PNX Metals

Iron Blow Scoping Study Design

Prepared by Rombus Mining Pty Ltd for PNX Metals Ltd

26 February 2016

Document Identification, History, Status & Distribution

Identification

Document	Scoping Study Design for Iron Blow Deposit
File Name & Path:	C:\Users\Roddy\Documents\0 ROMBUS\Clients\Jobs\011_PNX\DOC_Iron Blow Conceptual Design Re 160226.docx
Author:	Roddy Ormonde
Last Saved:	16 February 2017
Organisation:	Rombus Mining Pty Ltd

History & Status

Issue	Rev No.	Revision	Date	Reviewed	Approved
Working	0	RAO	26/2/16	For review	

Distribution

Copy No	Quantity	Issued to	Date	Comments
	1	JB	26/2/16	Electronic for review

Executive Summary

Rombus Mining Pty Ltd has been contracted by PNX Metals Ltd (PNX) to prepare scoping-study level designs for the Iron Blow Deposit in the Northern Territory, and to schedule and cost the design.

Three option were designed, sequenced, scheduled and costed. The first option with a gold equivalent 3.0 g/t cut-off grade delivered 1.62 Mt of ore. In an effort to increase the resource recovery two subsequent options were run at gold equivalent cut-off grades of 2.5 and 2.7 g/t. Production tonnes are sensitive to cut-off grade in the range 2.5 to 3.0, and an additional 28 - 32% of tonnes, or approximately 500 kt, were added.

PHYSICALS			
	3.0 g/t	2.7 g/t	2.5 g/t
ORE			
TOTAL (kt)	**1,624**	**2,084**	**2,152**
AuEQ (g/t)	**6.1**	**5.3**	**5.2**
ORE (Au g/t)	2.3	2.1	2.1
ORE (Ag g/t)	158	128	125
ORE (Cu %)	0.25	0.25	0.25
ORE (Pb %)	1.09	0.88	0.86
ORE (Zn %)	5.34	4.64	4.57
DEVELOPMENT			
TOTAL (km)	8.2	9.4	9.6
LATERAL (km)	7.7	8.9	9.1
VERTICAL (km)	0.5	0.5	0.5

COSTS			
	Project Totals (1000's)		
	3.0 g/t	2.7 g/t	2.5 g/t
Mining Cost (Operating)	211,104	279,802	270,931
Development Cost	42,948	50,260	49,090
Capital	8,400	8,400	8,400
Total Cost	**262,452**	**338,462**	**328,421**

Total Cost to producing at 350 kt/yr rate	40.7	52.5	52.7

Table of Contents

Table of Figures

List of Tables

1 Background

An outcropping gossan was discovered at the site in 1873, which was subsequently mined as a small open pit and underground operation between 1886 and 1906. Further excavation was conducted in the 1980’s.[1]

A resource model was developed by AMC Consultants Pty Ltd (AMC) in November 2014 which stated a total Inferred Mineral Resource of 2.6 Mt at a gold equivalent (AuEQ) grade of 6.5 g/t. The resource was based on an AuEQ cut-off grade of 0.7 g/t for open pit exploitation and 3.0 g/t for underground operations.[2]

High stripping ratios in open-pit optimisation work by PNX prompted the decision to investigate the viability of an underground operation.

2 Scope

The scope included:

a) Prepare scoping study design for Iron Blow Deposit.
b) Sequence and schedule the design with a target production rate of 350 kt/yr.
c) Provide mine operating and capital costs for the schedule outputs.

3 Data

3.1 Geological

The initial block model provided by PNX was *modas70.dm*. The model used similar price and recovery assumptions to those employed by AMC for calculating the AuEQ grades.

A subsequent model (*ib_1114_m.dm*) was provided by PNX along with more recent price and recovery assumptions to use for calculating AuEQ. The change in recoveries is the result of bench testing. A comparison of the assumptions is collated in the table below.

			Au	Ag	Cu	Pb	Zn
AMC		Price	1300 USD/oz	20 USD/oz	7000 USD/t	2250 USD/t	2350 USD/t
		Recovery	90%	90%	70%	70%	70%
PNX	*modas70.dm*	Price	1311 USD/oz	20 USD/oz	6983 USD/t	2253 USD/t	2320 USD/t
		Recovery	90%	90%	70%	70%	70%
	ib_1114_m.dm	Price	1250 USD/oz	18 USD/oz	6200 USD/t	2000 USD/t	2400 USD/t
		Recovery	55%	75%	60%	60%	80%

TABLE 1 - PRICE AND RECOVERY ASSUMPTIONS

[1] (Bennet, 2016)
[2] (AMC Consultants Pty Ltd, 2016)

Individual mineralisation wireframes were provided for the major East, Central and West Lodes: *wfeast0915tr/pt.dm*, *wfcent0915tr/pt.dm* and *wfwest0915tr/pt.dm*. Wireframes for the minor lodes were combined into *wfminorwtr/pt.dm*.

The existing drillhole database was provided by way of *ass_jul2015.dm* and *dh_lith_jul2015.dm*.

3.2 Geotechnical

No geotechnical information was provided, however the generally good quality of recent diamond drill core reported by PNX employees, led to the assumption that the ore and waste is of reasonable quality, so a level spacing of 20 metre, floor-to-floor, and maximum stope length of 30 metres was adopted.

3.3 As-Builts

Wireframes of surface topography, including the open pit workings were provided (*iron_blow_140914(dtm)tr/pt.dm* and *ib_wastedumpsolidtr/pt.dm*), as were some strings covering the old underground workings. The old workings data shows some development at the 100-foot and 200-foot levels, coinciding with 1060 Level and just above the 1080 Level. Development exists on these levels along strike for a portion of the Eastern Lode, with some minor infrastructure in the hangingwall of the lode.

Evidence of stoping activities between these levels is not evident from the data provided. Further work in this regard would be required prior to developing the 1060 and 1080 levels. This puts some risk of not being able to mine approximately 30 kt of ore between these levels.

Some minor infrastructure is evident in the hangingwall, which while possibly affecting stability and dilution in the aforementioned stopes, will have no effect on the safety and stability of the designed development to the footwall of the Eastern Lode. Further investigation is nonetheless, recommended prior to portal location selection.

4 Design

4.1 Design Parameters

4.1.1 General Considerations

The underground cut-off grade of AuEQ 3.0 g/t determined by AMC was adopted for the design process.

4.1.2 Stoping

a) Geotechnical

No geotechnical data was provided. The shallow environment for the deposit (0-200m below the surface), and the generally good quality of recent diamond drill core reported by PNX employees, led to the assumption that the ore and waste is of reasonable quality, so a level spacing of 20 metre, floor-to-floor, and maximum stope length of 30 metres was adopted.

b) Drilling and Blasting Considerations

The majority of the lodes are less than 10 metres thick, so longitudinal retreat stoping is the predominant method. Where the stope width exceeds 20 metres transverse open stoping with access from a footwall drive has been designed. The narrower stopes would be best drilled by 76 mmØ blast holes, while the transverse stopes would be better suited to 89mm holes. Given the target production rate of 350 kt/yr, the production drilling could be achieved by a single drill rig.

Therefore, drilling assumptions have been based on using 76 mmØ holes, with a productivity of 5 t/metre drilled.

c) Bogging Considerations

In the transverse stopes, drawpoints have been designed at 15 metres long.

It is assumed that 40% of the tonnes may be bogged manually and the remaining 60% bogged under remotes.

4.1.3 Development

a) Portal

The portal has been designed in the steep footwall of the open cut. The footwall of the open cut appears to be steeper than the hangingwall, both of which are reportedly still stable after many years. The assumption drawn from this, even though the wall is not high, is that the footwall ground conditions are favourable, hence the location of the portal.

Note: There is stope on the final lift of the upper sequence which would destabilise the decline. In the next iteration of design the portal should be moved northwards. This can be achieved without affecting the physicals or costs.

b) Gradients

As the designs are at a scoping study level the decline was designed at a gradient of -1:7, and all remaining lateral development was designed with a flat gradient. Fresh air raises were designed between 65° and 85° so they can be equipped with ladderways for emergency egress.

c) Sizes

The decline plus level development in as far the level stockpile was designed to suit 55-tonne trucks. Level development beyond the stockpiles was designed to suit Caterpillar 2900 loaders, or similar.

d) Ground Support

Taking into account the short duration of the project, the shallow depth, and the lack of geotechnical data, it is assumed that all development will be amply supported by galvanised split sets and mesh. All intersection will be cablebolted, as will the ore development for stoping.

e) Decline

A minimum standoff for the decline from stoping of 40m was set.

4.1.4 Backfill

All stopes, apart from the crown pillar (980-1000 Level), and a few uphole stopes in the upper levels, will be filled, with cemented rock fill if it will be exposed, or loose rockfill if not.

4.2 Ventilation

Exhaust is stepped down with the decline every 40 vertical metres. No ventilation modelling was conducted, however the total vertical extent of approximately 200 metres means that while the stepped approach is not very efficient, the total resistance is unlikely to be significant enough to warrant a parallel circuit. For this reason one has not been designed, particularly as the fresh air / escape raises have been designed to convey air and ladderways.

The orebody is open at depth and should additional resource be defined a raisebored hole from the surface will likely be required.

4.3 Sequencing

Individual lodes are sequenced bottom up retreating towards a central crosscut. Without geotechnical modelling no attempt was made to specify leads and lags between lodes.

4.4 Scheduling

The Datamine 5D Planner data was exported EPS for scheduling.

Resources for lateral development and stope bogging were applied to tasks and used for levelling.

Standard industry productivities were applied, which means that the entire workload can be managed with one twin-boom jumbo, three large loaders (Cat 2900 or similar – two for production / development, and one for backfill), one large truck (Cat AD55 or similar), and one production drill rig. This list does not include miscellaneous equipment such as charge-up vehicles, IT's, graders, or light vehicles.

A target production rate of 350,000 t/yr was set by PNX. This was readily achievable in the 3 gram option, with a single jumbo achieving approximately 230 metres per month. For the 2.5 and 2.7 gram options it became necessary to increase the jumbo productivity to 270 metres per month, and speed up the decline from a rate of 90 metres per month to 120 metres per month. This was necessary due to the extra development required in the lower cut-off grade options driven by the footwall and drawpoint development for the transvers stopes. This increase does not take the necessary productivity outside the normal achievable rates. Further optimisation of development priorities may allow the annual production rate to be increased to 400,000 t/yr.

4.5 Options

The scope originally called for a single option. The design was begun using the *modas70.dm* block model and a cut-off grade of AuEQ 3.0 g/t. Significant areas in the lower part of the deposit were suitable for bulking the Western Lode and the Central Lode together to form a series of transvers stoping stopes.

The *ib_1114_m.dm* model was provided just prior to estimating the stoping and development grades for the initial designs. It was considered preferable due to its more recent price and recovery assumptions. The new assumptions reduced the resource average gold-equivalent grade by more than 2 g/t. The effect of the lower grade was to make the grade of much of the Western Lode unsuitable for bulking with the Central Lode, and as the separation of much of it is less than 5 metres, approximately 500 kt of material was removed from the design. By removing the transverse stopes and reverting to narrower longitudinal stopes the footwall drives and drawpoints were also removed, lowering the ore tonnes and the quantity of waste development. The total production for this option was 1.6 Mt @ AuEQ6.1 g/t

It was apparent that a much of the bulked Western Lode and interlude waste was not far below the 3.0 g/t cut-off. A request came from PNX to re-assess the project on an AuEQ 2.5 g/t cut-off grade, and that if the total ore was greater than 2 Mt, to determine a cut-off grade that would provide approximately 2 Mt. Changing the cut-off grade to 2.5 brought back nearly all the previously excluded Western Lode material.

A summary of the physicals from the three options is contained in Table 2 below

PHYSICALS			
	OPTIONS		
	3.0 g/t	2.7 g/t	2.5 g/t
ORE			
TOTAL (kt)	1,624	2,084	2,152
AuEQ (g/t)	6.1	5.3	5.2
STOPE ORE (kt)	1,369	1,780	1,836
AuEQ (g/t)	6.2	5.3	5.3
DEVELOPMENT ORE(kt)	254	304	316
AuEQ (g/t)	5.4	4.9	4.8
ORE (Au g/t)	2.3	2.1	2.1
ORE (Ag g/t)	158	128	125
ORE (Cu %)	0.25	0.25	0.25
ORE (Pb %)	1.09	0.88	0.86
ORE (Zn %)	5.34	4.64	4.57
DEVELOPMENT			
TOTAL (km)	8.2	9.4	9.6
LATERAL (km)	7.7	8.9	9.1
VERTICAL (km)	0.5	0.5	0.5
Capital Lateral (km)	2.9	3.0	3.0
Capital Lateral (kt)	221.0	229.0	229.0
Capital Vertical (km)	0.5	0.5	0.5
Capital Vertical (kt)	17.4	17.5	17.5
Ore (km)	3.7	4.3	4.4
Ore (kt)	254.5	304.2	316.0
Operating Waste (km)	1.2	1.7	1.7
Operating Waste (kt)	70.0	97.5	100.9

TABLE 2 - PHYSICALS SUMMARY

4.6 Costing

Operating and capital costs were estimated previous experience in similar operations.

Total costs for the three options are summarised in Table 3 below.

COSTS			
	Project Totals (1000's)		
	3g	2.5g	2.7g
Operating Cost	211,104	279,802	270,931
Development Cost			
Capital Lateral	13,995	14,691	14,691
Capital Vertical	2,446	2,473	2,473
Capital Waste Haulage	1,073	1,109	1,109
Operating Lateral	23,974	30,112	29,010
Operating Haulage	1,460	1,876	1,807
Capital			
Mobilisation	500	500	500
Demobilisation	400	400	400
Portal Establishment	500	500	500
Fan Instalation	500	500	500
Substation	250	250	250
Pump Station	250	250	250
Misc Capital	6,000	6,000	6,000
Total Cost	262,452	338,462	328,421

TABLE 3 - COST SUMMARY

Table 4 contains the build-up of the operating cost.

IRON BLOW		
SUMMARY (3g)		
Mining Cost		**74.92**
Processing Cost (inc transport)		**47.40**
G&A		**8.01**
Total Cost/tonne		**130.33**

SUMMARY	
Total Ore m	**3,650**
Total Extracted Stope Tonnes	**1,369,407**
No of Stopes	**91**
Ore m per stope	40.11
Dilution Factor (%)	**10.0%**
Mining Recovery Stoping (%)	**95.0%**
Tonnes Reconciliation Factor (%)	100%
Extraction Factor Tonnes (%)	105%
Grade Reconciliation Factor (%)	100%
Designed Stope Tonnes	14,400
Extracted Stope Tonnes	15,048
No of Bulkheads per stope	**1**
Slot Height	**20**
No of Cablebolts (metres per metre of ore dev)	**12**
Drilling Productivity (t/metre_drilled)	**5.0**
Rehandle (No of times)	**0.0**
% Load to Truck	**100.0%**
Truck Haulage Distance to ROM Pad	**1.70**
Truck Haulage Distance to shaft (km)	
Haulage Dist Mine to Mill	**17.00**
% Hoisted via shaft	**0.0%**
SG of Ore (t/m³)	**3.50**
% Manual Bogging	**40.0%**
% CRF	**75.0%**
% RF	**20.0%**

	Unit	Unit Cost	Total Cost ($)	Source
MINING OPERATING COST				
Stope Ground Support (m/Stope)	0.03198	67.00	2.14	Based on previous contract rates for similar operation.
Production Drilling (76mm) (drill m/t)	0.19	34.00	6.51	Based on previous contract rates for similar operation.
Stope Charge Up (76mm) Dry ANFO (ch_m/t)	0.15	39.00	5.97	Based on previous contract rates for similar operation.
Manual bog To Stockpile / Pass (t)	0.40	5.00	2.00	Based on previous contract rates for similar operation.
Remote bog to Stockpile / Pass (t)	0.60	8.00	4.80	Based on previous contract rates for similar operation.
Truck Loading at Stockpile	1.00	3.00	3.00	Based on previous contract rates for similar operation.
Rehandle	0.00	3.00	0.00	Based on previous contract rates for similar operation.
Truck Haulage to Surface (tkm)	1.50	3.00	4.50	Based on previous contract rates for similar operation.
Truck Haulage to Shaft (tkm)	0.00	1.30	0.00	Based on previous contract rates for similar operation.
Shaft Hoisting to Surface (t)	0.00	2.20	0.00	Based on previous contract rates for similar operation.
Surface haulage from mine to mill (t)	1.00	1.36	1.36	PNX
Bulkhead wall to contain backfill (wall per stope)	0.00005	5,500.00	0.27	Based on previous contract rates for similar operation.
CRF (m^3)	0.23	45.00	10.39	Based on previous contract rates for similar operation.
Backfill RF @ 2 t/m³ (m^3)	0.07	10.50	0.78	Based on previous contract rates for similar operation.
Geology	1.00	4.84	4.84	PNX
Mining Overhead (Production) ($/t)	1.00	17.35	17.35	Based on previous contract rates for similar operation.
Power Mining ($/t)	1.00	11.00	11.00	Based on previous contract rates for similar operation.
PROCESSING				
Transport	1.00	4.14	4.14	PNX
Milling (incl power) (t)	1.00	43.26	43.26	PNX
General and Administration (t)	1.00	8.01	8.01	PNX

TABLE 4 - OPERATING COST BREAKDOWN

5 Designs

Designs are supplied in Datamine 5DP format. A separate 5DP project was created for each option. An explanation of each file type is compiled in Table 5 below

File Name	Contents
cxs_*.dm	Stoping strings
fxs_*.dm	Development Strings
wre_all*.dm	Stoping and development wireframes
wred*.dm	Development wireframes
wres*.dm	Stoping wireframes
schedwre_all*.dm	Stoping and development wireframes coloured according to schedule period
EPS_IB*.ews	EPS schedule file
PNX*.s5*	5D Planner project files

TABLE 5 - FILE TYPES

A detailed list of files is provided in Appendix 1 – Files

Design Notes

a) Decline
The decline was designed in spiral form to minimise the development. A maximum gradient of -1:7 resulted in radii between 21 and 25 metres, depending on the lateral off set between level crosscut take-offs. Stockpiles have not been designed on the decline itself. The level stockpiles will suffice for the decline development, and were sequenced such that decline development could not proceed much past a level until the level stockpile is complete.
A minimum standoff for the decline from stoping of 40m was set.

b) Level Development
The level naming convention is based on adding 1000 metres to the elevation.

    c) Crosscuts
    To keep the lengths of crosscuts to a minimum, the only infrastructure placed in the crosscuts is sumps and stockpiles. Sumps are placed on the levels rather than in the declines, to reduce decline road maintenance necessitated when sump pumps fails and sumps overflow. Also, placing sumps on the levels reduces the amount of mud on the decline when sumps are bogged.

    d) Ore Drives
    For ease of design, the ore drives were designed as standard arched drives. Consideration should be given to shanty back drives to reduce dilution.

e) The egress system is designed to be contained within raisebored fresh-air raises. There are two legs to the system, the first of which coincides with the bottom of the first bottom-up sequence at 1000 Level. This system may require an employee to walk a number of levels down to access the egress system. There was insufficient time to check this requirement against the Northern Territory legislation. The raises have been designed to run parallel to the decline system so that if more regular access is required, it can be implemented without significant additional development.

Figure 1 to Figure 8 below convey the principal design elements discuss previously.

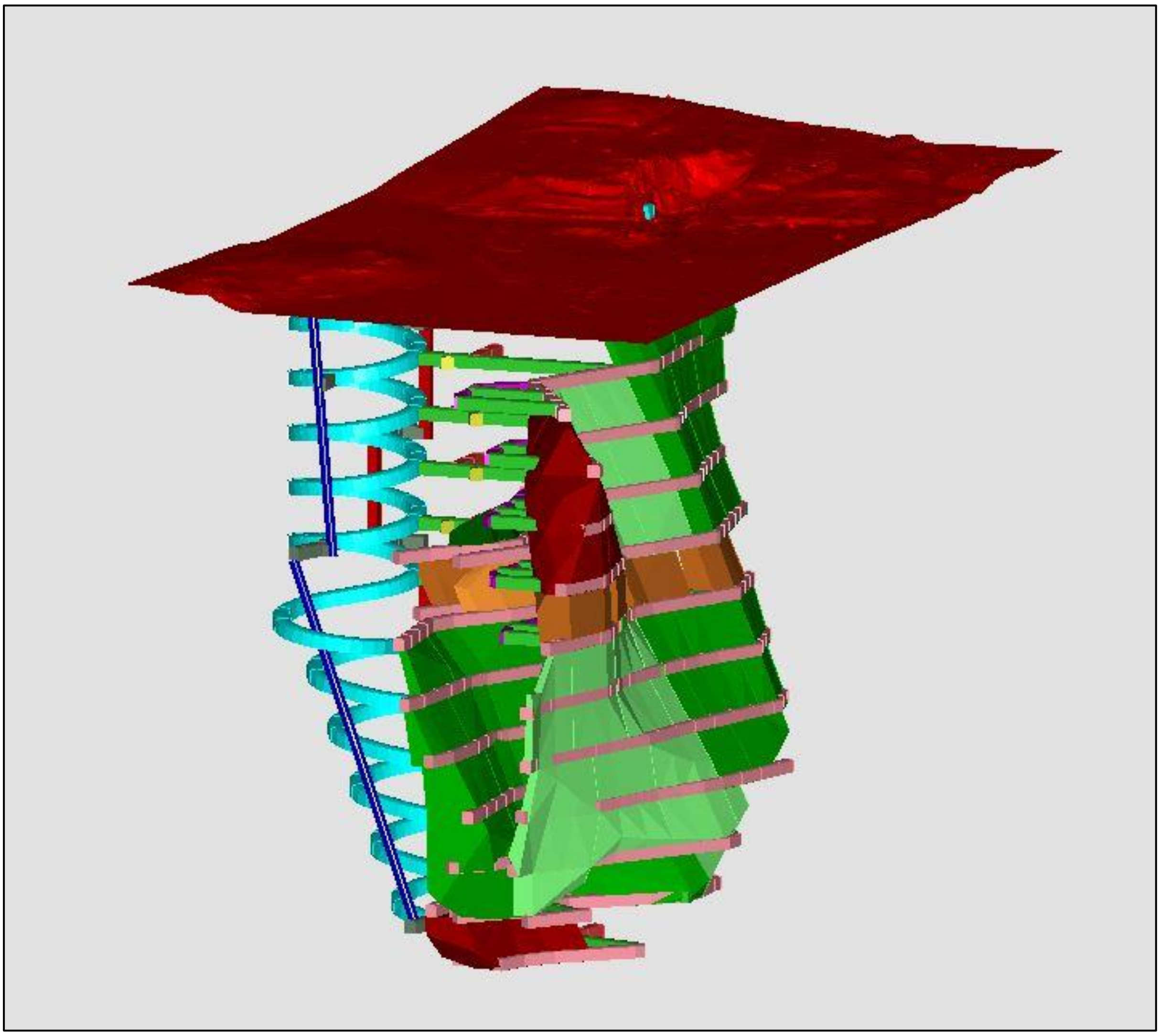

FIGURE 1 - 3.0 GRAM OPTION: ISOMETRIC VIEW FROM THE SE

In Figure 1 above the portal location can be seen as the light blue are in the red, shallow open pit. Longitudinal retreat stopes are represented in green, transverse stopes in red, and blind uphole stopes in brown. The brown stopes represent the crown pillar.

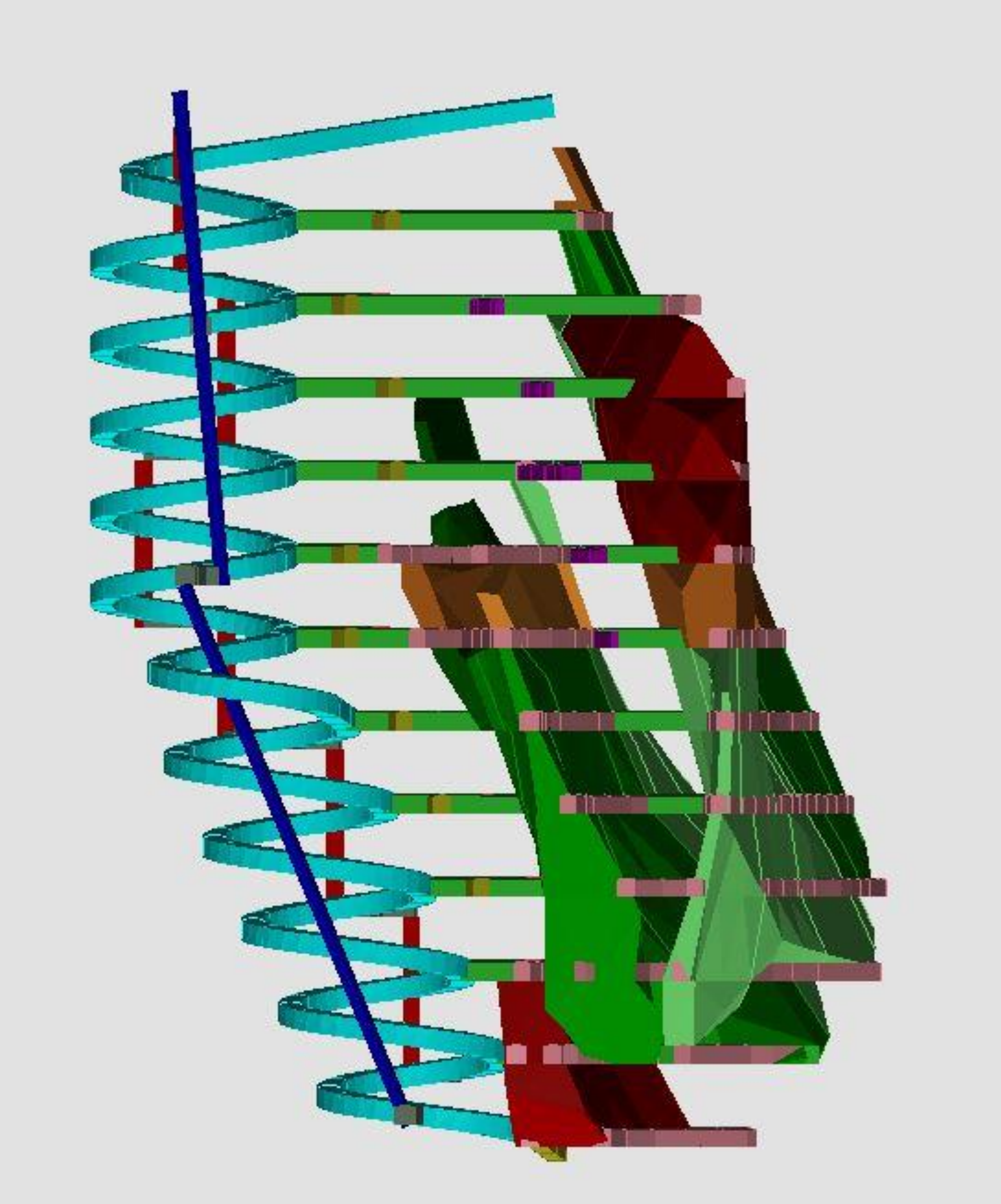

FIGURE 2 - 3.0 GRAM OPTION: CROSS-SECTION VIEW FROM THE SOUTH

Looking north in the figure above it can be seen that in the first lift, above the brown crown pillar, nearly all of the stoping is in the Eastern Lode. Below the pillar both the Central and Eastern Lodes are mined extensively, but the Central has greater width. The Western Lode is mined in preference to the Central Lode on the 860 and 880 level as the grade is higher.

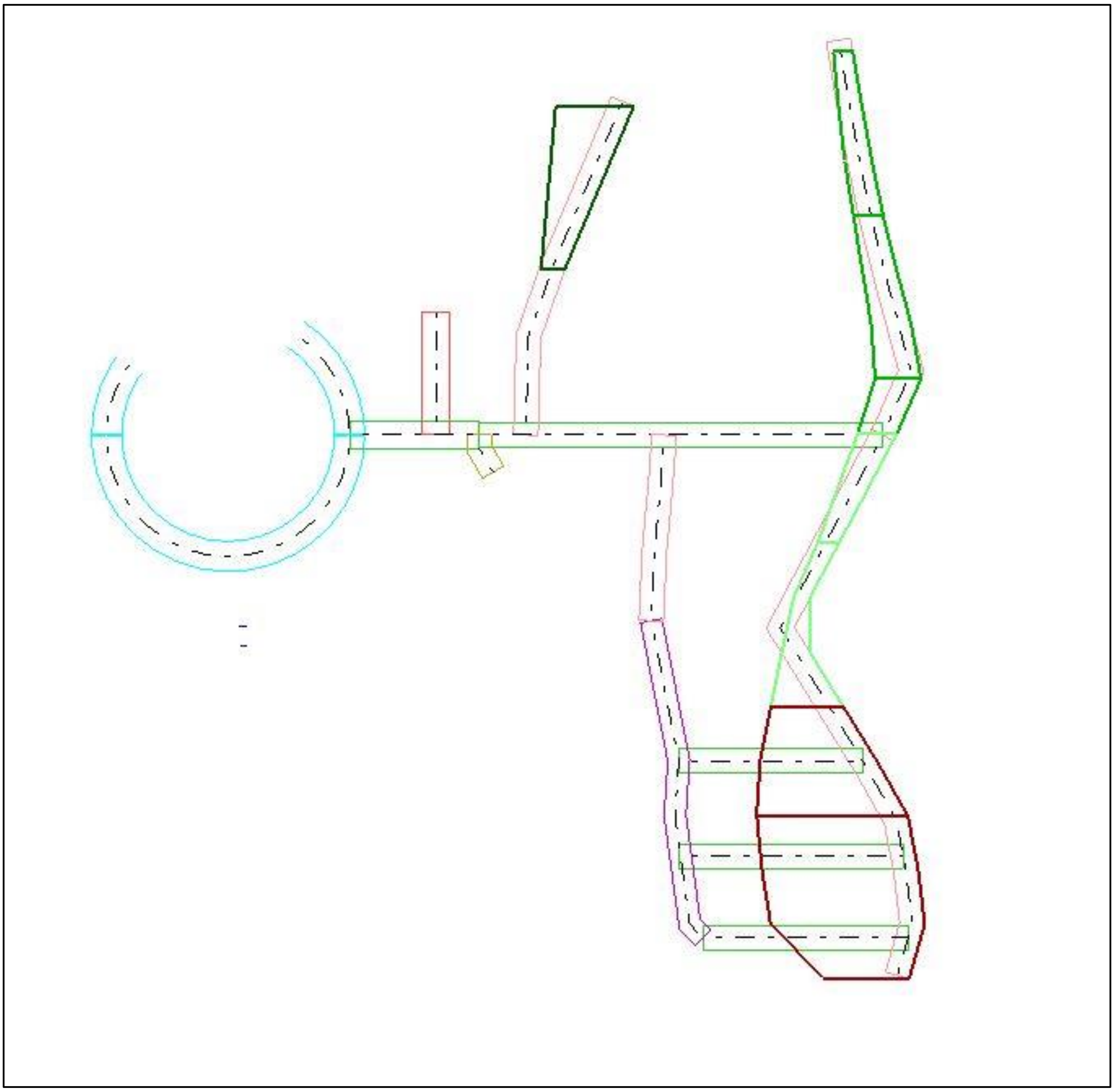

FIGURE 3 - 3.0 GRAM OPTION: 1020 LEVEL

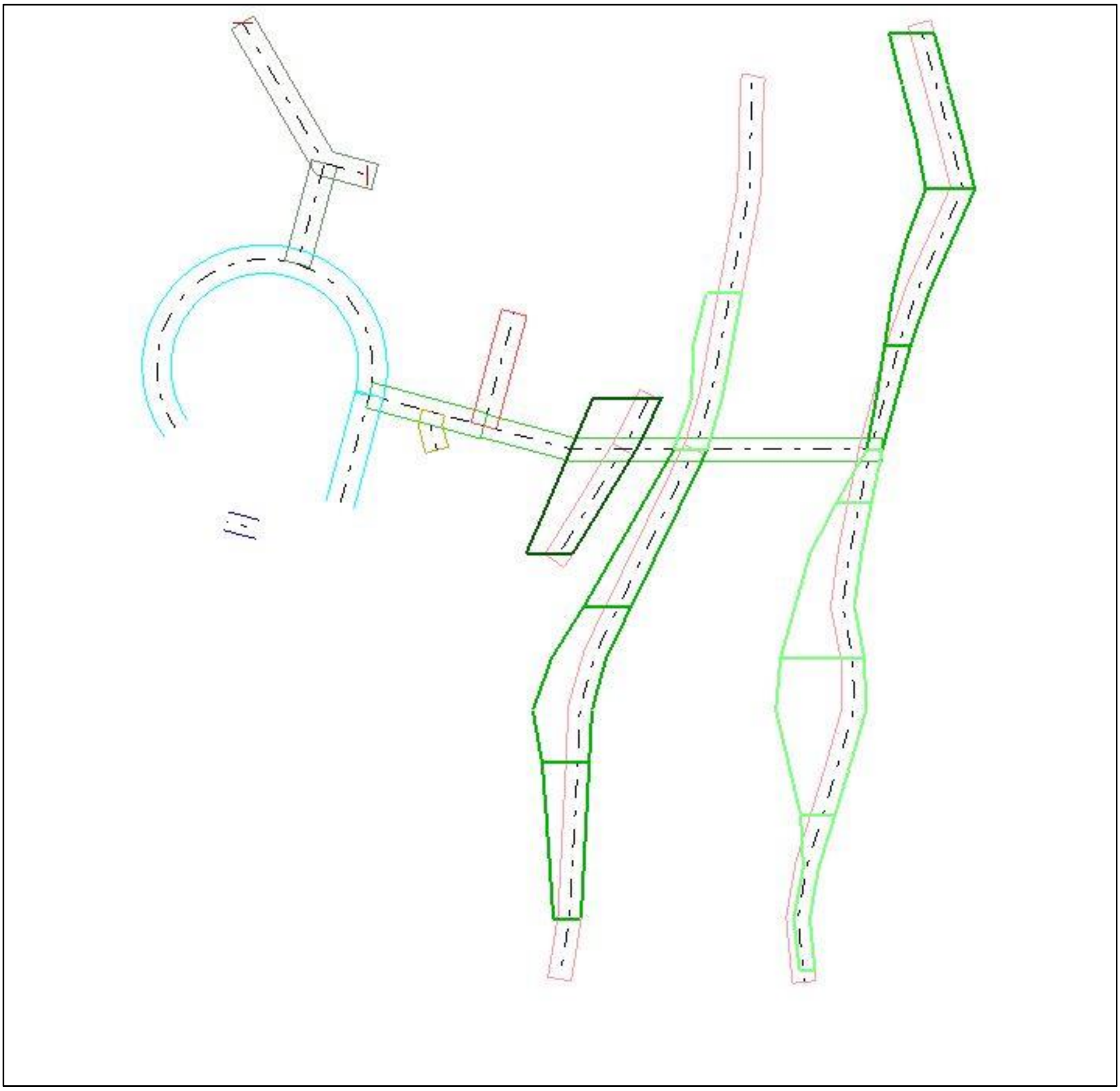

FIGURE 4 - 3.0 GRAM OPTION: 960 LEVEL

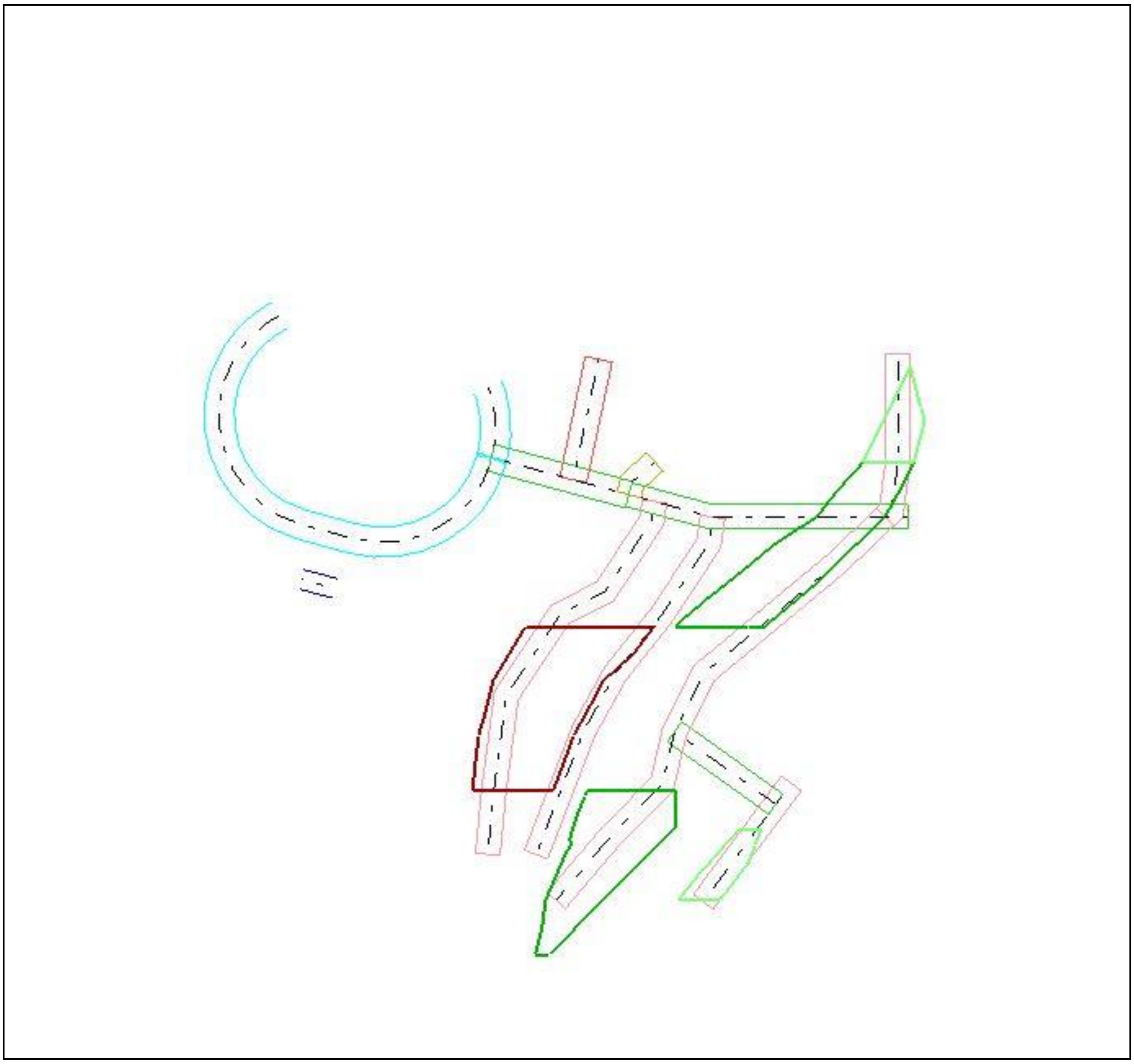

FIGURE 5: 3.0 GRAM OPTION: 880 LEVEL

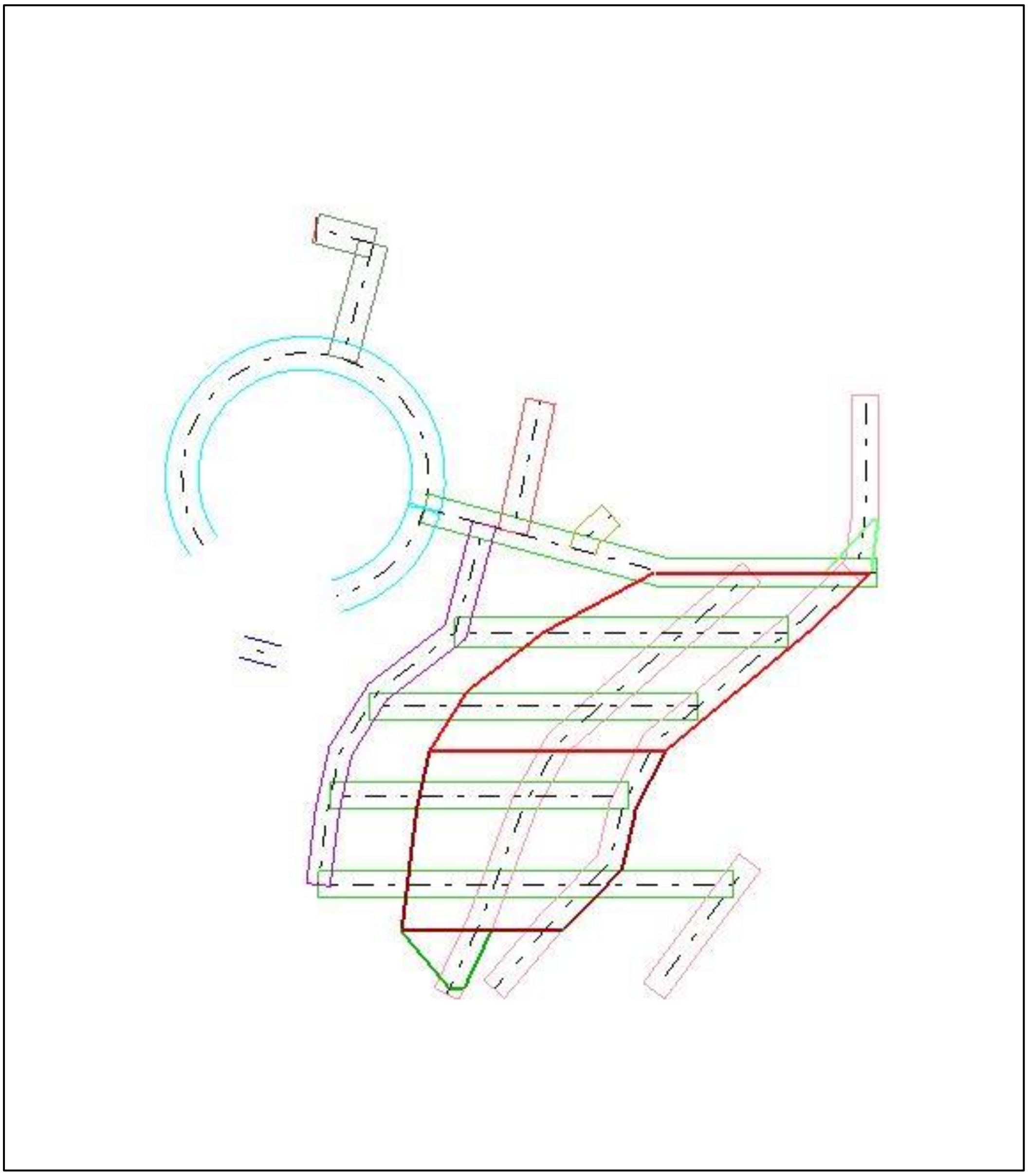

FIGURE 6 - 2.7 GRAM OPTION: 880 LEVEL

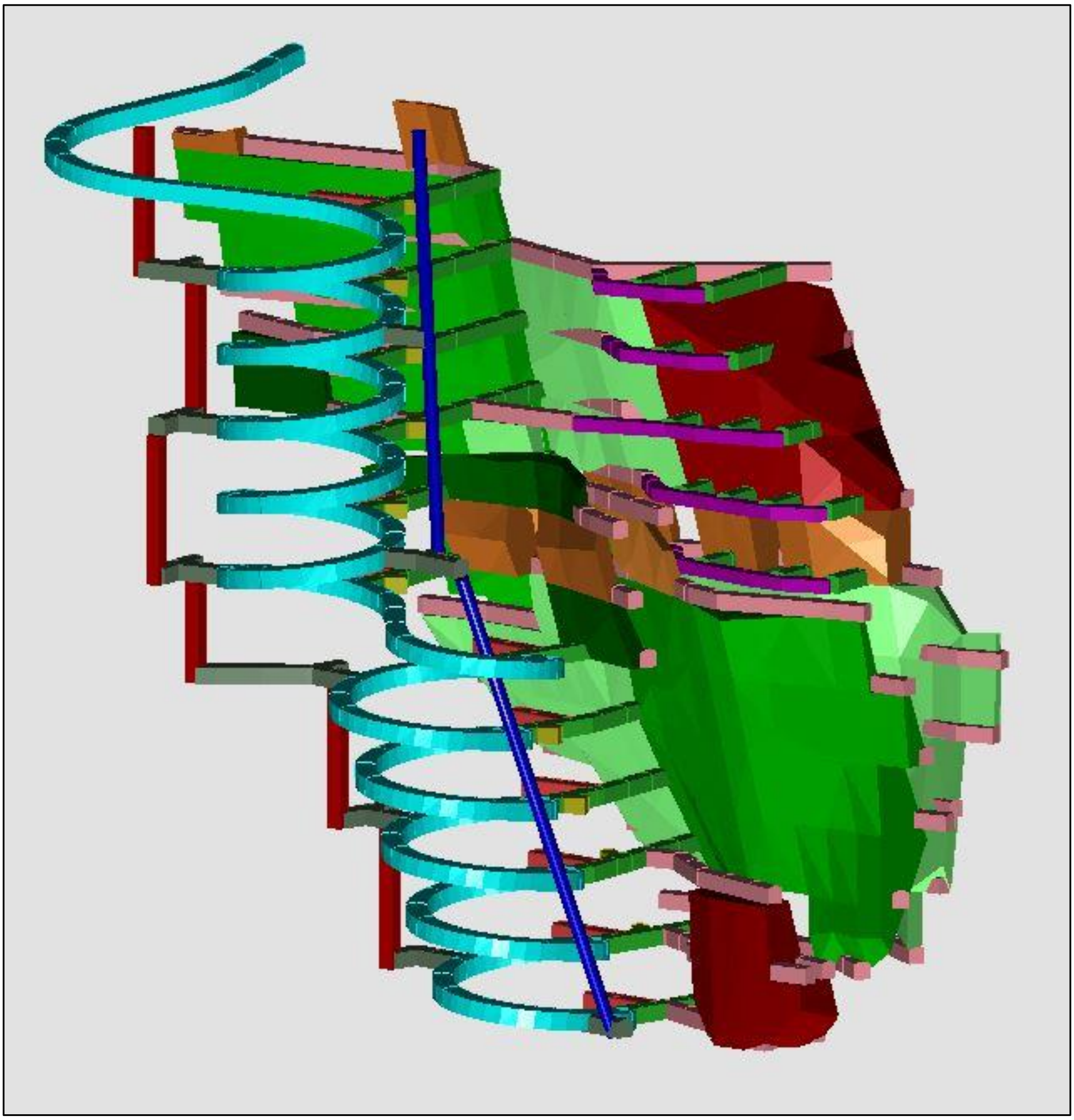

FIGURE 7 - 3.0 GRAM OPTION - ISOMETRIC VIEW FROM SW

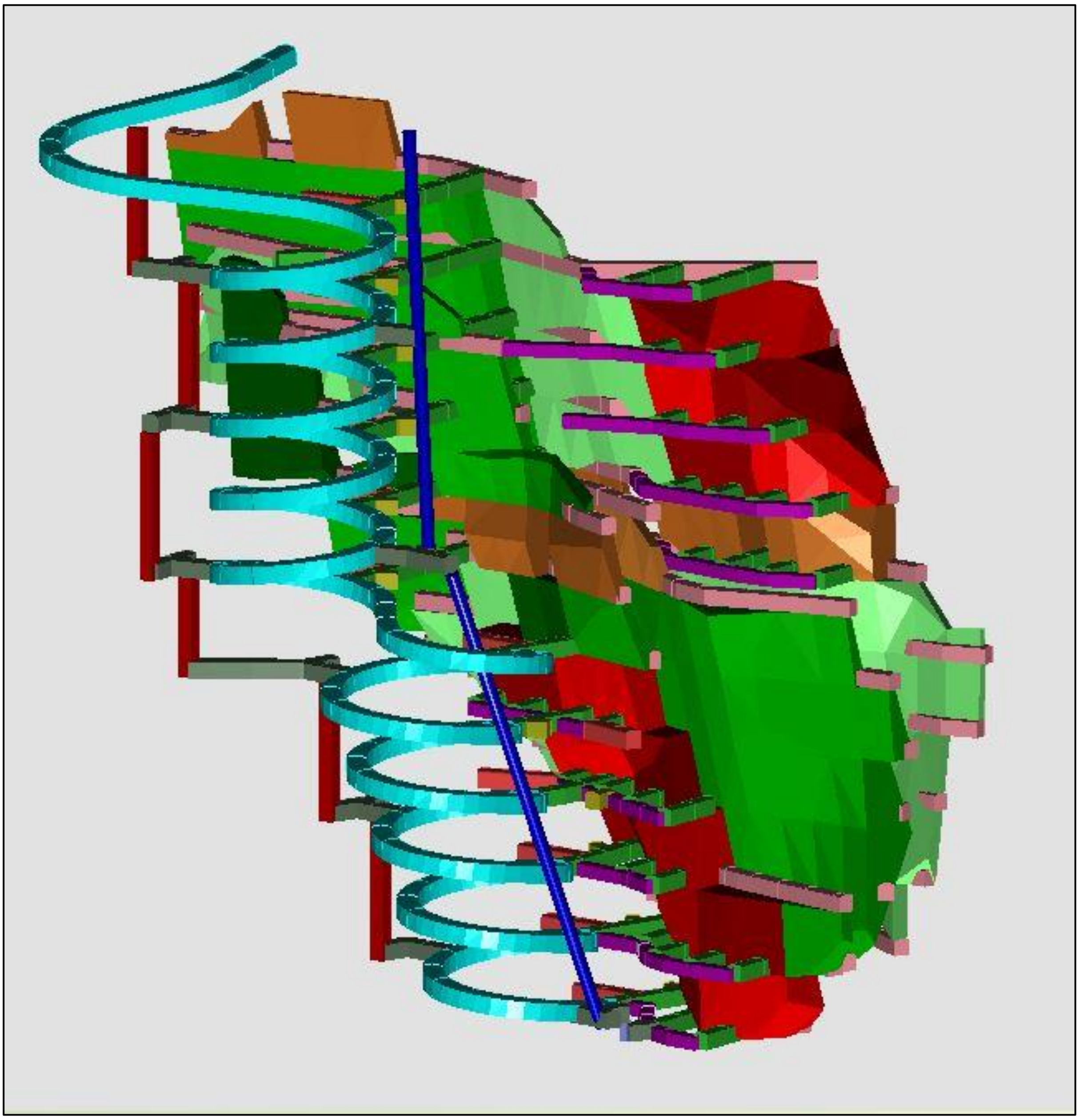

FIGURE 8 - 2.7 GRAM OPTION - ISOMETRIC VIEW FROM SW

Notice the extra development and transverse stoping (red) in the lower cut-off grade option represented in Figure 8.

There is stope on the final lift of the upper sequence which would destabilise the decline. In the next iteration of design the portal should be moved northwards. This can be achieved without affecting the physicals or costs. For this reason the stope physicals remain in the schedule. The stope in question can be seen as the large brown stope on the uppermost level in Figure 8 but has been removed from Figure 7

The uppermost leg of the return air system is 15m too short. This is a minor error in the design which will require amending on the next iteration of the design. The effect on the error is not material in assessing the viability of the project.

6 Further Work

Limited time for completion of the scope precluded the ability to iterate the designs. It is evident that the physicals are sensitive to cut-off grade in the 2.5 to 3.0 g/t range. Therefore, additional work to refine the mining cost assumptions, and recalculate a cut-off grade is recommended. Further metallurgical bench testing to refine recovery assumptions will enhance the next stage of cut-off grade analysis.

Consider racecourse design for decline if can be afforded. The increased safety provided by longer views up and down the decline at crosscut take-offs, and reduced wear on the drivetrains of heavy equipment are points in favour of the design. However, it is more expensive due to the longer crosscuts every second level.

7 Appendices

Appendix 1 – Files

All files are delivered electronically compressed in *ToClient.zip*

5DP	2_5	cxs_ib_25TMP.dm	2_7	cxs_ib_25TMP.dm	3_0	cxs_ib.dm
		EPS_IB_1stPass_25_4.ews		EPS_IB_1stPass_27_4.ews		EPS_IB_2ndPass_30.ews
		fxs_ib_25.dm		fxs_ib_25.dm		fxs_ib.dm
		links0.dm		links0.dm		links0.dm
		mine2sub.dat		mine2sub.dat		mine2sub.dat
		PNX_1st.s5d		PNX_1st.s5d		PNX_2nd.s5d
		PNX_1st.s5dproj		PNX_1st.s5dproj		PNX_2nd.s5dproj
		pointd0.dm		pointd0.dm		pointd0.dm
		points0.dm		points0.dm		points0.dm
		points_all_0.dm		points_all_0.dm		points_all_0.dm
		schedpoint_all_0.dm		schedpoint_all_0.dm		schedpoint_all_0.dm
		schedwall_all_0.dm		schedwall_all_0.dm		schedwall_all_0.dm
		schedwre_all_0pt.dm		schedwre_all_0pt.dm		schedwre_all_0pt.dm
		schedwre_all_0tr.dm		schedwre_all_0tr.dm		schedwre_all_0tr.dm
		walld0.dm		walld0.dm		walld0.dm
		walls0.dm		walls0.dm		walls0.dm
		walls_all_0.dm		walls_all_0.dm		walls_all_0.dm
		wred0pt.dm		wred0pt.dm		wred0pt.dm
		wred0tr.dm		wred0tr.dm		wred0tr.dm
		wres0pt.dm		wres0pt.dm		wres0pt.dm
		wres0tr.dm		wres0tr.dm		wres0tr.dm
		wre_all_0pt.dm		wre_all_0pt.dm		wre_all_0pt.dm
		wre_all_0tr.dm		wre_all_0tr.dm		wre_all_0tr.dm
DOCS		Cost Breakdown - to PNX 160226.xlsx				
		Schedules and costs 160226 0945.xlsx				

Appendix 2 – Schedules

3.0 g/t Option

	TOTAL	Pre-Start	6 MONTH SCHEDULE													
			Jan-17	Jul-17	Jan-18	Jul-18	Jan-19	Jul-19	Jan-20	Jul-20	Jan-21	Jul-21	Jan-22	Jul-22	Jan-23	Jul-23
PHYSICALS																
ORE																
TOTAL (t)	**1,623,876**		**6,068**	**35,474**	**87,333**	**175,000**	**175,000**	**175,000**	**175,000**	**175,000**	**175,000**	**175,000**	**175,000**	**95,002**		
AuEQ (g/t)	**6.1**		**4.8**	**4.8**	**4.1**	**5.7**	**6.3**	**5.4**	**4.9**	**7.3**	**5.0**	**8.7**	**6.9**	**5.9**		
STOPE ORE (t)	**1,369,407**			3,214	40,248	119,543	115,359	121,304	174,738	175,000	175,000	175,000	175,000	95,002		
AuEQ (g/t)	**6.2**			3.2	3.3	5.8	6.2	5.9	4.9	7.3	5.0	8.7	6.9	5.9		
DEVELOPMENT ORE (t)	**254,469**		6,068	32,260	47,085	55,457	59,641	53,696	262							
AuEQ (g/t)	**5.4**		4.8	5.0	4.8	5.6	6.5	4.6	2.7							
ORE (Au g/t)	**2.3**		1.7	2.4	2.3	2.2	2.1	2.0	2.4	2.8	2.0	3.1	2.2	2.3		
ORE (Ag g/t)	**158**		156	127	78	151	198	135	81	188	109	268	178	158		
ORE (Cu %)	**0.25**		0.11	0.13	0.16	0.20	0.21	0.23	0.32	0.33	0.26	0.30	0.26	0.22		
ORE (Pb %)	**1.09**		0.67	0.99	0.78	1.29	1.38	0.93	0.51	1.17	0.77	1.59	1.19	1.20		
ORE (Zn %)	**5.34**		3.88	3.53	3.43	4.79	5.02	5.00	4.67	6.34	4.76	7.02	6.69	5.00		
DEVELOPMENT																
TOTAL (m)	**8,238**		**907**	**1,438**	**1,553**	**1,465**	**1,414**	**1,457**	**3**							
LATERAL (m)	**7,749**		**867**	**1,398**	**1,394**	**1,436**	**1,374**	**1,276**	**3**							
VERTICAL (m)	**489**		**40**	**40**	**159**	**29**	**40**	**181**								
Capital Lateral (m)	**2,856**		646	496	444	368	490	412								
Capital Lateral (t)	**221,024**		50,770	38,748	34,201	28,021	37,981	31,303								
Capital Vertical (m)	**489**		40	40	159	29	40	181								
Capital Vertical (t)	**17,434**		1,746	1,766	5,090	1,300	1,766	5,765								
Ore (m)	**3,650**		94	503	699	791	841	718	3							
Ore (t)	**254,469**		6,068	32,260	47,085	55,457	59,641	53,696	262							
Operating Waste (m)	**1,242**		127	399	250	277	44	146								
Operating Waste (t)	**70,036**		7,625	21,977	13,851	15,183	2,606	8,795								

2.7 g/t option

			6 MONTH SCHEDULE													
	TOTAL	Pre-Start	Jan-17	Jul-17	Jan-18	Jul-18	Jan-19	Jul-19	Jan-20	Jul-20	Jan-21	Jul-21	Jan-22	Jul-22	Jan-23	Jul-23
PHYSICALS																
ORE																
TOTAL (t)	**2,084,083**		**9,598**	**38,734**	**128,052**	**175,000**	**175,000**	**175,000**	**175,000**	**175,000**	**175,000**	**175,000**	**175,000**	**175,000**	**175,000**	**157,700**
AuEQ (g/t)	**5.3**		**2.4**	**5.8**	**5.9**	**6.1**	**4.2**	**5.1**	**7.2**	**5.8**	**5.2**	**5.8**	**4.5**	**4.2**	**4.7**	**4.7**
STOPE ORE (t)	**1,779,884**				72,340	125,693	92,990	106,161	175,000	175,000	175,000	175,000	175,000	175,000	175,000	157,700
AuEQ (g/t)	**5.3**				7.1	7.0	3.4	4.7	7.2	5.8	5.2	5.8	4.5	4.2	4.7	4.7
DEVELOPMENT ORE (t)	**304,199**		9,598	38,734	55,711	49,307	82,010	68,839								
AuEQ (g/t)	**4.9**		2.4	5.8	4.3	3.4	5.1	6.1								
ORE (Au g/t)	**2.1**		1.1	2.1	2.1	2.1	2.5	2.1	3.5	2.5	2.1	2.2	1.4	1.5	1.8	1.8
ORE (Ag g/t)	**128**		68	187	185	171	90	120	180	151	114	165	82	75	102	102
ORE (Cu %)	**0.25**		0.11	0.17	0.23	0.24	0.17	0.20	0.37	0.30	0.32	0.24	0.26	0.23	0.23	0.23
ORE (Pb %)	**0.88**		0.31	1.41	1.46	1.29	0.78	0.89	1.03	0.95	0.71	1.02	0.53	0.51	0.74	0.74
ORE (Zn %)	**4.64**		1.79	4.22	4.44	5.14	3.00	4.58	5.68	4.70	4.85	4.87	5.16	4.50	4.45	4.45
DEVELOPMENT																
TOTAL (m)	**9,413**		**1,296**	**1,924**	**1,706**	**1,754**	**1,667**	**1,066**								
LATERAL (m)	**8,918**		**1,256**	**1,725**	**1,676**	**1,674**	**1,521**	**1,066**								
VERTICAL (m)	**495**		**40**	**199**	**29**	**80**	**146**									
Capital Lateral (m)	**2,998**		836	717	587	716	91	50								
Capital Lateral (t)	**228,986**		66,194	56,087	44,036	53,563	5,696	3,410								
Capital Vertical (m)	**495**		40	199	29	80	146									
Capital Vertical (t)	**17,493**		1,746	6,857	1,300	3,533	4,057									
Ore (m)	**4,259**		147	568	755	651	1,186	952								
Ore (t)	**304,199**		9,598	38,734	55,711	49,307	82,010	68,839								
Operating Waste (m)	**1,661**		273	440	334	307	244	64								
Operating Waste (t)	**97,453**		17,285	25,081	18,648	17,572	14,873	3,994								

2.5 g/t Option

			6 MONTH SCHEDULE													
	TOTAL	**Pre-Start**	**Jan-17**	**Jul-17**	**Jan-18**	**Jul-18**	**Jan-19**	**Jul-19**	**Jan-20**	**Jul-20**	**Jan-21**	**Jul-21**	**Jan-22**	**Jul-22**	**Jan-23**	**Jul-23**
PHYSICALS																
ORE																
TOTAL (t)	**2,152,323**		**9,598**	**38,734**	**128,052**	**175,000**	**175,000**	**175,000**	**175,000**	**175,000**	**175,000**	**175,000**	**175,000**	**175,000**	**200,470**	**200,470**
AuEQ (g/t)	**5.2**		**2.4**	**5.8**	**5.9**	**6.1**	**4.1**	**5.0**	**7.2**	**5.8**	**5.2**	**5.7**	**4.5**	**4.2**	**4.5**	**4.5**
STOPE ORE (t)	**1,836,292**				72,340	125,693	87,327	99,992	175,000	175,000	175,000	175,000	175,000	175,000	200,470	200,470
AuEQ (g/t)	**5.3**				7.1	7.0	3.4	4.7	7.2	5.8	5.2	5.7	4.5	4.2	4.5	4.5
DEVELOPMENT ORE (t)	**316,031**		9,598	38,734	55,711	49,307	87,673	75,008								
AuEQ (g/t)	**4.8**		2.4	5.8	4.3	3.4	4.9	5.8								
ORE (Au g/t)	**2.1**		1.1	2.1	2.1	2.1	2.5	2.1	3.5	2.5	2.0	2.2	1.4	1.5	1.9	1.9
ORE (Ag g/t)	**125**		68	187	185	171	86	117	180	151	112	160	82	75	96	96
ORE (Cu %)	**0.25**		0.11	0.17	0.23	0.24	0.17	0.20	0.37	0.30	0.32	0.23	0.26	0.23	0.22	0.22
ORE (Pb %)	**0.86**		0.31	1.41	1.46	1.29	0.74	0.87	1.03	0.95	0.71	1.01	0.53	0.51	0.70	0.70
ORE (Zn %)	**4.57**		1.79	4.22	4.44	5.14	3.00	4.52	5.68	4.70	4.88	4.69	5.16	4.50	4.24	4.24
DEVELOPMENT																
TOTAL (m)	**9,638**		**1,330**	**1,924**	**1,706**	**1,754**	**1,773**	**1,151**								
LATERAL (m)	**9,143**		**1,290**	**1,725**	**1,676**	**1,674**	**1,627**	**1,151**								
VERTICAL (m)	**495**		**40**	**199**	**29**	**80**	**146**									
Capital Lateral (m)	**2,998**		836	717	587	716	91	50								
Capital Lateral (t)	**228,986**		66,194	56,087	44,036	53,563	5,696	3,410								
Capital Vertical (m)	**495**		40	199	29	80	146									
Capital Vertical (t)	**17,493**		1,746	6,857	1,300	3,533	4,057									
Ore (m)	**4,425**		147	568	755	651	1,268	1,036								
Ore (t)	**316,031**		9,598	38,734	55,711	49,307	87,673	75,008								
Operating Waste (m)	**1,720**		308	440	334	307	268	64								
Operating Waste (t)	**100,855**		19,310	25,081	18,648	17,572	16,250	3,994								

Appendix 3 – Costs

3.0 g/t Option

	TOTAL	Pre-Start	Jan-17	Jul-17	Jan-18	Jul-18	Jan-19	Jul-19	Jan-20	Jul-20	Jan-21	Jul-21	Jan-22	Jul-22	Jan-23	Jul-23
			6 MONTH COSTS													
COSTS (1,000's)																
Operating Cost (Excl Devt)	**211,104**		789	4,612	11,353	22,750	22,750	22,750	22,750	22,750	22,750	22,750	22,750	12,350		
DEVELOPMENT																
Capital Lateral	**13,995**		3,165	2,431	2,176	1,803	2,399	2,021								
Capital Vertical	**2,446**		200	200	795	147	200	904								
Capital Waste Haulage	**1,073**		236	182	177	132	179	167								
Operating Lateral	**23,974**		1,082	4,419	4,653	5,233	4,335	4,234	17							
Operating Haulage	**1,460**		62	244	274	318	280	281	1							
Capital																
Mobilisation	**500**	500														
Demobilisation	**400**	400														
Portal Establishment	**500**	500														
Fan Instalation	**500**		500													
Substation	**250**	250														
Pump Station	**250**					250										
Misc Capital	**6,000**		500	500	500	500	500	500	500	500	500	500	500	500		
Total Cost	**262,452**	**1,650**	**6,534**	**12,588**	**19,929**	**31,133**	**30,643**	**30,857**	**23,268**	**23,250**	**23,250**	**23,250**	**23,250**	**12,850**		
		Total Cost to Ore at annualised 350,000 t/yr			40,701											

2.7 g/t option

	TOTAL	Pre-Start	6 MONTH COSTS													
			Jan-17	Jul-17	Jan-18	Jul-18	Jan-19	Jul-19	Jan-20	Jul-20	Jan-21	Jul-21	Jan-22	Jul-22	Jan-23	Jul-23
COSTS (1,000's)																
Operating Cost (Excl Devt)	**270,931**		1,248	5,035	16,647	22,750	22,750	22,750	22,750	22,750	22,750	22,750	22,750	22,750	22,750	20,501
DEVELOPMENT																
Capital Lateral	**14,691**		4,098	3,514	2,874	3,511	448	246								
Capital Vertical	**2,473**		200	995	147	400	730									
Capital Waste Haulage	**1,109**		306	283	204	257	44	15								
Operating Lateral	**29,010**		2,054	4,940	5,339	4,693	7,007	4,978								
Operating Haulage	**1,807**		121	287	335	301	436	328								
Capital																
Mobilisation	**500**	500														
Demobilisation	**400**	400														
Portal Establishment	**500**	500														
Fan Instalation	**500**		500													
Substation	**250**	250														
Pump Station	**250**	250														
Misc Capital	**6,000**		500	500	500	500	500	500	500	500	500	500	500	500		
Total Cost	**328,421**	**1,900**	**9,027**	**15,555**	**26,045**	**32,411**	**31,915**	**28,817**	**23,250**	**23,250**	**23,250**	**23,250**	**23,250**	**23,250**	**22,750**	**20,501**
		Total Cost to Ore at annualised 350,000 t/yr			52,527											

2.5 g/t Option

	TOTAL	Pre-Start	Jan-17	Jul-17	Jan-18	Jul-18	Jan-19	Jul-19	Jan-20	Jul-20	Jan-21	Jul-21	Jan-22	Jul-22	Jan-23	Jul-23
			6 MONTH COSTS													
COSTS (1,000's)																
Operating Cost (Excl Devt)	**279,802**		1,248	5,035	16,647	22,750	22,750	22,750	22,750	22,750	22,750	22,750	22,750	22,750	26,061	26,061
DEVELOPMENT																
Capital Lateral	**14,691**		4,098	3,514	2,874	3,511	448	246								
Capital Vertical	**2,473**		200	995	147	400	730									
Capital Waste Haulage	**1,109**		306	283	204	257	44	15								
Operating Lateral	**30,112**		2,225	4,940	5,339	4,693	7,523	5,393								
Operating Haulage	**1,876**		130	287	335	301	468	356								
Capital																
Mobilisation	**500**	500														
Demobilisation	**400**	400														
Portal Establishment	**500**	500														
Fan Instalation	**500**		500													
Substation	**250**	250														
Pump Station	**250**	250														
Misc Capital	**6,000**		500	500	500	500	500	500	500	500	500	500	500	500		
Total Cost	**338,462**	**1,900**	**9,206**	**15,555**	**26,045**	**32,411**	**32,463**	**29,259**	**23,250**	**23,250**	**23,250**	**23,250**	**23,250**	**23,250**	**26,061**	**26,061**
		Total Cost to Ore at annualised 350,000 t/yr			52,706											

8 References

Bennet, A. (2015). *Mining the Territory 2015 Iron Blow and Mt Bonnie Metals: A New Generation*.

AMC Consultants Pty Ltd, (2014). *Iron Blow Deposit*. Wayville.