, go well above and beyond what federal law currently requires in many areas with respect to the design and the operation of the pipeline. That doesn't mean we shouldn't be vigilant. It doesn't mean that we shouldn't hold the accountable responsible for how they operate the pipeline, but, you know, I have looked at this pipeline. I have looked at the specifications. I have talked to them, and I feel confident that this will, in fact, be the safest pipeline ever constructed, and that enhances security. And, as we know, pipelines are the safest mode of transportation. To me, this is a no-brainer.

Mrs. LUMMIS. One more question, this one for Mr. Knappenberger. Regarding the EPA's comments on the State Department report, the EPA questions the finding that Keystone XL would not substantially affect greenhouse gas emissions or contribute to climate change. Could you comment further on why you believe the State Department is correct rather than the EPA?

Mr. KNAPPENBERGER. Well, I don't take a strong opinion on which is correct when it comes to the carbon dioxide emissions from the pipeline. When you translate carbon dioxide emissions, though, into some sort of climate unit, which is what everyone is interested in, the climate impacts of the pipeline, you find that the differences between next-to-no emissions and EPA's analysis, which turned out to be 18.7 million metric tons of extra emissions, it sounds like a lot, but when you translate those extra emissions into carbon units or into climate change units, they turn out to be hardly any difference between them at all. We are talking about hundreds of thousandths of degrees here.

Mrs. LUMMIS. Is it true that we now meet Kyoto Protocol numbers?

Mr. KNAPPENBERGER. I don't believe that is the case, no.

Mrs. LUMMIS. Okay. Is it true that the Clean Air Act has produced cleaner air every year since it has been in effect?

Mr. KNAPPENBERGER. Well, the Clean Air Act, until recently, wasn't designed to regulate carbon dioxide emissions, so I think the Clean Air Act probably successfully cleaned up what I consider traditional pollutants in the air. I don't think that carbon dioxide is—sort of meets the definition of a traditional pollutant.

Mrs. LUMMIS. Is it a pollutant? Is carbon dioxide a pollutant?

Mr. KNAPPENBERGER. Not in my opinion.

Mrs. LUMMIS. Okay. Mr. Chairman, I yield the balance of my time.

Chairman STEWART. Thank you, Mrs. Lummis.

We now recognize Mr. Swalwell.

Mr. SWALWELL. Thank you, Mr. Chair.

And my concern is primarily environmental safety and economic growth and how we balance the two of those. And I understand and appreciate the need for jobs. And our brothers and sisters in the building trades will tell you that right now in these tough economic times that any job is a good job, even a temporary job, because we know, in the construction trades, they move from temporary project to temporary project. And I certainly appreciate that. And what I want to talk about is just kind of weighing the environmental impacts against economic growth and whether the long-term impacts outweigh the short-term gains in economic growth.

Also, my friends from the other side have expressed concerns about the Administration and frustration with the Administration going forward, but I think what we have seen here is two conflicting reports, one from the State Department and one from the EPA. And I would suggest and put forward that if there was a conspiracy by the Administration against this project, they are not doing it in a very good way because they certainly would not have two conflicting reports.

And so I ask you, Mr. Swift, does it seem like there is a conspiracy against this project from the Administration, or is it more complicated than that because of such a large-scale project?

Mr. SWIFT. Certainly no conspiracy. And I would also mention that this phase of the Keystone XL pipeline has really only been in review for about 12 months after it was rejected. This is a new presidential permit application. It restarts the process.

Mr. SWALWELL. Great. Mr. Swift, in your testimony you describe some significant environmental concerns associated with this project, including increased greenhouse gas emissions and potential risks to pipeline safety. Is there any way we can address or mitigate these impacts while still allowing Keystone XL to move forward?

Mr. SWIFT. Well, certainly, one of the key issues is a higher carbon content of tar sands. And, to some extent, we have seen very little progress in Canada at reducing the carbon content of tar sands production paths. Canada agreed with us to reduce our—their emissions by 17 percent of 2005 levels by 2020, and they are on track of—to increasing theirs by five percent while we are on track to meeting ours. So, to some extent, one of the issues is the nature of tar sands production.

Mr. SWALWELL. Also, an argument I have heard in favor of this project is that from a national security standpoint it is better that we are receiving extracted oil from allies like Canada rather than volatile areas like the Middle East. But given that the price of crude oil is set globally and world oil production was about 89 million barrels per year last year according to the Energy Information Administration, how would Keystone impact gas prices in the United States and, let's say, if we had a major supply disruption somewhere else in the world?

Mr. SWIFT. Keystone would not buffer us from supply disruptions, because when you have a supply disruption, there is a global market. Canadian oil prices go up despite the fact they have no other market to sell it to than the United States. I should mention that over the last five or six years, the one thing that has begun to protect the U.S. energy market is our reduced consumption of fossil fuels. We have reduced our use by over two million barrels a day, which is quite a bit more than Keystone would carry.

Mr. SWALWELL. Is there any guarantee in any of the contracts you have seen or specs you have seen that would promise that U.S. consumers would have access and rights to the oil first?

Mr. SWIFT. There is no guarantee whatsoever, and in fact, Trans-Canada has been asked to make such a guarantee and they have refused to do so. One of the areas of State's analysis indicates that over half of the crude oil in Keystone XL will be refined and exported internationally.

Mr. SWALWELL. And so when it comes to the impacts of oil supply disruptions and price volatility on our national security, do you think it is fair to say that the big issue is not so much America's dependence on foreign oil but rather it is our dependence on oil, period?

Mr. SWIFT. That is exactly how I see it.

Mr. SWALWELL. Great. Thank you. And I will yield back the balance of my time.

Chairman STEWART. Thank you. The Chair now recognizes Mr. Rohrabacher.

Mr. ROHRABACHER. Thank you very much, Mr. Chairman. And thank you for holding this hearing.

Let me just note, I was a young reporter before I got involved in working with President Reagan and coming here, and my memory has it that almost every single oil and gas project that has been proposed in my adult lifetime has been opposed by—and strenuously opposed by a certain group of people within our society. And I will have to say that most of the opposition to oil and natural gas, which, of course, provides us as Americans with—well, with the energy we need for—to have an agricultural system that provides us food and the fuel that we need for commerce and we have national defense and national security and industry. All of these things depend on oil and natural gas now. Yet, during my lifetime, there has been a group of people opposing every single new project. There is always some reason.

And I noted when I was younger—I covered a story when they were talking about oil spills, and there was an oil spill off of my coast, and I was concerned about it. And the oil companies did a study to see what the problems were, and when they had a hearing on it, they had a hearing—I happened to be a young reporter at the time and, Mr. Chairman, I will never forget this hearing. The oil companies were really boring and didn't give us much copy, but there was a young girl outside the hearing who was holding up a rubber duck covered with oil screaming "murderer" at the guys who were going in to testify. And you can imagine who got the press coverage.

This is really a significant—this is really significant to whether or not we are going to have prosperity in our country, because at

that time the American people took for granted that we were going to be prosperous, and we were going to be secure, and there would be these fundamental building parts of our economy that would develop as they always had been. That is not the case anymore. The American people understand how fragile we are economically and understand how, even with supposedly a 7.5 unemployment rate—anybody who believes that probably also believes in global warming—we have to take this seriously. And let's just note of all these objections what they have accomplished, Mr. Chairman, is that we have hired a lot more lawyers, and the lawyers have made a lot of money over the years on this, which is then added to the bill that costs for energy, of course.

The one other thing that I remember is also that the horrendous predictions of what would happen if we built the Alaskan pipeline. It just happened to be at that time. Now, I want everybody to think what our economy would have done in the last 20 years had we not built the Alaskan pipeline. But we heard the same thing and we heard the caribous were going to disappear because the pipeline was going right through their breeding area. And now, what have we found out after the pipeline? They love the pipeline, and in fact, there are more caribous than ever because they sort of snuggle up to it when it gets cold.

We have got to start using our heads on this when we are making decisions, because it is going to impact on more than just the caribous. It is going to impact on whether or not the United States is a prosperous and secure country. And I find the arguments that we faced about pipeline—about this particular project, it has nothing to do with safety; it has everything to do with the global warming theory that human beings are causing the planet to change and get warmer and warmer, I might add. The predictions that we have had is by now it would be five degrees warmer than it is, and actually, it is getting cooler.

So with those—that type of—I think I will—I have got exactly 25 more seconds, and instead of leaving it up to the panel, I will just—with one last little shot here, and that is I believe that global—the global warming theory based that mankind is impacting on our climate has been so exaggerated just beyond—obviously, mankind has some impact because we all exhale carbon dioxide. And—but it has been so exaggerated that it will bring down the standard of living of the American people, this fraudulent idea that we are the primary factor in climate change and then the predictions of climate change just never happened. I mean it is—we are going in the opposite direction.

Thank you very much, Mr. Chairman.

Chairman STEWART. I thank you, Mr. Rohrabacher.

And we now turn to your companion from California, Mr. Takano.

Mr. TAKANO. Thank you, Mr. Chairman. And I share the gentleman's concern and love of caribou.

Mr. ROHRABACHER. I eat the caribou.

Mr. TAKANO. I will leave it at that. I live somewhat inland from the gentleman in California. I live in a region of California that is in a basin surrounded by mountains, and so I am very grateful for strong EPA standards that have helped clean up the air. I remem-

ber as a little boy that we would have days where we couldn't go to physical education because the air quality was so bad. The air has gotten better through the standards, and the air may not be cleaner air from year to year, but certainly standards have helped us clean up the air in our region.

Now, my question to Mr. Swift: Is it the case that this bitumen—and I have learned a lot more about bitumen here—will this oil be refined within the United States, or do we expect the bitumen to be exported abroad on ships to be refined in other countries?

Mr. SWIFT. Well, in the short term, we are expecting it to be refined in the Gulf Coast of the United States. There is nothing—there are prohibitions to exporting crude produced in the United States. Canadian producers could export the bitumen for refinery—for refinement elsewhere, but the general expectation is it will move to the Gulf Coast, be refined there, and then many of the products from that would be exported internationally.

Mr. TAKANO. When you say the Canadians could export crude bitumen without being refined in the United States, what do you mean by that? You mean that even though it is transported through this pipeline, it could be exported even from the endpoint in the United States directly in its crude form?

Mr. SWIFT. There is no legal basis for preventing them from doing that once they get it to the—to Houston.

Mr. TAKANO. Okay. Well, Mr. McCown, you are shaking your head. Do you disagree with that answer?

Mr. MCCOWN. I do—yes, sir, I do disagree with that answer. You have to have an oil export license if you want to export raw crude. So I think it is—if the oil does not come here, and Canada built a different pipeline system or a rail system to somewhere else, sure, it can be exported. But if it comes to the United States, it has to be at least refined here.

Mr. SWIFT. The export license requirement is for crude produced in the domestic 48 States of the United States. It doesn't apply for crude produced in Alberta.

Mr. TAKANO. Okay. Mr. Chairman, you raised the point about the—you know, the preference—the desirability of having crude refined in our country rather than other countries, which may have less stringent standards. I am just wondering if there is consensus that perhaps—or this point to me brings up, you know, the possibility that maybe we should look at tightening up that provision, that all oil that leaves our shores should be refined here and meet the more stringent standards set by our EPA.

Mr. SWIFT. Well, one point I would make—was that a question for me?

Mr. TAKANO. Yes, yes, go ahead.

Mr. SWIFT. Well, one point I would make is that Canada has proven—there has been significant opposition to pipelines that would move tar sands across Canada's west coast to the point that even industry observers are saying that those pipelines are unlikely to move forward. And the other point to keep in mind is that China doesn't have the capacity to process heavy crude. So based on the refinery market that we see in the world today, the real question is does it get refined in the United States or does production expansion slow down? The question isn't whether, you know,

we see zero tar sands production in 2030; the question is does production go from two million to three million barrels a day or two million to six million barrels a day? And when it comes to the environmental impacts, that makes a big difference, which is an area you land on.

Mr. TAKANO. So it is the increased capacity that this pipeline would facilitate. It would stimulate far more rapid, intensive development of this source of bitumen?

Mr. SWIFT. That is exactly right.

Mr. TAKANO. How much experience do we have with bitumen flowing across oceans?

Mr. SWIFT. When it comes to Canadian tar sands bitumen, I don't think we have much experience.

Mr. TAKANO. Are there comparable source of bitumen that are transported in large container ships?

Mr. SWIFT. There are some heavy sources of crude from Venezuela that have some similar properties that move into Gulf Coast refineries.

Mr. TAKANO. Okay. Have there been any spills of this sort of bitumen of any note?

Mr. SWIFT. Not to my knowledge.

Chairman STEWART. And, Mr. Takano, if I could, you may have noticed that your—we didn't start the clock—

Mr. TAKANO. Oh, I am sorry.

Chairman STEWART. We didn't start on time. I think you are about out of time, but if you want to finish this question—

Mr. TAKANO. Okay. So, you know, my concerns are mainly about the Chairman's concern about China and India having lesser standards in terms of refining. Is that a significant reason why the environmental community is concerned about—is this what adds to the global climate change?

Mr. SWIFT. Well, certainly one of the key issues is, again, China and India don't have the capacity to process this crude, and Canada currently doesn't have the ability to send it to those markets. So, to some extent, the real issue is whether—the only way that tar sands crude or its refined products get to the international market right now is via Keystone XL.

Mr. TAKANO. Okay. Thank you. Mr. Chairman, thank you.

Chairman STEWART. Okay, thank you. Yes. It would surprise me if they—China and India don't develop that capability very quickly if the opportunity arose for them.

Mr. Weber.

Mr. WEBER. Thank you, Mr. Chairman.

For the panel, any of you all think that pipeline DB that wealth flowing through a pipeline produces as much CO₂ as 300 to 500 diesel 18-wheeler truckloads a day? Mr. Helms, somebody, yes or no?

Mr. HELMS. Well, Congressman Weber, I don't believe that it does and—

Mr. WEBER. Thanks. Mr. McCown.

Mr. MCCOWN. It is not.

Mr. WEBER. Mr. Swift.

Mr. SWIFT. I—

Mr. WEBER. Your mike is not on.

Mr. SWIFT. Truck transport is more energy intensive than pipeline.

Mr. WEBER. So you would agree that it does produce more CO₂?
Mr. Knappenberger.

Mr. KNAPPENBERGER. Yes, I agree.

Mr. WEBER. You agree, thank you.

Next question for the panel, an industry safety rating of 99.999525 percent safe, Mr. Helms, are you aware of any other industry that has that kind of safety record?

Mr. HELMS. Congressman, I am not aware of any—

Mr. WEBER. Thanks. Mr. McCown.

Mr. MCCOWN. I am not. And I think that will even go higher.

Mr. WEBER. Mr. Swift.

Mr. SWIFT. Industry is hoping to improve that record. When you think about the amount of oil—

Mr. WEBER. I will take that as a no. Mr. Knappenberger.

Mr. KNAPPENBERGER. I don't know of any, no.

Mr. WEBER. I don't either. Next question. Mr. Swift, you said that the likelihood—it seemed like you raised a lot of discussion about the likelihood of the bitumen oil leaking, and so that seems to be a great degree of your argument against the pipeline is based on the leakage. So you are not as concerned about the climate issues as you are the leakage. Is that fair to say?

Mr. SWIFT. No, we are also very concerned about the climate.

Mr. WEBER. More so than the leakage?

Mr. SWIFT. I would say one of the primary environmental impacts is the climate issue.

Mr. WEBER. Well, that is one of your primary environmental impacts. So if they—we can make the pipeline safer and if we can make climate emissions lesser, then you would be good?

Mr. SWIFT. Yeah, if we can do—if we can—yeah, if we lower the climate emissions and make the pipeline safer.

Mr. WEBER. Great. Are you familiar with the—and acronym BACT?

Mr. SWIFT. You may have to refresh my memory.

Mr. WEBER. Mr. Helms, do you know what BACT stands for?

Mr. HELMS. Yes, Mr. Congressman. It is best available control technology.

Mr. WEBER. Okay. And so is it safe to say that while we are developing—using this bitumen that we can improve our BACT, our best available control technology, so that we can reduce those emissions? In fact, I am somewhat amused by your discussion with my colleague from California talking about bitumen and how there wasn't much experience in moving it and all that those implications, because if we refrained from new innovations, indeed we would not—you all would not be so intent on green technology, would you not? Solyndra wouldn't have got half a billion dollars because they didn't have a track record, no experience.

So the truth of the matter is, in my opinion, that this very pipeline that comes into my district by the way—and it is not Houston; it is Port Arthur; Nederland, Texas, down on the Gulf Coast where XL pipeline terminates, just FYI. Under that assumption, the fact that we don't know how to handle bitumen, we would have never, ever embarked upon trying to improve on batteries, on wind power,

on solar power because we don't have that experience. I am amused, Mr. Swift, that you said after the Kalamazoo spill in 2010 there have not been any innovations. I am thinking, my gosh, only somewhat three years later there are no innovations, and yet, in your very discussion points, you say that you are concerned about the pipeline going out 50 years and how long out do we worry about global warming?

Mr. SWIFT. Quite some time.

Mr. WEBER. Quite some time, yet you are lamenting the fact that there is no new innovations in handling that you have seen over the scant two or three years. That seems antithetical to me.

How many of you all saw—did any of you all see the article in the *Wall Street Journal* yesterday about California and Texas producing oil? No? Okay. Well, let me make this point. My time is running short here. California—Texas produces more oil than the next four oil-producing States combined. California has been oil-averse, as my colleague over here said, people that were against everything about fossil fuel basically in his tenure. Texas' unemployment rate is 6.4 percent while California's is 9.4 percent. Texas has been the recipient of taxes of \$20 billion from the oil industry and has no income tax, while California has an unbelievable—has an income tax rate and a capital gains tax rate of 13.3 percent. So the economic impact for our working Americans is huge.

I am out of time. We need this pipeline. Mr. Chairman, I yield back eight seconds.

Chairman STEWART. Eight seconds. Thank you, Mr. Weber.

We now turn to Ms. Brownley from California.

Ms. BROWNLEY. Thank you, Mr. Chair.

I wanted to follow up on the line of questioning that Congresswoman Bonamici started at the beginning of the hearing and just talk a little bit more about job creation. And I am directing my question to you, Mr. Swift. You had mentioned that 35 jobs would be created from the Keystone pipeline. I wanted to really just explore a little bit about looking at job creation at Keystone compared to the job creation potential, I think, for sustainable alternative energy projects. And by the way, the comparison of Texas and California—I am from California—and we have been very focused on sustainable alternative energies and it is job creation as well. So if you could comment on that, I would appreciate it.

Mr. SWIFT. Certainly. In 2011 a Brookings study showed that clean energy jobs are one of the fastest-growing sectors in the United States growing twice as fast as the economy. There are over 2.7 million clean energy jobs today and a consortium of about 800 clean energy entrepreneurs recently reported that in 2012 their companies hired over 100,000 personnel. And these jobs tend to be—I mean, in clean energy, you tend to see a higher manufacturing base element to them. And in another recent study, they evaluated the job creation impact by dollar invested. It found that clean energy, for every dollar invested, you got more than three times as many jobs produced than the fossil fuel industry.

Ms. BROWNLEY. Thank you for that. Also, on the environmental side of this particular project, in your testimony I think you wrote and spoke to that the high-temperature tar sands pipelines are at a greater risk of leaks, and I think you cited a study in Kern Coun-

ty, California. And so the question is is it fair to say that railroad trains carrying tar sands are also at greater risk of leaks?

Mr. SWIFT. Well, one of the key things to keep in mind when it comes to railroads moving tar sands, while many railroads are moving Bakken crude, there has been very little tar sands by rail. A Reuters story just a few weeks ago showed that, you know, around 20,000 barrels a day was being moved to the Gulf Coast by rail or barge, and one of the—I mean the northern Albertan tar sands producers have been under many of the exact same market incentives to move their product by rail. The difficulty is they don't have the profit margins to afford the higher costs. They are more than 900 miles farther away from refinery markets. And, in fact, the mere process of moving tar sands by rail is more expensive. It requires specialized infrastructure, and you can actually fit less tar sands crude in each rail car relative to light crude. And we are not seeing the infrastructure being built out yet.

Ms. BROWNLEY. Thank you. And my last question is—I think Mr. Helms testified that his son-in-law is a farmer, I believe, and said he had no objection to the Keystone pipeline. And so I just, you know, wanted to hear your comments vis-a-vis rural areas, and will operators in rural areas be able to respond quickly in the event that there was some kind of accident or spill?

Mr. SWIFT. You know, I have talked to folks in Nebraska and South Dakota. The—one of the farmers who discovered the 20,000 gallon spill on the Keystone I pipeline was a first responder. He had no idea what to do in the event of a tar sands spill. And first responders are often the ones that detect leaks, that have to deal with it initially, and they don't have the training to deal with it.

And as far as farming goes, farmers in Nebraska are very opposed to the project, and they are concerned about its impact to their water and also looking at the climate impacts of, you know, warmer temperatures, disrupted weather on farming. Last year, we had the hottest year on temperature. Half of our corn crop was destroyed in a drought. So farmers are on both ends, concerned about their water quality and also feeling the brunt of climate change.

Ms. BROWNLEY. And do we have evidence of what your statement that you just made about ranchers', farmers' concerns and—

Mr. SWIFT. Certainly. Certainly. And statements and I can provide additional evidence of that.

Ms. BROWNLEY. Thank you. And I will yield the balance of my time.

Chairman STEWART. Thank you, Ms. Brownley.

Mr. Cramer from North Dakota, who has some interest in this, I suppose.

Mr. CRAMER. Yes, thank you, Mr. Chairman, and Ranking Member as well. Thank you to all of the witnesses. Special thank you to my friend, Lynn Helms, whose intellect is matched only by his integrity as a regulator.

And I might add that while North Dakota enjoys the fastest-growing personal per capita income and the lowest unemployment rate and a huge budget surplus in the State's coffers and more jobs available than people to fill them, we also were recently ranked by the American Lung Association with an A rating for clean air. We meet all ambient air quality standards as prescribed by the EPA.

We have the cleanest water, cleanest land, most productive topsoil in the country. We feed a hungry world, and we do it all pretty well, and most of the time we would like to tell the Federal Government we will call if we need your help, but they seem to want to impose themselves quite regularly.

I think, as an opening statement beyond that, I want to remind the Committee or those of you that maybe don't know, for nearly 10 years I was on the North Dakota Public Service Commission, carried the pipeline portfolio, have sited billions of dollars and thousands of miles worth of pipelines. Perhaps the biggest challenge in that tenure was siting the original Keystone pipeline. We talk about this like this is the first time it has been invented, as though no one ever thought about moving oil sands to market before.

The first 260 miles in the United States of the original Keystone pipeline are through North Dakota. If you hired Sacajawea to find a worse route, she couldn't have. They chose a lousy greenfield route in eastern North Dakota through some of the richest farmland in the country, two scenic rivers, eight counties, 600 landowners, none of whom benefited a bit from oil other than using it in their combines and their tractors and heating their homes and all the things that we all use oil products for.

The great part of that experience for me was that, while there were 600 landowners involved in the original TransCanada Keystone pipeline, all 600 willingly signed a contract. We did not have to go to condemnation for one inch of that pipeline. That is not because we are great regulators or great politicians; it is because we have citizens who understand the value of this important product and understand it is the safest way to move it.

Now, it is interesting, perhaps, for somebody from TransCanada to hear me expose the virtues of that process, because at the time they thought I was the biggest pain in the backside that they had ever come across because we did require them to do a lot of things that they weren't necessarily inclined to do, including pulling under rivers as opposed to cutting through them.

But I also think it is important to note that we did have a spill at one of the pumping station, but the good news was that after the spill everything worked. The SCADA system worked. The balance shut down. Eyewitnesses saw the oil. The berms kept it in. The little bit that got out was cleaned up at TransCanada's expense to the point where PHMSA was satisfied and the health department was satisfied in the Public service commission was satisfied with the repairs to the point that they were up and running within days. I think to talk about it as though there would never be a spill would be inaccurate, but I think it is also to talk about as though a spill is somehow going to ruin the world is also inaccurate. We always want to do better and always can.

I could talk about a lot of things, including siting the Bridger pipeline, which is the onramp to the Keystone XL. And wouldn't we love to have Bakken crude get to that market where they pay a premium as opposed to a discount, which is what we get in many of the markets?

That said, I want—I do have a technical question and probably start with you, Mr. Helms, anybody else that could help with this.

We talked about this dilbit or bitumen as though it is some sort of a foreign substance, but there has been some disagreement both here and in the Natural Resources Committee, and I think the E&C Committee as well. Could you tell us the difference and is it that dramatically different? Because I really do not know. Mr. Helms, if you could, you understand this production as well as anybody.

Mr. HELMS. Mr. Chairman, Congressman Cramer, I have been to the oil sands in Fort McMurray and looked at the dilbit. It is not all that different than the crude oil that I produced when I worked for Texaco in central Montana and northwestern Montana. Those were heavy crude oils that were produced out of the Sawtooth sands, and we transported them by truck to Great Falls, Montana, and had them refined there. It is not some foreign alien substance. It is a mixture of light hydrocarbon and heavy hydrocarbon, and you can move it in pipelines or tank trucks or railcars.

Mr. CRAMER. Mr. McCown, do you have anything to add?

Mr. MCCOWN. I completely agree with everything Mr. Helms just said.

Mr. CRAMER. Well, then, let me just in my remaining seconds cite a couple of other things. I think in situ process is interesting. It has become better and better and it always will be. China builds coal-fired power plants like we build stick houses. They are not going to not build refineries for this stuff. And I have been to enough funerals of North Dakota soldiers fighting in the Middle East to remind everybody that this is a matter of national security, not just economic security. And I yield back.

Chairman STEWART. Thank you, Mr. Cramer.

Then it looks like our last questioning from Mr. Veasey.

Mr. VEASEY. Thank you, Mr. Chairman.

I wanted to ask Mr. McCown a question about best practices and what his opinion was on best industry practices being used to build this pipeline. And more specifically, I want to know would somebody be able to come back, you know, after the pipeline is built a year later, two years later and say, well, actually, this could have been done to make the pipeline safer and even industry agreeing to that to a certain extent.

I know that with some of the environmental issues that we have had in the North Texas area, not just with oil and gas but others—take, for instance, flaring. Someone will say, well, it is too expensive to pipeline the gas out and so we will just flare it. We know environmentally that flaring is not the best thing to do, but sometimes, it is just done for efficiency and for maximizing profits. So are the very best practices being used as it relates to the environment and the safety of this pipeline?

Mr. MCCOWN. That is a very good question. And yes, they are. And I share your concern. I have been a planning and zoning commissioner in North Texas where I have voted against pipelines that didn't seem to make sense in places. But yes, the—yeah, the 57 special conditions that TransCanada has come up with, they did that before the passage of the last pipeline safety improvement bill. And a lot of the things that are in here are now lost. So they were cutting edge ahead of the law.

I think the key component is to make sure that the regulator not only holds them to the highest standard but requires continual refinement of that process. As technology includes—if you look at cars 20, 30 years ago, we didn't have airbags, we didn't have different things. As technology increases, then we hold the entire infrastructure system accountable as well. But the question isn't, you know, should we rebuild the pipeline? The question is this will be the state-of-the-art as we have today far exceeding anything else that is out there. And that makes it safer.

Mr. VEASEY. Mr. Swift, what is your opinion on the best practices and this being the safest possible pipeline to move crude?

Mr. SWIFT. Well, we heard this same language used with regard to Keystone I and TransCanada's natural gas Bison pipeline, both constructed in 2010, both with special conditions. Both said they were state-of-the-art and would unlikely to spill in the first 30 or 40 years. And with Keystone I, we saw 14 spills in the first year; and with the Bison pipeline, a 60-foot section of it exploded. Now, TransCanada was recently put under a sweeping review by Canadian regulators for what one whistleblower, who was a—quality control personnel, claims to be systematic violation of minimum safety standards in the building of pipelines.

So, on one hand, we have questions of whether they use the best methods available and this—or will they—will the specs be the best available? And the second is will they build to spec? And both of these issues seem to be a problem with regard to TransCanada.

And as a final note on these 57 conditions, as Brigham mentioned—as Mr. McCown mentioned, you know, many of the special conditions are now minimum safety standards set by the 2012 pipeline safety law. Many of these special conditions are conditions that TransCanada was already required to abide by because of the—its Canadian sections. So while there are a large number of conditions, if you really look at which ones add any, you know, bar above what the current bar is, it is a much smaller list.

Mr. VEASEY. And I would like for Mr. McCown to respond specifically to what Mr. Swift said about the specs.

Mr. MCCOWN. Sure. Well, there is a lot of spin going on there, but the fact that the Canadian portion is built to whatever spec, it doesn't require the U.S. portion to be built to that same spec. Two, the—PHMSA oversees the construction and the placement and service through its own inspections and through third-party validators both that the company uses and PHMSA uses so it is built to spec.

Secondly, you know, when I was at PHMSA, we moved the “spill criteria” down to basically, I think, anything more than five gallons. So when people say it was a spill, there is a big difference between a little spill and a big spill, and these numbers get thrown around like they are candy and it is a little misleading, frankly.

Mr. VEASEY. Mr. Chairman, thank you.

Chairman STEWART. Thank you. All right, thank you. It appears that that is the end of our questioning then. I would like to thank the witnesses one more time for your valuable testimony and for your time, your expertise. We appreciate it.

To the Members of the Committee, there may be those who have additional questions for you, and if that is the case, we will ask you

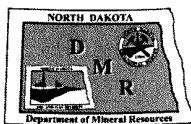
to respond to those in writing. The record will remain open for two weeks for additional comments and written questions from the Members.

The witnesses are excused and this hearing is now adjourned.
[Whereupon, at 11:37 a.m., the Subcommittees were adjourned.]

Appendix I

ANSWERS TO POST-HEARING QUESTIONS

ANSWERS TO POST-HEARING QUESTIONS



Department of Mineral Resources

Lynn D. Helms – Director

North Dakota Industrial Commission
www.dmr.nd.gov

June 6th, 2013

Congress of the United States
House of Representatives
Committee on Science, Space and Technology
2321 Rayburn House Office Building
Washington, DC 20512

RE: Questions for the Record

To Mr. Taylor Jordan,

Thank you for the opportunity to provide testimony and additional information.

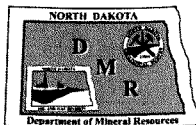
Following, you will find the committee member's questions with my responses.

To the Honorable Chris Stewart:

1. **Mr. Helms, the State Department's analysis concluded that construction of the Keystone XL pipeline would support 40,000 jobs. 12,000 of these would be in the project area states, and 1,000 more would be associated with the construction of Bakken Marketlink. Can you explain what the Marketlink project is and what benefits it will yield for North Dakota?**
 - a. **Additionally, please discuss how revenue, taxes, and royalties associated with production in the Bakken and infrastructure projects like Keystone XL have positively impacted the North Dakota economy and state budget.**

The Bakken Marketlink project is the facility to be constructed in Baker, Montana that will collect, store, and inject 60,000 to 100,000 barrels of light sweet crude oil produced in eastern Montana and western North Dakota into the Keystone XL pipeline. The primary supply mechanism planned for Bakken Marketlink is the Belle Fourche and Bridger gathering and transportation pipeline systems. The following benefits to North Dakota have been identified for oil transportation by pipeline into and out of Bakken Marketlink:

- 1) Reduction of 300 – 500 truck-loads of crude oil per day transported on North Dakota highways
 - a. Traffic statistics indicate approval of the Keystone XL pipeline will reduce highway fatalities in North Dakota by three to six per year and injury crashes by 85 to 150 annually.
 - b. Oil spill statistics indicate approval of the Keystone XL pipeline will reduce the number of oil spills in North Dakota 60 – 80 per year.
- 2) Reduction of one to two unit trains per day transporting crude oil from North Dakota.
 - a. Calculations show that approval of the Keystone XL pipeline will result in 450,000- 950,000 Kg/day less greenhouse gas emissions in North Dakota as well as significant decreases in dust.



Department of Mineral Resources

Lynn D. Helms – Director

North Dakota Industrial Commission
www.dmr.nd.gov

June 6th, 2013

Congress of the United States
House of Representatives
Committee on Science, Space and Technology
2321 Rayburn House Office Building
Washington, DC 20512

RE: Questions for the Record

To Mr. Taylor Jordan,

Thank you for the opportunity to provide testimony and additional information.

Following, you will find the committee member's questions with my responses.

To the Honorable Chris Stewart:

1. **Mr. Helms, the State Department's analysis concluded that construction of the Keystone XL pipeline would support 40,000 jobs. 12,000 of these would be in the project area states, and 1,000 more would be associated with the construction of Bakken Marketlink. Can you explain what the Marketlink project is and what benefits it will yield for North Dakota?**
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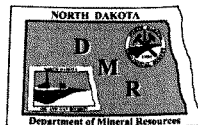
Following are impacts to the economy of North Dakota associated with Bakken production:

- 1) The oil and gas industry generated \$30.4 billion for North Dakota's Economy in 2011.
 - a. Direct impacts of the oil and gas industry were \$11.7 billion.
 - b. Secondary impacts were \$18.7 billion.
 - c. For every dollar spent in the state by the oil and gas industry, another \$1.59 in additional business activity was generated.
 - 2) The oil and gas industry created nearly 60,000 jobs statewide.
 - a. Direct employment of 40,856 full-time jobs or 9% of the state's workforce.
 - b. Secondary employment of 18,700 full-time equivalent jobs.
 - 3) The oil and gas industry contributed \$11.6 billion in economy-wide personal income.
 - a. \$798.1 million in in-state private royalties.
 - b. \$322 million in lease bonuses.
 - 4) The oil and gas industry generated \$2.65 billion in government revenues.
 - a. \$1.3 billion in gross production and severance taxes.
 - b. \$303 million in royalties, including \$145 million in state royalties, \$40 million in federal royalties returned to North Dakota, and \$117 in tribal royalties.
 - c. \$106 million in state and federal lease bonuses.
 - d. \$454 million in sales and use, corporate and personal income, property, and other taxes.
 - e. \$86.5 million in licenses, permits, and fees.
 - f. \$8.5 million in charitable donations.
 - g. \$395 million in indirect state government general tax collections.
 - 5) The oil and gas industry benefited other industries and sectors statewide and contributed \$7.4 billion in statewide retail sales.
2. The Pipeline and Hazardous Materials Safety Administration holds that pipelines are one of the safest and most cost-effective means to transport the extraordinary volumes of natural gas and hazardous liquid products that fuel our economy." Can you explain what sort of cost and safety trade-offs are being experienced in North Dakota as you try to transport crude from the Bakken in the absence of Keystone XL?

Keystone XL has signed up over 60,000 barrels per day of Bakken crude to transport from Baker, MT to Cushing, OK and has committed to carry 100,000 barrels per day. Currently, that production is being trucked from the well sites to rail facilities. This is the equivalent of 50 long haul truck loads for each 10,000 barrels. Once Keystone XL is in place, those trucked barrels will most likely be connected to a gathering system that will deliver them to Keystone XL.

Approval of Keystone XL will likely cause four things to happen:

- 1) 300 – 500 truck-loads per day will be taken off North Dakota highways.
- 2) There will be one to two less trains per day leaving North Dakota.
- 3) Our calculations show that oil spills from truck transportation occur at three to four times the rate of spills from pipelines. Approval of the Keystone XL pipeline will result in 60 – 80 fewer spills per year.
- 4) In the five years from 2006-2011 the number of crashes involving semi-trucks has risen substantially. Fatal crashes have more than doubled, injury crashes have more than tripled, and property damage crashes have doubled. The rate of fatal crashes has remained constant at 1.4 and injury crashes at 40 per 100 million miles driven. Approval of



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the Keystone XL pipeline is expected to reduce highway fatalities in North Dakota by three to six per year and injury crashes by 85 to 150 annually.

To the honorable Randy Neugebauer:

1. **The State Department concluded that Canadian oil sands oil would make it to market with or without the Pipeline. However, the EPA in its assessment of State's report, appeared to question this, and in particular is suspicious of other options, including rail. What is the State of North Dakota doing for transport in the absence of the pipeline and how is rail working to pick up the slack?**

Major shortfalls in pipeline export capacity have resulted in a very unbalanced transportation market for North Dakota crude oil. Lack of pipeline capacity in the midcontinent has led to much higher oil prices on the coasts and shifted the normal transportation mode away from pipelines to higher risk and impact alternatives such as rail and truck. In 2006, I co-authored an analysis of Williston Basin Crude Oil Bottlenecks that concluded transportation by rail would be an inefficient, uneconomic, short term solution. As shown by the current North Dakota oil transportation breakdown the size of the resource, changing markets, and innovations in the rail transportation industry have resulted in just the opposite. Currently, 565,000 barrels per day of North Dakota crude is transported out of state by rail with an additional 5,000-10,000 barrels per day of sour North Dakota crude trucked into Canada to access pipelines serving the best markets for that type of oil while 35,000 barrels per day of sweet Canadian crude oil is being trucked into North Dakota to access rail transportation loading facilities serving the best markets for that type of oil.

2. **While the hearing focused largely on the safety and environmental features of the pipeline, it is also true that the project will help the U.S. reduce its reliance on oil imports from less friendly nations like Venezuela, and strengthen trade ties with a strong, stable, and democratic ally. Can you discuss how North Dakota has benefited from trade ties with Canada, and what an increased energy partnership might mean for those states that have access to and can utilize the pipeline?**
 - a. **Additionally, according to the U.S. Census Bureau, for every dollar the U.S. spends on Canadian goods, Canada spends an approximate 89 cents on U.S. goods and services. Would you say that as a state, North Dakota enjoys benefits from its trade relationship with Canada?**

The US Department of Commerce's International Trade Administration statistical reports show massive trade growth between North Dakota and Canada in the last few years. North Dakota exports to Canada are up 560 percent since 2005 with the oil & gas portion of those exports up 4500 percent in that same time period. In 2005, 45 percent of ND's total exports were to Canada; by 2012 it had risen to 71 percent. In other words, North Dakota exported almost two and a half times as much to Canada than to the rest of the world combined. In 2012, 38 percent of North Dakota's exports to Canada were oil & gas. Much of those petroleum products re-entered the US to be consumed; this demonstrates how integrated the oil industry is between Canada and the USA.



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2012 was the first time in decades (maybe ever) exports from North Dakota to Canada exceeded imports from Canada to North Dakota. Other top exports to Canada include; machinery, chemicals, food products, petroleum and coal products, agricultural products and transportation equipment.

	2005	2012
Exports to Canada from ND	\$545m	\$3,063m
Exports of oil & gas to Canada	\$26m	\$1,183m
Total ND exports	\$1,192m	\$4,288m

The following statistics are provided by Government of Canada:

- North Dakota sells more goods to Canada than to all other countries combined (Canada accounts for 71 percent of ND exports).
- North Dakota 2012 exports to Canada: \$3.1 billion (up more than 40 percent over last year -- and less than half of this jump is oil).
- Number of North Dakota jobs that depend on trade with Canada: 23,100.
- North Dakota visits by Canadians: 958,800, \$255 million spent.

NOTE- North Dakota population is 700,000- visits by Canadians exceeded the population of North Dakota

Sincerely,

Lynn D. Helms

Lynn D. Helms
Director
North Dakota Industrial Commission
Department of Mineral Resources

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
Subcommittee on Environment
Subcommittee on Energy

Response to Hearing Questions for the Record
TO: The Honorable Chris Stewart

Keystone XL Pipeline: Examination of Scientific and Environmental Issues
FROM: Brigham A. McCown

- 1. You have been involved in pipeline safety and transportation issues for a long time. Have you ever witnessed the amount of delay and obstruction with regards to a piece of transportation infrastructure as we have witnessed with Keystone XL?**

Mr. Chairman, I have never witnessed any similar project having to undergo this amount of scrutiny and political wrangling. This project has now surpassed 1,700 days of review. To put this delay in contrast, the transcontinental railroad was completed in less time, the U.S. and its Allies had won World War II in Europe, and the U.S. Civil War had come and gone by now. This project has passed numerous environmental studies with flying colors and I concur with the State Department's assessment that this pipeline will offer a measure of safety above and beyond current systems.

- a. To your knowledge, would you say that the review of Keystone XL has been more thorough, exhaustive, and lengthy than typical permit applications for pipeline infrastructure?**

The Keystone XL project is clearly the most scrutinized and carefully reviewed pipeline project in our nation's history. Mr. Chairman, I would like to mention that the State Department figured out the correct answer that there would be no adverse environmental impact as early as August of 2011 when it issued the first Environmental Impact Statement in accordance with National Environment Policy Act of 1972 (NEPA).

Following revisions to a portion of the initial approved route in Nebraska, a Supplemental Environmental Impact Statement (SEIS) was issued on March 1, 2013.

The federal government has undertaken a thorough and rigorous risk assessment for this project as guided by Executive Order 13337. That Executive Order was intended “to expedite reviews of permits as necessary to accelerate the completion of energy production and transmission projects. . . connecting the United States with a foreign country...”¹ It is my opinion that 13337 has been used to delay, not expedite the review process.

b. Would it be fair to say that Keystone XL is the more studied pipeline in recent history, if not ever?

Yes indeed. After collaborating with the Departments of Commerce, Defense, Energy, Homeland Security, Interior, Justice and Transportation, as well as with other agencies such as the EPA, the State Department concluded in its EIS that Keystone XL poses little to no environmental risk for the U.S. The review process has been much more thorough than is typically required of a pipeline project, and at this point, it is fair to inform the Committee that the Keystone XL is the most extensively reviewed and heavily scrutinized pipeline in the history of our nation.

2. Mr. McCown, the State Department concluded that the proposed project would “have a degree of safety over any other typically constructed domestic oil pipeline system under current code” due to the 57 extra conditions agreed to by TransCanada. Can you touch on what a few of these special conditions or safety features are so we can get a sense of the measures being taken to ensure this is a state of the art pipeline?

¹ Executive Order 13337, 69 Fed. Reg. 25299 (issued April 30, 2004).

TransCanada and its contractors have voluntarily implemented state-of-the-art safety requirements and guidelines for this pipeline. For example, the company has committed to:

- Higher quality steel properties than required by regulation;
- Higher quality pipe manufacturing specifications than required by regulation;
- Institution of crack fracture plan above what is required by regulation;
- Installation of overpressure controls;
- Advanced control room monitoring which is more prescriptive than required under federal law;
- Reduced interval master control / valve spacing;
- Additional Pipe seam quality control to ensure welds are stronger than the pipe itself which is more prescriptive than industry standards; and
- Stronger pipe than is required for a .72 design factor.

I believe the Committee will see that the above points represent a few of the 57 different ways TransCanada has committed to a comprehensive safety plan well above what the industry, and the federal pipeline regulators at PHMSA require.

These actions are illustrative of the good faith efforts by the pipeline company to meet and exceed all requests, and frankly, they should be commended for going the extra mile when not every pipeline operator would show the willingness to do what has been offered here today.

For a full list of the 57 special conditions, please see the following link:

<http://keystonepipeline-xl.state.gov/documents/organization/205595.pdf>

a. Additionally, can you explain what a “degree of safety over any other” means in practical terms?

Construction of Keystone XL will be undertaken with the utmost attention to safety. TransCanada has agreed with PHMSA to employ special construction procedures for crossings of roads, highways, and railroads that will add additional safety where these transportation modes intersect. Additional procedures and protocols have been established to ensure appropriate offsets from existing underground utilities and safe excavation practices during construction.

In addition, the line will be remotely controlled from a control center that exceeds current federal safety standards and features enhanced safety monitoring. This also includes more robust training of control room personnel as well as a more robust Leak Detection System (LDS) than is required under the CFRs.

The Committee may like to know that I believe these enhanced safety protocols will make the safest form of large volume energy transportation even safer. Regardless of how the data is sliced, pipelines safely deliver approximately 31 million barrels of crude and refined product each and every day of the year.²

b. Please discuss the improvements in pipeline safety over the last decade and how this has reduced spills and incidents.

Pipeline operators spent at least \$2.7 billion on inspection and maintenance of their pipelines over a six-year period, and over \$600 million insuring the safety of their storage tanks. During the same period, releases have decreased by 59% and spill volumes have decreased by 43%, even as volume transported as increased. After an industry integrity management initiative,

² This figure does not take into account the volume of energy products transported by natural and other gas pipelines.

incidents caused by corrosion are down 73%, equipment failures down 50%, operational error down 40% and material and weld failures down 30%.

The pipeline industry has matured greatly since the mid-1900's and it continues to deploy the latest technology to more effectively manage risk. I expect this trend to continue in the years to come.

Pipelines safely transport 11.3 billion barrels of crude and refined petroleum product every day with a delivery success rate of 99.999952%.

While rare, pipeline incidents do occur and when they do, pipeline operators work with the U.S. DOT (PHMSA) and the NTSB to determine an incident's root cause in order to revamp procedures and regulations. PHMSA has not been shy in coming to Congress when it feels additional authority is needed, and that includes the ability to levy substantial fines against any operator who fails to meet it's corporate and environmental responsibilities. That said, I believe TransCanada will safely construct, operate and maintain the Keystone Pipeline System.

c. Additionally, can you speak to the disparity in spill rates for pipelines versus rail or truck that Mr. Helms included in his testimony?

I believe Mr. Helms' information is based upon his experiences in North Dakota. The information referenced in my testimony was compiled by the U.S. Department of Transportation's Research and Innovative Technology Administration, Bureau of Transportation Statistics, which is national in character.

Mr. Chairman, regional variations certainly do occur and with respect to rail data, HAZMAT incident levels vary substantially between urban and rural areas. I do concur with his testimony that the lack of appropriate pipeline infrastructure in the Bakken has led to a significant increase of vehicular and

rail traffic that if left unchecked, will result in more incidents while also taxing and degrading local transportation networks.

Response to Questions from the Members

U.S. House of Representatives
Committee on Science, Space, and Technology
Subcommittee on Environment
Subcommittee on Energy

Hearing Questions for the Record
The Honorable Chris Stewart

Keystone XL Pipeline: Examination of Scientific and Environmental Issues

Paul C. “Chip” Knappenberger
Assistant Director, Center for the Study of Science
Cato Institute
Washington DC

Question

1. In Mr. Helm’s testimony he stated that greenhouse gas emissions for the transport options are higher than those from the pipeline, 1.8 times higher for rail, and 2.9 times higher for trucks. Given the volumes of the crude that are now and could in the future be transported by truck and rail if the pipeline is not approved, would it be fair to say that it is rejection, not approval of the Keystone XL pipeline that would undermine U.S. efforts to reduce its carbon emissions?

a) Please include any other estimates you may have on the comparison of greenhouse gas emissions as the related to transportation of oil by pipeline versus other options like rail and truck.

Response

1. The Keystone XL pipeline has very little, if any, impact on U.S. carbon emissions. The 17% emissions premium associated with the tar sands oil compared with the average barrel of oil in the U.S. system, almost entirely arises from the oil extraction process (which occurs in Canada). Once extracted, there is very little difference in the carbon dioxide footprint from the tar sands oil compared with any other oil. Gasoline refined from tar sands oil produces virtually the same amount of carbon dioxide when burned as does gasoline refined from any other type of oil. So U.S. carbon dioxide emissions are largely unaffected by Canada’s development of its tar sands. Canadian (and global) carbon emissions may increase by producing oil from the tar sands, but not U.S. emissions (the total U.S. petroleum consumption is not expected to be impacted by the tar sands oil).

There is the very small exception to the above, which concerns the carbon dioxide emissions produced in the U.S. by the transportation of the tar sands crude to U.S. refineries. As far as oil transportation goes, on a ton/mile basis carbon dioxide emissions produced by pipeline

operations are lower than those produced by rail or truck transport. Whether or not denying the pipeline would undermine U.S. effort to reduce U.S. carbon dioxide emissions depends on whether, in the absence of the pipeline, the tar sands oil were transported via other methods to U.S. Gulf Coast refineries in amounts equal to the volume that the pipeline would have delivered, or whether the tar sands oil is delivered to other foreign interests outside of the U.S. (i.e., is not transported across the U.S.).

In the Draft Supplemental Environmental Impacts Statement (SEIS), the State Department analyzed the greenhouse gas emissions resulting from an alternative transportation scheme (a combination of trucks, rail, and existing pipelines) and found that greenhouse gas emissions from transportation of the crude were 8% higher than the operation of the Keystone XL pipeline. If trucks were used exclusively, instead of rail, in the same scenario, the additional greenhouse gas emissions would be, according to my calculation, some 250% percent higher. However, greenhouse gas emissions from the transportation of the tar sands crude oil only make up about 2 percent of the overall lifecycle greenhouse gas emissions of the tar sands oil. Consequently, the mode of transport has little impact on the overall greenhouse gas emissions (and hence climate change). By the numbers, there would be essentially no difference in wells-to-wheels (WTW) greenhouse gas emissions between the Keystone XL and the State Departments rail/pipeline scenario, why relying on a truck/pipeline scenario would increase overall WTW emissions by ~2 percent.

1a.

Additional information on greenhouse gas emissions related to the mode of transportation of crude oil can be found in the State Department draft SEIS in Sections 4.12.3.2, 5.1.2.12, and Appendix Z.

Question

2. One of the anti-Keystone groups has a slogan that goes something along the lines of "Stop Keystone XL! Stop climate change!" Given your analysis, would you agree that by stopping Keystone XL, we would be stopping climate change?

b. Additionally, this group and many other suggest that Keystone XL is the key to unlocking the oil sands. Do you believe that production of the oil sands will continue regardless of whether or not Keystone XL is built?

Response

2. As my analysis described in my written testimony shows, the Keystone XL pipeline produces a climate change so exceedingly small—about one ten-thousandths of a degree Celsius (0.0001°C), or less—that it is of no consequence whatsoever. So stopping the pipeline has no impact on the course of future climate change, human-caused or otherwise.

2a. In my opinion, the development of the Alberta tar sands will progress with or without the approval of the Keystone XL pipeline. It comes down to simple supply and demand. While the global demand for petroleum products remains high, new, competitive supply (such as the Alberta tar sands) will increasingly come to market. The specifics of how it gets to market may not be worked out, but the economic incentives are too great for the tar sands not to be produced.