Technical Report on the Flame & Moth Deposit, Flame & Moth Property, Keno Hill District, Yukon

Report Prepared for

Alexco Resource Corp.

Report Prepared by

SRK Consulting (Canada) Inc.
2CA017.004
August 8, 2012

Technical Report on the Flame & Moth Deposit, Flame & Moth Property, Keno Hill, Yukon

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Cover: Photo from Flame drill site looking North over District Mill

Important Notice

This report was prepared as a National Instrument 43-101 Technical Report for Alexco Resource Corp. (Alexco) by SRK Consulting (Canada) Inc. (SRK). The quality of information, conclusions, and estimates contained herein is consistent with the level of effort involved in SRK's services, based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this report. This report is intended for use by Alexco subject to the terms and conditions of its contract with SRK and relevant securities legislation. The contract permits Alexco to file this report as a Technical Report with Canadian securities regulatory authorities pursuant to National Instrument 43-101, Standards of Disclosure for Mineral Projects. Except for the purposes legislated under provincial securities law, any other uses of this report by any third party is at that party's sole risk. The responsibility for this disclosure remains with Alexco. The user of this document should ensure that this is the most recent Technical Report for the property as it is not valid if a new Technical Report has been issued.

Executive Summary

The Flame & Moth prospect is a silver-lead-zinc deposit in the historic Keno Hill silver-lead district located near Mayo, Yukon Territory. While historically explored to a shallow depth, exploration initiatives by Alexco Resource Corp (Alexco) have outlined an area of silver-lead-zinc mineralization with sufficient confidence to produce a geological interpretation and vein wireframes for a resource estimate. SRK Consulting (Canada) Inc. (SRK) constructed a mineral resource model during the second quarter of 2012 using a geostatistical block modeling approach. Mineral resources are classified as Indicated and Inferred, following the Canadian Institute of Mining & Metallurgy (CIM) Definition Standards for Mineral Resources and Mineral Reserves (December 2005) guidelines.

This technical report documents the mineral resource estimate for the Flame & Moth prospect. It was prepared following the guidelines of the Canadian Securities Administrators National Instrument 43-101 and Form 43-101F1, and in conformity with generally accepted CIM "Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines".

Property Description, Location, Access, and Physiography

The Flame & Moth property is located in the Mayo Mining District, approximately 350 kilometres (km) north of Whitehorse, Yukon Territory, within the Keno Hill mining district. Mayo is accessible from Whitehorse via a 460 km all weather road and by air via the Mayo airport. A gravel road connects Mayo to the project area. Alexco currently maintains a land position at the Flame & Moth property comprising 42 surveyed quartz mining leases and 12 un-surveyed quartz mining claims. Mineral exploration at Keno Hill is permitted under the terms and conditions set out by the Yukon Government in the Class IV Quartz Mining Land Use Permit – LQ00240, issued on June 17, 2008, and valid until June 16, 2018. The mineral resources for the Flame & Moth prospect reported herein are located on the Moth, Flame, Frances 5, and Frances 7 quartz mining leases.

Central Yukon is characterized by a sub-arctic continental climate with cold winters and warm summers. Average temperatures in the winter are between -15 and -20 degrees Celsius (°C) while summer temperatures average around 15°C. Exploration is limited to the summer months although mining work can be carried out year-round. The landscape around the Flame & Moth Project area is characterized by rolling hills with a local relief of up to 1,845 metres (m) on Keno Hill.

History

Claim staking and prospecting began at Flame & Moth in 1920, which was the start of a decade of commercial production in the Keno Hill district, and shallow workings identified two veins in the area, the Flame vein and the Moth vein.

Subsequent to this early work, little or nothing appears to have happened on the property until the acquisition by United Keno Hill Mines (UKHM) just prior to 1950. A 90 foot (ft) inclined shaft was sunk along the footwall of what was likely the Moth vein zone, where a quartz-carbonate vein hosted mineralization averaging 10 ounces per ton (opt) Ag, 1.6% Pb, and 5% Zn was encountered. Thirteen horizontal diamond drill holes totaling 193 m were drilled from the drift, but the core recovery was poor.

During 1954 and 1955, mineralization of pyrite and minor arsenopyrite was reported up to 240 m along strike to the north. This was explored by bulldozer trenching, soil sampling, and ground geophysics, but was unsuccessful because of the depth of gravel overburden.

UKHM returned to Flame & Moth in 1961 with a program of soil sampling and ground geophysics (self-potential, magnetics, Ronka EM), and drilled five surface diamond boreholes around the shaft to test the mineralization at depth. The soil samples and geophysics yielded little information, and no veining was intercepted in the drilling.

In the 1960s through the 1980s, multiple overburden drill campaigns were aimed at outlining an open pit resource around the historical workings and along strike. A small amount of mineralized material was sent to the mill in 1984 (406 tons @ 20.40 opt Ag, 1.39% Pb, and 0.72% Zn), perhaps coming from vein material exposed during stripping of overburden.

Total production at the Flame & Moth is listed as 1,590 tons grading 18.3 opt Ag, 1.1% Pb, and 0.9% Zn (Cathro 2006). It is assumed most of this figure came from the underground work of the 1950s.

UKHM operations closed permanently in 1989. In June 2005, Alexco was selected as the preferred purchaser of the assets of UKHM by PricewaterhouseCoopers Inc., the court-appointed interim receiver and receiver-manager of Keno Hill. In February 2006, Alexco's purchase of UKHM's assets through a wholly-owned subsidiary, Elsa Reclamation & Development Company Ltd. (ERDC), was approved. Under the Keno Hill Subsidiary Agreement, ERDC is indemnified against all historical liability, has property access for exploration and future development, and is not required to post security against pre-existing liabilities. ERDC received a water license from the Yukon territorial government in November 2007, giving Alexco free and clear title to surface and subsurface claims, leases, free-hold land, buildings, and equipment at Keno Hill. Alexco embarked on an aggressive surface exploration program in 2006 with continued yearly exploration programs through 2012.

Regional and Local Geological Setting

The Keno Hill mining camp is located in the northwestern part of the Selwyn Basin in an area where the northwest-trending Robert Service Thrust Sheet and the Tombstone Thrust Sheet overlap. The area is underlain by Upper Proterozoic to Mississippian rocks that were deposited in a shelf environment during the formation of the northern Cordilleran continental margin and underwent regional compressive tectonic stresses during the Jurassic and the Cretaceous, which produced thrusts, folds, and penetrative fabrics of various scales.

The Robert Service Thrust Sheet in the south is composed of Late Proterozoic to Devonian clastic sandstone, minor limestone, siltstone, argillite, chert, and conglomerate. The Tombstone Thrust Sheet to the north consists of Devonian phyllite, felsic meta-tuffs, and metaclastic rocks, overlain by Carboniferous quartzite, that are the main host for the silver mineralization in the Keno Hill camp. Four intrusive suites intrude the layered rocks:

- Late Triassic gabbro to diorite sills;
- Early Cretaceous Tombstone granite to granodiorite;
- Upper Cretaceous peraluminous porphyritic granite; and
- Late Cretaceous diabase dikes and sills.

The mineralized Flame & Moth vein system occurs in the upper part of the Mississippian Keno Hill Quartzite, within the thick Basal Quartzite Member that is overlain by the Sourdough Hill Member. The sequence was metamorphosed to greenschist facies assemblages during the Cretaceous. The Basal Quartzite is up to 700 m thick and comprises quartzite interbedded with minor graphitic phyllite and is intruded by Triassic greenstone sills. The Basal Quartzite is the dominant host to the silver

mineralization in the Keno Hill district. The overlying Sourdough Hill Member comprises graphitic and sericitic phyllite, chloritic quartz augen phyllite, and thin limestone units. To the south, the Robert Service Thrust Fault separates the Keno Hill Quartzite from the overthrust Upper Proterozoic Hyland Group, which is comprised of predominantly meta-sedimentary chlorite and quartz rich schist. The Keno Hill Quartzite is intruded by quartz-feldspar aplite sills or dykes that are correlated with the Early Cretaceous intrusive suite found elsewhere in the district.

Three phases of folding are identified in the district. The two earliest phases consist of isoclinal folding with sub-horizontal, easterly or westerly trending fold axes. The later phase consists of a sub-vertical axial plane and moderate southeasterly trending and plunging fold axis. In the Keno Hill district, the first phases of folding formed three structurally dismembered isoclinal folds of which the Basal Quartzite Member outlines two synforms at Monument and Caribou Hills, while the Flame & Moth Prospect is located on the limb of a the third dismembered syncline between Galena Hill and Sourdough Hill.

Within the district, up to four periods of faulting are recognized. The oldest fault set consists of south dipping foliation-parallel structures that developed contemporaneously with the first phase folding. The Robert Service Thrust Fault truncates the top of the Keno Hill Quartzite and sets the Precambrian schist of the Yusezyu Formation of the Hyland Group above the Mississippian Sourdough Hill Member of the Keno Hill Quartzite. The mineralization in the Keno Hill district is hosted by a series of northeast-trending pre- and syn- mineral “vein faults” that display apparent left lateral normal displacement. These are commonly offset by post-mineralization high angle cross faults, low angle faults, and bedding faults. Most commonly these comprise northwest striking cross faults that show apparent right-lateral displacement.

Deposit Types and Mineralization

The Keno Hill District is a polymetallic silver-lead-zinc vein district with characteristics analogous to: Kokanee Range (Slocan), British Columbia; Coeur d’Alene, Idaho; Freiberg and the Harz Mountains, Germany; and Príbram, Czech Republic. Common characteristics include the proximity to crustal-scale faults, affecting thick sequences of clastic metasedimentary rocks, intruded by felsic rocks that may have acted as a heat source driving the hydrothermal system. At Keno Hill, the largest accumulation of silver, lead, and zinc minerals occurred in structurally prepared competent rocks, such as the Basal Quartzite Member.

In general, gangue minerals include (manganiferous) siderite, minor calcite, and quartz. Silver most commonly occurs in argentiferous galena and argentiferous tetrahedrite. In supergene assemblages, silver can be native or in polybasite, stephanite, and pyrargyrite. Lead occurs in galena and zinc in iron-rich sphalerite. Other sulphides include pyrite, pyrrhotite, arsenopyrite, and chalcopyrite.

At the district scale, the mineral system exhibits sharp lateral mineralogical changes equivocally associated with temperature gradients around magmatic rocks. The hydrothermal veins also exhibit sharp vertical mineralogical zoning historically interpreted to be lead rich at the top to more zinc rich at depth. The Flame & Moth prospect is composed of two fault offset segments of the Flame vein where the most abundant minerals are pyrite, galena, sphalerite, arsenopyrite, pyrrhotite, quartz, and siderite.

Exploration

Most past exploration work in the Keno Hill district was conducted as support to the mining activities until the mines closed in 1989. This historical work involved surface and underground drilling designed to explore areas surrounding the main underground working areas.

The current exploration conducted by Alexco is the first comprehensive exploration effort in the district since 1997. The first holes were drilled in the Flame & Moth area in 2010, targeting the Flame & Moth veins at depth, below an area with a historical shallow open pit resource and minor historical production. Results of this drilling were sufficiently encouraging to continue exploration in 2011 and 2012.

Drilling by Alexco in the Flame & Moth prospect area totalled 13 surface core drill holes (3,974 m) in 2010 and 25 surface core holes (6,901 m) in 2011 for a total of 10,875 m in 38 drill holes.

Sampling Method, Approach and Analyses

Alexco implemented industry best practice procedures for all aspects of the drilling, collar and down hole surveying, core description and sampling, sample preparation and assaying, and database management. Assay samples were collected from half core sawed lengthwise with sampling intervals honouring geological boundaries. Sample intervals vary from 0.1 to 1 m in visibly mineralized core with up to 2 m lengths used away from obviously mineralized material.

Alexco used industry best-practices assaying protocols including the use of commercial certified control samples, sample blanks, and duplicates at an adequate frequency to monitor the accuracy of the laboratories: ALS in North Vancouver, BC, and AGAT Laboratory of Mississauga, ON, both of which are accredited under ISO-170025 by the Standards Council of Canada. Assay samples were dispatched for preparation and assaying using adequate security protocols. All samples were prepared using standard preparation protocols. Each sample was assayed for gold by fire assay and atomic absorption spectrometry on 30 gram (g) sub-samples and for a suite of between 27 and 48 elements (including silver, lead, and zinc) by four acid digestions and either inductively coupled plasma atomic emission spectroscopy or mass spectroscopy on 0.5 g sub-samples. Elements exceeding concentration limits were re-assayed using methods suitable for high concentrations.

Data Verifications

SRK reviewed the analytical quality control data produced by Alexco for the 2010 to 2011 core drilling at Flame & Moth deposit and concluded that Alexco personnel used diligence in monitoring quality control data, investigated potential failures, and took appropriate corrective measures when required for the collected data. The quality control data collected by Alexco in 2010 and 2011 is considered comprehensive and the final, in some cases replicated, assay results delivered by ALS and AGAT Labs are generally reliable for the purpose of resource estimation.

Mineral Processing and Metallurgical Testing

No metallurgical testing has been performed on the Flame & Moth deposit; however, SRK has assumed that the mineralization found within the deposit will have similar metallurgical characteristics to the Bellekeno deposit now being mined by Alexco.

Alexco's Keno Hill district mill located near Keno City currently processes output from the Bellekeno mine, and may in the future process output from other District mine sources as well. It is not

currently determinable if resources mined from Flame & Moth would or even could be processed through the District Mill. Until metallurgical testing has been carried out, it is not determinable if the existing District Mill would be suitable for processing resources from Flame & Moth. Furthermore, until mining plans have been developed for Flame & Moth it is also not determinable if the District Mill will have sufficient capacity to process Flame & Moth mine output.

Mineral Resource Estimates

The Flame & Moth resources were estimated using Gemcom's Gems™ (GEMS) 3D block modelling software in multiple passes in 3 by 5 by 5 m blocks by inverse distance squared. Grade estimates were based on capped 1 m composited assay data. Capping levels for silver were set to 1,300 grams per tonne (g/t) for both veins. Lead and zinc were capped at 10% and 18% respectively for both veins. Gold grades were capped at 1.1 g/t for both veins. Blocks were classified as Indicated mineral resources if at least two drill holes and six composites were found within a 60 m by 60 m search ellipse. All other interpolated blocks were classified as Inferred mineral resource.

Table i below summarizes the mineral resources estimated by SRK for the Flame & Moth deposit as of June 27, 2012.

Table i: Mineral Resource Statement* for the Flame & Moth deposit, June 27, 2012.

Class	Tonnes	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)
Indicated**	759,000	453	0.39	1.73	6.97
Inferred**	387,000	312	0.26	1.18	4.06

* Mineral resources are not mineral reserves and do not have demonstrated economic viability. All figures have been rounded to reflect the relative accuracy of the estimates.

** Reported at an NSR cut-off of $185 (1 USD = 1 CAD)/tonne using consensus long term metal prices (US$) and recoveries developed for the nearby Bellekeno deposit (Ag US$23.00/oz, recovery 96%; Pb US$ 0.95/lb, recovery 97%; Zn US$ 0.95/lb, recovery 88%; Au US$ 1,350/oz, recovery 72%). For both veins, Ag grades capped at 1,300 g/t; Pb and Zn capped at 10% and 18% respectively; Au grades capped at 1.1 g/t.

Conclusion and Recommendations

Between 2010 and 2011, Alexco conducted two drilling programs on its Flame & Moth property in the Keno Hill district, located in Central Yukon Territory. The drilling on the Flame & Moth deposit successfully outlined a significant polymetallic silver deposit in an area of limited historical exploration and production.

The mineralized Flame Vein system identified to date comprises two broadly north-northeast striking, southeast dipping vein segments - the Christal Zone and the Lightning Zone, offset by the northwest striking Mill Fault. The Christal Zone has a defined strike length of 250 m with a depth of 300 m, while the Lightning Zone extends 220 m in length and up to 290 m in depth.

The mineral resources presented in this report represent the first time disclosure of mineral resources for the Flame & Moth deposit by Alexco.

The mineral resource for the Flame & Moth deposit, at a net smelter return (NSR) cut-off of $185/tonne includes 759,000 tonnes at an average grade of 453 g/t silver classified as Indicated mineral resources and 387,000 tonnes at an average grade of 312 g/t silver classified as Inferred mineral resources.

SRK recommends that Alexco continues exploration of the Flame Vein above the new resource areas and along strike and to depth on both sides of the Mill Fault. SRK also recommends that Alexco initiates additional geotechnical, mineralogical and metallurgical data collection and baseline environmental studies in anticipation of favourable exploration results and preparation for a preliminary economic assessment. The total cost for the recommended exploration and development program is estimated at $1.8 M.

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Disclaimer

The opinions expressed in this report have been based on the information supplied to SRK Consulting (Canada) Inc. (SRK) by Alexco Resources Corp. (Alexco). These opinions are provided in response to a specific request from Alexco to do so, and are subject to the contractual terms between SRK and Alexco. SRK has exercised all due care in reviewing the supplied information. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. Opinions presented in this report apply to the site conditions and features as they existed at the time of SRK's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this report.

List of Abbreviations

Unit or Term	Abbreviation
Canadian Institute of Mining & Metallurgy	**CIM**
centimetres	**cm**
day	**d**
Degrees Celsius	**^{o}C**
Dollars (Canadian)	**$ or C$**
Dollars (US)	**US$**
foot	**ft**
grams	**g**
grams per tonne	**g/t**
kilograms per tonne	**kg/t**
kilometres	**km**
metres	**m**
micron	**µ**
millimetres	**mm**
Million / mega (10^{6})	**M**
Million years	**My**
National Instrument 43-101	**NI 43-101**
National Topographic Service	**NTS**
Net Smelter Return	**NSR**
North American datum	**NAD**
Ounce per ton	**opt**
specific gravity	**SG**
ton (2000 lbs)	**ton**
tonne (1000 kg)	**t**
tonne per day	**tpd**
Year	**yr**

1 Introduction

This technical report summarizes a mineral resource estimate produced for Alexco Resource Corp. (Alexco) for the Flame & Moth deposit located on the Flame & Moth property, one of several polymetallic silver-lead-zinc deposits occurring in the historic Keno Hill silver-lead district, near Mayo, Yukon Territory.

The mineral resource models were constructed by SRK Consulting (Canada) Inc. (SRK), during the first half of 2012 from drilling information acquired by Alexco from 2010 to 2011. Mineral resources were classified as Indicated and Inferred mineral resources following the CIM Definition Standards for Mineral Resources and Mineral Reserves (December 2005) guidelines. The report was prepared following the guidelines of the Canadian Securities Administrators National Instrument 43-101 and Form 43-101F1, and in conformity with generally accepted CIM “Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines”.

The report was compiled by Dr. Gilles Arseneau, P. Geo., and Darrell Farrow, M.Sc., Pr. Sci. Nat. with assistance from Melanie Roberts and Al McOnie of Alexco. The information contained in this report was provided by Alexco and gathered by SRK during the site visit. Dr. Arseneau carried out a site visit to examine the Flame & Moth deposit on May 7 and 8, 2012, which included examining drill core, core logging, and sampling procedures and visiting drill sites. Mineral resources were estimated by Darrell Farrow, M.Sc., Pr.Sci.Nat., under the supervision of Dr. Arseneau.

2 Reliance on other Experts

In preparing this report, SRK has relied on information provided by Alexco for matters pertaining to environmental, socioeconomic, and permitting issues. SRK did not carry out a title search for the property. Instead, SRK has relied on an opinion of title provided by Alexco.

3 Property Description and Location

The Flame & Moth property is located in the Mayo Mining District approximately 350 km north of Whitehorse, Yukon Territory, within the Keno Hill mining district (Figure 3.1). Mayo is accessible from Whitehorse via a 460 km all weather road and by air via the Mayo airport. A gravel road connects Mayo to the project area. The area is covered by National Topographic Service (NTS) map sheet 105M/14. Alexco currently maintains a land position at the Flame & Moth property (Figure 3.2) comprising 42 surveyed quartz mining leases and 12 un-surveyed quartz mining claims (Figure 3.3). The property is approximately 1.2 km west of Keno City adjacent to the Alexco District Mill and can be accessed from both the Duncan Creek Road and the Silver Trail Highway.

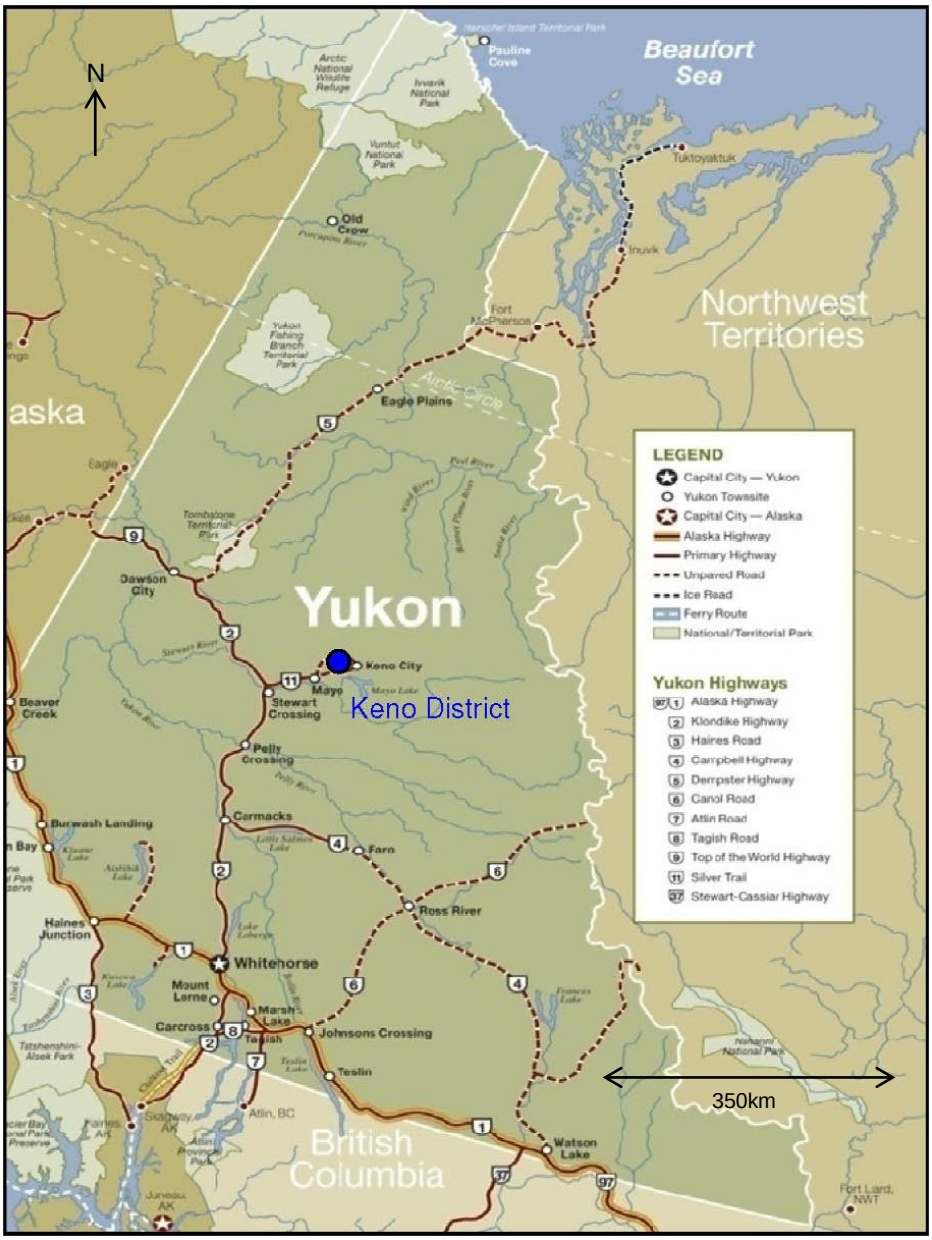


Figure 3.1: Keno District location map (from Alexco, 2012)

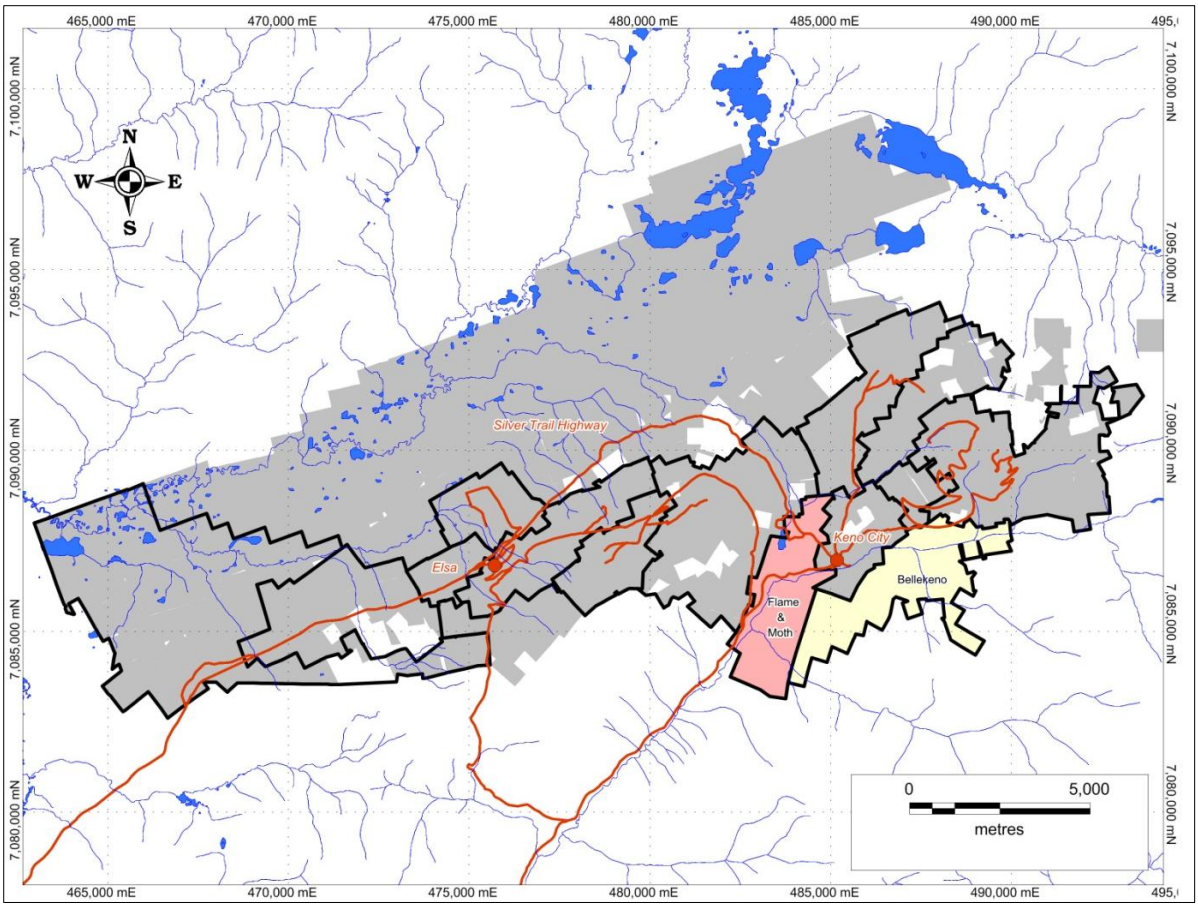


Figure 3.2: Flame & Moth Property location map (from Alexco, 2012)

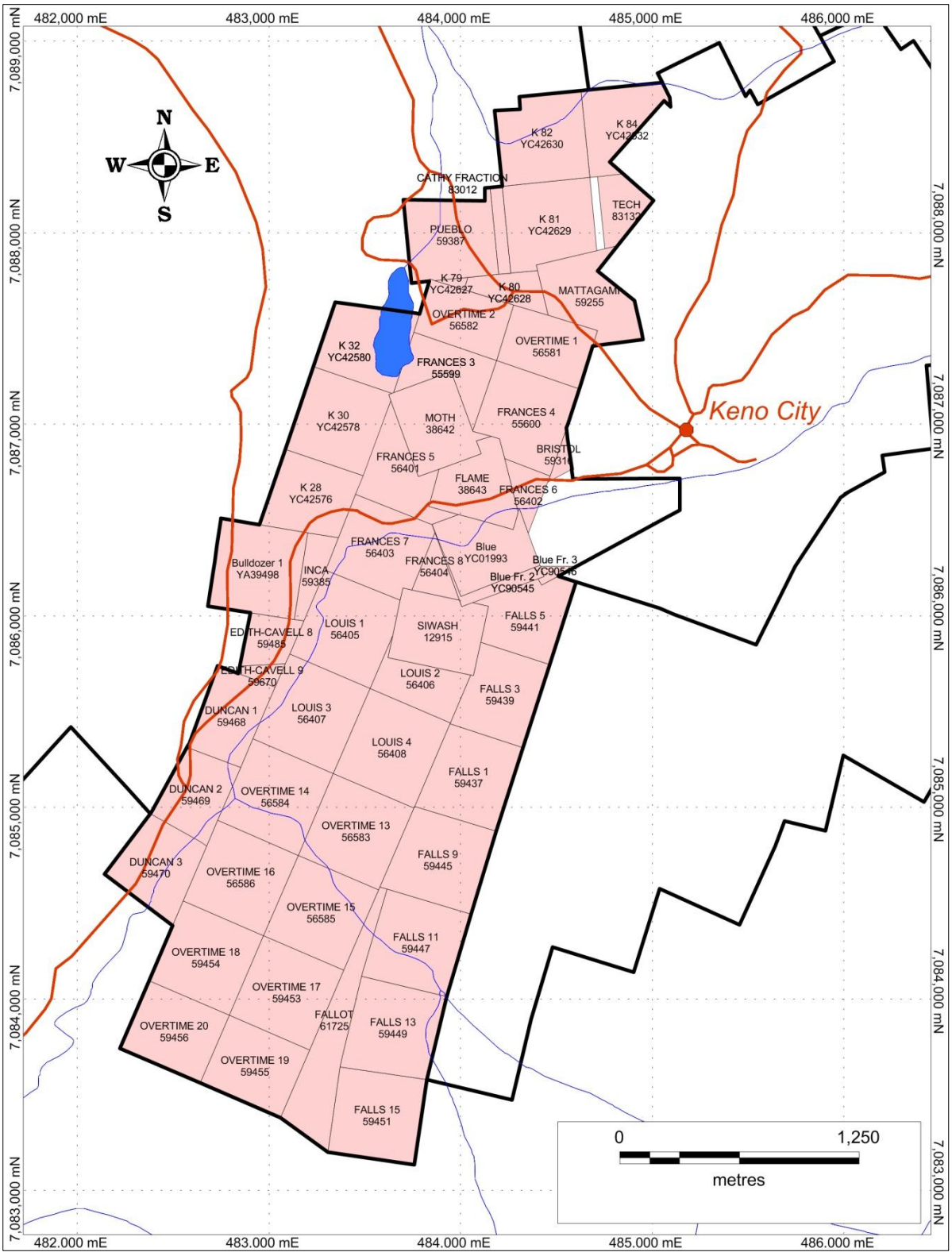


Figure 3.3: Flame & Moth Property claim map (from Alexco, 2012)

The Flame & Moth property is centred at Latitude 63.9023 degrees north; Longitude 135.334 degrees west. The mineral resources for the Flame & Moth prospect reported herein are located on the Moth, Flame, Frances 5, and Frances 7 quartz mining leases.

Mineral exploration in the Keno Hill district was initially permitted under the terms and conditions set out by the Yukon Government in the Class III Quartz Mining Land Use Permit – LQ00186, issued on July 5, 2006, and valid until July 4, 2011. Alexco subsequently obtained a Class IV Quartz Mining Land Use Permit – LQ00240 on June 17, 2008. The two permits were amalgamated on December 8, 2008, under LQ00240, which is valid until June 16, 2018.

The mineral resources for the Flame & Moth deposit reported herein are located on the Flame & Moth property comprising the Quartz mining claims and leases listed in Table 3.1.

Table 3.1: Flame & Moth Property Claims and Leases

Claim Label	Quartz Claim	Grant Number	Lease Number	Owner Name	Expiry Date (yyyymmdd)
CATHY FRACTION	97140211	83012	NM00594	Elsa Reclamation & Development Company Ltd. - 100%	20271102
MOTH	97140213	38642	4176	Elsa Reclamation & Development Company Ltd. - 100%	20161208
FLAME	97140214	38643	4175	Elsa Reclamation & Development Company Ltd. - 100%	20161129
FALLOT	97138428	61725	NM00525	Elsa Reclamation & Development Company Ltd. - 100%	20261101
FALLS 9	97138550	59445	NM00518	Elsa Reclamation & Development Company Ltd. - 100%	20261101
FALLS 13	97138552	59449	NM00522	Elsa Reclamation & Development Company Ltd. - 100%	20261101
OVERTIME 19	97138555	59455	NM00447	Elsa Reclamation & Development Company Ltd. - 100%	20251126
OVERTIME 20	97138556	59456	NM00448	Elsa Reclamation & Development Company Ltd. - 100%	20251126
PUEBLO	97139424	59387	NM00569	Elsa Reclamation & Development Company Ltd. - 100%	20271102
FALLS 1	97139425	59437	NM00510	Elsa Reclamation & Development Company Ltd. - 100%	20261101
FALLS 5	97139427	59441	NM00514	Elsa Reclamation & Development Company Ltd. - 100%	20261101
DUNCAN 1	97138626	59468	NM00367	Elsa Reclamation & Development Company Ltd. - 100%	20250430
FRANCES 5	97139480	56401	NM00263	Elsa Reclamation & Development Company Ltd. - 100%	20240109
FRANCES 6	97139481	56402	NM00264	Elsa Reclamation & Development Company Ltd. - 100%	20240109
FRANCES 8	97139482	56404	NM00266	Elsa Reclamation & Development Company Ltd. - 100%	20240109
LOUIS 1	97139483	56405	NM00433	Elsa Reclamation & Development Company Ltd. - 100%	20251126
LOUIS 3	97139484	56407	NM00434	Elsa Reclamation & Development Company Ltd. - 100%	20251126
LOUIS 4	97139485	56408	NM00435	Elsa Reclamation & Development Company Ltd. - 100%	20251126
OVERTIME 1	97138686	56581	NM00187	Elsa Reclamation & Development Company Ltd. - 100%	20230209
OVERTIME 13	97138687	56583	NM00439	Elsa Reclamation & Development Company Ltd. - 100%	20251126
OVERTIME 15	97138688	56585	NM00441	Elsa Reclamation & Development Company Ltd. - 100%	20251126

Claim Label	Quartz Claim	Grant Number	Lease Number	Owner Name	Expiry Date (yyyymmdd)
OVERTIME 16	97138689	56586	NM00442	Elsa Reclamation & Development Company Ltd. - 100%	20251126
EDITH-CAVELL 8	97139612	59485	NM00597	Elsa Reclamation & Development Company Ltd. - 100%	20271126
Bulldozer 1	97140812	YA39498		Elsa Reclamation & Development Company Ltd. - 100%	20131231
FRANCES 3	97249000	55599	NM00261	Elsa Reclamation & Development Company Ltd. - 100%	20240109
OVERTIME 18	97252118	59454	NM00446	Elsa Reclamation & Development Company Ltd. - 100%	20251126
OVERTIME 14	97263747	56584	NM00440	Elsa Reclamation & Development Company Ltd. - 100%	20251126
FRANCES 4	97263705	55600	NM00262	Elsa Reclamation & Development Company Ltd. - 100%	20240109
TECH	97270963	83132	NM00623	Elsa Reclamation & Development Company Ltd. - 100%	20300228
DUNCAN 2	97271006	59469	NM00368	Elsa Reclamation & Development Company Ltd. - 100%	20250430
OVERTIME 2	97269469	56582	NM00188	Elsa Reclamation & Development Company Ltd. - 100%	20230209
BRISTOL	97286371	59316	NM00287	Elsa Reclamation & Development Company Ltd. - 100%	20240627
DUNCAN 3	97309713	59470	NM00369	Elsa Reclamation & Development Company Ltd. - 100%	20250430
MATTAGAMI	97319353	59255	NM00271	Elsa Reclamation & Development Company Ltd. - 100%	20240118
INCA	97319425	59385	NM00272	Elsa Reclamation & Development Company Ltd. - 100%	20240118
OVERTIME 17	97326533	59453	NM00445	Elsa Reclamation & Development Company Ltd. - 100%	20251126
SIWASH	97323397	12915	NM00040	Elsa Reclamation & Development Company Ltd. - 100%	20200813
FALLS 15	97341777	59451	NM00524	Elsa Reclamation & Development Company Ltd. - 100%	20261101
FALLS 3	97337732	59439	NM00512	Elsa Reclamation & Development Company Ltd. - 100%	20261101
EDITH-CAVELL 9	97337733	59670	NM00386	Elsa Reclamation & Development Company Ltd. - 100%	20250522
FRANCES 7	97337772	56403	NM00265	Elsa Reclamation & Development Company Ltd. - 100%	20240109
LOUIS 2	97346575	56406	NM00596	Elsa Reclamation & Development Company Ltd. - 100%	20271126
FALLS 11	97374862	59447	NM00520	Elsa Reclamation & Development Company Ltd. - 100%	20261101
K 80	97144504	YC42628		Alexco Keno Hill Mining Corp. - 100%	20131215
K 81	97144505	YC42629		Alexco Keno Hill Mining Corp. - 100%	20131215
K 84	97144506	YC42632		Alexco Keno Hill Mining Corp. - 100%	20121215
K 28	97144852	YC42576		Alexco Keno Hill Mining Corp. - 100%	20121215
K 82	97245188	YC42630		Alexco Keno Hill Mining Corp. - 100%	20121215
K 32	97269536	YC42580		Alexco Keno Hill Mining Corp. - 100%	20121215
K 79	97337988	YC42627		Alexco Keno Hill Mining Corp. - 100%	20131215
K 30	97366552	YC42578		Alexco Keno Hill Mining Corp. -	20121215

Claim Label	Quartz Claim	Grant Number	Lease Number	Owner Name	Expiry Date (yyyymmdd)
				100%	
Blue Fr. 3	97261505	YC90546		Alexco Exploration Canada Corp. - 100%	20120920
Blue	97280044	YC01993		Alexco Exploration Canada Corp. - 100%	20140910
Blue Fr. 2	97354149	YC90545		Alexco Exploration Canada Corp. - 100%	20120920

4 Accessibility, Climate, Local Resources, Infrastructure, and Physiography

The Flame & Moth deposit is included within the historic Keno Hill mining camp, located in central Yukon Territory (Figure 3.1). The closest town is Mayo, located on the Stewart River, approximately 55 km to the south. Mayo is accessible from Whitehorse via a 460 km all weather road and is also serviced by Mayo airport. A gravel road leads from Mayo to the project areas. Historically, the mining camp was linked by river route to the outside world. The main link since 1950 is the all-weather highway, which was also used for transporting the ore.

The central Yukon Territory is characterized by a sub-arctic continental climate with cold winters and warm summers. Average temperatures in the winter are between -15 and -20°C but can reach -60°C. The summers are moderately warm with average temperatures in July around 15°C. Exploration is generally limited to the summer months although mining work can be carried out year round.

Because of its northern latitude, winter days are short; north-facing slopes experience ten weeks without direct sunlight around the winter solstice. Conversely, summer days are very long, especially in early summer around the summer solstice. Annual precipitation averages 28 centimetres (cm); half of this amount usually falls as snow, which starts to accumulate in October and remains until May or June.

Three phase power is available in many parts of the district as well as limited telephone service. A large number of roads constructed for past mining operations are still serviceable. The old company town of Elsa, located toward the western end of the district, comprises several buildings that are currently being used for storage, maintenance work, housing, and offices. The main camp and kitchen are located at Flat Creek, just west of Elsa.

The landscape around the Flame & Moth Project area is characterized by rolling hills with a local relief of up to 1,845 m on Keno Hill. Slopes are gentle except on the north sides of Keno Hill and Sourdough Hill (Figure 4.1).

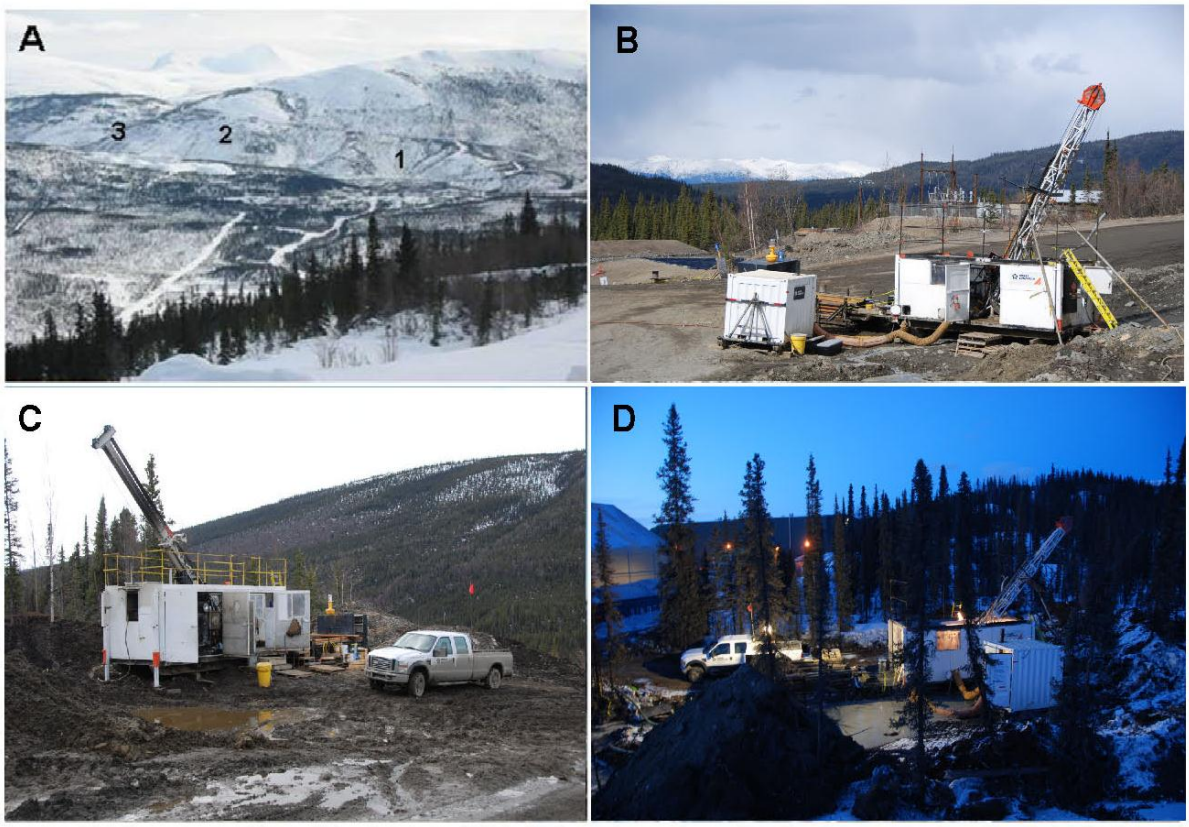


Figure 4.1: Typical landscape in the Keno Hill District.

Photo A: Taken from Galkeno 300, looking southeast at (1) Keno City and Flame & Moth area, (2) Lightning Creek Valley, (3) Bellekeno 600 adit is just out of sight from this view angle; Photo B: View of drill rig on south side of Duncan Creek Road, looking north at District Mill; Photo C: Drill site looking west at Galena Hill and Photo D: Drill site just southeast of District Mill infrastructure.

5 History

The history of the Keno Hill mining camp is described in Cathro (2006); the information presented in this section draws heavily from that source.

The Keno Hill mining camp area has a rich history of exploration and mining dating back to the beginning of the 1900s. Earliest prospectors had been working the area around Mayo for gold, especially after the Klondike gold rush of 1898. The first silver was found in 1901. However, interest was low due to the prospector's interest in gold alone despite an assay from 1905 yielding more than ten kilograms per ton (kg/t) silver. Small scale mining finally commenced in 1913 with an initial shipment of 55 ton of ore from the Silver King deposit to a smelter in San Francisco. Due to the shallow depth of the deposit and the First World War, interest in the area had dwindled by 1917.

The end of the First World War and high silver prices led to renewed and ultimately successful exploration activity in the area with the Yukon Gold Company and later Keno Hill Limited as the first truly commercial operators. Success at the Keno Mine led to a staking rush, resulting in the discovery of a number of rich deposits.

Claim staking and prospecting began at Flame & Moth in 1920. By 1923, numerous surface workings and a 43 ft inclined shaft had been sunk with a 15 ft crosscut developed from it on the Moth claim. It is believed that a second shaft to a depth of 100 ft was also sunk in this vicinity. An adit was also developed along 40 ft on the Frances 7 claim. Production for this period is not known.

Subsequent to this early work, little or nothing appears to have happened on the property until the acquisition by United Keno Hill Mines (UKHM) just prior to 1950. A 90 ft inclined shaft was sunk to a vertical depth of 70 ft along the footwall of what was likely the Moth vein. A crosscut, through the zone 45 ft below surface and 140 ft of drifting 75 ft below surface, identified quartz-carbonate vein hosted mineralization averaging 10 opt Ag, 1.6% Pb, 5% Zn developed in quartzite and greenstone along a zone approximately 100 ft long and up to 30 ft wide. Thirteen horizontal diamond drill holes totalling 193 m were drilled from the drift, but the core recovery was poor.

During 1954 and 1955, mineralization of pyrite and minor arsenopyrite was reported up to 240 m along strike to the north. This was explored by bulldozer trenching, soil sampling, and ground geophysics, but was unsuccessful because of the depth of gravel overburden, reported to a 12 m depth.

UKHM returned to Flame & Moth in 1961 with a program of soil sampling and ground geophysics (self-potential, magnetics, Ronka EM), and drilled five surface diamond drill holes located around the shaft to test the mineralization at depth. The soil samples and geophysics yielded little information, and no veining was intercepted in the drilling.

In 1965, 28 vertical overburden holes were drilled, along with another attempt at soil sampling and geophysics. A proposal to excavate an open pit was first made at this date, based on a calculated resource of 4,030 tons grading 16.7 opt Ag, 1.4% Pb, and 5.6% Zn. The pit would have reached to 60 ft below the surface.

In 1974, four lines of angled overburden drill holes totalling 989 m were drilled for extensions along a 180 m strike length, with limited success due to deep overburden and broken ground conditions, although a weakly mineralized structure was located at 76 m in the footwall of the main vein.

More overburden drilling was completed along strike in 1984 and four diamond drill holes were sited to test the downward projection of the known mineralization. The deeper drilling (200 to 300 ft below surface) returned only very low values from a wide but diffuse pyritic vein zone. A small amount of ore (406 tons at 20.40 opt Ag, 1.39% Pb, 0.72% Zn) was sent to the mill, which may have come from vein material exposed during stripping of overburden in preparation for the open pit development. In May of 1987, a review and recalculation of the open pit resource resulted in an estimated open pit resource of 13,915 tons at 20.4 opt Ag and 4.0% Pb to a depth of 80 ft. The key assumptions used to estimate this historical estimate are not known. The historical resource estimate does not use mineral resource categories as stipulated in NI 43-101 and the historical estimate is no longer relevant as it is being superseded by the mineral resource estimate presented in this report. The historical estimate is only stated here for completeness.

Total production at the Flame & Moth property is listed (Table 5.1) as 1,590 tons grading 18.3 opt Ag, 1.1% Pb, and 0.9% Zn (Cathro 2006). It is assumed most of this figure came from the underground work in the 1950s.

Table 5.1: Past production records for Flame & Moth property.

Mine	tons	Ag opt	Pb (%)	Zn (%)	Ag ounces	Pb pounds	Zn pounds
Flame & Moth	1,590	18.3	1.1	0.9	29,120	35,363	28,895

UKHM closed operations permanently in 1989. Between 1990 and 1998, the Dominion Mineral Resources and Sterling Frontier Properties Company of Canada Limited (Dominion), after acquiring 32% interest in UKHM, carried out extensive reclamation, remediation, and exploration work at the Bellekeno, Husky Southwest, and Silver King mines, in an effort to reopen operations. Lack of financing forced Dominion to abandon its rights, in effect reverting the rights back to UKHM. Environmental liabilities and site maintenance costs drove UKHM into bankruptcy and the Federal Government inherited the assets.

In June 2005, Alexco was selected as the preferred purchaser of the assets of UKHM by PricewaterhouseCoopers Inc., the court appointed interim receiver and receiver and receiver-manager of Keno Hill. In February 2006, following lengthy negotiations with the Federal and Territory Governments, the Supreme Court of the Yukon Territory approved Alexco's purchase of UKHM's assets through Alexco's wholly owned subsidiary, Elsa Reclamation & Development Company Ltd. (ERDC).

Interim closing of the Keno Hill transaction was completed on April 18, 2006, and an agreement governing management and future reclamation of the Keno Hill district was signed. Under the Keno Hill Subsidiary Agreement, ERDC is indemnified against all historical liability, has property access for exploration and future development, and is not required to post security against pre-existing liabilities. ERDC will also be reimbursed for its future environmental reclamation activities - estimated at more than C$50M - while itself contributing C$10M to the clean-up of the Keno Hill district. ERDC has also assumed responsibility for ongoing environmental care and maintenance of the site under

contract to the Yukon Territory Government, and is actively conducting a baseline environmental assessment and site characterization program.

To finalize the Keno Hill acquisition, ERDC applied for and received a water license in November 2007. Upon receipt of the license, ERDC received clear title to surface and subsurface claims, leases, free-hold land, buildings, and equipment at Keno Hill.

During 2006, Alexco embarked on an aggressive exploration program in the Keno Hill district and as a result the Bellekeno Mine was placed into production in 2011. Drilling by Alexco in the Flame & Moth prospect area totalled 13 surface core drill holes (3,974 m) in 2010 and 25 surface core holes (6,901 m) in 2011.

6 Geological Setting and Mineralization

6.1 Regional Geology

The Keno Hill mining camp is located in the northwestern part of the Selwyn Basin in an area characterized by the Robert Service Thrust Sheet and the Tombstone Thrust Sheet; these thrust sheets are overlapping and trend northwesterly. The area is underlain by Upper Proterozoic to Mississippian rocks that were deposited in a shelf environment during the formation of the northern Cordilleran continental margin (Figure 6.1). A compressional regime that possibly existed during the Jurassic, but certainly during the Cretaceous, produced thrusts, folds, and penetrative fabrics of various scales. Early large scale deformation (D_1) produced recumbent folds, resulting in local structural thickening of strata. A second (D_2), and possibly third ($D_{3),}$ deformational event produced gentle southwesterly plunging syn- and antiform pairs (Roots, 1997). The dominant structural fabric (foliation) is essentially axial planar to the D_1 recumbent folds.

The Robert Service Thrust Sheet lying to the south of the district is composed of Late Proterozoic to Cambrian sandstone, locally with interbedded limestone and argillite; a Cambrian to Middle Devonian succession of siltsone, limestone and chert, and unconformably overlying Upper Devonian argillite, chert, and chert pebble conglomerate.

The Tombstone Thrust Sheet to the north consists of Devonian phyllite, felsic meta-tuffs, and metaclastic rocks, overlain by Carboniferous quartzite. This latter rock unit is locally thickened due to folding and/or thrusting and hosts the silver-lead-zinc mineralization of the Keno Hill camp.

Intrusive rocks formed during four episodes of plutonism. During the Late-Triassic, gabbro to diorite formed sills of various sizes in the Devonian and Mississippian rocks of the Tombstone Thrust Sheet. A second phase of plutonism took place around 92 million years (My) ago in the early Cretaceous and resulted in widespread and voluminous Tombstone intrusions of commonly granitic to granodioritic composition. Cretaceous fine-grained lamprophyre dated at 89 My occurs as metre-scale dykes and sills. The youngest intrusions are the McQuesten intrusive suite that occurred around 65 My ago in the Upper Cretaceous and resulted in the formation of peraluminous megacrystic potassium feldspar granite.

In addition to the Keno Hill silver mining camp, where polymetallic veins were exploited, the area hosts a number of occurrences and showings of tungsten, copper, gold, lead, zinc, antimony, and barite.

Tin, tungsten, and molybdenite occurrences are possibly related to the suite of Cretaceous intrusion, whereas lead, zinc, and barite occur in stratiform calcareous sedimentary rocks of early to mid-Paleozoic age typical of sediment-hosted deposits.

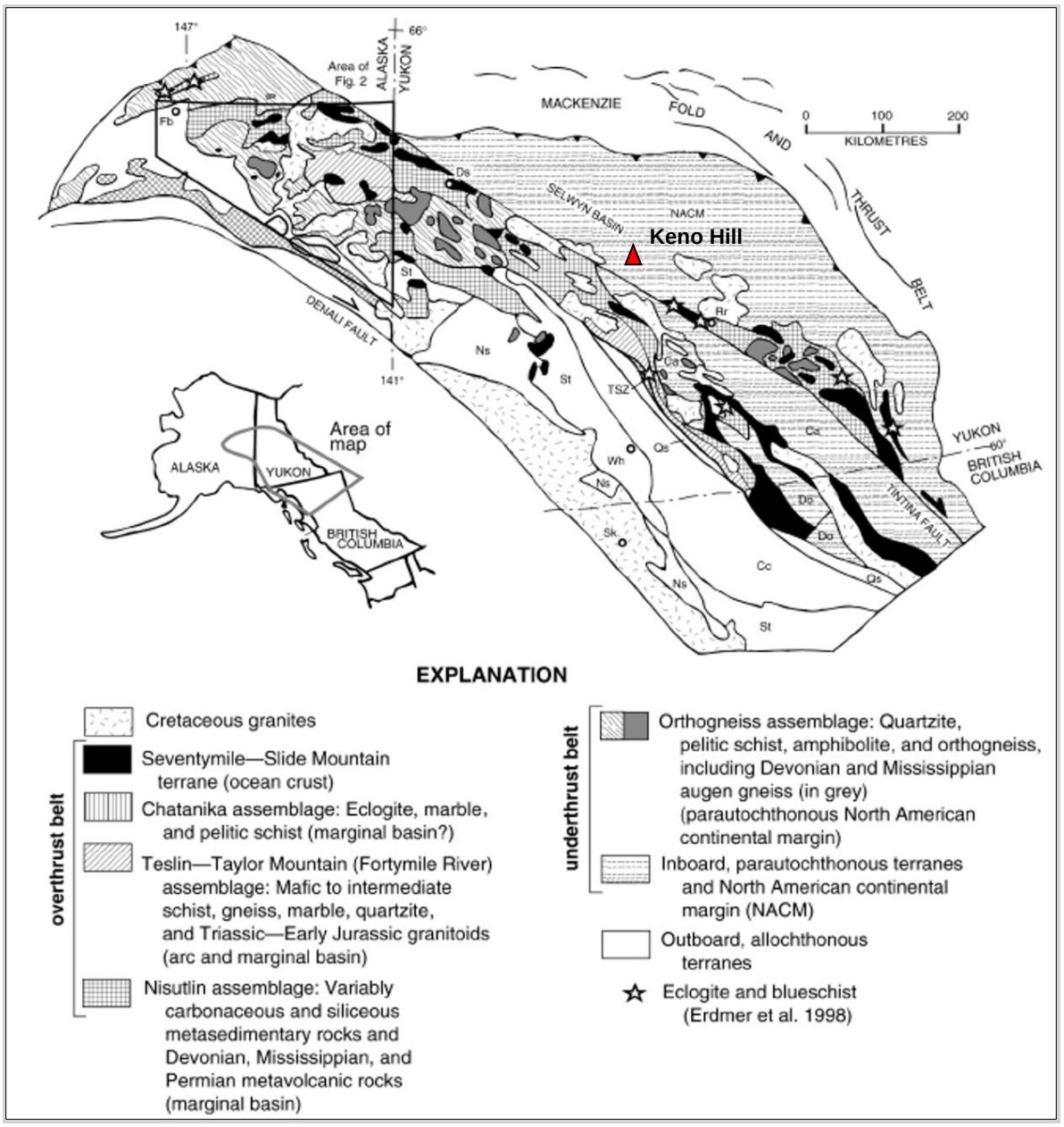
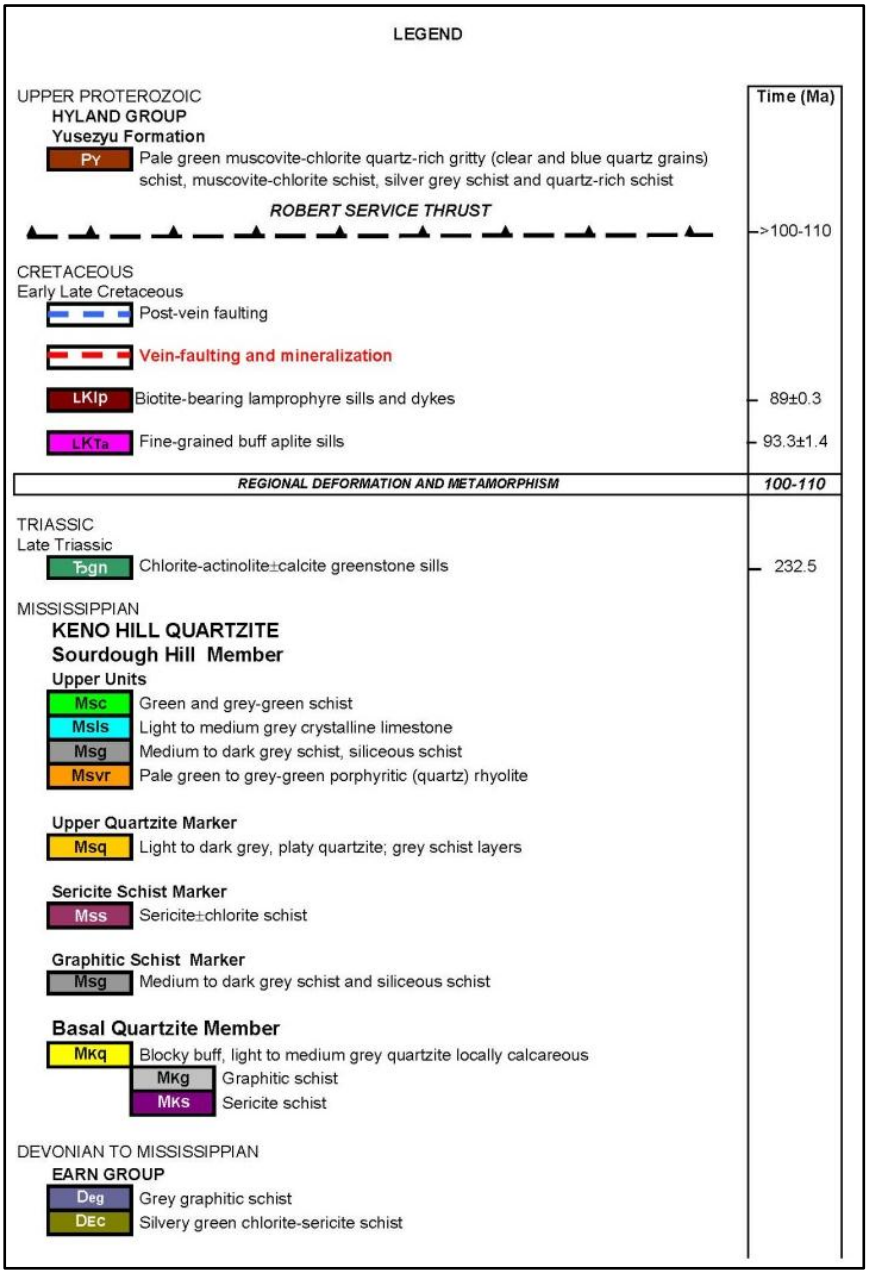


Figure 6.1: General Geology of the Selwyn Basin Area (from Dusel-Bacon et al. 2002)

6.2 District Geology

The district geology is dominated by the Mississippian Keno Hill Quartzite. This is composed of the Basal Quartzite Member and conformably overlying Sourdough Hill Member. The unit is overthrust in the south by the Upper Proterozoic Hyland Group and underlain in the north by the Devonian Earn Group (McOnie and Read 2009) as shown in Table 6.1.

Table 6.1: Keno Hill district stratigraphy



The Yusezyu Formation of the Precambrian Hyland Group is separated by the Robert Service Thrust Fault and, as seen in the Duncan Creek area, comprises greenish quartz-rich chlorite-muscovite schist with locally clear and blue quartz-grain gritty schist.

The Earn Group formerly mapped as the “lower schist formation” (Boyle, 1965) is typically composed of recessive weathering grey graphitic schist and green chlorite-sericite schist with an upper siliceous graphitic schist found locally.

Within the Keno Hill Quartzite, the Basal Quartzite Member is up to 1,100 m thick and comprises thick to thin bedded quartzite and graphitic phyllite (schist). This is the dominant host to the silver mineralization in the Keno Hill district. The overlying Sourdough Hill Member, formerly mapped as the “upper schist formation” (Boyle, 1965) is up to approximately 1,050 m in thickness and comprises predominantly graphitic and sericitic phyllite, chloritic quartz augen phyllite, and minor thin limestone.

The Earn Group and Keno Hill Quartzite are locally intruded by Middle Triassic greenstone sills.

The sequence is intruded by quartz-feldspar aplite sills or dykes that are correlated with the 92 My Tombstone intrusive suite found elsewhere in the district.

The sequence was metamorphosed to greenschist facies assemblages during the Cretaceous regional deformation.

Three phases of folding are identified in the district. The two earliest phases consist of isoclinal folding with sub-horizontal, easterly or westerly trending fold axes with the later phase having a sub-vertical axial plane and moderate southeasterly trending and plunging fold axis. In the Keno Hill district, the first phases of folding formed three structurally dismembered isoclinal folds of which the Basal Quartzite Member outlines two synforms at Monument and Caribou Hills, while the Flame & Moth Prospect is located on the limb of a the third dismembered syncline between Galena Hill and Sourdough Hill.

Within the district, up to four main periods of faulting are recognized. The oldest fault set consists of south dipping foliation-parallel structures that developed contemporaneously with the first phase folding. The Robert Service Thrust Fault truncates the top of the Keno Hill Quartzite and sets the Precambrian schist of the Yusezyu Formation above the Mississippian Sourdough Hill Member.

The silver mineralization in the Keno Hill district is hosted by a series of northeasterly trending pre- and syn- mineral “vein faults” that display apparent left lateral normal displacement locally referred to as “longitudinal” veins that, depending on the competency of the host rock, can be up to 30 m wide with an anastomosing system of sub-veins. A related set of faults, known as “transverse faults” that strike north-northeast and dip moderately to the southeast, can reach up to five metres in thickness.

High angle cross faults, low angle faults, and bedding faults offset veins and comprise post-mineralization faults. Most commonly these comprise northwest striking cross faults recognized by offset veins that show apparent right-lateral displacement.

6.3 Flame & Moth Deposit Geology

Much of the Flame & Moth area is blanketed by a thick cover of fluvio-glacial overburden deposited on an irregular erosional surface that is in places up to 50 m in depth.

The mineralization occurs within the upper section of the Basal Quartzite Member of the Keno Hill Quartzite. The host rocks predominantly comprise medium to thick bedded quartzite with interbedded graphitic schist. Within this sequence, two distinctive horizons of sericite schist, up to 10 m in thickness, occur 65 m and 90 m respectively below the top of the unit. Up to five greenstone sills that may be up to 50 m in thickness are found within the quartzite sequence below these horizons (Figure 6.2).

The mineralized sequence is overlain by the Upper Quartzite, Sericite Schist and Graphitic Schist Marker Units of the Sourdough Hill Member that outcrop on the Duncan Creek Road and along Lightning Creek to the south of the area.

The sequence generally strikes to the east to east-southeast and dips moderately to the southwest.

The north-northeast striking Flame Vein developed in an environment of competency contrasts caused by juxtaposition of quartzite, schist, and greenstone along the left lateral Flame vein-fault and was traced by drilling along a strike length of at least 600 m to a depth of at least 320 m. The structure dips moderately steeply to the east-southeast and, in the vicinity of the District Mill, is offset at surface by approximately 90 m of right lateral oblique slip movement along the west-northwest trending post-mineral Mill Fault. The Mill Fault dips approximately 66° to the southwest with the mineralization in the hangingwall section referred to as the Lightning Zone and that in the footwall section referred to as the Christal Zone.

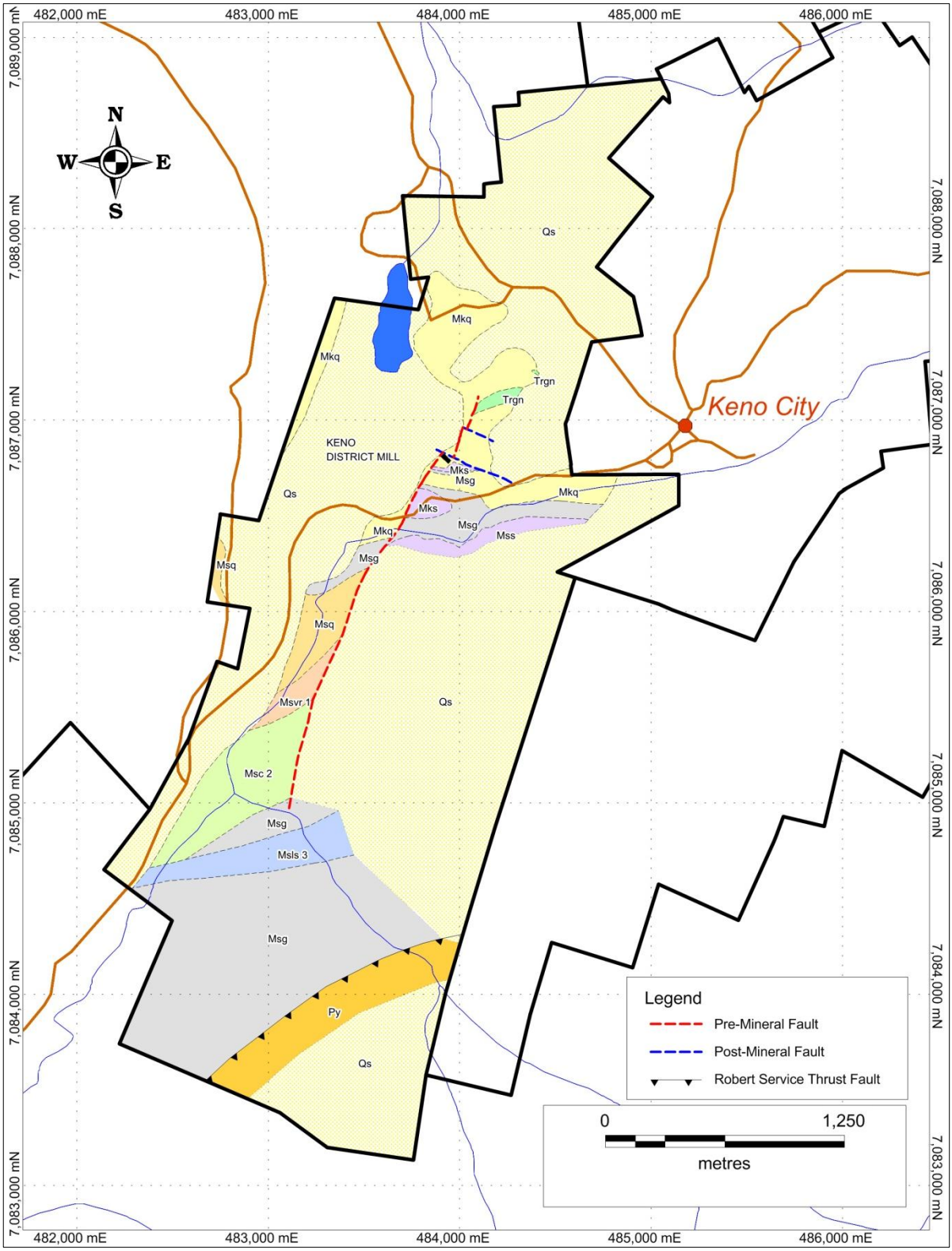


Figure 6.2: Geology of the Flame & Moth Property (stratigraphy detailed in Table 6.1). From Alexco, 2012

In the Christal Zone, the Flame Vein has an average strike of 025° and an average dip of 66° southeast over a strike length of 250 m to a depth of 300 m. In the Lightning Zone, the Flame vein has an average strike of 027° with a dip of 62° southeast, and extends over a strike length of 220 m and to a depth of 290 m.

Geological modelling has shown that the historical workings were likely centred on the Moth Vein vein structure, located in the footwall of the Flame Vein.

6.4 Mineralization

Summaries of the mineralogy of the Keno Hill District silver-lead-zinc mineralization can be found in Boyle (1965), Cathro (2006), Murphy (1997), and Roots (1997). Mineralization in the Keno Hill camp is of the polymetallic silver-lead-zinc vein type that typically exhibits a succession of hydrothermally precipitated minerals from the vein wall towards the vein center. However, at Keno Hill, multiple pulses of hydrothermal fluids, probably related to repeated reactivation and breccia formation along the host fault structures, have formed a series of vein stages with differing mineral assemblages and textures. Supergene alteration may have further changed the nature of the mineralogy in the veins. Much of the supergene zone may have been removed due to glacial erosion.

In general, common gangue minerals include (manganiferous) siderite and, to a lesser extent, quartz and calcite. Silver predominantly occurs in argentiferous galena and argentiferous tetrahedrite (freibergite). In some assemblages, silver is also found as native silver, in polybasite, stephanite, and pyrargyrite. Lead occurs in galena and zinc in sphalerite, which at Keno Hill can be either an iron-rich or iron-poor variety. Other sulphides include pyrite, pyrrhotite, arsenopyrite, and chalcopyrite.

Cathro (2006) suggested that the mineralized veins may exhibit a vertical zonation in mineralogy with a typical oreshoot displaying a vertical zoning from lead rich at the top to zinc rich at the bottom. He reported mineralogical changes to the mineralization with increasing depth from galena to galena-freibergite, to galena-freibergite-sphalerite-siderite, to sphalerite-freibergite-galena-siderite, to sphalerite-siderite, to siderite-pyrite-sphalerite that have been historically interpreted to indicate a silver-poor sphalerite-rich base to the economic mineralization. Historically, it was also believed that economic mineralization in the Keno Hill camp was restricted to a shallow zone of about 120 m thickness however the 370 m depth of production from the Hector-Calumet mine demonstrates that silver-rich veins may exist over much greater vertical intervals and that known veins exhibit exploration depth potential.

6.5 Flame & Moth Mineralization

In the area of interest for the current resource estimate, two main styles of the banded and locally brecciated mineralized veining are noted. An early phase comprises dominantly quartz gangue with abundant but irregular pyrite, sphalerite and arsenopyrite, while a later phase is siderite dominant with abundant sphalerite and irregular pyrite and galena development. Other minerals commonly observed include pyrrhotite and chalcopyrite, with trace amounts of the argentian tetrahedrite, pyrargyrite, jamesonite, boulangerite, and cassiterite identified in petrologic samples. The veining often displays multiple periods of brecciation and re-healing.

7 Deposit Types

The Keno Hill Mining camp has long been recognized as a polymetallic silver-lead-zinc vein district with characteristics possibly similar to other well-known mining districts in the world. Examples of this type of mineralization include the Kokanee Range (Slocan), British Columbia; Coeur d'Alene, Idaho; Freiberg and the Harz Mountains, Germany; and Príbram, Czech Republic.

The common characteristics of these locales are their proximity to crustal-scale faults and the occurrence in a package of monotonous clastic metasedimentary rocks, which have been intruded by plutons. Even though the mineralization may not be related to the intrusions, they may have acted as a heat source for hydrothermal circulation. Mineral precipitation occurred where metal-laden hydrothermal fluids, with a temperature of 250 to 300ºC, traveled through open fractures caused by a local tensional stress regime in an otherwise compressional environment and precipitated metals as pressure and temperature gradients changed.

The metals were likely leached from crustal rocks by hot circulating fluids and it is inferred that mineral deposition occurred at an average depth of about six kilometres. Mixing of hydrothermal fluid with meteoric fluid is common, as is boiling. Multiple fluid pulses may have resulted in a repetition of the mineral deposition sequence as well as recrystallization and modification of the existing mineral assemblage.

At Keno Hill, the largest accumulation of silver-lead-zinc mineralization occurred in structurally prepared competent rocks, such as the Basal Quartzite Member that could break with open spaces developed. Incompetent rocks, such as phyllites, would deform and produce fewer and smaller (if any) open spaces, limiting fluid flow and resulting mineral precipitation.

8 Exploration

Most past exploration work in the Keno Hill district was conducted in support of the mining activities until the mines closed in 1989. A good summary of the early exploration work is provided by Cathro (2006). This historical work involved surface and underground drilling designed to explore areas surrounding the main underground working areas. It is beyond the scope of this report to describe all historical exploration work completed in the Keno Hill district but that relating to the Flame & Moth prospect is described in Section 5.

The exploration conducted by Alexco is the first comprehensive exploration effort in the district since 1997. During the initial phase of Alexco's involvement at Keno Hill, a program of geologic data compilation, aero geophysical surveying (conducted by McPhar Geophysics), and surface diamond drilling was completed.

Past operator UKHM accumulated a large number of paper maps and documents relating to nearly 70 years of district mining, but the documentation and data were never assembled into a coherent database that could be used to decipher the geology on a district scale. Beginning in late 2005 and continuing through 2008, Alexco converted this historical data to digital form by scanning and data entry.

During 2006, Alexco embarked on an aggressive exploration program in the Keno Hill district. A district-wide surface geological mapping and structural study, started in 2008, was continued through the 2011 field season. Field mapping by McOnie and Read in 2009 identified the possible presence of two northeast trending vein faults thought to have movement upwards of 450 m based on the offset of local stratigraphy. In conjunction with review of the past exploration results on the property, this led to the generation of drill targets that were tested in 2010.

Aerial magnetic and electromagnetic surveys have been flown over the property and were successful in identifying hidden structures and covered stratigraphy.

During the 2010 drill program, a soil geochemical and a ground magnetic geophysical survey were completed over the Flame & Moth area. On the basis of drilling results obtained, a further 32 holes were collared at Flame & Moth in 2011.

9 Drilling

9.1 Historical Drilling

Historical drilling at Flame & Moth was predominantly shallow surface percussion overburden drill holes with 133 overburden holes totalling 4,044 m drilled on an average azimuth of 320^{o}. Nine core holes totalling 731 m were drilled from surface and 13 holes totalling 193 m were drilled from underground. Drill recovery was generally poor, particularly in silver-lead-zinc mineralized zones, and core assays were restricted to mineralized zones.

Due to recovery issues for the core holes, lack of careful sampling techniques, and the open-hole nature of the percussion drilling, drilling data from these programs were not deemed reliable for use in the resource calculation, although the data were used in construction of geologic models where applicable.

9.2 2010 to 2011 Alexco Drilling

Alexco conducted surface diamond drilling programs at Flame & Moth in 2010 and 2011 initiating 45 core holes, of which 38 drill holes were completed to target, for a total of 10,875 m, and used in the modelling and resource estimate (Figure 9.1). The exploration drilling was initially designed to test geologically derived targets in the vicinity of the historical Flame & Moth workings. Following new discoveries, additional drilling was successful in outlining two zones of silver-lead-zinc mineralization on the Flame Vein that were offset by the post-mineral Mill fault. Sufficient density of drilling was completed to permit a new resource estimate that could be completed using current standards. In 2010, 13 holes were collared to target the structure identified by surface mapping. After losing the first hole in deep overburden, 11 other holes intercepted silver-lead-zinc mineralization that defined a mineralized structure striking 025^{o} and dipping 62^{o} southeast (Christal Zone). One hole that was drilled furthest to the southwest, encountered silver-lead-zinc mineralization much deeper than anticipated and implied a right lateral fault offset of the structure. In total, twelve holes were drilled to target depth in 2010 for a total of 3,974 m.

In 2011, 32 holes were collared; however, eight were lost or abandoned. The majority of these holes targeted the up-dip extension of the mineralized vein located in the hangingwall of the Mill Fault (Lightning Zone) located in the 2010 drilling. In total, 24 holes were completed to target depth for a total of 6,901 m.

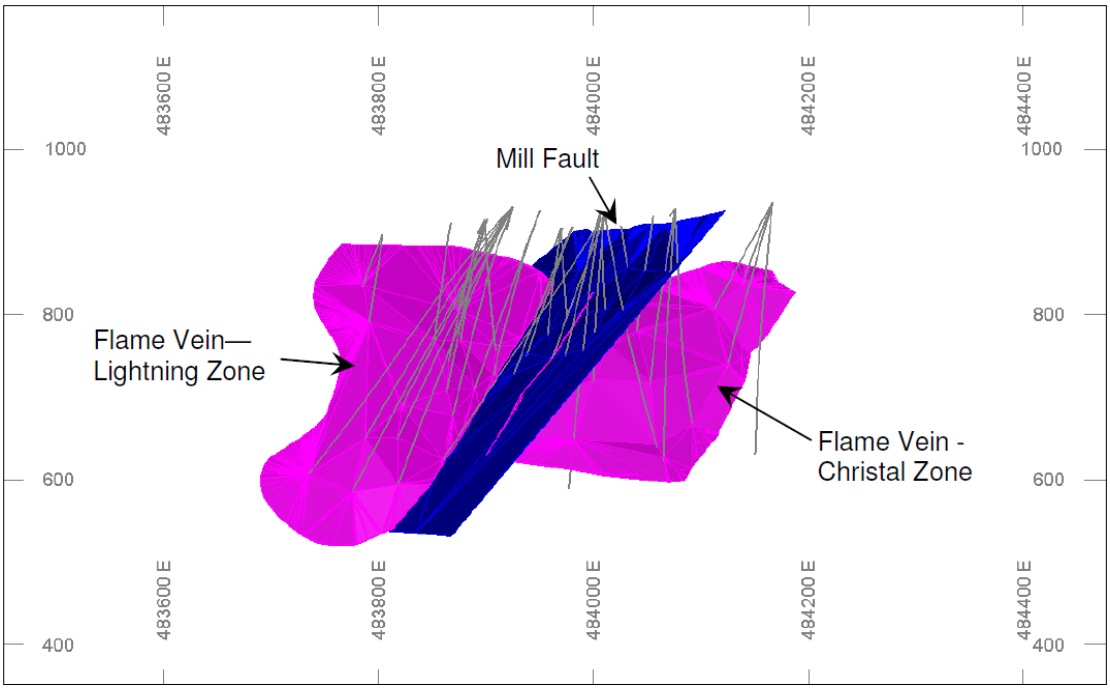


Figure 9.1: Location of Surface Drilling from 2010 to 2011 at Flame & Moth. Section is looking north-northwest

Surface drilling in 2010 was split amongst three contractors; Cabo Drilling based in Surrey, BC; Kluane Drilling of Whitehorse, Yukon; and Ensign Encore Drilling from Calgary, Alberta. Boart Longyear, based in Saskatoon, Saskatchewan, completed the 2011 drilling program. Drilling was completed by the wireline method using HQ and NQ-size equipment. For all campaigns, the drilling was well supervised, the drill sites were clean and safe, and the work was efficiently done. Diamond drill operational safety inspections were conducted on each drill rig at various times throughout the drilling programs.

Proposed drill hole collars were located using a Garmin hand-held GPS, while the final collars were surveyed with either an Ashtech GPS utilizing post-processing software or a Sokkia GRX1 RTK GPS. All coordinates are recorded in Universal Transverse Mercator NAD83 Zone 8 map projection.

Surface drill holes in the resource area that were drilled to target depth ranged in length from 126 m to 473 m. Most holes were drilled on a northwesterly azimuth with a declination of between 45-80°. In most cases, the drill holes were designed to intercept the mineralized zones perpendicular to the strike direction to give as close as possible a true thickness to the mineralized interval. Down hole surveys were taken at approximately 15 m intervals using a Reflex survey tool.

Standard logging and sampling conventions were used to capture information from the drill core. The core was initially logged using paper forms or directly in digital format as from 2011. The data was entered into a SQL database with separate tables for:

- Lithology;
- Stratigraphy;
- Structure;
- Mineralization;
- Alteration;

- Geotechnical; and
- Specific Gravity.

Lithology was documented by an alphanumeric code with additional modifiers and descriptive remarks also captured. Structural data consisted of type of structure, with measurements relative to core axis, and, where possible, the orientation of mineralized veins relative to a reference plane calculated for the area. The Mineral table captured visual percentage veining (by type), sulphide (galena, sphalerite, pyrite, arsenopyrite, stibnite, chalcopyrite, freibergite, and native silver), and oxide (limonite, sulphosalts, and manganese wad). Specific alteration features including silica, carbonate, and iron oxide (FeOx) alteration were also captured using a qualitative weak to strong scale. The geotechnical table recorded percentage recovery and rock quality determination for the entire hole and fracture intensity where warranted.

Alexco systematically measured core specific gravity (CSG) of mineralized material as well as basic rock types. Specific gravity is measured by using a balance and measuring the weight of core in air and in water. The core was not covered by wax or a plastic film before weighing in water. Alexco collected approximately 286 core specific gravity measurements from the resource area during the 2010 and 2011 drilling programs at Flame & Moth. Subsequently, a further 18 core specific gravity measurements were collected from drill holes where no core specific gravity measurements had been obtained from the vein intervals. Pulp specific gravity (PSG) measurements were obtained by pycnometry on select assay intervals of mineralized zones for Alexco drilling by ALS and AGAT Laboratories.

10 Sampling Method and Approach

10.1 Historical Sampling

Information regarding historical (pre-Alexco) sampling approach and methodology is limited. No historical information was used in the resource estimation at Flame & Moth.

10.2 2010 to 2011 Alexco Sampling

Sample intervals were broken at lithological contacts and at significant mineralization changes. The logging geologist marked the sample intervals within the major rock types outside of the main vein zones which were typically 2 m in length. Sample intervals within mineralized zones ranged from 0.1 m to 1.0 m, based on consistency of mineralization. Drill holes were initially sampled top to bottom but in areas of infill drilling where there was confidence in correlation of veining and stratigraphy, samples were only taken around the vein zones or areas of interest.

After logging, the core was digitally photographed and sawn in half lengthwise with a diamond saw, with attention paid to vein orientation. One half was returned to the core box for storage at site and the other bagged for sample shipment. No further on-site processing was performed.

11 Sample Preparation, Analyses, and Security

11.1 Historical Samples

Historical sample results were not used in the production of the resource estimate summarized in this report.

11.2 2010 to 2011 Alexco Exploration Programs

Some minor modification in the sample shipment procedure has occurred over time, primarily in response to changing laboratory locations and the logistics surrounding available commercial transport. In all cases, approximately four to five individual samples were placed in rice bags (grain sacks), sealed with a numbered security tag, placed on pallets, and wrapped for shipping. In 2010, samples were shipped via Manitoulin Transport to Whitehorse, Yukon, where they were couriered to the preparation facilities of either AGAT Labs or ALS in Whitehorse. The pulverized sub-sample splits were then sent to the AGAT Labs facility in Mississauga, Ontario, or the ALS facility in North Vancouver, British Columbia, for analysis. Samples were shipped to ALS for the 2011 drill program.

ALS and AGAT Laboratories are accredited to ISO 17025 by Standards Council of Canada for a number of specific test procedures, including fire assay for gold and silver with atomic absorption and gravimetric finish; multi-element inductively coupled plasma optical emission spectroscopy; and atomic absorption assays for silver, copper, lead, and zinc. ALS also participates in a number of international proficiency tests, such as those managed by CANMET and Geostats.

Sample preparation and analyses was consistent for the 2010 to 2011 Alexco programs for both labs. Sample preparation consisted of initial fine crushing of the sample to better than 70% passing 2 mm. A nominal 250 g split of this material was then pulverized to greater than 85% passing 75 µ and this portion was used for analyses. Duplicate samples were prepared, when indicated by the client, at the preparation facility by collecting a second 250 g split from the 2 mm crushed material.

Samples were analyzed for gold by fire assay and atomic absorption spectrometry on 30 g sub-samples and for a suite of 27 to 48 elements by four acid digestion and either inductively coupled plasma atomic emission spectroscopy (ICP-AES) or inductively coupled plasma mass spectroscopy (ICP-MS) on 0.5 g sub-samples. Elements exceeding concentration limits of ICP-AES or ICP-MS were re-assayed by single element four acid digestion and atomic emission spectroscopy. Silver results exceeding ICP-AES limits were re-assayed by fire assay and gravimetric finish on 30 g sub-samples. Lead and zinc results exceeding concentration limits were analyzed by volumetric titration.

Alexco implemented standard assay quality control procedures for all Keno Hill drill campaigns. Each 20 sample batch sent for assaying included three control samples: a commercial Standard Reference Material (SRM), a blank, and a duplicate. The location of control samples (SRM, blank, and duplicate) in the sample stream was determined by the logging geologist and control samples were inserted when the core was prepared. The SRM was already processed to a pulp and was inserted as ~50 to 100 g amounts. The blank was commercially purchased dolomitic “landscape rock” and approximately 0.35 kg to 1.5 kg of the material was inserted into the sample stream. An empty sample bag was inserted at the location of the duplicate which was prepared during sample preparation at the laboratory preparation facility and consisted of a coarse reject split of the preceding sample.

The quality control program developed by Alexco is considered mature and overseen by appropriately qualified geologists. The data collected by Alexco on the Flame & Moth project was acquired using adequate quality control procedures that generally meet or exceed industry best practices for a resource delineation stage exploration property.

12 Data Verification

12.1 Historical Data Verification

During almost 100 years of exploration and mining in the Keno Hill area, a large amount of data and documents were produced, and much of this material is accessible to Alexco. Historical data available for the Flame & Moth area included diamond drill logs, overburden drill logs, and underground and surface mapping, although none of this was used for the resource estimation.

12.2 Alexco Data Verification

Alexco maintains an SQL database of all Keno District drill and sample data. Each property was assigned an identifier to extract property specific subsets from the master database. All data was entered or imported into the database using Datashed database management software. The Flame & Moth data was exported from the SQL database by scripted routine to comma delimited (csv) files, which were imported into Minesight and MapInfo software. The following drill hole files were generated: collar, survey, drill hole assay, lithology, mineralization, structure, stratigraphy, alteration, and geotechnical. During the 2010 and 2011 drilling programs, Alexco personnel conducted routine visual verifications to ensure the reliability of the drilling data, including a 100% check of the collar and survey tables and a minimum 10% verification of the remaining exported tables. The process uncovered a low level of data entry errors which were corrected.

12.3 Analytical Quality Assurance and Quality Control Programs

Quality control measures are typically set in place to ensure the reliability and trustworthiness of exploration data. This includes written field procedures and independent verifications of aspects such as drilling, surveying, sampling, and assaying, data management, and database integrity. Appropriate documentation of quality control measures and regular analysis of quality control data are important as a safeguard for project data and form the basis for the quality assurance program implemented during exploration.

Internal and external laboratory control measures are implemented to monitor the precision and accuracy of the sampling, preparation, and assaying. They are also important to prevent sample mix-up and monitor the voluntary or inadvertent contamination of samples. Assaying protocols typically involve regular duplicate and replicate assays and insertion of quality control samples to monitor the reliability of assaying results throughout the sampling and assaying process.

12.3.1 Historical Exploration

Historical assays were not used in the estimation of mineral resources summarized in this report.

12.3.2 Alexco 2010 to 2011 Exploration Programs

During the 2010 to 2011 drill programs, three control samples (standard, blank, duplicate) were included in each twenty sample batch sent for assaying. Alexco used one of six Standard Reference Materials (SRM) purchased from WCM Sales Limited of Burnaby, British Columbia: one polymetallic copper, lead, zinc, and silver reference material (PB 131) and five silver reference materials (PM 1123, PM 1127, PM 1128, PM 1130 and PM 1133) for inclusion with each twenty sample batch (Table 12.1).

Table 12.1: Commercial SRM Used by Alexco for the 2010 to 2011 Drilling Programs

SRM	Pb (%)	S.D.	Zn (%)	S.D.	Ag (g/t)	S.D.	Au (g/t)	S.D.
PB131	1.04	0.04	1.89	0.06	262	11		
PM1123					31	1.3	1.42	0.04
PM1127					1580	36		
PM1128					592	12		
PM1130					101	3.0	3.74	0.19
PM1133					757	19		

Assay results for quality control samples were monitored on an ongoing basis during all drill programs (2010 to 2011). Each potential quality control failure was investigated and appropriate remedial action was taken, including the re-assaying of batches containing abnormal quality control results. In some instances, the potential failures occurred in batches of samples outside potentially mineralized areas. In such cases, no remedial actions were taken.

The 2010 to 2011 external analytical quality control data produced by Alexco is summarized in Table 12.2.

Table 12.2: Quality Control Data Produced by Alexco in 2010 to 2011 for the Flame & Moth Resource Area

Quality Control Type	Count	Percentage
Core Samples	2,196	
Blanks	137	1:16 (6.2%)
Standard Reference Material	138	1:16 (6.3%)
Coarse Reject Duplicate	134	1:16 (6.1%)

During 2010 and 2011, a number of standard reference material samples returned values greater than three standard deviations from the expected value and batches containing these failed standards were resubmitted to ALS for analysis and the new assays were used for the resource estimates.

Analysis of assays from coarse reject duplicate samples suggest that silver, lead, and zinc grades can be reasonably reproduced from the coarse reject split of the original samples with no apparent bias.

12.4 SRK Data Verification

SRK carried out a site visit on May 7 and 8, 2012, to examine drill core, core logging and sampling procedures and visit the drill sites. Drill site locations were verified with hand-held GSP and were found to agree with the digital database of drill hole locations. In April 2012, SRK completed an audit of the Alexco analytical and quality control data acquired during the sampling of the Flame & Moth deposit. The audit was completed by SRK Associate, Darrell Farrow. SRK conducted routine verifications to ascertain the reliability of the electronic borehole database provided by Alexco. All assays in the current database were verified against the independently sourced sample certificates

from ALS and AGAT laboratories. The silver, lead, zinc, and gold values in the assay table were found to match the laboratory certificates.

After the review, SRK is of the opinion that the Flame & Moth drilling database is sufficiently reliable for resource estimation.

12.4.1 Quality Control Results

Alexco made available to SRK the assay results for analytical quality control data accumulated for the Flame & Moth deposit from 2010 to 2011. SRK aggregated the assay results from the external quality control samples for further analysis. Sample blanks and certified reference materials data were summarized on time series plots to highlight any potential failure. Field duplicate paired assay data were analysed using scatter plots and ranked absolute relative difference charts.

Field blanks are used to monitor contamination introduced during sample preparation and to monitor analytical accuracy of the lab. True blanks should not have any of the elements of interest much higher than the detection levels of the instrument being used. SRK consider batch samples which contain a blank sample with more than five times of detection limit as problematic batches. In general, gold (Figure 12.1) and silver (Figure 12.2) returned good results while zinc (Figure 12.3) consistently returned values that were too high and lead (Figure 12.4) returned a number of values that were also too high. In general, the high zinc and lead values can be attributed to the fact that Alexco was using commercially purchased landscape rock dolomite as their source of blank material. It is again recommended that in future Alexco source a more appropriate material for blank samples. Some of the higher lead and zinc values can be attributed to samples treated after high value samples which points to possible contamination of samples in the laboratory. It is recommended that Alexco follow this up with the relevant laboratory.

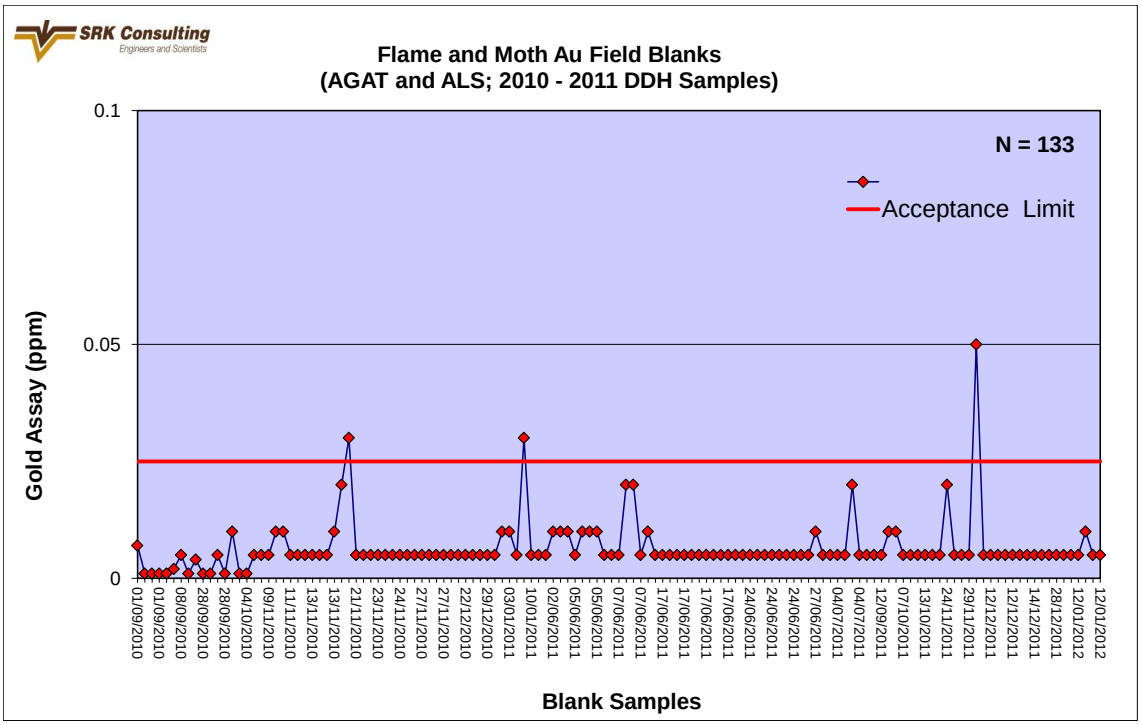


Figure 12.1: Blank analytical results for gold over time for commercially purchased landscape rock submitted with Flame & Moth deposit samples.

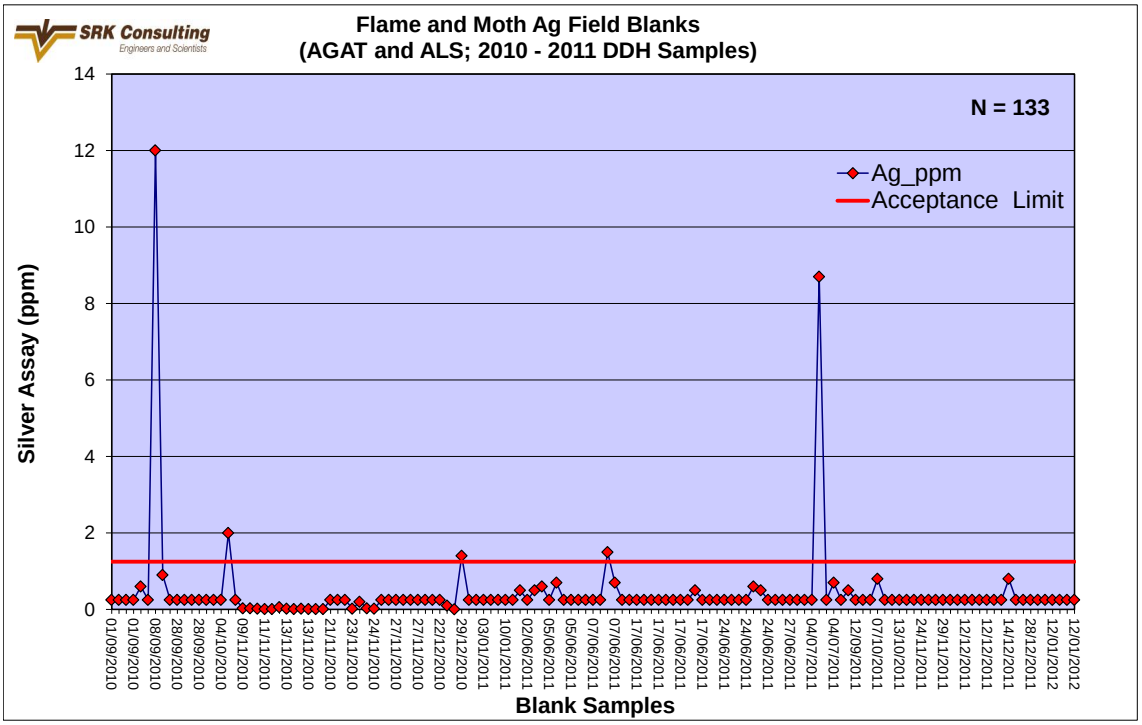


Figure 12.2: Blank analytical results for silver over time for commercially purchased landscape rock submitted with Flame & Moth deposit samples.

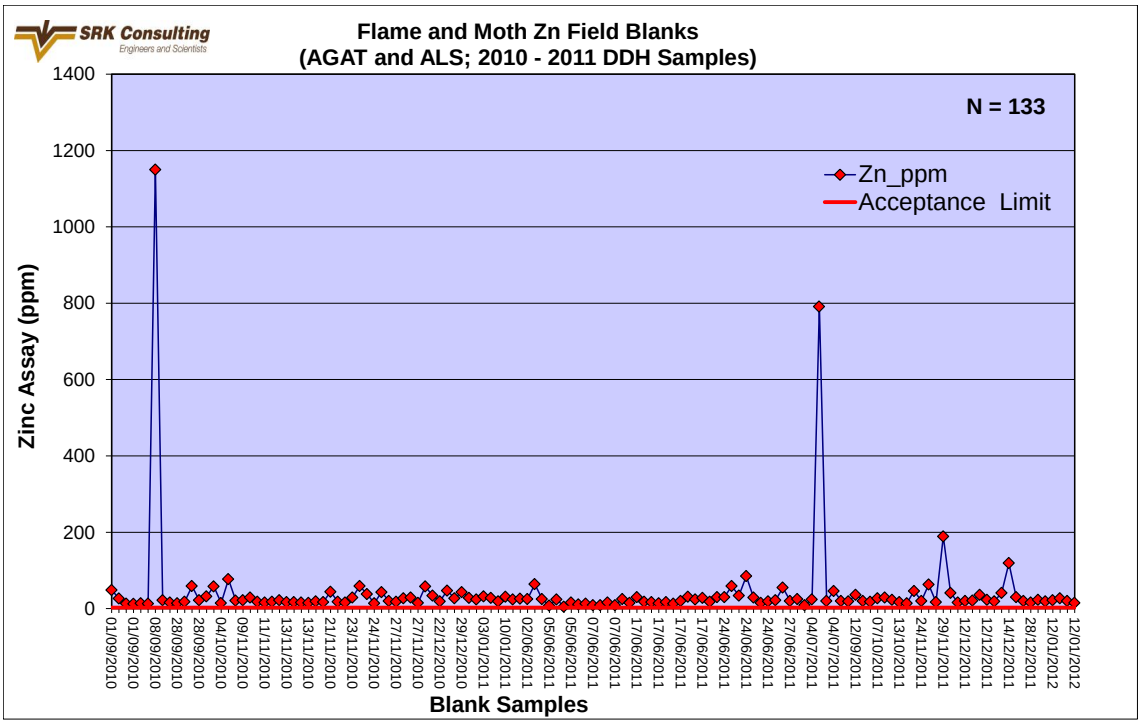


Figure 12.3: Blank analytical results for zinc over time for commercially purchased landscape rock submitted with Flame & Moth deposit samples.

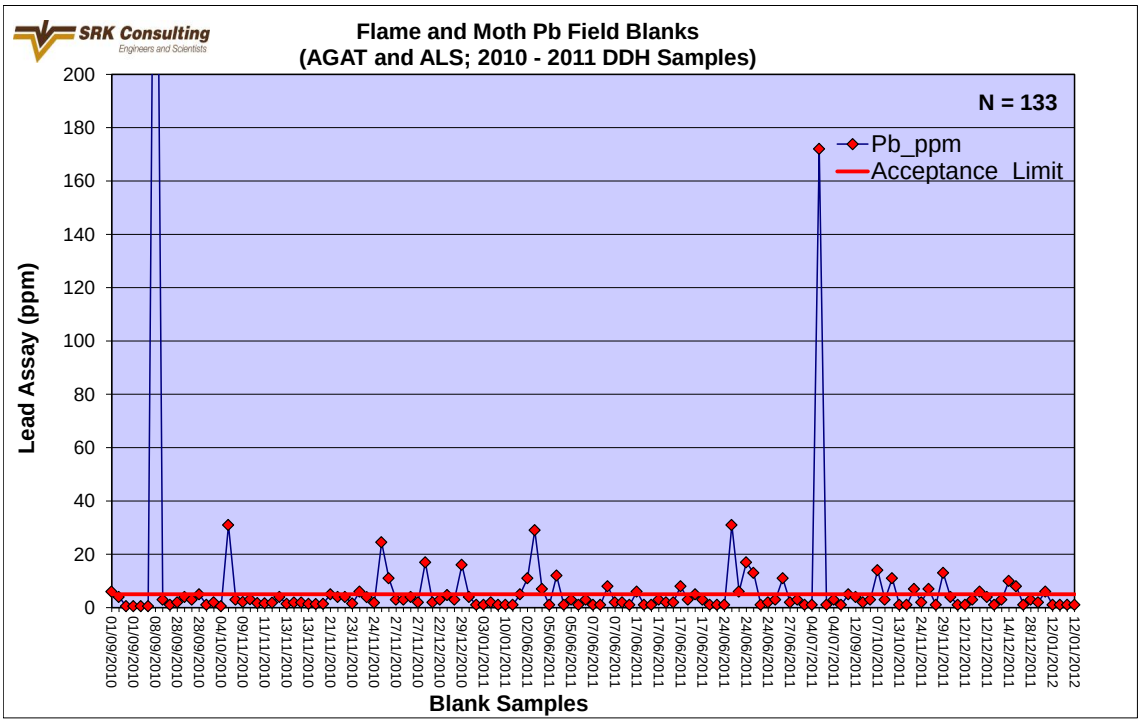


Figure 12.4: Blank analytical results for lead over time for commercially purchased landscape rock submitted with Flame & Moth deposit samples.

Scatter plots and percentile rank charts for coarse reject split duplicate gold, silver, zinc, and lead data are presented in Figure 12.5 to 12.8 respectively. Relatively good correlation is seen between course reject splits for silver, lead, and zinc with 79%, 81% and 90%, respectively, of duplicate pairs having a half absolute relative difference of less than 10%. Gold values for course reject splits were less well correlated with 66% of duplicate pairs having a half absolute relative difference of less than 10%.

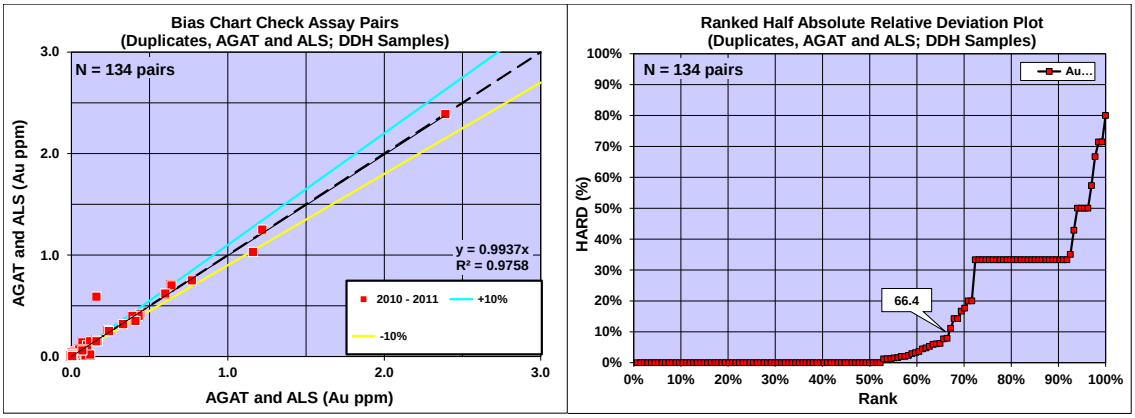


Figure 12.5: Scatter plot and Ranked Half Absolute Relative Deviation plot of gold data for course reject duplicate Flame & Moth samples

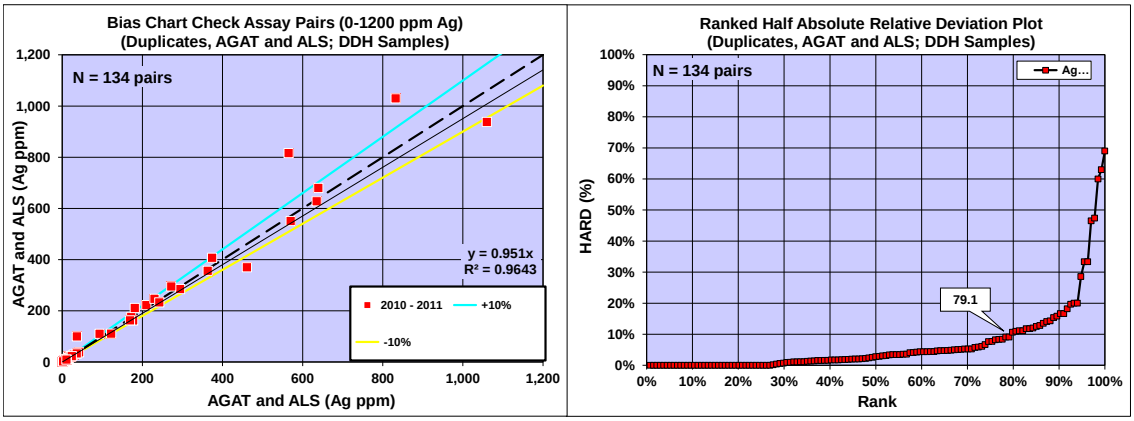


Figure 12.6: Scatter plot and Ranked Half Absolute Relative Deviation plot of silver data for course reject duplicate Flame & Moth samples

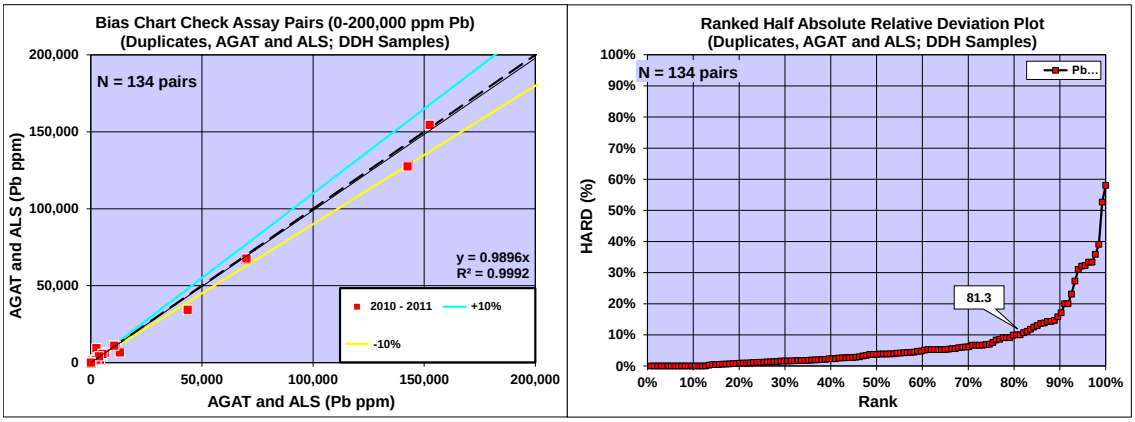


Figure 12.7: Scatter plot and Ranked Half Absolute Relative Deviation plot of zinc data for course reject duplicate Flame & Moth samples

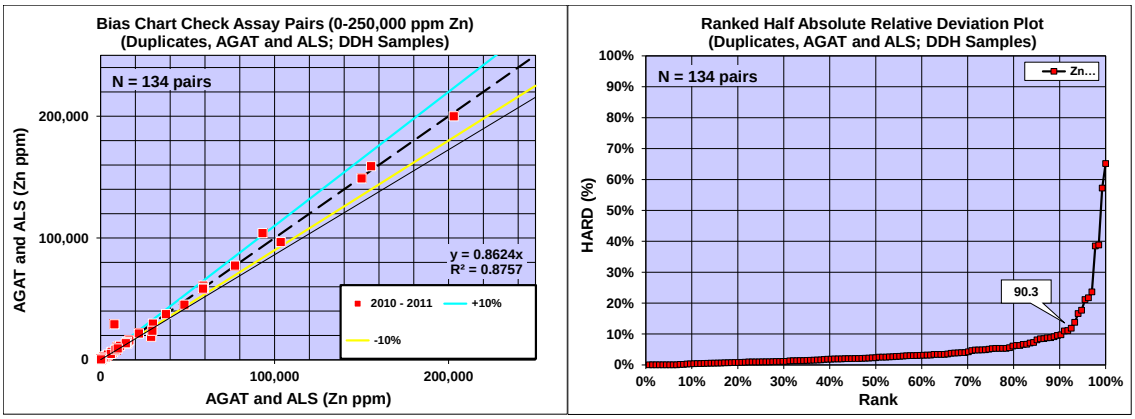


Figure 12.8: Scatter plot and Ranked Half Absolute Relative Deviation plot of lead data for course reject duplicate Flame & Moth samples

Time series plots for standard reference materials, PB131, PM1123, PM1127, PM1128, and PM1133, can be found in Appendix A, Figures A1 to A8. Only two samples of standard reference material PM1130 were submitted to the laboratories during 2011 and the results for these are not shown on time series plots. This standard returned low values for silver (within three standard deviations) and expected values for gold. Standard reference material PM1127 consistently returned low values with two of the samples returning values greater than three standard deviations from the expected value. Batches containing these failed standards were resubmitted for analysis at ALS and the new assays were used for the resource estimates.

During 2010 and 2011, a number of standard reference material samples returned values greater than three standard deviations from the expected value and batches containing these failed standards were resubmitted to ALS for analysis.

The review of analytical quality control data produced by ALS, AGAT and Alexco, suggests that silver, gold, lead, and zinc grades can be reasonably reproduced, suggesting that the final, and in some cases replicated, assay results reported by ALS and AGAT are generally reliable for the purpose of resource estimation.

13 Adjacent Properties

There are no adjacent properties considered relevant to this technical report.

14 Mineral Processing and Metallurgical Testing

No metallurgical testwork has been completed for the Flame & Moth deposit. For the purpose of this study, SRK has assumed that the deposit would have similar metallurgical properties to those of the Bellekeno deposit. Three separate metallurgical tests have been carried out on the mineralization at Bellekeno.

Test results from three testing programs indicate that the mineralization of the Bellekeno deposit responds well to a lead and zinc differential flotation process using a cyanide-free zinc mineral suppression regime. Silver minerals are intimately associated with lead minerals and are recovered as a silver-lead concentrate. A separate zinc concentrate is also produced from the Bellekeno operation.

Metallurgical performance estimated from test work and assumed for this report is based on test work completed by SGS Lakefield Research Ltd. in 2007 and by Process Research Associates Ltd. in 1996 and 2008 to 2009. Table 14.1 shows the average projected metallurgical performance.

Table 14.1: Summary of projected metallurgical recoveries

Product	Mass %	Grade				Recovery			
		Au (g/t)	Ag (g/t)	Pb (%)	Zn (%)	Au (g/t)	Ag (g/t)	Pb (%)	Zn (%)
Head	100	0.42	871	9.47	5.6	100	100	100	100
Pb-Ag Con	13.1	1.5	6,185	70.3	2.3	47.7	92.7	96.9	5.4
Zn Conc	9.1	1.1	300	0.52	54.4	23.9	3.1	0.5	88.4

15 Mineral Resource Estimates

15.1 Introduction

SRK was engaged in April, 2012, by the Alexco Resource Corporation to provide a mineral resource estimate for the Flame & Moth deposit.

Total production at the Flame & Moth deposit is listed as 1,590 tons grading 18.3 opt Ag, 1.1% Pb, and 0.9% Zn. (Cathro, 2006).

The mineral resources presented in this report represent the first time disclosure of mineral resource for the Flame & Moth deposit by Alexco.

15.2 Wireframe Construction

Wireframes were constructed for two portions of the Flame Vein offset along the Mill Fault in the geology model for the Flame & Moth prospect. The Flame Vein in the hangingwall of the Mill Fault was termed the Lightning Zone while the portion in the footwall of the Mill Fault was termed the Christal Zone (Figures 15.1 and 15.2). SRK reviewed and validated the wireframes before resource estimation. SRK concluded that the wireframes of the Flame & Moth deposit were fair representations of the mineralized veins and acceptable for resource estimation. The wireframes for resource modelling were constructed using Mintec's MineSight 3D software. All points of construction on the Flame Vein are from Alexco diamond drilling. Individual points were constructed on the hangingwall and footwall of each drill hole vein/structure intercept. These points were chosen based on the fault/vein structure where in most cases, the hangingwall and footwall contacts are clear and the mineralization is contained within a well-defined structure.

The Flame & Moth Vein has a strike of between 025^{o} and 027^{o} and a dip of between 62^{o} and 66^{o} to the southeast.

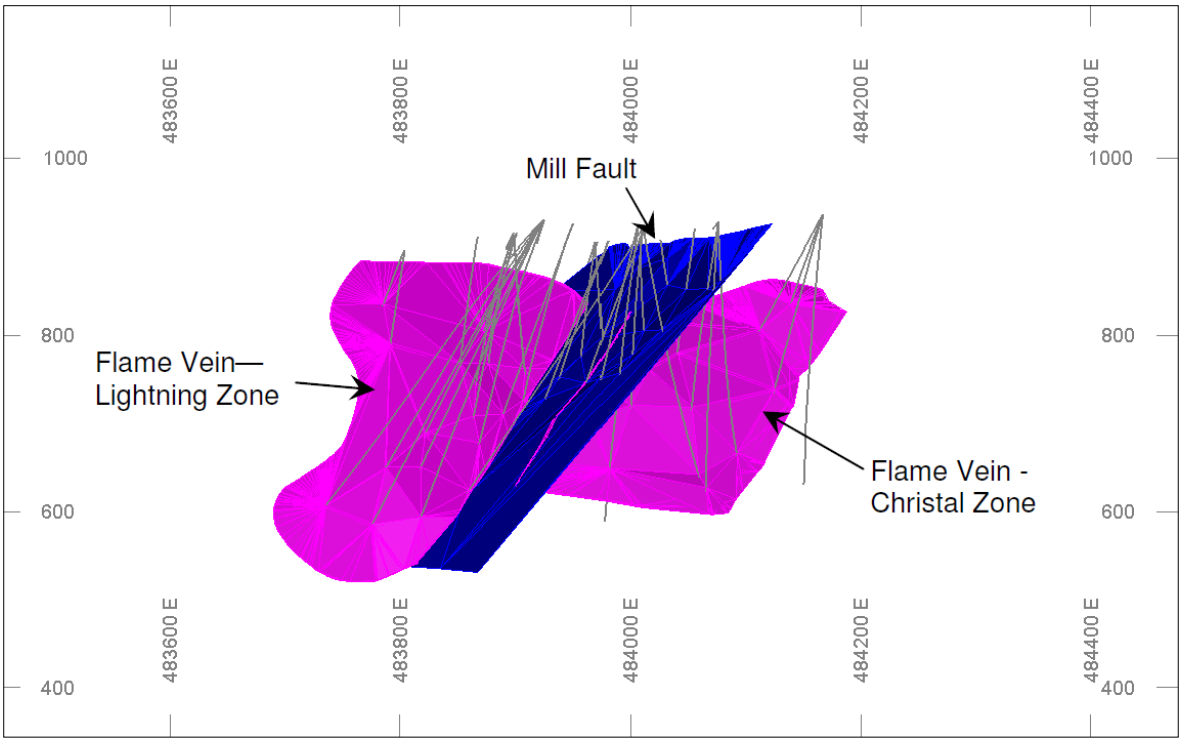


Figure 15.1: Long section of Flame & Moth wireframes looking north-northwest

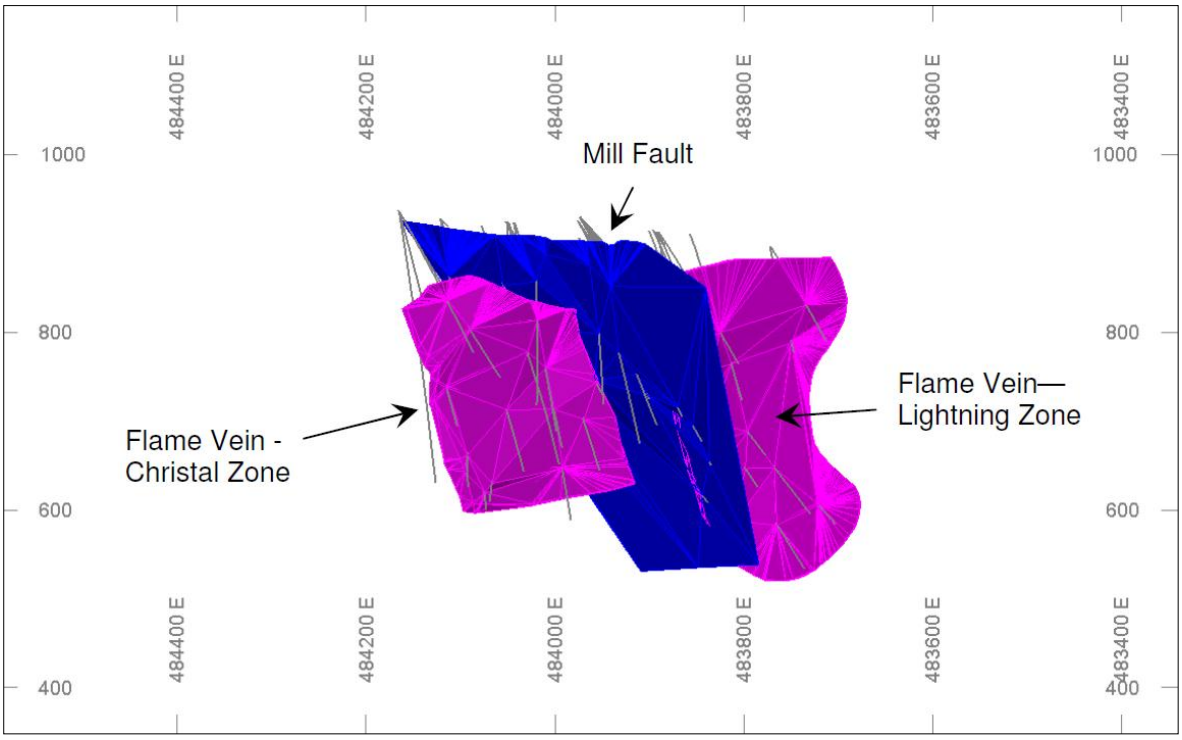


Figure 15.2: Long section of Flame & Moth wireframes looking south-southeast

15.3 Database

The Flame & Moth drill hole database comprises descriptive information and assay grades from exploration drilling carried out by Alexco from 2010 through 2011. The database was provided to SRK as an Excel format spreadsheet and contains 38 diamond drill holes (Table 15.1) used in the resource estimation (Table 15.2).

Table 15.1: Flame & Moth deposit sample database

Drill Hole			Number
Type	**Number**	**Length (m)**	**Samples**
DDH	38	10,875	2,196

Table 15.2: Flame & Moth deposit diamond drill hole vein intercepts

Vein	Drill Hole		Number
	Number	**Length (m)**	**Samples**
Flame Vein-Christal Zone	14	69	98
Flame Vein-Lightning Zone	19	112	144
TOTAL	**33**	**181**	**242**

The supplied mineral resource database was imported into GEMS Access database, and validated by checking for inconsistencies in naming conventions, analytical units, duplicate entries, length, distance values, or sample intervals less than or equal to zero, blank or zero-value assays, out-of-sequence intervals, intervals or distances greater than the reported drill hole length, inappropriate collar locations, and missing interval and coordinate fields. A few minor inconsistencies were noted and corrected by Alexco. No other significant validation errors were noted in the supplied database. Assay intervals marked as below detection limit were assigned nominal grades as per Table 15.3 prior to importing into GEMS.

Table 15.3: Grades assigned to Flame & Moth sample assays below detection limit

Metal	Detection Limit	Assigned Value
Au ppm	-0.002	0.001
Au ppm	-0.01	0.005
Ag ppm	-0.5	0.025
Pb ppm	-2.00	1.00
Pb ppm	-1.00	0.5

15.4 Specific Gravity

The data supplied by Alexco for Flame & Moth included a total of 324 specific gravity measurements on core samples and 733 pulp specific gravity measurements, respectively 96 and 191 of which fall within the modelled vein solids (Table 15.4). Specific gravity was measured on core samples by Alexco using a laboratory scale and recording the mass of drill hole core pieces in air and in water. Drill hole core was not covered by wax or plastic film prior to immersion. Pulp specific gravity measurements were measured by pynometer at ALS in North Vancouver. No strong correlation between specific gravity measurements and lead or zinc assay results was noted.

A linear regression of the core versus pulp specific gravity measurements for samples was calculated, where:

Core Specific Gravity = Pulp Specific Gravity/1.0385

Core specific gravity measurements were used where available for interpolation of specific gravity into blocks. Because pulp specific gravity measurements often over estimate specific gravity, pulp specific gravity measurements were corrected using the above equation for those samples with no core specific gravity measurements and the corrected specific gravity measurements were used for interpolation of specific gravity into blocks.

Table 15.4: Flame & Moth Specific gravity measurements

Zone	Type SG Measurement	Total Samples	Minimum Specific Gravity (g/cm^3)	Maximum Specific Gravity (g/cm^3)	Average Specific Gravity (g/cm^3)	Median Specific Gravity (g/cm^3)
Christal	Pulp	49	2.53	4.78	3.71	3.80
	Core	30	2.62	4.66	3.51	3.53
Lightning	Pulp	142	2.65	4.94	3.56	3.55
	Core	66	2.62	4.44	3.48	3.50
All Samples	Pulp	191	2.53	4.94	3.60	3.62
	Core	96	2.62	4.44	3.48	3.5

15.5 Compositing

Alexco identified a total of 242 diamond drill hole assay intervals as vein intercepts. These assay intervals were imported into GEMS, and assays were then composited to one metre length-weighted intervals within the defined vein wireframes. Histograms of sample length for the Christal and Lightning zones can be seen in Figures 15.3 and 15.4 respectively.

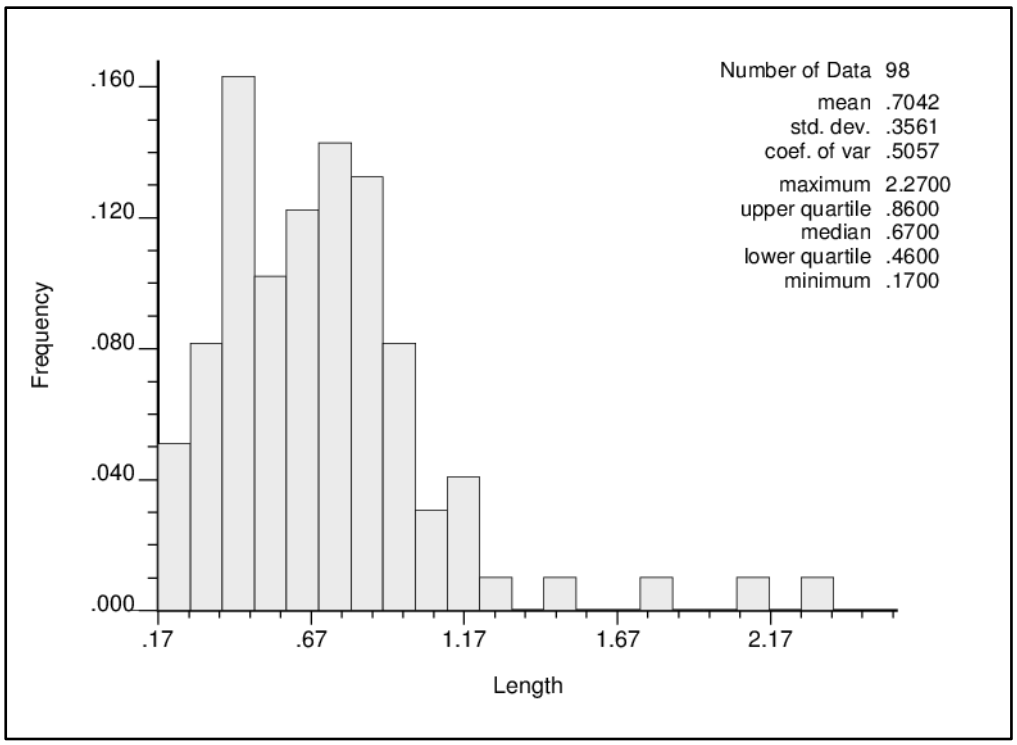


Figure 15.3: Histogram of Sample Length for the Christal Zone

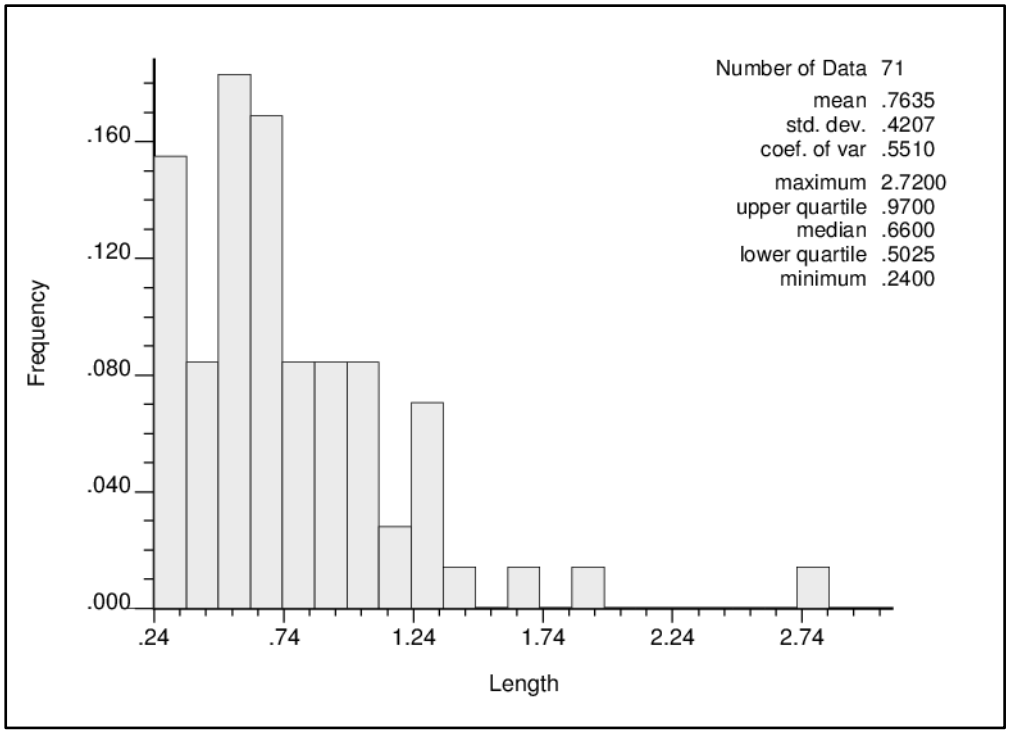


Figure 15.4: Histogram of Sample Length for the Lightning Zone

15.6 Capping

Grade capping analysis was conducted on the domain-coded sample assay and composited assay data in order to limit the influence of extreme assay values during estimation. The assays from the Christal and Lightning zones were examined using histograms and cumulative frequency plots. Capping threshold values were selected that minimize changes in the sample distribution, and composited values were capped to these values prior to estimation (Table 15.5).

Table 15.5: Sample capping levels for Flame & Moth

Zone	Commodity	Maximum Value	Cap Value	Number Capped	Average	Average Capped	Lost Metal*
Christal	**Ag ppm**	3,062	1,300	4	380	334	12.88%
	Au ppm	1.88	1.10	5	0.33	0.30	9.52%
	Pb %	18.61	10.00	2	1.39	1.24	11.41%
	Zn %	17.15	18	0	3.52	3.52	0.00%
Lightning	**Ag ppm**	2,317	1,300	5	359	339	5.73%
	Au ppm	2.11	1.1	4	0.34	0.32	6.06%
	Pb %	12.12	10	1	1.14	1.13	0.88%
	Zn %	21.94	18	8	6.32	6.19	2.08%

**Lost metal is (Average – Averaged Capped)/Average * 100 where Average is the average grade of the composited assays before capping and Average Capped is the average grade of the composited assays after capping.*

15.7 Data Statistics

Summary statistics were compiled for the composite data for the Flame & Moth veins (Table 15.6). A total of 71 composites were derived for the Christal Zone, and 114 composites for the Lightning Zone. Correlation analysis between commodities indicates a weak correlation between silver and lead, with a correlation coefficient of 0.62.

Table 15.6: Composite data summary statistics for Flame & Moth

Type	Statistic	Ag g/t	AgCap g/t	Au g/t	AuCap g/t	Pb %	PbCap %	Zn %	ZnCap %
Total Composites	Number of Samples	185	185	185	185	185	185	185	185
	Average	367	337	0.34	0.31	1.24	1.17	5.24	5.17
	Minimum	0.25	0.25	0.005	0.005	0.0001	0.0010	0.0011	0.0011
	Maximum	3,062	1,300	2.11	1.10	18.61	10.00	21.94	18.00
	St Dev.	466	361	0.37	0.29	2.31	1.92	5.46	5.26
	CV	1.27	1.07	1.09	0.94	1.86	1.64	1.04	1.02
Christal Composites	Number of Samples	71	71	71	71	71	71	71	71
	Average	380	334	0.33	0.30	1.39	1.24	3.52	3.52
	Minimum	6.86	6.86	0.005	0.005	0.018	0.018	0.023	0.023
	Maximum	3,062	1,300	1.88	1.10	18.61	10.00	17.15	17.15
	St Dev.	519	350	0.39	0.31	2.89	2.16	3.36	3.36
	CV	1.36	1.05	1.17	1.02	2.07	1.74	0.95	0.95
ning Com posit	Number of Samples	114	114	114	114	114	114	114	114

Type	Statistic	Ag g/t	AgCap g/t	Au g/t	AuCap g/t	Pb %	PbCap %	Zn %	ZnCap %
	Average	359	339	0.34	0.32	1.14	1.13	6.32	6.19
	Minimum	0.25	0.25	0.005	0.005	0.0001	0.0001	0.0011	0.0011
	Maximum	2317	1,300	2.11	1.10	12.12	10.00	21.94	18.00
	St Dev.	430	367	0.35	0.29	1.85	1.75	6.19	5.93
	CV	1.20	1.08	1.04	0.89	1.62	1.55	0.98	0.96

15.8 Block Model

A rotated block model was constructed to cover the entire extent of the mineralized veins as defined by Alexco. The block model includes separate sub-models for silver, lead, zinc, and gold grade estimates, as well as estimated specific gravity, classification criteria, validation estimates, and a calculated block NSR value. A block percentage model was used to accurately determine volume and tonnage values based on the supplied Alexco vein wireframes. The geometrical parameters of the block model are summarized in Table 15.7.

Table 15.7: Block model location and setup

Description	Easting (X)	Northing (Y)	Elevation (Z)
Block Model Origin NAD 83	483550	7086370	920
Block Dimensions (metres)	3	5	5
Number of Blocks	115	165	90
Rotation (degree)	30° clockwise		

15.9 Variography

Due to the limited number of samples in each of the Christal and Lightning zones, experimental semi-variograms could not be generated for silver, lead, zinc, or gold from composite grade data for these veins.

15.10 Grade Interpolation

Grades were interpolated into blocks using the inverse distance squared (ID2) method and search ellipses were set up to parallel the strike and dip of the veins. For silver, lead, zinc, and gold, a two-pass series of expanding search ellipsoids was used for sample selection and estimation.

Composite data used for the estimation was restricted to samples located in the respective veins. Individual block grades were used to calculate a NSR block model. Estimation criteria for each vein zone are summarized in Table 15.8. Blocks were classified as Indicated mineral resources if at least two drill holes and six composites were found within a 60 by 60 m search ellipse. All other interpolated blocks were classified as Inferred mineral resource.

Table 15.8: Search ellipse parameters for Flame & Moth

Commodity	Search Pass	Gemcom Rotations			Range			Number of Composites		Max. Samples per DDH
		Principal Azimuth	Principal Dip	Intermed. Azimuth	X-Rot	Y-Rot	Z-Rot	Min.	Max.	
Ag, Pb, Zn, Au	1	40	-35	0	60	60	20	6	12	4
	2	40	-35	0	100	100	40	6	12	4
Density	1	40	-35	0	60	60	20	4	8	3
	2	40	-35	0	100	100	40	4	8	3
	3	40	-35	0	100	100	40	2	8	1

15.11 Block Model Validation

The block model was validated visually by the inspection of successive section lines in order to confirm that the block model correctly reflects the distribution of high-grade and low-grade samples. The average composite sample grades for all blocks containing composite samples (informed blocks) were compared to the ID2 estimates using scatter plots. Due to the small number of informed blocks, both inferred and indicated blocks were plotted for both zones. The scatter plots for silver, lead, zinc, and gold for blocks in both the Lightning and Christal zones are displayed in Figure 15.5 and show an excellent correlation between informed and estimated blocks. Average sample grades for the informed blocks are compared against the average grade of the ID2 estimates for silver, lead, zinc, and gold in Table 15.9.

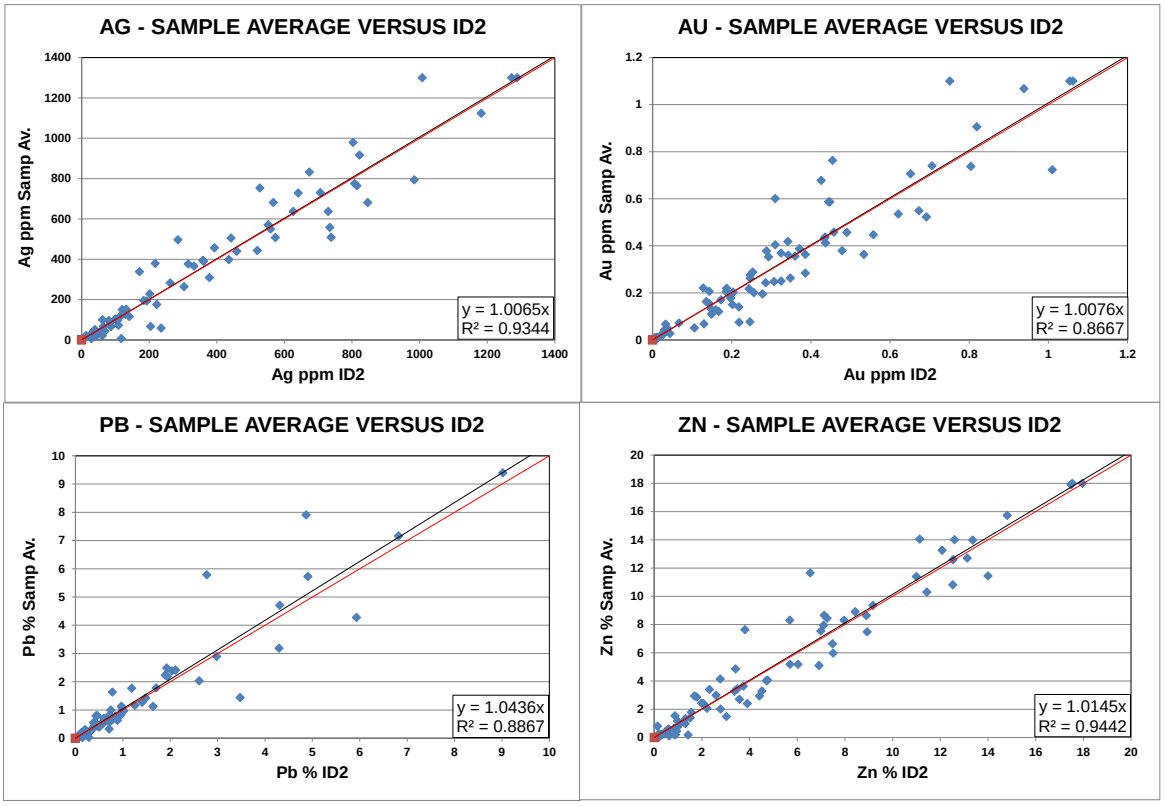


Figure 15.5: Comparison of ID2 and Average sample grades for Flame & Moth.

Table 15.9: Comparison of ID2 and Average sample grades for informed blocks

	Indicated			Inferred		
	NO. BLOCKS	ID2	SAMPLE AVERAGE	NO. BLOCKS	ID2	SAMPLE AVERAGE
Ag (g/t)	56	416	422	21	140	137
Pb (%)	56	1.51	1.59	21	0.41	0.42
Zn (%)	56	6.28	6.49	21	2.06	1.83
Au (g/t)	56	0.38	0.38	21	0.22	0.22

15.12 Block Model Sensitivity Analysis

Table 15.10 tabulates global quantities and grade estimates at different cutoff grades for the Flame & Moth deposit. Figure 15.6 presents the effects of increasing cut-offs on the tonnage and grade of the deposit. The reader is cautioned that these figures should not be misconstrued as a mineral resource. The reported quantities and grades are only presented as a sensitivity of the resource model to the selection of the cutoff grades.

Table 15.10: Flame & Moth inferred and indicated block model quantity and grade estimates* at various NSR cut-off values**

NSR Cut-Off C$	Indicated		Inferred	
	Tonnes	Ag (g/t)	Tonnes	Ag (g/t)
C$ 200	745,920	458	350,978	326
C$ 185	758,944	453	387,153	312
C$ 150	789,499	441	479,158	281
C$ 125	811,268	433	570,460	256
C$ 100	824,985	427	628,337	242

** The reader is cautioned that the figures presented in this table should not be misconstrued as a mineral resource statement. The reported quantities and grades are only presented to show the sensitivity of the resource model to the selection of cut-off grade.*
*** C$ values calculated at 1C$ = 1US$*

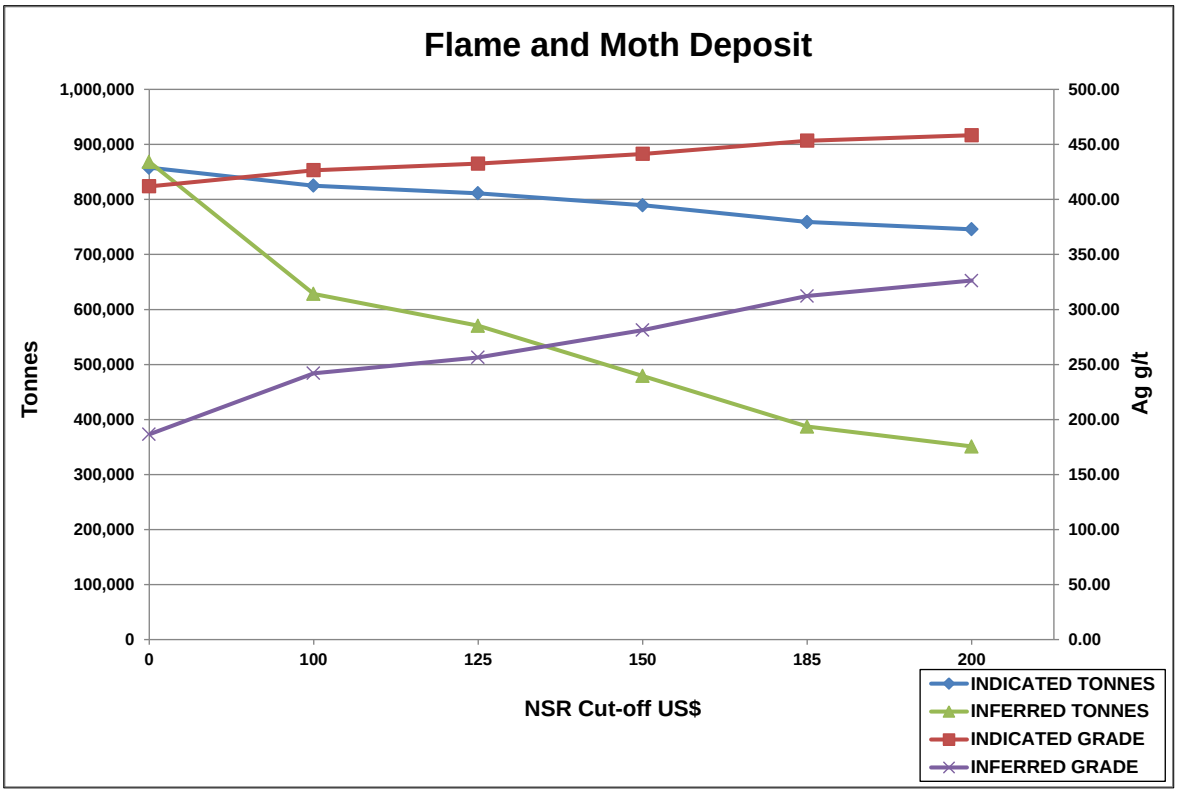


Figure 15.6: Grade tonnage curve for Flame & Moth

15.13 Mineral Resource Classification

Mineral resources were estimated in conformity with generally accepted CIM “Estimation of Mineral Resource and Mineral Reserve Best Practices” guidelines. Mineral resources may be affected by further infill and exploration drilling that may result in increases or decreases in subsequent resource estimates. Mineral resources may also be affected by subsequent assessments of mining, environmental, processing, permitting, taxation, socio-economic, and other factors.

Mineral reserves can only be estimated based on the results of an economic evaluation as part of a preliminary feasibility study or feasibility study. As such, no mineral reserves have been estimated by SRK as part of the present assignment. There is no certainty that all or any part of the Mineral Resources will be converted into a mineral reserve. Confidence in the estimate of Inferred mineral resources is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure.

Mineral resources for the Flame & Moth project have been estimated and classified according to the “CIM Standards on Mineral Resources and Reserves: Definition and Guidelines” (December, 2005) by DJ Farrow, Pr.Sci.Nat., under the supervision of Dr. Gilles Arseneau P.Geo., an “Independent Qualified Person” as defined by National Instrument 43-101. The commercial GEMS software program was used for mineral resource modeling.

SRK considers that the quality of the exploration data (confidence in the location and reliability of assaying results) acquired by Alexco is good and therefore is not a factor that would impact resource classification. The confidence in the underlying datasets support classification of Indicated and Inferred mineral resources within the meaning of the CIM Definition Standards. However, there is

insufficient information to confirm both the geological and grade continuity with the current level of sampling to support a Measured mineral resource classification within the meaning of the CIM Definition Standards.

Blocks were classified as Indicated mineral resources if at least two drill holes and six composites were found within a 60 by 60 m search ellipse. All other interpolated blocks were classified as inferred mineral resource.

15.14 Mineral Resource Statement

CIM Definition Standards for Mineral Resources and Mineral Reserves (December 2005) define a mineral resource as:

"A concentration or occurrence of diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge".

The "reasonable prospects for economic extraction" requirement generally implies that the quantity and grade estimates meet certain economic thresholds and that the mineral resources are reported at an appropriate cut-off grade taking into account extraction scenarios and processing recoveries. SRK considers that the silver mineralization evaluated in the Flame & Moth deposit is amenable for underground extraction.

Commodity prices were provided to SRK by Alexco as representative of their long term strategic forecast. Economic parameters are summarized in Table 15.11.

Table 15.11: Dollar equivalent (NSR) calculation parameters

Commodity	Price	Recovery
Ag	US$ 23.00/oz.	96%
Pb	US$0.95/lb.	97%
Zn	US$0.95/lb.	88%
Au	US$1,350.00/oz.	72%

Mineral resources for the Flame & Moth deposit defined relative to a NSR cut-off of $185/tonne, using metallurgical recoveries as proposed in the Preliminary Economic Assessment for the Bellekeno project at Keno Hill (Wardrop, 2009), are listed in Table 15.12 on the following page.

Table 15.12: Mineral resource statement*, Flame & Moth deposit, Flame & Moth Property, SRK Consulting (Canada) Inc., June 27, 2012

ZONE	Class	Tonnes	Ag g/t	Pb %	Zn %	Au g/t
Christal	Indicated	263,000	508	2.31	4.91	0.47
	Inferred	213,000	299	1.19	3.38	0.27
Lightning	Indicated	496,000	425	1.42	8.06	0.35
	Inferred	174,000	329	1.16	4.89	0.24
TOTAL	**Indicated**	**759,000**	**453**	**1.73**	**6.97**	**0.39**
	Inferred	**387,000**	**312**	**1.18**	**4.06**	**0.26**

* *Reported at a NSR cut-off grade of C$185.00/t* using metal prices (USD) and recoveries of Ag US$23.00/oz, recovery 96%; Pb US$ 0.95/lb, recovery 97%; Zn US$ 0.95/lb, recovery 88%; Au US$ 1,350/oz, recovery 72%. *All numbers have been rounded to reflect the relative accuracy of the estimates. Mineral resources are not mineral reserves and do not have demonstrated economic viability. Confidence in the estimate of Inferred mineral resources is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure.*

16 Other Relevant Data and Information

The Flame & Moth deposit is situated on the Flame & Moth property, approximately 1.2 km west of Keno City adjacent to the site of the Alexco District Mill in the Keno Hill District.

Commissioning of the Alexco conventional flotation plant and Bellekeno underground mine, initiated in late September, 2010, was completed at the end of December with both the mine and mill achieving an average throughput of 250 tonnes per day of ore for 30 days. The stated nameplate capacity of the District Mill as constructed is 407 tonnes per day. Alexco commenced commercial production at the Bellekeno mine on January 1, 2011.

In early December, 2010, Alexco announced the execution of lead and zinc off-take agreements for Bellekeno concentrate with Glencore Ltd., Stamford ("Glencore"); a branch of a wholly owned subsidiary of the Swiss-based international natural resources group Glencore International AG.

Total annual production from Bellekeno in 2011 came to 2.02 Moz Ag, 16.45 million lb of lead and 7.22 million lb of zinc from 81,064 tonnes of ore processed.

The District Mill currently processes output from the Bellekeno mine, and may in the future process output from other District mine sources as well. It is not currently determinable if resources mined from Flame & Moth would or even could be processed through the District Mill. Until metallurgical testing has been carried out, it is not determinable if the existing District Mill would be suitable for processing resources from Flame & Moth. Furthermore, until mining plans have been developed for Flame & Moth it is also not determinable if the District Mill will have sufficient capacity to process Flame & Moth mine output.

17 Interpretation and Conclusions

Between 2010 and 2011, Alexco conducted two drilling programs on its Flame & Moth property, in the Keno Hill district, located in Central Yukon Territory. The drilling on the Flame & Moth deposit successfully outlined a significant polymetallic silver deposit in an area of limited historical exploration and production.

Surface geologic mapping combined with drill hole data has allowed for the construction of high quality geologic models for use in resource estimation and ongoing exploration.

The mineralized Flame Vein system identified to date comprises two broadly north-northeast striking, southeast dipping vein segments - the Christal Zone and the Lightning Zone, offset by the northwest striking Mill Fault. The Christal Zone has a defined strike length of 250 m with a depth of 300 m, while the Lightning Zone extends 220 m in length and up to 290 m in depth. SRK considers the modelled wireframes constructed by Alexco to be fair representations of the mineralized veins and acceptable for resource estimation.

The Alexco drilling information was acquired using procedures that meet or exceed industry best practices. Alexco personnel used diligence in monitoring quality control assaying results, investigating potential failures, and taking appropriate corrective measures when required. The quality control data collected by Alexco in 2010 and 2011 is considered comprehensive and the final, in some cases replicated, assay results delivered by ALS and AGAT Labs are generally reliable for the purpose of resource estimation.

The mineral resources presented in this report represent the first time disclosure of mineral resource for the Flame & Moth deposit by Alexco.

The mineral resource for the Flame & Moth deposit, at a NSR cut-off of $185/tonne includes 759,000 tonnes at an average grade of 453 g/t silver classified as Indicated mineral resources and 387,000 tonnes at an average grade of 312 g/t silver classified as Inferred mineral resources.

18 Recommendations

SRK recommends that Alexco continues exploration of the Flame Vein above the new resource areas and along strike and to depth on both sides of the Mill Fault. SRK recommends that Alexco initiates additional geotechnical, mineralogical, and metallurgical data collection and baseline environmental studies in anticipation of favourable exploration results and preparation for a preliminary economic assessment. A detailed budget for the recommended exploration and development program is listed below (Table 18.1) with a total cost of $1.8 M.

Table 18.1: Budget for recommended exploration and development program

Activity	Quantity	Unit	Cost Estimate (CDN$)
Diamond drilling and assaying	7000	metres	$1,750,000
Preliminary metallurgical testing			$30,000
Geotechnical and mineralogical studies			$25,000
Environmental Baseline Studies			$25,000
TOTAL			**$1,830,000**

19 Date and Signature Page

This technical report was written by the following "Qualified Persons" and contributing authors. The effective date of this technical report is June 15, 2012.

Qualified Person	Signature	Date
Dr. Gilles Arseneau, P.Geo	"original signed"	August 8, 2012

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"original signed"

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Associate Consultant (Resource Geology)

Reviewed by

"original signed"

Marek Nowak, P.Eng

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

20 References

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APPENDIX A

Time Series Plots for Certified Reference Materials

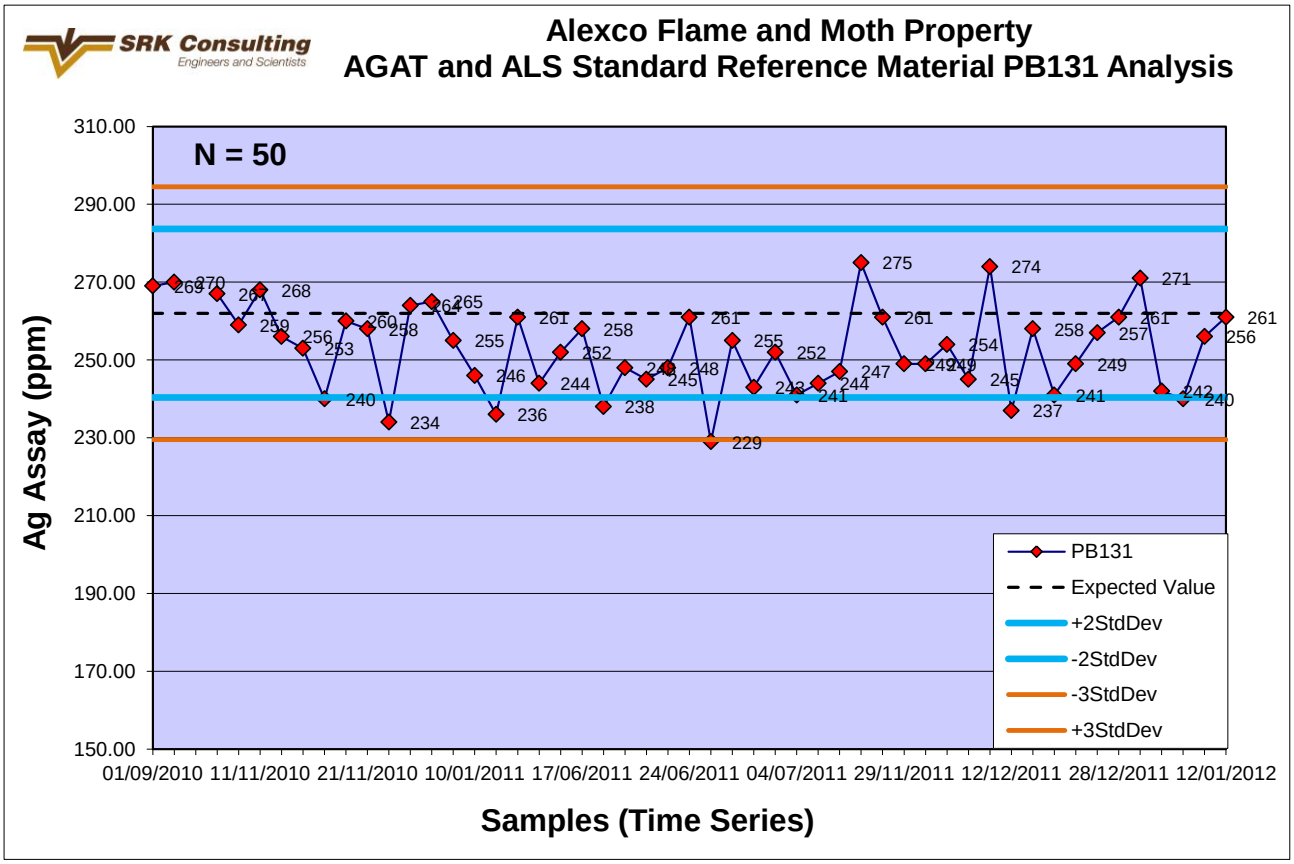

Figure A1: Analytical results for silver over time for standard reference material PB131 submitted with Flame & Moth deposit samples.

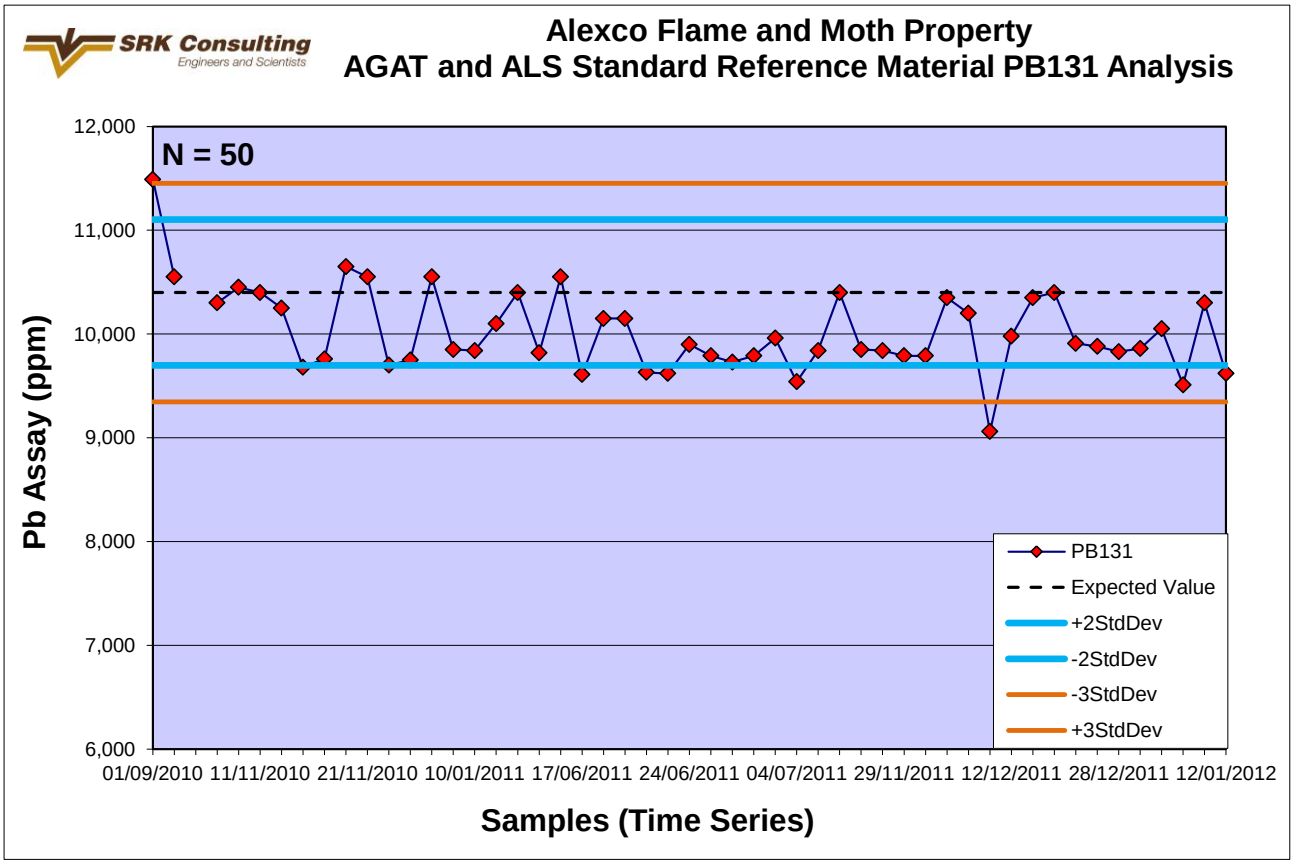

Figure A2: Analytical results for lead over time for standard reference material PB131 submitted with Flame & Moth deposit samples.

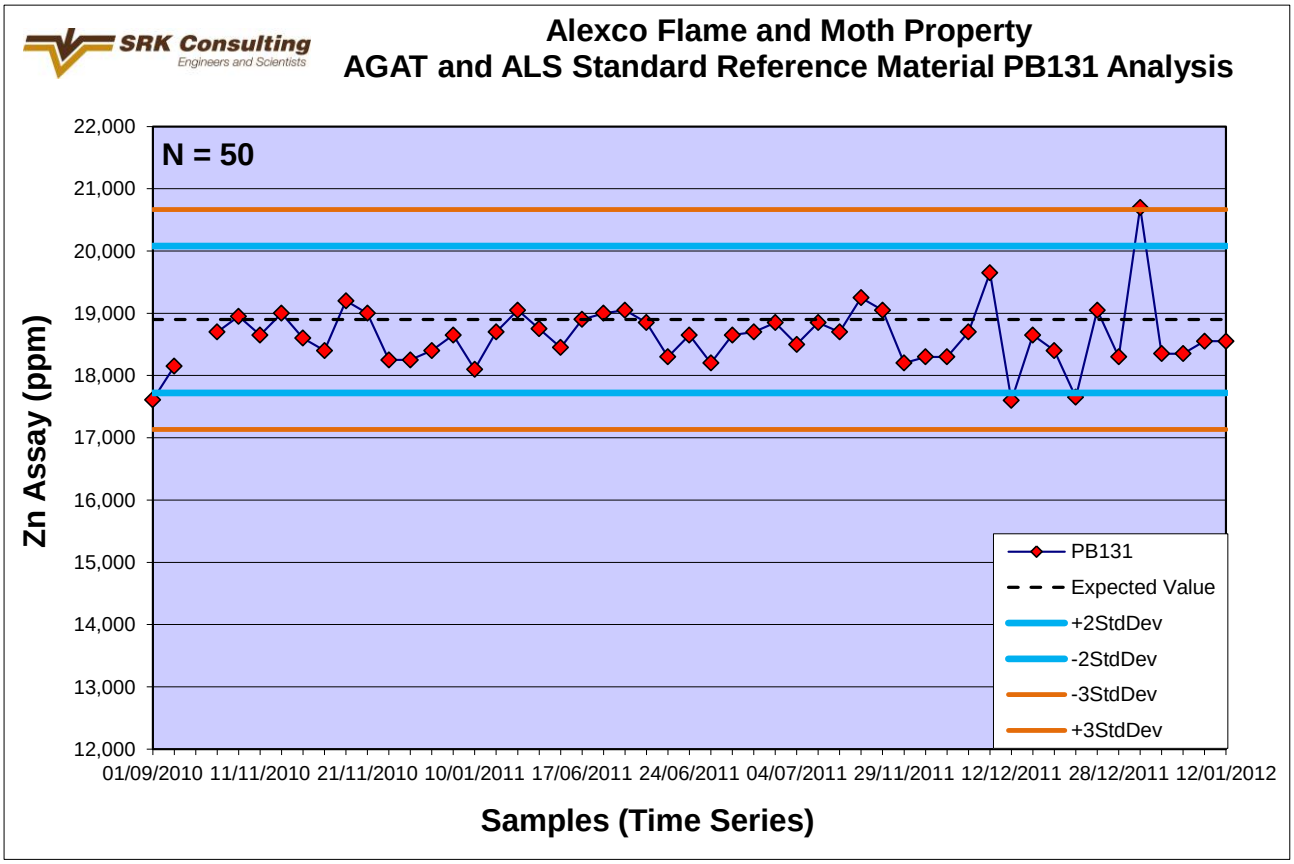

Figure A3: Analytical results for zinc over time for standard reference material PB131 submitted with Flame & Moth deposit samples.

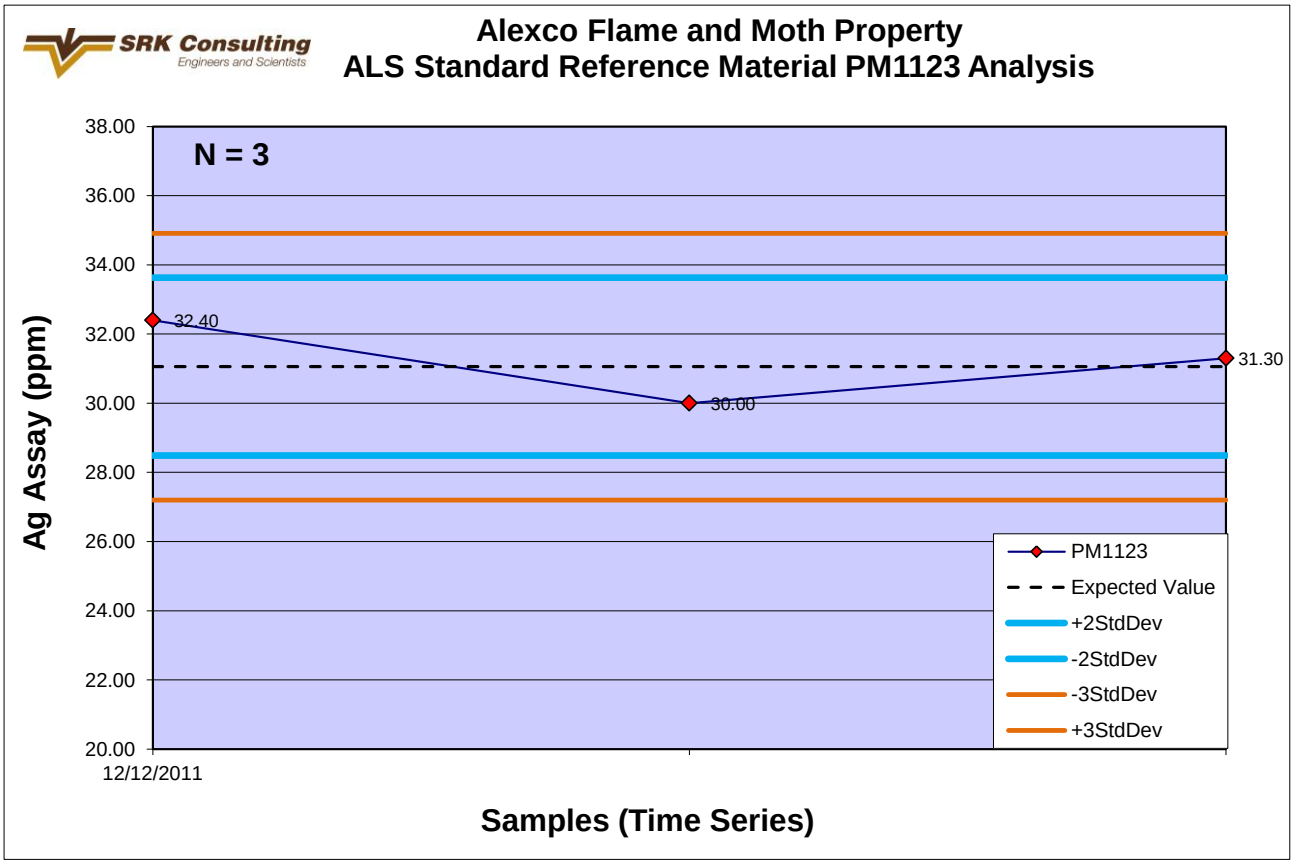

Figure A4: Analytical results for silver over time for standard reference material PM1123 submitted with Flame & Moth deposit samples.

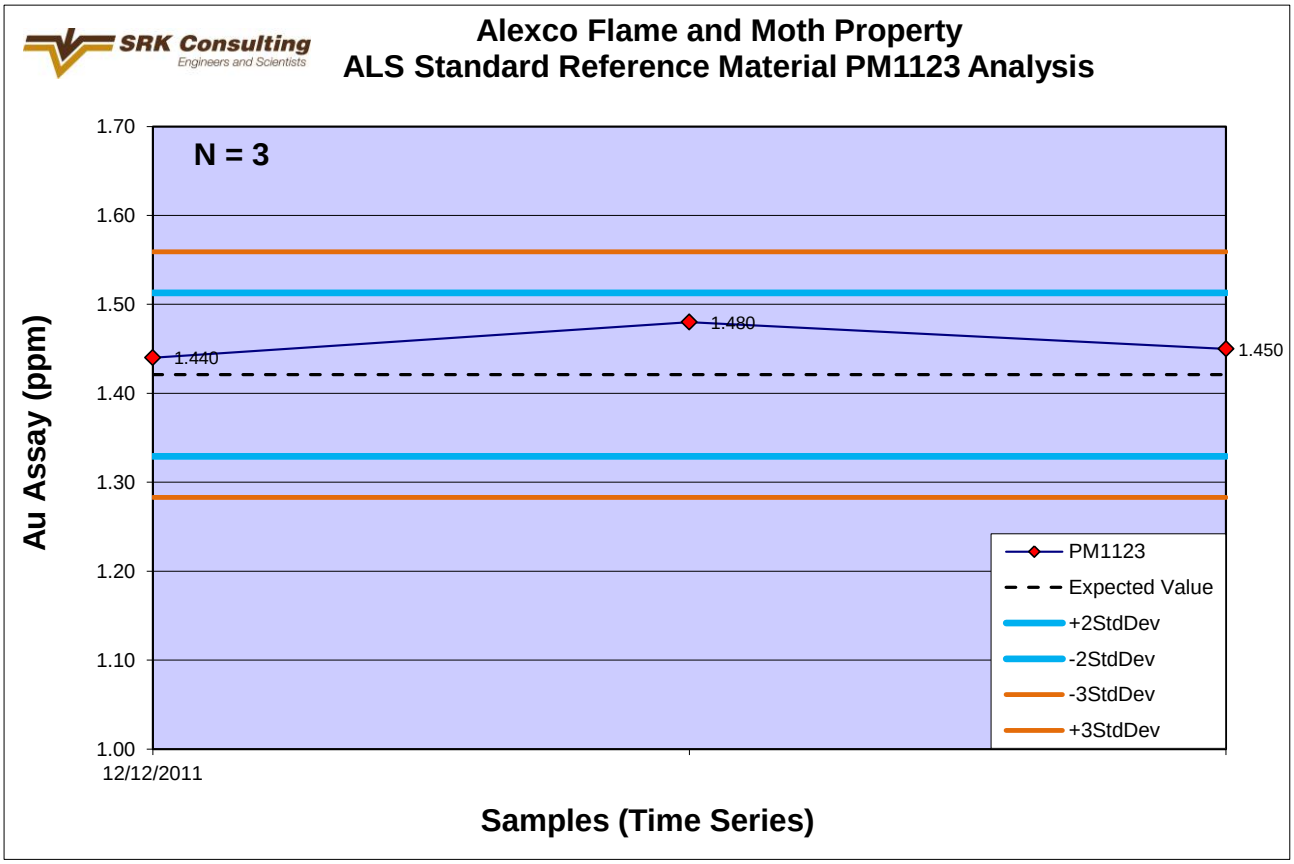

Figure A5: Analytical results for gold over time for standard reference material PM1123 submitted with Flame & Moth deposit samples.

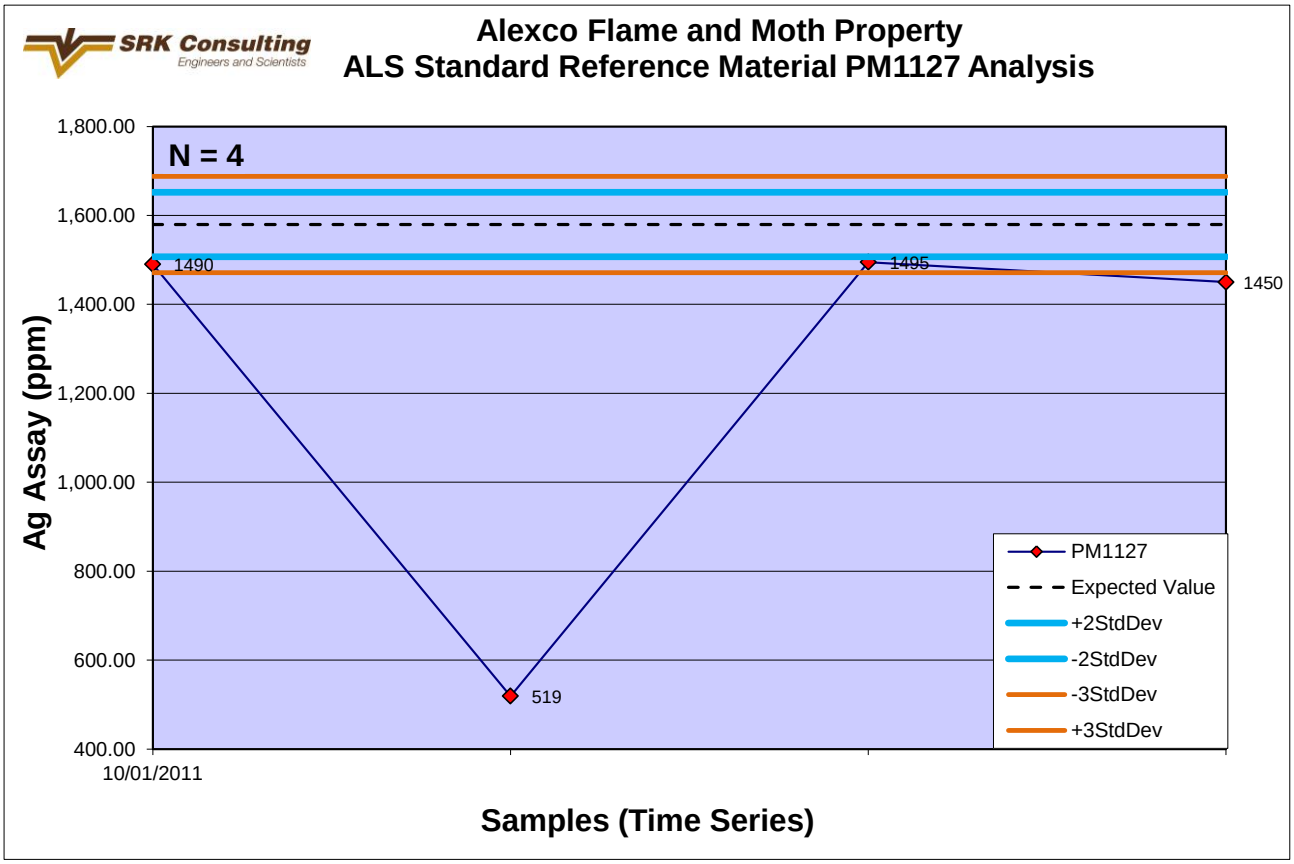

Figure A6: Analytical results for silver over time for standard reference material PM1127 submitted with Flame & Moth deposit samples.

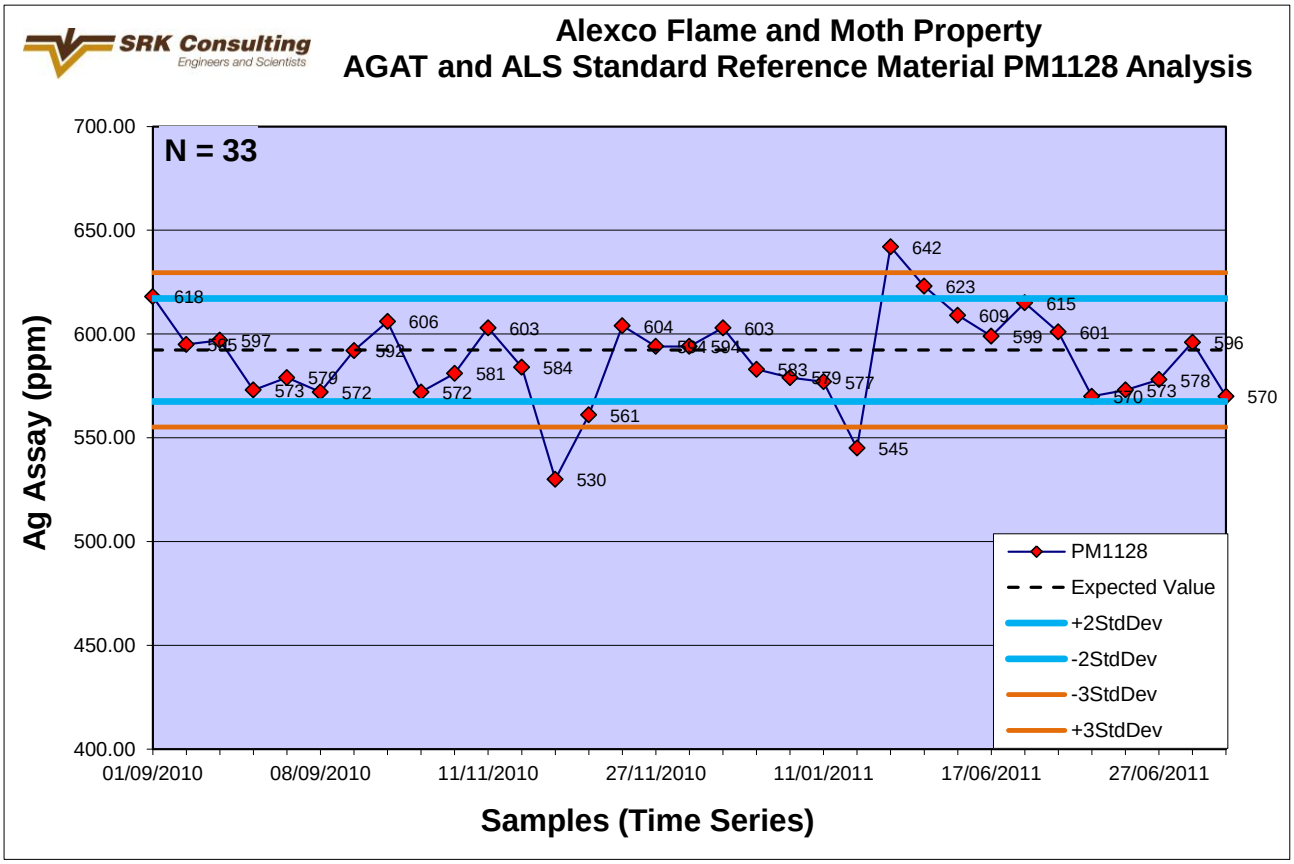

Figure A7: Analytical results for silver over time for standard reference material PM1128 submitted with Flame & Moth deposit samples.

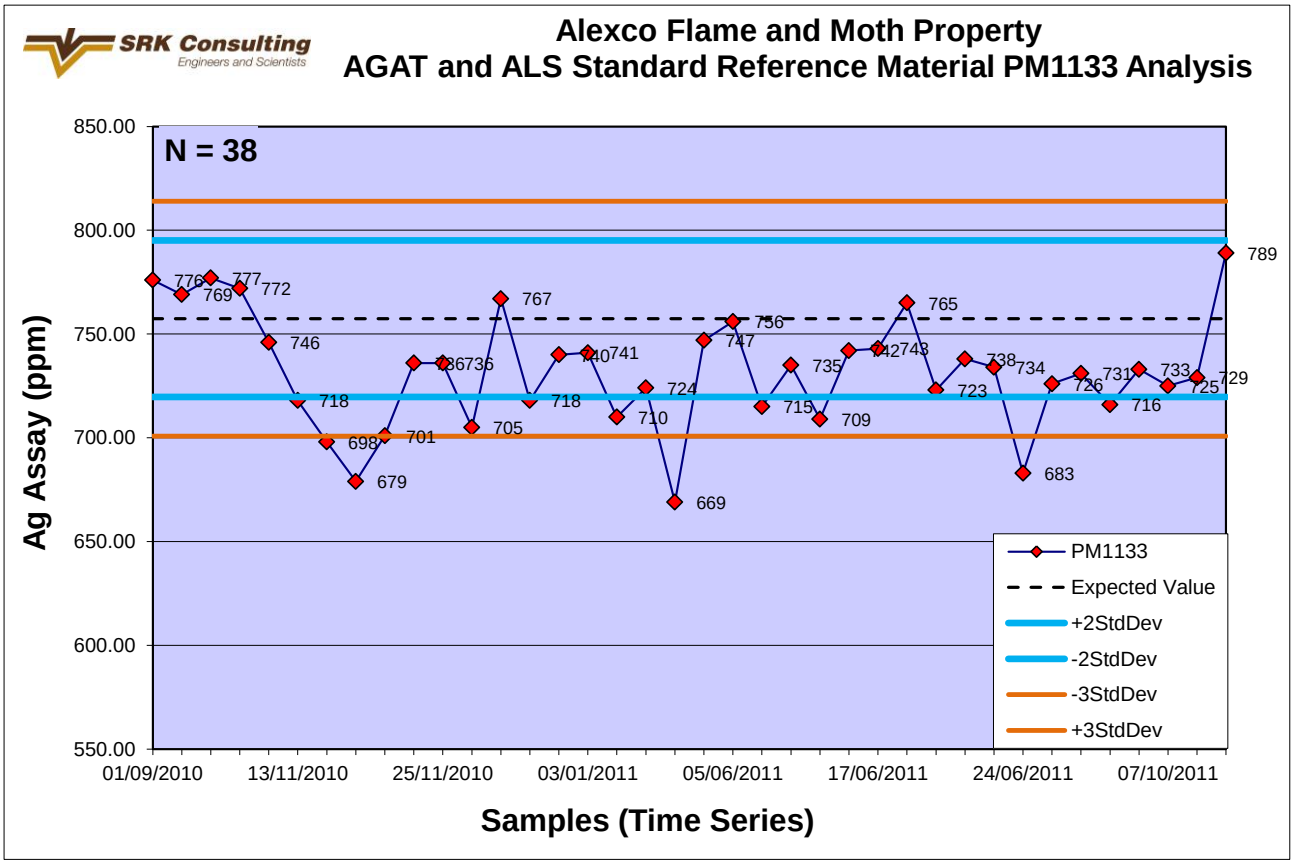

Figure A8: Analytical results for silver over time for standard reference material PM1133 submitted with Flame & Moth deposit samples.