December 6, 2021

Re: Mountain Valley Pipeline, LLC
Mountain Valley Pipeline Project
FERC Docket Nos. CP16-10-000 and CP21-57-000
Response to Document Accession #: 20211006-5019

Oil Change International submits this letter to respond to the above-cited document, regarding greenhouse gas pollution related to the Mountain Valley Pipeline Project ("Project"). Oil Change International is a nonprofit research, communications, and advocacy organization with expertise in the oil and gas industry's impact on climate change. We have analyzed and written about the Project repeatedly since 2016. This includes a 2017 estimate of the greenhouse gas pollution that the Project's construction and operation would generate.[1] That estimate incorporates our 2017 Gas Pipeline Climate Methodology ("Methodology") for calculating greenhouse gas emissions for gas infrastructure.[2]

As stated in our Methodology at the time:

"The level of methane leakage for the entire gas production, processing, transportation and storage system is estimated to be 3.8 percent of production. This is a U.S. national average and may be conservative given that Appalachian Basin pipelines will carry fracked gas from the Marcellus and Utica formations. The fracking process often leads to greater methane leakage at the extraction phase than conventional gas production.

…

We use a leakage rate of 3.8 percent of gross production. This is derived from a comprehensive review of existing research conducted by analysts at PSE Healthy Energy, published in November 2015. As this is a U.S. average, and as some studies suggest that leakage rates are higher for fracked wells due to venting during the completion process, we believe this to be a conservative estimate for Appalachian Basin gas, which is primarily fracked gas."

In early 2017 when our analysis was published, we judged this to be the most accurate available estimate of methane leakage. Notably, Mountain Valley Pipeline, LLC ("MVP") did not challenge our leakage estimate, nor our overall calculation of the Project's expected greenhouse gas pollution. Nor, to our knowledge, has MVP publicly expressed disagreement with these calculations in the 4 ½ years since they were published, until its October 2021 letter (Accession #20211006-5019). It is inaccurate to say, as their letter does, that our

---

1 L. Stockman, "The Mountain Valley Pipeline: Greenhouse Gas Emissions Briefing," Oil Change International, February 15, 2017. Available at: https://priceofoil.org/2017/02/15/mountain-valley-pipeline-greenhouse-gas-emissions-briefing/

2 L. Stockman, "Gas Pipeline Climate Methodology: Calculating Greenhouse Gas Emissions for Natural Gas Infrastructure," Oil Change International, February 8, 2017. Available at: https://priceofoil.org/2017/02/08/gas-pipeline-climate-methodology/

estimate “uses extreme inputs and assumptions” and “falsely inflates their emissions estimates”. Our estimate was the best available at the time, based on then-current peer-reviewed literature.

Since the publication of our analysis, other estimates of methane leakage rates in the United States have been produced. The widely-cited Alvarez et al[3] study in 2018 estimates a 2.3 percent leakage rate, on average, for the U.S. oil and gas supply chain. As with our 3.8 percent estimate, this study is a U.S. average. A 2020 study, also published in *Science*, of another large U.S. fracking basin, the Permian, estimated a leakage rate there of 3.7 percent.[4] One 2019 assessment puts the national average methane emission rate at 1.24 percent.[5]

Such low methane rate assumptions are generally based on U.S. Environmental Protection Agency (EPA) greenhouse gas inventory data, which is widely considered to underestimate actual methane emissions. For example, the EPA data reports total methane emissions from the oil and gas sector in 2019 at 7.9 million tons.[6] However, the International Energy Agency’s (IEA) estimate is 45 percent higher, at 11.5 million tons.[7] The Environmental Defense Fund, which has led a nationwide effort to expose the real level of oil and gas industry methane emissions, estimates the industry’s 2019 methane emissions at 16.2 million tons, more than double EPA’s inventory.[8]

The range of estimates available in the literature today makes clear that there is no consensus on the U.S. methane leakage rate. Even if the leakage rate is closer to lower estimates, the fundamental conclusion is the same—the Project will cause substantial greenhouse gas pollution. For example, revising our 2017 estimate to use Alvarez et al’s 2.3 percent, the Project would still be expected to produce 72.35 million metric tons CO_2-equivalent annually. This is 80% of our original estimate of 89.5 million metric tons.

MVP’s letter also takes exception to our use of the 20-year global warming potential for methane. It states that this is “vastly different from the commonly accepted 100-year estimate used by the EPA and global reporting frameworks.” In fact, the EPA considers several global

---

3 R. Alvarez et al, “Assessment of methane emissions from the U.S. oil and gas supply chain,” Science, July 13, 2018. Available at: https://www.science.org/doi/10.1126/science.aar7204

4 Zhang et al, “Quantifying methane emissions from the largest oil-producing basin in the United States from space,” Science, April 22 2020. Available at: https://www.science.org/doi/10.1126/sciadv.aaz5120

5 Littlefield et al, “Life Cycle Analysis of Natural Gas Extraction and Power Generation,” National Energy Technology Laboratory, April 19 2019. Available at: https://www.netl.doe.gov/energy-analysis/details?id=3198

6 United States Environmental Protection Agency, “Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990- 2019,” 2021. Available at: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019

7 International Energy Agency, “Methane Tracker Database,” October 7 2021. Available at: https://www.iea.org/articles/methane-tracker-database

8 Environmental Defense Fund, ”2019 U.S. Oil and Gas Methane Emissions Estimate,” April 2021, Available at: http://blogs.edf.org/energyexchange/files/2021/04/2019-EDF-CH4-Estimate.pdf

warming potentials (GWPs), not just the 25 referenced in MVP's letter. As noted in the same source cited in MVP's letter[9] (emphasis added):

"Methane (CH4) is estimated to have a GWP of 28–36 over 100 years
…
The EPA considers the GWP estimates presented in the most recent IPCC scientific assessment to reflect the state of the science. In science communications, the EPA will refer to the most recent GWPs. The GWPs listed above are from the IPCC's Fifth Assessment Report, published in 2014.

The EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks (Inventory) complies with international GHG reporting standards under the United Nations Framework Convention on Climate Change (UNFCCC). UNFCCC guidelines now require the use of the GWP values for the IPCC's Fourth Assessment Report (AR4), published in 2007.
…
The United States primarily uses the 100-year GWP as a measure of the relative impact of different GHGs. ***However, the scientific community has developed a number of other metrics that could be used for comparing one GHG to another.*** *These metrics may differ based on timeframe, the climate endpoint measured, or the method of calculation.*

For example, the 20-year GWP is sometimes used as an alternative to the 100-year GWP*. Just like the 100-year GWP is based on the energy absorbed by a gas over 100 years, the 20-year GWP is based on the energy absorbed over 20 years.* ***This 20-year GWP prioritizes gases with shorter lifetimes, because it does not consider impacts that happen more than 20 years after the emissions occur.*** *Because all GWPs are calculated relative to CO2, GWPs based on a shorter timeframe will be larger for gases with lifetimes shorter than that of CO2, and smaller for gases with lifetimes longer than CO_2.* ***For example, for CH4, which has a short lifetime, the 100-year GWP of 28–36 is much less than the 20-year GWP of 84–87.****"*

The Intergovernmental Panel on Climate Change (IPCC) concurs, noting, "There is no scientific argument for selecting 100 years compared with other choices".[10] Further, while EPA uses the 2006 IPCC Guidelines[11] for its Inventory, MVP's letter fails to mention that this is no longer the most recent guidance. The 2019 Refinements to the IPCC Guidelines[12] do not require a particular set of GWPs. Rather, they say "It is good practice to use the same set of

---

9 Environmental Protection Agency, "Understanding Global Warming Potentials," October 18 2021. Available at: https://www.epa.gov/ghgemissions/understanding-global-warming-potentials

10 Intergovernmental Panel on Climate Change, "Climate Change 2013: The Physical Science Basis," 2013. Available at: https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_all_final.pdf

11 Intergovernmental Panel on Climate Change, "2006 IPCC Guidelines for National Greenhouse Gas Inventories," 2006. Available at: https://www.ipcc.ch/report/2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/

12 Intergovernmental Panel on Climate Change, "2019 Refinements to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories," 2019. Available at: https://www.ipcc-nggip.iges.or.jp/public/2019rf/index.html

GWPs from **a** single IPCC assessment report for the entire time series." and list "Greenhouse gases with a GWP in **an** IPCC Assessment Report" (emphasis added), of which methane is one greenhouse gas to be reported. Our use of a 20-year GWP of 86 for methane comes directly from an IPCC Assessment Report, the 5th Assessment. This report represents the most up-to-date scientific consensus on methane's GWP.[13]

Moreover, we maintain that the use of a 20-year GWP, rather than a 100-year GWP for methane, is the more relevant choice. Whereas CO_2 accumulates in the atmosphere over the long-term, the impact of methane is felt in the short term. Its most important contribution to total warming occurs at the time of peak atmospheric CO_2 concentrations (i.e. net zero CO_2 emissions). According to IPCC scenarios, net CO_2 emissions need to reach zero around 2050 to have a 50 percent chance of limiting warming to 1.5 degrees Celsius. For a goal of limiting warming to 1.5 degrees Celsius, the most important impact of methane for a 40-year pipeline built in 2022 (MVP's current completion year target) will be between 0 and 29 years after the gas is transported, or between 2022 and 2050.

Additionally, MVP states that "the zero-sum attribution of all Scope-3 emissions (indirect emissions throughout the value chain including those by end users of the natural gas, whether by electric generation, consumers, or manufacturers) to Mountain Valley is a flawed concept." We disagree. Pipelines create additional takeaway capacity in the Appalachian Basin that would not otherwise exist, enabling a commensurate increase in production. Therefore, the life cycle emissions from the gas carried by the pipeline should be counted as additional emissions that would not otherwise occur without the existence of the pipeline. Recent comments from EPA to the Federal Energy Regulatory Commission (FERC) would seem to concur: "the evaluation of downstream end-use impacts should routinely include a quantitative estimate of the downstream GHG emissions that will result from burning the natural gas that the pipelines will transport."[14]

MVP's assertion that "Even if Mountain Valley never supplied a molecule of gas, these users are importing and will continue to import natural gas" is contradicted by analysis from the Institute for Energy Economics and Financial Analysis, which concluded that "Revised forecasts now predict lower natural gas demand than when the [P]roject was first proposed. The U.S. Energy Information Administration predicts gas demand will fall at least through 2030 in the Southeast and mid-Atlantic."[15]

---

[13] Intergovernmental Panel on Climate Change, "Climate Change 2013: The Physical Science Basis," 2013. Available at: https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_all_final.pdf

[14] V. Arroyo, "USEPA Comment Letter from Office of Policy Associate Administrator Victoria Arroyo," United States Environmental Protection Agency, May 26 2021. Available at: https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20210526-5267

[15] C. Kunkel, S. Mattei and C. Williams-Derry, "Mountain Valley Pipeline Faces Uphill Struggle to Financial Viability," Institute for Energy Economics and Financial Analysis, March 2021. Available at: http://ieefa.org/wp-content/uploads/2021/03/Mountain-Valley-Pipeline-Faces-Uphill-Struggle-to-Financial-Viability_March-2021.pdf

MVP further argues that "[T]here is a large segment of power generation in the Southeast Region that still relies heavily on coal and would need the supply of natural gas provided by Mountain Valley Pipeline to effectuate an immediate transition away from coal." This is valuable only if coal inherently generates more greenhouse gas pollution. It is true that gas burns cleaner than coal in terms of greenhouse gases. But when it comes to greenhouse gases, measuring emissions only at the chimney stack of the power plant gives a false picture of the relative impact of these fuels on climate change. This is primarily because of the impact of methane leakage across the natural gas supply chain. Analysts at PSE Healthy Energy estimate that a threshold for methane leakage used in power production is 2.8 percent of production.[16] At leakage rates above this level, the GHG emissions per unit of electricity produced from a gas plant are greater than that of a coal plant. At a rate such as the 2.3 percent estimated by Alvarez et al, the emissions benefits are limited.

Further, it is inaccurate to assume that gas-fired power is the only economically viable replacement for existing coal capacity. The unsubsidized Levelized Cost of Electricity for new build utility-scale wind and solar has been lower than for gas-fired power plants in the U.S. for several years. In March 2019, Bloomberg New Energy Finance reported, "The relentless decline of solar and wind costs has made these technologies the cheapest sources of new bulk electricity in all major economies, except Japan. This includes China and India, where not long ago coal dominated capacity additions, as well as the U.S. where the shale gas revolution has made gas cheap and abundant."[17]

A 2018 study by the Rocky Mountain Institute showed that combinations of clean energy resources, known as Clean Energy Portfolios (CEPs), could provide reliable energy cheaper than 90% of proposed gas-fired power plants at the time.[18] The study further showed that, if built, "the owners of these gas assets will face tens of billions of dollars of stranded costs with uncertain future revenues as clean energy continues to fall in price." They calculated that US electricity customers could save $29 billion (NPV) if CEPs were developed in place of these uneconomic gas plants.

In conclusion, we maintain that: 1) The greenhouse gas pollution from the Mountain Valley Pipeline Project would be substantial, even considering more recent estimates of methane leakage in the U.S. oil and gas supply chain; 2) The use of the 20-year global warming potential for methane from the IPCC's 5th Assessment Report is an appropriate value, and perhaps *the* most appropriate value, for reporting methane's climate impact in

[16] Physicians, Scientists and Engineers for Healthy Energy. "Climate Impacts of Methane Losses from Modern Natural Gas and Petroleum Systems," November 1 2015. Available at: https://www.psehealthyenergy.org/wp-content/uploads/2015/11/Methane-Science-Summary.pdf

[17] E. Giannakopoulou and T. Brandily, "1H 2019 LCOE Update," Bloomberg New Energy Finance, March 2019.

[18] M. Dyson, A. Engel, and J. Farbes, "The Economics of Clean Energy Portfolios: How Renewable and Distributed Energy Resources are Outcompeting and Can Strand Investment in Natural Gas-Fired Generation," Rocky Mountain Institute, 2018. Available at: www.rmi.org/insights/reports/economics-clean-energy-portfolios

relation to a pipeline's lifecycle emissions; 3) It is correct to attribute to the Project's lifecycle emissions the downstream combustion of the gas it proposes to carry.

Respectfully submitted,

Oil Change International

By: Kyle Gracey

Kyle Gracey
Research Analyst
kyle@priceofoil.org

Lorne Stockman
Research Co-Director
lorne@priceofoil.org