

Dear Secretary of the Board of Public Utilities (NJBPU) Sherri Golden,

Could you please send this message to the BPU Commissioners and President Fiordaliso as a forward to a comment I will be sending to the BPU President and Commissioners shortly for docket GO23020099, in the matter of the implementation of Executive Order 317 requiring the development of Natural Gas Utility Emission Reduction Plans.

Please note, I am forwarding a message I sent to NJDEP Bureau of Air Enforcement-Northern Division back in February 2023. The original message details how a specific natural gas facility owner (Tennessee Gas Company) has been substantially underreporting emissions for Methane and Volatile Organic Compounds (VOCs) that TGP provides NJDEP for annual emissions estimates. I have included the NJDEP Bureau of Air Enforcement-Northern Division on the distribution of this message. If there is any error in what I present or misstatement, I welcome any correction and or feedback.

After listening to the NJBPU technical sessions on Aug 2 and 3 around natural gas greenhouse gas emissions, I find that a majority of the speakers at the conference are unaware that natural gas companies are falsely presenting impossibly low methane and VOC emissions for each facility in New Jersey on an annual basis. I have been trying to encourage NJDEP through comments and emails to change their rules so that their air enforcement bureaus can have the tools and the authority to perform independent audits of each facility using what the EPA details in its optical gas imaging procedures. Some folks at the NJDEP responsible for creating these policies (not the air enforcement bureaus) still don't realize that actual methane emission rates can be assessed using FLIR cameras, despite EPA having standards and instructions detailing how this can be done in the Optical Gas Imaging (OGI) standards and procedures. This is critical since this is the only method that NJDEP and EPA will be able to audit, monitor and enforce natural gas facility owners to report more accurate annual estimate emissions.

In my research of New Jersey natural gas facilities providing annual emission updates, I have found that all of the facilities are posting annual emission updates to NJDEP that are much lower than actual emissions and, in some cases, virtually impossible emission updates for some facilities unless some turbines were shut completely off.

In my phone call with NJDEP Bureau of Air Enforcement-Northern Division Bureau Chief Jeffrey Meyer back in February, we discussed the Tennessee Gas Pipeline (TGP) compressor station CS-325 emissions. I learned several additional aspects that further distort the VOC and methane emissions estimates lower in the facility owner's annual update report:

1. NJDEP blowdown/venting reporting is only required if more than 2,000 pounds of VOC is emitted during the event. Over the past 20 years for CS-325, TGP only reported one blowdown event that exceeded the 2,000 pounds of VOC emission. All other blowdowns and venting were 2,000 pounds or less pounds of VOC and hence were not reported. The blowdown/venting report doesn't require any other emissions report than just VOC for that event. In other words, no data on methane or other toxic pollutants emitted during the blowdown event.
2. Natural Gas Facility owners are not required to add in fugitive emissions (leaking at valves on the facility, venting or blowdowns that occurred during that year at the facility) into their annual estimate emissions report.
3. Natural Gas Facility owners provide one set of details to FERC when filing an application for adding new turbines at a facility which includes providing the manufacturer's specifications of the turbines used at a facility. The facility owner does not provide this detail to NJDEP air permitting. Then the facility owner the submits annual estimate updates each year that are far lower than the estimates provided for permitting and does not include fugitive-venting/blowdowns nor fugitive-leaking at valves.

CS-325 is a perfect example where in 2009, TGP provided specifications to FERC for the two turbines to be installed at CS-325. These specifications stated that the annual emissions potential would be **601 tons of methane** (unburned methane emission from combustion for two turbines: 8.42 tons; fugitive-leaking from all valves: 478 tons; fugitive-venting: 115 tons) for each year.

After installation, the Facility owner (TGP) reported annual emissions for methane to NJDEP for the following subsequent years –

2010: 0.33 tons; 2011: 0.68 tons; 2012: 0.71 tons; 2013: 1.190 tons; 2014: 1.45 tons; 2015: 1.07 tons; 2016: 1.28 tons; 2017: 1.27 tons; 2018: 1.23 tons; 2019: 1.19 tons; 2020: 1.29 tons; and 2021: 1.3 tons.

All reported annual updates are impossibly below the specifications for just the natural gas fired turbines emissions.

4. All Natural Gas Facilities that utilize electric compressors are not required to report annual emission estimates to NJDEP or EPA, even if the facility owner detailed methane emissions greater than 142 tons of methane each and every year (example is TGP CS-327).

CS-325 single blowdown event reported in 2004

NJDEP provided me all of the annual blowdown event reports for CS-325 for the past 20 years. The facility owner for CS325 only reported a single blowdown in 2004 (6/10/2004) which lasted for 8 hours emitting 2,263 pounds of VOC emission. No other blowdowns for the past 20 years. The facility owner, Tennessee Gas Pipeline Company, uses the qualitative wording “reportable events” which means only blowdowns that emit more than 2,000 pounds of Volatile Organic Compounds (VOCs).

Using the Tennessee Gas Pipeline weight percentage specifications for that specific natural gas transmission line (East 300 Line), we can quickly perform simple ratio math to determine how much methane was emitted during those 8 hours. TGP weight percentage specifications indicate that VOC is .19% of the natural gas weight percentage and that methane is 96.12%. This means methane emission is 505.8947 times the emission amount of VOC (2,263 pounds). This would mean that during 2004 event, there was 1,144,839.789 pounds (**572.419 tons**) of methane emitted during that 8-hour blowdown event. NJDEP doesn’t require venting/blowdown events to be included in the annual estimate emissions report, so TGP reported to NJDEP **0.640 tons of methane** and **14.920 tons of VOC emissions for the year 2004.**

Notables:

- Facility owners report to FERC that venting and blowdowns are common occurrences as a quick fix to pressure and flow issues at the compressor station facilities.
- For CS-325 located at Libertyville Road, Wantage Twp, NJ 07461, the emissions of 2,000 pounds of VOC from a blowdown event means that 505.89 tons of methane would also be emitted.
- NJDEP rules do not allow actual auditing using FLIR cameras of methane emissions from any facility in New Jersey. When NJDEP had comments open for the new policy, I encouraged NJDEP to review and implement the EPA OGI (Optical Gas Imaging) standards and procedures. NJDEP response to my suggestion was that it is not possible to determine methane flow from FLIR imaging (which is incorrect).

Why is this important for Executive Order 317 and NJ BPU's recommendation response report due August 2024:

1. NJBPU and stakeholders and all other NJ Agencies have been inadvertently provided false sets of data points for the natural gas infrastructure within New Jersey. It is time to get the data right in order to have an effective reduction plan.
2. Since blowdowns and venting are not required to be included with the annual emissions estimates, we are missing a substantial piece of methane emissions from every natural gas facility within New Jersey and upstream of New Jersey. This urgently needs to be understood, audited and validated. It also means that along with the unaccounted-for methane, all of the toxic VOC components such as 2,2,4-Trimethylpentane; Benzene; Ethylbenzene; n-Hexane; Toluene; and Xylenes are not reported either. This poses as a direct health impact risk not clearly measured, monitored nor understood.
3. Understanding the impact of methane emissions and, the full extent of actual methane emissions, is a severe gap within New Jersey Agencies. Often it is rolled up into a carbon equivalent known as CO₂e. But CO₂e uses a multiplier of 25 for methane based on the warming potential after 100 years in the atmosphere. Yet, the warming potential multiplier after 1 year from when methane is emitted into the atmosphere is 116 (using IPCC AR6 datapoints) times the warming potential of carbon dioxide. We need to address methane separately and the short-term impacts and ramifications for climate change.

"Methane emissions induce an atmospheric feedback by decreasing the hydroxyl concentration, thereby increasing methane's lifetime. The strength of this feedback factor, approximately 1.3–1.4, causes the lifetime of a marginal emission, known as the perturbation lifetime, to be significantly higher than the lifetime of methane already in the atmosphere [7,8]." (<https://royalsocietypublishing.org/doi/pdf/10.1098/rsta.2021.0104>). Increased atmospheric methane concentrations initiates a feedback like a turbo boost, extending the longevity of methane and hence increasing concentration levels.

While NOAA publishes the global monthly methane concentration mean as 1900 parts per billion, the Cape May NOAA topping over 2100 parts per billion. Unfortunately, Cape May is the only nearby NOAA site that monitors methane. Methane concentrations vary based on many factors, but atmospheric concentration is directly impacted by local emissions. Natural gas emissions is one of the leading contributors to New Jersey atmospheric methane concentration.

We need to monitor, track and model methane emissions as a separate greenhouse gas emission from carbon dioxide. The real impacts of 1 year, 2 years and 5 years needs to be clearly understood and modeled into climate change analysis. Since currently methane is aggregated into the CO₂e quantity at a 100-year post emission impact, we end up not being able to see how climate change will occur in the next 5 years. And all of the indicators have shown that climate change has been coming much faster than we anticipated.

4. To reduce emissions, we need to know where are all the emissions are from and the actual emission amounts for methane and other greenhouse gases. Anecdotal indicators suggest that climate change has been occurring faster in the past 10 years than 20 years ago. This appears to correspond with the massive increase in natural gas pipelines and the associated unreported methane emissions from the hundreds of added facilities just in the central (New Jersey) and northeast US. Currently, none of these facilities are providing annual emissions reports that are even close to one tenth of the actual emissions amount for each facility. When aggregated together, the snowball effect of climate change can be more clearly understood.
5. Once the actual emissions of methane from natural gas is better understood and modeled, ***New Jersey can recognize the current red flag issue that natural gas poses today for New Jersey.***

I am sorry to say to President Fiordaliso, that we will see the severity of climate change even potentially in the next 5 years. It isn't generations away in the future. It is now and sadly; many deaths and suffering will be associated with it. Over the past several years the extremes of climate change have been more noticeable. But, with each new dramatic change, we tend to be lulled into accepting it as normal. It isn't normal and each year we witness never-before-seen extremes manifesting into flooding, destruction, fires, drought, heat domes (now a common occurrence), tornadoes and who knows what we are going to see this winter?

As Catherine Klinger stated in her opening remarks on August 2, 2023:

"The need for climate action is not only obvious to us here in New Jersey. It's existential."

I would just add to her comment: ***It is now.***

I didn't offer any ideas, suggestions or solutions in this comment. This comment was a preface grounding the issue that we currently have no idea about actual methane emissions, no idea about the corresponding atmospheric methane concentrations, no idea about the corresponding environmental systems impacted from this unknown and yet we are seeing the ocean currents quickly coming to a halt. There are so many tangential systems that all interact with each.

That is the reason why we need to get the emissions right as soon as possible. Even including very specific recommendations to Governor Murphy such as:

1. Enable NJDEP Air Enforcement Bureaus in unannounced emissions audits for all natural gas facilities including electric compressor stations.
2. Enable NJDEP Air Enforcement Bureaus to use FLIR cameras using EPA OGI standards and procedures. FLIR Cameras have been used by many nonprofit organizations and now even EPA to determine methane emissions. We need this enabled and implemented as soon as possible in the NJDEP Air Enforcement Bureaus.
3. Eliminate the Blowdown loophole where only blowdowns that emit more than 2,000 pounds of VOC must be reported.
4. Require that all venting and blowdowns need to be reported **and** each facility must fully detail all emissions from each venting and blowdown event. The emissions from the venting and blowdown events must be added into the annual emissions reports.
5. We need a better understanding of methane emissions, methane warming potential in the first 5 years and the methane atmospheric feedback loop.

I hope to have suggestions and solutions drafted in a comment for tomorrow.

I welcome any feedback, questions or even corrections. I am trying to do what I can to help educate you where we are starting from, I am always appreciative of corrections and education myself.

Below is the message I sent to NJDEP Bureau of Air Enforcement-Northern Division back in February 2023.

Sincerely,

Kirk Frost

From: kirkafrust@yahoo.com <kirkafrust@yahoo.com>

Sent: Wednesday, February 22, 2023 3:40 PM

To: airce-northern@dep.nj.gov; Chan.Suilin@epa.gov; Laurita.Matthew@epa.gov; mackenzie.lionel@epa.gov

Subject: Follow up discussion regarding TGP CS-325 air permit comment and substantial anomalies in emissions reporting

Dear Bureau of Air Enforcement-Northern.

I am sorry for the delayed response. I had hoped to get this message out soon after my call with Jeff Meyer. I very much appreciate the phone call I had back on January 25, 2023.

I decided to include the EPA Region 2 permitting division since I have been in touch with them as well.

I am also hoping that EPA Region 2 will recognize the issues presented and start a correction initiative within EPA since all of the natural gas stationary sources that EPA has been relying on the natural gas operators/owners and have the identical issues that I point out in my message below for all facilities. The end effect is that we (New Jersey and United States) have this false notion that methane and benzene emissions are decreasing from natural gas facilities, when in fact they are not. The actual emissions are more than 50 times than the amount that the companies are reporting to NJDEP and EPA. That is frightening.

If anyone within NJDEP Bureau of Air Enforcement-Northern or EPA Region 2 Air Permitting has an understanding of methane warming potentials on a yearly basis, will immediately acknowledge how the severe underreporting is drastically skewing all climate change modeling correlated with methane emissions.

In my message below, I specifically reference Tennessee Gas Pipeline (TGP) and compressor station 325 (CS-325) since that was the original comment I submitted to NJDEP Air Permitting. I had hoped that NJDEP Air Permitting would see the deviations and false emissions and then require that TGP resend and update all emissions for that site before considering the air permit. However, NJDEP Air Permitting acknowledged the issues, approved the permit and then stated that it was another department's responsibility (NJDEP Air Compliance) to follow up any details that might be misleading, inaccurate or false. Please note, I have been tracking many FERC projects and facilities and finding this common underreporting of combustion emissions and excluding venting and leaking fugitive emissions.

For the message below, I have spreadsheets created for calculations using data downloaded from FERC and NJDEP, as well as all of the FERC dockets and submissions submitted by TGP. I also have these documentations for many other projects. For me, it is a crack in the system that inspires me to further assess.

I have laid the message out in three sections: References, Analysis and Recommendations.

If you have any questions or would like to go through the details, please let me know. This is an extreme issue occurring now with substantial underreporting of methane (and benzene and other HAPs) that is going on continuously and unchecked by state and federal agencies. I am hoping you are able to see through the documentation who substantial a gap this is.

I very much appreciate the responses and dialogue from both NJDEP Compliance and EPA Region 2. My hope is that we can correct the anomalies that are occurring to the detriment of climate change modeling and air quality.

Sincerely,

References

Federal Energy Regulatory Commission (FERC) references. All natural gas expansion projects are required to submit all specifications and details for all natural gas transmission projects that traverse across more than one state (interstate). Each project is identified as a docket (the FERC reference number) and the Project name, and all projects are stored in the FERC database known as **eLibrary**. <https://elibrary.ferc.gov/eLibrary/search> While the eLibrary states it is more compatible with Chrome or Microsoft Edge, it actually works better in firefox browser when doing advanced searching functions.

In the comment I provided to NJDEP Air Permitting regarding Tennessee Gas Pipeline Compressor station 325 (TGP CS-325), I referenced all of the specifications and details that TGP submitted to FERC under two dockets. For the two existing 10,310hp **Caterpillar Solar Taurus 70 turbine** 94.6 MMBtu/hr units, the FERC Docket number is **CP09-444**, which was initiated in 2009. For the proposed additional 20,500 hp Caterpillar **Solar Titan 130 turbine** 168.47 MMBtu/hr, the FERC Docket number is **CP20-493**, which was initiated in 2020.

For the CP09-444, TGP submitted much more details than they do in recent applications. Recent projects don't provide valve counts or other details that enable a person to understand total fugitive emissions from leaking at valves (which occurs at all compressor stations and is identified as emissions in the specifications to FERC). In fact, for CP09-444, TGP provided 67 files in three submissions (each submission includes multiple files) for the application alone. Quite detailed and extensive. Some files are very large in storage size and large in number of pages. Most files are submitted as PDF files.

The reference resources for the compressor station turbine specifications are located under a file called Resource Report 09.

For the 10,310hp **Caterpillar Solar Taurus 70 turbines**, the specifications can be found in <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=01518EF0-66E2-5005-8110-C31FAFC91712>, titled as "300 Line Project - Resource Report 09.PDF". All resource report files for CP09-444 can be found in the TGP submission https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20090717-4007&optimized=false. Key pages for CS-325 emission details in the Resource Report 09 are: pages 9 (facility changes), 32-36 (detailed descriptions for CS-325), 481-483 (Solar Specs for emissions calculations), 548-600 (NJDEP details), 601-603, 612 (total project summary) and 618 (CS-325 before/after project emissions).

Note: TGP incorrectly labels new Taurus 70 units as Unit 5 and Unit 6 on page 618, but the emissions are accurate. As indicated on page 32, the original units, Solar Centaur, are units 5 and 6. The new Solar Taurus units are units 7 and 8, this is just a typo error by TGP.

For the 20,500 hp Caterpillar **Solar Titan 130 turbine**, the specifications can be found in the application files of CP20-493 in <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=0208EF94-66E2-5005-8110-C31FAFC91712>, titled as "RR_final.PDF"; <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=0208EF95-66E2-5005-8110-C31FAFC91712>, titled as "RR_Figures.PDF"; and in <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=0208EFA8-66E2-5005-8110-C31FAFC91712>, titled as "Appendix 9B_Air Permit Applications.PDF". These files include specifications for CS-325 added Solar Titan 130 turbine **and also** for the specifications for **Compressor Station 327 (CS-327)**, the electric compressor station 1,200 feet from the Monksville Reservoir. Key pages for specifications of CS-325 can be found in Appendix 9B_Air Permit Applications.PDF on pages 213 (CS0325 all units at site), 220-222 (before and after project for CS-325), 223 (NJDEP Thresholds), 253-254 (CS-325 smokestack emissions), 278 (critical fugitive emissions component calculation for natural gas mixture at CS-325), 280 (venting details for CS-325 **Solar Titan**), 282 (reportable emissions from CS-325 smokestack), and 265-268 (**false** turbine combustion emissions for CS-325 Solar Titan only – **no Solar Titan turbine emits**

less than 4 tons of methane each year – virtually impossible according to Caterpillar Solar company if the turbine is on).

RR 9_final.PDF lists on page 45, the only references for CS-327, which hides the methane emissions in CO2e notation (using the 100-year calculation of 25 times potency of carbon dioxide – meaning the potency of the methane emissions after 100 years is 25 times carbon dioxide). For CS-327, this table indicates that a total of 3,730 tons of CO2e is emitted from CS-327 electric turbine **each year**. To reverse calculate this number in to methane, we can use the CP20-493 Appendix 9B_Air Permit Applications.PDF page 278 (critical fugitive emissions component calculation for natural gas mixture at CS-325) to determine mixture content of natural gas for CS-327 (mixture won't change from CS-325 to CS-327). Knowing that this is fugitive emissions only, the reverse calculations can produce the emissions as follows: VOC = 561.4729297 pounds per year; 2,2,4-Trimethylpentane = 9.160874116 pounds per year; **Benzene = 6.79677757 pounds per year**; Ethylbenzene = 0.295512068 pounds per year; n-Hexane = 117.3182911 pounds per year; Toluene = 5.319217228 pounds per year; Xylenes = 2.955120682 and **Methane = 142.0231 tons per year**.

These are the resources from FERC. In each docket, it includes all submissions from the public, state and federal agencies and additional submissions from the applicant (transmissions pipeline company seeking to expand pipeline resources). In CP17-101, a project for Williams Transcontinental Pipeline, I was able to get the town I live in (Franklin Township, Somerset) to point out flaws, inaccuracies and some blatant misinformation details submitted by Transcontinental to FERC. I found that FERC responded to the town submissions whereas most of the time FERC would not acknowledge, nor reference public comments. So for many recent dockets, there are thousands of submissions to each docket. The key submission for details is usually the application submissions and also Applicant responses to FERC requests for further information.

NJDEP references – Annual stationary source emissions database. I also referenced NJDEP annual stationary source emissions to aggregate every year TGP submitted estimate annual emissions in to NJDEP for air emissions. I literally copied and pasted all submissions for each year into one spreadsheet for a specific site such as CS-325 (I can provide the spreadsheet if needed).

NJDEP CS 325 Station Site ID: 03405 Reported Pollutants	1998 TPY	2000 TPY	2001 TPY	2002 TPY	2003 TPY	2004 TPY	2005 TPY	2006 TPY	2007 TPY	2008 TPY	2009 TPY	2010 TPY	2011 TPY	2012 TPY	2013 TPY	2014 TPY	2015 TPY	2016 TPY	2017 TPY	2018 TPY	2019 TPY	2020 TPY	2021 TPY
Acetone							0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ammonia							0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO	1.250	0.000	0.780	0.790	0.830	0.990	0.420	2.410	0.880	0.900	4.670	5.230	10.490	0.000	0.110	0.890	4.240	1.320	4.120	0.910	4.180	0.110	4.520
GHG CO2					7.000	0.900	6.720	4.080	11.590	10.080	10.000	16.740	24.060	27.480	63.000	76.690	36.290	67.220	67.220	65.090	63.400	64.510	64.260
Formaldehyde					0.430	0.000	0.040		0.74-05	0.74-05	0.74-05	0.120	0.721	0.120	0.040	0.405	0.040	0.409	0.409	0.299	0.287	0.419	0.411
GHG Methane					10,262.90	0.640	0.620	0.270	0.260	0.690	0.660	0.220	0.660	0.730	1.190	1.460	1.070	1.290	1.270	1.230	1.190	1.290	1.2
NOx (Total)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PM10 (Total)	0.000	0.000	0.000	0.000	0.430	0.040	0.440	0.120	0.730	0.770	0.690	0.220	0.660	0.740	1.190	1.460	1.070	1.290	1.270	1.230	1.190	1.290	1.2
PM2.5 (Total)					0.430	0.040	0.440	0.120	0.730	0.770	0.690	0.220	0.660	0.740	1.190	1.460	1.070	1.290	1.270	1.230	1.190	1.290	1.2
Polycyclic aromatic matter					0.430	0.040	0.440	0.120	0.730	0.770	0.690	0.220	0.660	0.740	1.190	1.460	1.070	1.290	1.270	1.230	1.190	1.290	1.2
SO2	0.000	0.000	0.000	0.040	0.040	0.060	0.040	0.010	0.360	0.211	0.221	0.120	0.601	0.140	0.001	0.261	0.691	0.261	0.201	0.191	0.200	0.271	0.401
TSP	0.000	0.000	0.000	0.050	0.430	0.040	0.440	0.120	0.730	0.770	0.690	0.220	0.660	0.740	1.190	1.460	1.070	1.290	1.270	1.230	1.190	1.290	1.2
VOC (Total)	16.900	0.040	0.490	0.490	0.490	0.490	0.490	0.000	0.110	0.110	0.070	0.110	0.140	0.360	0.610	0.610	0.610	0.610	0.610	0.610	0.610	0.610	0.610

Note that the first year of methane reported is much higher than all subsequent emissions reported? Even that amount is only a small portion of the 671 tons of methane that TGP detailed as the annual methane emissions expected to FERC back in 2009.

Another resource from NJDEP are the annual reports for blowdowns, which I recently received for CS-325 from year 2002 through year 2021.

Analysis

1. TGP has been severely underreporting only the combustion emissions for CS-325 for Solar Taurus 70 turbines over the past 10 years. I provided the details for this based on the above references from FERC and also in my comment to NJDEP Air Permitting back on June 8,2022.

- a. Each Solar Taurus Turbine emits more than 3 tons of methane per year in the smokestack as unburned methane when used at 100% load. If used under 100% load, the efficiency and burn decreases, thereby increasing the amount of unburned methane emissions in the smokestack.
 - b. This can be easily cross referenced by the FERC CP09-444 specifications for the Solar Taurus 70 turbine as well as referencing other FERC projects that provide similar specifications for the Solar Taurus 70 turbine both recently and in the past projects.
 - c. It is virtually impossible for a **single** Solar Taurus 70 turbine to emit less than 1 ton of methane per year.
2. TGP has not been reporting venting or fugitive emissions that occur **at the CS-325 site** in terms of leaking and venting to NJDEP in its annual emissions report.
 - a. Fugitive Leaking emissions occurs at all of the valves on a constant basis during ongoing operation. All facility owner/operators (applicant) provide FERC with estimate annual fugitive emissions for a compressor station unit based on the number of valves, the pressure and piping design. **This type of emissions is always occurring and most apparent when a system is at 100% load** (electric compressors do not always operate at 100% load). For electric compressor stations, it smells like a gas leak nearby when the electric compressor is on 100% load. I have many experiences associated with this during wintertime.
 - b. Fugitive venting occurs at all compressor stations (electric and natural gas fired turbines). It is a common practice and a quick fix remedy to purge the local pipes and valves. This is why ***all*** facilities report venting to FERC as a part of the specifications for annual expected emissions for any added compressor unit (electric or turbine). The applicant to FERC provides an estimate of the total tons of methane (or CO2e) emissions planned in performing venting routinely throughout the year.
 - c. Even though venting and fugitives have been occurring for CS-325 throughout every year over the past 10 years, TGP has been erroneously referencing New Jersey Administrative Code N.J.A.C. 7:27-16.21(b) as the reason for not reporting using the term 'blowdowns' as a reason for not providing emissions for any venting and leaking fugitive emissions.
3. For CS-327, TGP detailed to FERC that the methane emissions would include 122.3031 tons from venting emissions and 19.72 tons from fugitive emissions every year based on the CO2e data provided. Additionally, based off of reverse calculations, CS-327 would be emitting 6.79677757 pounds of benzene each year (venting and leaking summed together), **which exceeds the N.J.A.C. 7:27-17.9 thresholds for benzene (6 pounds) requiring an operator to file emissions reporting every year.**
4. I requested and received the **TGP blowdown annual reports from 2002 through 2020**. Here are my observations of those reports:
 - a. **2003 reports a substantial blowdown event at location 'Ringwood'** (which is not the CS-325 facility, but may have used the CS-325 facility for releasing the blowdown). The report does not provide emissions details for methane or VOCs.
 - b. **2004 reports another substantial blowdown event for 8 hours at location 'Ramsey'** (which is not the CS-325 facility, but may have used the CS-325 facility for releasing the blowdown). The report does not provide emissions details for methane or VOCs.
 - c. **Missing annual reports from 2006 through 2016.** Was no report filed?
 - d. **2020 reports no blowdown events occurred that met 2,000 pounds of VOC emissions.** This report also demonstrates that TGP just copied and pasted the 2019 report, where they neglected to modify both references to the year so that it reads (highlighting bold added by me):
 "In accordance with New Jersey Administrative Code N.J.A.C. 7:27-16.21(b), Tennessee Gas Pipeline Company, LLC. (TGP) is submitting an annual report regarding natural gas pipeline blowdown events that occurred during **2019**. No Blowdown events occurred during **2020** that exceeded 2,000 lbs of VOC."
 - e. **2021 reports no blowdown events occurred that met 2,000 pounds of VOC emissions.** Further demonstrates sloppiness where TGP just copies the 2020 report and resubmits that update without modifying the date at all (highlighting bold added by me):
 "In accordance with New Jersey Administrative Code N.J.A.C. 7:27-16.21(b), Tennessee Gas Pipeline

Company, LLC. (TGP) is submitting an annual report regarding natural gas pipeline blowdown events that occurred during **2019**. No Blowdown events occurred during **2020** that exceeded 2,000 lbs of VOC."

- f. **None of the annual blowdown event reports detail specific amount of methane, VOCs or HAPs such as Benzene.** For 2003 and 2004 where there was a nearby blowdown occurrence, TGP did not provide the amount of methane or benzene emitted during the event. **The 2004 blowdown event lasted for 8 hours and no emissions were reported at all.**

5. **A venting event that emits 2,000 pounds of VOC would also emit more than 500 tons of methane.**

Using TGP's specification of fugitives in CP20-493 Appendix 9B_Air Permit Applications.PDF page 278 (critical fugitive emissions component calculation for natural gas mixture at CS-325), we can clearly calculate that for TGP, when 2,000 pounds of VOCs are emitted, 514.8 tons of methane is emitted.

6. **TGP incorrectly references New Jersey Administrative Code N.J.A.C. 7:27-16.21(b) as the reason why TGP does not have to report any blowdowns,** N.J.A.C. 7:27-16.21(b) does not set a threshold for reporting 'blowdowns', but instead only specifies that:

<https://www.nj.gov/dep/agm/currentrules/Sub%2016.pdf>

"(b) The owner or operator of any natural gas pipeline shall by May 31, 1995 achieve some reduction in VOC emissions from each blowdown event and shall implement the control technologies or procedures that the Control Measure Plan indicates would be appropriate for each blowdown event."

7. **The only reference to 2,000 pounds of VOC in the N.J.A.C. 7:27-16 rules is in N.J.A.C. 7:27-16.1 where the definition defines a blowdown event:**

' **"Blowdown event"** means the non-emergency release of natural gas from a pipeline for the purposes of inspection, maintenance, or repair and where, in the absence of control, more than 2,000 pounds of VOC could be released to the atmosphere. '

- a. **This definition does not exempt emissions where VOC emissions are less than 2,000 pounds.**
- b. **Nowhere in the N.J.A.C. 7:27-16 rules does it state that any venting less than 2,000 pounds of VOC does not have to be reported.**
- c. TGP has been routinely providing false annual emissions for CS-325 that only identifies impossible emissions from the smokestack (combustion) emissions and does not include emissions from venting and ongoing constant fugitive emissions.

NJDEP CS 325 Station Site ID: 83405 Reported Pollutants	1999 TPY	2000 TPY	2001 TPY	2002 TPY	2003 TPY	2004 TPY	2005 TPY	2006 TPY	2007 TPY	2008 TPY	2009 TPY	2010 TPY	2011 TPY	2012 TPY	2013 TPY	2014 TPY	2015 TPY	2016 TPY	2017 TPY	2018 TPY	2019 TPY	2020 TPY	2021 TPY
GHG Methane					20,363.90	0.64	0.61	0.37	0.91	0.83	0.86	0.33	0.68	0.71	1.19	1.45	1.07	1.28	1.27	1.23	1.19	1.29	1.30

Requests

From my extensive research of many facilities of many projects ranging from 2000 up to and including 2022, I have found that all natural gas companies submitting projects into FERC, send lowballed erroneous emissions data into each state using difference policy mechanisms as methods for reporting lower than actual emissions. In New Jersey, it is the false 2,000 VOC definition for Blowdowns and a misunderstood notion that emissions does not include the fugitive emissions (leaking and venting) from that facility.

Natural gas facilities have three possible sources of emissions:

1. Smokestack emissions from all facilities that use natural gas combustion turbines.
2. Fugitive Leaking emissions from valves and components located at the facility and connecting into each compressor unit.
3. Fugitive Venting emissions for purging the valves and pipes located at a facility. This also includes purging that can extend beyond the local facility when purging of pipes requires purging of the pipeline to a stop point valve further away from the facility. When the purging extends beyond the facility, this is often labeled as a

blowdown despite still being a purge / venting event where the emissions are emitted out an exhaust pipe at a facility.

As referenced above, the definition of blowdown as identified in N.J.A.C. 7:27-16.1 is just an extreme venting event. This definition in NJAC 7:27:16 has enabled natural gas companies to segregate those extreme events and not identify the routine events that are ongoing every year and provided to FERC. This is an extreme gap that companies such as TGP have been utilizing to justify not reporting all venting and leaking fugitive events. However, as far as I can see in NJAC rules, these companies, such as TGP, **should be providing an annual estimate that includes all methane emissions (combustion, leaking and venting).**

Request 1:

NJDEP Air Enforcement-Northern (Compliance) enforce an audit of CS-325 for the past 10 years that requires TGP to detail all venting events each and every year and revising the annual emissions to include combustion, venting and leaking for methane, benzene and all other components detailed in TGP's fugitive emissions details in CP20-490 Appendix 9B_Air Permit Applications.PDF page 278.

Request 2:

NJDEP Air Enforcement-Northern (Compliance) purchase either the FLIR GF320 (<https://www.flir.com/products/gf320/?vertical=optical%20gas&segment=solutions>) or FLIR GF620 (<https://www.flir.com/products/gf620/?vertical=optical%20gas&segment=solutions>) for performing Optical Gas Imaging (OGI) and emissions calculations. Both of these camera models are able to quantify (in quantification mode) the actual emissions of methane and VOCs. If NJDEP Air Enforcement-Northern doesn't have the budget, I urge them to work with EPA Region 2 to see if a shared camera can be purchased as an initial start.

Request 3:

NJDEP Air Enforcement-Northern (Compliance) to use N.J.A.C. 7:27-17.9 thresholds as a mechanism for requiring TGP CS-327 compressor station to report annual emissions every year including fugitive leaking and fugitive venting emissions for methane specifically as well as for VOCs occurring from the natural gas.