South Deep, A world class ore body in Perspective
Presentation transcript
15 April 2014

Nick Holland

Good afternoon or good morning, depending where you are in the world today. Thank you for joining us for this conference call. We do have some people who have been able to join us in the room today in the Gold Fields boardroom. So I'm grateful they could join us. But for those of you on the call we hope that you can follow the presentation which should be available to you. I just want to give a bit of background first before we start the presentation why we're doing the presentation in the first place. We've had quite a lot of queries on South Deep and the ore body in particular. And one of the things that we've done on 7th April is we put out a presentation on the website that we had done to a particular investor who raised quite a lot of questions. That investor wasn't the only investor or sell side analyst who has raised differing questions on the South Deep ore body itself, on the way we do the reserves, the methodology we apply etc. So what we thought we should do is given we'd done that presentation and put it on the website that we should follow it up and actually make the same presentation to as many people as we can. We felt this would be quite topical given that South Deep has obviously been something that is very important for Gold Fields and people are getting a much better understanding of the mine itself and the reserve. So what we've done is we've put this together. Tim Rowland has worked together with the mine in putting this together. I think they've done a great job. And I'm sure it is going to answer a lot of questions that people may have. How do we get confidence in what is one of the largest ore bodies in the world in the gold industry, one of the biggest and last opportunities in South Africa to bring a mechanised mine to account of this nature. So the starting point in all of that should obviously be let's make sure we understand the ore body. So this presentation is going to deal with the whole process we go through from initial drilling right through to doing the estimating that gets factored into the life of mine plan. So we show the entire value chain that we go through. Tim Rowland is next to me. He is the group competent person. That means that he is the judge in terms of signing off on our reserves and resources every year. And he doesn't only do that. In between all of that he obviously looks at all the work that we're doing over the year to make sure that at the end of each year we have a world-class set of reserves again. I think he is particularly proud that we've been able to win the award for reporting of reserves many times over the last number of years, which I think tells you something about the quality that goes into this whole preparation. So with that I'm going to hand over to Tim Rowland. He is probably going to need about an hour to an hour and a half to get through all of this. So if you could be patient and if there are questions at the end let's rather deal with them that way because I don't think we can break the flow of the presentation with 17 people participating. So if you don't mind, mark your questions and at the end we will allow Tim some time, or myself if there are particular operational questions on South Deep, to answer your questions. Tim, over to you.

Tim Rowland

Thank you very much for the introduction. If I do forget to remind people on the dial-in which slide I'm on it would be appreciated if you could just remind me on that so that they don't lose track. Thank you first of all to everyone with a physical presence here in the boardroom and also to those dialling in. Thank you very much for making the time available to spend an hour and a half or so going through the key aspects of the South Deep ore body. This is particularly relevant to Gold Fields as you will all understand. South Deep is a very important component of the Gold Fields portfolio, and it contributes 71% of the mineral resource base of the group and 73% of the mineral reserve base. Being a fully mechanised mine with the largest deep level underground fleet in the world, it is still currently in production ramp-up phase, scheduled to reach steady state production at the end of 2017. However, at the end of the day the fundamental asset of South Deep which will provide the inherent capability of the mine to deliver its cash flows and its margins and production ounces going forward, is the ore body. And I think it is particularly appropriate to spend the next hour or so really conveying the detail of the ore body, I think most importantly how Gold Fields manages the ore body and what we do differently to enhance our understanding of the ore body's to underpin the appropriate confidence levels, whether it be a life of mine plan, a 12 month operational plan or a seven year build-up plan to 2017. So it is about highlighting that aspect of the mineral resource management. Now, we've got a whole range of tools, methodologies and processes which we have employed at South Deep. I think they are all fit for purpose and they are all tailored to deliver a particular product in understanding the ore body. And I will walk you through those different techniques and methodologies over the next hour or so. I also want to highlight that at the end of the day you will realise how the ore body dictates how we do our mine design and scheduling, our production planning, why we do the de-stress cuts, why we do the different types of drilling etc. It is all rooted in the ore body dictating what we do, and I think that will come through very strongly this afternoon as well. I will also be highlighting the very significant investment that Gold Fields has made in skills and expertise, in our modelling software, in our drilling protocols. It has all come together to allow us to really pin the right confidence levels in this ore body, which as Nick said earlier is a massive gold resource even by global standards. What you will also leave this afternoon understanding is that we have significantly de-risked the production build-up plan at South Deep from an ore body perspective. You've got to understand the DNA of your ore body before you can have any approach to optimising your mine design and scheduling and your capital project investment etc. And I think I will be able to demonstrate to you how we've definitely de-risked the ore body component of the production build-up plan at South Deep. And then finally, this is already on the Gold Fields website, but we will be issuing a supplement to the integrated annual review toward the end of this calendar month which will provide technical reports or reviews of all eight operating assets and our main projects in Gold Fields. That will be out at the end of the month, and it will include a lot of information that I'm covering today on South Deep. But really similar information for all the other assets as well. So that should be looked out for by the end of April.

Forward looking statements

Certain statements in this document constitute "forward looking statements" within the meaning of Section 27A of the US Securities Act of 1933 and Section 21E of the US Securities Exchange Act of 1934.

In particular, the forward looking statements in this document include among others those relating to the Damang Exploration Target Statement; the Far Southeast Exploration Target Statement; commodity prices; demand for gold and other metals and minerals; interest rate expectations; exploration and production costs; levels of expected production; Gold Fields' growth pipeline; levels and expected benefits of current and planned capital expenditures; future reserve, resource and other mineralisation levels; and the extent of cost efficiencies and savings to be achieved. Such forward looking statements involve known and unknown risks, uncertainties and other important factors that could cause the actual results, performance or achievements of the company to be materially different from the future results, performance or achievements expressed or implied by such forward looking statements. Such risks, uncertainties and other important factors include among others: economic, business and political conditions in South Africa, Ghana, Australia, Peru and elsewhere; the ability to achieve anticipated efficiencies and other cost savings in connection with past and future acquisitions, exploration and development activities; decreases in the market price of gold and/or copper; hazards associated with underground and surface gold mining; labour disruptions; availability terms and deployment of capital or credit; changes in government regulations, particularly taxation and environmental regulations; and new legislation affecting mining and mineral rights; changes in exchange rates; currency devaluations; the availability and cost of raw and finished materials; the cost of energy and water; inflation and other macro-economic factors, industrial action, temporary stoppages of mines for safety and unplanned maintenance reasons; and the impact of the AIDS and other occupational health risks experienced by Gold Fields' employees.

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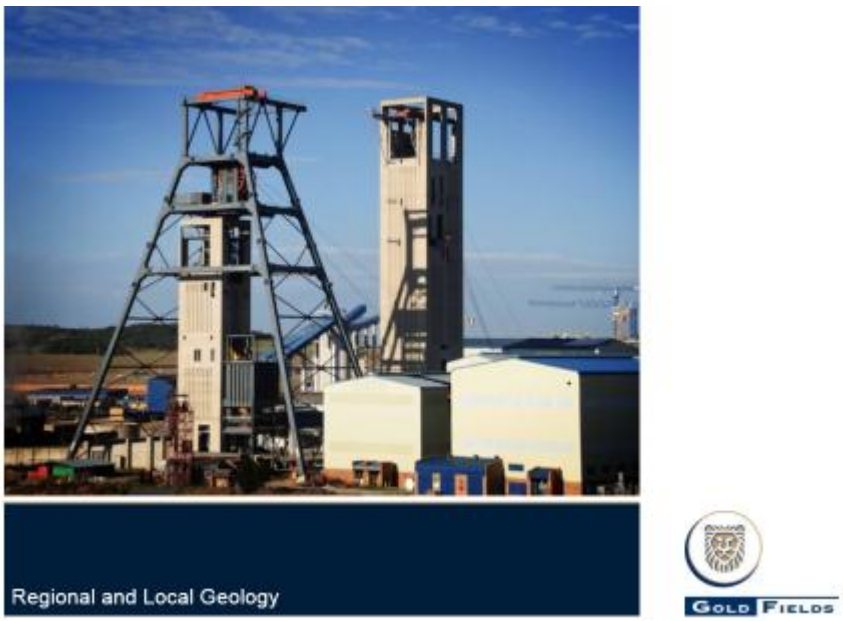
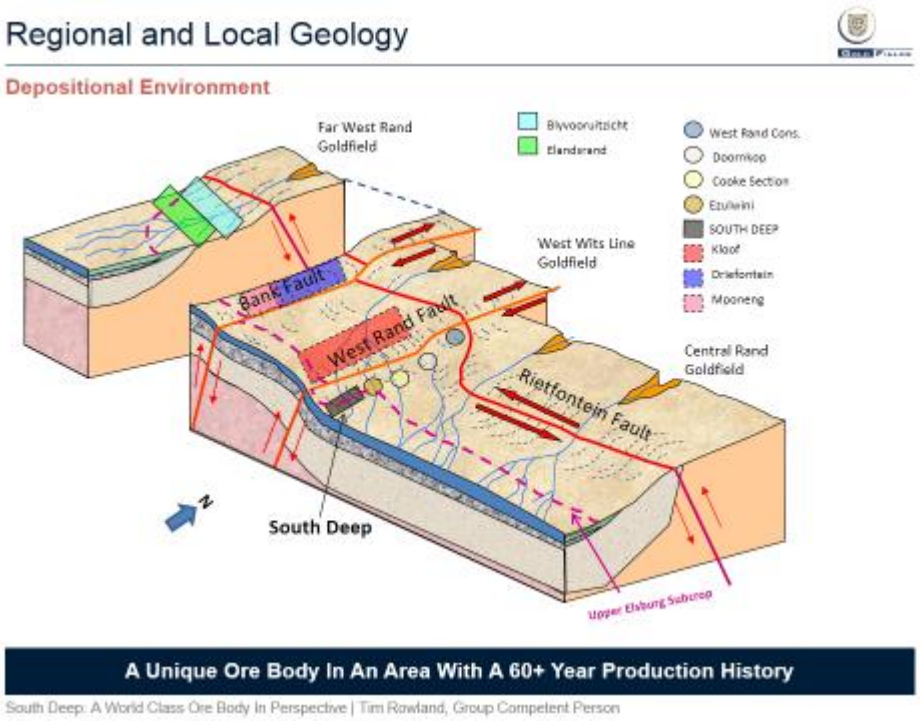
South Deep: A World Class Ore Body In Perspective | Tim Rowland, Group Competent Person

If everyone can at the appropriate time make sure they understand the content of this slide that will be greatly appreciated. And because we are in a closed period it would be appropriate that with any discussions today we do our best to keep them focussed on the topic in hand, which is the ore body. So I think that will help as well.

The agenda has been tailored to meet the requirements of the session this afternoon, which is really walking you through the macro aspects of the regional and local geology very quickly, taking you through the main inputs of where our empirical data comes from, and then covering the procedures and estimation planning processes that are all embedded at the mine, and then finally capping off with the mineral resource and mineral reserve position. And then I think importantly finishing off with some reconciliation waterfall charts to take you through. And then just completing the review with a summary and then an opportunity to take some questions at the end.





If I could take you back in geological history about 2.8 billion years to what the ancient geological landscape looked like on the West Rand, this is 2.8 billion years ago and what we've got here is an isometric view of the key components of the West Rand and far West Rand goldfield. What I want to highlight are the the key major structural faults. . We have Elandsrand and Blyvoor on the west of the Bank fault. We then have the West Rand fault. Along the West Rand fault we have a number of mines aligned on strike, South Deep here situated within the grey box, then Ezulwini, Cooke, Doornkop and right at the top end West Rand Cons. And over here to the west of the Bank fault we've got Driefontein and AngloGold's Mponeng mine.

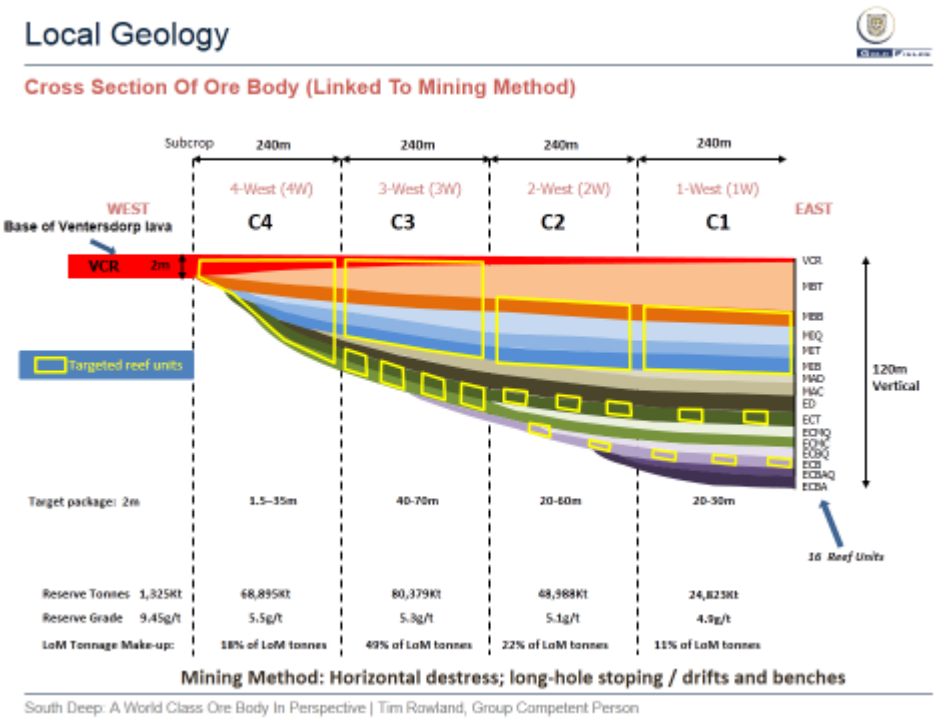
The reason I'm showing it to you is to give you a feel that approximately 2.6 to 3 billion years ago all these faults were tectonically active. Every time we got significant movement either horizontally or vertically on these faults it tended to re-energise the ancient fluvial drainage systems that were in place at the time. So what this facilitated was active drainage systems bringing erosion material off the higher ground or the hinterland areas and bringing the erosional sedimentary material through into the sub-basin, particularly in South Deep's context as sheet flood type deposits. So these are high energy sheet flood deposits in sharp contrast to the more braided stream environment which led to the typically singular style ore bodies at Mponeng, Elandsrand, Blyvoor etc.

I'm highlighting this because the high-energy sheet flood deposits at South Deep is what gives them their massive nature and geometry and their high level of spatial consistency. What you get on the more conventional mines in the lower-energy braided stream environment is much more high-grade channelling and pay shoots as oppose to more massive style mineralisation. That is an important contrast to highlight. So the 3D modelling of the multi-stacked ore body at South Deep is what is key here and the ancient geological landscape that led to that differential and 'largely unique' deposit at South Deep compared to the more traditional / conventional mining along the West Wits gold fields. I did highlight that mining the Upper Elsburg ore body at South Deep isn't totally unique in the industry.

Target, amongst a number of other mines, mines the Basal Reef and some of the Upper Elsburgs, which is a kind of proxy for South Deep albeit some 250 Km to the south-west. And of course Cooke section and part of Ezulwini operations mine components of the Middle and Upper Elsburgs as well.

They only get up to 30m to 40m thick. The fact that the Upper Elsburg package reaches over 120m thick at its most distal point at South Deep is what lends its uniqueness.

So I think that is just a quick overview of what happened ~2.8 billion years ago. This was subsequently capped by 4km or 5km of strata that eroded back down to give us the current depth of 2.5km to 3km for the South Deep ore body.



What we have here is a stylised section through the South Deep ore body. And importantly we've got it split into the four mining corridors. These mining corridors are not linked to the geology, but they give us effectively the mining corridors when you look at the spatial division of the way the mining is set up across the mine. So they are not geologically controlled corridors at this stage. They are the mining defined corridors.

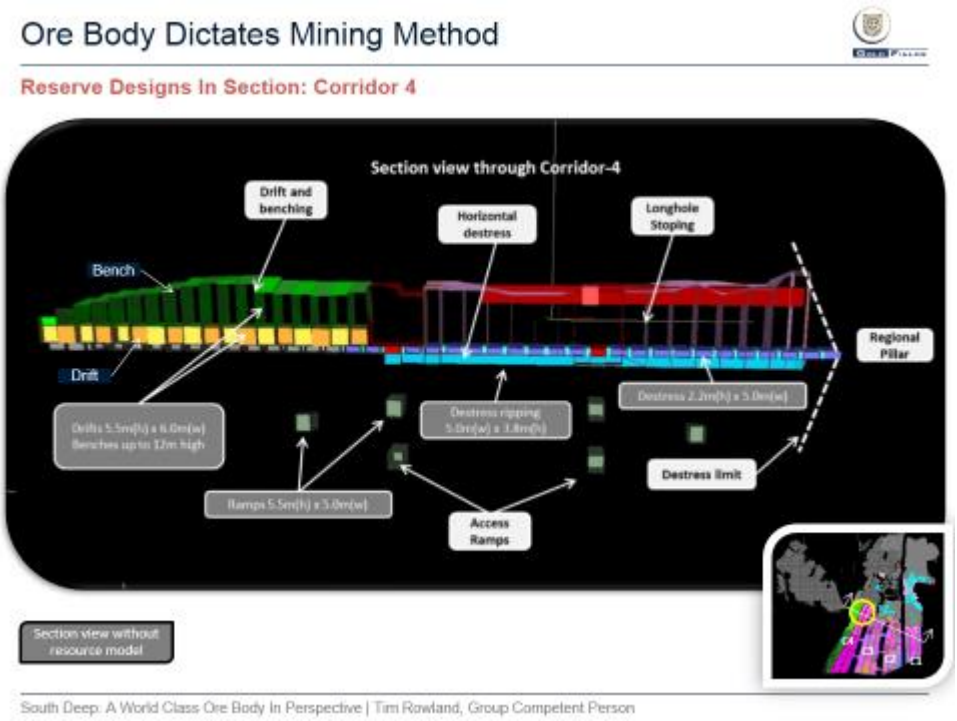
What it highlights is the very strong wedge-style nature of this ore body. On the far western limit of the ore body, where all the reefs sub-crop or on-lap each other, is the sub-crop position, so the ore body can be less than a metre thick here. But if you move from this proximal location, which is the entry point for the material coming into the sub-basin, as you move off to the east across the ore body you can see these corridors are just under a quarter of a kilometre wide. You reach the thickest part of the wedge of the ore body off to the eastern extremity, which can be in excess of 120m thick vertically.

The ore body comprises a whole myriad of different reef units. In fact, ~16 units are modelled quite distinctly at South Deep, which is in strong contrast to modelling a single carbon leader reef or a VCR reef on many of the mines located around South Deep. What we are also highlighting in the yellow polygon is the typical targeted areas for mining in this ore body. So as we move from west to east we get more inter-calated waste units or quartzites, which are either very poorly mineralised or effectively waste units. As you move from west to east across the ore body you become, by default, more selective in your mine design and scheduling in response to the increased granularity of the higher grade resource blocks.

So your overall extraction ratio on the full ore body in corridor one would be in the 25% territory. As you move to the west into corridor two you would be in the 35% extraction range. Into corridor three there are less inter-dispersed waste units and we've got more consistency in volume and grade. Your extraction ratio increases to about 75%. And then lastly the most proximal location in corridor four, where we've got all the units on-lapping each other with very little interstitial waste material, the extraction rate is as high as 90% to 95%. So you can see already how the nature of the ore body is controlling extraction ratios and mine design.

I would also like to highlight at the bottom of the schematic we've got the life of mine indicators for each corridor. So for corridor four you can see the life of mine grade here – and remember the life of mine at South Deep goes through to the year 2087. These grades would be slightly higher if we were looking just at Current Mine – you can see that corridor four has about 5.5 g/t, which is the reserve grade. So it has already had all the attrition factors applied, through to just under 5 g/t in corridor one. And we've also split out the ratio of life of mine tonnes that are contributed from each corridor. Just to give you a feel for which corridors are delivering at what ratios into the life of mine profile on tonnes and grade.

It's important also to highlight that the de-stress – and I will show you how the horizontal de-stress features in the life of mine design just now – that is a prerequisite to enabling longhole stoping but is not a prerequisite to doing the drift and fill. And you will see that in the next couple of schematics.

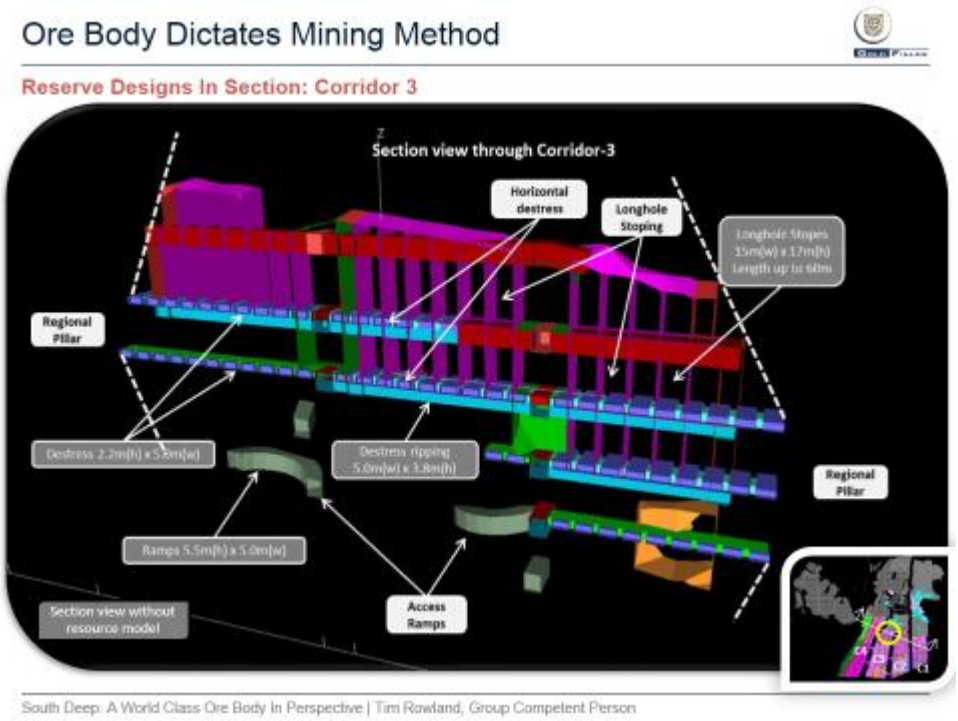


The small inset in the bottom right-hand corner of the slide is showing that the next four slides I'm going to show you actually if you pasted all these slides together they would all line up on strike across South Deep along this line here just below current mine. What I will highlight over these next four slides is how the ore body really dictates the way the macro mine design and scheduling is done at South Deep.

Here we are looking at the most westerly corridor, corridor four. And you can see that where the ore body is narrow here our access ramps actually lie outside of the ore body. Where we've got the on-lapping and the tightest wedge of the ore body on the westerly limit we're mainly focussed on drifting with benching up to about 12m high. That is a 7m horizontal de-stress cut that is shown in blue here.

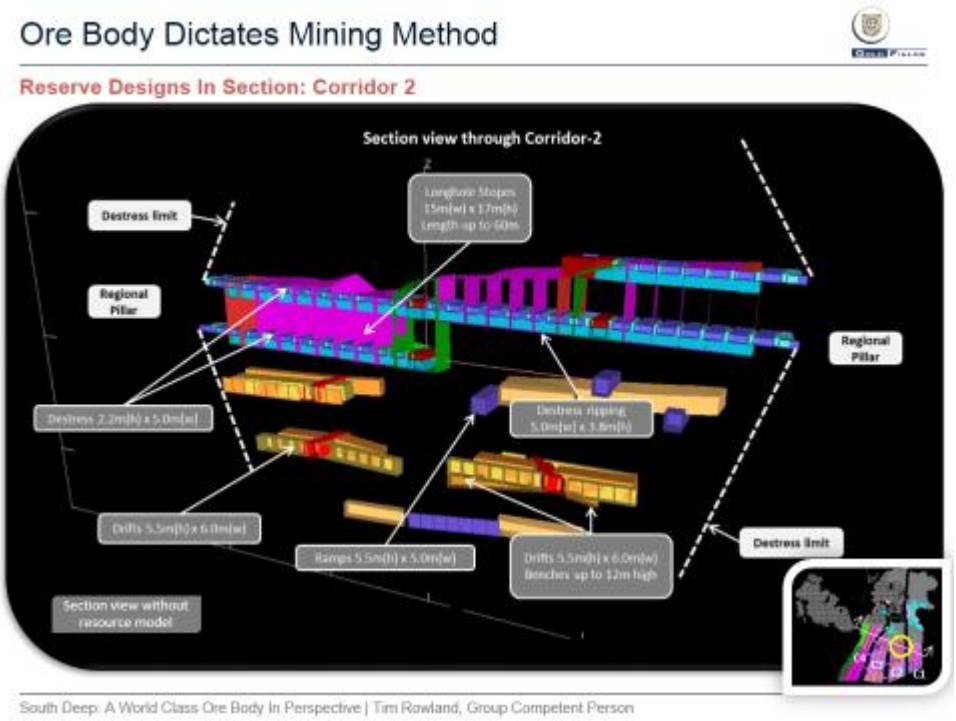
But to do the longhole stoping, which is shown in red here, we need to get the de-stress cut in place which provides the geotechnical shadow which effectively reduces the prevailing rock stresses from about 80 megapascals down to about 40 megapascals. That de-stress cut is fooling nature into believing that we are actually mining at half the depth that we are. The horizontal de-stress cut is shown in blue, the longhole stoping above. It also shows the de-stress limit, the shadow that the de-stress provides that you can only do your mine design within. And then off to the right-hand side is where we have regional pillars positioned which give you your macro geotechnical support across the entire layout.

And again this is effectively 90% to 95% extraction. What I would like to highlight before I leave this slide is the opportunity we have for doing de-stress stripping or de-stress ripping. This allows us to rip the original de-stress access end into a larger excavation closer to 5.4 metres. That allows us to take in the Simba rigs and the LHDs to do the longhole stoping. So that is opened up to allow the bigger equipment in that facilitates the longhole drilling and cleaning.



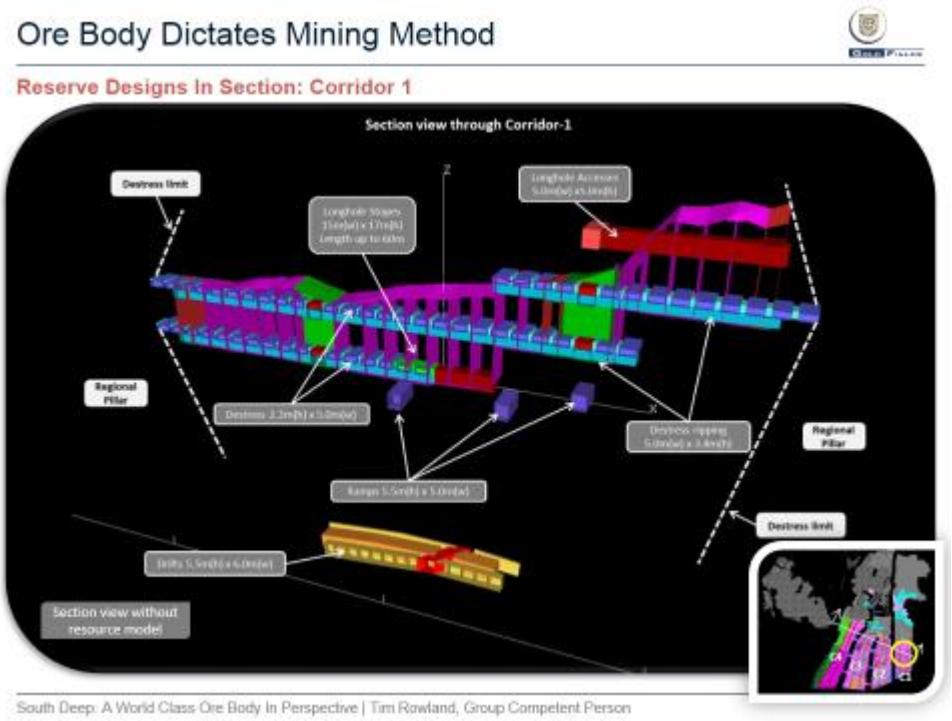
I'm going to move one corridor to the right now, which takes you into this area. We're in the area where the ore body is thickening. Corridor three has the best combination of volume and grade, so it lends itself to being the main gold contributor to the life of mine profile at South Deep. And we can see now how the drifts and drives play much less of a role and it is really into multi-stack longhole stoping with horizontal de-stress cuts in blue which actually overlap each other to make sure that the de-stress shadow is always in place.

You can see a heavy focus here on the massive longhole stoping which is expected to allow us to operate at lower cut-off grades and more effective Rand per kilogram production costs. Longhole stoping lends itself to being high efficiency and productivity and cost-effective in this kind of ore body. The largest access ramp is still placed in the footwall outside of the ore body at this stage. As I said earlier we are at about 75% extraction on the ore body at this stage. Again the regional pillars are shown constraining either side of the design in this particular case.



If I go on now to the next corridor, corridor two, this is where our approach needs to be more selective. There is not such consistency in volume and grade, so when we apply our minimum mining width and stope cut-off grades you can see that we are becoming more selective at about 35% extraction in this corridor. We do have drifts coming in targeting particular reef units and we do have some focussed longhole stoping here targeting where we've got combined mining width of above 12m to 15m which facilitates the longhole stoping.

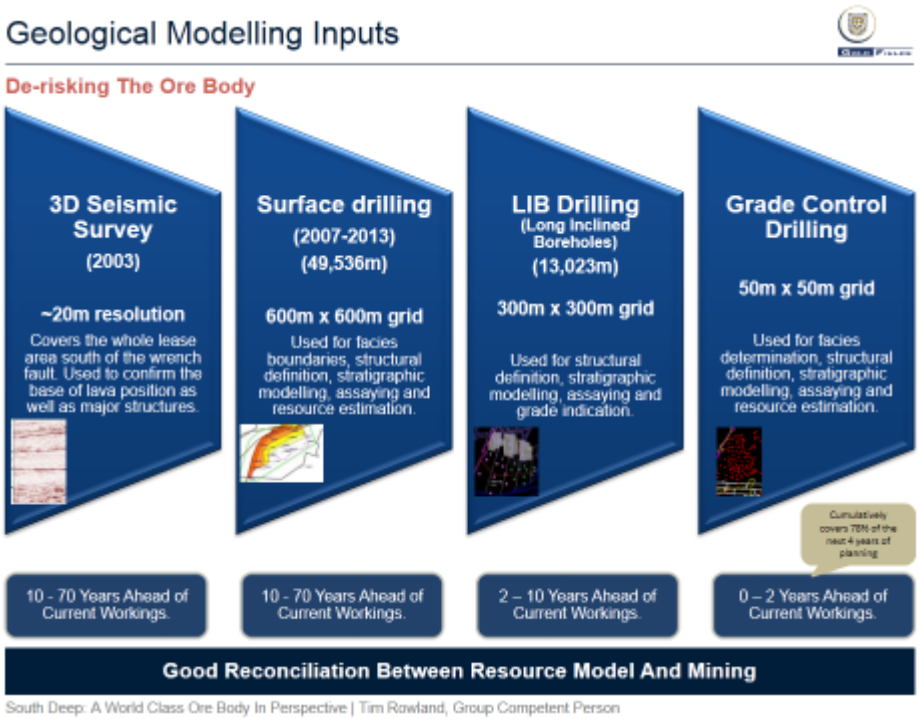
You can see as we move through the ore body from west to east the nature of the design and the layout is changing because of the ore body.



If I move to the final corridor, this is corridor one. This is where we have to be the most selective in doing our design and scheduling. Very limited targeted drifts on certain reef horizons that meet the cut-off grade, and then some targeted longhole stoping supported by the enabling horizontal de-stress cuts in blue. And the access drive because of the thickness of the ore body sits within the ore body. So when we do that access development we're actually mining gold, albeit at a lower grade. We are mining gold as we put that access development in as well.

I think just a few schematics there that tie in the way we do the drifts and drives, the longhole stoping and the de-stress cuts in response to how the ore body is changing as we move from west to east and thinner to thicker. We are at about 25% extraction ratio in this corridor.

Geological Modelling Inputs



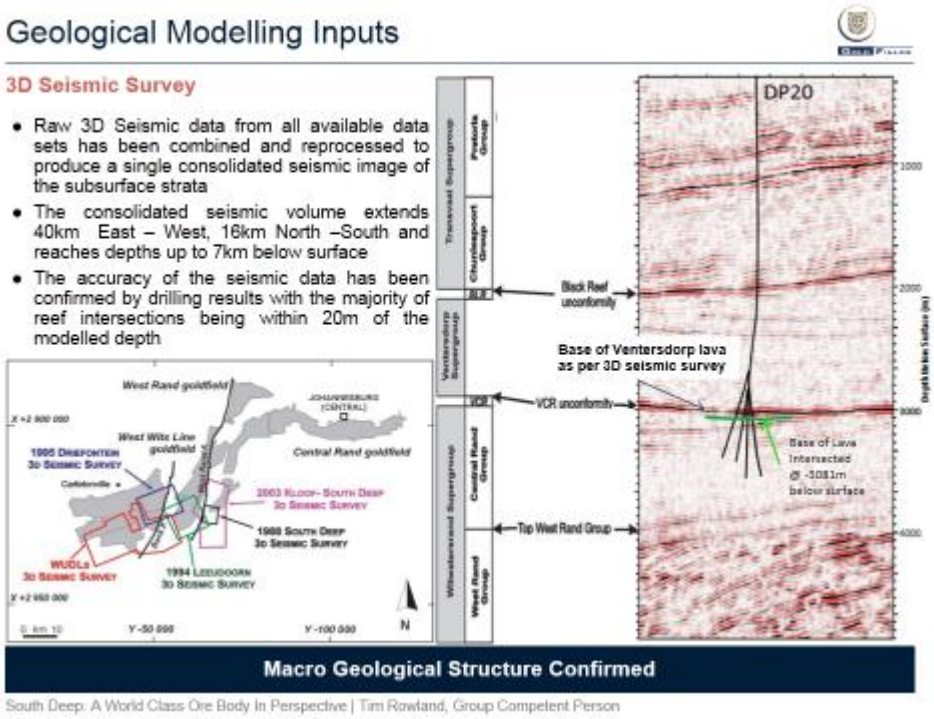
I am now moving on to the key geological modelling input. And I think this is a very useful one for us to spend a couple of minutes on. At South Deep a whole range of methods are applied to de-risk the ore body to the required level of confidence. And obviously we have different levels of confidence needed for long-term planning that could be two, three or four decades out. You need a different confidence level if you're doing a seven-year build-up plan, and equally if you're doing an operational 12 month budget plan you need an additional level of resolution.

What is nice about all these techniques we employ at South Deep is they all support each other and they all complement each other in the way the model and the database is built up. So I will follow with a few slides that talk to each particular tool individually, but it just good to show them in a value chain on this slide. If I start off on the left with the 3D seismic survey, this has got a 20m resolution of the depth of the ore body. It is effectively a proxy for drilling 20m by 20m surface boreholes. It provides you structural information and stratigraphic information. And because it picks the top of the ore body it effectively de-risks the macro structural position of the ore body for its entire life. I will go into a little bit more detail about that just now.

The seismic survey, which unplugs the macro structural risk, is then complemented by the surface drilling. We took on board a number of legacy surface boreholes when we fully took over the mine in 2007. And the surface drilling is really targeted on a 600m by 600m grid. It is used for facies boundaries, structural definition, detailed stratigraphic modelling and also the assaying and resource estimation. That can look up to 70 years ahead. I will show you where GFI has focussed their effort in the last decade on that.

LIB drilling, which was never done by previous owners on the mine, has proven to be a very important tool for us. This allows us to drill ahead of the mining front up to 1,500m ahead on a grid close to 300m by 300m. And it also provides structural definition, stratigraphic modelling, but because of the low angle of intersections through the ore body the low angle of intersection on the LIB holes, which is about 15 degrees, it doesn't pass muster with our QAQC. So that assay data doesn't make it into our final database. But it is extremely powerful for making sure that our mine designs and layouts go in at the right elevations.

Then finally the LIB drilling is complemented by grade control drilling. And I think we are probably one of the few massive mechanised underground mines in the world, in fact, I'm not really aware of any that does it to the intensity we do of 50m by 50m grade control drilling 3km underground. It is really a proxy for the way they do grade control drilling in an open pit. The reason we do it is it's not possible to do full channel sampling like you would normally do on conventional mines in the Wits basin. Because of the thickness of the ore body we use grade control drilling, and I can show you how we do that to good effect. But that moves as an information front ahead of our mining with a high level of detail particularly on grade trends and the detailed structural behaviour of the ore body. All these work very nicely together. They complement each other and give us a de-risked ore body model for the various levels of planning.

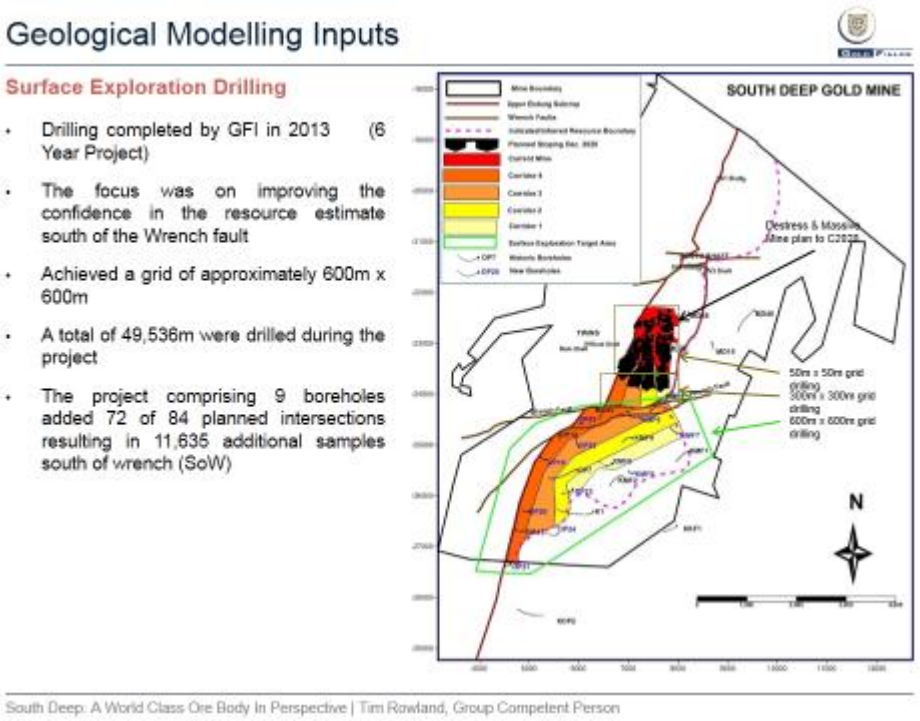


Just a slide on the 3D seismic survey. I think there was a level of serendipity that we did this survey back in 2003 orchestrated from Kloof. And we were doing a seismic survey across Kloof four shaft. It made a lot of sense when you mobilise a crew in from Europe, a crew that ostensibly works in the petroleum industry, you're looking for critical mass and economies of scale. So as I say with a degree of serendipity we got this done across South Deep as well at the time. And that information became available to us when we took ownership in 2006 or 2007.

To cut a long story short, what 3D seismic modelling effectively does is you've got big industrial trucks that pump high velocity sound waves into the ground similar to sonar applications in medicine. These sound waves can go down to 7km depth. The way they hit rocks of differing densities we get an acoustic impediment, and that sound wave bounces back to surface where we have a whole array of geophones covering a couple of square kilometres that record this information in a 3D volume.

It keeps a lot of geophysicists busy, but to cut a long story short it can pin down to a 20m accuracy the top of our south deep ore body for the entire life of the mine to 2087. So I think it is a huge structural de-risking of South Deep. How do we know it has performed well for us? Where we have actually hit the bottom of the Ventersdorp lavas, which is the top of the ore body where the VCR lies, which is a very clear pick in the seismic model, we have obviously drilled surface boreholes that pierce the same volumes.

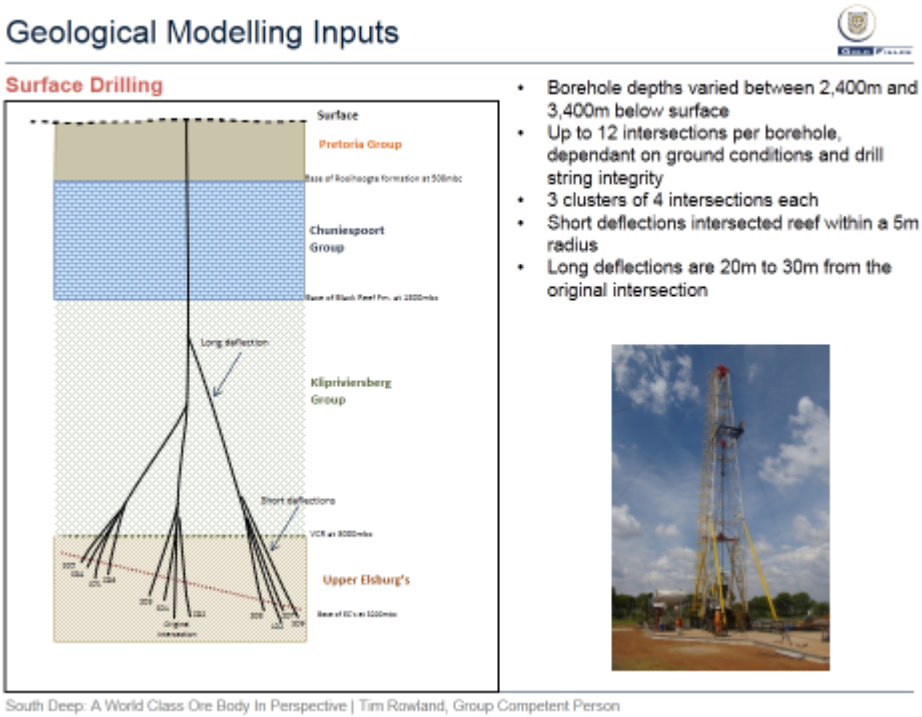
And DP20 which we have drilled actually intersected – and the VCR pick is the red line at the bottom of the black line. That's the base of the lavas – we picked to within just a couple of metres of where the borehole actually confirms the position of the top of the ore body or the base of lavas. So we added QAQC and corroborated from the surface drilling. I think that has been a great piece of work that has done a serious de-risking at South Deep.



If we move on to the surface exploration drilling, a total of just under 60km of drilling has been done over the last six years by Gold Fields. When we took over South Deep we were really uncomfortable with the degree of empirical information that was informing the ore body modelling south of the Wrench fault. The Wrench fault is a structure running through here. It is marked on the slide. It gets referred to quite a lot throughout the presentation as it does demarcate two episode in the [unclear] of the life of mine.

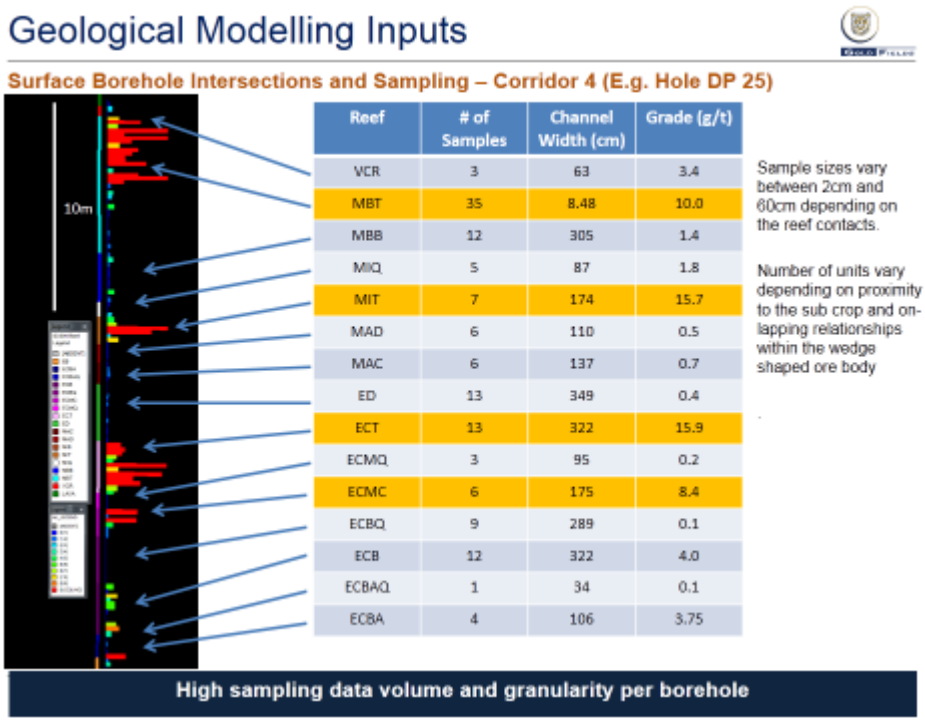
But we felt we needed to drill an array of surface boreholes here to feel comfortable about the SAMREC indicated resource that would comfortably convert to a probably reserve. That drilling has all been completed now. There is still some assay work going through QAQC, but in this coming cycle we will have a full resource model based on all this data we've gathered from the surface drilling built into this year's resource and reserve modelling.

This slide shows the position for each surface borehole. The short squiggly line actually shows the drill hole trace. This drills down and often corkscrews down over 3km through the thickness of the ore body at depth. So that is where we focussed our surface drilling in this green polygon. I think for context I want to highlight the shadowy area here in the centre of the slide. That is the de-stress and massive mining plan to 2020. And I think it is that black highlighted area that brings home the magnitude of South Deep. All our de-stress and massive mining to the year 2020 is under that black silhouetted area. You can see how far the mining is that we're actually using the surface drilling to inform that modelling. Nine boreholes we drilled contributing 72 intersections and nearly 12,000 additional samples into the database south of Wrench. I will show you some of the results on the primary target horizons just now.



This slide gives you the typical layout and geometry of the surface borehole. These surface boreholes, by the way, cost in the region of R10 million to R15 million to drill. I think if you look at these holes in five years' time you could probably double that cost. And it shows the typical layout of the geometry. We have another hole that is drilled from surface down through the various stratigraphy's, the Klipriviersberg lavas here I was referring to earlier. So we get to the VCR, and in this case that is about 3,000m mbc, which is below collar of the hole.

This mother hole will hit its first original intersection here, and then we will pull the drill string back a few metres and do three short deflections off the mother hole. These short deflections will achieve about a horizontal separation of about 5m. And then we pull the drill string back up and we will do the first long deflection. That one deflection will get out about 20m to 30m from the mother hole. Then an array of short deflections, pull up one last time to the final long deflection, get another 30m out from the mother hole with another array of short deflections. So we will typically get 12 intersections from this surface borehole. That is just to give you a feel for what this drilling has contributed to the database.



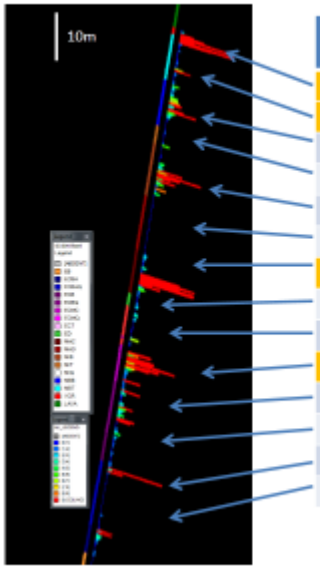
What we're going to show you now for each corridor is a typical set of grade values and channel width and a number of samples that go into each borehole intersection. And I really want to caveat the next couple of slides with a users' warning at this stage. The gold distribution in most Wits reefs and particularly in the South Deep ire body is what we call a strongly long normal distribution. It has a strong skew, a bell shaped distribution to the mineralisation and the grade, but it is strongly skewed to the left. We call it a long normal distribution.

That caveat here is that you shouldn't go and do arithmetic averages of grade to come up with the values that will go into any estimation process. All of these values have to take account of the long normal distribution. They have to take account of local and regional means. And all of this is done discretely for all 16 units in the ore body. So it is just a word of warning that if you do try in your calculations to come up with some average grades for these boreholes it is going to be fatally flawed from a geo-statistical point of view.

I still think the slides are very useful to show you the raw data coming out of the borehole intersections. So what we've highlighted in orange for each of these slides is really the main target horizons that will be the priorities for the mine planners. Obviously we look at minimum mining widths and we look at combining reef units that make the cut-off grade, which ones are most suitable for drifting and benching or which are most suitable for longhole stoping.

Geological Modelling Inputs

Surface Borehole Intersections and Sampling – Corridor 3 (E.g. Hole DP 7)



Reef	# of Samples	Channel Width (cm)	Grade (g/t)
VCR	5	108	30.9
MBT	31	672	7.9
MBB	29	697	3.6
MIT	12	274	1.0
MIB	33	791	4.4
MAD	31	810	0.2
MAC	28	665	10.7
ED	8	190	1.1
DYKE	22	538	1.1
ECMC	24	605	8.4
ECBQ	32	776	3.3
ECB	18	427	1.0
ECBAQ	24	971	3.0
ECBA	19	424	2.3

Sample sizes vary between 2cm and 60cm depending on the reef contacts.

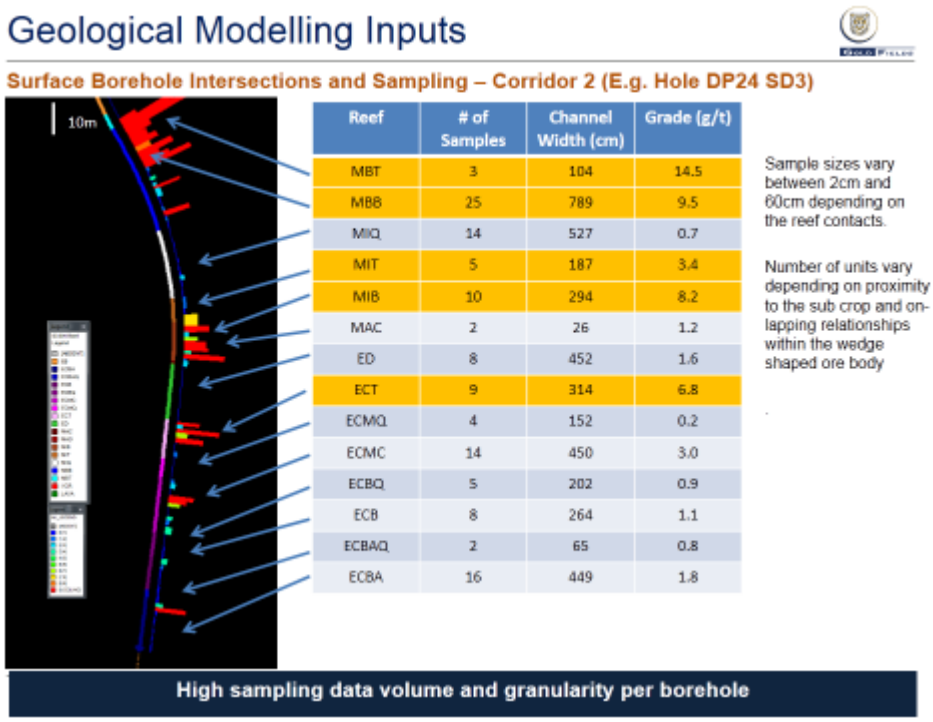
Number of units vary depending on proximity to the sub crop and on-lapping relationships within the wedge shaped ore body

High sampling data volume and granularity per borehole

You can see the borehole intersection going through here. If you just look at the MBT horizon that is one of 16 units intersected in the ore body. 35 samples were derived from that intersection. The geologist will pick his sample based on discrete lithologies and geological structure. They can vary between 2cm and 60cm thick. In the MBT case 35 samples. The channel width was about 8.4m thick. And then 10g per ton. You can see the MIT running at just under 16g per ton, the ECMQ unit carrying about 8.5g per ton.

Certain units like the ED are always particularly low grade and we effectively treat it as waste units. I think it does highlight the plethora of data that comes through from one single intersection through the ore body. And it is not an inherently complex ore body to model, but it is challenging from the sheer array of data and the multi-dimensional data and multiplicity of data that comes from drilling through 16 discrete reef units that are packaged into this wedge.

So that is from hole DP25 in corridor four, which is the most westerly corridor. As we move one corridor to the east on slide 17, looking at corridor three, here the typical intersection from borehole DP7. Here at the top of the package the VCR will kick in at 31g per ton over 108cm. The MBT at 6.5m is 8g per ton. And you can see the values from the other main units there as well.

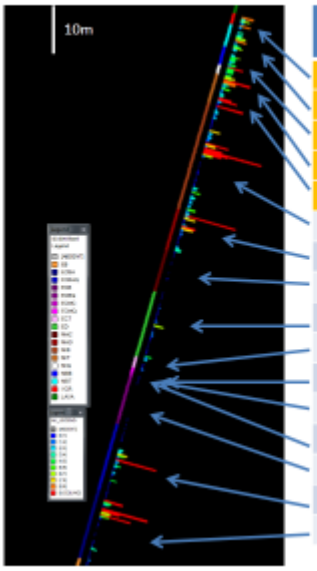


Similarly for hole DP24 in corridor two you can see some strong grades coming through on the top of the package, a bit further down from the MITs and the MIBs some good grades, and then the ECT carrying on with a good grade at just under 7g per ton. Sorry, that's slide 18.

All of these units do show a different level of variography as you move spatially across the ore body. So you're not guaranteed that the MBT 300m away is at 14.5g per ton, which is why your variography and your application of the variograms to your ordinary and simple [unclear], which is the geo-statistical tool we apply, are so important. But I think it gives you a bit of an intuitive feel for the horizons that are carrying the bulk of the grade and the variance you get from borehole to borehole.

Geological Modelling Inputs

Surface Intersections and Sampling – Corridor 1 (E.g. Hole K1)



Reef	# of Samples	Channel Width (cm)	Grade (g/t)
VCR	7	199	4.4
MBT	15	411	3.7
MBB	11	321	4.3
MIQ	6	170	5.3
MIT	19	523	5.7
MIB	74	1935	3.1
MAD	27	750	3.4
MAC	30	750	0.2
ED	47	1187	0.7
ECT	9	189	0.9
ECMQ	5	97	0.4
ECMC	4	74	0.2
ECBQ	29	755	0.2
ECB	6	111	0.1
ECBAQ	42	1185	2.1
ECBA	49	1253	3.5

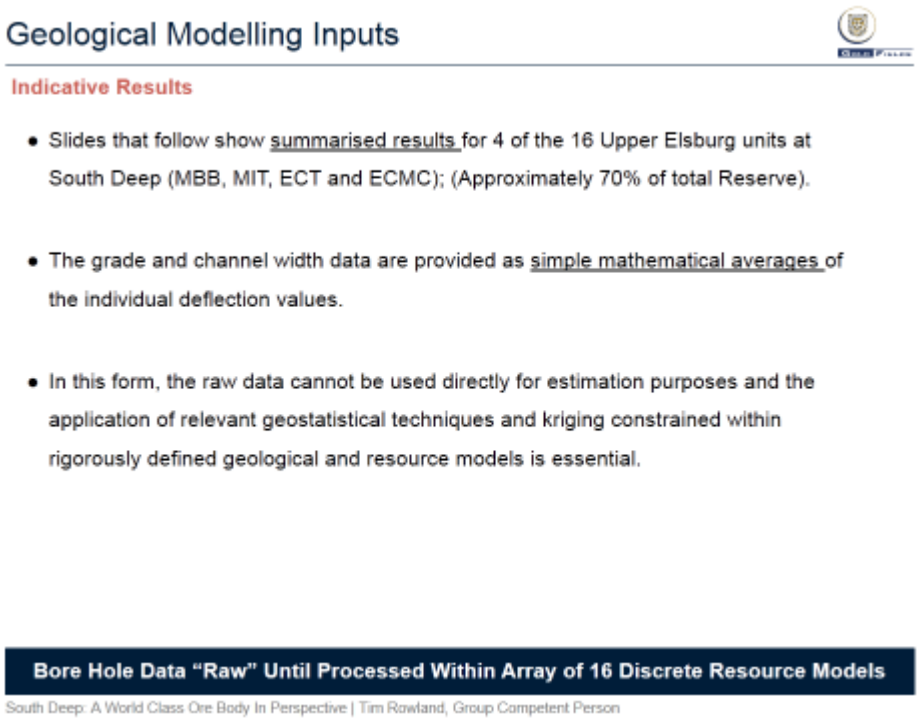
Sample sizes vary between 2cm and 60cm depending on the reef contacts.

Number of units vary depending on proximity to the sub crop and on-lapping relationships within the wedge shaped ore body

High sampling data volume and granularity per borehole

If I go to slide 19, which is hole K1 from corridor one where the ore body is at its thickest at the eastern side of the mine, you can see that most of the grade is bundled into the top four or five stratigraphic units. That will make an ideal target for longhole stoping. Or if it was a bit thinner you would be targeting some drift and fill. But it is showing the grades there averaging probably about 4.5g or 5g per ton at the eastern extremity of the ore body.

But again the volume of data coming through from each borehole intersection, if you drill a hole through the carbon leader or the VCR typical of Mponeng or Elandskraal you would normally have two or three samples for that one 2m unit. So it is a whole couple of orders of magnitude more complicated when it comes to the multiplicity of data here. That's what I was keen to bring through with those few slides.

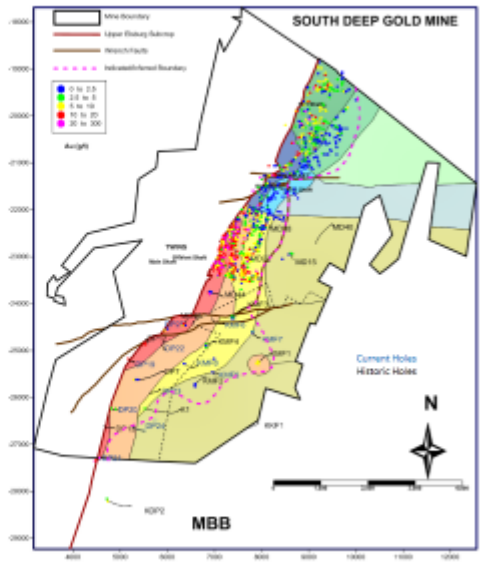


What I would like to do now is highlight some of the results of the surface borehole drilling, but particularly highlight how the drilling has corroborated the geological modelling and the geograms that are already in place. I'm going to show you a summarised results for four of the units in the entire package, the MBB, MIT, ECT and the ECMC. They probably contribute about 70% of the total reserve from a tonnage point of view at the end of the day, so they are good ones to target on.

Geological Modelling Inputs

Surface Drilling – MBB Reef

Borehole	Channel Width (cm)	Grade (g/t)
MD44	463	13.7
MD45	555	9.6
DP12	293	12.9
DP19	145	15.8
DP21	43	27.6
DP25	282	5.7
DP7	456	3.9
KDP2	402	7.9
KMF1	657	6.1
DP20	544	5.2
DP24	614	10.4
KMF3	558	2.7
KMF4	309	3.3
K1	327	3.7
MD22	526	22.1
KMF8	1863	1.0
KMF2	313	1.2
KMF5	1284	1.8
KMF7	376	1.2



South Deep: A World Class Ore Body In Perspective | Tim Rowland, Group Competent Person

Again I am just highlighting that we are showing simple mathematical averages for the boreholes, so they haven't gone through the geostatistical process. So it is effectively the raw data you will be shown for these particular horizons. So on the right-hand side this is the entire South Deep mine lease boundary in black I'm highlighting there on slide 21. The Upper Elsburg sub-crop is this line running up through the middle of the plan here. That is showing you the sub-crop position. The wedge narrows to a sub-crop position there. And then the plethora of coloured dots here is a combination of all surface and underground intersections over the life of mine. You can see in the older mined-out areas to the north there is a much higher density of borehole positions with less in the south Wrench area where Gold Fields has been focussing on surface drilling.

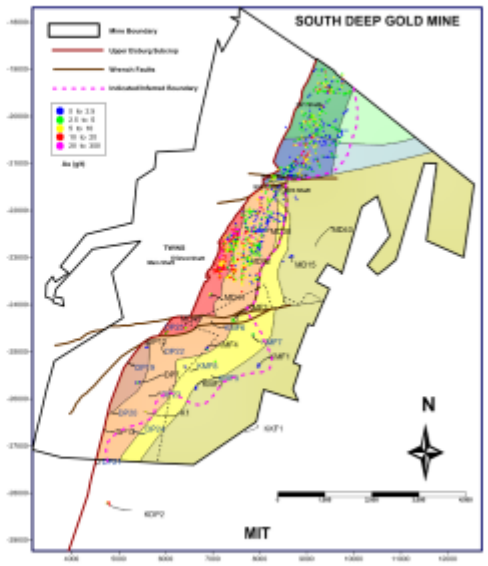
What I want to highlight is these corridors shown in these areas covered on this plan are not the mining corridors, these are specifically the geological corridors now, or what I will term from now on the geo-zones which are then sub-domained into various facies types and sub zones. . What we have done is on the left-hand side of the slide is colour code each of these surface boreholes for where they actually sit in the various geological veins as we move from west to east. Obviously the red geo-zone here is most proximal close to the sub-crop where we have a high extraction ratio and a good combination of tonnage and grade.

As you move out to the grey area here, the colour palette between the two pieces of software didn't match exactly so this olive green colour on the plan is talking to the grey colour here to these KMF holes at the bottom. As you move off to this green area on the right you move more distally, and you can see the overall average of this particular reef horizon is down in the 1g to 2g per ton territory, whereas more proximally near the sub-crop it is ranging from 10g per ton up to 28g per ton. And all this drilling corroborates and reinforces the geological modelling that we have in place.

Geological Modelling Inputs

Surface Drilling – MIT Reef

Borehole	Channel Width (cm)	Grade (g/t)
DP12	132	0.9
DP7	309	2.4
MD44	725	9.1
MD45	1030	9.2
DP25	208	7.5
DP24	194	2.1
KMF3	1513	4.3
KMF4	1687	3.2
K1	532	5.2
KDP2	440	13.5
KMF5	1256	2.6
KMF7	1100	2.5
KMF8	527	1.1
KMF1	1288	1.8
KMF2	668	0.7
MD15	252	0.5



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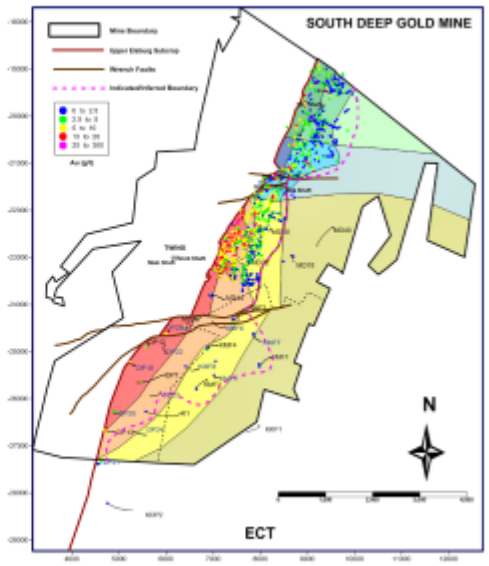
Slide 22 is really a very similar layout, but now we're looking at the MIT reef unit, one of the 16 units. We can see that the red geo-zone here is talking to that zone in the plan where this particular reef unit averages just under 10g per ton. You can see how the grades tail off as we move to the east and more distally into these other geo-zones. And all the borehole positions are referenced on there as well. Just to highlight the scale again, that scale bar is over 4km. And the bulk of this mining down here is done beyond 30 year horizon. So we are looking a long way out when we look at the ore body over here.

Geological Modelling Inputs

Surface Drilling – ECT Reef

Borehole	Channel Width (cm)	Grade (g/t)
DP12	575	6.8
DP13	164	7.7
DP7	760	6.7
MD44	425	4.2
MD45	492	4.9
DP19	551	6.2
DP20	469	3.2
DP25	405	13.1
K1	192	0.7
KMF3	584	2.0
DP24	195	7.3
KMF8	359	2.4
KMF2	672	0.7
KMF4	991	1.2
DP21	395	2.4
KMF5	461	2.3
KMF7	487	1.5
KDP2	392	1.0
KMF1	390	0.6
MD15	347	0.2



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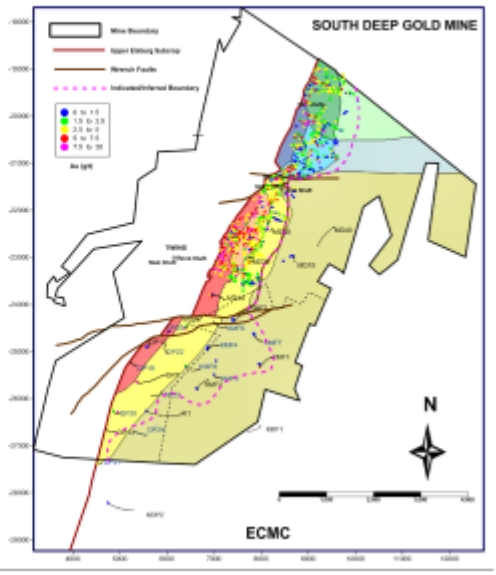
We move on now to slide 23 looking at the ECT reef horizon. Performing very strongly proximally, ranging from 5g to 8g per ton from these surface boreholes. And again the grade tailing off as we move to the east and more distally on this ECT reef horizon.

Geological Modelling Inputs

Surface Drilling – ECMC Reef

Borehole	Channel Width (cm)	Grade (g/t)
DP12	99	0.7
MD44	581	4.9
DP25	195	13.6
DP7	679	5.7
MD45	437	8.7
DP20	148	3.1
DP21	188	3.8
DP22	301	12.6
KMF8	863	1.7
KDP2	145	1.4
KMF1	300	0.2
KMF2	605	1.2
KMF3	575	0.7
KMF4	650	1.0
K1	75	0.2
MD15	161	0.5
DP24	318	2.8
KMF5	864	0.3
KMF7	221	0.5



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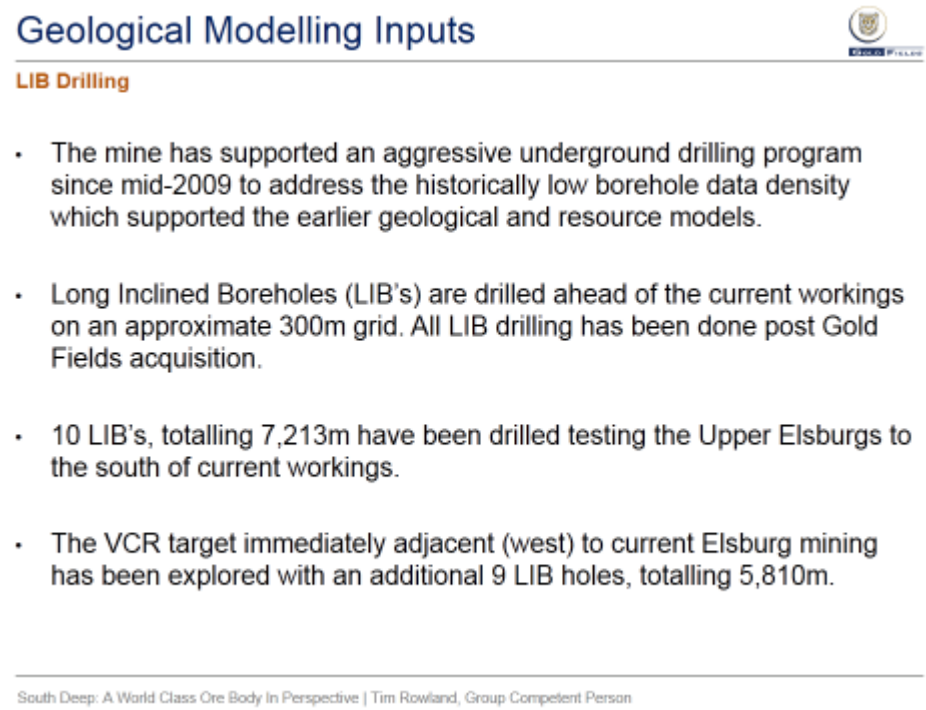
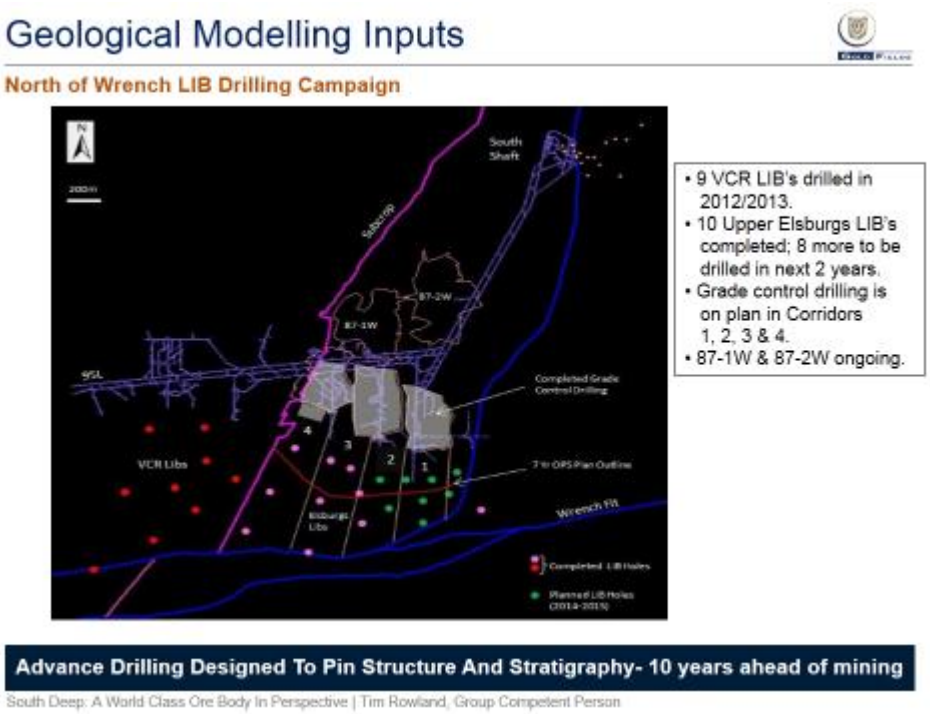
And finally the ECMC horizon, again showing the behaviour of the average grades of the ECMC horizon from the west to the east. And it does highlight that these surface boreholes, although they are intersecting the ECMC horizon, the actual stratigraphic unit can range from 1g to 14g per ton. So not only do we have 16 units making up the ore body, but they all behave slightly differently spatially as well as per their respective variographies. That is why you need your appropriate density of data to inform your modelling when you get into a rolling five-year plan scenario.



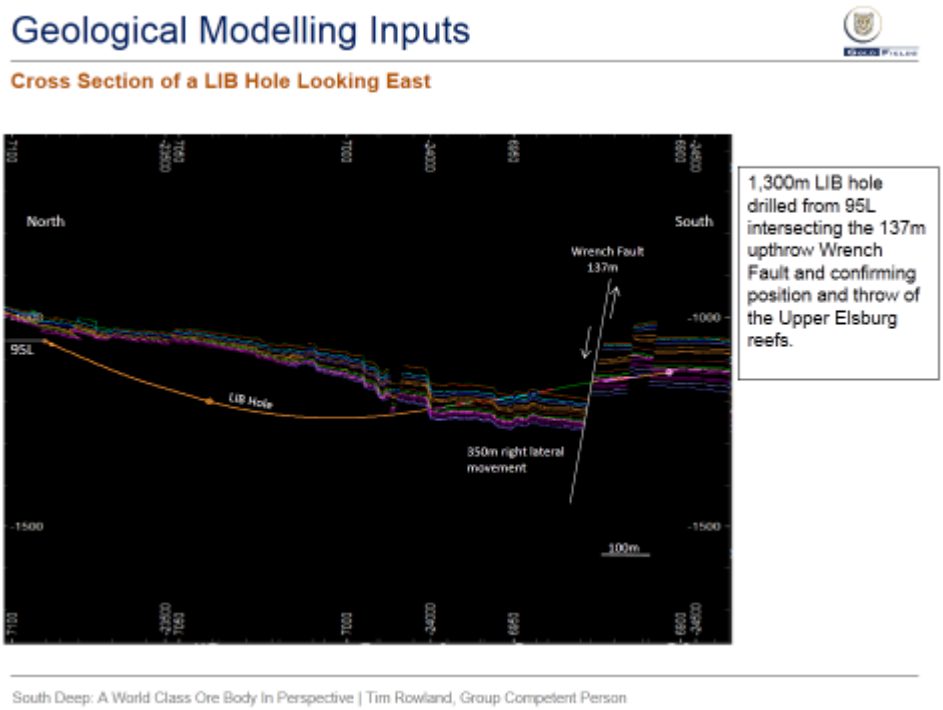
I would like to move on to the LIB drilling or the long incline borehole drilling now. South Deep has really supported an aggressive underground drilling programme since mid-2009 to address the low borehole density that was in place when we took over the mine. And we needed a higher level of information to support the geological resource model. We introduced the long incline borehole drilling to provide information on an approximate 300m by 300m grid, which is deemed appropriate for the style of ore body.

Ten holes have been drilled so far, equating to just over 7km of drilling into the Upper Elsburg to the south of current workings. The VCR target which is situated immediately adjacent to or west of the Upper Elsburg mining, has also received nine LIB holes totalling just under 6km of drilling.



This slide shows you spatially exactly where this LIB drilling is being conducted. First of all I would like to highlight that the shaded-out areas, i.e. these three polygons shaded out in the centre of slide 26, highlight the completed grade control drilling to date which has been finished .. and which I will talk to just now. But importantly these coloured dots are showing you the LIB hole drilling positions and grid layout. All these LIB holes into the VCR have been completed and are shown in red. The ones in purple have been completed on the Upper Elsburgs down dip of current mining. And the green, these four greens to the top side of the seven year line, will be drilled over the next 18 months, with the remainder to l be completed within the two year horizon.

I need to highlight this red line running through here at the bottom of the slide. It is marked as the seven year LoM plan outline. That is to give you perspective on where the seven year mining horizon or front will be. So in 2020 the mining will have only reached down to here. So it will be supported by all this LIB drilling as well as the surface borehole drilling and the 3D seismic modelling. And then there is the higher resolution grade control drilling which has been completed to date, I will show you how that rolls forward as the drilling positions are made available from the access development. Effectively we have pinned down the structure and stratigraphy of the ore body to a high level of confidence for ten years ahead of mining at this stage. That is what I've shown you.

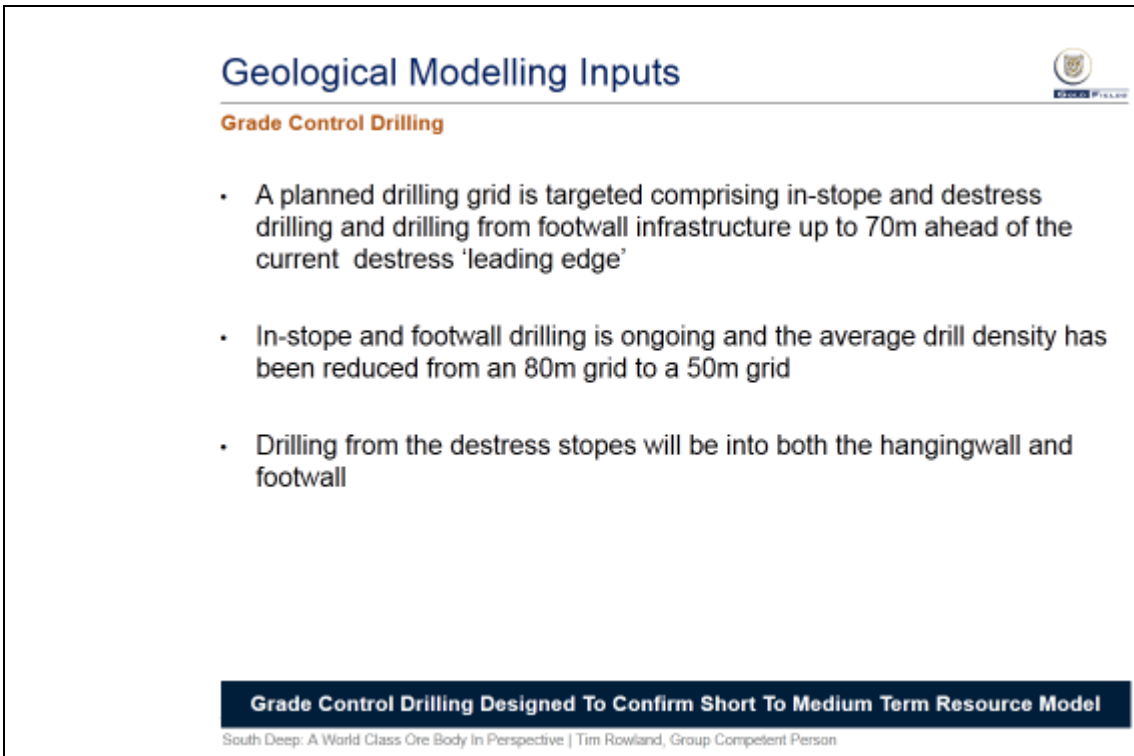


So here is the LIB drilling in cross section on slide 27, I think by looking at this slide you can see how stylised the last cross section of the ore body was. It showed a very significant wedging out of the ore body as we went from west to east. I think in through-section here based on empirical data you can see the wedge nature of the ore body is in fact more subtle than the stylised view I showed you earlier.

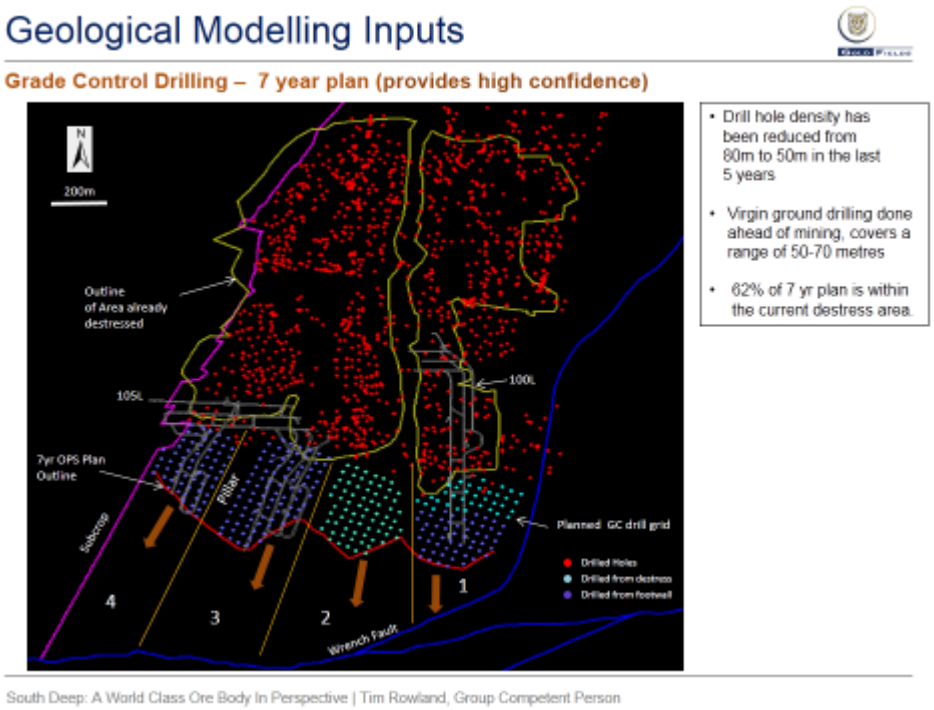
You can see the proximal sub-cropping nature of the ore body off to the west and then it is thickening and wedging as you go off to the east. In this cross-section we are showing the Wrench fault, which is a 140m vertical displacement and close to 350m horizontal displacement. And the LIB hole which was drilled from this 95 level footwall has been drilled off at a flat level. We put wedges into the hole, we kick the hole up, it comes back up through the Upper Elsburg ore body at this stage.

At this point it went through the Wrench fault into the up-thrown component of the ore body on the down-dip side of the Wrench fault, allowing us to pin exactly what the throw on the fault was. And because of our understanding of how these stratigraphy's talk to each other we have been able to pin the lateral movement on the fault to just over 350m. I will show you a bit later why understanding the movement on these faults is so important to underpinning rigorous geo-statistics.

Typically we won't do any long or short deflections off this hole because of the nature of how it goes through the ore body. It is very important for stratigraphy and structure, and not for assay work because of the low angle of the intersection.



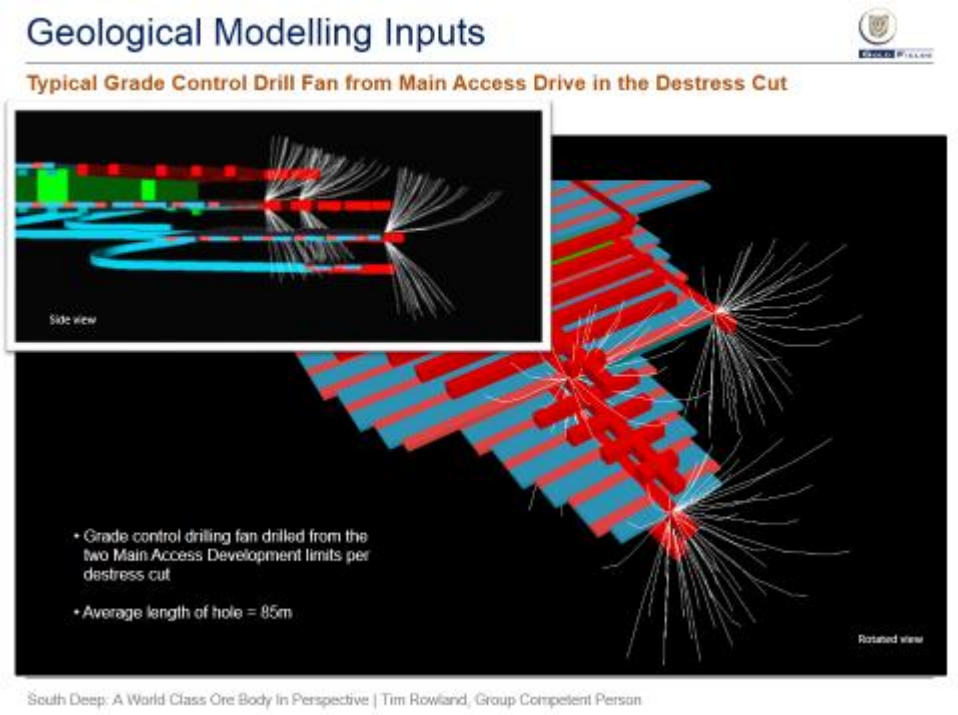
I'm going to move on to slide 28 now, which is really the fourth contributor to the database in helping us model the South Deep ore body. This is the grade control drilling aspect. The grade control drilling is on a targeted 50m by 50m grid. This grid spacing is based on our understanding of the overall variography or distribution of the grades at South Deep. 50m by 50m is appropriate for the style of ore body. And also the nature of the structural geology and the frequency of faulting lends itself to having a 50m by 50m grid as well. And it wasn't that tight over the last couple of years, but a concerted effort on getting this in place with the drilling contractor and developing customised drilling machines to get this work done more effectively permitted us to achieve a final 50m by 50m grid.



The outline here in the solid green colour is the area already de-stressed at South Deep. Within it this myriad of red dots is showing you all the grade control drilling completed to date. It looks slightly different optically from the planned grade control drilling we are doing going forward, because at the end of the day you have a number of logistical constraints on exactly where and how you can drill. But very close to a 50m by 50m grid overall within this de-stressed area.

Going forward in each of these corridors depending on the drilling platforms we have available, whether we drill from the footwall or within the de-stress cut, you can see there is a full commitment to get this grade control drilling in place ahead of the mining front. And again the seven year plan outline is shown in this red line and reflects the good grade control coverage that will be timeously put in place.

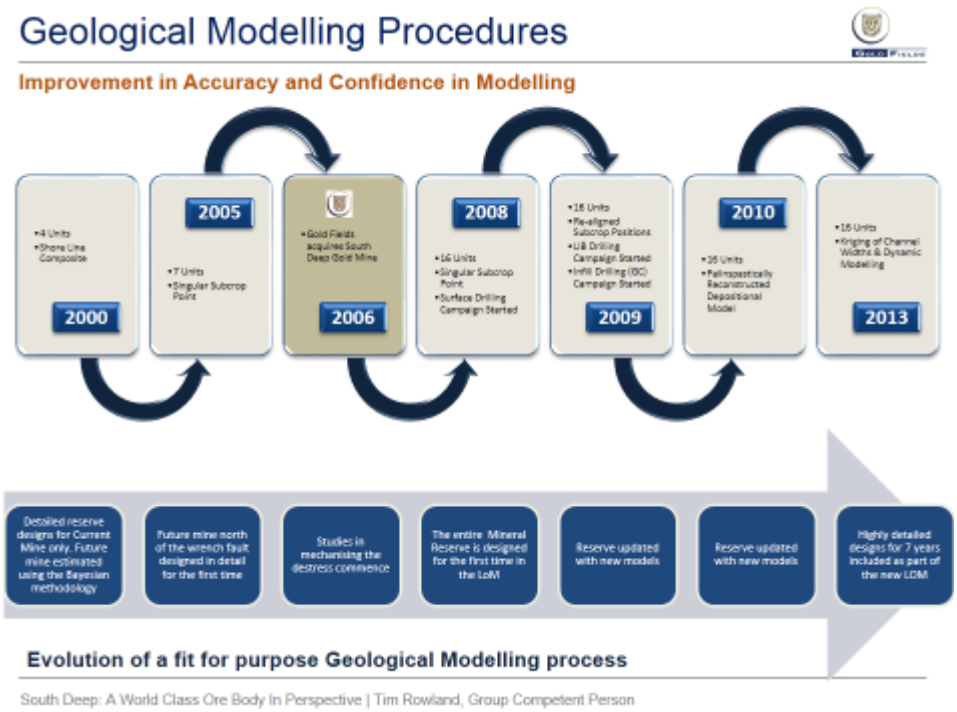
So the de-stress and the massive mining up till 2020, when you look at the grander scale of South Deep, is focussed on this particular 'focussed' component of the ore body where we have vast grade control drilling coverage complemented by all the other supporting tools I've shown you. So the production build up plan is significantly de-risked from an ore body predictability and confidence point of view.



We normally generate t a grade control apron of about 70m ahead of our current workings. This isometric view of a typical grade control drilled fan is complimented by the inset which shows the fan drilling in pure cross-section. In the cross-section what we are showing is the de-stress access drive and then the fan grade control drilling coming off these access drives. You can see that we drill not only between the de-stress cuts here but also into the virgin ground beyond the de-stressing. When we are at the extremity or the end of the de-stress access we are able to drill 50m to 70m ahead of the development.

So this intensity of 50m by 50m drilling really gives all the valuable information you need to get your short interval control modelling in place, particularly for a rolling two-year plan and even a five year plan when it is combined with the LIB drilling database. So that is the grade control drilling programme in summary.

The geological modelling procedures are next. This is important to highlight because at the end of the day your understanding of the geological framework, your geological zoning and your facies modelling, all provide the ultimate framework on how you approach your geo-statistics and your ore body modelling. If you don't have a good handle on the geological modelling you will not have a good grip on the process as you move through the value chain to your final resource estimation and your reserve statement. So I am hopefully not over-playing it, but I did want to highlight how significant this component is.



This slide is really a timeline of how the understanding of the South Deep ore body has evolved since 2000 and how it has evolved particularly quickly since Gold Fields took full ownership in 2007. If we look to the left of slide 32, back in year 2000, sixteen units weren't being modelled and the approach was much simpler. This was bundled into only four units being modelled. And the shore line composite, where the reef units on-lap each other to the sub-crop, was just treated as one single bundled or consolidated homogeneous unit without any discretion over the different stratigraphic units formulating that zone. So it was quite high level and lacked detail and resolution.

In 2005 it was increased to seven stratigraphic units being modelled and a singular sub-crop point. I think importantly, when we did our full due diligence and we realised what we needed to put in place from a quality ore body modelling perspective, we rapidly moved to modelling in 2008 the entire ore body on discrete 16 units. This was no mean feat because it meant going back to a lot of the legacy boreholes, re-logging, recalibrating and re-framing the entire model. And this is a big resource model underpinning a LoM through to 2087. A lot of really good work was done here.

Some of the work on legacy information didn't pass QAQC muster and wasn't used. As much as we could get in we utilised. And we took the quality of the ore body modelling from 2008 onwards in leaps and bounds. The surface drilling campaign was started in 2008 to ensure we had a good grip on the south of Wrench area going forward.

In 2009 with the 16 units being remodelled and wire framed we had realigned sub-crop positions based on further work on the seismic information and information coming from the surface boreholes. So the sub-crop position was pinned down even more accurately. The surface drilling campaign had been started and it was providing valuable framework information and also the grade control campaign had been started and was giving us very detailed information on short interval trends and local variography on the ore body.

In 2010 we introduced palinspastic reconstruction to the modelling process – I don't know how many people are familiar with the word palinspastic reconstruction? Palinspastic is reconstructing the original 3D spatial nature of the ore body when it was formed, in this case, some 2.5 billion years

ago. Over the last ~ 2.5 billion years this ore body has been faulted and cracked and stressed and strained and spatially put into a totally different 3D space as to how it was when it was originally deposited as the sheet flood deposits I showed you in the very first slide. In other words it has a lengthy tectonic history.

Palinspastic means we unpack it back to how the ore body looked in its original 3D state, and from that position we do the geostatisitcs and kriging to model the ore body. Because that makes sure that all the data is sitting in its correct 3D position. And then once you've done that you reconstruct it back palinspasticallly to how it looks today and how it is being mine designed and scheduled.

It is effectively putting humpty dumpty back together again after he has fallen off the wall. That's what it means. Again it is no mean feat because you have to understand the horizontal and vertical tectonic movements and understand the impact on stratigraphy. I think the team has done particularly well here to put this in place on such a massive ore body.

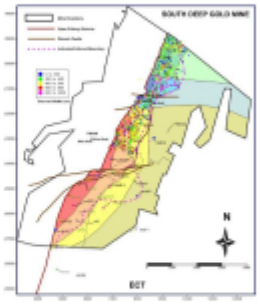
And then we introduced last year the kriging of channel widths across the ore body per stratigraphic unit. At South Deep it is not all about grade. It is equally about volume because volume and grade gives you your metal and ounces at the end of the day. It is a massive ore body, and understanding how each stratigraphic unit behaves geometrically is as important as understanding the grade trends. So we've actually introduced kriging to the prediction and modelling of channel widths for all the different stratigraphic units as well. That has been introduced to good effect.

So there it is, a quick timeline of where we have taken the management of the ore body over the last few years. We have not been shy to use various independent external auditors at South Deep over the recent years. We've had Snowden, SRK, RPA out of Toronto, and we've had Optiro from Perth all involved to provide governance over the R&R reporting process. They've had opportunities to model components of the ore body independently off-site to ratify our approach. And we've had good positive results from all of this independent review work that has been done on the quality of the ore body modelling. And in many cases it has been flagged as world class, so we are pleased with what we've got in place there. But we won't sit on our laurels and we will continue to improve that going forward.

Geological Modelling Procedures

Facies and Domains

- Geological facies are areas of the ore body that have been deposited under similar conditions and correlate with gold grade distribution
- Domains are areas within a facies zone in which a consistent grade distribution occurs
- Discrete facies and domains are constructed for each of the 16 units
- Facies and domains therefore provide a geological framework for geostatistical modelling
- Channel width models of the different units are constructed to enable the modelling of individual reef volumes and tonnages

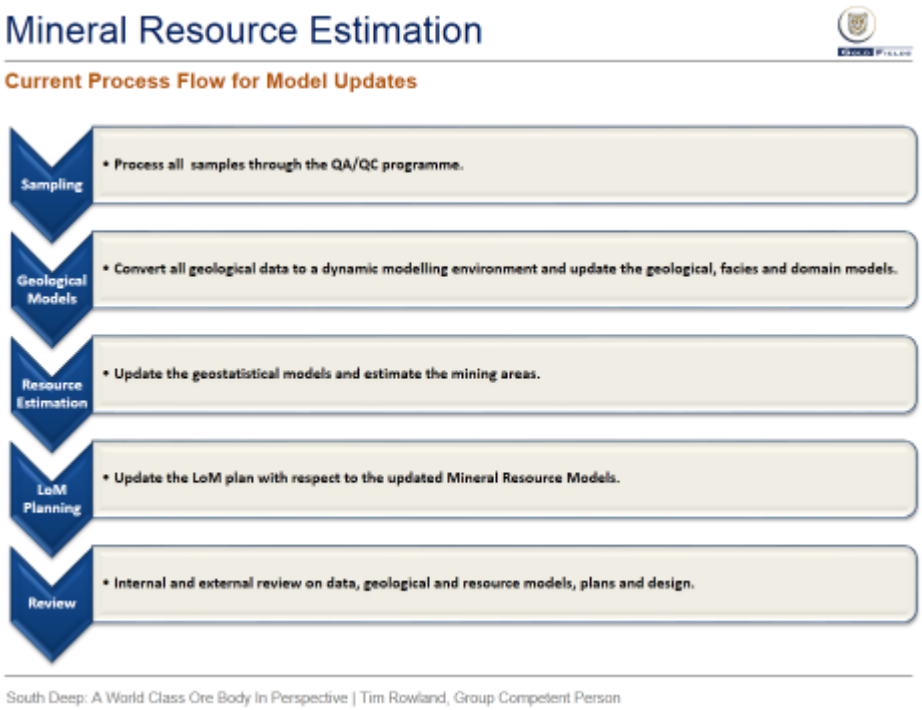


South Deep: A World Class Ore Body In Perspective | Tim Rowland, Group Competent Person

The role of facies and domains are highlighted. Geological facies are areas of the ore body that have been deposited under similar conditions. Typically faces and sub-zones or domains are used to constrain and frame the geostatistical process. And it is having a very clear understanding of that context in spatial 3D that allows you to do the resource estimation to a high level of rigour. I think that covers that slide.

Mineral Resource Estimation

South Deep Gold Mine



This is a graphic to highlight the current process flow for achieving model updates at South Deep. The sampling which is done, and I think you've seen the multiplicity of sampling which has to be completed as you work and drill through this ore body, particularly when it gets to be 120m thick on the eastern extremity. All of the sampling and assay work is done through a leading commercial lab with QAQC not only through by lab itself but by our own proprietary software before it gets into the database. All geological data is handled within a dynamic modelling environment. Recently we have introduced 'Leapfrog' as a proprietary modelling tool that allows us to get new models out much more routinely and at a faster rate, which is obviously what the mine design and planning team would like to see, the geological model updated as frequently as possible with material changes.

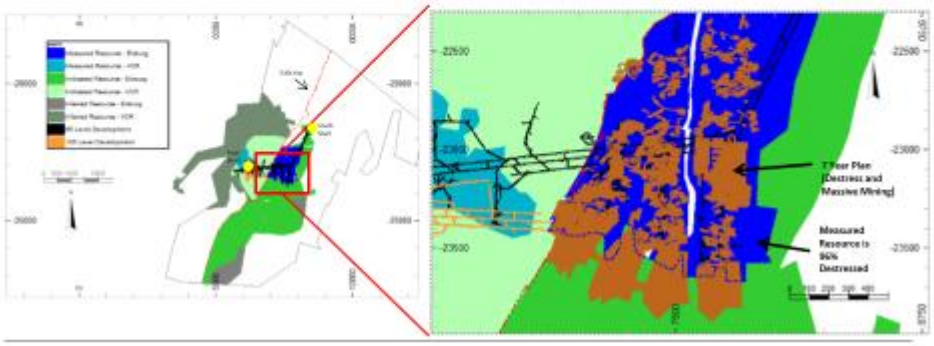
So we are looking for the very best products in the marketplace that can achieve that for us, to keep the models updated with the geological modelling and the sampling data. . What we will do is complete a holistic review of the South of Wrench area this year, once it has benefited from the full complement of data from the surface borehole programme, and we will effectively lock the model away until we get any material new empirical data to inform the South of Wrench area. So the South of Wrench resource model is effectively locked away until we get new data from drilling and development as move into the area in the future.

And finally internal/external review. Not only do we invest in external independent reviews but internal reviews by myself and the competent persons' team is done routinely throughout the year and at year end before we do a resource and reserve declaration. So a lot of rigour and over-arching governance is in place on this entire process.

Mineral Resource Estimation

Resource Evaluation and SAMREC Classification

- Geostatistical models are generated for each of the 16 units
- Estimation is constrained by geostatistical domains
- Ordinary and Simple Kriging techniques are utilised in the estimation of grade
- Facies modelling informs geological continuity from Current mine to Future mine
- 96% of the current mine Measured Resource is destressed, equating to 2.7 Moz gold



South Deep: A World Class Ore Body In Perspective | Tim Rowland, Group Competent Person

Slide 36 is highlighting on the left-hand insert the small component of the ore body that is really underpinning the seven year plan. What we are highlighting here in blue is the measured resource on the Upper Elsburg ore body, and the green is the Indicated or SAMREC Indicated component of the ore body stretching down to the southern limits of the mining lease area.

On the right-hand side, what we've shown in the brown areas is the seven year production plan, again reflecting the de-stress and the massive mining in the build-up year plan. You can see that it is underpinned by the blue polygon which shows the Measured resource. So you can see there is a significant component of the seven year plan that is already underpinned by a SAMREC compliant Measured resource. And when that is de-stressed it converts to a SAMREC Proved reserve. I don't think there are many mines that have that level of high confidence classification underpinning a five to seven year mining profile. It is because it is a massive ore body with relatively robust global consistency. We've been able to do the work proactively To achieve an end result which is a high level of confidence from a Measured resource and a Proved reserve. I will show you how much of the plan is underpinned by the Measured resource and Proved reserve now.

We are looking at a plan. Although the brown area does show from a top view the area that is in the seven year plan, it is important to remember it is very much a three dimensional massive style ore body. So if you move from west here to east over here to corridor one, there is a much larger volume in place. So it is very different from looking at a single reef band type ore body like the Carbon Leader, Middelvlei Reef or VCR. The third dimension (z-axis) is an important aspect that you need to be cognisant of.

And then you can see the dotted line is showing where the Measured resource comes to when it is overlaid on top of the seven year de-stressed mining plan. Again the scale bar here takes you up to 500m or half a kilometre. 96% of the current mine measured resource is de-stressed, which equates to about 2.7 million ounces of gold that could be mined right now by the mechanised fleet. This number is slightly less than the total reported Proved Reserve due to specific layout and sequencing constraints in some areas where complete blocks have not yet been fully destressed

Planning vs Measured Boundaries

Dec 2013 Measured Boundary & Dec 2014 Confidence Boundary

Planning		Dec 2013 Measured Boundary		Total
		Inside	Outside	
C2014	Tonnage (kt)	1 969	148	2 117
	%	93%	7%	100%
C2015	Tonnage (kt)	2 183	385	2 568
	%	85%	15%	100%
C2016	Tonnage (kt)	2 245	709	2 955
	%	76%	24%	100%
C2017	Tonnage (kt)	2 273	1 224	3 497
	%	65%	35%	100%

Table illustrates annual specific coverage, if calculated cumulatively, year-on -year the overall coverage is at 78% of planned mining (destress and massive) up to and including C2017 falls within the current Measured Resource boundary

On a rolling basis, year 1 of the plan will be >90% classified as Proved Reserve (i.e. destressed Measured Resource)

South Deep: A World Class Ore Body In Perspective | Tim Rowland, Group Competent Person

Here is the slide I promised you just now. This shows you the Measured resource confidence we have in the rolling plan at South Deep. So in any particular phase when we enter a budget year or a 12 month operational plan, as we have done here in calendar 2014, 93% of this year's production plan at South Deep is classified as a Measured resource and only 7% as an Indicated resource.

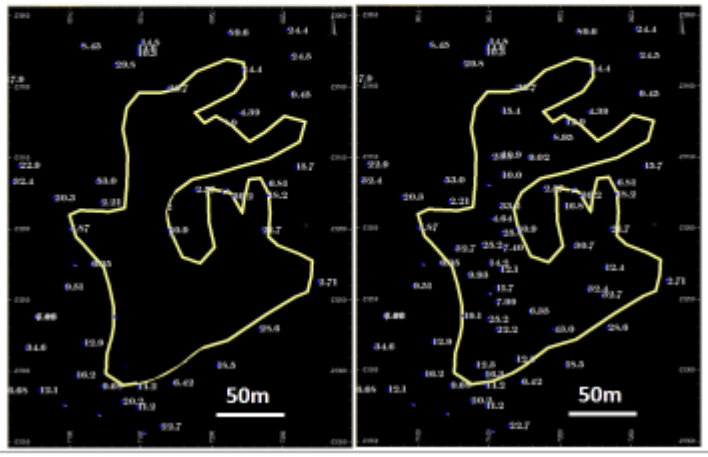
At this point in time, 2015 or year two of the plan, we are then reflecting an 85% Measured resource confidence. And if you go right out to calendar 2017, or four years out, we have 65% of that production plan already covered by a Measured resource classification. Because the grade control drilling and the LIB drilling is on a rolling model as we enter each year, as we enter 2015 next year we will have got that 85% back up to about 90%.

Mineral Resource Estimation

Grade Reconciliation – Resource Model vs Grade Control Model (MBB unit - Corridor 4)

Reef	Resource Model Grade (2011)	Grade Control Drilling Grade (2012)	Grade Control Model Grade (2013)	Percentage Change
MBB Reef (g/t)	17.11	16.77*	16.90	-1.2%

* Arithmetic mean calculated from actual raw assay results.



South Deep: A World Class Ore Body In Perspective | Tim Rowland, Group Competent Person

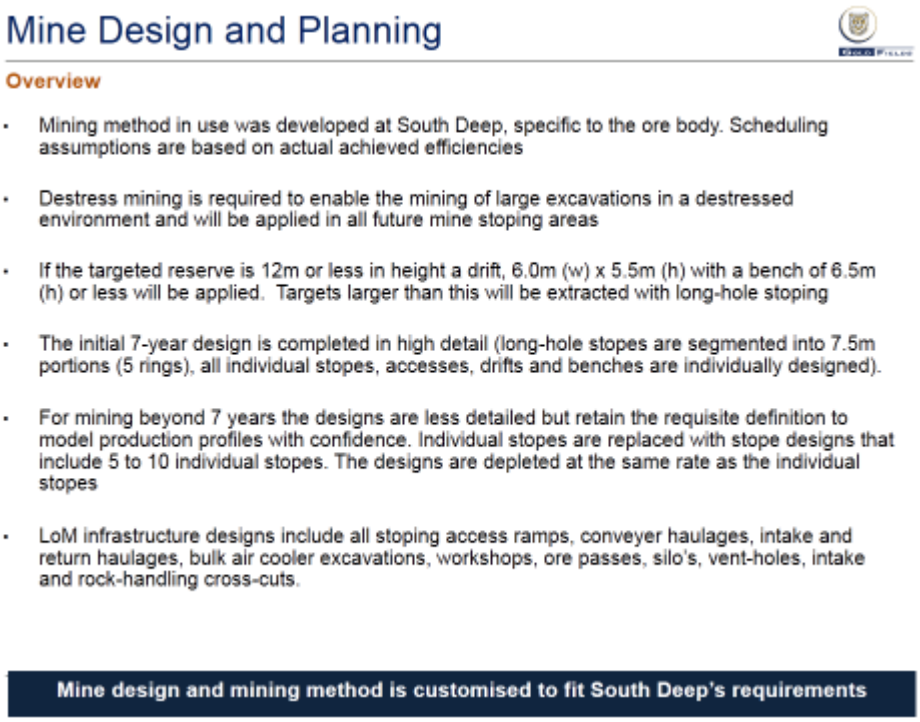
You might say, well, why have you got such confidence in how the ore body model is predicting what you've got ahead? I think this next case study highlights that very nicely for us. Slide 38. We've taken the MBB horizon. The MBB unit, one of the 16 stratigraphic units, does tend to have the highest variance on grade distribution. So we have the highest variance obviously when it comes to grade. So we picked one of the more challenging units. What you see on the left-hand side of the slide inside this yellow polygon is an area that didn't have any grade control drilling in place, yet around it there was grade control drilling on a 50m by 50m grid. So what we did was make an estimate of what the value was inside this polygon before we drilled 34 grade control holes within the zone.

So the resource model estimated the grade inside that polygon at 17.1g per ton. The grade control drilling on a straight arithmetic mean when the 34 holes were drilled gave us just under 17g per ton. When it went through the grade control model or the full geo-statistical rigour, it came out at 16.9g per ton. So without grade control drilling inside that polygon our ore body model based on proximal information was giving us just over 17g per ton. But when we completed all the drilling, just under 17g per ton was returned for the estimate, only a percentage point difference. I think that brings it home that we are dealing with relatively close tolerances and the ore body model and the rigour we've got in place is allowing us to predict in situ grade and tonnage relatively accurately on this scale.

We have the mineral resource manager at South Deep sitting just behind me. Manie will keep an eye on how we optimise the grid spacing. We are always aware of the cost benefit analysis on this process. We look across our full portfolio of mines in fact for what the most effective grid drilling is to get the answers you need without over or under drilling. It is all a means to an end, getting the resource into the confidence classification you need to appropriately underpin your planning. What we do know is we might need to tighten it up in certain areas. But I think it brings it home nicely that there is an appropriate level of confidence.

Mine Design and Planning

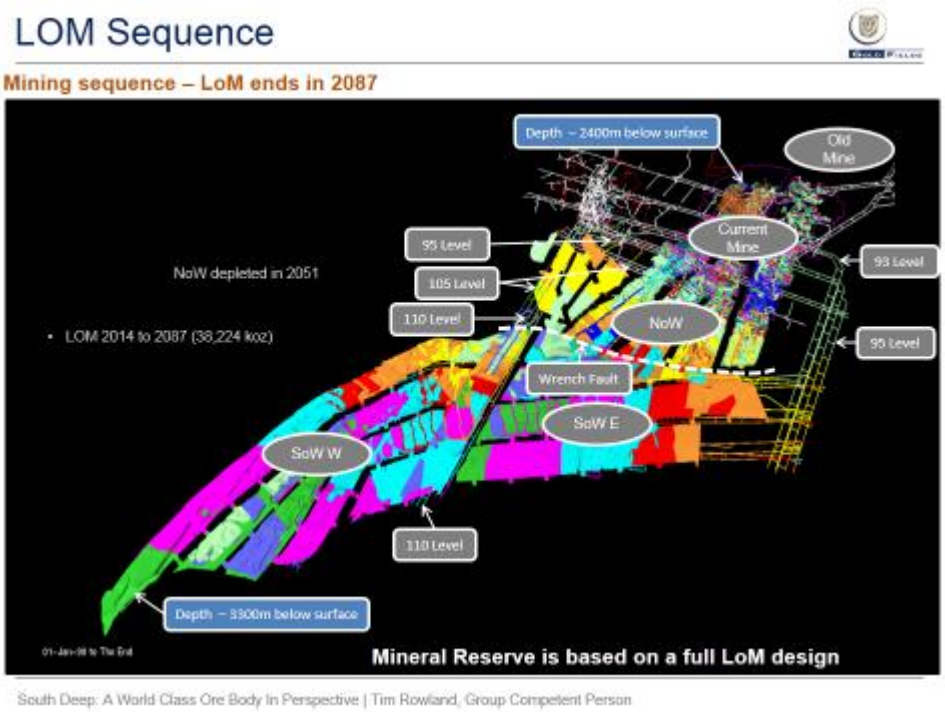
South Deep Gold Mine



Based on what we know 50m by 50m is the right GC drill grid for the prevailing variography, and it is right for the typical structural repetition of the faulting we get. So it fits in nicely. I will move on to slide 40, which is the mine design and planning. I'm not going to go through all these bullet points because you do have the slides and they are available on the website. However, I would like to highlight tone or two points made here as an overview to the mine design and planning.

The mining method effectively was developed to meet the specific needs of South Deep and the nature of the ore body. The scheduling assumptions in the life of mine planning are all based on actual achieved efficiencies. So aspirational targets are not built into the planning process at South Deep. De-stress mining is required to enable longhole stoping and generally the drift and benching. Where the package meets the cut-off criteria and minimum mining width of 12m or less it is well suited to benching and drifting. Where we are 15m and thicker then the ore body is well suited geometrically to longhole open stoping. We do favour the longhole stoping method over-all because it will be more cost effective and enjoy higher over-all productivities to the the size of the excavations and ore volumes moved..

As we move forward and build the plan through to 2017 there is a significant swing in tonnes away from drifting and benching moving toward longhole open stoping. It is a swing of about 30% now to 70% longhole stoping when we move into 2017 and 2018. That is quite a significant shift in mining method deployed which underpins productivity and should be more cost effective as well. For mining beyond seven years we haven't put the absolute detail in place to support monthly schedules. There are some assumptions on the granularity of the design and scheduling from 2020 onward. But you wouldn't want to tie up your mine planning team and your expertise doing detailed mine design and longhole stope designs 30 years out. I think we've got the appropriate level of resolution in place for the longer term planning.All life of mine infrastructure designs include the necessary access ramps, the conveyer, the air intake haulages, your bulk air excavations, all the civils etc. are built in there. So the inter-dependencies required in your mine design to support the production plan are built in upfront to the resolution of the planning.

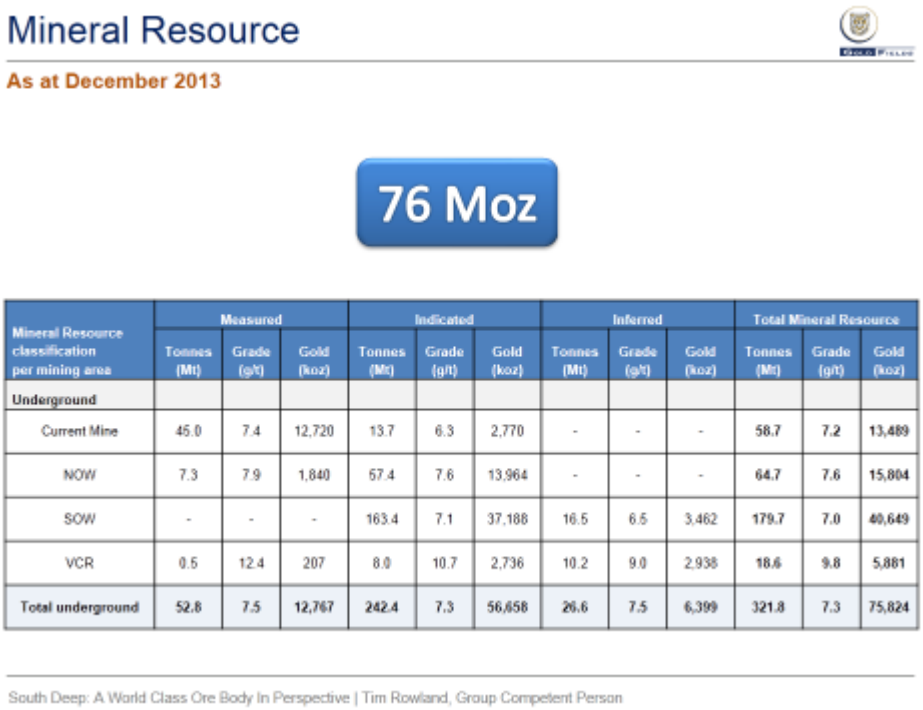


This is a graphic to show that the life of mine is fully planned out using Mine 2-4D software to 2087, which reports just over a 38 million ounce reserve. At its maximum depth we are mining at 3.3km below surface. At its shallowest depth in the life of mine plan we are mining at just under 2.5km at the top here. I will just highlighted the North Wrench area, the Current Mine which is the current focus for production, the South of Wrench on the eastern side and the South of Wrench to the west. And just highlighting the 110 level here that comes all the way through under the mine design in this diagram. You can see it showing underneath.

What we do want to do is try and get some of these graphics into animation in the coming few weeks. That will help you see when we start to rotate these models it really brings it home strongly the relationship between the ore body and the mine design and scheduling. So we will work on getting some animation together for you which will really help get a feel for the 3D context of the LoM plan.

Mineral Resource and Mineral Reserve

South Deep Gold Mine



Mineral Resource

As at December 2013

76 Moz

Mineral Resource classification per mining area	Measured			Indicated			Inferred			Total Mineral Resource		
	Tonnes (Mt)	Grade (g/t)	Gold (koz)	Tonnes (Mt)	Grade (g/t)	Gold (koz)	Tonnes (Mt)	Grade (g/t)	Gold (koz)	Tonnes (Mt)	Grade (g/t)	Gold (koz)
Underground												
Current Mine	45.0	7.4	12,720	13.7	6.3	2,770	-	-	-	58.7	7.2	13,489
NOW	7.3	7.9	1,840	57.4	7.6	13,964	-	-	-	64.7	7.6	15,804
SOW	-	-	-	163.4	7.1	37,188	16.5	6.5	3,462	179.7	7.0	40,649
VCR	0.5	12.4	207	8.0	10.7	2,736	10.2	9.0	2,938	18.6	9.8	5,881
Total underground	52.8	7.5	12,767	242.4	7.3	56,658	26.6	7.5	6,399	321.8	7.3	75,824

South Deep: A World Class Ore Body In Perspective | Tim Rowland, Group Competent Person

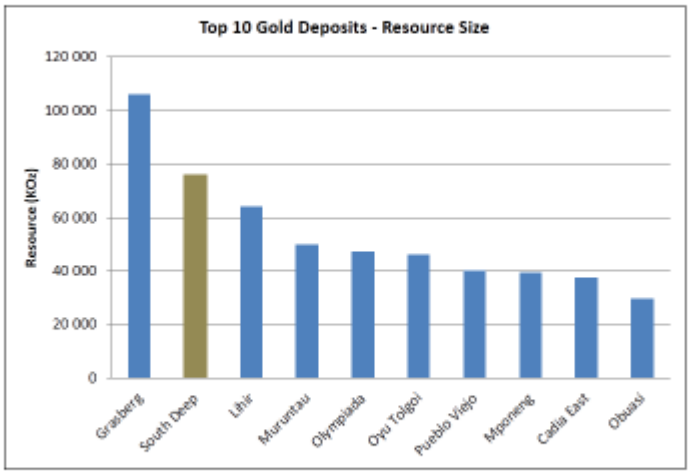
And then the last couple of slides which I will try and wrap up in five minutes is the resource and reserve and some reconciliation slides. The mineral resource is based on a gold price of R460,000 a kilogram. The reserve is based on R400,000 a kilogram. Based on the Rand Dollar exchange rates we've used, the reserve declaration price talks to US$1,300 /oz.

And what we've shown here is the classification of the Indicated and Inferred resource. There are key geographical areas reported as per the previous slide, with Current Mine through to North of Wrench and South of Wrench highlighted. And you can see the consistency of the overall underground grade, be it 7.5g/t Measured, 7.3g/t Indicated or Inferred at 7.5g/t. You often don't see this in ore bodies particularly outside of the Wits basin, where you can I get dramatic swings in global grades between resource classifications. Here you can see even if it is the Measured resource classification or Inferred, the global consistency in the ore body is standing up strongly.

Overall this is an in situ resource of 7.3g/t per ton or 75.8 million ounces. These are the same numbers as in the integrated annual review which has been issued, and they will be reflected in the resource and reserve supplement to be published shortly..

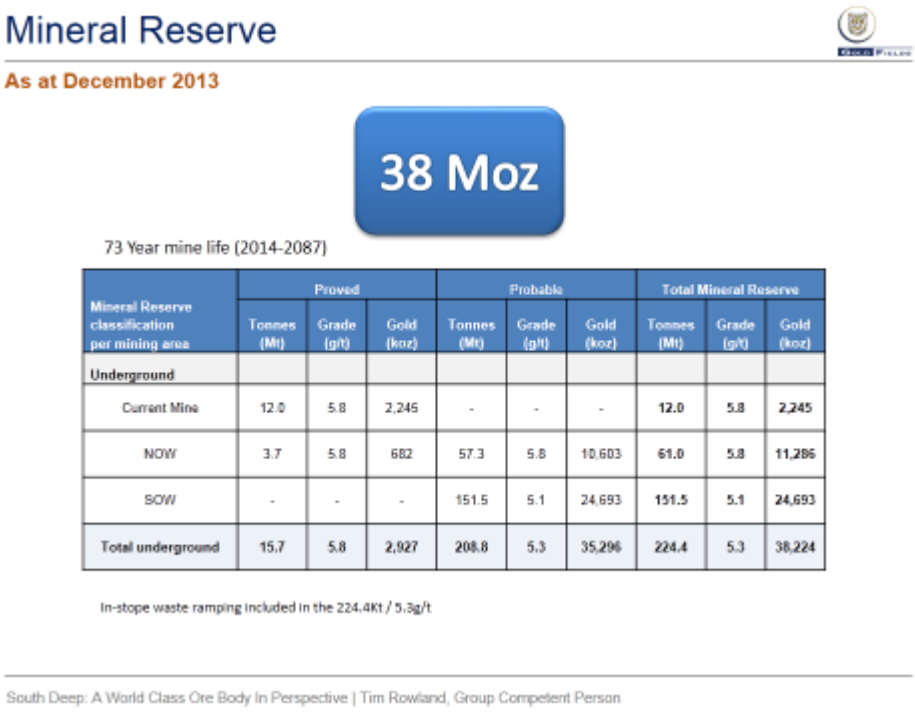
Mineral Resource

As at December 2013



World's Second Largest Gold Mineral Resource

Nick said I was allowed one marketing slide, so I've put the one marketing slide in here just to show that from a resource ounce perspective South Deep ranks between Grasberg and Lihir. You can see South Deep rates as a very significant role-player in the industry. If you look at the expenditure on global exploration, what exploration projects have been delivering over the last decade across the industry, to have ownership of this very significant sized ore body is a strong material position to be in going forward that is in support of where we would like to be positioned strategically.



Mineral Reserve

As at December 2013

38 Moz

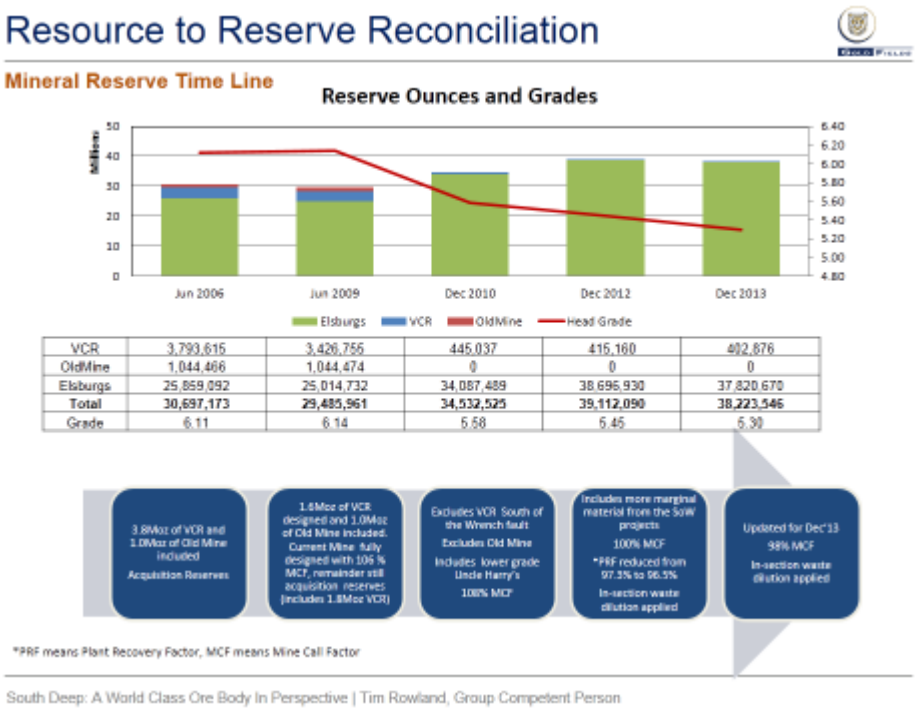
73 Year mine life (2014-2087)

Mineral Reserve classification per mining area	Proved			Probable			Total Mineral Reserve		
	Tonnes (Mt)	Grade (g/t)	Gold (koz)	Tonnes (Mt)	Grade (g/t)	Gold (koz)	Tonnes (Mt)	Grade (g/t)	Gold (koz)
Underground									
Current Mine	12.0	5.8	2,245	-	-	-	**12.0**	**5.8**	**2,245**
NOW	3.7	5.8	682	57.3	5.8	10,603	**61.0**	**5.8**	**11,286**
SOW	-	-	-	151.5	5.1	24,693	**151.5**	**5.1**	**24,693**
Total underground	**15.7**	**5.8**	**2,927**	**208.8**	**5.3**	**35,296**	**224.4**	**5.3**	**38,224**

In-stope waste ramping included in the 224.4Kt / 5.3g/t

South Deep: A World Class Ore Body In Perspective | Tim Rowland, Group Competent Person

Okay. Looking at the reserve. I said this was reported at a gold price of R400,000 a kilogram. We've got the Proved and Probable reserve grades shown at the bottom. It averages out over the entire life of mine to 2087 so the Reserve reflects over 70 years of production and not just the grades expected over the next 5-7 years, which a slightly higher than the average reserve grade. You always have to realise and appreciate the long timeline and longevity on this mine when you look at the 38 million ounces and the 5.3 g/t grade. Current Mine you can see is mining at a higher grade than the life of mine average. .



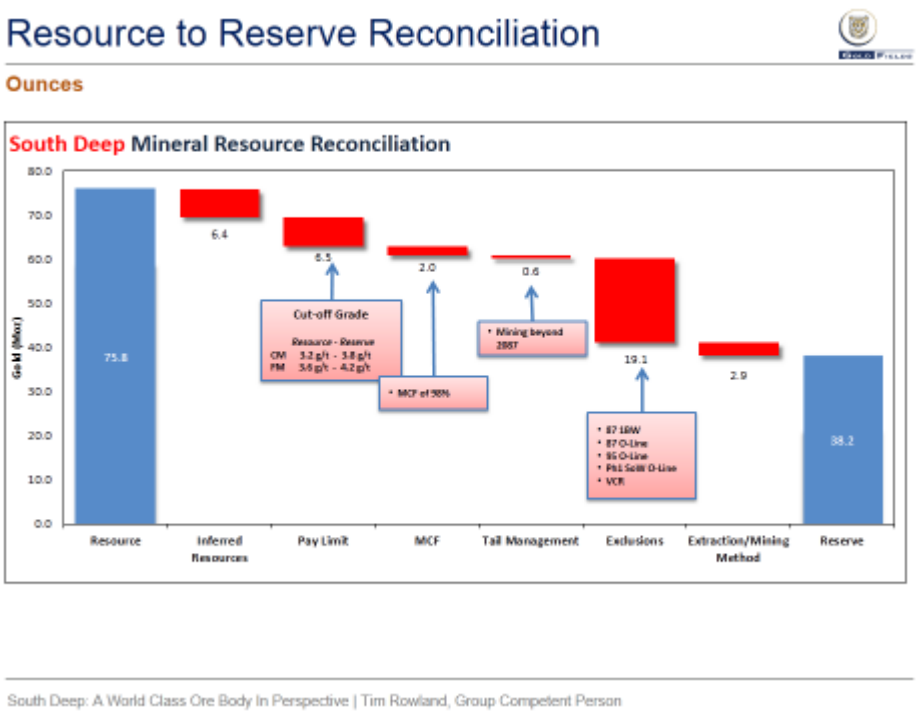
What I wanted to make sure I covered this afternoon on slide 46 was the overall reserve grade trend since 2006. There are some views,that the grade of the Upper Elsburg ore body has come off to some degree over the last few years. If you are reviewing figures at a high level i.e. the global reported numbers, without understanding the moving parts it might be a fair assumption for someone to make. However, I want to use this opportunity to highlight that there are a number of moving parts to the South Deep reserve grade that must be appreciated. If I just walk you through this slide quickly you will understand that the Upper Elsburg ore body is probably remaining one of the most consistent long-term reserve grades in the industry. But it is a number of the components or influencing elements around it that have changed in recent years.

Let me just step you through the slide. If you look at 2006, remember this was pre-acquisition by Gold Fields and there was quite a heavy conventionally mined VCR component in the LoM. The VCR back then was being mined conventionally with handheld drills, something that Gold Fields has moved off totally and will remain off any conventional mining at South Deep. We are a mechanised mine. And the historical reserve had a significant component of 'Old Mine' as well. So there was 3.8 million ounces from the VCR at about 10.8g per ton, and Old Mine was contributing at just under 9g per ton (comparatively high grades).

If we go through to 2009, 1.6 million ounces of the VCR and 1 million ounces of 'Old Mine' was included. And it still included 1.8 million ounces of VCR which wasn't designed but still treated as acquisition reserves at that point in time until the requisite due diligence work had been done on it by Gold Fields. But still a heavy component contributed from the VCR and Old mine. However, and you can see the grade coming off with the red line here, i.e. the reserve head grade. The reason that came off from 2009 to 2010 is very simply because of the VCR component which is not in our plan at this stage because it is not designed and scheduled and we don't have a low profile mining method validated and in place yet for it - this was profiled at 11g per ton. So those ounces were removed at 11g per ton and then Old Mine was removed from the LoM at just on 9g per ton as it was not validated in the LoM plan.

Resource to Reserve Reconciliation

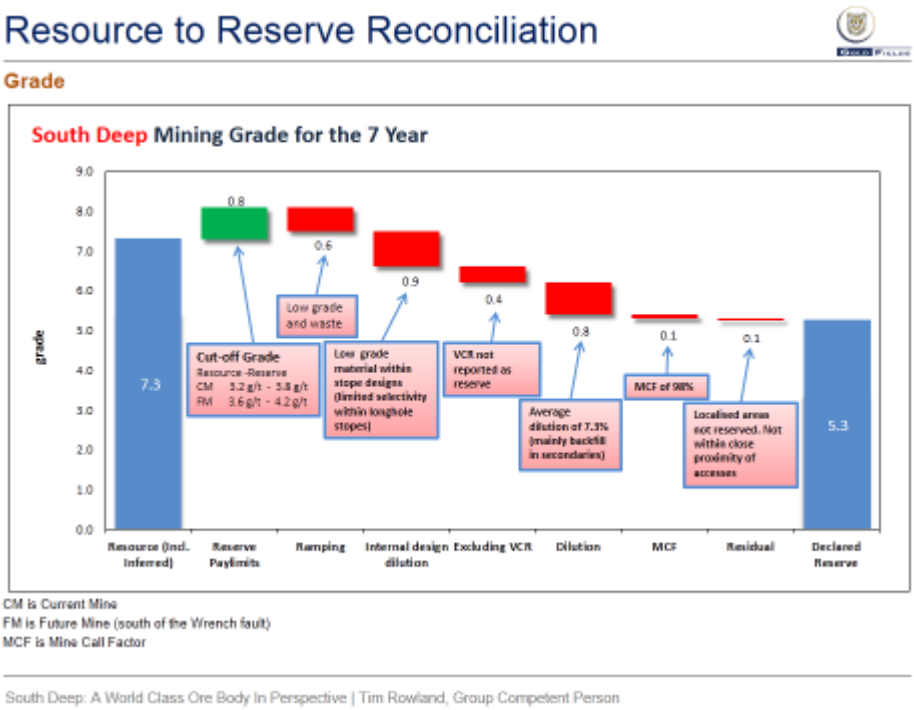
South Deep Gold Mine



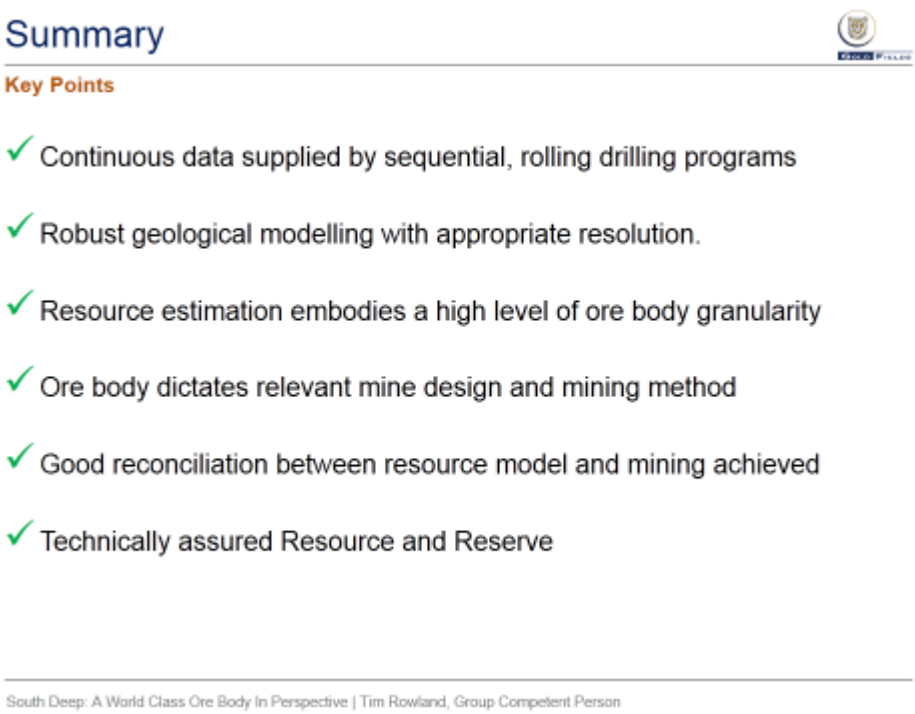
This slide is looking at the reconciliation, in a waterfall format, between the 75.8 million ounce resource to the 38.2 million ounce reserve. So it is showing the overall attrition components between the resource converting to a reportable reserve. And the first block I can highlight is obviously the 6.4 million ounces of Inferred resource which under the regulatory codes can't convert to a reserve. We then have the impact of the cut-off grades. The reserve cut-off grade is higher than the resource cut-off grade, impacting 6.5 million ounces here on overall pay limit. The impact of the mine call factor of 98% is shown. Tail end management played a minor role. I don't think it is anyone's real concern in this room, but in 2087 a diminished critical mass in production volumes means the production is curtailed, so there is some tail end management there.

And then quite a big component here, 19 million ounces of exclusions. Now, the O line close to the Uncle Harry's area I mentioned earlier and some of the shallower areas on 87 level together with some of the VCR has been excluded. Not all of that has been excluded because it doesn't make the reserve cut-off grade. But a lot of it reflects marginal ounces under prevailing economic conditions and is close to or just above the cut-off grade. We've had a concerted effort here to make sure that we're not bulking up the resource or the reserve at South Deep with marginal ounces that aren't going to add value and contribute to FCF and AISC. So we've done some clean-up there. We are not desperate to bulk up the reserve position, but we are keen that every ounce in the plan contributes to cash flow and margin. So there has been some casualty there in the resource and reserve conversion from a reportable ounce perspective, but it's about planning for value.

And then some extraction and mining method issues, the application of rock engineering rules and certain layout restrictions that have impacted the method mining layout. So that shows you roughly how you go from the 75 million resource to the 38 million ounce reserve.



A similar waterfall layout with similar silos is show here flagging how the grade from the in situ resource, which includes the Inferred material at 7.3g per ton, ultimately reports as an overall life of mine grade at 5.3g per ton. I won't go through all the silos because they are labelled quite clearly, but again there is the impact of the cut-off grade in green to note. Obviously the grade goes up then you apply a higher reserve cut-off compared to the resource cut-off. There is some low-grade material within stope designs that has to be taken as part of your mine design rules. Average dilution at 7%. Secondary mining comes through as a factor for the secondaries within the context of the longhole stoping. The impact of the Mine Call Factor is almost negligible at 0.1g per ton. And then some localised areas have not been reserved because they are not within close proximity to development access, which is something to be looked at in the future, also a miniscule contribution in the grater scheme. But overall these are the key role-players in the attrition from the 7g/t resource to the 5.5g/t reserve grade.



And that takes us through to slide 50 which is a consolidated high level summary of what I've tried to drive home this afternoon over the last 49 slides.

The quality of the geological modelling and how it eventually supports us in having a well constrained resource block model handed over to the mining engineers is well in place now. The resource estimation and high level of ore body granularity is fit for purpose. It is no mean feat routinely modelling 16 individual reef surfaces. But it is done very effectively by the team in place now. The ore body dictates the mine design and mining method. Nothing is being forced on the ore body. We have allowed the ore body to dictate and direct optimisation in design and planning all the way through the process.

We've got good reconciliation between the resource model and the mining achieved. Well, much of it is embodied and reflected in the Mine Call Factor. The Mine Call Factor effectively a KPI benchmark or formula for measuring the gold achieved versus that called for. And if your resource modelling is talking to the grades you get in your plant and ultimately the gold you pour, it is reflected in a good Mine Core Factor, that means the 'machinery of your whole estimation model' and your ore flow management is working well for you.

And at the end of the day you need to know that the South Deep production plan will ultimately focus on all-in sustaining costs, free cash flow margins and delivering on the plan. You need to know that there is a very robust ore body modelled that is fundamental to the mine's commerciality and it is a key anchor point to all of that, because that is where it all starts and ultimately where it all finishes – a well under-stood and well modelled ore body. Hopefully this presentation has brought it home to you that this is in place and at a highest industry standards.

Questions and Answers

Adrian Hammond

It's Adrian Hammond, BNP Cadiz. Can you just explain why the extraction ratios change from corridor four to one? I'm not quite understanding that. Can you give us that mining method and how it talks to [unclear]?

Tim Rowland

Importantly as you move from west to east (proximal to distal) across the ore body and it thickens as the wedge shaped nature of the Upper Elsburg's becomes more pronounced, the ore body inherently looks very different. When you're on the western side in corridors four and three the Upper Elsburg package reflects more closely or tightly stacked stratigraphic units (conglomerates) with limited intercalated waste or low grade units. There are comparatively little interspersed poorly mineralised material or even waste units. So through the application of stope cut-off grades and minimum mining widths you can hang the mine design largely on full or very high extraction ratios, as the ore body lends itself to this in the more proximal zones. In corridor four typical overall ore body extraction approximates 90%.. At the other extreme in corridor one, to the east and in the more distal zones, where you've gone from an ore body several to tens of metres thick to an ore body 50 to over 100m thick, the reef units themselves are less consistently mineralised and the prevalence of more consistent poorly mineralised units increases. The Upper Elsburg package is by nature more variable here as the poorly mineralised and 'waste units' in between the target conglomerates are thickening up as well. So the mine planners have to be much more selective with where they are designing the stope layouts. And that's why the overall ore body extraction ratio can reduce to 25% to 30% in corridor one compared to ~90% in corridor four.

Adrian Hammond

Thanks. Just talking to the thickening reef horizon starting on slide 16, does that talk to...?

Tim Rowland

This schematic does not attempt to show exactly what has gone into the reserving process but it aims to provide a perspective on the overall grade trends as controlled by the primary target units within the Upper Elsburg package. What we wanted to highlight here is the main units carrying grade and consequently targeted for mining in a typical borehole section drilled through the ore body. We also wanted to highlight the multiplicity of raw data that is sourced by just one drill hole reflecting the massive nature of the ore body. You can see here the red bars are showing where the grade is kicking in alignment with the primary gold carrying sedimetological units. So it shows that you get characteristic zones throughout the ore body which are the focus for the higher grade. But at the end of the day it will be up to the mine planners using the stope cut-off grade and mine design and scheduling rules to look at which components of the ore body can be bundled together to suit a particular mining method, whether it is drifting and benching or long hole open stoping or a mix of both. [overtalking].

Adrian Hammond

I mean the longhole stoping is ideal. So I'm trying to connect the channel widths here which you show which are far shorter than 15m. So you will be taking quite a bit of waste with it.

Tim Rowland

You would naturally include some lower grade units perhaps individually below the stope cut-off grade but the overal long hole stoping target would cumulatively far exceed the cut-off grade. At the end of the day mining the South Deep ore body is not like operating a cheese factory. You always have to moderate how you do your final mine design to ensure margin delivery and value accretion. You can't selectively just pick everything that is 15g per ton and mine that exclusively.

Nick Holland

I think the other point worth mentioning is there are about four to six of the 16 units that make up the bulk of the ore reserve. The guys are going for the selective target comprising of the better units. And as you are closer to the outcrop we're going to take much more of it because it is narrower, whereas when you move east it opens up and you've got to be much more selective. But you can't put mine design assumptions around that.

Adrian Hammond

The intersections you are seeing here now should be an indication of [inaudible segment]. That is a value chain process. The resource block [?] model is the end product that the mining engineers see.

Bruce Williams

Bruce Williams from Imara Asset Management. Just following on from that train of thought and maybe a little bit away from your discipline, but from a mining point of view surely you've got this massive reserve going through or resource going through to 2087. What is your thinking when you look as opposed to mining more west to east as opposed to north to south? I mean you've got this play of pushing out to the extremity on the west and then slowly going down to the south. When I look at some of the [unclear] it seems like the better grades are in the proximal area. So if you're looking for grade you're mining close to the western side.

Tim Rowland

Corridors three and four will contribute the bulk of the ramp-up tonnage over the next five to seven years and they are the highest contributors on a grade-tonnage basis. That is what we would like from a mining mix perspective. That's where you want your gearing to drive cash flow. Manie, do you want to add to that?

Bruce Williams

If you look at this from a 30 year life of mine how much would that change your thinking in mining west to east as opposed to pushing north down to the south?

Manie Keyser

Currently if you look at the strike direction you've got the four mining areas that have evolved as [unclear] down to where we currently are. So [inaudible segment] to mine out of that small portion of the ore body. We still have to develop down dip. To build up the volume that we need out of the mine you spread your mining across the strike of the ore body, which also mitigates seismicity. So the bigger [inaudible segment]. To get the maximum volume out of the ore body [inaudible segment] you are ideally mining the four corridors with the lower grade component to the eastern side but always off-set my the mining mix and tonnage contribution from the higher grade on the west side.

Bruce Williams

That's what I'm trying to grapple with in my mind. As you go to corridor three and four you're pushing more tonnage obviously. If it were a 30 year life of mine how different would it be? I understand as you're going down and the more infrastructure you put in you've got to open up.

Nick Holland

We've looked at different designs. You've got to actually mine with the [unclear] across the corridor and [inaudible] with the mine running along with the design volume [inaudible]. You can't concentrate your mining in this area. You've actually got to mine it across all of the corridors. Just remember what South Deep was and is. It's a bulk reasonably good grade underground mine. The trick with South Deep is the bulk mining. That's why 70% of the volume at full production will be longhole open stoping. We've looked at different scenarios whether we can get more value doing it that way, but I think we have come full circle. The design we've got now is the optimal design, and from a geo-technical perspective you've got to be able to advance your corridors together. You can't take the high grade corridors out discretely. It is not going to be sustainable.

Bruce Williams

Just from a cost point of view, leading on from Pete's question earlier on, the additional cost of the grade control and LIB drilling, how much is that as a percentage of total costs? I'm guessing that it is not a big component because your numbers are really good on the 50x50. [Inaudible segment and overtalking].

Manie Keyser

[Inaudible segment]. It is not a huge amount of extended drilling [inaudible segment and overtalking]. The cost here is minimal in the grand scheme of things.

Nick Holland

The benefits we are getting are good. As far as we are concerned we need to make sure we've got resolution on the planning grade going forward so that we know what we need to go after. Because

[unclear] you will find that your ore body is fairly uniform.

Bruce Williams

Thank you.

Hurbey Geldenhuys

It's Hurbey Geldenhuys from Vunani. It seems like finally we're going to see a mine where the miners are not going to blame the geologists. I'm pretty sure that's how it works.

Tim Rowland

There will likely never come a time when miners won't blame the geologists.

Hurbey Geldenhuys

What I'm very interested in, I mean you've got the same provenance from Cooke right through into Western Areas and now into South Deep. If you go from the shore line or outcrop, sub-crop, and on strike, let's say it's a 100m strike and going more distal, is it the same amount of gold that is deposited but just more dispersed? Have you done that estimation? Let's say Cooke one, on strike how much gold was actually deposited? Cooke two, how much gold? Cooke three...

Tim Rowland

OVM, ounces per vertical metre, is something we have looked at on some of our other assets. I must admit I've never really applied the ounces per vertical metre benchmark at South Deep.

Nick Holland

We have enough ounces to worry about here.

Tim Rowland

It's an interesting geological question.

Hurbey Geldenhuys

If the area had that much gold mined in a mining method, a more concentrated method and a different cost structure, are you going to mine the same amount of gold at a more diluted mining method but with a lower cost structure? But at the end is the profit margin going to be significantly higher?

Nick Holland

Let me try and jump in there. Remember this is a mechanised mine. At full production we are employing 4,000 odd people. You go and take a KDC operation (Sibanye). They are doing a million ounces and they are employing 30,000 people. And that was the historical mining that was done. When we bought South Deep it was one of the first things we stopped. . So that's the secret of South Deep. It can be bulk open stoping. That's why we call it longhole open stoping. When you drill these big holes there is a lot of ore that is going to fall every time you blast. You get that out with a minimum amount of people. That's the premise for South Deep. Remember it's a 5.3g/t ore body where you're going to have 4 million tonnes a year at full production. That's what is going to give us the leverage on productivity and costs. That's the view we had when we bought it, and I don't think

we have any different view today.

Unidentified male speaker

Your all-in sustainable cost (AISC) gives you an indication. What is your big number now, your all-in sustainable cost?

Nick Holland

At full production? US$900 per ounce. But the one thing we don't want to do here is we want to make sure we don't unnecessarily dilute the grade. We can actually probably get more in at a higher price, quite a bit more in. But the important thing we want is we want to get 60 years of mining. The key is to make sure that over those 60 years we get the best quality mining in. the grade here is important. So we wouldn't be happy to have a reserve say of 50 million or 60 million ounces at 4g per ton. Maybe one day if the gold price goes up to R1 million per kilogram maybe we will look again. But if it went up to R500,000 a kilogram would we change our mine plan? No, we wouldn't. We would mine the same.

Unidentified male speaker

Could you decrease the cut-off and the grade mined if the gold price went up?

Nick Holland

No, I think we want to keep the grade where it is. We wouldn't want to chop the cut-off grade. It is much more important for us to fill in the infrastructure with the right grade. By giving yourself more reserve at a lower grade the risk is that you get substitution of higher grade with low grade. So we don't want to change that strategy. That's the strategy of Gold Fields. That's not just for South Deep. If the gold price goes up we're not going to drop the cut-off grade.

Unidentified male speaker

[Inaudible segment] the key thing here is the variability of the reserve grade within the ore body is quite substantial. [Inaudible segment]. How does that connect with mining [unclear]? Do you think you are equipped well enough to handle being able to target these types of areas [inaudible segment]?

Manie Keyser

[Inaudible segment] if you follow the specific reef horizon and [unclear] you can take everything thereafter as well. So [inaudible segment] to a certain degree you are [inaudible segment].

Tim Rowland

We've also adopted a five ring approach to the longhole open stoping which is effectively a 7.5m incremental ring blast rather than a big bang approach to longhole stoping. That allows us to go in and do routine CMS or cavity monitoring often. As a result we can monitor under break and over break in the stopes more routinely on a short time interval. That introduces more quality control to the massive mining as well.

Unidentified male speaker

Is this something you can achieve now or is it [unclear]?

Nick Holland

That is the protocol that is already performing and is on the mine.

Alan Cooke

Just a few quick questions. It's Alan Cooke from JP Morgan. In corridor four the longhole stoping in that corridor [inaudible segment] in corridor four, longhole stoping? Or is that planned for later this year?

Manie Keyser

The longhole stoping will be initiated in corridor four this year.

Alan Cooke

You are doing the longhole stoping now apparently.

Manie Keyser

In corridor three, yes.

Alan Cooke

So it is happening now. And currently what percentage of your tonnes are coming from the longhole stoping? When you get to the end of the year how will that change?

Manie Keyser

[Inaudible segment].

Alan Cooke

Okay. And then, Tim, if you could help me with the definition on the de-stress measured resource on slides 36 and 37. It says 96% of the current mine measured resource is de-stressed, about 2.7 million ounces. If you have de-stress measured resource that is proved resource, right?

Tim Rowland

If it is measured and also de-stressed effectively it can normally be classified and treated as a Proved Reserve (SAMREC).

Alan Cooke

So you have 2.7 million ounces of Proved reserve ounces de-stressed currently?

Tim Rowland

The 2.7 million ounces is the de-stressed measured resource that can be mined right now. Correct. The actual reportable Proved Reserve is closer to 2.9 Moz with the difference due to certain prevailing mining rules preventing total block extraction in some select cases until final layouts are completed.

Alan Cooke

Okay. I'm just looking back to what has been said in previous [unclear] where the de-stress mining has been listed as [inaudible segment] previously.

Nick Holland

You've got to remember the 2.7 million ounces is one area. In order for us to sustainably [unclear] that needs to come from that area which starts in the current mine and also new mine which is north of the Wrench fault. If you don't get de-stress in place timeously we can't run the operation with full flexibility and at full volumes [inaudible segment]. In the current mine we will have a base load at full production of probably around about 40%. And then after seven years when south of Wrench comes in it will pay off. It looks like we don't have an issue. But we can't just mine all of that and say we've got all of this to mine because spatially you have to sequence it out.

Alan Cooke

I was looking at the de-stress [unclear] and I looked at that area and [inaudible segment] ounces.

Nick Holland

We could mine that out. We could focus only on the de-stressed area for current mine and we could make some really good cash for a number of years. But then there is no future. What we're trying to do here is we've built a mine that can hoist 330,000 tonnes per month. We've got a mine that can process 370,000 tonnes per month. We've got a backfill plant that will fill in the mining voids. We've got refrigeration capacity and we've got the ore body. So hopefully you will see now that Tim has demonstrated that. So the best proposition is to fill the infrastructure with the right grade and you will get the operational leverage. I guess the good news is we have de-stressed a large proportion of the current mine. Now we have to continue to work to accelerate the de-stress in the new mine. That will underpin getting to full production by 2017. We've got to look at the big picture here, and that's what we keep doing. We're trying to set up a mine here for 60 years. In ten years' time there will be a different bunch of people around here. We are trying to set it up so that this is not only achieving good results but it is sustainable for a long period of time.

Unidentified male speaker

You're hoisting 330,000 tonnes, how does that relate to the waste and backfill?.

Nick Holland

A significant portion of the tailings will go to backfill - 50% is going back. 50% goes back. Again there are opportunities to try and reduce that by looking at in-section waste. Can we use some of the in-section waste? We don't turn it out the mine, put it through the plant and back down. Those are all opportunities. There are lots of opportunities here. The key thing is we want to see a mine focussed on the base plan. We've got a VCR potentially for the future as well. There is Old Mine which is shallower. We've got potential to increase in Corridor 1 and the 'O' Line. But let's not get stars in our eyes. Let's focus on delivering the base plan. We shouldn't be thinking about anything else for the next four years. Can we take some calls on the telephone if there is nobody else in the room? Give the guys on the phone a chance. Okay, Dylan.

Operator

We have a question from Simon Gardiner-Bond of Investec. Please go ahead.

Simon Gardiner-Bond

Hi. The question is relating to a question that was asked in the room about the amount of area that is de-stressed. The reference to page 36. Could I also ask about the number on page 29 where it says 62% of the seven year plan is within the current de-stress areas? Could you expand on that a bit more? And also when you look at the outline on the diagram that is already de-stressed it looks like it has got a wide coverage.

Nick Holland

Manie, would you like to answer that?

Manie Keyser

If we look at some of those percentages we're talking about in the presentation it is really to show that the current de-stress window is giving us the drilling platform that we can drill from. And it informs the measured boundary. So with the current in-fill drilling that we have and the surface and LIB drilling from a structure point of view, those are the percentages we calculated that sits in a measured category from the seven year plan point of view. So that shows us that the bulk of the massive mining component of the plan is really covered almost in the current de-stress window. The brown that you see on slide 36 where you can clearly see the distinct four corridors is really the de-stress component that goes downwards into the south of Wrench area. But remember that that area is not the outline for the massive mining because you still need to honour the 45 degree line that the de-stress opens up for you that you can do the massive mining in the de-stressed shadow. Hence the reason that the percentage of coverage of the plan in the de-stress is that high.

Simon Gardiner-Bond

If I can change tack for a different question, we are wondering why as the mine is progressing quarter by quarter the production and grade is declining and not increasing as the de-stressed areas become more available.

Manie Keyser

The rate of de-stress determines the extraction really from a massive mining point of view as the corridor advances. Currently the furthest advances in corridor four, but not to the maturity level yet of what the corridor should mine at. And the least advanced corridor is really corridor one, because that is where we start mining basically from the yellow outline on some of the slides that the de-stress outline. So all the de-stress corridors really needs to over the next couple of years grow to maturity level where you then will have a consistent growth in your de-stress. That will speed up the process of longhole stoping. Hence the reason longhole stoping is growing over the next seven years from 30% to 70%.

Simon Gardiner-Bond

Okay. Thank you.

Operator

There are currently no further questions from the conference call.

Nick Holland

Okay, Dylan. Thanks. We will see if there is anything final in the room before we close up. Nothing

else. I'd like to thank everyone for joining us today and for those dialling in. I would like to give a special thanks to Tim for a great presentation and all the hard work that himself and Manie and Heinrich have put in. And we hope this gives you a much better perspective of all the work that we've done over the last seven years as Tim has demonstrated to de-risk the ore body and make sure that we've got better resolution to underpin the planning.

But I have to say I think the view we have on the ore body today is as good as it was when we bought South Deep at the end of 2006. It is comforting from our perspective to know that the ore body is there. I think the big challenge now as we've said in previous quarterlies is for us to execute and build our plan. We know that we can execute that, that the ore is there for the taking. With that thanks very much indeed for coming today and we look forward to chatting to you all soon.