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Appendix

Appendix 1

Table 4.2.2.1: Fe concentration in selected vein quartz deposits in Badulla

Site Name	Milky	Rose	Smokey	Transparent	Mica	Feldspar
Q 1	13			10		
	15			8		
Q 2	23	27				
	18	34				
Q 3	22	33	31	9	28	
	24	31	28	7	24	
Q 4	19		18	9		303
	22		24	12		313
Q 5	10	29			19	
	11	26			27	
Q 6		34	31			751
		26	27			722
Q 7			23		18	740
			26		15	743

Appendix 2

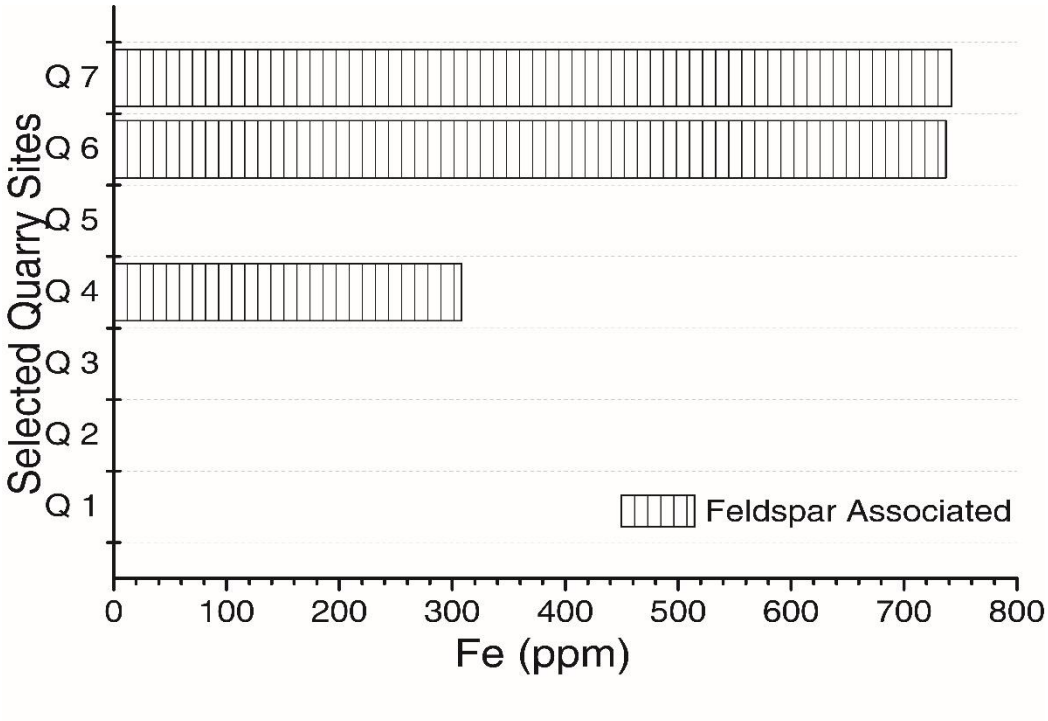

Figure 4.2.2.1-1: Fe concentration in feldspar-associated quartz

Appendix 3

Table 4.2.2.2: Al concentration in selected vein quartz deposits in Badulla

Site Name	ppm					
	Milky	**Rose**	**Smokey**	**Transparent**	**Mica**	**Feldspar**
Q 1	110			85		
	110			92		
Q 2	78	160				
	82	168				
Q 3	140	205	280	87	156	
	115	211	296	82	325	
Q 4	112		283	78		740
	100		259	83		743
Q 5	130	140			157	
	121	131			135	
Q 6		122	356			1715
		134	314			1738
Q 7			238		240	1959
			231		278	1905

Appendix 4

Table 4.2.2.3: Cr concentration in selected vein quartz deposits in Badulla

Site Name	ppb					
	Milky	**Rose**	**Smokey**	**Transparent**	**Mica**	**Feldspar**
Q 1	213			220		
	191			205		
Q 2	126	702				
	172	1784				
Q 3	184	1288	183	226	844	
	203	1369	196	232	891	
Q 4	105		272	252		868
	93		261	267		870
Q 5	240				931	
	198				896	
Q 6		960	808			1421
		689	790			
Q 7			293		911	1176
			250		934	

Appendix 5

Table 4.2.2.4: Mn concentration in selected vein quartz deposits in Badulla

Site Name	ppb					
	Milky	**Rose**	**Smokey**	**Transparent**	**Mica**	**Feldspar**
Q 1	189 168			209 190		
Q 2	180 156	495 315				
Q 3	350 188	644 596	390 331	201 180	693	
Q 4	240 233		363 347	204 213		18405 16887
Q 5	242 221				865 831	
Q 6		696 817	380 236			518
Q 7			238 221		926 1062	480

Appendix 6

Table 4.2.2.5: Ni concentration in selected vein quartz deposits in Badulla

Site Name	ppb					
	Milky	**Rose**	**Smokey**	**Transparent**	**Mica**	**Feldspar**
Q 1	50			42		
	70			30		
Q 2	41	1580				
	52	1970				
Q 3	92	1172	820	32	817	
	103	1065	791	39		
Q 4	78		478	38		1175
	63		401	43		1661
Q 5	60				1161	
	56					
Q 6		1248	1296			860
		1201	1640			
Q 7			991		1709	807
			1026		1409	

Appendix 7

Table 4.6: Fe concentration in trailer contaminated quartz and clean quartz

Site Name	Fe (ppm) in Quartz	
	Clean	**Trailer contaminated**
Q 1	13	167
	15	168
Q 2	23	136
	18	135
Q 3	22	114
	24	121
Q 4	19	150
	22	147
Q 5	10	113
	11	121

Appendix 8

Prevention techniques of iron in quartz processing plant,

Crusher Feeder Bin

- Feeder bin should be thoroughly cleaned to remove any iron oxide crust until shining metal is exposed before feeding any new raw material. This has to be carried out by clean wire brush. Any oil or kerosene should not be used for cleaning.

Jaw crusher

- Crusher mouth should be thoroughly cleaned to remove any iron oxide crust until shining metal is exposed before feeding any new raw material. This is carried out by clean wire brush. Any oil or kerosene should not be used for cleaning.
- Alloy steel jaw plates should be used for crushing.
- Permanent full plate magnet should be fixed just after the delivery of output to the conveyer belt to capture the external iron particles. The strength of full plate magnet should exceed 12,000 gauss and the external width should be 30 mm excess to the width of the conveyor belt. Recommended brand name is Atlas Copco. Magnetic drum full with captured iron should be replaced by an extra drum and the former cleaned after removal. New magnet has to be in place before removing the existing magnetic drum while removal should be at every predetermined time interval with the maximum at 3 hrs and the minimum is 1 ½ hrs. Timing interval is valid for the above specified brand only. It should be ensured that no oil contamination takes place when the drum is replaced. Magnetic drum angular velocity and linear velocity of the convey belt should be synchronized at the processing stage. Gap between magnetic drum surface and conveyor belt surface should be optimized to ensure maximum external iron removal. Magnetic drum's strength should be measured periodically and ensured that it should possess the necessary standard magnetic strength required for effective removal of external iron particles. If the magnetic strength is below the specified 10,000 gauss level, it should be replaced by a new one.

Conveyer Belt

- Full plate permanent magnets should be placed at every five-meter intervals above the flow level of the conveyer, at the optimized gap ensuring an extra sprocket at every location to remove iron particles. It is noted that all specified safeguard detailed out above should be observed wherever a magnet is located.
- Magnetic drums should also be placed near the point of the highest scattering of material for maximum capture of external iron particles.
- Ideally, the conveyer belt should be made of hard vulcanized rubber. In the existing setup, hence not endless belts, it is advised to cover belt joints properly with hard vulcanized rubber.

Roller Crusher

- Roller gaps should be optimized to minimize external iron contamination.
- Roller rotation speed should be optimized to minimize iron contamination.
- Roller gaps should be optimized to minimize the finer fraction (< 1 mm).

Vibrating Screen

- Material of screen mesh should be Ni free or less Ni material such as SUS 430, SUS 316 or SUS 304.
- Every 4 hour inspection of screen mesh is required to minimize over size and under size contamination.
- Feeding rate should be optimized for proper screening and reduce mesh damage.
- Permanent Full Plate Magnet should be fixed just after the delivery of output to the conveyer belt to capture the external iron particles. The strength of full plate magnet should exceed 12,000 gauss and the length should be 30 mm excess to the width of the conveyor belt.

Magnetic Separator

- Production flow should be optimized to capture the Fe material and Magnetic roller strength should be measured periodically and ensured that it should possess the necessary standard magnetic strength required for effective removal of external iron particles. If the magnetic strength is below the specified 10,000 gauss level, it should be replaced by a new one.

- Material and the thickness of rubber belt should not be changed in any situation, which may directly affect magnetism.

Centrifugal Pulveriizer

- Feeding rate should be optimized to build an inner layer and maximum output.
- Continuous feeding as well as recirculation of oversized material in same path with optimum speed should be considered.
- Exchange of spare parts with originals and on time with optimum condition is important.
- Removal of dust created inside the pulverizer should be considered to avoid contamination with products and the recommended power of the dust collector is 15 kW.

Swing Screen

- Material of screen mesh should be Ni free or less Ni material such as SUS 430, SUS 316 or SUS 304.
- An every 4 hour interval inspection of screen mesh is required to minimize over size and undersize contamination and to avoid mesh blocking and mesh damages.
- Feeding rate should be optimized for proper screening and reduce mesh damages

Tray type permanent Magnetic Separator

- Production flow should be optimized to do better magnetic separation
- Every hour magnets should have cleaned and replaced
- Minimum number of trays in the magnetic separator should be 12
- Magnetic tray strength should be measured periodically and ensured that it should possess the necessary standard magnetic strength required for effective removal of external iron particles