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Natural Gas Liquids:

Fracking's Hazardous Plastics and Pollution Scheme

The deluge of fracked natural gas has unleashed a dangerous buildout of wells, storage facilities and pipelines, worsening climate change and spreading a toxic web of pollution throughout the United States. As companies have looked for ways to absorb the excess natural gas, hedge against an electrified future and ensure fossil fuel dependence, they have turned to reliable moneymakers: a fracking byproduct known as natural gas liquids (NGLs), and the petrochemical facilities that rely on it. But a petrochemicals buildout fueled by NGLs means more plastic and more pollution — and a step backward for climate at a time when we should be taking the most aggressive action.

Key findings

- **The natural gas glut is fueling increased NGL exports and more unnecessary petrochemical and plastics facilities.** The United States is now the biggest global producer of NGLs. NGL production grew nearly threefold between 2007 and 2019 as fracking took off, while prices for NGLs plummeted 66 percent. Likewise, the real wholesale price for natural gas fell 62 percent as total production rose. This glut has led companies to rely on petrochemical manufacturing and NGL exports to spur increased demand and domestic production. Over the past five years, from 2015 to 2020, U.S. NGL exports increased 117 percent.
- **The cheap oversupply of NGLs has led to an infrastructure buildout frenzy, especially in wet gas-rich areas like Appalachia.** Over the past 10 years, oil and gas and chemical companies have committed to spending at least $200 billion on shale gas, with nearly 350 gas-dependent chemical plants in the works across the United States. For example, the proposed Appalachian

Storage and Trading Hub would create a multi-billion dollar natural gas storage complex and an associated network of gas pipelines designed to capitalize on the region's shale gas to supply chemical and plastics inputs for manufacturing plants.

- **NGLs and NGL infrastructure are notoriously dangerous to public health and safety.** NGLs are "extremely flammable" and typically odorless, making leaks from infrastructure easily undetected. Unlike natural gas, NGLs usually do not have a sulfur-based odorant added to them for leak detection. Many NGL pipelines are not federally regulated, and there is no federal siting or permitting process for these pipelines. Moreover, NGL storage facilities can leak, erupt into flames or form sinkholes, and petrochemical facilities can explode.
- **Petrochemical plants are disproportionately sited in or near low-income communities and communities of color.** The petrochemical plant-laden "Cancer Alley" region between New Orleans and Baton Rouge along the Mississippi River has been polluted for decades; in general, areas that are home to more communities of color have some of the worst air in the country. The petrochemical building boom in the Upper Ohio River Valley is taking place alongside a wide range of other industrial polluters in vulnerable communities.

The Natural Gas Liquids Bonanza

Over the past decade, the U.S. fossil fuel industry has surged by employing new techniques and technologies that combine horizontal drilling and hydraulic fracturing (or fracking) to extract oil and gas from shale rock formations. This boom in low-priced natural gas and natural gas liquids (NGLs) has spawned a resurgence in North American petrochemical and plastics manufacturing — and the pollution that comes with it.[1]

Natural gas is mostly methane, but some reserves contain other hydrocarbons called NGLs, which include ethane, a raw material used to manufacture and produce finished petrochemicals such as plastics.[2] "Wet" natural gas reserves, like the Utica and Marcellus shale formations under Ohio, Pennsylvania and West Virginia, contain higher concentrations of these NGLs.[3] NGLs are often confused with liquefied natural gas (LNG) due to their similar acronyms, but they are in fact quite different. LNG is the super-cooled form of dry natural gas (methane), which allows it to take the form of liquid, making it easier to transport.[4]

The fracking boom has enabled the development of more petrochemical facilities, like ethane or ethylene crackers, that utilize NGLs — locking in the demand for natural gas and increasing dangerous pipeline infrastructure, toxic air pollution, greenhouse gas emissions, plastics pollution and other public health threats.[5] Petrochemical manufacturing is the biggest consumer of NGLs, and 55 percent of this manufacturing goes toward the production of plastics and other products.[6]

Ethane is converted into ethylene to be used in manufacturing plastic. Other NGLs can be used in heating and cooking fuels (propane), transportation fuel blends (butane and pentane) and for energy recovery from some wells and oil sands.[7] Liquefied petroleum gas (LPG), a mixture of propane and butane, is used for heating, cooking and transportation purposes.[8] Recently, power plants have started experimenting with the use of ethane as a fuel blend with natural gas to produce electricity.[9]

The largest NGL hubs in the United States include Mont Belvieu, Texas and Conway, Kansas; in addition, a massive Appalachian Storage and Trading Hub is being promoted in the Pennsylvania, West Virginia and Ohio region.[10]

NGLs Boost Petrochemicals and Plastics Growth

U.S. fracking has produced an oversupply of cheap gas and ethane in the past few years.[11] Collapsing prices undermined the profitability of oil and gas companies, but all that additional gas has been a boon to the U.S. plastics industry.[12] Due to low ethane costs in the early 2010s, chemical companies began

aggressively investing in petrochemical plants and export facilities to capitalize on the ethane glut.[13] The United States is now the largest producer of NGLs globally, accounting for over a third of production.[14]

Persistently low prices have challenged the economic viability of the fracking industry's continuous and steady expansion. Between 2007 and 2019, the real wholesale price for natural gas fell 62 percent as total gas production rose (see Figure 1).[15] Likewise, NGL growth remained fairly steady until the fracking boom took off around 2007; it then grew nearly threefold to 5 million barrels per day in 2019 (see Figure 2). During this same period, the NGL composite price plummeted 66 percent.[16] To prop up a flailing industry, low prices have propelled frackers into a symbiotic relationship with the petrochemical and plastics industries that use NGLs as manufacturing feedstock.

Over the last 10 years, oil and gas and chemical companies have committed to spending at least $200 billion to squeeze North American shale for all it

FIG. 1: U.S. Natural Gas Production and Price
PRODUCTION IN MILLIONS OF CUBIC FEET, INFLATION ADJUSTED PRICE PER 1,000 CUBIC FEET IN 2019 DOLLARS

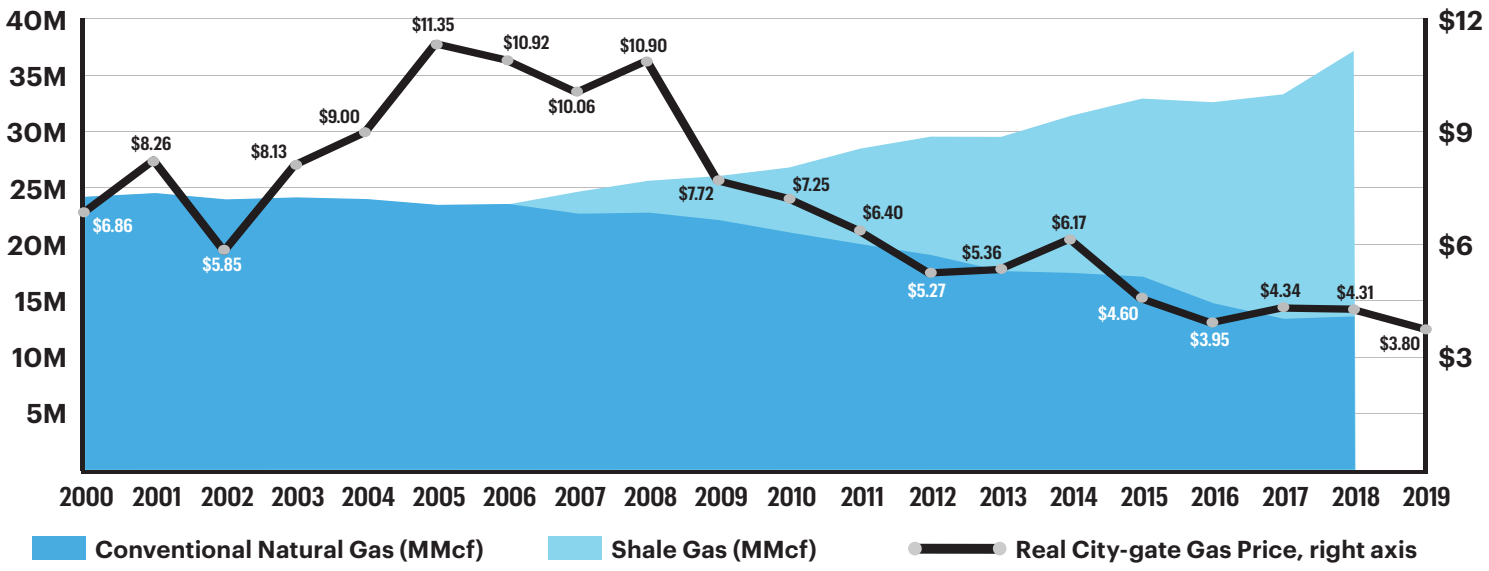
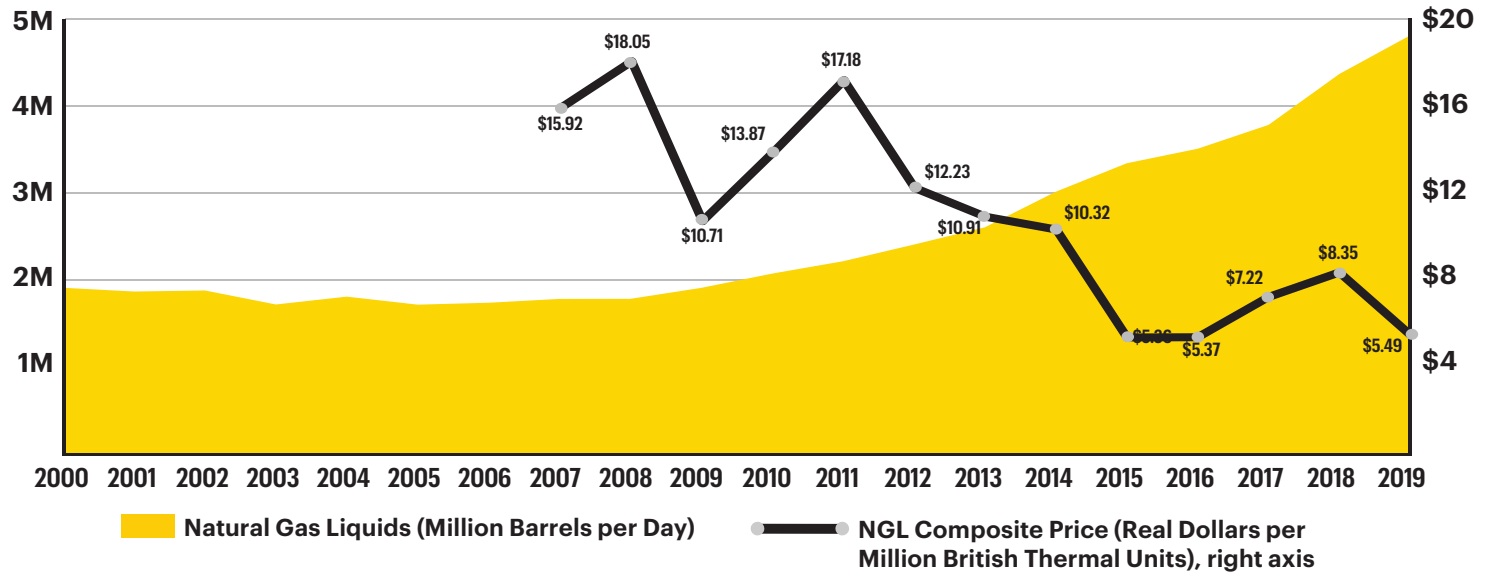


FIG. 2: U.S. Natural Gas Liquids Production and Price
PRODUCTION IN MILLION BARRELS PER DAY, INFLATION ADJUSTED PRICE PER MILLION BRITISH THERMAL UNIT IN 2019



DATA SOURCE: U.S. Energy Information Administration

is worth.[17] Across the United States, nearly 350 chemical plants are in the pipeline, "representing oil companies' life-or-death bet on plastics as the future."[18]

Oil and gas companies also look to petrochemicals and plastics to hedge against the decline in demand for fossil fuels as they anticipate the growth in electric vehicles and the growing fight against climate change.[19] With transportation fuel consumption expected to peak at the end of the 2020s with the transition to electric vehicles, NGLs are seen as a safeguard for the oil and gas status quo.[20] ExxonMobil projects NGL consumption in the chemicals sector to double in the next 20 years and expects this to mitigate the reduced demand for oil and gas from the transition to electric vehicles.[21]

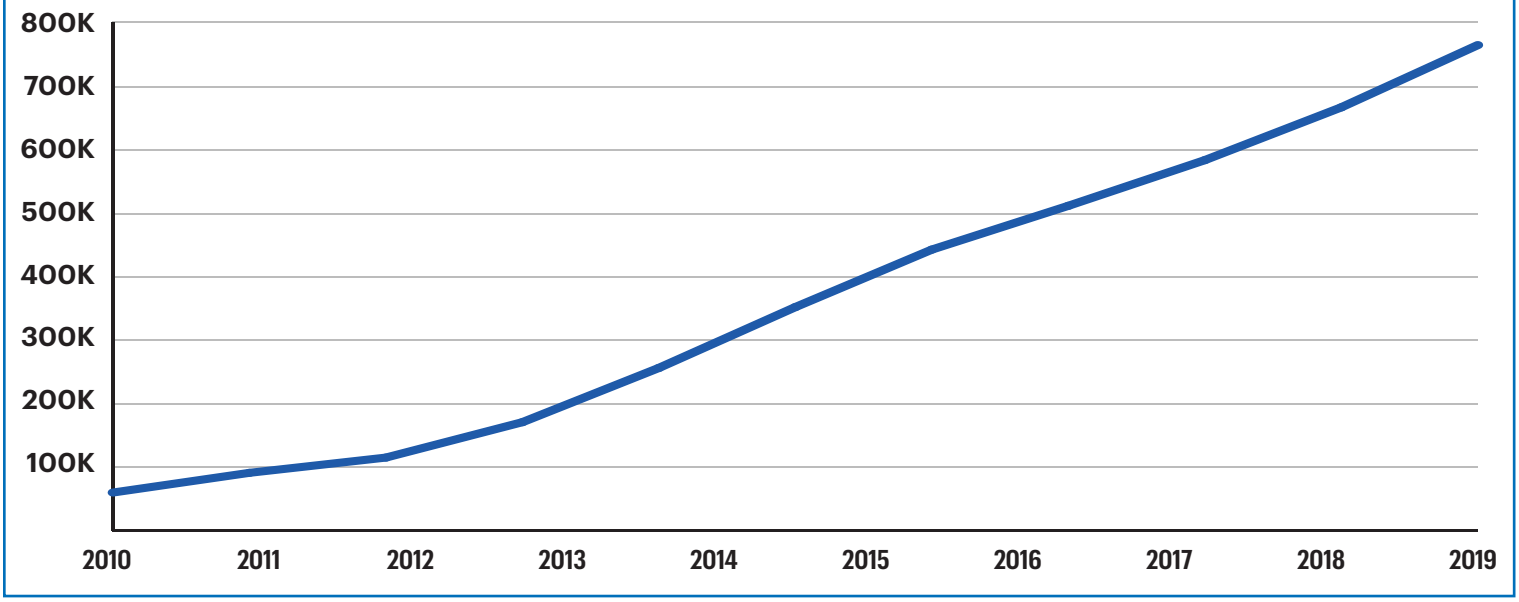
The NGL Buildout Frenzy

The cheap oversupply of NGLs has led to a buildout frenzy. The number and capacity of gas processing plants, NGL pipelines, petrochemical facilities and other infrastructure have exploded in the past decade, particularly in wet gas-rich areas like the Appalachian region.[22] These projects have included at least three proposed or planned cracker plants in Ohio, Pennsylvania and West Virginia; the Appalachian Storage and Trading Hub; the controversial Mariner East and Falcon pipelines in Pennsylvania; and various underground storage facilities like the proposed Mountaineer NGL Storage facility in Monroe County, Ohio.[23]

The Trump administration ballyhooed the Appalachian region's natural gas and NGLs as engines for economic growth, dubbing the buildout a "renaissance."[24] Ethane crackers are being proposed and built at breakneck speed to take advantage of cheap NGLs and to fill overseas demand.[25] IHS Markit and the American Chemistry Council estimate that Appalachian ethane could support around five to nine ethane cracker plants, including the Shell plant under construction in Beaver County, Pennsylvania.[26]

Low prices have increased the competitiveness of NGLs and U.S.-produced petrochemicals overseas due to their edge over heavier, more expensive oil-based feedstocks (i.e., naphtha) used by European and Asian producers.[27] From 2014 to 2020, U.S. NGL exports increased 117 percent (see Figure 3).[28] The glut has spurred the development of petrochemical plants, shipping terminals, storage facilities and upgrades both domestically and abroad to feed this international appetite,[29] and much of the new added capacity and production of NGLs and NGL-derivatives (i.e., ethylene and polyethylene) is set for abroad.[30] Petrochemicals and plastics producers also look to emerging markets where industry lobbyists are promoting greenwashing recycling programs and hamstringing attempts to limit plastics.[31]

FIG. 3: NGL Exports (Thousand Barrels)



DATA SOURCE: U.S. Energy Information Administration

In 2016, one of the first ethane export routes formed connecting Pennsylvania NGL production with European petrochemical manufacturing. The Europe-bound ethane is extracted by fracking in Pennsylvania and then carried via Sunoco's Mariner East pipeline to the Marcus Hook export facility near Philadelphia. From there, large vessels dubbed "dragon ships" carry the ethane to cracker plants in Norway and Scotland owned by Ineos, a European chemical company.[32] More recently, along the Houston Ship Channel, a new marine terminal joint venture between Enterprise Products Partners LP and Navigator Holdings Ltd. shipped its first ethylene cargo to Japan in early 2020. Enterprise is also developing two ethylene pipelines linking the hub in Mont Belvieu, Texas to the state's underground Markham storage hub.[33]

While investors rush to take advantage of the NGL gold rush, the economics justifying these projects can change unexpectedly due to circumstances such as plunging plastics prices, growing plastic pollution awareness, the coronavirus crisis and ballooning construction costs.[34] Banking on NGLs may have severe risks and ramifications for taxpayers and for local and state governments, which face an uncertain future in these assets.[35]

The Dangers of NGLs

The boom in NGL processing and production has been accompanied by a litany of documented incidents, including explosions, fires, environmental degradation and fatalities, a side effect of their hazardous nature. NGLs are volatile and flammable, and because their presence in air can go undetected, they can be particularly dangerous.[36]

NGLs remain in liquid form under very high pressure or very cold temperatures, but under normal atmospheric conditions (i.e., those outside of a pipeline), they exist in an invisible gaseous state and are colorless and nearly odorless (ethane is odorless, whereas butane, propane and propylene have a slight petroleum odor, and ethylene has a sweet odor).[37]

When exposed to typical atmospheric conditions, the liquids vaporize into extremely flammable/explosive gases.[38] As this happens, the gases can go undetected because they typically do not have a sulfur-based odorant added for pipeline leak detection.[39] According to the company that is building the Mariner East 2 pipeline: "The addition of odorant is not possible, given the potential end uses of the products such as textiles and plastics. This is one reason that the addition of odorants in transmission pipelines is not required by regulation."[40] In other words, there is concern that an odorant could cause plastic bottles to smell or taste like rotten eggs.

Unlike methane, which tends to migrate upward into the atmosphere when leaked, heavier NGLs stay close to the ground and disperse horizontally in a downwind fashion, creating vapor clouds.[41] These vapor clouds may disperse with no impact, or they could ignite and burn or explode, depending on their concentration in air, the amount released and other factors.[42] In some instances, electrical items as seemingly innocuous as a cell phone can ignite a pipeline leak.[43] Impacts from explosions can range from ruptured ear drums to fatality, as well as structural damage to surrounding buildings and danger to those inside.[44]

NGL-related accidents such as explosions and fires have been catastrophic over the years. In 2011, an inferno erupted at a Mont Belvieu Enterprise Partners NGL storage complex — the flames burned for hours and killed a plant worker.[45] In January 2015, a rupture in the ethane Appalachia-to-Texas (ATEX) pipeline led to an explosion that burned for hours in Brooke County, West Virginia.[46] A 2017 blast at an NGL pipeline station about 30 miles west of New Orleans resulted in a days-long inferno, causing the evacuation of 60 homes; one worker was hospitalized and another presumed dead.[47] In July 2020, an explosion occurred at an Energy Transfer NGL facility after a contractor hit a line carrying NGLs, resulting in a fire that lasted for over two hours.[48]

Poorly Regulated Pipelines

NGL pipelines carry substantial safety risks. They are classified as hazardous liquid pipelines, which transport liquid hydrocarbon substances like crude oil, refined petroleum products and highly volatile liquids. Highly volatile liquids include NGLs, condensates and any other products that can form a vapor cloud when exposed to the atmosphere.[49]

Pipelines are the most common and cheapest method of NGL transportation, moving more than 90 percent of all NGLs by volume. There are approximately 54,000 miles of documented NGL pipelines in the United States, designated for everything from purity products to downstream products like petrochemicals and fuel mixes.[50]

The Hazardous Liquids Pipeline Safety Act (1979) sets minimum nationwide safety standards for hazardous liquid pipelines.[51] The Pipeline and Hazardous Materials Safety Administration (PHMSA) is the primary agency that oversees and enforces pipeline safety, but the U.S. Environmental Protection Agency, the Coast Guard, the Occupational Safety and Health Administration and state agencies may also be involved with other safety concerns such as inspection, spill response, cleanup and worker safety – although oftentimes jurisdiction is unclear.[52] Federal standards and enforcement also apply to intrastate hazardous liquid pipelines unless a state chooses to assume those responsibilities instead.[53]

Despite this framework, many thousands of miles of pipelines remain unregulated and fall outside the scope of any federal and state oversight.[54] For instance, the PHMSA only regulates 4,000 miles out of an estimated 30,000 to 40,000 miles of onshore hazardous liquid gathering lines, and most states have chosen not to pick up the slack.[55] Moreover, there is no formal federal siting or permitting process for hazardous liquid pipelines; as a result, the process varies significantly from state to state.[56]

Mariner East 2: A Pipeline of Problems

Mariner East 2 pipeline construction cuts through a suburban neighborhood in Uwchlan, Pennsylvania.

Since construction of Sunoco's Mariner East 2 pipeline began in 2017, accidents have been plaguing local communities and contaminating their water resources. This 350-mile project runs through densely populated communities, close to people's homes and schools, and there are no proper, publicly available safety plans for evacuations in place — all so that Appalachian NGLs can be transported to the Sunoco's Marcus Hook facility for export, including across the Atlantic Ocean for the manufacture of plastics in Europe.[60]

Sunoco has been hit with multiple fines and shutdown orders by state regulators.[61] In September 2018, the Revolution pipeline — a natural gas gathering line that feeds into two other pipelines, including Mariner East 2 — was the site of an explosion that resulted in extensive property damage, evacuations, the closure of an interstate and an 11-month moratorium on construction permitting for the pipeline operator, Energy Transfer Partners. The explosion resulted in a $30.6 million fine to Energy Transfer Partners (Sunoco's parent company), one of the largest ever issued by the state.[62]

Nationally, Sunoco has some of the highest numbers of self-reported incidents and federal enforcement actions over the years. According to a *StateImpact Pennsylvania* analysis of PHMSA data, Sunoco Pipeline reported 302 hazardous liquid pipeline incidents between 2006 and 2018. The company had the second-highest number of incidents out of more than 2,100 operators in the agency database, with over 1.2 million gallons spilled (and only half recovered) during the same period.[63]

Still, despite these violations and enforcement actions, the company has continued to harm surrounding communities; large sinkholes have opened up along the pipeline route, and around 140 industrial waste spills have polluted waterways and wetlands.[64] The Federal Bureau of Investigation (FBI), along with county and state prosecutors, is currently investigating if Pennsylvania Governor Tom Wolf's administration pressured environmental protection officials to issue construction permits for Mariner East 2.[65] Wolf has received over $300,000 in campaign donations from the oil and gas industry, including contributions from Energy Transfer Partners, and members of his administration also have personal ties to the oil and gas industry.[66]

PHMSA data show that there have been 245 pipeline spills of NGLs and their derivatives over the past decade, resulting in around 10.2 million gallons being released into the environment, often without any remediation or assessment of long-term impacts. Costs related to property damage, emergency response and the environment total more than $59 million.[57] These numbers may even be substantially higher, due to the consistent underreporting of spills.[58] For example, a 2015 NGL pipeline spill in western North Dakota was initially reported to be 10 gallons but later turned out to be at least 240,000 gallons (the amount recovered) and may have been as large as 11 million gallons, with an estimated cleanup timeframe of up to 15 years.[59]

Storage

A combination of above- and below-ground facilities is used to store surplus NGLs.[67] These can involve above-ground tanks or underground salt, shale, granite or limestone formations that have been hollowed out to form caverns.[68]

In Appalachia, the proposed Appalachian Storage and Trading Hub would create a multi-billion dollar natural gas storage complex and associated network of gas pipelines designed to capitalize on the region's shale gas to supply chemical and plastics inputs for manufacturing plants.[69] The actual storage facility would be the region's cornerstone for the entire petrochemical development plan. It would hold up to 2 million gallons of ethane and other NGLs hundreds of thousands of feet underground in a geological salt formation between the Marcellus and Utica shale basins, and provide a steady stream of ethane to nearby crackers — acting as a trading post for fracking companies looking to sell their NGLs to petrochemical plants and plastics facilities.[70]

While underground storage locations like salt caverns are considered a safer way to store hydrocarbons, they are not without significant risk.[71] Underground storage increases the risk of sinkholes, which can lead to evacuation, property damage and lasting impacts on affected communities.[72] Leakage of stored NGLs can also harm local communities.

Awareness around fugitive NGL emissions and leaks from salt caverns has existed for decades.[73] NGL leakage from underground storage can contaminate water resources and air, lead to dangerous explosions and displace communities.[74] NGLs have been leaking from caverns in Conway, Kansas since the mid-1950s, contaminating local groundwater and causing the relocation of 30 households in the 1980s. In March 2004, more than 100 tons of NGLs escaped from a salt cavern facility at the Huntsman Polymer site in Odessa, Texas.[75]

Structural flaws in underground cavern facilities, such as leaky well casings, can also result in the escape of NGL gases to the surface. Propane, ethylene and propylene can be especially dangerous because they are heavier than air and are flammable, which puts nearby neighborhoods at risk. Gas release incidents have resulted in home explosions and evacuations. Ethane leakage from a hydrocarbon storage cavern in Fort Saskatchewan, Alberta in 2001 resulted in the ethane catching fire. While the accident occurred above ground, it was exacerbated by the huge volume of ethane located in the underground cavern.[76]

Dangerous Contaminants

Aside from NGLs, the NGL stream has many other dangerous substances. These include mercury, radioactive material and more.[77] Mercury is found in the raw natural gas stream and in NGL processing. Maintenance workers are often exposed to mercury vapors at concentrations above the legal limit during routine maintenance, and there is also potential for mercury accumulation in certain system processes and equipment.[78]

Moreover, radioactive material can contaminate natural gas and NGL processing. These contaminants include radon isotopes that occur naturally in the Earth's crust (known as naturally occurring radioactive material, or NORM) that decay into isotopes of radium, lead and polonium during the natural gas and NGL processing stream.[79] Due to the affinity that the radon isotopes have for natural gas, the radioactive contaminants migrate from the Earth's crust to the surface at the wellhead and can concentrate in NGL processing installations, storage tanks and pipelines.[80] Certain wet shale plays, like the Marcellus Shale, have

higher levels of NORM than other fracking-intensive regions.[81] NORM that is present in NGL infrastructure like natural gas processing plants can occur at levels harmful to workers; it has been found to contaminate the surrounding environment and can present disposal challenges.[82]

More NGLs Mean More Petrochemical Plants and Pollution

The scramble to develop NGLs and their associated infrastructure means more pollution and worsening environmental justice.

Plants that convert natural gas and NGLs into petrochemicals emit massive amounts of air and climate pollutants including polycyclic aromatic hydrocarbons, carbon dioxide, ozone-creating volatile organic compounds (VOCs, such as benzene and toluene) and nitrogen oxides.[83] These plants pump out mountains of toxic plastics that pile up in our landfills and oceans.[84]

The development of new petrochemical facilities, crackers and plastics plants will compound the existing pollution problems where the industry is expanding and spread it to new areas where projects are being developed. This pollution would worsen existing air quality and public health problems. The Gulf Coast has some of the highest pollution levels and pollution-related illnesses and diseases,[85] and the Tri-State region of Ohio, Pennsylvania and West Virginia already faces stark environmental and associated public health challenges from a century of industrial pollution.[86]

Environmental Justice, Health and Safety

Like other industrial polluters, pipelines and petrochemical plants are often sited in or near predominantly low-income and Black communities, in areas that have long borne a disproportionate share of toxic air and dirty water. In Louisiana, the petrochemical plant-laden "Cancer Alley" region between New Orleans and Baton Rouge along the Mississippi River has been polluted for decades; in general, areas that are home to more communities of color have some of the worst air in the country.[87]

In the Tri-State area, where one of the biggest petrochemical building booms is taking place, a sprawling network of pipelines, underground storage facilities, petrochemical plants and plastics facilities, including a Shell ethane cracker plant and the Mariner East 2 pipeline, exist to soak up the natural gas glut in Appalachia.[88] In this area — the Upper Ohio River Valley — the buildout is occurring alongside a wide range of other industrial polluters in vulnerable communities.[89] In 2015, people of color and low-income residents made up large portions of the population (10 percent and 17 percent, respectively) living within one mile of the more than 200 industrial facilities in the Upper Ohio Valley (excluding Allegheny County, Pennsylvania, where people of color made up 23 percent of the population near industrial facilities).[90]

Mont Belvieu, Texas, along the Houston Ship Channel in petrochemical alley, is the largest NGL hub in North America. With more than 240 million barrels of NGL storage capacity, the region contains multiple underground salt dome storage facilities and an extensive network of pipelines and fractionation facilities; it is also in close proximity to NGL end users, including petrochemical plants and oil refineries, and various modes of transportation – pipelines, rails, trucking and cargo vessels for domestic and international export.[91]

The Houston Ship Channel — a sprawling petrochemical, refinery and dirty energy exports complex in Texas — includes Mont Belvieu, the largest NGL hub in North America.

IMAGE COURTESY OF U.S. LIBRARY OF CONGRESS

The region serves as a striking example of the environmental blight and menace to public health brought on by a petrochemical buildout, with frequent and sometimes fatal explosions, pipeline ruptures, groundwater contamination, frequent evacuations due to leaks and other dangerous industrial incidents since the 1950s.[92] The area has also seen high levels of air pollution like VOCs from petrochemical plants, resulting in dangerous ozone formation.[93]

NGLs also fall under the classification of VOCs, and their emissions can harm public health and the environment due to the formation of ground-level ozone. Since 2009, atmospheric concentrations of ethane and propane have increased in the Northern Hemisphere near oil and natural gas production regions, a reversal of three decades of reductions. These increases in emissions have also led to increases in ground-level ozone at levels in violation of air quality standards and harmful to human health near fracking-intensive areas.[94]

Prolonged contact with ground-level ozone is linked to asthma and chronic obstructive pulmonary disease. When mixed with particulate matter, which has been linked to various cancers, smog can form.[95] In addition to asthma, long-term exposure to smog has been connected to premature deaths in adults and to low birthweight in babies.[96] Further, chronic exposure to air pollution can cause various illnesses and impairments, including cognitive deficits.[97]

Several studies have demonstrated that people's exposure to petrochemical facility pollutants is associated with heightened cancer risks, acute irritative symptoms (such as nausea and eye and throat irritation) and respiratory-related illnesses, especially for children.[98] Health burdens from these pollutants disproportionately impact people of color. Roughly 13.4 percent of Black children suffer from asthma, with a mortality rate of one in 1 million; in contrast, 7.3 percent of white children have asthma, and have a mortality rate of one in 10 million.[99]

NGLs and petrochemical infrastructure are also high risk when it comes to natural disasters.[100] With climate change worsening, extreme weather events like hurricanes and flooding may become even more common, in addition to NGL infrastructure accidents that result in fires or explosions or even loss of life.[101] When a storm makes landfall, facilities release extra pollutants when they shut down and later resume operations. In the wake of Hurricane Harvey in 2017, 46 facilities reported around 4.6 million pounds of airborne emissions that exceeded state limits; these plants included the Chevron Phillips chemical plant that released over 550,000 pounds and a Formosa Plastics plant that released 1.3 million pounds of excess emissions.[102]

Petrochemical plants have been the source of multiple fires and explosions over the years. In Pasadena, Texas in 1989, an NGL-derivative line or valve failed at a petrochemical complex, causing an explosion that killed 23 people and injured over 100.[103] In November 2019, 60,000 residents across four towns in southeast Texas were forced to evacuate after a butane derivative processing unit at a petrochemical plant in Port Neches exploded and spewed VOCs into the air. The accident was the fourth petrochemical infrastructure incident that year involving fires, which cumulatively resulted in one fatality and dozens of injuries.[104]

Conclusion and Recommendations

The fracking boom and the resulting NGL and petrochemical gold rush has resulted in a blighted environmental landscape, worsening public health and proliferating plastic pollution. As fossil fuel corporations build NGL infrastructure at breakneck speed, health and safety regulations to safeguard those living

near developments cannot keep pace. Now, more than ever, more people are being put at risk by the expansion of the petrochemical and plastics industry.

The expansion of drilling and fracking is associated with significant quality-of-life and public health problems and endangers society by worsening climate instability. This cheap and dirty fossil fuel is also proliferating its toxic legacy by facilitating the expansion of petrochemical plants, which are polluting and unsustainably producing materials that often end up in landfills. Rather than continually investing in fossil fuels and chemical industries, we must invest in clean, renewable energy.

To protect people and the climate, we need to overhaul our energy system. A movement is growing to support a large-scale effort to move the United States away from fossil fuels by building renewable energy and electrifying infrastructure. Technology for a large-scale transition to renewables has existed for more than 20 years and is cheaply available now — we just need strong government policies backed by political will to see it through.

Food & Water Watch recommends:

- An immediate national ban on fracking and its associated infrastructure, like pipelines, power plants and petrochemical facilities.
- Transitioning to 100 percent clean, renewable energy by 2030 through an investment in a New Deal-scale green energy public works program that fosters a rapid transition to real zero-emission clean energy like solar and wind, accompanied by widescale deployment of energy efficiency.

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