

Strategic Environmental Assessment of Shale Gas Development in the Central Karoo

*Phase 3:
Decision Support Tools Report*

APPENDIX 1

*Engagement, outreach, media,
skills development and publications*



CONTENTS

1. BACKGROUND TO STAKEHOLDER ENGAGEMENT	3
2. PROJECT GOVERNANCE GROUPS	5
2.1 Project Executive Committee	5
2.2 The Process Custodians Group	8
3. MULTI-AUTHOR TEAMS	11
4. STAKEHOLDER OUTREACH	12
4.1 Public Outreach Sessions	13
4.1.1 Public Meetings	13
4.1.2 Local Municipality Meetings	15
4.1.3 Methods of stakeholder communication	15
4.1.3.1 Project Website	16
4.1.3.2 Notification of public outreach sessions	17
4.1.4 SEA Media Coverage	19
5. PARTICIPATION THROUGH REVIEW	23
6. WORKSHOPS, CONFERENCES AND PUBLICATIONS	25
7. SKILLS DEVELOPMENT	28

Tables

Table 1: Project Executive Committee composition	5
Table 2: Details of PEC meetings held throughout the SEA process	7
Table 3: Members of the Process Custodians Group.	8
Table 4: Details of PCG meetings held throughout the Scientific Assessment Phase of the SEA.	10
Table 5: Author meetings were hosted throughout the SEA process with specific aims and to produce specific outputs.	12
Table 6: List of project updates on the SEA website	17
Table 7: Details of media coverage the SEA has received over the past 24 months.	20
Table 8: Consolidated summary of opportunities provided to governance groups, peer reviewers and general stakeholders to participate in the review of content material and process issues.	24

Figures

Figure 1: Points of stakeholder interaction throughout Phase 1 and 2 of the SEA process.	4
Figure 2: The rate of stakeholder registration over a 12 month period from May 2015 to May 2016, just prior to the release of the Second Order Draft for public review.	14
Figure 3: Home page (part of) of the Shale Gas SEA Website (http://seasgd.csir.co.za/)	16
Figure 4: Example of the trilingual notifications for SEA public meetings.	18
Figure 5: Examples of notifications of public briefings advertised in the Cape Argus (left) and Isolezwe lesiXHOSA (right).	19
Figure 6: Participants of the Karoo Bioblitz awareness day in April 2015, during which seven taxonomic groups were surveyed.	26

1. BACKGROUND TO STAKEHOLDER ENGAGEMENT

With the key objective of the SEA being the provision of a scientific evidence base for decision makers and stakeholders to better understand the opportunities and risks associated with SGD; the stakeholder engagement process for the SEA was uniquely designed in such a way to ensure stakeholder participation at every stage of the process. This was achieved through the establishment of four ‘pathways’ of participation, appropriate for different stakeholders. These were: (1) through integrated project governance structures; (2) through the generation of salient questions via stakeholder outreach; (3) through content generation using a multi-author team approach; and (4) through commentary on and review of content by independent peer reviewers and stakeholders.

The SEA was guided by the principles of legitimacy, saliency and credibility. Adherence to the principle of Legitimacy ensured that the process was transparent and conducted in an unbiased manner. The legitimacy of the process, as perceived by the decision makers and the general public, was achieved by the inclusion of the appropriate and relevant organisations and individuals making up the governance groups. Saliency was achieved through the consideration of the all legitimate values, concerns and perspectives of stakeholders, thus ensuring that the outcomes of the SEA process were of relevance to the decision makers and the general public.

Credibility was ensured by maintaining the standards of scientific rigor and technical accuracy with which the assessment was conducted. Essential to achieving credibility for this SEA; numerous distinguished scientists acted as authors, which sought to ensure that the sources of international, local and traditional knowledge were considered trustworthy by all stakeholders. The balanced and inclusive composition of the governance groups and the extensive and transparent expert and public review of the scientific assessment also furthered the credibility of the SEA.

The stakeholder engagement process sought to convey the SEA process and the preliminary outcomes of the scientific assessment to all interested and affected parties (I&APs), as well as to describe the ways in which they can engage in the process. This approach does not substitute that typically followed in an Environmental Impact Assessment (EIA), in which the concerns of the public are captured and responded to, but further adds to it, using those key concerns to help shape the scope of the scientific assessment at a strategic level, thus ensuring that all the material issues are addressed.

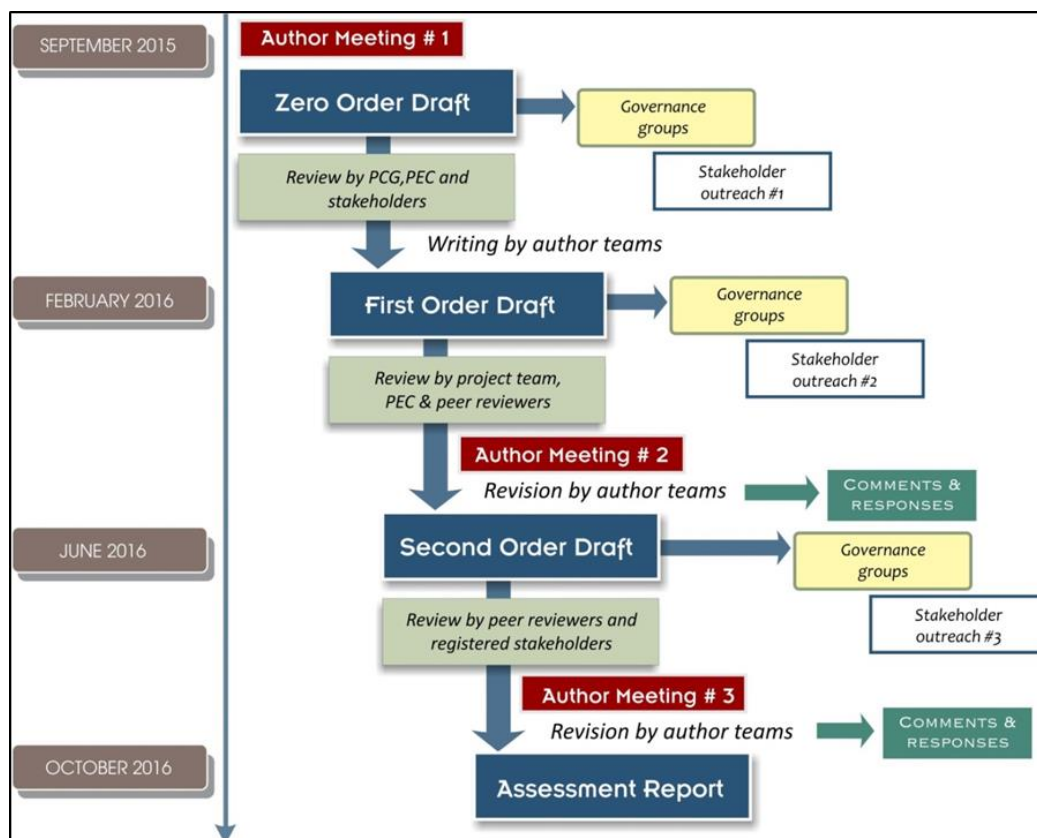


Figure 1: Points of stakeholder interaction throughout Phase 1 and 2 of the SEA process.

The scientific assessment phase of the SEA began with Author Meeting # 1 and the production of Zero Order Draft, followed by the first draft text, tables and figures in the First Order Draft which was sent for national and international peer review. Incorporating the comments from the peer review experts, the multi-author teams developed the Second Order Draft which was sent back to the peer review experts and simultaneously released to the general public for comment. Based on the feedback from the peer review experts and the general stakeholder comments, the final Scientific Assessment was published on 15 November 2016.

The degree of participation throughout the SEA by the governance groups, multi-author teams, expert reviewers and general stakeholders is evident from Figure 1. This approach allowed for full participation and for different types of technical and tacit knowledge to be obtained during the participatory processes. Through discussion and information sharing about the process the stakeholders were able to form a credible vision and understanding of the process. It assisted in making the process salient for them, and improved the likelihood that they will use its outcomes. Typically, governance group meetings and stakeholder outreach sessions were conducted following the development of the Zero, First and Second Order Drafts. Details on the four pathways

of participation relating to the governance groups, multi-author teams, stakeholder outreach and the review processes followed are provided in the sections below.

2. PROJECT GOVERNANCE GROUPS

The SEA was governed by two key governance groups, namely the Project Executive Committee (PEC) and the Process Custodians Group (PCG), which strengthened the legitimacy of the SEA.

2.1 Project Executive Committee

The PEC comprised of representatives of the nation and provincial government authorities who commissioned the SEA, as well as those members of government constituting the main users of the Decision- Making Framework (see Table 1 for PEC composition). Where the intended representatives were unable to attend, their alternatives were present on their behalf. Representatives of the project team, namely the CSIR, SANBI and CGS, were also members of the PEC with the objective to brief the PEC, elaborate on issues and convey decisions to the PEC.

Table 1: Project Executive Committee composition

Representing	Member name	Other members
Department of Environmental Affairs (Chair)	Dee Fisher	Simon Moganetsi, Surprise Zwane, Marlanie Sargonum Moodley, Sabelo Malaza, Wilma Lutsch, Patience Sehlapelo
Department of Water and Sanitation	Mkhevu Mnisi	Bayanda Zenzile, Alice Mabasa
Department of Mineral Resources	Mosa Mabuza	Nonthanthla Jali
Department of Energy	Muzi Mkhize	Mmarena Mphahlele, Stella Mamogale
Department of Science and Technology	Somila Xosa	Mere Kgampe, Mmboneni Muofhe, Nametshego Gumbi
Department of Agriculture, Forestry and Fisheries	Lydia Bosoga	Mary-Jean Gabriel, Edwin Mametja, Mpume Ntlokwana
Eastern Cape Department of Economic Development, Environmental Affairs and Tourism	Alistair McMaster	Gerrie Pienaar
Western Cape Department of Environmental Affairs and Development Planning	Paul Hardcastle	Henri Fortuin
Northern Cape Department of Environment and Nature Conservation	Bryan Fischer	Natalie Uys
Agricultural Research Council	Garry Paterson	-
SANBI	Jeffrey Manuel	Kristal Maze

Representing	Member name	Other members
CGS	Henk Coetzee	V.R.K. Vadapalli, Muvhuso Musethsho, Thato Kgari
CSIR	Bob Scholes and Paul Lochner (SEA co-leaders)	
Secretariat	Greg Schreiner (Project Manager), Luanita Snyman-Van der Walt (Project Officer), Megan de Jager and Andile Dlodla (Project Interns)	

The key responsibilities of the PEC entailed a project oversight role which involved coordinating and communicating scientific information; ensuring that the project remains within the determined scope, timelines and budget; ensuring that strategic and policy issues are adequately addressed; and evaluating feedback from the PCG where required. The PEC also served to satisfy the requirements of the South African Constitution for cooperative governance between departments and different spheres of government. The PEC convened at strategic points of the SEA, starting with an Inception Workshop in which, inter alia, the scope of the project and mandate was communicated to the PEC.

In addition, six (6) PEC meetings were held throughout the SEA process, which coincided with the outputs of the scientific assessment, namely the Zero, First and Second Order Drafts, and lastly the Decision-Making Framework. The PEC was tasked with reviewing these outputs in order to fulfil part of their mandate to ensure the project remains on scope and that the strategic and policy issues had been sufficiently addressed. Where possible, PEC members also attended the stakeholder outreach sessions held in the Central Karoo and the registered stakeholder workshop in Cape Town, which served to validate the legitimacy of the SEA process to the general stakeholders, as it showed that the process had consolidated and proportional buy-in from the government departments who commissioned the SEA. Details of the PEC meetings, including dates and purpose of each meeting, are provided in Table 2. The notes for the PEC meetings are provided in Appendix 1a.

1

Table 2: Details of PEC meetings held throughout the SEA process

Date	Meeting no.	Venue	Purpose of the meeting
12-13 February 2015	Inception Workshop	DEA Environment House, Pretoria	Establish a discussion forum to deliberate on and determine strategic issues for the SEA; Draw on existing experience and expertise from the forum, Communicate the principles, scope and approach to the SEA; Integrate the discussion and key topics in order to determine a suitable way forward; and Explain the structure and mandates of the project team, governance groups and multi-author teams.
22 July 2015	1	Executive Boardroom (A222), Building 3, CSIR Campus, Pretoria	Confirm Terms of Reference; Provide background to the SEA process, Provide a summary of outcomes from the Inception Workshop (12-13 February 2015); Provide an update on the SEA management and process, and on the SANBI Bioblitz; and Discuss the shale gas regulatory environment with regards to changes and new developments.
22 October 2015	2	Ulwazi Room, CSIR Knowledge Commons, Pretoria Campus	Provide an update on SEA progress; Provide and confirm SEA Scope of Work in terms of the Zero Order Draft; Provide overview of planned Public Outreach (9-13 November 2015) and confirm roles and responsibilities for PEC members; Convey key points from the 2 nd PCG Meeting; and Clarify other issues raised including PEC Mandate, Status of the SEA Process Document, Engagement between PEC and PCG, and the participation of the DRDLR in the PEC.
04 May 2016	3	Demo Room, Building 22, CSIR Pretoria Campus	Provide an update on SEA progress with regards to Public Outreach feedback and programme, Scenarios and Activities Chapter, and the Peer Review Process to be followed; Convey key findings on the identified Strategic Issues in the First Order Drafts.
13 June 2016	4	Ulwazi Room, CSIR Knowledge Commons, Pretoria Campus	Discuss the key issues of concern in the Second Order Draft Chapters of the Scientific Assessment prior to the release of the SOD; Engagement with the Summary for Policy-Makers; and Provide feedback and plans for Public Outreach.
26 September 2016	5	Executive Boardroom (A222), Building 3, CSIR Campus, Pretoria	Provide an update on SEA progress with regards to the Scientific Assessment process and its key findings, and the Public Outreach programme; Discuss the Decision-Making Framework for Phase 3 of the SEA.
23 March 2017	6	ECD Boardroom, Building 23, CSIR Campus, Pretoria	Provide an overview of the key Scientific Assessment findings, discuss the approach to strategic mitigation, limits of acceptable change and the Minimum Information Requirements, specifically the splitting of "Exploration" and "Appraisal" into two regulatory processes. This approach was discussed with and approved by PASA.

2.2 The Process Custodians Group

The PCG comprised of sixteen (16) eminent individuals, representing a broad range of interests from government, NGO's, academia/ research community, and the private sector; which further ensured the legitimacy of the process. The primary objective of the PCG was to ensure the process of collecting, evaluating and presenting the evidence of the scientific assessment was conducted in an independent, rigorous and balanced manner. The organisations represented by the PCG members were selected by the PEC based on their credibility in their respective sectors with regards to having a distinctive mandate, a broad representation, and a proven interest in the SGD debate. The expectation of the PCG members was not to represent their organisations per se, but to reflect the range of opinion within their respective sectors, without making an approving or disapproving judgement towards SGD. The PCG composition is provided in Table 3 below:

Table 3: Members of the Process Custodians Group.

Sector	Organisational home of member	Member name	Other members
Chair	IAIA-SA	Sean O'Bierne	-
Government	Department of Performance Monitoring and Evaluation	Rudi Dicks	Nkhensani Golele, Mukondi Masithi
Government	South African Local Government Agency	Intelligent Chauke	-
Government	Department of Economic Development	Andrew Matjeke	Khathutshelo Sikhitha
Government	Department of Environmental Affairs	Dee Fischer	Surprise Zwane, Marlanie Sargonum Moodley, Patience Sehlapelo
Government / Business	PetroSA	Jessica Courtoreille (withdrew from PCG)	Portia Manuel, Bongani Sayidini
Business	AgriSA	Wayman Kritzingner	Nic Opperman
Business	Onshore Petroleum Agency South Africa	Peter Price	Lizel Oberholzer/ Jane Blomkamp
Business	Business Unity South Africa	Marius Diemont	Laurel Shipalana
NGO	Treasure the Karoo Action Group	Jeanie le Roux	Jonathan Deal, Julius Kleynhans
NGO	World Wide Fund For Nature -SA	Morné du Plessis	-
NGO	South African Faith Communities Environment Institute	Stefan Cramer	-
NGO	Project 90 by 2030	David Fig	-
Research	Water Research Commission	Shafick Adams	Jo Burgess
Research	Human Sciences Research Council	Demetre Labadarios	Temba Masilela, Selma Karuaihe
Research	Square Kilometre Array	Selaelo Matlhane	Adrian Tiplady (withdrew)

Sector	Organisational home of member	Member name	Other members
			from PCG to become assessment author)
Research	Nelson Mandela Metropolitan University	Barry Morkel	Moctar Doucoufe, Maarten de Wit (withdrew from PCG)
Constitutional Body	South African Human Rights Commission	Janet Love	Chantal Kisoon, Angela Kariuki, Nada Kakaza
Project team	SANBI	Jeff Manuel	Kristal Maze
Project team	CGS	Henk Coetzee	V.R.K. Vadapalli, Muvhuso Musethsho, Thato Kgari
Project team	CSIR	Bob Scholes and Paul Lochner (SEA co-leaders)	
Project team	Secretariat	Greg Schreiner (Project Manager), Luanita Snyman-Van der Walt (Project Officer), Megan de Jager and Andile Dladla (Project Interns)	

The innovative concept of the PCG was designed specifically for Phase 2 of the SEA (the Scientific Assessment Phase) to perform a referee role which was not content prescriptive but rather process driven; ensuring that the process followed the pre-agreed guidelines set out in the SEA Process Document¹; that the multi-author teams had the necessary expertise and balanced representation of well-founded opinions; that all the material issues were covered in the assessment; that the expert peer reviewers were qualified, independent and balanced; and that the expert and stakeholder review comments and queries from stakeholder engagements were adequately addressed and documented. The individual members of the PCG were prohibited from being part of the SEA multi-author teams and expert reviewers; however the organisations from which they were sourced were permitted to provide stakeholder review comments, and nominate authors expert reviewers. Furthermore, these organisations were in no way prevented from expressing their opinions on SGD by means of media engagement, legal action or advocacy.

The PCG met at key junctures during the Scientific Assessment Phase in order to perform the prescribed governance role. As for the PEC, the PCG meetings were conducted in accordance with the scientific assessment outputs, namely the Zero, First and Second Order Drafts; and the meetings were generally held immediately prior to the PEC meetings to allow for reporting of the PCG findings to the PEC (see Figure 1). The PCG is, as far as possible, based on a consensus, however, where an agreement cannot be reached, the majority rule stands, which can be submitted with one or more minority reports if deemed necessary. In addition to communicating and discussing the scientific assessment output reports (ZOD, Scenarios and Activities FOD and SOD, and the 17 Strategic Issues

¹ The SEA Process Document downloadable at <http://seasgd.csir.co.za/library/>

Chapters); feedback was also provided as to stakeholder engagement progress, public outreach processes and mechanisms for stakeholder commenting, as part of their prescribed mandate. The process leading up to the final publication of the scientific assessment received no objections from the PCG. Details of the PCG meetings, including dates and purpose of each meeting, are provided in Table 4. The notes for the PCG meetings are provided in Appendix 1a.

Table 4: Details of PCG meetings held throughout the Scientific Assessment Phase of the SEA.

Date	Meeting no.	Venue	Purpose of the meeting
22 July 2015	1	Executive Boardroom (A222), Building 3, CSIR Campus, Pretoria	Introduction to the process and the Process Governance Model; Provision of meeting principles; Confirming Terms of Reference for the PCG; Overview of Approach and Scope of the SEA; Discuss the Integrative Specialist Teams.
22 October 2015	2	Ulwazi Room, CSIR Knowledge Commons, Pretoria Campus	Provide an outline of the SEA in terms of objectives, study area and governance; Provide update on Status of SEA project and progress; Discuss comments and responses on Specialist/ Author Team composition and balance; Provide SEA Scope of Work in terms of the Zero Order Draft and Risk Assessment approach; Provide Public Outreach programme for November 2015; Discuss issues such as duration allocated for comment and review, feedback to PEC, and circulation of PCG comments prior to submission to Project Team.
3 May 2016	3	Demo Room, Building 22, CSIR Pretoria Campus	Provide an update on SEA progress with regards to Public Outreach feedback and programme, the Second Order Draft of the Scenarios and Activities Chapter, and the Peer Review Process to be followed for the First Order Draft; Provide preliminary feedback on First Order Drafts.
26 September 2016	4	Executive Boardroom (A222), Building 3, CSIR Campus, Pretoria	Provide an update on SEA progress with regards to the Scientific Assessment process and its key findings, and the Public Outreach programme; Address questions on the process and other matters arising.

3. MULTI-AUTHOR TEAMS

The process leading to the development of the evidence-base in the scientific assessment was highly inclusive, drawing from a broad and balanced range of authorship. In order to advance the principles of credibility and saliency (the latter demonstrating balance and comprehensiveness), the process adopted a multi-author team approach, in contrast to the usual approach of appointing a single consultant per topic. Each of the chapters (strategic issues) had an average of six to eight authors, ranging between four (in the case of the waste chapter) and 20 authors (in the case of the biodiversity chapter).

Authors were selected according to their formal qualifications, publications and experience, as well as widespread peer-group consensus based on their track record of valuable contributions on the topic. The 146 authors of the were drawn from a broad range of employment backgrounds, including research institutions, academia, government, NGOs, private sector consultancies and the shale gas industry. They came from many regions of South Africa, with a range of gender and ethnicities.

There was a deliberate effort to ensure diversity and a balance of interests, disciplinary background, experience and perspectives in the team, a process which was overseen by the PCG. Remuneration of authors was designed primarily to cover expenses, rather than offer consultant-level fees which may have led to biased findings. Author workshops were hosted at Goudini Spa near Rawsonville in the Western Cape and were attended by Integrating and Contributing Authors² (each workshop had 60-70 authors in attendance). In total, three workshops were facilitated, each three days in duration. Table 5 below provides details of the three author workshops.

² The Integrating Authors were responsible for ensuring that all the components written by Contributing and Corresponding Authors were delivered on time, and were incorporated in a logical fashion; and that the scope, as decided at the first workshop in the Zero Order Draft, was covered. Integrating Authors ensured that the responses to comments from stakeholders and peer reviewers had been adequately addressed and/or incorporated and documented. The Contributing and Corresponding Authors delivered text, references, tables and graphics to their Integrating Author/s by agreed dates, and according to agreed formats and templates. They assisted in addressing reviewer comments (especially those relating to text they have contributed).

Table 5: Author meetings were hosted throughout the SEA process with specific aims and to produce specific outputs.

Date	Purpose of the meeting	Outputs
Author meeting # 1: 28–30 Sept 2015	Introduction to the process, team, leaders and managers. Author team familiarisation and bonding. Generation and evaluation of scenarios developed for the assessment. Inter and intra team meetings. Zero Order Draft of key issues as they related to each topic.	Scenarios and Activities document with detailed quantification metrics. Integrated Zero Order Draft ready for stakeholder comment and engagement.
Author meeting # 2: 18–20 April 2016	Author teams to work through the comments received on their First Order Drafts, and respond formally to all comments within the structured template, liaise with other teams on overlapping topic issues and plan the way forward to producing the Second Order Draft.	Documented comments and responses trail on the First Order Draft between authors and peer reviewers, Second Order Drafts ready for stakeholder review.
Author meeting # 3: 25–27 July 2016	Author teams to work through the comments received on their Second Order Drafts, and respond formally to all stakeholder comments within the structured template, liaise with other teams on overlapping topic issues and plan the way forward to producing the final drafts for the assessment.	Documented comments and responses trail on the Second Order Draft between authors, peer reviewers and general stakeholders. Final drafts developed, ready for public release.

4. STAKEHOLDER OUTREACH

The seventeen issues addressed in the SEA were generated by a combination of ‘top down’ and ‘bottom up’ dialogues. Top down approaches to selection of topics to be covered included gleaning key issues from the international literature on SGD experiences worldwide – these topics were then debated and agreed with governance groups and stakeholders participating in the SEA process. Bottom up approaches included direct engagement with stakeholders and open dialogues about their key concerns as they related to SGD in the Central Karoo, the process of which is described below.

Following the official launch of the SEA by the Minister of the Department of Environmental Affairs, I&APs were invited to register as stakeholders on the SEA website from September 2015, which was the primary, by not exclusive, means of communication. Additional efforts to improve stakeholder registration included a newspaper advertisement notifying I&APs of the opportunity to register, which was placed in The Rapport, the City Press and the Sunday Times in September 2015. Through registration, stakeholders were kept up to date with the progress of the SEA with regards to process documents; minutes for the PEC, PGC, public outreach sessions and stakeholder workshops; and any opportunities for stakeholder engagement including public meetings and commenting periods for the various scientific assessment outputs. Stakeholders who registered as such on the project website were also able to submit comments at any stage of the SEA process, which were taken into consideration

and responded to accordingly. Those stakeholders that did not have internet access were able to register and submit queries or concerns manually at the public outreach sessions which were converted into an electronic record. Feedback to these individuals was provided using alternative methods of communication, such as phone call, SMS or written letter. Figure 1 below indicates the points of interaction with general stakeholders throughout the initial two phases of the SEA process.

4.1 Public Outreach Sessions

4.1.1 Public Meetings

Three public outreach sessions were conducted in the Central Karoo towns of Graaff-Reinet in the Eastern Cape, Beaufort West in the Western Cape and Victoria West in the Northern Cape meetings (attendance registers and meeting minutes are provided in Appendix 1a). The first opportunity for public engagement followed the release of the ZOD for public perusal and comment in October 2015 (prior to the first round of public engagement) via the project website, and notification was sent to registered stakeholders. The ZOD was then presented to stakeholders at the first public outreach sessions in the Central Karoo, and at the first registered stakeholder workshop in Cape Town in November 2015 (Public Outreach Round 1a). The release of the ZOD to the public facilitated a highly constructive and open dialogue concerning whether the assessment scope, as define in the Zero Order Draft, covered all the material issues of significant concern. Constructive feedback from stakeholders and governance group members led to a number of changes and alterations to the define scope of work, such as the inclusion of an additional topic, 'Human health', in the assessment process. Comments provided on the ZOD were considered for incorporation into the FODs, but were not responded to individually. The preliminary findings of the FODs were communicated and discussed with the same local and stakeholder communities at the second public outreach sessions in Graff-Reinet and Beaufort West in May 2016 (Public Outreach Round 1b) to check that the key issues they raised had been addressed. Their feedback was incorporated via the review process and facilitated where necessary for stakeholders without access to internet, by capturing verbal input at the public meetings for stakeholders without access to internet. Subsequent to the consideration, response and incorporation of the expert and stakeholder review comments of the FODs; the SODs were drafted by the multi-author teams and were released for stakeholder comment over a period of 38 days in June 2016.

The draft findings of the Scientific Assessment Phase were presented and discussed with stakeholders at the third public outreach sessions in the Central Karoo and at the second registered stakeholder's workshop in Cape Town in July 2016 (Public Outreach Round 2). Hard copies and electronic copies

(cd's) of the draft SOD's, and hard copies of the Summary for Policy-Makers were sent to several libraries in Graaff- Reinet, Beaufort West and Victoria West, along with comment instruction documents and comment sheets to allow for stakeholders without internet to access the documents and provide comment. All stakeholder comments were documented and responded to in a manner consistent with that of the expert peer review comments, and appropriate stakeholder comments were incorporated into the final scientific assessment. In keeping with the transparency and legitimacy of the SEA process; the expert peer review and stakeholder comments were made publically available on the project website. Any stakeholder queries were addressed at each of the stakeholder engagement sessions and/or via the project website. In most instances the meetings were attended by the same individuals who had also attended previous sessions. It became clear that substantial levels of trust in the process had been established by the time the findings of the assessment were being conveyed, discussed and commented on. As a result many of the stakeholders expressly indicated that whilst they may not agree with every single finding of the assessment, they felt that it had made a valuable contribution as a reliable information basis for future decision-making. By the time of publication, there were in excess of 600 registered stakeholders (see Figure 2).

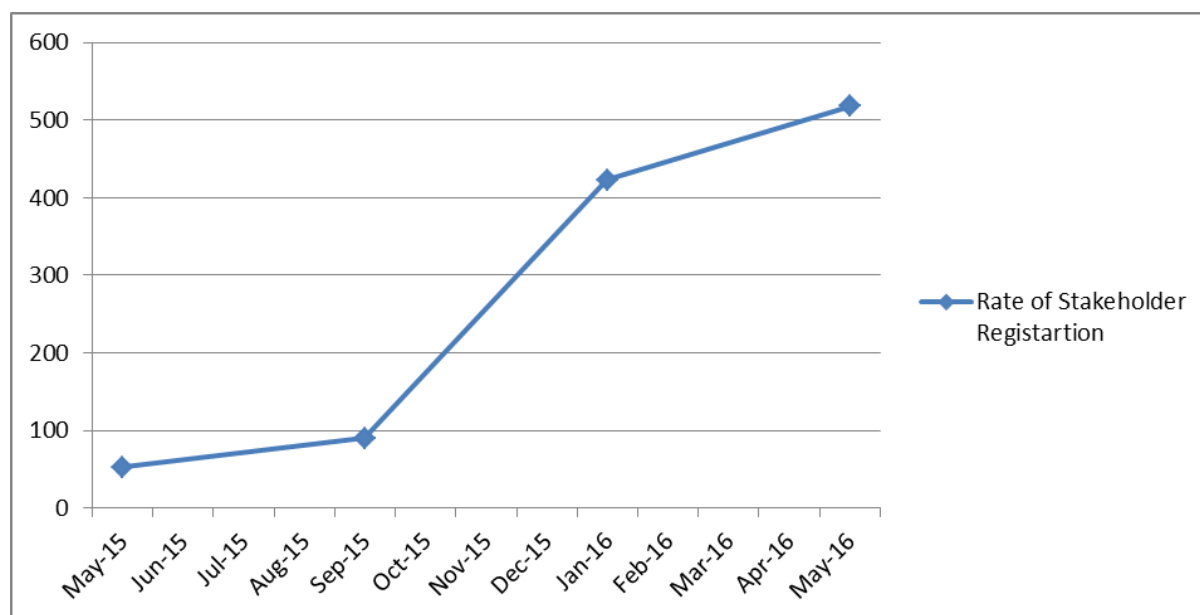


Figure 2: The rate of stakeholder registration over a 12 month period from May 2015 to May 2016, just prior to the release of the Second Order Draft for public review.

From the date of the SEA launch (12 May 2015) until end-June 2015, the management team received 53 online registrations. During the period between early-July 2015 and end-September 2015 a further 37 online registrations were received. During the period between early-October 2015 and end-Jan

2016 there was a substantial increase in online registrations with the management team received 333 registrations.

4.1.2 Local Municipality Meetings

Meetings were also held with the Local Municipalities of the towns in which the public outreach sessions were conducted, namely the Camdeboo Local Municipality, the Beaufort West Local Municipality and the Ubuntu Local Municipality for the second (Public Outreach Round 1b) and third public outreach sessions (Public Outreach Round 2). The Minister of Environmental Affairs, Mrs. Molewa, addressed letters to the Mayor at each municipality, which served to notify the Municipal Offices of the public briefings, and it also requested that a representative from each municipality be present at the public meetings in order to formally open the meeting and introduce the SEA project team. The letter also requested that a meeting be scheduled with the Municipal Offices or identified representatives of the municipality, together with a representative from the department at the Chief Director level, and the project team, prior to the public in order to ensure that the Local Municipalities were adequately informed of the objectives and intended outcomes of the public meetings, as well as the approach to be followed and the key roles and responsibilities of those in attendance meetings (attendance registers and meeting minutes are provided in Appendix 1a). These meetings provided an additional opportunity to inform the local people of the public outreach sessions, as the Local Municipalities were requested to distribute notice of the public meetings (dates and times) through their Local Government structures, namely Ward Councillors, by means of distributing flyers and loud haling. The Municipalities were also requested to have a representative at each of the public meetings to open the meeting and introducing the project team.

4.1.3 Methods of stakeholder communication

Various methods of communication were employed to engage with stakeholders and inform the public of the opportunities for stakeholder engagement. These methods include public meetings (Public Outreach Rounds 1a,b, and 2); the publication of written documents made available on the website, at public meetings and workshops, and at local libraries; interviews with the media and press releases including notification of public meetings on national and local radio stations, advertisements in provincial and local newspapers and via bulk SMS; explanatory materials such as videos on the project website; notification through social media such as Facebook; the distribution of flyers and notice through government structures such as Ward Councillors, the South African Local Government Agency and PEC- and PCG members; and art exhibitions to improve awareness of the SEA process and outcomes.

4.1.3.1 Project Website

As previously noted; the project website was established at the onset of the project, which provided the platform to not only share information with stakeholders on the SEA process and progress throughout, but also to gather information, concerns and comments from stakeholders (Figure 3).



Figure 3: Home page (part of) of the Shale Gas SEA Website (<http://seasgd.csir.co.za/>)

The website was regularly updated with the latest downloadable outputs of the scientific assessment. To date, a total of 14 updates were provided on the website from the SEA launch in May 2015 up to the publication of the final scientific assessment in November 2016 (see Table 6). I&APs were able to register as stakeholders via the website, which allowed them to receive communication about the SEA in terms of progress, outputs and stakeholder engagement. Stakeholders who registered via the website and through manual registration at public outreach sessions were informed by means of email, and where persons did not have an email address, written notices were sent or alternatively, where phone numbers were provided; SMS's were sent.

1 Table 6: List of project updates on the SEA website

Project Update/ Notification	Date
12 May 2015 - Project Launch	12 May 2015
22 July 2015 - Process Custodians Group Meeting	31 August 2015
31 August 2015 - Shale Gas SEA Process Document now available	31 August 2015
28-30 September - Multi-Author Team Workshop 1	08 October 2015
09-13 November 2015 – Round 1 Public Outreach on the SEA for Shale Gas Development	12 October 2015
21 October 2015 – Zero Order Draft Available for Review and Comment	21 October 2015
22 October – Process Custodians Group Meeting 2	04 November 2015
16-17 May 2016 – Round 1a Public Outreach on the SEA for Shale Gas Development- Graff-Reinet & Beaufort West	11 May 2016
12 May 2016 – Shale Gas Development Scenarios and Activities Summary Document & Video Release	12 May 2016
06 June 2016 – Reminder: Scientific Assessment Planned for Release for Stakeholder Review from 14 June to 15 July 2016	06 June 2016
14 June 2016 – Draft Scientific Assessment for Shale Gas Development Now Available for Stakeholder Review (14 Jun- 15 Jul 2016)	14 June 2016
185- 22 July 2016: Round 2 Public Outreach to Communicate Draft Findings of the Phase 2 Scientific Assessment	07 July 2016
15 July 2016: Comment Period for Draft Chapters Extended to 22 July 15:00	15 July 2016
15 November 2016: Final Scientific Assessment Published	15 November 2016

2 3 **4.1.3.2 Notification of public outreach sessions**

4 Notices of the public meetings were also advertised on local radio stations such as Radio Gamkaland
5 in Beaufort West and the Mdantsane FM radio station in Graaff-Reinet. For the first round of public
6 meetings (Public Outreach Round 1a) in Graaff- Reinet, Beaufort West, Victoria West and the
7 registered stakeholder workshop in Cape Town; trilingual (English, Afrikaans and isiXhosa)
8 newspaper advertisements were published in the Daily Dispatch, Diamond Fields, Sunday
9 Independent and Weekend Argus. See Figure 4 for an example of the trilingual advertisement.

NOTIFICATION OF PUBLIC BRIEFINGS FOR THE STRATEGIC ENVIRONMENTAL ASSESSMENT FOR SHALE GAS DEVELOPMENT IN SOUTH AFRICA

The Department of Environmental Affairs has appointed a project team, consisting of the Council for Scientific and Industrial Research, the South African National Biodiversity Institute and the Council for Geoscience, to undertake a Strategic Environmental Assessment for shale gas development. As part of the process, 3 public briefings sessions and 1 registered stakeholder workshop have been arranged in the study area.

KENNISGEWING VAN PUBLIKE UITREIKING VIR DIE STRATEGIESE OMGEWINGSTUDIE VIR SKALIEGASONTWIKKELING IN SUID-AFRIKA

Die Departement van Omgewingsake het 'n projekspan, betaande uit die Wetenskap en Nywerheids Navorsingsraad, die Suid Afrikaanse Nasionale Biodiversiteit Instituut en die Raad vir Geowetenskap, aangestel om 'n Strategiese Omgewings-Ondersoek vir skaliegasontwikkeling uit te voer. As deel van die proses is daar 3 publieke uitreik sessies en 1 werkswinkel vir geregistreerde belanghebbendes wat in die studiegebied gaan plaasvind.

ISAZISO NGAMASUNTSWANA EENDABA KU-WONKEWONKE NGOVAVANYO OLUCWANGCISIWEYO LWEMVELO NGOFUNYANISO LWE SHALE GAS EMZANTSI AFRIKA

Abecandelo lwezeMvelo bonyule iCouncil ye Scientific ne Industrial Research, iSouth African National Biodiversity Institute kunye ne Council ye Geoscience ukuba baqhube uhlelo lovavanyo olucwangcisiweyo lwemvelo ngofunyaniso lwe Shale Gas. Malunga nalenkqubo, kuzobakhona amaqanaba amathathu eentlanganiso ezimasuntswana kunye ne ndibano enye yababhalisileyo ngokuchaphazeleka ezobanjelwa endaweni yovavanyo.

Province	Town	Venue	Date and Time
1. Eastern Cape	Graaff- Reinet	Masizakhe Community Hall	09 November 2015; 16:00 - 19:00
2. Northern Cape	Victoria West	Victoria-West Town Hall	10 November 2015; 16:00 - 19:00
3. Western Cape	Beaufort West	Rustdene Community Hall, de Vries Street	11 November 2015; 16:00 - 19:00
Western Cape (Registered Stakeholder workshop)	Cape Town	Iziko Museum	13 November 2015; 10:30 - 15:00

Website: <http://seasgd.csir.co.za/> | Email: seashalegas@csir.co.za | Tel: 021 888 2482 | Fax 021 888 8693



Figure 4: Example of the trilingual notifications for SEA public meetings.

For the second rough of public meetings (Public Outreach Round 1b) in Graaff-Reinet and Beaufort West, newspaper advertisements were placed in the Cape Argus in English and Die Courier in Afrikaans in the Western Cape; and in the I'solezwe lesiXHOSA in isiXhosa, the Advertiser and the Herald in English in the Eastern Cape. For the third and final round of public meetings (Public Outreach Round 2), trilingual newspaper advertisements were placed in the I'solezwe lesiXHOSA, the Advertiser and the Herald in the Eastern Cape; Diamond Fields and the Advertiser in the Northern Cape, and the Cape Argus and Die Courier in the Western Cape. All advertisements provided the dates and venues for the meetings in each town; the contact details for the CSIR project team; as well as the link to the project website (see Figure 5).



Figure 5: Examples of notifications of public briefings advertised in the Cape Argus (left) and I'solezwe lesiXHOSA (right).

4.1.4 SEA Media Coverage

Throughout the SEA process, a number of media publications were released across different media outlets including printed and online newspapers, news websites, and magazines. Table 7 below provides details on the media coverage the SEA has received over the course of the SEA process.

Strategic Environmental Assessment for Shale Gas Development in the Central Karoo
Phase 3: Decision Support Tools Report

1

Table 7: Details of media coverage the SEA has received over the past 24 months.

Strategic Environmental Assessment media coverage			
Title	Date	Publication	Link
Environmental gas appraisal for Karoo	12/05/15	Business Day	http://www.pressreader.com/south-africa/business-day/20150512/textview
SA set to allow shale gas exploration to proceed despite 24-month risk assessment	12/05/15	Engineering News	http://www.engineeringnews.co.za/print-version/sa-set-to-allow-shale-gas-exploration-to-proceed-despite-24-month-risk-assessment-2015-05-12
Gov takes control of Karoo fracking	12/05/15	The Citizen	http://citizen.co.za/uncategorized/380903/government-takes-control-of-karoo-fracking/
SA shale gas regulations within two weeks	12/05/15	Fin24	http://www.fin24.com/Economy/SA-shale-gas-regulations-within-two-weeks-20150512
SA shale gas regulations within two weeks	12/05/15	SABC	http://www.sabc.co.za/news/a/bd04c5804858801692c7bbe1ccb64421/SA-shale-gas-regulations-within-two-weeks-20151205
Omgewingsondersoek oor skalie oplaas hier	13/05/15	Beeld	http://www.pressreader.com/south-africa/beeld/20150513/281814282437657
Omgewingsondersoek oor skalie oplaas hier	13/05/15	Die Burger	http://www.pressreader.com/south-africa/die-burger/20150513/282011850932989
Team to assess fracking established	13/05/15	The Star – Business Report	http://www.iol.co.za/business/news/team-to-assess-fracking-established-1857561
State rethink on shale gas	13/05/15	The New Age – KZN Business	http://www.pressreader.com/south-africa/the-new-age-free-state/20150513/282136404984379
Multibillion-rand probe into shale gas fracking launched	13/05/15	The Star	https://www.pressreader.com/south-africa/the-mercury/20150513/281603829039882
Team to look at potential impact of Karoo shale gas	13/05/15	SouthAfrica.info	http://www.southafrica.info/about/sustainable/shalegas-sea-130515.htm#.WEUJtn0aulk
Meaning of SA's two-year shale gas risk assessment explored	15/05/15	Engineering News	http://www.engineeringnews.co.za/article/meaning-of-sas-two-year-shale-gas-risk-assessment-explored-2015-05-15
Environment fracking out in the open at last	15/05/15	Mail & Guardian	http://mg.co.za/article/2015-05-14-fracking-out-in-the-open-at-last
Scientific Dimension	22/05/15	Engineering News	

Strategic Environmental Assessment for Shale Gas Development in the Central Karoo
Phase 3: Decision Support Tools Report

Strategic Environmental Assessment media coverage			
Title	Date	Publication	Link
TKAG wants Karoo exploration delayed until conclusion of enviro assessment	22/05/15	Mining Weekly	http://www.miningweekly.com/article/tkag-wants-karoo-exploration-delayed-until-conclusion-of-enviro-assessment-2015-05-22
A sober look at fracking	23/05/15	Weekend Argus – Saturday Edition	
Karoo: the fractious issue of fracking	23/05/15	Pretoria News Weekend	http://www.pressreader.com/south-africa/pretoria-news-weekend/20150523/281689728403128
Anti-frackers welcome impact assessment	26/05/15	The Mercury	http://www.iol.co.za/scitech/science/environment/anti-frackers-welcome-impact-assessment-1863150
A sober look at fracking	28/05/15	Weekend Argus	http://www.iol.co.za/news/a-sober-look-at-fracking-1864698
Calls for moratorium on fracking applications	19/08/15	Cape Times	http://www.iol.co.za/capetimes/call-for-moratorium-on-fracking-applications-1902062
Fracking challenge to state	19/08/15	The Mercury	http://www.iol.co.za/scitech/science/environment/fracking-challenge-to-state-1902136
Top team of 16 experts to examine impact of fracking in 2-year study	02/10/15	Cape Times	http://www.pressreader.com/south-africa/cape-times/20151002/281668253791708
Farmers fear possibility of fracking in province	14/10/15	The Mercury	http://www.kwanalu.co.za/farmers-fear-possibility-of-fracking-in-province/
Consultations on fracking to begin	10/11/15	Diamond Field Advertiser	https://www.pressreader.com/south-africa/diamond-fields-advertiser/20151110/281547994775438
Assessment to establish fracking risk	16/11/15	Cape Times	http://www.iol.co.za/capetimes/assessment-to-establish-fracking-risk-1946187
Dire warning on fracking	11/03/16	Pretoria News	
Shale gas in Karoo? Questions loom	11/03/16	Cape Time	http://www.iol.co.za/business/news/shale-gas-in-karoo-questions-loom-1996405
Mapping the future of fracking - (An environmental assessment on shale gas exploration may bring 'us' and 'them' closer)	12/03/16	Weekend Argus	http://www.iol.co.za/news/mapping-the-future-of-fracking-1997061

Strategic Environmental Assessment for Shale Gas Development in the Central Karoo
Phase 3: Decision Support Tools Report

Strategic Environmental Assessment media coverage			
Title	Date	Publication	Link
SA drawing on 150 experts as rigorous Karoo shale-gas environ assessment advances	01/04/16	Engineering News	http://www.engineeringnews.co.za/article/sa-drawing-on-150-experts-as-rigorous-karoo-shale-gas-enviro-assessment-advances-2016-04-01
Pasa ups estimate for Karoo shale gas	05/12/16	Dispatch live	http://www.dispatchlive.co.za/business/2016/05/13/pasa-ups-estimate-for-karoo-shale-gas/
International Biological Diversity Day – why SA is the 3 rd most biodiverse place on Earth	23/05/16	News24	http://traveller24.news24.com/Explore/Green/international-biological-diversity-day-why-sa-is-the-3rd-most-biodiverse-place-on-earth-20160523
Shale gas exploration not worth it at \$50 per barrel	12/07/16	City Press	http://city-press.news24.com/Business/shale-gas-exploration-not-worth-it-at-50-per-barrel-20160708
Shale Gas Development – A Scientific Assessment for South Africa	15/07/16	The HeritagePortal	http://theheritageportal.co.za/notice/shale-gas-development-scientific-assessment-south-africa
Shale gas fails the jobs test	03/09/16	City Press / Fin24	http://www.fin24.com/Economy/shale-gas-fails-the-jobs-test-20160902
WWF pulls apart report on economic benefits of fracking in SA	21/10/16	Fin24	http://www.fin24.com/Opinion/wwf-pulls-apart-report-on-economic-benefits-of-fracking-in-sa-20161021
Karoo fracking risky, experts say	23/11/16	The Mercury	http://www.kwanalu.co.za/karoo-fracking-risky-experts-say/
What the frack! Scientific report finds little sense in fracking	23/11/16	SAPromoMagazine	https://www.sapromo.com/frack-scientific-report-finds-little-sense-fracking/12221
CSIR fracking report shows the downside	27/11/16	City Press	http://www.fin24.com/Economy/csir-fracking-report-shows-the-downside-20161125

5. PARTICIPATION THROUGH REVIEW

The FOD chapters were submitted to 25 local and 46 international independent experts for peer review – this process was independently managed by the project management team acting in a review editor capacity. Disputes between author teams and peer reviewed were facilitated and managed by the project team until a consensual outcome emerged. While there were a few instances of disagreements between authors and peer reviewers, generally there was widespread and grounded views on what the key issues and levels of risk are.

Experts were nominated by governance groups, stakeholders, authors and recruited by the project management team following approval by the PCG based on experience in relation to SGD or specific knowledge of the Central Karoo socio-economic and ecological systems. Expert reviewers were drawn from government, NGOs, academia, the private sector with many international volunteers coming from the United States of America, Canada, Australia and other European countries. All peer review experts participated in the assessment process on a pro bono basis.

The peer review comments, each submitted as structured page-and-line numbered statements relating to the accuracy, balance and comprehensiveness of the chapter content, were considered and responded to by the author teams during development of the SOD. The responses to every comment were made in a public-domain database on the project website. Responses to comments were required to be sufficiently descriptive for the stakeholders to be able to trace them in the text or understand the basis on which they had been accepted or rejected. The primary criterion was to demonstrate that authors had adequately applied their minds in the consideration of the comments.

The same peer review experts reviewed the revised SOD which was released for broader stakeholder review. The comment provision and response mechanism for the SOD was the same as for the FOD. The collaboration between authors, expert reviewers and knowledgeable stakeholders resulted in the emergence of a variety of knowledges of the study area and particular topics. Table 8 presents the opportunities for review and commenting provided to the governance groups, peer reviewers and public stakeholders during the SEA process.

1 Table 8: Consolidated summary of opportunities provided to governance groups, peer reviewers and general
2 stakeholders to participate in the review of content material and process issues.

Review item	What was reviewed?	Stakeholder group			
		PEC	PCG	Peer reviewers	General stakeholders
		<i>Dates provided for stakeholder review on content and process</i>			
Approval of author team s	The expertise, balance and credibility of authors		07 – 17 September 2015		
Zero Order Draft	The coverage of all the material issues associated with SGD	21 October – 20 November 2015	21 October – 20 November 2015		21 October – 20 November 2015
Nomination of peer review experts	The nominated peer review experts where sufficiently experienced in aspects related to SGD or have specific knowledge of the Central Karoo socio-economic and ecological systems	18 January – 08 February 2016	05 January – 08 February 2016		Throughout round 1 of public outreach in November 2015 up to 08 February 2016
First Order Draft	The facts, evidence, structure or reports and assessment findings based on cited information	03 March - 29 March 2016		22 February – 18 March 2016	
Second Order Draft	Same as for the First Order Draft and any other content or process issue a stakeholder wished to comment or question	03 June – 22 July 2016	14 June – 22 July 2016	14 June – 22 July 2016	14 June – 22 July 2016
Approval of adequate response to review comments	The review comments received from expert and stakeholders been adequately addressed and have the responses been adequately documented		28 October – 10 November 2016		
Decision-Making Framework	The project has been delivered on brief and budget. The policy-level questions have been adequately addressed in the SEA	10 March – 07 April 2017 (tbc)			

3

6. WORKSHOPS, CONFERENCES AND PUBLICATIONS

The project team, including the CSIR, SANBI and CGS participated in numerous of conferences, workshops, and seminars over the course of the SEA, and also published a number of papers during this time.

In August 2015, a DEA representative and former PEC member, Surprise Zwane, presented on the SEA for SGD in South Africa at the 2015 Annual IAIAsa Conference at the Champagne Sports Resort in the Drakensberg, KwaZulu-Natal. Other PEC members from the DEA and project team members were also in attendance. See *Zwane, S., Schreiner, G.O., Fischer, D., & P.A. Lochner. Strategic Environmental Assessment for Shale Gas Development in South Africa. Proceedings of the 20th Annual Conference of the International Association for Impact Assessment South Africa; 12 – 14 August, 2015*

A Western Cape Intra-Governmental Shale Gas Forum was held in August 2015, at which project member, Greg Schreiner presented an overview of the SEA process. The purpose of the forum was to facilitate information sharing relating to the SEA for SGD, and to advise the Western Cape Government on potential institutional requirements associated with the implementation of shale gas related operations.

In August 2015, Greg Schreiner and Luanita van der Walt attended the Water Research Commission Water Science Plan for Unconventional Gas hosted in collaboration with the University of the Western Cape and North American research institutions. The South African Local Government Association (SALGA) held a Broader Karoo Region Small Town Regeneration and Regional Economic Development Conference in April 2016, at the Beaufort West Youth Hub. The theme of the conference was “Small Towns, New Futures”: Karoo Region; where Greg Schreiner presented an overview of the SEA.

Project partner, SANBI invited the CSIR to participate in the Bioblitz awareness day and launch, in April 2016 in Matjiesfontein (Figure 6). The Bioblitz, which is essentially a rapid biodiversity assessment conducted by means of field surveys at a single site in a short time period (usually a day) using as many observers as possible, including biologists, citizen scientists and general public, was undertaken as a result of significant data gaps within the Karoo region in an effort to improve the overall understanding of the biodiversity of the this region. Project team members, Prof Bob Scholes and Megan de Jager were part of more than 70 people who attended the Bioblitz launch in April 2016, including community members from Beaufort West, individuals who had registered as I&APs for the

SEA and government officials from the Department of Science and Technology, Department of Minerals Resources, and the Northern Cape and Western Cape conservation agencies. In addition to the one day field survey conducted at the launch, two fieldtrips were conducted in August- September 2015 (16 days) in the central and western section of the study area; and in December 2015 (four days) in the eastern section of the study area. Valuable observations of plants and animals were gained during the BioBlitz which saw the initiation of a citizen science engagement in the Karoo where citizens are able to post their images of plants and animals onto the iSpot Citizen Science Portal, as part of the Karoo BioGaps project³. To date, 4298 observations have been included on this portal. SANBI is in the process of engaging experts in identifying these postings so that citizen science observations can contribute to the overall datasets of animal and plant distributions feeding into decision making in the Karoo.



Figure 6: Participants of the Karoo Bioblitz awareness day in April 2015, during which seven taxonomic groups were surveyed.

In June 2016, SANBI held a Biodiversity Planning Forum at the Salt Rock hotel and Beach Resort in KwaZulu-Natal, where Prof Bob Scholes, Greg Schreiner and Luanita van der Walt presented on the SEA. As part of the Forum, the CSIR was invited to participate in a learning exchange with The Nature Conservancy (organised by SANBI); focusing on scenario analysis for the impacts associated with hydraulic fracturing for shale gas development, which took place on the two days preceding the Forum. The outputs of this session fed into the Biodiversity Planning Forum. See *Schreiner, G.O & L. van der Walt. 2015. A Strategic Environmental Assessment for Shale gas in South Africa. 12th National Biodiversity Planning Forum. 23-26 June 2015.*

The project team members, Prof Bob Scholes, Greg Schreiner and Luanita Snyman-Van der Walt submitted a paper in August 2016 for publication in a Special Issue on invasives in the African Biodiversity and Conservation (*Bothalia*) journal in October 2017. The paper is entitled “Scientific

³ The Karoo BioGaps project information is available at the following link <http://www.ispotnature.org/projects/karoo-biogaps/observations/map>

Assessments: Matching the process to the problem” and serves to explain how to conduct an assessment. This paper was by invitation, following the 2016 conference on Invasive Alien Species at Goudini, Worcester. See Scholes, R., Schreiner, G., Snyman- Van der Walt, L. (in press, accepted for publication). *Scientific assessments: Matching the process to the problem. Bothalia - African Biodiversity & Conservation. Special Edition.*

In September 2016, project co-leader, Paul Lochner, presented on the SEA at the 35th International Geological Conference (IGC) at the Cape Town International Convention Centre. The conference had over 4000 people in attendance from 117 countries, and over 5000 abstracts for oral and poster presentations. See Lochner, P.A., Schreiner, G.O. & Scholes R.J. 2016. Key note address: *Strategic Environmental Assessment for shale gas development in South Africa. International Geological Congress, 01 September 2016, CTICC, Cape Town.* Paul Lochner also presented on the SEA at the South African Oil and Gas Alliance (SAOGA) networking Breakfast in Granger Bay in September 2016.

In October 2016, the CSIR submitted a chapter entitled “Advancing a participatory and science-based approach to policy formulation for shale gas development in South Africa” for publication in the book; Citizen and other stakeholder participation in unconventional fossil fuel land use decision – making, policy formulation, regulatory practice or other governance mechanisms. The major theme of the book involves a comparative analysis of national governance systems for SGD, regulatory best practice and participation. See Schreiner, G.O., Scholes, R.J., Snyman-Van der Walt, L., De Jager, M., S, Esterhuysen, D., Dlodla, A., Lochner, P.A., Wright, J., Atkinson, D., Hardcastle, P., Kotze, H. (in press). *Advancing a participatory and science-based approach to policy formulation for shale gas development in South Africa. In eds Whitton, J., Cotton, M., Brasier, K. (in press). Citizen and other stakeholder participation in unconventional fossil fuel land use decision-making, policy formation, regulatory practice or other governance mechanisms. London: Routledge.*

A public seminar was held at the University of Cape Town in December 2016, which focused on UCT’s contribution to a sound evidence base for decision making as part of the SEA. Presentations were provided by authors of the scientific assessment, namely Prof Harald Winkler, Prof Leslie London, Dr Katye Altieri, Prof Jenny Day, and by project team members Greg Schreiner and Paul Lochner. A Question and Answer session was also held which further included authors Prof Andrea Rother, Matthew Meas, and project team member Luanita Snyman-Van der Walt.

For the 2017 IAIA Annual Conference, Greg Schreiner, Luanita Snyman-Van der Walt of the project team, Lydia Cape (CSIR) and Dee Fischer (DEA) will be presenting on the use of scenarios to model risk in the shale gas scientific assessment for South Africa. This presentation falls into the session focusing on cumulative environmental assessments and climate change.

The final scientific assessment was published in November 2016 as an 18 chapter peer reviewed, ISBN numbered scientific publication. See Scholes, R., Lochner, P., Schreiner, G., Snyman-Van der Walt, L. and de Jager, M. (eds.). 2016. *Shale Gas Development in the Central Karoo: A Scientific Assessment of the Opportunities and Risks*. CSIR/IU/021MH/EXP/2016/003/A, ISBN 978-0-7988-5631-7, Pretoria: CSIR. Available at <http://seasgd.csir.co.za/scientific-assessment-chapters/>

7. SKILLS DEVELOPMENT

As part of the Memorandum of Agreement between the DEA and CSIR, skills development and the promotion of research were noted as required outputs of the first milestone of the SEA, which was to be implemented throughout most of the SEA. As such, under the auspices of the SEA, and the funding authority which commissioned the SEA, various CSIR project members were provided financial support in conducting further studies or courses. CSIR project manager, Greg Schreiner obtained accreditation as a Commercial Mediator, which also allows mediation of court-referred disputes.

Disbursement costs such as flights, care hire and accommodation (where necessary) were provided for project intern, Megan de Jager, to conduct fieldwork in October 2016 and February 2017, and attend meetings with mentor and supervisor for her PhD in Environmental Geography which focuses on setting biophysical baseline conditions in the Karoo Basin, prior to the onset of shale gas development, using remote sensing techniques.

Funding was also provided for Megan to attend the 2016 Annual IAIA Conference in Port Elizabeth where she presented her PhD. Course fees and disbursements were provided from the SEA for two courses related to remote sensing at the Nelson Mandela Metropolitan University (presented by the South African National Space Agency) and University of Stellenbosch, which Megan attended in July and November 2016. Megan will be completed with her PhD by end-2018.

The other project intern, Andile Dlodla obtained his Post-Grad Diploma (PGD) in Environmental Management from the University of Stellenbosch, which was funded by the shale gas SEA project.

- 1 Andile will continue to further his studies and is enrolled for an MPhil for 2017. Funding was also
- 2 provided for Andile to attend the 2015 IAIA Annual Conference in KwaZulu-Natal. Andile will
- 3 have completed his Masters Degree by end-2017.

4