PFAS at the Sunshine Coast Airport Expansion Project site

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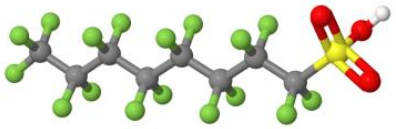
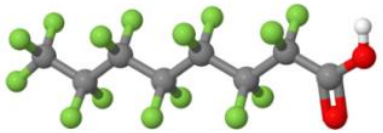
Queensland Government

About PFAS

PFOS



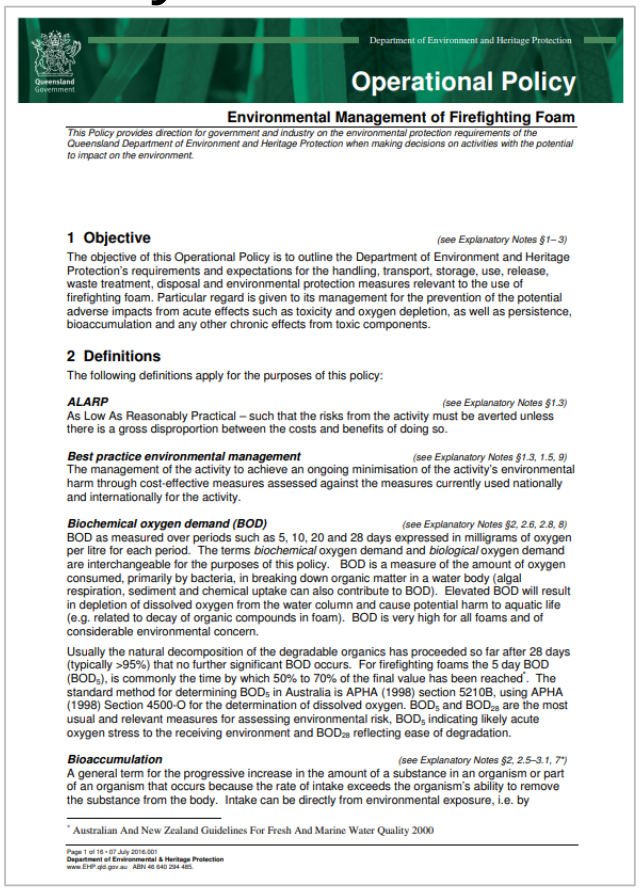
PFOA



- Per and poly-fluoroalkyl substances (PFAS) such as PFOS and PFOA are a group of manufactured chemicals.
- PFAS have not been manufactured in Australia.
- PFAS have been used since the 1950s in common household products, including non-stick cookware, fabric, furniture and carpet stain protection applications and food packaging.
- PFAS have also been previously used in some industrial processes, including in certain types of fire-fighting foams.

Queensland Firefighting Foam Policy

- July 2016
- Bans use of firefighting foams containing persistent chemicals.
- Management standards that need to be met by users.
- Sets practices for foam handling, use and disposal in accordance with the *Environmental Protection Act 1994.*
- Stricter environmental controls for all foams.
- Industrial sites directly engaged by DES to educate about the foam ban – wide success in the reduction of use.



Department of Environment and Heritage Protection

Operational Policy

Environmental Management of Firefighting Foam

This Policy provides direction for government and industry on the environmental protection requirements of the Queensland Department of Environment and Heritage Protection when making decisions on activities with the potential to impact on the environment.

1 Objective *(see Explanatory Notes §1– 3)*

The objective of this Operational Policy is to outline the Department of Environment and Heritage Protection's requirements and expectations for the handling, transport, storage, use, release, waste treatment, disposal and environmental protection measures relevant to the use of firefighting foam. Particular regard is given to its management for the prevention of the potential adverse impacts from acute effects such as toxicity and oxygen depletion, as well as persistence, bioaccumulation and any other chronic effects from toxic components.

2 Definitions

The following definitions apply for the purposes of this policy:

ALARP *(see Explanatory Notes §1.3)*

As Low As Reasonably Practical – such that the risks from the activity must be averted unless there is a gross disproportion between the costs and benefits of doing so.

Best practice environmental management *(see Explanatory Notes §1.3, 1.5, 9)*

The management of the activity to achieve an ongoing minimisation of the activity's environmental harm through cost-effective measures assessed against the measures currently used nationally and internationally for the activity.

Biochemical oxygen demand (BOD) *(see Explanatory Notes §2, 2.6, 2.8, 8)*

BOD as measured over periods such as 5, 10, 20 and 28 days expressed in milligrams of oxygen per litre for each period. The terms *biochemical* oxygen demand and *biological* oxygen demand are interchangeable for the purposes of this policy. BOD is a measure of the amount of oxygen consumed, primarily by bacteria, in breaking down organic matter in a water body (algal respiration, sediment and chemical uptake can also contribute to BOD). Elevated BOD will result in depletion of dissolved oxygen from the water column and cause potential harm to aquatic life (e.g. related to decay of organic compounds in foam). BOD is very high for all foams and of considerable environmental concern.

Usually the natural decomposition of the degradable organics has proceeded so far after 28 days (typically >95%) that no further significant BOD occurs. For firefighting foams the 5 day BOD (BOD_5), is commonly the time by which 50% to 70% of the final value has been reached*. The standard method for determining BOD_5 in Australia is APHA (1998) section 5210B, using APHA (1998) Section 4500-O for the determination of dissolved oxygen. BOD_5 and BOD_{28} are the most usual and relevant measures for assessing environmental risk, BOD_5 indicating likely acute oxygen stress to the receiving environment and BOD_{28} reflecting ease of degradation.

Bioaccumulation *(see Explanatory Notes §2, 2.5–3.1, 7*)*

A general term for the progressive increase in the amount of a substance in an organism or part of an organism that occurs because the rate of intake exceeds the organism's ability to remove the substance from the body. Intake can be directly from environmental exposure, i.e. by

* Australian And New Zealand Guidelines For Fresh And Marine Water Quality 2000

Page 1 of 16 • 07 July 2016.001
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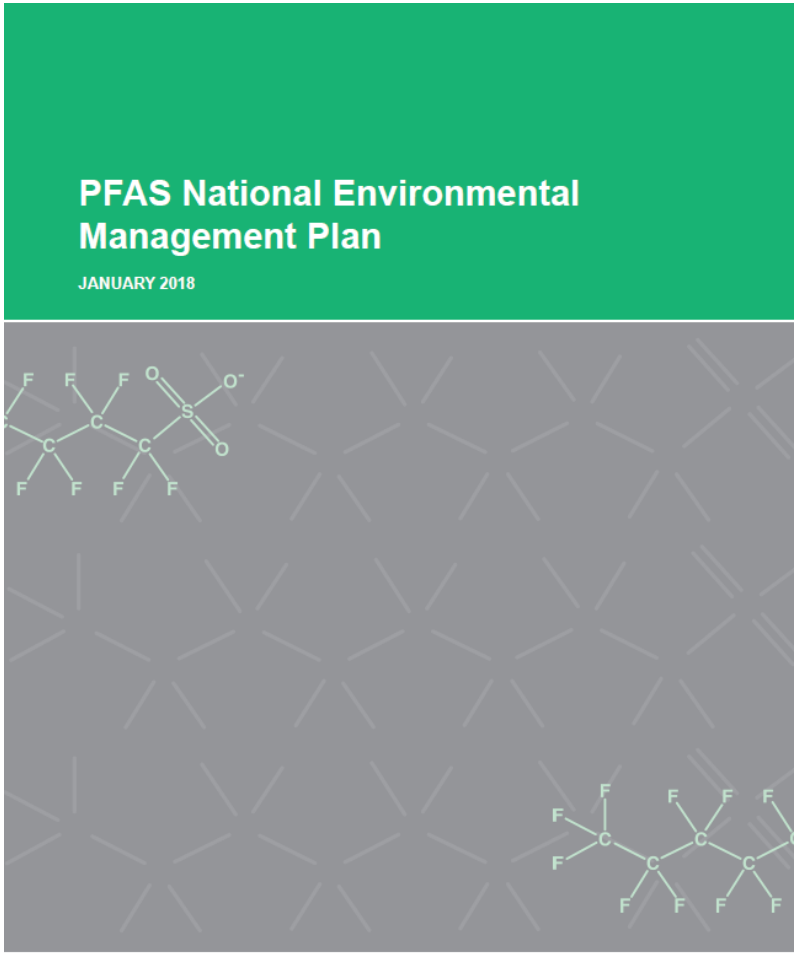
PFAS National Environmental Management Plan (NEMP)

- January 2018
- Collaboration between states, territories and Australian Government.
- Reflects increasing scientific knowledge relevant to environmental regulation of PFAS.
- Sets standards for environmental guidelines values to protect human health and ecosystems.



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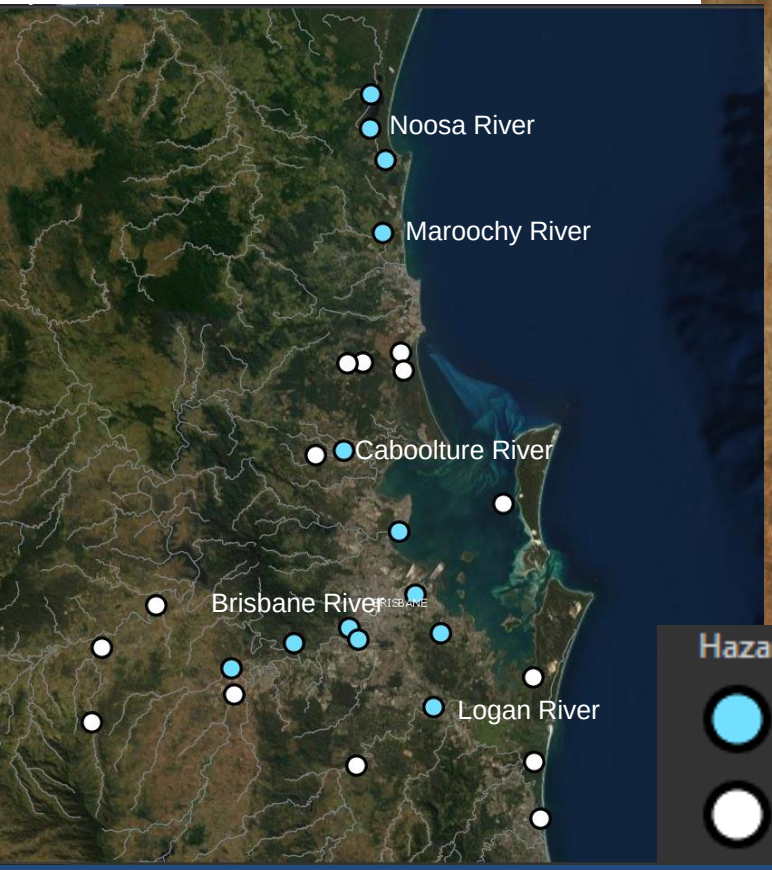
Qld ambient PFAS monitoring – May results (55 sites)

PFOS Hazard Quotient Aquatic Ecosystem 95% protection level

Hazard quotient = concentration in river / guideline value

<1 means low risk



Hazard Quotient PFOS 95% protection level

≤1

No detects

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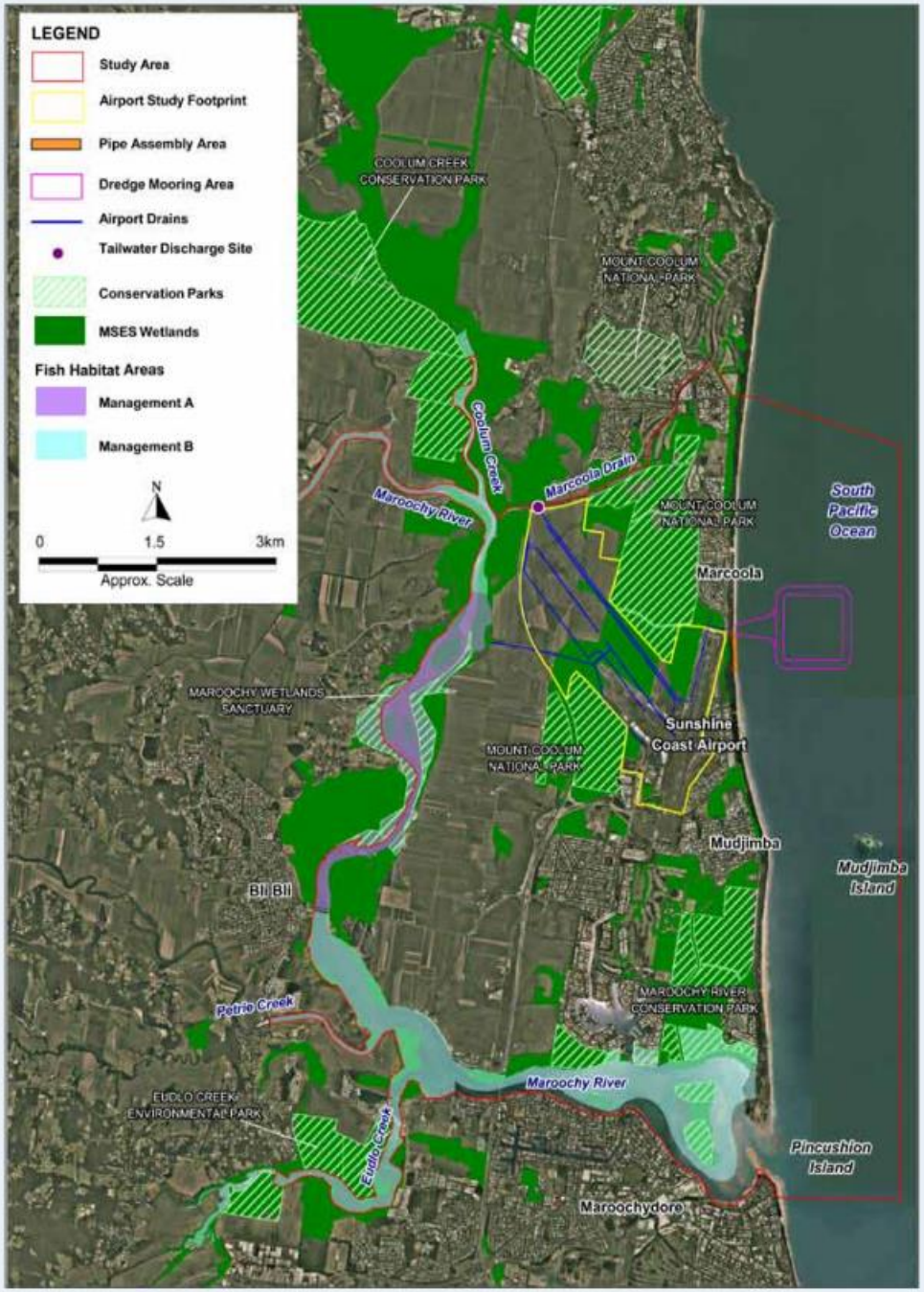
PFAS at the Airport

- PFAS use at airport ceased in 2010.
- Site not used as a training facility.
- Fire-fighting foam used in 2 light aircraft crashes NW of existing runway in 2005 and 2006.
- Accidental releases from tanks at fire stations.
- Performance testing and washdown of fire-fighting equipment.
- Relocation of soils during drainage works (since removed from site).

Maroochy river

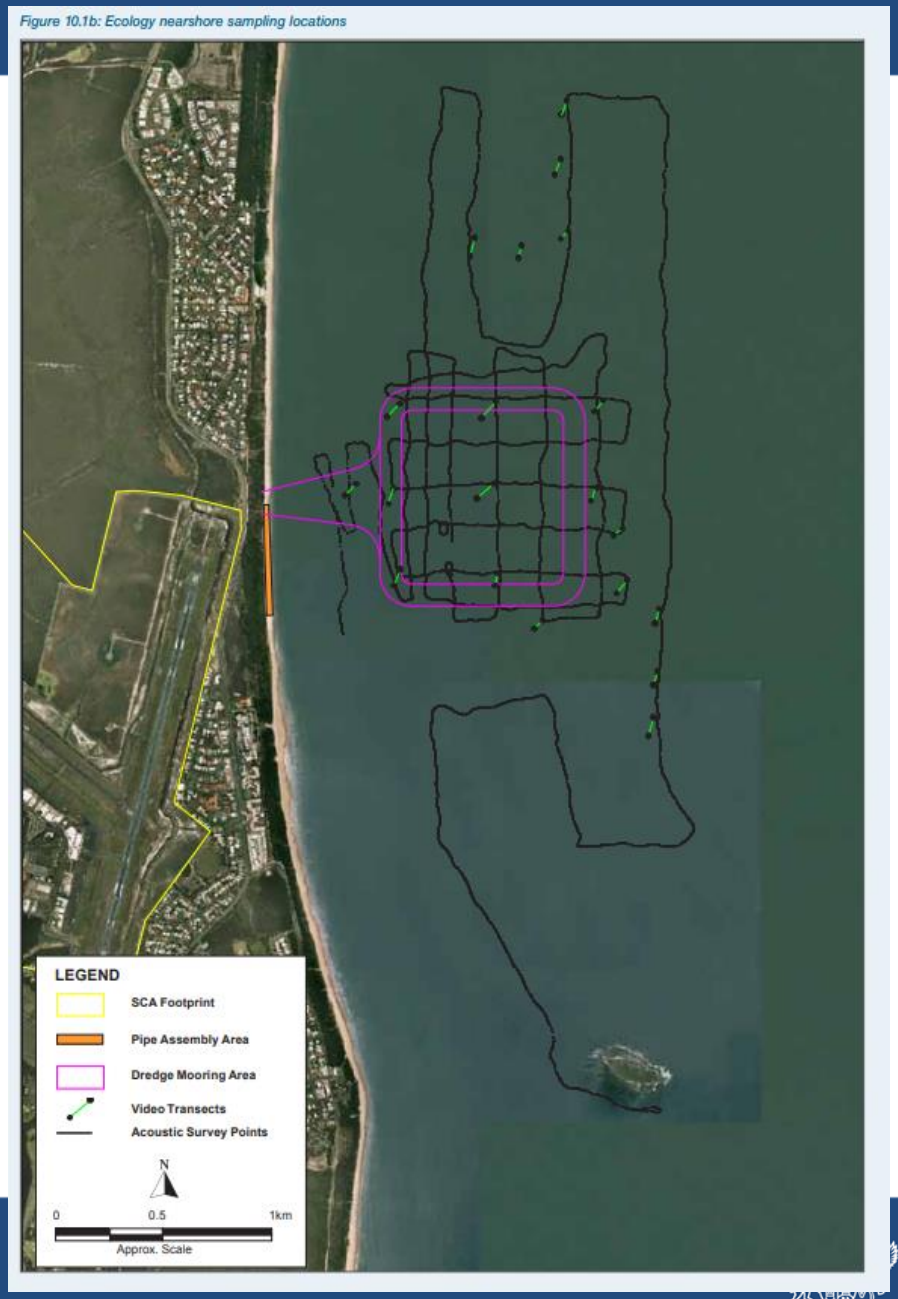
- Shows local protected areas relevant to marine ecology.
- State significant wetlands and national parks (green).
- Contain endangered fauna protected under State and Commonwealth laws.
- Fish habitat areas (purple and aqua)

Figure 10.2a: Locations of protected areas relevant to marine ecology



Ocean environment

- Study of seabed and fauna as part of the EIS.
- Seabed surveys in the area shown (black lines and green points).
- Sparse fauna present, not of conservation significance.
- Lack of diversity.
- Contrasts with Maroochy River.



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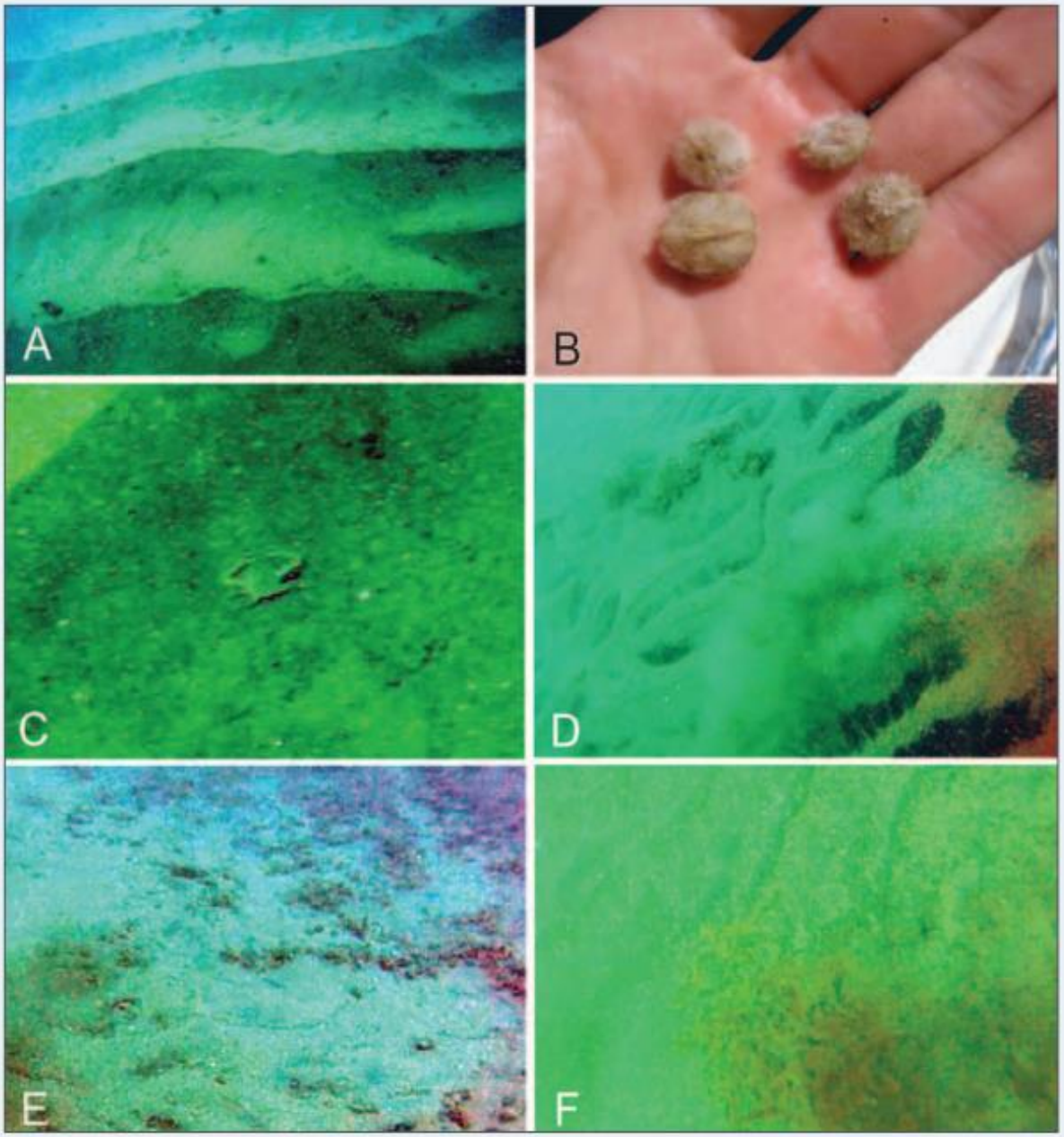
Seabed survey

- Sparse fauna present on shifting sands.
- Occasional swimmer crabs, mole crabs, sea cucumbers (holothurians), sea stars (asteroids) and bivalve molluscs.
- Large epifauna were rarely sighted during video transects.
- Grab samples frequently contained several small heart urchins.

Figure 10.2e: (A) Bare sand with detritus and bedforms; (B) heart urchins Echinocardium cordatum; (C) small portunid (swimmer) crab; (D) Halimeda (top left) on sand over coffee rock; (E) Halimeda and Caulerpa sp.); (F) Sargassum



Impacts of release

- DES technical advice is that PFAS at the low concentrations present in the water proposed to be released is not expected to impact biodiversity of the area of seabed offshore.
- The key risk considered by DES is whether bioaccumulation may occur, which is highly unlikely given the significant mixing, large dispersion, saline environment and the scarcity of fauna at the proposed release point.
- DES regulatory oversight of the release will occur through the Environmental Authority, Tidal Works permit, PFAS NEMP and the *Environmental Protection Act 1994*.