



Offshore Carbon Capture and Sequestration under the Sea Dumping Act in Australia

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Introduction

Offshore carbon capture and sequestration (CCS) has the potential to reduce emissions from hard-to-abate industrial sectors. Carbon dioxide (CO₂) is separated from other gases from industrial processes and is compressed. A suitable CO₂ stream may then be permanently stored in underground geological formations.

Waters surrounding Australia's coastlines are protected from wastes and pollution dumped at sea by the *Environment Protection (Sea Dumping) Act 1981* (the [Sea Dumping Act](#)). CO₂ streams from carbon capture processes for sequestration are defined as a waste or other matter that may be considered for dumping at sea (which includes in the sub-seabed) under the 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (the [London Protocol](#)).

As party to the London Protocol, the Australian Government has a responsibility to protect our marine environment.



Offshore CCS National Action List

The Offshore CCS National Action List (NAL) is a requirement of Annex 2 of the London Protocol to accept and assess applications for offshore CCS sea dumping permits. The NAL for offshore CCS was jointly developed by the department and CSIRO utilising a detailed scientific literature review.

The NAL:

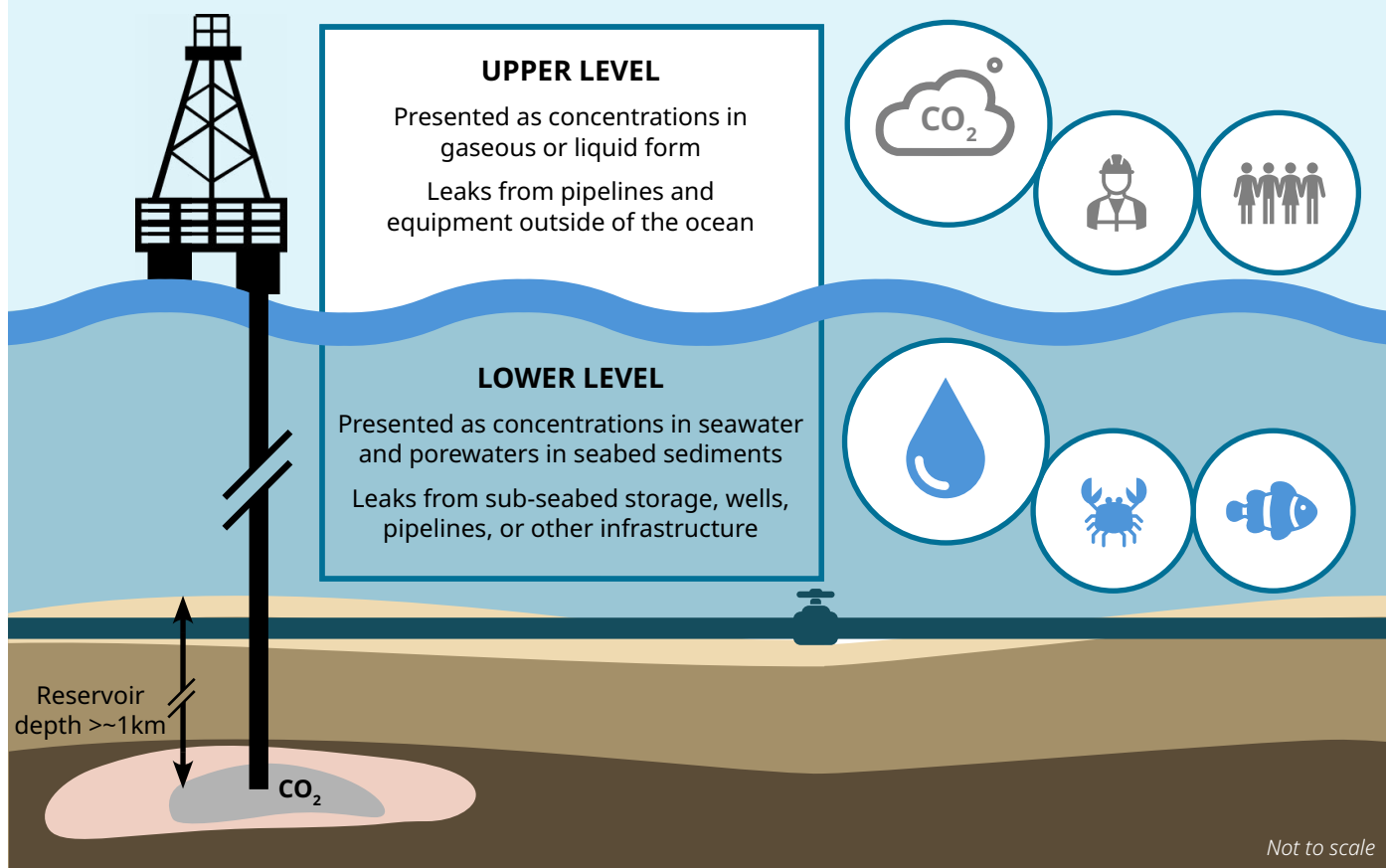
- outlines Upper and Lower Level concentrations for incidental associated substance (IAS) in CO₂ streams
- is a screening tool that supports the assessment of potential effects on the marine environment and human health
- is used by you to prepare your sea dumping applications and for the assessment of sea dumping applications by the department.

Interim Offshore CCS NAL

The Interim Offshore CCS NAL and the application form for a permit under the Sea Dumping Act for dumping of CO₂ streams by CCS at sea were released in February 2024. The interim NAL provides a pathway for industry to apply for a permit before the NAL is finalised. This ensures that offshore CCS sea dumping permits are legally robust and that applications are assessed in the manner required by the London Protocol. Once finalised, the NAL will replace the interim NAL.

Applicants can submit applications now using the [interim NAL](#) and the [available form](#). You are encouraged to contact the Sea Dumping Section to discuss potential projects at seadumpingccs@dcceew.gov.au.

AUSTRALIA'S OFFSHORE CCS NATIONAL ACTION LIST LEVELS



Upper Levels

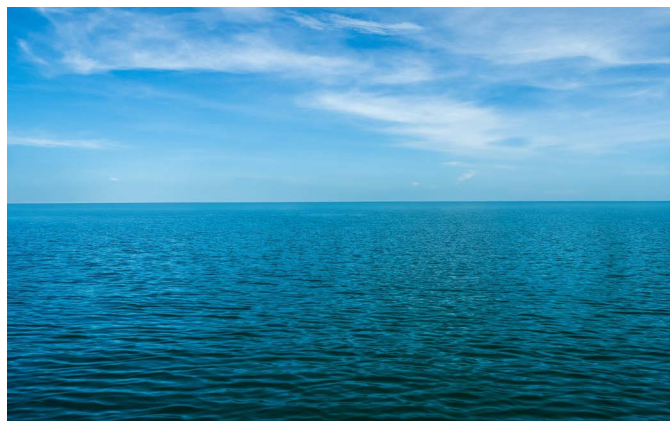
Upper Levels in the NAL are determined using Short Term Exposure Limits (STELs) which relate to workplace exposure standards. They are set to avoid acute or chronic effects on human health. STEL impacts most closely mimic an event that could have an acute impact on human health. The Upper Levels are presented as concentrations in gaseous and liquid CO_2 to reflect how potential human health risks would occur in air, in the unlikely event of a leak to air from infrastructure.

Lower Levels

Lower Levels are determined using Australian and New Zealand guidelines for fresh and marine water quality default guideline values (DGV). These are set to avoid negative impacts to the marine environment. The Lower Levels are presented as ppm (weight/volume) in seawater to reflect how risks to marine organisms and the environment would occur due to any possible leaks from sub-seabed reservoirs, wellbores, pipelines and any other sub-sea equipment to seawater or the sub-surface.

Upper and Lower Levels

Upper Level concentrations are higher than Lower Levels concentrations in all cases except where there is no safe level of exposure for humans. As the input data (STELs or DGVs) and the nature of impact (breathing in air versus exposure in water) differ for the Upper and Lower Levels, the input values are calculated independently of one another for a given IAS. See the decision tree on the next page for actions required by applicants for different IAS concentrations.



Decision tree for incidental associated substances in a CO₂ stream

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START

Is the IAS in the NAL?

NO

Conduct a risk assessment of non-NAL IAS (See NAGOCCS Part III section 1.5)

YES

Is the IAS concentration above the range of the relevant Upper Level in gaseous or liquid CO₂?

YES

Where there is no Lower Level, will the IAS be neutralised in the marine environment?

NO

Is the IAS below the relevant Lower Level in seawater?

NO

Remove the IAS from the CO₂ stream or reduce below the Lower Level

OR

Demonstrate that concentrations will remain in range of the Lower Levels in the marine environment in the event of a leak (e.g. through either dispersion modelling or modelling of subsurface transport/migration and/or other methods; see NAL section 4.1).

YES

This IAS should be considered to be of little environmental concern in relation to dumping. However, sufficient evidence is required to show that concentrations will:

- a) remain in range of the Upper Levels in gaseous or liquid CO₂ and
- b) remain in range of the Lower Levels in seawater

For example, this may involve providing data from the pre- and post-capture processes that shows consistent concentrations over time (see NAL section 4.1).

NO

Remove the IAS from the CO₂ stream or reduce below the Upper Level

OR

Make acceptable for dumping through the use of management techniques or processes (e.g. WHS or other engineering controls, processes and modelled exposure scenarios) to reduce and/or eliminate worker exposure to these concentrations during operational activities (see NAL section 4.1).

AND

If the concentration is not below the natural level in seawater (see NAL section 4.6.1 for example calculation), provide evidence to show how acute or chronic effects on sensitive marine organisms representative of the marine ecosystem will be avoided (see NAL section 4.2.4).

YES

Remove the IAS from the CO₂ stream or reduce below the Upper Level

OR

Make acceptable for dumping through the use of management techniques or processes (e.g. WHS or other engineering controls, processes and modelled exposure scenarios) to reduce and/or eliminate worker exposure to these concentrations during operational activities (see NAL section 4.1).

IAS – incidental associated substance
CCS – carbon capture and sequestration
NAL – Offshore CCS National Action List
NAGOCCS – National Assessment Guidelines for Offshore Carbon Capture and Sequestration

National Assessment Guidelines for Offshore Carbon Capture Sequestration and Application form

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The department and CSIRO have developed the National Assessment Guidelines for Offshore CCS (NAGOCCS). This document provides technical and procedural guidance on:

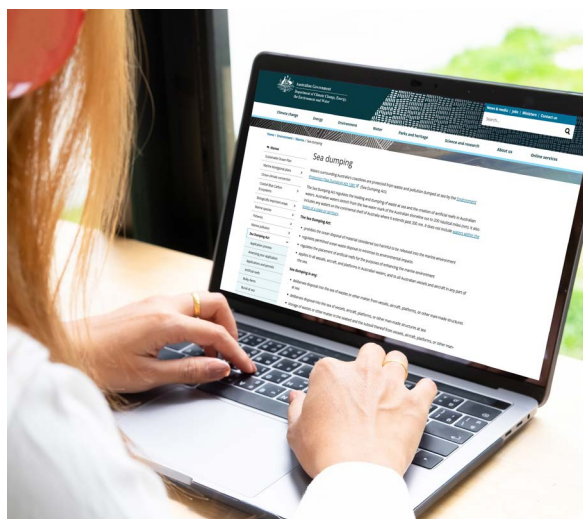
- the offshore CCS NAL
- completing the application form for a permit under the Sea Dumping Act for dumping of CO₂ streams by CCS at sea.

These guidelines do not replace the requirements of the:

- London Protocol
- Sea Dumping Act
- Application form for a permit under the Sea Dumping Act for dumping of CO₂ streams by CCS at sea

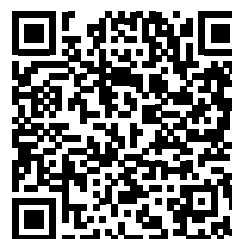
The department has updated the application form to align with the Offshore CCS NAL and NAGOCCS. Once finalised, applicants should prepare their permit applications in accordance with the offshore CCS NAL, the NAGOCCS and updated permit application form. Applications will be assessed by the department according to requirements in the London Protocol and Sea Dumping Act. The department may request additional information from applicants or analysis by experts to address these requirements during the assessment process.

You may require other environmental approvals to develop an offshore CCS project. This may include Commonwealth and State or Territory approvals. We have produced high-level guidance to help navigate the requirements and interaction of permitting and approvals in Commonwealth waters. Please see [Offshore Carbon Capture and Storage Regulatory Approvals 2023](#).



PLEASE PROVIDE YOUR FEEDBACK

You can provide feedback on Australia's Offshore Carbon Capture and Sequestration National Action List, National Assessment Guidelines for Offshore Carbon Capture and Sequestration and updated application form here.



More information

Learn more about sea dumping in Australia

Web dceew.gov.au/environment/marine/sea-dumping

Email seadumpingccs@dceew.gov.au

Acknowledgement of Country

We acknowledge the Traditional Custodians of Australia and their continuing connection to land and sea, waters, environment and community. We pay our respects to the Traditional Custodians of the lands we live and work on, their culture, and their Elders past and present.