A Marathon of Pollution
Marathon Oil’s decade of pollution in the Texas Eagle Ford Shale
December 2022
A Marathon of Pollution

Marathon Oil’s decade of pollution in the Texas Eagle Ford Shale

December 2022

AUTHORS:
Sharon Wilson and Rebekah Staub, Earthworks

Photos by Earthworks unless noted
Design by CreativeGeckos.com

EARTHWORKS
Offices in California, Colorado, Maryland, Montana, Pennsylvania, New Mexico, New York, Texas, West Virginia
EARTHWORKS • 1612 K St., NW, Suite 904 Washington, D.C., USA 20006
earthworks.org • Report at earthworks.org/marathon

Dedicated to protecting communities and the environment from the adverse impacts of mineral and energy development while promoting sustainable solutions.
# Table of Contents

Introduction .....................................................................................................................................5

- A Brief History of Marathon ........................................................................................................6
- International Troubles ..................................................................................................................6

Methane Pollution, Communities, and the Climate ...............................................................7

A Legacy of Pollution at Marathon’s Sugarhorn Central Processing Facility ........8

Documenting a Decade of Pollution .............................................................................................10

- Timeline of Decade of Pollution at Marathon’s Sugarhorn Facility ......................................11
- The Impacts of No Oversight ......................................................................................................12
- Benzene, a Known Carcinogen, and Lax Regulation .................................................................12

Beyond Sugarhorn—Marathon in the Eagle Ford Shale ..................................................13

- Marathon’s Corporate Irresponsibility .....................................................................................14

Marathon’s Climate Commitments ...............................................................................................15

Beyond Marathon—Oil and Gas Failings throughout Texas ..............................................16

Recommendations .........................................................................................................................17

Conclusion .....................................................................................................................................18

Endnotes .......................................................................................................................................19
“We believe that protecting the environment is about more than just complying with regulations. Safe, environmentally responsible operations are central to our company values and a key part of our commitment to stakeholders.”

—Marathon Oil
Introduction

Earthworks has been documenting air pollution at oil and gas operations throughout Texas, which produces more oil and gas than any other state in the United States. In some cases, these emission events are consistently documented at sites owned by the same operators. In the Eagle Ford Shale which cuts through a huge swath of Southern Texas, including College Station and Laredo, one of these companies is Marathon Oil.

For the past decade Earthworks has witnessed and recorded Marathon Oil sites failing to minimize the amount of toxic pollutants they release into the air which endangers workers, residents, and the climate. Even after Earthworks submitted 17 different complaints to the Texas Commission on Environmental Quality (TCEQ) after 60 site visits to Marathon facilities across the Eagle Ford Shale, this trend of ignored emissions unfortunately continues. Based on TCEQ's Notice of Violation database, Marathon has received more than 300 violations from TCEQ over the past seven years, but only two of those violations have resulted in an administrative order and subsequent fine. That means that only about 1 percent of the sites cited by TCEQ actually received administrative orders and fines.

At one site in Karnes County, the Marathon Sugarhorn Central Processing Facility, the TCEQ has failed to meaningfully address consistent pollution documented at the site despite their own investigations, complaints from citizens and eight years of Earthworks complaints submitted with optical gas imaging (OGI) footage of pollution. In one instance, TCEQ went so far as to directly refuse to investigate a complaint from a concerned member of the public attempting to notify the TCEQ of possible dangerous levels of pollution from Marathon. When investigations were conducted, the TCEQ failed to issue fines to improve operations.

The responsibility of operating in a way that reduces harm to people and the planet does not only fall on Marathon — the TCEQ has failed to curtail pollution from Marathon and from many other operators both large and small, leaving a harmful industry unregulated. This must be resolved, and it is clear that neither operators nor regulators are doing so. Such harm cannot and should not be allowed to continue.
A Brief History of Marathon

The company that would go on to become Marathon was founded in 1887, known then as the Ohio Oil Company. Ohio Oil was acquired by John D. Rockefeller’s Standard Oil, but this acquisition was short lived as the Supreme Court soon broke Standard Oil up into several companies in an effort to combat trusts. This resulted in an independent Ohio Oil Company which would ultimately change its name to Marathon Oil. In 2011, Marathon Oil split into two companies, Marathon Oil and Marathon Petroleum. Marathon Oil maintained control of upstream facilities (like wells and compressor stations) while Marathon Petroleum took control of downstream facilities (mostly oil refineries). While independent companies, Marathon Petroleum is described by Marathon Oil as a “spin-off,” when Marathon Petroleum was formed, Marathon Oil shareholders received Marathon Petroleum stock. Marathon Petroleum is noteworthy for:

- more than 1,000 violations issued to its sites by Texas regulators,
- a more than $3 million settlement with the Environmental Protection Agency (EPA) for violations at 10 major oil refineries,
- two major oil spills, that exposed communities to heavy crude oil,
- a refinery explosion, and multiple lawsuits filed against them by concerned citizens, just in the past decade.

Marathon Oil is active in four major shale reserves in the United States: the North Delaware Basin, part of the Permian Basin that is split across New Mexico and Texas, the Anadarko Basin in Oklahoma, the Williston Basin in North Dakota, and the Eagle Ford Shale in Southern Texas. Across the Eagle Ford, Marathon has 32 central processing facilities and more than 1,000 wells, producing 84,000 barrels of oil per day.

INTERNATIONAL TROUBLES

Internationally, Marathon has a number of facilities in Equatorial Guinea, where they produce nearly 50,000 barrels of oil per day. Equatorial Guinea’s oil economy has been rife with accusations of corruption, including a Senate probe that revealed Marathon Oil paid the President of Equatorial Guinea more than $2 million for land. In 2015 an offshore Marathon Oil drilling platform called Brae Alpha had a major pipeline rupture. The location of the explosion was described as looking like a “bombsite” and the gas that escaped set off 42 different gas detectors. Reports indicated that “only luck had prevented the gas from finding an ignition source leading to a potential disaster.”

Regulators had visited the site weeks before the incident and concluded that the site had a series of maintenance shortcomings and had been asked to improve conditions. It was later discovered that the pipework on site had not been properly evaluated and repaired for more than 30 years. Regulators stated, “These failures exposed personnel on the Brae Alpha installation to an unacceptable risk of serious personal injury from fire and explosion.”

Ultimately, Marathon was fined just under $1.5 million for the blast by UK regulators, one of the largest fines for an offshore facility ever issued in the UK.

Today, Marathon is headquartered in Houston, Texas. They describe themselves as a “force for good.”
Methane Pollution, Communities, and the Climate

The gas known as “natural gas” is a mixture of gases primarily composed of methane gas and many other less common compounds including ethane, nitrogen, hydrogen sulfide, and helium — all of which come from drilling a hole in the ground. Methane emissions are the second largest cause of the climate crisis today.¹⁶ The mixture of gases has a variety of uses, from producing energy to being refined into other products.

The massive networks of subsequent infrastructure needed to transport, process, and export that not-so-natural fracked gas (such as well sites, pipelines, processing plants, compressor stations, and storage tanks) are allowed to emit large volumes of methane and volatile organic compounds (VOCs) into the atmosphere.

Methane is an exceptionally potent greenhouse gas. Current estimates gauge methane to be more than 80 times more potent at warming the climate per pound than carbon dioxide.¹⁷ Luckily, methane has a relatively short life span in the atmosphere so stopping methane from oil and gas can have a substantial impact on mitigating the climate crisis.

Communities living close to extraction sites are exposed to toxic air and water. Roaring flares light their night skies. Heavy truck traffic destroys their roads and poses heightened safety risks to their everyday lives. Refineries, export terminals, and petrochemical plants are proliferating in marginalized communities that have long borne the toxic burden of our dependence on oil and gas.¹⁸ The VOCs, including benzene, that are emitted from operations have been linked to a variety of cancers and can cause a litany of other health problems.¹⁹

To protect billions of people from the immediate risks of climate change, current data tells us the world needed to end all new investment in oil and gas by 2021.²⁰ However, U.S. shale plays like the Permian Basin of West Texas and Southeast New Mexico are now on track to become one of the world’s largest sources of climate pollution.²¹ Unfortunately, oil and gas extraction procedures allow large amounts of methane to be released into the atmosphere both intentionally and as leaks. Current data indicates that more than 90 percent of methane and carbon dioxide released from oil and gas are intentional.²² This problem is so severe that global spikes in atmospheric methane are aligned with the expansion of U.S. fracking.²³

Where do greenhouse gas emissions come from?

More than 90% of methane and carbon dioxide releases from oil and gas are intentional and/or required to protect equipment. Less than 10% is from unintentional leaks.
A Legacy of Pollution at Sugarhorn Central Processing Facility

In 2014, Earthworks’ Sharon Wilson became certified as an optical gas imaging (OGI) thermographer. With the help of a FLIR GF 320 OGI camera, the user can capture video footage of hydrocarbon gases — including methane. Methane gas is invisible to the human eye, so this technology has been vital in detecting methane gas releases from oil and gas facilities. The FLIR GF 320 is the same model used by industry and government agencies to detect leaks and chronic pollution at oil and gas operations.

Using this technology, Wilson began visiting oil fields in order to examine whether operators were actually reducing methane releases from occurring at their facilities. The results were striking. More than 70 site visits just in that first year found some evidence of pollution. In the Eagle Ford Shale, where many of these visits took place, a site operated by Marathon Oil began to stand out: the Marathon Sugarhorn Central Processing Facility.

As a Central Processing Facility, Sugarhorn has a large set of equipment that is fed gas and liquids — including oil — from multiple wells. On site there is a variety of processing equipment including separators, compressors, and water tanks. The facility processes the gas before sending it downstream to refineries and ultimately into the marketplace.

The first time Wilson visited the Sugarhorn facility in March 2014, it was clear something was seriously wrong. The site was spewing a massive amount of flammable methane and other volatile organic compounds (VOCs) into the atmosphere. Through the OGI camera, what looked like gray smoke was blasting from every piece of equipment, blowing a massive cloud of emissions across the horizon.
Wilson was concerned that even a small spark could potentially ignite the huge plume and create a hazardous fireball. The situation was so severe that rather than following her normal procedure of making a complaint about pollution to Texas regulators when she returned home, Wilson called the TCEQ immediately. The TCEQ told her that their staff was in a workshop and would return her call when able. No one called her back.

The next day, Wilson returned to the site to see if the release had been resolved. The pollution continued unabated. Again, she called the TCEQ and again the TCEQ did not investigate. This time, she was told by the TCEQ Region 13 Air Section Manager George Ortiz that the TCEQ would not investigate her complaint because she was not a local.

Months later, Wilson was contacted by Gunnar Schade, an associate professor at Texas A&M University, to ask if she witnessed any major emissions events in a specific area of Karnes County on March 6 and 7, 2014 — the date of the Sugarhorn release. The professor had been checking the air quality monitor 20 miles from Sugarhorn in Floresville, Texas and noticed a large spike in air pollution on March 6. Based on wind patterns from that date it appeared that the pollution event TCEQ refused to investigate at Marathon Sugarhorn was so severe that even 20 miles away in Floresville, air quality monitors were able to pick up a spike in pollution. The Sugarhorn facility was exposing residents and workers to pollution far beyond the facility fenceline.
Documenting a Decade of Pollution

The Marathon Sugarhorn Central Processing Facility has a long history of releasing extensive emissions, starting when TCEQ first investigated the site in 2012 and found evidence of pollution. Following the initial site visit to Marathon Sugarhorn and subsequent complaint in 2014, Earthworks visited the site 17 times over the next eight years. Earthworks has found pollution at every site visit.

Despite the submission of multiple environmental complaints with documented video evidence of excess emissions and Marathon installing the best available emission control technology, it appears nothing has stopped the ongoing pollution. A decade of unchecked pollution is unacceptable.
Timeline of Decade of Pollution at Marathon’s Sugarhorn Facility

TCEQ first investigated the site in 2012 and found evidence of pollution. Following the initial site visit to Marathon Sugarhorn and subsequent complaint in 2014, Earthworks visited the site 17 times over the next eight years. Earthworks has found pollution at every site visit.
The impacts of no oversight

Mike and Myra Cerny lived on the Eagle Ford Shale with their son until recently. When living in the area, each family member was plagued by chronic health problems. Of the 37 facilities within just two miles of their home, 34 were operated by Marathon. One of those sites was the Sugarhorn Central Processing Facility just 1.3 miles away.

A public information request filed by Earthworks with the TCEQ for information from several of the wells and support facilities near the Cerny’s residence documented six site investigations that the TCEQ conducted in 2012. During the first investigation, a flare on site was documented smoking for fifteen continuous minutes. State and federal law limits smoking from flares to no more than five minutes. No violation for smoking was issued.

During the next inspection, the TCEQ Investigator’s Toxic Vapor Analyzer registered air toxins at 24 ppm, nearly five times the threshold for further testing. During the next visit, in June, the Toxic Vapor Analyzer registered air toxins at 132 ppm. That level was so high that the investigators were forced to evacuate the site in order to protect themselves. Despite being forced to flee the site, the TCEQ made no notice to the public about the potential risk, disregarding the families just “yards” from the site.

Beyond these airborne toxins, the TCEQ also recorded OGi footage of the well on two separate occasions and documented emissions including one day that was considered “extensive.”

Later that year, the TCEQ conducted further investigations on the site, this time in response to complaints from nearby residents that the pollution had become so severe that they were experiencing headaches and nose bleeds. The TCEQ conducted two investigations in response to those complaints. During the first investigation, the TCEQ recorded OGi footage of pollution from pressure relief valves on top of the storage tanks on site. During the second investigation, the TCEQ discovered that the internal combuster on site was unlit and was therefore releasing un-combusted methane and volatile organic compounds (VOCs) into the atmosphere unabated. The TCEQ informed the operator of the unlit flare on the same day.

Emissions events like the ones documented by TCEQ are supposed to be reported to the TCEQ within 24 hours. Marathon did not report these events for more than three months. When they finally did report them, the catalog of emissions showed on the day of the first investigation Marathon exceeded the VOC maximum allowable emissions rate by 500 times and the hydrogen sulfide maximum allowable emissions rate by 100 times. On the day of the second investigation Marathon’s flare was unlit for more than 11 hours which resulted in a release of 350 times the maximum allowable emissions rate for VOCs and 75 times the maximum allowable emissions rate for hydrogen sulfide, H\textsubscript{2}S.

TCEQ issued several violations related to these problems, but levied no fines or penalties and allowed facility operations to continue.

---

BENZENE, A KNOWN CARCINOGEN, AND LAX REGULATION

Benzene is one of many VOCs regularly released from oil and gas operations. The American Petroleum Institute has known since its 1948 toxicological study that “the only absolutely safe concentration for benzene is zero.” Exposure to benzene has been linked to various forms of cancer including leukemia. Despite this knowledge, the TCEQ continues to grant permits that allow benzene to be released from oil and gas operations across the state, potentially endangering the health of both workers and the public.
Beyond Sugarhorn—Marathon in the Eagle Ford Shale

Earthworks has recorded and documented pollution at many oil and gas sites owned by Marathon Oil in the Eagle Ford Shale.

<table>
<thead>
<tr>
<th>Marathon’s Site Name</th>
<th>Documented Pollution</th>
<th>Optical Gas Imaging (OGI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>East Sugarloaf</strong></td>
<td>At Marathon’s East Sugarloaf well facility, a smoking flare that was emitting improperly combusted gas into the atmosphere. <a href="#">Click to play video.</a></td>
<td><img src="#" alt="Video" /></td>
</tr>
<tr>
<td><strong>East Longhorn</strong></td>
<td>At Marathon’s East Longhorn Central Facility, emissions appear to originate from on site storage tanks. <a href="#">Click to play video.</a></td>
<td><img src="#" alt="Video" /></td>
</tr>
<tr>
<td><strong>East Karnes</strong></td>
<td>At Marathon’s East Karnes Comingle, two flares and multiple compressors release uncombusted gas into the air. <a href="#">Click to play video.</a></td>
<td><img src="#" alt="Video" /></td>
</tr>
<tr>
<td><strong>West Sugarloaf</strong></td>
<td>Marathon’s West Sugarloaf facility shows extensive uncombusted methane from the flare and compressors. There are also emissions from the tanks despite vapor recovery equipment. <a href="#">Click to play video.</a></td>
<td><img src="#" alt="Video" /></td>
</tr>
</tbody>
</table>
Marathon’s Corporate Irresponsibility

The realities of on-the-ground experiences with Marathon facilities in the Eagle Ford Shale conflict with the company’s stated commitment about complying with regulations, and that “protecting the environment is about more than money...” as they have stated on their website. In Texas, Marathon Oil has received more than 300 environmental violations over the past decade. In some cases dozens of violations have been issued to large Marathon processing facilities — the East Karnes Central Processing Facility, where Earthworks has recorded OGI footage, has received more than 40 violations in the last 10 years. Some of the violations were even for failing to disclose emissions events. Despite this, the East Karnes facility is still in operation. These violations were not the result of consistent TCEQ investigations, rather, 33 of the 40 were issued from just one investigation.

A site that is violating state law on 33 different counts in one investigation is not one that simply needs a tune-up.

Marathon’s problems are widespread:

• Their East Longhorn Central Processing Facility has been cited 11 times for failing to disclose emissions.

• East Sugarloaf Central Processing Facility has been cited 11 times for failing to record and disclose emissions events, and also received 2 flaring violations.

• Live Oak Central Processing Facility has been cited 25 times: 9 of those violations were for failing to test equipment; 3 were for submitting inaccurate emissions information.

• Marathon Oil has been issued violations more than 100 times over the past decade for flaring inadequacies across Texas.

• Of the more than 200 violations issued in the past seven years, just two have resulted in administrative orders and fines from the TCEQ. Meaning 99 percent of violations resulted in no fine.

The broad trend is Marathon often fails to properly maintain equipment, resulting in high emissions. Even if the equipment was maintained properly, when emissions would still occur, Marathon is unreliable about reporting them to regulators.

How is this company allowed to continue to operate?
Marathon Oil touts a variety of commitments to environmental improvements through several metrics. They claim to have decreased flaring by increasing their gas capture percentage from almost 95 percent in 2019 to 97 percent in 2020.31 They claim to use leak detection equipment to ensure that leaks are dealt with quickly and effectively. Notably, they make few commitments to mitigate intentional releases.

Marathon heavily emphasizes a pollutant metric called Greenhouse Gas (GHG) Intensity. Intensity measures the amount of pollution released per unit of oil produced rather than the overall amount of pollution released. Intensity is a misleading metric, because the rapidly warming climate of Earth only cares about overall emission sums. GHG Intensity is also an unreliable metric of the actual emissions per unit of oil because it is based on an estimation system rather than actual observations of emissions.32

According to Marathon’s own data, from 2019 to 2020 their methane intensity actually increased by 22 percent. Marathon largely overlooks this substantial increase in methane pollution and instead touts their alleged overall GHG intensity reduction. As detailed below, they routinely shift the focus of their reporting to whichever indicator they think paints them in the best light.”33

Older reports from Marathon depict a markedly different, clearer, and stronger commitment to reducing their methane emissions. From the 2018 emissions report: “Mitigating potential sources of methane emissions now is the most effective way for us to reduce our environmental impact. For this reason, we’ve chosen to make methane emissions reductions a focus in recent years.”34 In 2018 and 2019, Marathon reported a decrease in methane intensity and an increase in GHG intensity. It is worth noting that in 2018 when methane was heavily emphasized as a critically important pollutant, methane intensity went down. Whereas in 2020 when methane intensity went up, conveniently Marathon shifted its report focus to GHG intensity. In either case, Marathon’s progress is at best inconsistent even by its own metrics.

Given Marathon’s recorded tendency to fail to report emissions, it is likely that its actual methane and greenhouse gas release rates are much higher than presented in its emissions reports.35,36
Beyond Marathon—
Unregulated Pollution Throughout Texas

Unfortunately, Marathon Oil is not unique in its failure to protect people and the climate. Earthworks has visited hundreds of sites across all of the major shales in Texas, along with the export facilities that populate the Gulf Coast. On every trip we find pollution from oil and gas equipment that persist on repeat visits — month after month, year after year.

It is clear that such widespread pollution cannot simply arise from operators outmaneuvering earnest regulators. Regulators are failing on a broad systemic level. They refuse to investigate complaints. In some cases they claim to have conducted an investigation without even visiting the site in person. When they actually do visit a site and find evidence of unnecessary pollution, regulators in many instances fail to issue fines. Without fines there is little incentive for operators to improve their practices. When only 1 in 100 violations for an operator results in a fine and the largest fine the operator has received from the TCEQ only required it to pay $3,660 (about 1/1,000,000 Marathon’s global revenue for that year), it is easy to see why operators have no incentive to improve.

Even if the TCEQ were willing and able to enforce regulation, it would be unable to fulfill the oil and gas industry’s promise of a clean fuel. There are too many instances in which equipment must release potent methane gas into the atmosphere for the industry to ever truly become clean. Awareness of this fact has also led to regulatory loopholes in which operators can avoid penalties for releases if they can prove that they were operationally necessary and unavoidable.

250,000
number of oil and gas wells in Texas per the RRC, the state agency that regulates the oil and gas industry.

Marathon has 1,600 wells according to Marathon.
Recommendations

Spurring operators like Marathon to make adjustments of its own accord is unlikely to prove fruitful. Oil and gas has no place in a just and sustainable future. However, regulators like the TCEQ can and should take steps to minimize pollution from oil and gas.

1. **Investigate all complaints made by concerned citizens.** Perhaps the most obvious thing the TCEQ can do to better hold operators accountable is to fully investigate all complaints made by concerned citizens. Regardless of who the complaint originates from, regulators should investigate every complaint made. Not only will that help to protect residents, it also helps to protect oil and gas workers who may also be in danger and substantially less likely to complain to TCEQ.

2. **Mandate on-site investigations.** When the TCEQ opts to do an investigation it should actually visit the site. Especially during the peak of Covid but even now, the TCEQ has repeatedly opted to do “file investigations” where rather than actually visiting the offending site, the TCEQ contacts the operator to ask them to answer questions. This system gives operators far too much flexibility to mislead the TCEQ. Earthworks has discovered in public information requests instances of operators providing TCEQ untruths and inaccurate technical data with no pushback from the agency.

3. **Issue the highest fine when violations are found.** When violations are found on site, operators should be issued the highest fine permissible under state law with no exceptions. For air quality violations, that is $25,000 per day that the violation occurs. Increasing the financial penalty to operators who fail to comply with regulations will hopefully encourage better practices. The Texas regulatory apparatus is so reliant on self reporting from operators that operators need every incentive possible to ensure accurate self reporting. If operators are severely punished for failing to report emissions — which in Marathon’s cases it was not — there would be more motivation to ensure proper reporting. While no amount of compliance can make oil and gas clean, increased compliance would help to minimize the impacts of industry while rapidly transitioning to renewable energy.

4. **Use OGI equipment more.** The TCEQ should conduct OGI site visits more frequently so that sites are regularly inspected. Sharon Wilson by herself conducts more OGI site investigations than the TCEQ does in the Permian Basin. Since 20+ OGI cameras are managed by the TCEQ regional offices, it indicates that investigatory shortcomings are not a result of lack of resources but a lack of effort and focus.

5. **Stop issuing new permits.** The final, and the most important, recommendation is TCEQ should halt the granting of new air permits. If the TCEQ is unable to regulate a site that they have consistently received footage of pollution at for a decade, it is implausible to believe that they would be capable of regulating an expanding network of oil and gas facilities. The permitting system is heavily reliant on Best Available Control Technologies (BACT). This system is intended to ensure that operators minimize emissions as much as possible through infrastructure and operational parameters, Sugarhorn has been bound by these expectations since its permit revisions in 2017, yet these standards have failed to control emissions at the facility. It is irresponsible to grant new permits to an industry that continues to endanger Texans, the local environment, and the global climate.
Conclusion

The burden should fall on the operator, in this case Marathon, to conduct its operations in such a way that the company is not endangering nearby residents or the environment. Thus, it falls to regulators to protect Texans and the planet from climate change. Those regulators have failed. The Sugarhorn site has been allowed to stay in operation, yet not a single violation that’s been issued has resulted in a monetary fine. It is unacceptable that the TCEQ would refuse to investigate a site despite a complaint from certified thermographers — and their own observations — that the sites were releasing pollutants. It is easy to see how an operator like Marathon would lack motivation to improve their facilities when there’s no clear punishment for failing to do so.

That the Sugarhorn Central Processing facility with a decade of documented pollution has never even received a fine from the TCEQ is unacceptable. A facility with such a history should not be allowed to continue to operate, but the TCEQ has barely even attempted to address the excess emissions present. Ultimately, responsibility for such a cataclysmic failure lays both with Marathon Oil and the TCEQ. This is not the behavior of a company that is a “force for good.”
Endnotes

1 https://www.marathonoil.com/sustainability/environment/environment-overview
2 https://www.britannica.com/topic/Marathon-Oil-Company
4 https://www.epa.gov/enforcement/marathon-petroleum-corporation-clean-air-settlement
6 https://www.greenmatters.com/p/marathon-oil-spill-texas-city
8 https://www.marathonoil.com/operations/
9 https://www.marathonoil.com/operations/eagle-ford/
10 https://www.marathonoil.com/operations/eg/
12 https://www.offshore-energy.biz/brae-alpha-a-gas-lease-or-a-blast/
13 https://www.dailyrecord.co.uk/news/scottish-news/oil-platform-gas-lease-caused-7648686
14 https://www.marathonoil.com/operations/eg/
15 https://ir.marathonoil.com
18 https://www.permianclimatebomb.org/chapter-5
19 https://iaqscience.lbl.gov/vocs-and-cancer
20 https://www.iea.org/reports/net-zero-by-2050
29 https://www.documentcloud.org/documents/1373098-00010795
30 https://emergency.cdc.gov/agent/benzene/basics/facts.asp
31 https://www.marathonoil.com/sustainability/environment/emissions-management/
32 https://www.nature.com/articles/s41467-021-25017-4
33 https://www.marathonoil.com/sustainability/environment/emissions-management/
35 https://dash.harvard.edu/bitstream/handle/1/30761876/Novim_Writeup_v48_FF_njb.pdf?sequence=1
36 https://www.nature.com/articles/s41467-021-25017-4
37 https://earthworks.org/resources/hazards_in_the_air/