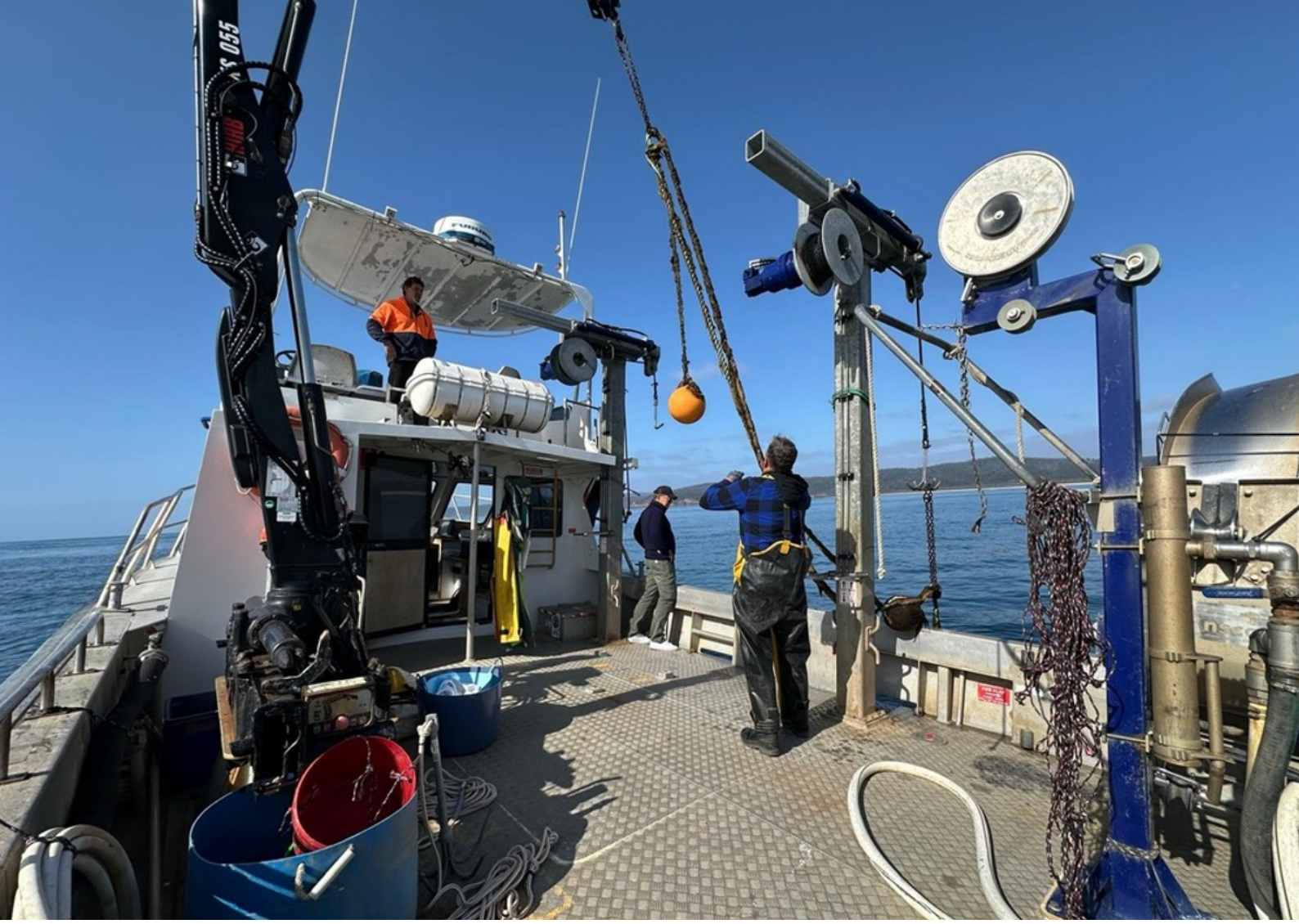

Eden-1 Construction and Deployment Management Plan 2026

Disaster Bay, NSW

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DOCUMENT DETAILS

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Document subtitle	Disaster Bay, NSW
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Lease Size	200 ha
Kelp Species	Ecklonia radiata
NSW Case ID	SSD-41680467
Date	13 Feb 2026
Version	1.1
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Project Definition	Kelp Aquaculture Farm

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1.0 PROJECT DETAILS

Eden-1 Kelp Aquaculture Farm

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- **Location:** Offshore in Disaster Bay
- **Growing Period:** Autumn, Winter, Spring (March–December)
- **Primary Hours of Operation:** 0700–1700 AEST
- **Key Activities:** Construction, mobilisation, deployment, commissioning, and demobilisation activities for offshore longline infrastructure (and associated onshore staging only)
- **Vessel Base:** Snug Cove, Port of Eden & Edrom (Pentarch) Industrial Area
- **Vehicle Base:** Industrial area Edrom (logistics depot and maintenance facility)

1.1 Overview

The Eden-1 Kelp Aquaculture Farm is a strategically positioned offshore aquaculture development located in Disaster Bay, on the far south coast of New South Wales. This area is characterised by its high-energy ocean conditions, minimal marine traffic, and lack of existing marine infrastructure, making it a suitable location for low-impact kelp cultivation. Given the open ocean conditions, environmental sensitivity, and regulatory oversight, a comprehensive Eden-1 Construction and Deployment Management Plan (CDMP) has been established to identify, manage and minimise environmental, social, safety and navigational risks associated with the construction and deployment stage of the Eden-1 Kelp Aquaculture Farm. The CDMP establishes the management framework, performance measures, and procedures to ensure construction and deployment is undertaken in accordance with:

- SSD consent conditions (once issued) and SEARs requirements for construction/deployment;
- Fisheries Management Act and aquaculture lease/permit conditions;
- Maritime safety requirements (Transport for NSW – Maritime, AMSA, AHO Notice to Mariners);
- Environmental controls under relevant NSW legislation (including POEO Act for noise oversight); and
- Best-practice offshore aquaculture deployment procedures.

Note: This CDMP should be read in conjunction with the Eden-1 Monitoring and Maintenance Program.

1.2 Project Details

Based on the proposed infrastructure design, approximately 100 x 1-hectare Kelp Aquaculture Farm rigs (see Figure 1) will be installed across the 200 hectare lease area designated AL21/004 (See Figure 4) using removable screw anchors, at an average depth of 20 meters.

1.3 Objectives

The primary objectives of this CDMP are:

- Deploy infrastructure safely and accurately within the approved lease envelope.
- Prevent or minimise debris, pollution, seabed disturbance and noise impacts.
- Maintain navigation safety and inform marine users.
- Ensure staged deployment occurs within defined windows and weather limitations.
- Provide clear community and regulator communication pathways, including complaints handling.
- Provide an auditable record of deployment works and any incidents, including break-away response.

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2.0 Scope of Works: What This CDMP Covers

This CDMP applies to the following activities:

2.1 Onshore staging, pre-assembly and mobilisation (industrial precinct)

- Receipt, storage, pre-assembly and staging of longline components (anchors, ropes, floats, droppers).
- Vessel mobilisation and loading at existing wharf facilities.
- No new buildings or permanent land-based works are proposed under this CDMP.

2.2 Offshore installation and deployment

- Installation of screw anchors (helical anchors) at designated GPS coordinates.
- Deployment and tensioning of backbone lines, moorings, floats, droppers.
- Installation of lease boundary markers / navigation aids (corner markers installed first).
- Setting / deployment of seeded culture lines and droppers.
- Commissioning checks and initial monitoring.

2.3 Demobilisation

- Removal of temporary equipment from staging areas.
- Waste removal and reinstatement of onshore work areas to pre-works condition (within existing industrial operations).

3.0 Project Description Summary

- Lease: AL21/004 (200 ha) in Disaster Bay, NSW.
- Active longline footprint at full development: up to ~100 ha (to preserve corridors for navigation and hydrodynamic flow).
- Offshore location: >1.1 km from shoreline (nearest point); average offshore distance ~2.1 km.
- Water depth: 20–25 m.
- Infrastructure type: standard longline aquaculture using screw anchors, rope systems and floats; no chains in 1-hectare rigs (per design) to reduce noise, corrosion risk and seabed contact.
- Deployment method: purpose-built Auskelp deployment vessel with screw-anchor drill rig mounted for installation, seeding, harvesting, and maintenance.

4. Roles, Responsibilities and Governance

4.1 Key roles

- Project Manager (PM): overall delivery, regulatory compliance, stakeholder notifications.
- Marine Operations Supervisor (MOS): vessel operations, deployment sequencing, safety oversight.
- Skipper / Master: navigation safety, marine compliance, weather go/no-go.
- Deployment Crew Lead: rigging, anchoring operations, lifting/winch activities.
- Environmental Lead (EL): environmental controls, incident reporting, fauna interaction log.
- Community Liaison Officer (CLO): notices, enquiries, complaints handling and reporting.

4.2 Competency and licensing

- All vessel operators will hold appropriate maritime qualifications (e.g., Coxswain/Master Near Coastal as applicable) and will be inducted to project-specific procedures including marine fauna protocols, spill response, and debris prevention.

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5. Staging and Indicative Construction Timeframe

5.1 Deployment phases

Deployment will be staged to manage risk, confirm performance, and reduce cumulative disturbance:

- **Phase 1:** up to 25 ha deployed and commissioned.
- **Phase 2:** up to 75 ha deployed and commissioned (cumulative).
- **Phase 3:** up to 100 ha deployed and commissioned (full active deployment footprint).

Note: The lease area is 200 ha; the active longline footprint is expected to be up to ~100 ha to preserve corridors.

5.2 Indicative timeline (per deployment campaign)

Indicative duration estimates (subject to weather windows and operational learning):

Setup / mobilisation

- Pre-assembly & staging: 7–14 days (depends on component readiness)
- Backbone construction / preparation: ~14 days
- Assembly of anchor / hardware components: ~7 days

Offshore installation

- Screw anchor installation: ~50 minutes per anchor
- Indicative anchor density: ~22 anchors per hectare (subject to final mooring design)
- Backbone ropes and floats: ~220 floats per hectare (subject to detailed layout)
- Setting seeded lines per 1-ha rig: ~7 days (subject to biological timing and crew efficiency)

Cultivation and harvest

- Harvest typically >140 days from setting (season dependent).

5.3 Indicative commencement

Subject to licensing/approvals, installation is planned to commence November 2026, with deployment of seeded lines targeted for February 2027. Timeframes are expected to improve as techniques are refined.

6. Construction and Operational Hours

Construction and deployment will seek, wherever practical, to align with standard EPA recommended construction hours:

- **Mon–Fri:** 7:00 am – 6:00 pm
- **Sat:** 8:00 am – 1:00 pm
- **Sun/Public holidays:** no planned works

Marine flexibility: Offshore works are weather-dependent; early starts (typically 5:30–6:30 am) may be required in summer to avoid afternoon northeasterlies/southerly changes. Emergency works (e.g., navigational hazard response or storm damage recovery) may occur outside these hours in accordance with maritime safety obligations.

7. Logistics: Transport and Movements

7.1 Vessel movements

- Construction/deployment stage: 0–6 return trips per day per lease between shore facilities and the farm site (depending on activity).
- Operations (post-deployment): 0–3 return trips per day per lease for inspection, repair, maintenance, cleaning and harvesting.

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- All vessel operations will comply with maritime safety requirements and local conditions.

7.2 Vehicle movements (onshore)

- Construction/deployment stage: 0–6 vehicle movements per day to the Edrom industrial facilities (e.g., Pentarch precinct) for delivery and staging of components and equipment.
- Operations: reduced to staff travel and routine logistics.

If any traffic risk is identified (heavy vehicle concentration, peak conflicts), traffic controls will be implemented consistent with TfNSW requirements and site rules.

8. Detailed Construction Methodology

8.1 Pre-deployment survey and set-out

- Confirm lease boundary and internal layout in **GDA2020 / MGA2020 Zone 56**.
- Pre-load GPS waypoints for all anchor locations and corner markers.
- Verify depths and seabed conditions against available mapping; adjust micro-siting within the approved envelope to avoid any mapped sensitive habitat.

8.2 Deployment sequence (high-level)

1. Install corner markers first (navigation aids) to delineate the lease footprint prior to other works.
2. Install screw anchors (helical anchors) at prescribed coordinates.
3. Deploy backbone/mooring ropes and tension system.
4. Attach floats and droppers per design spacing.
5. Deploy seeded twine/culture lines onto droppers (aligned to cultivation cycle).
6. Conduct commissioning checks (tension, freeboard, marker visibility, redundancy).
7. Record as-built coordinates and complete deployment log.

8.3 Screw anchors

Accurate as-built records and geospatial data form a critical component of lifecycle infrastructure management and decommissioning efficiency. Deployment documentation includes precise GPS coordinates for all anchor locations, boundary markers, and longline alignments, together with infrastructure layout logs and installation verification records. Maintaining this spatial record enables efficient and targeted retrieval of infrastructure at the end of operations, minimises unnecessary seabed search and disturbance during removal activities, and provides an auditable basis to confirm that all equipment has been fully recovered from the lease area.

The farm's screw anchors are installed below the seabed and provide high holding capacity with minimal seabed disturbance. According to the NSW DPIRD Fisheries screw anchor risk assessment completed for the Jervis Bay mussel farm, removal or retention may be considered on a case-by-case basis, as removal may cause greater disturbance than leaving anchors buried in situ. Discussions with NSW DPIE Fisheries will assess this at the time of farm removal to assess the most appropriate action.

8.4 Screw anchor installation methodology (no chain design)

- Screw anchors are installed using a hydraulic rotation drill rig mounted to the Auskelp deployment vessel.
- Installation uses rotational torque, not impact/percussive methods (i.e., no pile driving).

  Environmental rationale:

  - Minimal seabed disturbance (typically <1 m2 footprint per anchor point).
  - Reduced risk of drag/scour compared to dragged anchor systems; anchors are fixed and verified by torque and anchor depth.

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- No chains on 1-ha rigs reduces seabed contact, corrosion risk, and underwater noise.

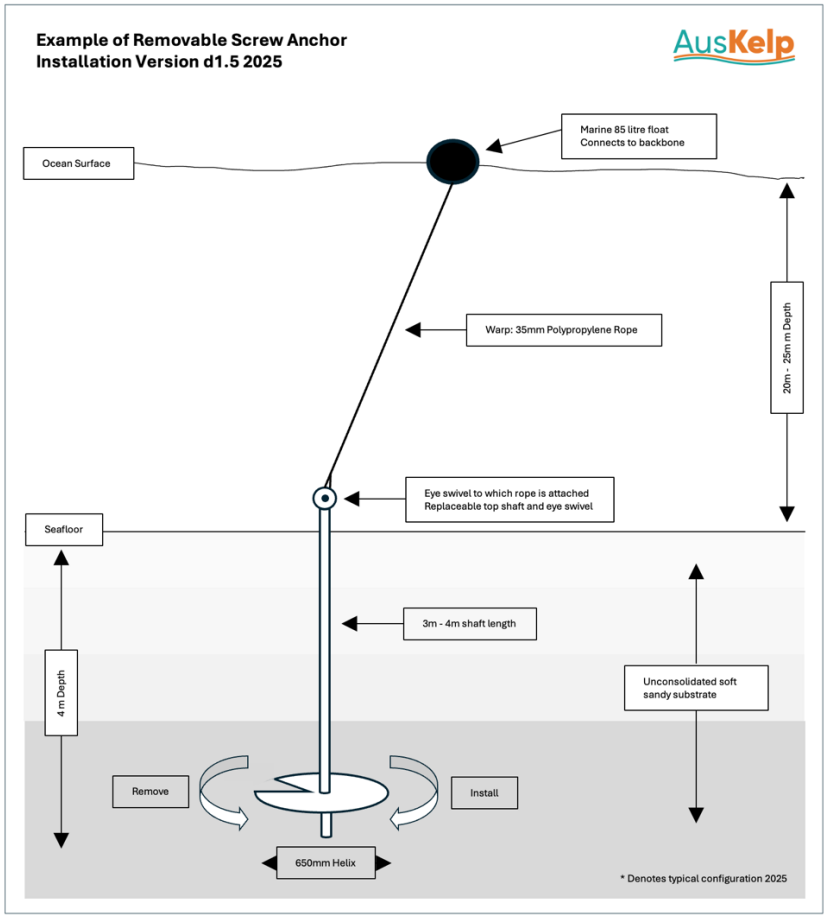

Figure 1. Auskelp Screw Removable Screw Anchor design (Credit: Auskelp 2025).

Corrosion risk to embedded screw anchors is reduced by design because the steel helix and shaft are installed below the seabed in sediments where dissolved oxygen is rapidly depleted. Oxygen availability (i.e., sediment aeration) is a primary driver of corrosion in soils/sediments, with higher oxygen typically occurring near the surface and in disturbed materials. In marine sediments, oxygen is commonly consumed within the upper centimetres of the seabed, so anchor elements installed below this zone are not continuously exposed to oxygenated seawater, reducing the corrosion driving potential relative to fully exposed infrastructure.

Reference: California Department of Transportation (Caltrans) 2018, Corrosion Guidelines, Division of Engineering Services, Sacramento, CA. Available at: https://dot.ca.gov/-/media/dot-media/programs/engineering/documents/mets/corrosion-guidelines-a11y.pdf

Installation controls

- Install only within approved weather windows and safe sea state thresholds.
- Torque/holding verification recorded for each anchor (as per engineering specs).
- Any installation refusal (unexpected substrate) triggers re-set within the permitted layout envelope and is recorded.

8.5 Buoys, boundary markers and navigation aids

- Boundary/corner markers installed in accordance with IALA and TfNSW – Maritime requirements, including:
  - Nominal light visibility: 1 nautical mile (~1.8 km).
  - Appropriate buoy colour/day shape/light flash characteristics for the marker type.

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- Radar reflectors for detectability in reduced visibility.
- Lease and permit identification clearly displayed in contrasting colours.

9. Environmental Management Controls

9.1 Noise management (airborne and underwater)

Regulatory context: Marine noise oversight is under NSW EPA (POEO Act and associated regulations), supported where relevant by DPIRD Fisheries for marine biodiversity interactions.

Controls

- No percussive installation (no pile driving/hammering).
- Well-maintained engines, winches, hydraulic systems; mufflers/baffles used where applicable.
- Limit simultaneous noise sources; stage activities by 1-ha modules.
- Daylight operations as standard; avoid sensitive biological windows where practicable.
- Marine fauna observation: trained crew and interaction logging during higher-noise tasks (e.g., anchor installation).

9.2 Pollution prevention and spill response

- Spill kits maintained on vessels and at staging areas.
- Fuels and lubricants stored in compliant containers; refuelling procedures prevent overfill and drips.
- Any spill triggers immediate containment, notification, and incident reporting.

9.3 Waste and debris prevention (construction)

- "Nothing overboard" policy: tools tethered, bins secured, packaging controlled.
- All damaged rope/float components returned to shore for disposal or recycling.
- Biofouling/organic residues managed as a resource where feasible via existing approved pathways (e.g., composting/bioproduct processing arrangements).
- Waste segregation at staging sites (general, recyclables, metals, hazardous).

9.4 Seabed disturbance minimisation

- Use fixed screw anchors to avoid dragged anchor scouring.
- Avoid sensitive habitats and deploy only above unconsolidated sandy substrate.
- No dredging, excavation, or seabed levelling.

10. Traffic Management (Marine and Road)

10.1 Marine traffic and exclusion management

- Maintain clear vessel-to-vessel communications (VHF).
- Maintain safe operational buffers around working lines.
- Avoid unnecessary transit at night; if night transit occurs, comply with COLREGS and lighting requirements.
- Notify relevant bodies (see Section 12) as required for significant deployment campaigns.

10.2 Road traffic management

- Deliveries scheduled to minimise peak conflicts at industrial sites.
- Heavy vehicle routes confined to established industrial access roads.
- If required, implement site-specific traffic controls (spotters, delivery windows).

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11. Access Constraints

- No commercial access through Nadgee Nature Reserve is proposed for construction or routine operations.
- Contingency visual observation only may occur after extreme events if ocean access is unsafe and only for:
  1. potential loss of infrastructure,
  2. storm-cast kelp observation, and/or
  3. drone launching from below MHWM (subject to all NPWS requirements).
- Access constraints:
  - Foot access only via designated pathways; no vehicles off roadways.
  - Drones launched below MHWM, not within 1 km of the south end of Greenglades Beach, and consistent with applicable NPWS/aviation constraints.
  - Use a spotter where feasible to avoid raptor interactions.
- Frequency: <12 times/year.

12. Communication, Notifications and Complaints Handling

12.1 Stakeholder notifications (construction/deployment)

Prior to major deployment campaigns, notify (as applicable):

- DPIRD Fisheries / relevant aquaculture regulator contacts
- TfNSW – Maritime / relevant port authority functions
- Australian Hydrographic Office (AHO) for charting and Notice to Mariners process (where required)
- Local stakeholders as per consultation framework (e.g., community groups, commercial fishers where relevant)

12.2 Community information procedures

- Publish a plain-English "deployment notice" including:
  - dates (indicative), hours, vessel activity expectations,
  - safety advice (do not tie up to buoys/lines),
  - contact details for enquiries/complaints.

12.3 Complaints management procedure

- Establish single point of contact (phone + email) monitored during works.
- Log every complaint (date, time, complainant, issue, location, evidence).
- Acknowledge within 10 days and provide response/actions.
- Escalate safety-critical issues immediately to MOS/Skipper and regulators where required.
- Include complaints summary in monthly deployment report during active campaigns.

13. Monitoring, Inspection and Reporting

13.1 Deployment records (as-built)

- As-built GPS coordinates for:
  - corner markers,
  - anchor points,

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  - longline rows and corridors.
- Daily deployment log: activities, weather, sea state, equipment used.
- Torque/verification record for each anchor installed.
- Incident/near miss register.

13.2 Environmental monitoring during deployment

- Marine fauna observation log during installation/anchor drilling tasks.
- Waste/debris checks at end of each shift.
- Spill checks during refuelling and hydraulic operations.

14. Break-Away Response Plan (damage/detachment)

14.1 Purpose

To ensure rapid detection, notification, and recovery of any detached infrastructure to prevent navigational hazards and environmental impacts.

14.2 Triggers

Activate the Break-Away Response Plan when:

- Severe weather thresholds are exceeded (major swell or wind events), or
- Loss of tension, missing floats, or line failure is detected, or
- Reports are received from marine users/community, or
- Corner marker position deviates from as-built by a defined tolerance (e.g., GPS drift beyond normal mooring excursion), or
- A notice is issued by authorities requiring hazard response.

14.3 Immediate response actions (0–24 hours, where safe)

- Safety first: assess sea state; no response if unsafe.
- Notify: MOS/PM immediately; notify TfNSW – Maritime and DPIRD Fisheries if navigational hazard plausible.
- Initial assessment:
  - On-water inspection if safe; otherwise remote assessment (binoculars/drone where permitted).
- Temporary risk controls:
  - If debris presents immediate hazard, coordinate maritime warning (VHF notice / authority notification).
- Recovery mobilisation:
  - Deploy recovery vessel with grappling/retrieval gear and spare components.

14.4 Recovery and clean-up

- Retrieve detached floats, ropes, droppers, and any associated components.
- Record recovered items and estimated missing items.
- Repair/replace damaged infrastructure only once conditions are safe and after root cause review.

14.5 Post-event verification and reporting (within 5 business days)

- Incident report including:
- weather data reference,

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- nature and extent of damage,
- items recovered/lost,
- corrective actions and design/maintenance improvements.
  - Update maintenance schedule and inspection frequency if required.

15. Performance Measures and Compliance

Deployment compliance

- Corner markers installed and operational prior to full deployment: Yes/No
- As-built coordinates recorded for all anchors/markers: Yes/No
- Anchor verification records complete: Yes/No

Environmental controls

- No percussive installation used: Yes/No
- Debris incidents: 0 target
- Spills: 0 target (or immediate containment + report)
- Waste returned to shore: 100% of non-organic materials

Community and stakeholder

- Deployment notices issued prior to campaign: Yes/No
- Complaints acknowledged within 10 days: ≥95% target

16. Review and Continuous Improvement

This CDMP will be reviewed when consent conditions, guidance or regulator requirements change, or when processes do not meet the minimum expected standards.

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