

Marine Biota Monitoring – Mitigation Measures – Brazil

The information in this document follows the official Guideline for Marine Biota Monitoring, issued on 2005 by the Brazilian Institute of Environment and Renewable Resources (IBAMA). A revision of the guideline is expected to be issued until the end of this year.

Covered species: all marine mammals (including dolphins and manatees) and chelonians.

Applicability: to all seismic operations. Specific requirements can be established as permit conditions.

Minimum of three dedicated MMOs on board, work shifts 1:30 / 30.

General Mitigation Measures

Visual Monitoring

- Pre-watch of 30min minimum to authorize soft-start.
- Soft-start of minimum 20min, maximum 40 min. Warning and Exclusion zones must be clear for at least 30 minutes for soft-start authorization. If by any reason the operations stop for until 5 minutes it can be resumed without soft-start.
- Two zones to be observed, from the center of the air guns:
 - o Warning zone: 1000 meters – If a marine mammal / chelonian is observed in this zone soft-start must be delayed.
 - o Exclusion zone: 500 meters – If a marine mammal / Chelonian is observed in this zone, air guns must be stopped.

Line changes

If the line change takes more than 20 minutes, the air guns must be ceased. Operations must resume normally with soft-start.

Nighttime and Poor Visibility

Operations cannot start during nighttime and periods of poor visibility. However, during line changes to avoid delays on the time schedule it is allowed as alternate measure to keep air guns on with lower capacity (160dB re 1uPa-m).

Specifics Mitigation Measures such as PAM, Aerial Monitoring and Beach Monitoring may be requested as permit conditions on case-by-case basis.

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