PROPOSED SEAFLOOR GEOCHEMICAL SAMPLING PROGRAMME IN LICENCE BLOCKS 5/6 (ER #224) AND 7 (ER #228), SOUTH-WEST COAST, SOUTH AFRICA

PASA Ref No.: 12/3/224 & 12/3/228

BACKGROUND INFORMATION DOCUMENT **MAY 2013**

1. BACKGROUND

On 29 May 2012, the Petroleum Agency of South Africa (PASA) awarded the Petroleum Oil and Gas Corporation of South Africa (Pty) Ltd (PetroSA) an Exploration Right for each of Licence Blocks 5/6 (ER #224) and 7 (ER #228) off the South-West Coast of South Africa (see Figure 1). As part of the process of obtaining the Exploration Rights, an Environmental Management Programme (EMP) was compiled for the proposed exploration programme, which included the undertaking of 2D/3D seismic and controlled source electromagnetic surveys.

On 17 August 2012 PetroSA assigned 80% of its interest and obligations under the Exploration Rights to Anadarko South Africa (Pty) Ltd (Anadarko) and retained a 20% interest. As a result, Anadarko is now the operator of these blocks. As part of Anadarko's commitment to the exploration for hydrocarbons in Blocks 5/6 & 7, it has undertaken a 2D seismic survey (2 December 2012 and 10 February 2013) and a multi-beam bathymetry survey (15 January to 17 March 2013).

Anadarko is now proposing to undertake a seafloor geochemical sampling programme consisting of seafloor sampling (piston coring), seafloor heatflow measurements and a possible further multi-beam bathymetry survey.

Anadarko has appointed CCA Environmental (Pty) Ltd (CCA) to meet the relevant requirements of the Mineral and Petroleum Resources Development Act, 2002 (No. 28 of 2002) (MPRDA) and the Regulations thereto.

2. KEY LEGISLATION

2.1 MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (MPRDA), 2002

In terms of Section 102 of the MPRDA, Anadarko is required to compile an EMP Addendum focusing on the proposed seafloor geochemical programme and submit it to PASA for consideration and for approval by the Minister of Mineral Resources. Furthermore, Interested and/or Affected Parties (I&APs) must be notified and consulted in this regard.

2.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA), 1998

The Environmental Impact Assessment (EIA) Regulations 2010 promulgated in terms of Chapter 5 of National Environmental Management Act, 1998 (No. 107 of 1998) (NEMA), as amended provide for the control of certain activities that are listed in Government Notices (GN) R544 (Listing Notice 1), R545 (Listing Notice 2) and R546 (Listing Notice 3). Activities listed in these notices must comply with the regulatory requirements listed in GN R543, which prohibits such activities until written authorisation is obtained from the competent authority.

There are currently no activities listed in Listing Notices 1, 2 or 3 applicable to the proposed seafloor geochemical sampling programme. Thus no Basic Assessment or Scoping and EIA process is required.

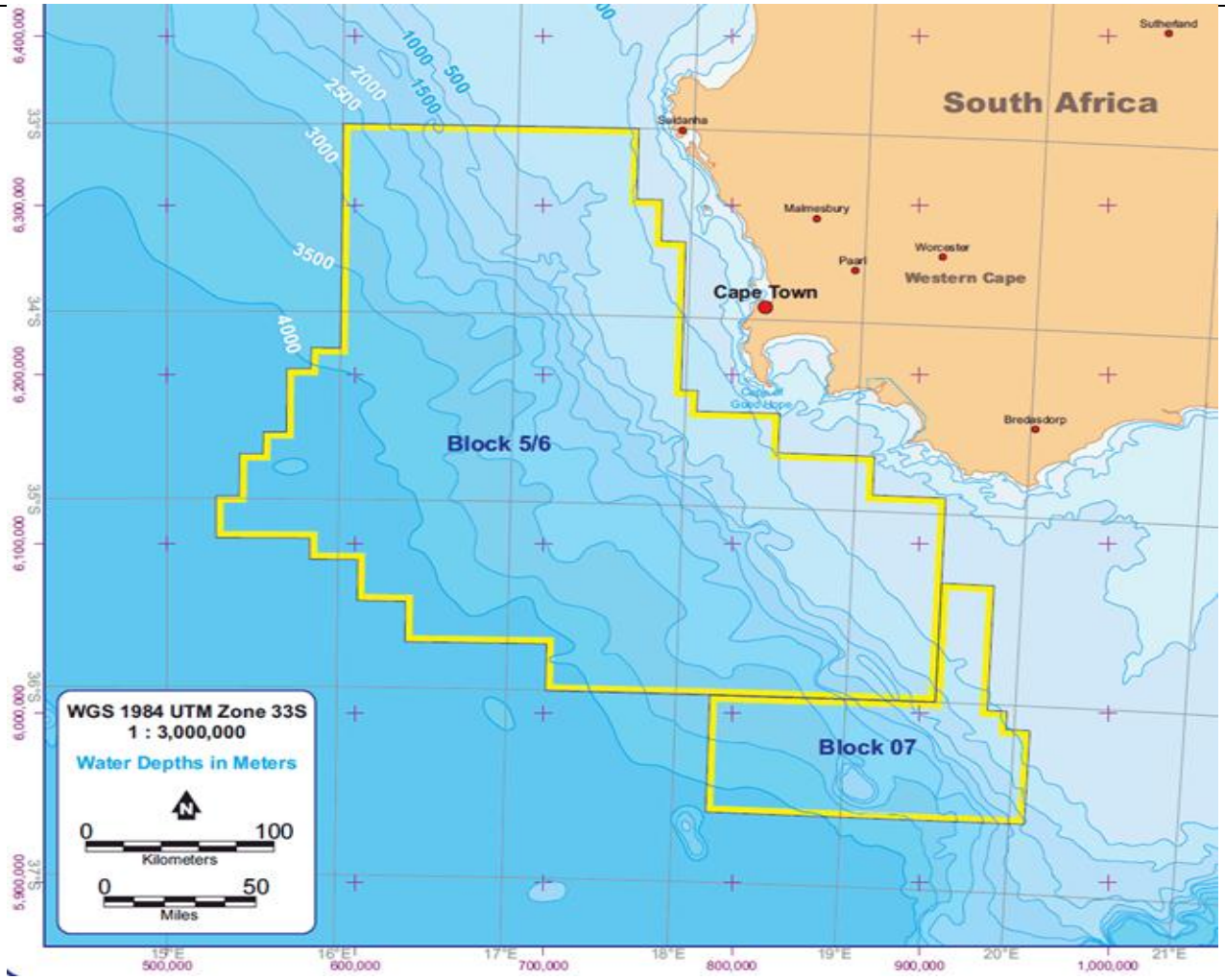

Figure 1: Location of License Blocks 5/6 (ER #224) and 7(ER #228) of the South-West Coast of South Africa.

3. PURPOSE OF THIS DOCUMENT

This Background Information Document (BID) serves to:

- Inform I&APs of the proposed seafloor geochemical programme;
- Provide a brief background to and description of the proposed seafloor geochemical programme;
- Discuss the applicability of the key legislation, namely MPRDA and NEMA;
- Describe the anticipated study process;
- Highlight some key issues regarding the potential environmental impacts of the proposed activities; and
- Provide I&APs with an opportunity to comment and/or raise any concerns they may have regarding the planned activities. The issues identified by I&APs will be included and addressed in the EMP Addendum.

4. THE STUDY PROCESS

The study will include the follow steps:

- Compile and distribute the BID to I&APs;
- Advertise the proposed project to inform the broader public and I&APs and provide the opportunity to raise any issues or concerns regarding the proposed project;
- Undertake specialist studies (including fishing and marine fauna);
- Compile an EMP Addendum and release for a 30-day comment period;
- Assimilate I&AP comments and prepare Comments Report;
- Finalise EMP Addendum and submit together with the Comment Report to PASA for consideration in terms of MPRDA; and
- Notify I&APs that the final EMP Addendum is available for information purposes.

5. SEAFLOOR GEOCHEMICAL SAMPLING PROGRAMME

The proposed seafloor geochemical sampling programme would most likely commence in late 2013. The geochemical sampling programme activities (namely seafloor sampling and heatflow measurements) would consist of approximately 250 samples / measurements cumulatively resulting in a total seabed disturbance volume of the less than 5 m^3.

5.1 Seafloor Sampling Programme

The seafloor sampling programme would consist of collecting seafloor sediment samples for laboratory geochemical analyses in order to determine if any naturally occurring hydrocarbons are present.

A piston coring device with ultra-short baseline (USBL) navigation would be used to collect the seafloor samples (see Figure 2). The USBL navigation system is used to accurately track the position of the core through the water column and position the core over the desired target for sampling. The piston corer is lowered over the side of the survey vessel and allowed to free fall from about 3 m above the seafloor to allow good penetration.

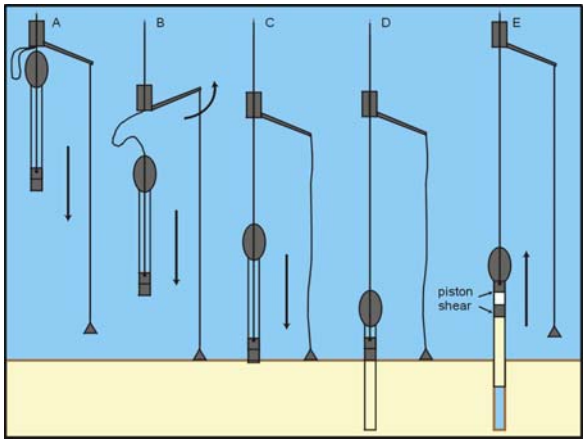

Figure 2: Schematic of a piston core operation at the seabed (Source: TDI-Brooks).

The programme would likely utilise core barrel capable of retrieving sediment samples that are up to 6 m in length and 6.7 cm in diameter. The recovered cores are visually examined at the surface for indications of hydrocarbons and sub-samples retained for further geochemical analysis in an onshore laboratory. The remaining sediment would be returned to the seafloor.

The exact number and location of core samples would only be identified following the analysis of the processed 2D seismic and the multi-beam bathymetric survey results. It is anticipated that the seafloor sampling programme would take in the order of four to eight weeks to complete.

5.2 Seafloor Heatflow Measurements

The heatflow measurements would be conducted using heatflow probes, which would measure both the temperature and thermal conductivity of sediments in situ up to 3 m below the seafloor. The primary goal of this programme is to measure the thermal conductivity of the seafloor sediments at numerous locations throughout the survey area to provide a representative dataset. Acquisition of these data would be used to determine the thermal regime and calibrate thermal models to understand hydrocarbon system potential.

The heatflow probe is normally 3 m in length and 7 cm in diameter, and has 16 sensors (see Figure 3). The first eleven measure temperature within the probe at 30 cm intervals down into the sediment. The remaining sensors measure the water temperature, internal temperature of the probe, the tilt of the probe from vertical, water pressure, as well as a reference resistor.

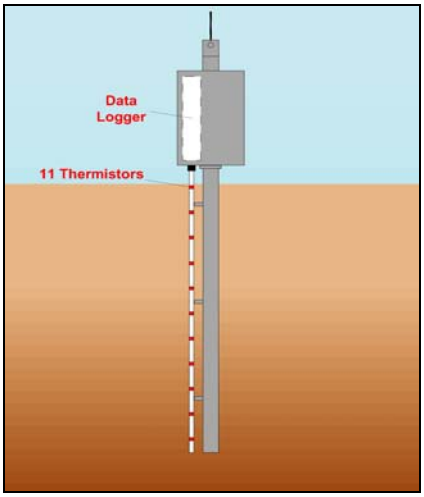

Figure 3: Heat flow probe schematic (http://www.tdi-bi.com/field_services/hf_info/description.htm).

The measurement device or probe would be dropped from a vessel into the seafloor. The probe is navigated to specific target sites using the USBL navigation. The probe is allowed to equilibrate and then recovered to the surface after about 20 minutes. A heat pulse is applied though the probe which allows the thermal conductivity of the sediments to be measured. No material is removed from the seabed, and the entire probe is retrieved at the end of the measurement.

The exact number and location of heatflow measurements would only be identified following the analysis of the processed 2D seismic and the multi-beam bathymetric survey results. It is anticipated that it would take in the order of four to eight weeks to complete, if undertaken together with the piston coring programme.

5.3 Multi-beam Bathymetry Survey

A further multi-beam bathymetry survey may be conducted in Blocks 5/6 & 7. This survey would produce a digital terrain model of the seafloor. A survey vessel would be equipped with a deep water multi-beam echo sounder and a sub-bottom profiler to obtain a digital terrain model of the structure and geology of the seafloor (see Figure 4).

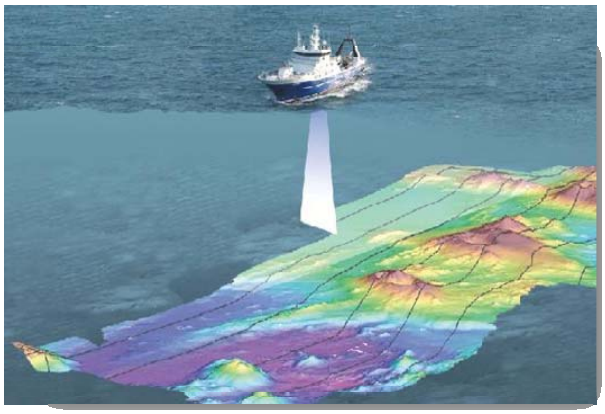

Figure 4: Illustration of a vessel using multi-beam depth/echo sounders (http://www.gns.cri.nz/).

Note that this type of survey typically does not require the vessel to tow any cables. However, due to the operational nature of this work would be "restricted in her ability to manoeuvre".

The multi-beam echo sounder emits a fan of acoustic beams from a transducer at frequencies ranging from 10 kHz to 200 kHz and typically produces sound levels in the order of 207 db re 1µPa at 1m (approximately 1 000 time less than a seismic survey). The sub-bottom profiler emits an acoustic pulse from a transducer at frequencies ranging from 3 kHz to 40 kHz and typically produces sound levels in the order of 206 db re 1µPa at 1m.

6. KEY ISSUES TO BE INVESTIGATED

The following key issues have already been identified in relation to proposed seafloor geochemical sampling programme:

- Disturbance and loss of benthic macrofauna habitat due to the removal of the sediment samples and penetration of the heatflow probe;
- Noise effects on marine fauna from the multi-beam bathymetry survey;
- Potential effects on the fishing industry due to temporary displacement of fishing activities;
- Interference with marine recreational facilities and transport routes; and
- Waste discharge to sea and atmosphere.

These potential impacts will be addressed in the EMP Addendum. Since the exact locations of the core samples and heatflow measurements are not known at this stage, the assessment will assume that the approximately 250 samples / measurements could be located anywhere within Blocks 5/6 & 7.

7. YOUR INVITATION TO COMMENT AND PARTICIPATE IN THE PROCESS

If you or your organisation wishes to register as an I&AP and/or to raise any issues or concerns regarding the proposed project, please contact Jeremy Blood of CCA at the contact details below. An I&AP Registration and Comment Form has been attached for registration and commenting purposes.

For comments to be included in the EMP they should be forwarded to CCA **no later than 13 June 2013.**

Attention: Jeremy Blood
CCA Environmental (Pty) Ltd
PO Box 10145, Caledon Square, 7905
Unit 35 Roeland Square, 30 Drury Lane, Cape Town, 8001

Tel: (021) 461 1118/9 Fax: (021) 461 1120
Email: jeremy@ccaenvironmental.co.za

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