Technical Report for the Phoenix Gold Project, Red Lake, Ontario

Report Prepared for

Rubicon Minerals Corporation

Report Prepared by

SRK Consulting (Canada) Inc.
3CR011.006
February 25, 2016

Technical Report for the Phoenix Gold Project, Red Lake, Ontario

Rubicon Minerals Corporation
Suite 400 - 44 Victoria Street
Toronto, Ontario, Canada
M5C 1Y2
E-mail: rubicon@rubiconminerals.com
Website: www.rubiconminerals.com
Tel: +1 866 365 4706; Fax: + 1 416 642 2299

SRK Consulting (Canada) Inc.
Suite 1300, 151 Yonge Street
Toronto, Ontario, Canada
M5C 2W7
E-mail: toronto@srk.com
Website: www.srk.com
Tel: +1 416 604 1445; Fax: +1 416 601 9046

SRK Project Number 3CR011.006

Effective date: January 11, 2016
Signature date: February 25, 2016

Authored by:

["Signed and Sealed"]
Sebastien Bernier, PGeo
Principal Consultant
(Resource Geology)
SRK Consulting (Canada) Inc.

["Signed and Sealed"]
Glen Cole, PGeo
Principal Consultant
(Resource Geology)
SRK Consulting (Canada) Inc.

["Signed and Sealed"]
Jean-François Ravenelle, PGeo
Senior Consultant
(Structural Geology)
SRK Consulting (Canada) Inc.

["Signed and Sealed"]
Michael O'Flaherty, PEng
Engineering Consultant

["Signed and Sealed"]
John William Frostiak, PEng
Engineering Consultant

With contributions by:
Oy Leuangthong, PhD, PEng - Principal Consultant (Geostatistics) - SRK Consulting (Canada) Inc.
Dominic Chartier, PGeo - Senior Consultant (Geology) - SRK Consulting (Canada) Inc.
Howard Bird, PGeo - Vice President, Exploration – Rubicon Minerals Corporation
Mark Ross, PGeo – Chief Geologist - Rubicon Minerals Corporation
Bill Shand, PEng – Vice President, Operations - Rubicon Minerals Corporation

Reviewed by:

["Signed and Sealed"]
Jean-Francois Couture, PhD, PGeo
Corporate Consultant (Geology)
SRK Consulting (Canada) Inc.

Cover: Phoenix Gold Project Area and Headframe, Red Lake, Ontario (Photo courtesy of Rubicon)

IMPORTANT NOTICE

This report was prepared as a National Instrument 43-101 *Standards of Disclosure for Mineral Projects* Technical Report for Rubicon Minerals Corporation (Rubicon) by SRK Consulting (Canada) Inc. (SRK). The quality of information, conclusions, and estimates contained herein are consistent with the quality of effort involved in SRK's services. The information, conclusions, and estimates contained herein are 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 Rubicon subject to the terms and conditions of its contract with SRK and relevant securities legislation. The contract permits Rubicon to file this report as a Technical Report with Canadian securities regulatory authorities pursuant to National Instrument 43-101. 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 Rubicon. 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

Introduction

The Phoenix gold project is a development underground mining project located in the district of Red Lake, Ontario, Canada. It is located approximately 265 kilometres (km) northeast of Winnipeg, Manitoba. Rubicon Minerals Corporation (Rubicon) wholly owns 100 percent (%) of the Phoenix gold project.

This technical report documents a new Mineral Resource Statement prepared by SRK Consulting (Canada) Inc. (SRK) for the Phoenix gold project. This technical report was prepared following the guidelines of the Canadian Securities Administrators' National Instrument 43-101 and Form 43-101F1 and supersedes all prior technical reports prepared for the Phoenix gold project.

The updated mineral resource model is based on a revised geological model that considers new information acquired by Rubicon since October 31, 2012 (the cut-off date for the previous mineral resource evaluation), including underground infill core drilling (94,575 m), underground development exposing the gold mineralization extensively for geological investigations, and test stopes. This new geological information has confirmed the complexity of the controls on the distribution of the gold mineralization, its grade and its continuity. It updates a mineral resource model prepared in 2013 which formed the basis for a preliminary economic assessment prepared by SRK as documented in an amended and restated technical report dated February 28, 2014 (referred to herein as the 2013 Technical Report).

Taking into consideration the significant changes to the mineral resources discussed herein, the conclusions of the preliminary economic assessment are no longer current and should not be relied upon. Moreover, the assumptions considered and the parameters used to derive the conceptual financial analysis have not been updated. In this context, this technical report focusses on the information required to support the disclosure of the new Mineral Resource Statement prepared for the project. Where relevant, this technical report also presents certain additional information about the current status of the mining, processing, and environmental aspects of the project.

Property Description and Ownership

The Phoenix gold project is located in the southwestern part of Bateman Township within the Red Lake mining district of northwestern Ontario, Canada. The total area of the mineral tenure is 510.4 hectares. It is centred on the historical McFinley shaft (now called the Phoenix shaft). The Phoenix gold project consists of 31 contiguous Mining Leases, Patented Claims, Mining Licences of Occupation, and a Staked Claim.

The property is subject to a 2% net smelter returns (NSR) on the majority of the water portions of the property. Rubicon has the option to reduce the NSR by 0.5% for US$675,000 at any time.

The project site is accessible via an 8-kilometre gravel road accessed from the community of Cochenour, part of the Municipality of Red Lake. Located on East Bay of Red Lake, the project is also easily accessible by water.

On February 10, 2014, Rubicon entered into a US$75 million gold streaming agreement with Royal Gold Inc. and its affiliate RGLD Gold AG. On May 12, 2015, Rubicon entered into a US$50 million secured loan agreement with CPPIB Credit Investments Inc., a wholly-owned subsidiary of Canada Pension Plan Investment Board. Pursuant to the loan and streaming agreements, the mining lease, owned patented claims, licences of occupation, and staked claim of the property are subject to charges/mortgages in favour of CPPIB and RGLD Gold AG, respectively.

History

The mining history of the Red Lake mining district dates back to 1925, when significant gold was first discovered by prospector L. B. Howey. The Phoenix gold property (previously known as the McFinley property) was initially staked by McCallum Red Lake Mines Ltd. in 1922. After a series of ownership changes, Rubicon optioned the property from Dominion Goldfields Corporation in two agreements in 2002. The surface rights of the patented claims are now owned by 0691403 B.C. Ltd., a wholly owned subsidiary of Rubicon.

Geological Setting and Mineralization

The Phoenix gold project is located in the Red Lake Greenstone Belt, of the Superior Province of the Canadian Precambrian Shield, one of Canada's preeminent gold producing districts with more than 26 million ounces of gold produced since the 1930s.

The Red Lake Greenstone Belt is subdivided into several rock assemblages recording magmatic and sedimentary activities that occurred from 3.0 to 2.7 billion years before the present. The tholeiitic and komatiitic metabasalts of the Balmer Assemblage are the oldest volcanic rocks in the greenstone belt and its lower and middle portions host the major lode gold deposits in the Red Lake district. The Phoenix gold project is hosted within northeast-trending Balmer Assemblage, which, in this area, is comprised of three tholeiitic mafic volcanic rock sequences, separated by distinct marker horizons of felsic and ultramafic volcanic rock.

A strong north-northeast-trending (north-south mine grid) structural fabric pervasive through the area is considered part of the East Bay Deformation Zone. The F2 gold deposit occurs in a northeast-trending (north-trending: mine grid) sequence of interbedded ultramafic and high-titanium basaltic rocks (HiTi basalt) that is cut by a series of felsic intrusive rock and minor mafic dikes.

At least four generations of structures occur in the F2 deposit. The first generation (D_1) is associated with a northeast-trending (north-trending: mine grid) penetrative foliation (S_1) that primarily occurs in ultramafic rock. D_2 structures are characterized by east-southeast- and north-northwest-trending (east-northeast- and west-northwest-trending: mine grid) shear zones. The D_2 shear zones are typically characterized by less than 1-to 3-metre wide zones of strongly-developed foliation, and occur with or without sets of laminated quartz veins or extensional quartz vein arrays. Underground development completed since 2013 has exposed the gold mineralization for study and approximately 95,000 metres (m) of new infill core drilling completed since 2013 has helped understand better its relationship to D_2 shear zones and its distribution. While the new geological information confirms the conceptual geological interpretation of 2013, the controls on the distribution of higher grade gold mineralization are now better defined.

Gold mineralization in the F2 gold system is characterized by vein and sulphide replacement style mineralization hosted within two main rock types – HiTi basalt units and felsic intrusive rock. These rock types have been correlated over vertical distances of approximately 1,500 m and horizontal distances of approximately 1,200 m. Gold mineralization occurred in two main stages: an early stage overprinted by D_1 and a later stage controlled by D_2 shear zones. The spatial relationship between D_2 shear zones and the second phase of gold mineralization could not be fully appreciated until new underground development excavated in 2014 and 2015 exposed more of the auriferous system.

Exploration and Drilling

Since acquiring the Phoenix gold project in 2002, Rubicon has conducted extensive exploration programs, including geological mapping, re-logging of selected historical boreholes, digital compilation of available historical data, ground and airborne magnetic surveys, mechanical trenching, channel sampling, bathymetric survey, airborne geophysical surveys, deep penetrating Titan 24 geophysical survey, petrographic study, topographic survey, data modelling and processing, along with several drilling programs.

Since 2002 and up to November 1, 2015, Rubicon has completed 523,283 m of core drilling (235,228 m from the surface and 288,055 m from underground stations) on the Phoenix gold project. During this period, 450,175 m of drilling targeted the F2 gold system. Since October 31, 2012, 561 new core boreholes (94,575 m) have been drilled with the majority of the new boreholes consisting of infill drilling targeting the Main Zone of the F2 deposit from underground drilling stations.

In the opinion of SRK, the sampling procedures used by Rubicon are consistent with generally accepted industry best practices and the resultant drilling pattern is sufficiently dense to interpret the geometry and the boundaries of the gold mineralization with confidence. All drilling sampling was conducted by appropriately qualified personnel under the direct supervision of appropriately qualified geologists.

The orientation of the surface core drilling was designed to attempt to intersect the targeted gold mineralization as perpendicular as possible to its interpreted trend. Logistical constraints imposed on surface drilling on a lake forced drilling fanned boreholes to target north, south, and depths extensions of the gold mineralization. Underground infill drilling completed in 2014 and 2015 was conducted from stations established west of the deposit along more regularly spaced sections. However, fanned drilling was also necessary to target the north, south, and depths extensions of the core of the deposit. As a result, the overall drilling pattern across the F2 gold deposit is quite variable. It is, however, a reasonable compromise to target both styles of gold mineralization identified in the F2 gold deposit. SRK considers that the resulting drilling pattern, while not optimal, and together with approximately 10,200 m of recent underground development, exposing the gold mineralization on several levels for test stoping information, and underground structural geology investigations conducted in November 2015, provides a reasonable distribution of samples and information to interpret the geology of the F2 gold deposit with reasonable confidence. The challenges imparted by the variable drilling pattern are in part overcome in the core of the deposit by the closely spaced infill drilling completed in 2014 and 2015.

Sample Preparation, Analyses and Security

All analytical or testing laboratories used for informing the mineral resource model are independent of Rubicon. Various analytical laboratories have been used by Rubicon over time. Samples collected before 2008 were sent to either the ALS Minerals (ALS) preparation lab in Thunder Bay, Ontario, or its analytical lab in Vancouver, British Columbia, or to Accurassay Laboratories (Accurassay), Thunder Bay, Ontario. Since January 2008, assays have been conducted by SGS Mineral Services (SGS) in Red Lake, Ontario. Umpire check assays have been completed on between 3% and 5% of these assays since January 2010 and were analyzed by ALS or Accurassay.

Prior to 2009, gold was analyzed using the fire assay process (with an atomic absorption or inductively coupled plasma finish) on a 30-gram subsample. If the sample contained greater than 10 grams per tonne (g/t) gold, it was sent for a gravimetric finish. Starting in October 2009, the assay subsample size was increased to 50 grams. Since 2009, core samples were also assayed for a suite of 50 trace elements using a multi-acid digestion followed by inductively coupled plasma atomic emission spectroscopy.

The analytical quality control program developed by Rubicon is appropriate for this development project and was overseen by appropriately qualified geologists. In the opinion of SRK, the exploration and infill data from the Phoenix project were acquired using sample preparation, sample analyses, and security measures that are consistent with generally accepted industry best practices and are, therefore, adequate. After review, SRK considers that the sampling approach used by Rubicon did not introduce a sampling bias.

Data Verification

Rubicon’s exploration work was conducted under a quality management system involving all stages of exploration, from drilling to data management. All field data were recorded digitally using standardized templates that ensure all relevant information was captured. Borehole data are reviewed by ioGlobal Pty Ltd. for quality assurance and quality control. Various levels of descriptive input were recorded, with appropriate validation procedures in place.

In accordance with National Instrument 43-101 guidelines, SRK visited the Phoenix gold project on various occasions between October 2011 and November 2015. The purpose of the site visits was to ascertain the geological setting of the project, witness the extent of exploration work carried out on the property, and undertake certain geological investigations. SRK reviewed the exploration database and validation procedures, reviewed exploration procedures, geological modelling procedures, examined core, and interviewed project personnel.

SRK reviewed the analytical quality control data produced by Rubicon since 2008. The analytical quality control data produced by Rubicon between 2002 and 2007 was reviewed by AMC Mining Consultants (Canada) Ltd in 2011. Historical boreholes drilled prior to 2002 do not have known analytical quality control data. For the period 2008-2015, assay results for sample blanks and certified reference materials collected by Rubicon were summarized by SRK on time series plots to highlight the performance of the control samples. Paired data (field duplicates and umpire check assays) were analyzed using bias charts, quantile-quantile, and relative precision plots.

In the opinion of SRK, the results of the analytical quality control data received from 2008 to 2015 are sufficiently reliable for the purpose of mineral resource estimation.

Metallurgical Testing

The metallurgical test work completed on representative samples from the F2 gold deposit to support the conceptual design of a processing plant was described in the 2013 Technical Report summarizing the results of a preliminary economic assessment. No additional testing was conducted after 2012.

Mineral Resource Estimates

In the opinion of SRK, the resource evaluation reported herein is a reasonable representation of the gold mineral resources found in the F2 gold system at the current level of sampling. The mineral resources have been estimated in conformity with generally accepted CIM *Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines* and are reported in accordance with the Canadian Securities Administrators' National Instrument 43-101.

The updated mineral resource model is based on a revised geological model that considers information from 94,575 m of new infill core drilling information acquired since October 31, 2012, the cut-off date for the previous mineral resource evaluation. The mineral resources reported herein consider drilling information available to November 1, 2015. In addition, the mineral resource model considers information on geological continuity gained from approximately 10,200 m of underground workings exposing the gold mineralization on several levels and in test stopes. The mineral resource evaluation work discussed herein represents the third Mineral Resource Statement prepared for this project.

The mineral resources were evaluated using a geostatistical block modelling approach constrained by 71 explicit gold mineralization wireframes interpreted using a 3 g/t gold cut-off grade (HG) and enclosed in 19 explicit gold mineralization wireframes derived using a 0.5 g/t gold cut-off grade (LG). The HG domains were constructed as explicit wireframes using interval selections of assay data while the broad LG domains were constructed with polylines on vertical sections. The domains were not modelled as grade interpolants.

Assay statistics were assessed for each domain separately and capping was applied to samples prior to compositing. Capping values were chosen based on a combination of probability plots, decile analysis, capping sensitivity plots, and three-dimensional visualization to determine the capping values. Capping in the HG domains range from 10 to 120 g/t gold, and in the LG domains range from 5 to 45 g/t gold. Gold and capped assay data were composited to a 1.0 m length and extracted for geostatistical analysis and variography.

SRK evaluated the spatial distributions of the gold mineralization using traditional semi-variograms and traditional correlograms of composited data as well as the normal score transform of the composited data.

A block model was generated with a block size of 2.5 by 5 by 5 m with subcells at 0.5 m resolution used to honour the geometry of the modelled mineralization. The block model was populated with a gold grade using ordinary kriging. Three estimation runs were used, each considering increasing search neighbourhoods and less restrictive search criteria. A spatial restriction was applied to high grade composites to restrict further their influence during estimation.

In the F2 gold system, higher grade gold mineralization is associated with crosscutting D_2 structures and the plunge of the gold mineralization within a given domain is controlled by the line of intersection between the domain and the crosscutting structure. Using the dynamic anisotropy function in Datamine Studio 3, polylines were used to assign an estimated dip and dip direction for each cell of that HG domain in the block model based on those intersections.

Based on specific gravity measurement on core samples, a mean specific gravity value for the domain type and lithology were assigned to blocks to convert volumes into tonnages. The specific gravity of lithology and mineralization domains varies from 2.76 to 2.90.

SRK considers that blocks within the HG domains estimated during the first estimation pass, informed from composites from at least three boreholes from five octants and located within the full range of the variogram for that domain can be classified in the Indicated category within the meaning of the CIM *Definition Standards for Mineral Resources and Mineral Reserves* (November 2010). SRK considers that for those blocks the level of confidence is sufficient to allow the appropriate application of technical and economic parameters to support mine planning and to allow the evaluation of the economic viability of the deposit. Conversely, all other modelled blocks were classified in the Inferred category as the confidence in the estimates is insufficient to allow for the meaningful application of technical and economic parameters or to enable an evaluation of economic viability.

SRK considers that the gold mineralization at the Phoenix gold project is amenable to underground extraction. SRK considers that it is appropriate to report the Phoenix gold project mineral resources at a cut-off grade of 4.0 g/t gold. The Mineral Resource Statement for the Phoenix gold project is presented in Table i. The mineral resources may be affected by further infill and exploration drilling that may result in increases or decreases in subsequent resource estimates. Mineralization excavated by underground development, stoping blocks and in a 40-metre crown pillar below the lake bottom has been excluded from the Mineral Resource Statement.

Table i: Mineral Resource Statement*, Phoenix Gold Project, Ontario, SRK Consulting (Canada) Inc., January 11, 2016

Resource Category	Quantity ('000 t)	Grade Au (g/t)	Contained Gold ('000 ounces)
Measured	-	-	-
Indicated	492	6.73	106
Measured + Indicated	**492**	**6.73**	**106**
Inferred	1,519	6.28	307

* Mineral resources are not mineral reserves and have not demonstrated economic viability. All figures are rounded to reflect the relative accuracy of the estimate. Samples have been capped where appropriate. Underground mineral resources reported at a cut-off grade of 4.0 g/t gold assuming a metal price of US$1,125 per ounce of gold and a gold recovery of 92.5%.

Mineral Reserve Estimates

There are no mineral reserves at the Phoenix gold project.

Mining Methods

This technical report focusses on the technical information that is relevant to support the new Mineral Resource Statement disclosed by Rubicon on January 11, 2016. This technical report supersedes a 2013 technical report filed by Rubicon to support the results of a preliminary economic assessment prepared by SRK for the Phoenix gold project. The 2013 technical report described a number of potential mining methods that could be used to extract the gold mineralization in the F2 gold deposit, from non-mechanized entry type methods to highly mechanized transverse longhole stoping.

Recent experience indicated that mining between the 305 and 122 levels using non-selective mining methods would be uneconomic under current economic conditions. Any future mining plan must accommodate a complex deposit that is relatively discontinuous, somewhat disseminated in nature, has weak visual indicators, and a strong nugget factor. By incorporating recent mining experience and expected variations in mineralization, two primary mining methods are being considered: mechanized cut and fill stoping and sub-level longhole stoping. Also more conventional mining methods such as cut and fill and shrinkage mining may prove appropriate. Hybrids of these mining methods will be necessary to extract the mineral resources economically. Mine design must include flexibility to accommodate variations in grade, width, and continuity of mineralization.

Recovery Methods

The construction of the processing mill and ancillary facilities was initiated in 2013 and was completed during 2015. The mill was designed with an initial throughput capacity of 1,250 tonnes per day (t/d), with provisions in the layout to increase capacity up to 2,500 t/d.

The unit operations installed for gold processing are essentially those described in the 2013 Technical Report. The process consists of a single line, starting with a semi-autogenous grinding (SAG) mill. The discharge from the SAG mill is sent to the ball mill circuit that uses hydrocyclones in closed circuit for classification. A gravity separation circuit is included in the closed circuit with hydrocyclones to partially recover and concentrate any gravity recoverable gold. The remaining gold is extracted in a conventional carbon-in-leach circuit. The loaded carbon is washed with hydrochloric acid solution to remove carbonates. Gold is then removed from the loaded carbon by elution (stripping) followed by electrowinning. The electrowinning and the gravity circuit both produce a high-grade gold concentrate that is smelted in an electric induction furnace to produce doré. The stripped carbon is regenerated in a reactivation kiln before being reintroduced to the process. Fine carbon is constantly eliminated (and recovered) from the process to avoid gold loss, with fresh carbon being continuously added to the process.

The cyanide contained in the tailings from the carbon-in-leach circuit is eliminated in a cyanide destruction tank using the SO_2-air process. Once the cyanide is destroyed, the tailings are pumped to the tailings management facility for disposal.

When paste backfill is required by the mine, tailings will be diverted to the paste plant where they will be filtered to lower the water content. The filter cake will then be mixed with fly ash and cement to produce a paste. The paste produced will be pumped to the mine for underground backfilling.

The gold recovery plant, cyanide destruction process, and the tailings management facility were commissioned and operated in 2015. The backfill plant has not operated as the mine had not yet required backfill. Major equipment for the tailing filter plant and the paste plant has been installed. However, some minor piping, electrical, and instrumentation connections remain to be completed before this plant can be commissioned.

During commissioning and start-up of the process plant, the mill treated low grade mineralized material mined during underground mine development. The mill ceased operating on November 21, 2015.

The actual gold recovery achieved from the processing of 57,793 t of mineralized material grading an average of 2.89 g/t from trial stopes between May and December 2015 was 91.5%. This result is consistent with the results obtained in the metallurgical test work used for the estimates used in the preliminary economic assessment in 2013. It is anticipated that with better knowledge of the gold deportment in the various zones of gold mineralization combined with steady state operation, higher head grades, and with continuous operational improvement efforts, gold recoveries greater than 91.5% may be realized in future years of operation.

Project Infrastructure

Effectively all but the final infrastructure discussed in the 2013 Technical Report has been completed except for a new office, mine dry, and warehouse. These have not been constructed.

The main surface infrastructure includes:

- Hoist, headframe, and hoist house

- Processing plant
- Tailings management facility
- Effluent treatment plant
- Electric power supply and substation
- Propane storage tanks
- Fibre optic communications cable
- Compressed air supply
- Process and potable water supplies
- Sewage works
- Mine ventilation fans and heater house
- Offices, shop, warehouse, core shack, and storage buildings provide housing for related site activities

The underground infrastructure required to support production mining includes material handling facilities, mine dewatering system, paste backfill distribution system, equipment repair shops, ventilation system, supply lines for compressed air and process water, electrical power supply, and miscellaneous facilities.

Market Studies and Contracts

The Phoenix gold project processing facilities are complete and able to produce high grade gold doré bars at the site, which are readily marketable.

Environmental Studies, Permitting, and Social Impacts

Permitting is in place for an average underground mine production of 1,250 t/d and the site has an approved closure plan.

The project site is situated on the McFinley Peninsula that is adjacent to a valued recreational lake. As such, emphasis for physical environmental sensitivities has been placed on potential off-site discharges of water, fugitive dust, and noise.

The project's social aspects include consultation with Aboriginal communities under the guidance of government agencies. To supplement the guidance from the government agencies, Rubicon commissioned an independent traditional land use study that concluded the project site is within the traditional territory of Lac Seul First Nation and Wabauskang First Nation.

An archaeological study of the McFinley Peninsula was commissioned by Rubicon, comprising a desktop study as well as field work. The study did not identify any sites with a high potential to host a cultural heritage value site within the development footprint (Ross Associates 2010). Also, as the project involves the re-development of the existing footprint with only moderate expansion, the potential for impacts to cultural heritage values as a result of the re-development of the area is considered to be negligible. Accordingly, it has been deemed reasonable to solely engage Lac Seul First Nation, Wabauskang First Nation, and the Métis Nation of Ontario to further discuss and identify potential cultural heritage value sites within the development footprint that may warrant protection.

Annual public information sessions have been held in the Red Lake community since 2008. No unresolved negative comments have been received to date during these sessions.

Rubicon maintains an issues tracking matrix as part of its environmental management system to effectively track and manage potential concerns as they arise.

Rubicon has planned and intends to execute the project in a manner that is consistent with industry best practices and conducive to a walk-away closure. Details of decommissioning requirements during potential production and upon closure have been determined and form part of the closure plan. Chemical and physical stability requirements have been identified and will be satisfied and monitored in accordance with regulatory requirements and the Phoenix project closure plan, which was filed by the Ministry of Northern Development and Mines on December 2, 2011 in accordance with Section 141 of the *Mining Act*.

Capital and Operating Costs

The capital and operating cost estimates prepared in the 2013 Technical Report are no longer current and should therefore not be relied upon.

Financial Analysis

The economic analysis presented in the 2013 Technical Report is no longer current and should not be relied upon. The financial analysis was not updated to consider new mineral resources documented herein.

Adjacent Properties and Other Relevant Data and Information

There are no adjacent properties that are considered relevant to this technical report. There is no other relevant data available about the Phoenix gold project.

Conclusion and Recommendations

Significant changes have occurred on the Phoenix gold project since the 2013 Technical Report. In particular, approximately 10,200 metres (m) of underground development have been completed, exposing the gold mineralization on several levels for geological investigation, test stoping, and allowing the drilling of 94,575 m of infill drilling to improve the delineation of the Main Zone in the F2 gold deposit. A processing mill with a throughput capacity of 1,250 t/d was also constructed with ancillary facilities. The mill operated in 2015 and ceased milling on November 21, 2015.

The F2 gold mineralization is exposed for study and the new underground closely spaced infill drilling have provided significant new insights on the controls on the distribution of the gold mineralization, its form and continuity. While the new geological information confirms the conceptual geological interpretation of 2013, the controls on the distribution of higher grade gold mineralization are now better defined.

A more detailed and conservative geology and mineralization model was constructed to account for the new information and the observed variable continuity of the higher grade gold mineralization exposed in underground workings. The new higher grade mineralization domains, which are now better defined by the tightly spaced infill drilling, are volumetrically much smaller than those interpreted in 2013 with much more widely spaced data. Furthermore, the extents of the higher grade zones of gold mineralization in regions of more widely spaced drilling were also restrained to match the continuity demonstrated in more tightly drilled and developed areas. The overall volume of the new wireframe models for the higher grade gold mineralization is now only 17% of what they were in 2013. The higher grade gold mineralization exists in such areas, but will require additional infill drilling to confirm its continuity

The grade estimation strategy was also modified to account for the considerable new information derived from the infill drilling and the underground workings. The influence of high grade outliers, which have a profound impact on grade distribution, was restricted by capping original samples and applying a spatial restriction to their influence. This strategy resulted in a drop in grade and together with the significant drop in tonnage impacted negatively on the metal content of the mineral resources.

The significant new information acquired by Rubicon since October 31, 2012 demonstrate that the distribution and continuity of the gold mineralization in the Main Zone of the F2 gold deposit is more difficult and restricted than previously modelled. The new more tightly spaced data results in a geology model that is more restricted. There is an opportunity to expand the extents of the higher grade gold mineralization with infill and step-out drilling, to the north, south and below the 427 level in those peripheral areas of the Main Zone where high grade gold mineralization was intersected by drilling, but where borehole spacing is insufficient to infer its continuity. This provides an opportunity to increase the mineral resources of the F2 gold deposit.

An exploration program comprising step-out and infill core drilling is proposed to target the interpreted plunge of the gold mineralization, north and south of the core of the F2 gold deposit with the potential to expand the mineral resources. The proposed program includes 5,000 m infill core drilling between the 244 and 305 levels and approximately 20,000 m of infill core drilling from the 610 level drilling platforms. The total cost is C$12.95 million, including certain engineering, and environmental work to maintain the status of the site infrastructures for the proposed underground exploration program, and to satisfy permitting obligations.

Table of Contents

List of Tables

List of Figures

1 Introduction and Terms of Reference

The Phoenix gold project is a development underground mining project located in the district of Red Lake, Ontario, Canada. It is located approximately 265 kilometres (km) northeast of Winnipeg, Manitoba. Rubicon Minerals Corporation (Rubicon) wholly owns 100 percent (%) of the Phoenix gold project.

In September 2015, Rubicon commissioned SRK Consulting (Canada) Inc. (SRK) to visit the property and prepare an updated geology and mineral resource model for the F2 gold deposit of the Phoenix gold project. The services were rendered between September 2015 and January 2016 leading to the preparation of the Mineral Resource Statement reported herein that was disclosed publically by Rubicon in a news release on January 11, 2016.

This technical report documents a Mineral Resource Statement for the F2 gold deposit of the Phoenix gold project prepared by SRK. It was prepared following the guidelines of the Canadian Securities Administrators' National Instrument 43-101 and Form 43-101F1. The Mineral Resource Statement reported herein was prepared in conformity with generally accepted CIM *Estimation of Mineral Resources and Mineral Reserves Best Practice* and CIM *Estimation of Mineral Resource and Mineral Reserves Best Practices Guidelines*.

The updated mineral resource model is based on a revised geological model that considers information from additional underground development, test stopes, and considerably more core drilling information. It updates a previous mineral resource model prepared by SRK in 2013 (SRK, 2013b) which formed the basis for a preliminary economic assessment prepared by SRK for the project as documented in an amended and restated technical report dated February 28, 2014 (referred to herein as the 2013 Technical Report).

In light of the significant changes to the mineral resources discussed herein, the conclusions of the preliminary economic assessment are no longer current and should not be relied upon. Further, the assumptions considered and the parameters used to derive the conceptual financial analysis have not been updated. In this context, this technical report focusses on the information required to support the disclosure of the new Mineral Resource Statement prepared for the project. Where relevant, this technical report also presents certain additional information about the current status of the mining, processing and environmental aspects of the project.

Phoenix is an underground development project focussing on the F2 Gold System, high-grade gold mineralization hosted within a complex structural framework. Since the previous mineral resource model, considerable underground development has exposed the gold mineralization and provided access for infill drilling. The mineral resource model documented herein considers information from 94,575 metres (m) of new core drilling that were not available for the previous model, as well as approximately 10,200 m of development and mining knowledge gained from trial stoping. This new geological information has confirmed the complexity of the controls on the distribution of the gold mineralization, its grade and its continuity.

1.1 Scope of Work

The scope of work, as defined in a letter of engagement executed on September 25, 2015 between Rubicon and SRK includes the construction of a mineral resource model for the gold mineralization delineated by drilling at the F2 deposit on the Phoenix gold project and the preparation of an independent technical report in compliance with National Instrument 43-101 and Form 43-101F1 guidelines. This work typically involves the assessment of the following aspects of this project:

- Topography, landscape, access
- Regional and local geology
- Exploration history
- Audit of exploration work carried out on the project
- Geological modelling
- Mineral resource estimation, classification and validation
- Preparation of a Mineral Resource Statement

The scope of work focussed on the geological aspect of the project. Where relevant, information pertaining to the mining, processing, and environmental aspects was provided by Rubicon personnel and other consultants involved with project.

1.2 Work Program

The Mineral Resource Statement reported herein is a collaborative effort between Rubicon, independent consultants engaged by Rubicon, and SRK personnel. The exploration database was compiled and maintained by Rubicon, and was audited by SRK. The geological model and outlines for the gold mineralization were constructed by SRK. In the opinion of SRK, the geological model is a reasonable representation of the distribution of the targeted mineralization at the current level of sampling. The geostatistical analysis, variography and grade models were completed by SRK during the months of November and December, 2015. The Mineral Resource Statement reported herein was presented to Rubicon in a memorandum report on January 6, 2016 and disclosed publicly in a news release dated January 12, 2016.

The technical report was assembled in Toronto during the months of January and February 2016.

1.3 Basis of Technical Report

This report is based on information collected by SRK on various site visits performed between October 2011 and November 2015 and additional information provided by Rubicon throughout the course of SRK's investigations. SRK has no reason to doubt the reliability of the information provided by Rubicon. Other information was obtained from the public domain. This technical report is based on the following sources of information:

- Technical discussions with Rubicon personnel
- Inspection of the Phoenix gold project area, including geological investigations of underground exposures and core
- Review of exploration data collected by Rubicon
- Information extracted from previous technical reports prepared for the property
- Additional information from public domain sources

1.4 Qualifications of SRK and Technical Report Team

The SRK Group comprises of more than 1,500 professionals, offering expertise in a wide range of resource engineering disciplines. The independence of the SRK Group is ensured by the fact that it holds no equity in any project it investigates and that its ownership rests solely with its staff. These facts permit SRK to provide its clients with conflict-free and objective recommendations. SRK has a proven track record in undertaking independent assessments of mineral resources and mineral reserves, project evaluations and audits, technical reports and independent feasibility evaluations to bankable standards on behalf of exploration and mining companies, and financial institutions worldwide. Through its work with a large number of major international mining companies, the SRK Group has established a reputation for providing valuable consultancy services to the global mining industry.

A tabulation of the qualified persons responsible for each section of this technical report is provided in Table 1. The mineral resource evaluation work was completed by Sébastien Bernier, PGeo (APGO #1847), with the assistance of Dr. Oy Leuangthong, PEng (PEO #90563867). Additional geological modelling contributions were provided by Dr. Jean-François Ravenelle, PGeo (APGO #2159) and Dominic Chartier, PGeo (OGQ #874). Geological and mineral resource modelling benefited from the senior review of Glen Cole, PGeo (APGO #1416).

Information about mining methods was provided by Michael O'Flaherty, PEng (PEO #90261934), an independent mining engineer currently assisting Rubicon in managing the project. The information about metallurgical testing, processing, recovery, and environmental aspects of the project were completed by John William Frostiak, PEng (PEO # 15150014).

Table 1: Qualified Persons Accepting Professional Liability for this Technical Report

Author	Company	Report Section (s)
Sebastien Bernier, PGeo	SRK	1 to 5, 8 to 11, 13, 22 to 25
Glen Cole, PGeo	SRK	1 to 5, 8 to 11, 13, 22 to 25
Jean-François Ravenelle	SRK	6, 7 and 13.2
Michael O'Flaherty, PEng	Independent	4.2, 14, 15, 17, 20, 21
John William Frostiak, PEng	Independent	3.4, 10.3, 12, 16, 18, 19, 25

By virtue of their education, membership to a recognized professional association, and relevant work experience, Mr. Bernier, Mr. Cole, Mr. O'Flaherty, and Mr. Frostiak are independent Qualified Persons as this term is defined by National Instrument 43-101.

Drafts of this technical report were reviewed by Dr. Jean-Francois Couture, PGeo (APGO#0197), Ms. Sophia Karadov and Ms. Alison Harrington prior to their delivery to Rubicon as per SRK's internal quality management procedures.

1.5 Site Visit

In accordance with National Instrument 43-101 guidelines, Mr. Bernier, Mr. Cole, and Dr. Ravenelle of SRK visited the Phoenix gold project separately on multiple occasions accompanied by Rubicon personnel.

Dr. Ravenelle visited the project in 2011 and again from October 26 to 28, 2015 and from November 9 to 14, 2015 to conduct certain geological investigations of underground workings exposing the gold mineralization and review core boreholes drilled on the F2 deposit. The site visits aimed at investigating the geological and structural controls on the distribution of the gold mineralization in order to aid the construction of the gold mineralization domains.

Mr. Bernier visited the property from October 26 to 28, 2015. The purpose of the site visit was to examine underground developments, audit project technical data, interview project personnel, and collect relevant information for the preparation of a mineral resource evaluation.

Mr. Cole visited the property from August 10 to 12, 2015 and from August 31 to September 4, 2015. The site visits aimed at providing operational assistance to Rubicon.

Mr. O'Flaherty has been on the property for 66 days between September 14, 2015 and January 31, 2016. He has been retained by Rubicon to prepare this technical report and to assist in managing the Phoenix gold project.

Mr. Frostiak has been to the project site and visited the mill and tailing management facility on numerous occasions. His most recent visit to the mill occurred on January 29, 2016.

SRK was given full access to relevant data and conducted interviews with Rubicon personnel to obtain information on the past exploration work, to understand procedures used to collect, record, store, and analyze historical and current exploration data.

1.6 Acknowledgement

SRK would like to acknowledge the support and collaboration provided by Rubicon personnel for this assignment. In particular, SRK would like to acknowledge the contribution of Howard Bird, Bill Shand, Mark Ross, Michelle Cote, Don Emms, James Sproul, Darryl Boyd, Leah Gold, Curtis Pedwell, Allan Candelario, and Michael Winship. Their collaboration was greatly appreciated and instrumental to the success of this project.

SRK also benefited from the input of independent consultants engaged by Rubicon to review and validate the geological interpretation and the resource modeling work. This consisted of Thomas C. Stubens, PEng, from Micon International Limited in Vancouver, British Columbia and Joseph G. Spiteri, PGeo, an independent mining consultant from Acton, Ontario. Their input is gratefully acknowledged.

1.7 Declaration

SRK's opinion contained herein and effective **January 11, 2016** is based on information collected by SRK throughout the course of SRK's investigations. The information in turn reflects various technical and economic conditions at the time of writing this report. Given the nature of the mining business, these conditions can change significantly over relatively short periods of time. Consequently, actual results may be significantly more or less favourable.

This report may include technical information that requires subsequent calculations to derive subtotals, totals, and weighted averages. Such calculations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, SRK does not consider them to be material.

SRK is not an insider, associate or an affiliate of Rubicon, and neither SRK nor any affiliate has acted as advisor to Rubicon, its subsidiaries or its affiliates in connection with this project. The results of the technical review by SRK are not dependent on any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings.

SRK was informed by Rubicon that there is no known litigation potentially affecting the Phoenix gold project.

2 Reliance on Other Experts

SRK has not performed an independent verification of the land title and tenure as summarized in Section 3 of this report. SRK did not verify the legality of any underlying agreement(s) that may exist concerning the permits or other agreement(s) between third parties, but has relied upon Rubicon’s reliance on the legal opinion of a specialist in corporate and commercial law with Weiler, Maloney, Nelson of Thunder Bay, Ontario as expressed in a letter provided to Rubicon on May 31, 2013 with an effective date of May 12, 2015**.** The reliance applies solely to the legal status of the rights disclosed in Section 3.1 below.

3 Property Description and Location

The Phoenix gold project is located in the southwestern part of Bateman Township within the Red Lake mining district of northwestern Ontario, Canada (Figure 1). The town of Red Lake is approximately 150 kilometres (km) northwest of Dryden, Ontario and 265 km northeast of Winnipeg, Manitoba.

The total area of the mineral tenure is 510.4 hectares. The Phoenix gold project is centred on the historical McFinley Shaft (now called the Phoenix Shaft), located at latitude 51.13 degrees north and longitude 93.74 degrees west. Rubicon has a 100 percent (%) interest in the Phoenix gold project subject to a 2% net smelter return (NSR) royalty on the majority of the water portions of the property to Franco-Nevada Corporation. Rubicon has the option to acquire a 0.5% interest in the NSR for US$675,000 at any time, in which case the NSR would be reduced to 1.5%.

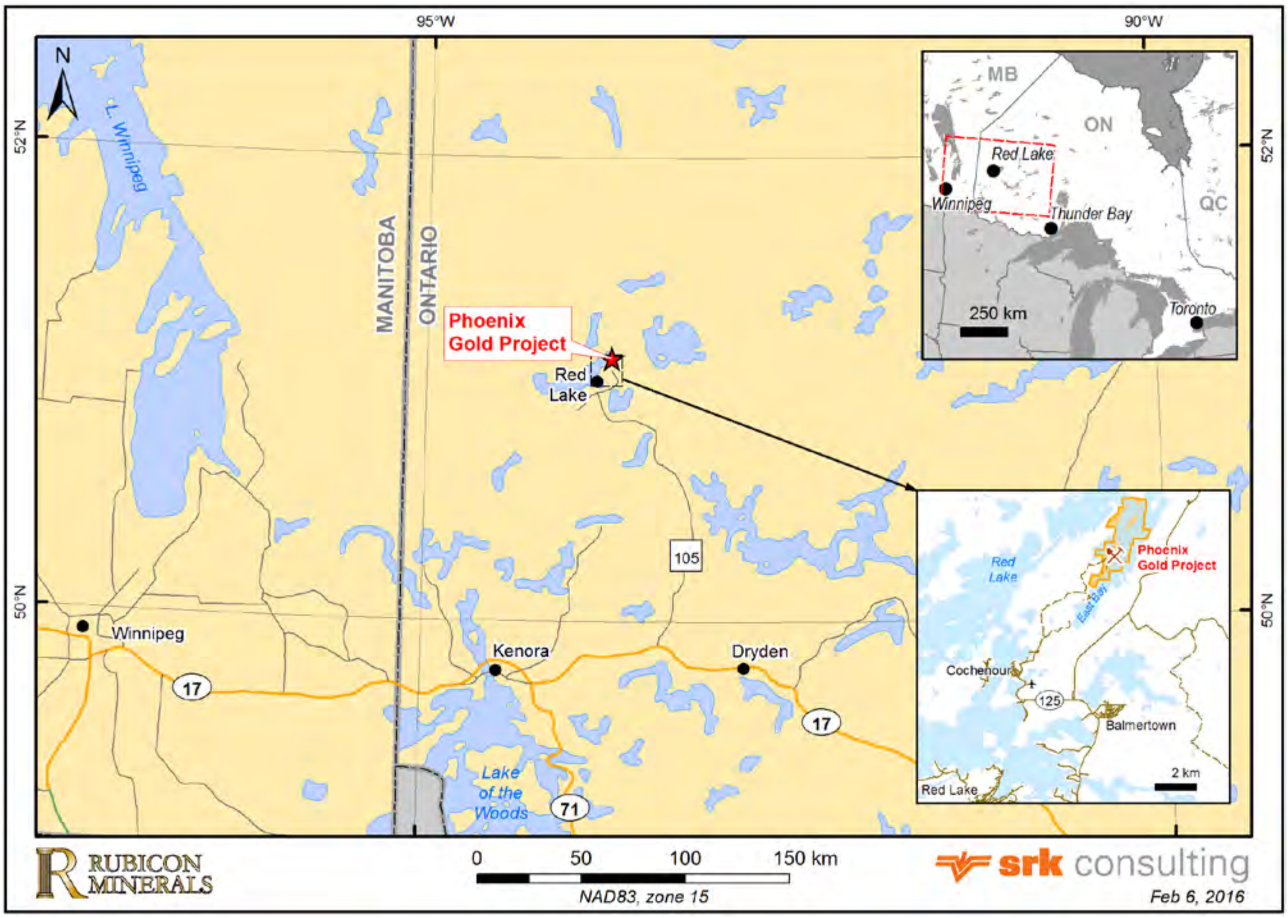


Figure 1: Location of the Phoenix Gold Project

3.1 Mineral Tenure

The Phoenix gold project consists of 31 contiguous Mining Leases, Patented Claims, Mining Licences of Occupation, and a Staked Claim (Table 2 and Figure 2) comprising:

- One Mining Lease covering four KRL blocks
- Sixteen Patented Claims covering land portions of the property
- Twenty-five Mining Licences of Occupation covering water portions of the property
- One Staked Claim

A single KRL or K numbered block can consist of a land portion (Patented Claim) and associated water portion (Mining Licences of Occupation containing a separate number) when it covers land and water within its boundaries. A single KRL or K numbered block can also consist of solely land portions or solely water portions of the property.

The mineral resources reported herein are contained within the Patented Claims and associated Mining Licences of Occupation in blocks K1499, KRL18376, KRL18735, KRL246, KRL18375, KRL247, KRL18374, K1493, K1498, KRL11038, KRL11039, KRL18374, and KRL18375.

The perimeter of the Phoenix property was surveyed by certified Ontario land surveyor Jim Bowman on February 7, 1985. This legal survey defined the Phoenix gold property at the time of the original mining lease application on October 20, 1986. This land survey was verified by Rubicon via professional land surveying services of Geomatics Inc. on August 3, 2012.

The mineral and surface rights of the Mining Lease and the mineral rights of the Patented Claims are registered under Rubicon with Ontario's Electronic Land Registration System. The surface rights of the Patented Claims are registered under 0691403 B.C. Ltd, a wholly owned subsidiary of Rubicon, with Ontario's Electronic Land Registration System. The mineral and surface rights of the Mining Licences of Occupation and the Staked Claim are registered under Rubicon with the Mining and Minerals Division of the Ministry of Northern Development and Mines.

The Mining Licences of Occupation are subject to a payment of rents shown on the face of each license. They do not have a stated term but exist during the pleasure of the Crown. No application for renewal is required.

The Mining Lease is for a standard fixed term. The current term has been extended to October 31, 2028. Prior to expiry of the extended term, an application must be made under the Ontario *Mining Act* for the Minister's consent to extend the leasehold for a further fixed term.

On June 22, 2009, mineral rights for one Staked Claim were recorded with the Minerals Division of the Ministry of Northern Development and Mines. To maintain the claim in good standing it is required by Rubicon to carry out eligible assessment work of C$400 prior to June 22, 2020.

SRK is not aware of any other significant factors or risks that may affect access, title, or the right or ability to perform work on the property.

Table 2: Mineral Tenure Information

KRL or K Numbered Block(s)	Number	Start Date	Expiry Date	Hectares	Current Resource
Mining Lease					
KRL503297, KRL503298, KRL503299, KRL526262	108126	November, 1986	October 31, 2028	56.0	
Patented Mining Claims (Land Portion)					
K1498	992	October 1, 1945	Not Applicable	3.0	
K1499	993	October 1, 1945	Not Applicable	11.5	Yes
K1493	994	March 1, 1946	Not Applicable	5.1	Yes
K1494	995	March 1, 1946	Not Applicable	8.4	
K1495	996	March 1, 1946	Not Applicable	10.4	
KRL246	997	March 1, 1946	Not Applicable	15.0	Yes
KRL247	998	March 1, 1946	Not Applicable	17.9	Yes
K1497	999	March 1, 1946	Not Applicable	13.5	
KRL11481	1446	November 1, 1941	Not Applicable	4.2	
KRL11482	1447	November 1, 1948	Not Applicable	6.9	
KRL11483	1448	November 1, 1941	Not Applicable	12.2	
KRL11487	1452	November 1, 1941	Not Applicable	15.3	
K954 (recorded as KRL 18152)	1977	January 1, 1947	Not Applicable	6.9	
K955 (recorded as KRL 18515)	1978	January 1, 1947	Not Applicable	4.3	
KRL18457	2449	January 1, 1950	Not Applicable	7.9	
KRL18735	2450	January 1, 1950	Not Applicable	20.9	Yes
Licenses of Occupation (Water Portion)					
KRL2155	3186	August 1, 1945	Not Applicable	9.9	
KRL2156	3187	August 1, 1945	Not Applicable	13.7	
K1498	3289	October 1, 1945	Not Applicable	11.0	Yes
K1499	3290	October 1, 1945	Not Applicable	2.4	Yes
K1493	3370	March 1, 1946	Not Applicable	5.0	
K1494	3371	March 1, 1946	Not Applicable	18.7	
K1495	3372	March 1, 1946	Not Applicable	10.1	
K1497	3380	March 1, 1946	Not Applicable	6.1	
KRL246	3381	March 1, 1946	Not Applicable	4.3	Yes
KRL247	3382	March 1, 1946	Not Applicable	4.5	Yes
KRL11483	10495	November 1, 1941	Not Applicable	6.7	
KRL11482	10496	November 1, 1948	Not Applicable	5.6	
KRL11481	10497	November 1, 1941	Not Applicable	14.1	
KRL11487	10499	November 1, 1941	Not Applicable	5.7	
KRL11038, KRL11039	10830	January 1, 1947	Not Applicable	28.7	Yes
KRL11031	10834	January 1, 1947	Not Applicable	17.9	
K954 (recorded as KRL18152)	10835	January 1, 1947	Not Applicable	9.3	
K955 (recorded as KRL18515)	10836	January 1, 1947	Not Applicable	10.0	
KRL18514	10952	October 1, 1947	Not Applicable	17.5	
KRL18735	11111	January 1, 1950	Not Applicable	12.2	
KRL18457	11112	January 1, 1950	Not Applicable	11.0	
KRL18373	11114	January 1, 1950	Not Applicable	7.7	
KRL18374	11115	January 1, 1950	Not Applicable	19.7	Yes
KRL18375	11116	January 1, 1950	Not Applicable	22.9	Yes
KRL18376	11117	January 1, 1950	Not Applicable	15.0	Yes
Staked Claim					
KRL4229741	N/A	June 22, 2009	June 22, 2020	1.0	
Total Area				**510.4**	

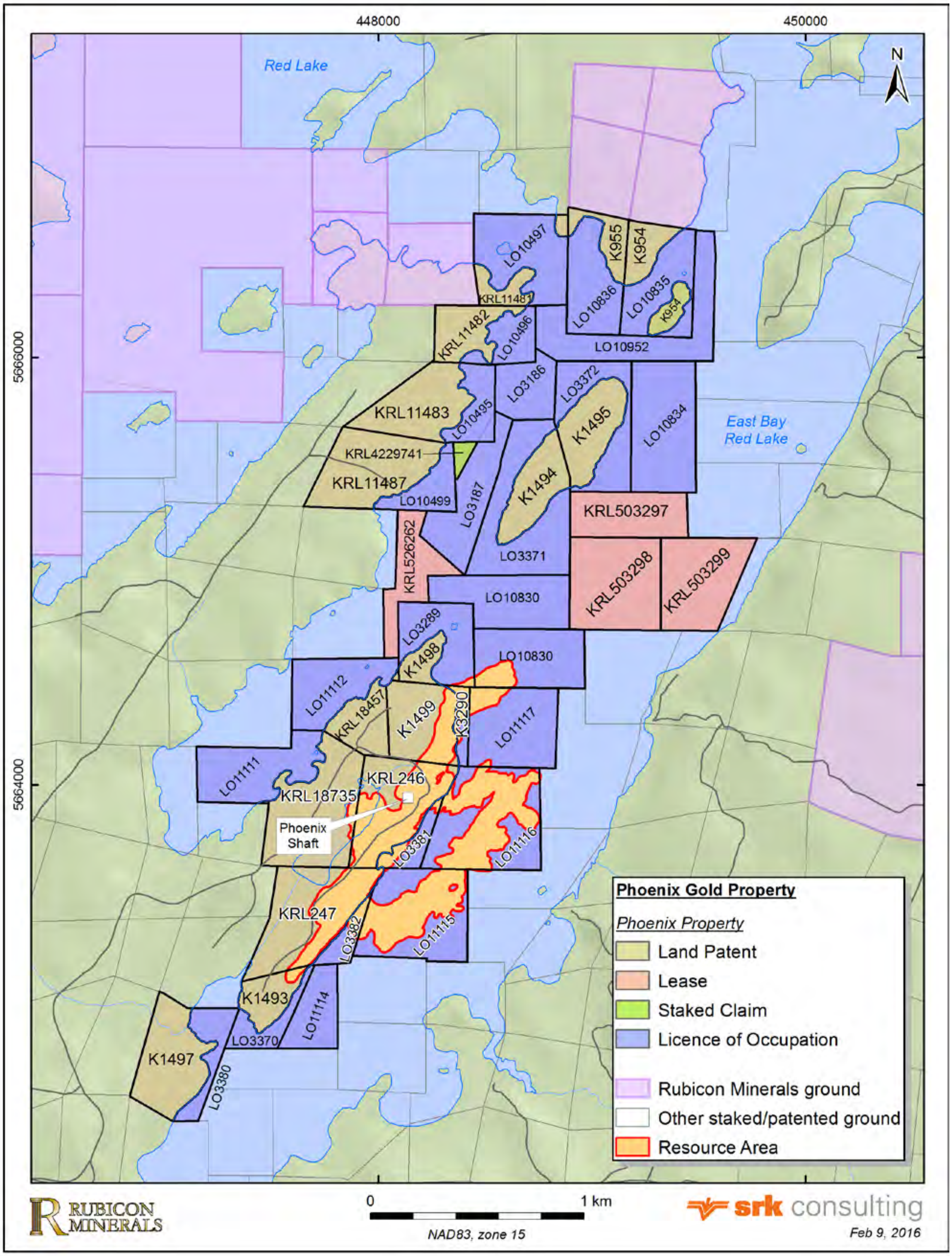


Figure 2: Land Tenure Map of the Phoenix Gold Project

3.2 Underlying Agreements

Rubicon's 100% interest in the property was acquired in two separate agreements entered into with Dominion Goldfields Corporation (Dominion Goldfields) in 2002. The 25 Mining Licences of Occupation and the one Mining Lease were optioned from Dominion Goldfields in January 2002 by agreeing to pay C$800,000 in cash, issue 260,000 shares to Dominion Goldfields, and complete US$1,300,000 of exploration work prior to March 31, 2006. During 2004, Rubicon acquired the Mining Licences of Occupation and Mining Lease from Dominion Goldfields after meeting all the required payments and expenditures. The Mining Licences of Occupation and the Mining Lease were subsequently transferred to Rubicon.

The water portions of the property, except the Staked Claim, are subject to a NSR royalty to Franco-Nevada Corporation of 2%. Franco-Nevada Corporation purchased the NSR from Dominion Goldfields in August 2011. Advance royalties of US$50,000 are due annually to a maximum of US$1,000,000 prior to commercial production of which US$650,000 was paid by Rubicon to January 1, 2016. Rubicon has the option to acquire a 0.5% NSR royalty for US$675,000 at any time, in which case the NSR royalty to Franco-Nevada Corporation would be reduced to 1.5%. Upon a positive production decision, Rubicon would be required to make an additional advance royalty payment of US$675,000. Rubicon has confirmed that the annual payments are up to date.

The mineral rights of the 16 Patented Claims were optioned from Dominion Goldfields in June 2002. The surface rights of the Patented Claims are owned by 0691403 B.C. Ltd, a wholly owned subsidiary of Rubicon. On October 25, 2011, Rubicon announced that by execution of its right of first refusal under its agreement with DGC, it had acquired and thereby extinguished all royalties on the blocks covering the land portions of the property. On closing the agreement, Rubicon issued a total of 1,216,071 of its common shares to Dominion Goldfields, at a deemed price per share of C$3.50, for total consideration of C$4,256,248.50.

On February 10, 2014, Rubicon entered into a US$75 million gold streaming agreement (the "Streaming Agreement") with Royal Gold Inc. and its affiliate, RGLD Gold AG. On May 12, 2015, Rubicon entered into a US$50 million secured loan agreement (the "Loan Agreement") with CPPIB Credit Investments Inc., a wholly-owned subsidiary of Canada Pension Plan Investment Board. Pursuant to the Loan Agreement and the Streaming Agreement, the mining lease, owned patented claims, licences of occupation and the staked claim of the Phoenix property are subject to charges/mortgages in favour of CPPIB and RGLD Gold AG, respectively.

3.3 Permits and Authorization

Rubicon currently holds all material permits required for it to carry out its drilling, underground exploration, development, and potential future production on the Phoenix gold project at an annual average rate of 1,250 tonnes per day (t/d). Amendments to some of these permits will be obtained for increases to the potential future production rate.

A full list of permits, applications and their status, is given in Section 19.

3.4 Environmental Considerations

The current and potential production phase environmental liabilities associated with the project site are described in the Phoenix Project Closure Plan (December 2, 2011), filed with the Ontario provincial government pursuant to Part VII of the *Mining Act*. The Phoenix Project Closure Plan has been updated via Notices of Material Change dated September 14, 2013 (additional vent raises), May 12, 2015 (change financial assurance from letter of credit to surety bond), September 11, 2015 (provide additional financial assurance for engineered dry cover) and January 22, 2016 (update general arrangement drawings to present as-built conditions and update financial assurance estimate). SRK understands that there are no significant chemical or physical stability liabilities associated with the project site and financial assurance is being provided to the Government of Ontario by Rubicon to rehabilitate all identified features of the project site in accordance with the *Mining Act*.

3.5 Mining Rights in Ontario

The Phoenix gold project is located in Ontario, a province that has a well understood permitting process in place and one that is coordinated between the municipal, provincial and federal regulatory agencies. As is the case for similar mine developments in Canada, the project is subject to a federal and provincial environmental assessment process. Due to the complexity and size of such projects, various federal and provincial agencies have jurisdiction to either provide authorizations or permits that enable project construction to proceed.

Federal agencies that have significant regulatory involvement at the pre-production phase include the Canadian Environmental Assessment Agency, Environment Canada, Natural Resources Canada, and Fisheries and Oceans Canada.

On the provincial agency side, the Ministry of Northern Development and Mines, Ministry of Environment and Climate Change, Ministry of Transportation, and the Ministry of Natural Resources and Forestry each have key project development permit responsibilities.

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

4.1 Accessibility

The Phoenix gold project is centred within the Red Lake area of northwestern Ontario, approximately 565 kilometres (km) by road (430 km direct) northwest of Thunder Bay and approximately 475 km by road (265 km direct) east-northeast of Winnipeg, Manitoba. Red Lake can be reached via Highway 105, which branches off the Trans-Canada Highway 17 some 170 km south of Red Lake. Red Lake is also serviced with daily flights from Thunder Bay and Winnipeg. Bus service is also available from Kenora, Ontario.

The project site is accessible via 8 km of all-weather road from Nungesser Road in the community of Balmertown, part the Municipality of Red Lake (Figure 1).

4.2 Local Resources and Infrastructure

The Red Lake Municipality comprises six communities: Red Lake, Balmertown, Cochenour, Madsen, McKenzie Island, and Starratt Olsen. The latest Canada Census of 2011 measured the population of the Municipality at 4,366. Mining is the primary industry and employer in the area. Other industries include small scale logging and tourism focused on hunting and fishing. All services expected in a municipality of this size are present.

The Phoenix gold project site is currently supplied by a 10.4-kilometre power transmission line connected to Hydro One’s 44 kilo Volts (kV) grid in the Municipality of Red Lake. Currently, the site is authorized for a load of 5.3 Mega Volt ampere (MVA) utilizing an 18 MVA substation installed on site to step down distribution voltages to 4,160 volts (V) for surface and underground. Further voltage step downs are utilized locally as required for specific equipment installations.

Mine water supply is from the nearby East Bay of Red Lake. The water is piped underground via a 100 millimetre water line for drilling use, muckpile watering, etc. A potable water plant is fully commissioned and operating at the processing plant. A second treatment plant is located at the camp area. Rubicon has all the surface rights required to conduct its potential operations. Rubicon has access to local workers and fly in, fly out workers.

4.3 Climate

The climate in this portion of northwestern Ontario is considered subarctic with temperature extremes generally ranging from winter lows of approximately -45 degrees Celsius (ºC) to summer highs of roughly 30ºC. Average winter temperatures are in the range of -15ºC to -20ºC and average summer temperatures are in the range of 15ºC to 20ºC. Between 1971 and 2000, annual average precipitation was measured at 64 centimetres (cm) with 47 cm of rain and 193 cm of snow. Average winter snow depths in the region range from 40 to 50 cm. Weather conditions have minimal impact on underground operations and the operating season.

4.4 Physiography

The topography within much of the project is mildly rugged. The elevation is commonly less than 15 metres (m) above the level of Red Lake. The topography is dominated by glacially scoured southwest trending ridges, typically covered with jack pine and mature poplar trees. Swamps, marshes, small streams, and small- to moderate-sized lakes are common. Rock exposure varies locally, but rarely exceeds 15% and is mostly restricted to shoreline exposures. Glacial overburden depth is generally shallow, rarely exceeding 10 m, and primarily consists of ablation till, minor basal till, minor outwash sand and gravel, and silty-clay glaciolacustrine sediments.

Vegetation consists of thick boreal forest composed of black spruce, jack pine, trembling aspen, and white birch. Figure 3 illustrates the typical landscape around the Phoenix gold project and the associated vegetation.

A portion of the project is covered by the East Bay of Red Lake with McFinley Island, directly to the north of McFinley Peninsula, representing the largest island on the property. Recent seismic surveys indicate average accumulations of 10 to 20 m of lake sediments and overburden at the lake bottom, with the water depth less than 8.5 m within the property boundary. The location of the tailings storage area and other site infrastructure are covered in Section 17.

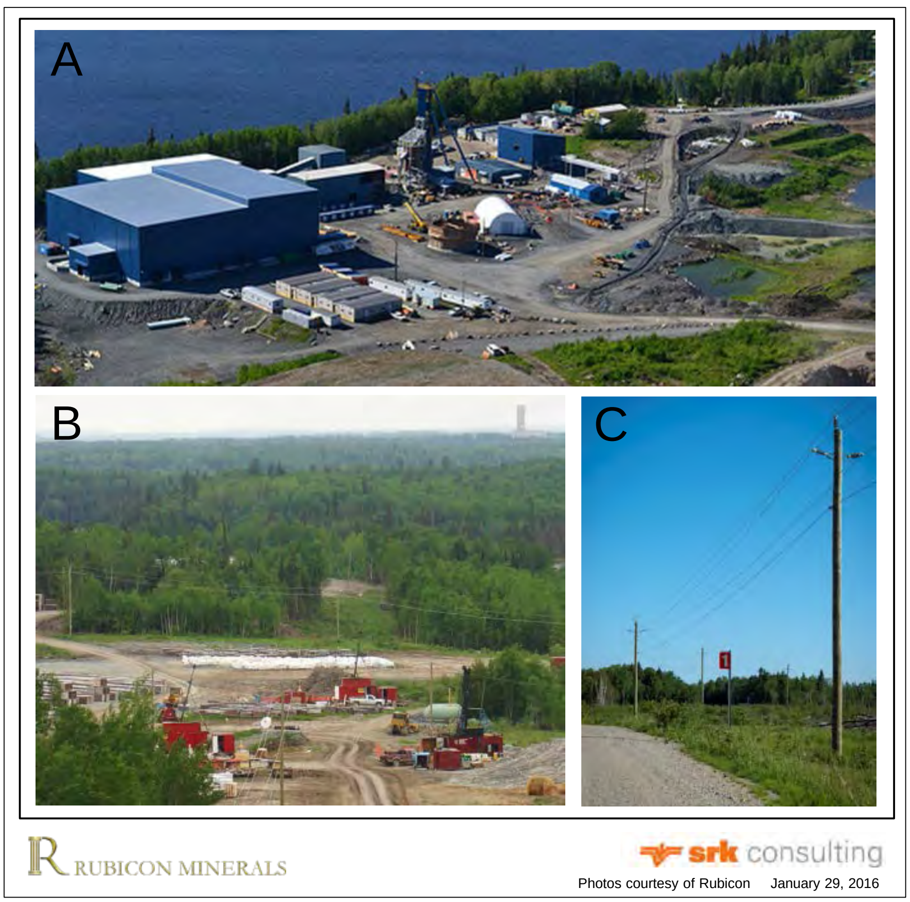


Figure 3: Typical Landscape in the Phoenix Gold Project Area (photos courtesy of Rubicon)

A. Aerial view of project area looking south. East Bay in background.
B. Typical landscape with drill rigs in foreground and Goldcorp's Cochenour Headframe in distance.
C. Gravel road and power line leading to project area.

5 History

Information in this section is summarized from a previous technical report prepared by AMC Mining Consultants (2011).

Gold was originally reported in the Red Lake area in 1897 by R. J. Gilbert of the North Western Ontario Development Company (Parrot 1995). The exploration and mining history of the Red Lake mining district dates back to 1925, when significant gold was first discovered by prospector L. B. Howey. The gold bearing veins he discovered were developed into Red Lake's first producing mine – the Howey mine.

The Phoenix gold property (previously known as the McFinley property) was initially staked and owned by McCallum Red Lake Mines Ltd. in 1922. Between 1944 and 1974, the property was owned by McFinley Red Lake Gold Mines Ltd. (McFinley Red Lake Gold Mines). In 1974, Sabina Industries Ltd. (Sabina) earned a 60 percent (%) interest in the property. McFinley Red Lake Gold Mines changed its name to McFinley Red Lake Mines Ltd. (McFinley Red Lake Mines) in 1975 and in 1983 by a plan of arrangement Sabina transferred its 60% in the project to McFinley Red Lake Mines.

In 1984, McFinley Red Lake Mines joint ventured the project with Phoenix Gold Mines Ltd. (42.9%) and Coniagas Mines Ltd. (7.1%). This 50% joint venture interest was subsequently repurchased by McFinley Red Lake Mines in 1986 with financial backing from Alexandra Mining Company (Bermuda) Ltd.

Financial difficulties experienced by McFinley Red Lake Mines in 1989 subsequently led to a period of inactivity between 1990 and 2002 with the eventual acquisition of the property by creditors in lieu of unpaid debts. Dominion Goldfields Corporation (Dominion Goldfields) was awarded title to the Mining Licences of Occupation and Mining Lease of the project in 1999 and 2002 through vesting orders from the Superior Court of Ontario. Dominion Goldfields and its wholly-owned subsidiary, 1519369 Ontario Ltd., were subsequently granted ownership of the mining rights and surface rights respectively by a vesting order of the Superior Court of Ontario in 2002.

Rubicon optioned the property from Dominion Goldfields in two agreements in 2002. The surface rights of the Patented Claims are now owned by 0691403 B.C. Ltd, a wholly-owned subsidiary of Rubicon.

5.1 Historical Exploration

The extensive history of exploration activities on the project have been described in detail in two previous reports prepared by G. M. Hogg (2002a; 2002b). One report covered the Patented Claims, with the second document discussing historical work completed on the Mining Licences of Occupation and Mining Lease, which comprise the project.

All historical information regarding property ownership, previous exploration work, and mineral resources prepared prior to 2002 is summarized below in Table 3.

Table 3: Exploration History of the Phoenix Gold Project

Year	Description of Work
1922	Original staking in 1922 undertaken to cover a high-grade silver occurrence on the McFinley Peninsula, the first mineral prospect on record in the area. Trenching, sampling, and shallow drilling was undertaken by McCallum Red Lake Mines Ltd. Wide-spread but erratic gold mineralization was noted in cherty metasedimentary rock on both McFinley Peninsula and McFinley Island.
1941 – 1942	Mineral occurrences were drilled as part of the Wartime Minerals Evaluation program.
1944 – 1946	McFinley Red Lake Gold Mines Ltd. carried out ground magnetic surveys, a 48 borehole drilling program consisting of 167 m (548 feet [ft]) of drilling over the McFinley Peninsula, and a 1,487-metre (4,877 ft) drilling program from the ice of Red Lake.
1946 – 1955	Fourteen boreholes (M Series) were completed for approximately 1,585 m (5,200 ft) of diamond drilling.
1955 – 1956	Little Long Lac Gold Mines sank a 130-metre (428 ft) vertical shaft on claim KRL 246 and completed 414 m (1,358 ft) of exploratory underground development on two levels. Work terminated in 1956.
1974 – 1975	Sabina completed 25 diamond boreholes for approximately 3,048 m (10,000 ft) of drilling on the project; ground magnetic and electromagnetic surveys; and 10 boreholes for approximately 735 m (2,410 ft) of diamond drilling over a portion of the lake properties.
1981 – 1983	Sabina and McFinley Red Lake Mines completed a magnetic/electromagnetic geophysical survey over the McFinley Peninsula area, surface bulk sampling, and 3,672 m (12,046 ft) of surface diamond drilling in 33 boreholes.
1983 – 1984	McFinley Red Lake Mines and Sabina completed seven boreholes for approximately 646 m (2,120 ft) of diamond drilling.
1984 – 1985	An agreement with Phoenix Gold Mines Ltd. allowed the reopening of the McFinley Shaft (now called the Phoenix Shaft) and completion of a total of 479 m (1,570 ft) of drifting and crosscutting on the 150 ft (46 m) and 400 ft (122 m) levels. Metallurgical work and mineral processing were carried out. Eighty underground boreholes totalling 1,829 m (6,000 ft) and 69 surface boreholes totalling 10,628 m (34,870 ft) of diamond drilling were completed. Funding difficulties resulted in the project being placed on temporary standby in February 1985.
1985 – 1987	A total of 1,151 m (3,775 ft) of drifting and crosscutting was carried out on the 150 ft (46 m) and 400 ft (122 m) levels. A total of 7,111 m (23,333 ft) of underground drilling, 9.14 m (30 ft) of raising, and an extensive chip-sampling program were completed. A program of 12,763 m (41,874 ft) of diamond drilling was also completed in 61 surface boreholes.
1987 – 1989	In recognition of a nugget effect in sampling results, a decision was made to proceed with a minimum 15,000 ton bulk sample. A 150-t/d mill and tailings management facility was constructed. Underground development (2,890 m/9,482 ft) continued on the 150 ft (46 m) and 400 ft (122 m) levels, a new 275 level (at 84 m) and on a ventilation raise from the 400 ft (122 m) level to surface. Additional sampling, diamond drilling (8,730 m/28,642 ft), and metallurgical testing were completed. Bulk sampling operations commenced in July 1988 with sampling indicating head grades in the range of 0.25 ounces per ton (oz/t) gold (8.23 grams of gold per tonne [g/t]) from prepared stope areas. Mill design problems, lack of income from bulk sampling, and lack of exploration funding forced the closure of the operation after an estimated 2,500 tonnes of material were milled. Total historical development in drifting, crosscutting and raising is estimated to be more than 5,791 m (19,000 ft). Total historical diamond drilling focused on the McFinley Peninsula area is estimated to be 45,110 m (148,000 ft) from surface and 35,814 m (117,500 ft) from underground. An estimated 54,864 m (180,000 ft) of core is stored on the property.
1999 – 2002	Dominion Goldfields foreclosed on the Mining Licences of Occupation and Mining Lease and was awarded title to the lake portion of the Phoenix gold project in 1999 and 2002, respectively. Dominion Goldfields and its subsidiary were subsequently awarded title to the Patented Claims of the project in 2002.

5.2 Previous Mineral Resource Estimates

Historical mineral resource estimates presented in this section have been superseded by the mineral resource estimate discussed herein. The information presented in this section is relevant to provide context but should not to be relied upon.

5.2.1 McFinley Red Lake Mines – 1986

An historical mineral resource estimate was prepared by McFinley Red Lake Mines staff in 1986 (Hogg 2002a; Hogg 2002b). The McFinley Red Lake Mines historical mineral resource is located approximately 450 m northwest of the F2 gold system. The estimate refers to the shaft area located on the McFinley Peninsula where historic underground exploration and development, and extensive sampling were carried out. The shaft area is in stratigraphic units separate to the current F2 gold system. The 1986 historical mineral resource estimate was developed using underground sampling results augmented with closely spaced borehole data.

5.2.2 GeoEx Limited – 2010 and 2011

GeoEx Limited (GeoEx) prepared two mineral resource estimates for the F2 gold system in 2010 and 2011 (GeoEx 2011a; GeoEx2011b).

5.2.3 AMC Mining Consultants (Canada) Ltd. – 2011

AMC prepared a Mineral Resource Statement for the F2 gold system using a block modelling approach based on drilling information available to February 28, 2011 (Table 4). The model was not constrained by a crown pillar and was extended to incorporate all drilling data. The Mineral Resource Statement was reported at a cut-off grade of 5.0 grams of gold per tonne (g/t gold).

Table 4: Mineral Resource Statement, F2 Gold Project, AMC Mining Consultant (Canada) Ltd., June 15, 2011

Classification	Million Tonnes	Grade (g/t gold)	Million Ounces of Gold
Indicated	1.028	14.5	0.477
Inferred	4.230	17.0	2.317

1. CIM definitions used for mineral resources
2. Cut-off grade of 5.0 g/t gold applied
3. Capping value of 270 g/t gold applied to composites
4. Based on drilling results to February 28, 2011

A total of 511 boreholes were used in the mineral resource modelling. Rubicon's interpretations of lithologies, mineralization controls, and geology domains were reviewed and accepted by AMC. Twelve mineralized domains were interpreted by AMC using a low gold threshold (0.1 g/t gold), and were further expanded to incorporate all significant mineralized zones.

A composite length of 1.0 metre (m) was chosen and gold composites were capped at 270 g/t gold. The parent block size was 2 by 8 by 12 m, sub blocking was utilized. The model blocks were assigned a gold grade using an inverse distance (power of three) estimator and a three pass search strategy with search ellipsoids adjusted to the geometry of the modelled gold mineralization. Search parameters for the first pass were 8 by 24 by 36 m. for the second and third pass the search volumes were inflated by two and three times, respectively. An average bulk density value of 2.90 tonnes per cubic metres (t/m^3) was used for all rock types.

Blocks were classified considering data support as a main criterion with a manual review creating volumes based on borehole density and number of samples to inform a block.

5.2.4 SRK Consulting (Canada) Inc. – 2013

SRK prepared a Mineral Resource Statement for the F2 gold system using a block modelling approach based on drilling information available to October 31, 2012. The database included information from 820 core boreholes (355,611 m), all drilled by Rubicon since 2008. The model was not constrained vertically by a crown pillar. The Mineral Resource Statement was reported at a cut-off grade of 4.0 g/t gold (Table 5).

Table 5: Mineral Resource Statement*, Phoenix Gold Project, Ontario, SRK Consulting (Canada) Inc., June 24, 2013

Domain	Resource Category	Quantity ('000 t)	Grade Au (g/t)	Contained Gold ('000 oz)
Main#	Measured	-	-	-
	Indicated	4,120	8.52	1,129
	Measured + Indicated	4,120	8.52	1,129
	Inferred	6,027	9.49	1,839
HW	Measured	-	-	-
	Indicated	-	-	-
	Measured + Indicated	-	-	-
	Inferred	151	5.21	25
External	Measured	-	-	-
	Indicated	-	-	-
	Measured + Indicated	-	-	-
	Inferred	1,274	8.66	355
Combined	Measured	-	-	-
	Indicated	4,120	8.52	1,129
	Measured + Indicated	4,120	8.52	1,129
	Inferred	7,452	9.26	2,219

* Mineral resources are not mineral reserves and do not have a demonstrated economic viability. All figures have been rounded to reflect the relative accuracy of the estimates. Reported at a cut-off grade of 4.0 g/t gold and assuming an underground extraction scenario, a gold price of US$1,500 per ounce, and metallurgical recovery of 92.5%.

The Main domain includes the Main 45 domain.

The gold mineralization wireframes were defined using an explicit wireframe interpretation constructed from a sectional interpretation of the drilling data that took into consideration structural geology investigation and modelling undertaken by SRK in collaboration with Rubicon. Resource domains were defined using a 0.5 g/t gold threshold. Within the gold mineralization domains, narrower, higher-grade subdomains were defined using a 3.0 g/t gold threshold. SRK defined 56 gold mineralization domains (31 higher-grade and 25 lower grade domains) that were used to constrain mineral resource modelling. These 56 domains were combined into three groups based on their spatial orientation: Main, Main 45, and Hanging Wall (HW). The gold mineralization located outside the modelled domains was also evaluated unconstrained.

Four rotated sub-celled block models were generated with block sizes and orientation specific to the mineralization domain grouping. SRK chose a primary 2.5 by 5 by 10 m dimension for the Main and

Main 45 domains, a 10 by 20 by 20 m dimension for the HW domain and a 5 by 10 by 20 m dimension for the External domain.

Sample assay data were composited to a 1.0 m length and extracted for geostatistical analysis and variography. The impact of gold outliers was examined on composited using log probability plots and cumulative statistics. SRK evaluated the spatial distributions of the gold mineralization using variograms and correlograms of original capped composited data as well as the normal score transform of the capped composited data. The block model was populated with a gold grade using ordinary kriging. Three estimation runs were used, each considering increasing search neighbourhoods and less restrictive search criteria. The first estimation pass considered search neighbourhoods adjusted to 80% of the modelled variogram ranges. A uniform specific gravity of 2.87 was applied to the lower grade domains and a value of 2.96 was assigned to the higher-grade domains to convert volumes into tonnages.

5.3 Past Production

There is no past production on the property. Mining exploration activities on the property were terminated in 1989 after test-milling of an estimated 2,250 tonnes (t) of material unrelated to the F2 gold system.

Development of the Phoenix gold project commenced in 2012 with shaft sinking and mill building foundation work, and followed by the establishment of levels and associated infrastructure at the 122 m, 183 m, 244 m, 305 m, 488 m, and 610 m levels.

In 2015, Rubicon started trial stoping on the 305 m level. Subsequent trial stoping followed on the 183 m and 244 m levels. Typical development followed mineralized material, via Alimak raising, lateral sill and sublevel advance. Test production of longhole stopes were completed on the 305 m and 244 m levels. Rubicon processed 57,793 t of mineralized material, grading at 2.89 g/t gold. Rubicon achieved an average mill recovery of 91.5% and produced 4,906 ounces of gold. Underground activities were suspended on November 3, 2015 and milling ceased on November 21, 2015.

6 Geological Setting and Mineralization

6.1 Regional Geology

The following description of the geology of the Red Lake Greenstone Belt was modified from Sanborn-Barrie et al. (2004) and the references therein.

The Phoenix gold project is located in the Uchi Subprovince of the Superior Province of the Canadian Precambrian Shield. Within the Uchi Subprovince, the Red Lake Greenstone Belt is host to one of Canada's preeminent gold producing districts with over 26 million ounces of gold produced since the 1930s.

The belt is interpreted to have evolved on the south side of the North Caribou Terrane, an ancient continental block originating approximately 3 billion years before present (Ga) (Figure 4). The terrane evolved from extensive magmatic and sedimentary activity that occurred from 3.0 to 2.7 Ga with multiple events of intense deformation, metamorphism, hydrothermal alteration, and gold mineralization. Regional metamorphic assemblages range from greenschist to amphibolite.

The tholeiitic and komatiitic metabasalts of the Balmer Assemblage, dated approximately between 3,000 million years and 2,988 million years before present (Ma), are the oldest volcanic rocks in the greenstone belt and host the major lode gold deposits in the Red Lake district. The assemblage consists of lower, middle, and upper massive to pillowed tholeiitic metabasalt sequences separated by distinctive felsic and ultramafic metavolcanic rock.

Metasedimentary rocks also occur within the Balmer assemblage, mainly as thinly bedded magnetite-chert ironstone. There is an angular unconformity between the Balmer Assemblage and all other younger assemblages in the district. The lower and middle portions of the Balmer Assemblage are the host rocks for the major gold deposits of the Red Lake camp.

Underlying the northwestern portion of the Red Lake Greenstone Belt is the Ball Assemblage (approximately 2,940 to 2,925 Ma) consisting of a thick sequence of metamorphosed intermediate to felsic calc-alkaline flows and pyroclastic rocks.

The Slate Bay Assemblage (approximately 2,903 to 2,850 Ma) extends the length of the belt and consists of clastic rocks of three main lithological facies varying from conglomerates, quartzose arenites, wackes, and mudstones. The contact of the Slate Bay Assemblage with the Ball and Balmer assemblages represents an unconformity (Figure 5).

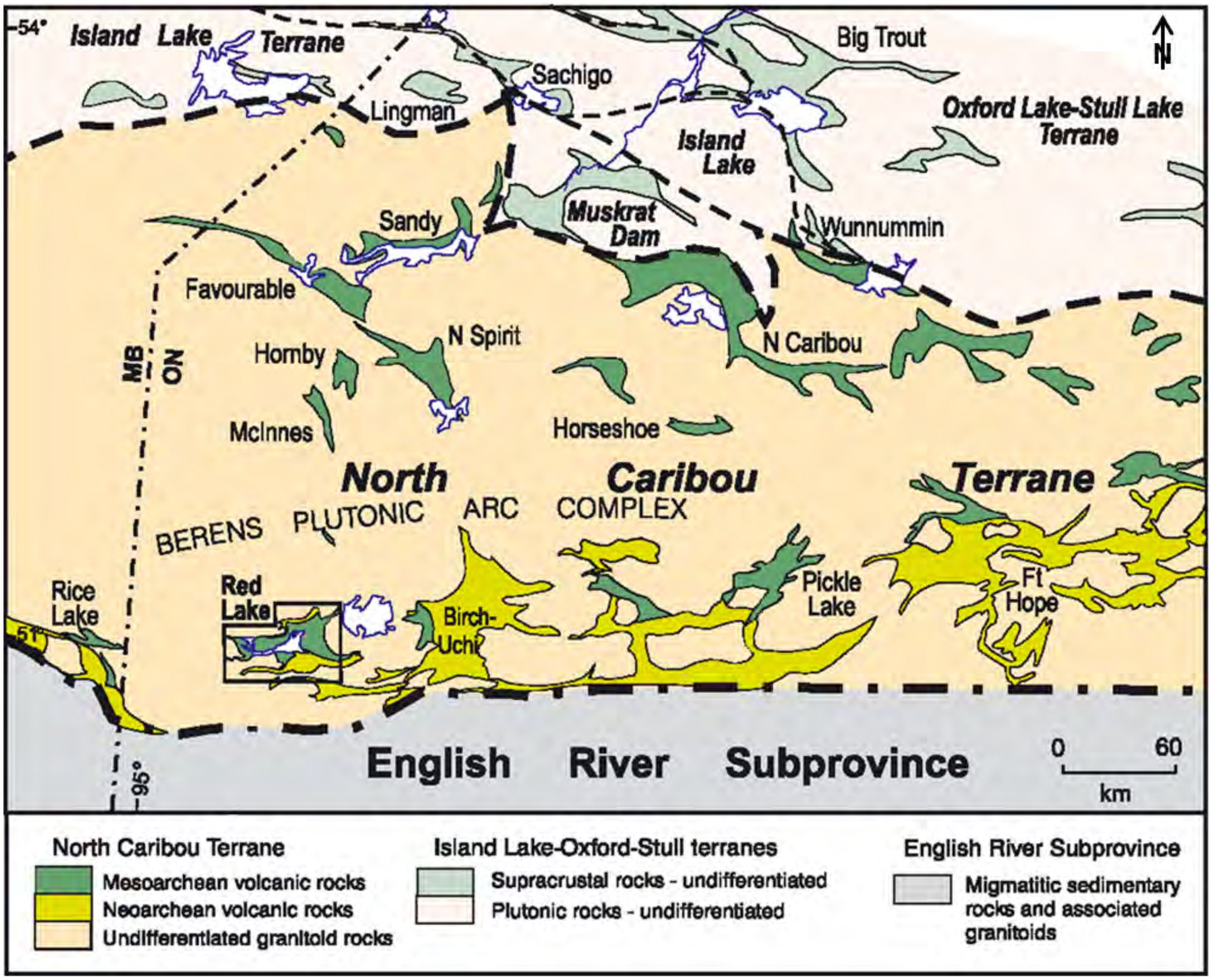


Figure 4: Geology of the North Caribou Terrane of the Superior Province

Source: (Sanborn-Barrie et al. 2004)

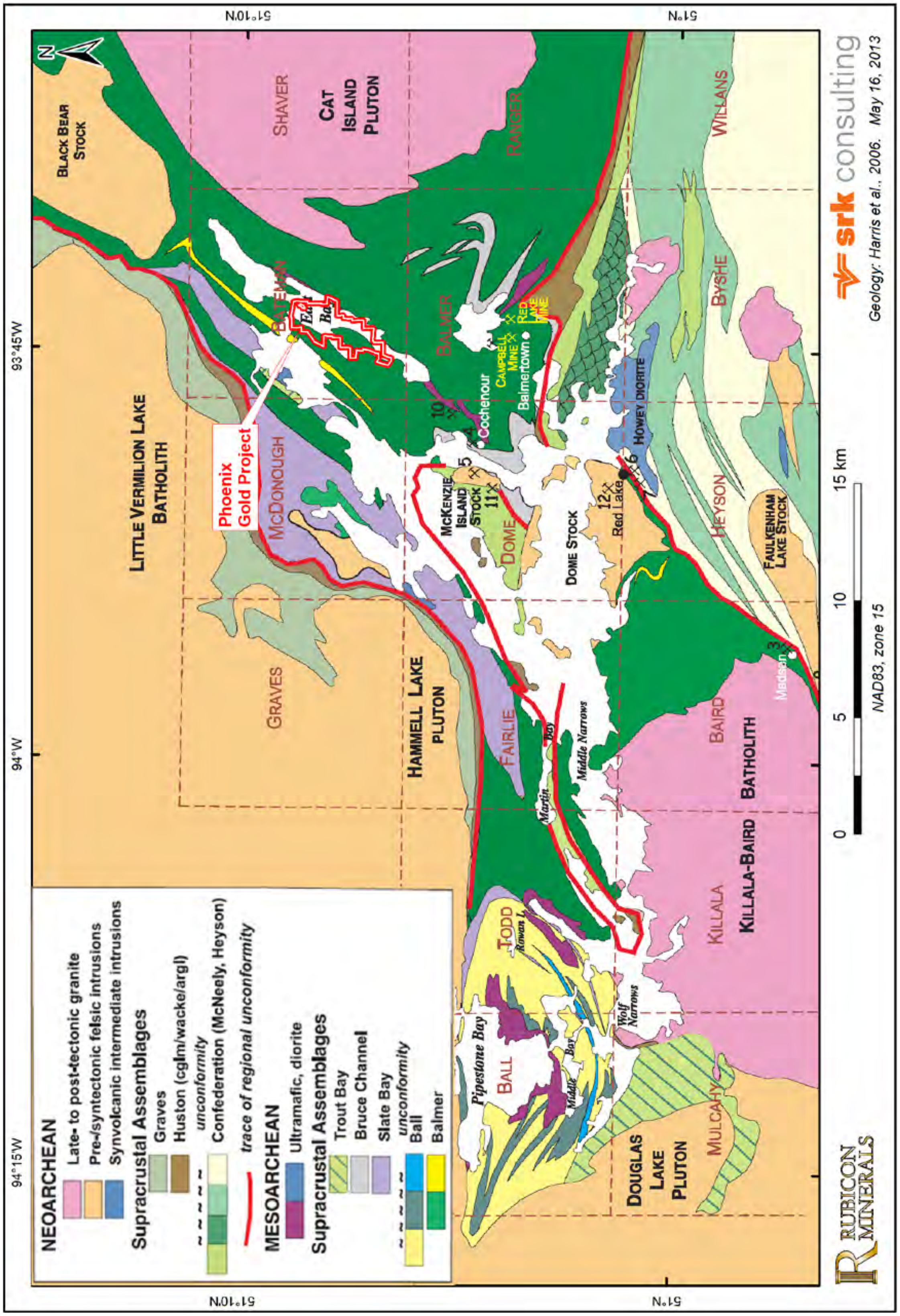


Figure 5: Simplified Geology of the Red Lake Greenstone Belt

Source: (Harris et al. 2006)

A thin sequence of calc-alkaline dacitic to rhyodacitic pyroclastic rocks of the Bruce Channel Assemblage (approximately 2,894 Ma) were deposited and overlain with clastic sediments and a chert-magnetite iron formation. Enriched LREE trace element profiles relative to the Balmer Assemblage are interpreted to indicate crustal growth at a juvenile continental margin.

The Trout Bay Assemblage (approximately 2,853 Ma) is exposed in the southwest portion of the Red Lake Greenstone Belt. It is a volcano-sedimentary sequence consisting of a lower tholeiitic basalt unit overlain by clastic rocks and interbedded with an intermediate tuff and a chert-magnetite-iron formation.

Following a lull in volcanic activity for approximately 100 million years, the Confederation Assemblage represents a time of widespread calc-alkaline volcanism (approximately 2,748 to 2,739 Ma). The McNeely sequence of the Confederation Assemblage formed during a shallow marine to subaerial arc on the existing continental margin with later intra-arc extension and eruption forming the Heyson sequence. The Heyson sequence consists of tholeiitic basalts and felsic volcanic rocks. In the Madsen area, the strata of the Confederation and Balmer assemblages represents an angular unconformity with opposing facing directions. The Balmer Assemblage was, thus, overturned prior to the deposition of the Confederation Assemblage.

Following the Confederation Assemblage, the Huston Assemblage (approximately between 2,742 and 2,733 Ma) records a time of clastic sedimentary deposition varying from immature conglomerates and wackes. The Huston Assemblage has been compared to the Timiskaming conglomerates commonly associated with gold mineralization in the Timmins camp of the Abitibi Greenstone Belt (Dubé et al. 2003). The Huston was followed by the Graves Assemblage (approximately 2,733 Ma) of calc-alkaline volcanism dominated by andesitic to dacitic pyroclastic tuff, and synvolcanic diorite and tonalite.

Plutonic rocks found in the Red Lake Greenstone Belt correlate with various stages of volcanism. These include mafic to ultramafic intrusions during Balmer and Ball time periods, gabbroic sills related to Trout Bay volcanism, felsic dikes and diorite intrusions during the Confederation Assemblage, and intermediate to felsic plutons, batholiths and stocks of Graves assemblage age. Post-volcanism plutonic activity is also evident from granitoid rocks such as the McKenzie Island stock, Dome stock, and Abino granodiorite (2,720 and 2,718 Ma) that were host to past producing gold mines. The last magmatic event recorded in the belt is from about 2.7 Ga with a series of potassium-feldspar megacrystic granodiorite batholiths, plutons, and dikes, including the Killala-Baird Batholith.

Structurally, the belt displays evidence of at least two deformational events with associated hydrothermal activity and gold mineralization. The main episode of penetrative deformation occurred after the Confederation volcanism, which took place at 2.74 Ga. This D_1 deformation event resulted in the formation of north-trending, south-plunging F_1 folds and associated fabrics.

A second important deformational event superimposes D_1 structures. East- to northeast-trending D_2 structures occur in western and central Red Lake, and southeast-trending folds and fabric are present in eastern Red Lake such as at the Campbell and Red Lake mines. The onset of penetrative D_2 strain across the belt from 2.72 Ga is interpreted to document the collision of the North Caribou Terrane and the Winnipeg River Subprovince to the south.

6.2 Phoenix Property Geology

The Phoenix gold project is hosted within northeast-trending Balmer Assemblage ultramafic to mafic volcanic and intrusive rock and minor sedimentary rock. Extensive mapping, trenching, core drilling, and geophysical surveys have defined a consistent geological sequence that can be correlated along the length of the property for over 4 kilometres (km). A summary of the stratigraphic units found within the project area is shown in Table 6 and Figure 6.

A strong north-northeast-trending structural fabric through the Phoenix gold project is considered part of the East Bay Deformation Zone. The mine grid lies roughly parallel to the East Bay Deformation Zone, at an orientation of +45 degrees to true north. Within the East Bay Deformation Zone, the S_1 foliation is oriented parallel to lithological contacts, except locally in fold closures. The East Bay Deformation Zone is in sharp structural contact with a later F2 domain to the southeast, where northwest-trending (F_2) fold axial traces and shear zones trend perpendicular to the East Bay Deformation Zone.

Table 6: Summary of Project Stratigraphy

Sequence	Stratigraphy
West Peninsula Sequence	Pillowed to massive basalts with banded iron formation (BIF), graphitic BIF and chert, banded silty to arenaceous sedimentary rocks and significant pyrite/pyrrhotite.
Central Basalt Sequence	Pillowed and massive tholeiitic basalts with flow top breccias occasional BIF and (graphitic) argillite.
Intrusive Komatiite Sequence	Massive, spinifex, and columnar jointed basaltic komatiite bounded by Hanging Wall BIF to the east and by Main BIF to the west. BIF possible in central part of sequence.
McFinley Sequence	Bounded to the west by Hanging Wall BIF and to the east by the Footwall BIF. At least five horizons of silica/oxide (carb.) facies BIF within pillowed and amygdaloidal basalt.
Hanging Wall Basalt Sequence	Pillowed to massive, amygdaloidal basalts. Variably carbonate altered, variable foliation.
East Bay Serpentinite	Extrusive and intrusive ultramafic rocks. Variable talcose alteration.
High Titanium Basalt (HiTi basalt)	Variable biotite alteration, sulphides (pyrite, pyrrhotite). Silica flooding, quartz breccia, and quartz veining throughout. The HiTi basalt is the main host to gold mineralization in the F2 gold system.

6.3 F2 Deposit Geology

The F2 gold deposit occurs in a northeast-trending (north-trending: mine grid) sequence of interbedded ultramafic and high-titanium basaltic rocks (HiTi basalt) that are cut by a series of felsic intrusive rock and minor mafic dikes. The HiTi basalt units are fine grained and, where fresh, comprise amphibole and plagioclase. The felsic intrusive rock is fine- to medium-grained albite, quartz ± biotite bearing, sill-like intrusions. Extensive ultramafic rock comprises the majority of the remainder of the F2 gold system.

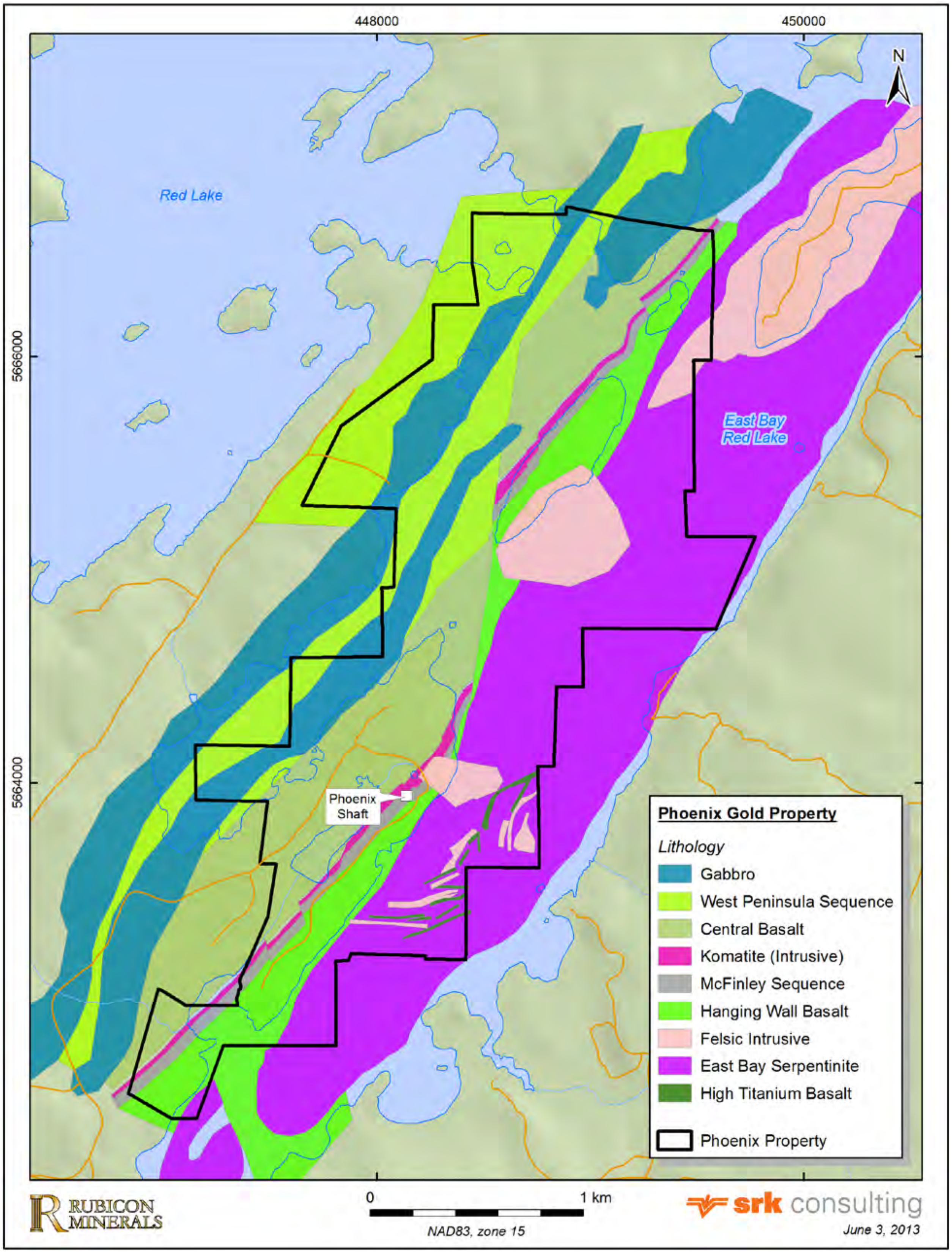


Figure 6: Lithological Map of Phoenix Gold Project
Source: Rubicon 2013

6.3.1 Structural Geology

At least four generations of structures occur in the F2 deposit. The first generation (D_1) is associated with a northeast-trending (north-trending: mine grid) penetrative foliation (S_1) that primarily occurs in ultramafic rock. The S_1 foliation is locally very strong, specifically near lithological contacts where it also locally affects HiTi basalt units and felsic dikes.

D_2 structures are characterized by east-southeast- and north-northwest-trending (east-northeast- and west-northwest-trending: mine grid) shear zones. The D_2 shear zones are typically characterized by less than 1- to 3-metre wide zones of strongly-developed foliation, and occur with or without sets of laminated quartz veins or extensional quartz vein arrays. Geological mapping in recent underground exposures and approximately 95,000 metres (m) of infilled drilling has helped refine the distribution and geometry of D_2 shear zones. These include structures interpreted using apparent offsets in lithological units (e.g., HiTi basalt and felsic intrusive rock) previously referred to as "uncharacterized faults." Figure 7 illustrates how the structural geometry has changed following recent underground developments and infilled drilling.

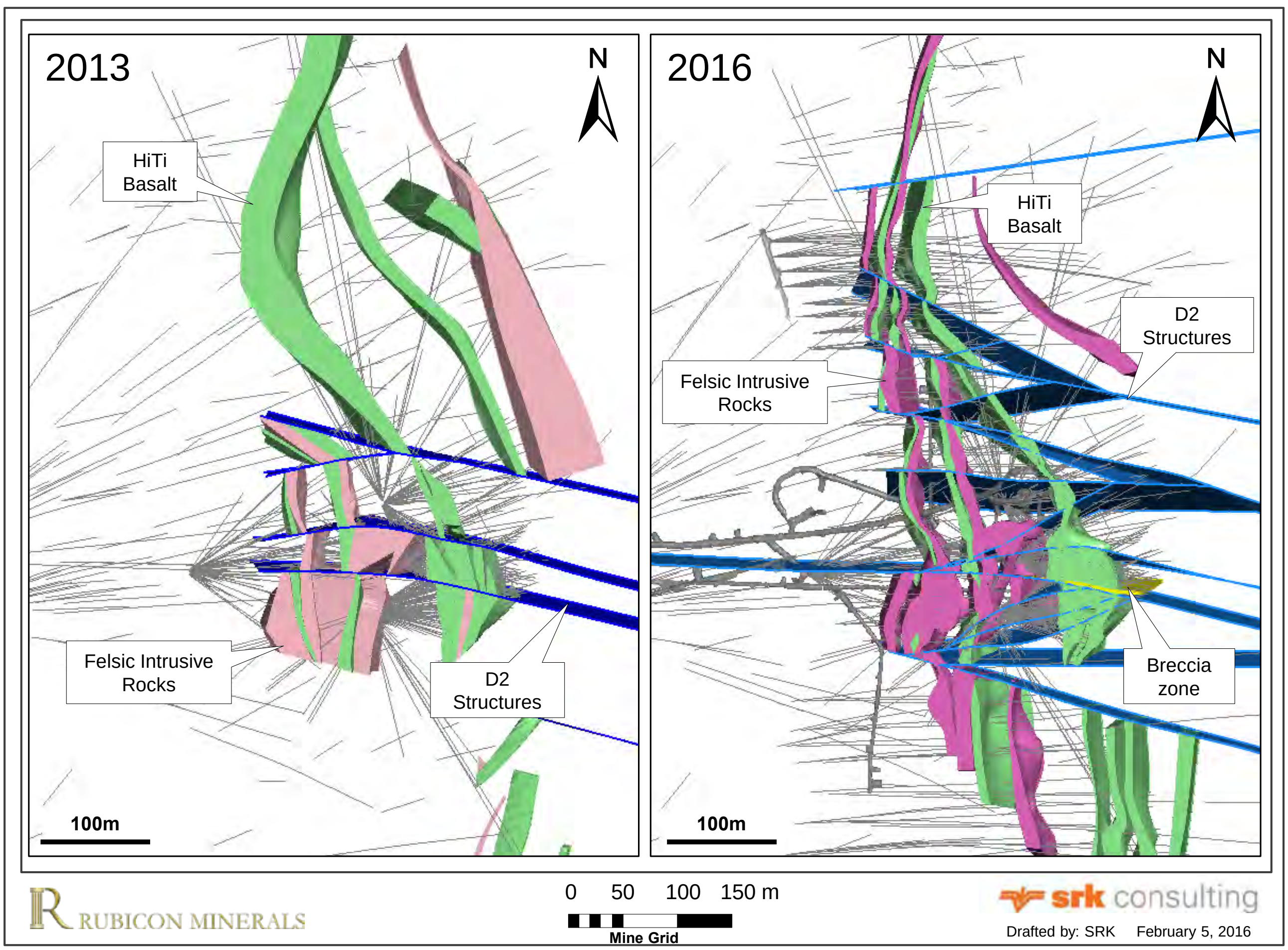


Figure 7: Litho-Structural Model Built in 2013 (Left) and in 2016 (Right)

The 2016 model benefits from information from 94,575 m of core drilling, primarily in the centre of the F2 deposit, and approximately 10,200 m of underground excavations that were not available in 2013.

6.3.2 Gold Mineralization

Gold mineralization in the F2 gold system is characterized by vein and sulphide replacement style mineralization hosted within two main rock types – HiTi basalt units and felsic intrusive rock. These rock types have been correlated over vertical distances of approximately 1,500 m and horizontal distances of approximately 1,200 m.

Gold mineralization at F2 occurred in two main stages: an early stage overprinted by D_1 and a later stage controlled by D_2 shear zones. The spatial relationship between D_2 shear zones and the second phase of gold mineralization was not fully appreciated until new underground development excavated in 2014 and 2015 exposed more of the auriferous system.

The early gold mineralization (Figure 8A and Figure 8B) is associated with grades ranging from less than 1.0 gram of gold per tonne (g/t) to approximately 4.0 g/t gold and comprises various styles of mineralization and alteration including:

- Stockworks of quartz-actinolite±pyrrhotite±pyrite veins and replacement bands hosted within biotite-actinolite-pyrrhotite-pyrite altered HiTi basalt units
- Silicified zones containing pyrite stringers and 1- to 4-centimetre thick semi-massive pyrite layers hosted in HiTi basalt units
- Silicified zones in felsic intrusive rock with biotite±pyrrhotite±pyrite

The S_1 foliation overprints the veins, replacement bands, and stringers associated with this phase of gold mineralization, indicating that it was emplaced before or early during D_1. This phase of gold mineralization is distributed along north-trending (mine grid) HiTi basalt units and felsic intrusive rock.

The second stage of gold mineralization (Figure 8C and Figure 8D) is primarily hosted within HiTi basalt units (less commonly in felsic intrusive rock) and is associated with grades reaching several tens of grams of gold per tonne. This later stage of gold mineralization is controlled by D_2 shear zones and associated with:

- Steep-dipping east-northeast- and west-northwest-trending (mine grid) metre-scale quartz vein arrays composed of approximately 10-centimetre thick laminated quartz veins and less than 1- to 20-centimetre thick extensional quartz veins with pyrrhotite and pyrite.
- Sub-vertical east-trending (mine grid) tabular breccia zones characterized by 1- to 50-centimetre thick quartz-breccia veins that contain up to 20% host rock fragments.

Where observed, the auriferous quartz vein arrays are generally hosted within east-northeast- and west-northwest-trending (mine grid) D_2 shear zones. Individual D_2 shear zones are typically 1- to 3-metre wide, but associated alteration and gold mineralization locally spread over distances reaching up to 10 to 20 m along the strike of the HiTi basalt units. The principal orientation (plunge) of this phase of the gold mineralization is controlled by the intersection of the vein arrays with the HiTi basalt units, forming steep-plunging zones. In ultramafic rocks outside the HiTi basalt units, D_2 shear zones are not significantly auriferous.

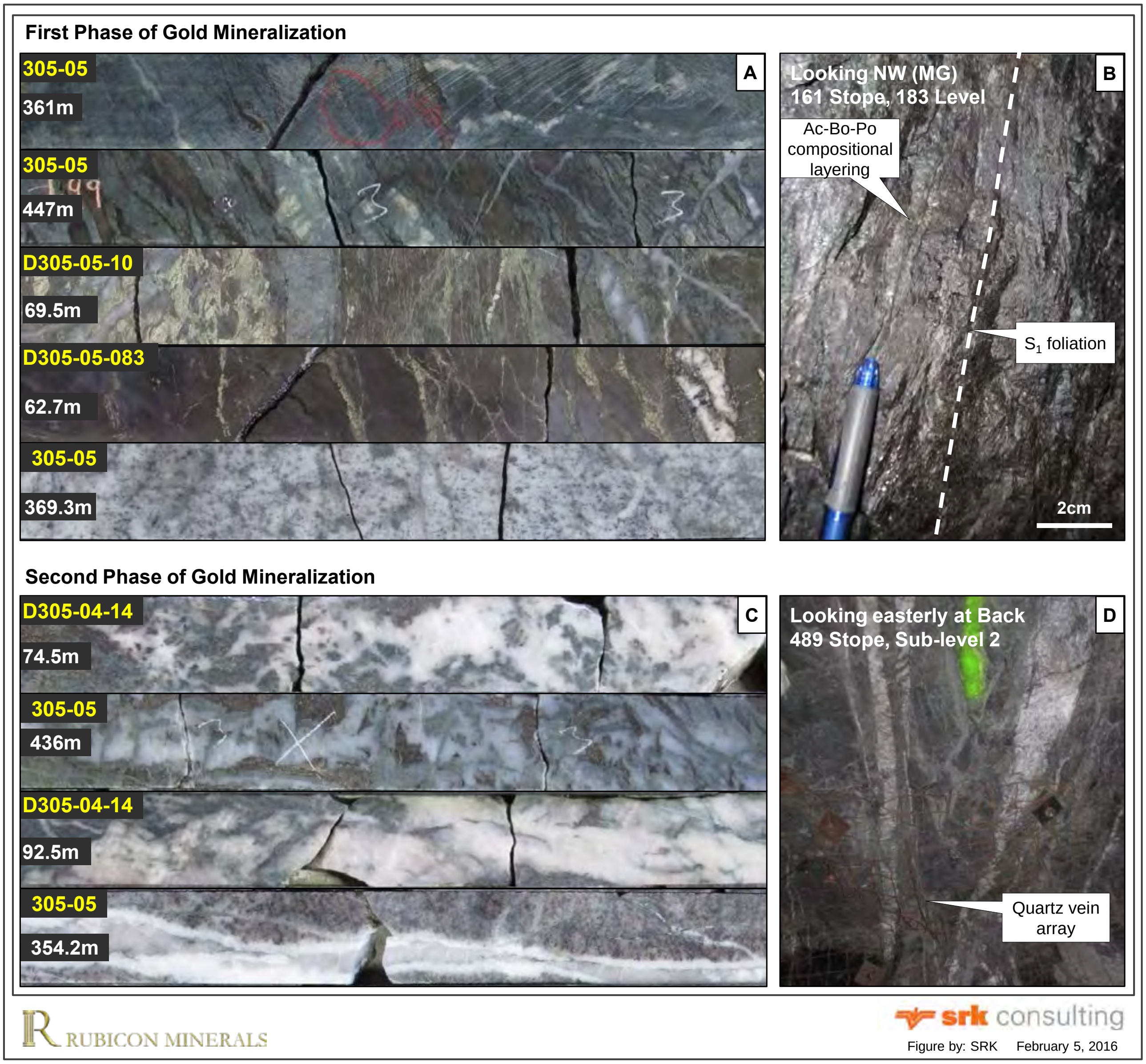


Figure 8: Gold Mineralization at F2 Gold Deposit

A: First phase of gold mineralization in core. Host rock is HiTi basalt except the lower piece of core which is hosted in felsic intrusive rocks.

B: First phase of gold mineralization in underground workings.

C: Second phase of gold mineralization. Host rock is HiTi basalt except the lower core piece which is hosted in felsic intrusive rock.

D: Second phase of gold mineralization in underground workings.

7 Deposit Types

The style of veining, the lithological setting, and the structural relationship with shear zones at the F2 deposit are compatible with orogenic-style gold mineralization (also referred to as mesothermal, or greenstone-hosted quartz-carbonate vein gold mineralization). This style of gold deposit is typically associated with regional arrays of major shear zones and form by circulation of gold-bearing hydrothermal fluids in structurally-enhanced permeable zones. They are characterized by strong lithological and structural controls and are hosted in deformed and metamorphosed volcanic, sedimentary, and granitoid rocks occurring across a wide range of crustal depths.

Orogenic gold deposits are widely spread throughout Canada and they occur principally in the greenstone belts of the Superior, Churchill, and Slave provinces, and in younger terranes including the Canadian Cordillera. The largest concentration of these deposits occurs in the greenstone belts of the south-central Superior Province.

In Red Lake, most of the gold production is derived from orogenic high-grade quartz-carbonate veins associated with deformation and folding in Balmer Assemblage rocks (Sanborn-Barrie et al. 2004). At the Campbell-Red Lake Mines, the main source of gold is found within quartz-carbonate veins associated with the Campbell and Dickenson fault zones and locally controlled by F2 folding (Dubé et al. 2001). A spatial relationship exists between the ultramafic rocks and gold mineralization, with the majority of gold mineralization at Cochenour-Willans and Campbell-Red Lake gold mines occurring within a few hundred metres of ultramafic bodies. Dubé et al. (2001) suggest that a competency contrast between basalt and ultramafic units is important in the formation of extensional carbonate veins in fold hinge zones during deformation, which are then later replaced by gold-rich siliceous fluids.

The F2 gold system shares attributes of other orogenic gold deposits located in the Red Lake district. These include the association of auriferous quartz-carbonate veins with fault zones (D_2 shear zones at F2) and the favourable lithological setting of Balmer Assemblage mafic and ultramafic rocks.

8 Exploration

8.1 Historical Exploration Work

The history of exploration activities from 1922 to 2002 is discussed in Section 5.1. Exploration conducted by previous owners is summarized in Table 3.

8.2 Exploration by Rubicon

Since acquiring the Phoenix gold project in 2002, Rubicon has conducted an extensive exploration program that has included geological mapping, re-logging of selected historic boreholes, digital compilation of available historical data, ground and airborne magnetic surveys, mechanical trenching, channel sampling, bathymetric survey, induced polarization Titan 24 survey, petrographic study, topographic survey, and data modelling and processing along with numerous drilling programs. A summary of the exploration activities undertaken at the Phoenix gold project between 2002 and 2015 by Rubicon is shown in Table 7.

Table 7: Summary of Exploration Activities by Rubicon from 2002 to 2015

Period	Exploration Activity
2002	Geological mapping Cataloguing, numbering and re-boxing of historical core cross-piled on property (over 60,000 m) Digital compilation of historical data High resolution airborne magnetic survey 22,000 m^2 of mechanical trenching and power washing (in 2002 and 2004) Channel sampling (876 samples between 2002 and 2004) Overwater bathymetric survey of Red Lake within property boundary 1,900 m of drilling on the Phoenix Peninsula
2003	Re-logging of selected historical boreholes (approximately 23,000 m from 161 boreholes) Digital compilation of historical data Phase 1 drilling program with 9,600 m of winter drilling including ice drilling Phase 2 drilling program consisting of 3,000 m drilled on the Phoenix Peninsula
2004	Continued mechanical trenching, power washing and channel sampling Winter drilling program with 13,300 m drilled
2005	11,800 m of surface drilling
2006	1,614 m of surface drilling
2007	13,444 m of surface drilling
2008	First phase of Titan 24 DCIP and MT survey 43,800 m of surface drilling
2009	Second and final phase of airborne Titan 24 survey completed Preliminary petrographic study Surface (44,675 m) and underground (25,512 m) core drilling
2010	Topographic survey utilizing airborne LiDAR technology (light detection and ranging) Surface (37,823 m) and underground (82,068 m) core drilling
2011	Surface (5,462 m) and underground (74,337 m) core drilling
2012	Surface (40,900 m) and underground (17,627 m) core drilling (to cut-off date of Nov 1, 2012)
2013	Underground core drilling (876 m) to support shaft development
2014	Underground core drilling (40,574 m), infill and step out drilling in central portion of deposit Surface core drilling (6,064 m) used to investigate the crown pillar
2015	Underground core drilling (47,061 m), infill used as production support for trial stoping Exploration surface core drilling (9,553 m) targeting the Carbonate Zone

A core re-logging program initiated in 2002 formed a solid basis for understanding the nature of mineralization hosted within the hanging wall volcanic units of the East Bay Deformation Zone.

The airborne magnetometer survey flown by Fugro Airborne Surveys in 2002 provided the data necessary to allow re-interpretation of the local geology within the Phoenix property boundary including the extrapolation of known geological contacts, the identification of local structural offsets, and the identification of large target areas such as magnetic lows, which potentially represent magnetic destruction through hydrothermal alteration processes.

The 2008 Titan 24 DCIP survey by Quantec Geoscience was completed after the discovery of the F2 gold system and successfully detected several known near surface gold zones and appears to have detected the alteration related to the F2 gold system. The extensive chargeability anomaly is over 1,500 metres (m) long and appears to correlate with strongly altered hosts rocks and sulphide bearing gold mineralization, extending from the southern extents of the F2 gold system to the North Peninsula zone. The F2 Titan anomaly is one of a number of similar anomalies developed along 3.0 kilometres of prospective stratigraphy extending to the northeast on the property. The anomalies range from vertical depths of 200 to over 800 m and constitute high priority regional targets.

Preliminary petrographic analysis performed by Vancouver Petrographics in 2009 on select representative core samples from the F2 gold system indicated that 90% to 95% of the native gold occurs in quartz as equant grains, mainly from 20-100 microns in size. Petrography identified that such fragments should be liberated relatively easily. Finer grains of native gold (mainly 5-20 microns), both in fragments of meta-andesite and less commonly in quartz, will be more difficult to liberate. Most likely the recovery of gold would not increase greatly with grinding below 15 microns.

The procedures and parameters applied for down-hole surveys are discussed in Section 9.2.2, whereas the borehole sampling methodology and approach are discussed in Section 9.2.3.

In the opinion of SRK, the sampling procedures used by Rubicon are consistent with generally accepted industry best practice and the resultant infill drilling pattern is sufficiently dense to interpret the geometry and the boundaries of the gold mineralization with confidence. All drilling sampling was conducted by appropriately qualified personnel under the direct supervision of appropriately qualified geologists. Accordingly there are no known factors that could materially impact the accuracy and reliability of the results.

The results of the drilling sampling, as well as, recent information gained from development and trial stoping, are used to model the geology of the F2 gold system and evaluate mineral resources as described in Section 13.

9 Drilling

9.1 Historical Drilling

The history of exploration from 1922 to 2002 is discussed in Section 5. Drilling conducted by previous owners is summarized in Table 3. The historical core boreholes are mainly located outside the main resource area. However, some core boreholes targeted the Hangingwall zone between 1984 and 1987 and have been used for geology and resource modelling.

9.2 Drilling by Rubicon

Since 2002 and up to November 1, 2015, Rubicon has completed 523,283 metres (m) of core drilling (235,228 m of surface drilling and 288,055 m of underground drilling) on the Phoenix gold project (Table 8). Of this drilling, 450,175 m were drilled on the F2 gold system. Since the previous Mineral Resource Statement (SRK 2013b), infill and step-out drilling focussed on the resource areas, testing the northern and southern extensions of the gold mineralization, to assist with preparing trial stoping development in the core of the Main Zone, and to investigate the crown pillar. Between November 1, 2012 and November 1, 2015, Rubicon drilled 429 boreholes (94,575 m).

Table 8: Core Drilling Programs

Year	Surface Boreholes		Underground Boreholes		Total	
	Count	Metres	Count	Metres	Count	Metres
2002 - 2005	188	41,480			188	41,480
2006	11	1,614			11	1,614
2007	24	13,444			24	13,444
2008	62	43,766			62	43,766
2009	69	44,675	42	25,512	111	70,187
2010	49	37,823	199	82,068	248	119,891
2011	6	5,462	296	74,337	302	79,799
2012	90	40,900	36	17,627	126	58,527
2013			4	876	4	876
2014	38	6,064	127	40,574	165	46,638
2015			260	47,061	260	47,061
Total	**537**	**235,228**	**964**	**288,055**	**1,501**	**523,283**

The majority of core drilling by Rubicon has targeted areas outside of the historical McFinley Red Lake Mines areas that were historically perceived to have exploration potential. Key target areas on the Phoenix gold project are presented in Figure 9.

The distribution of the drilling targeting the F2 gold system is shown in Figure 10. Surface drilling was completed generally along east-west sections (mine grid). However, borehole azimuth and plunge varied widely because much of the drilling was completed on a lake using a barge or on winter platforms. Surface drilling completed to November 1, 2012 improved the definition of the gold mineralization at a borehole spacing of approximately 50 m or better, locally. Underground drilling targeted the gold mineralization from the 122 m, 183 m, 244 m and 305 m levels along east west sections (normal to interpreted trace of the gold mineralization). Given the limited drilling stations available, fan drilling was necessary to target north, south and depth extensions of the interpreted gold mineralization. The additional underground drilling reduced the spacing between boreholes in the core of the F2 deposit to approximately 10 m or less (Figure 10).

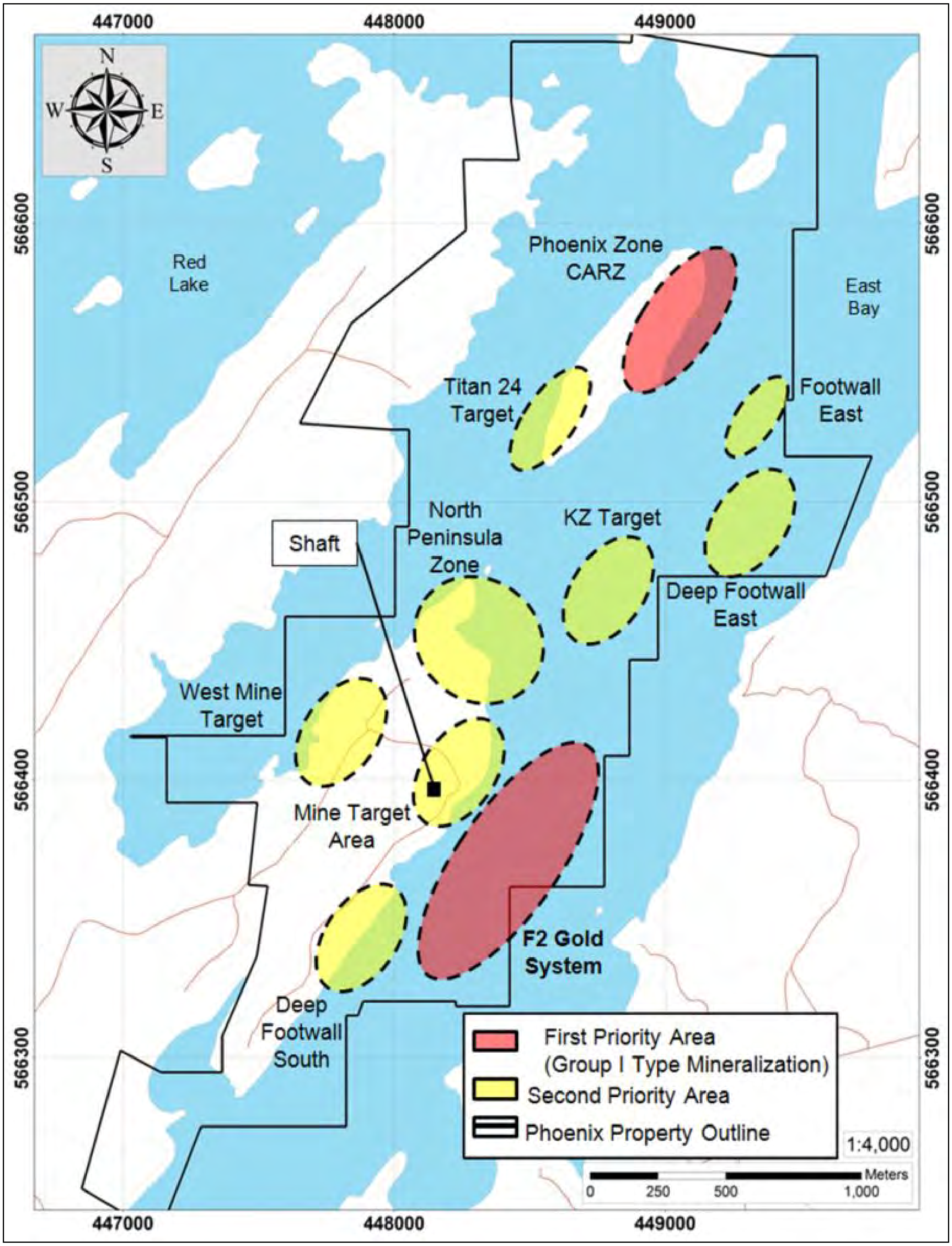


Figure 9: Key Target Areas on the Phoenix Gold Project
Source: Rubicon 2013

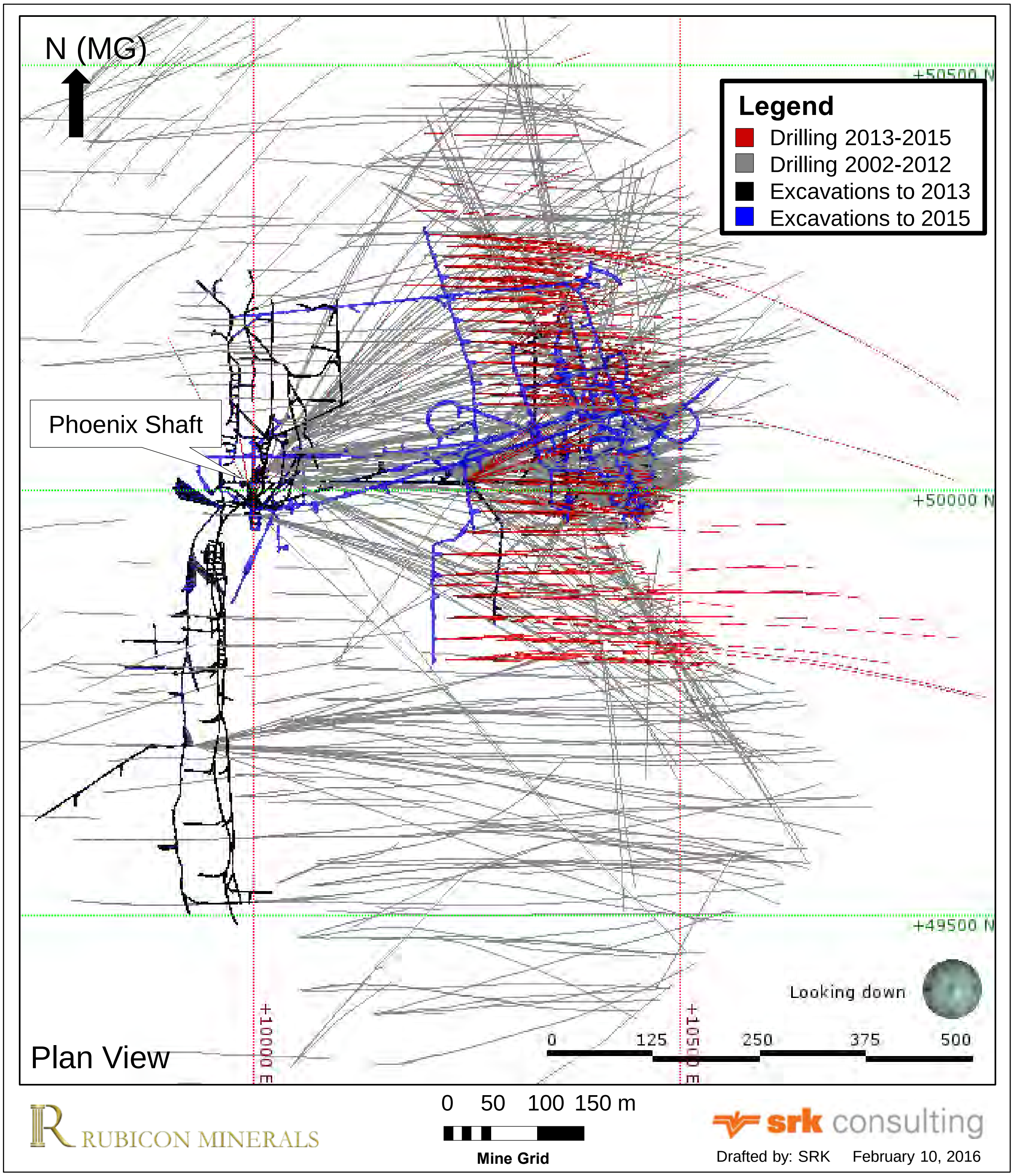


Figure 10: Distribution of Underground and Surface Drilling in the Main Zone of the F2 Gold System of the Phoenix Gold Project

In 2011, 302 core boreholes were drilled (79,799 m), including 5,462 m from surface and 74,337 m from underground. Underground core drilling was conducted on the 305 m level, from seven separate drill stations, 305-02 through 305-08. The majority of the drilling was focused on the F2 core zone with a number of boreholes testing the extension of the zone along strike.

The 2011 drilling campaign had continued to define the northeast-trending (F1) gold mineralization associated with silicification, quartz veining, and strong alteration within, and adjacent to, favourable host rock types. Gold mineralization also occurs in northwest-trending structures that are generally confined within, or immediately adjacent to, northeast-trending bounding geological units and parallel to the regional F2 fold trend direction. Typically, this mineralization occurs as local quartz veining and brecciation.

In 2012 126 boreholes (58,527 m) were drilled up to November 1, 2012, the cut-off date for drilling considered for geology and mineral resource modelling. Underground core drilling was conducted from the 305 m, 244 m, and 122 m levels, from four separate drill stations (305-02, 305-03, 244-09 and 122-03). Surface drilling was carried out on the ice during the winter months, as well as from land. The drilling was focused on the up-plunge of the F2 core zone as well as a series of deep targets.

The 2012 drilling program was successful at demonstrating continuity of the gold mineralization and in extending gold zones within the overall F2 gold system. Drilling results demonstrated reasonable continuity of the higher grade gold mineralization and broad lower grade gold zones. Although the main focus of the 2012 drilling campaign was infill, it also expanded the known strike length of the system by 71 m and the depth by 105 m.

In 2013, four underground geotechnical core boreholes were completed (876 m) to test the lower area of the shaft.

The 2014 to 2015 drilling program on the F2 gold deposit focused on testing the gold mineralization along strike, north and south of the core area of drilling and to assist with planning the test stoping areas (Figure 10). An exploration drift was developed on the 244 m level parallel to the main zone of gold mineralization. The program was completed with 25 m spaced pierce points both vertically and horizontally throughout. The program was designed to test between 5248 m elevation to 4943 m elevation (122-427 levels), targeting the HiTi basalts. Phase two of the program was to infill, where needed, to 12.5-metre spacing. Drilling along the northern portion of the deposit identified several higher grade targets. Drilling in the far southern portion of the F2 deposit confirmed the extension of the HiTi Basalt with gold mineralization confirming that the gold system is open to the south.

In 2015 Rubicon also drilled 21 surface core boreholes (9,553 m) targeting historical high-grade drilling results on the Carbonate Zone (CARZ).

9.2.1 Drilling Procedures

All proposed land and ice borehole collars were surveyed with a handheld global positioning system (GPS) instrument with an accuracy of ±3 m. Two foresight pickets were also surveyed and drills were set up under the direct supervision of a Rubicon geologist or geological technician. Collars for barge boreholes were also surveyed with a handheld GPS instrument and then marked with a buoy; the same foresight procedure was carried out. Changes in actual borehole location from planned locations, due to local ice conditions or other technical reasons were noted with the true easting and northing coordinates. Final collar locations are surveyed with a differential GPS unit (sub-metre accuracy) and recorded in the database. All surveys currently use the mine grid, which lies at an orientation of +45 degrees to the UTM grid.

The majority of the core drilling performed prior to 2013 has been carried out by Hy Tech Drilling of Smithers, British Columbia using Tech-4000 diamond core drills both from surface (on land, ice or barge) having a depth capacity of 2,500 m and from underground having a depth capacity of 1,500 m. Layne Christensen Canada Limited of Sudbury, Ontario was also contracted to complete deep boreholes using their skid-mounted CS 4002, which has a depth capacity of 2,500 m. Orbit Garant Drilling of Val-d'Or, Quebec was contracted to complete underground drilling using either a B-20 or Orbit 1500, which have a depth capacity of 1,500 m. Each drilling program was supervised by a Rubicon geologist. Generally, NQ2 (50.8 millimetres [mm] diameter) or NQ (47.6 mm diameter) core was drilled.

From 2013 to 2015, Boart Longyear was the drilling contractor. Boart had LM 75 electric drill rigs that have the ability to drill a 1,000 m hole at various core sizes. Boart Longyear also had several air powered drills, used for close proximity definition boreholes. All drilling was supervised by a Rubicon geologist. Drilling was completed with NQ (47.6 mm diameter), BQTK (40.7 mm diameter) or AQTK (35.5 mm diameter) size core.

Casing for boreholes collared on land were left in place, plugged, cemented, and covered with aluminum caps with the borehole number etched or stamped into the cap. Boreholes that were drilled from the ice or barge were plugged with a Van Ruth plug at 30 m down the borehole from the base of the casing, and then cemented to the top of the borehole. All casing was removed from these boreholes. Since January 2012, all boreholes drilled from the ice or barges are cemented from the bottom of the hole to the base of the casing. All boreholes that were drilled from underground were purposely left ungrouted if the borehole produced water less than 5 liters per minute (L/min). If the borehole produced water greater than 5 L/min, the hole would be pressure grouted from the bottom to top and sealed with a Van Ruth grout plug.

9.2.2 Collar and Down-Hole Survey

A Reflex or Ranger electronic single shot survey instrument was used to take down-hole surveys recording azimuth, inclination, magnetic tool face angle, gravity roll angle, magnetic field strength, and temperature at 30-metre intervals.

Rubicon discovered an error with underground core borehole collar locations. In April 2013 and January 2015, Total Precision Survey (TPS) using a gyro and plumb-bob, corrected the vertical reference line (survey control points at the shaft) resulting in both a translation and rotation shift to the underground excavations from the old survey to the new survey. The collars for many underground holes required correction due to an adjustment of the underground survey control points. The TPS work in 2013 and in 2015 resulted in a shift/rotation of the 84 m, 122 m, 244 m, and 305 m underground levels. The result was that all boreholes surveyed after April 2013 had the "corrected" mine grid coordinates while holes surveyed prior to April 2013 (mostly on 305 m level) had "uncorrected" mine grid coordinates. The shift in the corrected collar coordinates ranges from approximately 0.25 m to 3.0 m.

Rubicon performed a check "closed loop" survey on the 122 m, 244 m, and 305 m levels, to confirm accuracy and correct the location of the underground excavations. The closed loop survey data was verified by TPS and an Ontario Land Surveyor to be within 1st and 2nd order accuracy in November, 2015.

9.2.3 Sampling Method and Approach

Core was laid in wooden core boxes at the drilling site, with depth markers at every 3 m, and it was sealed with a lid and strapped with plastic bindings. Boxes were delivered once a day by the drilling contractor or Rubicon personnel to the on-site core logging facility.

Rock quality designation (RQD) and total core recovery were routinely measured after each drilling run. Core recovery was measured as actual recovered core length against drilled run length and recorded as a percentage. Core recovery was generally very good (greater than 98%).

Upon delivery of the core boxes to the core shack, the core boxes were placed in sequential order for description by an appropriately qualified geologist. The description procedure involved collecting elaborate information about colour, lithology, alteration, weathering, structure, and mineralization. Data was captured directly into a standardized computerized database.

Core sampling intervals were marked by considering geology by an appropriately qualified geologist. Core assay samples were collected from half core sawed lengthwise with a diamond saw. Sampling intervals of mineralized zones were set at a standard 1-metre length or less considering geological contacts.

9.3 SRK Comments

In the opinion of SRK, the sampling procedures used by Rubicon are consistent with generally accepted industry best practice. All drilling sampling was conducted by appropriately qualified personnel under the direct supervision of appropriately qualified geologists. Accordingly there are no known factors that could materially impact the accuracy and reliability of the results.

From 2002 to 2013 the orientation of the core drilling was designed to attempt to intersect the targeted gold mineralization as perpendicular as possible to its interpreted trend. The majority of the boreholes were drilled on easterly (mine grid) azimuths aiming to intersect north-south (mine grid) D1 structures associated with the first phase of gold mineralization hosted primarily in the northerly-trending (mine grid) HiTi basalts. Auriferous quartz vein arrays in the second phase of higher grade gold mineralization are generally confined to the northerly-trending HiTi basalt units along east-northeast- and west-northwest-trending (mine grid) D2 shear zones oblique to the drilling pattern. The overall strong association of higher grade gold mineralization to the D2 shear zones in the F2 gold deposit was only recently highlighted in the recently developed underground workings exposing gold mineralization extensively for direct geological observation. The predominant easterly (mine grid) drilling pattern thus is optimal to target the gold mineralization associated with the north-south (mine grid) D1 structures but is not optimal to test east-northeast- and west-northwest (mine grid) trending D2 structure high grade gold mineralization, since most of the drilling would intersect the D2 structures at a very low angle. Further, logistical constraints imposed to surface drilling on a lake forced drilling fanned boreholes to target north, south and depths extensions of the gold mineralization. As a result the surface drilling pattern to the end of 2012 is quite variable across the F2 gold deposit. However it is a reasonable compromise to target both styles of gold mineralization identified in the F2 gold deposit.

In 2014 and 2015 all infill drilling was conducted from underground drilling stations established west of the deposit core. The drilling pattern for that drilling is sectional and more regular to intersect the targeted mineralization. Boreholes were fanned, as required, to test the strike and dip extensions of the gold mineralization. SRK considers that the resulting drilling pattern, while not optimal, provides a reasonable distribution of drilling samples to interpret the geology of the F2 gold deposit with reasonable confidence.

For the construction of the 2013 geology and mineral resource model, only the core boreholes drilled after 2008 to October 2012 were considered. In November 2015, Rubicon provided to SRK the complete drilling database for the Phoenix gold project, including data for the exploration boreholes drilled outside the resource areas, and boreholes drilled prior to 2008. Some boreholes drilled from 1984 to 1987 targeted the Hangingwall zone of the F2 gold deposit. Information from these boreholes was considered in the construction of the model discussed herein. However, there are no blocks above cut-off in the Hangingwall zone and therefore no mineral resources in the Hangingwall zone in the January 11, 2016 Mineral Resource Statement.

The results of the complete drilling database combined with approximately 10,200 m of recent underground development, exposing the gold mineralization on several levels for test stoping, and structural geology investigation conducted in November 2015 were used to model the geology of the F2 gold deposit and evaluate mineral resources as described in Section 13.

10 Sample Preparation, Analyses, and Security

Since 2002 Rubicon has used three primary analytical laboratory for drilling on the Phoenix gold project. From 2002 to 2007 samples were sent to either ALS Minerals or Accurassay, both located in Thunder Bay, Ontario. From 2008 to 2015 samples were submitted at SGS Minerals in Red Lake, Ontario for preparation and analysis.

10.1 Sample Preparation and Security

Upon arrival at the core storage facility, the core was washed, logged, and split using a diamond blade saw under the on-site supervision of a Rubicon geologist. Samples were moved directly from the core shack to the cutting shack and then they were cut and shipped in individual zip tied sample bags. Approximately 10 individual bagged samples were placed in a large rice bag that was sealed with a security zip tie containing a unique numbered tamper-proof security seal. From 2002 to 2007 samples were shipped to either ALS Minerals or Accurassay in Thunder Bay. Since 2008, samples were delivered directly from the mine site to the SGS Canada Inc. (SGS) laboratory in Red Lake by Rubicon staff. Each sample number and security seal was recorded and then verified by SGS with a written acknowledgment upon receipt.

In 2014, the core shipping procedure was streamlined. Core samples were cut and sealed as usual. Rubicon placed the core samples in a larger shipping crate, allowing more samples to be shipped with less chain of custody forms. Generally the entire cut hole would be placed in a crate, sealed with a tamper proof security seal and shipped off site. Each sample number and security seal was recorded and then verified by SGS with a written acknowledgment upon receipt.

Individual samples received at the laboratory typically ranged from 0.5 to 2 kilograms in weight. The samples were dried prior to any sample preparation at the laboratory. The entire sample was crushed to 2 millimetres in an oscillating steel jaw crusher and either an approximate 250 gram split, or, in the case of metallics fire assay, the whole sample was pulverized in a chrome steel ring mill. The coarse reject was bagged and stored. The samples were then crushed to 90 percent (%) -8 mesh, split into 250- to 450-gram subsamples using a Jones Riffle Splitter and subsequently pulverized to 90% -150 mesh in a shatter box using a steel puck. Prior to analysis, the samples were homogenized. Silica cleaning between each sample was also performed to prevent any cross-contamination. All samples were sent for fire assay and the pulps remained on-site.

The logged and sampled core is stored at the project site in a secured area (locked building) near the core shack. There is only one road into the mine site, which has a gate with 24 hour security and restricted access. The pulps and rejects were returned from SGS and stored on the project site for long-term storage.

10.2 Sample Analyses

All analytical or testing laboratories used are independent of Rubicon. Various analytical laboratories have been used by Rubicon over time and these are discussed below. Samples collected before 2008 were sent to either the ALS Minerals (ALS) preparation laboratory in Thunder Bay, Ontario, or its analytical laboratory in Vancouver, British Columbia, or to Accurassay Laboratories (Accurassay), Thunder Bay, Ontario. Since January 2008, sample preparation and assaying have been conducted by SGS in Red Lake, Ontario. From January 2010 to October 2012 and in 2014 and

2015 (no samples were taken in 2013), umpire check assays were conducted by ALS and Accurassay, respectively.

All three laboratories are accredited to ISO/IEC Guideline 17025 by the Standards Council of Canada for conducting certain testing procedures, including the procedures used to prepare and assay for gold the samples submitted by Rubicon and informing the mineral resources.

Dr. Barry Smee, PGeo, Consultant Geochemist, audited the sample preparation facilities of SGS in Red Lake, Ontario on behalf of Rubicon in 2009 and 2011. Recommendations from his audit were provided to SGS and corrective measures were implemented (Smee and Associates Consulting Ltd., 2009 and 2011).

Analytical results from the historical core boreholes drilled prior to the acquisition of the project by Rubicon should be taken with precaution. The historical boreholes are drilled outside of the core area of the F2 gold deposit.

10.2.1 ALS Minerals (From 2002 – 2007)

Gold concentrations were determined by fire assay fusion of a 50-gram subsample with an atomic absorption spectroscopy (AAS) finish. This is the standard procedure used in umpire check analyses from 2010 to 2012. The gold-metallics assay, also known as screen fire assaying, required 100% pulverization of the sample and screening of the sample through a 150 mesh (100 micron). Material remaining on the screen was retained and analyzed in its entirety by fire assay fusion followed by cupellation and a gravimetric finish. The -150 mesh (pass) fraction was homogenized and two 50-gram subsamples were analyzed by standard fire assay procedures. In this way, the magnitude of the coarse gold effect can be evaluated via the levels of the +150 mesh material.

Representative samples for each geological rock unit and, generally, at least one sample every 20 metres, were selected for multi-element assaying using inductively-coupled plasma atomic emission spectroscopy (ICP-AES), following four-acid digestion. Copper, lead, and zinc values exceeding ICP-AES limits were re-assayed using wet chemistry. Only a few samples were assayed for whole rock major elements using X-ray fluorescence spectrometry (XRF).

Results were reported electronically to the project site in Red Lake and to the head office in Vancouver to multiple recipients with assay certificates filed and catalogued at Rubicon's head office in Vancouver.

10.2.2 Accurassay Laboratories (From 2002 – 2007)

Gold was determined by fire assay using a 30-gram fire assay charge. This procedure used lead collection with a silver inquart. The beads were then digested and an atomic absorption or ICP finish was used. All gold assays greater than 10 g/t were automatically re-assayed by fire assay with a gravimetric finish. A Sartorius micro-balance was used with a sensitivity of 1 microgram (six decimal places) giving a 5 parts per billion (ppb) detection limit.

Screen metallics analyses included the crushing of the entire sample to 90% -10 mesh and using a Jones Riffle Splitter to split the sample to a 1 kilogram subsample. The entire subsample was then pulverized and subsequently sieved through a series of meshes (80, 150, 200, 230, 400 mesh). Each fraction was then assayed for gold (maximum 50 gram). Results were reported as a calculated weighted average of gold in the entire sample. Core samples were also assayed for a suite of 32 trace elements using a multi-acid digestion followed by ICP-AES. As with ALS, results were reported electronically to the project site in Red Lake with assay certificates filed and catalogued at Rubicon's head office in Vancouver.

For the umpire check analyses from 2014 to 2015, gold was determined by fire assay using a 50-gram fire assay charge. If the sample contained greater than 10 g/t gold, it was re-assayed with a gravimetric finish.

10.2.3 SGS Mineral Services (From 2008 - 2015)

Prior to 2009, gold was analyzed using the fire assay process on a 30-gram subsample. If the sample contained greater than 10 grams gold per tonne (g/t gold), it was re-assayed using a gravimetric finish. Starting in October 2009, the subsample size was increased to 50 grams on the recommendations of Smee (2009). All gold assays greater than 10 g/t were automatically re-assayed with gravimetric finish.

A select suite of sample pulps were also assayed for a suite of 50 trace elements by the SGS Laboratory in Toronto, Ontario, using a multi-acid digestion and ICP-AES.

Results were reported electronically to the project site in Red Lake and to the head office in Vancouver to multiple recipients with assay certificates filed and catalogued at Rubicon's head office in Vancouver and added to the master Microsoft Access database stored on the Vancouver and Red Lake servers.

In 2014, the database management was moved to the project site. Rubicon received approved assay certificates from SGS, and retrieved analytical results digitally from the SGS server.

10.2.4 Rubicon Assay Laboratory

In 2015, Rubicon purchased and operated an assay laboratory located in Balmertown approximately 8 kilometres from the Phoenix mine site. This laboratory processed all production geology and mill related processing samples. The results prepared by the Rubicon laboratory were used for internal reporting only and were not used to inform the mineral resources reported herein.

10.2.5 Handling of Multiple Assay Values for One Sample

In cases where multiple assays were completed on an individual sample, gold values produced by the metallic fire assay are deemed to supersede fire assay gold values owing to the larger size of the sample analyzed and/or the better reproducibility in samples with coarse gold.

10.3 Sample Analyses of Metallurgical Testwork

10.3.1 G&T Metallurgical Services

Metallurgical testwork was completed at the G&T Metallurgical Services Ltd. (G&T) facility in Kamloops, British Columbia. Gold was measured by fire assay method using a 30-gram assay charge. When requested, metallic sieve preparation method was also used. Although not accredited, the laboratory has a complete written procedure and participates in a Proficiency Testing Program accredited by the Standards Council of Canada. This facility also performed assays for iron and arsenic content using a multi-acid digestion and ICP-AES method, and assays for sulphur and carbon by combustion furnace.

G&T also performed different metallurgical testing for the characterization of the mineralized material. All the tests performed were done using industry recognized methods for the testwork. In 2013, the facility was visited by Soutex personnel (SRK, 2013b). Soutex noted that the facility has well-documented controlled procedures for all types of testing. The quality management includes ISO-9001 accreditation.

10.3.2 ALS Minerals

All the assays related to the treatment of the bulk samples at SMC (Canada) Ltd. (SMC)'s McAlpine mill in Cobalt, Ontario during the summer and fall of 2011 were sent to ALS accredited laboratories. Gold assays were done with fire assay on a 30-gram assay charge. All samples that were head grade samples and tailings samples were prepared with screen metallic sieve preparation done on the whole received sample. All samples of gold concentrate were assayed without screen metallic sieve preparation. The samples were expedited and received at the Val d'Or facility and the assays were performed in ALS laboratory in North Vancouver. A series of blank, duplicate and certified samples were also sent to the laboratory for quality control.

10.4 Specific Gravity Data

The specific gravity database includes 6,666 records generated by Rubicon from measurements on core from 470 boreholes (Table 9). Of these records, 2,668 measurements are from samples within the mineralization envelopes modelled by SRK. Specific gravity measurements were taken from representative core samples intervals (approximately 0.1-metre in length). Specific gravity was measured using a water dispersion method. The samples were weighed in air, and then the uncoated sample was placed in a basket suspended in water and weighted again.

Table 9: Specific Gravity Data by Lithology Type

Rock Code	Description	Count	Specific Gravity			
			Average	STD	Minimum	Maximum
E1H	HiTi basalt	1,396	2.96	0.10	2.20	3.72
EOT	Talc rich unit	1,600	2.90	0.05	2.61	3.15
I3	Felsic intrusives	847	2.67	0.07	2.36	3.08
E0	Ultramafic flow	1,264	2.92	0.08	2.50	3.76
E0B	Komatiitic basalt	370	2.98	0.07	2.61	3.24
E1A	Basalt	198	2.89	0.09	2.67	3.54
AGZ	Altered green zone	97	2.93	0.09	2.69	3.20
Other	Other	894	2.88	0.12	1.85	3.45
Total		**6,666**				

* STD = standard deviation

10.5 Quality Assurance and Quality Control Programs

Quality control measures are typically set in place to ensure the reliability and trustworthiness of exploration data. These measures include 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.

Analytical control measures typically involve internal and external laboratory control measures implemented to monitor the precision and accuracy of the sampling, preparation and assaying. They are also important to prevent sample mix-up and to monitor the voluntary or inadvertent contamination of samples.

Assaying protocols typically involve regularly duplicating and replicating assays and inserting quality control samples to monitor the reliability of the assaying results throughout the sampling and assaying process. Check assaying is normally performed as an additional test of the reliability of the assaying results; it generally involves re-assaying a set number of sample rejects and pulps at a secondary umpire laboratory.

10.5.1 Rubicon Sampling 2008 - 2012

Rubicon relied partly on the internal analytical quality control measures implemented by the primary laboratories it used. In addition, Rubicon implemented external analytical control measures starting in 2008 on all sampling conducted at the Phoenix gold project. Analytical control measures by Rubicon consist of inserting control samples (blank, certified reference material, and field duplicates) in all sample batches submitted for assaying.

The blank consisted of store-bought white garden stone (quartz or quartzite). In 2010, Rubicon used material sourced from a granite boulder located near Red Lake, just off a northern road in the bush. From February 2011, Rubicon has been using granite slab purchased from Nelson Granite in Vermillion Bay, Ontario.

Field duplicates consisted of half core and have been taken since June 2009. Twenty-seven gold commercial certified reference materials sourced from CDN Resource Laboratories Ltd. (CDN) were used in sampling between 2008 and 2012. Control samples used range from 0.121 to 29.21 g/t gold (Table 10).

Table 10: Specifications of CDN Certified Control Samples Used by Rubicon on the Phoenix Gold Project between 2008 and 2012

Gold Reference Material	Recommended Value (g/t Au)	Standard Deviation (g/t)	Number of Samples
CDN-GS-P1	0.121	0.011	58
CDN-GS-P5B	0.44	0.02	90
CDN-GS-P7A	0.77	0.03	93
CDN-GS-P8	0.78	0.03	178
CDN-GS-10	0.82	0.05	3
CDN-GS-1J	0.946	0.051	170
CDN-GS-1H	0.972	0.054	297
CDN-GS-1G	1.14	0.05	91
CDN-GS-1E	1.16	0.03	1,649
CDN-GS-1P5A	1.37	0.06	16
CDN-GS-1P5B	1.46	0.06	83
CDN-GS-9	1.75	0.07	123
CDN-GS-2B	2.03	0.06	77
CDN-GS-2A	2.04	0.095	5
CDN-GS-2C	2.06	0.075	243
CDN-GS-3E	2.97	0.135	107
CDN-GS-3D	3.41	0.125	180
CDN-GS-5C	4.74	0.14	1
CDN-GS-5E	4.83	0.185	1,244
CDN-GS-5J	4.96	0.21	162
CDN-GS-5A	5.1	0.135	10
CDN-GS-5F	5.3	0.18	431
CDN-GS-6A	5.69	0.24	306
CDN-GS-7A	7.2	0.3	121
CDN-GS-6A	9.99	0.25	8
CDN-GS-11A	11.21	0.435	17
CDN-GS-30B	29.21	0.615	170

Control samples (including blanks, gold mineralized reference material, and field duplicates) were inserted every 25 samples. In addition, umpire laboratory testing was performed on approximately 5% of samples.

10.5.2 Rubicon Sampling 2014 - 2015

Rubicon relied partly on the internal analytical quality control measures implemented by the primary laboratories it used. In addition, Rubicon implemented external analytical control measures on all sampling conducted at the Phoenix gold project since the previous technical report. No drilling took place in 2013 with associated geochemical sampling. Analytical control measures by Rubicon consist of inserting control samples (blank, certified reference material, and field duplicates) in all sample batches submitted for assaying.

The blank used from 2014 to July, 2015 consisted of granite slab purchased from Nelson Granite in Vermillion Bay, Ontario. From August 3, 2015, a locally sourced granite from Red Lake was used after submitting a number of samples to verify that it was barren in gold.

Field duplicates consist of half core. Three gold commercial certified reference materials sourced from CDN Resource Laboratories Ltd. (CDN) were used in sampling between 2014 and 2015. Control samples used range from 1.16 to 5.69 g/t gold (Table 11).

Table 11: Specifications of CDN Certified Control Samples Used by Rubicon on the Phoenix Gold Project between 2014 and 2015

Gold Reference Material	Recommended Value (g/t Au)	Standard Deviation (g/t)	Number of Samples
CDN-GS-1L	1.16	0.05	186
CDN-GS-6A	5.69	0.24	172
CDN-GS-1P5L	1.53	0.07	5

Control samples (including blanks, gold mineralized reference material, and field duplicates) were inserted every 25 samples. In addition, umpire laboratory testing was performed on approximately 3% of samples.

10.6 SRK Comments

In the opinion of SRK, the sampling preparation, security, and analytical procedures used by Rubicon are consistent with generally accepted industry best practices and are, therefore, adequate for the purpose of mineral resource estimation.

11 Data Verification

11.1 Verifications by Rubicon

The core drilling completed up to 2012 was undertaken by experienced Rubicon geologists under the supervision of Rubicon employees. Since 2013, the geology work undertaken at the Phoenix mine site is performed by competent and experienced Rubicon geologists, under the supervision of Mark Ross, PGeo (APGO#1877), Chief Mine Geologist. Rubicon performs logging, surveying, sample selection, and inserts analytical quality control samples. Data are verified and double checked by senior geologists at site (for data entry verification, error analysis, plus assay pass/fail against standards and blanks, etc.). Borehole data are reviewed by ioGlobal Pty Ltd. (ioGlobal) for quality assurance and quality control.

Analytical protocols were developed in 2003 and revised in 2009 and 2011 in consultation with Barry Smee, PhD, PGeo, an independent geochemist (Smee, 2009 and 2011). .

Analytical results were verified by monitoring analytical results of controls samples inserted with the samples submitted for assaying. Results are tracked in an action log as part of the standard quality assurance and quality control procedures. Failures are investigated and samples are re-assayed as required Rubicon conducted two umpire assaying programs. In 2012, 5 percent (%) of the sample pulps were re-assayed by ALS. In 2015, 3% of the sample pulps were re-assayed by Accurassay (2014-2015).

11.2 Verifications by SRK

11.2.1 Site Visit

In accordance with National Instrument 43-101 guidelines, SRK visited the Phoenix gold project on various occasions between October 2011 and November 2015. The purpose of the site visits was to ascertain the geological setting of the project, witness the extent of exploration work carried out on the property, and undertake certain geological investigations. SRK reviewed the exploration database and validation procedures, reviewed exploration procedures, geological modelling procedures, examined core, and interviewed project personnel.

11.2.2 Verifications of Analytical Quality Control Data

Rubicon provided SRK with internal and external analytical control data containing the analytical results for the quality control samples between 2008 and 2015. The data between 2008 and October 2012 was summarized and analyzed in the 2013 technical report (SRK, 2013b). Rubicon did not provide analytical quality control data for boreholes drilled pre-2008. The analytical quality control data produced by Rubicon between 2002 and 2007 was reviewed by 2011 AMC (AMC, 2011). Historical boreholes drilled prior to 2002 do not have known analytical quality control data.

No sampling was conducted from November 2012 to the end of 2013.

Analytical quality control data for the drilling completed between 2014 and 2015 was provided in December 2015. SRK aggregated the assay results of the external analytical control samples produced in 2014 and 2015 for further analysis. Blanks and certified reference material data were summarized on time series plots to highlight the performance of the control samples. Paired data (field duplicates and umpire check assays) were analyzed using bias charts, quantile-quantile, and relative precision plots.

Rubicon Sampling 2008 - 2012

The external analytical quality control data produced between 2008 and 2012 are summarized in Table 12 and presented in graphical format in Appendix A. The external quality control data produced on this project represents 12.5% of the total number of samples assayed.

Table 12: Summary of Analytical Quality Control Data Produced between 2008 and 2012

	Total	(%)	Comment
Sample Count	130,126		
Blanks	5,808	4.46%	Store-bought white garden stone; granite boulder; granite slab from Nelson Granite
Certified Reference Material	5,963	4.58%	
CDN-GS-P1	58		CDN (0.121 g/t Au)
CDN-GS-P5B	90		CDN (0.44 g/t Au)
CDN-GS-P7A	93		CDN (0.77 g/t Au)
CDN-GS-P8	178		CDN (0.78 g/t Au)
CDN-GS-10	3		CDN (0.82 g/t Au)
CDN-GS-1J	170		CDN (0.946 g/t Au)
CDN-GS-1H	297		CDN (0.972 g/t Au)
CDN-GS-1G	91		CDN (1.14 g/t Au)
CDN-GS-1E	1,649		CDN (1.16 g/t Au)
CDN-GS-1P5A	16		CDN (1.37 g/t Au)
CDN-GS-1P5B	83		CDN (1.46 g/t Au)
CDN-GS-9	123		CDN (1.75 g/t Au)
CDN-GS-2B	77		CDN (2.03 g/t Au)
CDN-GS-2A	5		CDN (2.04 g/t Au)
CDN-GS-2C	243		CDN (2.06 g/t Au)
CDN-GS-3E	107		CDN (2.97 g/t Au)
CDN-GS-3D	180		CDN (3.41 g/t Au)
CDN-GS-5C	1		CDN (4.74 g/t Au)
CDN-GS-5E	1,244		CDN (4.83 g/t Au)
CDN-GS-5J	162		CDN (4.96 g/t Au)
CDN-GS-5A	10		CDN (5.10 g/t Au)
CDN-GS-5F	461		CDN (5.30 g/t Au)
CDN-GS-6A	306		CDN (5.69 g/t Au)
CDN-GS-7A	121		CDN (7.20 g/t Au)
CDN-GS-6A	8		CDN (9.99 g/t Au)
CDN-GS-11A	17		CDN (11.21 g/t Au)
CDN-GS-30B	170		CDN (29.21 g/t Au)
Field Duplicates	4,426	3.40%	Half Core
Total QC Samples	**16,197**	**12.45%**	
Check Assays			
ALS, Thunder Bay	**4,406**	**3.39%**	Pulp Duplicates

In general, the performance of the control samples (blank, certified reference material, and field duplicates) inserted with samples submitted for assaying between 2008 and 2012 is acceptable. Less than 1% of blank samples returned assay values above 0.055 gram gold per tonne (g/t gold), the batch assessment criteria threshold (failure limit) determined by Rubicon. However, a number of blanks (above 0.088 g/t gold) have gold values similar to a certified reference material, indicating possible sample misidentification. The blank material used prior to October 2009 was suspected by Rubicon of containing low levels of gold. A new blank material was sourced but the new blank material may not be barren in gold.

Rubicon uses three standard deviations as a batch assessment criteria threshold (failure limit). A number of individual certified reference materials are outside three standard deviations. However, the certified reference materials have similar means to the recommended value and/or less than 5% of the samples are outside three standard deviations. A number of certified reference materials have gold values similar to the blanks or other certified reference materials, indicating possible sample misidentification. SGS had difficulty with the precision and accuracy of certified reference material CDN-GS-2B and CDN-GS-3D. These control samples were used in 2008 and 2009.

Paired assay data for field duplicates produced by SGS and examined by SRK suggest that that gold grades are difficult to reproduce. Ranked half absolute relative difference (HARD) plots suggest that only 33% to 41% of the field duplicate sample pairs have HARD below 10%. The poor reproducibility of field duplicate results is to be expected in gold deposits with a strong nugget effect. The reproducibility does, however, improve between 2008 and 2012. The paired data produced by SGS does not show evidence of bias between the two-halves of the core sample.

Rubicon also submitted approximately 3.4% of the pulp samples produced by SGS to ALS for umpire laboratory testing. Between 25.9% and 49.6% of the umpire check assay pairs tested have a HARD below 10%. This confirms that it is difficult to reproduce analytical results from the same pulp. There is, however, no apparent bias between the two laboratories.

Overall, SRK considers that the analytical results delivered by the primary laboratory used by Rubicon between 2008 and 2012 are sufficiently reliable for the purpose of mineral resource estimation. The data sets examined by SRK do not present obvious evidence of analytical bias.

Rubicon Sampling 2014 - 2015

SRK also reviewed the analytical quality control data generated by Rubicon since October 31, 2012 for the data informing the new mineral resource model and found no material flaws. The external analytical quality control data produced by Rubicon from 2014 to October 2015 are summarized in Table 13 and presented in graphical format in Appendix A. New drilling informing the new resource model started in 2014, thus no data is present from the end of 2012 and 2013.

Table 13: Summary of Analytical Quality Control Data Produced in 2014 and 2015

	Total	(%)	Comment
Sample Count	**18,254**		
Blanks	440	2.41%	Granite slab from Nelson Granite, locally sourced granite
QC samples	363	1.99%	
CDN-GS-1L	186		CDN (1.16 g/t Au)
CDN-GS-6A	172		CDN (5.69 g/t Au)
CDN-GS-1PL	5		CDN (1.53 g/t Au)
Field Duplicates	308	1.69%	Half core
Total QC Samples	**1,111**	**6.09%**	
Check Assays			
SGS and Accurassay	**492**	**2.70%**	Umpire Check Assays on Pulps

In general, the performance of the control samples (blank, certified reference material, and field duplicates) inserted with samples submitted for assaying is acceptable. About 5% of blank samples returned assay values above 0.1 g/t gold, the batch assessment criteria threshold (failure limit) determined by Rubicon during this period. A number of blanks have gold values similar to certified reference material, indicating possible sample misidentification. However, further analysis of batches of samples assayed by SGS in July 2015 revealed that some blank samples with elevated gold content followed immediately samples containing gold, suggesting cross sample contamination during the preparation. Rubicon investigated this problem with SGS personnel. Subsequent samples with expected higher gold grade values were submitted with two blanks following the sample. Contamination was not detected in these assayed batches.

During the 2014-2015 drilling programs, Rubicon used primarily two certified reference materials. A third one was used in the final month of drilling. The two primary certified reference materials have means within 5% of the expected value. A number of certified reference materials have gold values similar to the blanks or other certified reference materials, indicating possible sample misidentification.

Paired assay data for field duplicates examined by SRK for this time period suggest that it is difficult to reproduce gold assays from two halves of the core; similar to what was found in the 2008 to 2012 data. Ranked half absolute relative difference (HARD) plots suggest that only 42% of the field duplicate sample pairs have HARD below 10%. While it is difficult to reproduce analytical results from field duplicate, the paired data do not show obvious evidence of bias.

Rubicon also submitted approximately 3.4% of pulp samples prepared by SGS to Accurassay in Thunder Bay, Ontario for umpire laboratory testing. Approximately 52% of the umpire check assay pairs tested have a HARD below 10%. The umpire assay results confirm the difficulty in replicating analytical results on the same pulp, between laboratories. There is, however, no apparent bias between the two laboratories.

SRK checked approximately 10% of the analytical data entries against the signed PDF electronic assay certificates. The electronic analytical data informing the mineral resources did not contain data entry errors.

Overall, SRK considers that the analytical results delivered by the primary laboratory used by Rubicon in 2014 and 2015 are sufficiently reliable for the purpose of mineral resource estimation. The data sets examined by SRK do not present obvious evidence of analytical bias.

12 Mineral Processing and Metallurgical Testing

This section summarizes the metallurgical test work completed on samples from the F2 gold deposit between 2008 and 2012 to support the conceptual design of a processing plant for the 2013 Technical Report. The information from this section was extracted from the 2013 Technical Report. No additional testing was conducted after 2012. The construction of the processing mill and ancillary facilities was initiated in 2013 and was completed during 2015. The actual results achieved during operation of the mill in 2015 are shown in section 12.2.2. During commissioning and start-up of the process plant, the mill treated low grade mineralized material mined during underground mine development. The mill ceased operating on November 21, 2015.

12.1 Summary of Historical Testwork

In September 2008, Vancouver Petrographics Ltd. (Vancouver Petrographics, September 2008) performed a petrographic analysis on 10 thin sections derived from representative mineralized core samples from the F2 Zone.

In October 2010, Rubicon completed a metallurgical testwork program (the “2010 study”) performed by Soutex (Soutex, October 2010). The study was done on small samples from different underground zones. The testwork program was conducted at G&T Metallurgical Services (G&T) under the supervision of Soutex (G&T, July 2010). This study included running a metallurgical testwork program, developing a preliminary milling process, and designing a preliminary concentrator. The design addressed the gold recovery process from a material delivered by the mine skip to the cyanide-free tailings going to the tailings management facilities and the production of gold doré. Paste plant considerations and tailings management facility were not included in the study.

In September 2011, Rubicon completed a further metallurgical testwork program (the “2011 study”) performed by Soutex. The study was done on representative subsamples (composites) extracted from two approximately 1,000-tonne bulk samples representing two underground areas on the 305 metres (m) level. The metallurgical testwork program was conducted at G&T under the supervision of Soutex. (G&T, October 2011).

Characterization of mineralized material competency for semi-autogenous grinding (SAG) milling was performed by G&T under the supervision of JKTech Pty Ltd. (JKTech, March 2011). Grinding circuit design was validated by simulation with SGS Minerals Services (SGS, June 2011). In July 2012, the processing of the two approximately 1,000-tonne bulk samples was completed at Sabin Metals Corporation McAlpine mill (SMC) under the supervision of Soutex in order to reconcile the bulk sample grades against the resource estimate (Soutex, July 2013).

12.2 Gold Recovery Estimates

12.2.1 Projected Gold Recovery

The gold recovery results obtained from only two core samples (RL-01-01 and RL-01-02) were used to evaluate the average gold recovery using gravity and cyanide leaching for the preliminary economic assessment (SRK, 2013b). These results are presented in Figure 11.

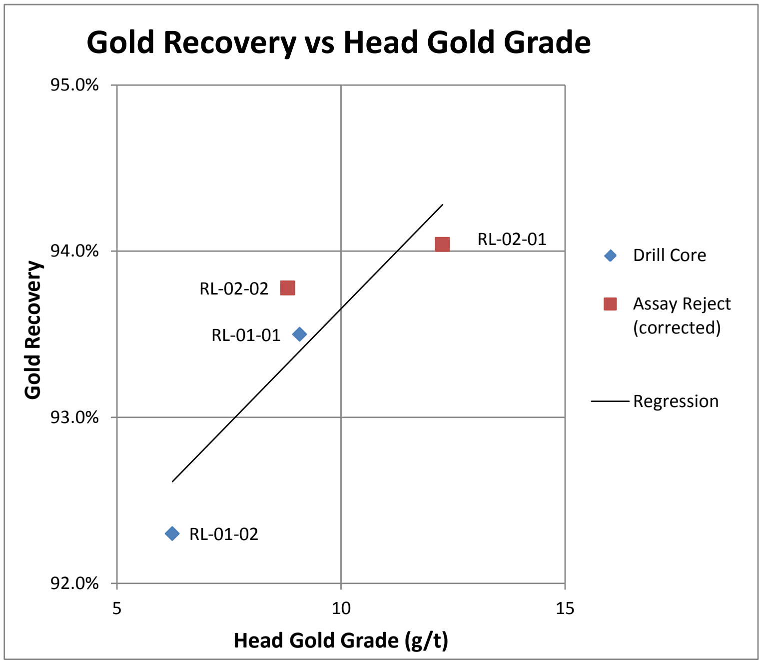


Figure 11: Effect of Head Gold Grade on Gold Recovery

12.2.2 Actual Gold Recovery Achieved During Operation in 2015

The mill commenced operation in May 2015 using gravity and carbon-in-leach to recover gold. Operation of the mill was intermittent as the mine could not sustain the permitted daily feed rate of 1,250 tonnes per day (t/d). Mill operation ceased on November 21, 2015 and the majority of the gold locked in the process plant was recovered during cleanup.

During commissioning and start-up of the process plant, the mill treated low grade mineralized material mined during underground mine development. The actual gold recovery achieved from the processing of 57,793 t ore grading an average of 2.89 grams of gold per tonne (g/t) from trial stopes between May and December 2015 was 91.5 percent (%). This result is consistent with the results obtained in the metallurgical testwork used for the estimates used in the preliminary economic assessment (Figure 11). In the preliminary economic assessment, the grade recovery relationship was developed from a small number of samples with head grades in a higher range than were delivered from the stopes mined. By extrapolating this curve into the lower head grade range of the mineralized material milled in 2015, the expected recoveries fall into the 88-90% range. The recoveries achieved by the mill are relatively high at 91.5%.

The final reconciled metallurgical data by month for the processing of test stope is shown in Table 14. Figure 12 displays the relationship between head grade and recovery derived from actual plant data combined with metallurgical test data.

Table 14: Monthly Metallurgical Reconciliation for 2015 During Trial Stoping

Parameter	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Mill Feed (tonnes dry)	13,226	11,747	5,940	8,460	6,318	275	11,826	-	57,793
Gold Poured (oz)	0	742	448	570	738	0	1,915	-	4,412
Inventory Change (oz)	795	-227	116	319	-172	34	-370	-	493
Change in Cathodes (oz)	0	178	94	49	100	0	-421	-	0
Gold in Tails (oz)	73	76	36	102	75	2	93	-	457
Gold in Mill Feed (oz)	868	769	693	1,041	740	35	1,217	-	5,362
Grade (g/t)	2.04	2.04	3.63	3.83	3.64	4.00	3.20	-	2.89
Recovery	91.5%	90.1%	94.8%	90.2%	89.9%	94.7%	92.4%	-	91.5%
Gold Recovered (oz)	795	693	657	938	665	34	1,124	-	4,906

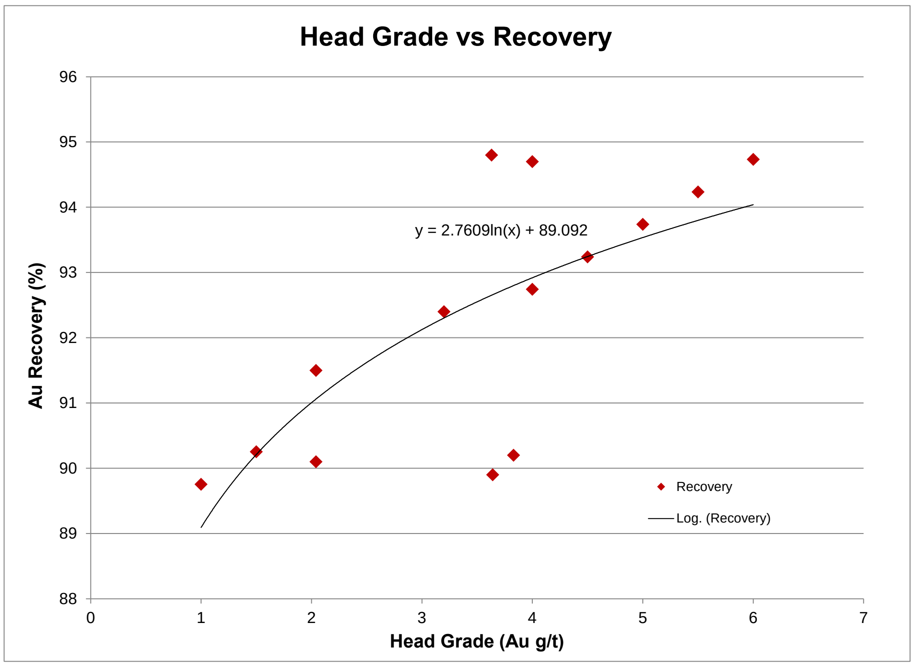


Figure 12: Head Grade and Recovery Derived from Actual Plant Data and Metallurgical Test Data

12.2.3 Improvements in Gold Recovery

It is anticipated that with better knowledge of the gold deportment in the various zones of gold mineralization combined with steady state operation, higher head grades, and with continuous operational improvement efforts, gold recoveries greater than 91.5% may be realized in future years of operation.

12.3 Mill Feed Sources

During commissioning and start-up of the process plant, the mill treated low grade mineralized material mined during underground mine development. This is standard practice in commissioning a new facility. The main source of feed was from the hanging wall (HW) of the main F2 gold deposit. Four stopes (030, 489, 159, 161) plus development muck accounted for 61% of the mineralized material milled. The balance of mill feed was mined from four stopes (977, 994, 065, 164) plus development muck in the F2 zone and account 17% of the mineralized material milled. The remaining 22% of tons milled was waste rock that entered the system while mining low grade.

12.4 Factors with Possible Effect on Potential Economic Extraction

12.4.1 Main Process Equipment

For operation of the grinding circuit at 1,250 t/d, it was expected that the SAG mill would be operated at a lower speed with a reduced ball charge. This was experienced in the early stages of operation. Although the mill is currently permitted to process up to 1,250 t/d, the mill is capable of processing approximately 1,800 t/d. For the envisaged future expansion at 2,500 t/d, the ball charge and mill speed would be increased and a pebble crusher might be needed to crush the SAG mill recirculating load in order to reach the production target. One additional ball mill is expected at 2,500 t/d as well as a second hydrocyclone cluster. Provision has also been made for a pre-crushing unit to support the grinding circuit if required and a second stripping column.

At the paste plant, for normal operation 1 disc filter would meet the operating requirement at 1250 t/d with the second unit on standby. At 2,500 t/d rate both disc filters would be required to operate to satisfy peak demand for paste. With paste plant utilization forecast at only 50%, the decision to add a third disc filter could be deferred until there is a definite need for additional capacity.

12.4.2 Plant Tailings Toxicity

Carbon-in-leach plant tailings are treated using the SO_2/air cyanide process and cyanide levels less than 5 parts per million (ppm) were consistently achieved.

12.4.3 Tailings Management Facility Effluent

The cyanide in the carbon-in-leach tailing is destroyed using the SO_2-air process. Cyanate ions are produced as a product of the destruction process. The cyanate breaks down producing ammonia. Ammonia is a regulated discharge parameter that must be kept within the allowable limits.

During initial operation ammonia concentrations in the tailing supernatant exceeded the allowable discharge limits. The sources of ammonia were identified to be 1) the cyanide destruction circuit and 2) the mine water which was pumped from underground to the tailings management facility. In order to comply with discharge limits, Rubicon implemented several mitigation measures. These included: 1) eliminating the use of ANFO explosives underground 2) locally treating mine water with zeolite in the mine and 3) installing a temporary ammonia removal system at the mill using zeolite to lower ammonia to meet discharge limits. A volume of 91,237 cubic metres (m^3) was successfully treated and discharged to the environment between September and November 2015.

Further testing and study work is required to develop and implement a permanent long term solution for tailings management facility management. Improved tailings deposition methods and effluent treatment processes to remove ammonia and any other deleterious elements are being considered.

13 Mineral Resource Estimates

This section describes the methodology and summarizes the key assumptions considered by SRK to prepare a new Mineral Resource Statement for the Phoenix gold project. In the opinion of SRK, the resource evaluation reported herein is a reasonable representation of the gold mineral resources found in the F2 gold system at the current level of sampling. The mineral resources have been estimated in conformity with generally accepted CIM *Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines* and are reported in accordance with the Canadian Securities Administrators' National Instrument 43-101.

The updated mineral resource model is based on a revised geological model that considers information from additional underground development, test stopes, and considerably more core drilling information. The database used to estimate the Phoenix gold project mineral resources was audited by SRK. SRK is of the opinion that the current drilling information is sufficiently reliable to interpret with confidence the boundaries of the gold mineralization and that the analytical data are sufficiently reliable to support mineral resource estimation.

The mineral resource model considers new infill core drilling information (94,575 m) acquired since October 31, 2012, the cut-off date for the previous mineral resource evaluation (see Section 5.2.4). The mineral resources reported herein consider drilling information available to November 1, 2015 and was evaluated using a geostatistical block modelling approach constrained by 71 explicit gold mineralization wireframes interpreted using a 3 grams of gold per tonne (g/t gold) cut-off grade (HG) and enclosed in 19 explicit gold mineralization wireframes derived using a 0.5 g/t gold cut-off grade (LG). In addition, the mineral resource model considers information on geological continuity gained from approximately 10,200 metres (m) of underground workings exposing the gold mineralization on several levels and in test stopes. The mineral resource evaluation work discussed herein represents the third Mineral Resource Statement prepared for this project.

The construction of the mineral resource model was a collaborative effort between Rubicon and SRK personnel. The construction of the three-dimensional geology model and gold mineralization domains was completed under the direction of Dr. Jean-François Ravenelle, PGeo (APGO#2159), whereas most of the resource evaluation work was completed by Sébastien Bernier, PGeo (APGO#1847) and Dr. Oy Leuangthong, PEng (APGO# 2059). The assignment benefited from the senior review of Glen Cole, PGeo (APGO#1416). The SRK team that contributed to various portions of the gold mineralization domain modelling and mineral resource model is presented in Table 15.

Table 15: SRK Mineral Resource Modelling Team

Professional	Position	Site Visit	Responsibility
Mineralization Domain Modelling			
Dr. Jean-François Ravenelle, PGeo	Senior Consultant	X	3D domain modelling
Dominic Chartier, PGeo	Senior Consultant		3D domain modelling
Dr. James Siddorn, PGeo	Principal Consultant		Domain model review
Mineral Resource Estimation			
Sébastien Bernier, PGeo	Principal Consultant	X	Geostatistics and resource estimation
Dr. Oy Leuangthong, PEng	Principal Consultant		Geostatistical analysis
Dr. David Machuca, PEng	Principal Consultant		Geostatistical Support
Senior Review			
Glen Cole, PGeo	Principal Consultant	X	Domain and estimation review

SRK also benefited from the input of independent consultants engaged by Rubicon to review and validate the geological interpretation and resource modelling work. This consisted of Thomas C. Stubens, PEng, from Micon International Limited in Vancouver, British Columbia and Joseph G. Spiteri, PGeo, an independent mining consultant from Acton, Ontario.

The mineral resource estimate may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.

13.1 Resource Database

The Phoenix exploration database up to November 1, 2015 comprises 1,921 core boreholes (621,587 m), including drilling outside the F2 gold deposit prior to 2008. The final complete data set was received by SRK on November 24, 2015. The data informing the mineral resource model include 450,175 m of drilling in 1,381 core boreholes drilled primarily by Rubicon since 2008. The database includes information from 561 new core boreholes (94,575 m) that have been drilled since October 31, 2012. The majority of the new boreholes consisted of infill drilling targeting the Main Zone of the F2 deposit (Figure 10 in Section 9.2) from underground drilling stations.

In October 2015, Rubicon corrected the collar locations of new and previously drilled boreholes based on underground surveying and the known water level elevation of Red Lake above the deposit where drilling was completed on barges or the ice. The collar location changes varied from 1 to 5 m.

Rubicon flagged some 256 boreholes that should not be considered for mineral resource evaluation because they are historical boreholes, geotechnical boreholes, metallurgical boreholes, or samples were assayed at an uncertified on-site laboratory, or had not yet been sampled. Information from these boreholes was used to guide geological modelling and thus have an impact on the domain volumes, but the sample analytical data were not used for grade estimation. In 2013, the geology and mineral resource model considered information from core boreholes drilled since 2008.The geology and mineral resource model discussed herein considers information from certain core boreholes targeting the Hangingwall zone of the F2 gold deposit drilled between 1984 and 1987.

Of the core boreholes in the exploration database, 1,049 boreholes were drilled from underground platforms (289,455 m) and 616 boreholes were drilled from surface (304,514 m). SRK received the borehole sampling data in a Microsoft Excel Spreadsheet file and subsequently converted the data into a series of CSV files for import into Leapfrog Geo for domain modelling and Datamine Studio 3 for block modelling and resource estimation.

All borehole data are located using the local mine grid coordinate space. The mine grid is rotated clockwise by 45° relative to the UTM grid.

SRK performed the following validation steps on the borehole data:

- Checked minimum and maximum values for each quality value field and confirmed and edited those outside of expected ranges
- Checked for gaps, overlaps, and out of sequence intervals for both assays and lithology tables

Additional data provided by Rubicon consist of a DXF file format of the mine workings dated December 15, 2015, a DXF of the lake bottom surface, a crown pillar surface representing the lake bottom surface projected 40 m downward vertically, and the outline of the property boundary.

13.2 Geological Modelling

The 3D geological model construed by SRK in 2013 was updated to account for 94,575 m of new infill drilling data and for structural geology investigations conducted in recently developed underground workings. While the new geological information provided by the infill drilling and underground workings confirms the conceptual geological interpretation of 2013, the controls on the distribution of higher grade gold mineralization are now better defined. This includes modelling the distribution and geometry of D_2 shear zones, now interpreted as an important control on the gold mineralization, as well as updating the distribution of HiTi basalt and felsic intrusive units, the two main hosts for the gold mineralization. A 5-metre wide breccia unit with a strike length of approximately 50 metres and a down-dip distance of approximately 190 m was also modelled. The 3D geological model was updated in the Main Zone area only.

In order to constrain grade estimation, two sets of gold mineralization explicit wireframes were constructed by SRK and Rubicon:

1. Broader zones of gold mineralization (up to 70 m thick) interpreted using a threshold of 0.5 g/t gold and labeled Low Grade domains (LG) (Figure 13A).
2. Discrete wireframes (between 0.5 and 10 m thick) defined using a threshold of 3.0 g/t gold and labeled High Grade domains (HG) (Figure 13B).

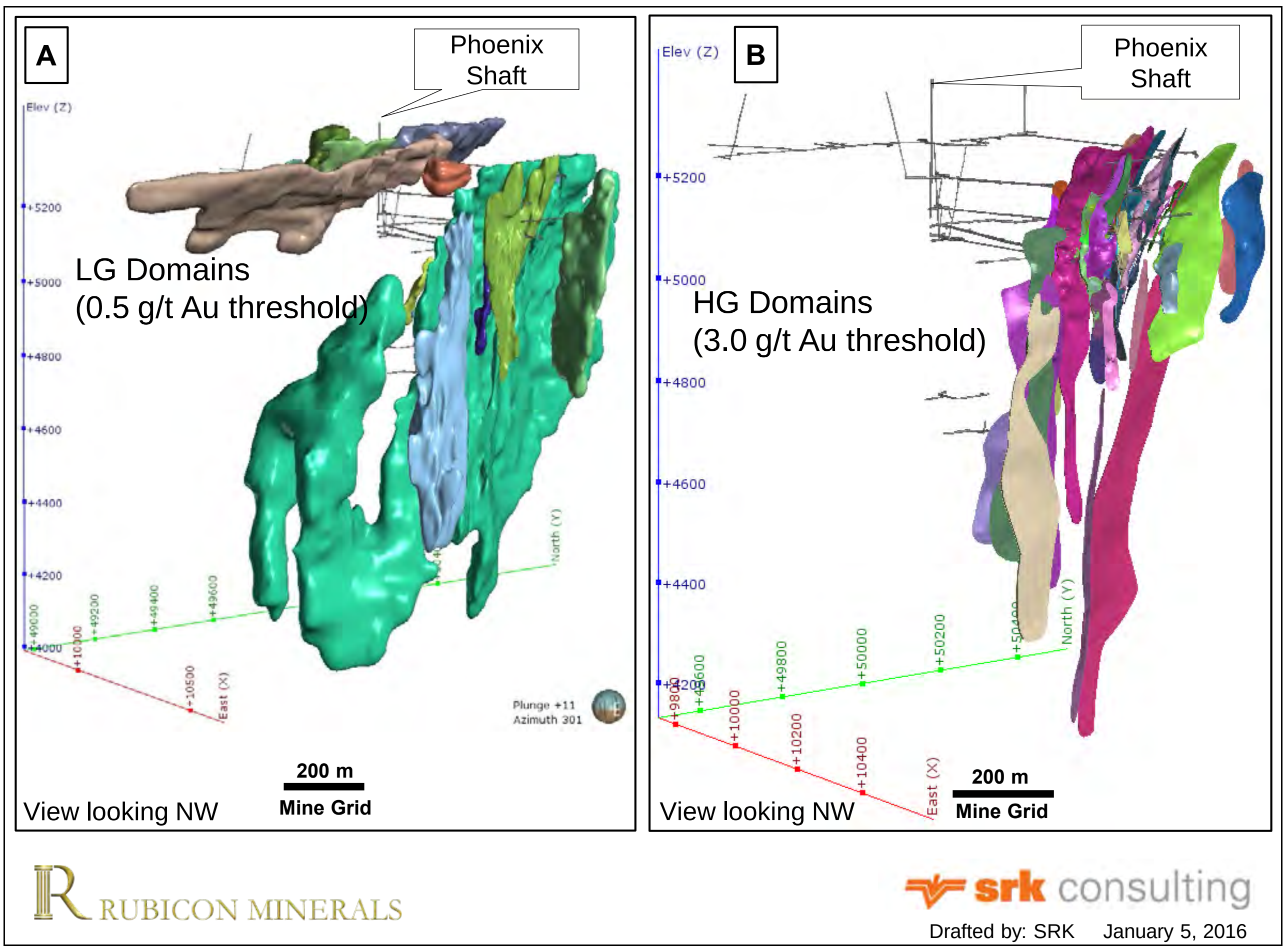


Figure 13: Oblique View Looking North (Mine Grid NW) of Lower Grade Gold Mineralization Wireframes (Left); and Higher Grade Gold Mineralization Wireframes (Right)

The discrete HG domains were constructed as explicit wireframes using interval selections of assay data while the broad LG domains were constructed with polylines on vertical sections. The domains were not modelled as grade interpolants.

The broad LG gold wireframes encompass broad halos of gold mineralization interpreted to largely include the earlier stage of gold mineralization (see Section 6.3.2). Within the Main Zone, the broad wireframes grossly follow the trend of the HiTi basalt and felsic intrusive units. These wireframes can locally include erratic high grade gold samples that could not be included in discrete wireframes (described below) due to the lack of demonstrated continuity or because they are located in areas of low drilling density (spacing over 100 m approximatively).

The discrete HG gold wireframes were built to capture higher grade gold mineralization which is largely related to the later phase of gold mineralization (Section 6.3.2). The bulk of these wireframes occurs within HiTi basalt units and only 14 of the 71 HG wireframes occur in other rock types (13 in felsic intrusive rock and 1 in ultramafic rock). One HG wireframe is modelled along a breccia unit that cuts HiTi basalt. These wireframes represent zones within which a concentrated distribution of boreholes intersected grade values above 3 g/t gold. The extent of each wireframe was stopped halfway to peripheral boreholes that did not intersect gold mineralization above 3 g/t gold. The vertical orientation of these wireframes is controlled by the intersection between D_2 structures and the HiTi basalt units. In ultramafic rock, D_2 shear zones are not significantly auriferous.

The new insight provided by the large amount of infill drilling, the underground development and test stopes in the Main Zone has improved the understanding about the distribution of the higher grade gold mineralization often related to D_2 shear zones, and exposed its challenging continuity between borehole samples. As a result, the volume of modelled HG domains has been reduced considerably relative to that modelled in 2013. Figure 14 and Figure 15 shows examples where infill drilling has restrained the continuity of gold mineralization within modelled domains. The extents of HG wireframes in regions of more widely spaced drilling were also restrained to match the continuity demonstrated in more tightly drilled areas. Higher grade gold mineralization exists in those areas outside the core of the modelled HG zones, but will require additional infill drilling to confirm its continuity.

In total, SRK and Rubicon defined 71 discrete HG domains and 19 broad LG domains for a total of 90 gold mineralization domains (Table 16) that were used as domains to constrain grade estimation. Figure 16 shows all wireframes colored according to their respective zone within the Phoenix project (Main and Hangingwall).

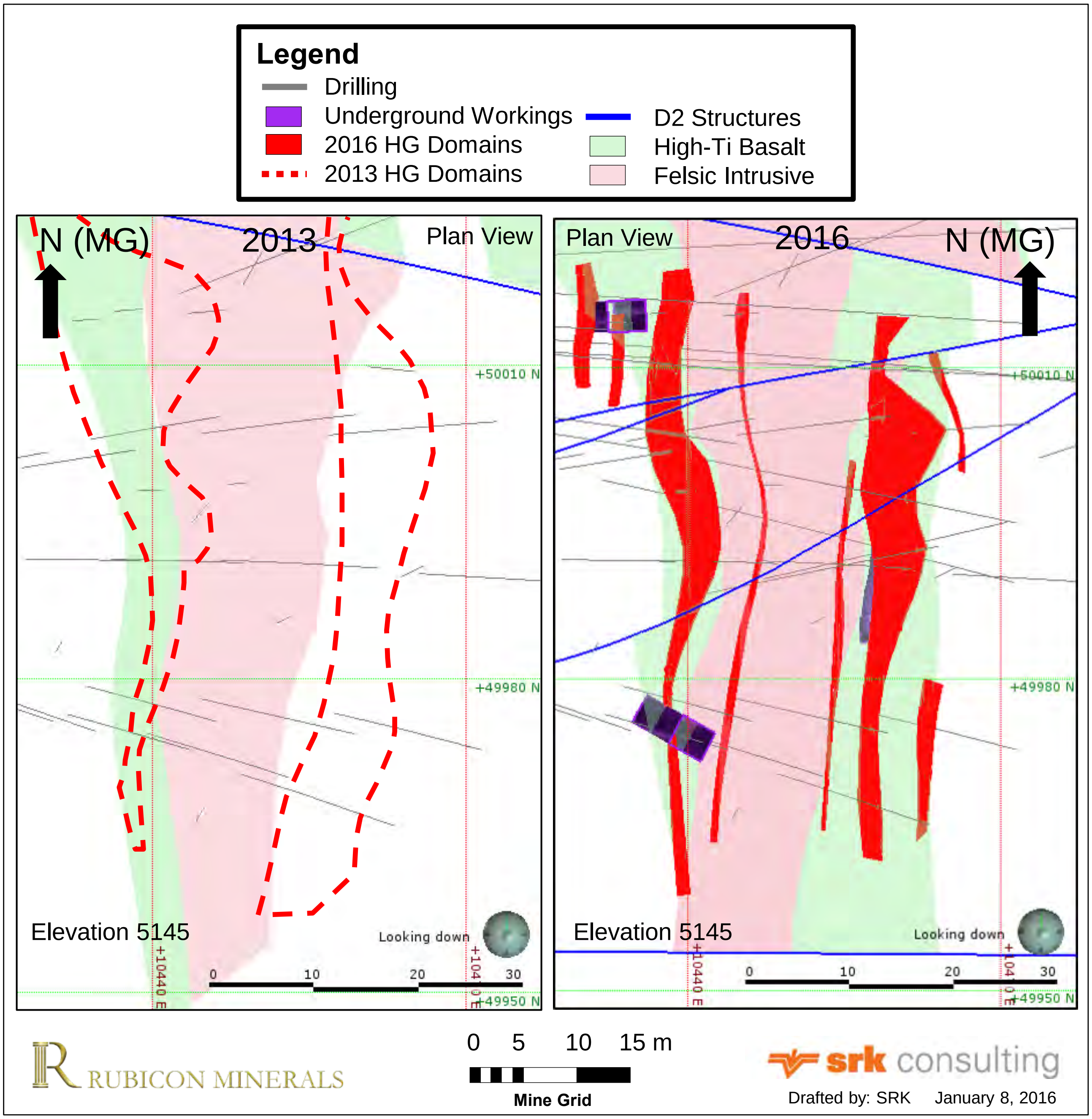


Figure 14: Plan View of Geological Domains and Gold Mineralization Domains in 2013 (Left) and 2016 (Right)

Plan depicts a 15-metre slice at 5,145 elevation.

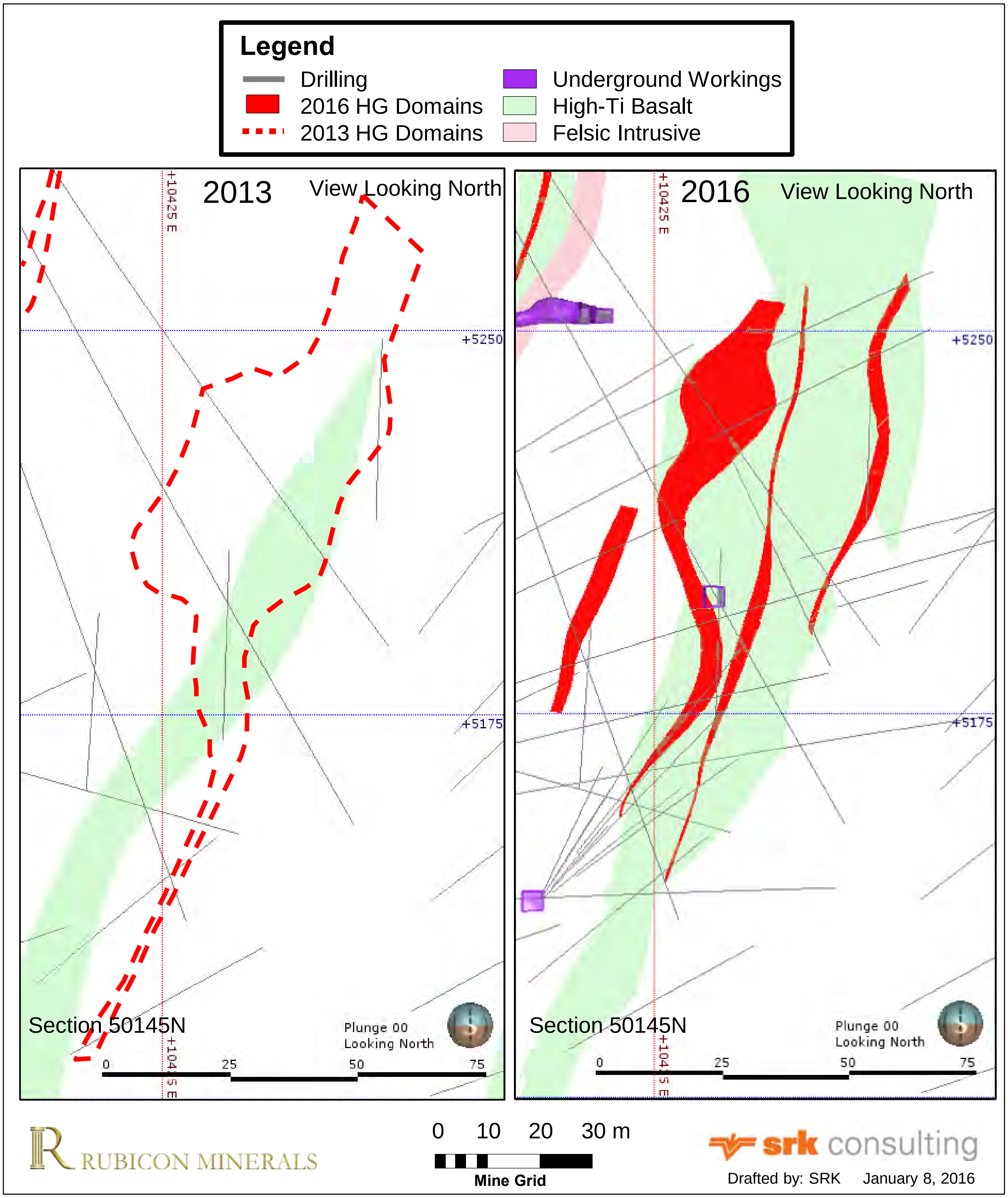


Figure 15: Vertical Cross Section of Geological Domains and Gold Mineralization Domains in 2013 (Left) and 2016 (Right)

Section depicts a 15-metre slice on Section 50145 North.

Table 16: Modelled Domains and Estimation Codes per Resource Area

Domains*	Estimation Code	Resource Area	Domains*	Estimation Code	Resource Area
3.0 g/t Au HG Domains*			54-HG_HT-3	1338	Main Zone
01-HG_HT-1	1101	Main Zone	55-HG_HT-3	1339	Main Zone
02-HG_HT-1	1102	Main Zone	56-HG_HT-3	1340	Main Zone
03-HG_HT-2	1201	Main Zone	57-HG_HT-3	1341	Main Zone
04-HG_HT-2	1202	Main Zone	58-HG_HT-3	1342	Main Zone
05-HG_HT-2	1203	Main Zone	59-HG_HT-3	1343	Main Zone
07-HG_HT-2	1204	Main Zone	60-HG_HT-3	1344	Main Zone
08-HG_HT-2	1205	Main Zone	61-HG_HT-3	1345	Main Zone
09-HG_HT-2	1206	Main Zone	76-HG_HT-3	1346	Main Zone
11-HG_HT-3	1301	Main Zone	78-HG_HT-3	1347	Main Zone
12-HG_HT-3	1302	Main Zone	79-HG_HT-3	1348	Main Zone
13-HG_HT-3	1303	Main Zone	62-HG_FI-1	2101	Main Zone
14-HG_HT-3	1304	Main Zone	65-HG_FI-1	2102	Main Zone
15-HG_HT-3	1305	Main Zone	66-HG_FI-1	2103	Main Zone
16-HG_HT-3	1306	Main Zone	74-HG_FI-1	2104	Main Zone
17-HG_HT-3	1307	Main Zone	06-HG_FI-2	2201	Main Zone
18-HG_HT-3	1308	Main Zone	69-HG_FI-2	2202	Main Zone
20-HG_HT-3	1309	Main Zone	75-HG_FI-2	2203	Main Zone
21-HG_HT-3	1310	Main Zone	19-HG_FI-3	2301	Main Zone
22-HG_HT-3	1311	Main Zone	63-HG_FI-5	2501	Main Zone
23-HG_HT-3	1312	Main Zone	67-HG_FI-5	2502	Main Zone
24-HG_HT-3	1313	Main Zone	68-HG_FI-5	2503	Main Zone
25-HG_HT-3	1314	Main Zone	73-HG_FI-5	2504	Main Zone
26-HG_HT-3	1315	Main Zone	64-HG_FI-6	2601	Main Zone
28-HG_HT-3	1316	Main Zone	10-HG_BR	3101	Main Zone
29-HG_HT-3	1317	Main Zone	77-HG_UM	4101	Main Zone
30-HG_HT-3	1318	Main Zone	**0.5 g/t Au LG Domains***		
31-HG_HT-3	1319	Main Zone	07-LG_HT	1191	Main Zone
32-HG_HT-3	1320	Main Zone	03-LG_HT-FI	1291	Main Zone
33-HG_HT-3	1321	Main Zone	01-LG_HT-3	1391	Main Zone
34-HG_HT-3	1322	Main Zone	02-LG_HT-3	1392	Main Zone
35-HG_HT-3	1323	Main Zone	05-LG_HT-FI	1901	Main Zone
36-HG_HT-3	1324	Main Zone	04-LG_FI-5	2591	Main Zone
37-HG_HT-3	1325	Main Zone	06-A-LG_FI	2901	Main Zone
39-HG_HT-3	1326	Main Zone	06-B-LG_FI	2902	Main Zone
40-HG_HT-3	1327	Main Zone	06-C-LG_FI	2903	Main Zone
41-HG_HT-3	1328	Main Zone	06-D-LG_FI	2904	Main Zone
42-HG_HT-3	1329	Main Zone	06-E-LG_FI	2905	Main Zone
43-HG_HT-3	1330	Main Zone	06-F-LG_FI	2906	Main Zone
44-HG_HT-3	1331	Main Zone	08-LG_HW	5901	Hangingwall
47-HG_HT-3	1332	Main Zone	09-A-LG_HW	5902	Hangingwall
48-HG_HT-3	1333	Main Zone	09-B-LG_HW	5903	Hangingwall
49-HG_HT-3	1334	Main Zone	09-C-LG_HW	5904	Hangingwall
51-HG_HT-3	1335	Main Zone	09-D-LG_HW	5905	Hangingwall
52-HG_HT-3	1336	Main Zone	09-E-LG_HW	5906	Hangingwall
53-HG_HT-3	1337	Main Zone	10-LG_HW	5907	Hangingwall

* Domain name includes primary lithological domain: HT - HiTi basalt; FI - Felsic Intrusive; BR - Quartz Breccia; UM - Ultramafic

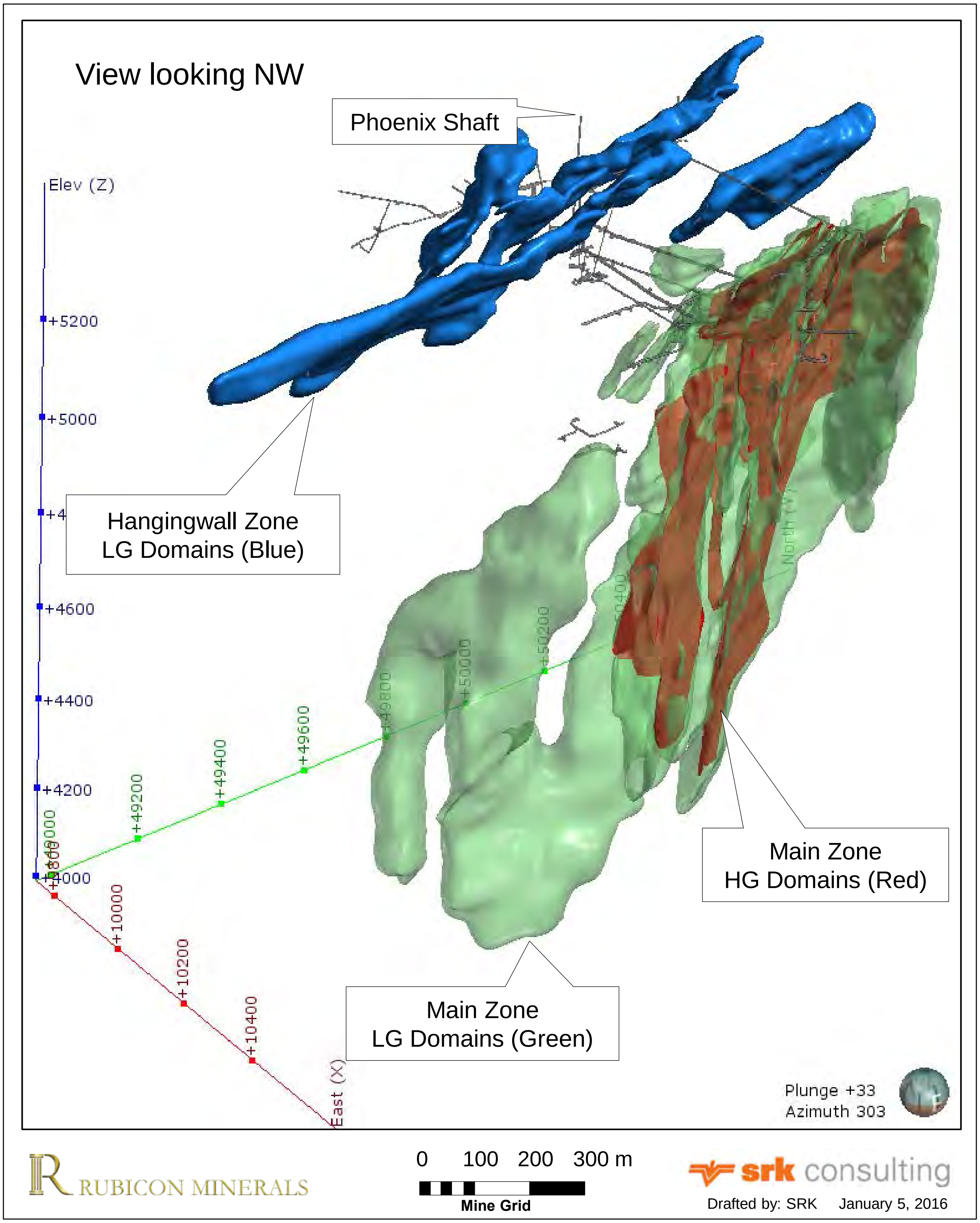
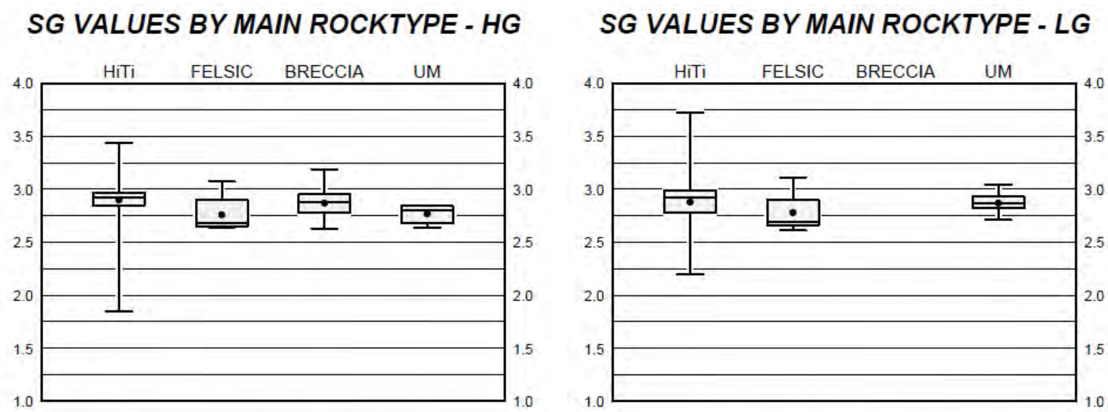


Figure 16: Oblique View Looking North (Mine Grid NW) Showing Gold Mineralization Domains Colored by Resource Areas

13.3 Specific Gravity Database

Rubicon measured specific gravity on small representative core pieces of selected sample intervals using a water displacement technique. A total of 2,668 specific gravity measurements are located within the resource domains modelled by SRK. The specific gravity data for the HG and LG domains as well as the host lithologies are summarized in Figure 17. A mean specific gravity value for the domain type and lithology were assigned to blocks to convert volumes into tonnages. For the LG domains in the Hangingwall zones where no data is available a specific gravity value of 2.88 was borrowed from the HiTi basalt LG domains.



	HG HiTi	HG FELSIC	HG BRECCIA	HG UM	LG HiTi	LG FELSIC	LG BRECCIA	LG UM	
Number of data	471	16	57	3	1752	289	0	80	Number of data
Mean	2.9	2.76	2.87	2.77	2.88	2.78		2.87	Mean
Std. Dev.	0.12	0.15	0.11	0.09	0.15	0.14		0.08	Std. Dev.
Coef. of Var.	0.04	0.06	0.04	0.03	0.05	0.05		0.03	Coef. of Var.
Maximum	3.44	3.07	3.19	2.85	3.72	3.11		3.04	Maximum
Upper quartile	2.97	2.9	2.95	2.84	2.99	2.9		2.93	Upper quartile
Median	2.92	2.68	2.88	2.8	2.92	2.69		2.87	Median
Lower quartile	2.85	2.65	2.78	2.68	2.78	2.66		2.82	Lower quartile
Minimum	1.85	2.64	2.63	2.64	2.2	2.61		2.71	Minimum

Figure 17: Specific Gravity Data for HG and LG Domains by Host Lithology

13.4 Capping and Compositing

The assay statistics were assessed for each domain separately. Length-weighted summary statistics are provided in Appendix B. SRK chose to cap the samples, prior to compositing. SRK relied on a combination of probability plots, decile analysis, capping sensitivity plots, and three-dimensional visualization to determine the capping values. Inflections in the probability plot or gaps in the high tail of the grade distribution are indicators of potential capping values. Decile analysis and spatial clustering were then used to confirm the reasonableness of capping threshold. The F2 gold deposit is highly sensitive to the choice of capping values. For example, in the HG domain 1201, there are 1,419 samples. A capping level of 120 g/t gold only eight samples are capped (less than 0.5% of the samples) but results in a reduction of the mean gold grade by 40%. This domain constitutes more than 10% of the resource volume for this deposit. For this reason, all subsequent analysis in the next sections will focus on the 1201 domain. All relevant statistics and plots for all domains are provided in Appendix B.

The choice of capping value is subjective, and in many cases, the range of possible capping values can be large. SRK anticipates that restricting the spatial influence of high grade samples might be required during estimation. For this reason, a capping value on the higher end of this range was selected. The capping values for each domain and the summary statistics of capped samples are also provided in Appendix B. Supporting probability plots for each domain, along with capping sensitivity plots, are provided in Appendix C.

Approximately 96% of all HG and 91% of all LG samples are 1.0 m or less in length (Figure 18). The thickness of the HG domains ranges from 0.5 to 10 m. For both HG and LG samples, SRK chose to composite at 1.0 m modal length, using a mode 1 approach in Datamine. Composite statistics are presented in Appendix B.

Due to the significant changes in the domain modelling, it is difficult to directly compare the capping values chosen in 2013 with those selected in 2016. Additional data in 2016 contributed to the enhanced definition of mineral resource domains, each characterized by a unique geostatistical signature. Capping was undertaken for data within each unique domain to preserve the grade integrity of each. In 2013 capping was applied to three zones; Main Zone: 200 g/t gold, HW: 150 g/t gold and External: 30g/t gold, whereas in 2016 capping was applied to 71 smaller HG domains with capping values ranging from 10 to 120 g/t gold and 10 LG domains ranging with capping values ranging from 5 to 45 g/t gold.

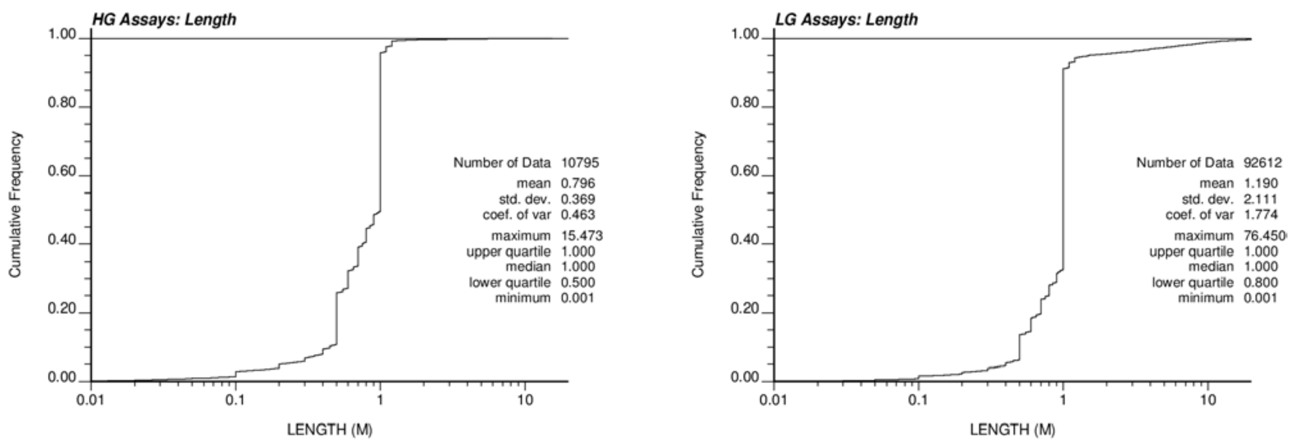


Figure 18: Length Cumulative Histograms for HG (left) and LG (right) Domains

13.5 Variography

Gold variograms were modelled for subgroups formed from the 90 HG and LG domains. The subgrouping is based on geology, orientation and proximity of the individual domains. For the 71 HG domains, a dynamic anisotropy approach was anticipated, thus orientation specification per domain is accounted for by the dynamic anisotropy field.

Variography was performed using the 1-metre composites. Directional variograms were calculated using the main orientation for each subgrouping of domains. In each case, SRK examined three different spatial metrics: (1) traditional semivariogram, (2) traditional correlogram, and (3) normal scores semivariogram. Where possible, the traditional semivariogram was the preferred spatial metric and formed the basis of the variogram model fitting. Overall, the majority of subgroups showed little to no continuity considering the traditional semivariogram; in these cases, SRK chose to model the normal scores semivariogram and then back-transformed the model to yield variogram structures in original gold units.

Table 17 and Table 18 summarize the modelled variograms for the various elements and domains. A full set of modelled variograms are provided in Appendix D. The variogram ranges are used to specify the size of the corresponding search ellipses used for the domains within the subgroups. For the 71 HG domains, all variogram and search orientations are controlled by the dynamic anisotropy field.

Table 17: Gold Variogram Models for the HG Subgroups

Groups	Domain	Datamine Angles*			Nugget	Structure No.	Variogram Parameters				
		1	2	3			cc	Type	1 (m)	2 (m)	3 (m)
1	1306, 1307, 1308, 1309, 1310, 1311, 1312, 1322, 1323, 1326, 1327, 1329, 1330, 1331, 2301, 1328, 1348, 4101	165	80	0	0.20	1	0.55	Exp	5.5	8	12
						2	0.25	Sph	7.5	65	12
2	1305, 1313, 1314, 1316, 1317, 1318, 1319, 1324, 1325, 1315, 1320, 2503	165	75	0	0.25	1	0.60	Exp	5.5	14	14
						2	0.15	Sph	10.0	70	25
3	1301, 1302, 1303, 1321	170	65	0	0.25	1	0.40	Exp	2.0	50	15
						2	0.35	Sph	2.0	75	25
4	2101, 2102, 2601, 2104	15	90	0	0.35	1	0.30	Exp	2.0	35	10
						2	0.35	Sph	3.0	60	20
5	1343**, 1344, 1345, 1206	15	85	0	0.25	1	0.60	Exp	3.5	14	8
						2	0.15	Sph	3.5	30	18
3101	3101	115	60	0	0.30	1	0.55	Exp	3.1	12	7
						2	0.15	Sph	3.1	25	14
8	1102, 1201, 1202, 2103, 2201, 2501, 2502, 2202, 2504, 2203	170	75	0	0.20	1	0.57	Exp	5.0	23	15
						2	0.23	Sph	5.0	70	25
9	1332, 1333, 1334, 1335, 1336, 1346	220	60	0	0.30	1	0.50	Exp	6.5	60	20
						2	0.20	Sph	6.5	65	25

* Datamine Studio 3 convention axis rotated about Z, X, Y (312)

** Based on domain 1343 only

Cc = variance contribution

Type = variogram structure type. Exp=Exponential, Sph=Spherical

Table 18: Gold Variogram Models for the LG Subgroups

Groups	Domain	Datamine Angles*			Nugget	Structure No.	Variogram Parameters				
		1	2	3			cc	Type	1 (m)	2 (m)	3 (m)
1	1391, 1392	170	90	0	0.20	1	0.55	Exp	8.0	10	12
						2	0.25	Sph	15.0	130	8
2	1291	170	55	0	0.10	1	0.55	Exp	20.0	70	20
						2	0.35	Sph	200.0	100	200
3	2591	175	50	-10	0.20	1	0.40	Exp	18.0	10	42
						2	0.40	Sph	18.0	40	42
4	1901	90	20	0	0.15	1	0.45	Exp	20.0	10	10
						2	0.40	Sph	20.0	65	60
5	2901, 2904, 2905	190	-75	0	0.30	1	0.55	Exp.	20.0	10	3
						2	0.15	Sph.	100.0	25	20
6	2902, 2906	160	-65	0	0.3	1	0.55	Exp.	7.0	10	7
						2	0.10	Sph.	120.0	10	15
						3	0.05	Sph.	120.0	80	20
7	2903	25	-85	0	0.2	1	0.70	Exp	7.0	7	4
						2	0.10	Sph	20.0	20	8
8	5901, 5902, 5904,5905, 5906, 5907	150	-40	0	0.35	1	0.60	Exp	5.0	5	4
						2	0.05	Sph	100.0	100	15
9	5903	140	-60	0	0.30	1	0.65	Exp	6.0	9	6
						2	0.05	Sph	20.0	40	16

* Datamine Studio 3 convention axis rotated about Z, X, Y (312) for Groups 1 to 4; Z, Y, X (321) convention used for Groups 5 to 9

Cc = variance contribution

Type = variogram structure type. Exp=Exponential, Sph=Spherical

13.6 Block Model Definition

Criteria used in the selection of block size included the borehole spacing, composite length, the geometry of the modelled domains, and the anticipated mining method. In collaboration with Rubicon, SRK chose a block size of 2.5 by 5 by 5 m. Subcells, at 0.5 m resolution, were used to honour the geometry of the modelled mineralization. Subcells were assigned the same grade as the parent cell. No rotation was applied. The block model coordinates are based on a local mine grid. The characteristics of the block model are summarized in Table 19.

Table 19: Phoenix Project Block Models Specification

Axis	Block Size (metres)		Origin*	Number of Cells
	Parent	Sub cell		
X	2.5	0.50	9,000	800
Y	5.0	0.50	48,000	600
Z	5.0	0.50	3,000	600

* Expressed as mine grid coordinates

13.7 Grade Estimation

The block model was populated with a gold value using ordinary kriging, informed by composite data and three estimation runs with progressively relaxed search ellipsoids and data requirements. Table 20 summarizes the search parameters used for each estimation pass. Each domain was estimated using a hard boundary approach that is using only the composites from that domain.

Table 20: Summary of Gold Estimation Search Parameters

Parameter	1st Pass	2nd Pass	3rd Pass*
Element estimated	Au	Au	Au
Interpolation method	Ordinary kriging	Ordinary kriging	Ordinary kriging
Search range X	1 x Var range	1 x Var range	2 x Var range
Search range Y	1 x Var range	1 x Var range	2 x Var range
Search range Z	1 x Var range	1 x Var range	2 x Var range
Minimum number of composites	7	4	2
Maximum number of composites	12	16	25
Octant search	Yes	No	No
Minimum number of octant	5	-	-
Minimum number of composites per octant	1	-	-
Maximum number of composites per octant	10	-	-
Maximum number of composites per borehole	3	3	3

* For select domains ranges were increased up to four times the variogram range to ensure full coverage of the domains

In the F2 gold system, higher grade gold mineralization is associated with crosscutting D_2 structures and the plunge of the gold mineralization within a given domain is controlled by the line of intersection between the domain and the crosscutting structure. A structural model representing the main structures mapped in the underground workings was constructed by SRK and Rubicon, and for each of the 71 HG domains, polylines representing the intersection of the modelled structures with the HG domains were digitized. These polylines were subsequently used to calculate dip and dip directions of the preferential grade continuity. Using the dynamic anisotropy function in Datamine Studio 3, these polylines were used to assign an estimated dip and dip direction for each cell of that domain in the block model. These directions were directly used by the search ellipses and variogram models for the estimation of the HG domains. In the LG domains, in which the geological and structural control on the mineralization is not well understood, the search ellipse orientation was given by the variogram models.

Given the sensitivity of the F2 gold deposit to a few high grade outliers and their highly localized occurrences learned from drilling, recent underground development and trial stoping, SRK chose to further limit the influence of high grade composites by restricting their spatial influence. This allows further controls of high grade smearing during grade estimation. The spatial restriction of high grade composites was applied to domains that were quite sensitive to capping, the range of capping levels that could have been chosen, and on the domain's materiality to the mineral resource based on volumetric contribution. The selection of grade thresholds and radial limit restrictions was based on a combination of indicator variograms, probability plots and estimation sensitivity runs. Indicator variograms were calculated to determine the grade threshold at which spatial correlation deteriorates, probability plots were then used to verify that the grade thresholds correspond to a change in the distribution, and estimation sensitivities were then visualized to determine reasonableness of the estimated grades. This analysis was performed collaboratively with geologists from Rubicon, and independent consultants. Table 21 lists the domains where a spatial restriction was applied to high grade composites, the thresholds used and the restricted radius length.

Table 21: Domains Affected by and Thresholds Used for High Grade Limited Radii

Domain	Threshold (g/t Gold)	Radii Limit (metres)
	HG Domains	
1201	35	10
1203	35	10
1204	35	10
1205	15	15
1301	45	20
1305	45	20
1306	45	20
1307	45	20
1308	45	20
1314	45	20
1324	45	20
1329	45	20
1335	45	20
1337	35	10
1343	45	20
1347	35	10
3101	30	10
	LG Domains	
1291	8	15
2591	7	15
2906	6	15

13.8 Model Validation and Sensitivity

SRK focussed on HG domain 1201 to evaluate the sensitivity of the block estimates to the estimation strategy. As described above, this domain is volumetrically large, anticipated to contribute a significant amount of contained metal, and likely represents one of the more complicated domains in this deposit. The following parameters were assessed for estimation sensitivity:

- Maximum number of boreholes used for a block estimate
- Minimum and maximum number of composites used for a block estimate
- Type of search used in Pass 1 (octant or ellipsoidal)
- Effect of grade capping by using uncapped gold composites, capping at two different values of 50 g/t gold and 120 g/t gold
- Effect of high grade limited radii, using two different sets of thresholds and radial limits (35 g/t gold limited to influence of 10-metre radii, and 25 g/t gold limited to influence of 20-metre radii)

The results of these sensitivities were compared globally considering global in situ quantity, grade, and contained metal at zero cut-off and at 4 g/t gold cut-off grade.

For a constant capping value of 120 g/t gold grade, SRK found that the model for Domain 1201 is not sensitive changing the minimum and maximum number of data, octant versus ellipsoidal search and maximum number of composites per borehole. Variations of these parameters have less than 2% impact in contained metal. The final set of data parameters are shown in Table 20.

Using the data constraints in Table 20, SRK then assessed the impact of dealing with high grade samples through a combination of grade capping and imposing spatial restriction to high grade data. A comparison of tonnage, grade and contained metal is shown in Table 22 for the various scenarios evaluated for domain 1201. Figure 19 shows the graphical comparison of contained metal for these four cases.

Table 22: Grade Tonnage Sensitivity to High Grade Outliers Treatment Strategies (HG Domain 1201)

Cut-off Grade (g/t)	Case 1 – 120 g/t cap, no HG limit			Case 2 – 50g/t cap, No HG limit			Case 3 – 120 g/t cap, 10m limit @ 35 g/t			Case 4 – 120 g/t cap, 20m limit @ 25 g/t		
	Tonnes (x1000)	Grade (g/t)	Metal (oz)	Tonnes (x1000)	Grade (g/t)	Metal (oz)	Tonnes (x1000)	Grade (g/t)	Metal (oz)	Tonnes (x1000)	Grade (g/t)	Metal (oz)
0.01	452	5.22	75,831	452	4.92	71,578	452	4.78	69,452	452	4.91	71,400
1	413	5.64	74,951	413	5.32	70,698	413	5.16	68,561	413	5.31	70,503
2	370	6.12	72,943	370	5.77	68,691	368	5.61	66,442	365	5.81	68,265
3	320	6.69	68,806	319	6.29	64,485	315	6.13	62,130	311	6.39	63,823
4	259	7.45	61,951	257	6.96	57,587	251	6.80	54,938	247	7.14	56,649
5	198	8.35	53,251	196	7.74	48,660	186	7.62	45,504	180	8.12	47,068
6	153	9.21	45,251	149	8.45	40,467	131	8.50	35,945	129	9.17	38,066
7	112	10.20	36,764	107	9.22	31,677	86	9.57	26,483	89	10.37	29,769
8	71	11.71	26,821	65	10.30	21,369	46	11.38	16,649	55	12.11	21,455
9	46	13.54	19,812	36	11.74	13,603	25	13.69	11,169	35	14.12	16,055
10	34	14.88	16,359	25	12.77	10,164	18	15.31	9,040	27	15.48	13,645

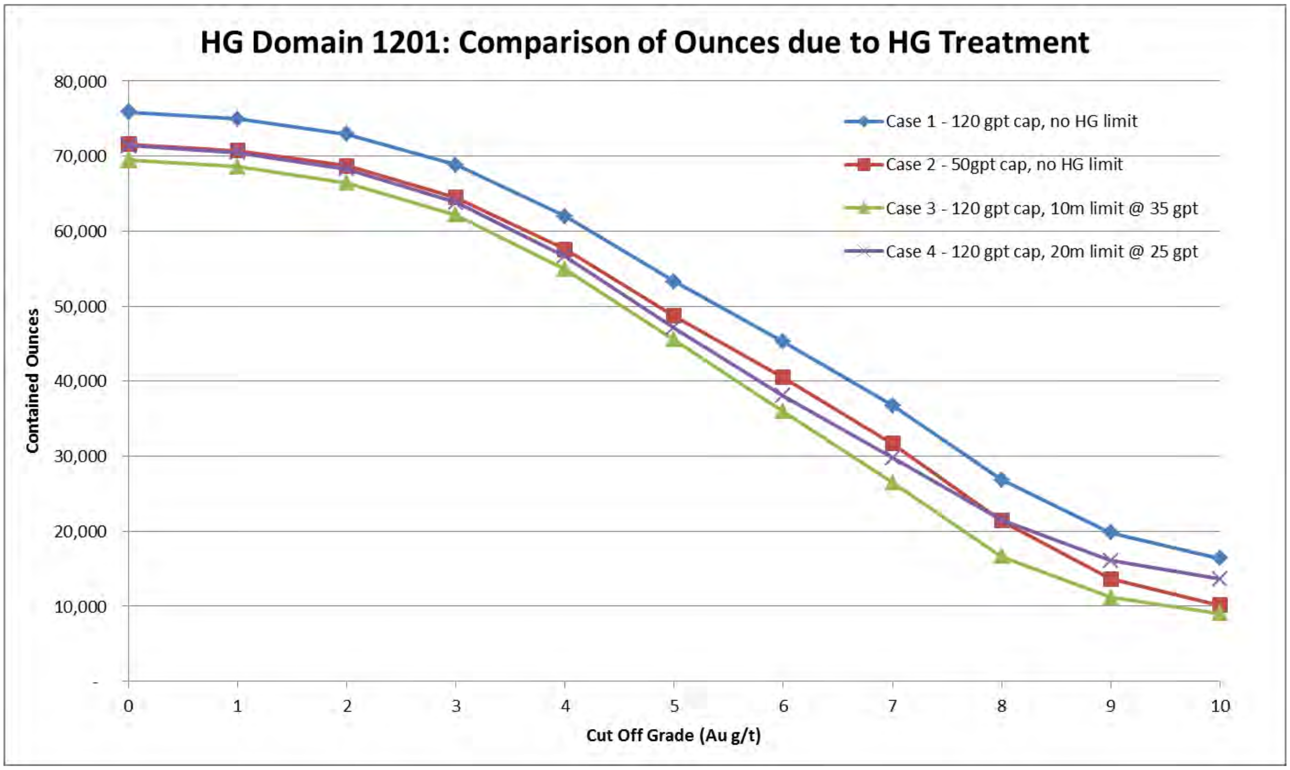


Figure 19: Comparison of Contained Gold for Domain 1201 Due to Different HG Treatment Strategies

At zero and 4 g/t gold cut-off grade, the impact of capping at a more conservative threshold of 50 g/t, relative to 120 g/t, is a 6% and 7% reduction in both gold grade and gold ounces, respectively. As expected, restricting the spatial influence of high grade samples with a higher capping value of 120 g/t gold (Cases 3 and 4 in Table 22) reduces average gold grade and contained metal relative to Case 1. Interestingly, these two cases also yield fewer gold ounces than imposing a 50 g/t gold capping value. A visual assessment of the block estimates shows that imposing spatial restriction to the high grade samples yields greater fidelity to the localized nature of the high grade occurrences, as observed by Rubicon and SRK in the field. The final case chosen for grade estimation was Case 3, and was based on overall quantitative and qualitative comparisons and mutual agreement by the team of SRK, Rubicon and independent consultants.

This grade estimation strategy was then carried out for all other domains, with a spatial restriction applied to high grade samples as shown in Table 21. For the larger HG domains and the main LG domain of 1291, a team of SRK, Rubicon and independent consultants reviewed the block model on a sectional basis, comparing block grades and nearby composites.

13.9 Mineral Resource Classification

Block model quantities and grade estimates for Phoenix were classified according to the CIM *Definition Standards for Mineral Resources and Mineral Reserves* (May 2014) by Sébastien Bernier, PGeo (APGO#1847) and Dr. Oy Leuangthong, PEng (PEO # 90563867).

Mineral resource classification is typically a subjective concept, and industry best practices suggest that resource classification should consider the quality and quantity of exploration data, the confidence in the geological interpretation and in the geological continuity of the mineralization, the geostatistical confidence in the quality of the estimates, and the continuity at the reporting cut-off grade. Appropriate classification criteria should aim at integrating these concepts to delineate regular areas at similar resource classification.

SRK is satisfied that the geological and gold mineralization model for the F2 gold deposit honours the current geological information and knowledge, including the vast amount of new information acquired since 2013 (94,575 m of core drilling, approximately 10,200 m of underground development, trial stoping and a structural geology investigations). The location of the samples and the analytical data are sufficiently reliable to support resource evaluation and do not present a risk that should be taken into consideration for classification. The mineral resource model is informed from core boreholes drilled with pierce points generally spaced approximately 15 to 25 m apart in the core of the deposit. The drilling density is sufficiently dense to demonstrate continuity of auriferous material along parts of the HiTi basalt units, ultramafic rock, crosscutting felsic intrusive rock, and breccia zone. Such parts are represented by the HG domains. The new drilling information acquired since October 2012 has improved the understanding of the distribution and complexity of the gold mineralization which exhibits considerable grade variations over distances shorter than the borehole spacing.

SRK considers that it is reasonable to classify blocks within the HG domains satisfying the following criteria in the Indicated category within the meaning of the CIM *Definition Standards for Mineral Resources and Mineral Reserves*. SRK considers that for those blocks the level of confidence is sufficient to allow appropriate application of technical and economic parameters to support mine planning and to enable an evaluation of economic viability worthy of public disclosure. Criteria applied to assign an Indicated classification include:

- Blocks located within a domain and estimated during the first pass within the variogram range
- Blocks informed by three or more boreholes and with composites from five octants

Conversely all other modelled blocks were classified in the Inferred category as the confidence in the estimates is insufficient to allow for the meaningful application of technical and economic parameters or to enable an evaluation of economic viability.

The automated classification was subsequently manually modified using Leapfrog Mining to smooth out the limits between classes, and reclassify isolated blocks. Isolated blocks or smaller cluster of blocks, far away from the main areas, were de-classified as Inferred. Overall, blocks classified in the Indicated category are informed from boreholes spaced at approximately 20 by 20 m.

13.10 Preparation of Mineral Resource Statement

CIM Definition Standards for Mineral Resources and Mineral Reserves defines 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 eventual 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 eventual 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 gold mineralization at the Phoenix project is amenable to underground extraction.

The assumptions considered to assist with the preparation of the Mineral Resource Statement were discussed with Rubicon and are summarized in Table 23.

Table 23: Assumptions Considered for Selection of Reporting Cut-Off Grade

Parameter	Value
Extraction Scenario	Underground mining
Gold recovery	92.50%
Gold price (US$/ounce)	US$1,125

After review, SRK considers that it is appropriate to report the mineral resources for the Phoenix gold project at a cut-off grade of 4.0 g/t gold.

Mineral resources were estimated in conformity with the generally accepted CIM *Estimation of Mineral Resource and Mineral Reserve Best Practices Guidelines*. The mineral resources may be affected by further infill and exploration drilling that may result in increases or decreases in subsequent resource estimates. The mineral resources may also be affected by subsequent assessments of mining, environmental, processing, permitting, taxation, socio-economic, and other factors. The Mineral Resource Statement for the Phoenix project is presented in Table 24. Mineralization excavated by underground development, stoping blocks and in a 40-metre crown pillar below the lake bottom is excluded from the Mineral Resource Statement. The effective date of the Mineral Resource Statement is January 11, 2016. Mineral resources are not mineral reserves and have not demonstrated economic viability.

Table 24: Mineral Resource Statement*, Phoenix Gold Project, Ontario, SRK Consulting (Canada) Inc., January 11, 2016

Resource Category	Quantity ('000 t)	Grade Au (g/t)	Contained Gold ('000 ounces)
Measured	-	-	-
Indicated	492	6.73	106
Measured + Indicated	**492**	**6.73**	**106**
Inferred	1,519	6.28	307

* Mineral resources are not mineral reserves and have not demonstrated economic viability. All figures are rounded to reflect the relative accuracy of the estimate. Samples have been capped where appropriate. Underground mineral resources reported at a cut-off grade of 4.0 g/t gold assuming a metal price of US$1,125 per ounce of gold and a gold recovery of 92.5%.

A breakdown of the mineral resources by underground is provided in Table 25.

Table 25: Mineral Resources by Underground Levels

Level	Indicated Mineral Resource*			Inferred Mineral Resource*		
	Tonnage ('000 t)	Grade Au (g/t)	Contained Gold ('000 oz)	Tonnage ('000 t)	Grade Au (g/t)	Contained Gold('000 oz)
122	5	5.74	1	12	7.7	3
183	59	6.59	13	71	5.3	12
244	122	6.16	24	66	5.82	12
305	128	6.63	27	82	6.24	17
366	125	7.22	29	120	6.31	24
427	52	7.37	12	136	6.53	29
488	0	4.17	0	186	5.73	34
549			-	90	5.61	16
610			-	88	5.98	17
671			-	112	5.78	21
732			-	88	5.25	15
793			-	79	5.42	14
854			-	75	6.17	15
915			-	84	7.25	20
976			-	56	8.06	15
1,037			-	60	8.13	16
1,098			-	48	8.32	13
1,159			-	36	8.2	9
1,220			-	30	6.26	6
1,281			-	1	4.65	0
1,342			-	0	4.15	0
1,403			-			-
1,464			-			-
1,525			-			-

* Mineral resources are not mineral reserves and have not demonstrated economic viability. All figures are rounded to reflect the relative accuracy of the estimate. Samples have been capped where appropriate. Underground mineral resources reported at a cut-off grade of 4.0 g/t gold assuming a metal price of US$1,125 per ounce of gold and a gold recovery of 92.5%.

13.11 Grade Sensitivity Analysis

The mineral resource model is sensitive to the selection of the reporting gold cut-off grade. To illustrate this sensitivity, the quantities and grade estimates are presented at various cut-off grades in Table 26 and as grade tonnages curves in Figure 20. The reader is cautioned that the figures presented in this table and the grade tonnage curves should not be misconstrued with a Mineral Resource Statement. The figures are only presented to show the sensitivity of the block model estimates to the selection of gold cut-off grade.

Table 26: Global Block Model Quantities and Grade Estimates* at Various Gold Cut-Off Grades

Cut-Off	Indicated Blocks			Inferred Blocks		
Grade Gold (g/t)	Tonnage ('000 t)	Grade Gold (g/t)	Contained Gold ('000 oz)	Tonnage ('000 t)	Grade Gold (g/t)	Contained Gold ('000 oz)
1.0	1,264	4.03	164	17,212	1.99	1,101
2.0	933	4.98	149	4,410	3.98	564
2.5	834	5.3	142	3,204	4.64	478
3.0	719	5.71	132	2,491	5.18	415
3.5	601	6.19	120	1,959	5.71	360
4.0	492	6.73	107	1,519	6.28	307
4.5	399	7.31	94	1,171	6.88	259
5.0	319	7.95	82	959	7.36	227
5.5	251	8.69	70	783	7.84	197
6.0	199	9.45	61	612	8.42	166
6.5	163	10.16	53	508	8.86	145
7.0	133	10.95	47	415	9.33	125
8.0	94	12.37	38	269	10.32	89
9.0	71	13.69	31	171	11.4	63
10.0	55	14.86	26	96	12.84	40

* The reader is cautioned that the figures in this table should not be misconstrued with a Mineral Resource Statement. The figures are only presented to show the sensitivity of the block model estimates to the selection of a cut-off grade.

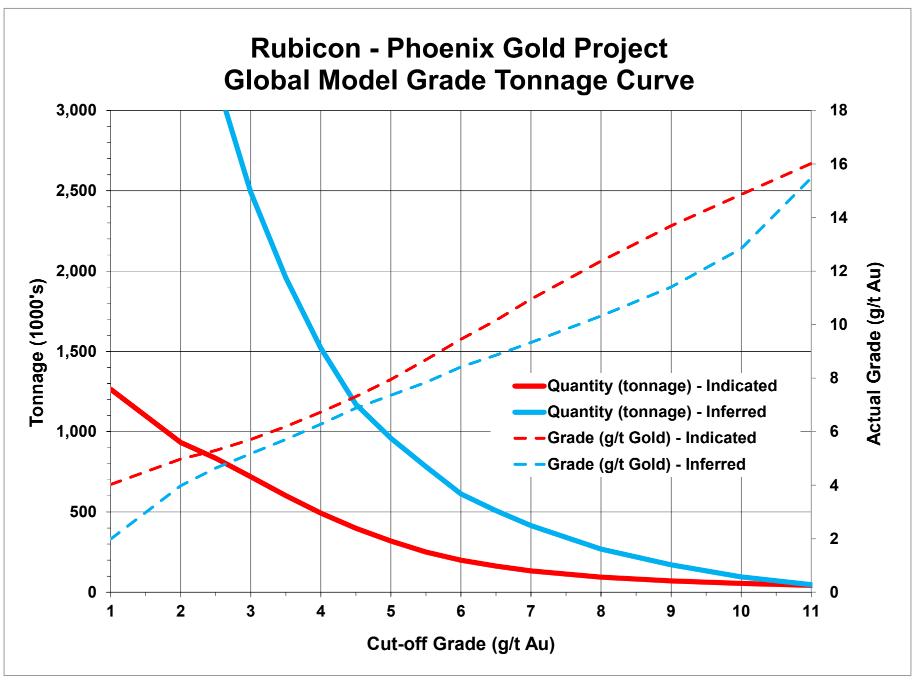


Figure 20: Grade Tonnage Curves for the Phoenix Project

The F2 gold deposit is characterized by very high grade gold mineralization and thus grade modelling is very sensitive to very few, extreme high grade samples. The impact of using capping and spatial restriction to the grade model is shown in Table 27. SRK cautions that the figures presented in Table 27 are not mineral resources. They are provided for the sole purpose of appreciating the impact of the treatment applied to limit the influence of the very few high grade samples.

Table 27 shows that grade capping reduces the global contained gold by 56%, and the spatial restriction applied to high grade samples further reduces the global contained gold for a combined impact of 69% less metal.

Table 27: Sensitivity of Estimates to High Grade Treatment Strategies

Category	Contained Gold ('000 ounces)*			Variation			
	Uncapped / No Limited Radii	Capped / No Limited Radii	Capped / With Limited Radii	Applying Capping		Applying Capping + Limited Radii	
Indicated	168	113	106	(55)	-33%	(62)	-37%
Inferred	1,167	479	307	(688)	-59%	(860)	-74%
Combined	**1,335**	**592**	**413**	**(743)**	**-56%**	**(922)**	**-69%**

* reported at a cut-off grade of 4.0 g/t gold

13.12 Reconciliation

It is difficult to reconcile the 2016 Mineral Resource Statement disclosed herein with the previous 2013 Mineral Resource Statement (2013 Technical Report) because the two mineral resource models are quite different. The 2016 mineral resource model considers an additional 94,575 m of core drilling and underground exposures of the gold mineralization that were not available for the 2013 model. This additional data and knowledge resulted in significant changes in domain modelling and estimation strategy. Nevertheless, a comparison is shown in Table 28 which attempts to compare quantities despite the significant changes in domain interpretation and their spatial extents.

Table 28: Comparison between the 2013 and 2016 Mineral Resource Statements

Category/Zone	Quantity ('000 tonnes)			Grade Gold (g/t)			Contained Gold ('000 ounces)		
	2013	2016	Change %	2013	2016	Change %	2013	2016	Change %
Main Zone									
Indicated	4,120	492	-88%	8.52	6.73	-21%	1,129	106	-91%
Inferred	6,027	1,519	-75%	9.49	6.28	-34%	1,839	307	-83%
Hangingwall*									
Indicated	-	-	-	-	-	-	-	-	-
Inferred	151	-	-100%	5.21	-	-100%	25	-	-100%
External**									
Indicated	-	-	-	-	-	-	-	-	-
Inferred	1,274	-	-100%	8.66	-	-100%	355	-	-100%
Combined									
Indicated	4,120	492	-88%	8.52	6.73	-21%	1,129	106	-91%
Inferred	7,452	1,519	-80%	9.26	6.28	-32%	2,219	307	-86%

* In the 2016 model no Hangingwall zone blocks are above the 4.0 g/t gold cut-off grade

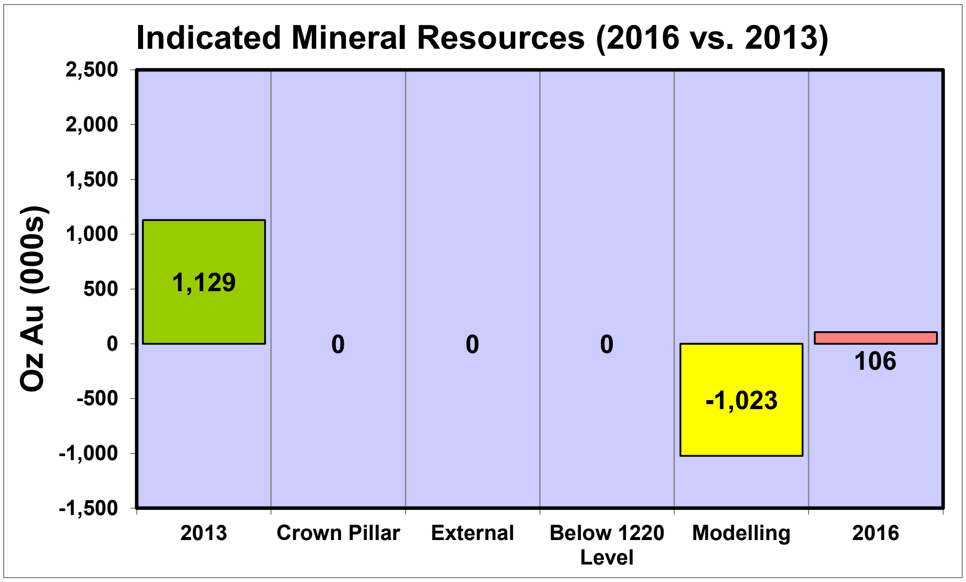
** Samples outside the HG and LG domains were not considered in the 2016 model

The primary factors contributing to the variance between the reported 2013 and 2016 mineral resource variances are presented in Table 29. The impact of these primary factors is also illustrated in Figure 21. Locally, significant gold mineralization exists outside the modelled domains. In 2013, to account for this mineralization, the areas located outside the modelled domains were also evaluated as a separate "unconstrained" domain (External domain) and the resulting blocks reported as Inferred mineral resources if they met the reporting assumptions. In 2016, the gold mineralization outside the modelled domains was not estimated.

As a result of the new geological interpretation that considers the 94,575 m of new core drilling and information from the underground workings, the 2016 mineral resource model shows a significant reduction in tonnage, which directly translates to a reduction in contained metal. To appreciate the spatial distribution of these changes, SRK generated vertical swaths comparing the tonnage, average grade and contained gold ounces in the F2 gold deposit at 4.0 g/t gold cut-off between the 2013 and 2016 resource models (Appendix E). Irrespective of the classification category, these plots show a significant tonnage reduction in the 2016 model, relative to the 2013 model, at all elevations and with no tonnages above cut-off below an the 1,150 level. The average grade of 2016 model is also consistently lower at all elevations. The combined impact of reduced tonnes and grade is a significantly muted profile of contained ounces.

Table 29: Primary Parameters which Contributed to the Reported 2013 – 2016 Mineral Resource Variance

Parameter	2013 Mineral Resource	2016 Mineral Resource	Impact
Informing Data			
Drilling data	820 core boreholes 355,600 m	1,381 core boreholes 450,175 m	Confirms complexity and limited grade continuity
Underground workings	Minimal gold mineralization exposed	>9,000 m of underground development and exposure of gold mineralization in trial stoping	Confirms complexity and limited grade continuity
Geological Modelling			
Wireframes/ Volumetrics	Continuity modelled based on available information	New data shows more limited high-grade continuity. HG domains only 17% of that in 2013	Reduced tonnes due to significantly narrower domains
High Grade Treatment Strategy			
Capping grade	Main Zone: 200 g/t Au HW: 150 g/t Au External : 30 g/t Au	HG: 10 - 120 g/t Au (71 domains) LG:5-45 g/t Au 19 domains	Reduced grade
HG limited radii	Not applied	HG composites limited to 10-20 m	Reduced grade
Exclusions			
	None	Crown pillar (40 m) Material external to wireframes Material below 1,220 level	-267,000 Inferred ounces -355,000 Inferred ounces -728,000 Inferred ounces



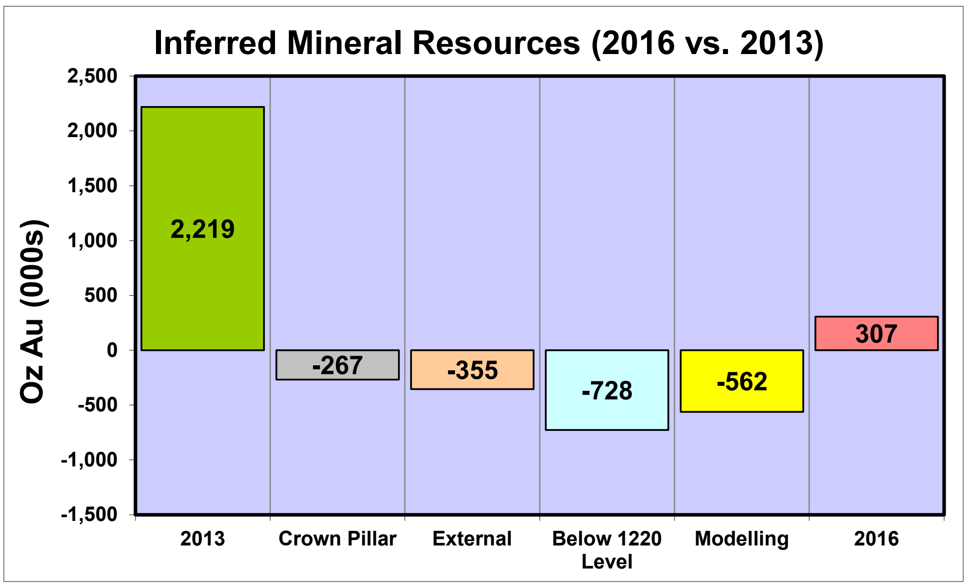


Figure 21: Charts Showing the Causes for the 2013 – 2016 Mineral Resource Variance

The volumetric variance noted above can be attributed to a change in the geological understanding brought about the large quantity of new infill drilling information and from the exposures of the gold mineralization in underground workings, resulting in a significant change to the geological interpretation and the modelling of the domains considered for resource modelling. Structural geology investigations of newly excavated underground workings (Stopes 161, 159, 489, and 015) locally highlight the variable continuity of the high grade gold mineralization within and across individual stopes. The higher density of drilling information acquired through the Main Zone since the 2013 model forced a reinterpretation of the extent of the discrete HG domains that are now volumetrically much smaller, but better defined, than those considered in 2013 as shown in plan view on Figure 14 and on a vertical cross section on Figure 15. The volumes of the new HG domains in the core area of the Main Zone now represent about 30 percent of what they were in 2013.

Given the more limited continuity of the gold mineralization demonstrated by the new infill drilling information acquired since 2013 and in the underground workings, and the complexity of the gold domains in those densely drilled areas, SRK and Rubicon used a more conservative approach to interpret discrete HG gold domains in areas of low drilling density (mainly below the 5,000-metre elevation). As a result, the overall volume of the HG domains at depth is much smaller than that in the 2013 model. Overall, the volume of the new HG domains is 17 percent of what they were in the 2013 model. This conservative modelling approach to areas of low drilling density needs to be checked by additional drilling.

Another significant change to the modelling approach relates to the grade estimation strategy. The 2016 resource model considers a dual approach to limit the influence of high grade samples. Due to the significant changes in the domain modelling discussed above, it is difficult to directly compare the capping values chosen in 2013 with those selected in 2016. Nevertheless, SRK notes that in the 2016 model high grade outliers were capped more conservatively. This more conservative approach is consistent with underground mining experience of Rubicon since 2013. In addition, a spatial restriction was introduced to limit further the influence of higher grade samples to reflect better the highly localized nature of their occurrence as demonstrated by infill drilling and in underground excavations. SRK, Rubicon and the independent geologists and engineers involved in the modelling project believes this approach was necessary to yield a more realistic model reflecting actual continuity of gold mineralization observed to date in underground workings.

SRK notes that there is an opportunity to increase the drilling density below 427 Level, which may significantly impact definition of gold domains (and therefore mineral resources) at these elevations.

14 Mineral Reserve Estimates

There are no mineral reserves to report at the Phoenix gold project.

15 Mining Methods

This technical report focusses on the technical information that is relevant to support the new Mineral Resource Statement disclosed by Rubicon on January 11, 2016. This technical report supersedes the 2013 Technical Report prepared by SRK for the Phoenix gold project. This section summarizes the information that is relevant about mining methods envisioned for this project. It is modified from the 2013 Technical Report. Where appropriate, it includes new information about mining activities that have occurred on the property since June 25, 2013.

The projected mining method and mine plan are conceptual in nature and additional technical studies will need to be completed in order to fully assess their viability. There is no certainty that a potential mine will be realized or that a production decision will be made. A mine production decision that is made without a feasibility study carries additional potential risks which include, but are not limited to, the inclusion of Inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. Mine design and mining schedules may require additional detailed work, economic analysis, and internal studies to ensure satisfactory operational conditions and decisions regarding future targeted production.

15.1 Previous Mining

The property has never been in commercial production to date, though a number of bulk samples have been taken in the past on both the F2 gold system and the unrelated mineralization that the McFinley mine was exploring. Trial stoping and milling was conducted on the F2 gold system by Rubicon at the Phoenix project.

In 1956, a 129-metre deep exploration shaft was sunk by McFinley Red Lake Gold Mines Ltd. and followed up with 414 metres (m) of lateral workings on two levels before work was suspended in mid-1957 (G.M. Hogg & Associates Ltd. 1983).

In 1984, the shaft was re-opened as the Phoenix Shaft and an additional 479 m of lateral development was completed on the 46 m (150 ft) and 122 m (400 ft) levels. After a temporary shutdown starting in February 1985, a further 1,151 m of lateral development and 10 m of raise development was completed prior to the decision to take a bulk sample in 1987. The bulk sample program started in July 1988 from prepared stoping areas (OMNDM 2013).

The level naming convention for the mine was originally measured in feet below the shaft collar. The 400 foot level was the original bottom level of the McFinley mine and is now referred to by its metric equivalent, the 122 level. The project uses the metric system and all measurements are metric.

Mining exploration activities on the property were terminated in 1989 after test-milling of an estimated 2,250 t of material unrelated to the F2 gold system.

Rubicon acquired the property in June 2002 and resumed exploration work.

In 2009, the existing shaft was dewatered and reconditioned to support an advanced exploration program. In June 2009, shaft sinking started to deepen the existing shaft to 350 m and a 3-tonne loading pocket was installed to support development at the 305 level, followed by lateral and vertical development on the 244 and 305 levels. This lead to two approximately 1,000-tonne bulk samples being excavated on the 305 m level in 2011 using development methods.

Shaft sinking resumed in July 2012 after upgrading the headframe and hoisting plant. It was slowed significantly due to a zone of squeezing ground encountered during this phase of the shaft sinking through ultramafic units. The installation of concrete reinforcing rings and other measures were taken to ensure these issues would not cause potential future delays. The shaft was completed to a depth of 730 m in December 2013.

Lateral and vertical development continued from January 2014. The project underwent a period of trial stoping and milling. In June 2015, Rubicon announced its first gold pour. In November 2015, the company announced it was suspending underground activities at the project while it enhances its geological model of the F2 gold deposit. This report provides the result of said enhancements.

Table 30 lists development during the years 2009 to 2015, by year, by level. Reconciled milled tonnage for the period of spring 2015 to fall 2015 resulted in 60,200 wet t processed. Mineralized material processed is accounted for in Table 31.

Table 30: Underground Development (2009 to 2015)

Development (m)	2009	2010	2011	2012	2013	2014	2015	Total
Lateral	0	0	0	0	93.4	3,210.9	4,605.2	7,909.5
Vertical	0	0	0	0	30.4	884.8	1,532.6	2,447.8
Shaft	148	68	0	239	147	0.0	0.0	602.0
Total	**148**	**68**	**0**	**239**	**270.8**	**4,095.7**	**6,137.8**	**10,959.3**

Table 31: Mineralized Material Processed in 2014 and 2015

Hoisted (wet tonnes)	2014	2015	Total
Waste	166,383	188,192	354,475
Mineralized material	503	60,077	60,580
Development Material	503	33,670	34,173
Stope Mineralized Material	0	26,407	26,407
Total	**166,886**	**248,269**	**415,155**

Mine infrastructure (Figure 22) includes muck handling facilities for all levels, a ventilation system capable of supporting 1,250 tonnes per day (t/d) production levels, a paste backfill distribution system near complete, a mid-shaft loading pocket complete with spill pocket, and a shaft bottom loading pocket. Ramp access has been established between the 305 m level and 244 m level. Remaining ramp connections are within 380 m of completion. A ramp from surface to the 122 m level has been designed.

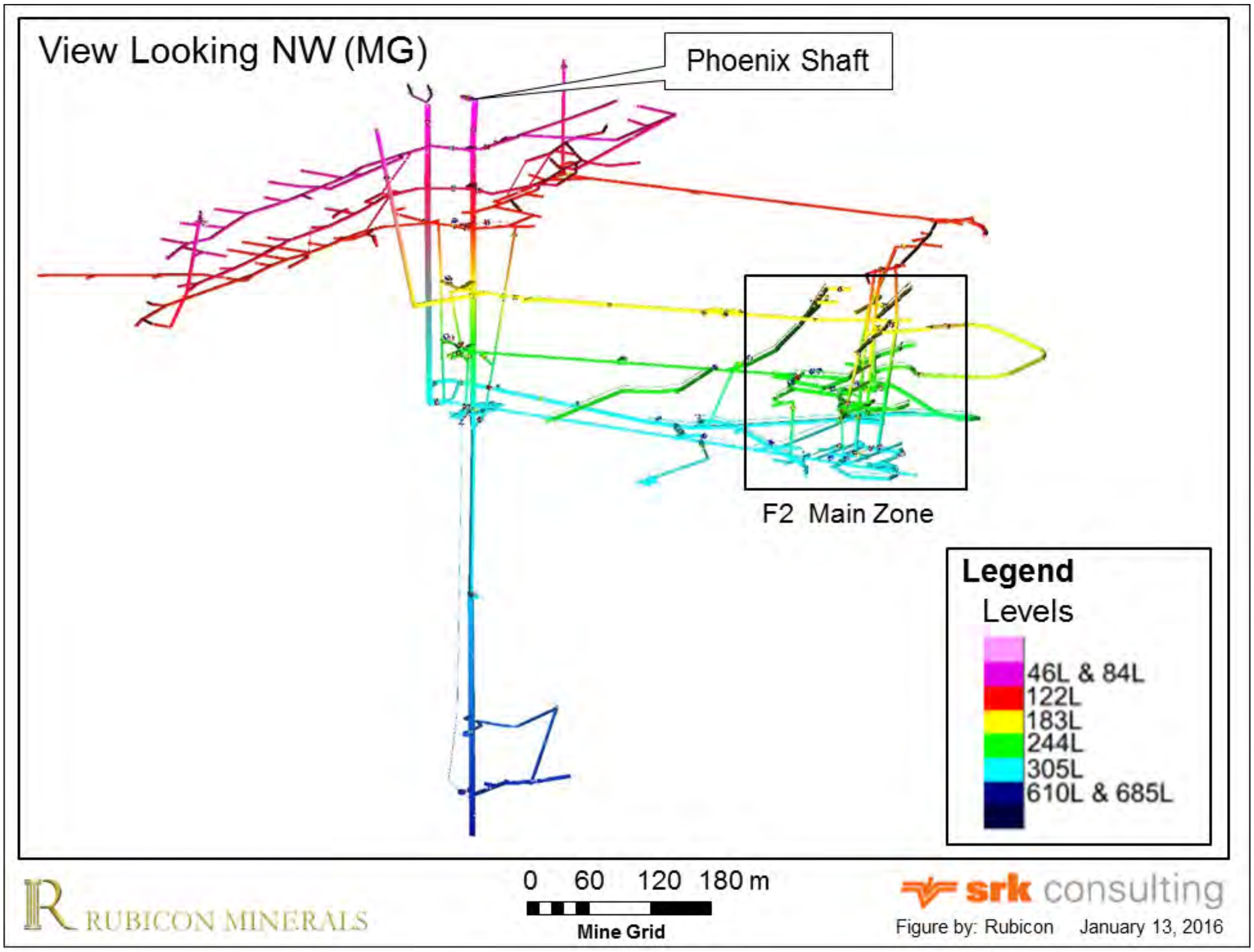


Figure 22: Phoenix Mine Underground Infrastructure
Isometric View Looking Northwest (Mine Grid). Source: Rubicon, 2016

15.1.1 Description of Test Stoping

Test stoping of eleven mining blocks was in various stages of development and mining at the time the decision was made to suspend underground activity and initiate an evaluation study announced by Rubicon in November 2015. In general all test stopes were developed for sub-level longhole, longitudinal retreat mining. Access to the mining blocks was gained via Alimak raise climber.

Figure 23 shows the location of the 030, 065, 944 and 977 trial stopes relative to the underground workings.

During the development work for preparing for test stoping, it became evident that the geology was more complex than expected. Mineralization width was less than expected. Continuity along strike was variable and establishing vertical continuity between sub-levels proved difficult. The gold bearing horizon was more difficult to follow than expected given the lack of visual markers indicating higher grade material. The strong influence of crosscutting D_2 shear zones also further increased the overall complexity of the geometry of the gold mineralization. The more discontinuous gold mineralization along strike and down dip suggested that a more selective mining methods may be more appropriate in the future.

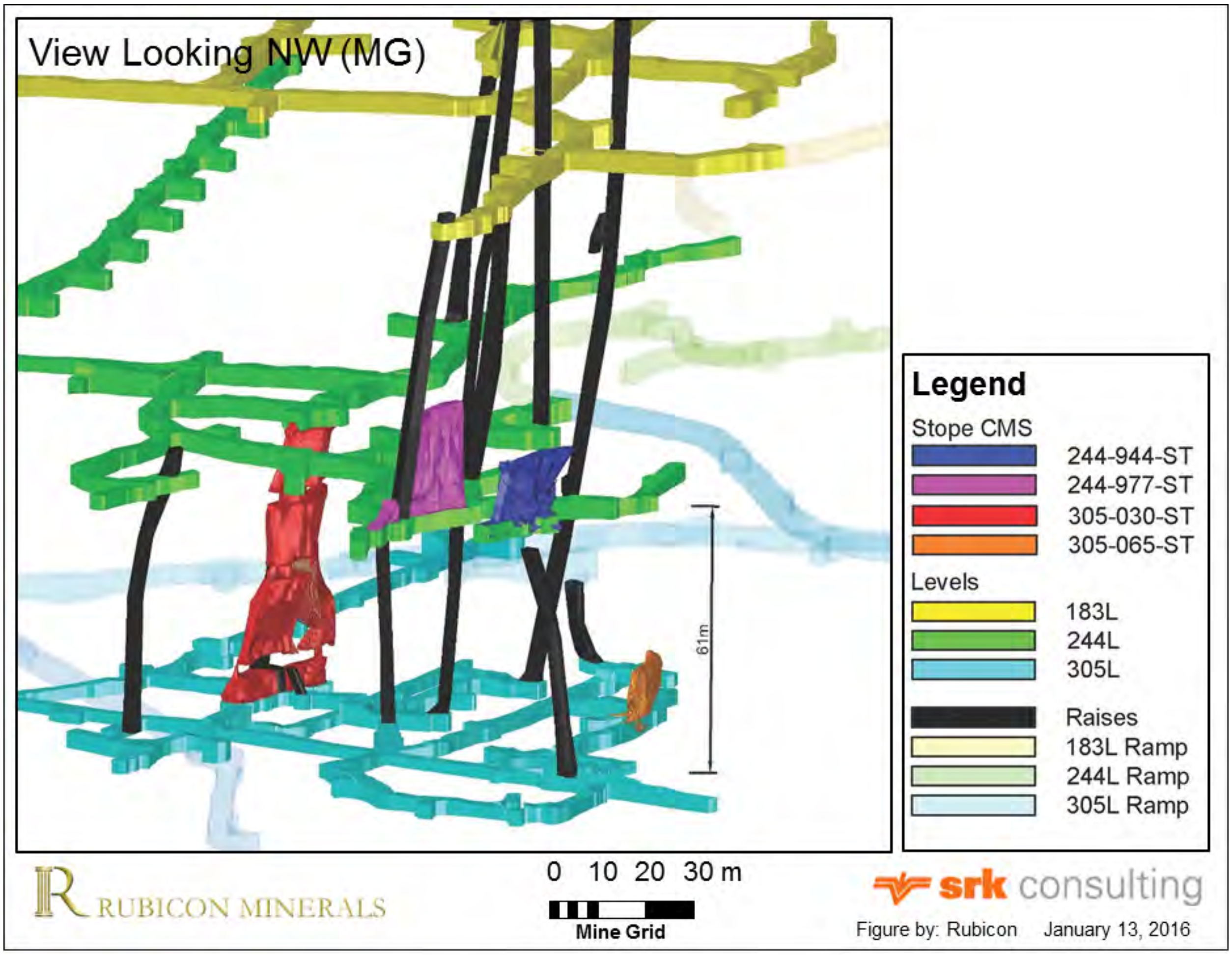


Figure 23: Location of Trial Stopes

See Figure 22 for location

Development of longhole test stopes followed the general sequence below:

1. Drilling delineation on the level above and below.
2. Development of Alimak raise on the hanging wall contact between the ultra-mafic and the HiTi basalt from one elevation to the next.
3. Sublevels developed from the Alimak raise at 15-metre intervals, with the exception of the 244-977 stope which had a sub-level interval of 20 m. All sub-levels were developed using hand held pneumatic drills and slushers.
4. Geological mapping and face sampling during development delineated higher grade for areas within each block. The grade information was used to produce a shape within the HiTi basalt which then defined the mining block. Following a geotechnical evaluation, a sequence of extraction was established which accommodated ground conditions and production efficiencies.
5. Top hammer pneumatic longhole drills were used to drill the mining blocks from one sub-level to the next.
6. A slot was opened up at one end of the first block and blasted to the mucking horizon where the mined material was removed via a remote control load-haul-dump (LHD). The muck was transported to either the ore pass, or direct loaded into ore cars on the 305 m level.

7. Following completion of mining, the excavation was surveyed via a cavity monitoring system to enable comparison of the design shape to the actual excavated opening.

15.2 Geotechnical Evaluation

15.2.1 Introduction

In general ground conditions at the Phoenix gold project can be considered good, in particular in the F2 zone area. Within the F2 deposit recent cavity monitoring surveys in the 305-030 trial stope has confirmed the good ground conditions in this area with minimal external dilution. Historic ground stability issues have been encountered in a talcose ultramafic unit west of the F2 zone, largely related to geological structures. Conditions have been mitigated by the application of appropriate ground support.

Geotechnical evaluations completed to date include a scoping level evaluation by SRK in July 2013 (SRK, 2013a), a crown pillar assessment by AMC in December 2014 (AMC, 2014), and a Ground Control Management Plan drafted internally by Rubicon in September 2015 (Shin, 2015). Detailed information contained in these evaluations can be found in the respective documents.

15.2.2 Geotechnical Assessment by SRK

Geotechnical assessment conducted by SRK is available in the preliminary economic assessment for the F2 gold system (amended and restated) issued February 28, 2014 (SRK, 2013b).

15.2.3 Crown Pillar Assessment by AMC

Rubicon commissioned AMC to conduct an assessment of the crown pillar as the gold mineralization extends to the lake bottom. A high degree of caution will be required by Rubicon during development and mining in the shallow crown pillar areas to prevent crown pillar instability. AMC recommended a conservative minimum crown pillar thickness of 40 m and certain other risk mitigation options. Special operating procedures are recommended outlining ground support, backfill, and instrumentation / monitoring strategies in the moderate to high risk areas.

15.2.4 Ground Control Management Plan by Rubicon

The Ground Control Management Plan was drafted internally by Rubicon in June 2015 (Shin, 2015). This comprehensive document describes technical ground stability issues on the Phoenix project as well as mitigating strategies for development and production headings. Stope stability analysis was conducted which indicated stable conditions in all designed stope dimensions. Experience in test stoping concurs with the stability expected through empirical design.

The Ground Control Management Plan contains recommendations for ground support in all types of ground and openings on the Phoenix project. It was used to guide all ground support design on the project site. Standard ground support methodology includes use of rockbolts, rebar, mesh, cablebolts, and shotcrete.

15.3 Planned Mining Methods

The 2013 technical report described a number of potential mining methods that could be used to extract the gold mineralization in the F2 gold deposit; from non-mechanized entry type methods to highly mechanized transverse longhole stoping. Recent experience indicated that mining between the

305 and 122 levels using non-selective mining methods would be uneconomic under current economic conditions. Any future mining plan must accommodate a complex deposit that is relatively discontinuous, somewhat disseminated in nature, has weak visual indicators, and a strong nugget factor. By incorporating recent mining experience and expected variations in mineralization, two primary mining methods are being considered: mechanized cut and fill stoping and sub-level longhole stoping. Also more conventional mining methods such as cut and fill and shrinkage mining may prove appropriate. Hybrids of these mining methods will be necessary to extract the mineral resources economically. Mine design must include flexibility to accommodate variations in grade, width and continuity of mineralization on a shift by shift basis.

In order to optimize recovery of the mineral resource, it will be important to delineate the auriferous zones appropriately with core drilling, sampling, development and geological mapping. This information will guide development of good quality local block models improving predictions of gold grade distributions in areas with limited information. These production block models may represent one or more levels or only one part of a level interval, depending on the local variations in shape and extent of mineralization.

The mine engineering group will use these block models to design stopes and associated development in 3D (three-dimensions), to support mineral reserve estimates and the long term production plan. Once the design of a stope or group of stopes has been finalized, the 3D shapes will be used by the short-term mine planners to prepare detailed layouts for stope development and production mining. Development layouts will be executed under survey control with adjustments made as additional geological data comes available from mapping and sampling the exposed mineralization.

A few cycles of reconciling the actual mining results with the block model predictions will help refine this method to give reasonable estimates of future production, mitigating much of the uncertainty caused by the nugget effect and the disseminated nature of the deposit.

15.3.1 Conceptual Mining Method Selection

The main physical characteristics (context) of the gold mineralization that are relevant to the conceptual mining method selection are:

- The deposit is located approximately 400 m east of the existing shaft
- The upper levels have already been established potentially as a track mine on 61 m level intervals from 122 m level to 305 m level
- The small size of the existing shaft limits practical equipment size to 6.7-tonne class load-haul-dump (LHDs) and 20-tonne trucks, although this would be subject to review if a surface ramp was developed
- About half of the current known deposit is below the current shaft bottom
- The deposit consists of multiple zones, each with a separate block model
- The mineralized zone is 150 to 200 m wide in section, high grade zones are approximately 1.0 m to 5.0 m wide, up to 1,000 m along strike and discontinuous to the extent that much of this area is below the design cut-off grade
- There are isolated mineralized zones outside the main corridor
- The deposit dips at between 75° and 80° with the shaft on the hanging wall side
- Individual mineralized zones range in dip from 65° to vertical
- Mineralized zones above the conceptual mine design cut-off grade vary in true width from less than 1 m to 6 m
- Mineralized zones above the conceptual mine design cut-off grade can pinch and swell rapidly along strike and along dip

- The deposit is located under a lake, therefore a stable crown pillar must be maintained
- Any extraction from the crown pillar should wait until the end of the potential mine life
- The 2013 conceptual mine plan ranges from 122 m level (bottom of crown pillar) to 1586 m level, a vertical distance of 1,464 m
- The mineralized zone has contacts that are difficult to identify visually
- The mine was very dry and water inflows do not appear to be an issue as the known geological units have low permeability
- Grade continuity in the mineralized zones above design cut-off grade is generally variable, which is indicative of a strong nugget effect
- The 122 m, 244 m, and 305 m levels are established as track drifts from the shaft station to the F2 zone area
- An internal ramp is connected between above 244 m level to below 305 m level. The remaining ramp to connect from 122 m level to below 305 m level is approximately 385 m from completion
- Muck handling systems are established on all operating levels except 122 metre level
- The paste backfill system construction is near complete other than commissioning. Following commissioning it will be available to deliver backfill to underground

To successfully mine a deposit with the above characteristics will require a high level of geological effort to understand the mineralization trends at the stope level, including closely spaced definition drilling and a chip sampling programs. Given the general lack of visual indicators of mineralization, all headings in mineralized material will be under direct control of a geologist. Frequent sampling, test holes, core drilling etc. will be necessary to effectively define the economic mineralized zones.

This complex deposit will challenge the mine engineers to develop and employ a comprehensive tool box of mining solutions to optimize the extraction of the mineral resources. This will require the employment of multiple mining methods and variations on those mining methods to deal with situations where the mineralization is not continuous to the next level or has an irregular geometry.

The conceptual mining methods envisioned may include:

Longitudinal Retreat Longhole

This method involves development of the ore body at regular vertical intervals, typically every 15 m, and retreating to one abutment. Mucking takes place within the undercut of the mining block via remote control load-haul-dump (LHD) equipment. Open strike length is dictated by wall stability in the open stope and is initially determined by empirical design. Cable bolts installed in the walls at all elevations can provide additional stability and increase the open strike length possible.

Longitudinal retreat longhole mining is a cost effective, low development mining method capable of good productivity. Disadvantages include lack of flexibility in variable ore bodies and waste generated from access development at multiple elevations.

Uppers Longhole Method

This simple method involves driving a drift along the strike of the mineralized zone, and positioning an inverse (slot) raise at the stope extremity, and production drilling of 15 m up holes at a 70 degree dip. Blasting and mucking will retreat towards the stope entrance. These stopes may or may not be backfilled.

This method is best used where ore continuity is known and strike length is limited. It can be used in combination with other methods as part of an overall mining strategy.

Conventional Captive Cut and Fill (CAF)

This mining method can be very selective to a minimum mining width of 1.8 to 2.4 m as dictated by mining equipment. Productivity is low but selectivity is high. Segregation of ore and waste is possible when combined with a grade control program and active geological input in the mining sequence.

The mining sequence begins by driving one or more crosscut drifts into the mineralized zone and silling out the mineralized zone at the main level elevations (top and bottom). Once the full strike length is known at the main level elevations, a service raise is driven from the bottom level to the top level. The service raise is equipped with a man-way, power, compressed air, water, backfill lines, and a slide compartment for lowering materials into the stope using a tugger hoist located at the top of the raise.

A sublevel is then driven off the service raise to leave a sill pillar above the level and establish a number of man-ways and box-holes, the quantity based on stope strike length. If required, a sill mat is installed.

Once the stope infrastructure is established, the mining sequence begins by drilling and blasting uppers with handheld drills, bolting the back off the muck pile and mucking to the box-holes with scrapers. Once one side is mined out, the box-holes and man-ways on that side are raised, a fill wall constructed and that side backfilled while mining continues on the other side of the service raise. Once both sides have been backfilled, the central area around the service raise is mined in a similar manner and backfilled.

The cycle is repeated until the stope breaks through to the upper level, unless a sill pillar is to be left. The bottom sill pillar can also be extracted after the stope is completed. Due to the lack of mechanized equipment, the stope height will be kept generally around 2.4 to 2.8 m.

Mechanized Cut and Fill (MCF)

Mechanized cut and fill is a moderately productive, highly selective mining method. For ore widths more than 2.4 m and less than 10 m muck can be segregated into ore, mineralized material and waste, each to be handled differently based on logistical conditions at the time the material is generated. Ore will be sent to surface for processing, mineralized material can either be sent to surface and processed, sent to surface and stockpiled, stockpiled underground for future consideration, or left in the stope as backfill. When possible, waste is stockpiled underground or left in the stope as backfill.

The mining sequence begins by driving an attack ramp either from a level or from a nearby ramp. The attack ramp is generally driven at a -15% gradient to access the bottom (sill) cut of the mineralized zone near the centre of the stope mass using the same development equipment as that used for ramp and level development. The mineralized zone is developed with sill drifts to the extents of the mineralization. A sill mat is installed, if required, prior to backfilling with pastefill or rockfill if available from the nearby development headings.

After backfilling is complete, a section of the attack ramp is back slashed and rebolted to gain elevation for access to the next cut. The waste rock broken while doing this will be generally left in place or stored nearby to provide a road bed in the ramp and rockfill for the next cut. This cycle is repeated until the designed number of cuts has been mined. Mining continues upward by repeating the process from a new attack ramp to access the mineralized zone at the next higher elevation.

Stope heights are generally 3.5 m to suit the same equipment that was used for ramp and level development if the mineralized zone is wide enough. For stopes between 2.4 and 3.0 m wide, a 3.5-tonne load-haul-dump (LHD) (1.5yd to 2yd) is used.

Shrinkage Stoping

This is a historic mining method which has fallen out of favour in recent years but still has an application in steeply dipping, shallow depth ore bodies in competent ground. It can be moderately productive and moderately selective.

The mining sequence begins by developing the bottom and top cut of the ore body. A bypass drift is typically developed on the footwall of the ore body and access crosscut are driven at approximately 10 m intervals. An access raise is driven in the centre of the ore body, or a raise is driven at each end of the ore body. A slide, man-way and services are installed in the raise(s). A man-way is constructed at each end of the ore body, or in the centre of the ore body opposite the access raises. Ore is drilled and blasted with a combination of uppers and breasting, with the swell being removed from the draw points below. Services are advanced from the lower elevation and removed from the access raises as each lift is mined. Once the entire stope is broken, the broken muck can be removed from the entire stope.

These mining methods combined may provide the type of flexibility necessary to extract the highly complex and variable F2 Main Zone resource.

16 Recovery Methods

This sections documents the recovery methods proposed for the Phoenix gold project. Since the 2013 Technical Report, a processing mill was constructed on site, along with ancillary mine waste and tailings storage facilities. Construction of the mill began in 2013 and was completed during 2015. The mill is operational.

The mill contains an ore handling system feeding a two stage grinding circuit. Free gold is recovered by gravity concentration in the grinding section and by cyanide leaching in a carbon-in-leach circuit. The mill is newly constructed and was commissioned in 2015.

16.1 Process

The simplified process block diagram for the Phoenix gold project is presented in Figure 24. The mill was designed with an initial throughput capacity of 1,250 tonnes per day (t/d), with provisions in the layout to increase capacity up to 2,500 t/d.

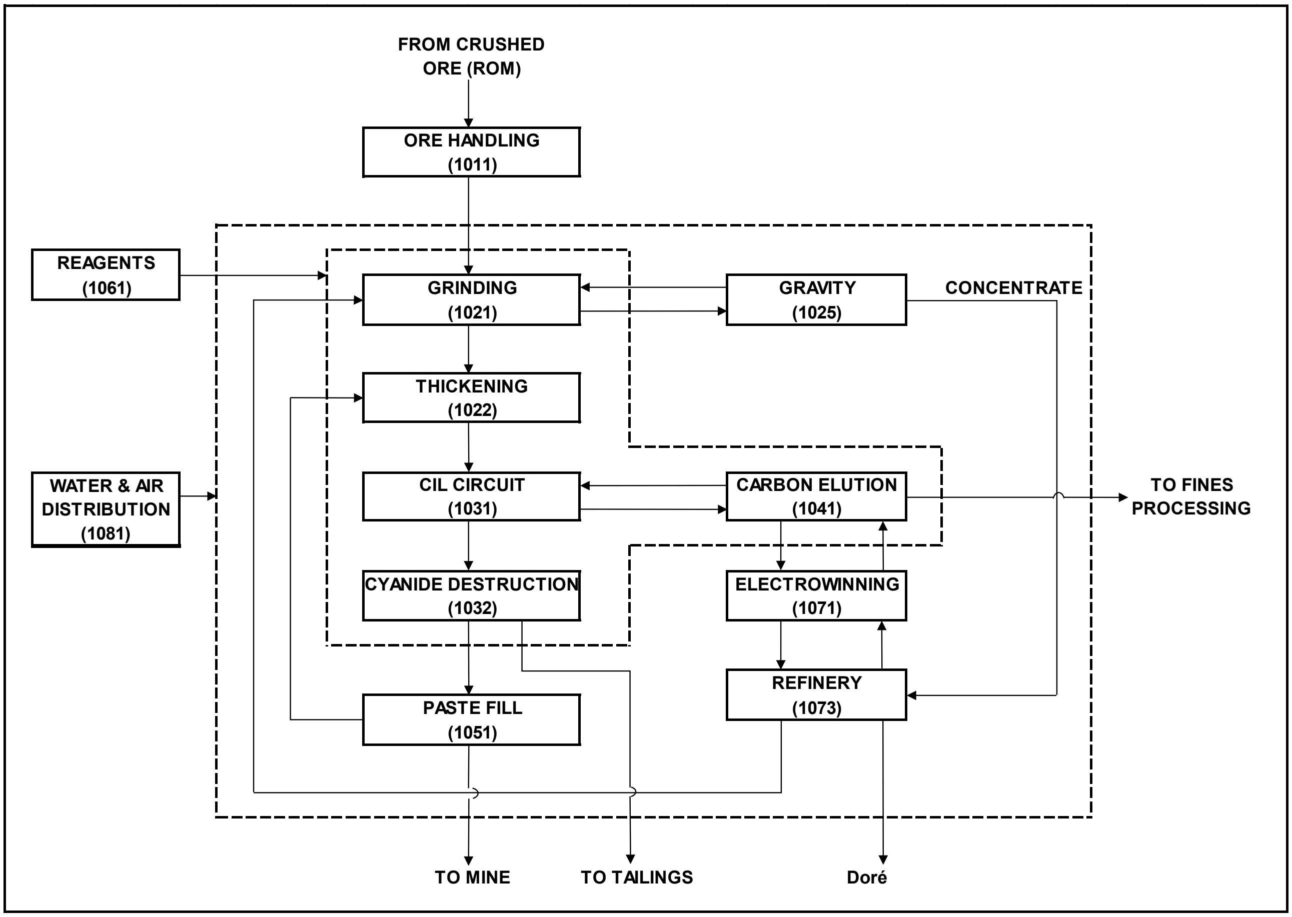


Figure 24: Simplified Process Block Diagram

Source: Rubicon 2016

16.2 Simplified Process Description

The process plant construction commenced in 2013 and was essentially complete in the spring of 2015. The gold recovery plant was commissioned in 2015 and operated intermittently until November 21, 2015 surface stockpile milling was completed. A paste backfill plant was also constructed to prepare paste backfill for use in the underground mine. The backfill plant has not been commissioned.

The unit operations installed for gold processing are essentially those described in the 2013 technical report (SRK, 2013b).

The process consists of a single line, starting with a semi-autogenous grinding (SAG) mill. The discharge from the SAG mill is sent to the ball mill circuit that uses hydrocyclones in closed circuit for classification. A gravity separation circuit is included in the closed circuit with hydrocyclones to partially recover and concentrate any gravity recoverable gold. The remaining gold is extracted in a conventional carbon-in-leach circuit. The loaded carbon is washed with hydrochloric acid solution to remove carbonates. Gold is then removed from the loaded carbon by elution (stripping) followed by electrowinning. The electrowinning and the gravity circuit both produce a high-grade gold concentrate that is smelted in an electric induction furnace to produce doré. The stripped carbon is regenerated in a reactivation kiln before being reintroduced to the process. Fine carbon is constantly eliminated (and recovered) from the process to avoid gold loss, with fresh carbon being continuously added to the process.

The cyanide contained in the tailings from the carbon-in-leach circuit is eliminated in a cyanide destruction tank using the SO_2-air process. Once the cyanide is destroyed, the tailings are pumped to the tailings management facility for disposal.

When paste backfill is required by the mine, tailings will be diverted to the paste plant where they will be filtered to lower the water content. The filter cake will then be mixed with fly ash and cement to produce a paste. The paste produced will be pumped to the mine for underground backfilling

The gold recovery plant, cyanide destruction process, and the tailings management facility were commissioned and operated in 2015.The backfill plant has not operated as the mine had not yet required backfill. Major equipment for the tailing filter plant and the paste plant has been installed. However, some minor piping, electrical, and instrumentation connections remain to be completed before this plant can be commissioned.

16.3 Process Description

16.3.1 Mineralized Material Storage

An underground grizzly screen on the 305 m level with, typically, 23 centimetres (cm) openings (9″ by 9″) and a rock breaker are used to reduce the ore size prior to hoisting it to the surface. A crusher will be installed below the 610 m level to appropriately size the material before it reports to the 685 m level loading pocket. The skipped mineralized material is dumped into a coarse ore bin when the coarse mineralized material chute lift is opened while the waste is dumped into a waste bunker when the raw ore chute lift is closed. The mineralized material is discharged from the coarse ore bin via a discharge chute onto a vibratory feeder, which then transfers the mineralized material onto the storage bin feed conveyor. A magnet fitted with a small conveyor is situated above and running perpendicular to the storage bin feed conveyor and is used to remove tramp metal from the coarse mineralized material. The tramp metal is collected in a bin for disposal. The remaining mineralized material is conveyed to the coarse ore bin.

16.3.2 Grinding and Thickening

The raw mineralized material from the coarse ore bin is reclaimed by two apron feeders and is discharged onto a first conveyor. The material on the first conveyor is discharged on a second conveyor equipped with a belt scale, which then transfers the mineralized material to the SAG mill mobile feed chute.

The grinding circuit is a double-stage circuit consisting of a SAG mill and a ball mill. The SAG mill operates in open circuit while the ball mill is operated in closed circuit with hydrocyclones. Process water is added to the SAG mill feed chute to achieve the correct dilution for grinding. The main portion of the hydrocyclones underflow is directed to the ball mill for regrinding while the remaining portion goes to the gravity separation circuit. The hydrocyclones overflow pulp flows to the thickening circuit.

The thickening circuit consists of one trash screen, and one thickener. The trash screen is fed, by gravity, from the hydrocyclone cluster overflow. The screen undersize flows by gravity, via primary and secondary samplers, to the pre-leach thickener feed box. Any oversize trash is dumped into a trash bin.

The pre-leach thickener is fed by the trash screen undersize and the thickening area sump pump. Flocculent is also added to improve the settling rate. The thickener overflow feeds by gravity to the process water tank while the underflow is pumped to the pre-aeration tank in the carbon-in-leach circuit.

16.3.3 Gravity Separation

The gravity circuit consists of one vibrating screen, two gravity concentrators, one gravity table, and one gravity table magnet. The underflow from three of the hydrocyclones within the cluster is sent to the gravity circuit (two operational and one standby). The remaining five hydrocyclones underflow is sent to the grinding circuit (three to four operational and one to two standby).

The hydrocyclones underflow flows by gravity to the gravity screen. Dilution water is added to the screen oversize to transport the material to the gravity pump box. This material is directed to the gravity tails pump box and then pumped to the hydrocyclone feed pump box in the grinding circuit.

The gravity screen undersize flows to the gravity concentrator where gravity recoverable gold is recovered. Dilution water is added directly to the gravity screen underflow to facilitate the pulp flow into the concentrator and to adjust the feed pulp %-solids. The gravity concentrator concentrate is pumped to the gravity holding tank while the gravity concentrator tails are directed to the gravity tails pump box and then pumped to the hydrocyclone feed pump box in the grinding circuit.

The gravity concentrator concentrate stored in the gravity holding tank is fed to the gravity table magnet where the magnetic particles are removed and sent back to the grinding circuit. The non-magnetic portion of the stream is sent to the gravity table to produce an upgraded gold concentrate that is calcined in an oven prior to being smelted into doré in the on-site refinery. The gravity table tails are pumped to the hydrocyclone feed pump box, along with the gravity screen oversize, the gravity concentrator tails and the magnetic particles from the gravity table magnet for reprocessing in the grinding circuit.

16.3.4 Carbon-in-Leach

The underflow from the pre-leach thickener is pumped to the pre-aeration tank. Slurry from the pre-aeration tank overflows into the first of six agitated carbon-in-leach tanks arranged in series. Cyanide solution and lime are added, as required, to the pre-aeration tank and to the first and fourth tanks for gold dissolution and pH control. Lead nitrate can be added in the pre-aeration tank to improve the gold leaching kinetics. Gold in the solution is adsorbed onto the activated carbon.

The six tanks have been sized to provide 36 hours of residence time at the design flow rate and solids concentration. Each tank is equipped with a single interstage screen and a carbon-transfer pump and is agitated to maintain the solids in suspension. Air is injected in the bottom of the pre- aeration tank and in each tank for gold dissolution. Interconnecting tank launders are arranged so that any tank in series can be bypassed without having to shut down the entire carbon-in-leach circuit.

On a regular basis, loaded carbon is pumped counter current to the slurry flow through the tanks in order to increase gold loading. The carbon-forwarding pump of the first tank transfers the slurry onto the loaded carbon screen to recover the loaded carbon from the slurry. Screen undersize flows by gravity back to the first tank while the oversize, containing the loaded carbon, flows by gravity to the acid wash column in the elution circuit. Fresh and regenerated carbon is added into the last tank.

16.3.5 Elution and Carbon Reactivation

Loaded carbon recovered by the loaded carbon screen gravitates to the loaded carbon tank which is then pumped to the acid wash column of the elution circuit. The carbon elution circuit treats a 4-tonne batch in approximately 12 hours. The circuit is designed to process one elution per day.

The acid solution is prepared in the dilute acid tank and then pumped through the acid wash column. Once the acid wash is complete, the spent acid is neutralized with caustic. The carbon is transferred from the acid wash column to the strip column for gold desorption. The solution from the barren strip solution tank flows through a series of heat exchangers and a heater in order to reach the right temperature in the strip column. The solution strips the gold loaded onto the carbon which then exits through a Johnson screen from the upper side of the column. The pregnant solution then goes to the electrowinning cells in the refinery for gold recovery.

The stripped carbon is drawn from the bottom of the strip column and goes to the carbon reactivation kiln. After the reactivation, the carbon is discharged into the carbon quench tank. The carbon from the carbon quench tank is pumped and screened out to remove (and recover) fine carbon and then drops by gravity to the last carbon-in-leach tank. Fresh carbon is added in the carbon quench tank on a regular basis to compensate the fine carbon removal.

16.3.6 Electrowinning and Refinery

The pregnant solution from the strip column flows first by gravity to the electrowinning flash tank and then to two parallel electrowinning cells, where the gold is plated on cathodes. The barren solution from the electrowinning cells is recovered in a pump box and pumped back to the barren strip solution tank in the carbon elution circuit.

After a certain period, the stainless steel wool cathodes are cleaned with high pressure water and the gold sludge sinks to the bottom of the cells. The gold sludge is then pumped with a diaphragm pump to a filter-press to remove excess water. The filtrate from the filter-press flows to the electrowinning tanks or the barren solution pump box.

The filtered gold sludge from the filter-press is sent to the calcination oven to remove excessive humidity. The dried gold sludge is then mixed with suitable fluxes (typically borax, soda ash, sodium nitrate, and silica sand) and is fed into the crucible of the electric induction furnace. Once the gold is melted, it is poured into the doré moulds. Doré bars are then recovered for shipment.

16.3.7 Cyanide Destruction

The safety screen is fed by the last carbon-in-leach tank overflow. It prevents the loss of carbon in the eventuality of a failure of the last tank interstage screen. The carbon is recovered at the oversize bin.

The screen undersize flows by gravity into the cyanide destruction tank feed pump box and is pumped to the cyanide destruction tank. Oxygen is added at the bottom of the cyanide destruction tank within a dispersion cone. Sulphur dioxide (SO_2) is added in liquid form at the bottom of the tank. The copper sulphate and the lime are added at the top of the tank.

Once cyanide destruction is complete, the tailings are discharged into the cyanide destruction discharge distributor. When the paste plant is operating, the tailings flow by gravity to the buffer tank feed pump box and are pumped to the buffer tank. When the paste plant is not operating, the tailings flow by gravity to the tailings pump box and are pumped to the tailings pond. Service water can also be added to the tailings pump box to prevent pump surging.

16.3.8 Tailings Filtration (not commissioned)

The construction of tailings filtration circuit has not been fully completed and commissioned. The tailings filtration system consists of two disc filters with two filter feed pumps, two vacuum pumps, two snap blow receivers, two filtrate tanks, and two filtrate pumps.

The tailings from the cyanide destruction circuit are pumped from the buffer tank feed pump box to the buffer tank. The tailings are then pumped to one of the two disc filters for filtration (one operational, one standby). The filtrate is recovered in the filtrate tank and pumped to the tailings box. The filtered tailings are discharged on the tailings conveyor which feeds the paste mixer.

16.3.9 Paste Backfill Preparation (not commissioned)

The construction of paste backfill plant has not been fully completed and commissioned. The disc filter tailings cake is discharged on the tailings conveyor and then mixed with service water in the paste mixer to produce backfill paste. Fly ash and Portland cement are also added to the mixer to meet underground backfilling strength requirements. The cement and binders discharged from the storage bins are controlled to achieve the proper concentration in the backfill paste. The paste produced by the mixer is then discharged into the paste pump feed hopper.

16.3.10 Paste Backfill Distribution (not commissioned)

The construction of paste backfill distribution system has not been fully completed and commissioned. Once the paste is prepared, one positive displacement pumps is used to move the paste into the underground stopes. The pump is equipped with a hydraulic unit.

16.3.11 Reagents

Except for the reagents used in relatively small quantities at the electrowinning and refinery sectors, the following reagents are used throughout the process:

Sodium cyanide

Sodium cyanide (NaCN) is supplied in 1 tonne bags and is mixed with water in batches on site in a controlled environment then transferred to the cyanide distribution tank. The sodium cyanide solution is pumped to the carbon-in-leach circuit and the barren elution solution tank.

Flocculant

Flocculant is used in the pre-leach thickener to improve the solids settling rate. Flocculant is supplied in bags. The preparation station consisting of a wetting unit, mixing tank and distribution tank. The flocculant is then pumped into the pre-leach thickener.

Hydrochloric acid

Hydrochloric acid (HCl) is used for the carbon acid wash. The hydrochloric acid is supplied in totes and pumped to the acid storage tank. The acid is pumped to the dilute acid tank in the carbon elution circuit as required.

Lead nitrate

Lead nitrate ($PbNO_3$) is sometimes used to improve the gold leaching kinetics in the carbon-in-leach circuit. A PbNO3 handling and addition system has been installed but not used in 2015.

Sulphur dioxide

Liquid sulphur dioxide (SO_2) is used as an oxidizing agent in the cyanide destruction process. The sulphur dioxide is delivered by truck and stored in the sulphur dioxide tank. The sulphur dioxide tank is equipped with a pressure system to keep the sulphur dioxide in liquid form and to deliver the sulphur dioxide to the cyanide destruction tank.

Lime

Lime, delivered as quicklime (CaO), is used to control the pH in the grinding, carbon-in-leach and cyanide destruction circuits to prevent cyanide (HCN) gas formation. The lime is delivered in bulk by truck and stored in the lime bin. A screw feed conveyor transfers the lime to the lime slaker to prepare the milk of lime. The milk of lime is stored in the lime distribution tank. Distribution pumps deliver the milk of lime to the carbon-in-leach circuit and cyanide destruction circuits through a closed loop distribution system.

Copper sulphate

Copper sulphate ($CuSO_4$) is used as a catalyst in the cyanide destruction process. Copper sulphate is supplied in bags and is mixed in batches with water on site in a controlled environment then transferred to a distribution tank. The copper sulphate solution is pumped to the cyanide destruction tank as required.

Sodium hydroxide

Sodium hydroxide (NaOH) is used for carbon stripping and to neutralize the residual acid in the dilute acid tank and the acid wash column. The caustic is supplied in drums and pumped to the caustic storage tank. A distribution pump transfers the caustic to the dilute acid tank and to the barren strip solution tank.

Descalant

A descalant reagent is used to reduce calcium carbonate deposits. The descalant is supplied in totes and pumped to the process water tank and barren strip solution tank as required.

Cement

Cement will be used at the paste plant to enhance the strength of the paste backfill. Cement will be delivered in bulk by truck and will be stored in a bin. A screw conveyor will deliver the cement to the paste mixer. This system has been constructed but has not been commissioned or operated.

Fly Ash

Fly ash will be used at the paste plant to enhance the strength of the paste backfill. Fly ash is delivered in bulk by truck and will stored in a bin. A screw conveyor delivers the slag to the paste mixer. This system has been constructed but has not been commissioned or operated.

16.3.12 Utilities

Fresh Water

A fresh water system is required in order to store and distribute fresh water to various areas of the mill and project site. The existing fresh water tank, situated at the highest topographical location, south of the hoist room, is used to store fresh water. The fresh water tank is fed by the redesigned pump system that draws water from Red Lake. Two fresh water pumps (one operational, one standby) distribute fresh water to the processing plant and various other areas at the project site. Fresh water is used for reagent preparation, cooling, and washbasins.

Reclaim Water

The water recovered in the tailings pond (reclaim water) is pumped into the service water tank. One of the two reclaim water pumps located in the tailings pond is used to supply reclaim water to the service water tank. The remaining reclaim water pump is used either as spares or for feeding the water treatment plant for the treatment and discharge of surplus water from the tailings management facility to the environment.

Service Water

The service water tank is used to store reclaim water that contains low values of cyanide. It is fed by reclaim water from the tailings pond, and by fresh water when required. The service water tank overflows in the process water tank and serves as make-up process water. The service water is also pumped and distributed throughout the concentrator.

Process Water

The process water is stored in the process water tank located on the west side of the pre-leach thickener to allow any overflow from the thickener to gravitate into the process water tank. The process water tank is also fed by the service water tank overflow, if additional water is required. Two process water pumps (one operational, one standby) distribute the water to various process areas. Process water is used in the grinding, gravity, and thickening circuits.

Domestic Water for Emergency Showers

Domestic (potable) water feeds the domestic water heaters. Two domestic water pumps (one operational, one standby) distribute domestic water to the emergency showers throughout the concentrator as well as the rest of the project site.

Air Service

Mine air compressors supply compressed air at 125-pounds per square inch gage (psig) to the process plant as service air and to an air dryer. The air dryer supplies dry air to a dry air receiver that stores and supplies dry air for instrumentation requirements.

Two air blowers are used for the air distribution to the CIL circuit. One blower is in service and the other standby.

16.4 Concentrator Design

16.4.1 Design Criteria

Table 32 presents the main design criteria used for the concentrator design. The design criteria are identical to those described in the 2013 technical report.

Table 32: Concentrator Main Design Criteria

Parameter	Value	Units
Feed Characteristics		
Gold Head Grade (Nominal)	8.06	g/t
Gold Head Grade (Maximum)	20	g/t
Mineralized Material Moisture	5	% w/w
Mineralized Material Specific Gravity	2.9	
Draw Down Angle	50	o
Repose Angle	40	o
Operating Schedule		
Scheduled Operating Days	365	day/yr
Operating Hours	24	hr/day
Plant Availability	92	%
Shifts	2	shift/day
Production Rate		
Plant Feed Rate (Nominal)	1,250	t/d
Plant Feed Rate (Operation)	1,359	t/d
Plant Feed Rate (Future Expandable)	2,500	t/d
Production Target (Dry)	456,250	t/y
Gold Recovery	92.5	%
General Characteristics		
Ambient Temperature	10 to 30	°C
Outdoor Temperature	-36 to 28	°C
Relative Humidity	20 to 100	%
Altitude Above Sea Level	600	m

16.4.2 Mass Balance

Table 33 is the theoretical mass balance developed for the mill as presented in the 2013 technical report. The mass balance is based on a concentrator availability of 92% and a nominal feed rate of 1,250 t/d. The clarifier which is shown in the mass balance was not installed. The effect is not material to the overall mass balance. This stream now reports directly to the tailings box.

Table 33: Concentrator Mass Balance

Stream Description	Solids (t/h)	Solids (m^3/h)	Solution (t/h)	Pulp (t/h)	Pulp (m^3/h)	Solids (%w/w)
Grinding Circuit						
SAG Mill						
SAG Mill Feed	56.6	19.5	2.98	59.6	22.5	95
SAG Mill Discharge	56.6	19.5	23.9	80.5	43.4	70.3
Ball Mill						
Hydrocyclone Underflow to Grinding Circuit	127.4	43.9	54.6	182	98.5	70
Ball Mill Discharge	127.4	43.9	59.6	187	103.5	68.1
Hydrocyclone Feed Pump Box						
SAG Mill Discharge	56.6	19.5	23.9	80.5	43.4	70.3
Ball Mill Discharge	127.4	43.9	59.6	187	103.5	68.1
Gravity Circuit Tailings	42.5	14.6	66	108.5	80.7	39.1
Hydrocyclone						
Hydrocyclone Feed	226.4	78.1	177.9	404.4	256	56
Hydrocyclone Underflow	169.8	58.6	72.8	242.6	131.4	70
Hydrocyclone Underflow to Grinding Circuit	127.4	43.9	54.6	182	98.5	70
Hydrocyclone Underflow to Gravity Circuit	42.5	14.6	18.2	60.7	32.8	70
Hydrocyclone Overflow	56.6	19.5	105.1	161.7	124.7	35
Gravity Circuit						
Hydrocyclone Underflow to Gravity Circuit	42.5	14.6	18.2	60.7	32.8	70
Gravity Circuit Tailings	42.5	14.6	66	108.5	80.7	39.1
Gravity Table Concentrate	0.0011	0.00011	0.00006	0.001	0.0002	95
Thickening Circuit Trash Screen						
Hydrocyclone Overflow	56.6	19.5	105.1	161.7	124.7	35
Trash Screen Undersize	56.6	19.5	110.1	166.7	129.7	34
Clarifier (not installed)						
Clarifier Feed (Filtrate + Vacuum Seal Water)	0.014	0.00484	31.2	31.2	31.2	0.04
Clarifier Overflow	-	-	27.9	27.9	27.9	-
Clarifier Underflow	0.014	0.00484	4.12	4.13	4.13	0.34
Pre-Leach Thickener						
Thickener Feed	56.6	19.5	115.4	172	134.9	32.9
Thickener Overflow	0.012	0.0041	58.8	58.8	58.8	0.02
Thickener Underflow	56.6	19.5	56.6	113.2	76.1	50
CIL Circuit						
Pre-Aeration Tank A Feed	56.6	19.5	58.1	114.7	77.6	49.3
Loaded Carbon Screen Undersize	7.94	2.66	8.65	16.6	11.3	47.9
CIL Tank A Feed	56.6	19.5	59	115.6	78.5	49
CIL Circuit Tailings to Safety Screen	56.6	19.5	59	115.6	78.5	49
Loaded Carbon Screen						
Pulp Transfer (with Carbon) to the Loaded Carbon Screen	8.12	2.8	8.46	16.6	11.3	49
Carbon Feed to Acid Wash Column	0.181	0.139	0.725	0.906	0.864	20
Loaded Carbon Screen Undersize	7.94	2.66	8.65	16.6	11.3	47.9
Cyanide Destruction Safety Screen						
CIL Circuit Tailings to Safety Screen	56.6	19.5	59	115.6	78.5	49
Safety Screen Oversize	0.00068	0.000523	0.00008	0.00075	0.0006	90
Safety Screen Undersize	56.6	19.5	60.5	117.1	80	48.3
Cyanide Destruction Tank						
Cyanide Destruction Tank Feed	56.6	19.5	62	118.6	81.5	47.7
Cyanide Destruction Tank Discharge	56.6	19.5	62.1	118.7	81.6	47.7
Buffer Tank Feed	31.1	10.7	35	66.1	45.7	47.1
Tailings Pond Feed	25.5	8.78	53.7	79.1	62.4	32.2

Table 33 (continued): Concentrator Mass Balance

Stream Description	Solids (t/h)	Solids (m^3/h)	Solution (t/h)	Pulp (t/h)	Pulp (m^3/h)	Solids (%w/w)
Carbon Regeneration and Attrition Carbon Reactivation Kiln						
Carbon Reactivation Kiln Feed	0.09	0.0692	0.0047	0.095	0.0739	95
Carbon Reactivation Kiln Discharge	0.09	0.0692	-	0.09	0.0692	100
Carbon Quench Tank						
Fresh Carbon Dewatering Screen Oversize	0.0935	0.072	0.0104	0.1039	0.0823	90
Carbon Reactivation Kiln Discharge	0.09	0.0692	-	0.09	0.0692	100
Regenerated Carbon Fines Screen Feed	0.184	0.141	0.734	0.918	0.875	20
Regenerated Carbon Fines Screen						
Regenerated Carbon Fines Screen Feed	0.184	0.141	0.734	0.918	0.875	20
Regenerated Carbon Fines Screen Oversize (to CIL Tank F)	0.182	0.14	0.0321	0.214	0.172	85
Regenerated Carbon Fines Screen Undersize (to carbon fines tank)	0.00152	0.00117	0.742	0.744	0.743	0.2
Acid Wash Column						
Carbon Feed to Acid Wash Column	0.181	0.139	0.725	0.906	0.864	20
Carbon Transferred to Elution	0.181	0.139	0.725	0.906	0.864	20
Acid Wash Flow	-	-	3.03	3.03	2.72	-
Acid Solution Recirculation	-	-	3.03	3.03	2.72	-
Elution Strip Column A						
Carbon Transferred to Elution	0.181	0.139	0.725	0.906	0.864	20
Eluted Carbon Transfer to Unloaded Carbon Dewatering Screen	0.0906	0.0697	0.362	0.453	0.432	20
Eluted Carbon Transfer to Fresh Carbon Dewatering Screen	0.0906	0.0697	0.362	0.453	0.432	20
Barren Strip Solution Flowrate	-	-	8.7	8.7	8.7	-
Eluate Solution to Electro winning (electrowinning feed)	-	-	8.7	8.7	8.7	-
Refinery Electro winning						
Eluate Solution to Electro winning (electrowinning Feed)	-	-	8.7	8.7	8.7	-
Electro winning Solution Discharge Pump to Barren Strip Solution Tank	-	-	8.7	8.7	8.7	-
Sludge Filter Pump Discharge (electrowinning conc.)	0.00036	0.00002	0.0015	0.0018	0.0015	20
Paste Plant Buffer Tank						
Buffer Tank Feed	31.1	10.7	35	66.1	45.7	47.1
Filter Feed	31.1	10.7	35.8	66.9	46.5	46.5
Disc Filter	-	-	-	-	-	
Filter Feed	31.1	10.7	35.8	66.9	46.5	46.5
Cake	31.1	10.7	7.78	38.9	18.5	80
Tailings Box Feed (filtrate + vacuum seal water)	0.014	0.00484	28	28	28	0.05
Mixer						
Cake	31.1	10.7	7.78	38.9	18.5	80
Water Addition to the Mixer	-	-	2.97	2.97	2.97	-
Slag Feed	0.903	0.31	-	0.903	0.31	100
Cement Feed	0.226	0.0717	-	0.226	0.0717	100
Paste Production	32.3	11.1	10.8	43	21.9	75
Water Management Tailings Pond						
Tailings Pond Feed	25.5	8.78	53.7	79.1	62.4	32.2
Reclaim Water from the Tailings Pond to the Service Water Tank	-	-	51.3	51.3	51.3	-

16.4.3 Equipment List

The equipment list presented in Table 34 was initially developed for the conceptual mill presented in the 2013 technical report

The equipment was selected based on design criteria outlined in Table 33 above for a 1,250 t/d throughput and an availability of 92%. Some major equipment was designed for an expansion to 2,500 t/d. A major equipment list with a brief description of the equipment is presented in Table 34.

In the design of the mill that was constructed, certain components were added or deleted (noted with an asterisk in Table 34). The notable changes were:

- The number of cyclones installed increased from 6 to 8
- A loaded carbon tank was added
- A second gravity concentrator was added
- A gravity concentrator feed screen was added
- The storage bin designated for slag will be used for fly ash as a slag supply is unavailable
- One paste pump was installed to meet the initial requirements for paste fill. Foundations for the second pump were constructed

Table 34: Major Process Equipment

Equipment No.	Equipment Name	Equipment Description	Changes*
1011-BIN-002	Ore Storage Bin	10.7 m (35 ft) diameter by 18.1 m (59.5 ft) high, 2,300 tonnes capacity	
1011-CVO-002	SAG Mill Feed Conveyor A		
1011-CVO-003	SAG Mill Feed Conveyor B		
1011-FED-002	Apron Feeder A		
1011-FED-003	Apron Feeder B		
1011-FED-004	Apron Feeder C		
1011-FED-005	Apron Feeder D		
1021-CLU-001	Hydrocyclone Cluster	8 cyclones installed (each 381 mm (15 in) in diameter)	
1021-MIL-001	SAG Mill	6.1 m (20 ft) diameter by 3.35 m (11 ft) (F/F), 3.0 m (10 ft) (EGL), 1,790 kW (2,400 hp)	
1021-MIL-002	Ball Mill A	3.2 m (10.5 ft) diameter by 4.9 m (16 ft) (F/F), 4.7 m (15.5 ft) (EGL), 597 kW (800 hp)	
1022-CLA-001	Loaded Carbon Tank		*
1022-SCR-005	Trash Screen	Linear, 1.2 m by 2.4 m (4 ft by 8 ft)	
1022-THK-001	Pre-Leach Thickener	High rate, 14.0 m (46 ft) diameter	
1025-GCO-001	Gravity Concentrator A & B		*
1031-SCR-006	Loaded Carbon Screen	Vibrating, 0.9 m by 1.8 m (3 ft by 6 ft)	
1031-SCR-010	Gravity Screen	Vibrating, 0.9 m by 1.8 m (3 ft by 6 ft)	*
1031-TNK-004	Pre-Aeration Tank A	8.5 m (28 ft) diameter by 9.6 m (31.5 ft) high	
1031-TNK-005	CIL Tank A	8.5 m (28 ft) diameter by 9.6 m (31.5 ft) high	
1031-TNK-006	CIL Tank B	8.5 m (28 ft) diameter by 9.6 m (31.5 ft) high	
1031-TNK-007	CIL Tank C	8.5 m (28 ft) diameter by 9.6 m (31.5 ft) high	
1031-TNK-008	CIL Tank D	8.5 m (28 ft) diameter by 9.6 m (31.5 ft) high	
1031-TNK-009	CIL Tank E	8.5 m (28 ft) diameter by 9.6 m (31.5 ft) high	
1031-TNK-010	CIL Tank F	8.5 m (28 ft) diameter by 9.6 m (31.5 ft) high	
1032-SCR-015	Safety Screen	Linear, 1.2 m by 2.4 m (4 ft by 8 ft)	
1032-TNK-011	Cyanide Destruction Tank	7.0 m (23 ft) diameter by 7.6 m (25 ft) high	
1041-COL-001	Acid Wash Column	4 t	
1041-COL-002	Strip Column A	4 t	
1041-KIL-001	Carbon Reactivation Kiln	2 t, 7.46 kW (10 hp) (Rotation), 130 kW (heat)	
1041-TNK-012	Dilute Acid Tank		
1041-TNK-013	Barren Strip Solution Tank		
1041-TNK-016	Carbon Quench Tank	2 t, 1.5 m (5 ft) diameter by 2.3 m (7.5 ft) high	
1051-BIN-011	Cement Storage Bin		
1051-BIN-012	Fly Ash Storage Bin		*
1051-FIL-002	Disc Filter A		
1051-FIL-003	Disc Filter B		
1051-MIX-001	Paste Mixer	2 motors at 56 kW (75 hp)	
1051-PMP-040	Paste Pump A	Putzmeister	*
1051-TNK-017	Buffer Tank		
1071-EWC-001	Electrowinning Cell A		
1071-EWC-002	Electrowinning Cell B		
1073-FUR-001	Smelting Furnace	340 kg (750 lb), 125 kW	
1073-GTA-001	Gravity Table	shaking table	

* Addition and deletions in equipment from the conceptual design of the 2013 preliminary economic assessment

17 Project Infrastructure

This section updates the project infrastructure from that described in the 2013 Technical Report. In each section a brief description of the infrastructure is given, with an update near the end of the section. Effectively all but the final infrastructure discussed in the 2013 Technical Report has been completed except for a new office, mine dry and warehouse. These have not been constructed.

17.1 Surface infrastructure

The Phoenix gold project site is accessed via a dedicated 8-kilometre gravel road from Nungesser Road in the Municipality of Red Lake. The road is nominally 10 metres (m) wide within a 50 m right-of-way. Entry into the project facilities is controlled by perimeter fencing and a security gate with 24 hours service. A network of gravel roads on site provides vehicular access to the project infrastructure. A significant amount of infrastructure has been constructed. The main surface infrastructure includes (Figure 25 and Figure 26):

- Hoist, headframe, and hoist house
- Processing plant
- Tailings management facility
- Effluent treatment plant
- Electric power supply and substation
- Propane storage tanks
- Fibre optic communications cable
- Compressed air supply
- Process and potable water supplies
- Sewage works
- Mine ventilation fans and heater house
- Offices, shop, warehouse, core shack, and storage buildings provide housing for related site activities

17.1.1 Hoisting Facility

The Phoenix shaft hoist is a Canadian Ingersoll Rand double drum hoist with 4.27-metre (14 ft.) diameter drums and two 932 kW (1,250 hp) motors. A recent shaft deepening was completed to 730 m below surface and includes operational loading pockets at the 337 m level and 685 m level. The production conveyances include a skip over double deck cage combination and second skip, operated in balance, with a skip capacity of 10 t. Development rock hoisted to surface is dumped into a bin beside the headframe. Rock not used for site construction work is either stockpiled or deposited in the tailings management facility.

There are a number of alternatives for access to depths below the current shaft bottom of the 730 m level. These include a third phase of shaft deepening, sinking of an internal winze closer to the mineralized zone, ramp access, and new shaft. Economic and logistic viability of each of these alternatives has not been conducted.

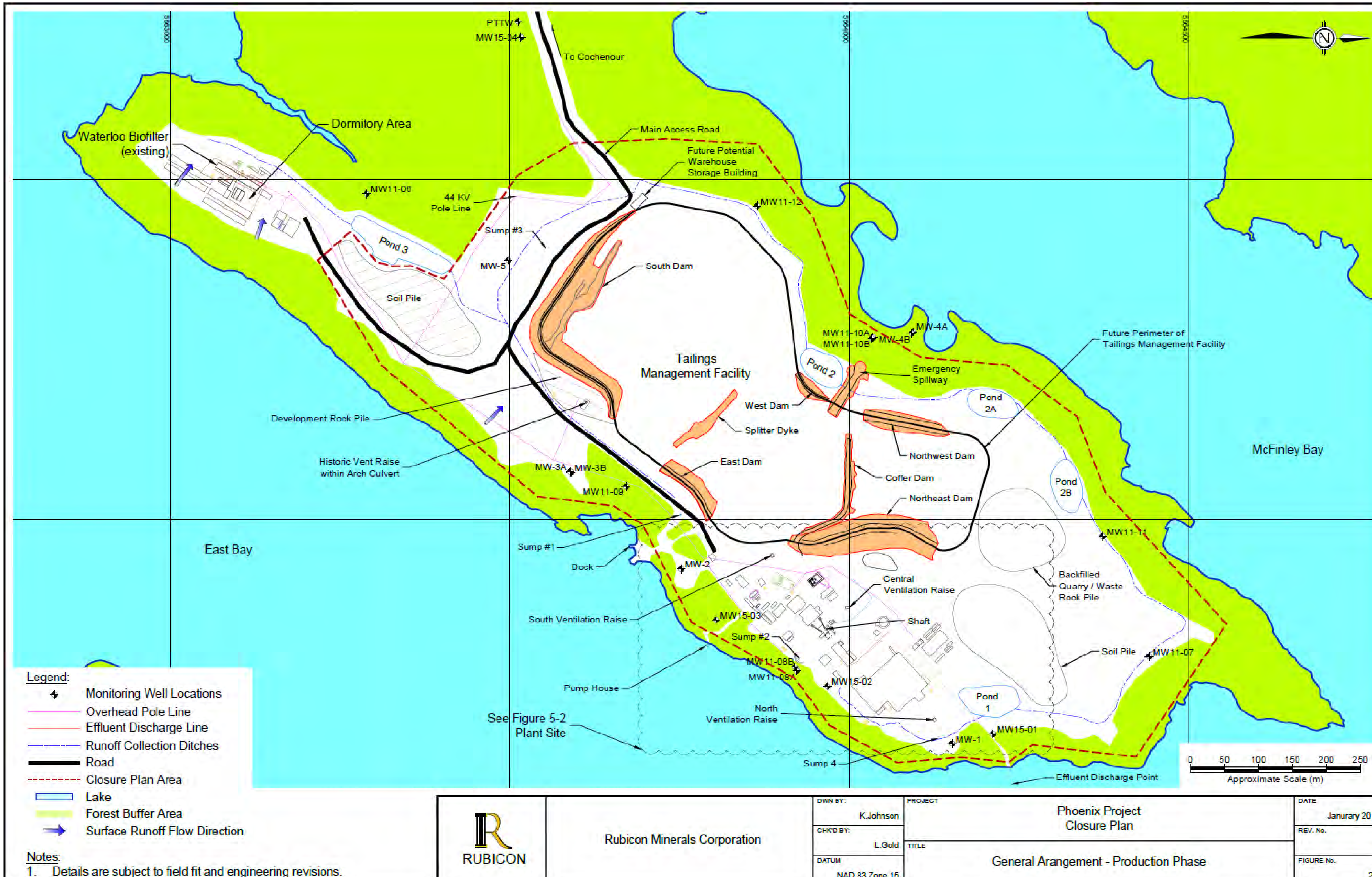


Figure 25: Project Site Plan

Source: Rubicon 2016

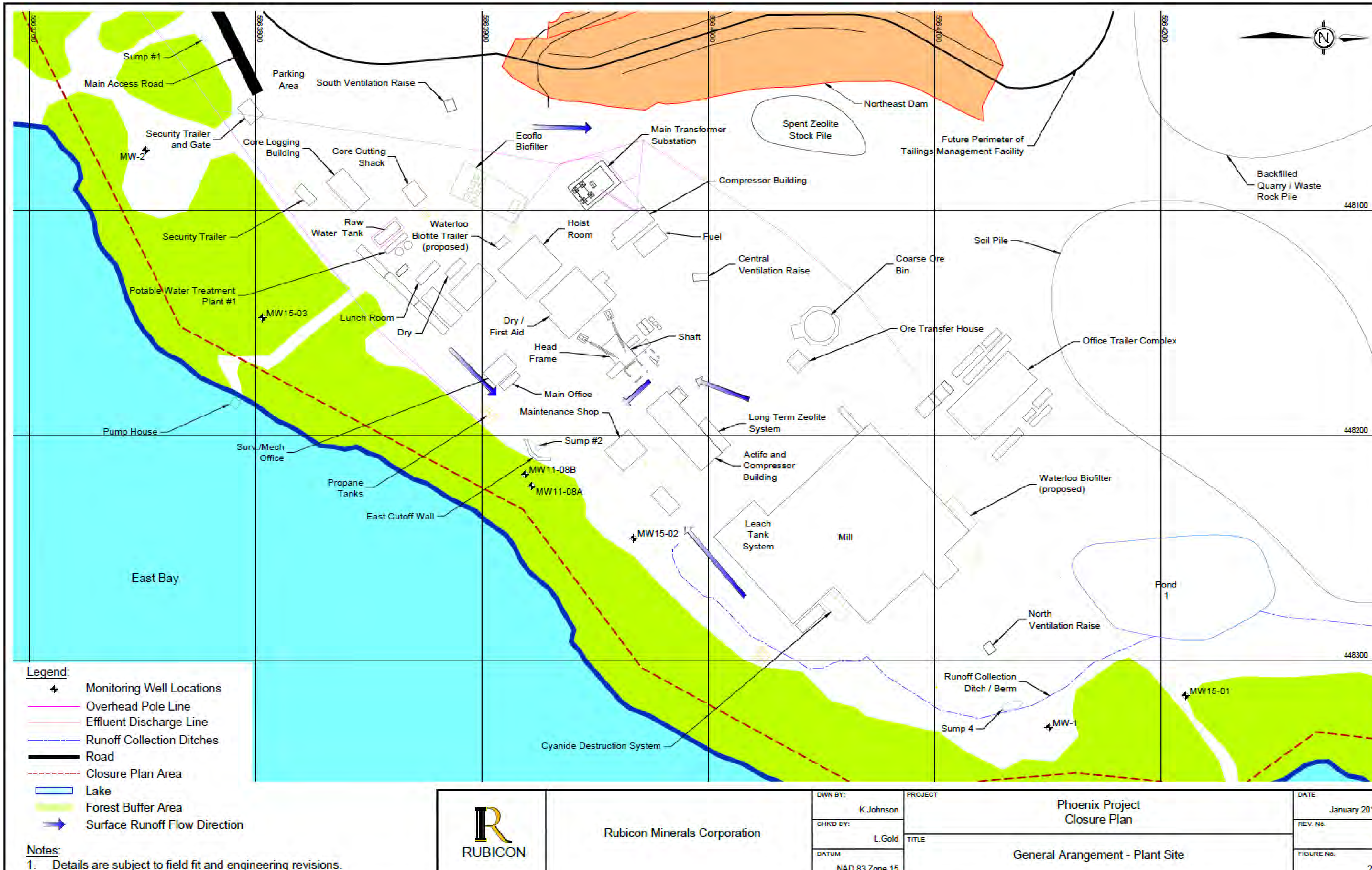


Figure 26: Detailed Project Site Plan of Mine Area

Source: Rubicon 2016

17.1.2 Processing Plant

The mill is designed for a base processing rate of 1,250 tonnes per day (t/d) and can be upgraded incrementally to handle a processing rate of 1,800 t/d and 2,500 t/d. The mill has been constructed and is permitted to process 1,250 t/d of ore on average. Details of the processing facility design and recovery methods are presented in Section 16.

The mill houses a paste backfill plant that will produce a cemented paste fill product from the tailings. The paste fill will be pumped underground for placement into mined out stopes. A recent update on the condition of this system is contained under the Underground Infrastructure section.

17.1.3 Tailings Management Facility

The historic tailings management facility consisted of a dam and pond. The containment pond was constructed by McFinley Mines Ltd. in 1988 and operated under a Certificate of Approval. After test milling a bulk sample in 1989, the facility received minimal use. The tailings management facility was re-activated by Rubicon, upgraded, and the necessary government approvals have been obtained.

The tailings dam will be raised in planned stages periodically over the life of the mine to increase the capacity of the tailings management facility as more tailings are produced. Foundation investigation has been carried out for the current design. For future dam raises, similar foundation investigations will be required to refine the designs. The location of the tailings management facility and related facilities are presented in Figure 25.

The tailings management facility design utilizes mine rock that was hoisted to surface for the construction of the tailings management facility dams, buttresses, etc.

The tailings management facility and effluent treatment plant are designed to withstand a 30-day duration of a 1-in-100-years rain or snow event. The mill has a sulphur dioxide (SO_2-air) cyanide destruction system that treats tailings slurry prior to discharge to the tailings management facility. Discharge from the tailings management facility is processed by an Actiflo clarification system with a capacity of between 780 and 3,100 metres cube per day (m^3/day). This system is designed to remove total suspended solids and metals from the water prior to discharging it to the environment. Rubicon is permitted to discharge a maximum of 3,100 m^3/day of water to the environment from March to November. As a temporary measure in advance of installing a permanent ammonia treatment system, in 2015 Rubicon retrofitted two leach tanks in the mill to contain zeolite media for the removal of ammonia from effluent. This system operated successfully for the duration of the discharge period in 2015 and effluent consistently met effluent criteria.

17.1.4 Power and Communications

Electricity Supply

Rubicon executed a Capital Cost Recovery Agreement and subsequent Distribution Connection Agreement with Hydro One Networks Inc. in 2011 which granted an allocation of 5.3 MVA (for a period of ~5 years, after which time the portion that is not being used by Rubicon could be allocated to other customers, in accordance with the Distribution System Code and the Transmission System Code).

In anticipation of increasing power requirements, Rubicon executed additional contracts with Hydro One in 2015 relating to a grid upgrade and an amended operating agreement that allows Rubicon to draw additional electricity, subject to potential load curtailment under the guidance of Hydro One. This additional allowed power consumption will become an allocation to Rubicon once the grid upgrades have been completed in accordance with the above noted contract. The contracts with Hydro One have been amended to reflect the current temporary suspension (as defined in *Mining Act*) status of the Phoenix gold project.

The on-site electrical supply is from a 44 kV grid connection to Hydro One. This feeds the main substation which contains two 18 MVA transformers feeding a common 5 kVA bus supplying the site.

The mine electrical distribution system consists of one 3 conductor 4/0 AWG 5 kV Tech 90 cable installed in the shaft from the surface winch room to the 305 m level and one 3 conductor 350 MCM 5kV Tech 90 cable that is also installed in the shaft and goes from the surface winch room down to the 610 m level.

The current underground power distribution system is inadequate to support the expected production rates. An upgraded design necessary for the expansion includes installation of 2 – 500 MCM 5kV Tech 90 cables from the surface powerhouse down drill holes to the 122 m level, continuing down the emergency escape-way to all accessible levels. A disconnect is planned for each of the 122, 183, 244 and 305 m levels. The total estimated cost for the underground electrical distribution upgrade is $480,000. Estimated installation duration is six weeks once the additional cable arrives.

A mine substation is required on the 610 m level prior to diamond drilling on this level. This will also free up additional capacity on the 305 m level to accommodate the new dewatering pumps. The substation is in position, but requires the completion of the terminations.

Propane

Propane is available from a local supplier and tanks have been placed at various locations throughout the property to be used as a source of heat. There are two 8,770-litre tanks at the 122 Fresh Air Raise fan location to supply propane to two ventilation air heaters. There are three 6,000-litre tanks located at the dormitory (camp), a 3,000-litre tank at the pole barn and a 3,000-litre tank at the construction trailers near the mill. A new propane tank farm has been placed on the south end of the property with a capacity of 226,000 litres.

Natural Gas

Natural gas supply is available in the Red Lake area and could be considered an energy alternative in the future.

Fuel Storage

A 25,000-litre above ground diesel fuel storage tank and dispensing station is currently located besides the compressor building. The facility has the requisite spill storage capacity and meets other fuel storage requirements of the Technical Standards & Safety Authority (TSSA).

A small supply of gasoline is currently kept on site for emergency use. There is no regular gasoline dispensing facility.

Communications

Site surface communication is via a VOIP telephone system. The system is connected by a fibre optic cable installed along the same route as the electrical power supply line. Radios are used for site wide communications.

Communication systems underground include a leaky feeder system and FEMCO telephones located in shaft stations and refuge stations. A fibre optic cable has been installed in the shaft for future communications and instrumentation applications underground.

17.1.5 Compressed Air Supply

The project has two 313 kW (420 hp) air compressors rated at 3,041 square metres per hour (m^3/hr) (1,790 cfm), two 447 kW (600 hp) air compressors rated at 5,097 m^3/hr (3000 cfm), and a small back-up unit. The estimated compressed air requirement for production is 11,961 m^3/hr (7,040 cfm) at 1,800 t/d and 15,920 m^3/hr (9,370 cfm) at 2,250 t/d. The compressors are housed in a permanent building with temperature controlled louvers to exhaust heat from the building. The compressors operate on a cascading system controlled by local controllers on each unit. The two larger units operate on a continuous basis and cycle loaded and unloaded. The remaining smaller units provide compressed air during periods of high demand. Status of the underground distribution system is described under Underground Infrastructure

17.1.6 Process and Potable Water Supply

Lake water is pumped from the adjacent East Bay of Red Lake to feed the process water and underground activities. The authorized pumping rate from the lake through Rubicon's Permit to Take Water is 695 litres per minute (L/min) with a max daily total of 1,000,000 litres per day (L/day).

Process water in the mill and water accumulated in the tailings management facility is recirculated back into the mill process water supply system, thereby minimizing the amount of water pumped from the lake. The underground dewatering system reports to the tailings management facility and is authorized by Permit to Take Water 3812-9C9KVF for a maximum of 2,917 L/min with a maximum of 2,100,000 L/day.

Potable water for the project site as well as for the on-site dormitory is taken from East Bay and regulated under an exception under the *Water Resources Act*. The potable water is conditioned by a system of nano membrane modules and UV bacterial disinfection prior to use.

17.1.7 Sewage Treatment Facility

The project's two domestic sewage systems and industrial sewage systems are regulated by Environmental Compliance Approval 7500-9VK4A.

The dormitory's Waterloo Biofilter is permitted to a maximum capacity of 40,000 L/day of domestic sewage. This discharges effluent to the tailings management facility. Domestic sewage from the project site is processed by a subsurface disposal Ecoflo Biofilter system that is permitted for a maximum of 15,000 L/day.

All site waste water reports to the tailings management facility (approximately 9 hectares in size). The mill has a sulphur dioxide (SO_2-air) cyanide destruction system that treats tailings slurry prior to discharge to the tailings management facility. Discharge from the tailings management facility is processed by an Actiflo clarification system with a capacity of between 780 m^3/day and 3,100 m^3/day. This system is designed to remove total suspended solids from the water prior to discharging it to the environment. Rubicon is permitted to discharge a maximum of 3,100 m^3/day of water to the environment from March to November.

17.1.8 Mine Ventilation Facilities

Mine ventilation is supplied by a push/pull system designed around a surface installation on the 305 Fresh Air Raise consisting of two 72″ diameter 250 hp Alphair fans, complete with associated heaters and ancillary equipment. This system is capable of providing 340-370 thousand cfm to the workings, however, the current heating capacity reduces the upper limit of the entire installation to 320 thousand cfm. This system is installed but has not been commissioned.

Mining to date has been serviced by a ventilation system consisting of a 54″ 250 hp fan and associated heaters/ancillary equipment located on surface at the collar of the 122 EW FAR, supplemented by a 42″ 75 hp fan near the toe of the 305 FAR, and a 54″ 100 hp at the toe of the 122 FAR. This system is capable of supplying approximately 120,000 cfm to the mine.

17.1.9 Other Site Buildings

Facilities provided by other buildings in the vicinity of the Phoenix shaft include:

- Bunkhouse and kitchen
- Dry
- Offices
- Core shack and core storage
- Maintenance shop
- Warehouse
- Cold storage
- Muck handling system
- Processing plant

17.1.10 Waste Rock Stockpiles

A total of approximately 355,000 t of waste have been hoisted from the underground workings from the most recent period of development. Due to the inconsistent quality of waste material hoisted from underground only a small percentage of mine waste has been used for surface construction. The talcolse ultramafic waste rock does not lend itself for use as an aggregate. The waste pile is located on the northwest corner of the peninsula in a containment area previously referred to as the quarry.

17.1.11 Production Material Stockpiles

There are no stockpiles of mineralized mine production material as all stockpile material was milled by November 21, 2015. There are currently no plans to maintain significant stockpiles of mineralized material on site. It is possible in the future to establish an area for mineralized material stockpiling to accommodate operations and maintenance schedules.

17.1.12 Explosives Magazines

No surface explosives magazines are planned. Upon delivery to site, explosives are moved to authorized magazines underground for storage.

17.1.13 Assay Laboratory

An assay laboratory is located off site in a commercial mall in Balmertown. It has facilities for crushing, pulverizing, fusion, cupellation, acid digestion and atomic absorption analyses. The two fusion furnaces each have capacity for 42 crucibles, heated to temperatures from 850 to 1060 degrees Celsius. The laboratory is capable of processing a maximum of 252 samples every three hours. The limiting operational factor is the capacity of the aqua regia digestion laboratory.

17.2 Underground Infrastructure

The underground infrastructure required to support production mining includes material handling facilities, mine dewatering system, paste backfill distribution system, equipment repair shops, ventilation system, supply lines for compressed air and process water, electrical power supply, and miscellaneous facilities.

17.2.1 Material Handling

The material handling system is described as the upper material handling system (122 to 305 m levels), the lower material handling system (366 to 685 m levels), and the material handling below the 610 m level.

Upper Material Handling System

The upper material handling system consists of a series of connected raises between the 122 and 305 m levels where the ore and waste is then transported by rail. This system allows both ore and waste movement from each level to the mid-shaft loading pocket on the 337 m level. Construction of ore and waste passes on the 122 m level is 10% complete. The 183 and 244 m levels ore and waste passes are operational. Chutes are installed and operational on the ore and waste passes on the 305 m level. Haulage to the shaft is operational with one rock breaker/grizzly installation complete and operational while the second installation remains to be completed.

Lower Material Handling System

The lower material handling system has not been constructed. To date a 10-tonne loading pocket has been commissioned on the 685 m level and excavations for muck handling near the shaft have been started. The current design includes a rock breaker / grizzly screen combination on 610 level with a chute at the bottom of the waste pass raise on 685 level. This chute will transfer waste rock to a conveyor arrangement which will feed the loading pocket. An ore system is also designed which will accept ore from rail cars on 610 level through a raise to the 640 m elevation where a jaw crusher will be installed to size the material to – 4 inch. This sized material will be placed in a raise with a chute on 685 level. This chute will transfer the crushed ore to a conveyor arrangement which will feed the loading pocket.

Below 610 Metre Level Material Handling System

Pending continued exploration, alternatives for accessing the mineralized zone at depths greater than the 610 m level will be evaluated.

17.2.2 Mine Dewatering

Main dewatering stations are located at shaft bottom, the 610 m level, 305 m level and 122 m level. This system is capable of pumping a maximum flow rate of approximately 757 L/m (200 USgpm).

An upgraded system capable of pumping 3,028 L/m (800 USgpm) from the 305 m level to surface is 70% complete. The current project permit allows dewatering at a rate of 2,917 L/min (771 USgpm) and a maximum of 2.1 million L/day (0.56M USgal/day).

17.2.3 Compressed Air Distribution System

The main compressed air line is installed in the shaft and consists of a 150 mm (6″) line from surface to the 305 m level and a 200 mm (8″) line from there to the shaft bottom. While adequate for exploration purposes, this system will require additional capacity to accommodate expected production rates. Construction of the compressed air distribution system upgrade is approximately 20% complete.

17.2.4 Refuge Stations

There are four refuge stations located underground, three of which are complete (122 m, 183 m, and 305 m levels) and one which needs approximately two weeks work to complete (244 m level). Additional refuge stations will be required once mine development progresses. The currently constructed refuge stations meet Ministry of Labour requirements.

17.2.5 Paste Backfill Distribution System

The paste backfill distribution system is 90% complete for supplying material to workings above the 305 m level. Piping has been run on all but one level underground and all but one interconnection are prepared. This work can be completed over a two-week duration.

The surface plant requires final connections and initial run testing before backfill can be consistently delivered underground. The final connections could be completed over a two-week duration.

Laboratory testing of binder types and mixtures have been completed. Operational testing will be required to achieve optimal binder addition to achieve desired backfill strengths and costs.

17.2.6 Repair Shops

There are two maintenance areas located on the 183 and 244 m levels. These locations do not meet the requirements of a repair shop. A repair shop will be required at or near the 610 m level to service mobile equipment.

A repair shop or maintenance bay will be required to service track equipment on every level where track is installed.

17.2.7 Miscellaneous Facilities

Other underground facilities not covered above include but are not limited to storage bays for supplies and equipment, electrical substations, diamond drill stations, local electrical panels, charging stations, and toilet facilities located convenient to active headings.

18 Market Studies and Contracts

18.1 Market Studies

The Phoenix gold project processing facilities are complete and able to produce high grade gold doré bars at the site, which are readily marketable.

19 Environmental Studies, Permitting, and Social or Community Impact

The information presented in this section is extracted from the 2013 Technical Report and was updated, where appropriate to reflect the current status of the property.

19.1 General

From an environmental perspective, it is significant that the Phoenix gold project occupies the McFinley Peninsula in Red Lake. The land and water adjoining the site are generally used for wilderness/recreation, mineral resource development, and forestry. The project is a brownfield site that was developed intensively in the 1980s prior to the acquisition by Rubicon in 2002. Rubicon has assumed full ownership of the historic brownfield site conditions and all known environmental liabilities have been identified and addressed by Rubicon.

The project commenced an advanced exploration phase in 2009, a development phase from 2011 to 2015, and was placed into temporary suspension at the end of 2015. The project is currently permitted for commercial production at a rate of 1,250 tonnes per day (t/d) on an annual average basis.

19.2 Environmental Regulatory Setting

The environmental assessment and permitting framework for metal mining in Canada is well established. The federal and Ontario provincial environmental assessment processes provide a mechanism for reviewing major projects to assess and resolve potential environmental impacts. Following a successful environmental assessment, a project undergoes a licensing and permitting phase for the legal and environmental aspects of the project. The project is then regulated through all life cycle phases (construction, operation, closure, and post-closure) by both federal and provincial agencies.

19.2.1 Current Regulatory Status

The advanced exploration phase, which commenced in Q1 2009, was in accordance with regulatory approvals. In Q1 2011, a Form 1 Notice of Project Status was submitted to the Ontario Ministry of Northern Development and Mines to move the project from advanced exploration status to production status in accordance with Section 141 of Ontario's *Mining Act*. In Q4 2015, a Notice of Project Status Submission was submitted to Ontario Ministry of Northern Development and Mines to move the Phoenix project to temporary suspension status.

Approvals currently in force for the project are presented in Table 35. The approvals generally relate to a 1,250 t/d production rate and amendments will be required if a production increase is required. It is specifically noted that title was secured to the access road and power line right-of-way for the connection to the grid through Section 21 of the *Public Lands Act* for the Crown land portion and a negotiated agreement was reached with the landowners and leaseholders for the private land portion of the right-of-way.

Table 35: Current Approvals

Permit	Regulatory Agency	Relevant Legislation	Date of Issuance	Rationale
Permit to Take Water 3812-9C9KVF	Ministry of Environment and Climate Change	Ontario *Water Resources Act*	December 11, 2008 (last amendment November 20, 2013)	Withdrawal of water from shaft.
Permit to Take Water 3585-85KGHG	Ministry of Environment and Climate Change	Ontario *Water Resources Act*	November 19, 2008 (last amendment May 21, 2010)	Withdrawal of water from East Bay of Red Lake.
Environmental Compliance Approval 7500-9VKJ4A	Ministry of Environment and Climate Change	*Environmental Protection Act*	January 2009 (last amendment May 6, 2015)	Approve industrial and domestic sewage works.
Environmental Compliance Approval 6656-8RVMES	Ministry of Environment and Climate Change	*Environmental Protection Act*	January 27, 2009 (last amendment 28 February 2012)	Approve air emissions from site.
Easement over Crown Land	Ministry of Natural Resources and Forestry	*Public Lands Act*	September 2, 2011	Approve easement over Crown owned surface rights for access corridor.
LRIA Approval No. RL-2014-01, RL-2014-01C	Ministry of Natural Resources and Forestry	*Lakes and Rivers Improvement Act*	January 23, 2009 (last amended November 6, 2015)	Approve Stage 1 construction of the tailings management facility dams and emergency spillway.
Phoenix Gold Project (production) Closure Plan	Ministry of Northern Development and Mines	*Mining Act*	December 2, 2011	Approve development and closure of the production phase of the project.
Amendment to the Zoning By-Law 1277-10	Municipality of Red Lake	Municipal By-Law 1277-10	Process completed in February 2011	Necessary to change the zoning of the project site to mineral mining from hazard land. The new zoning is more appropriate because the entire project site is now subject to a filed closure plan and is no longer considered an abandoned mine site. The amended zoning will also allow the issuance of building permits for the subject land.

In addition to the approvals noted above, Rubicon completed a Class Environmental Assessment pursuant to O. Regulation 116/01 to allow it to seek and ultimately be issued an Air ECA for contingency diesel fired generators (< 5 MW cumulative capacity). Also, Rubicon completed Class Environmental Assessments in accordance with the environmental assessment for Resource Stewardship and Facility Development projects for the activities within the access corridor. The environmental assessment process has been initiated in relation to the shoreline land tenure that Rubicon continues to seek and the 2015 application to re-locate the effluent discharge line to an optimized location in East Bay where improved mixing would be provided.

Currently there are not any outstanding environmental compliance issues on the Phoenix gold project. Rubicon is currently in material compliance and has fulfilled the monitoring and reporting obligations of the approvals listed in Table 35. The obligations under federal and provincial legislation including the Metal Mining and Effluent Regulations and the Environmental Protection Act have been fulfilled to date. On September 8, 2015 an Order was received from the Ministry of

Environment and Climate Change (last amended on January 25th, 2016). The requirements of the Order to date have been completed within the specified timelines. However, as outlined in the Order, there are still some items that need to be complied with, including the requirement to install and commission a long-term ammonia treatment plant if the project proceeds to *Mine Production and Development* status, as defined in the *Mining Act*.

19.2.2 Federal Environmental Assessment Process

In 2011, the Canadian Environmental Assessment Agency confirmed that the 1,250 t/d production phase of the project will not trigger an environmental assessment pursuant to the *Canadian Environmental Assessment Act*. The project has been advanced since this time, and is currently regarded as a mine and is therefore subject to mining sector legislation, including the Metal Mining Effluent Regulations that have been promulgated under the *Fisheries Act*.

In the spring of 2012, the1992 *Canadian Environmental Assessment Act* was amended and replaced by Canadian Environmental Assessment Agency, 2012. Two significant results of the updated Act were the redefinition of conditions that would trigger a federal environmental assessment and the introduction of legislated time periods within the federal environmental assessment process. With respect to the Phoenix gold project, there are two methods for which a federal environmental assessment could be required under Canadian Environmental Assessment Agency, 2012:

- A proposed project will require an environmental assessment if the project is described in the Regulations Designating Physical Activities
- Section 14(2) of Canadian Environmental Assessment Agency, 2012 allows the Minister of Environment to (by order) designate a physical activity that is not prescribed by regulation if, in the Minister's opinion, either the carrying out of that physical activity may cause adverse environmental effects or public concerns related to those effects may warrant the designation

With respect to the first method above, the Regulations Designating Physical Activities (2012) have been amended. The Regulations Amending the Regulations Designating Physical Activities state:

> *17. The expansion of an existing*
>
> *(a) metal mine, other than a rare earth element mine or gold mine, that would result in an increase in the area of mine operations of 50% or more and a total ore production capacity of 3 000 t/day or more*
>
> *(b) metal mill that would result in an increase in the area of mine operations of 50% or more and a total ore input capacity of 4 000 t/day or more*
>
> *(c) rare earth element mine or gold mine, other than a placer mine, that would result in an increase in the area of mine operations of 50% or more and a total ore production capacity of 600 t/day or more*

Federal environmental assessment requirements would have to be satisfied prior to seeking any permits in the event that an increased production rate is desired. Due to the required increase in the area of operations and given that the site occupies a peninsula with little to no opportunity for material expansion to the operations area, a federal environmental assessment is not likely to be required under 17(a) above.

With respect to the second method above, it is not anticipated that the federal Minister of the Environment would designate the project for environmental assessment due to the relatively minute footprint, the benign nature of concerns expressed by the public to date and the absence of discernible, significant adverse environmental effects during the operations to date and in the foreseeable future.

In preparation for potential future increases to the production rate, the engineering work that is required to support planning and environmental permitting for increasing the throughput to 2,000 t/d is materially complete.

19.2.3 Provincial Environmental Assessment Process

The *Environmental Assessment Act* is administered by the Ministry of the Environment and Climate Change and the Ministry of Natural Resources and Forestry. The *Environmental Assessment Act* promotes responsible environmental decision making and ensures that interested parties have an opportunity to comment on projects that may affect them. Interested parties may make a designation request to the Ministry of the Environment and Climate Change to have a project referred to an individual environmental assessment. Ministry of the Environment and Climate Change assesses the merits of the request and may make a recommendation to the Minister, as outlined on the Ministry of the Environment and Climate Change website under the tab titled Environmental Assessments under Designating Regulations and Voluntary Agreements.

The consultation for the advanced exploration permits as well as the numerous other permits issued to date (Table 35) have not resulted in designation requests for an individual environmental assessment.

A Class Environmental Assessment for Resource Stewardship and Facility Development Projects was completed in 2011 for a portion of the corridor to connect the project site to Nungesser Road and the work associated therein. No negative comments were received during this process, which was conducted in accordance with the Ministry of Natural Resources and Forestry process outlined in MNR (2003). An environmental assessment process is being completed in relation to the shoreline land tenure that Rubicon continues to pursue the 2015 application to re-locate the effluent discharge line to an optimized location in East Bay where improved mixing would be provided.

A Class Environmental Assessment was completed in 2011 pursuant to Ontario Regulation 116/01 for the use of less than 5 MW of diesel generation at the project site. No negative comments were received during the process.

19.2.4 Environmental Assessment Requirements for the Project

The project is currently permitted for a production rate of 1,250 t/d on an annual average basis. Federal and provincial environmental assessment requirements would have to be satisfied prior to seeking any permits in the event that an increased production rate is desired.

19.3 Environmental Approvals Process

This section describes the federal and provincial approvals processes for potential production rate increases that may be contemplated in future economic assessments.

19.3.1 Federal Approvals Process

Federal environmental assessment requirements would have to be satisfied prior to seeking any permits in the event that an increased production rate is required (refer to Section 19.2.2).

Permits would need to be maintained pursuant to the *Nuclear Source Control Act* for the use of density gauges in the concentrator that utilize nuclear sources.

19.3.2 Provincial Approvals Process

Provincial environmental assessment requirements would have to be satisfied prior to seeking any permits in the event that an increased production rate is required.

In preparation for a potential future increase to the production rate, the engineering work that is required to support planning and environmental permitting for increasing throughput to 2,000 t/d is materially complete. However, limited refined engineering is required to determine the nature of the amendments to the provincial approvals required to increase the production rate. As a minimum, it is envisioned that amendments would be required to the approvals listed in Table 36.

Table 36: Anticipated Amendments to Approvals

Permit	Regulatory Agency	Relevant Legislation	Rationale for Permit Issuance	Rationale for Amendment
Permit to Take Water 3585-85KGHG	Ministry of Environment and Climate Change	Ontario *Water Resources Act*	November 19, 2008 (last amendment May 21, 2010)	Increased withdrawal of fresh water from East Bay.
Environmental Compliance Approval 7500-9VKJ4A	Ministry of Environment and Climate Change	*Environmental Protection Act*	Approves industrial and domestic sewage works	Increased production rate (administrative amendment), potential changes associated with changes to water balance, approve engineering design for tailings management facility modifications during late stages of the mine life.
Environmental Compliance Approval 6656-8RVMES	Ministry of Environment and Climate Change	*Environmental Protection Act*	Approve air emissions from site	Modifications to mine ventilation and increased return air volume; additional potential sources of fugitive dust and gaseous emissions.
LRIA Approval No. RL-2014-01, RL-2014-01C	Ministry of Natural Resources and Forestry	*Lakes and Rivers Improvement Act*	Approve Stage 1 construction of the TMF dams and Emergency Spillway	Ongoing tailings management facility construction.
Phoenix Gold Project (production) Closure Plan	Ministry of Northern Development and Mines	*Mining Act*	Approve development and closure of the production phase of the project	Increased production rate and modified dimensions of the tailings management facility upon closure, along with modified financial assurance requirement. The spatial extent of the project footprint will not be materially affected by the increased production rate.

19.4 Environmental Studies and Management

19.4.1 Environmental Studies

The project closure plan describes current conditions at the property. Baseline monitoring activities and areas of study to date are listed below and have been incorporated into the closure plan, annual environmental performance reports, and other submissions to regulatory agencies:

- Monthly surface water monitoring since 2007 in the vicinity of the project site
- Semi-annual sampling of groundwater monitoring wells since 2009
- Archaeological assessment by Ross Associates
- Annual species at risk assessment by Northern Bioscience
- Background conditions study by BZ Environmental
- Aquatic biological assessment by EAG
- Effluent mixing and plume delineation studies by EAG and Story Environmental
- Assessment of risks to the downstream environment from the project by Novatox
- Hydrogeological characterization by AMEC Earth and Environmental
- Phase 1 and Phase 2 environmental site assessments by True Grit Consulting
- Risk assessment of the groundwater and soils at the project site in accordance with O. Regulation 153/04 by Novatox
- Geochemical characterization of development rock associated with the Advanced Exploration phase by AMEC Earth and Environmental
- Geochemical characterization of development rock, ore, tailings and quarried surface rock by Chem-Dynamics
- Geotechnical assessments of underground workings by AMEC Earth and Environmental and AMC Mining Consultants
- Project reviews by WESA Consultants and ArrowBlade Consulting Services

No biological values, i.e., species at risk, ecologically significant features, regionally significant wetlands, significant wildlife habitat, environmentally sensitive areas, etc., that would preclude the re-development of the project site have been identified to date. Ongoing field studies have been conducted with input from the Ministry of Natural Resources and Forests to ensure adherence to the provincial *Endangered Species Act, Public Lands Act, Crown Forest Sustainability Act,* and the Provincial Policy Statement that has been issued pursuant to Section 3 of the *Planning Act*.

Consultation to date with Aboriginal communities has not identified the presence of cultural heritage values in the vicinity of the project site. In addition, the desktop and field work by Ross Archaeological Research Associates did not identify any areas with a high potential to host cultural heritage values on McFinley Peninsula (Ross Associates 2010). As the project involves the re-development of the existing footprint with only moderate expansion, the potential for impacts to cultural heritage values as a result of the re-development of the brownfield project site are considered to be negligible.

19.4.2 Environmental Management

Rubicon has developed and adheres to an environmental management system for the project (Rubicon 2015). The environmental management system is a simple, plain language tool that has been prepared internally to identify and help manage environmental compliance obligations for the Phoenix property. The extent of the property covered by the environmental management system includes the project site on McFinley Peninsula as well as off-site areas within the larger Phoenix lands and along the access corridor.

The elements of the environmental management system are:

- Lists of the relevant legislation, approvals, agreements and documents that contain Rubicon's environmental obligations
- Division of the property into discrete environmental management areas, each area having a description of the environmental obligations and the corresponding inspection frequency
- Designated inspectors and documented inspection protocols
- Procedures to deal with non-compliance issues and conditions
- Guidance for documentation requirements, regular updates, and regular internal reporting on performance and auditing

The environmental management system identifies the project's compliance obligations and outlines inspection/audit protocols to ensure compliance issues are identified, reported, mitigated, and documented. The environmental management system also addresses community engagement/consultation obligations and includes a commitments registry of Aboriginal agreements, community commitments, etc. The environmental management system is expected to evolve into a tool to manage corporate social responsibility commitments and obligations.

19.5 Social Setting

This section summarizes Rubicon's consultation and outreach program, which began on a formal basis in 2008.

19.5.1 Aboriginal Consultation

Rubicon has undertaken consultation with Aboriginal communities under the guidance of government agencies. To supplement the guidance, Rubicon commissioned an independent traditional use study that concluded the project site is within the traditional territory of Lac Seul First Nation and Wabauskang First Nation (Forbes 2011).

An archaeological study of the McFinley Peninsula was commissioned by Rubicon. The study did not identify any sites with a high potential to have cultural heritage value within the development footprint (Ross Associates 2010). Also, as the project involved the re-development of the existing footprint with only moderate expansion, the potential for impacts to cultural heritage value sites as a result of the re-development of the area were considered to be negligible. Accordingly, it was deemed reasonable to solely engage Lac Seul First Nation, Wabauskang First Nation, and the Métis Nation of Ontario to further discuss and identify potential areas of cultural heritage values within the development footprint that may have warranted protection.

Rubicon commissioned an independent conservative risk assessment to quantify the potential risks to valued environmental components identified in Forbes (2011) and to human habitations downstream of Red Lake. The study identified effluent discharge as the sole credible pathway for exposure of the downstream valued environmental components and communities to potential contaminants of concern. The study concluded that the additional, incremental ecological and human health risk that the planned operation of the project poses to the environment downstream of Red Lake is not significant (Novatox 2011). Accordingly, Rubicon has not engaged Aboriginal communities with traditional territory downstream of Red Lake regarding potential impacts as a result of the project.

Rubicon believes in the value of establishing and maintaining meaningful relationships with Aboriginal communities in the Red Lake district where the project is located. In January, 2010 Rubicon became the first public company in the Red Lake district to sign an Exploration Accommodation Agreement with the Lac Seul First Nation. In January of 2012, Rubicon signed a Letter of Intent with the Métis Nation of Ontario and continues to grow its relationship with the Métis citizens particularly in Region 1, where the project is located. In 2014, Rubicon signed an Exploration Accommodation Agreement with Wabauskang First Nation and also settled the judicial review of the closure plan that was launched in 2012. Rubicon has established a successful history of consultation with the local Aboriginal communities and is committed to continued consultation over the life of the project. Rubicon has set a goal to establish benefits agreements with neighbouring Aboriginal communities as the project moves forward.

Rubicon's Aboriginal Policy

Rubicon formalized its Aboriginal policy in 2008. The current policy is reproduced as follows:

- Rubicon management endeavors to responsibly develop and operate projects that meet high economic, environmental, and social standards.
- We respect and value the communities that neighbor our projects, and recognize the unique status of Aboriginal people as the original members of those communities.
- Whenever our operations might affect an Aboriginal community, Rubicon seeks to develop enduring relationships with those communities built upon trust and respect.

Rubicon will:

- Identify and engage the Aboriginal communities with an interest in the area of our projects
- Maintain ongoing, transparent and good faith communications with the Aboriginal communities that we engage
- Provide thorough, accurate and understandable information regarding Rubicon's activities and plans
- Seek a clear understanding of the interests of the Aboriginal communities and duly consider these interests during all stages of our projects
- Respect the traditional knowledge, cultural practices, and culturally-significant sites of the Aboriginal communities that we engage

Additional details regarding Rubicon's First Nation agreements, related economic development, capacity funding and outreach efforts continue to be available on Rubicon's website.

19.5.2 Public Consultation

Public information sessions have been held annually in the Red Lake community since 2008. No unresolved negative comments have been received to date during these sessions. Rubicon maintains an open door policy to proactively identify and address stakeholder concerns regarding the project. Formal public consultation to date is summarized in Table 37.

Table 37: Summary of Public Consultation

Date	Summary of Public Consultation that was Undertaken	Summary of Information Provided	Summary of Comments that were Received (if any)
December 2008	Public information session in Cochenour, in accordance with Section 140 *Mining Act* and Section 8 O. Regulation 240/00.	Overview PowerPoint presentation of the project, including the diesel generator aspect.	No comments received in relation to any aspect of the project. There was a general discussion regarding the modernization of the *Mining Act*.
December 2009	Voluntary Annual Public Information Session. Notice was in general accordance with Section 8 of O. Regulation 240/00.	Overview PowerPoint presentation of the project, including the diesel generator aspect.	No comments received in relation to any aspect of the project.
2008 to 2010	Class environmental assessment in accordance with MNR (2003) and Environmental Registry postings.	The Environmental Registry postings include that associated with Air Certificate of Approval 9500-7NGTTC, which included diesel generators.	One comment was received by MNR as part of their Class environmental assessment process in March – April 2010. The comment was positive, in support of the project.
September 2010 to March 2011	Notice of Commencement of Screening and Notice of Completion, Class environmental assessment process pursuant to O. Regulation 116/01.	Publish newspaper article, mail notices to nearby landowners, notify relevant government agencies.	No comments received in relation to the supplemental diesel generators or the project.
December 2010	Public information session in Red Lake, in accordance with Section 141 *Mining Act* and Section 8 O. Regulation 240/00. This session was also held as part of the Class environmental assessment process required pursuant to O. Regulation 116/01.	Publish newspaper article, mail notices to nearby landowners, notify relevant government agencies.	No written comments. The sole question posed following the session was to inquire if water sampling would be conducted in East Bay and in the future tailings management facility.
December 2011	Voluntary Annual Public Information Session. Notice was in general accordance with Section 8 of O. Regulation 240/00.	Overview PowerPoint presentation of the project, the potential production phase, road upgrades and the PEA.	No comments received in relation to any aspect of the project.
2012	Voluntary Annual Public Information Session. Notice was in general accordance with Section 8 of O. Regulation 240/00.	Published newspaper notice of meeting. Overview PowerPoint presentation of the project highlighting infrastructure updates (mill foundation and camp), consultation and anticipated update and optimization of the PEA.	No comments received in relation to any aspect of the project.
2013	Voluntary Annual Public Information Session. Notice was in general accordance with Section 8 of O. Regulation 240/00.	Published newspaper notice of meeting. Overview PowerPoint presentation of the project highlighting infrastructure updates (mill foundation and camp), consultation and anticipated update and optimization of the PEA.	No comments received in relation to any aspect of the project.

Table 37: Continued

Date	Summary of Public Consultation that was Undertaken	Summary of Information Provided	Summary of Comments that were Received (if any)
2014	Voluntary Annual Public Information Session. Notice was in general accordance with Section 8 of O. Regulation 240/00.	Published newspaper notice of meeting. Overview PowerPoint presentation of the project highlighting infrastructure updates (mill foundation and camp), consultation and anticipated update and optimization of the PEA.	No comments received in relation to any aspect of the project.
2015	Voluntary Annual Public Information Session. Notice was in general accordance with Section 8 of O. Regulation 240/00.	Local community outreach prior to the information session. Overview PowerPoint presentation to provide an infrastructure update, suspension of mining activities, initiation of Phoenix Project Implementation Plan.	Comments were received regarding employment and business concerns if the Project does not re-start.

Public complaints received to date are summarized below:

- One complaint was received by Rubicon in relation to noise from the construction activities at the project site. Rubicon has planned the project features to mitigate noise emissions and expects that noise emissions will be within government criteria during routine operation of the project site.
- One comment was received regarding noise from Rubicon's regional exploration activities in close proximity to the project site. The nuisance noise has been effectively mitigated and no subsequent comments have been received.
- One comment was received regarding fan noise north of the site, the source of which was clearly identified and mitigated.

Rubicon maintains an issues tracking matrix as part of its environmental management system to effectively track and manage potential concerns as they arise.

19.6 Tailings Disposal

A tailings management facility consistent with contemporary regulatory requirements was constructed at the project site by McFinley Mines Ltd. in 1988 in preparation for a bulk-sampling program. The site chosen was an extensive topographic depression lying immediately west of the shaft site, and a retaining dam was constructed to impound tailings and effluents prior to ultimate drainage south into the waters of East Bay. The disposal area received a Certificate of Approval in 1988. The termination of activities on the project in 1989, after test-milling of an estimated 2,500 tons of the bulk sample, resulted in minimal use of this area.

The tailings management facility, and other sewage works, have been re-activated and approved by an Environmental Compliance Approval issued pursuant to the *Environmental Protection Act*. The tailings management facility has been constructed to Stage 1 design elevation in accordance with an approval issued pursuant to the Ontario *Lakes and Rivers Improvement Act*.

19.7 Environmental Sensitivities

The project site is situated on a peninsula in a valued recreational lake. As such, emphasis has been placed on potential off-site discharges of water, fugitive dust, and noise.

19.7.1 Water Discharge

Responsible management of water discharges will be a priority during production and closure. Project features related to mitigating potential risks to local water quality are summarized in the bullets below.

- An engineered runoff collection system has been constructed around the perimeter of the project site to effectively collect runoff from the operations area where ore, tailings, and waste rock will be handled. Collected runoff will be pumped to the tailings management facility prior to use as process water or treated and discharged to the environment in accordance with regulatory requirements. The effluent treatment system combined with the storage capacity in the tailings management facility will have the ability to contain and manage a robust environmental design flood.
- The effluent treatment system that treats surplus water from the tailings management facility is regarded as best-in-class and, after full installation and commissioning, has been proven to be effective for the removal of metals and suspended solids at other sites in Canada.
- The tailings management facility is being designed in accordance with appropriate design criteria based on the Hazard Potential Classification that was determined in accordance with (MNR 2011; CDA 2007).
- Cyanide will be destroyed in tailings slurry using the proven SO_2-air process prior to the tailings being discharged from the mill building envelope.
- Ammonia in the tailings management facility (TMF) water that is present due to mine water inputs and the hydrolysis of cyanate generated by the SO_2-air process, will be treated using a regenerable zeolite-based ion exchange treatment system that is supplemented by biological treatment on a seasonal basis.
- Ammonia in mine water due to blasting products will be managed by worker education/good housekeeping practices, good blasting practices with regular audits, product selection, absorbent media (zeolite) at blast faces and in sumps, biological treatment, and other approved treatment methods.
- Mine water pumped from underground and water reclaimed from the tailings management facility will be recycled for use in the mill to the maximum extent practical to reduce water intake from East Bay.

19.7.2 Fugitive Dust

Air emission sources will comprise diesel-fired equipment, diesel generators, propane- and natural-gas-fired combustion heating units, return air from the underground workings, and fugitive dust emissions from vehicle operation, the tailings management facility, crushing and material handling typically associated with an underground mining and milling operation. Rubicon has implemented a best practices management plan for the control of fugitive dust.

Practices to minimize fugitive dust are listed in the bullets below:

- Minimize vehicle speed and travel time, utilize dust suppressants on travelled roads, minimize track-out of fines from material handling areas
- Minimize stockpile size and utilize buildings and treelines as windbreaks to the maximum extent practical
- Frequent re-location of the tailings discharge location in order to maintain a wetted tailings surface
- Tackifier and/or binder (cement or fly ash) could be added to deposited tailings to bind together the tailings solids and prevent entrainment by wind
- Enclose material transfer points and utilized water sprays to suppress dust
- Other applicable best practices listed in Ministry of the Environment and Climate Change (2009) and Environment Canada (2009)

Rubicon has implemented a best management practices plan for the control of fugitive dust.

19.7.3 Noise

There are permanent and seasonal residential interests on East Bay with potential for exposure to noise. Rubicon has designed infrastructure for the project so that noise emissions from the site are largely controlled in order to protect the residential interests. Modern noise abatement measures have been integrated into the project design.

19.8 Closure Plan

Rubicon has planned and intends to execute the project in a manner that is consistent with industry best practices and conducive to a walk-away closure condition. Chemical and physical stability requirements will be satisfied and monitored in accordance with regulatory requirements and the closure plan, which was filed by Ontario Ministry of Northern Development and Mines on December 2, 2011 in accordance with Section 141 of the *Mining Act*.

Close-out rehabilitation activities will be completed within approximately 36 months of project closure. Major activities are presented below in general chronological order:

- Buildings, trailers, intermodal shipping containers, storage tanks, equipment, and any chemicals/consumables will be removed and salvaged, recycled or disposed of in accordance with applicable legislation. Concrete foundations will be demolished to grade as is necessary and used to backfill local depressions.
- Hydrocarbon contaminated soil will be identified and remediated in accordance with applicable legislation (*Environmental Protection Act*).
- Equipment in the underground workings will be purged of all operating fluids and salvaged to the maximum extent practicable. Consumables will be removed from the underground workings and salvaged.
- Mine openings will be sealed to prevent access, in accordance with O. Regulation 240/00.
- Impounded water within the tailings management facility may be partially treated to reduce metal concentrations based on consultation with Ministry of the Environment and Climate Change and MNDM and directed to the underground workings. The dewatered tailings surface will be covered with a dry cover and native topsoil from the established stockpiles and re-vegetated. Downstream embankments will be progressively rehabilitated during the production phase to the extent practical to reduce work that will be required at closure. Post-closure, the spillway channel will be lowered to prevent ponding of runoff water. An

engineered overflow channel will be constructed to direct runoff from the surface of the tailings management facility to the downstream toe of the existing dam to effectively return the local drainage pattern to the pre-development condition. While the dry cover is being constructed, the small volume of residual seepage that is expected to be collected in the tailings management facility seepage collection system will be pumped underground. The operation of the tailings management facility seepage collection system will cease in consultation with Ministry of the Environment and Climate Change and Ontario Ministry of Northern Development and Mines post-closure, once the seepage rate decreases and is demonstrated that it does not pose an environmental risk.

- Ancillary areas within the closure plan area that are overlain with development rock will be scarified and any modest embankments will be sloped for long-term physical stability. These prepared areas will be re-vegetated after placement of native soil from the established stockpiles on McFinley Peninsula. Accumulations of soil-sized particles in rock embankment crevices will be planted with native tree seedlings in accordance with established silvicultural practices.
- Site roads will be rehabilitated in general accordance with Ministry of Natural Resources (1995). Power lines will be removed.
- Pipelines (water, compressed air) on the site will be purged and left in place. Fuel pipelines (propane / natural gas) will be decommissioned as per legislative requirements and Technical Standards and Safety Association standards as applicable.
- Domestic sewage disposal system components will be salvaged. The septic tank will be purged of its contents and backfilled with locally available soil and/or rock.
- Remaining liquid and solid waste at the project site will be removed for recycling or disposal with licensed contractors in accordance with legislative requirements. No mineralized material will be left on site at mine closure.
- The long term chemical and physical stability monitoring program will be continued to completion, in accordance with the closure plan.

19.8.1 Closure Cost Estimate

Approximately C$7.7M of financial assurance was previously provided to the Ministry of Northern Development and Mines as part of the closure plan and this was confirmed by an independent professional engineer in January 2016 to be adequate to rehabilitate the current, as-built site.

In order to rehabilitate the features associated with the future potential development and operation at the site, namely the tailings and rock repository that is contemplated at the north end of McFinley Peninsula, an engineered dry cover is planned unless empirical data collected during the life of the mine demonstrates that there is no material risk of chemical instability. According to the preliminary dry cover design that has been prepared in accordance with Ontario Regulation 240/00 promulgated under the *Mining Act*, this is anticipated to be approximately C$4.1M for construction and long-term monitoring.

20 Capital and Operating Costs

The capital and operating cost estimates prepared in the 2013 Technical Report are no longer current and should therefore not be relied upon.

21 Economic Analysis

The economic analysis presented in the 2013 Technical Report is no longer current and should not be relied upon. The financial analysis was not updated to consider new mineral resources documented herein.

22 Adjacent Properties

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

23 Other Relevant Data and Information

SRK is not aware of any other data or information that is relevant to the Phoenix gold project.

24 Interpretation and Conclusions

In 2013, SRK prepared a geology and mineral resource model for the F2 gold deposit of the Phoenix gold project to support the design at a conceptual level of an underground mine and a preliminary economic assessment. The mineral resource model, the third prepared for the project, considered drilling information available to October 31, 2012. The results of the preliminary economic assessment were disclosed by Rubicon in a news release dated June 25, 2013 and further documented in the 2013 Technical Report.

Significant changes have occurred on the Phoenix gold project since then. In particular, approximately 10,200 metres (m) of underground development have been completed, exposing the gold mineralization on several levels for test stoping and allowing the drilling of 94,575 m of infill drilling, primarily from underground drilling stations, to improve delineation of the Main Zone of the F2 gold deposit. A processing mill with a throughput capacity of 1,250 tonnes per day was also constructed with ancillary facilities. The mill operated in 2015 and ceased milling on November 21, 2015.

During the third quarter of 2015, SRK was mandated by Rubicon to conduct certain geological investigations to study the distribution of the exposed gold mineralization and to prepare a new geology and mineral resource model to account for the substantial additional sampling information. SRK visited the property in September, October, and November 2015 to review the new information, conduct geological investigations in accessible underground workings exposing the gold mineralization, and review and audit exploration data acquired since October 31, 2012. The F2 gold mineralization is exposed for study and the new underground closely spaced infill drilling have provided significant new insights on the controls on the distribution of the gold mineralization, its form and continuity. While the new geological information confirms the conceptual geological interpretation of 2013, the controls on the distribution of higher grade gold mineralization are now better defined.

SRK, in collaboration with Rubicon and other independent consultants, has constructed a new and more detailed geology and mineralization model to account for the new information and the observed more variable continuity of the higher grade gold mineralization exposed in underground workings. As a result, the new higher grade mineralization domains, which are now better defined by the tightly spaced infill drilling, are volumetrically much smaller than those interpreted in 2013 with much more widely spaced data. Further, to account for the more challenging continuity, the extents of the higher grade zones of gold mineralization in regions of more widely spaced drilling were also restrained to match the continuity demonstrated in more tightly drilled and developed areas. The overall volume of the new wireframe models for the higher grade gold mineralization is now only 17% of what they were in 2013. This significant reduction in volume occurs primarily outside the main areas targeted by infill drilling and underground workings completed since 2013, where sampling spacing is not sufficient to model the limits of the higher grade gold mineralization with confidence. The higher grade gold mineralization exists in such areas, but will require additional infill drilling to confirm its extent and continuity.

The grade estimation strategy was also modified to account for the considerable new information derived from the infill drilling and the underground workings. The influence of high grade outliers, that have a profound impact on grade distribution, was restricted by capping original samples and applying a spatial restriction to their influence. This strategy resulted in a drop in grade and together with the significant drop in tonnage impacted negatively on the metal content of the mineral resources.

While it is difficult to reconcile the 2016 Mineral Resource Statement disclosed herein with the previous 2013 Mineral Resource Statement because the two mineral resource models are quite different, the primary contributing factors to the reduction in grade, tonnage, and contained gold ounces include the following:

- Significant amount of new informing data: 94,575 m of closely spaced infill drilling, approximately 10,200 m of underground workings exposing the gold mineralization on several levels for geology investigations and test stoping, both demonstrating the complexity and challenging continuity of the higher grade gold mineralization.
- More conservative geological modelling of the higher grade gold mineralization to account for the observed complexity and challenging continuity, leading to a significant reduction in the volume of the higher grade mineralization.
- Treatment of high grade outliers involving capping and spatial restriction to limit their influence, leading to a reduction in average grade of the higher grade zones of gold mineralization.
- Excluding from the Mineral Resource Statement mineralized material in the crown pillar, unconstrained gold mineralization, and mineralized material below the 1,220 level, respectively removing 267,000, 355,000 and 728,000 ounces of gold from the Inferred mineral resources, relative to that in 2013.

SRK draws the following conclusions:

- The significant new information acquired by Rubicon since October 31, 2012 demonstrates that the distribution and continuity of the gold mineralization in the Main Zone of the F2 gold deposit is more restricted than previously modelled.
- The new information confirms the previous conceptual geological interpretation, but the new more tightly spaced data results in an improved geology model that is more restricted.
- There is an opportunity to expand the extents of the higher grade gold mineralization with infill and step-out drilling, to the north, south, and below the 427 level in those peripheral areas of the main zone of gold mineralization where high grade gold mineralization was intersected by drilling, but where borehole spacing is insufficient to infer its continuity. This provides an opportunity to increase the mineral resources of the F2 gold deposit with more core drilling.

25 Recommendations

Additional geological data generated at the Phoenix gold project since the previous mineral resource model has exposed the complexity of the gold mineralization, its distribution and its continuity in the Main Zone of the F2 gold deposit (above 305 level).

Closely spaced drilling is required to demonstrate the continuity of the higher grade gold mineralization. On this basis, SRK considers that additional exploration work is warranted to establish the continuity of the higher grade gold mineralization associated with the second stage D_2 structures, away from the existing mineral resources. SRK believes that there is an opportunity to expand the mineral resources with additional drilling.

Infill core drilling and underground drifting completed since 2013 has shown that the best gold mineralization occurs at the intersection between the D_2 structures and the north-trending (mine grid) HiTi basalt units. In this context, step-out and infill core drilling should target the interpreted plunge of the gold mineralization as well as identify new D_2 structures, north, and south of the centre of the F2 gold deposit.

Subject to obtaining the required financing a proposed exploration program should comprise the following components:

- Underground development to establish drilling stations and provide access for drilling.
- Step-out and infill core drilling targeting shallow (above 305 level) gold mineralization and strike extensions with the objective of establishing the continuity of the higher grade gold mineralization associated with D_2 structures and expanding the mineral resources.
- Infill core drilling in areas of lower drilling density below the 610 level from the exploration drive on the 610 level. This program should target high grade intercepts and the up-dip and down-dip extensions of D_2 structures intersecting HiTi basalt with the potential to expand the mineral resources.
- Step-out core drilling to test the extensions of the modelled breccia zone and other breccia zones intersected by drilling.
- Underground exploration drifting and sampling to study and characterize further the continuity of the gold mineralization and to validate the mineral resource model.
- Geological and mineral resource modelling to integrate new geology and drilling information and revise geological interpretation as required.

The understanding of the distribution of the gold mineralization, its form and continuity, would also benefit from additional underground exposures. The underground ramp to the 366 level should be completed to allow development of a 400-metre drive to the north (mine grid) primarily within HiTi basalt. This drive should provide good exposures to validate the geological interpretation and the mineral resource model.

Exploration data outside the mineral resource areas should be reviewed to identify other exploration targets, particularly new D_2 structures intersecting other HiTi basalt units.

The McFinley gold deposit data, west of the F2 gold system, should be reviewed in light of the new insight on the geology of the F2 gold deposit.

SRK understand that Rubicon has budgeted C$6.23 million (M) for 5,000 metres (m) infill core drilling between the 244 and 305 levels and approximately 20,000 m of infill core drilling from the 610 level drilling platforms (Table 38). This program is reasonable.

As the Phoenix gold project is a development property, certain other engineering, processing, and environmental work must be carried out to maintain the status of the site infrastructures for the proposed underground exploration program, and to satisfy permitting obligations. These include:

- Environmental monitoring work related to the environmental management system.
- Maintenance and the completion of certain infrastructure to facilitate the proposed underground exploration program, including the installation of an emergency generator, maintenance of hoist and shaft, water lines, ventilation and surface buildings, etc.

The estimated costs of the recommended work program are presented in Table 38.

Table 38: Cost Estimates for Recommended Work Programs*

Task	Units	Quantity	Unit Cost* (C$)	Total (C$)
Exploration Drilling				
Shallow infill drilling (between 244-305 Level)	metres	5,000	210	1,050,000
Sampling and assay analyses	samples	2,500	30	75,000
Deep infill drilling (below 610 Level)	metres	20,000	240	4,800,000
Sampling and assay analyses	samples	10,000	30	300,000
McFinley review and drill design				40,000
Regional review and drill design				20,000
Subtotal				**6,285,000**
Underground Development				
Development drifting (on 366 Level)	metres	400	12,250	4,900,000
Sampling and assay analyses	samples	1,000	30	30,000
Subtotal				**4,930,000**
Geological Studies				
Structural geology studies				50,000
Ongoing geological and mineral resource modelling				100,000
Subtotal				**150,000**
Engineering and Other Studies				
Metallurgical testing (grinding and gold recoveries)				50,000
Infrastructure support for exploration				355,000
Subtotal				**405,000**
Contingency (10%)				1,177,000
Total				**12,947,000**

* All-inclusive costs

26 References

AMC Mining Consultants (Canada), 2011. "F2 Gold System - Phoenix Gold Project. Bateman Township. Red Lake, Canada." Technical report prepared for Rubicon Minerals Corporation. August 8, 2011. Available at www.sedar.com.

AMC Mining Consultants (Canada), 2013. "712022 Rubicon Phoenix PEA Optimization: Preliminary Stope Stability Assessment". Internal report prepared for Rubicon Minerals Corporation.

AMC Mining Consultants (Canada), 2014. "Rubicon Crown Pillar Assessment, 10 December 2014". Internal report prepared for Rubicon Minerals Corporation.

Andrews, A.J., Hugon, H., Durocher, M., Corfu, F., and Lavigne, M., 1986: The anatomy of a gold-bearing greenstone belt: Red Lake, north-western Ontario; Proceedings of GOLD '86, and International Symposium on the Geology of Gold, (ed.) A.J. Macdonald, Konsult International Inc., Toronto, Ontario, p. 3-22.

Dubé, B., Balmer, W., Sanborn-Barrie, M., Skulski, T., and Parker, J., 2000. "A preliminary report on amphibolite-facies, disseminated-replacement style preliminary report on amphibolite-facies mineralization at the Madsen gold mine, Red Lake, Ontario." Geological Survey of Canada, Current Research 2000-C17, 12p.

Dubé, B., Williamson, K., and Malo, M., 2001. "Preliminary report on the geology and controlling parameters of the Goldcorp Inc. High Grade Zone, Red Lake mine, Ontario." Geological Survey of Canada, Current Research 2001-C18, 13p.

Dubé, B., Williamson, K., and Malo, M., 2003: Gold mineralization within the Red Lake mine trend: example from the Cochenour-Willans mine area, Red Lake, Ontario, with new key information from the Red Lake mine and potential analogy with the Timmins camp; Geological Survey of Canada, Current Research 2003-C21, 15p.

GeoEx Limited George. P.T.11 January 2011. Mineral Resource and Geological Potential Estimates, F2 Gold System - Phoenix Gold Project. Technical Report prepared for Rubicon by George, P.T. Available at www.sedar.com.

GeoEx Limited George, P.T. 11 April 2011. Mineral Resource and Geological Potential Estimates, F2 Gold System - Phoenix Gold Project. Technical Report prepared for Rubicon by George, P.T. Available at www.sedar.com.

G.M. Hogg & Associates Ltd. 1983. A report on the McFinley Red Lake Gold Property of Sabina Industries Ltd. and McFinley Mines Ltd., Bateman TWP., Ontario.

G&T Metallurgical Services. "Preliminary Evaluation of the Phoenix Project," Report KM2550, July 2010.

G&T Metallurgical Services. "Bulk Sample Grade Assessment – Phoenix Gold Project," Report KM2814, October 2011.

G&T Metallurgical Services, "Analysis of Gold from Bulk Samples – Phoenix Gold Project," Report KM3264, March 2012.

Harris, J.R., Sanborn-Barrie, M., Panagapko, D.A., Skulski, T., and Parker, J.R., 2006. Gold prospectivity maps of the Red Lake greenstone belt: application of GIS technology. Canadian Journal of Earth Sciences, Volume 43, pages 865-893.

Hogg, G.M., 2002a. Exploration Activities of Rubicon Minerals Corporation on the McFinley Property, Red Lake, Ontario. 17 May 2002. Internal report prepared for Rubicon Minerals Corporation.

Hogg, G. M., 2002b. Exploration Activities of Rubicon Minerals Corporation on the McFinley Property, Red Lake, Ontario. 15 October 2002. Internal report prepared for Rubicon Minerals Corporation.

JKTech Pty, 2011. "JKDW Test Report on Two Samples from Rubicon Phoenix Project," JKTech Job No. 11017/P4, March 2011.

Ontario Ministry of Northern Development and Mines (OMNDM), 2013. MDI File MDI52N04SE00005 report. http://www.geologyontario.mndmf.gov.on.ca/gosportal/gos?command=mndmsearchdetails:mdi&uuid=MDI52N04SE00005.

Parrott, D.F., 1995. The Gold Mines of Red Lake, Ontario, Canada. Derksen Printers, Steinbach, Manitoba, 256 p.

Pirie, J., 1981. "Regional geological setting of gold deposits in the Red Lake area, northwestern Ontario." Miscellaneous Paper. Ontario Ministry of Northern Development and Mines, Ontario Geological Survey.

Ross Archaeological Research Associates (Ross Associates), 2010. "Stage 1 Archaeological Assessment and Property Inspection, Rubicon Minerals Phoenix Mine Property." Internal report prepared for Rubicon Minerals Corporation.

Sanborn-Barrie, M., Skulski, T., and Parker, J., 2004. "Geology, Red Lake Greenstone Belt, western Superior Province, Ontario." Geological Survey of Canada, Open File 4594.

Smee and Associates Consulting Ltd., 2009. "Results of an Audit of the SGS Laboratory, Red Lake, Ontario." Internal report prepared for Rubicon Minerals Corporation.

Smee and Associates Consulting Ltd., 2011. "Results of an Audit of the SGS Laboratory, Red Lake, Ontario." Internal report prepared for Rubicon Minerals Corporation in October 2011.

Shin, W., 2015. "Ground Control Management Plan, Phoenix Gold Project". Internal report prepared for Rubicon Minerals Corporation.

SRK, 2013a: Preliminary Geotechnical Assessment of the Phoenix Gold Project. Report prepared for Rubicon Minerals Corporation, July 2013.

SRK, 2013b: Preliminary Economic Assessment for the F2 Gold System, Phoenix Gold Project, Red Lake, Ontario; Report (amended and restated) Prepared for Rubicon Minerals Corporation, Effective date: June 25, 2013, Issue date: August 9, 2013. Amended and Restated: February 28, 2014. 263 p. Available at www.sedar.com.

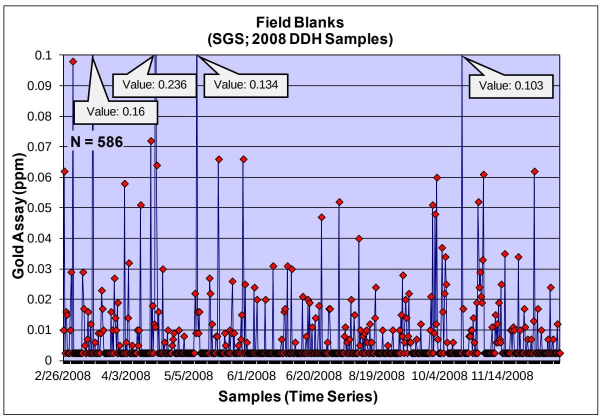
APPENDIX A

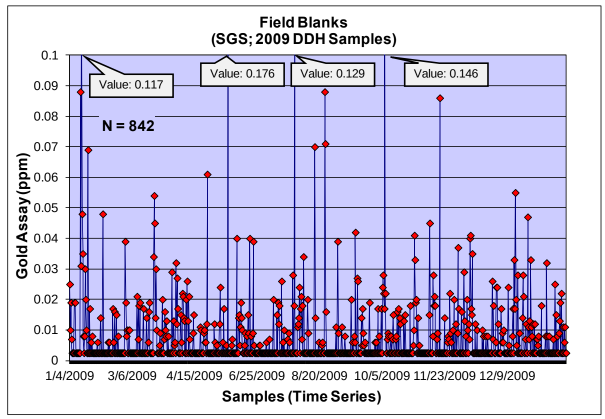
Analytical Quality Control Charts

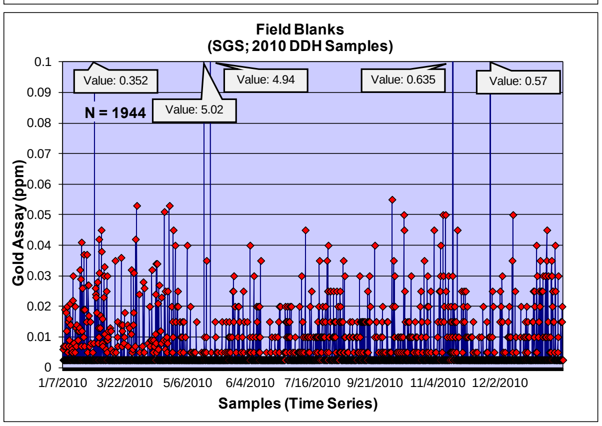
Time Series Plots for Blank Samples Assayed by ALS, Vancouver and SGS, Red Lake between 2008 and 2012

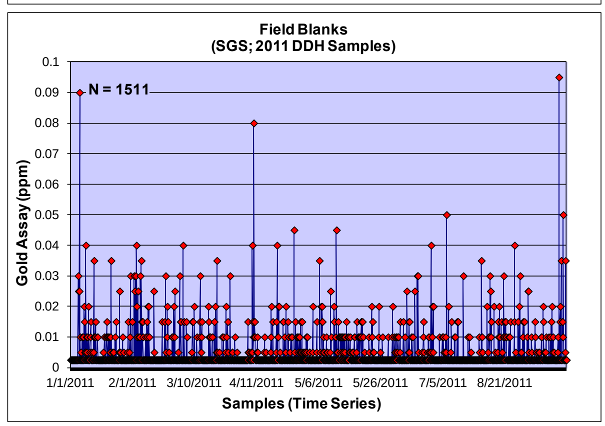
Project	F2 Zone, Phoenix Gold
Data Series	2008-2012 Blanks
Data Type	DDH Samples
Commodity	Au in ppm
Laboratory	SGS
Analytical Method	Fire Assay, AAS Finish
Detection Limit	0.005 ppm

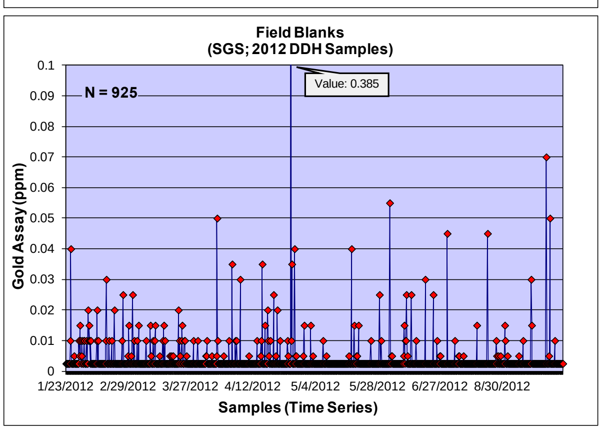
Statistics	**2008**	**2009**	**2010**	**2011**	**2012**
Sample Count	586	842	1,944	1,511	925
Mean	0.008	0.008	0.012	0.006	0.005
Min	0.003	0.003	0.003	0.003	0.003
Max	0.236	0.176	5.020	0.095	0.385
Mode	0.003	0.003	0.003	0.003	0.003









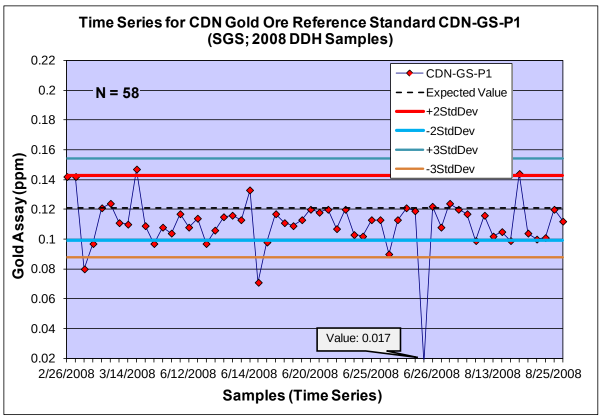


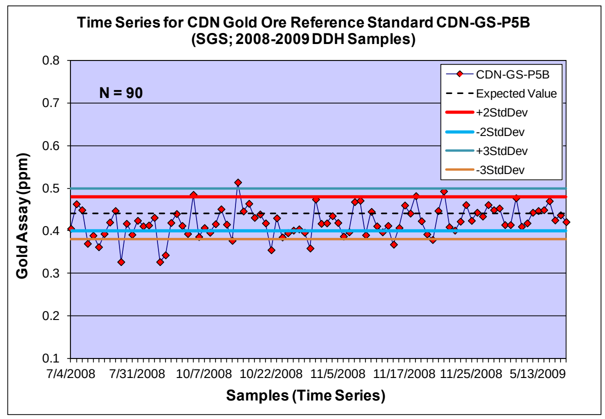
Time Series Plots for Gold Ore Reference Standard Samples Assayed by SGS, Red Lake between 2008 and 2012

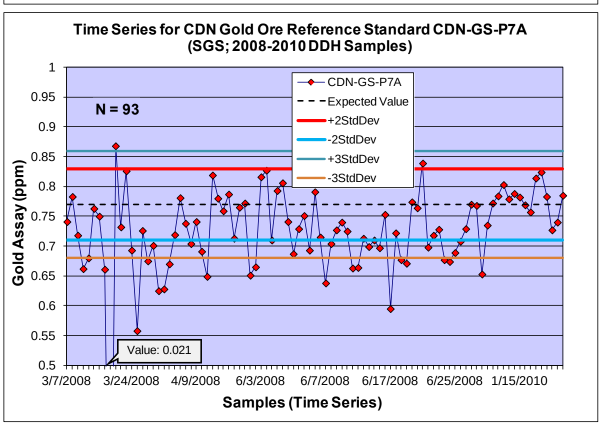
srk consulting

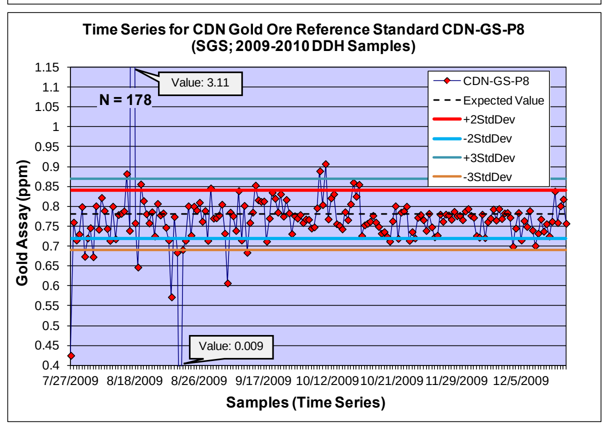
Project	F2 Zone, Phoenix Gold
Data Series	2008-2012 CDN Gold Standards
Data Type	DDH Samples
Commodity	Au in ppm
Laboratory	SGS
Analytical Method	Fire Assay, AAS Finish
Detection Limit	0.005 ppm

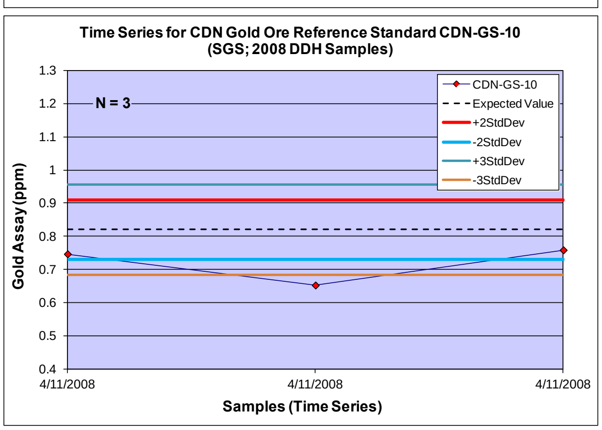
Statistics	P1	P5B	P7A	P8	10	1J
Sample Count	58	90	93	178	3	170
Expected Value	0.121	0.44	0.77	0.78	0.82	0.946
Standard Deviation	0.011	0.02	0.03	0.03	0.05	0.051
Mean	0.110	0.42	0.72	0.77	0.72	0.973
Outside 2StdDev	17.2%	31.1%	37.6%	18.5%	33.3%	8.2%
Below 2StdDev	8	24	33	24	1	8
Above 2StdDev	2	4	2	9	0	6

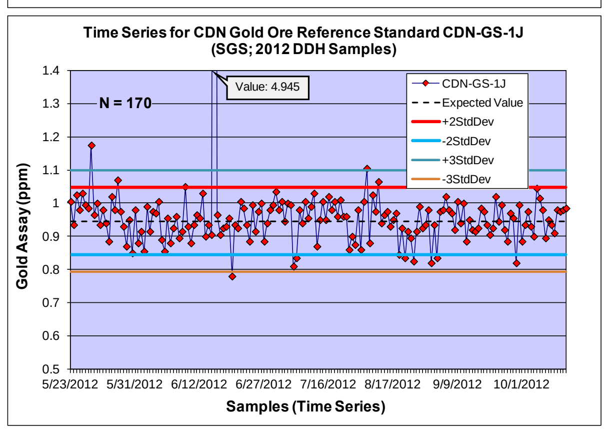










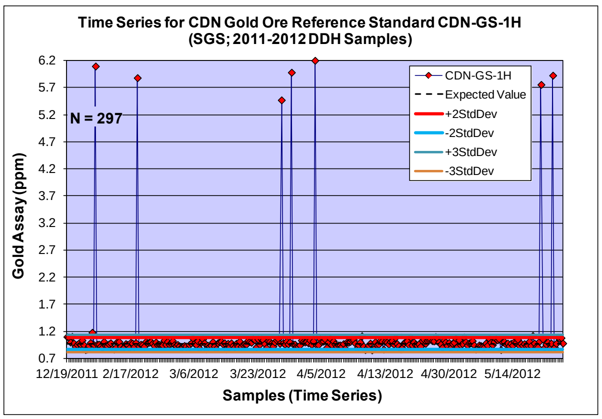


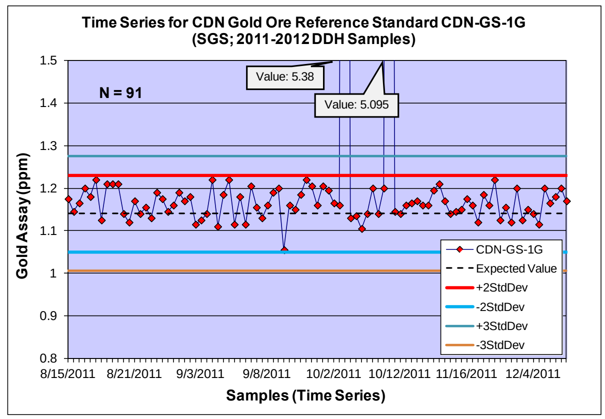
Time Series Plots for Gold Ore Reference Standard Samples Assayed by SGS, Red Lake between 2008 and 2012

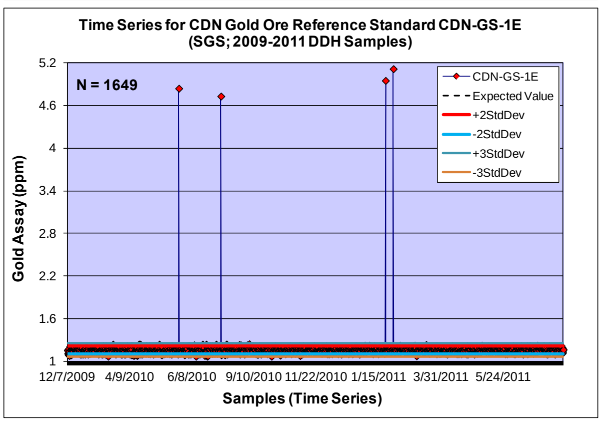
srk consulting

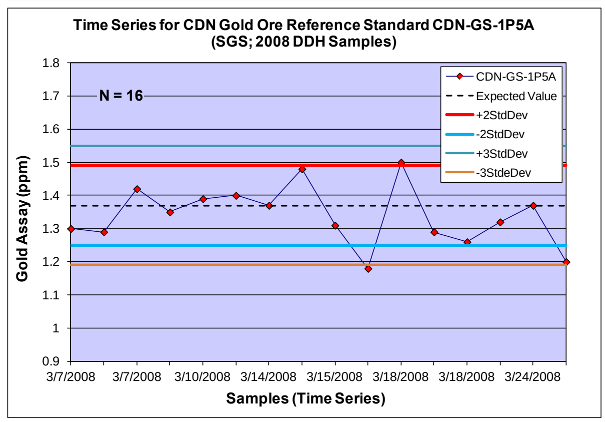
Project	F2 Zone, Phoenix Gold
Data Series	2008-2012 CDN Gold Standards
Data Type	DDH Samples
Commodity	Au in ppm
Laboratory	SGS
Analytical Method	Fire Assay, AAS Finish
Detection Limit	0.005 ppm

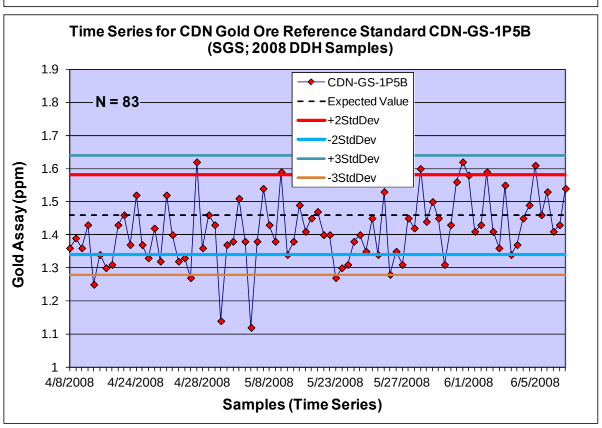
Statistics	1H	1G	1E	1P5A	1P5B	9
Sample Count	297	91	1,649	16	83	123
Expected Value	0.972	1.14	1.16	1.37	1.46	1.75
Standard Deviation	0.054	0.05	0.03	0.06	0.06	0.07
Mean	1.090	1.25	1.17	1.34	1.41	1.72
Outside 2StdDev	7.4%	2.2%	3.0%	18.8%	26.5%	22.0%
Below 2StdDev	4	0	22	2	16	21
Above 2StdDev	18	2	27	1	6	6

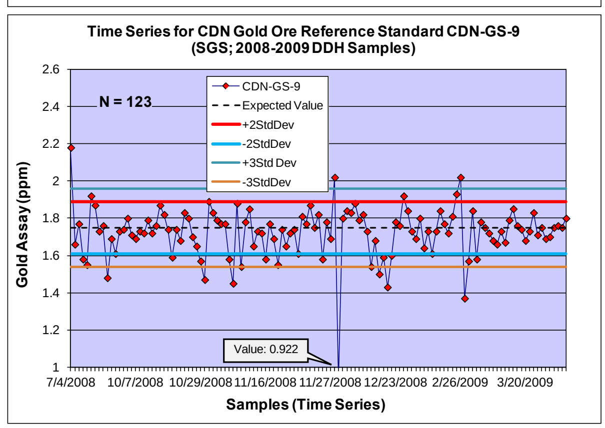










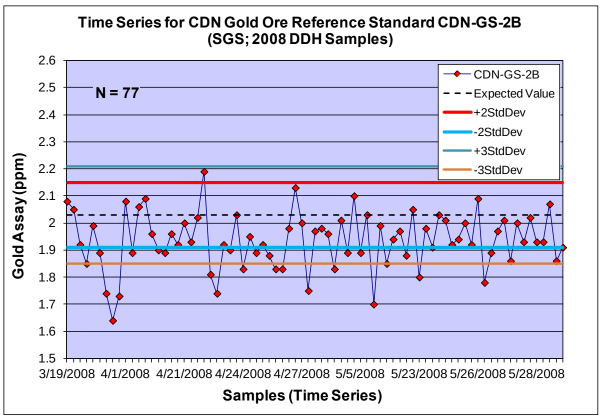


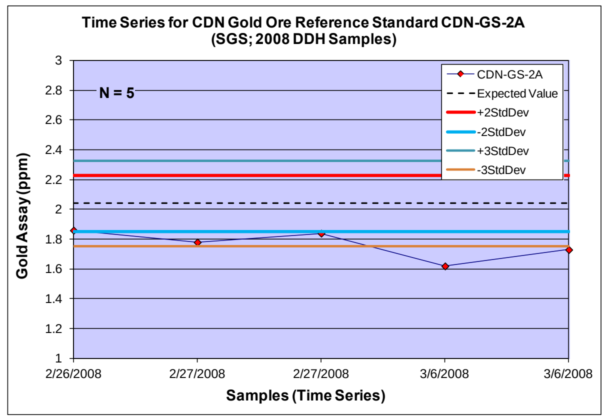
Time Series Plots for Gold Ore Reference Standard Samples Assayed by SGS, Red Lake between 2008 and 2012

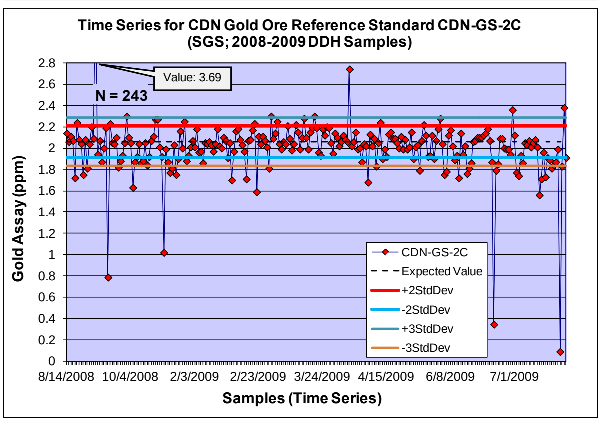
srk consulting

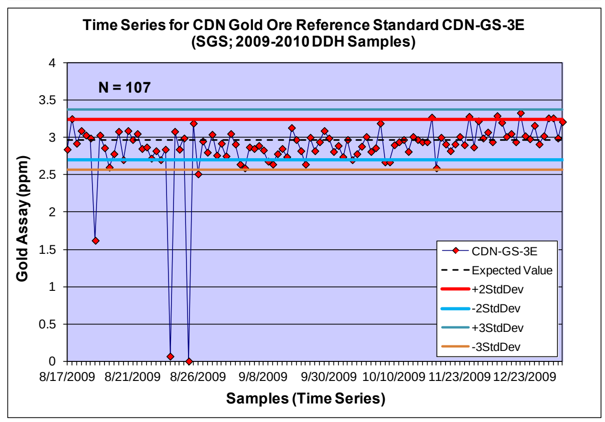
Project	F2 Zone, Phoenix Gold
Data Series	2008-2012 CDN Gold Standards
Data Type	DDH Samples
Commodity	Au in ppm
Laboratory	SGS
Analytical Method	Fire Assay, AAS Finish
Detection Limit	0.005 ppm

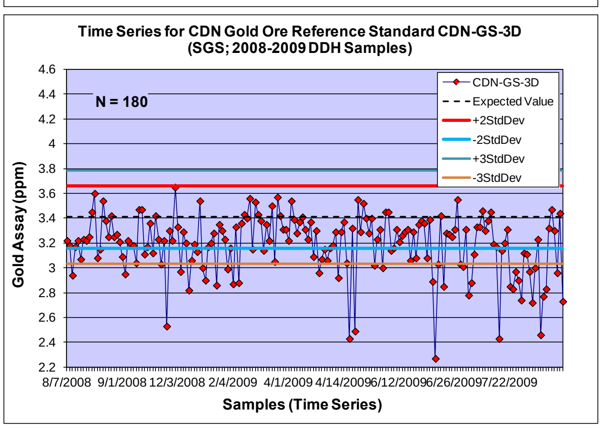
Statistics	2B	2A	2C	3E	3D	5C
Sample Count	77	5	243	107	180	1
Expected Value	2.03	2.04	2.06	2.97	3.41	4.74
Standard Deviation	0.06	0.095	0.075	0.135	0.125	0.14
Mean	1.93	1.77	2.00	2.86	3.19	4.81
Outside 2StdDev	37.7%	80.0%	30.0%	18.7%	36.1%	0.0%
Below 2StdDev	28	4	54	13	65	0
Above 2StdDev	1	0	19	7	0	0

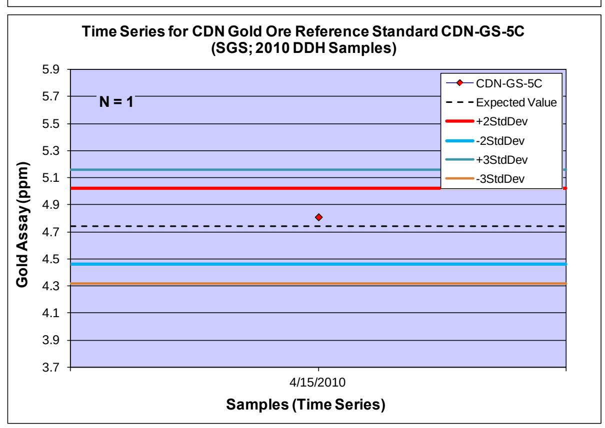










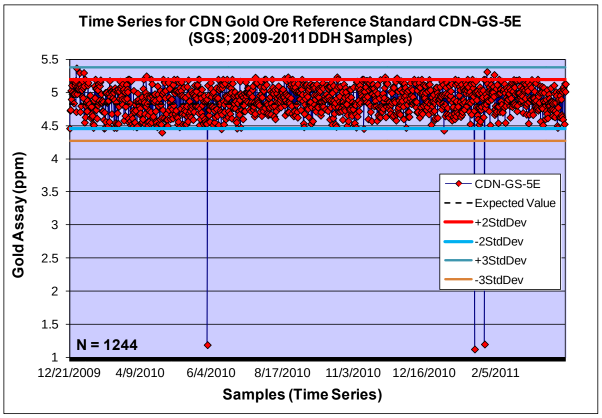


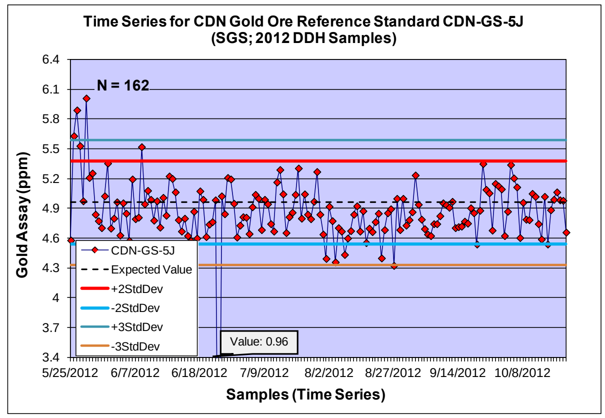
Time series plots for Gold Ore Reference Standard Samples Assayed by SGS, Red Lake between 2008 and 2012

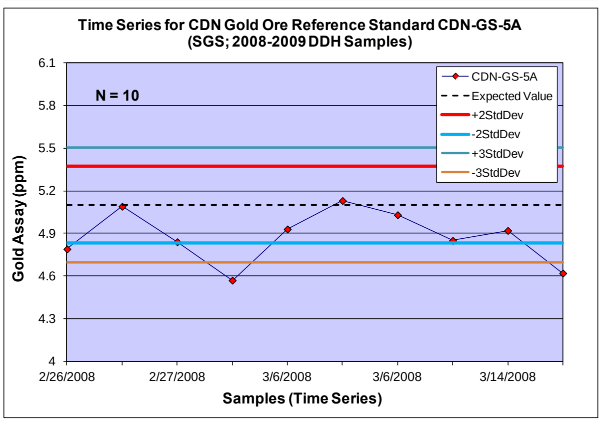
srk consulting

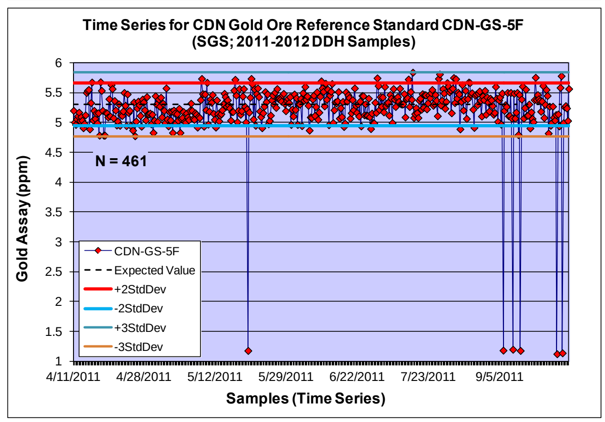
Project	F2 Zone, Phoenix Gold
Data Series	2008-2012 CDN Gold Standards
Data Type	DDH Samples
Commodity	Au in ppm
Laboratory	SGS
Analytical Method	Fire Assay, AAS Finish
Detection Limit	0.005 ppm

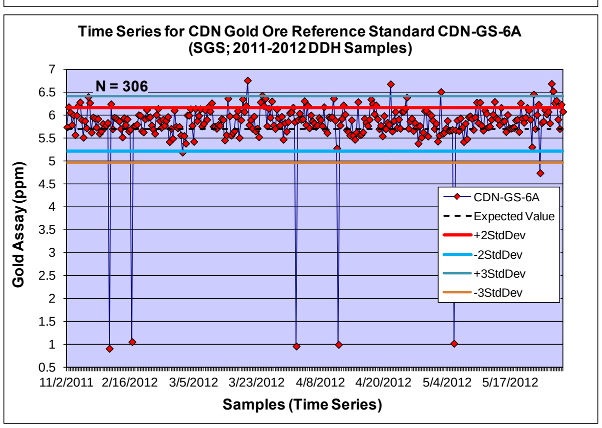
Statistics	5E	5J	5A	5F	6A	7A
Sample Count	1,244	162	10	461	306	121
Expected Value	4.83	4.96	5.10	5.30	5.69	7.20
Standard Deviation	0.185	0.21	0.135	0.18	0.24	0.30
Mean	4.88	4.86	4.88	5.22	5.80	7.26
Outside 2StdDev	1.5%	6.8%	30.0%	10.6%	15.4%	14.0%
Below 2StdDev	7	6	3	30	7	3
Above 2StdDev	12	5	0	19	40	14

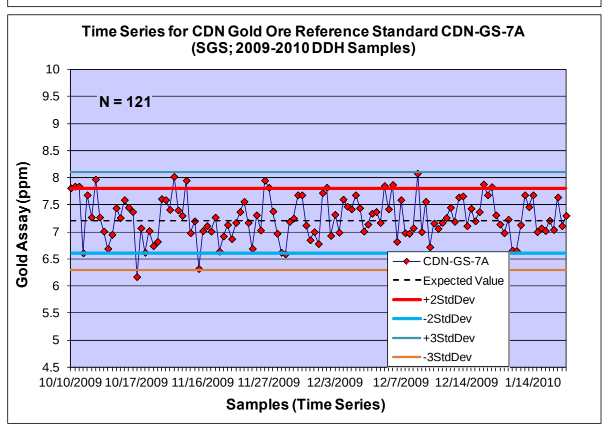










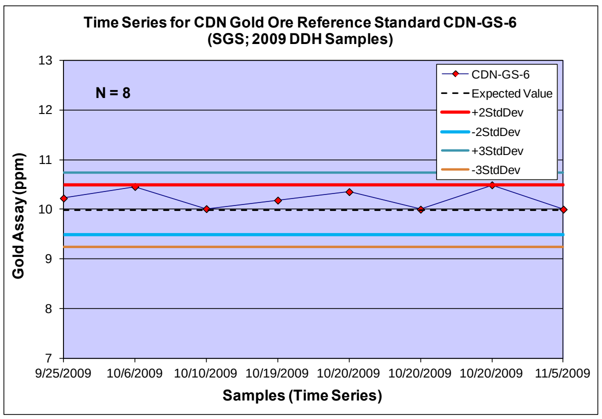


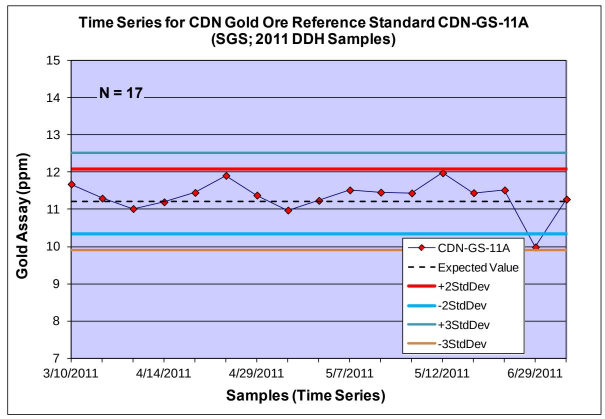
Time series plots for Gold Ore Reference Standard Samples Assayed by SGS, Red Lake between 2008 and 2012

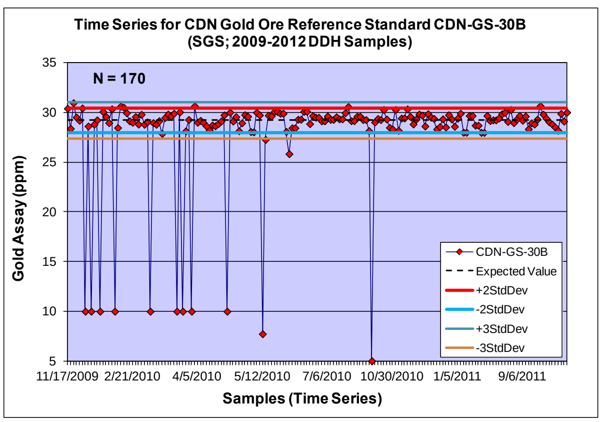
srk consulting

Project	F2 Zone, Phoenix Gold
Data Series	2008-2012 CDN Gold Standards
Data Type	DDH Samples
Commodity	Au in ppm
Laboratory	SGS
Analytical Method	Fire Assay, AAS Finish
Detection Limit	0.005 ppm

Statistics	**6**	**11A**	**30B**
Sample Count	8	17	170
Expected Value	9.99	11.21	29.21
Standard Deviation	0.25	0.435	0.615
Mean	10.22	11.34	27.96
Outside 2StdDev	12.5%	5.9%	12.9%
Below 2StdDev	0	1	16
Above 2StdDev	1	0	6





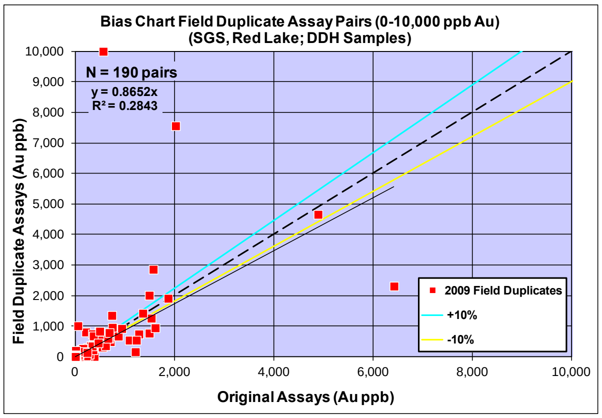


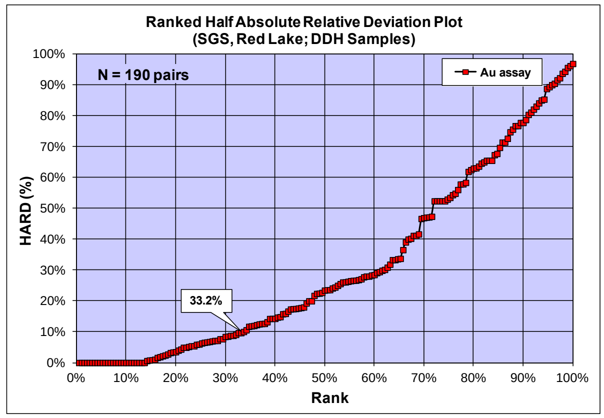
Bias Charts and Precision Plots for Field Duplicate Samples Assayed by SGS, Red Lake in 2009

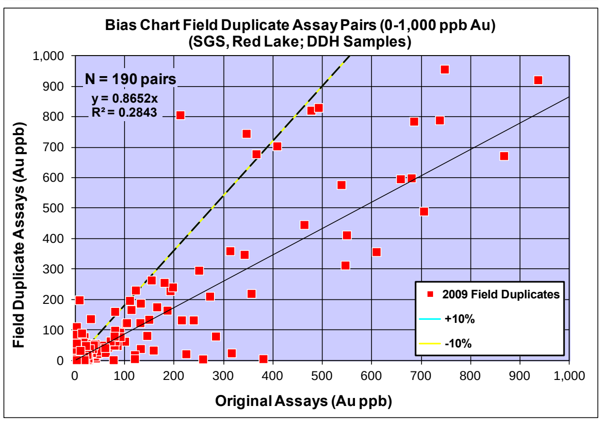
srk consulting

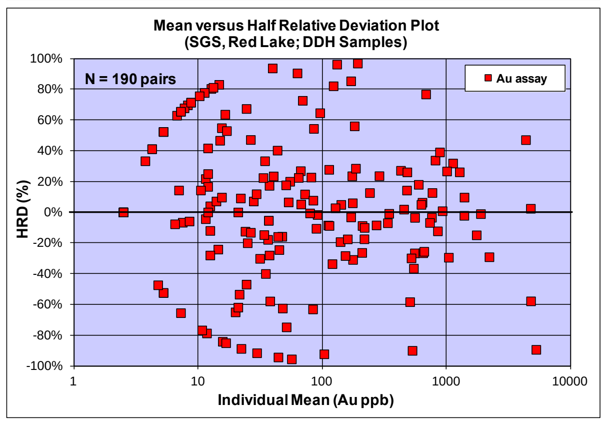
Project	F2 Zone, Phoenix Gold
Data Series	2009 Field Duplicates
Data Type	DDH Samples
Commodity	Au in ppb
Analytical Method	Fire Assay, AAS Finish
Detection Limit	5 ppb
Original Dataset	Original Assays
Paired Dataset	Field Duplicate Assays

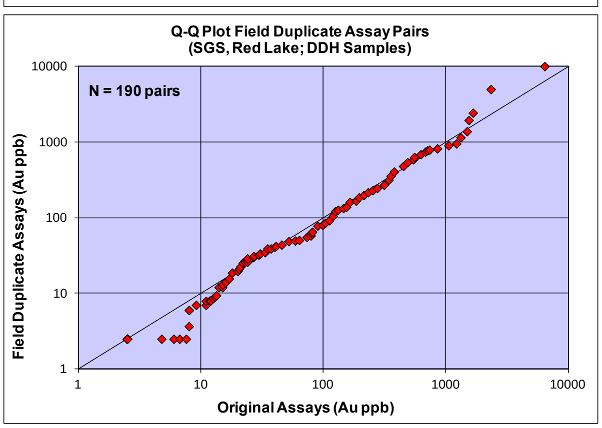
Statistics	**Original**	**Field Duplicate**
Sample Count	190	190
Minimum Value	2.50	2.50
Maximum Value	6,420	10,000
Mean	264.58	317.72
Median	30.50	33.50
Standard Error	49.59	74.64
Standard Deviation	683.56	1,028.85
Correlation Coefficient	0.5412	
Pairs ≤ 10% HARD	33.2%	

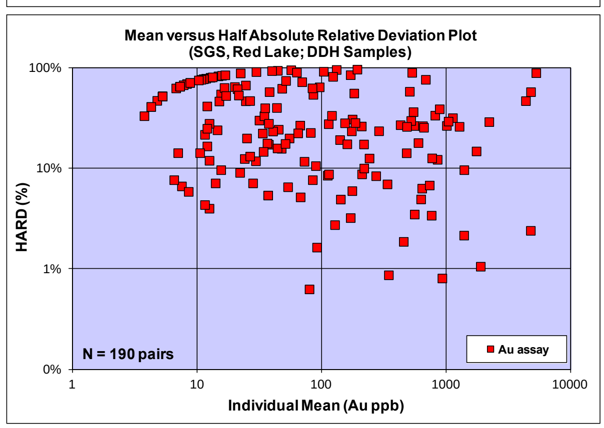










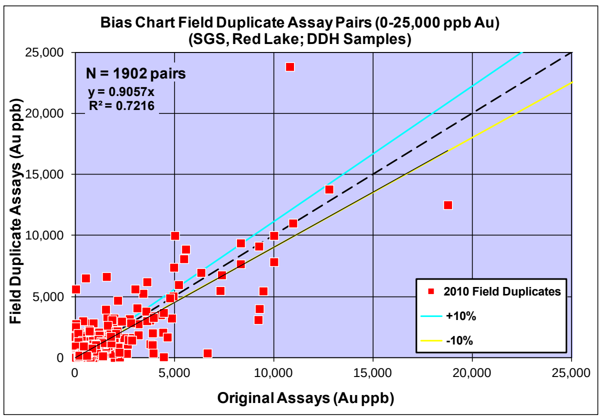


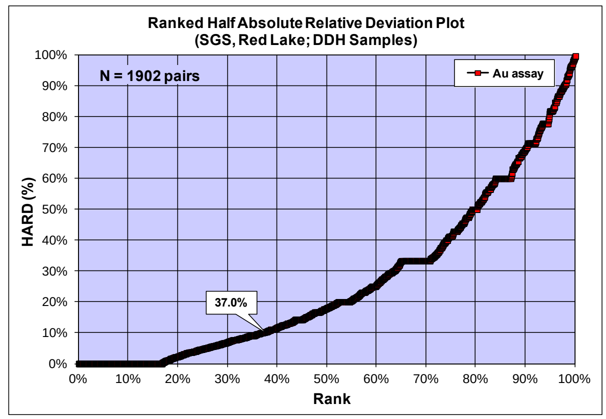
Bias Charts and Precision Plots for Field Duplicate Samples Assayed by SGS, Red Lake in 2010

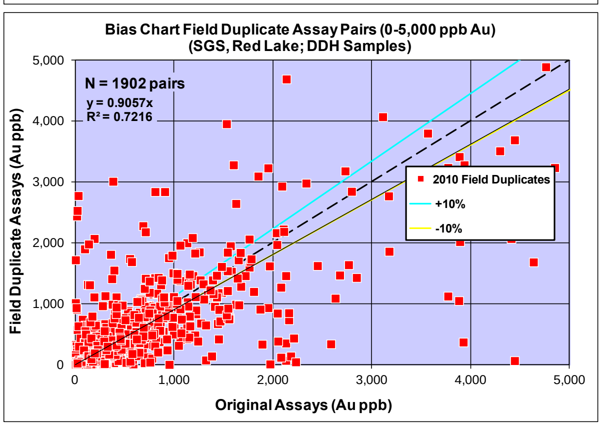
srk consulting

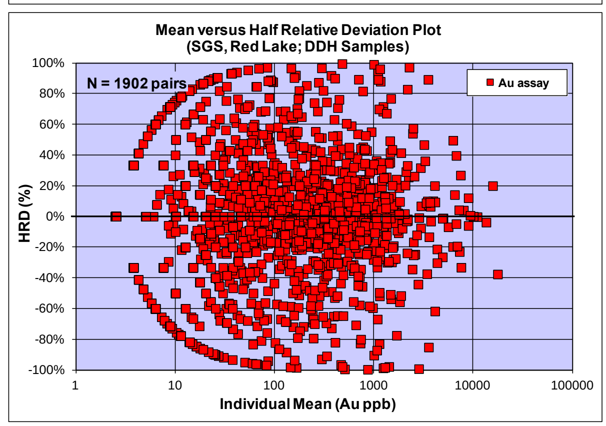
Project	F2 Zone, Phoenix Gold
Data Series	2010 Field Duplicates
Data Type	DDH Samples
Commodity	Au in ppb
Analytical Method	Fire Assay, AAS Finish
Detection Limit	5 ppb
Original Dataset	Original Assays
Paired Dataset	Field Duplicate Assays

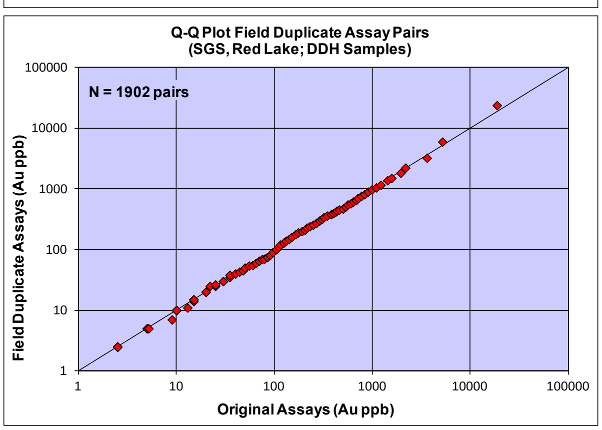
Statistics	**Original**	**Field Duplicate**
Sample Count	1,902	1,902
Minimum Value	2.50	2.50
Maximum Value	18,756	23,835
Mean	398.80	397.80
Median	65.00	60.00
Standard Error	25.82	27.16
Standard Deviation	1,126.19	1,184.68
Correlation Coefficient	0.8501	
Pairs ≤ 10% HARD	37.0%	

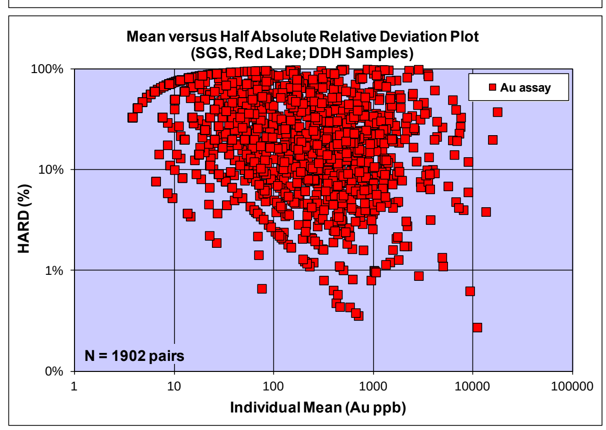








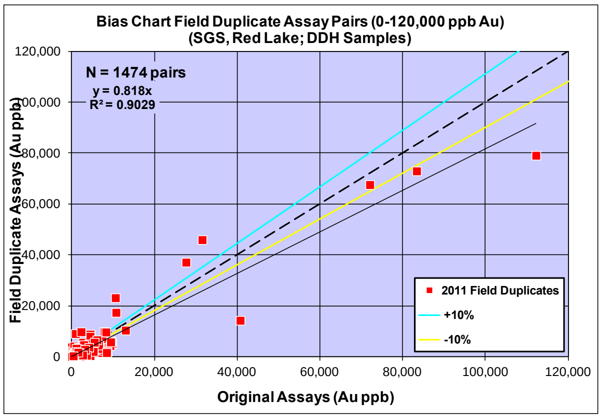


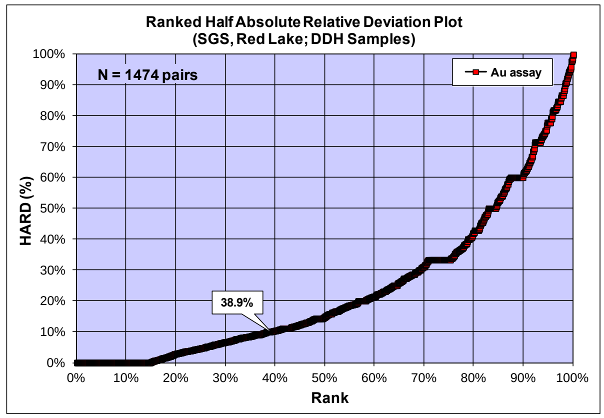


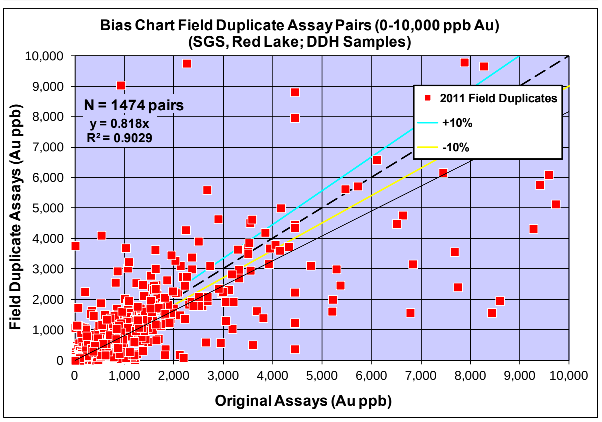
Bias Charts and Precision Plots for Field Duplicate Samples Assayed by SGS, Red Lake in 2011

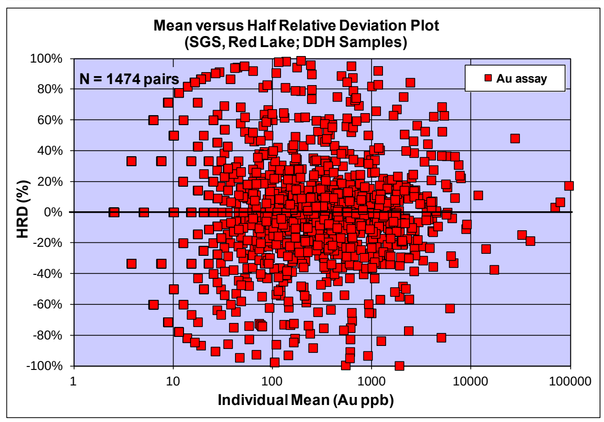
Project	F2 Zone, Phoenix Gold
Data Series	2011 Field Duplicates
Data Type	DDH Samples
Commodity	Au in ppb
Analytical Method	Fire Assay, AAS Finish
Detection Limit	5 ppb
Original Dataset	Original Assays
Paired Dataset	Field Duplicate Assays

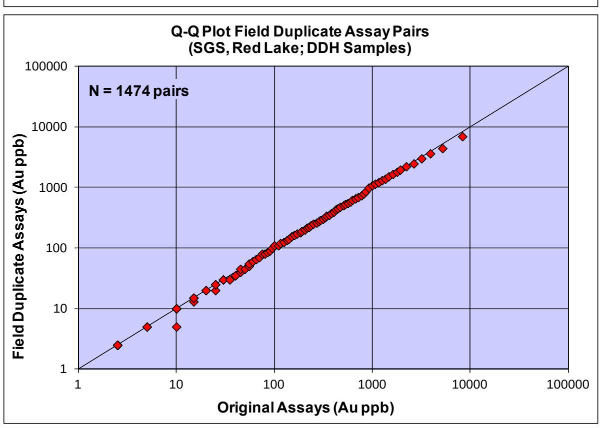
Statistics	Original	Field Duplicate
Sample Count	1,474	1,474
Minimum Value	2.50	2.50
Maximum Value	112,214	79,122
Mean	804.50	762.05
Median	135.00	135.00
Standard Error	117.26	100.40
Standard Deviation	4,501.91	3,854.57
Correlation Coefficient	0.9506	
Pairs ≤ 10% HARD	38.9%	

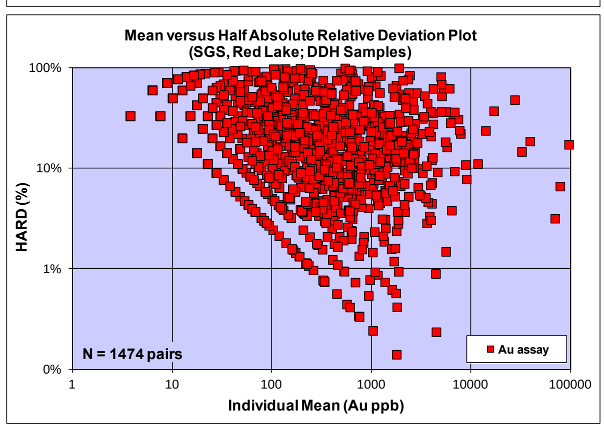










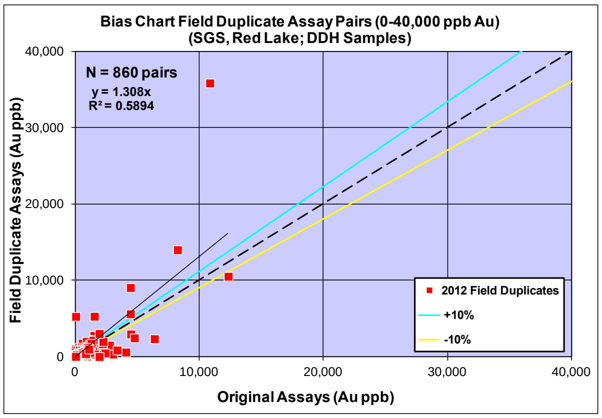


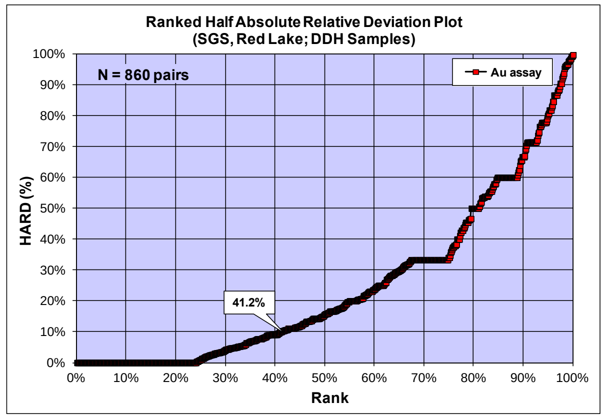
Bias Charts and Precision Plots for Field Duplicate Samples Assayed by SGS, Red Lake in 2012

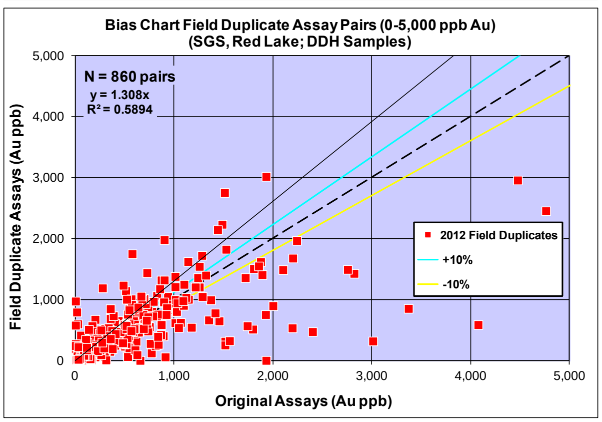
srk consulting

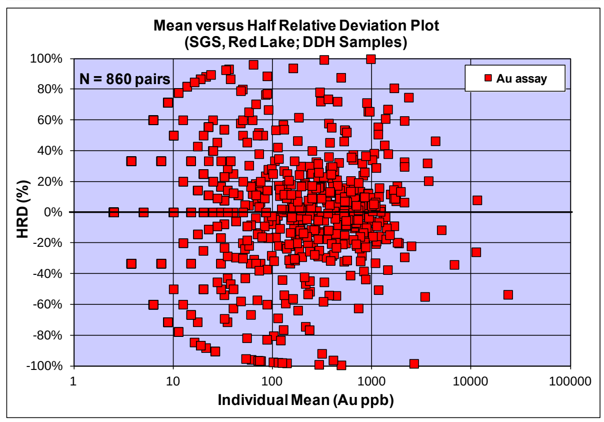
Project	F2 Zone, Phoenix Gold
Data Series	2012 Field Duplicates
Data Type	DDH Samples
Commodity	Au in ppb
Analytical Method	Fire Assay, AAS Finish
Detection Limit	5 ppb
Original Dataset	Original Assays
Paired Dataset	Field Duplicate Assays

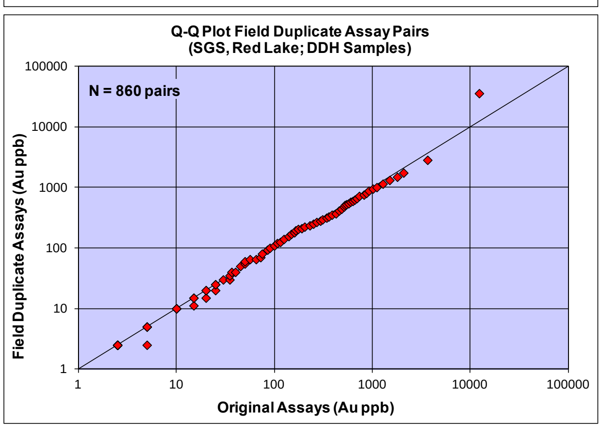
Statistics	**Original**	**Field Duplicate**
Sample Count	860	860
Minimum Value	2.50	2.50
Maximum Value	12,323	35,852
Mean	318.32	337.28
Median	45.00	50.00
Standard Error	28.70	50.08
Standard Deviation	841.63	1,468.78
Correlation Coefficient	0.7699	
Pairs ≤ 10% HARD	41.2%	

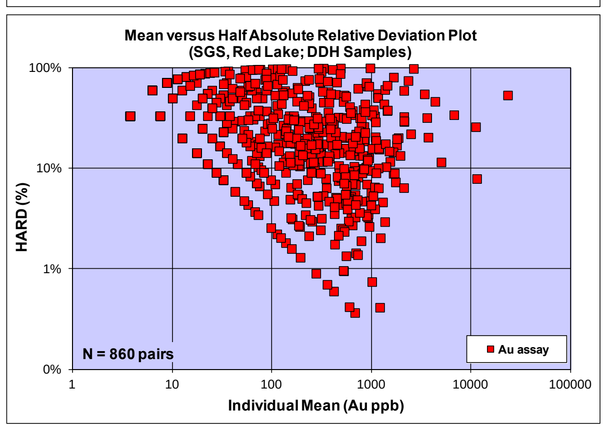










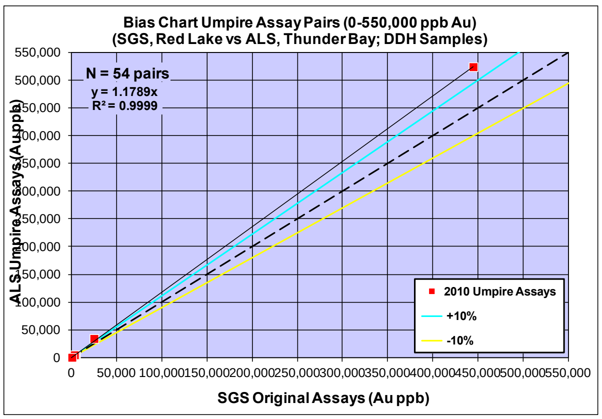


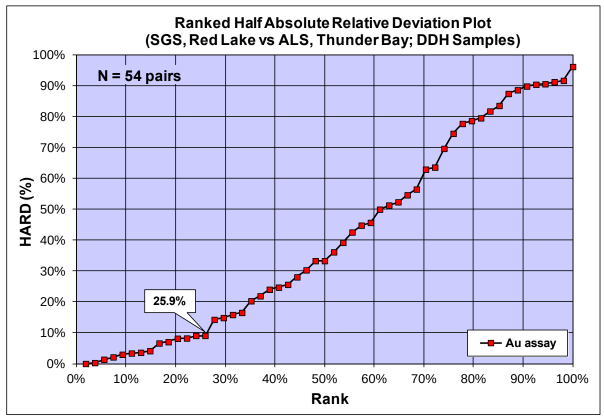
Bias Charts and Precision Plots for Check Assay Samples (SGS, Red Lake versus ALS, Thunder Bay) Assayed in 2010

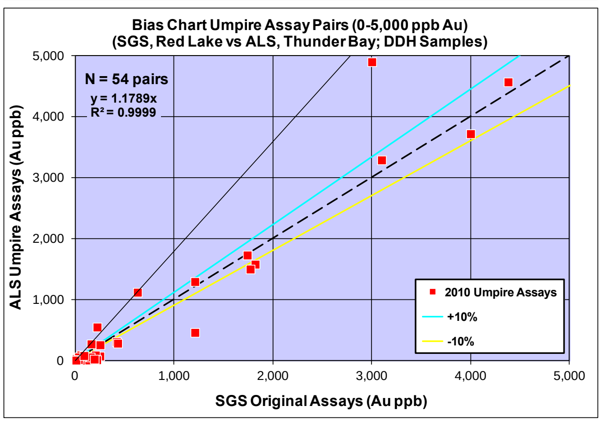
srk consulting

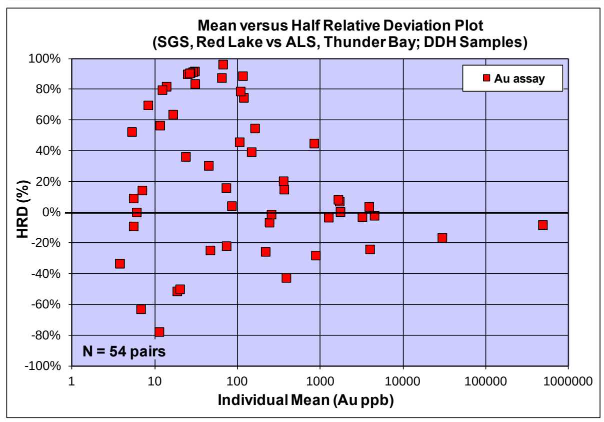
Project	F2 Zone, Phoenix Gold
Data Series	2010 Umpire Assays
Data Type	DDH Samples
Commodity	Au in ppb
Analytical Method	Fire Assay, AAS Finish
Detection Limit	5 ppb
Original Dataset	SGS Original Assays
Paired Dataset	ALS Umpire Assays

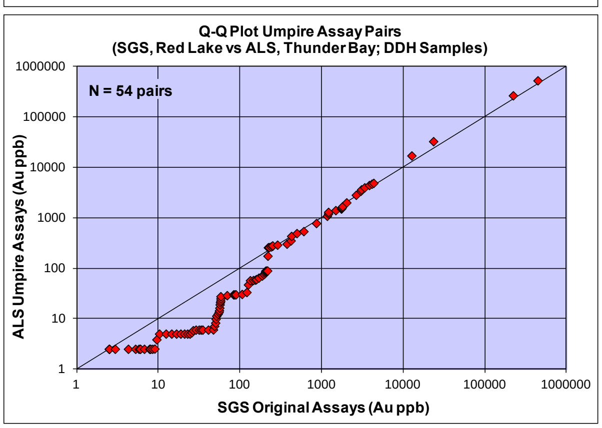
Statistics	Original	Umpire
Sample Count	54	54
Minimum Value	2.50	2.50
Maximum Value	444,718	524,000
Mean	9,189.31	10,838.63
Median	86.00	30.00
Standard Error	8,230.78	9,703.80
Standard Deviation	60,483.65	71,308.11
Correlation Coefficient	0.9999	
Pairs ≤ 10% HARD	25.9%	

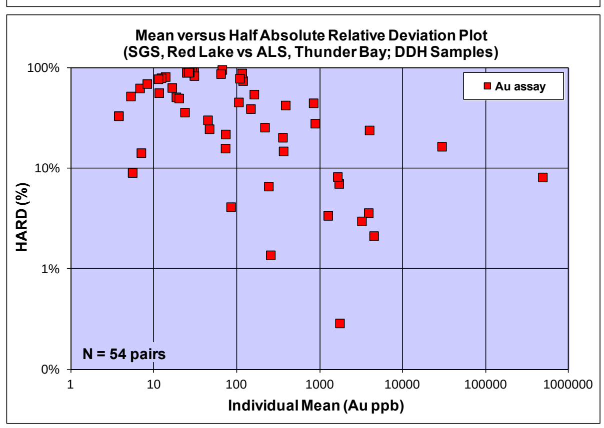










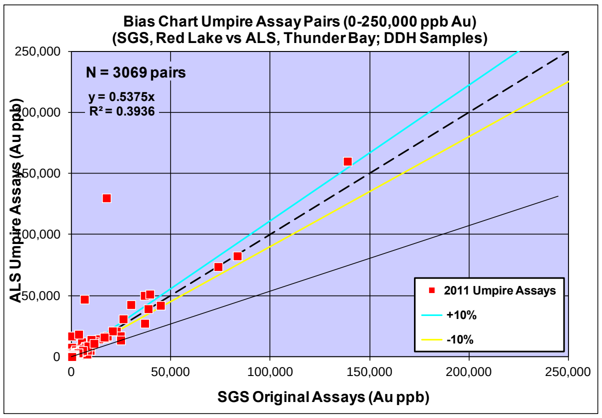


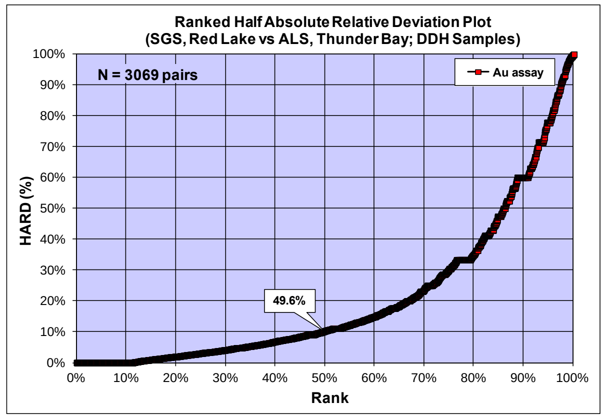
Bias Charts and Precision Plots for Check Assay Samples (SGS, Red Lake versus ALS, Thunder Bay) Assayed in 2011

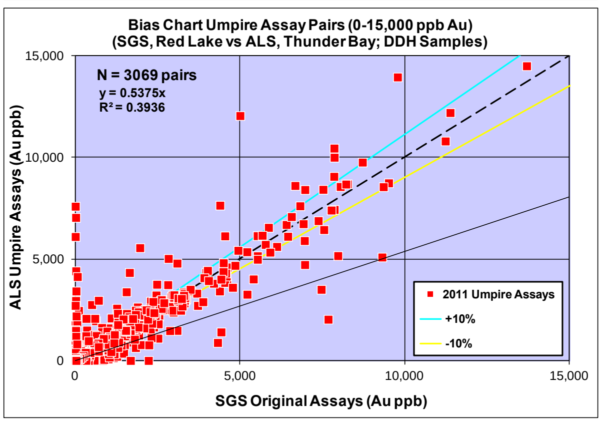
srk consulting

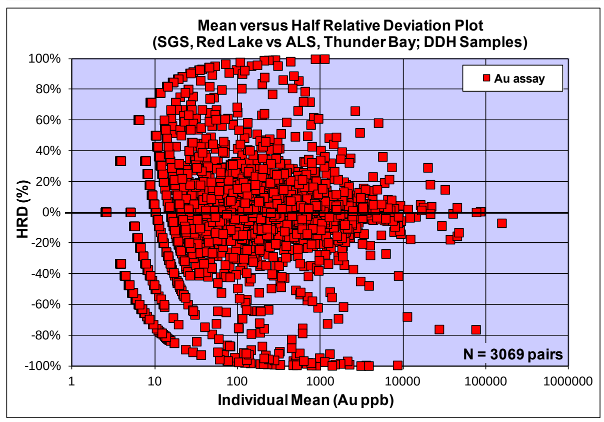
Project	F2 Zone, Phoenix Gold
Data Series	2011 Umpire Assays
Data Type	DDH Samples
Commodity	Au in ppb
Analytical Method	Fire Assay, AAS Finish
Detection Limit	5 ppb
Original Dataset	SGS Original Assays
Paired Dataset	ALS Umpire Assays

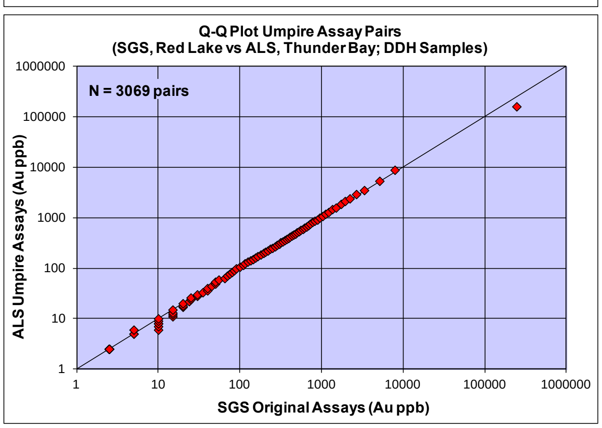
Statistics	Original	Umpire
Sample Count	3,069	3,069
Minimum Value	2.50	2.50
Maximum Value	245,008	160,000
Mean	784.12	798.11
Median	100.00	106.00
Standard Error	106.45	89.08
Standard Deviation	5,897.37	4,935.17
Correlation Coefficient	0.6321	
Pairs ≤ 10% HARD	49.6%	

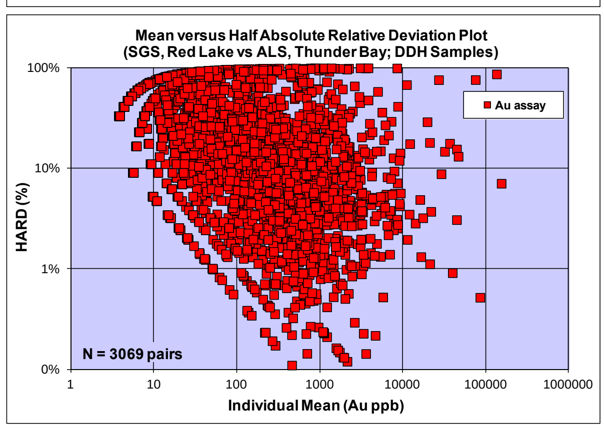










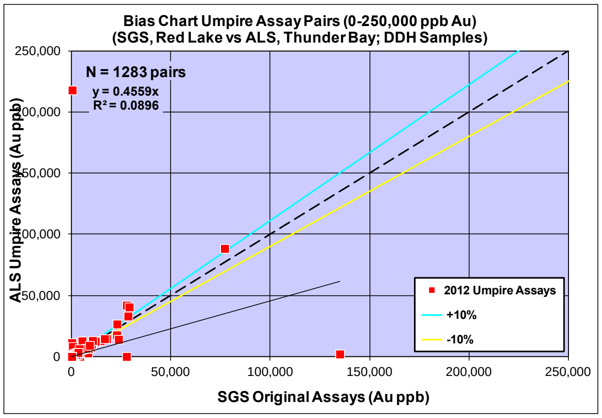


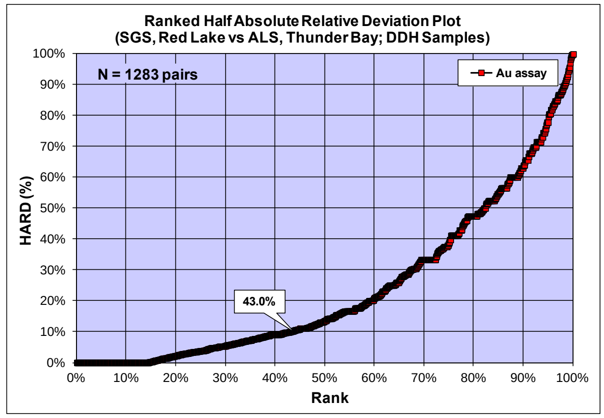
Bias Charts and Precision Plots for Check Assay Samples (SGS, Red Lake versus ALS, Thunder Bay) Assayed in 2012

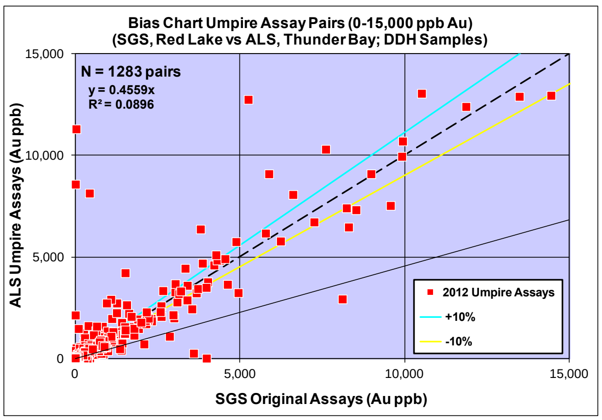
srk consulting

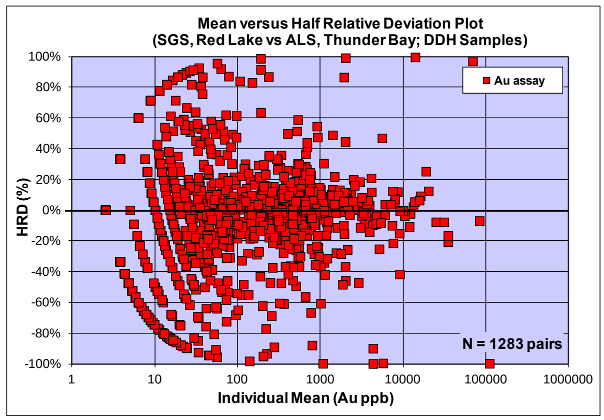
Project	F2 Zone, Phoenix Gold
Data Series	2012 Umpire Assays
Data Type	DDH Samples
Commodity	Au in ppb
Analytical Method	Fire Assay, AAS Finish
Detection Limit	5 ppb
Original Dataset	SGS Original Assays
Paired Dataset	ALS Umpire Assays

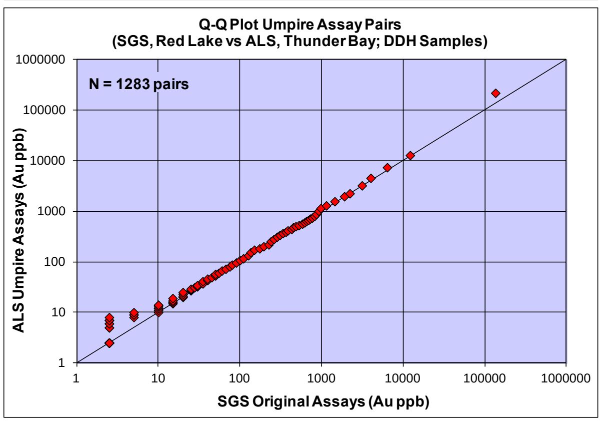
Statistics	**Original**	**Umpire**
Sample Count	1,283	1,283
Minimum Value	2.50	2.50
Maximum Value	134,973	218,000
Mean	754.28	850.05
Median	35.00	37.00
Standard Error	137.25	196.06
Standard Deviation	4,916.10	7,022.76
Correlation Coefficient	0.3081	
Pairs ≤ 10% HARD	43.0%	

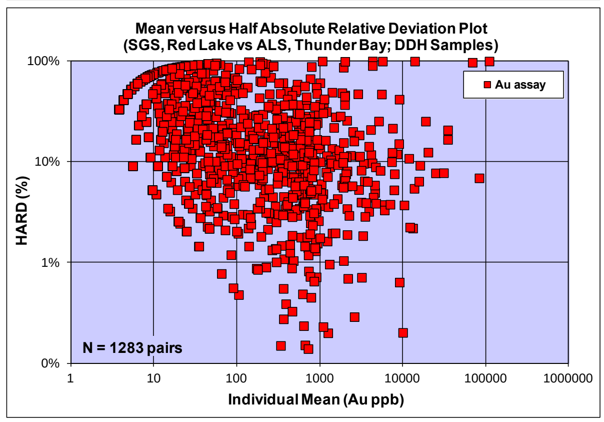










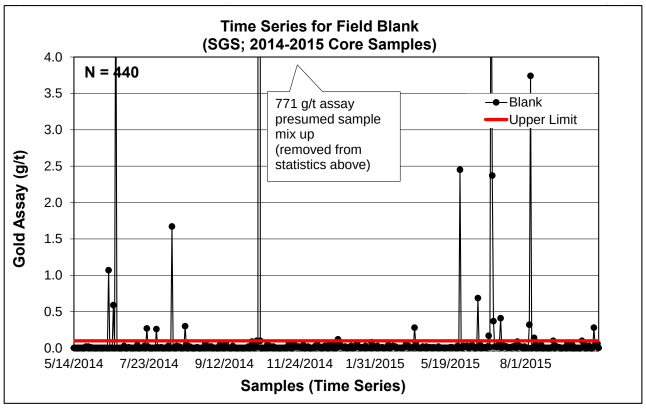


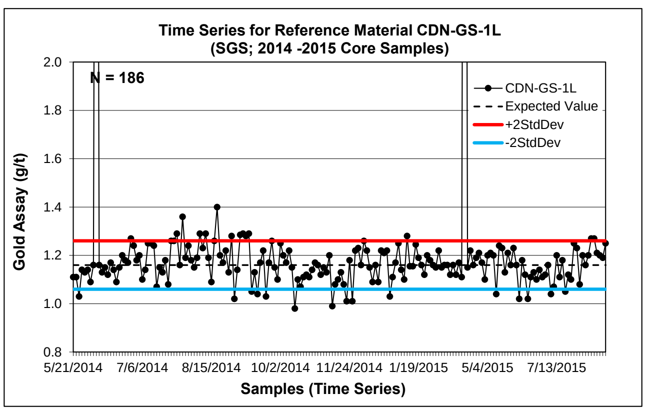
Time series plots for blanks and certified reference material samples prepared and assayed by SGS in Red Lake, Ontario, and Vancouver, British Columbia during 2014 and 2015.

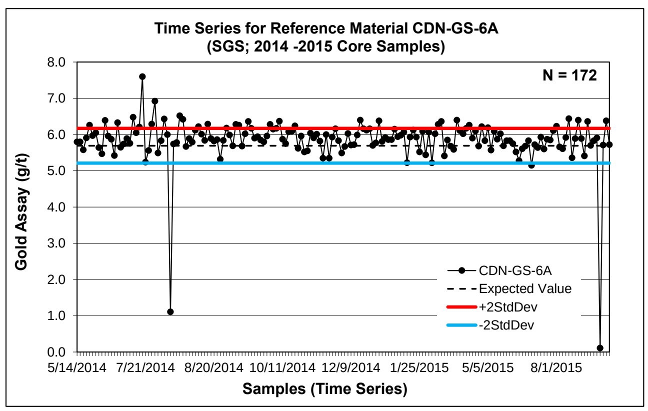
srk consulting

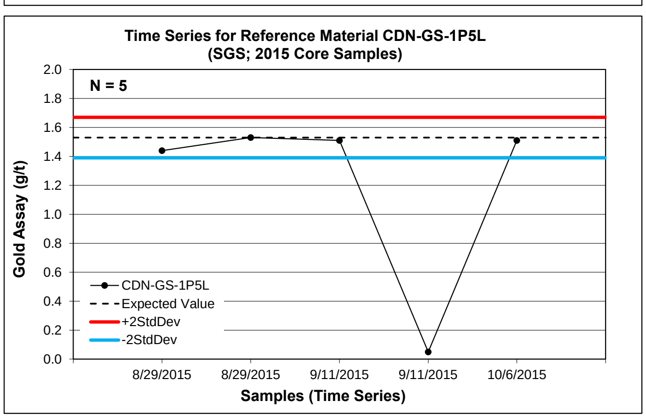
Project	Phoenix Project
Data Series	2015 Blanks and Standards
Data Type	Core Samples
Commodity	Au in g/t
Laboratory	SGS Red Lake/Vancouver
Analytical Method	Fire assay - AA fand Grav. (>10) finish
Detection Limit	0.005 g/t Au

		Standards		
Statistics	**Blank**	**1L**	**6A**	**1P5L**
Sample Count	440	186	172	5
Expected Value	0.010	1.16	5.69	1.53
Standard Deviation	-	0.05	0.24	0.07
Data Mean	0.074	1.21	5.86	1.21
Outside 2StdDev/UL	5%	17%	21%	20%
Below 2StdDev	-	15	3	1
Above 2StdDev	-	16	33	0







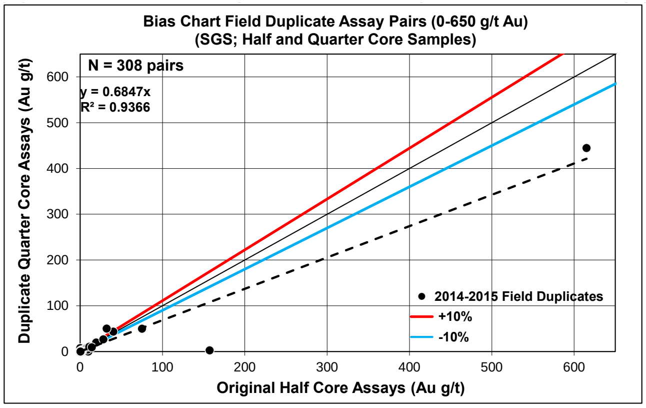


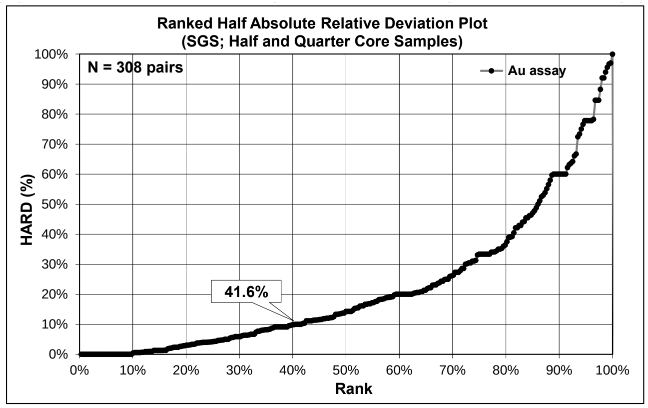
Bias charts and precision plots for quarter-core field duplicates assayed by prepared and assayed by SGS in Red Lake, Ontario, and Vancouver, British Columbia during 2014 and 2015.

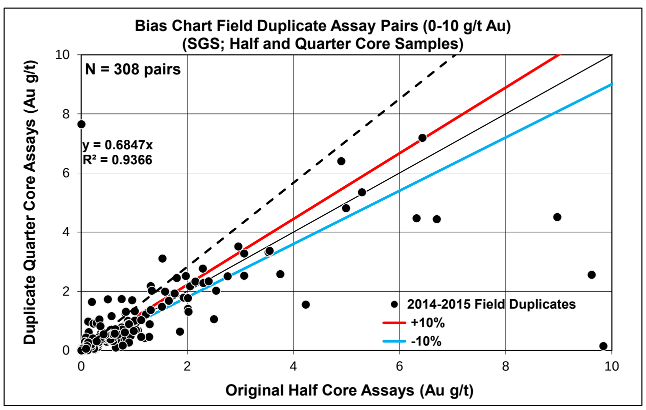
srk consulting

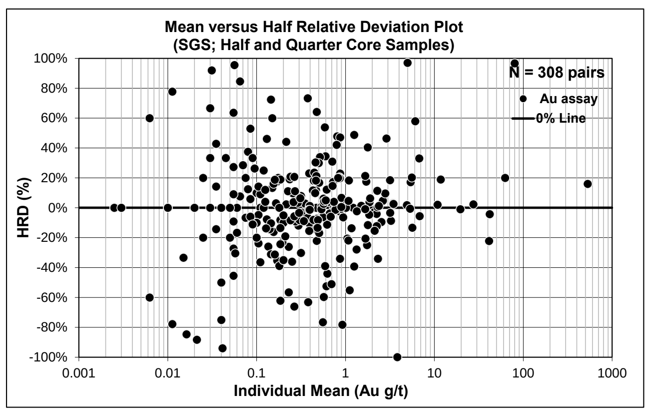
Project	Phoenix Project
Data Series	2014-2015 Field Duplicates
Data Type	Half and Quarter Core Samples
Commodity	Au in g/t
Analytical Method	Fire Assay
Detection Limit	0.005 gpt Au
Original Dataset	Original Half Core Assays
Paired Dataset	Duplicate Quarter Core Assays

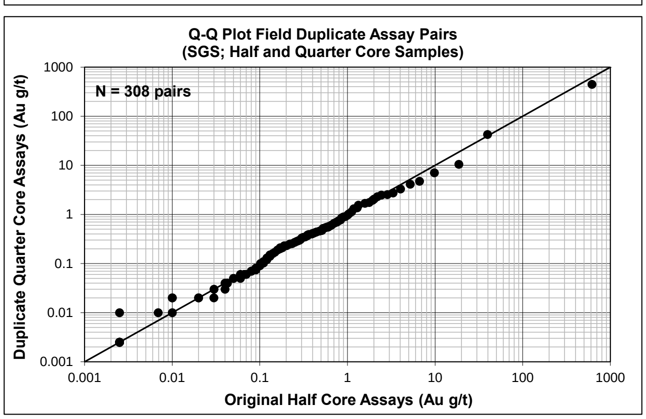
Statistics	**Original**	**Duplicate**
Sample Count	308	308
Minimum Value	0.003	0.003
Maximum Value	615.00	445.00
Mean	3.909	2.772
Median	0.265	0.285
Standard Error	2.079	1.470
Standard Deviation	36.486	25.803
Correlation Coefficient	0.9678	
Pairs ≤ 10% HARD	41.6%	

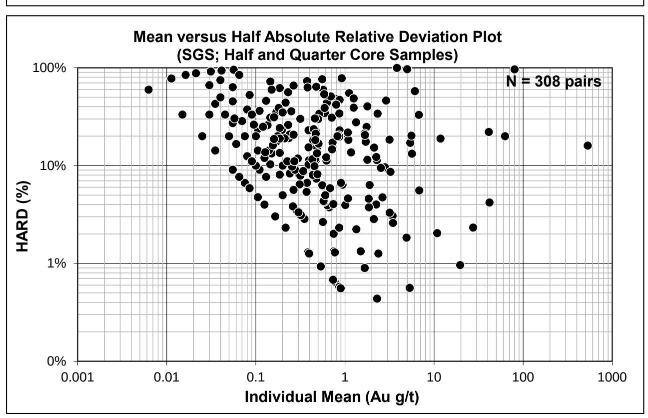










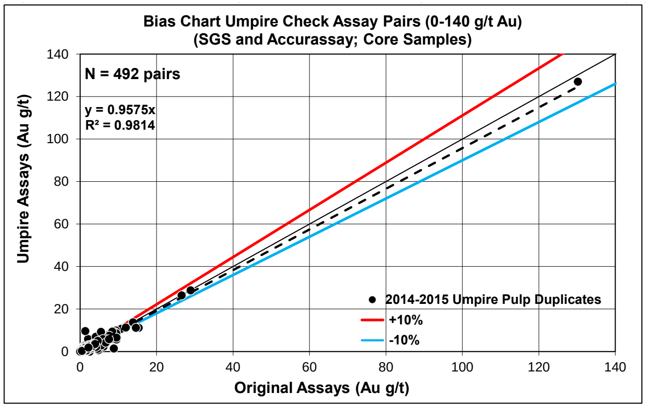


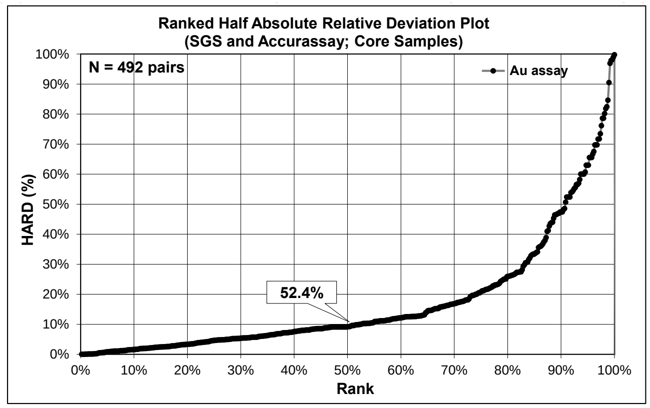
Bias charts and precision plots for pulp duplicate umpire check samples prepared by SGS in Red Lake, Ontario, and assayed by SGS in Vancouver, British Columbia and Accurassay in Thunder Bay, Ontario, during 2014 and 2015.

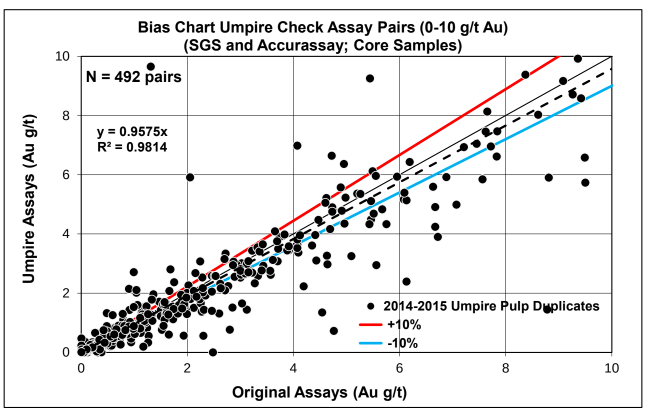
srk consulting

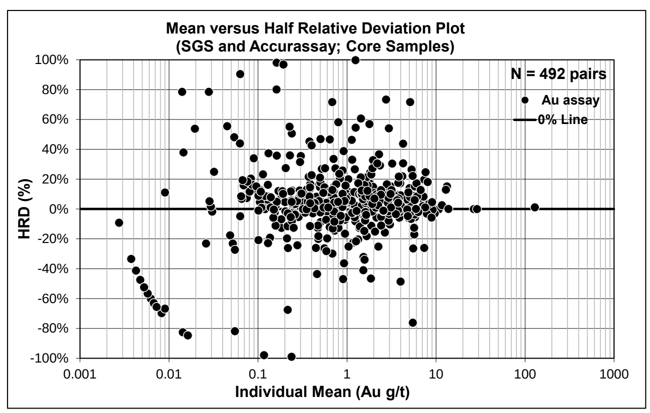
Project	Phoenix Project
Data Series	2014-2015 Umpire Pulp Duplicates
Data Type	Core Samples
Commodity	Au in g/t
Analytical Method	Fire Assay
Detection Limit	0.005 gpt Au
Original Dataset	Original Assays at SGS
Paired Dataset	Umpire Assays at Accurassay

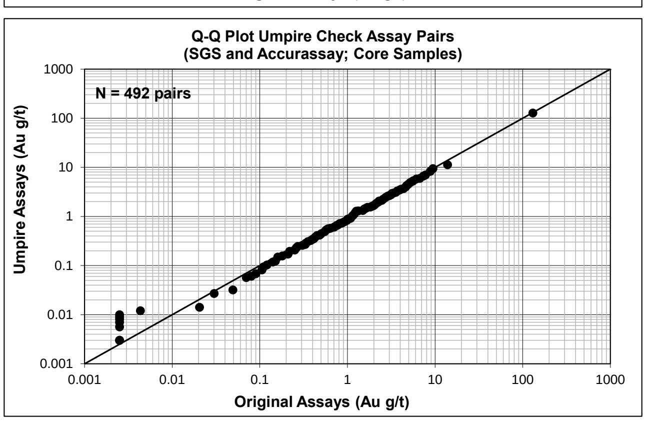
Statistics	SGS Original	Umpire Lab
Sample Count	492	492
Minimum Value	0.003	0.003
Maximum Value	130.20	127.09
Mean	2.218	2.035
Median	0.895	0.759
Standard Error	0.292	0.283
Standard Deviation	6.471	6.285
Correlation Coefficient	0.9907	
Pairs ≤ 10% HARD	52.4%	

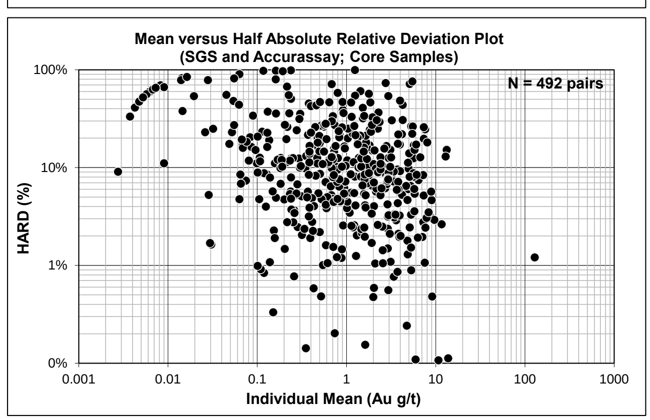












APPENDIX B

Summary Statistics

HG Uncapped and Capped Assay Statistics (Gold in g/t)

Zone	No. Data	Mean	Std. Dev.	Min	Median	Max	CoV	Mean	Std. Dev.	Min	Median	Max	CoV	Cap Value	No. Data Capped	Percentile (%)
1100s	**218**	**3.744**	**6.851**	**0**	**2.201**	**97.04**	**1.83**	**3.514**	**4.775**	**0**	**2.201**	**38.99**	**1.36**			
1101	74	5.491	6.227	0	3.767	38.99	1.13	5.491	6.227	0	3.767	38.99	1.13	n/a		
1102	144	2.91	6.977	0	1.21	97.04	2.40	2.569	3.521	0	1.21	15	1.37	15	1	99.17
1200s	**2301**	**6.808**	**73.364**	**0**	**1.77**	**3194.65**	**10.78**	**4.395**	**9.199**	**0**	**1.77**	**120**	**2.09**			
1201	1419	7.813	90.985	0	1.613	3194.65	11.65	4.683	10.302	0	1.613	120	2.20	120	8	99.61
1202	202	4.287	5.354	0	3.187	46.97	1.25	4.287	5.354	0	3.187	46.97	1.25	n/a		
1203	96	5.731	8.274	0.03	4.106	75.44	1.44	5.731	8.274	0.03	4.106	75.44	1.44	n/a		
1204	149	12.394	77.671	0	2.278	1010.4	6.27	5.968	12.88	0	2.278	80	2.16	80	3	98.76
1205	240	4.075	11.617	0	1.77	201.21	2.85	3.475	5.182	0	1.77	30	1.49	30	5	98.82
1206	195	2.795	8.269	0	0.64	112.16	2.96	2.222	3.713	0	0.64	20	1.67	20	3	98.43
1300s	**6902**	**5.399**	**32.382**	**0**	**2.33**	**2305.23**	**6.00**	**4.131**	**8.206**	**0**	**2.33**	**100**	**1.99**			
1301	711	4.261	15.823	0	2.274	403.47	3.71	3.803	8.091	0	2.274	100	2.13	100	5	99.60
1302	261	3.687	17.94	0	1.37	263.42	4.87	2.684	4.506	0	1.37	45	1.68	45	2	99.53
1303	78	4.555	10.617	0.01	2.756	72.35	2.33	3.113	3.114	0.01	2.756	15	1.00	15	2	96.24
1304	45	5.541	17.022	0	1.965	143.27	3.07	4.146	6.896	0	1.965	40	1.66	40	1	98.00
1305	417	4.509	16.195	0	1.966	330.77	3.59	4.078	9.046	0	1.966	100	2.22	100	2	99.66
1306	765	5.318	16.472	0	3.01	340.14	3.10	4.867	9.961	0	3.01	100	2.05	100	6	99.39
1307	297	4.695	9.532	0.02	3.143	185.37	2.03	4.435	5.427	0.02	3.143	60	1.22	60	1	99.70
1308	113	5.584	11.957	0	3.199	108.02	2.14	5.421	10.683	0	3.199	80	1.97	80	1	99.24
1309	99	5.914	11.4	0	3.445	99	1.93	5.454	8.309	0	3.445	45	1.52	45	1	98.51
1310	42	14.258	40.917	0	1.611	193.92	2.87	6.731	10.873	0	1.611	40	1.62	40	2	93.58
1311	42	7.578	14.444	0	3.193	72.24	1.91	6.485	10.073	0	3.193	40	1.55	40	4	94.91
1312	18	5.12	12.236	0.05	1.016	62.5	2.39	3.41	4.827	0.05	1.016	20	1.42	20	1	92.92
1313	238	4.631	12.726	0	2.7	162.04	2.75	4.081	6.685	0	2.7	60	1.64	100	1	99.35
1314	216	12.51	129.627	0	2.145	2305.23	10.36	4.033	6.806	0	2.145	40	1.69	40	5	98.07
1315	205	3.849	7.762	0	2.392	100.16	2.02	3.689	6.162	0	2.392	50	1.67	50	2	99.33
1316	201	7.719	73.926	0.01	2.066	1248.02	9.58	3.138	4.15	0.01	2.066	35	1.32	35	2	99.13
1317	44	5.503	5.828	0.04	4.045	31.21	1.06	5.503	5.828	0.04	4.045	31.21	1.06	n/a		
1318	84	5.357	11.013	0.12	2.402	77.98	2.06	4.6	6.972	0.12	2.402	35	1.52	35	2	97.50
1319	14	4.038	4.972	0	1.185	16.5	1.23	4.038	4.972	0	1.185	16.5	1.23	n/a		
1320	75	4.858	18.011	0	2.541	199.17	3.71	3.382	3.603	0	2.541	20	1.07	20	1	98.69
1321	12	5.416	3.746	0	4.316	17.6	0.69	5.416	3.746	0	4.316	17.6	0.69	n/a		
1322	34	6.257	14.562	0.05	3.022	74.98	2.33	4.032	4.855	0.05	3.022	20	1.20	20	3	94.00
1323	79	3.3	5.743	0	2.321	39.53	1.74	3.3	5.743	0	2.321	39.53	1.74	n/a		
1324	148	7.169	18.95	0.02	2.873	161.01	2.64	6.253	12.405	0.02	2.873	80	1.98	80	3	98.60
1325	81	5.643	21.95	0	2.9	216.1	3.89	3.042	2.461	0	2.9	10	0.81	10	2	97.30
1326	54	5.389	7.764	0	3.155	39.79	1.44	5.141	6.773	0	3.155	30	1.32	30	3	96.30
1327	27	7.315	12.934	0.65	3.446	73.44	1.77	7.315	12.934	0.65	3.446	73.44	1.77	n/a		
1328	70	6.016	33.488	0	2.526	361.84	5.57	3.04	3.477	0	2.526	20	1.14	20	1	99.05
1329	25	36.794	140.296	0	5.328	895.54	3.81	16.714	27.688	0	5.328	100	1.66	100	1	94.96
1330	66	7.7	19.787	0.04	3.148	125.57	2.57	5.24	7.528	0.04	3.148	35	1.44	35	2	95.73
1331	5	6.136	2.405	3.32	5.345	11.32	0.39	6.136	2.405	3.32	5.345	11.32	0.39	n/a		
1332	90	5.418	6.325	0	4.224	45.13	1.17	4.991	4.464	0	4.224	20	0.89	20	3	96.60
1333	14	4.458	2.367	0.99	3.51	12.46	0.53	4.458	2.367	0.99	3.51	12.46	0.53	n/a		
1334	40	6.838	19.496	0	1.468	113.27	2.85	4.746	9.149	0	1.468	40	1.93	40	1	95.84
1335	214	6.034	33.397	0	2.726	608.21	5.53	4.496	8.066	0	2.726	85	1.79	85	1	99.56
1336	66	4.786	10.93	0	2.095	89.75	2.28	4.089	6.494	0	2.095	30	1.59	30	1	98.15
1337	472	5.39	22.34	0	1.87	323.52	4.14	4.406	11.65	0	1.87	100	2.64	100	6	99.02
1338	105	3.107	4.392	0	1.4	31.93	1.41	3.023	3.943	0	1.4	20	1.30	20	3	98.27
1339	43	18.412	86.677	0.01	3.308	509.73	4.71	3.337	2.402	0.01	3.308	10	0.72	10	1	95.48
1340	65	2.732	9.069	0	0.662	88.82	3.32	2.133	4.112	0	0.662	25	1.93	25	1	98.35
1341	137	2.271	4.14	0	0.553	27.05	1.82	2.271	4.14	0	0.553	27.05	1.82	n/a		
1342	44	2.532	3.357	0.04	0.998	20.06	1.33	2.532	3.357	0.04	0.998	20.06	1.33	n/a		
1343	497	4.106	13.132	0	1.75	317.18	3.20	3.723	6.933	0	1.75	70	1.86	70	3	99.60
1344	158	5.198	20.86	0	1.07	211.03	4.01	3.053	4.459	0	1.07	20	1.46	20	4	98.11
1345	152	2.852	5.202	0	0.611	47.15	1.82	2.852	5.202	0	0.611	47.15	1.82	n/a		
1346	28	4.965	6.134	0.54	2.737	34.53	1.24	4.965	6.134	0.54	2.737	34.53	1.24	n/a		
1347	163	9.445	45.656	0	1.439	444.72	4.83	5.788	14.683	0	1.439	100	2.54	100	4	98.66
1348	48	3.159	3.554	0	2.406	17.72	1.13	3.159	3.554	0	2.406	17.72	1.13	n/a		

Continued: HG Uncapped and Capped Assay Statistics (Gold in g/t)

Zone	No. Data	Mean	Std. Dev.	Min	Median	Max	CoV	Mean	Std. Dev.	Min	Median	Max	CoV	Cap Value	No. Data Capped	Percentile (%)
2100s	**167**	**4.943**	**7.577**	**0**	**2.347**	**53.81**	**1.53**	**4.943**	**7.577**	**0**	**2.347**	**53.81**	**1.53**			
2101	102	5.269	8.623	0	2.288	53.81	1.64	5.269	8.623	0	2.288	53.81	1.64	n/a		
2102	55	3.953	5.59	0	2.22	26.53	1.41	3.953	5.59	0	2.22	26.53	1.41	n/a		
2103	3	10.32	6.746	4.21	7.03	19.72	0.65	10.32	6.746	4.21	7.03	19.72	0.65	n/a		
2104	7	5.652	2.55	1.43	6.556	9.36	0.45	5.652	2.55	1.43	6.556	9.36	0.45	n/a		
2200s	**136**	**3.649**	**12.178**	**0**	**0.645**	**130.2**	**3.34**	**2.795**	**4.615**	**0**	**0.643**	**25.45**	**1.65**			
2201	29	2.705	4.255	0	0.86	25.45	1.57	2.705	4.255	0	0.86	25.45	1.57	n/a		
2202	85	1.986	3.078	0	0.53	16.96	1.55	1.986	3.078	0	0.53	16.96	1.55	n/a		
2203	22	10.629	27.417	0	2.686	130.2	2.58	5.618	7.438	0	2.686	25	1.32	25	1	93.65
2300s	**79**	**6.081**	**13.039**	**0**	**2.57**	**111.19**	**2.14**	**5.399**	**8.742**	**0**	**2.57**	**40**	**1.62**		2	
2301	79	6.081	13.039	0	2.57	111.19	2.14	5.399	8.742	0	2.57	40	1.62	40	2	97.72
2500s	**102**	**6.111**	**11.891**	**0**	**1.586**	**62.53**	**1.95**	**6.111**	**11.891**	**0**	**1.586**	**62.53**	**1.95**			
2501	8	2.903	1.408	0	3.226	4.76	0.49	2.903	1.408	0	3.226	4.76	0.49	n/a		
2502	23	12.97	17.911	0	4.7	59.75	1.38	12.97	17.911	0	4.7	59.75	1.38	n/a		
2503	61	4.372	10.007	0	0.793	62.53	2.29	4.372	10.007	0	0.793	62.53	2.29	n/a		
2504	10	5.901	4.962	2.03	3.828	19.6	0.84	5.901	4.962	2.03	3.828	19.6	0.84	n/a		
2600s	**27**	**10.073**	**20.071**	**0.24**	**3.141**	**79.88**	**1.99**	**10.073**	**20.071**	**0.24**	**3.141**	**79.88**	**1.99**			
2601	27	10.073	20.071	0.24	3.141	79.88	1.99	10.073	20.071	0.24	3.141	79.88	1.99	n/a		
3100s	**833**	**7.506**	**31.585**	**0**	**1.717**	**676.71**	**4.21**	**6.118**	**14.825**	**0**	**1.717**	**110**	**2.42**			
3101	833	7.506	31.585	0	1.717	676.71	4.21	6.118	14.825	0	1.717	110	2.42	110	8	99.08
4100s	**30**	**5.461**	**6.087**	**0.17**	**4.239**	**32.91**	**1.11**	**4.585**	**2.87**	**0.17**	**4.239**	**10**	**0.63**			
4101	30	5.461	6.087	0.17	4.239	32.91	1.11	4.585	2.87	0.17	4.239	10	0.63	10	1	94.27

LG Uncapped and Capped Assay Statistics (Gold in g/t)

Zone	No. Data	Mean	Std. Dev.	Min	Median	Max	CoV	No. Data	Mean	Std. Dev.	Min	Median	Max	CoV	Chosen	No. Data Capped	Percentile %
1191	238	1.054	3.209	0	0.1	42.45	3.04	238	0.802	1.149	0	0.1	5	1.43	5	6	98.24
1291	47854	0.579	9.978	0	0.08	1770.2	17.23	47854	0.455	1.763	0	0.08	45	3.87	45	59	99.94
1391	19005	0.575	3.743	0	0.13	368.95	6.51	19005	0.481	0.985	0	0.13	10	2.05	10	95	99.70
1392	4222	0.513	2.201	0	0.09	127.93	4.29	4222	0.453	1.072	0	0.09	10	2.37	10	30	99.55
1901	2181	0.444	3.241	0	0.03	114.53	7.30	2181	0.328	1.066	0	0.03	10	3.25	10	13	99.57
2591	3927	0.398	2.519	0	0.01	185.26	6.33	3927	0.347	0.986	0	0.01	15	2.84	15	18	99.80
2901	2719	0.31	2.438	0	0.09	117.47	7.86	2719	0.252	0.643	0	0.09	8	2.55	8	7	99.77
2902	998	0.584	3.425	0	0.14	75.26	5.86	998	0.39	0.97	0	0.14	7	2.49	7	15	98.81
2903	307	0.424	1.25	0	0.13	24.75	2.95	307	0.384	0.798	0	0.13	6	2.08	6	2	99.39
2904	121	0.357	0.957	0	0.09	6.48	2.68	121	0.357	0.957	0	0.09	6.48	2.68	n/a		
2905	294	0.56	4.024	0	0.13	73.88	7.19	294	0.34	0.857	0	0.13	6	2.52	6	3	99.11
2906	813	0.283	3.222	0	0.01	131	11.39	813	0.221	1.281	0	0.01	25	5.80	25	2	99.88
5901	2521	0.743	39.996	0	0.01	3151.1	53.83	2521	0.205	0.741	0	0.01	10	3.61	10	7	99.81
5902	2689	0.332	8.303	0	0.02	728.9	25.01	2689	0.22	0.723	0	0.02	8	3.29	8	15	99.74
5903	1648	0.369	4.025	0	0	170.94	10.91	1648	0.245	0.978	0	0	10	3.99	10	12	99.61
5904	1153	0.18	0.91	0	0	25.1	5.06	1153	0.171	0.749	0	0	10	4.38	10	4	99.85
5905	722	0.099	0.403	0	0	13.2	4.07	722	0.099	0.403	0	0	13.2	4.07	n/a		
5906	49	0.246	1.118	0	0	11.1	4.54	49	0.246	1.118	0	0	11.1	4.54	n/a		
5907	1151	0.652	1.869	0	0.2	41.7	2.87	1151	0.621	1.395	0	0.2	15	2.25	15	6	99.71

HG Composite Statistics (Gold in g/t)

Zone	No. Data	Mean	Std. Dev.	Min	Median	Max	CoV
1100s	**183**	**3.514**	**4.605**	**0**	**2.18**	**38.99**	**1.31**
1101	59	5.491	5.92	0.002	4.146	38.99	1.08
1102	124	2.569	3.44	0	1.285	14.62	1.34
1200s	**1872**	**4.395**	**8.165**	**0**	**2.164**	**120**	**1.86**
1201	1118	4.683	9.252	0	2.1	120	1.98
1202	166	4.287	4.364	0	3.156	26.45	1.02
1203	75	5.731	7.755	0.049	4.354	75.44	1.35
1204	123	5.968	10.506	0	2.453	59	1.76
1205	209	3.475	4.487	0	2.002	28.325	1.29
1206	181	2.222	3.51	0	0.725	20	1.58
1300s	**5621**	**4.131**	**7.045**	**0**	**2.49**	**100**	**1.71**
1301	591	3.803	6.618	0	2.487	90	1.74
1302	217	2.684	3.636	0	1.491	24.055	1.35
1303	66	3.113	3.06	0.017	2.738	15	0.98
1304	37	4.146	5.266	0.064	1.906	22.371	1.27
1305	286	4.078	7.371	0	2.246	72.855	1.81
1306	592	4.867	8.153	0.006	3.083	100	1.68
1307	244	4.435	4.738	0.086	3.214	60	1.07
1308	88	5.421	10.275	0	3.264	76.51	1.90
1309	72	5.454	7.559	0.005	3.63	45	1.39
1310	33	6.731	10.811	0.005	1.905	40	1.61
1311	30	6.485	9.624	0	3.194	40	1.48
1312	13	3.41	4.207	0.075	2.267	13.844	1.23
1313	188	4.081	6.092	0	2.77	60	1.49
1314	159	4.033	6.271	0.01	2.339	40	1.55
1315	171	3.689	5.35	0.016	2.439	50	1.45
1316	148	3.138	3.684	0.186	2.096	34.185	1.17
1317	41	5.503	5.602	0.055	4.1	28.969	1.02
1318	63	4.6	6.446	0.163	2.402	33.335	1.40
1319	9	4.038	4.972	0.019	1.476	16.5	1.23
1320	62	3.382	3.051	0	2.749	11.14	0.90
1321	11	5.416	3.212	0	4.958	12.692	0.59
1322	25	4.032	4.378	0.069	3.343	18.46	1.09
1323	60	3.3	5.651	0.025	2.394	39.53	1.71
1324	131	6.253	10.758	0.04	2.896	56.27	1.72
1325	61	3.042	2.342	0	3.16	9.91	0.77
1326	45	5.141	6.384	0	3.168	30	1.24
1327	20	7.315	7.971	0.75	3.732	29.827	1.09
1328	58	3.04	3.192	0	2.484	16.26	1.05
1329	20	16.714	27.043	0.046	5.52	98.22	1.62
1330	52	5.24	7.057	0.115	3.086	35	1.35
1331	5	6.136	2.405	3.32	5.345	11.32	0.39
1332	81	4.991	4.281	0	4.235	20	0.86
1333	12	4.458	1.786	2.38	3.632	8.74	0.40
1334	36	4.746	9.043	0	1.476	40	1.91
1335	174	4.496	6.603	0.004	2.788	58.948	1.47
1336	47	4.089	5.622	0	2.219	29.835	1.37
1337	391	4.406	10.215	0	2.088	100	2.32
1338	83	3.023	3.707	0	1.767	20	1.23
1339	37	3.337	2.372	0.041	3.308	10	0.71
1340	54	2.133	3.749	0	0.737	19.58	1.76
1341	120	2.271	3.96	0	0.592	23.31	1.74
1342	44	2.532	3.327	0.04	1.321	20.06	1.31
1343	446	3.723	5.685	0	1.845	43.544	1.53
1344	147	3.053	4.15	0	1.076	19.658	1.36
1345	154	2.852	4.701	0	1.064	34.63	1.65
1346	21	4.965	4.992	0.71	3.811	19.365	1.01
1347	135	5.788	10.753	0	2.094	67.473	1.86
1348	41	3.159	3.33	0	2.522	17.72	1.05

Continued: HG Composite Statistics (Gold in g/t)

Zone	No. Data	Mean	Std. Dev.	Min	Median	Max	CoV
2100s	**153**	**4.943**	**7.258**	**0**	**2.473**	**46.172**	**1.47**
2101	91	5.269	8.181	0	2.362	46.172	1.55
2102	52	3.953	5.52	0	2.226	26.53	1.40
2103	3	10.32	6.746	4.21	7.03	19.72	0.65
2104	7	5.652	2.55	1.43	6.556	9.36	0.45
2200s	**90**	**2.795**	**4.312**	**0**	**0.678**	**22.71**	**1.54**
2201	26	2.705	3.41	0	0.965	14.74	1.26
2202	49	1.986	3.057	0	0.547	16.96	1.54
2203	15	5.618	7.068	0	2.941	22.71	1.26
2300s	**57**	**5.399**	**8.57**	**0**	**2.619**	**40**	**1.59**
2301	57	5.399	8.57	0	2.619	40	1.59
2500s	**84**	**6.111**	**11.146**	**0**	**2.289**	**56.105**	**1.82**
2501	7	2.903	1.367	0.186	3.226	4.645	0.47
2502	18	12.97	16.865	0	4.562	56.105	1.30
2503	51	4.372	9.297	0	0.8	46.13	2.13
2504	8	5.901	3.364	2.52	5.26	13.123	0.57
2600s	**22**	**10.073**	**18.095**	**0.284**	**3.178**	**79.88**	**1.80**
2601	22	10.073	18.095	0.284	3.178	79.88	1.80
3100s	**637**	**6.119**	**12.67**	**0**	**1.994**	**110**	**2.07**
3101	637	6.119	12.67	0	1.994	110	2.07
4100s	**26**	**4.585**	**2.852**	**0.17**	**4.139**	**10**	**0.62**
4101	26	4.585	2.852	0.17	4.139	10	0.62

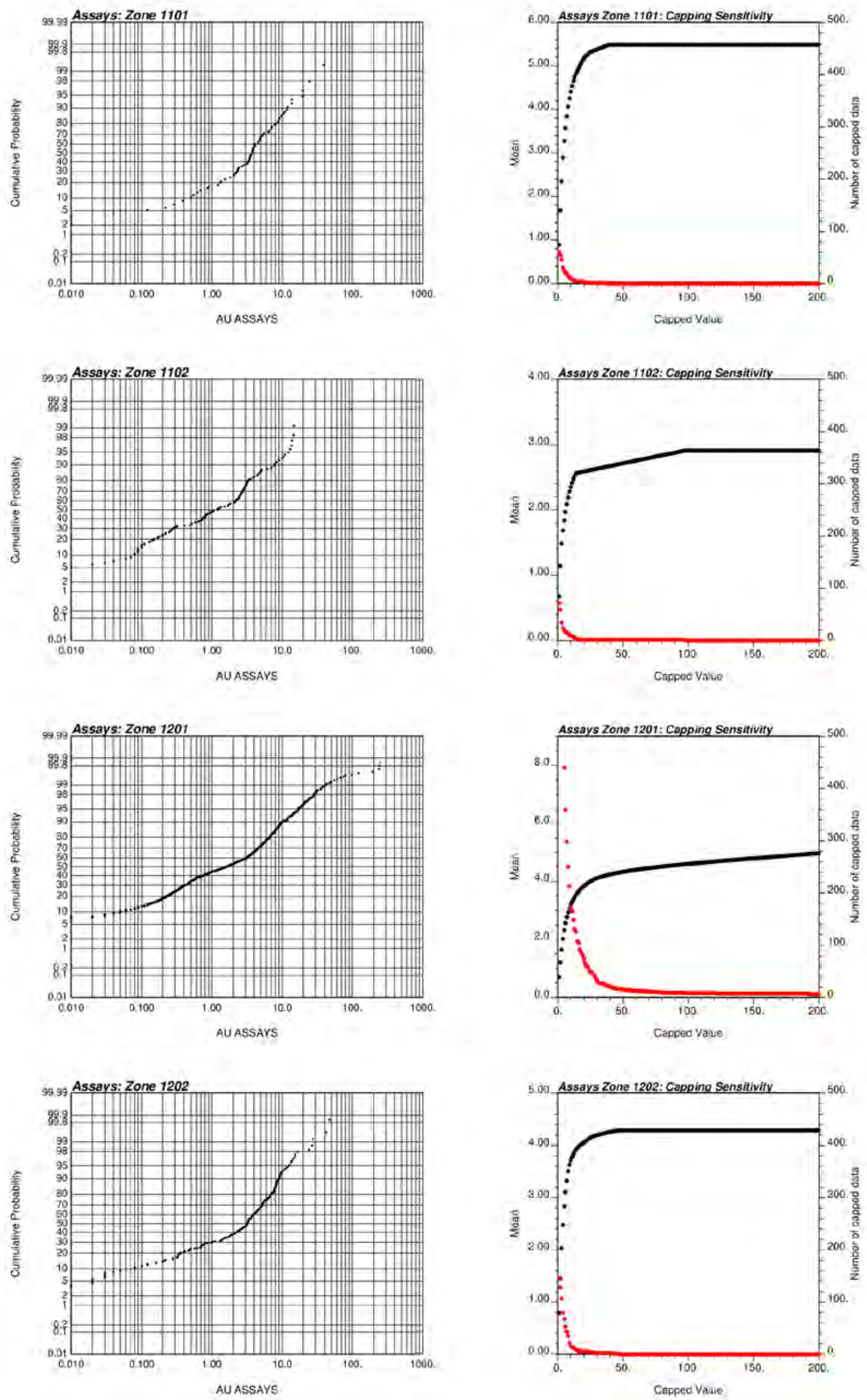
LG Composite Statistics (Gold in g/t)

Zone	No. Data	Mean	Std. Dev.	Min	Median	Max	CoV
1191	326	0.802	1.062	0	0.284	5	1.32
1291	58410	0.455	1.476	0	0.105	45	3.24
1391	19831	0.481	0.876	0	0.158	10	1.82
1392	4995	0.453	0.959	0	0.126	10	2.12
1901	2662	0.328	0.93	0	0.037	10	2.84
2591	5965	0.347	0.857	0	0.048	15	2.47
2901	2698	0.252	0.523	0	0.105	7.594	2.08
2902	1094	0.39	0.838	0	0.161	7	2.15
2903	293	0.384	0.647	0	0.156	4.122	1.68
2904	112	0.357	0.778	0	0.099	5.437	2.18
2905	289	0.34	0.738	0	0.145	5.759	2.17
2906	1044	0.221	1.124	0	0.028	24.336	5.09
5901	3114	0.205	0.614	0	0.021	8.897	3.00
5902	2748	0.22	0.562	0	0.038	7.65	2.55
5903	2462	0.245	0.817	0	0	9.959	3.33
5904	2058	0.171	0.629	0	0	9.613	3.68
5905	1105	0.099	0.291	0	0	4.021	2.94
5906	82	0.246	0.824	0	0	5.595	3.35
5907	928	0.621	1.155	0	0.239	12.38	1.86

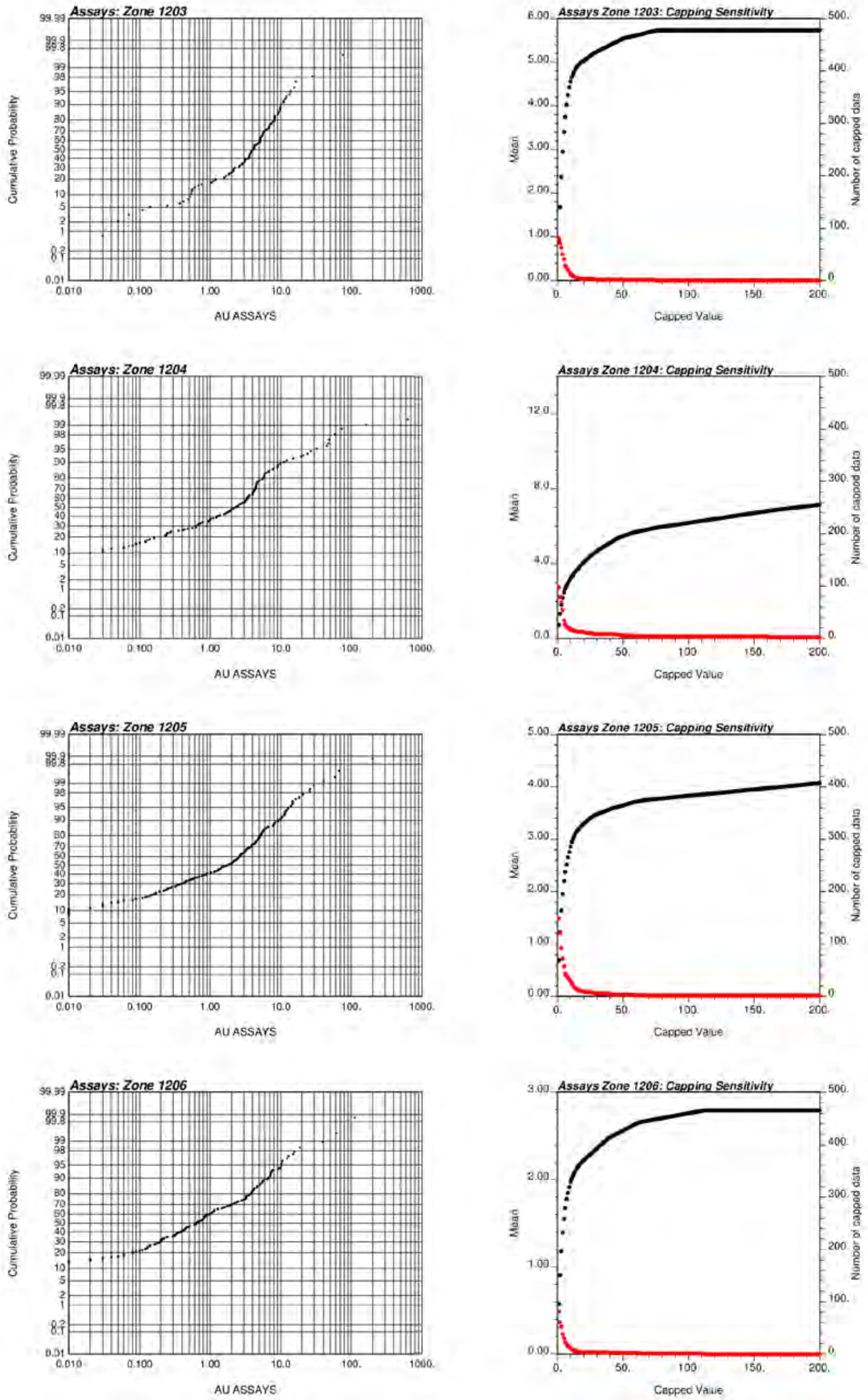
APPENDIX C

Probability Plots and Capping Sensitivity Plots

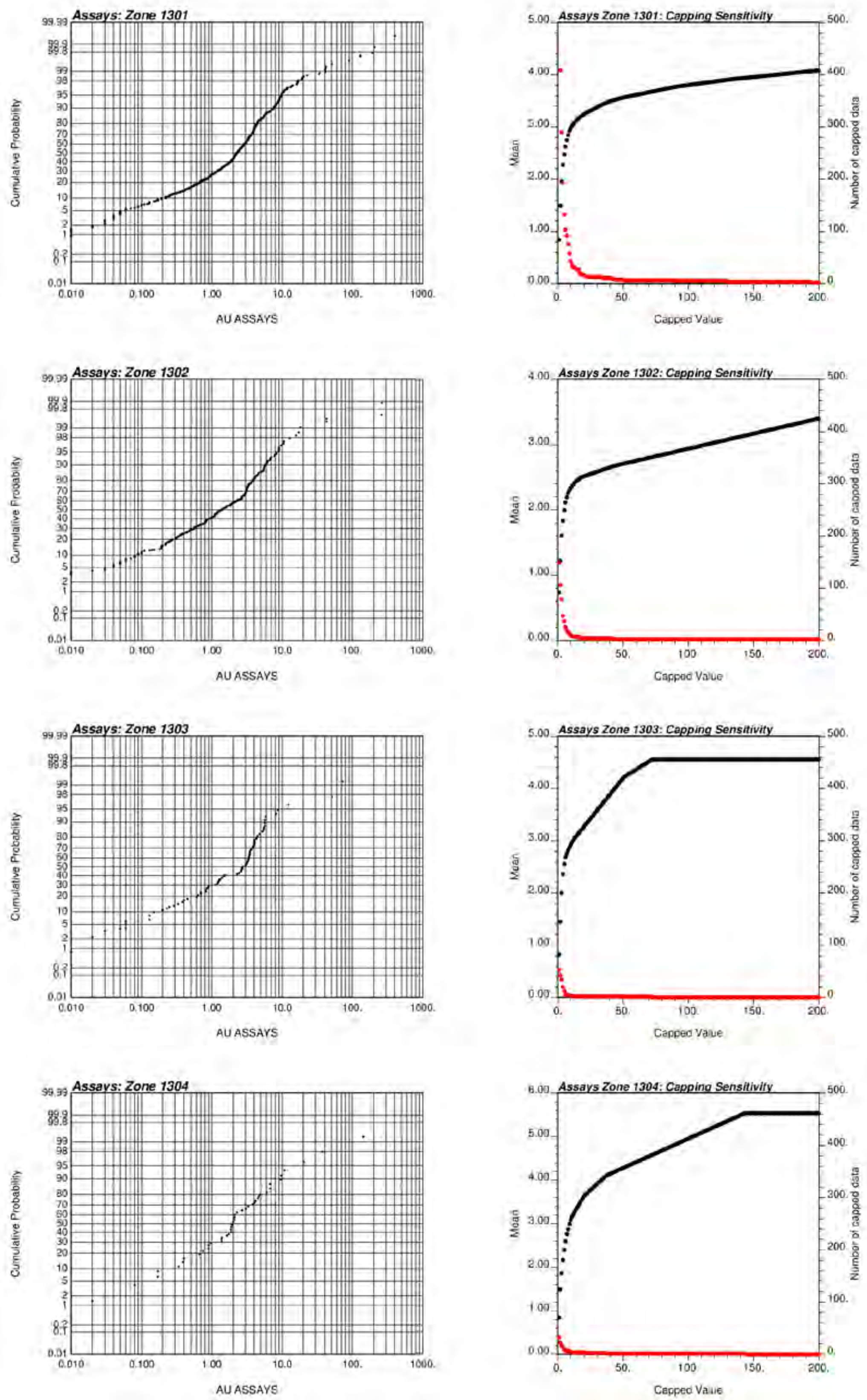
Rubicon: HG Assays Capping



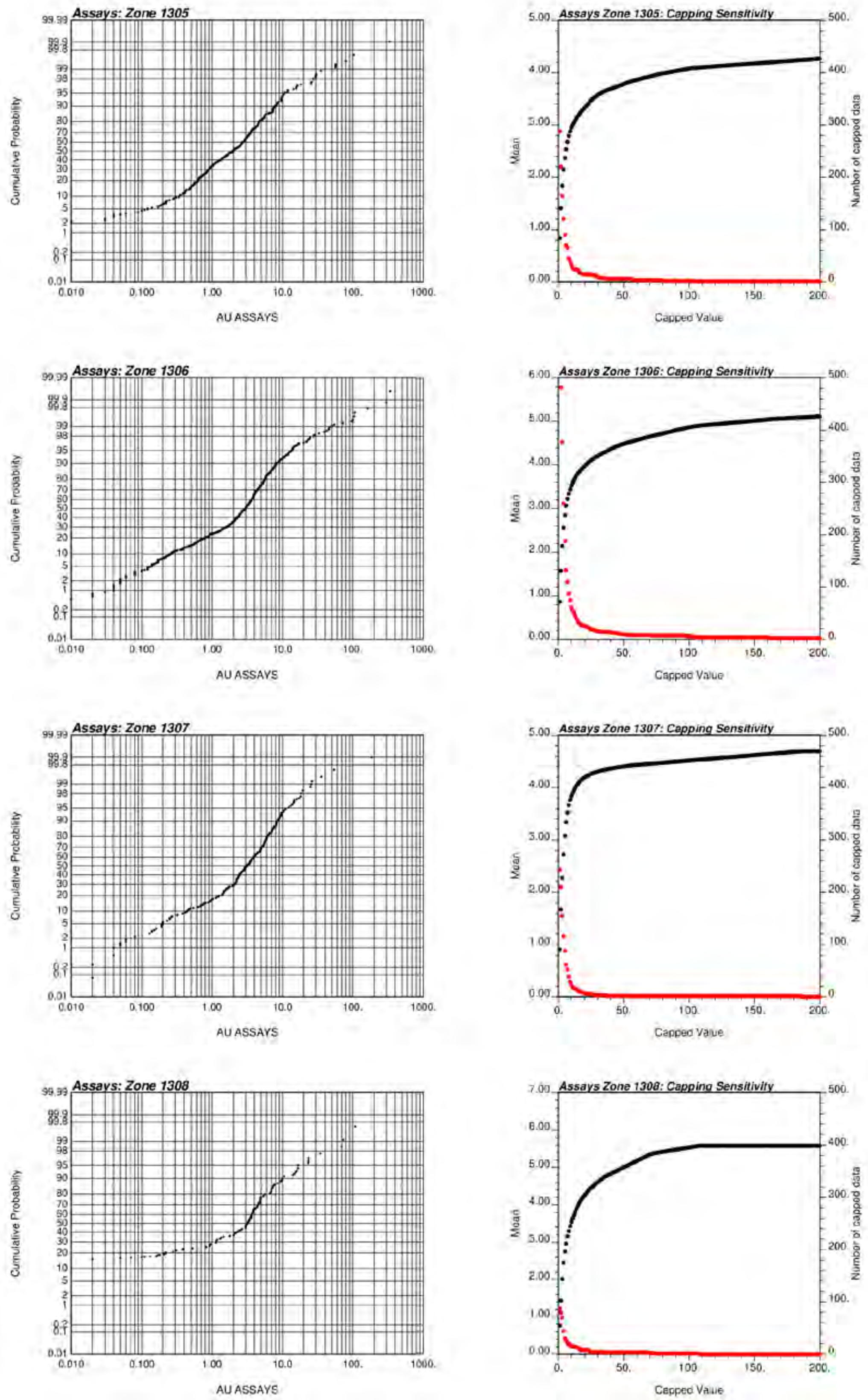
Rubicon: HG Assays Capping



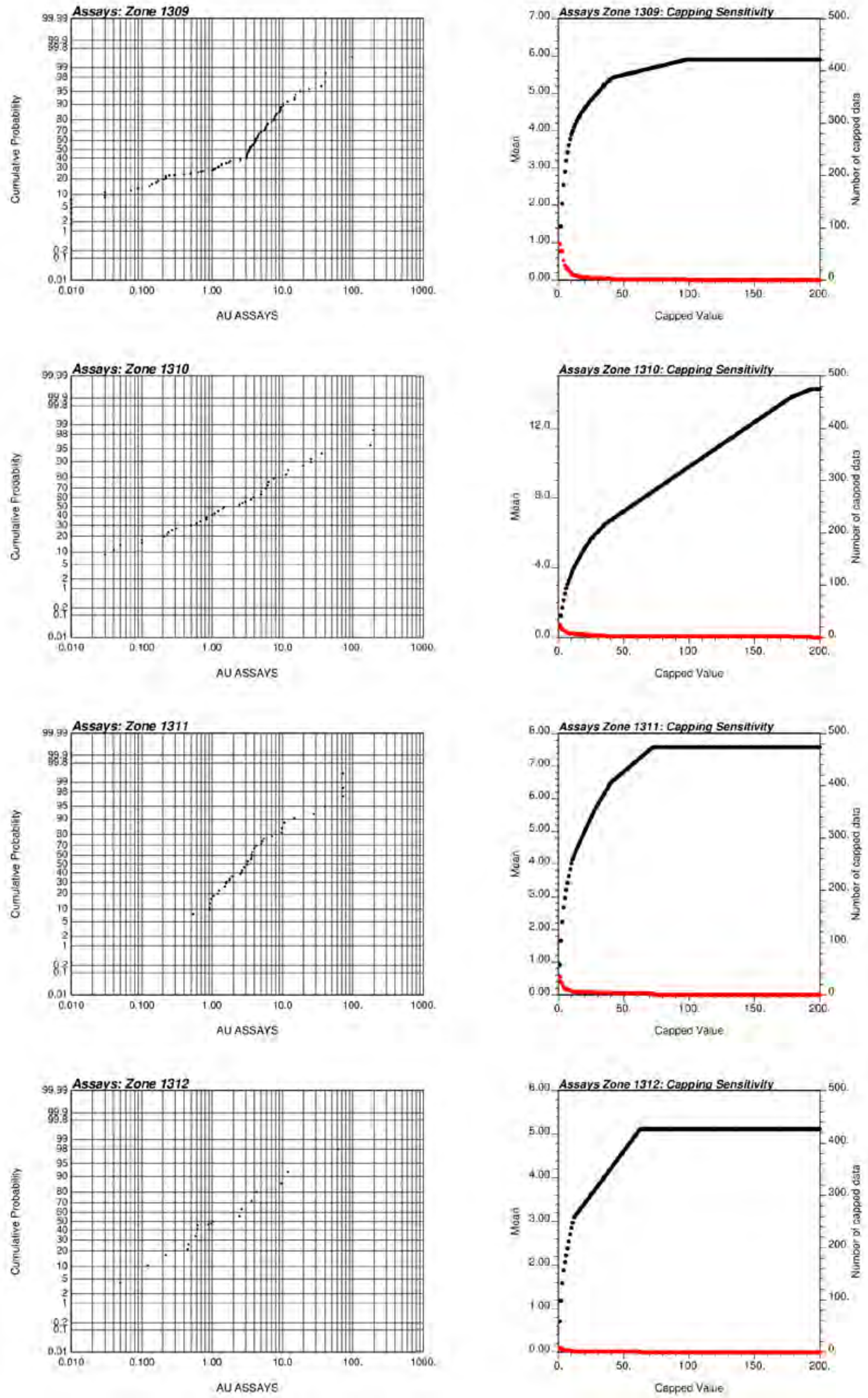
Rubicon: HG Assays Capping



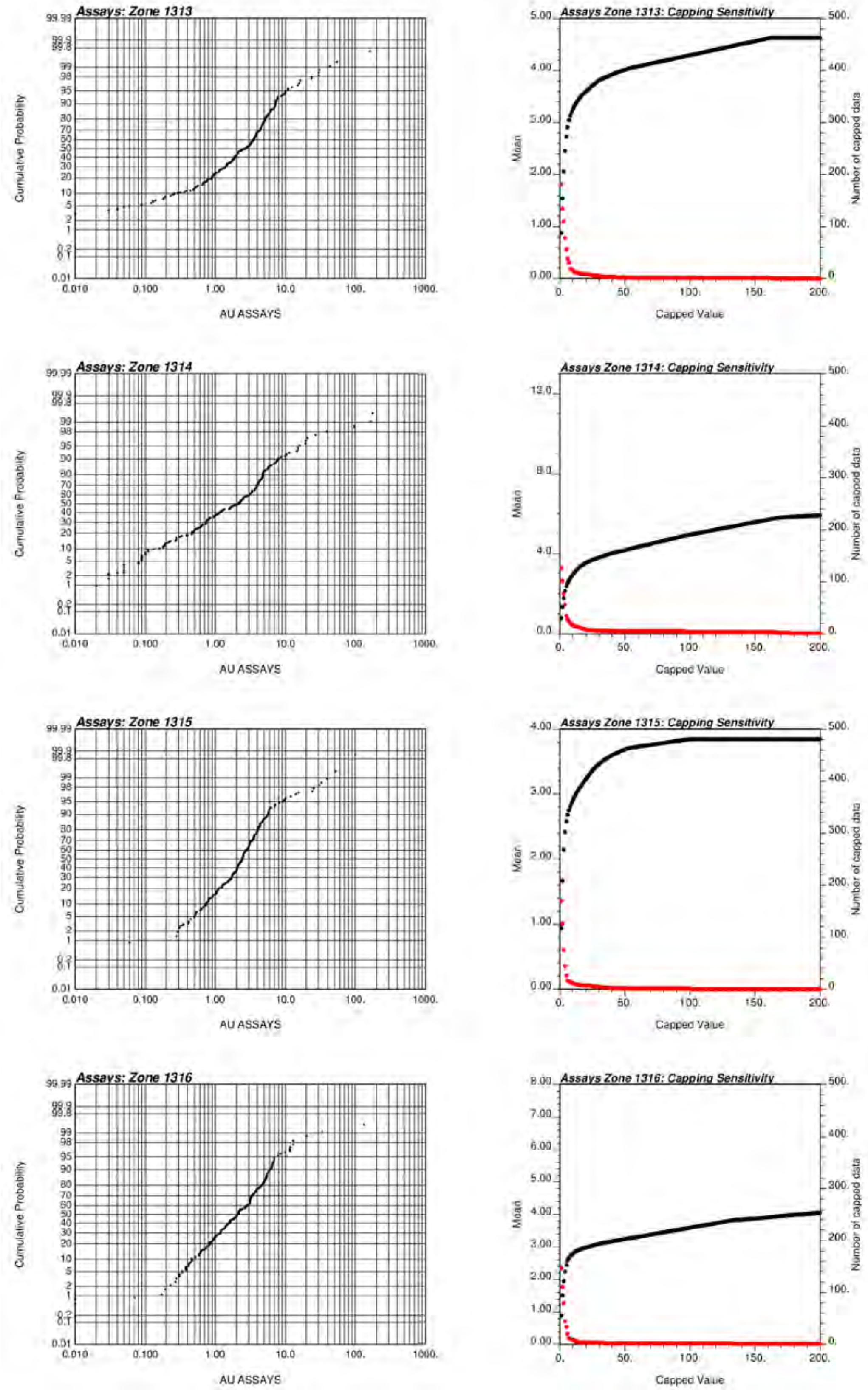
Rubicon: HG Assays Capping



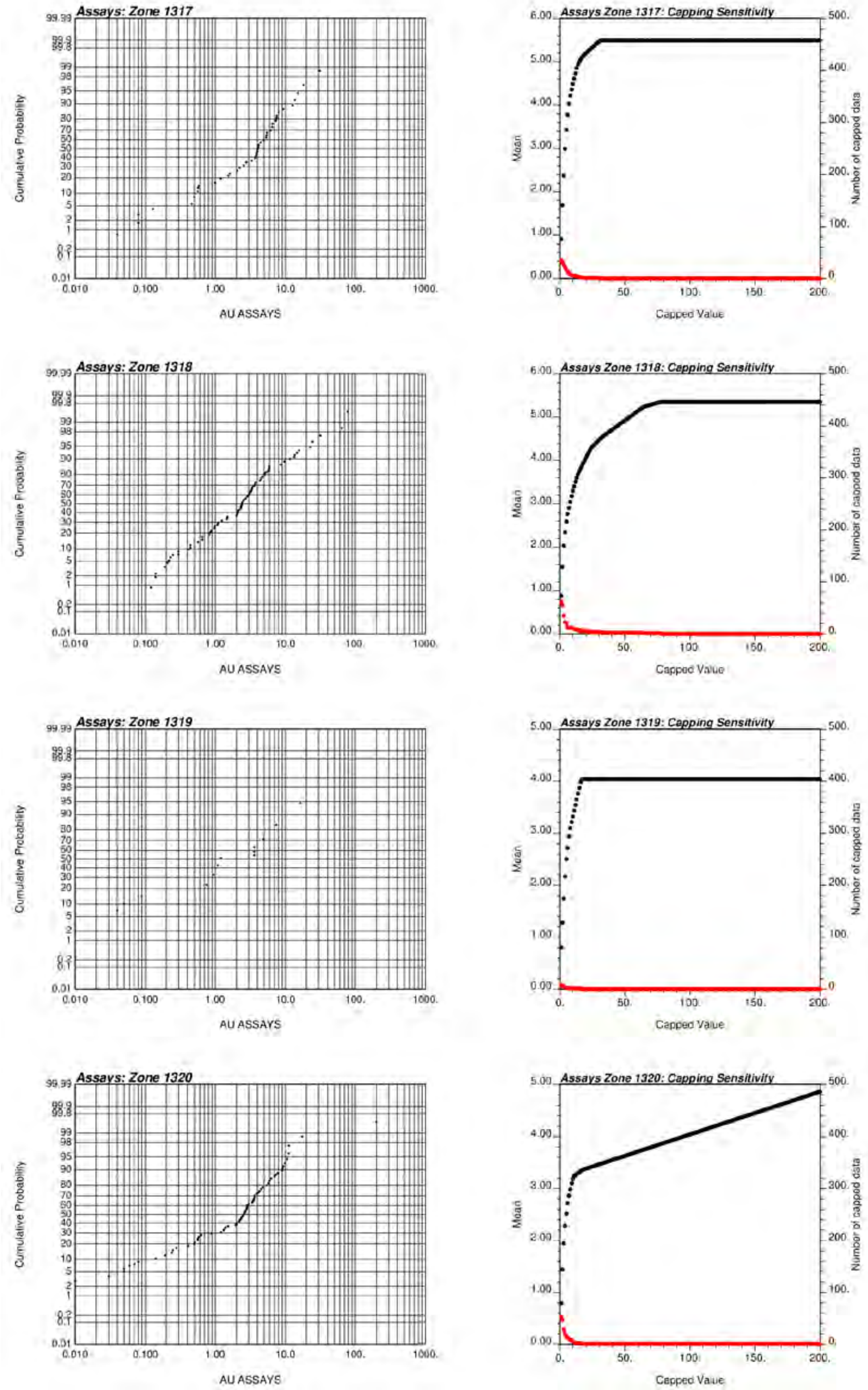
Rubicon: HG Assays Capping



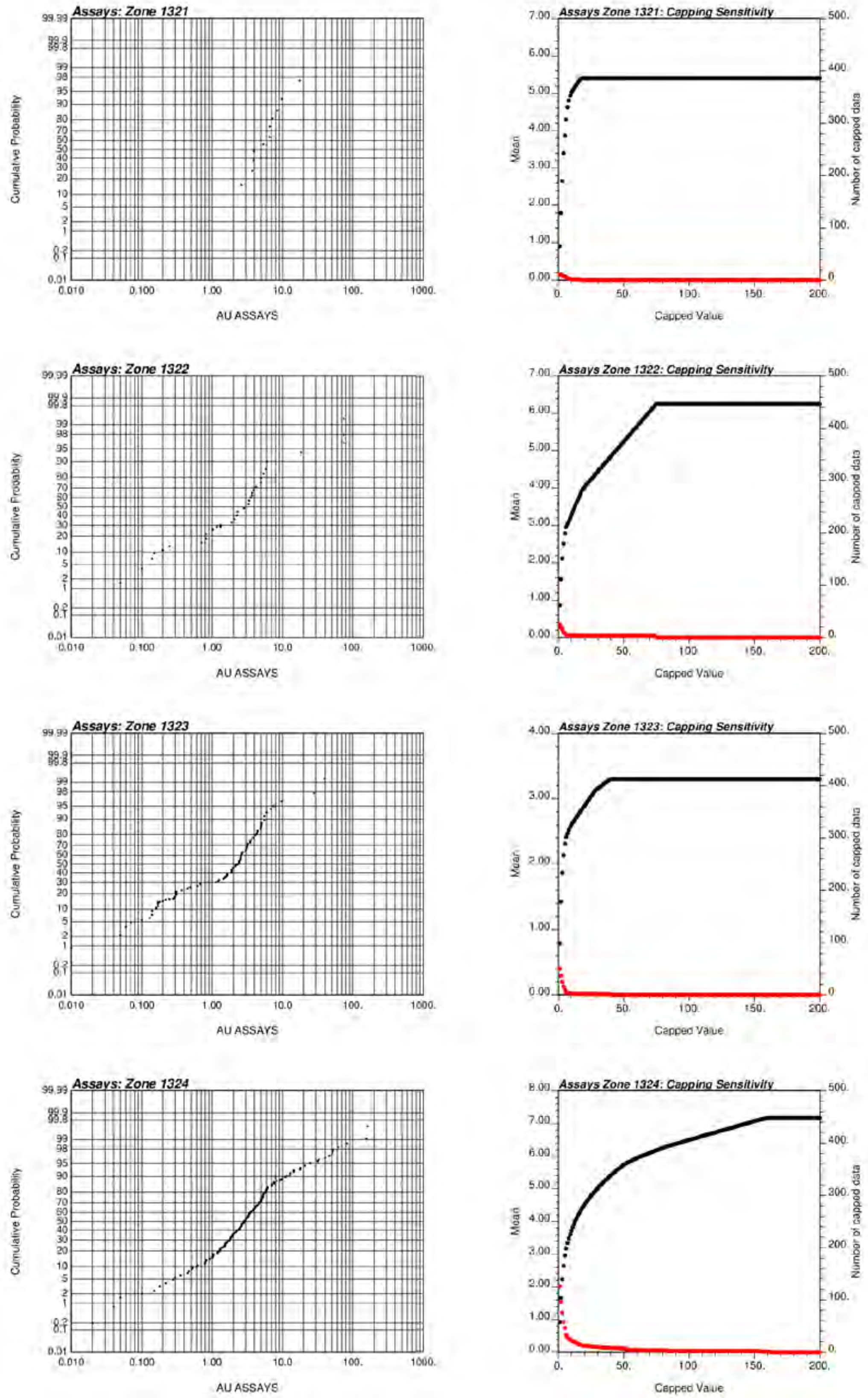
Rubicon: HG Assays Capping



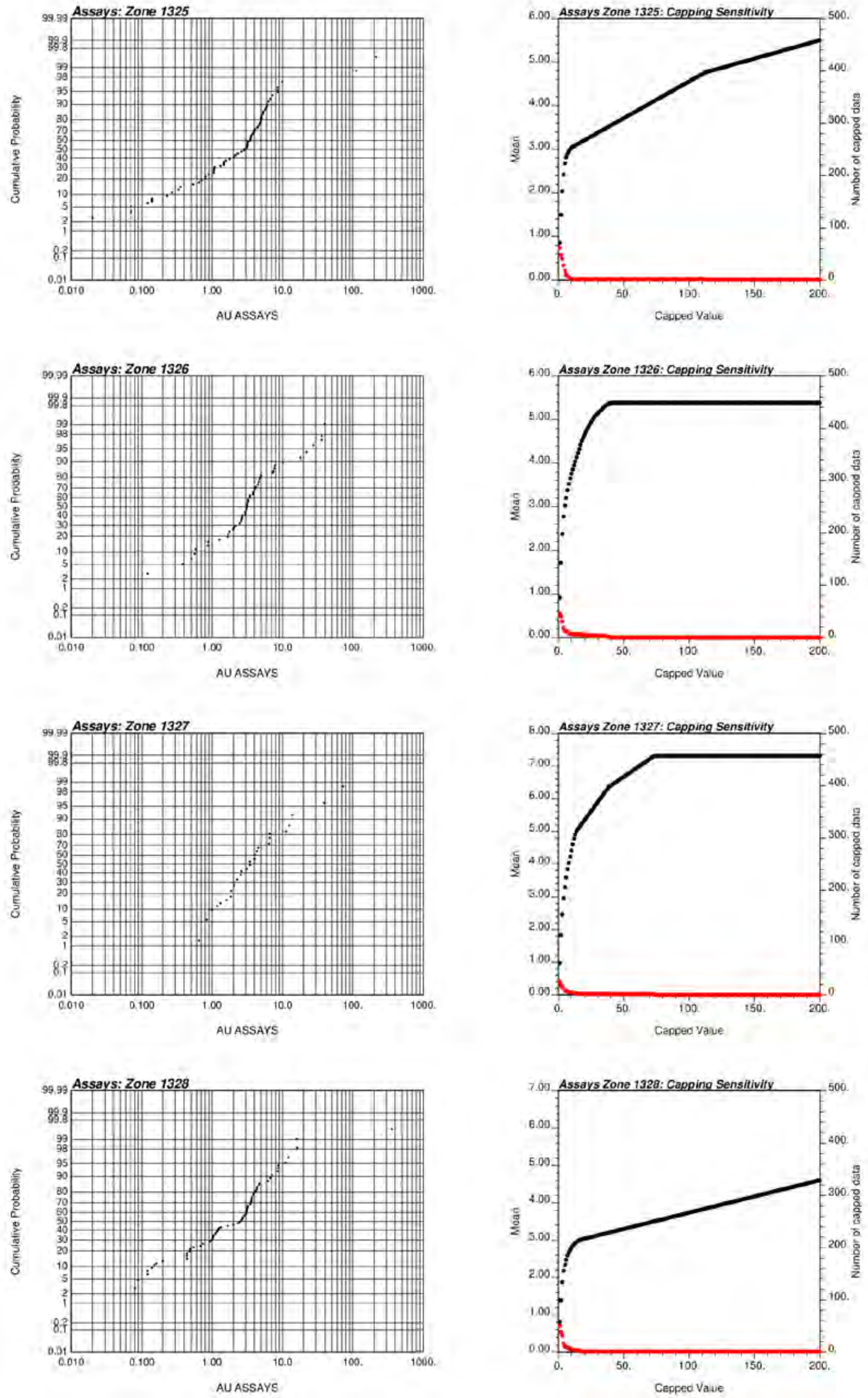
Rubicon: HG Assays Capping



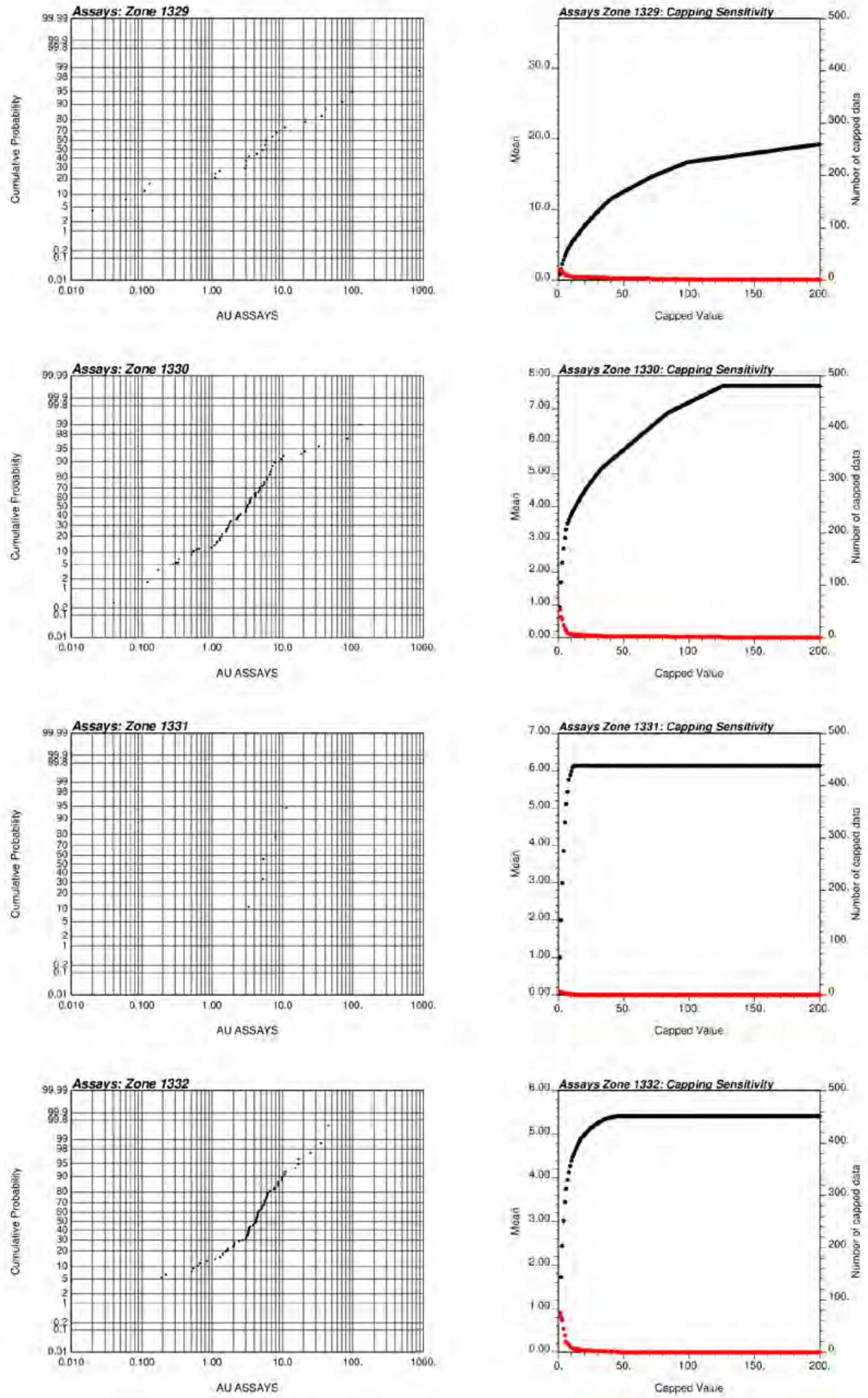
Rubicon: HG Assays Capping



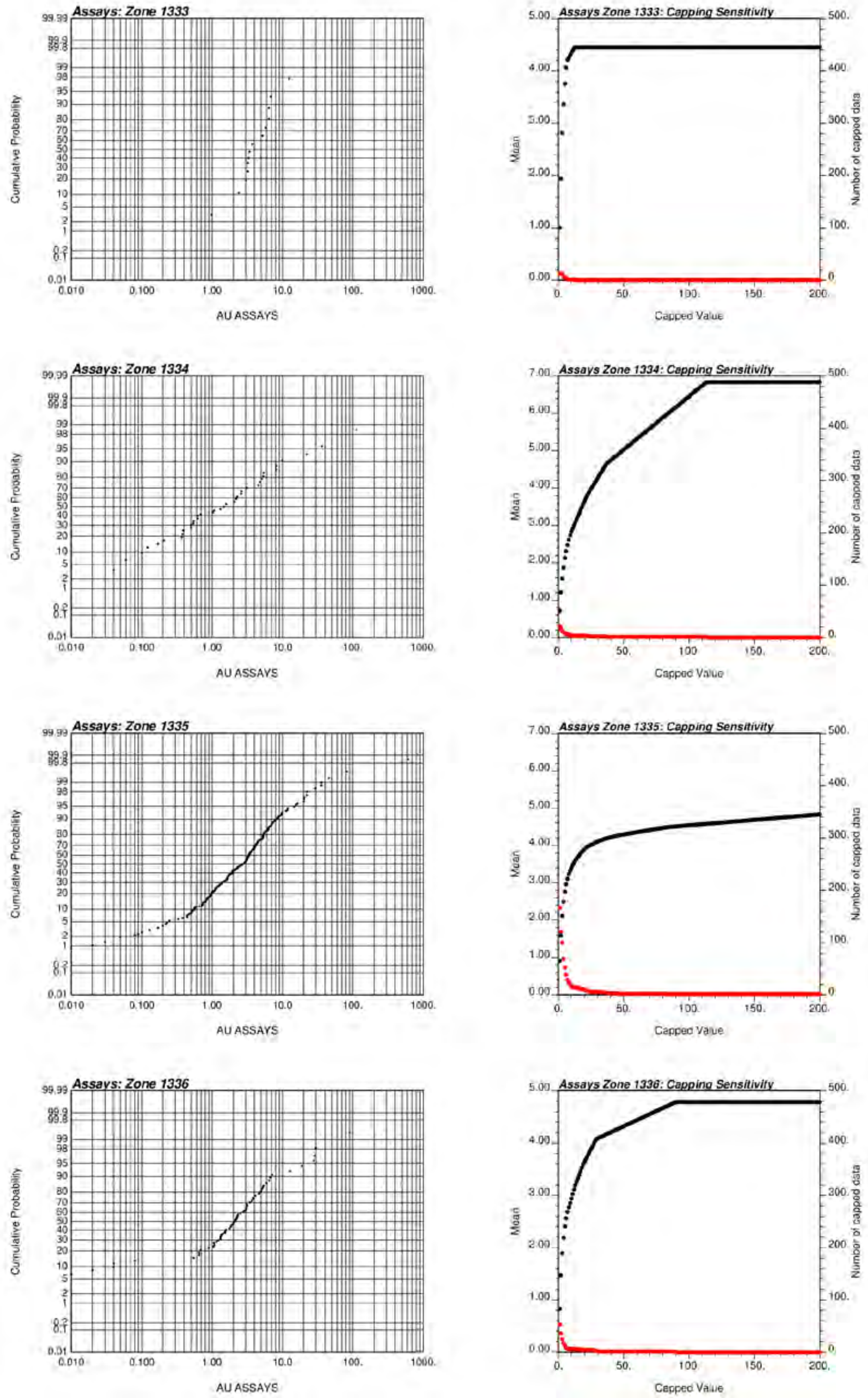
Rubicon: HG Assays Capping



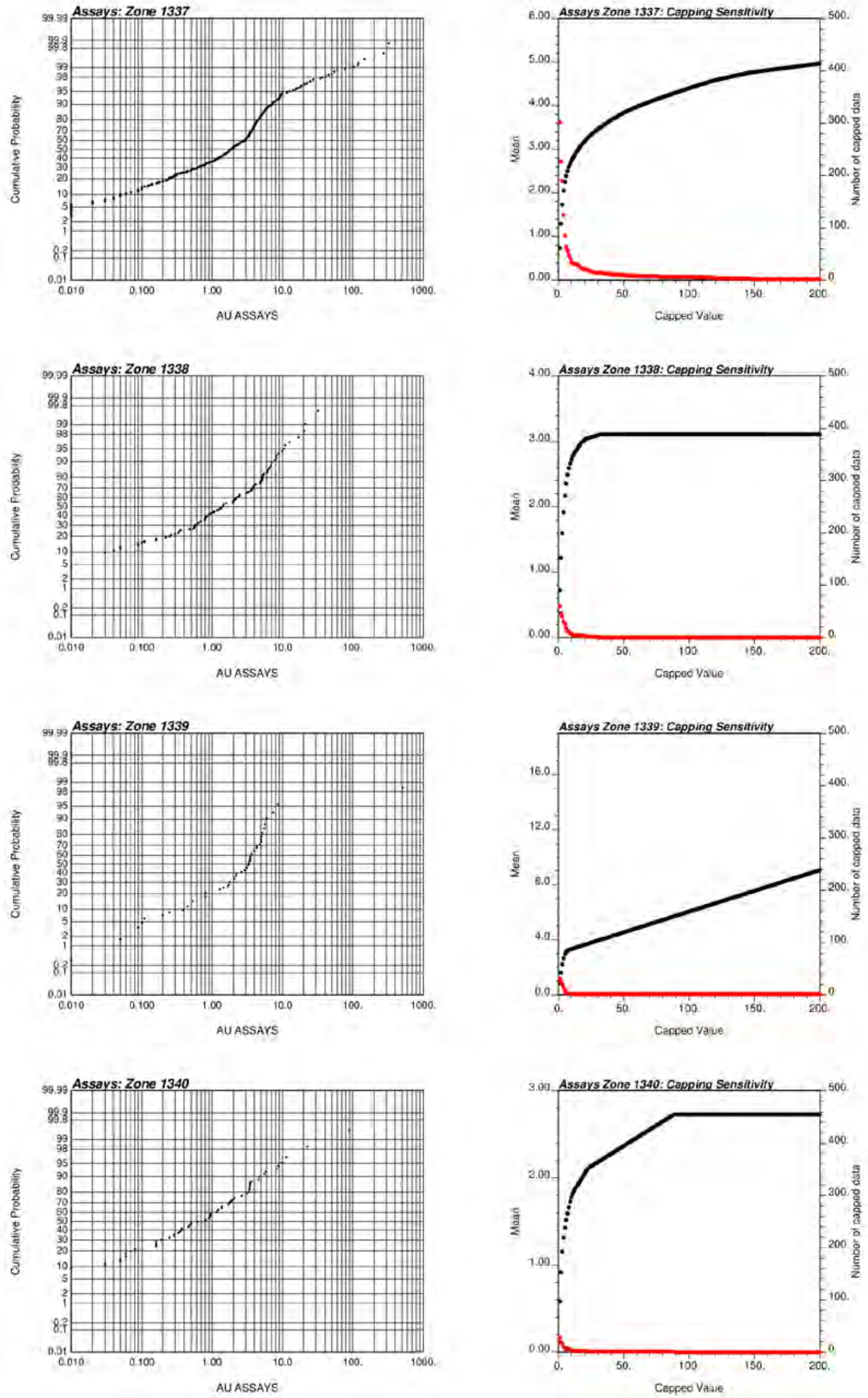
Rubicon: HG Assays Capping



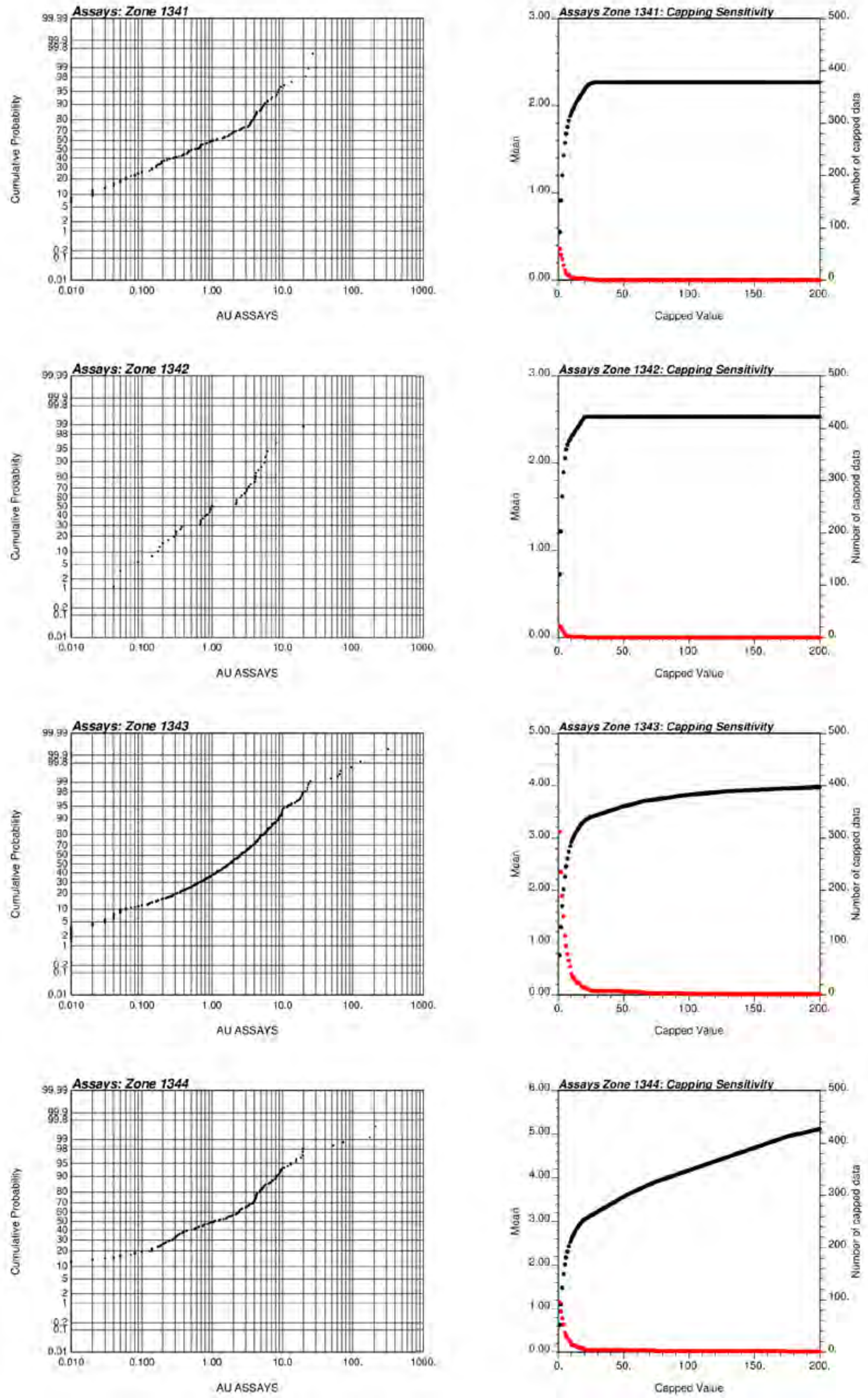
Rubicon: HG Assays Capping



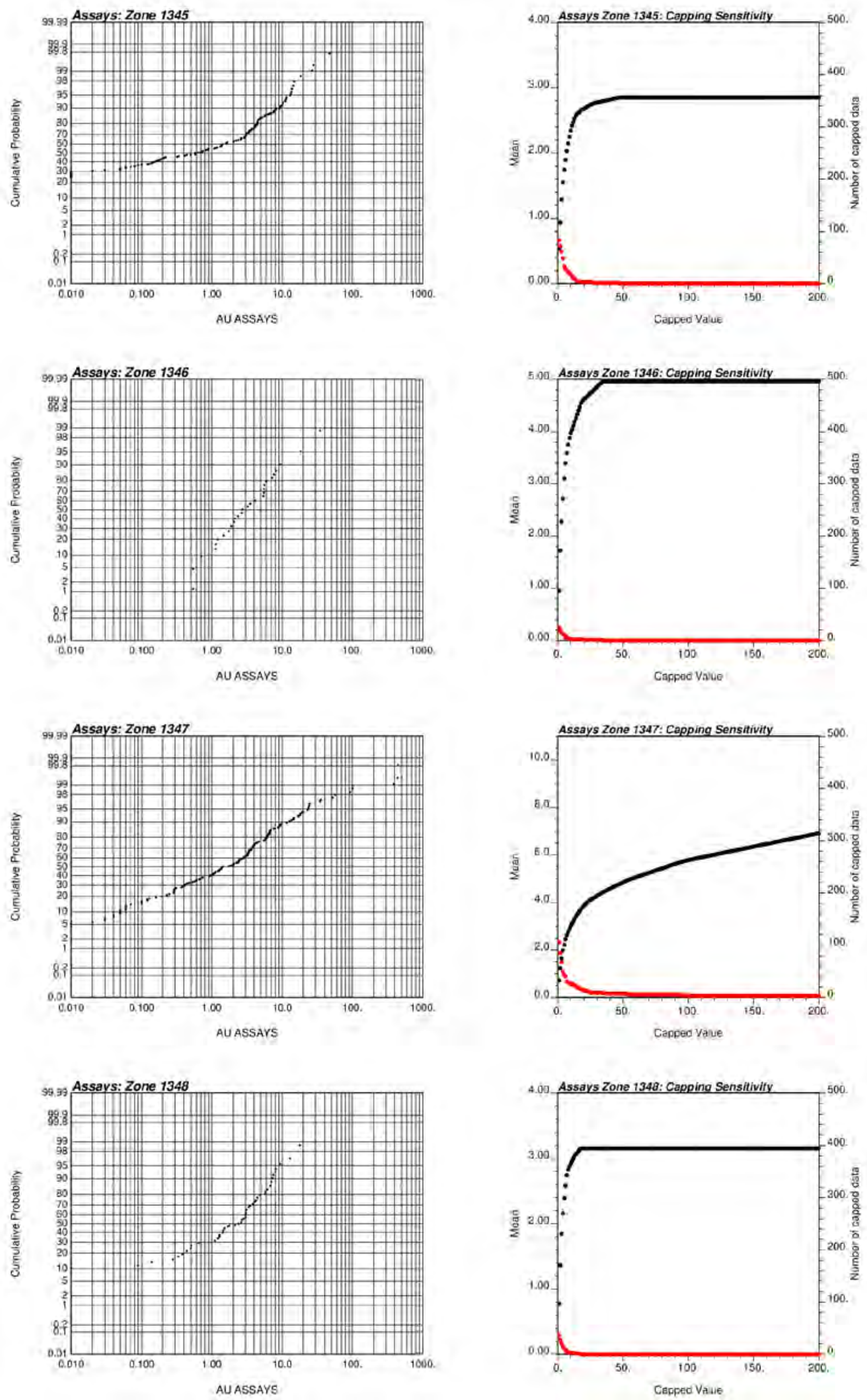
Rubicon: HG Assays Capping



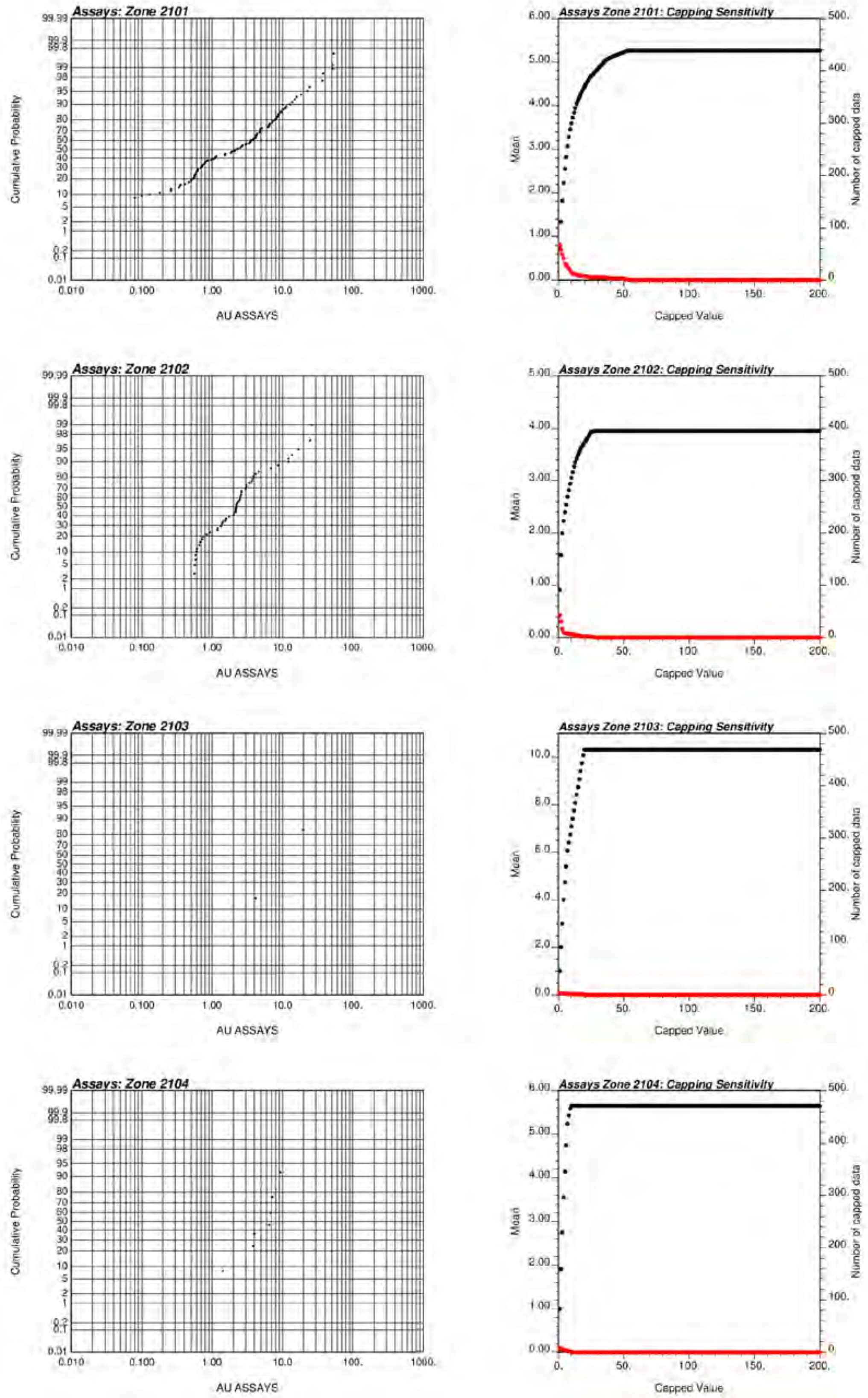
Rubicon: HG Assays Capping



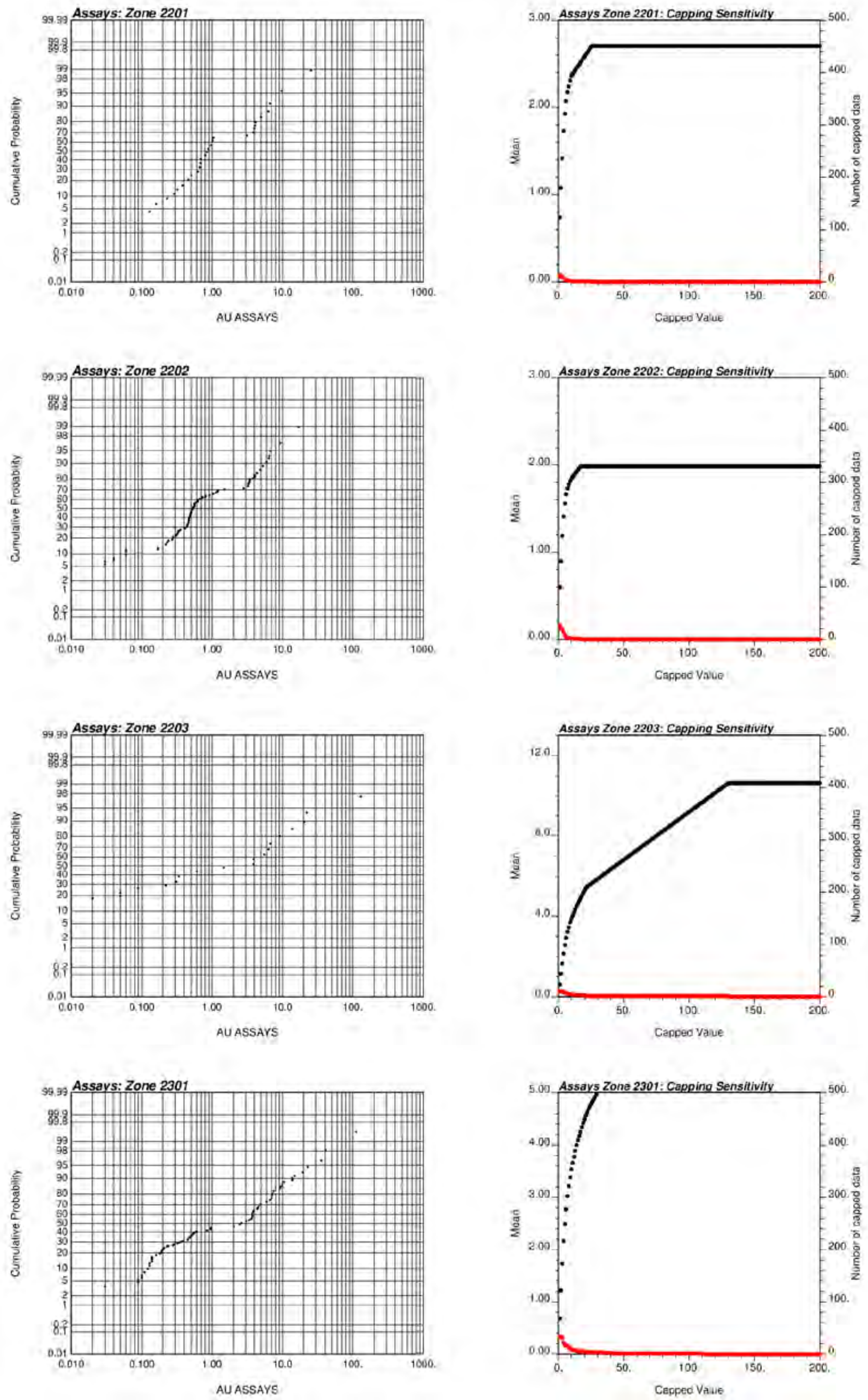
Rubicon: HG Assays Capping



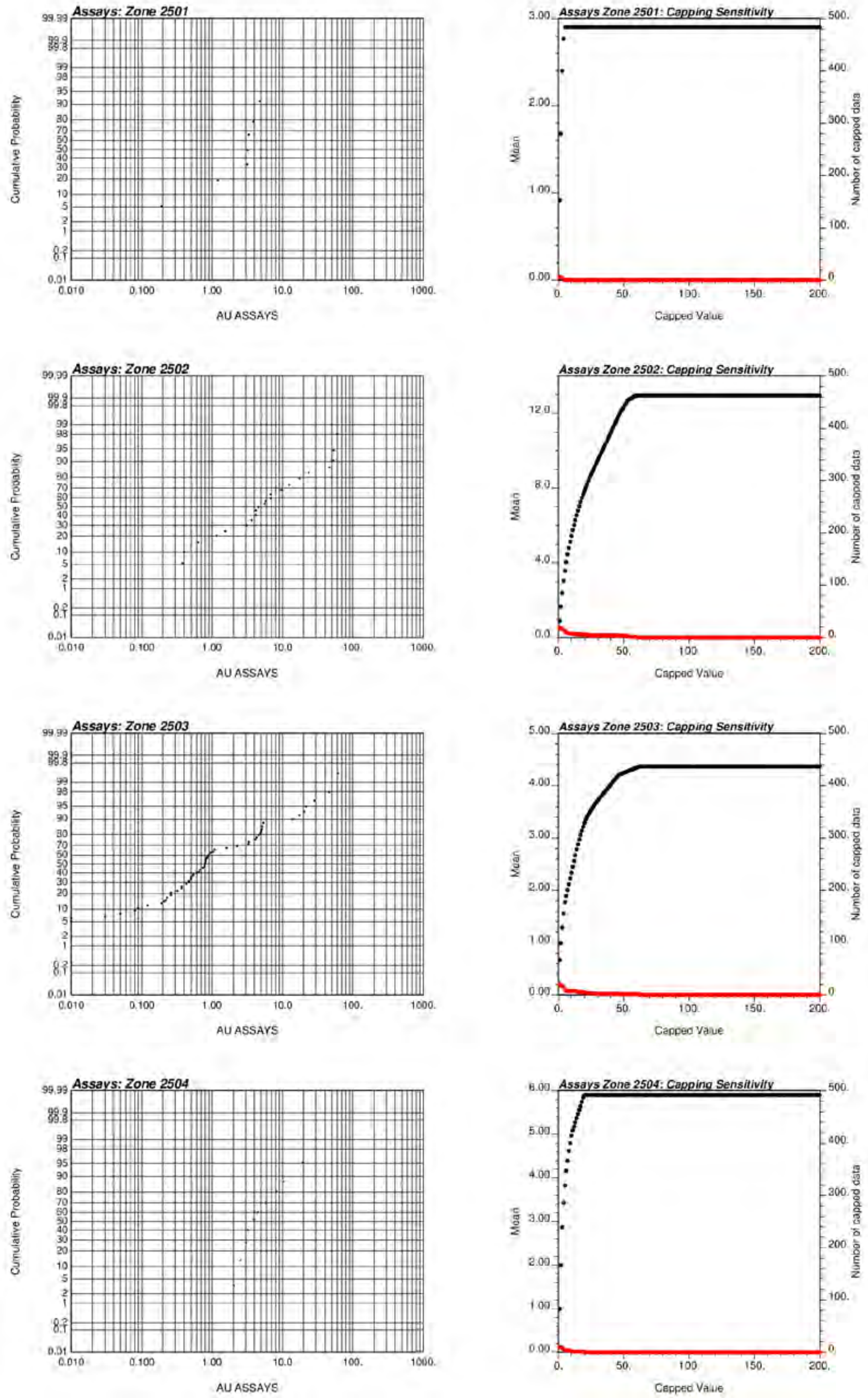
Rubicon: HG Assays Capping



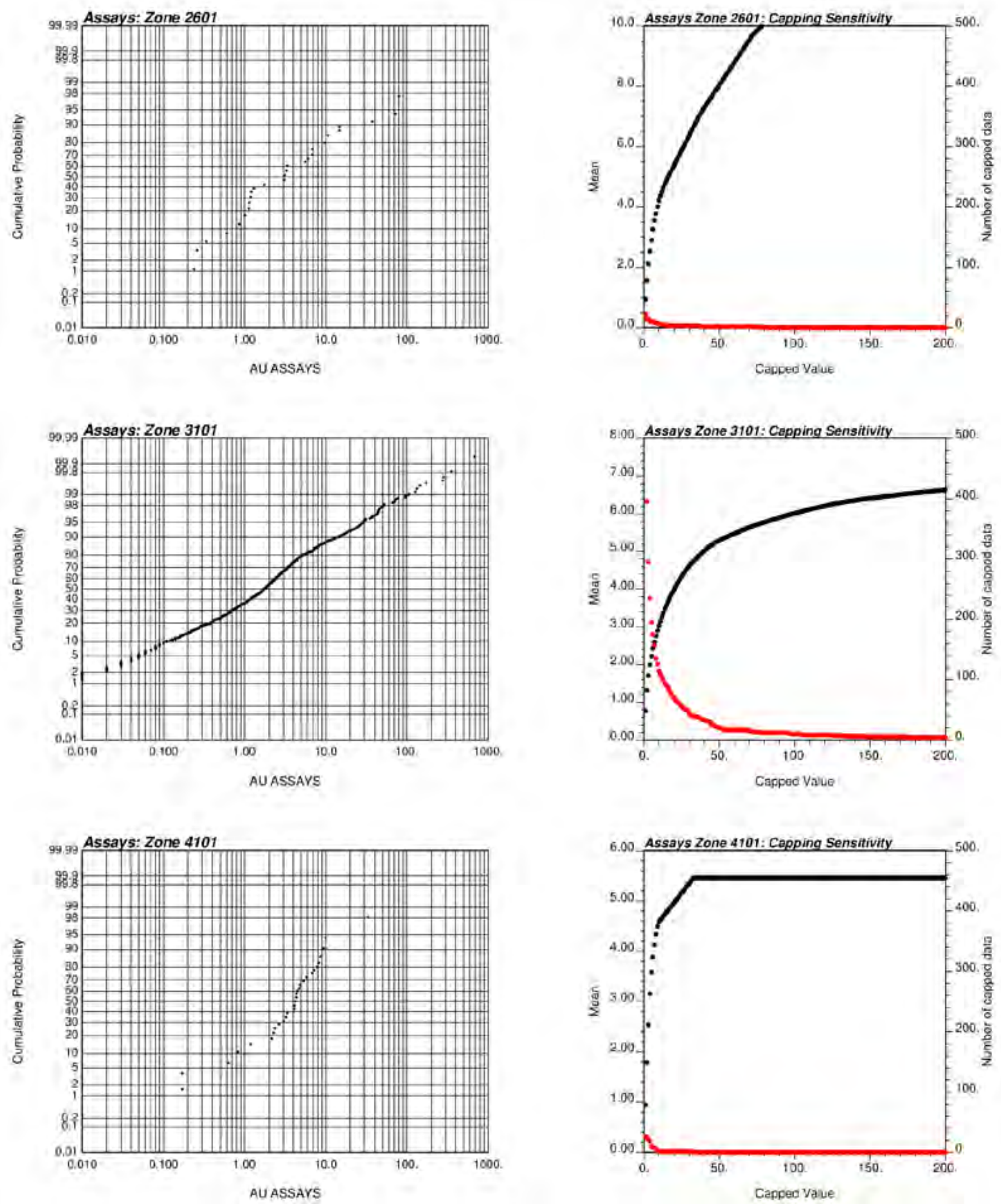
Rubicon: HG Assays Capping



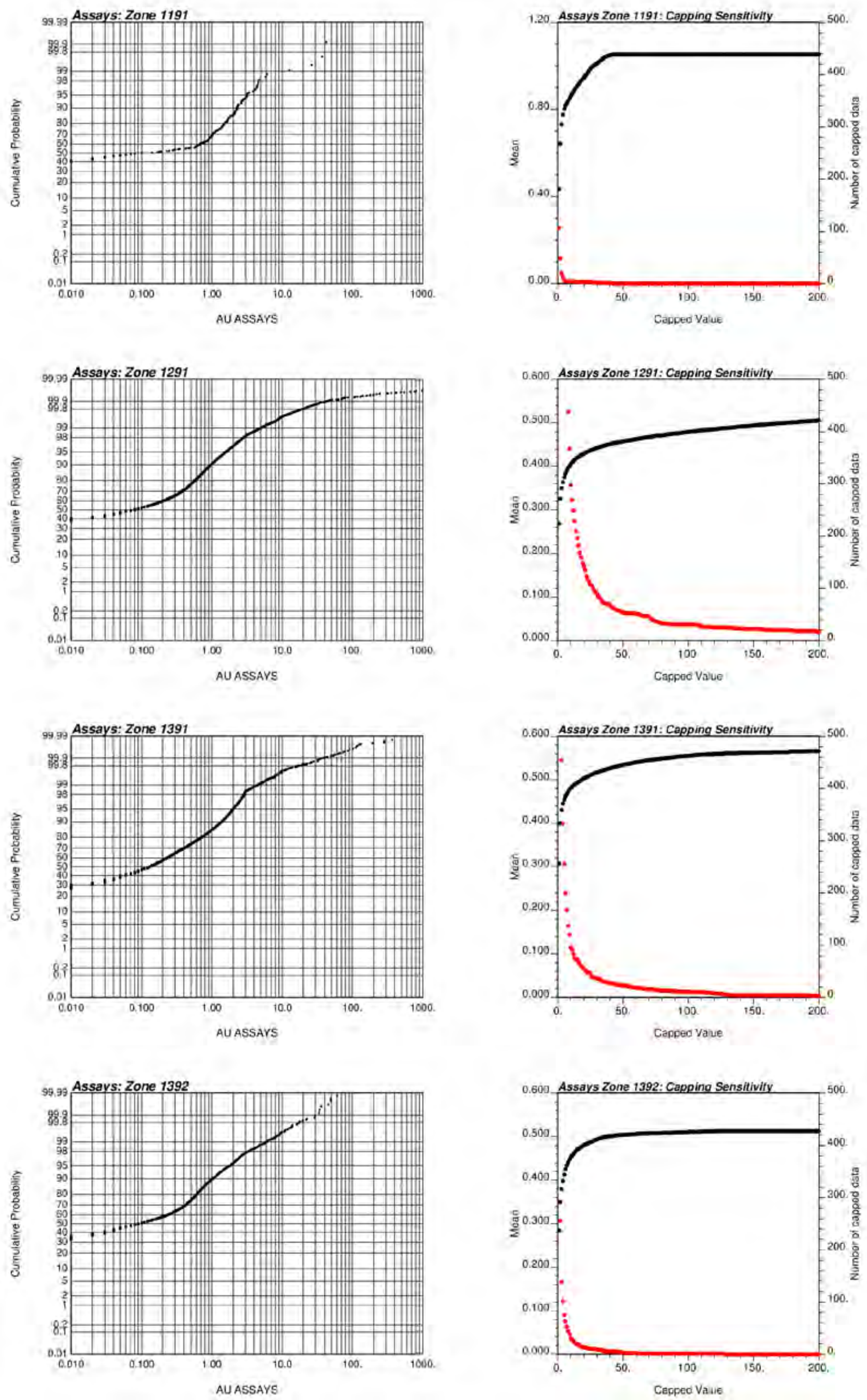
Rubicon: HG Assays Capping



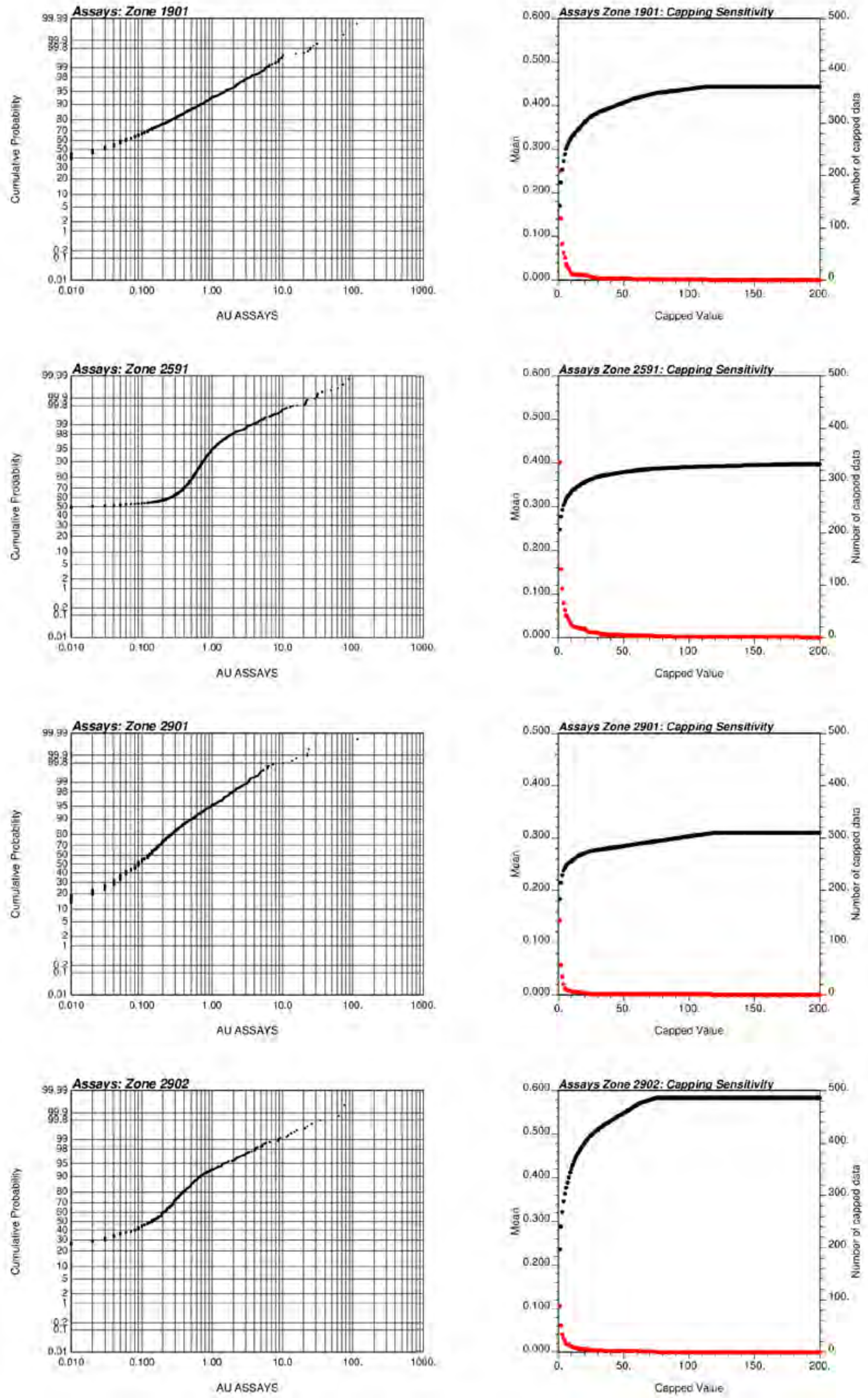
Rubicon: HG Assays Capping



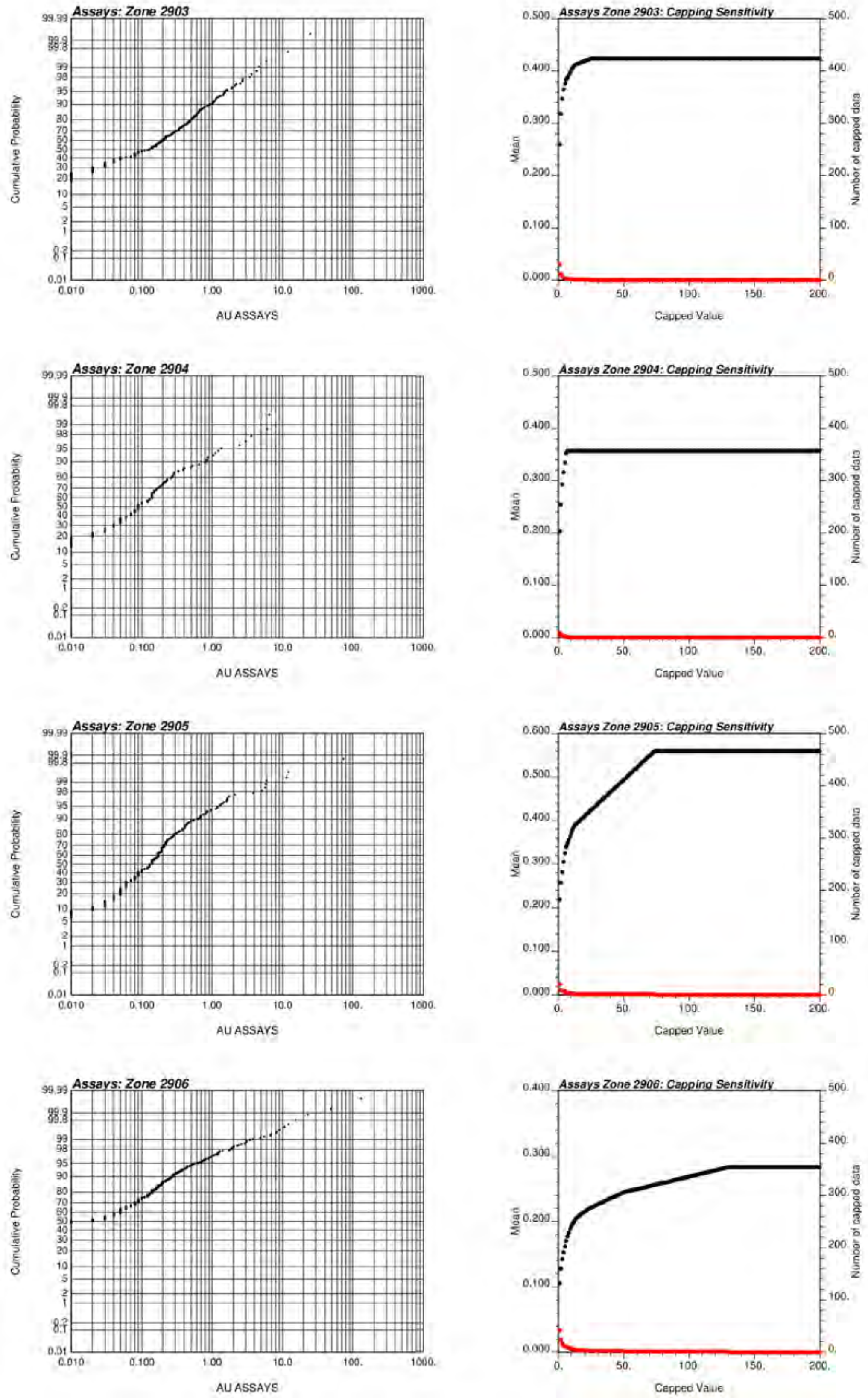
Rubicon: LG Assays Capping



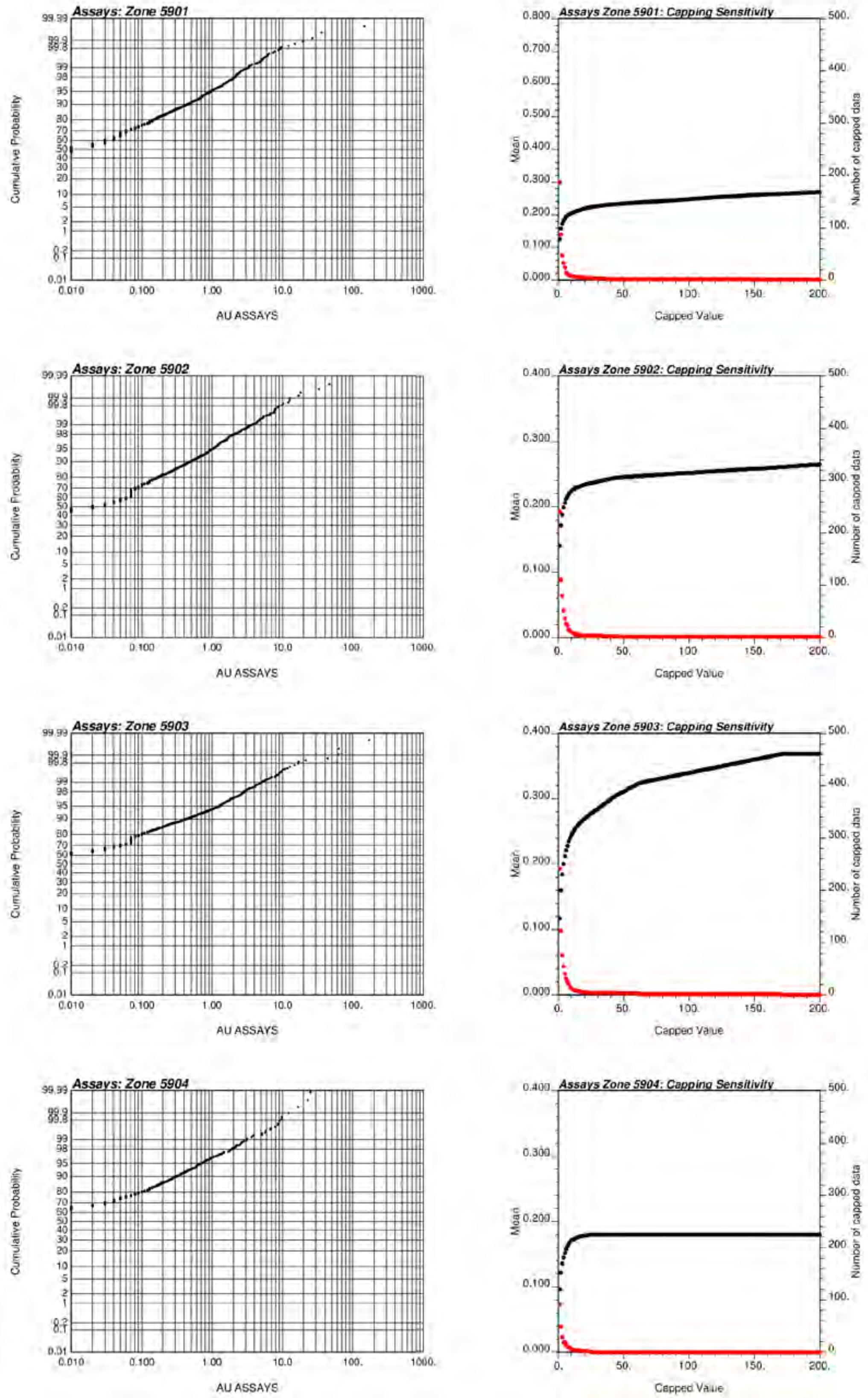
Rubicon: LG Assays Capping



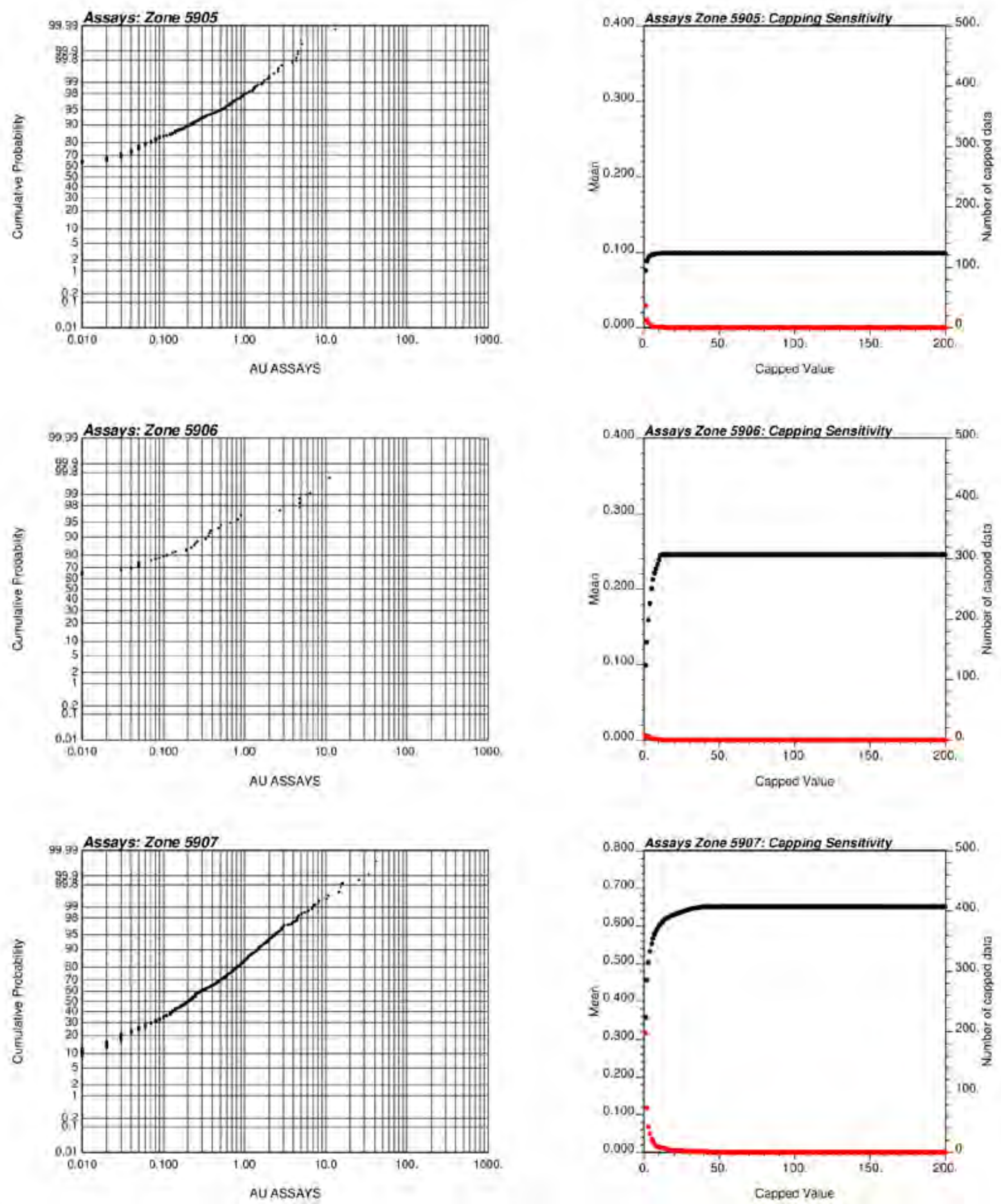
Rubicon: LG Assays Capping



Rubicon: LG Assays Capping



Rubicon: LG Assays Capping

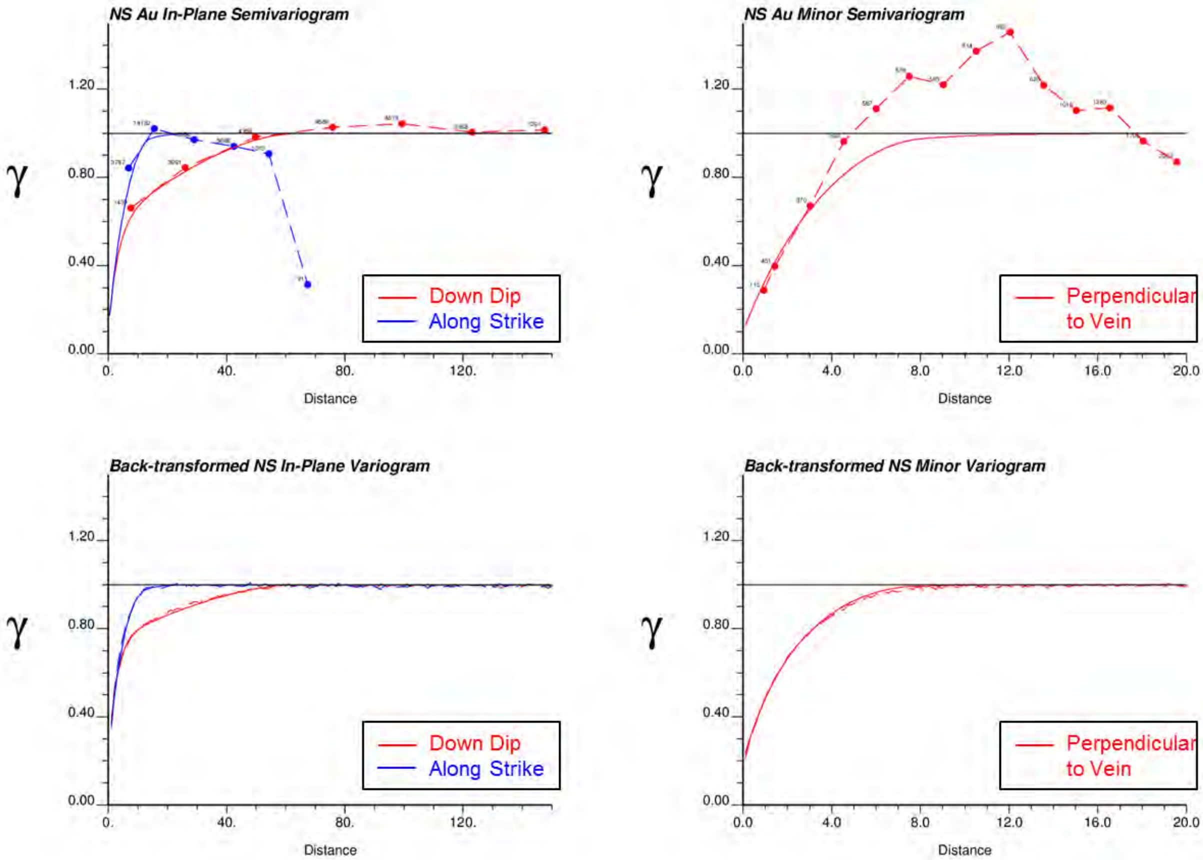


APPENDIX D

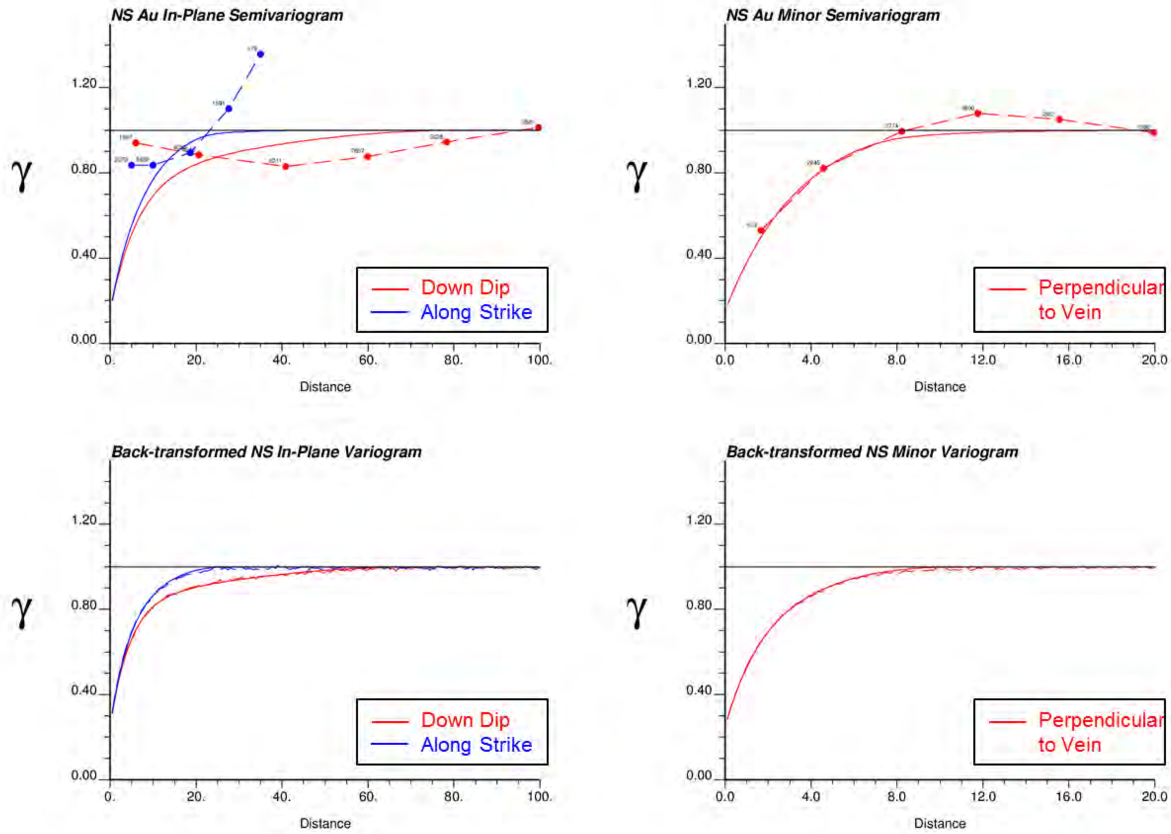
Variograms

List of Variogram Models used by Individual HG domains

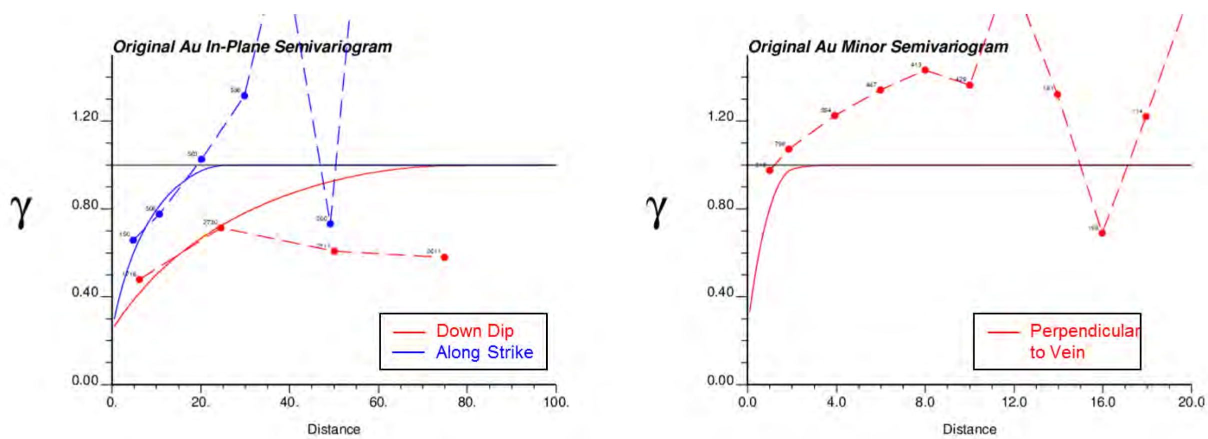
HG Domains	Variogram Model to Use	HG Domains	Variogram Model to Use	HG Domains	Variogram Model to Use
1100s		**1300s cont'd**		**1300s cont'd**	
1101	Group 8	1318	Group 2	1345	Group 5
1102	Group 8	1319	Group 2	1346	Group 9
1200s		1320	Group 2	1347	Group 8
1201	Group 8	1321	Group 3	1348	Group 1
1202	Group 8	1322	Group 1	**2100s**	
1203	Group 8	1323	Group 1	2101	Group 4
1204	Group 8	1324	Group 2	2102	Group 4
1205	Group 8	1325	Group 2	2103	Group 8
1206	Group 5	1326	Group 1	2104	Group 4
1300s		1327	Group 1	**2200s**	
1301	Group 3	1328	Group 1	2201	Group 8
1302	Group 3	1329	Group 1	2202	Group 8
1303	Group 3	1330	Group 1	2203	Group 8
1304	Group 3	1331	Group 1	**2300s**	
1305	Group 2	1332	Group 9	2301	Group 1
1306	Group 1	1333	Group 9	**2500s**	
1307	Group 1	1334	Group 9	2501	Group 8
1308	Group 1	1335	Group 9	2502	Group 8
1309	Group 1	1336	Group 9	2503	Group 2
1310	Group 1	1337	Group 8	2504	Group 8
1311	Group 1	1338	Group 8	**2600s**	
1312	Group 1	1339	Group 8	2601	Group 4
1313	Group 2	1340	Group 8	**3100s**	
1314	Group 2	1341	Group 8	3101	3101
1315	Group 2	1342	Group 8	**4100s**	
1316	Group 2	1343	Group 5	4101	Group 1
1317	Group 2	1344	Group 5		



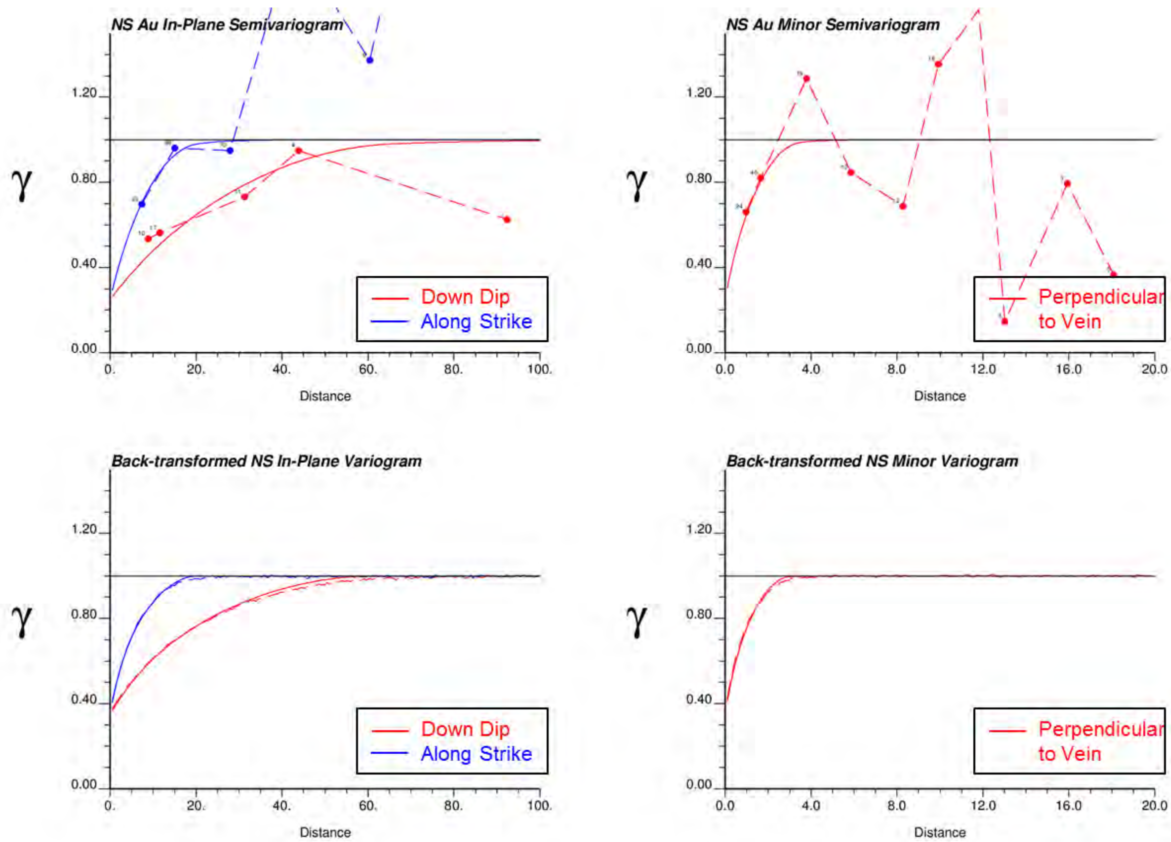
HG Group 1 Back-Transformed Variogram Model for Gold



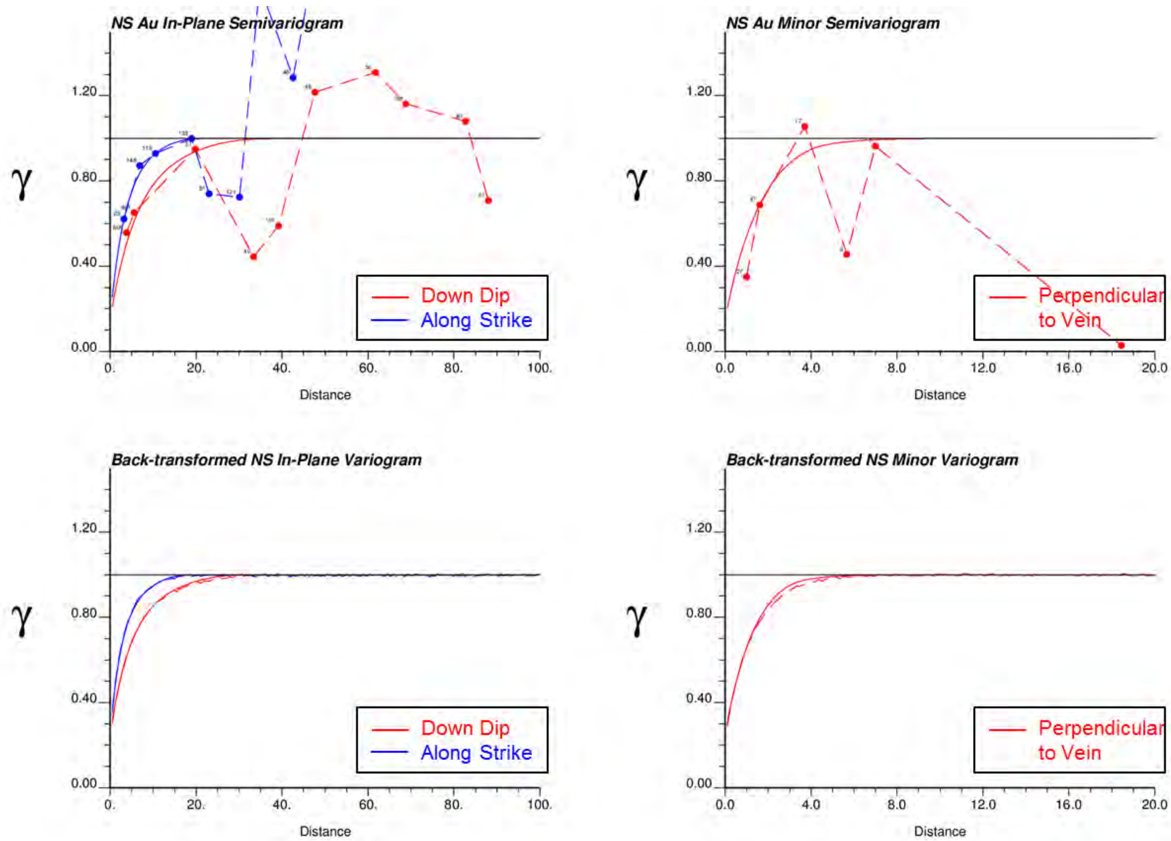
HG Group 2 Back-Transformed Variogram Model for Gold



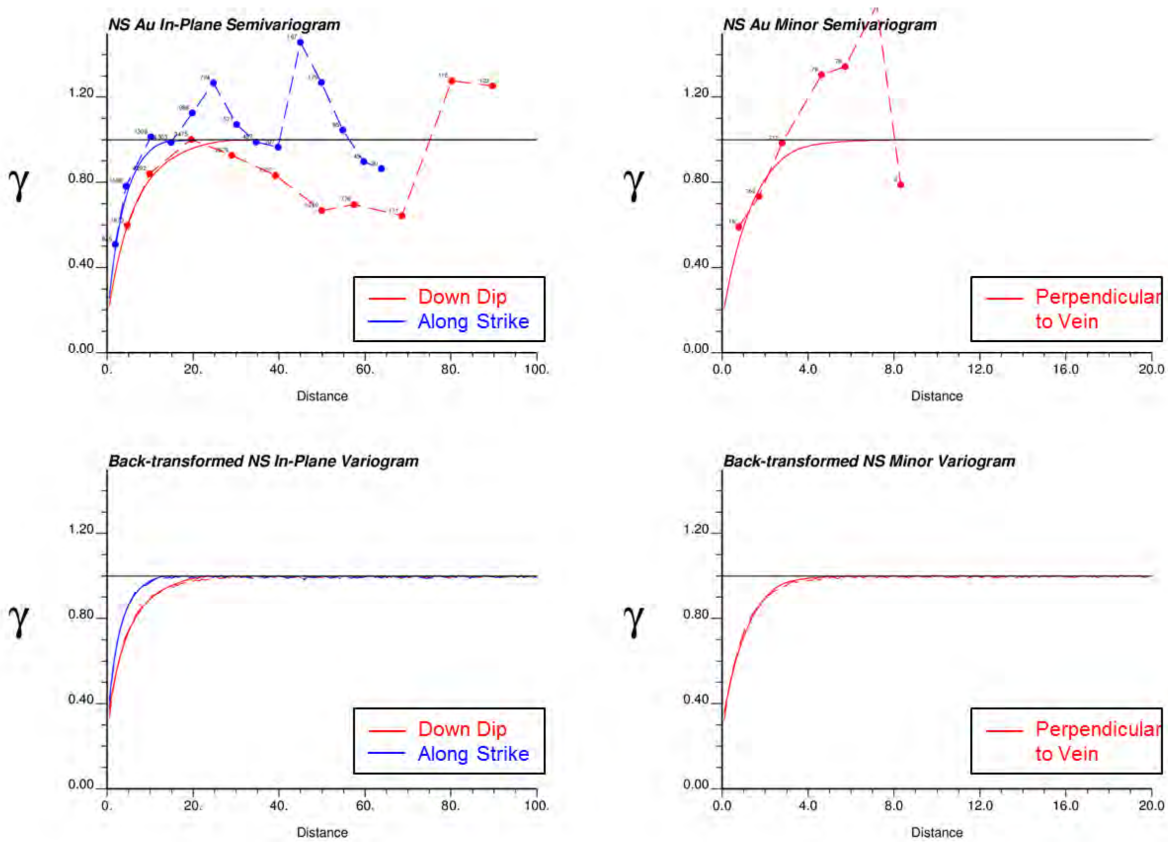
HG Group 3 Traditional Variogram Model for Gold



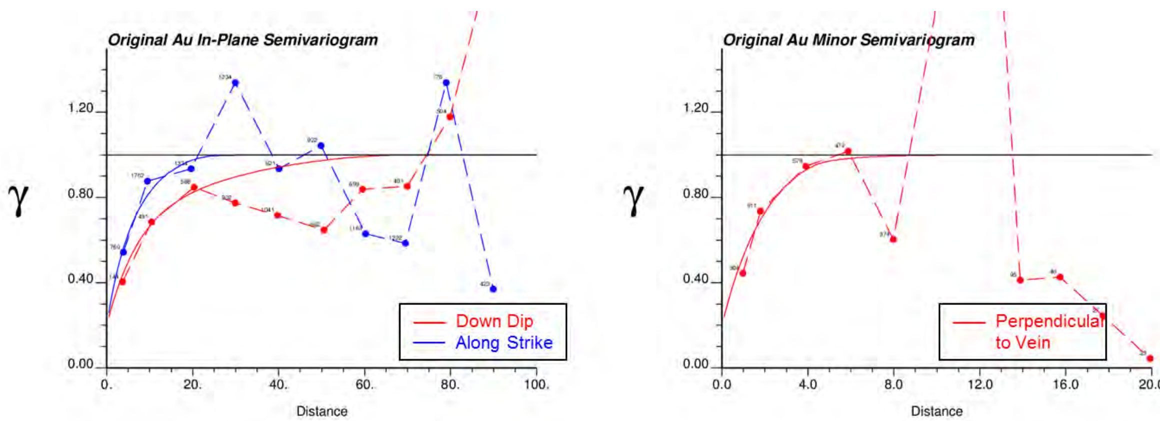
HG Group 4 Back-Transformed Variogram Model for Gold



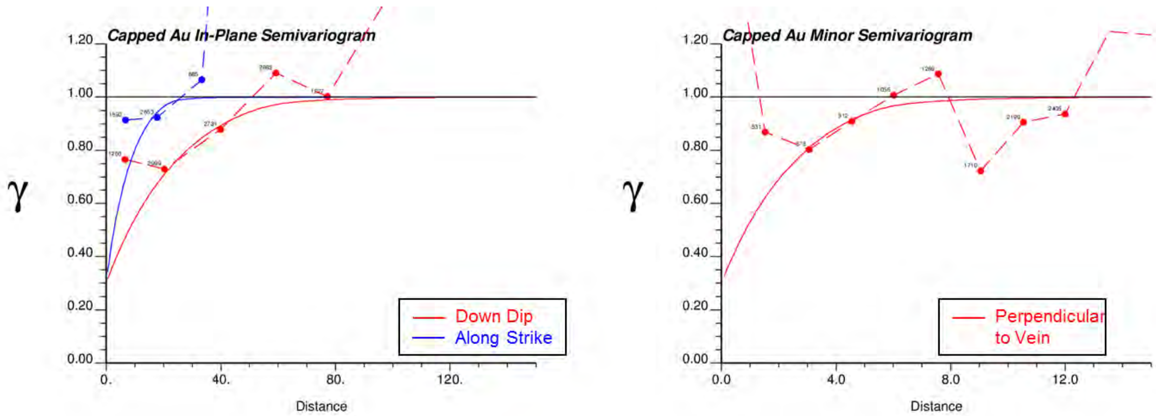
HG 1343 Domain (used for Group 5) Back-Transformed Variogram Model for Gold



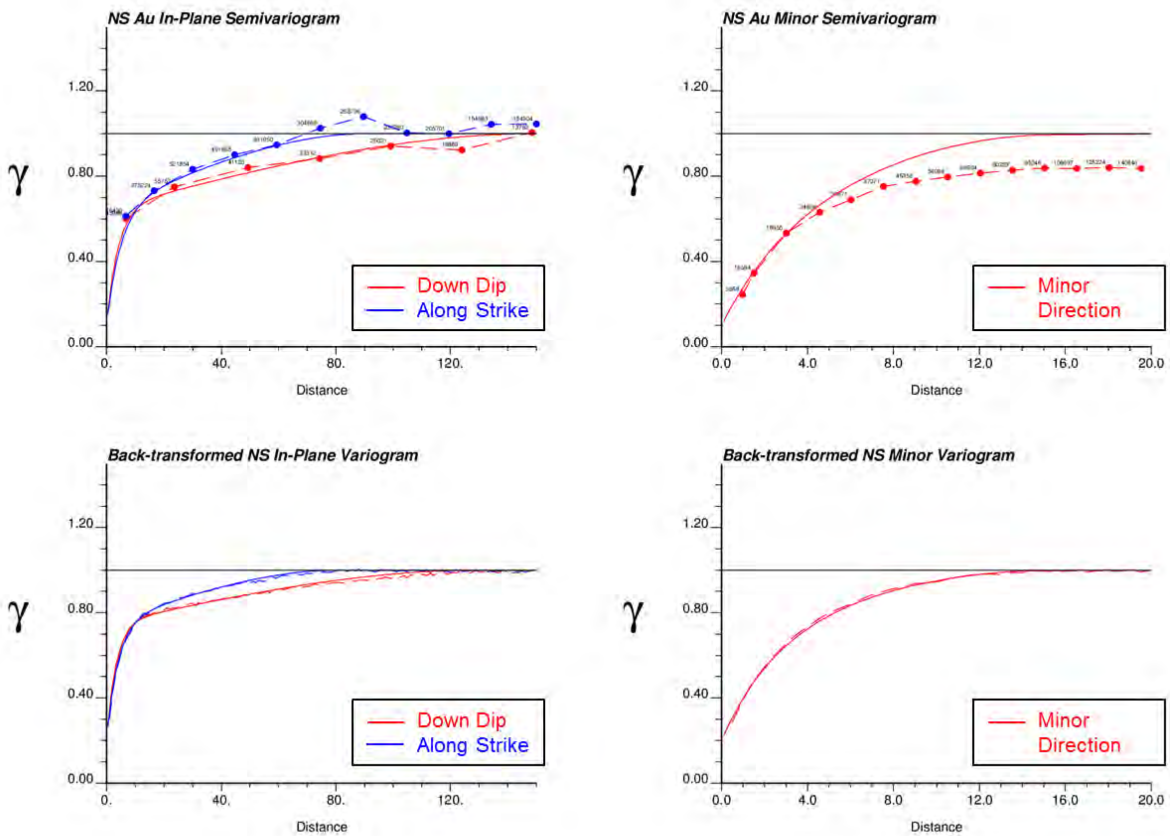
HG 3101 Domain Back-Transformed Variogram Model for Gold



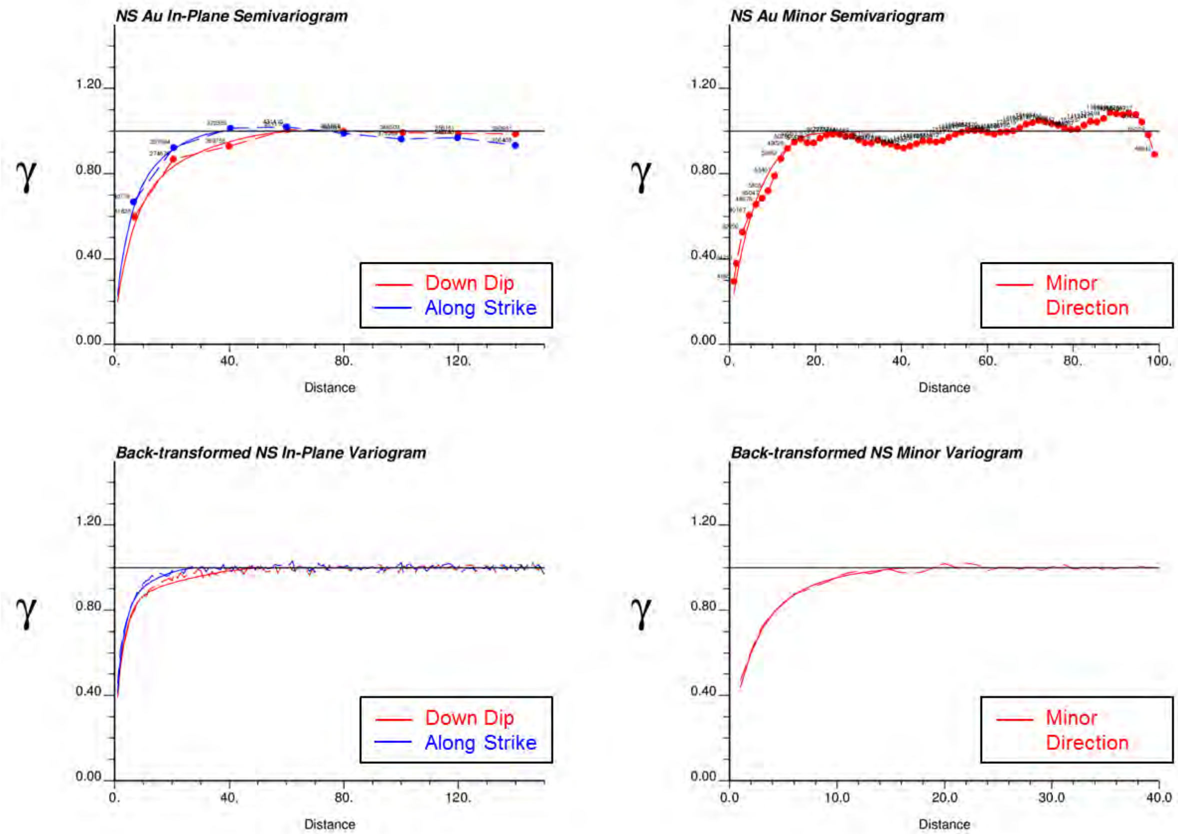
HG Group 8 Traditional Variogram Model for Gold



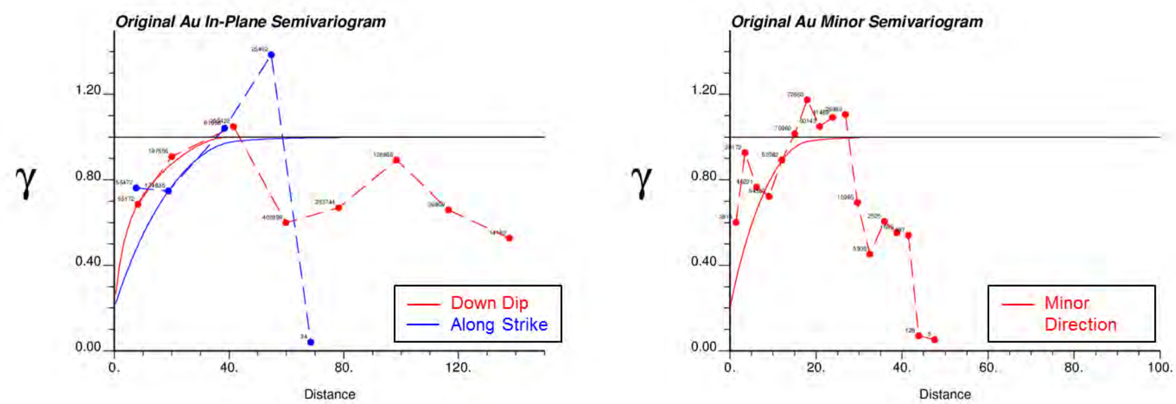
HG Group 9 Traditional Variogram Model for Gold



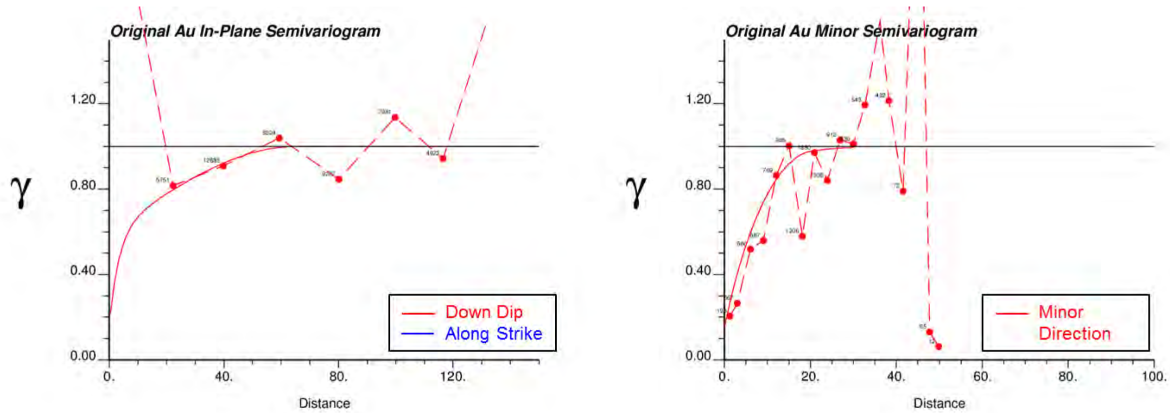
LG Group 1 Back-Transformed Variogram Model for Gold



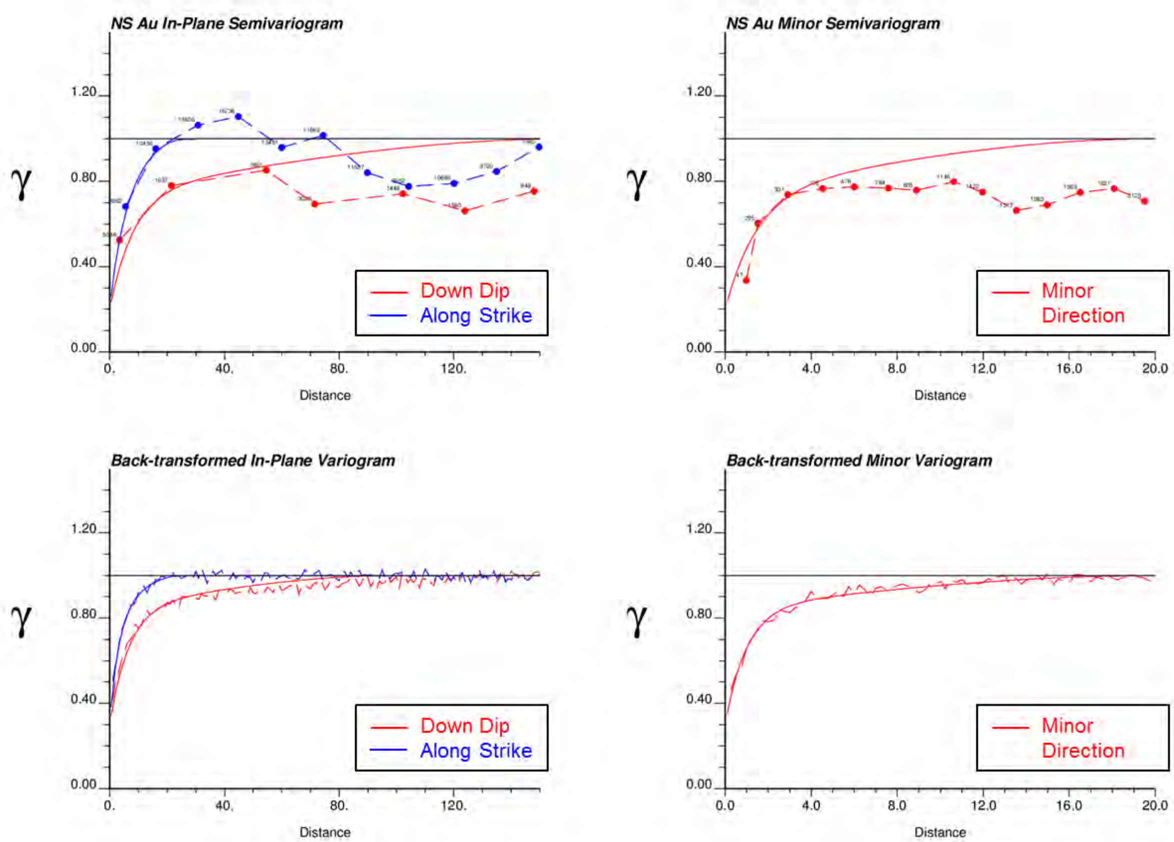
LG Group 2 Back-Transformed Variogram Model for Gold



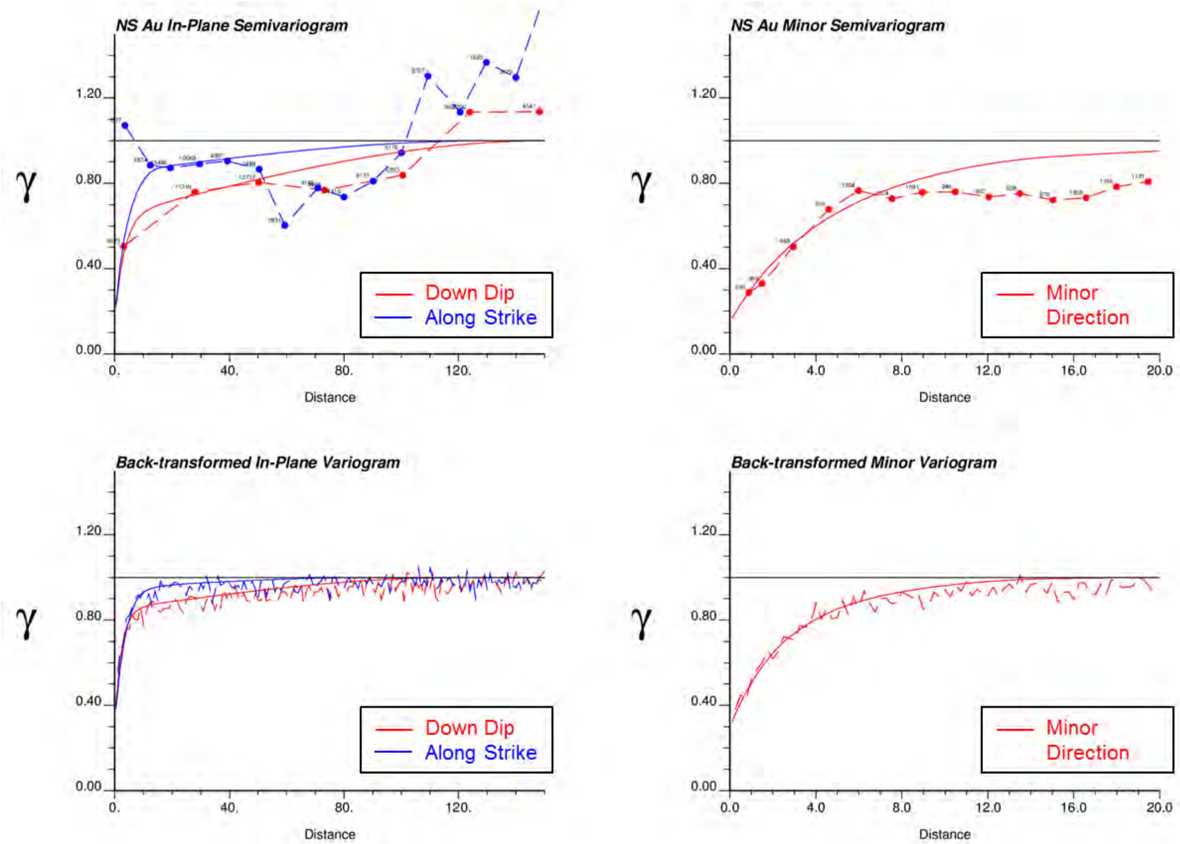
LG Group 3 Back-Transformed Variogram Model for Gold



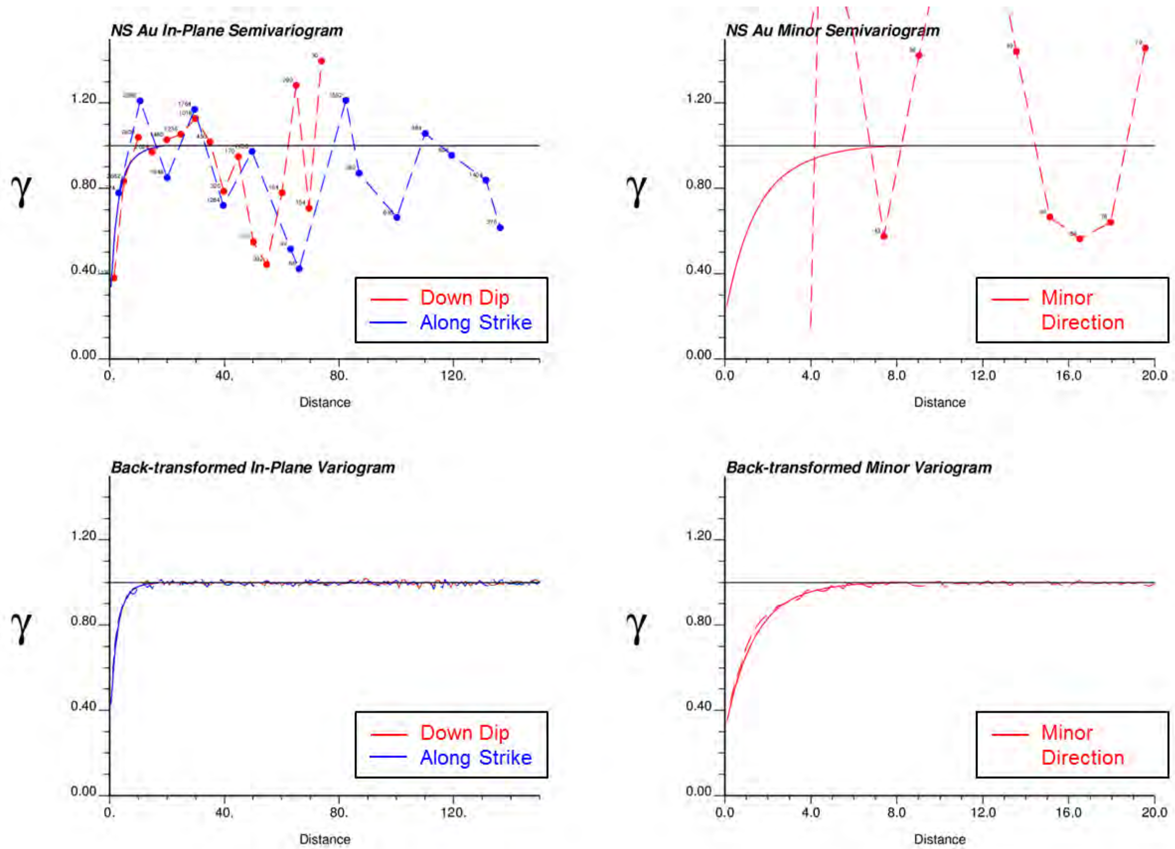
LG Group 4 Back-Transformed Variogram Model for Gold



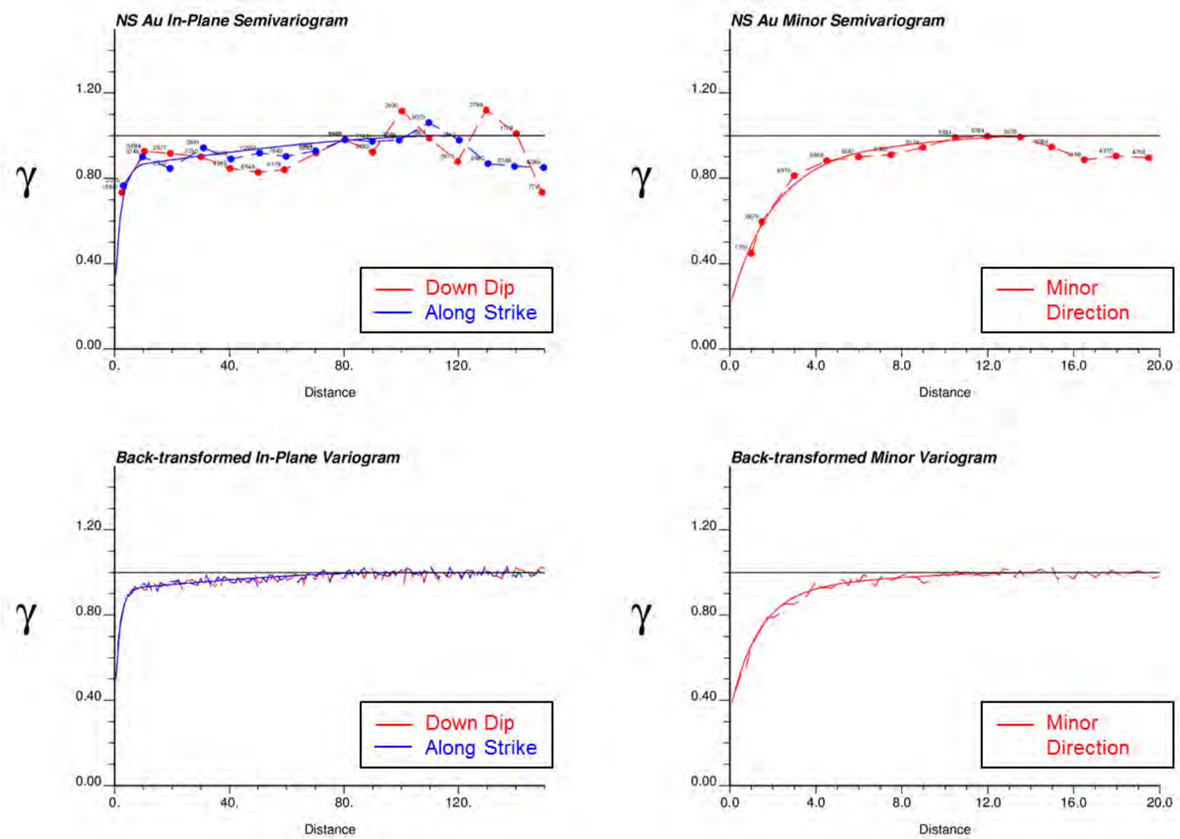
LG Group 5 Back-Transformed Variogram Model for Gold



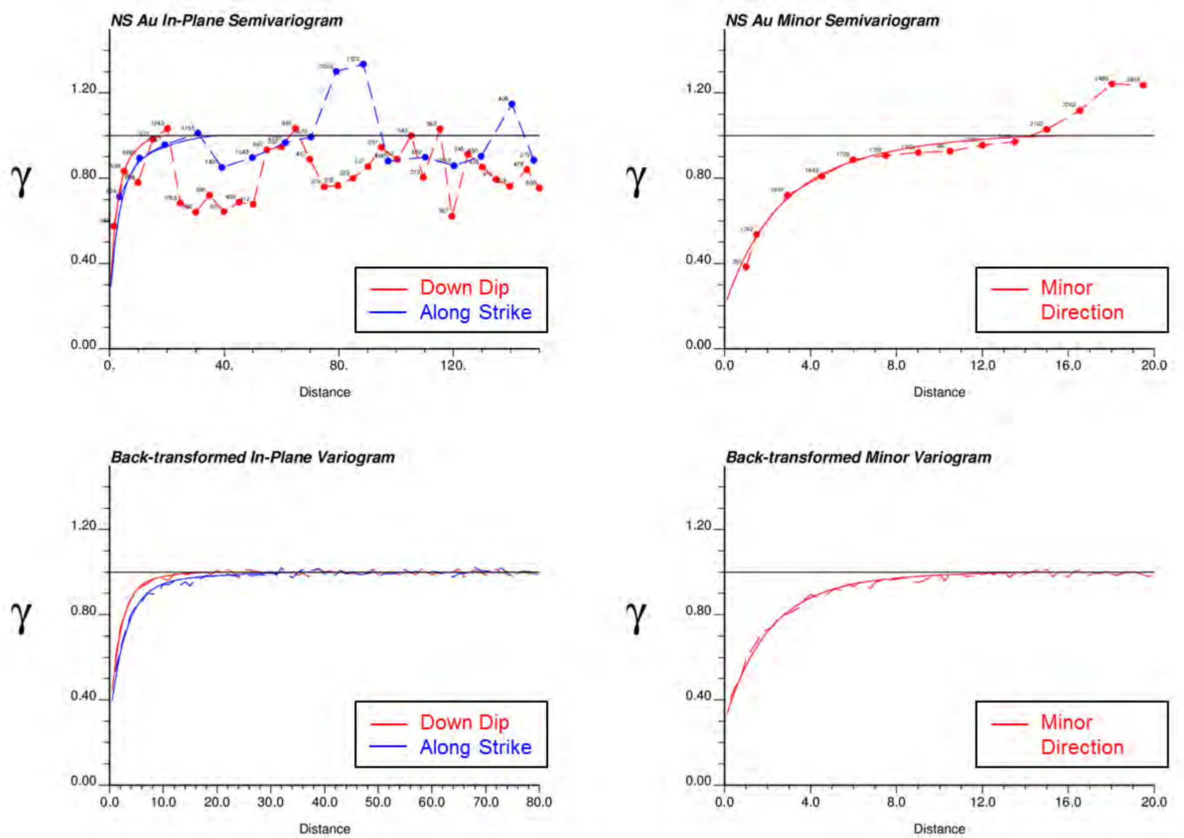
LG Group 6 Back-Transformed Variogram Model for Gold



LG Group 7 Back-Transformed Variogram Model for Gold



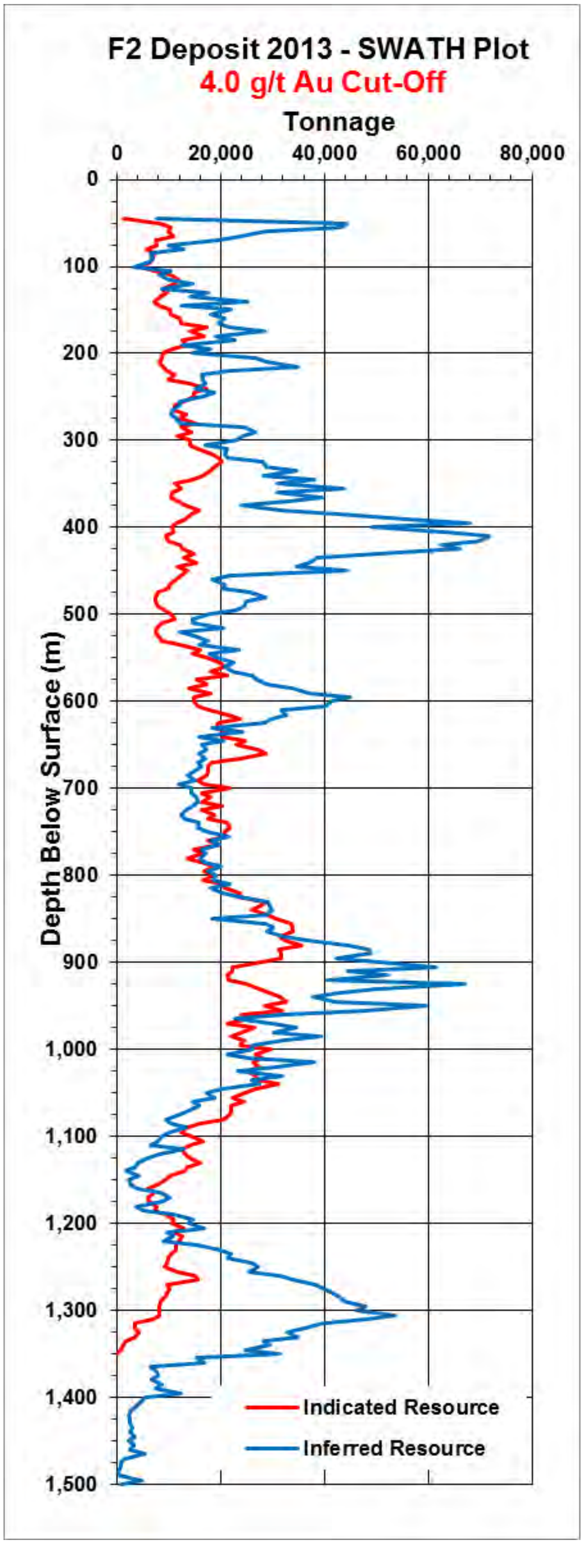
LG Group 8 Back-Transformed Variogram Model for Gold

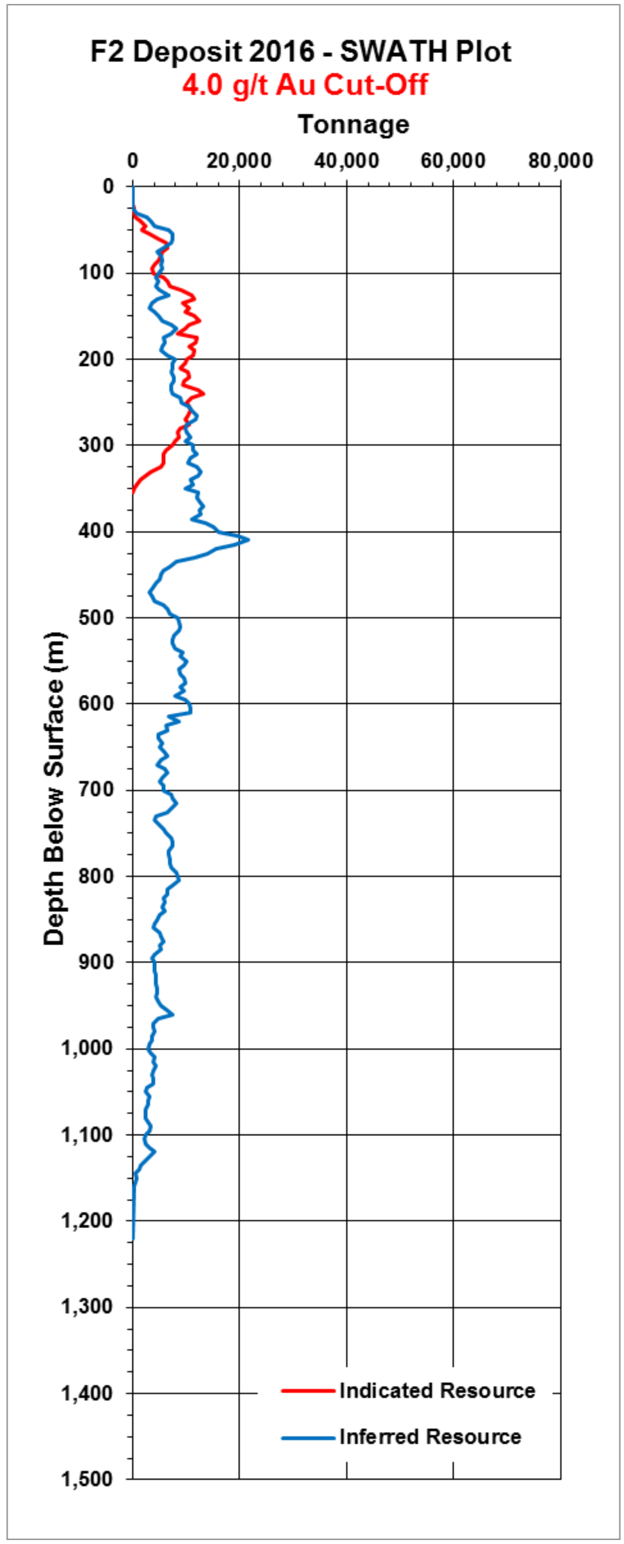


LG Group 9 Back-Transformed Variogram Model for Gold

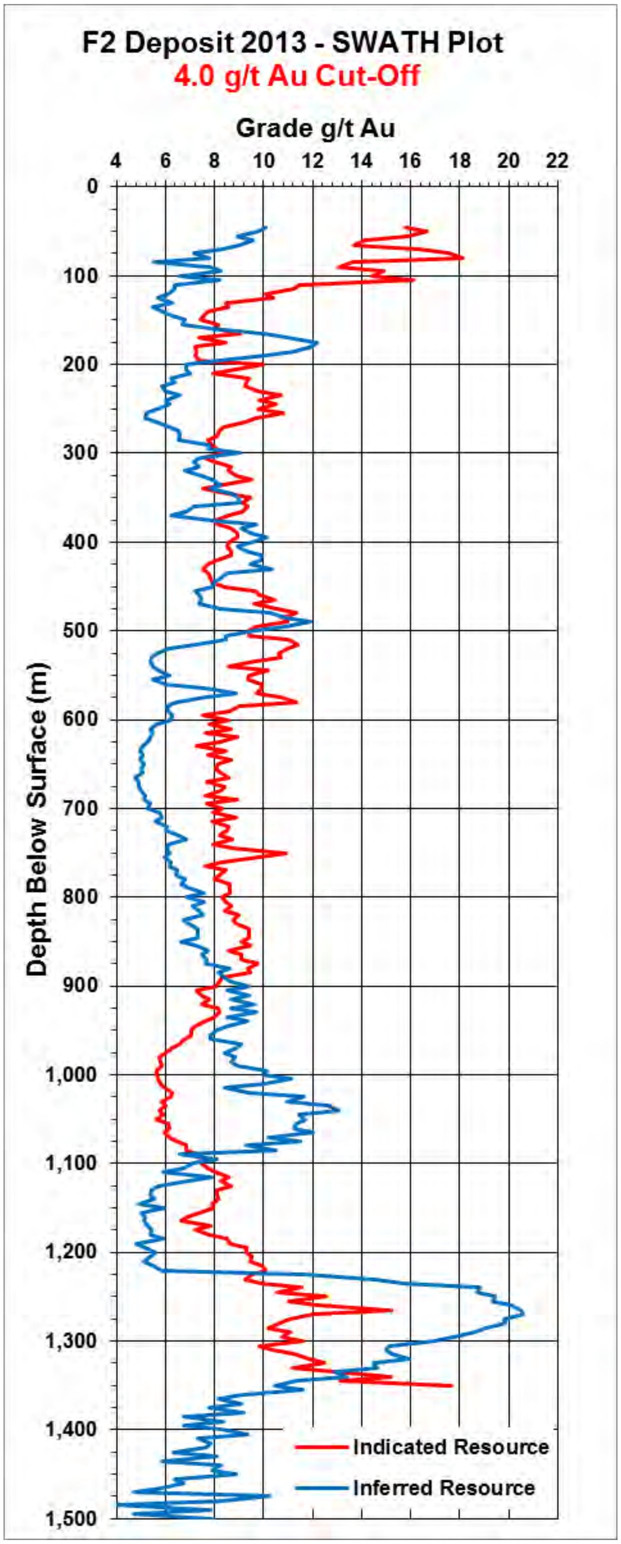
APPENDIX E

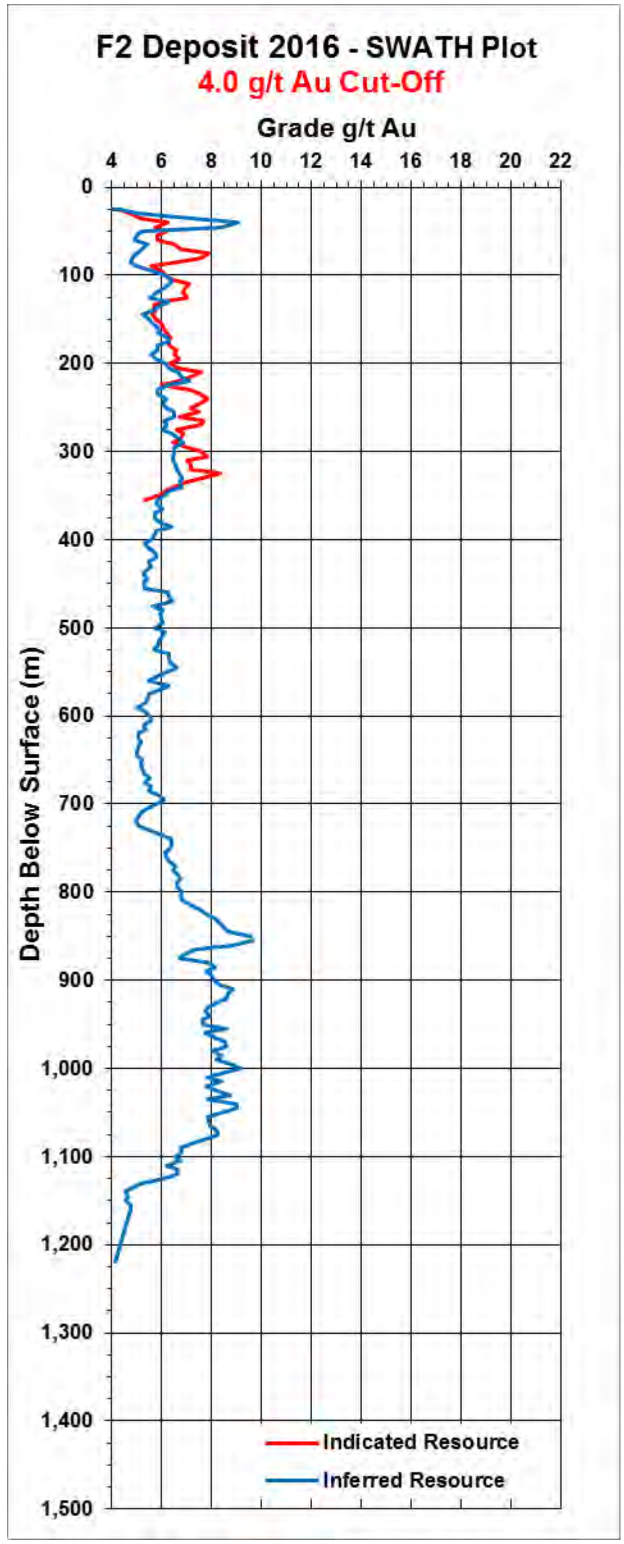
Comparative 2013 versus 2016 Mineral Resource Model Swath Plots



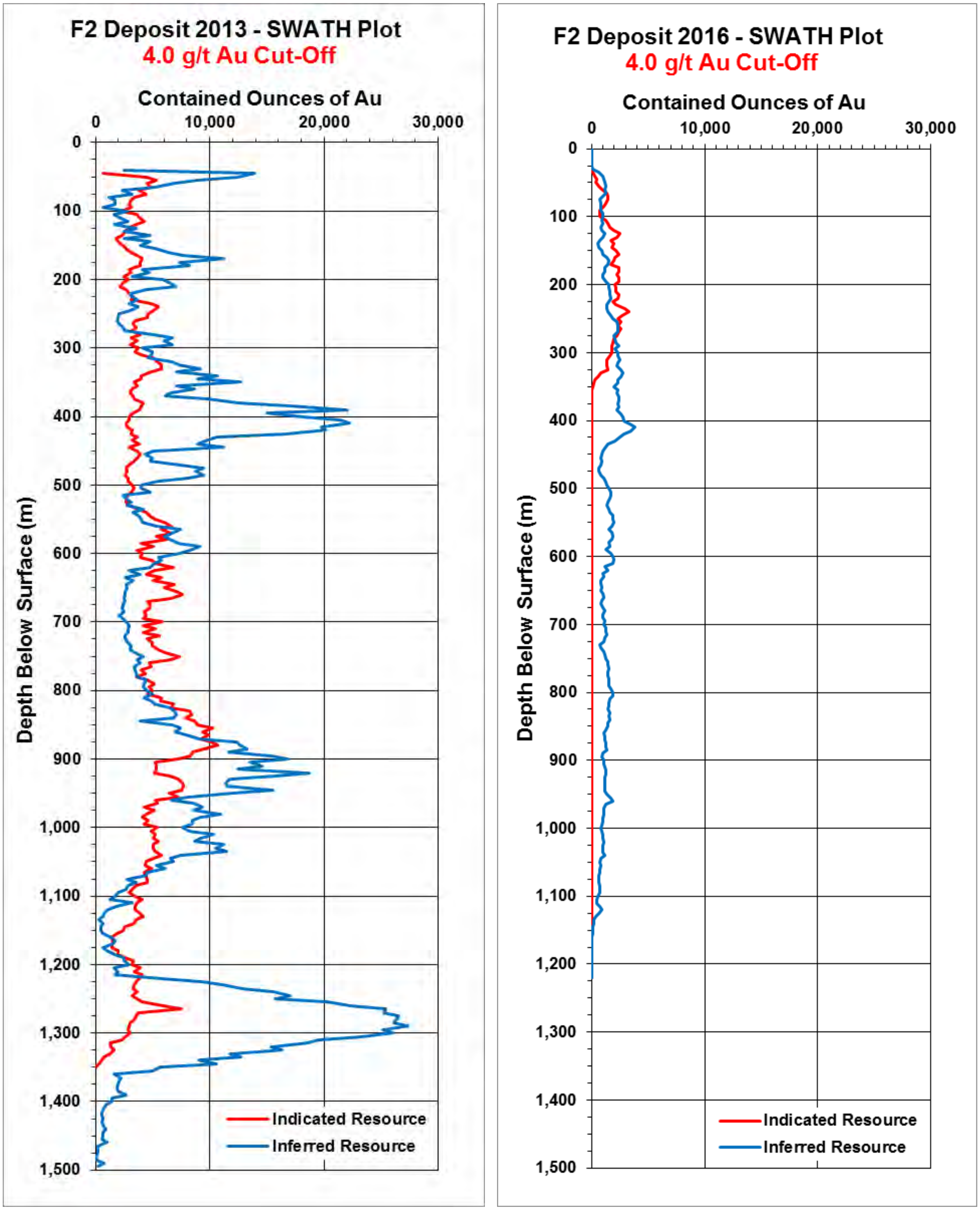


Comparative 2013 versus 2016 Mineral Resource Model Swath Plots – Tonnage





Comparative 2013 versus 2016 Mineral Resource Model Swath Plots – Gold Grade



Comparative 2013 versus 2016 Mineral Resource Model Swath Plots – Contained Metal (Gold Ounces)

CERTIFICATE OF QUALIFIED PERSON

To accompany the report entitled: "Technical Report for the Phoenix Gold Project, Red Lake, Ontario" dated February 25, 2016.

I, Sébastien B. Bernier, do hereby certify that:

1) I am a Principal Consultant (Resource Geology) with the firm of SRK Consulting (Canada) Inc. (SRK) with an office at Suite 101, 1984 Regent Street South, Sudbury, Ontario, Canada;
2) I am a graduate of the University of Ottawa in 2001 with B.Sc. (Honours) Geology and I obtained M.Sc. Geology from Laurentian University in 2003. I have practiced my profession continuously since 2002. I worked in exploration and commercial production of base and precious metals mainly in Canada. I have been focussing my career on geostatistical studies, geological modelling and resource modelling of base and precious metals since 2004;
3) I am a professional Geoscientist registered with the Association of Professional Geoscientists of Ontario (# 1847);
4) I have personally inspected the Phoenix gold project between October 26 to 28, 2015.
5) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1;
6) I, as a Qualified Person, am independent of the issuer as defined in Section 1.5 of National Instrument 43-101;
7) I am the co- author of this report and responsible for sections 1 to 5, 8 to 11, 13, 22 to 25 and Appendix A to E of this technical report and accept professional responsibility for those sections of this technical report;
8) I have had prior involvement with the subject property having contributed to a mineral resource model and conceptual mining study in 2013;
9) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith;
10) SRK Consulting (Canada) Inc. was retained by Rubicon Mineral Corporation to prepare a new geology and mineral resource model to account for the substantial additional sampling information. This supporting technical report was completed using CIM "*Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines*" and Canadian Securities Administrators National Instrument 43-101 guidelines. The preceding report is based on a site visit, a review of project files and discussions with Rubicon Minerals Corporation personnel;
11) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the Phoenix project or securities of Rubicon Minerals Corporation; and
12) That, as of the date of this certificate, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

["signed and sealed"]

Sudbury, Ontario — Sébastien B. Bernier, PGeo (APGO#1847)
February 25, 2016 — Principal Consultant (Resource Geology)

CERTIFICATE OF QUALIFIED PERSON

To accompany the report entitled: “Technical Report for the Phoenix Gold Project, Red Lake, Ontario” dated February 25, 2016.

I, Glen Cole do hereby certify that:

1) I am a Principal Consultant (Resource Geology) with the firm of SRK Consulting (Canada) Inc. (SRK) with an office at Suite 1300, 151 Yonge Street, Toronto, Ontario, Canada;
2) I am a graduate of the University of Cape Town in South Africa with a B.Sc (Hons) in Geology in 1983; I obtained an M.Sc (Geology) from the University of Johannesburg in South Africa in 1995 and an M.Eng in Mineral Economics from the University of the Witwatersrand in South Africa in 1999. I have practiced my profession continuously since 1986. Between 1986 and 2005, I worked on exploration projects, underground and open pit mining operations in Africa and held positions of Mineral Resources Manager, Chief Mine Geologist and Chief Evaluation Geologist, with the responsibility for estimation of mineral resources and mineral reserves for development projects and operating mines. Since 2006, I have estimated and audited mineral resources for a variety of early and advanced international base and precious metals projects.
3) I am a Professional Geoscientist registered with the Association of Professional Geoscientists of the Province of Ontario (APGO#1416), the Association of Professional Engineers and Geoscientists of the Province of Saskatchewan (PEGS#26003) and am also registered as a Professional Natural Scientist with the South African Council for Scientific Professions (Reg#400070/02);
4) I have personally inspected the Phoenix Gold Project from August 10 to 12, 2015 and from August 31 to September 4, 2015.
5) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1;
6) I, as a Qualified Person, am independent of the issuer as defined in Section 1.5 of National Instrument 43-101;
7) I am the co- author of this report and responsible for sections 1 to 5, 8 to 11, 13, 22 to 25 and Appendix A to E of this technical report and accept professional responsibility for those sections of this technical report;
8) I have had prior involvement with the subject property having contributed to a mineral resource model and conceptual mining study in 2013.
9) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith;
10) SRK Consulting (Canada) Inc. was retained by Rubicon Minerals Corporation to prepare a technical audit of the Phoenix gold project. In conducting our audit, a gap analysis of project technical data was completed using CIM “*Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines*” and Canadian Securities Administrators National Instrument 43-101 guidelines. The preceding report is based on a site visit, a review of project files and discussions with Rubicon Minerals Corporation personnel;
11) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the Phoenix gold project or securities of Rubicon Minerals Corporation; and
12) That, as of the date of this certificate, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

["signed and sealed"]

Toronto, Ontario — Glen Cole, P.Geo (APGO#1416)
February 25, 2016 — Principal Consultant (Resource Geology)

CERTIFICATE OF QUALIFIED PERSON

To accompany the report entitled: "Technical Report for the Phoenix Gold Project, Red Lake, Ontario" dated February 25, 2016.

I, Jean-Francois Ravenelle, PhD, PGeo, do hereby certify that:

1) I am a Senior Consultant (Structural Geology) with the firm of SRK Consulting (Canada) Inc. (SRK) with an office at Suite 1300 - 151 Yonge Street, Toronto, Ontario, Canada;
2) I am a graduate of McGill University with a BSc. in Geology obtained in 2002. I obtained a MSc. in Earth Sciences from McGill University in 2005 and a Ph.D in economic geology from Institut National de la Recherche Scientifique in 2013. My relevant experience includes over 14 years of experience in geological mapping and structural analysis of precious metal deposits hosted in various parts of the world including Canada, the United States, Central America, South America, West Africa, and Central Africa;
3) I am a Professional Geoscientist registered with the Association of Professional Geoscientists of the province of Ontario (APGO#2159) and l'Ordre des Géologues du Québec (OGQ#1062);
4) I have personally inspected the Phoenix gold project in 2011 and again from October 26 to 28, 2015 and from November 9 to 14, 2015.
5) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1;
6) I, as a Qualified Person, am independent of the issuer as defined in Section 1.5 of National Instrument 43-101;
7) I am the co-author of this report and responsible for Sections 6, 7 , and 13.2 of this technical report and accept professional responsibility for those sections of this technical report;
8) I have had prior involvement with the subject property having contributed to a mineral resource model and conceptual mining study in 2013.
9) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith;
10) SRK Consulting (Canada) Inc. was retained by Rubicon Minerals Corporation to prepare a technical audit of the Phoenix gold project. In conducting our audit, a gap analysis of project technical data was completed using CIM "*Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines*" and Canadian Securities Administrators National Instrument 43-101 guidelines. The preceding report is based on a site visit, a review of project files and discussions with Rubicon Minerals Corporation personnel;
11) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the Phoenix project or securities of Rubicon Minerals Corporation; and
12) That, as of the date of this certificate, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

[<u>"signed and sealed</u>"]

Toronto, Ontario | Jean-Francois Ravenelle, PhD, PGeo
February 25, 2016 | Senior Consultant (Structural Geology)

CERTIFICATE OF QUALIFIED PERSON

To accompany the report entitled: "Technical Report for the Phoenix Gold Project, Red Lake, Ontario" dated February 25, 2016.

I, Michael O'Flaherty do hereby certify that:

1) I am an independent consultant located at 621 Beach Road, Keewatin, Ontario.
2) I graduated from University of Manitoba with a Bachelor of Science, Geological Engineering.
3) I am a member in good standing of Professional Engineers Ontario, #90261934 and of Ontario Society of Professional Engineers, #11385725.
4) I have worked in the Mining Industry as an Engineer for 20 of the last 28 years.
5) I have been on the Rubicon Minerals, Phoenix property 66 days between September 14, 2015 and January 31, 2016, and am familiar with all relevant material in the sections listed in item 6.
6) I am responsible for the preparation of sections; 4.2 Local Resources and Infrastructures; 15. Mining Methods; 17. Project Infrastructure, and I am qualified person for sections 14. Mineral Reserve Estimates, 20. Capital and Operating Costs and 21. Economic Analysis of the report entitled "Technical Report for the Phoenix Gold Project, Red Lake, Ontario" dated February 25, 2016.
7) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1.
8) I am not aware of any material fact or material change with respect to the subject matter of the sections listed in item 7 that is not reflected in the said sections of the Technical Report, the omission to disclose which make the Technical Report misleading.
9) I have been retained by Rubicon Minerals Corporation to prepare this technical report, and assist in managing the Phoenix Project property.
10) I have not received, nor do I expect to receive any interest, directly or indirectly, in the Phoenix gold project or securities of Rubicon Minerals Corporation.

["signed and sealed"]

Red Lake, Ontario — Michael O'Flaherty P.Eng. (PEO#90261934)
February 25, 2016 — Engineering Consultant

CERTIFICATE OF QUALIFIED PERSON

To accompany the report entitled: "Technical Report for the Phoenix Gold Project, Red Lake, Ontario" dated February 25, 2016.

I, John William Frostiak do hereby certify that :

1) I am an independent Professional Engineer resident at: 56 McManus St., Balmertown, Ontario, Canada, P0V1C0.

2) I graduated with a Bachelor of Science in Mining Engineering (Mineral Processing) from Queen's University (Kingston, Ontario) in 1973.

3) I am a member of the Professional engineers of Ontario (PEO No. 15150014), the Ontario Society of Professional Engineers (OSPE No. 11389251), the Society for Mining, Metallurgy & Exploration (SME Member ID 4019986), and a life member of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM No. 92165).

4) I have worked as an engineer for a total of forty (40) years since graduating from university. During that time I gained operational management and project and study management experience in Canada, the USA, Australia, Chile, Peru, Tanzania and South Africa.

5) I have been to the Phoenix project site and visited the mill and tailing management facility (TMF) on numerous occasions. My last visit to the mill specifically was on January 29, 2016.

6) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1.

7) I have reviewed all data provided by Rubicon Minerals Inc. I am the co-author of sections 12 and 16 and the independent reviewer of section 19 of the Technical Report. I am the qualified person for sections 3.4, 10.3, 12, 16, 18, 19 and 25.

8) I have been retained by Rubicon Minerals Corporation since October 2015 to prepare this report and to assist the project.

9) I am independent of the issuer applying all the tests in Section 1.5 of Regulation 43-101 (National Instrument 43-101).

10) I have not received, nor do I expect to receive any interest, directly or indirectly, in the Phoenix gold project or securities of Rubicon Minerals Corporation.

Balmertown, Ontario — *["signed and sealed"]*

February 25, 2016 — John William Frostiak P.Eng., (PEO No. 15150014)

Engineering Consultant