

# ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR AN APPLICATION FOR EXPLORATION RIGHT FOR PETROLEUM (350 ER)

**Various farms, Free State & KwaZulu-Natal**

Prepared for: Rhino Oil and Gas Exploration South Africa

(Pty) Limited

Authority Ref: PASA: 12/3/350 ER

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## EXECUTIVE SUMMARY

### 1. INTRODUCTION

This Executive Summary provides a synopsis of the Environmental Impact Report (EIR), including Environmental Management Programme (EMPr) prepared as part of the Scoping and Environmental Impact Assessment (hereafter collectively referred to as “S&EIA”) process that is being undertaken for the application by Rhino Oil and Gas Exploration South Africa (Pty) Limited (Rhino Oil and Gas) for an exploration right (ER), in terms of Section 79 of the Minerals and Petroleum Resources Development Act, 2002 (No. 28 of 2002) (MPRDA) (Ref 12/3/350 ER), for petroleum products on various farms in the Free State and KwaZulu-Natal and provinces.

The EIR summarises the EIA process followed to date and provides an overview of the proposed project and the affected environment. It also provides an assessment of the impacts of the proposed project and sets out the recommend management measures

#### 1.1 Opportunity to Comment

This EIR has been distributed for a 30-day comment period from **28 August to 29 September 2020** in order to provide interested and affected parties (I&APs) with an opportunity to comment on the findings of the S&EIA process.

Copies of the full report have been made available for download from the SLR Consulting (South Africa) (Pty) Ltd (SLR) website (at <https://slrconsulting.com/public-documents><sup>1</sup>). An electronic copy of the EIR can be emailed or provided on CD on request. The report’s Executive Summary has also been translated into Sesotho, isiZulu and Afrikaans and is available for download from the SLR website or can be emailed on request.

Any comments should be forwarded to SLR at the address, telephone/fax numbers or e-mail address shown below. For comments to be included in the Final EIA Report, they should reach SLR by **no later than 29 September 2020**. The document will then be updated to a final report, giving due consideration to the comments received, and be submitted to the Petroleum Agency of South Africa (“PASA”), the designated agency responsible for the administration of petroleum related minerals, for decision-making.

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<sup>1</sup> The website provides a data-free download capability, ensuring the report is available to I&APs constrained by access to mobile data

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

Attention: Matthew Hemming

PO Box 1596, Cramerview 2060

Tel: (011) 467 0945

Fax: (011) 467 0978

Cell: 072-997-3082

E-mail: [7201803400016@slrconsulting.com](mailto:7201803400016@slrconsulting.com)

## 1.2 Project Background

Rhino Oil and Gas has lodged an application for an ER with PASA.

Minerals included in the application are oil, gas, condensate, coal bed methane, helium and biogenic gas. The ER application area is broad and encompasses parts of the Free State and Northern KwaZulu-Natal (see Figure 0). Rhino Oil and Gas previously held a Technical Co-operation Permit (TCP 165) over this area. **The ER application area excludes all properties where the granting of an ER is prohibited by Section 48 of the MPRDA, such as protected areas, roads and residential areas.**

In this ER application Rhino Oil & Gas has applied for authorisation to undertake early-phase exploration for oil and gas which might be located within suitable geological strata. **The proposed exploration work programme is restricted to desktop data review and the undertaking of an aerial survey.** The sole purpose of the proposed work would be to indicate the presence of any possible petroleum resource which could be investigated further. No stimulation, pressure testing, hydraulic fracturing or water abstraction is included in the proposed exploration work to authorised by this ER.

**FIGURE 0: LOCATION OF THE PROPOSED 350 ER EXPLORATION RIGHT APPLICATION AREA (ORANGE OUTLINE)**

## 1.3 Summary of Authorisation Requirements

An application for an ER requires statutory approval in terms of both the MPRDA and NEMA. In terms of Section 79 of the MPRDA an ER is required from the Minister of Mineral Resources (or delegated authority) prior to the commencement of any exploration activities. The 350 ER application, submitted in terms of Section 79 of the MPRDA, was accepted by PASA in 23 January 2019. Acceptance of the application only permits the applicant to continue with the regulated consultation and environmental reporting process.

Under Section 79(4) of the MPRDA a requirement for obtaining an ER is that an applicant must comply with Chapter 5 of NEMA with regards to consultation and reporting (see below). The Minister (or delegated authority) may only grant the ER if an Environmental Authorisation is issued. This requires that applicant obtain an Environmental Authorisation (EA) from the competent authority, in this case being the Minister of Mineral Resources (or delegated authority). The proposed exploration right application triggers Activity 18 of Listing Notice 2 (GN R984) and thus a S&EIA process must be undertaken in order for PASA, as the delegated authority,

to consider an application for Environmental Authorisation and make a recommendation to the Minister of Mineral Resources.

SLR has been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the S&EIA process. The scope of the current EIA process is aligned specifically to the early-phase exploration work programme (i.e. aerial full tensor gradiometry gravity survey). The environmental assessment of further ground-based exploration including core hole drilling, seismic surveys, appraisal or well drilling activities for exploration or future production falls outside of the scope of this EIA process.

In accordance with the EIA Regulations 2014, all other legislation and guidelines that were considered in the preparation of the EIR are documented. The policy and legislative context within which the project is proposed presented in Section 2 of the EIA Report.

## **2. EIA METHODOLOGY**

### **2.1 Scoping Phase**

The Scoping Phase complied with the requirements of NEMA and the EIA Regulations 2014, as amended. This involved a process of notifying I&APs of the proposed project and S&EIA process in order to ensure that all potential key environmental impacts, including those requiring further investigation, were identified.

The Scoping Report for the proposed project, which was prepared in compliance with Appendix 2 of the EIA Regulations 2014, was accepted by PASA on 30 January 2020.

### **2.2 EIA Phase**

In accordance with Appendix 3 of GN No. R982, the objectives of the EIA are to:

- identify the relevant policies and legislation relevant to the activity;
- present the need and desirability of the proposed activity and its preferred location;
- identify feasible alternatives related to the project proposal;
- ensure that all potential key environmental issues and impacts that would result from the proposed project are identified;
- provide a reasonable opportunity for I&APs to be involved in the EIA process;
- assess potential impacts of the proposed project alternatives during the different phases of project development;
- present appropriate mitigation or optimisation measures to minimise potential impacts or enhance potential benefits, respectively; and
- Through the above, to ensure informed, transparent and accountable decision-making by the relevant authorities.

The EIA process for this application was interrupted by the COVID-19 pandemic and South Africa's response thereto. All timeframes relating to environmental permitting services and actions were extended by Directions published by the Minister (refer to Section 2.3) in terms of the Disaster Management Act. EIA processes were able to recommence from 5 June 2020, subject to provision set out in revised Directions by the Minister (refer to Section 2.3). SLR subsequently made application to PASA for further extension of the timeframes in order for the EIA phase of this application to be completed. PASA approved the extension and the final EIA Report is due to PASA on or before 6 October 2020.

As per the Plan of Study for EIA presented in the Scoping Report, specialist studies were not required to inform the impact assessment.

SLR used an assessment methodology which considered: the intensity, extent, duration of impacts, the probability of the impact occurring, the reversibility and the degree to which the impacts can be mitigated. The process involves consideration of, *inter alia*: the purpose and need for the project; views and concerns of I&APs; social and political norms, and general public interest.

The significance of environmental impacts was rated before and after the implementation of mitigation measures. The method applied to the assessment of environmental impacts was:

- Consequence is a function of intensity, spatial extent and duration;
- Significance is a result of the consequence and probability.

### **3. NEED AND DESIRABILITY**

This section in the report aims to provide an overview of the need and desirability for the proposed project by firstly, highlighting the applications for the use of natural gas (particularly with reference to the electricity generation sector) and, secondly, indicating how these applications are aligned within the strategic context of national policy and energy planning, broader societal needs and regional planning, as appropriate.

#### **Use of Natural Gas**

Natural gas is a fossil fuel, used globally as a source of energy for heating, cooking, and electricity generation, amongst others. The fastest growing use of natural gas is for the generation of electric power.

Of the three fossil fuels used for electric power generation (coal, oil and natural gas), natural gas emits the least carbon dioxide per unit of energy produced. Burning natural gas also releases lower amounts of nitrogen oxides, sulphur dioxide, particulates and mercury when compared to coal and oil (Union of Concerned Scientists, n.d.). Some research shows that, over a 20-year time period, both shale gas and conventional natural gas have a larger GHG footprint, than do coal or oil for any possible use of natural gas.

As economic growth is dependent on the availability of electricity, ensuring a sustainable and reliable supply of electricity with sufficient capacity is a key aspect to growing the economy of South Africa. The electricity shortages experienced in South Africa over the past decade were a contributing factor to the significant slowdown in economic growth rate. In the context of the above, the use of natural gas for electricity generation is considered to have substantial benefits and is identified in national policy, together with renewable energy

technologies, toward diversifying the domestic energy supply away from coal. The economic feasibility of using natural gas for domestic power generation is dependent on the availability of domestic reserves of natural gas, as well as the financial cost of importing natural gas.

At present, domestic resources are limited to Reenergy's Virginia Gas Project which is currently South Africa's only onshore production site and the offshore gas fields close to Mossel Bay (F-A field), which are understood to be in decline. The F-O offshore field (Project Ikhwezi) is envisioned to complement this supply in the short- to medium-term. Other proven offshore reserves include the Total's Brulpadda discovery in Block 11B/12B and the Ibhuesi Gas Field off the West Coast of South Africa. The development of this field to supply gas to the existing Ankerlig Power Station is currently being considered. Neighbouring countries (Mozambique and Namibia) and regional African nations (Angola and Tanzania) have substantial gas reserves.

Although limited, gas infrastructure and consumption do exist in South Africa. Presently, gas is imported to South Africa through the Republic of Mozambique Pipeline Company (ROMPCO) pipeline from Mozambique. This gas is mostly used in Sasol's coal-to-liquid (CTL) process in Secunda (Bischof-Niemz, Carter-Brown, Wright, & Zinaman, 2016). In Johannesburg, Egoli Gas supplies industry and households in some suburbs with reticulated natural gas that is sourced from Sasol. In 2013, the total natural gas supply in South Africa (domestic production and import) equated to approximately 2.5% of total primary energy supply for the country (Bischof-Niemz, Carter-Brown, Wright, & Zinaman, 2016). Thus, an increase in domestic natural gas reserves would enable South Africa to take steps to secure the countries' energy supply (through diversification), assist in reducing the emissions of greenhouse gases (by reducing the country's reliance on coal for electricity generation) and reduce the need for the importation of gas. As such, exploration for additional domestic hydrocarbon reserves is considered important and supported by national policy, and any discoveries would be well received by the local market.

### **National Policy and Planning Context**

An overview of the national policy and planning context relating to the promotion of economic development in general within South Africa, development of the energy sector (with specific reference to natural gas and renewable energy) and response to climate change is provided. The following documents were considered:

- White Paper on the Energy Policy of the Republic of South Africa (1998)
- White Paper on the Renewable Energy Policy (2003)
- National Gas Infrastructure Plan (2005)
- New Growth Path (2011)
- National Development Plan (2012)
- Draft Integrated Energy Plan (2013)
- Gas Utilisation Master Plan (GUMP)
- Paris Agreement, United Nations Framework Convention on Climate Change

- National Climate Change Response White Paper
- Integrated Resource Plan (2019)

Consideration was also given to regional policy and planning context relating to development within the Free State and KwaZulu-Natal in general. The District Municipal planning framework was identified but has limited relevance to the current remote sensing approach.

#### 4. PROJECT DESCRIPTION

The EIA Report includes a general description of the proposed project and a comparative assessment of project alternatives.

##### 4.1 The applicant

The applicant for the Exploration Right, Rhino Oil and Gas Exploration South Africa (Pty) Ltd is a South African registered subsidiary of Rhino Resources Ltd. Rhino Resources Ltd is a privately owned, independent, technology driven oil and gas exploration and development company focused on Africa. More information is available on <http://www.rhinoresourcesltd.com/management>.

##### 4.2 Exploration Right application area

The exploration right application area includes approximately 4 270 properties (farms and portions) over an area of 773 259 ha (see Figure 0). The list of the properties (farm name, number and portion), with the 21 digit Surveyor General code, are included in the report. In broad terms the ER application area extends from the Upper Tugela region of KwaZulu-Natal, north past Harrismith to just north of Warden in the Free State. The ER application area extends westward, from Harrismith, past Kestell to Bethlehem. In the north the ER application area extends from Warden past Reitz up to Lindley.

**All exclusions as required by Section 48 of the MPRDA, such as protected areas and residential properties, are excluded from this Exploration Right application area** (in so far as the available information is accurate). Access would not be required to any property as no physical, on-the-ground exploration activities are proposed as part of the exploration work programme.

##### 4.3 Description of the Exploration Work Programme

Rhino Oil and Gas proposes to undertake early-phase exploration for oil and gas resources which may be located within suitable subsurface geological strata. The exploration work would target key geologies of the Karoo Basin. **The proposed exploration work programme is restricted to desktop data review and the undertaking of an aerial survey.** The initial, early-phase exploration proposed by Rhino Oil and Gas is only aimed at determining if there is an oil or gas resource in the area that would warrant further exploration. The results of the proposed exploration would serve as a basis for planning possible further exploration.

The proposed 3-year exploration work programme includes:

###### YEAR 1:

- **Data Acquisition**

- **Full tensor gradiometry gravity survey (OR in year 2)**

#### YEAR 2:

- **Data Processing**
- **Full tensor gradiometry gravity survey (if not in year 1)**

#### YEAR 3:

- **Data Migration and lead identification**

A full tensor gradiometry gravity (“FTG”) survey images subsurface geology from an airborne platform. The instrument measures gravity gradients to enable the identification of geological structures. Large areas can be surveyed very efficiently. The survey would involve low-level grid-based flight of a light aircraft at slow speeds. The survey plane would typically only pass over a particular area once. The flight parameters, survey grid and timing can be adapted depending on relevant restrictions.

No further ground-based exploration, appraisal or well drilling and future production forms part of the current ER application. Thus no extraction of hydrocarbons or water, no stimulation of wells or hydraulic fracturing (fracking) is proposed in the initial three-year exploration work programme for which approval is sought.

#### 4.4 Summary of project alternatives

The project scope to be considered and assessed in the EIA is the 3-year exploration work programme as proposed by the applicant and described above. No reasonable and feasible alternatives have been proposed and only the preferred alternative and the no-go alternative were considered during the EIA phase.

#### 4.5 Related Applications

Rhino Oil and Gas Exploration South Africa (Pty) Limited has previously made six other applications for onshore exploration rights in various areas of the Eastern Cape, Free State and KwaZulu-Natal Provinces. Details of these applications and their current status are summarised in the Table below. Readers are referred to PASA’s Hubmap for information on the location of these and other onshore oil and gas rights.

ER Ref	Known as/Location	Status
291 ER	Rhino O&G: KwaZulu-Natal	ER relinquished by holder
294 ER	Rhino O&G: Free State	ER granted
295 ER	Rhino O&G: Eastern Cape	ER granted
317 ER	Rhino O&G: Northern KZN	EA abandoned by applicant
318 ER	Rhino O&G: Northern Free State	ER granted
346 ER	Rhino O&G: Free State & KZN	Appeal on PASA’s acceptance of ER application
350 ER	Rhino O&G: Free State & KZN	This application

#### **4.6 Further exploration or future production**

Further detailed exploration and future production do not form part of the current Exploration Right application for which authorisation is sought. The regulatory framework sets out that the applicant would have to obtain further environmental authorisation if they elected to pursue any activities beyond the scope of the exploration work programme for which application is being made. Any further approval in terms of the MPRDA and NEMA would be subject to an additional environmental assessment process with further public consultation. Approvals for such additional exploration work are also likely to be required in terms of other legislation.

If any of the future work were to pose unacceptable environmental risk, as determined by the regulated assessment processes, then the required approvals should not be granted by the competent authorities. In such cases the proposed work could not continue.

#### **5. DESCRIPTION OF THE AFFECTED ENVIRONMENT**

Baseline information for this EIR (See Chapter 6 of the EIR) was sourced through a desktop study and draws extensively on information contained in studies that have been conducted by various government departments and non-government environmental organisations responsible for the area covered by the exploration right application. The baseline information is important to understanding of the ER application area's overall sensitivity, but is of limited relevance in the context of the proposed aerial surveys.

All areas with protected status under the National Environmental Management: Protected Areas Act, 2003 (No. 57 of 2003); Biodiversity Act, 2004 (No. 10 of 2004); National Forests Act, 1998 (No. 84 of 1998) and Mountain Catchment Areas Act, 1970 (No. 63 of 1970) have been excluded from the extent of the Exploration Right application area. The exclusions were made based on data sourced from SANBI.

All properties within the towns (i.e. erfs) located within the Exploration Right application are excluded from the application by virtue of the fact that 'residential areas' are excluded from the ER application area in terms of section 48 (2) of the MPRDA. There are several areas within the Exploration Right application area that have significant rural communities living on property administered by the Traditional Authorities. These areas are not formally registered as 'residential areas' although the density of houses may approximate that of formal residential areas. Where feasible these have been excluded from the extent of the Exploration Right application area.

## 6. KEY PROJECT ISSUES

The following key project issues have been identified by the S&EIA project team, with input from I&APs:

### SUMMARY OF THE KEY PROJECT ISSUES

Key issues identified by the project team, with I&APs input	Indication of the manner in which the issues were incorporated, or the reasons for not including them
<b>1. Opposition to the project</b>	
<p>There is strong opposition to the proposed exploration right application. The major themes of the public opposition are the following:</p> <ul style="list-style-type: none"> <li>Concern, even fear, of the future risks that might arise from production should a resource be found. Production, and hydraulic fracturing (fracking) in particular, has potentially large risks to society and the environment and should not be entertained in any form. There is a significant body of evidence from around the world (not least that fracking is banned in a growing number of countries and territories) that fracking results in unacceptable risks to surface and groundwater resources and human health. Such risks are borne by the landowners and local communities who do not participate in the economic benefits that accrue to the right holder and government. While there may be a consumer driven need for hydrocarbons, the risks and costs to society and the environment far outweigh the benefits. There is a lot of evidence of the risks and costs and little evidence that gas production can consistently be undertaken in a safe manner. For this reason I&amp;APs argue that the project should not be approved.</li> <li>Concern that given the money involved, if any hydrocarbon resource is found, it will not be possible to stop production regardless of what the future EIA processes may indicate in terms of risk. Thus the only way to avoid such risks is to not open the door to such projects. In addition to the argument presented above, there is an opinion that the oil and gas industry has a reputation for massive financial contributions, bribery and conspiracy with governments. It is considered evident that the large amounts of money involved in the industry are such that governments have traditionally and will continue to favour the needs of the oil and gas industry. The substantial, often short-term, economic benefits that are likely to be derived 'blind' government to sound decision making and it is the landowners and local communities who will bear the risks. The South African government has been associated with a number of financial scandals, providing scant comfort for the integrity of the legislation. In order to prevent any such</li> </ul>	<p>Overall the public opposition makes for a very strong argument against the application and the process. It is evident that the primary driver of the opposition are concerns about future risks that might arise from production should a resource be found. I&amp;APs have low levels of trust in the legislative provisions separating exploration and production activities, and the fact that the requisite approvals should not be granted if future work were to pose unacceptable environmental risks. Regardless of their reasons or motivation, the fact remains that the majority of I&amp;APs participating in the EIA process are strongly opposed to the project. It is noted that a small percentage of I&amp;APs have expressed interest in knowing the outcomes of the exploration or being able to participate in the benefits.</p> <p>If the S&amp;EIA process were simply a democratic process then the majority vote is clearly "no". It is vital that this public opinion is taken into consideration throughout the EIA process, by the applicant and by the decision makers.</p>

Key issues identified by the project team, with I&APs input	Indication of the manner in which the issues were incorporated, or the reasons for not including them
<p>risks it is best not to begin exploration as once the economic value is known, the greed of the participating parties will make it very difficult to stop production, despite the known risks. For this reason I&amp;APs argue that the project should not be approved.</p> <ul style="list-style-type: none"> <li>• Hydrocarbon based energy is a flawed concept and countries are moving away from new hydrocarbons in favour of a renewable energy sources. The extraction of hydrocarbons from the earth and their subsequent processing and combustion for human energy needs is the major driver of global warming and climate change. The global community has acknowledged the risk that these place on the planet and humans. Vast amounts of money and effort are being directed to avoid further climate change. The global community has further agreed on the need to move away from hydrocarbon based energy toward more sustainable sources such as renewable energy. Despite gas being cleaner burning than coal and thus considered by some as a transition fuel, the argument is that any continued development of hydrocarbons is counter to the renewable energy path. South Africa has various policies that support the implementation of renewables into the energy pool. For this reason I&amp;APs argue that the project should not be approved.</li> <li>• A deep mistrust of government institutions and the people involved in such an application and their true motives. Whilst the exploration right application and EIA processes are set out in legislation, there is a deep mistrust of how these processes are implemented and who the real beneficiaries are. Many people have voiced suspicion that National government has committed to pursue gas extraction and will do so despite public opinion or the findings of an EIA. There is also general suspicion that high ranking political figures and connected families are involved. The South African government and various figures have been associated with a number of financial scandals. There is an expectation that Rhino Oil and Gas (a two person company) is not making the application without some form of support from such parties. Lastly there is a suspicion that Rhino Oil and Gas would ultimately sell the right onto such parties, who would likely ignore the commitments and legislation in the pursuit of profit. For this reason I&amp;APs argue that the project, which has risks and could lead to even greater risk in the future, should not be approved.</li> <li>• Significant doubt over government’s ability to enforce compliance to the legislation. Some participants accept that the EIA process must take place in terms of legislation and expect that the EIA and EMPr will provide for reasonable measures to manage and</li> </ul>	

Key issues identified by the project team, with I&APs input	Indication of the manner in which the issues were incorporated, or the reasons for not including them
<p>mitigate risk. Thus in theory the exploration project could be undertaken without unacceptable risk to health and the environment. The concern, however, is that there is little to no enforcement of compliance during operations. The result is that rights holders can and will do what they want with little regard for landowners and local communities who will bear the brunt of negative impacts. For this reason the project, which has risks and could lead to even greater risk in the future, should not be approved.</p> <p>Numerous objections have been made to the project and EIA process.</p>	
<p>The EIA should assess the potential future exploration and production related impacts (including fracking)</p>	<p>The scope of this EIA is aligned with and limited to the activities that have been proposed by Rhino Oil and Gas. This is in line with the regulatory framework which sets out that the applicant would have to obtain further environmental authorisation if they elected to pursue any activities beyond the scope of the exploration work programme for which they have currently made application.</p> <p>A decision on the current Exploration Right application does not in any way guarantee the holder future approvals that would be required, 1) to undertake further exploration and future production activities, and 2) nor those required under other legislation (e.g. land owner consent, WUL). Any further exploration work to evaluate an identified resource (i.e. beyond the aerial survey for which authorisation is sought) or the future production of oil or gas would require further approval in terms of the MPRDA &amp; NEMA. Such approvals will be subject to the relevant legal requirements which include further public consultation and environmental impact assessment. If the future work were to pose unacceptable environmental risk, as determined by the regulated assessment processes, then the required approvals should not be granted by the competent authorities. In such cases the proposed work could not continue.</p> <p>In the EIA Regulations, 2014 “cumulative impact” includes the ‘reasonably foreseeable future impact of an activity’. While it is foreseeable that further exploration and future production activities could arise from the Exploration Right (if granted), the applicant has stated that there is not currently sufficient information to make reasonable assertions as to nature of any future work. This is due to the current lack of relevant geological information, which the proposed exploration process aims to address (refer to Section 5.2). The possible range of the future</p>

Key issues identified by the project team, with I&APs input	Indication of the manner in which the issues were incorporated, or the reasons for not including them
	<p>work that could arise might vary hugely in scope, location, extent and duration depending on whether a resource(s) is discovered, its size, properties and location. It would not be reasonable to undertake an assessment of the environmental impacts of an undefined project. Such impacts could not be reliably assessed and the range of outcomes is so vast that the findings would be speculative at best and of no value in ascertaining the potential impacts. It is also possible that future exploration determines that an economic resource does not exist, in which case there would be no production.</p>
<p>Restrictions and sensitivities will prevent exploration/production</p>	<p>Rhino Oil and Gas has indicated that the broad view necessary for early-phase exploration, particularly in regions with limited geological information, requires a regional approach. Hence the need to apply for a right over a wide area, so that aerial exploration surveys have the best chance of identifying the boundaries of relevant geological structures. Such information is important to petroleum exploration. This is not to say that exploration would be undertaken in all areas over which the right is held.</p> <p>Rhino Oil and Gas has made this application over properties where it is lawful to hold an Exploration Right. In their view the application area complies with Section 48 of the MPRDA (see Section 5.2.2.1). If however there are properties where Section 48 of the MPRDA has not been applied properly or for which the parameters have changed in the interim, then the application area would need to be adjusted.</p> <p>Rhino Oil and Gas is also aware that restrictions/exclusions may be applicable to further exploration and future production activities. Such restrictions/exclusions might prevent the production of oil and gas from target areas. However, the nature of such restrictions/exclusions could vary depending on the activities proposed and regulatory requirements. Thus the Restrictions/exclusions relating to further exploration and future production activities are not applicable to this EIA. Restrictions/exclusions relating to the proposed exploration work programme have been identified and applied through the course of this EIA. The land use, water resources and biodiversity features that underlie the sensitivity of sites within the Exploration Right application area are documented in the EIA Report.</p> <p>Rhino Oil and Gas continually monitors the regulatory regime and environmental sensitivities of target areas and will consider this information in making decisions on whether to proceed</p>

Key issues identified by the project team, with I&APs input	Indication of the manner in which the issues were incorporated, or the reasons for not including them
	<p>with future exploration activities. Rhino Oil and Gas would apply the restrictions/exclusions relevant to future exploration activities at the appropriate time to ensure a lawful and environmentally responsible approach. Such information could result in the extent of the Exploration Right application area being adjusted.</p>
<p>The adequacy of the public participation process / methodology was challenged, particularly with regards informing rural communities.</p>	<p>The requirements for public participation and the timeframes for a scoping and EIA process are set out in the EIA Regulations 2014. The timeframes provided in the EIA Regulations require that an applicant must within 106 days of acceptance of the Scoping Report by the competent authority submit an EIA report, which has been subject to a public participation process of at least 30 days. To date this has included:</p> <ul style="list-style-type: none"> <li>• Land owner identification and notification (by email, post, fax and SMS).</li> <li>• I&amp;AP identification and notification (by email, post, fax and SMS).</li> <li>• Distribution of a Background Information Document (BID) in English, Afrikaans, isiZulu and Sotho) to the above parties.</li> <li>• Advertisements in 11 newspapers in the week of 12 November (in English, Afrikaans and isiZulu).</li> <li>• Site notices placed at multiple locations within towns in the application area.</li> <li>• Six public information meetings held in the week of 3 to 7 December 2018.</li> <li>• The project has also been reported on in several regional and local newspapers and social media campaigns.</li> <li>• Notification to I&amp;APs of the acceptance of the Scoping Report.</li> </ul> <p>Further details of the outlining the public participation process are provided in the EIA report (Section 3.4.4)</p>
<p>Objections to the application</p>	<p>SLR has, and will continue to, receive and document all opposition to and objections against the application. Throughout the course of the current S&amp;EIA process SLR will respond to all submissions which are reasonable and relevant to the exploration work programme proposed for this Exploration Right application.</p> <p>I&amp;APs are advised that where objections are based on concerns relating to further exploration or future production activities these will be documented but not responded to in this EIA</p>

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	<p>process. The reason for this is that legislation provides that Rhino Oil and Gas would have to make further application for approval/authorisation for any activities beyond the proposed exploration work programme. The responsibility for assessing impacts and considering objections to future work rests with those future application and decision-making processes.</p> <p>Objections that cannot be resolved through the EIA process would have to be handled in terms of the mechanisms provided for in the legislation.</p>
<b>2. Impacts on Physical Aspects</b>	
Effect on Soils and Land Cover	<p>No physical, on the ground activities are included in the proposed exploration work programme. Thus there would be no impacts to soils or land cover.</p> <p>These issues will not be investigated further in the EIR.</p>
Effect on Surface Water	<p>No physical, on the ground activities are included in the proposed exploration work programme. The proposed aerial survey would not cause impacts to groundwater quality. The use of water will be limited to that that required to operate and maintain an aeroplane for the duration of the survey period. The water would be sourced from existing suppliers and its consumption is unlikely to meaningfully influence groundwater supply.</p> <p>These issues do not require to be investigated further in the EIR. However, the importance and sensitivity of the various water resources is documented in Section 6.5.5 of the EIR.</p>
Effect on Groundwater	<p>No physical, on the ground activities are included in the proposed exploration work programme. The proposed aerial survey would not cause impacts to groundwater quality. The use of water will be limited to that that required to operate and maintain an aeroplane for the duration of the survey period. The water would be sourced from existing suppliers and its consumption is unlikely to meaningfully influence groundwater supply.</p> <p>These issues do not require to be investigated further in the EIR. However, the importance and sensitivity of the various water resources is documented in Section 6.5.5 of the EIR.</p>

Key issues identified by the project team, with I&APs input	Indication of the manner in which the issues were incorporated, or the reasons for not including them
Effect on air quality	<p>No physical, on the ground activities are included in the proposed exploration work programme. The proposed aerial survey would not generally cause impacts to air quality. The FTG survey aeroplane will consume fuel and release emissions during operations as will the vehicles of support services. Given the relatively short duration, small source and wide extent of the survey neither the regional nor localised impact of the emissions is likely to be detectable.</p> <p>This issue of the effect on localised air quality will thus not be investigated further in the EIR.</p>
Effect on geology and seismicity	<p>No physical, on the ground activities are included in the proposed exploration work programme. The proposed aerial survey would not cause vibrations that could result in seismic events. This issue does not require to be investigated further in the EIR.</p>
<b>3. Impacts on Biological Aspects</b>	
Effect on flora	<p>No physical, on the ground activities are included in the proposed exploration work programme. The proposed aerial survey would not cause impacts to floral habitats or plants. These issues do not require to be investigated further in the EIR.</p>
Effect on wetland habitats	<p>No physical, on the ground activities are included in the proposed exploration work programme. The proposed aerial survey would not cause direct impacts to wetland habitats. Additionally the project would not cause impacts to surface water quality and therefore would not affect water entering wetlands. These issues do not require to be investigated further in the EIR.</p>
Effect on faunal habitats	<p>No physical, on the ground activities are included in the proposed exploration work programme. The proposed aerial survey would not cause impacts to faunal habitats. These issues do not require to be investigated further in the EIR.</p>
Disturbance of fauna	<p>No physical, on the ground activities are included in the proposed exploration work programme. Thus the project would not generally cause impacts to fauna. However, the flying of aerial surveys may cause disturbances to the fauna through increased activities in a particular area, noise and direct mortality. The potential impact on fauna will be assessed in the EIA phase.</p>

Key issues identified by the project team, with I&APs input	Indication of the manner in which the issues were incorporated, or the reasons for not including them
	<p>The aim of this assessment will be to determine which species, particularly those of conservation concern, would be sensitive to the impacts of the aerial surveys. The known distribution and key habitats/sites for such species within the application area will be mapped at a broad scale. Additionally the relevant legal restrictions on flight location and parameters are identified and documented in the EMPr.</p>
<b>4. Impacts on Socio-Economic Aspects</b>	
Effects on heritage	<p>No physical, on the ground activities are included in the proposed exploration work programme. Thus the project would not cause impacts to heritage resources.</p> <p>This issue does not require to be investigated further in the EIR.</p>
Effects on roads and other infrastructure	<p>No physical, on the ground activities are included in the proposed exploration work programme. The proposed aerial survey would not cause impacts to existing infrastructure such as roads and water supply. The FTG survey contractors will operate from an existing airport/airfield in terms of a commercial agreement with the owner/operator of the facility. The short-term use of such a facility for the survey (with a small staff compliment) is not considered likely to place the infrastructure or other users thereof at any significant risk.</p> <p>This issue does not require to be investigated further in the EIR.</p>
Effect on existing land uses	<p>No physical, on the ground activities are included in the proposed exploration work programme. The proposed aerial survey would not cause impacts to existing land uses through either direct transformation or disturbances. This issue does not require to be investigated further in the EIR.</p>
Effect on ambient noise levels	<p>No physical, on the ground activities are included in the proposed exploration work programme. Thus the project would not generally result in disturbing noise levels. However, the aerial FTG surveys (at low altitude) will generate noise that can be considered a nuisance or cause a disturbance to a receptor. The survey aeroplane is modified to generate low noise and vibration levels as these would otherwise interfere with the FTG instrumentation. No health impacts</p>

Key issues identified by the project team, with I&APs input	Indication of the manner in which the issues were incorporated, or the reasons for not including them
	<p>(such as loss of hearing or increased blood pressure) are anticipated based on the proposed FTG survey.</p> <p>The potential noise impact of the FTG survey are assessed in Section 7.1.3.1. Additionally the relevant legal restrictions on flight location and parameters are identified and documented in an EMPr.</p>
Effect on safety and security	<p>No physical, on the ground activities are included in the proposed exploration work programme. The proposed aerial survey would not result in an influx of workers to an area nor would any exploration worker require access to property. The public would have almost no interaction with the aerial survey and would not be placed in danger. This issue does not require to be investigated further in the EIR.</p>
Risk of fires	<p>No physical, on the ground activities are included in the proposed exploration work programme. The proposed aerial survey would not result in any change to the fire risk. Rhino Oil and Gas would have risk insurance for the activities being undertaken. This issue does not require to be investigated further in the EIR.</p>
Effect on land tenure	<p>No physical, on the ground activities are included in the proposed exploration work programme. Thus Rhino Oil and Gas has no intent of accessing any property to conduct exploration, nor will have permission in terms of its exploration right to undertake any on the ground exploration.</p> <p>Despite the issuance of an exploration right, the owner remains in control of the surface rights. A land owner has specific rights over land for which they hold title and is entitled to deny access to their land as this is private property. There would not be any change in land tenure.</p> <p>Should Rhino Oil and Gas wish to access any property for the undertaking of future exploration (subject to obtaining the required approvals), they could not do so without engaging with the land owner to agree on the terms of access. Rhino Oil and Gas's stated approach is to negotiate with willing participants.</p>

Key issues identified by the project team, with I&APs input	Indication of the manner in which the issues were incorporated, or the reasons for not including them
Effect on local economy	<p>No physical, on the ground activities are included in the proposed exploration work programme. Thus the project would not generally result in actions which disturb or disrupt the local environment (other than perhaps noise, see above) or the activities which drive the local economies. It also is not anticipated that the proposed exploration work programme would have any positive impact on the regional economy. The majority of the services required are specialised and would likely be undertaken by foreign contractors. There would be a limited opportunity for local business to supply goods and services to the survey contractors. Overall the project would not result in significant changes to the economy.</p> <p>This issue does not require to be investigated further in the EIR. The importance and sensitivity of the various agricultural and tourism economies are documented in Section 5 of the EIR.</p>
Contribution to socio-economic development	<p>Exploration is recognised as an economically high-risk activity that would not result in the generation of income for the holder of such a right as no resources are extracted or beneficiated. Thus in the exploration phase of such a project there is limited opportunity for contributions to be made to economic and social development. The requirement for BBBEE participation during exploration is specified in the Petroleum and Liquid Fuels Charter (not the Mining Charter) and specifies that licences for exploration must make a 9% stake available for buy-in by Historically Disadvantaged South Africans and contribute to the "Upstream Training Trust" to fund skills development at various levels in the industry. Rhino Oil and Gas would comply with all such requirements. This issue does not require to be investigated further in the EIR.</p>

Key issues identified by the project team, with I&APs input	Indication of the manner in which the issues were incorporated, or the reasons for not including them
Rehabilitation and liability for damages	<p>As no physical, on the ground activities are included in the proposed exploration work programme the project would not cause disturbances on the ground that would require rehabilitation.</p> <p>However, as required by Section 24P of NEMA, Rhino Oil and Gas would have to provide a quantum for financial provision for rehabilitation, closure and on-going post decommissioning management of negative environmental impacts (Regulations Pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations, GN 1147). This quantum must be made available by Rhino Oil and Gas to PASA as security for the completion of rehabilitation should Rhino Oil and Gas fail to do so (Section 8.5).</p>

## 7. IMPACT ASSESSMENT CONCLUSIONS

Only those potential impacts associated with remote exploration techniques have been assessed. The potential impacts of core hole drilling and seismic surveys have not been assessed in this EIA as they do not form part of the proposed 'early-phase exploration' work for which Rhino Oil and Gas are seeking environmental authorisation.

### 7.1 Aerial FTG Surveys

#### Biophysical Impacts

The flying of a light aircraft to undertake an FTG survey is not anticipated to have any impact of significance on the biophysical environment. Overpass flights of light aircraft are not uncommon over the region, even protected areas. Other than a momentary flight response, it is estimated that the impact of noise on wildlife would be **insignificant**.

#### Cultural/ Heritage Impacts

The flying of a light aircraft to undertake an FTG survey is not anticipated to have any impact of significance on the cultural or heritage environment. Any noise impact would be as described below.

#### Socio-economic impacts: Noise Impacts

The noise generated by a light aircraft flying at a low altitude (approximately 100 m) could be a nuisance to or result in the localised disturbance of a receptor. No health impacts (such as loss of hearing or increased blood pressure) are anticipated based on the proposed FTG survey.

Based on a light aircraft (e.g. Cessna) flying at a low altitude of + 80 m, it is estimated that the maximum noise level would not exceed 70 dBA outdoors and 60 dBA indoors. The latter is similar to conversational speech measured at 1 m. At any one location the duration of the overflight would be tens of seconds. Indoors the noise generated would probably not be noticed. Although the survey would cover wide areas, the extent of the impact is localised for each receptor. Where there are no receptors there would be no impact. Thus, depending on the selected flight path, an impact is possible.

Although aircraft noise would increase noise levels in what are largely quiet rural and agricultural areas, only a slight disturbance or nuisance is anticipated (i.e. **low** intensity). Based on these considerations and the fact that disturbances from light aircraft are not uncommon with a multitude of light aircraft working in and traversing the region, the significance of this impact is considered to be **very low** before and after mitigation.

All planned survey flights should comply with local civil aviation rules. Flight paths must be pre-planned to avoid special nature reserves, national parks and world heritage sites. Where this is not possible, an altitude of 2 500 feet (762 m) should be maintained (as per Section 47(1) of NEMPAA), unless permission is obtained from the management authority or in an emergency. Where flights are planned to occur over game farms, landowners should be notified of the survey programme prior to survey commencement.

## 7.2 Local limitations

The flying of a light aircraft to undertake an FTG survey would be unlikely to pose significant risk to the environment. As a result there are relatively few constraints arising from legislation, regulation, guidelines and best practice that would apply. The FTG survey would have no effect on water use or availability and could therefore be undertaken without regard for water related constraints and restrictions.

At the time of completion of the EIR there was no indication of any change to the public or landowner position with regards the application. The majority opinion is opposed to exploration for unconventional gas or petroleum resources in the ER application area.

## 7.3 Granting of a Right

There is strong public opinion and I&APs refer to a significant body of evidence from around the world (not least that fracking is banned in a growing number of countries and territories), that late phase exploration and production of unconventional gas has huge risks to society and the environment. Such risks are borne by the landowners and local communities who do not participate in the economic benefits that accrue to the right holder and government. While there may be a consumer driven need for hydrocarbon extraction, the risks and costs to society and the environment far outweigh the benefits. The extraction of unconventional hydrocarbons is therefore not wanted in the ER application area.

Even though early-phase exploration may have impacts of low significance, the public have raised concern that the granting of an exploration right would set in motion the development of a petroleum extraction project that would be extremely difficult to stop. Because the future process has unknown outcome and risk, this exploration right should not be approved.

The MPRDA provides that the State, as custodian of mineral and petroleum resources in South Africa, may issue mineral and petroleum rights to applicants. Such rights must enable the sustainable development of South Africa's mineral and petroleum resources within a framework of national environmental policy, while promoting economic and social development.

The granting of a right has no effect on the presence or absence of a resource; merely on who has the entitlement to that mineral (i.e. minerals and petroleum exist regardless of the holder). A mineral and/or petroleum right is only part of the regulatory approval required by a holder and in isolation does not enable the holder to access the subject mineral. A holder must also have obtained environmental authorisation in terms of Chapter 5 of the NEMA. Furthermore, a mineral and/or petroleum right and environmental authorisation do not provide blanket approval for any conceived operation, but are both particular to the specific activities that the holder has detailed in an application. The holder is also required to negotiate access with the land owner and determine payment of compensation for loss or damages due to the specific activities. It is therefore presented that the grant of a right over a parcel of land does not provide the holder carte blanche with respect to the mineral and land in question. There is thus not necessarily a direct conflict with the land owners' right to use the surface. It would in fact be the undertaking of specified activities that could result in an impact on or conflict between the land owner and the mineral and/or petroleum rights holder (if any). Such specified activities would have been subject to approval through an environmental authorisation process. In the case of this application by Rhino Oil and Gas, only remote sensing activities are included which have been shown not to have any impact on the environment.

Any further exploration activity (beyond what may be approved in an environmental authorisation) would have to be subject to the requisite environmental assessment and authorisation process under the NEMA and an amendment to the ER in terms of the MPRDA. Such processes assess the merits of an application in light of the principles of sustainable development as set out in Section 2 of NEMA. An environmental authorisation process would not grant approval for the undertaking of activities resulting in impacts of unacceptable significance. Each of the petroleum right approval sections in the MPRDA (80 and 84) set out that such rights may only be granted if the activity will not result in unacceptable pollution, ecological degradation or damage to the environment. Thus a decision to grant the current ER application by Rhino Oil and Gas (for remote sensing activities only) does not presuppose that future applications for further exploration or production would be approved.

It is also noted that the specified activities associated with a mineral and/or petroleum right may also be subject to approval requirements under other legislation. The need for such authorisations (e.g. water use licence, land use planning permission etc.) provides further permitting frameworks for impact assessment and management.

#### **7.4 No-go Alternative**

The potential positive implications of not going ahead with the proposed exploration are:

- no impacts resulting from the FTG survey within the exploration right area;
- no (reduced) chance of any risks arising from further exploration or future production; and
- allayment of the current majority opposition from the public.

The potential negative implications of not going ahead with the proposed exploration are as follows:

- South Africa would lose the opportunity to further understand and potentially establish the extent of indigenous oil or gas reserves in the Free State and KwaZulu-Natal;
- Lost economic opportunities related to sunken costs (i.e. costs already incurred) of initial desktop investigations in the proposed exploration licence area;
- If economic oil and gas reserves do exist and are not developed, South Africa / Rhino Oil and Gas would lose the opportunity to maximise the use of its own indigenous oil and gas reserves; and
- Other sources of energy would need to be identified and developed in order to meet the growing demand in South Africa.

The great majority of I&APs that have participated in the EIA process have expressed their opposition to all forms of oil and gas exploration in the Free State and KwaZulu-Natal and to this application in particular. Thus the “no-go” alternative would alleviate much of the anxiety and concerns related to potential future shale gas development should reserves be identified for further exploration and/or future production.

Given the wide array of unknown facts regarding the potential for economic growth and the potential for environmental impacts arising from unconventional gas production, as well as the unknown facts of the future

energy mix in the absence of gas, the overall impact associated with the “no-go” alternative is considered to be of **unknown significance**.

## 7.5 Cumulative Impact

Given that the assessed impacts of the aerial FTG surveys and other remote sensing methods are considered to be of very low significance, there is no chance of cumulative impacts of any significance. Given that there are many separate applications for exploration rights in the eastern regions of South Africa, cognisance will need to be given to potential cumulative impacts if these applications proceed past early-phase exploration.

I&APs continue to request that the impacts of potential further exploration and future production be assessed in this EIA order for them to have a complete understanding of the risk of the eventual oil or gas production project (given that the purpose of exploration is to get to extraction). Rhino Oil and Gas maintains that it cannot yet, without conducting the early-phase exploration work, know what the future options entail. Without information on the scope, extent, duration and location of future activities proposed by an applicant it is not possible for an EAP to undertake a reliable assessment of future impacts.

## 8. CONCLUSIONS AND RECOMMENDATIONS

SLR, as the environmental assessment practitioner appointed by Rhino Oil and Gas, has undertaken a Scoping and EIA process in terms of the EIA Regulations, 2014 to inform an authority decision on the application made for environmental authorisation under the NEMA. The current ER application only includes remote exploration techniques, restricted to analysis of existing data and an aerial full tensor gradiometry gravity survey. If the application is approved Rhino Oil and Gas would be in a position to conduct the remote exploration techniques. Thereafter, should Rhino Oil and Gas propose to conduct ground-based exploration activities (core boreholes and seismic surveys) this would necessitate a further application to PASA and a separate environmental assessment and authorisation process in terms of NEMA.

The key finding of the EIA is of a contrast between very low significance impacts resulting from an exploration work programme which is limited to desktop and remote sensing methods and extremely strong public opposition to all forms of exploration for onshore unconventional gas.

The assessment concluded that the impacts of proposed exploration activities would be extremely limited in extent, widely dispersed, of very short duration and very low intensity and would therefore have very low significance. On the simple merits of the application there is therefore no environmental reason why the exploration activities should not be approved. All of the ER application area would be suitable for the undertaking of the remote sensing exploration methods as proposed. It is noted however that the proposed activities are likely to be the first in a series of exploration stages comprising activities that would likely increase in impact significance (if exploration was successful and the project proceeded to the following stages). The intensity and duration of such impacts would likely increase with each subsequent phase, but would likely become confined to increasingly limited target areas.

The public opposition to the exploration right application has been strongly voiced and have been received almost unanimously from all the sectors of society that have participated in the EIA. It is evident however that the majority of the opposition is not directly against the merits of exploration activities as proposed, but rather

against the anticipated outcome and risks that, if exploration is successful, could result from production. The public perception is interpreted to be that issuing of an exploration right could lead to successful exploration; that would ultimately result in an application for production with the potential use of hydraulic fracturing. It is further perceived that this could lead to widespread impacts on water and land causing devastation to local livelihoods. The perception is informed by the widely publicised, purported negative effects of hydraulic fracturing and the decisions taken by many governing bodies from around the world to suspend such activities. The related concern is that once an exploration right is granted, it will be nearly impossible to stop the process later, even if the environmental risks to local receptors outweigh the benefits. This is seen to arise from a mistrust and or misunderstanding of the governance framework that is in place to regulate petroleum exploration and production; concern as to whether government can balance the needs and interests of local people against such development, and an expectation that enforcement of compliance with environmental management obligations would be poor. For these reasons the public approach is to 'close the door on exploration before it opens', thereby preventing any future risk, or potential benefit, from resulting.

It is the opinion of SLR in terms of the sustainability criteria described above and the nature and extent of the proposed early-phase exploration programme (remote sensing only), that the generally very low significance of the impacts, with the implementation of the proposed mitigation measures, should support a positive decision being made by the Minister of Mineral Resources (or delegated authority) in this regard. Since the proposed exploration activities are associated with Rhino Oil and Gas's initial three-year exploration work programme, the applicant requests that that Environmental Authorisation (should it be granted) be issued and remain valid for a period of three years or more.

The estimated cost for management and / or rehabilitation of potential negative environmental impacts that might be incurred during the proposed remote sensing exploration activities is nil.

In spite of the recommendation for a positive environmental authorisation of the current exploration work programme, the following key points with likely applicability to potential future applications and activities are noted by the EAP:

- parts of the exploration right application area have environmental attributes that may not be compatible with development (including ground-based exploration or production activities);
- restrictions imposed by current regulations would render parts of the exploration right application area unavailable to certain ground-based exploration and production activities; and
- I&APs in general are strongly opposed to all forms of onshore exploration and extraction of unconventional oil and gas and this is unlikely to change for future applications or operations.

The applicant and authority have been informed this and advised that current planning and decision-making should as much as possible take cognizance of the above.

## **9. ENVIRONMENTAL MANAGEMENT PROGRAMME**

The EMPR, once approved by the competent authority, is a legal document and Rhino Oil and Gas is overall accountable and responsible for the implementation thereof. The EMPR is set out to provide environmental

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management i) objectives, ii) outcomes and iii) actions for the planning and design, undertaking of exploration; and rehabilitation and post closure phases.

