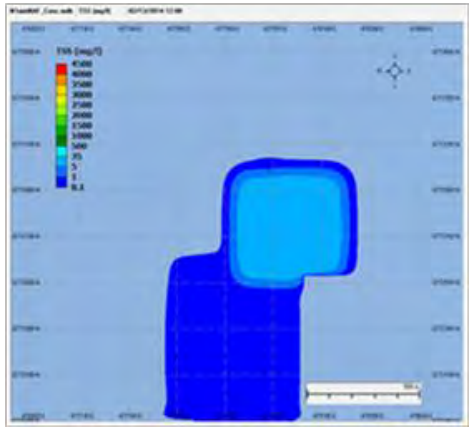
PART 3: EIA Results

Moderate to Minor Impacts to Marine Ecology

Impacts related to drilling cuttings and muds on normal and sensitive benthic communities from smothering and bioaccumulation of Non-Aqueous Drilling Fluid (NADF)

- The **disposal of drill cuttings** and muds to the seabed could cause smothering of sensitive sessile benthic fauna, if present, and physical alteration of the benthic habitat **<200m from the well**
- In order to **avoid impacts** to sensitive habitats Eni will conduct **a pre-drilling ROV survey** to determine if there are any sensitive habitats present on the seabed and position the well at least 500 m from the sensitivity.
- Areas of deposition of <5mm thickness will be mainly isolated to within a 100m radius of the wellhead.
- Discharged cuttings will contain less than 5% of drilling fluid by weight. The adoption of dryer system will **minimize the presence of residual NADF** mud adhered to cuttings.

- The overall footprint **deposition, > 1 mm**, impacts a maximum area of **7km^2** around the well site.
- Mobile **benthos will recolonise** the impacted area relatively quickly.



Source: ERM

Moderate to Minor Impacts to Marine Ecology

Impacts of helicopter noise associated with drilling on marine fauna and seabirds

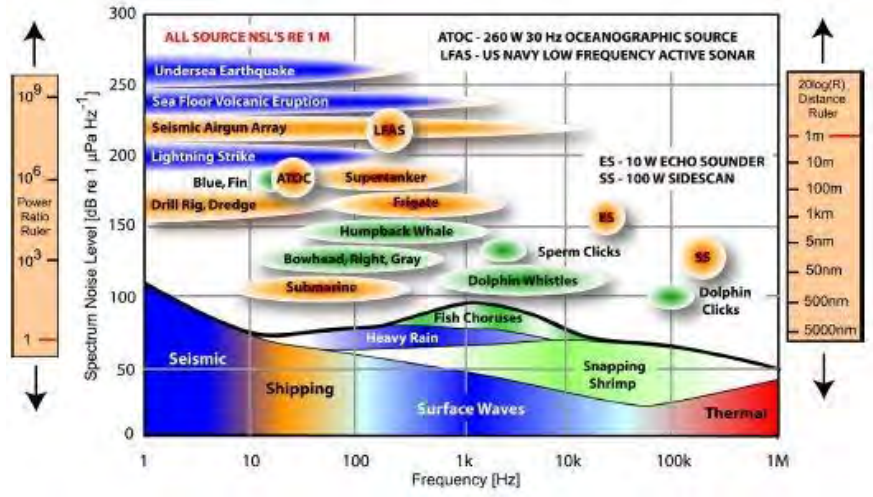
- Noise generated by helicopters undertaking crew transfers between helipad and the drillship could **affect seabirds** in breeding colonies and roosts on the coast. Negative effects of disturbance to seabirds by aircraft include reduction of usable habitat, increased energy expenditure, reduced food intake and resting time and ultimately affect breeding success.
- Reactions to aircraft flyovers vary both within and between species, and range from **no or an observable behavioral response.**

Source: Shutterstock

Moderate to Minor Impacts to Marine Ecology

Impacts of underwater noise generated by drilling and vessels on marine fauna masking behaviour

- The sound level generated by drilling operations and vessels fall within the 120 to 190 dB re 1 µPa range, **comparable with common noise range of shipping** and commercial vessels.
- The underwater noise generated by drilling operations falls within the hearing range of most fish and marine mammals.
- Noise impacts could result in **localised behavioral changes or masking** of biologically relevant sounds in marine fauna.
- Marine fauna may either respond by retreating from the noise or could be attracted to the source.
- The species most vulnerable to noise disturbance in the project area are turtles, pelagic seabirds, large migratory pelagic fish and both migratory and resident cetaceans.

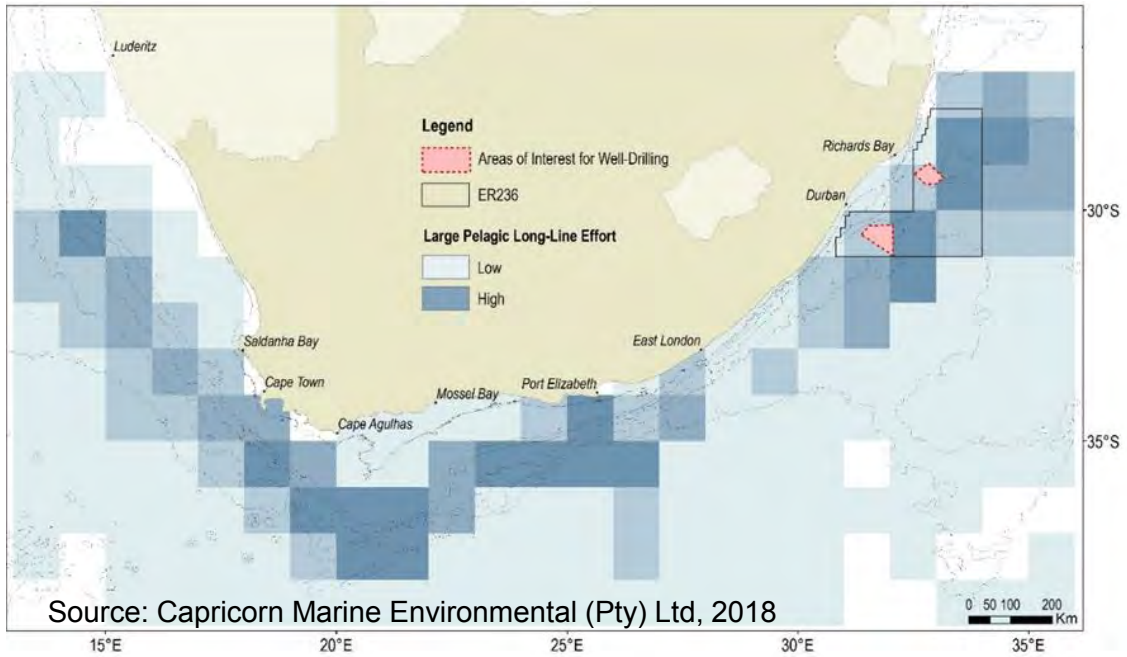


Source: Goold & Coates 2001

Minor Impacts to Fisheries

Pelagic Fishing:

- The fishery operates extensively within the South African EEZ, primarily along the continental shelf break and further offshore.
- There are currently 30 commercial large pelagic fishing rights issued and 21 vessels active in the pelagic fishery.
- Areas with medium effort for pelagic longline fishery overlap with the drilling areas of interest.
- During drilling operations no fishing is allowed within the exclusion zone (**500 m** radius around drillship).
- The **impact** was considered **be local in extent** (limited to the area of interest) and of **short-term duration** (up to two months).
- The scale of the impact is determined to be small.



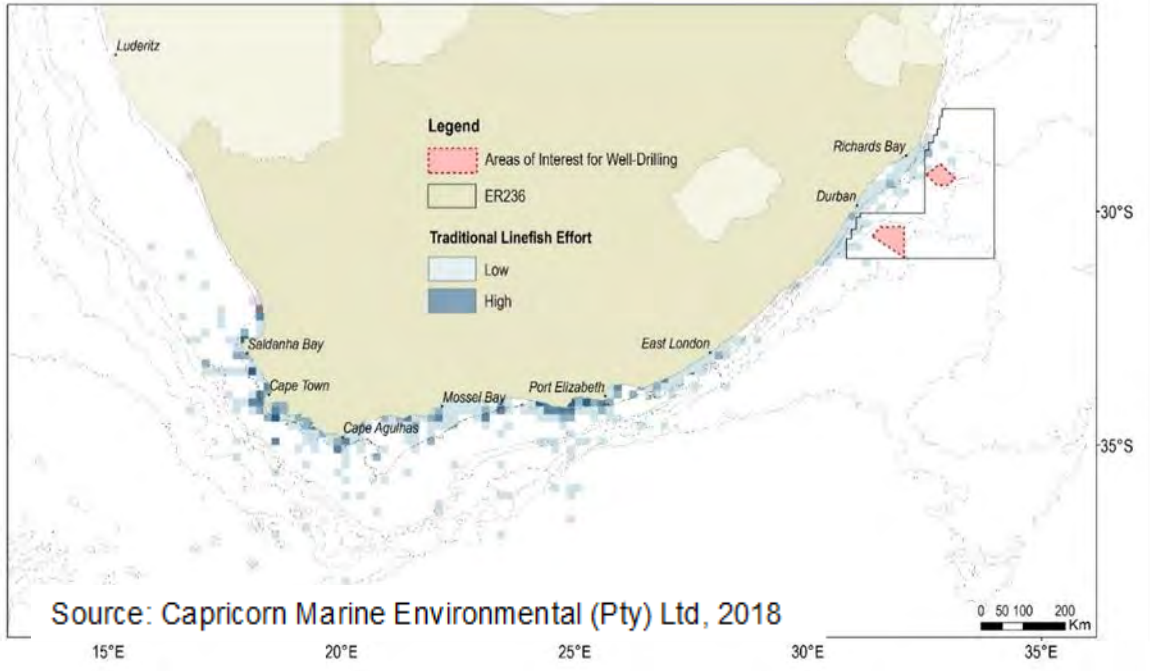
Source: Capricorn Marine Environmental (Pty) Ltd, 2018

Spatial distribution the long-line sector targeting large pelagic species in relation to ER236 and the drilling areas of interest

Minor Impacts to Fisheries

Nearshore (Coastal) Fishing:

- The KwaZulu-Natal (KZN) prawn trawl fishery lies 30 to 35km inshore of the northern and southern drilling areas of interest, respectively.
- The KZN line-fish fishing effort lies at least 10km and 35km inshore of the northern and southern drilling areas of interest, respectively.
- The KZN line-fish and prawn trawl fishery partially overlap with the Block but no areas overlap with drilling area of interest.
- During drilling operations there will be **no impact to the linefish and crustacean trawl** fisheries.



Spatial distribution of traditional line-fish sector showing there is no interaction with ER236 and the drilling areas of interest

Risk Significance of Unplanned Events

An **unplanned/ accidental event** is a foreseeable unlikely incident with a very low probability of occurrence.

MODELLING CONDUCTED

Three accidental spill scenarios events were assessed in the EIA Report to predict their consequences:

1. Accidental **oil spill due to a vessel collision**;
2. Accidental **oil spill due to a blowout**; and
3. Emergency **release of Non-Aqueous Drilling Fluid** (NADF) due to the **disconnection of the riser**.

The simulations have been performed without the response and mitigation measures applied. This is a **unrealistic situation with no mitigation.** In reality Eni and its contractor will immediately **activate the Contingency Plan to promptly react** to the emergency, limit the environmental impacts and solve the emergency situation.

LIKELIHOOD / PROBABILITY OF A SPILL

- The **probability of a blowout is very low** where the frequency of occurrence is 2.5×10^{-4} ,**1 case in 4,000 drilled wells** (OGP Report, 2010).
- Eni assesses the risk of a well blowout, from the geological factors, tools reliability and human errors, during the well design phase and considers the use and development of new technology to minimize the risk. This results in a **reduction of the blowout frequency** from 10^{-4} down to 10^{-6}, **1 case in 400,000 drilled wells.**

Unplanned Events

RISK SIGNIFICANCE ON MARINE & COASTAL

HABITATS AND SPECIES

- A **slick** resulting from all 3 scenarios would **spread in a south-westerly direction** and would be **unlikely to reach the shore.**
- **Dissolved aromatic hydrocarbon concentrations may persist** in the top few meters of the water column beneath the slick from a blowout potentially **resulting in toxicological effects in marine fauna** coming in contact with the slick for extended periods.

LIVELIHOODS, FISHING, TOURISM

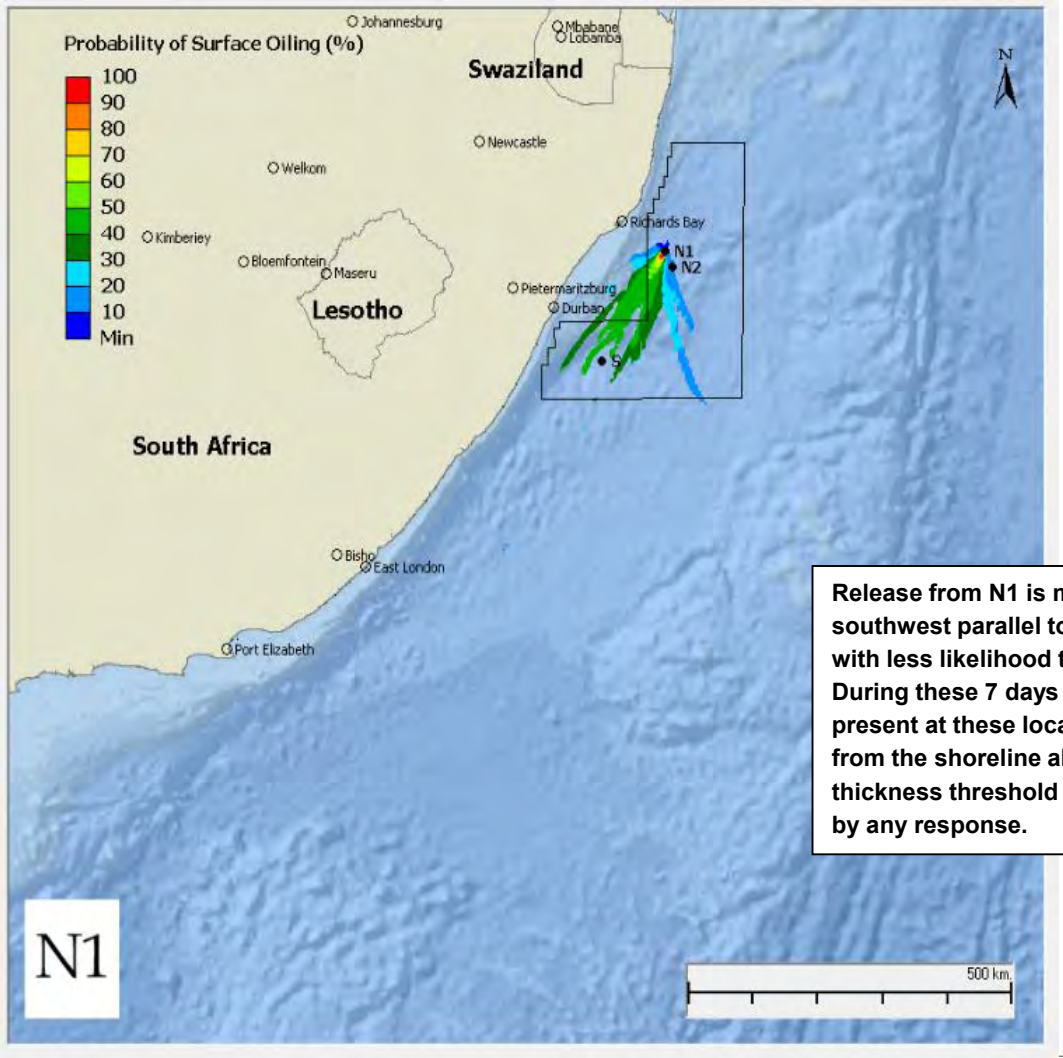
- Result of the modelling indicates that **no significant shoreline oiling would occur**, and it is therefore, unlikely that the unplanned release of hydrocarbons would affect the operations of the nearshore fisheries.
- Extent of loss of livelihood would depend of the severity of the spill and how long **clean-up operations** take to complete.
- In a vessel to vessel collision there is a risk of injury or fatalities to crew or passengers on other vessel and loss of work.
- Disturbances and damages to fishing/tourism would result in the **temporary stand-by and loss of access** during the implementation of the oil spill contingency plan.

Oil Spill Modelling Results

THRESHOLDS APPLIED TO MODELLING

- Significant slick thickness: 1 µm minimum thickness threshold for smothering of aquatic organisms and wildlife.
- Significant shoreline mass flux: 100 g oil/m² threshold for shoreline oiling, provides a lower-limit to delineate significance for injuring wildlife making contact with shoreline deposits.
- Dissolved Aromatic Hydrocarbon (DAH): highly conservative 5 parts per billion (ppb) threshold, indicates that there is no observable effects on organisms in terms of narcosis from aromatic hydrocarbons content within an oil spill.

Oil Spill Modelling Scenarios and Results of the Northern Well

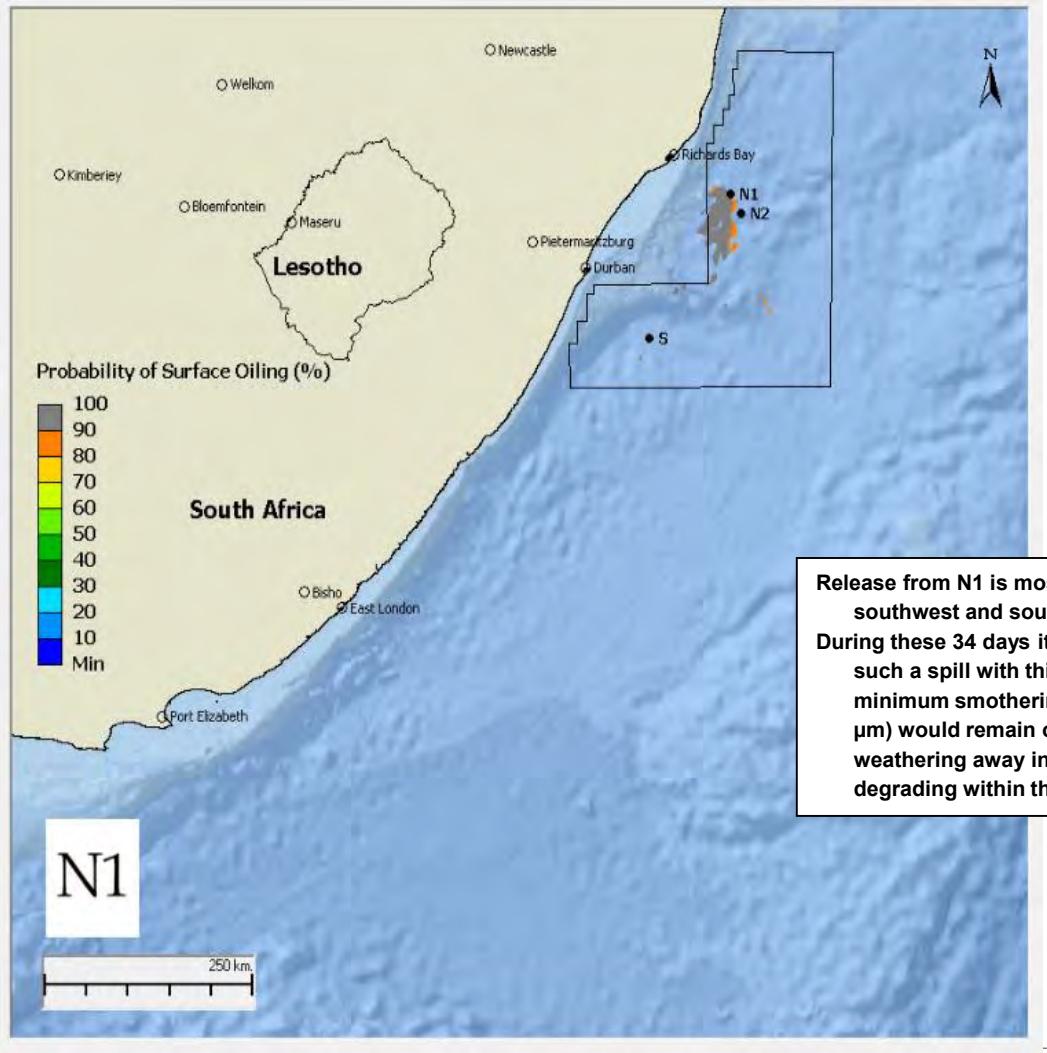


Release from N1 is most likely to travel southwest parallel to the coastline and with less likelihood to the southeast. During these 7 days the diesel could be present at these locations up to 50 km from the shoreline above the 1 µm thickness threshold if left unmitigated by any response.

Scenario 1: Vessel Collision Diesel Spill

The figure shows the probability of oil being present at a location on the water surface from a very unlikely diesel oil spill due to a vessel collision.

Oil Spill Modelling Scenarios and Results of the Northern Well



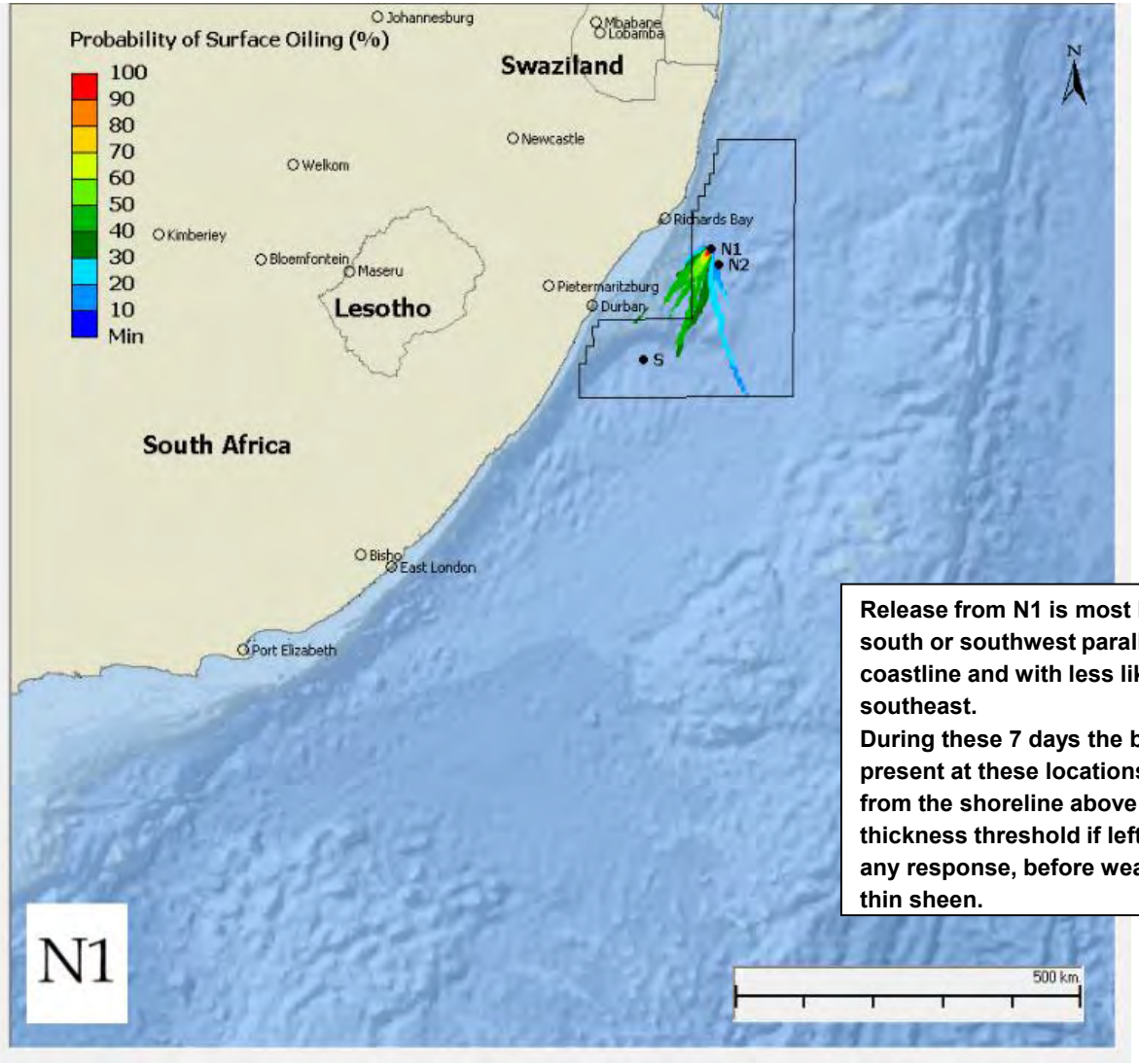
Release from N1 is most likely to travel southwest and south.

During these 34 days it is highly likely that such a spill with thickness above the minimum smothering thickness (1.0 µm) would remain out to sea before weathering away into a thin sheen or degrading within the ocean.

Scenario 2b: 20-Day Crude Oil Blowout

The figure shows the probability of oil being present at a location on the water surface from a very unlikely crude oil spill due to a blowout being stopped by the installation of a capping system after 20 days of release.

Oil Spill Modelling Scenarios and Results of the Northern Well

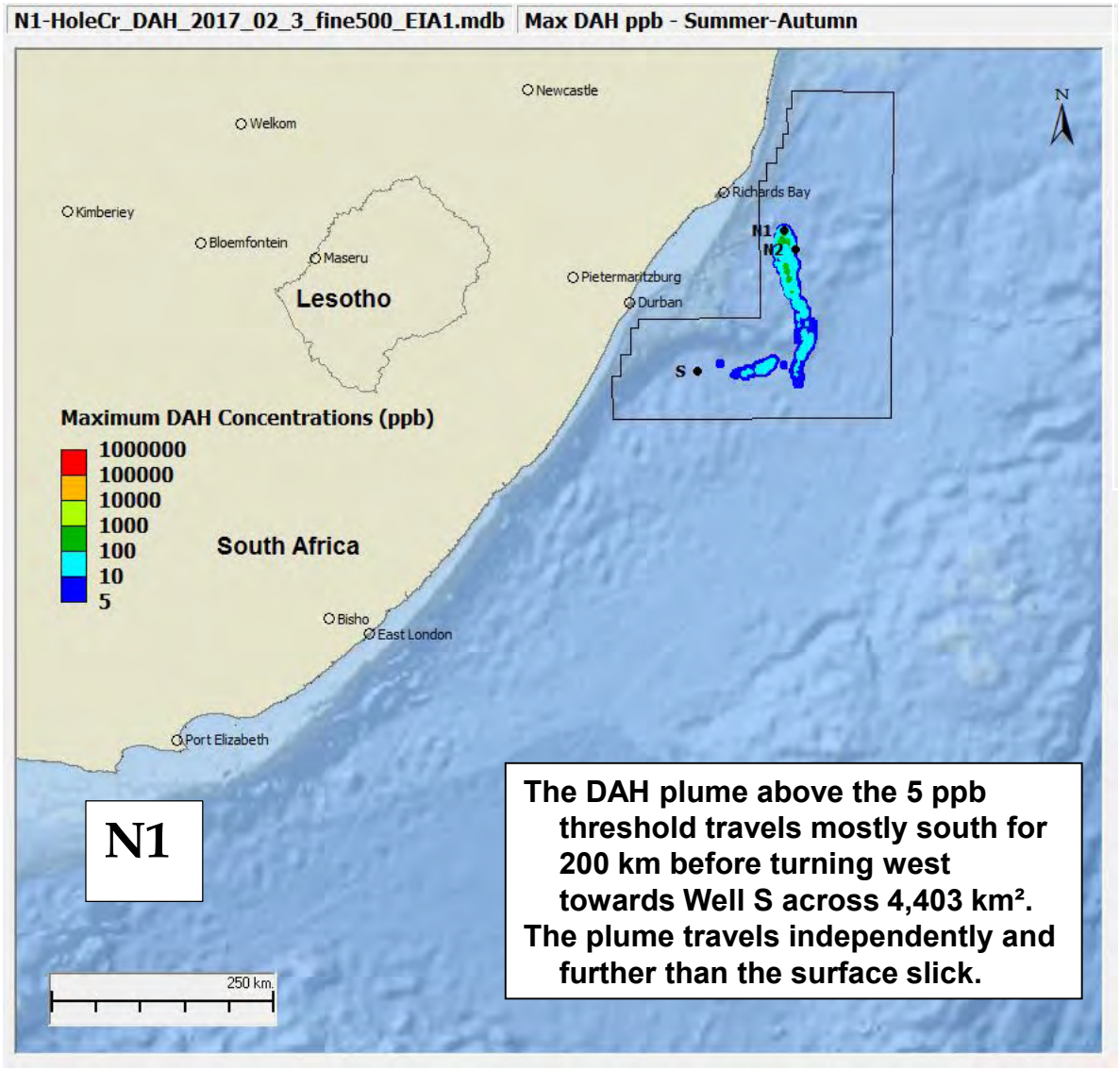


Release from N1 is most likely to travel south or southwest parallel to the coastline and with less likelihood to the southeast.
During these 7 days the base oil could be present at these locations up to 60 km from the shoreline above the 1 µm thickness threshold if left unmitigated by any response, before weathering away to a thin sheen.

Scenario 3: NADF Mud Release

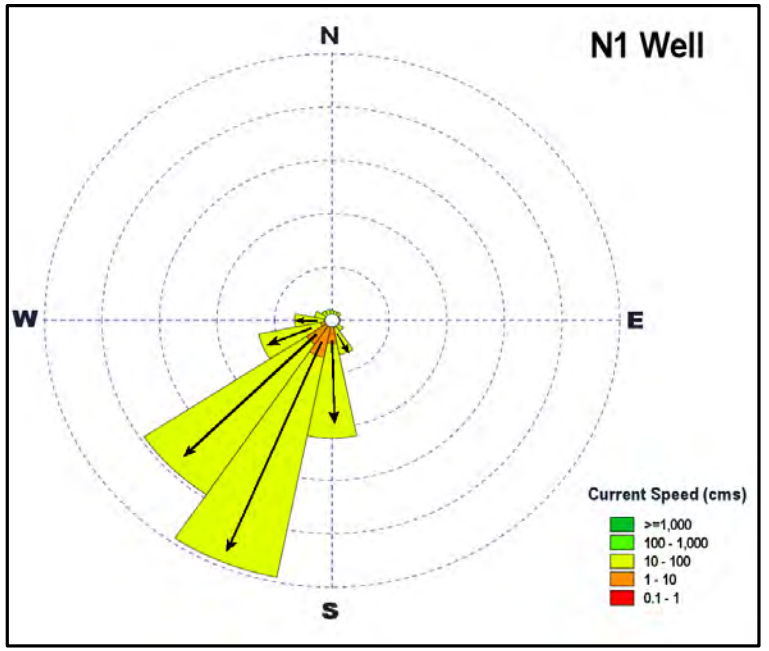
The figure shows the probability of oil being present at a location on the water surface a very unlikely oil spill due to a riser disconnect and No Aqueous Drilling Fluid (NADF) dispersion.

DAH Results of the Northern Well



The maximum concentrations of dissolved aromatics in the water from a 7-day blowout over a 21-day period from a very unlikely oil spill. The colored contours depict the DAH at various concentrations increasing by order of magnitude starting with 5 ppb, the designated acute toxic threshold.

Note that this maximum value may be present at any depth, but if typically near the surface except for the plume of DAH rising from the blowout.



Risk Prevention and Response Measures

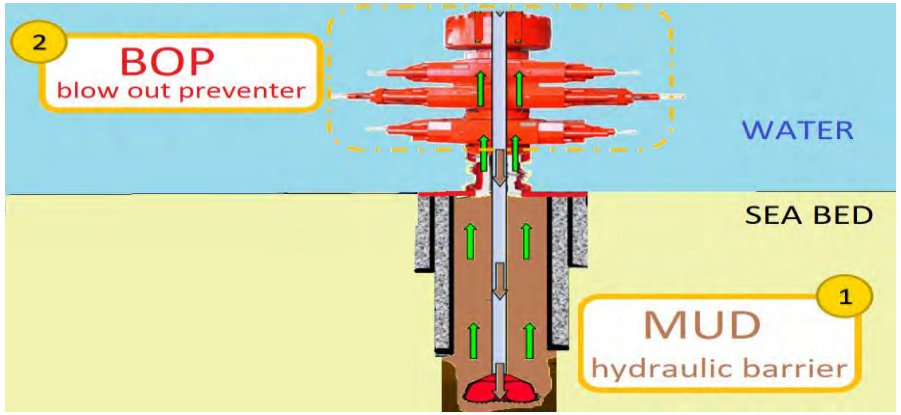
SHUT IN OF WELL IN CASE OF EMERGENCY

In case of an emergency when all preventing and well control actions are not sufficient, different mechanical tools can be used to shut in the well, such as:

- Flow-back preventing valve inside the drilling string; and
- Subsea BOP (Blowout Preventer).

The BOP rapidly seals the well (or “shut in”) and its use is mandatory to avoid an unwanted release of hydrocarbon to surface, also called “blowout”. The BOP will be regularly pressure and function tested as per ISO/API standards.

Recent development of new technologies allows the availability of a back-up tool: the capping stack system.



Source: Eni

Risk Prevention and Response Measures

AVOIDANCE AND PREVENTATIVE MEASURES

- Eni and its contractors have competent, certified and qualified staff.
- Adoption of **highest industry standard**, for **well design, material** and **equipment selection, drilling procedures** and **operations** to guarantee integrity and provide **multiple barriers** (adoption of dual barrier principle). For instance:
  - **Casings and equipment selection** designed to withstand a variety of forces, such as collapse, burst or tensile failure & chemical aggression;
  - **Weighted mud properties selection and control**: to guarantee wellbore stability and bottom hole pressure balanced, controlling its properties and using downhole/surface sensors for monitoring; and
  - **Blowout prevention**: presence of certified safety critical equipment, e.g. BOP Preventer Stack, to control pressure anomalies.
- Drilling program revised by Eni HQ drilling technical authority.
- Preparation and approval of an **Emergency Response and Oil Spill Contingency Plans.**

Source: Shutterstock

Risk Prevention and Response Measures

REDUCTION AND RESPONSE MEASURES

- In case of unwanted emergency, Eni will adopt the contingency plans to promptly react and reduce effects. The presence and application of the Oil Spill Contingency Plan is mandatory. It is based on 3 principle components:
  - Crisis management and control;
  - Spill response, containment and clean-up; and
  - Well control.
- BOP immediate closure and sealing of well; in case of BOP failure, mobilisation and installation of capping system.
- Deployment and use of offshore containment equipment including booms, skimmers, tanks, dispersants.
  - Eni will provide primary response equipment on board of vessels; additional will be mobilised from onshore.
- Onshore mobilisation and installation of containment, absorbent and clean-up equipment in case of spill approaching the shore.

Source: Eni

Negligible Impacts From Planned Activities

- Wastewater discharges from operational project vessels on marine fauna;
- Pre- drilling and drilling operations on seabed sediments & benthic fauna;
- Abandoned (“decommissioned”) wellhead on marine based activities;
- Light from project vessels on marine and avian fauna;
- Project greenhouse gas emissions on climate change;
- Maritime heritage from drilling operations; and
- Creation of local employment opportunities.

Source: Shutterstock

Environmental Management Programme

Purpose of the EMPr: The EMPr details the mitigation measures, which must be implemented during the project and assigns responsibilities for specific tasks.

It is applicable to all work activities during the planning, mobilisation, drilling and demobilisation of the proposed activities.

ROLES AND RESPONSIBILITIES

Eni's primary responsibility to meet environmental and safety commitments with application and respect of international best practise and standards, top industry technology and with the presence of dedicated competent, skilled and trained personnel that will manage and oversee all the Environmental, Health and Safety (EHS) aspects throughout the project life cycle.

Source: Shutterstock

Environmental Management Programme

SPECIFIC MANAGEMENT PLANS TO BE DEVELOPED BY ENI

Emergency Response Plan

- Prepare and respond to process unwanted, accidental, and emergency situations in a manner appropriate to the operational risks, and to prevent/limit their potential negative consequences.

Oil Spill Contingency Plan

- Drafted prior to the commencement of drilling activities.
- The plan includes all resources and actions required to manage different levels of severity (Tiers) of oil spill.
- To be reviewed by PASA and the DEA, where the pollution certificate is issued by SAMSA prior to start of drilling.

Waste Management Plan

- Establishes the procedures adopted for the management of waste for both offshore and onshore operations (drilling, vessels, onshore support facilities).
- It will cover the waste collection, transport, storage, treatment, recycle/reuse, discharge, disposal, and data reporting.
- It will comply with applicable National Law and International Conventions for the Prevention of Pollution from Ships (MARPOL 73/78).

Stakeholder Communication Plan

- Tailored to allow the effective communication.
- Includes a grievance mechanism to receive and facilitate grievances and communication with affected stakeholders.

Environmental Management Programme

KEY MITIGATION MEASURES TO BE IMPLEMENTED

Pelagic longline fishery

- Presence of 500 m Exclusion Zone around vessels
- Affected stakeholders to be notified of the location, duration and likely implication of drilling activities

Air & GHG emissions on climate change

- Compliance to MARPOL 73/78 Annex VI regulations regarding the reduction of greenhouse gas (GHG) emissions from vessel engines.
- All diesel motors and generators will undergo routine inspections and receive adequate maintenance to minimise soot and unburnt diesel released to the atmosphere

Wastewater discharges on marine fauna

- Compliance with MARPOL 73/78 Annex I, Annex IV, Annex V standards for all project vessels

Seabed and benthic fauna sensitivities

- Ensure drill site is located more than 500m from any identified vulnerable habitats

Discharge of drilling cuttings and mud

- Use high efficiency solids control equipment to minimize liquid content on cuttings, maximize reuse and recycle of drilling mud and minimise the final residual spent mud
- Perform regular test prior of discharge to guarantee compliance to limits and with international good practice.

Noise

- Regularly maintain vessels to reduce noise
- Avoid extensive low-altitude coastal flights from helicopters (<914 m and within 2km of the shore)

Lights from project vessels

- Lighting on drilling vessels to be oriented and reduced but to be always compatible with safe operations

Damage to marine cultural heritage

- Review data demonstrated no evidence of shipwrecks. Perform a ROV survey prior to operations.

Local employment creation

- Eni will establish a recruitment policy which prioritises the employment of South African and local residents, where possible.

You can also submit your comments on the Draft EIA Report to ERM:

Email: eni.offshore.eia@erm.com

Post: Postnet Suite 90, Private Bag X12,Tokai, 7966

Tel: 021 681 5400

Website: www.erm.com/eni-exploration-eia

Thank you

The business of sustainability

ERM

Annex C5

Communication with Commenting Authorities

Commenting authorities were informed of the project through telephonic and electronic communication.

C5.1. Notifications Letter
Notification letters were sent to all relevant commenting authorities on 19 October 2018. The letters informed the relevant commenting authorities of the commenting period and the availability of the draft EIA report.

C5.2. Emails Notifications
Emails notifications were sent to the relevant commenting authorities to inform them of the release of the Draft EIA and reminding them to submit comments.

C5.3. Ezemvelo KZN Wildlife Acknowledgement
Ezemvelo KZN Wildlife issued a letter acknowledging receipt of the draft EIA report and stating that they will peruse and issue a comment.

C5.4. KZN DAFF Response
DAFF forestry acknowledged receipt of the EIA report and stated that they would re-route the report to the DAFF Fisheries management branch for comment.

C5.5. Communication with SAHRA
The EIA report was uploaded on the South African Heritage Resource Association (SAHRA) website upon request.