BC Geological Survey Assessment Report 34440

# TRENAMAN MINING SERVICES LTD.

# PRELIMINARY RESOURCE ESTIMATION FOR SOCIETY GIRL TARGET

# MOYIE, BRITISH COLUMBIA

# BASED ON DATA OBTAINED FROM SEVENTEEN DIAMOND DRILL HOLES

# PRELIMINARY ANALYSIS 2007 & 2008

# EDITED AND COMPLETED OCTOBER 2013

BY

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NOTE: DRILL LOGS AVAILABLE IN DIGITABLE FORMAT UPON REQUEST

# RESOURCE ESTIMATE- SOCIETY GIRL TARGET, ONE OF TWO SULFIDE MINERALIZED ZONES IDENTIFIED WITHIN MINERAL CLAIMS 505101-AND 514019 CURRENTLY OWNED BY TRENAMAN MINING SERVICES LTD (TMS)).

## THIS ESTIMATE IS BASED ON DIAMOND DRILL AND OTHER EXPLORATION PROGRAMMES CONDUCTED UNDER THE DIRECTION OF THE AUTHOR IN 2006 AND 2007 ON THE SOCIETY GIRL TARGET.

## 1.

#### SUMMARY

An estimated resource of 164,900 metric tonnes (MT) containing 5.65% combined lead/zinc within five discrete resource blocks within the target area has been established based on diamond drilling during 2006 and 2007, supplemented by geological mapping and geophysical programmes. Within these blocks three higher grade cores are estimated to total 60,000 MT with a combined grade averaging 12 to 15% combined lead/zinc The 164,900 MT resource is contained in a much larger volume of favorable **Upper Aldridge stratigraphy (UA)** within the target area estimated at 2.5 million MT, that contains variable but low concentrations of lead/zinc sulfide values.

Supplementary data used in the preparation of this estimate has been extracted from Minister of Mines Reports dating from 1898 through to 1954, and numerous documents (including plans and sections, of the underground Society Girl workings) acquired from Cominco and Falconbridge between 1999 and 2003.

During 2006 and 2007 a seventeen hole diamond drill progamme involving 3774.1 meters of core drilling was completed by St. Eugene Mining Corporation Ltd. on the Society Girl target, at a direct cost of approximately \$750,000. These holes tested a panel of the steeply dipping Society Girl break, here a 40 meter wide zone of fracturing, for a strike length of 350 meters and dip length of 250 meters; the majority of holes were confined to a segment of this panel 100 meters in strike by 250 meters in dip. Geological interpretation of the data obtained from cores, coupled with assay results for the core sections sampled have been synthesized to produce a **preliminary mineral resource estimate**. Forming part of this report are two tables and seventeen figures to which the reader should refer for clarification of the issues addressed and conclusions reached.

#### 2. Brief History of the Society Girl Mining Development and Production

The Pb/Zn/Ag mineral occurrences which have been identified to date in the area defined as the "Society Girl Target", and the subject of this analysis fall, within the domain of the St. Eugene fault, This is a southeast/northwest steeply south dipping fault structure that has been traced over a strike length of 5km. To the west of the Society Girl target, this structure hosts a number of mineral deposits that include the St. Eugene, mine (St. Eugene ,Moyie, Lakeshore ore shoots), and Aurora and Guindon prospects. To the east on the trace of this structure lies the John D prospect.

The Society Girl surface showing is located 2.6 km in a direct line southwest of the town of Moyie, BC. (Refer to Location Maps following page 4). The property was probably located in the early 1890's, about the time that the St. Eugene mine outcrops were staked, but development did not proceed until 1899, when rail transportation became available with construction of the CPR Crowsnest rail line.

Mine development proceeded on two fronts; commencing in 1899 mining of the surface outcrop was initiated as a glory hole located on the original find, followed by the driving of a 25 metre ft crosscut (No 1 Level) to access the deposit at 16 metres below surface. Somewhat later, a 355 metre crosscut (No 2 Level) was commenced to access the vein system at a depth of approximately 80 metres. From No 2 level the vein system was drifted on both east and west for a total of 170 metres, a raise driven to tie into No 1 level, and a number of stoping blocks extracted.

From 1900 to 1922 the Society Girl was a small but regularly consistent producer, producing between 300 and 1000 tonnes most years. Throughout these years the mining activities were conducted by a group of free miners and prospectors, working within a cooperative framework, receiving by way of payment, shares in the cooperative. Income from the efforts of their labors was restricted since there was a limited market for the zinc component of the ore, which was discarded in the waste dumps, or left in place.

Commencing in 1948, a second campaign of mining was undertaken by a small group of leasers who, with improved prices for zinc metal (1949 to 1953) focused efforts on salvaging the zinc contained in waste dumps that had been discarded from the earlier operations. During this period, also, additional ore was mined by underhand mining below the earlier stoping in the area of the No1 level. Based on the data available it does not appear that the No. 2 adit was reopened during this period. Approximately 2200 MT were salvaged and shipped to the Trail smelter between 1949 and 1952. In total the property produced approximately 5000 MT.

St. Eugene Mining Corporation Ltd (SEM) staked a substantial block of ground in 2005 in the St. Eugene mine area; during 2005 to 2006 SEM identified six explorations targets within this land package. The Society Girl target was one of the targets identified. In 2010 Trenaman Mining Services Ltd. (TMS) purchased Mineral Claim Numbers **514019 and 505105** (amongst others) from SEM by Bill of Sale recorded Nov 17, 2010 as event 4810393. The Society Girl target is situated within these claims.

This report deals with the results obtained by diamond drilling in 2006 and 2007.on the Society Girl target.. Further exploration work should result in an enhancement to the quality and size of the resources as outlined in this report. The potential; of the underlying Mine Quartzite target with a substantially larger potential has yet to be explored.





# **3** GEOLOGICAL ENVIRONMENT AND HOST FOR LEAD/ZINC SULFIDES

Drill hole cores show that lead/zinc sulfides are confined within the target area to intervals of early stage brecciated UA argillites/siltstones within the boundaries of the Society Girl break. (The Society Girl break is a local component of the well defined northwesterly striking and steeply south dipping St. Eugene break which has been traced laterally for a minimum of five km.) The UA stratigraphy within the target area is relatively flat lying, striking north westerly semi-parallel to the Society Girl break and dipping approximately 10 degrees to the north east. Breccia intervals are wide spread throughout the upper 200 meter section of the UA formation, and may extend over a greater vertical interval, but drill coverage is inadequate to confirm. Individual intervals may be 20 metres thick and, based on incomplete sampling, average 0.70 to 1% combined lead/zinc, (Refer to Figure 07-13) exclusive of intervals selected as potential mining blocks. Based on the current level of understanding the volume of sulfide bearing breccia is estimated to be a minimum of 2.5 million MT. Within this envelope of low grade sulfides are a number of core intercepts that are higher grade; these form the basis of the resource estimates which are the subject of this report.

This breccia host for lead/zinc sulfide mineralization in the UA formation has not been previously identified, and provides additional evidence for the strength of the mineralizing system at work within the St Eugene break.. The controls to higher grade zinc/lead concentrations within these zones of brecciation is poorly understood; based on present data, they may be focused within the Society Girl break near cross cutting faults, these a part of its early development.

# Other possible subordinate controls.

The St. Eugene and Society Girl basic sills (diabase) appear to exert some influence to the position of sulfide concentrations. In a number of instances the lithology adjacent to the sills contains a component more quartzitic than the surrounding strata, which, based on evidence from elsewhere, is more favorable for sulfide deposition. On the other hand the sills may represent a relative impervious barrier to ascending mineral rich solutions and provide a damming impact.

#### 4.

# TREATMENT OF DIAMOND DRILL DATA

A. All drill holes were cored to NQ or NQ2 size. A precise GPS survey instrument was employed to establish three dimensional coordinates for drill hole collars. Most of the drill core was logged by two geologists, Mr. Peter Klewchuk and Mr. Peter Read, both Professional Geologists. Sampling was carried out under the direction of either of the above and core splitting, bagging and shipping of samples, was carried out under the supervision of Mr. Dave Pighin, P Geologist. All assaying was conducted by ALS Laboratory Group, Vancouver, BC. All drill core is stored in racks at a core processing and storage facility owned by Mr. D. Pighin, at the north end of Upper Moyie Lake. The drill programme was directed by the writer, R. T Trenaman, P Eng., with guidance from the above named geologists.

B. Core hole data was drafted graphically on cross section, long section, and plan in digital format (Autocad) (Refer to Figures RC-1, RC-2 and RC-3). To assist in understanding

the complexities of at least two epochs of faulting all drill holes were further generated as 3D models, highlighting certain geological features. A section for each drill hole was prepared on which existing mine workings and assay data was added. These sections were transferred to a common section (Fig RC 2 Section B-B (containing Holes SG 06-02, 03 and SG 07-05). The majority of holes were drilled at an azimuth of 31 degrees, normal to the assumed azimuth of the Society Girl break. Holes that were not drilled to the common azimuth were rebatted to 31 degrees. Following a number of attempts to match significant assay data between holes, it appeared that the best fit could be achieved by "building" in a north trending, steeply easterly dipping fault. This fault provides a dipslip displacement of about 15 meters with the easterly panel offset and down dropped to the east. Evidence for this fault appears to be confirmed by DDH 07-17. This resolution provides two mining panels, an East and a West. The east panel contains evidence for Main, North and Avenue stoping blocks; the west panel, Main and North blocks.

Even with this extensive analysis, providing a satisfactory estimate has proven to be fraught with numerous uncertainties. The main problems relate to establishing continuity of mineral grades and deposit thickness between drill holes. All drill holes cores record a significant number of faults. Drill core logged by P. Read provides a catalogue of the family of faults (early) which are of importance to the mineralizing process, and the family of faults (later) which have no impact to the mineralizing process, but confuse the analysis process by having offset the mineralized zones uncertain amounts. Offsets have taken place with both families of faults. If sufficient core drilling was carried out, it would be reasonable to assume that these challenges could be resolved; however the costs related to this undertaking, where average hole lengths are + 200 meters, would be considerable.

C. Sample data. For each drill hole, significant assay results were composited and assigned to one of the five stoping blocks which appeared to provide a logical fit. A minimum mining width of 2 meters was assumed and sample results were composited to achieve a weighted average over this interval (Refer to Table 1A). To simplify the process at this point, lead and zinc assay values were summed along with silver values, which have been factored in at 0.15 % of lead values (Silver values show as a constant relationship to lead values of 1 ounce silver for each 3.5% lead). Where sampling did not cover the required interval, a "non" value over the interval to achieve the desired 2 meters, was incorporated. As a comment, it should be noted, that where stope dips approaches 70 degrees, as here, a stope mining width of 1.25 meters is practical; achieving this objective would provide a 33 % improvement to the grades assigned in Tables 1A and 1B. The grades shown provide a cushion for dilution due to faulting or exploration and access development within the stoping process.

D. Volume and Tonnage Calculations. Stoping block outlines were established on a long section aligned to the plane of the Society Girl break (23 degrees from vertical-Refer to Figure RC-3). Boundaries were established to incorporate all drill holes contained within a specific block. The underlying principle used was this: Sulfide mineralization is widespread within the breccia zones; there are insufficient data points to establish the boundaries to higher grade lenses, thus all drill results within a given block should be

included. Volume for each block was calculated by first computing dip and strike parameters to establish a block plan and then multiplying by the average thickness of the sample chosen (normal to the block plan). A Specific gravity of 3.9 was used to establish stope metric tonnes. Grade was assigned based on the weighted average of the drill hole intercepts assigned. (refer to Table 1A)

# 5. CONTROLS GOVERNING POSITION OF MINING BLOCKS BASED ON PRESENT DATA

A The favorable rocks are sections of siltstones and argillites of the UA, which have been subjected to early stage slump folding and faulting that has provided a mosaic of breccia which is the primary host for sulfide deposition. (Refer to paper by P. Read- presented at East Kootenay Exploration conference in Fernie BC November 2007). Within the Society Girl target area, this control to sulfide mineralization appears to be restricted to the upper 200 meter section of the UA; it has not been observed in the overlying Creston Formation, and below the 200 meters favorable interval, based on the limited drill core available, the UA stratigraphy becomes more quartzitic, and not as susceptible to the favorable slump faulting. The sulfides of zinc and lead within the argillite hosts are surprisingly free of iron sulfides; aside from breccia fragments of argillite/siltstone the main gangue mineral is a weak, but persuasive overprint of silicfication.

B. Portions of the average stoping blocks defined by this analysis are considerably higher grade and thicker than the average tabulated; these portions, estimated to total 60,000 MT may be enriched by association with one or more north trending faults which crosscut the Society Girl break. Certainly within the overlying Creston formation, cross faults are mapped and effect a control to the locations of the ground mined in the past.

C. Defined stoping blocks occur in three identified environments within the St. Eugene break; parallel and near to the hangingwall (main vein), footwall boundary (footwall vein), and in a connecting avenue direction between (avenue veins). This is the habit common within the adjacent St. Eugene mine and also further west in the Aurora deposit; this ore deposit characteristic is evident at the Society Girl target a well and has been evoked to help define avenue type blocks in the Society Girl target. .. Assay results records that the sections of hole included as part of a stoping block are contained within envelopes consisting of lower grade sulfide material; ranging in grade between 0.7 and 1% zinc/lead which may be up to 18 meters in cross section. (Refer of assay tabulations shown on Figure RC 13 and RC 14 (Sections for SG 07–12 SG 07-13)... Within the area (which is open along strike and to depth) this block of low grade material represents in the order of 2.5 million MT

D. Initially the proposed configuration of stoping blocks for Society Girl was modeled on the experience from the St. Eugene Mine, namely that stopes would be aligned within the Society Girl break, adjacent to cross faults and within quartz rich lithology. Elements of this model appear to be valid; there appears to be a relationship between cross faults and sulfide concentrations, but the importance of early stage slump faulted and brecciated zones of siltstones/argillites lithology as a sulfide host is a newly identified and important control element. In addition to providing a host for the stoping blocks considered in this analysis, these zones offer larger tonnage exploration targets which may be amenable to bulk mining concepts.

E Slump faulting, brecciation, and principal sulfide deposition are considered to be of mid Proterozoic age. Subsequent faulting, considered to be Tertiary in age, has produced zones of crushing and gouge; and in some cases offsets to walls. These offsets do not appear to be substantial, but have complicated the process of understanding relationships between potential ore grade intersections in adjacent drill holes.

F. The dimensions provided for stoping blocks are based on less than an ideal number of data points. Because of the complications alluded to in "e" above, in the authors view, a doubling of the number of data points would be required to be able to significantly improve the quality of data beyond that presented here.

Underground access to the deposit for a close in look would be the favored option.

As a check on the tonnage estimates in the above compilations, it is worthwhile to apply the factor developed for the mined area (which was restricted to defined quartzite members within the Creston formation) during earlier mining activities. This factor is 13MT per square metre of slope distance of south structure explored. (See Appendix 1 below) The areas defined (within the plane of the vein structures) that contain the tonnages detailed in the resource calculations are as follows: (Refer to Figure RC 3).

TOTAL			20635	164,900
North Vein	49M	34M	1666	<u>14,400</u>
Main Vein	74M	95M	7030	47,500
West Panel				
North Vein	31M	95.5M	2961	28,700
Avenue	66M	36M	2376	19,300
Main Vein	71M	93M	660	28,700
East Panel				
Structure	Strike Length	Slope Length	Area (Square Metre	es) <u>Tonnes Estimate</u> d

**Factor** 164,900/20635 = 8 This suggests that the estimates may be conservative compared to the experience from the earlier mining above No 2 level in the Creston Formation.

## 6. ADDITIONAL COMPILATION OF DATA RECOMMENDED

Information of use in enhancing the quality of the resource figures, using the core log information already available could be obtained by two additional steps:

i: Further sampling of brecciated sections of drill core not already sampled. This would shed information on the trends of the lead/zinc content within the breccia envelope surrounding the higher grade core blocks.

ii: Thirteen of the seventeen holes drilled were meticulously logged by Mr. P. Read in a format compatible for use in one or more three dimensional software programmes. These logs contain detailed information on at least fifteen attributes of the core. The application of an appropriate software programme might lead to a better appreciation of the trends of breccia zones, in which sulfides are concentrated.

RTT October 2013

TABLE 1A											
CALCULATION SHEET FOR DRILL HOLE INTERVALS AND ASSAYS INCORPORATED TO ESTABLISH 2 M MINING WIDTH											
DD HOLE	DIP	AZIM	CORRECTION FACTOR	MINIMUM CORE SECTON	SAMPLE #	INTERVAL	COMBINED GRADE**	PRODUCT			STOPING BLOCK GRADE + THICKNESS
						A	В	AXB	WT AVG%/2M		
WEST PANEL MAIN											
SG06-02	45	31	0.92	2.17	304394	0.25	4.77	1.92			
					304395	1.05	25.69	26.97			
					304396	0.20	1.09	0.38			
					NON	0.67	0.32	0.21			
						2.17		29.48	13.6/2 M	27.2	
SG 07-05	53	31	0.88	2 27	81495	0.95	5 47	5 20			
50 07-05	- 55	51	0.00	2.21	81496	0.35	28.21	22 57			
					81497	0.00	26.69	14 68			
					81498	0.45	1.52	0.68			
					81499	0.65	11.55	7.51			
					81500	0.60	7.2	4.32			
						4.00		54.96	13.74/3.68 M	50.56	
SG 07-08	49	31	0.87	2.3	81974	0.30	3.03	0.91			
					81975	0.60	0.62	0.37			
					81976	0.40	12.02	4.80			
					81977	1.00	0.62	0.62	0 70/0 0 14	<b>F</b> 4	
						2.30		6.70	2.70/2.0 WI	5.4	
SG07-07	53	31	0.88	2.27	81962	0.55	0.95	0.52			
					81963	0.35	2.08	0.73			
					81964	0.50	12.91	6.45			
					81965	0.50	0.82	0.41			
					81966	0.15	14.01	2.10			
					NON	0.22	0	0.00			
						2.27		10.21	4.50/2.0 M	9	
00.07.40			0.05	0.05	50707	1.04	0.50				
SG 07-16	55	31	0.85	2.35	52/6/	1.24	3.58	4.44			
					52766	1.40	2.65	4.13 9.57	2 10/2 20 M	7.24	
						2.09		0.57	3.19/2.29 WI	7.51	
SG07-14	49	31	0.91		E72759	0.55	5.51	3.03			
					72761	0.60	4.39	2.63			
					72762	0.60	0.46	0.28			
					72763	0.45	0.98	0.44			
						2.20		6.38	2.90/2.0 M	5.8	
										105.27	7.53/2.33

WEST PA	NEL I	NOR	ſH								
SG 07-05	53	31	0.88	2.27	81554	0.85	7.41	6.29			
					81555	0.75	3.85	2.89			
					81556	0.60	0.81	0.49			
					81557	0.07	1.56	0.11			
						2.27		9.78	4.31/2.0		
SG 07-16	55	31	0.85	2.35	52769	0.57	7.19	4.1			
					NON	1.78	0.2	0.36			
						2.35		4.46	1.90/2.0		3.11%/2M
EAST PA		ΛΑΙΝ									
SG 07-09	65	53	0.7	2.86	81978	0.80	14.13	11.3			
					81979	0.75	7.78	5.83			
					NON	0.32	0.2	0.06			
					F209405	0.99	0.62	0.61			
						2.86		17.8	6.22/2.0	12.44	
SG 07-10	62	67	0.57	3.51	81984	0.72	13.15	9.73			
					NON	2.49	0.2	0.50			
					81985	0.30	4.25	1.27			
						3.51		11.50	3.28/2.0	6.56	
SG 07-12	58.5	82	0.54	3.7	81901	0.85	5.98	5.08			
					81902	1.05	2.11	2.22			
					81903	0.55	8.24	4.53			
					E209410	1.10	1.39	1.53			
					E209409	0.15	1.29	0.19	3.66/2.0	7.32	
						3.70		13.55			
SG 07-13	54	21	0.84	2.38	81919	0.90	1.23	1.11			
					81920	0.90	2.84	2.56			
					81921	1.00	1.26	1.26			
					81922	0.7	5.52	3.86			
						3.80		8.79	2.31/3.19	7.34	
SG 07-14					52756	0.80	0.76	0.61			
					52758	0.82	1.43	1.43			
					52760	0.58	1.1	1.07			
						2.20		3.11	1.41.2.0	2.82	
										36.48	3.26/2.24 M

EAST PA		NORT	H								
SG 07-13	54	21	0.84	2.38	81923	0.30	0.47	0.14			
					81924	0.30	23.59	7.08			
					81925	0.80	2.61	2.09			
					81926	0.90	2.36	2.36			
						2.30		11.67	5.06/2.0		
SG 07-12	58.5	82	0.54	3.7	E209415	0.60	0.57	0.34			
					E209416	1.00	0.42	0.42			
					E209417	0.75	0.67	0.50			
					E209418	0.40	0.57	0.23			
					81906	0.40	8.88	3.55			
					81907	0.15	94.77	14.22			
					81908	0.40	2.59	1.04			
					0.000	3.70	2.00	20.30	5.49/2.0		
											5.28/2 M
EAST PA	NEL A	VEN	UE								
SG 07-10	62	67	0.57	3 51	81980	0.80	12 64	10 11			
	02	01	0.01	0.01	81981	0.00	54 12	40 59			
					81982	0.60	20.65	12.39			
					E209406	0.35	0.21	0.73			
					NON	1 01	0.2	0.70			
						3.51	0.2	64 03	18 24/2 0		
			FACTORED B	Y 0.7 FOR AVEN		ON =12.75	//2.0 M	01.00	1012 1/210		
SG 07-12	58.5	82	0.54	37							
000112	00.0	02	0.01	0.1	81904	07	10.82	7 57			
					81905	0.2	8.88	1 78			
					NON	2.8	0.00	0.56			
					Non	37	0.2	9.91	2.68/2.0		
			FACTORED B	Y 0.9 FOR AVEN		ON( NEAR	MAIN VEIN)	=2.41%/2.0	M		10.32%/2 M
RTT 30-12-0	07										
**NOTE PB	3 +7N (	COMBI	NED, AG INCO	RPORATED AS P	PB FQUIVAI	FNT AT 0 1	5 X PB %		I	1	1
FG. ASSAY	10%	PB. 15	% ZN, 3 OPT 4	AG = COMBINED	GRADE 26 5	5%	C / C / C				
	.G. ASSAT. 10% FD, 15 % ZN, 5 OF FAG = COMBINED GRADE 20.5%										

TABLE IB									
PRELIMINARY RESOURCE ESTIMATE SOCIETY GIRL TARGET BASED ON 2006-07 DRILLING									
	DIMENSIONS (M) TONNES COMBINED GRADE								
STOPING BLOCK	PANEL	STRIKE	DIP°	THINKNESS	VOLUME	FACTOR 3.90	PB+ZN+AG%		
MAIN VEIN	WEST	55	95	2.33	12,174	47,500	7.53%		
NORTH	WEST	50	37	2.00	3,700	14,400	3.11%		
MAIN VEIN	EAST	70	90	2.44	14,112	55,000	3.26%		
NORTH VEINS(2)	EAST	40	92	2.00	7,360	28,700	5.28%		
AVENUE	EAST	67	26	2.00	3,484	19,300	10.32%		
TOTAL TONNES (1	1ETRIC)					164,900	5.65%		
GROSS VALUE(CDN) @ \$1.00/LB=2240 X 0.0565 X 164,000= \$20,800,000. NOTE:HIGHER GRADE COMPONENT 60,000 MT @ 12.1% COMBINED ORIGINALLY PREPARED JAN 2008; EDITED OCTOBER 2013 To accomapy Resource Estimation Report November 2013 by R. T. TRENAMAN									

TABLE IB

# **APPENDIX 1**

## A. REWIEW OF THE EARLY EXPERIENCE-WHAT CAN WE LEARN

## SUMMARY

While early stage faults which cross cut the attitude of the Society Girl break play a control function to sulfide concentrations, differences in litho/chemical characteristics between the Creston Formation, and UA Formation sequences immediately beneath, explains the more favorable environment for lead/zinc concentrations within UA sequence.

# ANALYSIS OF PREVIOUS MINING RECORDS

Earlier mine workings developed the Society Girl break above the main area of 2006-2007 drilling, within the overlying Creston formation, and over a strike length 170 meters. The remnant data from this mining is contained in old mining plans. While the current drilling has demonstrated discrepancies as to the position of these workings, both in plan and elevation, this data provides general ideas of the direction of mining endeavors and the pattern of ore bodies. The data to be derived from these old records, coupled with excerpts from a number of Annual Minister of Mines Reports (MMR), relates primarily to activities carried out on the South (Main) Vein.

Detailed mapping of the surface surrounding the Glory Hole workings, carried out in 2007, reveals a maze of crisscrossing fractures, many trending slightly east of north. With these fractures, steep dips prevail both east and west. Drag folding is associated with the most westerly of the north trending fractures within the stoped area indicating west side down. These fractures probably play an important role in localizing the ore material found nearby, but it is impossible to ascertain which fault may be dominant as an ore control element. To the east of the stoped area, a set of fractures which parallel the strike orientation of the ore block warp into an avenue direction (azimuth 60-70 degrees) and some are rimmed with chlorite. Thin films of sphalerite were noted on some of these fractures.

Based on the data base available of the previous mining activities the following observations appear valid.

- A. South (Main)Vein. Overview. Development and mining activities were confined to Creston Formation Strata, here a sequence of sandstones, sandy argillites and siltstones, and intercalated "conglomerite", a dense fine grained unlithified argillaceous rock type. Two sandy sections are present, one confirmed by a number of diamond drill holes, at the elevation of Society Girl #2 Level (Creston Transition zone) and the second, inferred, stratigraphically higher, at the level of the Glory Hole workings. Ore blocks that were mined were defined by specific geological controls and had dimensions as governed by the parameters listed below, and confined within the plane of the Society Girl break.
- a. Stope Centres. Ore bodies were confined to the sandy sections of the stratigraphy, contained within a series of shoots, having a maximum 30 meters width and spaced along the South Vein at intervals between 30 and 70 metres (average 40 meters). With regard to the controls governing this spacing of shoots along strike, based on observations from mining plans available from the St. Eugene Mine and the

Aurora/Guindon mine workings, spacing laterally appears to be determined by areas of lower confining pressure resulting from displacement of the hanging wall relative to the footwall segments of the St. Eugene break. There is evidence also, from the Moyie shoot stopes (St. Eugene mine) that fault structures which cross cut the vein structure provide a control to the location of ore bodies. This feature would appear to be the main control in the case of the Society Girl ore blocks. The largest ore block, based on the mining campaigns conducted over 50 years (1900-1952), forms an almost continuous stope extending from the Glory hole workings to the No 2 level (ref; 1951-52 MM reports) plunging steeply to the east, controlled by a series of closely spaced north trending fractures; this as identified in mapping of the area surrounding the Glory Hole workings. This suggests that this is the dominant cross cutting structure identified to date associated with the Society Girl target.

- b. Stope Thickness. The plans provide no clues as to the thickness of ore blocks mined. However considering the environment in which this work was carried out, i.e.- a group of free miners who were paid from the proceeds of smelter shipments, it is probable that any rock which contained lead/zinc would be mined, and subsequently hand cobbed prior to transporting to the rail cars at Moyie. Thus the ore outlines contained on the plans available, in so far as they may be considered accurate, probably contains the outlines of sulfide mineralization to a minimum of 6" (0.18 m). Additional evidence which may be factored in is the data available from the glory hole workings. Here the mining was conducted to an average width of 1.8 meters based on what may be observed of the openings today.
- c. Average Stope Size. Based on the mine plans of the area developed and mined, ore blocks had an average strike length of 13 m, an estimated average thickness of 1.3 m and a dip length of 14 m (the dip length governed by the thickness of sandy strata which appears to provide a control. (Logging of holes drilled through the section of strata where the stopes shown on the sections are situated provide a thickness for the Creston Transition sandstones of 15 meters). This favorable strata, with the other constraints considered would provide a stoping block of approximately 1000 M.T. Stoping blocks (as indicated from the old maps available) were positioned approximately 40 meters along strike.
- d. This sandy strata would appear to be the limits of favorable ground above the Upper Aldridge/Creston contact within the area explored, except for the Glory hole deposit which appears to have been constrained to the Glory hole quartzite member and to have produced approximately 1350 MT. The ground between the transition sandy member and the Glory hole quartzite contained the "conglomerite" unit, which based on the experience at the St Eugene deposit destroyed the potential for the propagation of fractures.
- e. The potential for stoping blocks on the south structure is thus, over the strike length of 170 meters tested, 4000 MT constrained to the sandstone strata. In total this analysis provides a tonnage potential from the **south vein** within the area developed-a 170 m strike length by 15 m dip length of 4000MT. + 1300MT for the Glory Hole

or 5300MT (Note that the North vein and Avenue structures were not adequately tested.) It is of interest to note that production reported from the Society Girl based on various reports of smelter shipments and Minister of Mines reports is 5000 tons.

- B. Avenue Veins. A portion of the deposit mined was aligned in an avenue direction; this similar to the ore habit of the neighboring St. Eugene ore shoot, 1000 meters to the west.
- C. North Vein. Mining plans evidence that a start was made at developing a north vein structure; this again providing evidence of a mineral deposit with features characteristic of the St. Eugene ore bodies.
- D. Combined tonnage potential for South, Avenue and North vein structures within the Creston strata accessed.

It is not possible to provide a comparable analysis for the tonnage potential for the Avenue and North vein structures because these veins were not explored to the same extent. However, in addition to the evidence of preliminary mine development on both avenue and north vein structures contained on the mine plans, the recent diamond drilling confirmed their presence up to 70 meters below the # 2 level. By drawing a comparison from the St. Eugene ore shoot, where ore is present as both south, avenue and north structures, it is reasonable to estimate a doubling of tonnage with the north and avenue potential included. Thus an estimate of mineable tonnage within the Society Girl structure opened up by the old mine workings (all in Creston formation)n is 10,000 MT. This provides a **factor of approximately 13 MT of ore grade material per square meter of favorable quartzite strata within the Creston formation along Society Girl vein structure.** 

E Lessons which might be learned from the early mining experience within the Creston Formation lithology.

a. Sulfides will be concentrated within Society Girl break adjacent to steeply dipping cross fractures. There appear to be a number cross cutting the Society Girl break and the dominant fracture identified to date is that associated with the Glory Hole stope; it appears to plunge easterly at a steep dip, and yet the west wall of the Glory Hole stope dips steeply west.

b. Ore bodies will selectively concentrate within or adjacent to lithological units with specific characteristics. Such units may possess unique physical/chemical characteristics relative to their neighbors. Within the belt it is well recognized that quartzitic rocks are more fertile domains for ore bodies; their importance may reside in physical attributes, and or in part chemical (limy component).

c. The early mine development provides evidence of a pattern of south, north and avenue veins, confirming a structural regime similar to the St. Eugene mine.

F. Lithological and Compositional Differences between Creston and UA strata within Society Girl Mineral Deposit Setting

Seven holes cored sections of the Creston formation in the region of the Society Girl target, providing coverage of 60 of the 170 metre interval of Creston Transition stratigraphy explored by the early mining activities. Logs of the Creston formation section of these holes, commencing at the UA (contact and measuring upward record first a section of sandstone from 5 to 15 meters thick, above which lies a 11 to 15 meter thick section of "conglomerite",. Above this interval the upper parts of the holes cored fine grained sandstones and siltstones. With one exception, and this may be related to the main Society Girl early stage cross fault, there is no evidence of slump folding or early faulting; this in contrast to the cores of the underlying U/A argillites/ argillaceous siltstone where these features are common.

There may be a number of explanations for this difference in physical behavior; the following come to mind; a- the slump folding, which in most cases appears to be a locus for early stage faulting, proceeded deposition of the overlying Creston strata; b; from observed data concerning the fracture patterns at the St. Eugene ore shoot area, the "conglomerite" is observed to dampen and or destroy the St. Eugene break when it passes into this rock. It may provide a similar dampening to fracturing to Creston rocks adjacent to bands of "conglomerite"; c- the very difference in composition of the two rock types, the Creston in the section of strata under consideration largely sandstones, while the underlying UA, finer grained argillites and silty argillites.

It should be pointed out that the majority of core recovered from the Creston formation falls outside the main Society Girl break structure, while a much larger portion of the core recovered in the Upper Aldridge falls within this structure.

The alignment of the "conglomerite" forming an isthmus along the trend of the Society Girl break as suggested by core hole logs, may suggest that when the "conglomerite" was emplaced, the down dropping of the hanging-wall block, with which slump faulting is associated, had already occurred and the "conglomerite" material flowed into the escarpment so produced. (Refer to description of Sullivan Mine environment setting as contained in GASC Special Publication 1 The Geological Environment of the Sullivan Deposit, British columbia)).

If the wide spread sulfide mineralization occurring in the Upper Aldridge and associated with early stage faulting extended into the Creston, there should be a surface geochemical signature. There is no such signature, based on soil geochemical surveys conducted over the area. Thus it is concluded that this fracture type mineralization is unique to the upper 200 meters of the UA, and perhaps concentrated near centres of cross fracturing.

RTT October 2013

# SUMMARY OF COSTS RELATED TO PREPARATION OF PRELIMINARY RESOURCE ESTIMATE- SOCIETY GIRL TARGET, MOYIE BC, FORT STEELE MINING DIVISION, BRITISH COLUMBIA

#### PREPARED BY R. T. TRENAMAN, P ENG

# 1. SEARCH DATA SOURCES , EVALUATE, AND ASSEMBLE TO FORMMODEL.-7 DAYS @ \$800 PER DAY\$ 6,000

# 2. MODIFY EXISTING GEOLOGICAL PLANS AND SECTIONS OF MINE WORKINGS, AND DIAMOND DRILL HOLES AND CONSTRUCT NEW PLANS AND SECTIONS- 5 DAYS @ \$800 PER DAY \$4,000

#### 3. PREPARE REPORT- 1.2 DAY @ \$800 PER DAY

\$ 1,000

TOTAL

\$11,000

R. T. TRENAMAN, P.ENG

**OCTOBER 2013** 

## **AUTHORS QUALIFICATIONS**

Dated at Vancouver, British Columbia this 8 day of November 2013

As author of this report I, Roland T Trenaman, certify that I am an independent Mining Engineer practicing under the Corporation name Trenaman Mining Services.

I am a graduate in Mining Engineering from University of British Columbia in 1957.

I am a member in good standing of the Professional Engineers and Geoscientists of British Columbia, Licence Number 5794.

I have been actively involved in the mineral industry in Canada and internationally in engineering, management and as a consultant for in excess of sixty years.

For twenty five years I was intimately involved in the development and operation of small mine operations where the search for, and evaluation of smaller mineral resources potential, was essential for the success of the operation.

R. T. Trenaman Trenaman Mining Service

FIGURES











190 M EAST OF SECTION	
1600 UPPER ADIT 185 M EAST OF SECTION	
1580 SURFACE PODEN OF FORT A FACT FE OFFICIAL	
1560	
	//
ADIT	
SOCIETY GIRL # 2 TUNNEL 270 M EAST OF SECTION	
	2
1480- EL 1479 M FUH 1006 M (330 F	1480 T)
	.,
1400	1400
1400	1400
NE SAMPLING	
DDH SG 06-04	
5458793 N	
586671 E	
AZIM: 035 DEG	
	<i>C</i>
FIGURE RU	$\square$
1200	
VERTICAL SECTION THROUGH DD	HDI F
701-675 W HASTING ST.	
VANCOUVER, B.C. 0 SCALE I:2500	200
(TO ACCOMPANY RESOURCE ESTIMATION REPORT DATED NOV 2103) RTT EDIT OCT	2013 89HR.





















