

BOLIDEN - WESTMIN CANADA LTD
Myra Falls Operation
January 2004 Ore Reserves

830733

MFO GLOBAL RECONCILIATIONS – 1998 to Present

BOLIDEN - WESTMIN CANADA LTD
Myra Falls Operation
January 2004 Ore Reserves
Reconciled Tonnage and Grade for 2003

MYRA FALL OPERATION 2003 ACTUAL VS BUDGET		BUDGET					ACTUAL					BUDGET TONNES ACTUAL GRADES					ACTUAL TONNES BUDGET GRADES					
MINE	AREA	BUD TNS	BUD CU	BUD PB	BUD ZN	BUD ZN	ACT TNS	ACT CU	ACT PB	ACT ZN	ACT FE	BUD TNS	ACT CU	ACT PB	ACT ZN	ACT FE	ACT TNS	BG	BUD CU	BUD PB	BUD ZN	BUD ZN
BG	18 LEV Total	17,660	0.71	0.36	5.45	5.09	13,677	0.84	0.36	7.51	15.46	17,660	0.59	0.11	4.38	16.80	13,677	0.44	0.22	3.36	3.14	
BG	G Total	39,599	1.60	0.54	12.03	10.01	36,424	1.69	0.54	15.88	10.52	39,599	1.23	0.20	13.85	7.57	36,424	1.40	0.60	12.00	8.50	
BG	GN Total	96,599	1.29	0.77	11.34	10.23	74,700	1.22	0.81	10.73	10.92	96,599	0.66	0.41	6.12	7.50	74,700	0.66	0.40	5.85	5.19	
BG	H Total	20,483	0.71	1.00	7.20	5.41	11,143	0.35	0.43	4.17	15.06	20,483	0.24	0.29	2.49	19.69	11,143	0.76	0.90	7.36	5.66	
BG	J Total	20,509	0.60	0.60	5.50	4.60	17,866	1.43	0.32	5.71	13.58	20,509	1.21	0.24	4.39	12.90	17,866	0.60	0.60	5.50	4.60	
BG	M Total	152,888	1.64	0.34	12.78	11.61	120,034	1.47	0.23	11.12	12.34	152,888	1.41	0.18	10.22	10.78	120,034	1.85	0.36	13.67	12.39	
BG	ST Total	43,168	1.49	0.18	11.75	14.27	47,947	1.94	0.32	11.51	17.36	43,168	1.86	0.30	11.29	16.93	47,947	1.52	0.18	12.00	14.38	
BG	BATTLE Total	516,847	1.46	0.57	11.32	10.97	320,191	1.44	0.43	10.92	12.86	516,847	1.15	0.25	8.72	11.17	320,191	1.31	0.40	10.31	9.53	
BG	GAP Total	125,941	1.70	0.80	11.80	12.70	125,941	2.19	0.64	13.82	18.48	125,941	2.04	0.48	9.85	21.89	125,941	1.38	0.65	9.41	10.30	
BG Total		516,847	1.46	0.57	11.32	10.97	449,126	1.66	0.49	11.69	14.47	516,847	1.36	0.30	8.99	13.74	449,126	1.33	0.47	10.05	9.75	
HW	23 LEV Total	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0	0.00	0.00	0.00	0	0	0.00	0.00	0.00	0.00	
	B Total	67,868	1.51	0.43	5.89	14.07	43,776	1.26	0.32	4.70	15.60	67,868	0.74	0.19	2.89	8.62	43,776	1.41	0.47	5.53	13.64	
	BP Total	200,341	2.10	0.13	2.71	27.82	196,343	2.27	0.17	3.37	28.05	200,341	1.73	0.27	4.59	26.19	196,343	2.06	0.17	2.99	27.02	
	C	32,500	1.30	0.00	1.00	26.20	19,255	0.69	0.05	0.77	29.99	32,500	0.69	0.05	0.77	29.99	10,455	1.30	0.00	1.00	26.20	
	C Total	35,839	1.30	0.00	1.00	26.20	13,211	0.65	0.05	0.77	28.30	35,839	0.67	0.05	0.77	29.24	13,211	1.30	0.00	1.00	26.20	
	F Total	11,520	1.26	0.50	6.13	16.29	30,190	0.75	1.32	6.87	9.42	11,520	1.07	2.35	11.01	7.12	30,190	0.28	0.11	1.37	3.63	
	K Total	14,652	1.10	0.40	4.10	14.00	7,903	1.63	0.04	1.66	17.85	14,652	0.79	0.02	0.80	8.66	7,903	1.10	0.40	4.10	14.00	
	N Total	11,890	2.23	0.08	2.18	30.66	22,184	1.26	0.04	0.77	25.88	11,890	1.65	0.05	1.03	27.49	22,184	1.19	0.04	1.15	16.70	
	S Total	20,000	1.40	0.10	1.20	28.90	19,237	0.32	0.05	3.04	26.31	20,000	0.50	0.05	1.92	32.30	43,237	0.19	0.01	0.17	3.99	
	SF Total	53,410	1.87	1.10	10.15	10.19	37,998	1.82	1.28	11.16	9.79	53,410	1.71	1.08	10.14	9.80	67,998	1.65	1.10	9.89	10.27	
U Total	42,524	0.54	1.83	6.23	6.53	28,989	0.54	2.60	8.39	4.34	42,524	0.25	1.17	3.96	1.87	28,989	0.45	2.49	7.19	4.43		
HW Total		458,044	1.67	0.45	4.29	21.01	452,721	1.60	0.56	4.94	20.87	458,044	1.26	0.45	4.45	18.81	452,721	1.45	0.46	3.98	17.27	
43BLK Total		78,615	1.68	0.94	5.36	13.22	146,253	1.59	0.41	5.30	13.63	78,615	1.47	0.26	4.30	12.52	146,253	0.84	0.23	2.01	4.75	
LYNX	LYNX	0	1.00	1.10	6.00	9.00	6,156	1.17	0.62	3.58	10.25	0	1.17	0.62	3.58	10.25	6,156	1.00	1.10	6.00	9.00	
Grand Total		1,053,505	1.57	0.54	7.82	15.50	1,054,256	1.62	0.51	7.86	17.12	1,053,505	1.33	0.36	6.67	15.90	1,054,256	1.28	0.43	6.31	12.28	
	TONNES		CU %	PB %	ZN %	FE %																
	2003 BUDGET	1,053,505	1.57	0.54	7.82	15.50																
	2003 STOPE PROD	1,054,256	1.62	0.51	7.86	17.12																
	@85 %		1.38		6.68																	
	TRAMMED	1,088,783	1.61	0.58	8.31	17.07																
	@85 %		1.37		7.06																	
	SKIPPED	1,046,262																				
	@85 % - 2.76 % H2O	1,017,385																				
	MILLED DRY	1,035,989	1.35	0.42	6.50	16.12																

BOLIDEN - WESTMIN CANADA LTD

Myra Falls Operation January 2004 Ore Reserves

Reconciled Tonnage and Grade for 2002

MYRA FALL OPERATION 2002 ACTUAL VS BUDGET		BUDGET					ACTUAL					BUDGET TONNES ACTUAL GRADES				ACTUAL TONNES BUDGET GRADES					
MINE	AREA	BUD_TNS	BUD_CU	BUD_PB	BUD_ZN	BUD_FE	ACT_TNS	ACT_CU	ACT_PB	ACT_ZN	ACT_FE	BUD_TNS_AG	ACT_CU	ACT_PB	ACT_ZN	ACT_FE	ACT_TNS_BG	BUD_CU	BUD_PB	BUD_ZN	BUD_FE
	18 LEV Total	6885	1.23	0.43	9.40	7.60	18068	1.96	0.69	14.92	14.35	6885	1.98	0.38	11.50	14.98	18068	1.15	0.34	8.69	9.73
	G Total	50982	1.78	0.11	13.66	10.50	39605	2.14	0.23	11.75	17.35	50982	2.13	0.20	11.96	16.78	39605	1.73	0.11	13.04	10.29
	GN Total	43920	1.11	0.68	10.00	9.63	44420	1.36	0.61	10.68	13.19	43920	1.54	0.61	10.08	13.89	44420	1.12	0.64	10.36	9.64
	H Total	32858	0.58	1.27	6.37	5.28	36985	1.47	2.16	15.60	7.70	32858	1.46	2.11	16.13	7.29	36985	0.57	1.22	6.13	5.13
	J Total	22000	1.17	0.22	6.14	9.92	24296	0.97	0.17	5.17	10.90	22000	0.93	0.19	4.84	10.85	24296	1.19	0.22	6.07	9.76
	M Total	97024	1.49	0.28	12.16	10.59	110299	1.86	0.60	15.78	12.07	97024	1.75	0.48	13.23	11.06	110299	1.45	0.30	12.30	10.19
	ST Total	39404	1.36	0.16	13.59	13.31	42747	1.65	0.24	9.68	15.85	39404	1.57	0.28	9.33	15.63	42747	1.35	0.17	13.82	12.49
	T Total	6936	2.30	0.25	20.67	11.80	9723	2.68	0.36	22.43	13.16	6936	2.68	0.36	22.43	13.16	9723	2.30	0.25	20.67	11.80
	GAP Total	41257	1.39	1.97	16.02	9.47	40345	2.50	0.69	18.15	19.03	41257	2.50	0.59	15.76	20.14	40345	1.29	2.18	17.79	9.29
BG Total		341266	1.36	0.59	11.91	10.04	366488	1.80	0.66	13.69	13.61	341266	1.79	0.58	12.38	13.65	366488	1.31	0.60	11.94	9.78
	28 LEV Total	0	0.00	0.00	0.00	0.00	1201	0.94	0.70	9.38	6.72	0	0.00	0.00	0.00	0.00	1201	1.00	2.00	5.00	5.00
	23 LEV Total	6930	2.13	0.09	2.65	24.82	353	0.50	0.00	0.50	30.00	6930	0.17	0.00	0.17	10.00	353	3.00	0.17	4.68	28.67
	B Total	32670	1.61	0.26	6.08	16.24	21437	1.72	0.45	4.93	16.45	32670	1.74	0.38	4.06	13.71	21437	1.58	0.29	6.31	16.81
	BP Total	81200	2.08	0.18	3.54	25.05	76637	1.64	0.17	6.29	28.15	81200	1.12	0.13	4.96	22.27	76637	1.71	0.27	4.47	23.65
	C Total	15000	1.30	0.06	0.83	27.77	140	1.30	0.06	0.83	27.77	15000	1.30	0.06	0.83	27.77	140	1.30	0.06	0.83	27.77
	F Total	18200	1.26	0.50	6.13	16.29	9923	1.04	1.56	10.51	8.99	18200	0.64	0.96	6.47	5.53	9923	1.26	0.50	6.13	16.29
	K Total	12300	1.83	0.07	2.58	22.70	14557	1.67	0.05	2.31	24.28	12300	1.68	0.05	2.31	24.19	14557	1.82	0.07	2.56	22.72
	N Total	21600	1.52	0.05	0.90	26.73	30405	1.73	0.04	1.28	27.82	21600	2.00	0.05	1.48	29.50	30405	1.55	0.05	1.19	27.31
	S Total	60230	1.31	0.26	3.08	27.35	25728	1.31	0.21	1.66	33.17	60230	0.74	0.16	1.25	17.75	25728	1.82	0.32	2.24	27.19
	SF Total	77990	1.63	1.16	9.76	11.94	43626	1.47	1.08	9.64	14.58	77990	0.78	0.78	5.50	6.28	43626	1.47	0.57	9.70	14.92
	U Total	31440	0.55	2.63	8.44	5.53	25805	0.61	3.29	10.90	4.26	31440	0.92	3.23	10.81	5.84	25805	0.45	3.00	8.93	4.64
HW Total		357560	1.56	0.63	5.29	19.76	249812	1.46	0.71	6.09	21.70	357560	1.06	0.60	4.39	15.42	249812	1.51	0.59	6.33	19.90
	42BLK Total	42890	1.42	0.42	4.71	10.94	98844	1.39	0.51	5.68	11.14	42890	1.26	0.46	5.48	11.20	98844	1.47	0.47	4.89	11.54
	43BLK Total	64280	1.25	0.47	4.43	11.01	41949	1.34	0.41	4.14	11.99	64280	0.76	0.21	2.15	6.64	41949	1.42	0.41	4.70	10.53
43BLK Total		107170	1.31	0.45	4.54	10.98	140793	1.38	0.48	5.22	11.39	107170	0.96	0.31	3.48	8.47	140793	1.45	0.45	4.83	11.24
LYNX	LYNX	25000	1.00	1.10	6.00	9.00	15767	0.60	0.47	6.48	6.78	25000	0.60	0.47	6.48	6.78	15767	1.00	1.10	6.00	9.00
Grand Total		830996	1.43	0.60	7.93	14.31	772860	1.59	0.64	9.54	15.68	830996	1.33	0.55	7.62	13.54	772860	1.40	0.58	8.39	13.30
	TONNES		CU %	PB %	ZN %	FE %															
	2002 BUDGET	830996	1.43	0.60	7.93	14.31															
	2002 STOPE PROD	772860	1.59	0.64	9.54	15.68															
	@85 %		1.35		8.11																
	TRAMMED	788889	1.62	0.64	9.45	16.63															
	@85 %		1.38		8.03																
	SKIPPED	778718																			
	@ 85 % - 2.76 % H2O	757225																			
	MILLED DRY	773858	1.22	0.45	7.29	14.78															

* PRODUCTION AND BUDGET NUMBERS EXCLUDE GENERAL INVENTORY DRAW DOWN OF 40,000 TONNES WHICH WAS BUDGETED FOR JAN - MAR 02

BOLIDEN - WESTMIN CANADA LTD

Myra Falls Operation

January 2004 Ore Reserves

Reconciled Tonnage and Grade for 2001

MYRA FALL OPERATION			BUDGET					ACTUAL					BUDGET TONNES					ACTUAL TONNES				
2001 ACTUAL VS BUDGET													ACTUAL GRADES					BUDGET GRADES				
MINE	AREA	STOPE	TONNES	CU	PB	ZN	FE	TONNES	CU	PB	ZN	FE	TONNES	CU	PB	ZN	FE	TONNES	CU	PB	ZN	FE
	18 Total		2400	1.30	0.30	10.15	7.20	20425	1.06	0.31	9.00	13.36	2400	2.02	0.03	16.02	16.75	20425	1.03	0.21	5.93	6.92
	G Total		79205	1.61	0.17	12.40	12.30	50512	2.99	0.55	24.38	20.83	55167	2.29	0.50	21.21	14.99	50512	2.15	0.20	15.24	18.67
	H Total		19128	0.32	0.80	5.46	4.90	19285	0.84	1.61	10.06	6.38	19128	0.81	2.07	11.61	7.06	19285	0.34	0.78	5.43	5.05
	J Total		4590	1.07	0.08	4.30	9.17	18522	0.41	0.03	1.72	4.92	21710	0.23	0.02	0.97	2.78	18522	0.40	0.03	1.60	3.42
	M Total		94987	1.74	0.37	12.66	11.41	35376	4.78	0.94	34.26	32.83	20193	6.00	1.96	46.42	40.31	35376	3.93	0.73	29.12	26.35
	GAP Total		48023	1.71	0.61	12.39	16.18	29625	2.21	1.14	13.14	20.10	42311	1.35	0.35	5.01	13.13	29625	1.50	0.55	9.60	16.16
	ST Total		157566	1.86	0.14	8.68	15.38	52889	6.64	0.77	37.29	66.28	46625	5.81	0.86	35.51	63.19	52889	7.08	0.48	30.73	55.44
	T Total		19890	2.00	0.16	7.04	12.24	41176	1.04	0.12	5.39	5.65	46173	1.44	0.08	7.41	7.80	41176	0.63	0.05	2.31	3.87
	23 Total		9360	0.87	0.31	2.56	13.93	8026	1.03	0.31	4.09	25.89	9360	0.00	0.00	0.00	0.00	8026	1.22	0.69	2.73	18.31
	B Total		15099	1.61	0.03	0.71	29.06	0	0.00	0.00	0.00	0.00	15099	0.00	0.00	0.00	0.00	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	BP Total		311014	1.76	0.12	3.04	24.57	209999	2.17	0.10	3.05	29.12	311014	1.49	0.08	2.02	21.11	209999	1.84	0.07	2.63	25.33
	C Total		58951	1.34	0.05	0.82	27.76	24231	0.63	0.13	1.28	20.39	58951	0.70	0.08	1.10	31.37	24231	1.30	0.06	0.82	27.72
	F Total		17550	1.24	0.52	6.34	15.60	17942	1.05	0.69	6.50	18.05	17550	0.98	0.59	5.32	19.32	17942	1.21	0.54	6.51	15.02
	K Total		5850	1.34	0.09	2.15	20.32	51480	1.81	0.10	2.22	25.44	5850	1.99	0.08	2.44	23.83	51480	1.53	0.08	1.69	24.22
	43BLK Total		95451	1.41	0.39	4.69	10.39	82326	1.04	0.35	3.63	10.18	95451	0.32	0.12	1.13	3.98	82326	1.39	0.39	4.67	10.20
	N Total		31976	2.38	0.08	1.66	25.01	7930	1.14	0.04	1.08	32.18	31976	0.43	0.01	0.20	9.30	7930	2.59	0.05	0.67	23.57
	S Total		80674	1.53	0.08	0.92	31.03	74230	1.27	0.11	2.00	32.83	80674	0.35	0.04	2.38	14.42	74230	1.27	0.11	2.00	32.83
	SF Total		27950	1.33	1.07	8.10	8.00	40053	1.60	0.93	8.99	14.76	27950	1.67	0.85	9.79	14.54	40053	1.60	0.93	8.99	14.76
	U Total		47550	0.76	1.66	5.54	7.42	45900	1.16	2.02	9.87	12.81	47550	0.82	1.13	6.29	8.87	45900	1.16	2.02	9.87	12.81
	HW Total		701425	1.58	0.30	3.16	21.54	562117	1.59	0.38	3.92	23.78	701425	0.99	0.19	2.39	16.40	562117	1.55	0.36	3.82	21.88
	L Total		31000	1.00	1.10	6.00	9.00	1715	0.86	0.88	4.43	6.37	31000	1.00	1.10	6.00	9.00	1715	0.88	4.43	6.37	0.00
	Grand Total		1158214	1.60	0.31	5.90	18.17	997754	1.73	0.39	7.66	20.44	1158214	1.24	0.30	5.90	15.41	997754	1.61	0.31	6.23	18.13
			TONNES	CU %	PB %	ZN %	FE %	TONNES VAR	CU VAR	PB VAR	ZN VAR	FE VAR										
	2001 BUDGET		1158214	1.60	0.31	5.90	18.17															
	2001 BUDGET-NOV		1060549	1.61	0.32	5.93	18.21															
	ACTUAL MUCKING		997754	1.73	0.39	7.66	20.44	-62795	0.12	0.07	1.73	2.23										
	@85 %			1.47	0.33	6.52	17.38		-0.14	0.01	0.59	-0.83										
	TRAMMED		1008564	1.77	0.42	8.07																
	@85 %			1.50	0.36	6.86																
	SKIPPED		1026804	1.43	0.75	7.85																
	MILLED DRY		978608	1.58	0.28	6.52	19.47	-81941	-0.03	-0.04	0.59	1.26										

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Reconciled Tonnage and Grade for 2000

MYRA FALL OPERATION 2000 YEAR PLAN VS ACTUAL				PLANNED					ACTUAL					PLAN TONNES ACTUAL GRADES			ACTUAL TONNES PLAN GRADES		
MINE	GROUP	SOURCE		PLAN TONNES	CU	PB	ZN	FE	ACT TONNES	CU	PB	ZN	FE	PLAN TNS	ACT CU	ACT ZN	ACT TNS	PL CU	PL ZN
BG	18LEV Total			14376	1.67	0.35	9.77	12.54	12187	1.54	0.33	11.04	12.36	14376	0.30	1.61	12187	1.50	7.98
BG	G STOPES Total			113847	1.78	0.15	11.47	14.68	96420	2.02	0.27	14.19	19.01	113847	1.42	10.32	96420	1.69	11.64
BG	H STOPES Total			10640	0.47	0.89	5.17	5.49	26100	1.56	0.35	7.27	16.58	10640	1.99	6.33	26100	0.56	6.79
BG	J STOPES Total			13094	1.95	0.20	7.63	15.09	10127	0.91	0.20	6.16	11.70	13094	0.91	6.16	10127	1.95	7.63
BG	M STOPES Total			99150	1.77	0.51	12.50	10.33	79688	2.37	0.50	12.90	14.81	99150	1.78	10.92	79688	1.86	12.98
BG	P STOPES Total			36600	1.65	0.13	7.15	19.61	20919	1.23	0.15	6.05	27.77	36600	1.30	6.19	20919	1.65	7.15
BG	S STOPES Total			120452	1.90	0.24	7.43	19.55	144523	1.89	0.24	7.95	21.42	120452	2.28	8.92	144523	1.68	7.14
BG	T STOPES Total			7770	2.48	0.12	8.59	17.59	13920	3.04	0.08	5.22	21.29	7770	3.04	5.22	13920	2.48	8.59
BG	IMPROV Total			11500	1.81	0.29	9.81	16.13	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00
	BG Total			427429	1.78	0.29	9.77	15.27	403884	1.97	0.30	10.23	19.03	415929	1.74	9.06	403884	1.67	9.43
HW	23 LEV Total			1566	2.32	0.04	0.28	37.21	4882	0.54	0.05	1.51	34.63	1566	0.32	3.75	4882	1.93	0.84
HW	B STOPES Total			291669	2.09	0.07	2.60	26.58	322656	2.63	0.07	2.26	31.27	291669	2.16	1.91	322656	2.13	2.19
HW	C STOPES Total			65626	0.95	0.08	1.27	25.35	44683	1.12	0.10	3.38	37.62	65626	1.13	3.82	44683	0.94	1.36
HW	F STOPES Total			5891	1.04	0.62	6.48	11.27	16790	0.95	0.79	7.07	13.81	5891	1.05	7.25	16790	0.99	7.16
HW	K STOPES Total			41181	1.25	0.31	3.21	13.32	29737	1.05	0.09	1.93	16.96	41181	0.23	0.90	29737	0.92	2.87
HW	N STOPES Total			132800	2.95	0.07	1.07	28.16	69758	2.68	0.15	0.81	34.81	132800	1.66	0.51	69758	2.50	1.08
HW	S STOPES Total			111046	1.32	0.41	4.16	20.81	167502	1.84	0.19	3.91	31.07	111046	1.19	2.65	167502	1.75	2.42
HW	U STOPES Total			26471	0.76	1.63	5.44	5.22	37331	0.73	2.36	9.10	6.05	26471	0.83	6.39	37331	0.44	4.38
HW	IMPROV Total			6878	0.78	0.54	4.27	8.16	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00
	HW Total			683128	1.90	0.21	2.62	23.91	693339	2.12	0.25	3.05	29.62	676250	1.62	2.11	693339	1.82	2.34
	LYNX LP	LYNX PIT BOTTOM		25000	1.00	1.10	8.00	9.00	64808	1.00	0.63	5.02	5.36	25000	1.00	5.02	64808	1.00	8.00
	LYNX LP	LYNX PIT WALL 6L		10000	0.50	0.50	3.00	5.00	9000	0.46	0.50	2.93	5.00	10000	0.46	2.93	9000	0.50	3.00
	LP Total			35000	0.86	0.93	6.57	7.86	73808	0.93	0.62	4.76	5.32	35000	0.85	4.42	73808	0.94	7.39
AUX	CUSTOM MILL	PA Total		10000	0.50	0.20	10.00	15.00	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00
	Grand Total			1155557	1.81	0.26	5.45	20.15	1171031	1.99	0.29	5.63	###	1155557	1.60	4.63	1171031	1.72	5.10

	TONNES	CU %	PB %	ZN %	FE %
2000 PLANNED	1155557	1.81	0.26	5.45	20.15
ACTUAL MUCKING	1171031	1.99	0.29	5.63	24.44
@85 %	1.69			4.79	
TRAMMED	1143974	1.91		5.78	
@85 %	1.624			4.913	
SKIPPED	1143081	1.91		5.78	
LYNX	73808	0.93		4.76	
	1216889	1.85		5.72	
@ 85 % + 2.5 % H2O	1186467	1.57		4.86	
MILLED DRY	1168617	1.72		5.04	

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Myra Falls Operation

January 2004 Ore Reserves

Reconciled Tonnage and Grade for 1999

1999 PRODUCTION			PLANNED			VARIANCE	ACTUAL			PLAN TONNES VS ACT GRADE			ACT TONNES VS PLAN GRADE			
MINE	TYPE	STOPE	PLAN TONNES	% CU PLN	% ZN PLN		ACTUAL TNS	% CU ACT	% ZN ACT	PL TONNES	ACT. CU	ACT ZN		PL CU	PL ZN	
BG		BG DEV	16123	1.32	9.09	-12415	3708	2.14	14.42	16123	2.14	14.42		3708	1.32	9.09
BG		G STOPES	114722	1.50	13.14	-14542	100180	1.83	13.88	114722	1.83	13.88		100180	1.50	13.14
BG		H STOPES	12089	0.70	9.50	-10100	1989	0.15	7.70	12089	0.15	7.70		1989	0.70	9.50
BG		J STOPES	11352	0.55	6.53	-9588	1764	0.38	0.18	11352	0.38	0.18		1764	0.55	6.53
BG		M STOPES	115698	1.87	14.07	-34024	81674	1.92	15.22	115698	1.92	15.22		81674	1.87	14.07
BG		S & T STOPES	55006	1.39	9.04	9315	64321	1.61	8.68	55006	1.61	8.68		64321	1.39	9.04
	BATTLE	TOTAL	324990	1.54	12.21	-71354	253636	1.78	12.86	324990	1.78	12.86		253636	1.54	12.21
HW		HW DEV	17700	1.00	1.50	8732	26432	1.44	0.80	17700	1.44	0.80		26432	1.00	1.50
HW		B STOPES	108766	1.37	2.36	6482	115248	0.91	2.17	108766	0.91	2.17		115248	1.37	2.36
HW		C STOPES	114197	0.73	2.26	-1419	112778	0.92	2.93	114197	0.92	2.93		112778	0.73	2.26
HW		F STOPES	37192	1.00	5.19	-18221	18971	0.82	4.63	37192	0.82	4.63		18971	1.00	5.19
HW		K STOPES	4000	1.60	1.30	-3872	128	1.00	5.00	4000	1.00	5.00		128	1.60	1.30
HW		N STOPES	76730	2.07	1.72	28180	104910	2.90	1.93	76730	2.90	1.93		104910	2.07	1.72
HW		S STOPES	128930	1.82	2.10	-22016	106914	2.44	2.60	128930	2.44	2.60		106914	1.82	2.10
HW		U STOPES	4910	0.60	5.52	-268	4642	0.40	5.52	4910	0.40	5.52		4642	0.60	5.52
	HW	TOTAL	492425	1.40	2.37	-2402	490023	1.69	2.44	492425	1.69	2.44		490023	1.40	2.37
	99 PLANNED	TOTAL	817415	1.46	6.28	-73756	743659	1.72	5.99	817415	1.67	6.66		743659	1.48	5.66
	99 ACTUAL	TOTAL	743659	1.47	5.09		@ 85 %	1.47	5.09							
	99 TRAMMED	TOTAL	777533	1.58	6.28											
	99 SKIPPED	TOTAL	784333													
	99 MILLED	TOTAL	733353	1.63	5.71											

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Reconciled Tonnage and Grade for 1998

1998 PRODUCTION			PLANNED				ACTUAL			PLAN TONNES VS ACT GRADE			ACT TONNES VS PLAN GRADE		
MINE	TYPE	STOPE	PLAN TONNES	% CU PLN	% ZN PLN		ACTUAL TNS	% CU ACT	% ZN ACT	PL TONNES	ACT. CU	ACT ZN		PL CU	PL ZN
BG		BG DEV	10968	2.04	12.85	-1176	9792	2.57	14.38	10968	2.57	14.38	9792	2.04	12.85
BG		G STOPES	154720	1.74	12.32	-56901	97819	2.33	10.56	154720	2.33	10.56	97819	1.74	12.32
BG		H STOPES	18608	0.74	7.63	-5179	13429	1.37	11.48	18608	1.37	11.48	13429	0.74	7.63
BG		J STOPES	26030	0.83	7.39	-4931	21099	1.50	8.09	26030	1.50	8.09	21099	0.83	7.39
BG		M STOPES	178141	2.03	13.13	-45517	132624	2.34	15.26	178141	2.34	15.26	132624	2.03	13.13
BG		S & T STOPES	30348	1.59	9.92	-21599	8749	2.10	5.78	30348	2.10	5.78	8749	1.59	9.92
	BATTLE	TOTAL	418815	1.76	11.99	-135303	283512	2.23	12.60	418815	2.23	12.20	283512	1.77	12.06
HW		HW DEV	11478	0.94	0.50	-1907	9571	0.68	0.47	11478	0.68	0.47	9571	0.94	0.50
HW		C STOPES	35598	2.13	1.66	27080	62678	2.46	2.79	35598	2.46	2.79	62678	2.13	1.66
HW		F STOPES	206042	1.24	3.18	4550	210592	1.17	3.08	206042	1.17	3.08	210592	1.24	3.18
HW		K STOPES	56053	1.59	2.62	-27685	28368	1.77	3.00	56053	1.77	3.00	28368	1.59	2.62
HW		N STOPES	77483	2.54	3.53	47163	124646	2.56	3.42	77483	2.56	3.42	124646	2.54	3.53
HW		S STOPES	174703	1.48	3.76	20457	195160	1.78	3.99	174703	1.78	3.99	195160	1.48	3.76
HW		U STOPES	10874	0.44	7.35	-9097	2777	0.55	14.30	10874	0.55	14.30	2777	0.44	7.35
	HW	TOTAL	642339	1.59	3.30	66435	708774	1.81	3.53	642339	1.71	3.65	708774	1.69	3.26
	98 PLANNED	TOTAL	1061154	1.66	6.73	-68869	992285	1.93	6.12	1061154	1.92	7.03	992285	1.71	5.77
	98 ACTUAL	TOTAL	992285	1.64	5.20		@ 85 %	1.64	5.20						
	98 TRAMMED	TOTAL	1061397	1.67	5.48										
	98 SKIPPED	TOTAL	1005543												
	98 MILLED	TOTAL	1027416	1.70	5.57										

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**Selected Stope Reconciliations - MFO Engineering – from Jan. 2003 ore reserve
report**

To: Ivor McWilliams

From: Al

cc: interested parties

Reconciled results for P143B1

1. within the stope, we attempted to blast 904 (blast 1) + 2894 (blast 2) = 3798 m³ of rock in this stope. Stope sampling indicated that the density of the material was 3.64, meaning that we should have mucked 13,824t out of the stope, assuming absolutely no dilution.
2. Stope mucking numbers indicate that we mucked 14784 tonnes from the stope at 2.72% Cu and 22.83% Zn. Calculated diluted mucking grades were planned to be 1.8% Cu and 19.56% Zn. Note that the Copper grade ended up being very high. During this stope's life, very significant problems were encountered at the mill, possibly confirming the connection between metallurgical difficulty and soluble copper.
3. The total CMS void size (including development = 3883 m³. The stope will therefore require 8000t of fill. After the CMS was performed, an additional 650t (178m³) was mucked from the stope after projectile explosives were used. Additionally, there was some shadowing in the CMS. I would estimate that 80m³ of shadowing occurred. The calculated total void size based on these estimations is therefore: 4141 m³
4. The original development volume was 570 m³, meaning that we actually mucked out a volume of 3571 m³. At the calculated density, this suggests that our mucking tonnage should have been 13,000t. (compared to sampled / tabulated results of 14784).
5. CMS comparisons to the blast mesh indicate that a significant amount of underbreak occurred on the footwall side of the stope (North). This has happened on all three of the GAP stopes in this area and we should endeavour to recover more ore on this side of the stope. CMS results show that the underbreak amounted to 780m³ of material. As mentioned above, some areas of the CMS are not fully detailed so that this number is likely to be artificially large. I would estimate that 700 m³ would be a closer to the truth, but it should be noted that there is a SIGNIFICANT amount of underbreak.

On the south side of the stope, there is an amount of overbreak to the tune of 185m³. This may have been ore due to the presence of a fault bounding the bottom of the void that was quite apparent during the inspection of the stope. On the east wall, 45m³ of overbreak also occurred which was part of the 'skin' of ore adjacent to the next stope, P144B1. Approximately 100m³ of this 'skin' did not fall apart and remained stuck on the fill of the other stope, even though it was only 2m thick and 28m high. A total of 230m³ of overbreak was experienced.

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6. All of these numbers indicate that we:

- a. recovered only 3276m³ of the actual blasted volume = 86.3% recovery
- b. did not recover 700m³ of the blasted volume
- c. experienced a total of 230m³ external dilution. Visual estimates suggest that at least half of this was ore dilution. total external dilution = 6%
- d. applying calculated densities to these numbers indicate that we should have mucked approximately 13,000t from the stope, and not 14,784t as indicated in operations tabulations. Note that I have estimated an amount of CMS shadowing at 80m³. The amount of shadowing would have to be much more significant (i.e. 570 m³) which I would say is impossible by taking a close look at the stope and at the CMS results. Density? Nevertheless, the volume of the excavation and calculated density results indicate that we should have mucked more like 13,000t.

7. This stope can only be considering marginally successful, given that we left behind 700 m³ of ore at a VERY significant grade. In the next stope, we should provide more void for the final blast by increasing to three blasts. However, the stope was very successful when considering that absolutely minimal external dilution was experienced, and virtually no oversize was seen at the drawpoint. The stope mucked very well, the brow did not peel, and a safe mucking situation existed.

Thanks,

Al Polk

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January 2004 Ore Reserves

To: ivor McWilliams

from: Al Polk

cc: interested parties

Reconciled results for BP365B6

1. Within the stope, we attempted to blast 5250m³ of material. Some waste was blasted within this volume considering the presence of drifts just above the interpreted ore contact. Stope sampling indicated that the density of the sampled material was 3.6, and considering that some of the blasted material was waste, we should have mucked out approximately 18,400t of ore grade material. This assumes 100% extraction + 0% overbreak dilution.
2. In fact, stope mucking numbers indicated that we mucked out 32,249t of ore at a grade of 1.44% Cu and 10.62% Zn, compared to a planned grade of 1.8% Cu and 9.44% Zn. It would appear from these numbers that we mucked a very large amount of dilution, but that some of the dilution was ore.
3. The total CMS void size (3 cms's were taken during the life of the stope and all show a very similar final back height) including pre-blasting development = 8770 m³. This means that the stope will take 17,000t of fill to be tight filled.
4. The original development void was 1200 m³, meaning that we actually mucked 7570 m³ of material from the stope. At the sampled density, we should have therefore mucked out 26,500t of material. (compared to the tabulated number of 32,250t???)
5. CMS comparisons to the blast mesh show that a very significant amount of caving occurred in the back of the stope. In places, this caving went up to the back of the old filled drift above the stope but immediately above the brow, the caving propagated approximately 3m above the back of the old filled drift. Word has it that a cave of approximately 3 -4m had occurred in that very drift and ultimately resulted in the filling of the drift in the past so it appears that the stope void propagated up to that previous cave. **Stope back caving to the tune of 2260 m³ occurred !!!**. This caving included 620m³ of fill dilution which occurred from the filled drift just above the top of the drilled longholes. Although not 'scheduled' per se, we expected that to occur. ~150m³ of fill dilution was mucked off the floor because we were on top of filled drifts. Some small amount of underbreak on the east side of the stope occurred to the tune of 150 m³. The CMS also shows approximately 100 m³ of underbreak directly above the brow, but this was not picked up well with the survey so could be anomalous.
6. All of these numbers indicate that we:
 - a. recovered 97% of the blasted ore. Note that it appears that the stope was mucked out very well, to the point that some fill dilution occurred from the floor. It seems that everything that broke got mucked.
 - b. did not recover only 3%.. strictly as a result of underbreak
 - c. experienced approximately 2260 + 150 m³ of dilution in the stope = 46% external dilution!!! Wow!
 - d. applying calculated densities to these numbers indicates that we should have mucked approximately 26,500t from the stope, and not 32,250t as indicated in the mucking tabulations.
7. What is success? Did we get all of the metal from this stope? Did the stope get mucked at the scheduled rate, and on time? First of all the schedule for this stope was blown way out of the water by caving in the previous stope, S373B11. Now the schedule for the next stope is blown away because of the caving in

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this stope. What would the grade have been had we not mucked 46% dilution? It is very difficult to call this stope a success, but developing a top drill drift would have been difficult (not impossible) because of the presence of other old filled drifts.

In other terms there are many things that we should discuss regarding the results from this stope.

1. it is becoming so very obvious that we are experiencing paper buckets in the mine. This stope was 'just about empty' for a couple of weeks and yet word had it that we were mucking several hundred tonnes per day and that 'additional caving' was occurring from the 'back end' of the stope. The three CMS's we took prove absolutely that no 'additional caving' occurred during the last couple of weeks of mucking. This also occurred in GN183B1. Out of three stopes that I have reconciled in the last week, all three had mucking numbers which were impossibly high. While on the topic, it sure seems like that grade has also been out of whack for quite a while. It is now my opinion that the muckers are trying to get back their 10%.
2. Purely uphole blocks will be the end of us. No time was provided in the schedule to recess cables so that some stope support could be done.
3. It is also important to note that the 'skin' of ore adjacent to S373B11 did not fall out at all. This was planned to be recovered during the mining of S373B11 but was not as a direct result of the development being way off line. We thought that some of this MIGHT fall off during the mining of this stope, but this did not happen. The development crews must provide better results so that the stopes can come out properly.
4. There were virtually no drill holes in this area. Was the caving actually ore? What was the grade of the ore here? We definitely need to establish a better relationship in geology and engineering so that drift mapping can be used to check the stope design and make sure that we are drilling off the appropriate stuff. During the design of this stope, we couldn't find any mapping in the old drifts above so that this could be done. By looking at the cave outline of this stope and S373B11, I can plainly see that there is a very large structure in the waste above the interpreted ore outline. We need to find this kind of thing. Planners and geologists need to pay attention during the mining of the development and adjust the design to fit the information. I've seen way too many situations where we just keep going on the original plan and don't check into all of the information. Couldn't we have chip sampled the undercut development? Maybe had we done that, we would have found that the grade here was double the model grade and therefore 46% dilution makes total sense considering that the final stope grade was okay.

thanks,
al

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January 2004 Ore Reserves

to: Ivor McWilliams

from: Al Polk

cc: interested parties

Reconciled results for K426B1

Well, the jury is finally in and here are the results of a truly nasty stope.

1. within the stope, we attempted to blast 14,100 m³ of ore. A small amount of waste was blasted within this volume towards the north end of the stope. Stope sampling indicated that the average density of the ore mucked out of the stope was 3.19 t/m³ so that the mucking numbers should have been in the range of 45,000t assuming 100% break and 100% recovery with no dilution.
2. Stope mucking numbers indicate that we mucked 66,487t of ore, 2234t of ore oversize, and 12,329t of waste out of the stope for a total mucked of 81,050 tonnes of material.. wow! Of course these numbers indicate a tremendous amount of dilution from waste. Stope grades ended up being 1.58Cu and 6.04Zn, which was still higher than the planned grade of 1.23 Cu and 4.12 Zn. During the life of this stope, a large grade discrepancy existed between the mine and mill, but this grade discrepancy also existed before this stope so I don't think we can draw any definite conclusions from this.
3. The total CMS void size (4 separate CMS survey) including development = 23,700 m³. (wow) The stope will therefore require some 48,000t of fill. Plans are to have this stope open as a waste dump for the maximum amount of time. The resulting CMS opening is fairly decent given that four surveys were performed and we can feel fairly confident about the accuracy of the total void and of the reconciliation numbers.
4. The original development volume within the stope boundaries was 1640m³ for the top drift and 1590m³ for the bottom drift, indicating that the total mucked volume of material should have been 20,470 m³. Because material was left within the stope at the back end, the total mucked volume of material can be estimated to be something more like 21,470 m³ (generous estimate). At a weighted density for ore and waste, we should therefore have mucked out a total tonnage of 66,500 tonnes. Again, we see a discrepancy between the mucking numbers and the calculated numbers.. very high on the mucking side.
5. CMS comparisons to the blast mesh indicate many things.
 - a. VERY significant caving occurred on the North and West side of the stope, against the 43 Block flat fault. The caving propagated over top of the adjacent stope, which had no back support. The cave proceed 7m higher than the previous caving in K425B1. In K426B1, the areas which had stope back support did not cave significantly, lending credence to developing top drill drifts. Primarily waste caving adds up to an incredible 6800 m³ of dilution!! A significant amount of the dilution was separated from the ore and stockpiled around the mine in an attempt to reduce dilution. These numbers indicate that we mucked at least 18,360t of waste out of the stope.
 - b. Ironically, the CMS indicates that a fair amount of underbreak occurred to the south end of the stope. Some of this could be shadowing in the survey, but visual indications from the top dump point do reveal some underbreak. This volume amounts to 950 m³... a fair amount. Given that this material was ore, we left 3000t of ore on the walls of the stope.

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c. A fair amount of fill dilution occurred on the K425B1 side of the stope. It is quite obvious that K425B1 was not tight-filled. Caving therefore occurred over top of the fill, which then dragged the fill down into the mucking area. Fill dilution to the tune of 2760 m³ (again, wow!) occurred. As an aside, I would say this is a 'low side' estimate because of shadowing in the CMS results from K425B1. We mucked 5500 tonnes of fill from the stope.

d. We ended up closing the stope before it was finally mucked out because of difficult mucking conditions and the possibility of caving on the remote scoop. On the left side, and at the back end of the stope, 2500 m³ of 'ore' was left in the stope. This material is likely to be broken based on the geometries and at least the material on the left side would have been very diluted with fill. With broken ore density, we probably left 5300t of ore left in the stope. If we assume that this was diluted material at approximate average dilution rates, we likely left ~ 3300t of ore and 2000t of waste mixed in the stope.

e. If the calculated mucked volume is 21,470 m³ (refer to #4 above) and using 6800 m³ of waste dilution and 2760 m³ of fill dilution, we actually mucked only 11,940 m³ of ORE from the stope.

6. All of these numbers indicate that we:

- a. recovered only 11,940 m³ of ore from the stope = ~ 85% recovery
- b. did not recover 950m³ of ore to underbreak = 6.7% lost
- c. did not recover 1100m³ of un-mucked ore = ~ 8% lost
- d. experienced a total of 6800 m³ of waste dilution... 57% dilution of the grade
- e. experienced a total of 2760 m³ of fill dilution... 23% dilution of the grade

f. we should have mucked 38,200 tonnes of ore + 18,400t waste + 5500t fill = 62,000t of material mucked out of the stope. Of course density plays an important role in the calculation here, but I feel very confident that the mucked tonnage from the stope should be in the 65,000 tonnes, and not in the 81,000 tonne range as is indicated by the mucking numbers.

7. What a disastrous stope. The problems all started when K425B1 was taken without a top drift for stope back support. If I briefly discuss the history of that stope.. a drill drift wasn't developed for that stope because 'The ground is so bad we won't be able to drift there'. Yet we feel that we can blast a huge longhole stope there? In K426B1, the saving grace which likely prevented an additional 10,000 tonnes of dilution was that we did go through the effort of putting a drill drift in. Tight filling in all stopes is an absolutely critical part of mining here and we must go through way more effort to ensure that it happens. In this stope, we barely made the effort to tight fill in K425B1 and it really hurt us badly.

The caving in this stope also hurt the 43 Block schedule very badly. This stope took an unbelievable 4 months to muck out and we had schedule two months. One of the reasons was that 430 Orepass was not reliable enough to use. We have now endeavoured to fix this problem so perhaps future blocks will not need to be mucked all the way to 384 Orepass.

Therefore: put drill drifts in! go through the effort to drift through poor ground conditions because the bolting pattern and cable-bolting can then hold the poor ground up instead of letting it cave.

Tight fill stopes! Take extra time to ensure that adjacent stopes are FILLED. In 20 - 23L, we need to install flushing valves all over the mine to allow us to flush in different locations. We learned that this is necessary in Battle, but somehow we haven't learned it in HW.

Note that the grade of the so-called ore was still higher than the planned grade for this stope. I believe that we have a certain amount of biased sampling which occurs on the mucking side, but I also believe that a size distribution difference between waste and ore means exists which also biases the results. Doesn't it

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make sense that the size of blasted material is on average much smaller than the size of cave material? This means that ore will always get sampled more than waste and this in turn means that the mucking grade will always be higher than the true stope grade when significant amounts of caving exist. We experienced 80% grade dilution within this stope yet ended up with higher than planned grades?? In the last month of mucking this stope, the grade discrepancy at the mill started to disappear. CMS results show that very little additional caving occurred in the last month of mucking meaning that we managed our way through the big stuff and were finally getting more representative samples. No proof of course but I think it makes sense.

Thanks,

Al Polk

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to: Ivor McWilliams

from: Al Polk

cc: interested parties

Reconciled results for BP366B1

... decently successful on the engineering side of things with some very interesting geology issues...

1. Within this stope, we attempted to blast 4200 m³ of rock. This does not include a fair amount of fill in two filled drifts crossing through the top of the stope. Stope sampling indicated that the average density of the ore mucked from the stope was 4.4 t/m³ (wow). Blast volumes therefore indicate that we should have mucked 18480 tonnes of rock from the stope. Another 820 m³ (1650 tonnes) of fill should have also fallen into the stope so that the total planned mucking numbers assuming 100% recovery should have been 20,130 tonnes.
2. Stope mucking numbers indicate that we mucked 21273 tonnes from the stope. Stope grades ended up being 1.73% Cu + 4.98% Zn compared to the planned blast grade of 1.43% Cu and 2.06% Zn. Some geological analysis should be done to discuss this difference... particularly because we changed the original design for this stope to NOT incorporate an overcut as a result of the geological information that the upper part was too low grade. Because no elevated zinc grades were noted at all in the bottom development, I'm wondering how much good zinc we threw away above the stope.
3. The total CMS void size including development and fill dilution = 6300 m³ meaning that the stope will required 12,500 tonnes of fill. The CMS results for this stope are excellent and very little shadowing has occurred.
4. The original development volume within the stope boundaries was 1050 m³. We therefore mucked approximately 5250 m³ of ore (including some fill) from the stope. At the grade calculated density, we should expect to see mucking numbers of 22,000 tonnes.. close to the tabulated mucking numbers of 21273. This is the first reconciliation in quite a while which reveals tabulated mucking numbers which are close to those expected from the volume of the CMS.
5. CMS comparisons to the blast mesh indicate several things:
 - a. Negligible caving occurred in the back of the stope, except for the fill which fell out of the drifts. This was expected. Unexpected overbreak / sloughing occurred from the lower North wall of the stope, bringing 300 m³ of ore into the stope. I perceive that there are two possibilities for this:
 - i) The geometry looks as if structure could have connected up to the old filled drifts, producing blocks that fell off the North wall. or
 - ii) this is the first stope of a barrier pillar retreat and significant stress could exist which caused the failure of the wall. WE MUST PAY ATTENTION TO THIS POSSIBILITY AS THE STOPES ARE RETREATED FROM THE NORTH.
 - b. Fill dilution to the tune of 820 m³ fell from the old filled drifts above. No fill dilution at all occurred from the stopes to the south but it does appear that we broke up to the fill as planned.

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c. Underbreak resulting in possible missholes occurred in the upper North East part of the stope to the tune of: 260 m³ It looks like the ends of the holes simply did not break out the corner of the stope.

6. All of these numbers indicate that we:

- a. recovered 3940 m³ (94%) of the ore that we blasted..
- b. did not recover 260 m³ (6%) of the ore that we blasted.. some possible missholes here
- c. experienced 300 m³ (7%) of overbreak dilution (ore dilution)
- d. experienced 820 m³ (21%) of fill dilution (planned)
- e. mucking numbers are close to volumetrically calculated tonnes

7. This was a successful stope. A considerable amount of planned fill dilution was mucked. The overall drilling + blasting geometry was quite tight and the presence of the filled drifts was accomodated nicely with the design. On the geology side, some work should be done to figure out if any decent grade ore exists above the stope. For the future it is absolutely necessary that we pay attention to the possibility of high stress developing in this barrier pillar and react as quickly as possible to problems.

Thanks,

Al Polk