APPENDIX 1: ATTENDANCE REGISTER

Name	Interest	Postal Address	Telephone	Email / Fax
Alex Pheiffer	Metago Environmental Engineers (Pty) Ltd	PO Box 1596 Cramerview 2060	011 467 0945	alex@metago.co.za 011 467 0978
Natasha Daly			011 467 0945 083 226 8570	natasha.daly@metago.co.za 011 467 0978
Wynand Van Wyk	Landowner	PO Box 703 Bronkhorstspruit	082 321 9852	wynand@lantic.net
Danie and Isabell Ehlers	Landowner	PO Box 50 Baltimore 0619	082 498 4436 082 896 0572	jaober@lantic.net
Stoffel Meyer	Landowner	PO Box 7 Baltimore 0619	082 780 6768 082 494 4370	
Pieter Badenhorst	Landowner	PO Box 18 Baltimore 0619	082 760 5853	
Simon Van Niekerk	Landowner	PO Box 1 Tom Burke 0621	082 584 8056	simonhvn@mweb.co.za
Lourens and Lida and Mazila Hanekom	On behalf of landowner	PO Box 17 Baltimore 0619	083 362 8990	lida@telkomsa.net
C Klippoort	Landowner	PO Box 63 Tom Burke 0619	082 785 7205	
Riaan De Beer	Landowner	PO Box 3553 Pietersburg	083 628 1951	debeer@telkomsa.net
Maritz Kruger	Landowner	PO Box 97 Tom Burke 0621	082 436 9906	maritzkruger@vodamail.co.za
Johan Voye		PO Box 12169 Benoryn 1504	084 505 8641	jakkals@absamail.co.za
Duard Barand	Duard Barnard and Associates		082 571 6665	duard@envirolaw.co.za

APPENDIX 2: PRESENTATION

TURQUOISE MOON TRADING 157 (PTY) LTD

OMGEWINGS EVALUERING VIR DIE VOORGESTELDE MOONLIGHT YSTER ERTS MYN

PROJEK OPDATERING VERGADERING

12 MAART 2011

metago
Environmental Engineers (Pty) Ltd

AGENDA

* Inleiding
* Opdatering van die projek and omgewings proses
* Algemene bespreeking
* Sluit

metago

DOEL VAN DIE VEGADERING

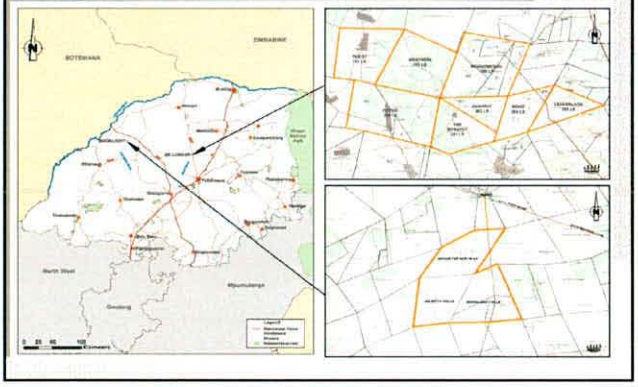
Die doel van vandag se vergadering:

* Verstaan die projek opdatering
* Verstaan die omgewings proses vorentoe
* Verhoog (vra) and rekord omgewings kwessies

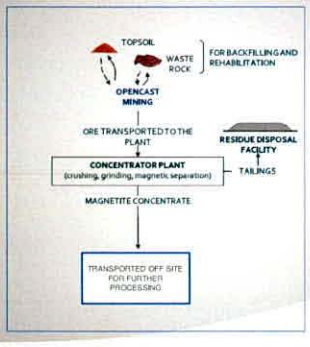
OPDATERING

* Verfyn van besigheidsplan
* Sluit smelter uit van Moonlight site – hersiening van myn-werks program
* Sluit uit De Loskop van mynbou aansoek
* Pad voorentoe:
  - Moonlight: Nuwe aansoek
  - De Loskop: Voortsit onder prospekteerreg & S102 goedgekeur

DIE PROJEK GEBIED



OORSIG VAN DIE PRODUKSIE PROSES



VRAE

TYDLYN VOORENTOE

* Omgewings proses fokus op Moonlight
* Gaan aan met the spesialist ondersoeke
* Addisionele komenteer - aangespreek in die proses and verslag
* Verslag – begin Julie 2011

SLUIT

APPENDIX F: COMMENT AND RESPONSE REPORT

APPENDIX F: SUMMARY OF ISSUES RAISED BY REGULATORY AUTHORITIES AND IAPS

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
Current prospecting activities		
I am not satisfied with prospecting activities, as indigenous trees are being knocked down. I would like a copy of the prospecting right.	Dr. C. Pienaar, focused landowner meeting, 06 July 2010.	A copy of the prospecting right, prospecting works programme and prospecting EMP was forward to Dr Pienaar by Metago on 16 July 2010. As indicated by Turquoise Moon, the current landowner agreements include a commitment to take care when prospecting is undertaken on the farms. This includes appropriate rehabilitation and other mitigatory measures as per the approval of DMR, as well as environmental performance assessments on an annual basis.
We request proof of consultation prior to the exploration work done.	Riaan De Beer, comments received at Koedoesrand focused scoping review meeting, 13 November 2010	This information was forwarded to Riaan de Beer in November 2010, and is still available on request.
Procedural issues		
Please provide me with the EIA application, as an interested and affected party as well as a BID.	Waterberg District Municipality. Phathu Seibe, via questionnaire, 27 August 2001.	A copy of the BID and application has been forwarded to Phathu Seibe.
We need to be involved throughout the entire process.	C.F. Kruger at Moonlight public scoping meeting, 02 October 2010.	All IAPs registered on the database will be involved throughout the process. Turquoise Moon has an open and transparent approach to stakeholder engagement and invites any pro-active input from all IAPs.
How many projects that Metago has been involved in, have been approved?	Johan Vogel at Moonlight public scoping meeting, 02 October 2010.	Most of the projects have been approved.
Should the record of decision be negative, will the mining operations be allowed to go ahead?		No. If the record of decision is negative, no activities that require authorisation will be allowed to be conducted. However the process does make provision for a negative decision to be appealed by the applicant.
We would like to consult with the specialists.	M.F. Du Preez at Moonlight public scoping meeting, 02 October 2010.	This has been arranged in the form of open days.
As a property owner in the Ellisras District we need to be registered as an interested party.	Ken Du Plessis, request received via email, 14 September 2010.	This has been done.
If the mine buys our properties we will not complain.	Nico Lombard at Koedoesrand focused scoping review meeting, 13 November 2010.	Your comment has been noted.

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
When will we be able to appeal the project?	M.F. Du Preez at Moonlight public scoping meeting, 02 October 2010.	IAPs will timeously be notified of the appeal process and timeframes in the record of decisions that will be circulated to all IAPs registered on the database. The appeal process and relevant timeframes will be adhered to as per the provisions of the relevant statutes. Any IAP may raise his/her objections during the stakeholder engagement process as well as in the appeal period.
I know that your company has done all relevant studies regarding this project. But I need to know where I stand and what procedure to follow if I object.	PG Ras, via email, 20 September 2010.	
We would like a copy of the minutes of meeting.	Johan Vogel at Moonlight public scoping meeting, 02 October 2010.	The minutes of all meetings held to date are included in Appendix C and E of the EIA and EMP report.
Will the report provided to IAPs during the review period be the final scoping report?	M.F. Du Preez at Moonlight public scoping meeting, 02 October 2010.	The reports that are made available to the public are draft reports. Once IAPs have submitted their comments the reports will be finalised to include all comments received. This report is then referred to as the final report which is forwarded to the the Limpopo Department of Economic Development, Environment and Tourism and Department of Environmental Affairs A copy of the final scoping report has been made available to IAPs.
This is a big project that you are talking about and we cannot give proper input at such short notice. Let us take this day as an introduction to the proposed project.	Mr Molokomme at the focused meeting with the Ga-Seleka tribal council, 14 October 2010	Agreed. The main purpose of this initial meeting was to introduce the proposed project and the process that Metago is running to the leadership of Ga-Seleka Tribal Authority. This meeting is meant to provide guidance on the consultation process going forward.
Metago has enlightened us with regards to potential developments on the neighbouring farms therefore let us as the tribal authority and as well as the members of the community discuss the proposed project amongst ourselves before commenting. The council must consult the community privately regarding the project.	Mr Moroka at the focused meeting with the Ga-Seleka tribal council, 14 October 2010	Noted.
You are advised to describe the nature and extent of any further investigations required in the environmental impact assessment report, including any specialists reports that may be required.	MB Mudua, Department of Mineral Resources, via fax, 20 May 2011	Specialist studies were undertaken in line with the terms of reference included in the scoping report.
A detailed environmental awareness plan must also be provided indication who the responsible person will be and the frequency and the issues to be addressed.		An environmental awareness plan for the mine is included in Section 23 of the EIA and EMP report.

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
We would like to have another meeting whereby all the constituencies of this tribe will be present. During the meeting, the project and its impacts can be presented so that the people can comment.	Mr Molokomme at the focused meeting with the Ga-Seleka tribal council, 14 October 2010	Noted. Metago would welcome this. A public meeting for the larger community was held on Friday 12 November 2010. A follow up meeting was held on 21 February 2011. Both meetings weer arranged through the tribal council. Minutes of the meetings are included as Appendix E of the EIA and EMP report.
Each person in the tribe has the right to information on the proposed project. There is a sense of ownership. The tribal council may get into trouble for holding our own meetings without the communities' knowledge. Let us involve Metago in the consultation of the constituencies.	Mr Molokomme at the focused meeting with the Ga-Seleka tribal council, 14 October 2010	
We want the process to include all 24 of our villages.	Mr Molokomme at the focused meeting with the Ga-Seleka tribal council, 14 October 2010	
We want the process to be fair and transparent.		Metago is committed to conducting a fair and transparent process and to provide IAPs with an opportunity to contribute to the environmental assessment process.
I feel as though you are withholding information and not telling us all that you know.	Simon Makata, at the meeting held with Seleka community, 21 February 2011.	
Please note that there is a strict dress code. All women coming to the tribal office must wear headscarves' and dresses.	Mr Mocheko at the focused meeting with the Ga-Seleka tribal council, 14 October 2010	Noted. Metago will adhere to this dress code.
It is customary to bring the Kgosi a gift upon a first meeting.		Noted. Metago will comply with your customs.
We are BaTswana people and would like the BIDs and summaries to be translated into Setswana.		Noted. All summary documents and newsletters have and will continue to be translated into Setswana.
We propose setting up a committee that can be used during the EIA process and ongoing.	M.F. Du Preez at Moonlight public scoping meeting, 02 October 2010.	This committee has been set up and is referred to as the Koedoesrand Grondeienaars (Landowners) Forum. The contact person for the committee is Mr Riaan de Beer (see database in Appendix D).
Specialist should not just focus on the immediate project area, but also investigate the effects that the mining activities will have on the environment, that is not within the vicinity of the mine itself.	M.F. Du Preez at Moonlight public scoping meeting, 02 October 2010.	Your comment is noted. The terms of reference for the specialist studies was described in scoping report and is included in each of the specialist studies attached as appendices to the EIA and EMP report.
What weather data will be used? Is this data applicable to local conditions? If not-how does it differ?	Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.	Climatic data used for the project is included in the baseline description of the environment (see Section 1 of the EIA and EMP report). Assumptions regarding the use of climatic data are included in Section 11 of the EIA and EMP report.
The answers given within the scoping report summary are blatant lies. 50% of EIA's are pathetic, the methods and management measures are inadequate.	Eli Stroh at Koedoesrand focused scoping review meeting, 13 November 2010.	Your comment has been noted. Please provide us with specific details in order for us to review your comment in a pro-active manner.

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
Mining companies say that landowners have a say, this is however not true, landowners are given the opportunity, but mining companies will proceed with or without a landowners consent.	Joan Jackson at Koedoesrand focused scoping review meeting, 13 November 2010.	Your comment has been noted. However, the MPRDA and NEMA provide for compulsory stakeholder engagement like this to obtain comments and recommendations.
I am aware that the state holds the mineral rights and therefore companies who have been issued a mining license are legally allowed to conduct mining activities on farms, regardless of who holds the surface rights. Surface rights held by the landowners are just as important. A mining right should not be categorised as being more important.	Eli Stroh at Koedoesrand focused scoping review meeting, 13 November 2010.	Your comment has been noted. The applicant is bound to adhere to the provisions of the relevant Acts. However, the applicant will follow a pro-active approach to reach a reasonable agreement with surface right owners.
We do not like the fact that there are two different projects within the same process. It is confusing.	Riaan De Beer at Koedoesrand focused scoping review meeting, 13 November 2010.	Initially, the two project areas were combined under one process as the approved prospecting right covered two separate areas under one right. The initial mining right application carried this through and as such the two project areas were included in one process. Following input received from IAPs during the scoping process and a change in Turquoise Moon's feasibility plan, the project areas have been split. The proposed Moonlight project will continue under a new mining right application and the De Loskop project will continue under the existing prospecting right, for the time being.
We want to put on record that we are not happy with the two projects combined in one document.	Riaan De Beer, comments received at Koedoesrand focused scoping review meeting, 13 November 2010	
What motivates the specialists to want to do these investigations? Is there any benefit for them?	Giel Du Preez at Koedoesrand focused scoping review meeting, 13 November 2010.	The specialists are appointed by Metago as independent specialists to investigate various environmental and technical aspects in their area of expertise. This is a requirement of various statutes including NEMA and NEM:WA.
The scoping summary mentions that meetings were held yesterday (12 November 2010). What were these meetings about? We would like to see the attendance register of who attended these meetings, agenda of the meeting, the questions raised and the responses provided.	Eli Stroh at Koedoesrand focused scoping review meeting, 13 November 2010.	Scoping meetings were held with the regulatory authorities in the morning and the Ga-Seleka community in the afternoon. Questions raised during the meetings have been included in this table with a full copy of the meeting minutes included in Appendix E of the EIA and EMP report.
The municipality did not notify this forum of the proposed project. Will it be possible to make all relevant documentation available to us? We want the documents to be distributed to this forum.	Sello Kgageng, comment raised at focused Lephalale government communicators forum scoping meeting, 21 January 2011	Yes, a copy of all documentaton will be forwarded to the forum for review. In addition a full copy of the scoping report is available at the municipality for public review.
Will we be informed next time should there be other meetings?		Yes. All IAPs registered on the database will be kept up to date on the project and environmental assessment process.
We want to see the mining license once it has been granted.	Giel Du Preez at Koedoesrand focused scoping review meeting, 13 November 2010.	This can be arranged on request.

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
Of greatest concern is the focussing of the scoping report and the strategy of the EIA, primarily on the Moonlight study site itself. The global, holistic view of the impacts on the surrounding terrain, a minimum of 20km buffer zone, are mostly neglected and overseen. Wildlife Protection and the Game Ranching Business will be most definitely affected up to at least 20km away from the construction site. Minor affects and influences may extend up to 50km or more from the activity site. It is understood that various studies are still in progress but the importance of the issues identified and some of the limitations of the already presented information cannot be emphasised well enough.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	Your comments are noted. Please note that the scoping report is meant to provide a basic understanding of the existing environment. The potential zone of impact and detailed information on various aspects of the environment will only be known once the specialist studies and assessment work have been completed.
Metago should arrange a meeting with the Department of Water Affairs (DWA) to discuss the results of the specialist studies, the relevant water use applications and water quality management.	Malegodi Malatji, regulatory authorities meeting, 12 November 2010.	This will be arranged at the appropriate time. Noted.
The various and relevant sections of the DWA should be present in this meeting. Zama Masando and Malegodi Malatji will assist with the arrangements of this meeting.		
Turquoise Moon should meet with Lephalale Local Municipality to discuss the proposed project as well as the integration of the proposed project in the spatial plans of the municipality particularly in terms of bulk services such as water and sewage. Turquoise Moon should also ensure conformity to all the spatial plans of the municipality. It must be noted that mining activities do not take precedence over agricultural and tourism activities in this area.	Leonard Sole, regulatory authorities meeting, 12 November 2010.	Initial consultations took place as part of the social and labour plan (SLP) process. It is envisaged that as the project develops, Turquoise Moon will continue to engage with the local municipality.
Applications for land use changes should be lodged with the relevant local municipalities.		Noted. The relevant application will be lodged with the municipality.
Consultation with the land owners and users together with proof of consultation is very important for the proposed project and the environmental assessment process. The Department of Rural Development and Land Restitution (DRDLR) deals with land that is state owned or under claims not privately own.	Kwena Mantshilu, regulatory authorities meeting, 12 November 2010.	Your comment is noted.
Is the public meeting at Ga-Seleka village still going to take place this afternoon? I would like to attend it.	Lawrence Kgonyane, regulatory authorities meeting, 12 November 2010.	Yes.

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
After the provisional evaluation of the requirements of sustainable development and the legislation relevant to mining, the interested and affected parties are satisfied that the proposed mine may not be authorised at all and are strongly opposed to it. This decision was not merely an emotional reaction to mining. It reflects a scientific evaluation of the issue. You are therefore requested to ensure that all specialist investigations are also based on and provide this perspective. It is standard practice in defining the Terms of Reference (ToRs) of a specialist to ask the specialist to determine the potential impacts of the mine. The study then assumes that there shall be a mine. In this matter the reality that an application for mining rights mine may be refused should form part of the ToRs of this and other specialists and they must be required to deal fully with the "no-mining" perspective in reports.	Riaan De Beer, via email, 01 February 2011.	The "no-project" option assumes that the mine is not developed and therefore the status quo remains. The terms of reference for specialist studies is not to assess the current environment but is to provide a description of the current baseline environment so as to assess the potential changes to the baseline as a result of the project. This is included in all specialist studies attached as appendices to the EIA and EMP report. The "no-go option" is assessed by the Metago EIA team and is included in Appendix B of the EIA and EMP report.
All specialists need to address the question of, should mining activities be undertaken here at all? If this is not addressed the application is flawed.	Duard Barnard, comment at the Moonlight farmers update meeting, 12 March 2011	
I would like to have something in writing regarding the proposed project.	David Marapole, at the meeting held with Seleka community, 21 February 2011.	The scoping report summaries were distributed last year for public review via post and the Traditional Office. Additional background information documents (BIDs) are available at the office for the community to collect. Summaries of the EIA and EMP report will also be made available to IAPs for review.
There is confusion amongst the people because we are always called for meetings by different companies and we would like to know who you are and who has sent you to talk to us.	Kemotho Mutole, at the meeting held with Seleka community, 21 February 2011.	Turquoise Moon Trading 157 (Pty) Ltd (TM) is the applicant wanting to develop the mine. Metago has been appointed by TM to conduct an environmental impact assessment (EIA). As part of the EIA, Metago's role is to facilitate the public consultation process and specialist investigations, identify and assess potential environmental impacts and present this information to government departments for decision making.
In the presentation you said that the government is the ultimate decision makers. If that is the case, why have you called this meeting if we don't have a say in the decision making?	Zachariah Matopa, at the meeting held with Seleka community, 21 February 2011.	The government take the decision to either approve or not approve the project based the input from interested and affected parties (IAPs), specialists and the technical project team.
We would like to know the results of the specialist studies as well as to meet the specialists.	Jeremiah Moweke, at the meeting held with Seleka community, 21 February 2011.	The EIA report has been made available for public review and a feedback open day in Seleka has been arranged. Project team members: Metago, representative/s from Turquoise

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
We would like to have the representatives of the mine present at these meetings so that they can hear our issues at first hand and also answer our questions.	Zachariah Matopa and Samuel Murowani, at the meeting held with Seleka community, 21 February 2011.	Moon and specialist will be present at the open day to answer any questions.
It would have been better if we had lawyers and people who are well acquainted with the EIA process in this meeting so that they can make sure that the process you are following the information you are sharing with us is accurate.	Kinsgsley Muteve, at the meeting held with Seleka community, 21 February 2011.	You are welcome to do this.
Why did we have to meet at 2pm? The time is too late in the day.	Khaugelo Ngoepe, at the meeting held with Seleka community, 21 February 2011.	This was the time arranged with the tribal office. In future Metago will consider having meetings earlier in the day. This consideration has been taken into account in the planning of the feedback open day.
In addition, had this hall been full, the people would not have heard each other.	Philemon Lobodi, at the meeting held with Seleka community, 21 February 2011.	Comment noted.
The way the details of this meeting were disseminated was not satisfactory because different people had different times for it. So please make sure that all the IAPs get the same information.	Philemon Lobodi, at the meeting held with Seleka community, 21 February 2011.	Comment noted. The details of any future meetings will be communicated in the form of a newsletter and through the tribal office.
What is the relationship between Seleka and Turquoise Moon?	Daniel Morepa, at the meeting held with Seleka community, 21 February 2011.	Metago has identified two traditional authorities that are near the project area and one of them is the Seleka Traditional Authority.
Please explain further regarding the project area and which farms are owned by Seleka?	Daniel Morepa, at the meeting held with Seleka community, 21 February 2011.	The three farms that fall within the project area are privately owned. The nearest farm that falls under the Seleka Tribal Authority is about 8kms away from the project area.
Is there a report that is available for our review that outlines all the information that you have just shared with us?	TS Moepi, at the meeting held with Seleka community, 21 February 2011.	A scoping report was left at the traditional office for public review last year as well as the relevant summaries. This report highlighted the project description and the way forward for the EIA process.
All specialists to be undertaken in terms of Regulations 33 of GNR. 385 of EIA Regulations of 2006.	TA Kubaye, Limpopo Department of Economic Development, Environment and Tourism, ia fax, 28 June 2011	Noted. This was done (see specialist studies included as appendices to the EIA and EMP report)
Water use license or proof of submission of application to the Department of Water Affairs for the existing boreholes and/or new boreholes is required.		Noted. This will be done at the required time.
All issues and objections raised by the interested and affected parties must be completely addressed in the EIA report.		All issues raised by IAPs have been included in this issues table with full copies of correspondence included in Appendix E of the EIA and EMP rpeort.

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
Proof that you have applied wit Eskom with regards to power supply as indicated on page 4-7 of the scoping report is required.	TA Kubaye, Limpopo Department of Economic Development, Environment and Tourism, ia fax, 28 June 2011	Noted. These will be included in the final report to the department.
Service agreement letters must be submitted together with the EIA report form all service providers.		
The mining right application should have been made available to registered IAPs prior to this meeting. In terms of section 10 and 22 of the Mineral and Petroleum Resources Development Act no. 28 of 2002 (MPRDA) this documentation should have been made available to the public. It is therefore Metago's responsibility to ensure that the mining right application was made available to registered IAPs.	Duard Barnard, comment at the Moonlight farmers update meeting, 12 March 2011	On receipt of the DMR acceptance letter, Metago notified IAPs of the mining right application, the project and the environmental assessment process. In terms of section 10 of the MPRDA Act, it is the responsibility of the Regional Manager to notify IAPs of the application. In terms of section 22 of the Act, if the regional manager accepts an application the regional manager must notify the applicant in writing to conduct an environmental impact assessment and submit an EMP and notify and consult with IAPs within 180 days from the date of the notice. This requirement is being met.
Metago is responsible for forcing the regional manager to make this documentation available.		Metago disagrees with this statement. Metago is not in a position to force the DMR to undertake its activities.
Has the mining right application that was originally submitted been withdrawn?		Yes, and at the same time a new application was submitted to cater for the changes in the mine works programme.
When was the new application submitted to the Department of Mineral Resources (DMR)?		In December 2011
We were not notified that a new mining right application was submitted? The problem we have is that we were not made aware of the new mining right application.	Mazila Hanekom, comment at the Moonlight farmers update meeting, 12 March 2011	IAPs were notified of the new mining right application in January 2011 via newsletter distributed to all IAPs on the project database and through newspaper advertisements. Copies of the newsletters and newspaper advertisments are included in Appendix E of the EIA and EMP report.
I feel that the DMR just continues and we are never notified.		
We require a copy of the new mining right application so that we know what to expect. It is legally incorrect that we have not received this documentation.	Duard Barnard, comment at the Moonlight farmers update meeting, 12 March 2011	Metago has forwarded your request to Turquoise Moon.
Going forward there are things that we as IAPs require. This includes: A copy of the complete mining right application that needs to be made available to all registered IAPs via email and/or fax, and a copy of the withdrawal of the original mining right application also needs to be made available to registered IAPs.		

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
The mining right application also needs to be included in the EIA and EMP report.	Duard Barnard, comment at the Moonlight farmers update meeting, 12 March 2011	Turquoise Moon has opted to address this outside of the EIA process.
Did lawyers prepare the new mining right application?	Mazila Hanekom, comment at the Moonlight farmers update meeting, 12 March 2011	Metago does not know who completed the application only that it was submitted by the applicant.
As far as I am aware all new applications submitted to the DMR have been put on hold. As such how was Turquoise Moon able to submit its application? This is illegal.	Simon Van Niekerk, comment at the Moonlight farmers update meeting, 12 March 2011	A moratorium was placed on all prospecting applications. Turquoise Moon submitted a mining right application.
I am concerned about the way forward as you will be submitting the EIA/EMP report without answering the question as to should this mine be allowed to go ahead.	Duard Barnard, comment at the Moonlight farmers update meeting, 12 March 2011	The process being followed complies with the requirements of the relevant regulatory authority framework. The "no-project" option is considered as part of the EIA and EMP report (see Section 8 and Appendix B of the EIA and EMP report).
Have you heard the farmers complaints? You are not listening. We do not want a mine here and still Metago goes ahead.	Mazila Hanekom, comment at the Moonlight farmers update meeting, 12 March 2011	The compilation of the EIA and EMP report forms part of the environmental assessment process. The report includes the impacts identified, the significance thereof as well as the issues and concerns raised. At the end of the process this report is submitted to the decision making departments for consideration. Your objections to the project do not stop the environmental assessment process, however your objections have been clearly outlined in this table and in the report for the decision making departments to take into consideration.
Government departments don't care.		Your comment has been noted.
How long is the review period for the EIA/EMP report?	Riaan De Beer, comment at the Moonlight farmers update meeting, 12 March 2011	IAPs will be given 60 days to review the report.
The specialist reports need to be available prior to the feedback meetings.		All specialist reports are included as appendices to the EIA and EMP report.
The feedback meeting needs to be structured properly. These meetings are time consuming and the farmers are not attending, they don't see any value and have already attended four DLU meeting this week. I propose that any further project and process related updates need to be conveyed to us via newsletter and that future meeting dates need to be arranged in conjunction with the Koedoesrand DLU meetings.	Riaan De Beer, comment at the Moonlight farmers update meeting, 12 March 2011	Your comments are noted and have been taken into consideration in the planning of the feedback open day.

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
Due to the original mining right application being withdrawn, we believe that nothing done in terms of the application is of any value anymore. What is the purpose of inviting interested and affected parties to attend a meeting that is to present a new application? Several members drove large distances and wasted time attending this meeting.	Riaan De Beer, Chairperson of Koedoesrand Grondeienaarsforum, letter received 28 March 2011.	The initial scoping process played a key role in identifying issues and in refining the project scope. The results of the initial scoping process therefore cannot be ignored or discarded. The purpose of today's meeting was to discuss the proposed changes to the mining right application as notified in the January 2011 newsletter to IAPs. The scoping report which was compiled in support of the new mining right application was distributed for public review at the end of January 2011 together with a newsletter to IAPs informing them of the changes to the mining right application and the availability of the scoping report for public review. A copy of this scoping report was distributed directly to Mr Riaan de Beer, representative of the Koedoesrand Grondeienaarsforum. Copies of the scoping report were also made available for public review at the same places as the initial scoping report. The newsletter informed IAPs of these review places and made provision for IAPs to request an electronic copy of the report. This provided IAPs with an opportunity to submit any objections, comments and requests to Metago and/or the Department of Mineral Resources.
According to the letter/notice dated 31st January 2011, the original mining right application was withdrawn in December 2010. The meaning of this sentence is that the application that you started with originally does not exist anymore. Therefore, nothing done in terms of that application is of any value anymore. Your allegation that the old Scoping Report "is still relevant" is wrong and misleading. That Scoping Report, with all its weaknesses, has no more value whatever. An entirely new Scoping Report must be produced.		
Your request in the letter that "additional comments (be provided)…by Saturday 5 March 2011" has no basis in law and you have no justification to demand such comments. After all, the application on which the Scoping report is based has been withdrawn. This withdrawal stripped the Scoping report of any legitimacy it may have had. We are not prepared to comment on a document that has no legal value anymore.		

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In the course of discussions between Ms A Pheiffer representing Metago and Mr Duard Barnard at Baltimore on 12 March 2011, the attitude of Ms Pheiffer was that it is regarded as unnecessary to serve the mining right application on interested and affected parties. This is simply not true and is a blatant disregard of the law.	Riaan De Beer, Chairperson of Koedoesrand Grondeienaarsforum, letter received 28 March 2011.	To clarify discussions between Ms A Pheiffer representing Metago and Mr Duard Barnard prior to the meeting held on 12 March 2010 in Baltimore, Mr Barnard made reference to two sections of the MPRDA, namely Section 10 and 22 and stated that it is the role of the applicant and Metago to provide IAPs with a copy of the mining right application. In this regard, on Metago's receipt of the original DMR acceptance letter, Metago compiled a background information document based on the contents of the mine works programme as included in the mining right application and used this document to notify IAPs of the mining right application, the project and the environmental assessment process. For the new mining right application, Metago distributed a newsletter and made available copies of the new scoping report to the public for review and comment. This report was based on the contents of the new mine works programme in the mining right application. Metago is always happy to facilitate the provision of additional information on request. In this regard, your requests were passed on to Turquoise Moon on receipt.
It was previously clearly stated potential impacts would be limited to a radius of 20km. At another meeting it was indicated that the radius is in fact 5km. Restrictions cannot be placed to only focus on the mine and the immediate area. The specialist investigations need to include an area that runs from the Orange and Limpopo River, Musina, Louis Trichardt and Vaalwater all which form part of the Waterberg basin. We feel that this is the impact zone. If you disagree with us then you need to provide a motivation why.	Duard Barnard, comment raised at Moonlight Farmers update meeting, 12 March 2011	Metago is in full agreement that specialists need to predict the spatial extent of impacts. No restrictions have been placed in this regard. For clarity, the 20km radius referred to previously related to the area where Turquoise Moon will be looking for groundwater as a water supply source for the mine. The 5km radius referred to the area that would be covered by the project hydrocensus. The hydrocensus undertaken for the project covered a 10k radius around the mine (see specialist report included as Appendix K to the EIA and EMP report).

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We have serious reservations as to the study area identified by you. At a previous meeting the indication was given that the area studied would be 20 kilometres in diameter. During that meeting, the study area dropped to 5 kilometres in diameter. After a while the area did not form part of the discussion. The interested and affected parties, basing their observations on the extensive indigenous knowledge that they have of this area, realise that the proposed mine is in a large integrated whole. The interaction between the components of the whole is contributing to the qualities of this area. The introduction of the proposed mine is likely to affect the interaction of the other components in a manner that will cause a highly undesirable holistic result. You are therefore required to consider this holistic aspect properly. In this regard the water resources in the entire area is likely to be one of the more important aspects that would be closely and definitively affected by the proposed mine. The interested and affected parties conclude that the study area (the 'whole' for holistic purposes) should be as follows: From Stockpoort along the Limpopo River in an easterly direction up to Musina. From there south past Louis Trichardt and Polokwane to Mokopane (Potgietersrus), then to the west to Vaalwater, then north past Lephalale (Ellisras) to Stockpoort. If you do not agree with the identification of this whole, you are required to motivate a smaller area in accordance with proper scientific protocols. If you are of the view that this area is unreasonable large, the following two aspects should be borne in mind: It is your duty to determine the potential impacts of the proposed mine. If the impacts (both above and below ground level) are experienced a 100 kilometres way, they still are impacts that must be dealt with. You chose the site for a proposed mine. It is your bad luck or judgment if the site is so placed that its investigation is more demanding and expensive than other better chosen sites. You may not use this difficulty you have to fob of the public with inadequate studies.	Riaan De Beer, via email, 01 February 2011.	Metago is in full agreement that specialists need to predict the spatial extent of impacts. No restrictions have been placed in this regard. For clarity, the 20km radius referred to previously related to the area where Turquoise Moon will be looking for groundwater as a water supply source for the mine. The 5km radius referred to the area that would be covered by the project hydrocensus. The hydrocensus undertaken for the project covered a 10k radius around the mine (see specialist report included as Appendix K to the EIA and EMP report).

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Land claims		
The farms designated for mining in the Moonlight Project appear to be under the authority of Ga-Seleka. Land claims are under way.	Mr Moloantoa at the focused meeting with the Ga-Seleka tribal council, 14 October 2010	Your comments are noted. Based on Metago's initial enquiry into land claims, it is our understanding that there are no land claims on the farms Moonlight, Julietta and GoudaFontein. Should IAPs have any information contrary to our initial enquiry, please forward to Metago as soon as possible.
Let us investigate the land claims issue and find out if the land claims include the farms mentioned as part of the proposed Moonlight Project and then give Metago feedback thereafter.	Mr Moroka at the focused meeting with the Ga-Seleka tribal council, 14 October 2010	
What will happen if Seleka submits a land claim application for these farms on the project area which are currently private owned?	RJ Muthoni, at the meeting held with Seleka community, 21 February 2011.	This issue would need to be addressed at the appropriate time.
Objections to the project		
I object to this project	Willem Briel, social scan, 20 July 2010	Your objections have been noted.
Objects towards the proposed mining project.	Attie Mahne, social scan, 20 July 2010.	
I object towards this project.	Wynand van Wyk, telephonic discussion, 20 July 2010.	
I object towards the proposed project.	PJ Kruger, social scan, 20 July 2010.	
I am not happy with the idea of a mine opening in the area.	Andre du Plessis, focused landowner meeting, 06 July 2010.	
We do not want the project to go ahead.	Objection raised by all attendees at Moonlight public scoping meeting, 02 October 2010.	
This land was given to us by God. What gives Turquoise Moon the right to take it away from us? Why do we not have any rights? It is clear that money has more say than anything else.	Eli Stroh at Koedoesrand focused scoping review meeting, 13 November 2010.	
Section 23(1) d of the MPRDA states that mining may not result in unacceptable pollution, ecological degradation or damage to the environment. I have considered all environmental and integrated aspects and I have come to the conclusion that no matter what the mining method this cannot be sustainable. The magnitude of the cumulative affect alone is such that the project should be refused.	Duard Barnard, comment at the Moonlight farmers update meeting, 12 March 2011	

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Project alternatives		
It is unclear as to why the mine should be established within this area as there are other areas where mining infrastructure already exists. In addition to this we have been told that it is a low grade ore.	Danie Meyer at Moonlight public scoping meeting, 02 October 2010.	The position of the ore body is geographically placed. Turquoise Moon believes there is a feasible ore body to be developed at the Moonlight site. A feasibility study is being undertaken at the same time as the EIA process to inform the viability of establishing a mine in this area.
Can Turquoise Moon not find an alternative location for the project?	Joan Jackson at Moonlight public scoping meeting, 02 October 2010.	
What other sources of ore is available in SA where it can be mined?	Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.	The Moonlight and De Loskop ore bodies are the only ore bodies Turquoise Moon holds any rights for.
All transport alternatives must be assessed with affected parties and detailed plans together with impacts and mitigations must be supplied.		Alternatives transport options considered for the project are outlined in Appendix B of the EIA and EMP report. Transport-related issues are assessed in Section 7.2 with proposed mitigation measures included in Section 19 and Appendix A of the EIA and EMP report.
Technical/project related issues		
Is the mine going to be an opencast or an underground one?	Kinsgsley Muteve, at the meeting held with Seleka community, 21 February 2011.	It is going to be an open pit mine.
I do not have a problem with the mine as you cannot stand in the way of progress.	PH Fourie, telephonic discussion, 22 July 2010.	These comments are noted.
I would like the contact details of the mine representatives.	Attie Mahne, social scan, 20 July 2010.	The contact details for the project representatives are included in the Introduction to the EIA and EMP report. The contact details for the mine is: 011-510-0159 (tel).
What is the life of mine?	Anel Malan, social scan, 20 July 2010.	The current planned life of the mine is approximately 30 years (see Section 2 of the EIA and EMP report). This however could increase depending on the results of ongoing exploration work being conducted.
Has Turquoise Moon bought the farms from the immediate landowners?	Nico Lombard at Moonlight public scoping meeting, 02 October 2010.	No, as indicated by Turquoise Moon, only landowner agreements are in place at this stage.
The summary document indicates that none of the immediate farms have been bought by Turquoise Moon. This is a lie, as the farms have been bought.	Eli Stroh at Koedoesrand focused scoping review meeting, 13 November 2010.	Metago is responsible for conducting the environmental assessment process. Landowner agreements are handled between Turquoise Moon and the relevant landowners.
What will happen should the landowners refuse to sell their properties?	Johan Vogel at Moonlight public scoping meeting, 02 October 2010.	Turquoise Moon will consider a lease agreement with landowners for the length of the operations.
It is unclear what procedures and processes will be conducted at the mine.	Simon van Niekerk at Moonlight public scoping meeting, 02 October 2010.	A description of the proposed project is included in Section 2 and Appendix A of the EIA and EMP report.
What raw material will be used within the process?		

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How does the mine plan on undertaking the operations?	C.F. Kruger at Moonlight public scoping meeting, 02 October 2010.	
What is the iron ore ratio?	M.F. Du Preez at Moonlight public scoping meeting, 02 October 2010.	Expected to be in the region of 38%.
Will the ore be processed in South Africa?	Phalana Mojela, comment raised at focused Lephalale government communicators forum scoping meeting, 21 January 2011	It is planned at this stage to transport the concentrate off site for further processing within South Africa. The preferred option at this stage is Lephalale however other alternative sites in Mokopane, Polokwane, Thabazimbi and Selebi Phikwe (Botswana) (see Appendix B of the EIA and EMP report).
The mine should use a separate power network rather than our network.	Louwrens Hanekom at Moonlight public scoping meeting, 02 October 2010.	It is planned at this stage for Eskom to supply power to the mine via a dedicated power line from the Medupi power station. The EIA for the powerline will be undertaken as a separate process by Eskom (see Section 2 of the EIA and EMP report). At this stage the only feasible option for the project is Eskom power. Alternative power sources for domestic supply such as solar water geysers and/or solar panels will be considered in the detailed design phase of the mine (see Appendix B of the EIA and EMP report).
The Scoping Report does not describe the exact type of power line to be erected, would it be wooden masts (what height?) or steel pylons (what height?). What would be the width of the servitude of mass destructive vegetative clearing, and what would be the exact geographic route that such a power line will follow. The natural and visual impact of such a line can only be quantified once this information is provided.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	
Current infrastructure is struggling to cope with the demand of electricity. How will the mine address this?	Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.	
As Turquoise Moon will be mining for a variety of minerals, will these minerals all be exported at the same time?	M.F. Du Preez at Moonlight public scoping meeting, 02 October 2010.	The minerals will be processed together at the plant in order to produce one product. This product will be transported from the site for both domestic and international markets.
Should mines be nationalised, will the proposed project go ahead as planned?	Johan Vogel at Moonlight public scoping meeting, 02 October 2010.	Metago cannot comment on political opinion.
Will the proposed air strip be available to the public?	Johan Vogel at Moonlight public scoping meeting, 02 October 2010.	The proposed air strip has been excluded from the project scope.
Where will the landing strip be situated?	Phalana Mojela, comment raised at focused Lephalale government communicator's forum scoping meeting, 21 January 2011.	
How deep is the ore body?	Simon Van Niekerk at Koedoesrand focused scoping review meeting, 13 November 2010.	The proposed mine plan at this stage is to develop a pit to a depth of 160m (see Section 2 of the EIA and EMP report).

<table>
<tr><th>ISSUE RAISED</th><th>BY WHOM AND WHEN</th><th>RESPONSE GIVEN BY PROJECT TEAM
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<tr><td>What will the footprint of the tailings dam be?</td><td rowspan="2">Giel Du Preez at Koedoesrand focused scoping review meeting, 13 November 2010.</td><td>The tailings dam and associated support infrastructure covers an estimated area of 312 ha (see Section 2 and Appendix A of the EIA and EMP report).</td></tr>
<tr><td>Will the tailings dam design be in the report?</td><td rowspan="2">A dedicated tailings storage facility and waste dumps (for overburden and rock) are planned for the project (see Figure 14 of the EIA and EMP report). The preliminary design for the tailings dam and waste dumps is included in Appendix A of the EIA and EMP report with the full tailings dam specialist report included as Appendix U of the EIA and EMP report. The risk of acid generation is unlikely (see Section 3.3 of the EIA and EMP report).</td></tr>
<tr><td>What is the Acid Generation Potential of the mine waste being placed in the open pit? Where would the discard be placed? What is the Acid Generation Potential of the discard? How would the fines be discarded? Would the base of the discard/fines dump be lined?</td><td>Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.</td></tr>
<tr><td>How were you able to determine the annual cost to operate if you don't know what the water costs are?</td><td>Simon Van Niekerk at Koedoesrand focused scoping review meeting, 13 November 2010.</td><td>The figure provided is an estimate based on certain assumptions and will be refined during the course of the project.</td></tr>
<tr><td>Give the design criteria for the pollution control dams? What is the operational philosophy for the pollution control dams? Where will the pollution control dams be situated? Will they be lined? What liner would be used? What would be the impact of high acidy and salts on the liners performance? Is there provision for decant from the pollution control dams? Will the pollution control dams be filled via gravity or a pumped system?</td><td>Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.</td><td>The layout of the site is shown in Figure 14 of the EIA and EMP report. The conceptual design of any pollution control dams is included in Appendix A of the EIA and EMP report.</td></tr>
<tr><td>Please give an analysis of the rainwater water balance pre and post mining. Do you agree with the below, if not how do you differ?
<table>
<tr><th></th><th>Pre mining</th><th>Post mining</th></tr>
<tr><td>Recharge</td><td>4%</td><td>15%</td></tr>
<tr><td>Runoff</td><td>6%</td><td>20%</td></tr>
<tr><td>Evapo transpiration</td><td>30%</td><td>15%</td></tr>
<tr><td>Sub surface (Superficial aquifer)</td><td>60%</td><td>50%</td></tr>
</table>
</td><td rowspan="2">Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.</td><td rowspan="3">A site wide climatic water balance has been developed for the project (see Appendix W of the EIA and EMP report).</td></tr>
<tr><td>How much water will evaporate from the pollution control dam?</td></tr>
<tr><td>It is essential that a reliable water balance study be provided. The supply of water cannot be restricted to the rainfall in the area. It must include water transported to the study area by way of faults. In considering water use, not only actual use but also probable legitimate growth in the demand for water resulting from increased economic activities must be researched.</td><td>Riaan De Beer, via email, 01 February 2011.</td></tr>
</table>

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Who is looking at the different project alternatives?	Phalana Mojela, comment raised at focused Lephalale government communicators forum scoping meeting, 21 January 2011	Turquoise Moon and the appointed feasibility team are responsible for taking into consideration feasible project alternatives, with input from environmental and other specialist teams on environmental, social and economic aspects.
Where is Turquoise Moon from?		Turquoise Moon is a South African holding company which is 74% owned by Ferrum Crescent Limited (listed on the Australian Stock Exchange and currently listing on the London Stock Exchange).
What will the time period of the temporary jobs be?		The duration of the construction phase is expected to be approximately two years (see Section 2 of the EIA and EMP report).
What minerals are now included into the mining right application?	Simon van Niekerk, comment raised at Moonlight Farmers update meeting, 12 March 2011	The minerals included in the application are marble, nickel, limestone, iron ore and manganese ore (see Section 1.3 of the EIA and EMP report). These are the same as those included in the original application.
Soil, land capability and land use		
How many hectares (ha) of high potential soils is still available on the Bushveld?	Riaan De Beer, comments received at focused scoping review meeting, 13 November 2010.	This would require a detailed study of soils in the bushveld, which did not form part of the current project scope.
How will subsidence be addressed post decommissioning? How will hard setting be addressed post closure?		It is proposed that the open pit will remain open at closure therefore no issues of subsidence or hard setting will occur.
Give evidence if there will be a statement that land capability will be approximate to pre mining land capability taking all of the above into consideration.		The proposed closure objectives are included in Section 14 of the EIA and EMP report.
What are the alternative land uses and combination of land uses?		Alternative land uses are identified in Section 4 of the EIA and EMP report.
What is the post mining land use alternative?		A description of the pre-mining land capability and land use is given in Section 1.1 and 1.3 of the EIA and EMP report. Relevant specialist studies are included as appendices to the EIA and EMP report. Potential impacts on these land uses have been addressed in Sections 7.2.11 and 7.2.18 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
What is the quantitative pre-mining land capability verses the post mining land capability.		
What is the current land use on the proposed mining area? What is the post-mining land use envisaged as? Will the post-mining land use be sustainable?		
The quality of our grazing and the condition of our cattle and game will decrease.	Peter James at Moonlight public scoping meeting, 02 October 2010.	
My farm is used as a tourist attraction, mainly for game hunting. Access to existing land use would be an issue and the continuation of land use adjacent to the mine.	Andre du Plessis, focused landowner meeting, 06 July 2010.	
We do not want the mine. It impacts on the agriculture and tourism of the area. We do not want the area to change.	C.F. Kruger at Moonlight public scoping meeting, 02 October 2010.	

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Tabana investments, owner of Tabana LR133, through M. Spoelstra are very concerned about the affect the proposed project will have on both the game breeding and hunting/tourism business conducted on the farm. In this light we request that all available information and options be communicated to us as a matter of urgency.	Minderd Spoelstra, comments received via e-mail, 31 August 2010.	A description of the pre-mining land use is given in Section 1.3 of the EIA and EMP report. Relevant specialist studies are included as appendices to the EIA and EMP report. Potential impacts on these land uses have been addressed in Sections 7.2.11 and 7.2.18 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
The scoping report needs to include a study of the effect that pollution will have on the game and cattle breeding.	M Spoelstra at Moonlight public scoping meeting, 02 October 2010.	
A quantitative standing vegetation carrying capacity assessment, before the date of any land destruction, for both grass, herbaceous plants, and browse, expressed as number of Grazing Units and number of Browser Units, are needed to quantify the capability of the land to sustain animal produce. Such a survey, which involves intensified field work, should have been done by Ecorex. This information is necessary to quantify the animal production business potential of the land owners within the separate zones of the potential 20 km impact area. It is also needed as a benchmark to measure the progress of the after rehabilitation in the reinstalling of the land capabilities.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	
What will happen to the three farms after closure?	Isaac Thutlwa, comment raised at focused Lephalale government communicators forum scoping meeting, 21 January 2011	
No mentioning of any specific conservation projects in the region of the Moonlight Study Site in the Scoping Report. Though one project has been noted by the author, there might be more and the EIA need to investigate. Within the 10-20 km impact zone a special project are being launched by the World Wildlife Fund (WWF) in collaboration with local game ranchers. This project is of special immediate importance as it relates to the ambient national and international epidemic of rhino poaching. This project will be directly at risk and in jeopardy if the mine construction proceeds.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	

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The potential impact and risk on the livestock and game ranching industry (when considering aspects such as land capability, carrying capacity, natural vegetation, biodiversity, animal wealth and performance, water quality, water quantity, acid rain and heavy metal outfall, blasting noise, traffic and machinery noise, air traffic noise, visual pollution, domestic crime, animal poaching crime, ecotourism, professional hunting, game production for live sales, wilderness atmosphere, economic wealth of game and livestock farming) at varying distances from the Moonlight Site range from destroyed to slight reduced. *Note: This is a summary of the information provided. For the full comment, refer to Appendix E of the EIA and EMP report.*	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	A description of the pre-mining land use is given in Section 1.3 of the EIA and EMP report. Relevant specialist studies are included as appendices to the EIA and EMP report. Potential impacts on these land uses have been addressed in Sections 7.2.11 and 7.2.18 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
Only the immediate landowners of the Moonlight Study Site have been listed by name and farm description in the documentation provided with the Scoping Report. The potential area of negative impact has not been mapped in the report nor have the Game Ranches and Livestock Farms and their owners being identified and listed within the potential 20 km zone of impact. A preliminary draft assessment indicated approximately 91 potential directly affected land units. These should be listed and described in the EIA. Basic statistics of the specific land use of each of these land units need to be presented in the EIA. The brief description of land use as being reported in the Scoping Report is insufficient, more details are needed.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	The list of landowners included as Table 3.3 in the scoping report was intended to provide an indication of surface right ownership on and immediately adjacent to the site. This list was not intended to identify the zone of impact. A description of the pre-mining land use is given in Section 1.3 of the EIA and EMP report. Relevant specialist studies are included as appendices to the EIA and EMP report.
Rehabilitation and financial provision		
The mine needs to put money into a trust fund specifically for rehabilitation. The farmers need to be compensated for the damages caused by mining activities. The trust fund will ensure that we are not left with any rehabilitation costs.	M.F. Du Preez at Moonlight public scoping meeting, 02 October 2010.	Turquoise Moon is responsible for the rehabilitation of the project area as per the requirements of the MPRDA and NEMA. A financial provision for the rehabilitation and closure of the project site has been calculated by Metago (see Section 22 and Appendix V of the EIA and EMP report). A financial provision is a legal requirement. Prior to the commencement of any activities, Turquoise Moon will need to provide this amount to the Department of Mineral Resources (DMR). This amount is then updated on an annual basis depending on the area of disturbance and the rehabilitation that has taken place to date.
Who will be responsible for the rehabilitation?		
How can we be sure that money will be put aside for rehabilitation costs?	Giel Du Preez at Koedoesrand focused scoping review meeting, 13 November 2010.	
Placing money into a trust fund prior to any mining activities commencing is inefficient, because once a mining company has been liquidated, there will be no money to rehabilitate anything, even if a rehabilitation plan is in place.	Eli Stroh at Koedoesrand focused scoping review meeting, 13 November 2010.	

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What rehabilitation cost is envisaged to the surface rehabilitation after mine closure?	Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.	Turquoise Moon is responsible for the rehabilitation of the project area as per the requirements of the MPRDA and NEMA. A financial provision for the rehabilitation and closure of the project site has been calculated by Metago (see Section 22 and Appendix V of the EIA and EMP report). A financial provision is a legal requirement. Prior to the commencement of any activities, Turquoise Moon will need to provide this amount to the Department of Mineral Resources (DMR). This amount is then updated on an annual basis depending on the area of disturbance and the rehabilitation that has taken place to date.
What rehabilitation and maintenance cost is envisaged to the surface water control measures after mine closure?		
What annual operational cost post closure is envisaged?		
We do not trust the DMR. The money should be placed in a trust fund that is separate from any department.	M.F. Du Preez at Moonlight public scoping meeting, 02 October 2010.	Noted. This will be brought to the attention of the relevant authorities.
We will not allow any mining activities to commence without a guarantee that the financial provision is in place.	Eli Stroh at Koedoesrand focused scoping review meeting, 13 November 2010.	Provision of a financial guarantee is a legal requirement. A copy of the guarantee can be forwarded to you. Please note that this will only be done near the end of the decision making process, if a positive decision is taken by the decision making authorities.
What is the yield of current rehabilitated areas on your mines?	Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.	Turquoise Moon does not own or operate any other mines.
What is the yield of rehabilitated areas on other mines?		This is highly variable and depends on the type of mine, rehabilitation and closure objectives and natural factors such as soils, climate and the surrounding ecology. The DMR may have more detailed results.

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The Scoping Report does not supply a comprehensive Strategy Plan for after rehabilitation of the Moonlight Study Site. It is only mentioned that a certain amount of funding is to be set aside for the purpose. A detailed action plan is needed with estimated time frames and costs involved. The detailed quantitative surveyed information as being required in par 4.3 forms a crucial part of the rehabilitation plan in order to measure and compare the pre-situation with the after match. Take note that the maximum animal browsing height is 5.7 meters for giraffe and elephant. Thus, to restore the before Game Ranching and Ecotourism land capability a tree canopy 5,7 meters high need to be grown as part of the rehab program. The indigenous biodiversity of the before situation also need to be re-established. The major of the indigenous trees will take 15 to 40 years to be restored. These frameworks and the financial costs thereof need to be spelled out in the EIA, and the mining company needs to sign an agreement and invest in a trust fund before-hand to meet these criteria.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	Your comments are noted. A conceptual plan for the decommissioning and rehabilitation of the site is included in Section 2 and Appendix A of the EIA and EMP report. Information informing the setting of closure objectives for the project is included in Section 14 of the EIA and EMP report. It is expected that detailed closure planning will commence at least five years prior to the decommissioning of the site.
Environment and natural resources		
The environment will be destroyed.	Rudoulf Scheepers, social scan, 21 July 2010.	Potential impacts on the environment have been addressed in Sections 7.2 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
The proposed project will place pressure on our natural resources.	D.M. Ehlers at Moonlight public scoping meeting, 02 October 2010.	
We are concerned to the general pollution of the entire area as a result of the mine.	Ronald and Joan Jackson, comments received via fax, 02 October 2010.	
Pollution of the area associated with the proposed project needs to be taken into consideration. The proposed project will destroy the area, the farming community and the environment with uncontrolled pollution.	P.L. Prinsloo, comment received by email, 02 October 2010.	Potential impacts on the environment have been addressed in Sections 7.2 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
The environment will be destroyed	Casper Vorster, telephonic discussion, 10 December 2010.	

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Blasting-related issues		
How many blasts will be required in order to extract 83 000 tons of pig iron per month?	M.F. Du Preez at Moonlight public scoping meeting, 02 October 2010.	The proposed blast plan is included in Section 2 of the EIA and EMP report.
Please make up a detailed baseline of all structures within 10 km of the area and give detailed risk analysis of all structures in relation to potential blasting damage (detailed baseline of all structures is needed by a qualified structural engineer).	Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.	Blast-related impacts have been addressed in Sections 7.2.12 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
Blasting activities will impact on the game within the surrounding area. There is a high possibility that the animals will try and escape through the gaming fences when the blasts go off. Turquoise Moon needs to investigate how the mining activities especially blasting will impact on animal behaviour.		
How will affected structures be replaced if damaged?		
What will be the potential cost of replacement if structures are damaged (on an individual basis)		
Water		
A groundwater study for the area needs to be conducted.	C.F. Kruger at Moonlight public scoping meeting, 02 October 2010.	A groundwater study was conducted (see specialist report included as appendix K to the EIA and EMP report)
What are you going to do about the inflow of groundwater into the open pit?	Giel Du Preez at Koedoesrand focused scoping review meeting, 13 November 2010.	Inflow of groundwater into the pit will be re-used in the mine water circuit (see water balance study included as Appendix W to the EIA and EMP report)
We rely on groundwater which is fed by rain water. The mine is going to collect that rain water and take it from us.	Eil Stroh at Koedoesrand focused scoping review meeting, 13 November 2010.	The rain water which will be collected by the mine is that which falls on its property and which it is required to contain as per regulatory requirements. .
Why will the hydrocensus only cover a 10km radius if the water supply study will cover a 20km radius?	Simon Van Niekerk at Koedoesrand focused scoping review meeting, 13 November 2010.	The hydrocensus covered a 10km radius around the site as this is deemed sufficient by DWA and the specialist team to understand the baseline conditions and predict potential impacts from the project. The water supply study considered a 20km radius to provide sufficient area to identify potential sources of water.

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
Where is the mine planning on getting its water from, as our current groundwater conditions will not be able to accommodate mining activities depending on how water intensive the mining operations will be.	Attie Mahne, social scan, 21 July 2010.	In terms of the mine's water supply, it is envisaged at this stage that the mine will require a make-up water requirement of between 620,000 and 950,000m^3 per annum. This volume takes into consideration the re-use and recycling of water within the mine process water circuit, collection of rainfall and runoff on site as required by law, and dewatering of the mine workings (to ensure safe mining conditions). A Phase 1 water supply study was conducted to input into the EIA. Based on the outcomes of the water supply study, the development of new water resources is not recommended due to over allocation and potential over abstraction. Alternative water supply options are still being considered (see Appendix B of the EIA and EMP report). If required, separate approval will be sought depending on the chosen alternative.
Where does the mine plan on sourcing its water from?	Dannie Meyer, social scan, 21 July 2010.	
I am concerned about the availability of water.	Jennifer Ras, telephonic discussion, 22 July 2010	
I am concerned about availability of groundwater in area.	Willem Briel, social scan, 20 July 2010	
I am generally concerned about the depletion of groundwater levels.	Riaan de Beer, telephonic discussion, 23 July 2010.	
Concerned about the shortage of water.	Erwin Kruger, social scan, 20 July 2010.	
Water within this area is already under pressure. Should water be pumped from the Melinda fault, it will affect the entire area. If water is used from the Palala River, it will increase the pressure on the Limpopo farmers as Eskom is currently pumping water from the upper crocodile river and in order to supply this mine with power will increase the pressure on the farmers and environment. The rivers and the Melinda fault supply the underground water systems. With Eskom as well as other potential mines in the area (north of the Melinda fault towards Swartwater) will put pressure on the water resources. This area does not have water for this type of mine?	P.L. Prinsloo, via e-mail on 02 October 2010.	
There is no water in the Limpopo River. It is not running. There is not enough water to cater for the proposed mining operations.	Giel Du Preez at Koedoesrand focused scoping review meeting, 13 November 2010.	
You mentioned that as an alternative, water may be sourced from Thabazimbi. The farmers in Thabazimbi use that water for irrigation. What gives Turquoise Moon the right to take that water away from those farmers?	Eli Stroh at Koedoesrand focused scoping review meeting, 13 November 2010.	
How many litres of water will the mine require?	Johan Vogel at Moonlight public scoping meeting, 02 October 2010.	

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Where will the mine source its water from?	Dr Pienaar, focused scoping meeting, 23 August 2010.	In terms of the mine's water supply, it is envisaged at this stage that the mine will require a make-up water requirement of between 620,000 and 950,000m3 per annum. This volume takes into consideration the re-use and recycling of water within the mine process water circuit, collection of rainfall and runoff on site as required by law, and dewatering of the mine workings (to ensure safe mining conditions). A Phase 1 water supply study was conducted to input into the EIA. Based on the outcomes of the water supply study, the development of new water resources is not recommended due to over allocation and potential over abstraction. Alternative water supply options are still being considered (see Appendix B of the EIA and EMP report). If required, separate approval will be sought depending on the chosen alternative. A description of the baseline groundwater conditions is given in Section 1.1 of the EIA and EMP report. Relevant specialist study is included as Appendix K to the EIA and EMP report. Dewatering related issues due to the mining of the open pit and potential groundwater contamination issues have been addressed in Section 7.2.6 and 7.2.7 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
I would like to know how much water the mine will require and where the water will be sourced from.	Johan Vogel, via e-mail, 30 August 2010.	
We are concerned about the water in the area.	Ronald and Joan Jackson, via fax, 02 October 2010.	
Is there enough water to support the mine and plant.	C.F. Kruger at Moonlight public scoping meeting, 02 October 2010.	
How will the proposed project impact on the groundwater levels taking into consideration that the area already has problems with water shortage?	Wynand van Wyk, telephonic discussion, 20 July 2010.	
The proposed project will contribute to the groundwater shortage in the area.	Louis Smuts, telephonic discussion, 22 July 2010.	
Concerned about water availability as the current water levels are greatly affected by irrigation and the proposed mining activities will only contribute towards the decreasing water levels.	Ronald Jackson, social scan, 20 July 2010.	
I am concerned about the effects that the mine will have towards our groundwater supply.	Klasina Vogel, telephonic discussion, 22 July 2010.	
The proposed project will decrease our groundwater levels.	Riana Spoelstra, telephonic discussion, 21 July 2010.	
I am concerned about the water shortage in the area.	Louwrens van Staaden, telephonic discussion, 21 July 2010.	
In general there is a water shortage in the area. How will the mine impact on this current water shortage situation?	P. Aucamp, social scan, 21 July 2010.	
The proposed project will result in a drastic decrease in our water levels.	Rudoulf Scheepers, social scan, 21 July 2010.	
Concerned about the impact that the mine will have towards water availability in the area.	Anel Malan, social scan, 20 July 2010.	
How will the mine impact on groundwater levels and availability?	Elrick Viljoen, social scan, 22 July 2010.	
Concerned about the availability of water.	Casper Vorster, telephonic discussion, 10 December 2010.	

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There is not enough water for our cattle. I have to get water from my neighbour.	Eli Stroh at Koedoesrand focused scoping review meeting, 13 November 2010.	In terms of the mine's water supply, it is envisaged at this stage that the mine will require a make-up water requirement of between 620,000 and 950,000m3 per annum. This volume takes into consideration the re-use and recycling of water within the mine process water circuit, collection of rainfall and runoff on site as required by law, and dewatering of the mine workings (to ensure safe mining conditions). A Phase 1 water supply study was conducted to input into the EIA. Based on the outcomes of the water supply study, the development of new water resources is not recommended due to over allocation and potential over abstraction. Alternative water supply options are still being considered (see Appendix B of the EIA and EMP report). If required, separate approval will be sought depending on the chosen alternative. A description of the baseline groundwater conditions is given in Section 1.1 of the EIA and EMP report. Relevant specialist study is included as Appendix K to the EIA and EMP report. Dewatering related issues due to the mining of the open pit and potential groundwater contamination issues have been addressed in Section 7.2.6 and 7.2.7 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
My water in and around my property will be polluted.	P.G Ras, comment received by email, 20 September 2010.	
Groundwater will be more influenced the deeper the mining operations go. What will be done with the sludge and how will dewatering impact surrounding groundwater?	Eli Stroh at Koedoesrand focused scoping review meeting, 13 November 2010.	
How much water will be impacted upon by the operations during each year of process? How will the impact be mitigated?	Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.	
Where will the decant points of the open pit be? When will the decantation of the open pit start? What will be the quality of the decant water? What impact will dewatering have on other mines? How much decant water is expected over the life of mine?		
How much decant water is expected after closure of the mine? (Give the calculations please) How will the water quality be mitigated during and after the mine operation?		
For that period will the water be polluted after closure?		
How will the water quality in the pit be mitigated?		
What is the current status of boreholes adjacent to the mine in terms of delivery and water quality?		
What is the current state of the pollution of the river system up and downstream of mine?		
What are primary uses of the water of this sub catchment as well as the catchment lower down?		
What impact will any pollution have on the water users lower down?		
What is the current status of the catchment water quality and quantity requirement vs water available? (water balance)		
The extent of the dewatering cone has to be shown as well as the figures that were measured locally and used in the calculations. How will the impact be mitigated?		
What is the predicted water quality of the water coming of as seepage from the discard dump? How is this water quality mitigated and to what standard?		
What is the cumulative surface water and groundwater impact?		

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Little detail has yet being presented in the Scoping Report other than the basic requirements of the mining operation. An in-person discussion with locals has revealed horrifying experiences. According to them the levels of boreholes in the region has dropped significantly between 5 and 15 meters over the past 10 years, indicating a major drop of the groundwater table. It is assumed for the decline to be the result of several centre-point irrigation systems deployed as well as the effect of the vast subtraction of water by the other mines and power stations in the greater region. A significant increase in salinity and decrease in water quality, as a result of the drop of the groundwater table, is also experienced. The idea of another mine opening and subtracting more water in bulk seems devastating to the greater environment of the already stressed region. Pollution of drinking water by heavy metals and phosphates can be lethal to the performance and growth of wild animals as well as man.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	In terms of the mine's water supply, it is envisaged at this stage that the mine will require a make-up water requirement of between 620,000 and 950,000m3 per annum. This volume takes into consideration the re-use and recycling of water within the mine process water circuit, collection of rainfall and runoff on site as required by law, and dewatering of the mine workings (to ensure safe mining conditions). A Phase 1 water supply study was conducted to input into the EIA. Based on the outcomes of the water supply study, the development of new water resources is not recommended due to over allocation and potential over abstraction. Alternative water supply options are still being considered (see Appendix B of the EIA and EMP report). If required, separate approval will be sought depending on the chosen alternative. A description of the baseline groundwater conditions is given in Section 1.1 of the EIA and EMP report. Relevant specialist study is included as Appendix K to the EIA and EMP report. Dewatering related issues due to the mining of the open pit and potential groundwater contamination issues have been addressed in Section 7.2.6 and 7.2.7 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
Water itself can and will be contaminated by mining. Precise particulars regarding the nature and extent of the contamination are of course essential. Polluted water is however also a carrier of pollution. Particulars of the soil that would be polluted by water must be provided as well. In this regard it is also appropriate to mention that in several cases it is the special quality of water that makes a specific type of farming venture a success. Replacing the water actually used by the farmer with water that meets the Water Quality Guidelines of the Department of Water Affairs would destroy or seriously prejudice the farming venture on such a farm. This aspect must also be investigated as it is also an impact resulting from mining.	Riaan De Beer, via email, 01 February 2011.	

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The interested and affected parties experience the present geological faults and lineaments as important and valuable suppliers of water for many farming and related activities. The faults also range over large areas that may even extend beyond the boundaries of the study area set out above. Indigenous knowledge also indicates that there are significant connectivity between different faults. You are required to study the faults in depth and among others to provide information as to precisely where the faults come from and go to, the quantity of water they carry, the manner in which the faults are recharged and the extent of their interconnectivity.	Riaan De Beer, via email, 01 February 2011.	A description of the baseline groundwater conditions is given in Section 1.1 of the EIA and EMP report. Relevant specialist study is included as Appendix K to the EIA and EMP report. Dewatering related issues due to the mining of the open pit and potential groundwater contamination issues have been addressed in Section 7.2.6 and 7.2.7 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
An important feature of the study area set out above is its lush growth, large trees and water resources in an area that is should essentially be dry and arid. The conclusion regarding the origin of plant growth and the value of the land for agricultural purposes is that the high water table feeds or waters the plants. It is therefore essential that the precise and detailed impact of the proposed mine on the level of the water table be investigated. The results of this study are also important in considering the vegetation study.	Riaan De Beer, via email, 01 February 2011.	
What is the financial provision for the managing of the water impact during the duration of the impact? How was the provision calculated and by whom.	Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.	Estimated costs for implementing the mitigation measures as outlined in the EIA and EMP report are included in Section 25 of the report.
What will be the cost of water treatment post decommissioning?		The need and cost for water treatment post closure requires input from monitoring of the operational phase of the mine and would be addressed as part of the detailed closure planning. At this stage in project planning, no water treatment is anticipated.
How will a loss of water in boreholes by neighbours be handled?		If mine-related loss of water occurs, appropriate measures will be taken to prevent the loss from occurring, to provide the affected third parties with an alternative supply of equal quality and/or possibly purchase affected farms (see Section 19 and Appendix A of the EIA and EMP report).
How will Turquoise Moon compensate us for the loss of groundwater?	Louw van Staden at Koedoesrand focused scoping review meeting, 13 November 2010.	

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Air quality		
There will be an increase in dust pollution.	Louis Smuts, telephonic discussion, 22 July 2010.	A description of the baseline air quality conditions is given in Section 1.1 of the EIA and EMP report. Relevant specialist study is included as Appendix L to the EIA and EMP report. Air related issues have been addressed in Section 7.2.8 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
I am concerned about dust pollution associated with the proposed mining activities.	Ronald Jackson, social scan, 20 July 2010.	
I am concerned about an increase in dust pollution.	P. Aucamp, social scan, 21 July 2010.	
Air quality in the area will decrease.	Rudoulf Scheepers, social scan, 21 July 2010.	
I am concerned about the possibility of acid rain. In addition to this, dust fallout will affect cattle grazing.	Eli Stroh, social scan, 22 July 2010.	
Mine dust will cause medical problems.	P.G Ras, comment received by email, 20 September 2010.	
How will the dust at households be mitigated?	Riaan De Beer, comments received at focused scoping review meeting, 13 November 2010.	
What is the health risk to humans of the dust?		
What level of PM 10 dust is expected? What is the PM dust currently? What will be the cumulative PM 10 count?		
How will the dust from blasting be mitigated?		
Predict the dust from the access and haul roads on all structures and areas that will be impacted upon-including all sensitive receptors adjacent all access roads.		
How will the impact of dusts towards human health be mitigated? What suppression methods are envisaged? How many l/sqm/hour is needed for 70% dust suppression? How many l/sqm/hour is needed for 90% dust suppression?		
What are the square meters needed for all dust producing areas that will need to be suppressed during each year of operations?		
How much water is needed for dust suppression in each year of the LOM? Where will the water for the dust suppression be sourced? What water quality would be used for dust suppression? What other dust suppressant will be used? How often will it be used on different surfaces? What would be the long term impact of poor water quality used in dust suppression to rehabilitation/ human health and the environment?		
What is the seasonal difference in dust pollution and dust control?		

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What is the cumulative dust impact?	Riaan De Beer, comments received at focused scoping review meeting, 13 November 2010.	A description of the baseline air quality conditions is given in Section 1.1 of the EIA and EMP report. Relevant specialist study is included as Appendix L to the EIA and EMP report. Air related issues have been addressed in Section 7.2.8 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
Depletion of quantity and quality of natural pasture and grazing for animal consumption due to air pollution, dust, acid rain and outfall of heavy metals and phosphates. The un-palatability and avoidance of grazing due to dust outfall and heavy metal lead outfall from low speed (30-55 km/hour) tourist vehicles in the Kruger National Park has been proved significantly by science. Heavy duty hauling trucks and wind storms running across the stock piles, and fast racing (uncontrollable taxis) will create far more outfall than tourist vehicles. Acid rain, phosphates and heavy metals are amongst the chemicals that are potentially hazardous in effecting body growth, animal bone structure and trophy development. Trophy development is the major marketing produce of game ranching.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	
How will the mine and the people who stay near the mine know whether or not the mine is affecting their health? If and should their health deteriorate due to the mining activities how will the mine help such people?	C Maleka, at the meeting held with Seleka community, 21 February 2011.	
What is the impact of dust on the plants surrounding the area? By how much will photosynthesis be reduced? How large an area will be impacted on? What is the impact on fauna and flora and biodiversity? How will the impact be mitigated?	Riaan De Beer, comments received at focused scoping review meeting, 13 November 2010.	
How will you be able to correctly investigate the impact that blasting activities will have on the surrounding air quality if the specialist study is conducted prior to any blasting activities having taken place? Specific information on the material will be blasted is needed.	Simon Van Niekerk at Koedoesrand focused scoping review meeting, 13 November 2010.	
Any modelling of air quality impacts from blasting is inadequate and does not show a true picture.		It is correct that Gaussian plume models, as the one used in the air quality study, cannot compute for events less than 1 hour. Ambient air quality standards are however only for 24-hour averages and therefore the significance from short-term events cannot be determined, even should a model be used that can compute for 5-minute intervals.

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Biodiversity		
What is the cumulative impact of biodiversity?	Riaan De Beer, comments received at focused scoping review meeting, 13 November 2010.	A description of the baseline biodiversity is given in Section 1.1 of the EIA and EMP report. Relevant specialist study is included as Appendix H to the EIA and EMP report. Air related issues have been addressed in Section 7.2.3 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
What will the impact be on our flora if workers take wood out of our environment?		
When looking at vegetation, the information presented by Ecorex in the Scoping Report seems to be a desktop assessment and not an onsite survey. It is entirely insufficient for an EIA and need to be seriously upgraded with survey data. The following important information is lacking: Comprehensive plant species inventory list for the Study Site; Inventory list of important plants (both for domestic and wild animal feeding, and for conservation and tourism) within a 20 km radius from the construction site. The author has noticed some young Boabab trees (approximately 60 years age) within 10 km from the site. What trees, sizes and age is currently on the study site?; A quantitative plant density analysis of all major plant species on the Study Site, as for each plant community and vegetation variant on the Moonlight Study Site; Likewise a quantitative plant canopy cover assessment at 50 cm interval heights from ground level up to 5,5 meters, to include the total spectrum of utilization by wildlife animals. No EIA, in respect of wildlife production and conservation, is complete without the above detailed information. This information will also be needed as a control for the after rehabilitation. NB! These surveys need to be done before any destructive operational activities may be performed on the land. The author has been notified that destructive activities has already commenced on the site! This could result in serious legal actions. Ecorex make no reference to the fact that Veldtype SVcb19 (Limpopo sweet bushveld) is already deteriorating at an alarming rate with Mopane, Ciklebush and Swarthaak encroachment in areas where the habitat experience physical disturbance from over grazing, human activities and/or pollution stresses. This deterioration is a phenomenon which also forms part of Global Warming and need to be prevented at all cost. Major financial declines have already being experienced by land owners due to this encroachment which deplete the natural production capabilities of land.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	

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When looking at animals, the information presented by Ecorex in the Scoping Report is very limited and insufficient for an EIA and need to be seriously upgraded with survey data. The following important information is lacking: Comprehensive animal species inventory list for both the Study Site and the larger 20 km radius area. This inventory must include all larger animal life which is mammals (both small and large and including bats), reptiles, amphibians and birds; For the sake of the Game Ranching Business stakeholders of the area, it is necessary to include a full inventory of historic, past and present suitability and distribution of wild animals in the region, and to what extent they may or may not form part of the present Game Ranching Business; The region of the Moonlight Study Site most definitely does include the habitat and natural distribution range of several endangered, threatened and sensitive wildlife species. No one of these animals has been noted in the Scoping Report neither are any statistics given on the status quo of such species within the region and or the Study Site itself. This issue need seriously be addressed in the EIA.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	A description of the baseline biodiversity is given in Section 1.1 of the EIA and EMP report. Relevant specialist study is included as Appendix H to the EIA and EMP report. Air related issues have been addressed in Section 7.2.3 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
The in depth surveys and inventories are crucial for assessment of impact on natural environment with regards to biodiversity. The consequences and risks towards any depletion of the ambient biodiversity in the entire 20 km radius and more need to be highlighted and described in much more detail. The importance of maintaining biodiversity has not been emphasized enough in the Scoping Report. No mentioning is made of the signing of the treaty of the International Convention on Biodiversity by South Africa and the obligations of the Country towards this undertaking, the NEMBA regulation. No mentioning is made of the burden that biodiversity is already experiencing due to the other mines and power stations in the greater Limpopo region. The claims of Ecorex that there is no concern with regards to any endangered and endemic species in the region of the Moonlight Study Site is false and superficial and need to be investigated in more detail.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	

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Noise		
The proposed project will result in an increase in noise levels.	Riaan de Beer, telephonic discussion, 23 July 2010.	A description of the baseline noise environment is given in Section 1.1 of the EIA and EMP report. Relevant specialist study is included as Appendix M to the EIA and EMP report. Noise related issues have been addressed in Section 7.2.9 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
Concerned about the increase in noise levels and the implications it will have towards their game.	Willem Briel, social scan, 20 July 2010	
What will the impact of noise be toward the surrounding landowners	Riaan de Beer, telephonic discussion, 23 July 2010.	
There will be an increase in noise levels.	Louis Smuts, telephonic discussion, 22 July 2010.	
I am concerned about the increase in noise levels associated with mining activities.	Riana Spoelstra, telephonic discussion, 21 July 2010.	
We are concerned about the impact on the surrounding environment as a result of an increase in noise levels.	Ronald and Joan Jackson, comments received via fax, 02 October 2010.	
Has the mine investigated the impact that pollution and noise will have on the animals in the area?	Joan Jackson at Moonlight public scoping meeting, 02 October 2010.	
How much noise will be at households and areas adjacent to the mine?	Riaan De Beer, comments received at focused scoping review meeting, 13 November 2010.	
What is the current noise during the following conditions: 1.Summer-night and day, 2.Winter-night and day, 3. Overcast conditions and 4. Misty conditions.		
What would the increased noise levels (dB) be to the households adjacent to the mine?		
What noise will be generated from the trucks and other vehicles on the access roads? What are the sensitive receptors? How will this impact be mitigated? What will the predicted noise (including cumulative) noise be after mitigation?		
Will the reverse hooters be included in the predictions of where and how much noise will be generated?		
Which blast monitoring standards will be used? Is noise monitoring standards applicable to grave sites, low cost, mud, and rock and mud houses as is found in the area? Is noise monitoring standards applicable to water supply boreholes as found in the area?		

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
What mitigation measures are proposed for the unmitigated impact of noise?	Riaan De Beer, comments received at focused scoping review meeting, 13 November 2010.	A description of the baseline noise environment is given in Section 1.1 of the EIA and EMP report. Relevant specialist study is included as Appendix M to the EIA and EMP report. Noise related issues have been addressed in Section 7.2.9 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
What is the cumulative noise impact?		
Noise pollution has tremendous impact upon the Game Ranching Industry • Heavy duty hauling traffic create noise that scare and frighten animals, disturb the wilderness atmosphere for hunting and ecotourism, and lower the success rate of hunting per se. • Continuous machinery operating noise disturbs the wilderness atmosphere for hunting and ecotourism, resulting in a decline of clients. • Air-traffic noise of low flying craft poses a threat to animal wealth and hunting success due to the spooking of animals which often result in animals running into boundary fences getting injured and sometimes killed. • Explosive blasting creates stress amongst animals and often may spook animals to flee at great speed, running into fences. Sudden spooks from blasts reduce hunting success of hunters and may entirely ruin a hunting expedition resulting in a financial loss to the land owner. The occurrence of frequent blasts will indefinitely result in a decline of hunting clients.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	
Air traffic landing and taking off at the Moonlight Study Site will greatly affect the 5 km Impact Zone B (Terms of reference 3.4 & 3.6). Low flying aircraft and helicopters do not only spook animals to flee into boundary fences and insure or kill themselves, but also disturb animals making them extremely weary and difficult to hunt. To the worst is a hunter that has been stalking a prime trophy animal for 2-3 days and at last gained a superb view and position for the ultimate shot, and suddenly a low flying craft passes over and spook the animal. The land owner will now have to carry the loss of the potential income as well as the damages of refunding the foreign hunter for his expedition as well as the costs of the accompanying professional hunter guide, plus the risk that the client will never return again.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	The landing strip is no longer included in the project scope. Noise related issues have been addressed in Section 7.2.9 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
Traffic		
Where will the ore be transported to and how many haul trucks will be required?	Johan Vogel at public scoping meeting	A description of the proposed transport requirements for the mine is included in Section 2 of the EIA and EMP report. Relevant specialist study is included as Appendix T to the EIA and EMP report. Transport-related issues have been addressed in Section 7.2.9 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts. A key mitigation measure, as included in Section 2 and Appendix B of the EIA and EMP report, is to transport the concentrate from site via pipeline.
What will the implications of the proposed project be towards traffic?	Riaan de Beer, telephonic discussion, 23 July 2010.	
There will be an increase in traffic and the project will result in the degradation of our roads.	Louis Smuts, telephonic discussion, 22 July 2010.	
Concerned about the increase in traffic.	Rudoulf Scheepers, social scan, 21 July.	
The roads will not be able to handle the mine's vehicles movement.	P.L. Prinsloo, comment received by email, 02 October 2010.	
I will be affected by the movement of traffic.	P.G Ras, comment received by email, 20 September 2010.	
I am concerned about the impact that transportation will have on our local roads. The roads will be destroyed.	Gerhard Visser at Koedoesrand focused scoping review meeting, 13 November 2010.	
Is the proposed new road on public or servitude roads or on private roads	Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.	
How many trucks per hour will be on the roads from the current operations, new operations and other mines?		
Turquoise Moon should ensure that the impacts on the roads are investigated and the negative impacts are mitigated accordingly.	Leonard Sole, regulatory authorities meeting, 12 November 2011.	

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
Besides the water issue is road traffic most likely the second greatest risk of impact. A railway siding to haul the ore produce would have far less impact on both the natural biological environment as well as the socio-economic environment. The Scoping Report do not quantify the type of and quantity of heavy duty hauling vehicles and loads to be using the public road network which encompasses the N11 the R518 and some other connecting roads between the Moonlight Study Site and wherever the cargo is to be supplied. The exact route of cargo supply has not been described in the Scoping Report. No mentioning is made of what procedures and funds are being allocated and put into place for the continuous maintenance of the road surface of the public road network to be used by the heavy duty hauling vehicles. South African road networks are in general chaos of deterioration from heavy duty cargo traffic. The private light vehicle user, in this instance the land owners and their precious clients are deemed to be most negatively affected by the inevitably deterioration of the road network in the area. The mine should be held responsible for the creation of a feasible road maintenance trust fund before any construction commence. The value of such a trust fund needs to be investigated and prescribed by the EIA.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	A description of the proposed transport requirements for the mine is included in Section 2 of the EIA and EMP report. Relevant specialist study is included as Appendix T to the EIA and EMP report. Transport-related issues have been addressed in Section 7.2.9 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts. A key mitigation measure, as included in Section 2 and Appendix B of the EIA and EMP report, is to transport the concentrate from site via pipeline.
Heritage		
What listed buildings are in the area?	Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.	One historical house was identified within the project site that could be disturbed by the project (see Section 1.3 of the EIA and EMP report). These issues haves been addressed in Section 7.2.14 and 7.2.15 of the EIA and EMP report. The recommended mitigation measures outlined in Section 19 and Appendix A have been designed to minimise unacceptable impacts.
How will the graves be handled? (Inclusive of the blasting damage).		
What will happen with the graves that are on the project area farms?	Daniel Matebela at the meeting held with Seleka community, 21 February 2011.	
I used to live on one of the project area farms and my grandparents were buried on the farms. I'd like to be involved in the burial retrieval or in the heritage study.	Johannes Ramotepe at the meeting held with Seleka community, 21 February 2011.	Thank you for letting us know. Details of the Ramotepe family graves were forwarded to the heritage specialist.

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
Visual		
We are concerned about the aesthetic impact that the proposed project will have towards the surrounding environment.	Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.	A description of the baseline visual environment is given in Section 1.1 of the EIA and EMP report. Relevant specialist study is included as Appendix N to the EIA and EMP report. Visual related issues have been addressed in Section 7.2.10 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
Visual impact of structures on the area.		
What is the cumulative impact on the sense of place?		
The Scoping Report does mention the type of structures to be erected but do not give specifications of especially the above-ground-level height of any of these structures and masts. Without this crucial information the consequence of the potential visual impact with regard to the Game Ranching and Ecotourism Industry cannot be evaluated but merely speculated upon.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	
The Scoping Report give no details about the actual height of infrastructures that are about to be erected. While visiting the area in December 2010 the author noticed that 25 m tall main-line Escom pylons are visible from distances of 5-10 km across the flat topography of the very area. Wooden masts 12-15m high are visible 2-5 km across the same topography. The smoking towers of the power station at Laphelala, which is approximately 60 m high (guessing) are visible over 40 km and the main buildings, which is half the height, is visible over 25 km. Visual pollution of tall masks, overhead power lines, tall building structures and visible tailing dumps and stock piles, which in parallel with noise pollution, discard and demolish the entire wilderness experience atmosphere, mostly desired by tourists and hunting clients, resulting in clients and tourists to reroute to other still remote venues elsewhere. The game ranch owners will be forced out of business and the natural biodiversity will eventually be lost and replaced with degraded land.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
Socio-economic: employment, housing of workers and associated issues		
How many people will the mine employ and how will they be transported? In addition to this, where will employees be housed?	Riaan de Beer, telephonic discussion, 23 July 2010.	At this stage in the project planning, it is expected that the temporary construction workforce will peak at approximately 1000 people and that the permanent operational jobs (including contractors) will peak at 455 people (this includes shift workers). Where possible local labour will be sourced as far as possible. Housing of both construction and operational staff will be done off site in already established residential areas. The majority of the workforce will be transported to site by bus or mini van.. Related issues have been addressed in Section 7.2.19 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
How is the mine planning on transporting its employees?	Louis Smuts, telephonic discussion, 22 July 2010.	
Why will there only be 210 permanent jobs and approximately 500 temporary. This does not seem correct, there is no balance.	Sello Kgageng, comment raised at focused Lephalale government communicators forum meeting, 21 January 2011	
How many people is the mine planning on employing and where will the mine house all its employees? How will the mine transport its mine labourers because if they are not transported they will find the shortest route to work, which will most likely be through my property in which case poaching will increase.	Attie Mahne, the social scan, 21 July 2010.	
Farm labourers will resign to work for the mine where they will receive a higher income.	Dannie Meyer, social scan, 21 July 2010.	
Where will mining employees be housed?	P. Aucamp, social scan, 21 July 2010.	
Where will the proposed employees stay?	Mr Du Plessis, comment raised at focused scoping meeting, 23 August 2010.	
How will the additional houses required for mine employee's impact on the area?	Ronald and Joan Jackson, comments received via fax, 02 October 2010.	
Where will all the employees be housed?	Abri Le Roux at Moonlight public scoping meeting, 02 October 2010.	
We are concerned that the employment of people will bring about the possibility of squatters.	Riaan De Beer at Moonlight public scoping meeting, 02 October 2010.	
Mine labourers will cut the game fences and walk through our properties. In addition to this the poaching within the area will increase.	Comment raised by M.F. Du Preez at Moonlight public scoping meeting, 02 October 2010.	
The impact that labour will have on the area needs to be taken into consideration.	P.L. Prinsloo, comment received by email, 02 October 2010.	

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
Where will employees be housed as their accommodation will affect surrounding landowners?	P.G Ras, comment received by email, 20 September 2010.	At this stage in the project planning, it is expected that the temporary construction workforce will peak at approximately 1000 people and that the permanent operational jobs (including contractors) will peak at 455 people (this includes shift workers). Where possible local labour will be sourced as far as possible. Housing of both construction and operational staff will be done off site in already established residential areas. The majority of the workforce will be transported to site by bus or mini van.. Related issues have been addressed in Section 7.2.19 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
Are the individuals from this community going to be employed by the mine?	Mr Mocheko at the focused meeting with the Ga-Seleka tribal council, 14 October 2010	
It should be noted that the Koedoesrand District farmers employs approximately 9200 workers. The mine will only employ 210 workers. We would like to understand the motivation for establishing this project in this area as it is lacking in comparison to the employment of the Koedoesrand District.	Nico Lombard at Koedoesrand focused scoping review meeting, 13 November 2010.	
We demand an independent study on current employment and how they are going to be affected and the amount of employees the mine will employ.	Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.	
Where will the employees of the mine get recourses to basic living: Wood for fires, water, sanitation, transportation		
Concerned about the employment of 200 people as their farm workers will leave the farms to rather work at the mine	Casper Vorster, telephonic discussion, 10 December 2010.	
It would be ideal that Turquoise Moon incorporates housing for the mine workforce with one of the already existing settlements and not establish an isolated town which might end up being a white elephant when the mine closes.	Leonard Sole, regulatory authorities meeting, 12 November 2011	
I am happy that Limpopo Province and Lephalale have also been presented with potential job opportunities at the mines such a this one which will benefit amongst others the youth of this province.	Mpapa Gertjie Maema, by fax, 8 April 2011 and 9 May 2011; Mokome Andriess Marakalala, by fax, 28 April 2011 and 25 May 2011; Shimane Albert Maema, by fax, 9 May 2011; Rhudzani Kwinda, by fax, 24 May 2011	
I would like to know as to after the completion of the project, what is going to happen to those who would have working in the project?		
How will the mine benefit the people of Ga-Seleka?	Mr Molokomme at the focused meeting with the Ga-Seleka tribal council, 14 October 2010	
Are we going to benefit from the project?	Mr Mocheko at the focused meeting with the Ga-Seleka tribal council, 14 October 2010	

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
How will the community benefit?	Isaac Thutlwa, comments raised during focused Lephalale government communicator forum scoping meeting, 21 January 2011.	At this stage in the project planning, it is expected that the temporary construction workforce will peak at approximately 1000 people and that the permanent operational jobs (including contractors) will peak at 455 people (this includes shift workers). Where possible local labour will be sourced as far as possible. Housing of both construction and operational staff will be done off site in already established residential areas. The majority of the workforce will be transported to site by bus or mini van.. Related issues have been addressed in Section 7.2.19 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
What are the local economic benefits associated with the proposed project?	Leonard Sole, regulatory authorities meeting, 12 November 2011	
Lephalale area is equipped with people with skills and companies that can do some of the jobs at the mine therefore it will be ideal that Turquoise Moon procures services and skilled labour from within the Lephalale area or the Limpopo Province.		
How will the mine procure employment?	RJ Muthoni, at the meeting held with Seleka community, 21 February 2011.	
What will the impacts of the mine be on the local people?	Asser Mothoni at the meeting held with Seleka community, 21 February 2011.	
What are the expected job opportunities for the local community? We want to see people from the local community employed.	Khaugelo Ngoepe, at the meeting held with Seleka community, 21 February 2011.	
How will the people from Seleka benefit from this proposed project?	David Marapole, at the meeting held with Seleka community, 21 February 2011.	
Socio-economic: procurement of services		
Will the mine consider local procurement service?	Mr C. Pienaar and Mr Du Plessis, comment raised at focused scoping meeting, 23 August 2010.	These issues have been addressed in Section 7.2.18 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
Will the mine consider using local services?	M.H. Mmamaleka at Moonlight public scoping meeting, 02 October 2010.	
What about local procurement opportunities. If there are forms that need to be filled in then we need to start completing them now.	Sello Kgageng, comment raised at focused Lephalale government communicators forum scoping meeting, 21 January 2011.	

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
Socio-economic: loss in land uses and economic activity		
What is the difference in value over a 100 year period between mining and the combination of alternative land uses	Riaan De Beer, comments received at Koedoesrand focused scoping review meeting, 13 November 2010.	Land use and socio-economic studies have been conducted for the project Relevant sections of the EIA and EMP report draw information from the studies and full copies thereof are included as appendices to the EIA and EMP report (see Appendices P and S of the EIA and EMP report). These issues have been addressed in Section 7.2.11 and 7.2.18 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
Has the mine done studies that focus on the tourism aspect associated with game hunting within the area, taking into consideration that Limpopo is the province that is renowned for its tourism? The project will influence the tourism rate of the area. The GDP of game farming is more than that of gold mining.	Joan Jackson at the public scoping meeting, 02 October 2010.	
An ecologists needs to be appointed that will focus on the turnover of tourism in this area. I have a contact from the University of Pretoria who will be able to assist in this study.	Joan Jackson at Koedoesrand focused scoping review meeting, 13 November 2010.	
Figures and statistics of the Game Ranching and Livestock Industry in both the effected 20 km zone area and the greater Limpopo-North region need to be investigated and presented. Both the WRSA and the author may be able to help in this regard but it will take immense time. Without these statistics no reliable comparison can be made to measure the potential impact of the mine development. The following information are required, separately for each Impact Zone: Number of farms and owners, Proportion of business industry operated per farm, percentage of livestock verses game, ecotourism, other, Number of staff employed, Number of foreign hunters per annum, Number of local hunters per annum, Number of tourists per annum, Number of bed-nights accommodated per annum, Total number of heads of animals on farm, per animal class: big five, valuable species, common species, exotic species, livestock, Number of trophies hunted per annum, Number of non-trophy animals hunted per annum, Number of animal live sales per annum (also livestock marketed)	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	
I am aware that all the studies that will be conducted will come up with solutions to mitigate the proposed impacts. However what will happen to the future generations? This area is a farming area. It is not meant for mining iron ore. Nobody is going to eat iron ore. This area is not the correct place to develop a mine.	Nico Lombard at Koedoesrand focused scoping review meeting, 13 November 2010.	

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
What is the economic cost of the dust damage? How will the economic cost be calculated and by whom?	Riaan De Beer, comments received at focused scoping review meeting, 13 November 2010.	Land use and socio-economic studies have been conducted for the project Relevant sections of the EIA and EMP report draw information from the studies and full copies thereof are included as appendices to the EIA and EMP report (see Appendices P and S of the EIA and EMP report). These issues have been addressed in Section 7.2.11 and 7.2.18 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
What is the cumulative agriculture loss of land and food security?	Riaan De Beer, comments received at focused scoping review meeting, 13 November 2010.	
Concerned about the impact that the project will have on his business relating to game hunting	Caper Vorster, telephonic discussion, 10 December 2010.	
Game Ranching and the Ecotourism Industry rely predominantly on the purity, calmness and remoteness of a land or terrain, being spaced distantly from any technological and urban development, in creating a true wilderness atmosphere. Constructing a technological development such as a mine in the center of a thriving Game Ranching / Ecotourism Industry will indefinitely redeem the wealth and prosperity of such business. Regular clients will be lost and new clients will be much harder to recruit. Visual and noise pollution will most definitely discard and demolish the entire wilderness experience atmosphere which is mostly desired by tourists and hunting clients. This will result in clients and tourists rerouting their activities and business influx to other still remote venues elsewhere. The game ranch owners will be forced out of business and the natural biodiversity will eventually be lost and replaced with degraded land.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	
The effect of the mining construction impact upon the professional hunting is a major socio-economic concern. Professional hunting will be negatively affected through: Disturbance of the wilderness atmosphere, Decline in animal production due to decreased fodder supply and quality of fodder, Decline in trophy quality due to water pollution and outfall air pollution, Influence of noise pollution on animal behaviour, Increase of both domestic and poaching crime.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	
The proposed mine will destroy an area that contributes to the food supply within South Africa.	Joan Jackson at the public scoping meeting, 02 October 2010.	The predicted loss of R11.6 million is 0.02% of national agricultural gross domestic product (see Section 6 and 7.2.18 of the EIA and EMP report).

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
Socio-economic: Land values		
How will losses to landowners and occupiers be calculated? Most of the farms are family driven farms, how is the mine going to compensate for the loss of income for all the family members employed on the farm? Will the mine compensate us for loss in market value?	Riaan De Beer, comments received at focused scoping review meeting, 13 November 2010.	Turquoise Moon will implement the mitigation measures as outlined in Section 19 and Appendix A of the EIA and EMP report to reduce its overall impact on the environment and surrounding land-uses. Should the impact on the pre-mining land use and/or pre-mining economic activity of the land still prove unacceptable, Turquoise Moon will compensate the relevant landowners accordingly. A base case valuation of land surrounding the site will be undertaken prior to the commencement of the mine (see Section 19 and Appendix A of the EIA and EMP report).
The value of our properties will decrease.	Joan Jackson at Moonlight public scoping meeting, 02 October 2010.	
The decrease in land value needs to be addressed.	Riaan De Beer at Moonlight public scoping meeting, 02 October 2010.	
Our value of land will decrease.	Louis Smuts, telephonic discussion, 22 July 2010.	
Having a mine in the area will decrease our property values. Our farm has sentimental value as it was purchased for our children.	Riana Spoelstra, telephonic discussion, 21 July 2010.	
How will we be compensated?	Joan Jackson at Moonlight public scoping meeting, 02 October 2010.	
How will land owners and occupiers be remunerated for any losses? Will the mine compensate us for loss in market value?	Riaan De Beer, comments received at focused scoping review meeting, 13 November 2010.	
Will the mine compensate us for loss of animals due to poaching?	Riaan De Beer, comments received at focused scoping review meeting, 13 November 2010.	
How will affected parties be compensated for with regards to the impact of dust pollution? When will affected parties be compensated?	Riaan De Beer, comments received at focused scoping review meeting, 13 November 2010.	
Will the mine take out insurance that will compensate farmers for any damages?	Johan Vogel at Moonlight public scoping meeting, 02 October 2010.	This option will be considered by Turquoise Moon.
Socio-economic: Relocation		
If the proposed project is approved I would like the mine to purchase my property.	Andre du Plessis, focused landowner meeting, 06 July 2010.	Noted. Your request has been forwarded to Turquoise Moon.
I do not wish to sell my property as it has sentimental value. Reasons for this is that there are graves on my property. I am an active farmer and am currently making a good living.	Dr. C. Pienaar, focused landowner meeting, 06 July 2010.	Noted. This issue is brought to the attention of the decision-making authorities.
We would like to know what is happening with regards to how our properties will be purchased or leased.	Dr Pienaar, focused scoping meeting, 23 August 2010.	Should the project be approved, Turquoise Moon will purchase and/or lease the properties within the application boundary. Further detail will be provided by Turquoise Moon at the relevant time.

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
How many occupiers are there currently on the affected areas? To where will they be moved? Are the floor plans of each households new house available? What economic activity will they be able to take part in at the new housing area? What is the level of education of each household?	Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.	These issues have been addressed in Section 7.2.20 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
What will the mine do with the people that live near the three farms?	Johannes Seleka, at the meeting held with Seleka community, 21 February 2011	
Socio-economic: Informal settlements, safety, security and services		
The mine needs to construct a wall 3.5 metres in height that will surround the entire mine perimeter.	M.F. Du Preez at Moonlight public scoping meeting, 02 October 2010.	These comments will be taken into consideration by Turquoise Moon when designing the mine plan.
As an alternative a 2 x 3 meter trench can be constructed that will prevent people from crossing over onto our properties.	Johan Vogel at Moonlight public scoping meeting, 02 October 2010.	
We need a specialist study on how the impact of crime is going to affect us.	Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.	A socio-economic study has been conducted for the project. Relevant sections of the EIA and EMP report draw information from the study with a full copy included as Appendix S of the EIA and EMP report. These issues have been addressed in Section 7.2.11 and 7.2.18 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
Our community spends a lot of time and money on keeping this area safe and clean. We are concerned as to what impact the proposed mine will have on our safety as a result of the outside labour force that will be bought into our area.	D.M. Ehlers at Moonlight public scoping meeting, 02 October 2010.	
I will be affected by the increase in crime levels.	P.G Ras, comment received by email, 20 September 2010.	
The proposed project will increase crime levels.	Ronald Jackson, social scan, 20 July 2010.	
We are currently experiencing problems associated with crime. The proposed project will increase crime levels in the area.	Rudoulf Scheepers, social scan, 21 July 2010.	
We are concerned about the increase in crime.	Mr Du Plessis, focused scoping meeting, 23 August 2010.	
The security in the area will be an issue.	Ronald and Joan Jackson, comments received via fax, 02 October 2010.	
We are concerned about what impact the increase in population will have towards the surrounding community?	Ronald and Joan Jackson, comments received via fax, 02 October 2010.	
I am concerned about the increase in poaching.	Nico Lombard at Koedoesrand focused scoping review meeting, 13 November 2010.	

ISSUE RAISED	BY WHOM AND WHEN	RESPONSE GIVEN BY PROJECT TEAM (Responses have been updated for the purposes of the EIA and EMP report)
What is the cumulative impact towards safety and security-how are the mine going to protect the farmers in regards to farm attacks	Riaan De Beer, comment received at Koedoesrand focused scoping review meeting, 13 November 2010.	A socio-economic study has been conducted for the project. Relevant sections of the EIA and EMP report draw information from the study with a full copy included as Appendix S of the EIA and EMP report. These issues have been addressed in Section 7.2.11 and 7.2.18 of the EIA and EMP report. The recommended management measures outlined in Section 19 and Appendix A of the EIA and EMP report have been designed to prevent and minimise unacceptable impacts.
Increased animal poaching due to increased human traffic and increased awareness of the local animal values for the underworld wildlife smuggling mafia. The overall rhino conservation and protection incentives will be in much more danger. Domestic crime rates will also increase due to increased human traffic. The environment will become less save for both local residents and land owners as well as for foreign visitors and clients. Take note that hunting and tourism lodges on game ranches are mostly remotely located and therefore prime targets for crime sneakers. Many servitude and secondary roads in the area serving game ranches and livestock farms will need to be closed and manned with controlled security access gates. This will result in immense cost outlays to the land owners. It is a common world phenomenon for higher waged industrial workers to create stir-ups upon the moral of lesser waged local labourers and farm workers.	Deon Furstenburg, Agricultural Research Council, 24 January 2011.	
The type of operations will affect our car and home insurance premiums. A lot of accidents and crime incidences will result from the mining activities.	Joan Jackson at Moonlight public scoping meeting, 02 October 2010.	
How will the proposed project impact on our school services?	Lida Hanekom at Moonlight public scoping meeting, 02 October 2010.	

APPENDIX G: SOIL AND LAND CAPABILITY STUDY

Specialist report prepared by Earth Science Solutions CC, June 2011

Earth Science Solutions

Our Ref: MEE.TMS.S.10.06.055
Your Ref:

24th June 2011

Metago Environmental Engineers (Pty) Ltd
P.O. Box 1596
CRAMERVIEW
2060

Tel +27 (0)11 467 0945, Fax. +27 (0)11 467 0978, Cell.
E-mail: alex@metago.co.za

Attention: Ms. Alex Pheiffer'

Re: Moonlight Iron Ore Project
Specialist Soils and Land Capability Assessment

Dear Alex

Herewith please find our specialist report for the Moonlight Iron ore project – Soils and land Capability baseline studies and environmental impact assessment, project number T020-02 (Order No. 1324). The report and mapping detail the findings of the site investigation and the results of the impact assessment and proposed management measures for the open cast mining and processing.

Should you require any additional information in this regard, please do not hesitate to contact us.

Yours sincerely,
Earth Science Solutions (Pty) Ltd

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Moonlight Iron Ore Project

SPECIALIST SOILS & LAND CAPABILITY IMPACT ASSESSMENT AND MANAGEMENT PLANNING

FINAL REPORT v1.8

Compiled For

Metago
Environmental Engineers (Pty) Ltd

June 2011

Sustaining the Environment

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Declaration

This specialist report has been compiled in terms of the South African Environmental legislation and forms part of the overall impact assessment, both as a standalone document and as supporting information to the overall impact assessment and management plan for the proposed development.

The specialist Pedological and Land Capability studies where managed and signed off by Ian Jones (Pr. Sci Nat 400040/08), an Earth Scientist with 34 years of experience in these fields of expertise.

I declare that both, Ian Jones, and Earth Science Solutions (Pty) Ltd are totally independent in this process, and have no vested interest in the project.

The objectives of the study were to:

- Provide a permanent record of the present soil resources in the area that are potentially going to be affected by the proposed development and processing/mining related activities,
- Assess the nature of the site in relation to the overall environment and its present and proposed utilization, and determine the capability of the land in terms of agricultural utilization, and
- Provide a base plan from which long-term ecological and environmental decisions can be made, impacts of the proposed development can be determined, and mitigation and rehabilitation management plans can be formulated.

The Taxonomic Soil Classification System and a combination of the Canadian Land Inventory System and Chamber of Mines Land Capability Rating Systems were used as the basis for the soils and land capability investigations respectively. These systems are recognized nationally and internationally.

Signed: 24th June 2011 at Nelspruit

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GLOSSARY OF TERMS

Alluvium: Refers to detrital deposits resulting from the operation of modern streams and rivers.

Base status: A qualitative expression of base saturation. See base saturation percentage.

Black turf: Soils included by this lay-term are the more structured and darker soils such as the Bonheim, Rensburg, Arcadia, Milkwood, Mayo, Sterkspruit, and Swartland soil forms.

Buffer capacity: The ability of soil to resist an induced change in pH.

Calcareous: Containing calcium carbonate (calcrete).

Catena: A sequence of soils of similar age, derived from similar parent material, and occurring under similar macroclimatic conditions, but having different characteristics due to variation in relief and drainage.

Clast: An individual constituent, grain or fragment of a sediment or sedimentary rock produced by the physical disintegration of a larger rock mass.

Cohesion: The molecular force of attraction between similar substances. The capacity of sticking together. The cohesion of soil is that part of its shear strength which does not depend upon inter-particle friction. Attraction within a soil structural unit or through the whole soil in apedel soils.

Concretion: A nodule made up of concentric accretions.

Crumb: A soft, porous more or less rounded ped from one to five millimetres in diameter. See structure, soil.

Cutan: Cutans occur on the surfaces of peds or individual particles (sand grains, stones). They consist of material which is usually finer than, and that has an organisation different to the material that makes up the surface on which they occur. They originate through deposition, diffusion or stress. Synonymous with clayskin, clay film, argillan.

Desert Plain: The undulating topography outside of the major river valleys that is impacted by low rainfall (<25cm) and strong winds.

Denitrification: The biochemical reduction of nitrate or nitrite to gaseous nitrogen, either as molecular nitrogen or as an oxide of nitrogen.

Erosion: The group of processes whereby soil or rock material is loosened or dissolved and removed from any part of the earth's surface.

Fertilizer: An organic or inorganic material, natural or synthetic, which can supply one or more of the nutrient elements essential for the growth and reproduction of plants.

Fine sand: (1) A soil separate consisting of particles 0,25-0,1mm in diameter. (2) A soil texture class (see texture) with fine sand plus very fine sand (i.e. 0,25-0,05mm in diameter) more than 60% of the sand fraction.

Fine textured soils: Soils with a texture of sandy clay, silty clay or clay.

Hardpan: A massive material enriched with and strongly cemented by sesquioxides, chiefly iron oxides (known as ferricrete, diagnostic hard plinthite, ironpan, ngubane, ouklip, laterite hardpan), silica (silcrete, dorbank) or lime (diagnostic hardpan carbonate-horizon, calcrete). Ortstein hardpans are cemented by iron oxides and organic matter.

Land capability: The ability of land to meet the needs of one or more uses under defined conditions of management.

Land type: (1) A class of land with specified characteristics. (2) In South Africa it has been used as a map unit denoting land, mapable at 1:250,000 scale, over which there is a marked uniformity of climate, terrain form and soil pattern.

Land use: The use to which land is put.

Mottling: A mottled or variegated pattern of colours is common in many soil horizons. It may be the result of various processes *inter alia* hydromorphy, illuviation, biological activity, and rock weathering in freely drained conditions (i.e. saprolite). It is described by noting (i) the colour of the matrix and colour or colours of the principal mottles, and (ii) the pattern of the mottling.

The latter is given in terms of abundance (few, common 2 to 20% of the exposed surface, or many), size (fine, medium 5 to 15mm in diameter along the greatest dimension, or coarse), contrast (faint, distinct or prominent), form (circular, elongated-vesicular, or streaky) and the nature of the boundaries of the mottles (sharp, clear or diffuse); of these, abundance, size and contrast are the most important.

Nodule: Bodies of various shapes, sizes and colour that have been hardened to a greater or lesser extent by chemical compounds such as lime, sesquioxides, animal excreta and silica. These may be described in terms of kind (durinodes, gypsum, insect casts, ortstein, iron, manganese, lime, lime-silica, plinthite, salts), abundance (few, less than 20% by volume percentage; common, 20 – 50%; many, more than 50%), hardness (soft, hard meaning barely crushable between thumb and forefinger, indurated) and size (threadlike, fine, medium 2 – 5mm in diameter, coarse).

Overburden: A material which overlies another material difference in a specified respect, but mainly referred to in this document as materials overlying weathered rock

Ped: Individual natural soil aggregate (e.g. block, prism) as contrasted with a clod produced by artificial disturbance.

Pedocutanic, diagnostic B-horizon: The concept embraces B-horizons that have become enriched in clay, presumably by illuviation (an important pedogenic process which involves downward movement of fine materials by, and deposition from, water to give rise to cutanic character) and that have developed moderate or strong blocky structure. In the case of a red pedocutanic B-horizon, the transition to the overlying A-horizon is clear or abrupt.

Pedology: The branch of soil science that treats soils as natural phenomena, including their morphological, physical, chemical, mineralogical and biological properties, their genesis, their classification and their geographical distribution.

Slickenslides: In soils, these are polished or grooved surfaces within the soil resulting from part of the soil mass sliding against adjacent material along a plane which defines the extent of the slickenslides. They occur in clayey materials with a high smectite content.

Sodic soil: Soil with a low soluble salt content and a high exchangeable sodium percentage (usually EST > 15).

Swelling clay: Clay minerals such as the smectites that exhibit interlayer swelling when wetted, or clayey soils which, on account of the presence of swelling clay minerals, swell when wetted and shrink with cracking when dried. The latter are also known as heaving soils.

Texture, soil: The relative proportions of the various size separates in the soil as described by the classes of soil texture shown in the soil texture chart (see diagram on next page). The pure sand, sand, loamy sand, sandy loam and sandy clay loam classes are further subdivided (see diagram) according to the relative percentages of the coarse, medium and fine sand subseparates.

Vertic, diagnostic A-horizon: A-horizons that have both, a high clay content and a predominance of smectitic clay minerals possess the capacity to shrink and swell markedly in response to moisture changes. Such expansive materials have a characteristic appearance: structure is strongly developed, ped faces are shiny, and consistence is highly plastic when moist and sticky when wet.

1. INTRODUCTION AND TERMS OF REFERENCE

Metago Environmental Engineers (Pty) Ltd commissioned Earth Science Solutions (ESS (Pty) Ltd.) to undertake a pedological survey for the Moonlight Iron Ore Project. The initial study covered a study area of approximately 4,700ha on a reconnaissance base, with additional and more detailed studies of the areas of impact undertaken as part of the environmental impact assessment.

The area of study is situated in the northern province of South Africa, some six kilometres to the south of Marnitz, a farming outpost situated on the national road (N11) between Baltimore and the Botswana Boarder (Refer to Figure 1 – Locality Plan).

1.1 Terms of Reference

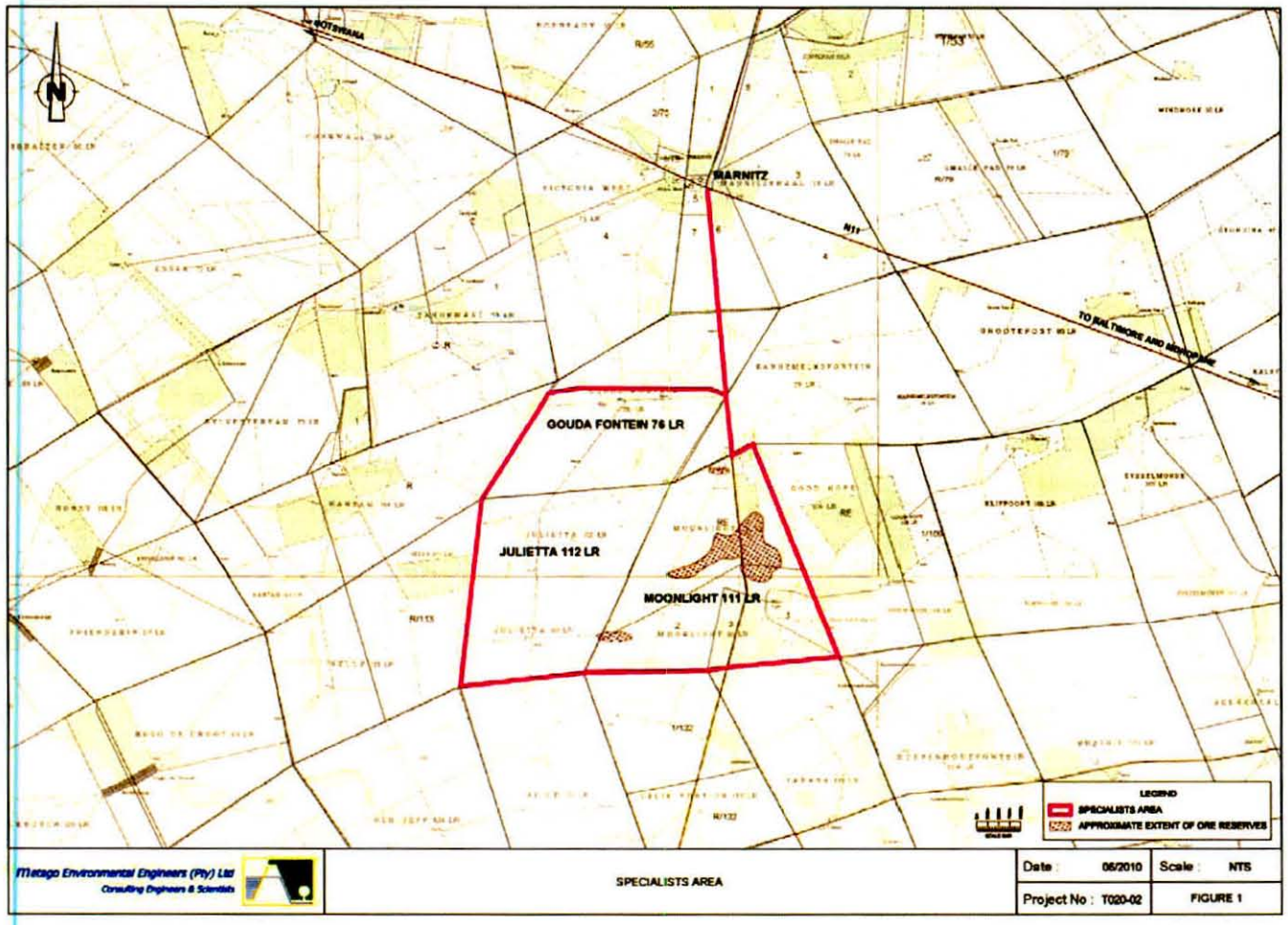
The Terms of Reference (ToR) required that a baseline assessment be conducted, and any associated documentation available should be included and referenced where relevant. Using this information the soils and land capability for the areas delineated on the base map supplied (Refer to Figure 1 above) was to be:

- Characterise and mapped so as to obtain a full and detailed record of the existing state of the soils and land capability aspects (Field Study and Assessment), and
- Log and document any key vulnerabilities (or sensitivities) or fatal flaws, as well as opportunities or other important information relating to the geomorphology and associated earth sciences;

In addition, it was required that all information presented in the baseline assessment is relevant to the assessment and that the relevance of the information is described fully, while the relative size and spatial extent of the area of study (study domain) is assessed in terms of the proposed development and related degree of impact that is expected. To this extent, a list of the prominent and necessary variables needed to characterise the baseline have been documented (Refer to Section 2), and the existing state (or baseline) of the environment for each of the specialist disciplines has been described (quantified or qualified).

The soil and land capability specialist assessments have been carried out using the provisions and guidelines contained in the International Finance Corporation - Equator Principles. These principles are not specific and do not give prescriptive conditions that describe the actions to be taken in terms of the soils and land capability disciplines specifically. However, the provisions followed have been derived from the principles themselves and the IFC's Performance Standards and EHS Guidelines.

Figure 1 Locality Plan



1.2 Scope of Work

The Scope of Work (SoW) has been based on the ToR supplied and consideration of the outcomes envisaged. To this end, a number of geomorphological parameters and soil characteristics were mapped and classified using the standard *Taxonomic Soil Classification System for South Africa (Mac Vicar et al, 2nd edition* 1991), the site specific climate Information, orthophotographic (topographic) maps and regional land type cartography. This information was then used to rate the land Capability of the site using the S.A. Chamber of Mines Land Classification System and Canadian Land Inventory System.

The SoW included:

- An assessment and characterization (classify/rate) of the existing state of the environment for the soils and land capability prior to any planning taking place;
- The classification of the different soil types and groupings based on their physical and chemical properties and resultant nutrient stores etc;
- The production of a "dominant soils group" map for the pre-construction/development areas to a scale and accuracy that will allow for decision making during the planning of the facilities;
- The rating of the existing/present land capability of the areas proposed for development as an aid in decision making for the planning and development phase, and
- The development of soil utilization principles based on the site specific information obtained, that can be used as inputs to the specialist pool of knowledge that will be used as the basis for the impact assessment and rehabilitation planning.

In a world of ever increasing pressures for resources, it has become imperative that the full scientific facts for any particular site are known, and the effects on the land to be used by any proposed developer must be environmentally evaluated, prior to the new activity being considered for implementation.

The role of this study must be seen as an aid to the overall environmental assessment of the sites proposed for development, and as a specialist standalone baseline of information that can be used to inform the soil utilization and "Land End Use" planning.

This document describes the in-field methods used to classify and describe the variations in soils, it rates the land capability based on the soil and related geomorphological information available (climate, ground roughness, topographic variables), and gives details of the pre-construction or present state of the environment as a baseline to be used in the design and planning initiatives. The impact assessment and mitigation scenarios will be based on the project specified system of impact assessment and rating, with inputs from the results of the site (in-field) survey and an interpretation of the field results.

1.3 Methodology and Approach

The soil and land capability specialist studies are designed to characterise and classify the different soil types in the areas that will be affected by the Open Pit mining and its associated processing infrastructure and waste stockpile sites using a specific set of principles as set down in the Taxonomic Soil Classification System (described in detail later). These principles are consistent with world standards and national nomenclature.

The resultant physical and chemical characteristics of the materials are used to characterise and highlight the site specific sensitivities (if any) of the different soil Forms, which are further combined into dominant soils "groups" that have similar characteristics, sensitivities if disturbed, worked on and/or stored, so that the developer and interested or affected parties (Public and Authorities) can make informed and scientifically based decisions on the significance of possible impact. In addition, the sensitivities and/or vulnerability of the materials, constructive and sustainable mitigation can be planned and managed.

The approach to the pedological and land capability studies was tailored to the understanding of the different elements of the proposed projects and how these elements are likely to affect/impact the soils and land capability.

It is believed that the mining venture will have a significantly much greater or larger effect on the soils and land capability than the processing activities, albeit that the waste storage and dump facilities will cover a significantly large footprint, and are permanent structures.

The types of sample to be taken, the depth of sampling of the materials, the grid spacing for the observation, and the intensity of mapping were all tailored to obtaining a scientifically meaningful data set based on the development plan in hand.

In better understanding and informing these studies on how sensitive or vulnerable a soil or land capability is, it was essential that the system being used is able to establish and measure in a constant manner, the aspects and determinants that contribute to a material being robust or sensitive. The Soil Classification System and Land capability Rating Systems supply the scientific knowledge, while the interaction of these with the environment is what determines the sensitivity or vulnerability. The way in which the soils react to wind or water erosion, the sensitivity to having the vegetative cover removed, and the chemical nature of the materials and their vulnerability to being taken into solution are all aspects that have been assessed in measuring sensitivity and ultimately vulnerability.

It was essential to ensure that the soils were adequately described and characterised so as to allow for an accurate assessment of the impact by the development proposed and to obtain sufficient site specific information so as to allow for the development of a conceptual soil utilization guide and plan for the developer. It is also important that the findings of this study are able to deal with and wherever possible answer the issues and concerns regarding land use and land capability that have been raised by the public participants. Of specific concern in this area (highlighted) are the possible impacts of development on and around the calcrete based features, pans and sensitive wet soil environments associated with the pan structures, and the impact that the mining will have on the livelihoods of the farming/hunting community.

Using this philosophy, the study areas (Figure 2 – Mine Base Plan) were investigated on a comprehensive reconnaissance grid base and an assessment and understanding of the baseline conditions for the soils and land capability obtained.

The mining and related processing activities and its associated infrastructure have been assessed in terms of the issues raised and documented in the "Issues Tables" – Appendix B Table D: Summary of issues raised by regulatory authorities and IAP's – Moonlight Study Area), and from sections 8.4.3, 8.4.7 and 8.4.13 of the Scoping Report and the BID.

The level of study and intensity of the observations made was guided by a number of practical variables. These included the accessibility of the sites, the degree of impact that is expected (Development Planning), and that was tabled as part of the ToR received, and the complexity and sensitivity of the soils encountered during the site evaluation.

The availability and access to existing data aided by the comprehensive list of information supplied by the lead consultant/developer helped in understanding the potential socio environmental concerns associated with the proposed project. No detailed soils information was available from any of these regional assessments, and although of help in understanding the proposed planning for the area and the high level understanding of the agricultural potential, land capability and associated earth sciences variables, the sensitivities and site specific variations and aspects that are important to the ecological balance of the area of study were lacking.

Of added assistance in the execution of the investigations was the group/team meeting organised by the lead consultants. The meetings with the lead consultants were invaluable and extremely beneficial to the better understanding of the project deliverables and the planning of the survey methodology.

1.4 Legal

The specialist studies have been undertaken as part of the environmental impact assessment and management strategy required for any listed activity in terms of the National Environmental management Act (NEMA), NEM:WA and the MPRDA and have been structured so as to meet the minimum criteria as presented in the performance Standards of the International Finance Commission and the Equator Principles as required in terms of the World bank Standards.

More specifically, the specialist soils and land capability studies have been structured to so as to meet the requirements of the most recent South African Environmental Legislation when considering the management of soil. These include, but are not necessarily confined to:

- *The law on Conservation of Agricultural Resources (Act 43 of 1983) states that the degradation of the agricultural potential of soil is illegal.*
- *The Bill of Rights states that environmental rights exist primarily to ensure good health and wellbeing, and secondarily to protect the environment through reasonable legislation, ensuring the prevention of the degradation of resources.*
- *The Environmental right is furthered in the National Environmental Management Act (No. 107 of 1998), which prescribes three principles, namely the precautionary principle, the "polluter pays" principle and the preventive principle.*
- *It is stated in the above-mentioned Act that the individual/group responsible for the degradation/pollution of natural resources is required to rehabilitate the polluted source.*
- *Soils and land capability are protected under the National Environmental Management Act 107 of 1998, the Minerals and Petroleum Resources Development Act 2002 and the Conservation of Agricultural Resources Act 43 of 1983.*
- *The National Veld and Forest Fire Bill of 10 July 1998 and the Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act 36 of 1947 can also be applicable in some cases.*
- *The National Environmental Management Act 107 of 1998 requires that pollution and degradation of the environment be avoided, or, where it cannot be avoided be minimized and remedied.*
- *The Minerals and Petroleum Resources Development Act 2002 requires an EMPR, in which the soils and land capability be described.*
- *The Conservation of Agriculture Resources Act 43 of 1983 requires the protection of land against soil erosion and the prevention of water logging and salinization of soils by means of suitable soil conservation works to be constructed and maintained. The utilization of marshes, water sponges and water courses are also addressed.*

In addition to the South African legal compliance listed, this proposed development has also been assessed in terms of the International Performance Standards as detailed by the International Finance Corporation.

The IFC has developed a series of Performance Standards to assist developers and potential clients in assessing the environmental and social risks associated with a project and assisting the client in identifying and defining roles and responsibilities regarding the management of risk.

Performance Standard 1 establishes the importance of:

- Integrated assessment to identify the social and environmental impacts, risks, and opportunities of projects;
- Effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them; and
- The client's management of social and environmental performance throughout the life of the project.

Performance Standards 2 through 8 establish requirements to avoid, reduce, mitigate or compensate for impacts on people and the environment, and to improve conditions where appropriate. While all relevant social and environmental risks and potential impacts should be considered as part of the assessment, Performance Standards 2 through 8 describe potential social and environmental impacts that require particular attention in emerging markets. Where social or environmental impacts are anticipated, the client is required to manage them through its Social and Environmental Management System consistent with Performance Standard 1.
Of importance to this report are:

- The requirements to collect adequate baseline data;
- The requirements of an impact/risk assessment;
- The requirements of a management program;
- The requirements of a monitoring program; and most importantly;
- To apply relevant standards (either host country or other).

With regard to the application of relevant standards (either host country or other) there are no specific guidelines relating to soils and land use/capability, either locally or within the World Bank's or IFC's suite of Environmental Health and Safety Guidelines. The World Bank's Mining and Milling, Underground guideline does state, however, that project sponsors are required to prepare and implement an erosion and sediment control plan. The plan should include measures appropriate to the situation to intercept, divert, or otherwise reduce the stormwater runoff from exposed soil surfaces, tailings dams, and waste storage.

Project sponsors are encouraged to integrate vegetative and non-vegetative soil stabilization measures in the erosion control plan.

Sediment control structures (e.g., detention/retention basins) should be installed to treat surface runoff prior to discharge to surface water bodies. All erosion control and sediment containment facilities must receive proper maintenance during their design life. This will be included in the appropriate management plans.

This specialist study has been written as a standalone document, but should be read as part of the larger EIA and forms a part of the baseline study used in the determination of the impacts as well as informing the environmental management programme (EMP).

The findings are based primarily on a pedological survey involving a number of specialists in differing fields (pedologist, geomorphologist and soil geochemist) of expertise and the interpretation of the resulting data.

1.5 Assumptions, Limitations and Uncertainties

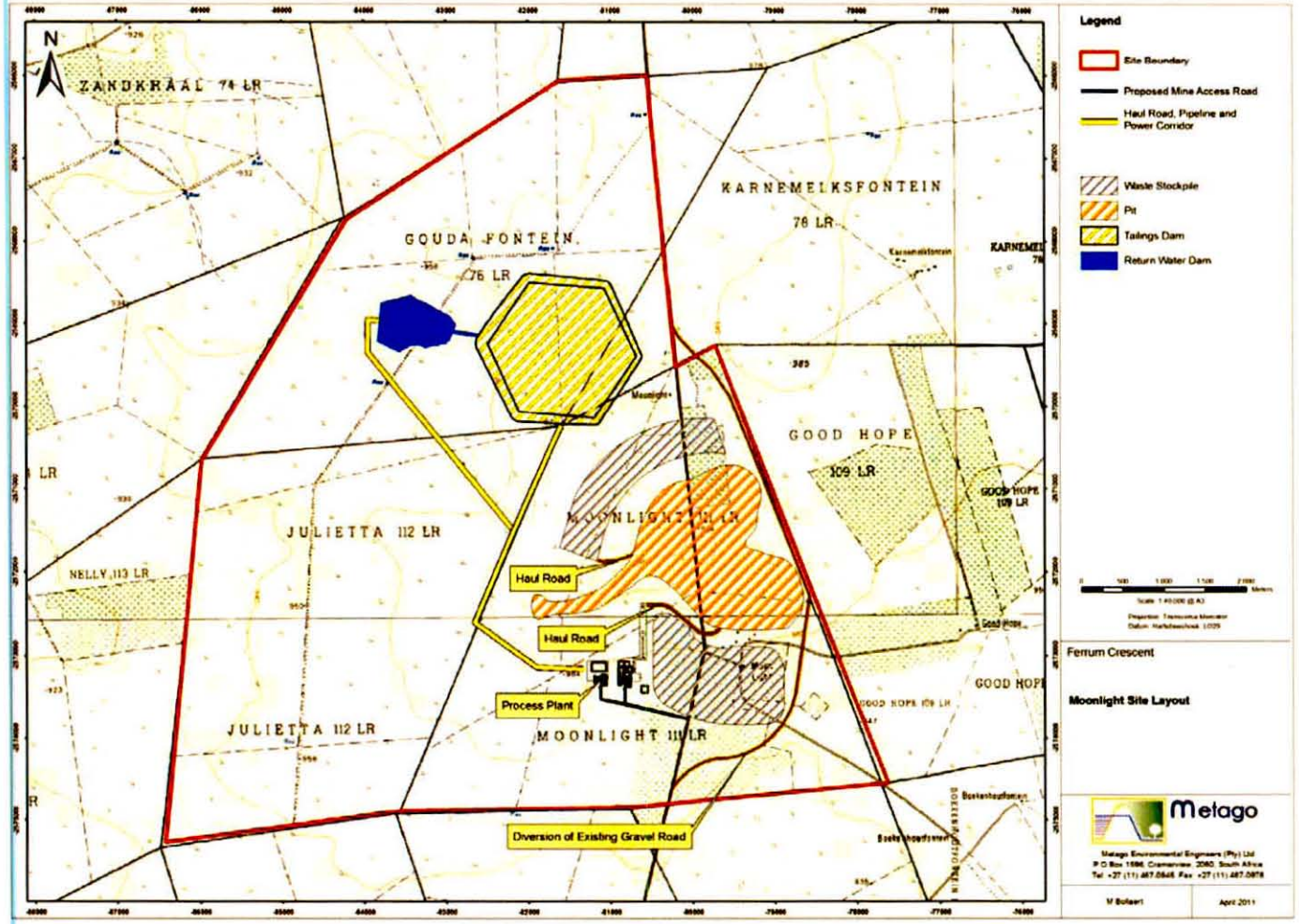
It has been assumed that the total area of possible disturbance was included as part of the area of study, that the mining plan as tabled has documented and catered for all actions and activities that could potentially have an impact on the environment, and that the recommendations made and impact ratings tabled for the soils and land capability will be re-assessed if the mine plan changes.

Limitations to the accuracy of the pedological mapping (as recognised within the pedological industry) are accepted at between 50% (reconnaissance mapping) and 80% (detailed mapping), while the degree of certainty for the soils physical and chemical (analytical data) results will be based on **"composite"** samples taken from the dominant soil types mapped in the study area.

The area in question has been mapped on a reconnaissance base, the degree and intensity of mapping and geochemical sampling being considered and measured based on the complexity of the soils noted in field during mapped, and the interplay of geomorphological aspects (ground roughness, slope, aspect and geology etc).

Accessibility on site was restricted in some instances due to the density of the natural bush and areas that had been subjected to historical over grazing, resulting in extremes of thorn bush and pioneer grasses. This inability to easily access portions of the site has led to some degree of uncertainty on portions of the study area albeit that the areas are moderately small in spatial extent and extrapolation from areas of similar geomorphology increased the ability to predict with better confidence the probable soil forms.

Figure 2 Proposed Mining Plan (April 2011)



2. DESCRIPTION OF THE PRE-CONSTRUCTION ENVIRONMENT

2.1 Data Collection and Gap Analysis

2.1.1 Review of Available Information

As part of the original ToR the developer made available to the project team all published information, and any aerial imagery. The scoping and pre-feasibility study and any exploration results available were used as the basis for the scope of work tabled.

The specialist pedological and land capability studies have been undertaken in a number of phases, with the baseline survey undertaken in the absence of any defined engineering designs or finalised mining plan.

The need for a desktop evaluation of the proposed development areas was highlighted in the delineation of environmentally sensitive "No Go" areas, while baseline studies of the proposed open cast mining and processing sites were recognised as essential in the assessment of alternatives prior to any planning or development taking place.

The development of a best alternative site plan for the processing facilities and their associated waste stockpile, and the routing of the roads (access and haulage) and essential services (power and pipelines) were initially based on the engineering requirements and economics of scale, with alternative positioning of the processing and its support infrastructure being decided on with the aid of the scoping information.

The alternatives tabled has influence the development and planning, and ultimately the long term sustainability of the project, with the sensitivities and workability of the materials to be impacted controlling the outcomes. Based on these sensitivities and the workability of the materials in conjunction with the climatic and topographic constraints, the soil environ and other environmental issues associated with the soils and land capability will be better managed and the impacts more easily mitigated during the operation and after the development is closed.

The government survey maps (geological and topocadastral) and the regional descriptions were used in obtaining an understanding of the general lithological setting for the area, while discussions with the farming community and local wildlife specialists helped in understanding the possible pedogenic processes that are unique to the specific environment. However, the scale of this information is insufficient for the level of data needed for a project of this magnitude.

Little information was available at the time of the field mapping on the influence and effects of the evaporites (calcrete) on the local ecological balance and sustainability of the systems that naturally occur as a result of the hard carbonate horizons common to this environment. In addition, it was difficult to obtain sufficient reliable information on the overall thickness and consistency of the calcrete layer from the hand augering and limited test pitting undertaken. The geotechnical investigations that will inevitable be carried out prior to the design of infrastructure will shed more light on these issues.

The aerial imagery (Colour Aerial Photographs) supplied by the developer is recent and of good quality and proved to be invaluable and of great assistance in the mapping of the dominant soil patterns.

Integration of Data

The geological exploration being conducted for the iron ore mining project and the regional geological mapping for the area is of significance and important to the soils study.

The depth to the calcrete interface, depths of weathered rock and the static water level associated with the fractured rock aquifer are all useful in better understanding the earth science of the study area.

The moderately complex suite of rocks that make up the overall sequence of lithologies and the complex geological structures that define the mineralised zone all have an effect on the weathered materials and soil characteristics produced.

The regional geology is dominated by the Archaean basement lithologies (ultramafic, mafic and politic gneisses) of the Beit Bridge Complex within the Limpopo Mobile Belt (LMB). The LMB is subdivided into three domains, namely the Central, the South Marginal and the Northern Marginal Zones. The borders between these zones, as well as the borders between the LMB and the Kaapvaal and Zimbabwe Cratons, are prominent fault zones. Each zone is distinct in terms of its dominant rock type and structural history, although all characterized by high-grade metamorphism (ProMet 2010).

The Moonlight deposit is located within the Central Zone of the LMB. Information on the presence of mineralisation within this area is based on exploration data collected by Turquoise Moon since 2006. The iron mineralisation is found within the Banded Iron Formations (BIFs) of the Mount Dowe Group, the oldest group of the Beit Bridge Complex. Outcrop in the area is poor with most of the ore body overlain by approximately 50 to 65m of alluvium, sand and calcrete. The BIFs within the Moonlight deposit strike east-northeast with a flat shallow dip towards the north. The BIF units vary from a few metres to 40 m in thickness. South of the Moonlight deposit lies the large east-west trending Melinda Fault and the Palala Shear zone, which forms the southern margin of the Central Zone (WGC 2010).

The large scale regional studies undertaken and published by the government have been used as a regional guide and as part of the desktop study that was used in defining the possible "No Go" areas during the scoping phase, while the baseline information has refined these outputs.

The geological and geotechnical information combined with a terrain model of the disconformable contact of the soils with the evaporite (calcrete) layer is essential to the understanding of the water movements within the vadose zone and into the weathered aquifer (perched water), as the soil water balance of this arid environment is believed to hinge on these facts. These studies should be highlighted as part of the additional specialists studies recommended going forward, and should be considered as necessary for the integrated rehabilitation planning.

Field Work

The reconnaissance pedological study of the site was performed using various different scales of mapping, with the majority of the area being assessed on a reconnaissance base of between 150m and 500m depending on the complexity of the soil patterns noted and the degree of impact that is likely to occur. The areas of greater impact by construction of heavy structures and deep foundations were assessed in more detail, albeit that the grid base intensity was again varied depending on the degree of complexity and the accessibility to the natural environment.

The surveys were undertaken during December 2010 and April 2011. In addition to the grid point observations, a representative selection of the soil forms mapped were sampled and analysed to determine their chemistry and physical attributes. The soil mapping was undertaken on a 1:10,000 scale (Refer to Figure 4) orthophotographic base.

A total area of approximately 4,700ha was covered in the course of these studies, with in excess of 280 primary observations (auger point) and nine test pits being used in the observation and characterisation of the soils of the study area.

The majority of observations used to classify the soils were made using a hand operated bucket auger and Dutch (clay) auger with limited test pitting to refine and better understand the in-situ character of the dominant soils.

Standard mapping procedures and field equipment were used throughout the survey.

The fieldwork comprised a number of site visits during which profiles of the soil were examined and observations made of the differing soil extremes. Relevant information relating to the climate, geology, wetlands and terrain morphology were also considered at this stage, and used in the classification of the soils of the area, while the variation in the natural vegetation was also used to help in the more accurate placing of the changes in soil form.

The pedological study was aimed at investigating/logging and classifying the soils within the area of potential disturbance. Terrain information, topography and any other infield data of significance was also recorded, with the objective of identifying and classifying the area in terms of:

- The soil types to be disturbed/rehabilitated;
- The soil physical and chemical properties;
- The soil depth;
- The erodibility of the soils;
- Pre-construction soil utilisation potential, and
- The soil nutrient status.

Soil Profile Identification and Description Procedure

The identification and classification of soil profiles were carried out using the *Taxonomic Soil Classification System (Mac Vicar et al, 2nd edition 1991)*

The Taxonomic Soil Classification System is in essence a very simple system that employs two main categories or levels of classes, an upper level or general level containing Soil Forms, and a lower, more specific level containing Soil Families.

Each of the soil Forms in the classification is a class at the upper level, defined by a unique vertical sequence of diagnostic horizons and materials.

All soil forms are subdivided into two or more families, which have in common the properties of the Form, but are differentiated within the Form on the basis of their defined properties.

In this way, standardised soil identification and communication is allowed by use of the names and numbers given to both Form and Family. The procedure adopted in field when classifying the soil profiles is as follows:

i. Demarcate master horizons;
ii. Identify applicable diagnostic horizons by visually noting the physical properties:

- Depth (below surface)
- Texture (Grain size, roundness etc.)
- Structure (Controlling clay types)
- Mottling (Alterations due to continued exposure to wetness)
- Visible pores (Spacing and packing of peds)
- Concretions (cohesion of minerals and/or peds)
- Compaction (from surface)

iii. Determine from i) and ii) the appropriate Soil Form
iv. Establishing provisionally the most likely Soil Family

Sample Analysis

Sampling of representative soils were carried out and submitted for analysis.

Factors that were considered in the laboratory included:

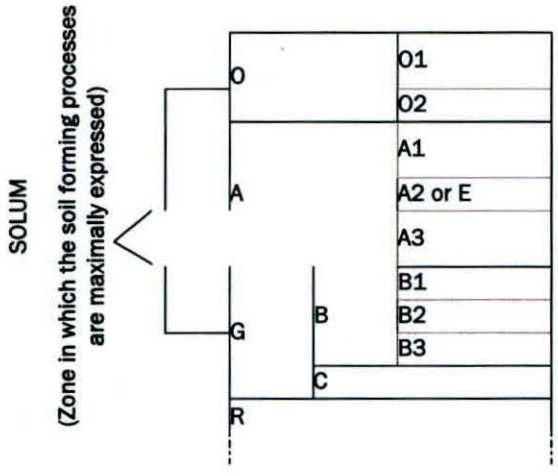
- Determination of the pH
- Exchangeable bases
- C.E.C. (cation exchange capacity)
- Texture (% clay)
- Nutrient status and
- Any potential pollutants

The methods employed in the determination of the above variables are:

i) The Spectro Atomic Analyser for the determination of the basic elements
ii) The titration method for the determination of Organic Carbon contents, and
iii) The use of a density meter for the determination of the clay contents.

Analytical results are given for the extractable quantities available from the soil (Refer to Tables 2.1.3.1 a - b).

Table 2.1.1 Typical Arrangement of Master Horizons in Soil Profile



O1	Loose leaves and organic debris, largely undecomposed
O2	Organic debris, partially decomposed or matted
A1	Dark coloured due to admixture of humified organic matter with the mineral fraction
A2 or E	Light coloured mineral horizon
A3	Transitional to B but more like A than B
B1	Transitional to A but more like B than A
B2	Maximum expression of B-horizon character
B3	Transitional to C
C	Unconsolidated material
R	Hard rock

Arrangement of master horizons

2.1.2 Description

Soil Forms Identified

The soils encountered can be broadly categorised into five major groupings, with 17 dominant soil forms (Refer to Figure 2.1.2a and Table 2.1.2).

The major soil forms are associated predominantly with the change in the underlying parent materials from which the soils have been formed/derived, and less by the surface topography.

It is hypothesised that, the evaporite layer that is disconformable to the underlying lithologies, and which appears to have been eroded prior to the emplacement of the present day soils and sand cover, is one of the dominant pedogenetic drivers. The occurrence of a semi continuous (drilling results) calcrete (evaporite) layer at depth, and the occasional surfacing of this layer as outcrop (Pan like Structures) and their occurrence at greater than three metres (depth of TLB digger arm) depth in other places confirms the idea of a relict land surface from which, and onto which the present soils have been deposited and/or formed.

The dominant soils are described in terms of their physical and chemical similarities and to some extent their topographic position and pedogenisis along with their spatial distribution (Refer to Figure 2.1.2a and Table 2.1.2). The major soil groupings are described in more detail later in this section (Refer to Figure 2.1.2b).

The soils mapped range from shallow sub-outcrop and outcrop to very deep sandy loams.

The shallow, to very shallow soil profiles are generally associated with a ferricrete layer and/or the calcrete layer. This recently developed evaporite layer (geologically) and ferricrete horizon are responsible for the barrier to water infiltration that results in surface water being held close to or on surface for periods of time in pan like structures.

The degree to which the evaporite layer has been cemented (Refer to Appendix 2 – Calcrete Classification – friability of the calcrete) will determine the effectiveness of the layer as a barrier to water infiltration, with the depth of overlying soil or sand determining how easily or difficult it is for the soil water to be accessed and utilized by the fauna and flora. The friability of the calcrete layer will also have an effect on the amount of clay mineralisation that the soil contains, and will in turn influence the water holding characteristics of the soil, a very important factor in the sustainability of vegetative growth.

In contrast, the deep (>1,5m) sandy profiles associated with aeolian processes are characterised by low clay contents (often <6%), textures that are equigranular and comprise predominantly fine sandy loams and have little to no structure. These soils are well sorted, and extremely well drained. The depth to a restrictive layer is variable with the depth of sand determining the utilization potential of the soils.

The shallow and relatively much more structured soils are distinctly different and easily distinguished from the flat to undulating sandy zones that comprised both colluvial and aeolian derived materials.

As with any natural system, the transition from one system to another is often complex with multiple facets and variations that vary and grade over large distances. However, in simplifying the trends mapped, the following major soil groupings pertain (Refer to Table 2.1.2):

Figure 2.1.2a Soil Polygon Map – Dominant Soils

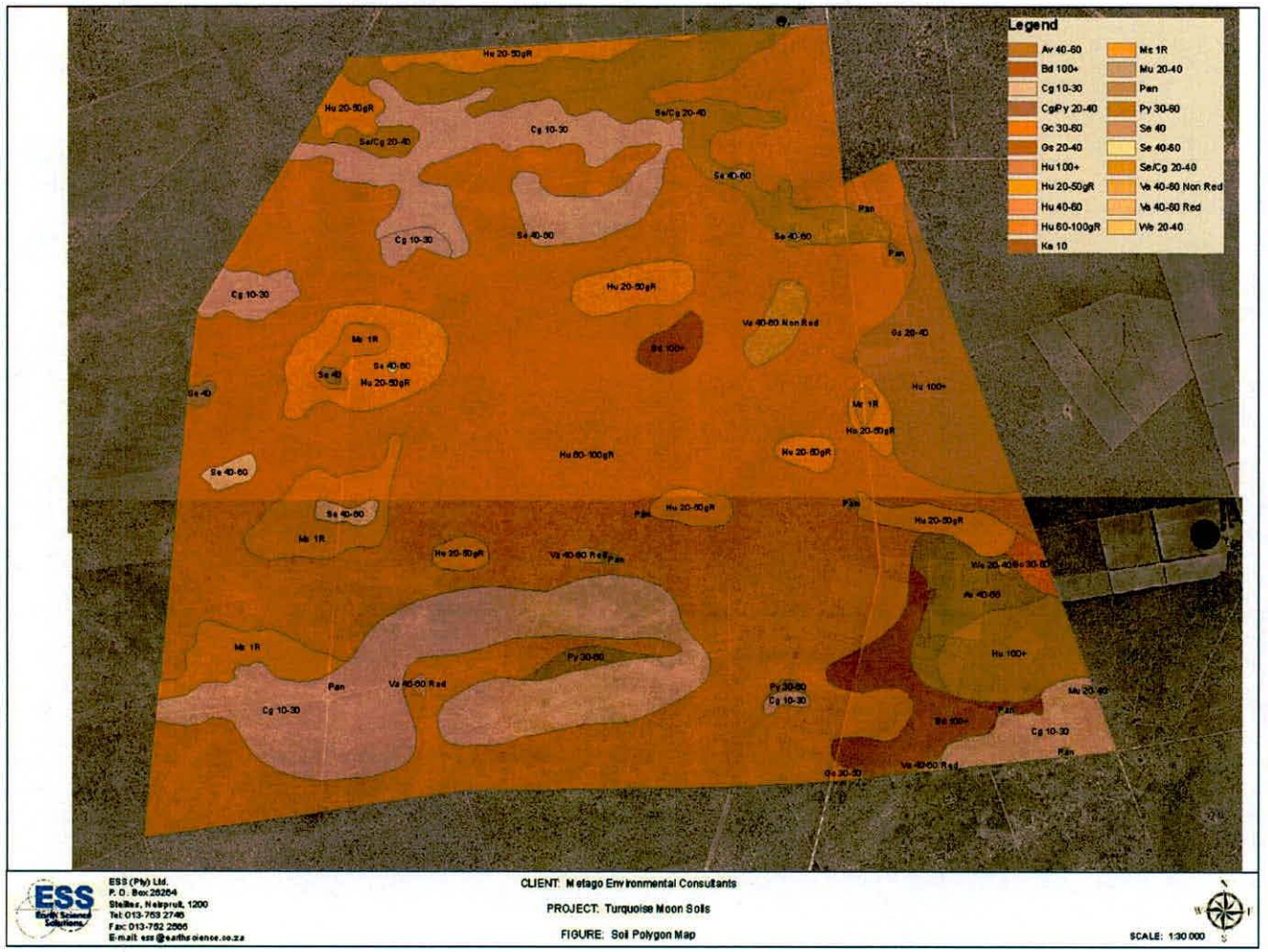


Table 2.1.2 Dominant and Sub-dominant Soil Forms as % of Total Area

Group	Dominant Soil Form	Percentage	Sub Dominant 1	Percentage	Sub Dominant 2	Percentage	Sub Dominant 3	Percentage	Area (Ha)
1	Hu 100+	90%	Hu 50-100R	10.00%					253.36
2	Hu 60-100gR	70%	Hu 10-120R	10.00%	Hu 30-60gR	10.00%	Py 30-60	10.00%	2 688.80
3	Hu 20-50gR	70%	Ms 10	15.00%	Hu 60-100gR	15.00%			289.45
4	Ms 1R	60%	Surface Rock	40.00%					151.71
5	Bd 100+	80%	Bv 100+	10.00%	Av 100+	10.00%			127.78
6	Va 40-60 Red	90%	Hu 60-100gR	10.00%					5.67
7	Va 40-60 Non Red	90%	Se 100	10.00%					24.58
8	Se 40-60	90%	Va Non Red	10.00%					30.01
9	We 20-40	100%							1.30
10	Av 40-60	60%	Lo	40.00%					73.52
11	Mu 20-40	100%							1.03
12	Gc 30-60	100%							16.33
13	Py 30-60	80%	Ky 30-60	10.00%	Cg 10-30	10.00%			16.98
14	Cg 10-30	60%		60.00%					990.14
15	Ka 10	100%							0.30
G	Gs 20-40	100%							0.45
P	Pan								6.12
Total Area (Ha)									**4 677.54**
Abb	Hu - Hutton, Ms - Mispah, Bd - Bloemdal, Va - Valsrivier, Se - Sepane, We - Westleigh, Av - Avalon, Mu - Montagu, Gc - Glencoe, Cg - Coega, Ka - Katspruit, Gs - Glenrosa, Lo - Longlands, Ky - Kimberley, Py - Plooysburg								

- A group of ***generally moderately deep to shallow, structured*** (apedel to strong blocky or pedocutanic) fine to medium grained sandy to silty clay loams that are associated with the development of in-situ materials.

  The calcareous evaporite layer is often found occurring as sub outcrop or at surface associated with the undulating disconformities that form the base to the soil profile where the geology is close to surface.

  These zones comprise some of the better land capability units in the area (Good quality grazing and/or arable potential rating), with the soil water holding capability and associated clay content rendering the soils capable of sustained good vegetative growth through the dry spells that characterise the semi-arid environment. This grouping includes neocutanic soils, red to red brown in colour with moderately strong structured (weak blocky to strong blocky) and small but significant areas of neocarbonate and soft carbonate soils with varying depths of weakly structured to apedel sandy loams (Moderately deep 40cm to 80cm) Hutton, Valsrivier (Red and Brown) and Kimberley).

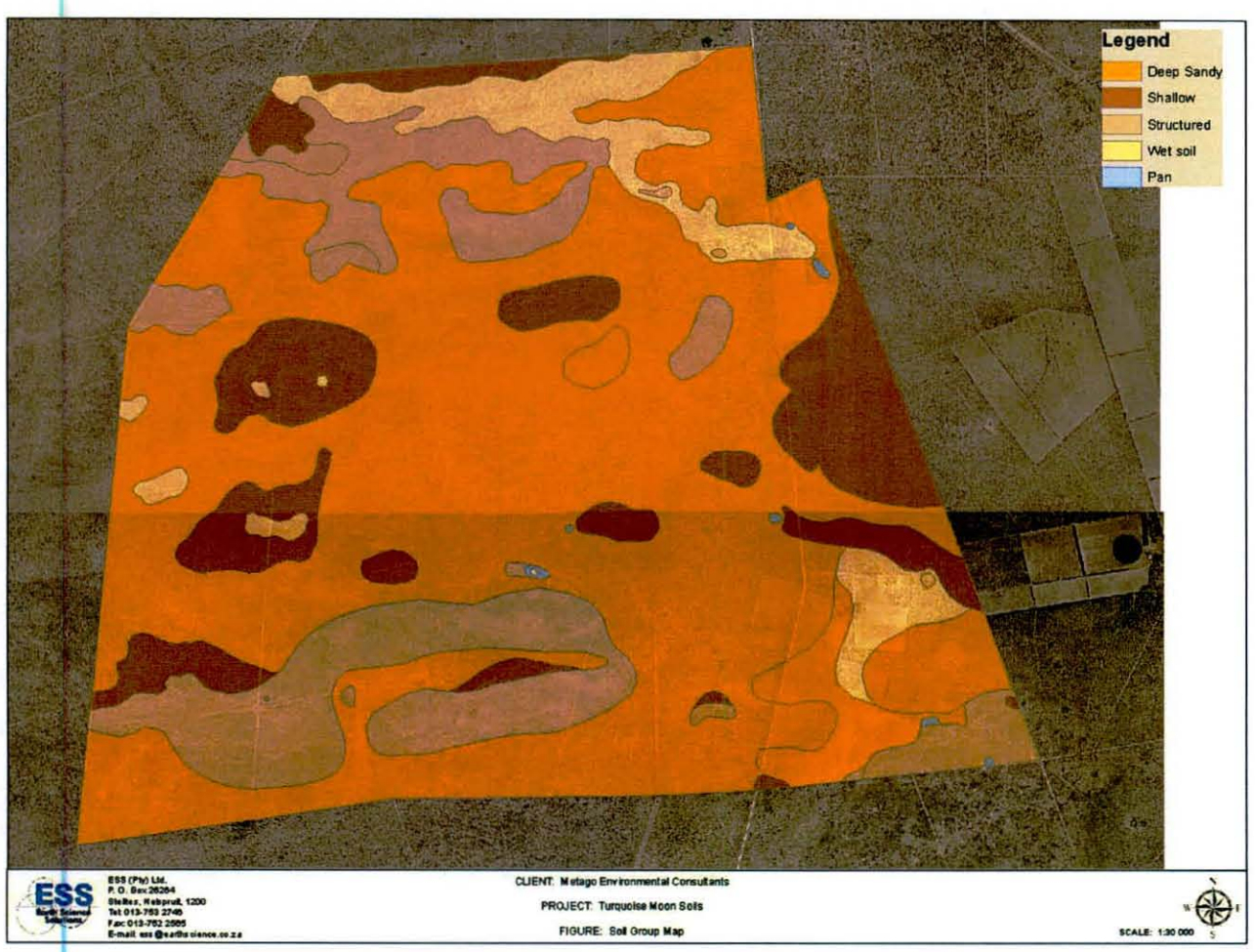
- A group of generally much ***shallower soils*** which are associated almost exclusively with the outcropping of the mineralised zone and/or the evaporite layer at surface. These areas form a relatively small percentage of the overall area of study, but are believed to have a relatively large and important function in the sustainability of the overall biodiversity of the area. This group of soils comprise the pan like structures and water holes. Groundwater is generally relatively deep (>15m) for the majority of the area of study and is reported (hydrogeologists) to have little to no influence on the soil water and water found within the vadose zone. No perched aquifers are reported, albeit that significant area of well-developed ferricrete and evaporites were mapped. The development of wet based soils and moist grassland environments are mapped in association with these soil forms.

Again, it is noted as important to the baseline study, that these soil groupings (Avalon, Coega, Longlands, Sepane, Bainsvlei, Bloemdal and Glencoe Forms) are not extensive in spatial area, and are relatively few in number, but are well distributed across the area of study and form important features to the overall biodiversity of the area (Mispah, Glenrosa, some Glencoe (40cm to 60cm) Plooysburg and Coega).

- In contrast, the aeolian derived materials that make up the majority of the well sorted and much more ***sandy soils*** (<6% clay) and/or stratified horizons, are generally deep (greater than 800mm), and vary in texture from fine grained silty sands to highly sorted single grained sands (Deep (>80cm) Hutton, Avalon, Bloemdal and Bainsvlei).

- In addition to these major soil groups, there are the ephemeral pan like structures associated with the wet base soils and the retention of water (perched water) within the vadose zone (Longlands, Avalon, Bainsvlei, Bloemdal, Sepane, Montague and Westleigh).

Figure 2.1.2b Major Soil Groups



In almost all cases mapped, the soil materials are founded on a hard base that comprises either the host lithology (bedrock) or a sequence of disconformable evaporite derived sediments of varying consistency (Calcium Carbonate) that occur at varying depths (20cm to greater than 1,500cm).

The concentrations of natural salts and stores of nutrients within these soils are again a sensitive balance due to the extremes of rainfall, wind and temperature. The ability of a soil to retain moisture and nutrients, and in turn influence the sustainability of vegetative growth and dependence of animal life is determined by the consistency and degree of soil moisture retention within the profile but out of the influence of evaporation.

These conditions associated sensitivity should be noted in terms of the overall bio-diversity balance if the sustainability equation is to be managed and mitigation engineered.

All areas included in the study have been captured in a GIS format and mapped according to their soil classification nomenclature and soil depth (decimetres) – Please refer to Table 2.1.2.

2.1.3 Soil Chemical and Physical Characteristics

A suite of representative samples from the differing soil forms/types were taken and sent for analyses for both chemical and physical parameters Refer to Table 2.1.3). A select number of samples were submitted, each sample containing a number of sub samples from a particular soil Form or Type, which is representative of the area in question, thus forming a "composite sample", which in turn is representative of the Soil Form rather than a specific point sampled.

2.1.3.1 Soil Chemical Characteristics

Sampling of the soils for nutrient status was confined where possible to areas of undisturbed land. However, some of the better soil and rock exposure, and areas where sampling was easily undertaken are associated with the drilling sumps (pit structures) that had been dug as part of the exploration program. The sumps gave good exposure to the soil profile in a terrain that has little topographic change, and thus little in the way of cuttings or natural profiles that could be mapped.

These sites expose the profile from surface to the hard rock or evaporite contact in some cases.

Samples were taken at intervals down the profile within the sumps, and where available samples of the disturbed topsoil's were also taken for analysis from the test pits.

These results are representative indications of the pre-construction conditions. However, these results are at best a reconnaissance representation of the baseline conditions.

On-going sampling and monitoring of the in-situ conditions will be necessary throughout the operational phase to accurately define the post operational conditions for the rehabilitation to be successful.

The results of the laboratory analysis returned a variety of materials that range from very well sorted sands with low nutrient stores and little to no clay (<6%) to soils with a moderate stratified and in places moderate blocky structure, silt to sand and in places moderate grained sandy texture and varying degrees of utilizable nutrients.

In general, the pH ranges from neutral soils at 7.3 to rather acid materials with values as low as 5.6, a base status ranging from 3me% to 7me% (Eutrophic (slight leaching status) to Mesotrophic (moderate leaching status)), and nutrient levels reflecting generally high levels of calcium and sodium, but deficiencies in the levels of magnesium, potassium, phosphorous, copper, aluminium and zinc, with exceptionally low levels of organic carbon matter.

The slightly more structured (moderate blocky) and associated sandy and silty clay loams returned values that are indicative of the more iron rich materials and more basic lithologies that have contributed to the soils mapped. They are inherently low in potassium reserves, and returned lower levels of zinc and phosphorous.

The growth potential on soils with these nutrient characteristics are at best moderate to poor.

Table 2.1.3.1 Analytical Results

Results: Turqouise Moon											
Sample No		3722	3723	3724	3725	3726	3727	3728	3729	3730	3731
YOUR REF. BLOCK		229B	229A	74	74A	3A	3B	273A	273B	15A	15B
pH (Water)	pHunit	6.52	6.5	7.35	6.95	6.01	5.63	6.46	6.17	5.98	6.03
Res (ohms)	ohms	3200	3100	850	970	990	610	700	240	180	770
Ca	mg/kg	488	401	1436	979	179	121	298	511	576	173
Mg	mg/kg	108	95	211	164	32	69	50	73	108	42
K mg/kg	mg/kg	66	100	118	140	60	77	119	93	94	118
Na mg/kg	mg/kg	4	2	17	6	1	1	1	8	6	1
P	(Bray1)	0.2	0.9	0.5	0.7	1.8	0.3	1	1	3	2.1
Al	mg/kg	6.00	5	4	6	9	10	8	6	5	9
Ca/Mg		4.52	4.22	6.81	5.97	5.59	1.75	5.96	7	5.33	4.12
Ca+ Mg/K		9.03	4.96	13.96	8.16	3.52	2.47	2.92	6.28	7.28	1.82
Zn	mg/kg	0.51	2.6	0.78	1.01	0.04	0.68	0.62	0.1	0.1	0.35
Mn	mg/kg	143	163	188.00	156	128	41	209	167	154	151
Fe	mg/kg	44.9	49.4	49.50	59.3	44.6	18.4	45.7	19.6	24.1	37
Sand	%	85	88	86	84	84	80	74	74	84	84
Silt	%	7	8	2	2	12	8	12	10	4	6
Clay	%	8	4	12	14	4	12	14	16	12	10

2.1.3.1.3 Soil fertility

The soils mapped returned at best moderate levels of some of the essential nutrients required for plant growth with sufficient stores of calcium and sodium. However, levels of Zn, P, Mg, Al, Cu and K are generally lower than the optimum required.

Significantly large areas of soil with a lower than acceptable level of plant nutrition were mapped across the study area. These poor conditions for growth were further compounded by the high permeability and low clay and carbon contents of the majority of the soils.

There are no indications of any toxic elements that are likely to limit natural plant growth in the soils mapped within the study area

2.1.3.1.4 Nutrient Storage and Cation Exchange Capacity (CEC)

The potential for a soil to retain and supply nutrients can be assessed by measuring the cation exchange capacity (CEC) of the soils.

The inherently low organic carbon content (arid to semi-arid environment) and very low clays are detrimental to the exchange mechanisms, as it is these elements which naturally provide exchange sites that serve as nutrient stores. These conditions will result in a low retention and supply of nutrients for plant growth.

Low CEC values are an indication of soils lacking organic matter and clay minerals. Typically a soil rich in humus will have a CEC of 300 me/100g (>30 me/%), while a soil low in organic matter and clay may have a CEC of 1-5 me/100g (<5 me/%).

Generally, the CEC values for the soils mapped in the area are low and enhanced due to the low clay contents of many of the soils.

2.1.3.1.5 Soil organic matter

The soils mapped are all extremely low in organic carbon as would be expected for a semi-arid environment. This factor coupled with the low clay contents for the majority of the soils mapped will adversely affect the erosion indices for the soils, with a very high index prevailing for the majority of the materials classified, all be it that the flat to undulating topography does temper this significantly.

2.1.3.2 Soil Physical Characteristics

The majority of the soils mapped exhibit apedel to single grained structure, low clay content and a eutrophic leaching character. Their texture is commonly single grained sandy to silty sands with generally single grained apedel to weak crumby or in the extreme weak blocky structure, and a range of effective rooting depths. The aeolian derived and well sorted sands are characterised by very low clay contents (generally less than 6%), while the slightly structured materials are often associated with stratified features common of water deposition, a sign that the Limpopo River might at one time have flowed in this area.

Of great significance, and a feature that is unique to semi-arid and arid environments that characterise this area is the calcrete or calcium carbonates formations noted at the base of the soil profile.

The arid climate combined with the geochemistry of the parent formations in the study area are conducive to the formation of evaporites, with low rainfall (<350mm/yr), high evaporation (1,450mm/yr) and a calcium rich source.

These are the driving mechanism. Hard pan calcification at or close to surface (100mm to 500mm) is moderately common due to the precipitation of salts (calcium and magnesium predominantly) as the salt enriched waters evaporate off. These layers are considered to be an extremely important feature of the biosphere and are expected to contribute to the sustainability of the ecological systems in these arid to semi-arid environments.

The gradation of calcrete formation and weathering from calcareous soil (very friable and easily dug with a spade or shovel), through calcified soil (varying in particle size from sand to gravel – but no cementation) and powdery calcrete (silt and sand sized calcrete particles – little to no cementation) to nodular calcrete (cementation of calcareous grains into nodules), honeycomb calcrete (cemented nodules) and hard pan calcrete (cemented honeycomb – all voids filled).

This classification is taken from the geotechnical system developed by F. Netterberg and J. H. Caiger entitled "A Geotechnical classification of calcretes and other pedocretes" (*Geological Society, London, Special Publications* 1983; v. 11; p. 235-243) and forms the basis for classify the calcrete portion of the soil horizon in terms of its workability (engineering properties) and storage sensitivities.

The soil classification system takes cognisance of calcrete derived or induced soils and has specific nomenclature for these occurrences (Refer to The South African Taxonomic Soil Classification - See list of references).

The variation in the consistency of the calcrete layer, its thickness and extent of influence across/under the site are all important to the concept of a "barrier" layer that is formed at the base of the soil profile and/or close to the soil surface when the calcrete develops to a nodular form or harder (Nodular, Honeycomb and Hard Pan). Evidence from the exploration drilling, pedological pitting and augering indicate that the calcrete layer is extensive regionally (a common feature in low rainfall and arid climates) and forms an undulating disconformable layer over which the recent deposits of sand and soil have been developed.

Important to an understanding of the development of the calcrete formation is the geological time and presence of the specific calcium rich waters. This situation will be very difficult to emulate or recreate if impacted or destroyed.

2.1.4 Soil Erosion and Compaction

Erodibility is defined as the vulnerability or susceptibility of a soil to erosion. It is a function of both the physical characteristics of that soil as well as the treatment of the soil.

The resistance to or ease of erosion of a soil is expressed by an erodibility factor ("K"), which is determined from soil texture/clay content, permeability, organic matter content and soil structure. The Soil Erodibility Nomograph (*Wischmeier et al,* 1971) was used to calculate the "K" value.

With the "K" value in hand, the index of erosion (I.O.E.) for a soil can then be determined by multiplying the "K" value by the "slope" measured as a percentage. Erosion problems may be experienced when the Index of Erosion (I.O.E) is greater than 2.

Erodibility ratings are expressed as:

Resistant	"K" factor = <0.15
Moderate	"K" factor = 0.15-0.35
Erodible	"K" factor = 0.35-0.45
Highly erodible	"K" factor = >0.45

The majority of the soils mapped can be classified as having a high erodibility index in terms of their clay content (very low), organic carbon (very low) and structure (structureless), which is off-set and tempered by the almost flat terrain to an index of moderate.

However, the vulnerability of the "B" horizon to erosion once the topsoil and/or vegetation is removed must not be under estimated when working with or on these soils. These horizons (B2/1) are vulnerable and rate as medium to high when exposed.

The concerns around erosion and inter alia compaction, are directly related to the disturbance of the protective vegetation cover and topsoil that will be disturbed during any construction operation. Once disturbed, the effects and actions of wind and water are increased.

Loss of soil (topsoil and subsoil) is extremely costly to any operation, and is generally only evident at closure or when rehabilitation operations are compromised.

Well planned management actions during the planning, construction and operational phases will save time and money in the long run, and will have an impact on the ability to successfully "close" an operation once completed.

2.2 Pre-Construction Land Capability

2.2.1 Data Collection

Based on a well-developed and scientifically founded baseline of information, the South African Chamber of Mines (1991) Land Capability Rating System in conjunction with the Canadian Land Inventory System has been used as the basis for the land capability study.

Using these systems, the land capability of the study area was classified into four distinctly different and recognisable classes, namely, wetland soils, arable land, grazing land and wilderness or conservation land. The criteria for this classification are set out in Table 2.2.1.

Table 2.2.1 Criteria for Pre-Construction Land Capability (S.A. Chamber of Mines 1991)

Criteria for Wetland Land with organic soils or supporting hygrophilous vegetation where soil and vegetation processes are water determined. Criteria for Arable Land Land, which does not qualify as having wetland soils. The soil is readily permeable to a depth of 750mm. The soil has a pH value of between 4.0 and 8.4. The soil has a low salinity and SAR The soil has less than 10% (by volume) rocks or pedocrete fragments larger than 100mm in the upper 750mm. Has a slope (in %) and erodibility factor ("K") such that their product is <2.0 Occurs under a climate of crop yields that are at least equal to the current national average for these crops. Criteria for Grazing Land Land, which does not qualify as having wetland soils or arable land. Has soil, or soil-like material, permeable to roots of native plants, that is more than 250mm thick and contains less than 50% by volume of rocks or pedocrete fragments larger than 100mm. Supports, or is capable of supporting, a stand of native or introduced grass species, or other forage plants utilisable by domesticated livestock or game animals on a commercial basis. Criteria for Conservation of Land Land, which does not qualify as having wetland soils, arable land or grazing land, and as a result is regarded as requiring conservation practise/actions.

2.2.2 Description

The "land capability classification" as described above was used to characterise and classify the land units identified during the pedological survey.

In summary, of the total area investigated (approximately 4,670 ha), approximately 30% is considered to be of a conservation/wilderness (require conservation actions if disturbed) or low intensity grazing land potential rating/status based on the depth of the materials alone, while approximately 63% is considered to be of an arable land capability if well managed.

Figure 2.2.2 illustrates the distribution of land capability classes.

Land Capability	Area Ha	% of Area
Arable	2 942.16	63%
Grazing	336.69	7%
Wilderness	1 033.62	22%
Wetland Soils	358.95	8%
Pan	6.12	0%
Total Area (Ha)	**4 677.54**	**100%**

Arable Land

The low rainfall of this area limits the utilization potential of the study area to low intensity grazing and wildlife conservation with the land utilization ability reflecting a lower than acceptable yield of cropping in terms of the of the national average (a measure used in the Land Capability Rating System – Refer Table 2.2.2 above), and thus negates the idea of even the deep soils having a potential for arable cultivation unless the water requirements can be augmented through inputs by irrigation. There are no areas of arable potential.

Grazing Land

The areas that classify as grazing land are generally confined to the shallower and transitional zones that are well drained. These soils are generally darker in colour, and are not always free draining to a depth of 750mm, but are capable of sustaining palatable plant species on a sustainable basis, especially since only the subsoil's (at a depth of 500mm) are periodically wetted. In addition, there should be no rocks or pedocrete fragments in the upper horizons of this soil group. If present it will limit the land capability to wilderness land.

Wilderness / Conservation Land

The majority of the area in question classifies as either conservation or wilderness land based on the shallow rocky nature of the materials, or the excessive depth of free draining (no clay) sands, both of which render the soils unable to sustain a crop yield that is at least equal to the current national average.

Wetland (Areas with wetland status soils)

Wetland areas in this document (soils and land capability) are defined in terms of the wetland delineation guidelines, which use both soil characteristics, the topography as well as vegetation criteria to define the domain limits (Separate Wetland Delineation has been undertaken).

These zones (wetlands) are dominated by hydromorphic soils (wet based) that often show signs of structure, and have plant life (vegetation) that is associated with seasonal wetting or permanent wetting of the soil profile (separate study).

The wetland soils are generally characterised by dark grey to black (organic carbon) in the topsoil horizons and are often high in transported clays and show variegated signs of mottling on gleyed backgrounds (pale grey colours) in the subsoil's. Wetland soils occur within the zone of soil water influence.

There are only a very few areas of true wetland soils present within the study area, with zones of slight wetness at depth where the calcrete layer is moderately close to surface, and on the fringes of some of the pan structures where there is sufficient soil coverage on the calcrete to create a recognisable soil profile with characteristic wetland mottling etc, These zones are considered very important, sensitive and vulnerable due to their ability to contain and hold water for periods through the summers and into the dry winter seasons. They are also well distributed across the terrain and form watering points for the wildlife and plant species not found on the sandy soils.

Figure 2.2.2 Land Capability Plan