

2015 09 10



Warren Kindzierski <warrenk@ualberta.ca>

Re: Alberta on track to have worst air quality in Canada, warns environment minister - Calgary Herald

1 message

Warren Kindzierski <warrenk@ualberta.ca>

Thu, Sep 10, 2015 at 10:20 AM

To: Oliver Bussler <Oliver_Bussler@transalta.com>

Cc: Jennifer Pierce <Jennifer_Pierce@transalta.com>, Don Wharton <Don_Wharton@transalta.com>

Oliver,

I read the Alberta Air Zone report before 6:00 this morning. The annual benchmark used for judging 'poor ambient air quality' for PM2.5 (i.e., 10 ug/m3) is less than average levels inside Edmonton non-smoking homes during summer (10.7 ug/m3). 'Far-fetched' would be a good way to characterize the lack of understanding of this issue.

Warren Kindzierski, Ph.D., P.Eng.
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fax: 780-492-9070
email: warrenk@ualberta.ca

On Thu, Sep 10, 2015 at 8:44 AM, Oliver Bussler <Oliver_Bussler@transalta.com> wrote:

Hi Warren,

I'd be surprised if you haven't seen these articles. Since you are a recognized expert in this area, I was wondering if you have heard what the Environment Ministry may have planned to address the cause of air pollution. It looks like our study will be very timely.

Oliver

Alberta on track to have worst air quality in Canada, warns environment minister

<http://calgaryherald.com/news/politics/alberta-on-track-to-have-worst-air-quality-in-canada-warns-environment-minister>

2015 09 11 b



Warren Kindziarski <warrenk@ualberta.ca>

Re: Presentation of study results

1 message

Warren Kindziarski <warrenk@ualberta.ca>

Fri, Sep 11, 2015 at 12:55 PM

To: Oliver Bussler <Oliver_Bussler@transalta.com>

Cc: Don Wharton <Don_Wharton@transalta.com>, Jennifer Pierce <Jennifer_Pierce@transalta.com>, "Md. Aynul Bari" <mdaynul@ualberta.ca>

Oliver,

We can possibly remove the slides related to 2010/CAPE claim.

Yes Wednesday is open for me (I will block off the whole day). I would like Aynul to also attend the meeting.

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email: warrenk@ualberta.ca

On Fri, Sep 11, 2015 at 12:06 PM, Oliver Bussler <Oliver_Bussler@transalta.com> wrote:

Hi Warren,

Thank you for sending through the attached. I will review your draft presentation and provide feedback. I have just been told that we've secured a meeting with government on Wednesday afternoon next week, to relay this presentation. We will have to condense your materials into a 45 minute slot. Please confirm that you are still available next week. Thx.

Oliver

2015 09 11 c



Warren Kindzierski <warrenk@ualberta.ca>

Re: Presentation of study results

1 message

Warren Kindzierski <warrenk@ualberta.ca>

Fri, Sep 11, 2015 at 1:33 PM

To: Oliver Bussler <Oliver_Bussler@transalta.com>

Cc: Don Wharton <Don_Wharton@transalta.com>, Jennifer Pierce <Jennifer_Pierce@transalta.com>, "Md. Aynul Bari" <mdaynul@ualberta.ca>

Yes for sure we will be available.

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email: warrenk@ualberta.ca

On Fri, Sep 11, 2015 at 1:08 PM, Oliver Bussler <Oliver_Bussler@transalta.com> wrote:

Hi Warren,

I just found out that we are trying to schedule a second government meeting for Thursday afternoon. Would you and Aynul be available at that time as well? I believe the second meeting is tentative at this time.

Oliver

From: Warren Kindzierski [mailto:warrenk@ualberta.ca]
Sent: Friday, September 11, 2015 12:55 PM
To: Oliver Bussler
Cc: Don Wharton; Jennifer Pierce; Md. Aynul Bari
Subject: Re: Presentation of study results

Oliver,

We can possibly remove the slides related to 2010/CAPE claim.

2015 09 11 d

Warren Kindzierski <warrenk@ualberta.ca>

Re: Presentation of study results

1 message

Warren Kindzierski <warrenk@ualberta.ca>

Fri, Sep 11, 2015 at 3:00 PM

To: Oliver Bussler <Oliver_Bussler@transalta.com>

Oliver, I am working at home now; *any chance for a quick phone call now to discuss your suggestions.* I have no issue with them, rather I just want to make sure the right information is in there if GOA scientists look at the presentation. My number is [REDACTED] S. 17(1) & (4)(g)(i)(ii)

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On Fri, Sep 11, 2015 at 2:53 PM, Oliver Bussler <Oliver_Bussler@transalta.com> wrote:

Hi Warren,

Thank you again for making yourself available for both meetings. It is much appreciated and this will be a great opportunity to further propagate this work. I will be able to provide you with timing and audience information shortly.

In terms of feedback on the presentation materials, here are my thoughts:

1) I have no concerns with including the slides related to 2010/CAPE claim. Since the CAPE claims are on everyone's' minds, I think it would be best to address them upfront. The same goes for the claims we saw earlier this week suggesting that "Alberta is on track to have worst air quality in Canada".

2) Your slide #41 should appear near the front. I think everyone will be eager to know the findings/results of your study at the start of the presentation.

3) I was wondering if we could simplify the overall messaging. The audience will be novices when it comes to ambient air quality standards and modelling. Ideally we could place some of the more technical materials into an appendix. For example your "Methods" section could move to the appendix. Some of the Seasonal slides could also move into the appendix if you are in

agreement. My thinking is that if we limit the number of technical slides the presentation may also become more inviting to discussion and questions from the audience. Questions could then be addressed via appendix materials. The "Background" section could be expanded to become an "Overview" where we provide the audience with the layperson perspective of the work such as (note these are my words and I am not suggesting you use this language, I'm only intending to provide my thoughts on level of detail and potential key messages):

- Since multiple sources contribute to PM2.5, the study is attempting to determine how much various sources/factors are contributing to the Edmonton air shed, including coal plants.
- The study breaks PM2.5 down into a long list of principal chemical components to thereby determine the sources (such as combustion). This type of analysis is called speciation. Although reliant on other peer reviewed work, this type of analysis and modelling has not been done before.
- One of the four air monitoring stations in Edmonton (called the Edmonton McIntyre National Air Pollutant Surveillance station) collects speciation data that allows for the identification of different contributing PM2.5 sources/factors.
- Based on speciation analysis and leveraging other studies, the investigation has identified six factors as contributing to PM2.5 concentrations in Edmonton: 1) Secondary Organic Aerosol [28.6%]; 2) Secondary Sulfate [21.2%]; 3) Secondary Nitrate [15.9%]; 4) Traffic [8.8%]; 5) Biomass burning [7%]; 6) Road-salt [5.8%]; 7) Soil [5.3%]; 8) Metal Industry (e.g. cement) [3.3%]; 9) Metallurgy/Industrial mix [3.2%]; and 10) Refinery [0.9%]. Each of these factors have their own key chemical species composition / fingerprint.
- The study looked at local and long distance source of emission however because of their small contribution, the study was not able to identify coal fired power plants as one of the main sources of PM2.5 in Edmonton although secondary sulfate (primarily comprised of SO₄ and NH₄) is believed to be linked to power plants. Approximately 5-10% of the secondary sulfate emissions could be attributable to the power plants. More detailed results are as follows...

I want to reiterate that it is definitely not my intention to suggest what you should say. The study is very much your work and independent. I do however think it is important that how we decided to relay the information should consider the audience.

Please let me know your thoughts on the above.

2015 09 11 e



Warren Kindzierski <warrenk@ualberta.ca>

Re: Source Apportionment Study for Power Plants

1 message

Warren Kindzierski <warrenk@ualberta.ca>
To: Bob Myrick <Bob.Myrick@aemera.org>
Cc: Oliver Bussler <Oliver_Bussler@transalta.com>

Fri, Sep 11, 2015 at 3:56 PM

Bob,

Here is a summary of the methods we are using for the study:

Receptor modeling approach

Approach used to investigate contributions of different emission sources to measured PM2.5 concentrations at Edmonton McIntyre station: Positive Matrix Factorization (EPA PMF version 5.0)
Dataset: 5-years (2010–2014) of 1-in-3 day 24-hour filter samples (n=522)

PMF-source verification approaches

1. Short range influences - using the conditional probability function (CPF) method to examine PM2.5 concentration-wind relationships
2. Long range influences - using NOAA Air Resources Laboratory HYSPLIT (Hybrid Single Particle Lagrangian Integrated Trajectory) Model and meteorological data for North America

Several backward trajectory approaches are being used:

- a. using the *air mass trajectory clustering* method to identify homogeneous groups of air mass transport patterns influencing PM2.5 concentrations in Edmonton
- b. using the *potential source contribution function (PSCF)* method to identify long range source locations and preferred trajectory paths associated with high PM2.5 trace element and aerosol values
- c. also using the *concentration weighted trajectory (CWT)* method – similar to the PSCF method, however this method can more easily distinguish source strength by assigning concentration values at the receptor site (Edm McIntyre) to their corresponding trajectories

3. Also performing correlation analysis to measure of strength of correlation between PMF sources and other variables:

- Using the Pearson coefficient to assess whether PMF sources are related to various other measured pollutants, including:
 - PMF source at Edm McIntyre versus other measured pollutants and meteorological variables at Edm South
 - PMF source at Edm McIntyre versus measured major volatile organic compound species at Edm East
 - PMF source versus other PMF sources at Edm McIntyre
- All of these methods, except the CWT method for displaying PMF-source backward trajectories, were used in our peer-reviewed 2015 *ES&T* and *Building & Environ* journal publications of PM1 and VOC indoor and outdoor source apportionments based on the 2010 Edmonton winter/summer air quality study conducted for Health Canada.

Warren Kindzierski, Ph.D., P.Eng.
Associate Professor,
Environmental Health Sciences
School of Public Health

Bob,

Once we have a report completed I would think the power plants would want this to happen. The intent of the report is to have it shared with government. Early October is the completion timeline.

Warren Kindzierski, Ph.D., P.Eng.

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email: warrenk@ualberta.ca

On Fri, Sep 11, 2015 at 9:21 AM, Bob Myrick <Bob.Myrick@aemera.org> wrote:

Hi Warren,

I have heard that you are doing some air quality work for the power plants. If you have any information or reports that you can provide to me, that would be much appreciated.

Thank!

Bob Myrick
Director of Airshed Sciences

Alberta Environmental Monitoring Evaluation and Reporting Agency
12th Floor, Baker Centre
10025 108 Street
Edmonton, AB T6J 1G4
Phone: (780) 415-9364
Email: bob.myrick@aemera.org

Check air quality in your community: www.airquality.alberta.ca

Or by phone: 1-877-247-7333

measures. assess. inform.

Alberta Environmental Monitoring,
Evaluation and Reporting Agency



2015 09 12 a
(attachment)

Warren Kindzierski <warrenk@ualberta.ca>

Re: Presentation of study results

1 message

Warren Kindzierski <warrenk@ualberta.ca>

Sat, Sep 12, 2015 at 12:09 PM

To: Oliver Busler <Oliver_Busler@transalta.com>

Cc: Don Wharton <Don_Wharton@transalta.com>, Jennifer Pierce <Jennifer_Pierce@transalta.com>, "Md. Aynul Bari" <mdaynul@ualberta.ca>, Riley Georgsen <Riley_Georgsen@transalta.com>

Oliver,

We have reorganized the presentation, putting the majority of the technical details in the appendix. There are 22 slides and I would target a 20-minute presentation.

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On Fri, Sep 11, 2015 at 2:53 PM, Oliver Busler <Oliver_Busler@transalta.com> wrote:

Hi Warren,

Thank you again for making yourself available for both meetings. It is much appreciated and this will be a great opportunity to further propagate this work. I will be able to provide you with timing and audience information shortly.

In terms of feedback on the presentation materials, here are my thoughts:

1) I have no concerns with including the slides related to 2010/CAPE claim. Since the CAPE claims are on everyone's minds, I think it would be best to address them upfront. The same goes for the claims we saw earlier this week suggesting that "Alberta is on track to have worst air quality in Canada".

2) Your slide #41 should appear near the front. I think everyone will be eager to know the findings/results of your study at the start of the presentation.

2015 09 15 a



Warren Kindzierski <warrenk@ualberta.ca>

Re: Presentation of study results

1 message

Warren Kindzierski <warrenk@ualberta.ca>
To: Oliver Bussler <Oliver_Bussler@transalta.com>

Tue, Sep 15, 2015 at 9:00 AM

Oliver,

When you have the details for the meetings (location time, etc.), please forward them to me.

Warren Kindzierski, Ph.D., P.Eng.
Associate Professor,
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email: warrenk@ualberta.ca

On Sat, Sep 12, 2015 at 2:55 PM, Oliver Bussler <Oliver_Bussler@transalta.com> wrote:
Hi Warren,

The presentation looks good from my perspective. I think that you've struck a good balance of high level context and study details. Since my colleagues are more familiar with the policy maker audience to whom you will be presenting, I'm going to see if they have any final comments on the materials. I hope you have a nice rest of your weekend.

Oliver

On Sep 12, 2015, at 12:09 PM, Warren Kindzierski <warrenk@ualberta.ca> wrote:

Oliver,

We have reorganized the presentation, putting the majority of the technical details in the appendix. There are 22 slides and I would target a 20-minute presentation.

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2015 09 15 b



Warren Kindzierski <warrenk@ualberta.ca>

Re: Presentation of study results

1 message

Warren Kindzierski <warrenk@ualberta.ca>

Tue, Sep 15, 2015 at 11:38 AM

To: Riley Georgsen <Riley_Georgsen@transalta.com>

Cc: Don Wharton <Don_Wharton@transalta.com>, Oliver Bussler <Oliver_Bussler@transalta.com>

Riley,

For sure I can be there at 12:30 pm. I would also like to bring Dr. Bari (Aynul) along to the meeting as he was heavily involved in a lot of the analyses.

Warren Kindzierski, Ph.D., P.Eng.
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On Tue, Sep 15, 2015 at 10:45 AM, Riley Georgsen <Riley_Georgsen@transalta.com> wrote:

Hello Warren

Thanks for making yourself available to present the results of your report.

I have confirmed the attendance of staff from both department of Environment and Parks as well as Department of Energy.

Our meeting will be held tomorrow at 1pm in Boardroom 11A on the 11th Floor of South Petroleum Plaza (9945 108 St NW, Edmonton, AB)

I expect between 6-8 department and political staff to be in attendance.

I would recommend we meet ahead of time at TransAlta's offices (10707 100 Avenue Edmonton, AB T5J 2W3), they are only half a block from our meeting. Then we could touch base briefly on your presentation and I could provide you background on those in attendance. Would 12:30 work for you to meet?

2015 09 16
(attachment)



Warren Kindzierski <warrenk@ualberta.ca>

Re: Presentation of study results

1 message

Warren Kindzierski <warrenk@ualberta.ca>

Wed, Sep 16, 2015 at 10:43 AM

To: Riley Georgsen <Riley_Georgsen@transalta.com>, Oliver Bussler <Oliver_Bussler@transalta.com>, Don Wharton <Don_Wharton@transalta.com>, Jennifer Pierce <Jennifer_Pierce@transalta.com>

Cc: "Md. Aynul Bari" <mdaynul@ualberta.ca>

Riley, Oliver,

Attached is a higher quality PDF of the presentation; if there is an opportunity to use it today.

The presentation is exactly the same.

However we have added two slides at the very end of the file (i.e., not part of the presentation):

(1) One slide looks at the Red Deer PM2.5 issue using a larger dataset. To us the PM issue in Red Deer suspiciously points to a couple of possible logical explanations - winter time 'wood-burning', winter time inversion frequency and possible changeover in the operating temperature of the continuous PM monitoring equipment that took place in 2009 across Alberta.

(2) The second slide is from the U Toronto/Environment Canada 2011 Jeong study with a smaller dataset than ours. It supports our finding for secondary sulfate.

I would plan to bring both the PowerPoint and PDF file on a memory stick to the meeting.

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email: warrenk@ualberta.ca

Edm study slides 16sep2015v.pdf
4595K

2015 10 16



Warren Kindzierski <warrenk@ualberta.ca>

Re: Some thoughts about messaging of the report

1 message

Warren Kindzierski <warrenk@ualberta.ca>
To: Don Wharton <Don_Wharton@transalta.com>

Fri, Oct 16, 2015 at 7:07 AM

Don,

I got to thinking last night that maybe I could offer some points from the report that your communications people could consider in developing the messaging. Here are my thoughts...

Looking at indicators of air quality over a 17 year period in the City Edmonton (from 1998 to 2014), the study found a number of good news stories:

- In most instances, Edmontonians experienced better air quality in 2014 than in 1998.
- Statistical analysis showed that only levels of fine particulate matter (PM_{2.5}) and ground-level ozone, the two air pollutants of most concern for human health, have been unchanged in the city since 1998.
- Levels of nitrogen dioxide, sulfur dioxide, carbon monoxide and total hydrocarbons (volatile chemicals that contain carbon and hydrogen atoms) have all decreased since 1998

This was also the case for individual chemicals in PM_{2.5} since 2007:

- Statistical analysis showed that only sodium chloride (a component of road-salt) actually increased:
- Levels of all other components in PM_{2.5} were unchanged or decreased.

The study also identified the sources of PM_{2.5} in Edmonton using scientific tools developed by the U.S. Environmental Protection Agency and air monitoring data for 2010 to 2014:

- The major sources are made up of secondary particulates (those that form in the atmosphere from other gaseous pollutants). These include secondary organic aerosol, secondary sulfate and secondary nitrate. Together these sources make up two-thirds of the PM_{2.5}.
- Other sources identified are made up of primary particulates (those that are directly released into the atmosphere).
- For primary particles, soil, traffic and biomass (wood) burning emissions made up one-quarter of the PM_{2.5}.
- Other smaller primary particle sources (road-salt, refinery and mixed industrial emissions) made up less than one-tenth of the PM_{2.5}.
- The study found that coal combustion emissions contribute to secondary sulfate and nitrate in Edmonton. However, their contribution is small – in the range of less than one-tenth to one-fifth of the secondary sulfate and nitrate mass.

Finally, the study looked into possible causes of high PM_{2.5} levels that occurred in Edmonton during 2010. It looked at how the contribution of sources for PM_{2.5} differed in 2010 compared to other years (2011 to 2014):

- It found that changes in the operation of monitoring equipment during 2009 and sources other than secondary sulfate were responsible these events that occurred in 2010.
- It concluded that coal combustion sources would have had an unimportant role in contributing to the high PM_{2.5} levels during 2010.

s. 24(1)(a) & (b)(i)

Also, please carefully read the 2nd and 3rd paragraphs of page 1 (Introduction). s. 24(1)(a) & (b)(i)
s. 24(1)(a) & (b)(i) recommendation that we made in the Health Canada-funded/published-
study... *more work being needed to further resolve various source contributions to ambient air quality in the
Capital Region in order to inform policy makers about sources of fine particulate matter.*
Recall, that it was I who approached you to try get funding to address the above need.

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On Thu, Oct 15, 2015 at 5:50 PM, Warren Kindzierski <warrenk@ualberta.ca> wrote:
Don,

The draft report is attached. Please note it is rather technical.

Let me know how you would like to proceed after you have had a chance to look at it.

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2015 10 28



Warren Kindzierski <warrenk@ualberta.ca>

Re:

1 message

Warren Kindzierski <warrenk@ualberta.ca>

Wed, Oct 28, 2015 at 10:42 AM

To: Don Wharton <Don_Wharton@transalta.com>

Don,

I hope things are going well. I would like to check with you about any feedback from the draft report we provided with you 11 days ago and finalizing the report.

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On Sat, Oct 17, 2015 at 7:44 PM, Warren Kindzierski <warrenk@ualberta.ca> wrote:

Don,

We were looking further into the Canadian Association of Physicians for the Environment issue of PM2.5 exceedances in Edmonton and we identified something worthy of reporting.

Basically we can show that a combination of changes in operation of continuous PM2.5 monitoring equipment made during 2009 and a single major wildfire smoke event in 2010 (August 19-22) had a strong influence on resulting 3-year averages of annual 98th percentile 24-hr average concentrations at the Edmonton central station.

We have revised Part III of the report to show this new information.

Now, we have also added a new paragraph to the Executive Summary and to the Findings sections (these have been blocked out in yellow for you to see).

All other parts of the report are unchanged except for minor text edits.

The revised draft is attached here.

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2015 11 03



Warren Kindzierski <warrenk@ualberta.ca>

Re:

1 message

Warren Kindzierski <warrenk@ualberta.ca>
To: Don Wharton <Don_Wharton@transalta.com>

Tue, Nov 3, 2015 at 11:32 AM

Don,

I am just checking again about whether you have any feedback on our report.

Warren Kindzierski, Ph.D., P.Eng.
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On Wed, Oct 28, 2015 at 10:42 AM, Warren Kindzierski <warrenk@ualberta.ca> wrote:

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2015 11 19 a
(attachment)



Warren Kindzierski <warrenk@ualberta.ca>

Project report

1 message

Warren Kindzierski <warrenk@ualberta.ca>
To: Don Wharton <Don_Wharton@transalta.com>

Thu, Nov 19, 2015 at 6:27 PM

Don,

Attached is a copy of the final report and the executive summary as a separate document.

Early next week I plan to forward a copy to AEMERA and the Executive Director of Alberta Capital Airshed (Gary Redmond), whom I know.

Thank you for allowing us the opportunity to undertake this work on air quality in Edmonton Capital Region.

Don, please feel free to contact me if you if you have questions about the report or about other air quality issues that may arise in the future.

Warren Kindzierski, Ph.D., P.Eng.
Associate Professor,
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2 attachments

2015 Edm AQ study execsumm.pdf
1067K

2015 Edm AQ study reportfinal.pdf
7301K

2015 11 19 b
(attachment)



Warren Kindzierski <warrenk@ualberta.ca>

Re: Project report

1 message

Warren Kindzierski <warrenk@ualberta.ca>

Thu, Nov 19, 2015 at 10:31 PM

To: Don Wharton <Don_Wharton@transalta.com>

Don,

Yes I am in agreement with forwarding the report to the mayors. They are free to contact me directly if they have questions about the report.

I have suggested some edits to the note you sent me (attached here). Otherwise I am very comfortable with it.

Warren Kindzierski, Ph.D., P.Eng.
Associate Professor,
Environmental Health Sciences
School of Public Health
3-57B South Academic Building
University of Alberta
Edmonton, AB T6G 2G7
phone: 780-492-0382
fax: 780-492-9070
email: warrenk@ualberta.ca

On Thu, Nov 19, 2015 at 7:58 PM, Don Wharton <Don_Wharton@transalta.com> wrote:

Warren:

Thank you very much. Your final report is indeed timely. In fact, we have had a request from the mayors of 30+ municipalities around the province to see the report as soon as it is available. You may have noticed that these same mayors have been in the media lately expressing concern about the spectre of accelerated coal plant closures and the effects on their communities.

To that end, we would like to facilitate them receiving your report, and our Communications VP has drafted a covering note from TransAlta presuming that a) you would be agreeable with us forwarding the report to them, and b) you are comfortable with the conveyance note we have drafted (attached).

Could I request your review of the attached note? We'd be happy to change it to ensure it meets your approval

I'd appreciate it if you could give this attention at your earliest convenience. We would hope to forward it to the mayors on Friday.

Thanks

Don

From: Warren Kindzierski <warrenk@ualberta.ca>
Sent: Thursday, November 19, 2015 6:27 PM
To: Don Wharton
Subject: Project report

Don,

Attached is a copy of the final report and the executive summary as a separate document.

Early next week I plan to forward a copy to AEMERA and the Executive Director of Alberta Capital Airshed (Gary Redmond), whom I know.

Thank you for allowing us the opportunity to undertake this work on air quality in Edmonton Capital Region.

Don, please feel free to contact me if you if you have questions about the report or about other air quality issues that may arise in the future.

Warren Kindzierski, Ph.D., P.Eng.
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November 20, 2015

An independent analysis of the sources of air quality issues in and around the Edmonton area, conducted over the past six months, has now been completed by University of Alberta scientist Dr. Warren Kindzierski. The full report can be found on TransAlta's website: www.transalta.com.

It has become accepted as fact that coal plants west of Edmonton are a major source of Edmonton's air quality issues and responsible for measureable human health effects. However, the argument that health impacts in Edmonton are related to coal is not substantiated by scientific research conducted in Alberta.

Dr. Kindzierski's work has determined, using provincial government monitoring data, that emissions from coal-fired generation are a minimal source of Edmonton's air pollution. This research questions the frequently reported assertion that health quality issues in Alberta are related to coal-fired generation.

Dr. Kindzierski is an Associate Professor at the School for Public Health at the University of Alberta specializing in assessing factors contributing to environmental contaminant exposure, particularly from air emissions.

Dr. Kindzierski used data taken from provincial monitoring stations over the last nine years. His research can be summarized as follows:

- Dr. Kindzierski examined the chemical "signatures" for emissions related to air quality concerns in Edmonton and found that they point to several sources, including local industries, vehicles and aircraft fireplace wood burning. A signature is a unique chemical fingerprint that identifies the composition and the source, of particulate matter.
- Dr. Kindzierski found that there was no evidence that points to coal plants as a major factor contributing to Edmonton's air quality issues. Emissions from coal combustion are minor contributors.
- Some particulate matter in the airshed comes directly from sources such as residential wood-burning, but the majority of particulate matter is formed through atmospheric chemical reactions, referred to as secondary particulates or aerosols.
- Secondary organic aerosols, which are formed from emissions from vehicles, local industry, and a variety of other human-activities outside of Edmonton are, in fact, the largest single source of particulates, accounting for 29 per cent of particulate matter in the Edmonton area.
- Secondary nitrate (16.4 per cent) – largely from transportation – and secondary sulfates (21.5 per cent) – largely from local industry such as oil and gas refineries and chemical plants – combined, account for almost 38 per cent of particulate matter in the Edmonton area.
- Only about 10% or less of all particulate matter in the airshed can be attributed to coal combustion emissions.

~~The study also looked at 17 years of wind patterns and confirmed that, in most seasons, the local winds around Edmonton predominately blow into the city from the south and southeast, not from the west where coal-fired generation is concentrated.~~

In addition, the study examined trends in Edmonton's air quality and observed the following:

- Hourly concentrations of nitrogen dioxide (NO₂), sulfur dioxide (SO₂), total hydrocarbon (THC) and carbon monoxide (CO) have steadily decreased since 1998;
- Hourly concentrations of particulate matter are unchanged since 1998, and;
- Hourly concentrations of ozone (O₃) show inconsistent change.

The research used data collected from three ambient air quality monitoring stations that are configured to measure air contaminants and calculate the provincial air quality health index. These three stations are directly managed by Alberta Environment. A fourth station's data, the National Air Pollution Surveillance (NAPS) program, which measures particulate matter, was also analyzed for the study.

TransAlta financially supported Dr. Kindzierski's work, but had no direct involvement in the scientific investigation or the interpretation of the results.

Claims of a causal relationship have been made by other parties based on hypothetical modeling in other jurisdictions, chiefly the United States, and have limited, if any, applicability to Alberta. The current research suggests that it has limited scientific value in the Alberta context.

Three important points arise from this work:

1. Accelerating the closure of coal plants will have little, if any, impact on Edmonton's air quality.
2. Edmontonians and residents in outlying communities are entitled to know that, although health concerns may be legitimate, the important sources of pollutants are not coal facilities. Appropriate actions should be taken to better understand and deal with the major sources of pollutants if the municipality and the province chose to address this issue.
3. Drawing a linkage between human health concerns and coal fired generation west of Edmonton is unsubstantiated by science, and should not continue as a rationale for closing coal units.

TransAlta, ATCO and Maxim have submitted a "Dial-Up Dial-Down" proposal to the province that addresses the government's climate change objectives. We stand by our commitment to work collaboratively and reiterate our offer to work with environmental groups, communities, unions and the province on a forward-looking solution.

Please contact us if you would like further information.

2016 01 25



Warren Kindzierski <warrenk@ualberta.ca>

CPANS February luncheon presentation - Are ozone and fine particulate matter risk factors for heart attack hospital admission in the Alberta Population?

1 message

Warren Kindzierski <warrenk@ualberta.ca>
To: Don Wharton <Don_Wharton@transalta.com>

Mon, Jan 25, 2016 at 2:20 PM

Don,

If you are interested (see below), I have already notified some of your people from the Edmonton area. You would not be disappointed with what we found.

Warren Kindzierski, Ph.D., P.Eng.
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[View this email in your browser](#)

**Air & Waste Management Association
Canadian Prairie and Northern Section**

EDMONTON LUNCHEON ANNOUNCEMENT

Friday, February 5, 2015

**Are ozone and fine particulate matter risk factors for
heart attack hospital admission in the Alberta population?**

About the Presentation

Using the largest assembled sample to date of heart disease patients for the Alberta population, a study was undertaken to examine whether changes in short-term concentrations of ozone and fine particulate matter in Alberta are risk factors for hospital admission of first-time

heart attack patients for the period January 1999 to December 2010. The study, published last year in the journal PLoS One, used a case-crossover design -- a form of case-control where a patient serves as both the case and control. De-identified historical patient records were obtained from Alberta Health administrative databases. Air pollution data were obtained from the Environment Canada National Ambient Pollution Surveillance (NAPS) database and meteorological data were obtained from the United States National Climatic Data Center (NCDC). All records were linked thru postal code. The study looked at 0 to 5 lag days before onset of a first-time heart attack event as possible case exposure periods for each patient. The method looked at both univariate analysis (i.e., heart attack event influenced only by one environmental factor) and multivariate analysis (heart attack event influenced by multiple environmental factors) in order to understand the role of confounding. The study also looked at the role of model uncertainty in influencing outcomes of air pollutant-acute health effect associations. Although both Bayesian and bootstrap model averaging are recognized statistical methods for examining model uncertainty for these datasets, the latter (bootstrap) method was used because of its ability to obtain results easier than through Bayesian analysis.

Presenter: Warren Kindzierski, Ph.D., P.Eng., School of Public Health, University of Alberta

Dr. Warren Kindzierski is an associate professor at the School of Public Health at the University of Alberta, Edmonton. Prior to that, he was an associate professor in the Department of Civil and Environmental Engineering for 9 years and the Head of Chemical Risk Assessment for Alberta Health for 3 years. He has trained 48 graduate students and 10 research associates and post-doctorates, mainly in air quality investigations and health risk assessment and is an author/co-author of over 110 refereed journal and conference papers.

New for the Luncheons This Year

To speed up registration this year, we asked that attendees sign up online, in advance, at the following link:

<http://cpans.org/events/>

Advance registration is quick and easy. Payments will be processed with a credit card through PayPal and receipts are printable right away. Note, only cash or cheque will be accepted at the door this season. No credit cards will be accepted at the door.

About the Luncheon

The luncheon is scheduled for **Friday, February 5, 2016**. The luncheon will be a short reception followed by a buffet lunch. Reservations are accepted until noon, **Wednesday, February 3, 2016 at 12 noon**. Please note: If you register for a luncheon and do not attend, we reserve the right to invoice you if you do not cancel your registration prior to this date.

Location: The University of Alberta Faculty Club (11435, Saskatchewan Drive), Papaschase Room (upstairs, right)

Date: Friday, February 5, 2016

Time: 11:30 to 1:00 p.m. (registration starts at 11:30)

Cost: \$30 - A&WMA Members / \$40 - Non-Members / \$15 - Students (includes hot lunch & coffee). All prices include GST.

Payment: Online through PayPal or during the day of the luncheon through cash or cheque. Contact e-mail - edmontonluncheon@cpans.org if you like to attend the event.

The U of A campus is accessible by light rail transit and bus. A map of the campus is available at: <http://www.campusmap.ualberta.ca/>. You are encouraged to use public transit or ride-share. Parking is available in the V-Lot (coin and credit card, \$2 for the lunch hour) and Windsor (\$1 for 15 minutes).

2016 06 13 9



Warren Kindzierski <warrenk@ualberta.ca>

Update of manuscripts from our air quality study and other information

1 message

Warren Kindzierski <warrenk@ualberta.ca>
To: Don Wharton <Don_Wharton@transalta.com>

Mon, Jun 13, 2016 at 10:40 AM

Don,

I hope you are doing well.

We have had two scientific publications from the work that we did for last year. I will send these in a separate email to you. The better news is that we found a high-quality scientific journal willing to accept our source apportionment analysis (Environmental Pollution). We hope to have it published in the next 30-45 days.

Now, I have two requests of TransAlta...

1. *I would like to request your approval to extend the contract end date from August 31, 2016 (current) to October 31, 2016 (proposed) - an additional two months?* This allows me to continue funding the research assistant on your contract.

2. [REDACTED]

[REDACTED] Our study being published is actually different that what we did last fall; but the news from your perspective is just as good.

Please let me know if you have any questions. Thanks and take care.

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|--------------------------|
| S. 24(1)(a) & (b) (i) |
|--------------------------|

2016 07 06
(attachment)



Warren Kindzierski <warrenk@ualberta.ca>

Contract extension

1 message

Warren Kindzierski <warrenk@ualberta.ca>
To: Don Wharton <Don_Wharton@transalta.com>

Wed, Jul 6, 2016 at 12:00 PM

Don,

Thanks for returning my call.

Further to my phone message, the contract that we had to do the study last year currently has an end date of August 31, 2016. There will still be ~\$10,000 remaining at that date. The research assistant that did the work with me for the study is funded on soft dollars.

I would like to request your written approval to extent the contract end date from August 31, 2016 (current) to October 31, 2016 (proposed) - an additional two months.

This allows me to continue funding the research assistant on your contract until October 31, 2016. I have attached template that you can use to provide your approval in a letter. It can be scanned and emailed to me.

s: 24(1)(a) & (b)

A large grey rectangular redaction box covering several lines of text.

Thanks for your time and have a good day.

Warren Kindzierski, Ph.D., P.Eng.
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2016 07 06 attach

[TransAlta Letterhead]

Date

Warren Kindzlerski, Ph.D., P.Eng.
Associate Professor,
Environmental Health Sciences
School of Public Health
3-57B South Academic Building
University of Alberta
Edmonton, AB T6G 2G7

Sec. 25(1)(b)

RE: [REDACTED] TRANSA Kindzlerski, Request for Contract Extension

Dear Warren:

Sec. 25(1)(b)

Further to our correspondence, I am providing written approval to extend the [REDACTED] contract end date from August 31, 2016 to October 31, 2016.

Please do not hesitate to contact me by email (Don_Wharton@transalta.com) if you require any additional information.

Sincerely,

[Signature]

Don Wharton
[Credentials]