Independent Technical Report on the Bethania Silver Project

Department of Huancavelica
Province of Huancavelica
District of Acobambilla
Peru

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1.0 SUMMARY

At the request of private Canadian company Kuya Silver Corp. ("Kuya" or the "Company"), Caracle Creek International Consulting Inc. ("Caracle" or the "Consultant"), a Canadian company, has prepared this technical report as a National Instrument 43-101 ("NI 43-101") Technical Report (the "Report") on the Bethania Silver Project (the "Project"), located in central Peru, about 175 direct kilometres southeast of Lima.

This technical report was prepared as an NI 43-101 Technical Report for Kuya in preparation for a future transaction. In October 2017, Kuya entered into a Share Purchase Agreement ("SPA") to acquire up to 80% of the shares of S & L Andes Export S.A.C. ("S&L"), a private Peruvian company based in Lima that owns 100% of the Bethania Silver Mine (Santa Elena concession), by investing a total of US$10.0 million; a combination of work and capital/debt commitments to the Property, cash payments, and shares in Kuya.

Dr. Scott Jobin-Bevans, by virtue of his education, experience, and professional association, is considered a Qualified Person ("QP") as defined in the National Instrument 43-101 ("NI 43-101) standard, for this Report and is responsible for all sections in the Report. Dr. Jobin-Bevans visited the Project on Tuesday, June 15, 2019, for one day, accompanied by Kuya Silver and S&L Andes Export S.A.C. personnel Alejandro Garcia (legal counsel for S&L) and Dionicio Milla Simon (Geological Engineer).

1.1 Property Description and Location

The Bethania Silver Project, located in the high Andes of Central Peru and about 70 km (direct) southwest of the city of Huancayo, capital city of neighbouring Junín Department, consists of four concessions situated near the borders of the departments of Huancavelica, Lima and Junín. Collectively, the four concessions are referred to as the Bethania Silver Project (the "Project") and the focus of this Report is the Santa Elena concession (the "Property", "Bethania Property" or "Bethania Mine").

The Santa Elena concession, on which the Bethania Silver Mine is located, is in the northwestern part of Huancavelica Department, Province of Huancavelica, and District of Acobambilla. The Property is about 316 km by road from Peru's capital city of Lima, but it is possible to fly from Lima to Jauja (Jauja is about 50 km or an one hour drive from Huancayo) and then drive southwest to the Property via Huancayo (about 4 hours).

Historically known as Mina Santa Elena, the Bethania Mine operated on and off from 1977 and was put on care and maintenance in 2016. The Bethania Mine and related infrastructure are centred at approximate UTM coordinates 442766mE, 8603236mS (PSAD56, UTM Zone 18 South; EPSG:24878) and at about 4,688 metres above sea level ("mASL").

1.1.1 Mining Concessions

The main Property, registered as Santa Elena (Bethania Mine), is licensed as a mining concession and was originally registered in 1970 to cover artisanal and colonial-era pits and workings known at the time. This concession, covering 45 hectares (1.5 km x 300 m), is owned 100% by Peruvian company S&L Andes Export S.A.C.

S&L also has registered 100% in their name, the Chinita I concession, located about 5.5 km to the west of the Santa Elena concession (Bethania Mine). The Chinita I concession covers 200 hectares. Aerecura Materiales S.A.C. ("Aerecura"), a wholly owned subsidiary of Kuya, has filed for two additional concessions in the area, Tres Banderas 01 and 02, which are contiguous and together cover some 1500 hectares. The Company is permitted to undertake exploration work on the two concessions while they are in the process of being granted.

1.2 History

According to locals, silver veins in the region and on the Property (e.g., Española Vein) were first exploited by the Spaniards as early as the 1600s, through small-scale mining of the rich silver veins. Modern exploitation of the vein systems (Española and 12 de Mayo veins) started in 1977, was suspended in the 1980s due to political issues in Peru (i.e., terrorism), and subsequently re-started production in 2008 which continued until 2016.

1.2.1 Historical Mineral Reserves and Resources

S&L has calculated its own internal mine resources and reserves for internal planning purposes and at times to promote investment in the mine (Milla, 2016a; Milla and Osorio, 2016). These calculations, summarized in Table 1-1, have not been verified by a third party nor independently by a QP and are therefore not considered by Company management as being NI 43-101 or JORC Code compliant.

The Author has reviewed the amount and quality of the data used by S&L and their modelling methods and is of the opinion that the mineral resources and reserves, although not independently calculated, are of high quality and reliable for the purposes of operations and planning at the Bethania Mine.

Table 1-1. Summary of historical mineral reserves and resources, Bethania Mine.

Type	Tonnes (t)	Ag (g/t)	Ag (oz/t)	Pb (%)	Zn (%)	Ag (Contained Oz)
Mine Reserves	79,722	540	15.75	4.47	2.81	1,384,842
Resources	355,491	605	17.65	5.44	2.76	6,910,745
Totals:	**435,263**	**573**	**16.71**	**4.96**	**2.78**	**8,295,587**

1.2.2 Historical Stockpile Resources

A historical estimation of three stockpiles located on the Property, are estimated to contain some 25,000 tonnes of material at an approximate grade of 11.5 oz/t Ag, 4.5% Pb, and 1.3% Zn. Details of the size and grades of the three stockpiles are provided in Table 1-2. The Author noted the presence of the three stockpiles on the Property but did not conduct any sampling.

Table 1-2. Summary of historical mineral resources from three stockpiles on the Property.

Stockpile	Level (m)	Tonnes	Ag (g/t)	Ag (oz/t)	Pb (%)	Zn (%)	Ag (Contained Oz)
Cancha 1	740	6,084	414.51	12.09	7.10	1.91	81,080
Cancha 2	720	6,052	236.23	6.89	3.17	0.95	45,965
Cancha 3	690	21,527	288.69	8.42	2.38	0.68	199,805
	Total:	**25,247**	**402.51**	**11.74**	**4.50**	**1.27**	**326,850**

1.3 Geology and Mineralization

The Bethania Silver Project is located in the Cordillera Central, which contains prolific and prospective base and precious metals belts that are host to numerous styles of mineralisation including epithermal Au-Ag, porphyry Cu-Au-Mo, and replacement/skarn Zn-Cu. Peru is the second largest silver producer in the world with approximately 50% of silver production associated with gold production and 50% associated with base metal/polymetallic mines.

Given the lithological, structural, mineralogical and alteration characteristics observed at the Project and specifically in the Bethania Mine vein system, mineralization identified to date can be classified as a polymetallic intermediate sulphidation epithermal ("ISE"), with significant accumulations of silver, lead, zinc, copper, and gold. The Bethania Mine and other deposits, occurrences and mines in the immediate area are interpreted to be located within an ancient volcanic caldera.

1.4 Exploration Potential – Bethania Mine (Santa Elena)

At the Bethania Mine (Santa Elena concession), much can be gained by drilling along the well-known northeast-trending and lesser explored northwest-trending mineralized structures to determine continuity, from surface and/or from underground. In most cases, this should be a relatively low risk method to increase the resource size, resource confidence and understanding of the mineralization on the Property.

Historically, production has focused on the vein systems at Bethania and to date, no systematic studies have been conducted to identify and characterize the disseminated sulphide mineralization observed in the host rocks (i.e., altered andesite-dacite and stockwork siliceous breccias) located between the vein sets.

1.5 Mineral Processing and Metallurgical testing

Veins at the Bethania Mine have been mined, most recently and at small-scale, on and off between 1977 and 2016. Total silver recovery from January 2013 to August 2016, a combination of what was recovered from the production of lead and zinc concentrates through toll milling, was 741,804.83 ounces of silver. Between 2001 and 2015, there were six metallurgical studies commissioned by S&L that have been reported on by independent laboratories using material from the Santa Elena Mine (Bethania Mine).

1.6 Environmental Studies, Permitting and Social or Community Impact

S&L has secured all the necessary operational permits (mine, explosives, water), has an approved Declaracion de Impacto Ambiental ("DIA") which addresses the environmental and social impact of the mine and allows the Company to carry out mining operations in the mine area. The Company has submitted the Evaluacion de Impacto Ambiental ("EIA") for the processing plant which includes an outline for community workshops that evaluated the social impact. The Company has developed and maintains good positive relationships with the project's stakeholders, including an agreement with the local community of Bethania as it relates to the mine and processing plant.

1.7 Adjacent Properties

With the exception of the Corihuarmi gold heap leach mine to the northwest, properties adjacent to or within a few kilometres of the Santa Elena concession (Bethania Mine) are fragmented among several different owners, none of which are nearly as advanced or have the mining infrastructure of the Bethania Mine (Stein, 2018). The Author, in consultation with the Company, considers the most important adjacent prospects to be immediately north, south and west of the Property:

1) Immediately north of the Bethania Mine on what is referred to as the "Fiopo I" concession, there are several polymetallic showings and what appear to be abandoned artisanal mines. This ground has been held and explored in the past by Mineral IRL Limited ("MIRL").

2) South of the Bethania Mine, on what is referred to as the "El Alcatraz 12" concession, Stein (2018) described linear silicified outcrops similar to what is observed above mineralized veins at the Bethania Mine site - sulphides are weathered away leaving a silica dominant host rock. There are also polymetallic showings noted on regional maps, similar to those on the Fiopo I concession. This concession was previously worked as a joint venture between Minera IRL and Rio Blanco Copper.

3) MIRL drill-tested the area south of the Bethania Mine between 2008 and 2010 (mostly on the El Alcatraz 12 concession). No resource was ever reported, but several significant intersections of low-grade gold (~0.5 g/t Au) were reported from surface. The low-grade disseminated gold is reportedly similar to Minera IRL's Corihuarmi Mine, located approximately 5 km northwest of the Bethania Mine. The gold mineralization may be an indicated of a larger regional porphyry system that was feeding several different styles of precious and base metal mineralization in the area, including mineralization at the Bethania Mine.

In July 2010, MIRL reported initial exploration drilling results had indicated a potentially widely disseminated gold and copper system with plenty of space for a large mineralized body or bodies within the system. Six drill holes intersected broad zones of gold copper molybdenum mineralization, characteristic of the targeted porphyry system. The best drill hole results, from RC10-BET10 intersected 276 metres from surface averaging 0.38 g/t Au, 0.09% Cu, and 30 ppm Mo, including (also from surface) 72 metres at 0.66 g/t Au, 0.13% Cu, and 40 ppm molybdenum. Hole RC10-BET07 averaged 0.32 g/t Au, 0.09% Cu, and 32 ppm Mo over the entire 426 metres of the hole and included a zone of 124 metres at 0.39 g/t Au, 0.10% Cu, and 22 ppm molybdenum from 260 metres down hole. Drill hole RC10-BET09 recorded two intersections: 90 metres from surface at 0.46 g/t Au, 0.15% Cu, and 54 ppm Mo plus 64 metres from 216 metres down hole grading 0.41 g/t Au, 0.11% Cu, and 25 ppm molybdenum. Drill hole RC10-BET11 averaged 0.29 g/t Au, 0.10% Cu, and 30 ppm Mo over 424 metres from surface (MIRL news release July 5, 2019).

4) West of the Bethania Mine and immediately east of the Chinita I concession, are three properties owned by the same owner and known as Carmelitas. None of the properties have been permitted to mines, however several “exploration” adits have been opened up and polymetallic mineralization has been recovered. The size and potential of these artisanal mines is not yet known.

1.8 Other Relevant Data and Information

Kuya Silver is acquiring up to an 80% controlling interest in the Bethania Silver Project with a plan to modernize and upgrade the mine and expand production. Contingent on financing, initial expansion will take the mine to 350 tonnes per day (“tpd”) in the first year and subject to further exploration results at Bethania, as well as regional exploration results, Kuya may evaluate a second expansion to +500 tpd.

1.9 Interpretation and Conclusions

The Property, located in the Cordillera Central of Peru, is host to volcanic-hosted intermediate sulphidation epithermal Ag-Pb-Zn-Cu-Au mineralization. This polymetallic mineralization is primarily hosted by northeast-trending veins and structures which contain bonanza grade silver grades (i.e., >100 g/t Ag) and are hosted by altered andesite and dacite.

Given the extensive northeast-trending vein systems, the possibility of additional resources from the intervening mineralized volcanic host rock, prospectivity of the mineralized hydrothermal quartz stockwork (siliceous bodies), and the potential in the as yet unexplored northwest-trending veins, the Bethania Silver Property (Santa Elena) exhibits significant exploration upside.

Although historical in nature, mineral resources and reserves calculated by S&L and possibly containing 8.3M ounces of silver in 435,000 tonnes, demonstrate the future production potential of the Bethania Mine. Moreover, the stockpiles located on the mining concession could contain some 326,000 ounces of silver in 25,000 tonnes which could provide ready-feed to future production that

could be treated in a process plant immediately, while underground development and mining continues.

In addition to exploration, the Company is in the process of developing a mining plan for near-future implementation, along with the permitting and design of a 350 tpd process plant (flotation) and related water and tailings storage facilities. During the mine planning phase, the Company may want to evaluate the historical use of cut and fill mining methods against a potential change to the shrinkage stoping method.

1.10 Recommendations

It is the Author's opinion that additional exploration expenditures are warranted on the Bethania Silver Project and specifically the Bethania Mine (Santa Elena concession). Future attention should be given to the prospectivity of the additional concessions the Company has acquired in the region (i.e., Chinita I, Tres Bandera 01/02), but current focus should be on the Santa Elena concession (Bethania Mine).

A program comprising surface investigations (CAD$100,000) and underground/surface diamond drilling (CAD$475,000) is proposed for the Bethania Mine/Santa Elena concession (Table 1-3).

Table 1-3. Proposed exploration program for the Bethania Silver Mine, Santa Elena concession.

Surface Investigations		
Item	**Description**	**Objective**
3D Modelling/Data Integration	continue with integration and modelling as new information and data is generated	up to date database
Surveys	integrate and correlate historical surveys from surface and underground elevation and spot data	verify accuracy in existing surface and underground data models
Geological Mapping	systematic mapping and sampling; use of a handheld XRF unit to test rocks and soils	develop new target areas for trenching/sampling evaluate potential of volcanic host rocks
Alteration Study	mapping of alteration patterns assisted by a portable infrared mineral analyzer (PIMA) XRD unit	understanding of alteration system
Structural Study	structural mapping (contacts, veins, joints, faults) integrating surface and underground information	aid in future 3D geological modelling, interpretation and targeting
Diamond Drilling		
Item	**Description**	**Objective**
Diamond Drilling	8 holes totalling 1,944 metres; collared from surface and/or underground	test multiple veins, explore for new vein systems and test economic potential of the volcanic host rock between vein systems

2.0 INTRODUCTION

At the request of private Canadian company Kuya Silver Corp. ("Kuya" or the "Company"), Caracle Creek International Consulting Inc. ("Caracle" or the "Consultant"), a Canadian company, has prepared this technical report as a National Instrument 43-101 ("NI 43-101") Technical Report (the "Report") on the Bethania Silver Project (the "Project"), located in central Peru, about 175 direct kilometres southeast of Lima (Figure 1).

2.1 Terms of Reference and Purpose of the Report

This technical report was prepared as an NI 43-101 Technical Report for Kuya in preparation for a future transaction. In October 2017, Kuya entered into a Share Purchase Agreement ("SPA") to acquire up to 80% of the shares of S & L Andes Export S.A.C. ("S&L"), a private Peruvian company based in Lima, that owns 100% of the Bethania Silver Mine (Santa Elena concession) and Chinita I concession (together the "Asset").

Kuya agreed to acquire an 80% controlling interest in the Asset from Alfredo Soria and Erika Soria (the "Soria Family" - owners of S&L) by investing a total of US$10.0 million; a combination of work and capital/debt commitments to the Asset, cash payments, and shares in Kuya. The current SPA (amended February 2019) outlines the following transaction:

- US$4.5M investment in the Bethania Mine project:
  - US$2.5M toward repayment of debt and liabilities.
  - US$2M for a work program (drilling, PEA, mine expansion), mine care and maintenance, G&A, and deal costs.
- US$3.5M deferred acquisition payment (cash).
- US$2.0M in Kuya shares (share price of $1.00) on closing of acquisition.

The entire investment and payments must be made by April 30, 2020 (the "Closing Date"). If Kuya reaches the Closing Date before the entire investment amount and payment has been completed or Kuya terminates the agreement prior to the Closing Date, it will receive the proportional ownership of S&L based on a total valuation of US$12.5 million and enter into a new shareholders' agreement with the Soria family. Also, in the event that Kuya determines that the entire amount allocated to debt and liabilities repayment is not required, the difference could be re-allocated to the work program at Kuya's discretion such that the total investment amount remains the same. As of June 30, 2019, Kuya's investment of US$2.85M had earned the Company a 22.8% interest in S&L.

The quality of information, conclusions, and recommendations contained herein is consistent with the level of effort involved in Caracle's services, on the basis of: i) information available at the time of Report preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this Report. This Report is intended for use by Kuya subject to the terms and conditions of its contract with Caracle and relevant securities legislation. The agreement between Kuya and Caracle permits Kuya to file this Report with Canadian securities regulatory authorities pursuant to NI 43-101, Standards of Disclosure for Mineral Projects. Except for the

purposes legislated under provincial securities law, any other uses of this Report by any third party is at that party's sole risk. The responsibility for this disclosure remains with Kuya. The user of this document should ensure that this is the most recent technical report for the Project as it is not valid if a new technical report has been issued.

This Report provides a review of historical Mineral Resource and Mineral Reserve estimates with references to the classification of resources and reserves as outlined in the Canadian Institute of Mining, Metallurgy and Petroleum Standards on Mineral Resources and Reserves: Definitions and Guidelines, May 10, 2014 (CIM, 2014).

2.2 Qualifications of Consultant

Dr. Scott Jobin-Bevans (the "Consultant") preparing this Report is a professional geoscientist in the field of geology, mineral exploration, Mineral Resource and Mineral Reserve estimation and classification, underground mining, geotechnical, environmental, permitting, metallurgical testing, mineral processing, processing design, capital and operating cost estimation, and mineral economics.

The Consultant employed in the preparation of this Report has no beneficial interest in Kuya and the Consultant is not an insider, associate, or an affiliate of Kuya.

The results of this Report are not dependent upon any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings between Kuya and the Consultant. The Consultant is being paid a fee for their work in accordance with normal professional consulting practices.

Dr. Scott Jobin-Bevans, by virtue of his education, experience, and professional association, is considered a Qualified Person ("QP"), as defined in the NI 43-101, for this Report and is responsible for all sections in this Report. The Certificate of Author is provided in Appendix 1.

2.3 Details of Inspection – Site Visit

Dr. Scott Jobin-Bevans visited the Project on Tuesday, June 15, 2019, for one day. Scott was accompanied by Kuya Silver and S&L Andes Export S.A.C. personnel Alejandro Garcia (legal counsel for S&L) and Dionicio Milla Simon (Geological Engineer). The purpose of the site visit was to observe mine and general property conditions, surficial geology, underground geology and mining procedures, proposed sites for the processing plant and related equipment, and sites for any exploration work including historical surface trenching and excavation (past mining), inclusive of associated quality assurance/quality control ("QA/QC"). Travel from Huancayo to the Bethania Mine site took approximately 4 hours, followed by about 6 hours on site, and 4 hours to return to Huancayo.

During the site visit, a total of five rock samples were collected from five of the main veins, either from surface exposures or from underground workings (Table 1).

Figure 1. Country-scale location of the Bethania Silver Project and outline of departments, Peru, South America.

Table 1. Verification samples collected by the Author from the Bethania Silver Project, June 2019.

Sample	Vein/Site	Location	[1]UTMX	[1]UTMY	[2]UTMX	[2]UTMY	Description
KS-12M	12 de Mayo	surface	442700	8602856	442932	8603221	altered andesite; ~1% disseminated sulphide in wall rock; tourmaline veinlets with sulphide
KS-SW	Stockwork Andesite	surface	442719	8602924	442951	8603289	quartz vein stockwork in andesite; not correct location for siliceous body as mapped
KS-E2	Espanola 2	surface	443355	8603077	443587	8603442	altered dacite; semi-massive polymetallic sulphide sample
KS-CV	Carolina	surface	442616	8602920	442848	8603285	altered andesite; ~1% disseminated sulphide in wall rock
KS-E1	Espanola 1	670 Level	442718	8602955	442950	8603320	"Pirca 6"; polymetallic high-grade ore

[1]WGS84 Z18S; [2]PSAD56 Z18S

Samples were collected and packaged by the Author and dropped off at Bureau Veritas Inspectorate Services Peru laboratory based in Lima, Peru (Miller 249, Callao 07001). A summary of the results from the analyses is provided in Table 2, assay certificates are provided in Appendix 2, and a series of field/sample photos are in Appendix 3.

Table 2. Summary of assay results for the samples collected by the Author, June 2019.

Sample	Au (ppm)	Ag (ppm)	As (ppm)	Ba (ppm)	Cd (ppm)	Cu (ppm)	Cu (%)	Pb (ppm)	Pb (%)	Sb (ppm)	Zn (ppm)	Zn (%)
Method-->	FA430	MA301/402/FA530	MA301	MA301	MA301	MA301	MA402	MA301	MA402	MA301	MA301	MA402
KS-12M	0.434	8.4	538	148	30	443	-	1673	-	289	3285	-
KS-SW	0.054	0.3	80	417	<1	26	-	55	-	10	27	-
KS-E2	0.008	2584	1020	29	75	9654	-	-	20.965	7558	1786	-
KS-CV	2.014	364	1252	55	468	2385	-	-	3.527	3310	-	5.243
KS-E1	2.223	6916	1751	31	1485	-	2.002	-	14.106	>10000	-	20.989

The five rock samples were prepared for analysis under lab prep code PRP70-250:

> Crushing of sample to 70% passing mesh 10 (2 mm openings), riffle split 250 g of representative material from the total mass received and pulverize the 250 g split to 85% passing mesh 200 (75 micron openings).

Following preparation, the samples were analyzed for gold by Fire Assay Fusion-Cupellation with an Atomic Absorption Spectroscopy finish (lab code FA430-FA450):

> The prepared sample (30 g or 50 g) is mixed with a lead collection flux composed of PbO, sodium carbonate, borax and silica and loaded into a high temperature fusion furnace for 50 minutes. The reducing conditions convert the Pb) to metallic lead that forms a Pb-Au complex (lead button). The lead button is loaded into a high temperature cupellation furnace for an hour. The lead will be absorbed by the cupel and some is oxidized because of the presence of atmospheric oxygen in the furnace. When the cupellation is complete the gold containing prill (the doré bead) will be left in the cupel. The clean doré bead is introduced to a diluted mixture of nitric and hydrochloric acid (2-acid aqua regia), releasing the Au into solution, which is then sent for analysis by Atomic Absorption Spectroscopy (AAS). Lower and upper limits of detection for gold by this method are 0.005 ppm and 10 ppm, respectively.

Samples were analyzed for silver by four-acid digestion (near-total digestion) and an Atomic Absorption Spectroscopy finish (lab code MA402):

> The prepared sample (0.5 g) is introduced to four concentrated acids (nitric, hydrochloric, perchloric and hydrofluoric) which dissolves much of the sample material. The solution of digested sample is stabilized and calibrated then sent to be analyzed by Atomic Absorption Spectroscopy (AAS). The lower and upper limits of detection for silver by this method are 1 ppm and 1,000 ppm, respectively.

Samples were analyzed for 43 elements by four acid digestion and an ICP-OES finish (lab code MA301):

> The prepared sample is introduced to four concentrated acids (nitric, hydrochloric, perchloric and hydrofluoric) which dissolves much of the sample material. The solution of digested sample is stabilized and calibrated then sent to be analyzed by Inductively Coupled Plasma – Optical Emission Spectrometry (ICP-OES). Analyses for lead and zinc by this method have a 5 ppm lower limit of detection and a 10,000 ppm upper limit of detection. Copper by this method has a 2 ppm lower limit of detection and a 10,000 ppm upper limit of detection.

One sample reported an over limit for silver (>1,000 ppm Ag) and was re-analyzed by Fire Assay Fusion (30 g sample) with a Gravimetric finish (lab code FA530_Ag). Three samples reported over limits for copper, lead, and zinc and were re-analyzed by four-acid digestion (near-total digestion) with an Atomic Absorption Spectroscopy finish (lab code MA402).

2.4 Sources of Information

This Report is based in part on internal Company technical reports, production reports, previous studies, maps, published government reports, Company letters and memoranda, and public information as cited throughout this Report and listed in Section 27, References. The mining cadastre for Peru was accessed through GEOCATMIN (www.geocatmin.ingemmet.gob.pe/geocatmin) and digital data was acquired through the government of Peru website INGEMMET (www.ingemmet.gob.pe) and other online sources.

Standard professional review procedures were used in the preparation of this Report. Caracle reviewed data and information provided by Kuya, conducted a site visit to confirm the data and mineralization, and reviewed the project site.

Company personnel and related consultants were actively consulted post and during report preparation and during the mine site property visit. Personnel include David Stein (President and Director, Kuya), Christian Aramayo (Chief Operating Officer, Kuya), Alejandro Garcia (Legal Counsel, S&L Andes Export S.A.C.), Erika Soria (co-owner, S&L Andes Export S.A.C.), Dionicio Milla Simon (Geological Engineer, Consultant), and Guillermo Enrique Philipps (Mining Engineer/Bethania Advisor, S&L Andes Export S.A.C.).

2.5 Effective Date

The Effective Date of this Report is July 31, 2019.

2.6 Units of Measure

Table 3 identifies many of the terms and abbreviations used in this Report. All units in this Report are based on the International System of Units ("SI"), except for units that are industry standards, such as troy ounces for the mass of precious metals.

Table 3. Terms and abbreviations.

Abbreviation or Symbol	Unit	Abbreviation or Symbol	Unit
a	annum	L	litre
A	ampere	lb	pound
bbl	barrels	L/s	litres per second
btu	British thermal units	m	metre
°C	degree Celsius	M	mega (million); molar
CAD$	Canadian Dollar	m^2	square metre
cfm	cubic feet per minute	m^3	cubic metre
cm	centimetre	µ	micron
cm^2	square centimetre	mASL	metres above sea level
d	day	µg	microgram
dia	diameter	m^3/h	cubic metres per hour
dmt	dry metric tonne	mi	mile
dwt	dead-weight ton	min	minute
°F	degree Fahrenheit	µm	micrometre
ft	foot	mm	millimetre
ft^2	square foot	mph	miles per hour
ft^3	cubic foot	MVA	megavolt-amperes
ft/s	foot per second	MW	megawatt
g	gram	MWh	megawatt-hour
G	giga (billion)	oz	Troy ounce (31.1035g)
Gal	Imperial gallon	oz/t, oz/st, opt	Troy ounce per short ton
g/L	gram per litre	ppb	part per billion
Gpm	Imperial gallons per minute	ppm	part per million
g/t	gram per tonne	psia	pound per square inch absolute
gr/ft^3	grain per cubic foot	psig	pound per square inch gauge
gr/m^3	grain per cubic metre	RL	relative elevation
ha	hectare	s	second
hp	horsepower	st	short ton
hr	hour	stpa	short ton per year
Hz	hertz	stpd	short ton per day
in.	inch	t	metric tonne
in^2	square inch	tpa	metric tonne per year
J	joule	tpd	metric tonne per day
k	kilo (thousand)	tpm	metric tonne per month
kcal	kilocalorie	US$	United States Dollar
kg	kilogram	USg	United States gallon
km	kilometre	USgpm	US gallon per minute
km^2	square kilometre	V	volt
km/h	kilometre per hour	W	watt
kPa	kilopascal	wmt	wet metric tonne
kVA	kilovolt-amperes	wt%	weight percent
kW	kilowatt	yd^3	cubic yard
kWh	kilowatt-hour	yr	year

The currency used is United States Dollars ("USD" or "US$"), unless specified otherwise. Unless otherwise stated, coordinates are given in WGS84 projected coordinate system (EPSG:32718; suitable between 78°W and 72°W), UTM Zone 18S.

3.0 RELIANCE ON OTHER EXPERTS

The Author has relied on David Stein (President & CEO, Kuya Silver) and Alejandro Garcia (Lima-based legal counsel for S&L) for the legal description and title evaluations of the Santa Elena (Bethania Mine), Chinita I, Tres Banderas 01, and Tres Banderas 02 concessions. The Author expresses no legal opinion as to the concessions title or ownership status of the concessions other than to comment on the status of annual concession fee payments required to maintain the concessions in good standing and other information publicly available through the Peruvian Government website GEOCATMIN (http://geocatmin.ingemmet.gob.pe/geocatmin/).

The Author has relied on Kuya Silver principals and affiliated technical staff, including COO Christian Aramayo (P.Eng.) and consultant Dionicio Milla Simon (P.Eng.), for providing geologic, geochemical (assay), mining, and production information, as well as information available in the public domain. The Author expresses his confidence in the information provided to him by Kuya Silver, S&L Andes Export S.A.C., and their consultants and information available from the Government of Peru.

4.0 PROPERTY DESCRIPTION AND LOCATION

The Bethania Silver Project, located in the high Andes of Central Peru and about 70 km (direct) southwest of the city of Huancayo, capital city of neighbouring Junín Department, consists of four concessions situated near the borders of the departments of Huancavelica, Lima and Junín (Figures 2 and 3; Table 4). In general, all known mineralization, economic or potentially economic and the focus of this Report, is located within the Santa Elena concession (11020736X01). Collectively, the four concessions are referred to as the Bethania Silver Project (the “Project”) but the focus of this Report is on the Santa Elena concession (“Bethania Mine”, “Bethania Property” or the “Property”).

4.1 Property Location

The Santa Elena concession, on which the Bethania Silver Mine is located, is in the northwestern part of Huancavelica Department, Province of Huancavelica, and District of Acobambilla (Figure 3). Historically known as Mina Santa Elena, the Bethania Mine has been operating on and off since 1977 and was put on care and maintenance in 2016, due in part to the financial position of S&L at that time, and their objective to build their own on-site processing plant. The Bethania Mine and related infrastructure are centred at approximate UTM coordinates 442766mE, 8603236mS (PSAD56, UTM Zone 18 South; EPSG:24878) and at about 4,688 metres above sea level (“mASL”).

4.2 Mineral Titles

The Peruvian state is the owner of natural resources, which include minerals; therefore, the Peruvian state owns mining rights. Exploration use and exploitation of mining rights can be granted to private parties, through the regime of mining concessions. Mining concessions have the nature of immoveable goods. Copies of the mineral titles for the four concessions are provided in Appendix 4.

The Bethania Property, registered as Santa Elena (Bethania Mine), is licensed as a mining concession and was originally registered in 1970 to cover artisanal and colonial-era pits and workings known at the time. This concession, covering 45 hectares (1.5 km x 300 m), is owned 100% by Peruvian company S&L Andes Export S.A.C. (Table 4).

S&L also has registered 100% in their name, the Chinita I concession, located about 5.5 km to the west of the Santa Elena concession (Bethania Mine). The Chinita I concession is 2.0 kilometres by 1.0 kilometres and covers 200 hectares (Figure 3).

Aerecura Materiales S.A.C. ("Aerecura"), a wholly owned subsidiary of Kuya, has filed for two additional concessions in the area, Tres Banderas 01 and 02, which are contiguous and together cover some 1500 hectares (Table 4). These two concessions are currently "En Tramite" (translation: in process), but it is expected that they will be converted to "Titulado" (translation: titled) within one year of their respective application dates. The Company is permitted to undertake exploration work on the two concessions while they are in the process of being granted.

Table 4. Summary of mineral concessions that comprise the Bethania Silver Project.

Mineral Title	Ownership	Type	Authorized	Due Date	Reference	Hectares
Santa Elena	S&L Andes Export S.A.C.	Titulado (Concesion)	June 10, 1970		11020736X01	45
Chinita I	S&L Andes Export S.A.C.	Titulado (Concesion)	March 11, 2010		650006710	200
*Tres Banderas 02	Aerecura Materiales S.A.C.	Tramite	*November 12, 2018*	-	010427218	1000
*Tres Banderas 01	Aerecura Materiales S.A.C.	Tramite	*July 5, 2019*	-	010226519	500
*applied						

In Peru, mineral concessions are granted following receipt of a paper application specifying the coordinates of the claim boundaries, based on UTM Zone 18 South (datum WGS 1984) coordinates. All pre-2016 claims were staked using the PSAD 1956 datum but were subsequently converted to the new WGS 1984 coordinate system. All new concessions must use the new grid and must be at least 100 ha in area. Where new claims overlap with older concessions converted to the new system, the older concession has precedence.

Mining concessions are considered immovable assets and are therefore subject to being transferred, optioned, leased and/or granted as collateral (mortgaged) and, in general, may be subject to any transaction or contract not specifically forbidden by law. Mining concessions may be privately owned and the participation in the ownership of the Peruvian State is not required. Buildings and other permanent structures used in a mining operation are considered real property accessories to the concession on which they are situated.

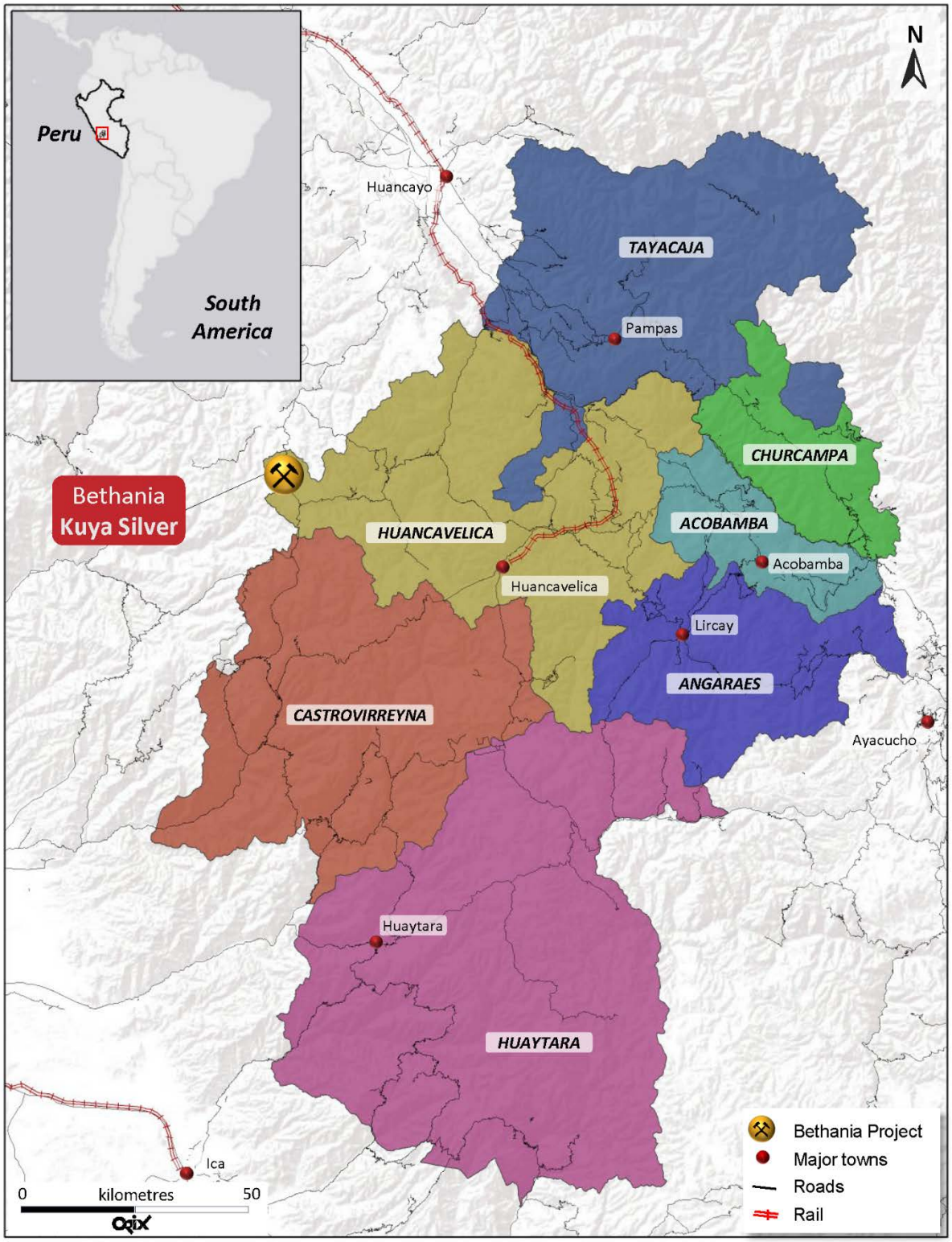

Figure 2. Department-scale location of the Bethania Silver Project in Huancavelica Department, Province of Huancavelica, and District of Acobambilla, Peru, South America.

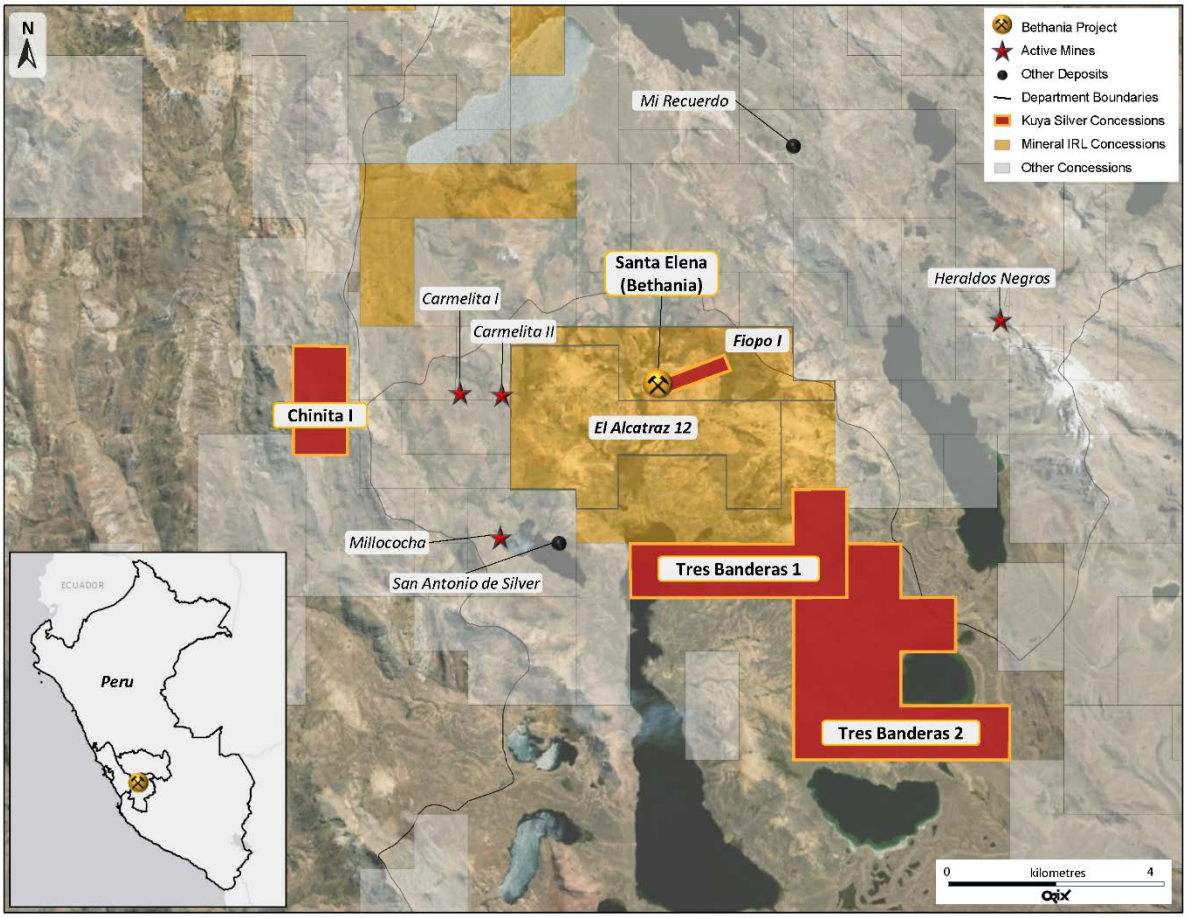

Figure 3. Locations of relevant mining concessions, active mines, and deposits in the region of the Bethania Silver Project (see Table 4).

Two of the four concessions are “Titulado” and are in good standing and Caracle is not aware of any pending litigation or legal issues relating to the Property. Assuming the requisite annual investment is achieved and annual “Derecho de Vigencia” (right of validity) payments are made, concessions are considered irrevocable.

4.2.1 Surface Rights

Mining concessions constitute a different right from surface land over it. Owners of surface lands are not authorised to perform mining activities, unless they have a valid mining concession title granted by the INGEMMET. Surface rights are not included in mineral rights, and permission must be obtained in writing from owners and a two third majority of community members when surface rights are owned by local communities, before commencing drilling activities.

The surface lands in the area of the Bethania Mine belong to the Community of Poroche. The Company has a long-term agreement signed with the Poroche which allows them surface access to the 45 hectares of the Santa Elena concession (Bethania Mine). In addition, the Company recently signed an agreement to allow the Company to indefinitely access and permit 37 hectares of

Poroche lands to be used for the planned processing plant and tailings facility. A further area of land has been secured by the Company from the Poroche to be used for a future water treatment plant.

4.3 Royalties, Agreements and Encumbrances

As of 2018, mine production in Peru is subject to a Royalty, payable to the Peruvian government. This Royalty is based on a percentage of the sale value of the minerals being exploited, ranging between 1% and 3% (Table 5).

Table 5. Production royalties payable to the government of Peru.

Total Mineral Sales	Royalty Payable
<US$60M	1.00%
US$60M to <US$120M	2.00%
≥US$120M	3.00%

There are no other production royalties attached to the properties.

4.4 Permitting

Companies must obtain a government permit prior to commencing any drilling or major earth moving programs, such as road and drill pad construction. Depending on the scale of work intended, exploration programs must be presented to the Ministry of Mines, which then will grant an approval to initiate activities provided the paperwork is in order. All major ground disturbances must be remediated and re-contoured following completion of the work activities.

Mining activities at the Bethania Mine are subject to various Peruvian mining laws, regulations and procedures. Mining Activities in Peru are subject to the provisions of the Uniform Code of the General Mining Law ("General Mining Law"), which was approved by Supreme Decree No. 14-92-EM, on June 4, 1992 and its subsequent amendments and regulations, as well as other related laws. Under Peruvian law, the Peruvian State is the owner of all mineral resources in the ground. The rights to explore for and develop these mineral resources are granted by means of the "Concessions System" (https://iclg.com/practice-areas/mining-laws-and-regulations/peru).

4.4.1 Required Permits and Project Status

S&L has secured all the necessary operational permits (mine, explosives, water), has an approved Declaracion de Impacto Ambiental ("DIA") which addresses the social impact of the mine, and will soon submit the Evaluacion de Impacto Ambiental ("EIA") which will include an outline for community workshops to evaluate the social impact. The Company has developed and maintains good positive relationships with the project's stakeholders, including an agreement with the local community of Bethania as it relates to the mine and processing plant.

4.5 Annual Fees and Obligations

The mining concession shall be maintained by paying validity fees and complying with the corresponding minimum production obligation ("MPO"). Regarding the obligation to pay the validity fees, the price of these administrative fees depends on the condition of the title-holders (small, artisanal or general regime). Validity fees shall be paid annually to maintain mining concessions in force. The non-compliance of validity fees payment for two consecutive years causes the mining concession to expire.

Pursuant to article 39 of the General Mining Law, title holders of mining concessions pay an Annual Maintenance Fee (Derecho de Vigencia). The Derecho de Vigencia is due on June 30 of each year and is paid one year in advance and is calculated at US$3.00 per hectare. Failure to pay Derecho de Vigencia for two consecutive years causes the expiration (caducidad) of the mining concession. However, according to article 59 of the General Mining Law, payment for one year may be delayed with penalty and the mining concessions remain in good standing. The outstanding payment for the past year can be paid on or before the following June 30 along with the future year.

Concession owners must pay US$3.00 per hectare to file each claim, plus an administrative fee. An annual holding fee of US$3.00 per hectare is required to maintain the claims, once granted, for the first six years, after which the owner is assessed at twice the annual rate, in addition to the annual holding fee, if the property has not been put into production.

Annual holding costs for the current Kuya Titulado concessions are US$735. Assuming conversion of the two Tramite concessions (Tres Banderas 1 and 2) to Titulado, the new annual holding costs will be US$4,745.

4.5.1 Small-Scale Production

Small title-holders are entities or individuals holding concessions in an area of less than 2,000 hectares with no more than 350 tonnes per day ("tpd") of production and must pay a validity fee of US$1.00 per hectare; artisanal title-holders are entities or persons holding concessions in an area of less than 1,000 hectares with no more than 25 tpd and must pay a validity fee of US$0.50 per hectare; finally the general regime applicable for entities or persons who do not qualify as small or artisanal and the fees are US$3.00 per hectare. Validity fees must be paid annually to maintain mining concessions in force. Non-compliance of validity fee payment for two consecutive years results in the extinction of the mining concession.

The Company, whose Santa Elena concession (Bethania Mine) is 45 ha, is currently permitting its operations as a <350 tonnes per day producer and as such will be considered a "small title-holder" requiring them to pay a validity fee of US$1.00 per hectare (US$44.90 payable annually). The Chinita I concession requires an annual payment of US$200.

The Mining Law obligates mining concessions holders to move into production. Currently, two regimes of MPO coexist:

(i) Legislative Decree No. 1054 (granted on June 2008) this regime established that mining concessions holders – qualifying under the general regime - need to reach a minimum annual production equivalent to one tax unit (approximately US$1,160) per year per hectare. If the holder of mining concession cannot reach such minimum annual production on the first semester of the eleventh year since the year in which the concessions was granted, the holder will be required to pay a penalty equivalent to 10% of the applicable minimum production per year per hectare until the fiftieth year. After the period of 15 years, the mining concessions may remain in force for an additional period of up five additional years in the case of: (i) the holder paying the applicable penalty and securing investments in the mining concession of 10 times the applicable penalty that should be paid; or, (ii) events of force majeure. If the minimum production is not reached after this period has lapsed, the mining concession will inevitably expire.

(ii) Legislative Decree No. 1320 – (granted in 2017 and in force in year 2019) according to this disposition, mining concessions holders shall reach the minimum annual production on the first semester of the eleventh year since the year in which the concession was granted. Under this new regime if the mining concession holder could nor reach such minimum annual production, it will be required to pay a penalty equivalent to 2% of the applicable minimum production per year per hectare until the fiftieth year. If the holder cannot reach the minimum annual production on the first semester of the sixtieth year since the year in which the concessions was granted, holder will be required to pay a penalty equivalent to 5% of the applicable minimum production per year per hectare until the twentieth year. If the holder cannot reach the minimum annual production on the first semester of the twentieth year since the year in which the concessions was granted, the holder will be required to pay a penalty equivalent to 10% of the applicable minimum production per year per hectare until the thirtieth year. Finally, if the holder cannot reach the minimum annual production until during this period, the mining concession will be automatically expired.

4.6 Ownership of Mining Rights

According to General Mining Law mining concession is irrevocable as long as titleholder fulfils the legal obligations required to maintain it in force. However, the titleholder shall comply with the entire obligation in order to maintain the mining concession valid. General Mining Law provides that mining concessions can be extinguished only by: expiration as a consequence of a failure by a titleholder to pay the mining validity fee and/or penalties for two years (consecutive or not); abandonment as a consequence of the breach of the mining procedure rules applicable to a mining claim; nullity in the case that a mining concession was claimed by an individual or entities that have restrictions according to the mining law; resignation in the case that the titleholder requests the extinction of the mining right; and, cancellation in the case that a mining concession overlaps with priority rights, or when the right is unassailable.

Pursuant to the General Mining Law, mining rights may be forfeited only due to a number of circumstances defined by law (i.e., non-payment of the maintenance fees and/or noncompliance with the Minimum Production Obligation). The right of concession holders to sell mine production

freely in world markets is established. Peru has become party to agreements with the World Bank's Multilateral Investment Guarantee Agency and with the Overseas Private Investment Corporation.

4.7 Taxation and Foreign Exchange Controls

The Tax Administration Superintendent is the entity empowered under the Peruvian Tax Code to collect federal government taxes. The Tax Administration Superintendent can enforce tax sanctions, which can result in fines, the confiscation of goods and vehicles, and the closing of a taxpayer's offices.

The corporate tax rate in Peru is 29.5%, personal income tax is 39%, and withholding tax for dividends paid to non-resident companies is 5%, subject to existing tax treaties between the countries involved in the transaction. There are currently no restrictions on the ability of a company operating in Peru to transfer dividends, interest, royalties or foreign currency into or out of Peru or to convert Peruvian currency into foreign currency.

Temporary Net Assets Tax, which applies to companies' subject to the General Income Tax Regime, imposes a 0.4% tax on any asset exceeding one million Peruvian soles (approximately US$305,000). Taxpayers must file a tax return during the first 12 days of April and the amounts paid can be used as a credit against Income Tax. Companies which have not started productive operations or those that are in their first year of operation are exempt from the tax.

The general rate of Value Added Tax ("VAT") is 18% (16% of VAT itself plus 2% of municipal promotion tax). VAT is applicable to (1) Sale of goods within the country; (2) Rendering or first use of services within the country; (3) Construction contracts; (4) The first sale of real estate made by constructors; and, (5) Import of goods. For all transactions, the vendor is subject to VAT, except in the case of importation of goods or services rendered abroad, but economically used within Peru, for which VAT is self-assessed by the importers and users, respectively. The VAT law follows a debit/credit system, and input VAT may be offset by output VAT. Should excess input VAT be obtained in a particular month, it shall offset output VAT obtained during the following months, until it is exhausted.

4.8 Environmental Liabilities

Caracle is not aware of any environmental liabilities on the Project or Property. On August 22, 2019, the Company submitted its Environmental Impact Assessment ("EIA") for the Bethania Processing Plant to the Regional Mining Office of Huancavelica ("DREM") for its review and approval.

4.9 Other Significant Factors and Risks

Caracle is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the Project or Property.

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

The Bethania Silver Project is located in the high Andes of Central Peru, in the very northwest area of Huancavelica Department, about 316 km by road from Peru's capital city of Lima (Figures 1, 2 and 3). The Project is near the triple junction of the three departments of Lima, Junin and Huancavelica. It is possible to drive to the Property via the Pan Americana Highway South (Route 1S) from Lima, exiting eastward at Canete/San Vicente (exit 132) toward Route 24, travelling Route 24 to LM-936 and then onto Road 128 north to Bethania. This drive covers about 316 km and takes about 6.5 hours to complete. Alternatively, it is possible to fly from Lima to Jauja (Jauja is about 50 km or a one hour drive from Huancayo) and then drive southwest to the Property via Huancayo (about 4 hours).

5.1 Access to Property

From Huancayo it is about 120 km to the small village of Bethania, first along a well maintained paved road to the village of Chongos Alto (~2 hours) and then secondarily along a gravel road that winds its way through the interior to the Property. The drive from the city of Huancayo to the Bethania Mine takes about 3.5 to 4.0 hours and is best accomplished in a 4x4 truck.

5.2 Climate and Operating Season

Climate is seasonal with heavy rains typically falling between November and March but does not hinder operations which can be year-round in some capacity. Average annual temperatures in Huancavelica, about 60 km southeast of Bethania and at 3700 mASL, are shown in Table 6.

Table 6. Average annual temperatures and precipitation in Huancavelica Department, Peru.

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	9.8	9.7	9.7	9.5	8.6	7.5	7.3	8.2	9	9.6	9.9	9.7
Min. Temperature (°C)	3.8	3.8	3.6	2.6	0.7	-1.3	-1.8	-0.8	0.9	1.9	2.1	2.7
Max. Temperature (°C)	15.9	15.6	15.8	16.5	16.6	16.4	16.5	17.2	17.2	17.4	17.7	16.8
Avg. Temperature (°F)	49.6	49.5	49.5	49.1	47.5	45.5	45.1	46.8	48.2	49.3	49.8	49.5
Min. Temperature (°F)	38.8	38.8	38.5	36.7	33.3	29.7	28.8	30.6	33.6	35.4	35.8	36.9
Max. Temperature (°F)	60.6	60.1	60.4	61.7	61.9	61.5	61.7	63.0	63.0	63.3	63.9	62.2
Precipitation / Rainfall (mm)	126	146	140	57	24	9	11	22	39	53	61	96

There is a difference of 137 mm of precipitation between the driest and wettest months and the variation in temperatures throughout the year is 2.6 degrees Celsius.

5.3 Local Resources and Infrastructure

Huancayo (3,259 mASL), with a population of approximately 456,250 (2017 census) and Huancavelica (3,676 mASL), with a population of approximately 49,570 (2017 census), are the nearest significant population centres. These cities offer a range of goods and services, education institutions, and workers well-experienced in mineral exploration and mining (Figure 2).

S&L rents some of the buildings in the village of Bethania for accommodation and office space but also have offices and warehouses set up near the mine site itself. Permitted installations include a wastewater pond, fuel storage and explosives magazine.

5.3.1 Water Rights

The Company through S&L has been granted a water permit by the National Water Authority (dated April 11, 2012) and which is subject to an annual fee of approximately 300 soles (US$91.00).

Mining industry demands a great percentage of water to develop its activities (such as mineral processing, dust suppression, mud transportation and employee's needs). As a consequence of that, the Peruvian mining industry has focused its efforts on being appreciated as an activity that makes sustainable use of resources and the environment, including the preservation of water sources.

The National Water Authority ("ANA") is the entity assigned to the Agriculture Ministry and responsible for granting water rights. The corresponding water rights are the following: (i) licence: it is the right granted in order to use the water to a certain aim and in a determined place, and will be valid until the activity for which it was granted subsists (i.e., beneficiary concession); (ii) permission: it is the right granted in surplus water periods, by which the use of water is eventual and temporal; and (iii) authorisation: this is a right granted only for a period of two years – extended for an additional year – for the execution of studies, construction and land wash (i.e., mining projects). None of these are unlimited nor indefinite. In order to maintain valid water rights, their beneficiary must fulfil certain duties, the main ones being: (i) payment of retribution, water tariff and any other economic obligation; and (ii) allocating the use of water according the water right requested.

According to the hydrological law, the water rights cannot be transferred nor mortgaged. However, in case the titleholder of the activity or of the surface land who is also the beneficiary of a water right change, the new title holder will able to initiate a simple procedure to obtain the corresponding water right needing only two requirements: (i) a document that accredit the title in favour of the new one and (ii) accomplish with the payment of the economic retribution (https://latinlawyer.com/jurisdiction/1004576/peru).

5.3.2 Electricity

Approximately 9% of Peruvian territory is supplied with electrical power, however, if energy supply does not reach mining facilities or if the supply is deficient, it is possible for the mining facilities to generate their own energy supply in order to perform their activities. If the power generated is not

over than 500 kW, it can be made freely without authorisation. If the power is over than 500 kW it will need the authorisation (in the case of thermoelectric generation) or an electrical concession (in case the electric power is generated with renewable natural resources) from the Ministerio de Energia y Minas (MINEM; https://www.gob.pe/minem).

The Bethania Silver Project does not have any existing power lines with the closest being 5 km and 8 km away. In the past, the mine has relied on diesel generators to provide the necessary electrical requirements.

5.4 Physiography

The Bethania Silver Project is characterised by gently rolling topography between 4,691 and 4,858 mASL. Hillsides can be barren of vegetation or populated by short grasses and bushes, valley bottoms are typically more densely vegetated. Transient grazing of various animals is the only recognised farming activity in the area of the Project.

There are several large lakes in the region, some connected by seasonal and/or year-round river systems, including Coyllococha and Huichicocha (north of the Property), Acchicocha (east of the Property), and Huarmi Chocha, Ujujuy, Millococha, Nahuincocha, Shucullococha, and Astococha (south of the Property).

6.0 HISTORY

The earliest history of the Bethania Mine comes from verbal communication with the local inhabitants of the area. According to locals, silver veins in the region and on the Property (e.g., Española Vein) were first exploited by the Spaniards as early as the 1600s, through small-scale mining of the rich silver veins. Modern exploitation of the vein systems (Española and 12 de Mayo veins) started in 1977, was suspended in the 1980s due to political issues in Peru (i.e., terrorism), and subsequently re-started in 2008, continuing until mid-2016.

6.1 Property Ownership

Although production at the Bethania Mine began in 1977, the earliest confirmed ownership of the Property (Santa Elena Mine) comes from a 1988 technical report by Minero Bank of Peru, which points to the owner as engineer Heraclio Lopez.

In 1989, the Property was purchased and transferred to company S&L Andes Export S.A.C., owned by the Soria family (Peru), the current owner of the Property.

6.2 Exploration - Surface

The earliest written referral to the Property is from an August 1988 technical report prepared by the Minero Bank of Peru. This report also refers to a regional study carried out by Minero Bank in 1977 that examined the Bethania – Huarmicocha areas including the Santa Elena Mine. The 1988

report by Minero Bank described exploration in the region as minimal and production from the Santa Elena Mine as small-scale, implicating the lack of a nearby concentration plant as the main reason for it remaining small. Production methods at this time focused on high-grade, selective mining of the veins.

Historical surface exploration on the Property by S&L (2008-2016) has been limited to geological and structural mapping and rock sampling, trenching and sampling, and the drilling of short "pack sack" drill holes. The general locations and projections of some of these packsack drill holes are shown on mine level plans but results from this drilling are not available. No other surface exploration is known to have been completed on the Property.

6.2.1 Due Diligence Sampling – 2017

In January 2017, David Stein and Christian Aramayo visited the Bethania Mine as part of the Company's due diligence. At this time, two grab samples were collected from the Property (Table 7): (1) Rock sample from mineralized quartz stockwork which assayed 74.74 g/t Ag and 0.55 g/t Au; and, (2) Sample from ore stockpile which assayed 554.40 g/t Ag, 1.71 g/t Au, 6.60% Pb, 1.13% Zn, and 0.45% Cu. Of significance are the high concentrations of silver and anomalous gold in the quartz stockwork which occurs at various locations on the Property (surface and underground) in regions between historically targeted vein systems and has never been the target for potentially economic ore.

Table 7. Summary of due diligence surface samples collected by D. Stein in 2017.

Sample	*UTM E	*UTM N	Description	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Cu (%)
00037-1	442982	8603306	Siliceous Stockwork	74.74	0.55	na	na	na
00037-2	442584	8603208	Ore Stockpile near 670m Portal	554.40	1.71	6.60	1.13	0.45
*PSAD56, UTM Zone 18 South; EPSG:24878								

6.3 Exploration – Underground

S&L provides the most thorough documentation on underground exploration on the Property. Exploration for vein extensions, vein splays and new veins is a continuous part of the mining plan/program at the Santa Elena (Bethania Mine). For example, ahead of the 2012 mining year, S&L proposed their exploration plan:

> During the period of 2012, in the project will be developed an intense exploration program in the back of the denunciation with the purpose of locating more economic veins and in this way to prolong the useful Life of Mine, will develop exploration short, cruises, chimneys and galleries. The work was mainly directed towards the exploration of the main veins (12 de Mayo and Española 1), as well as to the surface exposures of veins (Española 2 and Santa Elena), with some later exploration aimed at the structures identified in the underground mine, such as the Victoria, 12 de Mayo, Branch, Carolina, Rocio, and Betzaida.

6.4 Historical Mineral Reserve and Mineral Resource Estimates

S&L has calculated its own internal mine resources and reserves for internal planning purposes and at times to promote investment in the mine (Milla, 2016a; Milla and Osorio, 2016). These calculations, as summarized in Table 8, have not been verified by a third party nor independently by a QP and are therefore not considered by Company management as being NI 43-101 or JORC Code compliant.

The Author has reviewed the amount and quality of the data used by S&L and their modelling methods and is of the opinion that the mineral resources and reserves, although not independently calculated, are of high quality and reliable for the purposes of operations and planning at the Bethania Mine. Representative cross-sections showing mineral reserve and resource calculations are provided in Appendix 8.

Table 8. Historical Mineral Resources and Mineral Reserves, Bethania Mine (Milla, 2016a).

Type	Tonnes (t)	Ag (g/t)	Ag (oz/t)	Pb (%)	Zn (%)	Ag (Contained Oz)
Mine Reserves	79,722	540	15.75	4.47	2.81	1,384,842
Resources	355,491	605	17.65	5.44	2.76	6,910,745
Totals:	**435,263**	**573**	**16.71**	**4.96**	**2.78**	**8,295,587**

6.4.1 Calculation of Historical Mineral Reserves and Resources

Mineral reserves and resources were calculated using simple block modelling for ore stopes and larger resource blocks using the data collected through drifting and thousands of assay samples of the mine workings (Stein, 2018). The Bethania Mine has more than 6,000 metres of horizontal development among seven (7) different veins. In addition, there is vertical development in the ore reserve areas between production stopes. The vein and ore development were methodically sampled for silver, lead and zinc consistently, as well as the thickness of each vein sample recorded.

Copper and gold were assayed only intermittently, and while samples suggest significant gold and copper grades are associated with the polymetallic ore, more sampling is required in order to include these metals in any future mineral resource estimates. Non-systematic sampling and assaying for copper and gold suggests likely grades of 0.25-0.4% Cu and approximately 1.0 g/t Au.

Mineral reserve estimates consider mineralized material that is immediately accessible by existing mine workings and is exclusive of Mineral Resources. Reserves include remnant ore blocks in the upper 150 metres of the mine that could be recovered, as well as mineralized material between the 4640 m and 4670 m levels, ready for near-term production. In all cases, at least one side of the reserve block (usually the top) has been directly sampled and assayed.

Resources are projected vertically at depth, using average vein widths and grades. Indicated resources are calculated at 120 m depth from the lowest level of reserves in each vein, and inferred resources are calculated at 60 m depth from the indicated resources (for a total of 180 m depth).

6.5 Historical Stockpile Resources

In 2013, engineers from Urion del Peru S.A.C. ("Urion"), a consulting group from Lima and subsidiary of multinational commodity trading company Trafigura Group Pte. Ltd., visited the Property and wrote a report (Donayre and Guzman, 2013). The purpose of the site visit was to assess the production potential of the mine, verify and sample three ore stockpiles on the Property, and to determine and compare the costs involved to deliver ore to Minera Sol, planta de Roy Rivera (242 km by road) northwest of Huancayo or Corporacion Castrovirreyna (169 km by road) in Huancavelica Department.

Urion estimated the three stockpiles contained some 25,000 tonnes of material at an approximate grade of 11.5 oz/t Ag, 4.5% Pb, and 1.3% Zn. Details of the size and grades of the three stockpiles are provided in Table 9. The Author noted the presence of the three stockpiles on the Property but did not conduct any sampling.

Table 9. Approximate size and grade of three stockpiles at the Bethania Mine.

Stockpile	Level (m)	Tonnes	Ag (g/t)	Ag (oz/t)	Pb (%)	Zn (%)	Ag (Contained Oz)
Cancha 1	740	6,084	414.51	12.09	7.10	1.91	81,080
Cancha 2	720	6,052	236.23	6.89	3.17	0.95	45,965
Cancha 3	690	21,527	288.69	8.42	2.38	0.68	199,805
	Total:	**25,247**	**402.51**	**11.74**	**4.50**	**1.27**	**326,850**

It should be noted that the hand sampling completed by Urion did not test more than a few metres into the stockpiles. Given the age of the stockpiles and the weathering they have subjected to over time, it is likely that sulphide enrichment has occurred at depth into the piles and so the overall grade can be expected to be higher as one goes deeper.

According to the Company, there are also unanalyzed additional stockpiles from the Española Vein located underground on Levels 720, 830, 830E, and 850E, totalling approximately 13,500Mt.

6.6 Historical Production – Santa Elena/Bethania Mine

The Bethania Mine (also referred to as Mina Santa Elena or Santa Elena Mine) has operated during three periods between 1977 and 2016. Historically, mining has occurred on multiple structurally controlled veins within the mine property. Additional historical production reporting along with level plan maps of historical underground sampling from the Bethania Mine are provided in Appendix 5.

6.6.1 Santa Elena Mine: 1977 to 1988

Between 1977 and 1988, production by operators Compania Minera Sierra Nevada S.A. focused on the veins 13 de Enero (now named Española 1) and 12 de Mayo (current name) using upward cut and fill mining methods and under the following criteria:

- A dilution width of 20 cm, 10 cm per mining panel.
- A cut of the mineral zone was not necessarily linear but followed the mineralization.
- A cut width of at least 1 metre with surplus waste serving as fill.
- A specific gravity of 3 g/cm3 (t/m3) applied to production estimations.

During this time, the 12 de Mayo vein had three levels and produced about 4,500 tonnes of ore:

Level 4649m: 300 metres of drifts and four raises creating about 7,700 tonnes of accessible ore. Operating grade was 18.9 oz/t Ag, 4.69% Pb and 3.89% Zn. Sampling of the vein system is provided in Table 10.

Table 10. Sampling of the 12 de Mayo vein on Level 4649m, Bethania Mine.

Sample	Width (m)	Ag (oz/t)	Pb (%)	Zn (%)
7960	0.25	18.3	5.18	3.56
7969	0.35	8.6	4.01	5.13
7970	0.30	0.1	0.15	0.60
7971	0.30	8.8	5.80	2.09
7972	0.15	45.9	29.03	5.50
7973	0.30	52.3	8.29	6.60
7974	0.20	73.2	39.13	9.87
7975	0.20	34.0	14.21	8.24
7976	0.20	12.4	13.77	17.82
7977	0.35	24.9	8.31	4.51

Levels 4717m and 4770m: 50 metres of drifting. Sampling of the vein system is provided in Table 11.

Table 11. Sampling of the 12 de Mayo vein on Levels 4717m and 4770m, Bethania Mine

Sample	Width (m)	Ag (oz/t)	Pb (%)	Zn (%)
7982	0.15	40.61	14.56	7.59
7983	0.10	12.60	3.09	6.07

During this period 5,000 tonnes of ore was produced and results of this mining are summarized in Table 12.

During this period, nine shipments of ore were made to the Cercapuquio plant located about 43 km northeast of the Bethania Mine. The ore was shown to be amenable to sulphide flotation.

Consideration was given to constructing a flotation plant at the mine site, but this endeavor failed to find adequate financing. The mine was put on care and maintenance from 1989 to 2008 due to low metal prices.

Table 12. Summary of mining (1977 to 1988), Santa Elena Mine (Bethania Mine).

Vein	Cut	Galery (mts)	Pipe (mts)
Veta 13 de Enero	101	366	77
Veta 12 de Mayo		230	59

Vein	Pot. M	Ag Oz/Tc	Pb%	Zn%
Veta 13 de Enero	0.57	20.73	5.48	9.90
Veta 12 de Mayo	0.30	25.58	11.58	6.29

	Tons	Au Oz/Tc	Ag Oz/Tc	Pb%	Zn%	Cd%
Mineral for flotation		-	12.00	3.70	4.00	
Wipe mineral	213.00	-	82.00	41.00		
Conc. Pb	109.00	0.20	100.42	42.00		
Conc. Zn	84.00	-	11.60		46.50	0.30
Conc. Bulk Pb/Zn	256.00	0.10	58.10	20.00	30.30	0.18

6.6.2 Santa Elena Mine: 2008 to 2010

In June 2008, under a mining contract with S&L, the company San Antonio de Silver re-started production at the Santa Elena Mine. By 2010 they were producing 60 tonnes per month of selective high-grade ore with grades up to 30 oz/t Ag. Between 2012 and 2014 production reached 3,000 tonnes per month.

From 2008 to 2010, mine development and mining focused on veins 12 de Mayo, Española 1, and Victoria, developing four mine levels (Table 13).

Production focused on vein 12 de Mayo (Table 14) using upward cut and fill mining methods and utilized the following equipment:

- Wagner ST-2D Scooptram (2.5 cubic yards)
- 15 CFM (cubic feet/minute) Fan
- Ventilation Sleeves
- 15 HP Electric Tow Winch
- 1 ton Mining Cars (x8)
- 750 CFM Ingersoll Rand Compressor
- 850 CFM Atlas Copco XAMS Compressor
- CAT D343 120 kW Caterpillar Generator Set
- Jack Leg Drilling Rig (x6)

During a period of about 17 months the mine produced between 1,200 to 1,500 tonnes per month.

Table 13. Development completed by San Antonio de Silver at the Santa Elena Mine (2008-2010).

Level	Tipe	Name	Meters	Section
760	Preparation	Galery 195	171.00	1.20 x 2.10
760	Preparation	Galery 995 E	176.80	1.20 x 2.10
760	Exploration	Crosscut 130 N	7.00	1.20 x 2.10
760	Preparation	Sub levels	234.8	1.20 x 2.10
760	Preparation	Pipes	109.35	1.20 x 2.10
740	Preparation	Galery 170	344.7	1.20 x 2.10
740	Preparation	Galery 915 E/W	14.1	1.20 x 2.10
740	Preparation	Sub levels	293.7	1.20 x 2.10
740	Preparation	Pipes	116.72	1.20 x 2.11
720	Exploration	Crosscut 185	158.00	1.20 x 2.10
720	Exploration	Crosscut 180	86.80	1.20 x 2.10
720	Exploration	Galery 180 E	324.50	1.20 x 2.11
720	Exploration	Galery 185	50.20	1.20 x 2.12
720	Exploration	Galery 180 W	65.50	1.20 x 2.13
720	Preparation	Sub levels	326.90	1.20 x 2.14
720	Preparation	Pipes	107.45	1.20 x 2.15
690	Preparation	Bypass 160	61.60	3.00 x 3.00

Table 14. Summary of production on the 12 de Mayo vein, Santa Elena Mine (2009).

MES	Tonnes	Ag (Gr)	Ag (Oz/TM)	Pb%	Zn%
mar-09	549.26	545.37	17.53	8.61	3.25
abr-09	784.06	440.76	14.17	5.20	2.86
abr-09	108.28	650.57	20.92	5.02	3.75
may-09	924.25	442.39	14.22	6.14	2.56
jun-09	1,016.10	462.36	14.87	5.65	2.46
jul-09	1,231.87	516.08	16.59	8.28	2.30
ago-09	1,327.82	478.97	15.40	8.27	1.58
sep-09	1,632.85	440.03	14.15	7.59	1.84
oct-09	1,807.29	492.04	15.82	6.74	1.64
nov-09	2,008.76	402.67	12.95	6.44	1.79
Total	**11,390.54**	**463.77**	**14.91**	**6.98**	**2.09**

Ore was shipped to the San Valentin Mine for treatment in their sulphide flotation plant, located about 30 km (direct) north-northwest of the mine or about 60 km by road. Results of the first flotation treatment are provided in Table 15.

Table 15. Recovery results from flotation treatment of the first delivery in 2009.

TRATAMIENTO MINERAL SANTA ELENA AÑO 2009
I.- PRIMERA CAMPAÑA

TMH	342.97	% H2O	4.59
TMS	327.23		

		ENSAYES				CONTENIDO METALICO				RECUP. METALURGICA				RADIO	%Fe
PRODUCTO	TMSD	Ag Oz/to	%Cu	%Pb	%Zn	Ag	Cu	Pb	Zn	Ag	Cu	Pb	Zn	CONC.	
CABEZA	327.23	12.98	0.30	4.44	1.99	4681.93	0.98	14.53	6.51	100.00	100.00	100.00	100.00		
CONC.PB	21.12	122.79	3.43	66.88	5.11	2859.02	0.72	14.13	1.08	93.62	75.05	97.23	16.58	15.49	
CONC. ZN	9.65	7.58	0.96	1.40	52.32	80.60	0.09	0.14	5.05	2.64	9.59	0.93	77.51	33.92	**6.24**
RELAVE	296.46	0.35	0.05	0.09	0.13	114.38	0.15	0.27	0.39	3.75	15.35	1.84	5.92		

In June 2010, S&L terminated the operating contract due to various breaches of the agreement by San Antonio de Silver and assumed control of the operations at Santa Elena Mine (Bethania).

6.6.3 Santa Elena/Bethania Mine: 2010 to 2016

At the re-start of operations by S&L in June 2010, an updated mining plan was put into place and production began. As is required for obtaining a Certificate of Mining ("COM"), S&L has kept detailed records of its mining operations (see Appendix 5).

During this six year period, an estimated 91,000 tonnes of ore was mined, with the bulk of production from the Española 1, 12 de Mayo, and Victoria veins and lesser production from the Española 2, Ramal 12 de Mayo, and Carolina veins (Table 16). Upward cut and fill mining methods were applied utilizing the following equipment:

- Diesel Compressors Atlas Copco XAS 186 (x3; one used as backup)
- Mine Loaders (skid steers) CASE SR150 and SR220 (x2)
- Generator Set (x2)
- 4x4 Van
- Dump Truck (x2)
- 2.5 Ton Locomotive
- 5,000 CFM Fan (x2)
- Drad Drum Winches (x3)
- Lifting Winches (x3)
- Jack Leg Drilling Rig (x10)
- Pack Sack Portable Drill
- Airfoil (ventilation system)
- One Ton Mining Cars (x8)

A total of 115 personnel were required during this period of mining including 95 mine workers, 7 staff, 3 warehouse, 2 nurses, 2 maintenance, 3 topography/surveying, and 3 driver/operators.

Table 16. Summary of production from the Santa Elena Mine (2010-2016).

PERIOD	2010	2011	2012	2013	2014	2015	2016
PRODUCTION							
TONNES	4,100.00	6,890.00	9,136.70	21,500.00	28,789.00	17,885.00	2,717.00
ORE GRADES							
Ag (Oz/Tm)	20.17	25.61	21.32	14.39	13.10	16.33	9.63
Pb%	10.20	8.51	7.69	3.31	2.07	4.05	3.51
Zn%	1.40	2.90	3.26	2.30	1.99	2.89	1.29
LEAD CONCENTRATE							
METRIC TONNES	NO PRODUC.	NO PRODUC.	NO PRODUC.	1,316.52	1044.49	949.00	288.30
Pb%				44.08	46.30	55.13	46.07
Ag (Oz/Tm)				155.81	244.8	187.96	145.23
Au (Gr/Tm)				3.23	6.03	3.94	3.20
ZINC CONCENTRATE							
METRIC TONNES	NO PRODUC.	NO PRODUC.	NO PRODUC.	347.73	524.96	695.52	81.26
Zn%				34.97	48.77	49.90	45.49
Ag (Oz/Tm)				18.35	29.54	26.02	23.28

When operations began in mid-2010, S&L sold run-of-mine ore to Sociedad Minera Austria Duvaz, transporting the ore approximately 300 km to Morococha (Junín department). This process continued until 2012.

In 2013, with the construction of a 100 tpd plant in the town of Huaria (Junín Department), about 80 km closer than Morococha, the Company began selling its ore to Minera Peru Sol S.A.C.'s San Martin flotation plant (2 circuits, lead and zinc). The Company then sold the concentrate to Trafigura metals traders

From late 2013 to September 2015, the owners contracted the services of Compania Minera San Valentin S.A. to process their ore at Planta San Pedro, which was closer to the Bethania Mine and could treat a larger capacity of up to 800 tpd.

Post September 2015, ore from the Bethania Mine was processed at the Azulcocha Zinc Mine, located near Chupaca (near Huancayo), a 500 tpd flotation plant which offered much better mineral processing control. In 2016, Azulcocha ceased operations, limiting the nearby alternatives for the processing of ore from the Bethania Mine. In August 2016, S&L made the decision to put the Bethania Mine on care and maintenance due in part to the closure of Azulcocha but also due to issues with operating cash flow.

6.7 Mining Methods

The following description is from Soria (2019) and is based on historical mining performed by S&L between 2010 and 2016. Specifically, an example from year 2012 is provided below.

Historically, at the Santa Elena Mine, an overhand (upward) cut and fill selective mining method (high-grade, narrow vein) was used. This mining method is a favoured choice for steeply dipping, narrow width and irregular bodies such as those mineralized narrow (<0.50 m) and high-grade veins at Bethania. This method was utilized from exploration and development through to production, creating raises on vein, that served as ventilation and manway shafts, and drifting on vein for sub-levels and crosscuts.

According to a geomechanics study, the behavior of the rock is of two main types: regular to good rock type as found in the 12 de Mayo vein, which do not require much support, and poor rock type as found in the Española 1 vein, which requires continuous support.

A summary of the metres advanced through exploration, development, and preparation methods as described below is provided in Table 17.

Table 17. Summary of advanced metres in the Santa Elena/Bethania Mine (2010-2016).

PERIOD	2011	2012	2013	2014	2015	2016
Linear advances mts						
Exploitation	-					
Develop	413.89	699.70	922.25	1343.15	637.01	194.45
Preparation	320.60	113.80	1,009.40	756.45	474.33	
Exploration	44.50	675.52	1,323.95	915.01	68.60	
Rehabilitation	81.60	-	-	-	-	

6.7.1 Development Methods

On the basis of exploration work, the continuity of the mineralized structure (vein) was determined, and subsequent development work carried out. Development consisted of delimiting ore blocks between drifts, with the construction of raises located every 50 metres and following the mineralized structure. These raises connect the levels, delineating ore blocks at 50 metre intervals, with intermediate raises (double compartment) to serve as waste rock passes. Drifts are furnished with narrow gauge (500 mm), 30 pound rail (weight per yard) lines. Once the development is complete the defined ore block can be exploited.

6.7.2 Preparation Methods

Preparation work consisted of running sub-levels on sections 1.2 metres wide by 2.1 metres high. This work started once the raises were made, leaving a pillar of 2.0 metres with respect to the drift, with each sub-level having distance of 50 metres, with an intermediate wooden hopper at 25 metres distance; the hoppers rise as the ore block is being exploited.

In the Española 1 vein the sub-levels were run on sections 1.2 metres wide by 2.1 metres high, but the ground was considered to be of poor quality and so the drifts were developed with the support of wooden cribbing and a pillar of 2.5 to 3.0 metres.

In the last years, to deepen the mine, three exploration shafts, each approximately 30 metres deep, were completed. An inclined ramp (30 degrees) with a length of approximately 100 metres, followed by a 30 metre crosscut which cut the Española 1 vein on Level 640m, was also completed.

6.7.3 Exploitation Methods

Mining begins from the base sub-level with vertical upward cuts, leaving a pillar of 2.0 to 3.0 metres with respect to the main drift and depending on rock competency. Rock support is provided by permanent (systematic) or temporary support through wooden posts, split set and wooden panels depending on the rock quality.

7.0 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geology

The Bethania Silver Project is located over the Cordillera Central, which contains prolific and prospective base and precious metals belts that are host to numerous styles of mineralisation including epithermal Au-Ag, porphyry Cu-Au-Mo, and replacement/skarn Zn-Cu (Figure 4). Peru is the second largest silver producer in the world with approximately 50% of silver production associated with gold production and 50% associated with base metal/polymetallic mines.

The geological, mining and metallurgical institute ("INGEMMET") publish geological maps covering much of Peru at 1:100 000 and 1:50 000 scales. INGEMMET also publish descriptive bulletins ("Boletíns") detailing regional geology, lithological units, structure, and economic geology for much of Peru.

The Project area is located in National Topographic (1:100K) sheets 26-L (Tupe) and 26-M (Huancavelica), covered by geological report and maps in Bulletins 44 (Salazar and Landa, 1993) and 73 (Morche and Larico, 1996), respectively. Key regional geological features related to these maps sheets and the Project area include (Figure 5):

- Mesozoic sedimentary rocks (Cretaceous) folded along an NNW trend.
- Andean-trending, NNW faulting in part controls exposure of older sedimentary and volcanic sequences.
- Andesitic intrusions related to Cenozoic volcanism (Coastal Batholith) are exposed.
- Intrusives related to the Coastal Batholith are exposed in and around the Project area.
- A disconformity exists between the upper Mesozoic (Cretaceous) formations and the lower formations of the Cenozoic (Tertiary) formations.
- Varied quaternary deposit are concentrated along water courses and valley bottoms.
- The Bethania Mine is located along an interpreted major north-northeast fault line, expressed through regional topography and the geometry of Laguna Huarmicocha.
- The Bethania Mine and other deposits, occurrences and mines in the immediate area are interpreted to be located within an ancient volcanic caldera.
- The Property is situated in the northern region of the Southern Peru Au-Ag Epithermal Belt, hosted largely by Tertiary-age volcanic rocks.

7.2 Property and Local Geology

The Santa Elena concession (Bethania Mine) covers Tertiary volcanic rocks that include andesite, dacite, and tuff (Figures 5 and 6). Outcrop exposure is best in areas of higher elevation (high cliffs, hill tops etc.) and along road or stream cuts, with much of the region covered by vegetation and Quaternary deposits (overburden).

All of the mineralized veins discovered to date are hosted by altered andesite and/or dacite with some anomalous mineralization hosted by siliceous bodies of stockwork quartz-breccia. The focus of past on-vein exploitation has focused on east-northeast trending systems but there are

numerous north-northwest trending veins that have seen little if any exploration and testing. All of the known veins on the Santa Elena concession (Bethania Mine) are listed in Table 18.

The total lengths of the vein systems are not clear for all the veins and there is evidence that the northeast-trending veins (e.g., Española and Carolina) could extend several hundred metres along strike. In addition, many of the veins continue at depth as evidenced from underground mine development.

Ausenco (2017) noted that geochemical results indicate the potential for an igneous body of the copper porphyry type existing at depth, suggesting the possibility for deeper copper dominant mineralization. Work in the immediate area of the Santa Elena concession provides evidence for a porphyry system underlying the area including drilling by Minera IRL (see Section 23, Adjacent Properties).

Table 18. Known veins and their characteristics, Bethania Mine property.

Vein	Status	Az (general)	Dip (general)	Length (m)	Comments
Espanola 1	focused exploitation	60	75-86SE	500	principal structure; length recognized from underground work
Espanola 2	focused exploitation	280	60-88SW	200	NE side of the concession; length recognized from underground work
12 de Mayo	focused exploitation	60	75-86SE	550	principal structure; length recognized from underground work
Ramal 12 de Mayo	focused exploitation	70	70-85NW	100	intersects Victoria vein and does not continue; length recognized from underground work
Victoria	focused exploitation	60	70-90SE	110	main structure displaces veins 12 de Mayo and Ramal 12 de Mayo; length recognized from underground work
Carolina	limited exploitation/exploration	60	70-90SE	100	tension structure to Española 1 vein hanging wall; mapped at surface
Betsaida	limited exploitation/exploration	95	70-75NE	100	intersects with Carolina vein; mapped at surface
Maria	limited exploitation/exploration	90	75-86S	60	likely tensional to Española 1 vein hanging wall; length recognized from underground work
Rocio	limited exploitation/exploration	290	85NE	95	NE side of concession; mapped at surface
Santa Elena	limited exploitation/exploration	270	60-70S	45	NE side of concession; length recognized from underground work
Yolanda	limited exploitation/exploration	66	68NW	30	parallel to vein 12 de Mayo; mapped at surface

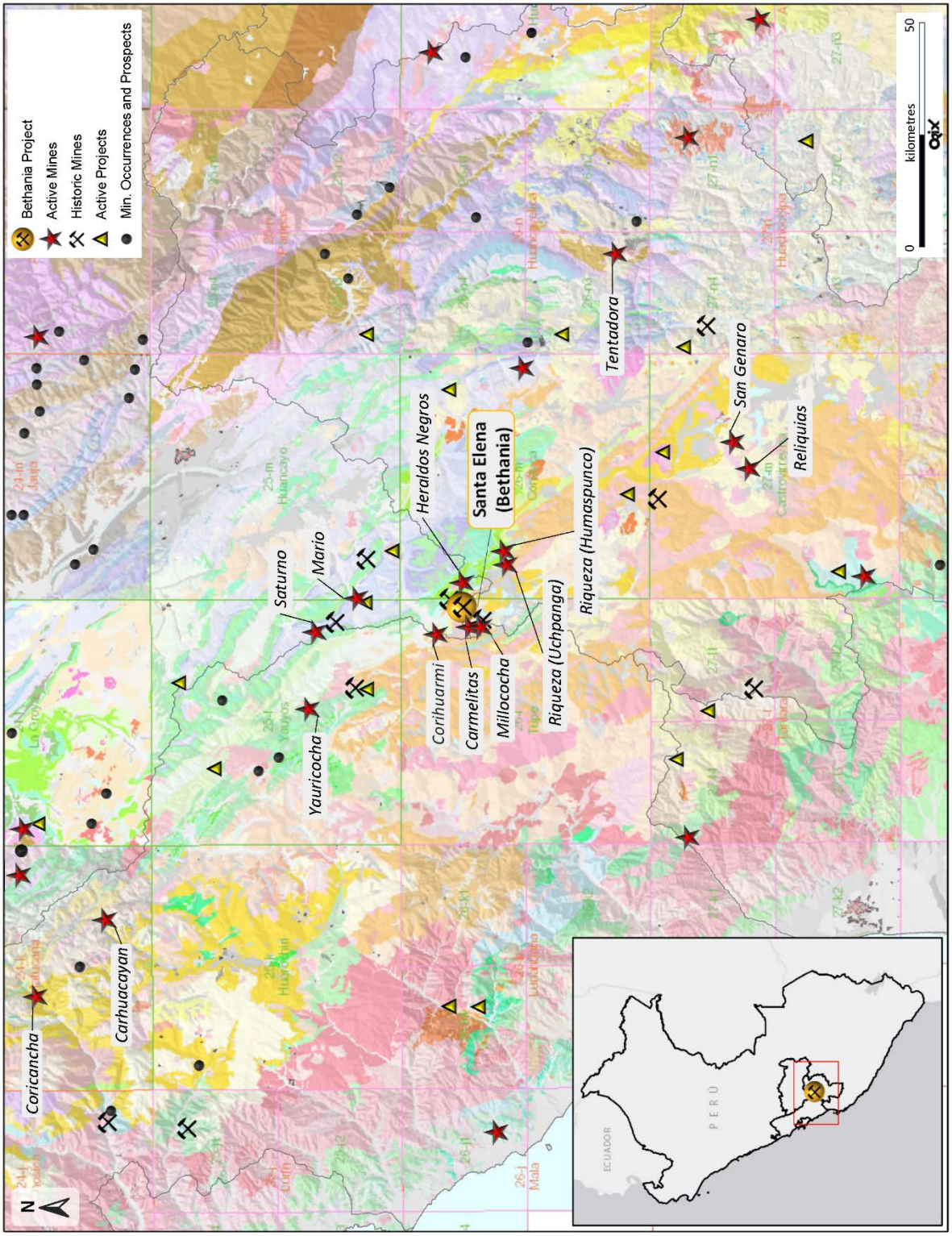

Figure 4. Regional geology of Peru showing the location of the Bethania Silver Project in the Cordillera Central, along with past and current producing mines.

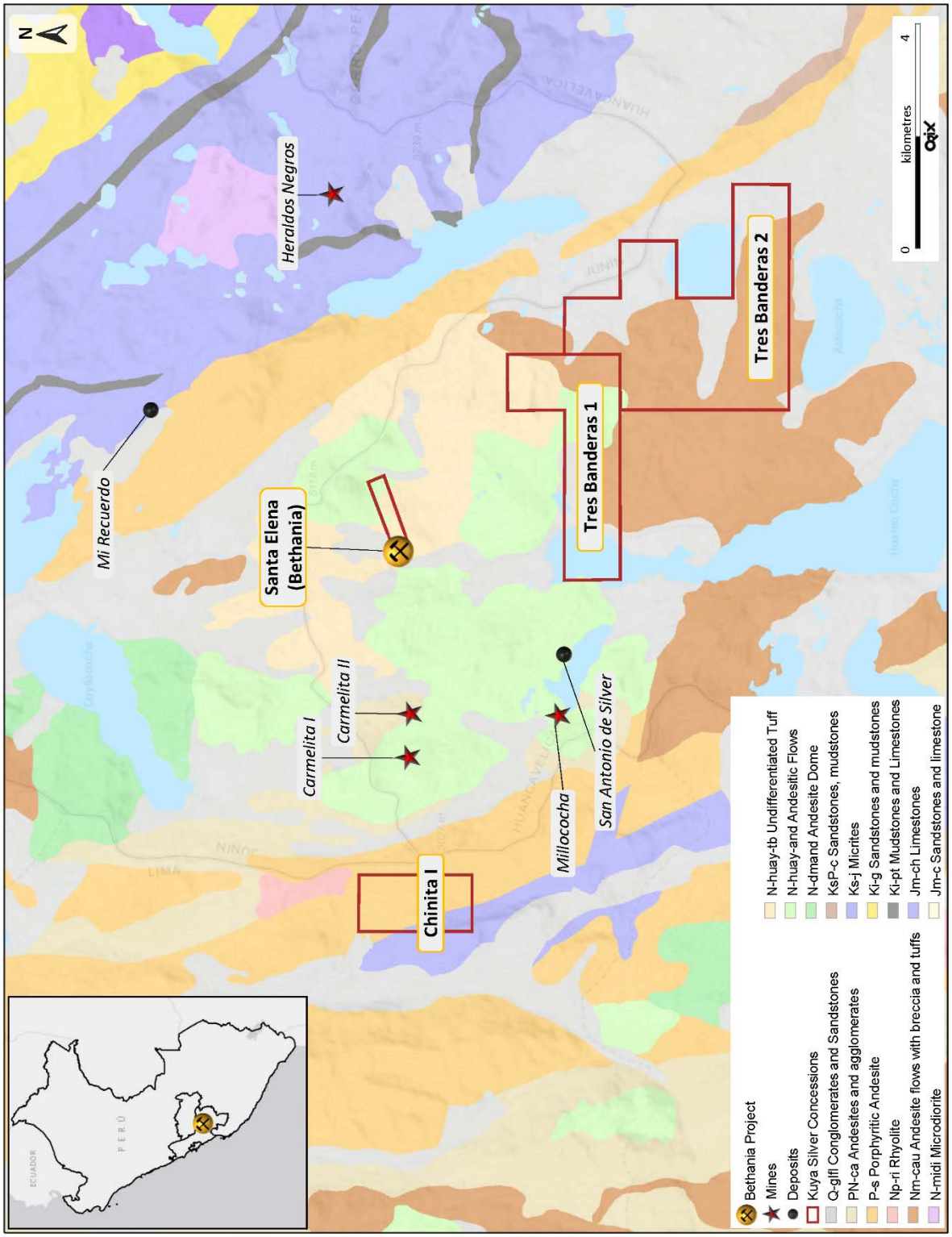

Figure 5. Regional geological map with the location of the four concessions that make up the Bethania Silver Project. Important major units are: Ts-a:tuff; Ts-as:andesite; T-a:diorite; Qr-g:overburden; Ks-j:limestone; TM-ss:andesite porphyry (Bulletins 44 and 73).

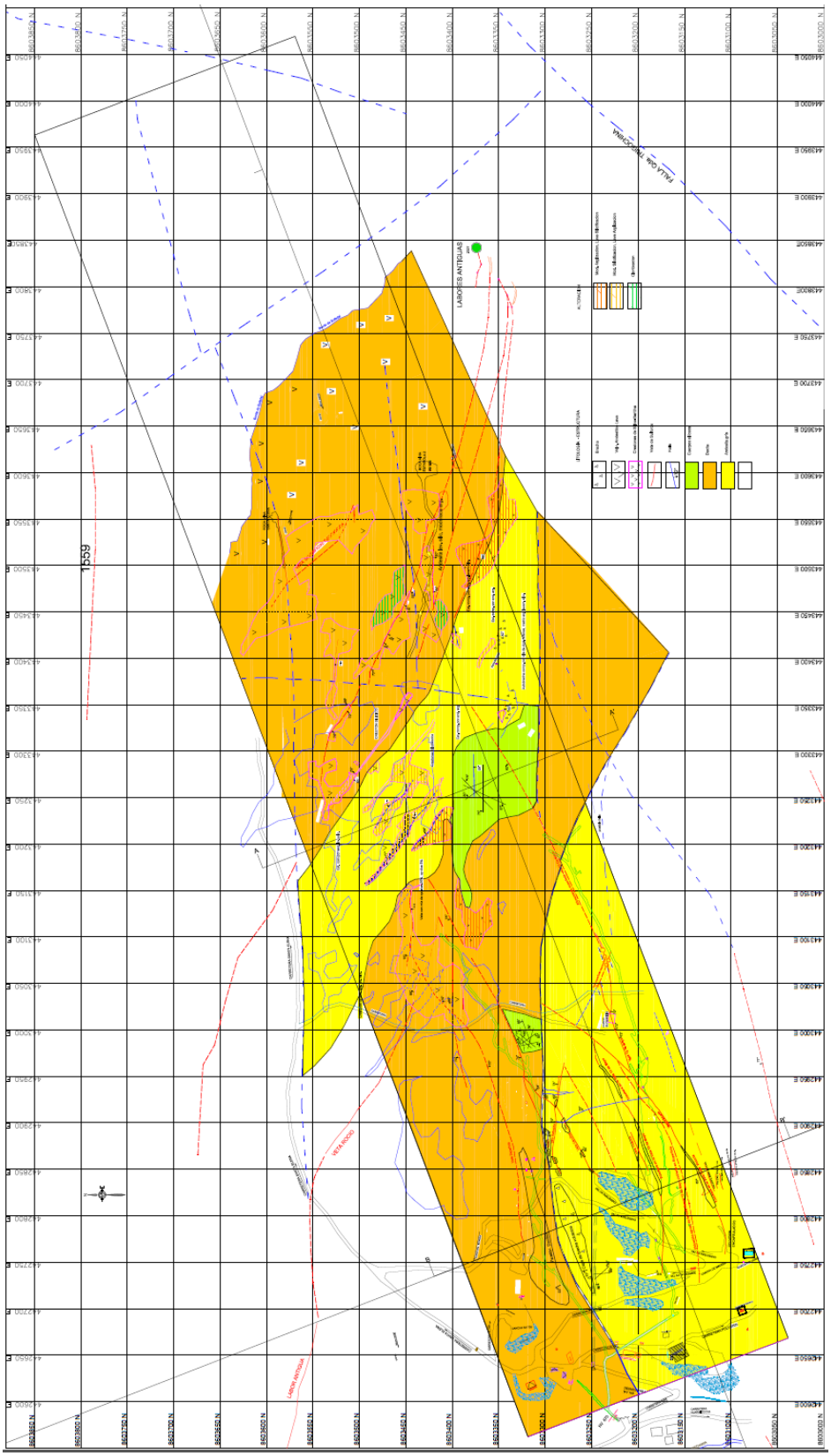

Figure 6. Property-scale geological and structural map of the Santa Elena concession (Bethania Mine); Dacite (orange), Andesite (yellow), Siliceous Body (green) (from Milla, 2016b).

7.2.1 Lithology

A list of the main lithologies that underly the four concessions along with a summary of their characteristics is provided in Table 19.

Table 19. Summary of the main lithologies underlying the four concessions, Bethania Silver Project.

Concession	Group	Formation	Units		Description	Topo Map
Santa Elena		Auquivilca	N-huay-tb	Ts-a	tuff	Tupe 26L
Santa Elena	Coastal Batholith		N-and	T-a	diorite	Tupe 26L
Santa Elena		Glacial Deposits	Q-glfl	Qr-g	overburden	Tupe 26L
Chinita I	Imperial	Jumasha	Ks-j	Ks-j	limestone	Tupe 26L
Chinita I	Sacsaquero		P-s	Tm-ss	andesite porphyry	Tupe 26L
Tres Banderas 01		Astobamba	N-huay-and	Ts-as	andesite	Tupe 26L/Conayca 26M
Tres Banderas 01		Auquivilca	Nm-au	Ts-a	tuff/breccia	Tupe 26L/Conayca 26M
Tres Banderas 01		Glacial Deposits	Q-glfl	Qr-g	overburden	Tupe 26L/Conayca 26M
Tres Banderas 02		Auquivilca	Nm-au	Ts-a	tuff/breccia	Tupe 26L/Conayca 26M

7.2.2 Structure

There are a number of high-angle, northeast-, northwest-, and north-south-trending fault systems on the Santa Elena concession (Bethania Mine). Principal veins of economic interest are oriented east-northeast (~60Az) and dip from approximately 70 degrees to the southeast to near-vertical.

7.2.3 Alteration

Hydrothermal alteration observed on the Property includes silicification, sericitization, chloritization, and tourmalization, with silicification immediately associated with economic vein mineralization. Argillic alteration (clay) occurs away from the veins and chloritic alteration more distal to the veins. Stein (2018), was of the opinion that geological controls, such as alteration, have not been studied in any great detail, and that the project could benefit from some basic work in this area.

7.3 Mineralization

Given the lithological, structural, mineralogical and alteration characteristics observed at the Project and specifically in the Bethania Mine vein system, mineralization identified to date can be classified as volcanic-associated, polymetallic intermediate sulphidation epithermal ("ISE"), with significant accumulations of silver, lead, zinc, copper, and gold.

Dominated by silver, Bethania Mine's polymetallic ore is fairly typical in its composition, containing appreciable amounts of lead, zinc, gold and copper. On the basis of multi-element assays and production history, it is clear that dominant ore minerals include silver sulfosalts (e.g., Ag_3AsS_3, Ag_3SbS_3), galena (PbS), sphalerite (ZnS), and chalcopyrite ($CuFeS_2$).

Ore mineralization of the major veins, Española and 12 de Mayo, can be more than 1.5 metres thick, but averages are about 0.6 metres; minor veins average about 0.3 metres in thickness.

8.0 DEPOSIT TYPES

Currently accepted definitions of epithermal deposits include precious and base metal deposits forming at depths of <1.5 km and temperatures of <300 degrees Celsius in subaerial environments within volcanic arcs, at convergent plate margins and in intra- and back-arc as well as post collisional extensional settings. Epithermal systems can be grouped into high, intermediate, and low sulphidation types based on variations in their hypogene sulfide assemblages (e.g., Sillitoe and Hedenquist, 2003; Corbett, 2007). Most epithermal gold deposits are Cenozoic in age and although some older deposits are known, none of the giant ore deposits of this type are older than Cretaceous.

The Bethania silver deposit is a polymetallic (Ag-Pb-Zn-Cu-Au) hydrothermal deposit whose mineralogy, mineralization, textures, and associated alteration phases are consistent with the intermediate sulphidation epithermal geological model for volcanic-hosted precious metal deposits (Figure 7).

8.1 Intermediate Sulphidation Epithermal Deposits

Epithermal gold and silver deposits of both vein and bulk-tonnage styles may be broadly grouped into high-, intermediate-, and low-sulfidation types based on the sulfidation states of their hypogene sulfide assemblages (Sillitoe and Hedenquist, 2003). Intermediate sulfidation epithermal deposits are one of the subtypes of epithermal deposits (i.e., a subtype of low sulphidation type) formed in subduction-related arc settings or post-collisional orogenic belts and an essential component of porphyry-epithermal systems. Economically significant in terms of their polymetallic mineralization (i.e., Ag-Au-Pb-Zn-Cu), IS deposits typically have a close relationship with andesitic-dacitic volcanic-subvolcanic rocks, usually related to oxidized calcic to calc-alkaline magmatism and formed at depths between 300 metres and >1 kilometre (Wang et al., 2019).

General characteristics of ISE deposits include:

- Generally, veins and breccias like low sulphidation systems but with coarser banding.
- May contain alunite like high sulphidation systems.
- Usually contain significant silver with gold and lead (galena), zinc (sphalerite), copper (chalcopyrite) at depth.
- Gold and silver deposition is controlled by boiling whereas base metal deposition by fluid mixing and/or cooling.
- Indications of boiling are reflected in the replacement of calcite by silica.

Sillitoe and Hedenquist (2003), indicate that intermediate and low sulfidation epithermal ("LSE") deposits have been found to be mutually exclusive mainly in the tectonic setting of formation. However, there is growing evidence that some deposits exhibit composite characteristics of both ISE and LSE mineralization styles (e.g., Camprubi et al., 2006; Carillo et al., 2003). Given that characteristics of high sulphidation epithermal ("HSE") systems are also noted in ISE systems, it is more likely that a continuum exists between ISE and LSE systems and between ISE and HSE systems.

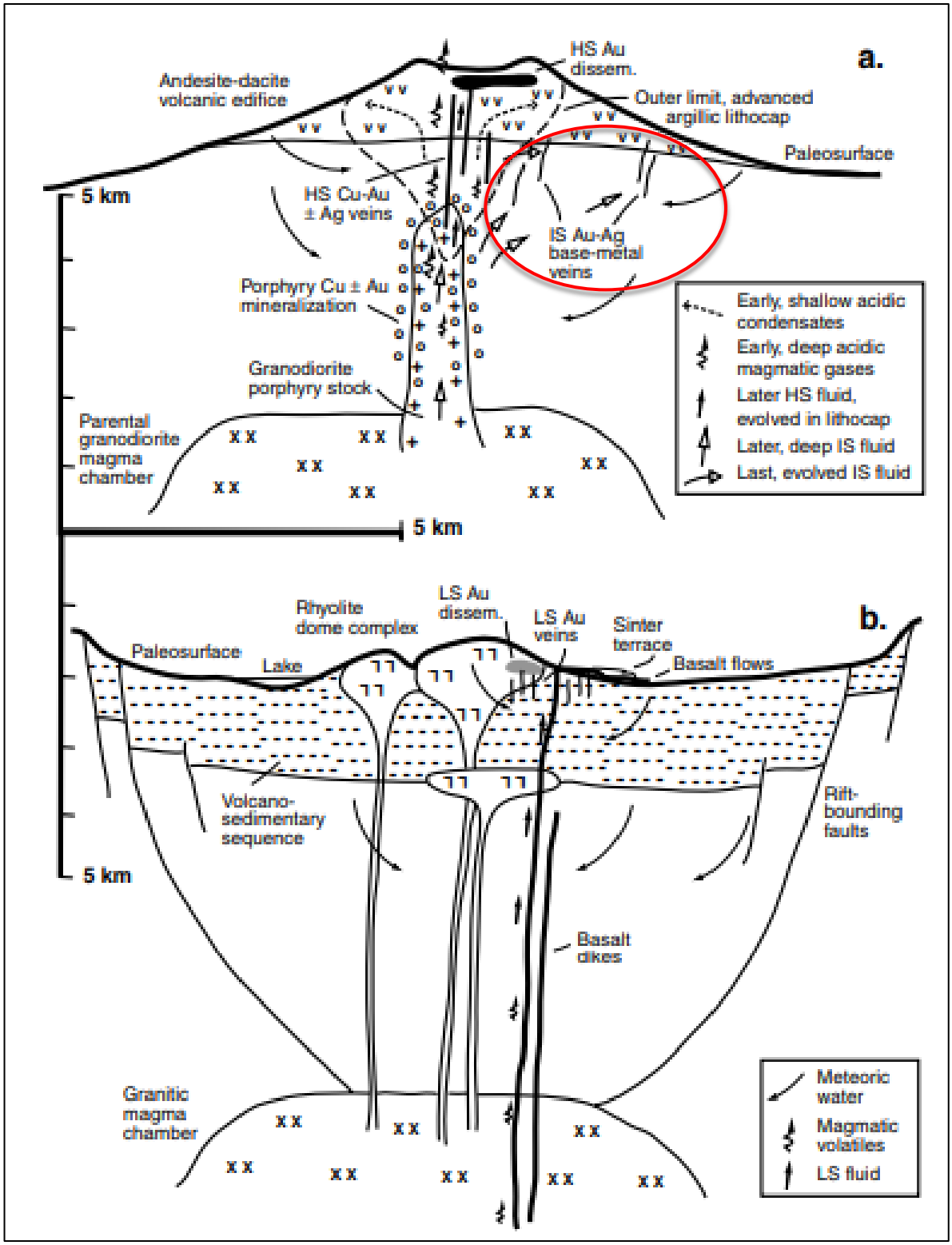

Figure 7. Generalized epithermal deposit models showing the various subtypes – low, intermediate and high sulphidation – in (a) volcanic setting and (b) rift setting (Sillitoe and Hedenquist, 2003). An approximation of the location of the volcanic associated Bethania Mine mineralization is circled in red.

9.0 EXPLORATION

There has been no systematic surface or underground exploration at Bethania, other than drifting along the known veins to build confidence for mining.

9.1 High-Resolution Elevation Drone Survey

In April 2019, ACOMISA completed a photogrammetric report using data collected from a high-resolution drone survey over the Santa Elena concession (Bethania Mine). Elevation models produced from the data include contour intervals of 0.5 and 1.0 metres.

9.2 Data Compilation and Review

In mid-2019, the Company engaged Orix Geoscience Inc. ("Orix") of Toronto, Canada to complete data compilation and a review of all public and private information from the Bethania including 2D compilation (GIS database), 3D compilation (Leapfrog), and geological modelling (3D) with associated recommendations:

- Create an ArcGIS 2D Compilation of all publicly available data as well as data provided by Kuya Silver.
- Re-project, georeference and digitize available geological interpretation completed by the team in Peru.
- Import all relevant and available digital data into a 3D platform (Leapfrog).
- Use surface geological interpretation to create simplified geological model.
- Use digitized structural information to create/visualize structural trends.
- Use underground channel/vein sampling, surface, plan, and section interpretations to create a detailed vein model.
- Create grade shells to aid on future targeting and possible drill hole planning.

9.2.1 2D Compilation (ArcGIS)

Downloaded and date-stamped shapefiles (SHP) that include (sources include INGEMMET):

- "Concession" fabric as of June 1, 2019.
- Gravity Bouguer points.
- Structure: folds, faults and structural domains at 100K and 50K.
- Rock samples with geochemical data (50 elements) for 50K NTS sheet.
- Geology polygons and polylines for the NTS 26L sheet as well as the regional geology at 100K.
- Topography: includes infrastructure such as highways, roads, land use and main towns.
- Hydro: includes rivers and lakes.
- Boundaries: includes NTS sheets and administrative boundaries (Municipalities etc.).
- INGEMMET: linked for up to date/live data from the Geological Survey of Peru:
    - Geology and structures for Peru at 100K.
    - Geology at 50K scale (specific areas only).
    - Concession Fabric: a) Active Concessions; b) Concessions Requested; c) Exploration Concessions; and, d) Mining Concessions.

9.2.2 3D Compilation (Leapfrog)

The following information was integrated into a 3D model:

- Topography: ALOS, ASTER and SRTM DEM point files (at 30 m accuracy), 2 satellite images and elevation contour lines from ACOMISA.
- Concession boundary pressed to topography.
- Mineralization: Digitized vein interpretations from plans and surface.
- Interpretations: 5 Plans and 26 Cross Sections.
- Surface geology pressed to topography, as interpreted by team in Peru.
- Vein sampling represented as channel samples/drill holes.
- Polylines of faults and veins digitized from cross sections and surface interpretations.
- Structural data (joints, faults and veins), and regional structural interpolated from 463 measurements.
- Infrastructure meshes wireframed in Datamine (main drifts only - sub-levels and raises pending wireframing).
- Geological model includes surfaces and volumes for 11 veins and 3 main faults.
- Numeric models: Preliminary Ag and Zn grade shells.

9.2.3 Geological Model

Following a review and compilation of all data in 2D and 3D, a geological model was created in Leapfrog covering the area of the Santa Elena concession (Bethania Mine) that includes underground workings, plan maps and interpreted sections (about 800 by 500 metres):

- The model was broken into 4 blocks on the basis of 3 main faults.
- Structural data was filtered by 3 categories - joints, faults, veins:
    - From vein data an initial form interpolant was created.
    - Fault data was used to inform fault surfaces.
- Created lithology from surface interpretation.
- Detailed vein model from digitized lines on plans, sections and surface.
- Vein interactions and cross cutting relationships:
    - Minor veins need pinch outs (to be completed).
- Created grade shells for Ag and Zn, using isotropic unmodified trends and the structural form interpolant as a global trend.
    - Silver and zinc mineralization in vein system display plunge of ~25-30 degrees SW.

Orix suggested that the vein system corresponds to “Rosario” style veining, with a pinch and swell characteristic. However, due to the sparse underground control data, the veins were modelled as continuous surfaces, honouring the contacts measured to date.

9.3 Exploration Potential – Bethania Mine

At the Bethania Mine (Santa Elena concession), much can be gained by drilling along the well-known northeast-trending and lesser explored northwest-trending mineralized structures to determine continuity, from surface and/or from underground. In most cases, this should be a relatively low risk method to increase the resource size, resource confidence and understanding of the mineralization on the Property.

Historically, production has focused on the vein systems at Bethania and to date, no systematic studies have been conducted to identify and characterize the disseminated sulphide mineralization observed in the host rocks (i.e., altered andesite-dacite and stockwork siliceous breccias) located between the vein sets.

9.3.1 Strike Length Extension

Mining has occurred (and internal reserves calculated) on six veins, including the major Española and 12 de Mayo structures and the minor or cross-cutting Victoria, Carolina, Maria, Ramal 12 de Mayo and Española 2 veins. The major structures have been explored from West to East, starting near the main adit at the western edge of the property. Both structures have been developed for approximately 500 m and remain open in both strike length directions. Both Española and 12 de Mayo have the potential to be delineated over the entire 1.5 km length of the property which would increase their resource potential by as much as three times (potentially more given that the upper levels of major veins have been largely mined out but could be preserved along strike). The minor structures with the exception of Española 2, were discovered subparallel to the major structures through regular mining development of the two major veins. In these cases, there is still significant strike length (200 to +300 m) between the two major veins available for future exploration.

9.3.2 Depth Extension

Through mining at various levels over the past 40 years, the vertical continuity of both the major and minor veins appears to be very strong – all seven of the developed veins remain completely open at depth. While some pinching and swelling of veins is to be expected, ore has been mined (or reserve development) in the largest vein, 12 de Mayo, from the 4790 m level down to the 4640 m level, or 150 m. The vein at the 4640 m level still appears to be consistent with typical Bethania Mine ore grades and thicknesses, suggesting further depth potential. Stein (2018) notes a similar vertical extension in the Española, Maria, Carolina, Ramal 12 de May, and Victoria veins. At the Española 2 vein, located further east than the other six veins, mineralization has been identified at surface around 4940 m with mining development at the 4830 m level, and like the western veins, mineralization remains open at depth. Generally, for the resource calculations, indicated resources have been projected 120 m down-dip and inferred resources another 60 m down-dip for a total depth of 180 m below current outlined reserves.

9.3.3 New Vein Discoveries

At Bethania, five minor veins (translation: vetas) are structurally related to the two main subparallel 12 de Mayo and Española veins, and with the exception of Española 2 which was discovered at surface, the other minor veins were discovered through normal mine development. Several other veins have been discovered through the same means; however, they currently lack the exploration and development to classify them as a resource.

These veins include (Stein, 2018):

- Veta Desconocida – sampled up to 21 oz/t Ag +Pb/Zn at 4670m level.
- Veta Alina – sampled up to 38 oz/t Ag + Pb/Zn; intersects Victoria near the western edge of mine; may be an offset of 12 de Mayo or a splay.
- Veta Rocio – intersects Española and trends NW; no samples.
- Veta Yolanda – intersected at 4720m level crosscut between Española and 12 de Mayo; thin but may thicken along strike; no samples.
- Veta Betsaida – intersected in crosscut near and subparallel to Carolina; thin but may thicken along strike; no samples.

One additional vein is known from surface outcropping near Española 2:

- Veta Mercedes – sub-parallel to Española 2; 100 m to the east; no samples.

9.4 Exploration Potential – Other Concessions

The Chinita I concession, located about 5.5 km east of the Santa Elena concession (Bethania Mine), covers a regional north-south oriented unconformity (fault) between older Cretaceous sedimentary (limestone) rocks in the east and Tertiary volcanic (andesite) and sedimentary (sandstone) rocks to the west. S&L has identified several large (multi-kilometre) structures and alteration, however the Chinita property is at a very early stage and remains a lower priority target as Kuya looks to acquire properties closer to the Bethania Mine.

The Tres Bandera 01 and Tres Bandera 02 concessions, located between about 3 km and 7 km southeast of the Santa Elena concession (Bethania Mine) respectively, are underlain by Tertiary andesite, tuff, and tuff breccia cut by localized north-northeast-trending structures.

10.0 DRILLING

There has been no historic or current drilling on the Property.

11.0 SAMPLE PREPARATION, ANALYSIS AND SECURITY

This section is not relevant at this stage of the Project.

12.0 DATA VERIFICATION

This section is not relevant at this stage of the Project.

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

Veins at the Bethania Mine have been mined most recently at small-scale, on and off between 1977 and 2016. Between 2001 and 2015, there were six metallurgical studies commissioned by S&L that have been reported on by independent laboratories using material from the Santa Elena Mine (Bethania Mine). A complete metallurgical test report from the most recent work (2015) commissioned by S&L, along with additional metals recovery information, is provided in Appendix 6.

A summary of the toll milling recoveries of metals from lead and zinc concentrates between January 2013 and August 2016, when data collection was strongest, is provided in Table 20.

Table 20. Summary of toll milling recoveries (lead-zinc concentrates) 2013 to 2016, Bethania Mine.

Process Information					Recovery (Lead Concentrate)							
Year	Deliveries	Plant	Delivered (t)	Lead Concentrate (t)	Ag (oz)	%R	Pb (t)	%R	Zn (t)	%R	Cu (t)	%R
2013	11	Minera Peru Sol - Huari Minera San Valentin - Yauyos	20,235.10	1,331.69	207,405.85	87.84	587.48	92.91	135.01	42.55	-	-
2014	50	Minera San Valentin - San Pedro	24,753.65	1,023.83	253,052.08	85.55	485.93	89.20	58.56	28.58	2.85	74.15
2015 2016	43	Minera San Valentin - San Pedro Mina Azulcocha Zinc	16,620.50	843.22	187,528.92	83.01	539.94	93.83	65.56	14.97	28.68	73.18
		Totals:	**61,609.25**	**3,198.74**	**647,986.85**		**1,613.35**		**259.13**		**31.53**	
Process Information					**Recovery (Zinc Concentrate)**							
Year	**Deliveries**	**Plant**	**Delivered (t)**	**Zinc Concentrate (t)**	**Ag (oz)**	**%R**	**Pb (t)**	**%R**	**Zn (t)**	**%R**	**Cu (t)**	**%R**
2013	11	Minera Peru Sol - Huari Minera San Valentin - Yauyos	20,235.10	351.88	6,513.13	2.76	12.11	1.92	123.82	39.02	-	-
2014	50	Minera San Valentin - San Pedro	24,753.65	661.11	19,230.60	6.68	16.45	3.27	325.58	63.79	4.57	8.76
2015 2016	43	Minera San Valentin - San Pedro Mina Azulcocha Zinc	16,620.50	626.76	21,165.26	9.17	8.49	1.56	322.40	75.54	4.65	11.65
		Totals:	**61,609.25**	**1,639.75**	**46,908.99**		**37.05**		**771.80**		**9.22**	

Total silver recovery is a combination of what was recovered from the lead and zinc concentrates, which in this period was 741,804.83 ounces of silver. Typically, in the sale of lead concentrate, payment is made on the basis of the recovery of lead, silver, and gold (no credit for zinc) and in the sale of zinc concentrate, payment is made on the basis of the recovery of zinc, silver, and gold (no credit for lead).

13.1 Flotation Test - 2001

Completed by Etudes Metallurgiques et D'Engineering E.I.R.L. (Lima, Peru), this study homogenized four samples of run-of-mine ore collected from the Bethania Mine. Identified sulphides included galena (PbS) and sphalerite (ZnS), with gangue minerals pyrite (FeS_2), quartz, and carbonate. The sulfosalt tetrahedrite was also present. The analyzed head grade of the composite sample was 19.78 oz/t Ag, 2.81% Pb, and 1.98% Zn. Results of the flotation tests, aimed at Pb-Ag recovery, are provided in Table 21.

Table 21. Results of the 2001 Pb-Ag flotation tests, Santa Elena Mine.

Sample Stage	Pb (%)	Ag (oz/t)
Concentrate	51.43	176.67
Middlings	3.70	35.30
Tailings	0.41	7.06

The 2001 report concluded that the ore could be concentrated by standard flotation methods, including zinc which was not reported on due to its low head grade of 1.98% Zn. The report also indicated that in order to be profitable, the ore should be processed at a facility near the mine.

13.2 Flotation Test – 2011

Completed by Etudes Metallurgiques et D'Engineering E.I.R.L. (Lima, Peru), this flotation study was aimed at creating Pb-Ag-Au and Zn-Ag concentrates from homogenized run-of-mine ore collected from the Bethania Mine. Identified sulphides included galena (PbS), sphalerite (ZnS), and chalcopyrite (CuFeS2), with gangue minerals pyrite (FeS2) and quartz. The analytical head grade of the sample was 31.42 oz/t Ag, 1.5 g/t Au, 10.99% Pb, 4.07% Zn, 0.54% Cu, and 0.21% As. Results of the flotation tests are provided in Table 22.

Table 22. Results from 2011 flotation tests and Pb-Ag-Au/Zn-Ag concentrates, Santa Elena Mine.

Sample Stage	Au (g/t)	Ag (oz/t)	Pb (%)	Zn (%)	Cu (%)	As (%)
Cleaner Concentrate: Pb-Ag	0.067	192.49	68.11	2.65	3.09	0.83
Middlings: Pb-Zn	-	115.46	40.13	15.14	-	-
Cleaner Concentrate: Zn-Ag	0.80	20.44	4.64	55.77	-	-
Middlings: Zn	-	21.74	6.93	8.89	-	-
Scavenger: Zn	-	16.27	4.44	18.39	-	-
Tailings	0.91	2.22	0.54	0.82	-	-

The report concluded that recoveries were excellent with 93.75% for Pb, 94.00% for Ag, 70.52% for Zn, and 36.63% for Au. Recommendations were made to scale up the flotation tests for larger samples and it was cautioned that gold may be intimately associated with the pyrite. It should be noted that the increase in arsenic (As) content from the head grade was due to the use of an arsenic depressor during flotation.

13.3 Flotation Test – 2012

Completed by Etudes Metallurgiques et D'Engineering E.I.R.L. (Lima, Peru), this flotation study was aimed at creating Pb-Ag and Zn-Ag concentrates from homogenized run-of-mine ore collected from the Bethania Mine. Identified sulphides included galena (PbS), sphalerite (ZnS), and chalcopyrite (CuFeS2), with gangue minerals pyrite (FeS2) and quartz. The analytical head grade of the sample

was 4.65 oz/t Ag, 0.72% Pb, 1.18% Zn, 0.16% Cu, 0.06% Sb, and 0.09% As. Results of the flotation tests are provided in Table 23.

Table 23. Results from the 2012 flotation tests and Pb-Ag/Zn-Ag concentrates, Santa Elena Mine.

Sample Stage	Au (oz/t)	Ag (oz/t)	Pb (%)	Zn (%)	Cu (%)	Sb (%)	As (%)
Cleaner Concentrate: Pb-Ag	0.119	68.51	19.26	3.21	1.63	0.75	0.55
Middlings: Pb-Ag	-	36.31	9.80	3.45	-	-	-
Cleaner Concentrate: Zn-Ag	-	26.30	4.30	*52.00	-	-	-
Middlings: Zn	-	9.03	1.77	5.27	-	-	-
Tailings	-	0.90	0.34	0.09	-	-	-

*recommended re-analysis by volumetric method

The report concluded that recoveries were excellent with 71.37% for Pb, 72.86% for Ag, and 78.41% for Zn and that there was oxidation in the mineralization. It should be noted that the increase in arsenic (As) content from the head grade was due to the use of an arsenic depressor during flotation and that the presence of iron in the sample resulted in a depressed lead grade of 19.26%.

13.4 Flotation Test – 2013

Completed by ED&ED Ingenieria y Servicios S.A.C. (Lima, Peru), this flotation study was aimed at creating a Pb-Zn concentrate from homogenized run-of-mine ore collected from the Bethania Mine. Identified sulphides included galena (PbS) and sphalerite (ZnS), with gangue minerals pyrite (FeS2) and quartz. The analytical head grade of the sample was 223.11 g/t Ag (6.51 oz/t Ag), 0.49 g/t Au, 2.21% Pb, 0.73% Zn, 0.13% Cu, 0.05% Sb, and 0.07% As. To test the effects of grinding, two flotation tests were completed using one 1 kg samples, the first being 50% -m200 (SELENA-1; coarser grind) and the second being 60% -m200 (SELENA-2; finer grind). Results of the flotation tests are provided in Tables 24 and 25.

Table 24. Results from the 2013 flotation tests and Pb-Zn concentrate, Santa Elena Mine.

SELENA-1/Sample Stage	Ag (g/t)	Ag (oz/t)	Pb (%)	Zn (%)	As (%)	Sb (%)
Concentrate: Pb	4877.45	142.26	52.11	6.01	0.87	0.42
Concentrate: Zn	580.65	16.94	6.23	47.11	0.29	0.19
SELENA-2/Sample Stage	**Ag (g/t)**	**Ag (oz/t)**	**Pb (%)**	**Zn (%)**	**As (%)**	**Sb (%)**
Concentrate: Pb	4990.32	145.55	53.98	5.84	0.91	0.50
Concentrate: Zn	480.25	14.01	4.82	48.67	0.33	0.21

Table 25. Recovery results from the 2013 flotation tests and Pb-Zn concentrate, Santa Elena Mine.

SELENA-1/Metal	Recoveries (%)
Ag	73.28
Pb	75.61
Zn	61.74
SELENA-2/Metal	**Recoveries (%)**
Ag	79.52
Pb	80.09
Zn	60.76

The report concluded that the lead concentrate contains the highest concentration of silver and that better concentrates are observed in sample SELENA-2 which experienced a finer grind (60% -m200). Moderate concentrations of arsenic (As) and antimony (Sb) occurred in the concentrates from both samples; additional elements were analyzed using ICP multi-element methods. Specific gravity for the sample was determined to be 2.79 (average of three tests) and the natural pH was determined to be 5.55 (average of three tests).

13.5 Flotation Test – 2014

The 2014 flotation tests, completed by Universidad Nacional de Ingenieria, Facultad de Ingenieria Geologica Minera y Metalurgica (Lima, Peru), were performed on four 1 kg samples of homogenized run-of-mine ore collected from the Bethania Mine.

Identified sulphides included galena (PbS), sphalerite (ZnS), chalcopyrite (CuFeS2), and silver minerals, with gangue minerals pyrite (FeS2), iron oxides, and quartz. The analytical head grade of the sample was 13.89 oz/t Ag, 1.43% Pb, 2.02% Zn and 0.18% Cu and the ore was noted to be of average hardness.

Prior to flotation tests, grinding tests were performed to determine the optimum time for flotation (Table 26 and Figure 8).

Table 26. Results from 2014 grinding tests for sample from Santa Elena Mine (Bethania Mine).

TIEMPO (minutos)	% - 200 mallas
0	30.19
15	62.62
20	73.21
25	82.63
30	91.22
55% -200 mallas =11´49"	
60% -200 mallas =13´52"	
65% -200 mallas =16´04"	

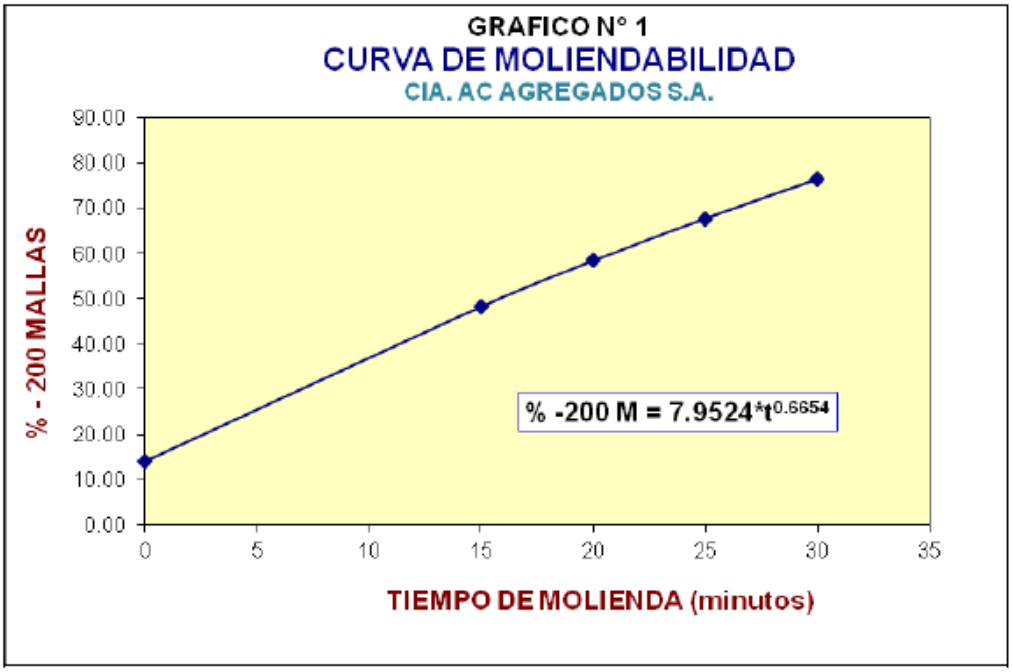

Figure 8. Grinding curve for sample from Santa Elena Mine (Bethania Mine).

To test the effects of grinding, four flotation tests were completed, the first two being 65% -m200, the third being 60% -m200, and the fourth being 55% -m200. Results of the bulk and selective flotation (cleaner) tests are provided in Table 27.

Table 27. Results from the 2014 flotation tests and Zn concentrate, Santa Elena Mine.

		Concentrate Grade						Global Recovery			
Flotation Test	Cond.	Zn (%)	Pb (%)	Cu (%)	Ag (oz/t)	As (%)	Sb (%)	Zn (%)	Pb (%)	Cu (%)	Ag (%)
1-Bulk Zn Concentrate	65% -m200	4.04	57.27	3.22	293.08	0.71	2.72	37.43	91.81	82.37	93.29
1-Clean Zn Concentrate		60.28	1.26	0.24	12.67	0.25	0.19	60.07	3.87	7.59	4.15
2-Bulk Zn Concentrate	65% -m200	3.58	61.14	2.96	297.20	0.74	2.35	16.48	94.64	78.68	92.77
2-Clean Zn Concentrate		64.47	0.40	0.19	15.59	0.06	0.08	80.18	1.69	6.57	4.13
3-Bulk Zn Concentrate	60% -m200	3.93	60.70	2.95	320.00	0.54	1.80	13.14	92.94	71.09	88.77
3-Clean Zn Concentrate		61.32	0.87	0.97	22.00	0.01	0.10	83.48	3.34	18.16	7.59
4-Bulk Zn Concentrate	55% -m200	8.41	49.86	5.26	418.13	0.50	2.27	18.31	94.35	79.54	92.54
4-Clean Zn Concentrate		63.69	0.51	0.20	25.30	0.01	0.01	77.82	2.04	6.42	5.93

The report concluded that the best silver recoveries (93.29%) were in the bulk flotation concentrate of sample 1 (finer grind) but at the lowest silver grade in the concentrate (293.08 oz/t). The highest grade of silver in concentrate (418.13 oz/t) was in the sample 4 which gave a silver recovery of 92.54%; this bulk flotation test also gave the highest comparative zinc grade (8.41%). According to the results obtained, it was recommended to work with a grinding between 60-65% -200 mesh.

13.6 Flotation Test – 2015

The 2015 flotation tests, completed by Universidad Nacional de Ingenieria, Facultad de Ingenieria Geologica Minera y Metalurgica (Lima, Peru), were performed on four 1 kg samples of homogenized run-of-mine ore collected from the Bethania Mine. Identified sulphides included galena (PbS), sphalerite (ZnS), chalcopyrite (CuFeS2), and silver minerals, with gangue minerals pyrite (FeS2), iron oxides, and quartz. The analytical head grade of the sample was 13.89 oz/t Ag, 1.43% Pb, 2.02% Zn and 0.18% Cu and the ore was noted to be of average hardness.

Prior to flotation tests, grinding tests were performed to determine the optimum time for flotation (Table 28 and Figure 9).

Table 28. Results from 2014 grinding tests for sample from Santa Elena Mine (Bethania Mine).

TIEMPO (minutos)	% - 200 mallas
0	25.50
15	55.51
20	67.12
25	77.78
30	87.73
55% -200 mallas =11´49”	
60% -200 mallas =14´48”	

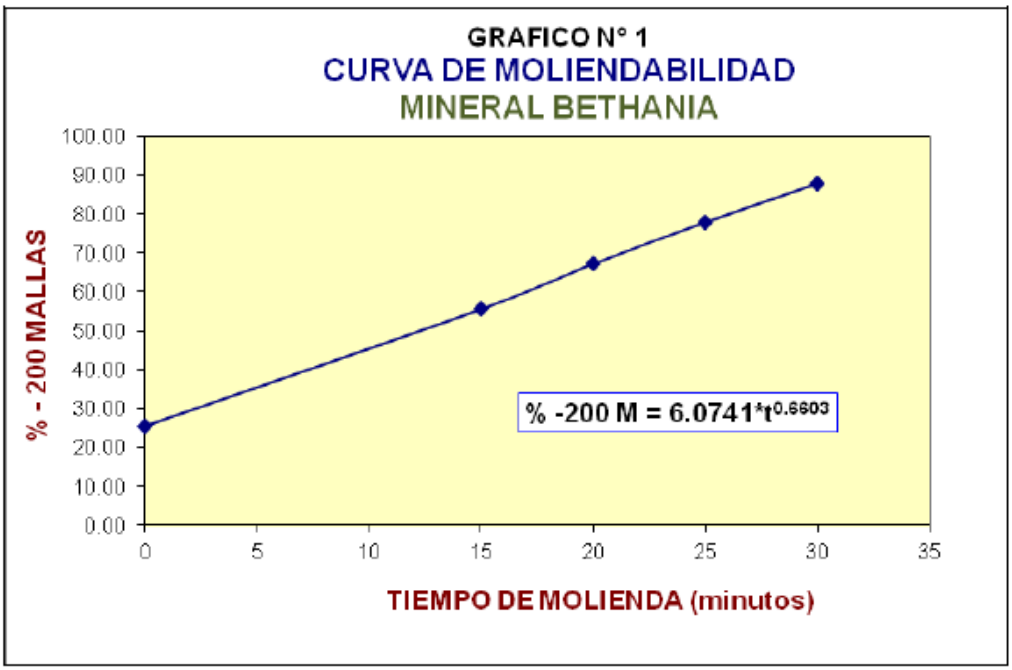

Figure 9. Grinding curve for sample from Santa Elena Mine (Bethania Mine).

A particle size distribution test was also completed on the sample which determined that 44.92% of the ore sample is less than +1/2", a high percentage that can be separated before crushing/grinding (Figure 10).

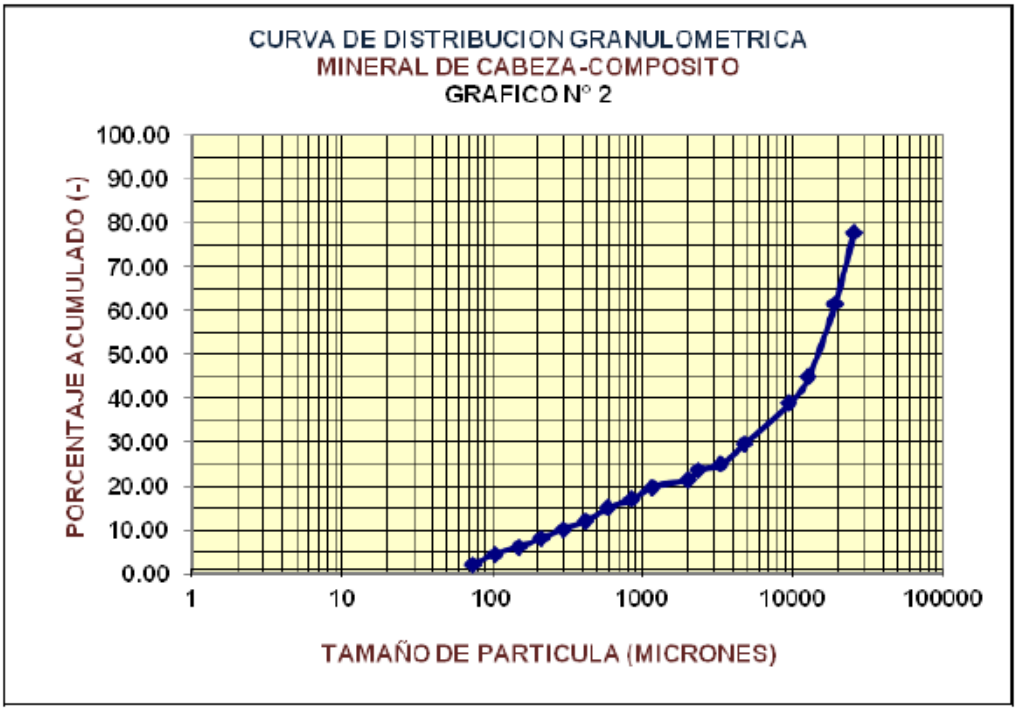

Figure 10. Particle size distribution 0for sample from Santa Elena Mine (Bethania Mine).

To test the effects of grinding, three flotation tests were completed, the first two being 60% -m200 and the third being 55% -m200. Results of the bulk and selective flotation (cleaner) tests are provided in Table 29.

Table 29. Results from the 2015 flotation tests and Zn concentrate, Santa Elena Mine.

	Concentrate Grade						Global Recovery			
Flotation Test	Cond.	Zn (%)	Pb (%)	Cu (%)	Ag (oz/t)	Au (g/t)	Zn (%)	Pb (%)	Cu (%)	Ag (%)
1-Bulk Zn Concentrate	60% -m200	4.12	60.28	5.48	210.70	19.00	8.06	81.81	77.25	68.81
1-Clean Zn Concentrate		65.73	2.72	0.63	53.00	-	87.40	7.67	12.40	21.92
2-Bulk Zn Concentrate	60% -m200	3.87	66.68	3.95	261.00	10.21	7.88	77.36	49.45	64.82
2-Clean Zn Concentrate		60.44	5.43	2.87	92.00	-	88.31	12.99	43.40	29.57
3-Bulk Zn Concentrate	55% -m200	4.35	60.44	6.03	202.20	9.87	9.47	84.61	79.08	66.99
3-Clean Zn Concentrate		59.92	2.13	0.81	72.30	-	86.86	7.76	13.82	26.77

The report concluded that of the three tests, test number 1 shows the best metallurgical behaviour. According to the results obtained, it is recommended to work with a grinding between 60-65% -200 mesh. The highest silver recoveries (68.81%) were in the bulk flotation concentrate of sample 1 (fine grind) but at the second lowest silver grade in the concentrate (210.70 oz/t). The highest grade of silver in concentrate (261.00 oz/t) was in the sample 2 which gave a silver recovery of 64.82%.

14.0 MINERAL RESOURCE ESTIMATES

The Project currently has no NI 43-101 Mineral Resources. Historical Mineral Resources are covered in Section 6.0, History.

15.0 MINERAL RESERVE ESTIMATES

The Project currently has no NI 43-101 Mineral Reserves. Historical Mineral Reserves are covered in Section 6.0, History.

16.0 MINING METHODS

At this time, there is no mining on the Property. As description of past mining methods used during past production is presented in Section 6.0, History.

17.0 RECOVERY METHODS

At this time, there is no mining on the Property. As description of recovery methods used during past production is presented in Section 6.0, History.

18.0 PROJECT INFRASTRUCTURE

Asesores Y Consultores Mineros S.A. ("ACOMISA"), a Lima-based engineering group, has been retained by the Company to complete all the necessary permits, licences, plans and applications to re-start production at the Bethania Mine in the near future. ACOMISA has been involved in all aspects of the mine permitting and planning including the environmental and social plan, mine design, the mining plan, processing plant, water and waste management and the tailings facility. Draft mine site engineering plans (these have not been approved by the local authorities) including process flow sheet, plant design and tailings containment are provided in Appendix 7.

19.0 MARKET STUDIES AND CONTRACTS

Kuya has not carried out any market studies on the silver from the Bethania Silver Project. Silver, by its nature, has a readily-defined market. In the past, S&L has found a ready local market for run-of-mine ore, having processed polymetallic ore (Ag-Pb and Zn concentrates) from the Bethania Mine at several processing plants in the region (see sections 6.6 and 13.0).

20.0 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

S&L has secured all the necessary operational permits (mine, explosives, water), has an approved Declaracion de Impacto Ambiental ("DIA") which addresses the environmental and social impact of the mine and allows the Company to carry out mining operations in the mine area. The Company has submitted the Evaluacion de Impacto Ambiental ("EIA") for the processing plant (see Section 4.8) which includes an outline for community workshops that evaluated the social impact. The Company has developed and maintains good positive relationships with the project's stakeholders, including an agreement with the local community of Bethania as it relates to the mine and processing plant.

20.1 Water Treatment and Waste Management

Regarding the treatment of acid mine waters, 0sedimentation ponds have been made in order to avoid contamination of the tributary water to the community of Bethania. In addition, monitoring will be carried out to avoid physical, biological and ergonomic damages. With Solid Waste Deposits in both portal and camp which are accumulated in Landfills and in addition will be made the destruction of Explosives that have been damaged in accordance with the Regulation.

21.0 CAPITAL AND OPERATING COSTS

This section is not applicable.

22.0 ECONOMIC ANALYSIS

This section is not applicable.

23.0 ADJACENT PROPERTIES

With the exception of the Corihuarmi gold heap leach mine to the northwest, owned by Mineral IRL, properties adjacent to or within a few kilometres of the Santa Elena concession (Bethania Mine) are fragmented among several different owners, none of which are nearly as advanced or have the mining infrastructure of the Bethania Mine (Stein, 2018). The Author, in consultation with the Company, considers the most important adjacent prospects to be immediately north, south and west of the Property (Figures 3 and 11):

- Immediately north of the Bethania Mine (and surrounding the Santa Elena concession) is the "Fiopo I" concession which contains several polymetallic showings and what appear to be abandoned artisanal mines. This ground has been held and explored in the past by Mineral IRL Limited ("MIRL").

- Immediately south of the Bethania Mine, on the "El Alcatraz 12" concession, Stein (2018) described linear silicified outcrops similar to what is observed above mineralized veins at the Bethania Mine property - sulphides are weathered away leaving a silica dominant host rock. There are also polymetallic showings noted on regional maps, similar to those on the Fiopo I concession. This concession was previously worked as a joint venture between MIRL and Rio Blanco Copper (https://rioblanco.com.pe/).

  MIRL drill-tested the area south of the Bethania Mine between 2008 and 2010 (mostly on the El Alcatraz 12 concession). No resource was ever reported, but several significant intersections of low-grade gold (~0.5 g/t Au) were reported from surface. The low-grade disseminated gold is reportedly similar to Minera IRL's Corihuarmi Mine, located approximately 5 km northwest of the Bethania Mine. The gold mineralization may be an indicated of a larger regional porphyry system that was feeding several different styles of precious and base metal mineralization in the area, including mineralization at the Bethania Mine (see Section 23.1 below).

- West of the Bethania Mine are three properties owned by the same owner and known as Carmelitas. None of the properties have been permitted to mines, however several "exploration" adits have been opened up and polymetallic mineralization has been recovered. The size and potential of these artisanal mines is not yet known (see Section 23.3.2 below).

23.1 Minera IRL Limited

MIRL's Bethania gold-copper porphyry project consisted of four concessions covering 3,294 ha with two of the concessions, the El Alcatraz 12 and Fiopo I, located adjacent to the Bethania Mine (Santa Elena concession). The El Alcatraz 12 concession is located immediately south of the Bethania Mine and the Fiopo I concession fully encircles and covers the area to the north, east and west of the Santa Elena concession (Figure 3).

Exploration on the four concessions commenced in October 2009 with a 12 hole, 4,856 m reverse circulation (RC) drilling program that was completed in February 2010. The target was a large porphyry gold or gold/copper deposit. An extensive alteration zone, measuring approximately 3.5 km by 1.2 km, is associated with an Induced Polarization chargeability/resistivity anomaly indicating the presence of extensive disseminated sulphide mineralization. Coincident ground magnetic anomalies, extending beyond the recently explored area, are interpreted to be associated with near-surface potassic-altered mineralized centres (MIRL news release July 5, 2010).

In July 2010, MIRL reported initial exploration drilling results had indicated a potentially widely disseminated gold and copper system with plenty of space for a large mineralized body or bodies within the interpreted system. Six drill holes intersected broad zones of gold copper molybdenum mineralization, characteristic of the targeted porphyry system. The best drill hole results, from RC10-BET10 intersected 276 metres from surface averaging 0.38 g/t Au, 0.09% Cu, and 30 ppm Mo, including (also from surface) 72 metres at 0.66 g/t Au, 0.13% Cu, and 40 ppm molybdenum. Hole RC10-BET07 averaged 0.32 g/t Au, 0.09% Cu, and 32 ppm Mo over the entire 426 metres of the hole and included a zone of 124 metres at 0.39 g/t Au, 0.10% Cu, and 22 ppm molybdenum from 260 metres down hole. Drill hole RC10-BET09 recorded two intersections: 90 metres from surface at 0.46 g/t Au, 0.15% Cu, and 54 ppm Mo plus 64 metres from 216 metres down hole grading 0.41 g/t Au, 0.11% Cu, and 25 ppm molybdenum. Drill hole RC10-BET11 averaged 0.29 g/t Au, 0.10% Cu, and 30 ppm Mo over 424 metres from surface (MIRL news release July 5, 2019).

23.2 Inca Minerals Ltd.

The Greater Riqueza Zn-Ag-Pb-Cu property, held by Inca Minerals Ltd. (https://www.incaminerals.com.au/greater-riqueza/), is located about 15 km south-southeast of the Bethania Silver Project and within Peru's Miocene Porphyry-skarn Mineral Belt (Figure 11). Importantly, there are three known porphyries within 20 km of the Riqueza property and all of these have mineralisation related to them; geophysics has identified several large porphyry and porphyry-skarn targets within this area.

23.3 Mining in the Region – Current and Historical

Within about 15 km of the Bethania Mine (Santa Elena concession) there are three mines currently in operation, Corihuarmi, Carmelitas, and Heraldos Negros and three mines that are not currently operating, Mi Recuerdo, San Antonio de Silver, and the Santa Elena (Tables 30a and 30b; Figures 4, 5, and 11).

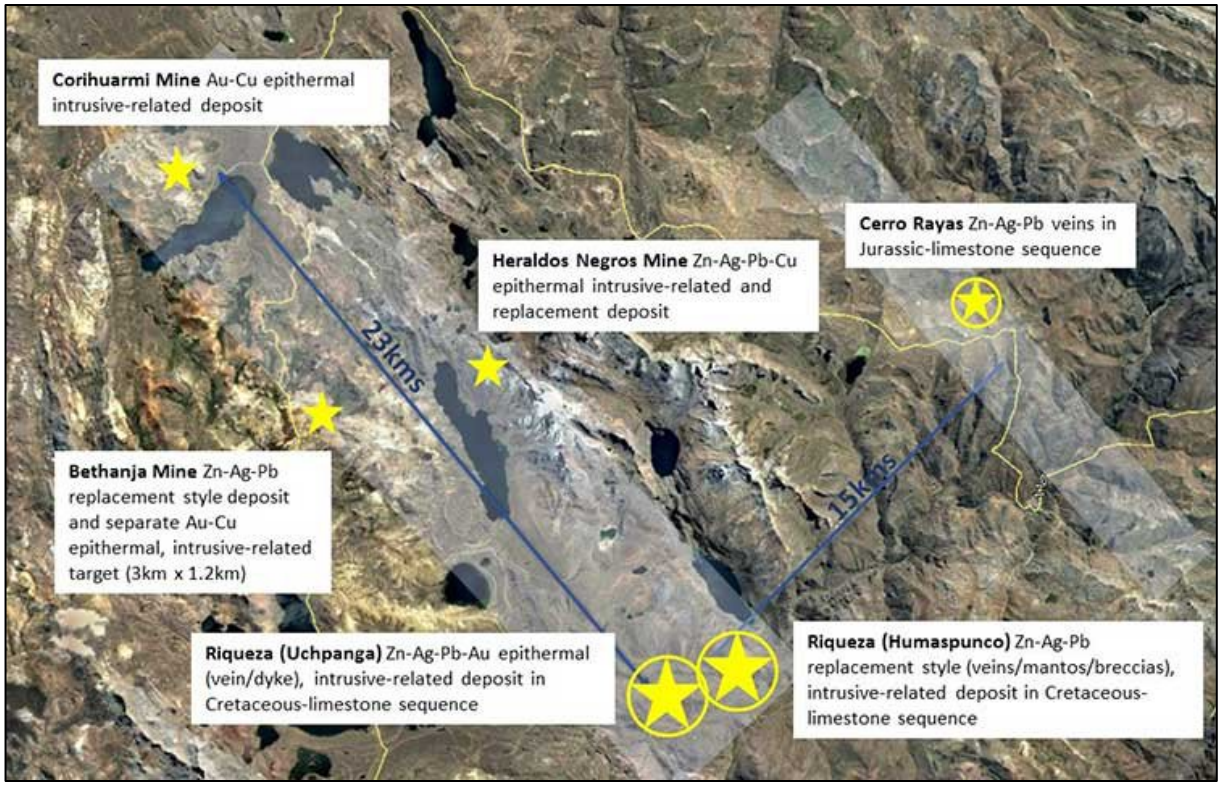

Figure 11. A regional satellite image showing the location of the Bethania Silver Mine and other projects and mines in the region including Corihuarmi Au-Cu Mine and the Heraldos Negros Zn-Ag-Pb-Cu Mine (Inca Minerals Ltd., Quarterly Report, June 2017).

Table 30a. Mines operating within 15 kilometres of the Bethania Mine property.

Mine	Geographic Coordinate		Principal Structures	Principal Mineral	Estimated Monthly Production (tpm)
	Latitude S	Longitude W			
Corihuarmi	12°34'7.70"	75°34'25.13"	disseminated mineralization in volcanic rocks	Au	200,000
Carmelita	12°38'22.88"	75°34'8.14"	veins in volcanic rocks	Ag	300
					exploration stage
Heraldos Negros	12°37'34.22"	75°28'17.23"	veins in limestone	Zn	6,000

Table 30b. Suspended mines located within 15 kilometres of the Bethania Mine property.

Mine	Geographic Coordinate		Principal Structures	Principal Mineral	Estimated Monthly Production (tpm)
	Latitude S	Longitude W			
Santa Elena (Bethania)	12°38'15.91"	75°31'48.67"	veins in volcanic rocks	Ag	3,000
Mi Recuerdo	12°35'50.49"	75°30'21.54"	veins in volcanic rocks	Ag	800
San Antonio de Silver	12°39'48.64"	75°32'45.48"	veins in volcanic rocks	Ag	1,000

For reference, producing mines and mines whose operations are suspended and that are located greater than 15 km away from the Bethania property are provided in Tables 31a and 31b.

Table 31a. Mines operating greater than 15 kilometres from the Bethania Mine property.

Mine	Geographic Coordinate		Principal Structures	Principal Mineral	Estimated Monthly Production (tpm)
	Latitude S	Longitude W			
Yauricocha	12°12'47.96"	75°43'25.73"	veins in limestone	Zn	30,000
Mario	12°24'38.89"	75°29'54.48"	veins in limestone	Zn	300
Saturno	12°19'42.28"	75°33'55.96"	veins in limestone	Ag oxides	800

Table 31b. Suspended mines located greater than 15 kilometres from the Bethania Mine property.

Mine	Geographic Coordinate		Principal Structures	Principal Mineral	Estimated Monthly Production (tpm)
	Latitude S	Longitude W			
San Valentín	12°24'28.80"	75°40'57.59"	Skarn	Zn	20,000
Brillante	12°22'7.09"	75°32'47.89"	Skarn	Zn	restarting
Cercapuquio	12°25'47.59"	75°25'3.51"	Skarn	Zn	3,000

23.3.1 Corihuarmi Gold Mine

The Bethania Silver Project is located about 10 km southeast of the Corihuarmi Gold Mine (Minera IRL Limited (CSE:MIRL); https://www.minera-irl.com/corihuarmi-3/), an open-pit mine located at nearly 5,000 mASL (Figure 11). The Corihuarmi gold mine was built for about US$20 million and the capital investment was recovered during its first year of production. The property was first identified in 1996 and started production in March 2008. Up to March 2017 it had produced 280,184.46 ounces of gold. Projected gold production is an average 21,000 ounces per annum through 2020.

The Corihuarmi is located at the northern extreme of the southern Peru Au-Ag epithermal belt. Mineralisation is of a high-sulphidation (HS) epithermal type hosted in volcanic rocks close to the Chonta fault, a regionally significant north-northwest trending structure. The Chonta fault is a major geological break which separates Cenozoic volcanic deposits from folded Paleozoic sediments. Zoned alteration and mineralisation is centred on dacitic and rhyodacitic domes intruded close to the Chonta Fault at its intersection with subordinate northeast faults (Seers et al., 2018).

23.3.2 Carmelita Mine

The Carmelita Silver Mine is located in the Western Cordillera de los Andes, near the juncture of Lima, Junín, and Huancavelica departments (Tupe District), and about 4 km west of the Santa Elena concession. There are multiple adits on the three “Carmelitas” concessions (2005 I, II and III) with at least one of the mining areas located at Viscastina Hill (438914mE, 8602749mN; 4837 mASL) and belonging to the District of Tupe, Yauyos Province, Lima Department.

Given the lithological, structural, mineralogical and alteration characteristics of the veins in the Carmelita mine, it has been classified as hydrothermal origin, low sulphidation epithermal volcanic. The silver, lead, zinc, and gold mineralized vein systems are hosted within a tectonic anticline. In detail, mineralization occurs as fracture filling with a banded texture, with minerals of argentite,

galena and yellow sphalerite, and lesser fine pyrite, porous silica, rhodonite, manganese oxide, and limonite; it is likely that elevated gold concentrations are associated with high percentages of pyrite.

23.3.3 Heraldos Negros Mine

The Heraldos Negros underground Zn-Ag-Pb-Cu mine is located at approximately 448799mE, 8604158mS (PSAD56 Z18S) in the Junín Department, Huancayo Province and Chongos Alto District (Figure 11). An intrusive-related skarn and replacement deposit, Heraldos Negros has been in production for about 50 years, and is owned by Compania Minera San Valentin S.A. a private Peruvian company.

23.3.4 Yauricocha Polymetallic Mine

Sierra Metals Inc.'s Yauricocha Mine and Chumpe plant, located in the Lima Department of Peru, has been producing and processing polymetallic mineral for more than 50 years, with production from the mine processed at the Chumpe plant (www.sierrametals.com).

Mineralisation at Yauricocha is genetically and spatially related to the Yauricocha stock; six skarn bodies host mineral resources around the margins of the stock. Near surface mineral is exhausted but significant mineral resources are reported at depth, over 13Mt of measured and indicated resources and a further 6.5Mt of inferred resources were reported in an SRK resource, Effective Date, July 31st, 2017 (Table 32; Rubio et al., 2018).

Table 32. Mineral Resources at the Yauricocha Mine, Peru (SRK, 2018).

Catergory	Tonnes(kt)	Ag (g/t)	Au (g/t)	Cu (%)	Pb (%)	Zn (%)	Density
Measured	3,094	69.97	0.79	1.72	1.23	3.20	3.74
Indicated	10,111	59.91	0.60	1.46	0.83	2.67	3.80
Measured + Indicated	13,205	62.26	0.65	1.52	0.92	2.79	3.79
Inferred	6,632	43.05	0.55	1.19	0.47	2.16	3.71

The geometry and grade of mineralisation at Yauricocha lends itself to sub-level caving mining and accounted for more than 98% of total current mineral production (3,000 tpd). Mineral and waste is hoisted to the 720 level and is carried by electric locomotive to the Chumpe plant for processing. Yauricocha has three hoisting shafts with a combined capacity of 4,500 tpd at the current waste to mineral ratio of 0.5:1.

24.0 OTHER RELEVANT DATA AND INFORMATION

Kuya Silver is acquiring up to an 80% controlling interest in the Bethania Silver Project with a plan to modernize and upgrade the mine and expand production. Contingent on financing, initial expansion will take the mine to 350 tpd in the first year and subject to further exploration results at Bethania, as well as regional exploration results, Kuya may evaluate a second expansion to +500 tpd.

25.0 INTERPRETATION AND CONCLUSIONS

The Property, located in the Cordillera Central of Peru, is host to volcanic-hosted intermediate sulphidation epithermal Ag-Pb-Zn-Cu-Au mineralization. This polymetallic mineralization is primarily hosted by northeast-trending veins and structures which contain bonanza grade silver grades (i.e., >100 g/t Ag) and are hosted by altered andesite and dacite.

Based on evaluation of the data available from the Bethania Property, the Author of this Technical Report has formed the following conclusions:

1. The Bethania Mine (Santa Elena concession) started producing in 1977 and was operating on and off until 2016 (almost 40 years).
2. Past production has shown that the polymetallic ores are suited to standard flotation processing and that optimum recovery is best achieved on a lead-silver flotation circuit.
3. Past mining methods have been upward cut and fill selective mining method, which is suited to high-grade, narrow vein deposit types.
4. The Soria family (S&L) acquired the Bethania Mine and restarted production in 2009 (toll processing 2013 to 2016) achieving production of 28,788 tonnes (79 tpd) in 2014 and producing 425,000 ounces of silver equivalent (Pb-Zn by-products).
5. Historical production from 2010 to 2016 saw an estimated 91,000 tonnes of ore mined (15,000 tonnes per year) at an average grade of 20 oz/t Ag.
6. Historical due diligence grab sampling by the Company suggests that the mineralized (disseminated sulphide) siliceous stockwork contains anomalous gold-silver concentrations (0.55 g/t Au and 74.74 g/t Ag).
7. Mineralized (disseminated sulphide) volcanic host rocks, intervening rock to the vein systems, could contain anomalous concentrations of precious metals.
8. Unexplored northwest-trending vein systems (at least 5 known to date) could contain anomalous concentrations of precious/base metals.
9. Mined and targeted northeast-trending vein systems have been explored (surface and underground) and mined on less than 50% of the Santa Elena concession, leaving more than 50% of the concession toward the northeast to be evaluated for along strike extensions of the productive vein systems.
10. Existing vein systems have shown through underground mining and development to continue at depth, providing further upside to a future mining plan.
11. The Chinita I concession and the Tres Bandera 01 and 02 concessions, although currently low-priority areas for exploration, show promise for future exploration programs.

Given the extensive northeast-trending vein systems, the possibility of additional resources from the intervening mineralized volcanic host rock, prospectivity of the mineralized hydrothermal quartz stockwork (siliceous bodies), and the potential in the as yet unexplored northwest-trending veins, the Bethania Silver Property (Santa Elena) exhibits significant exploration upside.

Although historical in nature, mineral resources and reserves calculated by S&L and possibly containing 8.3M ounces of silver in 435,000 tonnes, demonstrate the future production potential of the Bethania Mine. Moreover, the stockpiles located on the mining concession could contain some 326,000 ounces of silver in 25,000 tonnes which could provide ready-feed to future production that

could be treated in a process plant immediately, while underground development and mining continues.

In addition to exploration, the Company is in the process of developing a mining plan for near-future implementation, along with the permitting and design of a 350 tpd process plant (flotation) and related water and tailings storage facilities. During the mine planning phase, the Company may want to evaluate the historical use of cut and fill mining methods against a potential change to the shrinkage stoping method.

26.0 RECOMMENDATIONS

It is the Author's opinion that additional exploration expenditures are warranted on the Bethania Silver Project and specifically the Bethania Mine (Santa Elena concession). Future attention should be given to the prospectivity of the additional concessions the Company has acquired in the region (i.e., Chinita I, Tres Banderas 01/02), but current focus should be on the Santa Elena concession (Bethania Mine).

A program comprising surface investigations (CAD$100,000) and underground/surface diamond drilling (CAD$475,000) is proposed for the Bethania Mine/Santa Elena concession (Table 33).

Table 33. Proposed exploration program for the Bethania Silver Mine, Santa Elena concession.

Surface Investigations		
Item	**Description**	**Objective**
3D Modelling/Data Integration	continue with integration and modelling as new information and data is generated	up to date database
Surveys	integrate and correlate historical surveys from surface and underground elevation and spot data	verify accuracy in existing surface and underground data models
Geological Mapping	systematic mapping and sampling; use of a handheld XRF unit to test rocks and soils	develop new target areas for trenching/sampling evaluate potential of volcanic host rocks
Alteration Study	mapping of alteration patterns assisted by a portable infrared mineral analyzer (PIMA) XRD unit	understanding of alteration system
Structural Study	structural mapping (contacts, veins, joints, faults) integrating surface and underground information	aid in future 3D geological modelling, interpretation and targeting
Diamond Drilling		
Item	**Description**	**Objective**
Diamond Drilling	8 holes totalling 1,944 metres; collared from surface and/or underground	test multiple veins, explore for new vein systems and test economic potential of the volcanic host rock between vein systems

26.1 Surface Investigations

It is recommended that surface investigations, totalling CAD$100,000, include:

- 3D Modelling and Data Integration: Data compilation (2D information) and 3D modelling of all historical data was completed in July 2019. Further data integration and modelling should continue as new information and data is generated.
- Surveys: integrate and correlate historical surveys from surface topography (high-resolution drone survey 2019) and underground surveys, confirming the accuracy of the data.
- Geological Mapping: spot verification of previous geological mapping and in-fill geological mapping and sampling. Use of a portable XRF unit would assist greatly in obtaining real time analyses on rocks and soils.
- Alteration Study: mapping of alteration patterns assisted by a portable infrared mineral analyzer (PIMA) XRD unit.
- Structural Study: structural mapping (contacts, veins, joints, faults) integrating surface and underground information.

Not contemplated at this time but recommended for consideration in future work programs are geophysical surveys (high resolution magnetics and Induced Polarization/Resistivity) and trenching programs to follow up on any new surface discoveries.

26.2 Diamond Drilling

It is recommended that a targeted 1,944 metre diamond drilling program, totalling CAD$475,000, be completed as outlined in Table 34. The current plan is to have the drill set ups underground on Level 670m.

Table 34. Proposed underground diamond drill holes for the Bethania Silver Mine.

DDH	Length (m)	Dip	Az (°)	Level (collar)	Objective	Comments
SE-1	290	-57	159	670	12 de Mayo, Maria, Victoria veins	intercept at elevation 4490 mASL
SE-2	280	-53	159	670	12 de Mayo, Victoria veins	intercept at elevation 4490 mASL
SE-3	274	-54	159	670	12 de Mayo vein	intercept at elevation 4490 mASL
SE-4	270	-69	339	670	Española 1, Maria veins	recognize structure at elevation 4490 mASL
SE-5	250	-74	339	670	Española vein	recognize structure at elevation 4490 mASL
SE-6	250	-60	339	670	Española vein	recognize structure at elevation 4490 mASL
SE-7	150	0	63	670	Cuerpo Siliceo	explore northeast side of the concession
SE-8	180	0	61	670	Cuerpo Siliceo	explore northeast side of the concession
Total:	**1,944**					

Although diamond drilling could be completed using underground setups, it may be beneficial to consider drilling at least some of the drill holes from surface. This would provide additional information (longer intercepts from surface) about the known vein systems, host rocks, and may intersect parallel and/or unknown vein systems. Planned drill hole cross sections and plan map are provided in Appendix 9.

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https://www.gob.pe/minem

APPENDIX 1 - Certificate of Author

[1 page]

CERTIFICATE OF AUTHOR

Scott Jobin-Bevans (P.Geo.)

I, Scott Jobin-Bevans, P.Geo., do hereby certify that:

1. I am an independent consultant of Caracle Creek International Consulting Inc. (Caracle) and have an address at 1545 Maley Drive, Ste. 2018, Sudbury, Ontario, Canada, P3A 4R7.
2. I graduated from the University of Manitoba (Winnipeg, Manitoba) with a B.Sc. Geosciences (Hons) in 1995 and from the University of Western Ontario (London, Ontario) with a Ph.D. (Geology) in 2004.
3. I am a member, in good standing, of Association of Professional Geoscientists of Ontario, License Number 0183.
4. I have practiced my profession continuously for 24 years and have been involved in mineral exploration, mine site geology, mineral resource and reserve estimations, preliminary economic assessments, and pre-feasibility studies on numerous base metal, gold, silver, nickel-copper-platinum group element , lithium projects in Canada, the United States, China, Central and South America, Europe, Africa, and Australia since 1988.
5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 Standards of Disclosure for Mineral Projects ("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. I am responsible for the preparation of all sections of the report titled "National Instrument 43-101 Technical Report, Bethania Silver Project, Department of Huancavelica, Province of Huancavelica, District of Acobambilla, Peru (the "Technical Report"), dated August 29, 2019 and with an Effective Date of July 31, 2019.
7. I visited the Bethania Silver Project on June 15, 2019 for one day.
8. I am independent of Kuya Silver applying all of the tests in Section 1.5 of NI 43-101.
9. I have had no prior involvement with the Property that is the subject of the Technical Report.
10. I have read NI 43-101, Form 43-101F1 and confirm the Technical Report has been prepared in compliance with that instrument and form.
11. As of the Effective Date of the Technical Report, to the best of my knowledge, information and belief, the Sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed at Santiago, Chile this 29th day of August, 2019.

"electronic signature"

_____

Scott Jobin-Bevans (Ph.D., PMP, P.Geo.)

APPENDIX 2 - Assay Certificates

[13 pages]

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URB STA PATRICIA 2° ETAPA - LA MOLINA
LIMA Lima Peru

Submitted By: Scott Jobin-Bevans
Receiving Lab: Bureau Veritas Perú - Callao
Received: June 28, 2019
Report Date: July 05, 2019

CERTIFICATE OF ANALYSIS CLL19001497.1

CLIENT JOB INFORMATION

Project: CARACLE
Shipment ID:
P.O. Number
Number of Samples: 5

SAMPLE DISPOSAL

DISP-PLP Dispose of Pulp After 90 days
DISP-RJT Dispose of Reject After 60 days

Bureau Veritas does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Procedure Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
PRP70-250	5	Crush, split and pulverize 250 g rock to 200 mesh			LIM
FA430	5	Lead Collection Fire Assay Fusion - AAS Finish	30	Completed	CLL
EN002	5	Environmental disposal charge-Fire assay lead waste			CLL
MA301	5	43 elements 4 acid by ICP-AES	0.35	Completed	CLL
MA402	5	4 Acid Digestion 0.5g/100mL, AAS finish	0.5	Completed	CLL

ADDITIONAL COMMENTS

Invoice To: S&L Andes Export SAC
CAL.TRECE MZA. D LOTE. 28
URB STA PATRICIA 2° ETAPA - LA MOLINA
LIMA Lima
Peru

CC: E. Soria

FLOR MELGAR
JEFE DE LABORATORIO
CIP: N°186937

The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of multiple samples of geologic materials collected by the prospective investor or by a qualified person selected by him and based on an evaluation of all engineering data which is available concerning any proposed project.
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LIMA Lima Peru

Project: CARACLE
Report Date: July 05, 2019

CERTIFICATE OF ANALYSIS CLL19001497.1

	Method	WGHT	FA430	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301
	Analyte	Wgt	Au	Al	Ag	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu	Fe	Ga	Ge	In	K	La
	Unit	kg	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	MDL	0.01	0.005	0.01	0.2	5	5	0.5	5	0.01	1	10	1	1	2	0.01	5	10	10	0.01	2
KS-12M	Rock	0.36	0.434	4.14	8.4	538	148	1.0	<5	0.07	30	<10	15	18	443	2.37	13	<10	<10	2.72	3
KS-SW	Rock	0.66	0.054	5.20	0.3	80	417	1.5	<5	0.02	<1	<10	<1	18	26	1.64	15	<10	<10	3.83	2
KS-E2	Rock	0.95	0.008	0.25	>200	1020	29	<0.5	238	<0.01	75	17	11	5	9654	9.81	<5	<10	<10	0.07	<2
KS-CV	Rock	0.71	2.014	1.30	>200	1252	55	<0.5	<5	0.02	468	10	6	16	2385	7.12	7	<10	<10	0.50	<2
KS-E1	Rock	0.95	2.223	0.74	>200	1751	31	<0.5	<5	0.01	1485	<10	1	11	>10000	1.75	16	<10	<10	0.42	<2

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	Method	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301
	Analyte	Li	Mg	Mn	Mo	Na	Nb	Ni	P	Pb	Re	Sb	S	Sc	Se	Sn	Sr	Te	Ti	Tl	U
	Unit	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm
	MDL	5	0.01	2	2	0.01	10	1	10	5	5	5	0.01	1	5	10	1	5	0.01	5	10
KS-12M	Rock	13	0.08	70	122	2.32	<10	5	926	1673	<5	289	2.72	3	<5	<10	129	<5	0.23	6	<10
KS-SW	Rock	16	0.22	17	64	0.28	<10	2	502	55	<5	10	0.30	6	<5	<10	45	<5	0.09	5	<10
KS-E2	Rock	8	<0.01	47	7	<0.01	<10	1	42	>10000	<5	7558	>15	<1	23	<10	255	12	<0.01	6	<10
KS-CV	Rock	41	0.05	173	13	0.02	<10	5	45	>10000	<5	3310	11.13	1	22	<10	30	13	0.01	15	<10
KS-E1	Rock	36	0.03	477	45	0.03	<10	1	371	>10000	<5	>10000	>15	1	<5	<10	22	30	0.02	6	<10

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	Method	MA301	MA301	MA301	MA301	MA301	MA402
	Analyte	V	W	Y	Zn	Zr	Ag
	Unit	ppm	ppm	ppm	ppm	ppm	ppm
	MDL	1	10	1	5	5	1
KS-12M	Rock	54	28	3	3285	<5	9
KS-SW	Rock	82	<10	11	27	<5	<1
KS-E2	Rock	2	23	2	1786	<5	>1000
KS-CV	Rock	9	<10	5	>10000	<5	364
KS-E1	Rock	10	<10	2	>10000	<5	>1000

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QUALITY CONTROL REPORT CLL19001497.1

	Method	WGHT	FA430	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301
	Analyte	Wgt	Au	Al	Ag	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu	Fe	Ga	Ge	In	K	La
	Unit	kg	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	MDL	0.01	0.005	0.01	0.2	5	5	0.5	5	0.01	1	10	1	1	2	0.01	5	10	10	0.01	2
Pulp Duplicates																					
KS-12M	Rock	0.36	0.434	4.14	8.4	538	148	1.0	<5	0.07	30	<10	15	18	443	2.37	13	<10	<10	2.72	3
REP KS-12M	QC																				
KS-CV	Rock	0.71	2.014	1.30	>200	1252	55	<0.5	<5	0.02	468	10	6	16	2385	7.12	7	<10	<10	0.50	<2
REP KS-CV	QC			1.29	>200	1255	60	<0.5	<5	0.01	468	11	6	17	2375	7.13	7	<10	<10	0.50	<2
Core Reject Duplicates																					
KS-SW	Rock	0.66	0.054	5.20	0.3	80	417	1.5	<5	0.02	<1	<10	<1	18	26	1.64	15	<10	<10	3.83	2
DUP KS-SW	QC		0.053	4.89	0.5	75	419	1.5	<5	0.02	<1	10	<1	15	26	1.55	16	<10	<10	3.66	4
Reference Materials																					
STD OREAS151B	Standard			8.35	0.6	34	203	0.9	<5	2.14	1	17	11	30	1922	3.65	20	<10	<10	1.31	6
STD OREAS504B	Standard																				
STD OREAS504B	Standard																				
STD OREAS504B	Standard																				
STD OREAS605	Standard																				
STD OREAS600B	Standard																				
STD OREAS602B	Standard																				
STD OREAS604B	Standard																				
STD OREAS630	Standard			7.04	10.9	668	28	1.5	6	1.56	13	61	2	15	367	8.46	24	<10	<10	3.11	12
STD OREAS602B	Standard			5.46	117.0	911	60	1.8	58	0.65	5	56	4	38	5021	2.56	25	<10	<10	1.86	18
STD OXA131	Standard		0.078																		
STD OXH139	Standard		1.313																		
STD OXN134	Standard		7.640																		
STD OREAS605 Expected																					
STD OREAS600B Expected																					
STD OREAS604B Expected																					
STD OREAS630 Expected				7.194	10.5	667.4		1.59	7.6	1.58	13.15			17.18	384.2	8.64	20.85		0.4	3.12	22.08
STD OREAS151B Expected				7.84	0.551	30.7	203	0.82	0.37	2.02	0.58	20.1	11.6	28.2	1820	3.53	18.4			1.23	9.91
STD OREAS602B Expected				5.38	119	874		1.69	58	0.655	4.89	51	5.08	33.5	4960	2.52	24.3			1.78	23.5
STD OREAS504B Expected																					

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Project: CARACLE
Report Date: July 05, 2019

QUALITY CONTROL REPORT CLL19001497.1

	Method	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301
	Analyte	Li	Mg	Mn	Mo	Na	Nb	Ni	P	Pb	Re	Sb	S	Sc	Se	Sn	Sr	Te	Ti	Tl	U
	Unit	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm
	MDL	5	0.01	2	2	0.01	10	1	10	5	5	5	0.01	1	5	10	1	5	0.01	5	10
Pulp Duplicates																					
KS-12M	Rock	13	0.08	70	122	2.32	<10	5	926	1673	<5	289	2.72	3	<5	<10	129	<5	0.23	6	<10
REP KS-12M	QC																				
KS-CV	Rock	41	0.05	173	13	0.02	<10	5	45	>10000	<5	3310	11.13	1	22	<10	30	13	0.01	15	<10
REP KS-CV	QC	41	0.05	173	14	0.02	<10	4	45	>10000	<5	3288	11.08	1	21	<10	32	14	<0.01	19	<10
Core Reject Duplicates																					
KS-SW	Rock	16	0.22	17	64	0.28	<10	2	502	55	<5	10	0.30	6	<5	<10	45	<5	0.09	5	<10
DUP KS-SW	QC	15	0.21	17	60	0.27	<10	<1	469	53	<5	9	0.28	6	<5	<10	48	<5	0.08	<5	<10
Reference Materials																					
STD OREAS151B	Standard	10	1.65	345	57	2.35	<10	15	617	55	<5	<5	0.77	16	<5	<10	182	5	0.30	<5	<10
STD OREAS504B	Standard																				
STD OREAS504B	Standard																				
STD OREAS504B	Standard																				
STD OREAS605	Standard																				
STD OREAS600B	Standard																				
STD OREAS602B	Standard																				
STD OREAS604B	Standard																				
STD OREAS630	Standard	23	1.02	>10000	10	0.53	<10	10	462	2701	<5	44	7.51	10	<5	<10	94	21	0.21	54	<10
STD OREAS602B	Standard	22	0.08	187	7	1.40	12	14	277	558	<5	115	2.12	4	25	<10	236	40	0.16	5	<10
STD OXA131	Standard																				
STD OXH139	Standard																				
STD OXN134	Standard																				
STD OREAS605 Expected																					
STD OREAS600B Expected																					
STD OREAS604B Expected																					
STD OREAS630 Expected		23.57	1.122	22400	11.09	0.557	9.05	11.3	460	2720		43.95	7.728	10.13		3.32	150.5		0.236	48.87	7.26
STD OREAS151B Expected		8.34	1.62	330	55	2.22	3.38	15.2	580	43.6			0.724	15.8	3.54	1.83	170	0.11	0.308		0.72
STD OREAS602B Expected		20.3	0.0759	188	7.45	1.4	12	14.2	279	493		105	2.13	3.56	24.1	8.96	260	34.4	0.149	2.17	3.8
STD OREAS504B Expected																					

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PHONE +51(1) 6138080

Client: **S&L Andes Export SAC**
CAL.TRECE MZA. D LOTE. 28
URB STA PATRICIA 2° ETAPA - LA MOLINA
LIMA Lima Peru

Project: CARACLE
Report Date: July 05, 2019

QUALITY CONTROL REPORT CLL19001497.1

	Method	MA301	MA301	MA301	MA301	MA301	MA402
	Analyte	V	W	Y	Zn	Zr	Ag
	Unit	ppm	ppm	ppm	ppm	ppm	ppm
	MDL	1	10	1	5	5	1
Pulp Duplicates							
KS-12M	Rock	54	28	3	3285	<5	9
REP KS-12M	QC						9
KS-CV	Rock	9	<10	5	>10000	<5	364
REP KS-CV	QC	9	<10	5	>10000	<5	
Core Reject Duplicates							
KS-SW	Rock	82	<10	11	27	<5	<1
DUP KS-SW	QC	78	<10	15	24	<5	<1
Reference Materials							
STD OREAS151B	Standard	205	<10	13	255	15	
STD OREAS504B	Standard						4
STD OREAS504B	Standard						3
STD OREAS504B	Standard						3
STD OREAS605	Standard						977
STD OREAS600B	Standard						26
STD OREAS602B	Standard						119
STD OREAS604B	Standard						500
STD OREAS630	Standard	45	14	20	5373	163	
STD OREAS602B	Standard	17	13	10	809	155	
STD OXA131	Standard						
STD OXH139	Standard						
STD OXN134	Standard						
STD OREAS605 Expected							972
STD OREAS600B Expected							25.2
STD OREAS604B Expected							507
STD OREAS630 Expected		45.1	19.94	20.61	5400	168.82	
STD OREAS151B Expected		203	2.36	13.3	246	17.1	
STD OREAS602B Expected		15.8	13.8	8.69	764	149	119
STD OREAS504B Expected							3.07

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Client: **S&L Andes Export SAC**
CAL.TRECE MZA. D LOTE. 28
URB STA PATRICIA 2° ETAPA - LA MOLINA
LIMA Lima Peru

Project: CARACLE
Report Date: July 05, 2019

QUALITY CONTROL REPORT CLL19001497.1

		WGHT	FA430	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301	MA301
		Wgt	Au	Al	Ag	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu	Fe	Ga	Ge	In	K	La
		kg	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	%	ppm
		0.01	0.005	0.01	0.2	5	5	0.5	5	0.01	1	10	1	1	2	0.01	5	10	10	0.01	2
STD OXA131 Expected			0.077																		
STD OXN134 Expected			7.667																		
STD OXH139 Expected			1.312																		
BLK	Blank																				
BLK	Blank																				
BLK	Blank			<0.01	<0.2	<5	<5	<0.5	<5	<0.01	<1	<10	<1	1	<2	<0.01	<5	<10	<10	<0.01	<2
BLK	Blank																				
BLK	Blank		<0.005																		
BLK	Blank		<0.005																		
Prep Wash																					
QUARTZ_CLL	Prep Blank		<0.005	0.02	0.2	<5	11	<0.5	<5	<0.01	<1	<10	<1	23	2	0.24	<5	<10	<10	<0.01	<2
QUARTZ_CLL	Prep Blank		<0.005	0.02	<0.2	<5	8	<0.5	<5	<0.01	<1	<10	<1	40	2	0.23	<5	<10	<10	<0.01	<2

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PHONE +51(1) 6138080

Client: **S&L Andes Export SAC**
CAL.TRECE MZA. D LOTE. 28
URB STA PATRICIA 2° ETAPA - LA MOLINA
LIMA Lima Peru

Project: CARACLE
Report Date: July 05, 2019

QUALITY CONTROL REPORT CLL19001497.1

		MA301 Li ppm 5	MA301 Mg % 0.01	MA301 Mn ppm 2	MA301 Mo ppm 2	MA301 Na % 0.01	MA301 Nb ppm 10	MA301 Ni ppm 1	MA301 P ppm 10	MA301 Pb ppm 5	MA301 Re ppm 5	MA301 Sb ppm 5	MA301 S % 0.01	MA301 Sc ppm 1	MA301 Se ppm 5	MA301 Sn ppm 10	MA301 Sr ppm 1	MA301 Te ppm 5	MA301 Ti % 0.01	MA301 Tl ppm 5	MA301 U ppm 10
STD OXA131 Expected																					
STD OXN134 Expected																					
STD OXH139 Expected																					
BLK	Blank																				
BLK	Blank																				
BLK	Blank	<5	<0.01	<2	<2	<0.01	<10	<1	<10	<5	<5	<5	<0.01	<1	<5	<10	<1	<5	<0.01	<5	<10
BLK	Blank																				
BLK	Blank																				
BLK	Blank																				
Prep Wash																					
QUARTZ_CLL	Prep Blank	5	<0.01	27	<2	<0.01	<10	<1	<10	15	<5	<5	<0.01	<1	<5	<10	1	<5	<0.01	<5	<10
QUARTZ_CLL	Prep Blank	<5	<0.01	26	<2	<0.01	<10	1	<10	6	<5	<5	<0.01	<1	<5	<10	<1	<5	<0.01	<5	<10

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Client: **S&L Andes Export SAC**
CAL.TRECE MZA. D LOTE. 28
URB STA PATRICIA 2° ETAPA - LA MOLINA
LIMA Lima Peru

Project: CARACLE
Report Date: July 05, 2019

QUALITY CONTROL REPORT CLL19001497.1

		MA301 V ppm 1	MA301 W ppm 10	MA301 Y ppm 1	MA301 Zn ppm 5	MA301 Zr ppm 5	MA402 Ag ppm 1
STD OXA131 Expected							
STD OXN134 Expected							
STD OXH139 Expected							
BLK	Blank						<1
BLK	Blank						<1
BLK	Blank	<1	<10	<1	<5	<5	
BLK	Blank						<1
BLK	Blank						
BLK	Blank						
Prep Wash							
QUARTZ_CLL	Prep Blank	<1	<10	<1	<5	<5	<1
QUARTZ_CLL	Prep Blank	<1	<10	<1	<5	<5	<1

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Client: **S&L Andes Export SAC**
CAL.TRECE MZA. D LOTE. 28
URB STA PATRICIA 2° ETAPA - LA MOLINA
LIMA Lima Peru

Submitted By: Scott Jobin-Bevans
Receiving Lab: Bureau Veritas Perú - Callao
Received: July 09, 2019
Report Date: July 22, 2019

CERTIFICATE OF ANALYSIS CLL19001497O.1

CLIENT JOB INFORMATION

Project: CARACLE
Shipment ID:
P.O. Number
Number of Samples: 3

SAMPLE DISPOSAL

DISP-PLP Dispose of Pulp After 90 days

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Procedure Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
SLBHP	3	Sorting, labeling and boxing samples received as pulps			LIM
FA530-Ag	2	Lead collection fire assay fusion - gravimetric finish	30	Completed	CLL
MA402	3	4 Acid Digestion 0.5g/100mL, AAS finish	0.5	Completed	CLL

ADDITIONAL COMMENTS

Bureau Veritas does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

Invoice To: S&L Andes Export SAC
CAL.TRECE MZA. D LOTE. 28
URB STA PATRICIA 2° ETAPA - LA MOLINA
LIMA Lima
Peru

CC: E. Soria

FLOR MELGAR
JEFE DE LABORATORIO
CIP: N°186937

The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of multiple samples of geologic materials collected by the prospective investor or by a qualified person selected by him and based on an evaluation of all engineering data which is available concerning any proposed project.
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Client: **S&L Andes Export SAC**
CAL.TRECE MZA. D LOTE. 28
URB STA PATRICIA 2° ETAPA - LA MOLINA
LIMA Lima Peru

Project: CARACLE
Report Date: July 22, 2019

CERTIFICATE OF ANALYSIS CLL19001497O.1

		Method	FA530	MA402	MA402	MA402
		Analyte	Ag	Cu	Pb	Zn
		Unit	ppm	%	%	%
		MDL	20	0.001	0.001	0.001
KS-E2	Rock		2584		20.965	
KS-CV	Rock				3.527	5.243
KS-E1	Rock		6916	2.002	14.106	20.989

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LIMA Lima Peru

Project: CARACLE
Report Date: July 22, 2019

QUALITY CONTROL REPORT CLL19001497O.1

	Method	FA530	MA402	MA402	MA402
	Analyte	Ag	Cu	Pb	Zn
	Unit	ppm	%	%	%
	MDL	20	0.001	0.001	0.001
Pulp Duplicates					
KS-E2	Rock	2584		20.965	
REP KS-E2	QC			20.689	
KS-CV	Rock			3.527	5.243
REP KS-CV	QC			3.596	5.567
KS-E1	Rock	6916	2.002	14.106	20.989
REP KS-E1	QC	6899			
Reference Materials					
STD MRI-220 PB	Standard	2475			
STD OREAS139	Standard		0.027	2.217	13.468
STD OREAS133B	Standard		0.033	5.061	11.384
STD OREAS139	Standard		0.027	2.210	13.573
STD OREAS602B	Standard		0.498	0.049	0.080
STD OREAS603	Standard		0.998	0.198	0.915
STD OREAS605	Standard		5.021	0.130	0.214
STD OREAS604B	Standard		2.113	0.080	0.114
STD OREAS604B	Standard		2.124	0.079	0.117
STD MRI-220 PB Expected		2478			
STD OREAS602B Expected			0.496	0.0493	0.0764
STD OREAS603 Expected			1	0.1908	0.92
STD OREAS605 Expected			5.02	0.1297	0.216
STD OREAS133B Expected			0.032	5.06	11.35
STD OREAS139 Expected			0.02713	2.21	13.63
STD OREAS604B Expected			2.12	0.0792	0.117
BLK	Blank	<20			
BLK	Blank	<20			
BLK	Blank		<0.001	<0.001	<0.001
BLK	Blank		<0.001	<0.001	<0.001

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APPENDIX 3 – Photographs Bethania Mine Site Visit
(coordinates in WGS84 Zone 18S)
[6 pages]

1. Looking east toward the Bethania Mine (hill) and Bethania Community (valley) (442047mE, 8602871mS).

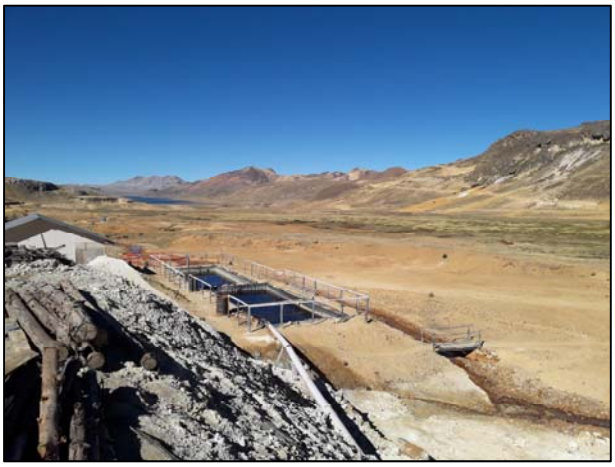
2. Looking west from the Bethania Mine toward historical mine workings across the valley (442331mE, 8602846mS).

3. Looking southwest from the Bethania Mine toward historical mine workings across the valley (442338mE, 8602847mS).

4. Looking south toward Bethania Mine offices, mine workings to the left, and Laguna Huarmicocha in the far distance (442331mE, 8602846mS).

5. Looking northwest from the Bethania Mine toward Bethania Community (442331mE, 8602846mS).

6. The Author at the 670 Level Bethania Mine portal, looking north (442342mE, 8602854mS).



7. Looking S-SW at the mine drainage retention pond with Laguna Huarmicocha in the far distance (442331mE, 8602846mS).

8. Vein 12 de Mayo looking east through historical mining cut (442700mE, 8602856mS).

9. Vein 12 de Mayo looking east through historical mining cut (442705mE, 8602861mS).

10. Vein 12 de Mayo looking southwest along historical mining cut (442705mE, 8602861mS).

11. Sample “KS-12M” from 12 de Mayo vein (442705mE, 8602861mS).

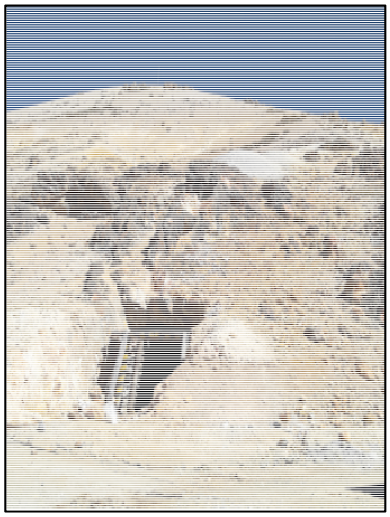
12. Looking southwest toward historical workings on the Victoria Vein with Laguna Huarmicocha in the distance (442633mE, 8602799mS).

13. Looking southwest along the historical workings on the Victoria Vein (442614mE, 8602779mS).

14. Typical silver-rich (sulphosalts) polymetallic (galena+sphalerite) ore from the Victoria Vein (442614mE, 8602779mS).

15. Looking northwest across the townsite of Bethania from the siliceous stockwork breccia (442719mE, 8602924mS).

16. Siliceous stockwork breccia from which sample “KS-SW” was collected (442719mE, 8602924mS).



17. Historical mine entrance to the Espanola 2 Vein on east side of “dome” 443355mE, 8603077mS).

18. Historical dumps of Espanola 2 ore and infrastructure on the east side of the “dome” (443355mE, 8603077mS).

19. High-grade polymetallic sample, historical ore dumps east side of “dome”, Espanola 2 Vein (443355mE, 8603077mS).

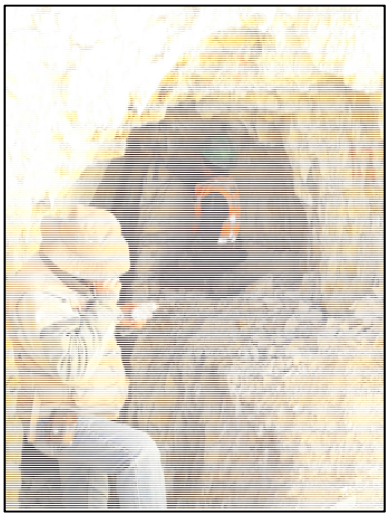
20. Looking northeast at historical entrance to the Santa Elena Mine located on the east side of the “dome” (443363mE, 8603246mS).

21. Looking northeast at historical workings on the Espanola 1 Vein (442559mE, 8602970mS).

22. Looking southwest at historical workings on the Espanola 1 Vein (442559mE, 8602970mS).

23. Looking northeast at historical workings on the Carolina Vein (442616mE, 8602920mS).

24. Volcanic breccia near the Carolina Vein (442616mE, 8602920mS).



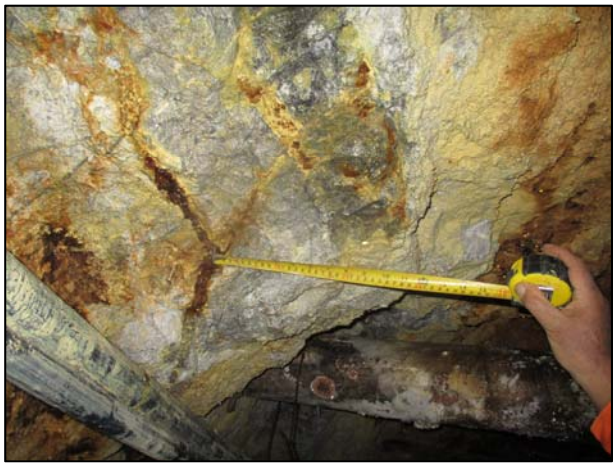
25. Historical workings on the upper Carolina Vein from which sample “KS-CV” was collected (442657mE, 8602910mS).

26. Sample “KS-CV” from the upper Carolina Vein (442657mE, 8602910mS).

27. High-grade polymetallic ore in Pirca 6 on the 670 Level (PSAD56: 443000mE, 8603353.5mS).

28. Sample ‘KS-E1” collected from high-grade polymetallic ore at Pirca 6 on the 670 Level (PSAD56: 443000mE, 8603353.5mS).

29. 12 de Mayo Vein on the 640 Level, Stope 390.



30. 12 de Mayo Vein on the 640 Level, Stope 390.

31. 12 de Mayo Vein in the 390 manway between 670 and 640 Level.

32. 12 de Mayo Vein in the 390 manway between 670 and 640 Level.

33. Underground on the 670 Level. From left to right: Scott Jobin-Bevans (Author), Guillermo Philipps (Mine Manager/Mining Engineer) and Alejandro Garcia (S&L Andes Export S.A.C.).

APPENDIX 4 – Concession Titles
[9 pages]

RESUMEN DEL DERECHO MINERO

Datos Generales

Código	**11020736X01**	Nombre	**SANTA ELENA**
Fecha de Formulación	**10/06/1970**	Situación	**VIGENTE**
Procedimiento	**TITULADO(CONCESION)**	Tipo	**DENUNCIO (D.LEG.109 Y ANTERIORES)**
Has. Formuladas	**45.00**	Sustancia	**METALICA**
Has. Rectificadas		Has. Formadas	
Has. Reducidas		Has. Disponibles	
Ubicación	**ARCHIVO CENTRAL desde el 30/04/2019**		

Titular Referencial

Tipo	*Nombre de Razón Social*	*Dirección*	*% Participación*
JURIDICO	S & L ANDES EXPORT S.A.C.	JR. SAN MARTIN Nº 107 URB.SANTA PATRICIA LIMA/LA MOLINA/LIMA	100

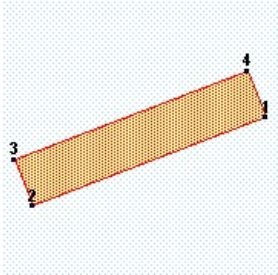
Demarcaciones

Departamento	*Provincia*	*Distrito*
HUANCAVELICA	HUANCAVELICA	ACOBAMBILLA

Cartas

Código	*Descripción*	*Zona UTM*
26-L	TUPE	18

	Coordenadas UTM PSAD56		Coordenadas WGS84	
Vertice	*Norte*	*Este*	*Norte*	*Este*
1	8,603,569.42	444,069.43	8,603,201.47	443,845.75
2	8,603,038.44	442,668.31	8,602,670.49	442,444.63
3	8,603,318.67	442,562.12	8,602,950.73	442,338.44
4	8,603,849.65	443,963.24	8,603,481.71	443,739.56



Pagos

Nro. Recibo	*Monto*	*Fecha Pago*	*Nro. Cuenta*	*Banco*	*Concepto*

Resoluciones

Nro. Resolución	*Fec. Resolución*	*Decisión*	*Plazo*
INGEMMET/PCD/PM	22/11/2010	PONGASE EN CONOCIMIENTO AL INTERESADO LO RESUELTO	
INGEMMET/PCD/PM	22/11/2010	TENGASE PRESENTE	
4433-96-RPM	06/08/1996	CONCESION MINERA	15 dias
EXJ	12/06/1970	AUTO DE AMPARO DE EXPLORACION	15 dias

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Fecha de emisión: domingo 23 de junio del 2019

Escritos

Escrito	Sede	Trámite	F. Presentación	Contenido	Razon Social
0100757914D	LIMA	DOCUMENTO	23/12/2014	OFICIO ADJUNTA COPIA DE ANOTACION DE INSCRIPCION	SUNARP
0100835510T	LIMA	TRAMITE P.O.M.	22/10/2010	RECTIFICACION DE RESOLUCION	S & L ANDES EXPORT
0100379310T	LIMA	TRAMITE P.O.M.	14/05/2010	CONTRATO DE CESION - TRANSFERENCIA	S & L ANDES EXPORT
0100249310D	LIMA	DOCUMENTO	11/05/2010	ANOTACIONES DE INSCRIPCION	SUNARP
0100212008T	LIMA	TRAMITE P.O.M.	07/02/2008	ACREDITA TITULARIDAD	S&L ANDES EXPORT

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RESUMEN DEL DERECHO MINERO

Datos Generales

Código	**650006710**	Nombre	**CHINITA I**
Fecha de Formulación	**11/03/2010**	Situación	**VIGENTE**
Procedimiento	**TITULADO(CONCESION)**	Tipo	**PETITORIO (D.LEG. 708)**
Has. Formuladas	**200.00**	Sustancia	**METALICA**
Has. Rectificadas		Has. Formadas	
Has. Reducidas		Has. Disponibles	
Ubicación	**REGION LIMA desde el 11/03/2010**		

Titular Referencial

Tipo	*Nombre de Razón Social*	*Dirección*	*% Participación*
JURIDICO	S & L ANDES EXPORT S.A.C.	CALLE AUGUSTO B. LEGUIA 260 LIMA/HUACHO/HUAURA	100

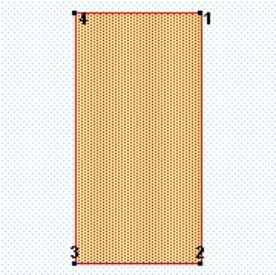
Demarcaciones

Departamento	*Provincia*	*Distrito*
LIMA	YAUYOS	TUPE

Cartas

Código	*Descripción*	*Zona UTM*
26-L	TUPE	18

	Coordenadas UTM PSAD56		Coordenadas WGS84	
Vertice	*Norte*	*Este*	*Norte*	*Este*
1	8,604,000.00	437,000.00	8,603,632.09	436,776.31
2	8,602,000.00	437,000.00	8,601,632.07	436,776.31
3	8,602,000.00	436,000.00	8,601,632.08	435,776.31
4	8,604,000.00	436,000.00	8,603,632.09	435,776.30



Pagos

Nro. Recibo	*Monto*	*Fecha Pago*	*Nro. Cuenta*	*Banco*	*Concepto*
0610500700019	US $/ 200.00	01/03/2010	070362957784	SCOTIABANK PERÚ S.A.A.	Vigencia

Resoluciones

Nro. Resolución	*Fec. Resolución*	*Decisión*	*Plazo*
221-2010-GRL-GRDE-DREM	24/08/2010	CONCESION MINERA	15 dias
GR	28/04/2010	EXPIDASE LOS CARTELES	30 dias

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Emitida a través de consultas por internet. No tiene validez para trámites administrativos, judiciales u otros.

Fecha de emisión: domingo 23 de junio del 2019

Escritos

Escrito	Sede	Trámite	F. Presentación	Contenido	Razon Social
0100099517D	LIMA	DOCUMENTO	10/03/2017	ANOTACIONES DE INSCRIPCION	SUNARP
0100757914D	LIMA	DOCUMENTO	23/12/2014	OFICIO ADJUNTA COPIA DE ANOTACION DE INSCRIPCION	SUNARP
0100558611D	LIMA	DOCUMENTO	12/09/2011	OFICIO ADJUNTA COPIA DE ANOTACION DE INSCRIPCION	SUNARP

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RESUMEN DEL DERECHO MINERO

Datos Generales

Código	**010226519**	Nombre	**TRES BANDERAS 01**
Fecha de Formulación	**05/07/2019**	Situación	**VIGENTE**
Procedimiento	**TRAMITE**	Tipo	**PETITORIO (D.LEG. 708)**
Has. Formuladas	**500.00**	Sustancia	**METALICA**
Has. Rectificadas		Has. Formadas	
Has. Reducidas		Has. Disponibles	
Ubicación	**TRAMITE - REGISTRO DE INFORMACIÓN desde el 05/07/2019**		

Titular Referencial

Tipo	*Nombre de Razón Social*	*Dirección*	*% Participación*
JURIDICO	AERECURA MATERIALES S.A.C.	AV. 28 DE JULIO 1044 INT. 602 URB.SAN ANTONIO LIMA/MIRAFLORES/LIMA	100

Demarcaciones

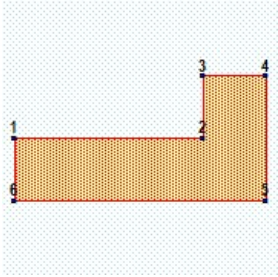
Departamento	*Provincia*	*Distrito*
HUANCAVELICA	HUANCAVELICA	ACOBAMBILLA

Cartas

Código	*Descripción*	*Zona UTM*
26-L	TUPE	18

Coordenadas WGS84

Vertice	*Norte*	*Este*
1	8,600,000.00	442,000.00
2	8,599,000.00	442,000.00
3	8,599,000.00	446,000.00
4	8,601,000.00	446,000.00
5	8,601,000.00	445,000.00
6	8,600,000.00	445,000.00



Pagos

Nro. Recibo	*Monto*	*Fecha Pago*	*Nro. Cuenta*	*Banco*	*Concepto*
001-0043421	S/ 420.00	05/07/2019	CAJA	CAJA	Tramite
1940760056746	US $/ 1,500.00	05/07/2019	1609001-1-45	BANCO DE CREDITO BCP	Vigencia

Resoluciones

Nro. Resolución	*Fec. Resolución*	*Decisión*	*Plazo*

COPIA INFORMATIVA
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Fecha de emisión: lunes 08 de julio del 2019

Escritos

Escrito	Sede	Trámite	F. Presentación	Contenido	Razon Social

COPIA INFORMATIVA
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RESUMEN DEL DERECHO MINERO

Datos Generales

Código	**010427218**	Nombre	**TRES BANDERAS 02**
Fecha de Formulación	**12/11/2018**	Situación	**VIGENTE**
Procedimiento	**TRAMITE**	Tipo	**PETITORIO (D.LEG. 708)**
Has. Formuladas	**1,000.00**	Sustancia	**METALICA**
Has. Rectificadas		Has. Formadas	
Has. Reducidas		Has. Disponibles	
Ubicación	**DCM - UNIDAD LEGAL desde el 13/06/2019**		

Titular Referencial

Tipo	*Nombre de Razón Social*	*Dirección*	*% Participación*
JURIDICO	AERECURA MATERIALES S.A.C.	AV. 28 DE JULIO 1044 INT. 602 URB.SAN ANTONIO LIMA/MIRAFLORES/LIMA	100

Demarcaciones

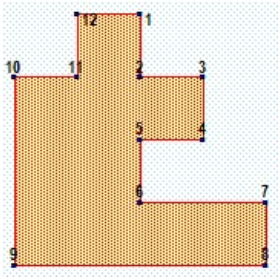
Departamento	*Provincia*	*Distrito*
HUANCAVELICA	HUANCAVELICA	ACOBAMBILLA
JUNIN	HUANCAYO	CHONGOS ALTO

Cartas

Código	*Descripción*	*Zona UTM*
26-L	TUPE	18

Coordenadas WGS84

Vertice	*Norte*	*Este*
1	8,600,000.00	447,000.00
2	8,599,000.00	447,000.00
3	8,599,000.00	448,000.00
4	8,598,000.00	448,000.00
5	8,598,000.00	447,000.00
6	8,597,000.00	447,000.00
7	8,597,000.00	449,000.00
8	8,596,000.00	449,000.00
9	8,596,000.00	445,000.00
10	8,599,000.00	445,000.00
11	8,599,000.00	446,000.00
12	8,600,000.00	446,000.00



Pagos

Nro. Recibo	*Monto*	*Fecha Pago*	*Nro. Cuenta*	*Banco*	*Concepto*
001-0036003	S/ 415.00	12/11/2018	CAJA	CAJA	Tramite
1940760414234	US $/ 3,000.00	12/11/2018	1609001-1-45	BANCO DE CREDITO BCP	Vigencia

Resoluciones

Nro. Resolución	*Fec. Resolución*	*Decisión*	*Plazo*
DCM	24/01/2019	CONTINUESE TRAMITE	0 dias
DCM	24/01/2019	EXPIDASE LOS CARTELES	30 dias

Fecha de emisión: domingo 23 de junio del 2019

COPIA INFORMATIVA
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Resoluciones

Nro. Resolución	Fec. Resolución	Decisión	Plazo
DCM	24/01/2019	RECTIFICACIONES DE OFICIO DATOS DE LA HOJA IGN / ZONA / ESCALA	
DCM	24/01/2019	RECTIFICACIONES DE OFICIO DEMARCACION DEL PETITORIO	

COPIA INFORMATIVA
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Escritos

Escrito	Sede	Trámite	F. Presentación	Contenido	Razon Social
0100458519T	LIMA	TRAMITE P.O.M.	31/05/2019	OFICIO REMITE OPINION	MINISTERIO DE
0100189619T	LIMA	TRAMITE P.O.M.	05/03/2019	ADJ. PUBLICACION : DIARIO LOCAL	AERECURA
0100166319T	LIMA	TRAMITE P.O.M.	27/02/2019	ADJ. PUBLICACION: EL PERUANO	AERECURA

COPIA INFORMATIVA
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APPENDIX 5 – Historical Production and Level Sampling

[11 pages]

		ADVANCE (m)		EXPLOITATION (t)	
	STAGE	PLANNED	ACTUAL	PLANNED	ACTUAL
MAY	PRODUCTION	0.00	0.00	177.99	157.65
	DEVELOPMENT	95.00	65.80	198.07	107.74
	PREPARATION	75.00	49.80	117.49	151.79
	EXPLORATION	20.00	0.00	13.40	0.00
JUNE	PRODUCTION	0.00	0.00	305.46	131.45
	DEVELOPMENT	50.00	58.80	59.85	104.50
	PREPARATION	85.00	93.10	137.39	292.90
	EXPLORATION	20.00	13.60	0.00	11.50
JULY	PRODUCTION	0.00	0.00	361.85	316.30
	DEVELOPMENT	70.00	76.54	155.03	301.55
	PREPARATION	80.00	15.90	138.02	78.05
	EXPLORATION	10.00	6.60	13.86	4.90
AUGUST	PRODUCTION	0.00	0.00	396.90	433.90
	DEVELOPMENT	58.00	41.35	115.83	68.40
	PREPARATION	80.00	50.90	182.62	192.30
	EXPLORATION	30.00	21.10	10.40	7.75
SEPTEMBE	PRODUCTION	0.00	0.00	531.76	514.25
	DEVELOPMENT	75.00	57.70	124.25	130.70
	PREPARATION	91.00	66.20	89.47	44.35
	EXPLORATION	30.00	0.00	16.83	0.00
OCTOBER	PRODUCTION	0.00	0.00	512.09	476.62
	DEVELOPMENT	85.00	31.40	144.49	128.28
	PREPARATION	57.00	11.60	62.79	2.25
	EXPLORATION	35.00	3.20	13.86	7.35
	REHABILITATION	72.00	56.60	0.00	0.00
NOVEMBER	PRODUCTION	0.00	0.00	597.68	542.25
	DEVELOPMENT	60.00	39.00	158.19	133.50
	PREPARATION	30.00	14.60	55.44	27.75
	EXPLORATION	15.00	0.00	0.00	0.00
	REHABILITATION	30.00	25.00	0.00	0.00
DECEMBER	PRODUCTION	0.00	0.00	563.46	478.75
	DEVELOPMENT	75.00	43.30	114.84	114.75
	PREPARATION	40.00	18.50	83.16	67.25
	EXPLORATION	15.00	0.00	0.00	0.00
	REHABILITATION	35.00	0.00	0.00	0.00
	TOTAL:	**1,418.00**	**860.59**	**5,452.44**	**5,028.72**

OPERATIONS REPORT 2012
SANTA ELENA MINE

MONTH	ADVANCE (m)		PRODUCTION (t)	
	PLANNED	ACTUAL	PLANNED	ACTUAL
JANUARY	120.00	86.56	862.84	595.21
FEBRUARY	243.00	126.79	1,069.19	754.97
MARCH	238.00	71.87	992.24	757.13
APRIL	115.00	104.60	840.86	772.01
MAY	249.70	69.18	1,078.64	617.90
JUNE	291.00	35.86	1,317.07	562.98
JULY	100.00	54.90	844.39	502.49
AUGUST	105.00	97.40	807.06	532.05
SEPTEMBER	105.00	97.40	807.06	532.05
OCTOBER	230.00	144.50	826.84	883.00
NOVEMBER	230.00	179.95	1,098.63	1,139.68
DECEMBER	204.00	228.85	1,028.09	1,312.10
TOTAL:	**2,230.70**	**1,297.86**	**11,572.91**	**8,961.57**
ACCOMPLISHED:	**58.18%**		**77.44%**	

PRODUCTION	EXPLOITATION (t)		DEVELOPMENT (t)		PREPARATION (t)		EXPLORATION (t)			
	PLANNED	ACTUAL	PLANNED	ACTUAL	PLANNED	ACTUAL	PLANNED	ACTUAL	TOTAL (t)	
JANUARY	641.88	757.85			501.96	534.05			1,291.90	
FEBRUARY	684.59	771.45	296.83	295.50	127.58	75.00			1,141.95	
MARCH	819.20	775.00	323.80	315.80	374.59	358.50			1,449.30	
APRIL	913.67	934.78	246.12	265.50	192.00	276.50	29.25	157.50	1,634.28	
MAY	1,050.89	972.00	345.07	592.21	166.38	193.30	40.00	30.24	1,787.75	
JUNE	1,071.57	1,001.67	336.87	238.56	63.63	56.16	192.67		1,296.39	
JULY	1,102.38	1,044.62		34.27	347.76	336.61			1,415.50	
AUGUST	1,117.83	960.09		106.42	400.68	177.78	94.50	1.50	1,245.79	
SEPTEMBER	1,102.40	1,171.50		15.00	204.39	180.00	209.79		1,366.50	
OCTOBER	1,405.52	1,721.50			170.10	18.00		93.00	1,832.50	
NOVEMBER	1,903.98	1,795.00		61.50	138.51	309.00	65.27	267.00	2,432.50	
DECEMBER	2,073.76	1,861.50		172.83	281.88	145.17	217.35	79.50	2,259.00	
	13,887.68	**13,766.96**	**1,548.69**	**2,097.59**	**2,969.46**	**2,660.07**	**848.83**	**628.74**	**PLANNED (t)**	**ACTUAL (t)**
									19,254.66	19,153.36

EXPLOITATION (t):	13,766.96
ADVANCE (t):	5,386.40

LINEAR ADVANCE	DEVELOPMENT (t)		PREPARATION (t)		EXPLORATION (t)			
	PLANNED	ACTUAL	PLANNED	ACTUAL	PLANNED	ACTUAL	TOTAL (t)	
JANUARY	14.00	14.30	115.50	76.90	110.00	134.25	225.45	
FEBRUARY	38.00	61.40	60.00	42.80	160.00	160.00	264.20	
MARCH	40.00	44.40	68.00	51.90	150.00	110.15	206.45	
APRIL	148.00	152.20	68.00	68.70	50.00	48.10	269.00	
MAY	65.00	45.90	70.00	53.80	115.00	128.50	228.20	
JUNE	75.00	80.40	22.00	24.30	193.00	82.90	187.60	
JULY	45.00	46.15	140.00	198.10	120.00	65.35	309.60	
AUGUST	95.00	86.30	170.00	150.10	85.00	38.20	274.60	
SEPTEMBER	85.00	73.30	130.00	134.80	140.00	124.40	332.50	
OCTOBER	142.00	114.20	105.00	101.10	110.00	101.00	316.30	
NOVEMBER	103.00	104.40	70.00	50.60	167.00	141.70	296.70	
DECEMBER	105.00	99.30	155.00	56.30	200.00	189.40	345.00	
	955.00	**922.25**	**1,173.50**	**1,009.40**	**1,600.00**	**1,323.95**	**PLANNED (t)**	**ACTUAL (t)**
							3,728.50	3,255.60

PRODUCTION	EXPLOITATION (t)		EXPLORATION (t)		PREPARATION (t)		DEVELOPMENT (t)		RECOVERY (t)		TOTAL (t)	
	PLANNED	ACTUAL	PLANNED	ACTUAL	PLANNED	ACTUAL	PLANNED	ACTUAL	PLANNED	ACTUAL	PLANNED	ACTUAL
JANUARY	2,131.41	1,800.00	129.15	39.00	153.36	326.15		251.35			2,413.92	2,416.50
FEBRUARY	1,696.42	1,807.25	0.00	5.80	130.41	357.24	79.20	547.30			1,906.03	2,717.59
MARCH	1,980.46	1,315.05	100.80	54.60	170.10	319.90	86.40	38.20		270.20	2,337.76	1,997.95
APRIL	1,970.24	1,613.60	214.20	90.99	96.39	300.72	63.00	162.09		60.20	2,343.83	2,227.60
MAY	1,957.00	1,719.80	173.25	50.00	145.80	132.60				123.20	2,276.05	2,025.60
JUNE	3,000.36	2,302.76	221.13	191.80							3,221.49	2,494.56
JULY	2,802.49	2,325.60	143.64	218.65	123.12	265.38	28.80	123.57			3,098.05	2,933.20
AUGUST	2,837.16	2,154.00	137.97	45.94	131.76	117.06	50.40	0.00			3,157.29	2,317.00
SEPTEMBER	2,722.01	2,508.40				118.60					2,722.01	2,627.00
OCTOBER	2,891.46	2,549.00			110.97	142.00					3,002.43	2,691.00
NOVEMBER	3,013.67	2,716.60		25.20	128.94	206.50		64.40			3,142.61	3,012.70
DECEMBER	2,230.51	1,124.55	63.00		86.40	99.40	129.60	128.80			2,509.51	1,352.75
	29,233.19	**23,936.61**	**1,183.14**	**721.98**	**1,277.25**	**2,385.55**	**437.40**	**1,315.71**		**453.60**	**32,130.98**	**28,813.45**

EXPLOITATION (t):	23,936.61	**ADVANCE (t):**	4,423.24	**RECOVERY (t):**	453.60

LINEAR ADVANCE	EXPLORATION (t)		PREPARATION (t)		DEVELOPMENT (t)		TOTAL (t)	
	PLANNED	ACTUAL	PLANNED	ACTUAL	PLANNED	ACTUAL	PLANNED	ACTUAL
JANUARY	175.00	119.50	86.00	109.30	90.00	65.80	351.00	294.60
FEBRUARY	190.00	61.70	80.00	126.60	95.00	147.90	365.00	336.20
MARCH	200.00	128.10	128.00	119.60	95.00	70.50	423.00	318.20
APRIL	185.00	142.00	135.00	142.70	75.00	77.40	395.00	362.10
MAY	140.00	47.70	105.00	111.30	72.00	131.20	317.00	290.20
JUNE	110.00	42.90		11.20	25.00	28.70	135.00	82.80
JULY	100.00	46.75	110.00	107.40	30.00	40.60	240.00	194.75
AUGUST	90.00	58.50	100.00	111.50	55.00	18.30	245.00	188.30
SEPTEMBER	115.00	90.20	60.00	61.55	65.00	25.00	240.00	176.75
OCTOBER	117.00	71.16	95.00	176.30	55.00	51.30	267.00	298.76
NOVEMBER	170.00	105.00	85.00	180.80	55.00	50.05	310.00	335.85
DECEMBER	70.00	1.50	80.00	84.90	62.00	49.70	212.00	136.10
	1,662.00	**915.01**	**1,064.00**	**1,343.15**	**774.00**	**756.45**	**3,500.00**	**3,014.61**

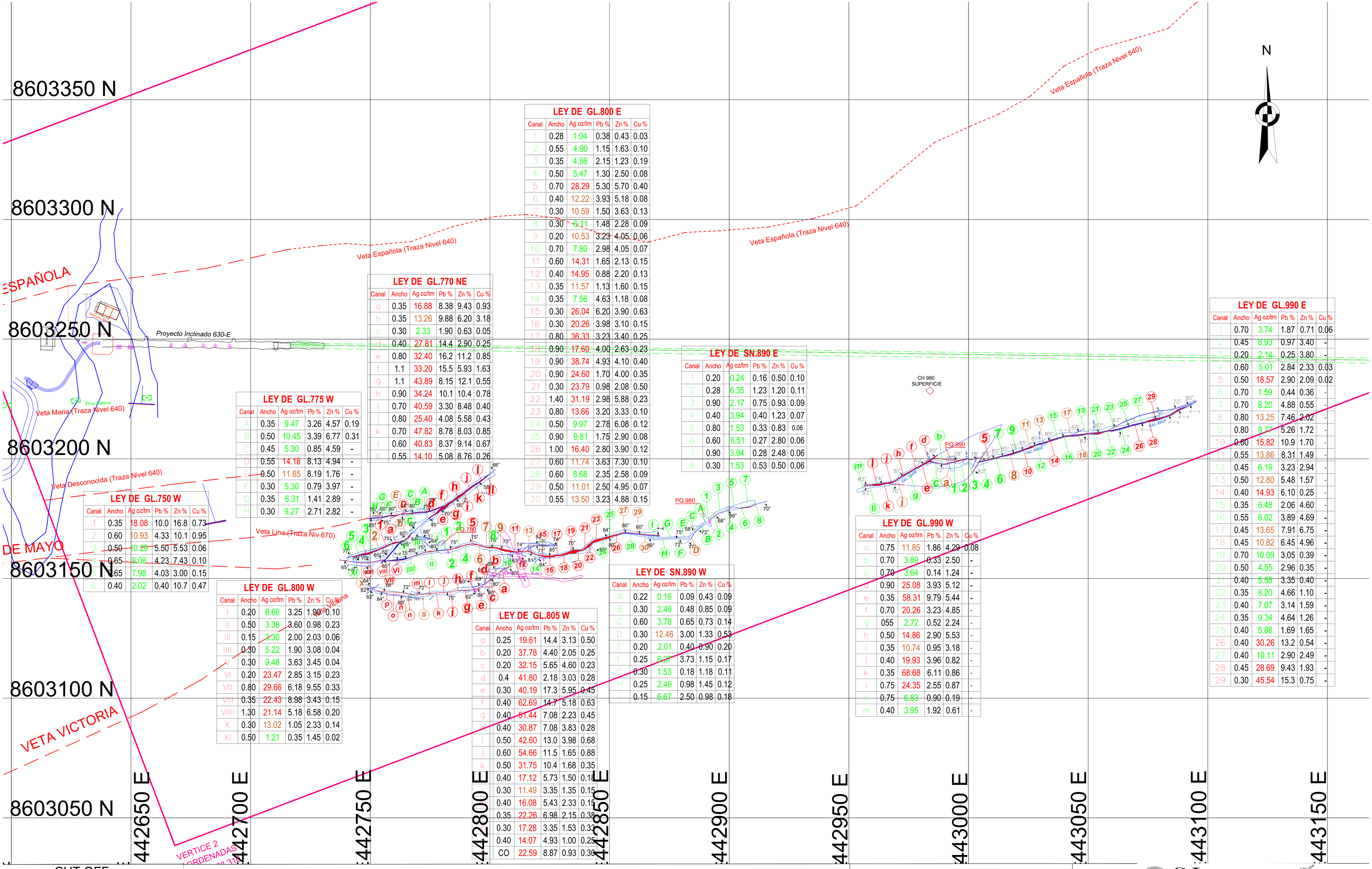
MONTH	VEIN	PRODUCTION (t)	ADVANCE (t)	OTHER (t)	TOTAL
JANUARY	12 DE MAYO		128.80		128.80
	12 DE MAYO (R)	51.80			51.80
	ESPAÑOLA	968.80	8.40		977.20
	VICTORIA		5.60		5.60
		1,020.60	142.80		1,163.40
FEBRUARY	VEIN	PRODUCTION (t)	ADVANCE (t)	OTHER (t)	TOTAL
	12 DE MAYO		166.60	179.20	345.80
	12 DE MAYO (R)	58.80			58.80
	ESPAÑOLA	922.60			922.60
	VICTORIA		7.00		7.00
		981.40	173.60	179.20	1,334.20
MARCH	VEIN	PRODUCTION (t)	ADVANCE (t)	OTHER (t)	TOTAL
	12 DE MAYO	54.46	306.88	7.00	368.34
	12 DE MAYO (R)	249.20			249.20
	ESPAÑOLA	362.60			362.60
	VICTORIA		308.42		308.42
		666.26	615.30	7.00	1,288.56
APRIL	VEIN	PRODUCTION (t)	ADVANCE (t)	OTHER (t)	TOTAL
	12 DE MAYO	405.40	83.16		488.56
	12 DE MAYO (R)	60.06			60.06
	CAROLINA		22.90		22.90
	ESPAÑOLA		47.74	68.70	116.44
	VICTORIA	268.96	239.44		508.40
		734.42	393.24	68.70	1,196.36
MAY	VEIN	PRODUCTION (t)	ADVANCE (t)	OTHER (t)	TOTAL
	12 DE MAYO	481.50	63.00		544.50
	12 DE MAYO (R)		12.00		12.00
	CAROLINA		47.25		47.25
	ESPAÑOLA	157.50	199.50	7.50	364.50
	VICTORIA	562.50	37.50		600.00
		1,201.50	359.25	7.50	1,568.25
JUNE	VEIN	PRODUCTION (t)	ADVANCE (t)	OTHER (t)	TOTAL
	12 DE MAYO	628.50	24.00	13.50	666.00
	12 DE MAYO (R)		118.50		118.50
	CAROLINA	27.75			27.75
	ESPAÑOLA	133.50	10.50		144.00
	VICTORIA	691.50	49.50		741.00
		1,481.25	202.50	13.50	1,697.25

MONTH	VEIN	PRODUCTION (t)	ADVANCE (t)	OTHER (t)	TOTAL
JULY	12 DE MAYO	739.50	150.00		889.50
	12 DE MAYO (R)	127.50	175.50		303.00
	CAROLINA	26.25			26.25
	VICTORIA	522.00			522.00
		1,415.25	325.50		1,740.75
AUGUST	VEIN	PRODUCTION (t)	ADVANCE (t)	OTHER (t)	TOTAL
	12 DE MAYO	345.00	177.00		522.00
	12 DE MAYO (R)	688.50	60.00		748.50
	CAROLINA	62.55			62.55
	VICTORIA		105.00		105.00
		1,096.05	342.00		1,438.05
SEPTEMBER	VEIN	PRODUCTION (t)	ADVANCE (t)	OTHER (t)	TOTAL
	12 DE MAYO	337.50	36.00		373.50
	12 DE MAYO (R)	589.50			589.50
	CAROLINA	113.85			113.85
	VICTORIA		268.50		268.50
		1,040.85	304.50		1,345.35
OCTOBER	VEIN	PRODUCTION (t)	ADVANCE (t)	OTHER (t)	TOTAL
	12 DE MAYO	565.50	462.00	3.00	1,030.50
	12 DE MAYO (R)	579.00			579.00
	CAROLINA	163.50			163.50
	VICTORIA	190.50	21.00		211.50
		1,498.50	483.00	3.00	1,984.50
NOVEMBER	VEIN	PRODUCTION (t)	ADVANCE (t)	OTHER (t)	TOTAL
	12 DE MAYO	727.50	463.50		1,191.00
	12 DE MAYO (R)	412.50			412.50
	CAROLINA	6.00			6.00
	VICTORIA	112.50	1.50		114.00
		1,258.50	465.00		1,723.50
DECEMBER	VEIN	PRODUCTION (t)	ADVANCE (t)	OTHER (t)	TOTAL
	12 DE MAYO	930.00	424.50	10.50	1,365.00
	12 DE MAYO (R)	82.50			82.50
	VICTORIA	217.50			217.50
		1,230.00	424.50	10.50	1,665.00

TOTAL PRODUCTION (t):	13,624.58
TOTAL ADVANCE (t):	4,231.19

MONTH				
JANUARY	VEIN	PRODUCTION (t)	ADVANCE (t)	TOTAL
	12 DE MAYO	1,176.00	138.75	1,314.75
	VICTORIA	27.00		27.00
		1,203.00	138.75	1,341.75
FEBRUARY	VEIN	PRODUCTION (t)	ADVANCE (t)	TOTAL
	12 DE MAYO	289.50	31.50	321.00
		289.50	31.50	321.00
MARCH	VEIN	PRODUCTION (t)	ADVANCE (t)	TOTAL
	12 DE MAYO	99.75	16.50	116.25
		99.75	16.50	116.25
APRIL	VEIN	PRODUCTION (t)	ADVANCE (t)	TOTAL
	12 DE MAYO	39.00	171.00	210.00
		39.00	171.00	210.00
MAY	VEIN	PRODUCTION (t)	ADVANCE (t)	TOTAL
	12 DE MAYO	181.50	18.00	199.50
		181.50	18.00	199.50
JUNE	VEIN	PRODUCTION (t)	ADVANCE (t)	TOTAL
	12 DE MAYO	197.00	46.50	243.50
		197.00	46.50	243.50
JULY	VEIN	PRODUCTION (t)	ADVANCE (t)	TOTAL
	12 DE MAYO	182.25	47.25	229.50
		182.25	47.25	229.50

TOTAL PRODUCTION (t):	2,192.00
TOTAL ADVANCE (t):	469.50



LEY DE GL.800 E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.28	1.04	0.38	0.43	0.03
2	0.55	4.90	1.15	1.63	0.10
3	0.35	4.98	2.15	1.23	0.19
4	0.50	5.47	1.30	2.50	0.08
5	0.70	28.29	5.30	5.70	0.40
6	0.40	12.22	3.93	5.18	0.08
7	0.30	10.59	1.50	3.63	0.13
8	0.30	6.11	1.48	2.28	0.09
9	0.20	10.53	3.23	4.05	0.06
10	0.70	7.80	2.98	4.05	0.07
11	0.60	14.31	1.65	2.13	0.15
12	0.40	14.95	0.88	2.20	0.13
13	0.35	11.57	1.13	1.60	0.15
14	0.35	7.56	4.63	1.18	0.08
15	0.30	26.04	6.20	3.90	0.63
16	0.30	20.26	3.98	3.10	0.15
17	0.80	36.33	3.23	3.40	0.25
18	0.90	17.60	4.00	2.63	0.23
19	0.90	38.74	4.93	4.10	0.40
20	0.90	24.60	1.70	4.00	0.35
21	0.30	23.79	0.98	2.08	0.50
22	1.40	31.19	2.98	5.88	0.23
23	0.80	13.66	3.20	3.33	0.10
24	0.50	9.97	2.78	6.08	0.12
25	0.90	9.81	1.75	2.90	0.08
26	1.00	16.40	2.80	3.90	0.12
27	0.60	11.74	3.63	7.30	0.10
28	0.60	8.68	2.35	2.58	0.09
29	0.50	11.01	2.50	4.95	0.07
30	0.55	13.50	3.23	4.88	0.15

LEY DE GL.770 NE

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
a	0.35	16.88	8.38	9.43	0.93
b	0.35	13.26	9.88	6.20	3.18
c	0.30	2.33	1.90	0.63	0.05
d	0.40	27.81	14.4	2.90	0.25
e	0.80	32.40	16.2	11.2	0.85
f	1.1	33.20	15.5	5.93	1.63
g	1.1	43.89	8.15	12.1	0.55
h	0.90	34.24	10.1	10.4	0.78
i	0.70	40.59	3.30	8.48	0.40
j	0.80	25.40	4.08	5.58	0.43
k	0.70	47.82	8.78	8.03	0.85
l	0.60	40.83	8.37	9.14	0.67
ll	0.55	14.10	5.08	8.76	0.26

LEY DE SN.890 E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.20	0.24	0.16	0.50	0.10
2	0.28	6.35	1.23	1.20	0.11
3	0.90	2.17	0.75	0.93	0.09
4	0.40	3.94	0.40	1.23	0.07
5	0.80	1.53	0.33	0.83	0.06
6	0.60	6.51	0.27	2.80	0.06
7	0.90	3.94	0.28	2.48	0.06
8	0.30	1.53	0.53	0.50	0.06

LEY DE GL.990 E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.70	3.74	1.87	0.71	0.06
2	0.45	8.93	0.97	3.40	-
3	0.20	2.14	0.25	3.80	-
4	0.60	5.01	2.84	2.33	0.03
5	0.50	18.57	2.90	2.09	0.02
6	0.70	1.59	0.44	0.36	-
7	0.70	8.20	4.88	0.55	-
8	0.80	13.25	7.46	2.02	-
9	0.80	9.77	5.26	1.72	-
10	0.60	15.82	10.9	1.70	-
11	0.55	13.86	8.31	1.49	-
12	0.45	6.19	3.23	2.94	-
13	0.50	12.80	5.48	1.57	-
14	0.40	14.93	6.10	0.25	-
15	0.35	6.48	2.06	4.60	-
16	0.55	6.02	3.89	4.69	-
17	0.45	13.65	7.91	6.75	-
18	0.45	10.82	6.45	4.96	-
19	0.70	10.09	3.05	0.39	-
20	0.50	4.55	2.96	0.35	-
21	0.40	5.58	3.35	0.40	-
22	0.35	8.20	4.66	1.10	-
23	0.40	7.07	3.14	1.59	-
24	0.35	9.34	4.64	1.26	-
25	0.40	5.88	1.69	1.65	-
26	0.40	30.26	13.2	0.54	-
27	0.40	10.11	2.90	2.49	-
28	0.45	28.69	9.43	1.93	-
29	0.30	45.54	15.3	0.75	-

LEY DE GL.775 W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
A	0.35	9.47	3.26	4.57	0.19
B	0.50	10.45	3.39	6.77	0.31
C	0.45	5.30	0.85	4.59	-
D	0.55	14.18	8.13	4.94	-
E	0.50	11.65	8.19	1.76	-
F	0.30	5.30	0.79	3.97	-
G	0.35	6.31	1.41	2.89	-
H	0.30	9.27	2.71	2.82	-

LEY DE GL.750 W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.35	18.08	10.0	16.8	0.73
2	0.60	10.93	4.33	10.1	0.95
3	0.50	10.29	5.50	5.53	0.06
4	0.65	8.08	4.23	7.43	0.10
5	0.65	7.98	4.03	3.00	0.15
6	0.40	2.02	0.40	10.7	0.47

LEY DE GL.990 W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
a	0.75	11.85	1.86	4.29	0.08
b	0.70	3.89	0.33	2.50	-
c	0.70	3.64	0.14	1.24	-
d	0.90	25.08	3.93	5.12	-
e	0.35	58.31	9.79	5.44	-
f	0.70	20.26	3.23	4.85	-
g	055	2.72	0.52	2.24	-
h	0.50	14.86	2.90	5.53	-
i	0.35	10.74	0.95	3.18	-
j	0.40	19.93	3.96	0.82	-
k	0.35	68.68	6.11	0.86	-
l	0.75	24.35	2.55	0.87	-
ll	0.75	6.83	0.90	0.19	
m	0.40	3.95	1.92	0.61	-

LEY DE GL.800 W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
I	0.20	8.60	3.25	1.90	0.10
II	0.50	3.38	3.60	0.98	0.23
III	0.15	2.30	2.00	2.03	0.06
IIII	0.30	5.22	1.90	3.08	0.04
V	0.30	9.48	3.63	3.45	0.04
VI	0.20	23.47	2.85	3.15	0.23
VII	0.80	29.66	6.18	9.55	0.33
VIII	0.35	22.43	8.98	3.43	0.15
VIIII	1.30	21.14	5.18	6.58	0.20
X	0.30	13.02	1.05	2.33	0.14
XI	0.50	1.21	0.35	1.45	0.02

LEY DE GL.805 W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
a	0.25	19.61	14.4	3.13	0.50
b	0.20	37.78	4.40	2.05	0.25
c	0.20	32.15	5.65	4.60	0.23
d	0.4	41.80	2.18	3.03	0.28
e	0.30	40.19	17.3	5.95	0.45
f	0.40	62.69	14.7	5.18	0.63
g	0.40	51.44	7.08	2.23	0.45
h	0.40	30.87	7.08	3.83	0.28
i	0.50	42.60	13.0	3.98	0.68
j	0.60	54.66	11.5	1.65	0.88
k	0.50	31.75	10.4	1.68	0.35
l	0.40	17.12	5.73	1.50	0.18
ll	0.30	11.49	3.35	1.35	0.15
m	0.40	16.08	5.43	2.33	0.15
n	0.35	22.26	6.98	2.15	0.38
o	0.30	17.28	3.35	1.53	0.33
p	0.40	14.07	4.93	1.00	0.25
q	CO	22.59	8.87	0.93	0.30

LEY DE SN.890 W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
A	0.22	0.16	0.09	0.43	0.09
B	0.30	2.49	0.48	0.85	0.09
C	0.60	3.78	0.65	0.73	0.14
D	0.30	12.46	3.00	1.33	0.53
E	0.20	2.01	0.40	0.90	0.20
F	0.25	6.37	3.73	1.15	0.17
G	0.30	1.53	0.18	1.18	0.11
H	0.25	2.49	0.98	1.45	0.12
I	0.15	6.67	2.50	0.98	0.18

CUT OFF

- Mena >14 Oz Ag
- Marginal >10.5<14 Oz Ag
- Baja Ley <10.5 Oz Ag

Elaborado :	Rogelio Osorio
Dibujado :	Rogelio Osorio
Revisado :	Ing. Juan Carlos Benavides
Aprobado :	Ing. Ludwen Vilca
Área / Dpto :	Geologia

ESCALA 1/500

FECHA 03-May-2016

MINA SANTA ELENA

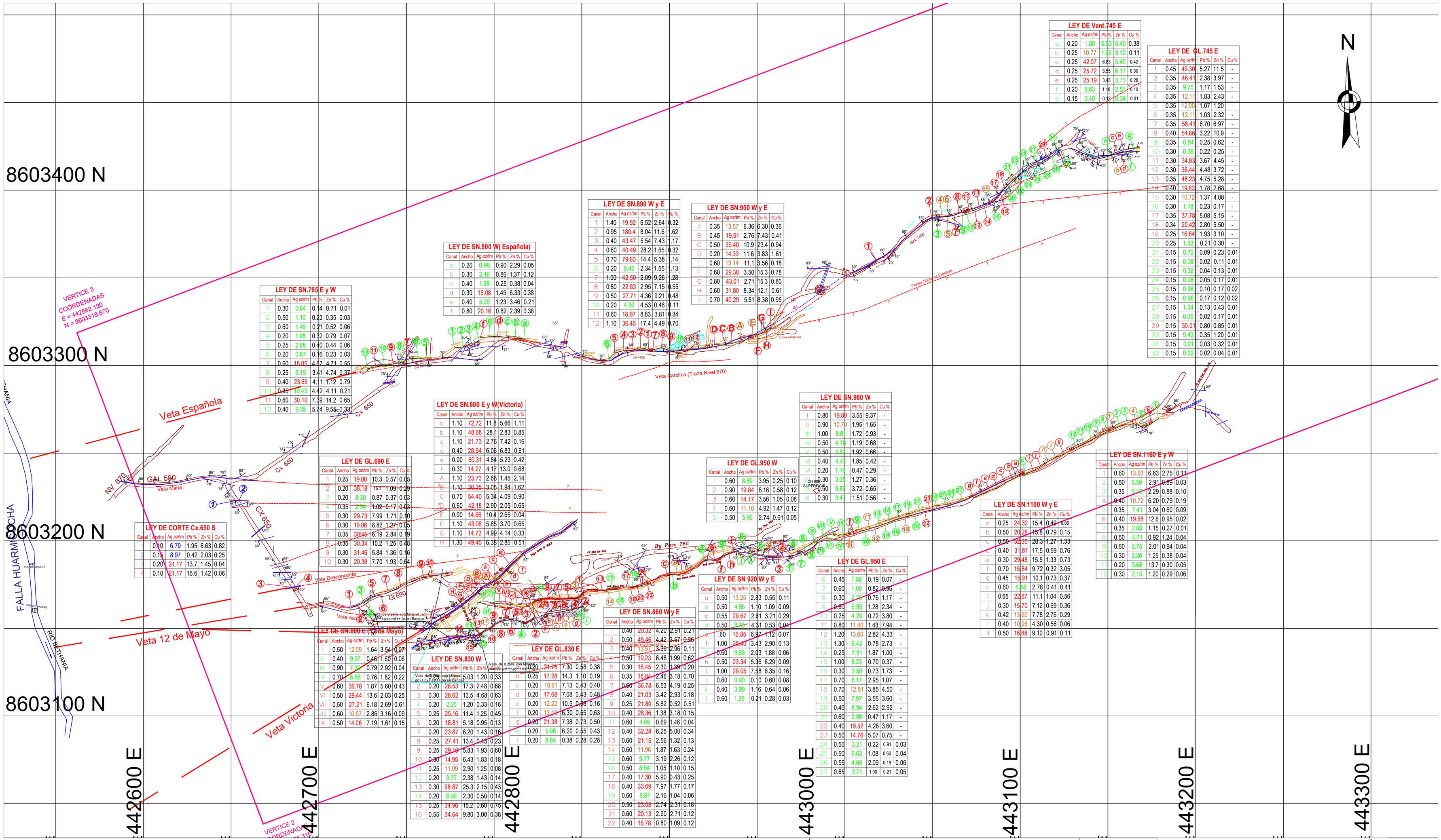
MINA SANTA ELENA

PLANO DE MUESTREO

NIVEL 640

NIVEL 640

LAMINA 1



LEY DE Vent.745 E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
a	0.20	1.88	0.83	0.40	0.38
b	0.25	10.77	1.40	3.12	0.11
c	0.25	42.07	6.83	5.40	0.42
d	0.25	25.72	3.55	6.17	0.30
e	0.25	25.19	3.43	3.73	0.28
f	0.20	8.63	1.18	2.53	0.10
g	0.15	0.40	0.12	0.04	0.01

LEY DE GL.745 E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.45	49.30	5.27	11.5	-
2	0.35	46.41	2.38	3.97	-
3	0.35	9.75	1.17	1.53	-
4	0.35	12.11	1.83	2.43	-
5	0.35	12.00	1.07	1.20	-
6	0.35	12.11	1.03	2.32	-
7	0.35	58.41	6.70	6.97	-
8	0.40	54.66	3.22	10.9	-
9	0.35	0.54	0.25	0.62	-
10	0.30	0.38	0.22	0.25	-
11	0.30	34.83	3.67	4.45	-
12	0.30	36.44	4.48	3.72	-
13	0.35	48.23	4.75	5.28	-
14	0.40	19.83	1.78	2.68	-
15	0.30	10.72	1.37	4.08	-
16	0.30	1.18	0.23	0.17	-
17	0.35	37.78	5.08	5.15	-
18	0.34	20.42	2.80	5.50	-
19	0.25	16.64	1.93	3.10	-
20	0.25	1.53	0.21	0.30	-
21	0.15	0.72	0.09	0.23	0.01
22	0.15	0.08	0.02	0.11	0.01
23	0.15	0.32	0.04	0.13	0.01
24	0.15	0.06	0.05	0.17	0.01
25	0.15	0.96	0.10	0.17	0.02
26	0.15	0.96	0.17	0.12	0.02
27	0.15	1.34	0.13	0.43	0.01
28	0.15	0.05	0.02	0.17	0.01
29	0.15	30.01	0.80	0.85	0.01
30	0.15	9.43	0.35	1.20	0.01
31	0.15	0.21	0.03	0.32	0.01
32	0.15	0.02	0.02	0.04	0.01

LEY DE SN.890 W y E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	1.40	19.92	6.52	2.64	0.32
2	0.95	180.4	8.04	11.6	1.62
3	0.40	43.47	5.54	7.43	1.17
4	0.60	40.49	28.2	1.65	0.32
5	0.70	79.60	14.4	5.38	1.14
6	0.20	9.45	2.34	1.55	1.13
7	1.00	42.50	2.09	9.26	1.28
8	0.80	22.83	2.95	7.15	0.55
9	0.50	27.71	4.36	9.21	0.48
10	0.20	4.30	4.53	0.48	0.11
11	0.60	18.97	8.83	3.81	0.34
12	1.10	36.46	17.4	4.49	0.70

LEY DE SN.950 W y E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
A	0.35	13.57	6.36	6.30	0.36
B	0.45	19.51	2.76	7.43	0.41
C	0.50	39.40	10.9	23.4	0.94
D	0.20	14.33	11.6	3.83	1.61
E	0.60	13.14	11.1	3.56	0.18
F	0.60	29.38	3.50	15.3	0.78
G	0.80	43.01	2.71	15.3	0.80
H	0.60	31.80	8.34	12.1	0.61
I	0.70	40.29	5.81	8.38	0.95

LEY DE SN.800 W(Española)

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
a	0.20	0.99	0.90	2.29	0.05
b	0.30	3.16	0.86	1.37	0.12
c	0.40	1.96	0.25	0.38	0.04
d	0.30	15.08	1.45	6.33	0.38
e	0.40	5.20	1.23	3.46	0.21
f	0.80	20.16	0.82	2.39	0.36

LEY DE SN.765 E y W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.30	0.64	0.14	0.71	0.01
2	0.50	1.16	0.23	0.35	0.03
3	0.60	1.45	0.21	0.52	0.06
4	0.20	1.08	0.32	0.79	0.07
5	0.25	2.05	0.40	0.44	0.06
6	0.20	0.67	0.16	0.23	0.03
7	0.60	18.05	4.67	4.71	0.55
8	0.25	9.19	3.41	4.74	0.37
9	0.40	23.65	4.11	1.12	0.79
10	0.35	10.43	4.42	4.11	0.21
11	0.60	30.10	7.39	14.2	0.65
12	0.40	9.35	5.74	9.55	0.33

LEY DE SN.800 E y W(Victoria)

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
a	1.10	72.72	11.8	5.66	1.11
b	1.10	48.68	28.1	2.83	0.85
c	1.10	21.73	2.76	7.42	0.16
d	0.40	28.94	6.06	6.83	0.61
e	0.90	60.31	4.84	5.23	0.42
f	0.30	14.27	4.17	13.0	0.68
A	1.10	23.73	2.68	1.45	2.14
B	1.10	30.35	3.05	1.94	1.62
C	0.70	54.40	5.34	4.09	0.90
D	0.60	42.18	2.90	2.05	0.65
E	0.90	14.66	10.4	2.65	0.04
F	1.10	43.08	5.65	3.70	0.65
G	1.10	14.72	4.99	4.14	0.33
H	1.30	49.45	6.38	2.85	0.51

LEY DE SN.980 W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
I	0.80	19.80	3.55	9.37	-
II	0.90	10.70	1.95	1.65	-
III	1.00	8.81	1.72	0.93	-
IV	0.50	4.18	1.19	0.68	-
V	0.50	5.82	1.92	0.66	-
VI	0.40	4.47	1.85	0.42	-
VII	0.20	1.16	0.47	0.29	-
VIII	0.30	3.25	1.27	0.36	-
IX	0.50	9.87	3.72	0.65	-
X	0.30	3.47	1.51	0.56	-

LEY DE GL.950 W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.60	8.89	3.95	0.25	0.10
2	0.90	19.84	8.16	0.58	0.12
3	0.60	14.17	3.56	1.05	0.08
4	0.60	11.10	4.92	1.47	0.12
5	0.50	5.90	2.74	0.61	0.05

LEY DE SN.1160 E y W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.60	13.93	6.63	2.75	0.11
2	0.50	6.50	2.91	0.89	0.03
3	0.35	5.15	2.29	0.88	0.10
4	0.40	10.72	6.20	0.79	0.19
5	0.35	7.41	3.04	0.60	0.09
6	0.40	19.68	12.6	0.95	0.02
7	0.35	2.08	1.15	0.27	0.01
8	0.50	4.71	0.92	1.24	0.04
9	0.50	2.75	2.01	0.94	0.04
10	0.30	2.26	1.29	0.38	0.04
11	0.20	9.68	13.7	0.30	0.05
12	0.30	2.15	1.20	0.29	0.06

LEY DE SN.1100 W y E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
a	0.25	24.32	15.4	0.49	0.06
b	0.50	20.28	15.8	0.79	0.15
c	0.50	52.35	28.3	1.27	1.33
d	0.40	31.81	17.5	0.59	0.76
e	0.30	29.48	15.5	1.33	0.73
f	0.70	15.84	9.72	0.32	3.05
g	0.45	15.91	10.1	0.73	0.37
h	0.60	5.48	2.78	0.41	0.41
i	0.65	22.67	11.1	1.04	0.56
j	0.30	15.70	7.12	0.69	0.36
k	0.42	13.60	7.78	2.76	0.29
l	0.40	10.96	4.30	0.56	0.06
II	0.50	16.88	9.10	0.91	0.11

LEY DE GL.690 E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.25	19.00	10.3	0.57	0.05
2	0.20	38.18	16.1	1.09	0.29
3	0.20	8.30	0.87	0.37	0.03
4	0.35	2.94	1.02	0.17	0.03
5	0.30	29.73	7.99	1.71	0.10
6	0.30	19.06	8.82	1.27	0.05
7	0.35	30.45	6.19	2.84	0.19
8	0.35	30.34	10.2	1.25	0.48
9	0.30	31.46	5.84	1.36	0.16
10	0.30	20.38	7.70	1.93	0.64

LEY DE CORTE Cx.650 S

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.10	6.79	1.95	6.63	0.82
2	0.15	8.97	0.42	2.03	0.25
3	0.20	21.17	13.7	1.45	0.04
4	0.10	21.17	16.6	1.42	0.06

LEY DE SN.860 W y E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.40	20.32	4.20	2.91	0.21
2	0.50	45.46	4.42	3.57	0.26
3	0.40	13.52	3.39	2.96	0.11
4	0.50	19.23	6.48	1.99	0.62
5	0.30	18.45	2.30	1.39	0.20
6	0.35	18.84	2.46	3.18	0.70
7	0.60	36.78	6.53	4.19	0.25
8	0.40	21.03	3.42	2.93	0.18
9	0.25	21.80	5.82	0.52	0.51
10	0.40	28.36	1.38	3.18	0.15
11	0.60	4.89	0.69	1.46	0.04
12	0.40	32.28	6.25	5.00	0.34
13	0.60	21.15	2.56	1.32	0.13
14	0.60	11.96	1.87	1.63	0.24
15	0.60	9.77	3.19	2.26	0.12
16	0.50	8.94	1.05	1.10	0.15
17	0.40	17.30	5.90	0.43	0.25
18	0.40	33.69	7.97	1.77	0.17
19	0.60	8.81	2.16	1.04	0.06
20	0.50	23.06	2.74	2.31	0.18
21	0.60	20.13	2.90	2.71	0.12
22	0.40	16.78	0.80	1.09	0.12

LEY DE SN 920 W y E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
a	0.50	13.25	2.83	0.55	0.11
b	0.50	4.95	1.10	1.09	0.09
c	0.55	29.67	2.61	3.21	0.29
d	0.50	8.36	4.31	0.53	0.04
e	.60	16.85	6.97	1.12	0.07
f	1.00	25.40	3.43	2.90	0.13
g	0.60	9.68	2.03	1.88	0.06
h	0.50	23.34	5.36	6.29	0.09
i	1.00	29.05	7.58	6.35	0.16
j	0.60	0.90	0.10	0.60	0.08
k	0.40	3.99	1.16	0.64	0.06
l	0.60	1.29	0.21	0.28	0.03

LEY DE GL.950 E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
6	0.45	1.86	0.19	0.07	-
7	0.60	1.60	0.82	0.96	-
8	0.30	2.75	0.76	1.17	-
9	0.60	5.90	1.28	2.34	-
10	0.25	4.20	0.72	3.80	-
11	0.80	11.40	1.43	7.94	-
12	1.20	13.60	2.82	4.33	-
13	1.30	6.43	0.78	2.73	-
14	0.25	7.91	1.87	1.00	-
15	1.00	8.23	0.70	0.37	-
16	0.30	3.50	0.73	1.73	-
17	0.70	8.17	2.95	1.07	-
18	0.70	12.51	3.85	4.50	-
19	0.50	7.97	3.55	3.60	-
20	0.40	8.94	2.62	2.92	-
21	0.60	2.06	0.47	1.17	-
22	0.40	19.52	4.26	3.60	-
23	0.50	14.76	5.07	0.75	-
24	0.50	3.21	0.22	0.91	0.03
25	0.50	6.63	1.08	0.60	0.04
26	0.55	4.60	2.09	0.19	0.06
27	0.65	2.71	1.00	0.21	0.05

LEY DE SN.830 W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.75	5.03	1.20	0.33	
2	0.20	28.53	17.3	2.48	0.68
3	0.30	28.62	13.5	4.68	0.63
4	0.20	2.25	1.20	0.33	0.16
5	0.25	25.16	11.4	1.25	0.45
6	0.20	18.81	5.18	0.95	0.13
7	0.20	23.87	6.20	1.43	0.16
8	0.25	27.41	13.4	0.43	0.23
9	0.25	29.10	5.83	1.93	0.60
10	0.30	14.95	6.43	1.83	0.18
11	0.25	11.09	2.90	1.25	0.08
12	0.20	9.73	2.38	1.43	0.14
13	0.30	98.87	25.3	2.15	0.43
14	0.20	6.99	2.30	0.50	0.14
15	0.25	34.96	15.2	0.60	0.75
16	0.55	34.64	9.80	3.00	0.38

LEY DE GL.830 E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
a	0.20	21.76	7.30	0.58	0.38
b	0.25	17.28	14.3	1.10	0.19
c	0.20	10.61	7.13	0.43	0.40
d	0.20	17.68	7.08	0.43	0.48
e	0.20	12.22	10.5	0.58	0.16
f	0.20	13.16	6.30	0.55	0.63
g	0.20	21.38	7.38	0.73	0.50
h	0.20	5.06	6.20	0.55	0.43
i	0.20	8.84	0.38	0.28	0.28

LEY DE SN.800 E (12 de Mayo)

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
I	0.50	12.09	1.64	3.54	0.07
II	0.40	9.97	0.46	1.60	0.06
III	0.90	7.39	0.79	2.92	0.04
IV	0.70	6.88	0.76	1.82	0.22
V	0.60	36.78	1.87	5.60	0.43
VI	0.50	29.44	13.6	2.03	0.25
VII	0.50	27.21	6.18	2.69	0.61
VIII	0.60	10.57	2.86	3.16	0.09
IX	0.50	14.06	7.19	1.61	0.15

CUT OFF

- Mena >14 Oz Ag
- Marginal >10.5<14 Oz Ag
- Baja Ley <10.5 Oz Ag

Elaborado :	Rogelio Osorio
Dibujado :	Rogelio Osorio
Revisado :	Ing. Juan Carlos Benavides
Aprobado :	Ing. Ludwen Vilca
Área / Dpto :	Geologia

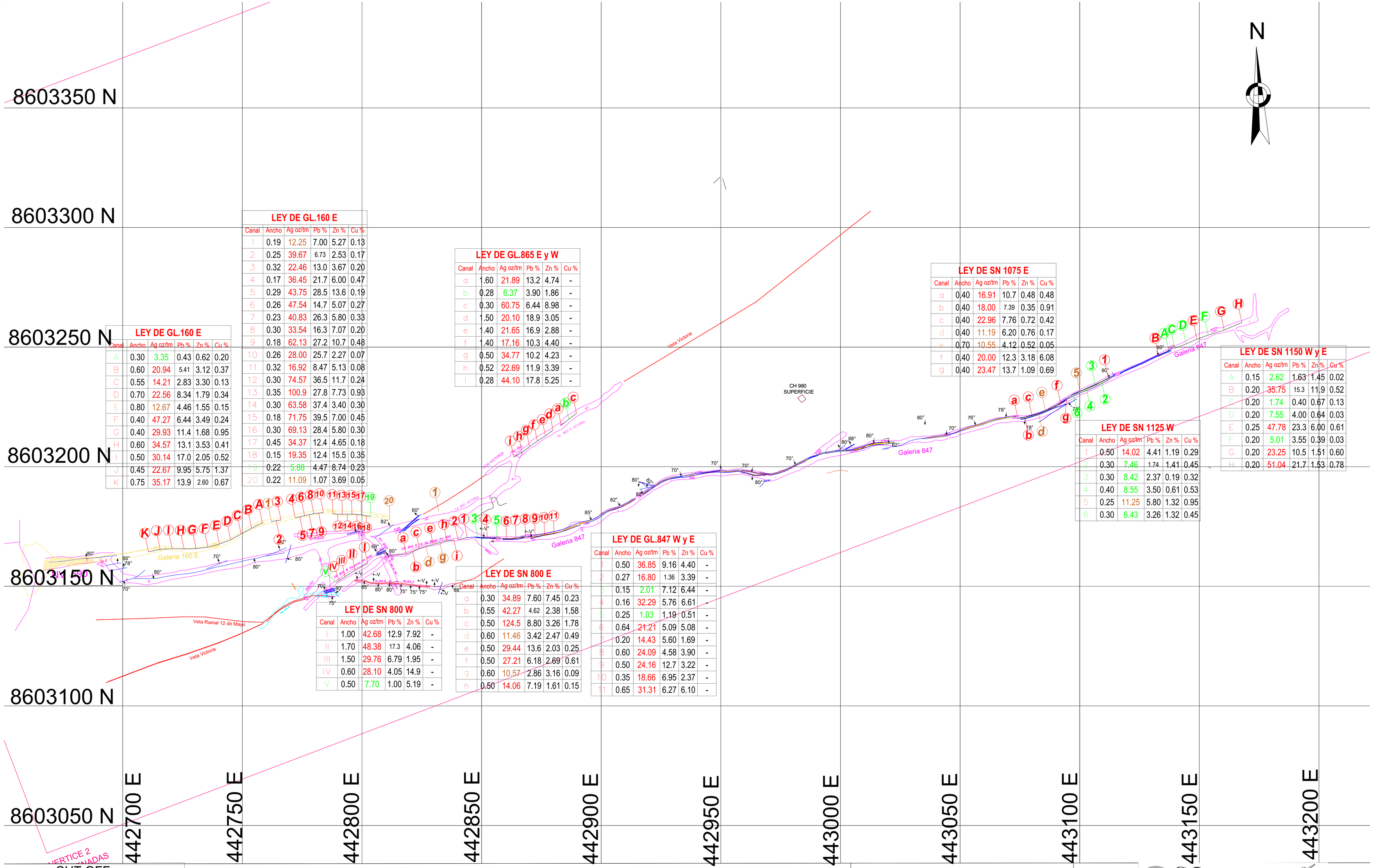
ESCALA 1/1000

FECHA 05-May-2016

S&L ANDES EXPORT S.A.C. — MINA SANTA ELENA — AREA DE GEOLOGIA

MINA SANTA ELENA
PLANO DE MUESTREO
NIVEL 670
NIVEL 670

LAMINA 1



LEY DE GL.160 E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
A	0.30	3.35	0.43	0.62	0.20
B	0.60	20.94	5.41	3.12	0.37
C	0.55	14.21	2.83	3.30	0.13
D	0.70	22.56	8.34	1.79	0.34
E	0.80	12.67	4.46	1.55	0.15
F	0.40	47.27	6.44	3.49	0.24
G	0.40	29.93	11.4	1.68	0.95
H	0.60	34.57	13.1	3.53	0.41
I	0.50	30.14	17.0	2.05	0.52
J	0.45	22.67	9.95	5.75	1.37
K	0.75	35.17	13.9	2.60	0.67

LEY DE GL.160 E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.19	12.25	7.00	5.27	0.13
2	0.25	39.67	6.73	2.53	0.17
3	0.32	22.46	13.0	3.67	0.20
4	0.17	36.45	21.7	6.00	0.47
5	0.29	43.75	28.5	13.6	0.19
6	0.26	47.54	14.7	5.07	0.27
7	0.23	40.83	26.3	5.80	0.33
8	0.30	33.54	16.3	7.07	0.20
9	0.18	62.13	27.2	10.7	0.48
10	0.26	28.00	25.7	2.27	0.07
11	0.32	16.92	8.47	5.13	0.08
12	0.30	74.57	36.5	11.7	0.24
13	0.35	100.9	27.8	7.73	0.93
14	0.30	63.58	37.4	3.40	0.30
15	0.18	71.75	39.5	7.00	0.45
16	0.30	69.13	28.4	5.80	0.30
17	0.45	34.37	12.4	4.65	0.18
18	0.15	19.35	12.4	15.5	0.35
19	0.22	5.88	4.47	8.74	0.23
20	0.22	11.09	1.07	3.69	0.05

LEY DE GL.865 E y W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
a	1.60	21.89	13.2	4.74	-
b	0.28	6.37	3.90	1.86	-
c	0.30	60.75	6.44	8.98	-
d	1.50	20.10	18.9	3.05	-
e	1.40	21.65	16.9	2.88	-
f	1.40	17.16	10.3	4.40	-
g	0.50	34.77	10.2	4.23	-
h	0.52	22.69	11.9	3.39	-
i	0.28	44.10	17.8	5.25	-

LEY DE SN 1075 E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
a	0.40	16.91	10.7	0.48	0.48
b	0.40	18.00	7.39	0.35	0.91
c	0.40	22.96	7.76	0.72	0.42
d	0.40	11.19	6.20	0.76	0.17
e	0.70	10.55	4.12	0.52	0.05
f	0.40	20.00	12.3	3.18	6.08
g	0.40	23.47	13.7	1.09	0.69

LEY DE SN 1150 W y E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
A	0.15	2.62	1.63	1.45	0.02
B	0.20	35.75	15.3	11.9	0.52
C	0.20	1.74	0.40	0.67	0.13
D	0.20	7.55	4.00	0.64	0.03
E	0.25	47.78	23.3	6.00	0.61
F	0.20	5.01	3.55	0.39	0.03
G	0.20	23.25	10.5	1.51	0.60
H	0.20	51.04	21.7	1.53	0.78

LEY DE SN 1125 W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.50	14.02	4.41	1.19	0.29
2	0.30	7.46	1.74	1.41	0.45
3	0.30	8.42	2.37	0.19	0.32
4	0.40	8.55	3.50	0.61	0.53
5	0.25	11.25	5.80	1.32	0.95
6	0.30	6.43	3.26	1.32	0.45

LEY DE SN 800 W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
I	1.00	42.68	12.9	7.92	-
II	1.70	48.38	17.3	4.06	-
III	1.50	29.76	6.79	1.95	-
IV	0.60	28.10	4.05	14.9	-
V	0.50	7.70	1.00	5.19	-

LEY DE SN 800 E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
a	0.30	34.89	7.60	7.45	0.23
b	0.55	42.27	4.62	2.38	1.58
c	0.50	124.5	8.80	3.26	1.78
d	0.60	11.46	3.42	2.47	0.49
e	0.50	29.44	13.6	2.03	0.25
f	0.50	27.21	6.18	2.69	0.61
g	0.60	10.57	2.86	3.16	0.09
h	0.50	14.06	7.19	1.61	0.15

LEY DE GL.847 W y E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.50	36.85	9.16	4.40	-
2	0.27	16.80	1.36	3.39	-
3	0.15	2.01	7.12	6.44	-
4	0.16	32.29	5.76	6.61	-
5	0.25	1.03	1.19	0.51	-
6	0.64	21.21	5.09	5.08	-
7	0.20	14.43	5.60	1.69	-
8	0.60	24.09	4.58	3.90	-
9	0.50	24.16	12.7	3.22	-
10	0.35	18.66	6.95	2.37	-
11	0.65	31.31	6.27	6.10	-

CUT OFF

- Mena >14 Oz Ag
- Marginal >10.5<14 Oz Ag
- Baja Ley <10.5 Oz Ag

Elaborado :	Rogelio Osorio
Dibujado :	Rogelio Osorio
Revisado :	Ing. Juan Carlos Benavides
Aprobado :	Ing. Ludwen Vilca
Área / Dpto :	Geologia

ESCALA 1/500

FECHA 13-May-2016

MINA SANTA ELENA
AREA DE GEOLOGIA

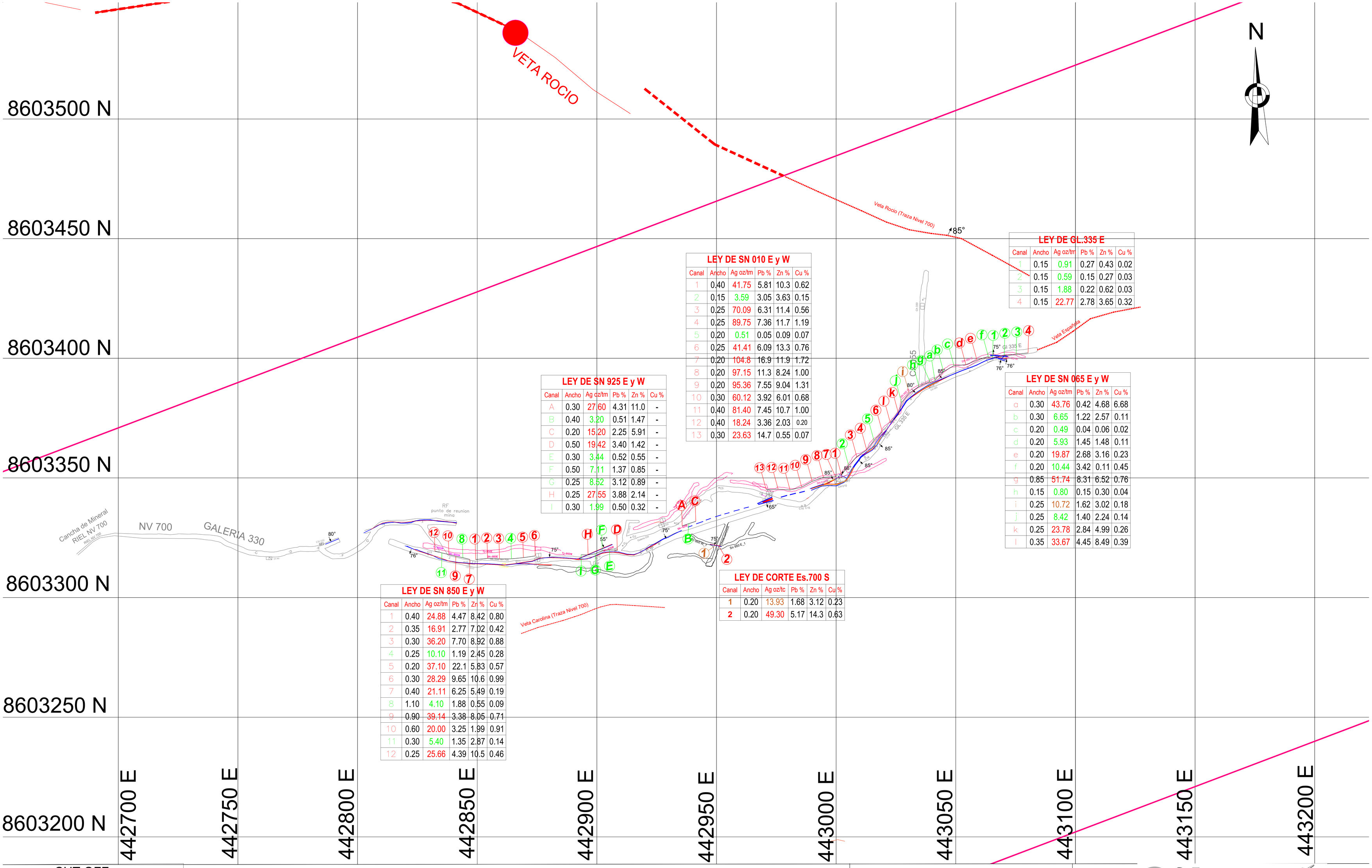
MINA SANTA ELENA

PLANO DE MUESTREO

NIVEL 690

NIVEL 690

LAMINA **1**



LEY DE SN 925 E y W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
A	0.30	27.60	4.31	11.0	-
B	0.40	3.20	0.51	1.47	-
C	0.20	15.20	2.25	5.91	-
D	0.50	19.42	3.40	1.42	-
E	0.30	3.44	0.52	0.55	-
F	0.50	7.11	1.37	0.85	-
G	0.25	8.52	3.12	0.89	-
H	0.25	27.55	3.88	2.14	-
I	0.30	1.99	0.50	0.32	-

LEY DE SN 010 E y W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.40	41.75	5.81	10.3	0.62
2	0.15	3.59	3.05	3.63	0.15
3	0.25	70.09	6.31	11.4	0.56
4	0.25	89.75	7.36	11.7	1.19
5	0.20	0.51	0.05	0.09	0.07
6	0.25	41.41	6.09	13.3	0.76
7	0.20	104.8	16.9	11.9	1.72
8	0.20	97.15	11.3	8.24	1.00
9	0.20	95.36	7.55	9.04	1.31
10	0.30	60.12	3.92	6.01	0.68
11	0.40	81.40	7.45	10.7	1.00
12	0.40	18.24	3.36	2.03	0.20
13	0.30	23.63	14.7	0.55	0.07

LEY DE GL.335 E

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.15	0.91	0.27	0.43	0.02
2	0.15	0.59	0.15	0.27	0.03
3	0.15	1.88	0.22	0.62	0.03
4	0.15	22.77	2.78	3.65	0.32

LEY DE SN 065 E y W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
a	0.30	43.76	0.42	4.68	6.68
b	0.30	6.65	1.22	2.57	0.11
c	0.20	0.49	0.04	0.06	0.02
d	0.20	5.93	1.45	1.48	0.11
e	0.20	19.87	2.68	3.16	0.23
f	0.20	10.44	3.42	0.11	0.45
g	0.85	51.74	8.31	6.52	0.76
h	0.15	0.80	0.15	0.30	0.04
i	0.25	10.72	1.62	3.02	0.18
j	0.25	8.42	1.40	2.24	0.14
k	0.25	23.78	2.84	4.99	0.26
l	0.35	33.67	4.45	8.49	0.39

LEY DE SN 850 E y W

Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.40	24.88	4.47	8.42	0.80
2	0.35	16.91	2.77	7.02	0.42
3	0.30	36.20	7.70	8.92	0.88
4	0.25	10.10	1.19	2.45	0.28
5	0.20	37.10	22.1	5.83	0.57
6	0.30	28.29	9.65	10.6	0.99
7	0.40	21.11	6.25	5.49	0.19
8	1.10	4.10	1.88	0.55	0.09
9	0.90	39.14	3.38	8.05	0.71
10	0.60	20.00	3.25	1.99	0.91
11	0.30	5.40	1.35	2.87	0.14
12	0.25	25.66	4.39	10.5	0.46

LEY DE CORTE Es.700 S

Canal	Ancho	Ag oz/tc	Pb %	Zn %	Cu %
1	0.20	13.93	1.68	3.12	0.23
2	0.20	49.30	5.17	14.3	0.63

CUT OFF

- Mena >14 Oz Ag
- Marginal >10.5<14 Oz Ag
- Baja Ley <10.5 Oz Ag

Elaborado :	Rogelio Osorio
Dibujado :	Rogelio Osorio
Revisado :	Ing. Juan Carlos Benavides
Aprobado :	Ing. Ludwen Vilca
Área / Dpto :	Geologia

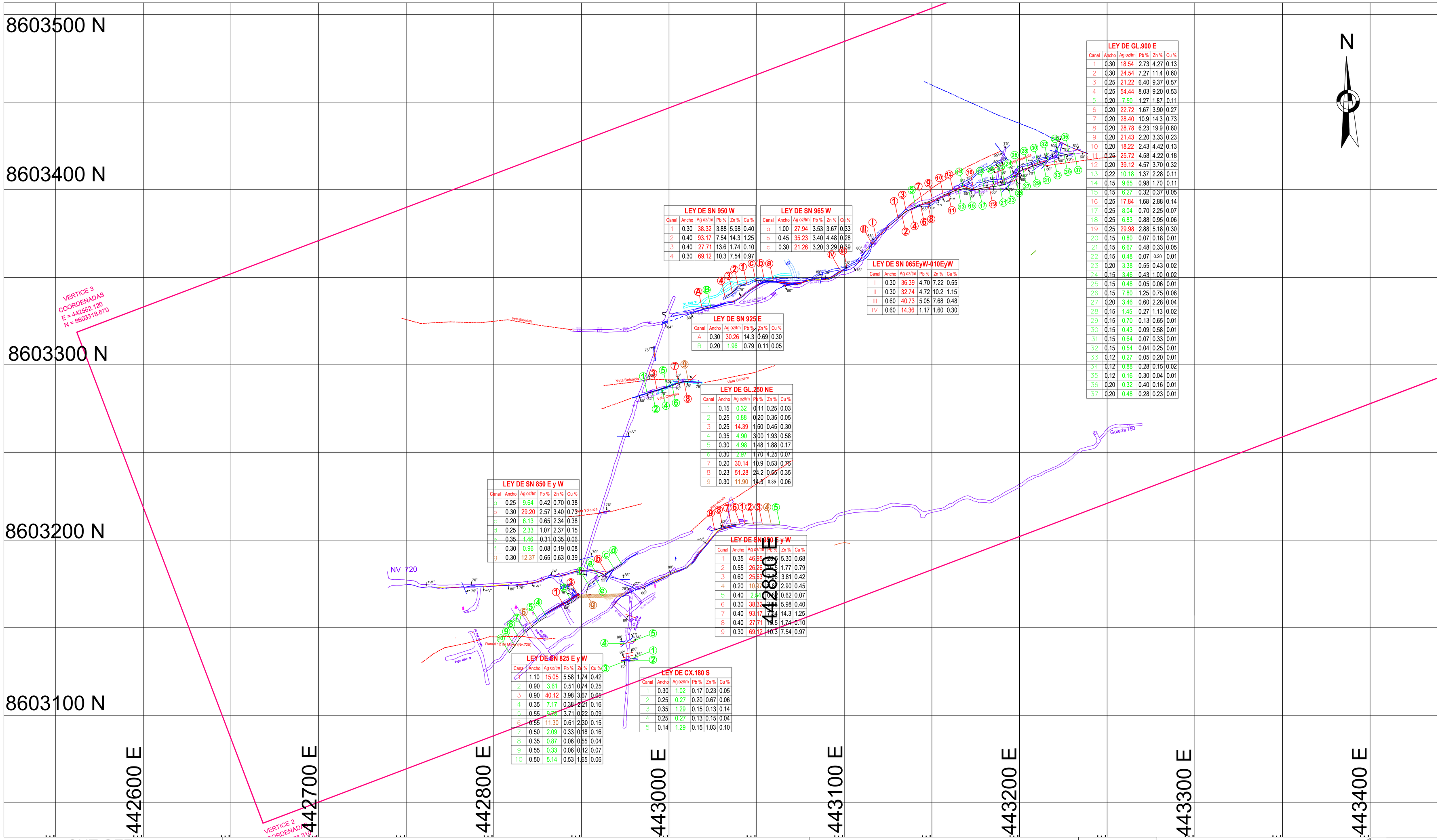
ESCALA 1/500

FECHA 15-May-2016

MINA SANTA ELENA
AREA DE GEOLOGIA

MINA SANTA ELENA
PLANO DE MUESTREO
NIVEL 700
NIVEL 700

LAMINA 1



LEY DE GL.900 E					
Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.30	18.54	2.73	4.27	0.13
2	0.30	24.54	7.27	11.4	0.60
3	0.25	21.22	6.40	9.37	0.57
4	0.25	54.44	8.03	9.20	0.53
5	0.20	7.50	1.27	1.87	0.11
6	0.20	22.72	1.67	3.90	0.27
7	0.20	28.40	10.9	14.3	0.73
8	0.20	28.78	6.23	19.9	0.80
9	0.20	21.43	2.20	3.33	0.23
10	0.20	18.22	2.43	4.42	0.13
11	0.25	25.72	4.58	4.22	0.18
12	0.20	39.12	4.57	3.70	0.32
13	0.22	10.18	1.37	2.28	0.11
14	0.15	9.65	0.98	1.70	0.11
15	0.15	6.27	0.32	0.37	0.05
16	0.25	17.84	1.68	2.88	0.14
17	0.25	8.04	0.70	2.25	0.07
18	0.25	6.83	0.88	0.95	0.06
19	0.25	29.98	2.88	5.18	0.30
20	0.15	0.80	0.07	0.18	0.01
21	0.15	6.67	0.48	0.33	0.05
22	0.15	0.48	0.07	0.20	0.01
23	0.20	3.38	0.55	0.43	0.02
24	0.15	3.46	0.43	1.00	0.02
25	0.15	0.48	0.05	0.06	0.01
26	0.15	7.80	1.25	0.75	0.06
27	0.20	3.46	0.60	2.28	0.04
28	0.15	1.45	0.27	1.13	0.02
29	0.15	0.70	0.13	0.65	0.01
30	0.15	0.43	0.09	0.58	0.01
31	0.15	0.64	0.07	0.33	0.01
32	0.15	0.54	0.04	0.25	0.01
33	0.12	0.27	0.05	0.20	0.01
34	0.12	0.88	0.28	0.15	0.02
35	0.12	0.16	0.30	0.04	0.01
36	0.20	0.32	0.40	0.16	0.01
37	0.20	0.48	0.28	0.23	0.01

LEY DE SN 950 W					
Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.30	38.32	3.88	5.98	0.40
2	0.40	93.17	7.54	14.3	1.25
3	0.40	27.71	13.6	1.74	0.10
4	0.30	69.12	10.3	7.54	0.97

LEY DE SN 965 W					
Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
a	1.00	27.94	3.53	3.67	0.33
b	0.45	35.23	3.40	4.48	0.28
c	0.30	21.26	3.20	3.29	0.39

LEY DE SN 065EyW-010EyW					
Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
I	0.30	36.39	4.70	7.22	0.55
II	0.30	32.74	4.72	10.2	1.15
III	0.60	40.73	5.05	7.68	0.48
IV	0.60	14.36	1.17	1.60	0.30

LEY DE SN 925 E					
Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
A	0.30	30.26	14.3	0.69	0.30
B	0.20	1.96	0.79	0.11	0.05

LEY DE GL.250 NE					
Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.15	0.32	0.11	0.25	0.03
2	0.25	0.88	0.20	0.35	0.05
3	0.25	14.39	1.50	0.45	0.30
4	0.35	4.90	3.00	1.93	0.58
5	0.30	4.98	1.48	1.88	0.17
6	0.30	2.97	1.70	4.25	0.07
7	0.20	30.14	10.9	0.53	0.75
8	0.23	51.28	24.2	0.55	0.35
9	0.30	11.90	14.3	0.35	0.06

LEY DE SN 850 E y W					
Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
a	0.25	9.64	0.42	0.70	0.38
b	0.30	29.20	2.57	3.40	0.73
c	0.20	6.13	0.65	2.34	0.38
d	0.25	2.33	1.07	2.37	0.15
e	0.35	1.16	0.31	0.35	0.06
f	0.30	0.96	0.08	0.19	0.08
g	0.30	12.37	0.65	0.63	0.39

LEY DE SN 830 E y W					
Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.35	46.95	[illegible]	5.30	0.68
2	0.55	26.26	[illegible]	1.77	0.79
3	0.60	25.63	[illegible]	3.81	0.42
4	0.20	10.97	[illegible]	2.90	0.45
5	0.40	2.54	[illegible]	0.62	0.07
6	0.30	38.32	[illegible]	5.98	0.40
7	0.40	93.17	[illegible]	14.3	1.25
8	0.40	27.71	[illegible]	1.74	0.10
9	0.30	69.12	10.3	7.54	0.97

LEY DE SN 825 E y W					
Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	1.10	15.05	5.58	1.74	0.42
2	0.90	3.61	0.51	0.74	0.25
3	0.90	40.12	3.98	3.67	0.68
4	0.35	7.17	0.38	2.21	0.16
5	0.55	9.75	3.71	0.22	0.09
6	0.55	11.30	0.61	2.30	0.15
7	0.50	2.09	0.33	0.18	0.16
8	0.35	0.87	0.06	0.55	0.04
9	0.55	0.33	0.06	0.12	0.07
10	0.50	5.14	0.53	1.65	0.06

LEY DE CX.180 S					
Canal	Ancho	Ag oz/tm	Pb %	Zn %	Cu %
1	0.30	1.02	0.17	0.23	0.05
2	0.25	0.27	0.20	0.67	0.06
3	0.35	1.29	0.15	0.13	0.14
4	0.25	0.27	0.13	0.15	0.04
5	0.14	1.29	0.15	1.03	0.10

CUT OFF

- Mena >14 Oz Ag
- Marginal >10.5<14 Oz Ag
- Baja Ley <10.5 Oz Ag

Elaborado :	Rogelio Osorio
Dibujado :	Rogelio Osorio
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Aprobado :	Ing. Ludwen Vilca
Área / Dpto :	Geologia

ESCALA 1/1000

FECHA 22-May-2016

S&L ANDES EXPORT S.A.C. — MINA SANTA ELENA — AREA DE GEOLOGIA

MINA SANTA ELENA
PLANO DE MUESTREO
NIVEL 720
NIVEL 720

LAMINA 1

APPENDIX 6 – Historical Metallurgical Test Work

[24 pages]

UNIVERSIDAD NACIONAL DE INGENIERÍA

FACULTAD DE INGENIERÍA GEOLÓGICA,MINERA Y METALÚRGICA

LABORATORIO DE PROCESAMIENTO DE MINERALES Y METALURGIA EXTRACTIVA

Lima 14 de Marzo del 2015

Srs.

S & L ANDES EXPORT S.A.C.

Presente **Atención : Ing. Gianni Beltrami Reyna**

De nuestra especial consideración:

Por intermedio de la presente les hago llegar el **INFORME** del**" ESTUDIO METALURGICO DE FLOTACION DE MINERAL POLIMETALICO",** solicitado por su empresa.

En espera de sus observaciones me suscribo de Ud.

Atentamente

EDGAR SEGURA TUMIALÁN
ING. METALURGISTA
JEFE DE LABORATORIO DE METALURGIA
FIGMM – UNI

UNIVERSIDAD NACIONAL DE INGENIERIA

FACULTAD DE INGENIERIA GEOLOGICA MINERA Y METALURGICA

ESCUELA PROFESIONAL DE INGENIERIA METALURGICA

LABORATORIO DE PROCESAMIENTO DE MINERALES Y METALURGIA EXTRACTIVA

ESTUDIO METALURGICO DE FLOTACION DE MINERAL POLIMETALICO

S & L ANDES EXPORT S.A.C.

POR: ING. EDGAR SEGURA TUMIALAN

ESTUDIO METALURGICO DE FLOTACION DE MINERAL POLIMETALICO

S & L ANDES EXPORT S.A.C.

I. INTRODUCCION

A Solicitud del Ing. Gianni Beltrami Reyna de la Cía. S & L ANDES EXPORT S.A.C., se ha desarrollado el Estudio metalúrgico de Flotación de sus minerales polimetálicos, con contenidos de plomo, cobre, plata, oro y zinc.

El Mineral recibido en nuestro Laboratorio siguió las siguientes etapas experimentales:

- Se prepararo la muestra a 100% - 10 mallas. Pesándose muestras de 1 kg para las pruebas de flotación.

- Se realizo las pruebas de Moliendabilidad para determinar el tiempo óptimo para la flotación.

- Las pruebas de flotación se ejecuto bajo el esquema para un mineral polimetálico.

A continuación se detallan las leyes de cabeza del mineral a emplearse en la prueba experimental.

CUADRO Nº 1

	Cu (%)	Pb (%)	Zn (%)	Ag (oz/TM)	Au (gr/TM)
Mineral cabeza	0.38	4.02	3.98	15.60	1.16

Los resultados de las pruebas metalúrgicas se muestran a continuación.

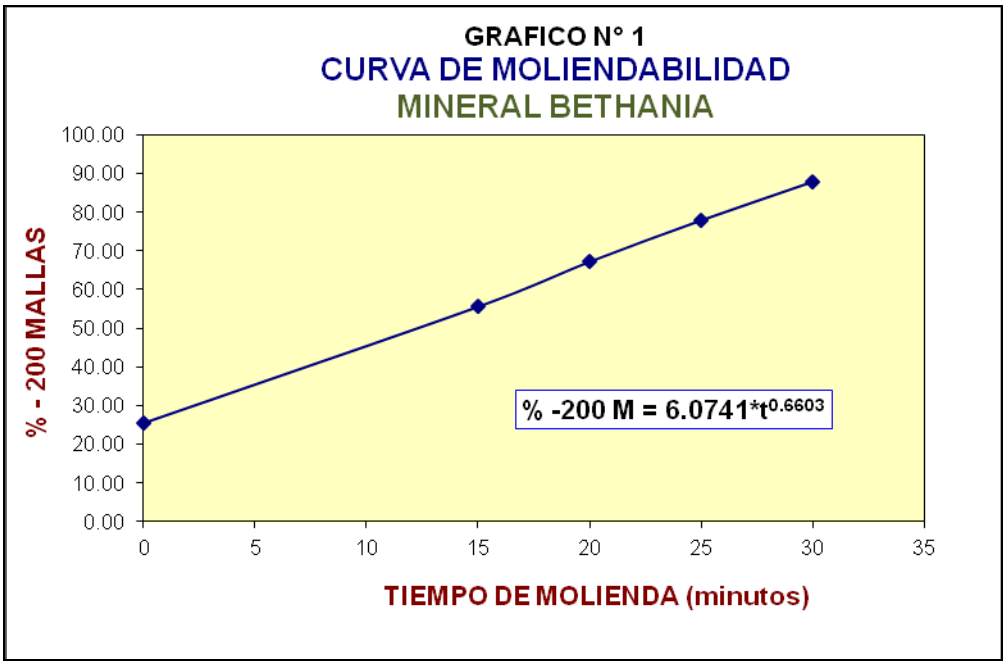
II. PRUEBAS EXPERIMENTALES

2.1 PRUEBAS DE MOLIENDABILIDAD

Se realizaron pruebas de molienda para determinar la curva de Moliendabilidad del mineral polimetálico. El **cuadro Nº 2** y **gráfico Nº 1**, nos muestran los resultados obtenidos.

CUADRO Nº 2

TIEMPO (minutos)	% - 200 mallas
0	25.50
15	55.51
20	67.12
25	77.78
30	87.73
55% -200 mallas =11´49”	
60% -200 mallas =14´48”	



2.2 ANALISIS GRANULOMETRICO DEL MINERAL DE CABEZA - COMPOSITO

El cuadro Nº 3 y Grafico Nº 2 nos presenta los análisis granulométricos del mineral de cabeza recepcionado por el laboratorio.

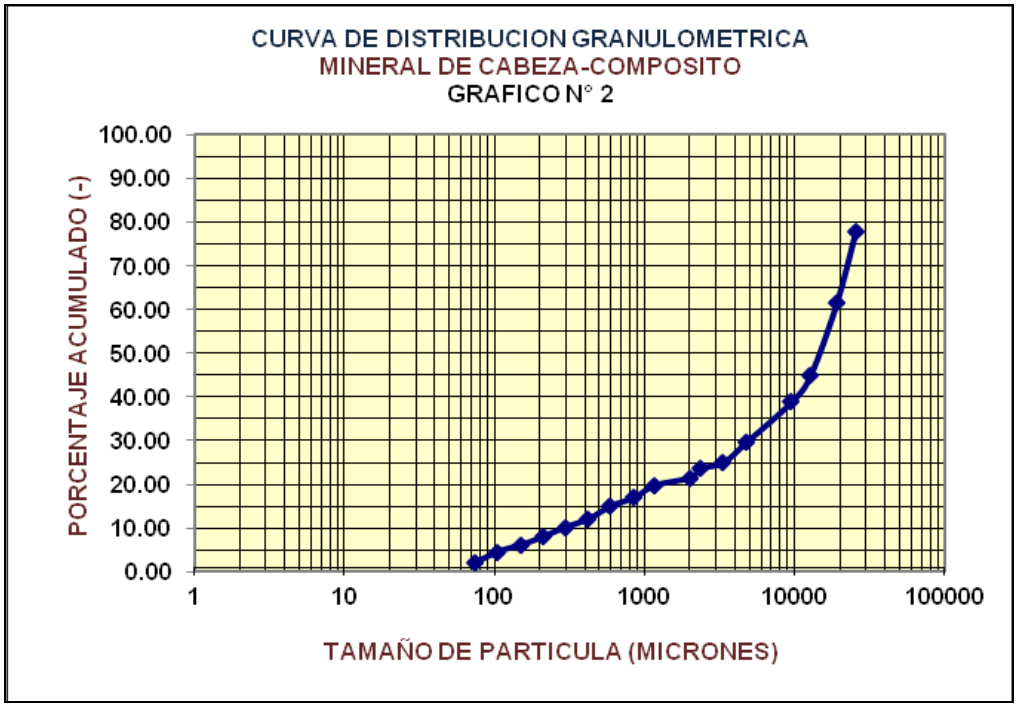
CUADRO Nº 3

ANALISIS GRANULOMETRICO POR MALLAS

MINERAL DE CABEZA-COMPOSITO

MALLAS	TAMAÑO DE PARTICULA (microns)	PESO (GR)	% PESO	% ACUMULADO (+)	% ACUMULADO (-)
+1 1/2"	38100	558.00	11.16	11.16	88.84
+1"	25400	541.00	10.82	21.98	78.02
+3/4"	19050	815.00	16.30	38.28	61.72
+1/2"	12700	840.00	16.80	55.08	44.92
+3/8"	9525	302.00	6.04	61.12	38.88
+4 M	4750	466.00	9.32	70.44	29.56
+ 6 M	3350	228.60	4.57	75.01	24.99
+8 M	2360	71.90	1.44	76.45	23.55
+ 10 M	2000	105.60	2.11	78.56	21.44
+ 14 M	1168	84.80	1.70	80.26	19.74
+ 20 M	850	141.50	2.83	83.09	16.91
+ 30 M	595	95.70	1.91	85.00	15.00
+ 40 M	420	150.30	3.01	88.01	11.99
+ 50 M	297	91.10	1.82	89.83	10.17
+ 70 M	210	111.50	2.23	92.06	7.94
+ 100 M	150	92.60	1.85	93.91	6.09
+ 140 M	105	78.50	1.57	95.48	4.52
+ 200 M	74	128.40	2.57	98.05	1.95
- 200 M		97.50	1.95	100.00	0.00
TOTAL		**5000.00**	**100.00**		

El 44.92% del mineral de cabeza se encuentra por debajo de -1/2”, porcentaje alto que puede ser separado antes del chancado.



2.3 DISTRIBUCION POR MALLAS DE LOS CONTENIDOS DE COBRE Y PLATA

El cuadro Nº 4 y gráficos Nº 3 y Nº 4 nos muestran la distribución del cobre y la plata por mallas en el concentrado Compósito de Zinc.

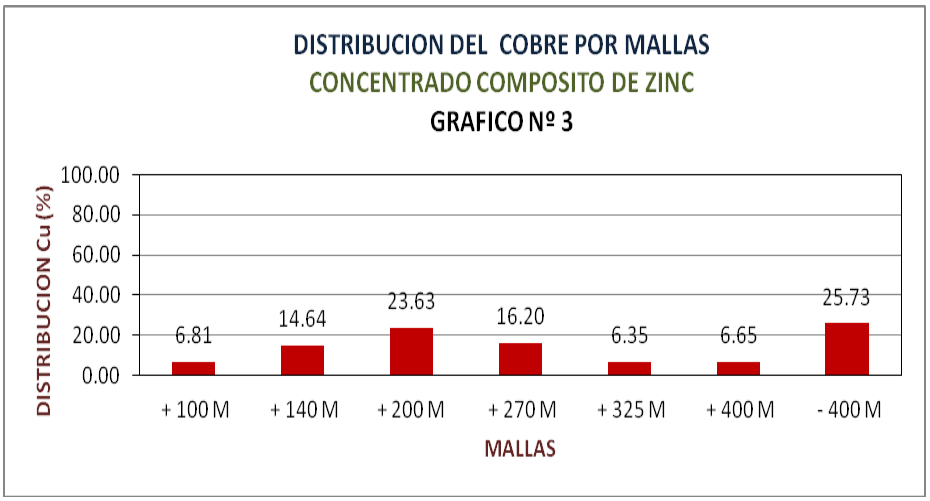
CUADRO Nº 4

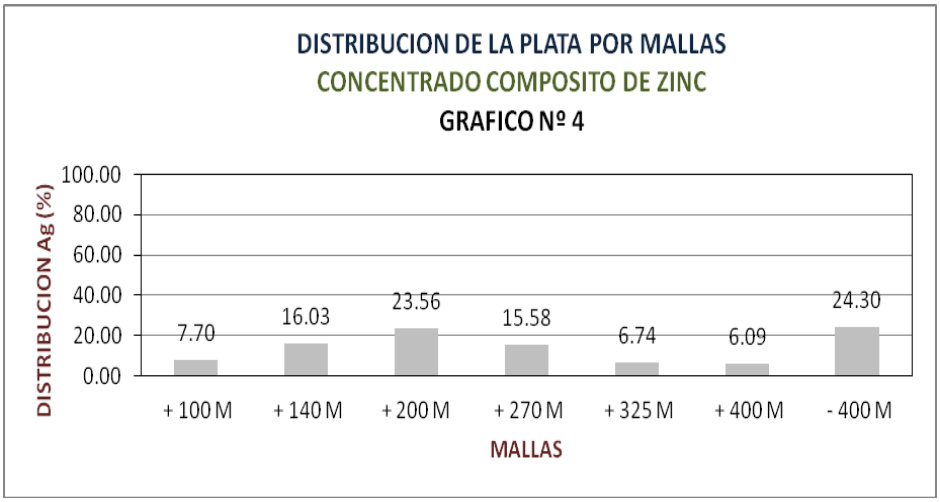
ANALISIS GRANULOMETRICO VALORADO

COMPOSITO DE CONCENTRADO DE ZINC

MALLAS	TAMAÑO DE (microns)	(GR)	%	LEY Cu (%)	FINOS Cu	LEY Ag (oz/TM)	FINOS Ag	DISTRIBUCION Cu (%)		DISTRIBUCION Ag (%)	
								PARCIAL	ACUM.	PARCIAL	ACUM.
+ 100 M	150	16.80	8.40	0.97	8.148	72.200	606.480	6.81	6.81	7.70	7.70
+ 140 M	105	29.20	14.60	1.20	17.520	86.500	1262.900	14.64	21.44	16.03	23.73
+ 200 M	75	35.80	17.90	1.58	28.282	103.700	1856.230	23.63	45.07	23.56	47.28
+ 270 M	53	28.10	14.05	1.38	19.389	87.400	1227.970	16.20	61.27	15.58	62.87
+ 325 M	43	13.10	6.55	1.16	7.598	81.100	531.205	6.35	67.62	6.74	69.61
+ 400 M	37	13.50	6.75	1.18	7.965	71.100	479.925	6.65	74.27	6.09	75.70
- 400 M		63.50	31.75	0.97	30.798	60.300	1914.525	25.73	100.00	24.30	100.00
COMPOSITO CALCULADO		**200.00**	**100.00**	**1.20**	**119.70**	**78.79**	**7879.24**	**100.00**		**100.00**	

Existe una relación casi directa entre los contenidos de cobre y plata en el concentrado de zinc, es importante lograr flotar el cobre que se desplaza hacia el zinc.


DISTRIBUCION DEL COBRE POR MALLAS
CONCENTRADO COMPOSITO DE ZINC
GRAFICO Nº 3
DISTRIBUCION Cu (%)
100.00
80.00
60.00
40.00
20.00
0.00
6.81
14.64
23.63
16.20
6.35
6.65
25.73
+ 100 M
+ 140 M
+ 200 M
+ 270 M
+ 325 M
+ 400 M
- 400 M
MALLAS


DISTRIBUCION DE LA PLATA POR MALLAS
CONCENTRADO COMPOSITO DE ZINC
GRAFICO Nº 4
DISTRIBUCION Ag (%)
100.00
80.00
60.00
40.00
20.00
0.00
7.70
16.03
23.56
15.58
6.74
6.09
24.30
+ 100 M
+ 140 M
+ 200 M
+ 270 M
+ 325 M
+ 400 M
- 400 M
MALLAS

2.4 PRUEBAS DE FLOTACION

2.4.1 Prueba de Flotación Nº 1.-

Esta prueba de flotación se realizo a 60% - 200 mallas. Con una flotación selectiva.

Molienda

Peso de mineral	:	1.0 kg
Líquido/sólido	:	½
Granulometría	:	65% -200 mallas
Complejo	:	400 gr/TM
		NaCN : 100 gr/TM
		$ZnSO_4$: 300 gr/TM
$ZnSO_4$	:	500 gr/TM
AP-3418	:	20 gr/TM
AR-242	:	10 gr/TM
Tiempo de molienda	:	16´53”

FLOTACION

Flotación Rougher Bulk

Acondicionamiento	:	5´
pH	:	8.5
Z- 11	:	20 gr/TM
MIBC	:	7 gr/TM
Flotación	:	3´

Flotación Scavenger Bulk

Acondicionamiento	:	3´
pH	:	8.5
Z- 11	:	10 gr/TM
MIBC	:	7 gr/TM
Flotación	:	1´

Flotación Cleaner Bulk

Acondicionamiento	:	3´		
pH	:	8.5		
Complejo	:	100 gr/TM		
		NaCN	: 25	gr/TM
		$ZnSO_4$	: 75	gr/TM
$ZnSO_4$	:	100 gr/TM		
MIBC	:	7 gr/TM		
Flotación	:	2´		

Flotación Rougher Zn

Acondicionamiento	:	5´
pH	:	11
$CuSO_4$	:	500 gr/TM
Z- 11	:	20 gr/TM
MIBC	:	14 gr/TM
Flotación	:	2´

Flotación Scavenger Zn

Acondicionamiento	:	3´
pH	:	11
Z- 11	:	10 gr/TM
MIBC	:	7 gr/TM
Flotación	:	1´

Flotación Cleaner Zn

Acondicionamiento	:	3´
pH	:	11
MIBC	:	7 gr/TM
Flotación	:	2´

El cuadro Nº 5, nos muestra el Balance de la Prueba de Flotación Nº 1.

BALANCE METALURGICO

Cuadro Nº 5.- Balance Metalúrgico de la prueba de Flotación Nº 1 del mineral polimetálico.

	Peso (gr)	% Peso	LEYES					RECUPERACION (%)				RADIO CONCENTRACION
			Cu (%)	Pb (%)	Zn (%)	Ag (oz/TM)	Au (gr/TM)	Cu (%)	Pb (%)	Zn (%)	Ag (%)	
Cabeza	**1000.00**	**100.00**	0.38	4.02	3.98	15.60	1.16	**100.00**	**100.00**	**100.00**	**100.00**	
Conc. Bulk Cu-Pb	**45.40**	**4.54**	**5.48**	**60.28**	**4.12**	**210.70**	**19.00**	**74.38**	**72.35**	**5.44**	**64.06**	**22.03**
Medios Bulk Cu-Pb	**9.90**	0.99	0.97	36.12	9.09	71.50		2.87	9.45	2.62	4.74	
Conc.Rougher Bulk Cu-Pb	**55.30**	**5.53**	**4.67**	**55.95**	**5.01**	**185.78**		**77.25**	**81.81**	**8.06**	**68.81**	
Conc. Zn	**42.30**	**4.23**	**0.63**	**2.72**	**65.73**	**53.00**		**7.97**	**3.04**	**80.92**	**15.01**	**23.64**
Medios Zn	**37.10**	3.71	**0.40**	**4.72**	**6.01**	**27.80**		4.44	4.63	6.49	6.91	
Conc. Rougher Zn	**79.40**	**7.94**	**0.52**	**3.65**	**37.83**	**41.23**		**12.40**	**7.67**	**87.40**	**21.92**	
Relave Flotación	865.30	86.53	0.04	0.46	0.18	1.60		10.35	10.52	4.53	9.27	
Cabeza Calculada	**1000.00**	**100.00**	**0.33**	**3.78**	**3.44**	**14.93**		**100.00**	**100.00**	**100.00**	**100.00**	

2.4.2 Prueba de Flotación Nº 2.-

Esta prueba de flotación se realizo a 60% - 200 mallas. Con una flotación selectiva. Se adiciono AR-208 en la molienda para mejorar la flotación del cobre.

Molienda

Peso de mineral	:	1.0 kg	
Líquido/sólido	:	½	
Granulometría	:	60% -200 mallas	
DP-1003	:	40 gr/TM	
MIX	:	500 gr/TM	
		$ZnSO_4$	: 250 gr/TM
		$NaHSO_3$	: 250 gr/TM
Complejo	:	200 gr/TM	
		NaCN	: 50 gr/TM
		$ZnSO_4$	: 150 gr/TM
$ZnSO_4$	:	500 gr/TM	
AP-3418	:	20 gr/TM	
AR-208	:	20 gr/TM	
Tiempo de molienda	:	16´04”	

FLOTACION

Flotación Rougher Bulk

Acondicionamiento	:	5´
pH	:	8.5
Z- 11	:	20 gr/TM
MIBC	:	7 gr/TM
Flotación	:	4´

Flotación Scavenger Bulk

Acondicionamiento	:	3´
pH	:	8.5
Z- 11	:	10 gr/TM
MIBC	:	7 gr/TM
Flotación	:	2´

Flotación Cleaner Bulk

Acondicionamiento	:	3´
pH	:	8.5
$ZnSO_4$	:	100 gr/TM
MIBC	:	7 gr/TM
Flotación	:	2´

Flotación Rougher Zn

Acondicionamiento	:	5´
pH	:	11
$CuSO_4$	:	500 gr/TM
Z- 11	:	20 gr/TM
MIBC	:	14 gr/TM
Flotación	:	2´

Flotación Scavenger Zn

Acondicionamiento	:	2´
pH	:	11
Z- 11	:	5 gr/TM
MIBC	:	7 gr/TM
Flotación	:	1´

Flotación Cleaner Zn

Acondicionamiento	:	3´
pH	:	11
MIBC	:	7 gr/TM
Flotación	:	2´

El cuadro Nº 6, nos muestra el Balance de la Prueba de Flotación Nº 2.

BALANCE METALURGICO

Cuadro Nº 6.- Balance Metalúrgico de la prueba de Flotación Nº 2 del mineral polimetálico.

	Peso (gr)	% Peso	LEYES					RECUPERACION (%)				RADIO CONCENTRACION
			Cu (%)	Pb (%)	Zn (%)	Ag (oz/TM)	Au (gr/TM)	Cu (%)	Pb (%)	Zn (%)	Ag (%)	
Cabeza	**1000.00**	**100.00**	0.38	4.02	3.98	15.60	1.16	**100.00**	**100.00**	**100.00**	**100.00**	
Conc. Bulk Cu-Pb	**41.00**	**4.10**	**3.95**	**66.68**	**3.87**	**261.00**	**10.21**	**44.92**	**66.65**	**4.39**	**45.38**	**24.39**
Medios Bulk Cu-Pb	**21.50**	2.15	0.76	20.44	5.85	56.30		4.53	10.71	3.48	5.13	
Conc.Rougher Bulk Cu-Pb	**62.50**	**6.25**	**2.85**	**50.77**	**4.55**	**190.58**		**49.45**	**77.36**	**7.88**	**50.51**	
Conc. Zn	**48.70**	**4.87**	**2.87**	**5.43**	**60.44**	**92.00**		**38.76**	**6.45**	**81.52**	**41.07**	**20.53**
Medios Zn	**28.80**	2.88	**0.58**	**9.32**	**8.51**	**33.10**		4.63	6.54	6.79	4.04	
Conc. Rougher Zn	**77.50**	**7.75**	**2.02**	**6.88**	**41.14**	**137.29**		**43.40**	**12.99**	**88.31**	**45.12**	
Relave Flotación	860.00	86.00	0.03	0.46	0.16	1.20		7.16	9.64	3.81	4.38	
Cabeza Calculada	**1000.00**	**100.00**	**0.36**	**4.10**	**3.61**	**23.58**		**100.00**	**100.00**	**100.00**	**100.00**	

2.4.3 Prueba de Flotación Nº 3.-

Esta prueba de flotación se realizo a 55% - 200 mallas. Con una flotación selectiva. Se vario la granulometría.

Molienda

Peso de mineral	:	1.0 kg
Líquido/sólido	:	½
Granulometría	:	55% -200 mallas
DP-1003	:	40 gr/TM
Complejo	:	400 gr/TM
		NaCN : 100 gr/TM
		$ZnSO_4$: 300 gr/TM
$ZnSO_4$	:	500 gr/TM
AP-3418	:	20 gr/TM
AR-208	:	20 gr/TM
Tiempo de molienda	:	14´48”

FLOTACION

Flotación Rougher Bulk

Acondicionamiento	:	5´
pH	:	8.5
Z- 11	:	20 gr/TM
MIBC	:	7 gr/TM
Flotación	:	3´

Flotación Scavenger Bulk

Acondicionamiento	:	3´
pH	:	8.5
Z- 11	:	10 gr/TM
MIBC	:	7 gr/TM
Flotación	:	1´

Flotación Cleaner Bulk

Acondicionamiento	:	3´		
pH	:	8.5		
$ZnSO_4$	:	100 gr/TM		
Complejo	:	100 gr/TM		
		NaCN	: 25	gr/TM
		$ZnSO_4$	: 75	gr/TM
MIBC	:	7 gr/TM		
Flotación	:	2´		

Flotación Rougher Zn

Acondicionamiento	:	5´
pH	:	11
$CuSO_4$	:	500 gr/TM
Z- 11	:	10 gr/TM
MIBC	:	14 gr/TM
Flotación	:	2´

Flotación Scavenger Zn

Acondicionamiento	:	2´
pH	:	11
Z- 11	:	10 gr/TM
MIBC	:	7 gr/TM
Flotación	:	1´

Flotación Cleaner Zn

Acondicionamiento	:	3´
pH	:	11
MIBC	:	7 gr/TM
Flotación	:	2´

El cuadro Nº 7, nos muestra el Balance de la Prueba de Flotación Nº 3.

BALANCE METALURGICO

Cuadro Nº 7.- Balance Metalúrgico de la prueba de Flotación Nº 3 del mineral polimetálico.

	Peso (gr)	% Peso	LEYES					RECUPERACION (%)				RADIO CONCENTRACION
			Cu (%)	Pb (%)	Zn (%)	Ag (oz/TM)	Au (gr/TM)	Cu (%)	Pb (%)	Zn (%)	Ag (%)	
Cabeza	**1000.00**	**100.00**	0.38	4.02	3.98	15.60	1.16	**100.00**	**100.00**	**100.00**	**100.00**	
Conc. Bulk Cu-Pb	**45.90**	**4.59**	**6.03**	**60.44**	**4.35**	**202.20**	**9.87**	**75.83**	**74.33**	**6.05**	**60.95**	**21.79**
Medios Bulk Cu-Pb	**16.50**	1.65	0.72	23.24	6.85	55.70		3.25	10.27	3.42	6.04	
Conc.Rougher Bulk Cu-Pb	**62.40**	**6.24**	**4.63**	**50.60**	**5.01**	**163.46**		**79.08**	**84.61**	**9.47**	**66.99**	
Conc. Zn	**43.80**	**4.38**	**0.81**	**2.13**	**59.92**	**72.30**		**9.72**	**2.50**	**79.51**	**20.80**	**22.83**
Medios Zn	**29.90**	2.99	**0.50**	**6.56**	**8.12**	**30.40**		4.10	5.26	7.36	5.97	
Conc. Rougher Zn	**73.70**	**7.37**	**0.68**	**3.93**	**38.90**	**55.30**		**13.82**	**7.76**	**86.86**	**26.77**	
Relave Flotación	863.90	86.39	0.03	0.33	0.14	1.10		7.10	7.64	3.66	6.24	
Cabeza Calculada	**1000.00**	**100.00**	**0.37**	**3.73**	**3.30**	**15.23**		**100.00**	**100.00**	**100.00**	**100.00**	

III. OBSERVACIONES Y RECOMENDACIONES

3.1 OBSERVACIONES

- El mineral en estudio tiene como sulfuros a la galena, calcopirita, esfalerita y minerales de plata, con pirita con presencia de óxidos de sílice y hierro.

- De acuerdo a la molienda el mineral es de dureza media.

PRUEBAS DE FLOTACION

Flotación Nº 1

- La prueba de flotación se realizo a una molienda de 60% -200 mallas, usando como depresor una mezcla de sulfato de zinc con bisulfito de sodio. El cuadro Nº 5, nos presenta el Balance Metalúrgico donde el concentrado Bulk tiene leyes de 5.48% Cu, 60.28 % Pb, 4.12% Zn, 210.70 oz Ag/TM y 19.00 grAu/TM con recuperaciones de 74.38% del cobre, 72.35% del plomo, 5.44% del zinc y 64.06% de la plata, con un radio de concentración 22.03. el concentrado Bulk Rougher estimado tiene leyes de 4.67% Cu, 55.95 % Pb, 5.01% Zn y 185.78 oz Ag/TM con recuperaciones de 77.25% del cobre, 81.81% del plomo, 8.06% del zinc y 68.81% de la plata.

- El concentrado de Zinc tiene leyes de 0.63% Cu, 2.72 % Pb, 65.73% Zn, 53.00 oz Ag/TM con recuperaciones de 7.97% del cobre, 3.04% del plomo, 80.92% del zinc y 15.01% de la plata, con un radio de concentración de 23.64. El concentrado Rougher de Zinc estimado tiene leyes de 0.52% Cu, 3.65 % Pb, 37.83% Zn, y 41.23 oz Ag/TM, con recuperaciones de 12.40% del cobre, 7.67% del plomo, 88.81% del zinc y 21.92% de la plata.

Flotación Nº 2

- La prueba de flotación se realizo a una molienda de 60% -200 mallas, usando como depresor una mezcla de sulfato de zinc con cianuro de sodio. El cuadro Nº 6, nos presenta el Balance Metalúrgico donde el concentrado Bulk tiene leyes de 3.95% Cu, 66.68 % Pb, 3.87% Zn, 261.00 oz Ag/TM y 10.21 grAu/TM con recuperaciones de 44.92% del cobre, 66.65% del plomo, 4.39% del zinc y 58.23% de la plata, con un radio de concentración 24.39. el concentrado Bulk Rougher estimado tiene leyes 2.85% Cu, 50.77 % Pb, 4.55% Zn y 190.58 oz Ag/TM con recuperaciones de 49.45% del cobre, 77.36% del plomo, 7.88% del zinc y 64.82% de la plata.

- El concentrado de Zinc tiene leyes de 2.87% Cu, 5.43 % Pb, 60.44% Zn, 92.00 oz Ag/TM con recuperaciones de 38.76% del cobre, 6.45% del plomo, 81.52% del zinc y 24.38% de la plata, con un radio de concentración de 20.53. El concentrado Rougher de Zinc estimado tiene leyes de 2.02% Cu, 6.88 % Pb, 41.14% Zn, y 70.11 oz Ag/TM, con recuperaciones de 43.40% del cobre, 12.99% del plomo, 88.31% del zinc y 29.57% de la plata.

Flotación Nº 3

- La prueba de flotación se realizo a una molienda de 55% -200 mallas, usando como depresor una mezcla de sulfato de zinc con cianuro de sodio. El cuadro Nº 7, nos presenta el Balance Metalúrgico donde el concentrado Bulk tiene leyes de 6.03% Cu, 60.44 % Pb, 4.35% Zn, 202.20 oz Ag/TM y 9.87 grAu/TM con recuperaciones de 75.83% del cobre, 74.33% del plomo, 6.05% del zinc y 60.95% de la plata, con un radio de concentración 21.79. el concentrado Bulk Rougher estimado tiene leyes 4.63% Cu, 50.60 % Pb, 5.01% Zn y 163.46 oz Ag/TM con recuperaciones de 79.08% del cobre, 84.61% del plomo, 9.47% del zinc y 66.99% de la plata.

- El concentrado de Zinc tiene leyes de 0.81% Cu, 2.13 % Pb, 59.92% Zn, 72.30 oz Ag/TM con recuperaciones de 9.72% del cobre, 2.50% del plomo, 79.51% del zinc y 20.80% de la plata, con un radio de concentración de 22.83. El concentrado Rougher de Zinc estimado tiene leyes de 0.68% Cu, 3.93 % Pb, 38.90% Zn, y 55.30 oz Ag/TM, con recuperaciones de 13.82% del cobre, 7.76% del plomo, 86.86% del zinc y 26.77% de la plata.

3.2 CONCLUSIONES

El siguiente cuadro nos resume los resultados de las 03 pruebas de flotación con etapas separación diferencial del cobre y plomo.

Nro Prueba		LEYES CONCENTRADOS						RECUPERACION (%)				Condiciones
		Cu (%)	Pb (%)	Zn (%)	Ag (oz/TM)	Au (gr/TM)		Cu %	Pb %	Zn %	Ag %	
1	Conc. Bulk	**5.48**	**60.28**	4.12	**210.70**	**19.00**		**77.25**	**81.81**	8.06	**68.81**	60% -200 m (complejo)
	Conc. Zn	0.63	2.72	**65.73**	**53.00**			12.40	7.67	**87.40**	**21.92**	
2	Conc. Bulk	**3.95**	**66.68**	**3.87**	**261.00**	**10.21**		**49.45**	**77.36**	7.88	**64.82**	60% -200 m (mix+complejo)
	Conc. Zn	**2.87**	**5.43**	**60.44**	**92.00**			**43.40**	12.99	**88.31**	**29.57**	
3	Conc. Bulk	**6.03**	**60.44**	**4.35**	**202.20**	**9.87**		**79.08**	**84.61**	9.47	**66.99**	55% -200 m (complejo)
	Conc. Zn	**0.81**	**2.13**	**59.92**	**72.30**			**13.82**	**7.76**	**86.86**	**26.77**	

- De las 3 pruebas, la prueba Nº1, es la que mejor comportamiento metalúrgico nos muestra.

- El desplazamiento del cobre y la plata en los concentrados de zinc es alto en todas las pruebas.

3.3 RECOMENDACIONES

- De acuerdo a los resultados obtenidos se recomienda trabajar con una molienda entre 60-65% -200 mallas. Se debe usar el reactivo DP-1003, para neutralizar las sales y se debe incrementar la dosificación del AR-208 y AP_3418 a niveles de 40-50 gr/TM, para mejorar la flotación del cobre y la plata.

UNIVERSIDAD NACIONAL DE INGENIERÍA

FACULTAD DE INGENIERÍA GEOLÓGICA, MINERA Y METALÚRGICA

LABORATORIO DE ESPECTROMETRIA

Solicitado por : S & L ANDES EXPORT S.A.C.

Muestra : Minerales de Flotación

RESULTADOS DEL ANALISIS QUIMICO

muestras	Cu (%)	Pb (%)	Zn (%)	Ag (oz/TM)	Au (gr/TM)
Camión Morales	----	----	----	307.30	----
Camión Fano	----	----	----	276.30	----
Camión Vallejo	----	----	----	291.90	----
Zn.2- 10/2/15	1.16	----	----	73.10	----
Zn.1 -11/2/15	2.04	----	----	137.00	----
Zn.2 -11/2/15	1.00	----	----	65.10	----
Zn.1 -12/2/15	1.55	----	----	95.80	----
Zn.2 -12/2/15	1.07	----	----	61.80	----
Cabeza	0.38	4.02	3.98	15.60	1.16
Conc. Bulk -1	5.48	60.28	4.12	210.70	19.00
Medios Bulk -1	0.97	36.12	9.09	71.50	----
Conc. Zn-1	0.63	2.72	65.73	53.00	----
Medios. Zn-1	0.40	4.72	6.01	27.80	----
Relave flotación-1	0.04	0.46	0.18	1.60	----
Conc. Bulk -2	3.95	66.68	3.87	261.00	10.21
Medios Bulk -2	0.76	20.44	5.85	56.30	----
Conc. Zn-2	2.87	5.43	60.44	92.00	----
Medios. Zn-2	0.58	9.32	8.51	33.10	----
Relave flotación-2	0.03	0.46	0.16	1.20	----
Conc. Bulk -3	6.03	60.44	4.35	202.20	9.87
Medios Bulk -3	0.72	23.24	6.85	55.70	----
Conc. Zn-3	0.81	2.13	59.92	72.30	----
Medios. Zn-3	0.50	6.56	8.12	30.40	----
Relave flotación-3	0.03	0.33	0.14	1.10	----

UNI, 13 de Marzo del 2014

Ing. ATILIO MENDOZA A.
Jefe Lab. Espectrometría

UNIVERSIDAD NACIONAL DE INGENIERÍA
FACULTAD DE INGENIERÍA GEOLÓGICA, MINERA Y METALÚRGICA

LABORATORIO DE ESPECTROMETRIA

Solicitado por : S & L ANDES EXPORT S.A.C.

Muestra : MINERALES DE PRUEBAS DE FLOTACION

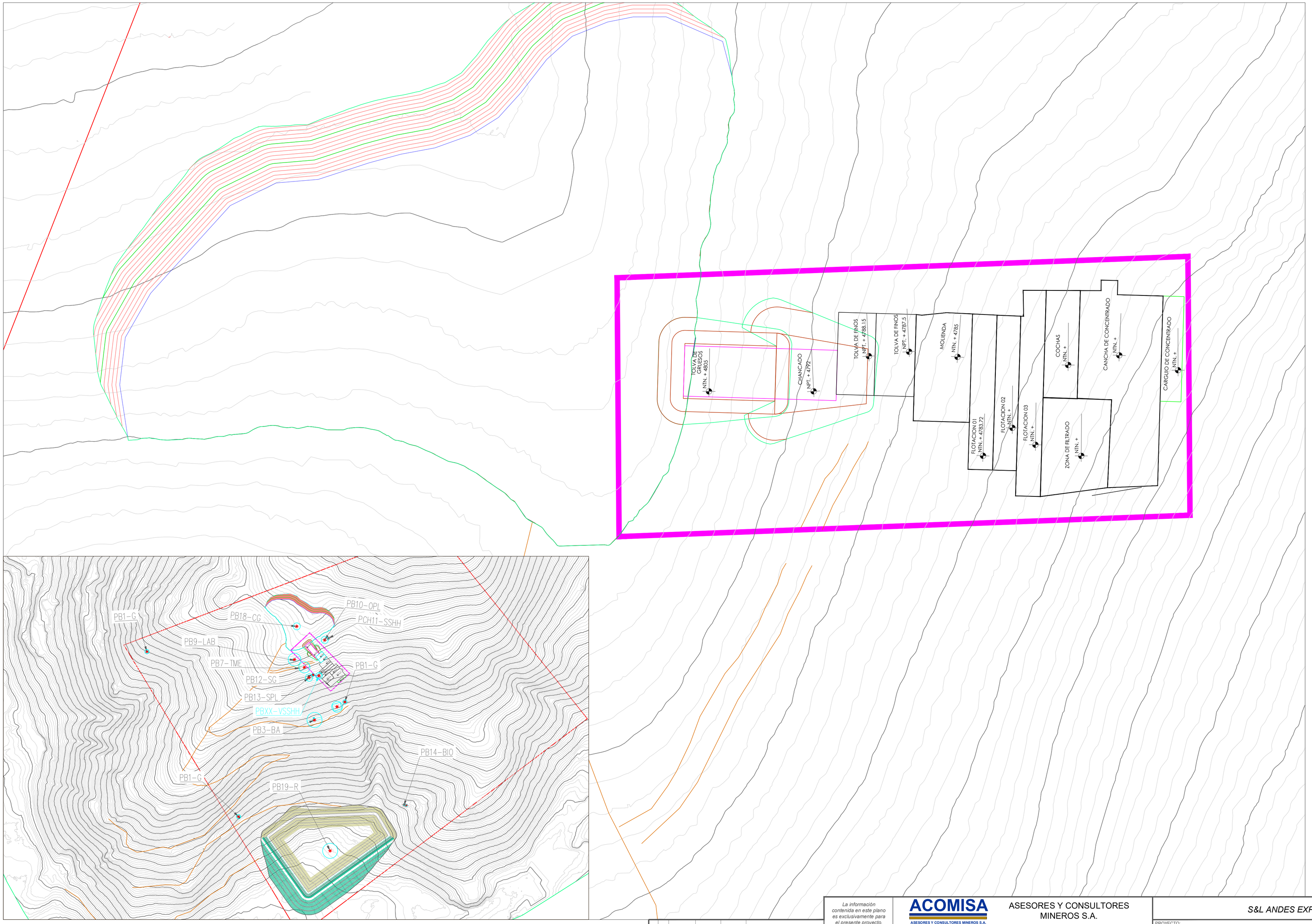
muestras	Cu (%)	Pb (%)	Zn (%)	Ag (oz/TM)	Au (gr/TM)	As (%)	Sb (%)	Fe (%)	Bi (%)	Hg (%)
Conc. Zn +100m	0.97	----	----	72.20	----	----	----	----	----	----
Conc. Zn +140m	1.20	----	----	86.50	----	----	----	----	----	----
Conc. Zn +200m	1.58	----	----	103.70	----	----	----	----	----	----
Conc. Zn +270m	1.38	----	----	87.40	----	----	----	----	----	----
Conc. Zn +325m	1.16	----	----	81.10	----	----	----	----	----	----
Conc. Zn +400m	1.18	----	----	71.10	----	----	----	----	----	----
Conc. Zn -400m	0.97	----	----	60.30	----	----	----	----	----	----
Tomas-Alta ley	0.06	2.18	5.09	5.70	0.05	0.07	0.08	7.22	0.01	0.01
Tomas-Baja ley	0.05	1.72	4.30	5.40	0.02	0.05	0.05	5.78	0.01	0.01

UNI, 20 de Marzo del 2014

Ing. ATILIO MENDOZA A.
Jefe Lab. Espectrometría

APPENDIX 7 – Mine Engineering Plans [DRAFTS]

[7 pages]



DRAFT

REVISIONES				
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N°	FECHA	REVISO	APROBO	DESCRIPCIÓN

La información contenida en este plano es exclusivamente para el presente proyecto, esta prohibida cualquier modificación y/o adaptación del mismo, sin previa autorización. En caso contrario será responsabilidad exclusiva del usuario.

ACOMISA
ASESORES Y CONSULTORES MINEROS S.A.

ASESORES Y CONSULTORES MINEROS S.A.

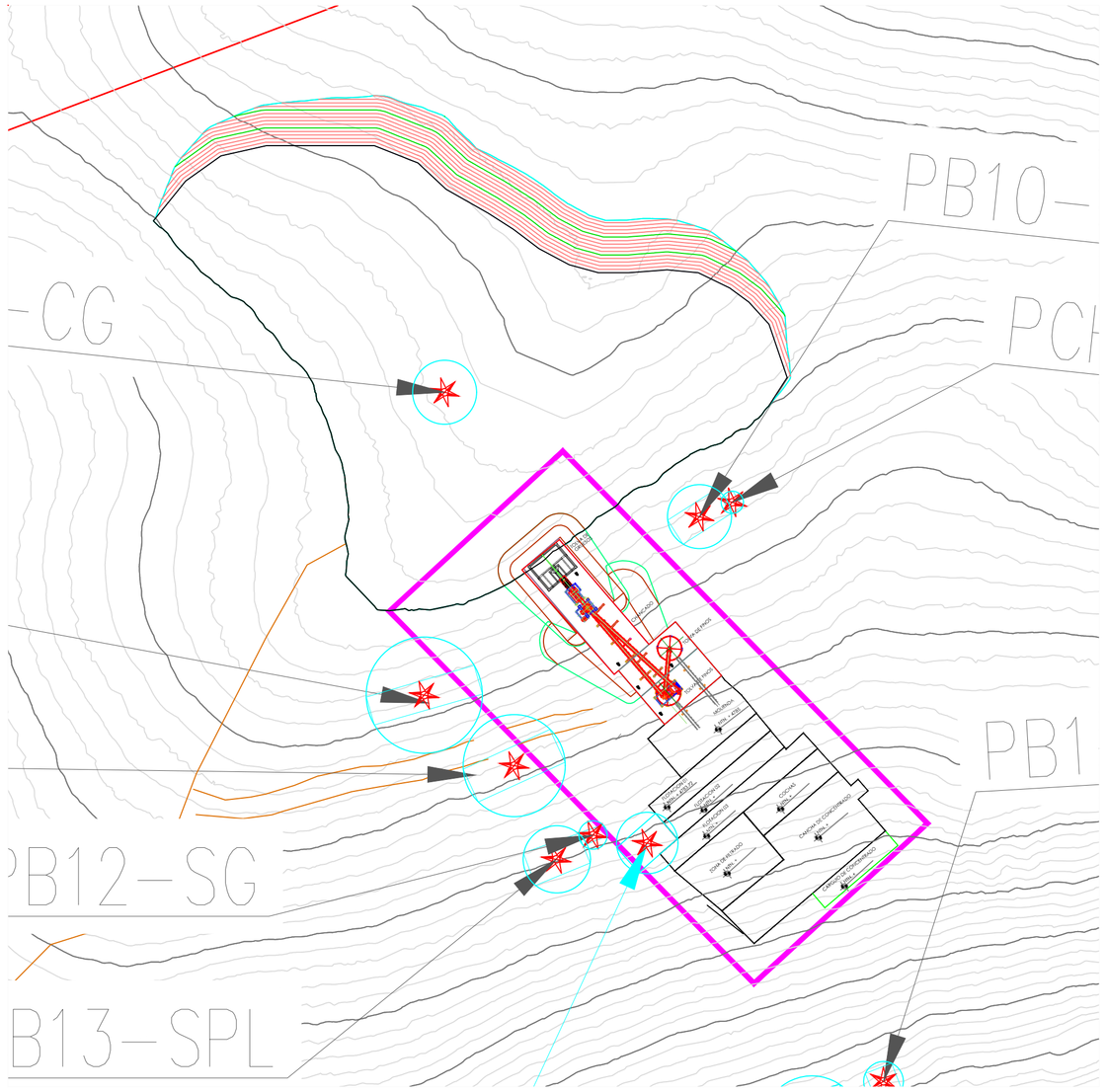
		NOMBRES	FECHA		NOMBRES	FECHA
ACOMISA	DISEÑO	D.L.I.T	07/05/18	DISEÑO		
	DIBUJO	D.L.I.T	07/05/18	DIBUJO		
	GRTE. PROYECTO	D.L.I.T	12/05/18	PROY. APROBADO		
CLIENTE	GRTE. INGENIERIA			PROY. REVISADO		
	GRTE. PROYECTO					

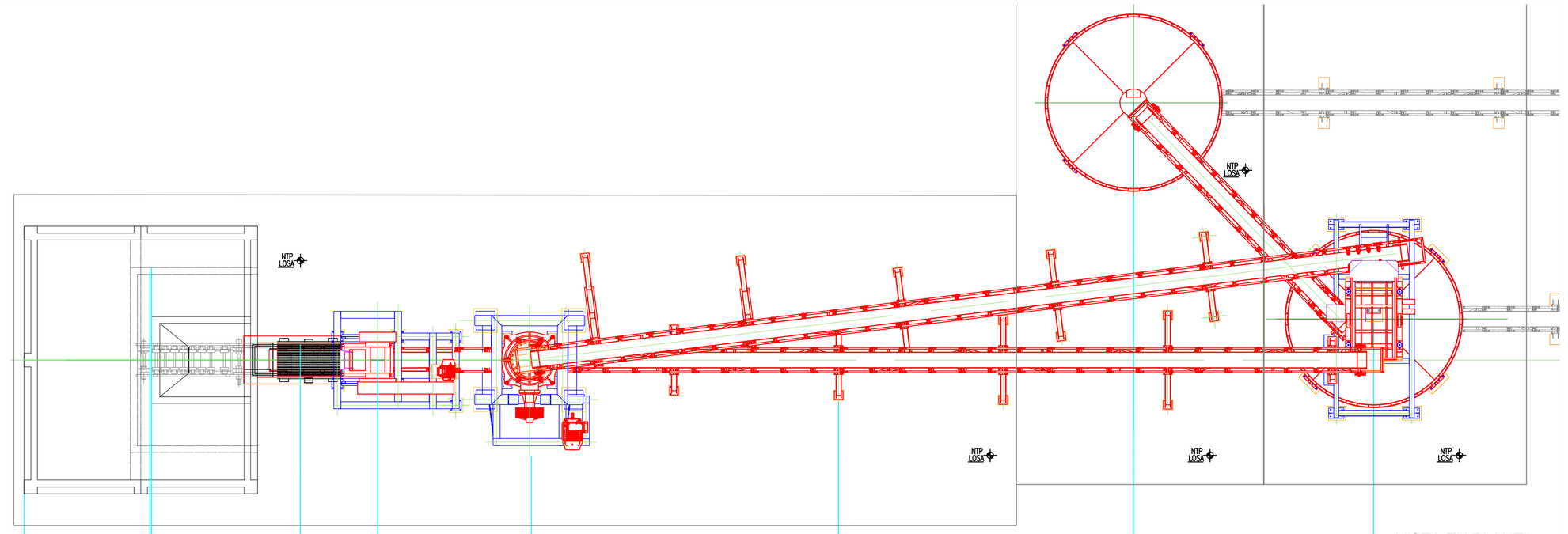
S&L ANDES EXPORT S.A.C.

PROYECTO:
SOLICITUD DE CONCESION DE BENEFICIO
"PLANTA DE BETHANIA "

PLANO:
UBICACIÓN GENERAL PLANTA

DISTRITO: ACOBAMBILLA	PROVINCIA: HUANCAVELICA	DPTO: HUANCAVELICA	N° DE PLANO:
REVISADO POR: Ing. Deyvis L. Ingaroca Torres CIP: 184667	ESCALA: INDICADA	CÓD. DE PLANO: AE_PM_001	001





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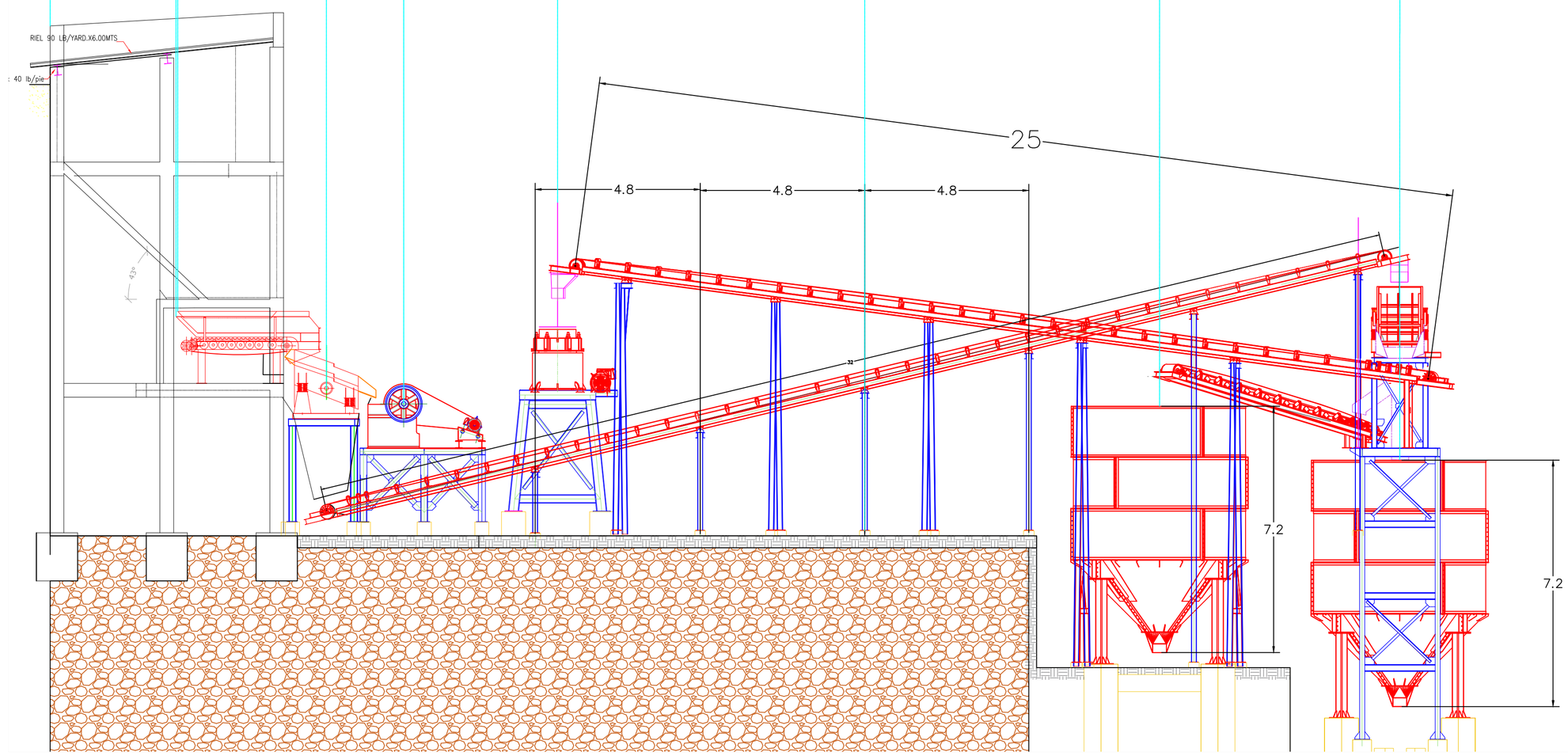
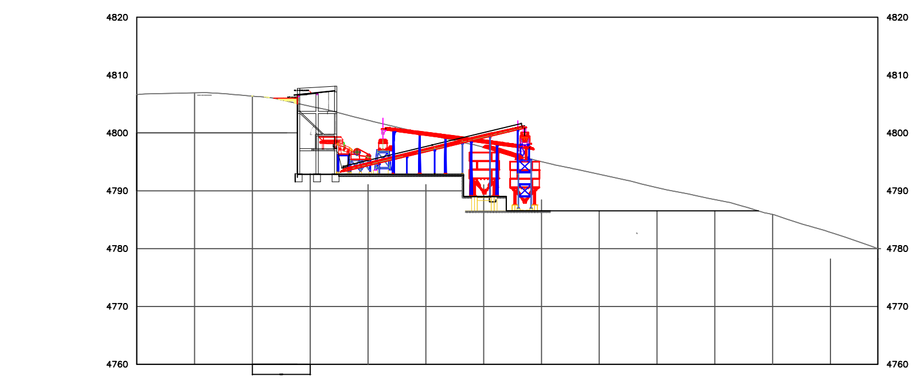
SECCIÓN CHANCADO





COTA RASANTE	4806.927	4806.356	4804.616	4802.185	4799.811	4797.534	4795.021	4792.863	4790.537	4788.465	4785.895	4782.806
COTA TERRENO	4806.927	4806.356	4804.616	4802.185	4799.811	4797.534	4795.021	4792.863	4790.537	4788.465	4785.895	4782.806
KILOMETRAJE	0+010	0+020	0+030	0+040	0+050	0+060	0+070	0+080	0+090	0+100	0+110	0+120

PERFIL 1:750

SECCIÓN A

ELEVACIÓN A-A´
1:100

DRAFT

REVISIONES				
N°	FECHA	REVISO	APROBO	DESCRIPCIÓN
0				

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ACOMISA
ASESORES Y CONSULTORES MINEROS S.A.

ASESORES Y CONSULTORES MINEROS S.A.

		NOMBRES	FECHA
ACOMISA	DISEÑO	D.L.I.T	07/05/18
	DIBUJO	D.L.I.T	07/05/18
	GRTE. PROYECTO	D.L.I.T	12/05/18
CLIENTE	GRTE. INGENIERIA		
	GRTE. PROYECTO		

	NOMBRES	FECHA
DISEÑO		
DIBUJO		
PROY. APROBADO		
PROY. REVISADO		

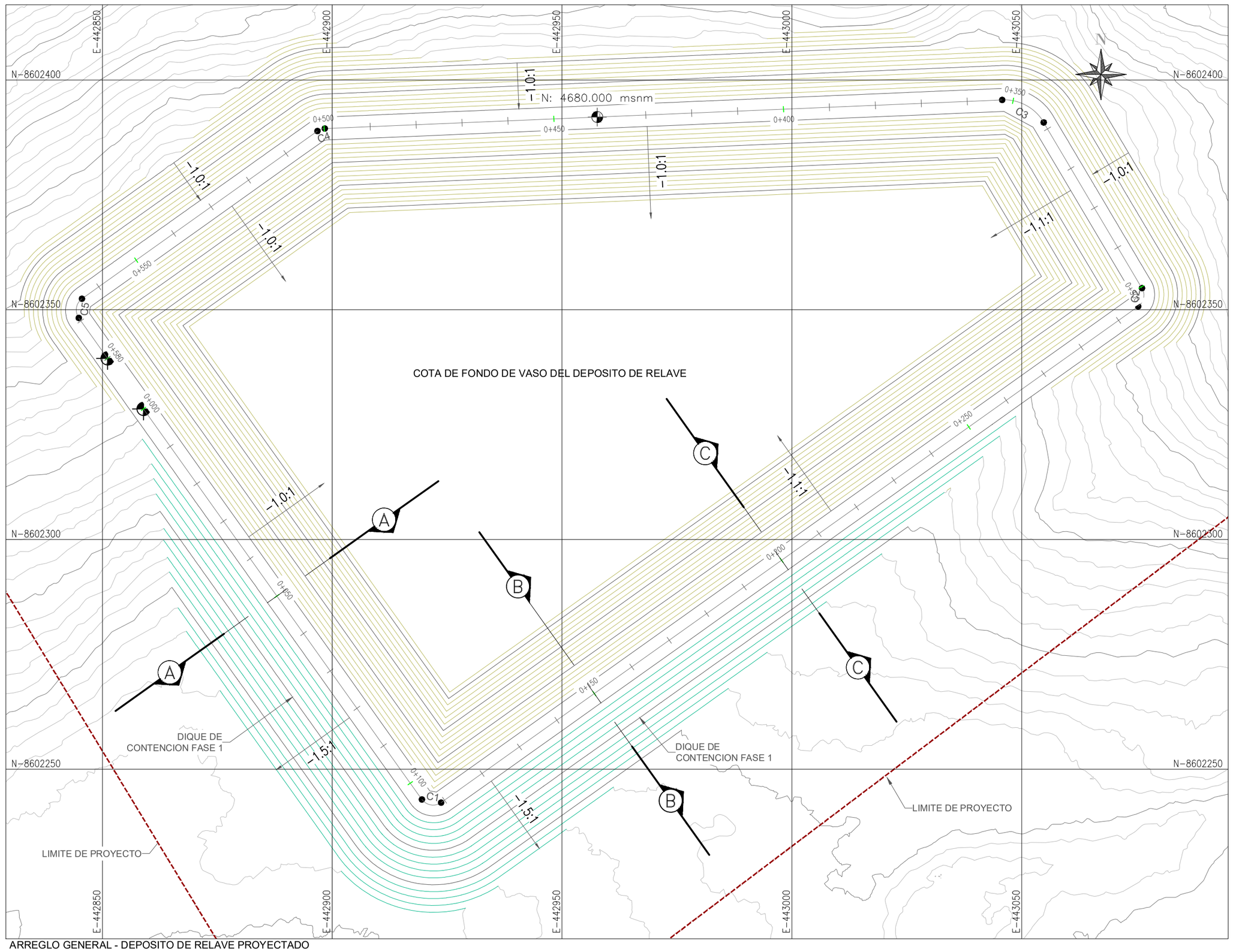
S&L ANDES EXPORT S.A.C.

PROYECTO: SOLICITUD DE CONCESION DE BENEFICIO "PLANTA DE BETHANIA "

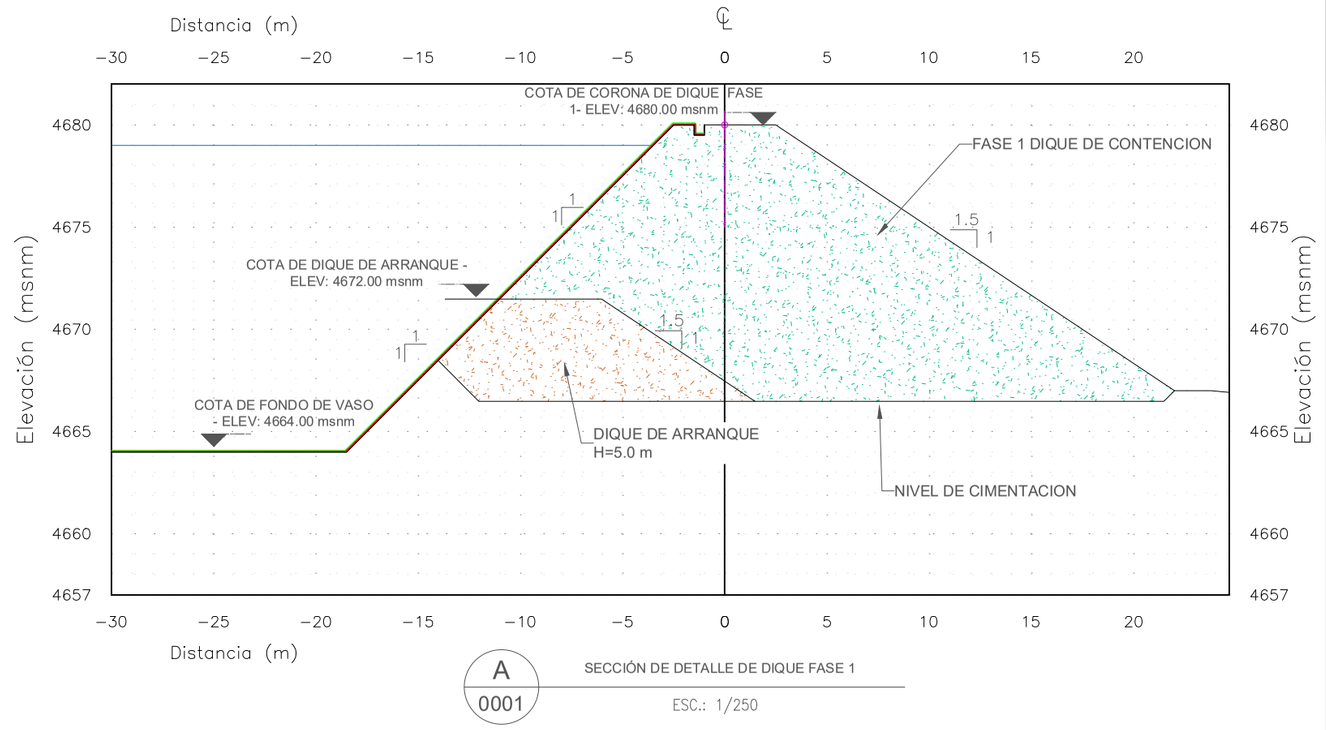
PLANO: *PLANTA CONCENTRADORA - ELEVACION*

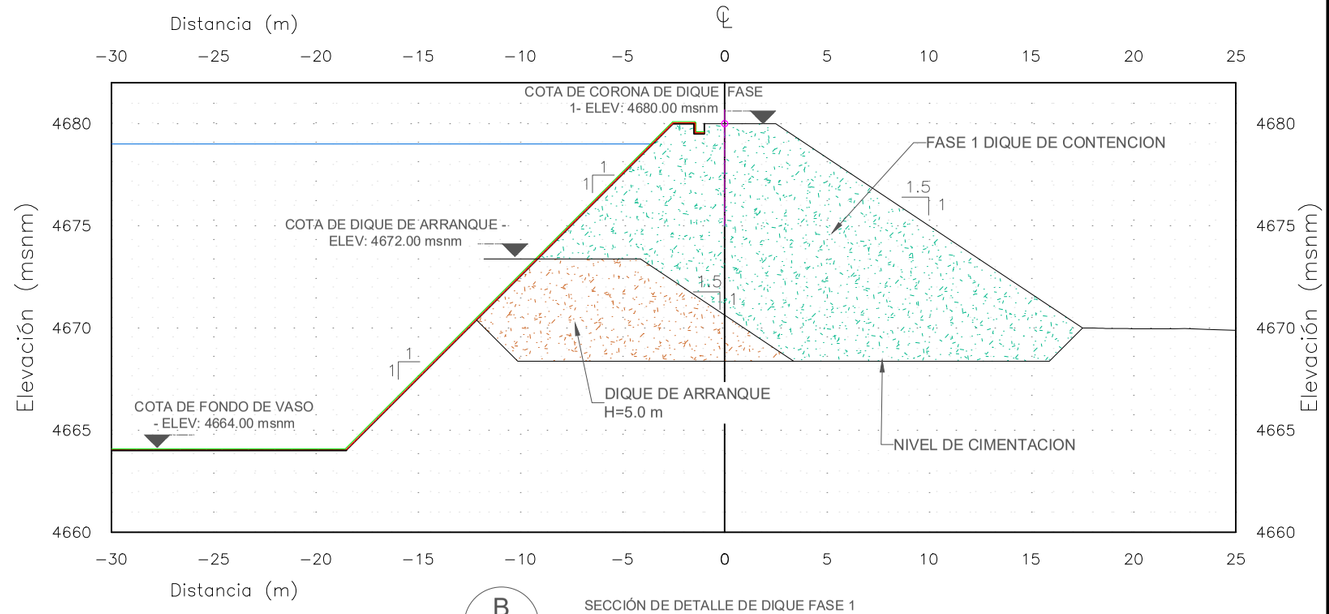
DISTRITO: ACOBAMBILLA | PROVINCIA: HUANCAVELICA | DPTO: HUANCAVELICA | N° DE PLANO: 406

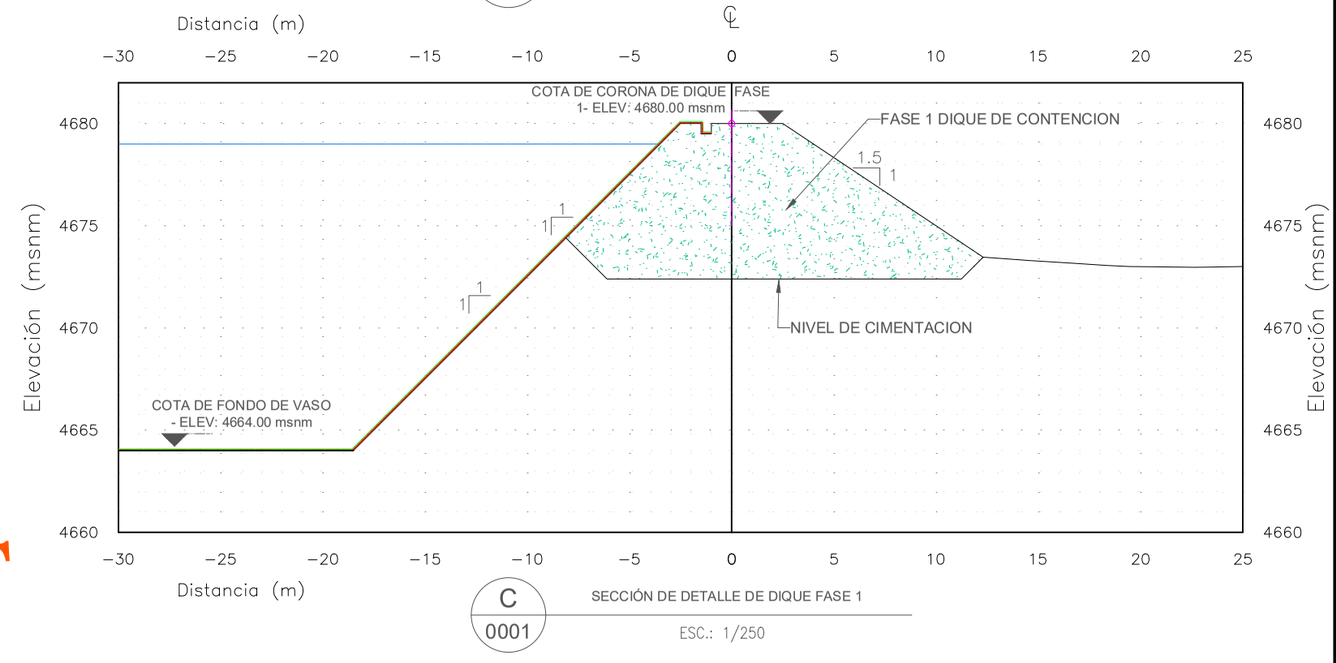
REVISADO POR: Ing. Deyvis L. Ingaroca Torres CIP: 184667 | ESCALA: INDICADA | CÓD. DE PLANO: AE_PM_406



ARREGLO GENERAL - DEPOSITO DE RELAVE PROYECTADO
ESC.: 1/ 750







CUADRO N° 01	
CARÁCTERISTICAS DEL DEPOSITO DE RELAVE-PROYECTADO FASE 1	
DESCRIPCIÓN	CANTIDAD
TALUD DE AGUAS ARRIBA	H:1.0-V:1.0
TALUD DE AGUAS ABAJO	H:1.5-V:1.5
TALUD DE CORTE DE TERRENO	H:1.0-V:1.0
COTA MAXIMA DE ALMACENAMIENTO	4679.00 msnm
LONGITUD DE CORONA DE LA PRESA	250.00 m
COTA DE FONDO DE LA PRESA DE RELAVE	4660.00 msnm
PRODUCCIÓN DIARIA	300.00 TMD
VOLUMEN DE ALMACENAMIENTO	463731.01 m3
VOLUMEN DE CORTE DE TERRENO	256,319.32 m3
VOLUMEN DE RELLENO (CUERPO DE LA PRESA)	41,874.71 m3
TIEMPO DE VIDA UTIL DEL DEPOSITO DE RELAVE	4 AÑOS

CUADRO DE COORDENADAS y ELEMENTOS DE CURVAS

CURVA	SENTIDO	DELTA	RADIO	TANG.	LONG. CURVA	LONG. CUERDA	EXTERNA	MEDIA	P.I	P.C	P.T	P.I NORTE	P.I ESTE
C1	S80° 27' 51.05"E	090°00'00"	3.000	3.000	4.712	4.243m	1.243	0.879	0+107.355	0+104.355	0+109.068	8602240.967	442921.239
C2	N11° 56' 00.83"E	085°12'17"	3.000	2.759	4.461	4.061m	1.076	0.792	0+297.987	0+295.228	0+299.689	8602352.317	443077.554
C3	N61° 32' 35.45"W	061°44'56"	10.000	5.979	10.777	10.263m	1.651	1.417	0+347.596	0+341.617	0+352.395	8602395.896	443051.710
C4	S71° 03' 32.83"W	033°02'47"	3.000	0.890	1.730	1.706m	0.129	0.124	0+500.767	0+499.877	0+501.608	8602389.385	442897.496
C5	S09° 32' 08.95"W	090°00'00"	3.000	3.000	4.712	4.243m	1.243	0.879	0+567.491	0+564.491	0+569.203	8602350.644	442843.111

LEYENDA

- 10 — CURVAS DE NIVEL SUPERFICIE TERRENO NATURAL
- 10 — CURVAS DE NIVEL SUPERFICIE DE EXCAVACIÓN
- 10 — CURVAS DE NIVEL SUPERFICIE OBRA PROYECTADA
- LIMITE DE PROYECTO
- EJE DE LA PRESA DE RELAVE

DRAFT

ESCALA GRÁFICA
(En metros)
20 0 10 20 40 60 80 100
1:750
SISTEMA DE CUADRILLADO: UTM CADA 50 m
DATUM: WGS-84
ZONA: 18

La información contenida en este plano es exclusivamente para el presente proyecto, esta prohibida cualquier modificación y/o adaptación del mismo, sin previa autorización. En caso contrario será responsabilidad exclusiva del usuario.

ACOMISA — ASESORES Y CONSULTORES MINEROS S.A.

	ING. DETALLE	NOMBRES	FECHA
ACOMISA	DIBUJO	J.R.C.	10/07/19
	DISEÑO	J.R.C.	10/07/19
	GRTE. PROYECTO	G.V.C.	10/07/19
CLIENTE	GRTE. INGENIERIA	----	10/07/19
	GRTE. PROYECTO		

FACTIBILIDAD	NOMBRES	FECHA
DISEÑO		
DIBUJO		
PROY. APROBADO		
PROY. REVISADO		

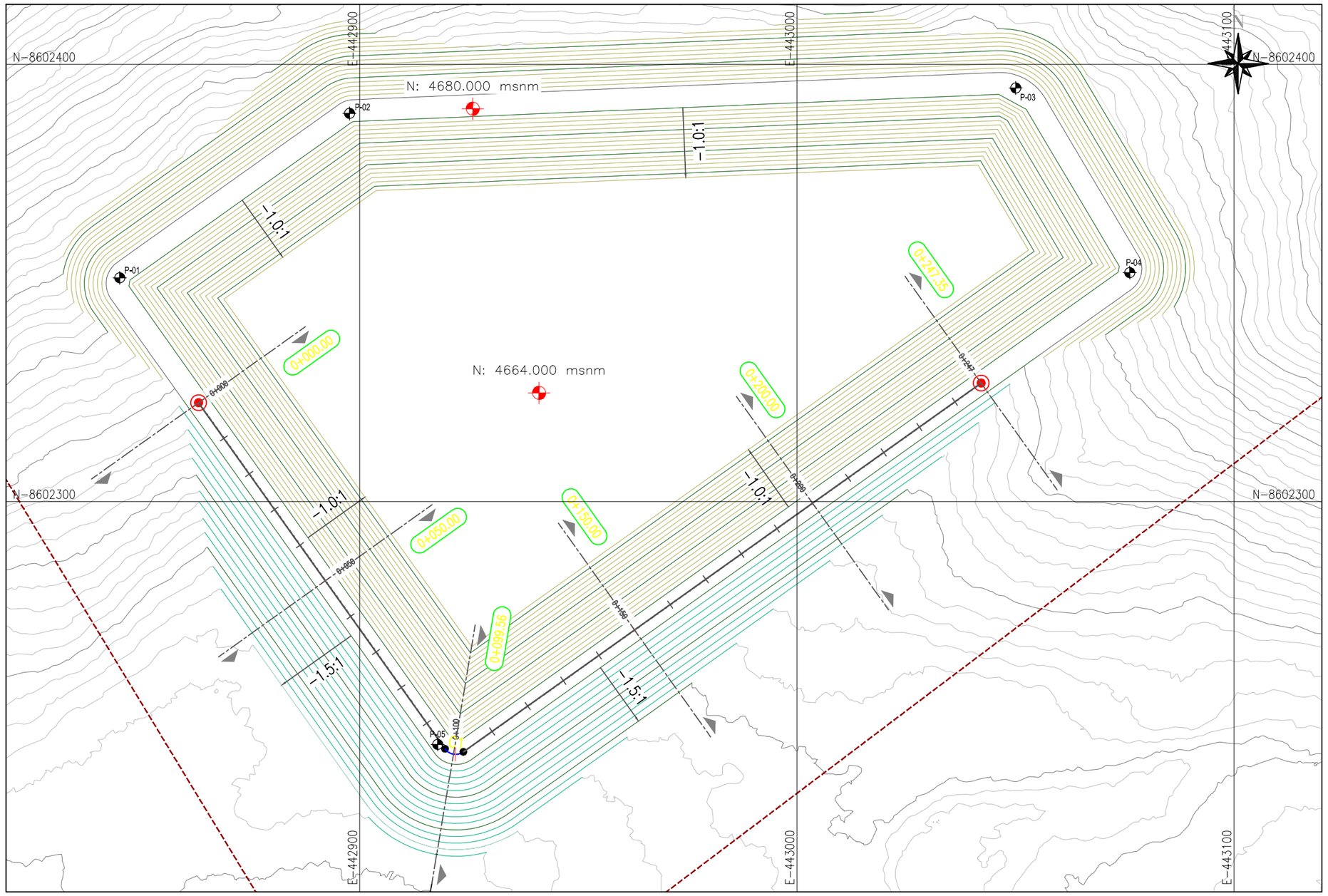
S & L ANDES EXPORT S.A.C.

PROYECTO: DISEÑO DEL DEPOSITO DE RELAVE PARA EL PROYECTO CONCESIÓN DE BENEFICIO "PLANTA BETHANIA"

PLANO: *ARREGLO GENERAL DEPOSITO DE RELAVE*

DISTRITO: ACOBAMBILLA | PROVINCIA: HUANCAVELICA | REGIÓN: HUANCAVELICA | N° DE PLANO: 01

REVISADO: | ESCALA: INDICADA | CÓD. DE PLANO: DDRA-AG-201



CUADRO Nº 1													
CUADRO DE COORDENADAS y ELEMENTOS DE CURVAS													
CURVA	SENTIDO	DELTA	RADIO	TANG.	LONG. CURVA	LONG. CUERDA	EXTERNA	MEDIA	P.I	P.C	P.T	P.I NORTE	P.I ESTE
C1	S80° 27' 51.05"E	090°00'00"	3.000	3.000	4.712	4.243m	1.243	0.879	0+100.202	0+097.202	0+101.914	8602240.967	442921.239

CUADRO Nº 4		
CUADRO DE COORDENADAS		
PUNTO	NORTE	ESTE
P-1	8295072.768	573489.306
P-2	8294971.986	573608.476
P-3	8294995.496	573632.403
P-4	8294995.140	573652.400
P-5	8294996.205	573673.414
P-6	8294999.415	573695.962

CUADRO Nº 2						
CUADRO DE COORDENADAS						
CURVA	PC		PI		PT	
	NORTE	ESTE	NORTE	ESTE	NORTE	ESTE
C1	8602243.410	442919.499	8602240.967	442921.239	8602242.708	442923.683

CUADRO Nº 3							
ELEMENTOS DE CURVA							
CURVA	RADIO	ALFA	LONGITUD	TANGENTE	PC	PI	PT
C1	3.000	S80° 27' 51.05"E	4.712	3.000	0+097.20	0+100.20	0+101.91

LEYENDA

- 1020 — CURVA DE NIVEL Y ELEVACIÓN DE LA TOPOGRAFÍA BASE
- 1070 — CURVA DE NIVEL Y ELEVACIÓN DE LA SUPERFICIE PROYECTADA
- LÍMITE GEOTEXTIL NO TEJIDO DE 300 gr/m2
- GEOMEMBRANA HDPE DE 1.5 mm DE ESPESOR SIMPLE TEXTURADA
- SUPERFICIE DE ALMACENAMIENTO DE RELAVE
- SUPERFICIE PREPARADA PARA GEOMENBRANA
- SUPERFICIE DE TOPOGRAFÍA BASE
- MATERIAL DE RELLENO DEL DIQUE

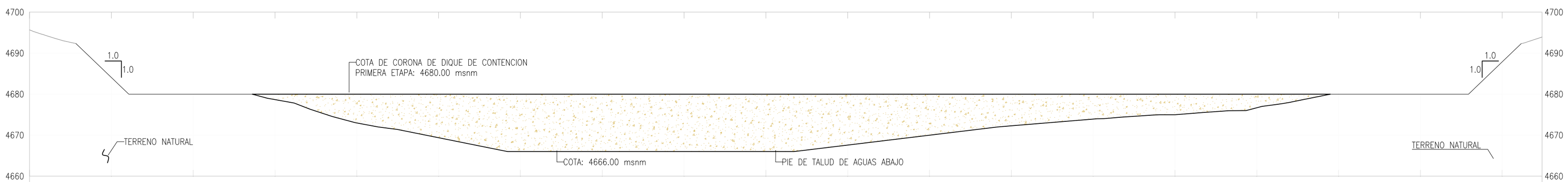
CUADRO Nº 5
VOLUMEN TOTAL DE CONFORMACION DE DIQUE DE LA PRIMERA ETAPA
VOLUMEN TOTAL DE RELLENO: 41, 874.71 m3

ESCALA GRÁFICA
(En metros)

20 0 10 20 40 60 80 100

1:750

SISTEMA DE CUADRILLADO: UTM CADA 50 m
DATUM: WGS-84
ZONA: 18



COTA RASANTE	689.907	684.085	678.708	672.964	669.610	667.589	667.112	666.886	668.083	669.412	670.845	672.292	673.914	675.061	676.674	680.446	685.043	690.887
COTA TERRENO	689.907	684.085	678.708	672.964	669.610	667.589	667.112	666.886	668.083	669.412	670.845	672.292	673.914	675.061	676.674	680.446	685.043	690.887
ALINEAMIENTO								R= 4.0										
KILOMETRAJE	0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220	0+240	0+260	0+280	0+300	0+320	0+340	0+360

02
0001

DETALLE DE DIQUE DE CONTENCION PRIMERA ETAPA
ESC.: 1/ 750

NOTAS :

1. EL RELLENO DEL DIQUE SERÁ DE MATERIAL PROPIO (EXTRAIDO DE LA ZONA DEL VASO DEL DEPÓSITO DE RELAVES PROYECTADO), EL CUAL SERA COMPACTADO AL 95% DEL PROCTOR MODIFICADO.
2. V1: VOLUMEN DISPONIBLE DE ALMACENAMIENTO DE RELAVES + AGUA, CONSIDERANDO UN NIVEL MÁXIMO DE ALMACENAMIENTO DE 4679.00 msnm.
3. A1: SUPERFICIE DEL VASO DEL DEPÓSITO
4. A2: SUPERFICIE DEL ESPEJO DE AGUA
5. LAS MEDIDAS QUE SE MUESTRAN ESTÁN EN METROS (m), SALVO SE INDIQUE LO CONTRARIO.

DRAFT

La información contenida en este plano es exclusivamente para el presente proyecto, esta prohibida cualquier modificación y/o adaptación del mismo, sin previa autorización. En caso contrario será responsabilidad exclusiva del usuario.

ACOMISA
ASESORES Y CONSULTORES MINEROS S.A.

	ING. DETALLE	NOMBRES	FECHA
ACOMISA	DIBUJO	J.R.C.	10/07/19
	DISEÑO	J.R.C.	10/07/19
	GRTE. PROYECTO	G.V.C.	10/07/19
CLIENTE	GRTE. INGENIERIA	----	10/07/19
	GRTE. PROYECTO		

FACTIBILIDAD	NOMBRES	FECHA
DISEÑO		
DIBUJO		
PROY. APROBADO		
PROY. REVISADO		

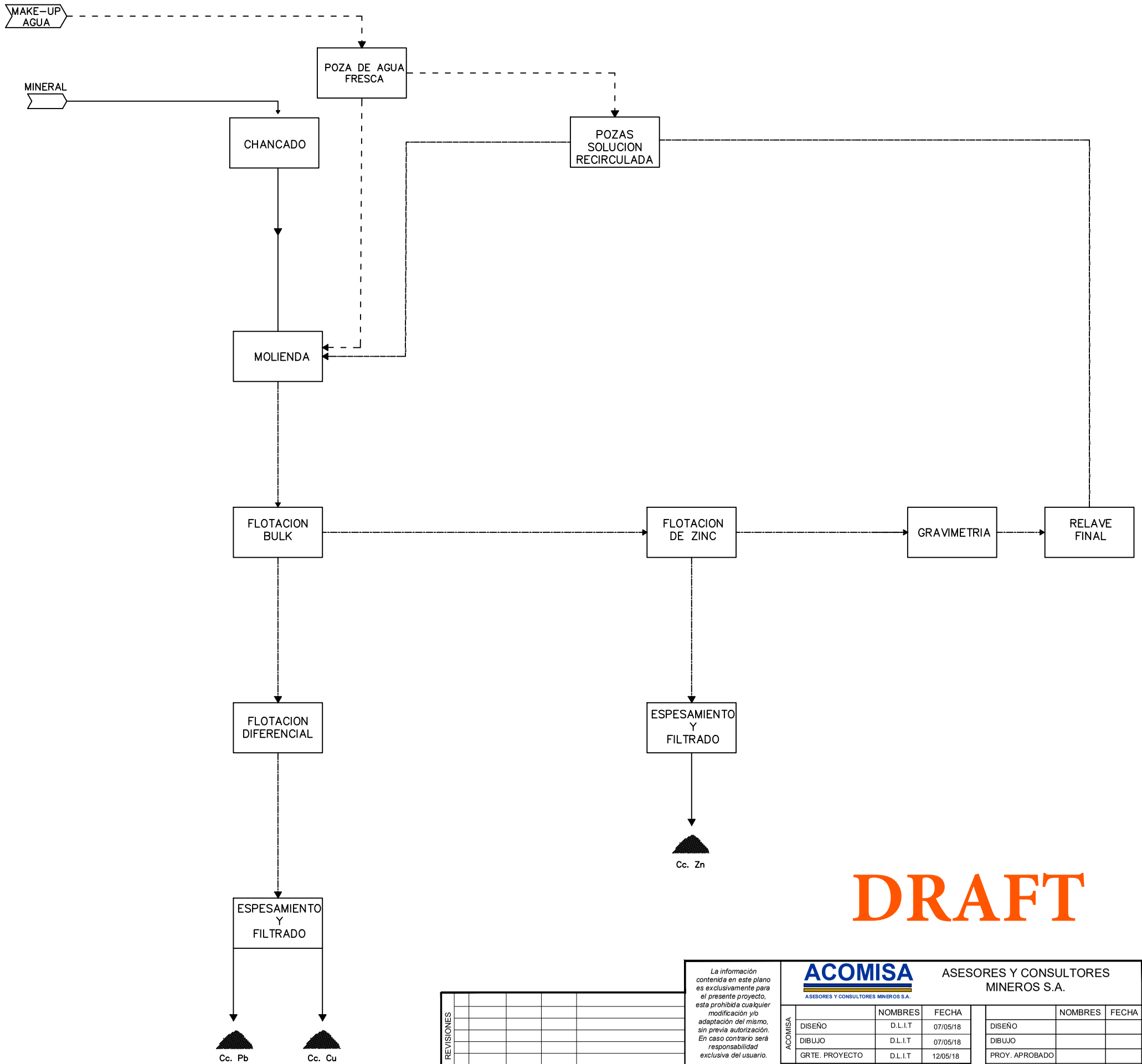
S & L ANDES EXPORT S.A.C.

PROYECTO: DISEÑO DEL DEPOSITO DE RELAVE PARA EL PROYECTO CONCESIÓN DE BENEFICIO "PLANTA BETHANIA"

PLANO: *VISTA EN PLANTA DEPOSITO DE RELAVE*

DISTRITO: ACOBAMBILLA | PROVINCIA: HUANCAVELICA | REGIÓN: HUANCAVELICA | N° DE PLANO: 02

REVISADO: | ESCALA: INDICADA | CÓD. DE PLANO: DDRA-VP-202



LEYENDA
- MINERAL
- AGUA FRESCA
- PULPA
- SOLUCIÓN RECIRCULADA

MINERAL
- SULFURO DE COBRE
- SULFURO DE PLOMO
- SULFURO DE ZINC
- Au y Ag

PRODUCTOS
- CONCENTRADO DE COBRE
- CONCENTRADO DE PLOMO
- CONCENTRADO DE ZINC

LEYENDA
- MINERAL
- AGUA FRESCA
- PULPA
- SOLUCIÓN RECIRCULADA

DRAFT

REVISIONES				
0				
N°	FECHA	REVISO	APROBO	DESCRIPCIÓN

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ACOMISA
ASESORES Y CONSULTORES MINEROS S.A.

ASESORES Y CONSULTORES MINEROS S.A.

		NOMBRES	FECHA			NOMBRES	FECHA
ACOMISA	DISEÑO	D.L.I.T	07/05/18		DISEÑO		
	DIBUJO	D.L.I.T	07/05/18		DIBUJO		
	GRTE. PROYECTO	D.L.I.T	12/05/18		PROY. APROBADO		
CLIENTE	GRTE. INGENIERIA				PROY. REVISADO		
	GRTE. PROYECTO						

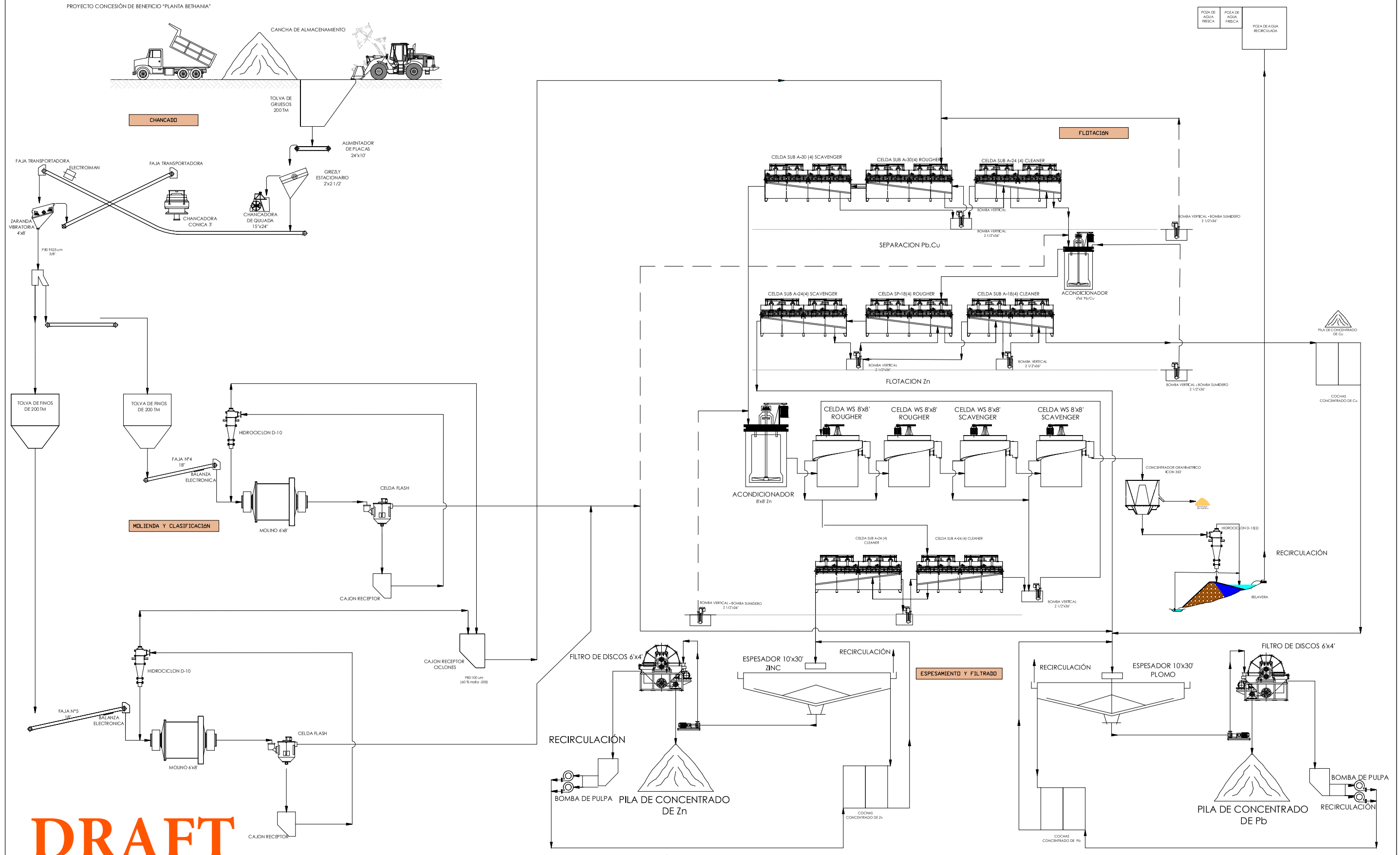
S&L ANDES EXPORT S.A.C.

PROYECTO: SOLICITUD CONCESION DE BENEFICIO "PLANTA BETHANIA"

PLANO: *DIAGRAMA GENERAL DE BLOQUES*

DISTRITO: ACOBAMBILLA	PROVINCIA: HUANCAVELICA	DPTO: HUANCAVELICA	N° DE PLANO:
REVISADO POR: Ing. Deyvis L. Ingaroca Torres CIP: 184667	ESCALA: S/E	CÓD. DE PLANO: AE_PM_401	401

PROYECTO CONCESIÓN DE BENEFICIO "PLANTA BETHANIA"



DRAFT

COMENTARIOS

La información de ESTE DIAGRAMA DE FLUJO es representativo con respecto a la forma de construcción.

REVISIONES				
0				
N°	FECHA	REVISO	APROBO	DESCRIPCIÓN

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ACOMISA
ASESORES Y CONSULTORES MINEROS S.A.

ASESORES Y CONSULTORES MINEROS S.A.

		NOMBRES	FECHA
ACOMISA	DISEÑO	D.L.I.T	07/05/18
	DIBUJO	D.L.I.T	07/05/18
	GRTE. PROYECTO	D.L.I.T	12/05/18
CLIENTE	GRTE. INGENIERIA		
	GRTE. PROYECTO		

	NOMBRES	FECHA
DISEÑO		
DIBUJO		
PROY. APROBADO		
PROY. REVISADO		

S&L ANDES EXPORT S.A.C.

PROYECTO: SOLICITUD CONCESION DE BENEFICIO "PLANTA BETHANIA"

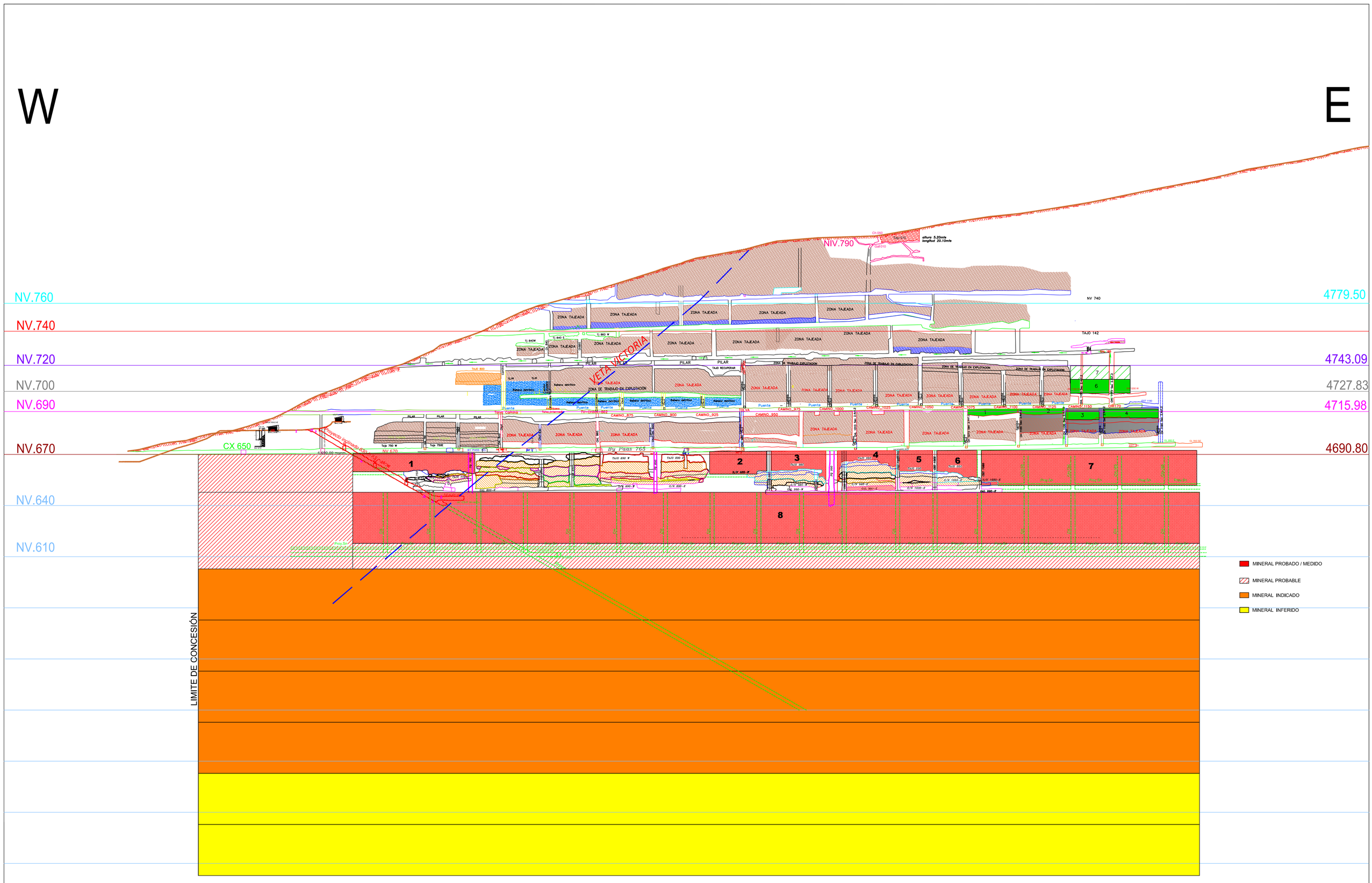
PLANO: *FLOW SHEET 350TMSD*

DISTRITO: ACOBAMBILLA	PROVINCIA: HUANCAVELICA	DPTO: HUANCAVELICA	N° DE PLANO:
REVISADO POR: Ing. Deyvis L. Ingaroca Torres CIP: 184667	ESCALA: S/E	CÓD. DE PLANO: AE_PM_403	403

EMPRESA	PROYECTO PLANTAS DE BENEFICIO
ANDALUCITA S.A.	EIAsd para la Planta Lucita I.
MINERA COLIBRI S.A.C.	EIAsd para la Planta de Benecio Doble D.
COMPAÑIA MINERA CORIRE S.A.C.	EIAsd para la Planta Ishihuinca.
MINERA HUINAC S.A.C.	EIAsd para la Planta de Ticapampa.
CIA. MINERA CASAPALCA S.A.	EIA para la Planta Berna en la UEA Americana.
CIA MINERA LONDRES SAC	EIAsd para Mina y Planta en la U.M. Oroya Sur.
ZTRATEK S.A.C.	IGAC para la Planta Ecológica Cajamarquilla.
MINERA SAN ANTONIO DE SILVER S.R.L.	EIAsd para la Planta de Beneficio Sansil.
PROCESADORA LESLIE SAMANCO S.A.C	EIAsd para la Planta de Beneficio Samanco.
S.M.R.L. LAS BRAVAS Nº 2 DE ICA	EIAsd para la Planta de Beneficio Arasqui
COMPAÑIA MINERA SAN VALENTIN S.A.	EIA para la Planta Solitaria

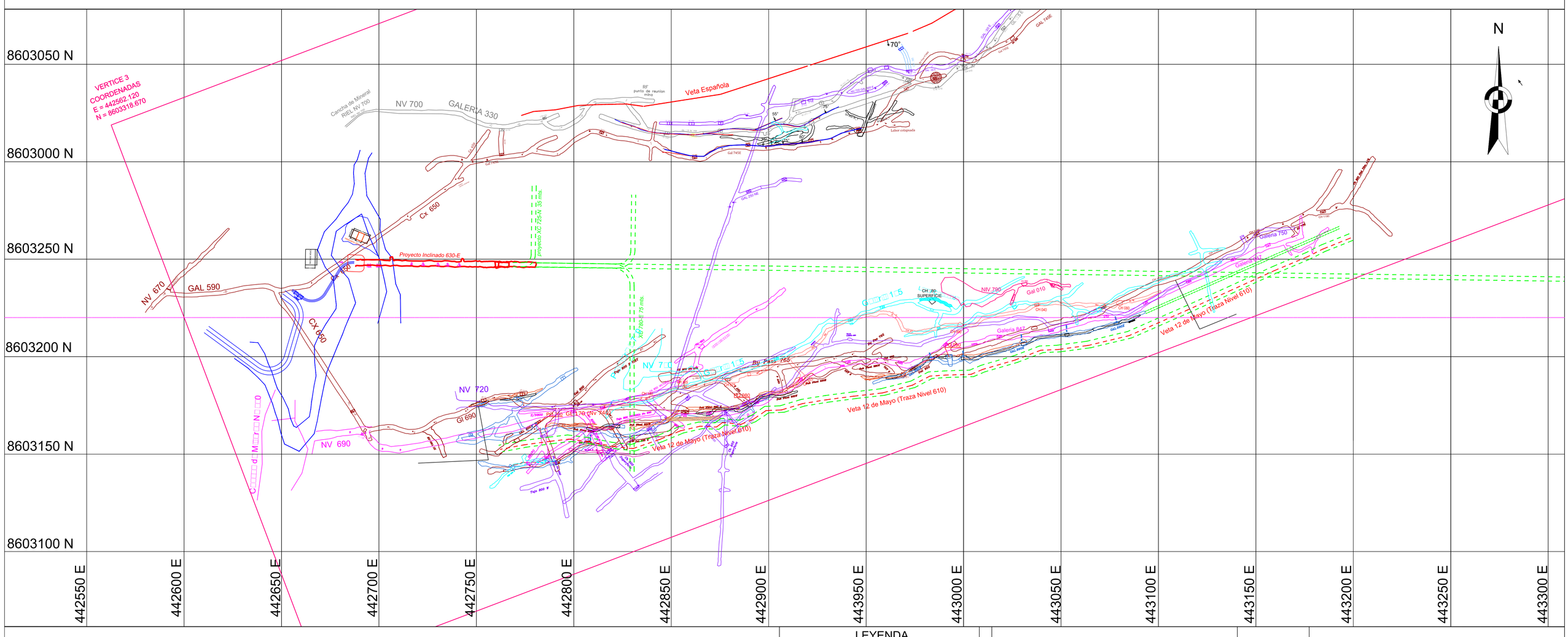
APPENDIX 8 – Cross-Sections: Historical Reserves and Resources

[6 pages]



Reservas	Largo	Potencia	Profundidad	Volumen	P.e	Tonelaje
Probado	500	0.6	30	9000	3	27000
Probable	500	0.6	15	4500	3	13500

Recurso	Largo	Potencia	Profundidad	Volumen	P.e	Tonelaje
Medido	500	0.6	30	9000	3	27000
Indicado	587	0.6	120	42264	3	126792
Inferido	587	0.6	60	21132	3	63396



LEYENDA

- Proyecto Labores
- Avance
- Area de Interes

Topografía :	Rogelio Osorio
Dibujado :	Rogelio Osorio
Revisado :	Ing. Ludwen Vilca
Aprobado :	Ing. Pedro Soria
Área / Dpto :	Geologia - Ing. Dionicio Milla S.

ESCALA 1/2000

FECHA Marzo - 2016

U.P. SANTA ELENA

MINA SANTA ELENA

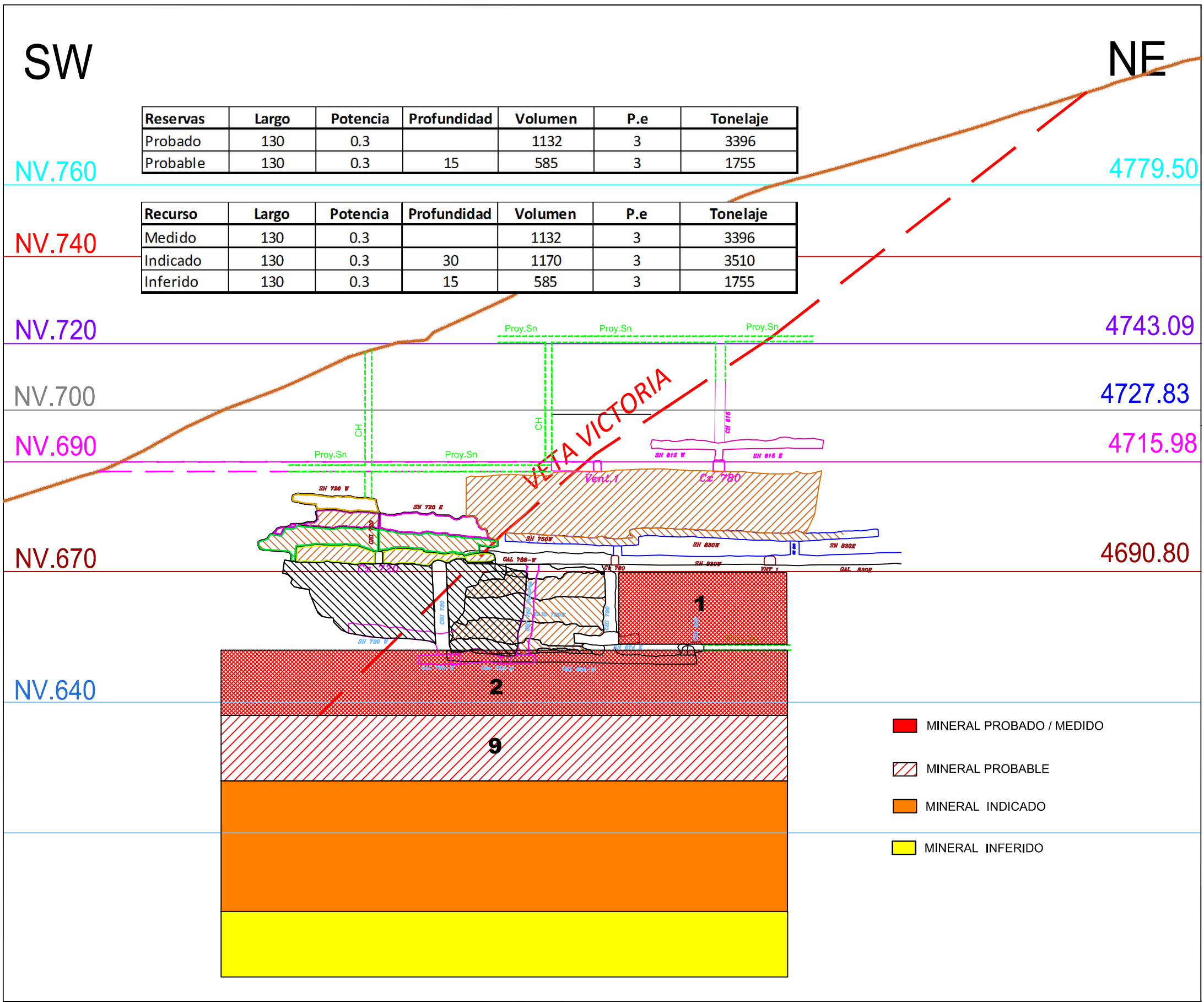
Estimación de Recursos y Reserva Minerales Veta 12 de Mayo

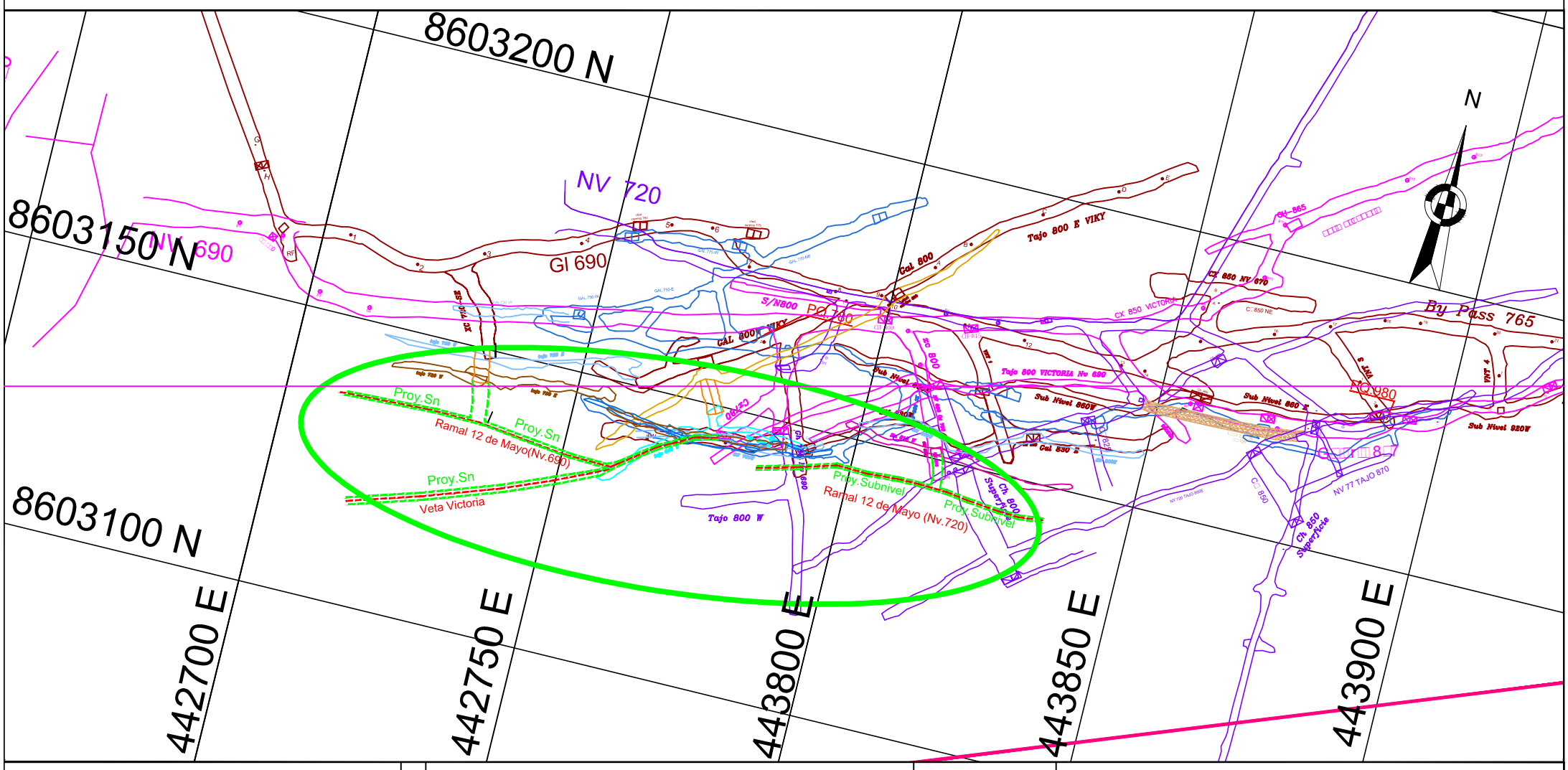
LAMINA **2**

SW NE

Reservas	Largo	Potencia	Profundidad	Volumen	P.e	Tonelaje
Probado	130	0.3		1132	3	3396
Probable	130	0.3	15	585	3	1755

Recurso	Largo	Potencia	Profundidad	Volumen	P.e	Tonelaje
Medido	130	0.3		1132	3	3396
Indicado	130	0.3	30	1170	3	3510
Inferido	130	0.3	15	585	3	1755





LEYENDA

- Proyecto Labores
- Avance
- Area de Interes

Topografía :	Rogelio Osorio
Dibujado :	Rogelio Osorio
Revisado :	Ing. Ludwen Vilca
Aprobado :	Ing. Pedro Soria
Área / Dpto :	Geologia - Ing. Dionicio Milla S.

ESCALA 1/2000

FECHA Marzo-2016

U.P. SANTA ELENA

MINA SANTA ELENA

Estimación de Recursos y Reserva Minerales Veta Ramal 12 de MAyo

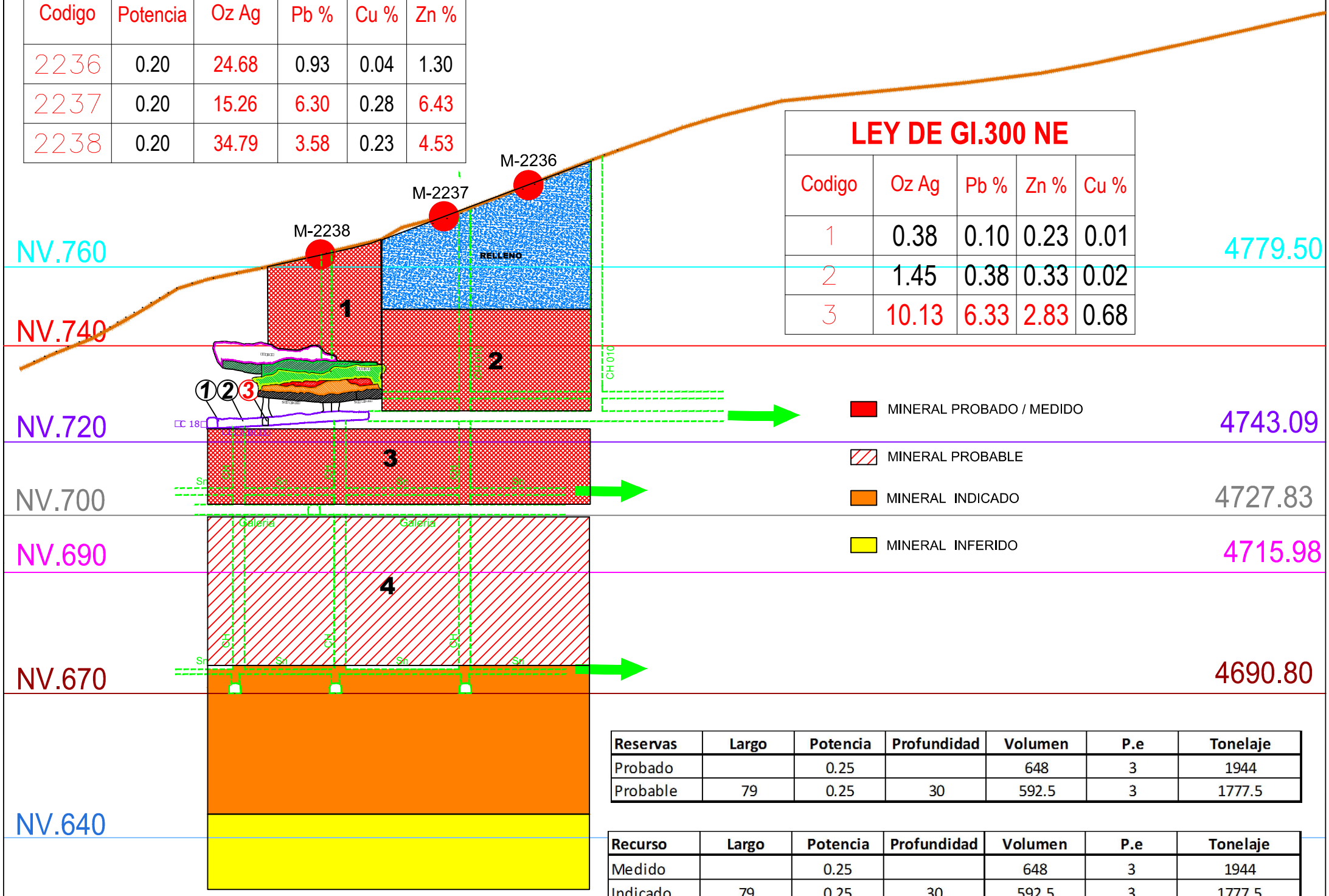
LAMINA **3**

LEY DE SUPERFICIE

Codigo	Potencia	Oz Ag	Pb %	Cu %	Zn %
2236	0.20	24.68	0.93	0.04	1.30
2237	0.20	15.26	6.30	0.28	6.43
2238	0.20	34.79	3.58	0.23	4.53

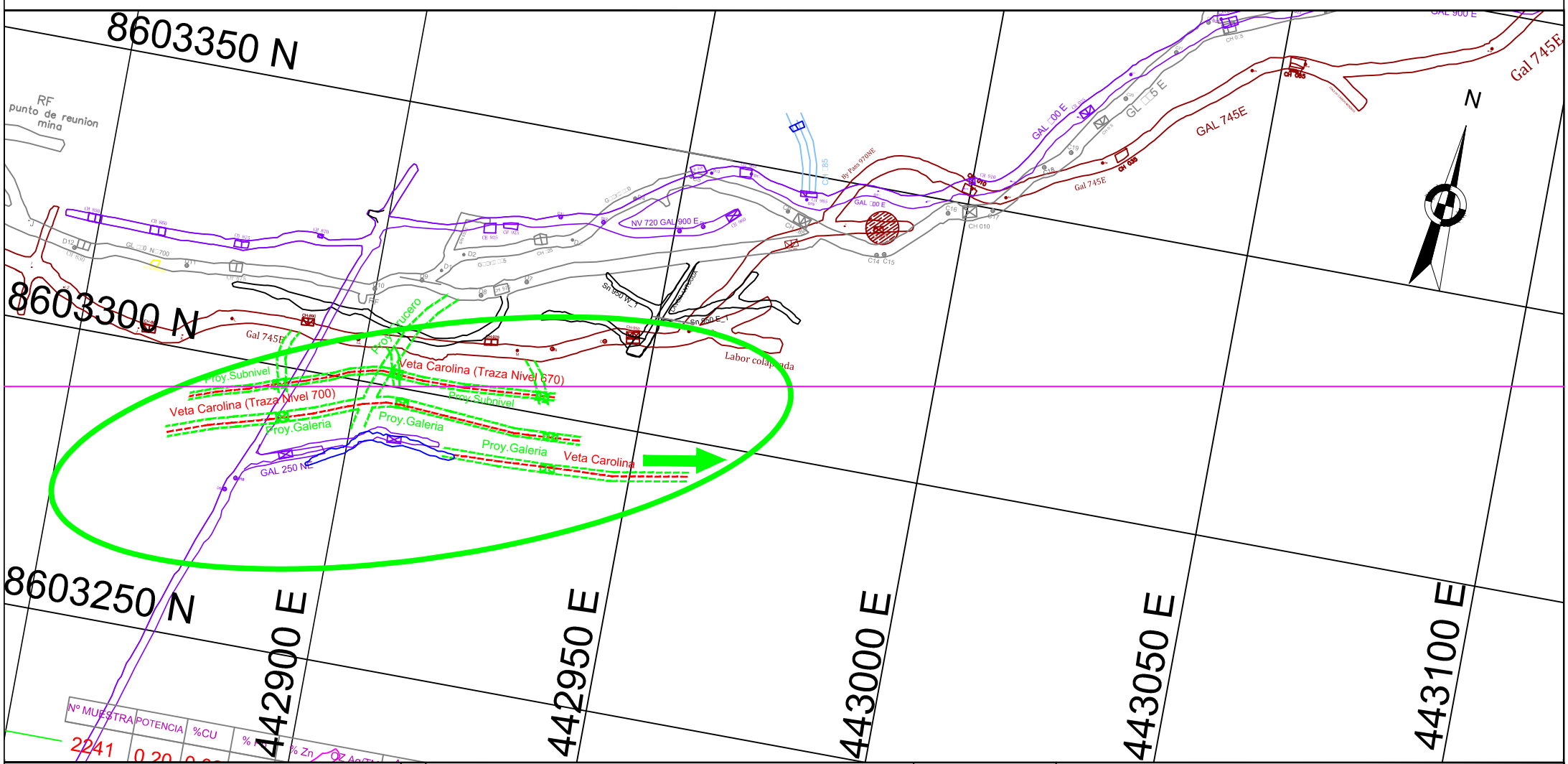
LEY DE GI.300 NE

Codigo	Oz Ag	Pb %	Zn %	Cu %
1	0.38	0.10	0.23	0.01
2	1.45	0.38	0.33	0.02
3	10.13	6.33	2.83	0.68



Reservas	Largo	Potencia	Profundidad	Volumen	P.e	Tonelaje
Probado		0.25		648	3	1944
Probable	79	0.25	30	592.5	3	1777.5

Recurso	Largo	Potencia	Profundidad	Volumen	P.e	Tonelaje
Medido		0.25		648	3	1944
Indicado	79	0.25	30	592.5	3	1777.5
Inferido	79	0.25	15	296.25	3	888.75



LEYENDA
Proyecto Labores
Avance
Area de Interes

Topografía :	Rogelio Osorio
Dibujado :	Rogelio Osorio
Revisado :	Ing. Ludwen Vilca
Aprobado :	Ing. Ing. Pedro Soria
Área / Dpto :	Geologia - Ing. Dionicio Milla S.

ESCALA 1/2000

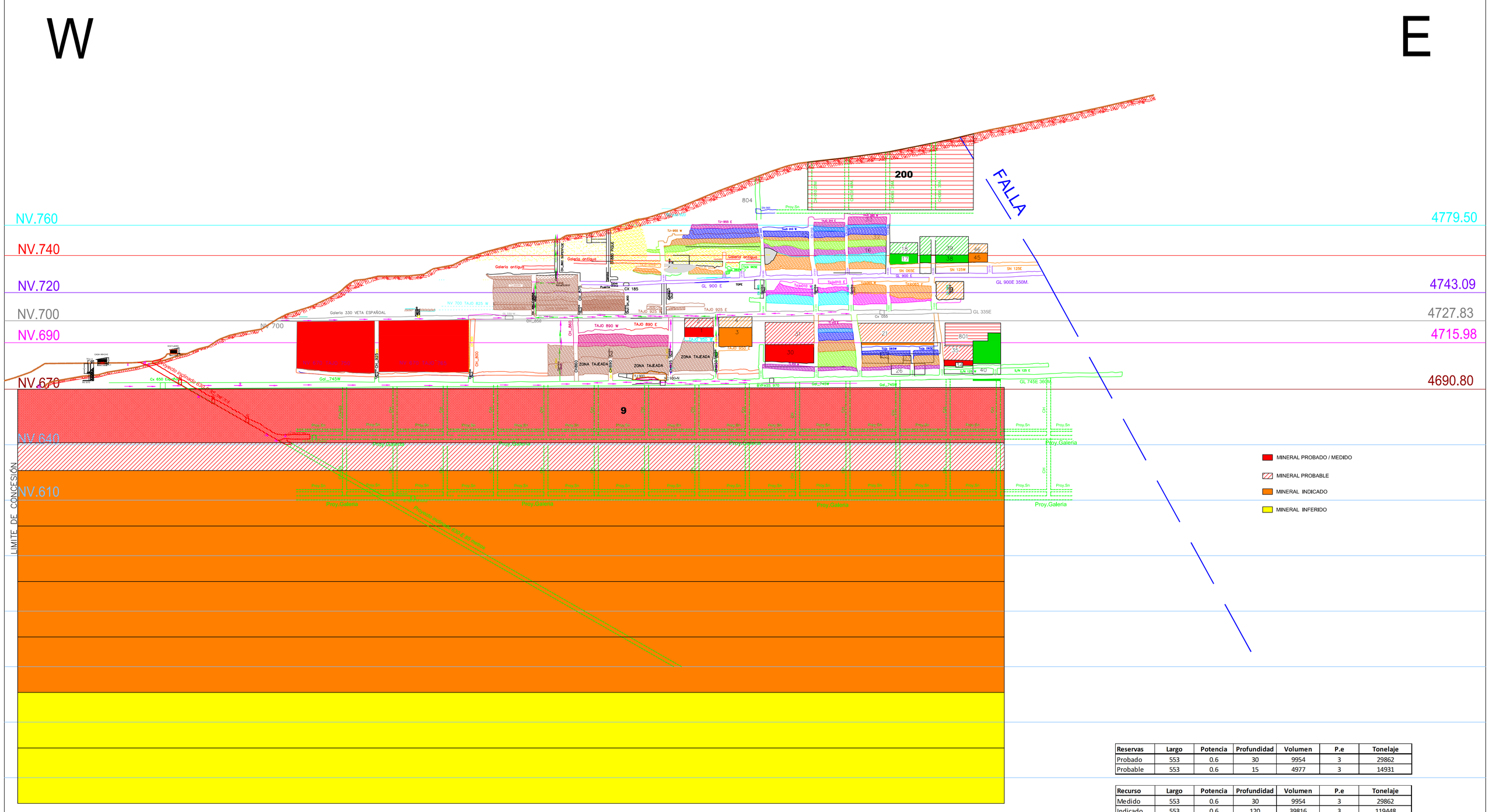
FECHA Marzo-2016

U.P. SANTA ELENA

MINA SANTA ELENA

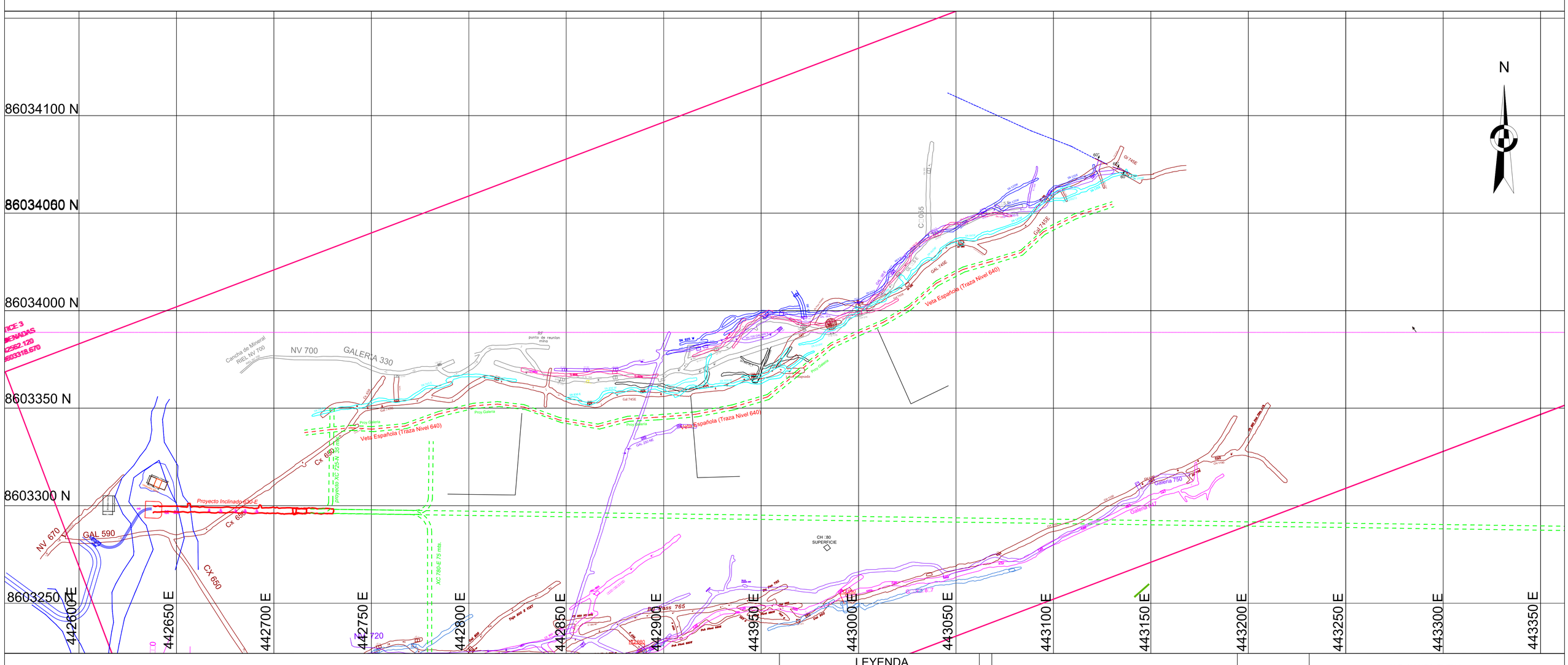
Estimación de Recursos y Reserva Minerales Veta Carolina

LAMINA **5**



Reservas	Largo	Potencia	Profundidad	Volumen	P.e	Tonelaje
Probado	553	0.6	30	9954	3	29862
Probable	553	0.6	15	4977	3	14931

Recurso	Largo	Potencia	Profundidad	Volumen	P.e	Tonelaje
Medido	553	0.6	30	9954	3	29862
Indicado	553	0.6	120	39816	3	119448
Inferido	553	0.6	60	19908	3	59724



LEYENDA

Pr□□□□□□ L□□□r□□

A□□□□□

Ar□□ d□ I□□□r□□

Topografía :	R□□□□□□ O□□r□□
D□□□□d□ :	R□□□□□□ O□□r□□
R□□□□d□ :	I□□. L□d□□□ V□□□□
A□r□□□d□ :	I□□. P□dr□ S□r□□
Área / Dpto :	G□□□□□□□ □I□□. D□□□□□□□ M□□□ S.

ESCALA
1/2000

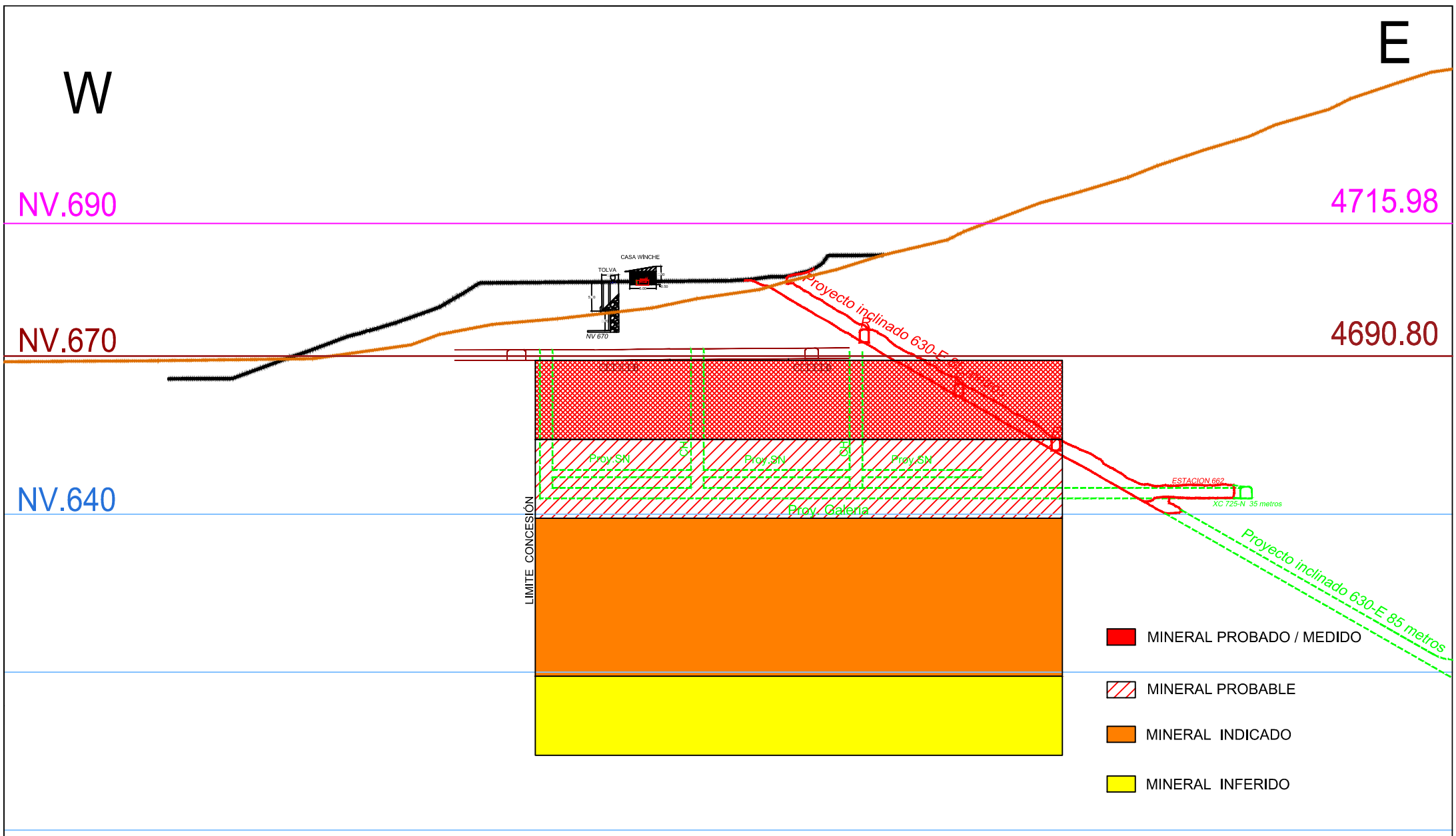
FECHA
M□r□□□201□

U.P. SANTA ELENA

MINA SANTA ELENA

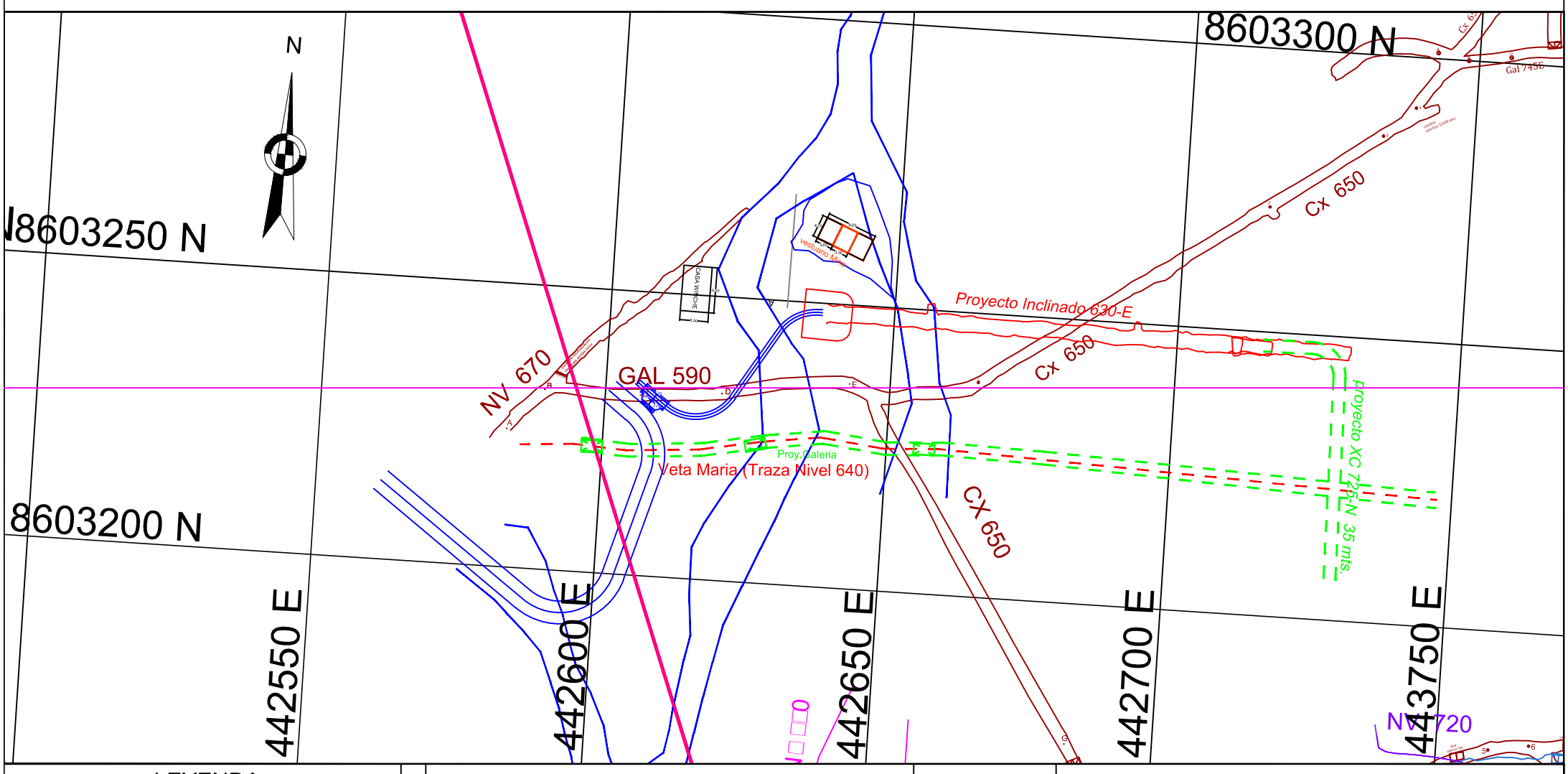
Estimación de Recursos y Reserva Minerales Veta 12 de Española

LAMINA
1



Reservas	Largo	Potencia	Profundidad	Volumen	P.e	Tonelaje
Probado	100	0.4	15	600	3	1800
Probable	100	0.4	15	600	3	1800

Recurso	Largo	Potencia	Profundidad	Volumen	P.e	Tonelaje
Medido	100	0.4	15	600	3	1800
Indicado	100	0.4	30	1200	3	3600
Inferido	100	0.4	15	600	3	1800



LEYENDA

Pr□□□□□□ L□□□r□□

A□□□□□

Ar□□ d□ l□□□r□□

Topografía :	R□□□□□ O□□r□□
D□□□□d□ :	R□□□□□ O□□r□□
R□□□□d□ :	I□□. L□d□ □□ V□□□□
A□r□□□d□ :	I□□. P□dr□ S□r□□
Área / Dpto :	G□□□□□□□ □I□□. D□□□□□□□ M□□□ S.

ESCALA

1/2000

FECHA

M□r□□□201□

U.P. SANTA ELENA

MINA SANTA ELENA

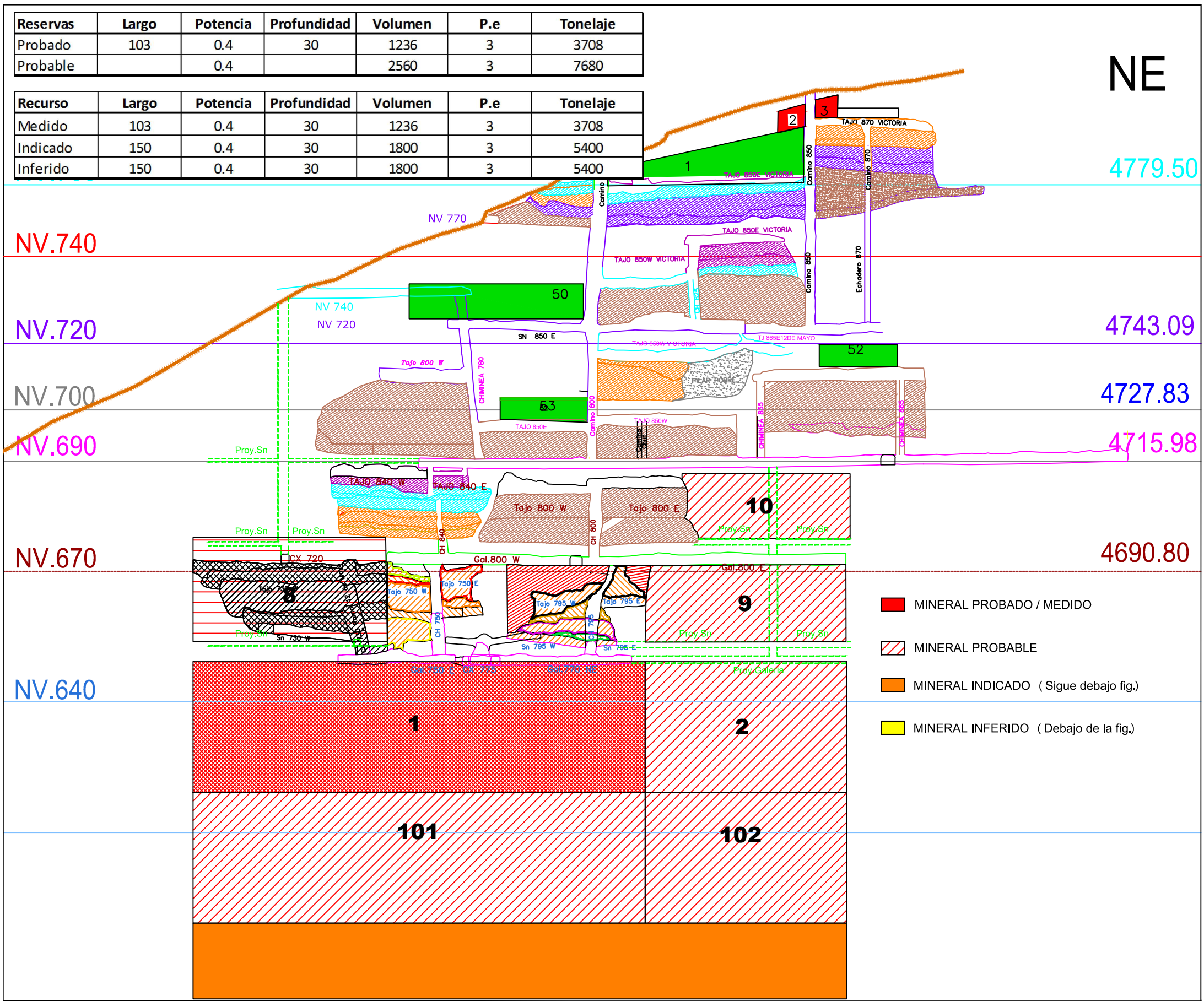
Estimación de Recursos y Reserva Minerales Veta María

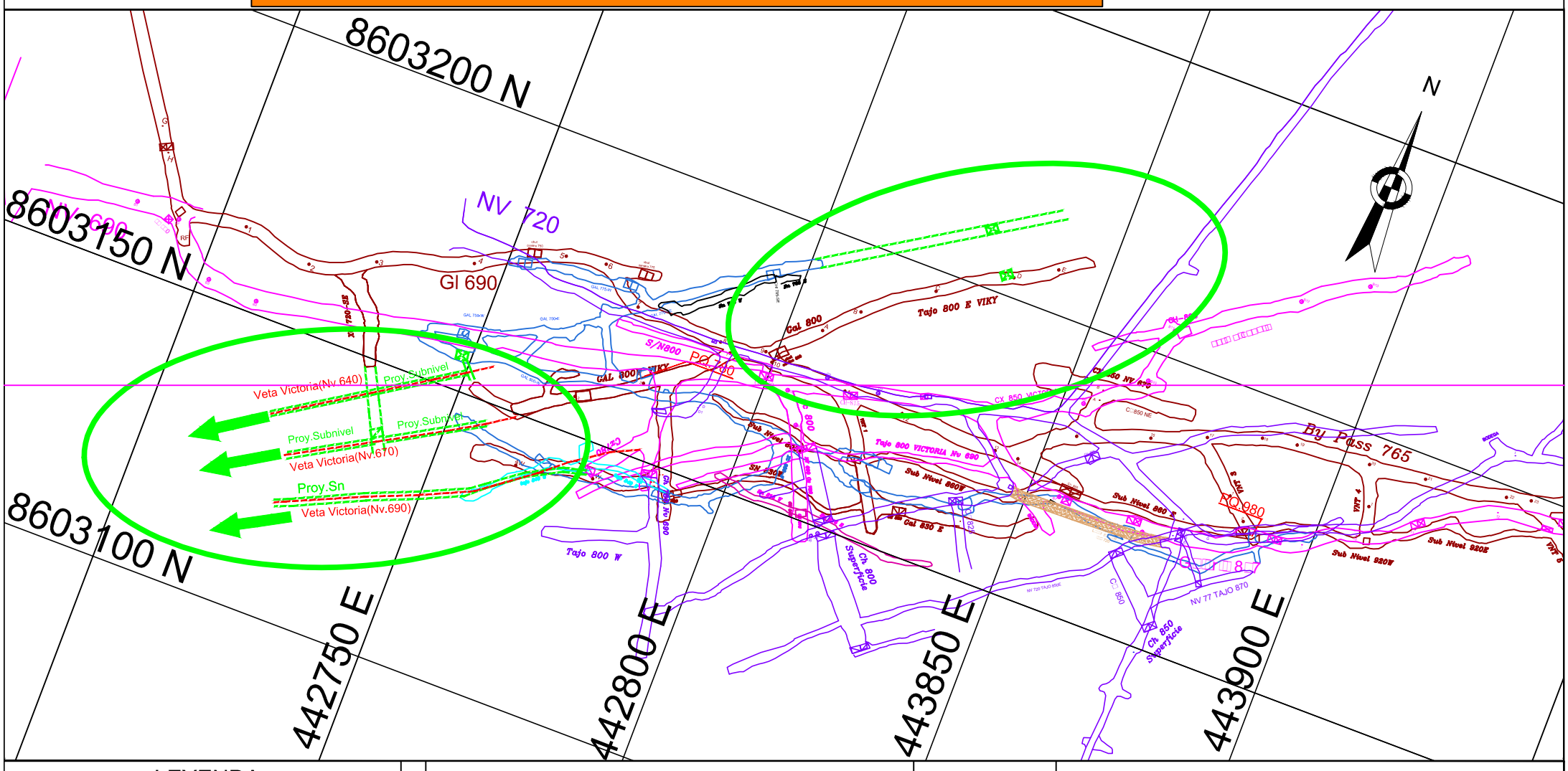
LAMINA

4

Reservas	Largo	Potencia	Profundidad	Volumen	P.e	Tonelaje
Probado	103	0.4	30	1236	3	3708
Probable		0.4		2560	3	7680

Recurso	Largo	Potencia	Profundidad	Volumen	P.e	Tonelaje
Medido	103	0.4	30	1236	3	3708
Indicado	150	0.4	30	1800	3	5400
Inferido	150	0.4	30	1800	3	5400





LEYENDA

- Proyecto Labores
- Avance
- Area de Interes

Topografía :	Rogelio Osorio
Dibujado :	Rogelio Osorio
Revisado :	Ing. Ludwen Vilca
Aprobado :	Ing. Pedro Soria
Área / Dpto :	Geologia - Ing. Dionicio Milla S.

ESCALA 1/2000

FECHA Marzo-2016

U.P. SANTA ELENA

MINA SANTA ELENA

Estimación de Recursos y Reserva Minerales Veta Victoria

LAMINA **6**

APPENDIX 9 – Planned Drill Hole Plan Map/Cross Sections

[10 pages]

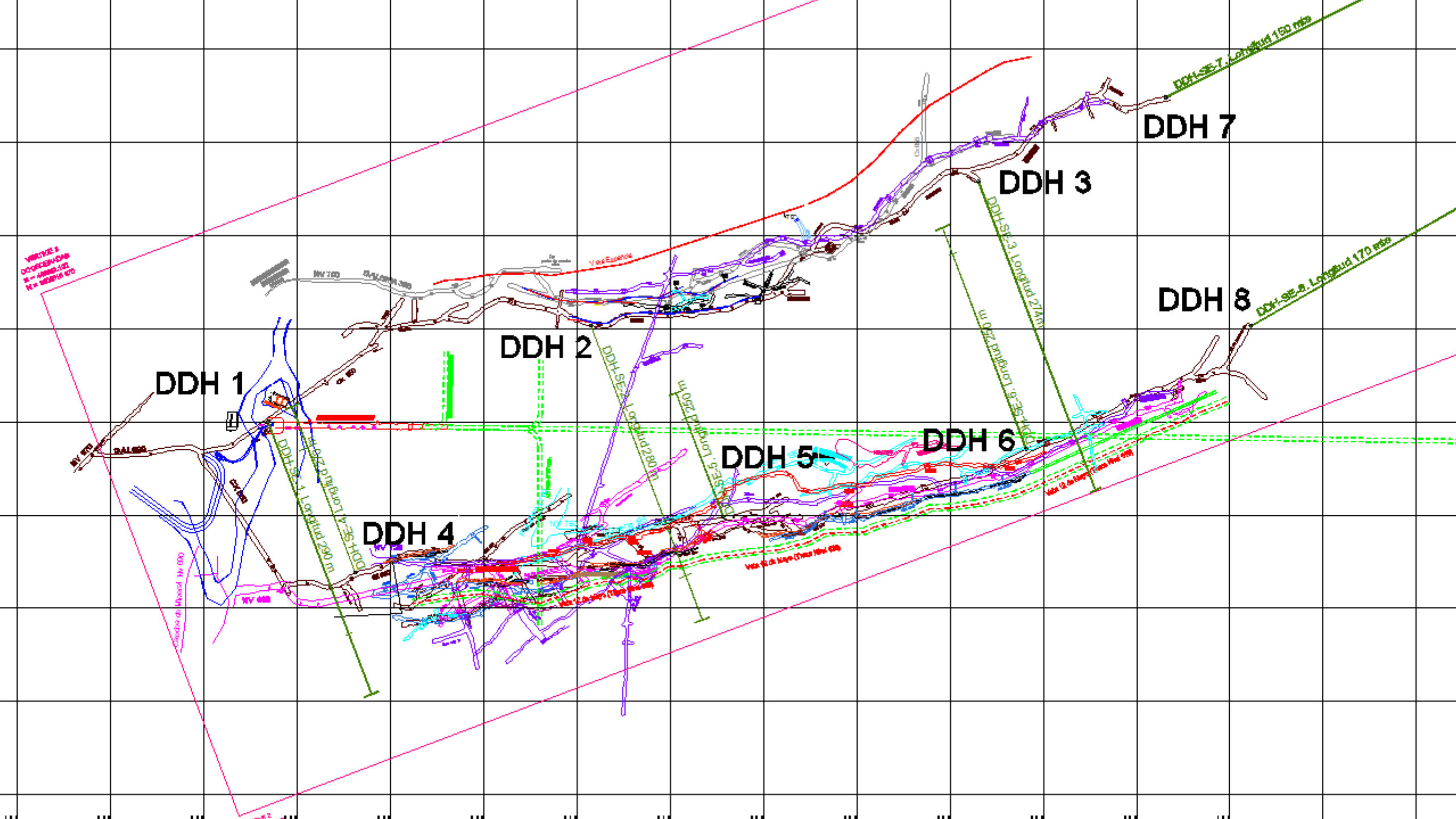
MINA SANTA ELENA

AREA DE GEOLOGIA

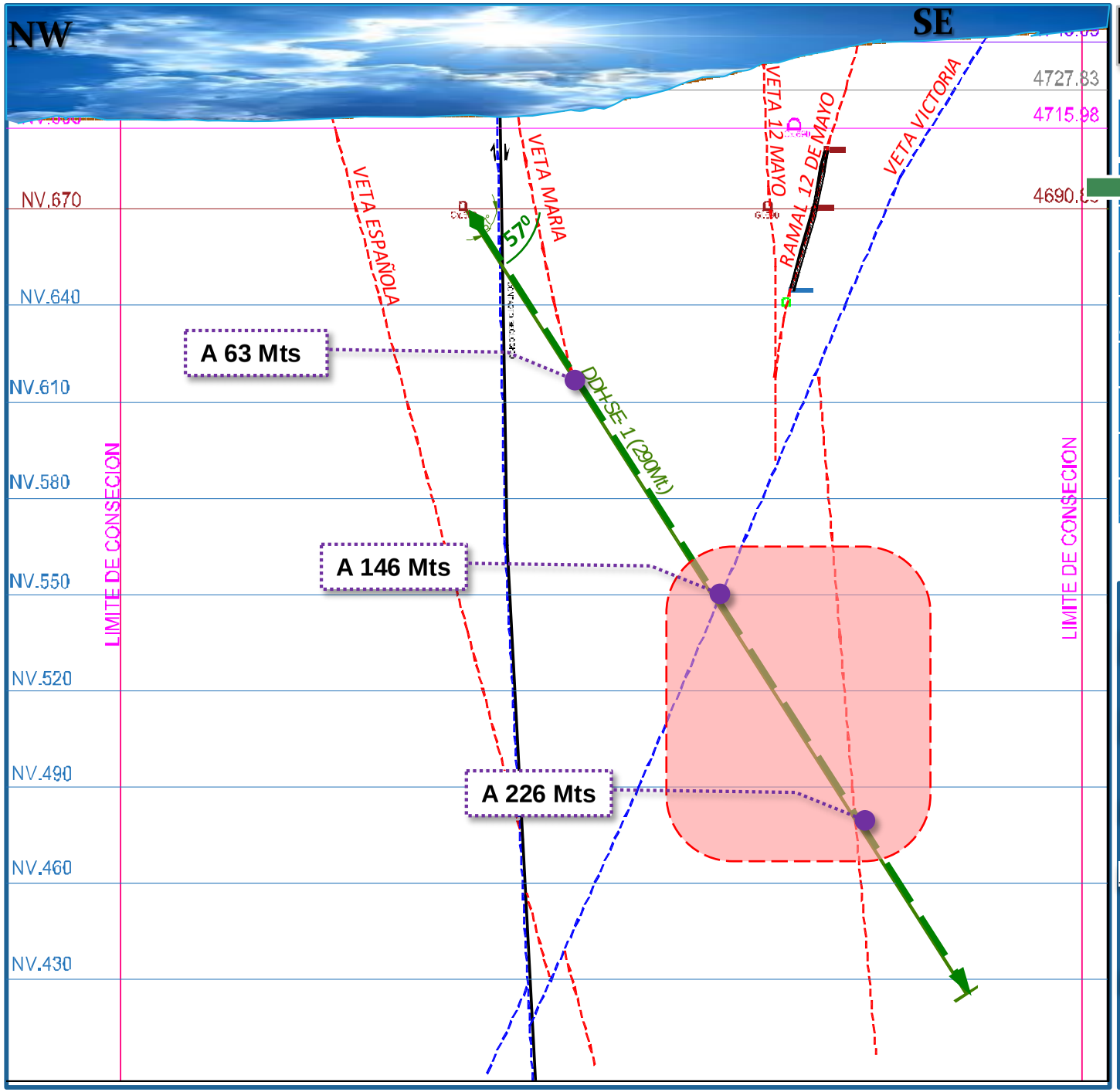
PROYECTOS DE PERFORACIÓN DIAMANTINA MINA SANTA ELENA

Nro.	DDH	LONGITUD	INCLINACION	OBJETIVO/Estructura Mineralizada
1	DDH-SE-1	290	-57	Veta 12 de Mayo, María, Victoria
2	DDH-SE-2	280	-53	Veta 12 de Mayo Victoria
3	DDH-SE-3	274	-54	Veta 12 de Mayo
4	DDH-SE-4	270	-69	Española
5	DDH-SE-5	250	-74	Española
6	DDH-SE-6	250	-60	Española
7	DDH-SE-7	150	Hztl	Cuerpo silíceo
8	DDH-SE-8	180	Hztl	Cuerpo silíceo

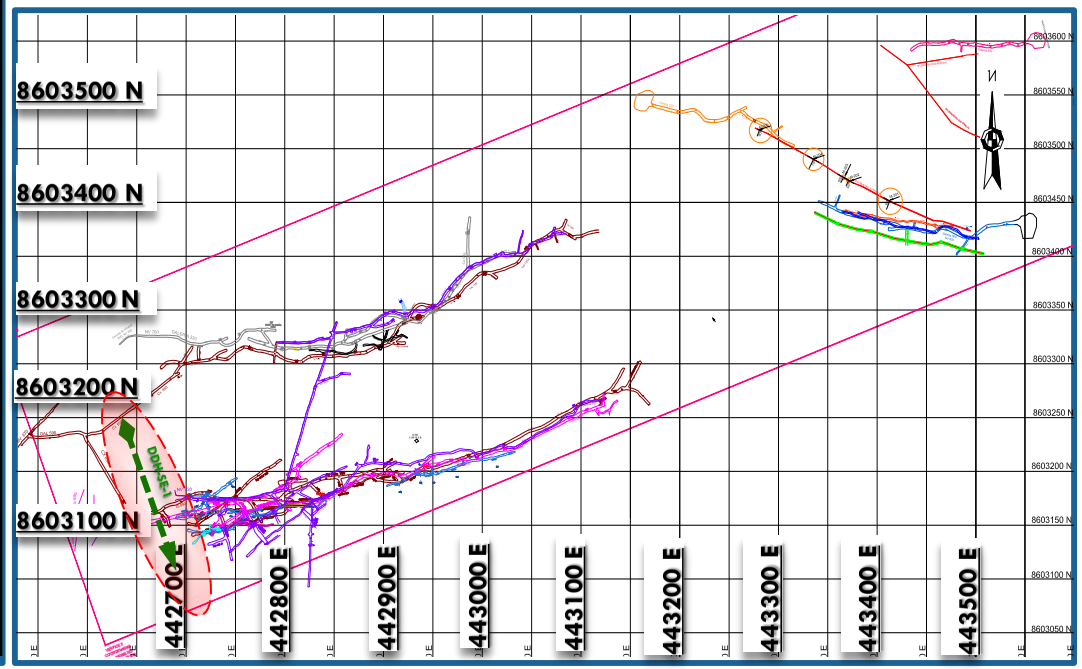
TOTAL	1944 MTS

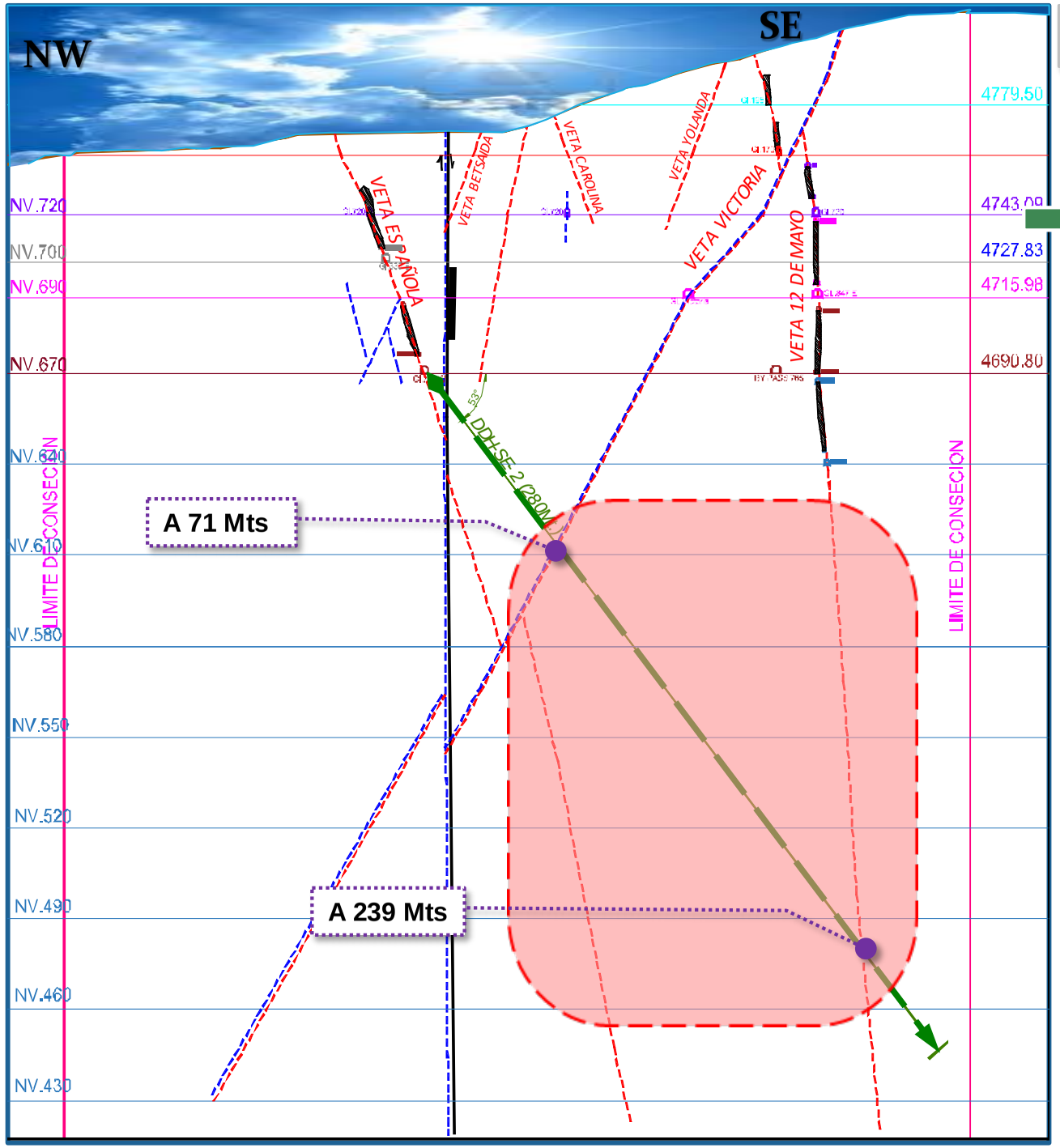

DDH 1
DDH 2
DDH 3
DDH 4
DDH 5
DDH 6
DDH 7
DDH 8
DDH-SE-1 Longitud 290 m
DDH-SE-2 Longitud 280 m
DDH-SE-3 Longitud 274 m
DDH-SE-4 Longitud 250 m
DDH-SE-5 Longitud 250 m
DDH-SE-6 Longitud 250 m
DDH-SE-7 Longitud 150 mts
DDH-SE-8 Longitud 170 mts

PROYECTOS DE DDH MINA SANTA ELENA



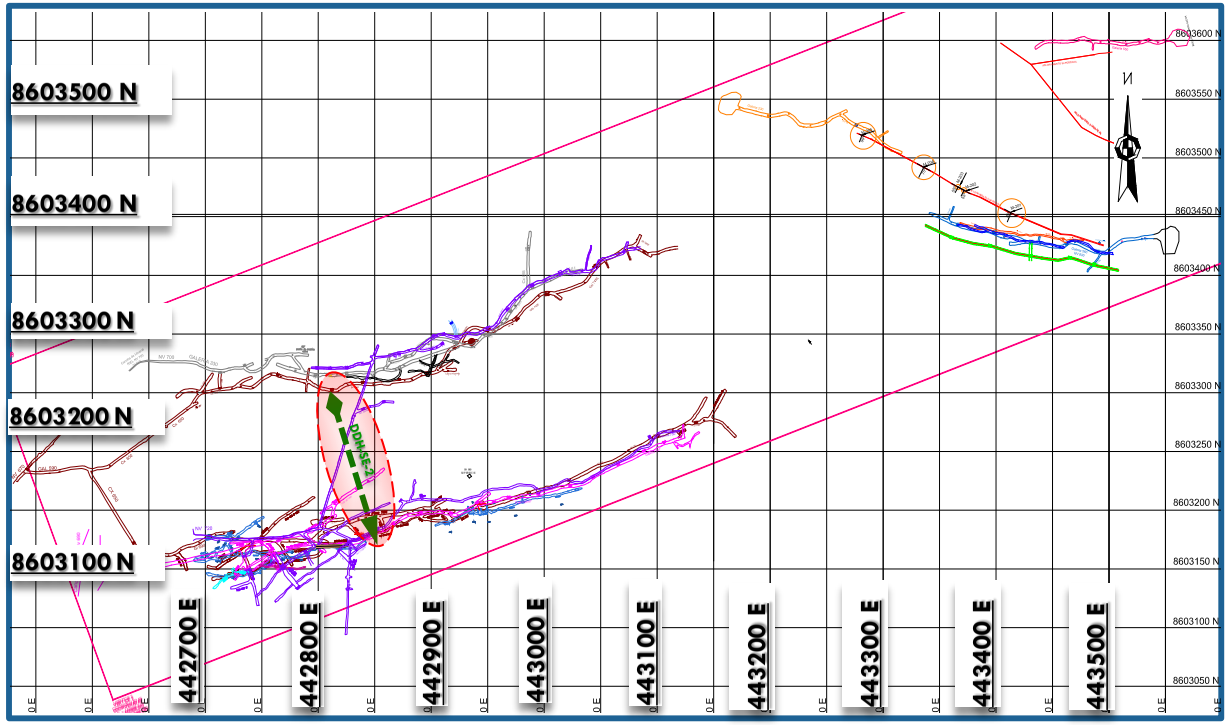
Nro.	DDH	LONGITUD	INCLINACION	OBJETIVO/Estructura Mineralizada
	DDH-SE-1	290	-57	Veta 12 de Mayo, Maria, Victoria
2	DDH-SE-2	280	-53	Veta 12 de Mayo Victoria
3	DDH-SE-3	274	-54	Veta 12 de Mayo
4	DDH-SE-4	270	-69	Española
5	DDH-SE-5	250	-74	Española
6	DDH-SE-6	250	-60	Española
7	DDH-SE-7	150	0	Cuerpo silíceo
8	DDH-SE-8	180	0	Cuerpo silíceo

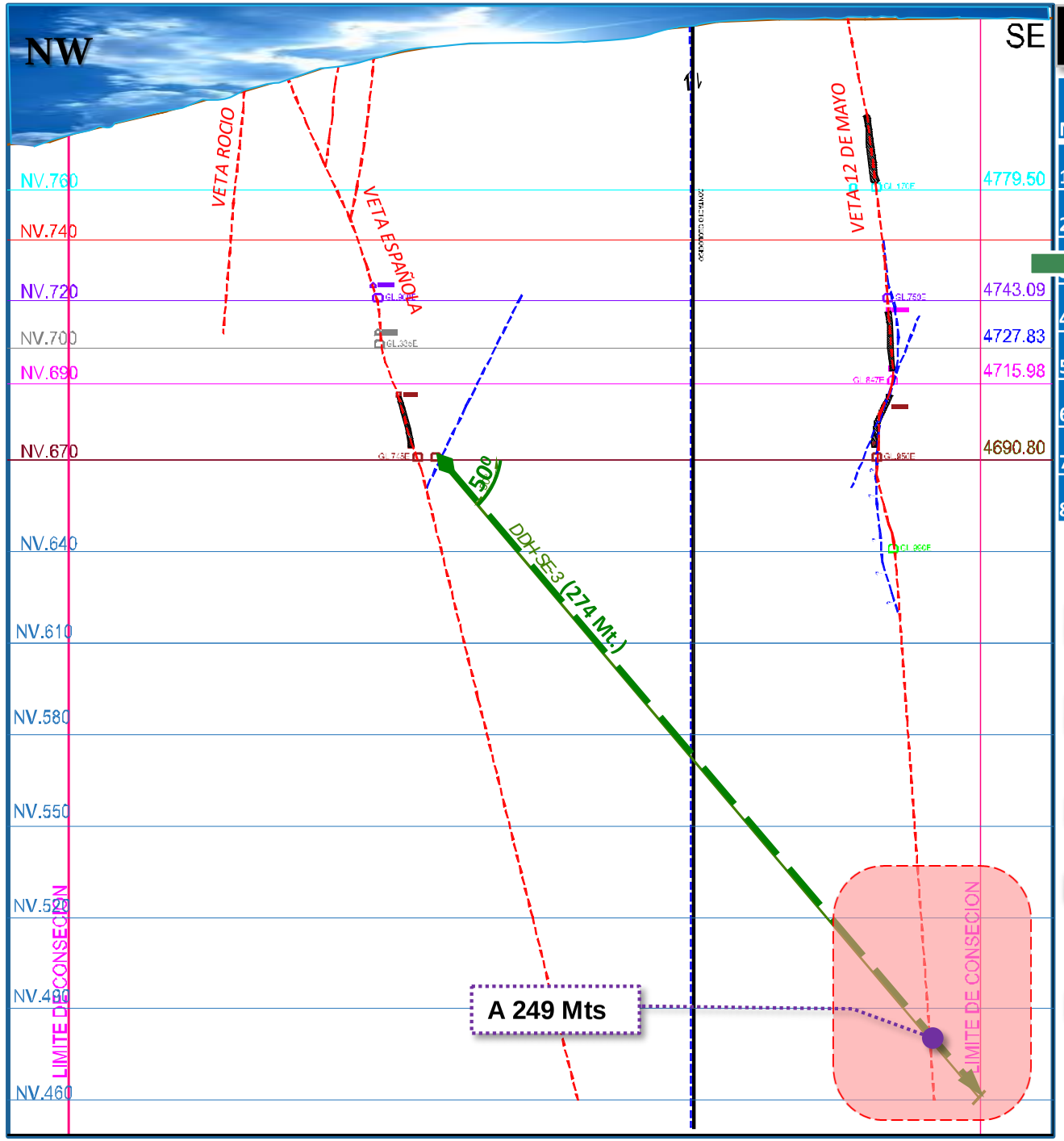




PROYECTOS DE DDH MINA SANTA ELENA

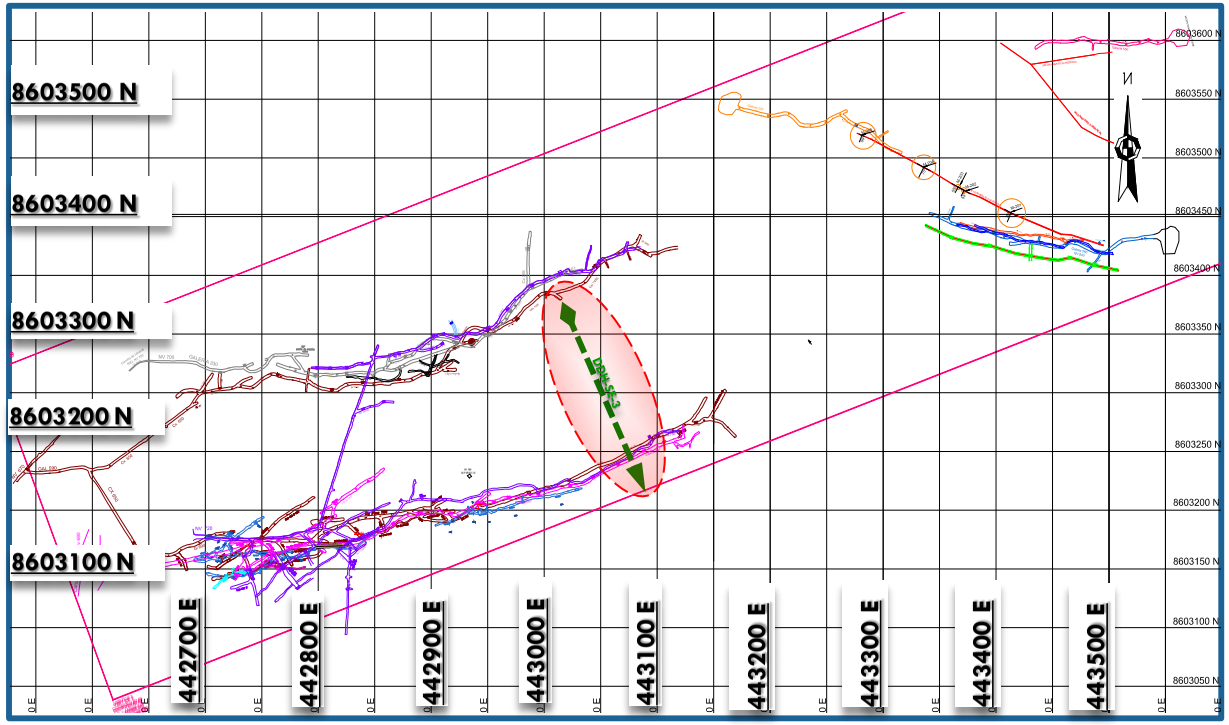
Nro.	DDH	LONGITUD	INCLINACION	OBJETIVO/Estructura Mineralizada
1	DDH-SE-1	290	-57	Veta 12 de Mayo,Maria,Victoria
	DDH-SE-2	280	-53	Veta 12 de Mayo Victoria
3	DDH-SE-3	274	-54	Veta 12 de Mayo
4	DDH-SE-4	270	-69	Española
5	DDH-SE-5	250	-74	Española
6	DDH-SE-6	250	-60	Española
7	DDH-SE-7	150	0	Cuerpo silíceo
8	DDH-SE-8	180	0	Cuerpo silíceo

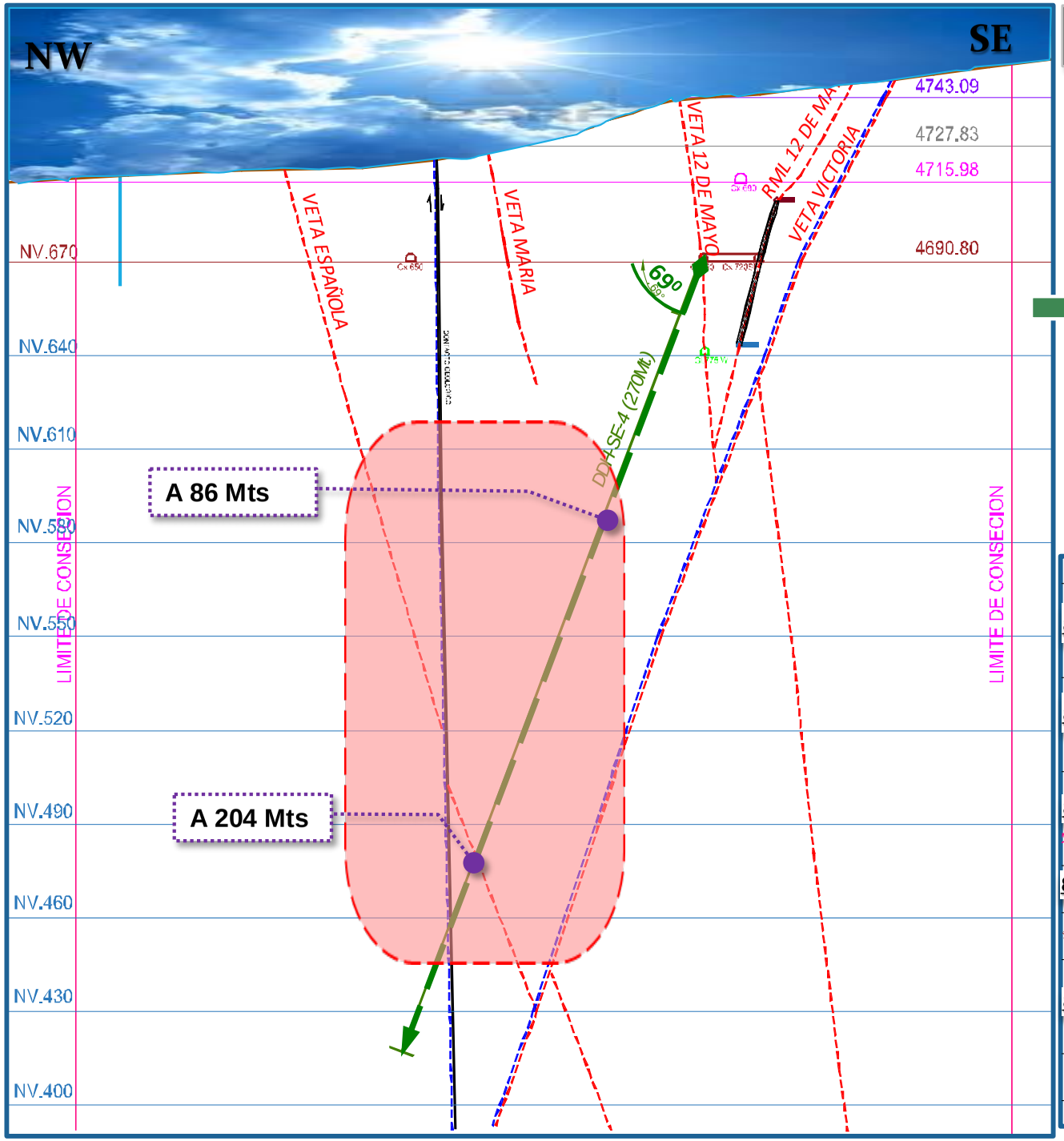




PROYECTOS DE DDH MINA SANTA ELENA

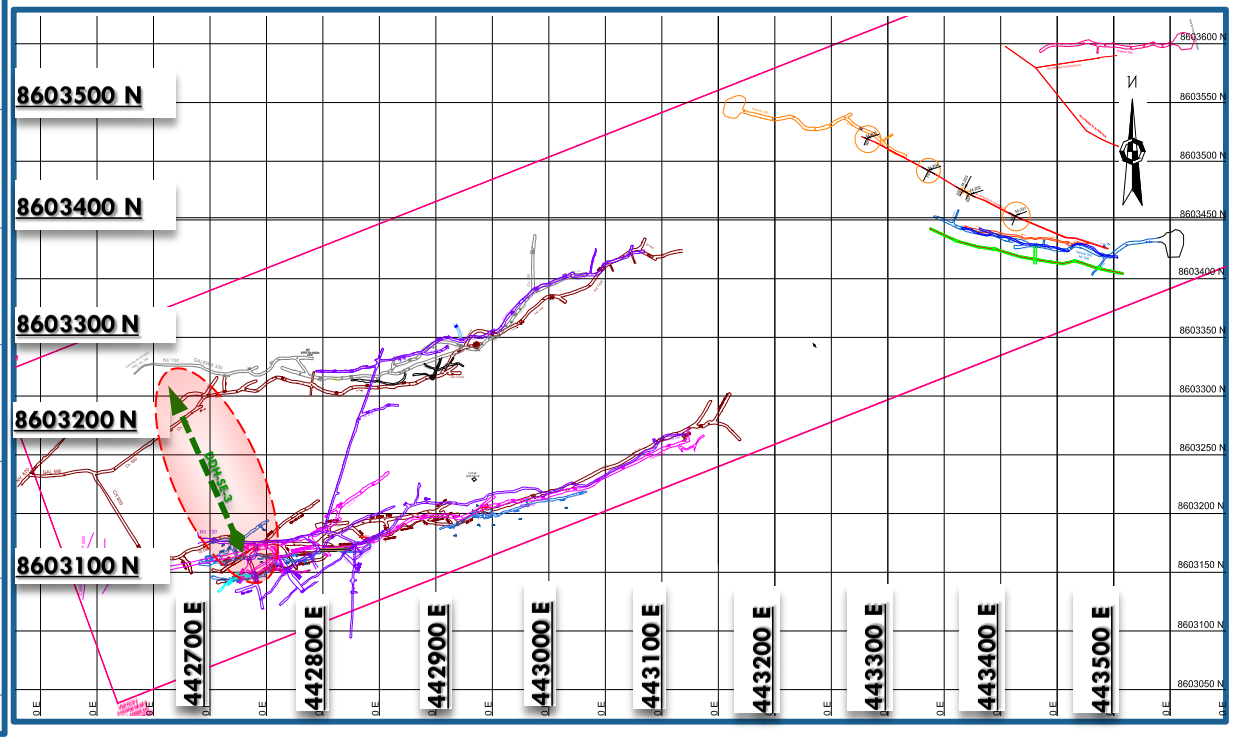
Nro.	DDH	LONGITUD	INCLINACION	OBJETIVO/Estructura Mineralizada
1	DDH-SE-1	290	-57	Veta 12 de Mayo,Maria,Victoria
2	DDH-SE-2	280	-53	Veta 12 de Mayo Victoria
3	DDH-SE-3	274	-54	Veta 12 de Mayo
4	DDH-SE-4	270	-69	Española
5	DDH-SE-5	250	-74	Española
6	DDH-SE-6	250	-60	Española
7	DDH-SE-7	150	0	Cuerpo silíceo
8	DDH-SE-8	180	0	Cuerpo silíceo

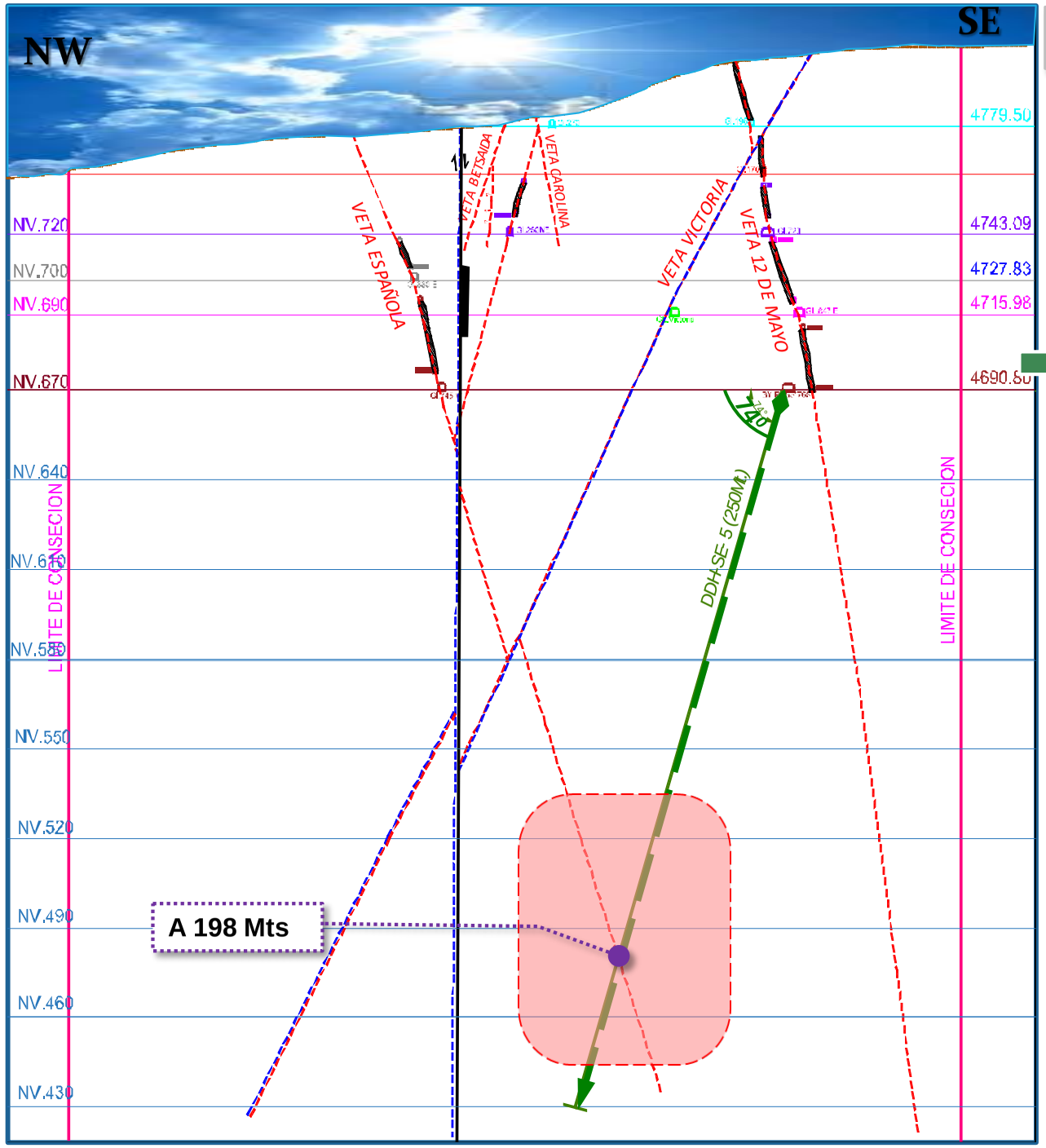




PROYECTOS DE DDH MINA SANTA ELENA

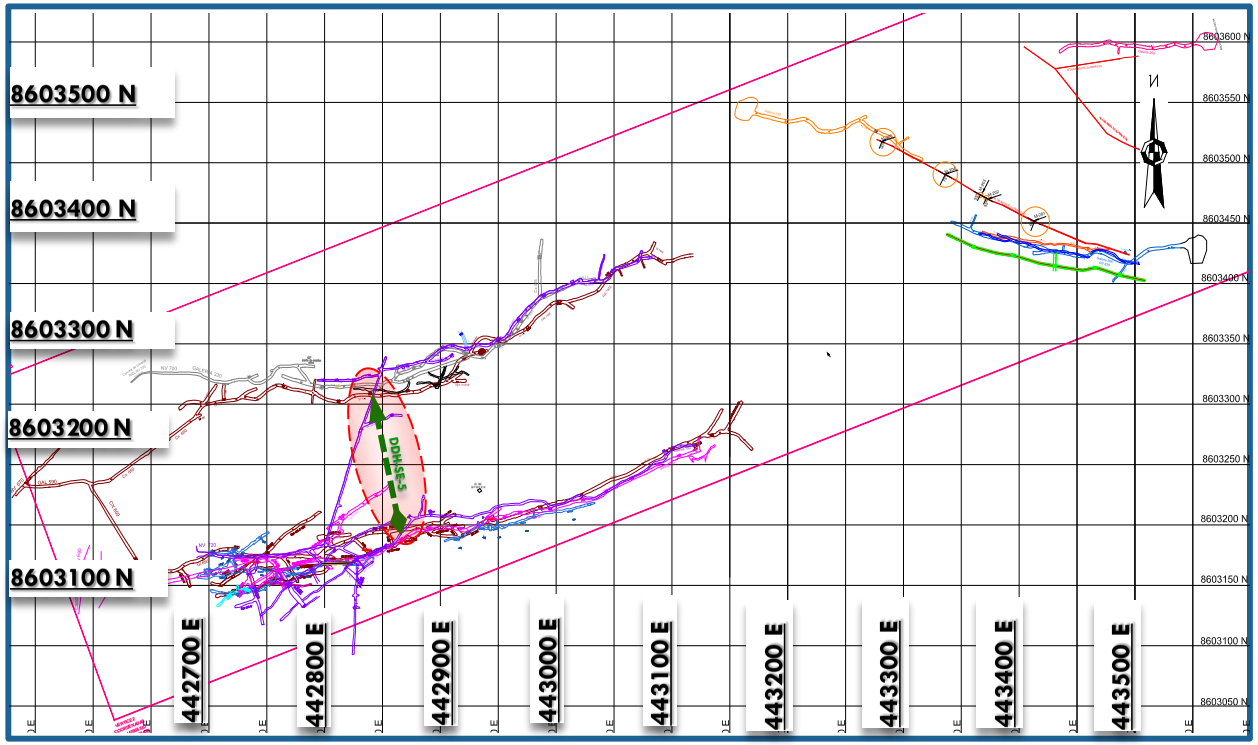
Nro.	DDH	LONGITUD	INCLINACION	OBJETIVO/Estructura Mineralizada
1	DDH-SE-1	290	-57	Veta 12 de Mayo,Maria,Victoria
2	DDH-SE-2	280	-53	Veta 12 de Mayo Victoria
3	DDH-SE-3	274	-54	Veta 12 de Mayo
4	DDH-SE-4	270	-69	Veta Española,Maria
5	DDH-SE-5	250	-74	Veta Española
6	DDH-SE-6	250	-60	Veta Española
7	DDH-SE-7	150	0	Cuerpo silíceo
8	DDH-SE-8	180	0	Cuerpo silíceo

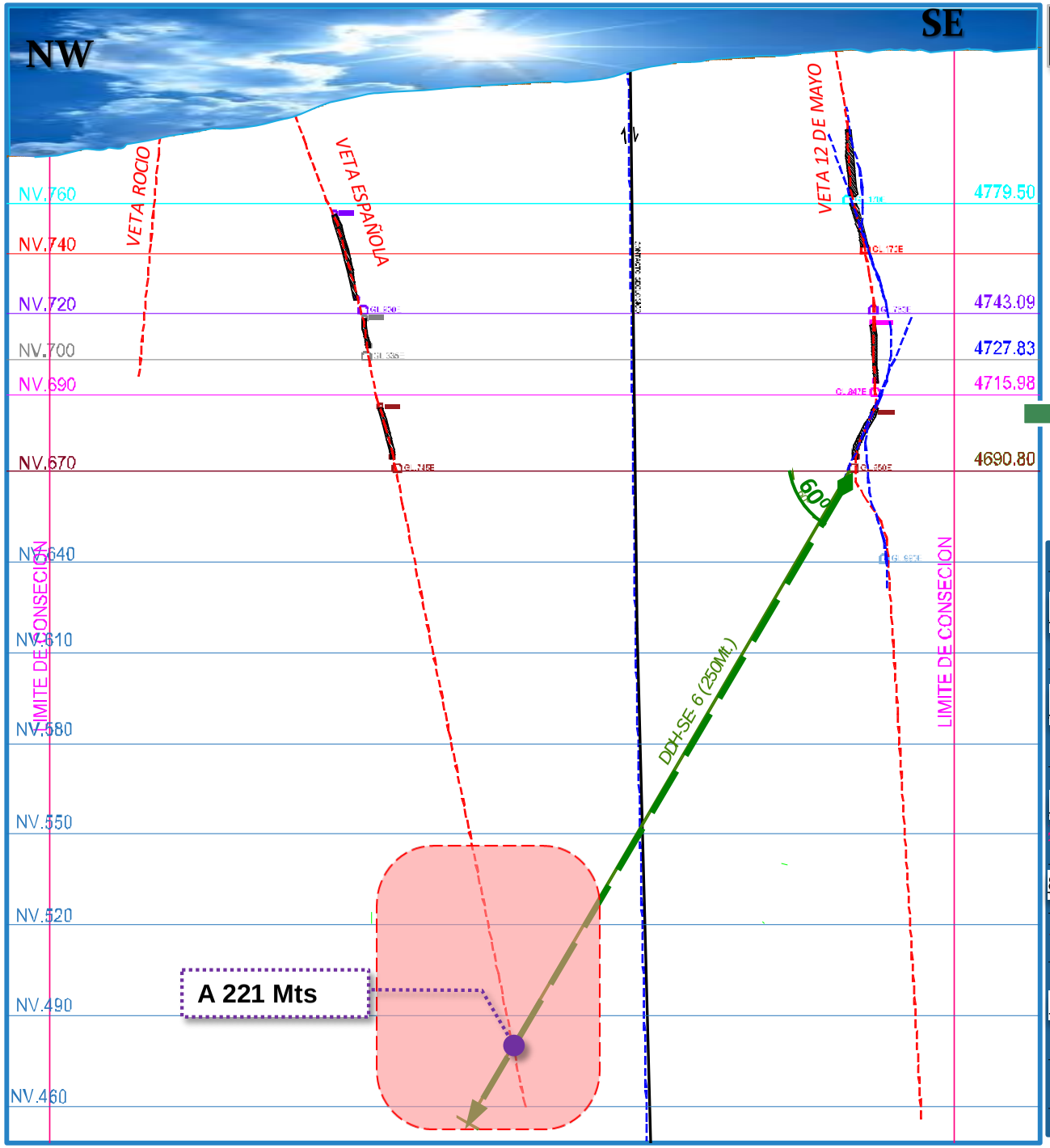




PROYECTOS DE DDH MINA SANTA ELENA

Nro.	DDH	LONGITUD	INCLINACION	OBJETIVO/Estructura Mineralizada
1	DDH-SE-1	290	-57	Veta 12 de Mayo,Maria,Victoria
2	DDH-SE-2	280	-53	Veta 12 de Mayo Victoria
3	DDH-SE-3	274	-54	Veta 12 de Mayo
4	DDH-SE-4	270	-69	Veta Española,Maria
5	DDH-SE-5	250	-74	Veta Española
6	DDH-SE-6	250	-60	Veta Española
7	DDH-SE-7	150	0	Cuerpo silíceo
8	DDH-SE-8	180	0	Cuerpo silíceo





PROYECTOS DE DDH MINA SANTA ELENA

Nro.	DDH	LONGITUD	INCLINACION	OBJETIVO/Estructura Mineralizada
1	DDH-SE-1	290	-57	Veta 12 de Mayo,Maria,Victoria
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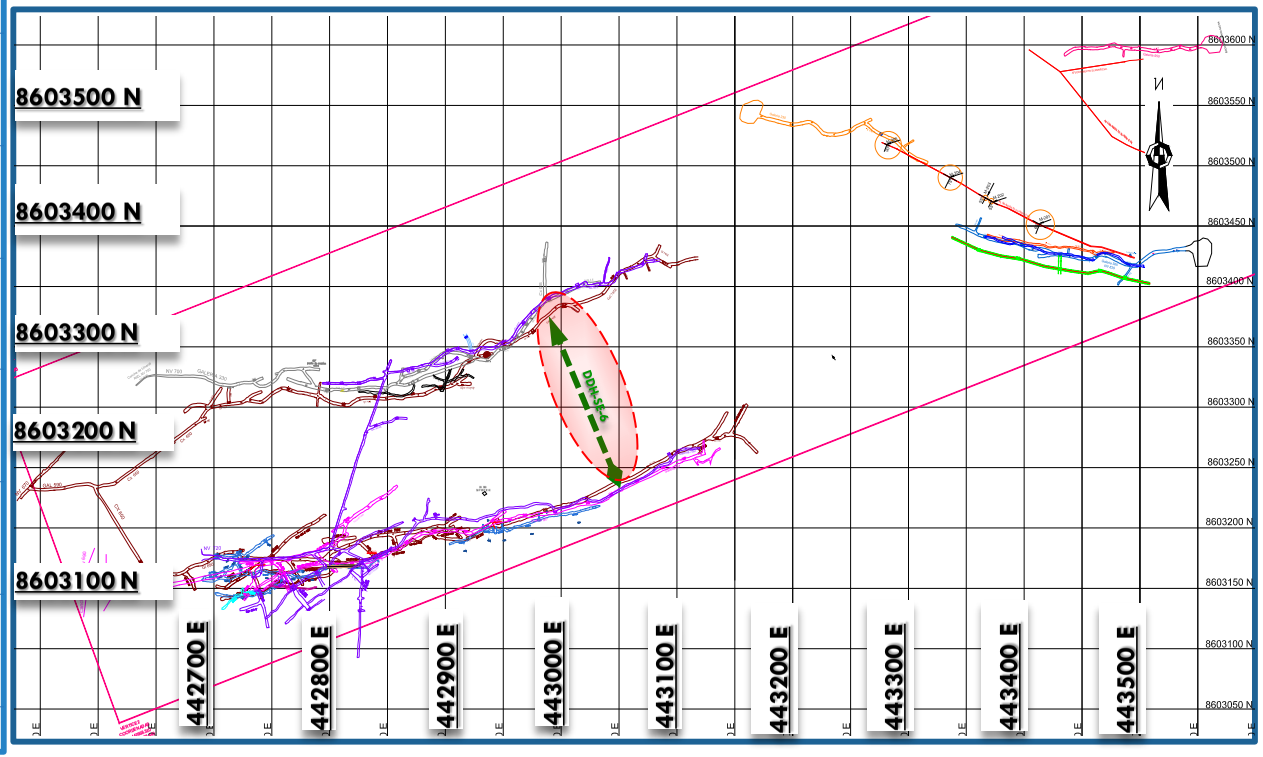
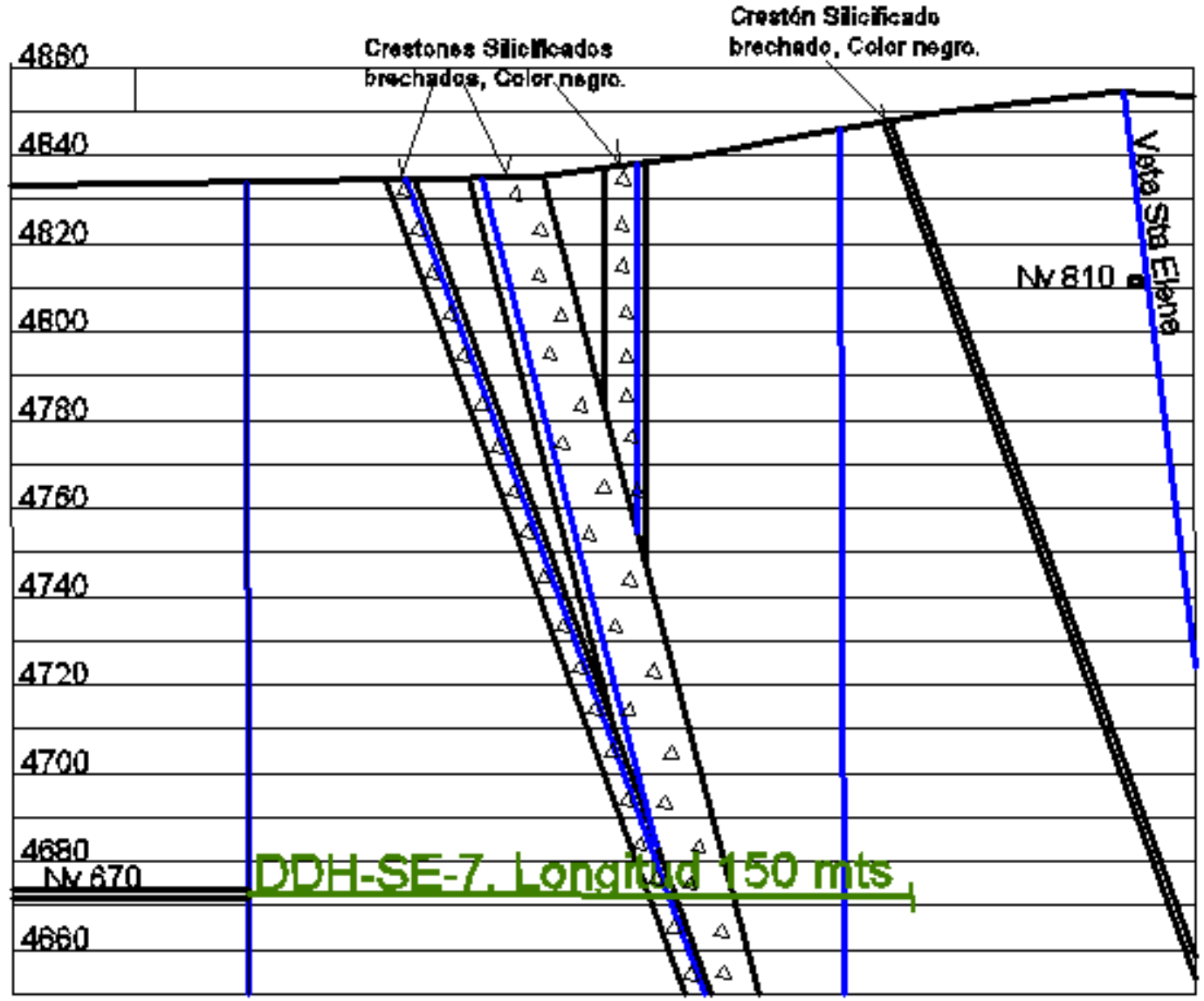
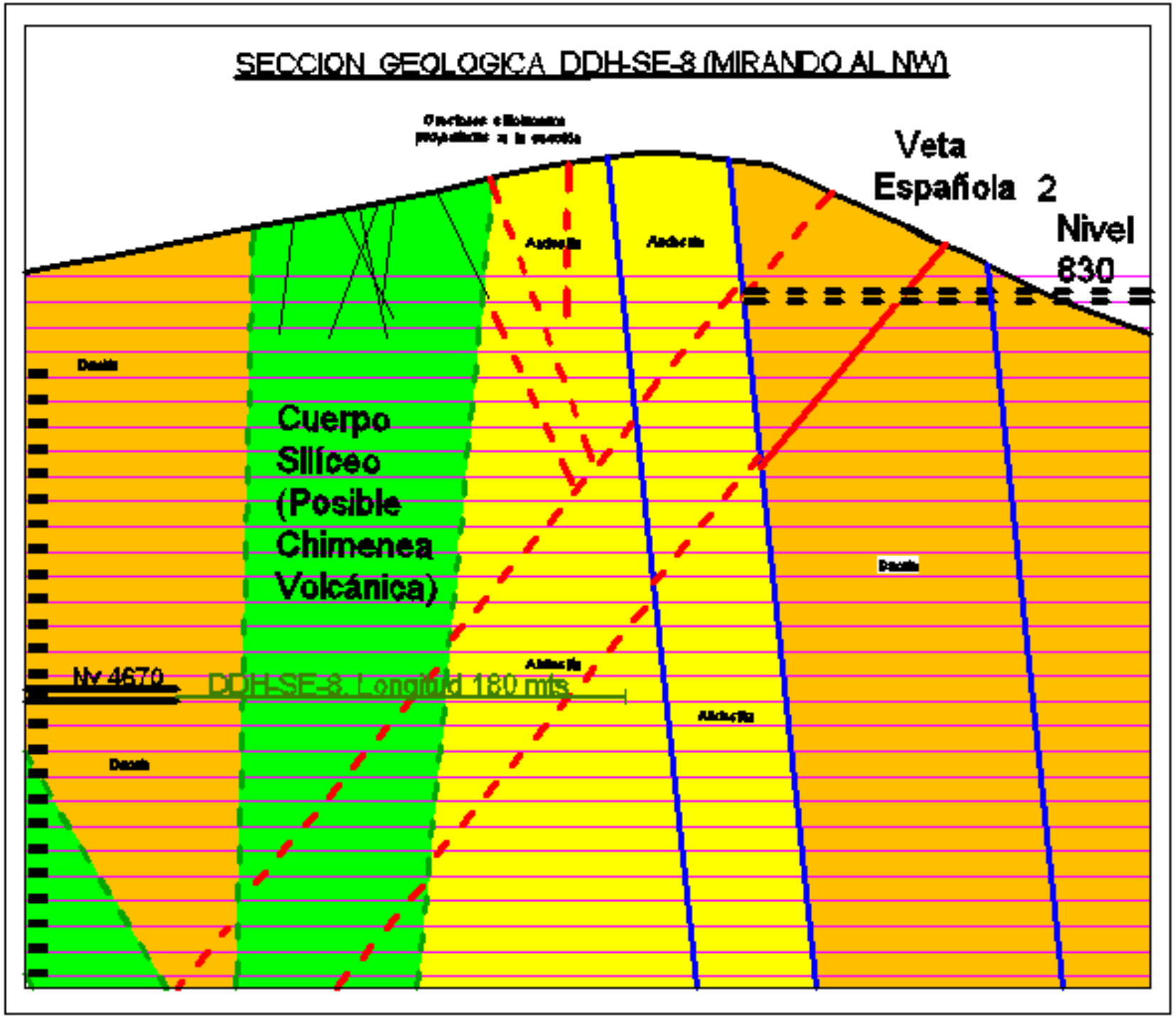
4	DDH-SE-4	270	-69	Veta Española,Maria
5	DDH-SE-5	250	-74	Veta Española
	DDH-SE-6	250	-60	Veta Española
7	DDH-SE-7	150	0	Cuerpo silíceo
8	DDH-SE-8	180	0	Cuerpo silíceo



SECCION GEOLOGICA DDH-SE-7 (MIRANDO AL NW)




SECCION GEOLOGICA DDH-SE-8 (MIRANDO AL NW)
Veta
Española 2
Nivel
830
Cuerpo
Silíceo
(Posible
Chimenea
Volcánica)
Nv 4670
DDH-SE-8, Longitud 180 mts