



# PROPOSED SEABED SEDIMENT SAMPLING IN BLOCK 1 OFF THE WEST COAST OF SOUTH AFRICA

PASA REF NO: 12/3/83 ER

## BACKGROUND INFORMATION DOCUMENT

AUGUST 2014

### 1. PROJECT BACKGROUND

Cairn South Africa (Pty) Ltd (hereafter referred to as "Cairn") is the operator and holder of an existing Exploration Right for undertaking seismic surveys and exploration drilling in Block 1. Block 1 is located off the northern West Coast of South Africa roughly between Alexander Bay and Kleinsee (see Figure 1). The block area is approximately 20 000 km<sup>2</sup> in extent with water depths ranging from 20 m to 750 m. Cairn recently took over as operator of Block 1 from the Petroleum Oil and Gas Corporation of South Africa (Pty) Ltd (PetroSA), which has retained a 40 % working interest in the block.

Prior to Cairn's involvement in Block 1, PetroSA obtained the Exploration Right for the area in December 2008 in terms of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA). As part of the process of applying for the Exploration Right, an Environmental Management Programme (EMPr) and subsequent Addendum Reports were compiled and approved for the undertaking of two- (2D) and three-dimensional (3D) seismic surveys and exploration drilling of four to six wells within a portion of the block. Exploration drilling also received Environmental Authorisation under the National Environmental Management Act, 1998 (No. 107 of 1998) (NEMA), as amended.

Under the aforementioned EMPr, three seismic surveys have been undertaken to date. Application has subsequently been made in terms of the MPRDA and NEMA to expand the approved drilling programme for a further possible five wells outside the area that is already approved for drilling and a Scoping & Environmental Impact Assessment (S&EIA) process is currently being undertaken in this regard.

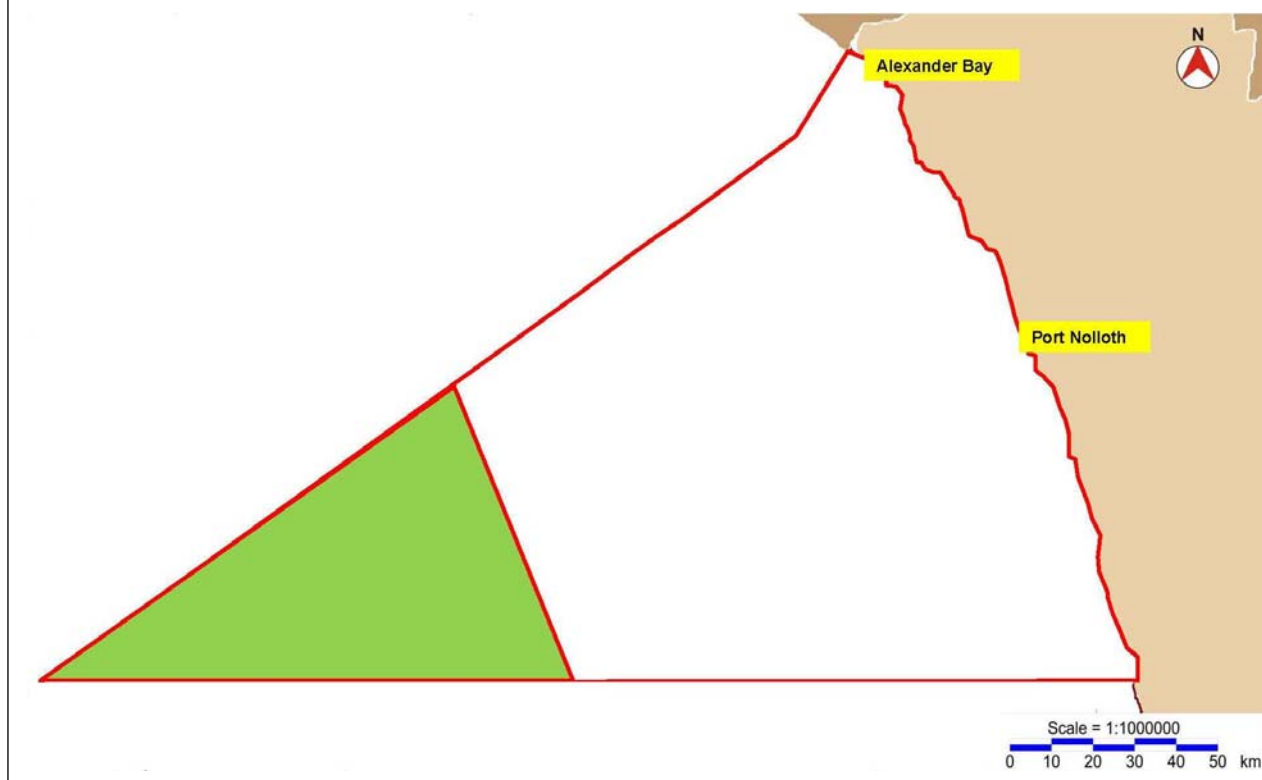
Cairn is now proposing to undertake seabed sediment sampling over the western portion of the licence area (see Figure 1).

### 2. PURPOSE OF THIS DOCUMENT

This Background Information Document (BID) serves to:

- inform interested and affected parties (I&APs) about the legislative process that Cairn is required to comply with;
- provide a description of the proposed seabed sediment sampling activities;
- describe the study process;
- present the specialist consultants' scope of work; and
- describe how I&APs can participate in the process.

**Figure 1: Locality of Block 1 off the West Coast of South Africa. The focus area for seabed sediment sampling is shown in green.**



### **3. WHO ARE THE CONSULTANTS?**

CCA Environmental (Pty) Ltd (CCA) has been appointed by Cairn to undertake the necessary application process in terms of the MPRDA.

### **4. WHAT AUTHORISATION IS REQUIRED?**

The proposed seabed sediment sampling activities require the amendment of the approved EMPr in terms of the MPRDA. This application will be dealt with separately to the process currently underway for the expanded exploration drilling programme.

The proposed sampling does not trigger any activity listed under the NEMA. Thus no environmental authorisation is required for these activities.

#### **4.1 MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002: EMPR ADDENDUM**

In terms of the MPRDA exploration activities may not begin prior to the issuing of an Exploration Right. A requirement of obtaining an Exploration Right is that an EMPr must be compiled in terms of Section 39 of the MPRDA, submitted to Petroleum Agency SA (PASA) for consideration and approved by the Minister of Mineral Resources (or the delegated authority). To proceed with the proposed seabed sediment sampling activities in Block 1 requires an amendment application in terms of Sections 29(6) and 102 of the MPRDA. An EMPr Addendum covering the proposed seabed sediment sampling will be compiled and submitted to PASA in this regard.

## 5. PROJECT OVERVIEW

The proposed seabed sediment sampling programme would include a drop core survey as well as a geotechnical investigation of the seabed properties in the block. The proposed sampling activities are likely to occur during a fair weather period in 2015.

### 5.1 DROP CORING

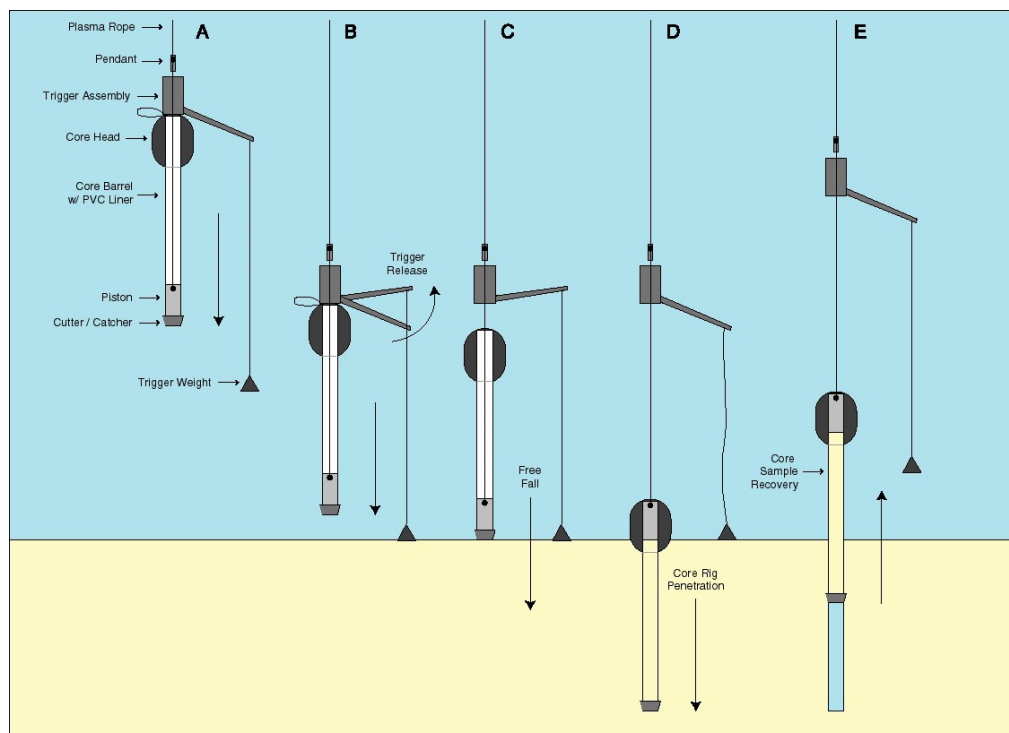
#### 5.1.1 Activity description

The proposed drop core (or piston core) survey would be designed to sample for potential hydrocarbon seepage occurring naturally at the seabed. Drop coring entails the collection of seafloor sediment samples for laboratory geochemical analyses.

Drop coring is one of the more common seafloor sampling methods. A piston coring device with ultra-short baseline (USBL) navigation would be used to accurately target and collect the seafloor samples (see Figure 2). The programme would likely utilise a piston corer (approximately 1 000 kg) capable of retrieving sediment samples that are approximately 6 m to 7 m in length.

The piston corer is lowered over the side of the survey vessel on a line and allowed to free fall from about 3 m above the seafloor to allow better penetration (see Figure 2-A). As the trigger weight hits the bottom (Figure 2-B), it releases the weight on the trigger arm and the corer is released to "free-fall" the 3 m distance to the bottom (Figure 2-B & C), forcing the core barrel to travel down over the piston into the sediment (Figure 2-D). The movement of the core barrel over the piston creates suction below the piston and expels the water out the top of the corer. When forward momentum of the core has stopped, a slow pullout of the winch commences. This suction triggers the separation of the top and bottom sections of the piston (Figure 2-E). The corer and sample are then slowly pulled from the seafloor and retrieved.

**Figure 2: Schematic of a drop piston core operation at the seabed (from TDI Brooks).**



At the surface, recovered sediment samples are visually described and the presence/absence of hydrogen sulphide and oil noted. Samples are taken, sealed and frozen on board for later transfer to laboratories on shore for geochemical analysis. The residual core sample is then disposed overboard.

### **5.1.2 Sample location and quantity**

Sampling locations are chosen based on observed features on the seafloor that could indicate fluid expulsion or small fault scarps. Additional sites may be located above potential migratory pathways observed on seismic data. It is anticipated that approximately 45 core samples would be collected within the western triangular area indicated in Figure 1. Each individual core would have a disturbance volume of 0.05 m<sup>3</sup>, resulting in a maximum disturbance volume of approximately 2.55 m<sup>3</sup>.

## **5.2 GEOTECHNICAL INVESTIGATION**

### **5.2.1 Activity description**

In order to safely design and establish offshore structures, a clear understanding of the nature of the seafloor (e.g. type of sediment, rocky outcrops, etc.) is required. Geotechnical investigations seek to obtain information on a number of features including:

- Geological history;
- Vertical and horizontal uniformity of seabed soils;
- Stratification and variability of sediments and rocks; and
- Soil strength, deformation and consolidation characteristics.

A number of techniques can be applied to recover samples for analysis (e.g. gravity coring, piston coring, Abrams coring, Kullenberg device, box coring, push-in sampling and grab sampling). The proposed geotechnical investigation in Block 1 would make use of a coring type technique, however, the specific type of coring has as yet not been determined. Recovered samples are sent to laboratories onshore for analysis in order to determine specific engineering parameters.

### **5.2.2 Sample location and quantity**

The geotechnical investigation would also be undertaken in the western triangular area of the block (see Figure 1). Approximately 10-20 samples would be obtained for geotechnical analysis. The exact number and size of samples would ultimately be determined by the coring method selected. The geotechnical sampling programme would be designed such that the maximum disturbance volume would be less than 2.45 m<sup>3</sup>.

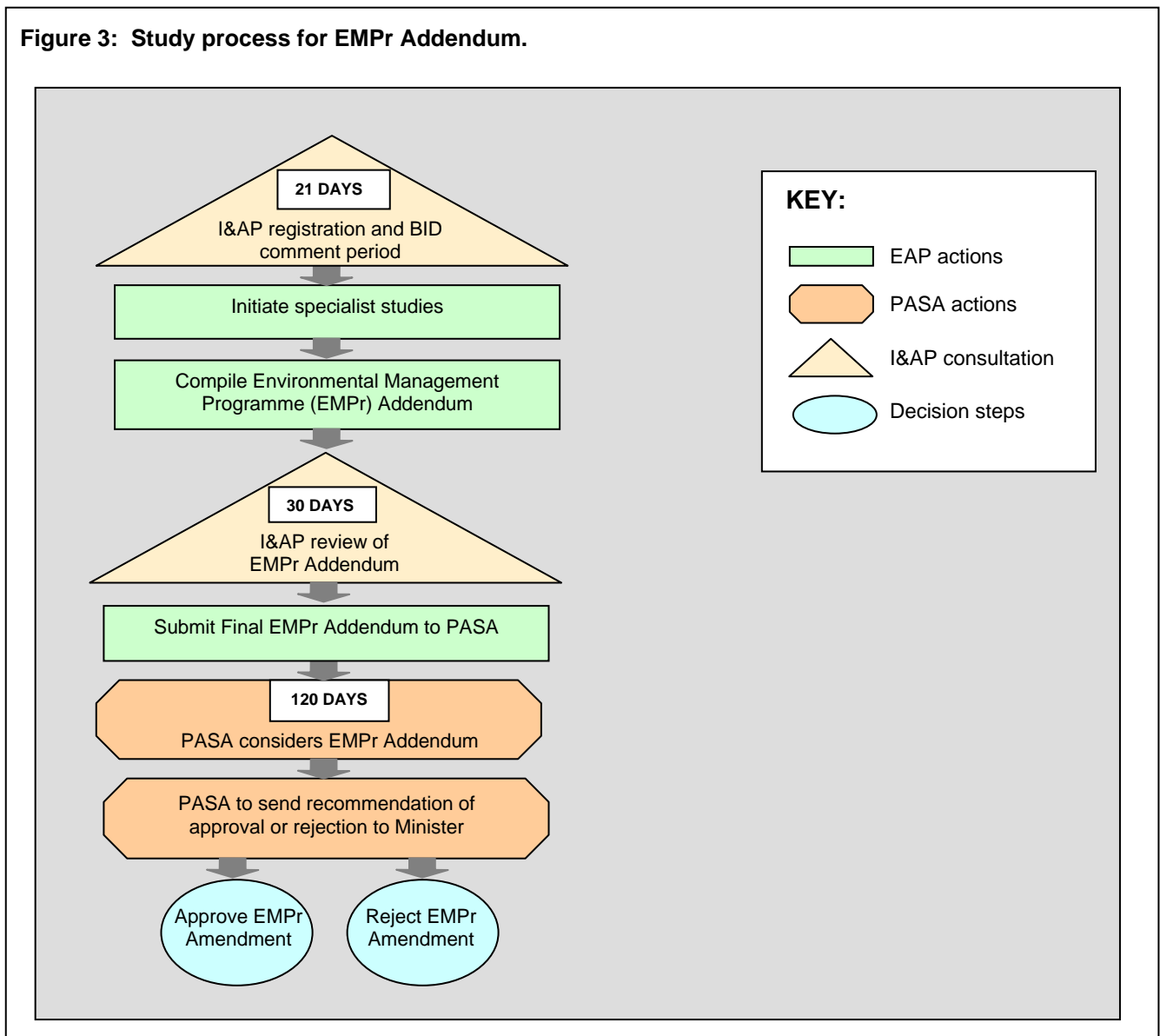
## **6. KEY ISSUES TO BE INVESTIGATED**

The key focus areas that have been identified, and that will be addressed in the EMPr Addendum for the seabed sediment sampling activities, include:

- Disturbance and loss of benthic macrofauna habitat due to the removal of sediment samples;
- Potential effects on the fishing industry due to temporary displacement of fishing activities;
- Potential interference with marine traffic; and
- Waste discharge to sea and atmosphere.

## 7. THE STUDY PROCESS

The EMPr Addendum study process is shown in Figure 3.



### 7.1 Public participation

The key steps in the process where you can participate and provide input include:

- Distribution of BID for a 21-day comment and I&AP registration period; and
- Distribution of EMPr Addendum for a 30-day comment period.

Comments received during the 21-day comment and registration period will be collated and responded to in an Issues Trail which will be included with the EMPr Addendum. Any comments on the EMPr Addendum will be forwarded to PASA directly for consideration.

## 7.2 Impact Assessment

The EMPr Addendum will include the identification of impacts and the determination of the significance of impacts. Specialists will provide management actions to enhance positive benefits or avoid/minimise potential negative impacts. The specialist studies identified thus far to respond to the issues of concern and the potential impacts are listed below.

### **Marine Faunal Assessment (Pisces Environmental Services: Dr Andrea Pulfrich)**

- Describe the local marine fauna in and around the block area;
- Determine the primary risks to the marine environment associated with seabed sediment sampling;
- Identify, describe and assess the significance of potential impacts of the proposed seabed sediment sampling activities on the local marine fauna (including the benthic and pelagic environments); and
- Identify practicable mitigation measures to reduce any negative impacts on marine fauna.

### **Fisheries Assessment (CapFish SA: Dave Japp & Sarah Wilkinson)**

- Describe the fishing activities expected in and around the block area;
- Undertake a spatial and temporal assessment of expected fishing effort in the proposed sampling area;
- Assess the risk of impact of the sampling area on the different fishing sectors;
- Assess the impact of the proposed safety zones around the sampling support vessel on the fishing activities in terms of estimated catch and due to the loss of fishing grounds; and
- Identify practicable mitigation measures to reduce any negative impacts on the fishing industry.

## 8. YOUR INVITATION TO COMMENT AND PARTICIPATE IN THE PROCESS

This BID has been distributed for a 21-day comment and I&AP registration period from 15 August 2014 to 5 September 2014. If you or your organisation wish to register as an I&AP and / or wish to raise any initial issues or concerns regarding the proposed seabed sediment sampling activities, please contact **Elizabeth Dudley** of CCA at the contact details below. An I&AP Registration and Response Form has been attached for registration and commenting purposes. In order for comments to be included in the EMPr Addendum they should be forwarded to CCA **by no later than 5 September 2014**.

**Please contact:**

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