

## Climate Health WA Inquiry

### About your submission

Are you responding on behalf of an organisation or group?

No

Yes

If yes, please identify the organisation:

### Your contact details

The following information will not be published without your permission but enables the Inquiry to contact you about your submission if required.

First name	Black
Surname	Dr John
Address	[REDACTED]
Phone	[REDACTED]
Email	[REDACTED]

### Publication of submissions

Submissions will be published with the name of the submitter unless otherwise indicated below. Do you consent to be identified in the published submission?

Yes, I / my organisation agree to be identified

No, I / my organisation request to remain anonymous

### Terms of Reference

You are encouraged to address at least ONE of the Terms of Reference as listed below. Please select which item/s you will address:

1. Establish current knowledge on the implications of climate change for health in Western Australia (WA) and recommend a framework for evaluating future implications.

2. Identify and recommend a program of work to manage the implications of climate change for health in WA, which will protect the public from the harmful health impacts of climate change.

3. Identify and recommend a program of work to manage the implications of climate change for health in WA, which will strengthen the preparedness and resilience of communities and health services against extreme weather events, with a focus on the most vulnerable in the community.

- 4. Identify and recommend a program of work to manage the implications of climate change for health in WA, which will reduce the contribution of WA health services to climate change and other detrimental impacts.
- 5. Identify and recommend a program of work to manage the implications of climate change for health in WA, which will enable WA Health services to implement change, including energy efficiency, to a more sustainable model.
- 6. Evaluate the likely benefits (health and wellbeing, social and economic) arising from climate change mitigation strategies, with a focus on WA health services.
- 7. Define the role of the Department of Health in leading public policy on climate change and health.
- 8. Recommend the Terms of Reference, scope and preferred methods for undertaking a climate change vulnerability assessment for the health sector.
- 9. Recommend the Terms of Reference, scope and preferred methods for developing a Climate Change Adaptation Plan for the health sector.

### Submissions response field

**Please type your response to the item(s) selected above into the field below. Alternatively you may provide your submission as a separate attachment (suggested maximum 5 pages).**

#### Climate Health WA Inquiry

I wish to address the following term of reference of the Inquiry:

- **Establish current knowledge on the implications of climate change on health in WA and recommend a framework for evaluating future implications.**

Carbon dioxide (CO<sub>2</sub>) produced by industries and transport in WA contribute to the greenhouse gas (GHG) effect, with increases in global temperatures and more violent weather systems that will have implications for human health. However, these polluting operations also produce other compounds that have major and more direct effects on health of Western Australian citizens.

I wish to outline these additional pollutants, the need for monitoring their concentrations and the need to reduce their presence in the atmosphere.

#### ***Pollutants associated with GHG production that impact on human health***

As an example, the Woodside Energy Limited, Liquefied Natural Gas facility on the Burrup Peninsula near Karratha is the second largest producer of CO<sub>2</sub> in WA<sup>1</sup>. This plant produces 7.7 million tonnes (t) of CO<sub>2</sub> into the atmosphere each year<sup>2</sup>. However, according to the National Pollution Inventory for 2017-2018<sup>3</sup>, the plant also produces 2,500 t carbon monoxide; 1,400 t of volatile organic compounds (VOC) including hexanes, benzenes, toluene and formaldehyde; 900 t of oxides of nitrogen; 58 t of PM<sub>10</sub> and 49 t PM<sub>2.5</sub> sized particles annually into the atmosphere.

These compounds are known to have significant impacts on the health of people.

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VOC have been reported to cause acute and long-term symptoms in humans including irritation of nose, throat, and eyes, cause headaches, nausea, impaired concentration, as well as allergic skin reactions, damage to liver and kidneys, cancer and accelerated onset of dementia<sup>4</sup>.

Oxides of nitrogen, particularly nitrogen dioxide, have been related to lung and heart diseases, low birth weight infants, premature births, poor infant lung development, lung cancer, asthma, diabetes and mental health disorders<sup>5,6</sup>. Similar effect on lung and heart disease have been found for PM<sub>10</sub> and PM<sub>2.5</sub> particulate matter in the air.

The other major contributor to GHG in WA is transport using internal combustion engines. These engines also produce large amounts of nitrogen dioxide, sulphur dioxide and particulate matter, with known adverse effects on human health<sup>5</sup>.

#### ***Inadequate monitoring and public availability of pollutant concentrations***

There appears to be a lack in either monitoring these pollutants associated with GHG emissions or an unwillingness of industry to make the results from their measurements available to the public.

For example, the last published report in the concentrations of pollutants on Burrup Peninsula was by Gillett (2008)<sup>7</sup>. These reported measurements were made before the LNG plant or the Yara Pilbara fertiliser and ammonium nitrate plants were operating.

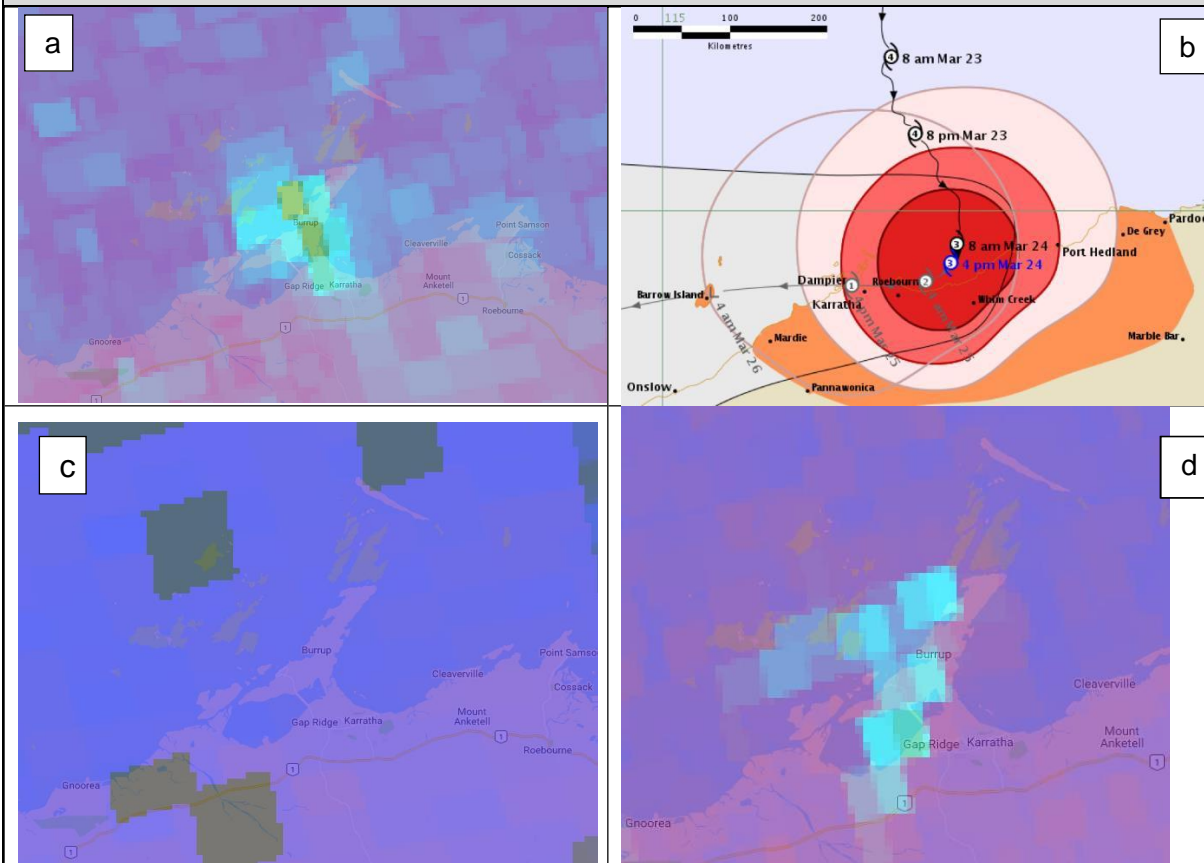
Woodside was to measure atmospheric concentrations of pollutants for two years to 2013 under the Ministerial Statement 757 provided with the licence to operate the LNG plant. The report with these measurements was provided to the WA Environmental Protection Authority in 2014, but has not been made available through request by the EPA or Department of Water and Environmental Regulation. Woodside have refused to provide the Report directly to me when requested. [REDACTED]

I recommend that the concentrations of pollutants in the atmosphere at various sites on Burrup Peninsula, Dampier and Karratha are continually monitored so the implications for human health can be properly assessed.

One possible cheap method for Government to monitor the impact of industry on pollution of Murujuga is via a recently launched satellite that measures nitrogen dioxide concentrations round the world. The satellite data shows moderate concentrations of nitrogen dioxide over much of the Dampier Archipelago (Figure 1) with higher concentrations over the Woodside Energy and Yara Pilbara industrial complexes (a). The effects of industrial operations are seen clearly by comparing satellite images during (c) and after (d) cyclone Veronica (b).

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**Figure 1. Images of the Dampier Archipelago region of Australia from a satellite that measures nitrogen dioxide concentrations around the world.**

(a) Shows mean nitrogen dioxide concentrations for October 2018; (b) shows path and dates of cyclone Veronica; (c) shows mean nitrogen dioxide concentrations for 24-26 March 2019 when industry was largely shut down because of cyclone Veronica; (d) shows mean nitrogen dioxide concentrations for May 2019, where the emissions are spreading over much of the Dampier Archipelago and the mainland.

### ***Use of modern scrubber technology to reduce pollutants***

Modern emissions scrubber technology can reduce the emissions from industrial stacks to less than 0 ppm for sulphur dioxide and by more than 99% for nitrogen dioxide<sup>8</sup>. Woodside personnel, at a recent meeting, said there are now scrubbers that can reduce nitrogen dioxide emissions from industrial stacks to less than 20 mg/m<sup>3</sup>. However, their current licence permits them to emit up to 350 mg/m<sup>3</sup>. Woodside have claimed that it is too expensive to install this equipment immediately, despite a Macquarie Institute study claiming the cost of reducing emissions would be about 2% of a company's profits.

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I recommend industry on the Burrup Peninsula is ordered to install these scrubbers on all pollutant emitting outlets.

#### **Citations**

<sup>1</sup> <https://thewest.com.au/business/energy/future-emissions-shock-for-was-major-ling-players-ngb881143493z>

<sup>2</sup>

[http://www.epa.wa.gov.au/sites/default/files/Referral\\_Documentation/North%20West%20Shelf%20Project%20Extension%20Proposal%20Section%2038%20Referral%20Supporting%20Information.pdf](http://www.epa.wa.gov.au/sites/default/files/Referral_Documentation/North%20West%20Shelf%20Project%20Extension%20Proposal%20Section%2038%20Referral%20Supporting%20Information.pdf)

<sup>3</sup> <http://www.npi.gov.au/npidata/action/load/individual-facilitydetail/criteria/state/WA/year/2018/jurisdiction-facility/WA1033>

<sup>4</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5910572/>

<sup>5</sup> <https://www.abc.net.au/radionational/programs/lifematters/how-clean-is-the-air-you-breathe/11400612>

<sup>6</sup> <https://www.umweltbundesamt.de/en/press/pressinformation/nitrogen-dioxide-has-serious-impact-on-health>

<sup>7</sup> Gillett R (2008) Burrup Peninsula Air Pollution Study: Report for 2004/2005 and 2007/2008. Report prepared for the Burrup Rock Art Monitoring Management Committee.

<sup>8</sup>

<http://www.sname.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=6402337a-a6f4-d395-37b1-e570bbfc9d8a>

**Please complete this sheet and submit with any attachments to: Climate Health WA Inquiry**