Duntroon Multi-client 3D and 2D Marine Seismic Survey

1. Purpose

This report describes NOPSEMA's consideration of key matters in the assessment of the Duntroon Multi-client 3D and 2D Marine Seismic Survey environment plan.

This report should be considered in the context of the published *Duntroon Multi-client 3D and 2D Marine Seismic Survey Environment Plan* (EP) and NOPSEMA's decision notice that sets out the conditions in full that apply to the activity.

2. Background

PGS Australia Pty Ltd (PGS) is proposing to undertake the Duntroon Multi-client 3D and 2D Marine Seismic Survey (the activity) in the GAB within the periods 1 September – 30 November 2019 and possibly 1 September – 30 November 2020. In order to gain acceptance to undertake the activity, PGS submitted the Duntroon Multi-client 3D and 2D Marine Seismic Survey Environment Plan (EP) under the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (Environment Regulations).

Due to the conservation values and sensitivities associated with this region, the associated socio-economic features and the level of public interest, NOPSEMA is providing this report that outlines how NOPSEMA has considered key matters raised by stakeholders during its assessment of this EP.

The EP was initially submitted to NOPSEMA on 27 February 2017 and was accepted subject to conditions on 14 January 2019 at the conclusion of the assessment. During the assessment NOPSEMA requested that the EP be modified on two occasions, and also requested further written information from PGS.

In deciding to accept the EP, NOPSEMA was required by the Environment Regulations to be reasonably satisfied that criteria for acceptance specified in the Environment Regulations had been met. In making a decision to accept the EP, NOPSEMA took into account:

- the Environment Regulations;
- NOPSEMA's Assessment Policy (PL0050), Environment Plan Assessment Policy (PL1347), and Environment Plan Decision Making Guidelines (GL1721);
- the PGS Duntroon Multi-client 3D and 2D Environment Plan (EP);
- the information raised by relevant persons, government departments and agencies that is relevant to making a decision;
- relevant plans of management and threatened species recovery plans developed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and relevant guidance published on the Department of the Environment and Energy website;
- advice from the Australian Antarctic Division of the Department of the Environment and Energy with respect to pygmy blue whales and southern right whales.

NOPSEMA has accepted the EP subject to conditions to provide greater transparency and certainty to stakeholders about how the activity will be managed in a way that ensures adequate environmental protection. The conditions were applied to address scientific uncertainty, and ensure sufficient protection for the environment, associated with timing of upwelling events and presence, abundance and movements of EPBC Act listed species. These conditions are in addition to the requirements that are applied through measures detailed in the accepted EP. The titleholder is required by law to adhere to the conditions and the accepted EP in full.

3. Key matters

A range of matters of particular interest to stakeholders, reflecting the important values and sensitivities of the region, have been summarised as:

- potential impacts from the survey to: Pygmy blue whales (*Balaenoptera musculus)*; Southern right whales (*Eubalaena australis);* Sperm whales (*Physeter microcephalus)*; Australian sealions (*Neophoca cinerea)*; Southern blue fin tuna (*Thunnus maccoyii*); Western Eyre Australian Marine Park – Kangaroo Island Pool, primary productivity associated with Key Ecological Features (KEFs); and
- consultation undertaken by PGS in the course of preparing the EP and arrangements in place for ongoing consultation.

This report does not provide an exhaustive record of all matters relevant to environmental management and decision-making for this EP. Readers should also refer to relevant sections of the EP particularly where these references are provided. A copy of the EP is published at https://www.nopsema.gov.au/environmental-management/activity-status-and-summaries/details/387.

For further information about NOPSEMA's assessment contact: environment@nopsema.gov.au.

How NOPSEMA took into account key matters raised by stakeholders

What was raised:	What PGS are doing:	What NOPSEMA required and decided:
Pygmy blue whales		
There would be unacceptable impact to Pygmy blue whales, particularly during foraging. Claims were raised that pygmy blue whales present in the seismic area may be injured and/or displaced from foraging.	PGS has responded to this matter by undertaking a comprehensive assessment of the presence and potential impacts to pygmy blue whales (refer to s3.5.5.2, Table 6-21, s6.2.3.8 in the EP). This has been informed by underwater acoustic modelling that has accounted for physical and behavioural impacts (Appendix B) and contemporary scientific literature. In response to NOPSEMA's requirements, PGS changed the timing of the survey to avoid the majority of the pygmy blue whale foraging season in the Great Australian Bight (GAB). PGS will ensure that there is (Table 6-12 of the EP): • No injury to pygmy blue whales; • No interference with foraging behaviours in the blue whale foraging Biological Important Area (BIA) including no displacement from foraging areas. The measures in place to ensure that this level of performance will be met include: • Undertaking the Duntroon survey in the period 1 September to 30 November, 2019 or 2020 and will have a maximum duration of 91 days per season to avoid overlap with the majority of the PBW feeding period identified in the recovery plan and the NCVA (Table 6-52 and s6.2.3.1 of the EP). • For periods of greater upwelling potential in November, monitoring of upwelling and primary productivity conditions in the eastern GAB. If environmental variables are indicative of an upwelling event, blue whale aerial surveillance will be undertaken and in the event that a blue whale is detected, the survey will cease (s6.2.5.4 of the EP). • Implementation of EPBC Act Policy Statement 2.1 Parts A and B including adaptive management measures for higher than expected densities of whales (Table 6-52, Table 6-55, s6.2.4 of the EP).	NOPSEMA recognises the matter raised and agrees there is the potential for the activity to have an impact on pygmy blue whales should they be present in the region during the course of the petroleum activity. In making a decision regarding this matter, NOPSEMA took into account the content of PGS's EP; specific advice from the Australian Antarctic Division of the Department of the Environment and Energy; the views expressed by relevant persons including Blue Whale Study, The Wilderness Society, Kangaroo Island Dolphin Watch; NOPSEMA's Decision Making Guidelines (GL1721); the Conservation Management Plan for the Blue Whale (DoE, 2015); EPBC Act Policy Statement 2.1 (DEWHA, 2008); and the EPBC Act Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (DEWHA, 2013). Recognising the earlier proposed survey period overlapped March to May, a period that is known to be important for foraging pygmy blue whales, NOPSEMA required PGS to ensure there were control measures in place to demonstrate that pygmy blue whales would not be displaced from foraging in biologically important areas. In response, PGS revised the survey period to avoid potential overlap with the majority of the pygmy blue whale foraging period. In addition, PGS proposed to cease seismic operations in the event that a pygmy blue whale is sighted via aerial surveillance in November during an upwelling event. NOPSEMA is reasonably satisfied that restrictions in timing of the activity to avoid the majority of the pygmy blue foraging season and adoption of additional control measures will largely reduce impacts to an acceptable level. However, given the presence of scientific uncertainty associated with upwelling events and increased likelihood of pygmy blue whale food source abundance in November, some additional conditions were imposed by NOPSEMA. In addition to the control measures proposed, PGS must also commence monitoring of upwelling indicators using independent expertise a week prior to November. They must also use trained Marine Fauna Observers (MFOs) during vessel based observations to inform cessation of operation of the acoustic array if pygmy blue whales are detected in November. After taking into consideration all of the environmental management requirements in place (including conditions), NOPSEMA concluded that the activity will not cause unacceptable impacts (no injury) to pygmy blue whales.

What was raised:	What PGS are doing:	What NOPSEMA required and decided:
Southern right whales		
There would be an unacceptable impact to southern right whales in the calving biological important area and during migration of adults and calves to and from coastal calving areas. Claims were raised that southern right whales would be impacted at unacceptable levels moving into the calving biologically important areas, during calving in coastal areas and during migration out of calving areas to feeding habitat.	PGS has responded to this matter by undertaking a comprehensive literature review of the known established breeding and calving areas on the Southern Australian coast (refer to s3.7.5.3 of the EP). This review identifies that the closest emerging calving area to the survey area is Encounter Bay, approximately 300 km to the east, and Sleaford Bay approximately 51km NNE of the survey area. The evaluation of impacts was supported by a comprehensive evaluation using underwater acoustic modelling and Animat Movement Modelling (Appendix B of the EP). This concluded the sound exposure levels that the nearest emerging aggregation area was predicted to receive would be 110 dB re 1µPa (SPL). This is lower than behavioural disturbance thresholds in publish literature for low frequency cetaceans. PGS changed the timing of the survey to avoid the period of movement into the coastal calving BIAs, avoiding impacts to pregnant females which generally arrive during late May and early June (s3.7.5.3 of the EP). 'Animat' modelling undertaken to understand the number of whales potentially exposed to sound levels which could elicit behavioural responses during oceanic migration was predicted to be approximately 5 individuals from the entire Australian population. This represents 0.25% of the whale population (s6.2.3.8 of the EP). PGS will ensure that there is (Table 6-12 of the EP): • No injury to southern right whales. • No biologically significant behavioural disturbance to SRWs in calving/aggregation areas located in coastal South Australian waters. The measures in place to ensure this level of performance will be met include: • No discharge of the acoustic source outside the operational area to ensure that sound levels in coastal calving BIA are below behavioural disturbance thresholds. • Policy Statement 2.1 to mitigate impacts to migrating SRWs following the calving period. • An additional marine fauna observer (MFO) to supplement the trained MFOs on the survey vessel (fulfils commitment made to Kangaroo Island Council and Kangaroo Island Dolphin Watch).	NOPSEMA recognises the matter raised and agrees there is the potential for the activity to have impact on southern right whales if the calving and breeding phases were disturbed, or if whales come within close proximity to the source and were subjected to injurious levels of sound. In making a decision regarding this matter, NOPSEMA took into account the content of PGS's EP; views expressed by relevant persons including The Wilderness Society and Kangaroo Island Dolphin Watch; NOPSEMA's Decision Making Guidelines (GL1721); Conservation Management Plan for the southern right whale (SEWPC, 2012); EPBC Act Policy Statement 2.1 (DEWHA, 2008); and EPBC Act Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (DEWHA, 2013). NOPSEMA is reasonably satisfied that the survey avoids the critical period for pregnant females moving into the GAB for calving in Autumn or early winter. There is a low likelihood that the calving portion of the population will be affected at behavioural disturbance levels given site specific modelling predicts sound will be below this threshold at the boundary of the BIA. Small numbers of southern right whales may demonstrate avoidance behaviours should they be moving out of the coastal calving BIAs during September/October. However, based on the evidence provided, it appears that there are no restricted migration corridors and that numbers moving through the operational area are likely to be low. Given the potential for the survey to be also undertaken in 2020 and the feasibility for PGS to verify received levels at the calving BIA boundary (refer to Table 6-52 of the EP), NOPSEMA has applied conditions on the activity for seabed sound loggers to be deployed on the boundary of the calving BIA to measure received levels. This information is to be used to inform the need for adaptive management in the following year. In addition, to account for the uncertain sensitivity of mother and calf pairs moving out of the GAB, NOPSEMA applied conditions on the activity for increased mitigation zones (low power and shut down) to apply to southern right whales. After taking into consideration all the environmental management requirements in place, NOPSEMA concluded that the activity will not cause unacceptable impact (no injury or biologically significant behavioural disturbance) to southern right whales.

What was raised:	What PGS are doing:	What NOPSEMA required and decided:
Sperm Whales		
There is potential for unacceptable impact on sperm whales utilising biologically important areas. Claims were raised in relation to managing impacts on known biologically important areas in the region and consideration of options to avoid and/or mitigate all known or potential impacts to sperm whales.	PGS has responded to this matter by undertaking a comprehensive review of scientific literature relevant to the disturbance of odontocetes (refer to s3.7.5.6 of the EP) and undertaken an underwater acoustic modelling exercise to predict the distance at which physical and behavioural disturbance may occur (Appendix B of the EP). Results from modelling predicted that 13km is the furthest distance at which behavioural disturbance to sperm whales may occur (Appendix B, Table 13 of the EP). This has been used to inform the selection of control measures to mitigate impacts to sperm whales. PGS will ensure that there is (Table 6-12 of the EP): • No interference with foraging behaviours in the sperm whale foraging BIA. • No injury to pygmy blue, fin, sei, humpback, sperm, southern right or other whales within the Australian whale sanctuary. The measures in place to ensure this level of performance will be met include: • PGS will adopt a 13 km buffer between the operational array and sperm whales observed to display foraging behaviours during survey activities. This behaviour will be established through a PAM system (to establish presence) and visual observation using support vessels (as required) (p382 of the EP). • If foraging is detected within the sperm whale foraging BIA, PGS will take a precautionary approach and implement an increased low-power zone to 13 km to reduce received levels and the potential for behavioural changes in sperm whale foraging. This will be detected through the application of PAM, initial survey surveillance and if whale numbers are higher than expected to prevent disturbance to foraging activities (s6.2.4 of the EP).	NOPSEMA recognises the matter raised and agrees that requirements need to be in place to mitigate impacts on sperm whales. In making a decision regarding this matter, NOPSEMA took into account the content of PGS's EP; the views expressed by relevant persons including The Director of National Parks, Kangaroo Island Dolphin Watch; NOPSEMA's Decision Making Guidelines (GL1721); the South-west Marine Parks Network Management Plan 2018 (Director of National Parks, 2018); Marine bioregional plan for the South-west Marine Region (SEWPC, 2012b); EPBC Policy Statement 2.1 (DEWHA, 2008); and EPBC Act Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (DEWHA, 2013). NOPSEMA agrees that there is the potential for behavioural disturbance to sperm whales to occur up to 13 km from the seismic source. NOPSEMA is reasonably satisfied that with application of passive acoustic monitoring (PAM) to detect sperm whales and implementation of shut down procedures, there will be sufficient mitigation of potential impacts on sperm whales. After taking into consideration all the environmental management requirements in place, NOPSEMA concluded that the activity will not cause unacceptable impacts (no injury to and no interference with foraging behaviours in the sperm whale foraging BIA) on sperm whales.

What was raised:	What PGS are doing:	What NOPSEMA required and decided:
Australian *Sea Lion*		
There would be an unacceptable impact on pinnipeds due to sound ingress into the male and female foraging biologically important area affecting lactating females and the production of milk for pups. Claims were raised that the survey should be restricted to avoid BIAs, particularly waters surrounding breeding colonies and foraging areas of the Australian sea lion to prevent ambient noise levels within female foraging areas to a level that might result in site avoidance or other significant physiological or behavioural responses.	PGS has responded to this matter by undertaking a comprehensive review of scientific literature relevant to the disturbance of pinnipeds (refer to s3.7.6.1 of the EP) and undertaken an underwater acoustic modelling exercise (Appendix B of the EP) to predict the distance at which physical and behavioural disturbance may occur in pinnipeds. Results from the modelling predicted that received sound levels at Australian sea lion colonies would be below the behavioural disturbance level for pinnipeds and that the greatest distance at which permanent or temporary hearing damage could occur is 270m and 70m respectively (Table 6-33 and Table 6-34 of the EP). PGS will ensure that there is (Table 6-12) • No injury to Australian sea lions. • Ambient noise levels with the male and female Australian sea lion foraging BIA is maintained at a level which does not result in site avoidance or other physiological or behavioural responses. The requirements in place to ensure this level of performance will be met include: • Duntroon survey design includes a spatial buffer of 10 km between the acoustic source and the BIA foraging boundary (male and female sea lion) utilising a threshold value of 160 dB re 1µPa (SPL) for behavioural impacts to marine mammals (Table 6-39). • Standard Management Procedures (EPBC 2.1 – Part A3 – applicable at all times) (s6.2.4).	NOPSEMA recognises the matter raised and agrees there is the potential to impact Australian Sea Lions. In making a decision regarding this matter, NOPSEMA took into account the content of PGS's EP, views expressed by relevant persons including The Wilderness Society and Wild Migration Limited; NOPSEMA's Decision Making Guidelines (GL1721); the South-west Marine Parks Network Management Plan 2018 (Director of National Parks, 2018); Recovery Plan for the Australian Sea Lion 2013 (*Neophoca cinerea*) (SEWPC, 2013); Marine bioregional plan for the South-west Marine Region (SEWPC, 2012b); EPBC Policy Statement 2.1 (DEWHA, 2008); and EPBC Act Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (DEWHA, 2013). In acknowledging the scientific uncertainty associated with appropriate underwater noise thresholds for injury to pinnipeds, NOPSEMA has required the implementation of shutdown zones to apply to pinnipeds. With adoption of a shutdown zone of 500m radius from the source for pinnipeds, there is confidence that injurious levels of noise are unlikely to occur. Through acoustic modelling, PGS has been able to demonstrate that noise levels into the male and female foraging BIA is likely to be below behavioural disturbance thresholds given the 10km buffer between the acquisition area and the BIA (Appendix B, Table 13, site 5 of the EP). After taking into consideration all the environmental management requirements, NOPSEMA concluded that the activity will not impact on pinnipeds at a level that would affect important biological life stages and result in population level impacts.

What was raised:	What PGS are doing:	What NOPSEMA required and decided:
Southern Blue Fin Tuna		
There is potential for significantly altered behaviour of southern blue fin tuna migrating into the Great Australian Bight. Claims were raised that, if the survey is undertaken between November to March, the behaviour of juvenile southern blue fin tuna may be significantly altered resulting in changes to timing of migration into the GAB, the proportion of the total juvenile population that enter the GAB and/or surface behaviour of southern blue fin tuna in the GAB impacting fishing operations.	PGS has responded to this matter by undertaking a comprehensive review of scientific literature relevant to the impacts on southern blue fin tuna and associated food sources (refer to s3.7.4.5, s3.8.3.1, s3.8.4, s6.2.3.2, Table 6-20, s3.3.2.2, s3.3.5, Table 6-22, s6.2.3.3, s6.2.3.4 of the EP). To support the evaluation PGS utilised underwater acoustic modelling (Appendix B of the EP) to predict the horizontal and vertical distances at which tuna may be impacted. In addition, PGS changed the timing of the survey to avoid the pontoon activities and purse seine fishing. PGS concluded the Duntroon survey does not overlap juvenile southern blue fin tuna presence in the eastern Great Australian Bight. PGS will ensure that there is (Table 6-12 of the EP): • No behavioural disturbance to fish stock during CSIRO SBT survey which would affect TACs allocated to the fishery. • No behavioural disturbance to SBT in pontoons located on the continental shelf before April 1 from Duntroon survey activities. The requirements in place to ensure this level of performance will be met include: • No survey activities between January and April to prevent disruption to CSIRO SBT surveys; GABTS FIS surveys and SASIA egg count surveys (Table 6-31 of the EP). • Undertaking the survey to avoid coinciding with the SBT capture and pontooning on the continental shelf during December to March (EP, p317).	NOPSEMA recognises the matter raised and agrees there is potential for the activity to impact on southern blue fin tuna fishing operations should juveniles be present within the area that may be affected by acoustic emissions at levels that cause behavioural disturbance. In making a decision regarding this matter, NOPSEMA took into account the content of PGS's EP; views expressed by relevant persons including the Commonwealth Scientific and Industrial Research Organisation (CSIRO), and Australian Southern Bluefin Tuna Industry Association (ASBTIA); NOPSEMA's Decision Making Guidelines (GL1721); the South-west Marine Parks Network Management Plan 2018 (Director of National Parks, 2018); and Marine bioregional plan for the South-west Marine Region (SEWPC, 2012b). Given restrictions in the timing of the activity made during the assessment, NOPSEMA is reasonably satisfied that potential impacts to southern blue fin tuna populations, fishing activities and stock assessment surveys will largely be reduced to an acceptable level. However, should southern blue fin tuna be present in, or adjacent to, the operational area during November, NOPSEMA believes there is potential for tuna stocks to be disturbed at behavioural disturbance levels approximately 20km from the source. This has been informed by modelling (Appendix B of the EP) and scientific literature (Fewtrell and McCauley, 2012). NOPSEMA also believes environmental factors that influence the arrival of southern blue fin tuna remain uncertain and there are currently no reliable predictive indicators of presence and behaviour patterns (Evans et al., 2017). Recognising the conservation status of southern blue fin tuna (threatened – conservation dependent under the EPBC Act), the stringent restrictions on the Total Allowable Commercial Catch (TACC), and the potential for southern blue fin tuna to be present in the survey area during November, NOPSEMA has applied conditions on the activity requiring the titleholder to develop and implement a process to detect the presence of southern blue fin tuna aggregations within 30km of the operational area and cease operations should southern blue fin tuna aggregations be detected within 20km of the operational area in November. These mitigation zones have been selected as a precautionary distance to ensure there is sufficient time to communicate with the seismic survey vessel and cease operations prior to scientifically documented behavioural disturbance sound levels being exceeded (approximately 150dB SPL according to Fewtrell and McCauley, 2012). NOPSEMA believes this is a highly precautionary approach based on the modelling and anatomical studies on the inner ear of several tuna species (refer to Popper et al., 1981; Song et al., 2006) which determined a lack of connection between the swim bladder and inner ear suggesting that tuna is primarily sensitive to the particle motion component of the sound field. After taking into consideration all of the environmental management requirements in place, NOPSEMA concluded that the activity (with conditions applied) will not cause unacceptable impacts to southern blue fin tuna populations, stock assessments or fishing activities.

What was raised:	What PGS are doing:	What NOPSEMA required and decided:
Primary Productivity		
There would be unacceptable impacts to primary productivity – Kangaroo Island Pool, canyons and adjacent shelf-break & Eyre Peninsula upwelling and Eyre Peninsula Upwelling and the Meso-scale Eddies key ecological feature (KEF). Claims were raised that periods of high productivity will be adversely impacted by seismic sound emissions resulting in cascading effects through the food chain particularly before April 1.	PGS has responded to this matter by undertaking a comprehensive evaluation of impacts to primary productivity - Kangaroo Island Pool, canyons and adjacent shelf-break & Eyre Peninsula upwelling and Eyre Peninsula Upwelling and the Meso-scale Eddies KEF (refer to s3.3.2, s3.3.3, s6.2.3, s3.7.2, s6.2.3.2, Table 6-20 in the EP). The evaluation has been informed by predictive modelling (Appendix B) and contemporary scientific literature. Given the timeframe of the activity is proposed predominantly within the winter/spring and outside key upwelling period; the survey area which spatially overlap this KEF will be acquired first in the MSS program to reduce the potential for temporal overlap in November. In addition, adopted controls to detect and protect against blue whale foraging displacement (s 6.2.3.8, Table 6-21 of the EP) in November will also provide additional protection to primary productivity should a blue whale be detected during November. Further, as documented conservatively by Richardson et al (2017) plankton simulation survey impacts are expected to be localised, short-term and recoverable. PGS will ensure that there is: • No serious or irreversible ecosystem disturbance to: Primary productivity within the Kangaroo Island Pool, canyons and associated shelf break and Eyre Peninsula Upwelling Meso-scale eddies KEF (Table 6-12 of the EP). The measures in place to ensure this level of performance will be met include: • Undertaking the Duntroon survey between 1 September and 30 November in 2019 or 2020 to temporally and spatially avoid the primary upwelling period (December-March) and upwelling related activity/productivity (s6.2.3.1 of the EP). • Survey activities will commence in the shallower water depths in September-October and move further offshore as the season progresses thereby limiting the potential for spatial overlap with areas affected by upwelling during November where slow-moving weather patterns increase the potential for upwelling favourable wind (s6.2.3.1 of the EP).	NOPSEMA recognises the matter raised and agrees there is the potential for the activity to have adverse impacts to primary productivity. In making a decision regarding this matter, NOPSEMA took into account the content of PGS's EP; views expressed by relevant persons including ASBTIA, SARDI, and Blue Whale Study; NOPSEMA's Decision Making Guidelines (GL1721); the South-west Network Australian Marine Parks Management Plan 2018 and associated zone objectives (Director of National Parks, 2018). NOPSEMA is reasonably satisfied that restrictions in timing of the activity and adoption of additional control measures required through our assessment will largely reduce impacts to primary productivity associated with these KEFs to acceptable levels. NOPSEMA has taken into account contemporary studies including McCauley et al. (2017) and the work of Richardson et al. (2017) to put the McCauley et al. (2017) results into the context of a commercial seismic survey and concluded that while there may be mortality to zooplankton this would be localised with effects expected to be short term and recoverable. However, given the presence of scientific uncertainty associated with upwelling events and increased productivity in November, NOPSEMA has applied additional conditions on the activity. In addition to the control measures proposed, PGS must also use vessel based observations to inform survey cessation if pygmy blue whales are detected in November indicating increased productivity. After taking into consideration all of the environmental management requirements, NOPSEMA concluded that the activity will not cause serious or irreversible ecosystem disturbance to Kangaroo Island Pool, canyons and adjacent shelf-break & Eyre Peninsula Upwelling KEF.

What was raised:	What PGS are doing:	What NOPSEMA required and decided:
Marine Parks		
There would be unacceptable impacts to the values and sensitivities of the Western Eyre Australian Marine Park – South west Commonwealth marine reserve network (AMP) Claims were raised that the activity needs to be consistent with management plan objectives and values of marine parks and consideration should be given to the impacts of seismic testing on the productivity of the ecosystem and broader benthic biodiversity.	PGS has responded to this matter by using information from the South-west Marine Parks Networks Management Plan including the representative values of the Western Cape Eyre Marine Park and the relevant zone objectives to inform the impact assessment. Each of the values of the marine park are specifically assessed throughout section 6 of the EP. PGS will ensure that there is: • No serious or irreversible impacts to zooplankton during non-upwelling or upwelling seasons or to the ecological processes for key fauna values and ecosystem within the Western Eyre AMP (Southwest Marine Parks Network Management Plan 2018 - IUCN Reserve Management Principles (IUCN VI)). • No behavioural disturbance to: - Foraging whales (blue and sperm); - Foraging white shark (white shark BIA not within CMP); - Foraging Australian sea lions (no significant overlap of survey lines in CMP on continental shelf); - Foraging seabirds; - Calving southern right whales (no spatial overlap). • No serious or irreversible ecosystem disturbance to: - Demersal fish within the Ancient Coastline KEF; - Primary productivity within the Kangaroo Island Pool, canyons and associated shelf break and Eyre Peninsula Upwelling meso-scale eddies KEF; - Small pelagic fish KEF; - Benthic invertebrate communities of the eastern GAB. The requirements in place to ensure this level of performance will be met include: • Control measures and performance standards relevant to the values of the AMP provided in Table 6-61 of the EP.	NOPSEMA recognises the matter raised and recognises the requirement to ensure that activity is consistent with relevant EPBC Act plans of management. In making a decision regarding this matter, NOPSEMA took into account PGS's EP; views expressed by relevant persons including the Director of National Parks; NOPSEMA's Decision Making Guidelines (GL1721); NOPSEMA's Guidance Note – Petroleum activities and Australian Marine Parks (GN 1785); the South west Network Marine Parks Management Plan 2018 and associated zone objectives and relevant recovery plans relating to the values of the Western Eyre AMP (Director of National Parks, 2018). NOPSEMA is reasonably satisfied that impacts on the values of Western Eyre AMP will largely be reduced to acceptable levels. However, given the presence of scientific uncertainty associated with upwelling events and the potential for the activity to impact on the ecological values of the Western Eyre Australian AMP, in particular, the ecosystem processes attributed to the Kangaroo Island Pool, canyons and adjacent shelf-break and Eyre Peninsula Upwelling KEF, some additional requirements have been set by NOPSEMA. NOPSEMA has applied conditions on the activity requiring that upwelling conditions will be monitored prior to November, and by using the presence of pygmy blue whales as an indicator for increased productivity, if a pygmy blue whale is detected operation of the acoustic array will cease for the year. After taking into consideration all of the environmental management requirements, NOPSEMA concluded that the activity will not cause unacceptable impact to the values of the Western Eyre AMP.

What was raised:	What PGS are doing:	What NOPSEMA required and decided:
Consultation during development of the EP		
The consultation undertaken in the course of preparing the EP was inappropriate. Claims were raised that sufficient time and information had not been provided, and that objections and claims about the activity had not been adequately addressed.	PGS commenced consultation with relevant persons (stakeholders) in Mid-November 2016. This consultation continued throughout 2017 - 2018 and will continue prior to, and during the activity. Seventy six (76) stakeholders were consulted during this period and the determination of stakeholders' relevancy to the activity was refined over the period of consultation. Between October 2016 and November 2018 stakeholders were engaged through various means such as face to face meetings, attendance at council meetings, public information sessions, direct correspondence and phone calls. Information about the activity was also available on PGS's website for the broader public. PGS provided stakeholders with a full copy of the draft EP when requested. Supporting detail was also provided to stakeholders when requested including underwater acoustic and spill scenario modelling. PGS has committed to notifying stakeholders at least 1 month prior to survey commencement; at least 5 days prior to equipment deployment; at commencement of survey acquisition; and at survey completion (within 10 days of survey completion). As a result of claims raised by stakeholders and NOPSEMA's requirements, the timing of the activity was changed to avoid the majority of important periods for key sensitivities. Relevant stakeholders were advised of the change to the timing of the activity in July and September 2018 in the form of written correspondence. This correspondence was tailored to each stakeholder and included responses to claims raised by that specific stakeholder. The correspondence also contained information about additional control measures that were adopted as a result of consultation.	NOPSEMA recognises the importance of consultation undertaken with individuals and organisations who may be affected by petroleum activities and recognises the value this has in informing the evaluation of potential impacts and risks. In making a decision regarding this matter, NOPSEMA took into account the content of PGS's EP, which included the full text of the views expressed by relevant persons, the extent of the consultation effort undertaken by PGS, NOPSEMA's Decision Making Guidelines; and third party correspondence received by NOPSEMA during its assessment of the EP. NOPSEMA found that relevant persons were followed up by PGS via letters, emails and phone calls when no response was provided. It is also apparent that information gathered from consultation has been used to inform the preparation of the EP. In addition, it was evident that PGS has adopted a methodical approach to the identification of relevant persons, formulation of a consultation strategy, and maintenance of consultation records. From review of over 3000 pages of correspondence provided in the EP, it is apparent that relevant persons have been kept informed of new developments and changes in aspects of the EP over the course of the assessment. NOPSEMA is reasonably satisfied that PGS has provided each relevant person with sufficient information and a reasonable period to make an informed assessment of the possible consequences of the activity on the functions, interest or activities of the relevant person. In some cases PGS has provided detailed modelling information and a full copy of the entire EP when requested. NOPSEMA acknowledges that there are still some remaining concerns held by organisations regarding provision of sufficient information and time. However, given the extent and duration of the consultation undertaken, the detailed and tailored information provided, and provisions for ongoing consultation, NOPSEMA considers that consultation for the purposes of preparing the EP is appropriate. NOPSEMA concluded that the relevant persons have been provided with sufficient information and time, and that claims about the activity have been adequately addressed through the impact evaluation, the adoption of control measures.

What was raised:	What PGS are doing:	What NOPSEMA required and decided:
Arrangement for ongoing consultation		
The plans for consultation during the activity are insufficient. A range of requests were made for ongoing information to be provided during the implementation of the activity including marine fauna sighting and a survey completion report.	PGS acknowledged these requests and made several substantial commitments to providing relevant stakeholders with requested information during the implementation of the seismic survey. Specifically, PGS has committed to providing the following information to relevant stakeholders on request: • The Environmental Performance and Activity Completion Reports • Aerial surveillance data and MFO reports on all marine fauna sightings obtained during the survey • A weekly summary of whale sightings during the survey period. In addition, PGS committed to a comprehensive ongoing stakeholder consultation program with relevant authorities, and relevant individuals, commercial fisheries and organisations that requires: • Targeted, specific and timely consultation if certain triggers are met (Table 9-3 and section 9.2). These triggers include the commencement of the survey, any significant incidents, survey completion, the receipt of environmental reports, and in the event that there is new information or changes to the activity that may affect stakeholders' interest or activities. • An assessment of the merits of any new claims or objections made by a relevant stakeholders and where warranted, modification to the management of the activity to address claims.	NOPSEMA recognises that there is a high level of interest in oil and gas activities undertaken in the GAB and the need for effective ongoing consultation prior to and during the conduct of the survey. In making a decision regarding this matter, NOPSEMA took into account the content of PGS's EP and NOPSEMA's Decision Making Guidelines (GL1721). NOPSEMA also considered the outcomes of the consultation carried out by PGS and the subsequent measures adopted to address specific requests for ongoing consultation. Recognising the high degree of relevant stakeholder and public interest in environmental performance of this activity, NOPSEMA has set an additional requirement for PGS to make their environmental performance report publicly available within three months of the completion of a survey in 2019 and 2020. NOPSEMA concluded that arrangements for ongoing consultation during implementation of the survey, including information to be provided to relevant stakeholders and the requirements for consideration of new objections and claims made during the course of the survey, are appropriate.

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