

# Darwin methane leak ‘covered up’ by gas companies and regulators

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Environmental Impact

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**A**t the heart of the project that heralded northern Australia’s gas boom — Darwin’s first liquefied natural gas plant — was a storage tank that operators hailed as a major feat of engineering.

Likened to a “giant esky” standing 48 metres high by 92 metres wide, it was reportedly the world’s largest above-ground tank when it came online in 2006.



The LNG tank is about 7 kilometres from Darwin. (ABC News: *Tristan Hooft*)

Gas bubbles soon appeared in mud near the tank, but its operator, ConocoPhillips, said it had found the leak and the emissions were “minute”.

For the next 18 years, the tank held vast amounts of super-cold fuel bound for Asia, before its source in the Timor Sea finally dried up.

It sits empty now, but documents seen by the ABC suggest the scale of leaking pollutants could be equivalent to 8,300 new cars on the road every year it is in use.

And it’s about to be filled up again.

Later this year, the Darwin Liquefied Natural Gas plant (DLNG) is set for a new lease of life in the hands of gas giant Santos as part of the controversial \$5.6 billion Barossa project.

Critics of Barossa include mining billionaire Andrew Forrest, who branded it “atrocious” and “one of the most polluting projects in the world” over its release of greenhouse gas from a new Timor Sea gas field.

But the project also involves a dirty secret back in Darwin, which gas companies and government agencies have kept from the public for years.

Confidential documents leaked to the ABC, and correspondence obtained via Freedom of Information by the Environment Centre Northern Territory, reveal a design fault in the DLNG tank caused a major methane leak that is set to continue for decades to come.

Methane is a potent greenhouse gas that is responsible for 25 per cent of global warming and is up to 80 times more harmful than carbon dioxide (CO<sub>2</sub>), according to the United Nations.

Northern Territory regulators found out about the DLNG leak in 2020, just hours after signing off on a proposal to extend its operations until 2050.

It briefly sparked concerns of an explosion risk to people in Darwin and nearby Palmerston, 7 and 11 kilometres away, respectively.



Source: European Union/Sentinel 2

Estimates of emissions from the leak have varied, ranging up to the equivalent of millions of tonnes of carbon dioxide.

Despite this, NT and federal regulators have not forced Santos to repair or replace the tank, or measure how much methane it leaks into the atmosphere when in use.

They and the company say the leak is stable, and poses a moderate climate risk but no immediate threat to the public or the environment.

But Kirsty Howey, executive director of the Environment Centre NT, says the handling of the leak represents a “national scandal”.

“What we have here is a cover-up at every conceivable scale, by ConocoPhillips, by Santos and by a range of regulators,” Ms Howey says.

“To know that there has been methane leaking from the facility in huge quantities, and the risk that that could pose in the event of an explosion, let alone the climate impacts, is pretty shocking.

“And it will be shocking to the people of Darwin and Palmerston when they realise the extent of the cover-up.”

The problems stem from a technical failure inside the “giant esky” at its inception.



The ABC has drawn on a confidential report from ConocoPhillips and correspondence with the NT Environment Protection Authority (NTEPA) to reconstruct what went wrong inside the huge tank.

When the first load of liquefied gas was piped into the tank in 2006, a design fault with nozzles at the top of the tank meant the LNG didn't flow safely inside.

Instead, the super-cooled liquid overflowed, splashing back onto the roof of the tank and into the space between its two walls.

The LNG soaked into a fibreglass blanket attached to the outside of the inner wall, and flowed down to the bottom of the cavity.

The freezing temperatures of the LNG caused thermal stress in an outer vapour barrier made of carbon steel, which was meant to contain the gas inside the tank.

Not made to withstand those temperatures, weld seams in that vapour barrier cracked.

With that barrier broken, the tank was no longer sealed and methane could escape into the atmosphere.

And escape it did. It seeped down, causing those bubbles in the muddy ground. And also up and out the top of the tank.

To make matters worse, for the entire operation of the facility, loose insulating material called perlite — which was supposed to be sealed in the cavity between the tank's walls — was being found in the LNG delivered to ships.

ConocoPhillips replaced the equipment that caused the problem, but little could be done about the damage it had caused, or the gas escaping through the damaged barrier.

The company failed to detect the scale or nature of the problem for 13 years, its hand-held gas detectors showing nothing to worry about.

Then in September 2019, ConocoPhillips called in new drone technology from the US to check on any leaking gas, known as fugitive emissions.

The results were “unexpected”, according to the company’s confidential investigation report.

They indicated a methane leak that was not minute, but releasing up to 184 kilograms per hour.

The timing was awkward because ConocoPhillips was about to sell control of the plant to Santos.

“The concern was, ‘Is our deal going to go south?’” one company insider told the ABC on condition of anonymity.

The insider says the leak helped Santos get a better price in a takeover deal announced in October 2019.

Under its environmental licence, ConocoPhillips had to report any breaches within 24 hours.

Instead, it waited eight months.

It ran a second drone survey in April 2020, and received a data analysis on May 5, 2020.

The next day, NTEPA announced conditional approval for the DLNG life extension, finding the “potential environmental impacts and risks ... are not so significant as to warrant [a full] environmental impact assessment”.

Several hours later, ConocoPhillips told the environmental regulator about the leak.

“We acknowledge that the initial round of monitoring completed in 2019 was not reported as the technology application was new and the confidence in the data output was under consideration,” it said.

Ms Howey says it is “hard not to be suspicious” about the timing of the leak disclosure amid a takeover deal with Santos, following a favourable decision about the plant’s future.

“And by then of course, it’s too late, the decision’s been made,” she says.

## **Explosion risk**

Government officials raised concerns about public safety for people in nearby Palmerston and Darwin. (ABC News: Tristan Hooft)

The documents reveal NT government officials were initially concerned about public safety, including from a potential catastrophic explosion and pollution.

They wanted to know what action the company had taken “with regards to the safety of not only the staff on site but persons residing in nearby residential areas of Palmerston, Darwin and its surrounds”.

NTEPA also believed the company was required to “relay details of this incident to members of the public” who were “likely to have a real interest in or be affected” by the leak.

But ConocoPhillips disagreed, saying it “doesn’t believe there are any affected persons outside of DLNG personnel”.

It belatedly reported the leak to the NT work safety regulator after NTEPA threatened to do so.

Documents show the NTEPA and ConocoPhillips disagreed over whether the public should be told about the leak. (Supplied)

Ms Howey says she “would have expected the regulators to demand that there be public disclosure of this risk and this leak”.

“Here we’re seeing the full effects of what I would call ‘state capture’ by the fossil fuel industry.”

NTEPA also told the company it was “concerned about potential environmental impact from continued use of the LNG tank without remediation of the issues resulting in the fugitive emissions”.

It asked how the company planned to stop those emissions, or if it would “switch out” the tank altogether.

## **‘Significant uncertainty’ about emissions**

Drone surveys were used to detect the scale of the methane leak from the tank. (Supplied: Neormap)

ConocoPhillips’s investigation report assessed the risk of fire and explosion as “low”.

It said drone surveys near the tank found methane concentrations of up to 6 parts per million (ppm), far below flammable levels.

However, the report warned leak estimates were subject to “significant” uncertainty.

It found the leak averaged 95 kilograms of methane every hour for 14 years, equating to more than 291,000 tonnes of CO<sub>2</sub>, but still only 1.35 per cent of DLNG's total emissions.

It was still more than five times the industry standard on fugitive emissions from gas storage, and the equivalent of adding more than 8,000 cars to the road every year.

A senior NTEPA official later questioned the emissions figures, saying calculations in the company report suggested they could be higher.

According to the Environment Centre NT, this meant the leak could drive up emissions at DLNG by 25 per cent.

A ConocoPhillips spokeswoman says the company "sold its interest in the DLNG joint venture to Santos in May 2020 and therefore all enquiries regarding DLNG should be directed to Santos".

NTEPA says subsequent surveys by Santos, which took over as operator of DLNG on May 28, 2020, found fugitive emissions were only 1 per cent of total emissions.

NTEPA says the leak is "a concern because it contributes to DLNG's overall greenhouse gas emissions profile," but is "not considered to pose a risk to human health or the environment at the level of current emissions".

"NTEPA has no reason to believe the estimates are inaccurate," it says.

Ms Howey says the "wildly divergent figures in the documents we've received [mean] we can't just take Santos's word for it that the scale of these emissions is small".

"I think there are certainly credible grounds for there to be an investigation into whether Santos has committed environmental pollution offences under relevant Northern Territory legislation."

## Repairing leak a 'commercial decision'

The gas plant is set for a new lease of life in the hands of gas giant Santos. (ABC News: Tristan Hooft)

Santos engaged with CSIRO, the Clean Energy Regulator and an engineering firm for advice on the leak.

However, it has decided not to replace the faulty tank in Darwin — or even repair it, despite it being out of action until the Barossa project comes online later this year.

Nor will it be paying for equipment to accurately measure how much methane is escaping.

In its environmental plan for the Barossa project - which was approved by Australia's offshore energy regulator, NOPSEMA, in April - Santos said that "given the volume of methane emissions expected from processing, the cost associated with the installation and maintenance of additional instrumentation is disproportionate".

NOPSEMA said the "risks of unplanned emissions from infrastructure faults at the onshore Darwin LNG facility" were a matter for NT authorities.

But NTEPA says emissions are a matter for the Clean Energy Regulator, which oversees the National Greenhouse and Energy Reporting Scheme.

Ms Howey says Santos should be forced to fix the leak as part of its environmental licence for DLNG, which is up for renewal on September 18.

"At the moment, the tank is sitting there empty ... there has never been a better time to fix it than right now," she says.

"The excuse we understand has been given by Santos is that it's simply too expensive — what we would say is that these are the costs of doing business."

However, NTEPA says it's up to the company.

"The decision whether to repair the leak is a commercial decision made by Santos," NTEPA says.

In a statement, Santos says the tank "remains fit and safe for service for the life of the Barossa gas project".

It is "regulated by NT WorkSafe and operates under an approved safety case".

"All regulatory approvals are in place and an ongoing monitoring program is in place," it says.

"Santos reports all its greenhouse gas emissions annually, including from DLNG, under the National Greenhouse and Energy Reporting Scheme (NGERS)."

Mr Sims says it's "crucial" to force companies to effectively measure fugitive methane emissions. *(ABC News: Greg Heap)*

Rod Sims, chair of pro-renewables think tank the Superpower Institute, says the scheme is flawed because Santos will be reporting estimates based on "default" formulas that do not take account of the leak at DLNG.

This is "nowhere near good enough given the importance of methane emissions" to Australia's climate goals, he says.

Mr Sims, a former head of Australia's competition watchdog, says it is "absolutely crucial" to start forcing companies like Santos to effectively measure, control and publicly report fugitive methane emissions.

"I think the government regulations are the problem that are allowing companies to take a bit of latitude, so let's fix that," he says.