AMENDED NI 43-101
TECHNICAL REPORT ON RESOURCES
FLORIDA CANYON ZINC PROJECT
Amazonas Department, Peru

PREPARED FOR

SOLITARIO ZINC CORP

4251 Kipling Street Suite 390
Wheat Ridge, CO 80033

Report Date: April 5, 2021
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Amended May 27, 2021

PREPARED BY

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1 EXECUTIVE SUMMARY (ITEM 1)

Gustavson Associates, LLC (Gustavson) was commissioned by Solitario Zinc Corporation (Solitario) to prepare an updated Mineral Resource Estimate for the Florida Canyon project in the Amazonas Department of Peru. The report was filed on May 10, 2021. This Amended Technical Report on Resources has been modified to include additional information from the Preliminary Economic Assessment of the Florida Canyon Project dated in August of 2017. The effective date of this report remains February 1, 2021, and the new publication date will be 27 May 2021. Material from the 2017 report has been summarized and added to sections 15 through 22.

The technical report presents the estimate in accordance with Canadian National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101), June 30,2011, and Canadian Institute of Mining, Metallurgy and Petroleum (CIM) "Best Practices and Reporting Guidelines for Mineral Resources and Mineral Reserves", May 10, 2014. Additional mineral resources identified since 2017 have changed the proportions of the ore types from the Mineral Resources identified in the PEA, though the Mineral Resource Estimate increased from the 2017 PEA, the mining and mineral processing parameters are not materially affected or adversely impacted by the updated mineral resource estimate. Gustavson has audited the mining and mineral processing information and we judge that it remains current and applicable to the project. Due to the increase in the mineral resource estimate, additional metallurgical testing is recommended prior to advancing the project.,

1.1 PROPERTY DESCRIPTION & OWNERSHIP

The Florida Canyon Zinc Project is in the Eastern Cordillera of Peru in the upper Amazon River Basin. It is 680 km north-northeast of Lima and 245 km northeast of Chiclayo, Peru, in the District of Shipasbamba, Bongará Province, Amazonas Department (Figure 4-1). The central coordinates of the Project are approximately 825,248 East and, 9,352,626 North (UTM Zone 17S, Datum WGS 84). Elevation ranges from 1,800 meters to approximately 3,200 meters. The climate is classified as high-altitude tropical jungle and the annual rainfall average exceeds 1 m with up to 2 m in the cloud forest at higher elevations.

The mineral resources at Florida Canyon are located on sixteen contiguous mining concessions covering approximately 12,600 ha (Table 4-1, Figure 4-2). The concession titles are in the name of the Peruvian company Minera Bongará S.A. and are subject of the Minera Bongará joint venture agreement between Solitario and Nexa Resources. All concession titles are current.

Nexa, who acts as Operator of the joint venture companies Minera Bongará and Minera Chambará, entered into a surface rights agreement with the local community of Shipasbamba which controls the surface rights of the portion of the Project affected by planned development. This agreement provides for annual payments and funding for mutually agreed upon social development programs in return for the right to perform exploration work including road building and drilling as described in 4.5.1.

1.2 GEOLOGY & MINERALIZATION

The Project is located within an extensive belt of Mesozoic carbonate rocks belonging to the Upper Triassic to Lower Jurassic Pucará Group and equivalents. This belt extends through the central and eastern extent of the Peruvian Andes for nearly 1000 km and is the host for many polymetallic and base metal vein and replacement deposits in the Peruvian Mineral Belt.

The Pucará Group is divided into 3 formations: Chambará (base), Aramachay (middle), and Condorsinga (top). The rocks of the Late Triassic-Early Jurassic Pucará Group that host the mineralized bodies were deposited along the coast basin.

The Chambará formation has an approximate thickness between 650 m and 750 m in the project area, and consists of crinoidal packstone, wackstones and rudstonesThe bulk of known zinc mineralization is hosted in Chambará 2. The stratigraphy between the distinctive Coquina (CM) and Intact Bivalve (IBM) paleontological marker horizons in Chambará 2 define a sequence of permeable higher energy facies within the Chambará 2 that control much of the especially strong dolomitization within the sequence.

The structure at Florida Canyon is dominated by a N50º-60ºW trending domal anticline (or doubly plunging anticline). This domal anticline is cut on the west by the Sam Fault and to the east by the Tesoro-Florida Fault.

Because most of the work has concentrated further west on the San Jorge, Karen Milagros and Sam Fault areas there is little information on the Tesoro-Florida Fault. At both the Karen-Milagros and San Jorge areas, feeder structures have an important control on the mineralized mantos but also represent a significant portion of the resource as steeply dipping structural fillings and replacement. Pre-mineral karsting also played a role in controlling mineralization along with simple structural filling and passive replacement adjacent to conduits.

The zinc-lead-silver mineralization of the Florida Canyon deposit occurs as sulfides hosted in dolomitized zones of the Chambará 2 Formation. Dolomite paragenesis and later sulfide mineralization are controlled by a combination of porosity, permeability, and structural preparation. Metals occur in sphalerite and lesser galena, which contains silver. Minor mineralization is hosted in limestones, but the bulk of sphalerite and galena is hosted in dolomite.

1.3 EXPLORATION STATUS

The Florida Canyon Project has identified and delineated mineral resources in the San Jorge, Sam, 1021, and Karen-Milagros areas. An extensive regional reconnaissance exploration program was also conducted over a large area throughout the Mesozoic carbonate belt to the north and south of the Property. Geochemical samples were collected of stream sediments, soils and rocks. During development of the San Jorge adit, Nexa completed geologic mapping and chip sampling of the underground workings.

The drill database includes 545 drillholes, with a total of 136,758.1 m drilled at the Florida Canyon Project (Table 10-1). All holes were diamond drilled, with 447 holes drilled from surface and 98 holes drilled from the San Jorge adit (underground). Drilling procedures meet industry best practice.

Exploration strategy for MVT deposits at the Florida Canyon project has been strongly influenced by the interpreted favorability of specific units of the stratigraphy of the region. Numerous occurrences of alteration and mineralization occur throughout the Pucara Group, but economic deposits have only been thus far located within the Triassic Chambará formation

1.4 MINERAL PROCESSING & METALLURGICAL TESTING

Limited test work undertaken on the sulfide samples from 2010 to 2014 indicated that a conventional polymetallic process flowsheet using standard chemical reagents will produce a marketable-grade zinc concentration (>50% Zn) with a projected recovery of 93% for sulfide only ore.

Historical test work completed was on oxide and mixed samples. The authors believe that the previous test work will need to be increased for the current mineral resource, however, based on the existing work, zinc recoveries are expected to be about 80% for partially oxidized material up to 93% for pure sulfide.

Therefore, a new metallurgical program has been proposed and is recommended for the sulfide samples acquired during the most recent drilling program in order to advance the project to the PFS level. No economic assessment of the project should be undertaken until this test work is completed.

1.5 MINERAL RESOURCE ESTIMATE

An updated Mineral Resources Estimate for Florida Canyon was completed by Nexa Resources based on a data base available in July of 2020. The database included 545 drill holes with a total drilled length of nearly 137 km. The estimate was audited by Donald E. Hulse of Gustavson Associates LLC with the audit completed on February 1, 2021. Work was completed in Datamine Studio RM, Leapfrog Geo, and Snowden Supervisor.

Florida Canyon is a Mississippi Valley type deposit, dominated by lead and zinc sulfides. The minerals are disseminated within stratigraphically controlled dolomitization within the Chambara Formation of the late Triassic/early Jurassic. The Florida Canyon deposit has the form of a dome at regional scale. This may be due to a regional anticline. This trend was incorporated into the geological model with the interpretation of 84 mineralized structures. (70 mantos and 14 feeders). The bodies are grouped into four areas, labeled as 1021, Karen Milagros, San Jorge, and Sam.

There are subtle local differences between the bodies, although most behave statistically well with coefficients of variation less than two. This indicates that the distributions are not highly skewed. Since there is insufficient drilling to connect all bodies, the spatial separation led to estimating each body as a separate zone.

Capping was performed area by area based on the shape of the cumulative frequency curve. Composites were nominal 2 meters long with some variability due to the thickness of the zone, with 88% of the composites approximately 2 meters.

Variography was completed on each zone with sufficient samples to calculate experimental variograms. If there were insufficient samples the models used were from nearby zones with similar grades and shapes. Any of these areas were classified as inferred resource. In general, the mantos are slightly lower grade that the feeders with longer variogram ranges.

The block model was estimated in Datamine software. The block size was 6x6x3m with a minimum sub-cell of 0.5m in each direction. Grades were estimated by three methods, Ordinary Kriging, Inverse Distance to a Power, and Nearest Neighbor. For economic stope design, the OK values were used.

The search distances were roughly ½ of the variogram range for Pass 1, the full variogram range for Pass 2, and a longer search was used for inferred to fill in between drill holes for the zone. For Pass 1 and 2, a minimum of 6 composites were required and a maximum of 16 were used, for Pass 3, a minimum of 2 and a maximum of 8 were used. Mineral resources reported were based on the OK estimates. A metallurgical recovery was assigned based on the oxidation state.

Density was calculated as a function of grade using an equation developed by SRK during the 2017 study. This relationship was not changed by Nexa during this study, and Gustavson judges that there was not sufficient additional data to change the equation.

1.6 MINERAL RESOURCE CLASSIFICATION

Mineral resource classification utilized criteria based on drill spacing and variogram ranges. Measured mineral resource required a spacing of 25x25m with at least 3 composites, indicated mineral resource, 50x50m with 3 composites, and inferred resource estimates required a spacing of 100x100m with at least 2 composites.

Using the estimated grade and recovery, economic stope shapes were developed using a "stope optimizer" tool in Deswik software. The limits for the stopes are summarized in Deswik Stope Parameters Table 14-8. The cutoff grade was established in net smelter return (NSR) for each mining method, Sublevel Stoping, Cut and Fill, and Room and Pillar. Only mineral resources within an economic stope shape were reported.

1.7 AUDIT OF FINAL MINERAL RESOURCE ESTIMATE

Gustavson audited the Nexa model by examining it in 3-dimensions in the Leapfrog software and by comparing the statistics of the samples in each zone with the modeled grades. The Leapfrog work appears to have been done carefully. Gustavson feels that this is a good representation of the volume of the mineralized material.

The grades reported have an implicit cutoff as part of the stope optimizer analysis in addition to the explicit cutoff applied to the composite data. The stope optimizer tends to select only the best grade where it is sufficiently continuous to allow development of a stope of a defined size. For the Florida Canyon study, the prices used were very near to the market prices in December of 2020 when the study was finalized. Gustavson was able to compare the statistics of samples within the stope shells with the reported mineral resources and found a generally good correlation.

The mineral resource estimate is tabulated in Table 1-1. Gustavson judges that the reported Mineral Resource Estimate meets the standard for reporting under CIM (2019).

1.8 MINERAL RESOURCE TABULATION

The Mineral Resource by zone is shown in Table 1-1 and the total Mineral Resource is shown in Table 1-2.

Table 1-1 Mineral Resource Summary

Zone	Classification	Sum of Tonnes	Zn %	Ag g/t	Pb %	Fe %
Karen Milagros	Measured	328,254	9.07	9.77	1.34	1.53
	Indicated	913,273	7.65	10.41	1.36	1.35
	Measured + Indicated	1,241,527	8.03	10.24	1.35	1.39
	Inferred	7,072,315	8.82	10.55	1.20	1.57
San Jorge	Measured	478,691	12.85	19.29	1.42	3.07
	Indicated	721,429	13.61	20.52	1.25	3.35
	Measured + Indicated	1,200,120	13.31	20.03	1.32	3.24
	Inferred	3,895,089	13.09	11.34	0.68	2.41
1021	Inferred	3,291,937	6.71	13.58	1.77	2.65
Sam	Inferred	599,392	12.78	6.99	2.96	0.93

Table 1-2 Total Mineral Resource

Classification	Sum of Tonnes	Zn %	Ag g/t	Pb %	Fe %
Measured	806,945	11.32	15.42	1.39	2.44
Indicated	1,634,702	10.28	14.87	1.31	2.23
Measured + Indicated	2,441,647	10.62	15.05	1.33	2.30
Inferred	14,858,733	9.63	11.28	1.26	2.00

Mineral Resources are not Mineral Reserves and have not been demonstrated to have economic viability. There is no certainty that the Mineral Resource will be converted to Mineral Reserves. The quantity and grade or quality is an estimate and is rounded to reflect the fact that it is an approximation. Quantities may not sum due to rounding.

1.9 MINING METHODS

The following material is summarized from the 2017 PEA prepared by SRK.

Depending upon the geometry of the mineralized zones, longhole stoping was selected for steeply dipping zones and mechanized drift-and-fill extraction methods in shallowly dipping mantos. Conventional room and pillar mining on a checkerboard pattern may be applicable to specific zones of the Florida Canyon project and should be considered in future trade-off studies at the prefeasibility level. Cemented paste backfill is planned for mined areas to increase mining recovery and to stabilize mined-out areas.

1.10 RECOVERY METHODS

The following material is summarized from the 2017 PEA prepared by SRK.

The Florida Canyon polymetallic zinc-lead-silver deposit can be processed using a conventional flotation plant consisting of three-stage crushing, grinding using ball mill, and differential flotation to produce two final products: a zinc concentrate and a lead concentrate. Further metallurgical testing is proposed in this study to refine the parameters.

1.11 Project Infrastructure

The following material is summarized from the 2017 PEA prepared by SRK.

The Florida Canyon deposit is in steep terrain in a remote part of northern Peru with moderate to high rainfall. These geographic and climatic conditions pose challenges to both access and infrastructure development. A small hydroelectric plant is under construction near the site, offering a lower cost alternative to on-site power generation. Water supply for operations appears to be straight forward, with abundant surface water available for mineral processing and camp support. At this time tailings storage has been evaluated as a dry stack facility in order to achieve geotechnical stability and reduce the area requiring reclamation. Trade-off studies are warranted to optimize moisture content, binding characteristics, and placement and compaction methods during tailings placement.

1.12 Material Development & Operations

Exploration will continue at Florida Canyon to further expand and upgrade the mineral resources. Relationships with the Shipsabamba community will continue. Small upgrades to infrastructure will proceed pending a decision to move the exploration status to preproduction.

1.13 Environment & Permitting

The Ministry of Environment (MINAM) is the environmental authority in Peru. Its administrative department oversees compliance of environmental regulations for mineral exploration activities. Depending on the level of environmental impacts of a proposed exploration program the proponent will be required to prepare an environmental study to support an operating plan according to the following criteria.

A fully detailed Environmental Impact Study (*Estudio de Impacto Ambiental Detallado* or EIAD) must be presented for mine construction. The Florida Canyon Project currently works under an approved EIAsd which has been modified four times. A fifth modification of the EIAsd is in preparation which will permit in excess of 100 additional drill sites and provide for expanded underground exploration previously permitted in earlier modifications. The fifth modification is planned for submission in 2021.

Thirteen authorizations, permits, and licenses will be required for future mining include. Based on the relationship with both the government and the community, there is no reason to expect that these cannot be acquired.

1.14 Economic Analysis

The following material is summarized from the 2017 PEA prepared by SRK. The financial results presented here are based on annual inputs from the production schedule prepared by SRK in 2017. All financial data is second quarter 2017 and currency is in U.S. dollars (US$), unless otherwise stated. Florida Canyon does not hold contracts for the provision of its products. Terms and conditions, payables and penalties are based on generic agreements and common practice.

It is currently planned that the project will produce two products, a lead concentrate and a zinc concentrate. It is expected that the concentrates will be sold to Nexa's Cajamarquilla smelter near Lima.

The pre-production period was estimated to be two years. Mine production is based on an average assumed LoM mine material movement of 2,358 t-ore/d (365 days/yr basis). Table 21-4 presents the LoM mine assumptions.

Table 21-3: Florida Canyon Mine Production Assumptions

Description	Value	Units
Mine Production		
Underground Ore	11,187	kt
Total Material	**11,187**	**kt**
Avg. Daily Capacity	2,358	t per day
Stripping Ratio	N/A	w:o
RoM Grade		
Silver	11.3	g/t
Lead	0.90%	%
Zinc	8.34%	%
Contained Metal		
Silver	4,068	koz
Lead	222,347	klb
Zinc	2,057,796	klb

Source: SRK, 2017

The evaluation of the Florida Canyon Project as of 2017 economics, indicates that the Project has a potential present value of approximately US$198 million, with an Internal Rate of Return (IRR) of 25%, based on an 8% discount rate. The operation will have two years of negative free cash flow, as it has to be constructed in this period. Even with some of the capital spent in the first year of operation, it is projected that this year will have a positive free cash flow. This economic analysis indicates that the investment payback should occur 2.6 years from the start of the commercial production.

1.15 CONCLUSIONS

Florida canyon has long been recognized as a significant Mississippi Valley Type mineral resource for zinc. The work performed to complete this study demonstrates that Florida Canyon has sufficient zinc resources, with about 2.4 million tonnes of measured and indicated mineral resource and nearly 15 million tonnes of inferred, to warrant further work. These tonnages are representative of material that is both of sufficient grade, and sufficient continuity to form potential stope shapes, even though mineral resources are not mineral reserves.

A thorough understanding of the resource and the mineralogy will be needed. At least some of the mineralized material is in the form of carbonates or silicates which will require distinct treatment to recover the metal and produce a viable concentrate.

The project is in a remote area with challenging topography which will require upgrading of the local infrastructure for a commercial operation. Successful development and operation will require a strong commitment to the community to maintain the social license.

1.16 RECOMMENDATIONS

Gustavson has reviewed many of the technical studies completed by Nexa and its predecessor, Votorantim. Most of these studies have been conducted at a prefeasibility level and will form the basis for feasibility investigations to support a production decision. To attain this level of project design detail, new studies will need to be completed in order to provide the foundation for future development. Recommendations for this future work are provided in the 2017 SRK PEA, most of which are not restated here. The following comments focus on the most impactful recommendations for project development in the near term.

1.16.1 Metallurgy

The focus of this report is to update, restate and refine the resource estimation. The newly restated resources define a larger inventory of ore with a significantly different mineralogical and metallurgical composition than that previously used in the PEA. The increased proportion of sulfide ore with less impurities of oxidized zinc and lead minerals provides a significant opportunity, in comparison to the PEA, for lower processing costs, higher recoveries and increased concentrate grades. These more favorable operating parameters should have a significant favorable impact on project economics, particularly combined with the larger global resources base. However, the currently available metallurgical studies are inadequate to support an optimization study of processing options.

Therefore, a redesigned program of metallurgy is recommended, starting with more representative sampling of the ore deposit with variability testing in mind. Future studies by a reputable metallurgical firm should prioritize work on the most abundant and most profitable ore type, sulfide ore. Upon completion of a new metallurgical study and combined with the newly increased resource base, a new economic assessment may be warranted.

1.16.2 Resource Conversion Drilling

Follow up drilling in 2018-19 of targets recommended in the 2017 PEA was very successful in defining new resources within the previously defined footprint of the deposit. Further additions by discovery of new bodies within the existing resource are probable but the primary emphasis of drilling in the core of the deposit should shift to resource conversion core drilling since the ratio of Measured/Indicated to Inferred resource is low. Detailed mine planning requires a higher proportion of closely spaced drilling. Underground drilling is recommended because the surface topography is challenging for the development of drill stations and the surface drilling season is short. The relative closeness of individual ore shoots also supports underground drilling, the access for which can be developed due to the steep terrain. It is likely that subsurface drilling will identify new zones that are not feasible to be tested from surface drill sites.

Permits will provide for underground drilling in both the northern and southern parts of the deposit.

1.16.3 Resource Expansion Drilling

Permitting is in progress to test several exploration targets that have been identified on the Minera Bongará Property. Figure 25-1 shows the location of these prospects. There are also surface drill sites that are currently permitted that can be used to test known targets.

A proposed work program is detailed in Table 1-3.

Table 1-4 Planned work program for 2021-2022

Florida Canyon Prefeasibility Technical Work				
Task	Description	Quantity	Unit Cost US$	Est. Budget
Metallurgy				
	Sampling	20		$10,000
	Test Work	20		$250,000
Underground				
	North Adit Development	1000 m	$2,000	$2,000,000
	South Adit Development	250 m	$2,000	$500,000
Drilling				
	Underground Resource	15,000 m	$250	$3,750,000
	Surface Resource	10,000 m	$300	$3,000,000
Support Cost	Camp, Oversight	-		$1,500,000
Total				$11,010,000

** Assumes Road Access Complete. (Does not include project fixed costs)

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2 INTRODUCTION (ITEM 2)

2.1 NOTICE OF AMENDMENT

This report amends the NI 43-101 Technical Report on Resources Florida Canyon Zinc Project, prepared by Gustavson Associates, LLC Inc. Dated April 5, 2021, Effective Date February 1, 2021. For some chapters, text and figures have been summarized from the 2017 Preliminary Economic Assessment Florida Canyon Zinc Project, Amazonas Department, Peru with Effective Date: July 13, 2017 and Report Date: August 3, 2017. This 2021 Technical Report update does not have a negative impact on or otherwise adversely affect the mineral resource inventory that formed the basis of the 2017 PEA. Some results and conclusions of the 2017 PEA are still considered current and therefore have been carried over for this Report.

2.2 TERMS OF REFERENCE AND PURPOSE OF THE REPORT

Gustavson Associates, LLC (Gustavson) was commissioned by Solitario Zinc Corporation, (Solitario) to prepare an updated Technical Report on Mineral Resources for the Florida Canyon Zinc project.

This report was prepared to comply with public reporting obligations for Canadian National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101), NI 43-101 Form F1, and Canadian Institute of Mining, Metallurgy and Petroleum (CIM) “Best Practices and Reporting Guidelines”. The mineral resource estimate and interpretations and conclusions reported here are based on technical data available prior to the effective date of this report, February 1, 2021.

2.3 QUALIFICATIONS OF QUALIFIED PERSONS

Mr. Donald Hulse, P.E., SME-RM V.P.**,** and Principal Mining Engineer for Gustavson, is a Qualified Person as defined by NI 43-101. Mr. Hulse acted as project manager during preparation of this report and is specifically responsible for report Chapters 1-10, Sections 11.4 and 11.5, Section 12, Sections 14-16, and Sections 18-24, portions of Sections 25 and 26, and for Section 27. Mr. Hulse is also responsible for the overall organization and content of the document. Mr. Hulse is independent of Solitario.

Mr. Simon Mortimer, Atticus Consulting, Principal Geologist at Atticus Consulting, Lima, is a Qualified Person as Defined by NI 43-101 and is responsible for Section 11 and 12, and Section 2.2.1. Mr. Mortimer has acted as an independent consulting geologist for Solitario, working on the Florida Canyon project and visited the project installations in Shipasbamba during the 2019 helicopter assisted drill campaign as part of a review and due diligence on the data collection processes.

Deepak Malhotra, PhD., SME-RM, President, ProSolv Consulting, is a qualified person as defined by NI 43-101 and is responsible for Section 13, Section 17, and portions of Section 1, Section 25, and Section 26. Dr. Malhotra is independent of Solitario.

2.3.1 Details of Inspection

Mr. Mortimer conducted a visit of the Florida Canyon Drill support camp in Shipasbamba from the 6th to the 8th of August, 2019, where the objective of his visit was to understand the protocols and processes surrounding the geological logging and sampling with respect to the generation of a geological model and subsequent resource calculation.

Time on site was spent with Todd Christensen, country manager for Solitario and Watson Flores, Florida Canyon project manager for Nexa. During this visit, time was spent in the core storage facility and the area used for the logging, reviewing the processes for the geological logging and data capture for lithology, alteration, and mineralization. The information captured by the logging geologists was recorded on a laptop or tablet using the software DH Logger which was configured to capture data in a controlled manner on rock type, texture, structure, fossil occurrence and mineral content. The sampling methodology was explained by Watson Flores and the process of data capture and subsequent data handling was reviewed; with samples taken through zones where mineralization was noted and using sample lengths based on geological contacts. The laboratory analyses were introduced directly into the Nexa company database by the designated database manager and a data export designed to extract all the drill hole data files relevant to the Florida Canyon project in a secure, and consistent manner.

A detailed review of the sample security and chain of custody of the samples was not part of the objective of this visit, however the protocols applied by Nexa at Florida Canyon in the collection and transport of samples to the laboratory and the QAQC methodology are considered extremely thorough and within industry standard practices.

It was not possible during the site visit to review the underground workings, and for logistical and safety reasons no time was spent in the helicopter or on the drill platforms.

2.3.2 Contributing Authors

Mrs. Amanda Irons, Geologist with Gustavson Associates, contributed writing and text editing, assisted with database preparation and resource audit, and prepared various figures as well as compilation and presentation of statistics for the report.

2.4 Sources of Information

The information, opinions, conclusions, and estimates presented in this report are based on the following:

- Information and technical data provided by Solitario.
- Review and assessment of previous investigations.
- Assumptions, conditions, and qualifications as set forth in the report; and
- Review and assessment of data, reports, and conclusions from other consulting organizations and previous property owners.

These sources of information are presented throughout this report and in Item 27 – References. The qualified persons are unaware of any material technical data other than that presented by Solitario.

Previous reports were reviewed by Gustavson to determine if the information were suitable to be used in this report and edited where necessary. Except for section 14 there were no material changes.

2.5 EFFECTIVE DATE

This report was completed based upon information available at the effective date of this report, February 1, 2021.

2.6 UNITS OF MEASURE

Unless stated otherwise, all measurements reported here are in metric units, tonnes are metric, and currencies are expressed in constant 2021 US dollars. Precious metal content is reported in grams metal per metric tonne (g/t).

3 RELIANCE ON OTHER EXPERTS (ITEM 3)

Solitario staff provided documentation related to environmental status, land and legal maps, deeds, mineral claims and royalty agreements, which were relied upon to support Sections 4, 5 and 6 of the report.

4 PROPERTY DESCRIPTION & LOCATION (ITEM 4)

4.1 PROPERTY DESCRIPTION & LOCATION

The Florida Canyon Zinc Project is in the Eastern Cordillera of Peru in the upper Amazon River Basin. It is 680 km north-northeast of Lima and 245 km northeast of Chiclayo, Peru, in the District of Shipasbamba, Bongará Province, Amazonas Department (Figure 4-1). The Project area can be reached from the coastal city of Chiclayo by the paved Carretera Marginal highway. The central point coordinates of the Project are approximately 825,248 East and, 9,352,626 North (UTM Zone 17S, Datum WGS 84). Elevation ranges from 1,800 meters to approximately 3,200 meters. The climate is classified as high-altitude tropical jungle and the annual rainfall average exceeds 1 m with up to 2 m in the cloud forest at higher elevations.

Figure 4-1 Project Location Map

4.2 MINERAL RIGHTS IN PERU

Mining in Peru is governed by the General Mining Law, which specifies that all mineral assets belong to the Peruvian State. Mining concessions are granted to individuals or other entities of national or foreign origin and authorize the title holder to perform all minerals-related activities from exploration to exploitation. Once titled, concessions are irrevocable for so long as the fees are paid to the federal government and legal obligations are performed on time. A claim can be granted only in multiples of a cuadrícula, which is a 100-ha plot, up to a maximum size of 1,000 ha. Boundaries of newly granted claims are oriented north-south or east-west. No monumentation of the claim boundary in the field is necessary.

Concessions are real assets and are subject to laws of private property. Foreign entities have the same rights as Peruvians to hold claims except for a zone within 50 km of international borders. Title holders have a right of access and development of minerals, but an access agreement is required with private property surface rights owners and formalized "Communities". To ratify an agreement with a Community, a majority of all community members must vote in favor of the agreement as written. A recently issued law (as modified) also requires formal consultation with federally recognized indigenous communities in certain areas.

To maintain mining concessions in good standing the owner must:

- Pay annual license fees ("derechos de vigencia"), currently USD$3/ha. Fees are reduced for qualified "small miners" who pay USD$1/ha. The small miner is an individual or company owning no more than 2000 ha of mineral rights in Peru. Failure to pay the applicable license fees for any two consecutive years results in the cancellation of mining concessions.

- Starting in year 11 after originally acquiring the concession, the owner must either meet minimum production levels or minimum expenditure commitments. If the concession owner does not meet expenditure or production commitments, then the owner must also pay an annual penalty as follows.

  - Minimum annual production (MAP) must have a value of one UIT (Unidad Impositiva Tributaria), equal to 4,400 Peruvian soles (approximately US$1200 in 2021) per hectare of the property. If the MAP is not achieved, then a penalty must be paid on a sliding scale escalating from 2% to 10% annually of the MAP. If the property is not in production by year 30 then the mineral rights are forfeited.

  - Minimum annual expenditure is defined as a value of ten times the value of the penalty as defined above.

  - Failure to pay applicable penalties for two consecutive years results in the cancellation of mining concessions.

4.3 MINERAL TITLES

The mineral resources at Florida Canyon are located on sixteen contiguous mining concessions covering approximately 12,600 ha (Table 4-1, Figure 4-2). The concession titles are in the name of the Peruvian company Minera Bongará S.A. and are subject of the Minera Bongará joint venture agreement between Solitario and Nexa Resources. All concession titles are current.

The Minera Bongará concessions are surrounded by a second group of forty-eight contiguous mining concessions, covering approximately 36,080 ha (Table 4-1, Figure 4-2). These concession titles are held in the name of Minera Chambará, a Peruvian company that is party to a separate joint venture agreement between Nexa and Solitario. Of the forty-eight concessions, nine titles are pending.

According to Peruvian law, concessions may be held indefinitely, subject to timely payment of annual fees to the government. At the time of issuance of this study, annual concession payments to the Peru Ministry of Mines were current for the Minera Bongará and Minera Chambará claims. Fees payable in 2021 for the Minera Bongará property will total approximately US $613,000 (Table 4-1).

Nexa, who acts as Operator of the joint venture companies Minera Bongará and Minera Chambará, entered into a surface rights agreement with the local community of Shipasbamba which controls the surface rights of the portion of the Project affected by planned development. This agreement provides for annual payments and funding for mutually agreed upon social development programs in return for the right to perform exploration work including road building and drilling as described in 4.5.1.

Table 4-1 List of Minera Bongará Mineral Concessions

Concession Name	Number	Status	Hectares	Claim Date	2021 Holding Fees (US$)	District
BONGARA CINCUENTICINCO	10233396	Titled	1,000	8/7/1996	26,561.64	FLORIDA/SHIPASBAMBA
BONGARA CINCUENTICUATRO	10233296	Titled	600	8/7/1996	15,936.99	FLORIDA/SHIPASBAMBA
BONGARA VEINTISIETE	10783595	Titled	300	6/26/1995	7,968.49	SHIPASBAMBA
DEL PIERO UNO	10338505	Titled	1,000	11/2/2005	26,561.64	FLORIDA/SHIPASBAMBA
DEL PIERO DOS	10338405	Titled	600	11/2/2005	13,280.82	FLORIDA/SHIPASBAMBA
DEL PIERO TRES	10338605	Titled	700	11/2/2005	15,936.99	FLORIDA/SHIPASBAMBA
DEL PIERO CUATRO	10000206	Titled	500	1/3/2006	26,561.64	FLORIDA/SHIPASBAMBA
DEL PIERO CINCO	10000306	Titled	1,000	1/3/2006	18,593.15	SHIPASBAMBA
DEL PIERO SEIS	10204507	Titled	1,000	3/23/2007	26,561.64	CAJARURO/FLORIDA
VM 42	10190507	Titled	1,000	3/21/2007	26,561.64	CAJARURO/FLORIDA/ SHIPASBAMBA
VM 74	10193707	Titled	1,000	3/21/2007	26,561.64	SHIPASBAMBA
VM 75	10193807	Titled	1,000	3/21/2007	26,561.64	SHIPASBAMBA
VM 94	10045708	Titled	900	1/28/2008	2,700.00	FLORIDA/SHIPASBAMBA
VM 95	10045808	Titled	500	1/28/2008	13,280.82	FLORIDA
VM 97	10046008	Titled	1,000	1/28/2008	26,561.64	FLORIDA/SHIPASBAMBA
VM 98	10046108	Titled	500	1/28/2008	13,280.82	FLORIDA/SHIPASBAMBA
Total					**$613,408.00**	

Source: Solitario, 2021

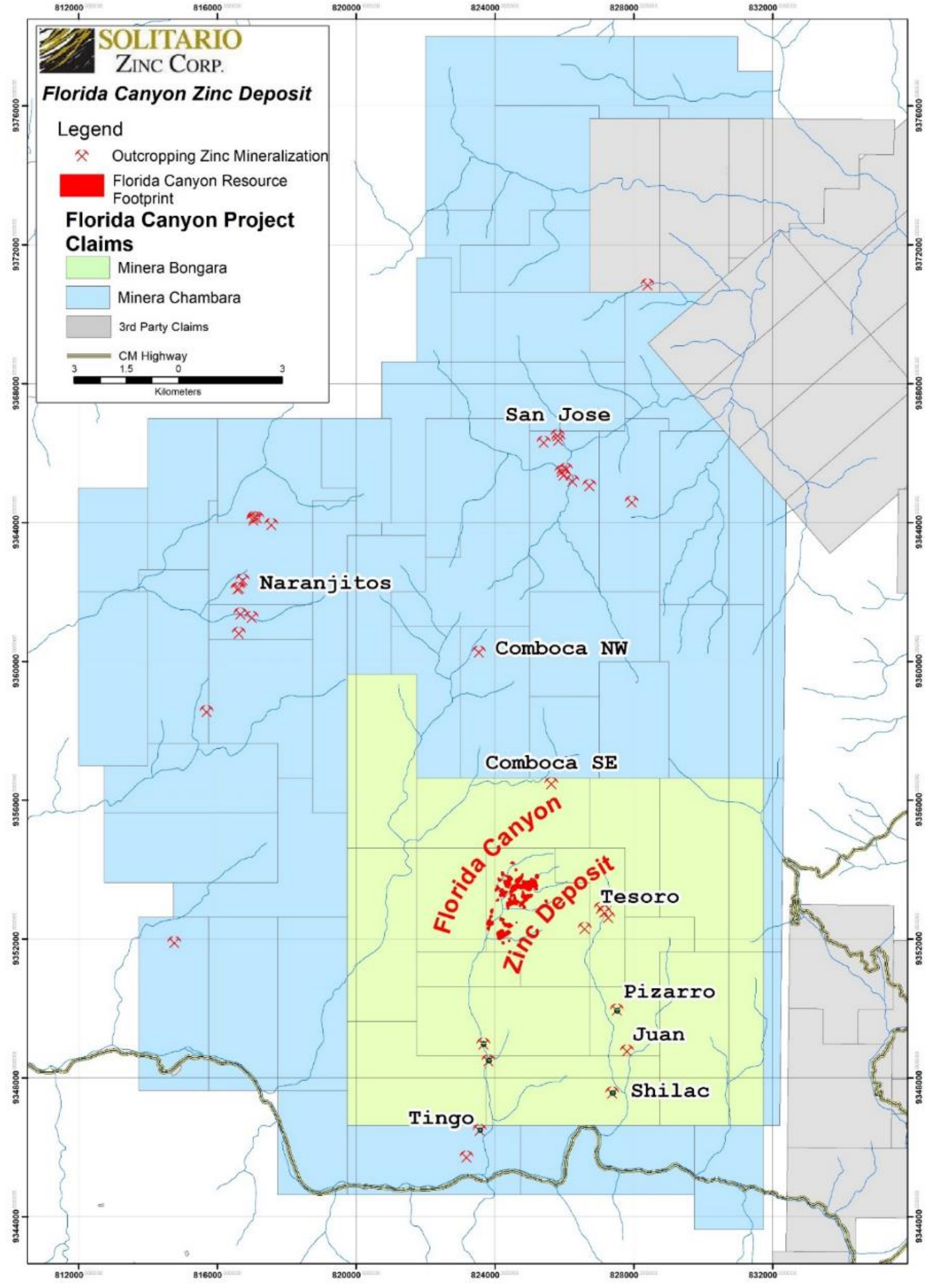

Figure 4-2 Map of Mineral Claims and Mineral Occurrences

4.4 NATURE AND EXTENT OF ISSUER'S INTEREST

Minera Bongará Properties

Minera Bongará S.A. is a Peruvian company formed in 2006 in accordance with the terms of a joint venture agreement between Votorantim Metais-Cajamarquilla S.A. (now Nexa Resources) and Solitario. Nexa is the operating partner of Minera Bongará and is responsible for keeping the property in good standing. Current shareholding ownership of Minera Bongará is 39% Solitario, 61% Nexa. Nexa will earn a 70% interest in Minera Bongará by continuing to solely fund all project expenditures through the completion of a positive feasibility study. Nexa is required to offer a loan facility at market rates for Solitario's portion of construction capital to build a mine. Solitario will repay the loan through 50% of its project cash flow.

4.5 ROYALTIES, TAXES & AGREEMENTS

Peru imposes a net smelter return royalty (NSR) on all precious and base metal production at a rate determined by the Operating Margin of a mining property. Table 4-2 shows the marginal royalty rate for various operating margins reported by the operator. The minimum rate is 1%.

Table 4-2 Marginal royalty rates for various operating margins

Royalty			
N°	Operating Margin		Marginal Rate
1	0%	10%	1.00%
2	10%	15%	1.75%
3	15%	20%	2.50%
4	20%	25%	3.25%
5	25%	30%	4.00%
6	30%	35%	4.75%
7	35%	40%	5.50%
8	40%	45%	6.25%
9	45%	50%	7.00%
10	50%	55%	7.75%
11	55%	60%	8.50%
12	60%	65%	9.25%
13	65%	70%	10.00%
14	70%	75%	10.75%
15	75%	80%	11.50%
16	>80%		12.00%

Corporate income tax in Peru is charged at a flat rate of 29.5%. However, mining companies must also pay an additional "Special Mining Tax" (SMT) varying from 2 to 8.4% of net operating profit. The tax rate for the SMT is determined by the reported operating profit corresponding to one of 17 published tax brackets.

A Value added Tax of 18% is applied to the purchase prices of goods and services. However, certain geographical economic zones are excluded from the levy of this tax.

Since 2014, mining title holders are required to pay a contribution to the agencies in charge of regulatory oversight of mining activities: OEFA (environment); and OSINERGMIN (health and safety). The amount of the contribution is payable monthly and is calculated on the basis of monthly sales at rates of 0.10% to OEFA and OSINERGMIN.

4.5.1 Property Agreements

The local community of Shipasbamba is the owner of the surface rights of the Minera Bongará Property. Nexa, the operator of the joint venture company Minera Bongará, entered into a three-year surface rights agreement in 2018 with the community of Shipasbamba. The agreement is in effect until the end of 2021. This agreement provides for annual payments to the community and funding for mutually agreed upon social development programs in return for Minera Bongará's right to perform exploration work including road building, underground exploration, and drilling. Under this agreement Nexa has obligations in 2021 as follows.

- Pay to the community US $80,000
- Improve and maintain the existing forty-two-kilometer road from the town of Shipasbamba to the project area and local communities (See Figure 4-3)
- Assist the community by surveying community boundaries
- Provide the services of a veterinarian and a professional agronomist to assist community members with community projects.

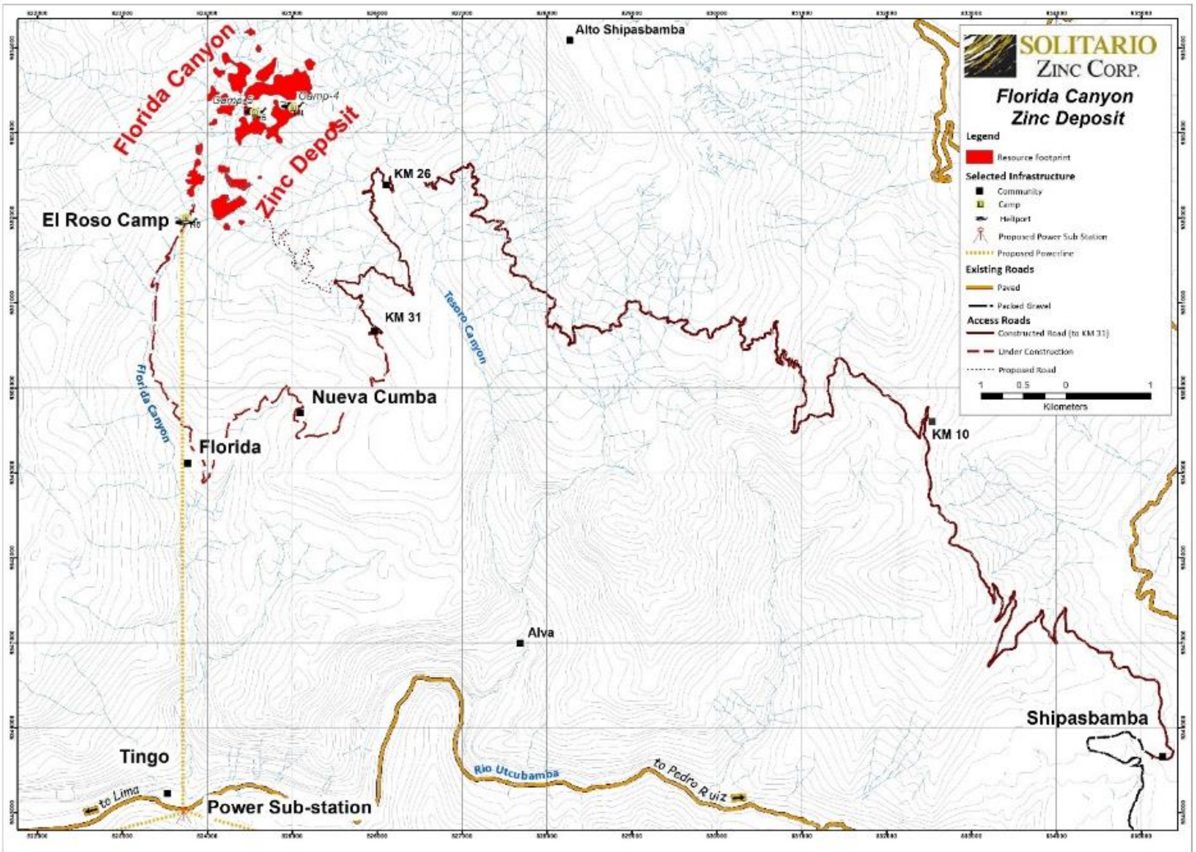

Figure 4-3 Access road to the Florida Canyon Project (in construction)

4.6 ENVIRONMENTAL PERMITTING

The Ministry of Environment (MINAM) is the environmental authority in Peru. Its administrative department oversees compliance of environmental regulations for mineral exploration activities. Depending on the level of environmental impacts of a proposed exploration program the proponent will be required to prepare an environmental study to support an operating plan according to the following criteria.

An Environmental Technical Report (*Ficha Técnica Ambiental* or FTA) is a study prepared for approval of exploration activities with non-significant environmental impacts and the applicant is seeking permission to construct less than 20 drill platforms. The environmental authority has 10 working days to approve or make observations to the FTA.

An Environmental Impact Declaration (*Declaración de Impacto Ambiental* or DIA) must be presented for Category I level exploration activities which have a maximum of 40 drill platforms or disturbance of surface areas of up to 10 ha. The environmental authority has 45 working days to make observations.

A semi-detailed Environmental Impact Study (*Estudio de Impacto Ambiental Semi-Detallado* or EIAsd) is required for Category II exploration programs which have between 40–700 drill platforms or a surface disturbance of more than 10 ha. The environmental authority has 96 working days to make observations. The total process including preparation of the study by a registered environmental consulting company can take 6–12 months not including potential baseline studies.

A fully detailed Environmental Impact Study (*Estudio de Impacto Ambiental Detallado* or EIAD) must be presented for mine construction. The preparation and authorization of such a study can take as long as two years after preparation of the mine plan has been finalized.

Specific authorizations, permits and licenses required for future mining include, at a minimum:

- EIA (as modified during the mine life);
- Mine Closure Plan and Final Mine Closure Plan within two years of end of operation;
- Certificate of Nonexistence of Archaeological Remains;
- Water Use License (groundwater and/or surface water);
- Water construction authorization;
- Sewage authorization;
- Drinking water treatment facility license;
- Explosives use license and explosives storage licenses;
- Controlled chemicals certificate;
- Beneficiation concession;
- Mining authorization;
- Closure bonding; and
- Environmental Management Plan approval.

The Florida Canyon Project currently works under an approved EIAd which has been modified four times. A fifth modification of the EIAd is in preparation which will permit in excess of 100 additional drill sites and provide for expanded underground exploration previously permitted in earlier modifications. The fifth modification is planned for submission in 2021.

4.7 Other Significant Factors & Risks

There are no known significant factors or risks affecting access, title or right or ability to perform work on the property that are not discussed herein. Common risks of service rights, negotiations and permitting are not expected to be significant.

The project is in a remote area with challenging topography which will require upgrading of the local infrastructure for a commercial operation. Successful development and operation will require a strong commitment to the community to maintain the social license.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE & PHYSIOGRAPHY (ITEM 5)

5.1 TOPOGRAPHY, ELEVATION, VEGETATION

The Project area elevation ranges between 1,800 and 3,200 m, with areas of steep topography consisting of prominent escarpments and deep valleys. Dense jungle or forest vegetation covers most of the area, as shown in Figure 5-1.

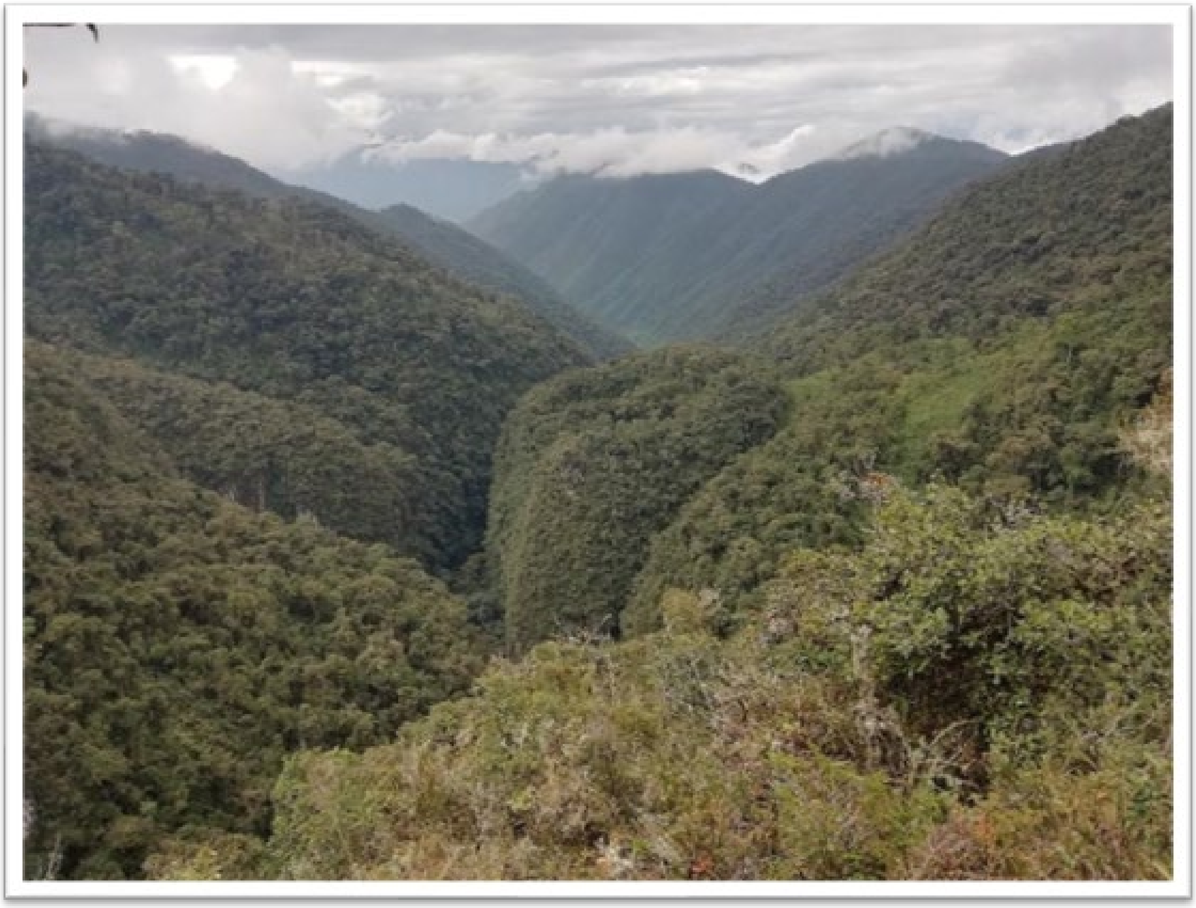

Figure 5-1 Photograph of the Florida Canyon Project Area

Source: Solitario, 2021

5.2 CLIMATE & LENGTH OF OPERATING SEASON

The climate at the Project is high-altitude tropical jungle. The annual temperature at elevations between 1,000 m and 2,000 m averages around 25°C. Most precipitation occurs during the rainy season, generally from November to April. The annual rainfall average exceeds 1 m with up to 2 m in cloud forest at higher elevations. Although exploration can continue year-round, surface exploration is more difficult during the rainy season when visibility hampers helicopter supported programs and muddy conditions hinder ground travel and field work.

5.3 SUFFICIENCY OF SURFACE RIGHTS

The Project concession package provides legal basis for entry, exploration and mining. However, agreements are required with local surface rights owners prior to surface disturbing activities. Through the exploration period conducted to date, Nexa has signed periodic surface rights agreements with the community of Shipasbamba which controls virtually all land for which Minera Bongará controls mineral rights. Small inliers of private surface rights exist for which agreements with individual landowners are required from time to time. Minera Bongará has sufficient right for surface for the foreseen footprint of the operation.

5.4 ACCESSIBILITY & TRANSPORTATION TO THE PROPERTY

Road access to the Bongará province of Amazonas is provided primarily by the Carretera Marginal paved highway connecting the port city of Chiclayo to Pedro Ruiz Gallo, the largest town immediately adjacent to the project property. The road distance from Chiclayo to Pedro Ruiz is approximately 300 km and takes, on average, 6 hours by car. Pedro Ruiz is a regional commerce center with hotels, restaurants, communication, and a population estimated to be 10,000. The immediate Project area is not populated but there are several small villages nearby including the district capital of the Shipasbamba. Important smaller towns near the project are Florida and Nueva Cumba. A graded gravel road is maintained from Pedro Ruiz to Shipasbamba. Nexa is constructing a road that extends from Shipasbamba to local villages and the Project as discussed in 4.5.1 and shown on Figure 4-3.

5.5 INFRASTRUCTURE AVAILABILITY & SOURCES

5.5.1 Existing Infrastructure

The Project area has little existing infrastructure with only the access road (under construction), several primitive drill camps (Figure 5-2 and Figure 5-3) and a number of drill pads. Drill camps provide support for drilling and technical crews, providing temporary housing, food preparation, mess halls, field offices and staging facilities during active drilling.

Surface drilling has been accomplished using helicopter support from Shipasbamba which lies 10 km to the southeast of the resource area. The Project core shed, heliport, sample preparation and sample storage facility are located in Shipasbamba (Figure 5-4). Office space and storage is also maintained in Pedro Ruiz.

Figure 5-2 Photograph of part of the Roso Field Camp at Project Site

Source: Solitario, 2014

Figure 5-3 Drill Support Camp

Source: Solitario, 2020

Figure 5-4 Shipsabamba Project Camp

Source: Solitario, 2020

5.5.2 Proximity to Population Center

No commercial services are currently available at the project site. The small communities of Florida and Nueva Cumba are 1 to 2 km south of the Roso drill camp on the foot trail from Tingo on the Utcubamba River to the Project. The Project Road under construction will connect Shipasbamba with the Roso camp and the villages of Florida and Nueva Cumba.

Shipasbamba is the nearest town to the Project with current road access. A graded gravel Provincial road provides access from Pedro Ruiz on the Carretera Marginal. Scheduled minibuses travel this route and public transportation is also provided by taxis and mototaxis.

Pedro Ruiz is the nearest town with commercial services including retail, hotels, restaurants and maintenance services. The nearest largest cities to Pedro Ruiz with regular air service are Chiclayo, a coastal port city, Jaen, a small city approximately three hours by road and Bagua Grande, two hours from Pedro Ruiz on the Carretera Marginal road.

The small population near the Project is supported by subsistence farming. Saleable crops include coffee, rocoto pepper, yucca, fruit and vegetables. Cedar trees are also harvested and used in local construction.

5.5.3 Power

There is currently no line power near the site. The 2017 Florida Canyon PEA assumed completion of a proposed hydropower generation and transmission development project located in close proximity to the mine (Figure 4-3). This planned project has now progressed to the detailed engineering phase by Energoret, a Private company with access to a mixture of government and private funding for hydroelectric projects. This Tingo hydroelectric complex near Florida Canyon is planned to be comprised of three separate hydroelectric plants along the Utcubamba River which will generate 400 MW. Power will be distributed to the national power grid by high voltage distribution lines. The closest point to the grid is seven kilometers south of El Roso camp on the

Utcubamba River where a substation is planned for power distribution to the Project (Figure 4-3). Nexa has entered into a Letter of Intent agreement with Energoret committing to use between 5 and 10 MW of available power. Current projections of power needs for a 2500 to 3000 tpd project at Florida Canyon is 7 to 8 MW.

The business arrangement between Energoret and Minera Bongará will be structured so that power rates would include repayment of capital to construct the powerline and substation.

5.5.4 Water

The operation will require water for use for processing, mining, dust suppression and potable consumption. The processing facility will utilize a combination of recycled water generated by dewatering of tailings and stormwater captured on site for the majority of the processing needs. It is anticipated that ground water will be encountered in the mine and captured in sumps for mine water needs. Excess water will be released after residence in settling ponds. The very low pyrite content of the ore and waste and its high buffering capacity strongly suggests that water treatment of mine and other contact water will not be required.

Any additional water that will be required could be supplied by water well(s) developed on site.

Tesoro Creek, a small local drainage, has been used for domestic water supply by nearby residents. Treated water from this creek may be used for domestic requirements. It will be piped by gravity from the creek to a small treatment plant and a water storage tank.

Permits will be required from the Autoridad Nacional del Agua for industrial use, domestic use and treatment.

5.5.5 Personnel

Many local workers have been employed at the project since its inception and have been trained in specialized tasks relating to minerals exploration. The majority reside in the local villages and in Pedro Ruiz. In addition, untrained labor is readily available from local communities where few formal employment opportunities currently exist. However, Peru is a mature mining country with a mobile workforce and abundant trained labor in specialized mining and industrial fields.

6 HISTORY (ITEM 6)

6.1 PREVIOUS OPERATIONS

Prior to the discovery of mineral occurrences by Solitario in 1994, no mineral prospecting had been done on the Property and no concessions had been historically recorded. In 1995 and later, Solitario staked many of the current mineral concessions in the Project area.

In 1996, Cominco Ltd. (Cominco) formed a joint venture partnership (JV) with Solitario. This agreement was subsequently terminated in 2000 and Solitario retained ownership of the property.

In 2006, Solitario formed two JV's with Nexa as described in Section 4.4, for the exploration and possible development of the properties.

6.2 HISTORICAL EXPLORATION & DEVELOPMENT RESULTS

In 1993 through 1995, Solitario executed a program of pitting and drilling at the previously known Mina Grande and Mina Chica oxide zinc prospects located 18 km northeast of the Project area. Solitario subsequently identified the Crystal prospect nearby and other oxidized zinc occurrences in the general area of the Yambrasbamba community. The geological studies and exploration work at these zinc deposits provided insights into the local stratigraphy and style of mineralization in the area. Comparisons with zinc occurrences elsewhere in Peru lead to the decision to undertake a regional exploration program to identify new occurrences of zinc in potentially more favorable stratigraphy.

The Florida Canyon zinc deposit was located through follow-up of an anomaly generated during a regional geochemical program in 1994.

Following formation of a JV with Solitario, Cominco Ltd., in conjunction with Solitario's workers, completed various programs of field work at Florida Canyon in 1997 to 2000 including geologic mapping, geophysical surveys, surface soil and rock sampling, and diamond drilling. The scope of these programs is summarized below.

- Geologic mapping at 1:1,000 scale covered 352 ha in the Project area. Mapping was conducted within Florida Canyon and its tributaries aided by hand-cut trails and clearing of vegetation-covered outcrops. This early mapping has been more recently validated in subsequent programs.
- Mineralized outcrops identified in the Project area were cleaned of soil cover and sampled by chip channels for a total of total of 347 channel samples collected. This sampling consisted of individual samples of lengths of up to 2.0 m at non-regular spacing.
- Stream sediment sampling of drainages was completed with consistent 500 m spacing along the gulches.
- Soil samples were collected along topographic contour lines spaced vertically 50 m apart but with irregular lateral spacing. Part of this soil sampling followed the crests of hills, especially in the western part of Florida Canyon, mainly to identify mineralized linear structures. A total of 600 samples were collected.

- An Induced Polarization (IP) geophysical survey in 3 lines covered 5.2 linear km. Two lines were located along the drainages A and B of the northern part of Florida Canyon with dipole-dipole spacing at 150 m, and a third line with dipole-dipole spacing a = 100 m along the southern sector of the Sam Fault target. Cominco also surveyed 6.5 km of radial lines from holes FC-41 and FC-47, drilled in 1999.
- Diamond drilling between 1997 and 2000 totaled 82 holes and 24,781 m.

Solitario continued field work at a reduced scale until forming the Minera Bongará and Minera Chambará JV's in 2006 with a subsidiary of the private Brazilian mining company Votorantim Metais (now Nexa). Since that time Nexa increased the total number of exploration drill holes on the property to 545 comprising about 136,000 meters of core and completed about 700 meters of tunneling at the San Jorge deposit including 212 underground drill holes. Additionally, Nexa performed preliminary metallurgical work and various other engineering studies through 2017.

1.1 RECENT WORK

Since the issuance of the 2017 Florida Canyon PEA, drilling was conducted in 2018 and 2019 at the Florida Canyon Deposit, almost entirely within the known footprint of mineralization. This program consisted of 34 surface core holes totaling about 17,000 meters (Table 6-1). The primary objective of this drilling was to increase sulfide-dominant zinc resources. Additionally, the global resource model was reexamined and refined as data was gathered from new drilling. These programs were designed to accomplish the following objectives.

a) Verify the hypothesized steeply dipping replacement deposit, the 1021 (ten twenty-one) Zone in the northern part of Florida Canyon. This objective was successful and delineated the mineralized structure for a strike length of approximately 800 meters based on a 1st pass spacing of drill intercepts. This new zone added Inferred Resources to the project resource model.
b) Extend the San Jorge Zone in the southern part of Florida Canyon along strike to the south. This zone was successfully enlarged, and additions increased Inferred Resources to the project resource.
c) Test continuity of the known steeply dipping Sam replacement zone. New drilling at the Sam Zone limited the extent of mineralization where tested and resulted in a modest decrease in Inferred Resources.
d) Test the inferred presence of a new Manto (zone SJ-1412) extending to the east of the San Jorge Zone which successfully added Inferred Resources.
e) Expand several other minor Manto zones which with modest increases in resources.
f) The program successfully increased sulfide resources as all the 2018-2019 drill intercepts were sulfide dominant. Drill targets for sulfides are, by nature, deeper due to the depth of oxidation induced by surface weathering. However, the desirability of sulfide ores is much higher due to more favorable metallurgical characteristics of the ore.
g) The change in Inferred resources as a result of all drilling and net of adjustments to the resource model was an addition of 6,015,733 tons of Inferred Resources in comparison to the previously reported 43-101 Compliant Report.

Table 6-1 Campaign Summary - Florida Canyon

Year	Drill Holes	Company	Meters	Type	Contractor
1997	34	Cominco	8,409.70	DDH	Boart Longyear
1998	8	Cominco	2,108.35	DDH	MDH Bradley
1999	9	Cominco	3,977.90	DDH	MDH Bradley
2000	31	Cominco	10,297.00	DDH	MDH Bradley
2006	26	Votorantim Metais	4,353.50	DDH	MDH Bradley
2007	33	Votorantim Metais	11,189.30	DDH	MDH Bradley
2008	54	Votorantim Metais	16,468.85	DDH	MDH Bradley
2009	13	Votorantim Metais	3,611.30	DDH	MDH Bradley
2010	42	Votorantim Metais	12,242.40	DDH	MDH Bradley
2011	44	Votorantim Metais	11,116.15	DDH	MDH Bradley
2012	110	Votorantim Metais	23,558.55	DDH	MDH Bradley
2013	102	Votorantim Metais	12,389.05	DDH	MDH Bradley
2018	5	Nexa Resources	2,202.90	DDH	Bretsa
2019	34	Nexa Resources	14,833.20	DDH	Bretsa
Total	**545**		**136,758.15**		

6.3 Historical Mineral Resource Estimates

There were no mineral resource estimates prepared prior to the implementation of NI 43-101. Two mineral resource estimates were completed for the property in 2014 and 2017 by Votorantim and Solitario.

In 2014, SRK reported Measured and Indicated at 2.78 Mt of 12.77% Zn, 1.78% Pb, and 18.2g/t Ag and, Inferred at 9.07Mt of 10.87% Zn, 1.21% Pb and 12.2g/t Ag.

In 2017, SRK reported Measured and Indicated at 3.256 Mt of 12.2% Zn, 1.53% Pb, and 18.51g/t Ag, and Inferred at 8.843Mt of 10.15% Zn, 1.05% Pb and 13.21g/t Ag.

6.4 Historical Production

There has not been any commercial mining in the Project area. The only underground excavation has been 700 m of underground drifting by Nexa to provide drill platforms at the San Jorge area.

7 GEOLOGICAL SETTING & MINERALIZATION (ITEM 7)

Information presented herein is derived from material provided by Nexa and Solitario, including Cominco reports, supported by independent reports including a thesis by Isaac Robles Vega of the National University of Huancavelica, M&R Consultores, and by the Regional Government of Amazonas, prepared by Walter Castro Medina. The character of the mineralization in core was confirmed by Simon Mortimer, Principle QP Geologist at Atticus Consulting in Lima/Santiago, during a site visit in 2020.

The Project is located within an extensive belt of Mesozoic carbonate rocks belonging to the Upper Triassic to Lower Jurassic Pucará Group and equivalents. This belt extends through the central and eastern extent of the Peruvian Andes for nearly 1000 km and is the host for many polymetallic and base metal vein and replacement deposits in the Peruvian Mineral Belt. Among these is the San Vicente Mississippi Valley Type (MVT) zinc-lead deposit that has many similarities to the Florida Canyon deposit and other MVT occurrences in the Project area. A regional geologic map is shown in Figure 7-1.

7.1 REGIONAL GEOLOGY

The Peruvian Andes are Northwest-Southeast trending. Reports by Megard (1979); Dalmayrac et al. (1988) and Benavides- Cáceres (1999) establish the regional geological studies related to the geological evolution of the Peruvian Andes. These include the basic tools that complement field data and geological context related to the occurrence of MVT mineralization.

The Marañón Complex of the Neoproterozoic Era forms the regional geological basement with a NW-SE orientation and consists of metasedimentary rocks (slate, quartzite, phyllite), schist, mica schist and gneiss. It outcrops in the Southwest sector of the quadrangle of Bagua and underlies the Mitu Group of the Permo-Triassic Period in an angular unconformity.

The Mitu Group is a typical molasse deposit (sandstones, shales, and conglomerates) of continental origin. It occurs in medium to thick layers and are differentiated by their reddish to pink colors. In the project area, it intercepts deep with drill holes V-46, V-36 and V37A. The most accessible outcrops are observed downstream of the Corontachaca bridge on the Utcubamba River (close to Pedro Ruiz). Along 10 km, there are red sandstone layers ranging from 0.30 m to 1 m in thickness. These layers are resistant to erosion and solidified the canyon morphology of the Utcubamba Valley. Overlying the Mitu Group outcrops the Upper Triassic to Lower Jurassic Pucará Group, which hosts the MVT mineralization of the Florida Canyon Project area.

The Pucará Group is divided into 3 formations: Chambará (base), Aramachay (middle), and Condorsinga (top). The rocks of the Late Triassic-Early Jurassic Pucará Group that host the mineralized bodies were deposited along the coast basin. Sedimentation was dominated by carbonate rocks along a coastal sabkha plain. Evaporites, primarily anhydrite, associated with the coastal sabkha plain, along with coarse marine anoxic silt-carbonated mudstone, provided most of the components needed to host the Florida Canyon zinc-lead ore bodies.

1. The Chambará Formation corresponds to a marine sedimentation developed in subtropical to tropical seas where terrigenous contribution was restricted. Due to its lithological and

textural characteristics, the Chambará Formation represents lithofacies from the middle of the carbonated platform. In parts with shallow water features, such as coquina bioclastic limestone, the dolomitized levels are what host most of the MVT mineralization of Florida Canyon. In the Florida Canyon Project area, the Chambará Formation is composed of high energy carbonates of barrier environments with local reef development that are represented by floatstone, wackestone, packstone and rudstone textures. Dimond drilling confirms the presence of district continuity of biostratigraphic markers.

2. The Aramachay formation is made up of a sequence of bituminous limestone with alternating silt and clay in thin layers, corresponding to basin levels, where rhythmic sedimentation predominates which resulted in flat, tabular and regular bedding in layers of 10-20 cm. These layers are dark gray to black in color and present an abundance of organic material with the presence of fossils.
3. The Corontachaca Formation is made up of calcareous conglomerates and calcareous sedimentary breccias. The presence of the rock in this formation is limited in the project area. However, it outcrops on the high peaks of the Santa Catalina area near Shipasbamba and on the Corontachaca Bridge on the Utcubamba River. It is related to the uplift and intense erosion of the limestones of the Pucara Group that give rise to the accumulation of slope deposits which were cemented by their own calcium carbonate solutions.

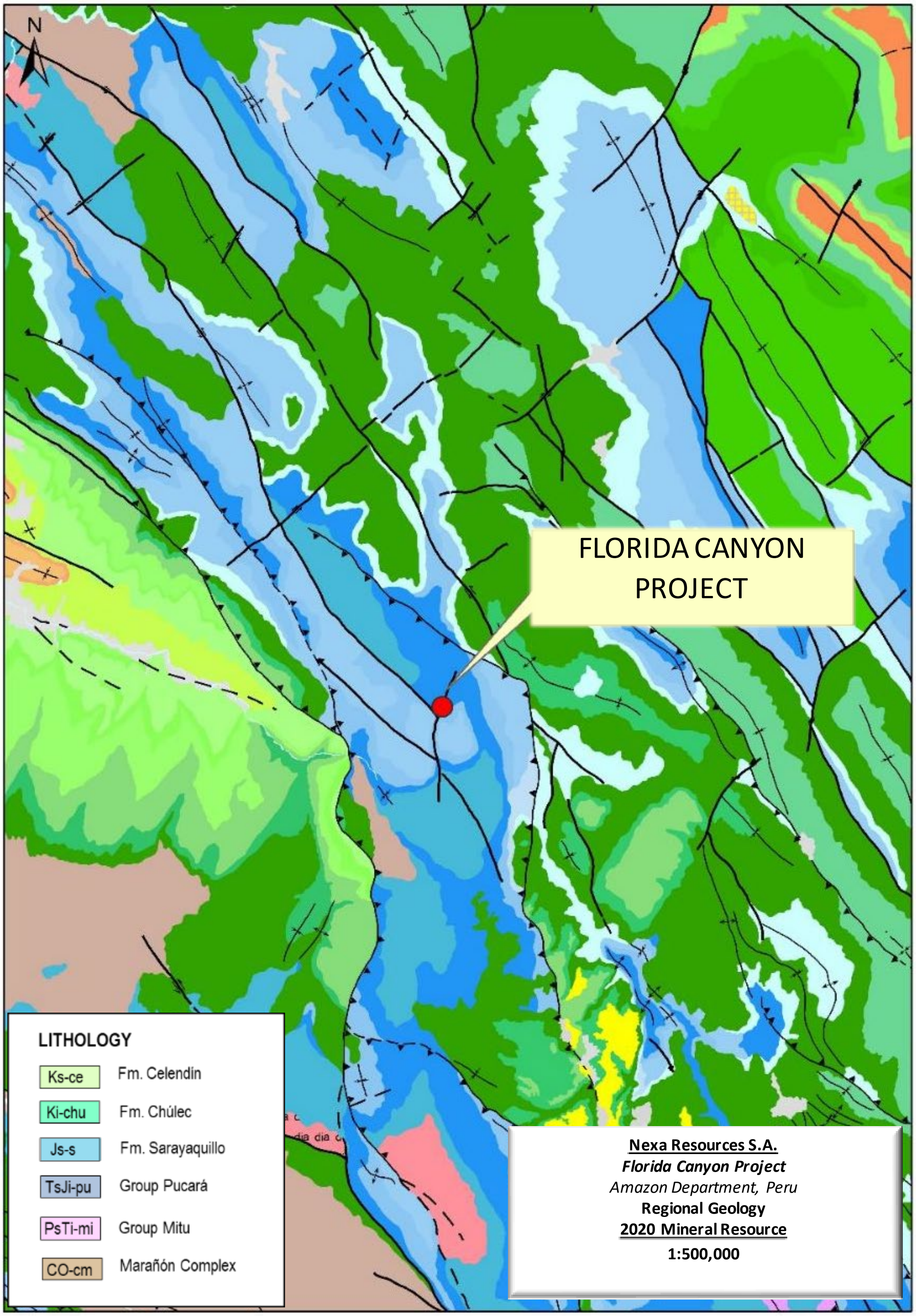

Figure 7-1 Regional Geologic Map

Source: Solitario, 2020 (translated)

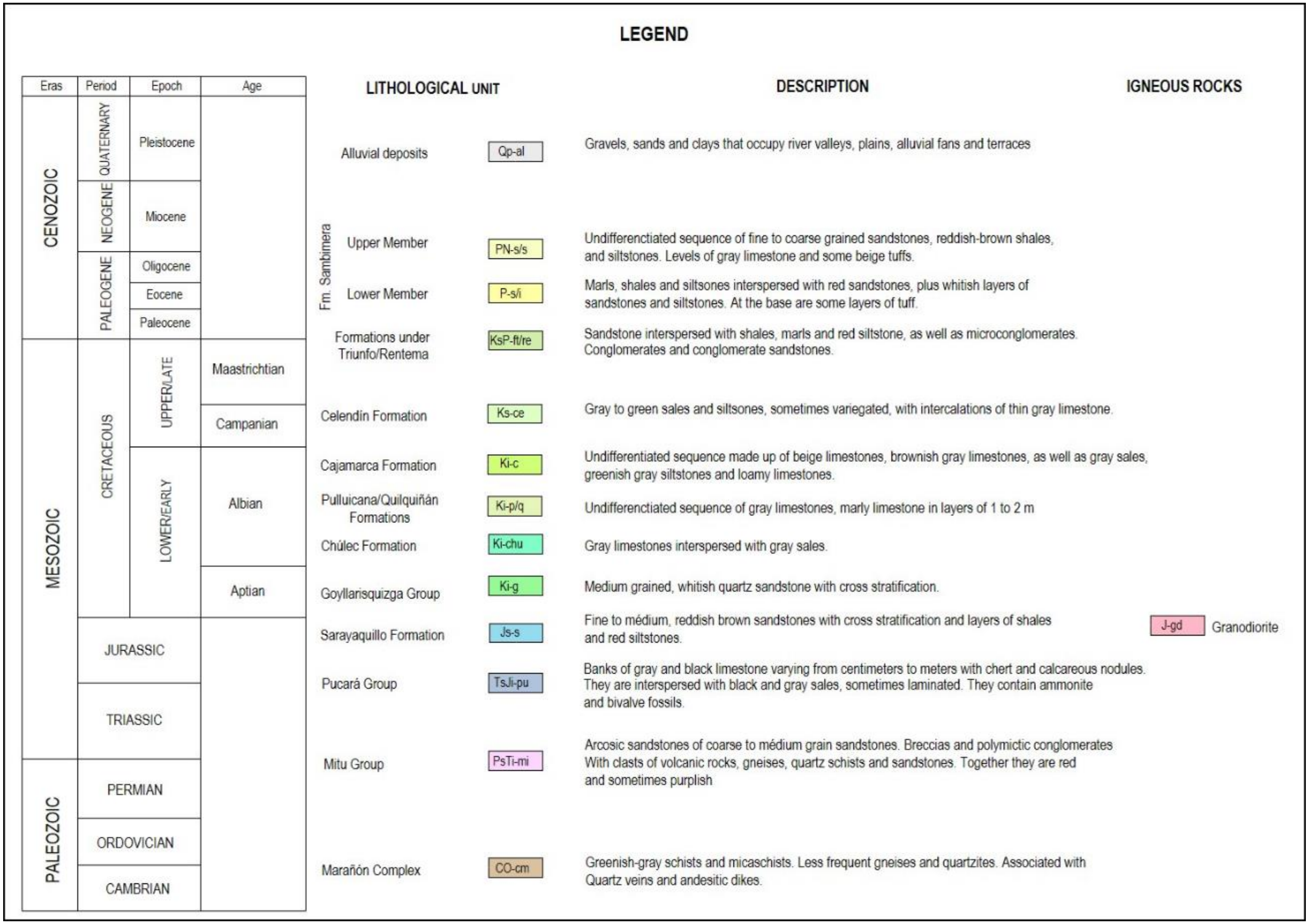

Figure 7-2 Legend of Regional Geology Map Figure 7-1

Source: Solitario, 2020 (translated)

7.2 LOCAL GEOLOGY

7.2.1 Lithography & Stratigraphy

A schematic stratigraphic column developed by Cominco and refined by Nexa shows the major geologic rock units in the Project area (Figure 7-3). The basement rocks are the Pre-Cambrian Marañón Complex consisting of gneisses, mica-schists, phyllites and quartzites. These are overlain by an angular unconformity with the overlying Permo -Triassic Mitu Group composed of a sequence of redbeds consisting of polymictic conglomerates interspersed with beds of fine-grained sandstones.

Figure 7-3 Project Area Stratigraphic Column

Source: Nexa, 2013b, translated by Solitario

Overlying the Mitu Group is the Pucará Group of Triassic - lower Jurassic age, which hosts the zinc-lead-silver mineralization of the Florida Canyon Project. The Pucará Group is divided into the Chambará Formation at the base, the Aramachay Formation in the middle and the Condorsinga Formation on top.

The Chambará formation has an approximate thickness between 650 m and 750 m in the project area, and consists of crinoidal packstone, wackstones and rudstones. It is divided into three members in the Florida Canyon vicinity; from bottom to top, they are Chambará 1, Chambará 2 and Chambará 3. The bulk of known zinc mineralization is hosted in Chambará 2. The stratigraphy between the distinctive Coquina (CM) and Intact Bivalve (IBM) paleontological marker horizons in Chambará 2 define a sequence of permeable higher energy facies within the Chambará 2 that control much of the especially strong dolomitization within the sequence.

The Aramachay formation lies conformably on the Chambará with a variable thickness between 150 m and 250 m, consisting of a monotonous sequence of black and limonitic shales and bitumen with thin interbedded nodular limestones. The Condorsinga Formation concordantly lies above, with restricted outcrop distribution due to erosion. It consists of calcareous gray mudstones with thicknesses varying between 150 m and 300 m.

The Corontochaca Formation of Upper Jurassic age lies unconformably on the Pucará Group. It outcrops in erosional remnants and is locally more than 300 m thick consisting of a package of monotonous oligomictic and polymictic fluvial calcareous sediments and colluvial limestone breccias with local fragments of Paleozoic or Precambrian fragments.

The Goyllarisquizga Formation occurs in angular unconformity over the Corontochaca and Pucará Group and is present mainly in the eastern and western sections of the Project area. It consists of poorly sorted yellowish to white sandstone deposited in coastal marine to fluvial-deltaic environments. It also contains some thin, lenticular intercalations of siltstones and mudstones whitish to reddish. The thickness ranges from 300 to 400 m.

7.2.2 Structure

The following discussion of structural geology in the Project area is adapted in part from an internal report by Cominco (2000).

The structure at Florida Canyon is dominated by a N50º-60ºW trending domal anticline (or doubly plunging anticline) as defined from the base of Chambará 2 formation. This domal anticline is cut on the west by the Sam Fault and to the east by the Tesoro-Florida Fault. The Sam Fault, which has been defined by drilling, has a north-south to northeast trend and a steep 80 to 85º westerly dip. The Sam Fault has an apparent scissor dip-slip displacement of >120 m in the north and <50 m in the south. To the south its trace is uncertain and complicated by northwest and possibly east-west structures. This appears to have been a long-lived structure, with its last strike-slip displacement being dextral. A facies change in the Chambará 2 from high energy to the east of the fault to low energy to the west many be due to original depositional features during growth fault formation that has important exploration implications.

At Florida Canyon there are also well-defined northwest and northeast fracture systems, which appear to have important controls on the location of mineralization. Mineralized structures occur in conjugate fractures, with N10º-50ºE trends present at a number of mineralized surface outcrops while trends of N50º-80ºW are identified at other showings. Mineralization of mantos within the Karen-Milagros area appears to be preferentially controlled by northeast feeder structures.

The Tesoro-Florida Fault defining the eastern limits of most drilling to date is a N15º-30ºW trending structure, part of a regional lineament, and defined by an escarpment. It is interpreted to have a steep dip, with its sense of motion not having been defined, but with the east block being structurally lower than the west block, which results in significantly deeper drilling on the east fault block to reach the Chambará 2 stratigraphy. Because most of the work has concentrated further west on the San Jorge, Karen Milagros and Sam Fault areas there is little information on the Tesoro-Florida Fault, but it likely has similarly complex splays as the Sam Fault and may be, like the Sam fault, a controlling feeder for untested mineral potential in the eastern area.

At both the Karen-Milagros and San Jorge areas, feeder structures have an important control on the mineralized mantos but also represent a significant portion of the resource as steeply dipping structural fillings and replacement. The displacement along these structures is not large although the exact throw is often difficult to ascertain due to the strong alteration and later mineralization. The interpretation of displacement is further obscured by likely subtle variation in thickness and lithology of local stratigraphic units on either side of structures due to growth faulting.

Pre-mineral karsting also played a role in controlling mineralization along with simple structural filling and passive replacement adjacent to conduits. Replacement of karst fragments and cave sediments are commonly observed in larger structurally controlled mineralized bodies. The configuration of mineralized structures as they control and merge with manto replacements often take the form of Christmas–tree breakthrough structures and will likely be shown to represent a larger proportion of the resource as more horizontally oriented drilling from underground workings supplants the dominantly high angle surface drilling performed to date.

Post mineral structure and karsting overprints earlier structural trends and controls in part oxidized remobilized mineralization.

7.2.3 Alteration

The alteration and solution overprints in the Florida Canyon deposit include dolomitization, pseudo brecciation and karstification, mainly affecting the limestones of Chambará 2 and locally Chambará 1 and 3. Dolomitization and karstification occurred in multiple events spatially overlapping the structural corridors Sam, San Jorge and Karen-Milagros. Dolomitization was an important control on the movement of mineralizing fluids and has been studied and logged in detail throughout all of the drilling campaigns. It is also modeled in this study as a limiting constraint on mineralization.

The alteration halo is open along structure in all directions and is especially pervasive in the stratigraphic interval lying between the paleontological marker horizons CM (Coquina Marker) and IBM (Intact Bivalve Marker) of the Chambará 2 formation. The alteration halo is composed mostly of medium and coarse-grained crystalline dolomite replacing calcareous packstone, rudstones, floatstones and wackestones. Mostly the dolomitic rudstones, and locally the packstones, transform laterally when in proximity of faults and major fractures (Sam, San Jorge and Karen-Milagros) to mineralized pseudobreccias and karst structures.

7.2.4 Mineralization

The zinc-lead-silver mineralization of the Florida Canyon deposit occurs as sulfides hosted in dolomitized zones of the Chambará 2 Formation. Dolomite paragenesis and later sulfide mineralization are controlled by a combination of porosity, permeability, and structural preparation. Metals occur in sphalerite and lesser galena, which contains silver. Minor mineralization is hosted in limestones, but the bulk of sphalerite and galena is hosted in dolomite.

In a number of core samples, the mineralization has very sharp contacts along the dolomitization boundary. Characteristic mineralization textures include massive and disseminated mantos, mineralization in dissolution breccias, collapse breccias and pseudobreccias. The different breccias and vein types are structurally controlled by faults of north-south and northeast-southwest direction.

The mineralization is characterized by the presence of sphalerite, galena and locally pyrite. Sulfide replacements occur in dolomitized limestone of variable grain sized and in solution breccias with white dolospar and lesser amounts of late generation calcite. Pyrite content is generally low, with percentages averaging less than 2% by volume. Sphalerite in mineralized sections has variable grain size from 0.1 to greater than 5 mm, with colors ranging from dark brown through reddish brown to light brown. It occurs as individual crystals or in massive form, sometimes displaying colloform textures with bands of slightly differing color zoning, indicators of polyphase hydrothermal deposition.

Early fine-grained sphalerite has evidence of later deformation and reactions to secondary mineralizing fluids. A second phase of more massive sphalerite mineralization is observed within the core of the deposit. These crystals are coarse-grained, regular, euhedral and show very little evidence of any post-depositional deformation. The sphalerite is contemporaneous with fine to coarse grained galena and is often overprinted with a later stage coarse-grained, euhedral galena.

The presence of zinc oxides, locally to considerable depths, is due to syngenetic oxidation, with later contributions of basin-derived connate water and movement of rainwater through fractures that leached the limestones and formed significant karst cavities.

7.3 Property Geology

The areas of current exploration interest are the Karen/Milagros, San Jorge and Sam Fault deposits. These mineralized zones are hosted in the dolomitized Chambará 2 sub-unit of the Pucará Group carbonates, bracketed by the Coquina and Intact Bivalve Marker beds. Geologic mapping and modeling include refining the extents of Chambará 2, and further defining the steeply dipping feeder structures to predict additional zinc-lead-silver mineralization. The outcrop geology of the deposit area is shown in Figure 7-4, with emphasis on the Chambará Formation.

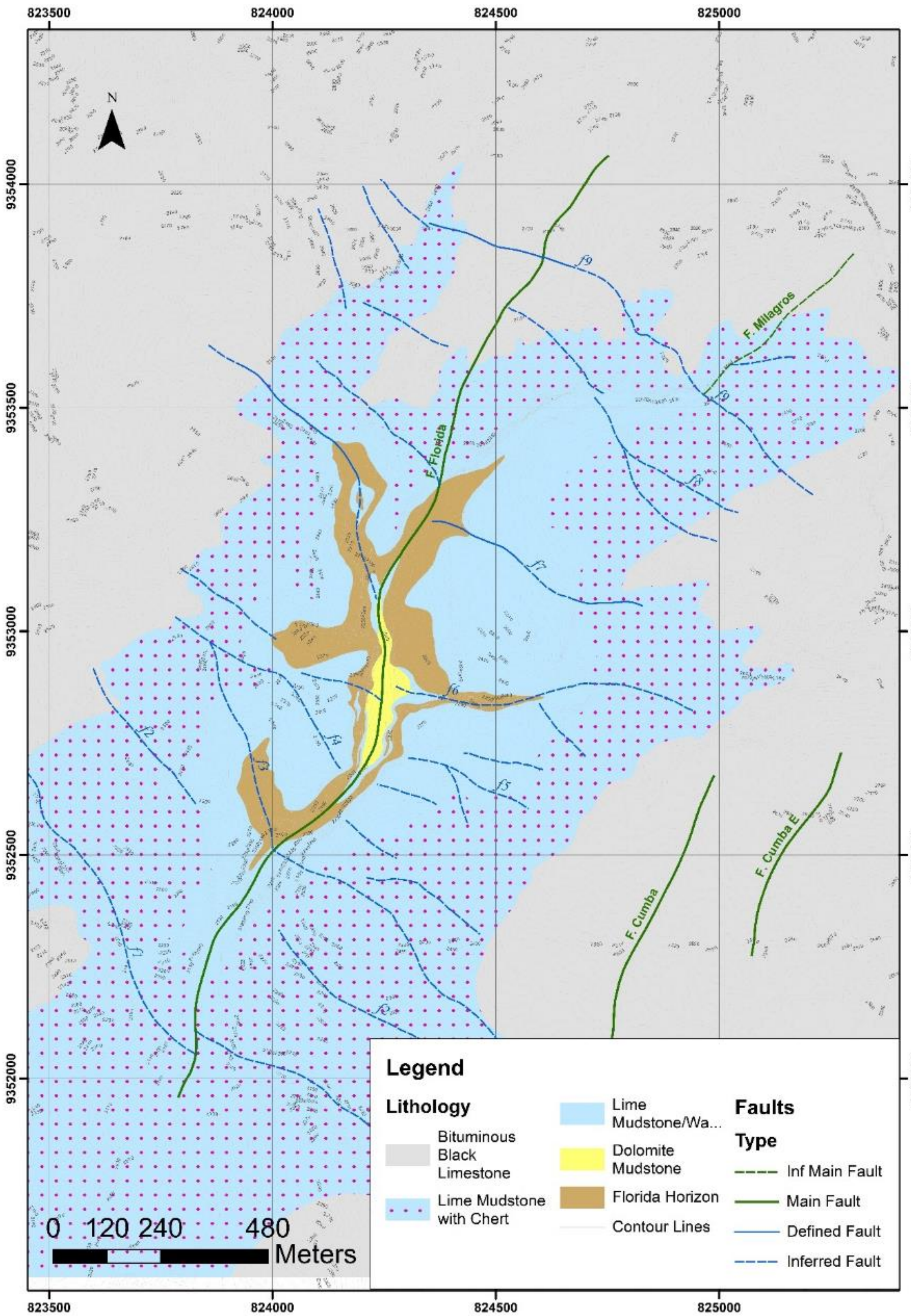

Figure 7-4 Florida Canyon Project Geologic Map

Source: Nexa, 2020 (translated)

7.4 SIGNIFICANT MINERALIZED ZONE

Local and regional geologic mapping, geologic drillhole logs, and the dome-shaped geometry of the deposit suggest the mineralization is hosted in a broad anticline structure. Florida Canyon is the collective name of the deposits in the Project area in Florida Canyon, and includes the Karen-Milagros, San Jorge, Sam Fault zones and similar mineralized strata between these areas.

Modeled manto zones are between 1 m and 9 m thick and occur over an area of about 1 km x 3 km and are open in all directions. Unmineralized gaps exist within the mineralized manto zones, as is typical for hydrothermal replacement deposits. Irregular steeply dipping replacement bodies also occur, frequently at the intersection of vein-like feeder structures and in karst-controlled mineralization.

Mineralization outcrops locally in a number of areas and has been drilled at depths of up to about 450 m below ground surface. Figure 7 4 is a west-facing cross section of the geologic model in the mineralized zone. Zinc mineralization occurs as massive sphalerite (ZnS) and is locally oxidized to smithsonite (ZnCO3) and hemimorphite (Zn4Si2O7 (OH)2). Lead occurs in galena (PbS), cerussite (PbCO3) and anglesite (PbSO4).

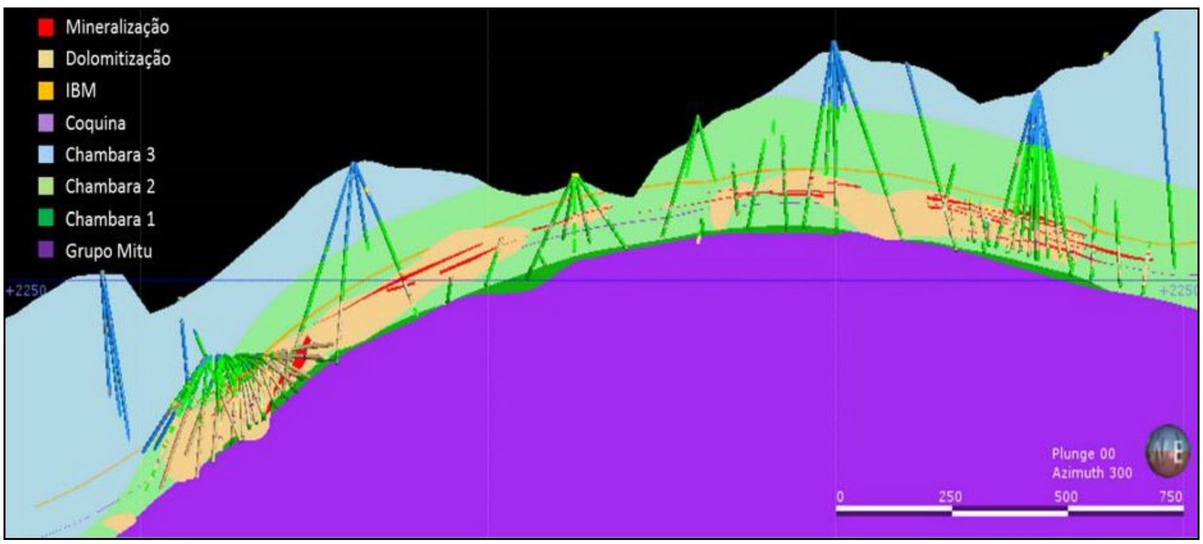

Figure 7-5 Cross Section of the Project Geologic Model

Source: Nexa, 2013b

8 DEPOSIT TYPES (ITEM 8)

MVT deposits are hosted in carbonate rocks and show cavity-filling or replacement-style mineralization. The characteristic minerals are sphalerite, galena, fluorite, and barite which provide clean concentrates of Zn and Pb. The host rock may be silicified, and common alteration minerals include dolomite, calcite, jasperoid and silica. MVT deposits are typically spatially extensive but limited by the permeability of the host rock units. This control makes them appear stratabound. Chemical and structural preparation are the main controls on permeability, and therefore, the extent of fluid migration and metal precipitation (Guilbert and Park, 1986).

Pb-Zn deposits in South America are hosted in the Mesozoic Carbonate sequence of the Pucará Group in the central Andes. In Peru, this type of deposit is represented mainly by the San Vicente and Shalipayco deposits (located in central Peru), and Florida Canyon, located in the Bongará Region of northern Peru.

The Florida Canyon Deposit is in the Eastern Cordillera of Peru within the limit of the Shipasbamba community of the Amazonas Department.

8.1 MINERAL DEPOSIT

An area of 20 km x 100 km extending from Mina Grande to north to 80 km south of the Florida Canyon deposit has become the focus of what is an emerging Mississippi-Valley Type (MVT) zinc and lead province, with many surface occurrences and stream sediment anomalies distributed throughout the Pucará Group. The main host rock of zinc and lead occurrences in the mineral district and Project area is dolomitized limestone, which may show karst or collapse breccia textures.

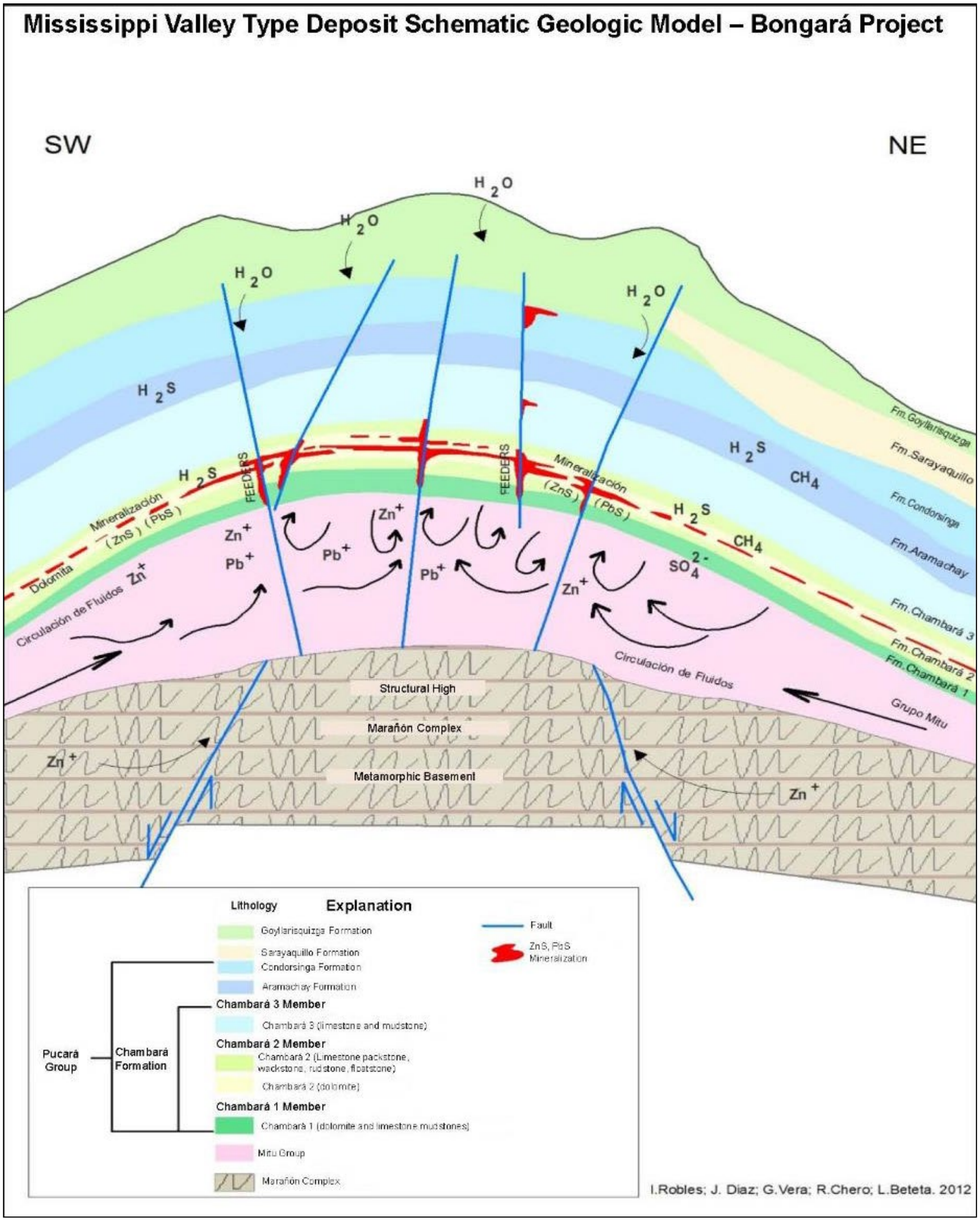

Figure 8-1 Mississippi Valley-Type Deposit Schematic Model

Source: Nexa, 2014a

9 EXPLORATION (ITEM 9)

9.1 RELEVANT EXPLORATION WORK

The Florida Canyon Project has identified and delineated mineral resources in the San Jorge, Sam, 1021, and Karen-Milagros areas.

In previous years, Cominco and Nexa executed detailed surface mapping and rock sampling programs of the areas near the reported resource. Stream sediment and soil samples were collected and analyzed as described in Section 6.2

An extensive regional reconnaissance exploration program was also conducted over a large area throughout the Mesozoic carbonate belt to the north and south of the Property. Geochemical samples were collected of stream sediments, soils and rocks.

During development of the San Jorge adit, Nexa completed geologic mapping and chip sampling of the underground workings. Results were applied to the Project geologic model in support of resource estimation and continued exploration drillhole planning.

Sampling of drill core is described in detail in Section 11. The regional stream sediment program collected sediments that were screened to -80 mesh, crushed and analyzed for a multielement suite by ICP. Soil samples collected were composites of B horizon soils and C horizon when accessible.

Rock sample methodology varied according to location. Grab samples were taken where outcrops were found that showed evidence of dolomitization of carbonate beds. Mineralized outcrops were cleared manually with machetes and shovels and systematically chip channeled. Channels were oriented perpendicular to bedding to most accurately represent stratigraphic thickness. Channel samples were limited to 2 m in length by Cominco and 1 m by Nexa. Most of the chip channel sampling of higher-grade mineralization has been conducted in the Karen Milagros zone and other areas in the central part of the Property where outcrops of mineralization are most common, as illustrated in Figure 9-1.

9.2 SIGNIFICANT RESULTS & INTERPRETATION

Exploration strategy for MVT deposits at the Florida Canyon project has been strongly influenced by the interpreted favorability of specific units of the stratigraphy of the region. Numerous occurrences of alteration and mineralization occur throughout the Pucara Group, but economic deposits have only been thus far located within the Triassic Chambará formation (Figure 7-2). More specifically the middle member of the Chambará Formation (Chambará 2) has been found to host the most persistent and highest grade manto deposits due to its higher permeability and susceptibility to altering and mineralizing fluids. Synsedimentary structures, formed during or slightly after sedimentation, controlled the flow of basinal brines that dolomitized and subsequently mineralized the carbonates. The mineral rich fluids migrated from these "feeders" laterally into the stratigraphic column to form mantos.

Economic resources have been delineated in both the stratigraphically controlled mantos as well as the feeders, such as the San Jorge and Sam mineralized bodies. The higher angle structures have also been subject to karst formation that further enhanced fluid flow and are themselves often well mineralized with higher grade wider mineralization e.g. San Jorge.

Particularly prospective locations to explore for these high grade, high tonnage deposits exist along the northeast trending lineaments (drainages) immediately north and south of Karen Milagros where outcropping massive mineralization may be expressions of breakthrough structures. These locations have not been adequately tested to date due to the difficult access for helicopter supported drilling. The completion of road access will facilitate testing of these targets.

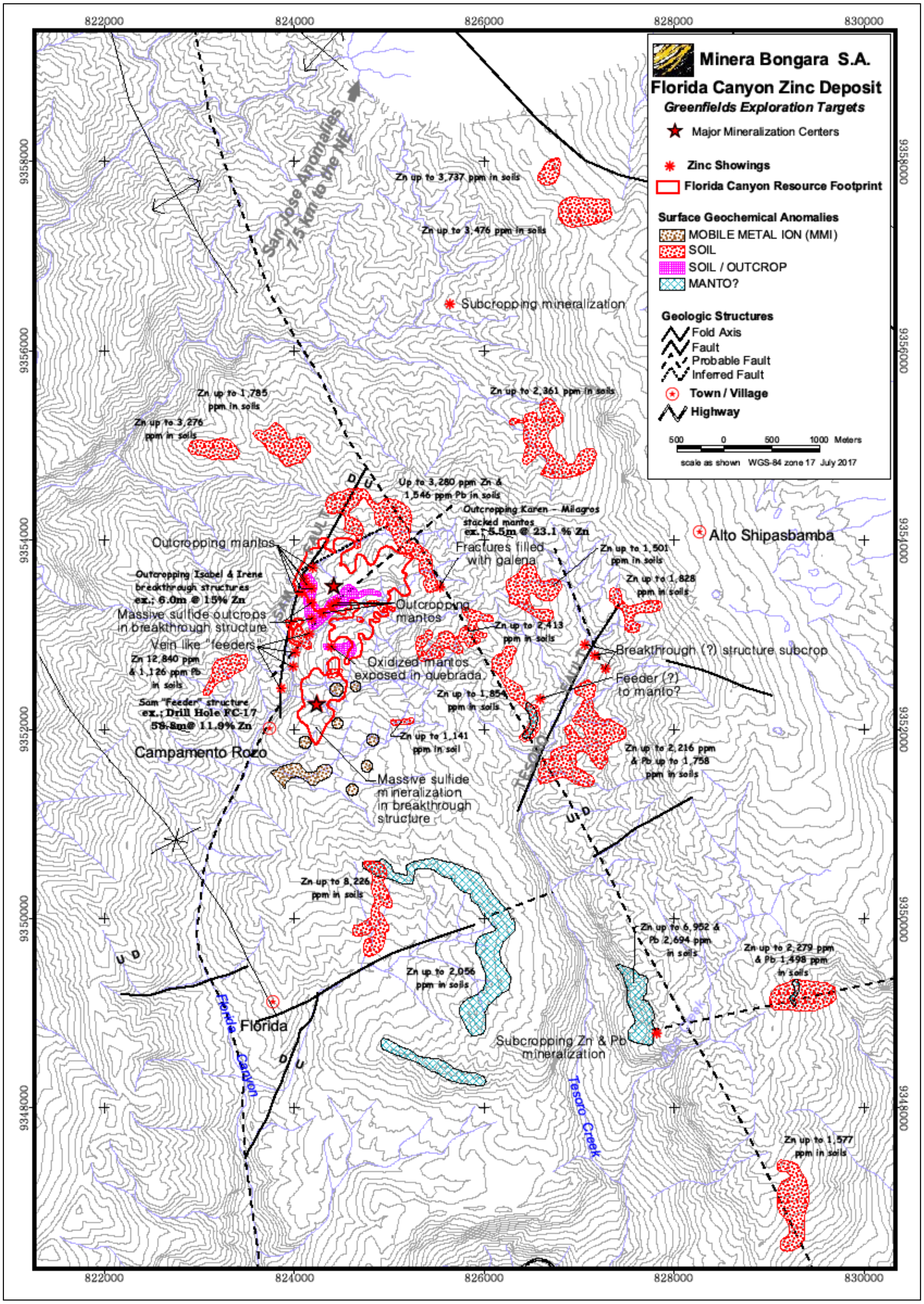

Figure 9-1 Florida Canyon Area Prospect and Geochemistry Map

These steeply dipping bodies occur over stratigraphic intervals that extend upwards into the Chambará 3, Aramachay and Condorsinga formations. The depth extent of mineralization in the feeders is currently unknown. These conduits enabled metal rich fluids to enrich the overlying stratigraphy and provide potentially important evidence for exploration.

Geochemical samples were collected at different stages during the life of the project. Information on sampling methods and results are scarce. Table 9-1 is a summary table on the surface sampling in the Project area.

Table 9-1 Summary of Total Surface Samples

Year	Company	Rocks	Soils	Stream Sediment
1996	Solitario		507	
1997	Cominco	1,240	2,361	3,426
1998	Cominco	1,404	3,821	1,773
1999	Cominco	380	1,752	491
2000	Cominco	155		26
2008	Votorantim	5	123	12
2009	Votorantim	77		20
2011	Votorantim	2		
2012	Votorantim	83	16	72
2019	Nexa	3		
TOTAL		**3,349**	**8,580**	**5,820**

Geochemical prospecting is very effective in locating the leakage halos in overlying stratigraphy around these structures. Initially stream sediments were used to identify geochemically enriched drainages and were followed up with prospecting and soil surveys to pinpoint mineralized centers. Although no detailed mapping has been done over much of the property, geologists made observations of the stratigraphic location within areas of high geochemical response.

Figure 9-2 shows the results of the regional geochemistry program. The area in the immediate vicinity of the Florida Canyon resource exhibits very high base metal content in stream sediment, soils and rocks. Only a small area of Chambará 2 crops out in this area as shown in orange color on the geologic map of the Florida/Tesoro vicinity (Figure 9-3). Outcropping high grade mineralization in this window of Chambará led to the initial discovery of the known Florida Canyon deposits.

Nearby, there are significant soil anomalies in higher stratigraphy that warrant future exploration drilling. These anomalies occur in undrilled areas within the horst that hosts the current resources as well as to the west of the Sam Fault and East of the Tesoro Fault.

Further to the north two very large and strong soil anomalies have been defined by the regional geochemical sampling program (Figure 9-2). The San Jose soil anomaly is of similar size and grade to that at Florida Canyon, however; it is untested with drilling. Based on the clear relationship between surface geochemistry and subsurface mineralization at Florida Canyon, drilling is warranted in the San Jose and Naranjitos areas.

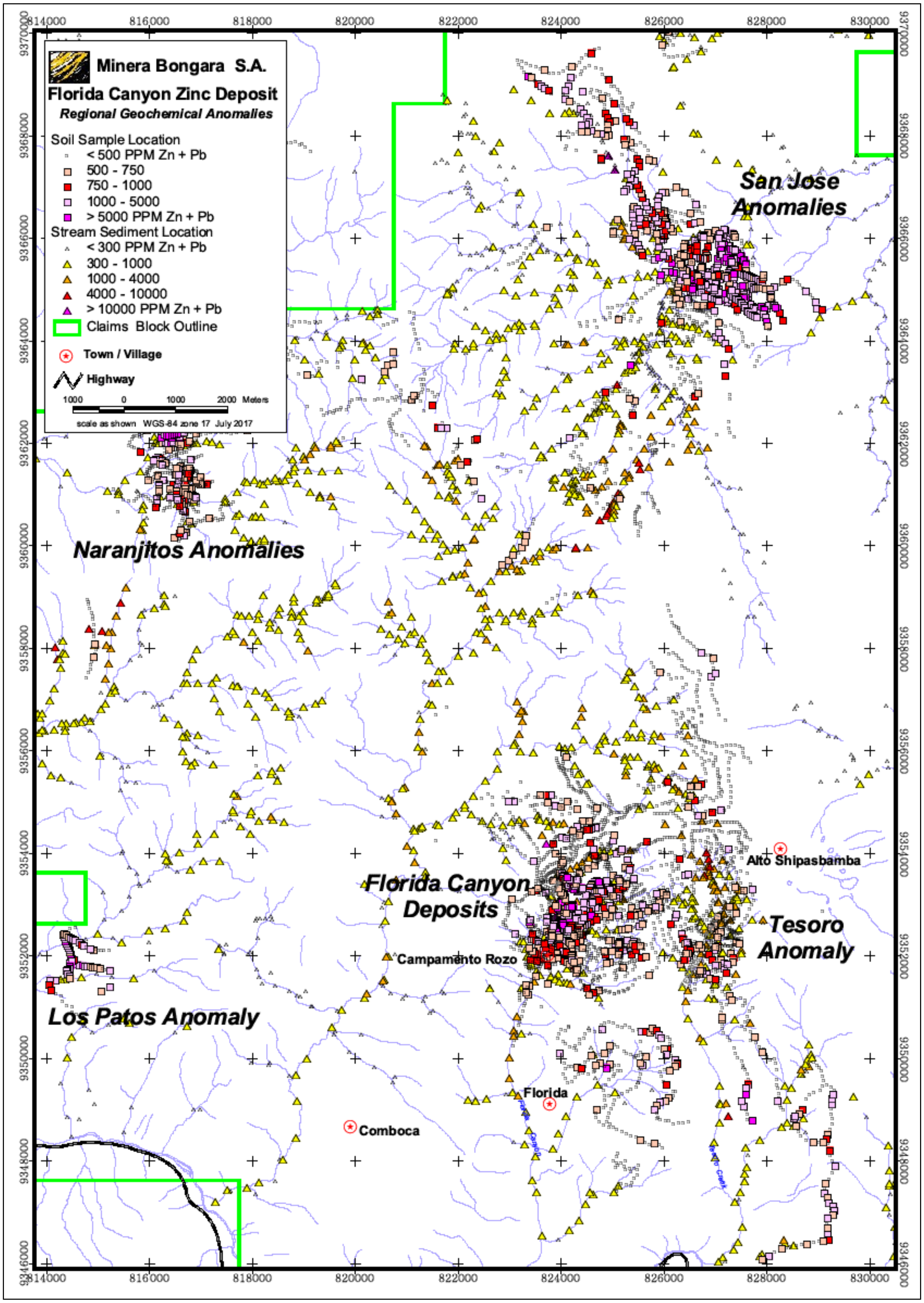

Figure 9-2 Regional Geochemical Results

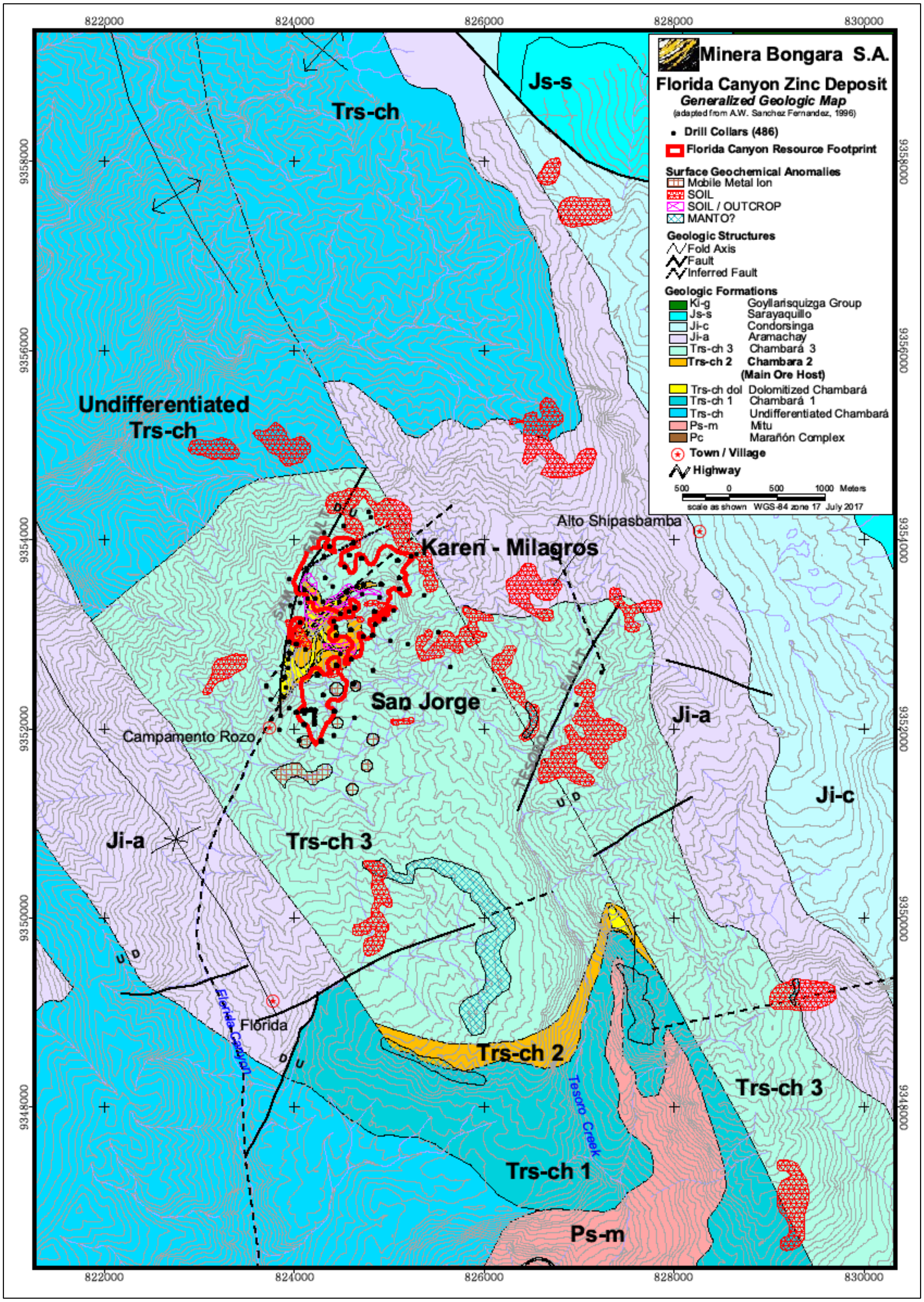

Figure 9-3 Florida Canyon Area Simplified Geology, Resource and Drillhole Map

10 DRILLING (ITEM 10)

The database used for modeling and estimation of mineral resources includes 545 drillholes, with a total of 136,758.1 m drilled at the Florida Canyon Project (Table 10-1). The full collar database is listed in Appendix A. All of the holes were diamond drilling, with 447 holes drilled from surface and 98 holes drilled from the San Jorge adit (underground). Drilling began in 1997 by Cominco, followed by Votorantim between 2006 and 2013, and the last campaign was carried out by Nexa in 2018 and 2019. The drilling was completed by contracting companies Boart Longyear in 1997, MDH Bradley from 1998-2013, and Bresta from 2018-2019. Figure 10-1 is a map of the drillhole locations at the project.

Table 10-1 Drilling Summary in Florida Canyon

Surface				San Jorge Adit			Total		
Year	**Number**	**Meters**	**Type**	**Number**	**Meters**	**Type**	**Number**	**Meters**	**Type**
1997	34	8,409.70	DTH				34	8,409.70	DDH
1998	8	2,108.35	DDH				8	2,108.35	DDH
1999	9	3,977.90	DDH				9	3,977.90	DDH
2000	31	10,297.00	DDH				31	10,297.00	DDH
2006	26	4,353.50	DDH				26	4,353.50	DDH
2007	33	11189.3	DDH				33	11,189.30	DDH
2008	54	16,468.85	DDH				54	16,468.85	DDH
2009	13	3,611.30	DDH				13	3,611.30	DDH
2010	42	12,242.40	DDH				42	12,242.40	DDH
2011	25	8,168.60	DDH	19	2,947.55	DDH	44	11,116.15	DDH
2012	59	14,163.00	DDH	51	9,395.55	DDH	110	23,558.55	DDH
2013	74	9,120.70	DDH	28	3,268.35	DDH	102	12,389.05	DDH
2018	5	2,202.90	DDH				5	2,202.90	DDH
2019	34	14,833.20	DDH				34	14,833.20	DDH
Total	**447**	**121,146.70**		**98**	**15,611.45**		**545**	**136,758.15**	

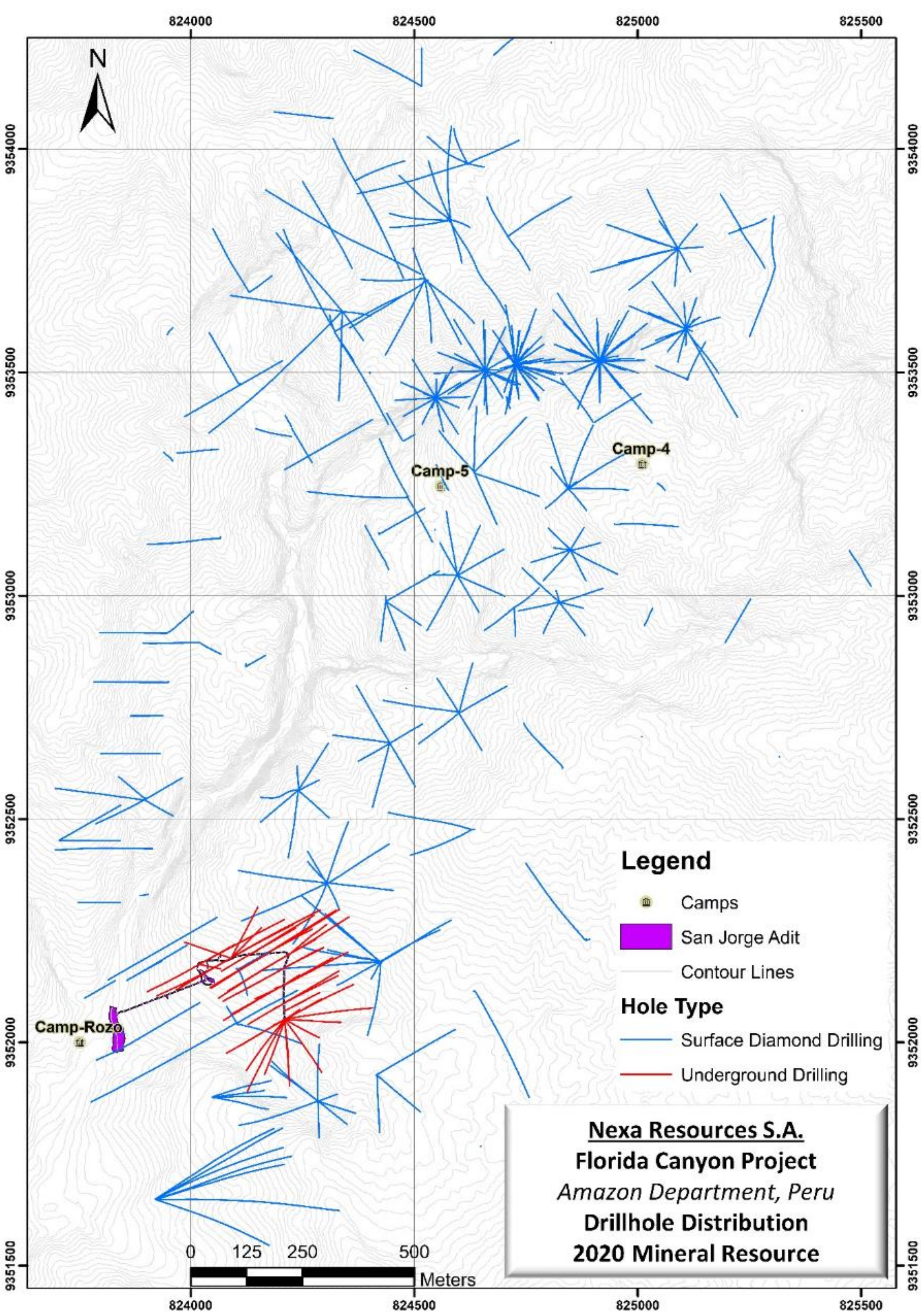

Figure 10-1 Drillhole Location Map

Source: Nexa, 2020 (translated)

10.1 PROCEDURES

Drilling procedures were coordinated and supervised by Cominco and Nexa geologists and were approved by the Exploration Manager. Diamond drillhole targeting is prepared by the geologists. Coordinates and orientation of the drillhole collars are communicated to a surveying supervisor who positions the drill precisely which is then validated by the geologist.

Cominco surface drilling was executed with a helicopter-supported LD-250 diamond core rig operated by Bradley Bros. Limited. Sermin completed the underground development and also completed drilling from the San Jorge adit with a LM-70 electric diamond core rig.

Drilling was performed on two 12-hour shifts with full 24-hour geological supervision by a geologist. The rig geologist role included:

- Coordination and communication between the drilling contractor and Nexa;
- Monitoring drilling procedures and inspecting the core extraction for sample quality;
- Boxing the core;
- Measuring and recording core recovery and Rock Quality Designation (RQD); and
- Completing a preliminary geological log.

Downhole surveys were completed with a Reflex EZ-Shot survey tool by the drillers at varying spacing, as summarized in Table 10-2. The survey records are stored digitally at the core facility. Drillhole collar locations were surveyed by Nexa with a GPS-based instrument.

Table 10-2 Downhole Survey Data Point Spacing

Drilling Program (Year)	Survey Spacing (m)
2010	100
2011	50
2012 to 2013	20
2018	25
2019	5

The identification of each drillhole was generated in a systematic and specific format which includes the camp, mining unit, year and sequential drillhole number. Basic drill information is entered into the database and archived within four days after the completion of the drillhole.

Drilling information was stored in a structured directory and was backed up to the central server in Brazil in the case of Nexa and in Vancouver for drilling conducted by Cominco. The information available in the drillhole database includes Collar, Survey, Assay and Lithology.

Surface drilling normally began with a HQ-diameter core (65mm) and is reduced to a NQ-diameter (45mm) hole if poor ground conditions necessitated.

After a drillhole is completed, the boxes were taken to a logging room where a logging and sampling was performed by a company or a contracted geologist. A photo was taken of each box for all holes and is stored on the server. Geologic logging was performed according to Cominco or Nexa Resources standards using geological, lithological, mineralogical and alteration terms.

Logging was recorded digitally using the software DH Logger, which is imported directly into Fusion Data Management Software. Fusion Software manages the database and automatically incorporates core and sample logging. The database administrator is responsible for verifying and validating the data and combining it into a series CSV files to later import into geological modeling software programs.

10.2 INTERPRETATION & RELEVANT RESULTS

The geologic logging and analytical data were added to the Project database after validation and applied to modeling and resource estimation. The modeling and resource estimation are discussed in detail in Section 14 (Mineral Resources). The true thickness of the mineralized intercepts varies from 80 to 100% of the drilled length and varies with the orientation of the drillhole.

Nexa's documentation of drilling procedures indicate that there is little or negligible sampling bias introduced during drilling. Nexa specifically analyzed the data for bias and the results are very appropriate with very low bias.

Gustavson considers the drilling and sample handling procedures to be appropriate for the geology, conducted according to industry best practice and standards, and the relevant results are sufficient for use in resource estimation.

11 SAMPLE PREPARATION, ANALYSIS & SECURITY (ITEM 11)

11.1 SAMPLING METHODS

Sampling procedures at the Florida Canyon Project are preformed according to the Nexa Procedure (PS-EXP-GTO-009-PT9).

Geologic core sampling was carried out from 0.3 m to 2.0 m, except when encountering mineralogical, structural, or lithological contacts. For these cases, one sample was taken per domain, either lithological, structural, or mineralogical. All massive sulfides were sampled, and additional “support” samples were taken on both sides of the core box that are within the surrounding carbonate rocks to ensure that the entire mineralized zone is sampled.

Sampling was done under the supervision of the lead geologist who defined the length of the sample and cut line. Core was sampled by sawing. If a sample was severely fractured, 50% of the fragmented material was taken as a sample, stored in a prelabeled bag, and sent to ALS laboratory, while the remaining sample is kept as back up. Figure 11-1 shows the process for core sampling.

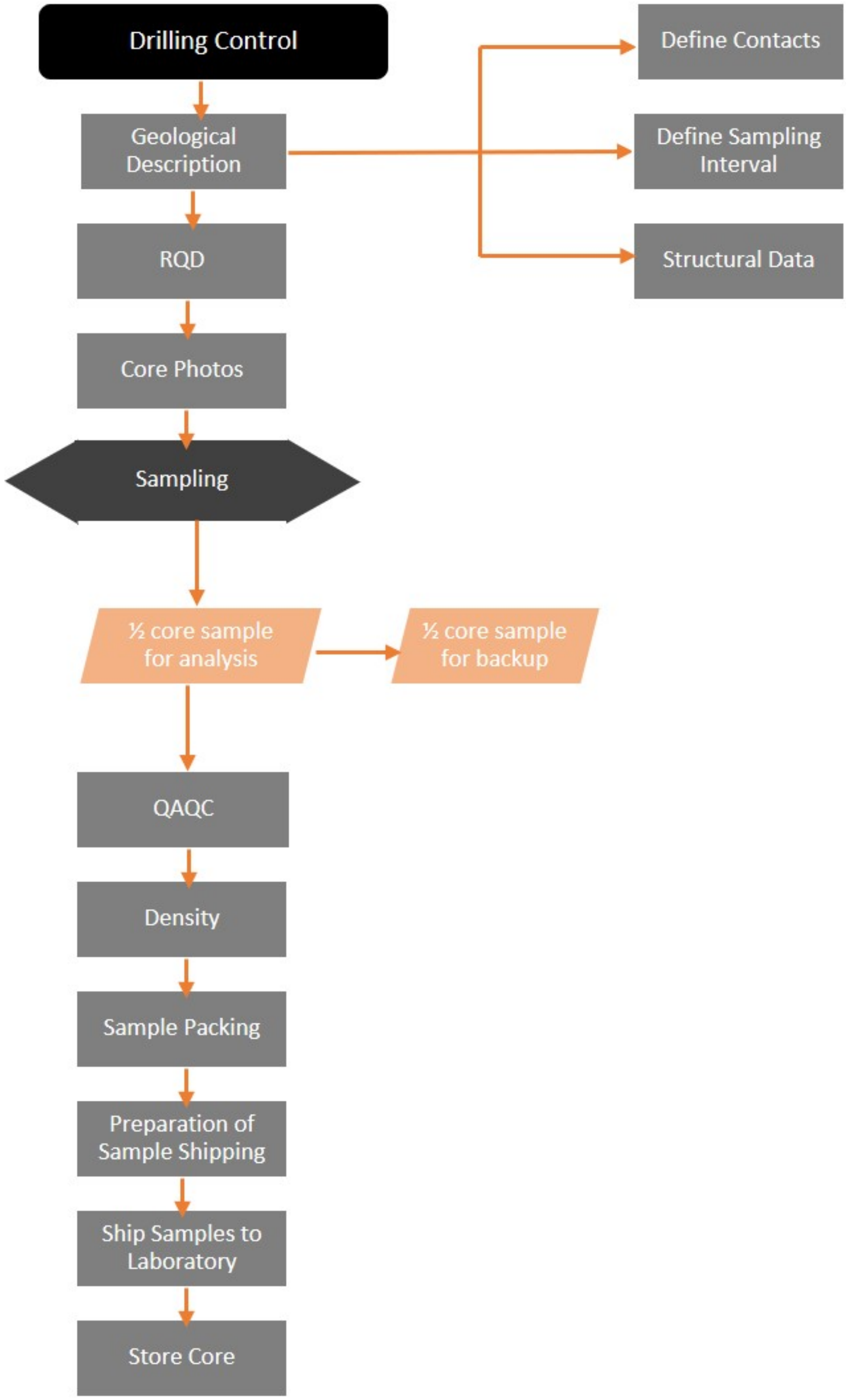

Figure 11-1 Diamond Core Sampling Process

Source: Nexa, 2020 (translated)

11.1.1 Sampling for Geochemical Analysis

After photographing the core and completing geotechnical and geologic logging, a geologist marked the core for sample intervals that averaged 100 cm long. Samples had a minimum length of 30 cm and a maximum of 150 cm but were defined so that 100 cm samples were maintained as much as possible. Cut lines parallel to the core axis were drawn by the logging geologist, to ensure nearly symmetrical halves and minimal sampling bias relative to any visible mineralization. The core was cut on a rock saw with a 40 cm blade, under supervision of a Project geologist. After the core was cut, both halves were replaced in the core box.

Samples were always taken from the left side of the saw-cut core, double bagged and marked with sample numbers in two places. These were transported in larger bags containing seven samples each by Mobiltours freight company to the ALS Minerals laboratory in Trujillo or Lima, operated by ALS Minerals. Prior to 2012, analysis was completed in Trujillo. Since then, it was done in Lima.

Cominco also split the core samples and sampled half for geochemical analysis. Sample breaks were determined by geologic criteria. Cominco core samples were analyzed by Acme Labs, in Lima, Peru.

11.1.2 Sampling for Density Measurement

Specific gravity (SG) measurements were completed on site by Nexa on every sample obtained from the 2018-2019 core. SG measurements were completed on all mineralized intervals. Three SG measurement methods were used:

- Volume displacement;
- Hydrostatic; and
- A mesh method for broken material.

These techniques were designed and implemented by Inspectorate Services Peru SAC. A group of samples was also sent to an external lab to validate the results in the field. Table 11-1 shows the number of density samples taken per year by different campaigns. Figure 11-2 is a map displaying the distribution of the density samples.

Table 11-1 Total number of Density Samples taken per year

Campaign	Type of Sample	No. Samples
CO1997	Drill Holes	194
CO1998	Drill Holes	8
CO1999	Drill Holes	10
CO2000	Drill Holes	44
VM2006	Drill Holes	124
VM2007	Drill Holes	233
VM2008	Drill Holes	258
VM2009	Drill Holes	177
VM2010	Drill Holes	264
VM2011	Drill Holes	792
VM2012	Drill Holes	2,024
VM2013	Drill Holes	4,077
NEXA2018	Drill Holes	111
NEXA2019	Drill Holes	879
Total		**9,195**

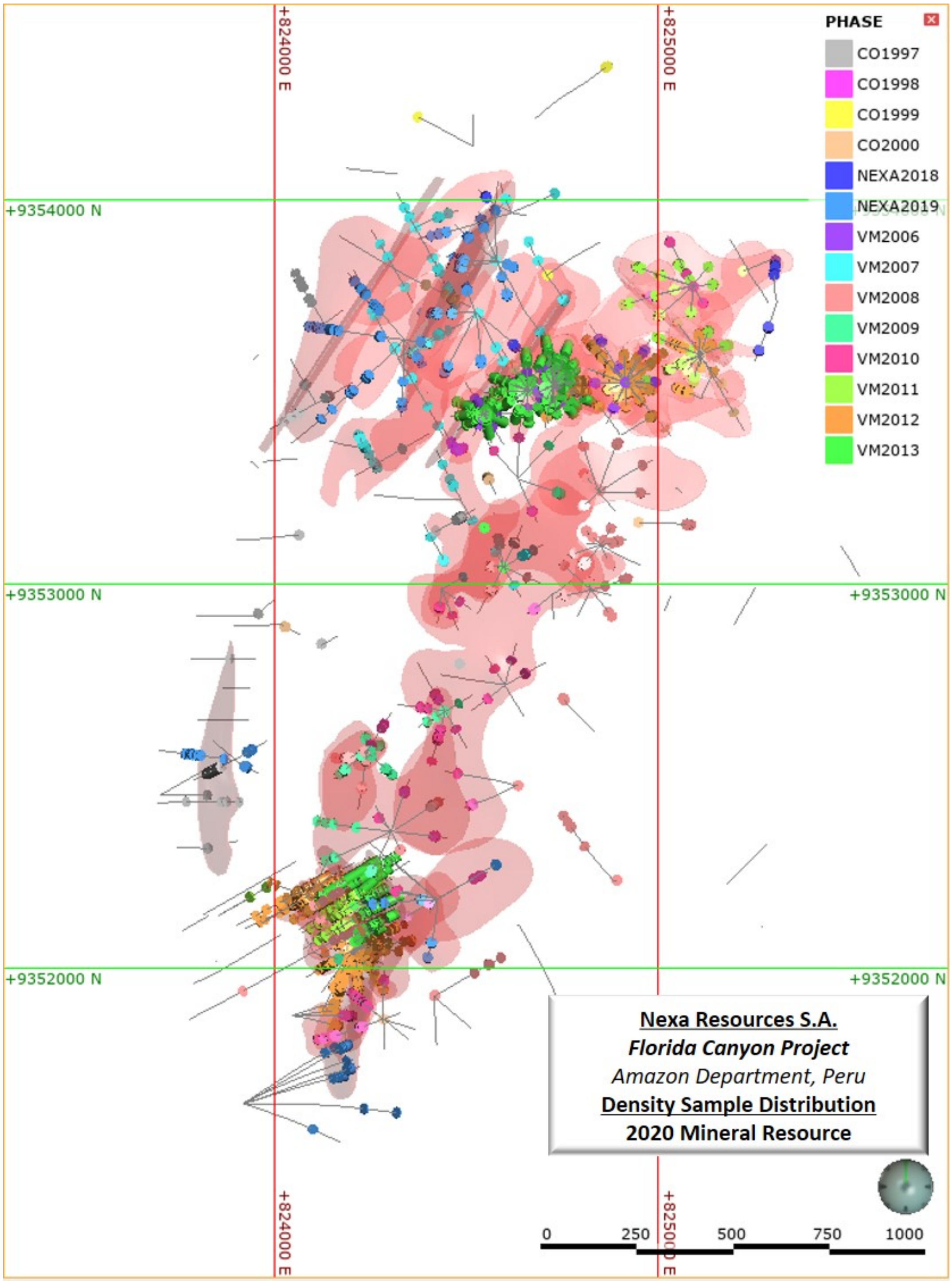

Figure 11-2 Density Sample Distribution

Source: Nexa, 2020 (translated)

11.2 SECURITY MEASURES

During the site visit, the observed sample storage was secure, and provided adequate protection from rainfall. Sample security and chain of custody were maintained while the samples were transported from the core shed in Shipasbamba to Lima. Assay certificates are retained in the Nexa office in Lima. Analytical data is loaded directly from the laboratory results files to the drillhole database, to minimize the risk of accidental or intentional edits.

11.3 SAMPLE PREPARATION FOR ANALYSIS

ALS Minerals (ALS) in Trujillo or Lima, Peru, completed sample preparation and analysis for all Nexa core samples. ALS is an independent, global analytical company recognized for quality, and is used by many exploration and mining companies for geochemical analysis. Current certifications and credentials include ISO 17025:2005 Accredited Methods & ISO 9001:2008 Registration in Peru, Brazil, Chile and Argentina (ALS Minerals, 2014a).

Upon delivery at the lab, bar coded sample identification labels were scanned, and the samples were registered to the Laboratory Information Management System (LIMS). Samples were weighed, and then air-dried in ambient conditions. Excessively wet samples were dried in an oven at a maximum 120°C. The sample preparation and analysis procedures used are summarized in Table 11-2. Specific analytical procedures and method detection limits for elements in the suite are reported in Table 11-3.

After analysis was complete, the remaining coarse reject and pulp samples were returned to the Florida Canyon core shed for storage.

Cominco analyzed samples with visible zinc or lead mineralization by atomic absorption spectrophotometry. All samples containing greater than 10,000 ppm zinc and lead were then analyzed by wet chemistry and the latter results were recorded in the data base.

Table 11-2 Analytical Codes and Methods

Procedure Code	Description
Sample Prep	
CRU-31	Crush to 70% less than 2 mm.
SPL-21	Riffle split off 1kg and retain the coarse reject.
PUL-32	Pulverize split to better than 85% passing 75 microns.
Multi-Element Methods	
ME-ICP61, -a	Multi-element Inductively Coupled Plasma method with Atomic Emission Spectroscopy analysis. Includes 4-acid, "near-total" digestion of 0.5 g sample.
(+)-AA62	HF, HNO3, HClO4 digestion, HCl leach and Atomic Absorption Spectroscopy analysis.
(+)-VOL70	Volumetric titration for very high-grade samples.
XRF10	X-Ray fluorescence on fused pellet, 5 g sample.
Element-Specific Methods	
Au-AA23	Gold by fire assay and Atomic Absorption Spectrometry, 30 g sample.
Au-AA25	Ore-grade gold by fire assay and Atomic Absorption Spectrometry, 30 g sample.
Au-GRA21	Gold by fire assay and gravimetric finish, 30 g sample.
Hg-CV41	Trace level mercury by aqua regia and cold vapor/AAS.
Hg-ICP42	High grade mercury by aqua regia and ICP-AES.

Procedure Code	Description
In-MS61	Multi-element Inductively Coupled Plasma method with Mass Spectrometry detection. Includes 4-acid, "near-total" digestion of 0.5 g sample.
S-IR08	Total sulfur by Leco furnace.

Source: ALS Minerals, 2014b,

Table 11-3 Analyzed Elements and Method Detection Limits

Element	Symbol	Method	Unit	Lower MDL	Upper MDL	Overlimit Method	Unit	Lower MDL	Upper MDL	Overlimit Method	Unit	Lower MDL	Upper MDL
Silver	Ag	ME-ICP61	ppm	0.5	100	Ag-AA62	ppm	1	1,500				
Aluminum	Al	ME-ICP61	%	0.01	50								
Arsenic	As	ME-ICP61	ppm	5	10,000								
Barium	Ba	ME-ICP61	ppm	10	10,000	ME-ICP61a	ppm	50	50,000	XRF10	%	0.01	50
Beryllium	Be	ME-ICP61	ppm	0.5	1,000								
Bismuth	Bi	ME-ICP61	ppm	2	10,000								
Calcium	Ca	ME-ICP61	%	0.01	50								
Cadmium	Cd	ME-ICP61	ppm	0.5	1,000	Cd-AA62	%	0.0005	10				
Cobalt	Co	ME-ICP61	ppm	1	10,000								
Chromium	Cr	ME-ICP61	ppm	1	10,000								
Copper	Cu	ME-ICP61	ppm	1	10,000								
Iron	Fe	ME-ICP61	%	0.01	50								
Gallium	Ga	ME-ICP61	ppm	10	10,000								
Potassium	K	ME-ICP61	%	0.01	10								
Lanthanum	La	ME-ICP61	ppm	10	10,000								
Magnesium	Mg	ME-ICP61	%	0.01	50								
Manganese	Mn	ME-ICP61	ppm	5	100,000								
Molybdenum	Mo	ME-ICP61	ppm	1	10,000								
Sodium	Na	ME-ICP61	%	0.01	10								
Nickel	Ni	ME-ICP61	ppm	1	10,000								
Phosphate	P	ME-ICP61	ppm	10	10,000								
Lead	Pb	ME-ICP61	ppm	2	10,000	Pb-AA62	%	0.001	20	Pb-VOL70	%	0.01	100
Sulfur	S	ME-ICP61	%	0.01	10	S-IR08	%	0.01	50				
Antimony	Sb	ME-ICP61	ppm	5	10,000								
Scandium	Sc	ME-ICP61	ppm	1	10,000								
Strontium	Sr	ME-ICP61	ppm	1	10,000								
Thorium	Th	ME-ICP61	ppm	20	10,000								
Titanium	Ti	ME-ICP61	%	0.01	10								
Thallium	Tl	ME-ICP61	ppm	10	10,000								
Uranium	U	ME-ICP61	ppm	10	10,000								
Vanadium	V	ME-ICP61	ppm	1	10,000								
Tungsten	W	ME-ICP61	ppm	10	10,000								
Zinc	Zn	ME-ICP61	ppm	2	10,000	Pb-AA62	%	0.001	30	Zn-VOL70	%	0.01	100
Gold	Au	Au-AA23	ppm	0.005	10	Au-AA25	ppm	0.01	100	Au-GRA21	ppm	0.05	1,000
Indium	In	In-MS61	ppm	0.005	500								
Mercury	Hg	Hg-CV41	ppm	0.01	100	Hg-ICP42	%	0.1	10				

Source: Nexa (2014b),

11.4 QA/QC PROCEDURES

Nexa has a well-established QA\QC protocol since 2007 for core samples from operating mines and brownfield/greenfield projects. Nexa uses a corporate database (GDMS Fusion) from Datamine since 2017, which replaced the previous corporate database system used from 2007 to 2016. The current database system has several default laboratory packages, specific for different

Business Units (ore deposit types/countries) with pre-defined preparation and assay methods, reporting units and over-limit methods. All assay dispatches from all mines and projects follows the same protocols for each medium type (core, rock, soil, stream sediment samples). All written protocols are in a corporate internal system that requires revision and update every three years.

Nexa's Quality Control includes three types of duplicates (pulp, coarse rejects and ½ core duplicates), blank controls and certified standards. Inter-laboratory checks are also carried out in annual basis at certified laboratories. Fusion database has a collection of pre-defined QA\QC charts for each type of control where Nexa parameters for each control are built in. All blanks and certified standards are approved and registered in Fusion by the database administrator. Nexa protocols for construction and certification of new standards from operating mines and projects include a minimum of ten laboratories and minimum of five samples per lab in the Round Robin. Laboratories need to be form different continents and only three laboratories from the same group are allowed.

Every mine and advanced projects provide a detailed QA\QC report at least once a year and they are appended into Mineral Resource update Technical Reports.

For assay report import procedures into the GDMS Fusion database there is a safe and well-defined routine stablished by Nexa using the available lab import profile tools from Fusion. There are customized lab import profiles for each laboratory used by Nexa. These lab import profiles are created only by the Fusion administrator after defining with all laboratories the assay report layout including standard headings information required for import. The template accounts for standardized unit definition for each metal (g/t, ppm, %) and automatic built in overlimit assay methods. Assay report import routine into Fusion is carried out by the nominated Qualified Person for Fusion. Fusion has several validation checks for assay import and verifies all configurations defined in the lab packages mentioned above.

The 2018-2019 quality assurance/quality control (QA/QC) program at the Florida Canyon Project and its processes complies with current industry best practices. A total of 1,177 greenfield exploration samples were analyzed at an ALS laboratory (Appendix B). 187 control samples were inserted, making up 15.9% of the total samples analyzed. The results of the processing and evaluation of QC data are as follows:

- Coarse blanks show no evidence of contamination during the laboratory sample preparation and analysis process. ALS performed ICP MS analysis for all samples.
- Twinned samples indicate an acceptable error rate (<10%).
- Coarse and fine duplicates indicate an acceptable error rate (<10%). Apart from coarse duplicate (RG) in Zn, 2 out of 11 samples failed in low grades.
- The standards show acceptable accuracy in all of the elements evaluated (Ag, Cu, Pb, Zn).
- The external check validated the accuracy between the secondary laboratory (Certimin) and the primary laboratory (ALS) (<5.0% variation).

Overall, coarse blanks, duplicates, and standards results are considered acceptable and valid. A summary of the results is in Table 11-4.

Table 11-4 QA/QC Insertion of Samples 2018-2019 Campaign

Control Type		No. Samples	Insertion Ratio
Blanks	Coarse	23	1.95%
Standards	Low Grade (SPY-01)	19	1.61%
	Medium Grade (SPY-02)	19	1.61%
	High Grade (SPY-03)	20	1.70%
Duplicates	Coarse Duplicate (RG)	11	0.93%
	Twin Duplicate (RP)	11	0.93%
	Fine Duplicate (DP)	58	4.93%
	External Check (DC)	26	2.21%
TOTAL		**1,177**	**15.89%**

11.4.1 Standards

Summaries of the Standard Reference Material (SRM) certified values and analytical results for silver, copper, lead and zinc are shown in Table 11-5. The certified Standard Reference Material, ST800044B. Other, lower-grade reference materials made from Florida Canyon core were also included. Example lab results for Zn Standards are shown in Figure 11-3.

Table 11-5 QA/QC Standard Bias % Results 2018-2019 Campaign

Lab	Element	SPY-01		SPY-02		SPY-03		Comments
		n	Bias %	n	Bias %	n	Bias %	
ALS	Ag ppm	19	-1.69	19	2.53	20	6.25	
	Cu %	19	-9.5	19	-3.6	20	-2.19	Very low Cu grade in standard SPY-01
	Pb %	19	2.2	19	-0.96	20	0.36	
	Zn %	19	-1.41	19	0.83	20	-0.82	

0 - 5% bias	Excellent	>10% bias	Reject
5 - 10% bias	Attention		

STD Bias % = (average/certified value) - 1

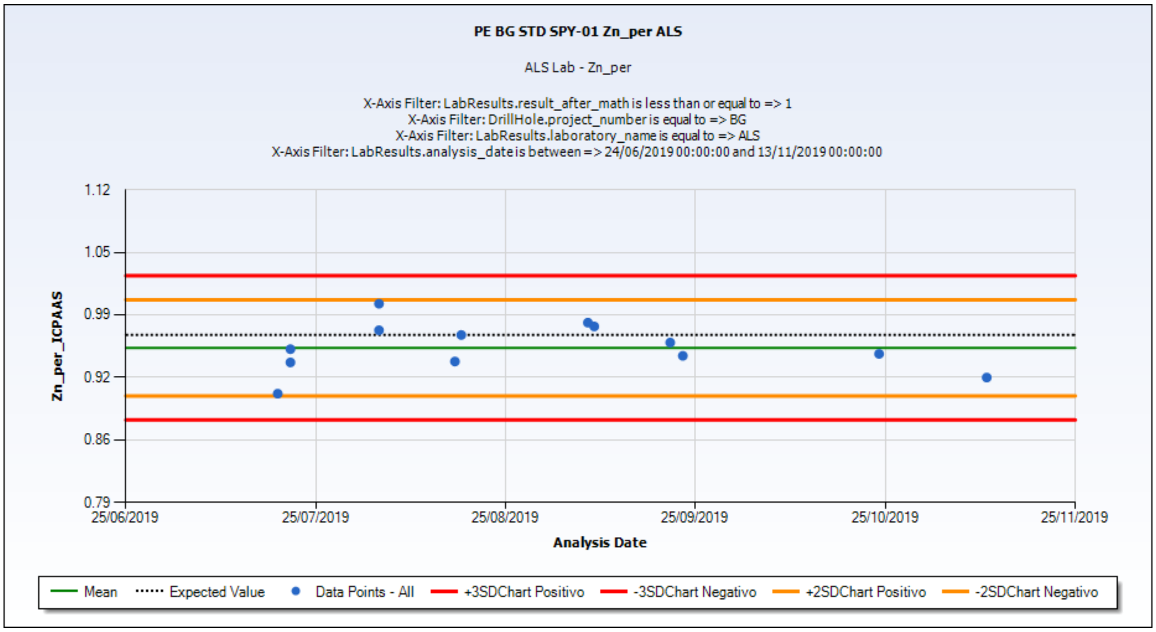

Figure 11-3 ALS Lab - Zn Standards Results

11.4.2 Blanks

There were no contamination issues with blanks (Table 11-6). Example lab results for Zn Blanks are shown in Figure 11-4.

Table 11-6 QA/QC Blanks Results 2018-2019 Campaign

Lab	Element	HILBG		Comments
		n	Failure %	
ALS	Ag ppm	23	0	
	Cu %	23	0	
	Pb %	23	0	
	Zn %	23	0	

Limit 5% failure Blank Failure = (failed/total samples)

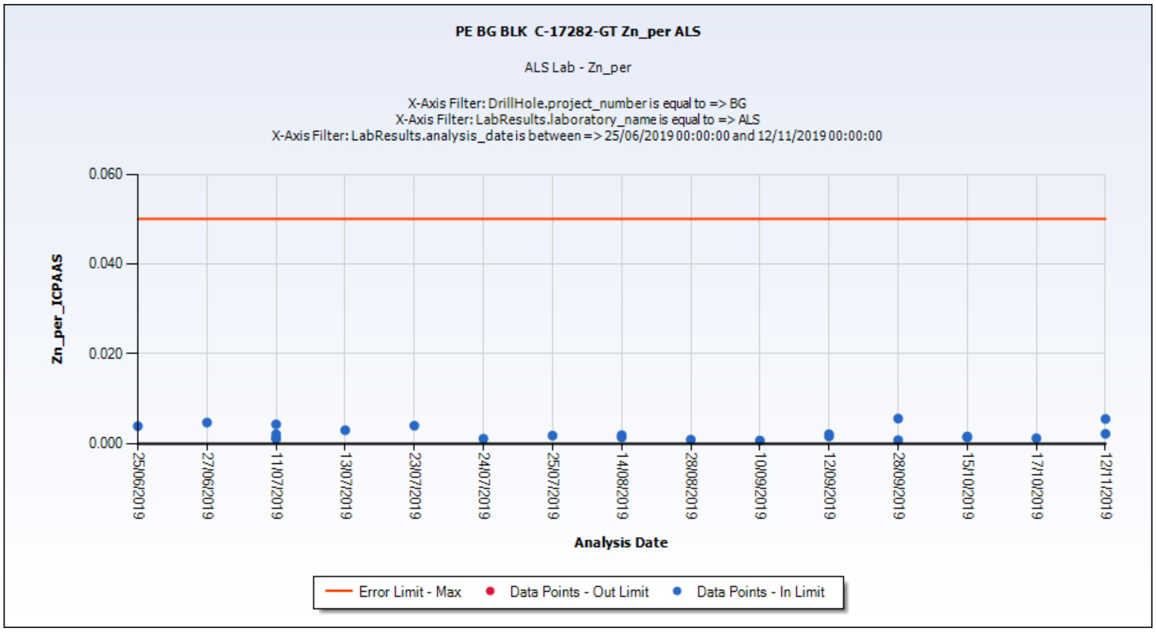

Figure 11-4 ALS Lab - Zn Blanks Results

11.4.3 Duplicates

Duplicate samples were evaluated with the hyperbolic method and the results were good. A summary of all duplicate sample pairs is shown in Table 11-7. Example lab results for Zn Duplicates are shown in Figure 11-5.

Table 11-7 QA/QC Duplicates Results 2018-2019 Campaign

Lab	Element	DP - Pulp duplicates		RG - Coarse Rejects		RP - Core duplicate		Comments
		n	Failure %	n	Failure %	n	Failure %	
ALS	Ag ppm	58	0	11	0	10	0	
	Cu %	58	0	11	0	10	0	
	Pb %	58	0	11	0	10	0	
	Zn %	58	0	11	18.18	10	0	2 failed in RG, low grade in Zn

Limit 10% failure

Duplicates Failure % - (failed/total samples)

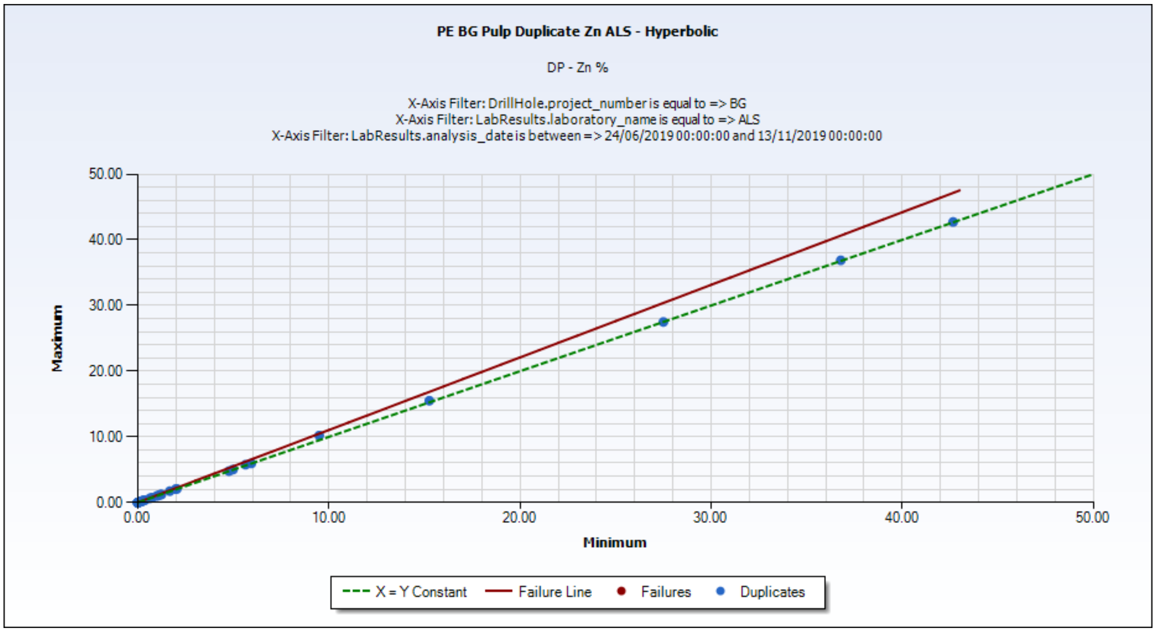

Figure 11-5 ALS Lab - Zn Duplicate Results

11.5 Opinion on Adequacy

The assay QC database is organized well and has an extremely low error rate. Nexa maintains the assay QC data well and analyzes it in real time to address any issues promptly. There were no systematic issues apparent in the results available to review.

Gustavson considers the sample preparation and analysis procedures to comply with industry best practice. The QA/QC methods and results adequately verify the analytical database as sufficient for use in resource estimation.

12 DATA VERIFICATION (ITEM 12)

12.1 PROCEDURES

All analytical data is checked by the on-site and Lima-based geologists before it is added to the database. This includes review of standard, blank and duplicate sample results for outliers, and requesting re-analysis if necessary. Final analytical data is appended to the database by the Sao Paulo office staff after additional verification. The checking procedures are well documented and conform to best industry practice.

During the site visit, the geologic database was checked for its consistency to a) logged core, b) logging sheets and sample records and c) database provided. All aspects of the data capture and storage were seen to be in good order. The core sample library in the core shed (Figure 12-1) helps to make the logged geology consistent and for the purposes of developing a consistent geological model.

Figure 12-1: Photograph of Project Core Lithology Reference Sample Library

Source: SRK, 2014

Drillhole collar locations are verified against topography and compared with the survey reports. Downhole survey data are reviewed by an on-site geologist to verify the results.

12.2 OPINION ON DATA ADEQUACY

Nexa geologists have an extensive quality control program, including not only standard check samples, but numerical checks of sample bias for each metal. The data controls are complete and compliant with industry best practice.

The Project geologists and support staff were diligent about data verification and the quality of the drillhole database. Database validation in preparation for resource estimation has been done by Nexa. Gustavson has reviewed their internal audit trail. We believe the degree of organization of the data base and the measures in place to minimize errors in data that the database is adequate for mineral resource estimation.

13 MINERAL PROCESSING & METALLURGICAL TESTING (ITEM 13)

A 43-101 PEA report was written in 2017 for the Florida Canyon Zinc Project. The report summarized the metallurgical studies performed on the samples from the prospect undertaken in 2010, 2011 and 2014. Since then, additional drilling has resulted in expansion of the sulfide resource which is the primary objective of this technical report.

13.1 METALLURGICAL TEST WORK, 2010-2014

Smallvill S.A.C. of Lima, Peru (Smallvill) performed metallurgical studies on Florida Canyon mineralization types in 2010, 2011 and 2014. The drilling completed in 2018 and 2019 has increased the proportion of mineral resources to be dominated by sulfide lead-zinc material. This changes the character of the proposed mineral processing.

Since no metallurgical studies have been performed on the recent drilling samples a summary of historical work is presented here for reference:

- The majority of the metallurgical studies were performed on oxide and mixed ores. Limited test work has been completed on sulfide samples.
- Some of the composite samples classified as sulfides should have been designated as mixed ore because of presence of significant amounts of oxide zinc (Table 13-1).
- The Bond's crusher work index (Wi of 8.54 kwh/t) indicates that the sulfide ore is soft.
- The conventional flotation scheme for polymetallic ores and reagents employed in the test work did produce marketable-grade zinc concentrate (±50% Zn).
- The selected test results, reported by SRK in the 2017 PEA, indicates zinc recovery of 80% to 90.1% for samples with a variable proportion of oxide minerals. For pure sulfides, the results project a maximum recovery of 93%. The concentrates produced are at a concentrate grade of 50% to 55% Zn.
- Some of the results reported in Table 13.1 are not correct. For example, San Jorge sample assayed 0.41% ZnO_x and 7.63 Zn_{Total}. Hence, it contained 5.4% of zinc as oxide. The recoveries reported in zinc concentrate are 90.1% for Zn_{Total} and 83.5% for ZnS. Even if all the oxide was recovered, the ZnS recovery should be 84.7%.
- The early logging of core from the project estimated visually the content of oxidized zinc minerals. Later, Nexa reanalyzed the mineralized core for zinc contained in sulfides vs. oxidized species. The visually estimated ratio of sulfide/oxide zinc was adjusted upward based on this study and current data reflects this adjustment.
- SRK projected recovery of metals by material type in the 2017 PEA (Table 13-2). Zinc recovery was projected to be 93% for the sulfide ores. The authors agree with the projection based on their extensive experience in polymetallic processing and the test work completed to date.

Drilling completed in 2019-20 has verified that the sulfide ore component of the deposit is greater than previously assumed.

Table 13-1 Metallurgical Tests – Selected Results

Report	Sample	Sample Type	Head Grade							
Date			Zn Total	ZnOx	ZnS	ZnOx/ ZnT	Pb Total	Pb S	Pb Ox	Ag g/t
2010 Apr	Core composite	Sulfide	7.52%	1.40%	6.10%	0.19	1.72%	1.26%	0.46%	11.6
2011 Jul	Core composite	Oxide	18.36%					18.40%	0.00%	1
2011 Aug	Core composite	Mixed	31.25%	13.20%	18.10%	0.42	2.38%			26.5
2011 Aug	Core composite	Sulfide	31.68%	0.98%	30.70%	0.03	3.88%			56.19
2011 Aug	Core composite	Mixed	31.25%	13.20%	18.10%	0.42	2.38%			26.5
2014 Feb	San Jorge	Sulfide	7.63%	0.41%	7.22%	0.05	0.65%			
2014 Feb	Karen Milagros	Sulfide	5.70%	0.00%	5.70%	0	1.12%			

Source: SRK, 2017

Table 13-2 Florida Canyon Metal Recoveries by Material Type

Parameter	Material Type		
	Sulfide	Mixed	Oxide
ZnOx/ZnT Ratio	<=0.2	0.2 to 0.8	>=0.8
Zn Recovery	93%	(-0.8833 (ZnOx/ZnT) + 1.1067) * 100	40%
Pb Recovery	84%	(-0.7333 (ZnOx/ZnT) + 0.9867) * 100	40%
Ag Recovery	56%	(-0.4 (ZnOx/ZnT) + 0.64) * 100	32%

14 MINERAL RESOURCE ESTIMATES (ITEM 14)

An updated Mineral Resources Estimate for Florida Canyon was completed by Nexa Resources based on a data base available in July of 2020. The database included 545 drill holes with a total drilled length of nearly 137 km.

The estimate was audited by Donald E. Hulse of Gustavson Associates LLC with the audit completed on February 1, 2021. Work was completed in Datamine Studio RM, Leapfrog Geo, and Snowden Supervisor. The models were reviewed by Gustavson using Leapfrog Geo for 3-dimensional geological models, Micro Model software for statistics and geostatistics, and Datamine RM for validation of the estimate. The Nexa database was reviewed, and statistical analysis was completed to validate the Nexa QA/QC results. Gustavson supports the use of the database for mineral resource estimation.

Geological modeling in Leapfrog utilized geological sections developed based on lithology, alteration, and mineralization to interpret a 3-dimensional geological model with 73 unique mineralized structures. Each of these structures was analyzed with classical statistics and geostatistics to estimate grades for zinc, lead, silver, and iron. Mineral resource classification utilized criteria based on drill spacing and variogram ranges. Measured mineral resource required a spacing of 25x25m with at least 3 composites, indicated mineral resource, 50x50m with 3 composites, and inferred resource estimates required a spacing of 100x100m with at least 2 composites. In addition, estimation required the demonstration of geological continuity within the Florida horizon as well as dolomitic alteration.

14.1 GEOLOGIC MODEL

Florida Canyon is considered to be a Mississippi Valley type deposit, dominated by lead and zinc sulfides. The minerals are disseminated within stratigraphically controlled dolomites within the Chambara Formation of the late Triassic/early Jurassic. The deposit is in karstic terrane and due to the local percolation of meteoric water, shallow mineralization has locally oxidized into silicates and carbonates (smithsonite, hemimorphite, and cerussite) collectively referred to as “oxides”.

The mineralization occurs in both sub horizontal “mantos”, and steeply dipping feeders. The mantos are stratigraphically controlled within the Florida horizon of the Chambara formation. The stratigraphy in the area is composed of the layers shown in Table 14-1. Within the Florida, the Coquina and IBM fossil beds were used as markers in the logging.

Table 14-1 Deposit Stratigraphy

Soils
Aramachay Formation
CMWCH Horizon
Florida Horizon
CDMWS Horizon
Mitu Group

A schematic of the local stratigraphy is shown in Figure 14-1. The high grade Pb-Zn mineralization occurs in dolomitized material within the calcites of the Florida horizon.

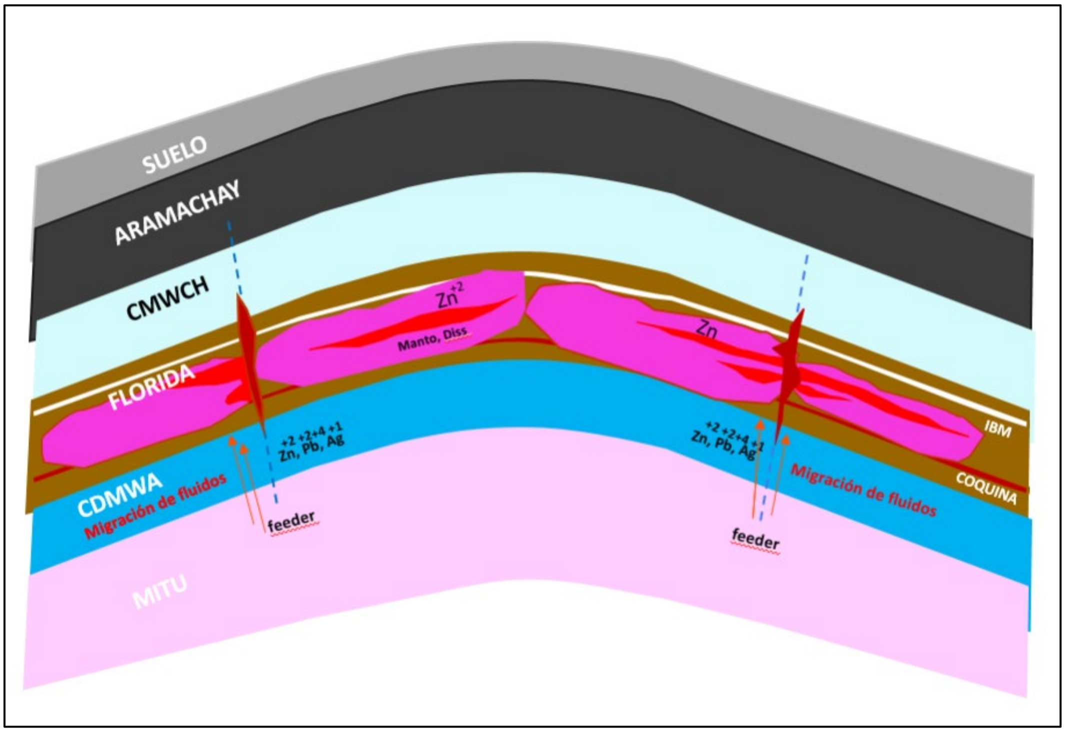

Figure 14-1 Schematic of Local Stratigraphy

The Florida Canyon deposit has the form of a dome at regional scale. This may be due to a regional anticline. This trend was incorporated into the geological model with the interpretation of 84 mineralized structures. (70 mantos and 14 feeders). The distribution of the mineral bodies is shown in Figure 14-2. The bodies are grouped into four areas, labeled as 1021, Karen Milagros, San Jorge, and Sam. The Sam bodies are associated with the Sam fault to the south west of the area. The extent of these bodies is currently limited by drill data.

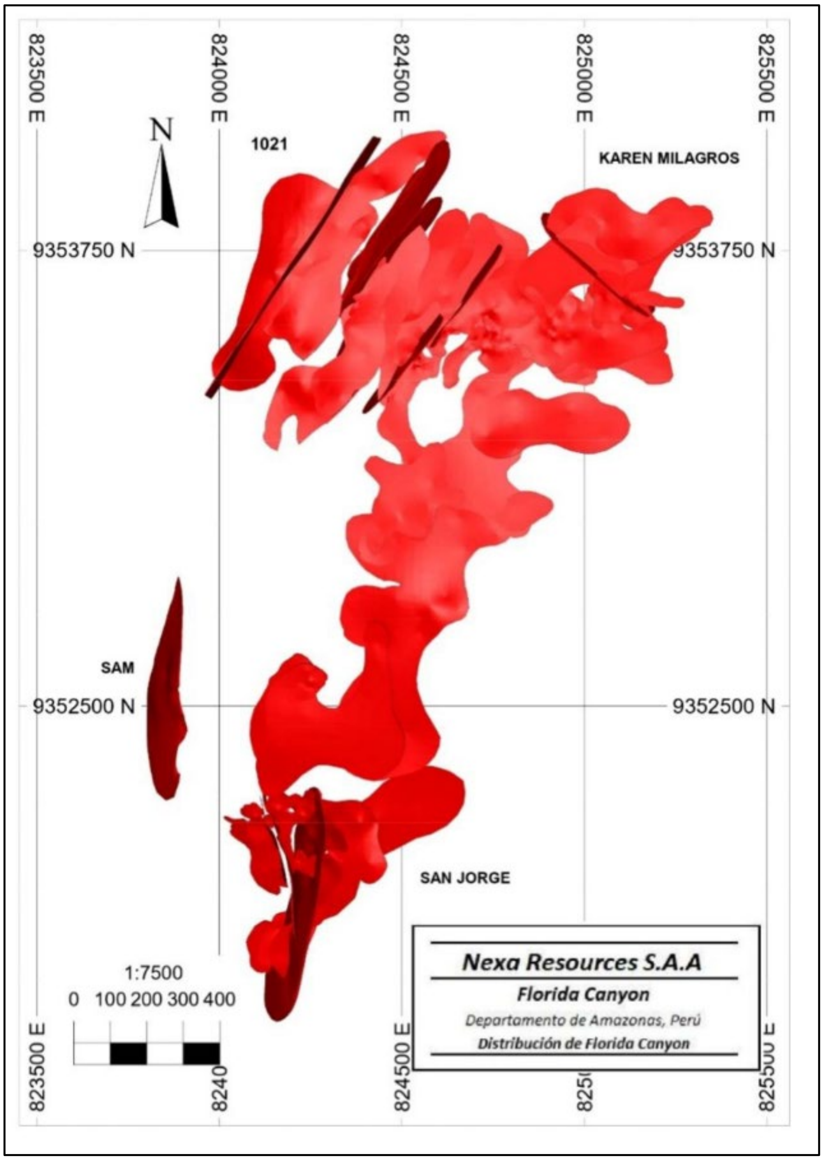

Figure 14-2 Distribution of Mineralized Bodies

14.2 EXPLORATORY DATA ANALYSIS

The database consists of 545 drill holes, measuring a total of 136,758.15m. The Exploratory Data Analysis (EDA) was performed on raw data (drill samples), composites, and capped values. Histograms and cumulative frequency diagrams were created for Zn, Pb, Ag and Fe. Summary examples of raw data, composite and capped cumulative frequency diagrams are in Appendix C and D.

For grade estimation, only samples within the solids defining the mantos and feeders were utilized. All drill and composite intervals were coded with the appropriate geological code. An example cumulative frequency curve is shown in Figure 14-3.

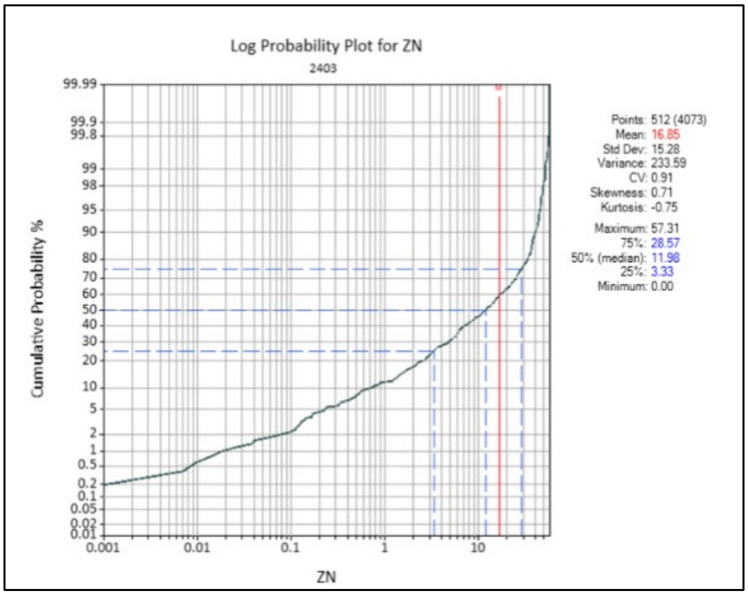

Figure 14-3 Cumulative Frequency Curve for Zinc (Nexa)

The statistics were analyzed for each of the 74 bodies. The domains are referenced in the included Table 14-2 by a three-part code. The first part is the area, the second part defines if it is a manto or a feeder zone, and the third part is a unique sequence number to identify separate zones in each area.

Table 14-2 Description of Zone Codes for Statistics

Areas	Code	Description
	D21	1021
	KM	Karen Milagros
	SJ	San Jorge
	Sam	Sam
Type	F	Feeder
	M	Manto

There are subtle local differences between the bodies, although most behave statistically well with coefficients of variation less than two. This indicates that the distributions are not highly skewed. Since there is insufficient drilling to connect all bodies, the spatial separation led to estimating each body as a separate zone. Summary zinc statistics for the principal zones are shown in Table 14-3.

Table 14-3 Summary Statistics for Zinc by Zone (after Nexa)

Zone Code	Zone	N-Samp	Min	Max	Mean	CV
1107	d21m1	12	0.06	29.2	5.34	1.35
1108	d21m2	34	0.04	49.58	8.23	1.55
1109	d21m3	17	0.04	9.53	2.39	1.26
1110	d21m4	12	0.01	13.6	1.5	2.08
1111	d21m7	17	0	36.58	9.77	1.15
1204	km3_10	33	0	39.24	7.97	1.36
1206	km1	48	0.01	37.66	6.66	1.32
1207	km2_1	56	0.01	42.6	8.83	1.29
1208	km2_3	13	0.96	40.49	14.01	1.04
1209	km3_1	27	0.09	40.31	8.8	1.28
1211	km3_4	22	0	30	8.2	1.24
1212	km3_5	72	0.01	44.41	7.9	1.37
1213	km3_7	32	0.02	39.37	5.03	1.93
1214	km3_8	16	0.26	34.64	10.21	1.21
1215	km3_9	4	1.27	39.76	13.62	1.27
1216	km3_2	144	0	46.63	6.54	1.56
1217	km4_1	27	0.08	28.91	3.22	1.8
1218	km4_2	16	0.08	41.39	7.43	1.45
1219	km4_3	134	0	45.48	5.88	1.63
1220	km4_5	15	0.02	11.4	2.42	1.13
1221	km4_7	41	0.47	32.7	6.87	1.33
1223	km6_2	30	0.15	32.99	6.77	1.31
1224	km6_3	14	0.34	39.64	4.77	1.52
1225	km6_5	36	0.02	40.24	11.51	1.13
1226	km6_6	9	1.23	39.27	13.46	1.04
1227	km6_9	76	0	41.58	8.17	1.29
1228	km7_1	89	0.18	49.06	9.31	0.97
1229	km7_2	16	0.01	15.45	3.54	1.19
1230	km7_3	4	0.25	1.59	0.83	0.7
1231	km10	42	0	39.31	6.26	1.57
1232	km13	29	0.1	35.15	5.65	1.51
1233	km15	22	0	35.01	9.54	1.24
1234	km6_4	56	0.22	36.05	12.19	0.84
1405	sjm1	21	0.07	25.7	7.25	1.3
1406	sjm2	42	0.01	40.68	6.27	1.72
1407	sjm3	40	0.01	44.09	9.07	1.33

Although there are differences in the grade from zone to zone, the overall behavior of the different areas is shown in Table 14-4

Table 14-4 Average Metal Grades by Area

		Samples	Avg Zn	Avg Ag	Avg Pb
Karen Milagros	Mantos	711	8.190	11.952	1.320
Karen Milagros	Feeders	98	11.351	18.866	2.590
San Jorge	Mantos	249	7.459	8.007	0.410
San Jorge	Feeders	306	10.607	16.154	0.724
1021	Mantos	25	5.066	9.542	0.709
1021	Feeders	117	6.378	13.646	1.373
Sam	Mantos	95	5.584	6.198	1.257

The overall distribution of the metal grades in the deposit is shown in the histograms in Figure 14-4, Figure 14-5 and Figure 14-6. Although the distributions for zinc and silver are slightly skewed, reflecting a log normal population, the overall behavior is good. This presents evidence that if the infill drilling connects these bodies, that the mineralization may develop as local zoning within a large continuous mineralized body. This is common in other MVT deposits, including the namesake deposits in the central USA.

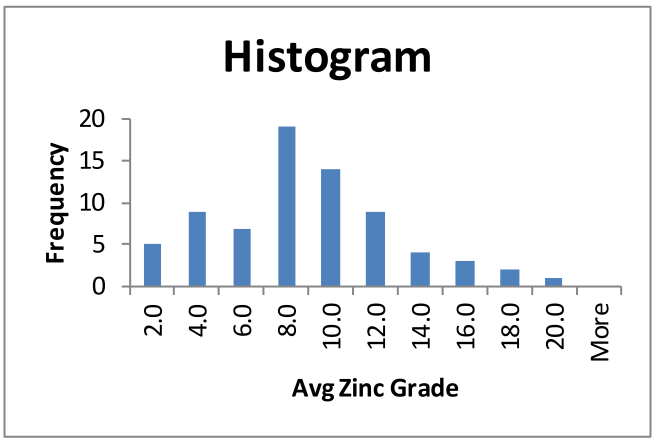

Figure 14-4 Histogram of Zinc in Mineral Zones

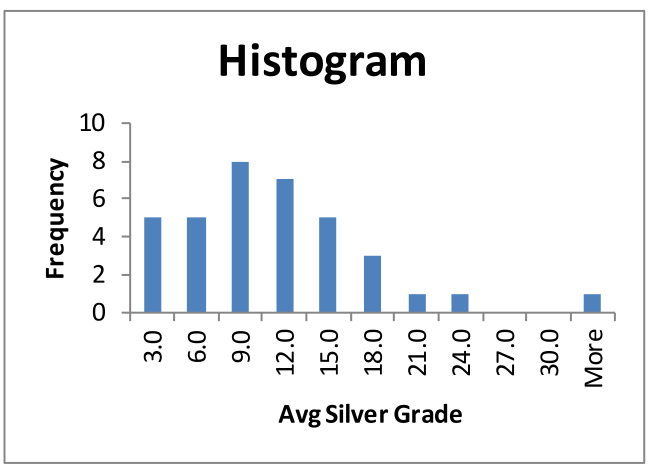

Figure 14-5 Histogram of Silver in Mineral Zones

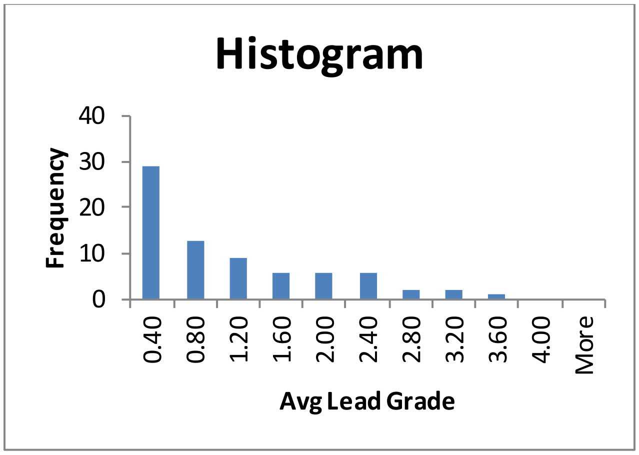

Figure 14-6 Histogram of Lead in Mineral Zones

14.3 DOMAINS FOR RESOURCE ESTIMATION

The domains or zones were defined in the EDA step of the study. Further drilling will support if these are unique pods of mineralization, or parts of a larger body. Due to the changing orientation identified in the Leapfrog model and the overall anticlinal shape, each zone was estimated with unique search parameters.

14.4 CAPPING AND COMPOSITING

Capping was performed area by area based on the shape of the cumulative frequency curve. Composites were nominal 2 meters long with some variability due to the thickness of the zone, with 88% of the composites approximately 2 meters. Capping values for key areas are shown in Table 14-5.

Table 14-5 Outlier Capping Values by Area (after Nexa)

Area	COD_OB	Zn Cap	Pb Cap	Fe Cap	Ag Cap
d21f1	2101	32	6	22	50
d21f2	2102	42	30	22	160
d21f3	2103	42	30	22	160
d21f4	2104	32	6	22	50
d21f5	2105	32	6	22	50
d21f6	2106	21	21	12	58
kmf1	2201	40	15	11	120
kmf2	2202	45	17	22	100
kmf3	2203	45	17	22	100
sam	2301	28	8	2.5	20
km3_10	1204	20	10	7	52
d21m1	1107	-	-	-	-
d21m2	1108	27	7	-	60
d21m3	1109	27	7	-	60
d21m4	1110	-	-	-	-
d21m7	1111	27	7	-	60
km1	1206	25	12	6	60
km2_1	1207	37.3	15	11	100
km2_3	1208	40	13	17	81
km3_1	1209	35	4	8	51
km3_3	12102	40	13	17	81
km3_4	1211	38	19	15	120
km3_5	1212	38	19	15	120
km3_7	1213	37.3	15	11	100
km3_8	1214	37.3	15	11	100
km3_9	1215	37.3	15	11	100
km3_2	1216	34	9	-	40
km4_1	1217	18	3.5	-	20
km4_2	1218	37.3	15	11	100
km4_3	1219	28	10	5	100
km4_5	1220	10	7	-	-
km4_7	1221	38	19	15	120
km6_1	12221	38	19	15	120
km6_2	1223	38	19	15	120
km6_3	1224	18	3.5	-	20
km6_4	1234	-	10	7	52
km6_5	1225	-	6	-	-
km6_6	1226	-	6	-	-
km6_9	1227	35	4	8	51

14.5 GEOSTATISTICS

Variograms were calculated in each of the zones. Variograms for the manto and feeder zones are shown in Figure 14-7 and Figure 14-8. Overall, the variograms are characterized by a relatively low nugget with about 20% of the total variance, a short spherical structure with about one half of the total variance, and a longer spherical structure with about 30% of the total variance.

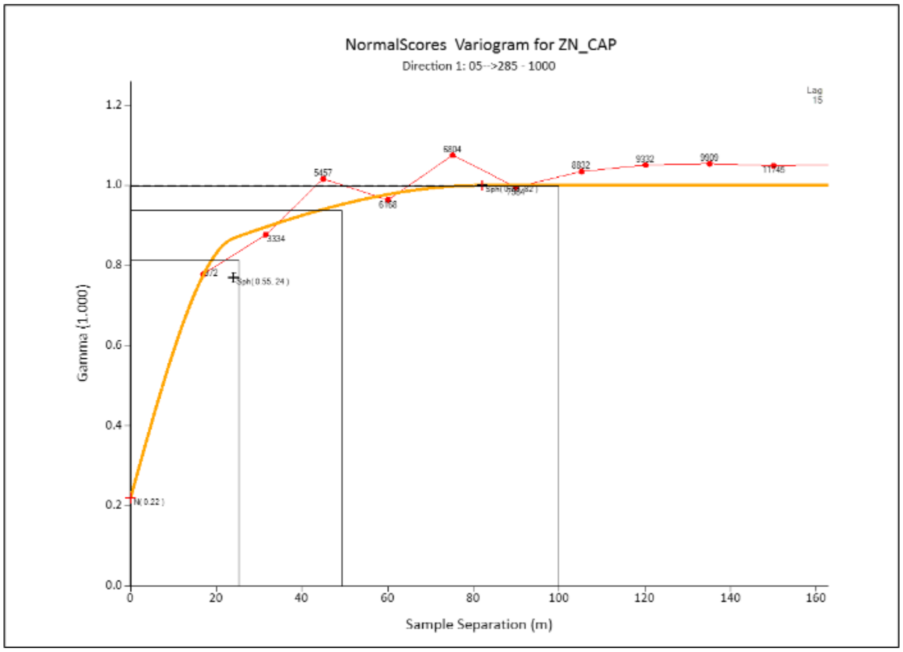

Figure 14-7 Example Zinc Variogram for Manto Zones (after Nexa)

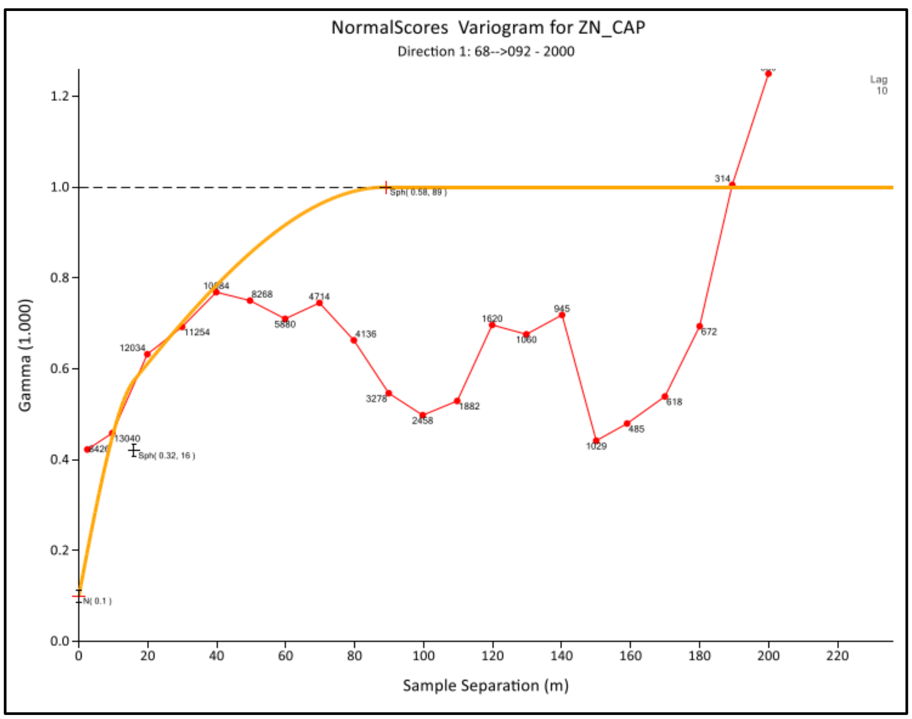

Figure 14-8 Example Zinc Variogram for Feeder Zones (after Nexa)

Generally, the variograms are similar in size and anisotropy, with variable orientations. Key variogram parameters are shown in Table 14-6.

Table 14-6 Selected Variogram Parameters (after Nexa)

						Structure 1				Structure 2			
Zone	Variable	Rotation	Dip	Plunge	Nugget(C0)	Max	Int	Minor	Sill(C1)	Max	Int	Minor	Sill(C2)
d21f6	AG_CAP	33.78	-83.58	0	0.1	28	10	2	0.56	121	53	13	0.34
d21f6	ZN_CAP	33.78	-83.58	0	0.13	16	17	4	0.4	83	104	11	0.47
d21f6	PB_CAP	33.78	-83.58	0	0.15	9	18	3	0.56	83	92	11	0.3
d21f6	FE_CAP	33.78	-83.58	0	0.16	9	23	2	0.32	114	136	13	0.52
d21m1	AG_CAP	-49.91	-4.33	-177.5	0.3	24	18	6	0.54	82	74	25	0.16
d21m1	ZN_CAP	-49.91	-4.33	-177.5	0.26	24	18	4	0.55	82	76	11	0.19
d21m1	PB_CAP	-49.91	-4.33	-177.5	0.18	25	22	3	0.49	107	70	36	0.32
d21m1	FE_CAP	-49.91	-4.33	-177.5	0.35	20	18	4	0.39	147	76	11	0.27
d21m2	AG_CAP	120.07	-4.7	-178.29	0.3	24	18	6	0.54	82	74	25	0.16
d21m2	ZN_CAP	120.07	-4.7	-178.29	0.26	24	18	4	0.55	82	76	11	0.19
d21m2	PB_CAP	120.07	-4.7	-178.29	0.18	25	22	3	0.49	107	70	36	0.32
d21m2	FE_CAP	120.07	-4.7	-178.29	0.35	20	18	4	0.39	147	76	11	0.27
d21m3	AG_CAP	120.07	-4.7	-178.29	0.3	24	18	6	0.54	82	74	25	0.16
d21m3	ZN_CAP	120.07	-4.7	-178.29	0.26	24	18	4	0.55	82	76	11	0.19
d21m3	PB_CAP	120.07	-4.7	-178.29	0.18	25	22	3	0.49	107	70	36	0.32
d21m3	FE_CAP	120.07	-4.7	-178.29	0.35	20	18	4	0.39	147	76	11	0.27
d21m4	AG_CAP	-145.44	-7.05	174.89	0.3	24	18	6	0.54	82	74	25	0.16
d21m4	ZN_CAP	-145.44	-7.05	174.89	0.26	24	18	4	0.55	82	76	11	0.19
d21m4	PB_CAP	-145.44	-7.05	174.89	0.18	25	22	3	0.49	107	70	36	0.32
d21m4	FE_CAP	-145.44	-7.05	174.89	0.35	20	18	4	0.39	147	76	11	0.27
d21m7	AG_CAP	120.07	0.7	-178.29	0.3	24	18	6	0.54	82	74	25	0.16
d21m7	ZN_CAP	120.07	0.7	-178.29	0.26	24	18	4	0.55	82	76	11	0.19
d21m7	PB_CAP	120.07	0.7	-178.29	0.18	25	22	3	0.49	107	70	36	0.32
d21m7	FE_CAP	120.07	0.7	-178.29	0.35	20	18	4	0.39	147	76	11	0.27

14.6 BLOCK MODEL PARAMETERS

The block model was estimated in Datamine software. The block size was 6x6x3m with a minimum sub-cell of 0.5m in each direction. General parameters are shown in Table 14-7.

Table 14-7 Block Model Parameters

Parameters	East (m)	North (m)	Elev (m)
Minimum	823,700	9,351,680	1,550
Maximum	825,650	9,354,422	3,161
Block dimension	6	6	3
Minimum sub-cell	0.5	0.5	0.5

14.7 Block Grade Estimation Methodology

Grades were estimated by three methods, Ordinary Kriging, Inverse Distance to a Power, and Nearest Neighbor. For economic stope design, the OK values were used.

The search distances were roughly ½ of the variogram range for Pass 1, the full variogram range for Pass 2, and a longer search was used for inferred to fill in between drilling for the zone. For Pass 1 and 2, a minimum of 6 composites were required and a maximum of 16 were used, for Pass 3, a minimum of 2 and a maximum of 8 were used.

Nearest neighbor estimates were used to check the unbiased average of each zone before applying a cutoff grade.

14.8 Resource Classification

Mineral resource classification utilized criteria based on drill spacing and variogram ranges. Measured mineral resource required a spacing of 25x25m with at least 3 composites, indicated mineral resource, 50x50m with 3 composites, and inferred resource estimates required a spacing of 100x100m with at least 2 composites. In addition, estimation required the demonstration of geological continuity within the Florida horizon as well as dolomitic alteration. In Figure 14-9 mineral resource classes are shown with Measured Resources shown in blue, Indicated in green and Inferred in red.

Figure 14-9 Distribution of Resource Classes (Source Nexa)

14.9 CUTOFF GRADE

Based on metallurgical test work, mineral types were assigned for sulfides, oxides, and mixed mineral based on the relation of oxide zinc with total zinc, and based on these criteria, a metallurgical recovery was assigned to each block. The blocks were coded with the most prominent oxidation state. Oxides are shown in orange, mixed material in yellow and sulfides in blue.

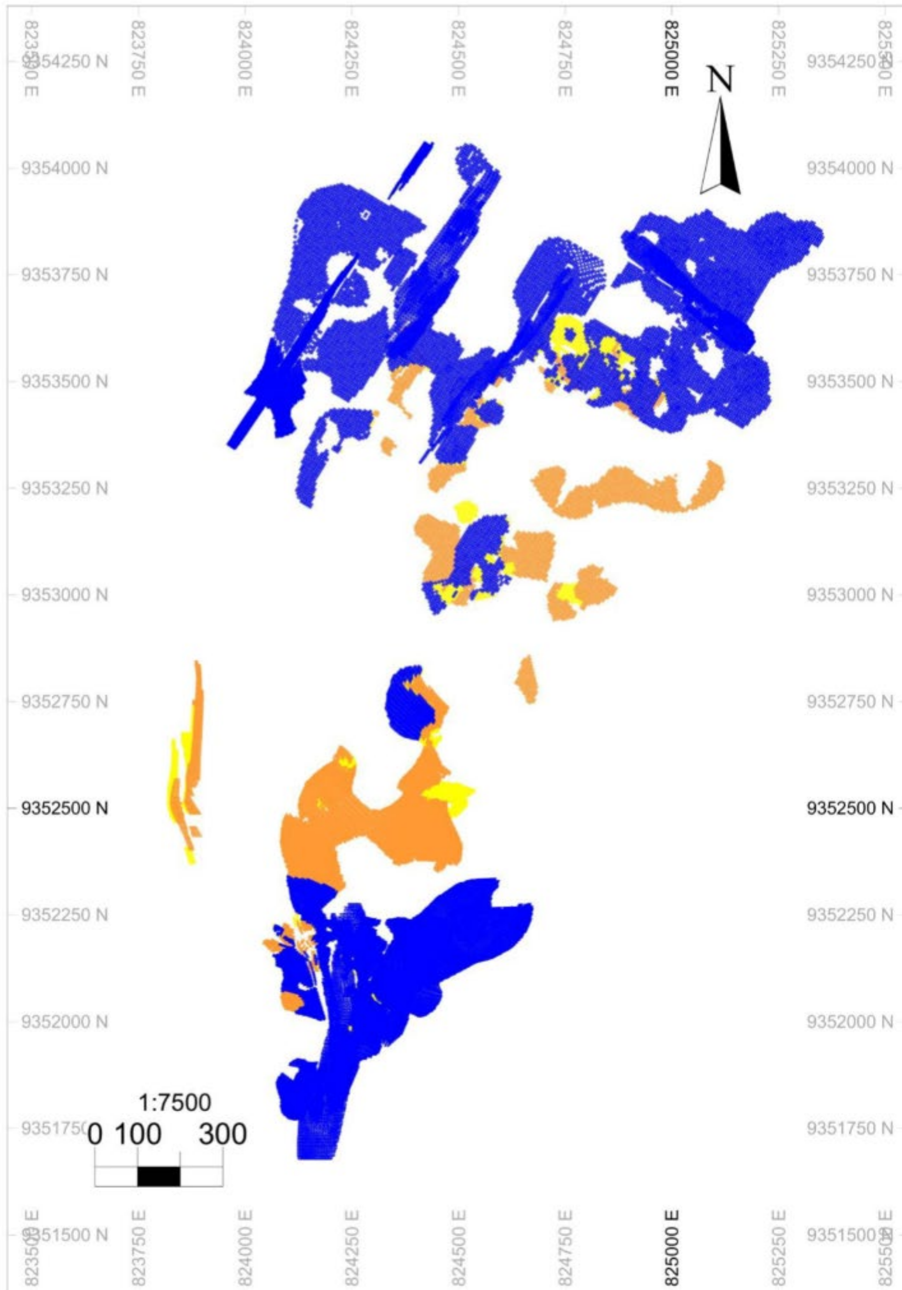

Figure 14-10 Oxidation state of the mineral zones (Source Nexa)

14.10 DEVELOPMENT OF ECONOMIC SHELLS FOR REPORTING

A recovery was assigned based on the oxidation state. Using the estimated grade and recovery, economic stope shapes were developed using a "stope optimizer" tool in Deswik software. The limits for the stope are summarized in Table 14-8. The cutoff grade was established in net smelter return (NSR) for each mining method, Sublevel Stoping, Cut and Fill, and Room and Pillar. Only mineral resources within an economic stope shape were reported.

Table 14-8 Deswik Stope Parameters

	Sublevel Stoping	Cut and Fill	Room and Pillar
Stope Length (m)	4	3	Room 5.5x5.5 and Pillar 6x6
Stope Height (m)	16	3	4 to 20
Minimum Stope Width (m)	3	3	4
Minimum Waste Pillar Width (m)	3	3	6
Dip	50°/90°	20°/50°	20°/20°
Cut-Off (NSR)	41.4	42.93	40.61

Long term metals prices used for calculation of NSR are in Table 14-9.

Table 14-9 Long term metal prices

Metal	$US/tonne	$US/lb
Zn	2.816	1.27
Pb	2.249	1.02
Ag		19.40 / OzT

An example of the stope shapes used to declare a mineral resource is shown in Figure 14-11. Gustavson feels that the stope shells are a good estimate of the economic potential of the material, and that the parameters used are sufficiently developed to meet the definition of mineral resource estimate of the CIM.

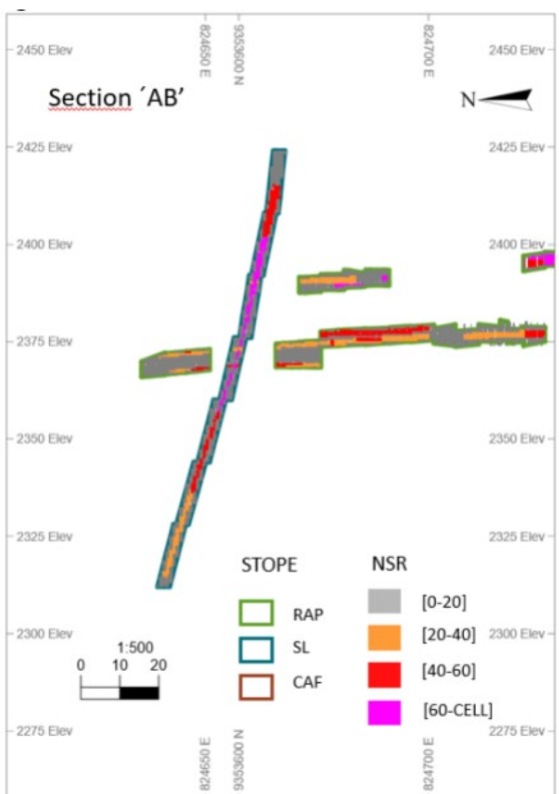

Figure 14-11 - Example Deswik Stope Shapes

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14.11 Specific Gravity/Density

Density was calculated as a function of grade using the following equation.

$$Density = 2.73 + 0.0126 * Zn + 0.035 * Pb$$

The equation was developed by SRK during the 2017 study. SRK determined that the expected error of using this equation for density was about 0.01%, and that there is no material effect or bias on the mineral resource estimate from this method.

14.12 Validation of Resource Estimate

The estimate was validated by statistical comparison of the three estimates, and by visual inspection of cross sections of estimates against composites. At this time the classification was reviewed based on the average drill density. Inspection plots for zinc and silver are shown in Figure 14-12 and Figure 14-13.

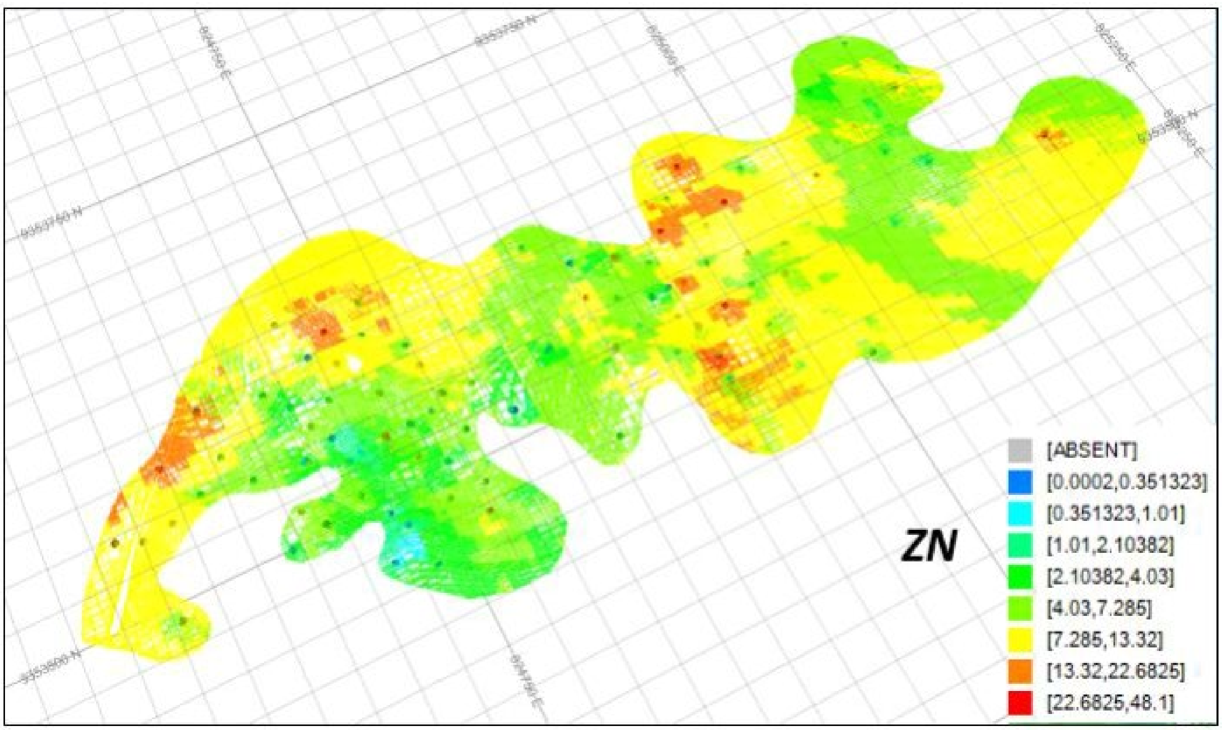


Figure 14-12 - Review of Estimates vs. Composites for Zinc in KM6-1

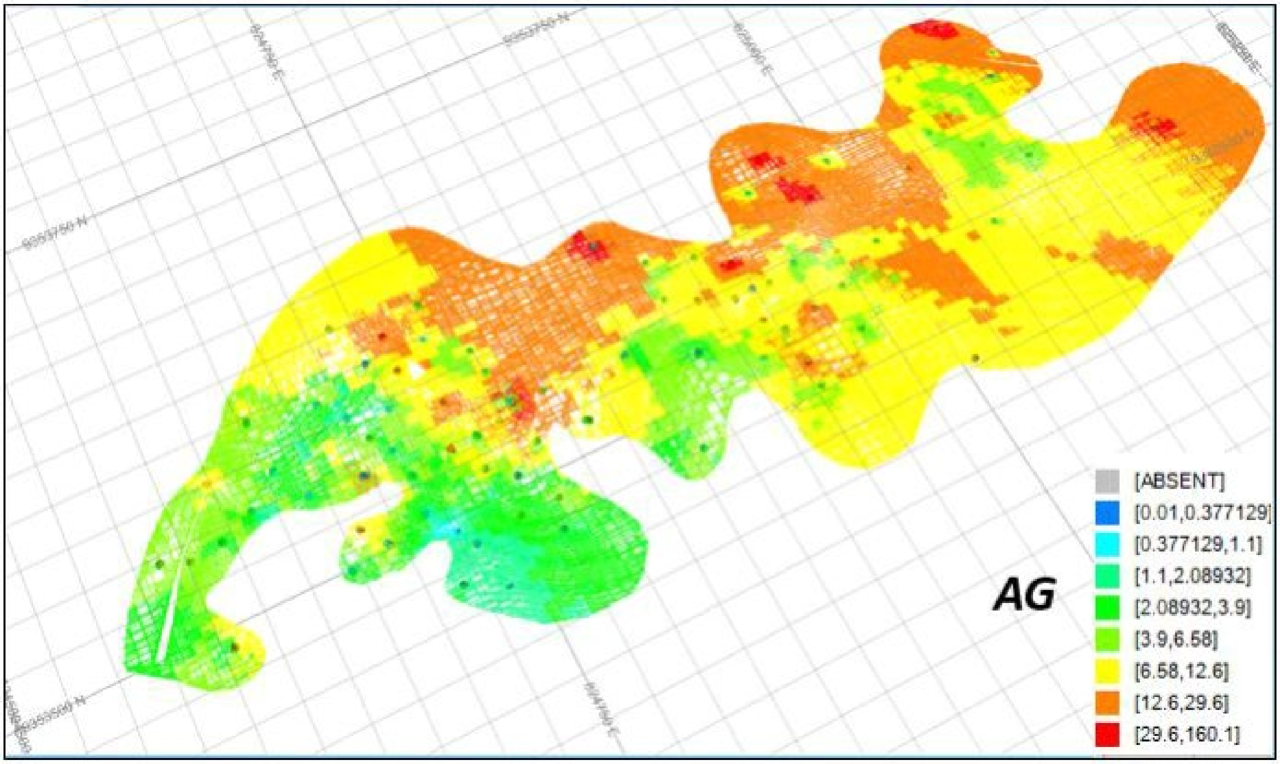


Figure 14-13 - Review of Estimates vs. Composites for Silver in KM6-1

14.13 AUDIT OF FINAL MINERAL RESOURCE ESTIMATE.

Gustavson audited the Nexa model by examining it in 3-dimensions in the Leapfrog software and by comparing the statistics of the samples in each zone with the modeled grades. The Leapfrog work appears to have been done carefully, taking into account the limits of the dolomite zone within the Chambara formation where lead, zinc, and silver grades are concentrated. Gustavson feels that this is a good representation of the volume of the mineralized material.

The grades reported have an implicit cutoff as part of the stope optimizer analysis in addition to the explicit cutoff applied to the composite data. The stope optimizer tends to select only the best grade where it is sufficiently continuous to allow development of a stope of a defined size. This is a direct comparison to an economic pit limit analysis used in open pit mining to define an “in pit resource”. In both cases, the use of the economic mining limit implies the potential for future economic extraction.

For the Florida Canyon study, the prices used were very near to the market prices in December of 2020 when the study was finalized. Gustavson was able to compare the statistics of samples within the stope shells with the reported mineral resources and found a generally good correlation. Some of the stope shapes were formed largely on inferred material with limited drilling, and correlations were most precise between stope grades and composite grades when sampling was most regular.

The mineral resource estimate is tabulated in Table 14-10 Mineral Resource Summary. Gustavson feels that the reported Mineral Resource Estimate meets the standard for reporting under CIM (2019). The Mineral Resource Estimate separated by zone and mantos vs feeder is in Appendix E.

14.14 MINERAL RESOURCE TABULATION

The Mineral Resource by zone is shown in Table 14-10.

Table 14-10 Mineral Resource Summary

Zone	Classification	Sum of Tonnes	Zn %	Ag g/t	Pb %	Fe %
Karen Milagros	Measured	328,254	9.07	9.77	1.34	1.53
	Indicated	913,273	7.65	10.41	1.36	1.35
	Measured + Indicated	1,241,527	8.03	10.24	1.35	1.39
	Inferred	7,072,315	8.82	10.55	1.20	1.57
San Jorge	Measured	478,691	12.85	19.29	1.42	3.07
	Indicated	721,429	13.61	20.52	1.25	3.35
	Measured + Indicated	1,200,120	13.31	20.03	1.32	3.24
	Inferred	3,895,089	13.09	11.34	0.68	2.41
1021	Inferred	3,291,937	6.71	13.58	1.77	2.65
Sam	Inferred	599,392	12.78	6.99	2.96	0.93

The total Mineral Resource at Florida Canyon is shown in Table 14-11.

Table 14-11 Florida Canyon Total Mineral Resources

Classification	Sum of Tonnes	Zn %	Ag g/t	Pb %	Fe %
Measured	806,945	11.32	15.42	1.39	2.44
Indicated	1,634,702	10.28	14.87	1.31	2.23
Measured + Indicated	2,441,647	10.62	15.05	1.33	2.30
Inferred	14,858,733	9.63	11.28	1.26	2.00

Mineral Resources are not Mineral Reserves and have not been demonstrated to have economic viability. There is no certainty that the Mineral Resource will be converted to Mineral Reserves. The quantity and grade or quality is an estimate and is rounded to reflect the fact that it is an approximation. Quantities may not sum due to rounding.

- CIM (2014) standards for mineral resources were followed.
- The effective date of the Mineral Resource Estimate is February 1st, 2021.
- The mineral resources are reported using a cutoff of US $41.40/t NSR for the sub-level, US $42.93/t for the cut and fill, and US $40.61/t for the room and pillar areas of the mine.
- The minimum thickness was 3 m for sub-levels in cut and fill, and 4 m for stopes and pillars.
- Mineral resources are reported exclusive of mineral reserves.
- Mineral resources are not mineral reserves and have not demonstrated economic feasibility.
- Numbers may not sum correctly due to rounding.
- Estimates for mineral resources are based on drill results received up to 30 October 2020, with 545 holes and a total length of 136,758.15 m stope shapes for support of economic potential were developed using the stope optimizer tool of Deswik (DSO).

15 MINERAL RESERVE ESTIMATES (ITEM 15)

This section does not apply because the Report does not include Mineral Reserves.

16 MINING METHODS (ITEM 16)

The text and figures in the following Chapter have been taken from the 2017 Preliminary Economic Assessment Florida Canyon Zinc Project, Amazonas Department, Peru with Effective Date: July 13, 2017 and Report Date: August 3, 2017. The 2021 TR update as described in this report does not have a negative impact on or otherwise adversely affect the mineral resource inventory that formed the basis of the 2017 PEA. The Inferred Mineral Resource estimate was increased by extending the known mineralized bodies. The results and conclusions of the 2017 PEA are still considered current and therefore have been summarized within this Report.

Various factors are considered in the selection of an appropriate mining method to exploit a mineralized zone. The factors include, but are not limited to, the geometry, depth, mineralogy, continuity of mineralization, geotechnical conditions, hydrological conditions, value of the mineral, and environmental factors.

Considering these parameters for the Florida Canyon project, the following underground methods are suitable for application.

- Sublevel Stoping (Longhole Stoping) for the steeply dipping bodies identified as F1 and SAM (Figure 15-1).
- Mechanized Cut and Fill for the moderate dipping bodies.
- Drift and Fill for the flat to moderate dipping bodies where more than one cut is required due to the width of the zone. To increase mining recovery initial (primary) cuts are backfilled with cemented paste or rock fill and intervening secondaries are removed and backfilled with unconsolidated waste rock or paste as required.

The geotechnical characterization work for the project was performed by Klohn Crippen Berger and documented in a geotechnical report dated October 2013 (KCB, 2013a).

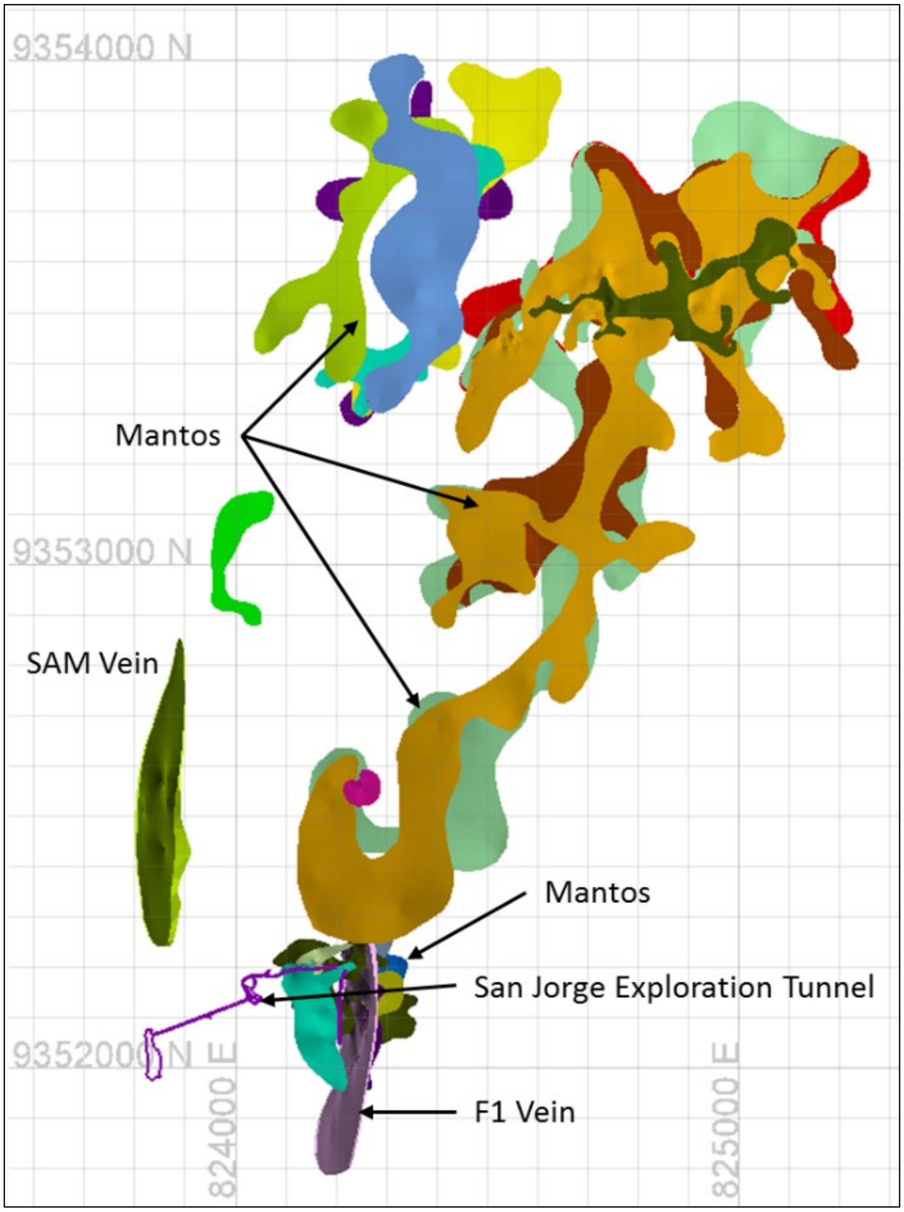


Figure 15-1 Overview of Florida Canyon Mineralized Bodies (After SRK 2017)

16.1 CUT AND FILL PARAMETERS

In cut and fill areas KCB recommended 35 m stope lengths in 2.50 to 3.0 m wide and high mineralized zones. They also recommend 16 m high sill pillars every 35 m vertically. Based on SRK's review of the available data, with good paste filling it may be possible to get three times that distance (about 100 m) based on the good rock mass quality of the hanging wall rocks and tight backfilling for the PEA level design. For cut and fill paste backfill will require a minimum of 1% to 2% cement to dewater the fill and minimize the potential for liquefaction.

16.2 SUB-LEVEL OPEN STOPING PARAMETERS

When the mineralized zone is steeper than 45° to 50° open stoping with paste backfill is the preferred mining method. The recommendations and dimensions listed are also applicable to the near vertical sections of the deposit. Rock quality in the Chambará 2 is quite good (Good to Very Good Quality – Q 20-40) which means larger stopes. Areas with flatter dips need stope stability to be managed. Chambara 2 contains the mineralized zone of the deposit. There is sufficient thickness of Chambara 2 on the order of tens of meters and is sufficient to support the hanging wall of the stoping section of the mine. Stacked manto stope areas should be mined from the top hangingwall to the footwall sequence.

Assessment of stable stope dimensions has been made using the empirical Stability Graph Method (Potvin 1988). The main objective has been to first confirm the stability of 16 m high stopes, then examine the potential for alternative dimensions.

Stability of the transverse hanging wall in 50° to 60° dipping mineralization will be the limitation on the size of the opening. KCB has recommended 300 m long transverse stopes in mantos that are 7 m high. This size stopes might be most efficiently mined with overcut and undercut with retreat mining the sill in between. The 2.5 to 3 m height is considered quite narrow such that stability of the back is not the critical factor in the design in the steeply dipping sections of the mine.

Table 15-2 lists the recommended stope dimensions for varying drift sizes. These are appropriate at a PEA level. Detailed stope sequencing and stress analysis is recommended for a feasibility level study and final mine design.

Table 15-1: Proposed Stope Dimensions

Sizes w x h (m)	Mz Zone	HR	Width (m)	Height (m)	Length (m)	Area (m^2)	Perimeter (m)	Maximum Height Allowed (m)
2.5 x 2.5	Wall	16		6.5	300	1,950	613	36
	Back	13	2.5	6.5		16.25	18	NA
2.5 x 3.0	Wall	16		7	300	2,100	614	36
	Back	13	3	7		21	20	NA
3.0 x 2.5	Wall	16		6.5	300	1,950	613	36
	Back	13	2.5	6.5		16.25	18	NA
3.0 x 3.0	Wall	16		7	300	2,100	614	36
	Back	13	3	7		21	20	NA

Source: KCB (2014a)

16.3 Crown Pillar

The scaled span method was used to assess the stability of the crown pillar for the stopes (Carter, 2014). This analysis was conducted to prevent a collapse of mine workings to the surface. Based on this analysis, if the stope size is restricted just below the crown and near the surface, then the crown pillar could be reduced to an equivalent of two to three times the span width.

For this preliminary study, a minimum crown pillar of 30 m has been used. This is based on the steep topography at the site and wanting to ensure that no stopes or openings approached the surface. Tight paste backfill of all stope openings is required.

16.4 Sill Pillar Dimensioning

Sill pillars are planned at 35 m intervals in the shallow dipping areas (less than 45°). In the steeply dipping vertical areas sill pillars with a height of 16 m may be used for every 96 m (six levels) of vertical excavation. It is assumed that 50% of these pillar levels will be recovered on retreat. This may be optimized depending on the geotechnical parameters of the paste fill material used. The sill pillars left should be the width of the stope being opened, which is expected to be the height of the orebody between 2.5 to 3 m.

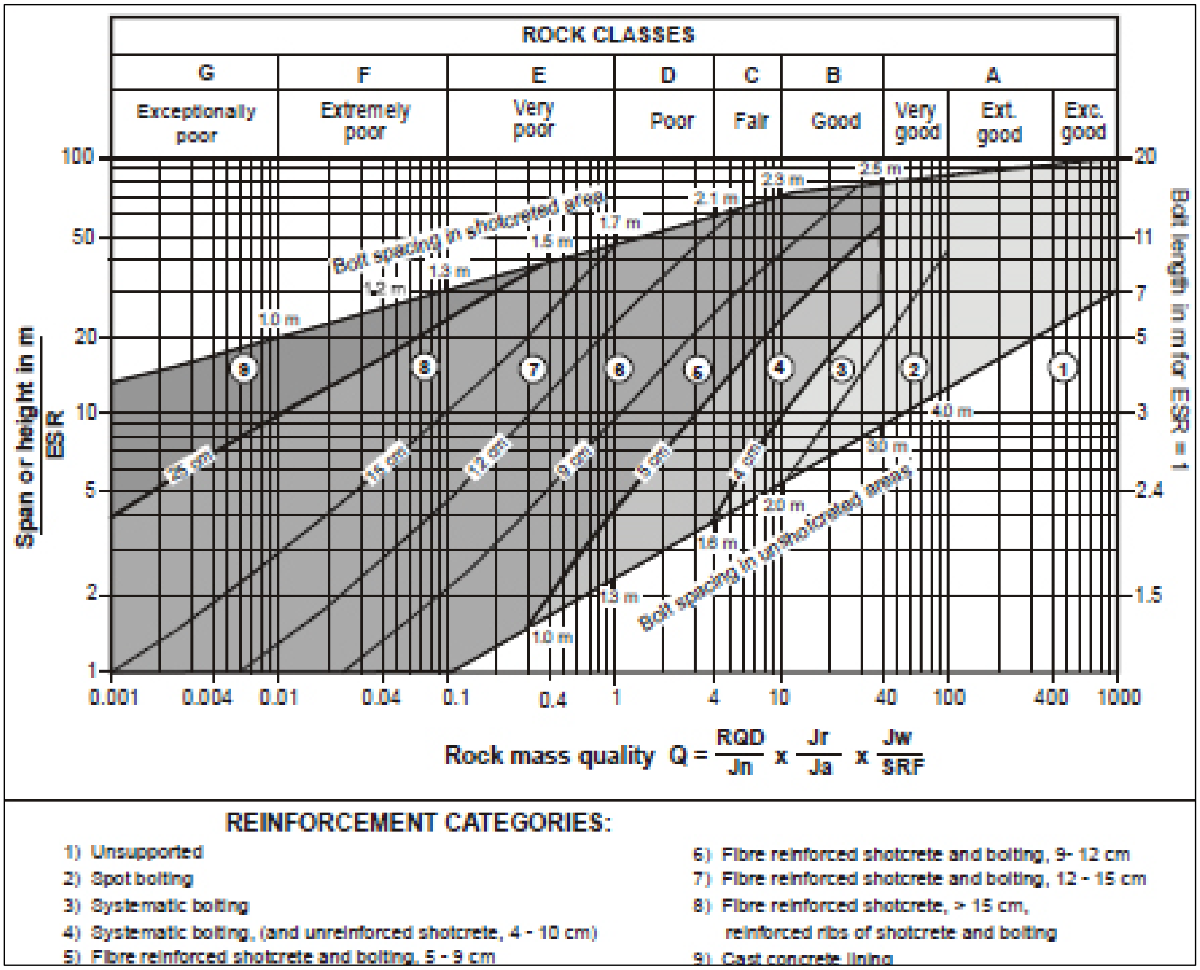
Partial recovery of the sill pillars may be possible. Detailed numerical modeling of the stope sequencing and a cost benefit analysis of ground support, dilution and recovery should be made. During feasibility and final design sill pillars should optimally be placed in either lower grade zones or waste if possible.

16.5 GROUND SUPPORT

The ground support estimate is based on the rock mass classification and on-site experience in the exploration drift. Based on the median Q values of 20 to 40 in Chambará 1 and 2, 75% to 90% of the ground is not estimated to require ground support. Local spot bolting around faults or shear zones may still be required. The local support classification is support class 1 (lowest level) unsupported ground. It is estimated that 10% to 25% of development openings will require mesh, bolts and 50 mm of shotcrete. Some drifts and openings in Chambará 3 will require pattern bolting and mesh / shotcrete (Class 4 support).

Short-term access to stopes and cut and fill areas (less than 2 years) may use friction bolts. Long term (greater than 2 years) bolt elements should consist of fully grouted (cement or resin) bar.

The estimated ground support parameters were developed based on Barton's tunneling quality index Q values as illustrated on Figure 15-3. Dimensions of the access drifts and input parameters for the Barton analysis are listed on Table 15-3.



Source: Grimstad and Barton, 1993

Figure 15-2: Grimstad and Barton Ground Support Estimate

Table 15-2: Parameters for the Barton Method

Excavation	Type of Excavation	Opening Dimensions W x H (m)	ESR Min	D_e
Access Drives	Long Term 2+ years	5 x 5	3	1.7 m
Development Drives	Short to Medium Term 1-2 years	4 x 4	2.5	1.6 m

Source: SRK

16.6 TAILINGS BACKFILL

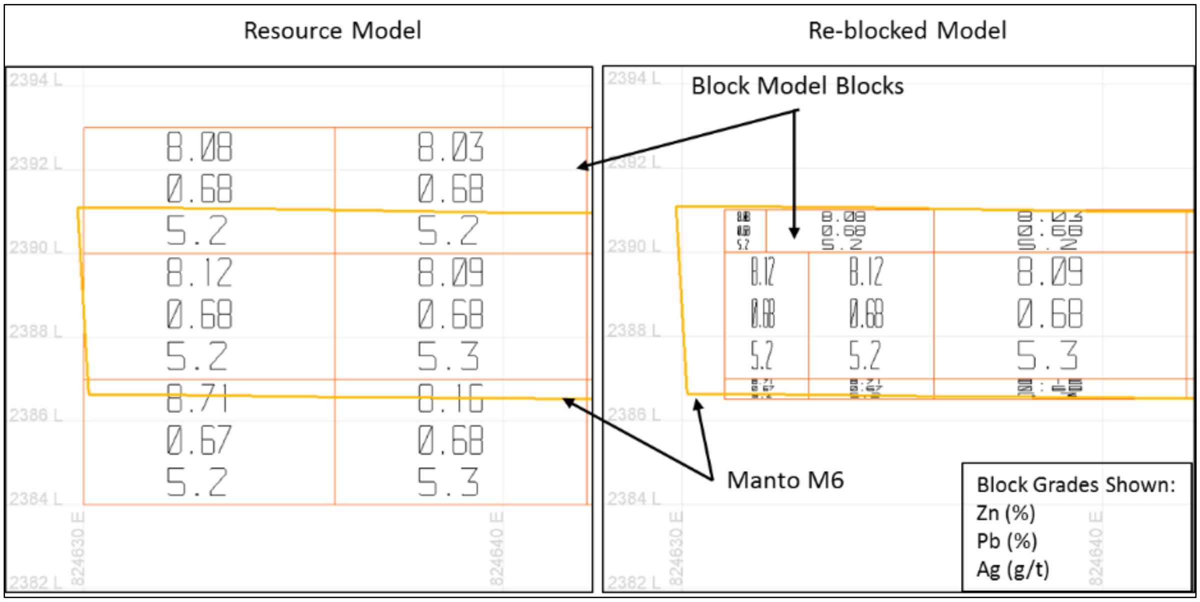
Paste-fill assume sufficient cement content to de-water the paste, so that the material will not liquefy. For stope backfill 1% to 2% cement backfill is recommended for costing.

16.7 MINE DESIGN

The analysis provided in this report is preliminary in nature. The reader is cautioned that Mineral Resources are not Ore Reserves and have not demonstrated economic viability. There is no certainty that this preliminary economic assessment will be realized.

A block model was created estimating silver, lead, and zinc values as well as the ratio of oxide minerals to total metal content for each commodity (silver, lead and zinc). Each block model block has been classified so that Measured, Indicated and Inferred Mineral Resources can be identified. Blocks in the resource model measures 6 m x 6 m x 3 m in the x, y and z directions, respectively.

Potential mining blocks shapes were constructed using Maptek Vulcan's implementation of Alford Mining System's Stope Shape Optimizer (Stope Optimizer). Considering the size and shape of the individual mineralized bodies as well as the concepts inherent in Stope Optimizer, the resource model blocks needed to be resized to produce a more realistic representation of the potential mining block shapes. Blocks in the model were re-blocked to a minimum size of 1 m x 1 m x 0.5 m based on the wireframe shapes. The grade values of the original blocks were applied to the blocks inside the wireframe shapes. Grade values of 0 were assigned to the blocks outside the wireframes. Figure 15-4 shows an example section at 9,353,600N (looking north) comparing the original resource model blocks and the re-blocked model blocks with the M6 manto wireframe.



Source: SRK, 2017

Figure 15-3: Section View Showing Resource and Re-blocked Model (9,353,600N - Looking North)

16.7.1 Net Smelter Return

The mineralized zones at Florida Canyon are polymetallic with zinc, lead and silver contributing to the total value of mineralized material. Because the value of the mineralization is not based on one commodity, the minable inventory estimate utilizes a Net Smelter Return (NSR) cut-off approach. NSR is defined as the proceeds from the sale of mineral products after deducting off-site processing and distribution costs and is typically expressed on a dollar per tonne basis. An NSR approach is commonly used in the mining industry for polymetallic deposits and is considered best practice. Inputs into the NSR calculation include the grade of material, processing recovery, commodity prices, concentrate shipping charges, and treatment and refining charges.

Resource grades are estimated for each block in the resource block model. As described above, the resource block model has been re-blocked to provide better definition around the wireframe models. Processing recoveries are modeled to be variable depending on the ratio of zinc metal associated with oxide mineralization to total zinc (ZnOx/ZnT). The expected processing recovery for each element is shown in Table 15-4.

Table 15-3: Expected Processing Recoveries

Parameter	Alteration State		
	Sulfide	Mixed	Oxide
ZnOx/ZnT Ratio	<= 0.2	0.2 to 0.8	>= 0.8
Zn Recovery	93%	(-0.8833 (ZnOx/ZnT) + 1.1067) *100	40%
Pb Recovery	84%	(-0.7333 (ZnOx/ZnT) + 0.9867) *100	40%
Ag Recovery	56%	(-0.4 (ZnOx/ZnT) + 0.64) *100	32%

Source: SRK, 2017

Work completed by Nexa has demonstrated that oxide and mixed material with higher oxide content can be processed, though at a lower recovery, and should be included as potential mining material in the inventory. Material processed at Florida Canyon will be made up of primarily sulfide and transition material.

Two concentrate products will be produced, a lead concentrate and a zinc concentrate. The lead concentrate will contain payable amount of lead and silver. No payable silver content is expected in the zinc concentrate.

As of the effective date of this report (2017), metals pricing in US dollars was exhibiting relatively significant volatility.

The parameters used in the NSR calculation for stope optimization are summarized in Table 15-5. Note that these values may vary somewhat from those used in the final economic model. An NSR value was assigned to each block model block in Vulcan software. Blocks outside the modeled wireframes, or with a zero grade, or with a classification of undefined have been assigned an NSR value of 0.

The mineralized bodies outcrop in several areas. Underground mining in these near-surface zones may be risky given the topography and environmental conditions. A 30 m buffer below topography was created, and the blocks within this buffer zone have been assigned an NSR value of 0 so that underground stopes shapes are not produced in these areas. The quantity of Measured, Indicated, or Inferred material in the resource model above the NSR cut-off and above the 30 m buffer is 151,000

t. Further study is required to determine if this material is minable using underground or surface methods.

Table 15-4: NSR Calculation Parameters for Stope Optimization

Parameter	Unit	Value
Metal Prices		
Zn price	US$ / lb Zn	$1.20
Pb price	US$ / oz Ag	$1.00
Ag price	US$ / oz Ag	$17.50
Recovery to Concentrate		
Zn	%	40% to 93%
Pb	%	40% to 84%
Ag	%	32% to 56%
Concentrate Grade		
Zn	%	50%
Pb	%	50%
Moisture Content	%	9%
Transportation and Treatment/Refining Charges		
Transportation Charge	US$/t concentrate	$70.00
Zn treatment charge	US$/t concentrate	$115.00
Pb treatment charge	US$/t concentrate	$100.00
Zn refining charge	US$/lb Zn	$0.115
Pb refining charge	US$/lb Pb	$0.100

Source: SRK, 2017

An example NSR calculation for an individual block is shown in Table 15-6.

Table 15-5: Example NSR Calculation

Parameter	Units	Value
Volume	m^3	7.5
Density	t/m^3	2.89
Tonnage	t	21.7
Resource Zn	%	6.62
Resource Pb	%	0.05
Resource Ag	g/t	9.78
Contained Zn	lb	3163.4
Contained Pb	lb	23.89
Contained Ag	oz	6.82
Zn Recovery		0.93
Pb Recovery		0.84
Ag Recovery		0.56
Recovered Zn	lb	2941.9
Recovered Pb	lb	20.06
Recovered Ag	oz	3.82
Value Zn	US$	$3530.33
Value Pb	US$	$20.06
Value Ag	US$	$66.79
Zn Concentrate (wet)	t	2.91
Zn Concentrate (dry)	t	2.67
Pb Concentrate (wet)	t	0.20
Pb Concentrate (dry)	t	0.18
Zn Concentrate Shipping	US$	$203.60
Zn Concentrate Treatment/Refining	US$	$645.25
Pb Concentrate Shipping	US$	$1.40
Pb Concentrate Treatment/Refining	US$	$3.83
Net Block Value	US$	$2,763.09
NSR	US$/t	$127.48

Source: SRK, 2017

16.7.2 Operating Costs

Technical studies have been completed on the project by both internal teams and external consultants. Considering the previous work and the geometry and size of the mineralized zones as they are currently known, a 2,500 t/d production rate has been selected. Operating costs used in the determination of potential mining shapes are based on previous studies of the Florida Canyon project, estimating manuals, first principals, and comparing the Florida Canyon project with similar operations in Central and South America. Table 15-7 lists the operating costs used to determine potential mining shapes for Florida Canyon.

Table 15-6: Operating Costs Used for Determining Potential Mining Shapes

Item	Cost (US$/t) Longhole	Cost (US$/t) Drift and Fill/ Cut and Fill
Mining	24.40	25.93
Processing	12.00	12.00
G&A	5.00	5.00
Total	**$41.40**	**$42.93**

Source: SRK, 2017

16.7.3 Stope Optimization

Potential mining blocks shapes were constructed using Maptek Vulcan's implementation of Alford Mining System's Stope Shape Optimizer (Stope Optimizer). NSR values were calculated using the parameters described in Section 15.7.1 for material classified as Measured, Indicated or Inferred. All other blocks are assumed to be waste with NSR and grade values of zero.

The mining method applicable to the San Jorge and SAM mineralized bodies is longhole stoping. Nominal level spacing in the longhole areas is 16 m from sill to sill. Potential mining shapes have a minimum width of 3 m. Mining in these narrow areas may utilize a resuing technique to control dilution if needed. Both longitudinal stopes (stopes oriented along strike) and transverse stopes (oriented perpendicular to strike) exist in the mining zones.

The mining methods applicable to the flat to moderate dipping areas is drift and fill or cut and fill. A minimum cut height of 3 m has been used with the potential mining blocks are oriented horizontally, although in practice the mining cuts in the flat to shallow dipping areas will likely follow the footwall.

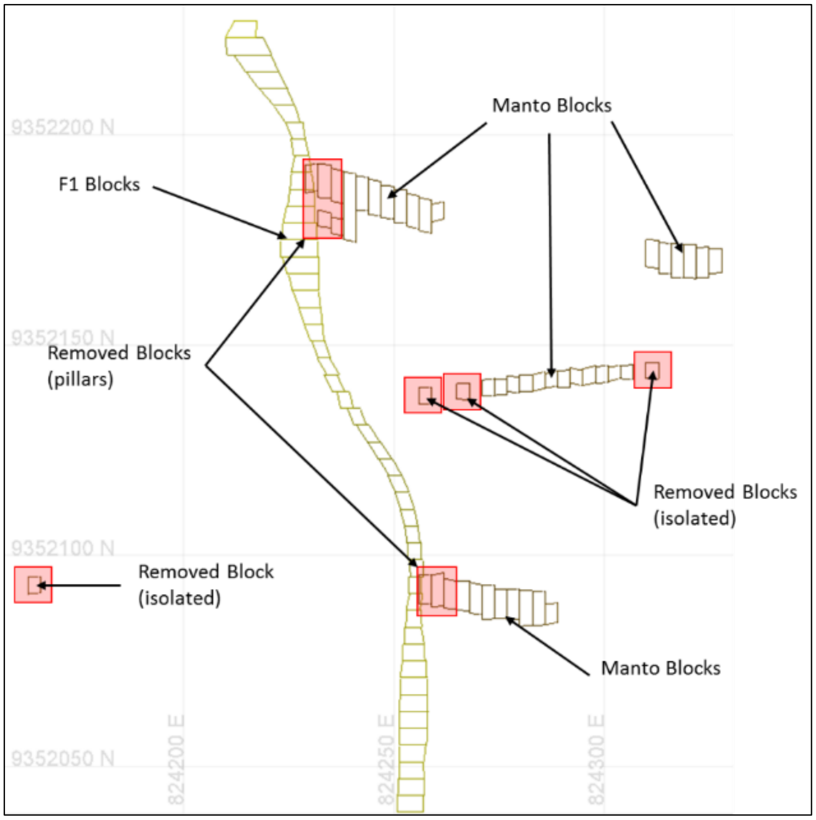
Key parameters used for stope optimization are provided in Table 15-8.

Table 15-7: Stope Optimization Parameters for Base Case Analysis

Mining Method	Longhole	Drift and Fill/ Cut and Fill
Minimum Stope Width (m)	3	3
Minimum Waste Pillar Width (m)	3	3
Stope Height (m)	16	3
Cut-off (NSR)	US$41.40	US$42.93

Source: SRK, 2017

The stope blocks output from Stope Shape Optimizer were visually inspected. Isolated blocks: i.e., small blocks far from larger groups of blocks or where additional development is not practical or economically feasible, were identified for removal from the mining block inventory. A small number of blocks were also removed in manto areas near the F1 longhole blocks to mitigate the impacts of mining induced stresses between the zones. Figure 15-5 shows an example level section at 2044.5 elevation in the F1 area. Blocks flagged for removal are outlined in red. Approximately 273,000 t of material was removed from the inventory over the entire Florida Canyon project area and is less than 2.5% of the tonnes within the inventory.



Source: SRK, 2017

Figure 15-4: Section View Showing Blocks Removed from Inventory

The stope optimization shapes were used to determine tonnes and grade of material inside the shapes for the 2017 PEA. Mining dilution and recovery factors were applied in a spreadsheet.

16.7.4 Mining Recovery and Dilution

The undiluted tonnes and grade of each potential mining block is based on the resource block model. Minable inventory tonnes and grade are calculated using the following factors:

- Mining Recovery: a factor resulting in material loss (tonnage reduction) due to the mining method applied and the deposit geometry; and
- Dilution: a factor resulting in a reduction of the overall average grade due to the mining of waste with the mineralized material.

The generalized formula for calculating the reserve tonnage in each mining block is:

$$T_{inventory} = T_{mining\ block} * \text{Mining Recovery\%} * (1+\text{Dilution\%}_{unplanned})$$

The generalized formula for calculating the reserve grade is:

$$G_{inventory} = \text{Resource Grade}_{mining\ block} / (1+\text{Dilution\%}_{unplanned})$$

The mining recovery applied to the areas using the longhole method is 90%. Pillars with a height of 16 m have been planned for every 96 m (six levels) of vertical excavation. It is assumed that 50% of these pillar levels will be able to be recovered on retreat. The mining recovery applied in the drift and fill and cut and fill areas is 95%.

Dilution is defined as the ratio of waste to mineralized material above cut-off. There are two types of dilution that would be expected in the mine: internal, also called planned dilution; and external, also called unplanned dilution.

- Internal or planned dilution occurs when material less than a cut-off grade falls within a designed stope boundary (i.e., it would be drilled and blasted within the stope during mining).
- External or unplanned dilution is derived from low- or zero-grade material outside the stope design boundaries. This dilution is the result of over-break arising from poor drilling and blasting techniques, adverse geological structures, and failure within zones of weak rock.

No additional external dilution has been applied to the Florida Canyon mining shapes. Internal dilution for the base case Florida Canyon scenario ranges from 13% to 73% and averages 34%. It is expected that a detailed design would likely reduce the overall average dilution. A detailed design, however, is beyond the scope of this study.

16.7.5 Cut-off Evaluation

The NSR value of each potential mining block was calculated and evaluated against the NSR cut-off value for the mining method to be applied to the block. The NSR cut-off includes mining costs, processing costs, and general and administrative costs as described in Section 15.7.2. Mining blocks with an average NSR value above the NSR cut-off are included in the minable inventory. In some cases, marginal blocks, defined as blocks below the economic cut-off but above the sum of the cost of mining and processing, are included in the inventory if they are adjacent to economic blocks and it is reasonable to expect that no significant additional development would be required to extract the marginal block. Mining blocks not meeting the criteria described above are classified as waste and excluded from the inventory.

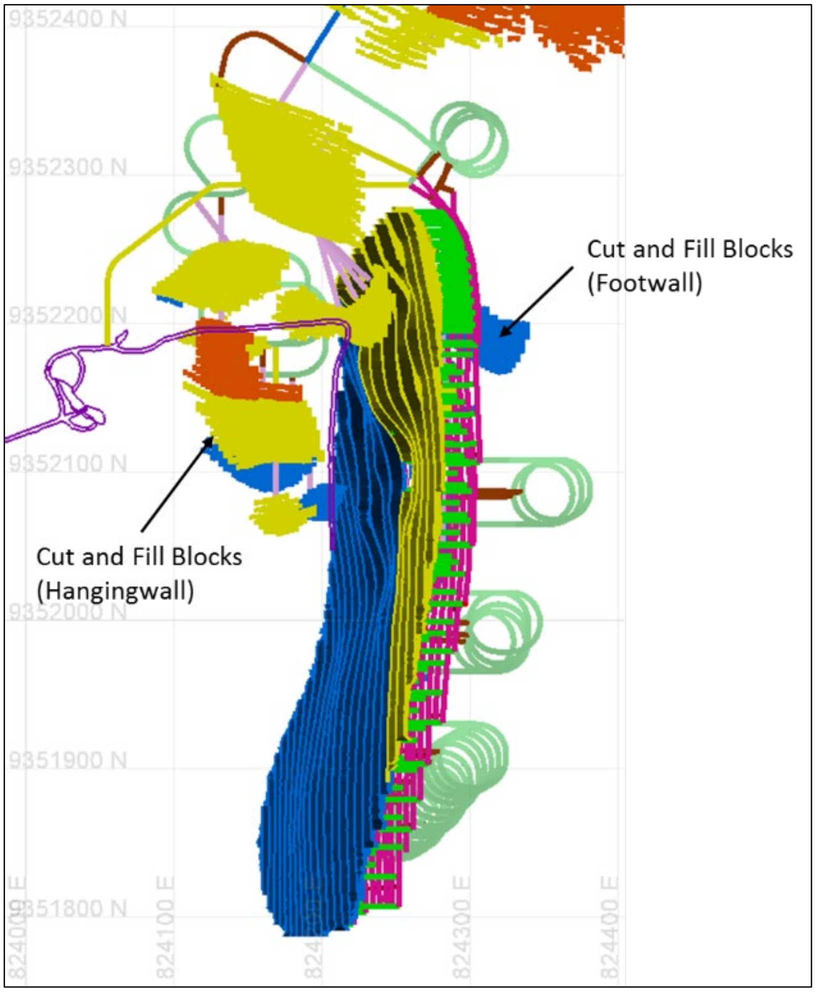
16.7.6 Mining Methods

Approximately 26% of the mining resource will be mined using longhole stoping in the SAM and F1 areas with the remaining mined using mechanized drift and fill and cut and fill. Cemented paste fill and cemented rock fill will be used to backfill primary stopes. Mine development waste will be used in secondary stopes with some secondaries backfilled with low content cemented paste fill where required.

Longhole Stoping

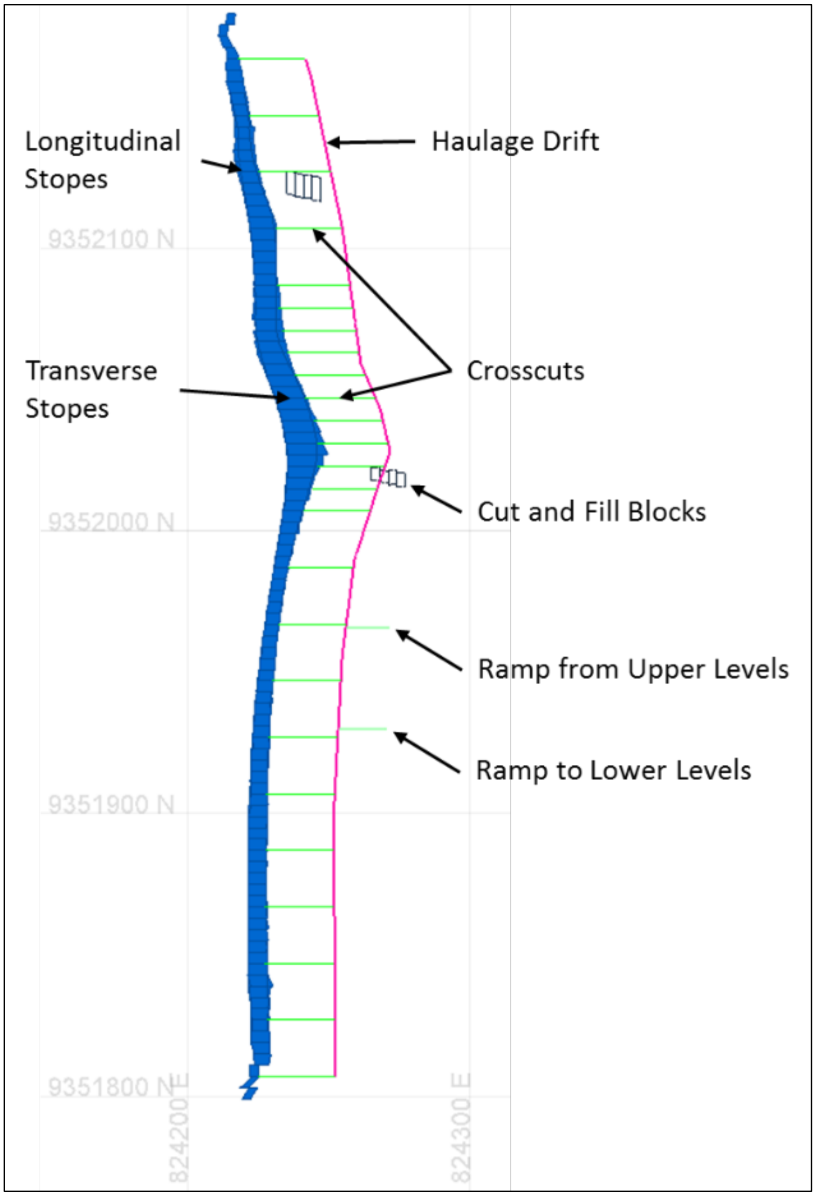
Sublevels in the longhole areas will be developed at 16 m intervals. Stopes less than 8 m wide will be mined longitudinally (along strike) with stopes greater than 8 m wide mined transversely (perpendicular to strike). Ramp, main haulage, and cross-cut development will be in the footwall. Haulage drifts have been offset from the stopes by 20 m. Sill development in the mineralized zones will provide access for drilling, blasting, ground support, and mucking. Blasthole drilling will be from the top sill using top hammer drills. Broken material will be mucked from the bottom of the stopes using remote controlled Load Haul Dump units (LHD).

Consideration for good ground control and the influence of mining induced stresses will have impact on the sequence of mining in these areas. The production schedule described in this study has mining occurring from the hanging wall to footwall with cut and fill blocks in the footwall mined on retreat. Figure 15-6 shows the F1 area and the proximity of cut and fill blocks to longhole blocks. Figure 15-7 shows a typical longhole level layout.



Source: SRK, 2017

Figure 15-5: Plan View of F1 Area Showing Cut and Fill and Longhole Blocks

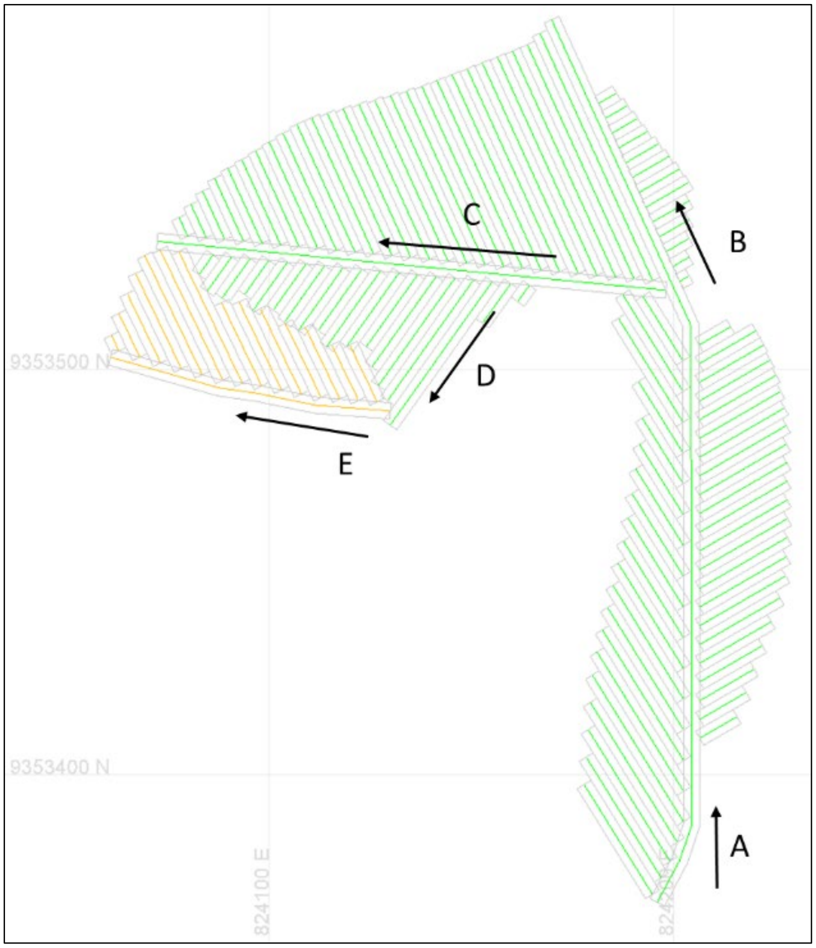


Source: SRK, 2017

Figure 15-6: Section View Showing Typical Longhole Level Layout (Elevation 1981)

Drift and Fill, Cut and Fill

Mining of shallow dipping (less than 27°) accounts for 70% of mine production. Mining cuts measuring 4 m wide x a minimum 3 m high will be used to minimize dilution in thin areas. Stopes within a given manto or group of mantos will be developed from the bottom-up with each subsequent 3 m level developed above the mined-out and backfilled cut below. Stopes are planned to follow the grade of the footwall up to a maximum allowable gradient of 15%. An example drift and fill layout in the M10 manto is shown in Figure 15-8 with haulage access progression labeled. Drill jumbos will be used to drill 45 mm holes with each round advancing 4 m. Blasting will primarily use ANFO/emulsion blends.



Source: SRK, 2017

Figure 15-7: Example Drift and Fill Layout, M10 Manto

Areas that require footwall waste development for stope block access will utilize access ramps with a maximum grade of 15%. Blocks of 12 to 16 m high will be mined using cuts of 3 to 4 m depending on the geometry of the mineralized material. Mining of cuts within a stope block will progress from the bottom to the top with lower cuts filled with cemented paste fill, cemented rock fill or development waste.

Large karst caverns have been encountered during the excavation of the San Jorge adit, and karstic features have been observed in drilling. Additional geotechnical and hydrogeological information and study is required to better understand the potential impact on mining and risk mitigation measures that may be required to ensure a safe working environment.

16.7.7 Mine Plan Resource

The tonnes and grade of the resource material contained within the mining blocks, adjusted by recovery and dilution, and categorized by the resource classification is provided in 15. The mine plan resource consists of a total of 11.2 Mt with an average grade of 8.34% Zn, 0.90% Pb, and 11.3 g/t Ag. and is made up of Measured, Indicated, and Inferred material. Estimated average dilution, processing recoveries and the ZnOx/ZnT ratio is also provided. Average process recovery and dilution for the mine plan resource are shown in Table 15-9.

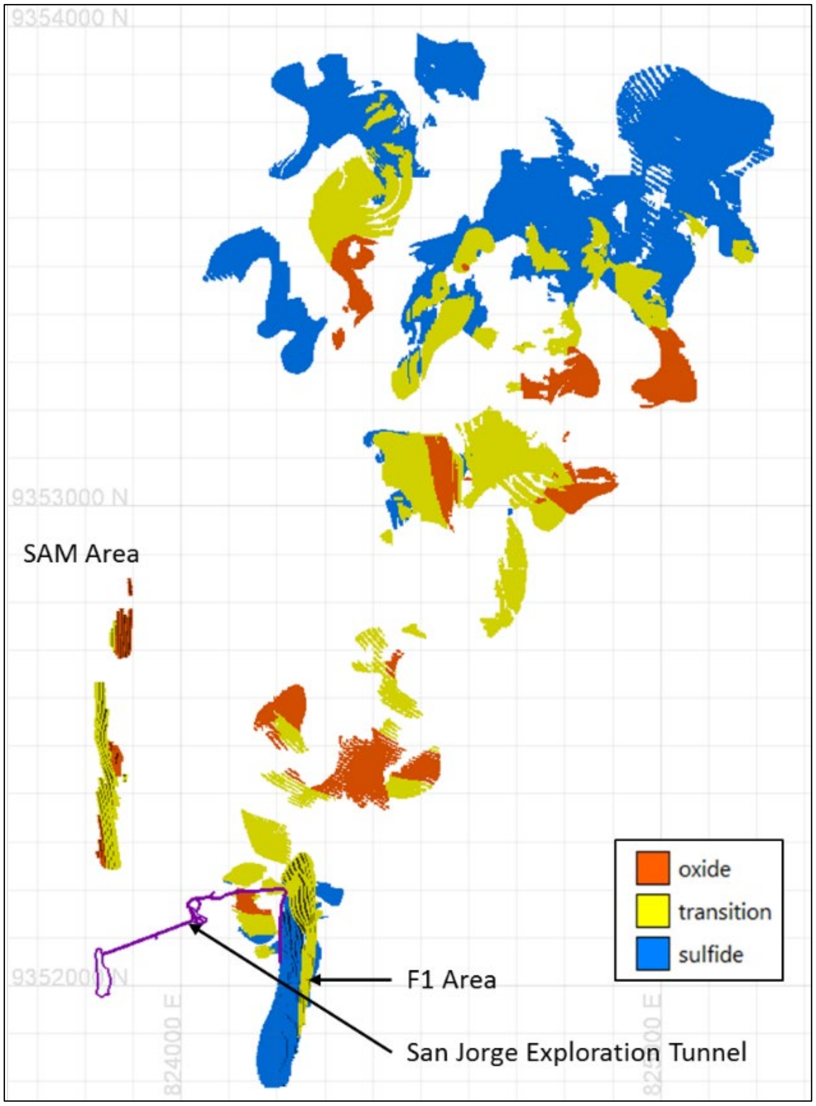
15 Source: SRK, 2017
* NSR is calculated using variable recoveries based on sulfide/oxide ratios (recovery ranging from 32%-93%), a Zn price of US$1.20/lb, a Pb price of US$1.00/lb, an Ag price of US$17.50/oz. The transportation charge is US$70.00/t conc, Zn treatment charge of US$115/t conc, Pb treatment charge of US$100/t conc, Zn refining charge of US$0.115/lb Zn, and Pb refining charge of US$0.1/lb Pb. These factors were used for mine planning and vary somewhat from the final economic model.
** ZnEq estimate is based on a NSR value of US$19.62 per 1% Zn. The US$19.62 is calculated using a Zn price of US$1.20/lb, a Pb price of US$1.00/lb, an Ag price of US$17.50/oz. The ZnEq also includes TC/RC and transportation costs and assumes an average Zn recovery of 78.15% which differs somewhat from that presented in the economic model. An example of the NSR to ZnEq calculation is (148.16/19.62)/0.7815

Table 15-8: Mine Plan Resource Average Process Recovery

	Process Recovery			ZnOx/ZnT Ratio	Dilution
	Ag (%)	Pb (%)	Zn (%)		
Mine Plan Resource	51.7	74.3	79.8	0.26	34%

The PEA is preliminary in nature, that it includes 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, and there is no certainty that the PEA will be realized. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

Figure 15-9 shows an overview of blocks included in the final mineral inventory as well as the existing San Jorge adit.



Source: SRK, 2017

Figure 15-8: Florida Canyon Mining Inventory

16.7.8 Development Layout

A development layout was created to provide access to the mining levels and to tie levels into ramps. Access to the underground workings will be via three main portals (San Jorge, P01 and P03). An additional portal (P02) will be used primarily for ventilation, and three additional drifts will daylight to facilitate ventilation. The only underground excavation that currently exists at the site is the San Jorge exploration adit. This adit will be utilized for access to the F1 area and surrounding cuts in the mantos. Dimensions of the San Jorge adit are currently 2.5 m x 3.5 m. Production blocks in the central part of the project allow for the connection of the southern and northern areas via underground drifts and ramps. This underground connection will improve ventilation, will make the movement of personnel and equipment more efficient, and will allow for more flexibility in the production plan.

It is expected that development in the flat and shallow dipping mineralized zones will follow the footwall where the gradient of the drift can be less than 12%. Waste development in those areas will be limited to the primary access to the mining blocks and small connector drifts between larger blocks. Only the primary access has been designed in these flat and shallow dipping areas. A more detailed level and ramp design was created for the more steeply dipping mantos.

The mine design assumptions are listed in Table 15-10.

Table 15-9: Development Design Assumptions

Parameter	Value
Maximum Ramp Gradient (Primary Ramps)	12%
Maximum Gradient (Stope Access, Attack Ramps)	15%
Primary Development Dimensions (w x h)	4 m x 5 m
Secondary Development Dimensions (w x h)	4 m x 4 m
Primary Ventilation Raise (diameter)	4 m
Ventilation Raise Between Levels (diameter)	3 m
Ore Pass (diameter)	2 m

Source: SRK, 2017

An additional development allowance of 10% has been applied to the primary ramp, main haulage and level access drifts to account for turnouts, laydowns, and miscellaneous ventilation and ore pass development that will be required but was not designed in detail on each level. It is expected that raise boring will be contracted. Development quantities are presented in Table 15-11.

Development has been classified as capital and operating. Capital waste development makes up the mine's long term and permanent infrastructure and includes primary ramps, level accesses, main haulage levels, ore passes, and ventilation raises. Operating waste development includes stope accesses and crosscuts. Three ventilation raises to surface are designed to ensure proper ventilation of four primary zones and the relatively large lateral extent of the project.

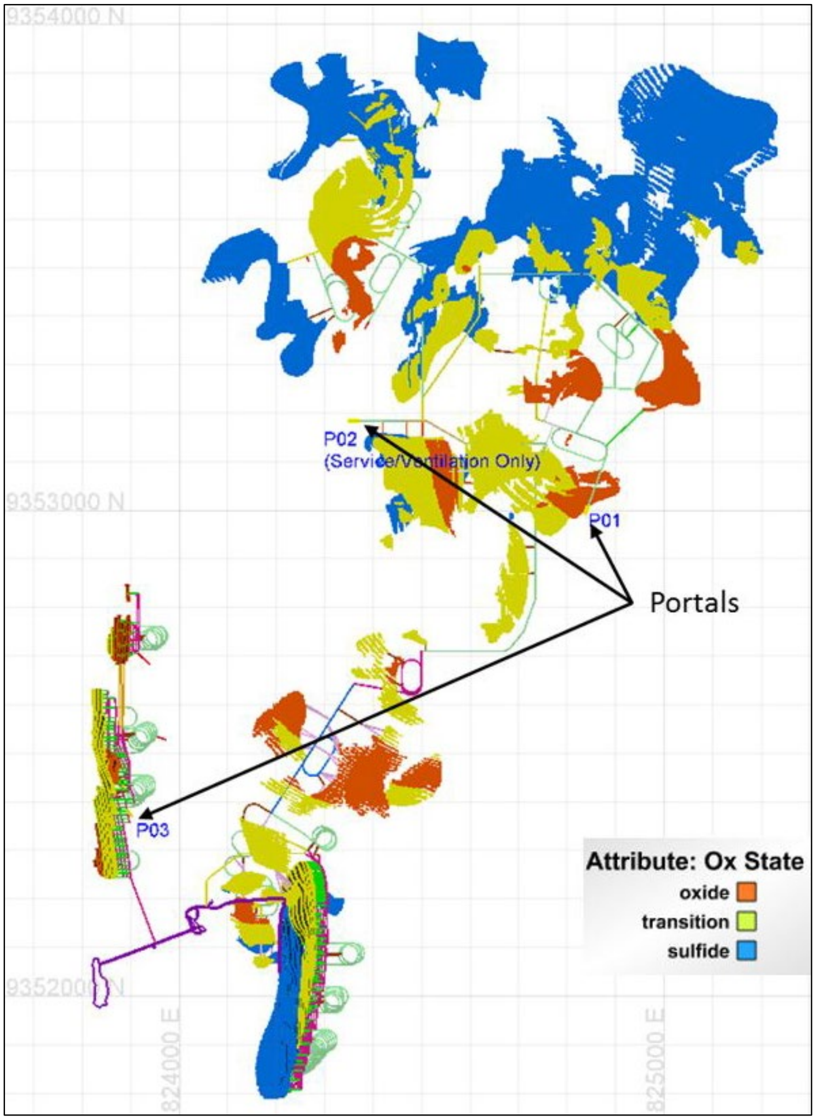
Table 15-10: Development Quantities

Category	Development Drifting (Meters)
Lateral Development (Capital)	30,944
Ventilation Raise to Surface (Capital)	617
Ventilation Raise and Ore Passes Between Levels (Capital)	1,078
Total Capital Development Meters	**32,639**
Operating	23,504
Total Development Meters	**56,143**

Source: SRK, 2017

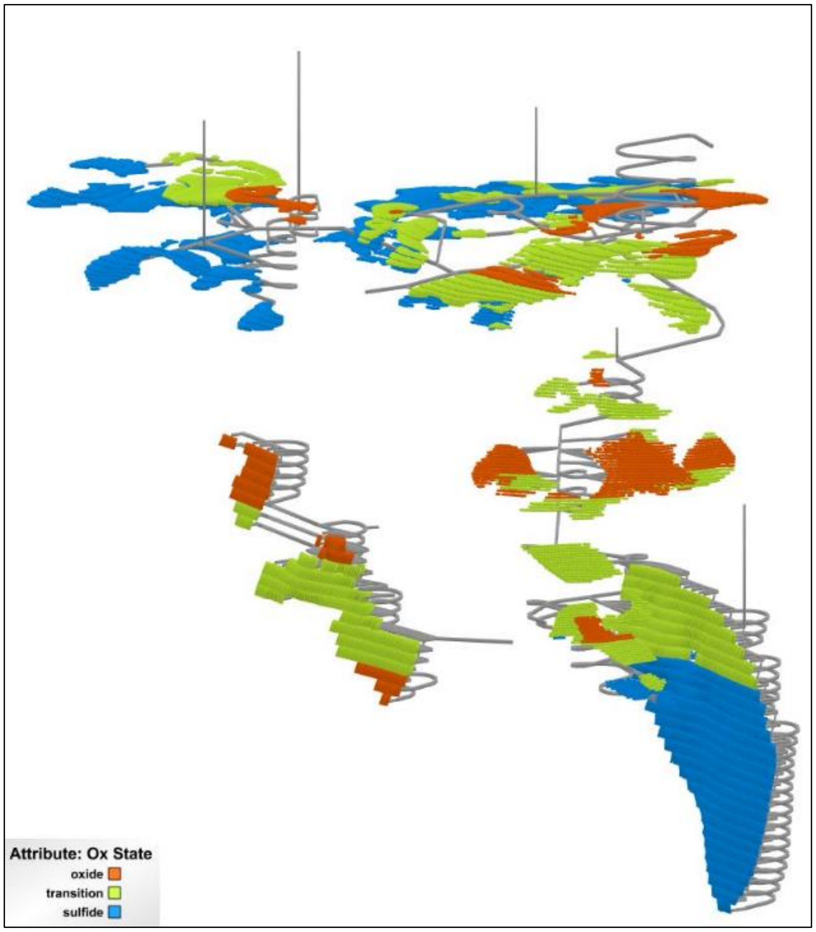
The following figures show the development layout:

- Figure 15-10 shows a plan view of the mining block inventory and development layout;
- Figure 15-11 shows a rotated view of the layout looking northeast;
- Figure 15-12 shows a rotated view of the layout looking northwest;
- Figure 15-13 shows a rotated view of the layout in the northern area of the project (drift and fill/cut and fill) looking northeast; and
- Figure 15-14 shows a rotated view of the layout in F1 and SAM looking northwest.



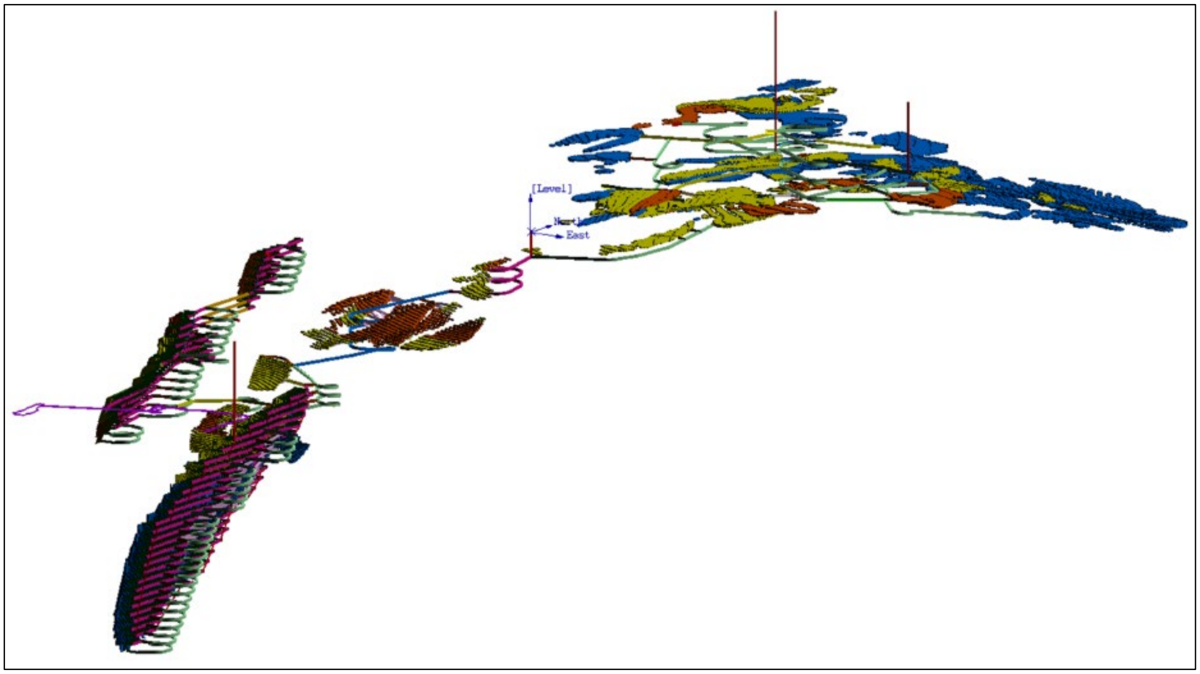
Source: SRK, 2017

Figure 15-9: Plan View of Mining Blocks and Development Layout



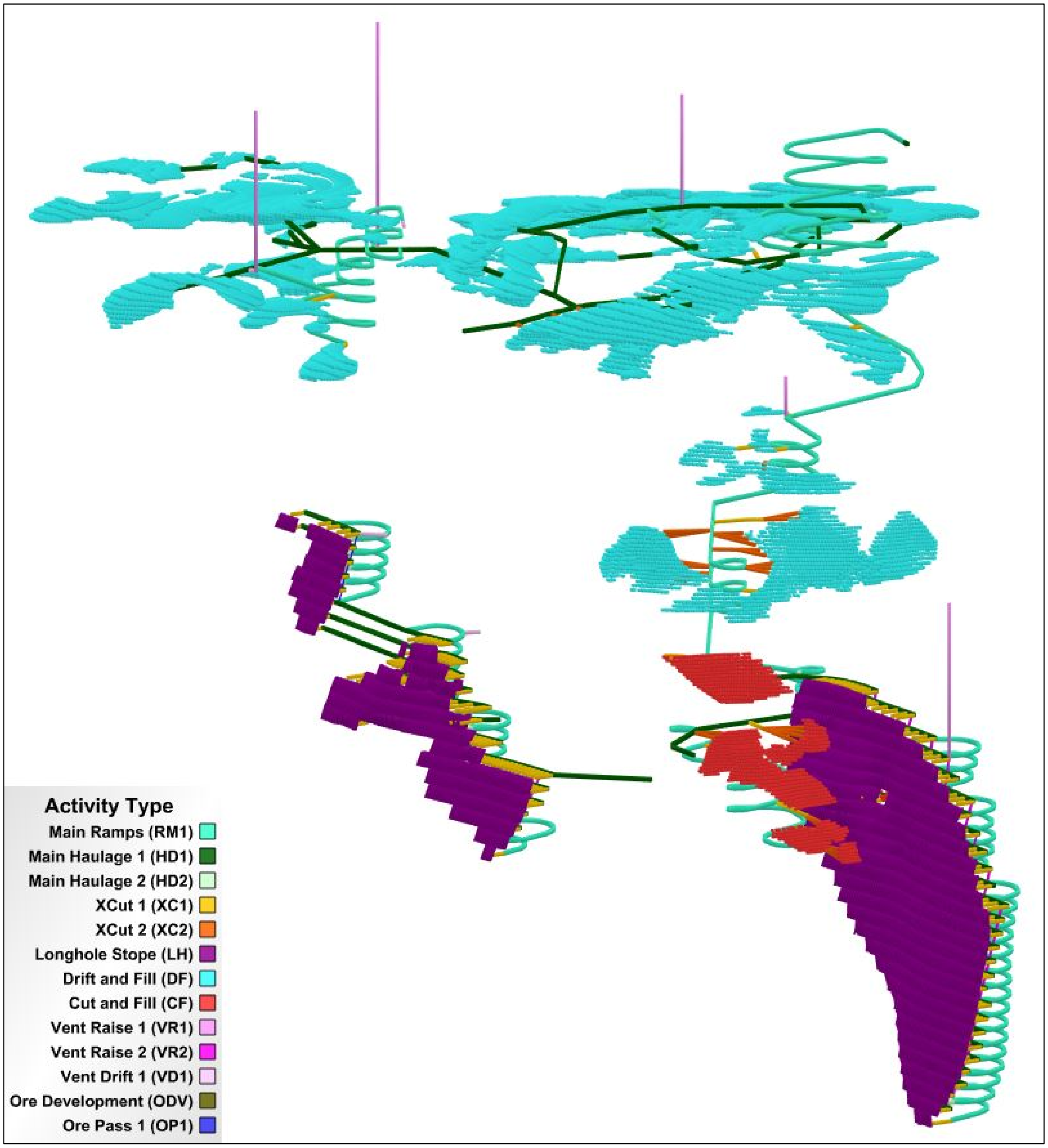
Source: SRK, 2017

Figure 15-10: Rotated View of Mining Blocks and Development Layout – All Areas (Looking Northeast)



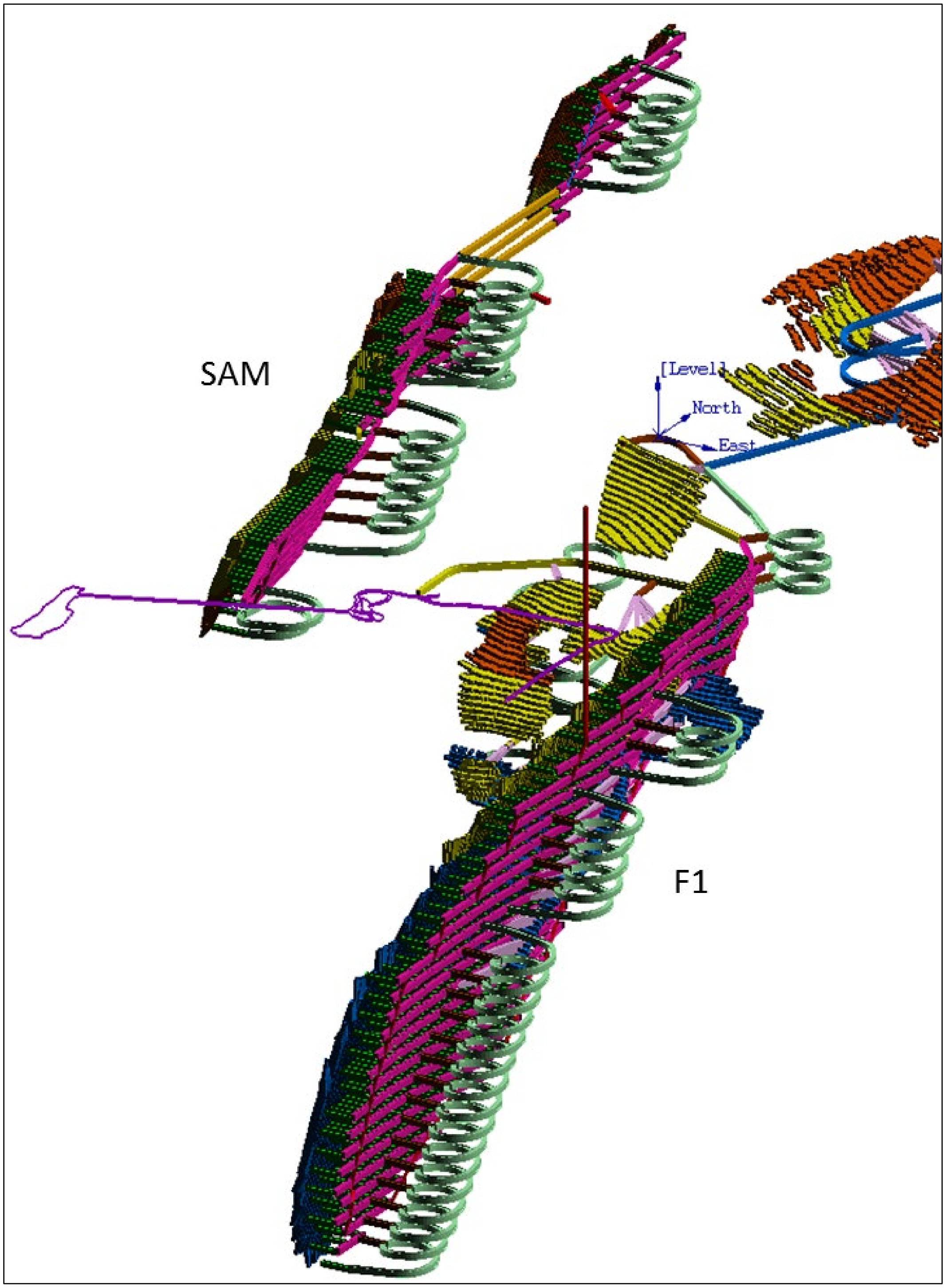
Source: SRK, 2017

Figure 15-11: Rotated View of Mining Blocks and Development Layout – All Areas (Looking Northwest)



Source: SRK, 2017

Figure 15-12: Rotated View of Mining Blocks and Development Layout – Drift and Fill/Cut and Fill (Looking Northeast)



Source: SRK, 2017

Figure 15-13: Rotated View of Mining Blocks and Development Layout – F1 and SAM (Looking Northwest)

16.7.9 Waste Rock Management and Backfilling

Development waste excavated during the two-year pre-production period will be hauled to surface and used as construction materials. This will allow stope mining to progress to a point where development waste can be placed underground. Additional development waste can be hauled to surface for construction materials where it is necessary and more cost effective than sourcing material on surface. Waste material has not been categorized in terms of its acid generating potential. It will be important in future studies to determine whether the waste material is potentially acid generating (PAG) and design storage or specify appropriate mitigation techniques should PAG material be encountered.

Backfilling is an important part of the mine plan. Backfilling stopes provides for ground support, a working platform during mining, storage for tailings, and storage of waste rock with an associated shorter haul compared to storage on surface. A mix of material will be used to backfill stopes including cemented paste tailings, cemented rockfill, and RoM development waste. The cement content will vary based on the type of waste and where it will be placed.

- Primary paste fill cement content: 6% by weight;
- Primary rock fill cement content: 4% by weight; and
- Secondary paste fill cement content (to prevent liquefaction): 2% by weight.

It is assumed that 50% of the stopes are primaries and 50% are secondaries. The life-of-mine (LoM) backfill and cement quantities by type is shown in Table 15-12.

Table 15-11: LoM Backfill and Cement Quantities by Type

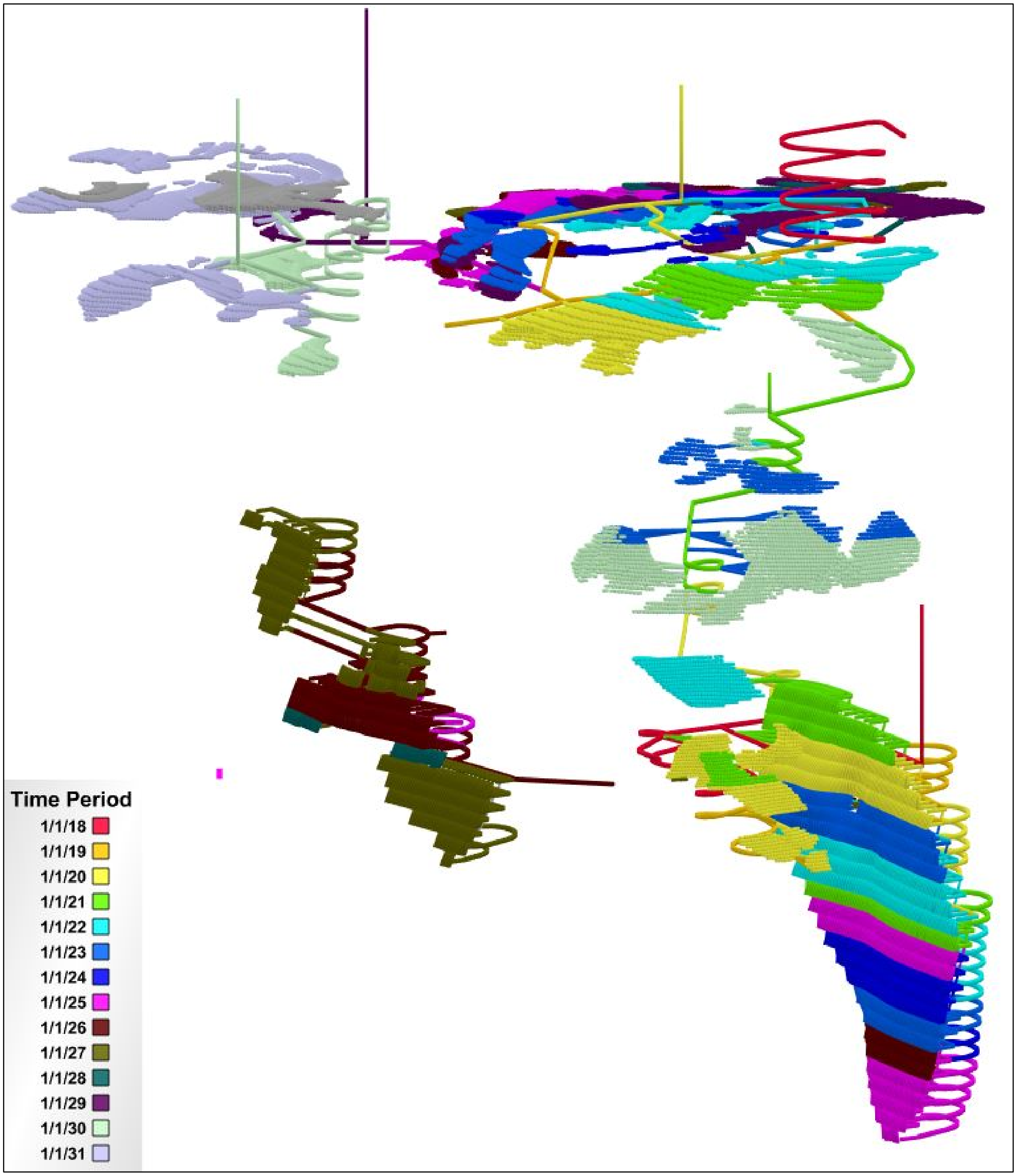
Parameter	Qty Fill (m^3)	Qty Cement Used (dmt *)
Primary cemented rock fill	161,424	10,957
Primary cemented paste fill	1,700,164	214,221
Secondary un-cemented rock fill	1,861,588	0
Secondary cemented paste fill	508,479	4,843
Total	**4,231,655**	**230,021**

Source: SRK, 2017
* dry metric tonne (dmt)

The total tailings sent to the TSF (i.e., Process tailing less tailing required for backfill) is 4,092,844 m^3, based on an average dry density of 1.6 t/m^3.

16.8 MINE PRODUCTION SCHEDULE

A production rate of 2,500 t/d has been selected to mine 912,500 mineralized tonnes per year. The mine will utilize two 12-hour shifts and operate 365 days per year. A two-year pre-production period is planned where mine development efforts will include enlarging of the San Jorge adit, development in the F1 area, and development in the north of the project area. Production will ramp up in schedule year 3 (production year 1) with an average daily mineralized material production rate of 2,005 t/d. Longhole, cut and fill, and drift and fill mining occur simultaneously. Longhole mining has been planned at a rate of 1,000 t/d and drift and fill/cut and fill mining will range from 1,500 to 2,500 t/d. Full production occurs in schedule years four through 14 (11 years of full production) with mining finished late in schedule year 15. Table 15-13 shows the Florida Canyon production schedule. It is illustrated in Figure 15-15.



Source: SRK, 2017

Figure 15-14: Rotated View of Mining Blocks Showing Production Schedule

Table 15-12: Florida Canyon Production Schedule

Parameter	Units	Period							
Schedule Year	yr	1	2	3	4	5	6	7	8
Production Year	yr	-2	-1	1	2	3	4	5	6
Mineralized t/d	t/d	-	-	2,005	2,498	2,500	2,502	2,503	2,505
Waste t/d	t/d	437	504	729	905	819	753	481	660
Total t/d	t/d	437	504	2,734	3,403	3,320	3,255	2,984	3,165
Ag	g/t	-	-	12.2	10.1	17.7	17.4	15.5	15.4
Pb	%	-	-	0.85	0.97	1.12	1.22	1.00	1.03
Zn	%	-	-	9.15	10.21	12.24	10.25	11.65	10.90
ZnOx/ZnT Ratio		-	-	0.42	0.52	0.24	0.16	0.09	0.07
Mineralized Tonnes	t	-	-	733,813	911,858	912,584	913,222	915,955	914,271
Waste Tonnes	t	159,597	183,798	266,986	330,158	299,096	274,792	176,144	240,886
Total Tonnes	t	159,597	183,798	1,000,799	1,242,017	1,211,679	1,188,014	1,092,099	1,155,157
LH Tonnes	t	-	-	294,548	365,000	365,000	365,000	366,000	365,000
Drift and Fill Tonnes	t	-	-	277,995	514,621	480,998	534,828	549,955	549,271
Cut and Fill Tonnes	t	-	-	161,270	32,237	66,586	13,394	-	-
Capital Dev Length (excl. Vnt. raise to surface)	m	2,545	3,133	2,517	4,256	3,278	2,283	1,532	2,855
Vent Raise to Surface	m	181	-	131	42	8	-	-	-
Opex Dev Length	m	272	198	2,773	2,181	2,602	3,408	2,097	1,999
Parameter	**Units**	**Period**							**Totals**
Schedule Year	yr	9	10	11	12	13	14	15	
Production Year	yr	7	8	9	10	11	12	13	
Mineralized t/d	t/d	2,501	2,503	2,507	2,503	2,508	2,500	1,093	2,076
Waste t/d	t/d	965	880	40	97	339	135	-	525
Total t/d	t/d	3,466	3,383	2,547	2,600	2,847	2,635	1,093	2,601
Ag	g/t	9.9	8.9	6.4	8.3	7.0	9.3	6.4	11.3
Pb	%	1.11	0.90	0.77	0.98	0.40	0.56	0.69	0.90
Zn	%	8.53	6.39	4.94	6.43	5.65	5.40	5.08	8.34
ZnOx/ZnT Ratio		0.13	0.42	0.13	0.43	0.45	0.20	0.47	0.26
Mineralized Tonnes	t	912,955	913,419	917,431	913,524	915,319	912,402	399,948	11,186,701
Waste Tonnes	t	352,067	321,253	14,802	35,532	123,862	49,225	-	2,828,197
Total Tonnes	t	1,265,022	1,234,671	932,233	949,056	1,039,181	961,627	399,948	14,014,897
LH Tonnes	t	334,680	358,729	82,538	-	-	-	-	2,896,495
Drift and Fill Tonnes	t	496,400	477,383	834,893	913,524	915,319	912,402	399,948	7,857,537
Cut and Fill Tonnes	t	81,875	77,307	-	-	-	-	-	432,669
Capital Dev Length (excl. Vnt. raise to surface)	m	3,278	3,174	118	475	1,718	861	-	32,022
Vent Raise to Surface	m	-	-	-	255	-	-	-	617
Opex Dev Length	m	3,847	3,382	184	-	482	78	-	23,504

Source: SRK, 2017

16.9 Mine Services

16.9.1 Underground Mine Equipment

Mine equipment selection is based on the mining methods employed, production requirements, expected number of open faces required to meet production, and development and stope dimensions. Double boom jumbos will be used for lateral development and single boom, low profile jumbos have been specified for drift and fill areas with cut heights of 3 m. LHDs with remote operating capabilities will be used for stope and development mucking and will load 30 t trucks. Table 15-14 provides a summary of the mining equipment.

Table 15-13: Mine Equipment

Equipment	Example	Number
LH Stope DTH Drills	Atlas Copco Simba Series	2
LH Production LHD (6 m3)	Sandvik LH514	3
Production Jumbo (D&F/C&F)	Low Profile, Atlas Copco M1L	6
D&F/C&F Production LHD (4 m3)	Sandvik LH410	6
Horizontal Development Jumbos (2 boom)	Atlas Copco Boomer (2 boom)	4
Development LHD (6 m3)	Sandvik LH514	4
Haul Trucks (30 t)	Sandvik TH430	6
Rock Bolter	Atlas Copco Boltec Series	2
Anfo Loader		2
Miscellaneous/Service Vehicles		5
Light Vehicles/General		5

Source: SRK, 2017

16.9.2 Electrical

The underground mine will be supplied by power from the main Project substation. The main underground power will be used for the crushers located at the portals, jumbos, drills, ventilation, and electric pumps. Additionally, power will support auxiliary use in the shops and for smaller loads such as secondary fans, temporary pumps, and auxiliary lighting.

16.9.3 Ventilation

A conceptual ventilation layout has been developed for this PEA study to estimate the number and location of ventilation openings to surface and to develop a cost estimate for ventilation. Additional detailed ventilation design is required in the next phase of study.

Ventilation of the Florida Canyon project will be subdivided into four zones. The San Jorge adit and a raise to surface will be used to ventilate the southern sections, the F1 area, of the mine. Workings in the central and northern parts of the mine, the flat to moderate dipping mantos, will utilize a newly excavated decline, a ventilation portal, and two raises to surface. The SAM area is largely isolated from the rest of the network and will be ventilated via its portals and ventilation drifts that daylight on surface. The northwestern part of the mine will be ventilated via a raise and ventilation drift daylighting on the surface.

Based on the equipment list SRK estimated airflow requirements using some general assumptions of average power and utilization. The airflow requirement is based on 125 cfm per brake horsepower (bhp) which is a commonly used rule-of-thumb value for this type of preliminary estimate. The number of personnel underground were estimated and airflow calculates used 55 cfm/person. Newer battery powered equipment may be used, with the additional capital cost offset by reduced ventilation requirements. A utilization percentage for equipment has not been used for airflow calculations and would reduce the required airflow. The estimated airflow requirement by zone are shown in Table 15-15 through Table 15-17 at typical production in the given zone.

Table 15-14: Estimated Airflow Requirements – Central/North and Northwest Areas

Description	Quantity	Estimate SRK (hp)	Utilization (%)	Air Required (cfm)
Scoops/LHD (4 m3)	4	300	100%	150,000
Scoops/LHD (6 m3)	3	350	100%	131,250
Bolters	1	75	100%	9,375
Development Jumbos	3	80	100%	30,000
Production Jumbos	4	110	100%	55,000
Trucks (30 t)	4	420	100%	210,000
Explosives Trucks	1	150	100%	18,750
Miscellaneous	7	120	100%	105,000
Personnel	40		100%	2,200
Subtotal				**561,575**
Misc Allowance	20%			112,315
Total				**673,890**

Source: SRK, 2017

Table 15-15: Estimated Airflow Requirements – F1 (San Jorge)

Description	Quantity	Estimate SRK (hp)	Utilization (%)	Air Required (cfm)
Scoops/LHD (6 m3)	4	350	100%	175,000
Bolters	1	75	100%	9,375
LH Drills	2	80	100%	20,000
Jumbos	2	110	100%	27,500
Trucks (30 t)	3	420	100%	157,500
Explosives Trucks	1	150	100%	18,750
Miscellaneous	5	120	100%	75,000
Personnel	25		100%	1,375
Subtotal				**484,500**
Misc Allowance	20%			96,900
Total				**581,400**

Source: SRK, 2017

Table 15-16: Estimated Airflow Requirements - SAM

Description	Quantity	Estimate SRK (hp)	Utilization (%)	Air Required (cfm)
Scoops/LHD (4 m3)	4	300	100%	150,000
Scoops/LHD (6 m3)	3	350	100%	131,250
Bolters	1	75	100%	9,375
Production Jumbos	4	110	100%	55,000
Trucks (30 t)	4	420	100%	210,000
Explosives Trucks	1	150	100%	18,750
Miscellaneous	7	120	100%	105,000
Personnel	40		100%	2,200
Subtotal				**561,575**
Misc Allowance	20%			112,315
Total				**673,890**

Source: SRK, 2017

16.9.4 Mine Personnel

Mine personnel requirements have been estimated based on production estimates, equipment selection, guidance from estimating manuals, and data from similar operations in production in Central and South America. The mine will utilize two 12-hour shifts and operate 365 days per year. Production personnel will be housed at the camp while on shift and will work a two week on/two week off rotation. Four crews will be required with two crews on site at any given time. Management and technical staff will work 4 day on/3 day off schedule. Table 15-18 lists the hourly and salaried personnel on site at any given time.

Table 15-17: Hourly and Salaried Personnel (On Site)

Hourly Personnel	Count
Stope Miners	24
Development Miners	15
General Equipment Operators	6
Ground Support	4
Exploration Drillers	3
Backfill Plant	2
Electricians	5
Mechanics	14
General Maintenance	7
Laborers/Helpers	16
Surface Laborers	7
Total Hourly	**103**
Salaried Personnel	**Count**
General Manager	1
Superintendents	2
Mine Foreman	5
Engineering	3
Geology	3
Environmental	3
Shift Supervisors	8
Technicians	3
Accountants	3
Purchasing	5
Personnel	5
Secretaries	7
Clerks	9
Total Salaried	**57**

Source: SRK, 2017

16.9.5 Health and Safety

The mine will have a communications system that has both mine phones and wireless communication through a leaky feeder system. A stench gas emergency warning system will be installed in the mine's intake ventilation system. This system can be activated to warn underground employees of a fire situation or other emergency whereupon emergency procedures will be followed. Typically, two means of egress from a working area are designed or use of a portable refuge station is assumed.

17 RECOVERY METHODS (ITEM 17)

The text and figures in the following Chapter have been summarized from the 2017 Preliminary Economic Assessment Florida Canyon Zinc Project, Amazonas Department, Peru with Effective Date: July 13, 2017 and Report Date: August 3, 2017. The 2021 Mineral Resource update as described in this report does not have a negative impact on or otherwise adversely affect the mineral resource inventory that formed the basis of the 2017 PEA. In general, the mineralogy of the newly delineated resource is similar to the resource considered in the 2017 report. The results and conclusions of the 2017 PEA are still considered current and therefore have been carried over for this Report.

17.1 PROCESSING PROJECTIONS AND METHODS

The mill will process 2,500 t/d of fresh mineralized material, and produce approximately 287 t of zinc concentrate grading 50% Zn, 1% Pb, and 0.6 g/t Ag and approximately 46 t of lead concentrate grading 50% Pb, 8.4 g/t Ag, and 6% Zn. Throughput and concentrate projections are provided in Table 16-1.

Table 16-1: Florida Canyon PEA Level Throughput and Concentrate Production Projections

Concentrate	Feed				Concentrate				Tails			
	Tonne	Lead (grade)	Silver (g/t)	Zinc (%)	Tonne	Lead (grade)	Silver (g/t)	Zinc (%)	Tonne	Lead (grade)	Silver (g/t)	Zinc (grade)
Global	2,500	1.13%	0.44	6.9%	333				2,167	0.1%	0.2	1.2%
Lead circuit	2,500	1.13%	0.44	6.9%	46	50%	8.4	6%	2,454	0.2%	0.3	6.9%
Zinc circuit	2,454	0.22%	0.29	6.9%	287	1.0%	0.6	50%	2,167	0.1%	0.2	1.2%

Source: SRK, 2017

17.2 PROCESSING METHODS AND FLOW SHEET

Because the challenging topography and road conditions, trucking Run-of-Mine (ROM) material would demand a lengthy route from the underground portals to the plant's location. Instead, SRK has designed a set of conventional overland conveyors with a maximum slope of 20° to simplify the operation and significantly reduce the cost of transferring mill feed from the mine portals to the process plant. A portable, 75 hp primary jaw crusher is to be installed at each underground mine portal to ensure the ROM is adequately sized for the conveying system. Planned overland conveying from the underground mine portals to the process plant is shown in Table 16-2.

Given the location of the deposit, it is anticipated three underground portals will be producing mill feed at any given time, and at different rates as presented in Table 16-2.

- The existing Portal San Jose is expected to produce in average 30% of the mill feed, equivalent to 750 t per day that is transferred to the overland conveyor at Portal 03 using a 297 m long conveyor.
- Approximately 60% of the mill feed will be produced through the new Portal 01 equivalent to 1,500 t per day and distant 840 m along the overland conveyor.
- The new Portal 03 will produce approximately 10% of the mill feed at an average of 250 t/d and will be transferred to the process plant area using an 1,855 m long conveyor.

Specifications for overland conveying are provided in Table 16-2.

Table 16-2: Overland Conveying from Underground Portals to the Process Plant

Origin or Mine Portal ID	Portal Type	Portal Elevation	Production				Conveyor			
			Throughput	Tonnes (/d)	Tonnes (/h)	Tonnes (/d max)	Destination	Elevation Difference	Length (m)	Slope (°)
Portal San Jose	Existing	2,107	30.0%	750	31	1,000	P03	24	297	5
P01	New	2,574	60.0%	1,500	63	2,500	Crushing Plant	41	840	20
P02 (ventilation)	New		0.0%	0	0	0	none			
P03	New	2,131	10.0%	250	10	1,000	Crushing Plant	484	1,855	20
Plant Area Elevation	m.a.s.l.	2,615								
Mine Production	tonnes/day	2,500								

Source: SRK, 2017

Crushed material produced by the primary jaw crushers is transferred to a 2,500t silo located at the process plant area. A secondary-tertiary crushing plant using 150 hp cone crushers in closed-circuit with vibrating screens will reduce the mill feed to approximately 80% passing 12 mm. The product from the crushing plant will be transferred to a mill feed silo (fine ore silo) capable of holding 2,500t.

The single stage 1,800 kW conventional ball mill operating in closed-circuit with a classification screen will produce a product sizing approximately 80% minus 44 microns that will feed the differential flotation stage.

The flotation will have two multi-stage flotation circuits, the first will produce a lead concentrate. The second multi-stage flotation circuit, the zinc circuit, receives tails from the lead circuit to produce a zinc concentrate. Both final concentrates will be transferred to its respective thickeners and then filtered (10 m^2 filtration area for lead concentrate, and 60 m^2 filtration area for zinc concentrate) to approximately 9% moisture before being trucked offsite to smelters.

Tailings from the flotation plant will be thickened to approximately 50% solids by weight. A fraction of the tails representing approximately 60% of the solids will be piped to a filtration plant (600 m^2 tails filtration area) located by the tailings storage area and then dry stacked at a moisture of approximately 17% by weight. Water recovered in the tails filter will be recycled to the process plant. The remaining 40% of the solid's stream will be transferred to a backfill plant to be used in the underground operation.

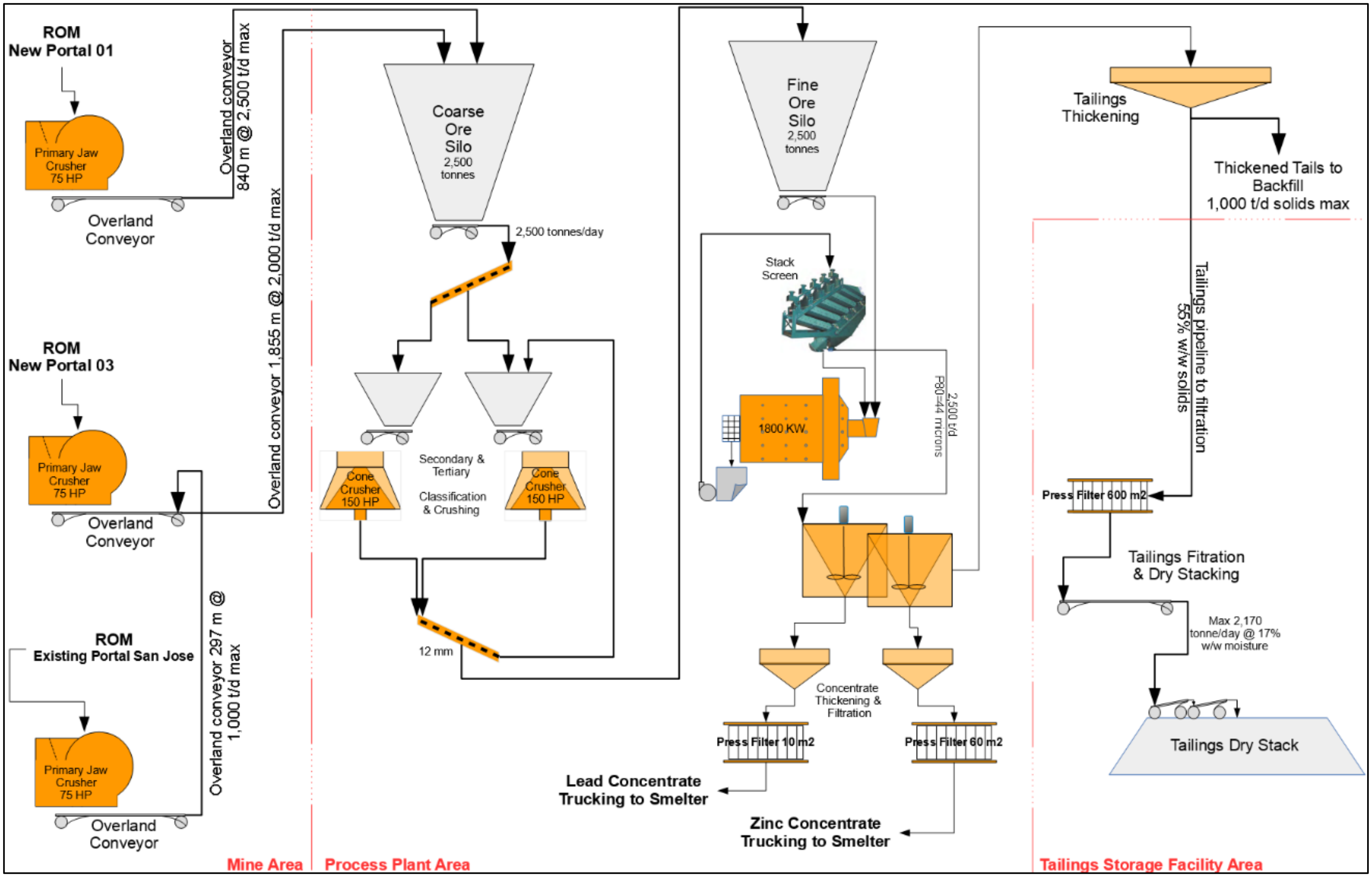
The process flow sheet for the Florida Canyon PEA is shown in Figure 16-1.

17.3 CONSUMABLES REQUIREMENT

The power requirements for the projected milling operation are estimated at maximum 3.5 MW. Power for milling operations will be supplied by a third-party as line power at an estimated cost of US$0.084/kWh.

The water requirement for the mill at a capacity of 2,500 t/d is estimated at maximum 20 liters per second. Water for processing will be acquired from surface water sources and as recycled water from tailings dewatering operations.

All the consumables will be supplied by road from Lima (Callao) and stored in the mill complex. It is estimated that a supply of 5 days of consumption will maintain a continuous supply to the operation. Typical flotation reagents include: Lime, NaCN, Zn Sulfate, Sodium Isopropyl Xanthate, Aerophine 3418, MIBC, Cu Sulfate, Sodium Isopropyl Xanthate (Z11), MIBC, and flocculants. Grinding media (steel balls) could arrive by sea via Callao, or on trucks from northern Chile.



Source: SRK, 2017

Figure 16-1: Florida Canyon PEA Level Process Flow Sheet

18 PROJECT INFRASTRUCTURE (ITEM 18)

The text and figures in the following Chapter have been taken directly from the 2017 Preliminary Economic Assessment Florida Canyon Zinc Project, Amazonas Department, Peru with Effective Date: July 13, 2017 and Report Date: August 3, 2017. The 2021 TRER update as described in this report does not have a negative impact on or otherwise adversely affect the mineral resource inventory that formed the basis of the 2017 PEA. As the additional resources estimated are extensions of previously known bodies, and the estimated production rate has not changed, the infrastructure is expected to be similar to that in the 2017 report. The results and conclusions of the 2017 PEA are still considered current and therefore have been carried over for this Report.

18.1 INFRASTRUCTURE AND LOGISTICS REQUIREMENTS

18.1.1 Access and Local Communities

Florida Canyon is a greenfield site with minimal infrastructure currently available. The operation is in north central Peru (Figure 17-1) approximately 700 km north of the (capital, Lima. The Project is in a sparsely populated area approximately 39 km northwest of Pedro Luis Gallo (population approximately 3,000), the largest town with any infrastructure near the Project. There are several smaller communities located nearer to the proposed operation, but they have no developed infrastructure to support the project. A camp for employees and contractors will be required.

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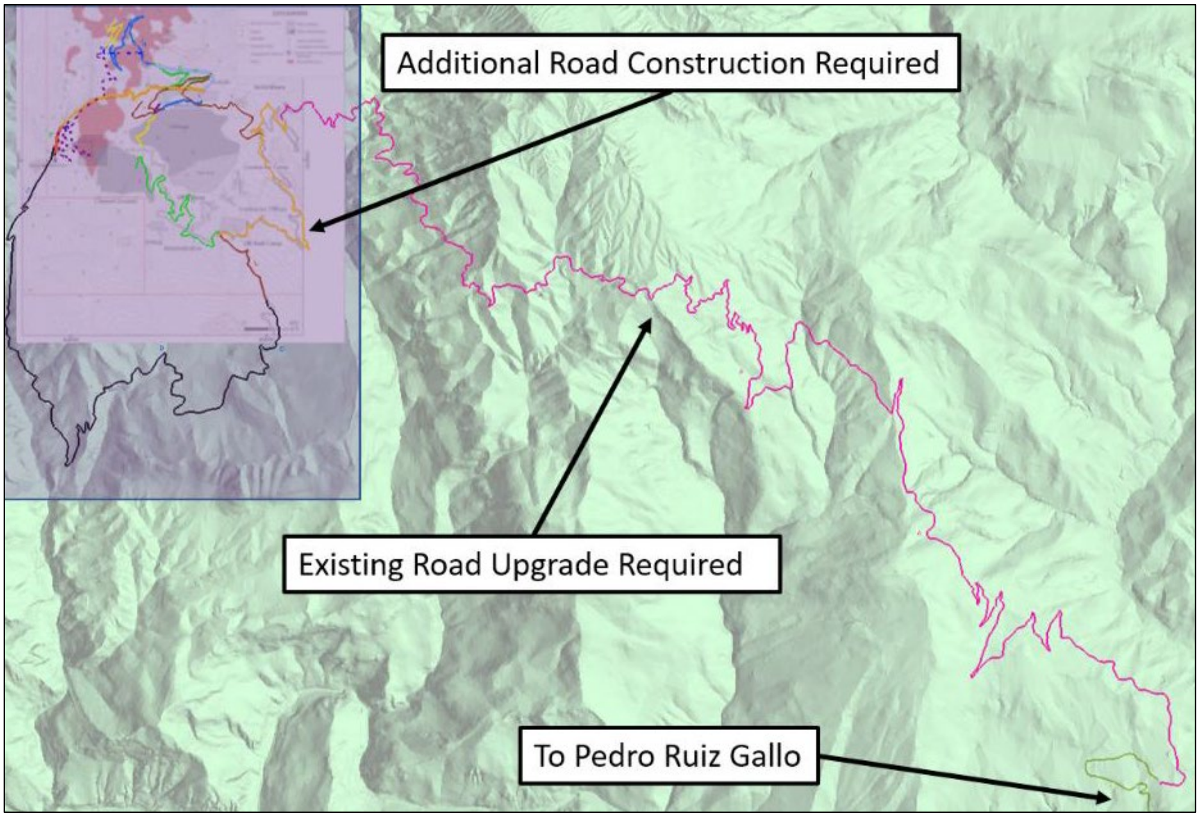
Source: Google Earth/SRK, 2017

Figure 17-1: Florida Canyon General Location

Access to the site is by paved road from Chiclayo (population approximately 740,000) located on the Pacific coast approximately 380 km to the west of Pedro Ruiz Gallo. A dirt road connects Pedro Ruiz with the district capitol of Shipasbamba where the project office and core storage facility is located. A 26 km newly constructed road connects Shipasbamba to the project area. This existing section of road will require upgrade to support construction and Project logistics including concentrate transport. Approximately 24 km of new road at the site will be required to allow access to the facilities and infrastructure. Figure 17-2 shows the planned roads in the highlighted area near the Project. New road construction is in fairly rugged topography and in an area of high rainfall that will require construction during the drier months to be efficient.



Source: SRK, 2017

Figure 17-2: Florida Canyon Existing and New Road Construction

18.1.2 Site Water Management

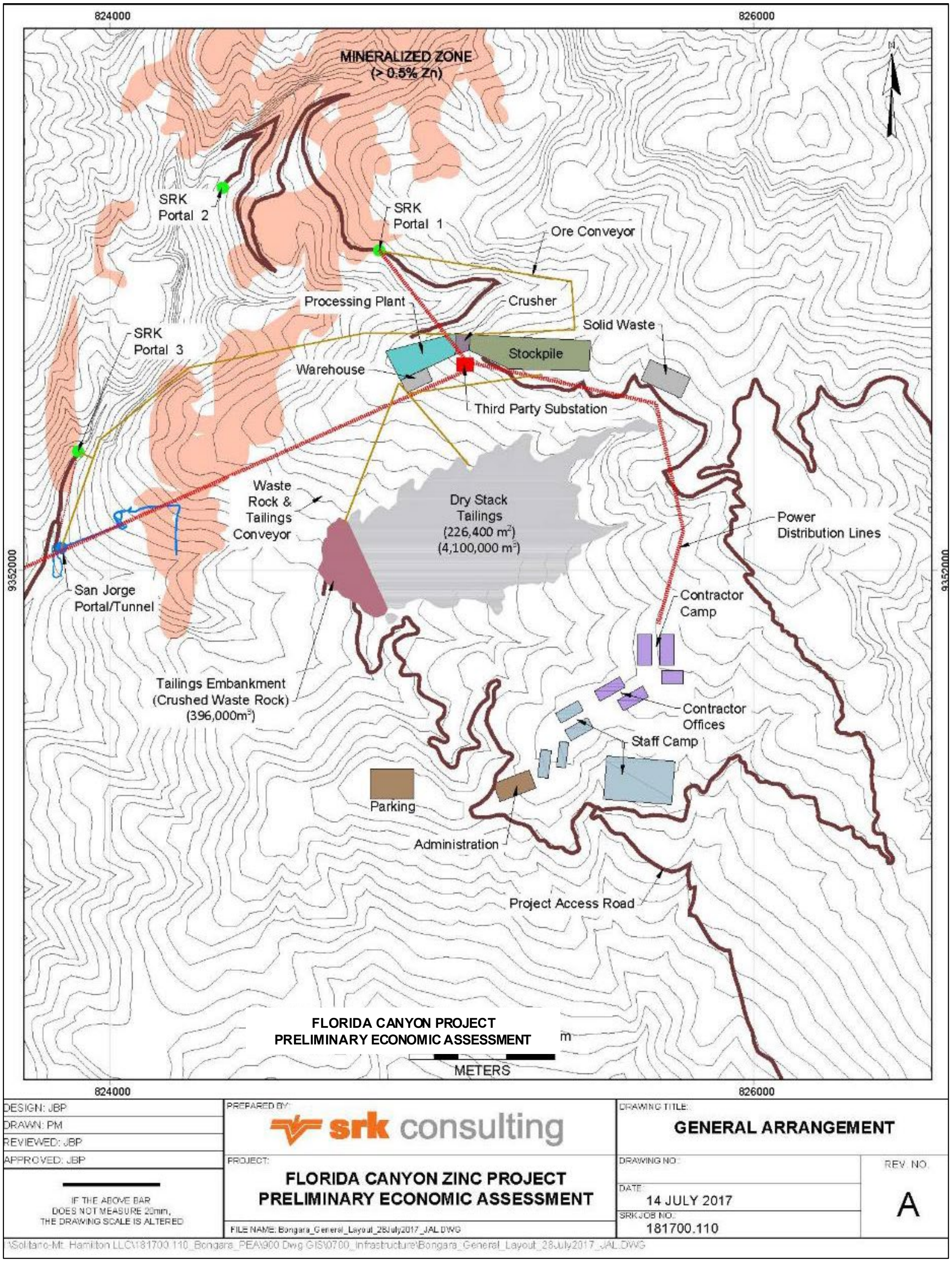
The operation will require water for use for processing, mining, dust suppression and potable consumption. The processing facility will utilize recycled water from the tailings facility and rainfall shed from the tailings for the processing needs. It is anticipated that there will be some ground water that will be encountered in the mine and captured in sumps and decantation basins for mine water needs.

Tesoro Creek, a small local drainage, has been used for domestic water supply by nearby residents. Clean water from this creek may be used for make-up process water, for fire suppression and for domestic requirements. It will be piped by gravity from the creek to a water storage tank. A small treatment plant will be utilized for potable water needs for the Project camp and other support areas.

Surface water control is discussed in the tailings Section 17.3.

18.1.3 Project Facilities

The project support infrastructure is shown in Figure 17-3. The facilities include the processing plant and associated infrastructure, mining infrastructure with portals, vent holes, road access to portals, tailings storage area, and support infrastructure including fuel storage, security, camp, power supply and distribution, and water supply and storage. Waste rock will be consumed in the construction of the tailings embankment so no separate waste rock storage is required.



Source: SRK, 2017

Figure 17-3: Florida Canyon Site General Arrangement

Mine Operations and Support Facilities

The production-related project elements include a mine office, mine dry, and mine maintenance shops near the plant location to support the underground operations. Additional detail is included in Section 15. The mining method selected for the underground operation will require backfill consisting of cemented paste and waste rock, both cemented and unconsolidated. The capital cost of a paste backfill plant and operating cost of distribution is included in the economics for the Project. An allowance for a small, cemented rock fill plant is also provided for two production periods when cemented rock fill is required for secondary stopes.

Process Support Facilities

The infrastructure at the process facilities includes the plant, mill feed stockpile, secondary crusher, supply conveyors, primary crushers at the portals and an office/maintenance building. The plant facilities are discussed in Section 16.

Additional Support Facilities

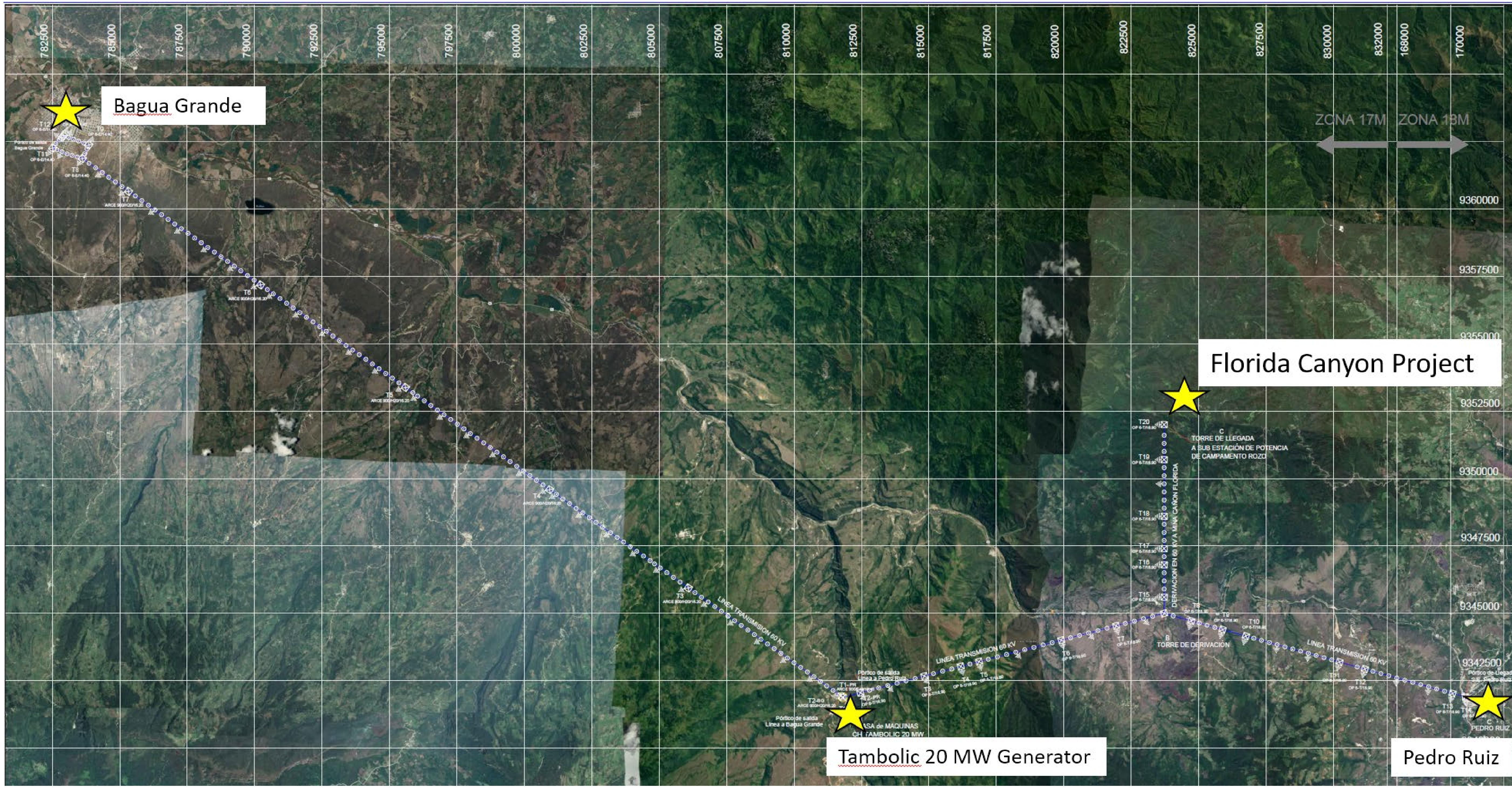
The Project requires a camp to support the operation as it is remote. A 400-person camp with a cafeteria and recreation center will be required. Additional support facilities include a rescue and first aid building, warehouse, health/safety/environmental office, security gate house, truck scale, truck wash, laboratory, septic, and incinerator system. Two 50,000-liter fuel tanks and associated pump facilities will store fuel for use by the Project.

18.1.4 Power Supply and Distribution

There is currently no substantive line power near the site. SRK considered a diesel-powered generator option for power supply. However, a third-party supplier, Energoret S.A.C, has a hydropower generation and transmission development project that will be located in close proximity to the mine. The Energoret system will generate 20 MW of power from a plant on a tributary to the Utcubamba River. Energoret indicates that half of the project, approximately 10 MW, has already been committed. The plant is designed to provide power to the city of Bagua Grande, west of their project, and to Pedro Ruiz to the east of the Project. Energoret indicates that it will invest in a transmission line to the Florida Canyon mine site and a substation on site. Their capital estimate is US$25 million. Figure 17-4**.** shows the location of Energoret's proposed hydroelectric plant, distribution lines to Bagua Grande and Pedro Ruiz as well as an extension to the Florida Canyon Project.

Neither Votorantim nor Solitario have entered into definitive negotiations with Energoret at this stage of study. Based on discussions with Energoret SRK estimated a power cost charge that would recover the capital expense for 6 MW of capacity of the plant plus the cost of transmission lines and a substation over the current 13 year life of the project including a risk premium and profit on both the capital and the operating costs. The estimated operating cost of power is US$0.084/kWhr.

SRK also included in the estimated capital cost for the project including medium voltage switchgear and 2.3 km of distribution lines to the processing plant and portals.



Source: Solitario, 2017

Figure 17-4: Florida Canyon Third Power Supply Alternative

18.2 Project Logistics

The Project will generate both lead and zinc concentrates which will be shipped by 30 t over-the-road trucks to market. Figure 17-5 shows a photograph of a typical 30 t truck.

Source: Solitario, 2017

Figure 17-5: Typical 30 Tonne Concentrate Transport Truck

SRK has considered shipping to the ports at Paita, Chiclayo (Pimental), and Lima (Callao) as well as direct shipping to Votorantim's Cajamarquilla Smelter near Lima. A high-level trade-off study of concentrate transportation was prepared by SRK considering truck haulage, capital cost for additional port and/or handling facilities, and ocean freight/handling charges. This study indicated that the direct shipping option to Cajamarquilla was most cost effective. Figure 17-6 shows the locations of ports and the Cajamarquilla smelter.

Source: SRK, 2017

Figure 17-6: Port and Smelter Locations

18.3 TAILINGS MANAGEMENT

The tailings storage facility (TSF) is planned in the valley to the south of the process plant as shown in Figure 18-3. The tailings will be filtered at the plant site to a "dry stack" condition (i.e. typical moisture content less than 20%). From the plant site, tailings will be transported to the TSF via overland conveyors.

Approximately 6.56 Mt of dry stack tailings will be produced over life of the mine and will have a final surface area of 266,400 m^2. The TSF basin will be lined with 2 mm geomembrane. Approximately 1 m of topsoil will be excavated from the embankment and basin footprint and stockpiled for use during closure. All tailings not placed in the TSF will be utilized as backfill in the mine.

The TSF starter dam will be keyed into native ground approximately 4.5 m. The dam will have with a slope of 2:1 Horizontal:Vertical (H:V) and will be constructed of waste rock from underground and residual soils from the tailings basin. Additional raises will be constructed via an upstream method using waste rock or blasted rock from the tailings basin to construct the upstream containment berms. The upstream containment berms will have an overall slope of 3:1 H:V. Tailings will be placed using mobile mining equipment at a slope of 4:1 H:V. Upstream construction is suitable for this seismic environment because the tailings have been dewatered and will be compacted as they are placed.

An upstream diversion will be constructed to manage stormwater during operations and convey it downstream to be released beyond the toe of the dam. This diversion will consist of a 2 m deep and 5 m wide channel cut into native ground and lined with 300 mm rip rap.

19 MARKET STUDIES & CONTRACTS (ITEM 19)

No specific market study has been conducted for this study. This PEA assumes metal prices based on the current spot market.

19.1 CONTRACTS AND STATUS

The Florida Canyon Project is a green field lead-zinc deposit that currently has no contracts that cover the sales of the projected lead and zinc concentrate production.

20 ENVIRONMENTAL STUDIES, PERMITTING & SOCIAL OR COMMUNITY IMPACT (ITEM 20)

20.1 Required Permits and Status

The text and figures in the following Chapter have been summarized from the 2017 Preliminary Economic Assessment Florida Canyon Zinc Project, Amazonas Department, Peru with Effective Date: July 13, 2017 and Report Date: August 3, 2017. The 2021 Mineral Resource update as described in this report does not have a negative impact on or otherwise adversely affect the mineral resource inventory that formed the basis of the 2017 PEA. In general, the planned operation and infrastructure is similar to that considered in the 2017 report and environmental impacts should be similar. The results and conclusions of the 2017 PEA are still considered current and therefore have been carried over for this Report.

20.1.1 Required Exploration Permits and Status

Environmental permits for mineral exploration programs are divided into two classes. Class I permits allow construction and drilling for up to 20 platforms with a maximum disturbance of 10 ha. A Class II permit provides for more than 20 drill locations or for a disturbance area of greater than 10 ha.

Class I permits require little more than a notification process for approval. Class II drilling permits require an environmental impact declaration (DIA), a permit for harvesting trees (if applicable), an archeological survey report (CIRA), a water use permit (ALA) and a Closure Plan.

Votorantim has previously filed applications for and received Class II permits for various phases of the Project and has filed and received the required associated permits. The 2017 review of existing exploration permit status indicates that only the archeological permits and the latest tree harvesting permit are still valid.

During exploration, Votorantim has developed a Social Management Plan with several programs ongoing in the community including:

- Communication, Information and Coordination Program with Residents;
- Attention to Concern, Claims and Conflict Resolution Program;
- Support Program for Participatory Environmental Monitoring and Information Workshops;
- Recruitment and Training Program for Local Labor;
- Support Program for Sustainable Socioeconomic Development; and
- Community Support Program in Education and Training.

20.1.2 Required Mining Permits

Permitting requirements for mining include an Estudio de Impacto Ambiental (EIA) that describes in detail the mining plan and evaluates the impacts of the plan on environmental and social attributes of the property. Baseline studies include air quality, surface and groundwater quality, flora and fauna surveys, archeological surveys, and a study of the social conditions of the immediate property and an area of interest that includes local communities. Many of the baseline studies required for mining have been completed by Votorantim. Public meetings are required in order that local community members can learn about and comment on the proposed operation. Social outreach has been clearly demonstrated during Votorantim's exploration efforts as described above.

Specific authorizations, permits and licenses required for future mining include:

- EIA (as modified during the mine life);
- Mine Closure Plan and Final Mine Closure Plan within two years of end of operation;
- Certificate of Nonexistence of Archaeological Remains;
- Water Use License (groundwater and/or surface water);
- Water construction authorization;
- Sewage authorization;
- Drinking water treatment facility license;
- Explosives use license and explosives storage licenses;
- Controlled chemicals certificate;
- Beneficiation concession;
- Mining authorization;
- Closure bonding; and
- Environmental Management Plan approval.

Information on environmental monitoring was limited in the SRK document review. Nevertheless, the need for additional monitoring in at least one dry and one wet period will be required for the EIA including terrestrial and aquatic fauna and flora and groundwater level and quality.

20.2 Environmental Monitoring Results

Environmental monitoring has been performed per the requirements to obtain the exploration permits, including the variables listed in the Table 19-1.

Table 19-1: Environmental Monitoring During Mining Exploration

Factor	Legal Norm	Variables	Frequency
Surface water quality (14 to 18 monitoring stations)	Environmental standards for surface water quality as to D.S. Nº 002-2008-MINAM	Temperature, Conductivity, pH, Total Suspended Solids (TSS), Oils and Grease, Cyanide – Total, Arsenic, Cadmium, Chromium VI, Copper, Iron, Lead, Mercury, Zinc, Sulphur, Nitrates, Phenols Dissolved oxygen thermotolerant coliforms total coliforms	Quarterly
Air quality (4 to 5 monitoring stations)	Environmental standards for air quality: PM10, NO2, CO and O3 as to D.S. Nº 074-2001-PCM PM2,5 and SO2 as to D.S. N° 003-2008-MINAM lead in PM10, D.S. Nº 085-2003-PCM	PM10-PM2.5-lead in PM 10- arsenic in PM10- gases.	Quarterly
Noice (2 monitoring stations)	D.S. Nº 085-2003-PCM	Sound pressure	Quarterly
Terrestrial fauna and flora	D.S. Nº 004-2014 IUCN 2014 CITES	various	variable
Soil quality	Environmental standards for soil quality, D.S. N°002-2013 MINAM	As, Ba, Cd, Hg, Free CN	variable

SRK, 2017

Information that SRK was able to review in the database was limited. Nevertheless, the need for additional monitoring in at least one dry and one wet period will be required for the EIA-d including terrestrial and aquatic fauna and flora and groundwater level and quality.

20.3 GROUNDWATER

Groundwater has been studied by Hydro-Geo Consultores (2010) and Klohn Crippen Berger (2013). The mine is located in a high rainfall environment. Infiltration of surface water persists to approximately 50 m depth and recharges groundwater via structural pathways and interconnected karst features in dolomitized and de-dolomitized carbonate stratigraphy. The potentiometric surface has been determined by a series of piezometers. This groundwater surface follows the south-southwest flow direction of Florida Canyon and daylights at the river level in the canyon. Most of the planned mining of the flat mantos will occur above the water table. Steeper zones of mineralization, such as San Jorge and Sam will occur below the water table as will parts of the Karen Milagros mantos to the north. Local inflows may be encountered when crossing faults or intercepting karst features.

Impact to groundwater is expected to be minimal as underground surface exposures are minor and exposed sulfides are not acid generating. There are no groundwater wells required for processing or potable water supply. These needs will be met by surface water available from nearby Tesoro Creek.

20.4 ENVIRONMENTAL ISSUES

The proposed underground mining operation is expected to have a small disturbance footprint compared to other mining methods. Waste rock from underground mining will be crushed and conveyed to the tailing storage facility (TSF) for use in construction of the tailings embankment. A small percentage of the waste rock will be used as underground backfill. As a result, there will be little, or no surface area disturbance related to waste rock placement.

Waste rock generated from the mine and used in the tailings facility construction is composed of limestone and dolomite with a high neutralizing capacity. Most waste rock has very low sulfide content so the potential for acid generation and metals leach is judged to be low. Nevertheless, waste rock characterization study is recommended for future work.

The primary area of surface disturbance is related to tailings placement. As shown in Figure 18-3, the final tailings placement will have an area of 23.5 ha. Tailings also require geotechnical and geochemical stabilization during placement and closure.

Water for processing is expected to be collected from surface streams and reclaimed from filtered tailings. There will be no need for groundwater consumption in the current processing plan. Groundwater will be intersected in deeper reaches of the underground mine. Most of this water will be used for dust suppression or piped to the mill to support comminution and flotation.

20.5 MINE CLOSURE

A conceptual closure plan was developed to facilitate the calculation of the reclamation and closure costs to include in the PEA economic analysis. Closure designs and costs are based primarily on closure actions typically performed at similar sites.

20.5.1 Post Mining Land Use

Closure Design Objectives for Mine Tailings

- Promote positive and controlled drainage off the tailings surface and away from the dam face;
- Maintain an erosional and geotechnically stable landform;
- Promote native vegetation growth on the tailings surface, and
- Create a closed facility that minimizes long-term monitoring and maintenance.

20.5.2 Portals and Vents

Closure Design Objectives

- Prevent public access to underground workings.
- Maintain an erosional and geotechnically stable landform.
- Create a landform that visually approximates the surrounding landscape.
- Promote native vegetation growth on the disturbed surface.
- Create a closed facility that minimizes long-term monitoring and maintenance.

Closure Tasks

- Portals and vents will be decommissioned by filling with waste rock or capping with a concrete bulkhead. Disturbed areas will be revegetated with native species.

20.5.3 Buildings and Infrastructure

Closure Design Objectives

- Remove any facilities not needed for future use.
- Maintain an erosional and geotechnically stable landform.
- Create a landform that visually approximates the surrounding landscape.
- Promote native vegetation growth on disturbed surfaces.
- Create a closed facility that minimizes long-term monitoring and maintenance.

Closure Tasks

- Buildings with no identified post-mining land use will be demolished and the debris will be hauled to the permitted landfill onsite.
- Mill and conveyor parts with useful remaining life will be removed from the site and sold. The rest of the structure will be demolished, and recyclable materials hauled offsite and the rest hauled to the permitted landfill onsite.

20.5.4 Roads and Miscellaneous Disturbance

Closure Design Objectives

- Maintain an erosional and geotechnically stable landform.
- Create a landform that visually approximates the surrounding landscape.
- Promote native vegetation growth on the disturbed surface.
- Create a closed facility that minimizes long-term monitoring and maintenance.

Closure Tasks

- Roads not needed for an identified post-mining land use will be regraded to approximately original contours and revegetated with native plant species.
- The main access roads and some internal mine roads may remain. Roads might be reconstructed to be smaller in width and include water control features to prevent erosion of the roadbed.
- Miscellaneous disturbance around other facilities will be regraded to approximately original contours and revegetated with native plant species.

20.5.5 Tailings Facility

Closure Design Objectives

- Promote positive and controlled drainage off the tailings surface and away from the dam face.
- Maintain an erosional and geotechnically stable landform.
- Promote native vegetation growth on the tailings surface.
- Create a closed facility that minimizes long-term monitoring and maintenance.

Closure Tasks

The tailings dam face will be constructed of waste rock at either 2:1H:V or 3:1 H:V. As long as stormwater is directed away from the dam face and the slopes are not changed from design the facility will be erosionally and geotechnically stable. No further reclamation will be performed. Tailings operations and closure involve:

- During operations, at the end of mine-life, deposit tails such that the surface slopes up to 1% toward the center of the tailings;
- Place 0.5 m of growth media on the tailings surface;
- Construct a stormwater channel in the center of the tailings to convey water to the southwest corner upstream from the dam into native ground;
- Construct a stormwater channel in native ground from the southwest corner of the tailings surface to spill into the natural drainage to the south;
- Decommission the stormwater drain on the north side of the tailings facility and direct flow onto the tailings surface to be captured by the center stormwater ditch; and
- Revegetate the tailings surface.

20.6 Post Closure Plans

Post mining land use will approximate a natural park setting which could be used for livestock grazing and visually appears like the surrounding landscape. Generally, disturbed areas will be physically reclaimed and revegetated to approximate surrounding landforms. Disturbed areas will also be revegetated with native species. Some facilities may remain in place to support future access for exploration and/or further mineral development.

SRK recommends in future studies to design the tailings surface and spillway stormwater structure and evaluate options to reduce or eliminate the long-term obligation for monitoring and maintenance.

20.7 Reclamation and Closure Cost Estimate

Closure costs were calculated using the Standardized Reclamation Cost Estimator (SRCE) 2.0. The SRCE is a spreadsheet model that uses a first principles approach to calculate lengths, areas and volumes of common mine facilities and apply productivities for common mine equipment to estimate the time required. Unit costs for labor, materials and equipment are then applied to estimate a total cost.

Unit costs were as follows:

- Labor costs were factored from Nevada labor used by the Nevada Division of Environmental Protection (NDEP) for financial surety by multiplying by 40%.
- Equipment and material costs were used without factoring from the NDEP costs used for financial surety; and
- A fuel cost of US$1.24 per liter was used from the PEA documentation.

Closure cost includes provision for General and Administrative, closure planning and engineering and staff oversite during the active closure. Provision is also included for monitoring and maintenance.

The estimated cost to close the mine is US$4,920,000 which will be spent over the two years following the end of mining. An additional long-term monitoring and maintenance expense of US$830,000 will be required spread over 50 years starting in 2034. The total estimated closure cost is US$5,750,000.

20.8 Post-Performance or Reclamations Bonds

Reclamation bonds have not yet been defined or posted for the project.

20.9 Social and Community

From the social point of view, the Florida Canyon Project is developed on lands of the Community of Shipasbamba, located in the district of the same name, in the province of Bongará in the department of Amazonas. This community was registered in the Directory of Peasant Communities by R.S. 49 on December 17, 1959 (220 families).

In order to develop its exploration work, Nexa – Cajamarquilla S.A., has signed with the CC of Shipasbamba, biannual agreements from 2009 to 2017 for the use of 12,500 ha. In summary, Nexa - Cajamarquilla has performed the following actions with the:

Government

- Comply with the requirements demanded by the sector to obtain the necessary environmental permits to carry out its exploration activities.
- In this context, it has developed several Citizen Participation Mechanisms in which the population has been informed about the objectives and scope of the Project and the type of relationship with the community that will be developed through its Community relations office.

Community

- Agreements for the use of Surface Lands
    - From the point of view of social responsibility Nexa - Cajamarquilla, in order to be able to operate in the area in harmony with the local inhabitants, has signed bi-annual agreements for the Use of Land;
    - These establish the commitments and counter-commitments to which both parties are bound (company and community);
    - The last agreement signed by both parties expired in July 2017, and
    - The revised documents state that the necessary steps were being taken to sign the Convention for the period 2016-2018.

- Community Relations:
    - Nexa - Cajamarquilla has developed a Social Management Plan with several Programs, on which detailed information is not available. It is assumed, from the photos included in a review of the company's activities that the programs are developing normally and are accepted by the community. These Programs are:
        - Social Management Plan and Community Relations;
        - Communication, Information and Coordination Program with Residents;
        - Attention to Concern, Claims and Conflict Resolution Program;
        - Support Program for Participatory Environmental Monitoring and Information Workshops;
        - Recruitment and Training Program for Local Labor;
        - Support Program for Sustainable Socioeconomic Development; and
        - Community Support Program in Education and Training.

21 CAPITAL & OPERATING COSTS (ITEM 21)

The text and figures in the following Chapter have been summarized from the 2017 Preliminary Economic Assessment Florida Canyon Zinc Project, Amazonas Department, Peru with Effective Date: July 13, 2017 and Report Date: August 3, 2017. The 2021 Mineral Resource update as described in this report does not have a negative impact on or otherwise adversely affect the mineral resource inventory that formed the basis of the 2017 PEA. In general, the planned operation and infrastructure is similar to that considered in the 2017 report. There was insufficient work performed in the 2021 Mineral Resource Estimate to re-estimate the costs. These inputs will need to be updated in the future however current commodities pricing is generally above the estimates used in the 2017 PEA. Operating and capital cost estimates from 2017 are still appropriate at a PEA level of study. The results and conclusions of the 2017 PEA are still considered valid and therefore have been carried over for this Report.

In the 2017 PEA SRK prepared an estimate of both capital and operating costs associated with the designed mineable resources production schedule. This section of the report presents and details these estimates of Capital Expenditure and Operating Expenditure. All estimates are based on yearly inputs of physicals and all financial data is second quarter 2017 and currency is in U.S. dollars (US$), unless otherwise stated.

The use of "ore" in the summary of tables of this PEA is a relative mineable material estimated. Ore, by definition, can only be ascribed to economic mineralization supported by Mineral Reserves.

21.1 CAPITAL COST ESTIMATES

The Florida Canyon Project is a green field lead-zinc deposit and the estimate of capital includes both an estimate of initial capital investment to install and commission the mine and a sustaining capital to maintain the equipment and expanding any supporting infrastructure necessary to continue running the project until the end of the projected production schedule. The estimate of capital was broken down into the following main areas:

- Mining areas access development and vent raises;
- Underground Mining Equipment;
- Surface crushing and conveying systems;
- Offsite Infrastructure;
- Site Facilities;
- Process Plant;
- Power Supply;
- Water Supply;
- Backfill Infrastructure;
- Cement Rockfill Infrastructure;
- Tailings Storage Facility;
- Owner's Cost; and
- Closure and Post-Closure Monitoring.

The capital cost estimates developed for this study comprise the costs associated with the engineering, procurement, construction, and commissioning required for all items. The cost estimate was based SRK's experience with similar projects installed in the region or estimates of cost specifically prepared for the project under a first principles basis. The work indicates that the project will require an initial capital of US$213.7 million and a sustaining capital of US$81.9 million Table 20-1 summarizes the estimate of capital.

Table 20-1: Florida Canyon Capital Estimate Summary

Description	Initial (US$000's)	Sustaining (US$000's)	LoM (US$000's)
Development	12,293	35,741	48,033
Vent Raises	686	672	1,358
Underground Mining Equipment	24,625	2,474	27,099
Surface Crushing & Conveying	1,430	0	1,430
Offsite Infrastructure	16,227	0	16,227
Site Facilities	14,697	0	14,697
Process Plant	60,000	0	60,000
Power Supply	2,472	0	2,472
Water Supply	250	0	250
Backfill Infrastructure	13,200	0	13,200
Cement Rockfill Infrastructure	200	0	200
Tailings Storage Facility	12,854	11,814	24,668
Owner's	14,595	0	14,595
Contingencies	40,138	0	40,138
Sustaining Capital	0	26,272	26,272
Closure	0	4,920	4,920
Post-Closure Monitoring	**0**	**830**	**830**
Total Capital	**$213,667**	**$82,722**	**$296,389**

Source: SRK, 2017

21.1.1 Basis for Capital Cost Estimates

The cost associated with mining area access development and the construction of vent raises was based on the preparation of a mineable resources production schedule that included a design of meters of development and meters of vent raises, these were combined with the following unit costs to result in the cost estimate:

- Development: US$1,500/m; and
- Vent Raises: US$2,200/m.

These unit costs are based on data from comparable underground mines also located in Peru or other South American areas with similar mining conditions.

A schedule of acquisition of underground mining equipment specific to the production schedule was prepared, Table 20-2 presents the unit costs and acquisitions of these equipment.

Table 20-2: Florida Canyon Underground Mine Equipment Acquisition Schedule

Equipment	UnitCost (US$)	TotalCost (US$)	Acquisition Year											
			1	2	3	4	5	6	7	8	9	10	11	11
LH Stope DTH Drills	432,000	864,000		1	1									
LH Production LHD	900,000	2,700,000		2	1									
Production Jumbo (D&F/C&F)	644,000	3,864,000		3	2								1	
D&F/C&F Production LHD	675,000	4,050,000		3	1								2	
Horizontal Development Jumbos (2 boom)	644,000	2,576,000	3	1										
Development LHD	900,000	3,600,000	3	1										
Haul Trucks	765,000	4,590,000	4	2										
Rock Bolter	829,000	1,658,000	1	1										
Anfo Loader	437,000	437,000		1										
Miscellaneous/Service Vehicles	320,000	1,600,000	3	2										
Light Vehicles/General	40,000	200,000	3	2										
Ventilation Fans	240,000	960,000	1		1	1								1

Source: SRK, 2017

The process plant cost estimate is based on data from similar flotation plants with the same capacity and same region. This investigation resulted in an estimate of about US$60 million.

The cost associated with the required surface crushing and conveying was based on required distances and elevation gain to cover. These include the movement of mineralized material from three mine portals to the plant feed area and some waste material that will be used to build the embankment for the tailings storage facility. This investigation resulted in an estimate of around US$1.4 million.

Offsite-infrastructure, site infrastructure, power supply, water supply and backfill infrastructure cost estimates were prepared based the required structures costs from comparable operations. It should be noted that this study assumes that a third-party is planning to build a hydro power plant that will provide power to the project. A company has approached Solitario to offer this option, including the construction of the transmission line and project substation. Table 20-3 summarizes the basis of these cost estimates.

Table 20-3: Florida Canyon Offsite, Site, Power, Water and Backfill Infrastructure

Type	Description	Quantity	Units	Unit Cost (US$)	Units	Total Cost (US$ millions)
Offsite Infrastructure	Access Road New Construction	15.6	km	339,000	US$/km	5,285,996
Offsite Infrastructure	Access Road Upgrade	33.1	km	330,500	US$/km	10,940,724
Energy	Fuel Tanks (50k liters each)	2	each	83,333	US$/tank	166,667
Energy	Fuel pumps and associated facilities	1	LS	225,000	US$/system	225,000
Energy	Medium Voltage Powerlines (on site)	2.3	km	900,000	US$/km	2,080,800
Water Supply	Potable Water Treatment	1	each	100,000	US$/unit	100,000
Facilities	Mine Office	1	each	858,479	US$/unit	858,479
Facilities	Mine Dry	1	each	822,418	US$/unit	822,418
Facilities	Rescue and First Aid	1	each	622,950	US$/unit	622,950
Facilities	Warehouse	1	each	1,701,300	US$/unit	1,701,300
Facilities	Health/Safety/Environmental Office	1	each	487,945	US$/unit	487,945
Facilities	Mine Maintenance Shops	1	each	4,159,230	US$/unit	4,159,230
Facilities	Administrative Building	1	each	1,212,554	US$/unit	1,212,554
Water Supply	Water System Tank and piping	1	each	150,000	US$/unit	150,000
Facilities	Security Gatehouse	1	each	298,204	US$/unit	298,204
Facilities	Truck Scale	1	each	159,515	US$/unit	159,515
Facilities	Truck Wash	1	each	280,239	US$/unit	280,239
Facilities	Personnel Camp with Cafeteria, Rec Center, 400 people	1	LS	3,000,000	US$/unit	3,000,000
Facilities	Laboratory	1	each	418,896	US$/unit	418,896
Facilities	Sewer	1	each	400,000	US$/unit	400,000
Facilities	Incinerator System	1	each	275,000	US$/unit	275,000
Backfill	Plant Cost	1	LS	10,300,000	US$/each	10,300,000
Backfill	Underground	1	LS	2,900,000	US$/each	2,900,000

Source: SRK, 2017

Cement will be added to underground waste rock and used to fill designated primary fill areas; this will be done by underground installed facilities that are estimated to cost roughly US$200,000.

In 2017, SRK prepared a preliminary design for a dry stack tailings storage facility to contain all the filtered tailings generated by the lead and zinc concentrates production. The cost estimate included the preparation of a stage construction using borrow material from the underground mine and construction area. This resulted in a total cost of US$24.7 million, which is split US$12.9 million initial capital and US$11.8 million sustaining capital. The relevant section of this report contains more details about this tailings storage facility design.

Closure costs were estimated by SRK as US$4.9 million for the actual closure and about US$830,000 for post closure site monitoring. Details of this estimate can be found in the relevant section of this report.

Other capital cost estimates include the following:

- Owner's cost: Estimate of about 10% of initial capital, excluding development and vent raises;
- Sustaining Capital: 2% of initial capital, excluding development, vent raises and owner's costs; and
- Contingencies: 25% contingencies were applied to initial capital, excluding development and vent raises and owner's costs.

21.2 Operating Cost Estimates

SRK prepared the estimate of operating costs for the associated mineable resources production schedule. These costs were subdivided into the following categories:

- Mining Operating Expenditure;
- Processing Operating Expenditure; and
- G&A Operating Expenditure.

The resulting LoM cost estimate is presented in Table 20-4.

Table 20-4: Florida Canyon Operating Costs Summary

Description	LoM (US$000's)	LoM (US$/t-Ore)	LoM (US$/lb-Zn)
Underground Mining	228,547	20.43	0.16
Process	144,063	12.88	0.10
G&A	39,153	3.50	0.03
Total Operating	**411,764**	**36.81**	**0.29**

Source: SRK, 2017

21.2.1 Basis for Operating Cost Estimates

The prepared estimates that compose the operating costs consist of domestic and international services, equipment, labor, etc. Where required, the following were included:

- Value added tax;
- Freight; and
- Duty.

No specific work schedule has been defined for the mine, plant and site operations.

All of the operating cost estimates are based on the quantities associated with the production schedule, including the following:

- Run of Mine;
- Primary and Secondary Backfill; and
- Plant Feed.

Unit costs from similar projects in the same region or in the Americas, adjusted for labor and consumables differences, were used to estimate the LoM operating costs. All operating costs include supervision staff, operations labor, maintenance labor, consumables, electricity, fuels, lubricants, maintenance parts and any other operating expenditure identified by contributing engineers. The following unit costs were used to calculate the operating costs:

- Underground Mining: US$ 15.30/t-RoM;
- Primary Cement Rockfill: US$22.18/$m^3$;
- Primary Cement Pastefill: US$26.23/$m^3$;
- Secondary Cement Pastefill: US$18.13/$m^3$; and
- Processing: US$12.00/t-Feed.

General and Administration costs were considered as 10% of the other operating costs, which resulted in a unit rate of US$3.50/t-RoM.

22 ECONOMIC ANALYSIS (ITEM 22)

The text and figures in the following Chapter have been summarized from the 2017 Preliminary Economic Assessment Florida Canyon Zinc Project, Amazonas Department, Peru with Effective Date: July 13, 2017 and Report Date: August 3, 2017. The 2021 Mineral Resource update as described in this report does not have a negative impact on or otherwise adversely affect the mineral resource inventory that formed the basis of the 2017 PEA. The planned operation is similar to that considered in the 2017 report. There was insufficient work performed in the 2021 Mineral Resource Estimate to re-estimate the costs, though a review of operating and capital cost estimates by Gustavson shows that they are still appropriate at a PEA level of study. These inputs will need to be updated in the future however current commodities pricing is generally above the estimates used in the 2017 PEA. The results and conclusions of the 2017 PEA are still considered valid and therefore have been carried over for this Report.

The financial results presented here are based on annual inputs from the production schedule prepared by SRK. All financial data is second quarter 2017 and currency is in U.S. dollars (US$), unless otherwise stated.

22.1 EXTERNAL FACTORS

Florida Canyon does not hold contracts for the provision of its products. The costs and discounts associated with the sales of the products are based on recent information from similar operations. This study was prepared under the assumption that the project will sell the following products.

- Lead concentrate; and
- Zinc concentrate;

It was also considered that the lead concentrate also contains payable amounts of silver.

Assumed prices are based on current market spot prices. Table 21-1 presents the prices used in the cashflow model, which were also used for mineable resource calculations.

Table 21-1: Florida Canyon Price Assumptions

Description	Value	Unit
Silver	16.50	US$/oz
Lead	1.00	US$/lb
Zinc	1.20	US$/lb

Source: Solitario, 2017

Treatment charges and net smelter returns (NSR) terms for each type of product are summarized in Table 21-2.

Table 21-2: Florida Canyon Net Smelter Return Terms

Description	Value	Units
Lead Concentrate		
Treatment Charges	210.10	US$/t-conc.
Payable Lead	95.0%	No deducts
Silver Smelting & Refining Charges	1.50	US$/oz-Ag
Payable Silver	95.0%	No deducts
Zinc Concentrate		
Treatment Charges	203.00	US$/t-conc.
Payable Zinc	85.0%	No deducts

Source: SRK, 2017

It was assumed that zinc concentrates will be trucked to the Cajamarquilla smelter owned by Votorantim near Lima, Peru. Lead concentrates will be trucked to the Port of Callao near Lima and shipped overseas to a lead smelter. It was assumed that the concentrates will have an average moisture content of 8%. Table 21-3 presents the calculated transportation costs considered for each product.

Table 21-3: Florida Canyon Product Logistics Cost

Items	Value	Unit
Lead Concentrate	87.05	US$/t
Zinc Concentrate	51.08	US$/t

Source: SRK, 2017

22.2 MAIN ASSUMPTIONS

Common prices for consumables, labor, fuel, lubricants and explosives were used by all engineering disciplines to derive capital and operating costs. Included in the labor costs are shift differentials, vacation rotations, all taxes and the payroll burdens. All currency is in U.S. dollars (US$) unless otherwise stated.

The pre-production period was estimated to be two years. This should be enough to develop access to mining areas, install and commission the plant and site infrastructure. Mine production is based on an average assumed LoM mine material movement of 2,358 t-ore/d (365 days/yr basis). The mine schedule does not include stockpiling as all blending of run of mine (RoM) is done in the mine. Table 21-4 presents the LoM mine assumptions.

Table 21-4: Florida Canyon Mine Production Assumptions

Description	Value	Units
Mine Production		
Underground Ore	11,187	kt
Total Material	**11,187**	**kt**
Avg. Daily Capacity	2,358	t per day
Stripping Ratio	N/A	w:o
RoM Grade		
Silver	11.3	g/t
Lead	0.90%	%
Zinc	8.34%	%
Contained Metal		
Silver	4,068	koz
Lead	222,347	klb
Zinc	2,057,796	klb

Source: SRK, 2017

The average mill feed is also 2,358 t/d (365 days/yr basis) over the LoM. The mill feed has an average head grade of 11.3 g/t Ag, 0.90% Pb and 8.34% Zn. The processing circuit is designed to recover a lead concentrate and a zinc concentrate, the lead concentrate also contains payable amounts of silver. Table 21-5 presents the projected LoM plant production.

Table 21-5: Florida Canyon Mill Production Assumptions

Description	Value	Units
RoM Ore Milled	**11,187**	**kt**
Daily Capacity	2,358	tperday
Lead Concentrate		
Moisture Content	8%	
Concentrate Silver Grade	436	g/t
Concentrate Lead Grade	50%	%
Concentrate Zinc Grade	0%	%
Recovery		
Silver	52%	
Lead	74%	
Zinc	0%	
Concentrate Yield	**150**	**kt(dry)**
Zinc Concentrate		
Moisture Content	8%	
Concentrate Silver Grade	0	g/t
Concentrate Lead Grade	0.0%	%
Concentrate Zinc Grade	50%	%
Recovery		
Silver	0%	
Lead	0%	
Zinc	80%	
Concentrate Yield	**1,491**	**kt(dry)**

Source: SRK, 2017

22.3 TAXES, ROYALTIES AND OTHER INTERESTS

The analysis of the Florida Canyon Project includes a total of 30% of income taxes over taxable income. Losses carried forward are used when possible, limited to 50% of profits. A depreciation schedule was calculated by SRK assuming a ten-year straight-line depreciation.

The Project includes payment of two types of governmental royalties, the first called a mining royalty and the second called a special mining tax. Both royalties are calculated as a rate depending on the ratio between the Earnings Before Interest and Taxes (EBIT) and the Net Revenue. This rate is applied on top of the EBIT, with the difference that the mining royalty can be replaced by a minimum rate of 1% over the net revenue, in case this 1% is higher than the mining royalty rate over the EBIT. The rates for each royalty are presented in Table 21-6.

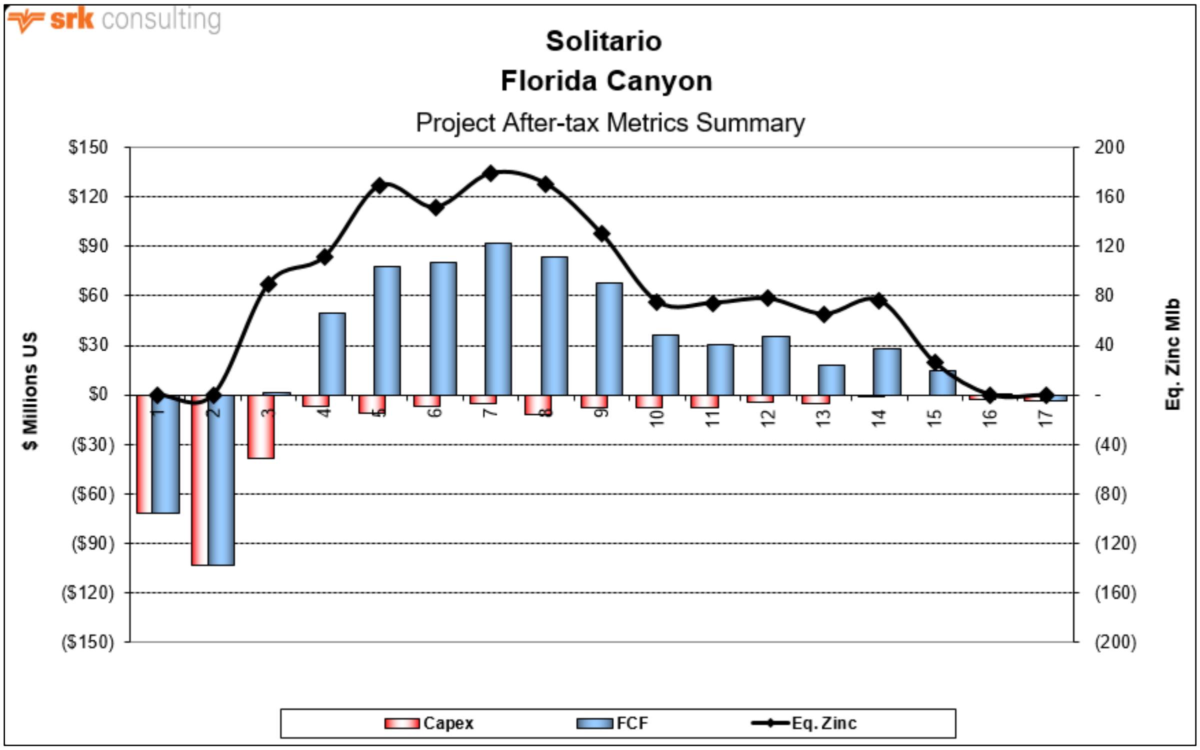
Table 21-6: Florida Canyon Royalty Rates

EBIT (%)	Special Mining Tax		Mining Royalty	
	Marg. (%)	Cum. (%)	Marg. (%)	Cum. (%)
0.00	0.00	0.00	0.00	0.00
10.00	2.00	0.20	1.00	0.10
15.00	2.40	0.32	1.75	0.19
20.00	2.80	0.46	2.50	0.31
25.00	3.20	0.62	3.25	0.48
30.00	3.60	0.80	4.00	0.68
35.00	4.00	1.00	4.75	0.91
40.00	4.40	1.22	5.50	1.19
45.00	4.80	1.46	6.25	1.50
50.00	5.20	1.72	7.00	1.85
55.00	5.60	2.00	7.75	2.24
60.00	6.00	2.30	8.50	2.66
65.00	6.40	2.62	9.25	3.13
70.00	6.80	2.96	10.00	3.63
80.00	7.60	3.70	11.50	4.74
85.00	8.00	4.10	12.00	5.34
90.00	8.40	4.52	12.00	5.34

Source: SRK, 2017

22.4 Results

The valuation results of the Florida Canyon Project indicate that the Project has a potential present value of approximately US$198 million, with an Internal Rate of Return (IRR) of 25%, based on an 8% discount rate. The operation will have two years of negative free cash flow, as it has to be constructed in this period. Even with some of the capital spent in the first year of operation, it is projected that this year will have a positive free cash flow. This economic analysis indicates that the investment payback should occur 2.6 years from the start of the commercial production. The estimate free cash flow of the project is presented in Figure 21-1.



Source: SRK, 2017

Figure 21-1: Florida Canyon After-Tax Free Cash Flow and Equivalent Metal Production

Indicative economic results are presented in Table 21-7, the table evidences that zinc is responsible for the clear majority of the revenue generation and the underground mining cost is the heaviest burden on the operation, followed by the mineral processing cost as a far second.

Table 21-7: Florida Canyon Indicative Economic Results (Dry Basis)

Description	Value	Units
Market Prices		
Silver	16.50	US$/oz
Lead	1.00	US$/lb
Zinc	$1.20	US$/lb
Estimate of Cash Flow (all values in US$000s)		
Concentrate Net Return		**$/oz-Ag**
Silver Sales	$32,957	$0.02
Lead Sales	$156,937	$0.11
Zinc Sales	$1,675,977	$1.20
Total Revenue	**$1,865,871**	**$1.34**
Treatment, Smelting and Refining Charges	($337,076)	
Freight, Impurities & Third Parties	($96,935)	($0.07)
Gross Revenue	**$1,431,860**	
Royalties	($61,734)	($0.04)
Net Revenue	**$1,370,126**	
Operating Costs		
Open Pit Mining	$0	$0.00
Underground Mining	($228,547)	($0.16)
Process	($144,063)	($0.10)
G&A	($39,153)	($0.03)
Ordinary Rights	$0	$0.00
Total Operating	**($411,764)**	**($0.29)**
Operating Margin (EBITDA)	**$958,362**	
Initial Capital	($213,667)	
LoM Sustaining Capital	($82,722)	
Income Tax	($224,873)	
After Tax Free Cash Flow	**$437,100**	
Payback	**2.59**	**years**
After-Tax IRR	**24.7%**	
NPV @: 8%	**$197,521**	

Source: SRK, 2017

Table 21-8 shows annual production and revenue forecasts for the life of the project. All production forecasts, material grades, plant recoveries and other productivity measures were developed by SRK and Solitario.

Table 21-8: Florida Canyon LoM Annual Production and Revenues

Period	RoM (Mt)	Plant Feed (Mt)	Lead Conc. (kt)	Zinc Conc. (kt)	Free Cash Flow (US$ millions)	Discounted Cash Flow (US$ millions)
-2	0.00	0.00	0.00	0.00	(72)	(72)
-1	0.00	0.00	0.00	0.00	(103)	(96)
1	0.73	0.73	9.06	95.86	2	2
2	0.91	0.91	11.07	119.02	50	40
3	0.91	0.91	14.87	180.57	78	57
4	0.91	0.91	17.73	161.95	80	54
5	0.92	0.92	14.78	191.19	92	58
6	0.91	0.91	15.26	181.90	84	49
7	0.91	0.91	15.80	138.77	68	37
8	0.91	0.91	12.22	80.34	36	18
9	0.92	0.92	11.73	79.35	31	14
10	0.91	0.91	11.24	83.01	35	15
11	0.92	0.92	4.82	69.77	18	7
12	0.91	0.91	7.76	81.33	28	10
13	0.40	0.40	3.53	27.54	14	5
14	0.00	0.00	0.00	0.00	0	0
15	0.00	0.00	0.00	0.00	(3)	(1)
16	0.00	0.00	0.00	0.00	0	0
17	0.00	0.00	0.00	0.00	0	0
Total	**11.19**	**11.19**	**150**	**1,491**	**437**	**198**

Source: SRK, 2017

The Florida Canyon project is mainly a zinc project, as this metal represents roughly 90% of the total projected revenue. The remainder of the revenue is related to lead and silver, where both these metals are by-products, as none represent a minimum of 20% of the revenue projection.

Project cash costs are reported under an equivalent zinc production. All-in costs for zinc, including initial and sustaining capital costs, are estimated at US$0.73/Zn-lb. Considering byproduct credits for lead and silver, all-in zinc cost is US$0.47/Zn-lb. Table 21-9 presents the composition of the Florida Canyon cash costs.

Table 21-9: Florida Canyon Cash Costs

Cash Costs	US$000's
Direct Cash Cost	
Underground Mining Cost	$228,547
Process Cost	$144,063
Site G&A Cost	$39,153
Ordinary Rights	$0
Treatment Charges	$334,080
Smelting & Refining Charges	$2,996
Freight	$96,935
By-Product Credits	($189,894)
Direct Cash Costs	**$655,881**
US$/t-ore	**$58.63**
US$/lb-Zn	**$0.47**
Indirect Cash Cost	
Royalties	**$61,734**
Exploration Expense	**$0**
Social Responsibility/Community Relations Expense	**$0**
Indirect Cash Costs	**$61,734**
US$/t-ore	**$5.52**
US$/lb-Zn	**$0.04**
Direct + Indirect Cash Costs	**$717,615**
US$/t-ore	**$64.15**
US$/lb-Zn	**$0.51**
Sustaining Capital Cash Cost	
Sustaining Capital	**$82,722**
Sustaining Cash Costs	**$82,722**
US$/t-ore	**$7.39**
US$/lb-Zn	**$0.06**
All-In Sustaining Cash Costs	**$800,337**
US$/t-ore	**$71.54**
US$/lb-Zn	**$0.57**
Initial Capital Cash Cost	
Initial Capital	**$213,667**
Initial Capital Cash Costs	**$213,667**
US$/t-ore	**$19.10**
US$/lb-Zn	**$0.15**
All-In Cash Costs	**$1,014,004**
US$/t-ore	**$90.64**
US$/lb-Zn	**$0.73**

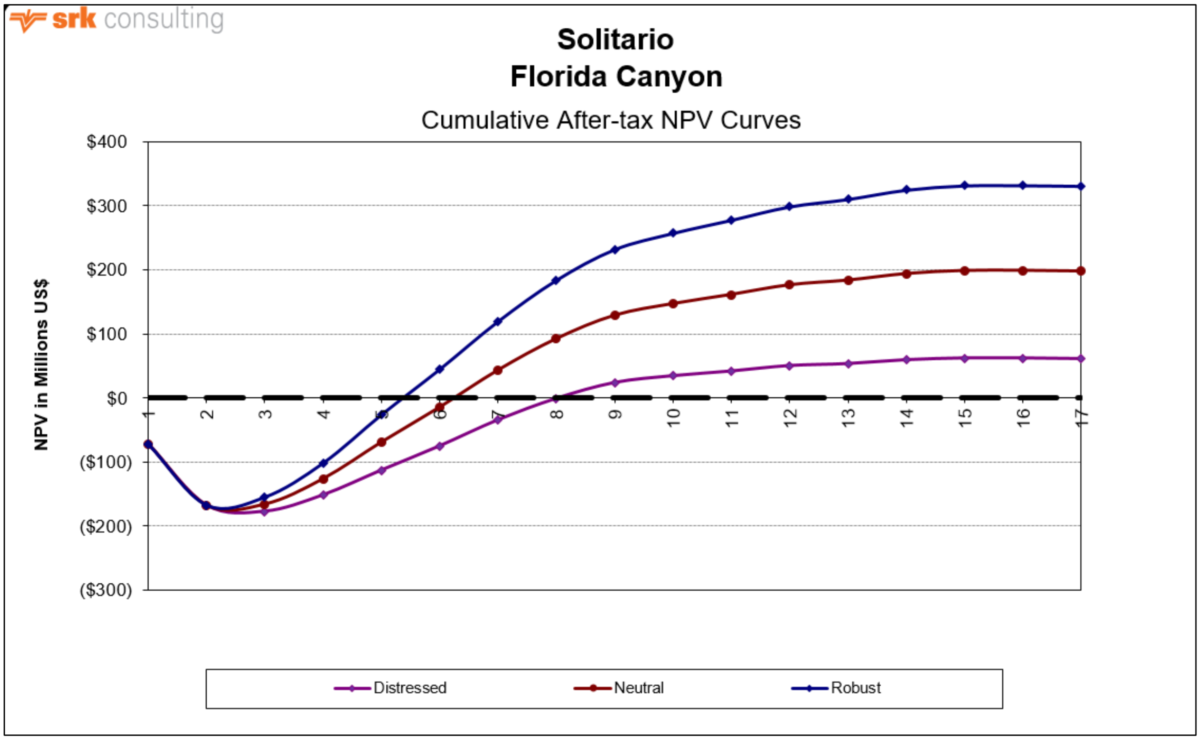
Source: SRK, 2017

22.5 BASE CASE SENSITIVITY ANALYSIS

Sensitivity on discount rates and different metal prices scenarios were conducted. The results are presented in Figure 21-2 and Figure 21-3.

Figure 21-2 presents the behavior of the accumulated after-tax net present value, where:

- Distressed metal prices are 20% lower than neutral prices;
- Neutral metal prices as presented in this section; and
- Robust metal prices are 20% higher than neutral prices.



Source: SRK, 2017

Figure 21-2: Florida Canyon Cumulative NPV Curves (after tax)

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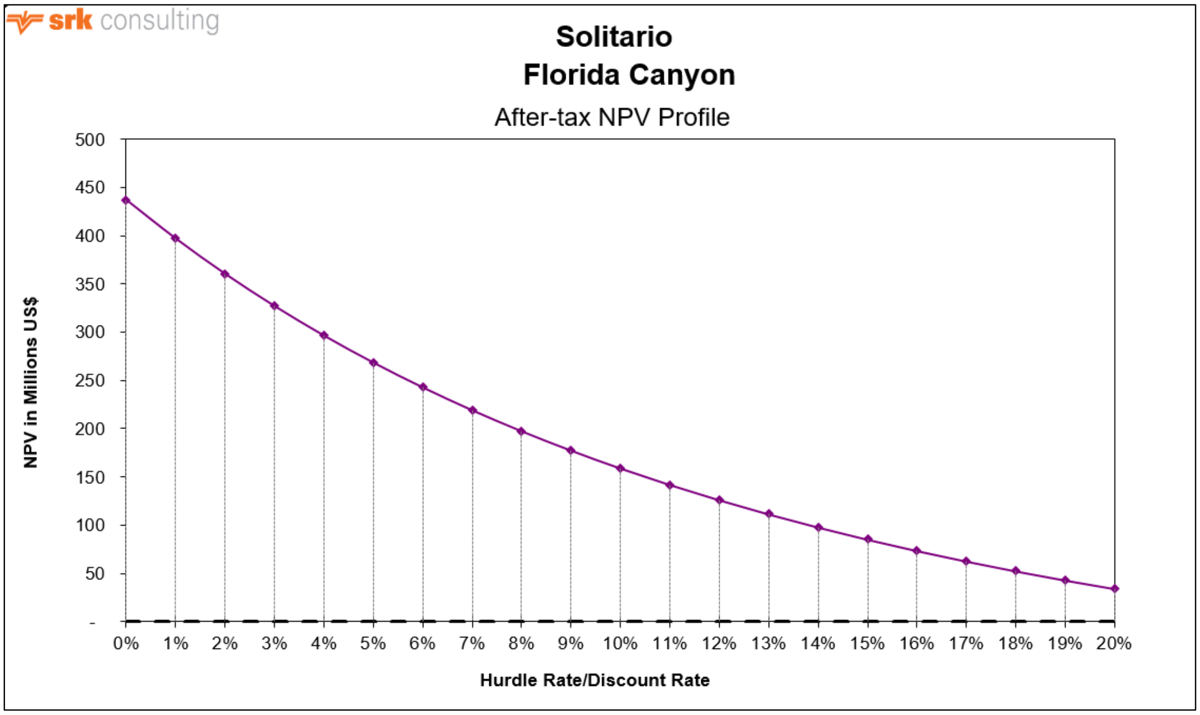
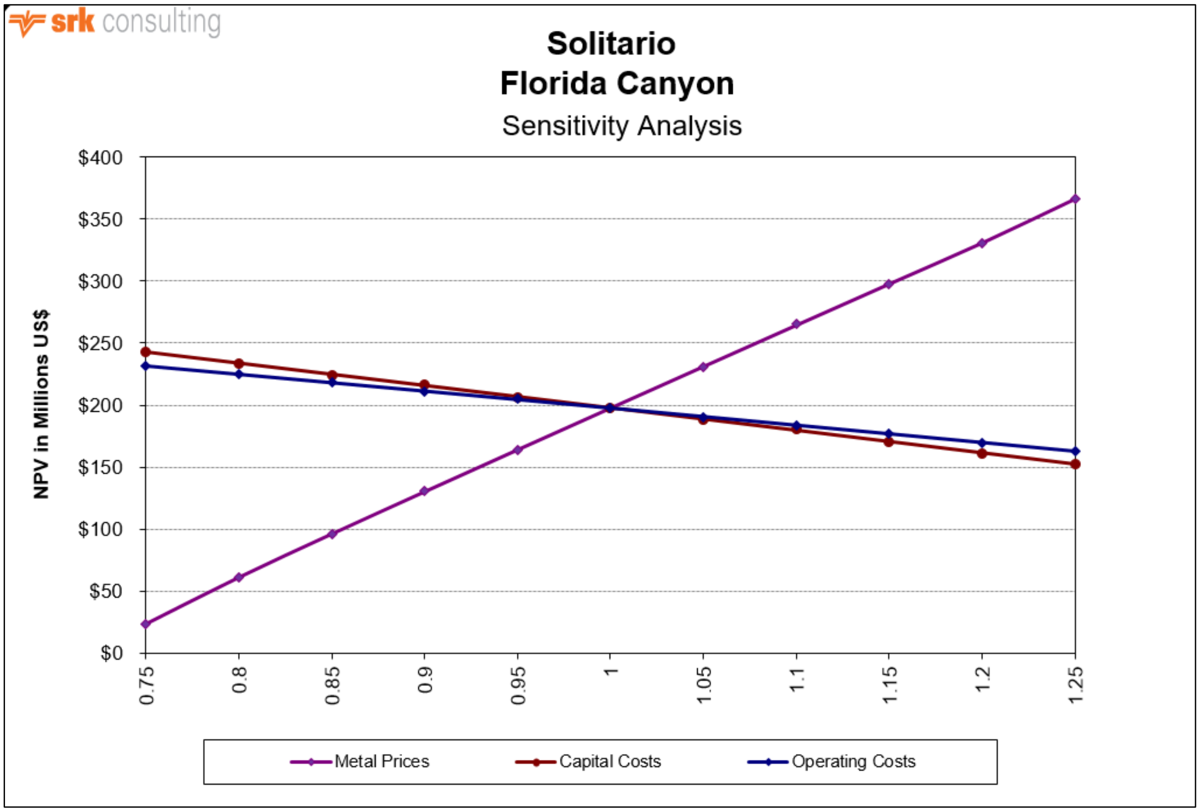


Source: SRK, 2017

Figure 21-3: Florida Canyon NPV Sensitivity to Hurdle Rate

A sensitivity analysis on variation of Project costs, both capital and operating, and metal prices indicated that the cash generating is mostly sensitive to the reduction of metal prices, or possibly loss on metal recovery, and secondly to the increase of capital costs. A chart of typical sensitivities is provided in Figure 21-4.



Source: SRK, 2016

Figure 21-4: Florida Canyon NPV Sensitivity (US$000's)

22.6 CONSERVATIVE METAL PRICE ALTERNATIVE ANALYSIS

The owners requested SRK to evaluate the Florida Canyon Project under a specific alternate metal price structure. This forecast includes a new set of long-term metal prices, which are considerably lower than current spot metal prices for zinc and lead. The alternative pricing is presented in Table 21-10.

Table 21-10: Alternate Market Forecast Metal Prices

Description	Value	Unit
Silver	18.91	US$/oz
Lead	0.88	US$/lb
Zinc	1.06	US$/lb

Source: SRK, 2017

The owners also asked that for these market conditions the project be evaluated with a higher discount rate of 9%.

Only these metal prices and the discount rate were changed in this alternative valuation. Other inputs and estimates were maintained the same as the base case, including:

- Mineable Resources;
- Process Recoveries;
- On-Site and Off-Site Operating Costs;

- Capital Costs; and
- Net Smelter Terms.

22.6.1 Impact to Mine Planning

SRK investigated the impact of using the more conservative economic inputs on mine planning, specifically, the NSR calculation. Using the new NSR calculation and applying it to the mine plan resource presented in this document, has the effect of lowering the overall average NSR by 23%. Overall, the revenue generated from the mine plan resource is 77% of the original assumptions.

Figure 21-5 shows the mine plan resource, colored by the sensitivity NSR (US$/t). The economic cut-off is approximately US$40/t-NSR. Dark blue mining areas in the figure are now below cut-off and light blue areas are marginal. Using the sensitivity NSR, when all areas are combined, the mine plan is still economic. Given these new sensitivity inputs, the mine plan could be optimized to eliminate the un-economic material and minimize the amount of marginal material in the mine plan.

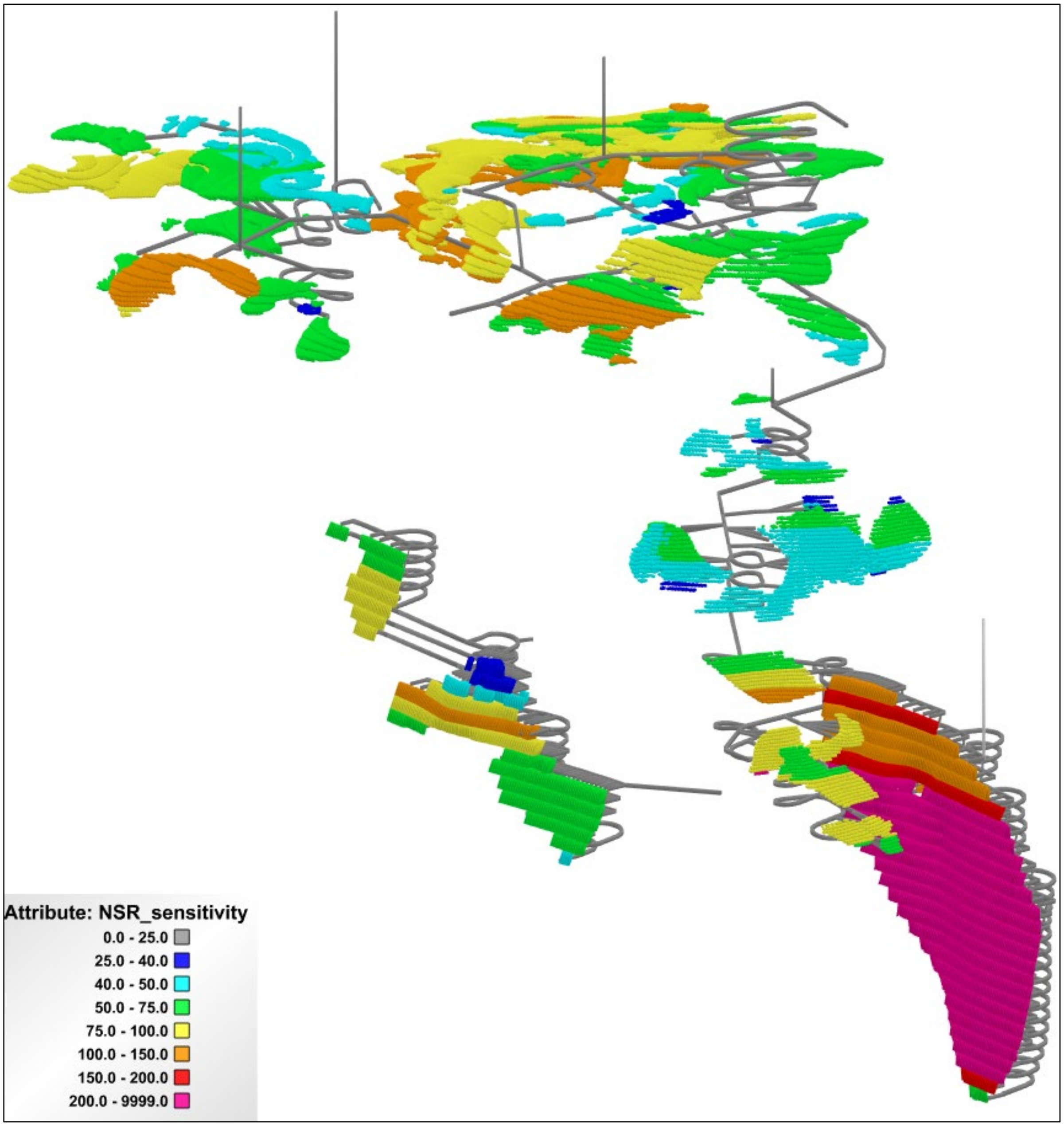
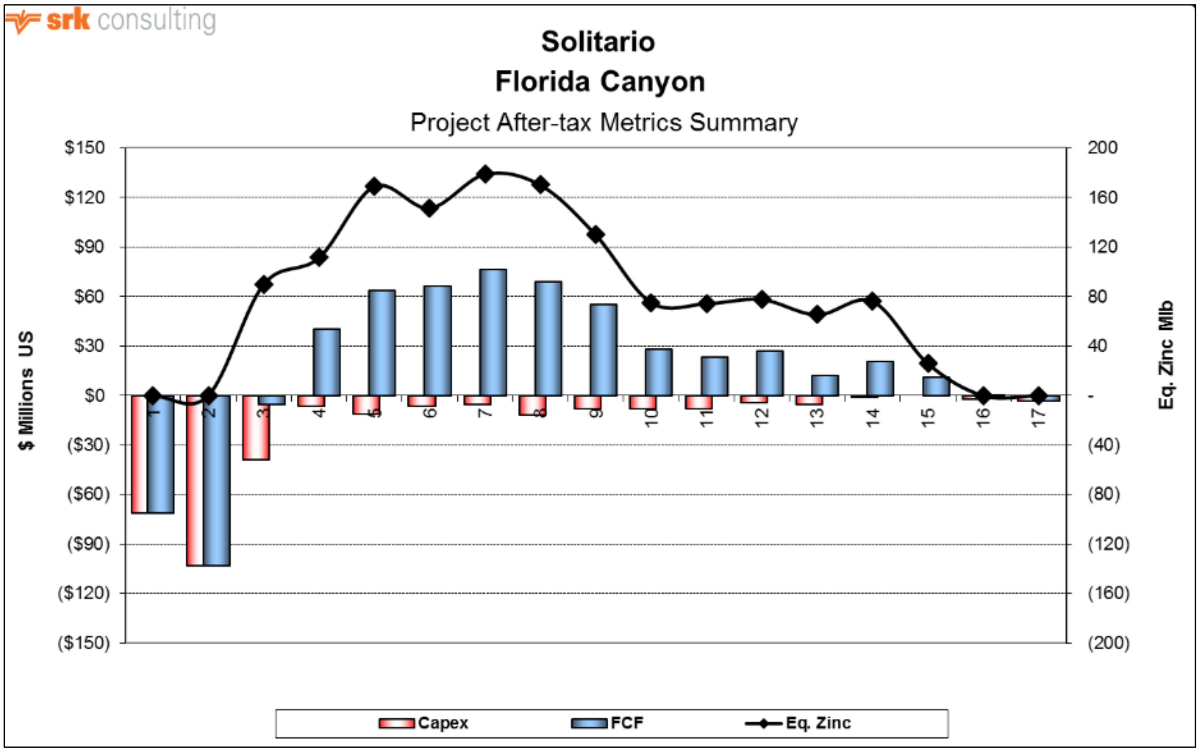


Figure 21-5: Mine Plan Resource colored by Sensitivity NSR (rotated view, looking Northeast)

22.6.2 Impact to Economics

The valuation of these alternate market assumptions is estimated to yield a net present value of US$106.1 million. The free cash flow project in this case presents three years of negative results, with cash flow becoming positive on the second year of commercial production. This also resulted in a longer payback period of around 3.15 years, compared to the base case payback period of 2.6 years. The lower zinc price is especially impactful in this case, as zinc is by far the highest revenue generator of the deposit, and this change reduced profits from every period modeled. The estimate of free cash flow of this alternate case is presented in Figure 21-6.



Source: SRK, 2017

Figure 21-6: Florida Canyon Alternate Case After-Tax FCF and Equivalent Metal Production

The indicative economic results of this alternate case are presented in Table 21-11, the table further evidences that zinc is responsible for the majority of the revenue generation, and the underground mining cost continues to be the heaviest cost center of the operation, followed by the mineral processing cost as a distant second.

Table 21-11: Florida Canyon Alternate Case Indicative Economic Results (Dry Basis)

Description	Value	Units
Market Prices		
Silver	18.91	US$/oz
Lead	0.88	US$/lb
Zinc	$1.06	US$/lb
Estimate of Cash Flow (all values in US$000's)		
Concentrate Net Return		**$/oz-Ag**
Silver Sales	$37,771	$0.03
Lead Sales	$137,603	$0.10
Zinc Sales	$1,481,158	$1.06
Total Revenue	**$1,656,532**	**$1.19**
Treatment, Smelting and Refining Charges	($337,076)	
Freight, Impurities & Third Parties	($96,935)	($0.07)
Gross Revenue	**$1,222,521**	
Royalties	($42,624)	($0.03)
Net Revenue	**$1,179,897**	
Operating Costs		
Open Pit Mining	$0	$0.00
Underground Mining	($228,547)	($0.16)
Process	($144,063)	($0.10)
G&A	($39,153)	($0.03)
Ordinary Rights	$0	$0.00
Total Operating	**($411,764)**	**($0.29)**
Operating Margin (EBITDA)	**$768,133**	
Initial Capital	($213,667)	
LoM Sustaining Capital	($82,722)	
Income Tax	($162,071)	
After Tax Free Cash Flow	**$309,673**	
Payback	**3.15**	**years**
After-Tax IRR	**19.1%**	
NPV @: 9%	**$106,137**	

Source: SRK, 2017

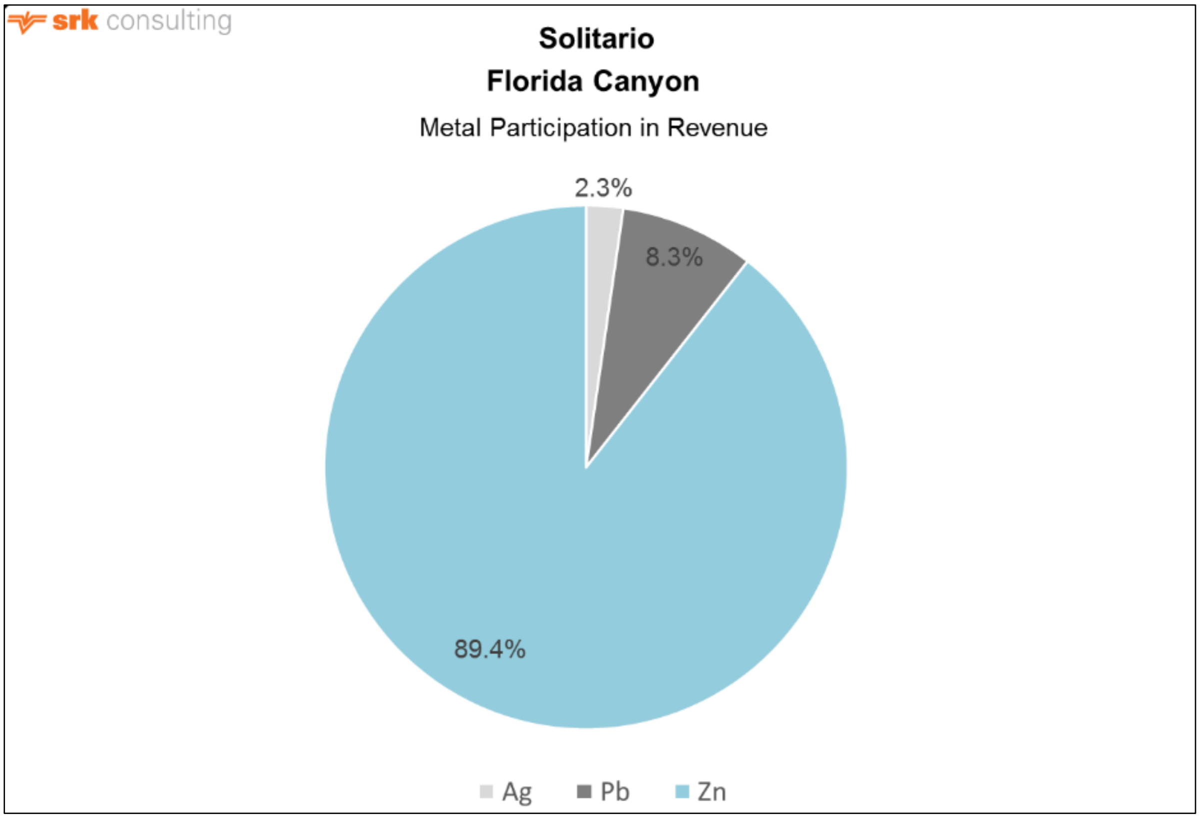
Table 21-12 shows annual production and revenue forecasts for the life of mine of the alternate case.

Table 21-12: Florida Canyon Alternate Case LoM Annual Production and Revenues

Period	RoM (Mt)	Plant Feed (Mt)	Lead Conc. (kt)	Zinc Conc. (kt)	Free Cash Flow (US$ millions)	Discounted Cash Flow (US$ millions)
-2	0.00	0.00	0.00	0.00	(72)	(72)
-1	0.00	0.00	0.00	0.00	(103)	(95)
1	0.73	0.73	9.06	95.86	(5)	(5)
2	0.91	0.91	11.07	119.02	40	31
3	0.91	0.91	14.87	180.57	64	45
4	0.91	0.91	17.73	161.95	66	43
5	0.92	0.92	14.78	191.19	76	46
6	0.91	0.91	15.26	181.90	69	38
7	0.91	0.91	15.80	138.77	55	28
8	0.91	0.91	12.22	80.34	28	13
9	0.92	0.92	11.73	79.35	23	10
10	0.91	0.91	11.24	83.01	27	11
11	0.92	0.92	4.82	69.77	12	4
12	0.91	0.91	7.76	81.33	21	7
13	0.40	0.40	3.53	27.54	11	3
14	0.00	0.00	0.00	0.00	0	0
15	0.00	0.00	0.00	0.00	(3)	(1)
Total	**11.19**	**11.19**	**150**	**1,491**	**310**	**106**

Source: SRK, 2017

This change of metal prices in the alternate case economics, including the reduction of both zinc and lead and the raise of silver, does not significantly change the distribution of the revenue generation by metal. Figure 21-7 presents a very similar profile for each metal contribution compared to the base case.



Source: SRK

Figure 21-7: Alternate Case Metal Participation in Revenue

The estimated all-in LoM cost decreased by US$0.01 to US$0.72/EqZn-lb as a result of reducing the royalty payments due to lower metal prices. Direct cash costs were raised by about US$0.01/EqZn-lb to a total of US$0.48/EqZn-lb due to the lower byproduct credit from the lower lead and silver price. Table 21-13 presents the details of the LoM cash costs.

Table 21-13: Florida Canyon Cash Costs

Cash Costs	US$000's
Direct Cash Cost	
Underground Mining Cost	$228,547
Process Cost	$144,063
Site G&A Cost	$39,153
Treatment Charges	$334,080
Smelting & Refining Charges	$2,996
Freight	$96,935
By-Product Credits	($175,374)
Direct Cash Costs	**$670,401**
US$/t-ore	**$59.93**
US$/lb-Zn	**$0.48**
Indirect Cash Cost	
Royalties	$42,624
Indirect Cash Costs	**$42,624**
US$/t-ore	**$3.81**
US$/lb-Zn	**$0.03**
Direct + Indirect Cash Costs	**$713,026**
US$/t-ore	**$63.74**
US$/lb-Zn	**$0.51**
Sustaining Capital Cash Cost	
Sustaining Capital	$82,722
Sustaining Cash Costs	**$82,722**
US$/t-ore	**$7.39**
US$/lb-Zn	**$0.06**
All-In Sustaining Cash Costs	**$795,748**
US$/t-ore	**$71.13**
US$/lb-Zn	**$0.57**
Initial Capital Cash Cost	
Initial Capital	$213,667
Initial Capital Cash Costs	**$213,667**
US$/t-ore	**$19.10**
US$/lb-Zn	**$0.15**
All-In Cash Costs	**$1,009,415**
US$/t-ore	**$90.23**
US$/lb-Zn	**$0.72**

Source: SRK, 2017

This conservative metal price alternative has a significant effect on the economic results of the project in comparison with the base case, probably in a scale that it would warrant additional optimization of the mineable resources and project plan.

23 ADJACENT PROPERTIES (ITEM 23)

The Minera Bongará concessions are surrounded by concessions held by Minera Chambará. Minera Chambará, as discussed in Section 4, is also a joint venture between Solitario and Nexa. The mineralized area as currently drilled is well within the limits of the Bongará concessions.

24 OTHER RELEVANT DATA & INFORMATION (ITEM 24)

To the qualified persons' knowledge, there is no other relevant data or information that is not already disclosed in this report.

25 INTERPRETATIONS & CONCLUSIONS (ITEM 25)

25.1 RESULTS & COMMENTS

Florida Canyon has long been recognized as a significant Mississippi Valley Type mineral resource for zinc. The work performed to complete this study demonstrates that Florida Canyon has sufficient zinc resources to warrant further work, with about 2.4 million tonnes of Measured and Indicated mineral resource and nearly 15 million tonnes of Inferred. These tonnages are representative of material that is both of sufficient grade and sufficient continuity to form potential stope shapes, even though mineral resources are not mineral reserves.

In the area of historical drilling the steep topography has made drill site construction difficult without road access. All drilling to date has been completed with helicopter support. This has resulted in gaps in drill coverage and, in some cases, gaps in modelled ore shapes that are likely to be continuous. An access road to the site, to be completed in 2021, will provide better sites for surface drilling, support for underground development and logistical support. Permitting, currently in progress, will provide future road-accessible work areas south of the current resources.

25.2 SIGNIFICANT RISKS & UNCERTAINTIES

A thorough understanding of the resource and the mineralogy will be needed. The majority of the ore is judged to be of favorable metallurgy as well as being amenable to producing a high quality and marketable concentrate. A subordinate quantity of the ore consists of variable amounts of the zinc minerals in the form of carbonates or silicates which may require distinct treatment to result in good recovery and produce a viable concentrate. The highest priorities for future work are to better quantify the metallurgy and to convert at least a portion of the resource from the Inferred to Indicated category so that reserves may be quantified for the completion of a Feasibility Study.

The project is in a remote area with challenging topography which will require upgrading of the local infrastructure for a commercial operation. Although the mine will be underground, with a relatively small surface footprint, the challenges of working in the area will require a strong attention to environmental sensitivities and a commitment to the community to maintain the social license.

26 RECOMMENDATIONS (ITEM 26)

26.1 GENERAL RECOMMENDATIONS

Gustavson has reviewed many of the technical studies completed by Nexa and its predecessor, Votorantim. Most of these studies have been conducted at a prefeasibility level and will form the basis for feasibility investigations to support a production decision. To attain this level of project design detail, new studies will need to be completed to provide the foundation for future development. A number of recommendations for this future work are provided in the 2017 SRK PEA, most of which are not restated in this report. The following recommendations focus on the most impactful recommendations for project development in the near term.

26.1.1 Metallurgy

The focus of this report is to review a new resource estimation by Nexa which updates, restates, and refines the 2017 resource estimation. The newly restated resources define a significantly larger inventory of ore with a very different mineralogical composition and metallurgical character than that previously described in the PEA. The increased proportion of sulfide ore with less oxidized zinc and lead minerals provides a significant opportunity, in comparison to the PEA, for:

1. Lower processing costs,
2. Higher metal recoveries,
3. Increased concentrate grades,
4. Lower transportation costs,
5. Decreased average smelter charges, and
6. Lower cutoff grade.

These more favorable operating parameters should have a significant impact on project economics, particularly combined with the larger global resource base.

However, the currently available metallurgical studies conducted by Smallvill S.A. are inadequate to support an optimization study of processing options. It is important to note that little of the historical studies have tested pure sulfide ore. Therefore, a new program of metallurgy is strongly recommended, starting with more representative sampling of the ore deposit with variability testing in mind. Planned studies should prioritize work on sulfide ore so that it may be scheduled for production early in the mine life.

The metallurgy of oxidized ore should also be recharacterized so that this lower quality ore can be to be incorporated into the mine plan.

It is recommended that the suggested program be undertaken by a reputable metallurgical consulting firm.

Samples for metallurgical test work can be procured from core in storage in Shipasbamba. New core for metallurgical sampling can be obtained by drilling from currently permitted sites from either underground or surface locations as described below if additional samples are needed.

Since additional drilling has indicated that sulfides constitute a majority of the total resources, a program of metallurgical testing is recommended with the following objectives:

- The emphasis of the metallurgical program for the project should be on the recovery of zinc, lead and silver from the sulfide ores.
- A secondary objective would be to refine the recoveries in oxidized ore.
- The composites should be prepared from the core currently in storage based on ore types/feed grade (high, average, and low grade). This would provide immediately available ore for testing. Follow up testing could use new drill core.
- Metallurgical testing should be directed at optimizing process parameters (grind size, flotation time, reagent type, dosage, etc.) for the rougher flotation and regrind and a determination of the number of cleaner stages required to produce marketable-grade concentrates.
- Locked-cycle tests should be performed to determine the recovery and quality of the concentrates.
- Miscellaneous tests should also be undertaken to generate data for prefeasibility and feasibility work. This would include comminution (CW_i, Ai, BW_i), thickening, filtration and tailing characterization testing.

26.1.2 Drilling

Additional exploration drilling is currently planned to increase the resource base of the project. Expansion of the resource is likely in a number of areas. However, drilling is also required to upgrade the category of the resource so that future mine planning and feasibility studies can be completed.

26.1.3 Resource Conversion Drilling

Follow up drilling in 2018-19 of targets recommended in the 2017 PEA was very successful in discovering new resources and new orebodies within the previously defined footprint of the deposit. Further future additions by discovery of new bodies within the limits of the existing resource are probable but it is recommended that the primary emphasis of drilling in the central part of the deposit be directed to resource conversion drilling since the ratio of Measured/Indicated to Inferred resource is low. Detailed mine planning requires an increased proportion of closely spaced drilling.

Underground drilling is preferable for resource conversion drilling because the surface topography is challenging and expensive for the development of surface drill stations. The relatively short distances between individual ore shoots also argues for underground drilling, the access for which can be readily developed due to the steep terrain. It is also likely that subsurface drilling will identify new zones and expand existing ones that are not feasible to be drilled from the surface sites. 15,000m of underground drilling is planned in the next campaign.

Development of underground access will be supported by completion of the new access road.

Previously obtained permits provided for new underground development and drilling in both the northern and southern parts of the deposit (Figure 25-1). However, it is uncertain if the previously permitted underground location in the northern part of the deposit (near zone 1021) is still current. Some additional underground development is currently permitted in the San Jorge workings.

Resource conversion drilling can also be efficiently completed from surface drill locations in certain locations. An example would be the expansion of drilling of the manto east of San Jorge, an area which is currently permitted.

Some additional drifting and infill drilling from underground at San Jorge could expand resources in permitted areas. Locations such as these could also offer opportunities for obtaining metallurgical samples.

26.1.4 Resource Expansion Drilling

An expansion of the existing surface drilling permit is currently in preparation. Figure 25-1 shows holes in prospective areas near the known resources to the south and east within the permit boundary (blue area).

Preparation of a longer-term permit (5th modification of the EIAsd) is also in progress for drill sites to test several new exploration targets that have been identified on the Minera Bongará Property. Figure 18-1 shows the location of some of these prospects. Ore grade outcropping mineralization is found at the Shillac, Juan, Tesoro and Pizarro. These surface showings, along with those in the expanded drilling area under the existing permit are quite accessible by new road construction compared to targets previously tested in the immediate vicinity of Florida Canyon.

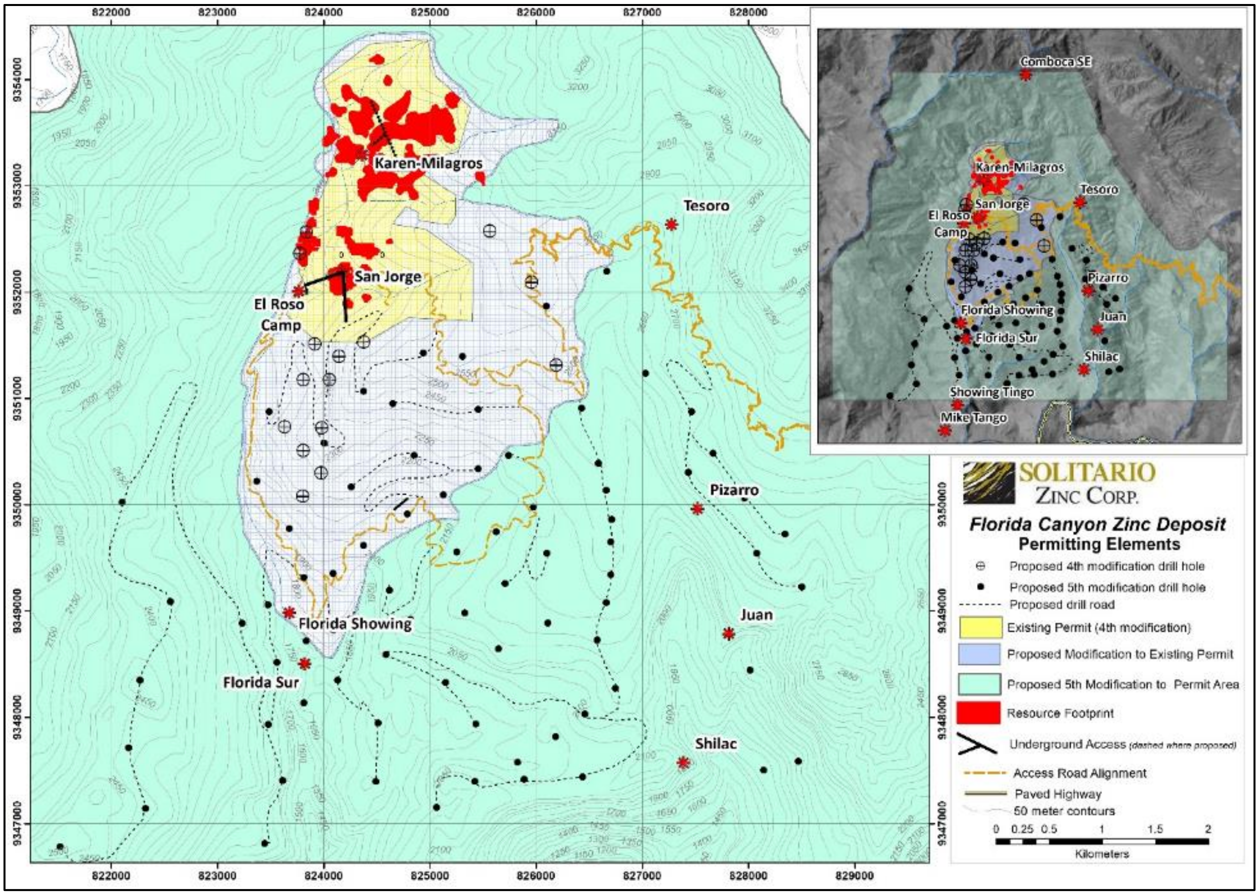


Figure 25-1 Future drilling and current and future underground exploration locations

Figure 25-2 shows the hypothesized extension in long section of the "Favorable Horizon" of Florida mineralization to the south to be tested with the drill holes in this area. The mineralized outcrops mentioned above are within the Favorable Horizon within the Chambara Formation. 10,000m of resource expansion drilling is proposed for 2021-2022.

Drilling of these areas may be delayed until 2022 due to the timing of approvals for the permit modification.

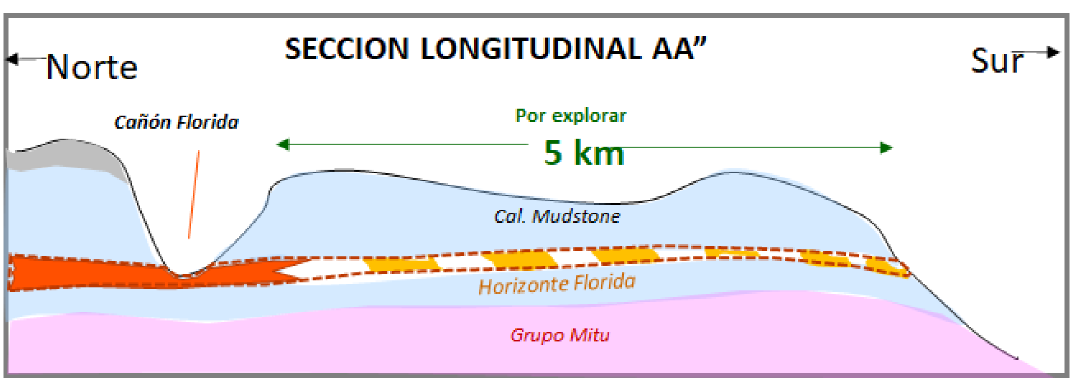


Figure 25-2 Northwest-Southeast long section of area shown in Figure 25-1

Table 25-1 is a projected work program budget.

Table 25-1 Planned work program for 2021-2022

Florida Canyon Prefeasibility Technical Work				
Task	Description	Quantity	Unit Cost US$	Est. Budget
Metallurgy				
	Sampling	20		$10,000
	Test Work	20		$250,000
Underground				
	North Adit Development	1000 m	$2,000	$2,000,000
	South Adit Development	250 m	$2,000	$500,000
Drilling				
	Underground Resource	15,000 m	$250	$3,750,000
	Surface Resource	10,000 m	$300	$3,000,000
Support Cost	Camp, Oversight	-		$1,500,000
Total				$11,010,000

** Assumes Road Access Complete. (Does not include project fixed costs)

27 REFERENCES (ITEM 27)

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28 GLOSSARY

28.1 MINERAL RESOURCES

The mineral resources and mineral reserves have been classified according to the "CIM Definition Standards for Mineral Resources and Mineral Reserves" (May 10, 2014). Accordingly, the Resources have been classified as Measured, Indicated or Inferred, any Reserves have been classified as Proven, and Probable based on the Measured and Indicated Resources as defined below.

A **Mineral Resource** is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.

An **Inferred Mineral Resource** is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

An **Indicated Mineral Resource** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation. An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve.

A **Measured Mineral Resource** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit. Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation. A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proven Mineral Reserve or to a Probable Mineral Reserve.

28.2 MINERAL RESERVES

Modifying Factors are considerations used to convert Mineral Resources to Mineral Reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors.

A **Mineral Reserve** is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Pre-Feasibility or Feasibility level as appropriate that include application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified.

The reference point at which Mineral Reserves are defined, usually the point where the ore is delivered to the processing plant, must be stated. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.

The public disclosure of a Mineral Reserve must be demonstrated by a Pre-Feasibility Study or Feasibility Study.

A Probable Mineral Reserve is the economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. The confidence in the Modifying Factors applying to a Probable Mineral Reserve is lower than that applying to a Proven Mineral Reserve. The Qualified Person(s) may elect, to convert Measured Mineral Resources to Probable Mineral Reserves if the confidence in the Modifying Factors is lower than that applied to a Proven Mineral Reserve.

Probable Mineral Reserve estimates must be demonstrated to be economic, at the time of reporting, by at least a Pre-Feasibility Study.

A **Proven Mineral Reserve** is the economically mineable part of a Measured Mineral Resource. A Proven Mineral Reserve implies a high degree of confidence in the Modifying Factors. Application of the Proven Mineral Reserve category implies that the Qualified Person has the highest degree of confidence in the estimate with the consequent expectation in the minds of the readers of the report. The term should be restricted to that part of the deposit where production planning is taking place and for which any variation in the estimate would not significantly affect the potential economic viability of the deposit.

Proven Mineral Reserve estimates must be demonstrated to be economic, at the time of reporting, by at least a Pre-Feasibility Study. Within the CIM Definition standards the term Proved Mineral Reserve is an equivalent term to a Proven Mineral Reserve.

28.3 GLOSSARY

The following general mining terms may be used in this report.

Table 27-1 Glossary

Term	Definition
Assay:	The chemical analysis of mineral samples to determine the metal content.
Capital Expenditure:	All other expenditures not classified as operating costs.
Crushing:	Initial process of reducing ore particle size to render it more amenable for further processing.
Cut-off Grade (CoG):	The grade of mineralized rock, which determines whether it is economic to recover its mineral content by further concentration.
Dilution:	Waste, which is unavoidably mined with ore.
Dip:	Angle of inclination of a geological feature/rock from the horizontal.
Fault:	The surface of a fracture along which movement has occurred.
Footwall:	The underlying side of an orebody or stope.
Gangue:	Non-valuable components of the ore.
Grade:	The measure of concentration of gold within mineralized rock.
Hangingwall:	The overlying side of an orebody or slope.
Haulage:	A horizontal underground excavation which is used to transport mined ore.
Igneous:	Primary crystalline rock formed by the solidification of magma.
Level:	Horizontal tunnel the primary purpose is the transportation of personnel and materials.
Lithological:	Geological description pertaining to different rock types.
LoM Plans:	Life-of-Mine plans.
LRP:	Long Range Plan.
Material Properties:	Mine properties.
Milling:	A general term used to describe the process in which the ore is crushed and ground and subjected to physical or chemical treatment to extract the valuable metals to a concentrate or finished product.
Mineral/Mining Lease:	A lease area for which mineral rights are held.
Mining Assets:	The Material Properties and Significant Exploration Properties.
Ongoing Capital:	Capital estimates of a routine nature, which is necessary for sustaining operations.
Ore Reserve:	See Mineral Reserve.
Pillar:	Rock left behind to help support the excavations in an underground mine.
RoM:	Run-of-Mine.
Sedimentary:	Pertaining to rocks formed by the accumulation of sediments, formed by the erosion of other rocks.
Shaft:	An opening cut downwards from the surface for transporting personnel, equipment, supplies, ore and waste.
Sill:	A thin, tabular, horizontal to sub-horizontal body of igneous rock formed by the injection of magma into planar zones of weakness.
Stope:	Underground void created by mining.
Stratigraphy:	The study of stratified rocks in terms of time and space.
Strike:	Direction of line formed by the intersection of strata surfaces with the horizontal plane, always perpendicular to the dip direction.
Sulfide:	A sulfur bearing mineral.
Tailings:	Finely ground waste rock from which valuable minerals or metals have been extracted.
Total Expenditure:	All expenditures including those of an operating and capital nature.

28.4 DEFINITION OF TERMS

The following abbreviations may be used in this report.

Table 27-2 Abbreviations

Abbreviation	Unit or Term
A	ampere
AA	atomic absorption
A/m^2	amperes per square meter
Ag	silver
Au	gold
°C	degrees Centigrade
CCD	counter-current decantation
CIL	carbon-in-leach
CoG	cut-off grade
cm	centimeter
cm^2	square centimeter
cm^3	cubic centimeter
cfm	cubic feet per minute
ConfC	confidence code
CRec	core recovery
CSS	closed-side setting
CTW	calculated true width
Cu	copper
°	degree (degrees)
dia.	Diameter
EDX	energy dispersive x-ray
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
FA	fire assay
ft	foot (feet)
ft^2	square foot (feet)
ft^3	cubic foot (feet)
g	gram
gal	gallon
g/L	gram per liter
g-mol	gram-mole
gpm	gallons per minute
g/t	grams per tonne
ha	hectares
Hp	Horsepower
HQ	drill core diameter of ~63.5 mm
HTW	horizontal true width
ICP-MS	inductively coupled plasma mass spectrometry
ID2	inverse-distance squared
ID3	inverse-distance cubed
kA	kiloamperes
kg	kilograms

Abbreviation	Unit or Term
km	kilometer
km^2	square kilometer
koz	thousand troy ounce
kt	thousand tonnes
kt/d	thousand tonnes per day
kt/y	thousand tonnes per year
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
kWh/t	kilowatt-hour per metric tonne
L	liter
L/sec	liters per second
L/sec/m	liters per second per meter
lb	pound
LHD	Long-Haul Dump truck
LOI	Loss On Ignition
LoM	Life-of-Mine
m	meter
m^2	square meter
m^3	cubic meter
masl	meters above sea level
Ma	millions of years before present
mg/L	milligrams/liter
MLA	mineral liberation analysis
mm	millimeter
mm^2	square millimeter
mm^3	cubic millimeter
MME	Mine & Mill Engineering
Moz	million troy ounces
Mt	million tonnes
MTW	measured true width
MW	million watts
m.y.	million years
NGO	non-governmental organization
NI 43-101	Canadian National Instrument 43-101
NQ	drill core diameter of ~47.5 mm
opt	troy ounce per ton
OSC	Ontario Securities Commission
oz	troy ounce
%	Percent
Pb	lead
PGM	Pilot Gold Mill
PLC	Programmable Logic Controller
PLS	Pregnant Leach Solution
PMF	probable maximum flood
ppb	parts per billion
ppm	parts per million
QA/QC	Quality Assurance/Quality Control

Abbreviation	Unit or Term
RC	rotary circulation drilling
RoM	Run-of-Mine
RQD	Rock Quality Description
Sb	antimony
sec	second
SEM	Scanning Electron Microscope
SG	specific gravity
SPT	standard penetration testing
st	short ton (2,000 pounds)
t	tonne (metric ton) (2,204.6 pounds)
t/h	tonnes per hour
t/d	tonnes per day
t/y	tonnes per year
TSF	tailings storage facility
TSP	total suspended particulates
µm	micron or microns
V	volts
VFD	variable frequency drive
W	Tungsten or watts
XRD	x-ray diffraction
XRF	x-ray fluorescence
Y	Year
Zn	zinc

29 CERTIFICATE OF AUTHOR FORMS

DONALD E. HULSE, P.E.
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Email: dhulse@gustavson.com

CERTIFICATE of AUTHOR

I, Donald E. Hulse, P.E., SME-RM do hereby certify that:

1. I am currently employed as Vice President of Mining by Gustavson Associates, LLC at:

   200 Union Boulevard, Suite 440
   Lakewood, Colorado 80228

2. I am a graduate of the Colorado School of Mines with a Bachelor of Science in Mining Engineering (1982) and have practiced my profession continuously since 1983.

3. I am a registered Professional Engineer in the State of Colorado (35269), and a registered member of the Society of Mining Metallurgy & Exploration (1533190RM).

4. I have worked as a mining engineer for a total of 39 years since my graduation from university; as an employee of a major mining company, a major engineering company, and as a consulting engineer. I have performed resource estimation and mine planning on numerous lead and zinc deposits for over 6 mining companies in three countries working as a consultant as well as an engineer or engineering manager for the projects.

5. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

6. Due to pandemic travel restrictions, I was unable to visit the property.

7. I am responsible for the preparation of the technical report entitled "NI 43-101 Technical Report on Resources, Florida Canyon Zinc Project, Amazonas Department, Peru", with effective date February 1, 2021, and dated April 5th, 2021 (rev. May 27, 2021) (the "Technical Report"), with specific responsibility for Chapters 1-10, Sections 11.4 and 11.5, Chapter 12, and Chapters 14-20. I am also responsible for the overall organization and content of the document.

8. I have had no prior involvement with the property that is the subject of this Technical Report.

9. I am independent of the issuer, Solitario Zinc Corp. and the Florida Canyon property, applying all of the tests in Section 1.5 of National Instrument 43-101.

10. I have read National Instrument 43-101 and Form 43-101, and the Technical Report has been prepared in compliance with that instrument and form.

11. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 5th day of April 2021 (rev. May 27, 2021)

/s/ Donald E. Hulse (Signature)
Signature of Qualified Person

Donald E. Hulse
Print name of Qualified Person

GUSTAVSON ASSOCIATES
GEOLOGISTS · ENGINEERS · ECONOMISTS · APPRAISERS

CERTIFICATE OF QUALIFIED PERSON

I, Simon James Atticus Mortimer, a professional geologist residing at Ramon Zavala 420, Miraflores, Lima, Peru do hereby certify that:

I am a co-author of the "NI 43-101 Technical Report on the Florida Canyon Project”.

- I am a Registered Professional Geoscientist, practicing, as a member of the Australian Institute of Mining and Metallurgy (#300947) and the Australian institute of Geoscientists (#7795). I graduated from the University of St. Andrews, Scotland, with a B. Sc. in Geoscience in 1995 and from the Cambourne School of Mines with a M.Sc. in Mining Geology in 1998.
- I have worked as a geoscientist in the minerals industry for over 20 years and I have been directly involved in the mining, exploration, and evaluation of mineral properties in Peru, Chile, Argentina, Brazil and Colombia for precious and base metals.
- I visited the Florida Canyon drill support camp at Shipasbamba from the 6th to the 8th of August 2019.
- I was retained by Solitario to visit the property to review the geological logging and data capture protocols with respect to the completion of a geological model and resource estimation.
- I am responsible for Chapters 11 and 12, and Section 2.2.1 of the "NI 43-101 Technical Report on the Florida Canyon Project”.
- I am independent of Solitario as independence is described by Section 1.5 of NI 43-101. I have not received, nor do I expect to receive, any interest, directly or indirectly from Solitario.
- I have read National Instrument 43-101 and Form 43-101F1 and, by reason of education and past relevant work experience, I fulfill the requirements to be a “Qualified Person” for the purposes of NI 43-101. This technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1.

Dated this 5th day of April 2021 (rev. May 27, 2021)

/s/ Simon James Atticus Mortimer (Signature)

____

Simon J.A. Mortimer, M.Sc. ACSM; Member AIG
Dated this 04/02/2021

CERTIFICATE OF AUTHOR

I, Deepak Malhotra, Ph.D., of Lakewood, Colorado, do hereby certify that:

1. I am currently employed as President of Pro Solv, LLC with an office at 15450 W. Asbury Avenue, Lakewood, Colorado 80228.
2. This certificate applies to the NI 43-101 Technical Report titled **"NI 43-101 Technical Report on Resources, Florida Canyon Zinc Project, Amazonas Department, Peru"** with effective date February 1, 2021, and dated April 5th, 2021 (rev. May 27, 2021) (the "Technical Report").
3. I am a graduate of Colorado School of Mines in Colorado, USA (Master of Metallurgical Engineering in 1973 and Ph.D. in Mineral Economics in 1978). I am a registered member in a good standing of the Association of Society of Mining and Metallurgical Engineers (SME) and a member of the Canadian Institute of Mining and Metallurgy (CIM). I have 48 years of experience in the area of metallurgy and mineral economics.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (Nl43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I have not visited the property due to pandemic travel restrictions.
6. I am responsible for Sections 13 of the Technical Report.
7. I am independent of the Issuer and related companies applying all of the tests in Section 1.5 of the NI 43-101.
8. I have not had prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101 F1.
10. As of the effective date of the Technical Report and the date of this certificate, to the best of 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.

Dated this 5th day of April 2021 (rev. May 27, 2021)

/s/ Deepak Malhotra (Signature)

Deepak Malhotra, Ph. D., SME-RM
Principal Metallurgist
Pro Solv, LLC

30 APPENDIX A: DRILL HOLE COLLARS

BHID	XCOLLAR	YCOLLAR	ZCOLLAR	DEPTH
BGFC-01	824110.3	9353472	2433.11	250.1
BGFC-02	824110.3	9353472	2433.11	189.7
BGFC-03	824109	9353471	2432.93	190.9
BGFC-04	824109	9353471	2432.93	213.1
BGFC-05	824306.8	9353337	2502.27	253.2
BGFC-06	824306.8	9353337	2502.27	220
BGFC-07	824436.6	9352986	2459.128	201.3
BGFC-08	823898.8	9352544	2299.51	207.3
BGFC-09	823959.4	9353301	2588.44	487.45
BGFC-10	823948	9353585	2521.34	457.4
BGFC-11	823947.5	9352916	2413.21	234.8
BGFC-12	824421.1	9353138	2472.183	158.6
BGFC-13	824482.3	9352793	2422.971	146.5
BGFC-14	824130.4	9353679	2461.91	244
BGFC-15	824422.4	9353138	2472.204	194.25
BGFC-16	824130.4	9353679	2461.91	187
BGFC-17	823898.8	9352544	2299.51	296.8
BGFC-18	824438.6	9352988	2458.92	204.2
BGFC-19	823898.8	9352544	2299.51	155.35
BGFC-20	824123.6	9352841	2368.83	147.1
BGFC-20A	824123.6	9352841	2368.83	93.9
BGFC-20B	824123.6	9352841	2368.83	174.3
BGFC-21	824721.4	9352972	2553.36	229.2
BGFC-22	824062.2	9353128	2467.13	237.4
BGFC-23A	823915	9352434	2209.45	343.55
BGFC-24	823931.9	9352647	2272.99	264.3
BGFC-25	823748.1	9352313	2238.38	274.9
BGFC-26	823949.8	9352806	2359.52	205.2
BGFC-27	823762.6	9352099	2114.94	230.8
BGFC-28	823949.8	9352806	2359.52	332.6
BGFC-29	823946.8	9352215	2218.196	368.5
BGFC-30	823705.8	9352452	2311.75	304.9
BGFC-31	823947.5	9352916	2413.21	361.9
BGFC-32	823705.8	9352452	2311.75	349.2
BGFC-33	824475.9	9353346	2401.37	87
BGFC-34	824318.6	9353818	2565.39	259.25
BGFC-35	824473.6	9353347	2401.293	109
BGFC-36	824915.9	9353523	2533.225	228.75

BHID	XCOLLAR	YCOLLAR	ZCOLLAR	DEPTH
BGFC-37	824516.8	9354141	2639.61	439.2
BGFC-38	823946.8	9352215	2218.196	225.7
BGFC-39	825178.1	9352219	2509.473	430.05
BGFC-40	825195.8	9352895	2609.16	329.4
BGFC-41	825287	9353844	2724.605	512.4
BGFC-42	827233.4	9352599	2711	316
BGFC-43	824785	9354291	2669.38	277.5
BGFC-44	825368.3	9353415	2733.05	439.2
BGFC-45	824785	9354291	2669.38	610
BGFC-46	826977.9	9352253	2599	488
BGFC-47	824516.8	9354141	2639.61	515.45
BGFC-48	824318.6	9353818	2565.39	326.35
BGFC-49	824709.1	9353805	2775.08	493
BGFC-50	825231	9353822	2713.835	504.75
BGFC-51	823937.5	9352731	2301.5	181.5
BGFC-52	824019.9	9352895	2389.29	233.9
BGFC-53	825228.1	9353822	2713.61	508.35
BGFC-54	824022.6	9352894	2389.16	208.95
BGFC-55	824062.2	9353128	2467.13	325.35
BGFC-56	825107.6	9353598	2608.545	369.05
BGFC-57	824062.4	9353327	2506.33	194.2
BGFC-58	825108.8	9353597	2608.553	335.5
BGFC-59	824145.6	9353374	2419.83	157.6
BGFC-60	825109.6	9353595	2608.607	341.6
BGFC-61	824576.6	9353236	2517.33	197.25
BGFC-62	825109.7	9353595	2608.593	350.75
BGFC-63	824401.4	9353498	2570.93	256.3
BGFC-64	824917	9353523	2533.282	278.25
BGFC-65	824619.7	9353967	2725.87	463.9
BGFC-66	825044.5	9353252	2729.091	375.15
BGFC-67	825521.9	9353021	2752.11	114.9
BGFC-68	825015.5	9352933	2628.01	341.6
BGFC-69	825521.9	9353021	2752.11	537
BGFC-70	824318.6	9354069	2659.23	451.4
BGFC-71	824806.8	9354239	2687.07	493.75
BGFC-72	824947.8	9353161	2738.632	387.3
BGFC-73	826101	9352414	2792	603.9
BGFC-74	825642.5	9352657	2772.61	500.3
BGFC-75	823886.7	9352329	2124.64	106.25
BGFC-76	824427.3	9352180	2366.55	378.2

BHID	XCOLLAR	YCOLLAR	ZCOLLAR	DEPTH
BGFC-77	824658.1	9353507	2465.706	208.3
BGFC-78	824285.5	9351867	2237.222	402.2
BGFC-79	824660.3	9353503	2465.616	150.55
BGFC-80	824318.6	9353818	2565.39	339
VMA1	824547.6	9353444	2429.054	160.15
VMA2	824550.5	9353439	2429.058	141.75
VMA3	824547.9	9353443	2429.057	106.25
VMA4	824549.8	9353446	2429.188	151.25
VMA5	824547.9	9353442	2428.999	137.25
VMA6	824552	9353443	2429.109	131.55
VMC1	824658.5	9353507	2465.66	179.2
VMC2	824658.4	9353503	2465.526	157.35
VMC3	824661.1	9353504	2465.467	154.55
VMC4	824656.7	9353506	2465.658	154.45
VMC5	824662.1	9353506	2465.646	150.1
VMC6	824658	9353503	2465.445	151.9
VMD1	824725.8	9353519	2480.759	87.5
VMD2	824726.7	9353517	2480.606	195.2
VMD3	824729.5	9353513	2480.645	194.1
VMD4	824730.3	9353518	2480.681	30
VMD4A	824730	9353518	2480.751	86.35
VMD5	824730.6	9353516	2480.778	179.2
VMD6	824726	9353516	2480.703	173.4
VMD7	824729.1	9353518	2480.675	101.8
VME1	824914.6	9353527	2533.173	282.35
VME2	824914.9	9353526	2533.104	238.4
VME3	824916.9	9353527	2533.286	272.15
VME4	824918.3	9353525	2533.166	240
VME5	824914.5	9353526	2533.097	255.2
VME6	824915.2	9353523	2533.242	242.1
V08	824620	9353967	2726	476.1
V08A	824620	9353967	2726	32.5
V08B	824620	9353967	2726	322.8
V09	824709	9353805	2775	512.95
V10	824709	9353805	2775	494.7
V10A	824709	9353805	2775	536.4
V13	824581.6	9353835	2688.352	413.3
V15	824582.2	9353834	2688.405	454.5
V18	824367.6	9353929	2588.43	324.4
V19	824367.6	9353929	2588.43	296.55

BHID	XCOLLAR	YCOLLAR	ZCOLLAR	DEPTH
V20	824367.6	9353929	2588.43	323.3
V21	824367.6	9353929	2588.43	377
V21A	824367.6	9353929	2588.43	341.35
V22	824528.6	9353706	2756.439	460.3
V23	824528.8	9353705	2756.451	491.2
V23A	824527.5	9353706	2756.4	494
V26	824315.8	9353816	2565.28	304
V28	824315.5	9353819	2565.28	298
V32	824321.8	9353594	2684.912	600
V33	824322	9353594	2684.914	380
V34	824321.6	9353591	2684.864	283.9
V35	824321.8	9353590	2684.883	442.95
V35A	824323.7	9353592	2684.864	416
V36	824486.6	9353221	2469.709	320.55
V37	824486.6	9353218	2469.744	191.2
V37A	824484.5	9353220	2469.553	452.1
V38	824597.4	9353048	2462.498	165.05
V39	824597.2	9353044	2462.226	162.55
V39A	824599.4	9353046	2462.498	167.4
V40	824225.5	9353379	2414.51	137.4
V41	824225.5	9353375	2414.444	149
V42	824437.3	9353073	2467.583	200.15
V43	824437	9353070	2467.337	167.7
V_44	824104.1	9352043	2218.567	308.4
V_45	824103.5	9352043	2218.577	293
V_46	824100.2	9352043	2218.641	750.5
V_47	824416.5	9351927	2328.957	430.1
V_48	824414.2	9351926	2328.954	453
V_49	824307.3	9352356	2469.198	339
V_50	824302.8	9352358	2469.207	168.1
V_51	824305.2	9352355	2469.171	377.6
V_52	824635.9	9352115	2405.196	434
V_53	824636.3	9352115	2405.242	583.4
V_54	824629.6	9352476	2580.375	398.6
V_55	824832.2	9352614	2625.939	46.2
V_56	824883.9	9352229	2492.771	497.5
V_57	824105.1	9352165	2269.818	293.6
V_58	824241	9352566	2392.067	257.4
V_59	824102.2	9352045	2218.616	83.45
V_63	824302.7	9352358	2469.212	162.4

BHID	XCOLLAR	YCOLLAR	ZCOLLAR	DEPTH
V_87	824597	9353047	2462.533	140.5
V_88	824597.9	9353045	2462.335	170
V_89	824597.7	9353048	2462.476	173
V_90	824595.8	9353048	2462.486	199.6
V_91	824595	9353046	2462.464	164.4
V_92	824594.3	9353044	2462.241	210
V_109	824823.1	9352987	2590.437	246.4
V_110	824824.9	9352987	2590.623	248
V_111	824825.7	9352985	2590.529	269.1
V_112	824823	9352986	2590.395	287.3
V_113	824825.1	9352984	2590.399	290.2
V_114	824823.7	9352985	2590.304	269.9
V_115	824832.1	9352616	2625.554	389.3
V_121	824844.4	9353241	2692.052	359.6
V_122	824846.5	9353240	2692.051	398.3
V_123	824844.2	9353242	2691.901	398.3
V_124	824845.4	9353241	2692.042	398.3
V_125	824844.2	9353241	2691.998	356.5
V_126	824846.2	9353240	2692.055	125.4
V_127	824845	9353239	2692.043	349.5
V_128	824843.2	9353240	2691.838	352
V_129	824846.7	9353240	2692.046	365.4
V_130	824850.7	9353102	2633.127	284.5
V_131	824848.6	9353103	2633.139	117.9
V_132	824848.2	9353101	2632.94	305.4
V_133	824849.6	9353102	2632.949	299.5
V_134	824849.1	9353103	2633.239	282.6
V_135	824848.2	9353103	2633.096	303.7
V_136	824851	9353101	2632.906	302.2
V_137	824848.7	9353104	2633.322	299.5
V_138	824850.3	9353104	2633.477	278
V_139	824882.2	9352229	2492.711	437.3
V_145	824950.1	9353159	2738.679	431.5
V_164	824106.2	9352163	2269.462	347.5
V_165	824108.2	9352165	2270.029	284.4
V_166	824241	9352563	2392.013	305.3
V_167	824826.1	9352985	2590.509	152.3
V_168	824241.9	9352563	2392.054	227.2
V_169	824304	9352355	2469.172	455.4
V_170	824243.1	9352564	2392.077	203.6

BHID	XCOLLAR	YCOLLAR	ZCOLLAR	DEPTH
V_171	824303.9	9352356	2469.138	465
V_172	824241.4	9352566	2392.099	209.6
V_173	824239.4	9352564	2392.004	265.1
V_174	824304	9352357	2469.222	415.2
V_175	824447.1	9352671	2379.978	130.8
V_176	824443.3	9352670	2379.91	122.8
V_177	824446.2	9352670	2379.949	169.1
V_178	824102.5	9352041	2218.596	380.2
V_179	824634.6	9353274	2568.23	271.3
V_180	824634.9	9353277	2568.257	296
V_181	824282.8	9351870	2237.225	425.4
V_182	824634.5	9353276	2568.171	230.6
V_183	824423.4	9352180	2365.946	107.9
V_184	824634.8	9353275	2568.239	260
V_185	824422.3	9352180	2365.977	436
V_186	824284.1	9351870	2237.193	395
V_187	824632.3	9353279	2568.249	291
V_188	824633.3	9353280	2568.269	285
V_189	824422.9	9352182	2365.979	365
V_190	824282.6	9351868	2237.166	561
V_191	824437	9352985	2458.758	205
V_192	824426.4	9352182	2366.05	379
V_193	824436.3	9352986	2458.815	210
V_194	824438.2	9352986	2458.886	190
V_195	824286.5	9351867	2237.1	116
V_196	824422.9	9352181	2365.96	65.5
V_197	824281.8	9351871	2237.341	183
V_198	824723.6	9352973	2553.712	246
V_199	824423	9352182	2365.977	374
V_200	824305.7	9352358	2469.171	340
V_201	824722.6	9352973	2553.68	239.2
V_202	825089.3	9353776	2669.645	445
V_203	824306.1	9352358	2469.169	358.8
V_204	824601.3	9352735	2447.233	156
V_205	824601.6	9352735	2447.221	193
V_206	824304.5	9352358	2469.198	325
V_207	824600.2	9352738	2447.158	185
V_208	824601.1	9352739	2447.196	180
V_209	825088.7	9353779	2669.645	469
V_210	824242.1	9352567	2391.97	219

BHID	XCOLLAR	YCOLLAR	ZCOLLAR	DEPTH
V_211	824626.7	9352475	2579.774	438
V_212	824444.5	9352668	2380.086	228
V_213	825090.8	9353776	2669.634	428
V_214	824444.1	9352673	2379.901	245
V_215	824626.6	9352477	2579.7	417
V_216	824443.1	9352671	2379.881	197
V_217	824446	9352669	2379.983	179
V_218	825088.6	9353776	2669.607	438
V_219	824599.7	9352739	2447.083	345
V_220	824049.4	9351876	2267.857	482
V_221	824604.1	9352739	2447.221	185
V_222	824599.6	9352737	2447.152	225
V_223	825107.1	9353596	2608.266	310.6
V_224	825106.8	9353596	2608.299	317.6
V_225	825107.6	9353598	2608.499	325
V_226	825107.4	9353598	2608.503	335.5
V_227	825108.9	9353599	2608.316	338.8
V_228	825109.8	9353598	2608.463	341.6
V_229	825108.1	9353595	2608.406	310
V_230	825109.8	9353597	2608.34	41.9
V_231	825110.2	9353597	2608.439	36
V_232	825089.5	9353776	2669.476	421.3
V_233	825088.4	9353776	2669.426	420.4
V_234	825088.7	9353777	2669.408	428.5
V_235	825090.7	9353775	2669.443	419.5
V_236	825091.7	9353777	2669.859	434.5
V_237	825091.1	9353778	2669.457	434.5
V_238	825089.2	9353779	2669.508	425.5
V_239	825088	9353776	2669.47	430
V_240	824207.3	9352165	2113.333	197.6
V_241	824207.4	9352165	2112.941	202.2
V_242	824207.6	9352165	2112.601	148.2
V_243	824207.9	9352166	2112.504	134.1
V_244	824212.4	9352168	2112.328	122.2
V_245	824212.8	9352168	2112.444	109.6
V_246	824213.2	9352168	2112.64	113.4
V_247	825088.4	9353777	2669.444	431
V_248	823844.3	9351986	2106.446	362.5
V_249	823846.9	9351987	2106.527	298
V_250	825106.9	9353597	2608.345	308.6

BHID	XCOLLAR	YCOLLAR	ZCOLLAR	DEPTH
V_251	824215	9352194	2112.572	205.8
V_252	824215.9	9352195	2111.973	133.4
V_253	824215.1	9352194	2112.235	200.5
V_254	824215.5	9352194	2111.975	167.5
V_255	824219.9	9352197	2111.892	81.6
V_256	824220.4	9352197	2112.229	95.45
V_257	824220.4	9352198	2112.773	105
V_258	824220.4	9352197	2113.324	157.8
V_259	823857.9	9352139	2117.582	227.3
V_260	823857.1	9352139	2117.765	212.5
V_261	824205.6	9352127	2113.235	195.3
V_262	824205.6	9352127	2113.055	218.2
V_263	824205.9	9352127	2112.89	190.4
V_264	824206.3	9352128	2112.907	169.3
V_268	824915.3	9353526	2533.106	242.5
V_269	825107.1	9353597	2608.343	315
V_265	824210	9352129	2112.889	140
V_266	824210.4	9352129	2112.892	134.8
V_267	824210.9	9352129	2113.1	145.1
V_270	824168.7	9352197	2111.506	163.1
V_271	824168.7	9352197	2111.865	104.8
V_272	824168.7	9352197	2111.13	187
V_273	824168.9	9352197	2110.835	176
V_274	824169.3	9352197	2110.853	105.95
V_275	824173.3	9352201	2110.823	95
V_276	824173.5	9352201	2111.059	93.75
V_277	824173.5	9352201	2111.74	118.7
V_278	824173.5	9352201	2112.236	186.4
V_279	825106.8	9353598	2608.335	334
V_280	824915.9	9353526	2533.13	239.5
V_281	825107.2	9353597	2608.369	323
V_282	824206.4	9352086	2113.093	207.2
V_283	824206.7	9352086	2113.109	200.8
V_284	824210.5	9352089	2112.958	166.4
V_285	824211.1	9352089	2113.3	196
V_286	825109.7	9353597	2608.516	45.8
V_287	825109.5	9353598	2608.454	313
V_288	825109.7	9353599	2608.439	320.6
V_289	824915.6	9353526	2533.12	226.6
V_290	824911.7	9353525	2533.11	223

BHID	XCOLLAR	YCOLLAR	ZCOLLAR	DEPTH
V_291	825107.1	9353596	2608.38	314.5
V_292	824208.2	9352050	2113.784	247.35
V_293	824208.5	9352050	2113.672	273.6
V_294	824209	9352050	2113.606	227.15
V_295	824208.9	9352049	2113.509	230
V_296	824209.1	9352049	2113.467	394
V_297	824209.9	9352049	2113.472	279.2
V_298	824212	9352051	2113.604	242.4
V_299	824212.4	9352051	2113.577	240
V_300	824213	9352053	2113.795	265.9
V_301	824212.4	9352052	2113.488	205.3
V_302	824212.6	9352052	2113.508	209.5
V_303	824213	9352053	2113.739	234.3
V_304	824911.4	9353525	2533.125	230.2
V_305	824087.3	9352187	2110.091	135
V_306	824087.2	9352187	2109.619	174.3
V_307	824087.5	9352187	2109.154	191.8
V_308	824087.8	9352187	2109.064	116.8
V_309	824087.7	9352189	2109.837	115.4
V_310	824091.4	9352190	2109.156	107
V_311	824091.9	9352191	2109.411	111.7
V_312	824091.9	9352191	2110.274	161
V_313	824091.7	9352190	2110.64	225.1
V_314	824087.3	9352187	2109.243	257
V_315	824091.5	9352190	2111.576	146.6
V_316	824091.9	9352190	2111.131	100.3
V_317	824913.5	9353524	2533.132	221.5
V_318	825108.2	9353596	2608.328	290.5
V_319	824914.7	9353527	2533.131	239.6
V_320	824914.8	9353527	2533.139	257.5
V_321	825108.4	9353599	2608.424	317.5
V_322	824911.7	9353526	2533.143	217
V_323	825108.3	9353599	2608.446	320.5
V_324	824911.8	9353525	2533.133	217
V_325	824913.8	9353524	2533.142	230.6
V_326	824728.6	9353518	2480.53	146
V_327	824913.7	9353524	2533.125	220
V_328	824728.9	9353518	2480.523	117.7
V_329	824913.7	9353524	2533.142	226.1
V_330	824728	9353518	2480.597	128.5

BHID	XCOLLAR	YCOLLAR	ZCOLLAR	DEPTH
V_331	824727.4	9353517	2480.54	122.6
V_332	824913.8	9353527	2533.184	221.5
V_333	824728	9353517	2480.595	146.1
V_334	824728.2	9353517	2480.598	158
V_335	824913.8	9353528	2533.189	223.3
V_336	824727.5	9353516	2480.573	125.5
V_337	824913.8	9353527	2533.188	239.5
V_338	824727.6	9353516	2480.565	131.5
V_339	824915.3	9353524	2533.155	211.5
V_340	824915.5	9353524	2533.15	212.5
V_341	824021	9352176	2108.104	128.1
V_342	824021.8	9352176	2107.852	123.3
V_343	824022.1	9352176	2108.059	130
V_344	824022.2	9352176	2108.6	152
V_345	824022.2	9352176	2108.988	49.8
V_346	824022.2	9352176	2109.231	215.5
V_347	824018.1	9352174	2108.134	271.05
V_348	824915.7	9353524	2533.157	97.3
V_349	824912.7	9353527	2533.218	215.5
V_350	824912.4	9353528	2533.229	227.5
V_351	824912.6	9353527	2533.22	248.1
V_352	824911.8	9353526	2533.126	209.5
V_353	824020.8	9352175	2108.07	148
V_354	824209.9	9352049	2113.49	314.3
V_355	824211.1	9352049	2113.584	289
V_356	824209.4	9352049	2113.458	262.8
V_357	824912	9353526	2533.129	153.2
V_358	824911.5	9353526	2533.144	171
V_359	824916	9353525	2533.17	218.5
V_360	824915.5	9353525	2533.142	230.5
V_361	824915.4	9353527	2533.123	230
V_362	824050.8	9351878	2267.92	508.1
V_363	824915.6	9353527	2533.144	242.5
V_364	824915.8	9353527	2533.165	268
V_365	824050.6	9351879	2268.429	576.4
V_366	824902.8	9353388	2652.128	368.5
V_367	824899.8	9353389	2652.076	367.5
V_368	825112.7	9353484	2680.215	367.9
V_369	824048	9351878	2267	569.5
V_370	825110.5	9353483	2680.188	421.2

BHID	XCOLLAR	YCOLLAR	ZCOLLAR	DEPTH
V_371	824284.8	9351868	2237.013	110
V_372	824284.8	9351868	2237.013	115
V_373	824714.3	9353419	2568.488	245
V_374	824284.8	9351868	2237.013	110.1
V_375	824417	9351927	2329	190
V_376	824417	9351927	2329	190
V_377	824726	9353520	2480.745	116
V_378	824726	9353520	2480.776	146.5
V_379	824726.5	9353520	2480.739	194
V_380	824726.5	9353520	2481.061	152
V_381	824726.9	9353519	2480.721	131.2
V_382	824727.4	9353519	2480.636	150
V_383	824726.5	9353519	2480.685	141.7
V_384	824726.8	9353519	2480.788	118.1
V_385	824727.4	9353519	2480.599	127.8
V_386	824727.1	9353518	2480.627	116
V_387	824728.1	9353517	2480.583	166.7
V_388	824727.5	9353517	2480.608	143.1
V_389	824727.3	9353516	2480.628	136.9
V_390	824726.1	9353515	2480.612	106.8
V_391	824726	9353515	2480.62	112.4
V_392	824725.6	9353515	2480.612	132
V_393	824725.4	9353514	2480.586	148
V_394	824725	9353516	2480.637	145
V_395	824724.8	9353515	2480.863	136
V_396	824723.6	9353517	2480.625	119
V_397	824723.9	9353517	2480.621	116
V_398	824724.2	9353519	2480.556	134.6
V_399	824724.5	9353519	2480.603	122.5
V_400	824725.3	9353519	2480.625	135
V_401	824725.3	9353520	2480.763	188.2
V_402	824725.4	9353520	2480.732	152.2
V_403	824128.5	9352195	2110.66	100.6
V_404	824128.5	9352195	2110.417	77.5
V_405	824129.2	9352195	2110.073	62.7
V_406	824134.3	9352198	2110.091	70.1
V_407	824134.6	9352198	2110.634	111.65
V_408	824134.7	9352198	2111.239	120.5
V_409	824134.7	9352198	2111.542	7.7
V_410	824134.6	9352198	2111.936	167.35

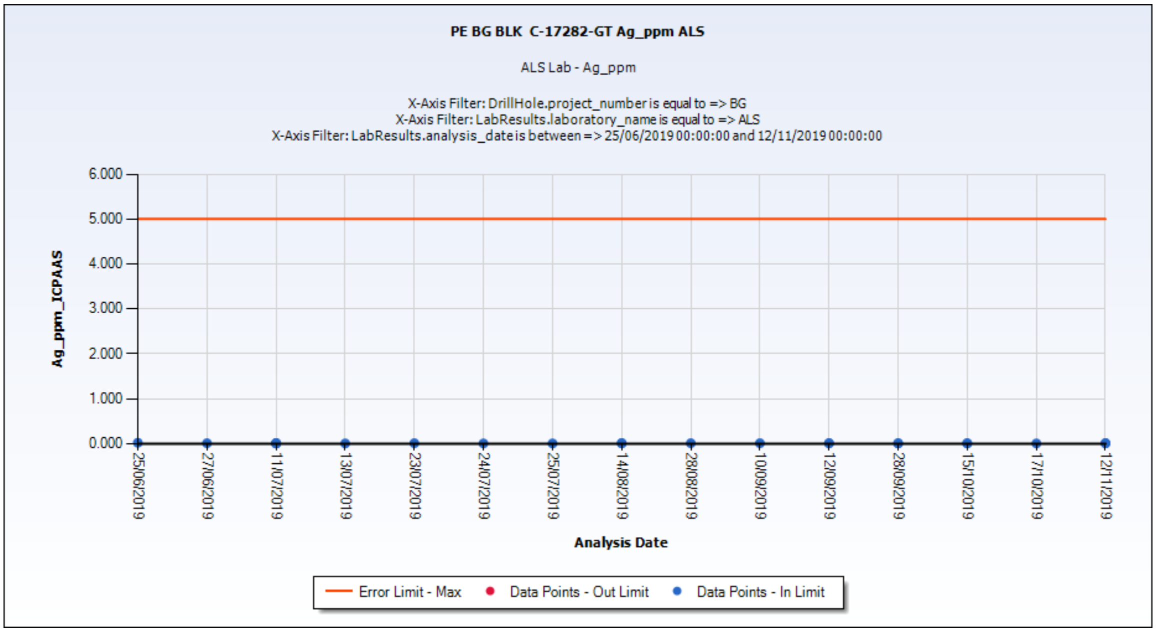
BHID	XCOLLAR	YCOLLAR	ZCOLLAR	DEPTH
V_411	824134.2	9352198	2110.02	72
V_412	824659.1	9353507	2465.702	157
V_413	824660.4	9353507	2465.633	151
V_414	824660	9353506	2465.648	101.3
V_415	824661	9353505	2465.441	107.3
V_416	824662.2	9353504	2465.561	116
V_417	824661.1	9353503	2465.502	116
V_418	824659.5	9353502	2465.472	135
V_419	824658.4	9353502	2465.483	136.5
V_420	824659	9353504	2465.58	119.5
V_421	824657.3	9353503	2465.538	150.6
V_422	824658.1	9353504	2465.59	116.4
V_423	824657.4	9353504	2465.619	125.1
V_424	824656.9	9353504	2465.549	156.3
V_425	824657.5	9353505	2465.575	108.9
V_426	824657.4	9353505	2465.612	140.2
V_427	824656.7	9353505	2465.672	163.8
V_428	824657.8	9353507	2465.694	116.4
V_429	824657.5	9353507	2465.693	98.4
V_430	824658.5	9353507	2465.748	110.3
V_431	824219.8	9352197	2111.621	93
V_432	824220.4	9352197	2113.788	109.1
V_433	824210.6	9352089	2112.95	168
V_434	824211.4	9352089	2114.204	145.5
V_435	824213.4	9352169	2113.393	107.1
V_436	824211	9352130	2113.873	136.5
V_437	824210.5	9352130	2112.817	132.7
V_438	824210	9352128	2112.822	151.3
V_439	824208.6	9352166	2112.332	120.1
V_440	824548.9	9353446	2429.17	83.4
V_441	824549.7	9353445	2429.127	95.4
V_442	824550	9353446	2429.162	86.1
V_443	824551.1	9353445	2429.107	88.7
V_444	824550.8	9353442	2429.106	101
V_445	824550.3	9353443	2429.13	95.2
V_446	824549.5	9353440	2428.945	106.5
V_447	824548.8	9353441	2429.029	92.3
V_448	824548.3	9353442	2429.042	86.3
V_449	824546.4	9353442	2428.982	101
V_450	824546	9353441	2429.026	115.5

BHID	XCOLLAR	YCOLLAR	ZCOLLAR	DEPTH
V_451	824545.6	9353443	2429.073	124.5
V_452	824546.8	9353444	2429.064	86.3
V_453	824546.4	9353444	2429.072	107
V_454	824545.9	9353444	2429.094	118.5
V_455	824547.6	9353445	2429.157	101.5
V_456	824213.4	9352169	2113.862	94.2
V_457	824211	9352129	2114.622	159.5
V_458	824173.5	9352201	2112.541	180.2
V_459	824210.5	9352071	2113.267	177
V_460	824547.6	9353444	2429.127	101.6
V_461	824725.4	9353519	2481.258	149.1
V_462	824658.5	9353506	2465.71	135
V_463	824913.8	9353525	2533.102	158.5
V_464	824546.6	9353148	2499.087	161.6
V_465	824210.8	9352071	2113.224	168.1
V_466	824211.1	9352071	2113.483	133
V_467	824597.5	9353044	2463.286	150
V_468	825317	9352640	2766.444	40
V_469	825009	9352684	2661	40
V_470	825269	9352108	2564	42.1
V_471	824963	9352030	2480.821	122.6
V_472	824649	9351768	2390	160
V_473	824885	9352230	2493	110.5
V_474	824209.8	9352071	2113.362	100.3
V_475	824218.1	9352195	2111.99	100.05
V_476	824130.5	9352197	2110.121	100.2
V_477	823852.1	9352019	2106.604	146.8
V_478	824211.4	9352071	2113.886	102.4
PEBGD000002	824617.4	9353969	2725.68	471.4
PEBGD000003	824523.6	9353708	2756.337	475.4
PEBGD000004	825307.7	9353737	2736.647	560
PEBGD000005	824621	9353967	2725.732	178.8
PEBGD000006	824524.5	9353709	2756.444	475.4
PEBGD000008	824337.6	9353635	2685.748	570.2
PEBGD000012	823896.6	9352542	2299.677	384.3
PEBGD000015	823922.3	9351648	2175.996	493.2
PEBGD000018	823898.8	9352544	2299.763	204.2
PEBGD000019	824337.5	9353638	2685.795	454.3
PEBGD000021	824617.5	9353967	2725.668	506
PEBGD000023	823922.8	9351648	2176.027	580.4

BHID	XCOLLAR	YCOLLAR	ZCOLLAR	DEPTH
PEBGD000027	824423.1	9352181	2366.159	341.4
PEBGD000031	824580.1	9353841	2688.52	420
PEBGD000032	824423.9	9352180	2366.17	377.7
PEBGD000035	824427.5	9352182	2366.298	339
PEBGD000036	824580.8	9353843	2688.627	440.9
PEBGD000038	823921.5	9351649	2176.029	471.2
PEBGD000039	824425	9352180	2366.17	488.5
PEBGD000001	825307	9353734	2736.695	517.3
PEBGD000007	824581.7	9353840	2688.603	402.1
PEBGD000009	824582.6	9353842	2688.575	393.7
PEBGD000010	824523.2	9353710	2756.439	497.5
PEBGD000011	824337.4	9353637	2685.757	461.4
PEBGD000013	824523.4	9353711	2756.456	470.2
PEBGD000014	824339.1	9353635	2685.738	423
PEBGD000016	824524.4	9353707	2756.42	464.4
PEBGD000017	823898.8	9352542	2299.698	230
PEBGD000020	823922.3	9351648	2175.992	555.2
PEBGD000022	824423.2	9352180	2366.143	463.8
PEBGD000024	824339.8	9353636	2685.775	383
PEBGD000025	824340.1	9353636	2685.8	383.9
PEBGD000026	823921.2	9351649	2176.002	465.4
PEBGD000028	824580.2	9353841	2688.529	426.3
PEBGD000029	824423.5	9352181	2366.206	316.5
PEBGD000030	823921.3	9351649	2176.099	488.2
PEBGD000033	824580.4	9353842	2688.618	440.7
PEBGD000034	823920.9	9351649	2176	550.3
PEBGD000037	824581.2	9353843	2688.586	470.9

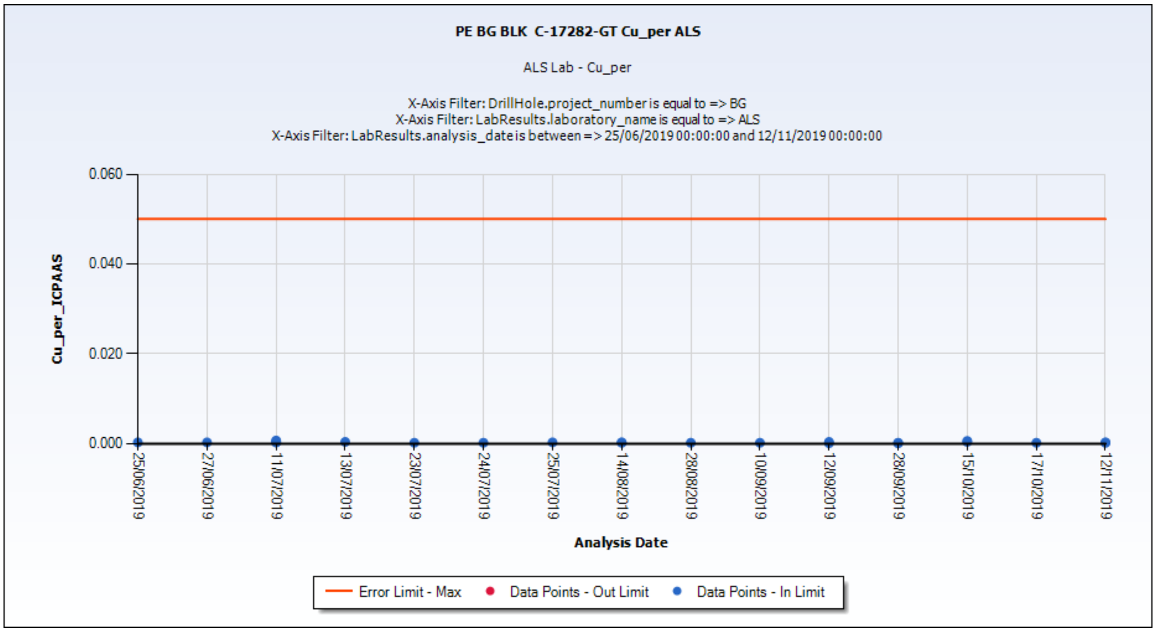
31 APPENDIX B: QA/QC 2019 LABORATORY RESULTS

31.1 COARSE BLANK RESULTS – ALS LABORATORY



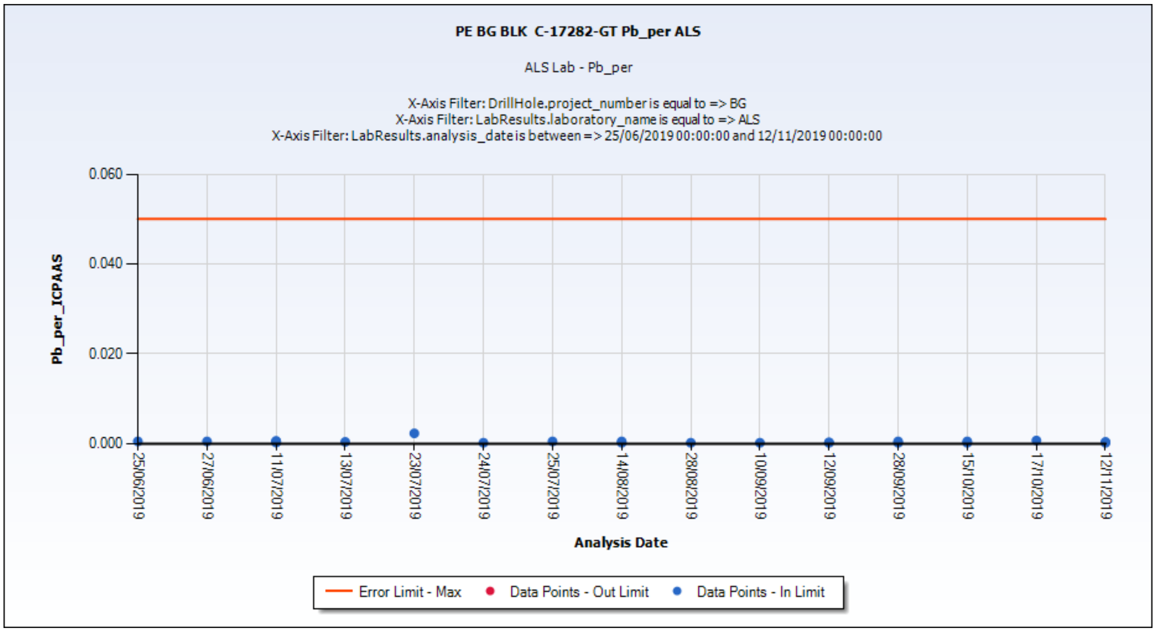
Summary

Standard Code	**C-17282-GT**
Element	**Ag**
Unit of Measure	**ppm**
Analytical Technique	**ICPAAS**
Project	**BG**
Lab	**ALS**
Analysis Date From	**25/06/2019**
Analysis Date To	**12/11/2019**
Count of Samples	**23**
Number Of Failures	**0**
Failure %	**0.00%**



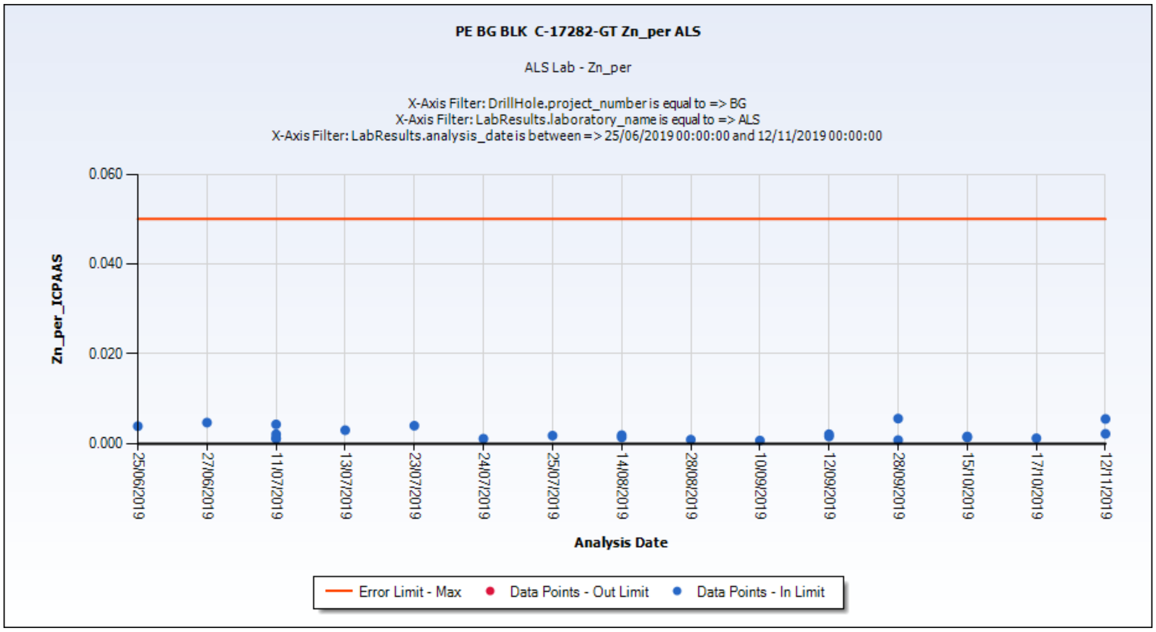
Summary

Standard Code	**C-17282-GT**
Element	**Cu**
Unit of Measure	**per**
Analytical Technique	**ICPAAS**
Project	**BG**
Lab	**ALS**
Analysis Date From	**25/06/2019**
Analysis Date To	**12/11/2019**
Count of Samples	**23**
Number Of Failures	**0**
Failure %	**0.00%**



Summary

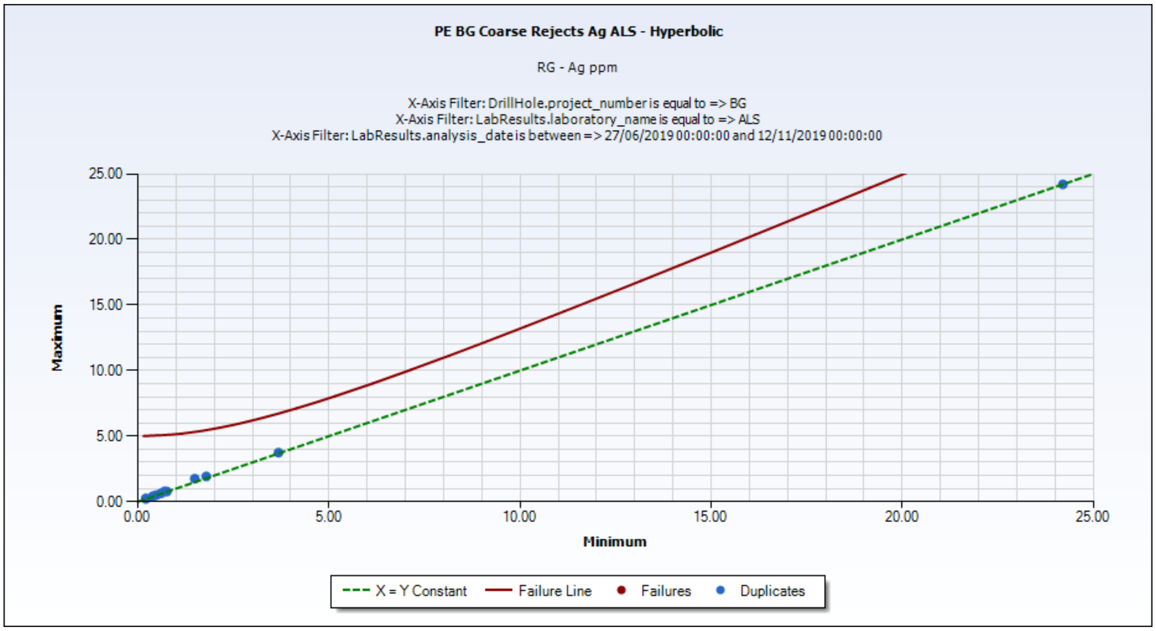
Standard Code	**C-17282-GT**
Element	**Pb**
Unit of Measure	**per**
Analytical Technique	**ICPAAS**
Project	**BG**
Lab	**ALS**
Analysis Date From	**25/06/2019**
Analysis Date To	**12/11/2019**
Count of Samples	**23**
Number Of Failures	**0**
Failure %	**0.00%**



Summary

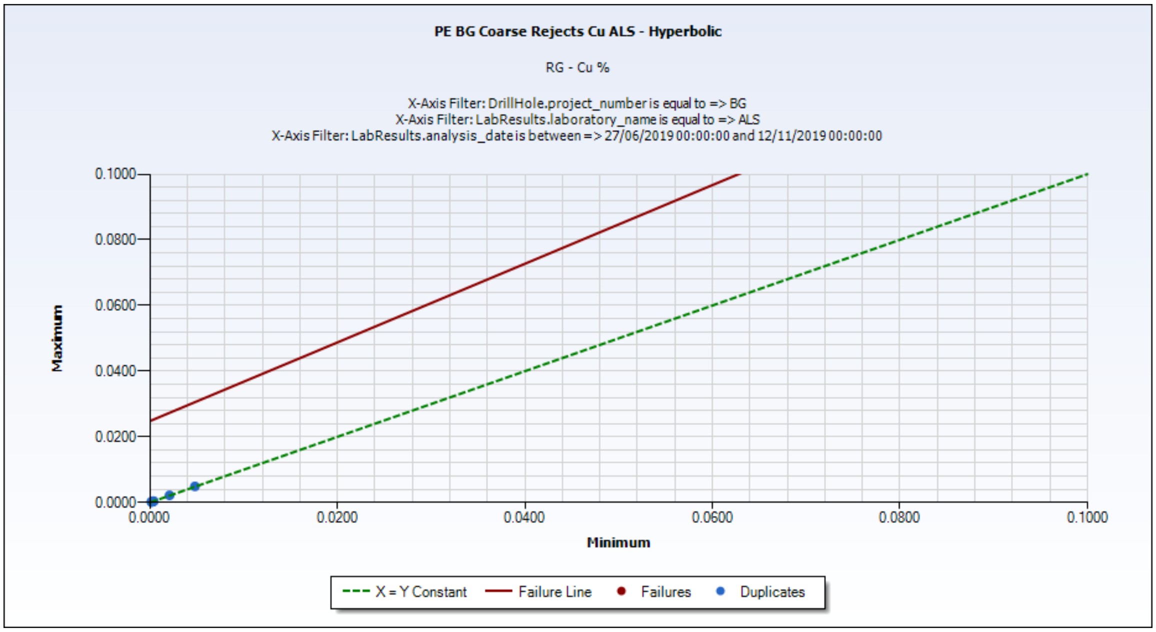
Standard Code	**C-17282-GT**
Element	**Zn**
Unit of Measure	**per**
Analytical Technique	**ICPAAS**
Project	**BG**
Lab	**ALS**
Analysis Date From	**25/06/2019**
Analysis Date To	**12/11/2019**
Count of Samples	**23**
Number Of Failures	**0**
Failure %	**0.00%**

31.2 DUPLICATE RESULTS – ALS LABORATORY



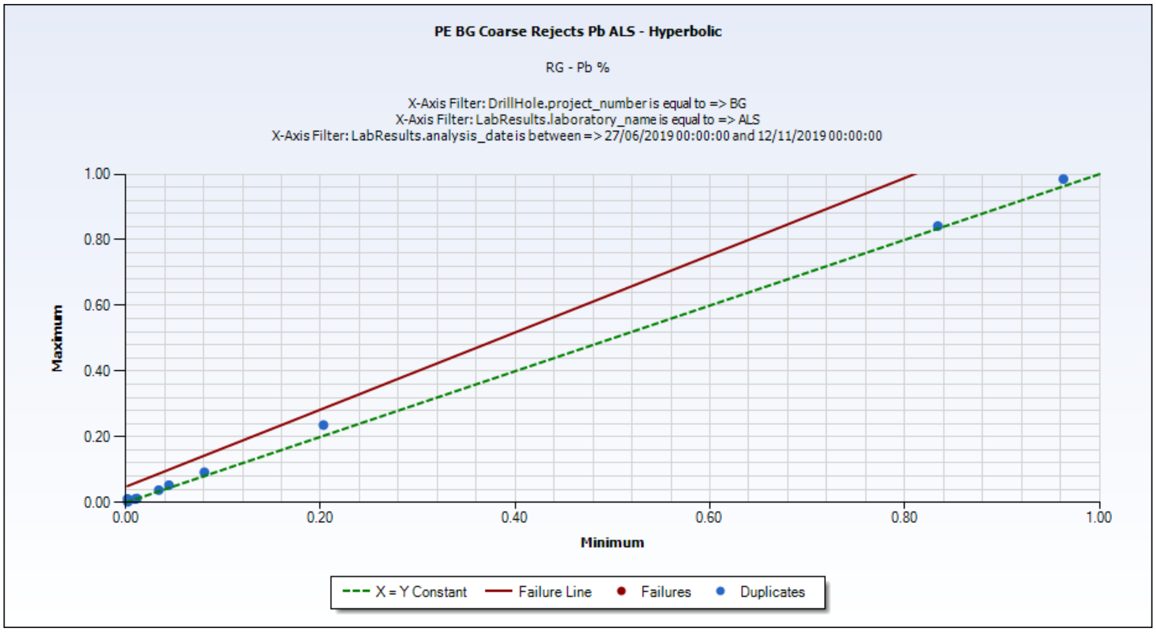
Summary

Original Sample Type	**OR**
Duplicate Sample Type	**RG**
Element	**Ag**
Unit of Measure	**ppm**
Analytical Technique	**Lab**
Original Mean Value	**3.18**
Duplicate Mean Value	**3.16**
Count of Samples	**11**
Number Of Failures	**0**
Failure %	**0.00**



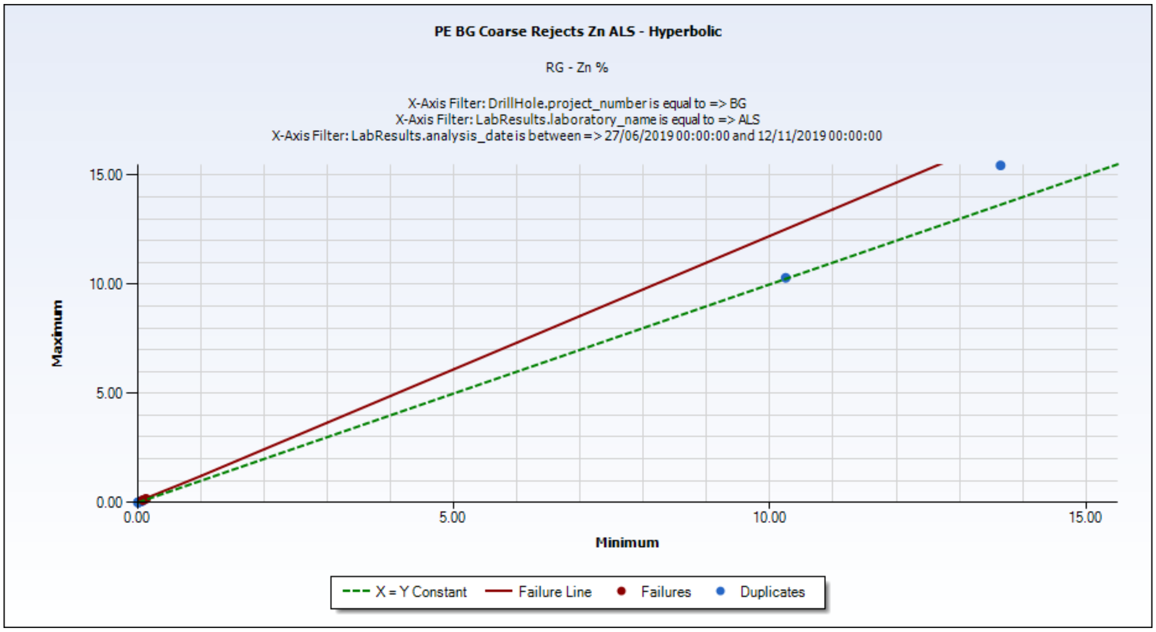
Summary

Original Sample Type	**OR**
Duplicate Sample Type	**RG**
Element	**Cu**
Unit of Measure	**per**
Analytical Technique	**Lab**
Original Mean Value	**0.0009**
Duplicate Mean Value	**0.0009**
Count of Samples	**11**
Number Of Failures	**0**
Failure %	**0.00**



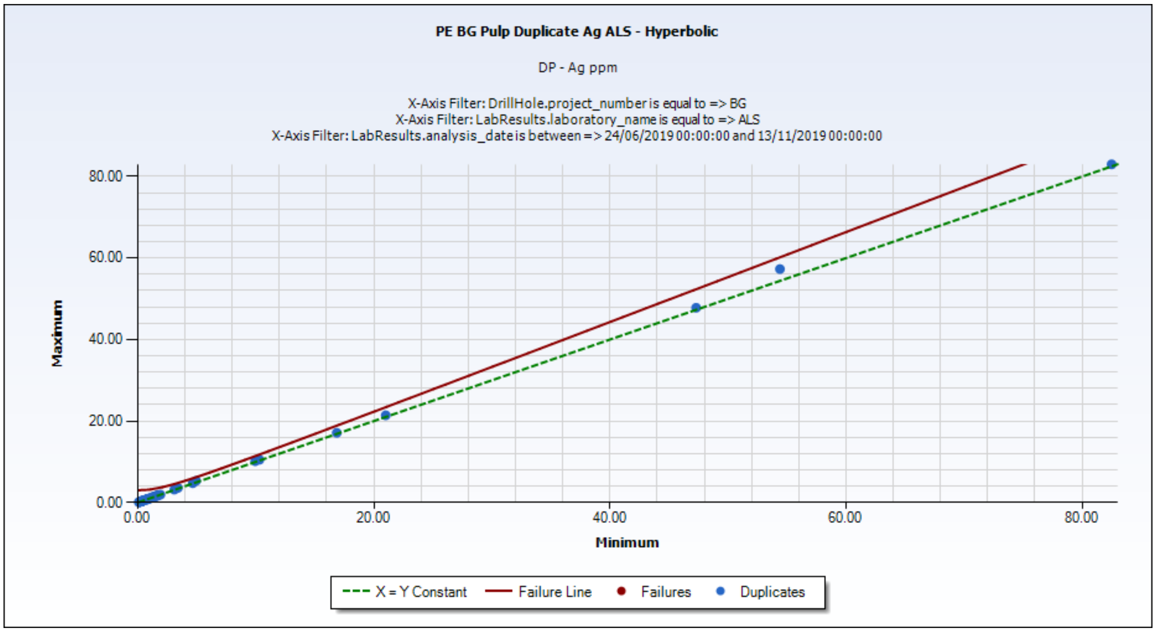
Summary

Original Sample Type	**OR**
Duplicate Sample Type	**RG**
Element	**Pb**
Unit of Measure	**per**
Analytical Technique	**Lab**
Original Mean Value	**0.21**
Duplicate Mean Value	**0.20**
Count of Samples	**11**
Number Of Failures	**0**
Failure %	**0.00**



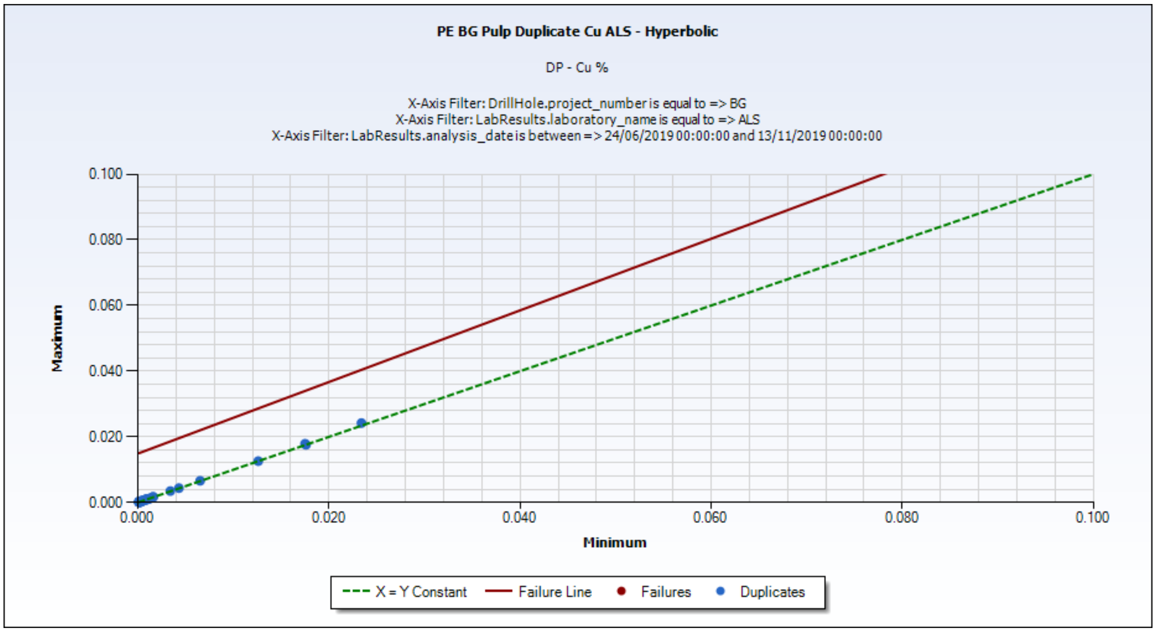
Summary

Original Sample Type	**OR**
Duplicate Sample Type	**RG**
Element	**Zn**
Unit of Measure	**per**
Analytical Technique	**Lab**
Original Mean Value	**2.22**
Duplicate Mean Value	**2.38**
Count of Samples	**11**
Number Of Failures	**2**
Failure %	**18.18**



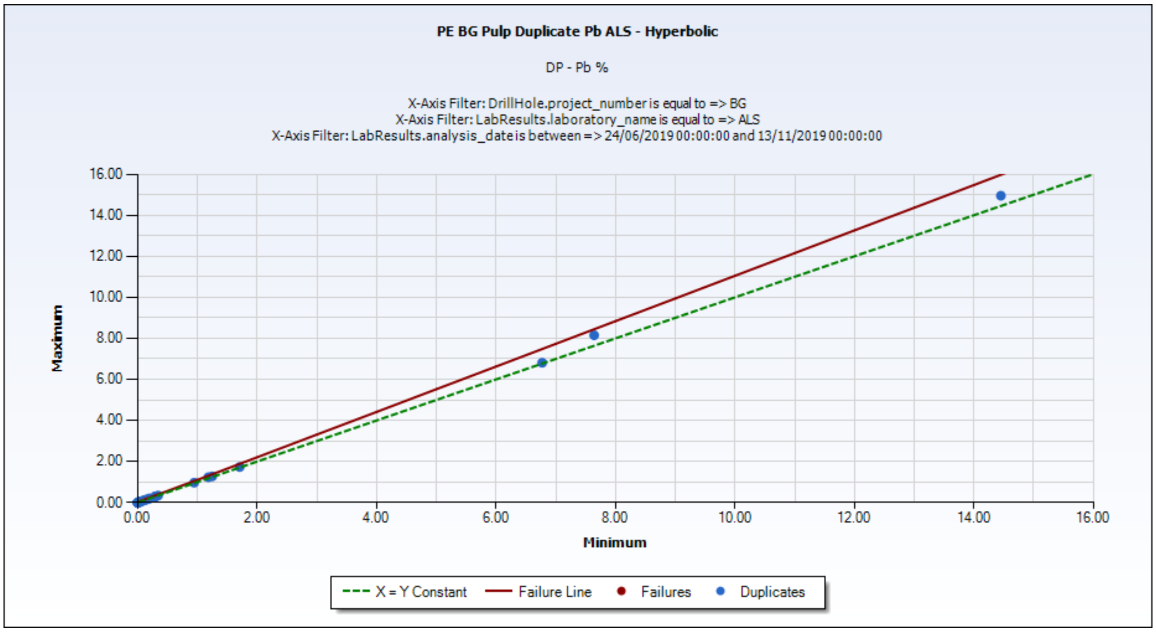
Summary

Original Sample Type	**OR**
Duplicate Sample Type	**DP**
Element	**Ag**
Unit of Measure	**ppm**
Analytical Technique	**Lab**
Original Mean Value	**5.04**
Duplicate Mean Value	**4.99**
Count of Samples	**58**
Number Of Failures	**0**
Failure %	**0.00**



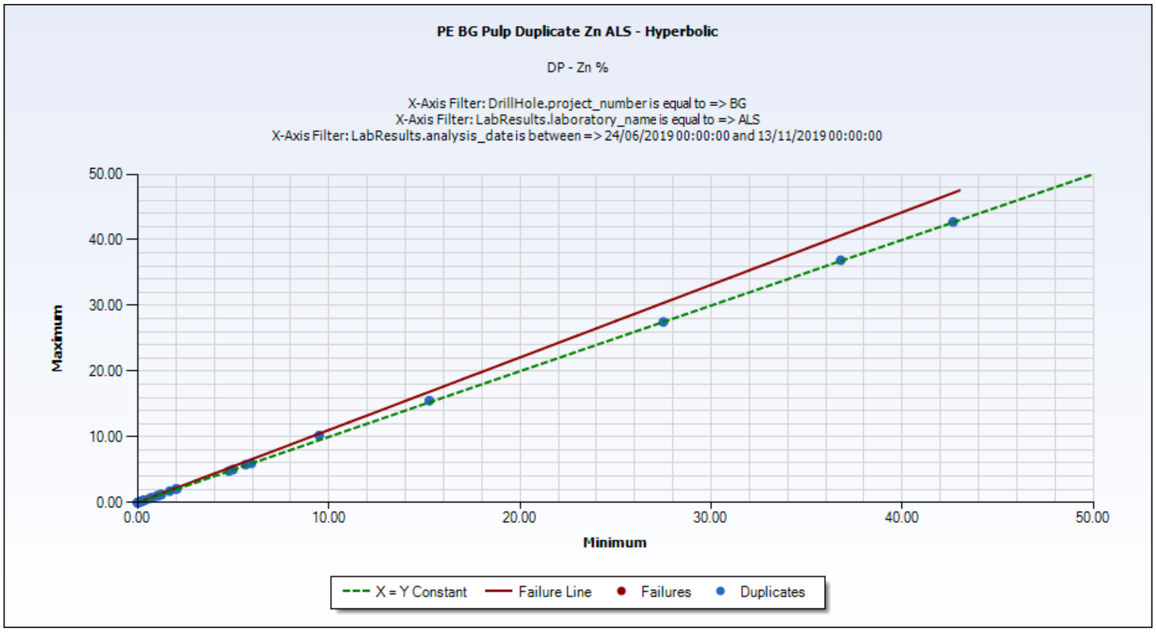
Summary

Original Sample Type	**OR**
Duplicate Sample Type	**DP**
Element	**Cu**
Unit of Measure	**per**
Analytical Technique	**Lab**
Original Mean Value	**0.002**
Duplicate Mean Value	**0.002**
Count of Samples	**58**
Number Of Failures	**0**
Failure %	**0.00**



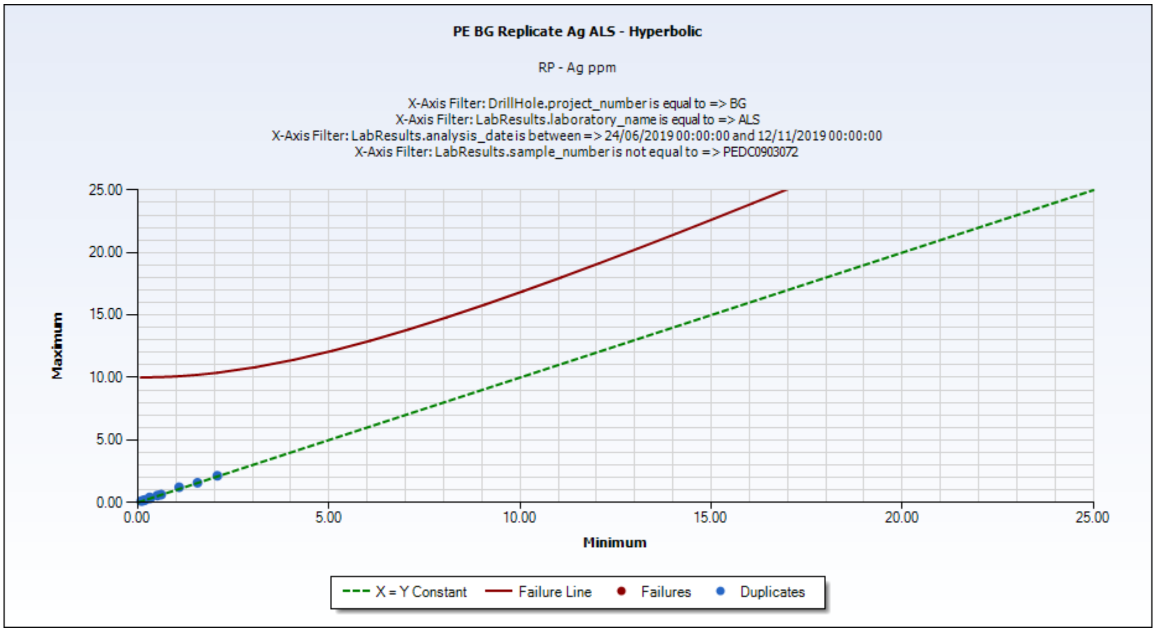
Summary

Original Sample Type	**OR**
Duplicate Sample Type	**DP**
Element	**Pb**
Unit of Measure	**per**
Analytical Technique	**Lab**
Original Mean Value	**0.65**
Duplicate Mean Value	**0.63**
Count of Samples	**58**
Number Of Failures	**0**
Failure %	**0.00**



Summary

Original Sample Type	**OR**
Duplicate Sample Type	**DP**
Element	**Zn**
Unit of Measure	**per**
Analytical Technique	**Lab**
Original Mean Value	**2.90**
Duplicate Mean Value	**2.89**
Count of Samples	**58**
Number Of Failures	**0**
Failure %	**0.00**



Summary

Original Sample Type	**OR**
Duplicate Sample Type	**RP**
Element	**Ag**
Unit of Measure	**ppm**
Analytical Technique	**Lab**
Original Mean Value	**0.71**
Duplicate Mean Value	**0.72**
Count of Samples	**10**
Number Of Failures	**0**
Failure %	**0.00**

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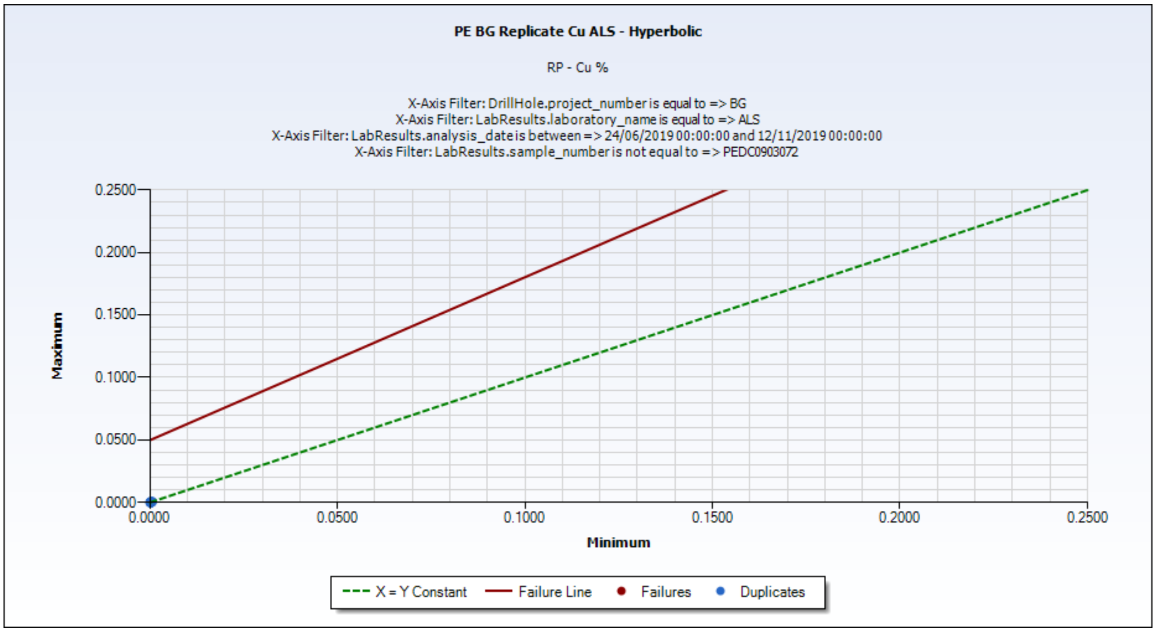
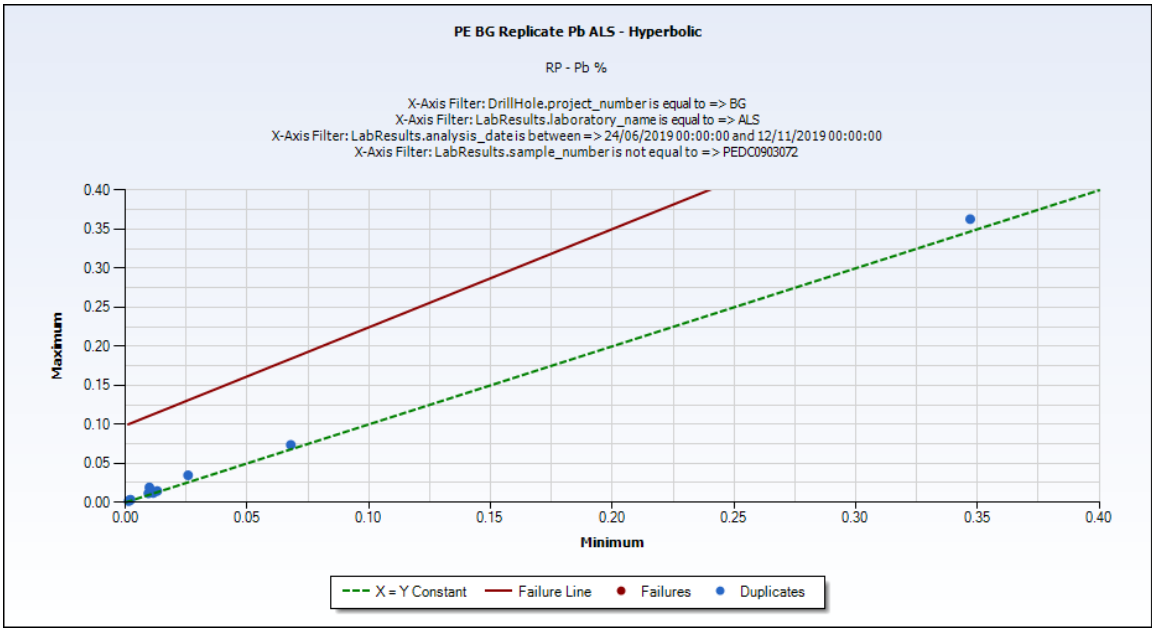


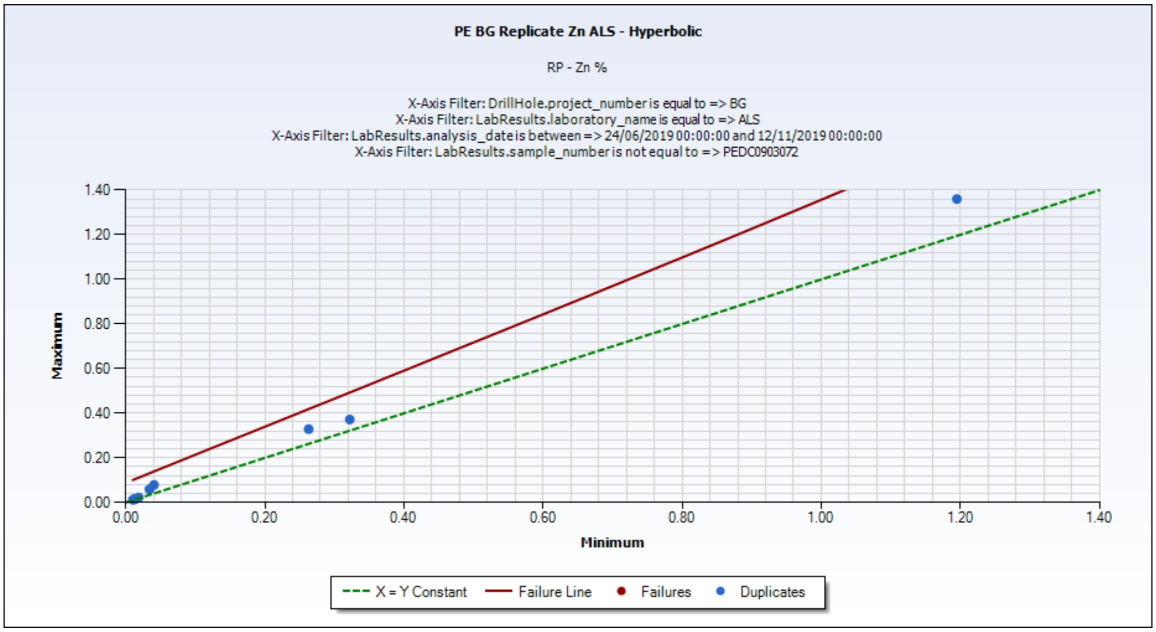
Summary

Original Sample Type	**OR**
Duplicate Sample Type	**RP**
Element	**Cu**
Unit of Measure	**per**
Analytical Technique	**Lab**
Original Mean Value	**0.0003**
Duplicate Mean Value	**0.0003**
Count of Samples	**10**
Number Of Failures	**0**
Failure %	**0.00**



Summary

Original Sample Type	**OR**
Duplicate Sample Type	**RP**
Element	**Pb**
Unit of Measure	**per**
Analytical Technique	**Lab**
Original Mean Value	**0.05**
Duplicate Mean Value	**0.05**
Count of Samples	**10**
Number Of Failures	**0**
Failure %	**0.00**



Summary

Original Sample Type	**OR**
Duplicate Sample Type	**RP**
Element	**Zn**
Unit of Measure	**per**
Analytical Technique	**Lab**
Original Mean Value	**0.19**
Duplicate Mean Value	**0.23**
Count of Samples	**10**
Number Of Failures	**0**
Failure %	**0.00**

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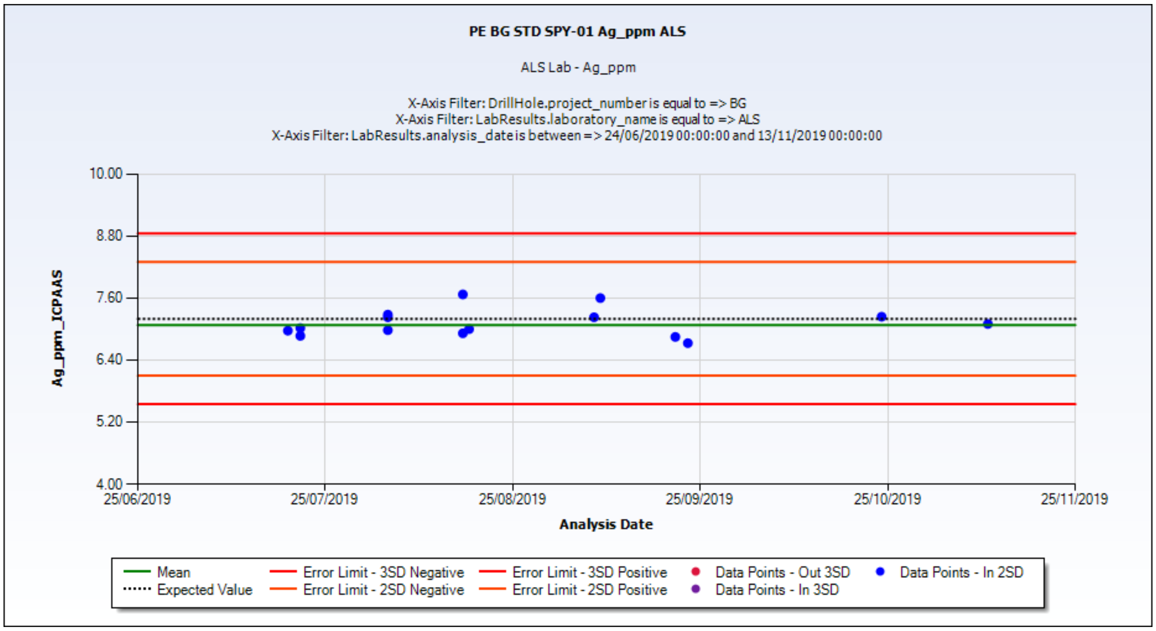
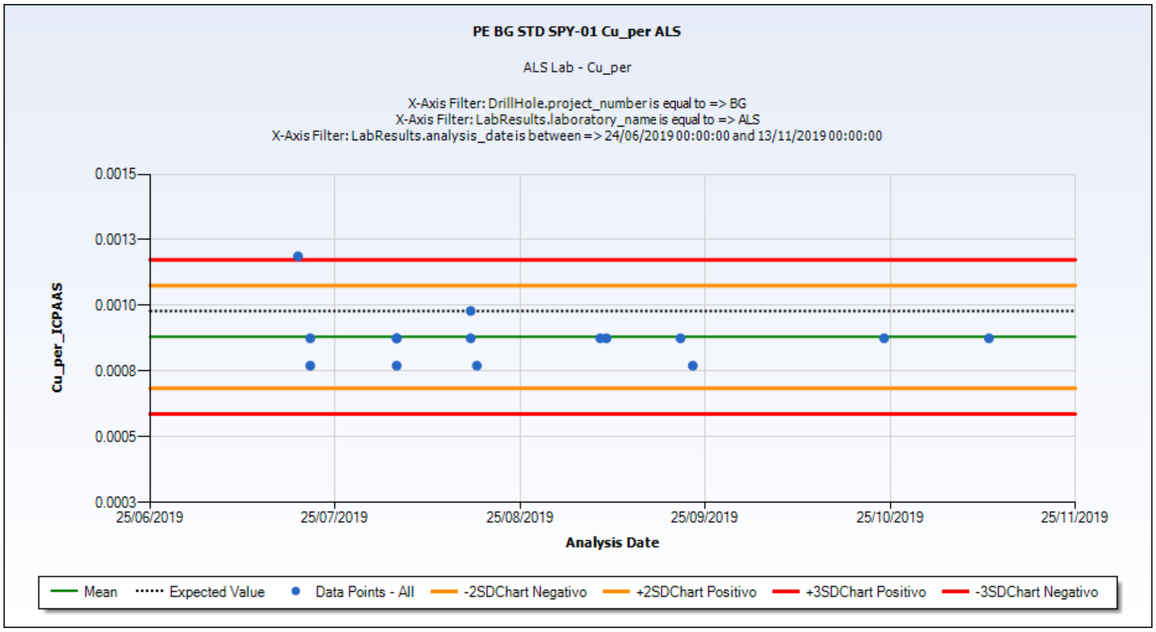
31.3 STANDARDS RESULTS – ALS LABORATORY



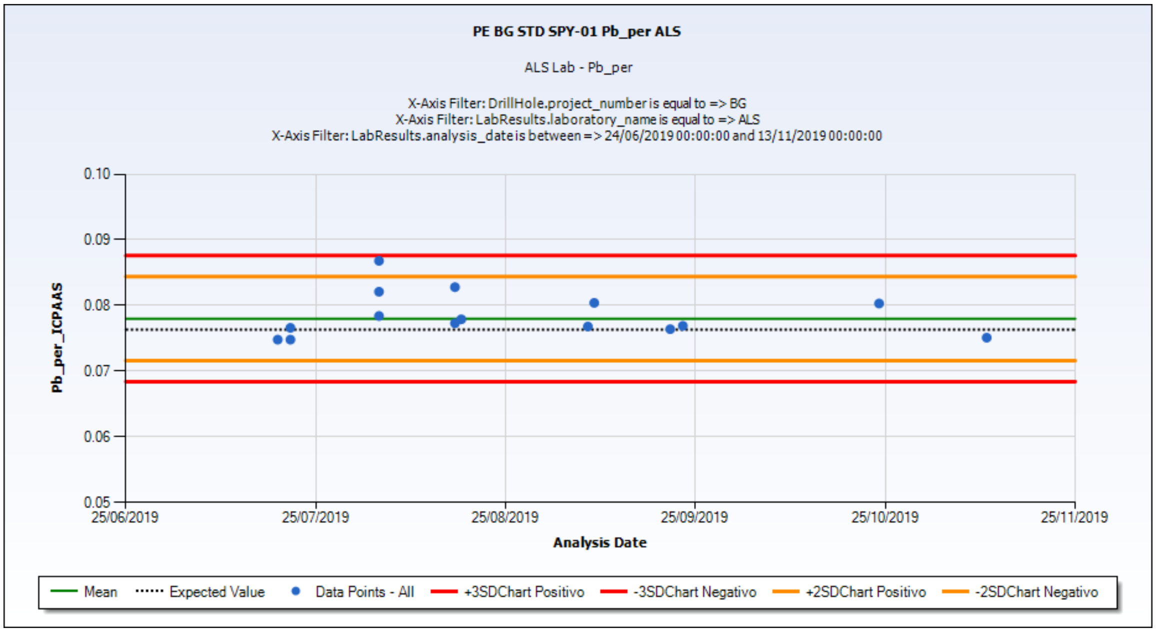
Summary

Standard Code	**SPY-01**
Element	**Ag**
Unit of Measure	**ppm**
Analytical Technique	**ICPAAS**
Expected (Actual value)	**7.20**
Project	**BG**
Lab	**ALS**
Analysis Date From	**25/06/2019**
Analysis Date To	**13/11/2019**
Standard Deviation	**0.55**
Count of Samples	**19**
Mean	**7.08**
Bias %	**-1.69**
Standard Deviation Chart	**0.26**



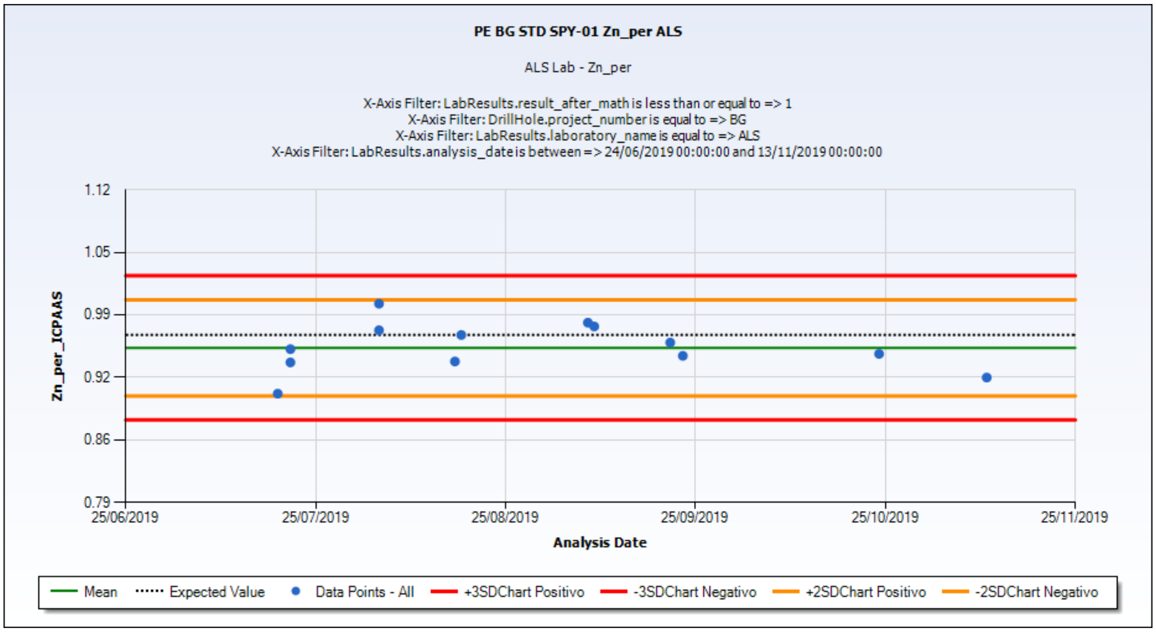
Summary

Standard Code	**SPY-01**
Element	**Cu**
Unit of Measure	**per**
Analytical Technique	**ICPAAS**
Expected (Actual value)	**0.0010**
Project	**BG**
Lab	**ALS**
Analysis Date From	**25/06/2019**
Analysis Date To	**13/11/2019**
Standard Deviation	**0.00005**
Count of Samples	**19**
Mean	**0.0009**
Bias %	**-9.50**
Standard Deviation Chart	**0.00009**



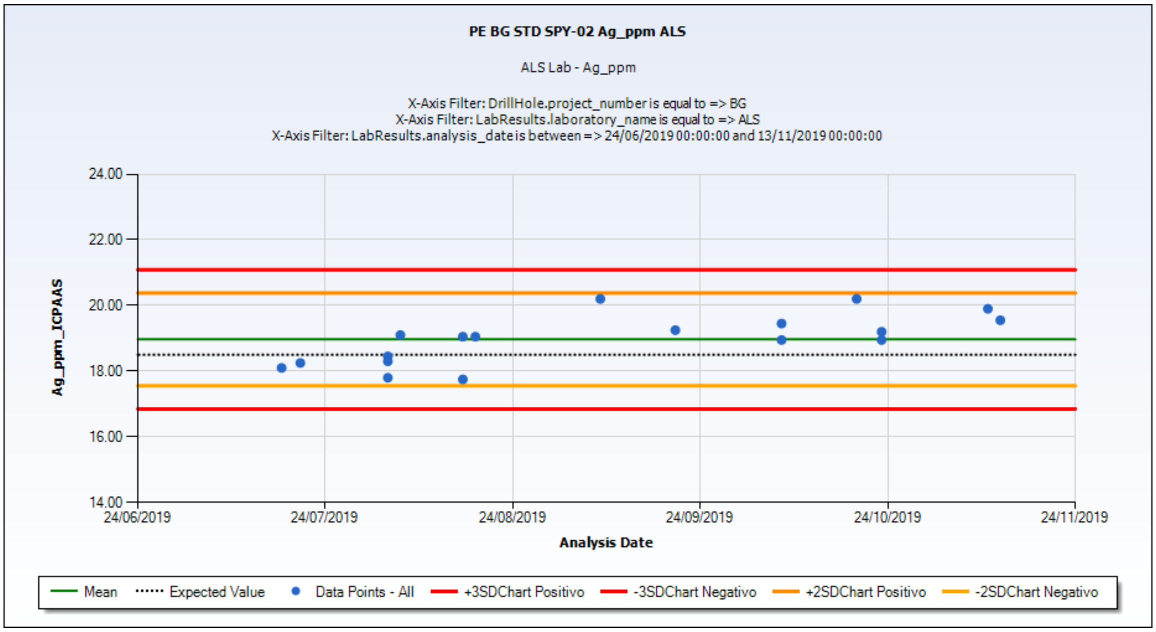
Summary

Standard Code	**SPY-01**
Element	**Pb**
Unit of Measure	**per**
Analytical Technique	**ICPAAS**
Expected (Actual value)	**0.08**
Project	**BG**
Lab	**ALS**
Analysis Date From	**25/06/2019**
Analysis Date To	**13/11/2019**
Standard Deviation	**0.00**
Count of Samples	**19**
Mean	**0.08**
Bias %	**2.20**
Standard Deviation Chart	**0.00**



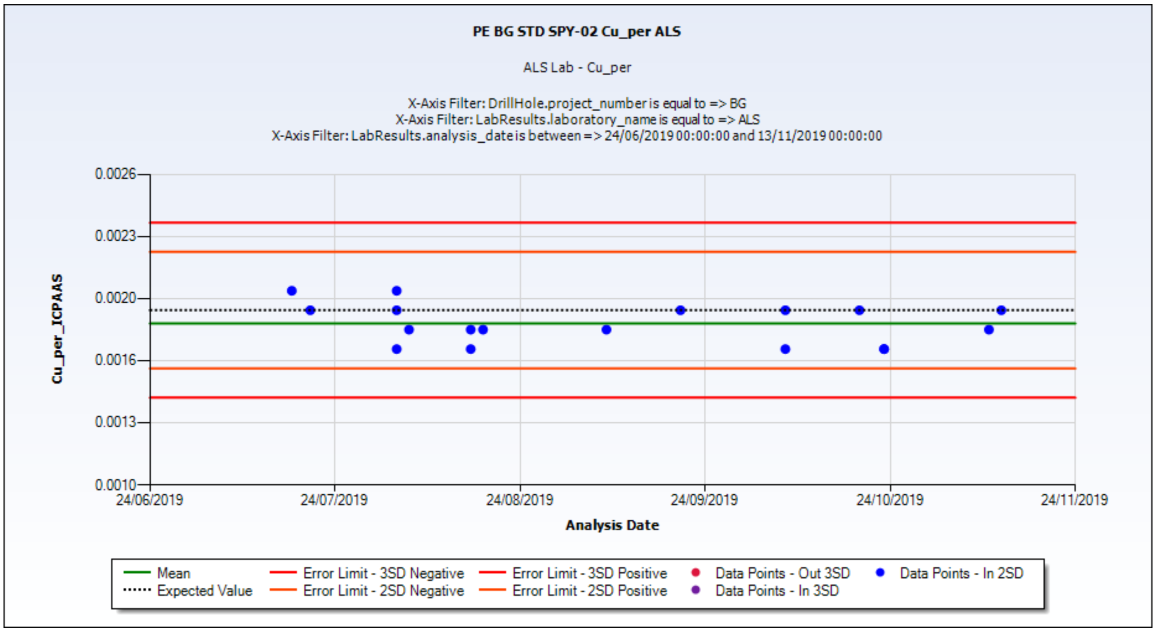
Summary

Standard Code	**SPY-01**
Element	**Zn**
Unit of Measure	**per**
Analytical Technique	**ICPAAS**
Expected (Actual value)	**0.97**
Project	**BG**
Lab	**ALS**
Analysis Date From	**25/06/2019**
Analysis Date To	**13/11/2019**
Standard Deviation	**0.01**
Count of Samples	**17**
Mean	**0.95**
Bias %	**-1.41**
Standard Deviation Chart	**0.03**



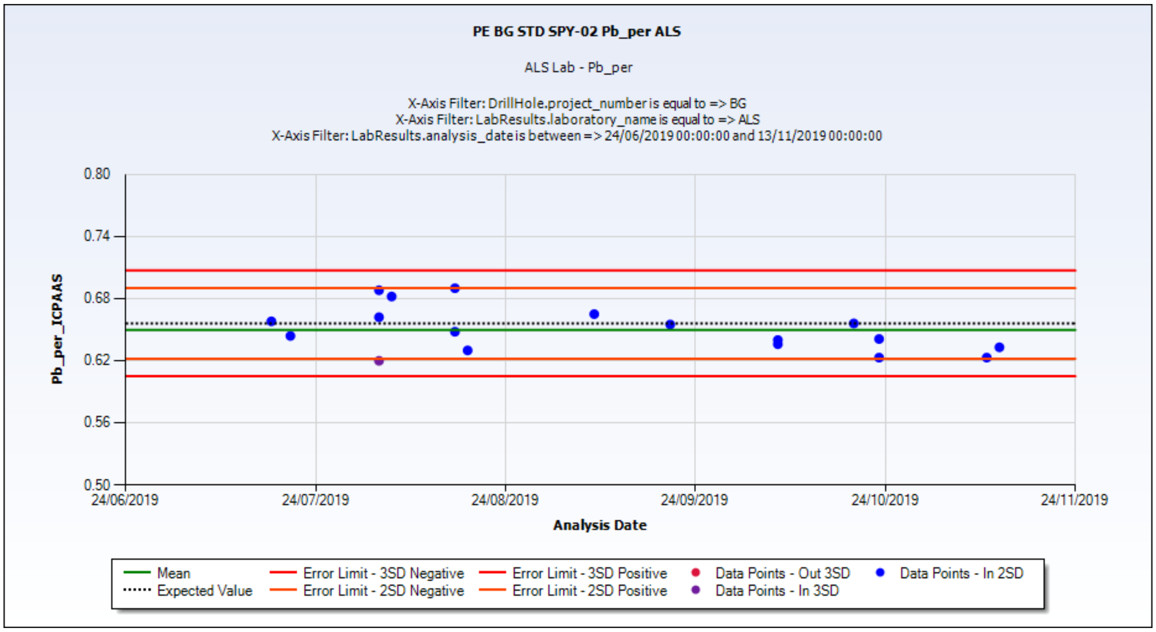
Summary

Standard Code	**SPY-02**
Element	**Ag**
Unit of Measure	**ppm**
Analytical Technique	**ICPAAS**
Expected (Actual value)	**18.50**
Project	**BG**
Lab	**ALS**
Analysis Date From	**24/06/2019**
Analysis Date To	**12/11/2019**
Standard Deviation	**0.30**
Count of Samples	**19**
Mean	**18.97**
Bias %	**2.53**
Standard Deviation Chart	**0.71**



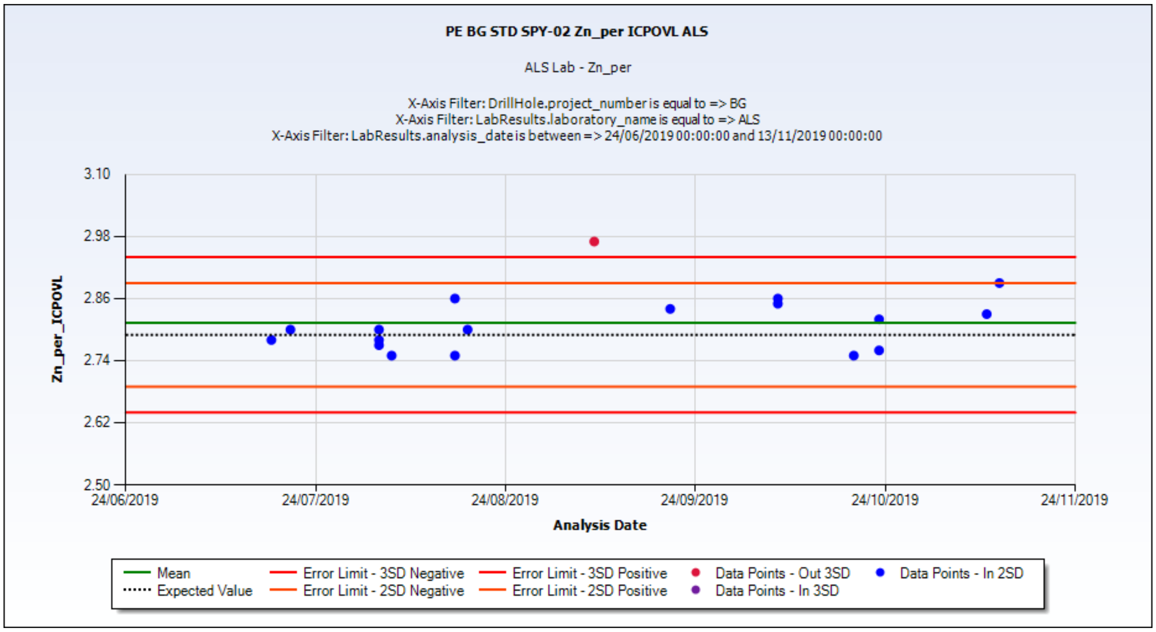
Summary

Standard Code	**SPY-02**
Element	**Cu**
Unit of Measure	**per**
Analytical Technique	**ICPAAS**
Expected (Actual value)	**0.0019**
Project	**BG**
Lab	**ALS**
Analysis Date From	**24/06/2019**
Analysis Date To	**12/11/2019**
Standard Deviation	**0.0002**
Count of Samples	**19**
Mean	**0.0018**
Bias %	**-3.60**
Standard Deviation Chart	**0.0001**



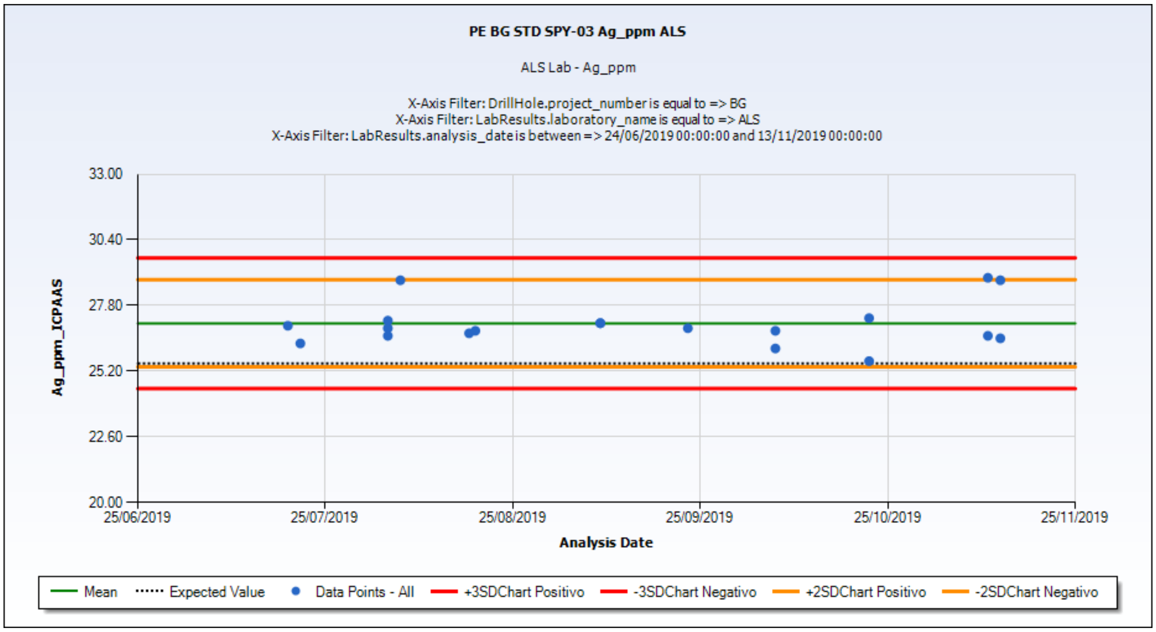
Summary

Standard Code	**SPY-02**
Element	**Pb**
Unit of Measure	**per**
Analytical Technique	**ICPAAS**
Expected (Actual value)	**0.66**
Project	**BG**
Lab	**ALS**
Analysis Date From	**24/06/2019**
Analysis Date To	**12/11/2019**
Standard Deviation	**0.02**
Count of Samples	**19**
Average Actual	**0.65**
Bias %	**-0.96**
Standard Deviation Chart	**0.02**



Summary

Standard Code	**SPY-02**
Element	**Zn**
Unit of Measure	**per**
Analytical Technique	**ICPOVL**
Expected (Actual value)	**2.79**
Project	**BG**
Lab	**ALS**
Analysis Date From	**24/06/2019**
Analysis Date To	**12/11/2019**
Standard Deviation	**0.05**
Count of Samples	**19**
Mean	**2.81**
Bias %	**0.83**
Standard Deviation Chart	**0.05**



Summary

Standard Code	**SPY-03**
Element	**Ag**
Unit of Measure	**ppm**
Analytical Technique	**ICPAAS**
Expected (Actual value)	**25.50**
Project	**BG**
Lab	**ALS**
Analysis Date From	**25/06/2019**
Analysis Date To	**12/11/2019**
Standard Deviation	**0.45**
Count of Samples	**20**
Mean	**27.10**
Bias %	**6.25**
Standard Deviation Chart	**0.86**

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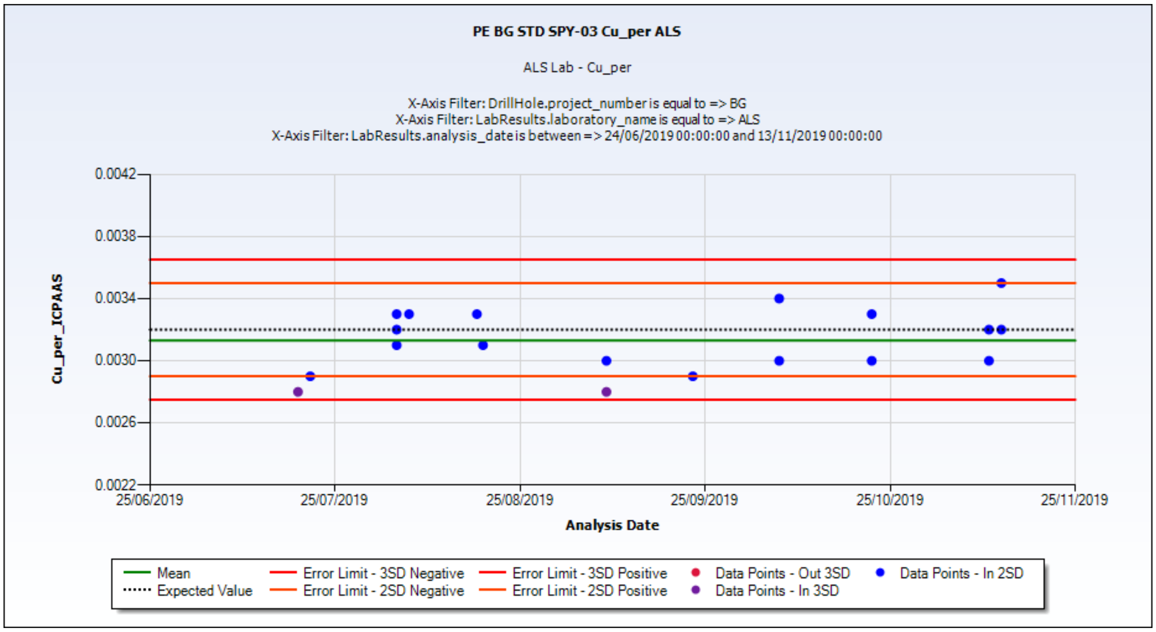
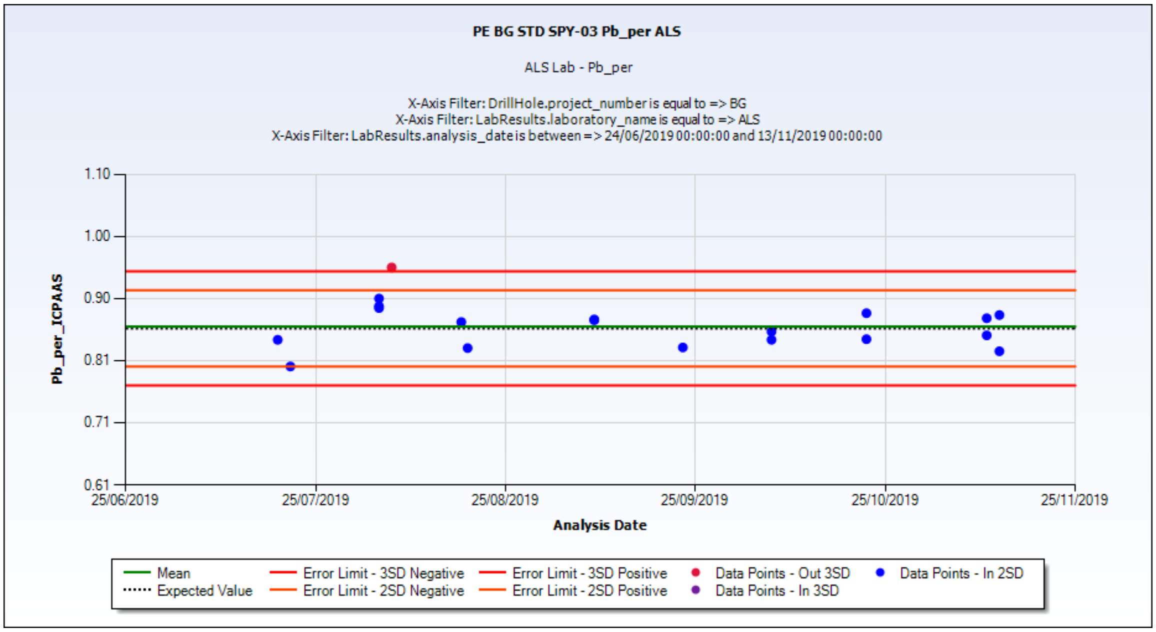


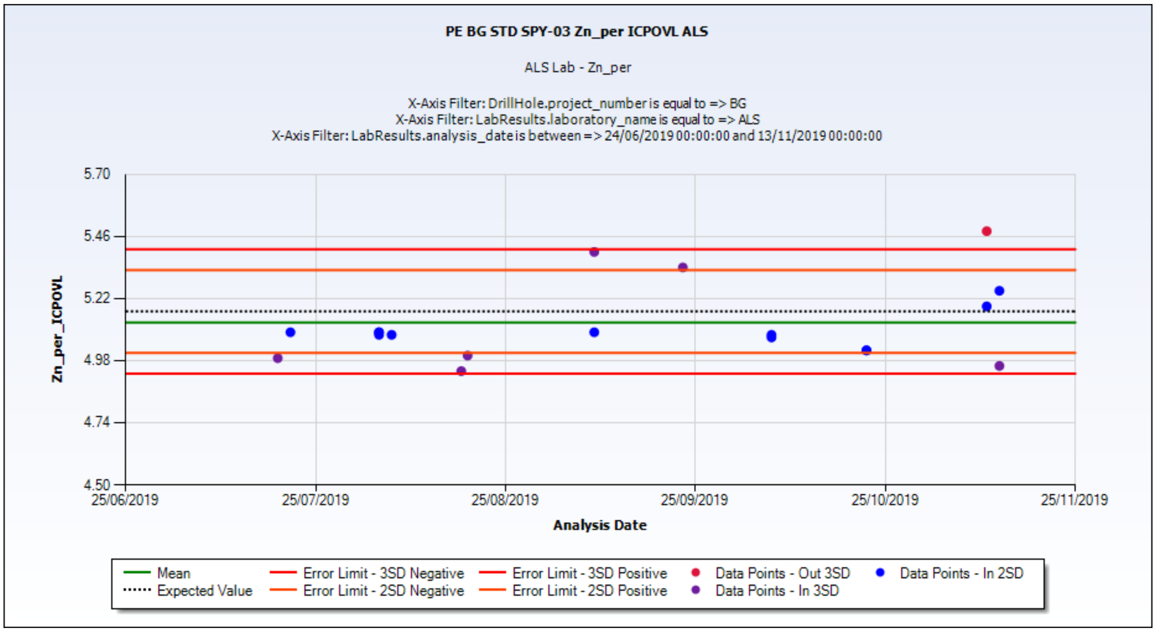
Summary

Standard Code	**SPY-03**
Element	**Cu**
Unit of Measure	**per**
Analytical Technique	**ICPAAS**
Expected (Actual value)	**0.0032**
Project	**BG**
Lab	**ALS**
Analysis Date From	**25/06/2019**
Analysis Date To	**12/11/2019**
Standard Deviation	**0.0002**
Count of Samples	**20**
Mean	**0.0031**
Bias %	**-2.19**
Standard Deviation Chart	**0.0002**



Summary

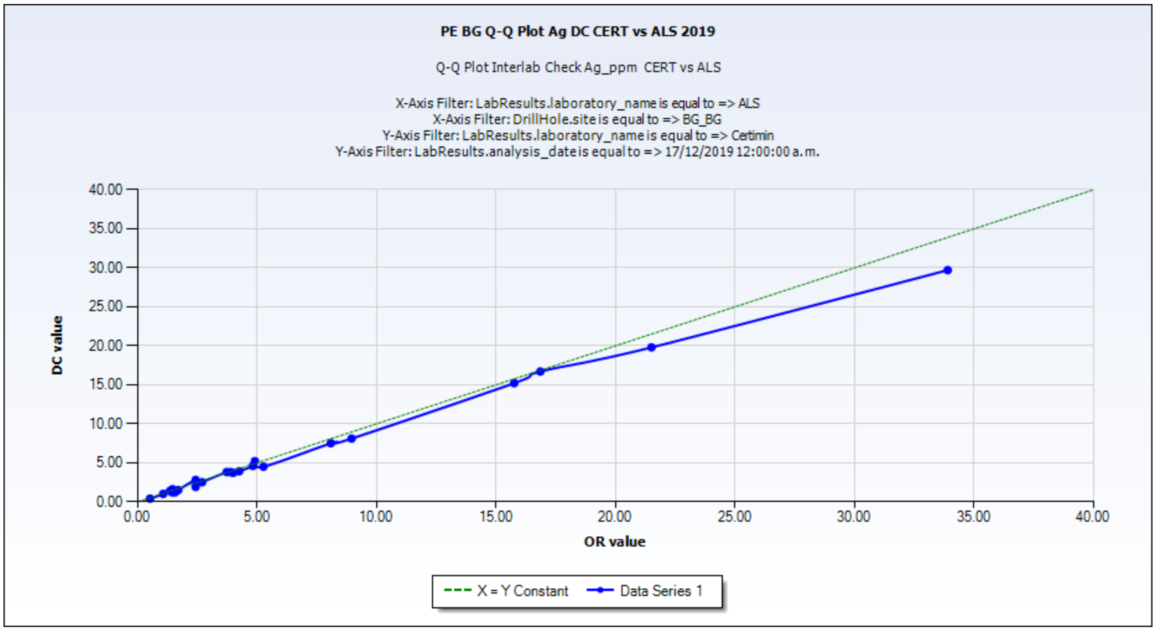
Standard Code	**SPY-03**
Element	**Pb**
Unit of Measure	**per**
Analytical Technique	**ICPAAS**
Expected (Actual value)	**0.86**
Project	**BG**
Lab	**ALS**
Analysis Date From	**25/06/2019**
Analysis Date To	**12/11/2019**
Standard Deviation	**0.03**
Count of Samples	**20**
Mean	**0.86**
Bias %	**0.36**
Standard Deviation Chart	**0.03**



Summary

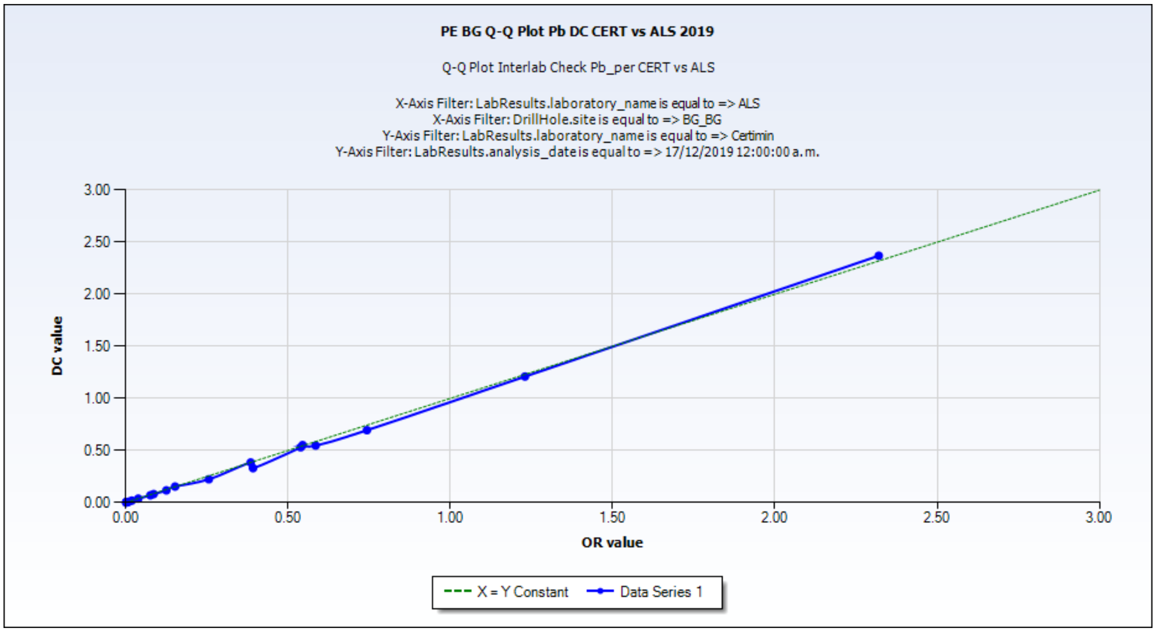
Standard Code	**SPY-03**
Element	**Zn**
Unit of Measure	**per**
Analytical Technique	**ICPOVL**
Expected (Actual value)	**5.17**
Project	**BG**
Lab	**ALS**
Analysis Date From	**25/06/2019**
Analysis Date To	**12/11/2019**
Standard Deviation	**0.08**
Count of Samples	**20**
Mean	**5.13**
Bias %	**-0.82**
Standard Deviation Chart	**0.15**

31.4 EXTERNAL CHECK RESULTS – CERT VS ALS LABORATORY



Summary

Original Sample Type	**OR**
Duplicate Sample Type	**DC**
Element	**Ag**
Unit of Measure	**ppm**
Analytical Technique	**Lab**
Original Mean Value	**6.41**
Duplicate Mean Value	**5.98**
Count of Samples	**24**
Bias %	**-0.63**



Summary

Original Sample Type	**OR**
Duplicate Sample Type	**DC**
Element	**Pb**
Unit of Measure	**per**
Analytical Technique	**Lab**
Original Mean Value	**0.31**
Duplicate Mean Value	**0.31**
Count of Samples	**24**
Bias %	**-0.74**

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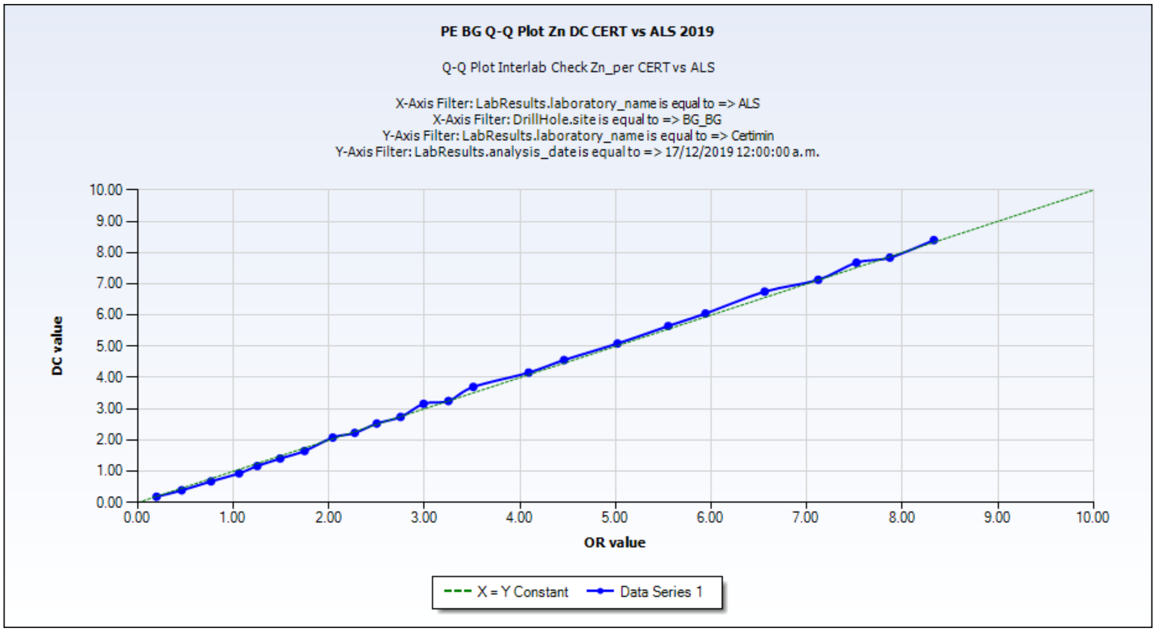
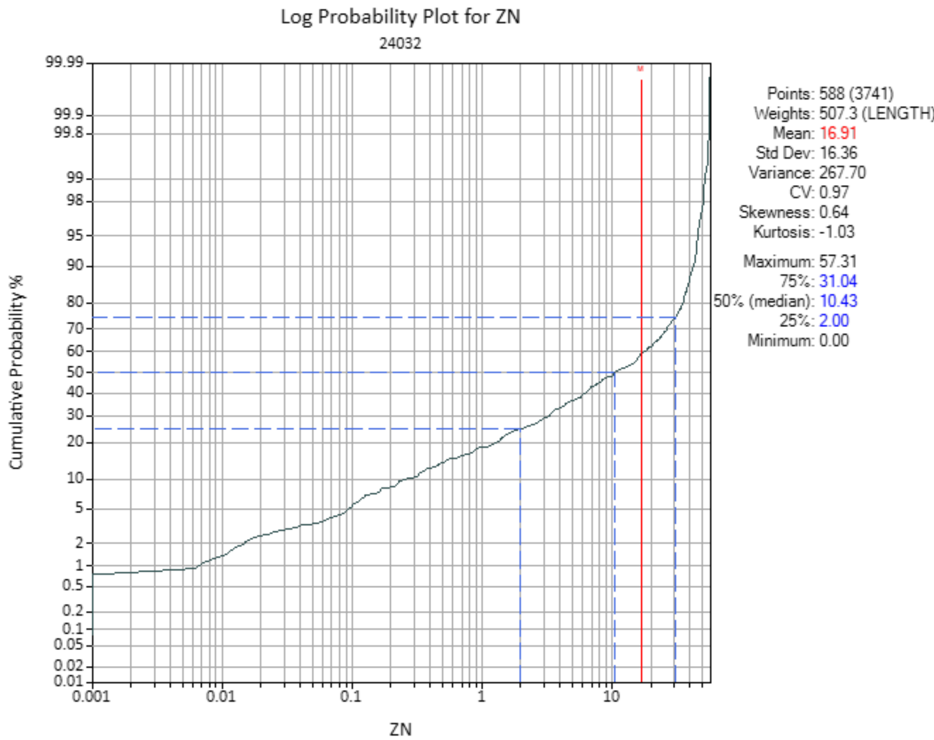
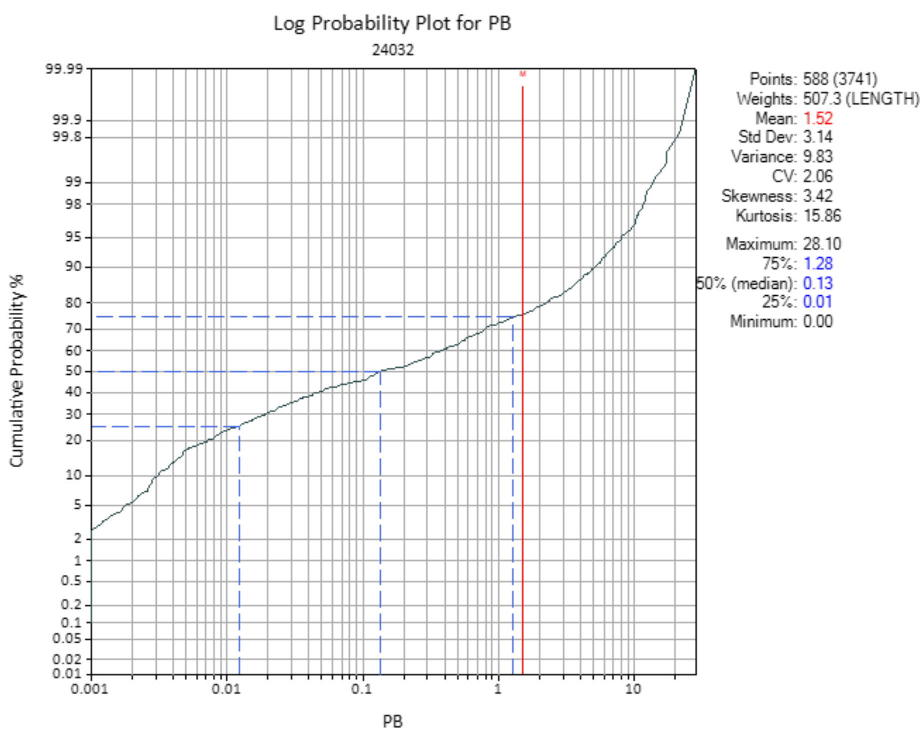


Summary

Original Sample Type	**OR**
Duplicate Sample Type	**DC**
Element	**Zn**
Unit of Measure	**per**
Analytical Technique	**Lab**
Original Mean Value	**3.70**
Duplicate Mean Value	**3.73**
Count of Samples	**24**
Bias %	**-0.12**

32 APPENDIX C: SAMPLE CUMULATIVE FREQUENCY PLOTS





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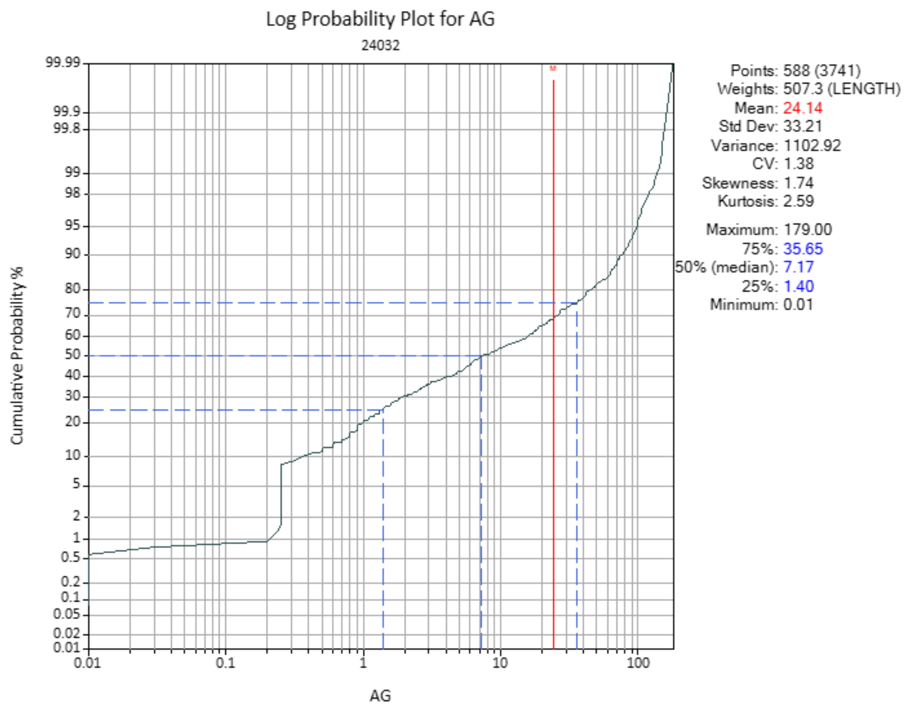
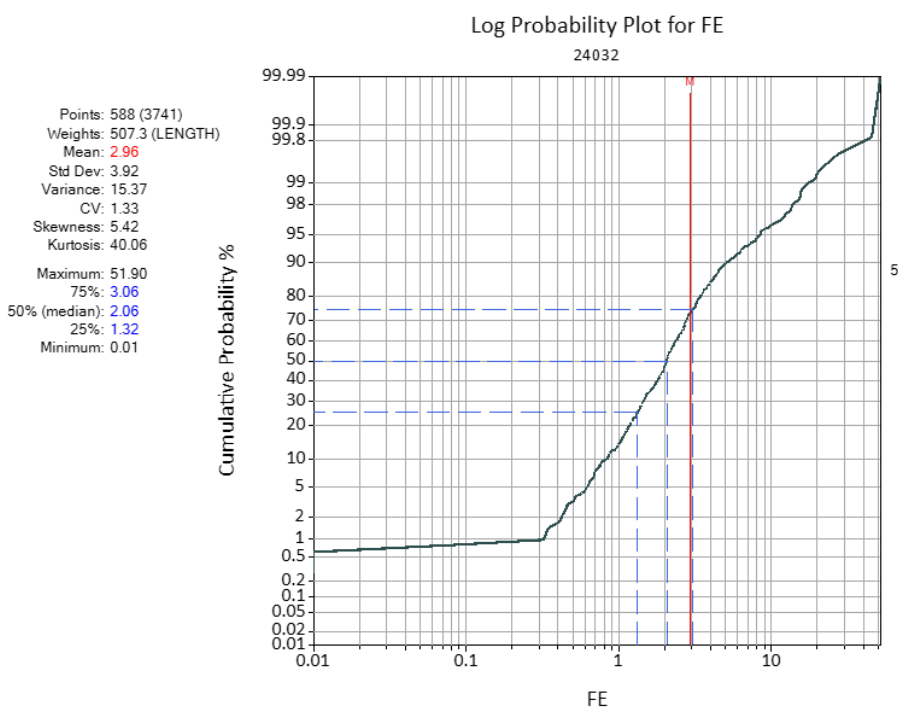
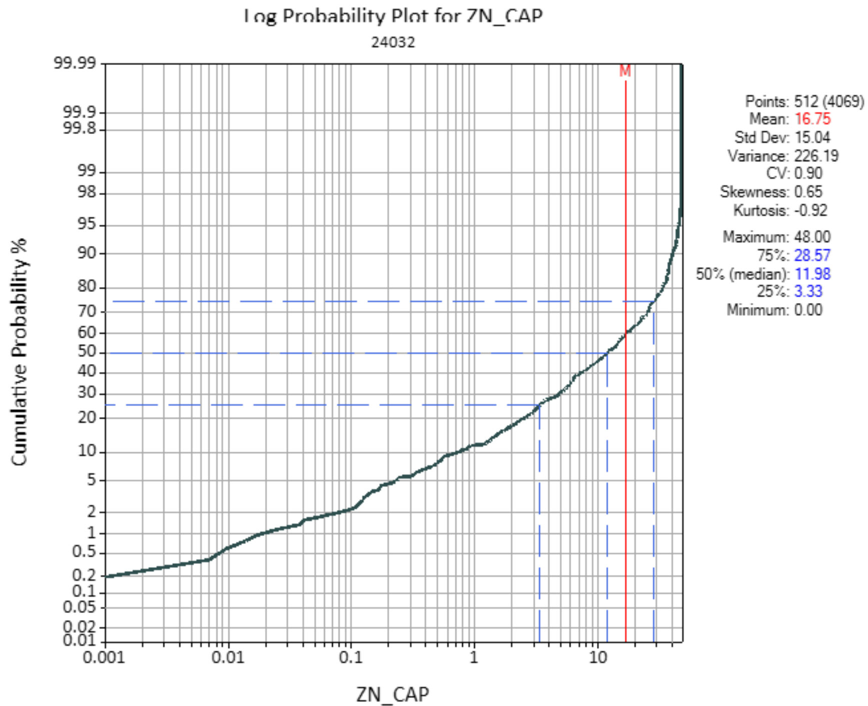
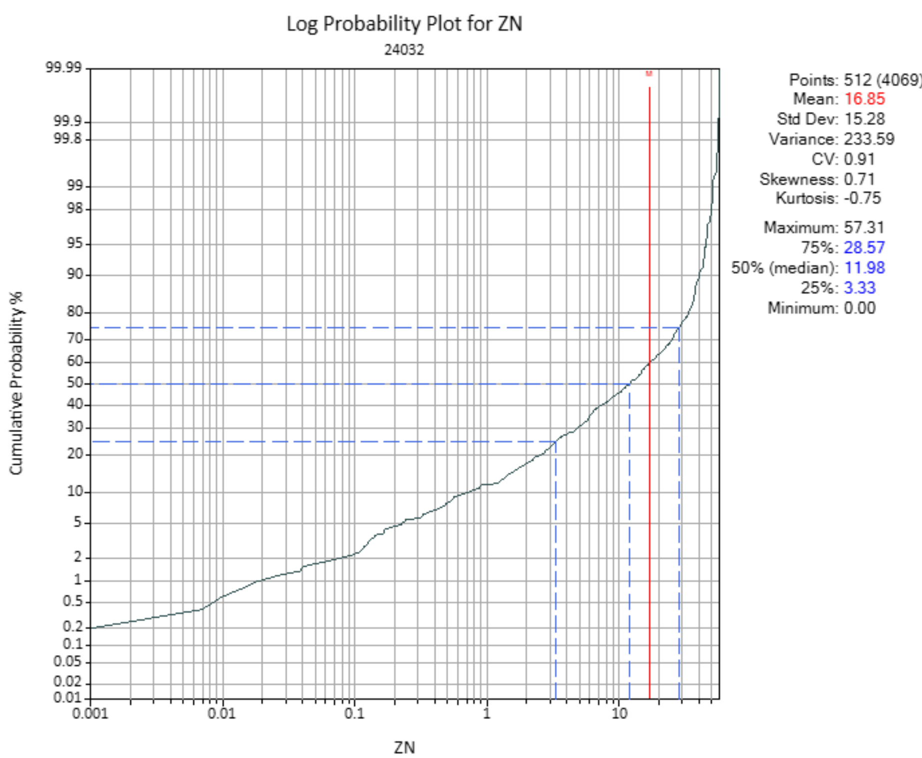

Log Probability Plot for AG
24032
Cumulative Probability %
AG
Points: 588 (3741)
Weights: 507.3 (LENGTH)
Mean: 24.14
Std Dev: 33.21
Variance: 1102.92
CV: 1.38
Skewness: 1.74
Kurtosis: 2.59
Maximum: 179.00
75%: 35.65
50% (median): 7.17
25%: 1.40
Minimum: 0.01


Log Probability Plot for FE
24032
Cumulative Probability %
FE
Points: 588 (3741)
Weights: 507.3 (LENGTH)
Mean: 2.96
Std Dev: 3.92
Variance: 15.37
CV: 1.33
Skewness: 5.42
Kurtosis: 40.06
Maximum: 51.90
75%: 3.06
50% (median): 2.06
25%: 1.32
Minimum: 0.01

33 APPENDIX D: CAP-COMPOSITE CUM. FREQUENCY PLOTS





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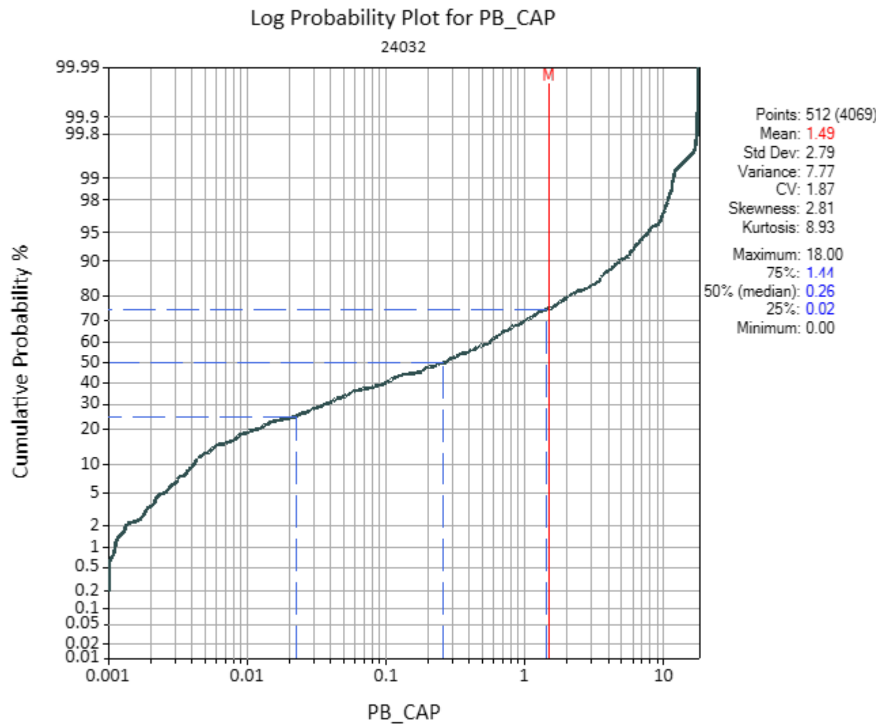
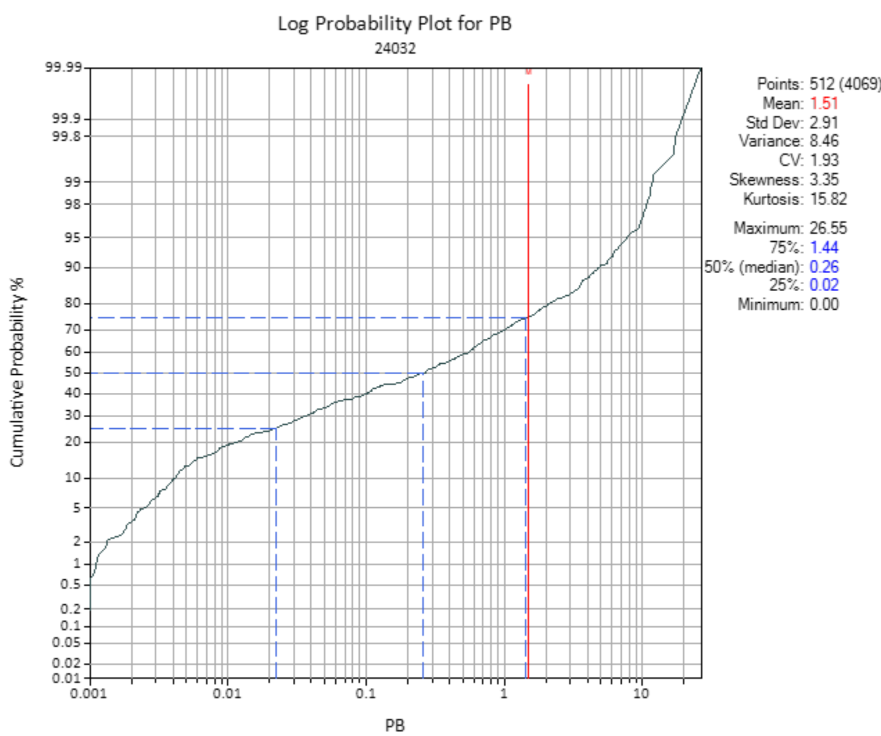
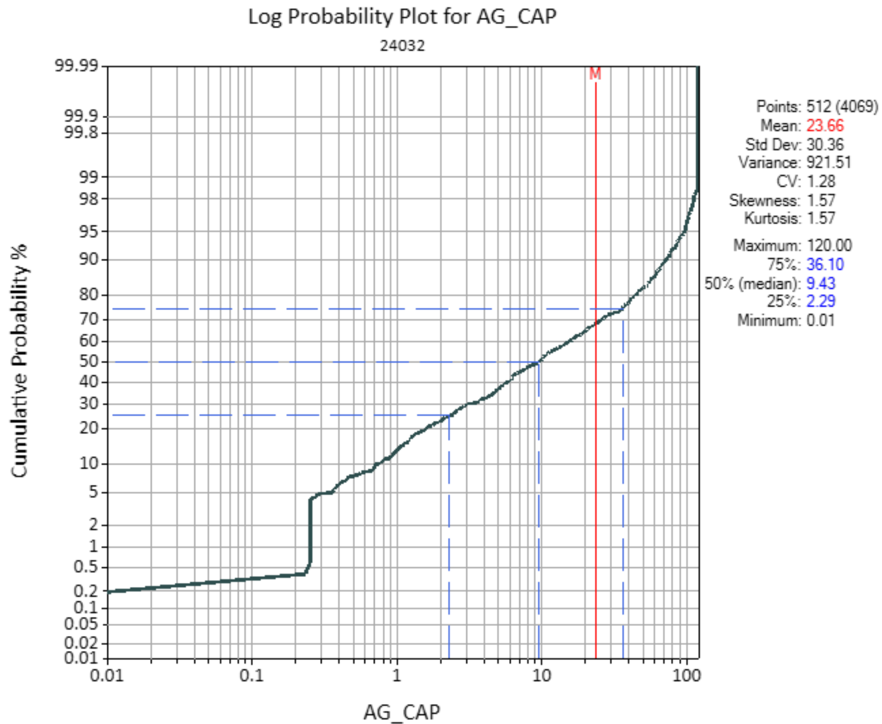
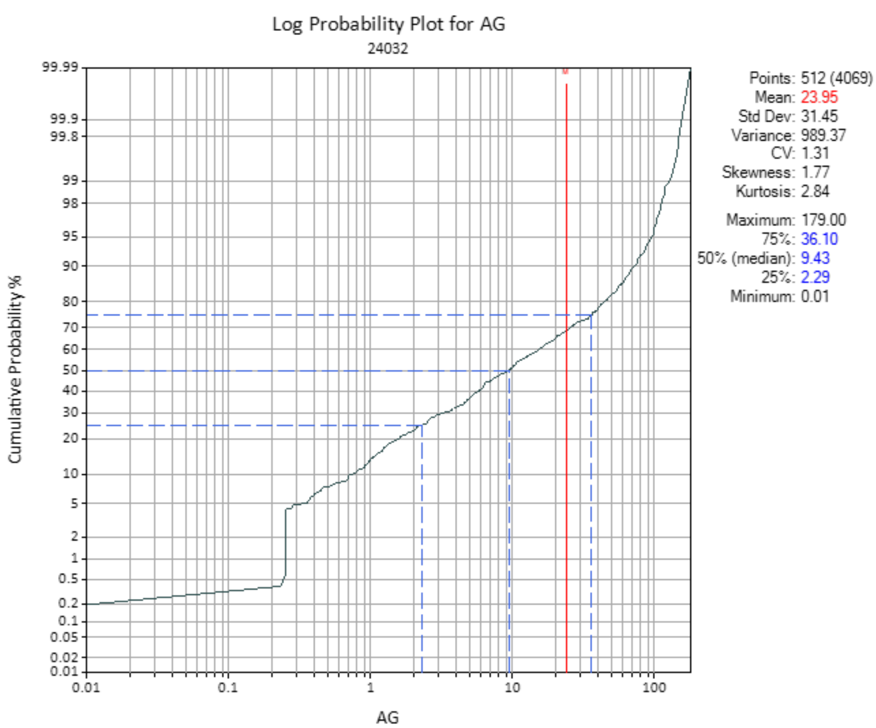
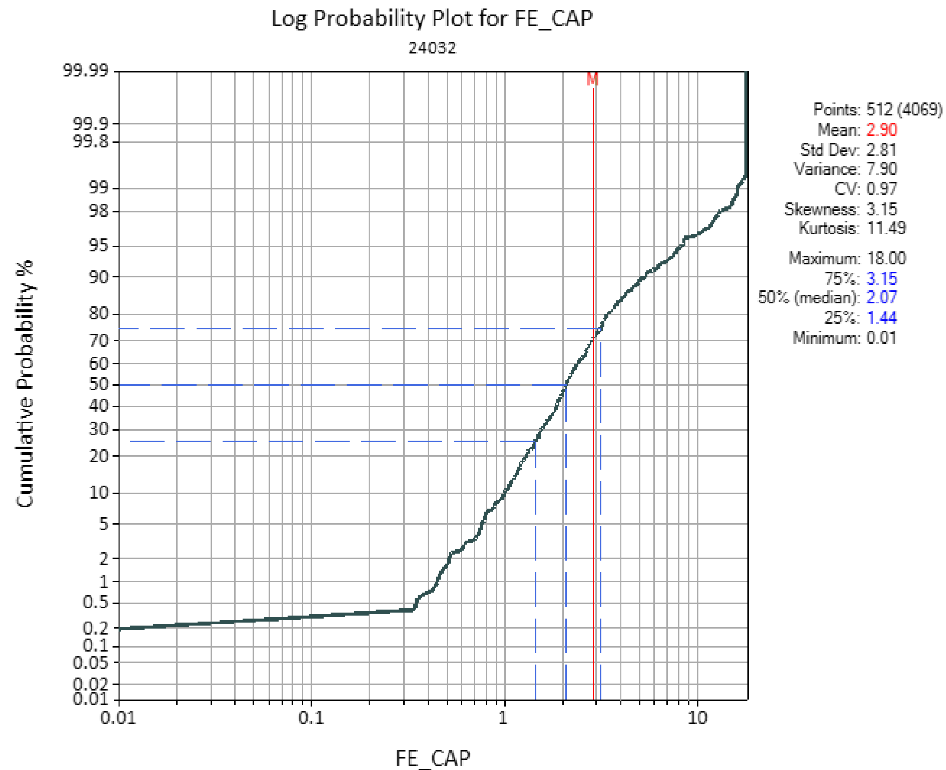
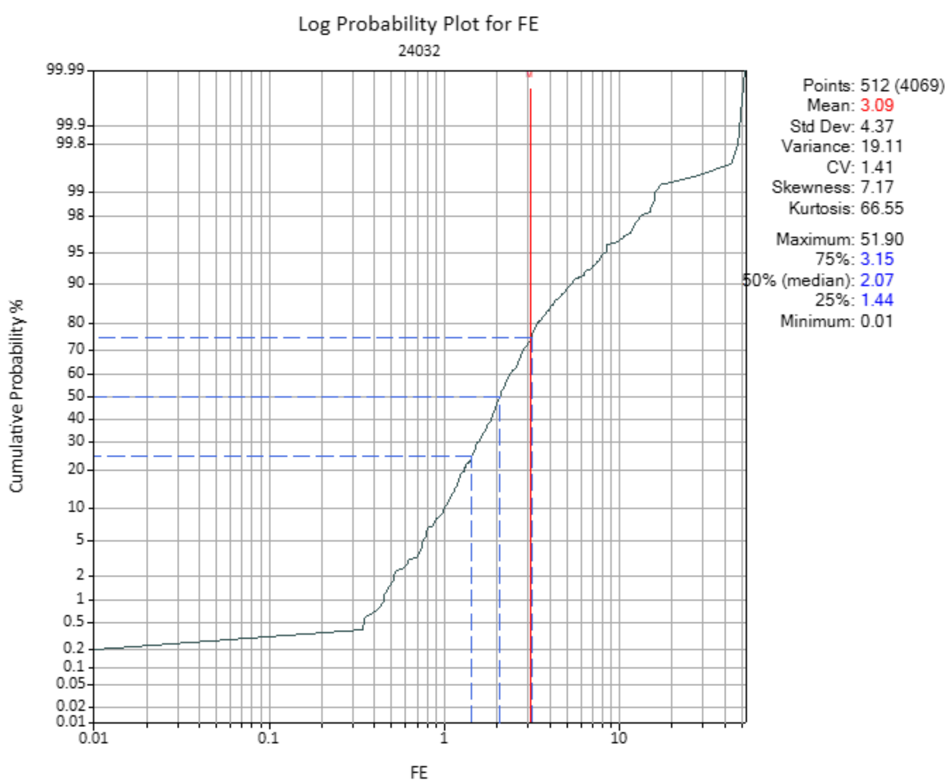

Log Probability Plot for PB_CAP
24032
Cumulative Probability %
PB_CAP
Points: 512 (4069)
Mean: 1.49
Std Dev: 2.79
Variance: 7.77
CV: 1.87
Skewness: 2.81
Kurtosis: 8.93
Maximum: 18.00
75%: 1.44
50% (median): 0.26
25%: 0.02
Minimum: 0.00


Log Probability Plot for PB
24032
Cumulative Probability %
PB
Points: 512 (4069)
Mean: 1.51
Std Dev: 2.91
Variance: 8.46
CV: 1.93
Skewness: 3.35
Kurtosis: 15.82
Maximum: 26.55
75%: 1.44
50% (median): 0.26
25%: 0.02
Minimum: 0.00


Log Probability Plot for AG_CAP
24032
Cumulative Probability %
AG_CAP
M
Points: 512 (4069)
Mean: 23.66
Std Dev: 30.36
Variance: 921.51
CV: 1.28
Skewness: 1.57
Kurtosis: 1.57
Maximum: 120.00
75%: 36.10
50% (median): 9.43
25%: 2.29
Minimum: 0.01


Log Probability Plot for AG
24032
Cumulative Probability %
AG
Points: 512 (4069)
Mean: 23.95
Std Dev: 31.45
Variance: 989.37
CV: 1.31
Skewness: 1.77
Kurtosis: 2.84
Maximum: 179.00
75%: 36.10
50% (median): 9.43
25%: 2.29
Minimum: 0.01


Log Probability Plot for FE_CAP
24032
Cumulative Probability %
FE_CAP
Points: 512 (4069)
Mean: 2.90
Std Dev: 2.81
Variance: 7.90
CV: 0.97
Skewness: 3.15
Kurtosis: 11.49
Maximum: 18.00
75%: 3.15
50% (median): 2.07
25%: 1.44
Minimum: 0.01


Log Probability Plot for FE
24032
Cumulative Probability %
FE
Points: 512 (4069)
Mean: 3.09
Std Dev: 4.37
Variance: 19.11
CV: 1.41
Skewness: 7.17
Kurtosis: 66.55
Maximum: 51.90
75%: 3.15
50% (median): 2.07
25%: 1.44
Minimum: 0.01

34 APPENDIX E: MINERAL RESOURCE

Zone	Classification	Tonnes	Zn (%)	Ag (g/t)	Pb (%)	Fe (%)
1021_m1	Inferred	96,236	3.07	10.45	0.15	0.44
1021_m2	Inferred	344,927	5.99	9.31	1.21	1.18
1021_m3	Inferred	33,616	2.7	7.65	0.99	0.75
1021_m4	Inferred	857	0.3	2.54	0.14	0.51
1021_m7	Inferred	332,228	7.06	17.56	0.94	2.06
m_m3_10	Measured	17,325	6.17	9.39	1.46	1.41
	Indicated	14,821	4.88	6.84	0.99	1.04
	Inferred	241	6.19	15.29	2.63	2.27
Km_m1	Indicated	48,683	5.78	10.7	1.68	1.19
	Inferred	212,585	6.23	16.13	2.45	1.36
Km_m2_1	Measured	8,920	3.79	4.58	0.67	1.13
	Indicated	48,066	5.82	8.32	1.14	1.1
	Inferred	487,535	7.01	9.42	1.4	1.48
Km_m2_3	Inferred	259,685	6.81	3.93	0.29	0.57
Km_m3_1	Inferred	128,365	11.41	11.92	0.74	3.29
Km_m3_4	Indicated	8,323	8.43	13.4	1.92	1.76
	Inferred	136,337	8.16	4.45	0.53	1.38
Km_m3_5	Indicated	30,480	7.72	2.35	0.16	1.1
	Inferred	567,175	8.43	5.77	0.38	1.29
Km_m3_7	Measured	11,396	6.89	16.41	2.6	1.62
	Indicated	2,380	3.65	6.38	0.94	1.31
Km_m3_8	Measured	4,068	5.92	4.81	0.67	0.72
	Indicated	13,566	8.49	12.42	1.72	0.92
	Inferred	39,879	9.63	15.19	2.01	0.95
Km_m3_9	Indicated	3,069	11.61	29.1	3.27	0.94
	Inferred	14,125	5.59	8.73	0.93	0.74
Km_m3_2	Indicated	75,331	5.78	5.56	0.84	1.09
	Inferred	607,754	8.07	9.01	1.16	1.7
Km_m4_1	Indicated	5,349	2.5	3.76	0.53	0.65
	Inferred	74,770	3.97	1.26	0.13	0.77
Km_m4_2	Measured	3,097	10.15	10.56	1.06	1.27
	Inferred	21,733	4.64	2.22	0.3	0.74
Km_m4_3	Measured	9,710	3.59	9.97	1.36	1.03
	Indicated	66,245	8.48	6.64	0.92	1.29
	Inferred	293,743	9.27	15.63	1.55	1.56
Km_m4_5	Inferred	1,790	1.72	3.69	0.46	0.57
Km_m4_7	Indicated	41,454	4.82	4.47	0.43	1.01
	Inferred	251,894	8.66	12.02	1.83	1.37

Zone	Classification	Tonnes	Zn (%)	Ag (g/t)	Pb (%)	Fe (%)
Km_m6_2	Inferred	*289,291*	*10.25*	*7.05*	*0.79*	*1.18*
Km_m6_3	Inferred	*38,627*	*4.97*	*5.08*	*0.94*	*1.04*
Km_m6_5	Inferred	*294,551*	*14.03*	*9.17*	*1.43*	*1.96*
Km_m6_6	Indicated	*319*	*8.93*	*21.41*	*1.69*	*1.13*
	Inferred	*50,975*	*15.18*	*33.56*	*2.61*	*1.62*
Km_m6_9	Indicated	*31,453*	*9.74*	*9.8*	*0.81*	*1.3*
	Inferred	*770,446*	*11.93*	*6.02*	*0.4*	*1.38*
Km_m7_1	Measured	*44,785*	*10.28*	*7.21*	*1.2*	*1.17*
	Indicated	*39,383*	*8.74*	*5.98*	*1.2*	*1.06*
	Inferred	*5,910*	*5.66*	*3.22*	*0.49*	*0.78*
Km_m7_2	Indicated	*311*	*2.25*	*14.72*	*1.02*	*0.21*
	Inferred	*56,648*	*3.09*	*16.77*	*1.83*	*0.34*
Km_m10	Inferred	*755,292*	*7.42*	*11.82*	*0.27*	*1*
Km_m13	Inferred	*72,413*	*6.41*	*5.4*	*1.02*	*0.51*
Km_m6_4	Measured	*28,288*	*14.01*	*7.07*	*0.84*	*1.23*
	Indicated	*10,570*	*14.6*	*4.88*	*0.44*	*1.06*
	Inferred	*1,054*	*12.56*	*4.79*	*0.53*	*1.2*
sj_m1	Measured	*373*	*11.06*	*9.12*	*0.21*	*1.39*
	Indicated	*17,477*	*8.63*	*6.35*	*0.11*	*1.06*
	Inferred	*24,631*	*8.67*	*5.02*	*0.03*	*1.12*
sj_m2	Measured	*37*	*1.38*	*15.06*	*0.1*	*1.53*
	Indicated	*5,830*	*6.75*	*11.23*	*0.02*	*1.82*
	Inferred	*32,176*	*5.46*	*4.54*	*0.3*	*0.66*
sj_m3	Measured	*60*	*6.75*	*7.74*	*0.31*	*2.59*
	Indicated	*8,524*	*9.4*	*9.45*	*0.5*	*2.98*
	Inferred	*17,632*	*5.81*	*7.95*	*0.14*	*2.25*
sj_m4	Measured	*20*	*4.69*	*4.8*	*0.15*	*0.56*
	Indicated	*26*	*7.43*	*5.19*	*0.62*	*0.69*
	Inferred	*5,633*	*8.47*	*3.95*	*0.69*	*0.66*
sj_m5	Measured	*3,696*	*6.07*	*25.03*	*0.55*	*1.11*
	Indicated	*7,546*	*5.04*	*28.1*	*0.63*	*1*
	Inferred	*1,140*	*4.15*	*21.34*	*0.47*	*0.78*
sj_m6	Measured	*31,784*	*7.13*	*6.59*	*0.23*	*1.77*
	Indicated	*21,048*	*13.11*	*16.57*	*0.69*	*1.57*
	Inferred	*3,836*	*14.27*	*20.97*	*0.97*	*1.65*
sj_m7	Measured	*18,612*	*9.99*	*16.06*	*1.34*	*6.52*
	Indicated	*72,773*	*6.54*	*10.18*	*0.76*	*8.61*
	Inferred	*8,692*	*7.07*	*5.84*	*0.23*	*2.2*

Zone	Classification	Tonnes	Zn (%)	Ag (g/t)	Pb (%)	Fe (%)
sj_m8	Measured	740	14.26	20.13	2.56	4.66
	Indicated	45,469	10.19	16.89	2.25	4.78
	Inferred	223,046	14.94	18.45	3.31	5.99
sj_m9	Indicated	41,624	6.29	7.74	0.63	1.72
	Inferred	65,342	8.78	9.14	0.99	1.96
sj_m10	Measured	4,112	10.52	29.18	0.42	2.08
	Indicated	16,031	5.92	16.79	0.27	1.3
	Inferred	3,211	3.45	8.25	0.1	0.9
sj_m11	Inferred	424,532	10.42	5.24	0.7	0.95
sj_m12	Inferred	270,429	8.78	6.58	0.54	4.17
sj_m13	Inferred	114,568	5.59	2.13	0	1.18
sj_m14	Inferred	71,914	11.98	13.48	0.68	1.52
sj_m15	Inferred	77,012	8.87	2.72	0.07	2.61
sj_m16	Inferred	29,828	4.54	1.95	0.01	1.42
sj_m17	Inferred	10,371	4.19	5.07	1.09	1.04
sj_m18	Measured	44	7.04	2.38	0.02	1.38
	Indicated	6,442	4.7	1.75	0.02	1.27
sj_m19	Indicated	3	3.32	6.31	0.32	4
sj_m20	Indicated	3,253	8.3	0.5	0.02	1.37
sj_m21	Measured	9,894	9.76	8.38	0.26	1.05
	Indicated	2,079	4.76	3.66	0.09	1.06
sj_m22	Inferred	21,803	11.3	0.92	0	1.45
sj_m23	Measured	34	0.85	1.83	0.01	0.66
	Indicated	1,593	6.35	10.35	0.04	0.85
sj_m24	Measured	452	12.54	13.51	0.43	1.74
	Indicated	264	8.35	6.98	0.27	1.43
1021_f1	Inferred	316,616	6.91	15.21	1.03	1.59
1021_f2	Inferred	1,002,131	7.95	13.44	1.41	3.35
1021_f3	Inferred	4,618	3.47	8.26	0.4	0.84
1021_f4	Inferred	22,371	2.49	4.51	0.5	1.1
1021_f5	Inferred	103,936	3.22	4.84	0.12	2.57
1021_f6	Inferred	1,034,401	6.52	14.96	3.19	3.28
km_f1	Inferred	519,921	4.11	13.64	1.98	0.92
km_f2	Inferred	288,920	8.36	18.49	2.56	6.42
km_f3	Inferred	437,530	14.38	12.86	1.36	2.18
Sam_f1	Inferred	599,392	12.78	6.99	2.96	0.93
sj_f1	Measured	21,430	8.66	14.8	0.58	1.39
	Indicated	19,797	9.5	14.48	0.33	1.65
	Inferred	148,436	5.6	7.56	0.28	1.2

Zone	*Classification*	*Tonnes*	*Zn (%)*	*Ag (g/t)*	*Pb (%)*	*Fe (%)*
sj_f2	Measured	15,720	7.5	14.44	0.09	1.5
	Indicated	20,833	7.16	9.79	0.14	1.34
	Inferred	9,852	3.48	10.33	0.25	1.21
sj_f4	Measured	13,427	8.39	2.99	0.19	1.21
	Indicated	9,443	6.72	2.29	0.06	0.99
Km_m3_3	Measured	60,395	7.64	12.36	1.44	2.23
	Indicated	252,459	8.62	16.14	1.95	1.98
	Inferred	127,411	6.99	9.99	1.34	1.78
Km_m6_1	Measured	140,270	9.63	9.97	1.4	1.5
	Indicated	221,011	7.67	10.34	1.43	1.04
	Inferred	265,715	9.53	19.84	4.01	0.81
sj_f3	Measured	358,256	14.35	21.83	1.74	3.33
	Indicated	421,374	17.7	26.9	1.6	3.09
	Inferred	2,331,005	15.51	13.75	0.54	2.38
Total		**17,300,383**	**9.77**	**11.82**	**1.27**	**2.05**

*Note: ***m*** = mantos, ***f*** = feeder