

Ucci, Nicholas (DOA)

From: Christine Muller <chmuller99@hotmail.com>
Sent: Friday, July 22, 2016 2:43 PM
To: DOA Energy Public Comment
Subject: SB-2015-06 Invenergy Energy Center, Comment by RI Interfaith Power&Light
Attachments: Comment to OER by RI Interfaith Power and Light 7-22-16.doc

Dear Madam/Sir:

In the attachment and below I am sending you the comment by RI Interfaith Power&Light concerning the proposed fracked-gas power plant in Burrillville.

I spoke yesterday at the OER workshop at URI. Please, take notice that my oral statement contained one error. It is corrected in red in the written comment I am providing with this e-mail.

We very much appreciate your efforts to inform the public and to give the community a voice.

With kind regards,
Christine Muller

RI Interfaith Power & Light
Christine Muller
Secretary of the Board of Directors
5 Carriage Lane
Kingston RI 02881

Comment to the Office of Energy Resources by RI Interfaith Power & Light concerning the impacts of the proposed fracked-gas power plant in Burrillville on greenhouse gas emissions and on whether the Facility will conform to the requirements and provisions of the Resilient Rhode Island Act, R.I. Gen Laws §§ 42-6.2-1 to 42-6.2-8, and state energy policies.

RI Interfaith Power & Light works with faith-based organizations to raise awareness about the serious threat of climate change and assists them to lower their carbon footprint. We are submitting comments to emphasize the moral problem with building a fracked-gas power plant in Burrillville. The board of RI Interfaith Power & Light consists of clergy and lay people. We are also scientists, engineers, health professionals, and educators. We represent many different religious communities in RI, but speak with one clear voice: This power plant would be harmful to the people of Burrillville, harmful to the people of RI, and harmful to every person and living being on this planet. For brevity, we will comment only on the last point.

The science is clear. Climate change is the largest threat humankind is facing today. The world is now slowly waking up to this fact, and all enlightened people and governments of the world are making efforts to reduce their use of fossil fuels. Just this June 30, for example, the United States, Canada, and Mexico joined together at the North American Leaders Summit to set an historic goal - to achieve 50 percent clean power across North America by 2025.

The Resilient RI Act 2014 establishes targets for greenhouse gas emissions, with an 85% reduction by 2050 below 1990 levels. In 1990, RI's total greenhouse gas emissions amounted to 10.7 million metric tons of CO2 equivalent for all sectors.¹ Reducing emissions by 85%

brings us to an emissions target of no more than 1.6 million metric tons. That number includes all sectors, not only energy, but also transportation, residential heating, agriculture, solid waste, and industrial activities. The Burrillville power plant alone would release 3.6 million tons of CO2 into the atmosphere every year, which alone is more than twice the 2050 target of 1.6 million metric tons! It will be impossible to reach the goal of the Resilient RI Act if this power plant will be built.

In the past, it was believed that gas could serve as a bridge fuel from coal to renewable energy. However, there are two major reasons why this argument does not hold true. Even if gas were less harmful than coal, greenhouse gas concentrations in the atmosphere have already reached an extremely dangerous level; we cannot afford to increase any use of fossil-fuels, be it coal, oil, or gas. Moreover, recent scientific research suggests that widespread leakage of methane from fracked-gas wells may cause equal or even more greenhouse gas emissions than coal.

There is an additional reason why it does not make sense to build this power plant: With increasing energy efficiency, conservation measures in all sectors, and the rapid growth of renewable energy, there is absolutely no need for this plant.

Proponents of the power plant are misleading the public when they tout the number of jobs the power plant would provide. We stand with the people who advocate for new jobs. We need them in Rhode Island. However, the renewable energy sector has the potential of creating far more job opportunities now and over many decades than the 300 temporary jobs involved in building this power plant.²

Climate change impacts already affect RI. We are experiencing more intense precipitation, floods, sea-level rise, worse storm surges, and warmer and more acidic water in the Bay which affects our fisheries. World-wide the poor are suffering first from climate disruptions, such as rising food prices, famines, floods, droughts, more extreme storms, and civil unrest that is often exacerbated by these disasters.

It is immensely immoral for us to continue to produce electricity by means that produce greenhouse gases that will cause suffering and death of millions of people. What greater injustice could we commit? If we do not have the moral and political will to urgently and dramatically reduce our total greenhouse-gas emissions, we will be condemning our children and future generations to living on a hotter planet that may no longer support a human civilization.

We must keep most of the remaining fossil fuels in the ground. Expanding gas infrastructure is clearly a huge step into the wrong direction.

We pray that you will have the moral courage to prevent this fracked-gas power plant in Burrillville from being built.

With much respect and kind regards,

For RI Interfaith Power & Light

Christine Muller, Secretary of the Board of Directors

¹ Data from NESCAUM RI Greenhouse Gas Inventory presentation on March 20,2014. Slide 9.
<http://www.planning.ri.gov/documents/climate/NESCAUM%20.pdf>

2 House committee OKs town vote on power plant tax agreement, Shaun Towne; Reporting by Perry Russom,
Published: May 31, 2016
Reference here: <http://wpri.com/2016/05/31/house-committee-oks-town-vote-on-power-plant-tax-agreement/>

RI Interfaith Power & Light
Christine Muller
Secretary of the Board of Directors
5 Carriage Lane
Kingston RI 02881

Kingston, 22 January, 2016

Comment to the Office of Energy Resources by RI Interfaith Power & Light concerning the impacts of the proposed fracked-gas power plant in Burrillville on greenhouse gas emissions and on whether the Facility will conform to the requirements and provisions of the Resilient Rhode Island Act, R.I. Gen Laws §§ 42-6.2-1 to 42-6.2-8, and state energy policies.

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does not hold true. Even if gas were less harmful than coal, greenhouse gas concentrations in the atmosphere have already reached an extremely dangerous level; we cannot afford to increase any use of fossil-fuels, be it coal, oil, or gas. Moreover, recent scientific research suggests that widespread leakage of methane from fracked-gas wells may cause equal or even more greenhouse gas emissions than coal.

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For RI Interfaith Power & Light

² House committee OKs town vote on power plant tax agreement, Shaun Towne; Reporting by Perry Russom, Published: May 31, 2016

Reference here: <http://wpri.com/2016/05/31/house-committee-oks-town-vote-on-power-plant-tax-agreement/>

Ucci, Nicholas (DOA)

From: Harvey Dugas <k1sqz@cox.net>
Sent: Friday, July 22, 2016 9:39 PM
To: DOA Energy Public Comment
Subject: Clear River Energy Center

Living here since 1973, clean and affordable energy means a lot to me. Therefore, I am in support of the proposed Clear River Energy Center. We need the construction of this plant to make up for the loss of other coal-powered plants that the environmentalists have carelessly caused to be shut down, without having alternative ways to provide us power to make up for the loss. Natural gas is a great resource to Americans. In fact, my whole house utilizes natural gas, and my bill is very reasonable. Usually, it is only \$40-\$50 per month. Not only is this natural resource helping me keep my cost down, it is also clean-burning. The construction of the Clear River Energy Center would be a great asset to the state. It would provide good paying jobs, keep our energy cost down, and be American based energy. Personally, I would like to see us not depend on hostile sources for any of our energy needs. Being dependent on other countries allows them to increase prices at any time. We need total energy independence and the new

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Version: 2016.0.7688 / Virus Database: 4627/12663 - Release Date: 07/22/16

Ucci, Nicholas (DOA)

From: Peter Nightingale <nigh@pobox.com>
Sent: Monday, July 25, 2016 9:39 AM
To: DOA Energy Public Comment
Subject: Correction—Testimony: Public Workshop Regarding the Climate Change Impacts of the proposed Burrillville Power Plant
Attachments: oer-concat.pdf

I noticed that the document I sent last week contained a broken link. Please find a corrected version attached and accept my apologies for the inconvenience.

Yours sincerely,
—Peter Nightingale

----- Forwarded Message -----

Subject: Testimony: Public Workshop Regarding the Climate Change Impacts of the proposed Burrillville Power Plant

Date: Fri, 22 Jul 2016 09:02:50 -0400

From: Peter Nightingale <nigh@pobox.com>

Reply-To: nigh@pobox.com

To: DOA.publiccomment@energy.ri.gov

Please find attached an updated electronic copy of my yesterday's testimony about the climate impact of the proposed Burrillville power plant. Please substitute the current version for the paper copy I submitted yesterday.

Thank you,
—Peter Nightingale

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The next auto-quote (sent by free-ware from my commercial-free computer) is:

Government being instituted for the common benefit, protection, and security, of the whole community, and not for the private interest or emolument of any one man, family, or class of men; therefore, whenever the ends of government are perverted, and public liberty manifestly endangered, and all other means of redress are ineffectual, the people may, and of right ought to reform the old, or establish a new government. The doctrine of nonresistance against arbitrary power, and oppression, is absurd, slavish, and destructive of the good and happiness of mankind.

(Constitution of New Hampshire: **Article 10. Right of Revolution**)

- [Kids win victory for Nature's Trust](#)
- [Youths secure second win in Washington state climate lawsuit](#)
- [Pledge to take action](#) against natural gas infrastructure expansion #StopSpectra #NoGasPlant
- [email our frack-friendly politicians](#)

[Peter Nightingale](#)

Department of Physics, East Hall

University of Rhode Island

Kingston, RI 02881, USA

Telephone 401.874.5882; Fax 401.874.2380

Testimony before RI Office of Energy Resources Public
Workshop Regarding the Climate Change Impacts of the
proposed Burrillville Power Plant

Peter Nightingale
nigh@pobox.com

July 24, 2016

From Mary Christina Wood, *Nature's Trust* (pp. 74-75):

While the public may assume agencies implement regulations in a formulaic, objective fashion requiring very little judgment, in fact agency behavior can be highly politicized and even corrupt. A host of scientific and technical presumptions flow into permit and other approval decisions, and the agencies commonly invoke their vast discretion to choose assumptions that ease the burden on politically powerful permit applicants.

Ignoring all the other problems of fracking and focusing on global warming only, the trouble with the fracked-gas policy is that methane is a much more powerful greenhouse gas than carbon-dioxide.

Methane decays in the atmosphere in about a decade. To estimate the impact of a gas policy on global warming, one converts the gas to a carbon dioxide equivalent with the same effect on global warming. The conversion factor is called the global warming potential (GWP).

For making small scale, real-life decisions one smears out the effect over a time horizon of 20 or a 100 years. For the 20 year horizon the rounded GWP conversion factor is roughly 90 and for a 100 years it is 30. These are the numbers from the latest IPCC report. (See Table 8.7 second line from the top on page 71—

https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5-Chapter08_FINAL.pdf

EPA uses the 100 year horizon and a conversion factor of 20, which is 20 years out of date. (See <https://www.law.cornell.edu/cfr/text/40/part-98/subpart-A/appendix-TableA-1>

In the long run (200 or 300 years) methane is irrelevant. The problem is that it's likely that within the couple of decades we might reach tipping points at which the climate will undergo irreversible changes. It seems that we are already beyond some of these:

1. Collapse of the West Antarctic Ice Sheet is under way—
<https://www.sciencedaily.com/releases/2014/05/140515090934.htm>
2. There are indications that the AMOC (Atlantic Meridional Overturning Circulation) is collapsing—
<http://www.climatecentral.org/news/climate-change-jamming-critical-heat-conveyor-18810>
If that happens, the weather patterns in the North Atlantic will change dramatically.
3. Extensive regions of the the Arctic, the “weather kitchen of the globe,” have warmed up by more than 3°C (5.4°F)—http://www.arctic.noaa.gov/reportcard/exec_summary.htm

In other words, use of the 100 year horizon is irresponsible; the decadal time scale is what we should be using.

When one uses the decadal time scale:

The conclusion stands that both shale gas and conventional natural gas have a larger GHG [greenhouse gas footprint] than do coal or oil, for any possible use of natural gas and particularly for the primary uses of residential and commercial heating.

This is from the abstract of this paper by Robert Howarth—<http://tinyurl.com/meth-bridge>

By the time the benefits of the *Clean Power Plan* show up, 50-80 years from now, as the plots on the next pages show, we'll all be dead and the climate will be ruined.

The quote from *Nature's Trust* at the top of this testimony fits perfectly with the OER presentation. The bar graph presented on page 21 of this document <http://tinyurl.com/gmgushz> is a demonstration of how this works. The disclaimer at the bottom

of the graph reads: “Note: Does *not* consider full life-cycle GHG emissions.” This makes the information presented totally irrelevant for global warming. The situation is even worse than the wrong estimates of the global warming potential used by the EPA. What OER creates here here Kahneman refers to as the *illusion of validity*.

Not surprisingly, this is exactly the method Invenergy uses to pretend that its proposed plant reduces greenhouse gas emissions as it does on page 15 of this presentation—

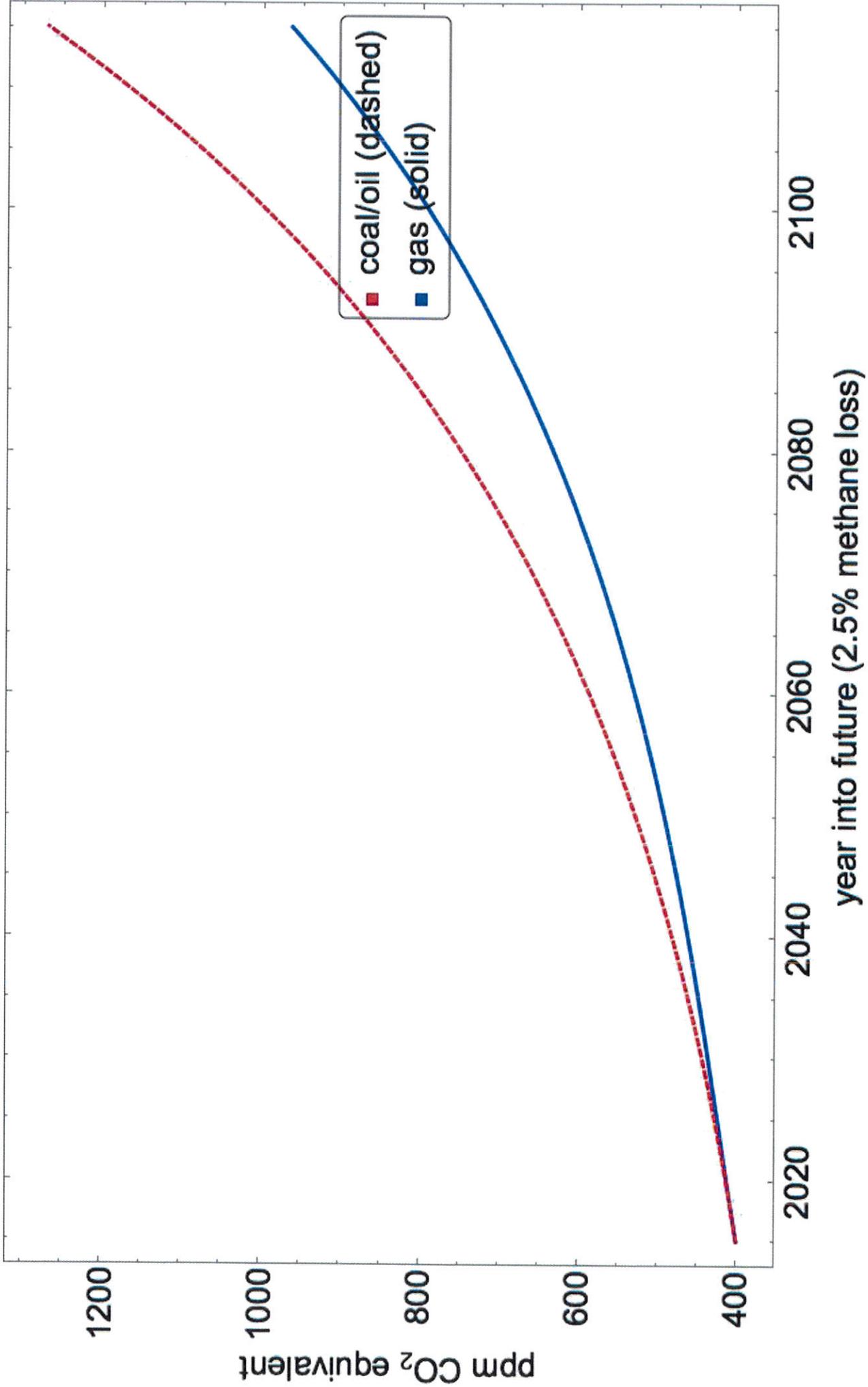
<http://tinyurl.com/h32xjy9>

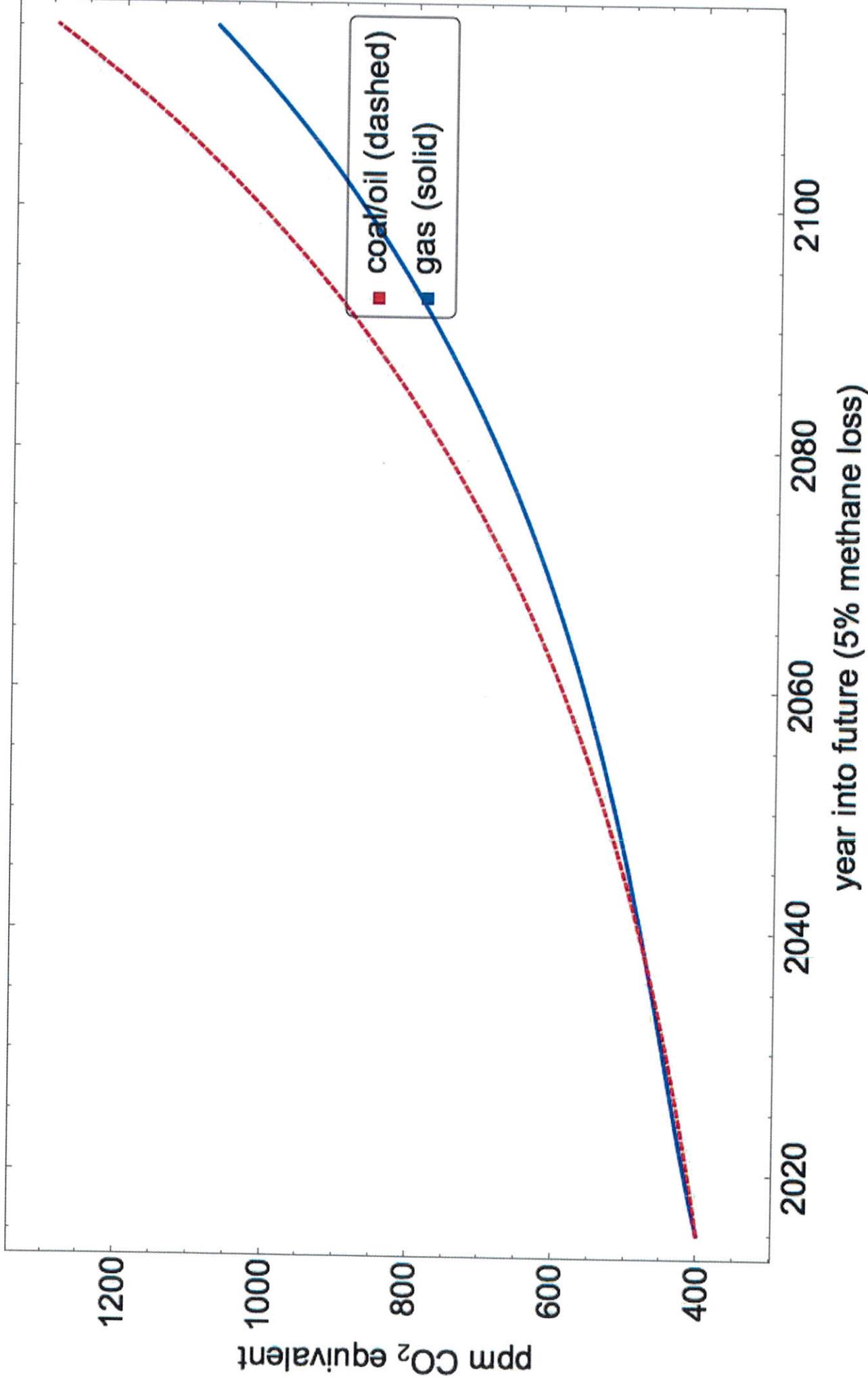
The only difference is that Invenergy fails to include a disclaimer.

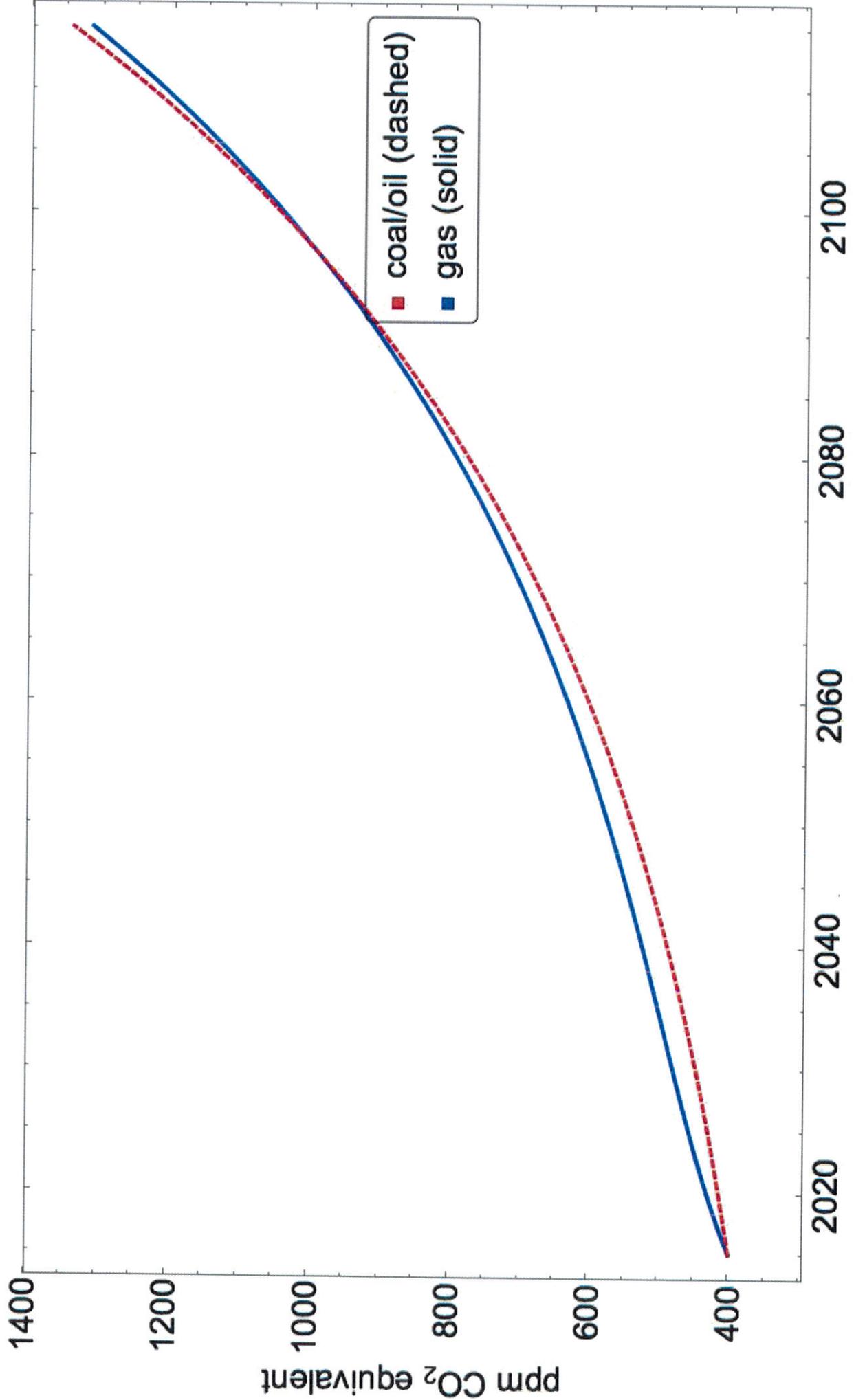
The next three pages contain some plots illustrating the impact of escaping methane. We look at the hypothetical, “ideal” implementation of the *Clean Power Plan*: the effect of switching power generation from only coal and oil completely to natural gas today assuming that energy consumption keeps growing according the pattern it has followed over the last 250 year, increasing by 2.2% per year.

There are three plots corresponding to 2.5%, 5% and 10% methane escaping unburned. Howarth’s latest estimate is that 12% is escapes—

https://www.dovepress.com/articles.php?article_id=24085







year into future (10% methane loss)

See in particular Question 13 of the following document. It raises a fundamental question about the studies that are done to model the impact of the proposed power plan. Once again, we have a process that creates merely the illusion of validity. We are still waiting for answers to the questions raised in this letter.

THE
UNIVERSITY
OF RHODE ISLAND

COLLEGE OF
ARTS AND SCIENCES

DEPARTMENT OF PHYSICS

East Hall, 2 Lippitt Road, Kingston, RI 02881 USA p: 401.874.2633 f: 401.874.2380 phys.uri.edu

March 20, 2016

Janet Coit, Director Rhode Island Department of Environmental Management
235 Promenade Street
Providence, RI 02908
Nicole Alexander-Scott, Director Department of Health
3 Capitol Hill
Providence, RI 02908

Dear Directors Coit and Alexander-Scott:

I hereby request that you, pursuant to your obligations under Title 42, Chapter 42-17.1 Section 42-17.1 (14)(i)-(iii) and Title 23, Chapter 23-1, Section 23-1-1, provide answers to the following questions raised in this writing. Please let me know within the next couple of days whether you will honor this request and, if so, by when.¹

Introduction & background

This writing is in part a follow up of a meeting that Robert Malin and I, members of Fossil Free RI, had with Barbara Morin, Julia Gold, and Julian Drix had a couple of weeks ago at the Department of Health. We promised to follow up with more information; please find that attached.

Let me start with a short summary of some parts of that exchange.

First of all, there is a Compendium about the health effects of fracking, compressors stations etc. The compendium (<http://concernedhealthny.org/compendium>) was published by the Concerned Health Professionals of NY and was last updated in October of 2015. For your convenience, I bookmarked and highlighted several sections that are of particular interest for the various natural gas projects in Burrillville. With a little bit of luck, you should be able to find those sections, but not all PDF readers are compatible and this may not work as intended. Please let me know in that case. I'll be happy to provide a list of the pages I bookmarked.²

Please find also attached a plot of a scenario that that satisfies the National Ambient Air Quality

¹I corrected minor typographical errors in this version;

²The compendium is not attached to this letter; please see my original email

Standards; see <http://www.epa.gov/criteria-air-pollutants/naaqs-table>. In spite of the fact that the standards are met, the plot shows the presence of levels of NO₂ that episodically exceed those standards by two orders of magnitude. The plot is a theoretical possibility that illustrates what is described in more detail in the attached by paper by Brown et al.³

In the present study we consider estimates of emissions from well pads, compressor stations and processing plants to gauge individuals possible exposures and the health risks those exposures pose. This is necessary because much of the publicly accessible emissions data has been collected to provide average exposures over a lengthy period of time and because the data collection is intended to document compliance with regional air quality standards.

Most of the questions in this writing are about the Air Dispersion Modeling Report - Clear River Energy Center - Burrillville, October 30, 2015, by ESS group. This report is part of the docket of the Energy Facility Siting Board (<http://www.ripuc.org/efsb/2015-SB-6.html>) *Invenergy Response to CLF - First Set*: http://www.ripuc.org/efsb/efsb/SB2015.05_DR1_R.pdf A second data set submitted by Invenergy may raise further questions.

As you know, several segmented projects will be coming together in Burrillville:

1. Spectra Energy's Aim Project
2. Invenergy's Clear River Energy Center
3. Access Northeast, a project of Eversource Energy, National Grid and Spectra Energy: <http://accessnortheastenergy.com/News-and-Events/#events>
4. TransCanada's Ocean State Power Phase III, submitted to the Energy Facility Siting Board on December 1 of last year.

First of all, please note the date of the EES report: October 30, 2015. To the best of my knowledge, the expansion of the Algonquin compressor station had not yet been completed on that date. Obviously, no data are available yet to DEM about the environmental impact of the expanded compressor station. Nor will there be any such data for some time as the National Ambient Air Quality Standards requires three-year averages.

Consequently, the report cannot possibly provide the reliable multi-source modeling analysis requested, as the ESS report mentions, by RI DEM. Instead, the report stacks hypotheticals upon hypotheticals and the resulting lack of reliability puts public health at risk.

Indeed, as the time line makes painfully clear, Burrillville may be subjected to a sequence of projects that exemplify impermissible segmentation as defined in item 46 on page 18 of this Federal Energy Regulatory Commission document <http://www.ferc.gov/CalendarFiles/20160128180805-CP14-96-001.pdf> Also see Request for Rehearing of Coalition of AIM Intervenors under CP14-96, http://elibrary.ferc.gov/idmws/file.list.asp?accession_num=20150402-5290

Some of the questions in the list below are related to the episodic nature of the emissions mentioned above in the work of Brown et. al.

³Once again to save paper this paper is not attached but it can be found here <http://www.tandfonline.com/doi/full/10.1080/10934529.2015.992663>

Average Moisture Conditions

The second paragraph of Section 2.0 of the ESS report states that the simulations were conducted at two typical temperature, namely 10F and 59F. Section 5.1 mentions that the simulations were run assuming average moisture conditions.

According to the this EPA web site

(<http://www3.epa.gov/airquality/airtrends/2007/report/groundlevelozone.pdf>), ground-level ozone forms when emissions of nitrogen oxides (NOx) and volatile organic compounds (VOCs) react in the presence of sunlight. These ingredients come from motor vehicle exhaust, power plant and industrial emissions, gasoline vapors, chemical solvents, and some natural sources.

Question 1: How can a modeling done at average temperature and humidity conditions capture the true episodic impact of CERC and the other nearby pollution sources on public health? Temperature, humidity and sunlight fluctuate wildly in Rhode Island and, due to climate change, they are expected to vary even more fiercely during the lifetime of the proposed Clear River Energy Center.

Effect of the 2015 build-out of the Algonquin Compressor Station

Table 15, NAAQS Compliance Determination, of the ESS's Air Dispersion Report on PDF page 45 contains the results of the simulations including the effect of the "Algonquin" Compressor Station up to 2014.

Question 2: How does the ESS modeling account for the AIM Project build-out of the compressor station that took place in 2015?

Question 3: Did the ESS modeling simultaneously simulate the four Rhode Island sources of pollution: Algonquin Station, Ocean State Power, RISE and CERC? If so, was the Algonquin compressor station characterized by its state before or after the 2015 AIM build-out? Due to the paucity of detail provided about the modeling, I cannot tell if it only simulated CERC while adding the other sources merely into the average background. Either way it seems that the simulation can only have been based on obsolete information that predates the 2015 build-out and ignores the fact that there also are out-of-state pollution sources.

Question 4: If the modeling did not simulate all four sources mentioned above simultaneously and in their post-AIM-build-out configuration, how did the modeling estimate the percentiles required to check that CERC will operate according to the National Ambient Air Quality Standards? (See *Reviewing National Ambient Air Quality Standards Scientific and Technical Information*, <http://www3.epa.gov/ttn/naaqs/criteria.html>)

How, in particular, did the simulations deal with the fact that it is mathematically impossible to obtain the required percentiles computed under those circumstances? For clarity let me add that this mathematical impossibility is the result of the fact that there are no addition laws that allow one to add averages to percentiles or percentiles to each other. Of course, some uncontrolled approximation might have been used to circumvent this problem. In that case, please supply the answer to question what approximation was used.

Question 5: If the modeling did simulate all four Rhode Island pollution sources simultaneously, please point us to the information that DEM supplied for the modeling, including start-up, shut-

downs, scheduled and unscheduled maintenance. Without this information it is impossible to ascertain even the feasibility of the modeling that presumably leads to the conclusion that the NAAQS standards are met upon construction of CERC.

Of particular concern in this context is the impact of coincidences such as a purge or blowdown of the Algonquin compressor station occurring during a startup-shutdown event of CERC? How was the impact of such coincidences obtained in the modeling used by ESS?

Question 6: One would assume that DEM has regulatory procedures in place to prevent the simultaneous occurrence of high-pollution episodes at the various sources and dangerous weather condition. Is this correct and, if so, what are those procedures?

Question 7: Are there any other sources of pollution in Massachusetts or Connecticut? If so, how were they accounted for in the modeling and in particular in the required NAASQ percentile estimates?

Nonattainment in Providence County

Question 8: How did the ESS simulations take into account that the Final Environmental Impact Statement of the AIM Project lists Providence County as Moderate NA (nonattainment) for NO_x and VOC and that purge and blowdown episodes of the Algonquin compressor station are listed in this context. Please see TABLE 4.11.1-3 (cont'd) Nonattainment and Maintenance Areas Within the Vicinity page 4-224 of (the first PDF of the list at the bottom of this web page: <http://www.ferc.gov/industries/gas/enviro/eis/2015/01-23-15-eis.asp>)

Forgive me if I repeat myself, but clearly, the results in this AIM project table predate the 2015 build-out and Invenergy's CERC proposal, both of which will be contributing to making a bad situation worse. How does the ESS dispersion report account for this?

Question 9: Once again, how could the relevant estimates be made if, as is clear from the years mentioned in Table 15 of the ESS Air Dispersion Report, the impact of the 2015 AIM build-out is as yet to be determined? For clarity let me reiterate that the National Ambient Air Quality Standards require three-year averages, the accumulation of which could not have started before 2015.

Question 10: The third paragraph of page 4-228 of the FEIS of the AIM Project states: Although the facility has existing GHG potential emissions greater than 100,000 tpy [ton per year] of CO_{2e} in Rhode Island, a major source of GHGs is not considered a major PSD [Prevention of Significant Deterioration] source if it is not also major for another PSD pollutant." Why does CERC, as major new source/modification at an existing source, not trigger a Nonattainment New Source Review? For more details see

<https://www.epa.gov/nsr/nonattainment-nsr-basic-information>

Question 11: The numbers in Table 15, NAAQS Compliance Determination, of the ESS Air Dispersion Report and those in TABLE 4.11.1-14 (con'd) on page 4-243 of the Final Environmental Impact Statement of the AIM Project appear to be inconsistent. To just give one example: according to Table 15, the one-hour number is 61.81% of the NAAQS impact, while the latter has 83.9%. There are two possibilities: (a) I am reading the table incorrectly, which is quite possible

because of the difference in nomenclature of the two tables and the absence of units in the ESS table; (b) CERC will be cleansing the atmosphere of NO₂, which sounds too good to be true. How can the numbers in these tables be reconciled with the national standards?

Noise Problems

Question 12: Pages 4-246 and 4-248 of the AIM Project's Final Environmental Impact Statement discuss noise problems of Algonquin compressor station, which in one area was rated as 57 decibels for its A-weighted sound pressure level even before the AIM Project. That is above the legal day-night limit of 55 dB.

What will DEM do to make sure that Spectra Energy/Algonquin will implement the remedies required by the Federal Energy Regulatory Commission? Will CERC push the noise pollution over the legal limit and if so by how much and what remedies will DEM and DOH require?

Changing Climate Conditions

As is well-known, one of the major effects of climate change will be an increase in the variability of the weather. To be specific, Hansen and Sato have shown that: The summer bell curves for the United States and (North and Central) Europe are shifted more than one standard deviation (1), while the shift in the winter is only about half of a standard deviation. The shift in summer is enough to increase the frequency of summers warmer than from less than 1% to greater than 10%. (<http://iopscience.iop.org/article/10.1088/1748-9326/11/3/034009>)

The shift to which Hansen and Sato refer compares 2005–2015 data to the 1951–1980 period, which they use as their base. In other words, the more than ten-fold increase in weather extremes they describe have occurred in a period of 45 years is comparable to the expected life time of the power plant Invenergy is proposing.

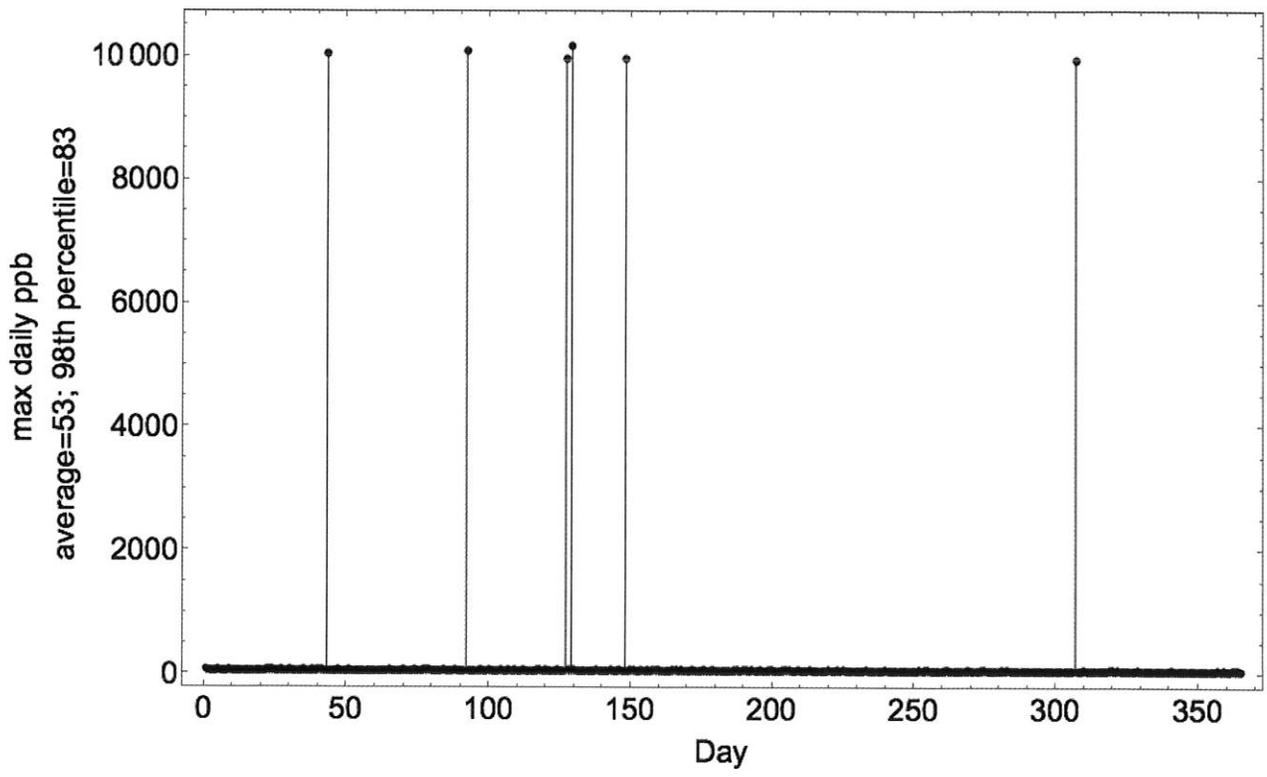
Question 13: What is the meaning of simulations that ignore the fact that conditions are likely to change during the lifetime of CERC?

Respectfully submitted,



Peter Nightingale
Professor of Physics
email: nightingale@uri.edu
tel. 401.789.7649

encl: Plot of NO₂: unhealthy in agreement with standards



Ucci, Nicholas (DOA)

From: Mike Gorman <MGorman@coastaltruck.com>
Sent: Monday, July 25, 2016 12:59 PM
To: DOA Energy Public Comment
Subject: Clear River Energy Center

Dear Sir or Madam,

Working the business side of a commercial truck dealership, I see firsthand how expensive it is to do business in this state. Fortunately, the company where I work is picking up again after almost a five year lull. Banks seem to be loosening up on their lending again which means more people are able to purchase commercial trucks, as opposed to several years ago. Still, our state needs to strike a balance somewhere because the cost of running a company coupled with high energy prices make it difficult to attract businesses. The proposed Clear River Energy Center is something that we need to make happen. Not only would the proposed gas energy plant bring new jobs, but it would make energy more affordable for everybody. It also has the potential of attracting new businesses to Rhode Island, which could further help to boost the economy with more job creation. Overall, I do not see a lot of negatives about the plant. Long story short, the Clear River Energy Center offers a lot to the citizens of our state. Affordable energy, new jobs, and the potential to further attract new businesses will benefit everybody--not simply the unemployed. This will be a big win for the state.

Michael Gorman
1 Milburn St
Johnston, RI 02919
(401) 556.3263

Ucci, Nicholas (DOA)

From: Robert Owens <buckzero@verizon.net>
Sent: Friday, July 29, 2016 12:32 PM
To: DOA Energy Public Comment
Subject: Docket # SB-2015-06: Please Approve Clear River Energy Center

Dear The Office of Energy Resources: I write today to express my strong support for construction of the 1,000-megawatt natural gas-powered Clear River Energy Center. I urge the Rhode Island Office of Energy Resources to support this project in the advisory opinion that it will provide to the state's Energy Facility Siting Board. ___ The fact is the increased use of natural gas in the United States has helped lower our nation's greenhouse gas emissions, helping us lead the rest of the world in carbon reduction. Using natural gas helps us to address climate change while providing the electricity that powers Rhode Island homes and businesses. At this time, renewable energy sources cannot fully meet our needs. ___ The benefits of natural gas were recently highlighted by Governor Raimondo in a meeting in Burrillville. She underscored the need to keep "energy prices as low as possible for the people of Rhode Island," and said that natural gas must be "a piece of [the] puzzle." I wholeheartedly agree. ___ Further, through the use of cutting-edge technologies and engineering, environmental impacts will be mitigated to the greatest possible extent during the operations of the Clear River facility. This project represents a very positive step forward in responsibly meeting our future energy needs. Thank you for your consideration. ___ Sincerely, Robert Owens 162 Ridge Rd Smithfield, RI 02917-2517

Ucci, Nicholas (DOA)

From: Henry Renaud <montecarloss_3@verizon.net>
Sent: Friday, July 29, 2016 12:35 PM
To: DOA Energy Public Comment
Subject: Docket # SB-2015-06: Please Approve Clear River Energy Center

Dear The Office of Energy Resources: I write today to express my strong support for construction of the 1,000-megawatt natural gas-powered Clear River Energy Center. I urge the Rhode Island Office of Energy Resources to support this project in the advisory opinion that it will provide to the state's Energy Facility Siting Board. ___ The fact is the increased use of natural gas in the United States has helped lower our nation's greenhouse gas emissions, helping us lead the rest of the world in carbon reduction. Using natural gas helps us to address climate change while providing the electricity that powers Rhode Island homes and businesses. At this time, renewable energy sources cannot fully meet our needs. ___ The benefits of natural gas were recently highlighted by Governor Raimondo in a meeting in Burrillville. She underscored the need to keep "energy prices as low as possible for the people of Rhode Island," and said that natural gas must be "a piece of [the] puzzle." I wholeheartedly agree. ___ Further, through the use of cutting-edge technologies and engineering, environmental impacts will be mitigated to the greatest possible extent during the operations of the Clear River facility. This project represents a very positive step forward in responsibly meeting our future energy needs. Thank you for your consideration. ___ Sincerely, Henry Renaud 34 John St Cumberland, RI 02864-7714

Ucci, Nicholas (DOA)

From: Henry Magendantz <magendantzh@cox.net>
Sent: Friday, July 29, 2016 12:45 PM
To: DOA Energy Public Comment
Subject: Docket # SB-2015-06: Please Approve Clear River Energy Center

Dear The Office of Energy Resources: I write today to express my strong support for construction of the 1,000-megawatt natural gas-powered Clear River Energy Center. I urge the Rhode Island Office of Energy Resources to support this project in the advisory opinion that it will provide to the state's Energy Facility Siting Board. ___ The fact is the increased use of natural gas in the United States has helped lower our nation's greenhouse gas emissions, helping us lead the rest of the world in carbon reduction. Using natural gas helps us to address climate change while providing the electricity that powers Rhode Island homes and businesses. At this time, renewable energy sources cannot fully meet our needs. ___ The benefits of natural gas were recently highlighted by Governor Raimondo in a meeting in Burrillville. She underscored the need to keep \"energy prices as low as possible for the people of Rhode Island,\" and said that natural gas must be \"a piece of [the] puzzle.\" I wholeheartedly agree. ___ Further, through the use of cutting-edge technologies and engineering, environmental impacts will be mitigated to the greatest possible extent during the operations of the Clear River facility. This project represents a very positive step forward in responsibly meeting our future energy needs. Thank you for your consideration. ___ Sincerely, Henry Magendantz 11 Willington Rd Pawtucket, RI 02861-2237

Ucci, Nicholas (DOA)

From: Patricia Pinsky <pjyeksnip@aol.com>
Sent: Friday, July 29, 2016 12:45 PM
To: DOA Energy Public Comment
Subject: Docket # SB-2015-06: Please Approve Clear River Energy Center

Dear The Office of Energy Resources: I write today to express my strong support for construction of the 1,000-megawatt natural gas-powered Clear River Energy Center. I urge the Rhode Island Office of Energy Resources to support this project in the advisory opinion that it will provide to the state's Energy Facility Siting Board. ___ The fact is the increased use of natural gas in the United States has helped lower our nation's greenhouse gas emissions, helping us lead the rest of the world in carbon reduction. Using natural gas helps us to address climate change while providing the electricity that powers Rhode Island homes and businesses. At this time, renewable energy sources cannot fully meet our needs. ___ The benefits of natural gas were recently highlighted by Governor Raimondo in a meeting in Burrillville. She underscored the need to keep "energy prices as low as possible for the people of Rhode Island," and said that natural gas must be "a piece of [the] puzzle." I wholeheartedly agree. ___ Further, through the use of cutting-edge technologies and engineering, environmental impacts will be mitigated to the greatest possible extent during the operations of the Clear River facility. This project represents a very positive step forward in responsibly meeting our future energy needs. Thank you for your consideration. ___ Sincerely, Patricia Pinsky 12 Corte Real Dr Bristol, RI 02809-2705

Ucci, Nicholas (DOA)

From: Floyd Grant <floydjanet@fctvplus.net>
Sent: Friday, July 29, 2016 1:22 PM
To: DOA Energy Public Comment
Subject: Docket # SB-2015-06: Please Approve Clear River Energy Center

Dear The Office of Energy Resources: I write today to express my strong support for construction of the 1,000-megawatt natural gas-powered Clear River Energy Center. I urge the Rhode Island Office of Energy Resources to support this project in the advisory opinion that it will provide to the state's Energy Facility Siting Board. The fact is the increased use of natural gas in the United States has helped lower our nation's greenhouse gas emissions, helping us lead the rest of the world in carbon reduction. Using natural gas helps us to address climate change while providing the electricity that powers Rhode Island homes and businesses. At this time, renewable energy sources cannot fully meet our needs. The benefits of natural gas were recently highlighted by Governor Raimondo in a meeting in Burrillville. She underscored the need to keep "energy prices as low as possible for the people of Rhode Island," and said that natural gas must be "a piece of [the] puzzle." I wholeheartedly agree. Further, through the use of cutting-edge technologies and engineering, environmental impacts will be mitigated to the greatest possible extent during the operations of the Clear River facility. This project represents a very positive step forward in responsibly meeting our future energy needs. Thank you for your consideration. Sincerely, Floyd Grant 5 Barneyville Rd Barrington, RI 02806-2714

Ucci, Nicholas (DOA)

From: Warren Gaudreau <warreng3@cox.net>
Sent: Friday, July 29, 2016 1:43 PM
To: DOA Energy Public Comment
Subject: Docket # SB-2015-06: Please Approve Clear River Energy Center

Dear The Office of Energy Resources: I write today to express my strong support for construction of the 1,000-megawatt natural gas-powered Clear River Energy Center. I urge the Rhode Island Office of Energy Resources to support this project in the advisory opinion that it will provide to the state's Energy Facility Siting Board. ___ The fact is the increased use of natural gas in the United States has helped lower our nation's greenhouse gas emissions, helping us lead the rest of the world in carbon reduction. Using natural gas helps us to address climate change while providing the electricity that powers Rhode Island homes and businesses. At this time, renewable energy sources cannot fully meet our needs. ___ The benefits of natural gas were recently highlighted by Governor Raimondo in a meeting in Burrillville. She underscored the need to keep \"energy prices as low as possible for the people of Rhode Island,\" and said that natural gas must be \"a piece of [the] puzzle.\" I wholeheartedly agree. ___ Further, through the use of cutting-edge technologies and engineering, environmental impacts will be mitigated to the greatest possible extent during the operations of the Clear River facility. This project represents a very positive step forward in responsibly meeting our future energy needs. Thank you for your consideration. ___ Sincerely, Warren Gaudreau 573 Black Plain Rd North Smithfield, RI 02896-9515

Ucci, Nicholas (DOA)

From: WILLIAM GRANT <MUDCAT099@LIVE.COM>
Sent: Friday, July 29, 2016 5:41 PM
To: DOA Energy Public Comment
Subject: Docket # SB-2015-06: Please Approve Clear River Energy Center

Dear The Office of Energy Resources: I write today to express my strong support for construction of the 1,000-megawatt natural gas-powered Clear River Energy Center. I urge the Rhode Island Office of Energy Resources to support this project in the advisory opinion that it will provide to the state's Energy Facility Siting Board. ___ The fact is the increased use of natural gas in the United States has helped lower our nation's greenhouse gas emissions, helping us lead the rest of the world in carbon reduction. Using natural gas helps us to address climate change while providing the electricity that powers Rhode Island homes and businesses. At this time, renewable energy sources cannot fully meet our needs. ___ The benefits of natural gas were recently highlighted by Governor Raimondo in a meeting in Burrillville. She underscored the need to keep "energy prices as low as possible for the people of Rhode Island," and said that natural gas must be "a piece of [the] puzzle." I wholeheartedly agree. ___ Further, through the use of cutting-edge technologies and engineering, environmental impacts will be mitigated to the greatest possible extent during the operations of the Clear River facility. This project represents a very positive step forward in responsibly meeting our future energy needs. Thank you for your consideration. ___ Sincerely, WILLIAM GRANT 48 Edgemere Ave Warwick, RI 02889-4029

Ucci, Nicholas (DOA)

From: John L. Cassino <cassinofamily@cox.net>
Sent: Friday, July 29, 2016 10:44 PM
To: DOA Energy Public Comment
Subject: Docket # SB-2015-06: Please Approve Clear River Energy Center

Dear The Office of Energy Resources: I write today to express my strong support for construction of the 1,000-megawatt natural gas-powered Clear River Energy Center. I urge the Rhode Island Office of Energy Resources to support this project in the advisory opinion that it will provide to the state's Energy Facility Siting Board. ___ The fact is the increased use of natural gas in the United States has helped lower our nation's greenhouse gas emissions, helping us lead the rest of the world in carbon reduction. Using natural gas helps us to address climate change while providing the electricity that powers Rhode Island homes and businesses. At this time, renewable energy sources cannot fully meet our needs. ___ The benefits of natural gas were recently highlighted by Governor Raimondo in a meeting in Burrillville. She underscored the need to keep "energy prices as low as possible for the people of Rhode Island," and said that natural gas must be "a piece of [the] puzzle." I wholeheartedly agree. ___ Further, through the use of cutting-edge technologies and engineering, environmental impacts will be mitigated to the greatest possible extent during the operations of the Clear River facility. This project represents a very positive step forward in responsibly meeting our future energy needs. Thank you for your consideration. ___ Sincerely, John L. Cassino 16 Atwood Ave North Providence, RI 02904-3605

Ucci, Nicholas (DOA)

From: Peter Pihun <pjpwrite@aol.com>
Sent: Monday, August 01, 2016 12:02 PM
To: DOA Energy Public Comment
Subject: Docket # SB-2015-06: Please Approve Clear River Energy Center

Dear The Office Of Energy Resources: I write today to express my strong support for construction of the 1,000-megawatt natural gas-powered Clear River Energy Center. I urge the Rhode Island Office of Energy Resources to support this project in the advisory opinion that it will provide to the state's Energy Facility Siting Board. ___ The fact is the increased use of natural gas in the United States has helped lower our nation's greenhouse gas emissions, helping us lead the rest of the world in carbon reduction. Using natural gas helps us to address climate change while providing the electricity that powers Rhode Island homes and businesses. At this time, renewable energy sources cannot fully meet our needs. ___ The benefits of natural gas were recently highlighted by Governor Raimondo in a meeting in Burrillville. She underscored the need to keep "energy prices as low as possible for the people of Rhode Island," and said that natural gas must be "a piece of [the] puzzle." I wholeheartedly agree. ___ Further, through the use of cutting-edge technologies and engineering, environmental impacts will be mitigated to the greatest possible extent during the operations of the Clear River facility. This project represents a very positive step forward in responsibly meeting our future energy needs. Thank you for your consideration. ___ Sincerely, Peter Pihun 440 Cottrell Rd Tiverton, RI 02878-4471

Ucci, Nicholas (DOA)

From: Lisa Petrie <teonlisa@juno.com>
Sent: Tuesday, August 02, 2016 5:29 PM
To: DOA Energy Public Comment
Subject: RE: Comments on the Clear River Energy Center
Attachments: My Testimony for OER 8-1-16.docx

Dear Commissioner Grant and Colleagues,

As promised, here is my testimony again with links to support my assertions (attached, and also pasted in below). In most cases, I included the links both as endnotes and as hyperlinks within the text for your convenience.

Thanks again for reviewing my testimony and giving it your serious consideration.

Sincerely,⁴³
Lisa Petrie

.....

COMMENTS ON THE PROPOSED CLEAR RIVER ENERGY CENTER, 8/1/16

My name is Lisa Petrie, and I live in Richmond, RI. I am a stay-at-home mom-turned climate activist and a member of Fossil Free Rhode Island. I became a climate activist because, as a mother, I'm committed to doing everything I can to safeguard my children's future—and the climate crisis is the biggest threat to that future, and to humanity itself.

I'd like to remind you that, in making this decision, you're not just responsible to your supervisors and/or the governor—you're also responsible to the people of Rhode Island, and above all to our children and future generations. All of us who are alive today have a responsibility to do everything in our power to avert [runaway, catastrophic climate change](#), including [a 9 ft. rise in sea level by 2050-2060](#).^[i] Why? Because we are the last generation that has the power to do that. If we don't succeed, our descendants will suffer the consequences, but they'll be powerless to stop them. You, moreover, bear a special weight of responsibility because you have been tasked with evaluating the climate impacts of this project.

As Professor Nightingale and others have pointed out, any meaningful analysis of the power plant's greenhouse gas impacts MUST take into account the upstream climate impacts of the methane that will be released into the atmosphere in the process of extracting, transporting, and processing the gas, as well as the greenhouse gas emissions on-site.

If I use electric heat, but the electricity comes from coal, can I say that I'm heating my house in a climate-friendly way just because there's no smoke coming out of my chimney? I don't think so. I have to take into account where that electricity comes from and all the impacts associated with producing and transporting it.

Similarly, with the power plant, you must take into account where the fuel comes from and all the impacts associated with producing, transporting, and processing it—otherwise, your analysis will be meaningless.

So it is vital that, in assessing the greenhouse gas emissions from the power plant, you take into account the methane that will be released at all stages, from the drilling of the well to extraction and transport, to the methane emitted by the power plant during combustion, blowdowns, etc., as well as the carbon dioxide and other greenhouse gas emissions throughout the life cycle.

Moreover, it is equally important to use a realistic figure for the global warming potential (GWP) of methane when calculating the carbon dioxide equivalent—one that takes into account the level of warming we've already reached and the fact that, if we fail to cut methane emissions now, [we will likely pass the tipping point for runaway, catastrophic warming within the next 15-35 years](#).^[ii] Therefore, a GWP based on a 100-year time frame—i.e., 34, or worse, the outdated figure of 25—is inappropriate to our current situation. You must therefore use a [GWP of 86](#) (based on a 20-year time frame),^[iii] and factor in ALL the greenhouse gas emissions from the whole life cycle of the fuels consumed, in assessing the greenhouse gas impacts of the power plant.

Finally, you must make a realistic determination of whether or not this power plant would be consistent with *both the letter and the spirit* of the Resilient Rhode Island Act of 2014. The intent of the Act was clearly to combat climate change, and therefore we must strive to achieve economy-wide emissions reductions in line with the targets set by the Act with respect to *both consumption and production*. After all, ALL greenhouse gas emissions contribute to climate change, regardless of where they are produced or where the associated products are consumed.

If *either* of these analyses suggests that the power plant would make it impossible to meet the goals of the Resilient Rhode Island Act, I believe you have a professional, ethical, and moral duty to respect the law and the democratic process that gave rise to it, and recommend that the plant not be built.

Dr. Timmons Roberts has stated that, in order to meet the near-term targets in the Act, we will need to cut our state's emissions by approximately 10 percent per year (please refer to his testimony; my earlier estimate of 6-7% was in error). This will be extremely challenging, but not impossible. However, if we are serious about achieving these targets and leaving our children a safe and stable climate, I believe we must cut emissions by *at least* 10 percent each year within the electricity generation sector, as reductions in other sectors may be even harder to achieve.

Should you decide that you need to see the EC4's comprehensive plan for meeting the targets in the Resilient Rhode Island Act before you can render your advisory opinion, you must ask the Energy Facility Siting Board (EFSB) to delay its final decision until after the plan is released, which I believe will be next spring. If the EFSB is serious about taking into account the greenhouse gas emissions caused by the power plant and respecting the targets in the Resilient Rhode Island Act, it cannot in good conscience rule on the project before you have had a chance to render an informed opinion.

As [Timmons Roberts](#) and [Jerry Elmer](#) have already stated, I believe it will be impossible to meet the targets of the Resilient Rhode Island Act while building a 900-1000 megawatt fracked gas and diesel fuel-fired power plant. Indeed, the International Energy Agency [warned in 2011](#) that any new infrastructure we build that consumes carbon will lock us into a high-emissions future, and that this lock-in effect is the biggest single factor placing us at risk for runaway, catastrophic climate change.^[iv] For the sake of your legacy, of protecting the gains you've made throughout your career for the environment and public health and safety, and above all for your children and grandchildren, I strongly urge you to recommend against building this power plant.

Sincerely,

[i] <http://www.insurancejournal.com/news/national/2016/04/12/405089.htm>

[ii] (<http://phys.org/news/2014-05-methane-greenhouse-gas-expert.html>); See also this report from PricewaterhouseCoopers which finds that we are on track to “blow our carbon budget by 2034: <http://www.usnews.com/news/blogs/data-mine/2014/09/12/pricewaterhousecoopers-warns-of-severe-consequences-from-climate-change>

[iii] <http://thinkprogress.org/climate/2013/10/02/2708911/fracking-ipcc-methane/>

[iv] <https://www.theguardian.com/environment/2011/nov/09/fossil-fuel-infrastructure-climate-change>; see also this article on gas infrastructure: <http://thinkprogress.org/climate/2016/07/22/3800752/a-bridge-to-forgetting-paris/>

While the public may assume agencies implement regulations in a formulaic, objective fashion requiring very little judgment, in fact agency behavior can be highly politicized and even corrupt. A host of scientific and technical presumptions flow into permit and other approval decisions, and the agencies commonly invoke their vast discretion to choose assumptions that ease the burden on politically powerful permit applicants. [Wood, Mary Christina. Nature's Trust (pp. 74-75).]

Ignoring all the other problems of fracking and focusing on global warming only, the trouble with the fracked-gas policy is that methane is a much more powerful greenhouse warming gas than carbon-dioxide.

Methane decays in the atmosphere in about a decade. To the impact of the gas policy on global warming, one converts the combination of carbon dioxide and methane to a carbon dioxide equivalent with the same effect on global warming. The conversion factor is called the global warming potential (GWP).

For making small scale, real-life decisions one smears out the effect over a time horizon of 20 or a 100 years. For the 20 year horizon the rounded GWP conversion factor is 90 and for a 100 years it is 30. These are the numbers from the latest IPCC report. (See Table 8.7 second line from the top on page 714—https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_Chapter08_FINAL.pdf)

EPA uses the 100 year horizon and a conversion factor of 20, which is 20 years out of date. (See <https://www.law.cornell.edu/cfr/text/40/part-98/subpart-A/appendix-TableA-1>)

In the long run (200 or 300 years) methane is irrelevant. The problem is that it's likely that within the couple of decades we might reach tipping points at which the climate will undergo irreversible changes. It seems that we are already beyond some of these: West Antarctic Ice Sheet collapse is under way—<https://www.sciencedaily.com/releases/2014/05/140515090934.htm>

There are indications that the AMOC (Atlantic Meridional Overturning Circulation) is collapsing—<http://archive.reportingclimatescience.com/archivenews/article/amoc-collapse-early-warming-signals-identified.html> If that happens, the weather patterns in the North Atlantic will change dramatically. In other words, use of the 100 year horizon is irresponsible; the decadal time scale is what we should be using.

When one uses the decadal time scale:

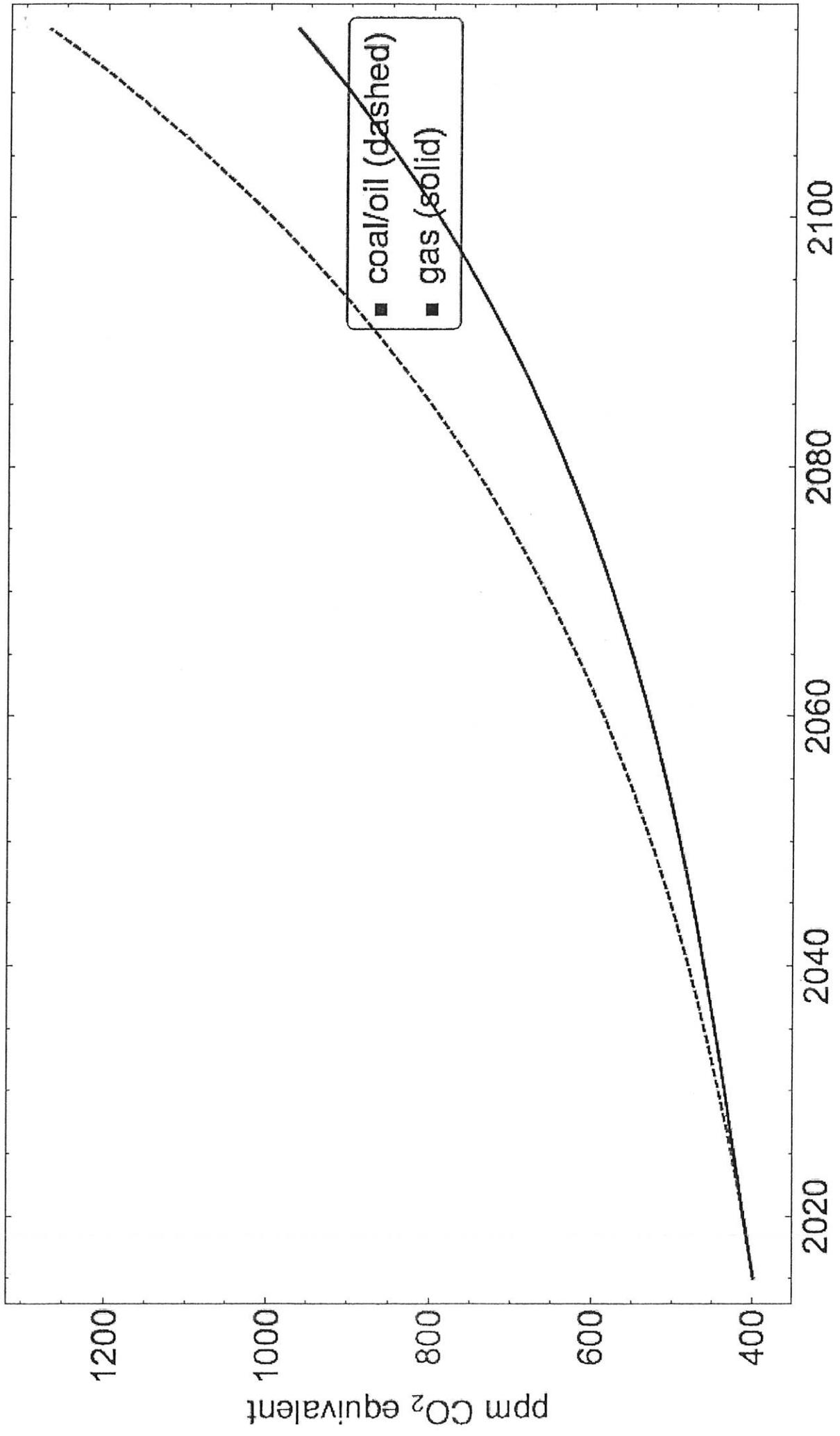
The conclusion stands that both shale gas and conventional natural gas have a larger GHG [greenhouse gas footprint] than do coal or oil, for any possible use of natural gas and particularly for the primary uses of residential and commercial heating.

(This is from the abstract of this paper by Robert Howarth—<http://tinyurl.com/meth-bridge>)

By the time the benefits of the Clean Power Plan show up, 50-80 years from now, we'll all be dead and the climate will be ruined.

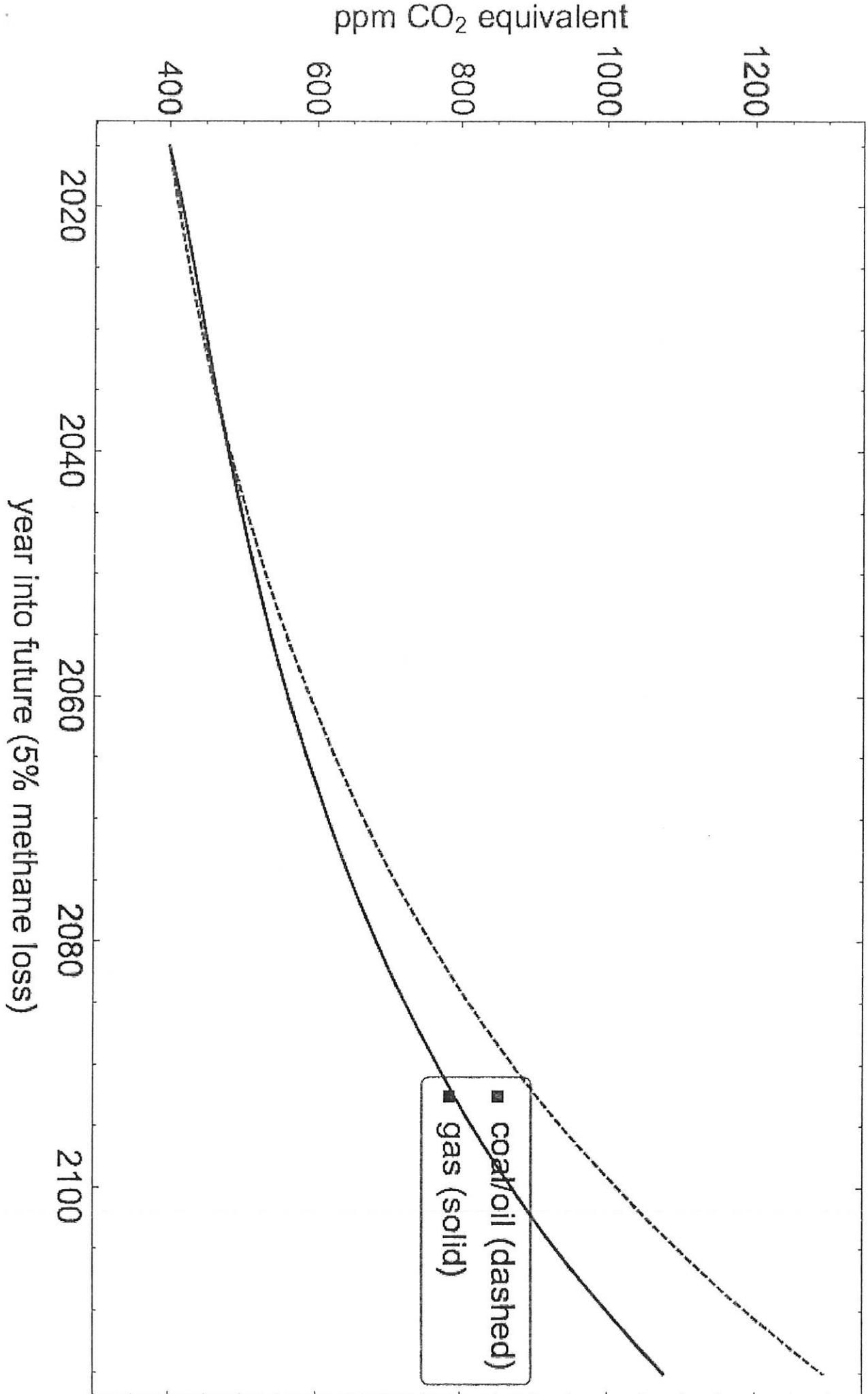
Peter Nightingale nigh@pobox.com 401.871.1289

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7-21-16

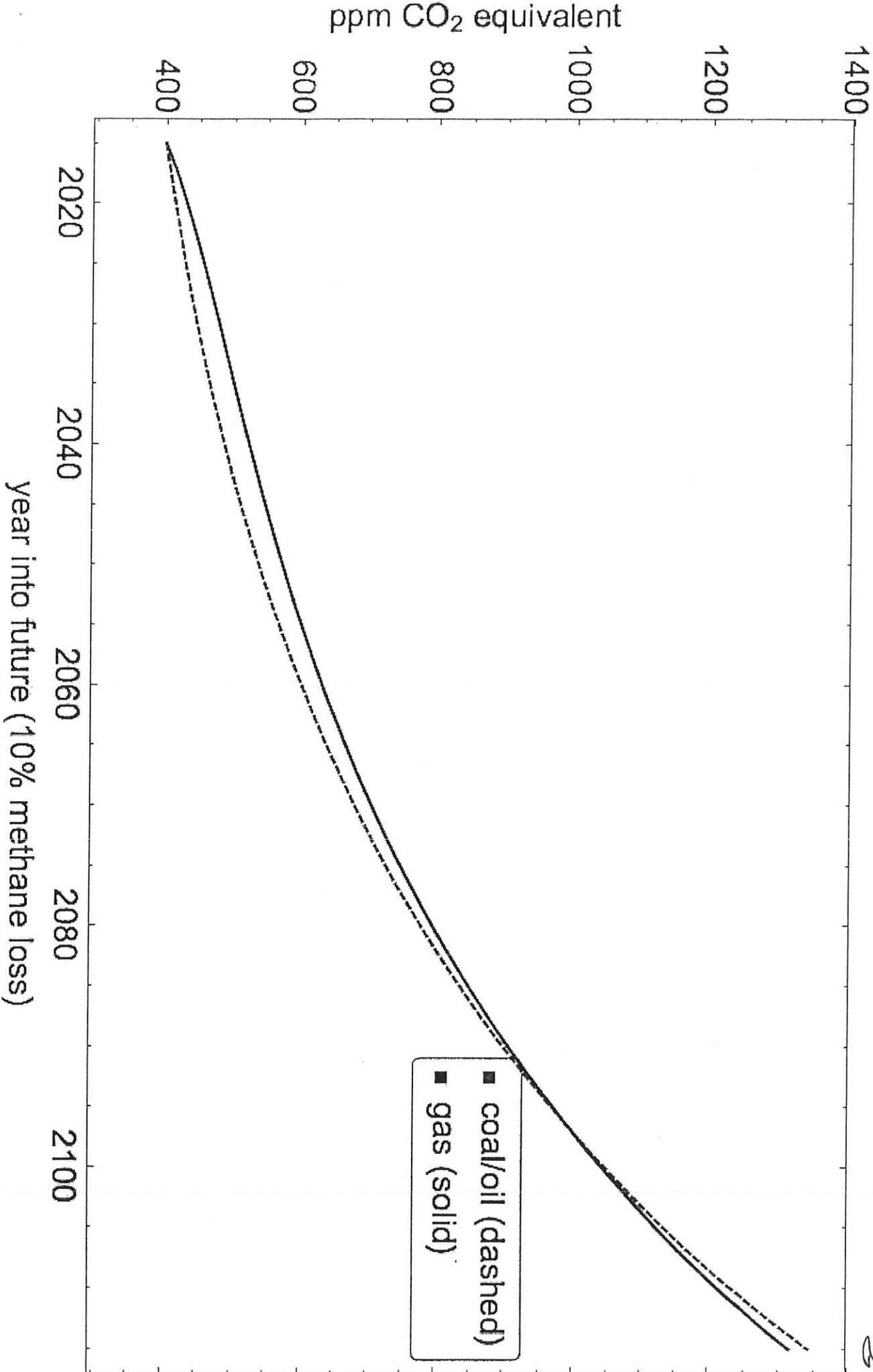


year into future (2.5% methane loss)

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2016



Alcw
7/21/16

THE
UNIVERSITY
OF RHODE ISLAND

COLLEGE OF
ARTS AND SCIENCES

DEPARTMENT OF PHYSICS

East Hall, 2 Lippitt Road, Kingston, RI 02881 USA p: 401.874.2633 f: 401.874.2380 phys.uri.edu

March 20, 2016

Janet Coit, Director Rhode Island Department of Environmental Management
235 Promenade Street
Providence, RI 02908
Nicole Alexander-Scott, Director Department of Health
3 Capitol Hill
Providence, RI 02908

Dear Directors Coit and Alexander-Scott:

I hereby request that you, pursuant to your obligations under Title 42, Chapter 42-17.1 Section 42-17.1 (14)(i)-(iii) and Title 23, Chapter 23-1, Section 23-1-1, provide answers to the following questions raised in this writing. Please let me know within the next couple of days whether you will honor this request and, if so, by when.¹

Introduction & background

This writing is in part a follow up of a meeting that Robert Malin and I, members of Fossil Free RI, had with Barbara Morin, Julia Gold, and Julian Drix had a couple of weeks ago at the Department of Health. We promised to follow up with more information; please find that attached.

Let me start with a short summary of some parts of that exchange.

First of all, there is a Compendium about the health effects of fracking, compressors stations etc. The compendium (<http://concernedhealthny.org/compendium>) was published by the Concerned Health Professionals of NY and was last updated in October of 2015. For your convenience, I bookmarked and highlighted several sections that are of particular interest for the various natural gas projects in Burrillville. With a little bit of luck, you should be able to find those sections, but not all PDF readers are compatible and this may not work as intended. Please let me know in that case. I'll be happy to provide a list of the pages I bookmarked.²

Please find also attached a plot of a scenario that that satisfies the National Ambient Air Quality

¹I corrected minor typographical errors in this version;

²The compendium is not attached to this letter; please see my original email

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Standards; see <http://www.epa.gov/criteria-air-pollutants/naaqs-table>. In spite of the fact that the standards are met, the plot shows the presence of levels of NO₂ that episodically exceed those standards by two orders of magnitude. The plot is a theoretical possibility that illustrates what is described in more detail in the attached by paper by Brown et al.³

In the present study we consider estimates of emissions from well pads, compressor stations and processing plants to gauge individuals possible exposures and the health risks those exposures pose. This is necessary because much of the publicly accessible emissions data has been collected to provide average exposures over a lengthy period of time and because the data collection is intended to document compliance with regional air quality standards.

Most of the questions in this writing are about the Air Dispersion Modeling Report - Clear River Energy Center - Burrillville, October 30, 2015, by ESS group. This report is part of the docket of the Energy Facility Siting Board (http://www.ripuc.org/efsb/2015_SB_6.html) *Invenergy Response to CLF - First Set*: http://www.ripuc.org/efsb/efsb/SB2015_05_DR1_R.pdf A second data set submitted by Invenergy may raise further questions.

As you know, several segmented projects will be coming together in Burrillville:

1. Spectra Energy's Aim Project
2. Invenergy's Clear River Energy Center
3. Access Northeast, a project of Eversource Energy, National Grid and Spectra Energy: <http://accessnortheastenergy.com/News-and-Events/#events>
4. TransCanada's Ocean State Power Phase III, submitted to the Energy Facility Siting Board on December 1 of last year.

First of all, please note the date of the EES report: October 30, 2015. To the best of my knowledge, the expansion of the Algonquin compressor station had not yet been completed on that date. Obviously, no data are available yet to DEM about the environmental impact of the expanded compressor station. Nor will there be any such data for some time as the National Ambient Air Quality Standards requires three-year averages.

Consequently, the report cannot possibly provide the reliable multi-source modeling analysis requested, as the ESS report mentions, by RI DEM. Instead, the report stacks hypotheticals upon hypotheticals and the resulting lack of reliability puts public health at risk.

Indeed, as the time line makes painfully clear, Burrillville may be subjected to a sequence of projects that exemplify impermissible segmentation as defined in item 46 on page 18 of this Federal Energy Regulatory Commission document <http://www.ferc.gov/CalendarFiles/20160128180805-CP14-96-001.pdf> Also see Request for Rehearing of Coalition of AIM Intervenors under CP14-96, http://elibrary.ferc.gov/idmws/file_list.asp?accession_num=20150402-5290

Some of the questions in the list below are related to the episodic nature of the emissions mentioned above in the work of Brown et. al.

³Once again to save paper this paper is not attached but it can be found here <http://www.tandfonline.com/doi/full/10.1080/10934529.2015.992663>

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Average Moisture Conditions

The second paragraph of Section 2.0 of the ESS report states that the simulations were conducted at two typical temperature, namely 10F and 59F. Section 5.1 mentions that the simulations were run assuming average moisture conditions.

According to this EPA web site (<http://www3.epa.gov/airquality/airtrends/2007/report/groundlevelozone.pdf>), ground-level ozone forms when emissions of nitrogen oxides (NOx) and volatile organic compounds (VOCs) react in the presence of sunlight. These ingredients come from motor vehicle exhaust, power plant and industrial emissions, gasoline vapors, chemical solvents, and some natural sources.

Question 1: How can a modeling done at average temperature and humidity conditions capture the true episodic impact of CERC and the other nearby pollution sources on public health? Temperature, humidity and sunlight fluctuate wildly in Rhode Island and, due to climate change, they are expected to vary even more fiercely during the lifetime of the proposed Clear River Energy Center.

Effect of the 2015 build-out of the Algonquin Compressor Station

Table 15, NAAQS Compliance Determination, of the ESS's Air Dispersion Report on PDF page 45 contains the results of the simulations including the effect of the "Algonquin" Compressor Station up to 2014.

Question 2: How does the ESS modeling account for the AIM Project build-out of the compressor station that took place in 2015?

Question 3: Did the ESS modeling simultaneously simulate the four Rhode Island sources of pollution: Algonquin Station, Ocean State Power, RISE and CERC? If so, was the Algonquin compressor station characterized by its state before or after the 2015 AIM build-out? Due to the paucity of detail provided about the modeling, I cannot tell if it only simulated CERC while adding the other sources merely into the average background. Either way it seems that the simulation can only have been based on obsolete information that predates the 2015 build-out and ignores the fact that there also are out-of-state pollution sources.

Question 4: If the modeling did not simulate all four sources mentioned above simultaneously and in their post-AIM-build-out configuration, how did the modeling estimate the percentiles required to check that CERC will operate according to the National Ambient Air Quality Standards? (See *Reviewing National Ambient Air Quality Standards Scientific and Technical Information*, <http://www3.epa.gov/ttn/naaqs/criteria.html>)

How, in particular, did the simulations deal with the fact that it is mathematically impossible to obtain the required percentiles computed under those circumstances? For clarity let me add that this mathematical impossibility is the result of the fact that there are no addition laws that allow one to add averages to percentiles or percentiles to each other. Of course, some uncontrolled approximation might have been used to circumvent this problem. In that case, please supply the answer to question what approximation was used.

Question 5: If the modeling did simulate all four Rhode Island pollution sources simultaneously, please point us to the information that DEM supplied for the modeling, including start-up, shut-

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downs, scheduled and unscheduled maintenance. Without this information it is impossible to ascertain even the feasibility of the modeling that presumably leads to the conclusion that the NAAQS standards are met upon construction of CERC.

Of particular concern in this context is the impact of coincidences such as a purge or blowdown of the Algonquin compressor station occurring during a startup-shutdown event of CERC? How was the impact of such coincidences obtained in the modeling used by ESS?

Question 6: One would assume that DEM has regulatory procedures in place to prevent the simultaneous occurrence of high-pollution episodes at the various sources and dangerous weather condition. Is this correct and, if so, what are those procedures?

Question 7: Are there any other sources of pollution in Massachusetts or Connecticut? If so, how were they accounted for in the modeling and in particular in the required NAASQ percentile estimates?

Nonattainment in Providence County

Question 8: How did the ESS simulations take into account that the Final Environmental Impact Statement of the AIM Project lists Providence County as Moderate NA (nonattainment) for NOx and VOC and that purge and blowdown episodes of the Algonquin compressor station are listed in this context. Please see TABLE 4.11.1-3 (cont'd) Nonattainment and Maintenance Areas Within the Vicinity page 4-224 of (the first PDF of the list at the bottom of this web page: <http://www.ferc.gov/industries/gas/enviro/eis/2015/01-23-15-eis.asp>)

Forgive me if I repeat myself, but clearly, the results in this AIM project table predate the 2015 build-out and Invenergy's CERC proposal, both of which will be contributing to making a bad situation worse. How does the ESS dispersion report account for this?

Question 9: Once again, how could the relevant estimates be made if, as is clear from the years mentioned in Table 15 of the ESS Air Dispersion Report, the impact of the 2015 AIM build-out is as yet to be determined? For clarity let me reiterate that the National Ambient Air Quality Standards require three-year averages, the accumulation of which could not have started before 2015.

Question 10: The third paragraph of page 4-228 of the FEIS of the AIM Project states: Although the facility has existing GHG potential emissions greater than 100,000 tpy [ton per year] of CO₂e in Rhode Island, a major source of GHGs is not considered a major PSD [Prevention of Significant Deterioration] source if it is not also major for another PSD pollutant." Why does CERC, as a major new source/modification at an existing source, not trigger a Nonattainment New Source Review? For more details see

<https://www.epa.gov/nsr/nonattainment-nsr-basic-information>

Question 11: The numbers in Table 15, NAAQS Compliance Determination, of the ESS Air Dispersion Report and those in TABLE 4.11.1-14 (con'd) on page 4-243 of the Final Environmental Impact Statement of the AIM Project appear to be inconsistent. To just give one example: according to Table 15, the one-hour number is 61.81% of the NAAQS impact, while the latter has 83.9%. There are two possibilities: (a) I am reading the table incorrectly, which is quite possible

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because of the difference in nomenclature of the two tables and the absence of units in the ESS table; (b) CERC will be cleansing the atmosphere of NO₂, which sounds too good to be true. How can the numbers in these tables be reconciled with the national standards?

Noise Problems

Question 12: Pages 4-246 and 4-248 of the AIM Project's Final Environmental Impact Statement discuss noise problems of Algonquin compressor station, which in one area was rated as 57 decibels for its A-weighted sound pressure level even before the AIM Project. That is above the legal day-night limit of 55 dB.

What will DEM do to make sure that Spectra Energy/Algonquin will implement the remedies required by the Federal Energy Regulatory Commission? Will CERC push the noise pollution over the legal limit and if so by how much and what remedies will DEM and DOH require?

Changing Climate Conditions

As is well-known, one of the major effects of climate change will be an increase in the variability of the weather. To be specific, Hansen and Sato have shown that: The summer bell curves for the United States and (North and Central) Europe are shifted more than one standard deviation (1), while the shift in the winter is only about half of a standard deviation. The shift in summer is enough to increase the frequency of summers warmer than from less than 1% to greater than 10%. (<http://iopscience.iop.org/article/10.1088/1748-9326/11/3/034009>)

The shift to which Hansen and Sato refer compares 2005–2015 data to the 1951–1980 period, which they use as their base. In other words, the more than ten-fold increase in weather extremes they describe have occurred in a period of 45 years is comparable to the expected life time of the power plant Invenegy is proposing.

Question 13: What is the meaning of simulations that ignore the fact that conditions are likely to change during the lifetime of CERC?

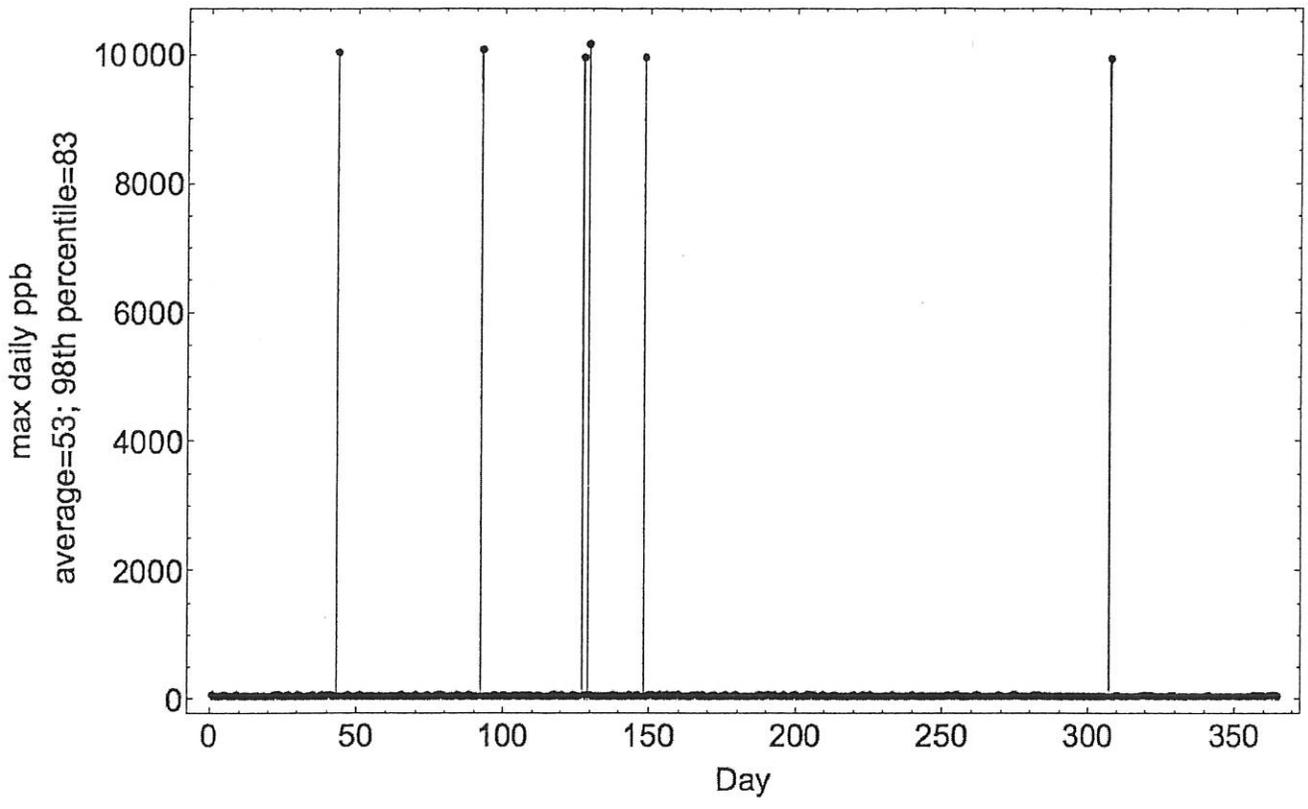
Respectfully submitted,



Peter Nightingale
Professor of Physics
email: nightingale@uri.edu
tel. 401.789.7649

encl: Plot of NO₂: unhealthy in agreement with standards

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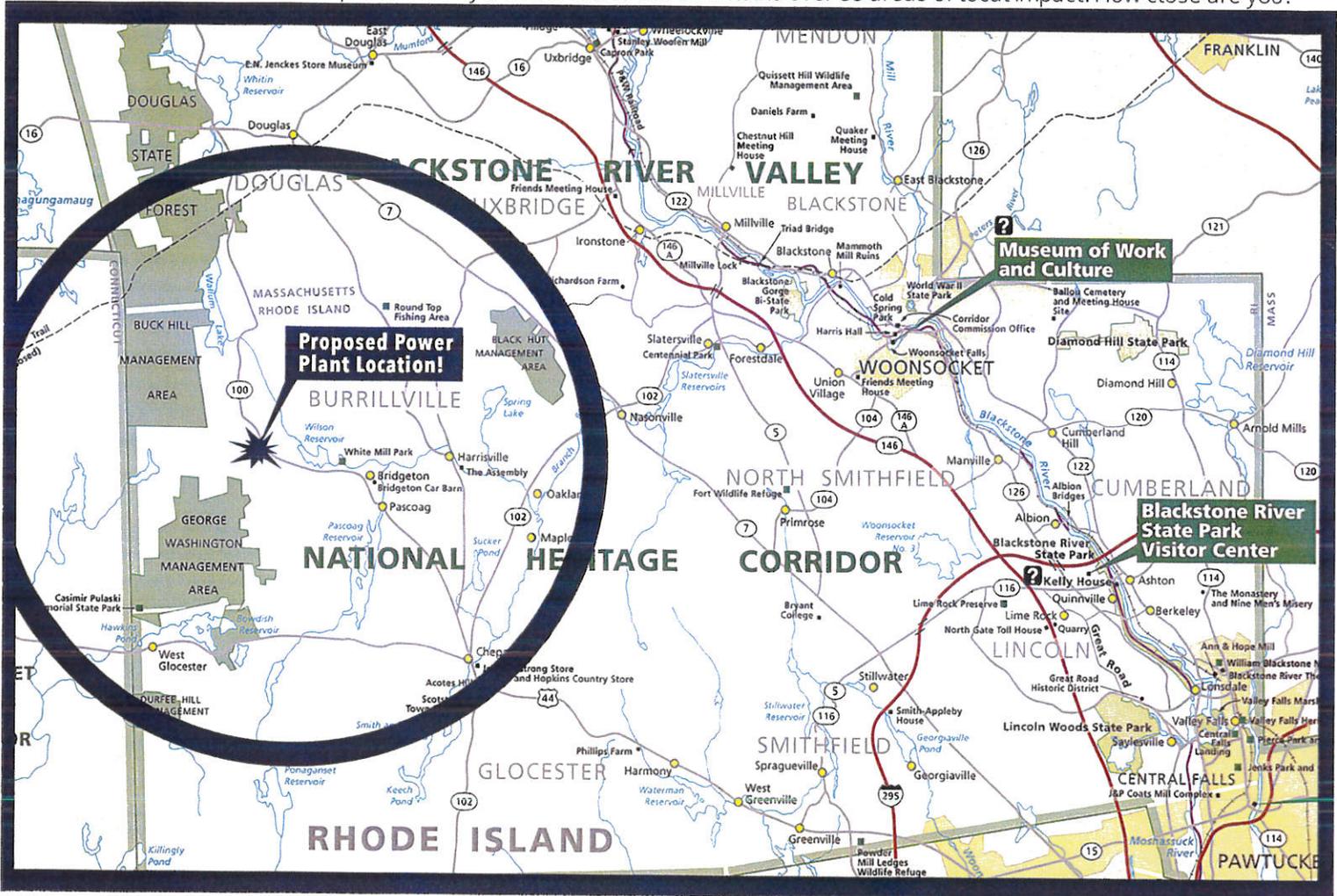


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KEEP RHODE ISLAND Beautiful

NO NEW BURRILLVILLE POWER PLANT!

The proposed **1000 Megawatt Power Plant** would be located in the middle of the Blackstone River Valley National Heritage Corridor U.S. Park. The circle represents only a 5 mile radius but it contains over 85 areas of local impact. How close are you?



The proposed plant is NOT a done deal. What can YOU do to stop it?

Write & Call

1. Contact the Governor of Rhode Island
Email: Gov.Outreach@governor.ri.gov Call: (401) 222-2080 Write: 82 Smith Street Providence, RI 02903.
2. Submit your written comments to the RI Energy Facilities Siting Board. Email the coordinator: todd.bianco@puc.ri.gov
3. Contact your local elected State & Town officials.

Attend

- Your support and presence at the meetings is very important.
1. Attend the Rally for Energy Independence Saturday, June 11th from 10 AM-2 PM in Burrillville, RI.
 2. Attend EFSB Public Comment Hearing at CCRI Auditorium, Warwick, RI June 30th 6.00 PM

Volunteer

- There are many ways you and your family can get involved and help.
1. Sharing information person to person is one of the most important things you can do
 2. You can also help with the petition drive, help staff awareness events, rallies, meetings, and much more.

Connect with us on social media and the web for full list of contacts & events.

The RISK to our children, our future, and our environment is just not worth the REWARD.

Get educated, share, contact officials, and take action.



Facebook/KeepRhodeIslandBeautiful



www.keeprhodeislandbeautiful.com

Paid for by citizens of Burrillville & Northern Rhode Island

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KEEP RHODE ISLAND Beautiful

NO NEW BURRILLVILLE POWER PLANT!

Did you know that Governor Gina Raimondo has proposed putting a **SECOND POWER PLANT** in Burrillville, Rhode Island? The proposed **1000 Megawatt Power Plant** would be **fueled by Fracked Gas & Diesel Oil** (Fossil Fuels) and would result in the **unnecessary industrialization** of our beautiful and ecologically diverse rural region and neighborhoods. It would also introduce **unnecessary risk to our health and safety** as well as **unnecessary risk to our water supply and quality**.

The facts below highlight how the proposed plant would **negatively impact Burrillville as well as the larger region and towns in RI, MA, and CT**. Due to current RI state law **the residents of Burrillville have NO VOTE**. The decision and approval for this plant now rests solely with the Rhode Island Energy Facility Siting Board. The EFSB, the Governor, and all elected state & town officials need to hear from us as citizens. Please **visit us online on Facebook and our website** for more details on the proposed plant, the process, and for contact info so you can take action and voice your concern before it's too late.

52
known pollutants

52 known pollutants will be spewed from **twin, 200 foot tall stacks** including **3 tons of formal Hazardous Pollutants** a year and **3.6 Million tons of CO2** a year, endangering the health of our families.

85
local areas

There are over **85 thriving environmental areas** within a **5 mile radius** including; 20 bodies of water, 26 Conservation Land Areas, 25 State Recreation Areas, 15 Historic Districts, 8 State Conservation areas, and many campgrounds and youth camps used by thousands.

100K
people

Over 100,000 people live in communities surrounding Burrillville, RI and the proposed plant including: Glocester, RI; N. Smithfield, RI; Uxbridge, MA; Douglas, MA; Thompson, CT; and Putnam CT

200
acres

At least 200 combined acres of **beautiful interior forest clearcut**: significantly impacting local habitats, wetlands, and **displacing over 165 distinct wildlife species** including **2 threatened species**.

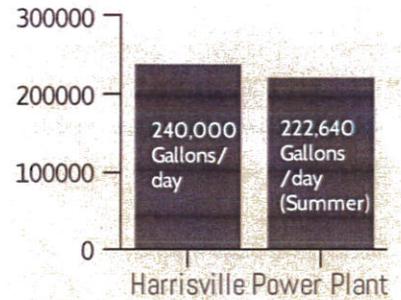
222K
gallons

222,640 Gallons of Water a Day (924,489 @ peak) will be drawn through an **MTBE contaminated well** posing significant risk of the **release of potentially carcinogenic contaminants**, while also **draining water resources** available for local aquifers and rivers.

2M
gallons

Two, 1 Million gallon tanks for storage of oil to be burned as needed in winter (= higher pollution & water usage levels) as well as a **40,000 gallon ammonia tank** and **hydrogen gas** stored in tube trailers.

The proposed plant is projected to use as much water per day as the entire Harrisville District!



"Water supplied to the project from PUD's well #3A should be considered to decrease the water flow available to the Clear River...it will be assumed that there will be a one for one reduction in the Clear River flow."

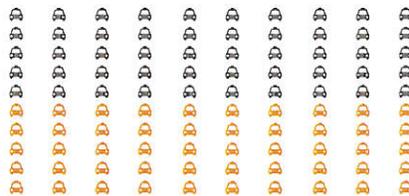
* from the Clear River Energy Center Application, 10/28/15 page 51

3,626,113 Tons of Additional Carbon Dioxide Emitted Annually!

38%

Approximate increase in annual energy-related Rhode Island CO2 emissions

* based on 2013 data from U.S. Energy Information Administration



Equivalent to **750,000 cars** (almost 2x the number of cars in RI).

* based on per passenger car estimate from EPA and registered Rhode Island vehicles from US DOT Office of Highway Information

"It would be impossible to ever meet the carbon-emission-reduction goals of the Resilient Rhode Island Act."

Jerry Elmer, Senior Counsel with Conservation Law Foundation

Elmer, J. (2016 January, 11). R.I. plant a step in wrong direction. The Providence Journal

The RISK to our children, our future, and our environment is just not worth the REWARD.



Get educated, share, contact officials, and take action.



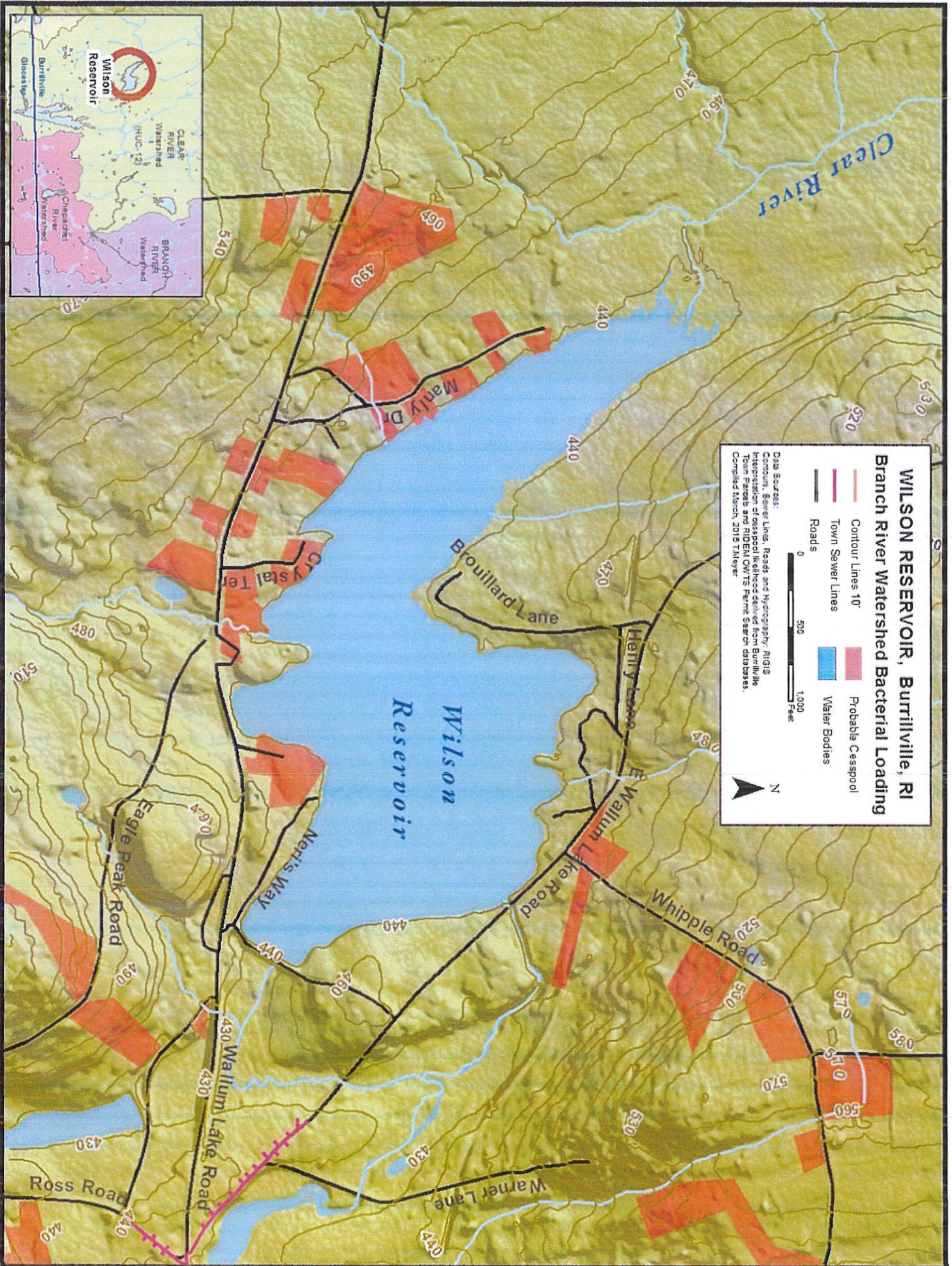
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Paid for by citizens of Burrillville & Northern Rhode Island

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