Agnico Eagle Mines Limited
400 - 543 Granville Street
Vancouver, British Columbia V 6 C 1X8
Phone 604.608.2557 Fax 604.608.2559

March 22, 2014

Deborah Prodeahl
Mining Lands Officer
Watson Lake Mining Recorders Office
P.O. Box 269 K-W L
Watson Lake, YT Y0A 1C0
(867) 536-7366

Dear Ms. Prodeahl,

Re: 2013 Report on Metallurgical and Environmental Study for LQ00191 - Jennings Project

Agnico-Eagle Mines Limited (AEM) operates the Jennings Project under permit LQ0091, which is located approximately 35 km southeast of Rancheria and 80 km west of Watson Lake. The Jennings Project is accessed by the Silvertip-Midway and Tootsee access roads. AEM is submitting the 2013 Report on Metallurgical and Environmental Studies on Jennings Project.

Please contact me via email at henry.castillo@agnico-eagle.com or by phone at 778-968-6858 should you have any questions or require any further information.

Regards,

Henry Castillo, B.Sc., P.Geo
Senior Geologist

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2013 SUMMARY REPORT
ON METALLURGICAL STUDY and ENVIRONMENTAL BASELINE MONITORING PROGRAM
JENNINGS PROJECT

Located 35 Kilometers SE of Rancheria, Yukon
Watson Lake, Mining District
NTS 105 B/01
60° 00’ N Latitude; 130° 07’ W Longitude

Grant Number	Claim Name
YA36789	HOT 1
YA36791	HOT 3
YA36793	HOT 5
YA36795	HOT 7
YA36797	HOT 9
YA36799	HOT 11
YA36805 - YA36816	HOT 17-HOT28
YA36824	HOT 34
YA36824	HOT 36
YA36826	HOT 38
YA36828	HOT 40
YA36830	HOT 42
YA71565 - YA71569	HOT 81-HOT 85
YC28702 - YC28789	TOOZ 1-TOOZ 97
YC73950 - YC73969	TOOZ 98- TOOZ 117
YC73970 - YC73971	TOOZ 118 - TOOZ 119
YE85213 - YE85231	TOOZ 120 - TOOZ 138
YF40415 -YF40417	TOOZ 139 - TOOZ 141
YD121277 - YD121294	TOOZ 142 - TOOZ 159
YE43993 -YE44000	TOOZ 160 - TOOZ 167

Owned and Operated by Agnico-Eagle Mines Limited

Author: Henry S. Castillo
400- 543 Granville Street
Vancouver, BC V6C 1X8

March 22, 2014

REPORT SUMMARY

The Jennings Project is an early stage porphyry molybdenum-tungsten prospect located 80 km west of Watson Lake, Yukon Territory. The project area consists of 206 claims for a total of 7,723.94 hectares claim block that straddles the British Columbia-Yukon border along the eastern flank of the Cassiar Mountain range. The property is road accessible and situated east of the Tootsee River on NTS Map Sheet 105B/01 and approximately 35 kilometers southeast of the village of Rancheria, Yukon Territory. The property has been explored by Agnico-Eagle Mines Limited (AEM) since 2008. AEM completed a 31,088.57 meters for 50 diamond drill holes and collected 1,100 soil samples on the property, conducted an environmental baseline study since 2010 and metallurgical study in 2012.

AEM conducted an initial scooping study on the metallurgy of Jennings molybdenum-tungsten deposit. Four composite haft core samples were submitted to SGS Minerals of Lakefield Ontario Canada in 2012 for the determination of Molybdenum and Tungsten recovery. The results of the initial scooping study were encouraging that show high recovery for Molybdenum, however, more test works were necessary to improve for better recovery of Tungsten. In 2013 additional one composite haft core samples were collected and submitted to SGS. The objective of the test program was to further define the conceptual flow sheet that was developed in the 2012 initial scooping study especially with Tungsten. The test works included floatation testing on moly and tungsten circuits, heavy liquid separation to produce tungsten concentrate, and gravity separation on tungsten feed and a coarse fraction of the ore. Wet High Intensity Magnetic Separation (WHIMS) was also completed to investigate further upgrading tungsten on gravity concentrates.

Golder Associates with Liard First Nations Development Corporation conducted an environmental baseline study on Jennings project since 2010 and in 2013 completed two environmental monitoring baseline programs consisted of the following: 1.) Meteorological records were downloaded from monitoring station equipment, data of the measurements of an hourly interval for air temperatures, relative humidity, vapour pressure, air temperatures, solar radiation average, wind speed, rainfall total and snow depth and checking of the Project's meteorological monitoring station equipment; and 2.) The aquatic baseline program consisted of stream flow measurements at eight sites on five unnamed watercourse. The stream flow sites were samples on three occasions throughout the open water season.

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SECTION 1.0 INTRODUCTION

This report has been prepared by Agnico Eagle Mines Limited to be used for the assessment credit filing and summarize the 2013 work program at the Jennings molybdenum-tungsten Project. The project area consists of 206 claims for a total 7,723.94 hectares that straddles the British Columbia-Yukon border, along the eastern flank of the Cassiar Mountain Range. The Yukon portion of the property is comprised of 195 contiguous Yukon Quartz mineral claims covering an area of 3,429.49 hectares and is 100% owned and operated by Agnico Eagle Mines Limited (AEM). The program consisted of metallurgical scoping test works and meteorological/aquatic baseline monitoring studies conducted by SGS Lakefield Ontario and Golder Associates of Vancouver, respectively.

1.1 RELIANCE ON OTHER EXPERTS

The author has relied on Golder Associate Limited's expertise on the results of the base line monitoring study and the SGS'S report on the metallurgical study. The results of the studies are incorporated into this assessment report. The author verified that the environmental base line data and metallurgical data used are fact and current in all respects.

1.2 LOCATION AND ACCESS

The Jennings Project is located 80 kilometres west the community of Watson Lake, Yukon and is accessible by 35 kilometres of gravel road south and east from Kilometre 1085 on the Alaska Highway. Access utilizes the two-wheel drive Midway-Silvertip Road south from the Alaska Highway to Kilometre 18 with bridges in place at the Rancheria and Tootsee River crossings. A further 17 kilometres of four-wheel drive road provides access to a network of drill roads into the property (Figure 1).

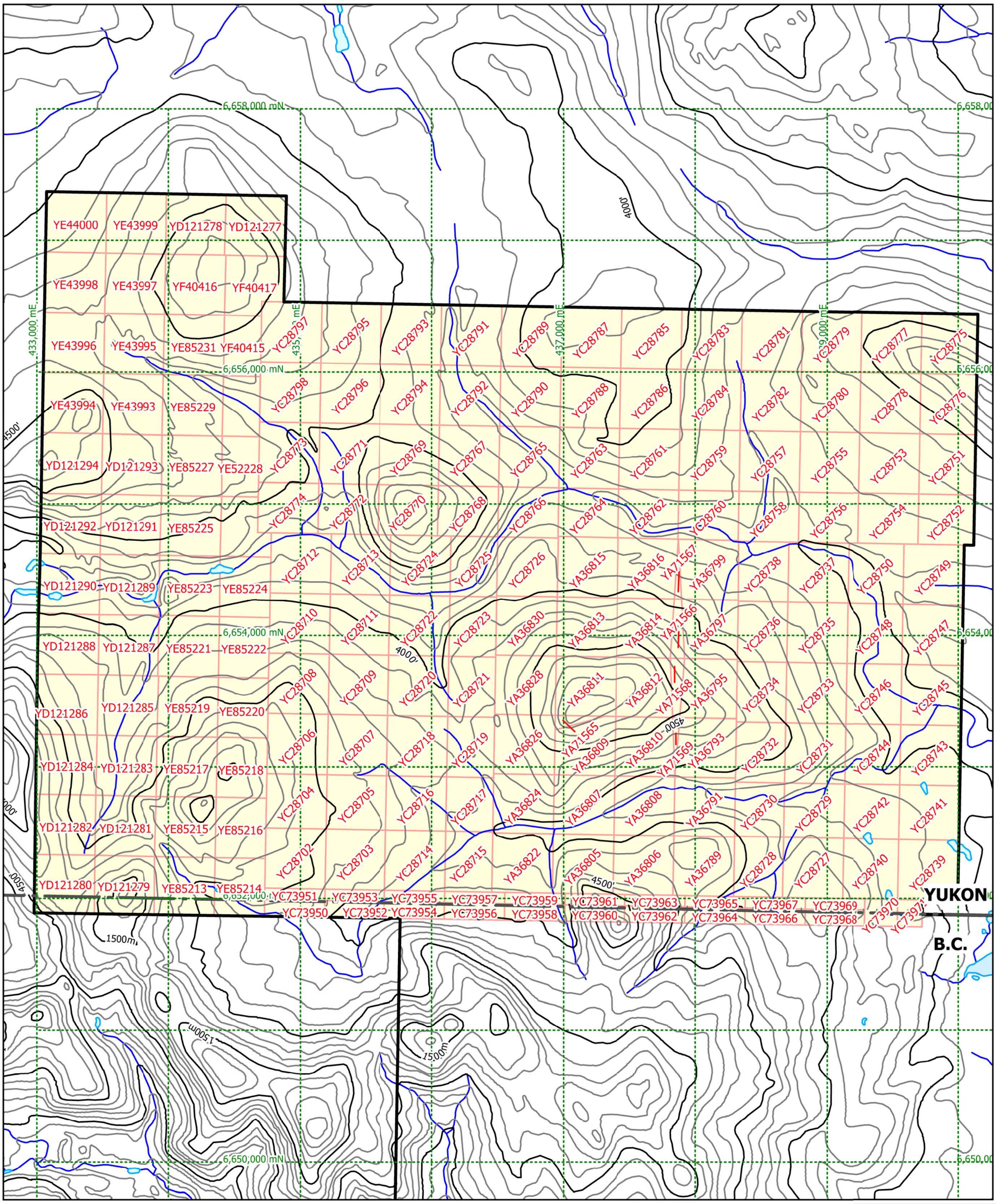
1.3 TOPOGRAPHY AND VEGETATION

The Jennings Project area is situated at the extreme eastern limit of the Cassiar Mountain range flanked east and west by the Little Rancheria and Tootsee Rivers respectively. Views to the east overlook extensive, subdued glaciofluvial terrain of the Liard Plateau. Topography in the property is moderately steep with elevations ranging from 1,000 to 1,500 metres. Extensive lodgepole pine forest and swamp to the east gives way to well-forested hillsides with locally sizeable pine, spruce and deciduous trees in the mountainous regions further west. The extreme tops of the ridges and peaks in the central and western project area are at or just above treeline with alpine-type vegetation. Slopes are covered by a thin veneer of glacial till and colluviated till with discontinuous permafrost noted on east and north-facing slopes. Eskers and kame-kettle deposits are widespread east of the property with small isolated eskers occurring locally along valley floors in the central project area.

1.4 CLAIMS

Mineral tenure on the Jennings Project in the portion of the project in Yukon is comprised of 195 contiguous Quartz Claims for a total of 3,429.49 hectares (Figure 2). The value of the assessment work on quartz claims YA36805, YA36807, YA36820, YA36824, YC28712, YC28743, YC28745, YC28763, YC28764, YC28765, YC2866 AND YC28774 described in this report will be applied to the entire claim block. Claim data is presented below in Table 1.


BEAUFORT SEA
-140 °
-135 °
-130 °
70 °
65 °
60 °
65
60
ALASKA
U. S. A.
YUKON TERRITORY
N.W.T.
Dawson City
Mayo
Pelly Crossing
Faro
Ross River
Carmacks
WHITEHORSE
Carcross
Atlin
Watson Lake
Rancheria
JENNINGS PROJECT
BRITISH COLUMBIA
PACIFIC OCEAN
-125 °
-120 °
Alaska
U. S. A.
Yukon Territory
Northwest Territories
Nunavut Territory
YELLOWKNIFE
WHITEHORSE
JENNINGS PROJECT
Alberta
Sask.
British Columbia
EDMONTON
PACIFIC OCEAN
VICTORIA
U. S. A.
0
150
300
kilometres
N
Agnico-Eagle Mines Limited
Jennings Project
British Columbia & Yukon
PROJECT LOCATION MAP
NTS:104 O/16 & 105 B/1
Mining Division: Liard
Scale: 1:70,000
Datum: NAD 83 Zone 9
Drawn by: HSC
Date: March 15, 2014
Filename: Jennings 2013 MET Sample
Figure 1



2 km

Agnico-Eagle Mines Limited

Jennings Project
British Columbia & Yukon

TENURE LOCATION MAP

NTS:104 O/16 & 105 B/1	Mining Division: Liard	
Scale: 1:7,000	Datum: NAD 83 Zone 9	Figure 2
Drawn by: HSC	Date: March 15, 2014	

Table 1: Tenure Details

Grant Number	Claim Name	Owner & Operator Owner & Operator	Recorded Date	Expiry Date	Claim Size
YA36789	HOT 1	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	20.78
YA36791	HOT 3	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	20.67
YA36793	HOT 5	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	19.99
YA36795	HOT 7	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	18.65
YA36797	HOT 9	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	18.67
YA36799	HOT 11	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	20.22
YA36805	HOT 17	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	20.70
YA36806	HOT 18	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	20.68
YA36807	HOT 19	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	20.68
YA36808	HOT 20	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	20.66
YA36809	HOT 21	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	18.65
YA36810	HOT 22	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	20.11
YA36811	HOT 23	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	20.67
YA36812	HOT 24	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	19.00
YA36813	HOT 25	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	20.67
YA36814	HOT 26	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	18.95
YA36815	HOT 27	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	21.07
YA36816	HOT 28	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	20.37
YA36822	HOT 34	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	20.70
YA36824	HOT 36	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	20.69
YA36826	HOT 38	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	20.68
YA36828	HOT 40	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	20.68
YA36830	HOT 42	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	20.67
YA71565	HOT 81	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	2.03
YA71566	HOT 82	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	3.68
YA71567	HOT 83	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	1.25
YA71568	HOT 84	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	3.67
YA71569	HOT 85	AGNICO-EAGLE MINES LIMITED	05/06/1979	22/01/2019	1.22
YC28702	TOOZ 1	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28703	TOOZ 2	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28704	TOOZ 3	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	18.87
YC28705	TOOZ 4	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	18.87
YC28706	TOOZ 5	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28707	TOOZ 6	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28708	TOOZ 7	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28709	TOOZ 8	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28710	TOOZ 9	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28711	TOOZ 10	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28712	TOOZ 11	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28713	TOOZ 12	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28714	TOOZ 13	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28715	TOOZ 14	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	16.34
YC28716	TOOZ 15	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	18.87
YC28717	TOOZ 16	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	14.72

YC28718	TOOZ 17	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28719	TOOZ 18	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	16.28
YC28720	TOOZ 19	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28721	TOOZ 20	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	16.25
YC28722	TOOZ 21	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28723	TOOZ 22	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	16.22
YC28724	TOOZ 23	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28725	TOOZ 24	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	16.20
YC28726	TOOZ 25	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.63
YC28727	TOOZ 26	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28728	TOOZ 27	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	17.00
YC28729	TOOZ 28	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	18.87
YC28730	TOOZ 29	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	15.39
YC28731	TOOZ 30	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28732	TOOZ 31	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	17.08
YC28733	TOOZ 32	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28734	TOOZ 33	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	17.13
YC28735	TOOZ 34	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28736	TOOZ 35	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	17.17
YC28737	TOOZ 36	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28738	TOOZ 37	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	17.32
YC28739	TOOZ 38	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28740	TOOZ 39	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	19.38
YC28741	TOOZ 40	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	18.87
YC28742	TOOZ 41	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	17.50
YC28743	TOOZ 42	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28744	TOOZ 43	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	19.38
YC28745	TOOZ 44	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28746	TOOZ 45	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	19.38
YC28747	TOOZ 46	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28748	TOOZ 47	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	19.38
YC28749	TOOZ 48	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28750	TOOZ 49	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	19.38
YC28751	TOOZ 50	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	19.38
YC28752	TOOZ 51	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	16.08
YC28753	TOOZ 52	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28754	TOOZ 53	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	17.35
YC28755	TOOZ 54	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28756	TOOZ 55	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	17.35
YC28757	TOOZ 56	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28758	TOOZ 57	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	17.35
YC28759	TOOZ 58	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28760	TOOZ 59	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	17.08
YC28761	TOOZ 60	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28762	TOOZ 61	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	16.97
YC28763	TOOZ 62	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28764	TOOZ 63	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	16.86

YC28765	TOOZ 64	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28766	TOOZ 65	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	17.35
YC28767	TOOZ 66	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28768	TOOZ 67	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	17.35
YC28769	TOOZ 68	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28770	TOOZ 69	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	17.35
YC28771	TOOZ 70	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28772	TOOZ 71	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	17.35
YC28773	TOOZ 72	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28774	TOOZ 73	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	17.35
YC28775	TOOZ 74	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	19.38
YC28776	TOOZ 75	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	19.38
YC28777	TOOZ 76	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28778	TOOZ 77	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28779	TOOZ 78	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28780	TOOZ 79	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28781	TOOZ 80	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28782	TOOZ 81	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28783	TOOZ 82	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28784	TOOZ 83	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28785	TOOZ 84	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28786	TOOZ 85	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28787	TOOZ 86	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28788	TOOZ 87	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28789	TOOZ 88	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28790	TOOZ 89	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28791	TOOZ 90	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28792	TOOZ 91	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28793	TOOZ 92	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28794	TOOZ 93	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28795	TOOZ 94	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28796	TOOZ 95	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28797	TOOZ 96	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC28798	TOOZ 97	AGNICO-EAGLE MINES LIMITED	02/06/2005	22/01/2019	20.90
YC73950	TOOZ 98	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	5.71
YC73951	TOOZ 99	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	3.96
YC73952	TOOZ 100	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	5.68
YC73953	TOOZ 101	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	3.94
YC73954	TOOZ 102	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	5.66
YC73955	TOOZ 103	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	3.93
YC73956	TOOZ 104	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	5.64
YC73957	TOOZ 105	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	3.92
YC73958	TOOZ 106	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	5.61
YC73959	TOOZ 107	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	3.92
YC73960	TOOZ 108	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	5.59
YC73961	TOOZ 109	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	3.93
YC73962	TOOZ 110	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	5.57

YC73963	TOOZ 111	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	3.93
YC73964	TOOZ 112	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	5.55
YC73965	TOOZ 113	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	3.87
YC73966	TOOZ 114	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	5.52
YC73967	TOOZ 115	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	3.86
YC73968	TOOZ 116	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	5.50
YC73969	TOOZ 117	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	3.85
YC73970	TOOZ FR. 11	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	5.08
YC73971	TOOZ FR. 11	AGNICO-EAGLE MINES LIMITED	30/08/2005	22/01/2019	3.85
YE85213	TOOZ 120	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	19.98
YE85214	TOOZ 121	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	16.65
YE85215	TOOZ 122	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	20.90
YE85216	TOOZ 123	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	17.45
YE85217	TOOZ 124	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	20.90
YE85218	TOOZ 125	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	17.46
YE85219	TOOZ 126	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	20.90
YE85220	TOOZ 127	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	17.46
YE85221	TOOZ 128	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	20.90
YE85222	TOOZ 129	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	17.47
YE85223	TOOZ 130	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	20.90
YE85224	TOOZ 131	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	17.48
YE85225	TOOZ 132	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	20.90
YE85226	TOOZ 133	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	14.72
YE85227	TOOZ 134	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	20.90
YE85228	TOOZ 135	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	12.79
YE85229	TOOZ 136	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	20.90
YE85230	TOOZ 137	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	12.80
YE85231	TOOZ 138	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	20.90
YF40415	TOOZ 139	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	12.80
YF40416	TOOZ 140	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	20.90
YF40417	TOOZ 141	AGNICO-EAGLE MINES LIMITED	01/10/2012	01/10/2014	18.64
YD121277	TOOZ 142	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YD121278	TOOZ 143	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.59
YD121279	TOOZ 144	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.01
YD121280	TOOZ 145	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.04
YD121281	TOOZ 146	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YD121282	TOOZ 147	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YD121283	TOOZ 148	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YD121284	TOOZ 149	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YD121285	TOOZ 150	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YD121286	TOOZ 151	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YD121287	TOOZ 152	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YD121288	TOOZ 153	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YD121289	TOOZ 154	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YD121290	TOOZ 155	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YD121291	TOOZ 156	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YD121292	TOOZ 157	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90

YD121293	TOOZ 158	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YD121294	TOOZ 159	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YE43993	TOOZ 160	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YE43994	TOOZ 161	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YE43995	TOOZ 162	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YE43996	TOOZ 163	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YE43997	TOOZ 164	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YE43998	TOOZ 165	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YE43999	TOOZ 166	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
YE44000	TOOZ 167	AGNICO-EAGLE MINES LIMITED	20/12/2012	20/12/2014	20.90
Total	**195 Claims**				**3429.18**

1.5 EXPLORATION HISTORY

1978 Elevated scheelite grain counts were detected in panned concentrates east of the project area by Amax Minerals Exploration Ltd. during the course of a regional exploration program.

1979 Hot (Yukon) and Heap (BC) claims were staked followed by linecutting (40 km) and preliminary geological mapping on the Tootsee River Property.

1980 Geological mapping, rock sampling, soil sampling, pan and stream sediment sampling and a VLF-EM and magnetic surveys were conducted. A public company was spun off to explore Canadian assets resulting in ownership change to Canamax Resources Incorporated.

1983 Limited geological mapping, soil geochemistry and a ground magnetic survey was conducted in BC. A fall diamond drill program consisted of one hole in BC and two holes in the Yukon for a total of 783 metres. Significant results were returned from TR83-02 in the Central Hornfels Zone, Yukon which reportedly intersected 174 metres of stockwork mineralization assaying 0.07% MoS_2 and 0.12% WO_3.

1984 Infill soil sampling at the Central Hornfels Zone and extended soil sampling and geological mapping at the Northwest Hornfels Zone. Drill pads and a water line were cut for an anticipated drill program.

1985 Detailed geological mapping, infill soil sampling, 11.3 kilometres of access, drill road and drill site construction, and a 163 line kilometre helicopter-borne magnetic-EM survey.

1989 Canamax Resources Inc. assets acquired by Canada Tungsten Mining Corporation.

1996 Canada Tungsten Mining Corporation-Aur Resources merger. Tungsten assets spun off to a new company, North American Tungsten Corporation Limited.

2005 Cumberland Resources Ltd. staked Yukon and BC claims peripheral to the 28 core HOT claims held by North American Tungsten Corporation Limited.

2006 Cumberland Resources Ltd. and North American Tungsten Corporation Ltd. finalized an option agreement to facilitate the exploration and development of the Tootsee River Property (subsequent name change to Jennings Project). Cumberland drilled three diamond holes for 1,494.00 meters.

2007 AEM acquired Cumberland Resources Limited, the company that explored the Jennings Project.

2008 AEM conducted 4,000.24 metres diamond drilling program on the Jennings Property in Yukon Claims from July to November for 8 holes. Additional 22 Yukon Quartz claims were staked (TOOZ 98-119) in September 2008 along the BC-Yukon border.

2009 AEM completed 8,400 metres of diamond drilling at Jennings Property in Yukon Claims from July 1 to October 29, 2009 for 12 holes. AEM also acquired the remaining interest in the property from North American Tungsten Corporation Ltd. The property is now 100% owned and operated by AEM. Equity Exploration Consultant was contracted for geochemical soil survey in BC claims.

2010 AEM completed 18,732.33 metres of diamond drilling at the Jennings Property in Yukon Claims from June 1 to October 30, 2010 for 27 holes, begins environmental base line study and First Nation consultation.

2011 AEM completed a soil geochemical survey at BC claims and collected 350 soil samples; Golder Associate continued collecting environmental base line data and continued consultation with the First Nations.

2012 AEM completed a 3 diamond drill holes for 1450meters in BC claims, collected 400 soil samples, collected three composite samples for metallurgical study, continue environmental monitoring study and staked additional 48 block claims in Yukon.

2013 AEM contracted SGS and Golder Associates, and completed metallurgical study and environmental monitoring study respectively at the Jennings project.

SECTION 2.0 PROJECT GEOLOGY

2.1 REGIONAL GEOLOGY

The Jennings Project area occurs within carbonate and clastic rocks of the ancestral North American continental shelf (Figure 3). Miogeoclinal strata range from Lower Cambrian to Lower Mississippian in age and form the footwall of a regional north-east directed thrust fault. Hanging wall to the thrust are marine sediments, mafic volcanics and related mafic to ultramafic intrusives of the Late Devonian to Late Triassic Sylvester Allochthon.

Emplacement of the allochthon took place between Late Triassic and Mid-Cretaceous followed by the intrusion of the Early to Mid-Cretaceous Cassiar batholith. Cryptic Late Cretaceous to Early Tertiary intrusives is marginal to the Cassiar Batholith. Two major structural events are documented in the area. An Early Jurassic collisional event caused major shortening of the North American continental margin and emplacement of the Sylvester Allochthon. A younger structural event is related to Late Cretaceous to Early Tertiary strike-slip faulting along the dextral Cassiar and Tintina fault systems that bound the project area. Quaternary to Recent continental basaltic magmatism is represented by valley fill flows and associated intrusive feeders that locally dominate regional aeromagnetic datasets.

2.2 PROPERTY GEOLOGY

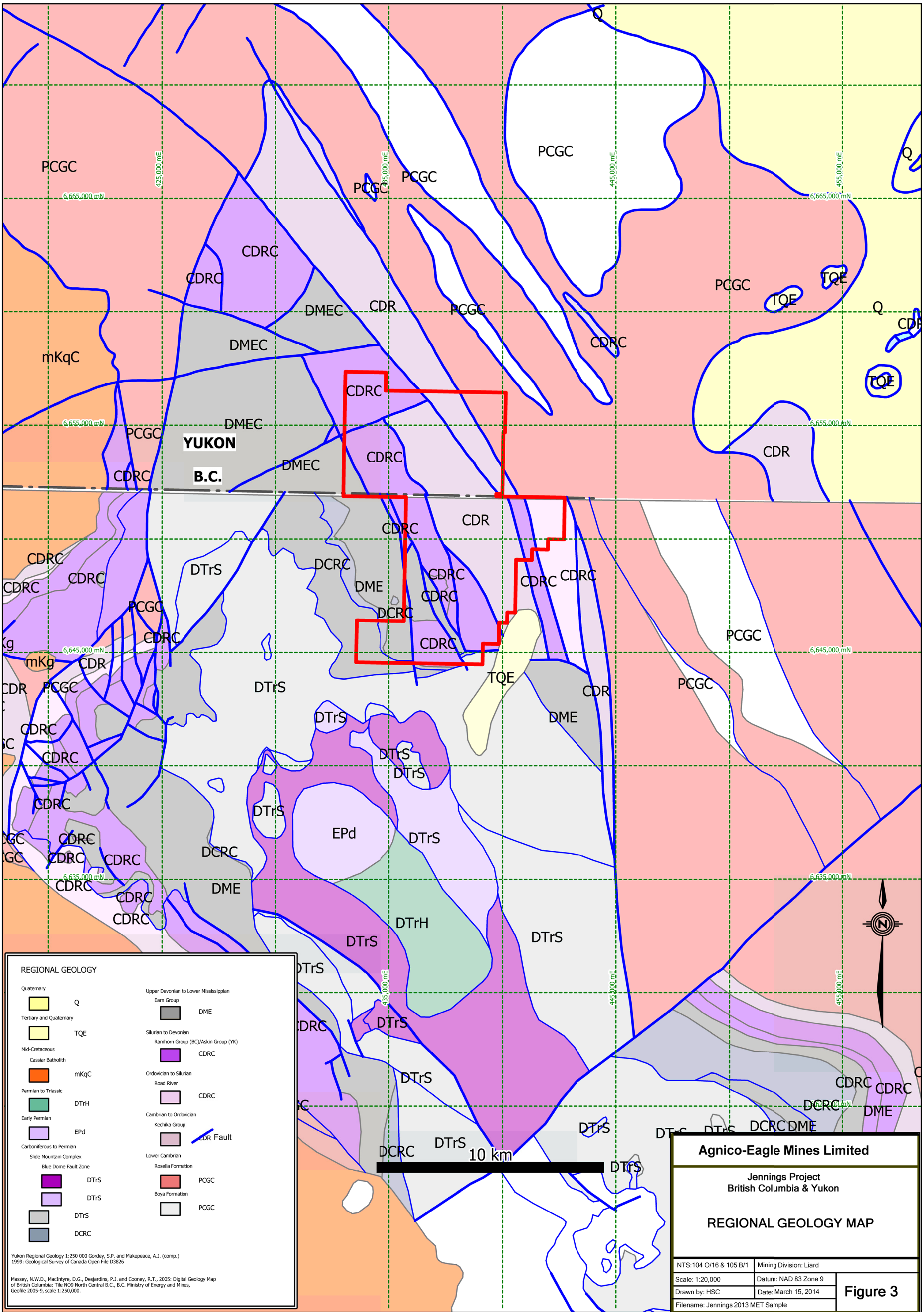
Jennings claims are underlain predominantly by a north-northwest trending, moderately to steeply west dipping package of calcareous and pelitic siltstone, shale and minor limestone of the Cambrian-Ordivician Kechika Group (Figure 4). Kechika Group sediments are flanked to the west by dolomitic quartzite and arenite with minor limestone and limy graphitic argillite of Silurian-Devonian age. Geological mapping in1984 has placed a strongly foliated amphibolite at the probable thrust contact between the Kechika Groupand Silurian-Devonian sediments. The northeastern project area is reportedly underlain by calcareous phyllite and limestone of the Lower Cambrian Atan Group but stratigraphic-type airborne geophysical conductors and government mapping in British Columbia suggest a component of Ordivician-Silurian Road River Group black shale or possibly thrust and/or fold repeated graphitic units of Silurian-Devonian age. Strongly magnetic flood basalts occur in the extreme southeastern project area. Kechika Group rocks are internally tightly folded and imbricated. A seven kilometre long, northwest trending aureole of pyrrhotite-bearing calc-silicate and pelitic hornfels and skarn has been mapped from southeast to northwest across the central and northern property area. Sedimentary rocks are converted to a strongly banded white to light green calc-silicate hornfels and lesser maroon biotite hornfels with intercalated pyroxene skarn or marble. Rare exposures of north-northwest trending aplite and quartz-feldspar porphyry dykes and a small plug are coincident with areas of strongly fractured and sulphidized hornfels in the Central Hornfels Zone (CHZ) and Northwest Hornfels Zone (NWHZ). References to lamprophyre and diorite dykes suggest a minor mafic intrusive component.

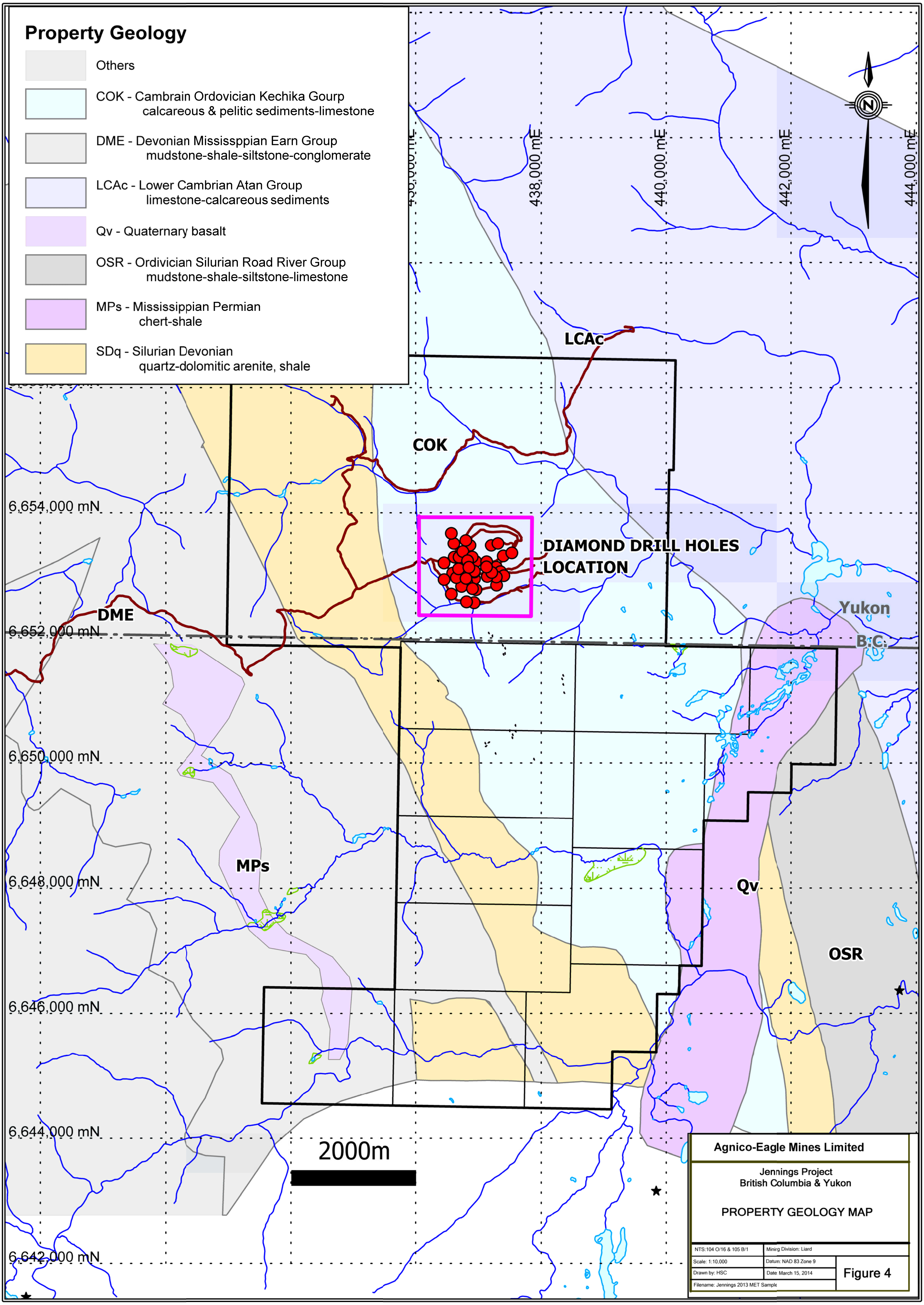
SECTION 3.0: SGS MINERALS REPORT SUMMARY - 2013 THE RECOVERY OF TUNGSTEN AND MOLYBDENUM

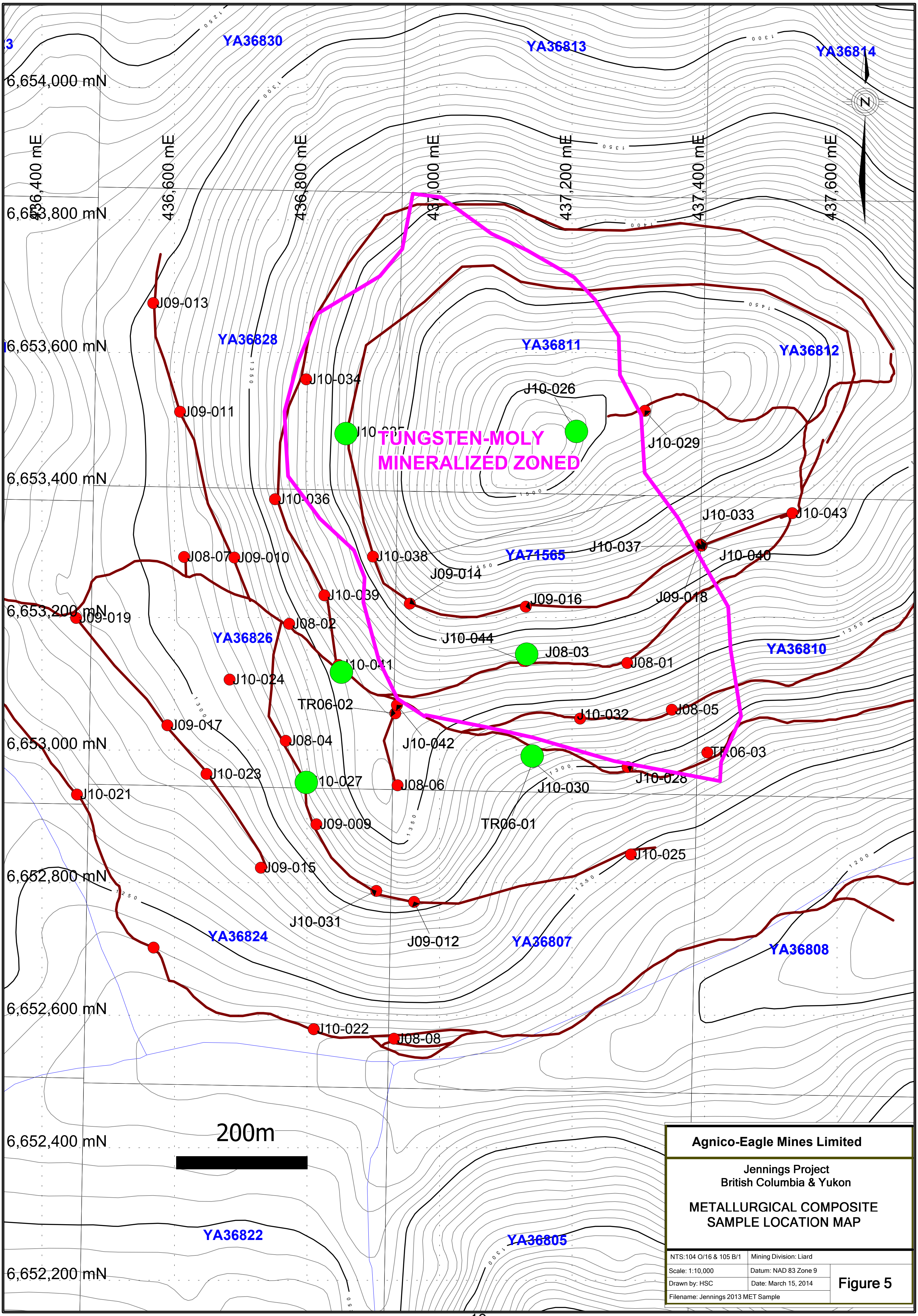
3.1.0 COMPOSITE SAMPLES

In June 1 to 2, 2013, composite sample of diamond drill core were collected from 6 diamond drill holes (Figure 5). The half core samples were selected on the intervals of molybdenum and tungsten mineralized zone representing the ore body. The 6 mini-composites of half core samples collected weight 74.90 kilos were submitted to SGS Minerals Laboratory in Lakefield Ontario (Table 2).

SGS Lakefield site prepared mastered composite of the core submitted and add two more composite samples that had prepared from the in 2012 test work. The test work completed on three composite samples consisting of Sample Preparation, Flotation Testing, Heavy Liquid Separation, Gravity Separation (Wilfley and Mozley Tabling), Magnetic Separation (WHIMS) to Upgrading Gravity Concentrates, and QEMSCAN Analysis on the Tungsten Cleaner Concentrates. The SGS complete test work report was attached as an appendix A.


YUKON
B.C.
10 km
REGIONAL GEOLOGY
Quaternary
Q
Tertiary and Quaternary
TQE
Mid-Cretaceous
Cassiar Batholith
mKqC
Permian to Triassic
DTrH
Early Permian
EPd
Carboniferous to Permian
Slide Mountain Complex
Blue Dome Fault Zone
DTrS
DTrS
DTrS
DCRC
Upper Devonian to Lower Mississippian
Earn Group
DME
Silurian to Devonian
Ramhorn Group (BC)/Askin Group (YK)
CDRC
Ordovician to Silurian
Road River
CDRC
Cambrian to Ordovician
Kechika Group
CDR Fault
Lower Cambrian
Rosella Formation
PCGC
Boya Formation
PCGC
Yukon Regional Geology 1:250 000 Gordey, S.P. and Makepeace, A.J. (comp.) 1999: Geological Survey of Canada Open File D3826
Massey, N.W.D., MacIntyre, D.G., Desjardins, P.J. and Cooney, R.T., 2005: Digital Geology Map of British Columbia: Tile NO9 North Central B.C., B.C. Ministry of Energy and Mines, Geofile 2005-9, scale 1:250,000.
Agnico-Eagle Mines Limited
Jennings Project
British Columbia & Yukon
REGIONAL GEOLOGY MAP
NTS:104 O/16 & 105 B/1
Mining Division: Liard
Scale: 1:20,000
Datum: NAD 83 Zone 9
Drawn by: HSC
Date: March 15, 2014
Filename: Jennings 2013 MET Sample
Figure 3


Property Geology
Others
COK - Cambrain Ordovician Kechika Gourp calcareous & pelitic sediments-limestone
DME - Devonian Mississppian Earn Group mudstone-shale-siltstone-conglomerate
LCAc - Lower Cambrian Atan Group limestone-calcareous sediments
Qv - Quaternary basalt
OSR - Ordivician Silurian Road River Group mudstone-shale-siltstone-limestone
MPs - Mississippian Permian chert-shale
SDq - Silurian Devonian quartz-dolomitic arenite, shale
438,000 mE
440,000 mE
442,000 mE
444,000 mE
6,654,000 mN
6,652,000 mN
6,650,000 mN
6,648,000 mN
6,646,000 mN
6,644,000 mN
6,642,000 mN
LCAc
COK
DIAMOND DRILL HOLES LOCATION
DME
Yukon
B.C.
MPs
Qv
OSR
2000m
Agnico-Eagle Mines Limited
Jennings Project
British Columbia & Yukon
PROPERTY GEOLOGY MAP
Figure 4



YA36830
YA36813
YA36814
N
6,654,000 mN
436,400 mE
436,600 mE
436,800 mE
437,000 mE
437,200 mE
437,400 mE
437,600 mE
6,653,800 mN
J09-013
6,653,600 mN
YA36828
YA36811
YA36812
J10-034
J10-026
J09-011
J10-029
TUNGSTEN-MOLY
MINERALIZED ZONED
6,653,400 mN
J10-036
J10-033
J10-043
J08-07
J09-010
J10-038
YA71565
J10-037
J10-040
J09-014
J10-039
J09-016
J09-018
6,653,200 mN
J09-019
J08-02
YA36826
J10-044
J08-03
YA36810
J08-01
J10-041
J10-024
TR06-02
J10-032
J08-05
J09-017
J10-042
6,653,000 mN
J08-04
TR06-03
J10-023
J10-027
J08-06
J10-028
J10-030
J10-021
J09-009
TR06-01
J10-025
J09-015
6,652,800 mN
J10-031
J09-012
YA36824
YA36807
YA36808
6,652,600 mN
J10-022
J08-08
6,652,400 mN
200m
YA36822
YA36805
6,652,200 mN
Agnico-Eagle Mines Limited
Jennings Project
British Columbia & Yukon
METALLURGICAL COMPOSITE
SAMPLE LOCATION MAP
NTS:104 O/16 & 105 B/1
Mining Division: Liard
Scale: 1:10,000
Datum: NAD 83 Zone 9
Drawn by: HSC
Date: March 15, 2014
Figure 5
Filename: Jennings 2013 MET Sample

Table 2: Composite Sampes

DDH_ID COMPOSITE J-SUL-001	EASTING	NORTHING	ELEV	AZ	DIP	DEPTH	FROM	TO	LENGTH	APPROX.WT. (KG)
J10-026	437,205.09	6,653,481.00	1,508.23	360	-90	831.00	405.00	406.50	1.50	3.34
							517.50	519.00	1.50	3.54
							630.00	631.50	1.50	3.06
							717.80	719.60	1.80	2.88
								WT.AVG.	**6.30**	**12.8**
J10-027	436,801.03	6,652,952.50	1,317.23	50	-50	783.00	283.50	285.00	1.50	3.69
							324.00	325.50	1.50	3.37
							400.50	402.00	1.50	2.77
							712.50	714.00	1.50	3.29
								WT.AVG.	**6.00**	**13.1**
J10-030	437,141.47	6,652,982.50	1,304.51	50	-78	600.73	199.50	201.00	1.50	3.43
							252.00	253.50	1.50	3.76
							376.50	378.00	1.50	3.14
							438.00	439.50	1.50	3.29
								WT.AVG.	**6.00**	**13.6**
J10-035	436,865.03	6,653,480.00	1,406.38	50	-55	612.00	442.00	444.00	2.00	4.89
							474.00	476.00	2.00	4.63
							532.00	534.00	2.00	4.89
							562.00	564.00	2.00	4.69
								WT.AVG.	**8.00**	**19.1**
J10-044	437,127.03	6,653,134.50	1,371.18	50	-85	720.00	231.00	233.00	2.00	4.6
							305.00	307.00	2.00	3.42
							344.00	346.00	2.00	4.23
							592.00	594.00	2.00	4.14
								WT.AVG.	**8.00**	**16.4**
J10-039	426,826.22	6,653,233.50	1,361.57	50	-56	702	313.00	315.00	2.00	4.0
							367.00	369.00	2.00	4.89
							419.00	421.00	2.00	4.46
							617.00	619.00	2.00	4.48
								WT.AVG.	**8.00**	**17.8**
						TOTAL		**TOT.WT.A**	**42.30**	**92.9**

3.1.1 Sample Preparation

The drill core intervals in the rice bags were first crushed to 100% passing ½”. A 10 kg charge was removed from the ½” material as a provision for conducting gravity separation on coarser materials. The remainder was further crushed to -6 mesh and mixed with Comp1 and Comp2 (-10 mesh) that had been already on the site from the previous test program on Jennings deposit. A master composite was produced with ~ 65 kg of Comp4, ~50 kg of Comp1, and ~54 kg of Comp 2. Approximately 40 kg of material was extracted from the master composite and rotary split into 2 kg charges. Three 2 kg charges were randomly selected and a 100 g subsample was removed from each charge for head chemical analysis. One of the three subsamples was submitted for head assays including WO3, Mo, S=, F, and ICPscan, while the other subsamples were only assayed for WO3, Mo, and S=. The remainder of the master composite was split into 10 kg test charges. A total of twelve 10 kg charges were prepared for the composite. All 2 kg and 10 kg charges were placed in freezer storage. All rejects from the composites were also stored.

3.1.2 Floatation Testing

Flotation testwork was performed on the composite samples. Ore samples were stageground to 100% passing 150 mesh and subjected to molybdenum flotation, followed by a sulphide rougher to remove sulphide minerals. Tungsten floatation tests were completed on sulphide rougher tails.

3.1.3 Heavy Liquid Separation

A heavy liquid separation (HLS) test was completed on two 2 kg charge samples at different feed particle sizes. The charge samples were combined and then screened into -6/+10 mesh, -10/+35 mesh, -35/+200 mesh, and -200 mesh. The mass of each fraction obtained are presented in Table 17. Each size fraction except for -200 mesh was submitted for HLS at specific gravities (SG) of 3.6 and 3.0 g/cm3. The sinks and floats, as well as the -200 mesh fraction, were submitted for WO3, Mo, S and WRA (whole rock analysis).

3.1.4 Gravity Separation

Initial gravity test was conducted on +250 mesh sulphide rougher tails from test FM2. There were ~95% of the WO3 reported to the FM2 sulphide rougher tails at ~97% mass. Approximately 4 kg of the sulphide tails were screened at 250 mesh (63µm), and ~1,237 g of +250 mesh materials were obtained. A sub-sample at ~200 g was split out from the +250 mesh fraction, and passed through a Mozley table. The Mozley concentrate recovered 82% of the WO3 grading 0.63% WO3. The concentrate grade was 11 times upgraded comparing to the feed grade. The gangue minerals reported to the Mozley concentrate ranged from 5% to 30%.

3.1.5 Magnetic Separation

Further upgrading Wilfley concentrate using WHIMS were investigated. Test G4 was conducted to perform WHIMS and Mozley tabling on G3 Wilfley concentrate 1. The concentrate was passed through an Eriez WHIMS separator at 15,000 Gauss. The WHIMS non-mags were screened at 300 µm (48 mesh). A Mozley test was carried on each of the 2 fractions (-506+300 µm and -300+106 µm).

3.1.6 QEMSAN Analysis

QEMSCAN analysis on two tungsten cleaner concentrates (a high-grade and a low-grade) revealed that fluorite was the biggest contaminant in both concentrates at ~36% and 71%, respectively. The rejection of fluorite in the high-grade concentrate was better than the low-grade concentrate. Other contaminants including apatite, calcite, and micas/clays were also found in the concentrates

SECTION 4 : GOLDER ASSOCIATES REPORT SUMMARY - METEOROLOGICAL MONITORING AND ACQUATIC BASELINE PROGRAM

4.1 METEOROLOGICAL MONITORING

A meteorological monitoring station (i.e., met station) was installed on site on November 9, 2011 as part of the baseline studies program for the Project (Figure 6). Meteorological data were downloaded on the quarterly visits in 2012 and 2013 work programs. The station was demobilized on October 17, 2013

Instruments installed at the met station were; 1.) CM106 3 metre tripod; 2.) MSX20R regulated solar panel - charges an on-board 12 volt battery (BP26); 3.) SC115 Flash Memory Drive with USB interface; 4.) CR1000 series Data Logger with BP26 battery and enclosure; 5.) 5103 R.M. Young Wind Monitor; 6.) Model 109L Temperature Probe MP45C212 Temperature and Relative Humidity Probe; 7.) TE525 Tipping Bucket Rain Gage; 8.) SR50A Sonic Ranging Sensor (Snow Depth); 9.) NR-LITE2 Net Radiometer

Data measurements are recorded on an hourly interval as follows: 1.) Air Temperature HMP Average; 2.) Air Temperature HMP Maximum; 3.) Air Temperature HMP time of Maximum; 4.) Air Temperature HMP Minimum; 5.) Air Temperature HMP time of Minimum; 6.) Relative Humidity Instantaneous; 7.) Relative Humidity Average; 8.) Vapour Pressure average; 9.) Saturation Vapour Pressure Average; 10.) Air Temperature 109 Average; 11.) Air Temperature 109 Maximum; 12.) Air Temperature 109 time of Maximum; 13.) Air Temperature 109 Minimum; 14.) Air Temperature 109 time of Minimum; 15.)Solar Radiation Average; 16.)Wind Speed Average; 17.) Wind Vector Average; 18.) Wind Vector Standard Deviation; 19.) Wind Speed Maximum; 20.) Wind Speed time of Maximum; 21.) Rainfall Total (snowfall data may be useful, and warrants consideration for future met station development); 22.)Snow Depth Instantaneous; and 23.) Snow Depth Quality Signal.

4.2 ACQUATIC BASELINE PROGRAM

The primary objectives of the 2013 aquatics baseline study were to characterize seasonal variation in water quality, stream flows, and water levels in the project area. The aquatics program consisted of water quality sampling and stream flow measurements at eight sites on five unnamed water course (Figure 7). The sites were sampled on three occasions throughout the open water season (June, August, and October). The water level data loggers were installed at four of these eight sites in June and recovered in October 2013.The regional drainages include the Tootsee River, located west of the Jennings Project area, which flows approximately 15 kilometers northward until it joins the Rancheria River. The Rancheria River flows in an east-north-easterly direction and eventually flows into the Liard River upstream of the community of Upper Liard. Unnamed streams in the project area are tributaries of the Rancheria River system.

4.2. Methodology

4.2.1 Hydrology

Stream flow measurements were collected with a Flow Tracker Acoustic Doppler Velocimeter for seven of the eight sites in May 14, June 5 and October 17, 2013. Water level data-loggers were installed at gauging sites BC-1, BC-2B, BC-5, and TR-1 on 14 May 2013 and removed on 17 October 2013. Sample sites are provided on Figure 1.

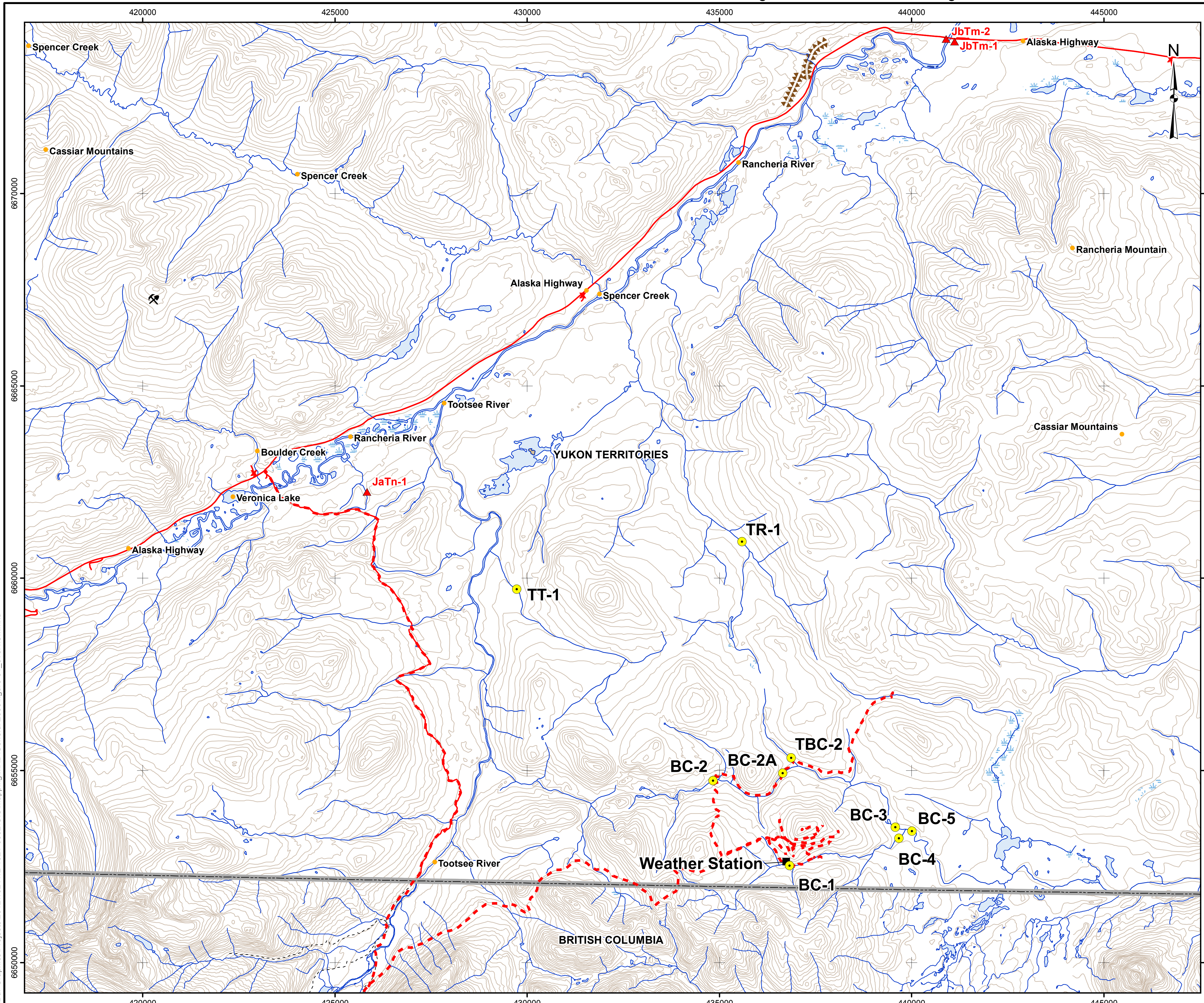
4.3. Results

4.3.1 Hydrology

Stream flow measurements were taken during all three field visits in 2013 shows the calculated discharge results at the time of surveys. Gauges were uploaded and removed from site on October 17, 2013. Data from the gauges have not been summarized to date. Digital data files will be stored with Golder and transferred to AEM.

Figure 6: MET Station Photo - 2011

Figure 7: Baseline Monitoring Sites



LEGEND

- Archaeological Site
- Aquatic Sample Station
- Weather Station
- Provincial / Territorial Boundary
- Access Road
- Contour
- Road
- Watercourse
- Waterbody
- Wetland

LEGEND FOR AQUATIC SAMPLE STATIONS

Station	Water Quality	Stream Flow	Transducer (2012)	Benthic Invertebrates (Sep. 2011)	Periphyton (Sep. 2011)
BC-1	■	■	■		■
BC-2	■	■			
BC-3	■	■			
BC-4	■	■		■	
BC-5	■	■	■	■	■
BC-2A		■	■		
TBC-2	■	■			■
TR-1	■	■	■	■	■
TT-1	■	■			

REFERENCE

CanVec 1:50,000 data obtained from Natural Resources Canada.
Projection: UTM Zone 83 Datum: NAD 9

2,000 0 2,000
SCALE 1:100,000 METRES

PROJECT
AEM JENNINGS MINE

TITLE
BASELINE MONITORING SITES

Golder Associates
Greater Vancouver Office, B.C.

PROJECT No. 12-1021-0002			PHASE No. 2000
DESIGN	CO	08JUL10	SCALE AS SHOWN REV. 0
GIS	JP	16MAR13	
CHECK	CHS	18APR13	
REVIEW	CHS	18APR13	

FIGURE 1

N:\Bur-Graphics\Projects\2012\1021\12-1021-0002\GIS\Mapping\MXD\General\2000\figure-01_overview.mxd

SECTION 5: CONCLUSIONS AND RECOMMENDATION

A. METALLURIGCAL STUDY (Conclusion and Results are from SGS Report)

Floatation and gravity separation testwork were completed on a master composite that was comprised of three composites, Comp1, Comp2, and Comp4 from Jennings W-Mo deposit. The objective of the test program was to further define the conceptual flowsheet that was developed in the initial scoping level study, and to evaluate gravity recovery as an option. The following conclusions can be made from the testwork.

The master composite contained 0.11% WO3, 0.085% Mo, 0.37% S, and 0.87% F. The content of Al, Ca, Fe, K, Mg, and Na were significantly higher than the other elements in the composite at 7.29% Al, 5.51% Ca, 4.40% Fe, 2.55% K, 1.48% Mg, and 1.39% Na.

A total of 11 tests were completed to investigate the effect of reagents, regrind fineness, and pulp potential on moly flotation;

- The feed was stage ground to 100% passing 150 mesh;
- A combination of pine oil and fuel oil was selected as a collector suite;
- Finer regrind was beneficial to the metallurgy. Better performance was achieved at a regrind P80 of 15 µm;
- Pulp potential (Eh) at -400 mV was selected for moly cleaners to achieve a high concentrate grade;
- NaCN was selected to depress the gangues, while NaHS was used to manipulate the pulp potential.

The moly rougher recoveries ranged from 86.0% to 95.5% with the grades varied from 3.76% Mo to 11.5% Mo. The best performance was achieved in test FM7 with 95.0% recovery and 11.5% Mo. Test FM10 produced a moly 2nd cleaner concentrate which graded 50.4% Mo with the highest recovery of 88.4%.

Results from test FM4 indicated that further upgrading the moly concentrate from 48.5% Mo (1st cleaner concentrate) to 55.4% Mo (3rd cleaner concentrate) resulted in a significant decline of Mo recovery from ~80% to 44%.

Sulphide flotation was carried out on the moly rougher tailings to remove sulphides. PAX was applied as the collector. The overall removal of sulphur (Mo + S rougher concentrates) varied between 71% and 92%. 8.0% to 29% of the sulphur reported to sulphide rougher tails (i.e. scheelite flotation feed). The tungsten reported to sulphide rougher tails ranging from 94.8% to 98.1%

A total of 13 rougher tests were completed on sulphide rougher tails to investigate the effect of reagents on the selective flotation of scheelite. Collectors (FS-2, V4085, BHD, and Cytec 6493), depressants (Na2SiO3, Que D-2, Calgon, Citric acid, BaCl2, Al3SO4), and dispersant K-8300 were evaluated.

The best tungsten rougher test, FW2, produced a rougher concentrate grading 3.19% WO3 at a stage recovery of 71.7%.

Five cleaner tests were completed for upgrading tungsten rougher concentrates. FW2 rougher conditions were applied. Reagents and dosages for tungsten cleaners were further investigated. The challenge was to achieve selective flotation of scheelite from Ca-bearing gangue minerals, particularly fluorite in the cleaner stage. The best result was obtained in test FW12, with the 4th cleaner concentrate which graded 30.7% WO3 at a stage recovery of ~55%.

QEMSCAN analysis on two tungsten cleaner concentrates (a high-grade and a low-grade) revealed that fluorite was the biggest contaminant in both concentrates at ~36% and 71%, respectively. The rejection of fluorite in the high-grade concentrate was better than the low-grade concentrate. Other contaminants including apatite, calcite, and micas/clays were also found in the concentrates. The liberation characteristics for scheelite in the concentrate were good with >89% of the scheelite being free or liberated. Therefore, regrinding for the purpose of improving liberation is likely not required.

Approximately 32% (in high-grade concentrates) and 57% (in low-grade concentrates) of the nonliberated scheelite were associated with fluorite.

A heavy liquid separation (HLS) test was performed on the master composite. The test results did not show much promise to recover tungsten using gravity separation. Although the tungsten grade for the 3.6 sinks was over 10 times higher than the 3.0 sinks in the sample, the mass of the 3.6 sinks was very low at 0.4% with the tungsten distribution at 18.5%. The 3.0 sinks had higher tungsten distribution at 30.5%, but the grade was relatively low at 0.56% WO3. An initial gravity separation (Mozley) test, G1, was completed on the +250 mesh sulphide rougher tails from test FM2. The Mozley concentrate recovered ~82% of available WO3 in the feed at a grade of 0.63% WO3, indicating a poor separation by gravity.

Gravity-Flotation testing was completed on 10 kg of the master composite. The sample was stage ground to 100% passing 38 mesh (-503 µm), and then wet screened at 150 mesh (106 µm). The -503+106 µm fraction passed through a Wilfley table (G2). A moly flash flotation was carried out on the G2 Wilfley concentrate. The moly flash tails subjected to Wilfley tabling (G3) for upgrading tungsten. G3 Wilfley tails and concentrates 2-8 were incorporated with the moly flash concentrate and the -106 µm fines from the wet screen, and subjected to moly and scheelite flotation (FM5). Approximately 40% of the mass was in the finer fraction (-106µm), while ~60% of the mass in the coarse fraction (-503+106 µm). The coarse fraction, with ~35% of Mo and ~39% of WO3 distributions, was passed through a Wilfley table (G2). The Wilfley concentrate (with 2 passes) recovered ~23% of the Mo and 30.5% of the WO3. There were 12% of the Mo and 8.9% of WO3 lost in the tailings at grades of 0.035% Mo and 0.020% WO3.

Approximately 66% of the available moly (global recovery ~15%) was recovered to the moly flash concentrate grading 17.2% Mo.

Gravity upgrading of the tungsten in the moly flash tails (G3) produced a first concentrate (G3 Wilfley concentrate 1) only grading 0.76% WO3 at ~67% recovery of the available tungsten (22.5% global recovery).

Approximately 66% of the mass, with ~87% of Mo and ~67% of WO3 distributions, subjected for flotation test FM5. The moly flotation circuit produced a moly cleaner concentrate grading 50.8% at a recovery of ~65%. The scheelite flotation was not successful. The rougher concentrate only recovered ~49% of the WO3 grading 1.33% WO3. The rougher concentrate was upgraded to a grade of 5.77% WO3 in the cleaner with only ~10% recoveries.

Further upgrading of G3 Wilfley concentrate 1 using WHIMS revealed that the WHIMS mags had a grade (0.87% WO3) very similar to the feed grade (0.79% WO3). This suggested that upgrading tungsten with WHIMS was also difficult.

Recommendations

The next phase of metallurgical testing should focus on optimization of the tungsten flotation circuit. A significant amount of sample in the order of 2-3 tonnes would be required for a proper systematic evaluation of flotation variables. The approach would be to process the material in a continuous mini-pilot plant to produce a bulk amount of tungsten feed. This would then be divided into a significant number of identical test charges for subsequent tungsten circuit development. The variables under examination would include different collector suites including some specifically developed for scheelite flotation in China. This examination would need to be tested in parallel to determination of the optimum depressant suite. The bulk testing would also generate significant molybdenum rougher concentrate to complete optimization of this circuit. The testing would generate several kilograms of WO3 cleaner concentrate. All testing to date supports that the maximum grade achievable by flotation is likely to be in the range of 30% WO3. Various upgrading testing (gravity and magnetic separation) would be evaluated and preliminary leach testing could be explored to assess amenability to an ammonium paratungstate (APT) process, which would likely be suitable for concentrates in this grade range. Preliminary dewatering and environmental testing should be completed on flotation tailings in the next test program since the flotation dispersant reagents applied in tungsten circuit can present challenges with tailings treatment.

B. METEOROLOGICAL AND ENVIRONMENTAL BASE LINE MONITORING

Golder Associates Limited has been contracted by AEM since 2010 for environmental base line monitoring study on Jennings project. Since then, data compilation over three years period (2010, 2011, 2012 and 2013) had been important to AEM in identifying potential environmental impacts over the project should the project go to the development stage. It is recommended to continue the baseline monitoring program on the project.

SECTION 6: REFERENCES

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Bailey, Jeff and Schmidt, Chris; Summary Report on 2012 Baseline Monitoring Program: unpublished report; April 18, 2013.

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Watts, A.C. (1985): Interpretation Report: Addendum to Report on Combined Helicopter Borne Magnetic, Electromagnetic and VLF Survey: Tootsee River, British Columbia/Yukon; unpublished report; December, 1985

SEC T I O N 7 : STATEMENT OF EXPENDITURES

2013 Testing-Jennings Deposit

June 1, 2013 to December 31, 2013

Description	Price
Sample Receipt and Preparation	**$ 750.00**
Head Assay (WO3, Mo, S=, F and ICP sacn)	**$ 450.00**
Mineralogy on WO3 Cleaner Cocentrates	**$3,225.00**
Heavy Liquid Separation	**$6,400.00**
Gravity Testing	**$8,150.00**
Flotation testing	**$49,770.00**
Project Management and Reporting	**$20,623.50**
Total Cost for 2013	**$89,368.50**

STATEMENT OF EXPENDITURES
Jennings Project
March 1, 2013-December 31,2013

PROFESSIONAL FEES AND WAGES:

C. Shmidt, Level-7		
17.00 hours @ $250/hour	$4,505.00	
A. Pickup, Level-3		
11.25 hours @ $145/hour	1,659.53	
J. Marquardson, Level-D		
84.00 hours @ $135/hour	12,020.41	
A. Dioquino, Level-C		
2.25 hours @ $75/hour	178.88	
K. Rankin, Level-B		
0.75 hours @ $55/hour	43.73	
J. Fraser, Level-B		
0.75 hours @ $55/hour	43.73	$ 18,451.28

EQUIPMENT RENTALS :

Helicopter-Direct Bill to AEM		$16,652.85

EXPENSES:

Joe Marquadson's Disbursment	$ 1,125.64	
Liard First Nation Development Corp. Disburstment	1,237.50	
		$2,363.14

SUB-TOTAL: Golder and AEM	**$ 37,467.27**
AEM Project Management and Administration	**4,570.30**
TOTAL:	**$ 42,037.57**

SEC T I O N 8 : STATEMENT OF QULIFICATION

QUALIFIED PERSON'S CERTIFICATE

Henry Sarreal Castillo
2148 East 33rd Avenue
Vancouver, B.C., Canada

I, **HENRY SARREAL CASTILLO**, P.Geo, do hereby certify that:

1. I am the Senior Geologist of Agnico Eagle Mines Limited and a Project Manager of the Jennings Tungsten-Molybdenum Project from 2008 to the present with an office address at 400-543 Granville Street, Vancouver, British Columbia.

2. I am a member of in a good standing (#33450) of the Association of Professional Engineers and Geoscientist of British Columbia (APEGBC) since 2009.

3. I am a graduate of Adamson University (1989) of Bachelor of Science degree in Geology. I passed the professional geological examination given by the Philippine Regulation Commission in 1991, and I have practiced my profession continuously since 1991.

4. Since 1991 I have been involved in mineral exploration for gold, silver, copper, molybdenum, lead and zinc in Canada, Mexico, Ecuador, Indonesia and the Philippines.

5. I was a directly involved with the planning and managing of the 2013 Metallurgical and Environmental Study at Jennings Project.

Dates at Vancouver, British Columbia, this 15th day of March 2014

PROFESSIONAL
PROVINCE OF
H. S. CASTILLO
33450
BRITISH COLUMBIA
GEOSCIENTIST

Henry Sarreal Castillo, B.S. Geo, P.Geo

APPENDIX A: SGS 2013 REPORT ON METALLURGICAL STUDY

An Investigation into

THE RECOVERY OF TUNGSTEN AND MOLYBDENUM FROM THE JENNINGS DEPOSIT

prepared for

AGNICO EAGLE MINES LTD

Project 13583-002 – Final Report
March 17, 2014

SGS Canada Inc. 1140 Sheppard Avenue West #6 Toronto ON M3K 2A2
Tel: (416) 633 9400 Fax: (416) 633 2695 www.met.sgs.com www.ca.sgs.com
Member of the SGS Group (SGS SA)

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Executive Summary

A test program was completed on a master composite comprised of Comp1, Comp2, and Comp4 from Jennings W-Mo deposit. The master composite graded 0.11% WO_3, 0.085% Mo, 0.37% S, 0.87% F, 7.29% Al, 5.51% Ca, 4.40% Fe, 2.55% K, 1.48% Mg, and 1.39% Na.

The objective of the test program was to further define the conceptual flowsheet that was developed in the initial scoping level study as well as to investigate the role of gravity separation in the process. The testwork included flotation testing on both molybdenum and tungsten circuits, heavy liquid separation to produce tungsten concentrate, and gravity separation on tungsten feed and a coarse fraction (-506+106 µm) of the ore. Wet High Intensity Magnetic Separation (WHIMS) was also completed to investigate further tungsten upgrading on gravity concentrates.

Flotation testwork was conducted using the flowsheet depicted in Figure 1. Sample charges were stage ground to 100% passing 150 mesh, then subjected to molybdenum flotation, followed by a sulphide rougher to remove sulphide minerals. Tungsten flotation testing was completed on sulphide rougher tails.

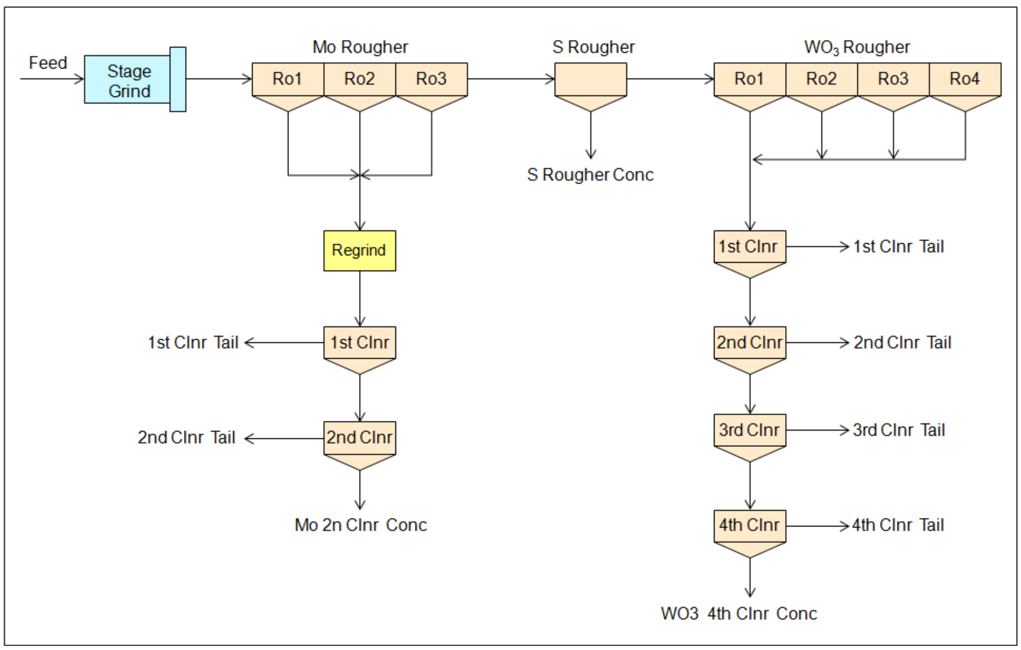


Figure 1: Flotation Testwork Flowsheet

A total of 11 tests were completed to investigate the effect of reagents, regrind fineness, and pulp potential on molybdenum flotation. A combination of pine oil and fuel oil was selected as a collector suite. Finer regrind was found to be beneficial to the metallurgy. Better performance was achieved at a regrind P_{80} of 15 µm. Pulp potential (Eh) at -400 mV was selected for molybdenum cleaners to achieve a high concentrate grade. NaCN was used to depress the gangue minerals, while NaHS was used to manipulate the pulp potential. The molybdenum rougher recoveries ranged from 86.0% to 95.5% with grades varying from 3.76% Mo to 11.5% Mo. The best performance was achieved in test FM7 with 95.0% recovery at a grade of 11.5% Mo. Test FM10 produced a Mo 2nd cleaner concentrate which graded 50.4% Mo with the highest recovery of 88.4%. The results from test FM4 indicated that further upgrading the molybdenum concentrate from 48.5% Mo (1st Cleaner Conc) to 55.4% Mo (3rd Cleaner Conc) resulted in a significant decline of molybdenum recovery from ~80% to 44%.

Sulphide flotation was carried out on the molybdenum rougher tailings to remove sulphides. PAX was applied as the collector, and the overall removal of sulphur (Mo + S rougher concentrates) varied between ~72% and ~92%. Between 8.0% and 28% of the sulphur and 94.8% to 98.5% of WO_3 reported to sulphide rougher tails (i.e. scheelite flotation feed), respectively.

A total of 13 rougher tests were completed on sulphide rougher tails to investigate the effect of reagents on the selective flotation of scheelite. Collectors (FS-2, V4085, BHD, and Cytec 6493), depressants (Na_2SiO_3, Que D-2, Calgon, Citric acid, $BaCl_2$, Al_3SO_4), and dispersant K-8300 were evaluated. The best tungsten rougher test, FW2, produced a rougher concentrate grading 3.19% WO_3 at a stage recovery of 71.7%.

Five cleaner tests were conducted for upgrading tungsten rougher concentrates. FW2 rougher conditions were applied and reagents and dosages for tungsten cleaners were further investigated. Challenge was found in achieving selective flotation of scheelite from Ca-bearing gangue minerals, particularly fluorite in the cleaner stage. The best result was obtained in test FW12, in which the 4th cleaner concentrate graded 30.7% WO_3 at a stage recovery of ~55%.

QEMSCAN™ analysis was performed on a high-grade (30.7% WO_3) and a low-grade (5.77% WO_3) tungsten cleaner concentrate. The results revealed that fluorite was the biggest contaminant in both concentrates at ~36% and 71%, respectively. Other contaminants including apatite, calcite, and micas/clays were also found. The liberation characteristics for scheelite in the concentrates were good with >89% of the scheelite being free or liberated (scheelite being >80% of particle area). Therefore, regrinding for the purpose of improving liberation is likely not required. There were 32% (high-grade conc.) and 57% (low-grade conc.) of the non-liberated scheelite associated with fluorite.

A heavy liquid separation (HLS) test was performed on the master composite at size fractions of -6/+10 mesh, -10/+35 mesh, and -35/+200 mesh. The test results did not show much promise to recover tungsten using gravity separation. Although the WO_3 grade for the 3.6 sinks was over 10 times higher than the 3.0 sinks in the sample, the mass of the 3.6 sinks was very low at 0.4% with the WO_3 distribution at 18.5%. The 3.0 sinks had higher WO_3 distribution at 30.5%, but the grade was low at 0.56% WO_3.

An initial gravity separation (Mozley) test, G1, was completed on the +250 mesh sulphide rougher tails from test FM2. The Mozley concentrate recovered ~82% of available WO_3 in the feed at a grade of 0.63% WO_3, indicating a poor separation by gravity.

Gravity-Flotation testing was completed on 10 kg of the master composite. The sample was stage-ground to 100% passing 38 mesh (-503 µm), and then wet screened at 150 mesh (106 µm). The -503+106 µm fraction was passed over a Wilfley table (G2). A molybdenum flash flotation stage was then carried out on the G2 Wilfley concentrate. The molybdenum flash tails were subjected to Wilfley tabling (G3) for upgrading tungsten. G3 Wilfley tails and concentrates 2-8 were incorporated with the molybdenum flash concentrate and the -106 µm fines from the wet screen. Molybdenum and scheelite flotation (FM5) was carried out on the combined materials. There was ~40% of the mass in the finer fraction (-106µm) and ~60% of the mass in the coarse fraction (-503+106µm). The coarse fraction, with ~35% of Mo and ~39% of WO_3 distributions, was passed over a Wilfley table (G2). The Wilfley concentrate (with 2 passes) recovered ~23% of the Mo and 30.5% of the WO_3. Approximately 12% of the Mo and 9.0% of WO_3 were lost in the tailings at grades of 0.035% Mo and 0.020% WO_3. The molybdenum flash concentrate recovered ~66% of the available molybdenum (global recovery ~15%), grading 17.2% Mo. Gravity upgrading of the tungsten in the molybdenum flash tails (G3) produced a first concentrate (G3 Wilfley Conc 1) only grading 0.76% WO_3 at ~67% recovery of the available tungsten (22.5% global recovery).

Approximately 66% of the mass, with ~87% of Mo and ~67% of WO_3 distributions, was subjected to flotation in test FM5. The molybdenum flotation circuit produced a molybdenum cleaner concentrate grading 50.8% Mo at a recovery of ~65%. The scheelite flotation was not successful. The rougher concentrate only recovered ~49% of the WO_3 grading 1.33% WO_3. The rougher concentrate was upgraded to a grade of 5.77% WO_3 in the cleaner with only ~ 10% recovery.

Further upgrading of G3 Wilfley Conc 1 using WHIMS revealed that the WHIMS mags had a grade (0.87% WO_3) very similar to the feed grade (0.79% WO_3). This suggested that upgrading tungsten with WHIMS was also not effective under the conditions tested.

Recommendations for further testwork include a focus on a flotation-only flowsheet with more detailed and systematic evaluation of WO_3 flotation circuit variables, focussed on collector and depressant suites coupled with mineralogical examinations. Testing should ensure the production of several kilograms of concentrate. Upgrading testing (gravity and magnetic separation) to attempt to produce grades in excess of 50% WO_3 could then be better evaluated in addition to a preliminary leach testing to show amenability to an ammonium paratungstate (APT) process. Preliminary dewatering and environmental testing should also be a component of the next test program.

Introduction

A core sample from Jennings W-Mo deposit was submitted to the SGS Lakefield site for metallurgical testwork in June of 2013. A master composite was prepared using the core sample and two other samples that had been on site at Lakefield from a previous scoping level study. This metallurgical test program was completed in order to further define the conceptual flotation flowsheet that was developed in the initial scoping level study as well as to examine gravity options. The testwork completed consisted of the following:

- Sample Preparation
- Flotation Testing
- Heavy Liquid Separation
- Gravity Separation (Wilfley and Mozley Tabling)
- Magnetic Separation (WHIMS) to Upgrading Gravity Concentrates
- QEMSCAN Analysis on Tungsten Cleaner Concentrates

Test data were issued and discussed on a regular basis with Mr. Camil Prince, Mr. Steven McRoberts, and Mr. Paul Cousin from Agnico Eagle Mines Limited.

Liping Gu, M.A.Sc.
Project Metallurgist

Dan Imeson, M.Sc.
Manager, Mineral Processing

Experimental work by: Conrad Wong, Hector Sarne
Report preparation by: Liping Gu
Reviewed by: Alicia Windsor, Dan Imeson

Testwork Summary

1. Sample Receipt and Preparation

1.1. Sample Receipt

In June of 2013, six rice bags of samples were received at the SGS Lakefield site and assigned the receipt number 0263-JUN13. There was a sample named Comp 4 received in the form of half core intervals with a weight of 74.9 kg.

1.2. Sample Preparation

The drill core intervals in the rice bags were first crushed to 100% passing ½”. A 10 kg charge was removed from the ½” material as a provision for conducting gravity separation on coarser materials. The remainder was further crushed to -6 mesh and mixed with Comp1 and Comp2 (-10 mesh) that had been already on the site from the previous test program on Jennings deposit. A master composite was produced with ~65 kg of Comp4, ~50 kg of Comp1, and ~54 kg of Comp 2. Approximately 40 kg of material was extracted from the master composite and rotary split into 2 kg charges. Three 2 kg charges were randomly selected and a 100 g subsample was removed from each charge for head chemical analysis. One of the three subsamples was submitted for head assays including WO_3, Mo, $S^=$, F, and ICP scan, while the other subsamples were only assayed for WO_3, Mo, and $S^=$. The remainder of the master composite was split into 10 kg test charges. A total of twelve 10 kg charges were prepared for the composite. All 2 kg and 10 kg charges were placed in freezer storage. All rejects from the composites were also stored. The procedure for the sample preparation is displayed in Figure 2.

1.3. Chemical Head Analyses

The head samples were submitted for chemical head analysis including an ICP Scan. The complete results are presented in Table 1. The composite graded 0.11% WO_3, 0.085% Mo, 0.37% S, and 0.87% F. The contents of Al, Ca, Fe, K, Mg, and Na in the composite were significantly higher than the other elements at 7.29% Al, 5.51% Ca, 4.40% Fe, 2.55% K, 1.48% Mg, and 1.39% Na.

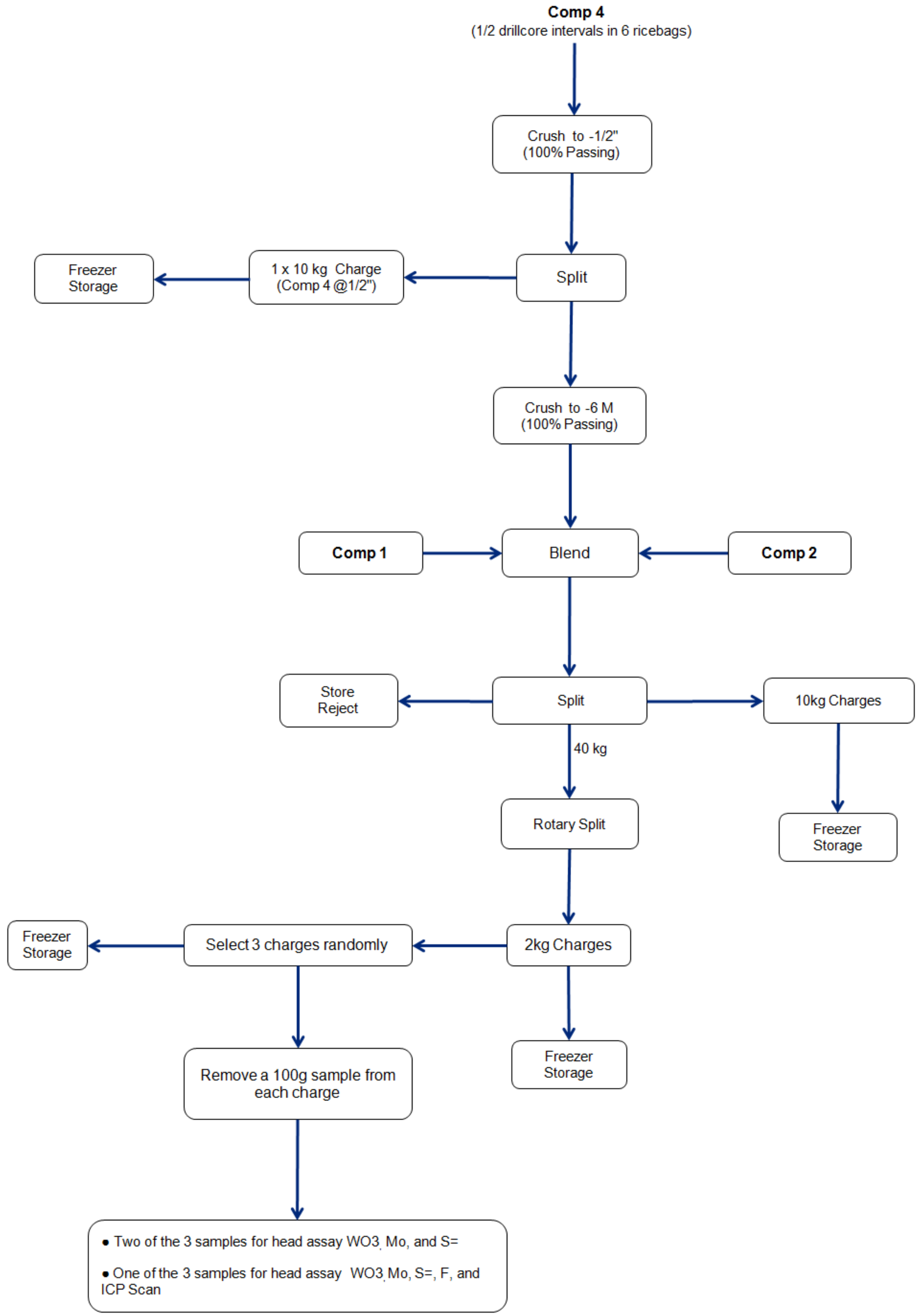


Figure 2: Sample Preparation Diagram

Table 1: Head Characterization of Master Composite

Element	Unit	Head Sample			
		A	B	C	Average
XRF					
WO_3	%	0.11	0.10	0.11	0.11
Mo	%	0.080	0.088	0.088	0.085
LECO					
S	%	0.37	0.34	0.39	0.37
ISE					
F	%			0.87	0.87
ICP-OES					
Ag	g/t			3.0	
Al	g/t			72900	
As	g/t			< 30	
Ba	g/t			198	
Be	g/t			12.5	
Bi	g/t			< 20	
Ca	g/t			55100	
Cd	g/t			< 2	
Co	g/t			10	
Cr	g/t			69	
Cu	g/t			51.3	
Fe	g/t			44000	
K	g/t			23500	
Li	g/t			114	
Mg	g/t			14800	
Mn	g/t			1220	
Na	g/t			13900	
Ni	g/t			< 20	
P	g/t			514	
Pb	g/t			29	
Sb	g/t			15	
Se	g/t			< 30	
Sn	g/t			40	
Sr	g/t			210	
Ti	g/t			2610	
Tl	g/t			< 30	
U	g/t			< 30	
V	g/t			45	
Y	g/t			23.1	
Zn	g/t			161	

2. Flotation Testing

Flotation testwork was performed using the flowsheet as shown in Figure 3. Ore samples were stage-ground to 100% passing 150 mesh and subjected to molybdenum flotation, followed by a sulphide rougher to remove sulphide minerals. Tungsten floatation tests were completed on sulphide rougher tails. The details of the flotation tests can be seen in Appendix A. The test conditions and results are presented and discussed in the following sections.

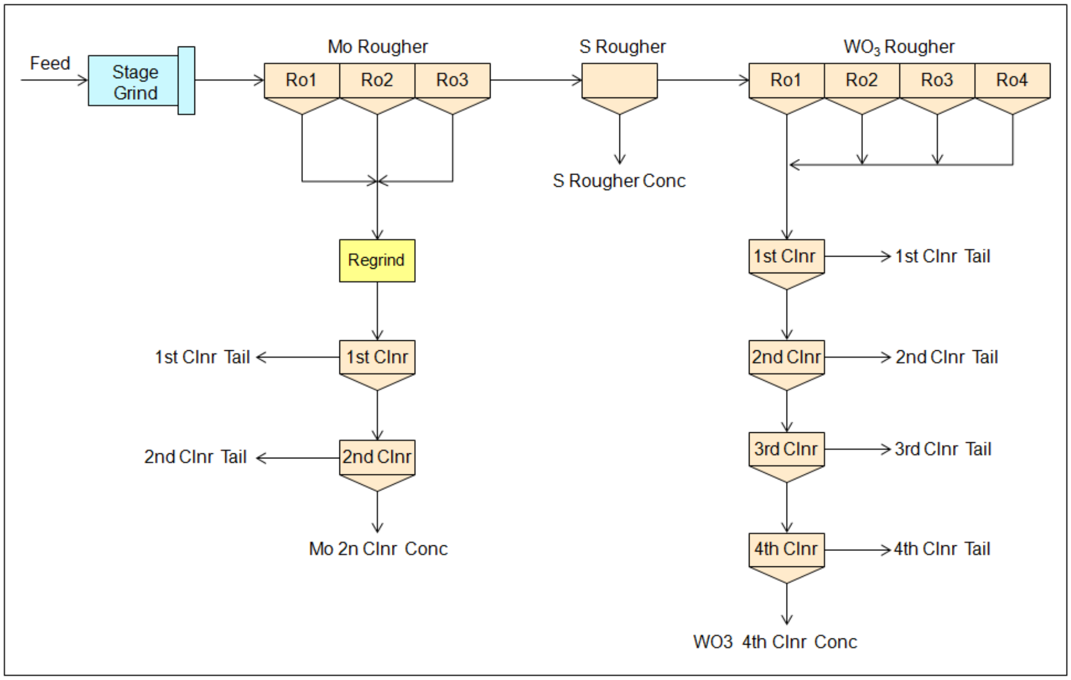


Figure 3: Flotation Test Flowsheet

2.1. Primary Grind Tests

Large-scale grinding tests were conducted on 12 kg (1 x 10 kg and 1 x 2 kg charges) of -6 mesh ore samples in order to produce stage ground feed for flotation tests. Figure 4 indicates the procedures for the primary stage grind. The 12 kg was passed through a screen at 150 mesh. The oversize was ground in a large laboratory rod mill. The mill discharge was passed through the screen again, and the oversize was reground until the target particle size (100% passing 150 mesh) was achieved.

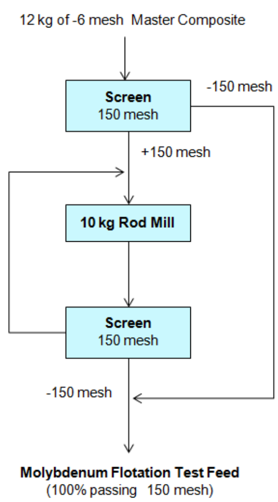


Figure 4: Primary Stage Grind Flowsheet

2.2. Molybdenum Flotation

Molybdenum flotation tests were conducted on 12 kg sample charges that had been stage ground to 100% passing 150 mesh. A total of 11 tests were completed. The test conditions and results are presented and discussed in the following sections.

2.2.1. Molybdenum Roughers

All molybdenum rougher flotation was performed for ~11-12 minutes using fuel oil, pine oil, and MIBC as the reagents. Fuel oil and pine oil were conditioned with mineral pulp for 5 minutes prior to the molybdenum roughers. The test conditions are presented in Table 2, with the results summarized in Table 3. Figure 5 shows the grade versus recovery relationships for the tests. Observations are as follows:

- The molybdenum rougher recovery ranged from 85.8% to 95.4% with the grade varying from 3.76% to 11.6% Mo.
- The best result was obtained in test FM7. The rougher concentrate recovered 95% of the Mo grading 11.5% Mo.
- The recovery of tungsten in the molybdenum rougher concentrates ranged from 1.1% to 3.8%. It is anticipated that the recovery of tungsten in the molybdenum flotation would be limited to less than 2% at a Mo recovery of 85-95%.

Table 2: Molybdenum Rougher Conditions

Test ID	Stage	P_{80}	Reagents added, g/t			Time, min		
		µm	MIBC	Pine Oil	Fuel Oil	Grind	Cond	Froth
FM1	Condition			10	15		5	
	Mo Rougher	70	2.5	2.5	7.5	*		12
	Sum		2.5	12.5	22.5			12
FM2	Condition			10	15		5	
	Mo Rougher	75	2.5	2.5	7.5	*		12
	Sum		2.5	12.5	22.5			12
FM3	Condition			10	15		5	
	Mo Rougher	76	2.5	2.5	7.5	*		12
	Sum		2.5	12.5	22.5			12
FM4	Condition			10	15		5	
	Mo Rougher	75	12.5	2.5	7.5	*		12
	Sum		12.5	12.5	22.5			12
FM6	Condition			11	16		5	
	Mo Rougher	68	10.3	4	8	*		11
	Sum		10.3	15.0	24.0			11
FM7	Condition			11	16		5	
	Mo Rougher	72	14	4	8	*		11
	Sum		14.0	15.0	24.0			11
FM8	Condition			11	16		5	
	Mo Rougher	65	12.5	4	8	*		11
	Sum		12.5	15.0	24.0			11
FM9	Condition			11	10		5	
	Mo Rougher	63	10.4	4	5	*		11
	Sum		10.4	15.0	15.0			11
FM10	Condition			11	16		5	
	Mo Rougher	62	8.3	4	8	*		11
	Sum		8	15.0	24			11
FM11	Condition			11	16		5	
	Mo Rougher	62	14	4	8	*		11
	Sum		14	15.0	24			11
FM12	Condition			11	16		5	
	Mo Rougher	62	14	4	8	*		11
	Sum		14	15.0	24			11

* Stage grind to 100% passing 150 mesh

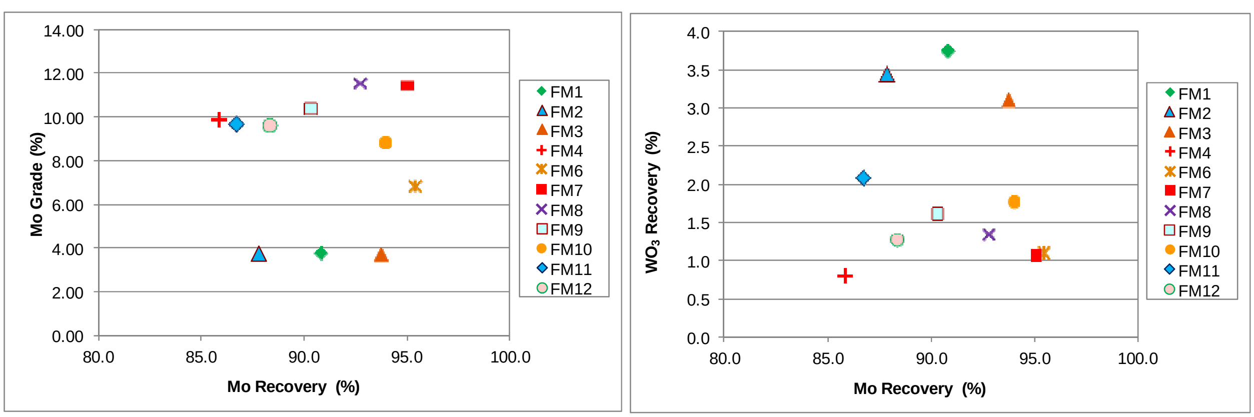


Figure 5: Grade vs. Recovery – Molybdenum Rougher Flotation

Table 3: Summary of Molybdenum Rougher Test Results

Test ID	Product	Wt.	Assays, %			% Distribution		
		(%)	WO_3	Mo	S	WO_3	Mo	S
FM1	Mo Rougher Conc 1-3	2.1	0.18	3.79	6.90	3.8	90.8	40.2
	Mo Ro Tails	97.9	0.10	0.008	0.22	96.2	9.2	59.8
	Head (calc)	100.0	0.10	0.088	0.36	100.0	100.0	100.0
FM2	Mo Ro Conc	2.2	0.14	3.76	4.16	3.5	87.8	22.7
	Mo Ro Tails	97.8	0.078	0.011	0.29	96.5	12.2	77.3
	Head (calc)	100.0	0.079	0.092	0.39	100.0	100.0	100.0
FM3	Mo Ro Conc	2.4	0.14	3.77	7.36	3.1	93.7	40.1
	Mo Ro Tails	97.6	0.095	0.006	0.24	96.9	6.3	59.9
	Head (calc)	100.0	0.10	0.087	0.40	100.0	100.0	100.0
FM4	Mo Ro Conc	0.9	0.11	9.90	8.10	0.82	85.8	20.4
	Mo Ro Tails	99.1	0.13	0.015	0.30	99.2	14.2	79.6
	Head (calc)	100.0	0.13	0.11	0.37	100.0	100.0	100.0
FM6	Mo Ro Conc 1-3	1.3	0.093	6.86	19.1	1.1	95.4	74.5
	Mo Ro Tails	98.7	0.11	0.006	0.13	99.3	6.1	36.6
	Head (calc)	100.0	0.11	0.095	0.34	100.0	100.0	100.0
FM7	Mo Ro Conc	0.7	0.14	11.5	12.7	1.1	95.0	24.6
	Mo Ro Tails	99.3	0.10	0.004	0.28	98.9	5.0	75.4
	Head (calc)	100.0	0.10	0.088	0.37	100.0	100.0	100.0
FM8	Mo Ro Conc1-2	0.8	0.14	11.6	11.8	1.4	92.7	27.6
	Mo Ro Tails	99.2	0.087	0.008	0.26	98.6	7.3	72.4
	Head (calc)	100.0	0.087	0.11	0.36	100.0	100.0	100.0
FM9	Mo Ro Conc	0.8	0.13	10.5	9.90	1.6	90.2	24.1
	Mo Ro Tails	99.2	0.065	0.009	0.25	98.4	9.8	75.9
	Head (calc)	100.0	0.065	0.094	0.33	100.0	100.0	100.0
FM10	Mo Ro Conc	0.9	0.14	8.86	8.31	1.8	93.9	23.2
	Mo Ro Tails	99.1	0.072	0.005	0.26	98.2	6.1	76.8
	Head (calc)	100.0	0.072	0.089	0.34	100.0	100.0	100.0
FM11	Mo Ro Conc	0.9	0.19	9.74	8.92	2.1	86.6	23.6
	Mo Ro Tails	99.1	0.082	0.014	0.27	97.9	13.4	76.4
	Head (calc)	100.0	0.083	0.10	0.35	100.0	100.0	100.0
FM12	Mo Ro Conc	0.9	0.16	9.66	9.73	1.3	88.3	26.1
	Mo Ro Tails	99.1	0.11	0.012	0.25	98.7	11.7	73.9
	Head (calc)	100.0	0.11	0.099	0.34	100.0	100.0	100.0

2.2.2. Molybdenum Cleaners

Molybdenum cleaning tests were carried out to upgrade the rougher concentrates. Reagents, regrind fineness, and pulp potential were investigated in the tests. The test conditions and results are summarized in Table 4 and Table 5.

2.2.2.1. Effect of Reagents

An initial cleaning test (FM2) was performed using NaCN to depress gangue minerals. There were 4 stages of cleaning completed but the test was not successful. The 4th cleaner concentrate only recovered 67.6% of the Mo at a grade of 23.8% Mo.

In test FM3, NaHS was added as an alternative pyrite depressant to achieve pulp potential (Eh) of -300 mV at each of the 4 cleaners. The molybdenum recovery was improved by ~10% at a concentrate grade (22.7% Mo) similar to test FM2.

Test FM4 repeated FM3, but a 15 minute regrind was carried out and NaHS was increased in the cleaners to achieve Eh -400 mV. The flotation performance was improved significantly as shown in Figure 6. The molybdenum 1st cleaner concentrate recovered ~80% of the Mo at a grade of 48.5% Mo. However, the recovery decreased significantly to ~44% when the concentrate grade was improved further to ~55% Mo (3rd cleaner concentrate). Regrind tests highlighted the significance of this as a variable.

Test FM6 was conducted to repeat FM4 conditions, and only one cleaner was completed. The cleaner concentrate had a grade of 30% Mo at ~82% recovery.

Test FM7 repeated FM6 conditions with 2 stages of cleaning. A total of 1,412 g/t of NaHS were added to the regrind mill and cleaners. The 2nd cleaner concentrate grade was improved to 51.3% Mo at a recovery of ~82%.

Table 4: Molybdenum Cleaner Conditions

Test ID	Stage	P_{80}	Reagents added, g/t					Time, min				pH	Eh (mV)
		µm	MIBC	Pine Oil	Fuel Oil	NaCN	NaHS	Grind	Regrind	Cond	Froth		
	Condition			10	15					5			
FM2	Mo Rougher	75	2.5	2.5	7.5			*			12		
	Mo Cleaner					17.5					8.5		
	Sum		2.5	12.5	22.5	17.5					20.5		
	Condition			10	15					5			
FM3	Mo Rougher	76	2.5	2.5	7.5			*			12	8.4	
	Mo Cleaner						417				8.5	10.0-10.6	-300
	Sum		2.5	12.5	22.5		417				20.5		
	Condition			10	15					5			
FM4	Mo Rougher	75	12.5	2.5	7.5			*			12	8.4	
	Mo Cleaner	25	0.4	0.4	2.5	20	**		15		14	9.5-11.0	-400
	Sum		12.9	12.9	25.0	20.0	0				26		
	Condition			11	16					5			
FM6	Mo Rougher	68	10.3	4	8			*			11	8.7-9.0	
	Mo Cleaner	32		0.4	2.5	5	**		10		8	11.0	-400
	Sum		10.3	15.4	26.5	5.0	0				19		
	Condition			11	16					5			
FM7	Mo Rougher	72	14	4	8			*			11	8.1-8.6	
	Mo Cleaner	20	1.7	0.4	2.5	10	1412		15		8	10.3-11.4	-400
	Sum		15.7	15.4	26.5	10.0	1412				19		
	Condition			11	10					5			
FM9	Mo Rougher	63	10.4	4	5			*			11		
	Mo Cleaner	16	1.25	0.4	2.5	5	1304		15		11		-400
	Sum		11.7	15.4	17.5	5.0	1304				22		
	Condition			11	16					5			
FM10	Mo Rougher	62	8.3	4	8			*			11		
	Mo Cleaner	15	1.7	0.4	2.5	10	1333		25		11		-400
	Sum		10	15.4	26.5	10	1333				22		
	Condition			11	16					5			
FM11	Mo Rougher	62	14	4	8			*			11		
	Mo Cleaner		1.7	0.4	2.5	10	1408		0		11		-400
	Sum		16	15.4	26.5	10	1408				22		
	Condition			11	16					5			
FM12	Mo Rougher	62	14	4	8			*			11		
	Mo Cleaner	20***	1.7	0.4	2.5	10	2080		15		11		-450
	Sum		16	15.4	26.5	10	2080				22		

* Stage grind to 100% passing 150 mesh
**Added as required to achieve the target Eh
*** Not available, use average of FM4, FM7 and FM9

Table 5: Summary of Molybdenum Cleaner Test Results

Test ID	Product	Wt.	Assays, %			% Distribution		
		(%)	WO_3	Mo	S	WO_3	Mo	S
FM2	Mo 4th Clnr Conc	0.3	0.54	23.8	20.1	1.8	67.6	13.5
	Mo 3rd Clnr Conc	0.3	0.51	22.3	19.0	2.0	73.8	15.0
	Mo 2nd Clnr Conc	0.3	0.49	20.4	17.9	2.1	76.6	15.9
	Mo 1st Clnr Conc	0.5	0.40	14.4	13.5	2.7	84.0	18.6
	Mo Ro Conc	2.2	0.14	3.76	4.16	3.7	88.2	23.1
	Mo Ro Tails	97.8	0.078	0.011	0.30	96.3	11.8	76.9
	Head (calc)	100.0	0.079	0.092	0.39	100.0	100.0	100.0
FM3	Mo 4th Clnr Conc	0.3	0.32	22.7	28.0	1.1	77.2	21.0
	Mo 3rd Clnr Conc	0.4	0.33	21.3	27.0	1.2	80.5	22.4
	Mo 2nd Clnr Conc	0.4	0.30	19.6	25.4	1.3	86.5	24.7
	Mo 1st Clnr Conc	0.6	0.26	13.6	19.1	1.7	90.5	28.1
	Mo Ro Conc	2.4	0.14	3.77	7.36	3.4	94.0	40.5
	Mo Ro Tails	97.6	0.095	0.006	0.26	96.6	6.0	59.5
	Head (calc)	100.0	0.10	0.087	0.40	100.0	100.0	100.0
FM4	Mo 4th Clnr Conc	0.0	0.077	56.0	37.5	0.02	21.2	4.1
	Mo 3rd Clnr Conc	0.1	0.080	55.4	37.0	0.05	44.3	8.6
	Mo 2nd Clnr Conc	0.1	0.084	54.0	36.1	0.07	55.2	10.7
	Mo 1st Clnr Conc	0.2	0.089	48.5	32.7	0.12	79.6	15.6
	Mo Ro Conc	0.9	0.11	9.90	8.10	0.82	85.8	20.4
	Mo Ro Tails	99.1	0.13	0.015	0.30	99.2	14.2	79.6
	Head (calc)	100.0	0.13	0.11	0.37	100.0	100.0	100.0
FM6	Mo Clnr Conc	0.3	0.065	30.0	26.1	0.2	82.0	20.0
	Mo Ro Conc 1-3	1.3	0.093	6.86	19.1	1.1	95.4	74.5
	Mo Ro Tails	98.7	0.11	0.004	0.088	98.9	4.6	25.5
	Head (calc)	100.0	0.11	0.095	0.34	100.0	100.0	100.0
FM7	Mo 2ndClnr Conc	0.1	0.040	51.3	35.2	0.06	81.6	13.1
	Mo 1st Clnr Conc	0.2	0.073	41.3	30.6	0.1	90.5	15.8
	Mo Ro Conc	0.7	0.14	11.5	12.7	1.1	95.0	24.6
	Mo Ro Tails	99.3	0.10	0.004	0.28	98.9	5.0	75.4
	Head (calc)	100.0	0.10	0.088	0.37	100.0	100.0	100.0
FM9	Mo 2ndClnr Conc	0.2	0.042	50.1	33.1	0.10	85.9	16.0
	Mo 1st Clnr Conc	0.2	0.079	40.3	27.8	0.2	88.5	17.2
	Mo Ro Conc	0.8	0.13	10.5	9.90	1.6	90.2	24.1
	Mo Ro Tails	99.2	0.065	0.009	0.25	98.4	9.8	75.9
	Head (calc)	100.0	0.065	0.094	0.33	100.0	100.0	100.0
FM10	Mo 2ndClnr Conc	0.2	0.054	50.4	33.5	0.12	88.3	15.4
	Mo 1st Clnr Conc	0.2	0.090	38.3	26.5	0.3	91.4	16.6
	Mo Ro Conc	0.9	0.14	8.86	8.31	1.8	93.9	23.2
	Mo Ro Tails	99.1	0.072	0.005	0.26	98.2	6.1	76.8
	Head (calc)	100.0	0.072	0.089	0.34	100.0	100.0	100.0
FM11	Mo 2ndClnr Conc	0.2	0.20	39.5	26.0	0.51	81.2	15.9
	Mo 1st Clnr Conc	0.3	0.23	30.7	20.6	0.8	85.0	16.9
	Mo Ro Conc	0.9	0.19	9.74	8.92	2.1	86.6	23.6
	Mo Ro Tails	99.1	0.082	0.014	0.27	97.9	13.4	76.4
	Head (calc)	100.0	0.083	0.10	0.35	100.0	100.0	100.0
FM12	Mo 2ndClnr Conc	0.2	0.070	50.9	33.6	0.10	83.8	16.3
	Mo 1st Clnr Conc	0.2	0.11	38.2	26.5	0.2	86.3	17.6
	Mo Ro Conc	0.9	0.16	9.66	9.73	1.3	88.3	26.1
	Mo Ro Tails	99.1	0.11	0.012	0.25	98.7	11.7	73.9
	Head (calc)	100.0	0.11	0.099	0.34	100.0	100.0	100.0

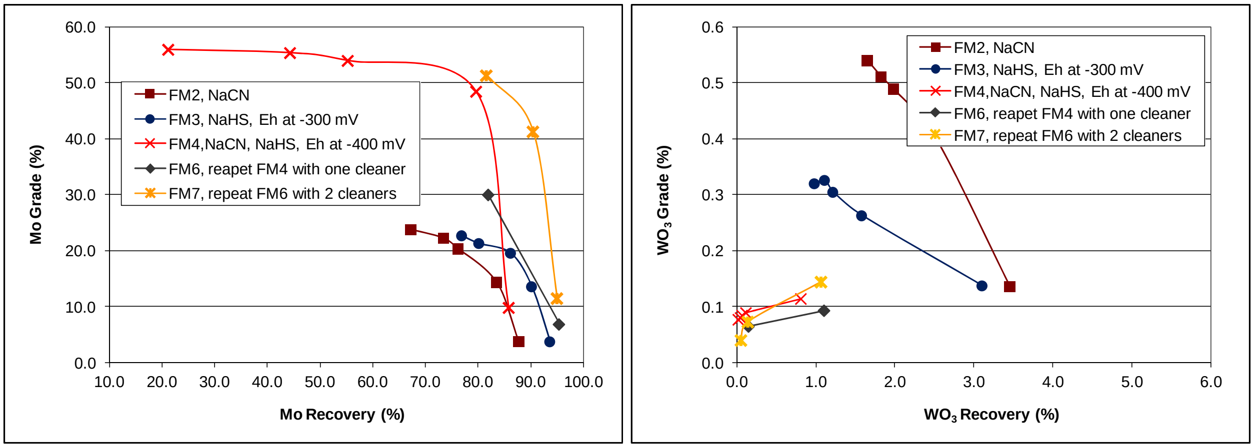


Figure 6: Grade vs. Recovery – Effect of Reagents on Molybdenum Cleaner

2.2.2.2. Effect of Collector Dosage

Test FM9 was completed using FM7 conditions, but fuel oil dosage was reduced from 25.5 g/t to 17.5 g/t to the rougher. The molybdenum recovery was slightly improved (~3.0%) at a concentrate grade (50.4% Mo) similar to FM7 (see Table 5 and Figure 7). It is concluded that dosage in this range did not have a major impact on metallurgy.

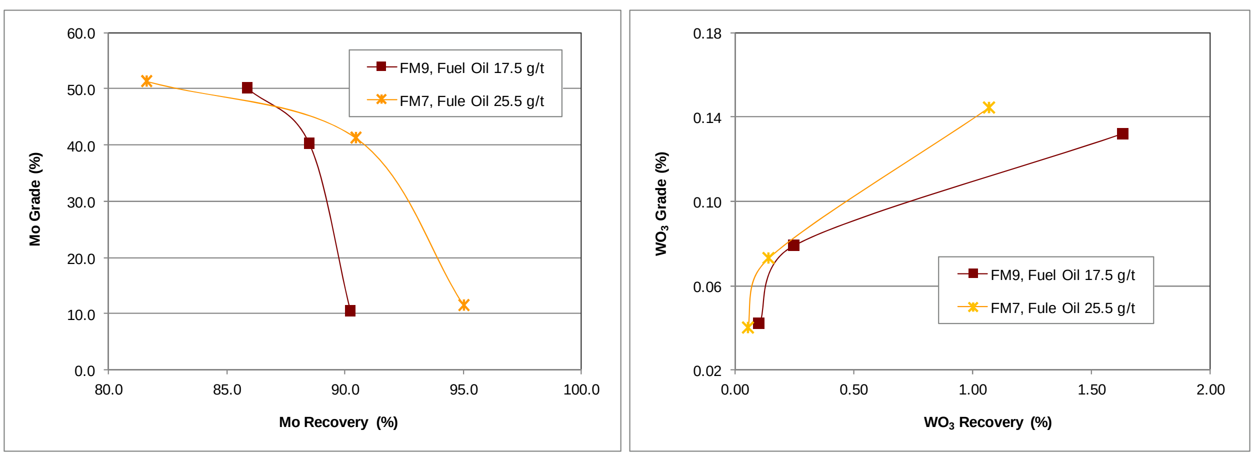


Figure 7: Grade vs. Recovery – Effect of Collector Dosage on Molybdenum Cleaner

2.2.2.3. Effect of Regrind Fineness

Tests FM4, FM7, FM10, and FM11 were performed at different regrind sizes (P_{80}) of 25 µm, 20 µm, 15 µm, and 62µm, respectively. Figure 8 shows the grade versus recovery relationships obtained from the tests. It was found that finer regrinding was beneficial to the metallurgy. With the finest regrind at a P_{80} of 15 µm, test FM10 had the highest molybdenum recovery (88.3%) at a similar grade from tests FM4 and

FM7. The recovery and grade declined significantly in test FM11 without regrind. Therefore, a regrind stage would be required for achieving high molybdenum concentrate grades and recoveries.

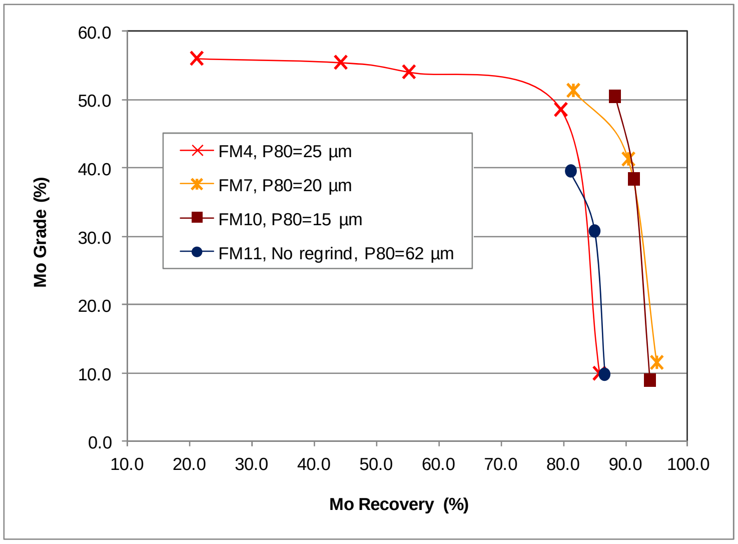


Figure 8: Grade vs. Recovery – Effect of Regrind Fineness on Molybdenum Cleaner

2.2.2.4. Effect of Pulp Potential (Eh)

Different pulp potentials (Eh) were investigated in tests FM7 and FM12. The metallurgical relationships obtained from the tests are shown in Figure 9. Further reducing Eh to -450 mV in test FM12 did not show any promise on metallurgy. The two tests had similar results with a grade of ~51% Mo at 82-84% recovery. It was concluded that pulp potential over this range did not have a significant influence on metallurgy.

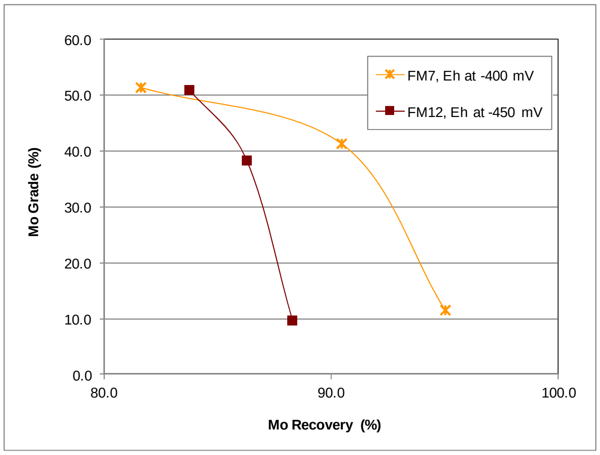


Figure 9: Grade vs Recovery – Effect of Pulp Potential on Molybdenum Cleaner

2.2.3. Sulphide Rougher

The molybdenum rougher tailings from the molybdenum rougher flotation were passed through a bulk sulphide rougher with the objective of removing the sulphides from the scheelite flotation feed. PAX was applied in all tests as the collector, while MIBC was used as the frother. The flotation conditions for the bulk sulphide flotation are listed in Table 6 with the results summarized in Table 7.

Figure 10 indicates overall removal of sulphur from the scheelite flotation feed (sulphide rougher tails). The recoveries to molybdenum and sulphides rougher concentrates varied between 72% and 92%. The tungsten and sulphur reported to the sulphide rougher tails ranging from 94.8% to 98.5%, and are illustrated in Figure 11. There was 8.0% to 28% of the S that reported to the scheelite flotation feed.

Table 6: Sulphide Rougher Conditions

Test ID	Stage	P_{80}	Reagents added, g/t		Time, min		pH
		µm	PAX	MIBC	Grind	Froth	
FM1	S rougher	70	50	2.5	*	10	Natural
FM2	S rougher	75	50	2.5	*	10	Natural
FM3	S rougher	76	50	2.5	*	10	Natural
FM4	S rougher	75	50	2.5	*	10	Natural
FM6	S rougher	68	57	2.5	*	7	Natural
FM7	S rougher	72	50	2.5	*	10	Natural
FM8	S rougher	65	50	4.2	*	10	Natural
FM9	S rougher	63	50	2.5	*	10	Natural
FM10	S rougher	62	50	2.5	*	10	Natural
FM11	S rougher	62	50	2.5	*	10	Natural
FM12	S rougher	62	50	2.5	*	10	Natural

* Stage grind to 100% passing 150 mesh

Table 7: Summary of Sulphide Rougher Test Results

Test ID	Product	Wt.	Assays, %			% Distribution		
		(%)	WO_3	Mo	S	WO_3	Mo	S
FM1	Mo Ro Conc	2.1	0.18	3.79	6.90	3.8	90.8	40.2
	S Ro Conc	1.0	0.15	0.28	19.6	1.4	3.0	51.8
	S Ro Tails	96.9	0.10	0.0056	0.030	94.8	6.1	8.0
	Head (calc)	100.0	0.10	0.088	0.36	100.0	100.0	100.0
FM2	Mo Ro Conc	2.2	0.14	3.76	4.16	3.7	88.2	23.1
	S Ro Conc	1.3	0.089	0.39	14.8	1.4	5.5	49.4
	S Ro Tails	96.6	0.078	0.006	0.11	94.9	6.3	27.5
	Head (calc)	100.0	0.079	0.086	0.37	100.0	100.0	100.0
FM3	Mo Ro Conc	2.4	0.14	3.77	7.36	3.4	94.0	40.5
	S Ro Conc	1.3	0.090	0.14	16.1	1.2	1.9	48.2
	S Ro Tails	96.4	0.095	0.004	0.1	95.4	4.1	11.3
	Head (calc)	100.0	0.10	0.087	0.40	100.0	100.0	100.0
FM4	Mo Ro Conc	0.9	0.11	9.90	8.10	0.82	85.8	20.4
	S Ro Conc	0.7	0.13	0.96	29.5	0.66	5.9	52.8
	S Ro Tails	98.4	0.13	0.009	0.10	98.5	8.3	26.8
	Head (calc)	100.0	0.13	0.11	0.37	100.0	100.0	100.0
FM6	Mo Ro Conc	1.3	0.093	6.9	19.1	1.1	95.4	74.5
	S Ro Conc	0.4	0.12	0.34	8.97	0.5	1.5	11.0
	S Ro Tails	98.3	0.11	0.003	0.050	98.4	3.1	14.5
	Head (calc)	100.0	0.11	0.095	0.34	100.0	100.0	100.0
FM7	Mo Ro Conc	0.7	0.14	11.5	12.7	1.1	95.0	24.6
	S Ro Conc	0.9	0.052	0.15	21.5	0.5	1.6	54.4
	S Ro Tails	98.3	0.10	0.003	0.080	98.4	3.4	21.0
	Head (calc)	100.0	0.10	0.088	0.37	100.0	100.0	100.0
FM8	Mo Ro Conc	0.8	0.140	11.6	11.8	1.4	92.7	27.6
	S Ro Conc	0.9	0.055	0.20	21.5	0.6	1.7	53.3
	S Ro Tails	98.3	0.087	0.006	0.070	98.1	5.6	19.1
	Head (calc)	100.0	0.087	0.11	0.36	100.0	100.0	100.0
FM9	Mo Ro Conc	0.8	0.13	10.5	9.90	1.6	90.2	24.1
	S Ro Conc	1.2	0.038	0.11	15.4	0.7	1.4	55.2
	S Ro Tails	98.0	0.065	0.008	0.070	97.7	8.4	20.7
	Head (calc)	100.0	0.065	0.094	0.33	100.0	100.0	100.0
FM10	Mo Ro Conc	0.9	0.14	8.86	8.31	1.8	93.9	23.2
	S Ro Conc	1.0	0.036	0.15	19.3	0.5	1.7	56.5
	S Ro Tails	98.1	0.072	0.004	0.070	97.7	4.4	20.3
	Head (calc)	100.0	0.072	0.089	0.34	100.0	100.0	100.0
FM11	Mo Ro Conc	0.9	0.19	9.74	8.92	2.1	86.6	23.6
	S Ro Conc	1.1	0.061	0.090	16.4	0.8	1.0	53.7
	S Ro Tails	98.0	0.082	0.013	0.08	97.1	12.4	22.7
	Head (calc)	100.0	0.083	0.10	0.35	100.0	100.0	100.0
FM12	Mo Ro Conc	0.9	0.16	9.66	9.73	1.3	88.3	26.1
	S Ro Conc	1.0	0.066	0.18	19.5	0.6	1.8	56.3
	S Ro Tails	98.1	0.11	0.010	0.060	98.1	10.0	17.5
	Head (calc)	100.0	0.11	0.099	0.34	100.0	100.0	100.0

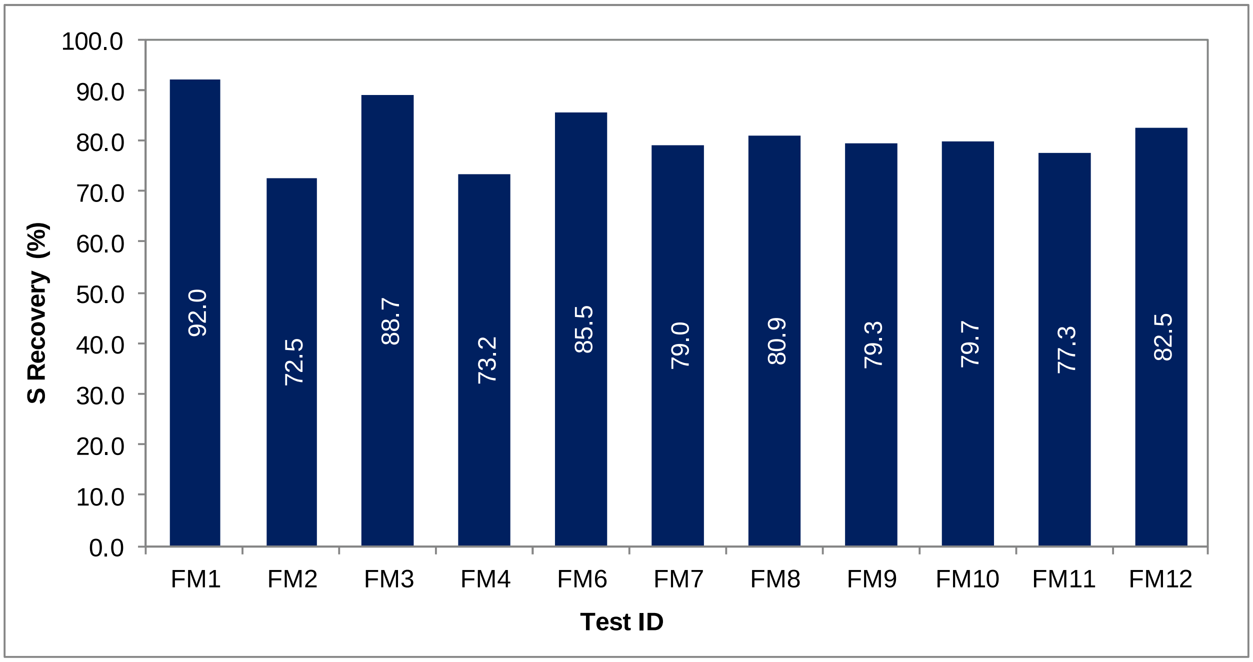


Figure 10: Overall Sulphur Recovery to Molybdenum and Sulphide Rougher Concentrates

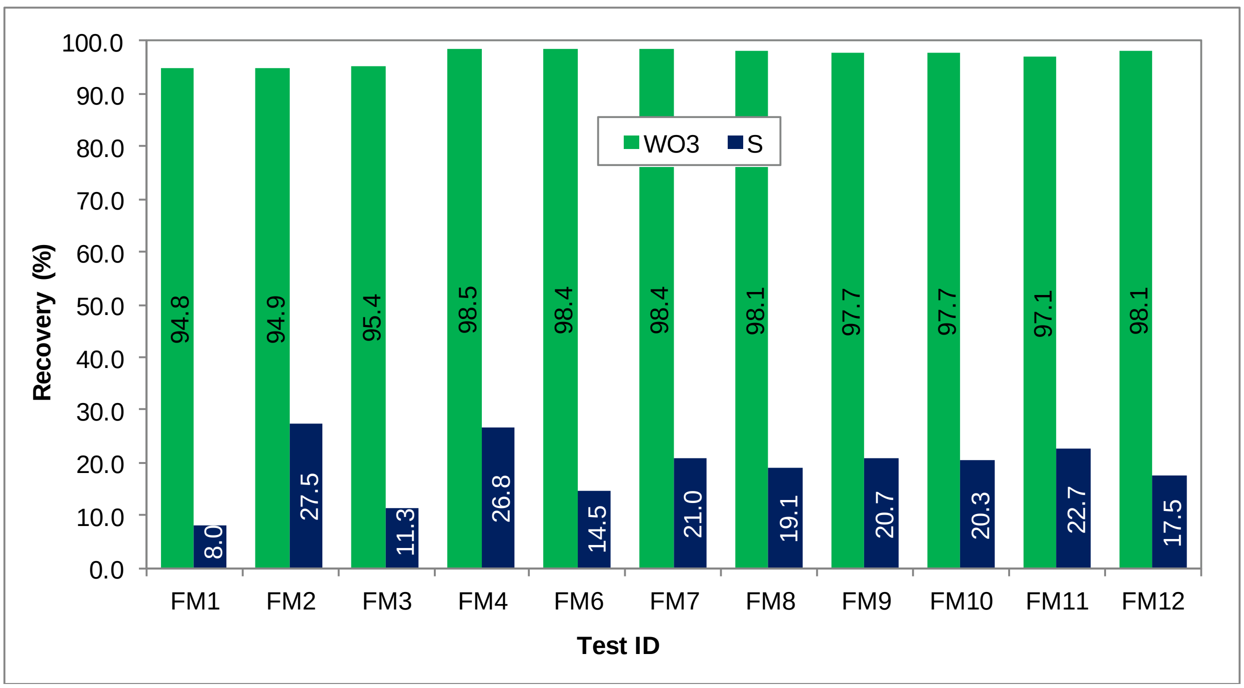


Figure 11: WO_3 and S Distributions in Sulphide Rougher Tails (Scheelite Flotation Feed)

2.3. Tungsten Flotation Tests

A total of 18 scheelite flotation tests were completed on sulphide rougher tails. The biggest challenge was to achieve selective flotation of scheelite from Ca-bearing minerals such as fluorite, calcite, and apatite, which have very similar surface properties as scheelite. Various reagents including collectors and depressants were investigated. The test conditions and results are presented and discussed in the following sections.

2.3.1. Scheelite Rougher Kinetics

There were 13 rougher tests completed to investigate the effect of reagents on the scheelite flotation. Reagents including collectors, depressants, and dispersants were evaluated in the tests. The test results are summarized in Table 9 with Figure 12 illustrating the rougher kinetics with tungsten recovery versus mass pull relationships. Note that all distributions are expressed in terms of WO_3 circuit feed.

The rougher kinetics of the tests fell in two groups. The group including tests FW1 to FW4, FW9 to FW11, and FW15 had tungsten recovery between 68% and 78% with the mass pull ranging from 2.0% to 10%, whereas the other group including tests FW5 to FW8 and FM14, had tungsten recovery from ~11% to ~30% with the mass pull between 1.8% and 10%. Test FW6 was completed on -250 mesh sulphide rougher tails from test FM2, while the +250 mesh fraction was subjected to Mozley tabling test G1. Only ~11% of the WO_3 was recovered in FW6 at a concentrate grade of 0.15% WO_3. The poor result is possibly due to the finer particle size that resulted in more entrainment occurring in the flotation cell, or unoptimized levels of reagents.

Table 8: WO_3 Rougher Conditions

Test ID	Stage	P_{80} µm	Reagents added, g/t													Time, min		pH
			Na_2CO_3	Na_2SiO_3	NaOH	Flotinor FS-2	V4085	Quebracho/ Que D-2	Calgon	Lankropol K-8300	Citric Acid	$BaCl_2$	Al_2SO_4	BHD	Cytec 6493	Cond	Froth	
FW1	WO_3 Rougher	70	500	500	500	250	30									14	10	11.1-11.3
FW2	WO_3 Rougher	70	500	2000	500	310	30									14	10	10.7-10.9
FW3	WO_3 Rougher	70	500	2000	500	310	15									16	10	10.7-10.9
FW4	WO_3 Rougher	75	500	1500	500	310	30	25								19	10	10.7-10.9
FW5	WO_3 Rougher	75	250	1500	175	310	30		1000							21	10	10.3-10.4
FW6	WO_3 Rougher	-250 M	500	2000	500	185	15									16	10	10.8-10.9
FW7	WO_3 Rougher	76	500	2500	500	310				45						14	10	10.2-10.3
FW8	WO_3 Rougher	76	500	2500	500	360				45						14	10	10.2-10.4
FW9	WO_3 Rougher	75	500	2000	500	435	22.5			60	450					14	10	10.6
FW10	WO_3 Rougher	75	500	2000	500	360	22.5					200				14	10	-
FW11	WO_3 Rougher	75	500	2000	500	360	22.5						200			14	10	-
FW14	WO_3 Rougher	65		2000		267		Pine Oil		MIBC				1200		21	10	9.5
FW15	WO_3 Rougher	65		1500				16.4		20					1200	24	7	10.0

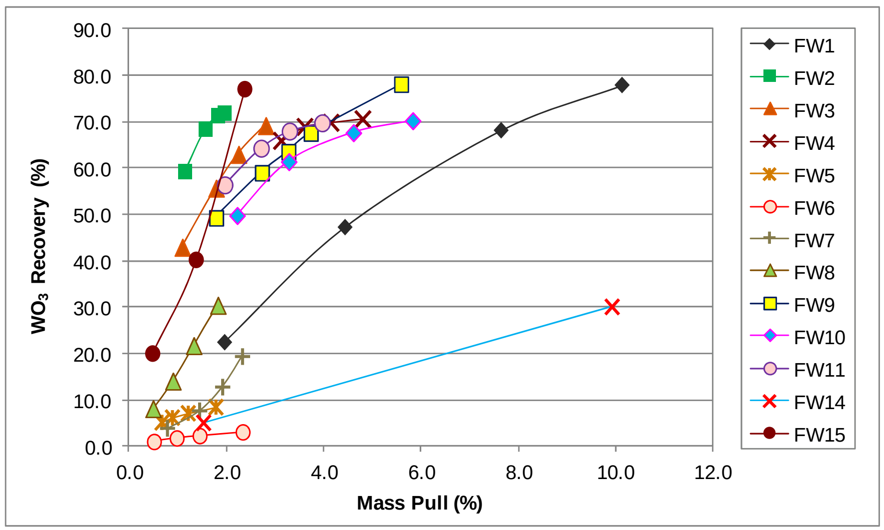


Figure 12: WO_3 Rougher Kinetics

Table 9: Summary of WO_3 Rougher Test Results

Test ID	Product	Wt	Assays, %						% Distribution					
		%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
FW1	Rougher Conc 1	2.0	1.11	7.16	39.4	11.1	20.0	1.22	22.4	15.9	1.2	3.8	5.2	19.2
	Rougher Conc 1+2	4.4	1.03	6.65	39.4	11.5	19.6	1.15	47.1	33.4	2.8	8.8	11.6	41.1
	Rougher Conc 1-3	7.6	0.86	5.91	39.9	12.1	18.4	1.01	68.0	51.2	4.9	16.0	18.9	62.3
	Rougher Conc 1-4	**10.1**	**0.74**	**5.15**	**41.2**	**12.2**	**17.1**	**0.87**	**77.7**	**59.2**	**6.6**	**21.4**	**23.3**	**71.1**
	Bulk Rougher Tail	89.9	0.024	0.400	65.3	5.05	6.4	0.04	22.3	40.8	93.4	78.6	76.7	28.9
	Head (calc.)	100.0	0.10	0.88	62.9	5.78	7.46	0.12	100.0	100.0	100.0	100.0	100.0	100.0
FW2	Rougher Conc 1	1.1	4.50	14.4	26.8	10.6	26.7	0.81	59.1	18.6	0.5	2.1	4.1	7.6
	Rougher Conc 1+2	1.6	3.78	13.4	28.7	10.6	25.3	0.74	68.2	23.8	0.7	2.9	5.3	9.6
	Rougher Conc 1-3	1.8	3.39	12.9	29.6	10.5	24.7	0.72	71.1	26.6	0.9	3.3	6.1	10.8
	Rougher Conc 1-4	**1.9**	**3.19**	**12.5**	**30.6**	**10.4**	**24.0**	**0.69**	**71.7**	**27.7**	**0.9**	**3.5**	**6.3**	**11.1**
	Bulk Rougher Tail	98.1	0.03	0.65	63.4	5.66	7.09	0.110	28.3	72.3	99.1	96.5	93.7	88.9
	Head (calc.)	100.0	0.087	0.88	62.8	5.75	7.42	0.12	100.0	100.0	100.0	100.0	100.0	100.0
FW3	Rougher Conc 1	1.1	3.75	8.33	39.4	9.04	17.5	0.33	42.9	9.8	0.7	1.7	2.5	3.0
	Rougher Conc 1+2	1.8	2.96	8.33	40.3	8.82	17.5	0.37	55.6	16.2	1.1	2.7	4.1	5.5
	Rougher Conc 1-3	2.2	2.66	8.66	40.1	8.83	17.9	0.42	62.9	21.2	1.4	3.4	5.3	7.7
	Rougher Conc 1-4	**2.8**	**2.33**	**8.62**	**40.4**	**8.61**	**18.2**	**0.48**	**69.1**	**26.4**	**1.8**	**4.2**	**6.7**	**11.1**
	Bulk Rougher Tail	97.2	0.030	0.69	63.5	5.66	7.21	0.11	30.9	73.6	98.2	95.8	93.3	88.9
	Head (calc.)	100.0	0.094	0.91	62.9	5.74	7.52	0.12	100.0	100.0	100.0	100.0	100.0	100.0
FW4	Rougher Conc 1	3.1	2.03	10.10	31.4	10.1	24.5	1.51	65.7	39.9	1.6	5.4	10.2	36.3
	Rougher Conc 1+2	3.6	1.84	9.45	32.9	10.1	23.1	1.38	68.7	43.1	1.9	6.2	11.1	38.3
	Rougher Conc 1-3	4.1	1.62	8.54	35.4	9.8	21.4	1.24	69.6	44.8	2.3	6.9	11.8	39.5
	Rougher Conc 1-4	**4.8**	**1.41**	**7.75**	**37.5**	**9.6**	**20.0**	**1.12**	**70.4**	**47.0**	**2.9**	**7.9**	**12.8**	**41.3**
	Bulk Rougher Tail	95.2	0.030	0.44	64.0	5.68	6.86	0.080	29.6	53.0	97.1	92.1	87.2	58.7
	Head (calc.)	100.0	0.10	0.79	62.7	5.87	7.49	0.13	100.0	100.0	100.0	100.0	100.0	100.0
FW5	Rougher Conc 1	0.7	0.82	8.40	33.7	12.6	19.5	1.69	5.1	6.5	0.4	1.4	1.7	8.9
	Rougher Conc 1+2	0.9	0.74	7.74	36.4	11.6	18.4	1.53	6.1	8.0	0.5	1.7	2.2	10.7
	Rougher Conc 1-3	1.2	0.63	6.67	40.4	10.5	16.6	1.28	7.0	9.4	0.8	2.2	2.7	12.3
	Rougher Conc 1-4	**1.8**	**0.51**	**5.52**	**44.5**	**9.5**	**14.6**	**1.02**	**8.4**	**11.5**	**1.3**	**2.9**	**3.5**	**14.3**
	Bulk Rougher Tail	98.2	0.081	0.77	63.4	5.80	7.34	0.11	91.6	88.5	98.7	97.1	96.5	85.7
	Head (calc.)	100.0	0.11	0.85	63.1	5.87	7.47	0.13	100.0	100.0	100.0	100.0	100.0	100.0
FW6 (on -250 mesh)	Rougher Conc 1	0.5	0.23	6.70	45.3	9.9	15.1	0.11	1.0	3.4	0.4	0.8	0.9	0.4
	Rougher Conc 1-2	1.0	0.21	4.25	51.2	8.6	11.9	0.12	1.8	4.2	0.8	1.3	1.4	0.8
	Rougher Conc 1-3	1.4	0.18	3.59	52.7	8.2	11.1	0.12	2.3	5.3	1.2	1.8	2.0	1.1
	Rougher Conc 1-4	**2.3**	**0.15**	**4.72**	**51.3**	**7.9**	**13.0**	**0.12**	**3.1**	**11.3**	**1.9**	**2.8**	**3.8**	**1.9**
	Bulk Rougher Tail	97.7	0.11	0.88	61.2	6.39	7.90	0.150	96.9	88.7	98.1	97.2	96.2	98.1
	Head (calc.)	100.0	0.11	0.97	61.0	6.42	8.02	0.15	100.0	100.0	100.0	100.0	100.0	100.0
FW7	Rougher Conc 1	0.8	0.46	1.72	53.9	7.4	8.4	0.14	3.8	1.6	0.7	1.0	0.9	0.8
	Rougher Conc 1+2	1.4	0.50	1.74	54.4	7.2	8.4	0.15	7.6	3.0	1.2	1.8	1.6	1.6
	Rougher Conc 1-3	1.9	0.63	1.78	54.1	7.2	8.5	0.16	12.7	4.0	1.6	2.4	2.2	2.4
	Rougher Conc 1-4	**2.3**	**0.78**	**1.81**	**54.0**	**7.1**	**8.7**	**0.18**	**19.3**	**5.0**	**2.0**	**2.9**	**2.7**	**3.1**
	Bulk Rougher Tail	97.7	0.078	0.82	63.0	5.63	7.48	0.130	80.7	95.0	98.0	97.1	97.3	96.9
	Head (calc.)	100.0	0.094	0.84	62.8	5.66	7.51	0.13	100.0	100.0	100.0	100.0	100.0	100.0
FW8	Rougher Conc 1	0.5	1.61	2.00	49.2	8.3	8.9	0.14	8.1	1.2	0.4	0.7	0.6	0.5
	Rougher Conc 1+2	0.9	1.50	2.04	50.4	7.9	9.0	0.14	14.0	2.2	0.7	1.2	1.1	1.0
	Rougher Conc 1-3	1.3	1.56	1.97	51.0	7.5	9.0	0.16	21.7	3.1	1.1	1.8	1.6	1.6
	Rougher Conc 1-4	**1.8**	**1.59**	**1.90**	**52.0**	**7.2**	**9.0**	**0.17**	**30.4**	**4.2**	**1.5**	**2.3**	**2.2**	**2.3**
	Bulk Rougher Tail	98.2	0.067	0.80	62.9	5.60	7.46	0.130	69.6	95.8	98.5	97.7	97.8	97.7
	Head (calc.)	100.0	0.094	0.82	62.7	5.63	7.49	0.13	100.0	100.0	100.0	100.0	100.0	100.0
FW9	Rougher Conc 1	1.8	2.50	11.4	28.5	13.6	22.8	1.17	49.2	24.3	0.8	4.1	5.4	16.1
	Rougher Conc 1+2	2.7	1.96	10.5	30.2	13.8	20.7	1.15	58.9	34.1	1.3	6.3	7.5	24.2
	Rougher Conc 1-3	3.3	1.75	10.0	31.5	13.4	20.1	1.29	63.4	39.0	1.6	7.4	8.7	32.6
	Rougher Conc 1-4	**3.7**	**1.64**	**9.2**	**33.1**	**12.9**	**19.4**	**1.45**	**67.5**	**41.1**	**2.0**	**8.1**	**9.6**	**41.8**
	Ro Conc + Ro Scav Conc	5.6	1.26	7.64	33.0	11.5	21.4	1.63	78.0	51.2	2.9	10.8	16.0	70.7
	Bulk Rougher Tail	94.4	0.021	0.43	64.4	5.58	6.66	0.040	22.0	48.8	97.1	89.2	84.0	29.3
	Head (calc.)	100.0	0.090	0.83	62.6	5.91	7.48	0.13	100.0	100.0	100.0	100.0	100.0	100.0
FW10	Rougher Conc 1	2.2	1.92	8.94	33.7	13.5	17.9	0.66	49.7	24.9	1.2	5.1	5.2	11.0
	Rougher Conc 1+2	3.3	1.60	8.51	34.2	13.9	16.9	0.67	61.3	35.1	1.8	7.7	7.3	16.4
	Rougher Conc 1-3	4.6	1.25	7.78	35.3	13.8	15.9	0.77	67.5	45.2	2.6	10.8	9.6	26.9
	Rougher Conc 1-4	**5.8**	**1.03**	**6.96**	**36.8**	**13.5**	**15.0**	**0.82**	**70.1**	**51.1**	**3.4**	**13.4**	**11.5**	**36.0**
	Bulk Rougher Tail	94.2	0.027	0.41	65.0	5.39	7.13	0.090	29.9	48.9	96.6	86.6	88.5	64.0
	Head (calc.)	100.0	0.09	0.79	63.4	5.86	7.59	0.13	100.0	100.0	100.0	100.0	100.0	100.0
FW11	Rougher Conc 1	1.9	2.93	11.7	28.3	14.4	22.1	0.73	56.3	27.2	0.9	4.7	5.8	10.3
	Rougher Conc 1+2	2.7	2.41	10.6	30.4	14.5	20.2	0.74	64.2	34.1	1.3	6.6	7.4	14.5
	Rougher Conc 1-3	3.3	2.10	9.95	31.8	14.1	19.5	0.95	67.9	38.9	1.7	7.8	8.7	22.7
	Rougher Conc 1-4	**3.9**	**1.79**	**9.09**	**33.5**	**13.7**	**18.4**	**1.06**	**69.7**	**42.8**	**2.1**	**9.1**	**9.9**	**30.4**
	Bulk Rougher Tail	96.1	0.032	0.50	64.1	5.59	6.91	0.100	30.3	57.2	97.9	90.9	90.1	69.6
	Head (calc.)	100.0	0.10	0.84	62.9	5.91	7.36	0.14	100.0	100.0	100.0	100.0	100.0	100.0
FW14	Ro Conc 1	1.5	0.32	1.52	47.6	9.92	8.41	0.43	5.0	2.5	1.1	2.6	1.7	4.6
	Rougher Conc 1-4	**9.9**	**0.29**	**1.36**	**49.3**	**9.69**	**8.57**	**0.31**	**30.0**	**14.8**	**7.7**	**16.4**	**11.6**	**21.3**
	Bulk Rougher Tail	90.8	0.080	0.87	65.1	5.50	7.19	0.13	74.4	86.6	92.7	84.9	89.2	82.5
	Head (calc)	99.1	0.098	0.91	63.8	5.85	7.31	0.14	100.0	100.0	100.0	100.0	100.0	100.0
FW15	Rougher Conc 1	0.5	3.57	9.48	31.1	8.47	27.0	5.12	19.9	5.2	0.2	0.7	1.7	18.9
	Rougher Conc 1-2	1.4	2.49	6.48	37.4	10.1	22.1	3.48	40.1	10.3	0.8	2.4	4.0	37.1
	Rougher Conc 1-3	**2.4**	**2.76**	**4.82**	**40.0**	**9.87**	**19.1**	**3.37**	**76.9**	**13.2**	**1.5**	**4.0**	**6.0**	**62.0**
	Slimes	3.1	2.09	3.75	45.0	8.66	15.8	2.54	77.2	13.7	2.3	4.7	6.6	62.3
	Bulk Rougher Tail	96.9	0.020	0.77	63.2	5.75	7.20	0.050	22.8	86.3	97.7	95.3	93.4	37.7
	Head (calc)	100.0	0.085	0.86	62.6	5.84	7.47	0.13	100.0	100.0	100.0	100.0	100.0	100.0

2.3.1.1. Effect of Na_2SiO_3 Dosage

Tests FW1, FW2, FW4, and FW7 were performed at the Na_2SiO_3 dosages of 500 g/t, 1,500 g/t, 2,000 g/t, and 2,500 g/t, respectively. In test FW1 and FW2, V4085 (alkenyl dicarboxylic acid anhydride) was added as a secondary collector, while K-8300 (disodium oleamido MIPA-sulfosucciante) was used as a dispersant in FW7. Quebracho was applied in test FW4 as a secondary depressant. Therefore, direct comparison of the effect of Na_2SiO_3 is not possible. The tungsten grade versus recovery relationships for the tests are illustrated in Figure 13, with the relationships of WO_3 recovery versus F, SiO_2, P_2O_5, Fe_2O_3, and CaO recoveries to demonstrate the selectivity of Na_2SiO_3 at the different dosages.

With less addition of Na_2SiO_3 at 500 g/t, test FW1 had higher tungsten recovery (~78%) but low concentrate grade (0.74% WO_3). It can be seen in Figure 13 that the selectivity of WO_3 against F, P_2O_5, and Fe_2O_3 was very poor with FW1. The recovery ratio of WO_3 to F, P_2O_5, and Fe_2O_3 was close to 1:1, while it was approximately 3:1 for the ratio of WO_3 to CaO.

The performance of test FW2 with 2,000 g/t Na_2SiO_3 was much better than the other two tests. The concentrate recovered ~72% of the WO_3 grading 3.19% WO_3. The selectivity of tungsten against all gangue minerals was significantly improved, although ~28% of the F and ~11% of the P_2O_5 were recovered to the concentrate.

The results of test FW4 were in between FW1 and FW2. The F, CaO, and P_2O_5 contents reported to the concentrate were high at ~47%, ~13%, and ~41%, respectively.

The high Na_2SiO_3 dosage at 2,500 g/t appeared to have significant depression on scheelite flotation. Test FW7 with 2,500 g/t of Na_2SiO_3 only recovered ~19% of the WO_3. However, the selectivity was improved with F, P_2O_5, and CaO recoveries all below ~5%. The appropriate Na_2SiO_3 dosage appears to be between 1,500 and 2,000 g/t.

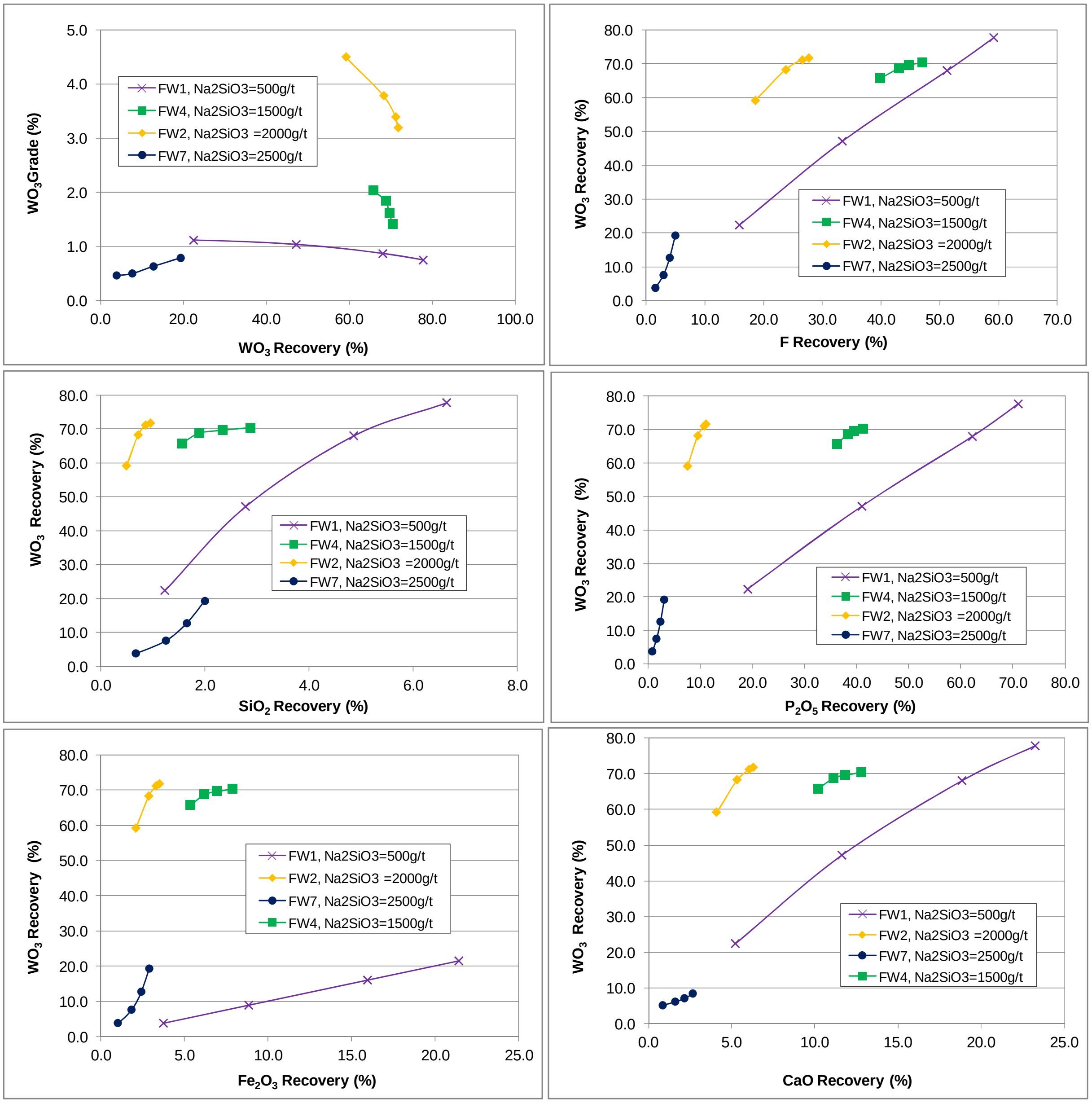


Figure 13: Tungsten Metallurgical Relationships – Effect of Na_2SiO_3 Dosage

2.3.1.2. Effect of Collector V4085 dosage

V4085 was used as a secondary collector in scheelite flotation. Test FW3 repeated FW2 conditions but with less V4085 to the tungsten rougher. Figure 14 demonstrates the metallurgical results obtained from the two tests. The high dosage of V4085 appeared to benefit the metallurgy. It was also beneficial to the selectivity of WO_3 against SiO_2, Fe_2O_3, and CaO. However, the selectivity of WO_3 against F and P_2O_3 was not improved with the high dosage of V4085.

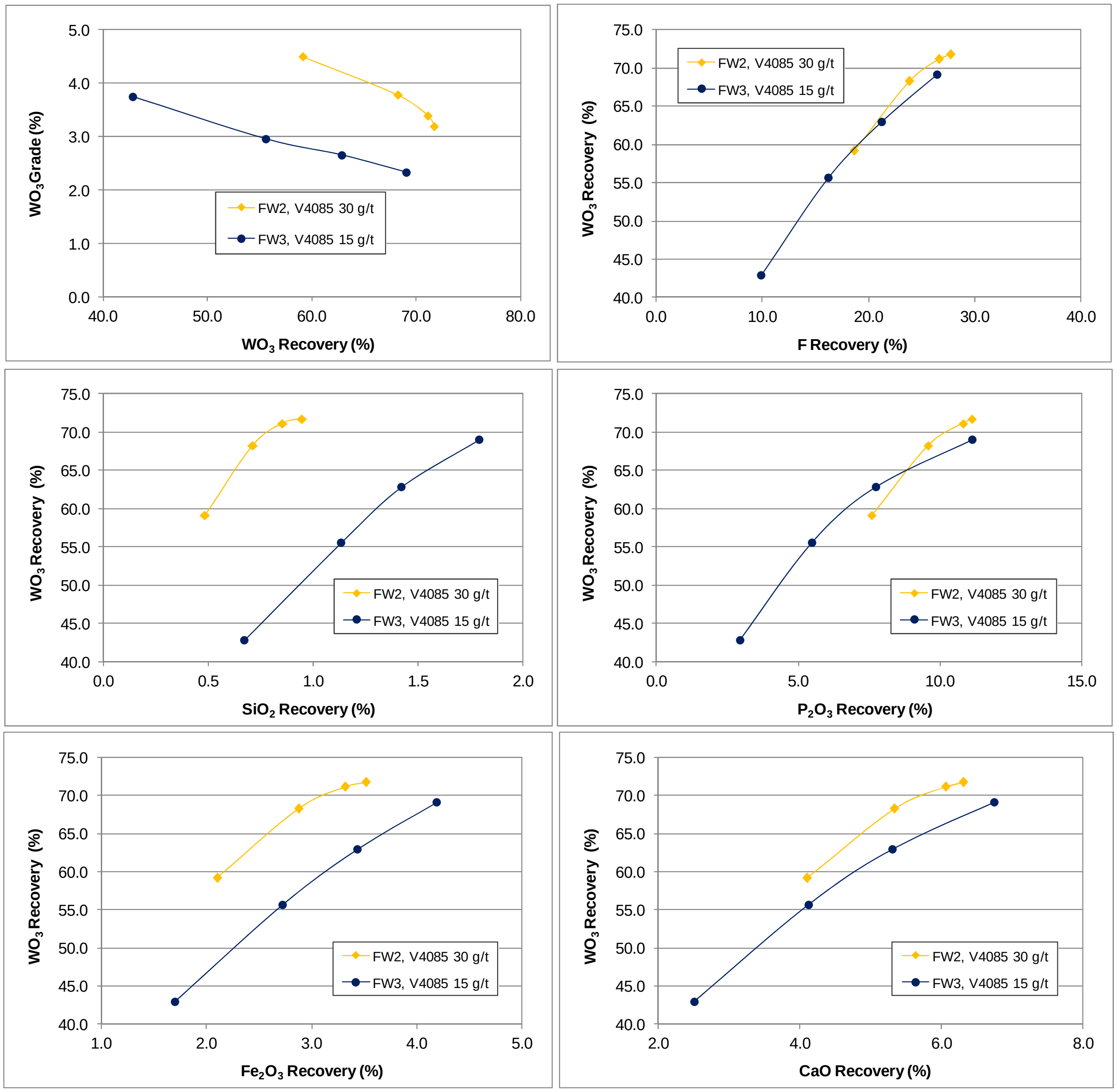


Figure 14: Tungsten Metallurgical Relationships – Effect of V4085 Dosage

2.3.1.3. Effect of Collector FS-2 Dosage

Test FW8 repeated FW7 conditions but with higher FS-2 dosage at 360 g/t. Figure 15 illustrates the performance of the two tests. Test FW8 had better performance; the WO_3 recovery increased ~10% at a concentrate grade (1.59% WO_3) two times higher than FW7. Higher FS-2 dosage also appeared to enhance the selectivity of tungsten against all gangue minerals.

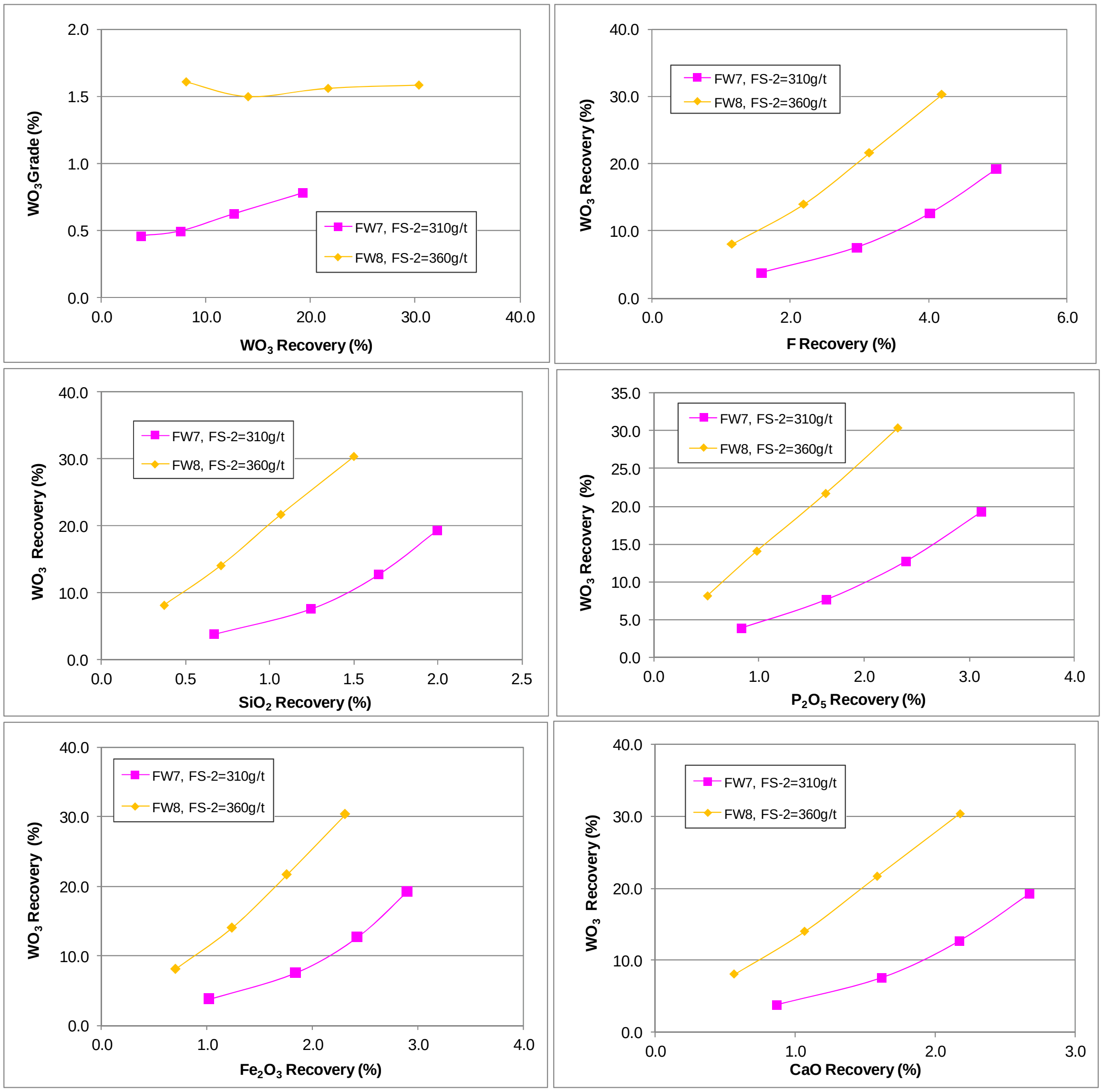


Figure 15: Tungsten Metallurgical Relationships – Effect of FS-2 Dosage

2.3.1.4. Effect of Secondary Depressant

Tests FW4, FW5, and FW9 to FW11 were conducted to investigate the effect of Quebracho, calgon, citric acid, $BaCl_2$, and Al_2SO_4 as a secondary depressant. The results are compared to test FW2 in Figure 16. All depressants appeared to have depression on the scheelite flotation, especially for calgon. The tungsten recovery achieved with all secondary depressants, except for calgon (FW5), were similar to FW2 at ~70%; however the grade was lower than FW2 ranging from 1.5% to 3.0% WO_3. This implies no selective depression on the gangue minerals achieved with the depressants tested.

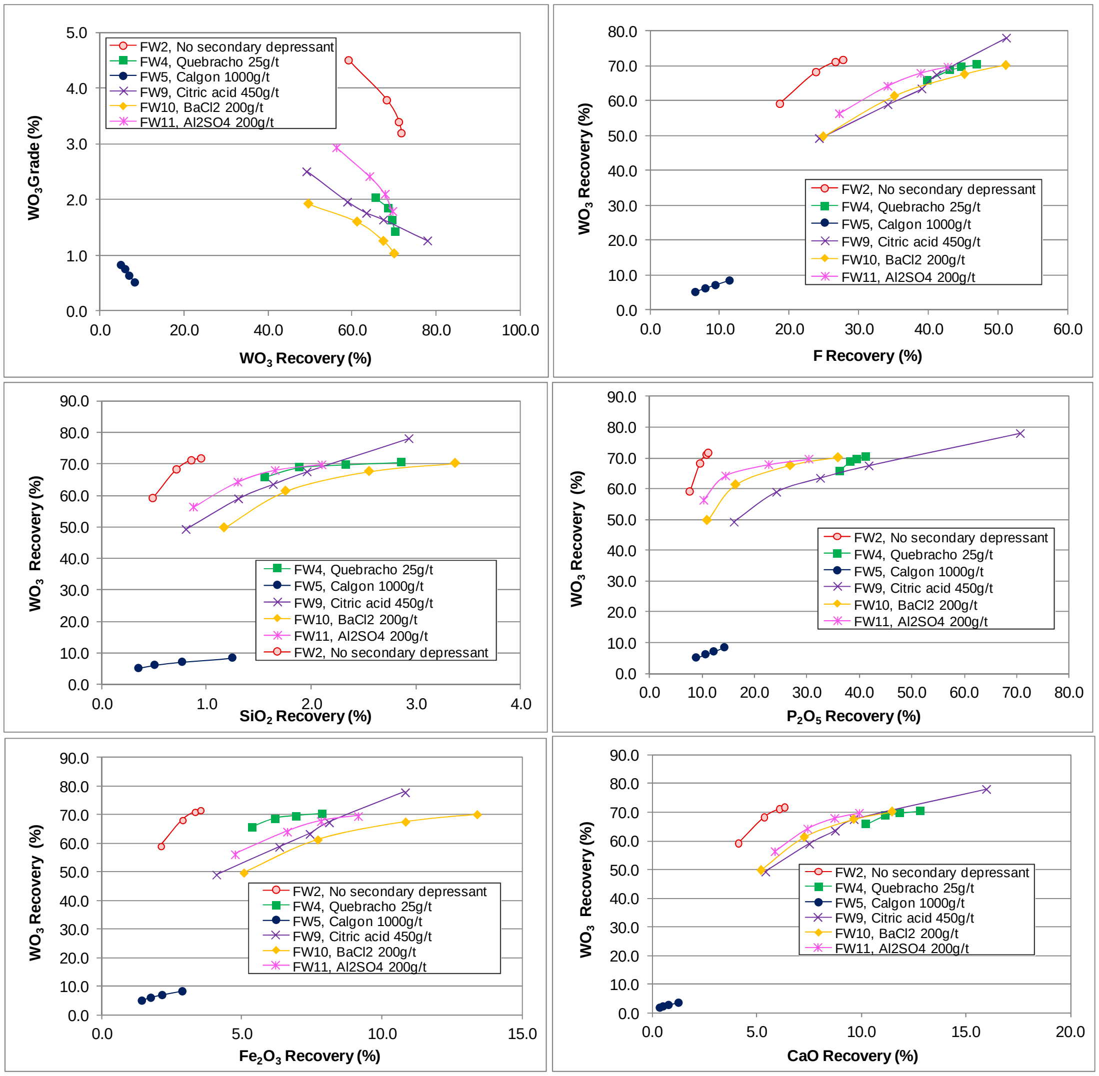


Figure 16: Tungsten Metallurgical Relationships – Effect of Secondary Depressant

2.3.1.5. Effect of Collector Type

Collectors BHD (Benzoylhydroxamte) and Cytec 6493 (Alkyl hydroxamate) were evaluated in tests FW14 and FW15. In test FW14, 600 g/t of BHD was added to the pulp and conditioned with sodium silicate (2,000 g/t) for 10 minutes. The rougher was carried out after the conditioning. The flotation appeared to be very poor with the collector. Two stages of cleaning were carried out on the rougher concentrate, but the flotation in the 2nd cleaner suffered from over-depression after a very small amount of Que-D2 and Na_2SiO_3 was added. The test was not successful, and it was suspected that 2,000 g/t of sodium silicate was too high with BHD.

In test FW15, Na_2SiO_3 was reduced to 1,000 g/t, and 600 g/t of Cytec 6493 was conditioned with the pulp for 10 minutes. The scheelite appeared to float better than FW14 in Rougher 1. The froth became light and full of water at Rougher 2. Rougher 3 was ineffective after 500 g/t of sodium silicate was added. The results illustrated in Figure 17 show promise with Cytec 6493. The rougher concentrate recovered ~77% of the WO_3 at a grade of 2.76% WO_3. Cytec 6493 appeared to be more selective on WO_3 against F than the other collectors. There was only ~13% of the F recovered to the rougher concentrate. On the contrary, the selectivity of WO_3 against P_2O_5 was very poor with 62% of the P_2O_5 floated.

Sodium silicate dosages appeared to be very critical to the flotation with both BHD and Cytec 6493. An optimized depressant system would be required to enhance the flotation with the two collectors. Conditioning method and time may also play a very important role in achieving selective flotation. It would be beneficial to further investigate depressant systems and conditioning methods with the collectors.

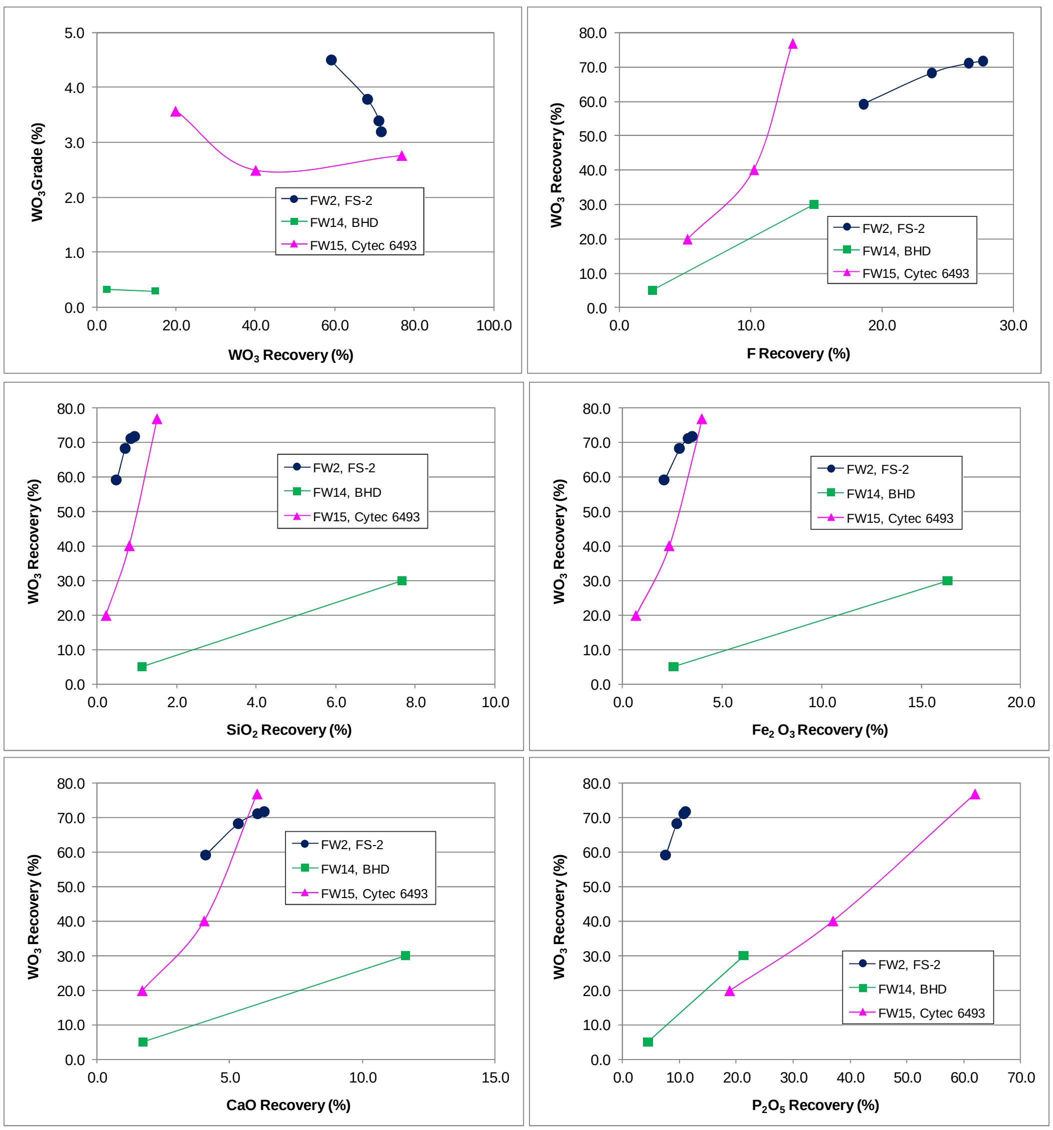


Figure 17: Tungsten Metallurgical Relationships – Effect of Collector Type

2.3.2. Scheelite Cleaner

A total of five cleaner tests were completed for upgrading tungsten rougher concentrates. The test conditions and results are summarized in Table 10 and Table 11, respectively, with Figure 18 illustrating the metallurgical relationships. Note that all distributions are expressed in terms of WO_3 circuit feed.

Table 10: WO_3 Cleaner Conditions

Test ID	Stage	P_{80} µm	Reagents added, g/t						Time, min		
			Na_2CO_3	Na_2SiO_3	NaOH	Flotinor FS-2	V4085	Que D-2	Cond.	Froth	pH
FW12	WO_3 Rougher	68	500	2000	500	280	9		14	12	11.4-11.8
	WO3 Cleaner		250	192	100			15	4	17	10.3-11.5
	Sum		750	2192	600	280	9	15	18	29	
FW13	WO_3 Rougher	72	500	2000	500	300	9		12	10	n/a
	WO3 Cleaner		250	272	100			20	2	12	10.5
	Sum		750	2272	600	300	9	20	14	22	
FW16	WO_3 Rougher	63	500	2000	500	381			17	8.5	10.0
	WO3 Cleaner		210	208	75	2.8				13	
	Sum		710	2208	575	383.8			17	21.5	
FW17	WO_3 Rougher	62	500	1600	500	355	9		15	12	10.8-11.4
	WO3 Cleaner		175	322	105				6	14	10.5-10.9
	Sum		675	1922	605	355	9		21	26	
FW18	WO_3 Rougher	62	500	2000	500	250			12	10	10.8-11.4
	WO3 Cleaner		250	192	100				4	17	10.3-11.5
	Sum		750	2192	600	250			16	27	

Table 11: Summary of WO_3 Cleaner Test Results

Test ID	Product	Wt	Assays, %						% Distribution					
		%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
FW12	**WO3 4th Clnr Conc**	**0.2**	**30.7**	**11.6**	**5.47**	**2.67**	**40.5**	**3.64**	**54.7**	**2.8**	**0.0**	**0.1**	**0.8**	**4.1**
	WO3 3rd Clnr Conc	0.2	24.2	12.9	8.82	3.36	41.0	3.61	59.3	4.2	0.0	0.1	1.2	5.6
	WO3 2nd Clnr Conc	0.4	13.9	14.5	15.6	4.89	38.7	2.99	62.0	8.6	0.1	0.3	2.0	8.3
	WO3 1st Clnr Conc	0.8	6.94	11.6	27.8	8.01	28.1	1.99	65.4	14.6	0.4	1.1	3.1	11.8
	WO3 Rougher Conc	1.9	3.15	9.66	33.9	10.3	22.1	1.56	69.7	28.5	1.0	3.4	5.7	21.7
	WO3 Ro +Ro Scav Conc	2.2	2.77	8.58	36.9	9.86	20.2	1.38	70.2	29.0	1.3	3.7	6.0	22.0
	WO3 Ro Scav Tails	97.8	0.026	0.47	63.8	5.72	7.14	0.11	29.8	71.0	98.7	96.3	94.0	78.0
	Head (calc)	100.0	0.09	0.65	63.2	5.81	7.43	0.14	100.0	100.0	100.0	100.0	100.0	100.0
FW13	**WO3 2nd Clnr Conc**	**0.1**	**14.8**	**15.6**	**10.4**	**5.23**	**44.1**	**0.23**	**15.4**	**1.8**	**0.02**	**0.1**	**0.6**	**0.2**
	WO3 1st Clnr Conc	0.7	4.88	19.4	18.6	6.41	42.3	0.45	35.8	16.2	0.2	0.8	4.2	2.5
	WO3 Rougher Conc	3.3	2.10	11.6	33.2	10.0	24.2	0.77	70.3	44.2	1.7	5.5	10.9	19.3
	WO3 Rougher Tails	96.7	0.030	0.50	64.0	5.91	6.75	0.110	29.7	55.8	98.3	94.5	89.1	80.7
	Head (calc)	100.0	0.10	0.87	63.0	6.04	7.32	0.13	100.0	100.0	100.0	100.0	100.0	100.0
FW16	**WO3 4th Clnr Conc**	**0.08**	**14.7**	**13.0**	**5.39**	**7.86**	**47.5**	**0.40**	**11.2**	**1.3**	**0.0**	**0.1**	**0.5**	**0.2**
	WO3 3rd Clnr Conc	0.4	10.8	15.4	8.09	4.91	50.5	0.95	38.2	7.0	0.0	0.3	2.5	2.6
	WO3 2nd Clnr Conc	0.9	6.91	17.5	12.0	5.19	48.0	1.49	61.2	19.7	0.2	0.7	6.0	10.1
	WO3 1st Clnr Conc	1.8	3.80	15.5	21.3	7.50	38.5	1.58	66.3	34.5	0.6	2.1	9.6	21.0
	WO3 Rougher Conc	3.8	1.88	9.82	34.8	9.59	24.3	1.25	70.5	46.9	2.1	5.8	13.0	35.8
	WO3 Ro +Ro Scav Conc	4.6	1.62	8.67	36.7	9.84	22.0	1.28	72.3	49.1	2.7	7.1	13.9	43.3
	WO3 Ro Scav Tails	95.4	0.030	0.43	63.7	6.14	6.51	0.080	27.7	50.9	97.3	92.9	86.1	56.7
	Head (calc)	100.0	0.10	0.81	62.5	6.31	7.22	0.13	100.0	100.0	100.0	100.0	100.0	100.0
FW17	**WO3 4th Clnr Conc**	**0.4**	**10.5**	**14.2**	**5.28**	**2.70**	**55.4**	**1.49**	**41.4**	**8.1**	**0.0**	**0.2**	**3.3**	**4.7**
	WO3 3rd Clnr Conc	1.0	6.16	14.7	9.00	3.50	53.0	2.59	56.7	19.5	0.1	0.6	7.4	18.9
	WO3 2nd Clnr Conc	1.7	4.05	14.2	14.1	4.92	47.3	2.85	61.6	31.3	0.4	1.3	10.9	34.4
	WO3 1st Clnr Conc	2.8	2.59	11.4	24.0	7.36	36.1	2.54	65.2	41.3	1.1	3.3	13.8	50.7
	WO3 Rougher Conc	6.1	1.25	6.39	35.5	10.1	23.2	1.55	67.8	50.2	3.4	9.6	19.1	66.7
	WO3 Ro Tails	93.9	0.038	0.41	64.3	6.11	6.34	0.050	32.2	49.8	96.6	90.4	80.9	33.3
	Head (calc)	100.0	0.11	0.77	62.6	6.35	7.36	0.14	100.0	100.0	100.0	100.0	100.0	100.0
FW18	**S Pan Conc**	**0.1**	**32.5**	**12.6**					**36.6**	**1.7**				
	S Pan Conc +Mid's	0.1	28.1	12.6					43.4	2.3				
	WO3 5th Clnr Conc	**0.2**	**25.1**	**12.9**					**45.2**	**2.8**				
	WO3 4th Clnr Conc	0.3	16.9	13.2	1.89	0.83	25.4	1.14	52.1	4.9	0.01	0.04	1.0	2.4
	WO3 3rd Clnr Conc	0.5	11.1	14.3	4.56	1.65	38.6	1.82	56.9	8.8	0.03	0.1	2.4	6.3
	WO3 2nd Clnr Conc	0.9	6.55	16.3	9.54	3.04	44.6	1.96	64.9	19.4	0.1	0.4	5.5	13.1
	WO3 1st Clnr Conc	1.6	3.79	15.6	19.2	5.27	38.6	1.77	69.3	34.3	0.5	1.4	8.7	21.9
	WO3 Rougher Conc	5.4	1.21	6.93	40.7	9.70	18.3	0.88	73.5	50.6	3.5	8.3	13.8	35.9
	WO3 Ro Tails	94.6	0.025	0.39	64.0	6.16	6.61	0.090	26.5	49.4	96.5	91.7	86.2	64.1
	Head (calc)	100.0	0.090	0.75	62.7	6.35	7.25	0.13	100.0	100.0	100.0	100.0	100.0	100.0

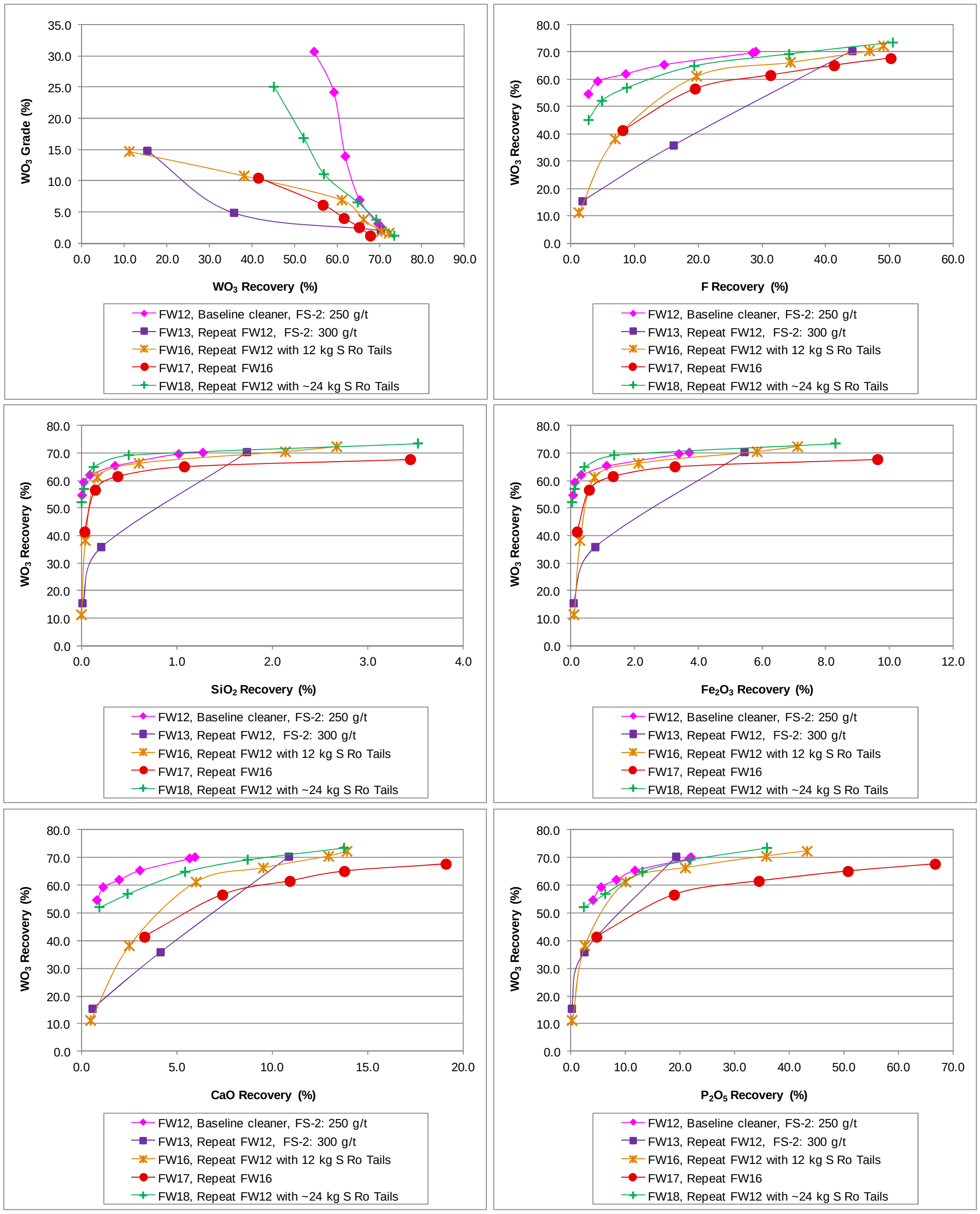


Figure 18: Tungsten Metallurgical Relationships – WO_3 Cleaner Tests

Test FW12 was performed on 12 kg sulphide rougher tailings from test FM6. FW2 rougher conditions were applied in the test. Four stages of cleaning were carried out on the rougher concentrate. The pH for the cleaners was maintained at ~11 with 250 g/t of $NaCO_3$, 192 g/t of Na_2SiO_3, and 100 g/t of NaOH. Que D-2 was added to the cleaners at 15 g/t as a secondary depressant. The results were encouraging with the 4th cleaner concentrate recovering ~54% of the WO_3, and grading 30.7% WO_3. Depression of apatite and fluorite are likely key to improving tungsten grades.

Test FW13 was conducted based on the FW12 conditions. The FS-2 dosage to the rougher was increased to 300 g/t, while sodium silicate and quebracho also was increased by 50% in the 1st and 2nd cleaners in an effort to better depress gangue minerals, particularly fluorite. The objective of the test was to achieve a higher grade concentrate with similar batch recovery to FW12. The test had a tungsten recovery and grade similar to FW12 with the increased collector, however, the cleaners deteriorated with increased depressants. The flotation in the 2nd cleaner became very poor, consequently, there was insufficient 2nd cleaner concentrate to perform a 3rd cleaner stage. The 2nd cleaner concentrate only recovered ~15% of the WO_3 at a grade of 14.8% WO_3

Since both depressants Na_2SiO_3 and Que-D2 to the cleaners were found to be very critical, test FW16 was performed to repeat FW12 cleaner conditions, but Que-D2 was eliminated. A 4th cleaner was carried out in an effort to recover a higher grade concentrate. However, the test was not successful. The 4th cleaner concentrate only graded 14.7% WO_3 at a recovery of ~11%.

Test FW17 also repeated FW12 cleaner conditions, while the sodium silicate to the rougher was reduced to 1,600 g/t. It was found that mass pull of the rougher concentrate increased from 2.2% (FW12) to 6.1% because less sodium silicate was added. Consequently, more sodium silicate had to be added to the cleaners in order to reject the additional gangue minerals that floated to the rougher concentrate. The 4th cleaner concentrate only recovered ~41% of the WO_3 grading 10.5% WO_3.

Test FW18 was conducted on 2 x 12 kg sulphide rougher tailings from test FM11 and FM12. The test was completed based on the FW12 conditions; however both V4085 and Que-D2 were eliminated in the test. A 5th cleaner was carried out in order to produce a higher grade concentrate. The 5th cleaner concentrate recovered ~45% of the WO_3 at a grade of 25.1% WO_3.

A Superpanner Table test was carried out on the 5th cleaner concentrate to assess gravity separation of scheelite from fluorite. This only upgraded the tungsten from 25.1% to 32.5% WO_3, but the stage recovery was good at ~81%.

2.4. Combined Results of Molybdenum and Scheelite Flotation

The combined results of molybdenum and scheelite flotation tests are summarized in Table 12 and Table 13. Figure 19 shows the grades and recoveries of the tungsten and molybdenum concentrates produced in each set of the molybdenum and scheelite cleaner tests.

The best molybdenum cleaner result was achieved with FM10 at a Mo recovery of 88.4% and a grade of 50.4% Mo. The best scheelite cleaner result was achieved with FW12 at a WO_3 recovery of 53.6% and a grade of 30.7% WO_3

Table 12: Combined Results of Molybdenum and WO_3 Rougher Flotation

Test ID	Product	Wt	Wt	Assays, %								% Distribution							
		g	%	WO_3	Mo	S	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	Mo	S	F	SiO_2	Fe_2O_3	CaO	P_2O_5
FW1	WO_3 Ro Conc 1	75.5	0.6	1.11			7.16	39.4	11.1	20.0	1.22	7.5			5.3	0.4	1.3	1.8	6.6
	WO_3 Ro Conc 1-2	171.2	1.5	1.03			6.65	39.4	11.5	19.6	1.15	15.8			11.2	0.9	3.0	4.0	14.2
	WO_3 Ro Conc 1-3	295.3	2.5	0.86			5.91	39.9	12.1	18.4	1.01	22.8			17.2	1.7	5.4	6.4	21.6
	WO_3 Ro Conc 1-4	391.4	3.3	0.74			5.15	41.2	12.2	17.1	0.87	26.1			19.9	2.3	7.3	7.9	24.6
	WO_3 Ro Tail	3477	29.6	0.024			0.400	65.3	5.05	6.4	0.04	7.5			13.7	31.8	26.8	26.1	10.0
	WO3 Feed (S Ro Tails)	3868	33.0	0.10	0.0056	0.030	0.88	62.9	5.78	7.46	0.12	33.6	2.1	2.7	33.6	34.0	34.1	34.0	34.6
FW2	WO_3 Ro Conc 1	43.0	0.4	4.50			14.4	26.8	10.6	26.7	0.81	17.3			6.1	0.2	0.7	1.4	2.5
	WO_3 Ro Conc 1-2	59.0	0.5	3.78			13.4	28.7	10.6	25.3	0.74	20.0			7.8	0.2	1.0	1.8	3.2
	WO_3 Ro Conc 1-3	68.6	0.6	3.39			12.9	29.6	10.5	24.7	0.72	20.9			8.7	0.3	1.1	2.0	3.6
	WO_3 Ro Conc 1-4	73.5	0.6	3.19			12.5	30.6	10.4	24.0	0.69	21.0			9.1	0.3	1.2	2.1	3.7
	WO_3 Ro Tail	3701	31.5	0.025			0.65	63.4	5.66	7.09	0.110	8.3			23.7	32.8	32.0	30.9	29.3
	WO3 Feed (S Ro Tails)	3775	32.2	0.087	0.0056	0.030	0.88	62.8	5.75	7.42	0.12	29.3	2.0	2.7	32.8	33.1	33.2	33.0	33.0
FW3	WO_3 Ro Conc 1	40.2	0.3	3.75			8.33	39.4	9.04	17.5	0.33	13.5			3.3	0.2	0.6	0.8	1.0
	WO_3 Ro Conc 1-2	66.1	0.6	2.96			8.33	40.3	8.82	17.5	0.37	17.5			5.4	0.4	0.9	1.4	1.8
	WO_3 Ro Conc 1-3	83.3	0.7	2.66			8.66	40.1	8.83	17.9	0.42	19.8			7.1	0.5	1.1	1.8	2.5
	WO_3 Ro Conc 1-4	104.2	0.9	2.33			8.62	40.4	8.61	18.2	0.48	21.8			8.9	0.6	1.4	2.2	3.6
	WO_3 Ro Tail	3629	30.9	0.030			0.69	63.5	5.66	7.21	0.11	9.8			24.7	32.2	31.4	30.8	28.8
	WO3 Feed (S Ro Tails)	3734	31.8	0.094	0.0056	0.030	0.91	62.9	5.74	7.52	0.12	31.5	2.0	2.6	33.6	32.8	32.7	33.0	32.4
FM1	Mo Ro Conc	247.5	2.1	0.18	3.79	6.9						4.0	90.8	40.2					
	S Ro Conc	112.5	1.0	0.15	0.28	19.6						1.5	3.0	51.8					
	S Ro Tails	11377	96.9	0.10	0.0056	0.030	0.89	62.8	5.76	7.47	0.12	94.4	6.1	8.0	100.0	100.0	100.0	100.0	100.0
	Head (calc.)	11737	100.0	0.10	0.088	0.36						100.0	100.0	100.0					
FW4	WO_3 Ro Conc 1	115.0	1.0	2.03			10.10	31.4	10.1	24.5	1.51	22.7			19.2	0.8	2.7	5.1	18.5
	WO_3 Ro Conc 1-2	132.8	1.2	1.84			9.45	32.9	10.1	23.1	1.38	23.8			20.8	0.9	3.1	5.6	19.5
	WO_3 Ro Conc 1-3	152.6	1.4	1.62			8.54	35.4	9.8	21.4	1.24	24.1			21.6	1.2	3.5	6.0	20.1
	WO_3 Ro Conc 1-4	176.7	1.6	1.41			7.75	37.5	9.6	20.0	1.12	24.3			22.7	1.4	3.9	6.4	21.0
	WO_3 Ro Tail	3510	31.3	0.025			0.44	64.0	5.68	6.86	0.080	8.5			25.6	48.6	46.3	43.8	29.9
	WO3 Feed (S Ro Tails)	3686	32.9	0.092	0.006	0.11	0.79	62.7	5.87	7.49	0.13	32.9	50.2	50.2	48.2	50.1	50.2	50.3	50.9
FW5	WO_3 Ro Conc 1	24.3	0.2	0.82			8.40	33.7	12.6	19.5	1.69	1.9			3.4	0.2	0.7	0.9	4.4
	WO_3 Ro Conc 1-2	32.2	0.3	0.74			7.74	36.4	11.6	18.4	1.53	2.3			4.1	0.3	0.9	1.1	5.3
	WO_3 Ro Conc 1-3	44.1	0.4	0.63			6.67	40.4	10.5	16.6	1.28	2.7			4.9	0.4	1.1	1.3	6.0
	WO_3 Ro Conc 1-4	64.9	0.6	0.51			5.52	44.5	9.5	14.6	1.02	3.2			5.9	0.6	1.4	1.7	7.0
	WO_3 Ro Tail	3594	32.0	0.081			0.77	63.4	5.80	7.34	0.11	28.3			45.8	49.3	48.4	48.0	42.1
	WO3 Feed (S Ro Tails)	3659	32.6	0.09	0.006	0.11	0.85	63.1	5.87	7.47	0.13	31.54	49.8	49.8	51.8	49.9	49.8	49.7	49.1
FW6	WO_3 Ro Conc 1	11.1	0.10	0.23			6.70	45.3	9.9	15.1	0.11	0.2			1.2	0.1	0.3	0.3	0.1
G1	WO_3 Ro Conc 1-2	21.6	0.2	0.21			4.25	51.2	8.6	11.9	0.12	0.4			1.5	0.2	0.4	0.5	0.3
	WO_3 Ro Conc 1-3	32.2	0.3	0.18			3.59	52.7	8.2	11.1	0.12	0.6			1.9	0.4	0.6	0.7	0.4
	WO_3 Ro Conc 1-4	52.1	0.5	0.15			4.72	51.3	7.9	13.0	0.12	0.8			4.1	0.6	0.9	1.2	0.7
	WO_3 Ro Tail	2198	19.6	0.11			0.88	61.2	6.39	7.90	0.15	23.5			32.0	29.1	32.6	31.6	35.1
	WO3 Ro Feed (-250 mesh)	2250	20.1	0.11			0.97	61.0	6.42	8.02	0.15	24.3			36.1	29.7	33.5	32.8	35.7
	Mozley Conc (+250 mesh)	91.3	0.8	0.63			1.58	47.9	15.3	15.3	0.31	5.6			2.4	0.9	3.2	2.5	3.0
	Mozley Tails (+250 mesh)	1146.1	10.2	0.011			0.48	68.8	4.45	6.14	0.060	1.2			9.1	17.1	11.8	12.8	7.3
	WO3 Feed (S Ro Tails)	3488	31.1	0.09	0.006	0.11	0.82	63.2	6.01	7.59	0.12	31.1	47.5	47.5	47.6	47.7	48.6	48.2	46.1
FM2	Mo Ro Conc	241.3	2.2	0.14	3.76	4.16						3.2	87.8	22.7					
	S Ro Conc	144.8	1.3	0.089	0.39	14.8						1.3	5.5	48.4					
	S Ro Tails	7345	65.5	0.090	0.006	0.11	0.82	62.9	5.87	7.48	0.13	64.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Head (calc.)	11219	100.0	0.092	0.092	0.39						100.0							
FW7	WO_3 Ro Conc 1	29.6	0.4	0.46			1.72	53.9	7.4	8.4	0.14	2.1			0.8	0.3	0.5	0.4	0.4
	WO_3 Ro Conc 1-2	54.7	0.7	0.50			1.74	54.4	7.2	8.4	0.15	4.3			1.5	0.6	0.9	0.8	0.8
	WO_3 Ro Conc 1-3	72.7	0.9	0.63			1.78	54.1	7.2	8.5	0.16	7.2			2.1	0.8	1.2	1.1	1.2
	WO_3 Ro Conc 1-4	88.2	1.1	0.78			1.81	54.0	7.1	8.7	0.18	10.9			2.6	1.0	1.5	1.4	1.6
	WO_3 Ro Tail	3714	47.0	0.078			0.82	63.0	5.63	7.48	0.130	45.7			49.3	49.7	49.5	49.5	49.3
	WO3 Feed (S Ro Tails)	3802	48.1	0.094	0.004	0.050	0.84	62.8	5.66	7.51	0.13	52.5	50.7	50.7	51.9	50.7	51.0	50.8	50.9
FW8	WO_3 Ro Conc 1	17.8	0.2	1.61			2.00	49.2	8.3	8.9	0.14	4.5			0.6	0.2	0.4	0.3	0.3
	WO_3 Ro Conc 1-2	15.3	0.2	1.50			2.04	50.4	7.9	9.0	0.14	3.6			0.5	0.2	0.3	0.2	0.2
	WO_3 Ro Conc 1-3	16.0	0.2	1.56			1.97	51.0	7.5	9.0	0.16	3.9			0.5	0.2	0.3	0.3	0.3
	WO_3 Ro Conc 1-4	18.6	0.2	1.59			1.90	52.0	7.2	9.0	0.17	4.6			0.6	0.2	0.3	0.3	0.3
	WO_3 Ro Tail	3676	46.5	0.067			0.80	62.9	5.60	7.46	0.130	38.8			47.6	49.1	48.7	48.9	48.8
	WO3 Feed (S Ro Tails)	3695	46.8	0.075	0.004	0.050	0.81	62.8	5.61	7.47	0.13	43.5	49.3	49.3	48.1	49.3	49.0	49.2	49.1
FM3	Mo Ro Conc	259.8	3.3	0.14	3.77	7.36						5.2	95.2	41.9					
	S Ro Conc	141.5	1.8	0.090	0.14	16.1						1.9	1.9	49.9					
	S Ro Tails	7497	94.9	0.085	0.004	0.05	0.82	62.8	5.64	7.49	0.13	96.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Head (calc.)	7898	100.0	0.086	0.13	0.58						103.1							
FW9	WO_3 Ro Conc 1	68.0	0.6	2.50			11.4	28.5	13.6	22.8	1.17	15.7			8.4	0.3	1.4	1.8	5.3
	WO_3 Ro Conc 1-2	104.1	0.9	1.96			10.5	30.2	13.8	20.7	1.15	18.8			11.8	0.4	2.2	2.5	8.0
	WO_3 Ro Conc 1-3	125.0	1.1	1.75			10.0	31.5	13.4	20.1	1.29	20.2			13.5	0.6	2.5	3.0	10.7
	WO_3 Ro Conc 1-4	142.6	1.2	1.64			9.2	33.1	12.9	19.4	1.45	21.5			14.2	0.7	2.8	3.3	13.8
	WO_3 Ro + Ro Scav Conc	213.9	1.8	1.26			7.6	33.0	11.5	21.4	1.63	24.8			17.7	1.0	3.7	5.4	23.3
	WO_3 Ro Tail	3625	31.0	0.021			0.43	64.4	5.58	6.66	0.040	7.0			16.8	32.8	30.4	28.6	9.7
	WO3 Feed (S Ro Tails)	3839	32.8	0.09	0.009	0.10	0.83	62.6	5.91	7.48	0.13	31.8	34.0	34.0	34.5	33.8	34.1	34.0	32.9
FW10	WO_3 Ro Conc 1	86.4	0.7	1.92			8.9	33.7	13.5	17.9	0.66	15.3			8.3	0.4	1.8	1.8	3.8
	WO_3 Ro Conc 1-2	128.0	1.1	1.60			8.5	34.2	13.9	16.9	0.67	18.8			11.8	0.6	2.7	2.6	5.7
	WO_3 Ro Conc 1-3	180.1	1.5	1.25			7.8	35.3	13.8	15.9	0.77	20.8			15.1	0.9	3.7	3.4	9.3
	WO_3 Ro Conc 1-4	227.9	1.9	1.03			7.0	36.8	13.5	15.0	0.82	21.6			17.1	1.2	4.6	4.0	12.5
	WO_3 Ro Tail	3695	31.6	0.027			0.41	65.0	5.39	7.13	0.090	9.2			16.4	33.8	29.9	31.2	22.2
	WO3 Feed (S Ro Tails)	3923	33.6	0.09	0.009	0.10	0.79	63.4	5.86	7.59	0.13	30.8	34.7	34.7	33.5	35.0	34.6	35.2	34.6
FW11	WO_3 Ro Conc 1	68.7	0.6	2.93			11.7	28.3	14.4	22.1	0.73	18.5			8.7	0.3	1.5	1.8	3.3
	WO_3 Ro Conc 1-2	95.1	0.8	2.41			10.6	30.4	14.5	20.2	0.74	21.1			10.9	0.4	2.1	2.3	4.7
	WO_3 Ro Conc 1-3	115.7	1.0	2.10			9.9	31.8	14.1	19.5	0.95	22.4			12.4	0.5	2.4	2.7	7.4
	WO_3 Ro Conc 1-4	139.3	1.2	1.79			9.1	33.5	13.7	18.4	1.06	22.9			13.7	0.7	2.9	3.0	9.8
	WO_3 Ro Tail	3390	29.0	0.032			0.50	64.1	5.59	6.91	0.100	10.0			18.3	30.6	28.5	27.7	22.6
	WO3 Feed (S Ro Tails)	3529	30.2	0.10	0.009	0.10	0.84	62.9	5.91	7.36	0.14	32.9	31.3	31.3	32.0	31.2	31.3	30.8	32.4
FM4	Mo Ro Conc	259.8	2.2	0.14	3.77	7.36						3.3	89.0	35.9					
	S Ro Conc	141.5	1.2	0.090	0.14	16.1						1.2	1.8	42.8					
	S Ro Tails	11290	96.6	0.092	0.009	0.10	0.82	63.0	5.89	7.48	0.13	95.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Head (calc.)	11692	100.0	0.093	0.094	0.45						100.0							
FW14	WO3 Ro Conc 1	39.0	0.4	0.07			1.2	54.4	8.8	7.5	0.13	0.3			0.6	0.4	0.6	0.4	0.4
	WO3 1st Cleaner Conc	30.5	0.3	0.64			2.0	38.8	11.4	9.6	0.81	2.4			0.7	0.2	0.6	0.4	2.0
	Rougher Conc 2-4	383.8	4.1	0.29			1.3	49.6	9.7	8.6	0.29	13.8			6.2	3.2	6.8	4.8	8.7
	Rougher Conc 1-4	422.8	4.5	0.27			1.3	50.0	9.6	8.5	0.27	14.1			6.8	3.6	7.4	5.2	9.1
	Bulk Rougher Tail	4149	43.9	0.067			0.87	65.1	5.50	7.19	0.13	34.3			43.8	46.1	42.0	43.5	42.9
	WO3 Feed (S Ro Tails)	4572	48.4	0.086	0.006	0.070	0.91	63.7	5.88	7.31	0.14	48.4	49.3	49.3	50.6	49.7	49.4	48.7	52.0
FW15	WO_3 Ro Conc 1	22.3	0.2	3.57			9.5	31.1	8.5	27.0	5.12	9.9			2.6	0.1	0.3	0.9	9.1
	WO_3 Ro Conc 1-2	64.4	0.7	2.49			6.5	37.4	10.1	22.1	3.48	19.9			5.1	0.4	1.2	2.1	17.8
	WO_3 Ro Conc 1-3	111.4	1.2	2.76			4.8	40.0	9.9	19.1	3.37	38.1			6.5	0.8	2.0	3.1	29.8
	WO_3 Ro Conc 1-4	147.9	1.6	2.09			3.8	45.0	8.7	15.8	2.54	38.3			6.7	1.1	2.4	3.4	29.9
	WO_3 Ro Tail	4558	48.3	0.020			0.77	63.2	5.75	7.20	0.050	11.3			42.6	49.2	48.2	47.9	18.1
	WO3 Feed (S Ro Tails)	4706	49.8	0.085	0.006	0.070	0.86	62.6	5.84	7.47	0.13	49.5	50.7	50.7	49.4	50.3	50.6	51.3	48.0
FM8	Mo Ro Conc	82.1	0.9	0.140	11.6	11.8						1.4	92.9	27.8					
	S Ro Conc	86.9	0.9	0.06	0.20	21.5						0.6	1.7	53.6					
	S Ro Tails	9278	98.2	0.085	0.006	0.070	0.89	63.2	5.86	7.39	0.14	98.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Head (calc.)	9447	100.0	0.085	0.11	0.37						100.0							

Table 13: Combined Results of Molybdenum and WO_3 Cleaner Flotation

Test ID	Product	Wt	Wt	Assays, %								% Distribution							
		g	%	WO_3	Mo	S	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	Mo	S	F	SiO_2	Fe_2O_3	CaO	P_2O_5
FW12	WO3 4th Clnr Conc	18.0	0.2	30.7			11.6	5.5	2.7	40.5	3.64	53.6			2.7	0.01	0.07	0.84	4.07
FM6	WO3 3rd Clnr Conc	24.8	0.2	24.2			12.9	8.8	3.4	41.0	3.61	58.1			4.1	0.03	0.12	1.17	5.55
	WO3 2nd Clnr Conc	45.0	0.4	13.9			14.5	15.6	4.9	38.7	2.99	60.8			8.5	0.10	0.32	2.01	8.35
	WO3 1st Clnr Conc	95.3	0.8	6.94			11.6	27.8	8.0	28.1	1.99	64.1			14.4	0.36	1.12	3.09	11.8
	WO3 Rougher Conc	223.5	1.9	3.15			9.66	33.9	10.3	22.1	1.56	68.3			28.0	1.03	3.39	5.69	21.7
	WO3 Ro +Ro Scav Conc	256.1	2.2	2.77			8.58	36.9	9.86	20.2	1.38	68.8			28.5	1.28	3.72	5.97	22.0
	WO3 Ro Scav Tails	11423	96.1	0.026			0.47	63.8	5.72	7.14	0.110	29.2			69.7	98.7	96.3	94.0	78.0
	WO3 Feed (S Ro Tails)	11679	98.3	0.087	0.003	0.050	0.65	63.2	5.81	7.43	0.14	98.0	3.09	14.4	98.2	100.0	100.0	100.0	100.0
	Mo Clnr Conc	31.0	0.3	0.065	30.0	26.1	0.39					0.2	82.0	20.0	0.2				
	Mo Ro Conc	157.8	1.3	0.093	6.86	19.1	0.65					1.4	95.4	74.5	1.3				
	S Ro Conc	49.8	0.4	0.12	0.34	8.97	0.76					0.6	1.5	11.0	0.5				
	Head (calc.)	11887	100.0	0.087	0.095	0.34	0.65					100.0	100.0	100.0	100.0				
FW13	WO_3 2nd Clnr Conc	11.8	0.1	14.8			15.6	10.4	5.2	44.1	0.23	15.2			1.8	0.0	0.1	0.6	0.2
FM7	WO_3 1st Clnr Conc	83.2	0.7	4.9			19.4	18.6	6.4	42.3	0.45	35.2			16.2	0.2	0.8	4.2	2.5
	WO_3 Rougher Conc	379.9	3.2	2.10			11.6	33.2	10.0	24.2	0.77	69.2			44.2	1.7	5.5	10.9	19.3
	WO_3 Rougher Tails	11137	95.1	0.030			0.50	64.0	5.91	6.75	0.11	29.2			55.8	98.3	94.5	89.1	80.7
	WO3 Feed (S Ro Tails)	11517	98.3	0.098	0.003	0.080	0.87	63.0	6.04	7.32	0.13	98.4	3.4	21.0	100.0	100.0	100.0	100.0	100.0
	Mo 2ndClnr Conc	16.40	0.1	0.040	51.3	35.2						0.1	81.6	13.1					
	Mo 1st Clnr Conc	22.6	0.2	0.073	41.3	30.6						0.1	90.5	15.8					
	Mo Ro Conc	85.3	0.7	0.14	11.5	12.7						1.1	95.0	24.6					
	S Ro Conc	111.2	0.9	0.052	0.15	21.5						0.5	1.6	54.4					
	Head (calc.)	11713	100.0	0.098	0.088	0.37						100.0	100.0	100.0					
FW16	WO3 4th Clnr Conc	8.5	0.1	14.7			13.0	5.39	7.86	47.5	0.40	11.0			1.3	0.0	0.1	0.5	0.2
FM9	WO3 3rd Clnr Conc	39.5	0.4	10.8			15.4	8.09	4.91	50.5	0.95	37.5			7.0	0.0	0.3	2.5	2.6
	WO3 2nd Clnr Conc	98.8	0.9	6.91			17.5	12.0	5.19	48.0	1.49	60.2			19.7	0.2	0.7	6.0	10.1
	WO3 1st Clnr Conc	194.7	1.8	3.80			15.5	21.3	7.50	38.5	1.58	65.1			34.5	0.6	2.1	9.6	21.0
	WO3 Rougher Conc	418.7	3.8	1.88			9.8	34.8	9.59	24.3	1.25	69.3			46.9	2.1	5.8	13.0	35.8
	WO3 Ro +Ro Scav Conc	496.7	4.5	1.62			8.7	36.7	9.84	22.0	1.28	71.1			49.1	2.7	7.1	13.9	43.3
	WO3 Ro Scav Tails	10383	93.5	0.030			0.43	63.7	6.14	6.51	0.080	27.4			50.9	97.3	92.9	86.1	56.7
	WO3 Feed (S Ro Tails)	10879	98.0	0.10	0.008	0.07	0.81	62.5	6.31	7.22	0.13	98.5	8.3	20.4	100.0	100.0	100.0	100.0	100.0
	Mo 2ndClnr Conc	18.10	0.2	0.042	50.1	33.1						0.1	86.0	16.1					
	Mo 1st Clnr Conc	23.2	0.2	0.079	40.3	27.8						0.2	88.6	17.3					
	Mo Ro Conc	91.1	0.8	0.13	10.5	9.90						1.1	90.3	24.2					
	S Ro Conc	134.1	1.2	0.038	0.11	15.4						0.4	1.4	55.4					
	Head (calc.)	11105	100.0	0.10	0.095	0.34						100.0	100.0	100.0					
FW17	WO3 4th Clnr Conc	47.8	0.4	10.5			14.2	5.28	2.70	55.4	1.49	40.8			8.1	0.0	0.2	3.3	4.7
FM10	WO3 3rd Clnr Conc	111.3	1.0	6.16			14.7	9.00	3.50	53.0	2.59	55.8			19.5	0.1	0.6	7.4	18.9
	WO3 2nd Clnr Conc	184.3	1.7	4.05			14.2	14.1	4.92	47.3	2.85	60.7			31.3	0.4	1.3	10.9	34.4
	WO3 1st Clnr Conc	304.6	2.8	2.59			11.4	24.0	7.36	36.1	2.54	64.2			41.3	1.1	3.3	13.8	50.7
	WO3 Rougher Conc	657.9	6.0	1.25			6.4	35.5	10.1	23.2	1.55	66.8			50.2	3.4	9.6	19.1	66.7
	WO3 Ro Tails	10181	92.1	0.038			0.41	64.3	6.11	6.34	0.050	31.7			49.8	96.6	90.4	80.9	33.3
	WO3 Feed (S Ro Tails)	10839	98.0	0.11	0.004	0.070	0.77	62.6	6.35	7.36	0.14	98.5	4.3	20.1	100.0	100.0	100.0	100.0	100.0
	Mo 2ndClnr Conc	17.50	0.2	0.054	50.4	33.5						0.1	88.4	15.5					
	Mo 1st Clnr Conc	23.8	0.2	0.090	38.3	26.5						0.2	91.4	16.7					
	Mo Ro Conc	105.8	1.0	0.14	8.9	8.31						1.2	94.0	23.3					
	S Ro Conc	111.1	1.0	0.036	0.15	19.3						0.3	1.7	56.7					
	Head (calc.)	11056	100.0	0.11	0.090	0.34						100.0	100.0	100.0					
FW18	S Pan Conc	22.3	0.1	32.5			12.6					35.7			1.7				
FM11	S Pan Conc +Mid's	30.6	0.1	28.1			12.6					42.4			2.3				
FM12	WO3 5th Clnr Conc	35.7	0.2	25.1			12.9					44.1			2.8				
	WO3 4th Clnr Conc	61.3	0.3	16.9			13.2	1.9	0.8	25.4	1.14	50.9			4.9	0.01	0.04	0.97	2.39
	WO3 3rd Clnr Conc	101.8	0.5	11.1			14.3	4.6	1.6	38.6	1.82	55.5			8.8	0.03	0.12	2.45	6.30
	WO3 2nd Clnr Conc	196.3	0.9	6.6			16.3	9.5	3.0	44.6	1.96	63.3			19.4	0.1	0.4	5.5	13.1
	WO3 1st Clnr Conc	362.5	1.6	3.79			15.6	19.2	5.3	38.6	1.77	67.5			34.3	0.5	1.4	8.7	21.9
	WO3 Rougher Conc	1205	5.3	1.21			6.9	40.7	9.7	18.3	0.88	71.7			50.6	3.5	8.3	13.8	35.9
	WO3 Ro Tails	20927	92.7	0.025			0.39	64.0	6.16	6.61	0.090	25.8			49.4	96.5	91.7	86.2	64.1
	WO3 Feed (S Ro Tails)	22132	98.1	0.090	0.010	0.060	0.75	62.7	6.35	7.25	0.13	97.5	10.0	17.9	100.0	100.0	100.0	100.0	100.0
	Mo 2ndClnr Conc	41.7	0.2	0.14	44.5	29.3						0.3	83.6	16.5					
	Mo 1st Clnr Conc	56.6	0.3	0.18	34.0	23.2						0.5	86.8	17.7					
	Mo Ro Conc	202.8	0.9	0.17	9.70	9.33						1.7	88.6	25.5					
	S Ro Conc	234.7	1.0	0.06	0.13	17.8						0.7	1.4	56.5					
	Head (calc.)	22569	100.0	0.090	0.098	0.33						100.0	100.0	100.0					
FM5	WO3 3rd Clnr Conc	11.2	0.2	5.77	0.28	0.46	12.3					15.1	0.4	0.2	3.3				
	WO3 2nd Clnr Conc	36.2	0.6	4.67	0.17	0.27	12.6					39.4	0.9	0.5	11.0				
	WO3 1st Clnr Conc	83.9	1.5	2.97	0.11	0.23	13.5					58.2	1.3	0.9	27.2				
	WO3 Rougher conc	229.9	4.0	1.33	0.06	0.20	8.68					71.4	2.1	2.1	47.8				
	WO3 Ro Tails	5410	94.4	0.021	0.007	0.11	0.39					26.5	5.4	27.2	50.5				
	WO3 Feed (S Ro Tails)	5640	98.4	0.074	0.009	0.11	0.73					97.9	7.4	29.2	98.3				
	Mo Ro Conc	47.8	0.8	0.11	13.3	12.8	0.76					1.3	90.0	27.8	0.9				
	S Ro Conc	46.1	0.8	0.08	0.39	20.4	0.71					0.8	2.5	42.9	0.8				
	Head (calc.)	5734	100	0.075	0.12	0.38	0.73					100	100	100	100				

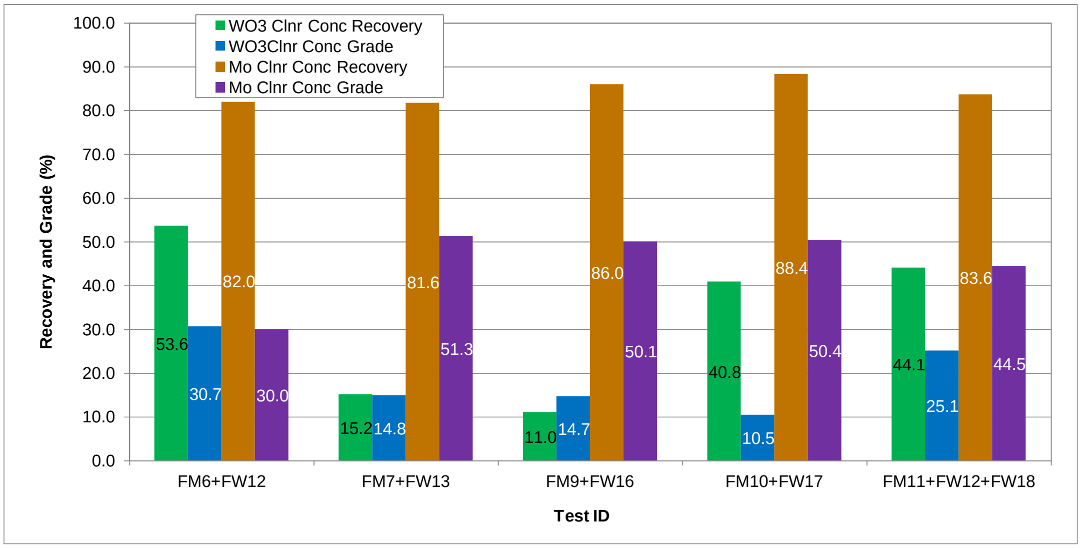


Figure 19: Concentrate Recovery and Grade - Combined Molybdenum and WO_3 Cleaners

2.5. Mineralogy Analysis on WO_3 Cleaner Concentrates

Two tungsten cleaner concentrate samples were submitted for mineralogy analysis using high definition mineralogical analysis (QEMSCAN™). The assays for the concentrate samples are presented in Table 14. The tungsten concentrate from test FW12 had high grade at 30.7% WO_3, while the concentrate from FM5 had low grade at 5.77% WO_3.

Table 14: Assays of WO_3 Cleaner Concentrates for QEMSCAN Analysis

Sample	Assay, %			
	WO_3	Mo	S	F
FW12 4th WO_3 Cleaner Conc	30.7	0.5	n/a	11.6
FM5 3rd WO_3 Cleaner Conc	5.77	0.28	0.46	12.3

The modes of operation used for QEMSCAN™ analysis of the sample consisted of Particle Mineral Analysis (PMA). PMA is a two-dimensional mapping analysis aimed at resolving liberation and locking characteristics of a generic set of particles. A pre-defined number of particles are mapped at a selected point spacing in order to spatially resolve and describe mineral textures and associations. The analysis also provides information on the modal distribution of minerals present in the scan. Key QEMSCAN™ mineralogical assays have been regressed with the chemical assays for the two samples. Overall correlation, as measured by R-squared criteria is 0.8644, with a slope (m) of 0.7598. This is considered to be acceptable. The details of the QEMSCAN™ analysis are presented in Appendix B

The results of the modal analysis, illustrating mineral distributions of the concentrate samples are given in Table 15. The liberation and association characteristics of the minerals in the concentrates are summarised in Table 16, Figure 20, and Figure 21. The major observations are as follows:

- The FW12 tungsten cleaner concentrate is primarily composed of scheelite (~41%), apatite (~11.5%) and fluorite (~36%). There is also ~1.1% of calcite contained in the concentrate.
- The FM5 tungsten cleaner concentrate is composed of fluorite (~71%), and scheelite (~9.5) and micas/clays (~6.7%). There is also ~1.7% of calcite contained in the concentrate.
- Fluorite clearly appeared to be the biggest contaminant in the concentrates. However, it can be seen that rejection of fluorite in the high-grade concentrate (FW12) was better than in the low-grade concentrate (FM5) when comparing fluorite deportment in the two tungsten cleaner concentrates.
- The rejection of calcite in the high-grade concentrate was also better than in the low-grade concentrate, although it was not as significant as fluorite. Note that the CaO grade (7.2%-8.0%) in the scheelite flotation feed (sulphide rougher tailings) was approximately 10 times higher than F grade (0.65%-0.95%). However, the content of calcite (1.1%-1.7%) in both concentrates was much lower than fluorite. This implies that the rejection of calcite was much more effective than fluorite in both high and low grade concentrates.
- Liberation characteristics for scheelite were good with >89% of the scheelite being free or liberated (>80% by surface area). This suggests that regrinding for the purpose of improving liberation is not required, but still should be tested to confirm..
- Approximately 32% (FW12) and 57% (FM5) of the non-liberated scheelite (the remaining 11%) are associated with fluorite.

Note that there was a big discrepancy between the actual F assay and QEMSCAN™ fluorite content for the both tungsten cleaner concentrates. The reason for the discrepancy is unclear, and is currently under investigation at the time of this report.

Table 15: Mineral Composition of WO_3 Cleaner Concentrates

Sample		FW-12 WO3 4th Cln Conc	FW-5 WO3 3rd Cln Conc
Fraction		-300/+3um	-300/+3um
Mass Size Distribution (%)		100.0	100.0
Calculated ESD Particle Size		20	18
		Sample	Sample
Mineral Mass	Molybdenite	0.02	0.50
	Scheelite	40.9	9.44
	Wolframite	0.67	0.03
	Pyrite	0.36	0.22
	Pyrrhotite	0.15	0.02
	Other Sulphides	0.10	0.19
	Plagioclase	1.33	2.03
	Quartz	0.90	1.71
	K-Feldspar	0.11	0.13
	Micas/Clays	2.67	6.69
	Garnet	0.35	0.39
	Pyroxene	0.17	0.19
	Amphibole	0.78	1.08
	Chlorites	0.65	0.61
	Sphene	0.15	0.17
	Epidote	0.37	0.56
	Other Silicates	0.08	0.13
	Fe-Oxides	0.25	0.18
	Calcite	1.11	1.66
	Other Carbonates	0.89	0.14
	Apatite	11.5	2.20
	Fluorite	36.1	71.4
	Other	0.36	0.38
	Total	100.0	100.0

Table 16: Liberation Characteristics of Minerals in WO_3 Cleaner Concentrates

Minerals	Liberation of Minerals (Free + Liberated), %	
	FW-12 WO_3 4th Clnr Conc	FW-5 WO_3 3rd Clnr Conc
W- Minerals	89.7	96.9
Molybdenum	58.7	98.0
Fluorite	89.8	95.2
Apatite	87.6	89.9
Carbonates	69.7	45.7
Fe-Sulphides	82.9	83.2

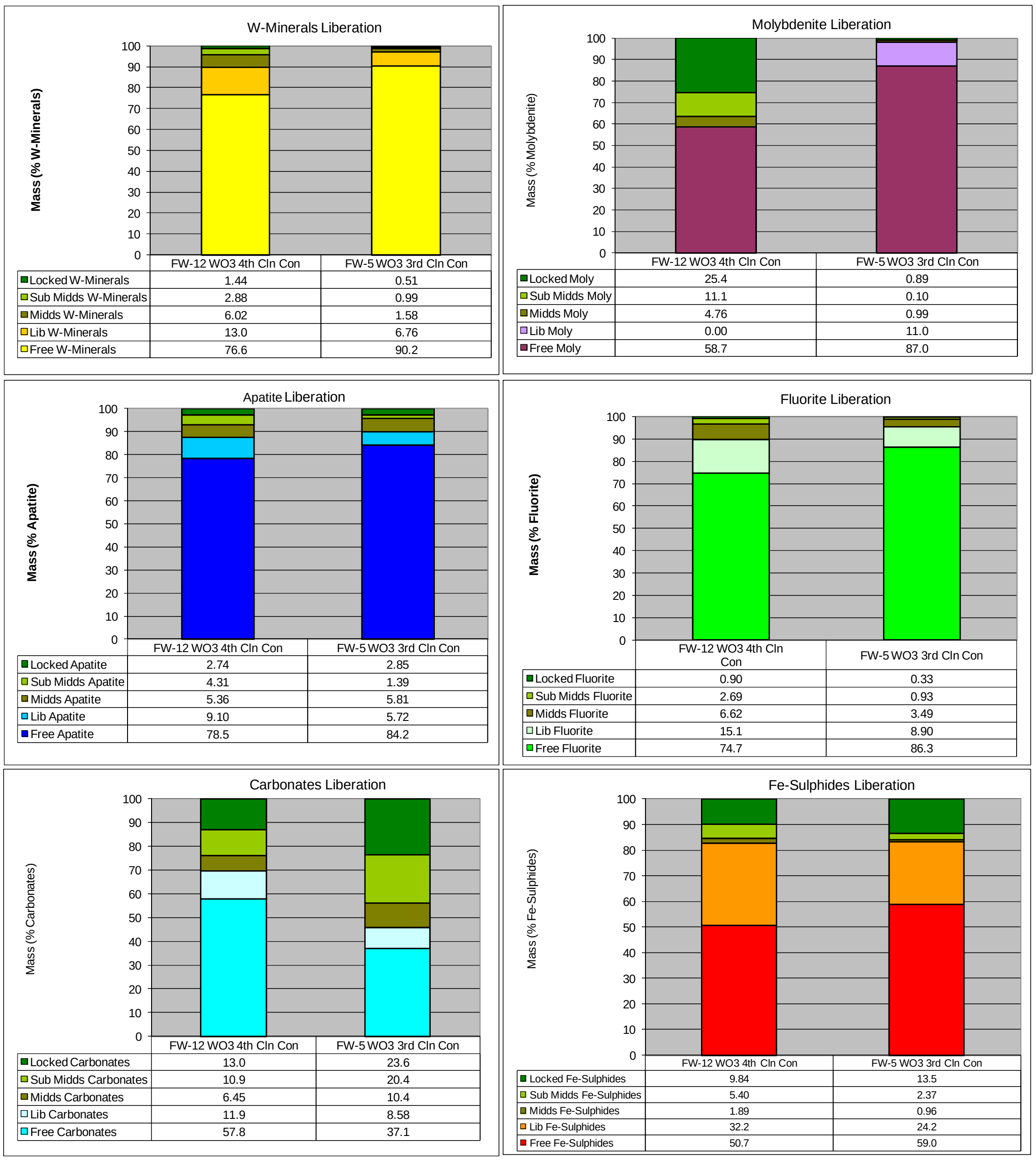
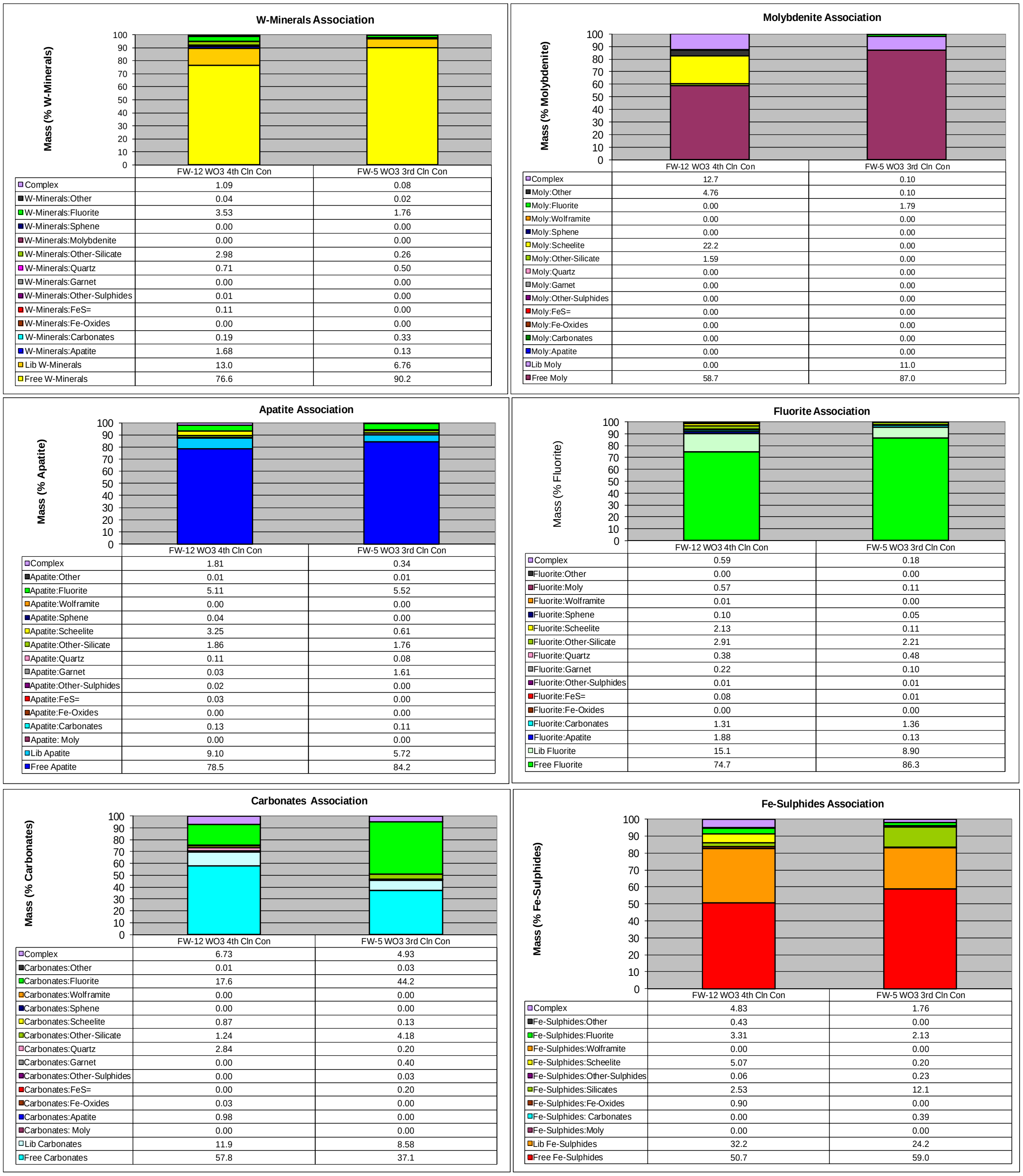


Figure 20: Mineral Liberation of WO_3 Cleaner Concentrates



W-Minerals Association

	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	1.09	0.08
W-Minerals:Other	0.04	0.02
W-Minerals:Fluorite	3.53	1.76
W-Minerals:Sphene	0.00	0.00
W-Minerals:Molybdenite	0.00	0.00
W-Minerals:Other-Silicate	2.98	0.26
W-Minerals:Quartz	0.71	0.50
W-Minerals:Garnet	0.00	0.00
W-Minerals:Other-Sulphides	0.01	0.00
W-Minerals:FeS=	0.11	0.00
W-Minerals:Fe-Oxides	0.00	0.00
W-Minerals:Carbonates	0.19	0.33
W-Minerals:Apatite	1.68	0.13
Lib W-Minerals	13.0	6.76
Free W-Minerals	76.6	90.2

Molybdenite Association

	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	12.7	0.10
Moly:Other	4.76	0.10
Moly:Fluorite	0.00	1.79
Moly:Wolframite	0.00	0.00
Moly:Sphene	0.00	0.00
Moly:Scheelite	22.2	0.00
Moly:Other-Silicate	1.59	0.00
Moly:Quartz	0.00	0.00
Moly:Garnet	0.00	0.00
Moly:Other-Sulphides	0.00	0.00
Moly:FeS=	0.00	0.00
Moly:Fe-Oxides	0.00	0.00
Moly:Carbonates	0.00	0.00
Moly:Apatite	0.00	0.00
Lib Moly	0.00	11.0
Free Moly	58.7	87.0

Apatite Association

	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	1.81	0.34
Apatite:Other	0.01	0.01
Apatite:Fluorite	5.11	5.52
Apatite:Wolframite	0.00	0.00
Apatite:Sphene	0.04	0.00
Apatite:Scheelite	3.25	0.61
Apatite:Other-Silicate	1.86	1.76
Apatite:Quartz	0.11	0.08
Apatite:Garnet	0.03	1.61
Apatite:Other-Sulphides	0.02	0.00
Apatite:FeS=	0.03	0.00
Apatite:Fe-Oxides	0.00	0.00
Apatite:Carbonates	0.13	0.11
Apatite: Moly	0.00	0.00
Lib Apatite	9.10	5.72
Free Apatite	78.5	84.2

Fluorite Association

	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	0.59	0.18
Fluorite:Other	0.00	0.00
Fluorite:Moly	0.57	0.11
Fluorite:Wolframite	0.01	0.00
Fluorite:Sphene	0.10	0.05
Fluorite:Scheelite	2.13	0.11
Fluorite:Other-Silicate	2.91	2.21
Fluorite:Quartz	0.38	0.48
Fluorite:Garnet	0.22	0.10
Fluorite:Other-Sulphides	0.01	0.01
Fluorite:FeS=	0.08	0.01
Fluorite:Fe-Oxides	0.00	0.00
Fluorite:Carbonates	1.31	1.36
Fluorite:Apatite	1.88	0.13
Lib Fluorite	15.1	8.90
Free Fluorite	74.7	86.3

Carbonates Association

	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	6.73	4.93
Carbonates:Other	0.01	0.03
Carbonates:Fluorite	17.6	44.2
Carbonates:Wolframite	0.00	0.00
Carbonates:Sphene	0.00	0.00
Carbonates:Scheelite	0.87	0.13
Carbonates:Other-Silicate	1.24	4.18
Carbonates:Quartz	2.84	0.20
Carbonates:Garnet	0.00	0.40
Carbonates:Other-Sulphides	0.00	0.03
Carbonates:FeS=	0.00	0.20
Carbonates:Fe-Oxides	0.03	0.00
Carbonates:Apatite	0.98	0.00
Carbonates: Moly	0.00	0.00
Lib Carbonates	11.9	8.58
Free Carbonates	57.8	37.1

Fe-Sulphides Association

	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	4.83	1.76
Fe-Sulphides:Other	0.43	0.00
Fe-Sulphides:Fluorite	3.31	2.13
Fe-Sulphides:Wolframite	0.00	0.00
Fe-Sulphides:Scheelite	5.07	0.20
Fe-Sulphides:Other-Sulphides	0.06	0.23
Fe-Sulphides:Silicates	2.53	12.1
Fe-Sulphides:Fe-Oxides	0.90	0.00
Fe-Sulphides: Carbonates	0.00	0.39
Fe-Sulphides:Moly	0.00	0.00
Lib Fe-Sulphides	32.2	24.2
Free Fe-Sulphides	50.7	59.0

Figure 21: Mineral Association of WO_3 Cleaner Concentrates

3. Gravity Separation Testing

3.1. Heavy Liquid Separation

A heavy liquid separation (HLS) test was completed on a 4 kg charge sample at different feed particle sizes. The charge sample was screened into -6/+10 mesh, -10/+35 mesh, -35/+200 mesh, and -200 mesh fractions. The mass of each fraction obtained are presented in Table 17. Each size fraction except for -200 mesh was submitted for HLS at specific gravities (SG) of 3.6 and 3.0 g/cm^3. The sinks and floats, as well as the -200 mesh fraction, were submitted for WO_3, Mo, S and WRA (whole rock analysis). The test results are summarized in Table 18. Details of the test can be seen in Appendix C.

Table 17: Mass of Size Fractions in HLS Feed

Fraction	Weight	
	g	%
-6/+10 mesh	688.7	17.3
-10/+35 mesh	2109.8	53.0
-35/+200 mesh	727.9	18.3
-200 mesh	452.0	11.4
Head (calc)	3978.4	100.0

Table 18: Summary of HLS Test Results

Size Fraction	Cumilative	Mass, %		Assay, %							Distribution, %						
	Product	Sample	Fractional	WO_3	Mo	S	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	Mo	S	SiO_2	Fe_2O_3	CaO	P_2O_5
-6+10 mesh	3.6 Sink	0.02	0.14	1.52	0.35	28.6	10.0*	51.5*	2.46*	0.060*	0.2	0.1	1.9	0.0	0.2	0.0	0.0
	3.0 Sink	1.22	7.04	0.27	0.066	1.64	46.9	15.1	14.8	0.11	2.0	0.9	5.4	1.0	3.1	2.6	1.0
	3.0 Float	16.1	93.0	0.17	0.034	0.14	59.0	5.49	7.37	0.120	16.9	6.2	6.1	17.2	15.0	16.8	14.9
	SUM	17.3	100.0	0.18	0.036	0.25	58.2	6.17	7.90	0.12	18.9	7.1	12	18.3	18.1	19.3	15.9
-10+35 mesh	3.6 Sink	0.21	0.40	6.86	1.87	28.6	10.0	51.5	2.46	0.060	9.0	4.4	16.4	0.0	1.8	0.1	0.1
	3.0 Sink	5.27	9.94	0.52	0.17	2.04	44.4	17.2	15.6	0.39	16.8	10.1	29.1	4.2	15.4	11.7	15.7
	3.0 Float	47.8	90.1	0.11	0.07	0.17	53.7	4.38	5.93	0.090	32.5	35.4	22.0	46.5	35.5	40.0	33.1
	SUM	53.0	100.0	0.15	0.076	0.36	52.8	5.66	6.90	0.12	49.3	45.5	51.0	50.8	51.0	51.7	48.8
-35+200 mesh	3.6 Sink	0.18	0.97	8.43	4.94	25.2	11.6	45.1	4.23	0.160	9.3	9.9	12.1	0.0	1.4	0.1	0.2
	3.0 Sink	2.25	12.3	0.84	0.67	3.04	40.7	19.4	16.5	0.37	11.7	16.8	18.5	1.7	7.4	5.2	6.4
	3.0 Float	16.1	87.7	0.06	0.04	0.09	58.7	3.47	4.80	0.070	6.0	6.3	3.9	17.1	9.5	10.9	8.7
	SUM	18.3	100.0	0.16	0.11	0.45	56.5	5.43	6.23	0.11	17.7	23.2	22.4	18.7	16.9	16.1	15.1
Head (cacl.)	3.6 Sink	0.4		7.22	3.10	27.1	10.7	48.7	3.2	0.1	18.5	14.4	30.4	0.1	3.4	0.2	0.3
	3.0 Sink	8.7		0.56	0.28	2.2	43.8	17.5	15.7	0.3	30.5	27.8	53.0	6.9	26.0	19.4	23.2
	3.0 Float	79.9		0.11	0.05	0.1	55.8	4.4	6.0	0.1	55.4	47.9	32.0	80.8	60.0	67.7	56.7
	-200 mesh	11.4		0.20	0.19	0.49	59.40	7.26	8.01	0.23	14.1	24.3	15.1	12.2	14.0	12.9	20.1
	Total	100.0		0.16	0.089	0.37	55.1	5.89	7.07	0.13	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* No assay avalable since insufficient sample. The assay of the 3.6 sink for -10+35 mesh fraction is applied.

The test results reveal the following:

- The tungsten grade of the 3.6 sinks for the -10+35 mesh and -35+200 mesh fractions was ~10 times higher than the 3.0 sinks, while it was ~6 times higher for the -6+10 mesh fraction.
- The mass pull of the 3.6 sinks was all very low at <1.0% (fractional) in each size fraction. This implies that there is only a small amount of tungsten carried by the high SG fraction. The low SG factions (3.0 sinks and float) contained most of the tungsten.
- The tungsten distribution in the 3.6 sinks was 0.2% for -6+10 mesh faction, 9.0% for -10+35 mesh, and 9.3% for -35+200 mesh. It was only 18.5% in total for the head sample. Therefore, it did not show much promise to recover tungsten in the 3.6 sinks using gravity separation.
- The tungsten distribution in the 3.0 sinks was higher than the 3.6 sinks at 2.0% for -6+10 mesh fraction, 16.8% for -10+35 mesh, and 11.7% for -35+200 mesh, and it was 30.5% in total in the head sample. However, the tungsten grade of the 3.0 sinks was 0.27%, 0.52%, and 0.84% for the three size fractions. These were much lower than the 3.6 sinks in each fraction. It was also not promising to separate the 3.0 sinks by gravity.

3.2. Gravity Separation

3.2.1. Mozley Tabling

An initial gravity test was conducted on +250 mesh sulphide rougher tails from test FM2. There was ~95% of the WO_3 that reported to the FM2 sulphide rougher tails at ~97% mass. Approximately 4 kg of the sulphide tails were screened at 250 mesh (63µm), and ~1,237 g of +250 mesh materials were obtained. A sub-sample at ~200 g was split out from the +250 mesh fraction, and passed through a Mozley table. The Mozley concentrate recovered 82% of the WO_3 grading 0.63% WO_3. The concentrate grade was 11 times upgraded comparing to the feed grade. The gangue minerals reported to the Mozley concentrate ranged from 5% to 30%. The results are summarized in Table 19. The details of the test are presented in Appendix D.

Table 19: Summary of Initial Gravity Test Results

Test ID	Product		Assays, %						% Distribution					
		%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
G1	Mozley Conc	7.4	0.63	1.58	47.9	15.3	15.3	0.31	82.0	20.8	5.3	21.5	16.6	29.2
	Mozley Tails	92.6	0.011	0.48	68.8	4.45	6.14	0.060	18.0	79.2	94.7	78.5	83.4	70.8
	+250 Mesh Head (calc.)	100.0	0.057	0.56	67.3	5.25	6.82	0.078	100.0	100.0	100.0	100.0	100.0	100.0

3.2.2. Gravity-Flotation Testing

Gravity-Flotation testing was carried out using the flowsheet as shown in Figure 22. Wilfley tabling test G2 was carried out on the -503+106 µm fraction of a 10 kg sample charge. The sample (-6 mesh) was stage ground to 100% passing 503 µm (38 mesh), and then wet screened at 106 µm (150 mesh). The -503+106 µm (-38+150 mesh) fraction was passed over a Wilfley table configured with a multiple divider (launder). The launder could divide the Wilfley concentrate into eight streams. The1st pass Wilfley tailings were re-passed over the table. Approximately 8 streams of concentrates were produced from each of the two passes. All streams as well as the 2nd pass tails were filtered, and a sub-sample was taken from each of the filtered cakes and submitted for molybdenum and tungsten assays to evaluate the metallurgy.

The remainders of the concentrates from G2 were combined and subjected to flash flotation to recover molybdenum. The molybdenum flash flotation tails were submitted for further upgrading (test G3) using the Wilfley table to concentrate tungsten. Approximately 8 streams of the concentrate were filtered individually, and a sub-sample was taken from each stream for tungsten and molybdenum assays. The concentrate streams 2-8 and the Wilfley tails were combined with the molybdenum flash concentrate, and then reground to target a particle size of -106 µm.

The reground materials were further combined with the original fines, the wet screen -106 µm undersize. Flotation test FM5 was completed on the combined materials. A molybdenum rougher was carried out. The molybdenum rougher concentrate was reground and then upgraded in the molybdenum cleaner. The molybdenum rougher tails were subjected to a sulphide rougher followed by four scheelite roughers and three stages of cleaning. Conditions for tests FM4 and FW2 were applied in the molybdenum flotation circuit and scheelite roughers. The test conditions for FM5 are summarized in Table 20. The results of Wilfley tests G2 and G3 are presented in Table 21 and Table 22. Overall results for the Gravity-Flotation testing are summarized in Table 23. Details of the gravity tests can be seen in Appendix D.

Table 20: Test FM5 Conditions

Test ID	Stage	P_{80}	Reagents added, g/t												Time, min		pH	Eh
		µm	PAX	MIBC	Pine Oil	Fuel Oil	NaHS	NaCN	Na_2CO_3	Na_2SiO_3	NaOH	FS-2	V4085	Que D-2	Grind	Froth		(mV)
FM5	Mo Rougher	102		16.5	12.5	22.5										14	natural	
	Mo Cleaner	19			0.8	5	525	5							10	8	11	-400
	S Rougher		50	2.5												10	natural	
	WO_3 Rougher								500	2000	500	310	30			10	natural	
	WO_3 Cleaner								300	230	300			35		6	11	
	Sum		50	19	13	28	525	5	800	2230	800	310	30	35	10	48		

Observations are as follows:

- Stage-grind to -503 µm and screening at 106 µm revealed that ~40% of the mass was in the finer fraction, while ~60% of the mass with ~35% of the Mo and ~39% of the WO_3 fed the Wilfley table (G2).
- G2 Wilfley 1st pass had ~22% of the feeding mass deporting to the cumulative Wilfley concentrates 1-8. The 2nd pass recovered ~24% of the mass to the cumulative concentrate. Approximately 23% of the Mo (stage ~66%) and ~30.5% of the WO_3 (stage ~77%) were recovered to the cumulative concentrate of the two passes.
- The G2 Wilfley tails graded 0.035 % Mo and 0.020% WO_3.There were 12% of the Mo and 8.9% of the WO_3 lost to the tailings.
- Figure 23 shows the concentrate grade for each stream of the G2 Wilfley test. The first concentrate in the 1st pass graded approximately 0.7% WO_3 and 0.3% Mo. The grades of the concentrates except for concentrate 1 in the second pass were less than the grade feeding the table. This low concentrate grade suggested gravity upgrading may be difficult.
- The molybdenum flash concentrate was not assayed since it was proposed to incorporate it into the feed for flotation test FM5. The molybdenum assay for the flash flotation concentrate was estimated at 17.2% Mo to match the head grade (G2 Wilfley concentrates 1-8), while the tungsten assay was set at 0.10% $WO_{3,}$ assuming the head grade similar to the flash flotation tails. Approximately 66% of the available molybdenum (global recovery ~15%) was recovered to the molybdenum flash concentrate. The residual molybdenum grade in the flash tailings was 0.027% Mo, accounting for ~8% of the global molybdenum (see Table 23).
- Gravity upgrading of the tungsten in the molybdenum flash tails only produced a first concentrate (G3 Wilfley concentrate 1) grading 0.76% W_{O3} at ~67% recovery of the available tungsten (22.5% global recovery). This represented an upgrade factor of approximately 10 times the tungsten content feeding the G3 Wilfley circuit (0.79%). G3 Wilfley concentrates 2-8 were all low grade and did not contribute significantly to recovery (see Figure 24).
- Approximately 66% of the mass with ~87% of the Mo and 67% of the WO_3 was fed to the FM5 flotation circuit. The molybdenum cleaner concentrate recovered ~65% of the Mo grading 50.8% Mo. The molybdenum recovery was ~20% lower than the previous molybdenum flotation tests, at a similar grade of ~50% Mo.
- The scheelite flotation in test FM5 was not successful for both rougher and cleaner concentrates. The rougher concentrate only recovered ~49% of the WO_3 grading 1.33% WO_3. The rougher concentrate was upgraded to 5.77% WO_3 with a recovery of ~10% in the cleaner. It was suspected that the

particle size (P_{80}) at 102 µm was relatively coarse and flotation conditions were not appropriate which resulted in the poor recovery and grade.

Note that the calculated head assay (0.079% WO_3) for the flash flotation and test G3 was applied as the assay for G2 Wilfley concentrates 1-8 (see Table 23). The actual assay for the Wilfley concentrate was 0.12% WO_3 (see Table 21). The discrepancy is likely due to subsamples (~10-15 g for each) taken from each of the Wilfley concentrate streams for assay analysis. These subsamples had a higher tungsten grade and were not incorporated to the feed for test G3, consequently resulting in the discrepancy between calculated and actual tungsten assay for G2 Wilfley concentrates 1-8.

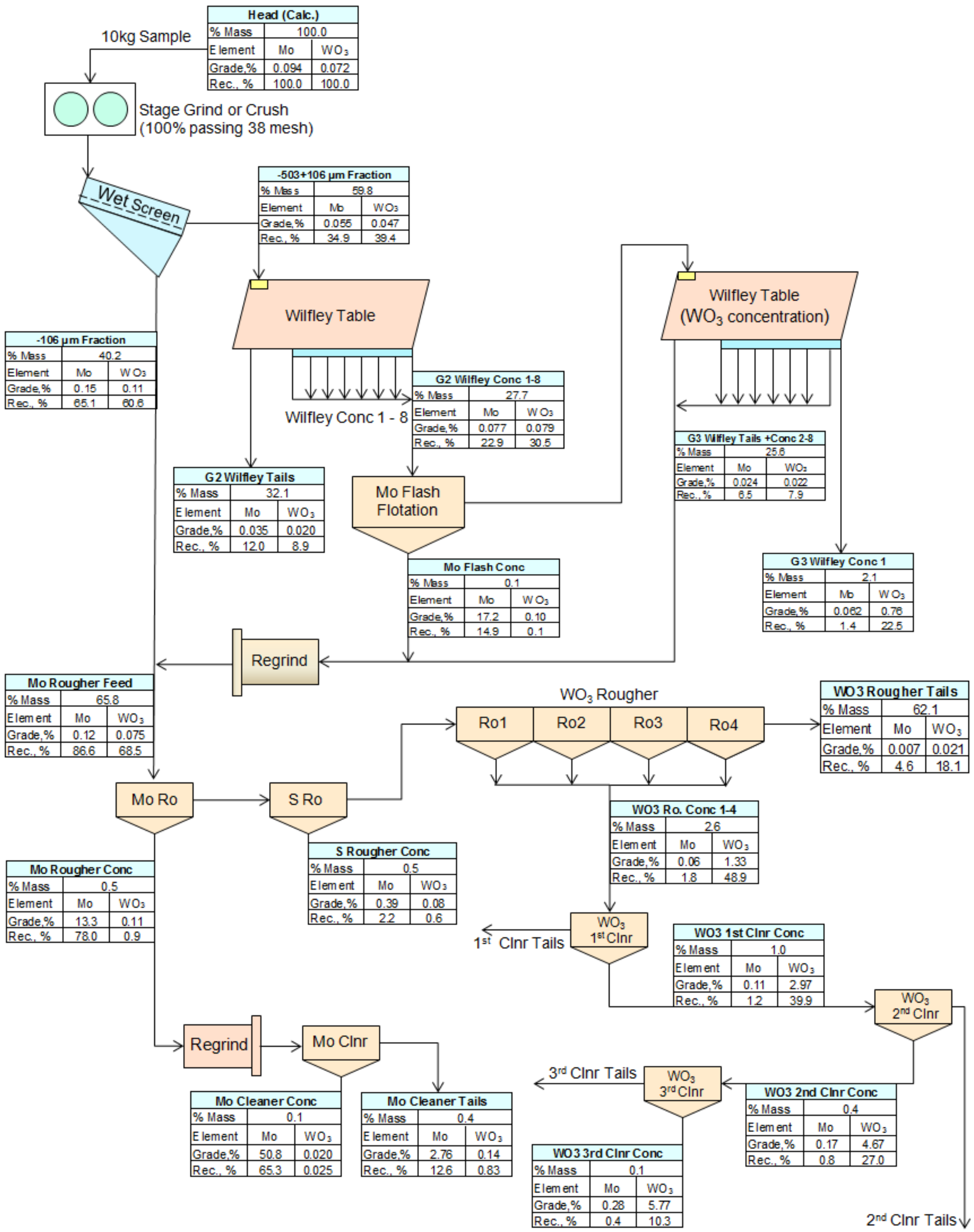


Figure 22: Gravity-Flotation Testing Flowsheet

Table 21: Summary of G2 Wilfley Test Results

Products	Stage Wt	Assays, %		% Distribution		Stage recovery, %	
	(%)	Mo	WO_3	Mo	WO_3	Mo	WO_3
1st Pass Conc 1	4.2	0.33	0.67	9.4	16.1	25.0	41.0
1st Pass Conc 1 -3	6.3	0.26	0.58	11.2	20.6	29.7	52.6
1st Pass Conc 1 -5	9.2	0.20	0.42	12.5	22.1	33.0	56.4
1st Pass Conc 1 -6	12.1	0.17	0.34	13.6	23.2	36.0	59.1
1st Pass Conc 1 -7	14.4	0.15	0.29	14.5	24.0	38.3	61.2
1 Pass Conc 1 -8	23.2	0.11	0.21	17.5	27.0	46.2	69.1
1 Pass Conc 1-8 +2nd Pass Conc1	26.5	0.11	0.19	19.9	28.8	52.7	73.6
1 Pass Conc 1-8 + 2nd Pass Conc1-3	28.2	0.107	0.18	20.5	29.1	54.2	74.4
1 Pass Conc 1-8 + 2nd Pass Conc1-5	31.3	0.101	0.17	21.5	29.9	56.7	76.4
1 Pass Conc 1-8 + 2nd Pass Conc1-6	34.2	0.096	0.16	22.3	30.6	58.8	78.1
1 Pass Conc 1-8 + 2nd Pass Conc1-7	37.4	0.091	0.15	23.0	31.1	60.8	79.3
1 Pass Conc 1-8 + 2nd Pass Conc1-8	48.7	0.077	0.12	25.6	33.3	67.8	85.1
2nd Pass Tails	51.3	0.035	0.020	12.2	5.84	32.2	14.9
Head (-503+106 µm)	100.0	0.056	0.069	37.8	39.2	100.0	100.0

Table 22: Summary of G3 Wilfley Test Results

Products	Weight	Assays, %		% Distribution	
	%	Mo	WO3	Mo	WO3
Wilfley Conc 1	7.0	0.062	0.76	5.6	67.3
Wilfley Conc 1 -3	8.8	0.056	0.61	6.4	68.5
Wilfley Conc 1 -5	11.2	0.049	0.50	7.2	70.3
Wilfley Conc 1 -6	15.1	0.042	0.38	8.3	72.6
Wilfley Conc 1 -7	18.5	0.039	0.32	9.4	74.6
Wilfley Conc 1 -8	31.7	0.033	0.21	13.3	82.4
Mo Flash Tails	99.7	0.027	0.079	34.4	99.6
Mo Flash Conc	0.3	17.2*	0.10**	65.6	0.4
Head (G2 Wilfley Conc 1-8)	100.0	0.077	0.079	100.0	100.0

* Calculated assay using the grade of G2 Wilfley concentrate 1-8

** Calculated assay assuming the head WO_3 grade as the Mo flash tails

Table 23: Summary of Gravity-Flotation Testing Results

Test ID	Stage	Products	Wt	Stage Wt	Assays, %		% Distribution		Stage Recovery, %	
			(%)	(%)	Mo	WO_3	Mo	WO_3	Mo	WO_3
FM5	Flotation	Mo Clnr Conc	0.1	0.2	50.8	0.02	65.4	0.03	75.5	0.04
		Mo Clnr Tails	0.4	0.7	2.76	0.14	12.6	0.8	14.6	1.2
		Mo Ro Conc	0.5	0.8	13.3	0.11	78.0	0.9	90.0	1.3
		S Rougher Conc	0.5	0.8	0.39	0.076	2.2	0.6	2.5	0.8
		WO3 3rd Clnr Conc	0.1	0.2	0.28	5.77	0.4	10.3	0.4	15.1
		WO3 2nd Clnr Conc	0.4	0.6	0.17	4.67	0.8	27.0	0.9	39.4
		WO3 1st Clnr Conc	1.0	1.5	0.11	2.97	1.2	39.9	1.3	58.2
		WO3 Rougher conc	2.6	4.0	0.064	1.33	1.8	49.0	2.1	71.4
		WO3 Ro Tails	62.1	94.4	0.007	0.021	4.6	18.2	5.4	26.5
		* Flotation Feed (calc.)	65.8	100.0	0.12	0.075	86.6	68.5	100.0	100.0
G3	Wilfley	Wilfley Conc 1	2.1	7.0	0.062	0.76	1.4	22.5	5.6	67.3
		Wilfley Tails+ Conc (2-8)	25.6	92.7	0.024	0.022	6.5	7.9	28.8	32.3
		Mo Flash Tails (G3 Wilfley Feed)	27.6	99.7	0.027	0.079	7.9	30.4	34.4	99.6
		Mo Flash Conc	0.1	0.3	17.2	0.10	15.0	0.1	65.6	0.4
		G2 Wilfley Conc1-8 (calc.)	27.7	100.0	0.077	0.079	22.9	30.5	100.0	100.0
G2	Wilfley	G2 Wilfley Conc1-8	27.7	48.7	0.077	0.079**	22.9	30.5	67.8	85.1
		2nd Pass Tails	32.1	51.3	0.035	0.020	12.0	8.9	32.2	14.9
		G2 Feed (-503+106 µm)(calc.)	59.8	100.0	0.055	0.047	34.9	39.4	100.0	100.0
		-106 µm Fraction (calc)	40.2		0.15	0.11	65.1	60.6		
		Head (cal.c)	100.0		0.094	0.072	100.0	100.0		

* Combination of - 106 µm fraction, Mo Flash Conc, G3 Wilfley Tails, and G3 Wilfley Conc 2-8

** Use the calculated assay from test G3

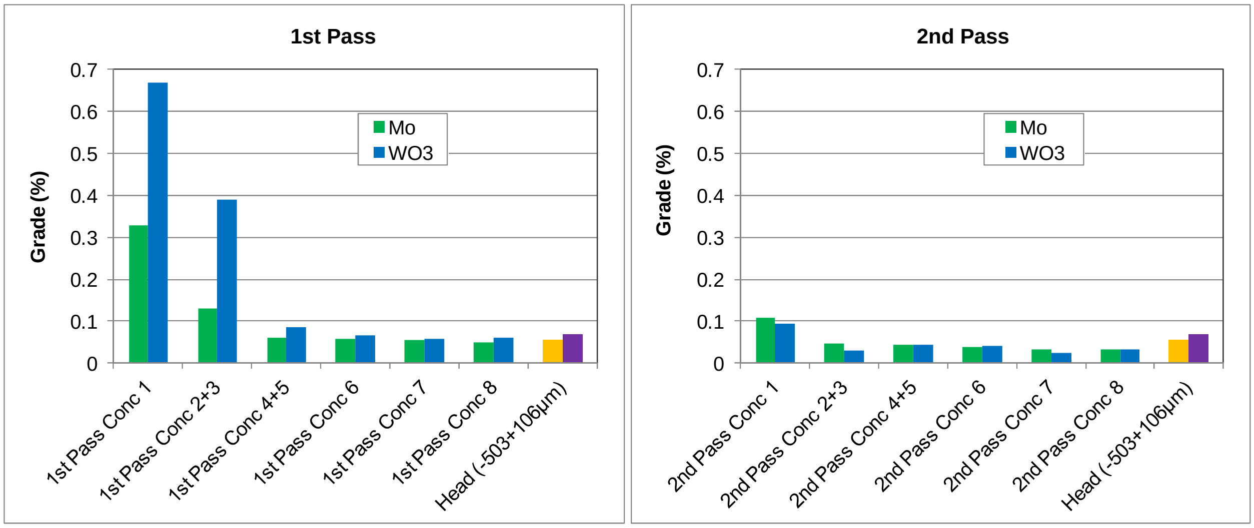


Figure 23: G2 Wilfley Concentrate Grades

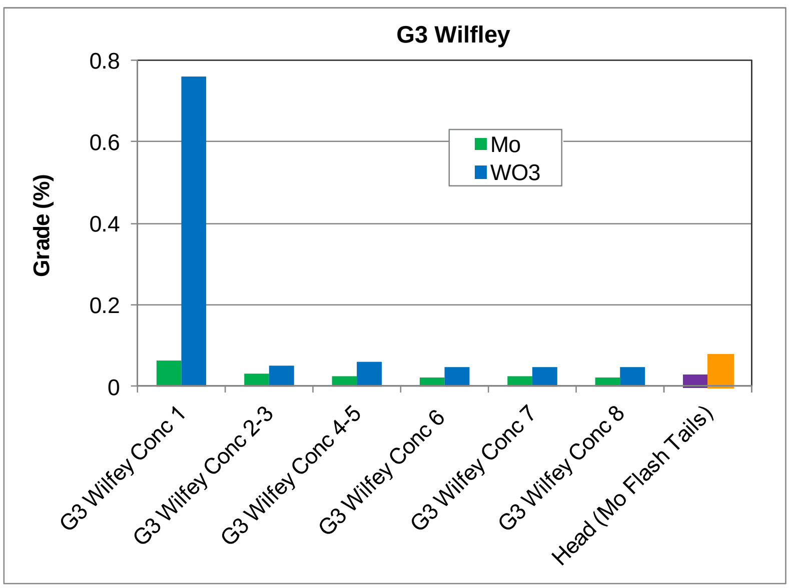


Figure 24: G3 Wilfley Concentrate Grades

3.3. Magnetic Separation

Further upgrading Wilfley concentrate using WHIMS was investigated. Test G4 was conducted to perform WHIMS and Mozley tabling on G3 Wilfley concentrate 1. The concentrate was passed through an Eriez WHIMS separator at 15,000 Gauss. The WHIMS non-mags were screened at 300 µm (48 mesh). A Mozley test was carried on each of the 2 fractions (-506+300 µm and -300+106 µm). The test results are summarized in Table 24. Details of the test are presented in Appendix D.

Table 24: Summary of Magnetic Separation (WHIMS) Test Results

Test ID	Product	Wt	Stage Wt.	Assays, %		% Distribution		Stage Recovery, %	
		%	%	WO_3	F	WO_3	F	WO_3	F
G4	WHIMS mags	1.0	48.3	0.87	1.26	12.5		53.7	38.3
	-503+300 µm Mozley Conc 1	0.07	3.1	1.49	0.83	1.4		5.9	1.6
	-503+300 µm Mozley Conc 1-2	0.1	5.0	0.99	0.86	1.5		6.4	2.7
	-503+300 µm Mozley Conc 1-3	0.1	6.6	0.78	0.84	1.5		6.6	3.5
	-503+300 µm Mozley Tails	0.06	2.9	0.29	0.62	0.2		1.06	1.1
	-503+300 µm Fraction	0.2	9.5	0.63	0.77	1.8		7.7	4.6
	-300+106 µm Mozley Conc 1	0.08	3.7	6.60	4.98	7.3		31.5	11.7
	-300+106 µm Mozley Conc 1-2	0.2	7.1	3.90	5.22	8.2		35.5	23.4
	-300+106 µm Mozley Conc 1-3	0.2	11.4	2.55	4.89	8.6		37.0	35.0
	-300+106 µm Mozley Tails	0.7	30.8	0.04	1.14	0.4		1.58	22.1
	-300+106 µm Fraction	0.9	42.2	0.72	2.15	9.0		38.6	57.1
	-503+106 µm Mozley Conc 1	0.1	6.8	4.29	3.11	8.7		37.4	13.3
	-503+106 µm Mozley Conc1-2	0.3	12.1	2.70	3.42	9.7		41.9	26.1
	-503+106 µm Mozley Conc 1-3	0.4	18.0	1.90	3.40	10.1		43.7	38.5
	-503+106 µm Mozley Tails	0.7	33.7	0.061	1.10	0.6		2.6	23.2
	G3 Wilfley Conc 1 (calc.)	2.1	100.0	0.79	1.59	23.2		100.0	100.0

Approximately 54% of the available tungsten (global recovery ~12.5%) was recovered to the WHIMS mags at a grade of 0.87% WO_3, which was very similar to the feed grade at 0.79% WO_3. This suggested that upgrading tungsten with the magnetic separation would also be a challenge.

Mozley upgrading of the WHIMS non-mags also did not show promise. The first concentrate (-503+106µm Mozley concentrate 1) only recovered ~37% of the available tungsten (8.7% global recovery) at a low grade of 4.29% WO_3.

Conclusions and Recommendations

Floatation and gravity separation testwork were completed on a master composite that was comprised of three composites, Comp1, Comp2, and Comp4 from Jennings W-Mo deposit. The objective of the test program was to further define the conceptual flowsheet that was developed in the initial scoping level study, and to evaluate gravity recovery as an option. The following conclusions can be made from the testwork.

- The master composite contained 0.11% WO_3, 0.085% Mo, 0.37% S, and 0.87% F. The content of Al, Ca, Fe, K, Mg, and Na were significantly higher than the other elements in the composite at 7.29% Al, 5.51% Ca, 4.40% Fe, 2.55% K, 1.48% Mg, and 1.39% Na.
- A total of 11 tests were completed to investigate the effect of reagents, regrind fineness, and pulp potential on molybdenum flotation;
  - The feed was stage ground to 100% passing 150 mesh;
  - A combination of pine oil and fuel oil was selected as a collector suite;
  - Finer regrind was beneficial to the metallurgy. Better performance was achieved at a regrind P_{80} of 15 µm;
  - Pulp potential (Eh) at -400 mV was selected for molybdenum cleaners to achieve a high concentrate grade;
  - NaCN was selected to depress the gangues, while NaHS was used to manipulate the pulp potential.
- The molybdenum rougher recoveries ranged from 86.0% to 95.5% and the grades varied from 3.76% Mo to 11.5% Mo. The best performance was achieved in test FM7 with 95.0% recovery and 11.5% Mo.
- Test FM10 produced a molybdenum 2nd cleaner concentrate which graded 50.4% Mo with the highest recovery of 88.4%.
- Results from test FM4 indicated that further upgrading the molybdenum concentrate from 48.5% Mo (1st cleaner concentrate) to 55.4% Mo (3rd cleaner concentrate) resulted in a significant decline of Mo recovery from ~80% to 44%.
- Sulphide flotation was carried out on the molybdenum rougher tailings to remove residual sulphides. PAX was applied as the collector. The overall removal of sulphur (Mo + S rougher concentrates) varied between 72% and 92%. 8.0% to 28% of the sulphur reported to sulphide rougher tails (i.e. scheelite flotation feed). The tungsten reported to sulphide rougher tails ranging from 94.8% to 98.5%
- A total of 13 rougher tests were completed on sulphide rougher tails to investigate the effect of reagents on the selective flotation of scheelite. Collectors (FS-2, V4085, BHD, and Cytec 6493), depressants (Na2SiO3, Que D-2, Calgon, Citric acid, BaCl2, Al3SO4), and dispersant K-8300 were evaluated.
- The best tungsten rougher test, FW2, produced a rougher concentrate grading 3.19% WO_3 at a stage recovery of 71.7%.
- Five cleaner tests were completed for upgrading tungsten rougher concentrates. FW2 rougher conditions were applied. Reagents and dosages for tungsten cleaners were further investigated. The challenge was to achieve selective flotation of scheelite from Ca-bearing gangue minerals, particularly fluorite in the cleaner stage. The best result was obtained in test FW12, with the 4th cleaner concentrate which graded 30.7% WO_3 at a stage recovery of ~55%.

- QEMSCAN™ analysis on two tungsten cleaner concentrates (a high-grade and a low-grade) revealed that fluorite was the biggest contaminant in both concentrates at ~36% and 71%, respectively. The rejection of fluorite in the high-grade concentrate was better than the low-grade concentrate. Other contaminants including apatite, calcite, and micas/clays were also found in the concentrates.
- The liberation characteristics for scheelite in the concentrate were good with >89% of the scheelite being free or liberated. Therefore, regrinding for the purpose of improving liberation is likely not required.
- Approximately 32% (in high-grade concentrates) and 57% (in low-grade concentrates) of the non-liberated scheelite were associated with fluorite.
- A heavy liquid separation (HLS) test was performed on the master composite. The test results did not show much promise to recover tungsten using gravity separation. Although the tungsten grade for the 3.6 sinks was over 10 times higher than the 3.0 sinks in the sample, the mass of the 3.6 sinks was very low at 0.4% with the tungsten distribution at 18.5%. The 3.0 sinks had higher tungsten distribution at 30.5%, but the grade was relatively low at 0.56% WO_3.
- An initial gravity separation (Mozley) test, G1, was completed on the +250 mesh sulphide rougher tails from test FM2. The Mozley concentrate recovered ~82% of available WO_3 in the feed at a grade of 0.63% WO_3, indicating poor separation by gravity.
- Gravity-Flotation testing was completed on 10 kg of the master composite. The sample was stage ground to 100% passing 38 mesh (-503 µm), and then wet screened at 150 mesh (106 µm). The -503+106 µm fraction was passed over a Wilfley table (G2). A molybdenum flash flotation was carried out on the G2 Wilfley concentrate. The molybdenum flash tails subjected to Wilfley tabling (G3) for upgrading tungsten. G3 Wilfley tails and concentrates 2-8 were incorporated with the molybdenum flash concentrate and the -106 µm fines from the wet screen, and subjected to molybdenum and scheelite flotation (FM5).
  - Approximately 40% of the mass was in the finer fraction (-106µm), while ~60% of the mass in the coarse fraction (-503+106 µm). The coarse fraction, with ~35% of Mo and ~39% of WO_3 distributions, was passed over a Wilfley table (G2). The Wilfley concentrate (with 2 passes) recovered ~23% of the Mo and 30.5% of the WO_3. There were 12% of the Mo and 8.9% of WO_3 lost to the tailings at the grades of 0.035% Mo and 0.020% WO_3.
  - Approximately 66% of the available molybdenum (global recovery ~15%) was recovered to the molybdenum flash concentrate grading 17.2% Mo.
  - Gravity upgrading of the tungsten in the molybdenum flash tails (G3) produced a first concentrate (G3 Wilfley concentrate 1) only grading 0.76% WO_3 at ~67% recovery of the available tungsten (22.5% global recovery).
  - Approximately 66% of the mass, with ~87% of Mo and ~67% of WO_3 distributions, subjected to flotation test FM5. The molybdenum flotation circuit produced a molybdenum cleaner concentrate grading 50.8% at a recovery of ~65%. The scheelite flotation was not successful. The rougher concentrate only recovered ~49% of the WO_3 grading 1.33% WO_3. The rougher concentrate was upgraded to a grade of 5.77% WO_3 in the cleaner with only ~10% recoveries.
  - Further upgrading of G3 Wilfley concentrate 1 using WHIMS revealed that the WHIMS mags had a grade (0.87% WO_3) very similar to the feed grade (0.79% WO_3). This suggested that upgrading tungsten with WHIMS was also difficult.

Based on the test results, a process flowsheet to include gravity separation is not recommended and further testing should focus on a flotation-only flowsheet.

Recommendations

The next phase of metallurgical testing should focus on optimization of the tungsten flotation circuit. A significant amount of sample in the order of 2-3 tonnes would be required for a proper systematic evaluation of flotation variables. The approach would be to process the material in a continuous mini-pilot plant to produce a bulk amount of tungsten feed. This would then be divided into a significant number of identical test charges for subsequent tungsten circuit development. The variables under examination would include different collector suites including some specifically developed for scheelite flotation in China. This examination would need to be tested in parallel to determination of the optimum depressant suite. Mineralogical examination of test products would be an essential tool to complement the metallurgical studies. The bulk testing would also generate significant molybdenum rougher concentrate to complete optimization of this circuit.

The testing would generate several kilograms of WO_3 cleaner concentrate. All testing to-date supports that the maximum grade achievable by flotation is likely to be in the range of 30% WO_3. Various upgrading testing (gravity and magnetic separation) would be evaluated and preliminary leach testing could be explored to assess amenability to an ammonium paratungstate (APT) process, which would likely be suitable for concentrates in this grade range.

Preliminary dewatering and environmental testing should be completed on flotation tailings in the next test program since the flotation dispersant reagents applied in the tungsten circuit can present challenges with tailings treatment.

Appendix A – Details of Flotation Tests

Test No.: FM 1 **Project No.**: 13583-002 **Operator**: HS **Date:** **2013-06-28**

Purpose: To conduct a baseline Mo rougher test on the Master Composite

Procedure: Take a sub-sample from S rougher tails for WO3, Mo and S assays
Take a sub-sample from S rougher tails for particle size analysis (PSA)
Divide sulphide tails into 3 charges as feed for WO_3 flotation

Feed: 12 kg of -6 mesh Master Composite
(1 x 10 kg charge + 1 x 2 kg charge)

Grind: Stage grind in a laboratory rod mill (10 kg Mill)
to 100% passing 150 mesh
Target P80: 70 µm

P80 = 70 µm

Conditions: Particle size analysis on S Ro Tail

Stage	Reagents added, g/t PAX	MIBC	Pine Oil	Fuel Oil	Time, min Grind	Cond.	Froth	pH	Temp °C
Condition			10	15	*	5		8.1	+110
									+110
Mo Rougher 1							2	8.1	+110
Mo Rougher 2		2.5					4	8.1	+120
Mo Rougher 3			2.5	7.5		1	6	8.1	+120
Mo Ro Tls									
Sulphide Rougher 1	50	2.5				1	10	8.2	0
Total	50	5	13	23	0	7	22		

* Stage grind to 100% passing 150 M

Stage	Mo Rougher	S Rougher	
Flotation Cell	10L	10L	
Speed: rpm	1500	1500	

Metallurgical Balance

Product	**Weight** g	%	**Assays, %** WO_3	Mo	S	**% Distribution** WO_3	Mo	S
Mo Rougher Conc 1+2	173.7	1.5	0.20	5.28	7.94	2.9	88.8	32.4
Mo Rougher Conc 3	73.8	0.6	0.14	0.28	4.46	0.9	2.0	7.7
S Rougher Conc	112.5	1.0	0.15	0.28	19.6	1.4	3.0	51.8
S Rougher Tail	11377*	96.9	0.10**	0.0056	0.030	94.8	6.1	8.0
Head (calc.)	11737*	100.0	0.10	0.088	0.36	100.0	100.0	100.0
Head (direct)			0.11	0.088	0.37			

Combined Products

* A total weight of the calculated feed of tests FW1, FW2 and FW3
** Average of the calculated feed assay of tests FW1, FW2,and FW3

Mo Rougher Conc 1-2	1.5	0.20	5.28	7.94	2.9	88.8	32.4
Mo Rougher Conc 1-3	2.1	0.18	3.79	6.90	3.8	90.8	40.2
S Ro Conc	1.0	0.15	0.28	19.6	1.4	3.0	51.8
S Ro Tails	96.9	0.10	0.006	0.030	94.8	6.1	8.0
Head (calc)	100.0	0.10	0.088	0.36	100.0	100.0	100.0

Test No.: FM 2 **Project No.**: 13583-002 **Operator**: HS **Date:** **2013-06-28**

Purpose: To conduct a Mo cleaner test on the Master Composite

Procedure: Take a sub-sample from S rougher tails for WO3, Mo and S assays
Take a sub-sample from S rougher tails for particle size analysis (PSA)
Divide sulphide tails into 3 charges as feed for WO_3 flotation

Feed: 12 kg of -6 mesh Master Composite
(1 x 10 kg charge + 1 x 2 kg charge)

Grind: Stage grind in a laboratory rod mill (10 kg Mill) P80 = 75 µm
to 100% passing 150 mesh
Target P80: 70 µm

Conditions: Particle size analysis on S Ro Tail

Stage	Reagents added, g/t					Time, min			pH	Temp °C
	PAX	MIBC	Pine Oil	Fuel Oil	NaCN	Grind	Cond.	Froth		
Condition			10	15		*	5			
Mo Rougher 1								2		
Mo Rougher 2		2.5						4		
Mo Rougher 3			2.5	7.5			1	6		
Comb Mo Ro Conc 1-3										
Mo 1st Cleaner					10		1	4		
Mo 2nd Cleaner					5		1	2		
Mo 3rd Cleaner					2.5		1	1.5		
Mo 4th Cleaner							1	1		
Mo Ro Tls										
Sulphide Rougher 1	50	2.5					1	10		
Total	50	5	12.5	22.5	17.5	0	11	31		

* Stage grind to 100% passing 150 M

Stage	Mo Rougher	S Rougher	Mo Cleaner
Flotation Cell	10L	10L	1 L
Speed: rpm	1500	1500	

Metallurgical Balance

Product	**Weight**		**Assays, %**			**% Distribution**		
	g	**%**	**WO_3**	**Mo**	**S**	**WO_3**	**Mo**	**S**
Mo 4th Clnr Conc	29.2	0.3	0.54	23.8	20.1	1.8	67.6	13.5
Mo 4th Clnr Tails	4.9	0.04	0.34	13.1	12.6	0.2	6.2	1.4
Mo 3rd Clnr Tails	4.6	0.04	0.32	6.29	9.33	0.2	2.8	1.0
Mo 2nd ClnrTails	21.3	0.2	0.24	3.55	5.50	0.6	7.4	2.7
Mo 1st Clnr Tails	181.3	1.6	0.049	0.24	1.07	1.0	4.2	4.5
S Rougher Conc	144.8	1.3	0.089	0.39	14.8	1.4	5.5	49.4
S Rougher Tail	10832.8	96.6	0.078	0.006	0.11	94.9	6.3	27.5
Head (calc.)	11218.9	100.0	0.079	0.092	0.39	100.0	100.0	100.0
Head (direct)			0.11	0.088	0.37			

Combined Products

Mo 4th Clnr Conc	29.2	0.3	0.54	23.8	20.1	1.8	67.6	13.5
Mo 3rd Clnr Conc	34.1	0.3	0.51	22.3	19.0	2.0	73.8	15.0
Mo 2nd Clnr Conc	38.7	0.3	0.49	20.4	17.9	2.1	76.6	15.9
Mo 1st Clnr Conc	60.0	0.5	0.40	14.4	13.5	2.7	84.0	18.6
Mo Ro Conc	241.3	2.2	0.14	3.76	4.2	3.7	88.2	23.1
S Ro Conc	144.8	1.3	0.089	0.39	14.8	1.4	5.5	49.4
S Ro Tails	10833	96.6	0.078	0.006	0.11	94.9	6.3	27.5
Head (calc)		100.0	0.079	0.092	0.39	100.00	100.00	100.00

Test No.: FM 3 **Project No.**: 13583-002 **Operator**: HS **Date:** **2013-07-25**

Purpose: To conduct a Mo cleaner test on the Master Composite using NaHS

Procedure: Take a sub-sample from S rougher tails for WO3, Mo and S assays
Take a sub-sample from S rougher tails for particle size analysis (PSA)
Divide sulphide tails into 3 charges as feed for WO_3 flotation

Feed: 12 kg of -6 mesh Master Composite
(1 x 10 kg charge + 1 x 2 kg charge)

Grind: Stage grind in a laboratory rod mill (10 kg Mill) P80 = 76 µm
to 100% passing 150 mesh
Target P80: 70µm

Conditions: Particle size analysis on S Ro Tail

Stage	Reagents added, g/t					Time, min			pH	Eh mV
	PAX	MIBC	Pine Oil	Fuel Oil	NaHS	Grind	Cond.	Froth		
Condition			10	15		*	5		8.5	+80
Mo Rougher 1								2	8.4	-200
Mo Rougher 2		2.5						4	8.4	+180
Mo Rougher 3			2.5	7.5			1	6	8.4	+180
Comb Mo Ro Conc 1-3										
									8.2	+130
Mo 1st Cleaner					333		1	4	10.0	-300
Mo 2nd Cleaner					42		1	2	10.5	-300
Mo 3rd Cleaner					42		1	1.5	10.6	-300
Mo 4th Cleaner							1	1	10.5	-280
Mo Ro Tls										
Sulphide Rougher 1	50	2.5					1	10	8.3	-10
Total	50	5	13	23	417		11	31		

* Stage grind to 100% passing 150 M

Stage	Mo Rougher	S Rougher	Mo Cleaner
Flotation Cell	10L	10L	1 L
Speed: rpm	1500	1500	

** Add NaHS as required to achieve a Eh in the ramge of -250 and - 300 mV

Metallurgical Balance

Product	**Weight**		**Assays, %**			**% Distribution**		
	g	**%**	**WO_3**	**Mo**	**S**	**WO_3**	**Mo**	**S**
Mo 4th Clnr Conc	35.4	0.3	0.32	22.7	28.0	1.1	77.2	21.0
Mo 4th Clnr Tails	3.9	0.04	0.38	8.76	17.6	0.1	3.3	1.5
Mo 3rd Clnr Tails	6.7	0.06	0.18	9.38	16.0	0.1	6.0	2.3
Mo 2nd ClnrTails	23.3	0.2	0.18	1.79	6.79	0.4	4.0	3.4
Mo 1st Clnr Tails	190.5	1.7	0.09	0.19	3.08	1.7	3.5	12.4
S Rougher Conc	141.5	1.3	0.09	0.14	16.1	1.2	1.9	48.2
S Rougher Tail	10640	96.4	0.10	0.004	0.05	95.4	4.1	11.3
Head (calc.)	11042	100.0	0.10	0.094	0.43	100.0	100.0	100.0
Head (direct)			0.11	0.088	0.37			

Combined Products

Mo 4th Clnr Conc	0.3	0.32	22.7	28.0	1.1	77.2	21.0
Mo 3rd Clnr Conc	0.4	0.33	21.3	27.0	1.2	80.5	22.4
Mo 2nd Clnr Conc	0.4	0.30	19.6	25.4	1.3	86.5	24.7
Mo 1st Clnr Conc	0.6	0.26	13.6	19.1	1.7	90.5	28.1
Mo Ro Conc	2.4	0.14	3.77	7.36	3.4	94.0	40.5
S Ro Conc	1.3	0.090	0.14	16.1	1.2	1.9	48.2
S Ro Tails	96.4	0.095	0.004	0.050	95.4	4.1	11.3
Head (calc)	100.0	0.10	0.094	0.43	100.0	100.0	100.0

Test No.: FM 4 **Project No.**: 13583-002 **Operator**: **Date:**

Purpose: Repeat FM3, but with regrind, and target Eh at -400 for Mo cleaners and add NaCN as a secondary depressant

Procedure: Take a sub-sample from S rougher tails for WO3, Mo and S assays
Take a sub-sample from S rougher tails for particle size analysis (PSA)
Divide sulphide tails into 3 charges as feed for WO_3 flotation

Feed: 12 kg of -6 mesh Master Composite
(1 x 10 kg charge + 1 x 2 kg charge)

Grind: Stage grind in a laboratory rod mill (10 kg Mill) to 100% passing 150 mesh — P80 = 75 µm
Target P80: 70 µm

Regrind 15 min in a pebble mill — P80 = 24.5 µm

Conditions: Particle size analysis on S Ro Tail — Marlvern on 1st cleaner tails

Stage	Reagents added, g/t						Time, min			pH	Eh
	PAX	MIBC	Pine Oil	Fuel Oil	NaHS	NaCN	Grind	Cond.	Froth		mV
Condition			10	15			*	5			
Mo Rougher 1									2		
Mo Rougher 2		8.25							4		
Mo Rougher 3		4.25	2.5	7.5				1	6		
Comb Mo Ro Conc 1-3											
Regrind			0.4	2.5	350		15				
Mo 1st Cleaner					**	5		1	8	11.0	-400
Mo 2nd Cleaner					**	5		1	3	9.8	-400
Mo 3rd Cleaner					**	5		1	2	9.5	-400
Mo 4th Cleaner		0.4			**	5		1	1	9.5	-400
Mo Ro Tls											
Sulphide Rougher 1	50	2.5						1	10		
Total	50	15	13	25	350			11	36		

* Stage grind to 100% passing 150 mesh
** Add NaHS as required to achieve the Eh of -400

Stage	Mo Rougher	S Rougher	Mo Cleaner
Flotation Cell	10L	10L	2 L
Speed: rpm	1800	1800	1200

Metallurgical Balance

Product	**Weight**		**Assays, %**			**% Distribution**		
	g	**%**	**WO_3**	**Mo**	**S**	**WO_3**	**Mo**	**S**
Mo 4th Clnr Conc	4.4	0.04	0.077	56.0	37.5	0.02	21.2	4.1
Mo 4th Clnr Tails	4.9	0.05	0.083	54.9	36.5	0.03	23.1	4.5
Mo 3rd Clnr Tails	2.6	0.02	0.10	49.0	32.9	0.02	10.9	2.1
Mo 2nd ClnrTails	7.2	0.07	0.097	39.4	27.0	0.05	24.4	4.9
Mo 1st Clnr Tails	81.8	0.8	0.12	0.88	2.36	0.69	6.2	4.8
S Rougher Conc	71.7	0.7	0.13	0.96	29.5	0.66	5.9	52.8
S Rougher Tail	10709	98.4	0.13	0.009	0.10	98.5	8.3	26.8
Head (calc.)	10882	100.0	0.13	0.11	0.37	100.0	100.0	100.0
Head (direct)			0.11	0.088	0.37			

Combined Products

Mo 4th Clnr Conc	0.04	0.077	56.0	37.5	0.02	21.2	4.1
Mo 3rd Clnr Conc	0.1	0.080	55.4	37.0	0.1	44.3	8.6
Mo 2nd Clnr Conc	0.1	0.084	54.0	36.1	0.1	55.2	10.7
Mo 1st Clnr Conc	0.2	0.089	48.5	32.7	0.1	79.6	15.6
Mo Ro Conc	0.9	0.11	9.90	8.10	0.8	85.8	20.4
S Ro Conc	0.7	0.13	0.96	29.5	0.7	5.9	52.8
S Ro Tails	98.4	0.13	0.009	0.10	98.5	8.3	26.8
Head (calc)	100.0	0.13	0.11	0.37	100.0	100.0	100.0

Test No.: FM 5 **Project No.**: 13583-002 **Operator**: **Date:**

Purpose: Conduct a Mo and WO3 flotation test on the Mo flash conc. + Wilfley conc 2-8 + Wilfey tails from test G3, as well as -106µm fines from test G2.
Apply FM4 conditions for Mo flotation.
Apply FW2 conditions for tungston flotation

Procedure: As outlined below.

Feed: 6.79 kg of combined materials
(Mo flash conc. + Wilfley conc 2-8 + Wilfey tails from test G3 + screen u/s (-106 µm from G2)

Regrind 32 min grind in a laboratory rod mill P80 = 102 µm
Target P80 70 µm

Regrind 1 10 min in a pebble mill P80 = 18.6 µm
Target P80 30 µm

Conditions: Particle size analysis on S Ro Tail Marlvern on 1st cleaner tails

Stage	Reagents added, g/t							Time, min		pH	Eh
	PAX	MIBC	Pine Oil	Fuel Oil	NaHS	NaCN	Grind	Cond.	Froth		mV
Combine Mo flash conc, G3 Wilfley tails, and G3 Wilfley conc 2-8 (**~ 2.64 kg**)											
Regring 1							32				
Combine the reground materials with Screen U/S (-106µm) from G2 (**~6.79 kg, estimated**)											
Condition			10	15				5			
Mo Rougher 1		8.25							3		
Mo Rougher 2		8.25							5		
Mo Rougher 3			2.5	7.5				1	6		
Comb Mo Ro Conc 1-3											
Regrind 2							10	didn't put reagents in re-grind			
Mo Cleaner			0.8	5	525	5		1	8	11.0	-400
Mo Ro Tls											
Sulphide Rougher	50	2.5						1	10		
	Na_2CO_3	**Na_2SiO_3**	**NaOH**	**FS-2**	**V4085**						
Sulphide RougherTail											
W-Cond. 1	500		500					2			
W-Cond. 2		2000						5			
W-Cond. 3				250	30			5			
W-Rougher 1									2		
W-Rougher 2									2		
W-Rougher 3				30				2	3		
W-Rougher 4				30					3		
Comb W-Ro Conc 1-4											
	Na_2CO_3	**Na_2SiO_3**	**NaOH**	**Que D-2**							
W-Cleaner 1	100	90	100	5				1	2	11.0	
W-Cleaner 2	100	100	100	10				1	2	11.0	
W-Cleaner 3	100	40	100	20				1	2	11.0	
	300	230	300	35							
Total	1150	2479	1113	408	555			25	48		

* Add NaHS as required to achieve the Eh of -400
** Add Que D-2 accordingly

Stage	Mo and WO_3 Rougher	S Rougher	Mo Cleaner	Mo Cleaner
Flotation Cell	10L	10L	2 L	2 L
Speed: rpm	1800	1800	1200	1200

Metallurgical Balance

Product	**Weight**		**Assays, %**				**% Distribution**			
	g	**%**	**WO_3**	**Mo**	**S**	**F**	**WO_3**	**Mo**	**S**	**F**
Mo Clnr Conc	10.5	0.2	0.015	50.8	33.5	0.14	0.04	75.5	16.1	0.04
Mo Clnr Tails	37.3	0.7	0.14	2.76	6.92	0.94	1.2	14.6	11.8	0.84
S Rougher Conc	46.1	0.8	0.076	0.39	20.4	0.71	0.8	2.5	42.9	0.78
WO3 3rd Clnr Conc	11.2	0.2	5.77	0.28	0.46	12.3	15.1	0.4	0.2	3.30
WO3 3rd Clnr Tails	25.0	0.4	4.17	0.12	0.19	12.8	24.3	0.4	0.2	7.66
WO3 2nd Clnr Tails	47.7	0.8	1.69	0.069	0.19	14.2	18.8	0.5	0.4	16.2
WO3 1st Clnr Tails	146.0	2.5	0.39	0.036	0.18	5.90	13.3	0.7	1.2	20.6
WO3 Ro Tails	5410	94.4	0.021	0.007	0.11	0.39	26.5	5.4	27.2	50.5
Head (calc.)	5734	100.0	0.075	0.12	0.38	0.73	100.0	100.0	100.0	100.0
Head (direct)										

Combined Products

Mo Clnr Conc	0.2	0.015	50.8	33.5	0.14	0.04	75.5	16.1	0.04
Mo Ro Conc	0.8	0.11	13.31	12.8	0.76	1.3	90.0	27.8	0.9
S Rougher Conc	0.8	0.076	0.39	20.4	0.71	0.8	2.5	42.9	0.8
WO3 3rd Clnr Conc	0.2	5.77	0.28	0.46	12.3	15.1	0.4	0.2	3.3
WO3 2nd Clnr Conc	0.6	4.67	0.17	0.27	12.6	39.4	0.9	0.5	11.0
WO3 1st Clnr Conc	1.5	2.97	0.11	0.23	13.5	58.2	1.3	0.9	27.2
WO3 Rougher conc	4.0	1.33	0.064	0.20	8.68	71.4	2.1	2.1	47.8
WO3 Ro Tails	94.4	0.021	0.007	0.11	0.39	26.5	5.4	27.2	50.5
Head (calc)	100.0	0.075	0.12	0.38	0.73	100.0	100.0	100.0	100.0

Test No.: FM 6 **Project No.**: 13583-002 **Operator**: DL **Date:** **2013-11-01**

Purpose: Repeat FM5, generate feed(S Ro tails) for test FW12 WO3 flotation
Target Eh at -400 for Mo cleaners and add NaCN as a secondary depressant

Procedure: Take a sub-sample from S rougher tails for WO3, Mo and S assays
Take a sub-sample from S rougher tails for particle size analysis (PSA)
Divide sulphide tails into 3 charges as feed for WO_3 flotation

Feed: 12 kg of -6 mesh Master Composite
(1 x 10 kg charge + 1 x 2 kg charge)

Grind: Stage grind in a laboratory rod mill (10 kg Mill) P80 = 68 µm
to 100% passing 150 mesh
Target P80: 70 µm

Regrind 10 min in a pebble mill P80 = 32.3 µm

Conditions: Particle size analysis on S Ro Tail Marlvern on 1st cleaner tails

Stage	Reagents added, g/t						Time, min			pH	Eh
	PAX	MIBC	Pine Oil	Fuel Oil	NaHS	NaCN	Grind	Cond.	Froth		mV
Condition			11	16			*	5			
Mo Rougher 1		8.25							5	9.0	
Mo Rougher 2		2.0							3		
Mo Rougher 3			4	8				2	3	8.7	
Comb Mo Ro Conc 1-3											
Regrind			0.4	2.5	350		10				
Mo Cleaner					**	5		1	8	11.0	-400
Mo Ro Tls											
Sulphide Rougher 1	57	2.5						1	7	8.0	
Total	57	13	15	27	350	5	10	9	26		

* Stage grind to 100% passing 150 mesh
** Add NaHS as required to achieve the Eh of -400

Stage	Mo Rougher	S Rougher	Mo Cleaner
Flotation Cell	10L	10L	2 L
Speed: rpm	1800	1800	1200

Metallurgical Balance

Product	Weight		Assays, %				% Distribution			
	g	%	WO_3	Mo	F	S	WO_3	Mo	F	S
Mo Clnr Conc	31.0	0.3	0.065	30.0	0.39	26.1	0.2	82.0	0.1	20.0
Mo Clnr Tails	126.8	1.1	0.10	1.20	0.71	17.4	1.0	13.4	0.9	54.5
S Rougher Conc	49.8	0.4	0.12	0.34	0.76	8.97	0.5	1.5	0.4	11.0
S Rougher Tail	11742	98.3	0.11	0.003	0.87	0.05	98.4	3.1	98.6	14.5
Head (calc.)	11950	100.0	0.11	0.095	0.87	0.34	100.0	100.0	100.0	100.0
Head (direct)			0.11	0.088	0.87	0.37				

Combined Products

Product	%	WO_3	Mo	F	S	WO_3	Mo	F	S
Mo Clnr Conc	0.3	0.065	30.0	0.39	26.1	0.2	82.0	0.1	20.0
Mo Ro Conc 1-3	1.3	0.093	6.86	0.65	19.1	1.1	95.4	1.0	74.5
S Ro Conc	0.4	0.12	0.34	0.76	8.97	0.5	1.5	0.4	11.0
Mo Ro Tails	98.7	0.11	0.004	0.87	0.088	98.9	4.6	99.0	25.5
Head (calc)	100.0	0.11	0.095	0.87	0.34	100.0	100.0	100.0	100.0

Test No.: FM 7 **Project No.**: 13583-002 **Operator**: **Date:**

Purpose: Repeat FM6, generate feed (S rougher tails) for WO3 test FW13

Procedure: Take a sub-sample from S rougher tails for WO3, Mo and S assays
Take a sub-sample from S rougher tails for particle size analysis (PSA)

Feed: 12 kg of -6 mesh Master Composite
(1 x 10 kg and 1 x 2 kg charges)

Grind: Stage grind in a laboratory rod mill (10 kg Mill) P80 = 72 µm
to 100% passing 150 mesh
Target P80: 70 µm

Regrind 15 min in a pebble mill P80 = 19.7 µm

Conditions: Particle size analysis on S Ro Tail Marlvern on 1st cleaner tails

Stage	Reagents added, g/t						Time, min			pH	Eh
	PAX	MIBC	Pine Oil	Fuel Oil	NaHS	NaCN	Grind	Cond.	Froth		mV
Condition			11	16			*	5			
Mo Rougher 1		11.6							5	8.6	
Mo Rougher 2		2	4	8				2	6	8.1	
Comb Mo Ro Conc 1-3											
Regrind			0.4	2.5	350		15				
Mo 1st Cleaner		1.7			354	5		1	8	11.4	-400
Mo 2nd Cleaner					708	5		1	3	10.3	-400
Mo Ro Tls											
Sulphide Rougher 1	50	2.5						1	10		
Total	50	18	15	26.5	1412			10	32		

* Stage grind to 100% passing 150 mesh
** Add NaHS as required to achieve the Eh of -400

Stage	Mo Rougher	S Rougher	Mo Cleaner
Flotation Cell	10L	10L	2 L
Speed: rpm	1800	1800	1200

Metallurgical Balance

Product	**Weight**		**Assays, %**			**% Distribution**		
	g	**%**	**WO_3**	**Mo**	**S**	**WO_3**	**Mo**	**S**
Mo 2nd Clnr Conc	16.4	0.1	0.040	51.3	35.2	0.06	81.6	13.1
Mo 2nd Clnr Tails	6.2	0.05	0.16	14.7	18.5	0.09	8.8	2.6
Mo 1st Clnr Tails	62.7	0.5	0.17	0.75	6.18	0.93	4.6	8.8
S Rougher Conc	111.2	0.9	0.052	0.15	21.5	0.50	1.6	54.4
S Rougher Tail	11517	98.3	0.10*	0.003	0.080	98.4	3.4	21.0
Head (calc.)	11713	100.0	0.10	0.088	0.37	100.0	100.0	100.0
Head (direct)			0.11	0.088	0.37			

Combined Products * Calculated head grade from FW13

	%	WO_3	Mo	S	WO_3	Mo	S
Mo 2ndClnr Conc	0.1	0.040	51.3	35.2	0.06	81.6	13.1
Mo 1st Clnr Conc	0.2	0.073	41.3	30.6	0.1	90.5	15.8
Mo Ro Conc	0.7	0.14	11.5	12.7	1.1	95.0	24.6
S Ro Conc	0.9	0.052	0.15	21.5	0.5	1.6	54.4
S Ro Tails	98.3	0.10	0.003	0.080	98.4	3.4	21.0
Head (calc)	100.0	0.10	0.088	0.37	100.0	100.0	100.0

Test No.: FM 8 **Project No.**: 13583-002 **Operator**: **Date:**

Purpose: Generate feed for WO3 cleaner tests FW 14 and FW15 . Repeat FM7 conditions and target Eh at -400 for Mo cleaners and add NaCN as a secondary depressant

Procedure: Divide sulphide tails into 2 charges as feed for WO_3 flotation
Take a sub-sample from S rougher tails for WO3, Mo and S assays
Take a sub-sample from S rougher tails for particle size analysis (PSA)

Feed: 10 kg of -6 mesh Master Composite
(1 x 10 kg charge)

Grind: Stage grind in a laboratory rod mill (10 kg Mill) P80 = 65 µm
to 100% passing 150 mesh
Target P80: 70 µm

Regrind

Conditions: Particle size analysis on S Ro Tail

Stage	Reagents added, g/t PAX	MIBC	Pine Oil	Fuel Oil	NaHS	NaCN	Time, min Grind	Cond.	Froth	pH	Eh mV
Condition			11	16			*	5			
Mo Rougher 1		9.7							5	9.0	
Mo Rougher 2		2.8	4	8				2	6		
Sulphide Rougher 1	50	4.17						1	10		
Total	50	17	15	24	0			8	21		

* Stage grind to 100% passing 150 mesh
** Add NaHS as required to achieve the Eh of -400

Stage	Mo Rougher	S Rougher	Mo Cleaner
Flotation Cell	10L	10L	2 L
Speed: rpm	1800	1800	1200

Metallurgical Balance

Product	**Weight** g	%	**Assays, %** WO_3	Mo	S	**% Distribution** WO_3	Mo	S
Mo Ro Conc	82.1	0.8	0.14	11.6	11.8	1.4	92.7	27.6
S Rougher Conc	86.9	0.9	0.055	0.20	21.5	0.6	1.7	53.3
S Rougher Tail	9592	98.3	0.087	0.006	0.070	98.1	5.6	19.1
Head (calc.)	9761	100.0	0.087	0.11	0.36	100.0	100.0	100.0
Head (direct)			0.11	0.088	0.37			

Combined Products

Mo Ro Conc	0.8	0.14	11.6	11.8	1.4	92.7	27.6
S Ro Conc	0.9	0.055	0.20	21.5	0.6	1.7	53.3
S Ro Tails	98.3	0.087	0.006	0.070	98.1	5.6	19.1
Head (calc)	100.0	0.087	0.11	0.36	100.0	100.0	100.0

Test No.: FM 9 **Project No.**: 13583-002 **Operator**: **Date:**

Purpose: Repeat FM7, but reduce the Fuel Oil dosage
Generate feed (S rougher tails) for WO3 test ,

Procedure: Take a sub-sample from S rougher tails for WO3, Mo and S assays
Take a sub-sample from S rougher tails for particle size analysis (PSA)

Feed: 12 kg of -6 mesh Master Composite
(1 x 10 kg and 1 x 2 kg charges)

Grind: Stage grind in a laboratory rod mill (10 kg Mill) P80 = 63 µm
to 100% passing 150 mesh
Target P80: 70 µm

Regrind 15 min in a pebble mill P80 = 16.1 µm

Conditions: Particle size analysis on S Ro Tail Marlvern on 1st cleaner tails

Stage	Reagents added, g/t PAX	MIBC	Pine Oil	Fuel Oil	NaHS	NaCN	Time, min Grind	Cond.	Froth	pH	Eh mV
Condition			11	10			*	5			
Mo Rougher 1		10.4							5		
Mo Rougher 2			4	5				2	6		
Comb Mo Ro Conc 1-3											
Regrind			0.4	2.5	350		15				
Mo 1st Cleaner		1.25			346**	5		1	8		-400
Mo 2nd Cleaner					608**			1	3		-400
Mo Ro Tls											
Sulphide Rougher 1	50							1	10		
Total	50	12	15	17.5	1304	5		10	32		

* Stage grind to 100% passing 150 mesh
** Add NaHS as required to achieve the Eh of -400

Stage	Mo Rougher	S Rougher	Mo Cleaner	
Flotation Cell	10L	10L	2 L	1L
Speed: rpm	1800	1800	1200	1000

Metallurgical Balance

Product	**Weight** g	%	**Assays, %** WO_3	Mo	S	**% Distribution** WO_3	Mo	S
Mo 2nd Clnr Conc	18.1	0.2	0.042	50.1	33.1	0.10	85.9	16.0
Mo 2nd Clnr Tails	5.1	0.05	0.21	5.40	8.94	0.15	2.6	1.2
Mo 1st Clnr Tails	67.9	0.60	0.15	0.27	3.79	1.38	1.7	6.9
S Rougher Conc	134.1	1.2	0.038	0.11	15.4	0.69	1.4	55.2
S Rougher Tail	11066	98.0	0.065	0.008	0.070	97.7	8.4	20.7
Head (calc.)	11292	100.0	0.065	0.094	0.33	100.0	100.0	100.0
Head (direct)			0.11	0.088	0.37			
Combined Products								
Mo 2ndClnr Conc		0.2	0.042	50.1	33.1	0.10	85.9	16.0
Mo 1st Clnr Conc		0.2	0.079	40.3	27.8	0.2	88.5	17.2
Mo Ro Conc		0.8	0.13	10.5	9.90	1.6	90.2	24.1
S Ro Conc		1.2	0.038	0.11	15.4	0.7	1.4	55.2
S Ro Tails		98.0	0.065	0.008	0.070	97.7	8.4	20.7
Head (calc)		100.0	0.065	0.094	0.33	100.0	100.0	100.0

Test No.: FM 10 **Project No.**: 13583-002 **Operator**: **Date:**

Purpose: Repeat FM7, but increase the regrind time to 25 minutes
Generate feed (S rougher tails) for WO3 test ,

Procedure: Take a sub-sample from S rougher tails for WO3, Mo and S assays
Take a sub-sample from S rougher tails for particle size analysis (PSA)

Feed: 12 kg of -6 mesh Master Composite
(1 x 10 kg and 1 x 2 kg charges)

Grind: Stage grind in a laboratory rod mill (10 kg Mill) P80 = 62 µm
to 100% passing 150 mesh
Target P80: 70 µm

Regrind 25 min in a pebble mill P80 = 14.7 µm

Conditions: Particle size analysis on S Ro Tail Marlvern on 1st cleaner tails

Stage	Reagents added, g/t						Time, min			pH	Eh
	PAX	MIBC	Pine Oil	Fuel Oil	NaHS	NaCN	Grind	Cond.	Froth		mV
Condition			11	16			*	5			
Mo Rougher 1		6.25							5		
Mo Rougher 2		2.08	4	8				2	6		
Comb Mo Ro Conc 1-3											
Regrind			0.4	2.5	350		25				
Mo 1st Cleaner		1.67			475**	5		1	8		-400
Mo 2nd Cleaner					508**	5		1	3		-400
Mo Ro Tls											
Sulphide Rougher 1	50							1	10		
Total	50	10	15	27	1333	10		10	32		

* Stage grind to 100% passing 150 mesh
** Add NaHS as required to achieve the Eh of -400

Stage	Mo Rougher	S Rougher	Mo Cleaner	
Flotation Cell	10L	10L	2 L	1L
Speed: rpm	1800	1800	1200	1000

Metallurgical Balance

Product	**Weight**		**Assays, %**			**% Distribution**		
	g	**%**	**WO_3**	**Mo**	**S**	**WO_3**	**Mo**	**S**
Mo 2nd Clnr Conc	17.5	0.2	0.054	50.4	33.5	0.1	88.3	15.4
Mo 2nd Clnr Tails	6.3	0.06	0.19	4.82	7.23	0.1	3.0	1.2
Mo 1st Clnr Tails	82.0	0.7	0.15	0.31	3.02	1.5	2.5	6.5
S Rougher Conc	111.1	1.0	0.036	0.15	19.3	0.5	1.7	56.5
S Rougher Tail	11027	98.1	0.072	0.004	0.070	97.7	4.4	20.3
Head (calc.)	11244	100.0	0.072	0.089	0.34	100.0	100.0	100.0
Head (direct)			0.11	0.088	0.37			

Combined Products * Calculated head grade from FW13

Mo 2ndClnr Conc	0.2	0.05	50.4	33.5	0.12	88.3	15.4
Mo 1st Clnr Conc	0.2	0.09	38.3	26.5	0.3	91.4	16.6
Mo Ro Conc	0.9	0.14	8.86	8.31	1.8	93.9	23.2
S Ro Conc	1.0	0.036	0.15	19.3	0.5	1.7	56.5
S Ro Tails	98.1	0.072	0.004	0.070	97.7	4.4	20.3
Head (calc)	100.0	0.072	0.089	0.34	100.0	100.0	100.0

Test No.: FM 11 **Project No.**: 13583-002 **Operator**: **Date:**

Purpose: Repeat FM7, but no regrind
Generate feed (S rougher tails) for WO3 test ,

Procedure: Take a sub-sample from S rougher tails for WO3, Mo and S assays
Take a sub-sample from S rougher tails for particle size analysis (PSA)

Feed: 12 kg of -6 mesh Master Composite
(1 x 10 kg and 1 x 2 kg charges)

Grind: Stage grind in a laboratory rod mill (10 kg Mill) P80 = 62 µm
to 100% passing 150 mesh
Target P80: 70 µm

Regrind

Conditions: Particle size analysis on S Ro Tail Marlvern on 1st cleaner tails

Stage	Reagents added, g/t						Time, min			pH	Eh
	PAX	MIBC	Pine Oil	Fuel Oil	NaHS	NaCN	Grind	Cond.	Froth		mV
Condition			11	16			*	5			
Mo Rougher 1		11.6							5		
Mo Rougher 2		2	4	8				2	6		
Comb Mo Ro Conc 1-3											
Mo 1st Cleaner		1.7	0.4	2.5	700**	5		1	8		-400
Mo 2nd Cleaner					708**	5		1	3		-400
Mo Ro Tls											
Sulphide Rougher 1	50	2.5						1	10		
Total	50	18	15	27	1408	10		10	32		

* Stage grind to 100% passing 150 mesh
** Add NaHS as required to achieve the Eh of -400

Stage	Mo Rougher	S Rougher	Mo Cleaner
Flotation Cell	10L	10L	2 L
Speed: rpm	1800	1800	1200

Metallurgical Balance

Product	**Weight**		**Assays, %**			**% Distribution**		
	g	**%**	**WO_3**	**Mo**	**S**	**WO_3**	**Mo**	**S**
Mo 2nd Clnr Conc	23.4	0.2	0.2	39.5	26.0	0.5	81.2	15.9
Mo 2nd Clnr Tails	8.1	0.07	0.33	5.35	4.92	0.3	3.8	1.0
Mo 1st Clnr Tails	69.7	0.6	0.17	0.26	3.65	1.3	1.6	6.6
S Rougher Conc	125.4	1.1	0.061	0.090	16.4	0.8	1.0	53.7
S Rougher Tail	10838	98.0	0.082	0.013	0.080	97.1	12.4	22.7
Head (calc.)	11065	100.0	0.08	0.10	0.35	100.0	100.0	100.0
Head (direct)			0.11	0.088	0.37			

Combined Products

Mo 2ndClnr Conc	0.21	0.20	39.5	26.0	0.5	81.2	15.9
Mo 1st Clnr Conc	0.3	0.23	30.7	20.6	0.8	85.0	16.9
Mo Ro Conc	0.9	0.19	9.7	8.92	2.1	86.6	23.6
S Ro Conc	1.1	0.061	0.090	16.4	0.8	1.0	53.7
S Ro Tails	98.0	0.082	0.013	0.080	97.1	12.4	22.7
Head (calc)	100.0	0.083	0.10	0.35	100.0	100.0	100.0

Test No.: FM 12 **Project No.**: 13583-002 **Operator**: **Date:**

Purpose: Repeat FM7, but adjust Eh at cleaners to -450 mV
Generate feed (S rougher tails) for WO3 test ,

Procedure: Take a sub-sample from S rougher tails for WO3, Mo and S assays
Take a sub-sample from S rougher tails for particle size analysis (PSA)

Feed: 12 kg of -6 mesh Master Composite
(1 x 10 kg and 1 x 2 kg charges)

Grind: Stage grind in a laboratory rod mill (10 kg Mill) P80 = 62 µm
to 100% passing 150 mesh
Target P80: 70 µm

Regrind 15 min in a pebble mill P80 = 20*** µm

Conditions: Particle size analysis on S Ro Tail

Stage	Reagents added, g/t						Time, min			pH	Eh
	PAX	MIBC	Pine Oil	Fuel Oil	NaHS	NaCN	Grind	Cond.	Froth		mV
Condition			11	16			*	5			
Mo Rougher 1		11.55							5		
Mo Rougher 2		2	4	8				2	6		
Comb Mo Ro Conc 1-3											
Regrind			0.4	2.5	350		15				
Mo 1st Cleaner		1.66			930**	5		1	8		-450
Mo 2nd Cleaner					800**	5		1	3		-450
Mo Ro Tls											
Sulphide Rougher 1	50	2.5						1	10		
Total	50	18	15	27	2080	10		10	32		

Stage	Mo Rougher	S Rougher	Mo Cleaner
Flotation Cell	10L	10L	2 L
Speed: rpm	1800	1800	1200

* Stage grind to 100% passing 150 mesh
** Add NaHS as required to achieve the Eh of -450
*** Average of FM4, FM7 and FM9

Metallurgical Balance

Product	**Weight**		**Assays, %**			**% Distribution**		
	g	**%**	**WO_3**	**Mo**	**S**	**WO_3**	**Mo**	**S**
Mo 2nd Clnr Conc	18.3	0.2	0.070	50.9	33.6	0.10	83.8	16.3
Mo 2nd Clnr Tails	6.8	0.06	0.23	4.12	7.24	0.13	2.5	1.3
Mo 1st Clnr Tails	76.5	0.7	0.17	0.29	4.24	1.05	2.0	8.6
S Rougher Conc	109.3	1.0	0.066	0.18	19.5	0.58	1.8	56.3
S Rougher Tail	11067	98.1	0.11	0.010	0.060	98.1	10.0	17.5
Head (calc.)	11277	100.0	0.11	0.10	0.34	100.0	100.0	100.0
Head (direct)			0.11	0.088	0.37			

Combined Products

Mo 2ndClnr Conc	0.2	0.070	50.9	33.6	0.10	83.8	16.3
Mo 1st Clnr Conc	0.2	0.11	38.2	26.5	0.2	86.3	17.6
Mo Ro Conc	0.9	0.16	9.66	9.73	1.3	88.3	26.1
S Ro Conc	1.0	0.066	0.18	19.5	0.6	1.8	56.3
S Ro Tails	98.1	0.11	0.010	0.060	98.1	10.0	17.5
Head (calc)	100.0	0.11	0.099	0.34	100.0	100.0	100.0

Test No.:FW 1 **Project No.**: 13583-002 **Operator**: HS **Date:** **2013-06-28**

Purpose: To conduct a baseline WO_3 rougher test on the sulphide taillings from Mo roughertest FM 1

Procedure: As outlined below.

Feed: ˜4 kg of Sulphide Taillins from test FM 1

Grind: P80 = 70 µm

Conditions: PSA on WO_3 Rougher Tails

Stage	Reagents added, g/t					Time, min			pH	Eh
	Na_2CO_3	Na_2SiO_3	NaOH	Flotinor FS-2	V4085	Grind	Cond.	Froth		mV
Sulphide RougherTail										
									8.2	+140
W-Cond. 1	500		500				2		11.6	+40
W-Cond. 2		500					5		11.5	+40
W-Cond. 3				250	30		5		11.3	+40
W-Rougher 1								2	11.3	+40
W-Rougher 2								2	11.2	+40
W-Rougher 3							2	3	11.1	+50
W-Rougher 4								3	11.1	+50
Total	500	500	500	250	30		14	10		

Stage	WO_3 Rougher	
Flotation Cell	4000g-D2	
Speed: rpm	1500	

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 Rougher Conc 1	75.5	2.0	1.11	7.16	39.4	11.1	20.0	1.22	22.4	15.9	1.2	3.8	5.2	19.2
WO_3 Rougher Conc 2	95.7	2.5	0.97	6.24	39.4	11.9	19.3	1.10	24.8	17.5	1.6	5.1	6.4	21.9
WO_3 Rougher Conc 3	124.1	3.2	0.63	4.89	40.7	12.8	16.8	0.82	20.9	17.8	2.1	7.1	7.2	21.2
WO_3 Rougher Conc 4	96.1	2.5	0.38	2.81	45.2	12.7	13.2	0.44	9.7	7.9	1.8	5.5	4.4	8.8
WO_3 Rougher Tails	3477	89.9	0.024*	0.40	65.3	5.05	6.37	0.040	22.3	40.8	93.4	78.6	76.7	28.9
Head (calc.)	3868	100.0	0.097	0.88	62.9	5.78	7.46	0.12	100.0	100.0	100.0	100.0	100.0	100.0
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

Product	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
Rougher Conc 1	2.0	1.11	7.16	39.4	11.1	20.0	1.22	22.4	15.9	1.2	3.8	5.2	19.2
Rougher Conc 1+2	4.4	1.03	6.65	39.4	11.5	19.6	1.15	47.1	33.4	2.8	8.8	11.6	41.1
Rougher Conc 1-3	7.6	0.86	5.91	39.9	12.1	18.4	1.01	68.0	51.2	4.9	16.0	18.9	62.3
Rougher Conc 1-4	10.1	0.74	5.15	41.2	12.2	17.1	0.87	77.7	59.2	6.6	21.4	23.3	71.1
Bulk Rougher Tail	89.9	0.024	0.40	65.3	5.05	6.37	0.040	22.3	40.8	93.4	78.6	76.7	28.9
Head (calc.)	100.0	0.10	0.88	62.9	5.78	7.46	0.12	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	Assays, %									
	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
WO_3 Rougher Conc 1	9.86	4.07	0.99	2.20	0.46	0.41	0.03	< 0.01	7.59	97.3
WO_3 Rougher Conc 2	9.80	4.43	0.92	2.24	0.48	0.44	0.03	< 0.01	7.69	97.7
WO_3 Rougher Conc 3	10.6	4.86	0.91	2.38	0.52	0.46	0.03	0.02	7.85	98.8
WO_3 Rougher Conc 4	11.6	5.01	1.10	2.52	0.56	0.42	0.03	0.01	6.57	99.5
WO_3 Rougher Tails	14.5	2.18	1.99	2.84	0.43	0.14	0.04	< 0.01	2.10	101.0

Test No.:FW 2 **Project No.:** 13583-002 **Operator**: HS **Date:** **2013-06-28**

Purpose: Repeat FW1 but with high Na_2SiO_3

Procedure: As outlined below.

Feed: ˜4 kg of Sulphide Taillins from test FM 1

Grind: P80 = 70 µm

Conditions: PSA on WO_3 Rougher Tails

	Reagents added, g/t					Time, min			pH	Eh
Stage	Na_2CO_3	Na_2SiO_3	NaOH	Flotinor FS-2	V4085	Grind	Cond.	Froth		mV
Sulphide RougherTail										
									8.2	+140
W-Cond. 1	500		500				2		11.6	+40
W-Cond. 2		2000					5		11.3	+40
W-Cond. 3				250	30		5		10.9	+40
W-Rougher 1								2	10.9	+40
W-Rougher 2								2	10.8	+50
W-Rougher 3				30			2	3	10.7	+60
W-Rougher 4				30				3	10.7	+60
Total	500	2000	500	310	30		14	10		

Stage	WO_3 Rougher	
Flotation Cell	4000g-D2	
Speed: rpm	1500	

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 Rougher Conc 1	43.0	1.1	4.50	14.4	26.8	10.6	26.7	0.81	59.1	18.6	0.5	2.1	4.1	7.6
WO_3 Rougher Conc 2	16.0	0.4	1.86	10.8	33.7	10.5	21.6	0.57	9.1	5.2	0.2	0.8	1.2	2.0
WO_3 Rougher Conc 3	9.6	0.3	0.98	9.72	35.0	10.0	21.2	0.59	2.9	2.8	0.1	0.4	0.7	1.2
WO_3 Rougher Conc 4	4.9	0.1	0.40	7.41	44.9	8.76	14.2	0.29	0.6	1.1	0.1	0.2	0.2	0.3
WO_3 Rougher Tails	3701	98.1	0.025*	0.65	63.4	5.66	7.09	0.11	28.3	72.3	99.1	96.5	93.7	88.9
Head (calc.)	3775	100.0	0.087	0.88	62.8	5.75	7.42	0.12	100.0	100.0	100.0	100.0	100.0	100.0
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

Product	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
Rougher Conc 1	1.1	4.50	14.4	26.8	10.6	26.7	0.81	59.1	18.6	0.5	2.1	4.1	7.6
Rougher Conc 1+2	1.6	3.78	13.4	28.7	10.6	25.3	0.74	68.2	23.8	0.7	2.9	5.3	9.6
Rougher Conc 1-3	1.8	3.39	12.9	29.6	10.5	24.7	0.72	71.1	26.6	0.9	3.3	6.1	10.8
Rougher Conc 1-4	1.9	3.19	12.5	30.6	10.4	24.0	0.69	71.7	27.7	0.9	3.5	6.3	11.1
Bulk Rougher Tail	98.1	0.025	0.65	63.4	5.66	7.09	0.11	28.3	72.3	99.1	96.5	93.7	88.9
Head (calc.)	100.0	0.087	0.88	62.8	5.75	7.42	0.12	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	Assays, %								
	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
WO_3 Rougher Conc 1	9.7	4.91	0.53	3.31	0.43	0.23	0.03	< 0.01	5.83	89.9
WO_3 Rougher Conc 2	11.4	4.88	0.74	3.61	0.46	0.22	0.05	0.01	5.80	93.5
WO_3 Rougher Conc 3	11.3	4.77	0.73	3.65	0.46	0.20	0.03	0.01	6.51	94.5
WO_3 Rougher Conc 4	13.2	4.08	1.23	3.60	0.47	0.19	0.04	< 0.01	7.13	98.1
WO_3 Rougher Tails	14.2	2.39	1.91	2.77	0.43	0.17	0.05	0.01	2.36	100.6

Test No.:FW 3 **Project No.**: 13583-002 **Operator**: **Date:** **2013-07-18**

Purpose: Repeat FW 2 but with V4085 in half

Procedure: As outlined below.

Feed: ˜4 kg of Sulphide Taillins from test FM 1

Grind: P80 = 70 µm

Conditions: PSA on WO_3 Rougher Tails

Stage	Reagents added, g/t Na_2CO_3	Na_2SiO_3	NaOH	Flotinor FS-2	V4085	Time, min Grind	Cond.	Froth	pH	Eh mV
Sulphide RougherTail									8.0	+110
W-Cond. 1	500		500				2		11.6	+30
W-Cond. 2		2000					5		11.1	+40
W-Cond. 3				250	15		5		10.9	+40
W-Rougher 1								2	10.9	+40
W-Rougher 2								2	10.7	+50
W-Rougher 3				30			2	3	10.7	+60
W-Rougher 4				30			2	3	10.7	+70
Total	500	2000	500	310	15		16	10		

Stage	WO_3 Rougher	
Flotation Cell	2000g-D2	
Speed: rpm	1800	

Metallurgical Balance

Product	Weight g	%	Assays, % WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	% Distribution WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 Rougher Conc 1	40.2	1.1	3.75	8.33	39.4	9.04	17.5	0.33	42.9	9.8	0.7	1.7	2.5	3.0
WO_3 Rougher Conc 2	25.9	0.7	1.73	8.32	41.8	8.47	17.5	0.44	12.7	6.3	0.5	1.0	1.6	2.5
WO_3 Rougher Conc 3	17.2	0.5	1.49	9.93	39.2	8.86	19.3	0.59	7.3	5.0	0.3	0.7	1.2	2.3
WO_3 Rougher Conc 4	20.9	0.6	1.04	8.49	41.6	7.74	19.3	0.73	6.2	5.2	0.4	0.8	1.4	3.4
WO_3 Rougher Tails	3629	97.2	0.030*	0.69	63.5	5.66	7.21	0.11	30.9	73.6	98.2	95.8	93.3	88.9
Head (calc.)	3734	100.0	0.094	0.91	62.9	5.74	7.52	0.12	100.0	100.0	100.0	100.0	100.0	100.0
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

Product	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
Rougher Conc 1	1.1	3.75	8.33	39.4	9.04	17.5	0.33	42.9	9.8	0.7	1.7	2.5	3.0
Rougher Conc 1+2	1.8	2.96	8.33	40.3	8.82	17.5	0.37	55.6	16.2	1.1	2.7	4.1	5.5
Rougher Conc 1-3	2.2	2.66	8.66	40.1	8.83	17.9	0.42	62.9	21.2	1.4	3.4	5.3	7.7
Rougher Conc 1-4	2.8	2.33	8.62	40.4	8.61	18.2	0.48	69.1	26.4	1.8	4.2	6.7	11.1
Bulk Rougher Tail	97.2	0.030	0.69	63.5	5.66	7.21	0.11	30.9	73.6	98.2	95.8	93.3	88.9
Head (calc.)	100.0	0.094	0.91	62.9	5.74	7.52	0.12	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	Assays, % Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
WO_3 Rougher Conc 1	12.5	4.08	1.06	3.29	0.44	0.20	0.05	0.01	6.41	94.3
WO_3 Rougher Conc 2	12.6	3.77	1.16	3.16	0.44	0.20	0.05	0.01	6.12	95.7
WO_3 Rougher Conc 3	12.3	3.98	1.09	3.28	0.44	0.20	0.04	0.01	6.60	95.8
WO_3 Rougher Conc 4	12.1	3.33	1.16	2.91	0.40	0.20	0.05	< 0.01	6.35	95.9
WO_3 Rougher Tails	14.1	2.37	1.91	2.72	0.43	0.17	0.04	< 0.01	2.07	100.3

Test No.:FW4 **Project No.**: 13583-002 **Operator**: HS **Date:** **2013-07-18**

Purpose: Repeat FW2 but add Quebracho prior to silicate

Procedure: As outlined below.

Feed: ˜4 kg of Sulphide Taillins from test FM 2

Grind: P80 = 75 µm

Conditions: PSA on WO_3 Rougher Tails

Stage	Reagents added, g/t						Time, min			pH	Eh
	Na_2CO_3	Quebracho	Na_2SiO_3	NaOH	Flotinor FS-2	V4085	Grind	Cond.	Froth		mV
Sulphide RougherTail											
										8.2	+140
W-Cond. 1	500			500				2		11.6	+40
W-Cond. 2		25						5			
W-Cond. 3			1500					5		11.3	+40
W-Cond. 4					250	30		5		10.9	+40
W-Rougher 1									2	10.9	+40
W-Rougher 2									2	10.8	+50
W-Rougher 3					30			2	3	10.7	+60
W-Rougher 4					30				3	10.7	+60
Total	500	25	1500	500	310	30		19	10		

Stage	WO_3 Rougher	
Flotation Cell	4000g-D2	
Speed: rpm	1500	

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 Rougher Conc 1	115	3.1	2.03	10.1	31.4	10.1	24.5	1.51	69.1	39.9	1.6	5.4	10.2	36.3
WO_3 Rougher Conc 2	17.8	0.5	0.60	5.22	42.7	9.97	14.3	0.55	3.2	3.2	0.3	0.8	0.9	2.0
WO_3 Rougher Conc 3	19.8	0.5	0.16	2.50	51.9	8.16	9.99	0.29	0.9	1.7	0.4	0.7	0.7	1.2
WO_3 Rougher Conc 4	24.1	0.7	0.11	2.70	51.0	8.36	11.0	0.35	0.8	2.2	0.5	0.9	1.0	1.8
WO_3 Rougher Tails	3510	95.2	0.025*	0.44	64.0	5.68	6.86	0.08	26.0	53.0	97.1	92.1	87.2	58.7
Head (calc.)	3686	100.0	0.092	0.79	62.7	5.87	7.49	0.13	100.0	100.0	100.0	100.0	100.0	100.0
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

Product		%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
Rougher Conc 1		3.1	2.03	10.10	31.4	10.1	24.5	1.51	69.1	39.9	1.6	5.4	10.2	36.3
Rougher Conc 1+2		3.6	1.84	9.45	32.9	10.1	23.1	1.38	72.3	43.1	1.9	6.2	11.1	38.3
Rougher Conc 1-3		4.1	1.62	8.54	35.4	9.8	21.4	1.24	73.2	44.8	2.3	6.9	11.8	39.5
Rougher Conc 1-4		4.8	1.41	7.75	37.5	9.6	20.0	1.12	74.0	47.0	2.9	7.9	12.8	41.3
Bulk Rougher Tail		95.2	0.03	0.44	64.0	5.68	6.86	0.080	26.0	53.0	97.1	92.1	87.2	58.7
Head (calc.)		100.0	0.09	0.79	62.7	5.87	7.49	0.13	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	Assays, %									
	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
WO_3 Rougher Conc 1	10.0	3.76	0.85	2.69	0.40	0.35	0.03	0.01	7.42	93.0
WO_3 Rougher Conc 2	13.1	4.37	1.17	3.62	0.47	0.26	0.04	0.01	7.6	98.2
WO_3 Rougher Conc 3	14.6	3.49	1.63	3.40	0.47	0.23	0.04	0.01	5.89	100.2
WO_3 Rougher Conc 4	14.2	3.34	1.54	3.15	0.46	0.27	0.06	< 0.01	5.94	99.7
WO_3 Rougher Tails	14.3	2.36	1.96	2.76	0.44	0.17	0.06	0.01	1.84	100.5

Test No.:FW5 **Project No.**: 13583-002 **Operator**: HS **Date:** **2013-07-18**

Purpose: Repeat FW2 but add Calgon prior to silicate

Procedure: As outlined below.

Feed: ˜4 kg of Sulphide Taillins from test FM 2

Grind: P80 = 75 µm

Conditions: PSA on WO_3 Rougher Tails

Stage	Reagents added, g/t						Time, min			pH	Eh
	Na_2CO_3	Calgon	Na_2SiO_3	NaOH	Flotinor FS-2	V4085	Grind	Cond.	Froth		mV
Sulphide RougherTail										8.2	-0.70
W-Cond. 1	250			125				2		10.4	-0.10
W-Cond. 2		1000		50				5		10.8	-0.10
W-Cond. 3			1500					5		10.6	+10
W-Cond. 4					250	30		5		10.5	+10
W-Rougher 1									2	10.4	+20
W-Rougher 2									2	10.3	+20
W-Rougher 3					30			2	3	10.3	+30
W-Rougher 4					30			2	3	10.3	+40
Total	250	1000	1500	175	310	30		21	10		

Stage	WO_3 Rougher	
Flotation Cell	4000g-D2	
Speed: rpm	1500	

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 Rougher Conc 1	24.3	0.7	0.82	8.40	33.7	12.6	19.5	1.69	6.2	6.5	0.4	1.4	1.7	8.9
WO_3 Rougher Conc 2	7.9	0.2	0.51	5.71	44.9	8.65	15.0	1.05	1.2	1.4	0.2	0.3	0.4	1.8
WO_3 Rougher Conc 3	11.9	0.3	0.31	3.79	51.0	7.31	11.8	0.61	1.1	1.4	0.3	0.4	0.5	1.6
WO_3 Rougher Conc 4	20.8	0.6	0.25	3.06	53.3	7.42	10.4	0.45	1.6	2.0	0.5	0.7	0.8	2.0
WO_3 Rougher Tails	3594	98.2	0.081*	0.77	63.4	5.80	7.34	0.11	89.9	88.5	98.7	97.1	96.5	85.7
Head (calc.)	3659	100.0	0.089	0.85	63.1	5.87	7.47	0.13	100.0	100.0	100.0	100.0	100.0	100.0
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

Rougher Conc 1	0.7	0.82	8.40	33.7	12.6	19.5	1.69	6.2	6.5	0.4	1.4	1.7	8.9
Rougher Conc 1+2	0.9	0.74	7.74	36.4	11.6	18.4	1.53	7.4	8.0	0.5	1.7	2.2	10.7
Rougher Conc 1-3	1.2	0.63	6.67	40.4	10.5	16.6	1.28	8.5	9.4	0.8	2.2	2.7	12.3
Rougher Conc 1-4	1.8	0.51	5.52	44.5	9.49	14.6	1.02	10.14	11.5	1.3	2.9	3.5	14.3
Bulk Rougher Tail	98.2	0.08	0.77	63.4	5.80	7.34	0.11	89.9	88.5	98.7	97.1	96.5	85.7
Head (calc.)	100.0	0.089	0.85	63.1	5.87	7.47	0.13	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	Assays, %									
	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
WO_3 Rougher Conc 1	10.8	3.76	0.80	2.85	0.41	0.23	0.11	0.02	7.06	93.5
WO_3 Rougher Conc 2	13.2	3.37	1.25	3.13	0.42	0.19	0.06	< 0.01	6.83	98.1
WO_3 Rougher Conc 3	14.4	2.98	1.48	3.11	0.43	0.18	0.06	< 0.01	6.29	99.5
WO_3 Rougher Conc 4	14.3	3.00	1.63	3.08	0.44	0.18	0.06	< 0.01	5.19	99.6
WO_3 Rougher Tails	13.9	2.38	1.89	2.72	0.44	0.16	0.05	< 0.01	2.18	100.3

Test No.:FW 6 **Project No.**: 13583-002 **Operator**: HS **Date:** **2013-07-24**

Purpose: Repeat FW2 conditions on -250 mesh S tails from test FM2, and reduce the collectors in half

Procedure: Screen the 4 kg sulphide taillings from FM2 at 250 mesh.
Put +250 mesh fraction across Mozley table.
Float -250 mesh fines using the conditions as below

Feed: ˜4 kg of Sulphide Taillins from test FM 2

Grind: P80 = µm
Particle size -250 mesh
Conditions: PSA on WO_3 Rougher Tails

Stage	Reagents added, g/t					Time, min			pH	Eh
	Na_2CO_3	Na_2SiO_3	NaOH	Flotinor FS-2	V4085	Grind	Cond.	Froth		mV
Sulphide RougherTail										
									8.2	+20
W-Cond. 1	500		500				2		11.2	+20
W-Cond. 2		2000					5		11.2	+20
W-Cond. 3				125	15		5		10.9	+10
W-Rougher 1								2	10.9	+20
W-Rougher 2								2	10.9	+30
W-Rougher 3				30			2	3	10.8	+30
W-Rougher 4				30			2	3	10.8	+30
Total	500	2000	500	185	15		16	10		

Stage	WO_3 Rougher	
Flotation Cell	4000g-D2	
Speed: rpm	1500	

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 Rougher Conc 1	11.1	0.5	0.23	6.70	45.3	9.93	15.1	0.11	1.0	3.4	0.4	0.8	0.9	0.4
WO_3 Rougher Conc 2	10.5	0.5	0.18	1.66	57.4	7.16	8.54	0.13	0.8	0.8	0.4	0.5	0.5	0.4
WO_3 Rougher Conc 3	10.6	0.5	0.12	2.24	55.7	7.48	9.42	0.12	0.5	1.1	0.4	0.5	0.6	0.4
WO_3 Rougher Conc 4	19.9	0.9	0.10	6.54	49.2	7.26	16.1	0.12	0.8	6.0	0.7	1.0	1.8	0.7
WO_3 Rougher Tails	2198	97.7	0.11	0.88	61.2	6.39	7.90	0.15	96.9	88.7	98.1	97.2	96.2	98.1
Head (calc.)	2250	100.0	0.11	0.97	61.0	6.42	8.02	0.15	100.0	100.0	100.0	100.0	100.0	100.0
Head (dir.)														

Combined Products

Rougher Conc 1	0.5	0.23	6.70	45.3	9.93	15.1	0.11	1.0	3.4	0.4	0.8	0.9	0.4
Rougher Conc 1-2	1.0	0.21	4.25	51.2	8.58	11.9	0.12	1.8	4.2	0.8	1.3	1.4	0.8
Rougher Conc 1-3	1.4	0.18	3.59	52.7	8.22	11.1	0.12	2.3	5.3	1.2	1.8	2.0	1.1
Rougher Conc 1-4	2.3	0.15	4.72	51.3	7.85	13.0	0.12	3.1	11.3	1.9	2.8	3.8	1.9
Bulk Rougher Tail	97.7	0.11	0.88	61.2	6.39	7.90	0.15	96.9	88.7	98.1	97.2	96.2	98.1
Head (calc.)	100.0	0.11	0.97	61.0	6.42	8.02	0.15	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	Assays, %									
	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
WO_3 Rougher Conc 1	12.6	3.39	1.33	3.2	0.44	0.18	0.13	< 0.01	5.79	97.5
WO_3 Rougher Conc 2	14.7	2.79	1.81	3.04	0.45	0.18	0.08	0.01	3.99	100.2
WO_3 Rougher Conc 3	14.4	2.95	1.73	3.11	0.46	0.18	0.09	< 0.01	4.54	100.2
WO_3 Rougher Conc 4	12.8	2.92	1.49	2.87	0.43	0.17	0.09	< 0.01	5.41	98.7
WO_3 Rougher Tails	14.4	2.56	1.97	2.83	0.46	0.18	0.06	< 0.01	2.45	100.6

Test No.:FW 7 **Project No.**: 13583-002 **Operator**: HS **Date:** **2013-08-12**

Purpose: Repeat FW2 conditions , but with high Sil N and use Lankropol K-8300, no V4085

Procedure: As outlined below.

Feed: ˜4 kg of Sulphide Taillins from test FM 3

Grind: P80 = 76 μm

Conditions: PSA on WO_3 Rougher Tails

Stage	Reagents added, g/t						Time, min			pH	Eh
	Na_2CO_3	Na_2SiO_3	NaOH	Flotinor FS-2	Lankropol K-8300		Grind	Cond.	Froth		mV
Sulphide RougherTail										8.0	+120
W-Cond. 1	500		500					2		11.5	
W-Cond. 2		2500						3		10.5	
W-Cond. 3				250	30*			5		10.3	
W-Rougher 1									2	10.3	+20
W-Rougher 2									2	10.2	+20
W-Rougher 3				30	15			2	3	10.2	+20
W-Rougher 4				30				2	3	10.2	+20
Total	500	2500	500	310	45			14	10		

* Add the frother dropwise untill get the drsire froth

Stage	WO_3 Rougher	
Flotation Cell	4000g-D2	
Speed: rpm	1500	

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 Rougher Conc 1	29.6	0.8	0.46	1.72	53.9	7.43	8.35	0.14	3.8	1.6	0.7	1.0	0.9	0.8
WO_3 Rougher Conc 2	25.1	0.7	0.54	1.76	55.0	7.02	8.54	0.16	3.8	1.4	0.6	0.8	0.8	0.8
WO_3 Rougher Conc 3	18.0	0.5	1.02	1.89	53.3	7.02	8.80	0.21	5.1	1.1	0.4	0.6	0.6	0.8
WO_3 Rougher Conc 4	15.5	0.4	1.52	1.97	53.5	6.61	9.24	0.23	6.6	1.0	0.3	0.5	0.5	0.7
WO_3 Rougher Tails	3714	97.7	0.078*	0.82	63.0	5.63	7.48	0.13	80.7	95.0	98.0	97.1	97.3	96.9
Head (calc.)	3802	100.0	0.094	0.84	62.8	5.66	7.51	0.13	100.0	100.0	100.0	100.0	100.0	100.0
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

Rougher Conc 1	0.8	0.46	1.72	53.9	7.43	8.35	0.14	3.8	1.6	0.7	1.0	0.9	0.8
Rougher Conc 1+2	1.4	0.50	1.74	54.4	7.24	8.44	0.15	7.6	3.0	1.2	1.8	1.6	1.6
Rougher Conc 1-3	1.9	0.63	1.78	54.1	7.19	8.53	0.16	12.7	4.0	1.6	2.4	2.2	2.4
Rougher Conc 1-4	2.3	0.78	1.81	54.0	7.09	8.65	0.18	19.3	5.0	2.0	2.9	2.7	3.1
Bulk Rougher Tail	97.7	0.08	0.82	63.0	5.63	7.48	0.130	80.7	95.0	98.0	97.1	97.3	96.9
Head (calc.)	100.0	0.09	0.84	62.8	5.66	7.51	0.13	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	Assays, %									
	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
WO_3 Rougher Conc 1	15.4	2.94	1.81	3.26	0.44	0.19	0.07	< 0.01	4.85	98.9
WO_3 Rougher Conc 2	15.4	2.95	1.81	3.25	0.44	0.18	0.06	0.01	4.96	99.8
WO_3 Rougher Conc 3	15.7	2.97	1.73	3.26	0.43	0.18	0.05	0.01	6.02	99.7
WO_3 Rougher Conc 4	14.9	2.86	1.73	3.15	0.42	0.17	0.05	< 0.01	5.81	98.7
WO_3 Rougher Tails	14.0	2.38	1.91	2.76	0.44	0.17	0.04	< 0.01	2.33	100.3

Test No.:FW 8 **Project No.**: 13583-002 **Operator**: HS **Date:** **2013-08-12**

Purpose: Repeat FW7 conditions , but increase FS-2 in W-Cond 3 to 300g/t

Procedure: As outlined below.

Feed: ˜4 kg of Sulphide Taillins from test FM 3

Grind: P80 = 76 µm

Conditions: PSA on WO_3 Rougher Tails

Stage	Reagents added, g/t						Time, min			pH	Eh
	Na_2CO_3	Na_2SiO_3	NaOH	Flotinor FS-2	Lankropol K-8300		Grind	Cond.	Froth		mV
Sulphide RougherTail										7.8	0
W-Cond. 1	500		500					2		11.3	-0.6
W-Cond. 2		2500						3		10.5	-0.4
W-Cond. 3				300	30*			5		10.5	-0.4
W-Rougher 1									2	10.4	-0.2
W-Rougher 2									2	10.2	-0.2
W-Rougher 3				30	15			2	3	10.2	0
W-Rougher 4				30				2	3	10.2	0
Total	500	2500	500	360	45			14	10		

* Add the frother dropwise untill get the drsire froth

Stage	WO_3 Rougher	
Flotation Cell	4000g-D2	
Speed: rpm	1500	

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 Rougher Conc 1	17.8	0.5	1.61	2.00	49.2	8.32	8.85	0.14	8.1	1.2	0.4	0.7	0.6	0.5
WO_3 Rougher Conc 2	15.3	0.4	1.37	2.08	51.8	7.37	9.23	0.15	5.9	1.0	0.3	0.5	0.5	0.5
WO_3 Rougher Conc 3	16.0	0.4	1.69	1.82	52.2	6.85	9.10	0.20	7.6	0.9	0.4	0.5	0.5	0.7
WO_3 Rougher Conc 4	18.6	0.5	1.65	1.73	54.8	6.27	8.94	0.18	8.7	1.0	0.4	0.6	0.6	0.7
WO_3 Rougher Tails	3676	98.2	0.067*	0.80	62.9	5.60	7.46	0.13	69.6	95.8	98.5	97.7	97.8	97.7
Head (calc.)	3744	100.0	0.094	0.82	62.7	5.63	7.49	0.13	100.0	100.0	100.0	100.0	100.0	100.0
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

Product	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
Rougher Conc 1	0.5	1.61	2.00	49.2	8.32	8.85	0.14	8.1	1.2	0.4	0.7	0.6	0.5
Rougher Conc 1+2	0.9	1.50	2.04	50.4	7.88	9.03	0.14	14.0	2.2	0.7	1.2	1.1	1.0
Rougher Conc 1-3	1.3	1.56	1.97	51.0	7.54	9.05	0.16	21.7	3.1	1.1	1.8	1.6	1.6
Rougher Conc 1-4	1.8	1.59	1.90	52.0	7.19	9.02	0.17	30.4	4.2	1.5	2.3	2.2	2.3
Bulk Rougher Tail	98.2	0.07	0.80	62.9	5.60	7.46	0.13	69.6	95.8	98.5	97.7	97.8	97.7
Head (calc.)	100.0	0.09	0.82	62.7	5.63	7.49	0.13	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	Assays, %									
	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
WO_3 Rougher Conc 1	14.6	3.24	1.65	3.27	0.42	0.18	0.05	< 0.01	6.07	96.0
WO_3 Rougher Conc 2	15.0	3.15	1.67	3.34	0.43	0.18	0.05	< 0.01	6.06	98.5
WO_3 Rougher Conc 3	15.1	2.93	1.73	3.20	0.41	0.18	0.05	0.01	6.31	98.2
WO_3 Rougher Conc 4	14.7	2.70	1.75	3.06	0.42	0.17	0.06	< 0.01	5.19	98.2
WO_3 Rougher Tails	14.1	2.40	1.93	2.77	0.43	0.17	0.04	< 0.01	2.43	100.4

Test No.:FW 9 **Project No.**: 13583-002 **Operator**: **Date:**

Purpose: Repeat FW2, but increase FS-2 to 300g/t and add citric acid as a secondary depressant

Procedure: As outlined below.

Feed: ˜4 kg of Sulphide Taillins from test FM 4

Grind: P80 = 75 μm

Conditions: PSA on WO_3 Rougher Tails

	Reagents added, g/t						Time, min			pH	Eh
Stage	Na_2CO_3	Na_2SiO_3	NaOH	Flotinor FS-2	V4085	Citric Acid	Grind	Cond.	Froth		mV
Sulphide RougherTail											
W-Cond. 1	500		500			250		2			
W-Cond. 2		2000						5			
W-Cond. 3				300	22.5			5			
W-Rougher 1					lankropol				2		
W-Rougher 2					K-8300				2		
W-Rougher 3				30	30			2	3	10.6	
W-Rougher 4				30	30				3		
W-Scav				75		200					
Total	500	2000	500	435	22.5	450		14	10		

Stage	WO_3 Rougher	
Flotation Cell	4000g-D2	
Speed: rpm	1400	

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 Rougher Conc 1	68.0	1.8	2.50	11.4	28.5	13.6	22.8	1.17	49.2	24.3	0.8	4.1	5.4	16.1
WO_3 Rougher Conc 2	36.1	0.9	0.93	8.72	33.4	14.1	16.7	1.11	9.7	9.9	0.5	2.2	2.1	8.1
WO_3 Rougher Conc 3	20.9	0.5	0.75	7.44	38.1	11.8	16.9	1.98	4.5	4.9	0.3	1.1	1.2	8.4
WO_3 Rougher Conc 4	17.6	0.5	0.79	3.85	44.2	8.91	14.7	2.60	4.0	2.1	0.3	0.7	0.9	9.3
WO_3 Ro Scav Conc	71.3	1.9	0.51	4.49	32.8	8.63	25.5	2.00	10.5	10.0	1.0	2.7	6.3	28.8
WO_3 Rougher Tails	3625	94.4	0.021*	0.43	64.4	5.58	6.66	0.040	22.0	48.8	97.1	89.2	84.0	29.3
Head (calc.)	3839	100.0	0.090	0.83	62.6	5.91	7.48	0.13	100.0	100.0	100.0	100.0	100.0	100.0
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

Product	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
Rougher Conc 1	1.8	2.50	11.4	28.5	13.6	22.8	1.17	49.2	24.3	0.8	4.1	5.4	16.1
Rougher Conc 1+2	2.7	1.96	10.5	30.2	13.8	20.7	1.15	58.9	34.1	1.3	6.3	7.5	24.2
Rougher Conc 1-3	3.3	1.75	10.0	31.5	13.4	20.1	1.29	63.4	39.0	1.6	7.4	8.7	32.6
Rougher Conc 1-4	3.7	1.64	9.21	33.1	12.9	19.4	1.45	67.5	41.1	2.0	8.1	9.6	41.8
Ro Conc + Ro Scav Conc	5.6	1.26	7.64	33.0	11.5	21.4	1.63	78.0	51.2	2.9	10.8	16.0	70.7
Bulk Rougher Tail	94.4	0.021	0.43	64.4	5.58	6.66	0.040	22.0	48.8	97.1	89.2	84.0	29.3
Head (calc.)	100.0	0.090	0.83	62.6	5.91	7.48	0.13	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	Assays, %									
	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
WO_3 Rougher Conc 1	10.1	5.25	0.54	3.62	0.45	0.21	0.11	0.02	3.96	90.3
WO_3 Rougher Conc 2	12.3	6.34	0.57	4.44	0.53	0.24	0.12	0.02	4.46	94.3
WO_3 Rougher Conc 3	12.9	4.88	0.97	3.53	0.49	0.22	0.09	0.01	4.84	96.7
WO_3 Rougher Conc 4	13.8	3.29	1.35	2.69	0.43	0.23	0.06	0.01	6.52	98.9
WO_3 Ro Scav Conc	9.26	2.93	1.10	1.71	0.36	0.46	0.05	0.01	11.4	96.2
WO_3 Rougher Tails	14.2	2.35	2.01	2.75	0.44	0.17	0.04	0.01	1.68	100.3

Test No.:FW 10 **Project No.**: 13583-002 **Operator**: **Date:**

Purpose: Repeat FW9, but add $BaCl_2$ as a secondary depressant

Procedure: As outlined below.

Feed: ˜4 kg of Sulphide Taillins from test FM 4

Grind: P80 = 75 µm

Conditions: PSA on WO_3 Rougher Tails

Stage	Reagents added, g/t						Time, min			pH	Eh
	Na_2CO_3	Na_2SiO_3	NaOH	Flotinor FS-2	V4085	$BaCl_2$	Grind	Cond.	Froth		mV
Sulphide RougherTail											
W-Cond. 1	500		500			200		2			
W-Cond. 2		2000						5			
W-Cond. 3				300	22.5			5			
W-Rougher 1									2		
W-Rougher 2									2		
W-Rougher 3				30				2	3		
W-Rougher 4				30					3		
Total	500	2000	500	360	22.5			14	10		

Stage	WO_3 Rougher	
Flotation Cell	4000g-D2	
Speed: rpm	1400	

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 Rougher Conc 1	86.4	2.2	1.92	8.94	33.7	13.5	17.9	0.66	49.7	24.9	1.2	5.1	5.2	11.0
WO_3 Rougher Conc 2	41.6	1.1	0.93	7.62	35.1	14.6	14.8	0.68	11.6	10.2	0.6	2.6	2.1	5.4
WO_3 Rougher Conc 3	52.1	1.3	0.40	5.99	38.1	13.8	13.5	1.04	6.2	10.1	0.8	3.1	2.4	10.4
WO_3 Rougher Conc 4	47.8	1.2	0.18	3.85	42.7	12.3	11.4	0.99	2.6	5.9	0.8	2.6	1.8	9.1
WO_3 Rougher Tails	3695	94.2	0.027*	0.41	65.0	5.39	7.13	0.090	29.9	48.9	96.6	86.6	88.5	64.0
Head (calc.)	3923	100.0	0.085	0.79	63.4	5.86	7.59	0.13	100.0	100.0	100.0	100.0	100.0	100.0
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

Product	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
Rougher Conc 1	2.2	1.92	8.94	33.7	13.5	17.9	0.66	49.7	24.9	1.2	5.1	5.2	11.0
Rougher Conc 1+2	3.3	1.60	8.51	34.2	13.9	16.9	0.67	61.3	35.1	1.8	7.7	7.3	16.4
Rougher Conc 1-3	4.6	1.25	7.78	35.3	13.8	15.9	0.77	67.5	45.2	2.6	10.8	9.6	26.9
Rougher Conc 1-4	5.8	1.03	6.96	36.8	13.5	15.0	0.82	70.1	51.1	3.4	13.4	11.5	36.0
Bulk Rougher Tail	94.2	0.027	0.41	65.0	5.39	7.13	0.090	29.9	48.9	96.6	86.6	88.5	64.0
Head (calc.)	100.0	0.085	0.79	63.4	5.86	7.59	0.13	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	Assays, %									
	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
WO_3 Rougher Conc 1	12	5.43	0.71	3.77	0.48	0.23	0.10	0.01	5.16	93.6
WO_3 Rougher Conc 2	13.1	6.41	0.64	4.35	0.54	0.25	0.09	0.01	5.09	95.7
WO_3 Rougher Conc 3	13.8	6.04	0.78	4.19	0.55	0.26	0.08	0.02	5.5	97.6
WO_3 Rougher Conc 4	14.4	5.30	1.03	3.94	0.54	0.26	0.06	0.01	5.38	98.3
WO_3 Rougher Tails	13.5	2.30	2.00	2.59	0.43	0.17	0.03	0.01	1.42	100

Test No.:FW 11 **Project No.**: 13583-002 **Operator**: **Date:**

Purpose: Repeat FW9 add Al_2SO_4 as a secondary depressant

Procedure: As outlined below.

Feed: ˜4 kg of Sulphide Taillins from test FM 4

Grind: P80 = 75 μm

Conditions: PSA on WO_3 Rougher Tails

Stage	Reagents added, g/t						Time, min			pH	Eh
	Na_2CO_3	Na_2SiO_3	NaOH	Flotinor FS-2	V4085	Al_2SO_4	Grind	Cond.	Froth		mV
Sulphide RougherTail											
W-Cond. 1	500		500			200		2			
W-Cond. 2		2000						5			
W-Cond. 3				300	22.5			5			
W-Rougher 1					lankropol				2		
W-Rougher 2					K-8300				2		
W-Rougher 3				30	15			2	3		
W-Rougher 4				30					3		
Total	500	2000	500	360	22.5	200		14	10		

Stage	WO_3 Rougher	
Flotation Cell	4000g-D2	
Speed: rpm	1400	

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 Rougher Conc 1	68.7	1.9	2.93	11.7	28.3	14.4	22.1	0.73	56.3	27.2	0.9	4.7	5.8	10.3
WO_3 Rougher Conc 2	26.4	0.7	1.07	7.81	35.7	14.7	15.4	0.77	7.9	7.0	0.4	1.9	1.6	4.2
WO_3 Rougher Conc 3	20.6	0.6	0.64	6.83	38.4	12.2	16.3	1.94	3.7	4.8	0.4	1.2	1.3	8.2
WO_3 Rougher Conc 4	23.6	0.7	0.27	4.87	41.9	11.7	13.0	1.58	1.8	3.9	0.4	1.3	1.2	7.7
WO_3 Rougher Tails	3390	96.1	0.032*	0.50	64.1	5.59	6.91	0.10	30.3	57.2	97.9	90.9	90.1	69.6
Head (calc.)	3529	100.0	0.101	0.84	62.89	5.91	7.36	0.14	100.0	100.0	100.0	100.0	100.0	100.0
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

Product	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
Rougher Conc 1	1.9	2.93	11.7	28.3	14.4	22.1	0.73	56.3	27.2	0.9	4.7	5.8	10.3
Rougher Conc 1+2	2.7	2.41	10.6	30.4	14.5	20.2	0.74	64.2	34.1	1.3	6.6	7.4	14.5
Rougher Conc 1-3	3.3	2.10	9.9	31.8	14.1	19.5	0.95	67.9	38.9	1.7	7.8	8.7	22.7
Rougher Conc 1-4	3.9	1.79	9.1	33.5	13.7	18.4	1.06	69.7	42.8	2.1	9.1	9.9	30.4
Bulk Rougher Tail	96.1	0.032	0.50	64.1	5.59	6.91	0.100	30.3	57.2	97.9	90.9	90.1	69.6
Head (calc.)	100.0	0.10	0.84	62.9	5.91	7.36	0.14	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	Assays, %									
	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
WO_3 Rougher Conc 1	10.2	0.22	0.48	3.52	0.46	0.22	0.11	0.02	4.33	90.4
WO_3 Rougher Conc 2	12.4	0.24	0.72	4.09	0.52	0.24	0.10	0.02	4.76	95.5
WO_3 Rougher Conc 3	12.8	0.24	0.98	3.32	0.49	0.24	0.09	0.01	5.37	97.0
WO_3 Rougher Conc 4	13.7	0.25	1.1	3.46	0.51	0.25	0.07	0.01	5.75	98.0
WO_3 Rougher Tails	14.4	0.17	2.01	2.75	0.44	0.17	0.06	< 0.01	1.75	100.6

Test No.:FW 12 **Project No.**: 13583-002 **Operator**: HS **Date:** **2013-06-28**

Purpose: Conduct a WO_3 cleaner test on the ~12kg S Ro Tails grnerated from test FM6
Repeat FW2 rougher conditions, but with 4 WO3 cleaners

Procedure: As outlined below.

Feed: ˜12 kg of Sulphide Taillins from test FM 6

Grind: P80 = 68 μm

Conditions: PSA on WO_3 Rougher Tails

Stage	Reagents added, g/t					Time, min			pH	Eh
	Na_2CO_3	Na_2SiO_3	NaOH	Flotinor FS-2	V4085	Grind	Cond.	Froth		mV
Sulphide RougherTail										
W-Cond. 1	500		500				2		11.8	
W-Cond. 2		2000					5		11.4	
W-Cond. 3				250	9		5			
W-Rougher 1								10		
W-Ro Scavenger				30			2	2		
W-Rougher Conc										
				Que D-2						
W- 1st Cleaner	100	96	100	5			1	6	11.5	
W- 2nd Cleaner	100	64		5			1	6	11.2	
W- 3rd Cleaner	50	32		5			1	3	10.8	
W- 4th Cleaner							1	2	10.3	
Total	750	2192	600	295	9		18	29		

Stage	WO_3 Rougher	WO_3 1st and 2nd Clnrs	WO_3 3rd and 4th Clnrs
Flotation Cell	10 L Cell	2.5 L	1 L
Speed: rpm	1800	1500	1200

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 4th Clnr Conc	18.0	0.2	30.7	11.6	5.47	2.67	40.5	3.64	54.7	2.8	0.0	0.1	0.8	4.1
WO_3 4th Clnr Tails	6.8	0.1	6.93	16.3	17.7	5.18	42.3	3.52	4.7	1.5	0.0	0.1	0.3	1.5
WO_3 3rd Clnr Tails	20.2	0.2	1.34	16.5	24.0	6.78	35.8	2.23	2.7	4.4	0.1	0.2	0.8	2.8
WO_3 2nd Clnr Tails	**50.3**	0.4	0.68	9.05	38.6	10.8	18.7	1.09	3.4	6.0	0.3	0.8	1.1	3.4
WO_3 1st Clnr Tails	128.2	1.1	0.34	8.20	38.4	12.0	17.6	1.25	4.3	13.9	0.7	2.3	2.6	9.9
WO_3 Ro Scav Conc	32.6	0.3	0.15	1.16	57.5	6.85	7.49	0.15	0.5	0.5	0.3	0.3	0.3	0.3
WO_3 Ro Scav Tails	11423	97.8	0.026*	0.47	63.8	5.72	7.14	0.11	29.8	71.0	98.7	96.3	94.0	78.0
Head (calc.)	11679	100.0	0.087	0.65	63.2	5.81	7.43	0.14	69.7	28.5	1.0	3.4	5.7	21.7
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

Product	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 4th Clnr Conc	0.15	30.7	11.6	5.5	2.7	40.5	3.64	54.7	2.8	0.0	0.1	0.8	4.1
WO_3 3rd Clnr Conc	0.21	24.2	12.9	8.8	3.4	41.0	3.61	59.3	4.2	0.0	0.1	1.2	5.6
WO_3 2nd Clnr Conc	0.39	13.9	14.5	15.6	4.9	38.7	2.99	62.0	8.6	0.1	0.3	2.0	8.3
WO_3 1st Clnr Conc	0.82	6.94	11.6	27.8	8.0	28.1	1.99	65.4	14.6	0.4	1.1	3.1	11.8
WO_3 Rougher Conc	1.91	3.15	9.7	33.9	10.3	22.1	1.56	69.7	28.5	1.0	3.4	5.7	21.7
WO_3 Ro +Ro Scav Conc	2.19	2.77	8.6	36.9	9.9	20.2	1.38	70.2	29.0	1.3	3.7	6.0	22.0
WO_3 Ro Scav Tails	97.8	0.026	0.47	63.8	5.72	7.14	0.110	29.8	71.0	98.7	96.3	94.0	78.0
Head (calc.)	100.00	0.087	0.65	63.2	5.81	7.43	0.14	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	Assays, %									
	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
WO_3 4th Clnr Conc	1.35	1.18	0.08	0.26	0.08	0.07	0.13	< 0.01	5.93	61.4
WO_3 4th Clnr Tails	4.96	1.93	0.65	0.97	0.21	0.16	0.09	< 0.01	5.66	83.4
WO_3 3rd Clnr Tails	7.44	2.92	0.71	1.78	0.27	0.2	0.06	< 0.01	4.17	86.4
WO_3 2nd Clnr Tails	12.4	4.45	1.08	3.27	0.47	0.27	0.09	0.01	4.76	96.1
WO_3 1st Clnr Tails	12.2	4.99	0.99	3.4	0.51	0.31	0.12	0.02	4.99	96.8
WO_3 Ro Scav Conc	15.6	2.76	1.79	3.11	0.44	0.19	0.1	0.01	4.35	100.3
WO_3 Ro Scav Tails	14.0	2.36	1.9	2.75	0.44	0.17	0.05	< 0.01	2.22	100.7

Test No.:FW 13 **Project No.**: 13583-002 **Operator**: HS **Date:** **2013-06-28**

Purpose: Conduct a WO_3 cleaner test on the ~12kg S Ro Tails grnerated from test FM7
Repeat FW12 rougher conditions, but increase FS-2 to 300g/t
Increase 50% of Na_2SiO_3 and Que D-2 in 1st and 2nd cleaners

Procedure: As outlined below.

Feed: ˜12 kg of Sulphide Taillins from test FM 7

Grind: P80 = 72 μm

Conditions: PSA on WO_3 Rougher Tails

Stage	Reagents added, g/t					Time, min			pH	Eh
	Na_2CO_3	Na_2SiO_3	NaOH	Flotinor FS-2	V4085	Grind	Cond.	Froth		mV
Sulphide RougherTail										
W-Cond. 1	500		500				2		10.8	
W-Cond. 2		2000					5			
W-Cond. 3				300	9		5			
W-Rougher 1								10		
W-Rougher Conc										
				Que D-2						
W- 1st Cleaner	100	144	100	7.5			1	7		
W- 2nd Cleaner	100	96		7.5			1	5	10.5	
W- 3rd Cleaner **	50	32		5						
W-4th Cleaner										
Total	750	2272	600	320	9		14	22		

** No sufficient sample to complete the 3rd cleaner

Stage	WO_3 Rougher	WO_3 1st and 2nd Clnrs	WO_3 3rd and 4th Clnrs
Flotation Cell	10 L Cell	2.5 L	1 L
Speed: rpm	1800	1500	1200

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 2n Clnr Conc	11.8	0.1	14.8	15.6	10.4	5.23	44.1	0.23	15.4	1.8	0.02	0.1	0.6	0.2
WO_3 2nd Clnr Tails	71.4	0.6	3.24	20.0	19.9	6.60	42.0	0.49	20.4	14.3	0.2	0.7	3.6	2.3
WO_3 1st Clnr Tails	296.7	2.6	1.32	9.44	37.3	11.0	19.1	0.86	34.5	28.1	1.5	4.7	6.7	16.8
WO_3 Rougher Tails	11137	96.7	0.030*	0.50	64.0	5.91	6.75	0.11	29.7	55.8	98.3	94.5	89.1	80.7
Head (calc.)	11517	100.0	0.10	0.87	63.0	6.04	7.32	0.13	70.3	44.2	1.7	5.5	10.9	19.3
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

Product	Weight %	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 2nd Clnr Conc	0.10	14.8	15.6	10.4	5.23	44.1	0.23	15.4	1.8	0.02	0.1	0.6	0.2
WO_3 1st Clnr Conc	0.72	4.88	19.4	18.6	6.41	42.3	0.45	35.8	16.2	0.2	0.8	4.2	2.5
WO_3 Rougher Conc	3.30	2.10	11.6	33.2	10.0	24.2	0.77	70.3	44.2	1.7	5.5	10.9	19.3
WO_3 Rougher Tails	96.7	0.030	0.50	64.0	5.91	6.75	0.110	29.7	55.8	98.3	94.5	89.1	80.7
Head (calc.)	100.0	0.10	0.87	63.0	6.04	7.32	0.13	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	Assays, %									
	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
WO_3 2n Clnr Conc	3.43	2.53	0.15	1.67	0.20	0.09	0.02	< 0.01	6.56	74.6
WO_3 2nd Clnr Tails	6.35	2.98	0.48	2.09	0.29	0.13	0.02	< 0.01	5.82	87.2
WO_3 1st Clnr Tails	12.0	4.76	0.95	3.59	0.48	0.24	0.02	0.02	6.37	96.8
WO_3 Rougher Tails	14.3	2.31	1.96	2.75	0.44	0.17	0.02	< 0.01	1.90	100.7

Test No.:FW14 **Project No.:** 13583-002 **Operator**: HS **Date:** **2013-06-28**

Purpose: Use Benzoylhydroxamate (BHD) as collector

Procedure: As outlined below.

Feed: ~5 kg of Sulphide Taillins from test FM 8

Grind: P80 = 65 µm

Conditions: PSA on WO_3 Rougher Tails

Stage	Reagents added, g/t									Time, min			pH	EMF
	Na_2CO_3	Na_2SiO_3	NaOH	BHD	HCl	Pine Oil	MIBC	F549	FS-2	Grind	Cond.	Froth		
Sulphide RougherTail														
High intensity condition at 65% pulp density														
Condition 1		2000									10			
											10			
Condition 2				600										
W-Rougher 1					24	27	20	25	267			2	9.5	
W-Rougher 2				200	*						2	2		
W-Rougher 3				200	*						2	3		
W-Rougher 4				200	*						2	3		
Comb W-Ro Conc 2-4														
	Que D-2													
W- 1st Cleaner	5	38.4			*		10					6	9.5-10	
W- 2nd Cleaner	2	38.4					15							
Total	7	2076.8	0	1200	24	27	45	25	267		26	16		

* Add as required to reach pH 9.0 - 10
** Add as required

Stage	WO_3 Rougher	WO_3 1st and 2nd Clnrs	WO_3 3rd and 4th Clnrs
Flotation Cell	10 L Cell	2.5 L	1 L
Speed: rpm	1800	1500	1200

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 Ro Conc 1	39.0	0.9	**0.07**	**1.17**	**54.4**	**8.77**	**7.49**	**0.13**	0.7	1.1	0.7	1.3	0.9	0.8
WO_3 1st Cleaner Conc	30.5	0.7	0.64	1.96	38.8	11.4	9.58	0.81	5.0	1.4	0.4	1.3	0.9	3.8
WO_3 1st Cleaner Tails	353.3	7.7	0.26	1.28	50.5	9.50	8.52	0.24	23.5	10.9	6.1	12.5	9.0	13.0
WO_3 Rougher Tails	4149	90.8	0.067*	0.87	65.1	5.50	7.19	0.13	70.8	86.6	92.7	84.9	89.2	82.5
Head (calc.)	4572	100.0	0.086	0.91	63.70	5.88	7.31	0.14	100.0	100.0	100.0	100.0	100.0	100.0
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

Product	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 Ro Conc 1	39.0	0.9	0.07	1.2	54.4	8.8	7.5	0.13	0.7	1.1	0.7	1.3	0.9	0.8
WO_3 1st Cleaner Conc	30.5	0.7	0.64	2.0	38.8	11.4	9.6	0.81	5.0	1.4	0.4	1.3	0.9	3.8
Rougher Conc 2-4	383.8	8.4	0.29	1.3	49.6	9.7	8.6	0.29	28.5	12.3	6.5	13.8	9.9	16.7
Rougher Conc 1-4	422.8	9.2	0.27	1.3	50.0	9.6	8.5	0.27	29.2	13.4	7.3	15.1	10.8	17.5
Bulk Rougher Tail	4149	90.8	0.067	0.87	65.1	5.50	7.19	0.130	70.8	86.6	92.7	84.9	89.2	82.5
Head (calc.)	4572	100	0.086	0.91	63.7	5.88	7.31	0.14	100	100	100	100	100	100

Additional Assays

Product	Assays, %									
	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
WO_3 Ro Conc 1	16	2.55	1.79	3.07	0.47	0.18	0.16	0.01	2.44	97.4
WO_3 1st Cleaner Conc	17.7	5.58	0.47	6.64	0.97	0.28	0.09	0.02	5.58	97.9
WO_3 1st Cleaner Tails	16.4	4.03	1.38	3.88	1.63	0.24	0.11	0.02	2.66	99.1
WO_3 Rougher Tails	13.9	2.29	2.01	2.66	0.33	0.17	0.05	< 0.01	1.31	100.7

Test No.:FW15 **Project No.**: 13583-002 **Operator**: HS **Date:** **2013-06-28**

Purpose: Use Alkyl hydroxamate (Cytec 6493) as collector

Procedure: As outlined below.

Feed: ˜5 kg of Sulphide Taillins from test FM 8

Grind: P80 = 65 μm

Conditions: PSA on WO_3 Rougher Tails

Stage	Reagents added, g/t							Time, min			pH	Eh
	Na_2CO_3	Na_2SiO_3	NaOH	Cytec 6493	HCl	Pine Oil	MIBC	Grind	Cond.	Froth		mV
Sulphide RougherTail												
High intensity condition at 65% pulp density												
Condition 1		1000							10			
Condition 2				600					10			
W-Rougher 1						*16.4	5			2	10.0	
W-Rougher 2				200			15		2	2		
W-Rougher 3		500		400					2	3		
Total	0	1500	0	1200	0	16.4	20		24	7		

* Add as required to reach pH 9.0 - 10

Stage	WO_3 Rougher	WO_3 1st and 2nd Clnrs	WO_3 3rd and 4th Clnrs
Flotation Cell	10 L Cell	2.5 L	1 L
Speed: rpm	1800	1500	1200

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO3 Rougher Conc 1	22.3	0.5	3.57	9.48	31.1	8.47	27.0	5.12	18.9	5.2	0.2	0.7	1.7	18.9
WO3 Rougher Conc 2	42.1	0.9	1.92	4.89	40.8	10.9	19.5	2.61	19.2	5.1	0.6	1.7	2.3	18.2
WO3 Rougher Conc 3	47	1.0	3.13	2.55	43.6	9.60	14.9	3.21	35.0	2.9	0.7	1.6	2.0	25.0
Slimes	36.5	0.8	0.04	0.49	60.0	5.00	5.72	0.040	0.3	0.4	0.7	0.7	0.6	0.2
WO_3 Rougher Tails	4558	96.9	0.025*	0.77	63.2	5.75	7.20	0.050	26.5	86.3	97.7	95.3	93.4	37.7
Head (calc.)	4706	100.0	0.089	0.86	62.6	5.84	7.47	0.13	100.0	100.0	100.0	100.0	100.0	100.0
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

Product	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO3 Rougher Conc 1	0.5	3.57	9.48	31.1	8.47	27.0	5.12	18.9	5.2	0.2	0.7	1.7	18.9
WO3 Rougher Conc 1-2	1.4	2.49	6.48	37.4	10.1	22.1	3.48	38.1	10.3	0.8	2.4	4.0	37.1
WO3 Rougher Conc 1-3	2.4	2.76	4.82	40.0	9.87	19.1	3.37	73.1	13.2	1.5	4.0	6.0	62.0
Slimes	3.1	2.09	3.75	45.0	8.66	15.8	2.54	73.5	13.7	2.3	4.7	6.6	62.3
Bulk Rougher Tail	96.9	0.025	0.77	63.2	5.75	7.20	0.050	26.5	86.3	97.7	95.3	93.4	37.7
Head (calc.)	100.0	0.089	0.86	62.6	5.84	7.47	0.13	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	Assays, %									
	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
WO3 Rougher Conc 1	8.86	1.83	1.05	1.65	0.56	0.31	0.14	< 0.01	3.55	89.7
WO3 Rougher Conc 2	9.64	3.18	1.14	1.75	1.49	0.44	0.16	0.02	2.34	93.9
WO3 Rougher Conc 3	12.1	2.83	1.38	2.53	0.76	0.24	0.17	0.01	3.05	94.4
Slimes	18.8	2.05	2.18	3.84	0.31	0.12	0.03	< 0.01	2.91	101
WO_3 Rougher Tails	14.2	2.41	1.93	2.78	0.42	0.17	0.05	< 0.01	1.08	99.2

Test No.:FW 16 **Project No.**: 13583-002 **Operator**: HS **Date:** **2013-06-28**

Purpose: Conduct a WO_3 cleaner test on the ~12kg S Ro Tails generated from test FM9
Repeat FW2 rougher conditions, but with 4 WO3 cleaners

Procedure: As outlined below.

Feed: ˜12 kg of Sulphide Taillins from test FM 9

Grind: P80 = 63 μm

Conditions: PSA on WO_3 Rougher Tails

Stage	Reagents added, g/t					Time, min			pH	Eh	
	Na_2CO_3	Na_2SiO_3	NaOH	Flotinor FS-2	V4085	Grind	Cond.	Froth		mV	
Sulphide RougherTail											
W-Cond. 1	500		500				2		11.4		
W-Cond. 2		2000					5		10.5		
W-Cond. 3				250			5				
				75			3			23 deg	
W-Rougher 1								6.5			
W-Ro Scavenger				56			2	2		25 deg	
W-Rougher Conc											
W- 1st Cleaner	85	96	55					4	11.0		2 L cell
W- 2nd Cleaner	85	64	20					4	10.2		
W- 3rd Cleaner	20	32						3	10.5		1L cell
W- 4th Cleaner	20	16		2.8				2	10.5		
Total	710	2208	575	383.8	0		17	21.5			

Stage	WO_3 Rougher	WO_3 1st and 2nd Clnrs	WO_3 3rd and 4th Clnrs
Flotation Cell	10 L Cell	2.5 L	1 L
Speed: rpm	1800	1500	1200

Metallurgical Balance

Product	**Weight**		**Assays, %**							**% Distribution**						
	g	**%**	**WO_3**	**F**	**SiO_2**	**Fe_2O_3**	**CaO**	**P_2O_5**	**WO_3**	**F**	**SiO_2**	**Fe_2O_3**	**CaO**	**P_2O_5**
WO_3 4th Clnr Conc	8.5	0.1	14.7	13.0	5.39	7.86	47.5	0.40	11.2	1.3	0.0	0.1	0.5	0.2
WO_3 4th Clnr Tails	31.0	0.3	9.72	16.1	8.83	4.10	51.3	1.10	27.0	5.7	0.0	0.2	2.0	2.3
WO_3 3rd Clnr Tails	59.3	0.5	4.33	18.9	14.6	5.37	46.3	1.85	23.0	12.8	0.1	0.5	3.5	7.5
WO_3 2nd Clnr Tails	**95.9**	0.9	0.59	13.5	30.8	9.89	28.8	1.67	5.1	14.8	0.4	1.4	3.5	10.9
WO_3 1st Clnr Tails	224.0	2.1	0.21	4.85	46.5	11.4	12.0	0.97	4.2	12.4	1.5	3.7	3.4	14.8
WO_3 Ro Scav Conc	78.0	0.7	0.26	2.50	46.8	11.2	9.64	1.40	1.8	2.2	0.5	1.3	1.0	7.5
WO_3 Ro Scav Tails	10383	95.4	0.030*	0.43	63.7	6.14	6.51	0.080	27.7	50.9	97.3	92.9	86.1	56.7
Head (calc.)	10879	100.0	0.10	0.81	62.5	6.31	7.22	0.13	70.5	46.9	2.1	5.8	13.0	35.8
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 4th Clnr Conc	0.08	14.7	13.0	5.39	7.86	47.5	0.40	11.2	1.3	0.0	0.1	0.5	0.2
WO_3 3rd Clnr Conc	0.36	10.8	15.4	8.09	4.91	50.5	0.95	38.2	7.0	0.0	0.3	2.5	2.6
WO_3 2nd Clnr Conc	0.91	6.91	17.5	12.0	5.19	48.0	1.49	61.2	19.7	0.2	0.7	6.0	10.1
WO_3 1st Clnr Conc	1.79	3.80	15.5	21.3	7.50	38.5	1.58	66.3	34.5	0.6	2.1	9.6	21.0
WO_3 Rougher Conc	3.85	1.88	9.82	34.8	9.59	24.3	1.25	70.5	46.9	2.1	5.8	13.0	35.8
WO_3 Ro +Ro Scav Conc	4.57	1.62	8.67	36.7	9.84	22.0	1.28	72.3	49.1	2.7	7.1	13.9	43.3
WO_3 Ro Scav Tails	95.4	0.030	0.43	63.7	6.14	6.51	0.080	27.7	50.9	97.3	92.9	86.1	56.7
Head (calc.)	100.00	0.10	0.81	62.5	6.31	7.22	0.13	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	**Assays, %**									
	Al_2O_3	**MgO**	**Na_2O**	**K_2O**	**TiO_2**	**MnO**	**Cr_2O_3**	**V_2O_5**	**LOI**	**Sum**
WO_3 4th Clnr Conc	1.53	1.14	0.21	0.53	0.08	0.04	0.03	0.01	5.12	69.8
WO_3 4th Clnr Tails	2.65	1.74	0.11	1.00	0.13	0.06	0.01	0.01	3.58	74.6
WO_3 3rd Clnr Tails	4.29	2.36	0.38	1.32	0.22	0.11	0.01	< 0.01	5.87	82.7
WO_3 2nd Clnr Tails	9.45	4.06	0.79	2.63	0.41	0.22	0.02	0.01	3.65	92.4
WO_3 1st Clnr Tails	13.7	4.45	1.27	3.24	0.52	0.28	0.03	0.01	4.28	98.7
WO_3 Ro Scav Conc	13.8	4.26	1.35	3.22	0.49	0.29	0.04	< 0.01	6.55	99.1
WO_3 Ro Scav Tails	14.1	2.35	1.96	2.74	0.43	0.16	0.03	< 0.01	2.27	100.4

Test No.:FW 17 **Project No.**: 13583-002 **Operator**: HS **Date: 2013-06-28**

Purpose: Conduct a WO_3 cleaner test on the ~12kg S Ro Tails grnerated from test FM10
Repeat FW2 rougher conditions, but with 4 WO3 cleaners

Procedure: As outlined below.

Feed: ~12 kg of Sulphide Taillins from test FM 10

Grind: P80 = 62 μm

Conditions: PSA on WO_3 Rougher Tails

Stage	Reagents added, g/t					Time, min			pH	Eh	
	Na_2CO_3	Na_2SiO_3	NaOH	Flotinor FS-2	V4085	Grind	Cond.	Froth		mV	
Sulphide RougherTail											
W-Cond. 1	500		500				2		11.4		
W-Cond. 2		1600					5		10.8		
W-Cond. 3				325	9		8				
W-Rougher 1								10			
W-Ro Scavenger				30			2	2			
W-Rougher Conc											
W- 1st Cleaner	85	130	85				1	6	10.9		2L cell
W- 2nd Cleaner	40	96	20				1	4	10.7		
W- 3rd Cleaner	25	48					1	2	10.5		1L Cell
W- 4th Cleaner	25	48					1	2	10.5		
Total	675	1922	605	355	9		21	26			

Stage	WO_3 Rougher	WO_3 1st and 2nd Clnrs	WO_3 3rd and 4th Clnrs
Flotation Cell	10 L Cell	2.5 L	1 L
Speed: rpm	1800	1500	1200

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 4th Clnr Conc	47.8	0.4	10.5	14.2	5.28	2.70	55.4	1.49	41.4	8.1	0.0	0.2	3.3	4.7
WO_3 4th Clnr Tails	63.5	0.6	2.90	15.0	11.8	4.11	51.2	3.42	15.2	11.4	0.1	0.4	4.1	14.2
WO_3 3rd Clnr Tails	73.0	0.7	0.82	13.6	21.8	7.08	38.6	3.25	4.9	11.8	0.2	0.8	3.5	15.5
WO_3 2nd Clnr Tails	120.3	1.1	0.36	6.96	39.3	11.10	18.9	2.07	3.6	10.0	0.7	1.9	2.8	16.3
WO_3 1st Clnr Tails	353.3	3.3	0.090	2.11	45.4	12.4	12.0	0.69	2.6	8.9	2.4	6.4	5.3	16.0
WO_3 Ro Tails	10181	93.9	0.038*	0.41	64.3	6.11	6.34	0.050	32.2	49.8	96.6	90.4	80.9	33.3
Head (calc.)	10839	100.0	0.11	0.77	62.6	6.35	7.36	0.14	67.8	50.2	3.4	9.6	19.1	66.7
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

Product	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WO_3 4th Clnr Conc	0.44	10.5	14.2	5.28	2.70	55.4	1.49	41.4	8.1	0.0	0.2	3.3	4.7
WO_3 3rd Clnr Conc	1.03	6.16	14.7	9.00	3.50	53.0	2.59	56.7	19.5	0.1	0.6	7.4	18.9
WO_3 2nd Clnr Conc	1.70	4.05	14.2	14.1	4.92	47.3	2.85	61.6	31.3	0.4	1.3	10.9	34.4
WO_3 1st Clnr Conc	2.81	2.59	11.4	24.0	7.36	36.1	2.54	65.2	41.3	1.1	3.3	13.8	50.7
WO_3 Rougher Conc	6.07	1.25	6.4	35.5	10.1	23.2	1.55	67.8	50.2	3.4	9.6	19.1	66.7
WO_3 Ro Tails	93.9	0.038	0.41	64.3	6.11	6.34	0.050	32.2	49.8	96.6	90.4	80.9	33.3
Head (calc.)	100.00	0.11	0.77	62.6	6.35	7.36	0.14	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	Assays, %									
	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
WO_3 4th Clnr Conc	1.32	1.01	0.06	0.44	0.08	0.07	0.03	< 0.01	4.52	72.4
WO_3 4th Clnr Tails	3.24	1.85	0.31	0.79	0.17	0.16	0.01	< 0.01	6.04	83.1
WO_3 3rd Clnr Tails	6.13	2.96	0.61	1.53	0.28	0.27	< 0.01	< 0.01	7.76	90.3
WO_3 2nd Clnr Tails	10.9	4.26	1.08	2.34	0.46	0.34	0.01	< 0.01	5.07	95.8
WO_3 1st Clnr Tails	12.8	4.29	1.29	2.81	0.49	0.47	0.02	0.01	7.41	100.1
WO_3 Ro Scav Tails	14.2	2.43	1.96	2.77	0.43	0.16	0.02	< 0.01	1.38	100.2

Test No.:FW 18 **Project No.**: 13583-002 **Operator**: HS **Date:** **2013-06-28**

Purpose: Conduct a WO_3 cleaner test on 2 x 12kg S Ro Tails grnerated from test FM11 and FM12

Procedure: Conduct WO3 rougher tests on the S Ro tails from FM11 and FM12 separately in the 10L cell
Combine the two rougher concentrates
Conduct a WO3 cleaner test on combined WO3 rougher concentrates

Feed: 2 x 12 kg of Sulphide Taillins from test FM 11 and FM12

Grind: P80 = 62 µm

Conditions: PSA on WO_3 Rougher Tails

Stage	Reagents added, g/t					Time, min			pH	Eh
	Na_2CO_3	Na_2SiO_3	NaOH	Flotinor FS-2	V4085	Grind	Cond.	Froth		mV
Sulphide RougherTail (2 x 12kg)										
W-Cond. 1	500		500				2		11.8	
W-Cond. 2		2000					5		11.4	
W-Cond. 3				250			5			
W-Rougher 1								10		
W-Rougher 2										
W-Rougher 3										
Comb W-Rougher Concs										
W- 1st Cleaner	100	96	100				1	6	11.5	
W- 2nd Cleaner	100	64					1	6	11.2	
W- 3rd Cleaner	50	32					1	3	10.8	
W - 5th Cleaner Conc										
Super Pan										
Total	750	2192	600	250			15	25		

Stage	WO_3 Rougher	WO_3 1st and 2nd Clnrs	WO_3 3rd and 4th Clnrs
Flotation Cell	10 L Cell	2.5 L	1 L
Speed: rpm	1800	1500	1200

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
S. Pan Conc	22.3	0.1	32.5	12.6					36.6	1.7				
S. Pan Midd	8.3	0.04	16.4	12.6					6.9	0.6				
S. Pan Tail	5.1	0.02	6.68	14.5					1.7	0.4				
WO_3 5th Clnr Tails	25.6	0.1	5.41	13.6	4.53	1.99	60.8	2.74	7.0	2.1	0.01	0.04	0.97	2.39
WO_3 4th Clnr Tails	40.5	0.2	2.34	15.9	8.60	2.88	58.5	2.84	4.8	3.9	0.0	0.1	1.5	3.9
WO_3 3rd Clnr Tails	94.5	0.4	1.67	18.5	14.9	4.55	51.1	2.12	8.0	10.6	0.1	0.3	3.0	6.8
WO_3 2nd Clnr Tails	166.2	0.8	0.52	14.8	30.6	7.90	31.6	1.55	4.4	14.9	0.4	0.9	3.3	8.8
WO_3 1st Clnr Tails	842.3	3.8	0.10	3.19	49.9	11.6	9.60	0.49	4.2	16.3	3.0	6.9	5.0	14.0
WO_3 Ro Tails	20927	94.6	0.025*	0.39	64.0	6.16	6.61	0.090	26.5	49.4	96.5	91.7	86.2	64.1
Head (calc.)	22132	100.0	0.090	0.75	62.73	6.35	7.25	0.13	100.0	100.0	100.0	100.0	100.0	100.0
Head (dir.)														

* Reassayed using ICP_MS

Combined Products

Product	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
S Pan Conc	0.1	32.5	12.6					36.6	1.7				
S Pan Conc +Mid's	0.1	28.1	12.6					43.4	2.3				
WO_3 5th Clnr Conc	0.2	25.1	12.9					45.2	2.8				
WO_3 4th Clnr Conc	0.3	16.9	13.2	1.89	0.83	25.4	1.14	52.1	4.9	0.01	0.04	1.0	2.4
WO_3 3rd Clnr Conc	0.5	11.1	14.3	4.56	1.65	38.6	1.82	56.9	8.8	0.03	0.1	2.4	6.3
WO_3 2nd Clnr Conc	0.9	6.6	16.3	9.54	3.04	44.6	1.96	64.9	19.4	0.1	0.4	5.5	13.1
WO_3 1st Clnr Conc	1.6	3.79	15.6	19.2	5.27	38.6	1.77	69.3	34.3	0.5	1.4	8.7	21.9
WO_3 Rougher Conc	5.4	1.21	6.93	40.7	9.70	18.3	0.88	73.5	50.6	3.5	8.3	13.8	35.9
WO_3 Ro Tails	94.6	0.025	0.39	64.0	6.16	6.61	0.090	26.5	49.4	96.5	91.7	86.2	64.1
Head (calc.)	100.0	0.09	0.75	62.7	6.35	7.25	0.13	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

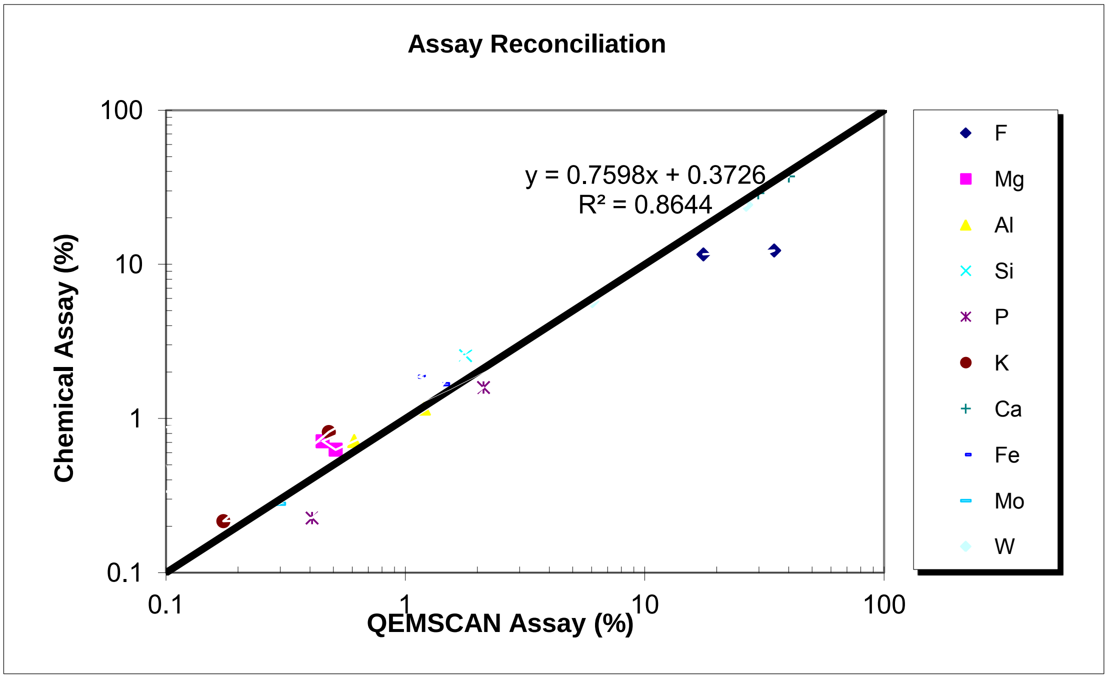
Product	Assays, %									
	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
Super Pan Conc										
Super Pan Tails										
WO_3 5th Clnr Tails	1.08	0.62	0.19	0.23	0.07	0.05	0.04	< 0.01	3.57	75.9
WO_3 4th Clnr Tails	2.25	1.01	0.34	0.48	0.12	0.09	0.02	< 0.01	3.4	80.5
WO_3 3rd Clnr Tails	4.14	1.72	0.46	0.96	0.19	0.12	0.03	< 0.01	2.79	83.1
WO_3 2nd Clnr Tails	8.68	3.08	0.97	2.09	0.36	0.23	0.03	0.01	4.38	91.5
WO_3 1st Clnr Tails	14.5	4.17	1.39	3.51	0.5	0.27	0.05	0.02	4.31	100.4
WO_3 Ro Tails	14.3	2.4	2.01	2.77	0.44	0.16	0.04	< 0.01	1.9	101

Appendix B – Details of QEMSCAN Analysis on Tungsten Cleaner Concentrates

Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Assay Reconciliation

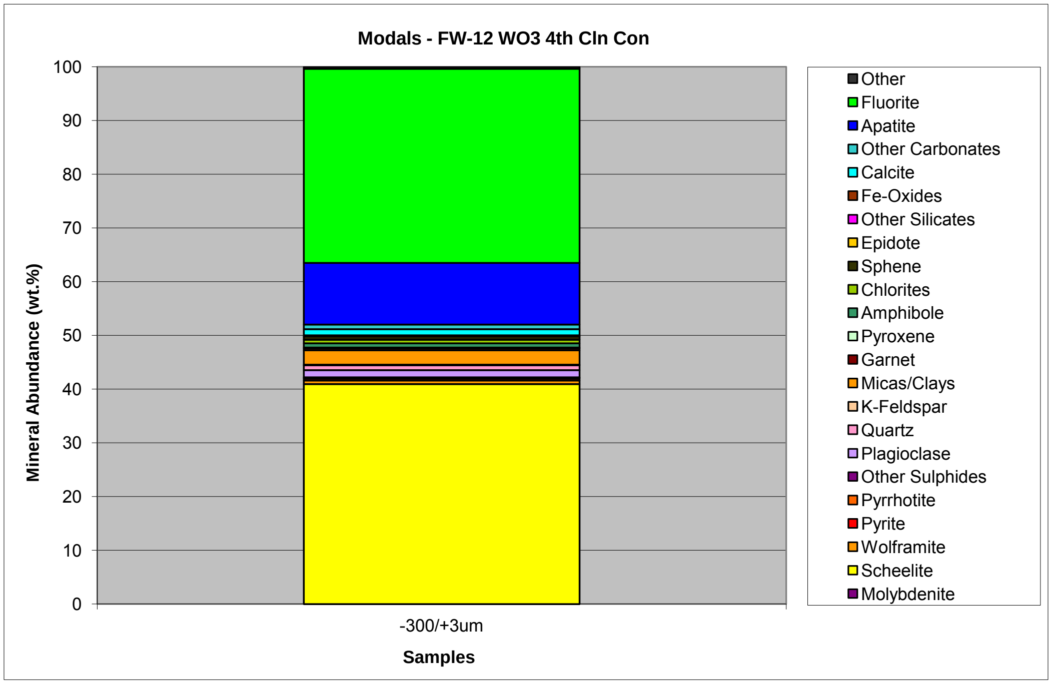


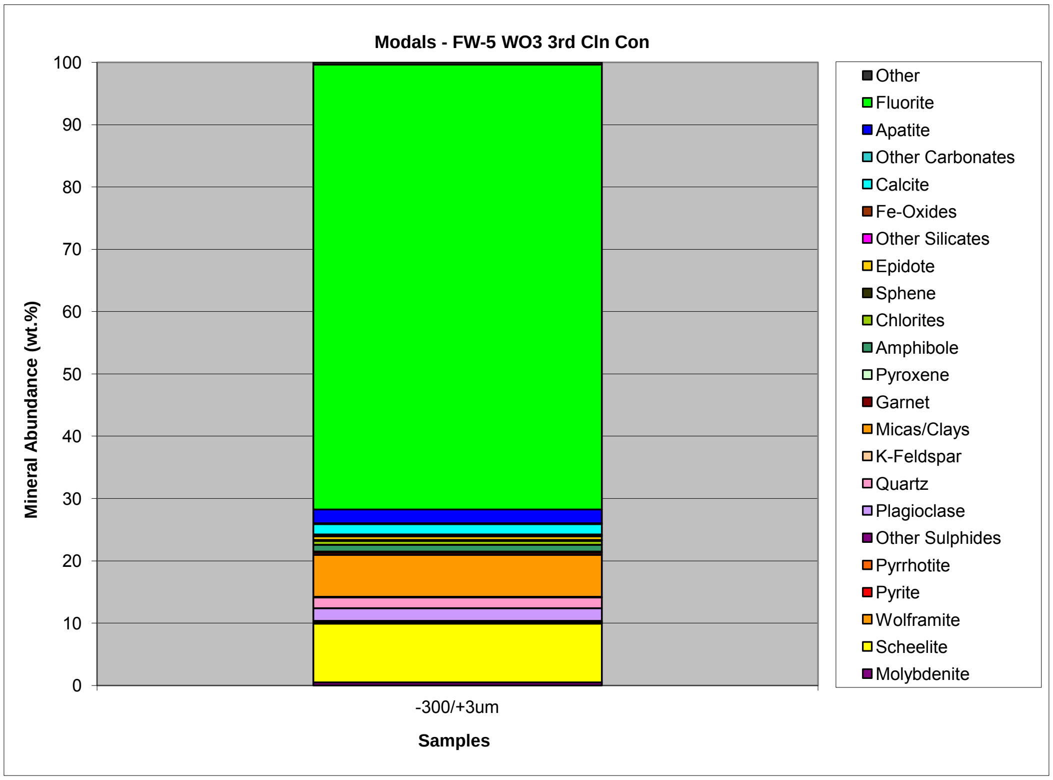
	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
	-300/+3um	-300/+3um
F (QEMSCAN)	17.6	34.7
F (Chemical)	11.6	12.3
Mg (QEMSCAN)	0.45	0.51
Mg (Chemical)	0.71	0.63
Al (QEMSCAN)	0.61	1.20
Al (Chemical)	0.71	1.16
Si (QEMSCAN)	1.78	0.00
Si (Chemical)	2.56	0.00
P (QEMSCAN)	2.12	0.41
P (Chemical)	1.59	0.23
K (QEMSCAN)	0.17	0.48
K (Chemical)	0.22	0.82
Ca (QEMSCAN)	29.8	40.0
Ca (Chemical)	28.9	37.2
Fe (QEMSCAN)	1.14	1.44
Fe (Chemical)	1.87	1.67
Mo (QEMSCAN)	0.01	0.30
Mo (Chemical)	0.50	0.28
W (QEMSCAN)	26.5	6.04
W (Chemical)	24.3	5.77

Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

<u>Modal Charts</u>





Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

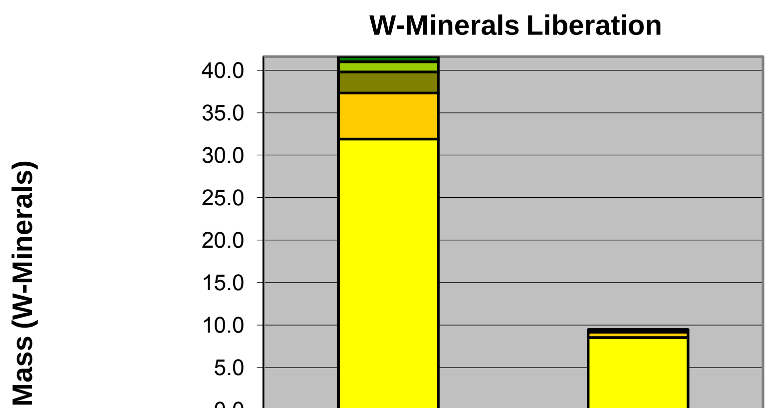
Modals

Survey		Agnico-Eagle (Jennings)	
Project		13583-002 / MI5012-DEC12	
Sample		FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Fraction		-300/+3um	-300/+3um
Mass Size Distribution (%)		100.0	100.0
Calculated ESD Particle Size		20	18
		Sample	Sample
Mineral Mass (%)	Molybdenite	0.02	0.50
	Scheelite	40.9	9.44
	Wolframite	0.67	0.03
	Pyrite	0.36	0.22
	Pyrrhotite	0.15	0.02
	Other Sulphides	0.10	0.19
	Plagioclase	1.33	2.03
	Quartz	0.90	1.71
	K-Feldspar	0.11	0.13
	Micas/Clays	2.67	6.69
	Garnet	0.35	0.39
	Pyroxene	0.17	0.19
	Amphibole	0.78	1.08
	Chlorites	0.65	0.61
	Sphene	0.15	0.17
	Epidote	0.37	0.56
	Other Silicates	0.08	0.13
	Fe-Oxides	0.25	0.18
	Calcite	1.11	1.66
	Other Carbonates	0.89	0.14
	Apatite	11.5	2.20
	Fluorite	36.1	71.4
	Other	0.36	0.38
	Total	100.0	100.0
Mean Grain Size by Frequency (μm)	Molybdenite	10	16
	Scheelite	22	22
	Wolframite	16	10
	Pyrite	12	13
	Pyrrhotite	7	6
	Other Sulphides	8	12
	Plagioclase	13	11
	Quartz	14	12
	K-Feldspar	10	9
	Micas/Clays	8	10
	Garnet	9	8
	Pyroxene	9	8
	Amphibole	7	7
	Chlorites	8	6
	Sphene	10	9
	Epidote	6	6
	Other Silicates	7	8
	Fe-Oxides	10	15
	Calcite	13	11
	Other Carbonates	14	9
	Apatite	18	15
	Fluorite	19	18
	Other	9	15

Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

W-Minerals Liberation



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Locked W-Minerals	0.60	0.05
Sub Midds W-Minerals	1.20	0.09
Midds W-Minerals	2.50	0.15
Lib W-Minerals	5.42	0.64
Free W-Minerals	31.9	8.53

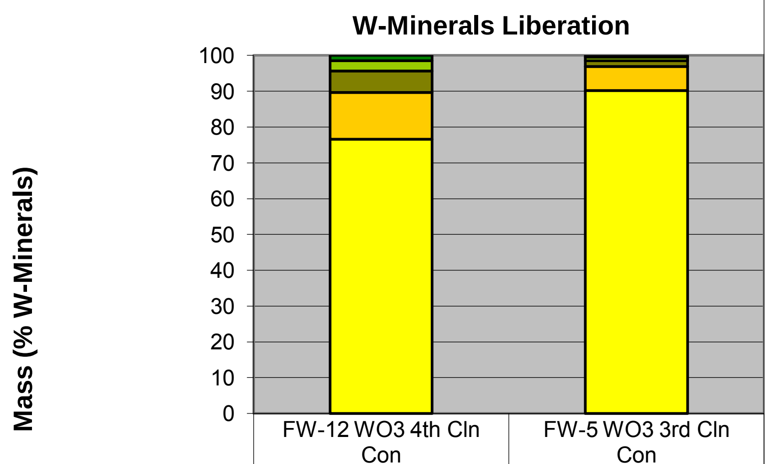
Absolute Mass of W-Minerals Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free W-Minerals	31.9	8.53
Lib W-Minerals	5.42	0.64
Midds W-Minerals	2.50	0.15
Sub Midds W-Minerals	1.20	0.09
Locked W-Minerals	0.60	0.05
Total	41.6	9.46

Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

W-Minerals Liberation



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Locked W-Minerals	1.44	0.51
Sub Midds W-Minerals	2.88	0.99
Midds W-Minerals	6.02	1.58
Lib W-Minerals	13.0	6.76
Free W-Minerals	76.6	90.2

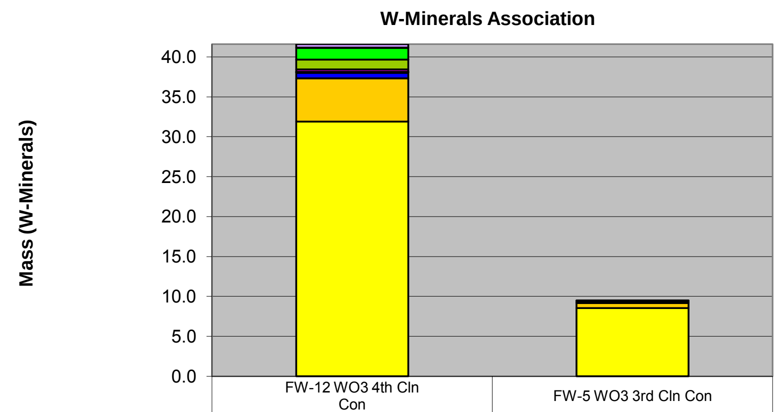
Normalized Mass of W-Minerals Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free W-Minerals	76.6	90.2
Lib W-Minerals	13.0	6.76
Midds W-Minerals	6.02	1.58
Sub Midds W-Minerals	2.88	0.99
Locked W-Minerals	1.44	0.51
Total	100.0	100.0

Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

W-Minerals Association



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	0.45	0.01
W-Minerals:Other	0.02	0.00
W-Minerals:Fluorite	1.47	0.17
W-Minerals:Sphene	0.00	0.00
W-Minerals:Molybdenite	0.00	0.00
W-Minerals:Other-Silicate	1.24	0.02
W-Minerals:Quartz	0.29	0.05
W-Minerals:Garnet	0.00	0.00
W-Minerals:Other-Sulphides	0.00	0.00
W-Minerals:FeS=	0.04	0.00
W-Minerals:Fe-Oxides	0.00	0.00
W-Minerals:Carbonates	0.08	0.03
W-Minerals:Apatite	0.70	0.01
Lib W-Minerals	5.42	0.64
Free W-Minerals	31.9	8.53

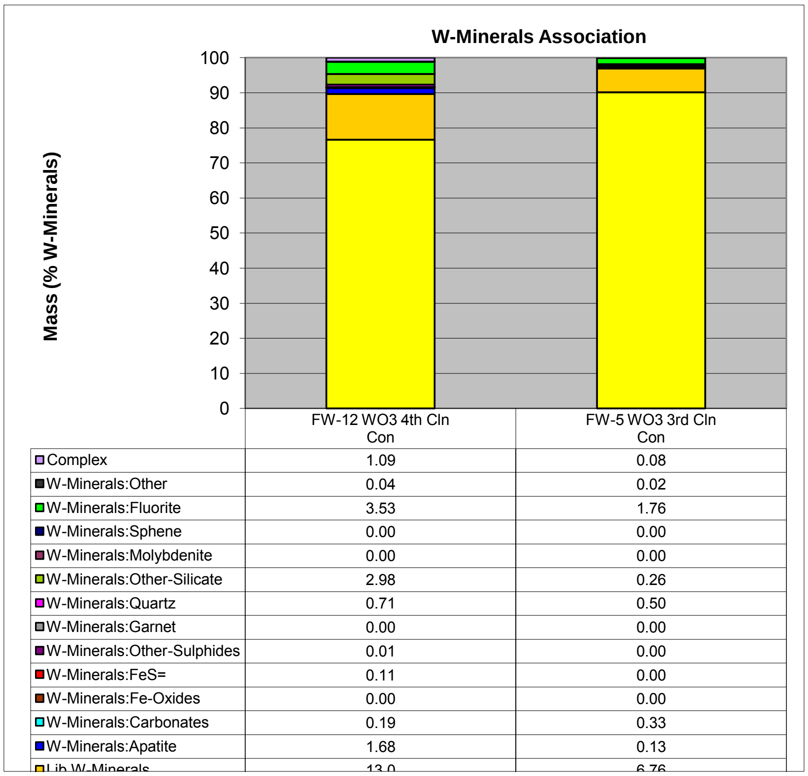
Absolute Mass of W-Minerals Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free W-Minerals	31.9	8.53
Lib W-Minerals	5.42	0.64
W-Minerals:Apatite	0.70	0.01
W-Minerals:Carbonates	0.08	0.03
W-Minerals:Fe-Oxides	0.00	0.00
W-Minerals:FeS=	0.04	0.00
W-Minerals:Other-Sulphides	0.00	0.00
W-Minerals:Garnet	0.00	0.00
W-Minerals:Quartz	0.29	0.05
W-Minerals:Other-Silicate	1.24	0.02
W-Minerals:Molybdenite	0.00	0.00
W-Minerals:Sphene	0.00	0.00
W-Minerals:Fluorite	1.47	0.17
W-Minerals:Other	0.02	0.00
Complex	0.45	0.01
Total	41.6	9.46

Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

W-Minerals Association



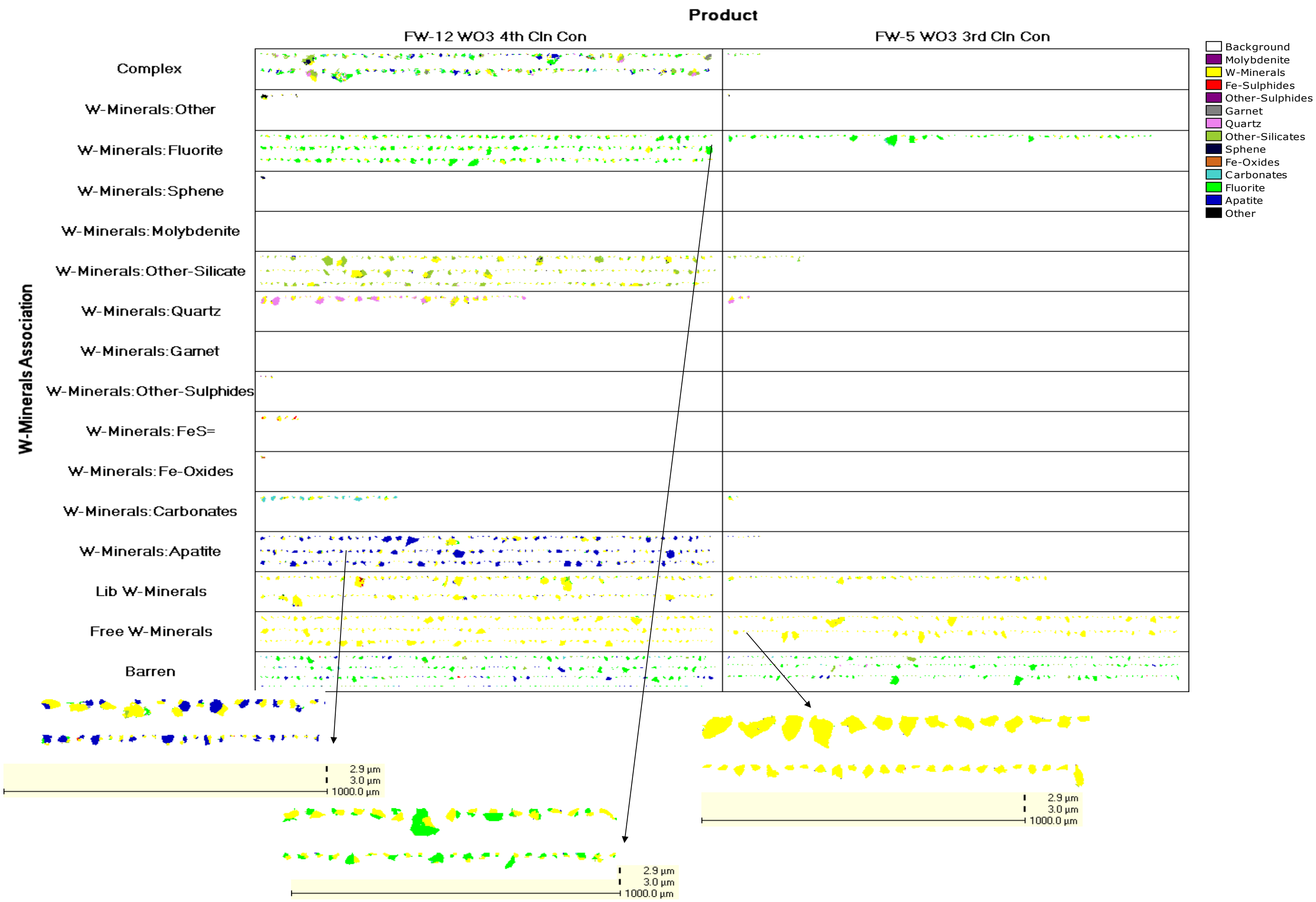
Normalized Mass of W-Minerals Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free W-Minerals	76.6	90.2
Lib W-Minerals	13.0	6.76
W-Minerals:Apatite	1.68	0.13
W-Minerals:Carbonates	0.19	0.33
W-Minerals:Fe-Oxides	0.00	0.00
W-Minerals:FeS=	0.11	0.00
W-Minerals:Other-Sulphides	0.01	0.00
W-Minerals:Garnet	0.00	0.00
W-Minerals:Quartz	0.71	0.50
W-Minerals:Other-Silicate	2.98	0.26
W-Minerals:Molybdenite	0.00	0.00
W-Minerals:Sphene	0.00	0.00
W-Minerals:Fluorite	3.53	1.76
W-Minerals:Other	0.04	0.02
Complex	1.09	0.08
Total	100.0	100.0

Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

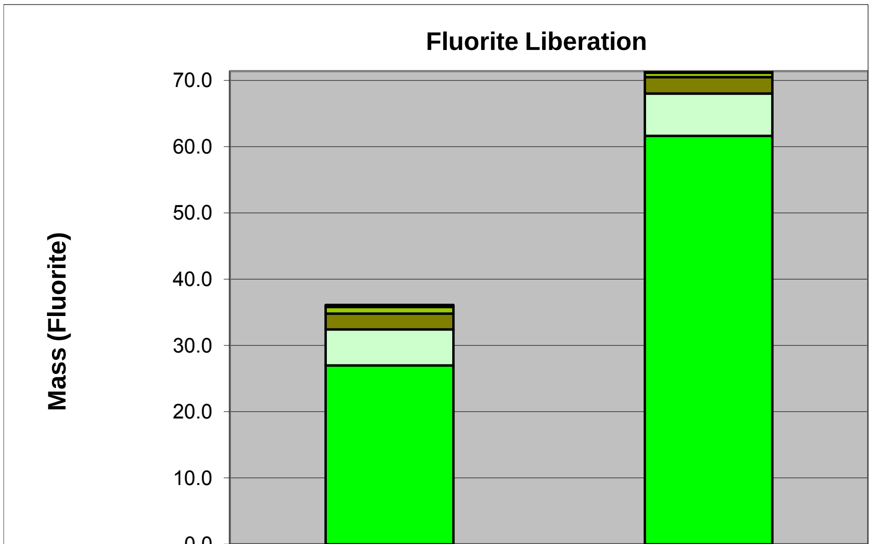
W-Minerals Association Image Grid



Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

<u>Fluorite Liberation</u>



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Locked Fluorite	0.32	0.24
Sub Midds Fluorite	0.97	0.66
Midds Fluorite	2.39	2.49
Lib Fluorite	5.46	6.35
Free Fluorite	27.0	61.6

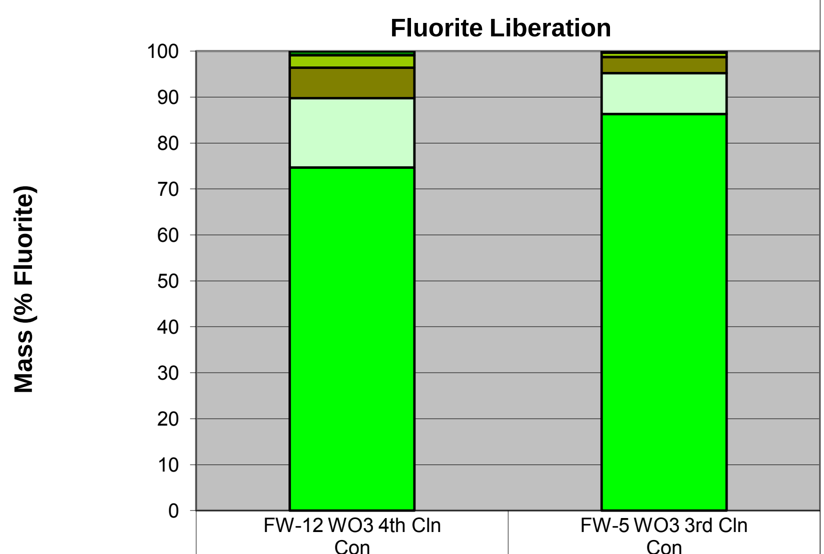
<u>Absolute Mass of Fluorite Across Samples</u>

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Fluorite	27.0	61.6
Lib Fluorite	5.46	6.35
Midds Fluorite	2.39	2.49
Sub Midds Fluorite	0.97	0.66
Locked Fluorite	0.32	0.24
Total	36.1	71.4

Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Fluorite Liberation



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Locked Fluorite	0.90	0.33
Sub Midds Fluorite	2.69	0.93
Midds Fluorite	6.62	3.49
Lib Fluorite	15.1	8.90
Free Fluorite	74.7	86.3

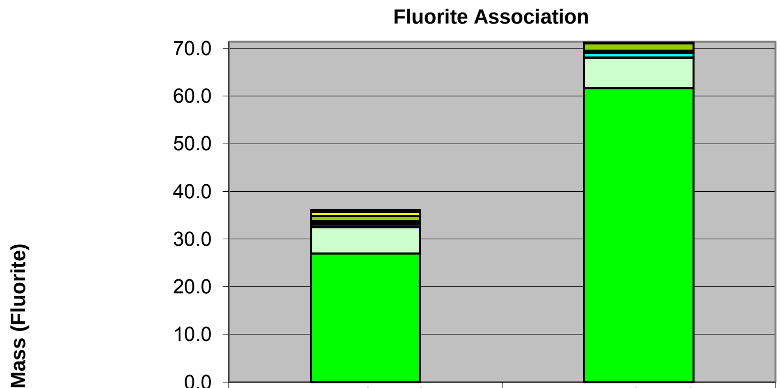
Normalized Mass of Fluorite Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Fluorite	74.7	86.3
Lib Fluorite	15.1	8.90
Midds Fluorite	6.62	3.49
Sub Midds Fluorite	2.69	0.93
Locked Fluorite	0.90	0.33
Total	100.0	100.0

Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Fluorite Association



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	0.21	0.13
Fluorite:Other	0.00	0.00
Fluorite:Moly	0.21	0.08
Fluorite:Wolframite	0.00	0.00
Fluorite:Sphene	0.03	0.04
Fluorite:Scheelite	0.77	0.08
Fluorite:Other-Silicate	1.05	1.58
Fluorite:Quartz	0.14	0.34
Fluorite:Garnet	0.08	0.07
Fluorite:Other-Sulphides	0.00	0.01
Fluorite:FeS=	0.03	0.01
Fluorite:Fe-Oxides	0.00	0.00
Fluorite:Carbonates	0.47	0.97
Fluorite:Apatite	0.68	0.09
Lib Fluorite	5.46	6.35
Free Fluorite	27.0	61.6

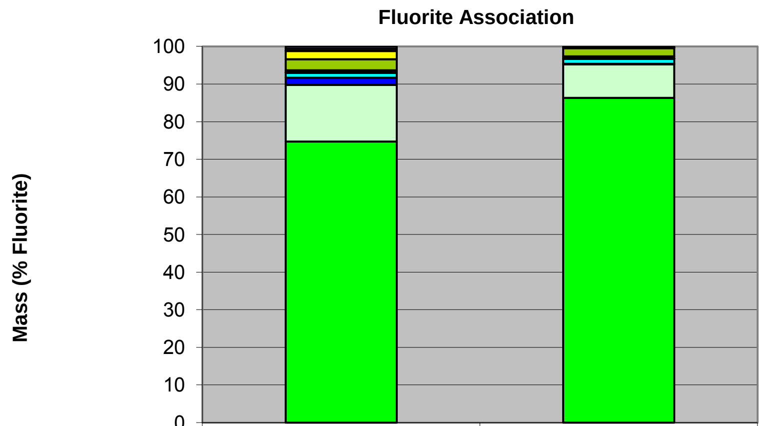
Absolute Mass of Fluorite Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Fluorite	27.0	61.6
Lib Fluorite	5.46	6.35
Fluorite:Apatite	0.68	0.09
Fluorite:Carbonates	0.47	0.97
Fluorite:Fe-Oxides	0.00	0.00
Fluorite:FeS=	0.03	0.01
Fluorite:Other-Sulphides	0.00	0.01
Fluorite:Garnet	0.08	0.07
Fluorite:Quartz	0.14	0.34
Fluorite:Other-Silicate	1.05	1.58
Fluorite:Scheelite	0.77	0.08
Fluorite:Sphene	0.03	0.04
Fluorite:Wolframite	0.00	0.00
Fluorite:Moly	0.21	0.08
Fluorite:Other	0.00	0.00
Complex	0.21	0.13
Total	36.1	71.4

Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Fluorite Association



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	0.59	0.18
Fluorite:Other	0.00	0.00
Fluorite:Moly	0.57	0.11
Fluorite:Wolframite	0.01	0.00
Fluorite:Sphene	0.10	0.05
Fluorite:Scheelite	2.13	0.11
Fluorite:Other-Silicate	2.91	2.21
Fluorite:Quartz	0.38	0.48
Fluorite:Garnet	0.22	0.10
Fluorite:Other-Sulphides	0.01	0.01
Fluorite:FeS=	0.08	0.01
Fluorite:Fe-Oxides	0.00	0.00
Fluorite:Carbonates	1.31	1.36
Fluorite:Apatite	1.88	0.13
Lib Fluorite	15.1	8.90
Free Fluorite	74.7	86.3

Normalized Mass of Fluorite Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Fluorite	74.7	86.3
Lib Fluorite	15.1	8.90
Fluorite:Apatite	1.88	0.13
Fluorite:Carbonates	1.31	1.36
Fluorite:Fe-Oxides	0.00	0.00
Fluorite:FeS=	0.08	0.01
Fluorite:Other-Sulphides	0.01	0.01
Fluorite:Garnet	0.22	0.10
Fluorite:Quartz	0.38	0.48
Fluorite:Other-Silicate	2.91	2.21
Fluorite:Scheelite	2.13	0.11
Fluorite:Sphene	0.10	0.05
Fluorite:Wolframite	0.01	0.00
Fluorite:Moly	0.57	0.11
Fluorite:Other	0.00	0.00
Complex	0.59	0.18
Total	100.0	100.0

Agnico-Eagle (Jennings)
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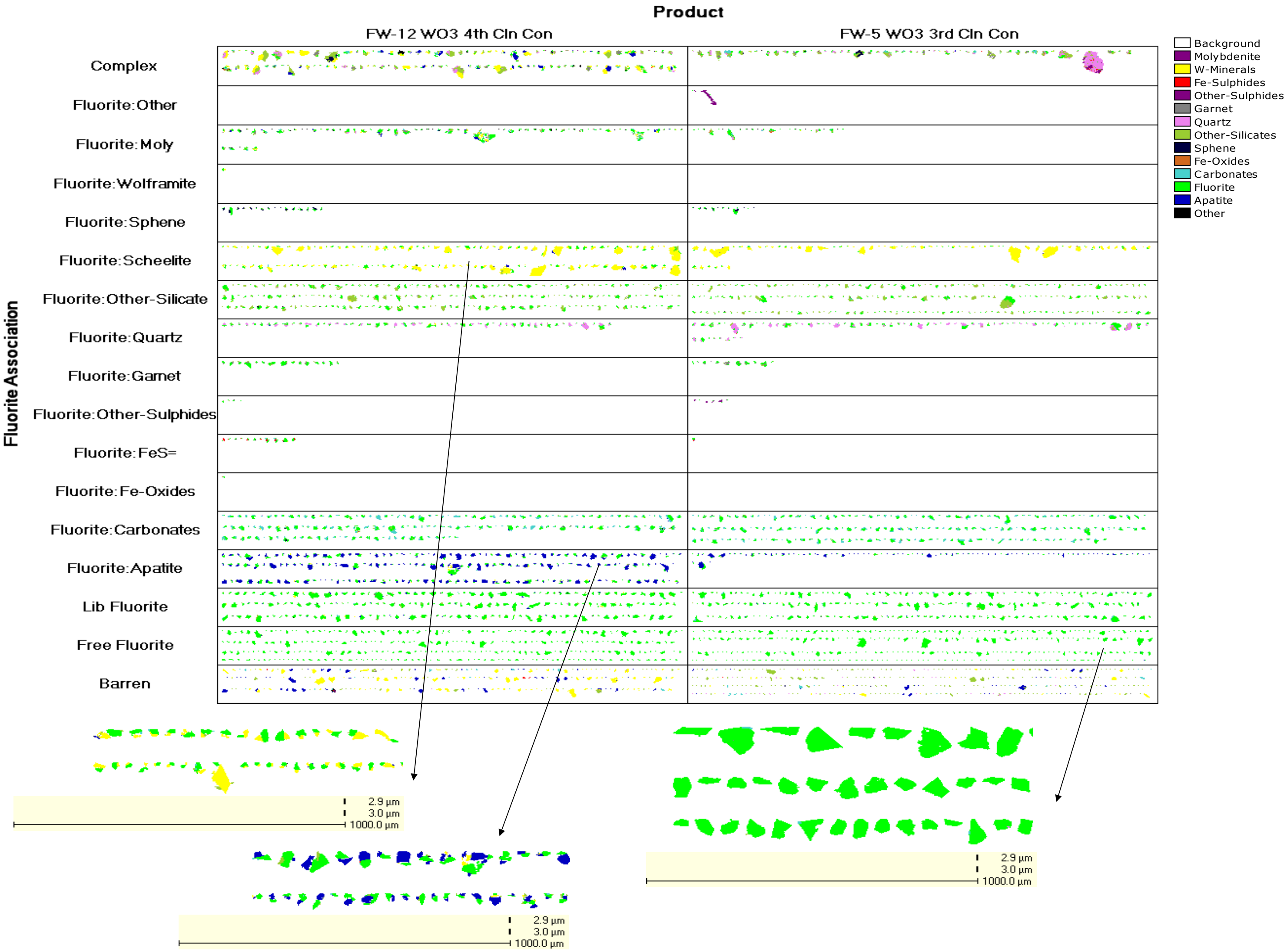
High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

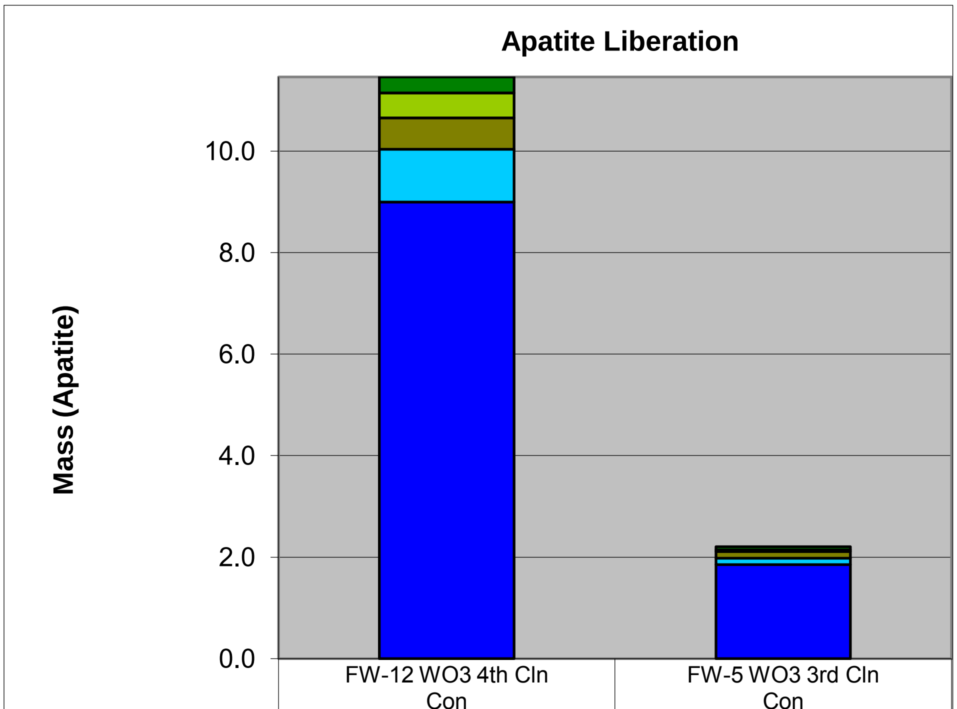
Fluorite Association Image Grid



Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Apatite Liberation



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Locked Apatite	0.31	0.06
Sub Midds Apatite	0.49	0.03
Midds Apatite	0.61	0.13
Lib Apatite	1.04	0.13
Free Apatite	9.00	1.86

Absolute Mass of Apatite Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Apatite	9.00	1.86
Lib Apatite	1.04	0.13
Midds Apatite	0.61	0.13
Sub Midds Apatite	0.49	0.03
Locked Apatite	0.31	0.06
Total	11.5	2.20

Agnico-Eagle (Jennings)
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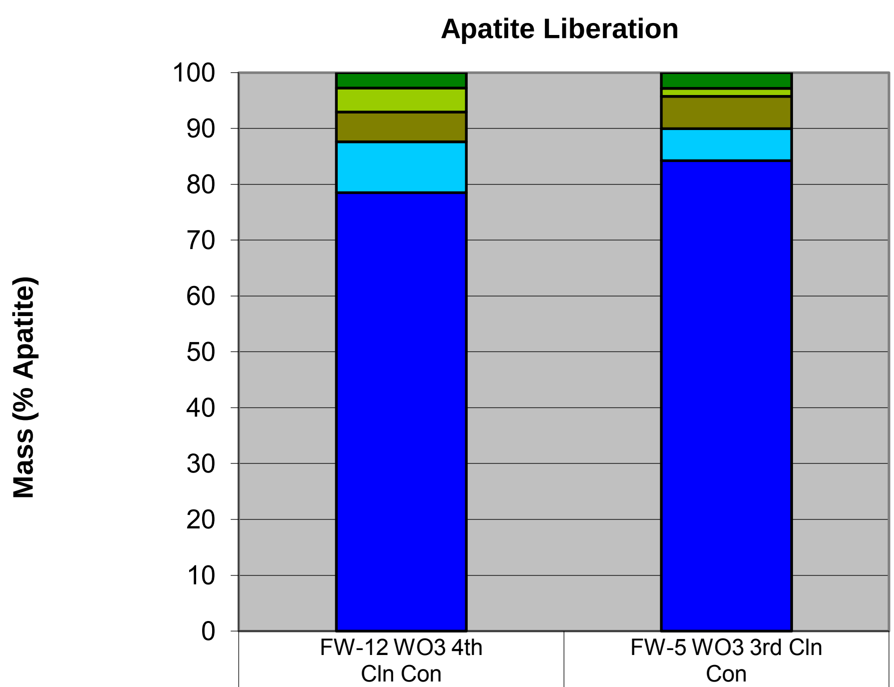
High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Apatite Liberation



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Locked Apatite	2.74	2.85
Sub Midds Apatite	4.31	1.39
Midds Apatite	5.36	5.81
Lib Apatite	9.10	5.72
Free Apatite	78.5	84.2

Normalized Mass of Apatite Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Apatite	78.5	84.2
Lib Apatite	9.10	5.72
Midds Apatite	5.36	5.81
Sub Midds Apatite	4.31	1.39
Locked Apatite	2.74	2.85
Total	100.0	100.0

Agnico-Eagle (Jennings)
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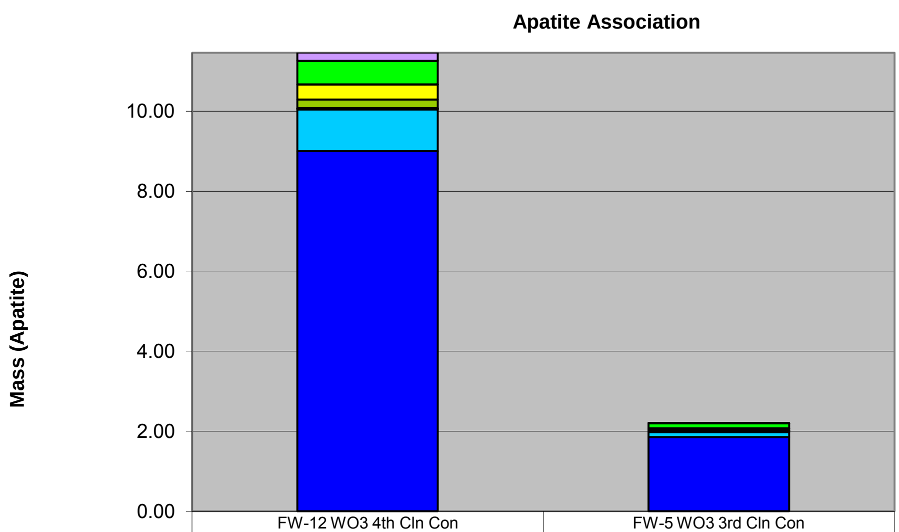
High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Apatite Association



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	0.21	0.01
Apatite:Other	0.00	0.00
Apatite:Fluorite	0.59	0.12
Apatite:Wolframite	0.00	0.00
Apatite:Sphene	0.01	0.00
Apatite:Scheelite	0.37	0.01
Apatite:Other-Silicate	0.21	0.04
Apatite:Quartz	0.01	0.00
Apatite:Garnet	0.00	0.04
Apatite:Other-Sulphides	0.00	0.00
Apatite:FeS=	0.00	0.00
Apatite:Fe-Oxides	0.00	0.00
Apatite:Carbonates	0.02	0.00
Apatite: Moly	0.00	0.00
Lib Apatite	1.04	0.13
Free Apatite	9.00	1.86

Absolute Mass of Apatite Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Apatite	9.00	1.86
Lib Apatite	1.04	0.13
Apatite: Moly	0.00	0.00
Apatite:Carbonates	0.02	0.00
Apatite:Fe-Oxides	0.00	0.00
Apatite:FeS=	0.00	0.00
Apatite:Other-Sulphides	0.00	0.00
Apatite:Garnet	0.00	0.04
Apatite:Quartz	0.01	0.00
Apatite:Other-Silicate	0.21	0.04
Apatite:Scheelite	0.37	0.01
Apatite:Sphene	0.01	0.00
Apatite:Wolframite	0.00	0.00
Apatite:Fluorite	0.59	0.12
Apatite:Other	0.00	0.00
Complex	0.21	0.01
Total	11.5	2.20

Agnico-Eagle (Jennings)
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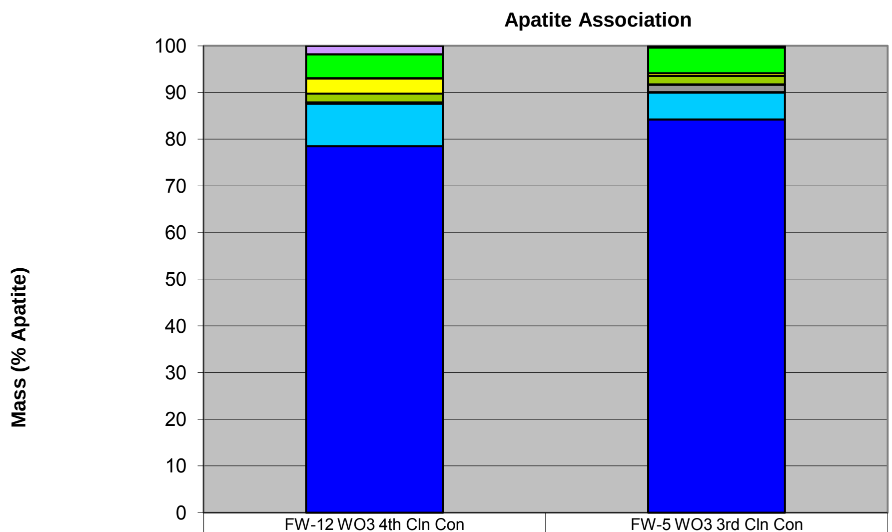
High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Apatite Association



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	1.81	0.34
Apatite:Other	0.01	0.01
Apatite:Fluorite	5.11	5.52
Apatite:Wolframite	0.00	0.00
Apatite:Sphene	0.04	0.00
Apatite:Scheelite	3.25	0.61
Apatite:Other-Silicate	1.86	1.76
Apatite:Quartz	0.11	0.08
Apatite:Garnet	0.03	1.61
Apatite:Other-Sulphides	0.02	0.00
Apatite:FeS=	0.03	0.00
Apatite:Fe-Oxides	0.00	0.00
Apatite:Carbonates	0.13	0.11
Apatite: Moly	0.00	0.00
Lib Apatite	9.10	5.72
Free Apatite	78.5	84.2

Normalized Mass of Apatite Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Apatite	78.5	84.2
Lib Apatite	9.10	5.72
Apatite: Moly	0.00	0.00
Apatite:Carbonates	0.13	0.11
Apatite:Fe-Oxides	0.00	0.00
Apatite:FeS=	0.03	0.00
Apatite:Other-Sulphides	0.02	0.00
Apatite:Garnet	0.03	1.61
Apatite:Quartz	0.11	0.08
Apatite:Other-Silicate	1.86	1.76
Apatite:Scheelite	3.25	0.61
Apatite:Sphene	0.04	0.00
Apatite:Wolframite	0.00	0.00
Apatite:Fluorite	5.11	5.52
Apatite:Other	0.01	0.01
Complex	1.81	0.34
Total	100.0	100.0

Agnico-Eagle (Jennings)
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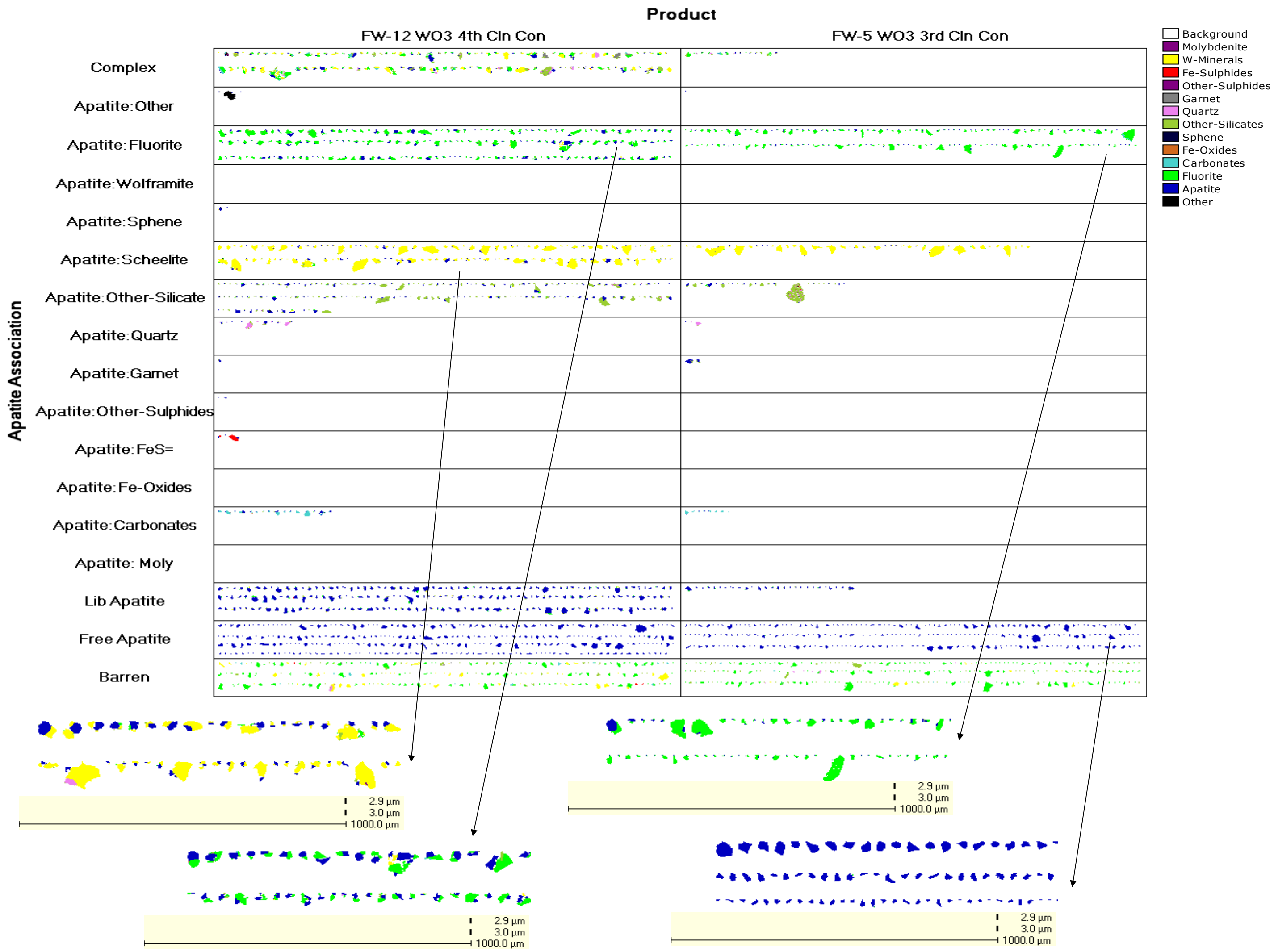
High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Apatite Association Image Grid



Agnico-Eagle (Jennings)
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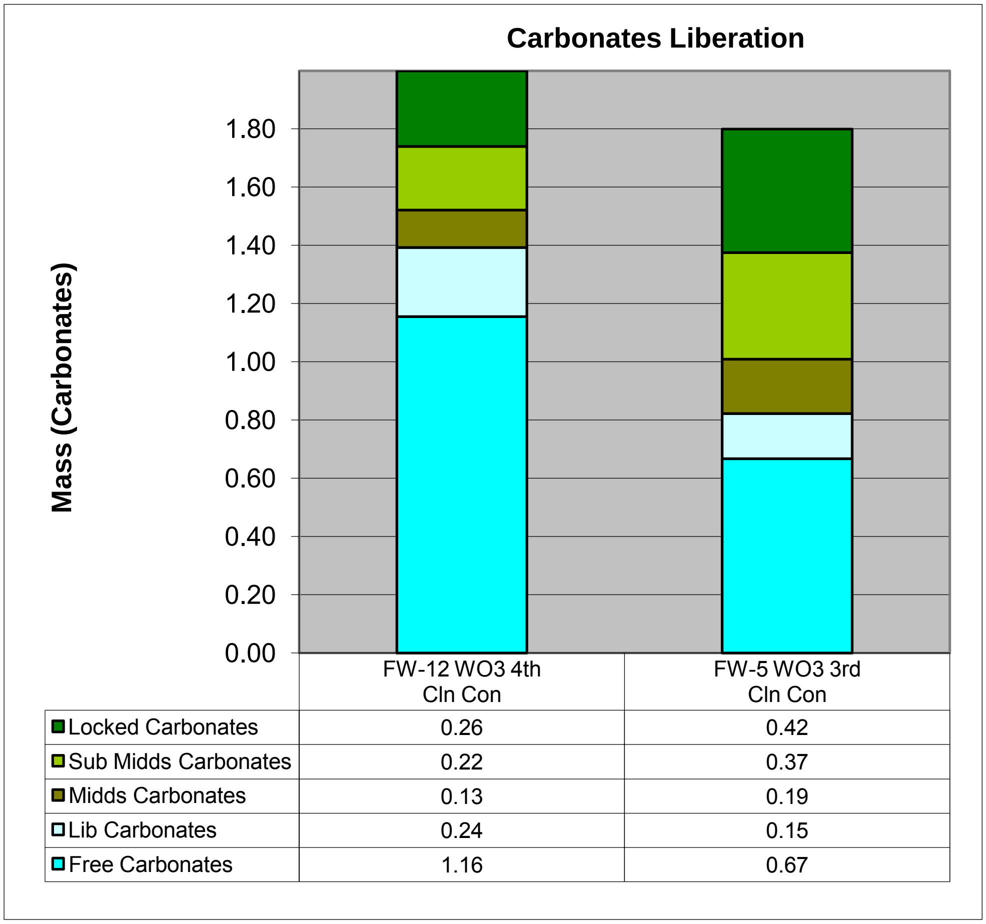
High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Carbonates Liberation



Absolute Mass of Carbonates Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Carbonates	1.16	0.67
Lib Carbonates	0.24	0.15
Midds Carbonates	0.13	0.19
Sub Midds Carbonates	0.22	0.37
Locked Carbonates	0.26	0.42
Total	2.00	1.80

Agnico-Eagle (Jennings)
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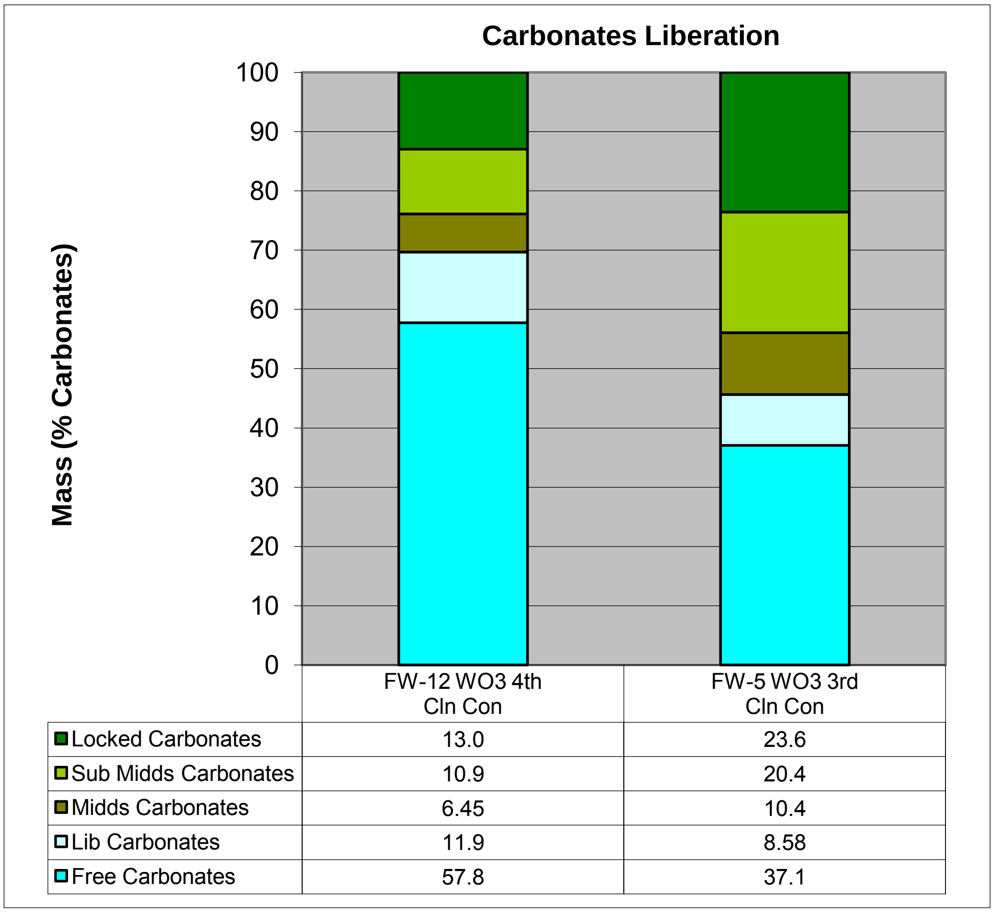
High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Carbonates Liberation



Normalized Mass of Carbonates Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Carbonates	57.8	37.1
Lib Carbonates	11.9	8.58
Midds Carbonates	6.45	10.4
Sub Midds Carbonates	10.9	20.4
Locked Carbonates	13.0	23.6
Total	100.0	100.0

Agnico-Eagle (Jennings)
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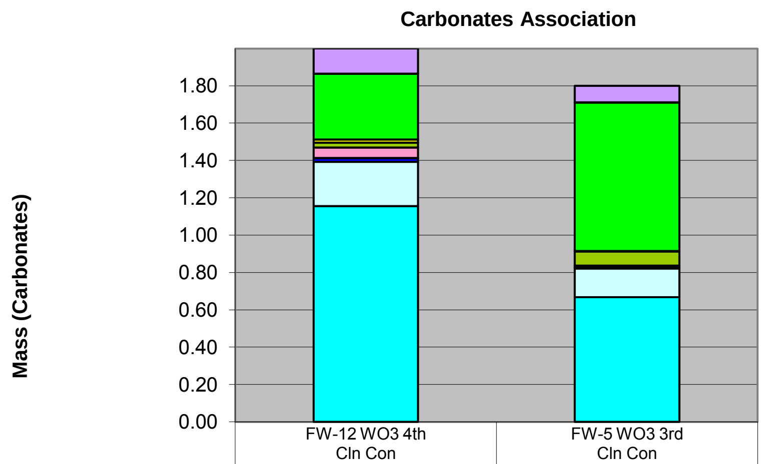
High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Carbonates Association



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	0.13	0.09
Carbonates:Other	0.00	0.00
Carbonates:Fluorite	0.35	0.80
Carbonates:Wolframite	0.00	0.00
Carbonates:Sphene	0.00	0.00
Carbonates:Scheelite	0.02	0.00
Carbonates:Other-Silicate	0.02	0.08
Carbonates:Quartz	0.06	0.00
Carbonates:Garnet	0.00	0.01
Carbonates:Other-Sulphides	0.00	0.00
Carbonates:FeS=	0.00	0.00
Carbonates:Fe-Oxides	0.00	0.00
Carbonates:Apatite	0.02	0.00
Carbonates: Moly	0.00	0.00
Lib Carbonates	0.24	0.15
Free Carbonates	1.16	0.67

Absolute Mass of Carbonates Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Carbonates	1.16	0.67
Lib Carbonates	0.24	0.15
Carbonates: Moly	0.00	0.00
Carbonates:Apatite	0.02	0.00
Carbonates:Fe-Oxides	0.00	0.00
Carbonates:FeS=	0.00	0.00
Carbonates:Other-Sulphides	0.00	0.00
Carbonates:Garnet	0.00	0.01
Carbonates:Quartz	0.06	0.00
Carbonates:Other-Silicate	0.02	0.08
Carbonates:Scheelite	0.02	0.00
Carbonates:Sphene	0.00	0.00
Carbonates:Wolframite	0.00	0.00
Carbonates:Fluorite	0.35	0.80
Carbonates:Other	0.00	0.00
Complex	0.13	0.09
Total	2.00	1.80

Agnico-Eagle (Jennings)
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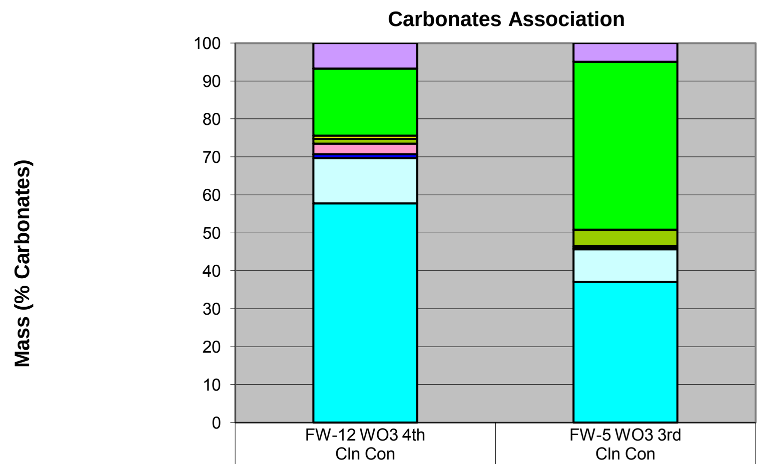
High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Carbonates Association



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	6.73	4.93
Carbonates:Other	0.01	0.03
Carbonates:Fluorite	17.6	44.2
Carbonates:Wolframite	0.00	0.00
Carbonates:Sphene	0.00	0.00
Carbonates:Scheelite	0.87	0.13
Carbonates:Other-Silicate	1.24	4.18
Carbonates:Quartz	2.84	0.20
Carbonates:Garnet	0.00	0.40
Carbonates:Other-Sulphides	0.00	0.03
Carbonates:FeS=	0.00	0.20
Carbonates:Fe-Oxides	0.03	0.00
Carbonates:Apatite	0.98	0.00
Carbonates: Moly	0.00	0.00
Lib Carbonates	11.9	8.58
Free Carbonates	57.8	37.1

Normalized Mass of Carbonates Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Carbonates	57.8	37.1
Lib Carbonates	11.9	8.58
Carbonates: Moly	0.00	0.00
Carbonates:Apatite	0.98	0.00
Carbonates:Fe-Oxides	0.03	0.00
Carbonates:FeS=	0.00	0.20
Carbonates:Other-Sulphides	0.00	0.03
Carbonates:Garnet	0.00	0.40
Carbonates:Quartz	2.84	0.20
Carbonates:Other-Silicate	1.24	4.18
Carbonates:Scheelite	0.87	0.13
Carbonates:Sphene	0.00	0.00
Carbonates:Wolframite	0.00	0.00
Carbonates:Fluorite	17.6	44.2
Carbonates:Other	0.01	0.03
Complex	6.73	4.93
Total	100.0	100.0

Agnico-Eagle (Jennings)
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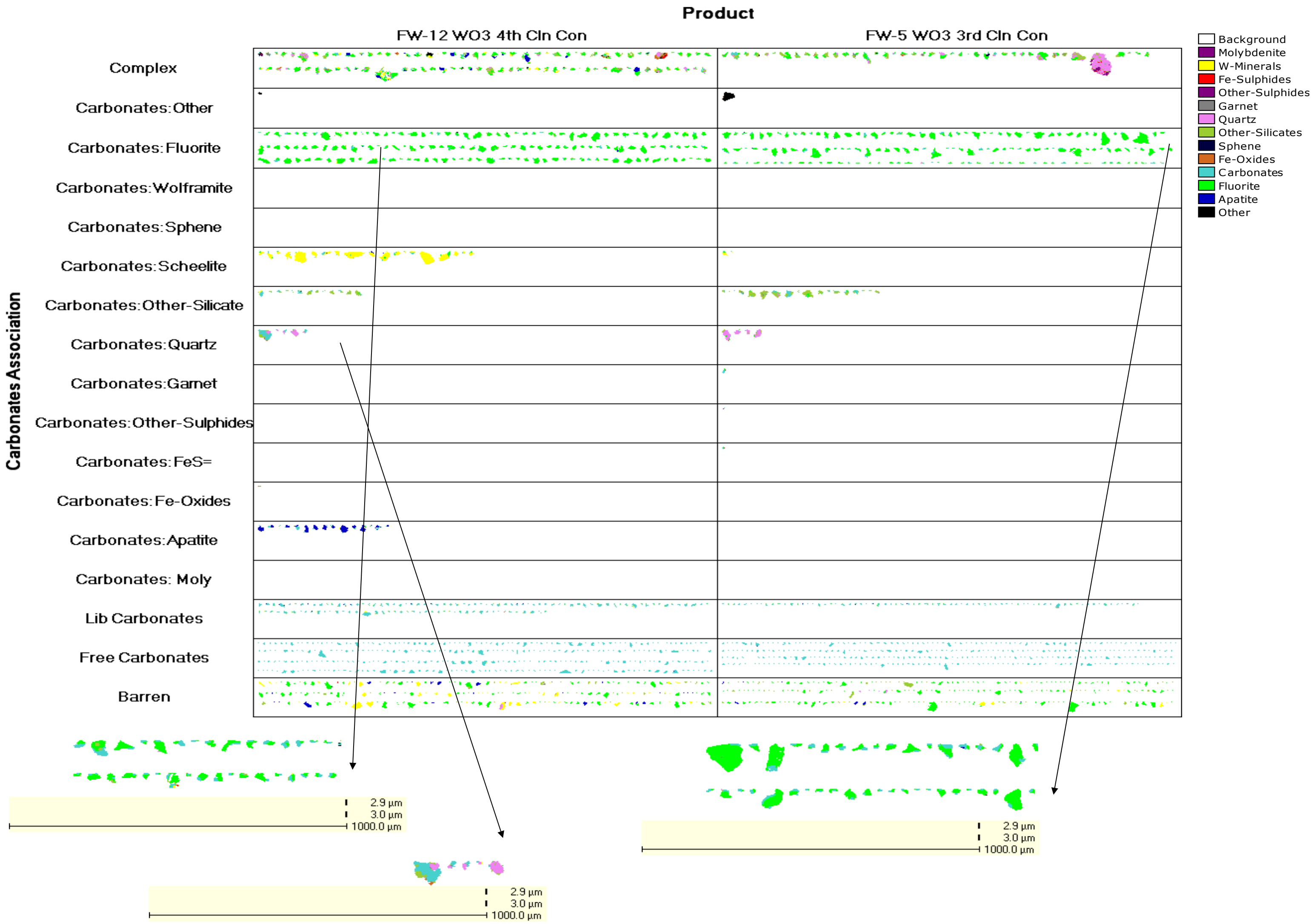
High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

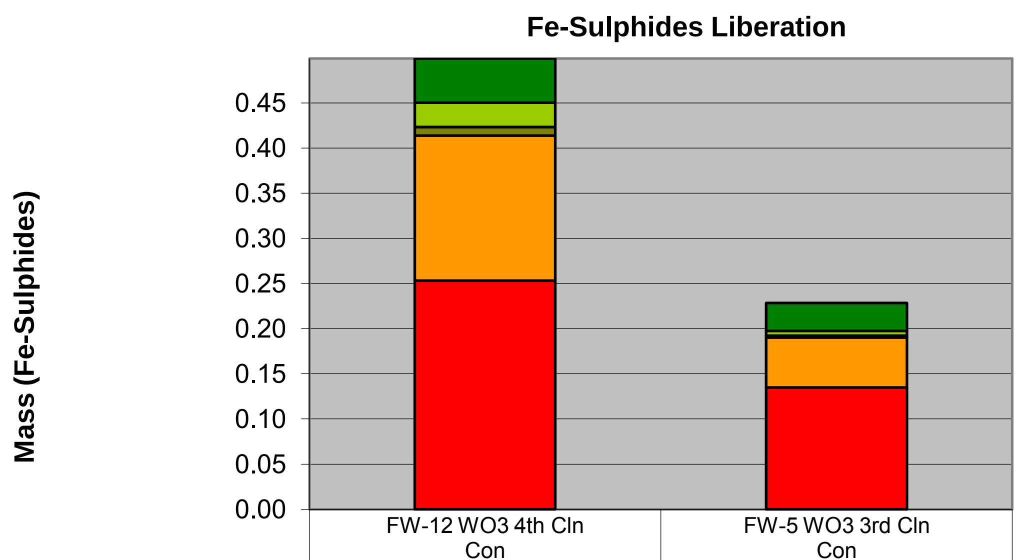
Carbonates Association



Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Fe-Sulphides Liberation



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Locked Fe-Sulphides	0.05	0.03
Sub Midds Fe-Sulphides	0.03	0.01
Midds Fe-Sulphides	0.01	0.00
Lib Fe-Sulphides	0.16	0.06
Free Fe-Sulphides	0.25	0.13

Absolute Mass of Fe-Sulphides Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Fe-Sulphides	0.25	0.13
Lib Fe-Sulphides	0.16	0.06
Midds Fe-Sulphides	0.01	0.00
Sub Midds Fe-Sulphides	0.03	0.01
Locked Fe-Sulphides	0.05	0.03
Total	0.50	0.23

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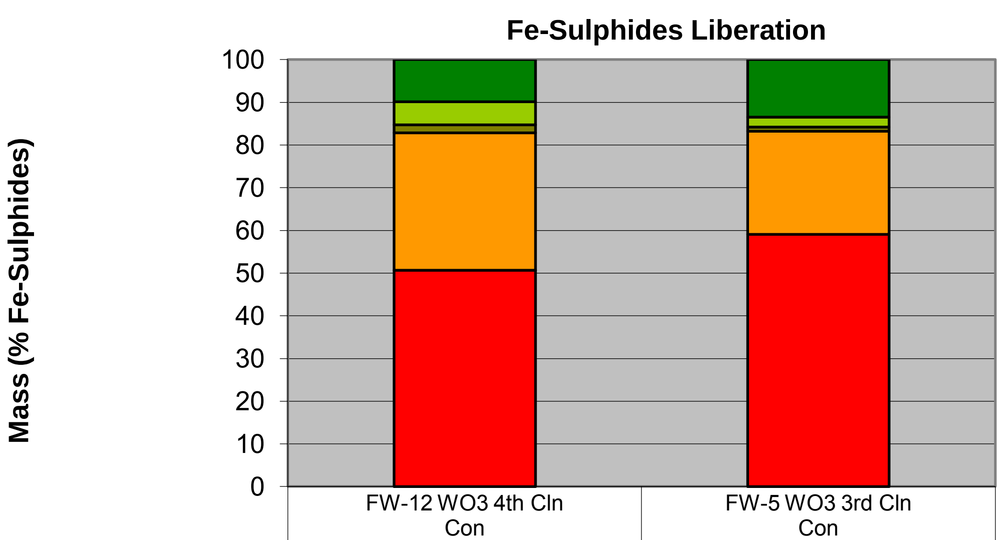
High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Fe-Sulphides Liberation



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Locked Fe-Sulphides	9.84	13.5
Sub Midds Fe-Sulphides	5.40	2.37
Midds Fe-Sulphides	1.89	0.96
Lib Fe-Sulphides	32.2	24.2
Free Fe-Sulphides	50.7	59.0

Normalized Mass of Fe-Sulphides Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Fe-Sulphides	50.7	59.0
Lib Fe-Sulphides	32.2	24.2
Midds Fe-Sulphides	1.89	0.96
Sub Midds Fe-Sulphides	5.40	2.37
Locked Fe-Sulphides	9.84	13.5
Total	100.0	100.0

Agnico-Eagle (Jennings)
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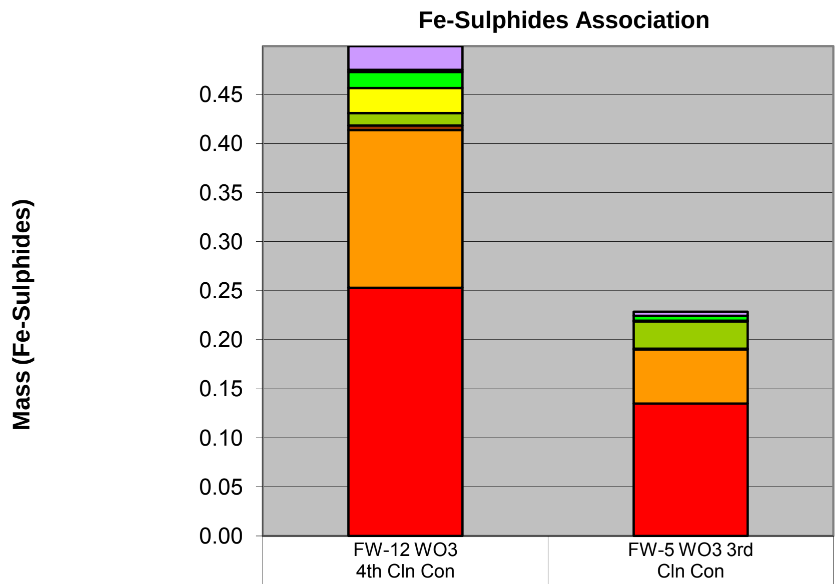
High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Fe-Sulphides Association



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	0.02	0.00
Fe-Sulphides:Other	0.00	0.00
Fe-Sulphides:Fluorite	0.02	0.00
Fe-Sulphides:Wolframite	0.00	0.00
Fe-Sulphides:Scheelite	0.03	0.00
Fe-Sulphides:Other-Sulphides	0.00	0.00
Fe-Sulphides:Silicates	0.01	0.03
Fe-Sulphides:Fe-Oxides	0.00	0.00
Fe-Sulphides: Carbonates	0.00	0.00
Fe-Sulphides:Moly	0.00	0.00
Lib Fe-Sulphides	0.16	0.06
Free Fe-Sulphides	0.25	0.13

Absolute Mass of Fe-Sulphides Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Fe-Sulphides	0.25	0.13
Lib Fe-Sulphides	0.16	0.06
Fe-Sulphides:Moly	0.00	0.00
Fe-Sulphides: Carbonates	0.00	0.00
Fe-Sulphides:Fe-Oxides	0.00	0.00
Fe-Sulphides:Silicates	0.01	0.03
Fe-Sulphides:Other-Sulphides	0.00	0.00
Fe-Sulphides:Scheelite	0.03	0.00
Fe-Sulphides:Wolframite	0.00	0.00
Fe-Sulphides:Fluorite	0.02	0.00
Fe-Sulphides:Other	0.00	0.00
Complex	0.02	0.00
Total	0.50	0.23

Agnico-Eagle (Jennings)
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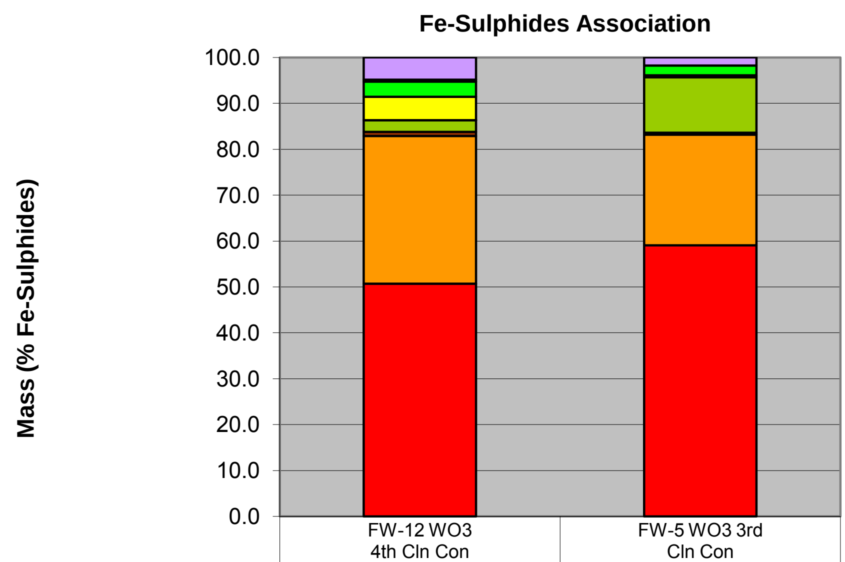
High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Fe-Sulphides Association



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	4.83	1.76
Fe-Sulphides:Other	0.43	0.00
Fe-Sulphides:Fluorite	3.31	2.13
Fe-Sulphides:Wolframite	0.00	0.00
Fe-Sulphides:Scheelite	5.07	0.20
Fe-Sulphides:Other-Sulphides	0.06	0.23
Fe-Sulphides:Silicates	2.53	12.1
Fe-Sulphides:Fe-Oxides	0.90	0.00
Fe-Sulphides: Carbonates	0.00	0.39
Fe-Sulphides:Moly	0.00	0.00
Lib Fe-Sulphides	32.2	24.2
Free Fe-Sulphides	50.7	59.0

Normalized Mass of Fe-Sulphides Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Fe-Sulphides	50.7	59.0
Lib Fe-Sulphides	32.2	24.2
Fe-Sulphides:Moly	0.00	0.00
Fe-Sulphides: Carbonates	0.00	0.39
Fe-Sulphides:Fe-Oxides	0.90	0.00
Fe-Sulphides:Silicates	2.53	12.1
Fe-Sulphides:Other-Sulphides	0.06	0.23
Fe-Sulphides:Scheelite	5.07	0.20
Fe-Sulphides:Wolframite	0.00	0.00
Fe-Sulphides:Fluorite	3.31	2.13
Fe-Sulphides:Other	0.43	0.00
Complex	4.83	1.76
Total	100.0	100.0

Agnico-Eagle (Jennings)
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High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Fe-Sulphides Association Image Grid

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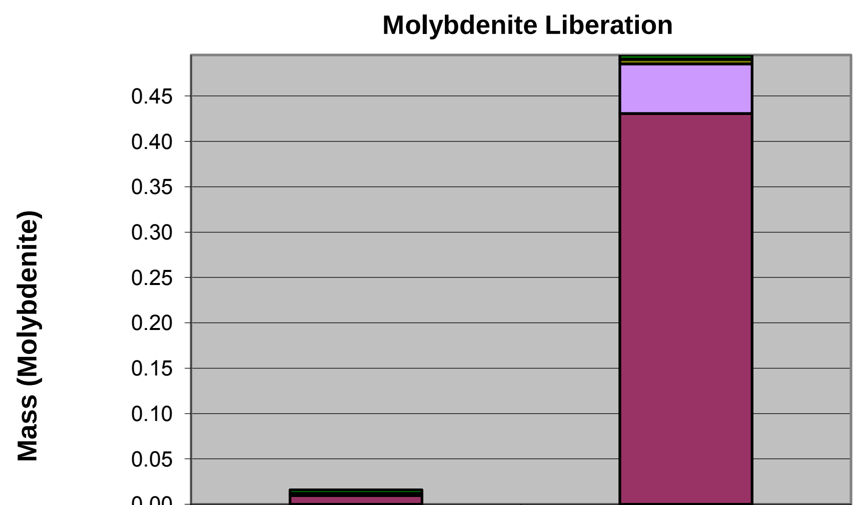
High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Molybdenite Liberation



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Locked Moly	0.00	0.00
Sub Midds Moly	0.00	0.00
Midds Moly	0.00	0.00
Lib Moly	0.00	0.05
Free Moly	0.01	0.43

Absolute Mass of Molybdenite Across Sampl

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Moly	0.01	0.43
Lib Moly	0.00	0.05
Midds Moly	0.00	0.00
Sub Midds Moly	0.00	0.00
Locked Moly	0.00	0.00
Total	0.02	0.50

Agnico-Eagle (Jennings)
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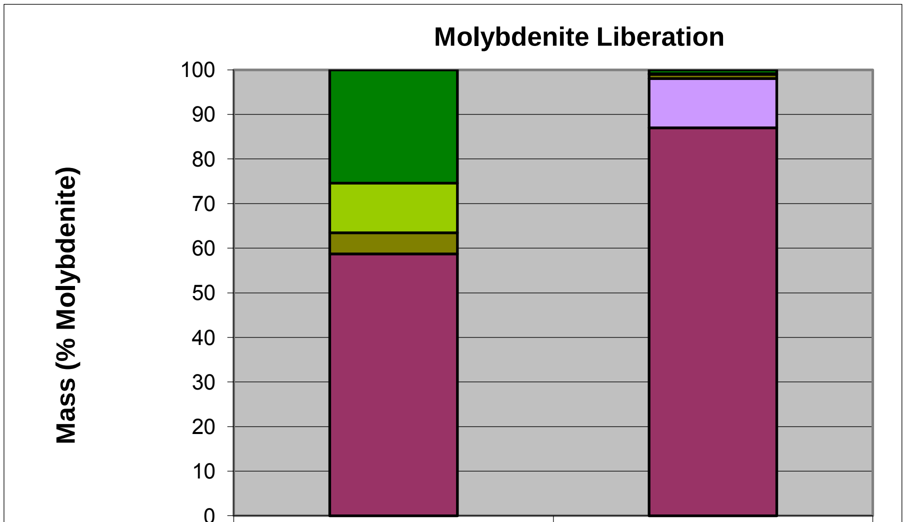
High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Molybdenite Liberation



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Locked Moly	25.4	0.89
Sub Midds Moly	11.1	0.10
Midds Moly	4.76	0.99
Lib Moly	0.00	11.0
Free Moly	58.7	87.0

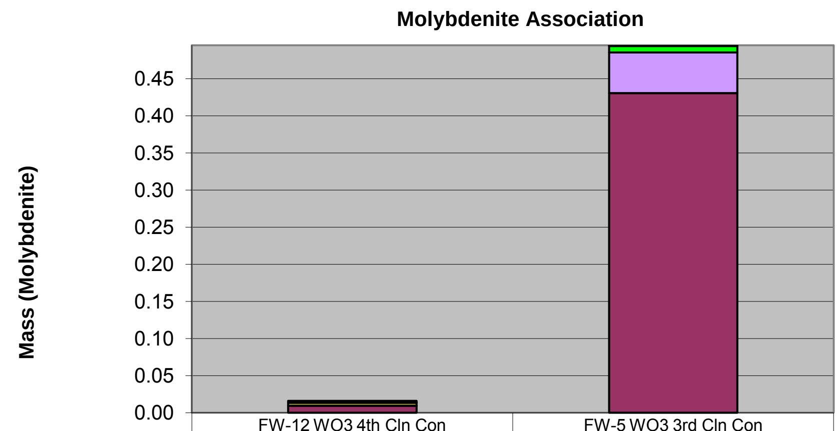
Normalized Mass of Molybdenite Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Moly	58.7	87.0
Lib Moly	0.00	11.0
Midds Moly	4.76	0.99
Sub Midds Moly	11.1	0.10
Locked Moly	25.4	0.89
Total	100.0	100.0

Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Molybdenite Association



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	0.00	0.00
Moly:Other	0.00	0.00
Moly:Fluorite	0.00	0.01
Moly:Wolframite	0.00	0.00
Moly:Sphene	0.00	0.00
Moly:Scheelite	0.00	0.00
Moly:Other-Silicate	0.00	0.00
Moly:Quartz	0.00	0.00
Moly:Garnet	0.00	0.00
Moly:Other-Sulphides	0.00	0.00
Moly:FeS=	0.00	0.00
Moly:Fe-Oxides	0.00	0.00
Moly:Carbonates	0.00	0.00
Moly:Apatite	0.00	0.00
Lib Moly	0.00	0.05
Free Moly	0.01	0.43

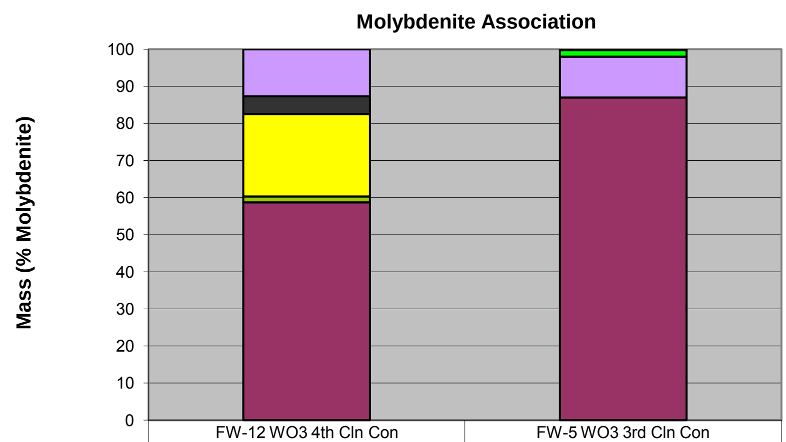
Absolute Mass of Molybdenite Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Moly	0.01	0.43
Lib Moly	0.00	0.05
Moly:Apatite	0.00	0.00
Moly:Carbonates	0.00	0.00
Moly:Fe-Oxides	0.00	0.00
Moly:FeS=	0.00	0.00
Moly:Other-Sulphides	0.00	0.00
Moly:Garnet	0.00	0.00
Moly:Quartz	0.00	0.00
Moly:Other-Silicate	0.00	0.00
Moly:Scheelite	0.00	0.00
Moly:Sphene	0.00	0.00
Moly:Wolframite	0.00	0.00
Moly:Fluorite	0.00	0.01
Moly:Other	0.00	0.00
Complex	0.00	0.00
Total	0.02	0.50

Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Molybdenite Association



	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Complex	12.7	0.10
Moly:Other	4.76	0.10
Moly:Fluorite	0.00	1.79
Moly:Wolframite	0.00	0.00
Moly:Sphene	0.00	0.00
Moly:Scheelite	22.2	0.00
Moly:Other-Silicate	1.59	0.00
Moly:Quartz	0.00	0.00
Moly:Garnet	0.00	0.00
Moly:Other-Sulphides	0.00	0.00
Moly:FeS=	0.00	0.00
Moly:Fe-Oxides	0.00	0.00
Moly:Carbonates	0.00	0.00
Moly:Apatite	0.00	0.00
Lib Moly	0.00	11.0
Free Moly	58.7	87.0

Normalized Mass of Molybdenite Across Samples

Mineral Name	FW-12 WO3 4th Cln Con	FW-5 WO3 3rd Cln Con
Free Moly	58.7	87.0
Lib Moly	0.00	11.0
Moly:Apatite	0.00	0.00
Moly:Carbonates	0.00	0.00
Moly:Fe-Oxides	0.00	0.00
Moly:FeS=	0.00	0.00
Moly:Other-Sulphides	0.00	0.00
Moly:Garnet	0.00	0.00
Moly:Quartz	0.00	0.00
Moly:Other-Silicate	1.59	0.00
Moly:Scheelite	22.2	0.00
Moly:Sphene	0.00	0.00
Moly:Wolframite	0.00	0.00
Moly:Fluorite	0.00	1.79
Moly:Other	4.76	0.10
Complex	12.7	0.10
Total	100.0	100.0

Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

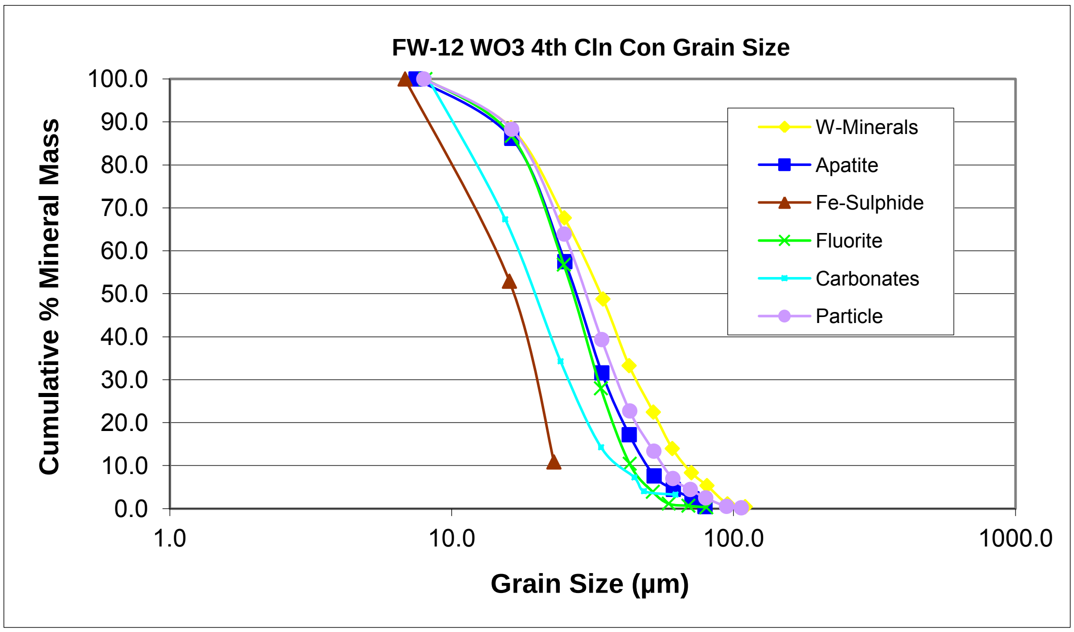
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

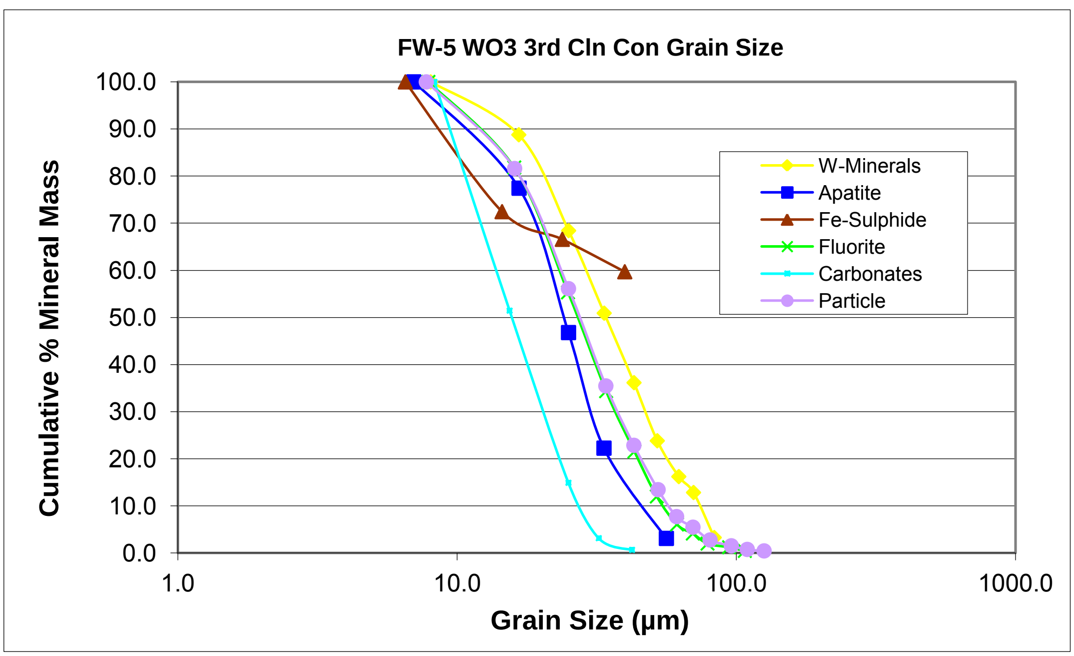
Molybdenite Association Image Grid

Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN
(Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Cumulative Grain Size Distribution

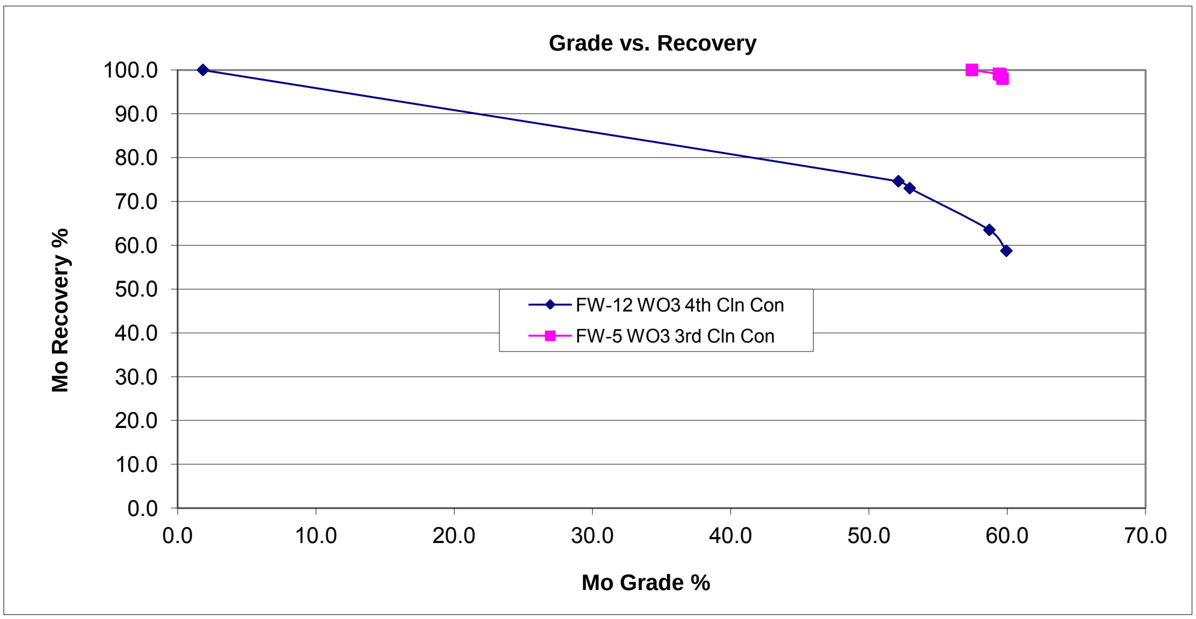




Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

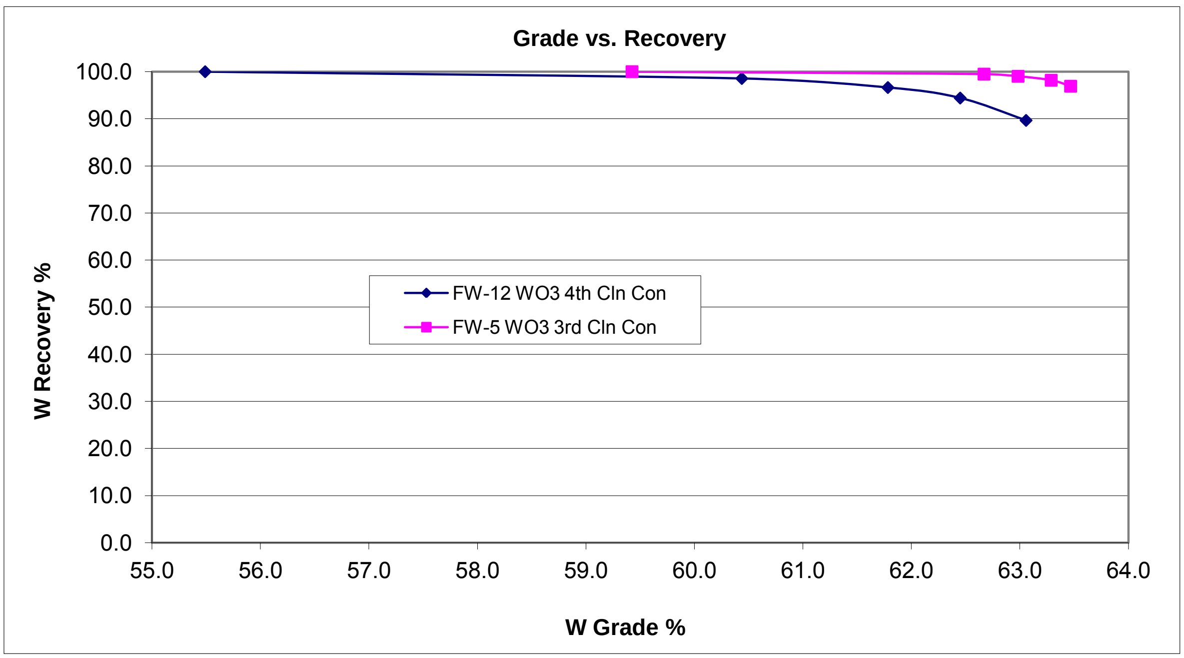
Mo Grade vs. Recovery:



Agnico-Eagle (Jennings)
13583-002
MI5012-DEC12

High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

W Grade vs. Recovery:



Appendix C – Details of Heavy Liquid Separation

Test No.: HLS-1 **Project No:** 13583-002 **Operator**: **Date**:

Purpose: Investigate heavy liquid separation to pruduce WO_3 concentrate

Procedure:

1) Screen 4 kg (2 x 2 charges) of the Master Composite into -6+10 mesh, -10+35 mesh, and -35 mesh.
2) Submit each size fraction for Heavy Liquid Separation (HLS) at SGs of 3.6 and 3.0. Separate the meterials first at SG 3.6, and then re-pass the the floats at Sg 3.0.
3) Submit 2 sincks and floats from each fraction for WO_3, Mo, S, and whole-rock analysis (WRA)

Feed: ~4 kg of Master Composite
(2 x 2 kg charges)

Metallurgical Balance

-6+10 mesh Fraction

Stream	Wt.		Assays, %																
	(g)	%	WO_3	Mo	S	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	MnO	Cr_2O_3	V_2O_5	LOI	Sum
-6+10m 3.6 Sink	0.97	0.14	1.52	0.35	28.6														
-6+10m 3.0 Sink	47.56	6.90	0.24	0.06	1.09	47.7	10.8	14.4	4.93	15.1	1.51	1.09	0.39	0.11	0.54	0.03	0.01	2.65	99.3
-6+10m 3.0 Float	640.36	93.0	0.17	0.034	0.14	59	14.3	5.49	2.41	7.37	2.21	2.63	0.46	0.12	0.16	0.05	0.01	2.50	96.7
Head (calc)	688.9	100.0	0.18	0.036	0.25	58.1	14.0	6.10	2.58	7.89	2.16	2.52	0.45	0.12	0.19	0.05	<0.01	2.51	96.7

Stream		Distribution, %																
	%	WO_3	Mo	S	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	MnO	Cr_2O_3	V_2O_5	LOI	Sum
-6+10m 3.6 Sink	0.14	**1.21**	1.36	16.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-6+10m 3.0 Sink	6.90	9.38	11.4	30.6	5.66	5.31	16.3	13.2	13.2	4.83	2.99	5.92	6.37	20.0	4.27	6.91	7.30	7.09
-6+10m 3.0 Float	93.0	89.4	87.2	53.0	94.3	94.7	83.7	86.8	86.8	95.2	97.0	94.1	93.6	80.0	95.7	93.1	92.7	92.9
Head (calc)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

-10+35 mesh Fraction

Stream	Wt.		Assays, %																
	(g)	%	WO_3	Mo	S	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	MnO	Cr_2O_3	V_2O_5	LOI	Sum
-10+35m 3.6 Sink	8.40	0.40	6.86	1.87	28.6	10	2.11	51.5	0.87	2.46	0.63	0.48	0.07	0.06	1.07	0.06	<0.01	19.5	88.8
-10+35m 3.0 Sink	201.06	9.54	0.25	0.099	0.93	45.8	9.37	15.8	5.41	16.2	1.2	1.09	0.38	0.4	0.52	0.03	0.01	2.95	99.2
-10+35m 3.0 Float	1897.79	90.1	0.11	0.066	0.17	53.7	12.4	4.38	1.79	5.93	2.08	2.73	0.38	0.09	0.11	0.04	<0.01	2.5	86.1
Head (calc)	2107.3	100.0	0.15	0.076	0.36	52.8	12.1	5.66	2.13	6.90	1.99	2.56	0.38	0.12	0.15	0.04	<0.01	2.61	87.4

Stream		Distribution, %																
	%	WO_3	Mo	S	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	MnO	Cr_2O_3	V_2O_5	LOI	Sum
-10+35m 3.6 Sink	0.40	18.2	9.76	32.0	0.08	0.07	3.63	0.16	0.14	0.13	0.07	0.07	0.20	2.79	0.61	0.40	2.98	0.41
-10+35m 3.0 Sink	9.54	15.9	12.4	24.9	8.28	7.41	26.6	24.2	22.4	5.75	4.06	9.57	31.9	32.4	7.32	9.54	10.8	10.8
-10+35m 3.0 Float	90.1	65.9	77.9	43.0	91.6	92.5	69.7	75.6	77.4	94.1	95.9	90.4	67.9	64.8	92.1	90.1	86.2	88.8
Head (calc)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

-35 mesh Fraction

Stream	Wt.		Assays, %																
	(g)	%	WO_3	Mo	S	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	MnO	Cr_2O_3	V_2O_5	LOI	Sum
-35m 3.6 Sink	7.02	0.97	8.43	4.94	25.2	11.6	2.78	45.1	1.18	4.23	0.62	0.56	0.19	0.16	0.75	0.04	<0.01	15.7	82.9
-35m 3.0 Sink	81.7	11.3	0.19	0.3	1.14	43.2	8.05	17.2	5.97	17.5	1.00	1.04	0.42	0.39	0.59	0.03	0.02	4.28	99.7
-35m 3.0 Float	633.9	87.7	0.06	0.035	0.09	58.7	11.2	3.47	1.38	4.80	1.75	2.67	0.32	0.070	0.090	0.06	<0.01	2.33	86.9
Head (calc)	722.6	100.0	0.16	0.11	0.45	56.5	10.8	5.43	1.90	6.23	1.65	2.47	0.33	0.11	0.15	0.06	<0.01	2.68	88.3

Stream		Distribution, %																
	%	WO_3	Mo	S	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	MnO	Cr_2O_3	V_2O_5	LOI	Sum
-35m 3.6 Sink	0.97	52.5	42.6	54.1	0.20	0.25	8.07	0.60	0.66	0.36	0.22	0.56	1.45	4.76	0.69	0.87	5.69	0.91
-35m 3.0 Sink	11.3	13.8	30.1	28.5	8.65	8.46	35.8	35.6	31.8	6.83	4.77	14.4	41.2	43.6	6.01	20.3	18.1	12.8
-35m 3.0 Float	87.7	33.7	27.3	17.4	91.2	91.3	56.1	63.8	67.6	92.8	95.0	85.1	57.4	51.6	93.3	78.8	76.3	86.3
Head (calc)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

-200 mesh (75 μm) Fraction

Stream	Wt.		Assay, %																
	(g)	%	WO_3	Mo	S	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	MnO	Cr_2O_3	V_2O_5	LOI	Sum
-200 mesh(75μm) Fraction	452	11.4	**0.20**	0.19	**0.49**	**59.4**	13.9	**7.26**	2.72	8.01	1.76	3.04	0.42	0.23	0.22	0.02	< 0.01	4.24	101.2

Appendix D – Details of Gravity Separation Tests

Test: **G1** Project: **13583-002** Operator: Date:

Purpose: Perform a Mozley separation on +250 mesh S taillings (sub-sample at 200g) from test FM2

Procedure:

Feed: +250mesh S taillings from test FM2

Grind: P_{80}= µm

Metallurgical Balance

Product	**Weight**		**Assays, %**						**% Distribution**					
	g	**%**	**WO_3**	**F**	**SiO_2**	**Fe_2O_3**	**CaO**	**P_2O_5**	**WO_3**	**F**	**SiO_2**	**Fe_2O_3**	**CaO**	**P_2O_5**
Mozley Conc	14.2	7.4	0.63	1.58	47.9	15.3	15.3	0.31	82.0	20.8	5.3	21.5	16.6	29.2
Mozley Tails	178.3	92.6	0.011	0.48	68.8	4.45	6.14	0.060	18.0	79.2	94.7	78.5	83.4	70.8
Head (+ 250 mesh)(calc)	192.5	100.0	0.057	0.56	67.3	5.25	6.82	0.078	100.0	100.0	100.0	100.0	100.0	100.0
+250 mesh Froction	1045		0.070	0.58	67.4	5.29	6.83	0.080						
Total +250 mesh fraction	1237													

15.6

84.4

Additional Assays

Product	**Weight**	**Assays, %**									
	%	**Al_2O_3**	**MgO**	**Na_2O**	**K_2O**	**TiO_2**	**MnO**	**Cr_2O_3**	**V_2O_5**	**LOI**	**Sum**
Mozley Conc	7.4	8.94	5.03	1.06	1.1	0.58	0.54	0.090	0.02	3.01	99.1
Mozley Tails	92.6	12.9	1.89	1.76	2.66	0.39	0.12	0.030	< 0.01	2.10	101.2

Test: G2 | Project: **13583-002** | Operator: | Date:

Purpose: Perform Wilfley table separation on -503+106 µm fraction of Master Composite

Procedure:
Stage grind 1 x 10kg sample (-6 mesh) to 100% passing -503 µm (38 mesh)
Wet screen on 106 µm (150 mesh)
Pass the -503+106 µm (-38+150 mesh) fraction through a Wilfley table configured with multiple dividers
Filter each of approx 8 streams,
Take a sub-sample from each of the filterd cakes and submit for Mo, WO_3 assay.
Filter Wilfley tails, and submit for Mo, WO_3, and assay.
Place the wilfley Conc cakes individually in plastic bags and store
Store -106 µm fractions (pulp) in a pail

Metallurgical Balance

Product	**Weight**		**Assays, %**		**% Distribution**	
	g	**%**	**Mo**	**WO_3**	**Mo**	**WO_3**
1st Pass Wilfley Conc 1	246.3	4.2	0.33	0.67	25.0	41.0
1st Pass Wilfley Conc 2+3	119.4	2.0	0.13	0.39	4.8	11.6
1st Pass Wilfley Conc 4+5	173.0	3.0	0.061	0.087	3.2	3.7
1st Pass Wilfley Conc 6	168.9	2.9	0.059	0.066	3.1	2.8
1st Pass Wilfley Conc 7	135.9	2.3	0.055	0.060	2.3	2.0
1st Pass Wilfley Conc 8	510.7	8.7	0.050	0.062	7.8	7.9
2nd Pass Wilfley Conc 1	193.3	3.3	0.11	0.095	6.5	4.6
2nd Pass Wilfley Conc 2+3	103.4	1.8	0.048	0.031	1.5	0.8
2nd Pass Wilfley Conc 4+5	177.4	3.0	0.046	0.044	2.5	1.9
2nd Pass Wilfley Conc 6	169.3	2.9	0.04	0.041	2.1	1.7
2nd Pass Wilfley Conc 7	187.7	3.2	0.035	0.026	2.0	1.2
2nd Pass Wilfley Conc 8	665.0	11.4	0.034	0.035	6.9	5.8
2nd Pass Wilfley Tails	2997	51.3	0.035	0.020	32.2	14.9
Head (calc.)	5847	100.0	0.056	0.069	100.0	100.0
Head (dir.)						

Combine Products

1st Pass Conc 1	246.3	4.2	0.33	0.67	25.0	41.0
1st Pass Conc 1 -3	365.7	6.3	0.26	0.58	29.7	52.6
1st Pass Conc 1 -5	538.7	9.2	0.20	0.42	33.0	56.4
1st Pass Conc 1 -6	707.6	12.1	0.17	0.34	36.0	59.1
1st Pass Conc 1 -7	843.5	14.4	0.15	0.29	38.3	61.2
1 Pass Conc 1 -8	1354	23.2	**0.11**	**0.21**	46.2	69.1
1 Pass Conc 1-8 +2nd Pass Conc1	1547	26.5	0.11	0.19	52.7	73.6
1 Pass Conc 1-8 + 2nd Pass Conc1-3	1651	28.2	0.11	0.18	54.2	74.4
1 Pass Conc 1-8 + 2nd Pass Conc1-5	1828	31.3	0.10	0.17	56.7	76.4
1 Pass Conc 1-8 + 2nd Pass Conc1-6	1998	34.2	0.096	0.16	58.8	78.1
1 Pass Conc 1-8 + 2nd Pass Conc1-7	2185	37.4	0.091	0.15	60.8	79.3
1 Pass Conc 1-8 + 2nd Pass Conc1-8	2850	48.7	0.077	0.12	67.8	85.1
2nd Pass Tails	2997	51.3	0.035	0.020	32.2	14.9

Test: G3 Project: **13583-002** Operator: Date:

Purpose: Perform Mo flash flotation on Wifley conc 1-8 from test G2, and then Wifley tabling on Mo flash flotation tails

Procedure (Mo flash flotation): Conditions are as outlined bellow
Filter the concentrate. Take a sub-sample from the cake and submit for Mo and WO_3 assay
Place the filtered conc. in a plastic bag and store
The tails further subject to Wilfley tabling

Procedure (Wilfley): Pass the Mo flash flotation tails through a Wilfley table configured with multiple dividers
Filter the Wifley Conc individually (approx 8 streams) , and take a sub-sample from each stream, and submit for Mo and WO3 assay. Store the remainder of each filtered cake
Filter the Wilfley tails. Take a sub-sample from the filtered cake and submit for Mo and WO_3 assay
Place the Wilfley tails in a plastic bag and store

Flash Flotation Conditions:

Stage	Reagents added, g/t						Time, min			pH	Eh
	PAX	MIBC	Pine Oil	Fuel Oil	NaHS	NaCN	Grind	Cond.	Froth		mV
Condition			10	15					2		
Mo Flash Flotation		7.5							3.5		

Stage	Mo Rougher
Flotation Cell	2kg - 4L
Speed: rpm	1500

Metallurgical Balance (1st Pass)

Product	**Weight**		**Assays, %**		**% Distribution**	
	g	**%**	**Mo**	**WO_3**	**Mo**	**WO_3**
1st Pass Wilfley Conc 1	199	7.0	0.062	0.76	5.6	67.3
1st Pass Wilfley Conc 2+3	51.7	1.8	0.032	0.049	0.8	1.1
1st Pass Wilfley Conc 4+5	68.0	2.4	0.026	0.060	0.8	1.8
1st Pass Wilfley Conc 6	110.1	3.9	0.022	0.047	1.1	2.3
1st Pass Wilfley Conc 7	95.8	3.4	0.026	0.046	1.1	2.0
1st Pass Wilfley Conc 8	374	13.2	0.023	0.047	3.9	7.8
1st Pass Wilfley Tails	1932	68.0	0.024	0.020	21.1	17.2
Mo Flash Conc	8.38	0.3	17.2*	0.10**	65.6	0.4
		0.0				
Head (calc.)	2838	100.0	0.077	0.079	100.0	100.0
Head (dir.)			0.077	0.12		

* Calculated using head (G2 Wilfley Conc 1-8) grade
** Estimated assuming the head grade similar to the Mo Flash Tails

Combine Products

Wilfley Conc 1	7.0	0.062	0.76	5.6	67.3
Wilfley Conc 1 -3	8.8	0.056	0.61	6.4	68.5
Wilfley Conc 1 -5	11.2	0.049	0.50	7.2	70.3
Wilfley Conc 1 -6	15.1	0.042	0.38	8.3	72.6
Wilfley Conc 1 -7	18.5	0.039	0.32	9.4	74.6
Wilfley Conc 1 -8	31.7	0.033	0.21	13.3	82.4
Mo Flash Tails	99.7	0.027	0.079	34.4	99.6
Mo Flash Conc	0.3	17.2	0.10	65.6	0.4
Head (G2 Wilfley Conc 1-8)	100.0	0.077	0.079	100.0	100.0

Test: **G4** Project: **13583-002** Operator: Date:

Purpose: Perform WHIMS separation and Mozley tabling on Wilfley Conc 1 from test G3

Procedure: Pass through G3 Wilfley Conc1 through an Eriez WHIMS separator at 15000 Gauss
Screen the WHIMS non-mags at 300µm (48 mesh)
Conduct a Mozley test on each of the 2 fractions, -506+300 µm and -300+106 µm
Take 3 concentrates at the end of each test, and submit for WO3, F, and WRA analyses
Submit the WHIMS mags and Mozley tails from each test for WO3, F, and WRA analyses

Feed: 198.7 g Wilfley Conc 1 from test G3

Grind: P_{80}= µm

Metallurgical Balance

Product	Weight		Assays, %						% Distribution					
	g	%	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WHIMS mags	94.3	48.3	0.87	1.26	42.0	21.7	6.55	0.10	53.7	38.3	40.5	68.3	39.2	27.8
-506+300 µm Mozley Conc 1	6.0	3.1	1.49	0.83	29.0	28.7	6.55	0.10	5.9	1.6	1.8	5.8	2.5	1.8
-506+300 µmMozley Conc 2	3.8	1.9	0.20	0.92	54.0	11.4	9.60	0.16	0.5	1.1	2.1	1.4	2.3	1.8
-506+300 µm Mozley Conc 3	3.1	1.6	0.13	0.75	59.0	7.06	9.24	0.13	0.3	0.7	1.9	0.7	1.8	1.2
-506+300 µm Mozley Tails	5.6	2.9	0.29	0.62	66.3	4.63	6.28	0.11	1.1	1.1	3.8	0.9	2.2	1.8
-300+106 µm Mozley Conc 1	7.3	3.7	6.60	4.98	21.7	29.2	15.4	0.82	31.5	11.7	1.6	7.1	7.1	17.6
-300+106 µm Mozley Conc 2	6.6	3.4	0.92	5.49	37.7	19.3	17.0	0.73	4.0	11.7	2.5	4.3	7.1	14.2
-300+106 µm Mozley Conc 3	8.3	4.3	0.28	4.34	48.4	12.2	16.2	0.51	1.5	11.6	4.1	3.4	8.5	12.5
-300+106 µm Mozley Tails	60.2	30.8	0.04	1.14	67.6	4.04	7.62	0.12	1.6	22.1	41.6	8.1	29.1	21.3
Head (calc.)	195.2	100.0	0.78	1.59	50.1	15.3	8.07	0.17	100.0	100.0	100.0	100.0	100.0	100.0
Head (dir.)			0.76											

Combined Product

Product	Weight %	Assays, % WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5	% Distribution WO_3	F	SiO_2	Fe_2O_3	CaO	P_2O_5
WHIMS mags	48.3	0.87	1.26	42.0	21.7	6.55	0.10	53.7	38.3	40.5	68.3	39.2	27.8
-506+300 µm Mozley Conc 1	3.1	1.49	0.83	29.0	28.7	6.55	0.10	5.9	1.6	1.8	5.8	2.5	1.8
-506+300 µm Mozley Conc 1-2	5.0	0.99	0.86	38.7	22.0	7.73	0.12	6.4	2.7	3.9	7.2	4.8	3.6
-506+300 µm Mozley Conc 1-3	6.6	0.78	0.84	43.6	18.4	8.09	0.12	6.6	3.5	5.8	7.9	6.6	4.7
-506+300 µm Fraction	9.5	0.63	0.77	50.5	14.2	7.55	0.12	7.7	4.6	9.6	8.8	8.9	6.6
-300+106 µm Mozley Conc 1	3.7	6.60	4.98	21.7	29.2	15.4	0.82	31.5	11.7	1.6	7.1	7.1	17.6
-300+106 µm Mozley Conc 1-2	7.1	3.90	5.22	29.3	24.5	16.2	0.78	35.5	23.4	4.2	11.4	14.3	31.9
-300+106 µm Mozley Conc 1-3	11.4	2.55	4.89	36.4	19.9	16.2	0.68	37.0	35.0	8.3	14.8	22.8	44.3
-300+106 µm Fraction	42.2	0.72	2.15	59.2	8.31	9.92	0.27	38.6	57.1	49.9	22.9	51.9	65.6
Head (calc.)	100.0	0.78	1.59	50.1	15.3	8.07	0.17	100.0	100.0	100.0	100.0	100.0	100.0

Additional Assays

Product	Weight	Assays, %									
	%	Al_2O_3	MgO	Na_2O	K_2O	TiO_2	MnO	Cr_2O_3	V_2O_5	LOI	Sum
-506+300 µm Mozley Conc 1	3.1	6.57	1.84	0.96	0.97	0.29	0.19	< 0.01	< 0.01	18.7	93.9
-506+300 µmMozley Conc 2	1.9	12.5	2.86	1.71	1.84	0.47	0.21	0.02	< 0.01	3.98	98.7
-506+300 µm Mozley Conc 3	1.6	14.2	2.83	2.01	2.11	0.52	0.17	0.02	< 0.01	1.32	98.6
-506+300 µm Mozley Tails	2.9	13.4	1.64	1.84	2.81	0.4	0.09	0.01	< 0.01	1.30	98.8
-300+106 µm Mozley Conc 1	3.7	3.82	2.00	0.57	0.55	0.36	0.23	< 0.01	< 0.01	8.57	83.2
-300+106 µm Mozley Conc 2	3.4	6.58	2.80	0.92	0.94	0.47	0.24	0.01	< 0.01	3.66	90.4
-300+106 µm Mozley Conc 3	4.3	8.72	3.37	1.19	1.24	0.51	0.26	0.01	< 0.01	4.14	96.7
-300+106 µm Mozley Tails	30.8	12.5	1.89	1.76	2.37	0.42	0.12	< 0.01	< 0.01	2.16	100.6

APPENDIX B : GOLDER ASSOCIATES 2013 ENVIRONMENTAL BASE LINE STUDY

February 14, 2014

AEM JENNINGS PROPERTY

Summary Report on 2013 Baseline Monitoring Program

Submitted to:
Agnico-Eagle Mines Limited
400 - 543 Granville Street
Vancouver, BC
V6C 1X8

REPORT

Report Number: 1210210002-007-R-Rev0

Distribution:

2 copies - Agnico-Eagle Mines Limited

2 copies - Golder Associates Ltd.

Golder Associates

Table of Contents

1.0 INTRODUCTION

This report provides a summary of Golder Associates Ltd.'s (Golder) environmental baseline monitoring program completed during 2013 at the Agnico-Eagle Mines Ltd. (AEM) Jennings Project (the Project) in the southern Yukon. The Project is a porphyry molybdenum-tungsten prospect consisting of a 7160 ha claim block that straddles the Yukon-British Columbia border, and is located approximately 80 km west of Watson Lake, Yukon. Exploration activities are currently focused on the southern Yukon portion of the claim block.

Baseline monitoring studies in 2013 consisted of downloads and checking of the Project's meteorological monitoring station (summarized in Section 2.0), and the fourth year of aquatic baseline program (summarized in Section 3.0).

2.0 METEOROLOGICAL MONITORING STATION MAINTENANCE

2.1 Introduction

This section provides details on maintenance of the meteorological monitoring station (i.e., met station) installed November 9, 2011 as part of the baseline studies program for the Project. Calibrations and maintenance were recommended by Golder for several of the sensors at the met station on an annual basis. Other sensors require calibration or maintenance on a longer term cycle, such as every two or three years.

During a water quality sampling visit and met station data download at the Project on August 30, 2012, a Golder technician noticed that the met station had sustained some damage, possibly via an ungulate, as the technician observed ungulate tracks near the met station. After assessing the data download, a Golder air quality scientist determined that instrumentation damage occurred on June 10, 2012, and further instrument data loss occurred on June 24, 2012. Subsequent to the August 30, 2012 site visit, Golder suggested that a site visit for calibration, maintenance, and repairs on the met station was necessary (as communicated in Golder's letter dated September 25, 2012). Approval for the site visit by an air quality specialist from Golder was subsequently provided by AEM. Repairs were performed by a Golder air quality scientist on October 3, 2012, and all instruments performed as expected after repairs. The station was demobilized on October 17, 2013.

2.2 Site Visit Details

2.2.1 Location and Logistics

The station was installed on November 9, 2010 at UTM NAD 83 9V 436859 6652535 (Photo 1). This location is at 1209 m elevation adjacent to recent drilling activity, and approximately 700 m north of the Yukon-BC border. The site was chosen for its proximity to the defined mineral resource, accessibility for maintenance and data recovery, and lack of tree cover.

Photograph 1: Meteorological Station at Jennings Project Area (Photograph: A. Pickup, 2011)

A site visit was performed by a Golder technician on October 17, 2013 to demobilize the station. A helicopter was used to access the station. Previous site visits for data downloads had been performed in conjunction with scheduled water quality visits in March, June, August, and October of 2012 and stream discharge monitoring site visits on May and June of 2013.

2.2.2 Data Logger and Instruments

As a summary, the following instrumentation was installed at the met station by Golder in November 2011:

- CM106 3 metre tripod: Note that this was intended as a temporary sensor support as the Meteorological Service of Canada recommends that a 10 metre tower be used for long-term installations. Golder recommends that when conditions are favourable, the sensors be moved to a new permanent, 10 metre tower;
- MSX20R regulated solar panel – charges an on-board 12 volt battery (BP26);
- SC115 Flash Memory Drive with USB interface;
- CR1000 series Data Logger with BP26 battery and enclosure;
- 05103 R.M. Young Wind Monitor;
- Model 109L Temperature Probe;

- HMP45C212 Temperature and Relative Humidity Probe;
- TE525 Tipping Bucket Rain Gage;
- SR50A Sonic Ranging Sensor (Snow Depth); and
- NR-LITE2 Net Radiometer

Measurements are recorded on an hourly interval as follows:

- Air Temperature HMP Average;
- Air Temperature HMP Maximum;
- Air Temperature HMP time of Maximum;
- Air Temperature HMP Minimum;
- Air Temperature HMP time of Minimum;
- Relative Humidity Instantaneous;
- Relative Humidity Average;
- Vapour Pressure Average;
- Saturation Vapour Pressure Average;
- Air Temperature 109 Average;
- Air Temperature 109 Maximum;
- Air Temperature 109 time of Maximum;
- Air Temperature 109 Minimum;
- Air Temperature 109 time of Minimum;
- Solar Radiation Average;
- Wind Speed Average;
- Wind Vector Average;
- Wind Vector Standard Deviation;
- Wind Speed Maximum;
- Wind Speed time of Maximum;
- Rainfall Total (snowfall data may be useful, and warrants consideration for future met station development);
- Snow Depth Instantaneous; and
- Snow Depth Quality Signal.

Note that the TE525 rain gauge will not work in below zero degrees Celsius conditions.

2.2.3 Maintenance Performed

No maintenance was performed on the station in 2013. The station was demobilized and data were downloaded successfully from the met station for all sensors on October 17, 2013.

2.2.4 Meteorological Data

The meteorological data set from installation in November 2011 to October 17, 2013, has been provided to AEM in the form of Excel data files. A summary of the data is provided in Appendix A. A full analysis of the data record has not yet been undertaken.

3.0 AQUATICS BASELINE PROGRAM

3.1 Introduction

This section summarizes activities of the fourth year (2013) of the aquatics baseline program conducted by Golder for the Project. The primary objective of the 2013 aquatics baseline study was to characterize seasonal variation in stream flows and water levels in the Project area. In 2013, the aquatics program was limited to stream flow measurements at eight sites on five unnamed watercourses (Figure 1). Water quality samples from streams were not taken in 2013 as an adequate seasonal sampling had been completed in previous years. The stream flow sites were sampled on three occasions throughout the open water season (May 14, June 5 and October 17, 2013). Water level data loggers were installed at four sites in May and recovered in October 2013.

Regional drainages include the Tootsee River, located west of the Jennings Project area, which flows approximately 15 km northward until it joins the Rancheria River. The Rancheria River flows in an east-north-easterly direction and eventually flows into the Liard River upstream of the community of Upper Liard. Unnamed streams in the Project area are tributaries of the Rancheria River system.

3.2 Methodology

3.2.1 Hydrology

Stream flow measurements were collected with a Flow Tracker Acoustic Doppler Velocimeter for seven of the eight sites in May 14, June 5 and October 17, 2013. Water level data-loggers were installed at gauging sites BC-1, BC-2B, BC-5, and TR-1 on 14 May 2013 and removed on 17 October 2013. Sample sites are provided on Figure 1.

3.3 Results

3.3.1 Hydrology

Stream flow measurements were taken during all three field visits in 2013 shows the calculated discharge results at the time of surveys. Gauges were uploaded and removed from site on October 17, 2013. Data from the gauges have not been summarized to date. Digital data files will be stored with Golder and transferred to AEM. Photos of stream discharge stations are provided in Appendix C.

Table 1: Discharge Results Summary for 2013

	Discharge (m^3/s)		
Site	**14 May 2013**	**05 Jun 2013**	**17 Oct 2013**
BC-1	0.0636	0.1442	0.2770
BC-2B	0.1925	0.2628	0.1489
BC-4	n/a	0.2707	0.0396
BC-5	0.5343	1.2054	0.3846
TBC-2	0.0888	0.1421	0.0533
TR-1	0.5355	0.4964	0.2150
TT-1	0.5458	0.2003	0.0860

4.0 CLOSING

We trust this information is sufficient for your needs at this time. Should you have any questions, please do not hesitate to contact the undersigned at (604) 296-4200.

KEYEH NEJEH GOLDER CORPORATION

ORIGINAL SIGNED

Jeff Bailey, M.A., RPCA
Managing Director Keyeh Nejeh Golder

GOLDER ASSOCIATED LTD.

ORIGINAL SIGNED

Chris Schmidt, B.Sc., R.P.Bio.
Associate, Senior Wildlife Biologist

JB/CHS/asd

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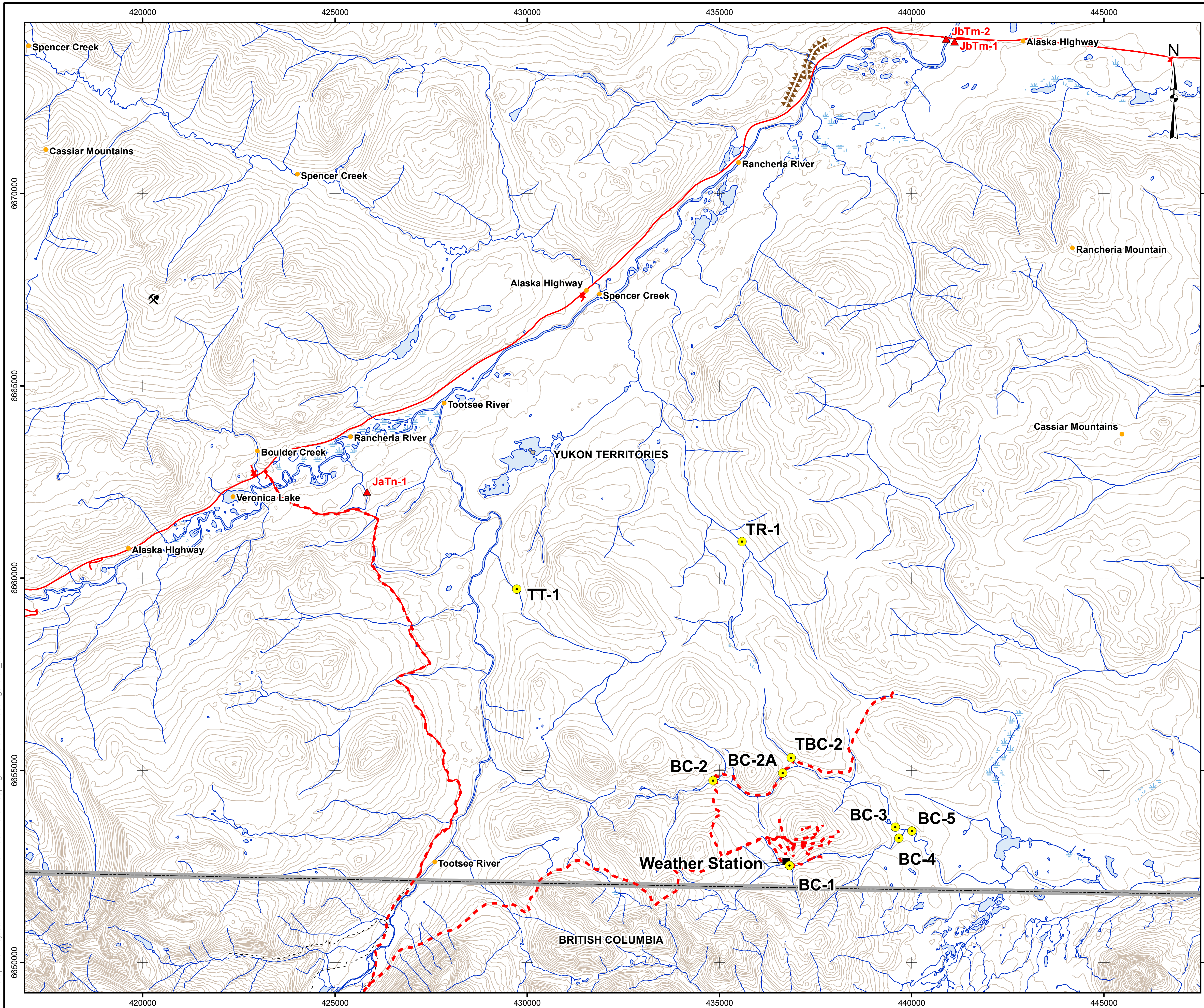

LEGEND

- Archaeological Site
- Aquatic Sample Station
- Weather Station
- Provincial / Territorial Boundary
- Access Road
- Contour
- Road
- Watercourse
- Waterbody
- Wetland

LEGEND FOR AQUATIC SAMPLE STATIONS

Station	Water Quality	Stream Flow	Transducer (2012)	Benthic Invertebrates (Sep. 2011)	Periphyton (Sep. 2011)
BC-1	■	■	■		■
BC-2	■	■			
BC-3	■	■			
BC-4	■	■		■	
BC-5	■	■	■	■	■
BC-2A		■	■		
TBC-2	■	■			■
TR-1	■	■	■	■	■
TT-1	■	■			

REFERENCE

CanVec 1:50,000 data obtained from Natural Resources Canada.
Projection: UTM Zone 83 Datum: NAD 9

2,000 0 2,000
SCALE 1:100,000 METRES

PROJECT
AEM JENNINGS MINE

TITLE
BASELINE MONITORING SITES

Golder Associates
Greater Vancouver Office, B.C.

PROJECT No. 12-1021-0002			PHASE No. 2000	
DESIGN	CO	08JUL10	SCALE AS SHOWN	REV. 0
GIS	JP	16MAR13		
CHECK	CHS	18APR13	FIGURE 1	
REVIEW	CHS	18APR13		

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APPENDIX A

Meteorological Data

APPENDIX A
Meteorological Data
AEM Jennings Property, Yukon – Summary of November 2011 to October 2013 Climate Data

Month	Temperature					Relative Humidity					Saturated Vapour Pressure			Vapour Pressure		
	Hourly Max_max	Daily Max_avg	Hourly average	Daily Min_avg	Hourly Min_min	Hourly Max_max	Daily Max_avg	Hourly average	Daily Min_avg	Hourly Min_min	Hourly Max_max	Hourly average	Hourly Min_min	Hourly Max	Hourly average	Hourly min
	Deg C	Deg C	Deg C	Deg C	Deg C	%	%	%	%	%	kPa	kPa	kPa	kPa	kPa	kPa
January	7.10	-10.08	-15.10	-20.89	-41.04	100.00	91.86	81.29	67.64	42.88	1.00	0.25	0.02	0.62	0.20	0.01
February	4.01	-3.67	-9.23	-15.71	-28.51	99.60	94.69	78.07	58.32	26.52	0.80	0.34	0.06	0.59	0.25	0.05
March	4.23	-5.50	-12.14	-19.95	-31.97	99.80	92.75	74.66	51.49	24.79	0.79	0.28	0.04	0.56	0.20	0.03
April	10.41	1.52	-4.61	-11.31	-25.62	99.40	94.20	73.70	46.52	19.14	1.17	0.48	0.08	0.65	0.32	0.07
May	20.94	8.74	3.53	-3.10	-10.11	100.00	92.43	65.15	38.95	18.66	2.28	0.84	0.29	1.12	0.50	0.25
June	25.06	15.31	9.11	1.77	-3.47	100.00	96.85	70.06	40.98	17.73	3.04	1.24	0.50	1.45	0.78	0.37
July	26.07	17.56	10.56	1.69	-4.12	100.00	95.42	67.24	37.17	18.82	3.27	1.37	0.46	1.61	0.82	0.38
August	25.00	16.64	9.47	1.92	-4.31	100.00	98.16	76.42	45.09	18.61	2.97	1.26	0.46	1.55	0.88	0.41
September	21.43	11.74	5.50	-0.90	-6.57	159.70	97.07	75.14	46.85	21.66	2.50	0.97	0.39	1.21	0.66	0.31
October	16.16	0.09	-4.66	-8.54	-28.17	100.00	97.12	86.61	68.66	36.81	1.78	0.50	0.06	0.93	0.41	0.05
November	0.80	-13.58	-17.41	-22.11	-38.49	100.00	90.89	84.49	77.01	61.37	0.64	0.19	0.02	0.56	0.16	0.02
December	7.23	-9.88	-14.12	-19.92	-35.06	100.00	91.04	78.80	65.64	35.18	0.99	0.27	0.03	0.68	0.20	0.02

APPENDIX A
Meteorological Data
AEM Jennings Property, Yukon – Summary of November 2011 to October 2013 Climate Data

Month	Solar Radiation					Windspeed, Average			Windspeed, Maximum			Rain	Snow
	Hourly Max	Daily Max	Hourly average	Daily Min	Hourly Min	Hourly Avg_max	Hourly average	Hourly Avg_min	Daily Max_max	Daily Max_avg	Daily Max_min	Monthly Avg	Depth_Max
	w/m2	w/m2	w/m2	w/m2	w/m2	m/s	m/s	m/s	m/s	m/s	m/s	mm	m
January	57.75	5.91	-17.46	-51.76	-80.40	9.41	1.51	0.00	18.58	6.48	1.53	0.00	0.55
February	24.25	-3.83	-23.98	-47.50	-141.20	6.52	1.72	0.07	13.64	6.94	2.10	1.42	0.53
March	71.65	7.29	-19.65	-58.67	-228.60	6.33	1.61	0.00	12.01	6.00	3.29	3.55	0.56
April	180.80	17.80	-6.61	-59.25	-343.10	6.89	1.90	0.00	14.11	7.17	3.76	23.55	0.96
May	620.60	185.80	67.60	-20.56	-244.70	7.67	1.92	0.06	16.44	7.76	2.67	18.68	0.98
June	769.00	216.10	94.61	0.00	-98.90	3.88	1.51	0.02	11.58	6.75	3.65	100.20	0.43
July	636.20	184.60	50.35	0.00	-88.00	4.47	1.55	0.00	10.37	6.78	3.67	41.40	—
August	571.80	145.00	35.77	0.00	-114.90	4.29	1.31	0.03	10.02	5.90	2.72	52.25	—
September	457.40	93.80	32.86	-19.67	-104.20	4.94	1.57	0.00	13.58	7.19	2.74	50.60	—
October	291.40	42.79	-12.55	-54.84	-206.80	6.82	1.33	0.00	13.97	5.75	1.63	35.91	0.33
November	22.13	2.11	-9.85	-56.21	-107.20	6.60	1.21	0.00	13.76	4.66	1.43	0.24	0.52
December	10.83	-1.62	-22.43	-77.03	-106.70	9.12	1.78	0.00	22.17	7.04	0.00	4.50	2.97

APPENDIX B

Photographs of Stream Discharge Sites

Photograph 1: Upstream view of BC-1 Discharge Transect, 14 May 2013

Photograph 2: Upstream view of BC-2B Discharge Transect, 14 May 2013

Photograph 3: Upstream view of BC-4 discharge transect, 14 May 2013

Photograph 4: Upstream view of BC-5 discharge transect, 14 May 2013

Photograph 5: Upstream view of TBC-2 discharge transect, 14 May 2013

Photograph 6: Upstream view of BC-1 discharge transect, 05 Jun 2013

Photograph 7: Upstream view of BC-5 discharge transect, 05 Jun 2013

Photograph 8: Upstream view of BC-2B discharge transect, 05 Jun 2013

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At Golder Associates we strive to be the most respected global company providing consulting, design, and construction services in earth, environment, and related areas of energy. Employee owned since our formation in 1960, our focus, unique culture and operating environment offer opportunities and the freedom to excel, which attracts the leading specialists in our fields. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees who operate from offices located throughout Africa, Asia, Australasia, Europe, North America, and South America.

Africa	+ 27 11 254 4800
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AGNICO EAGLE
EXPLORATION

Agnico Eagle Mines Limited
400 - 543 Granville Street
Vancouver, British Columbia V 6 C 1X8
Phone 604.608.2557 Fax 604.608.2559

March 21, 2014

Rena Rehfeldt
Mining Lands Officer
Watson Lake Mining Recorders Office
P.O. Box 269 K-W L
Watson Lake, YT Y0A 1C0
(867) 536-7366

Dear Ms. Rehfeldt,

Re: Certification of correction - Grant Number and Claim Name for LQ00191 - Jennings Project

This letter is to certify the correction of the Grant Number and Claim Name in the submitted Application for a Certificate of Work for Jennings Project dated January 21, 2014 to Watson Lake Mining Recorders Office. Agnico-Eagle Mines Limited (AEM) operates the Jennings Project under permit LQ0091, which is located approximately 35 km southeast of Rancheria and 80 km west of Watson Lake. The Jennings Project is accessed by the Silvertip-Midway and Tootsee access roads. AEM is submitting the 2013 Report on Metallurgical and Base Line Monitoring Study on Jennings Project.

Please contact me via email at henry.castillo@agnico-eagle.com or by phone at 778-968-6858 should you have any questions or require any further information.

Henry Castillo, B.Sc., P.Geo
Senior Geologist

Yukon
Energy, Mines and Resources

QUARTZ MINING ACT FORM 4 SECTION 56

APPLICATION FOR A CERTIFICATE OF WORK

Office Date Stamp

I, STEVEN McROBERTS ,

AGNICO-EAGLE MINES LIMITED

of 400-543 GRANVILLE STREET, VANCOUVER, BC, V56 1X8

Phone 604-608-2557

Client I.D. Number: LQ00191

make oath and say that:

1. I am the owner, or agent of the owner, of the mineral claim(s) to which reference is made herein.

2. I have done, or caused to be done, work, on the following mineral claim(s): (Here list claims on which work was actually done by number and name)

702 HC 97 HC 98 HC TOOZ HC

YC28701-YC28798/TOOZ 1-98; YC73950-YC73971/TOOZ 99-119; ~~YE85213-YE85231/TOOZ 120-122~~ .

YA36789-HOT 1; YA36791-HOT 3; YA36793-HOT 5; YA36795-HOT 7; YA36797-HOT9; YA36799-HOT11

YA36822-HOT 34; YA36824-HOT 36; YA36826-HOT 38; YA36828-HOT 40; YA36830-HOT 42

YA36805-YA36816/HOT 17-28; YA71565-YA569/HOT 81-85

situated at 35 KILOMETERS SE OF RANCHERIA Claim sheet No. 105B01

in the WATSON LAKE Mining District, to the value of at least 42,037.57 dollars,

since the 15 day of MARCH 2013 ,

to represent the following mineral claims under the authority of Grouping Certificate No. HL12480 .
(Here list claims to be renewed in numerical order, by grant number and claim name, showing renewal period requested).

TOOZ HC

YC28701-YC28798/TOOZ 1-98; YC73950-YC73971/TOOZ 99-119; YE85213-YE85231/TOOZ 120-138

YF40415-YF40417/TOOZ 139-141; YD12277-YD12294/TOOZ 142-159; YE43993-YE4400/TOOZ 160-167

YA36789-HOT 1; YA36791-HOT 3; YA36793-HOT 5; YA36795-HOT 7; YA36797-HOT9; YA36799-HOT11

YA36822-HOT 34; YA36824-HOT 36; YA36826-HOT 38; YA36828-HOT 40; YA36830-HOT 42

YA36805-YA36816/HOT 17-28; YA71565-YA569/HOT 81-85

3. The following is a detailed statement of such work: (Set out full particulars of the work done indicating dates work commenced and ended in the twelve months in which such work is required to be done as shown by Section 56).

AN ENVIRONMENTAL STUDY CONSISTING OF AN AQUATIC AND METEOROLOGICAL

BASE LINE STUDY ON THE JENNINGS PROJECT

Sworn before me at Vancouver, B.C. this 21st day of January 2014 .

Notary Public

Owner or Authorized Agent

YG(6049Q)F2 Rev. 04/2012

Yukon
Energy, Mines and Resources

QUARTZ MINING ACT FORM 4 SECTION 56

APPLICATION FOR A CERTIFICATE OF WORK

Office Date Stamp

I, STEVEN McROBERTS,

AGNICO-EAGLE MINES LIMITED

of 400-543 GRANVILLE STREET, VANCOUVER, BC, V56 1X8

Phone 604-608-2557

Client I.D. Number: LQ00191

make oath and say that:

1. I am the owner, or agent of the owner, of the mineral claim(s) to which reference is made herein.

2. I have done, or caused to be done, work, on the following mineral claim(s): (Here list claims on which work was actually done by number and name)

   YC28701-YC28798/TOOZ 1-98; YC73950-YC73971/TOOZ 99-119; YE85213-YE85231/TOZ120-122

   YA36789-HOT 1; YA36791-HOT 3; YA36793-HOT 5; YA36795-HOT 7; YA36797-HOT9; YA36799-HOT11

   YA36822-HOT 34; YA36824-HOT 36; YA36826-HOT 38; YA36828-HOT 40; YA36830-HOT 42

   YA36805-YA36816/HOT 17-28; YA71565-YA569/HOT 81-85

   situated at 35 KILOMETERS SE OF RANCHERIA Claim sheet No. 105B01

   in the WATSON LAKE Mining District, to the value of at least 42,037.57 dollars,

   since the 15 day of MARCH 20 13,

   to represent the following mineral claims under the authority of Grouping Certificate No. HL1248.
   (Here list claims to be renewed in numerical order, by grant number and claim name, showing renewal period requested).

   YC28701-YC28798/TOOZ 1-98; YC73950-YC73971/TOOZ 99-119; YE85213-YE85231/TOZ120-138

   YF40415-YF40417/TOOZ 139-141; YD12277-YD12294/TOOZ 142-159; YE43993-YE4400/TOOZ 160-167

   YA36789-HOT 1; YA36791-HOT 3; YA36793-HOT 5; YA36795-HOT 7; YA36797-HOT9; YA36799-HOT11

   YA36822-HOT 34; YA36824-HOT 36; YA36826-HOT 38; YA36828-HOT 40; YA36830-HOT 42

   YA36805-YA36816/HOT 17-28; YA71565-YA569/HOT 81-85

3. The following is a detailed statement of such work: (Set out full particulars of the work done indicating dates work commenced and ended in the twelve months in which such work is required to be done as shown by Section 56).

   AN ENVIRONMENTAL STUDY CONSISTING OF AN AQUATIC AND METEOROLOGICAL

   BASE LINE STUDY ON THE JENNINGS PROJECT

Sworn before me at Vancouver, B.C. this 21st day of January 20 14.

[signature] Notary Public

[signature] Owner or Authorized Agent

Yukon
Energy, Mines and Resources

QUARTZ MINING ACT FORM 4 SECTION 56

APPLICATION FOR A CERTIFICATE OF WORK

Office Date Stamp

I, STEVEN McROBERTS,

AGNICO-EAGLE MINES LIMITED

of 400-543 GRANVILLE STREET, VANCOUVER, BC, V56 1X8

Phone 604-608-2557

Client I.D. Number: LQ00191

make oath and say that:

1. I am the owner, or agent of the owner, of the mineral claim(s) to which reference is made herein.
2. I have done, or caused to be done, work, on the following mineral claim(s): (Here list claims on which work was actually done by number and name)

   YA36807-HOT19; YA36809-HOT21; YA36810-HOT22; YA36811-HOT23; YA36824-HOT36; YA36826-HOT38

   YA36828-HOT40; YC28719-HOT18 AND YA71565-HOT81

   situated at 35 KILOMETERS SE OF RANCHERIA Claim sheet No. 105B01

   in the WATSON LAKE Mining District, to the value of at least 89,368.50 dollars,

   since the 1 day of June 2013,

   to represent the following mineral claims under the authority of Grouping Certificate No. HL12480.
   (Here list claims to be renewed in numerical order, by grant number and claim name, showing renewal period requested).

   TOOZ HC

   YC28701-YC28798/TOOZ 1-98; YC73950-YC73971/TOOZ 99-119; YE85213-YE85231/TOZ 120-138

   YF40415-YF40417/TOOZ 139-141; YD12277-YD12294/TOOZ 142-159; YE43993-YE4400/TOOZ 160-167

   YA36789-HOT 1; YA36791-HOT 3; YA36793-HOT 5; YA36795-HOT 7; YA36797-HOT9; YA36799-HOT11

   YA36822-HOT 34; YA36824-HOT 36; YA36826-HOT 38; YA36828-HOT 40; YA36830-HOT 42

   YA36805-YA36816/HOT 17-28; YA71565-YA569/HOT 81-85

3. The following is a detailed statement of such work: (Set out full particulars of the work done indicating dates work commenced and ended in the twelve months in which such work is required to be done as shown by Section 56).

   A METALLURGICAL STUDY WAS COMPLETED IN JENNINGS PROJECTS BASED ON THE ASSAY

   RESULTS FROM 2008-2010 DIAMOND DRILLING PROGRAMS.

Sworn before me at Vancouver, B.C this 21st day of January 2014.

Notary Public

Owner or Authorized Agent

YG(5049O)F2 Rev. 04/2012

Yukon
Energy, Mines and Resources

QUARTZ MINING ACT FORM 4 SECTION 56

APPLICATION FOR A CERTIFICATE OF WORK

Office Date Stamp

I, STEVEN McROBERTS ,

AGNICO-EAGLE MINES LIMITED

of 400-543 GRANVILLE STREET, VANCOUVER, BC, V56 1X8

Phone 604-608-2557

Client I.D. Number: LQ00191

make oath and say that:

1. I am the owner, or agent of the owner, of the mineral claim(s) to which reference is made herein.

2. I have done, or caused to be done, work, on the following mineral claim(s): (Here list claims on which work was actually done by number and name)

YA36807-HOT19; YA36809-HOT21; YA36810-HOT22; YA36811-HOT23; YA36824-HOT36; YA36826-HOT38

YA36828-HOT40; YC28719-HOT18 AND YA71565-HOT81

situated at 35 KILOMETERS SE OF RANCHERIA Claim sheet No. 105B01

in the WATSON LAKE Mining District, to the value of at least 89,368.50 dollars,

since the 1 day of June 20 13 ,

to represent the following mineral claims under the authority of Grouping Certificate No. HL1248 .
(Here list claims to be renewed in numerical order, by grant number and claim name, showing renewal period requested).

YC28701-YC28798/TOOZ 1-98; YC73950-YC73971/TOOZ 99-119; YE85213-YE85231/TOZ120-138

YF40415-YF40417/TOOZ 139-141; YD12277-YD12294/TOOZ 142-159; YE43993-YE4400/TOOZ 160-167

YA36789-HOT 1; YA36791-HOT 3; YA36793-HOT 5; YA36795-HOT 7; YA36797-HOT9; YA36799-HOT11

YA36822-HOT 34; YA36824-HOT 36; YA36826-HOT 38; YA36828-HOT 40; YA36830-HOT 42

YA36805-YA36816/HOT 17-28; YA71565-YA569/HOT 81-85

3. The following is a detailed statement of such work: (Set out full particulars of the work done indicating dates work commenced and ended in the twelve months in which such work is required to be done as shown by Section 56).

A METALLURGICAL STUDY WAS COMPLETED IN JENNINGS PROJECTS BASED ON THE ASSAY

RESULTS FROM 2008-2010 DIAMOND DRILLING PROGRAMS .

Sworn before me at Vancouver, B.C this 21st day of January 2014 .

Notary Public

Owner or Authorized Agent