



To: **SLR Consulting (South Africa) (Pty) Ltd**

Per email: shell-NCUD@slrconsulting.com

From: **Natural Justice and The Green Connection**

Per: Melissa Groenink-Groves, David Mtshali & Rantsho Moraka: *Natural Justice*
Liziwe McDaid and Priyanka Naidoo: *The Green Connection*

Email: melissa@naturaljustice.org; david@naturaljustice.org;
rantsho@naturaljustice.org; liziwe@mweb.co.za and
Priyanka@thegreenconnection.org.za

Dear Environmental Assessment Practitioners,

**COMMENTS ON THE SHELL NCUD DRAFT ENVIRONMENTAL AND SOCIAL IMPACT
ASSESSMENT REPORT FOR THE PROPOSED EXPLORATION DRILLING IN BLOCK
NORTHERN CAPE ULTRA-DEEP SOUTH AFRICA**

A INTRODUCTION AND BACKGROUND

1. These submissions are made by Natural Justice and The Green Connection in response to the Draft Environmental and Social Impact Assessment Report (DESIAR) published for comment by SLR Consulting South Africa (EAP) for the proposed exploration drilling project in Block Northern Cape Ultra Deep (NCUD), for the commenting period from 11 November 2024 to 13 December 2024.
2. Natural Justice: Lawyers for Communities and the Environment is a non-profit organisation specialising in environmental and human rights law in Africa – with a focus on the pursuit of social and environmental justice for local and indigenous communities. Natural Justice offers support to local and indigenous communities impacted by the ever-increasing demand for land and natural resources.
3. The Green Connection is a registered non-governmental organisation, that believes economic growth and development, improvement of socio-economic status and conservation of natural resources can only take place within a commonly understood framework of sustainable development. It aims to provide practical support to both the government and non-governmental/civil society sectors, which are an integral part of sustainable development.

4. Natural Justice and The Green Connection (collectively referred to as “Organisations”) have an interest in this project, in the interests of protecting the environment, in the interests of protecting the local and indigenous peoples and communities who will be impacted, as well as in the public interest.
5. The Organisations contend that the DESIAR is fatally flawed, for the reasons set out in the comments below, and cannot serve as a lawful basis for granting an environmental authorisation.

B COMMENTS

Oil Spill Modelling

Oil Spill Modelling is incomplete and its threshold are insufficient

6. Both Appendix I “Description of the OSCAR Model” and Appendix II “Hydrodynamic Modelling Report” of the Oil Spill Modelling Technical Report (Appendix F) have no content.¹ The extent and impact of the spills could be underestimated. Both socioeconomic and ecological impacts should be assessed with the most conservative thresholds based on recent science. If the modeling had used lower socioeconomic thresholds described below, the results might show a larger footprint of potential surface oiling and higher probability of shoreline oiling.
 - a) The NCUD oil spill modelling used a surface oiling threshold of 1 μm .² The surface oiling threshold used to assess socioeconomic impacts is generally lower at 0.04 μm , as this appears as a silver sheen.³ Fishing activities may be prohibited in areas of visible oiling to prevent contamination of gear and catch.⁴ Several recent oil spill models for offshore drilling use a 0.04 surface oiling threshold.⁵ We also note studies of ecological effects of oil sheens found

¹ CLS Brasil, Draft ESIA Report Appendix F Oil Spill Modelling Proposed Exploration Drilling in Block Northern Cape Ultra-Deep, South Africa (November 2024) (hereinafter “CLS Brasil”) at 146 and 147.

² CLS Brasil at 36.

³ Bonn Agreement Aerial Operations Handbook, 2016, Microsoft Word - 0315_Aerial_Operations_Handbook.doc, at 11; Bonn Agreement Oil Appearance Code, https://www.bonnagreement.org/site/assets/files/1081/special_on_volume_calculation_20160607.docx.

⁴ See, e.g. Deepwater Horizon Oil Spill Frequently Asked Questions October 2010, Deepwater Horizon Oil Spill 2010 Frequently Asked Questions | NOAA Fisheries, “NOAA Fisheries Service is prohibiting fishing as a precautionary measure to ensure public safety and assure consumer confidence in Gulf of Mexico seafood. NOAA Fisheries Service strongly advises fishermen not to fish in areas where oil or oil sheens (very thin layers of floating oil) are present, even if those areas are not currently closed to fishing.”

⁵ See, e.g. Equinor Canada Ltd East Coast Operations Newfoundland and Labrador Offshore Area Spill Impact Mitigation Assessment, 14 April 2020, [equinor-canada-spill-impact-mitigation-assessment-final \(2\).pdf](#); see also African Oil South African Corp 3b4b Oil Spill Model (December 2023) at page 20 [URL not available]: “...[T]he minimum value of 0.04 μm was chosen to keep a margin and because it is also the minimum thickness visible as rainbow sheens in Bonn Agreement.” μm This is highly dependent on weather conditions, and the lower level of 0.04 μm is only visible under ideal conditions. Tests performed

toxicological effects below 10 μm (which the NCUD report claims is the ecological effects threshold). For example, the Deepwater Horizon assessment of 2018 found significant mortality to fish embryos exposed to sunlight-exposed surface oil sheens as thin as 1 μm .⁶ French-McCay (2018) noted a 1 μm “sublethal effects threshold for birds”.^[2] Zavelle et al. (2023) found latent effects on oyster larvae survival after 24 hour exposure to sheens as low as 0.5 μm , with sublethal effects occurring when combined with UV exposure.⁷

- b) The NCUD modelling used a dissolved oil threshold of 10ppb, but French-McCay 2024 notes that sublethal effects occur at 1ppb.⁸ Gissi et al. 2021 found sublethal effects in sea urchin embryos at 0.41 ppb total hydrocarbons.⁹
- c) The NCUD modelling used a shoreline threshold of 10 g/m², but socio-economic effects can occur at 1g/m², as per U.S. Department of the Interior Bureau of Safety and Environmental Enforcement (BSEE) (2016): “This is the threshold for potential effects on socioeconomic resource uses, as this amount of oil may conservatively trigger the need for shoreline cleanup on amenity beaches, and impact shoreline recreation and tourism.”¹⁰

There is no investigation of the deepest possible wells

7. The DESIAR states that the depths of the licence block go to 3200m, but the Oil Spill Modelling report claims the maximum depth is 3000m, and thus modelled a spill at a maximum of 3000m. This is an important limitation of the study since an empirical

by O’Hara and Morandin (2010) indicated that significant changes in feather structure did not necessarily occur at a thickness of 0.04 μm , but began to be visible at 0.1 μm .”

⁶ D. French-McCay et al., Comparative Risk Assessment of spill response options for a deepwater oil well blowout: Part 1. Oil spill modeling, Marine Pollution Bulletin 133 (2018) at 1005. “In birds, anemia, disrupted feather function, hypothermia, respiratory distress, seizures, diarrhea, hepatic disease and renal disease have been reported to result from either external or internal (via ingestion) exposure to oil, and to potentially have either sublethal or lethal effects (Mazet et al., 2002). O’Hara and Morandin (2010) suggest that birds may be affected by 0.1–3 μm of oil sheen, based on observed changes in feather microstructure and weight when feathers are placed in oil of these thicknesses. This suggests a sublethal effects threshold of about 1 g/m² (1 μm).”

⁷ MD Zavell MD et al., Interactive effects of Louisiana Sweet Crude (LSC) thin oil sheens and ultraviolet light on mortality and swimming behavior of the larval Eastern oyster, *Crassostrea virginica*, Curr Res Toxicol, (9 August 2023), <https://pmc.ncbi.nlm.nih.gov/articles/PMC10458706/>.

⁸ D. French-McCay (February 12, 2024), Considerations for Development of Entrained Oil Thresholds for Oil Spill Risk Assessment, https://energyproducers.au/wp-content/uploads/2024/07/Oil-in-Water-Threshold-Review_French-McCay_2024Feb12-1-1.pdf, at 3.

⁹ See, e.g. F. Gissi et al, A Comparison of Short-Term and Continuous Exposures in Toxicity Tests of Produced Waters, Condensate, and Crude Oil to Marine Invertebrates and Fish. Environ Toxicol Chem. (September 2021), <https://setac.onlinelibrary.wiley.com/doi/full/10.1002/etc.5129>; see Table 3 popout at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8457077/table/etc5129-tbl-0003/?report=objectonly> re Sea Urchin TPH from exposure to crude oil = 0.41 $\mu\text{g/L}$ or 0.41 ppb.

¹⁰ U.S. Department of the Interior Bureau of Safety and Environmental Enforcement (BSEE) 2016 Task 1: Worst Case Discharge Analysis (Volume I) Oil Spill Response Plan (OSRP) Equipment Capabilities Review, BPA No. E14PB00072, <https://www.bsee.gov/sites/bsee.gov/files/volume-i-worst-case-discharge-analysis.pdf>, at 19.

analysis of company-reported incidents on oil and gas production platforms in the Gulf of Mexico between 1996 and 2010 review of industry spills found that each 30 m of added depth increases the probability of a company-reported incident by 8.5%.¹¹ Thus the NCUD modelling must include a spill at the maximum potential depth of the project, and comprehensively assess all increased risks due to extreme well depth.

The region has very limited observations available, so the currents used in the model are of insufficient resolution

8. The spatial resolution of the currents from the Regional Ocean Modeling System (ROMS) hydrodynamic model use a scale of 1/16o (or roughly 6.9 kilometers) and are likely too coarse accurately predict movement of oil at depth, in multiple plumes, and at the surface.
 - a) For example, Russo et al. (2022) studied currents from three datasets with respect to the St Helena Bay Monitoring Line (SHBML), a monitoring transect consisting of 12 stations perpendicular to the coast from Eland's Bay (to the south of NCUD). Currents were found to be quite different in each data set.¹² The study concluded that: "The bay-scale and nearshore evaluations highlighted issues pertaining to the resolution of the reanalyses and their use at such a small scale. The reanalyses are limited by their resolution, as well as by their misrepresentation of submesoscale processes or lack thereof, prompting the need for the development of regional downscaled models in and around the southern African oceans based on the global ocean reanalysis products."¹³
9. The Oil Spill Modelling report fails to include assurances that the level of variability experienced at the ocean surface is captured in the model, and that deep currents are well represented. This is a particular risk given that the report notes that there is greater spreading of the oil plume in the deeper layers due to trapping of oil because of ocean density stratification.¹⁴
10. The modelling does not reflect the recirculations and eddies that occur in the area. NASA's SeaWiifs chlorophyll images collected by satellites and sea surface temperature distributions shows that the area proposed for drilling is always

¹¹ Muehlenbachs, L., M. A. Cohen, T. Gerarden (2013) The impact of water depth on safety and environmental performance in offshore oil and gas production, Energy Policy, 55, 699-705, <https://doi.org/10.1016/j.enpol.2012.12.074>.

¹² C. S. Russo, et al., An intercomparison of global reanalysis products for Southern Africa's major oceanographic features Front. Mar. Sci. (2022), doi: 10.3389/fmars.2022.837906.

¹³ *Ibid.*

¹⁴ CLS Brasil at 39.

occupied by recirculations, eddies of many sizes, and fronts that contribute to transporting and mixing material effectively.¹⁵

The report does not discuss the extent to which ROMS reproduces the upwelling system or the numerous eddies that are important and difficult to simulate properly

11. The major front in the NCUD area is associated with the wind field and a circulation of surface and subsurface currents along the coastline that give rise to the Benguela Upwelling System.¹⁶
12. Luyt (2018) compared several sea surface temperature models of the region and found a large mean error along this coastline.¹⁷ If eddies and fronts are not properly simulated, then the circulations that emerge from their interactions at scales of few kilometers, called submesoscales will be underestimated as well. Trajectories will appear well-defined instead of spread. The submesoscale circulations are responsible for cross-shore transport and have been shown to have been key to the oiling of the coastlines during the 2010 Deepwater Horizon spill.¹⁸

Fearon et al. (2024) used currents from a model that does not force strong data assimilative constraints to estimate the risk of oiling of the southern coastline of South Africa, which has a bathymetry comparable to that in the NCUD. They found, similarly to the case of the Gulf of Mexico, that submesoscale circulations when realistically represented contribute to mix the oil more in the cross-shore direction, significantly amplifying the risk of oiling on the coast.¹⁹ Omitting or poorly representing these kilometer-scale circulations in the NCUD modeling likely causes underestimation of the risk of this project.

¹⁵ See, e.g. SJ Weeks et al. Remotely sensed variability of temperature and chlorophyll in the southern Benguela: upwelling frequency and phytoplankton response. *African Journal of Marine Science*, 8 (2006), https://www.researchgate.net/profile/S-J-Weeks/publication/43456131_Remotely_sensed_variability_of_temperature_and_chlorophyll_in_the_southern_Benguela_Upwelling_frequency_and_phytoplankton_response/links/0deec53c5c172874f3000000/Remotely-sensed-variability-of-temperature-and-chlorophyll-in-the-southern-Benguela-Upwelling-frequency-and-phytoplankton-response.pdf?origin=publication_detail&_tp=eyJjb250ZXh0Ijp7ImZpcnN0UGFnZSI6Ii9kaXJlY3QiLCJwYWdlIjoicHVibGljYXRpb25Eb3dubG9hZCIsInByZXZpb3VzUGFnZSI6InB1YmtpY2F0aW9uIn19&__cf_chl=tk=g.rGmDU7tJY5FSXrf.ZoY8JUfzDXJm0wnp8lGrsaYhY-1733340773-1.0.1.1-DfnAcBrJvLwLDkxZRZ69kOpARdpH5k2KX7zwbOdYW6A.

¹⁶ SP. Kirkman et al., Spatial characterisation of the Benguela ecosystem for ecosystem-based management, *African Journal of Marine Science* (2016), DOI: 10.2989/1814232X.2015.1125390

¹⁷ H. Luyt, Quantifying the SST biases in data assimilative ocean simulations of the Benguela Upwelling System, MS Thesis, University of Cape Town (2018), <http://hdl.handle.net/11427/29734>.

¹⁸ S. Joye et al., The Gulf of Mexico Ecosystem, Six Years after the Macondo Oil Well Blowout. *Deep Sea Research Part II: Topical Studies in Oceanography* 129, 4–19 (2016), doi:<https://doi.org/10.1016/j.dsr2.2016.04.018>.

¹⁹ G. Fearon et al., Submesoscale variability enhances shoreline oiling in deepwater blowout simulations in the Agulhas Current, *Marine Pollution Bulletin*, 205, 116526 (2024) <https://doi.org/10.1016/j.marpolbul.2024.116526>.

The capping scenario of 20 days is unsupported and far from worst-case

13. It took 87 days for BP to cap the Deepwater Horizon well that occurred at a water depth of 1,600 meters, and 74 days to stop the spill at Montara at only 76 meters water depth.²⁰
14. While technology has improved, a reduction by more than four times is unsupported, and does not account for possible long delays from bad weather and rough seas that commonly occur in winter in the area.
15. Consultants to the US Bureau of Safety and Environmental Enforcement note that it can take more than 20 days to clear the site of a blowout and prepare the well for capping.²¹ Meng et al. (2019) noted that while capping stacks may take “days to weeks”, relief wells take “months”.²²
16. In 2018 Paul Barnes, Atlantic and Arctic Canada director of the Canadian Association of Petroleum Producers' (CAPP), stated: “The view around the world is if there is a blowout, it will take at least 30 days in order to stop it.”²³
17. Equinor Canada’s environmental impact statement (2020) modeled a spill duration of 36 days with capping and 115 days for relief wells at both 500 m water depth and 1,134 m water depth, for 160-day total simulation times.²⁴
18. The short capping scenario derives from the assumption that loss of well control will be immediately detected. However, there is no discussion of a contingency for the failure in the surface-controlled system, such as severed umbilical connection, or fire/explosion on the rig, which could lead to a much longer (and thus larger volume of spilled oil).

The NCUD oil spill model failed to model near surface spill risks

19. Loss of containment of marine diesel oil from mobile offshore drilling units (MODU) or vessel accidents or collisions are near surface spills that are not uncommon in

²⁰ Wood Group Kenny, Subsea Capping Stack Technology Requirements (2016), <https://www.bsee.gov/sites/bsee.gov/files/tap-technical-assessment-program/756aa.pdf>

²¹ <https://www.bsee.gov/sites/bsee.gov/files/tap-technical-assessment-program/756aa.pdf> at 89. “However, a subsea capping stack cannot be deployed on the wellhead/BOP of the incident site until the site has been cleared and made safer. The time to prepare the well for a subsea capping stack is estimated to be 14 to 21 days.”

²² H. Meng et al. (2019) A capping technique for emergency response in offshore blowout accidents, *Journal of Loss Prevention in the Process Industries*, 62, 103925, <https://doi.org/10.1016/j.jlp.2019.103925>.

²³ CBC News, Weeks to cap a subsea oil leak? It's industry standard, says official (Dec 06, 2018), Weeks to cap a subsea oil leak? It's industry standard, says official | CBC News.

²⁴ Equinor Canada, Bay du Nord Development Project Environmental Impact Statement (2020), <https://iaac-aeic.gc.ca/050/documents/p80154/135577E.pdf> at 16.

offshore operations, and thus must be modelled as part of NCUD's oil spill risks. This is standard practice for offshore oil spill modelling operations in other countries.²⁵

There is no evaluation about the potential ecological impact of oil plus dispersants on the Marine Protected areas and Ecologically or Biologically Significant Area (EBSAs), including the Benguela Current Marine Ecosystem site, a tentative UNESCO World Heritage Site.

20. Dispersants and dispersed oil particles are toxic to some marine organisms.²⁶ The oil spill modelling report shows that several EBSAs and MPAs are in the most likely oil spill trajectory. The NCUD's oil spill modelling report, the marine ecology impacts report, the fisheries impacts report and the DESIA as a whole must more carefully assess the ecological impacts of worst-case dispersant and dispersed oil on these sensitive ecosystems. A particular focus must be on potential impacts to the Benguela Upwelling System, one of the most productive boundary upwelling marine ecosystems in the world, tentatively listed by UNESCO as a World Heritage site for Outstanding Universal Value.²⁷

Underwater Acoustics

Failure to adequately quantify baseline ambient sound levels

21. This is significant because—given that marine organisms use sound for navigation, prey detection, and foraging—alterations made to the baseline natural soundscape will have ecological consequences that may be severe.
22. While the study considered baseline ecological and geophysical features of the proposed project region, no baseline soundscape assessment was made. Section 3.3 of the acoustic report states:

²⁵ See, e.g. Beach Energy Environment Plan, Offshore Gas Victoria (2024), https://beachenergy.com.au/wp-content/uploads/Beach-OGV-Drilling-EP-Rev-3_Clean.pdf at 511; see also Nexen Energy ULC, Flemish Pass Exploration Drilling Project (2018-2028) Environmental Impact Statement (2018), <https://iaac-aeic.gc.ca/050/documents/p80117/122064E.pdf>.

²⁶ NOAA Office of Response and Restoration, What Are Some Environmental Impacts from Dispersant Use? <https://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/resources/10-what-are-some-environmental-impacts-dispersants.html>.

²⁷ UNESCO, World Heritage Convention - The Benguela Upwelling System <https://whc.unesco.org/en/tentativelists/6094/#:~:text=The%20Benguela%20Upwelling%20System%20is,%2C%20hydrography%2C%20chemistry%20and%20trophodynamics>: “the annual new production in the Benguela system is 4.7×10^{13} gC/yr, making the Benguela system 30 to 65 times more productive per unit area than the global ocean average. Mean annual primary productivity of 1.25 grams of carbon per square metre per year (gC/m²-yr), with primary productivity estimates in some upwelling areas of the Benguela system of >300 gC/m²-yr, have been suggested to be the highest in the world.

Shipping traffic is an important component of ocean ambient noise in the project area. Given the shipping traffic in the NCUD Block, the ambient noise levels are expected to be at most 10 dB higher than the lowest level, within 80 and 90 dB re 1 μ Pa for the 10-10 kHz frequency range.

23. This statement broadly described ambient noise conditions and is insufficient to assess natural occurring ambient sound level in this region, or to compare natural ambient noise levels to this region. No effort was made to quantify what naturally occurring sound levels were for this region, what naturally occurring sources of sounds were present in this region, or what seasonal and temporal cycles in ambient sound levels exist that may be ecologically important cues. In the absence of known natural ambient noise levels, it is not possible to assess how much the proposed activities will increase ambient noise levels in the soundscape- and therefor to assess noise impacts.
24. Given that marine organisms use sound for navigation, prey detection, and foraging, alterations made to the natural soundscape will have ecological consequences that may be severe. If this region is generally below average ambient noise levels, the relative change associated with the proposed activities may have more deleterious impacts than if the relative change in noise levels is minimal. An adequate baseline assessment of the acoustic properties of the soundscape including biological sources of ambient sound (biophony), environmental sources of ambient sound, and ambient sound levels is needed to complete an assessment of noise impacts. The Applicant did not assess this.

Failure to consider the possibility of sound travelling great distances within the SOFAR (Sound Fixing and Ranging) channel

25. Given the amplitude of the sources and location of proposed activities, one also must consider the possibility of sound travelling great distances within the SOFAR channel. The SOFAR channel is a horizontal layer of water found in the ocean at which depth the speed of sound is at its minimum. Sound that enters this naturally occurring channel has the potential to travel for hundreds of kilometers. At mid-latitudes this channel occurs at between 800-1000 meters depth. Sounds produced at depth (such as drilling) can travel through this channel and possibly to great distances- upwards of 900 miles (see <https://oceanservice.noaa.gov/facts/sofar.html>). Alternatively, sound paths from a source near the surface (like vessels or drill ships) can come together, creating regions of higher sound pressure at about the same depth as the source at 50-60 km intervals away from the source (DOSITS.org). Given the proximity and direct overlap between the proposed drilling regions and MPAs, CBAs, and EBSA, noise will inundate important ecological habitats. Moreover, quiet biological sounds associated with important prey species in mesopelagic regions – including habitats similar the MPAs adjacent to and the CBAs and EBSAs within the study region – appear to be used as a cue for foraging megafauna (see Baumann-Pickering et al.

2021 for details). Thus, anthropogenic noise at even low levels in these regions may mask biologically relevant sounds associated with predator foraging. The general risk associated with anthropogenic noise in biologically sensitive or protected areas cannot be effectively assessed in the absence of robust sound propagation models that estimate how far sound travels in this region and what impact drilling, vessel, and helicopter noise may have on the underwater soundscape.

Failure to assess the risk associated with permanent soundscape alteration due to permanent changes on the seafloor due to drilling activities

26. This is significant because animals use the soundscape as a cue to inform migration, habitat suitability and settlement (i.e., where juvenile animals select to grow and populate).
27. The Marine Impact study considers the residual impact of underwater acoustics to marine fauna to be low. However, alterations to the seafloor may permanently change how sound travels in this region. Alterations to the sea floor result in changed bathymetry and subsea substrate density, which impacts how sound travels (DOSITS.org). Alterations to the substrate may in fact result in a change in the quality of sound and distance sound is capable of traveling, and thus alters how natural sounds are perceived by marine organisms in this region.
28. Animals use sound as a cue to inform migration,²⁸ habitat suitability and settlement (i.e. where juvenile animals select to grow and populate).²⁹ Permanent alterations to the seafloor may change the soundscape permanently. Sound propagation modeling should be used to assess the risk associated with permanent soundscape alteration.

Failure to adequately consider the timing of migration of protected species

29. This is significant because both humpback and right whales will be migrating during time periods that overlap with planned drilling operations. For example, the marine ecology report state that “Humpback whales are thus likely to be the most frequently encountered baleen whale in Licence Block NCUD, ranging from coastal

²⁸ Popper, A. N. & Hawkins, A. D. An overview of fish bioacoustics and the impacts of anthropogenic sounds on fishes. *Journal of Fish Biology*, 94(5):692-713 (2019). doi:10.1111/jfb.13948; Ellison, W. T., Clark, C. W. & Bishop, G. C. Potential use of surface reverberation by bowhead whales, *Balaena mysticetus*, in under-ice navigation: preliminary considerations. Report of the International Whaling Commission. 37, 329-332 (1987).

²⁹ Lillis, A., Bohnenstiehl, D., Peters, J. W. & Eggleston, D. Variation in habitat soundscape characteristics influences settlement of a reef-building coral. *PeerJ* 4, e2557 (2016); Gordon, T. A. C. et al. Habitat degradation negatively affects auditory settlement behavior of coral reef fishes. *Proc. Nat. Acad. Sci. U.S.A.* 115(20), 5193-5198. doi:10.24378/exe.265; Jeffs, A., Tolimieri, N. & Montgomery, J. C. Crabs on cue for the coast: The use of underwater sound for orientation by pelagic crab stages. *Mar. Freshw. Res.* 54, 841–845 (2003).

waters to beyond the continental shelf. They have a year-round presence with numbers peaking in June and July (northern migration) and to a lesser degree in September to October (southern migration). Regular encounters occur until February associated with subsequent feeding in the Benguela ecosystem. There is no effort to plan drilling or operations to avoid taking place in these highly sensitive and risky months.

Failure to assess cumulative acoustic impacts of multiple projects in the area

30. The applicant failed to assess the potential impact of multiple exposures to marine organisms in association with other proposed survey projects in the region (e.g., Searcher, TGS, TEEPSA, and Gx Technologies). This scenario – multiple projects occurring simultaneously – was not quantitatively modeled within the Acoustics Specialist Report, addressed in the Marine Ecology Report, and therefore adequately assessed in the EIA. This is a gross oversight that requires comprehensive consideration and mitigation strategies based in realistic data to remedy.
31. Each additional project in or near the proposed survey region is associated with a set of risks that compound when they occur in close spatial or temporal proximity. Most mitigation measures proposed to address the impact of anthropogenic noise in the EIA would be minimized or completely invalidated by the presence of additional exploration. Part of the EIA mitigation plan hinges on there being a ‘safe place’ for marine organisms to retreat to avoid the impacts of extremely high amplitude sound, or by minimizing the spatial and temporal scale of sound exposure associated with the project. These assumptions are untrue if multiple project occur simultaneously. Moreover, depending on the temporal scale of the other project, this would extend the overall high noise exposure to the environment, rendering the acoustics modelling incorrect, increasing the probability for both PTS and TTS for marine organisms, and increasing the probability for elevated stress levels in marine organisms at a regional level. Noting that the sound of seismic exploration, vessels, and other anthropogenic noise sources can travel for hundreds or even thousands of miles, the 40km buffer between ships would have minimal mitigation impact. No additional mitigation measures were proposed (e.g. adjusting the timing of operations, altering seasonality, stopping in the presence of other operations, etc.).

The DESIA’s acoustic assessments are flawed and deficient

32. It is also worth commenting that the ocean is an acoustic world. This is because water is a dense medium, and sound travels faster and farther underwater. Marine species utilize this efficiency and have evolved to depend on sound for essential biological functions, including feeding, breeding, travelling, and socializing. Anthropogenic noise caused by the drilling of exploratory wells includes vessel noise, drilling noise, and) blasts, and can cause significant temporary and permanent harm across taxa. Harm can be physiological, including loss of hearing, death, or other injury, and behavioural, including cessation of feeding, changes in spawning or breeding, changes in movement patterns, and masking of communication. These

behavioural harms can be as damaging to marine species fitness as direct physical harm. In addition, these harms are not limited to individual species, but can have ecosystem and population level impacts. Because of several flaws in its approach, the DESIAR does not fully capture the risk posed to marine species and ecosystems and does not effectively mitigate the risks from the proposed exploratory drilling activities.

Drilling Charges

Toxicity of drilling mud and produced water discharges

33. The DESIAR notes that barite (Barium sulphate) will be discharged as it is part of water-based drilling mud.³⁰ Barite contains heavy metals, including cadmium, copper, mercury and zinc. Research shows barite can increase the concentration of Zinc in sediment porewater by four times the background level, and in acidic conditions that mimic the guts of benthic animals, a major portion of the cadmium, copper, mercury and zinc in barite become soluble.³¹ The DESIAR should analyze the potential for bioaccumulation of these metals in benthic species.
34. The DESIAR states, “[i]f following onboard treatment, the hydrocarbon content is <30 mg/l, the produced water may be discharged overboard.”³² While this has historically been a common threshold used in the industry, achieving this alone does not align with NOPSEMA’s standard that “impacts and risks will be of an acceptable level and reduced to as low as reasonably practicable.” As NOPSEMA has stated: “While OIW limits may remain a valid control, the risk assessment process must address all impacts and risks. It may therefore be necessary to consider a range of other factors, including the PFW discharge regime, chemical composition, toxicity, extent of dispersion and fate (including potential for accumulation in sediments and biota).”³³ Assessing chemical composition, toxicity, extent of dispersion and fate are indeed critical as NOPSEMA suggests, not only because of the toxic non-oil components in the produced water, but also because different forms of hydrocarbons behave differently and have different impacts on the surrounding

³⁰ DESIAR at 330.

³¹ US Department of Interior Minerals Management Service, Study of Barite Solubility and the Release of Trace Components to the Marine Environment (2007), <https://espis.boem.gov/final%20reports/4289.PDF> at v. “...at acidic conditions, simulating the gut of deposit feeding benthic animals, a major portion of the Cd, Cu, Pb and Zn [in barite] are soluble”.... “the concentration of Zn in pore water increases by as much as a factor of four in anoxic sediment that contains 10 percent barite.”

³² DESIAR at 551.

³³ NOPSEMA, The Regulator, Issue 3, (2014) p. 5, <https://www.nopsema.gov.au/sites/default/files/documents/2021-04/A369617.pdf>.

ecosystem.³⁴ A best practice would be to model produced water discharges in advance, develop treatment and discharge thresholds for different components of the produced water based on best available knowledge, and monitor the composition of the water during well testing, deciding treatment, storage, and discharge options based upon this composition and pre-determined thresholds.

35. In general, the DESIAR contains little detail about the contaminants that may be present in flowback water from well flow testing, other than to note it is likely to contain hydrocarbons. Treated flowback and produced water contains not only dispersed oil, but also inorganic salts, heavy metals, organic acids, and radioactive material, in addition to dissolved and aromatic hydrocarbons and phenols and alkylphenols.³⁵ For example, the offshore oil and gas industry accounts for 97% of all alpha particle discharges in the OSPAR Convention area of the North-East Atlantic.³⁶
36. Studies have found that dispersion and dilution of flowback and produced water are defined by many factors, include the discharge composition, the characteristics of the discharge jet, and the current, tidal, and wind conditions, among others.³⁷ The toxicity of the produced water is similarly dependent on several factors including the

³⁴ [1] For example, the OPSAR 2023 Assessment of impacts of the offshore oil and gas industry on the marine environment states, “Naturally occurring hazardous components in PW [produced water] include substances belonging to the groups of phenols, alkylphenols, and naphthenic acids. The group of alkylphenol substances include individual substances with endocrine disrupting properties in aquatic organisms. Naphthenic acids include substances that are suspected to have endocrine disrupting effects. Other substances of concern are the BTEX-substances (Benzene, Toluene, Ethylbenzene, Xylenes) which, however, are expected to dissipate quickly from the water column due to evaporation. PAHs, including naphthalene, phenanthrene and dibenzothiophene (NPD) may have severe effects in the water column such as carcinogenicity, DNA damage, embryotoxicity, growth, oxidative stress, and narcotic effects.” OPSAR, Assessment of impacts of the offshore oil and gas industry on the marine environment, (2023), Section 1.2.1 Produced Water, <https://oap.ospar.org/en/ospar-assessments/quality-status-reports/qsr-2023/other-assessments/impacts-offshore-oil-and-gas-industry/>.

³⁵ [1] Jonny Beyer et al., Environmental effects of offshore produced water discharges: A review focused on the Norwegian continental shelf, 162, *Marine Environmental Research*, 105155 (2020), p. 2, <https://linkinghub.elsevier.com/retrieve/pii/S0141113620306164>; Ebenezer T. Igunnu & George Z. Chen, Produced water treatment technologies, 9, *Int. J. Low-Carbon Tech.*, 157–177 (2014), <https://academic.oup.com/ijlct/article-lookup/doi/10.1093/ijlct/cts049>.

³⁶ OSPAR, Assessment of impacts of the offshore oil and gas industry on the marine environment, (2023), <https://oap.ospar.org/en/ospar-assessments/quality-status-reports/qsr-2023/other-assessments/impacts-offshore-oil-and-gas-industry/#5>.

³⁷ Jonny Beyer et al., Environmental effects of offshore produced water discharges: A review focused on the Norwegian continental shelf, 162, *Marine Environmental Research*, 105155 (2020), p. 2, <https://linkinghub.elsevier.com/retrieve/pii/S0141113620306164>.

discharge mixture properties, the contaminants, and the organism and its life phase.³⁸

37. Without any information provided in the DESIAR about these discharges, including their possible chemical composition and quantities, it is impossible to accurately predict the impacts of these discharges on the surrounding ecosystem. Moreover, there are no plans in the DESIAR to test these discharges for assessment of their potential impacts.

Need and Desirability

Inadequate assessment of need and desirability of the proposed activities

38. The DESIAR states that the proposed project is in alignment with South Africa's plans and policies on energy, economy, climate change, and resource management.³⁹ On the contrary, the proposed activities are incompatible with South Africa's international commitments and its domestic laws. The DESIAR vaguely distinguishes between exploration and production EIA processes to justify need and desirability of the proposed activities. It posits potential future (production) economic benefits as the reason why the proposed activities are needed and desirable, but limits consideration of negative impacts to the exploration phase. The DESIAR draws this distinction despite two decisions⁴⁰ of the High Court that held that a comprehensive assessment that considers the entire life-cycle of a project is necessary to place all relevant information at the decision-maker's purview. Consequently, the DESIAR's assessment of need and desirability is replete with contradictions which we submit can only be cured through a comprehensive assessment that looks at the entire life-cycle of the proposed project in line with our courts' jurisprudence on this issue.

Inadequate consideration of need and desirability in the context of climate change

39. The DESIAR refers to South Africa's climate change strategies and policies, asserting that the proposed exploration activities will not exacerbate climate change.⁴¹ In fact, it claims these activities will help South Africa achieve its NDC targets.⁴² Additionally, the DESIAR argues that the Supreme Court of Appeal (SCA) ruling in *Minister of*

³⁸ Ann F. Nielsen et al., Critical review of the OSPAR risk-based approach for offshore-produced water discharges, 19, *Integrated Environmental Assessment and Management*, 1172–1187 (2023), <https://onlinelibrary.wiley.com/doi/abs/10.1002/ieam.4715>; Jonny Beyer et al., Environmental effects of offshore produced water discharges: A review focused on the Norwegian continental shelf, 162, *Marine Environmental Research*, 105155 (2020), p. 3-5, <https://linkinghub.elsevier.com/retrieve/pii/S0141113620306164>.

³⁹ Paragraph 10.1 of the DESIAR.

⁴⁰ *Earthlife Africa Johannesburg v Minister of Environmental Affairs and Others* [2017] 2 All SA 519 (GP); *Sustaining the Wild Coast NPC and Others v Minister of Mineral Resources and Energy and Others* 2022 (6) SA 589.

⁴¹ Paragraph 10 of the DESIAR.

⁴² Paragraph 10.1.3.

Mineral Resources and Energy and Others v Sustaining the Wild Coast NPC and Others 2024 (SCA judgment) backs the view that exploration activities do not contribute to climate change.⁴³ The DESIAR misinterprets the SCA judgment regarding oil and gas exploration in relation to South Africa's international climate change commitments. The SCA was merely taking an (erroneous) exception to the high court making a finding in respect of whether or not “authorising new oil and gas exploration, ...” complies with South Africa's international climate change commitments, it did not make a determination as to whether or not exploration and/or production of oil and gas contributes to climate change. The SCA would have erred if it had found that exploration and/or production of oil and gas does not contribute to climate change, as it is widely accepted that the extraction and use of fossil fuels (coal, oil, natural gas etc.) is a major contributor to climate change. Even if we accept the DESIAR's reading of the SCA judgment, it still does not absolve anyone from the obligation to conduct a thorough assessment that evaluates the entire lifecycle of the proposed project. Furthermore, the SCA upheld the judgment of the Makhanda High Court and its judgment does not disturb the High Court's finding that, climate change is a relevant factor to consider even during the exploration stages of a project.⁴⁴ It is also important to note that the SCA judgment is currently under appeal at the Constitutional Court under case no. 196/2024.

40. The DESIAR cites the potential economic benefits of future natural gas production to justify the need for exploration activities. It also promotes natural gas as a cleaner alternative to coal and oil.⁴⁵ However, it deliberately fails to flag potential negative impacts of the proposed project (all phases) on climate change in its motivation for the need and desirability of the proposed activities.⁴⁶ What is worse is that, a comprehensive assessment of the need and desirability of exploring for new oil and gas reserves for climate change and the right to food perspective, is a relevant factor to consider. The DESIAR states that exploration of gas and oil is not incompatible with South Africa's climate change plans and policies. It is submitted that the issue is not whether or not exploration of gas and oil is compatible with climate change policies or plans, it is rather, whether all relevant factors have been considered and that the competent authority has been provided with all the relevant information necessary to grant or refuse environmental authorisation.

Assumption of gas as a transition fuel

41. The DESIAR claims that gas may act as a transition fuel, and relies primarily on the 2019 IRP, to support this claim.⁴⁷ It also alleges that exploring for hydrocarbon

⁴³ *Ibid.*

⁴⁴ Paragraphs 108 – 125 of the DESIAR.

⁴⁵ Paragraph 10 of the DESIAR.

⁴⁶ Paragraph 10.1.3. of the DESIAR.

⁴⁷ Paragraph 10.1.1. of the DESIAR.

resources is needed and desirable. Nothing could be further from the truth.⁴⁸ It is our submission that any assertion of natural gas being a transition fuel is unfounded and contradicts widely accepted scientific conclusions. It is both inaccurate and deceptive to suggest that gas is necessary as a transition fuel in South Africa. Recent independent studies dispute the notion that fossil gas is essential for electricity generation or as a transition fuel, and they confirm that renewable energy, paired with battery storage, can fulfil nearly all of South Africa's energy requirements.

42. The International Institute for Sustainable Development's (IISD) report "Gas Pressure: Exploring the Case for Gas-Fired Power in South Africa" (March 2022) highlights that while it was once believed that fossil gas would be essential either during the transition to low-carbon energy or as part of the long-term energy mix for electricity generation, the dramatic reductions in renewable energy and battery storage costs have overturned this perspective. Analysis of South Africa's electricity system indicates that gas supply is not technically needed until at least 2035, if at all. In recent years, the risks associated with gas have either increased or become better understood. As a result, developing a large gas-to-power system now could lead to significant negative consequences for South Africa. The shift toward decarbonization, combined with the declining costs of renewable energy and storage, presents risks for gas investments, which are likely to result in higher consumer costs, challenges for workers during the transition, and losses for investors.⁴⁹
43. The IISD report highlights some of the risks associated with gas-to-power investment in South Africa. These risks encompass significant contributions to climate change (due to CO₂ and methane emissions from burning gas), growing global pressure to phase out gas because of its climate impacts, financial risks associated with gas-to-power projects, the potential for reduced security of affordable gas supply, the threat of stranded assets, and the risk of adding further just transition challenges (as future gas workers and communities may face similar difficulties to those currently experienced by the coal sector).⁵⁰
44. Meridian Economics' 'Hot Air about Gas – An Economic Analysis of the Scope and Role for Gas-Fired Power Generation in South Africa' (June 2022) report points out that while South Africa's large-scale use of gas appears to be central to current energy policy direction in South Africa, 'this rests on a 2012 vision which pre-dates dramatic reductions in renewable energy costs and carbon emissions space'.⁵¹ The report further explains that independent analyses from several recent studies indicate that South Africa's power requirements, both now and in the future, can be met with minimal reliance on gas. It states that there is "no evidence to support the

⁴⁸ *Ibid.*

⁴⁹ IISD report, piv. Available online at: <https://www.iisd.org/publications/report/south-africa-no-need-for-gas>

⁵⁰ IISD report, pages 8 – 12.

⁵¹ Meridian report, page ii. Available online at: <https://meridianeconomics.co.za/wp-content/uploads/2022/06/Hot-Air-About-Gas.pdf>.

large-scale gas envisioned in the GMP, as this is uneconomical even without considering carbon emissions." Meridian highlights that the assumption of gas-fired power generation replacing coal overlooks the fact that other technology combinations are now more effective at replacing coal-fired power than gas, and that gas-fired generation should be compared to these alternatives.⁵²

45. The Vital Ambition Report,⁵³ produced by Meridian Economics in partnership with the CSIR Energy Centre, states that gas for power generation is only justified in South Africa's energy mix if it is needed for low-utilization flexible capacity (peaker plants) to balance the system during peak power demand. The report confirms that there is no need for investments in gas infrastructure for energy production and generation at present or in the near future.⁵⁴
46. Furthermore the 2019 IRP is in the process of being updated, and should align with South Africa's Nationally Determined Contribution under the Paris Agreement and to keep pace with quickly evolving science and significant reductions in price for solar and wind energy. However, even the 2019 IRP, which is rooted in an outdated and scientifically and economically unsound understanding of the necessity for any gas in the energy mix[1], only projects the collective contribution of gas and diesel to the 2030 energy mix to be 1.3% combined.⁵⁵

Failure to consider climate change impacts as part of need and desirability

47. In assessing need and desirability, NEMA requires that development be sustainable and that the competent authority "take into account all relevant factors."⁵⁶ The Guidelines requires need and desirability assessment to address the impact of planned activities on global and international responsibilities relating to the environment, including climate change.⁵⁷ Recent court jurisprudence⁵⁸ regards failure to conduct a full climate change assessment of the proposed project as non-compliance with section 24O(1) of NEMA.⁵⁹ In *Shell* the court held "... *had the decision-maker had the benefit of considering a comprehensive assessment of the need and desirability of exploring for new oil and gas reserves for climate change and the right to food perspective, the decision-maker may very well have concluded*

⁵² *Ibid*, p1.

⁵³ Meridian Economics, 2020. A Vital Ambition: Determining the Cost of Additional CO2 Emission Mitigation in the South African Electricity System. See at <https://meridianeconomics.co.za/wp-content/uploads/2020/07/Ambition.pdf>

⁵⁴ Gas and peaking resources contribute just 1.1% of total electricity generation in 2025, and 2.4% by 2035 according to the same Meridian report.

⁵⁵ 2019 Integrated Resource Plan, page 42.

⁵⁶ 24O(1)(b) of NEMA.

⁵⁷ Paragraph 1.1.8 Page 11 of the Guidelines.

⁵⁸ At paragraph 125 of *Sustaining the Wild Coast NPC and Others v Minister of Mineral Resources and Energy and Others* 2022 (6) SA 589.

⁵⁹ At paragraphs 76-101 of *Earthlife Judgment*.

that the proposed exploration is neither needed nor desirable."⁶⁰ The DESIAR does not contain a comprehensive assessment of the impact of exploration activities on climate change, it reviewed South Africa's climate change policies instead of conducting a proper assessment that looks at the entire life-cycle of the proposed project.

48. As the court indicated in *Shell*, we believe that any rational decision-maker would refuse the environmental authorization in this case, given the urgency of phasing out fossil fuels to prevent the climate crisis. It is well-established that the climate change 'crisis' demands urgent, swift, and extensive cuts in greenhouse gas (GHG) emissions to limit global warming to 1.5°C. This includes accelerated efforts over the next 5 years to reduce global carbon dioxide emissions by 45% by 2030 compared to 2010 levels, and to reach net-zero emissions by mid-century. To support these claims, a few recent developments related to the climate crisis are briefly discussed below.
49. In August 2021, the Intergovernmental Panel on Climate Change (IPCC), an international organization dedicated to evaluating climate change science, published its 6th Assessment Report (AR6).⁶¹ In the summary for policymakers, the IPCC highlights, among other points, that:
 - a) It is unequivocal that human influence has warmed the atmosphere, ocean and land, and that widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred;⁶²
 - b) The scale of recent changes across the climate system as a whole - and the present state of many aspects of the climate system - are unprecedented over many centuries to many thousands of years;⁶³
 - c) Human-induced climate change is already impacting various weather and climate extremes worldwide. The evidence of changes in extremes, such as heatwaves, heavy rainfall, droughts, and tropical cyclones, as well as their connection to human activities, has become stronger since the release of AR5.⁶⁴
 - d) Global surface temperature will continue to increase until at least mid-century under all emissions scenarios considered, and that global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in CO₂ and other GHG emissions occur in the coming decades;⁶⁵

⁶⁰ At paragraph 125 of the *Shell* Judgement.

⁶¹ Climate Change 2021: The Physical Science Basis, available online at: <https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/>

⁶² Paragraph A.1.

⁶³ Paragraph A.2.

⁶⁴ Paragraph A.3.

⁶⁵ Paragraph B.5.

- e) Many changes in the climate system become larger in direct relation to increasing global warming. They include increases in the frequency and intensity of hot extremes, marine heatwaves, heavy precipitation, and, in some regions, agricultural and ecological droughts; an increase in the proportion of intense tropical cyclones; and reductions in Arctic sea ice, snow cover and
- f) permafrost;⁶⁶
- g) Continued global warming is projected to further intensify the global water cycle, including its variability, global monsoon precipitation and the severity of wet and dry events;⁶⁷
- h) From a physical science perspective, limiting human-induced global warming to a specific level requires limiting cumulative CO₂ emissions, reaching at least net zero CO₂ emissions, along with strong reductions in other GHG emissions. Strong, rapid and sustained reductions in CH₄ emissions would also limit the warming effect resulting from declining aerosol pollution and would improve air quality.⁶⁸

50. On 9 August 2021, the IPCC issued a press release relating to its AR6 report. It states that the report provides new estimates of the chances of crossing the global warming level of 1.5°C in the next decades, and finds that unless there are immediate, rapid and large-scale reductions in GHG emissions, limiting warming to close to 1.5°C or even 2°C will be beyond reach.⁶⁹

51. The International Energy Agency's (IEA) recent report, *"Net Zero by 2050: A Roadmap for the Global Energy Sector,"* states that reaching net zero by 2050 and limiting global temperature rise to 1.5°C above pre-industrial levels "demands a complete transformation of the energy systems" that support the world's economies. This goal can only be achieved if no new oil and gas fields are approved for development. The report emphasizes the urgent need for widespread deployment of all available clean and efficient energy technologies, along with a halt to approvals for new oil and gas projects.

52. In summary, we submit that a reasonable decision-maker could not approve this project if it were to consider the full life-cycle climate impacts.

Failure to consider climate change impacts on children and future generations

53. In our comment to the Draft Scoping Report,⁷⁰ we raised this issue but it was not included in the Final Scoping Report, and the DESIAR also does not consider climate change impacts on children and future generations.

⁶⁶ Paragraph D.1.

⁶⁷ Paragraph B.5.

⁶⁸ Paragraph D.1.

⁶⁹ <https://www.ipcc.ch/2021/08/09/ar6-wgl-20210809-pr/>.

⁷⁰ Paragraph 8 of our Comments to the Draft Scoping Report.

54. NEMA places a duty on the State to ensure participation of all interested and affected parties, including the vulnerable and disadvantaged in environmental governance, recognise the vital role of women and youth in environmental management and promote their full participation therein.⁷¹ Section 28(2) of the Constitution also places a duty on the state to consider the best interests of children as paramount in every matter that concerns them. This principle is also repeated in the Children's Act.⁷² Despite these legislative requirements, the report fails to consider the impact that this project will have on children.
55. Recently, the United Nations Committee on the Convention on the Rights of the Child published a general comment⁷³ wherein it stresses the importance of considering the impact of climate change on children and the need to consider children's rights when making decisions that may impact the environment. According to the general comment, children have the right to participate in environmental impact assessments that are child friendly. Some of the child rights that must be considered in the context of climate change is children's right to leisure, play, recreation and health. The report makes no mention of any possible impact on these rights and how such impact will be mitigated.
56. The fact that climate change affects children in different parts of the globe differently and that such impacts are unique from those on adults, is undisputed.⁷⁴ The difference in how climate change affects children is thought to be largely influenced by the preexisting social and economic disparities, and geographical variabilities.⁷⁵ The impacts are uniquely different for children compared to adults because of the vulnerability of their developing bodies.⁷⁶ The warm spells and heat waves caused by climate change exposes children to heat stress, respiratory and vector-borne diseases, and malnutrition with long term implications. Heavy precipitation events and intense tropical cyclones put children at higher risk of death than adults, exposes them to water-borne /water washed illnesses and malaria, reduces their options for play and social interaction etc. Furthermore, extreme high sea levels may increase the risk of death and bad health for children.⁷⁷
57. It is submitted that the impact of the proposed project on children's and future generations' environmental rights is a relevant factor to be considered by the competent authority, thus the absence of assessment of this factor in the DESIAR amount to non-compliance with section 240 (1) of NEMA. Consequently, the competent authority may not grant environmental authorisation as not all relevant information is placed in his or her purview.

⁷¹ Section 2(4)(f) and (q).

⁷² Section 9.

⁷³ UN Committee on the Rights of the Child General Comment No.26.

⁷⁴ Sheridan Bartlett "Understanding the impacts for children of factors related to climate Change" 2008; Sheffield P E and Landigan P J "Global Climate Change and Children's Health: Threats and Strategies for Prevention" 2011; Currie J and Deschênes O "Children and Climate Change: Introducing the Issue" 2016; Akresh R "Climate Change, Conflict and Children" 2016.

⁷⁵ *Ibid.*

⁷⁶ Sheridan Bartlett "Understanding the impacts for children of factors related to climate change" 2008.

⁷⁷ See footed 75 above.

Impact on Women and Girls

58. Similarly to the specific impacts on children raised above, the DESIAR fails to consider and assess the disproportionate impacts of oil and gas extraction and production (and subsequently climate change) on women. Furthermore, South Africa is a signatory to the Convention on the Elimination of Discrimination Against Women (CEDAW) as well as the Maputo Protocol on the Rights of Women in Africa. This therefore requires a specific understanding of how this project will impact and subsequently violate these specific rights. There is a need to include a specific analysis on the gendered impact of the project as a driver of climate change.

Public Participation

59. The overwhelming number of EIA participation processes on the West Coast has led to participation fatigue. Coastal communities, and in particular small-scale fishers, whose livelihoods are directly impacted by oil and gas are unable to meaningfully engage in lengthy processes where technical information is difficult to understand. This, coupled with the fact that the EIA process has been relegated to a tick-box exercise, has resulted in low turnouts and disengagement from coastal communities. Further, the fact that this commenting process is occurring late into the year would undoubtedly mean that many people may not have had the capacity to comment.

Incompatibility of the Project with the UN Guiding Principles on Business and Human Rights

60. We note that in addition to the mention of UN Guiding Principles on Business and Human Rights (UNGPs) in the DESIAR⁷⁸ Shell has publicly stated that their business approach is informed by the UNGPs.⁷⁹ The UNGPs, despite being ‘soft law’, have increasingly been used as an authoritative standard. The UNGPs provide a three-pillar framework which requires businesses to respect, protect and remedy any human rights violations. In light of the climate crisis, Shell has a duty of care not to pursue any business activities that will harm human rights. These rights include the right to a healthy environment, the right to equality, the right to food security, children’s rights as well as the right to life. The vertical and horizontal application of the Constitution also reiterates the importance of the “respect” pillar.

- The DESIAR makes express mention of the UNGPs and states that: “The objective of the Guiding Principles is to enhance standards and practices with regard to business and human rights so as to achieve tangible results for affected individuals and communities, and thereby also contributing to a socially sustainable globalization. These Guiding Principles pays particular attention to the rights and needs of, as well as the challenges faced by, individuals from

⁷⁸ Page 41 of the DESIAR.

⁷⁹ https://www.shell.com/sustainability/people/human-rights/jcr_content/root/main/section_copy/text_474563035.multi.stream/1715253381302/5f545bad961d73fb83a01c8caed1a21f633564b8/shells-approach-to-human-rights.pdf

groups or populations that may be at heightened risk of becoming vulnerable or marginalized, and with due regard to the different risks that may be faced by women...”.

- Despite this inclusion, there is no proposed analysis or understanding in the DSR on the rights of women, children and marginalised coastal communities.
- Furthermore, the DESIAR views the UNGPs as a mechanism for remedial action. This is a complete misunderstanding of the purpose of the UNGPs. The first pillar of the UNGPs (the respect pillar) places a duty on Shell to not proceed with any operation that would breach human rights. The extraction of oil and gas is incompatible with the target to keep global warming below 1.5 degrees. The purpose of the UNGPs is not to remedy any harm that has occurred because the first pillar has been disregarded.

ITLOS Advisory Opinion on Climate Change

61. The recent advisory opinion on climate change from the International Tribunal on the Law of the Seas must be taken in to consideration. We note that reference to the ITLOS Advisory Opinion now appears on page 39. The advisory opinion, has reiterated the duties of States to take all necessary measures to prevent, reduce and control marine pollution from anthropogenic GHG emissions and ensure policy coherence with this goal. Furthermore, the advisory opinion makes it clear that there is a general obligation on States to combat any form of degradation of the marine environment, including climate change impacts, such as ocean warming and sea level rise, and ocean acidification. Whilst the status of the advisory opinion is non-binding, it is legally persuasive and is likely to inform future State policy and legislation. This project poses an issue for the prevention of marine pollution and will inadvertently increase greenhouse gas emissions.

Socio Economic Impact

Inadequate assessment of the cumulative impact of drilling activities on reduction of cumulative compensation and household income

62. The DESIAR outlines the socio-economic impacts of the proposed drilling activities and highlights that over the two-year duration of the proposed drilling activities, it is anticipated that there will be a reduction in the cumulative earnings for commercial fishing. As the DESIAR states “cumulative compensation of formal and informal employees in the fishing industry value chain may be temporarily reduced by R1.1 million over 2 years (or R550 000 per year of exploration)...’ and additionally that “Household income may reduce by a cumulative R2.4 million over 2 years (or R1.2 million per year of exploration).”
63. The DESIAR then concludes that such an impact, in terms of their criteria, has a low consequence and very low intensity when considered against the larger context of employment creation, fiscal increase and investments. Such assessment conclusions

may be relevant only if one is assessing the impact of the proposed drilling activity in isolation and absent of any serious consideration of changes in estimated timelines of the proposed drilling activities, the cumulative socio-economic impact arising from current ongoing drilling activities and the compounding impact from potential future drilling activities by other actors in oil and gas space. More to the point, the proposed drilling activities will contribute to the reduction of cumulative compensation of formal and informal employees in the fishing industry value chain in relation to prior, current and future drilling activities by other players in the oil and gas industry. Providing an assessment of only the negative socio-economic impacts of drilling as they relate to a single proposed drilling operation will produce an inaccurate and unreliable assessment of the true scope and veracity of the negative socio-economic impacts due to a failure to consider such impact's cumulative, interrelated and compounding nature with respect to adjacent and proximate drilling operations.

64. Consider how, in the appraisal of the direct and indirect employment opportunities that will be created from the operations of the proposed drilling activities, the DESIAR rightfully mentions other oil and gas projects surrounding the proposed drilling block and holds that "Offshore drilling activities are also taking place in adjacent blocks, resulting in a cumulative benefit to local contractors, who are able to maintain or expand their revenue bases and staff complements.". Similarly, the negative impacts identified in so far as it pertains to the reduction in cumulative compensation and household income, will too be worsened by the presence of the same oil and gas extraction project taking place in adjacent blocks. To this end, the compensation and household reduction figures highlighted in the DESIAR, will be much higher and will arise from the cumulative negative socio-economic impact of all oil and gas drilling activities to which the proposed drilling activity in the DESIAR will be an additional contributing operation. The most vulnerable and informal fishers and fishing communities will be the most detrimentally impacted. As such, the omission of a sustained assessment of the cumulative impact on the socio-economic impacts on the reduction of compensation and income, as it implicates the proposed drilling activities, renders the assessment of this impact factor inadequate for failure to paint a truer picture of the broader implications of the proposed drilling activities in relation to similar projects, especially those within the same vicinity.

Flawed assessment of the remedial measure to cure the impact of reduced compensation and household income

65. It is stated in the DESIAR that "fishing can resume as before once drilling in an area is complete" and that the negative socio-economic income reductions as triggered by the proposed drilling project is temporary and confined to the two-year time period designated for the drilling operation. This assertion is overly simplistic and is only plausible if one totally disregards the larger context of extensive drilling activities currently being undertaken on the Western and Northern Cape offshores. Larger socio-economic concerns about climate change and the degradation of ocean health are motivated by a serious appreciation of the compounding impacts of all oil

and gas drilling activities. It is inaccurate and flawed to base an assessment of a remedial/mitigating measure for so serious a socio-economic impact (compensation and household income) on the presumption that after drilling, a drilling operation will dismantle, and socio-economic conditions will simply revert to their prior status or order. This kind of reasoning in the DESIAR avoids the difficult task of providing a more well-founded assessment of the scale of impact of many single drilling project considered cumulatively and as such, reveals the inadequacy of the remedial/mitigating assessment. An assessment in this regard, should account for both the specific impacts that will be as a result of the proposed drilling activity and then the further impact of such when appraised in combination with similar impacts arising from other drilling projects.

Inadequate consideration and assessment of the impact on social cohesion

66. Social disruption and change in social dynamics is another direct negative impact identified in the DESIAR. The gist of the assessment is that “conflicting opinions on offshore exploration may result in a deterioration in community cohesion and conflict between those in support of a project and those opposed to it” and that “reduction in community cohesions can be more evident and impactful in small communities where the polarising effect may be more obvious and personal relationships are more directly affected.”.
67. In this regard, the DESIAR presents an abridged framing of the negative impacts of the proposed drilling activities on social cohesion and dynamics. The issues that communities are grappling with, are not reducible to mere disagreements or opinion-based conflicts regarding the wisdom and benefits of supporting or objecting to a specific individual proposed oil and gas drilling operations. The activities of extractive industries, from mining to offshore drilling, occupy a central place in the larger South African socio-economic and socio-political public discourse. Public perspectives on the cost and benefits of such industries is a hotly debated topic on a local, regional and national level. South Africa’s specific history of land dispossession and community displacement caused in large part by extractive mining activities informs public sensibilities and sentiments as it related to oil and gas project now being expansively undertaken at Sea. Judicial institutions, parliament, executive policymakers, community organisations, social movements for environmental protection and climate justice as well as the academic scientific communities are all engaged with the question of how best to achieve a socio-economic landscape that protects constitutional rights and the environment within a context of striving for sustainable development. As such, an adequate assessment of the impact of the proposed drilling activities on social cohesion and dynamics cannot be mute about these overarching socio-economic and climate action interests which are harboured by the full spectrum of classes of persons, from directly affected local small fishing communities to the interest of the South African society at large. The DESIAR’s diminutive framing of these issues and its cursory treatment of climate change concerns renders the assessment of the negative impacts of the proposed drilling activities on social cohesion and dynamics insufficient.

Cultural Heritage impacts

Inadequate assessment of cultural heritage owing to general and generic framing of issues

68. The DESIAR outlines the impact of the proposed drilling activities on cultural heritage links to the sea in broad and overly general terms and lacks adequate detail as to the specific cultural heritage impacts of the proposed drilling activities. The cultural heritage impact assessment as outlined in the DESIAR constitute an self-evident, generic and overarching impacts that are a feature of and are true, in a more general sense, of any drilling activities at Sea. An adequate assessment of the cultural heritage impacts has to go beyond a presentation of the default impacts of any drilling activities at Sea. Such adequate assessment requires a showing, with reasonable specifics, of the unique impacts that are specific to the particular proposed drilling activities.
69. The nature of the cultural heritage impact assessment is generic, and it appears that no specific cultural group/s or representative cultural group/s (and by extension, interested and affected parties) have been directly engaged/considered. As a result, the assessment fails to present any assessment of the stakes between deeply held spiritual, historical, cultural and ceremonial relationship to the Sea and the encroachment on such by the proposed drilling project.
70. In place of such an assessment, the DESIAR states that “Communities engaged for the study, who self-identify as First Nations, aboriginal and indigenous believe in the importance of the ocean for ancestral / spiritual matters.”. First Nations and Aboriginal are not terms deployed for native black and coloured communities of South Africa. This is because, those terms arise out of particular historical instances, specific colonial dynamics and socio-political histories and contexts. The adding of these phrases in the assessment of impacts on cultural heritage within a socio-cultural context in which they are inapplicable, appears to serve as catch-all phrases and as such dips the cultural heritage assessment far below the threshold of adequate, actual and relevant.
71. Coastal fishing communities who will likely be the most impacted by the proposed drilling activities are not sufficiently focused on in the analysis of socio-economic impacts. The DESIAR lacks a specific, in-depth focus on especially the small-scale fishers and coastal fishing communities in the broader sense. As a result, the DESIAR does not adequately engage the legal and policy framework aimed at the recognition of the vulnerability of coastal fishing communities to oil and gas drilling operations. In addition, consideration of such coastal fishing communities’ right to culture and right to the marine ecosystem they depend on renders the socio-economic impact assessment of the DESIAR incomplete. To the extent that such factors are highly relevant to the decision as to whether or not to authorise the

application for environmental authorisation, their total absence should serve as a material reason to find the DESIAR inadequate and materially flawed.

72. This material shortcomings of the DESIAR as it related to grappling with actual cultural practices and beliefs together with the absence of a sample cultural group/s whose linkage to the Sea is substantively engaged, demonstrates the DESIAR's inadequate analysis and assessment of the impacts presented by the proposed drilling activities on cultural heritage.
73. As a consequence of these shortcomings, the assessment fails to give effect to section 2(4)(g) of NEMA, which requires that 'environmental decisions must take into account the interests, needs, and values of all interested and affected parties, including recognizing all forms of knowledge - traditional and ordinary knowledge'.

Inadequate assessment of the impact of cultural heritage owing to false comparison and inaccurate inferences

74. It is asserted in the DESIAR that:

'there are already impacts on this cultural heritage due to industrial activity and commercial fishing along the shore. However, any additional potential impacts of the proposed operations need to be considered.'

And elsewhere that:

'Nearshore and onshore project activities, such as supply vessel traffic and crew changes and re-supply from onshore bases, are virtually indistinguishable from other ongoing activities in South African coastal and port areas'

75. Read in the context of part 8.5.1.3 and 8.5.1.2 of the DESIAR in which the above statements appear, it would seem as though the industrial activity and commercial fishing already underway on the Sea is being presented as a pretext, even a comparison, for framing the impact of the proposed drilling activities on cultural heritage.
76. This is misleading because the proposed drilling activities in question are fundamentally different to, for instance, commercial fishing. They are distinguishable in terms of the nature of the activities, the purpose and scope of operation, the need and desirability of such activities etc. The degree of scrutiny applicable to an assessment of the impact of such activities on cultural heritage is also distinct. The comparative assessment framed around distinguishable activities at Sea in the DESIAR reveals the inadequate assessment of the impact of the proposed drilling activities on cultural heritage. There exists different circumstantial basis for the presence of various industrial activities onshore and offshore on the South African coastline. The mere presence of these other industrial activities does not serve as a justification that subsequent proposed activities, such as the proposed

drilling activities in question in the DESIAR, should be, on this basis, extended the same legal entitlement, rights and authorisation.

The DESIAR's Analysis of Cumulative Impacts is Flawed

77. Block NCUD lies within the West Coast of South Africa, where applications for gas and oil exploration well drilling have been approved in the Deep Water Orange Basin (DWOB) block adjacent to Licence Block NCUD, as well as in Block 5/6/7 and Block 3B/4B. Up to 20 exploration well drillings have been authorised in respect of the three applications adjacent to Block NCUD. The DESIAR acknowledges the possibility of future exploration in nearby blocks.⁸⁰ Beyond exploration, there is the intended realisation of production in Block NCUD if a significant discovery is made. The same holds true in other blocks adjacent to Block NCUD in both South African and Namibian waters, meaning that the area could continue on a path to high offshore oil and gas industrialisation.

78. There is a need for a more proactive, precautionary, and integrated approach to understanding cumulative effects. While the DESIAR acknowledges the challenges of assessing cumulative impacts, it proposes limiting the analysis to what can be evaluated "meaningfully," potentially overlooking significant environmental risks.⁸¹

The DESIAR Underestimates the Importance of a Comprehensive Cumulative Impact Assessment

79. The argument that cumulative impact assessment should be limited to the most "meaningful" impacts or risks, oversimplify the complexity of cumulative effects. The cumulative impacts of a project are often not immediately apparent or directly measurable but can emerge over time, becoming significant when combined with other actions. Thus, limiting the analysis to only certain receptors or impacts may fail to identify long-term or indirect consequences that could be highly significant. A more inclusive approach is necessary to fully understand and mitigate potential risks, rather than focusing on a narrow set of "meaningful" impacts.

Uncertainty Is Not a Valid Reason to Avoid Analysis

80. While the DESIAR argues that the lack of geological information prevents a meaningful assessment of future exploration and production activities, this does not justify ignoring cumulative impacts. Environmental impact assessments (EIAs) should be built on the principle of precaution, where uncertainty is acknowledged but does not preclude the identification and management of potential risks. Relying on the assertion that future activities cannot be reasonably defined due to the speculative nature of future resource discovery is not an excuse to forgo evaluating

⁸⁰ Paragraph 8.8. of the DESIAR.

⁸¹ Paragraph 8.8.1. of the Block NCUD.

potential cumulative impacts. It is essential to consider worst-case scenarios, even if specific outcomes remain uncertain.

81. The DESIAR proposes deferring a detailed cumulative impact assessment to future stages of development, especially once petroleum resources are identified. This approach is flawed because it allows potentially significant environmental impacts to be addressed only after the exploration phase has already occurred. By postponing the evaluation of potential impacts, this approach risks underestimating the long-term effects of exploration and related activities, making it difficult to design effective mitigation measures once the project is underway. Early, proactive assessment is critical to understanding the full scope of cumulative impacts.

Potential Unforeseen Cumulative Effects

82. The DESIAR's reliance on the assumption that "future activities cannot be reasonably defined" undermines the need to consider potential unforeseen cumulative effects. As the world faces increasingly complex environmental challenges, the interconnectedness of environmental systems is more apparent than ever. For example, the cumulative effects of local exploration activities could compound broader regional environmental issues, such as climate change or ocean acidification. A failure to account for these broader effects limits the effectiveness of the cumulative impact assessment.
83. While the DESIAR emphasizes the importance of including past, present, and reasonably foreseeable future activities, it still suggests that the analysis be constrained by current practical limitations. This approach underplays the importance of adopting a holistic, integrated approach to cumulative impact assessment that considers not only direct impacts but also cumulative environmental, social, and economic consequences. A truly meaningful cumulative impact assessment should examine the full scope of environmental risks and integrate broader social and economic factors, addressing both the immediate and long-term challenges posed by the project.
84. A consistent theme of the comments in this submission, has to do with DESIAR's insufficient consideration of the cumulative impacts of the proposed drilling activities. Each impact that is likely to arise as a result of the proposed drilling activities, requires a consideration of such cumulative impacts since each additional project in or near the proposed drilling site is associated with a set of risks that compound when they occur in close spatial or temporal proximity. Since multiple projects of the same or of a similar nature occur at the same time, this increases the scope and intensity of the majority of impacts associated with the proposed drilling activities. The consequences of this is an exponential increase in the probability of harm for marine organisms and an increase on the probability for elevated stress levels in marine organisms at a regional level. A failure to adequately consider the cumulative impacts of a number of multiple projects of the same of a similar nature taking place within the same vicinity of the proposed drilling activities, will render

the mitigation measures designed to respond to the impacts as identified by the DESIAR less effective, if at all.

85. The DESIAR does offer an assessment of potential cumulative impacts that may arise as a result of the collective impact of various prior, current and future drilling activities at or near the location of the proposed drilling activities. However, the framing of the cumulative impacts assessment is cloaked in language that seems to present any assessment of such cumulative impacts as inherently indeterminable. The nature, scope and damage of the highlighted cumulative impacts in the DESIAR is couched in the claim that cumulative impacts assessments are 'speculative', 'potential', 'temporary' and/or 'unpredictable'. As a result of this cumulative impacts assessment framing, the DESIAR misconstrues and evades a scientifically rigorous assessment of the cumulative impacts to which the proposed drilling activities will form part.
86. In its analysis of the cumulative impacts of noise, The DESIAR seems to repeatedly conflate or equate *cumulative* with *concurrent* in multiple instances. When addressing cumulative noise impacts for instance, the DESIAR states that 'it is expected that fewer than five wells will be drilled concurrently in the region, limiting the overall noise impact footprint at any one time.'. There is no way in which it can be guaranteed that concurrent drilling will not occur since there exists no explicit prohibition against concurrent drilling. In any case, it can be said as a matter of fact, that other offshore activities with noise impacts will be taking place concurrently with the proposed drilling activities in questions and as such, there will be concurrent cumulative noise impacts that require a thorough and comprehensive assessment.
87. These concurrent cumulative impacts must also be considered against the background of prior comments above, in which it is highlighted that even in the analysis of the specific noise impacts of the proposed drilling in question, there have been methodological flaws. Namely, that the DESIAR has failed to quantify baseline ambient sound level, impact of sound travelling over distance when immitted in the SAFAR channel and absence of a sufficient assessment of singular and cumulative soundscape alterations. It is clear that a sufficient assessment of cumulative impacts would produce a different set of risks, impacts, conclusions, and mitigation measures than the ones presented in the DESIAR.
88. A major reason for the importance of presenting a full and insightful assessment of the cumulative impacts to which a proposed drilling project will be contributing is that the expansion of oil and gas drilling operations across the south African coast line will inevitable have predictable and dire climate change impacts which the south African legal, policy and international obligations frameworks have an interest in addressing, managing and preventing. The emphasis on the crucial nature of a solid analysis of cumulative impacts is a critical way of having regard to the global Climate Emergency and South Africa's international commitment in the NDC to 'working with others to ensure temperature increases are kept well below 2°C above pre-industrial levels, which could include a further revision of the temperature goal to

below 1.5°C in light of emerging science’ by reducing greenhouse gas (GHG) emissions. The proposed drilling activities, if additional commercially viable resources are identified and developed through to production phase, will inevitably add to South Africa’s overall GHG emissions. As such, climate change is a reasonably foreseeable future impact especially in combination with impacts arising from similar offshore oil and gas exploration and production activities. The cumulative impacts of GHG emissions need to be identified and assessed because such evaluations of emissions is entirely possible. By approving each project in isolation instead of in cumulative, the South African government cannot know whether the major push to develop South Africa’s oil and gas resources is consistent with the country’s climate change obligations.

CONCLUSION

89. The phase out of oil and gas is urgently needed to avert the climate crisis, to protect and promote the State’s obligations to provide basic necessities such as water, food, shelter and an environment that is not harmful to health or well-being. Given this, the exploitation of oil and gas is not needed, is undesirable, is locally and globally irresponsible, is contrary to South Africa’s international climate change and biodiversity commitments and contravenes the State’s obligations under section 24 of the Constitution. The Green Connection and Natural Justice object to the authorisation of the proposed production activities.