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ORVANA MINERALS CORP.

TECHNICAL REPORT ON THE EL VALLE BOINÁS - CARLÉS OPERATION, ASTURIAS, SPAIN

NI 43-101 Report

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September 26, 2014

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EXECUTIVE SUMMARY

Roscoe Postle Associates Inc. (RPA) was retained by Orvana Minerals Corporation (Orvana) to prepare an independent Technical Report on the Kinbauri España – El Valle, Boinás, and Carlés Operation (EVBC Operation, EVBC, or the Project), located in the Asturias region of Spain in the municipalities of Belmonte de Miranda and Salas. The purpose of this report is to disclose Mineral Resource and Mineral Reserve estimates for the operation, as at September 30, 2014. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects. RPA visited the property from June 1 to 13, 2014.

Orvana is a gold and copper producer with operations in Spain and Bolivia. In September 2009, Orvana acquired Kinbauri Gold Corp and with it the past-producing EVBC Operation. Orvana operates EVBC through its wholly owned subsidiary, Kinbauri España S.L.U. (Kinbauri). The EVBC Operation commenced commercial production in August 2011.

The EVBC Operation consists of underground mines at Boinás and Carlés (El Valle open pit mining has been completed), producing a nominal 2,000 tonnes per day ore, of two material types – oxides and skarns. A gravity-flotation-leach processing plant, located at Boinás, produces doré bars and copper concentrate with gold and silver credits. Total production for fiscal year end 2013 (Orvana's fiscal year runs from October to September) was 66,000 ounces of gold and 6.7 million pounds of copper.

Mineral Reserves total 2.2 Mt, at grades of 4.29 g/t Au, 0.67% Cu, and 13.4 g/t Ag. A Life of Mine Plan (LOMP) for EVBC forecasts three years of mining at similar production rates, followed by two years of reduced, oxide-only production. Carlés will soon be placed on care and maintenance, pending an improved economic mining plan or higher metal prices, due to a lack of mineralization above cut-off grade.

CONCLUSIONS

RPA offers the following conclusions based on a review of the Project information:

GEOLOGY AND MINERAL RESOURCES

- Drilling, logging and sampling methodologies meet industry standard and are suitable to support Mineral Resource and Reserve Estimation.

- The sampling method and approach is reasonable to support resource estimation.

- The sample preparation, analysis, and security procedures at EVBC are adequate for use in the estimation of Mineral Resources.

- The quality assurance and quality control (QA/QC) program as designed and implemented by Orvana is adequate and the assay results within the database are suitable for use in a Mineral Resource and Mineral Reserve estimate.

- The database contains no significant errors and is suitable to support Mineral Resource and Mineral Reserve estimation.

- The Mineral Resource estimate, including databases, geological interpretation, compositing, capping, variography, block models, interpolation strategy, validation, cut-off grade, classification and Mineral Resource reporting is appropriate for the style of mineralization and the resource models are reasonable and acceptable to support the 2014 fiscal year-end Mineral Resource and Mineral Reserve estimates.

- Measured and Indicated Mineral Resources total 6.0 Mt, grading 4.41 g/t Au, 0.69% Cu and 13.98 g/t Ag, containing 850,900 oz Au, 41,500 t Cu and 2,700,500 oz Ag.

- Inferred Mineral Resources total 6.0 Mt, grading 5.05 g/t Au, 0.45% Cu and 6.80 g/t Ag, containing 979,500 oz Au, 26,900 t Cu and 1,318,600 oz Ag.

- There is significant potential to upgrade Inferred Resources to the Indicated category and for expansion of known zones along their peripheries.

MINING AND MINERAL RESERVES

- Proven and Probable Mineral Reserves total 2.2 Mt, grading 4.29 g/t Au, 0.67% Cu and 13.41 g/t Ag, containing 302,000 oz Au, 14,700 t Cu and 944,000 oz Ag. Mineral Reserves are estimated at metal prices of US$1,100 per oz gold, US$2.75 per lb copper, and US$20 per oz silver.

- Considerable marginal grade material is included in the Mineral Resources, and excluded from Mineral Reserves, due to application of dilution factors and higher cut-off grades. In the future, small changes in cut-off grades may have a large impact on Mineral Reserve tonnage.

- Mining unit costs are known to vary significantly by material type, with low-productivity oxide mining via hydraulic hammer being considerably more expensive than higher-productivity longhole mining in the skarns.

- The LOMP production schedule forecasts three years of mining at near-current production rates, followed by two years of reduced, oxide-only production. Higher head grades provide gains on metal production relative to recent results (increasing to an average of 72,000 oz gold for the next three years).

- Production activities are expected to continue at Carlés from developed areas through to early 2015, following which this mine will be placed on care and maintenance status. The decision was taken after drilling results indicated lower grades in the future mining blocks below current activities. The Carlés mechanized crew will be moved to assist with ramping up production in the higher grade Boinás Mine.

- Average LOMP operating costs are estimated to be US$131 per tonne milled. Sustaining capital costs are estimated to total US$43 million.

- Cash flow analysis of the LOMP verified that Mineral Reserves are economically mineable, under the metal price and cost assumptions summarized in this report.

MINERAL PROCESSING AND METALLURGICAL TESTING

- Operating results from the last three years have demonstrated the following:

    - Tonnages treated include approximately 20% Boinás oxide ore, 46% Boinás skarn ore and 34% Carlés skarn ore.

    - The operation has a sound basis of consistent production data.

    - Total average Au and Ag recoveries were 92% and 79%, respectively.

    - Total Cu recoveries averaged between 81% and 84%, despite a slight falling trend in head grades.

- Changes to the mill feed composition will show up soon, as a result of the updated LOMP, including the elimination of Carlés skarn ore and increases in the proportion of oxide ore to skarn ore. Going forward, the projected recoveries should be updated based on metallurgical testwork conducted on the new ore blend. Potential changes in the concentration of deleterious elements in the subsequent ore blend should also be identified.

- Ore samples for metallurgical testwork should be representative of the ore blend for each year for the remainder of the mine plan.

- Keeping fluorine grades in copper concentrate below threshold limits is likely to be an issue for the next three years, as the proportion of Boinás skarn ore (the highest-fluorine feed source) is higher than in the past. Following that, Boinás oxide ore will become the dominant feed source, and issues with fluorine will ease.

RECOMMENDATIONS

RPA offers the following recommendations:

GEOLOGY AND MINERAL RESOURCES

- Focus exploration and resource work on skarn type material to maintain the blend of mill feed moving forward.

- Consistently assay for fluorine and include results in the Mineral Resource estimate for mine planning purposes. Consider re-assaying previous drill core in critical areas to generate better fluorine estimates.

- Investigate the use of implicit or traditional wireframe modeling of grade distributions within the larger domain wireframes.

- Perform a study to determine sub-domaining thresholds more relevant to the Mineral Resource and Reserve cut-off grades.

- Continue to consistently produce long and short term block models and comparisons should be reported accordingly.

- Prorate mill grade and tonnes back to headings and stopes based on proportions determined during grade control sampling and implement a reconciliation system comparing mill results with short-term and long-term models.

- Reevaluate the classification for each zone in conjunction with an empirically driven drill hole spacing study and update the models generated prior to 2014 to include a final classification processing step.

MINING AND MINERAL RESERVES

- Review production and cost performance as the blend of ore types changes, and incorporate results into updated cut-off grade estimates.

- Incorporate blending for fluorine feed grade in short- and long-term mine planning.

- Undertake a review of alternatives for Carlés, including targeting narrow high-grade areas with more suitable mining methods and further exploration of certain zones.

- Investigate the possibilities of installing a backfill raise system in order to reduce the demands of the truck fleet.

MINERAL PROCESSING AND METALLURGICAL TESTING

- Additional metallurgical testwork should be carried out to consider the impact of the following:

    - Changes in the zones to be mined as a result of updates to the Mineral Resources and Mineral Reserves and LOMP and the elimination of Carlés skarn ore from production.

    - Potential changes in the concentration of deleterious elements, such as fluorine, in the subsequent ore blend, which could impact the grade of the final concentrate.

- Metallurgical testwork should include (but not be limited to) the following scope items:

    - Mineralogical characterization and metal deportment analysis on a broad range of ore samples representative of the areas to be mined and on intermediate products from the extraction process.

- Review the deportment of fluorine through the process, and investigate methods of reducing fluorine recovery to concentrate.

TECHNICAL SUMMARY

PROPERTY DESCRIPTION AND LOCATION

The EVBC Operation is located in northwestern Spain within the Oviedo Province, Asturias Principality approximately 35 km west of the Asturian Capital, Oviedo, and 30 km south of the north coast of Spain along the Cantabrian Sea.

The mining concessions combined occupy a total surface area of 4,298 hectares, which includes the Ortosa-Godán and La Brueva areas which are not currently being exploited. The property includes two Investigative Permits comprising 753.60 hectares.

LAND TENURE

The properties are controlled by Kinbauri España S.L.U. Orvana acquired the project through the purchase of Kinbauri Gold Corp. (KGC) in September 2009.

The mineral rights for the properties are held in the form of Exploitation Concessions (EC) and Investigation Permits (IP). The EC provides the holder of the concession the right to extract minerals from a specified area, subject to approval of an Exploitation Plan by the Mining Authorities. The term is for 30 years and is renewable upon application. The Exploitation Plan includes the Environmental Impact Study and the subsequent Restoration Plan, which were approved in 1996 and in 2000.

An IP provides the holder of the permit the right to investigate the resources in the permit area, subject to approval of an Investigation Plan by the Mining Authorities. The holder has the right to carry out all types of exploration activities including geological studies, soil geochemistry, geophysics, and drilling. If there is any activity on surface that the mining authorities believe may affect the environment, the company may be required to get additional approvals from environmental authorities. The term is for three years and is renewable upon application.

RPA is not aware of any environmental liabilities on the property. Orvana has all material permits to operate EVBC. RPA is not aware of any other significant factors and risks that may affect access, title, or the right or ability to operate EVBC.

EXISTING INFRASTRUCTURE

Surface and underground infrastructure at the EVBC Operation include the following:

- A 2,000 tpd processing facility
- A tailings pond located in an old open pit
- Shops, offices, warehouse facilities, and a mine dry
- Site power supply
- A shaft equipped for hoisting
- A decline and a series of ramp-connected levels

HISTORY

Prior to Orvana's involvement at EVBC, Boinás and Carlés have been subject to mining activities dating back to the Roman era. In the 1800s and the early 1900s, several small copper mines were in production and mining for arsenopyrite was carried out during World War II.

Modern exploration commenced in the 1970s at Carlés. Sporadic drilling and sampling programs through the 1970s and 1980s gave way to underground exploration in 1990. Further drilling and engineering work by Rio Narcea culminated in the start of production at Boinás West Pit in 1997, followed by Boinás East Pit, and El Valle Pit. Open pit mining from 1997 to 2003 produced approximately 4.9 Mt, containing approximately 916,000 ounces of gold.

Underground production began in 2003 at Carlés and 2004 at Boinás. Underground operations ceased in 2006 due to rising costs, lack of mill feed, and excessive dilution.

GEOLOGY AND MINERALIZATION

The Río Narcea Gold Belt is located in the western portion of the Cantabrian Zone in the northwestern part of the Hercynian-age Iberian Massif. The Cantabrian Zone and the nearby

West Asturian-Leonese Zone consist of a stratigraphic section of Paleozoic sedimentary rocks that range in age from Middle Cambrian to Permian. The lower stratigraphic section of the Cantabrian Zone includes the Láncara Formation (Cambrian limestone), which is underlain by Cambrian feldspathic sandstone. The limestone has a total thickness of approximately 250 m and constitutes the principal host rock for gold and copper mineralization at El Valle-Boinás.

The 45 km long and four kilometre wide Río Narcea Gold Belt is characterized by the alignment of mineral occurrences, Paleozoic sediments, Tertiary Basins, fracture zones, and igneous intrusions. The most important igneous intrusions, from north to south, are the Ortosa-Godán, Carlés, Pando, La Brueva, Villaverde-Pontigo, and El Valle-Boinás intrusives.

Metamorphism in the Río Narcea Gold Belt is related only to intrusion of the igneous rocks, which produced contact metamorphism in the sedimentary rocks. They produce hornfels in the clastic units and skarn in the carbonate units.

Gold mineralization in the Río Narcea Gold Belt consists mainly of two types:

- **Gold-bearing copper skarn:** related to the interaction between late Hercynian intrusions, mesothermal solutions, and carbonate host rocks. This is the primary type of gold deposit that may be affected by later events (favourable host rocks for skarn include the Láncara Formation at El Valle-Boinás and the Rañeces Group Formation at Carlés).

- **Jasperoid type:** related to subvolcanic dykes and epithermal solutions which cause silicification with argillization and sericitization, plus epigenetic, hypogene oxidation. This type of mineralization may overprint, remobilize, and enrich gold mineralization within the skarn deposits, as happened at El Valle-Boinás. Also, this can form the breccia-style gold mineralization that produced higher grades at El Valle-Bionás. Limited to structural zones of varying width, they dip at high angles. They are typically the sites of leaching and enrichment that extend as much as 400 m below the surface.

EL VALLE-BOINÁS

The gold mineralization system has a strike length of two kilometres and a width of at least 0.5 km. The intrusive is elongated trending N35°E with a length of 500 m, and an average thickness of 300 m. A copper-gold mesothermal skarn was developed mainly along the contact between the igneous rock and the carbonate unit.

CARLÉS

The Carlés deposit is a gold and copper bearing skarn developed predominantly in the Devonian limestones of the lower portion of the Rañeces Formation along the north margin of the Carlés granodiorite. The Carlés intrusion is approximately circular in plan with a diameter of about 750 m.

Mineralization is continuous for over 1,000 m. It ranges in thickness from 1.5 m to over 25 m, dipping 50º to 90º away from the granitic intrusion. The skarn is known over a vertical continuity of 400 m and remains open at depth.

MINERAL RESOURCES

The 2014 Mineral Resource estimate for EVBC included updating seven of the 20 block models, and the application of new cut-off grades and depletion criteria for Mineral Resource reporting purposes.

The Mineral Resources at EVBC, as of September 30, 2014 inclusive of Mineral Reserves are summarized in Table 1-1.

RPA reviewed the resource assumptions, input parameters, geological interpretation, and block modelling procedures and is of the opinion that the Mineral Resource estimate is appropriate for the style of mineralization and that the resource model is reasonable and acceptable to support the updated 2014 Mineral Resource and Mineral Reserve estimates.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other modifying factors that could materially affect the Mineral Resource and Mineral Reserve estimates.

TABLE 1-1 SUMMARY OF MINERAL RESOURCES INCLUSIVE OF MINERAL RESERVES – SEPTEMBER 30, 2014

Orvana Minerals Corp. – El Valle Boinás – Carlés Operation

Measured

Zone	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (t Cu)
Boinás Oxides	638	4.42	1.05	25.01	91	6,703
Boinás Skarn	666	2.79	0.78	16.58	60	5,194
Carlés	38	4.55	0.68	5.26	6	259
Total	**1,342**	**3.62**	**0.91**	**20.27**	**156**	**12,216**

Indicated

Zone	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (t Cu)
Boinás Oxides	1,835	6.76	0.80	13.47	399	14,681
Boinás Skarn	1,770	3.16	0.58	14.40	180	10,264
Carlés	1,059	3.40	0.41	6.22	116	4,343
Total	**4,664**	**4.63**	**0.63**	**12.18**	**694.7**	**29,382**

Measured + Indicated

Zone	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (t Cu)
Boinás Oxides	2,474	6.16	0.86	16.45	490	21,272
Boinás Skarn	2,435	3.06	0.64	14.99	240	15,587
Carlés	1,097	3.44	0.42	6.19	121	4,608
Total	**6,006**	**4.41**	**0.69**	**13.98**	**851**	**41,443**

Inferred

Zone	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (t Cu)
Boinás Oxides	2,499	7.16	0.46	3.63	575	11,495
Boinás Skarn	2,135	3.35	0.45	12.27	230	9,609
Carlés	1,393	3.90	0.43	4.12	175	5,988
Total	**6,027**	**5.05**	**0.45**	**6.80**	**980**	**27,121**

Notes:

1. CIM definitions were followed for Mineral Resources.
2. Mineral Resources are estimated at an Au equivalent cut-off grade of 3.8 g/t for Boinás oxide, 2.5 g/t for Boinás Skarn and 2.3 g/t for Carlés Skarn.
3. Mineral Resources are estimated using a long-term gold price of US$1,300 per ounce, copper price of US$3.10 per pound and a silver price of US$23 per ounce. A US$/Euro exchange rate of 1/1.33 was used.
4. Mineral Resources are inclusive of Mineral Reserves
5. A crown pillar of 10 m is excluded from the Mineral Resource below the El Valle open pit.
6. Unrecoverable material in exploited mining areas has been excluded from the Mineral Resource.
7. Numbers may not add due to rounding.

MINERAL RESERVES

Mineral Reserves were estimated by RPA, in conjunction with EVBC personnel, based on mine designs applied to Measured and Indicated Resources, with dilution and extraction factors applied. Areas where stopes above cut-off grade were isolated were removed from the estimate. Stopes planned for mining up to September 30, 2014 were excluded. Mineral Reserves are summarized in Table 1-2.

TABLE 1-2 MINERAL RESERVES – SEPTEMBER 30, 2014

Orvana Minerals Corp. – El Valle Boinás – Carlés Operation

Category	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (t Cu)
Proven	467	3.36	0.96	20.33	50	4,484
Probable	1,722	4.54	0.59	11.54	252	10,193
Proven and Probable	**2,189**	**4.29**	**0.67**	**13.41**	**302**	**14,677**

Notes:

1. CIM definitions were followed for Mineral Reserves.
2. Mineral Reserves are estimated using gold equivalent cut-off grades by zone, consisting of 4.5 g/t AuEq for Boinás Oxides, 2.9 g/t AuEq for Boinás Skarns, and 2.8 g/t AuEq for Carlés. Gold equivalent cut-offs were calculated using recent operating results for recoveries, off-site concentrate costs, and on-site operating costs.
3. Mineral Reserves are estimated using average long-term prices of US$1,100 per ounce gold, US$2.75 per lb copper, and US$20 per ounce silver. A US$/Euro exchange rate of 1/1.33 was used.
4. A minimum mining width of 4 m was used.
5. Numbers may not add due to rounding.

MINING METHODS

The current mining methods used at Boinás Mine are overhand drift and fill, and transverse longhole stoping. Due to decreasing thickness of the remaining Boinás skarns, RPA changed the design of the longhole mining from transverse to longitudinal where appropriate. Drift and fill mining will continue to be used in the oxide areas of the mine. Ore is hauled to surface via ramp and/or skipped via shaft, depending on location and ore type. Backfill is placed by truck and scoop, consisting of cemented rock fill or waste fill, as appropriate to the mining sequence and geotechnical demands.

Carlés Mine uses longitudinal longhole stoping methods. Ore is hauled to a surface stockpile via underground truck, and transferred to highway-rated surface trucks for transport to Boinás. Backfill is via waste fill, as stopes are separated by rib pillars.

The LOMP is currently a five year plan. The first three years are at full production with a reduction in production during the last two years as shown in Table 1-3. Carlés Mine will be placed on care and maintenance in early 2015, pending future increases in metal prices, new results from exploration, or determination of an economic mining method, such as conventional narrow vein mining.

TABLE 1-3 LIFE OF MINE PLAN
Orvana Minerals Corp. – El Valle Boinás – Carlés Operation

Item	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Total
Mill Feed						
Tonnes (‘000)	618	547	547	311	174	2,198
Au (g/t)	4.01	4.06	4.67	4.68	4.51	4.32
Cu (%)	0.73	0.57	0.41	0.91	1.27	0.68
Ag (g/t)	13.86	11.61	9.65	18.98	21.31	13.57
Metal Production						
Au (koz)	74	66	76	43	23	282
Cu (tonnes)	3,656	2,693	1,624	1,708	1,320	11,000
Ag (koz)	220	163	136	152	95	767

MINERAL PROCESSING

The EVBC Operation processing plant consists of the following sequence of macro unit operations:

- Crushing and Screening
- Grinding and Cycloning
- Gravity Concentration
- Flotation Concentration
- Leaching/Adsorption via carbon-in-leach (CIL) process
- Gravity Concentrate Leaching (ILIX)
- Desorption and Elution
- Electrowinning
- Smelting
- Detoxification Plant for CIL Tailings Pulp
- Tailings Storage Facility (TSF)

The processing plant has a nameplate capacity of 600,000 tpa, where subsequent expansions have enabled treatment of over 750,000 tpa depending on ore types. Overall recoveries achieved in recent operation are 92% for gold, 81% to 84% for copper, and 79% for silver. Products include doré bars and copper concentrate with gold and silver credits.

PROJECT INFRASTRUCTURE

The EVBC Operation main infrastructure was completed in 1997 for open pit operations. The office was expanded in 2011.

Surface facilities other than the process plant include changing rooms, lunch rooms, clinic, warehouses, maintenance shops, electromechanical workshops, a shotcrete plant, a cement batch plant for backfill, a laboratory, a core storage facility, electrical power lines and substations for both mines, and a complete telecommunication system providing phone lines and fast internet and intranet connections for the various offices.

The underground workings at EVBC have auxiliary fixed installations including main and auxiliary ventilation, pumping systems, electrical distribution, and clean-water supply circuit. Also included are mine and surface treatment circuits, drainage, and water decant ponds. A 420 m shaft at Boinás is again operational after recent repairs.

The tailings impoundment is located within the El Valle pit and is properly lined and has an adequate pumping system. The plant-tailings circuit is a no-discharge facility.

MARKETS

The principal commodities at the EVBC Operation are freely traded, at prices that are widely known, so that prospects for sale of any production are virtually assured, subject to achieving product specifications.

As per industry norms for copper concentrate, penalty charges are incurred for various deleterious elements when they are over specified concentrations. Fluorine specifications, however, also include a hard cap, above which the concentrate is not readily saleable.

Concentrate lots have been above this cap from time to time, and thus required blending with low-fluorine concentrate lots or negotiation with the off-take company before shipping to the smelter.

ENVIRONMENTAL, PERMITTING AND SOCIAL CONSIDERATIONS

The EVBC Operation is permitted and bonded. Kinbauri España has obtained all material permits to operate the mines, processing plant, and tailings storage facility.

CAPITAL AND OPERATING COST ESTIMATES

Capital cost estimates for EVBC are based on the LOMP. The sustaining capital costs total $43 million, including mine development (contractor and company), mine infrastructure, equipment costs, plant costs, and tailings management.

In addition to sustaining capital costs, a budget of $20.1 million for reclamation and closure is included. This estimate includes installation and operation of a post-closure water treatment plant, and decommissioning costs.

Operating costs in the LOMP are based on recent operating history, and average approximately $70 million per year for the next three years. After that, costs decline due to lower production forecasts. Unit rates are summarized in Table 1-4:

TABLE 1-4 UNIT OPERATING COSTS
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Item	Units	LOMP Average
Mining	$/t milled	70
Processing	$/t milled	24
G&A	$/t milled	38
Total	**$/t milled**	**131**

2 INTRODUCTION

Roscoe Postle Associates Inc. (RPA) was retained by Orvana Minerals Corporation (Orvana) to prepare an independent Technical Report on the Kinbauri España – El Valle, Boinás, and Carlés Operation (EVBC Operation, EVBC, or the Project), located in the Asturias region of Spain in the municipalities of Belmonte de Miranda and Salas. The purpose of this report is to disclose Mineral Resource and Mineral Reserve estimates for the operation as at September 30, 2014. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects.

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Mineral Reserves as of September 30, 2014, total 2.2 Mt, at grades of 4.32 g/t Au, 0.68% Cu, and 13.4 g/t Ag. A Life of Mine Plan (LOMP) for EVBC, forecasts three years of mining at similar production rates, followed by two years of reduced, oxide-only production. Carlés will soon be placed on care and maintenance, pending an improved economic mining plan or higher metal prices, due to a lack of mineralization above cut-off grade.

SOURCES OF INFORMATION

Site visits were carried out by RPA Qualified Persons (QPs) Jason Cox, P.Eng., Sean Horan, P.Geo., and Jeff Sepp, P.Eng., from June 1 to June 13, 2014.

Discussions were held with personnel from Orvana and Kinbauri:

- Mr. Michael Winship, P. Eng., President and Chief Executive Officer, Orvana
- Mr. Shawn Wilson, Director of Engineering, Orvana
- Ms. Daniella Dimitrov, Chief Financial Officer, Orvana
- Mr. Neil Ringdahl, Chief Operating Officer, Orvana
- Mr. Joao Luis Mateus Nunes, General Director, Kinbauri
- Mr. Jorge Rodríguez, Director – Finance and Administration, Kinbauri
- Ms. Guadalupe Collar Menéndez, Chief Geologist, Kinbauri
- Mr. Manuel Gonzalo Fernández, Senior Geologist, Kinbauri
- Mr. Ken Strobbe, Acting Chief Mining Engineer, Consultant
- Mr. Juan Antonio García Rodríguez, Metallurgist, Kinbauri

Mr. Horan was responsible for reviewing and preparing the mineral resource models for the mines, and prepared Sections 4 through 12, and 14 of the Technical Report. Mr. Sepp was responsible for the Life of Mine (LOM) design and schedule for the various mines, and prepared Sections 15, 16, and 18 of the Technical Report. Brenna Scholey, P.Eng., was responsible for metallurgical and environmental aspects, and prepared Sections 13, 17, and 20 of the Technical Report. Mr. Cox bears overall responsibility for the Technical Report, and prepared Sections 19, and 21 through 24. All authors share responsibility for Sections 1, 2, 3, 25, 26, 27, 28, and 29 of the Technical report.

The documentation reviewed, and other sources of information, are listed at the end of this report in Section 27 References.

LIST OF ABBREVIATIONS

Units of measurement used in this report conform to the metric system. All currency in this report is US dollars (US$) unless otherwise noted.

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

3 RELIANCE ON OTHER EXPERTS

This report has been prepared by Roscoe Postle Associates Inc. (RPA) for Orvana Minerals Corp. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to RPA at the time of preparation of this report,
- Assumptions, conditions, and qualifications as set forth in this report, and
- Data, reports, and other information supplied by Orvana Minerals Corp. and other third party sources.

For the purpose of this report, RPA has relied on ownership information provided by Orvana Minerals Corp. RPA has not researched property title or mineral rights for the EVBC Operation, and expresses no opinion as to the ownership status of the property.

RPA has relied on Orvana for guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from the EVBC Operation.

Except for the purposes legislated under provincial securities laws, any use of this report by any third party is at that party's sole risk.

4 PROPERTY DESCRIPTION AND LOCATION

The EVBC Operation is located in northwestern Spain within the Oviedo Province, Asturias Principality approximately 35 km west of the Asturian Capital, Oviedo, and 30 km south of the north coast of Spain along the Cantabrian Sea (Figure 4-1). EVBC is situated within the municipalities of Belmonte de Miranda and Salas. The coordinates for the properties are latitude 43°16’ N and longitude 6°18' W for El Valle-Boinás and latitude 43°21' N and longitude 6°14' W for Carlés.

The mineral rights for the properties are held in the form of Exploitation Concessions (EC) and Investigative Permits (IP). The combined EC occupy a total surface area of 4,298 ha, which includes the Ortosa-Godán and La Brueva areas which are not currently being exploited. The property includes two IP comprising 753.60 ha (Figure 4-2).

LAND TENURE

The following section on land tenure is summarized from Noble et al., 2012.

The EC and IP are granted by the Spanish government, but oversight has been delegated to the regional authorities of Asturias.

The EC provides the holder of the concession the right to extract minerals from a specified area, subject to approval of an Exploitation Plan by the Mining Authorities. The term is for 30 years and is renewable upon application. The Exploitation Plan includes the Environmental Impact Study and the subsequent Restoration Plan, which requires approval by the Environmental Authorities. The EVBC Operation Exploitation Plans and the respective Environmental Studies and Restoration Plans, which were approved in 1996 and in 2000, give the holder of the EC the right to carry out further investigation activity inside the mining areas. Authorization is required from the Mining Authorities, which is achieved by submitting an annual investigation plan. Work plans are presented to the Dirección General de Minería before January 31st of each year.

At the same time, Kinbauri España S.L.U. submitted a single Complementary Investigation Plan for La Brueva and Godán-La Ortosa projects, which needs no further authorization except for that from the mining authorities. Any activity on those projects that may affect the environment would require permission from the environmental authorities, and an Environmental Study and the subsequent Restoration Plan would be required.

An IP provides the holder of the permit the right to investigate the resources in the permit area, subject to approval of an Investigation Plan by the Mining Authorities. The holder has the right to carry out all types of exploration activities including geological studies, soil geochemistry, geophysics, and drilling. If there is any activity on surface that the mining authorities believe may affect the environment, the company may be required to get additional approvals from environmental authorities. The term is for three years and is renewable upon application.

The properties are controlled by Kinbauri España S.L.U. Orvana acquired the project through the purchase of Kinbauri Gold Corp. (KGC) in September 2009. A list of mining concessions is given in Table 4-1.

TABLE 4-1 KINBAURI ESPAÑA MINING AND EXPLOITATION CONCESSIONS
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Type	Concession Name	Project	Number	Owner	Date Granted	Date Consolidated	Expiration Date	Size (ha)	Comments
Exploitation	Mariluz y Demasía	El Valle-Boinás	29,781	Kinbauri España	13-07-1972	10-01-1978	10-01-2068	239.8	
Exploitation	UCA 2ª y Demasía	El Valle-Boinás	29,962	Kinbauri España	31-05-1996		31-05-2026	189.8	
Exploitation	Velázquez y Demasía	El Valle-Boinás	24,142	Kinbauri España	01-08-1940	31-03-1986	31-03-2046	271	
Exploitation	Plinio y Demasía	Ortosa-Godán	26,393	Kinbauri España	11-06-1959	14-03-1986	14-03-2046	1,297	
Exploitation	Fortuna	Carlés	23,606	Kinbauri España	18-08-1932	12-03-1985	12-03-2045	14	
Exploitation	Electra	Carlés	23,768	Kinbauri España	25-06-1935	13-03-1986	13-03-2046	25	
Exploitation	Demasía a Electra	Carlés	24,141	Kinbauri España	26-08-1940	13-03-1986	13-03-2046	2	
Exploitation	Magnética	Carlés	23,959	Kinbauri España	04-03-1939	13-03-1986	31-03-2046	39	
Exploitation	Felipe fracción 5ª	Carlés	30,030	Kinbauri España	26-07-1989		26-07-2019	1371	Have to request extension before 26/7/2016
Exploitation	Felipe fracción 9ª	Carlés	30,030	Kinbauri España	26-07-1989		26-07-2019	122	Have to request extension before 26/7/2016
Exploitation	2ª Ampliación Nueva Perdiz	La Brueva	29,653	Kinbauri España	19-06-1978	19-06-1978	19-06-2038	232	
Exploitation	Pepito y Demasía	La Brueva	9,242	Kinbauri España	01-03-1894	09-07-1986	09-07-2046	193	
Exploitation	Metamórfica	Ortosa-Godán	23,996	Kinbauri España	16-03-1940	14-05-1986	14-03-2046	42	

Type	Concession Name	Project	Number	Owner	Date Granted	Date Consolidated	Expiration Date	Size (ha)	Comments
Exploitation	Aurita	Ortosa-Godán	26,385	Kinbauri España	11-06-1959	14-05-1986	14-03-2046	260	
Investigation	Quintana	El Valle-Boinás	30,802	Kinbauri España	13-05-2013			726	
Investigation	Campalcarro	El Valle-Boinás	30,803	Kinbauri España	30-08-2013			28	

RPA is not aware of any environmental liabilities on the property. Orvana has all material permits to operate EVBC. RPA is not aware of any other significant factors and risks that may affect access, title, or the right or ability to operate EVBC.

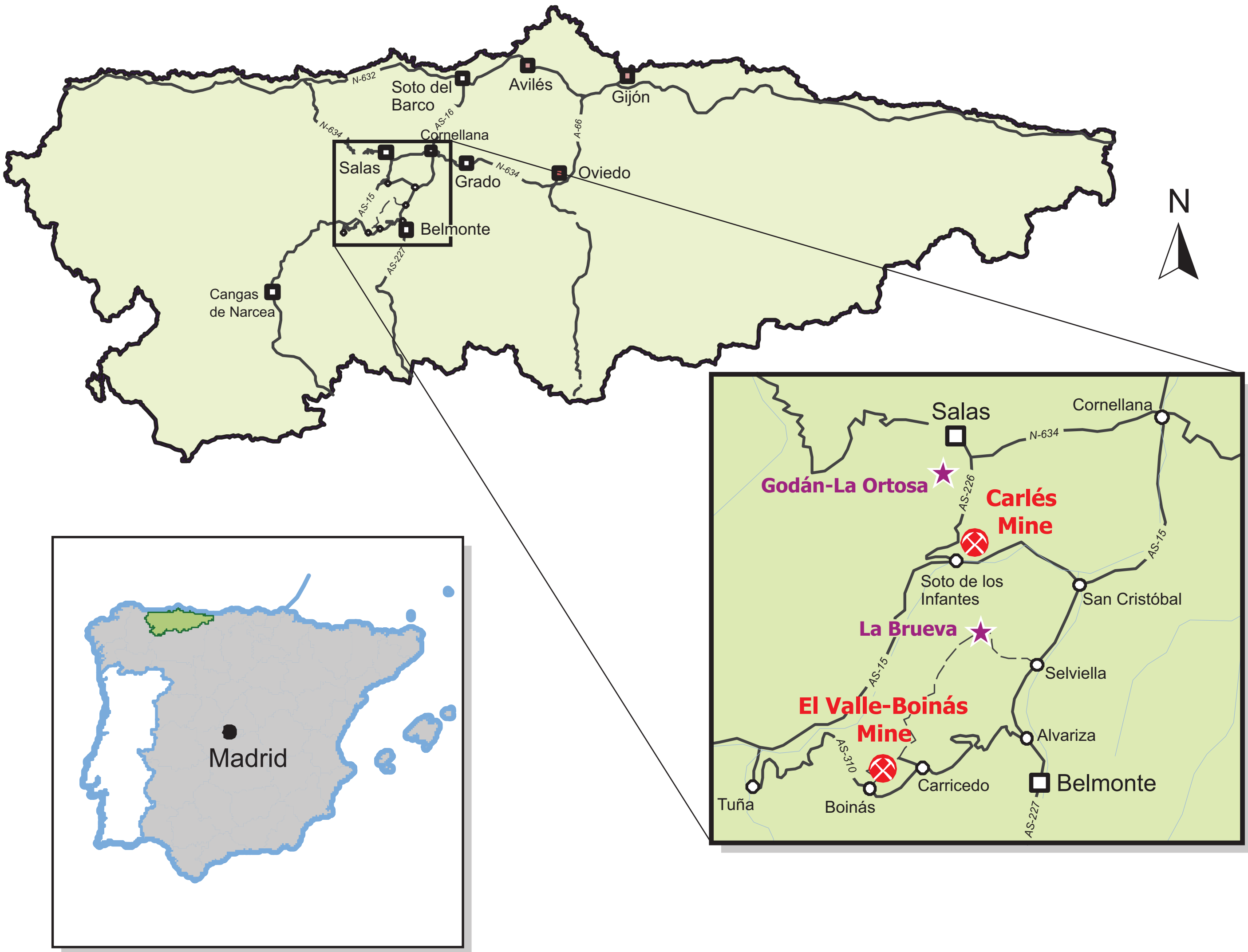

Figure 4-1

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Location Map

September 2014 **Source: *Orvana Minerals Corp., 2014.***

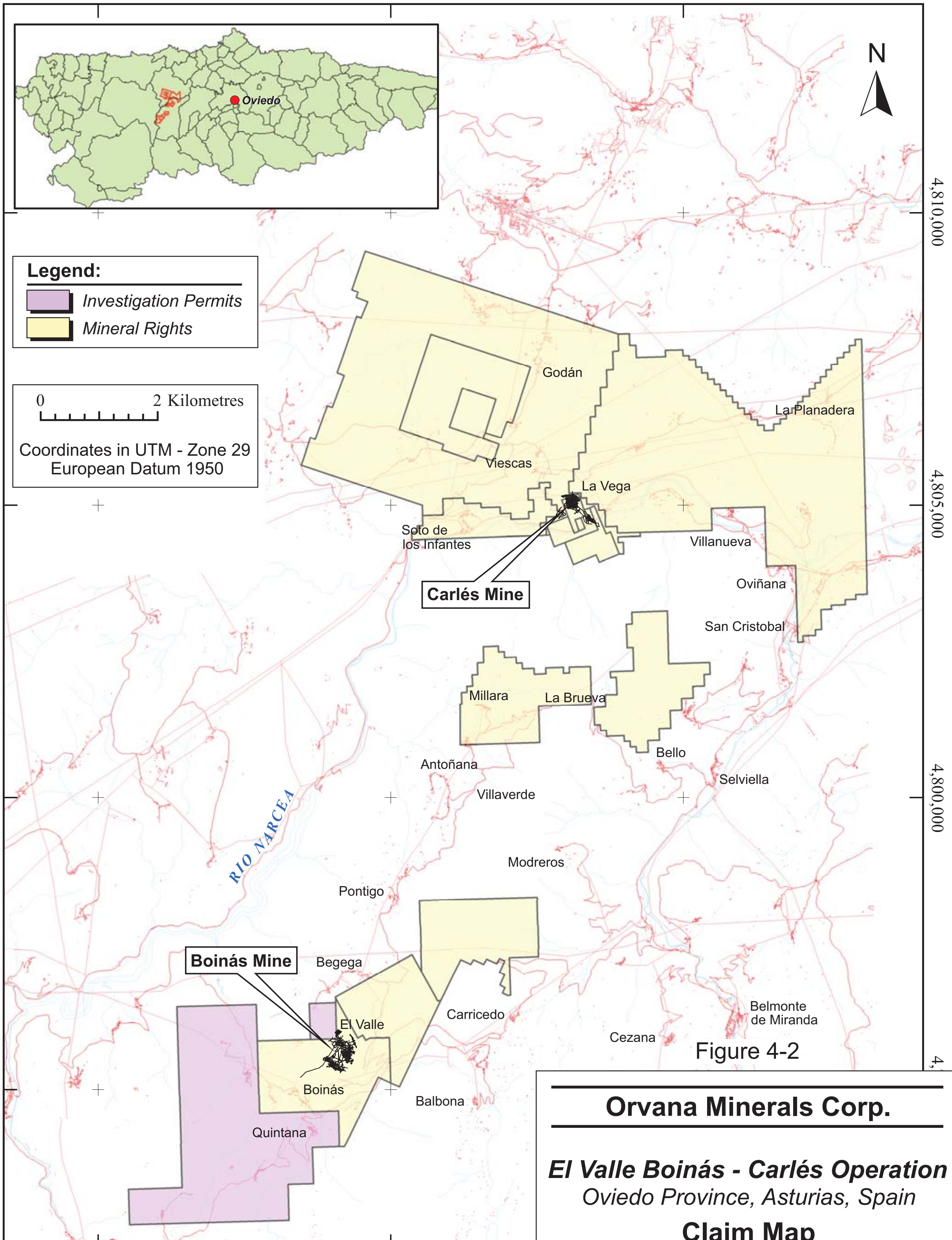

Figure 4-2

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Claim Map

September 2014

Source: Orvana Minerals Corp., 2014.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

ACCESSIBILITY

The Río Narcea Gold belt is located in northwestern Spain within Oviedo Province, Asturias Principality approximately 35 km west of the Asturian capital city of Oviedo and about 30 km south of the north coast of Spain. The Asturias airport and the port city of Avilés are located approximately 40 km northeast of the property. The properties are situated in the municipalities of Salas and Belmonte de Miranda.

The El Valle-Boinás area is located in the west side of the municipality of Belmonte de Miranda and is six kilometres west of the village of Belmonte. It is 15 km by road from Belmonte and 55 km by road from Oviedo.

The most northerly of the properties is the Ortosa-Godán area, which is located approximately three kilometres south of the village of Salas and 40 km by road from Oviedo.

The Carlés deposit is five kilometres southeast of Salas and 40 km by road from Oviedo. The deposit is located in the Municipality of Salas.

National road AS-15 and the Río Narcea River both cross over the Carlés deposit along the valley floor.

The La Brueva prospect is located six kilometres northwest of the village of Belmonte and about 50 km by road from Oviedo. It is located in the northern part of the Municipality of Belmonte de Miranda. The prospect is accessed by a narrow paved road that starts from Selviella on AS-227 that continues west to El Valle-Boinás.

CLIMATE

The climate is temperate with an average temperature of 12ºC and approximately 1,180 mm of annual precipitation. Mining and exploration activities take place year round.

LOCAL RESOURCES

There is a long history of mining in the area, and mine contractors and suppliers are locally available. High rates of unemployment in Spain have resulted in a ready supply of labour. The mine enjoys the support of local communities.

INFRASTRUCTURE

Surface and underground infrastructure at the EVBC Operation include the following:

- A processing facility with a capacity of up to 750,000 t per year
- A tailings pond located in an old open pit
- Shops, offices, warehouse facilities, and a mine dry
- Site power supply to both mines
- A 420 m shaft at Boinás equipped for hoisting
- A decline and a series of ramp-connected levels at each mine site
- Ventilation raises and escapeways

The EVBC Operation infrastructure was completed in 1997.

Other surface facilities include changing rooms, lunch rooms, clinic, warehouses, maintenance shops, electromechanical workshops, a shotcrete plant, a cement batch plant for backfill, a complete laboratory, a core storage facility, and a complete telecommunication system providing phone lines and fast internet and intranet connections for the various offices.

PHYSIOGRAPHY

The Properties are within a portion of the Río Narcea Gold belt that has a length of 15 km and a width of four kilometres, with a northeast-southwest orientation of the long axis. The terrain is hilly to mountainous and is dissected by numerous streams and rivers including the Río Narcea River. The hills are generally grass-covered with intermittent wooded areas.

6 HISTORY

The description of the history of the project is summarized from the Technical Report by Noble et al., 2012.

Prior to Orvana's involvement at EVBC, Boinás and Carlés have been subject to mining activities dating back to the Roman era. At El Valle and Boinás outcrops exposed in the walls of Roman pits were influential in the discovery of the deposit. Near the village of El Valle it is estimated that the Romans moved approximately 400,000 m^3 of material whereas near the village of Boinás approximately 700,000 m^3 was moved by the Romans.

In the 1800s and the early 1900s several small copper mines were in production and mining for arsenopyrite was carried out during World War II.

Modern exploration commenced in the 1970s at Carlés. A summary of historical exploration activities is given in Table 6-1.

TABLE 6-1 HISTORICAL EXPLORATION AND DEVELOPMENT
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Year	Company	Location	Activity
1971-1972	Gold Fields Española, S.A.	Carlés	Mapped Carlés Skarn, soil and outcrop sampling, geochemical analyses, surface magnetometer survey
1981	Boliden Minerals A.B.	La Ortosa	La Ortosa granodiorite geological mapping, soil geochemical and geophysical surveys on 600 m by 500 m grid, seven drill holes amounting to 1,085 m
1985	Exploraciones Mineras del Cantábrico S.A.	Carlés	Three drill holes totalling to 346 m
1985	Anglo American Company (AAC)	Carlés	1:6,000 and 1:25,000 aerial photography, photo geologic and outcrop mapping (1:1,000) 253 outcrop samples 240 soil samples 1,292 m of RC drilling from 25 holes 13,147 m of core drilling from 58 drill holes assayed Au, Cu, As Geotechnical studies and preliminary bench metallurgical test work
1990	AAC & Hullas del Coto Cortés, S.A. (HCC)	Carlés	910 m of decline, +70, +40, +18 levels, 200 m of ore drives and 80 m of raises 600 underground panel samples, 189 channel samples, 140 muck samples 90 samples weighing a total of 36 tonnes sent to American Research Laboratories in Johannesburg, South Africa for large-scale metallurgical testwork 6,012 m of core drilling in 108 holes
		Godán/El Valle Boinás	Mapping of Roman Pits, collected 858 samples, magnetometer, soil geochemical surveys
1991	AAC & HCC	Godán/El Valle Boinás	8,932 m of drilling from 43 holes at Boinás East, El Valle and Godán
		Carlés	Feasibility study
1992	AAC, HCC and Concord Joint Venture	La Brueva/El Valle Boinás	Mapping, trenching and drilling of the west breccia over 250 m strike length
1994	Rio Narcea (AAC, HHC and Concord)	La Brueva/El Valle Boinás	9,727 m of drilling in 50 holes at El Valle, Pontigo Prospect, Villaverde Prospect, Antonana and La Brueva
1994-1995	Rio Narcea	La Brueva/El Valle Boinás	Delineation and infill at El Valle and target testing at Villaverde, Antoñana,

Year	Company	Location	Activity
			Millara and La Brueva prospects
1996	Rio Narcea	El Valle Boinás	Infill drilling in the Black Skarn, feasibility study on the Boinás East Zone
		Carlés	16,283 m in 96 drill holes of infill drilling (drilling to 25 m spacing to 100 m below surface and to 50 m spaced drilling 200 m below surface)
1996-1998		Godán	5,656 m in 17 drill holes
1997-1998		El Valle Boinás	Commencement of open pit at Boinás West (870,000 tonnes mined for 115,000 Au ounces at a grade of 4.1 g/t Au by end of 1998)
1999, 2001			Commencement of open pit at Boinás East (1,215,000 tonnes for 192,450 ounces of gold at a grade of 4.93 g/t Au and 0.52% Cu)
1999			Boinás West pit backfilled with waste from Boinás East open pit.
1999-2003			Mining at Ell Valle open pit (2,760,000 tonnes for approximately 600,000 ounces of gold). Included mining of Caolinas zones and Charnela zone
2000-2002		Carlés	Surface mining at Carlés North (64,000 tonnes produced for 9,320 Au ounces at a grade of 4.54 g/t Au)
2002-2003		El Valle Boinás	Feasibility study for underground mining at Boinás East
2003		Carlés	Dewatering of the decline followed by underground drilling
2003-2006		Carlés	Underground production (296,000 tonnes for 49,000 Au ounces at grade of 5.22 g/t Au and 0.76% Cu)
2004-2006		El Valle Boinás	Underground mining commenced at Boinás East, closed due to rising costs, insufficient mill feed and excessive dilution
2004-2006		All properties	38,655 m of drilling

7 GEOLOGICAL SETTING AND MINERALIZATION

The description of the geology and mineralization of the project has been adapted from the Technical Report by Noble et al., 2012.

REGIONAL GEOLOGY

The Río Narcea Gold Belt is located in the western portion of the Cantabrian Zone in the northwestern part of the Hercynian-age Iberian Massif, as shown in Figure 7-1. The Cantabrian Zone is the eastern foreland area that transitions to the west through the West Asturian-Leonese Zone toward the internal zones of the Hercynian orogenic belt. The Cantabrian Zone and the nearby West Asturian-Leonese Zone consist of a stratigraphic section of Paleozoic sedimentary rocks that range in age from Middle Cambrian to Permian. Extensive early broad-scale folding and thrusting, and then normal faulting are common in the region, and intrusions of Hercynian and later age have intruded the sedimentary package. Post-dating the igneous intrusions are high-angle normal faults that in turn predate Tertiary sedimentation. The geologic situation is further complicated by Alpine thrusting, which may move older rocks over the Tertiary sediments and may also displace mineralization.

The Cantabrian Zone, a typical foreland thrust belt, takes on an arcuate shape and is characterized by an unmetamorphosed, 3,500 m thick sedimentary succession that includes a pre-orogenic pre-Carboniferous Paleozoic sequence, with clastic and carbonate sediments of shallow-water platform facies resting unconformably on upper Proterozoic turbidite facies deposits. The Carboniferous section corresponds to a synorogenic clastic sequence in the Upper Carboniferous.

The West Asturian-Leonese Zone, located west of the Río Narcea Gold Belt, consists of a nearly continuous series of siliciclastic rocks. Approximately 11,000 m of these Cambrian through Ordovician sediments have been subjected to intense deformation.

The Variscan Orogeny gave rise to superficial thrust sheets with associated structures, especially folds. The deformation took place under shallow crustal conditions without metamorphism.

Prior to Tertiary red bed sedimentation and westward-verging Alpine thrusting, late Hercynian normal faulting, along which faults dykes intruded, affected the Paleozoic rocks.

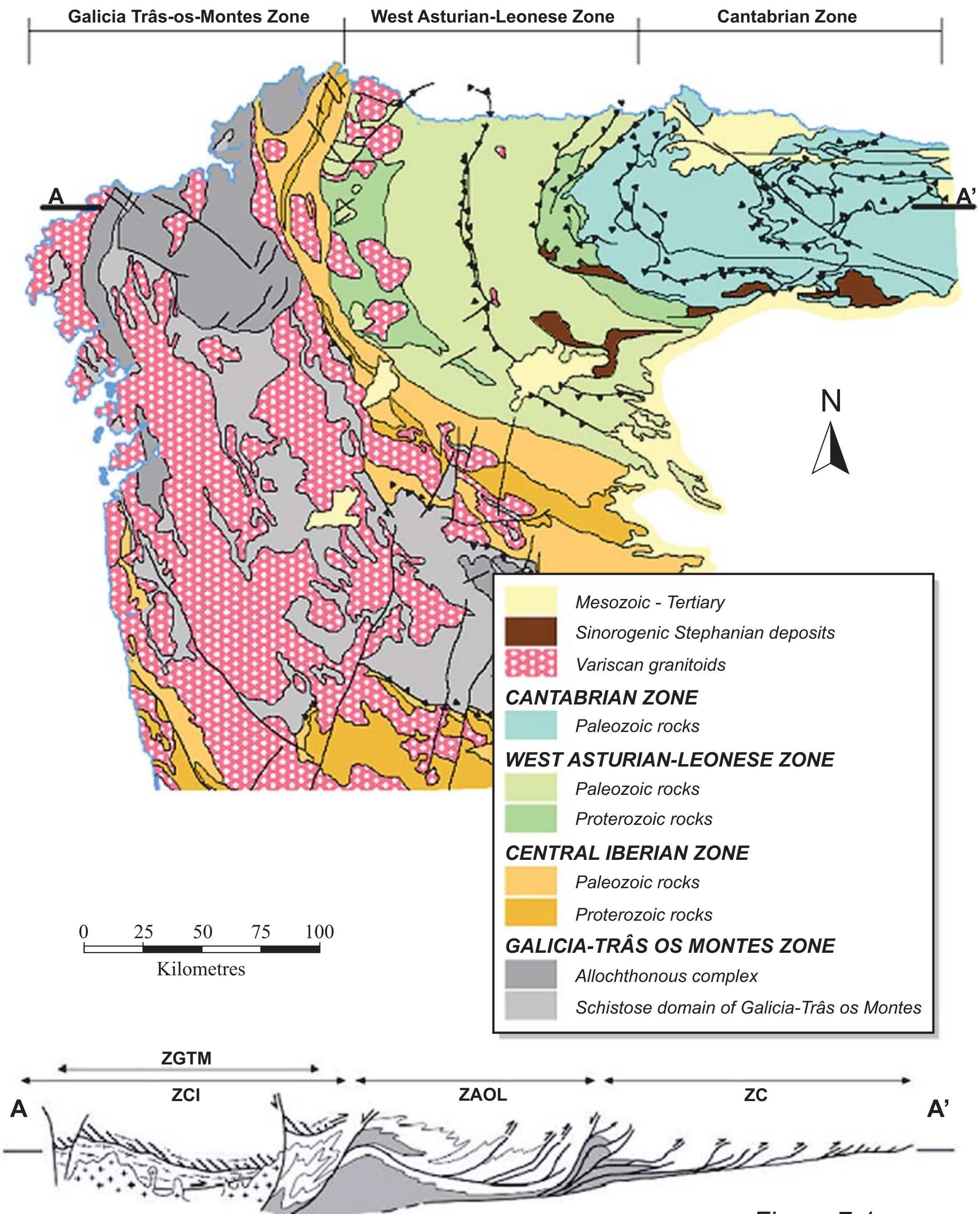

Figure 7-1

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Regional Geology

September 2014

Source: Orvana Minerals Corp., 2014.

LOCAL GEOLOGY

The project area is underlain mainly by Lower Paleozoic rocks and unconformably overlain in places by Tertiary sediments that fill a northeast-oriented channel eroded along the Río Narcea fracture system (Figure 7-2). The lower stratigraphic section of the Cantabrian Zone includes the Láncara Formation (Cambrian limestone), which is underlain by Cambrian feldspathic sandstone. The limestone has a total thickness of approximately 250 m and constitutes the principal host rock for gold and copper mineralization at El Valle-Boinás.

The Upper Cambrian Barrios Formation and Ordovician Oville Formation orthoquartzites overlie the earlier Cambrian rocks. The Ordovician section is overlain by 1,500 m of carbonate and clastic rocks (mostly shales) that represent the Silurian, Devonian and Lower Carboniferous in the region. About 100 m to 300 m of black shale (Lower Silurian Formigoso Formation) is overlain by 80 m to 200 m of ferruginous intertidal to marginal marine sandstone (Middle-Upper Silurian Furada Formation), which constitutes the main host rock for gold mineralization at the Ortosa deposit in the north part of the Río Narcea Gold Belt.

Devonian stratigraphy in the Río Narcea Gold Belt is represented by some 1,250 m of limestone with interbedded sandstone and shale that comprises the Rañeces Series. This unit is the host for skarn gold-copper mineralization at the Carlés deposit.

During the Carboniferous, synorogenic sedimentation began with deposition of conglomerate and finished with coal beds. The sedimentation took place in small basins formed during the tectonic deformation related to the Variscan Orogeny.

Upper Eocene-Lower Oligocene alluvial sediments cover nearly all of the mineralized section in a topographic depression along the Río Narcea fracture system. These sediments lie on an erosional unconformity above the Paleozoic bedrock and reach a maximum thickness of 130 m.

The project area is located in the western part of the Cantabrian Zone, called the Somiedo Unit, which is made up of four minor stair-like thrusts belonging to the Variscan Orogeny (Mid-Devonian to Lower Carboniferous age). The lowest thrust unit is located below the Láncara Formation. Later extensional events were responsible for normal faulting that controlled the emplacement of intrusions and provided conduits for mineralized hydrothermal fluids.

Remobilization and local enrichment occurred during the latest tectonic event known as the Alpine Orogeny (Tertiary age) along reactivated existing structures. In addition, slices of Paleozoic rocks were thrust over Tertiary sediments. The combination of overthrusted Paleozic sections and Tertiary cover is responsible for minimal exposure of mineralized bedrock with the exception of a few valleys in the Río Narcea Gold Belt.

Igneous activity occurred during various periods in the Cantabrian Zone, the majority being intrusive with minor volcanism consisting of interbedded basalt and trachyte flows and sills occurring during the upper Cambrian. Intrusive activity commenced during the late stages of the Hercynian orogeny and continued intermittently to the end of the Paleozoic. Northeast – southwest orientated faults formed during the extensional event and created preferential sites for post-orogenic calc-alkaline intrusions responsible for skarn and hornfels formation. Gold and copper mineralization is associated with the hydrothermal activity as a result of the intrusive events.

PROPERTY GEOLOGY

The 45 km long and four kilometre wide Río Narcea Gold Belt is characterized by the alignment of mineral occurrences, Paleozoic sediments, Tertiary Basins, fracture zones, and igneous intrusions.

High angle faults striking sub-parallel to the regional north-northeast trend of older structures predate igneous intrusions and Tertiary sediments which partly cover the anticlinal axis zone of the southern portion of the Río Narcea Gold Belt. From El Valle Boinás in the south to La Brueva further north, gold belt trends coincide with the anticlinal fold axis while north of La Brueva, the belt is truncated resulting in a north-northwest trend shown by the alignment of Carlés and La Ortosa deposits. Reactivation of older structures during the Tertiary Alpine Orogeny in the southern part of the belt has been found to cut and displace some mineralization.

The stratigraphy of the Río Narcea Gold Belt is shown in Figure 7-3.

A regional unconformity truncates the Upper Devonian section where small outcrops of sandstone and conglomerates represent the remnants of a thick Carboniferous section that developed toward the center of the sedimentary basin to form the coal-producing region of central and eastern Asturias.

In the N20°E-trending part of the Río Narcea Gold Belt the anticline is overturned to the northwest and the axial plane dips 45° to 70° to the southeast. The structure is affected by a number of relatively low-angle reverse faults that produced strong brecciation and a structurally prepared host rock especially at the contact between the siliciclastic Oville Formation and the carbonate rocks of the Láncara Formation. Reactivation of the northeast-trending fault structure during an extensive period of erosion was accompanied by hydrothermal activity occurring periodically through the end of the Paleozoic.

During the Mesozoic, the region underwent extensive periods of uplift, erosion, normal faulting and fault reactivation along northeast, northwest and east-west trends as the region adjusted to the opening of the Cantabrian Sea during late Triassic to early Cretaceous time. Streams carved valleys along the older mineralized fracture systems, forming a northeast-trending ridge along the east flank of the Río Narcea anticline. The overthrusted Paleozoic section together with the underlying Tertiary sediments, hide the mineralized bedrock in all but a few recent valleys and Roman pits along the gold belt.

Several Upper Carboniferous intrusive igneous rocks are known along the Río Narcea Gold Belt. The most important, from north to south, are the Ortosa-Godán, Carlés, Pando, La Brueva, Villaverde-Pontigo, and El Valle-Boinás intrusives.

Metamorphism in the Río Narcea Gold Belt is related only to intrusion of the igneous rocks, which produced contact metamorphism in the sedimentary rocks. They produce hornfels in the clastic units and skarn in the carbonate units.

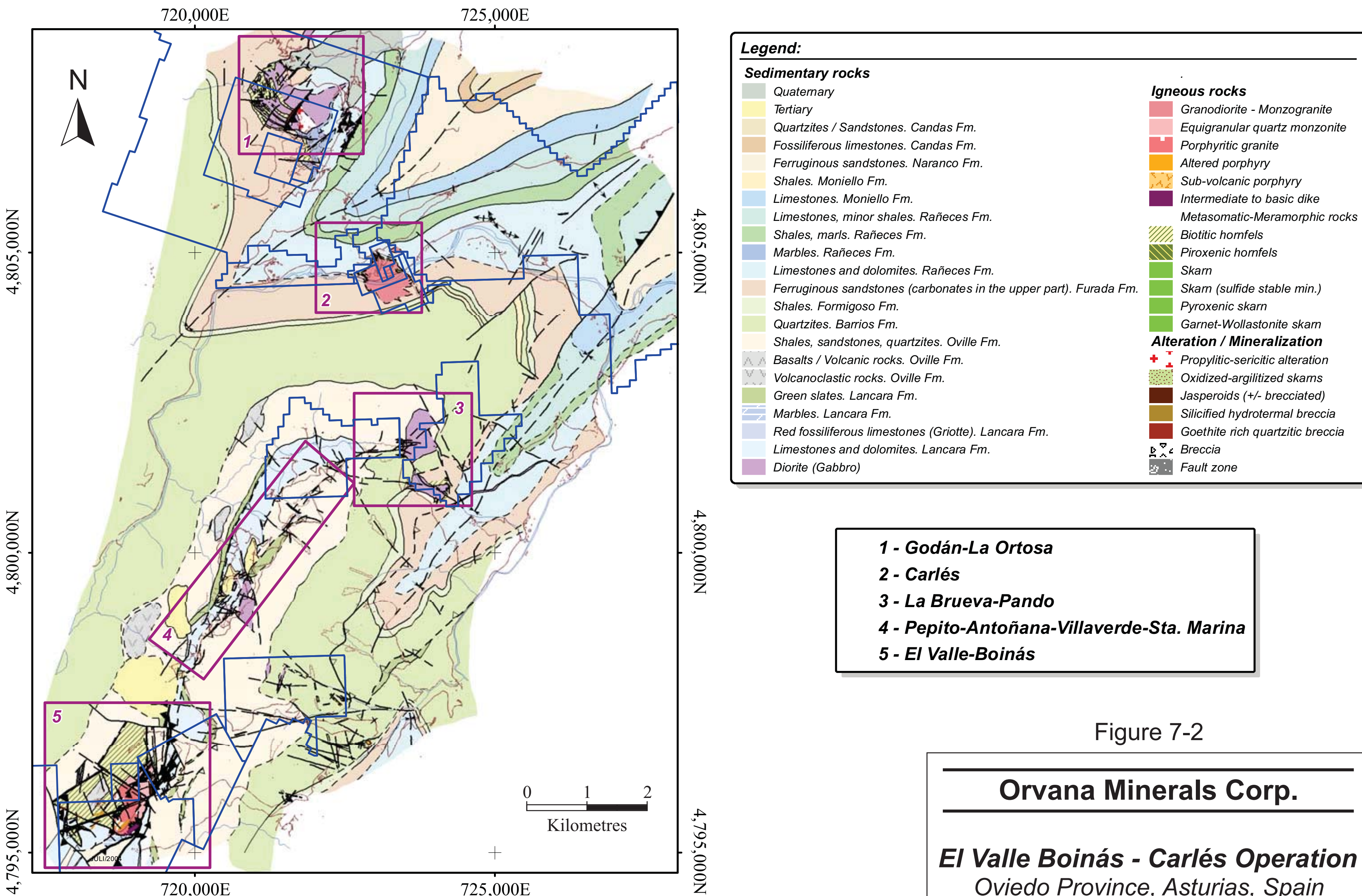

Figure 7-2

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Property Geology

September 2014

Source: Orvana Minerals Corp., 2014.

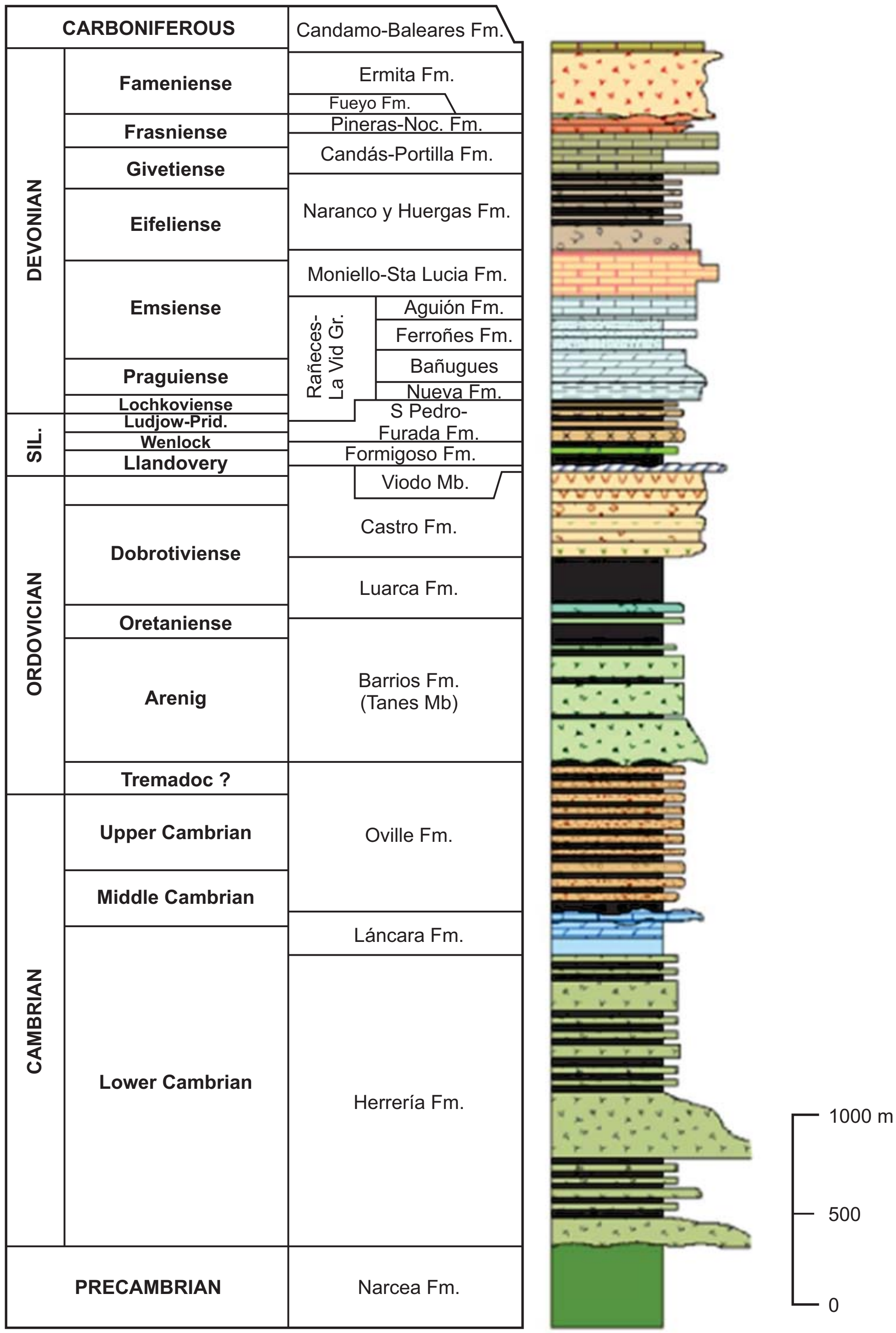

Figure 7-3

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Río Narcea Stratigraphy

Source: Orvana Minerals Corp., 2014.

MINERALIZATION

Gold mineralization in the Río Narcea Gold Belt consists mainly of two types:

- **Gold-bearing copper skarn:** related to the interaction between late Hercynian intrusions, mesothermal solutions, and carbonate host rocks. This is the primary type of gold deposit that may be affected by later events (favourable host rocks for skarn include the Láncara Formation at El Valle-Boinás and the Rañeces Group Formation at Carlés).
- **Jasperoid type:** related to subvolcanic dykes and epithermal solutions which cause silicification with argillization and sericitization, plus epigenetic, hypogene oxidation. This type of mineralization may overprint, remobilize, and enrich gold mineralization within the skarn deposits, as happened at El Valle-Boinás. Also, this can form the breccia-style gold mineralization that produced higher grades at El Valle-Bionás. Limited to structural zones of varying width, they dip at high angles. They are typically the sites of leaching and enrichment that extend as much as 400 m below the surface.

EL VALLE-BOINÁS

Mineralization at the El Valle-Boinás copper-gold deposit can be grouped into several significant deposits related to the Boinás granitic intrusive and carbonate rocks of the Láncara Formation (Cambrian age), as shown in Figure 7-4.

The gold mineralization system has a strike length of two kilometres and a width of at least 0.5 km. The intrusive is elongated trending N35°E with a length of 500 m and an average thickness of 300 m. A copper-gold mesothermal skarn was developed mainly along the contact between the igneous rock and the carbonate unit.

Late reactivation of the main northeast-trending fracture system was accompanied by two or more phases of epithermal mineralization as well as the intrusion of porphyry dykes. These events produced hypogene oxidation with further enrichment of gold, arsenic, antimony and mercury (Martin-Izard, et al., 1999).

Rhyodacite dykes, which are always sericitized, were emplaced along fractures and breccia zones trending north-northeast.

The intense silicification along fractures and breccia zones resulted in the formation of hematitic jasperoid that is characterized by enrichment in gold, arsenic, antimony and mercury.

The presence of cuprite and native copper in the structures and breccias suggests the leaching of chalcocite, which is encountered at a depth of approximately 400 m along the A107 structure. This can be viewed as evidence of two-cycle leaching and enrichment.

CARLÉS

The Carlés deposit is a gold and copper bearing skarn developed predominantly in the Devonian limestones of the lower portion of the Rañeces Formation along the north margin of the Carlés granodiorite, as shown in Figure 7-5. The Carlés intrusion is approximately circular in plan with a diameter of about 750 m. The intrusion is located at the intersection of major faults (east-west, northeast-southwest and southeast-northwest) and it is bisected from west to east by the Río Narcea River. The northern part of the granodiorite is in contact with the lower part of Rañeces Formation and the southern part of the intrusion is in contact with the siliciclastic Furada Formation. Several barren Permian porphyritic and diabasic dykes crosscut the existing lithologies.

Mineralization is continuous for over 1,000 m. It ranges in thickness from 1.5 m to over 25 m, dipping 50º to 90º away from the granitic intrusion. The skarn is known over a vertical continuity of 400 m and remains open at depth.

The Carlés skarn is of calcic composition and is an exoskarn although irregular endoskarn has developed locally. It consists of layers of garnet (grossularite-andradite composition) intercalated with layers of pyroxene skarn, mostly of hedenbergite composition. Retrograde phases of the skarn results in the formation of irregular magnetite layers associated with amphibole. Inside these bands is where most of the copper sulphides and gold mineralization occur. The skarn mineralization transitions into coarse-grained marbles then non-altered limestones away from the intrusive. The latter may show narrow intercalations of distal garnet-pyroxene incipient skarn.

Gold mineralization at Carlés is closely associated with copper sulphides, which consist of disseminated and patchy chalcopyrite and bornite that precipitated mainly in the magnetite zone. Other minerals common in the skarn are arsenopyrite, löellingite, pyrrhotite, and late-stage pyrite.

Mineralization at Carlés is divided into four areas: Carlés East, Carlés North, Carlés Northwest, and Carlés West.

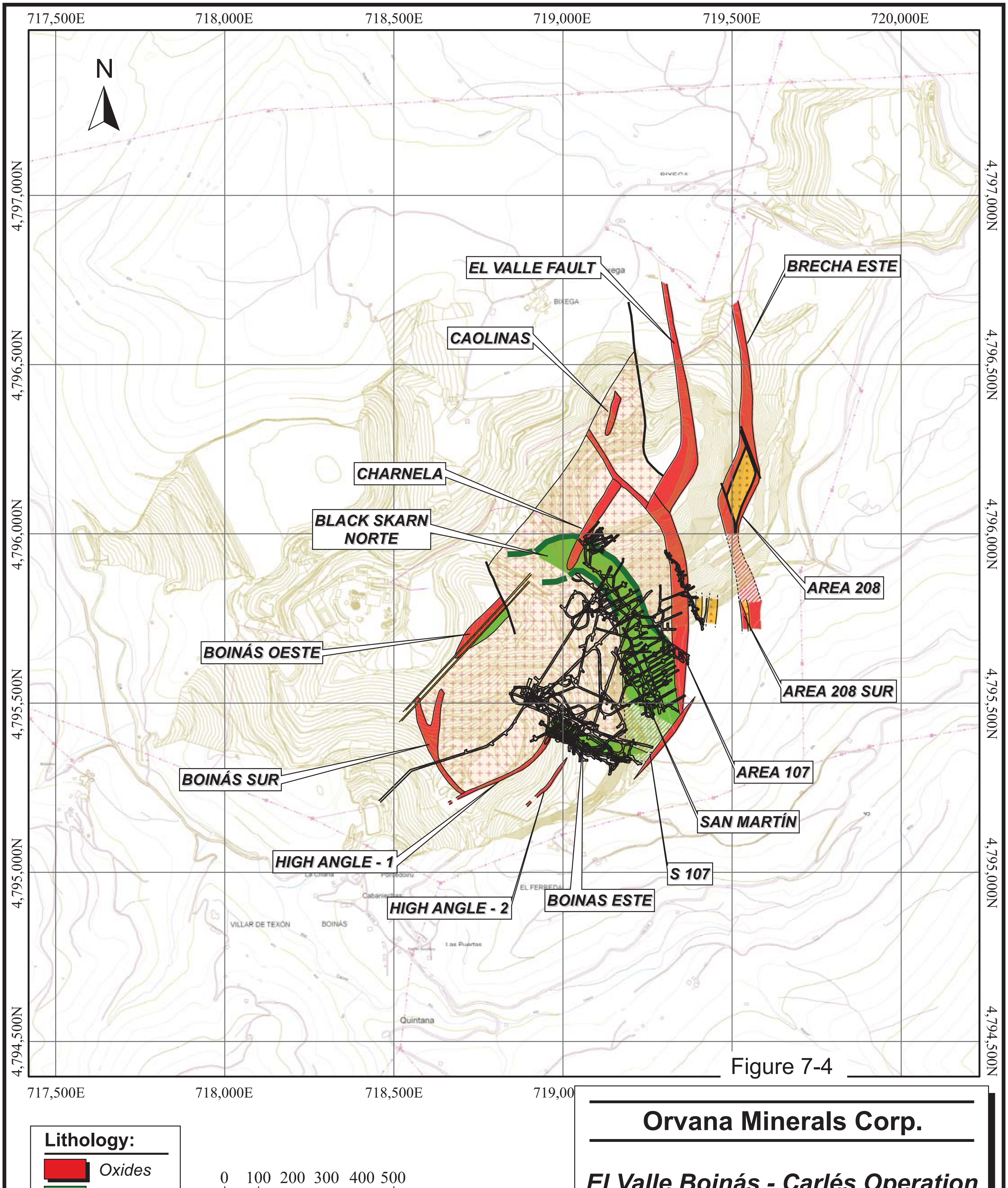

Figure 7-4

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Boinás Mineralized Zones

September 2014

Source: Orvana Minerals Corp., 2014.

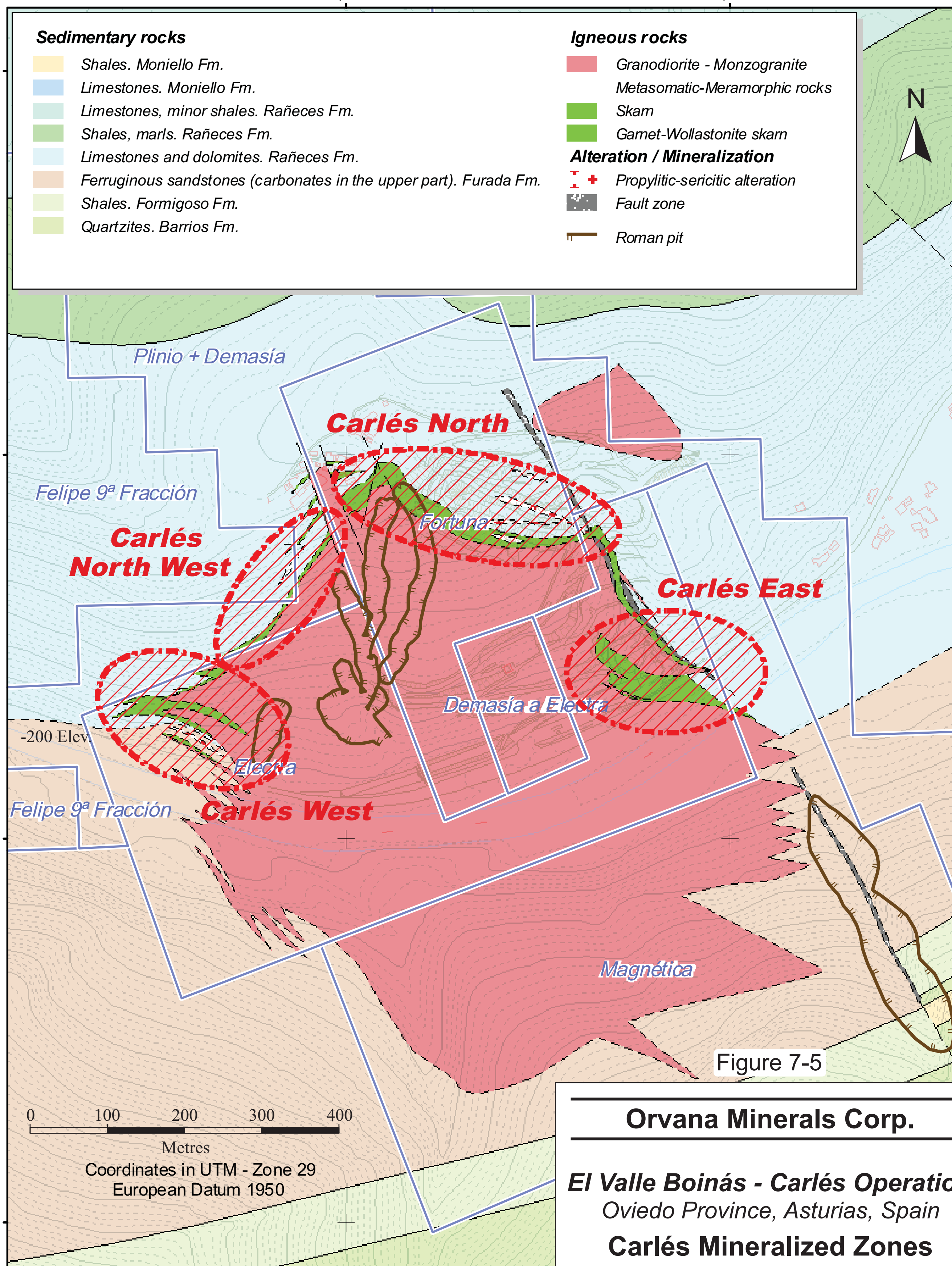

Figure 7-5

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Carlés Mineralized Zones

September 2014

Source: Noble, 2012.

8 DEPOSIT TYPES

The description of the deposit types for the project has been adapted from the Technical Report by Noble et al., 2012.

SKARN-TYPE DEPOSITS

Gold-copper skarns have developed mainly along the contact between intrusives and carbonate units. Two different types of skarn have been recognized at El Valle-Boinás. The first is a calcic skarn related to limestone units and the second is a magnesian skarn, called “black skarn”, that is related to dolomite units.

Calcic skarns consist mainly of garnet, pyroxene, and wollastonite. Retrograde calcic skarns consist of epidote, quartz, calcite magnetite, and sulphides (pyrite, arsenopyrite, and chalcopyrite). Gold mineralization in this type of skarn is erratic and mostly uneconomic, although some calcic skarns produced ore in the open pits.

Magnesian skarns consist of diopside with some interbedded forsterite. Retrograde magnesian skarn is altered to tremolite, actinolite, serpentine and magnetite. Commonly it is accompanied by chalcopyrite, bornite, pyrrhotite, pyrite, and arsenopyrite as well as disseminated electrum. The result of this retrogradation is development of a dark magnesian skarn. Geochemistry indicates a Cu-Ag-Au-As-Bi-Te association. Gold mineralization in this type of skarn is significantly higher grade than the calcic skarns and is generally a good target for underground mining. The magnesian skarns tend to have good continuity at cut-off grades below 2.0 g/t Au, but can be very difficult to predict above 3.0 g/t Au.

The gold-copper-bearing skarns at Carlés are generally calcic skarns. Better grade gold-copper mineralization is associated with high magnetite and bornite content that is localized in generally continuous, relatively thin (four metres thick) layers of retrograde skarn.

A different type of skarn is observed at Ortosa where gold is deposited without copper mineralization. These skarns are calcic skarns formed as thin, discontinuous layers interbedded with hornfels and pyroxene hornfels.

EPITHERMAL-TYPE DEPOSITS

At the El Valle-Boinás deposit, reactivation of fracture zones (along northeast-southwest, east-west and northwest-southeast orientations) produced widespread brecciation and favoured the emplacement of porphyritic dykes. A low-temperature alteration and mineralization event is spatially and genetically associated with the subvolcanic porphyry dykes, which overprint all previous lithologies. Depending on the host rock, there are different styles of hydrothermal alteration and mineralization, such as: sericite-adularia-carbonates (+py-aspy) in granites and skarns; leaching, enrichment, and silicification in skarns (+ native copper and chalcocite), and silicification (+py) in dolomites.

Highest gold grades occur where the low-temperature mineralization overprints previously mineralized gold-copper skarn, forming jasperoid or semi-jasperoids with native copper and minor chalcocite and cuprite. The associated geochemistry is characterized by an increase in As, Sb, and Hg. This low-temperature event is the principal gold-mineralizing episode at El Valle.

Gold, and in some cases, base-metal mineralization, has been found in association with late tectonic breccias related to low-angle thrust faults at El Valle-Boinás. The origin of the gold mineralization in these structures is thought to be due to remobilization of previous skarn or jasperoid related gold mineralization. Gold associated with low-angle structures is important at El Valle-Boinás where a significant percentage of the open pit minable gold mineralization extracted from the Boinás East Zone came from this type of structure.

9 EXPLORATION

Parts of the exploration section have been summarized from the Technical Report by Noble et al., 2012.

Since Kinbauri España's involvement with the EVBC Operation, there have been exploration and key discoveries at El Valle-Boinás, Carlés, Godán and La Ortosa. Limited exploration activity has been conducted since the previous technical report by Noble, Williams and Wheeler in 2012 with the exception of drilling the down dip extension of the Carlés North deposit.

The gold-copper deposits in the Río Narcea Gold Belt are complex deposits that present challenges for exploration. The original mineral deposits are usually internally complex skarn deposits that have been subjected to epithermal alteration and remobilization of the mineralization, plus displacement and distortion by both high-angle reverse and thrust faults. In addition, individual ore zones may be high grade, but relatively small and difficult to locate.

Despite these challenges, it was found that the area was sufficiently well mineralized that continued exploration at El Valle-Boinás found enough new resources to extend Río Narcea Gold Mines' (RNGM) mine life by 24% and to increase the amount of gold mined by 43% over the reserve at the beginning of mining. Key discoveries that extended mine life include the Sienna Zone at the east side of Boinás East, the Charnela Zone on the southern part of the El Valle pit and the Caolinas Zone on the west edge of the El Valle pit.

The Black Skarn North was discovered in 2001 by underground drilling at the north boundary of the main Boinás intrusive. The discovery drill hole, Val-1001, intersected 3.2 g/t Au and 0.54% Cu over 46 m, which includes high grade areas containing 10.17 g/t Au and 2.4% Cu over 7.60 m. At the same time, the Charnela South was also discovered by underground drilling.

In 2003, a program looking for deeper mineralization east of the El Valle pit discovered the Area 208 zone by intersecting mineralization from a deep surface hole. This was followed by further drilling from the bottom of the El Valle open pit and the first drill hole, Val-208, intersected 10.80 g/t Au over 51.10 m near the open pit and another zone with 13 g/t Au over five metres further east of the pit.

Kinbauri Gold Corp (KGC) discovered the Area 107 (A107) and San Martín mineralized zones in 2007 to 2008, and in 2010 Orvana discovered the S107 Zone. In 2011, mineralization was encountered in the Black Skarn Northwest Zone.

EXPLORATION POTENTIAL

The exploration potential at the EVBC Operation is summarized as follows (Figures 7-4 and 7-5).

BOINÁS

- A107 is open to the south and below the intersection with the Black Skarn North and San Martín skarns.
- The skarns at Boinás have potential for expansion around different portions of the Boinás stock, including the western lower portion of the Black Skarn, the Lower North Black Skarn, and the western portion of Boinás East.
- A small portion of High Angle 1 is open to depth while there is potential to the south at High Angle 2.
- Area 208 and El Valle fault zone remain open to depth.
- The East Breccia and Boinás South zones are partly unexplored and further exploration is warranted.

CARLÉS

- While mineralization at Carlés East appears to be more discontinuous at depth, mineralized skarn has been intercepted in the south part of Carlés East which may warrant lower priority exploration work.
- The Carlés North zone has been subject to most of the recent exploration work at EVBC. The mineralization has a shallower dip at depth but remains open.
- Carlés North West remains open to depth.
- Futhermore, Carlés North and Carlés North West may possibly connect at depth. Further investigation is warranted.

LA ORTOSA-GODÁN

- La Ortosa and Godán present exploration potential away from current operations. Early stage exploration efforts and roman pits suggest these areas may warrant future investigation.

LA BRUEVA

- La Brueva gold deposit is seven kilometers northeast of the Boinás mine on a 40 m wide, east-west trending fracture zone that cuts the Río Narcea anticline almost perpendicular to the axial trend. At surface, the fracture zone is located along the contact of the Oville and Barrios Formations. This deposit was mined by open pit by the Romans. The structure is open at depth.

Based on the review of the exploration potential, RPA is of the opinion that there is significant potential to upgrade Inferred Resources to the Indicated category and for expansion of known zones along their peripheries. In particular, RPA recommends focusing the expansion of resources on skarn material to maintain the oxide/skarn blend of future mill feed.

10 DRILLING

Drilling on the Project has totalled approximately 357,200 m in 2,481 holes of which Orvana drilled approximately 93,281 m in 711 holes. Of the total holes drilled to date, 57 holes in the database were exploratory in nature, and tested for satellite deposits.

For the skarns and some of the epithermal oxide zones, drill holes tend to intercept the mineralization at varying angles relative to the core axis attributed to drill access and the irregular morphologies of the mineral zones. More regular, planar deposits such as A107 have better drilling angles, especially when drilling to depth. In general, drilling is spaced between 20 m and 40 m in active or exploited mining areas. Drilling density away from the core of the underground mine and beneath previous pits is generally greater than 40 m and can be in excess of 100 m in lesser explored areas.

Drill hole locations for EVBC are illustrated in Figures 10-1 and 10-2. A summary of drilling is given in Table 10-1.

DRILLING BY PREVIOUS OPERATORS

Information on drilling by previous operators has been adapted from the Technical Report by Noble et al., 2012.

Early Anglo American Company (AAC) drilling was done with core rigs, but was plagued with poor recovery, especially in the oxide zones at El Valle. Recoveries were acceptable in the more competent rock at Carlés.

The initial work used reverse circulation (RC) drilling, which worked well for identifying new areas of mineralization, but had difficulty with high flows of water. Seven RC holes were drilled in El Valle, but were not used in resource estimates because of concerns with the quality of samples.

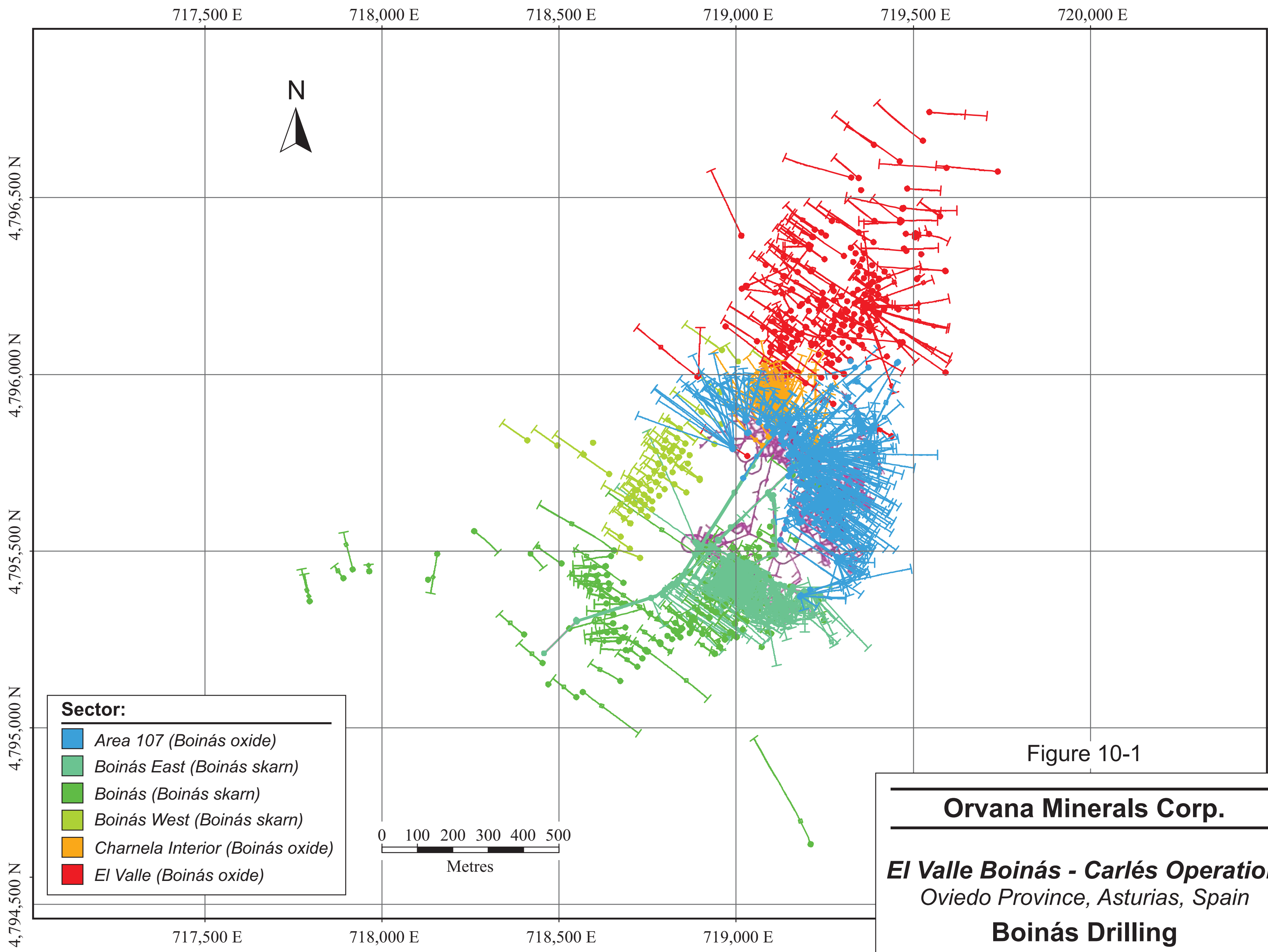

Figure 10-1

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Boinás Drilling

September 2014

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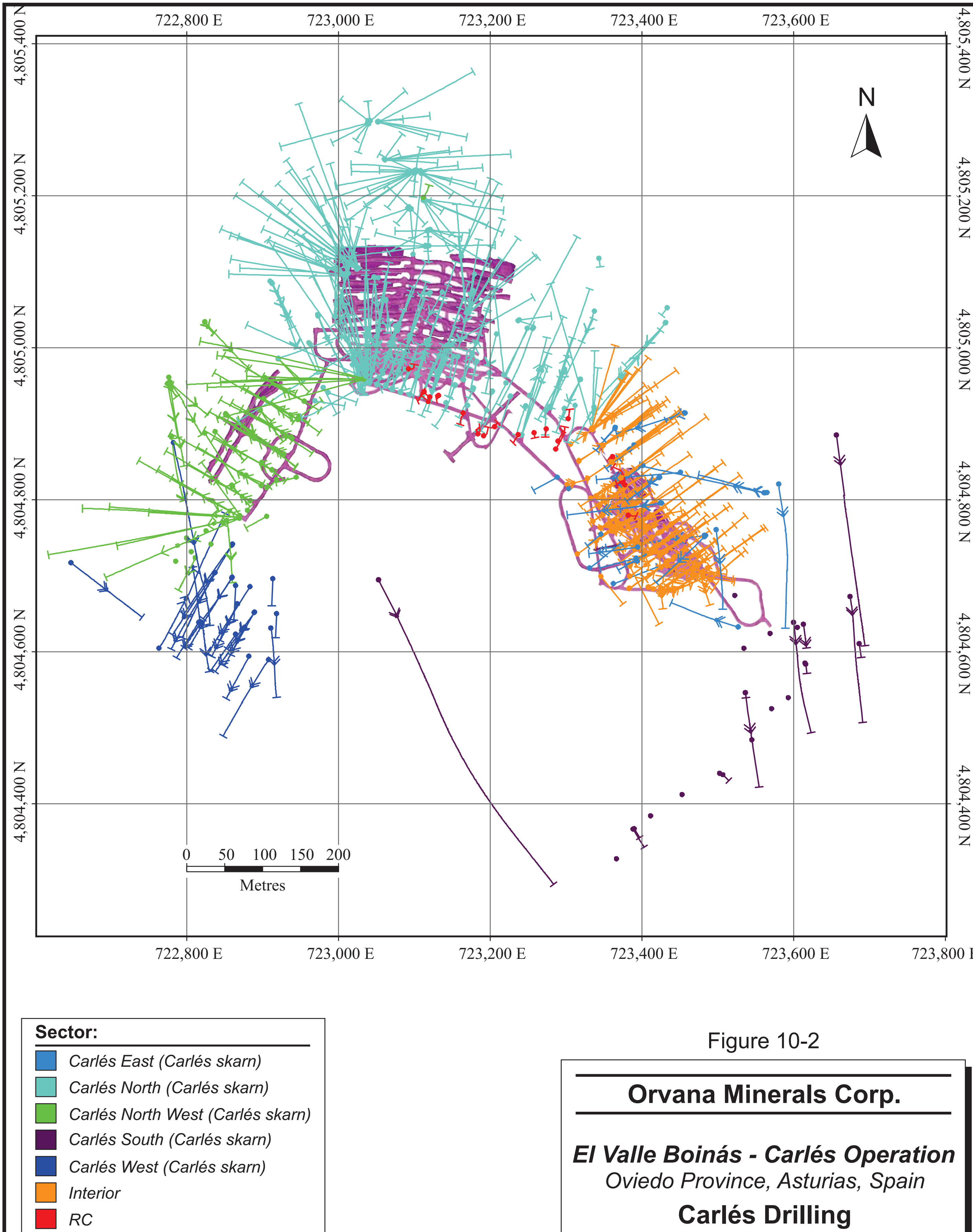


September 2014

Figure 10-2

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Carlés Drilling

TABLE 10-1 EVBC DRILLING SUMMARY
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

			Boliden Minerals A.B.	Exploraciones Mineras del Cantabrico S.A.	Anglo American Company	Anglo American Company + HCC	Anglo American Company + HCC	Rio Narcea A.I.E			RNGM & Barrick	RNGM	Kinbauri España								
Area	**Type**	**Years**	**1981**	**1985**	**1985**	**1990**	**1991**	**1994**	**1996**	**1998**	**2000**	**2004-2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**Mar-14**	**Total**
El Valle-Boinás	**Core**	**Number of Holes**					39	32				921	37	132	21	9	95	90	95	22	1,493
		Metres Drilled					8,029	7,090				161,955	8,685	22,383	7,042	1,034	9,080	6,703	7,351	2,171	241,524
Carlés	**RC**	**Number of Holes**			25	108															133
		Metres Drilled			1,292	6,012															7,304
	CORE	**Number of Holes**			58				96			436	6	3	12	16	27	70	60	14	798
		Metres Drilled			13,147				16,283			37,708	815	477	1,938	2,070	4,140	7,484	8,746	2,262	95,070
Ortosa-Godan	**CORE**	**Number of Holes**	7	4			4			17							2				34
		Metres Drilled	1,085	970			903			5,656							899				9,513
La Brueva	**RC**	**Number of Holes**						8													8
		Metres Drilled						1,148													1,148
La Brueva	**CORE**	**Number of Holes**									5										5
		Metres Drilled									1,152										1,152
El Pontigo	**CORE**	**Number of Holes**						3													3
		Metres Drilled						371													371
Villaverde	**CORE**	**Number of Holes**						3													3
		Metres Drilled						577													577
Antoñana	**CORE**	**Number of Holes**						4													4
		Metres Drilled						541													541
Total		**Number of Holes**	**7**	**4**	**83**	**108**	**43**	**50**	**96**	**17**	**5**	**1,357**	**43**	**135**	**33**	**25**	**124**	**160**	**155**	**36**	**2,481**
		Metres Drilled	**1,085**	**970**	**14,439**	**6,012**	**8,932**	**9,727**	**16,283**	**5,656**	**1,152**	**199,663**	**9,500**	**22,860**	**8,981**	**3,104**	**14,119**	**14,187**	**16,097**	**4,433**	**357,200**

In 1993, RNGM started using core drilling, but unsatisfactory core recovery prompted a review of methods and contracting a mud engineer to supervise the drilling. These steps resulted in an increase of recoveries to generally better than 90%.

In 1995, three combination rigs were brought to El Valle that allowed both core and reverse circulation. These rigs were used to drill the upper portions of the holes, primarily Tertiary sediments, with RC and the lower mineralized portions with core.

Underground core drilling from the El Valle drainage adit was started in 1997. Additional underground drilling has included detailed drilling of the Mónica Zone, the discovery and exploration drilling of the BSN and Charnela South, and exploration drilling in Area 107. A particular problem with underground core drilling is that core recoveries are low in holes drilled upwards into ground that has not been dewatered and is under high water pressure. In this case, the drilling mud cannot be maintained in the hole and high water flows wash out fines resulting in poor core recovery. The Charnela South Zone and the Area 107 Zone both have some holes with low core recovery.

DRILLING AND LOGGING

All drilling by Orvana has been conducted from underground. During RPA's site visit, two rigs were in operation at El Valle-Boinás drilling definition holes at Charnela and in the Black Skarn North. The majority of the holes drilled are HQ diameter with the exception of some NQ core at Carlés and some PQ core for metallurgical purposes.

Core boxes are transported daily from underground, delivered to the core shed and laboratory facility in Begega. The core is photographed wet with the name of the hole and the depth. The core is then laid on core logging benches awaiting both geotechnical and geological logging by the Orvana geologists.

Geotechnical logging consists of:

- Division of core into geotechnical zones
- Total Core Recovery (TCR)
- Solid Core Recovery (SCR)
- Rock Quality Designation (RQD)
- Number of joint sets

- Fracture frequency
- Joint type
- Intact rock strength
- Point load testing
- Large scale roughness
- Small scale roughness
- Joint alteration
- Type of infill
- Strength of infill
- Water flow

A Mining Rock Mass Rating (RMR) is then determined by the geologist and is later entered into the geological database. The RMR is also stored in the block models and is used for mine planning purposes.

Once the geotechnical logs are complete, geologists proceed to log lithology, alteration, mineralization and structure using pre-defined geological legends. The logs are hard copy hand written logs with graphical representations of the down hole geology. The start and end of geological units are marked on the boxes.

The sampling method and approach is discussed in the sample preparation, analyses and security section of this report.

Upon completion of the geotechnical logging, geological logging, sampling and density calculation, the hand written logs are transferred to the senior geologist who scans the logs and enters the information into the Recmin database.

Collar locations are measured during drilling by underground surveyors. The collar location, azimuth and inclination of the drill hole are measured and are subsequently used to replace pre-entered planned collar locations in the drill hole database.

Down hole survey measurements are conducted using a Reflex Maxibor instrument. Data is exported from the instrument to an excel file and then transferred to the drill hole database.

RPA reviewed the drilling, logging and sampling methodologies and is of the opinion that they meet industry standards and are suitable to support Mineral Resource and Mineral Reserve Estimation.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

The Project has its own on-site assay laboratory located on the hill side in Begega, above the El Valle open pit, approximately 15 minutes by road from the administration and processing facilities for the mine. Both sample preparation and analysis are performed at the laboratory. The laboratory is ISO 9001 certified which is renewed each year.

On average, 3,500 samples are assayed per month, consisting of exploration core, underground grade control samples, and mill samples.

SAMPLING METHOD AND APPROACH

Intervals selected for assaying are marked on the boxes, the sample code corresponding to the drill hole identification number and the sample depth. Sample tags are not used, the sample can be traced back based on the hole name and sample depth. Barcoded adhesive labels are prepared by geologists using the hole name and depth code. For Quality Assurance/Quality Control (QA/QC) samples, a false code is generated. The target sampling length is 1.5 m, rarely exceeding two metres. The minimum sampling length is 25 cm. Samples are taken on either side of the mineralization. Drill core not sent for assaying is discarded while the core selected for sampling is split, half the core is assayed and the remaining half of the core is returned to the core box and stored in covered core storage facilities near the logging facility. Harder drill core is split using a water cooled diamond saw while softer oxide material is split manually with a hammer and chisel.

At Boinás, grade control sampling consists of underground face channels over the entire face and the walls unless a litho-structural break can be identified; sampling of muck piles at active headings or remucks; and sampling of surface stockpiles with demarcated stockpiles on a round per round and stope by stope basis. Boinás underground channel samples are not used for resource estimation for the following reasons:

- Sampling of the oxide faces is problematic due to the timing of ground support/heading availability and only partial exposure of the face due to shotcrete cover.

- Face channel samples represent a different volume support as compared to drill core samples (face channel samples are typically longer than the average drill core sampling length).

At Carlés, underground chip samples are taken honouring a nominal 1.5 m interval and litho-structural boundaries. Given the similarity in sample support and the layered nature of the Carlés zones, the underground chip samples are used for resource estimation.

Density information is collected after logging at a density measurement station within the core logging facility. The density sample is returned to the box after density measurement. The following procedure is used:

- A length of core approximately 15 cm long is selected and the lithology recorded.
- The core is weighed in air.
- The core is weighed in water.
- The core is then dried overnight at 105° C and weighed again; this is the dry weight.

Density is then calculated using the formula:

$$\text{Density} = \text{Dry Weight} / (\text{Weight in Air} - \text{Weight in Water})$$

For highly fractured zones where density measurements cannot be reliably measured using the methodology described, densities were determined based on production results. A summary of the density measurements between 2007 and 2014 is given in Table 11-1.

TABLE 11-1 DENSITY MEASUREMENT SUMMARY
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Year	Area	Number of Densities	Average Density
2007-2008	Boinás	900	2.78
	Carlés	778	3.23
2007-2008 Total		**1,678**	**2.99**
2010-2011	Boinás	151	3.12
	Carlés	135	3.23
2010-2011 Total		**286**	**3.17**
2012	Boinás	101	2.93
	Carlés	382	3.29
2012 Total		**483**	**3.21**
2013	Boinás	181	2.98
	Carlés	669	3.24
2013 Total		**850**	**3.19**
2014	Boinás	234	2.98
	Carlés	758	3.25
2014 Total		**992**	**3.18**
Grand Total		**4,289**	**3.11**

RPA is of the opinion that the sampling method and approach is reasonable to support resource estimation. RPA recommends, that moving forward, the underground channel samples at Boinás be reduced in length to a nominal sampling length similar to the drill core sampling length so that the samples may be used during long and short term block modelling.

SAMPLE PREPARATION AND ANALYSIS

Once split, drill core samples are placed in a metallic sample tray with a large envelope containing two adhesive barcoded labels and one barcoded label pasted to the envelope. The remaining labels are stored within the envelope to accompany the sample throughout the sample preparation process.

The sample preparation procedure is as follows:

- The seven kilogram core samples are dried at a temperature of 105ºC.
- The entire dried sample is crushed through a jaw crusher to 95%<6 mm.
- The coarse-crushed sample is further reduced to 95%<425 microns using an LM5 bowl-and-puck pulverizer.

- An Essa rotary splitter is used to take a 450 g to 550 g sub-sample of each split for pulverizing. The remaining reject portion is bagged and stored.
- The sample is reduced to a nominal -200 mesh using an LM2 bowl-and-puck pulverizer.
- 105 g sub-samples are split using a special vertical-sided scoop to cut channels through the sample which has been spread into a pancake on a sampling mat.
- Samples are then sent to the laboratory for gold and base metal analysis. Leftover pulp is bagged and stored.

After sample preparation, 30 g samples are analyzed for Au by fire assay with an atomic absorption spectroscopy (AAS) finish and two gram samples for Ag, As, Bi, Cu, Hg, Pb, Sb, Se, and Zn by ICP-optical emission spectroscopy (ICP-OES) after an aqua regia digestion. All core samples are analysed twice and the average of the two values is reported. Gold values exceeding 15 g/t are automatically repeated to confirm the grade of the sample.

Assay results are received by the mine site geological personnel via email to be entered into the drill hole database.

In RPA's opinion, the sample preparation, analysis, and security procedures at EVBC are adequate for use in the estimation of Mineral Resources. RPA notes that while fluorine is considered a penalty element, until recently it has not been included in the suite of geochemical analyses. RPA recommends consistently assaying for fluorine and to include results in the Mineral Resource estimate for mine planning purposes.

QUALITY ASSURANCE/QUALITY CONTROL

The quality assurance/quality control (QA/QC) program comprised submission of certified reference material (CRM), blanks, and duplicate samples into the sample stream. The on-site senior geologist reviews the results prior to acceptance of the assay results. The QA/QC protocol was reviewed by RPA.

CERTIFIED REFERENCE MATERIAL

Orvana inserts three different CRMs into the sample stream (Table 11-2). The CRMs used by Orvana are only certified for gold with the exception of OREAS 62c which is also certified for silver. The CRM control charts for 2012 and 2013 QA/QC are shown in Figures 11-1 to 11-4.

TABLE 11-2 CRM SUMMARY
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

CRM	Recommended Value	Standard Deviation
Au		
ST146	6	0.39
ST-358	5.96	0.26
Oreas 62c	8.79	0.21
Ag		
Oreas 62c	8.76	0.49

RPA reviewed the CRM performance and notes that there are slight low biases at higher grades, however, RPA is of the opinion that the bias is not material to the project. In addition, RPA notes that disproportionately more ST146 CRMs are inserted compared to the other CRMs. RPA recommends randomly inserting CRMs so as to approximate equal insertion rates for each CRM. Lastly, RPA recommends using CRMs which are certified for Au and Cu given that these elements are the biggest revenue contributors.

FIGURE 11-1 ST146 AU CONTROL CHART

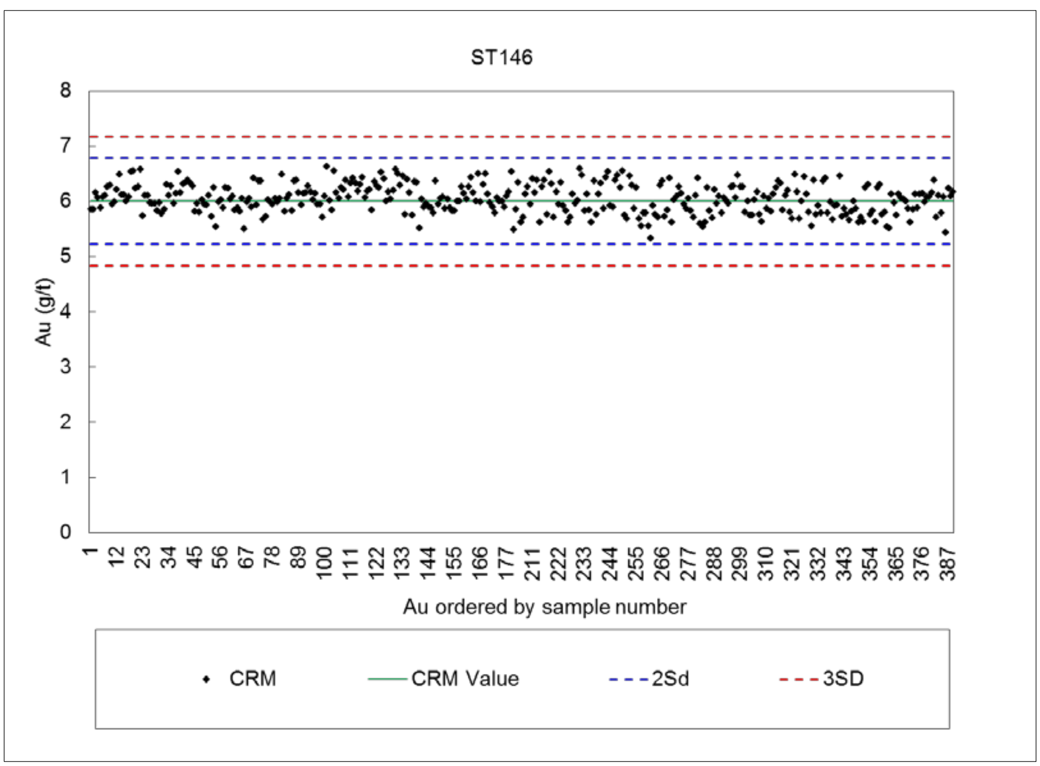


FIGURE 11-2 OREAS 62C AU CONTROL CHART

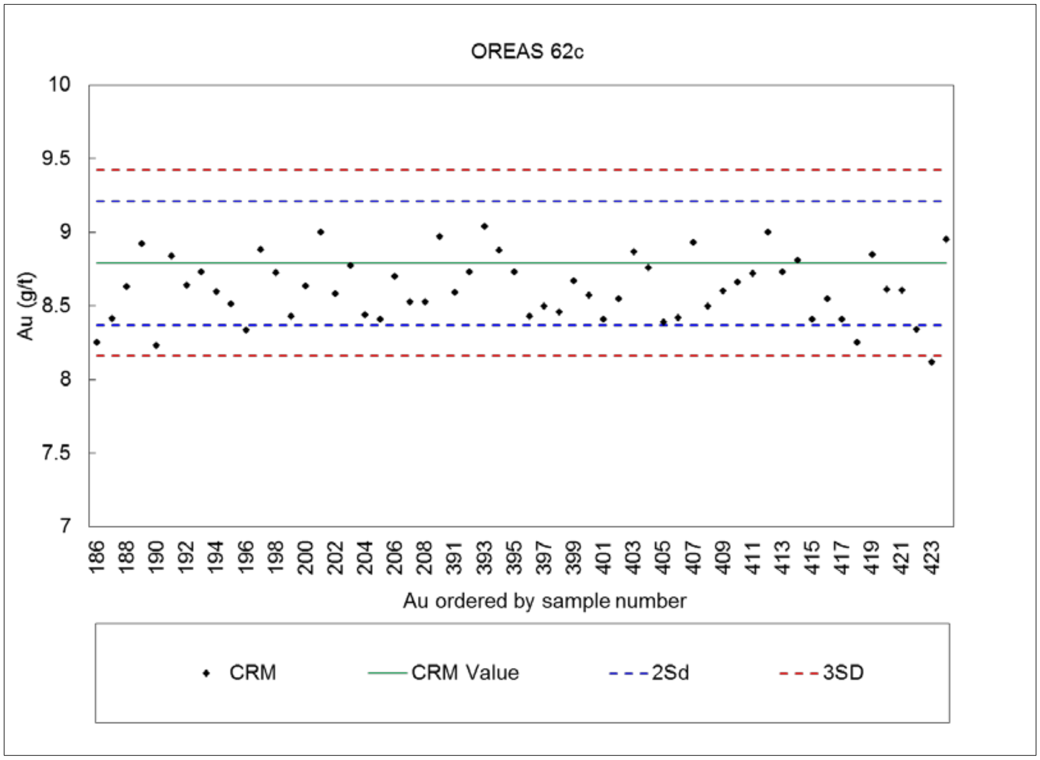


FIGURE 11-3 ST-358 AU CONTROL CHART

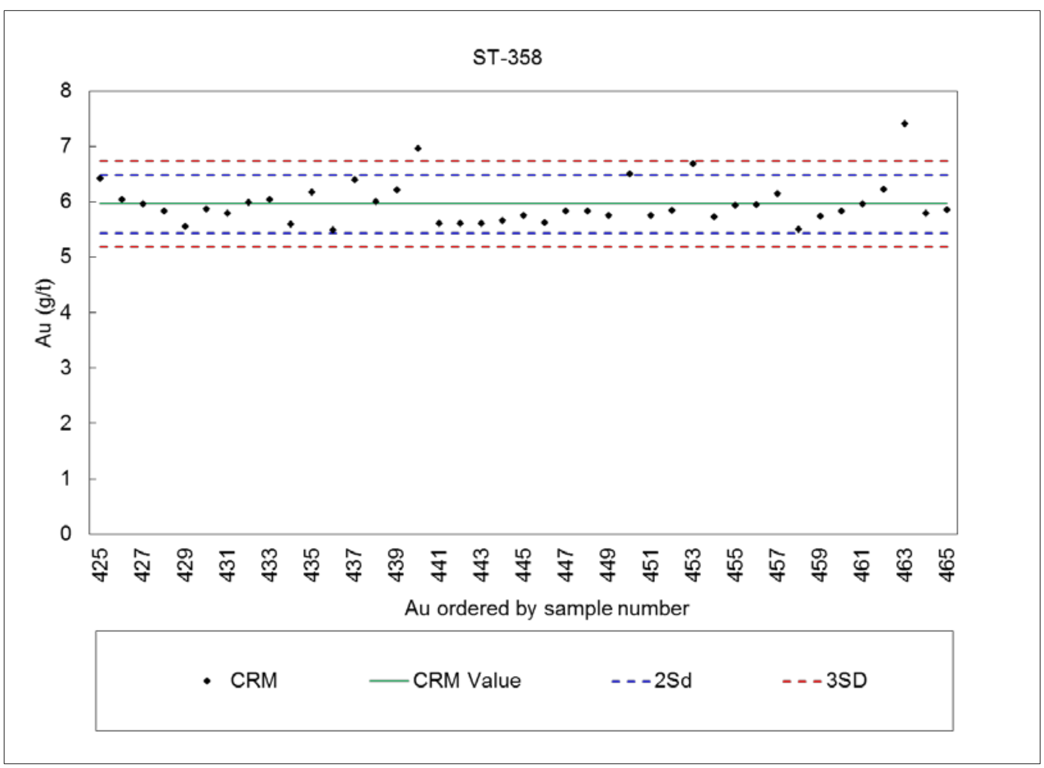
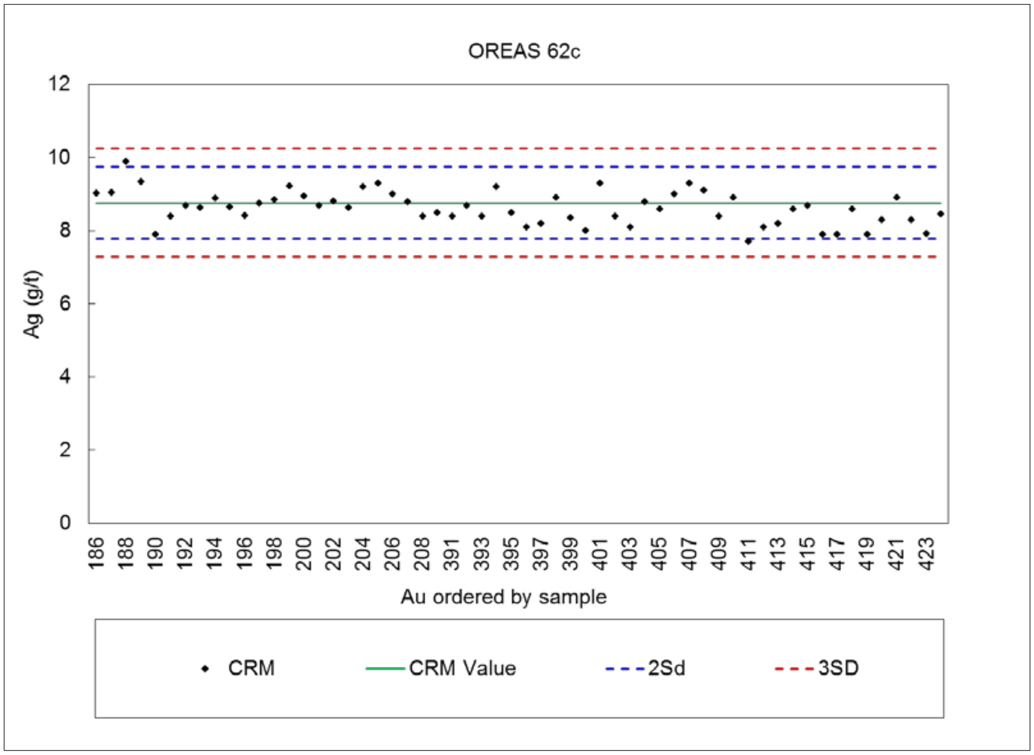


FIGURE 11-4 OREAS 62C AG CONTROL CHART



BLANKS

Blanks are inserted into the sample stream during sample preparation by a laboratory technician upon the request of the geologist. Approximately one blank is inserted into the sample stream for every 20 core samples. Blanks are comprised of silica sand. The blank control charts for 2012 and 2013 QA/QC are shown in Figures 11-5 to 11-7.

RPA reviewed the blank performance and is of the opinion that there is no significant contamination occurring during the sample analysis process.

FIGURE 11-5 AU BLANK CONTROL CHART

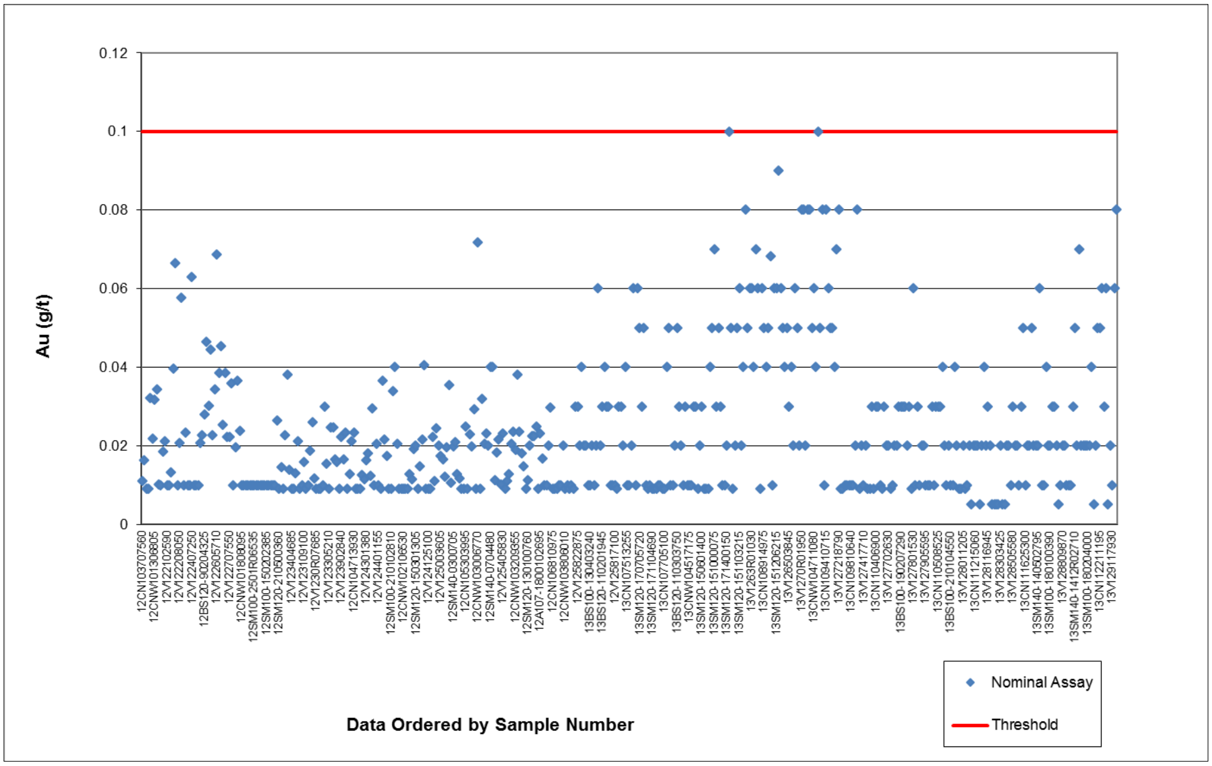


FIGURE 11-6 CU BLANK CONTROL CHART

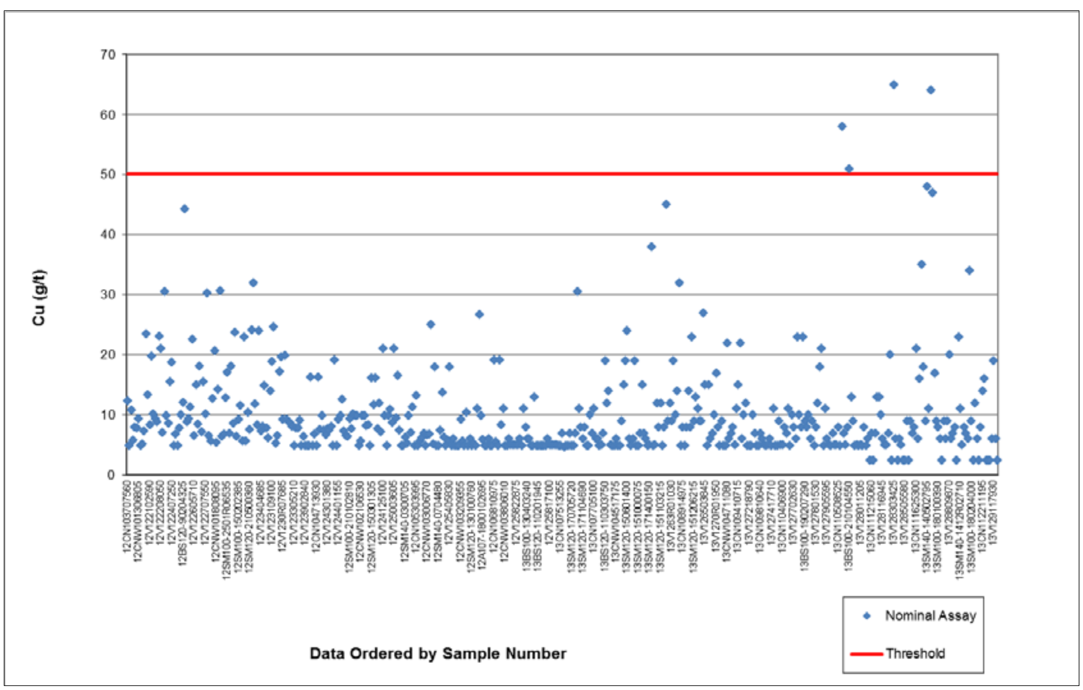


FIGURE 11-7 AG BLANK CONTROL CHART

DUPLICATES

For the internal reproducibility check, only pulp duplicates are inserted into the sample stream during sampling at EVBC. The geologist logging and sampling inserts pulp duplicates with an insertion rate of approximately one duplicate every 20 core samples. In 2013, 254 pulp duplicates were inserted into the sample stream. Duplicate performance for gold, silver, and copper is monitored. Results of the pulp duplicate analyses are given in Table 11-3 and Figures 11-8 to 11-10.

TABLE 11-3 PULP DUPLICATE SUMMARY
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Statistics	Au (g/t) Original Assay	Au (g/t) Check Assay	Ag (g/t) Original Assay	Ag (g/t) Check Assay	Cu (g/t) Original Assay	Cu (g/t) Check Assay
Number of samples	461	461	461	461	461	461
Min	0.005	0.005	0.5	0.5	1	1.285
Max	40.39	40.0	235	223.5	86,850	80,950.0
Median	0.39	0.39	0.99	1.005	391	398
Mean	1.74	1.74	8.19	8.13	3766.52	3745.29
Standard Deviation	4.22	4.26	21.40	20.98	8778.67	8590.23
Variance	17.78	18.14	457.81	440.24	77,065,081.81	73,792,016.93
CV	2.43	2.45	2.61	2.58	2.33	2.29
Correlation Coefficient	0.999		0.999		0.999	
Relative Standard Deviation	9%		9%		9%	
Percent Difference Between Means	-0.1%		0.7%		0.6%	

RPA did not detect any bias in pulp duplicate analysis. RPA recommends the insertion of field and coarse duplicates so as to better understand the sampling/analysis error introduced at the different sample splitting stages and to quantify the nugget effect for the core (on a zone by zone basis).

FIGURE 11-8 AU PULP DUPLICATE SCATTERPLOT

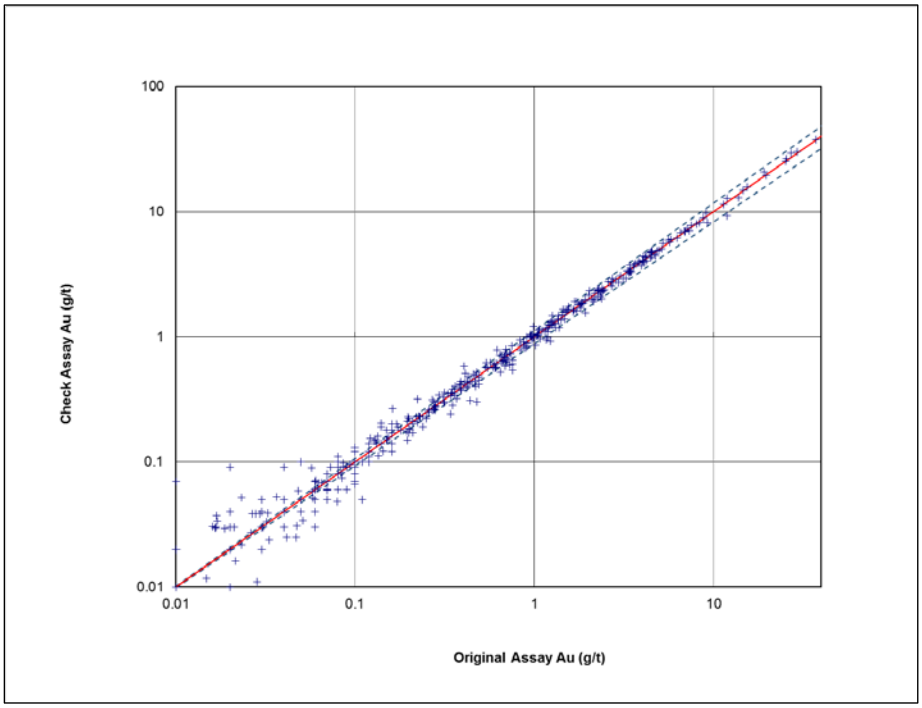


FIGURE 11-9 AG PULP DUPLICATE SCATTERPLOT

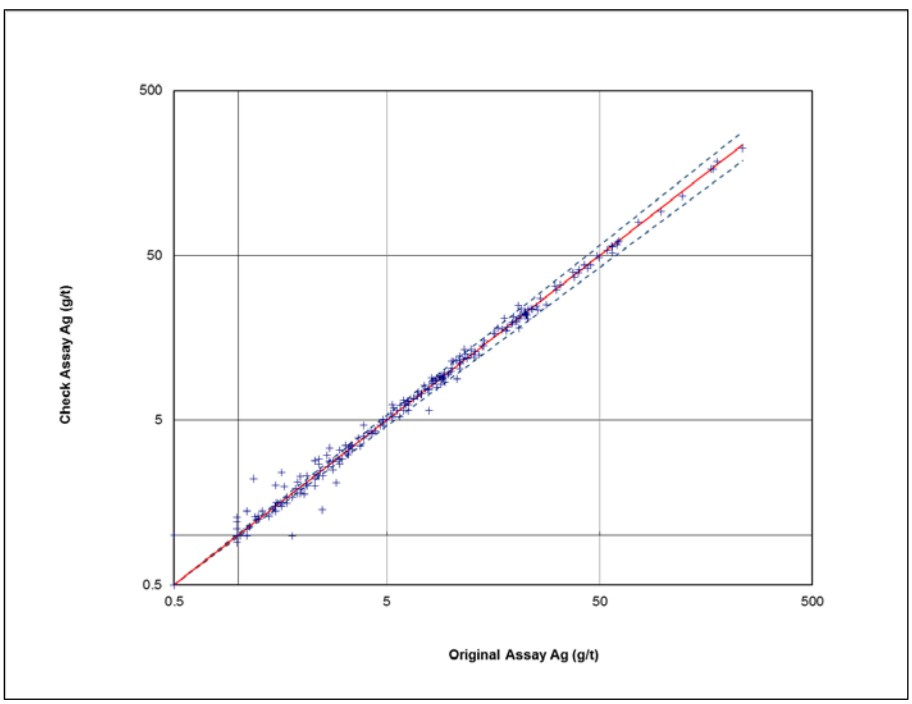
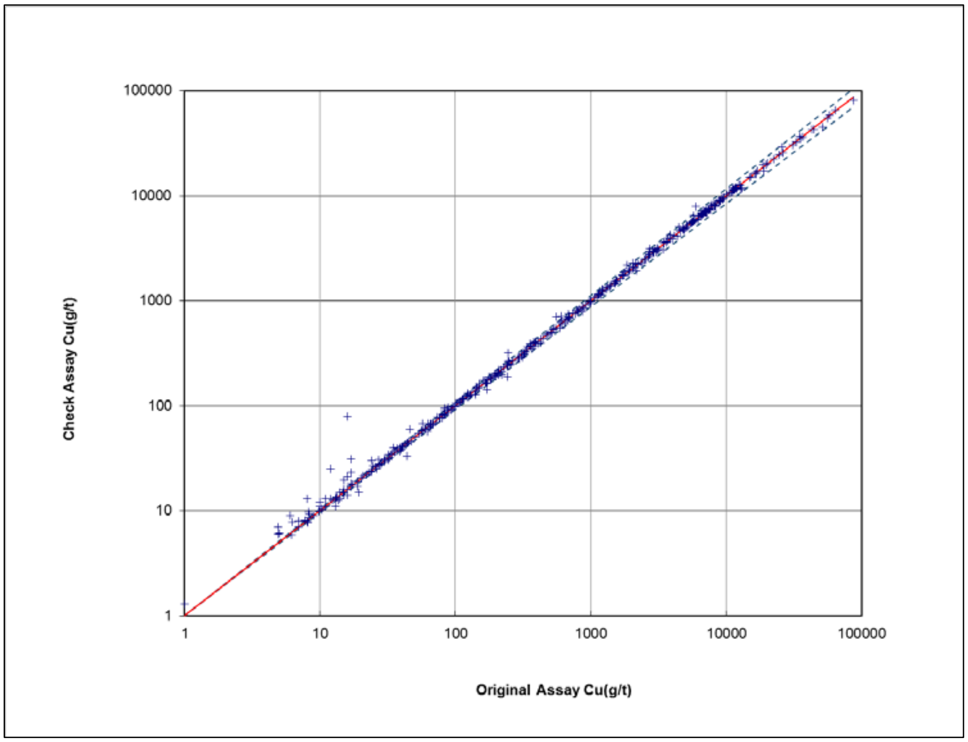


FIGURE 11-10 CU PULP DUPLICATE SCATTERPLOT



In 2013, a total of 194 pulps were sent to Chemex laboratories in Camas near Seville, Spain for check assays. The proportion of pulps sent to Chemex for analysis represents approximately 4% of the drill core assays for 2013. Duplicate performance for gold, silver, and copper is monitored. Results of the secondary lab check for 2012 and 2013 is given Table 11-4 and Figure 11-11 to 11-13.

RPA reviewed the results from the secondary laboratory check and did not detect any bias between the Orvana internal laboratory and the Chemex laboratory.

In RPA's opinion, the QA/QC program as designed and implemented by Orvana is adequate and the assay results are suitable for use in Mineral Resource and Mineral Reserve estimates.

TABLE 11-4 SECONDARY LABORATORY CHECKS
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Statistics	Au (g/t) Original Assay	Au (g/t) Check Assay	Ag (g/t) Original Assay	Ag (g/t) Check Assay	Cu (g/t) Original Assay	Cu (g/t) Check Assay
Number of samples	404	404	404	404	404	404
Min	0.01	0.01	0.20	0.01	4.90	4.90
Max	76.50	79.71	301.00	303.50	138,000.00	159,500.00
Median	0.40	0.38	1.40	1.47	584.00	567.00
Mean	1.99	2.03	9.12	9.07	3,967.06	4,053.66
Standard Deviation	6.20	6.40	23.73	24.75	10,768.36	11,574.50
Variance	38.40	41.00	563.15	612.53	115,957,541.67	133,969,030.79
CV	3.11	3.15	2.60	2.73	2.71	2.86
Correlation Coefficient	0.997		0.993		0.997	
Relative Standard Deviation	18%		24%		21%	
Percent Difference Between Means	-2%		1%		-2%	

FIGURE 11-11 AU SECONDARY LAB CHECK SCATTERPLOT

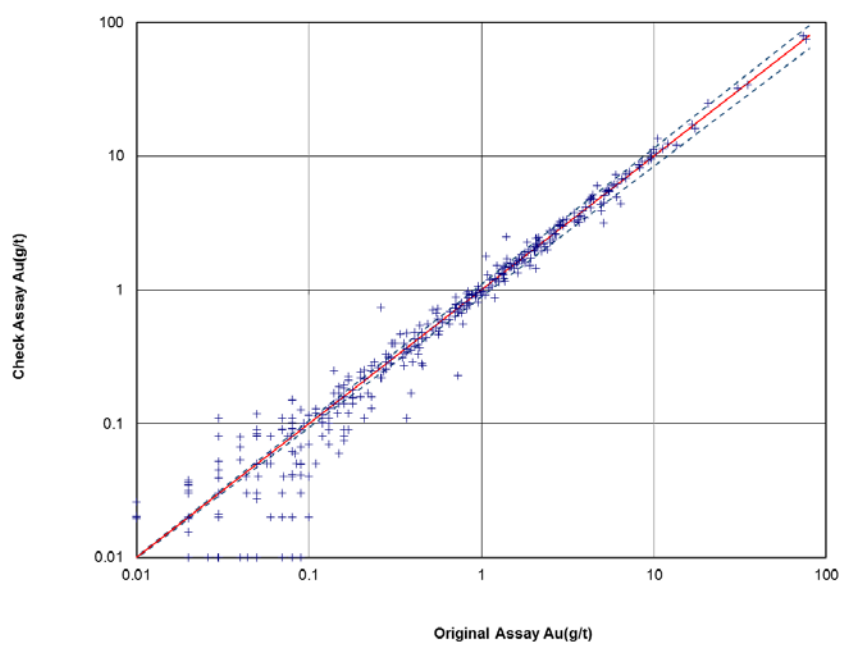


FIGURE 11-12 AG SECONDARY LAB CHECK SCATTERPLOT

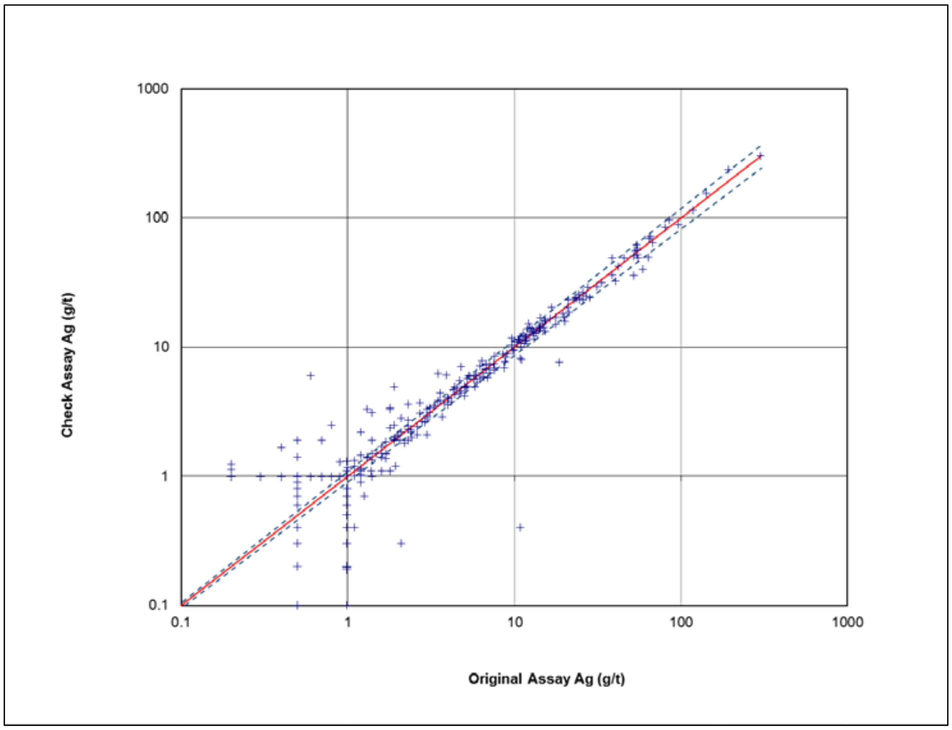
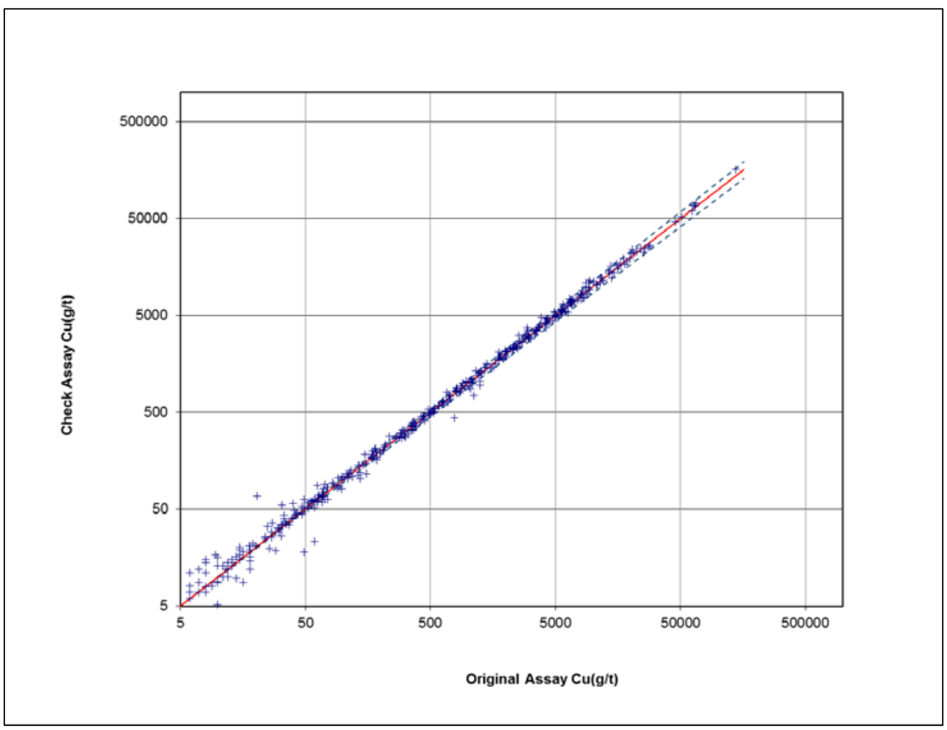


FIGURE 11-13 CU SECONDARY LAB CHECK SCATTERPLOT



12 DATA VERIFICATION

Orvana currently performs the following data verification steps prior to finalization of the data:

- Collar surveys conducted by in-house personnel are entered in a spreadsheet, transformed to UTM coordinates and checked by the project geologist.
- Geological logs are entered into a spreadsheet by the geologist responsible for logging the hole. When complete the database geologist checks and adds the data into the database.
- Results received from the labs are subject to QA/QC which is reviewed by the project geologist.
- Data entered into the RecMin database is subject to numerous controls to identify gaps, double-entry, overlaps, duplication, and absent values.

During 2013, AMC performed a review of the sampling method and approach, data entry, data verification and Mineral Resource estimation. AMC found minor errors with regard to incorrect sample labelling which were subsequently corrected. No other errors were identified by AMC.

RPA performed the following data verification steps:

- Checked drill hole logs versus core while at site.
- Checked drill hole logs versus the database supplied.
- Checked internal assay results versus results in the database.
- Checked for out of range assays, coordinates and down hole surveys.
- Checked for duplicate records in the database.
- Checked for overlapping down hole intervals in the database.

RPA found no significant errors and is of the opinion that the database is suitable to support Mineral Resource and Mineral Reserve estimations.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

Information on mineral processing and metallurgical testing is referenced from the Technical Report (Noble et al., 2012) and from technical and production information provided by Orvana.

MINERALIZATION

Copper in EVBC ore is found primarily as native copper in soft, oxidized materials and present as chalcopyrite and bornite in hard, sulphide skarn. The removal of copper prior to gold recovery by conventional cyanide leaching is important, because copper minerals present difficulties during the cyanide leaching of gold ore leading to excessively high consumption of cyanide (and oxygen) coupled with low extraction of gold. Copper cyanide species, if present at high levels, adversely affects the downstream processes such as activated carbon adsorption and effluent treatment.

Gold is present in EVBC ore as native gold and is recovered by gravity concentration, flotation and smelting. Gravity recoverable native gold and native copper are present in higher quantities in oxide ore than in sulphide ore. Therefore, bypassing the gravity circuit is possible if sulphide ores are being processed.

The gold-copper ore is mineralogically complex and has varying hardness and grindability. The El Valle plant can process 95 tonnes per hour (tph) of the oxide ore and up to 70 tph of the harder sulphide ore from Boinás and Carlés. The oxide and sulphide ores can be processed together without an impact on recoveries.

MINERAL PROCESSING AND METALLURGICAL TESTING

The EVBC Operation encompasses the Boinás and Carlés mineralized zones and can produce 750,000 tpa (ROM) depending on the ore type. The feedstock is comprised of Boinás and Carlés skarn ores and the softer, higher gold grade oxide ore (the oxide ore is approximately 20% of the total ore processed). Ore produced is transported to the processing plant which is capable of running at a throughput rate of 2,280 tpd using a carbon-in-leach (CIL) process.

The plant was restarted in May, 2011 after renovations. Metallurgical testing of various ores and ore blends was conducted at the plant laboratory and the test results aided in fine tuning the process after the plant was restarted. No recent metallurgical testwork was reported since the start of plant operation.

RPA reviewed the information in the 2012 Technical Report and the following data provided by Kinbauri España:

- Historical mill production and recovery data
- Metallurgical reports

Total average metal recoveries are summarized in Table 13-1.

TABLE 13-1 TOTAL AVERAGE METAL RECOVERIES
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

	FY 2012	FY 2013	YTD 2014	Comments
Gold	92.1	92.5	92.4	Approximate gold recovery from process stages: • 10% from gravity • 56% from flotation • 26% from CIL
Copper	84.1	83.6	81.3	Copper recovery primarily from flotation
Silver	75.3	79.6	79.8	Approximate silver recovery from process stages: • 2% from gravity • 69% from flotation • 8% from CIL

Based on this information, RPA offers the following comments:

- Operating results from the last three years have demonstrated the following:
  - Tonnages treated include approximately 20% Boinás oxide ore, 46% Boinás skarn ore and 34% Carlés skarn ore.
  - The operation has a sound basis of consistent production data.
  - Total average Au and Ag recoveries were 92% and 79%, respectively.

    - Total Cu recoveries averaged between 81% and 84%, despite a slight falling trend in head grades.

- It is recommended that additional metallurgical testwork be carried out to consider the impact of the following:

    - Changes in the zones to be mined as a result of updates to the RMR and LOMP and the elimination of Carlés skarn ore from production.

    - Potential changes in the concentration of deleterious elements, such as fluorine, in the subsequent ore blend, which could impact the grade of the final concentrate.

- Ore samples for metallurgical testwork should be representative of the ore blend for each year for the remainder of the mine plan.

- RPA considers that the projected recoveries for the budget and five year plan be updated based on metallurgical testwork conducted on the new ore blend.

14 MINERAL RESOURCE ESTIMATE

The 2014 updated Mineral Resource estimate for the EVBC Operation was completed by Orvana staff and reviewed by RPA. The Mineral Resources include updating of the block models for seven zones out of a total of 20 zones at EVBC, and the application of new cut-off grades and depletion criteria for Mineral Resource reporting purposes. Models not updated were completed prior to 2014 by Ore Reserves Engineering (ORE).

A summary of the updated Mineral Resources effective as of September 30, 2014 inclusive of Mineral Reserves is given in Table 14-1 and exclusive of Mineral Reserves is given in Table 14-2. A summary of the mineral zones constituting the September 30, 2014 Mineral Resource estimate is given in Table 14-3.

RPA reviewed the resource assumptions, input parameters, geological interpretation, and block modelling procedures and is of the opinion that the Mineral Resource estimate is appropriate for the style of mineralization and that the resource model is reasonable and acceptable to support the updated 2014 Mineral Resource and Mineral Reserve estimates.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other modifying factors that could materially affect the Mineral Resource and Mineral Reserve estimates.

TABLE 14-1 SUMMARY OF MINERAL RESOURCES INCLUSIVE OF MINERAL RESERVES – SEPTEMBER 30, 2014

Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Measured

Zone	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (t Cu)
Boinás Oxides	638	4.42	1.05	25.01	91	6,703
Boinás Skarn	666	2.79	0.78	16.58	60	5,194
Carlés	38	4.55	0.68	5.26	6	259
Total	**1,342**	**3.62**	**0.91**	**20.27**	**156**	**12,216**

Indicated

Zone	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (t Cu)
Boinás Oxides	1,835	6.76	0.80	13.47	399	14,681
Boinás Skarn	1,770	3.16	0.58	14.40	180	10,264
Carlés	1,059	3.40	0.41	6.22	116	4,343
Total	**4,664**	**4.63**	**0.63**	**12.18**	**694.7**	**29,382**

Measured + Indicated

Zone	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (t Cu)
Boinás Oxides	2,474	6.16	0.86	16.45	490	21,272
Boinás Skarn	2,435	3.06	0.64	14.99	240	15,587
Carlés	1,097	3.44	0.42	6.19	121	4,608
Total	**6,006**	**4.41**	**0.69**	**13.98**	**851**	**41,443**

Inferred

Zone	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (t Cu)
Boinás Oxides	2,499	7.16	0.46	3.63	575	11,495
Boinás Skarn	2,135	3.35	0.45	12.27	230	9,609
Carlés	1,393	3.90	0.43	4.12	175	5,988
Total	**6,027**	**5.05**	**0.45**	**6.80**	**980**	**27,121**

Notes:

1. CIM definitions were followed for Mineral Resources.
2. Mineral Resources are estimated at an Au equivalent cut-off grade of 3.8 g/t for Boinás oxide, 2.5 g/t for Boinás Skarn and 2.3 g/t for Carlés Skarn.
3. Mineral Resources are estimated using long-term prices of US$1,300 per ounce gold, US$3.10 per pound copper, and US$23 per ounce silver. A US$/Euro exchange rate of 1/1.33 was used.
4. Mineral Resources are inclusive of Mineral Reserves
5. A crown pillar of 10 m is excluded from the Mineral Resource below the El Valle open pit.
6. Unrecoverable material in exploited mining areas has been excluded from the Mineral Resource.
7. Numbers may not add due to rounding.

TABLE 14-2 SUMMARY OF MINERAL RESOURCES EXCLUSIVE OF MINERAL RESERVES – SEPTEMBER 30, 2014

Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Measured

Zone	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (000 t Cu)
Boinás Oxides	408.0	4.33	0.90	22.83	56.8	3.7
Boinás Skarn	509.4	2.58	0.72	15.91	42.3	3.7
Carlés	37.9	4.52	0.68	5.29	5.5	0.3
Total	**955.3**	**3.41**	**0.80**	**18.44**	**104.6**	**7.6**

Indicated

Zone	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (000 t Cu)
Boinás Oxides	1,142.1	6.30	0.79	13.41	231.2	9.1
Boinás Skarn	1,173.2	2.68	0.53	13.87	101.2	6.2
Carlés	854.9	3.28	0.39	5.86	90.1	3.3
Total	**3,170.3**	**4.15**	**0.59**	**11.54**	**422.5**	**18.6**

Measured + Indicated

Zone	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (000 t Cu)
Boinás Oxides	1,550.1	5.78	0.82	15.89	288.0	12.8
Boinás Skarn	1,682.7	2.65	0.59	14.48	143.5	9.9
Carlés	892.8	3.33	0.40	5.84	95.6	3.6
Total	**4,125.6**	**3.97**	**0.64**	**13.14**	**527.2**	**26.2**

Inferred

Zone	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (000 t Cu)
Boinás Oxides	2,498.9	7.16	0.46	3.63	575.3	11.4
Boinás Skarn	2,135.4	3.35	0.45	12.27	229.7	9.5
Carlés	1,392.5	3.90	0.43	4.12	174.5	6.0
Total	**6,026.9**	**5.05**	**0.45**	**6.80**	**979.5**	**26.9**

Notes:

1. CIM definitions were followed for Mineral Resources.
2. Mineral Resources are estimated at an Au equivalent cut-off grade of 3.8 g/t for Boinás oxide, 2.5 g/t for Boinás Skarn and 2.3 g/t for Carlés Skarn.
3. Mineral Resources are estimated using long-term prices of US$1,300 per ounce gold, US$3.10 per pound copper, and US$23 per ounce silver. A US$/Euro exchange rate of 1/1.33 was used.
4. Mineral Resources are exclusive of Mineral Reserves
5. A crown pillar of 10 m is excluded from the Mineral Resource below the El Valle open pit.
6. Unrecoverable material in exploited mining areas has been excluded from the Mineral Resource.
7. Numbers may not add due to rounding.

RPA

TABLE 14-3 MINERAL RESOURCE BLOCK MODEL DESCRIPTIONS

Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Zone	Mine	Ore Type	Block Model	Estimation Method	Depletion/Exclusion	Model Updated
A107	El Valle-Boinás	Oxide	mdcl107_5mii_updated	OK	Mining	Orvana - 2014
Charnela	El Valle-Boinás	Oxide	mdch_nt_1m_idmii	OK	Mining	Orvana - 2014
El Valle Fault	El Valle-Boinás	Oxide	mdevf_0911	ID	Crown Pillar	ORE - 2011
Sienna Zone	El Valle-Boinás	Oxide	mdsnz_0911	ID	Crown Pillar	ORE - 2011
S107	El Valle-Boinás	Oxide	mds107_0613	ID	none	ORE - 2013
E107	El Valle-Boinás	Oxide	modeleast	ID	Crown Pillar	ORE - 2009
East Breccia	El Valle-Boinás	Oxide	modeleast	ID	none	ORE - 2009
A208	El Valle-Boinás	Oxide	modeleast	ID	none	ORE - 2009
High Angle	El Valle-Boinás	Oxide	modelha	ID	none	ORE - 2009
West Skarn	El Valle-Boinás	Oxide	model_w_skarn	ID	Crown Pillar	ORE - 2009
Boinás East	El Valle-Boinás	Skarn	mdclbe_77c	OK	Mining/Sterilization	Orvana - 2014
Black Skarn North West	El Valle-Boinás	Skarn	mdclbsn_6mii	OK	Mining/Sterilization	Orvana - 2014
Black Skarn San Martín	El Valle-Boinás	Skarn	mdclbsn_6mii	OK	Mining/Sterilization	Orvana - 2014
Boinás South	El Valle-Boinás	Skarn	modelbso	ID	none	ORE - 2009
Carlés North	Carlés	Skarn	md_cn_5_mined	OK	Mining/Sterilization	Orvana - 2014
Carlés East	Carlés	Skarn	mdce_0410	ID	Mining/Sterilization	ORE - 2010
Carlés North West	Carlés	Skarn	md_cnw_7_mined	OK	Mining/Sterilization	Orvana - 2014
Capa Z	Carlés	Skarn	mdcez_0712	ID	none	ORE -2013
Carlés West	Carlés	Skarn	ModelWest_UTM	ID	none	ORE - 2009
Carlés South	Carlés	Skarn	ModelSouth_UTM	ID	none	ORE - 2010

Notes:

1. ORE – Models completed by Alan Noble of Ore Reserve Engineering.

DATABASE

The drill hole databases used for Mineral Resource estimation were cut off as of the 31st of March 2014 with the exception of the Black Skarn and San Martín databases which were cut off as of May 15, 2014 to allow for pending assay results to be received. Drill hole data is entered into Recmin software, which stores data in Microsoft Access databases. El Valle Boinás and Carlés drill holes are stored in separate databases. In addition to diamond drilling, underground face channel samples were used to estimate grade and tonnes at Carlés. In the databases, the drill holes are divided into groups depending on their locations relative to the mineralized zones. The databases used during resource estimation consists of 1,642 drill holes amounting to 241,021 m of drilling at El Valle-Boinás and 5,314 drill holes and 3,170 underground channel samples amounting to 91,332 m of drilling and 15,035 m of channels at Carlés.

A summary of the databases is given in Tables 14-4 and 14-5.

TABLE 14-4 SUMMARY OF EL VALLE-BOINÁS DATABASE
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Database Entries	A107	Boinás East	Boinás	Boinás West	Charnela	El Valle	Total
Number of DDH	374	379	201	90	84	365	1,493
Average of length (m)	182	94	230	134	151	183	162
Total Length (m)	68,134	35,608	46,256	12,041	12,658	66,826	241,524
Geochemical Analyses (number of entries)							
Au	24,132	17,389	26,912	4,168	5,061	115,163	192,825
Ag	23,242	15,520	18,873	4,163	4,041	14,928	80,767
As	22,981	14,991	17,945	3,284	4,045	13,928	77,174
Cu	24,111	17,135	26,450	4,168	5,056	115,111	192,031
Hg	13,758	9,119	11,401	2,304	1,347	11,323	49,252
Sb	22,875	13,373	11,399	2,303	3,745	12,027	65,722
Zn	7,564	922	-	2,304	54	8,157	19,001
Rec	25,339	17,838	19,253	4,359	5,728	20,116	92,633
Pb	11,738	1,944	-	2,304	54	8,160	24,200
Bi	22,560	14,972	18,605	2,749	4,045	89,209	152,140
Mo	2,666	981	-	1,717	54	4,879	10,297
Te	890	369	-	1,781	54	4,888	7,982
Tl	2,695	981	-	1,781	54	4,888	10,399
Se	2,901	-	-	-	-	-	2,901
Agua	95	-	-	-	-	-	95

Database Entries	A107	Boinás East	Boinás	Boinás West	Charnela	El Valle	Total
Litho Entries	9,845	7,143	8,505	848	2,726	73,972	103,039
Downhole Surveys	14,991	9,378	9,315	692	1,751	121,391	157,518
Geotechnical Entries	11093	6,824	9,184	86	2,328	3,938	33,453

TABLE 14-5 SUMMARY OF CARLÉS DATABASE
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Database Entries	Carlés East	Interior	Carlés North	Carlés North West	UG Channels	RC	Carlés South	Carlés West	Total
Number of DDH	34	237	355	101	3,170	19	24	28	8,484
Average Length (m)	130	57	115	136	5	14	117	157	85
Total Length (m)	4,410	13,565	40,795	13,780	15,035	267	2,808	4,409	95,070
Geochemical Analyses (number of entries)									
Au	56,952	123,900	291,039	54,558	306,768	3,486	12,264	33,033	882,000
Cu	56,952	123,564	287,847	54,474	306,810	3,486	11,865	33,054	878,052
Ag	57,309	126,882	305,298	58,401	307,188	3,486	12,495	34,230	905,289
Bi	56,616	44,814	136,500	35,154	-	3,045	6,153	33,033	315,315
Hg	56,952	50,442	142,254	35,154	8,085	3,381	6,153	33,033	335,454
Mo	3,276	16,527	121,821	37,233	102,627	-	105	15,435	297,024
Pb	3,276	11,613	119,910	37,401	102,942	-	-	15,435	290,577
Sb	3,276	16,401	126,462	37,401	150,633	-	84	15,435	349,692
Te	3,276	6,006	74,613	18,081	8,085	-	-	15,435	125,496
Tl	3,276	11,508	81,858	18,081	12,243	-	-	15,435	142,401
Zn	3,276	11,025	106,806	26,250	90,888	-	-	15,435	253,680
Rec	7,938	81,606	183,309	52,563	11,151	-	6,342	19,509	362,418
As	56,616	123,648	286,671	54,474	304,794	3,045	6,384	33,054	868,686
Water	-	2,625	2,898	588	8,316	-	-	-	14,427
Se	-	-	14,784	714	-	-	-	-	15,498
Litho Entries	1,618	2,869	8,354	1,190	10,666	63	223	773	25,756
Down Hole Surveys	2,180	2,147	15,177	2,015	-	213	103	204	22,039
Geotechnical Entries	-	1,320	3,733	758	1,456	-	139	-	7,406

RPA reviewed the databases used for Mineral Resource estimation and is of the opinion that they are well organized, auditable and secure, and are suitable to support Mineral Resource estimation.

GEOLOGICAL INTERPRETATION

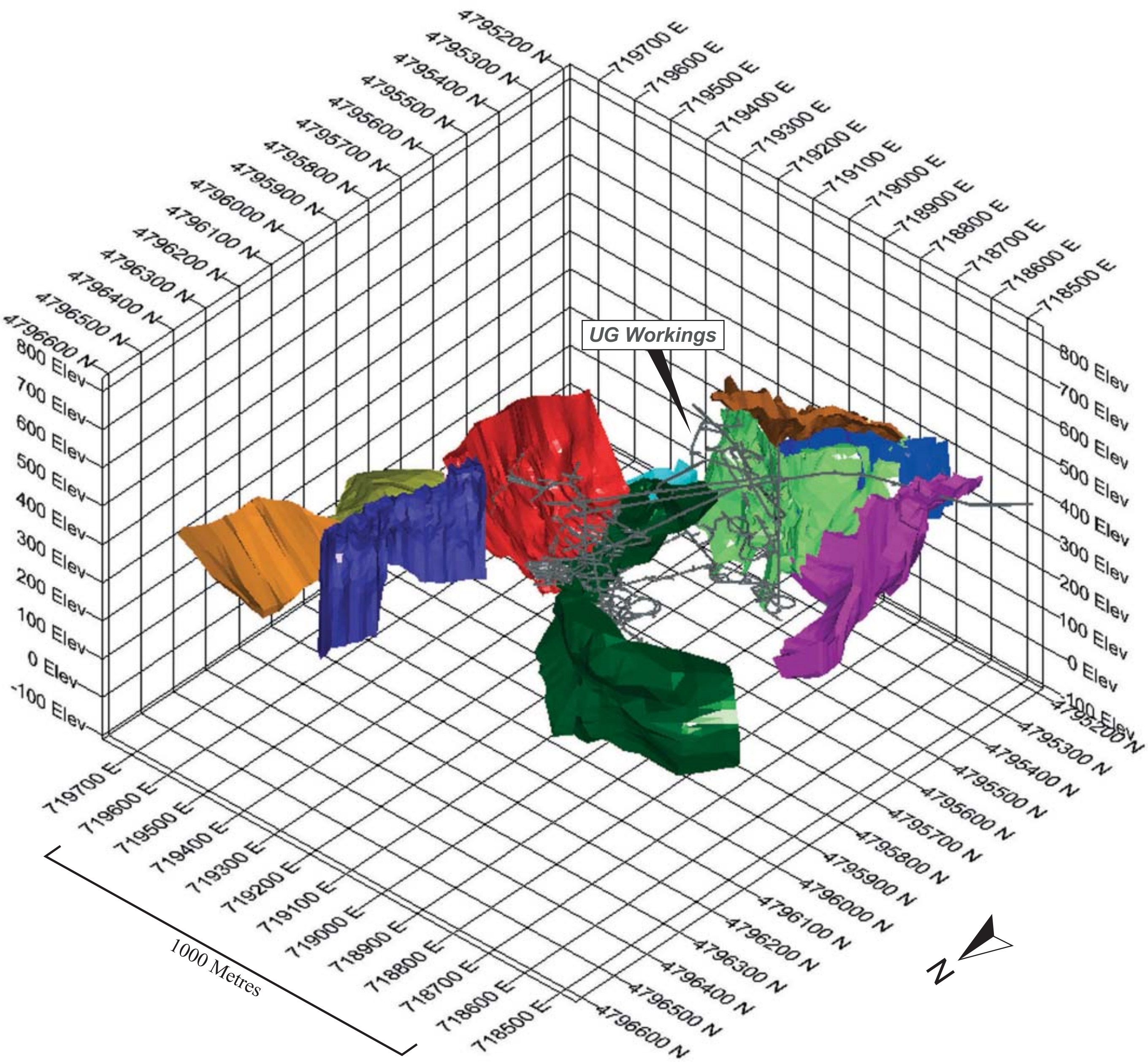
Geological interpretations at the EVBC Operation are conducted by site personnel and are updated as additional information becomes available. Wireframe solids (Figures 14-1 and

14-3) representing lithological controls on mineralization, constructed using Datamine Studio 3, were used to constrain block estimates. Due to limitations imposed by underground infrastructure and the varying orientations of the deposits, drilling often intercepts mineralization at down dip or at sub-parallel angles with no specific dominant drilling direction. Given the poor core angles, modelling using traditional sectional techniques is challenging.

Two main types of geological constraints were modelled at Boinás, with the exception of Charnela (Figure 14-2), which was constrained by polylines constructed on plan views spaced two metres apart:

- Calcic or magnesic skarns in contact with granite and dolomite or limestone.
- Jasperoid bearing oxide zones related to epithermal faults consisting of a number of lithologies.

At Carlés, wireframe solids were modelled for the mineralized skarn occurring at the contact between the granite and the limestones/dolomites to the north. In addition, wireframes were generated for barren/low grade garnet skarn horizons occurring within the mineralized skarn and in the hanging wall (Figure 14-4). The garnet skarn was not modelled as a distinct domain during block modelling but was used for geotechnical purposes during mine planning. For the Carlés West and Carlés South Zones, block estimates were not constrained by wireframes. The domains for these two zones were defined by a nearest neighbour (NN) assignment of a 0.5 g/t Au indicator.



Legend:

Black Skarn (including San Martin)	S107
Boinás East	A107
Boinás South	El Valle Fault Zone
High Angle Zone	A208
Sienna Zone	East Breccia

September 2014

Figure 14-1

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

El Valle-Boinás Mineral Wireframes

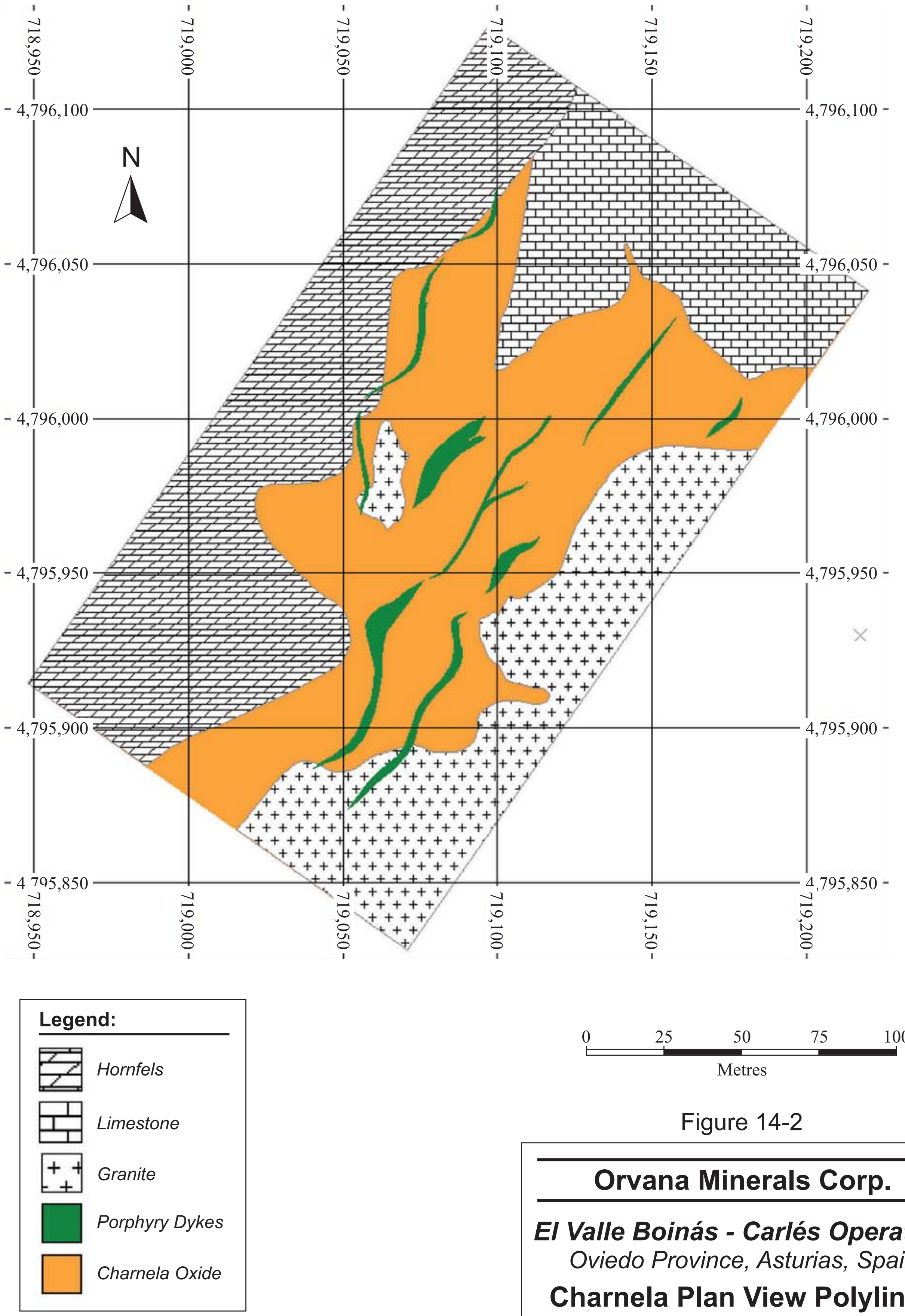


Figure 14-2

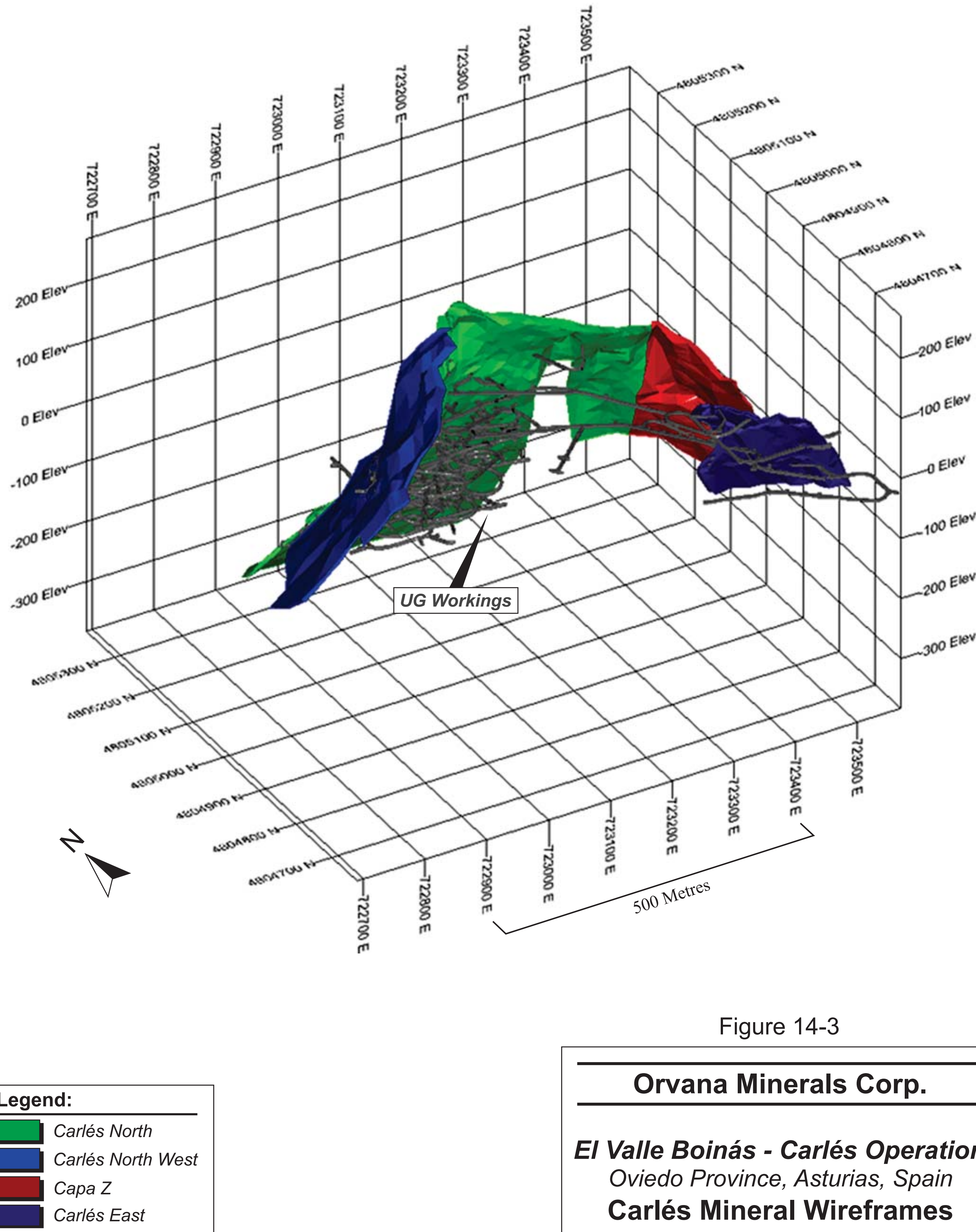
Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Charnela Plan View Polylines (333 m Elevation)

September 2014 ***Source: Orvana Minerals Corp., 2014.***



September 2014

Figure 14-3

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Carlés Mineral Wireframes

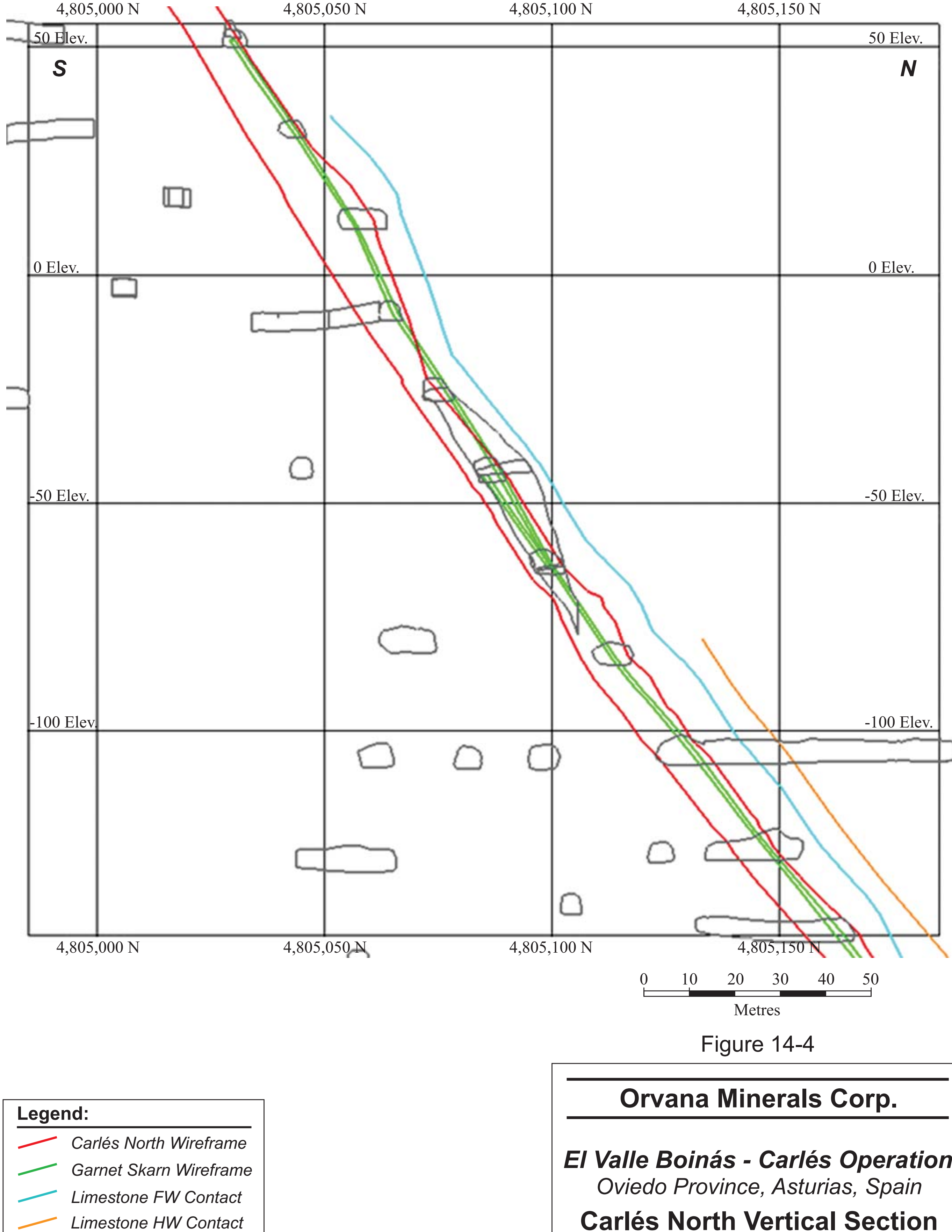


Figure 14-4

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Carlés North Vertical Section

September 2014

A summary of the geological constraints used to constrain block estimates is given in Table 14-6.

In addition to wireframe solids, Orvana constructs trend surfaces which represent the general trend of each domain (Figure 14-5). The objective of creating the trend surfaces is to allow for a coordinate transformation of blocks and composites into flattened coordinates during modelling. Blocks and composites were transformed into flattened coordinates using the following procedure:

- A distance, normal to the trend surface was calculated for each sample and block using the dot product of two vectors.
- Coordinates were rotated to best fit an orthogonal grid.
- The across strike coordinate was replaced with the normal distance calculated in the first step.

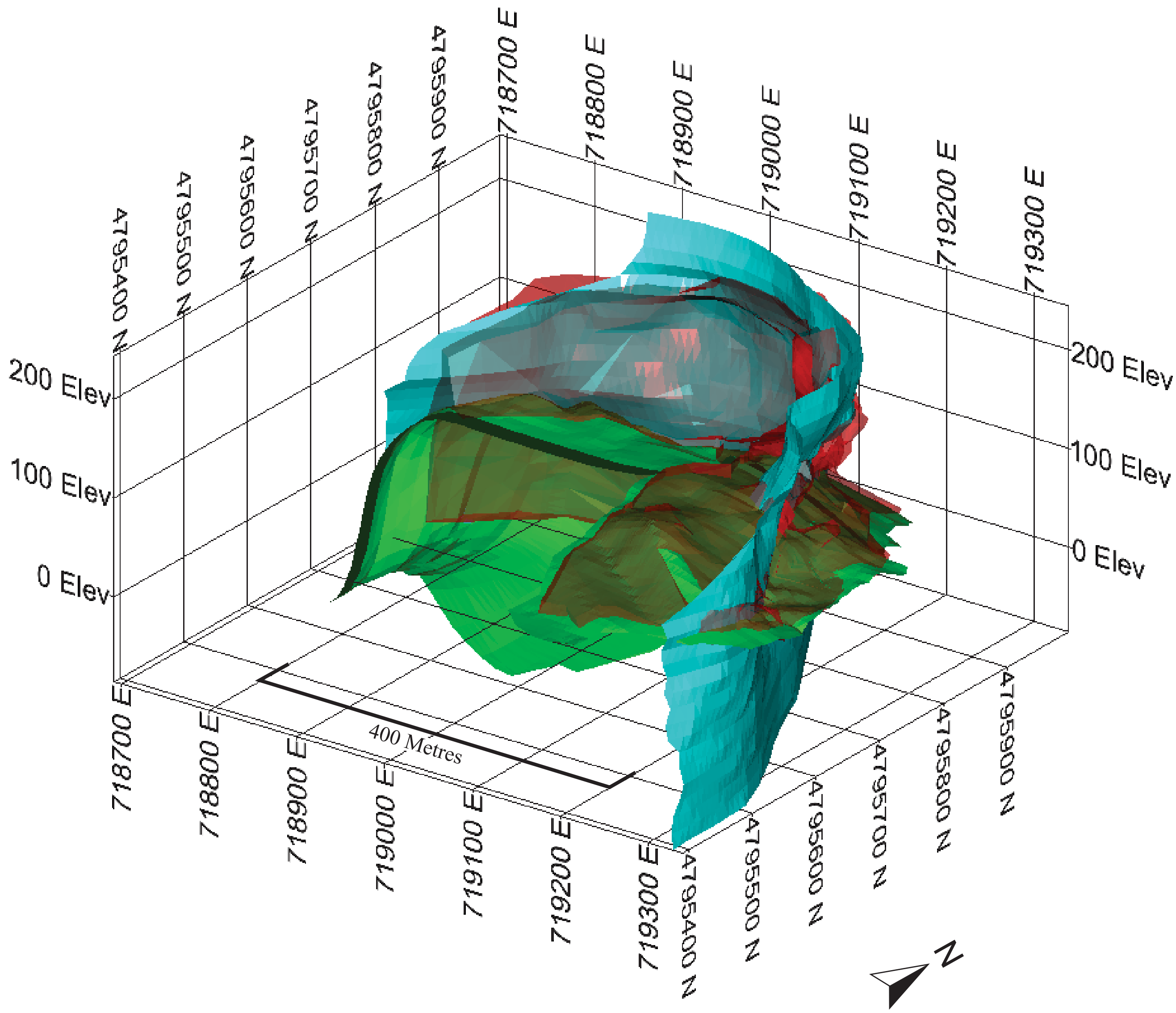
For domains with complicated morphologies, such as the Black Skarn at Boinás, the domains were divided up into sub-domains based on their general orientations and a trend surface for each sub-domain was modelled.

For models generated prior to 2014, sub-domaining of grade distributions within the wireframes was performed by using a Nearest Neighbour (NN) interpolation of grades above statistically derived grade thresholds. For models generated during 2014, when sub-domaining was performed, Indicator Kriging (IK) was used to estimate probabilities of the blocks exceeding the grade thresholds selected. An interpolated probability of 50% was chosen for flagging the sub-domains. A summary of the sub-domaining strategies is given in Table 14-6.

TABLE 14-6 SUMMARY OF DOMAINS FOR BLOCK MODELLING

Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

			Low Grade		Moderate Grade		High Grade		
Zone	Type	Geological Constraint	Threshold (Au g/t)	Method	Threshold (Au g/t)	Method	Threshold (Au g/t)	Method	Comments
Charnela South	Boinás Oxide	Polylines	0.35 (P<0.5)	IK	0.35 (P>0.5)	IK	20 (P>0.5)	IK	
Area 107	Boinás Oxide	Wireframe solid	-	-	-	-	-	-	
S107	Boinás Oxide	Wireframe solid	-	-	-	-	-	-	
El Valle Fault	Boinás Oxide	Wireframe solid	<0.1	NN	<0.75	NN	-	-	Au grades between 0.1 g/t and 0.75 g/t were flagged manually to maintain continuity
East Breccia	Boinás Oxide	Wireframe solid	<0.1	NN	<0.75	NN	-	-	Au grades between 0.1 g/t and 0.75 g/t were flagged manually to maintain continuity
A208	Boinás Oxide	Wireframe solid	<0.1	NN	<0.75	NN	-	-	Au grades between 0.1 g/t and 0.75 g/t were flagged manually to maintain continuity
E107	Boinás Oxide	Wireframe solid	<0.1	NN	<0.75	NN	-	-	Au grades between 0.1 g/t and 0.75 g/t were flagged manually to maintain continuity
High Angle	Boinás Oxide	Wireframe solid	<0.2	NN	>0.2	NN	-	-	
Sienna	Boinás Oxide	Wireframe solid	<0.2	NN	>0.2	NN	-	-	
Boinás East	Boinás Skarn	Wireframe solid	-	-	-	-	-	-	
Black Skarn North	Boinás Skarn	Wireframe solid							Separation from BSSM due to magnesic versus calcic skarns
Black Skarn San Martin	Boinás Skarn	Wireframe solid							Separation from BS due to magnesic versus calcic skarns
Boinás South	Boinás Skarn	Wireframe solid	<0.2	NN	>0.2	NN	-	-	
Carlés East	Carlés Skarn	Wireframe solid	-	-	-	-	-	-	
Carlés South	Carlés Skarn	NN Assignment	-	-	>0.5	NN	-	-	
Carlés West	Carlés Skarn	NN Assignment	-	-	>0.5	NN	-	-	
Capa Z	Carlés Skarn	Wireframe solid	-	-	-	-	-	-	
Carlés North	Carlés Skarn	Wireframe solid	<0.2	NN	>0.2	NN	-	-	
Carlés Northwest	Carlés Skarn	Wireframe solid	<0.2	NN	>0.2	NN	-	-	



Legend:
- *Black Skarn North-San Martin Wireframe*
- *Upper Trend Surface*
- *Lower Trend Furface*

Figure 14-5

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Black Skarn North-San Martín Trend Surfaces

September 2014

RPA reviewed the geological interpretations generated by the Orvana and is of the opinion that the interpretations adequately represent the geology at EVBC and while there is room for improvements in the context of characterization of the distribution of grade, the interpretations are adequate for Mineral Resource and Reserve estimation.

RPA is of the opinion that sub-domaining of grade distributions within the wireframe constraints is good practice. However, RPA recommends the following with respect to sub-domaining:

- Investigate the use of implicit or traditional wireframe modelling of grade distributions within the larger domain wireframes.
- Perform a study to determine sub-domaining thresholds more relevant to the Mineral Resource and Reserve cut-off grades.

COMPOSITING

Models updated prior to 2014 all used a variable length compositing strategy, taking into consideration the orientation of the drill hole relative to the local trend of the mineralization. Only models at Carlés updated in 2014 used variable compositing. The variable length compositing procedure is as follows:

- Drill hole intercepts are composited to full length.
- Trend surfaces are used to calculate the local trend of mineralization.
- The dot product between the composite dip and azimuth and the pole to the trend surface is used to establish the angle at which the drill hole intersects the mineralization.
- Based on this angle, the true thickness of the intercept can be calculated and then used to define the compositing length required such that each composite would represent a one metre true thickness composite.

In 2014, models at Boinás were updated using fixed length compositing due to challenges with identifying a local anisotropy. The trend surfaces characterize the general trends of the mineralization host lithologies but do not characterize local scale variations in anisotropy directions related to multiple phases of mineralization. Orvana used a one metre fixed composite length for all zones at Boinás updated in 2014.

RPA reviewed the compositing strategy adopted by Orvana and is of the opinion that the decision to move to fixed length compositing at Boinás is warranted. However, the dominant sampling length is typically in the region of 1.5 m while the compositing length is one metre. RPA recommends that Orvana adopt a 1.5 m composite length.

RPA notes that variable length compositing is effective for dealing with the difficult drilling angles and the more banded curvi-planar mineralization trends at Carlés.

A summary of the composite statistics is given in Table 14-7 below.

TABLE 14-7 EL VALLE-BOINÁS - CARLÉS COMPOSITE STATISTICS
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Zone	Field	# of Samples	Mean	Median	Min	Max	Stdev	CV	# of DDH
Area 107	Au (g/t)	4,710	2.90	0.64	0	195.00	8.07	2.78	200
Boinás East	Au (g/t)	6,881	1.98	1.11	0	188.84	4.36	2.20	452
BSN-San Martín	Au (g/t)	6,751	1.91	0.85	0	277.34	6.32	3.31	319
Carlés North	Au (g/t)	21,927	3.41	1.92	0	200.00	6.15	1.81	2,303
Carlés Northwest	Au (g/t)	1,121	2.17	1.03	0	89.98	4.97	2.29	234
Charnela South	Au (g/t)	7,932	0.92	0.16	0	253.00	5.80	6.30	88
Area 107	Ag (g/t)	4,622	8.53	2.00	0	530.28	23.65	2.77	200
Boinás East	Ag (g/t)	6,254	14.81	7.38	0	1371.40	34.97	2.36	422
BSN-San Martín	Ag (g/t)	6,706	10.59	4.60	0	690.45	26.31	2.48	319
Carlés North	Ag (g/t)	20,083	8.62	3.00	0	2,300.00	24.96	2.90	2,303
Carlés Northwest	Ag (g/t)	1,121	2.45	1.00	0	164.00	8.10	3.30	234
Charnela South	Ag (g/t)	6,780	4.44	1.00	0	580.00	15.18	3.42	79
Area 107	Cu (%)	4,709	0.45	0.12	0	28.55	1.09	2.44	200
Boinás East	Cu (%)	6,737	0.50	0.26	0	17.98	0.82	1.64	448
BSN-San Martín	Cu (%)	6,751	0.43	0.16	0	22.44	0.98	2.30	319
Carlés North	Cu (%)	21,805	0.41	0.09	0	16.40	0.81	1.99	2,303
Carlés Northwest	Cu (%)	1,121	0.11	0.01	0	7.67	0.39	3.60	234
Charnela South	Cu (%)	7,932	0.06	0.02	0	11.80	0.20	3.33	88

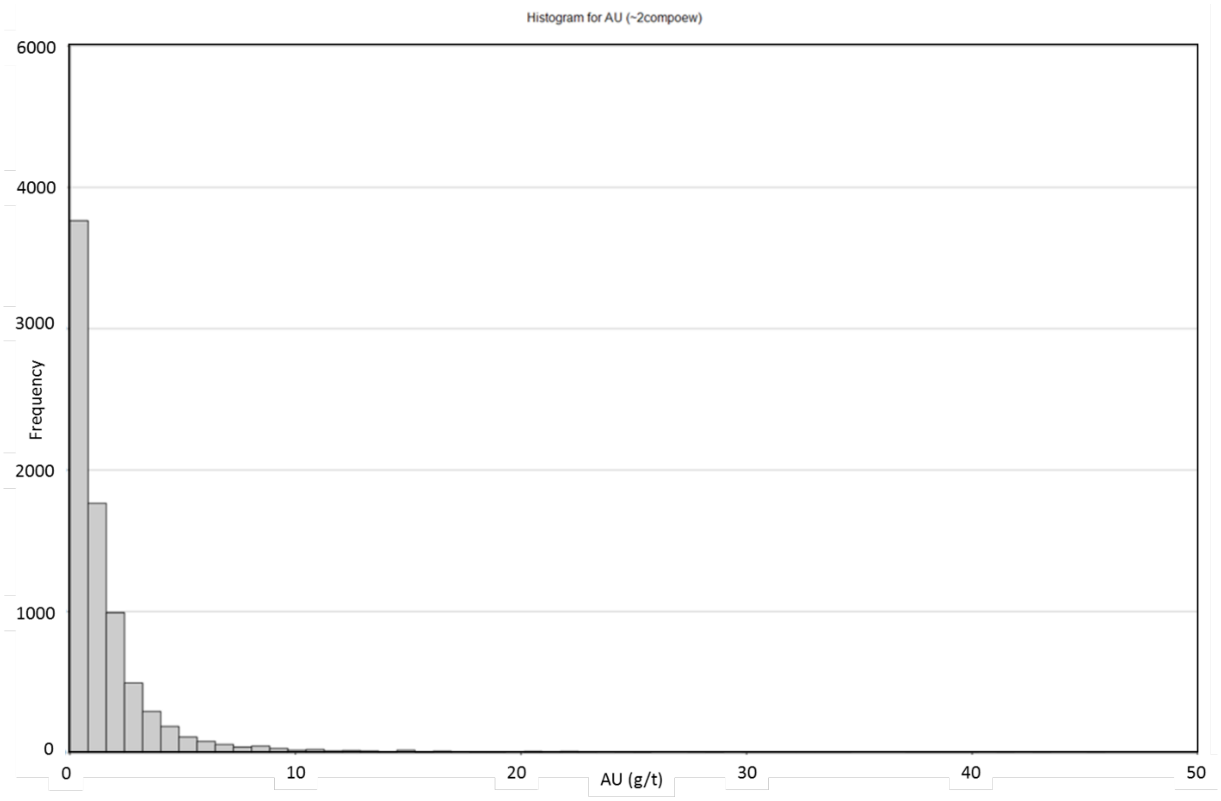
Notes:
1. Statistics are not shown for models not updated (those completed prior to 2014)
2. Refer to Noble, Wheeler and Williams, 2012 for statistics of models not updated.

GRADE CAPPING

Orvana performed outlier analysis on composited drill hole intercepts using the following analyses:

- Normal histograms (example Figure 14-6)
- Log probability plots
- Decile analysis
- Cutting curves

FIGURE 14-6 EXAMPLE OF A HISTOGRAM USED FOR CAPPING ANALYSIS



A summary of the capping grades by zone is given in Table 14-8.

TABLE 14-8 CAPPING GRADES

Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Zone	Au Cap (g/t)	Cu Cap (%)	Ag Cap (g/t)
Charnela South High-grade	100.0	2.0	no caps
Charnela South Mid-grade	30.0	2.0	no caps
Charnela South Low-grade	2.0	0.2	no caps
Area 107	60.0	8.0	150.0
S107	30.0	5.0	150.0
El Valle Fault High	50.0	5.0	-
El Valle Fault Low	1.5	1.0	-
East Breccia High	50.0	5.0	-
East Breccia Low	1.5	1.0	-
A208 High	50.0	5.0	-
A208 Low	1.5	1.0	-
E107 High	50.0	5.0	-
E107 Low	1.5	1.0	-
High Angle High	50.0	5.0	-
High Angle Low	1.5	1.0	-
Sienna High	100.0	6.0	-
Sienna Low	0.5	0.5	-
Boinás East	50.0	15.0	200.0
BSN-San Martín	30.0	10.0	150.0
Boinás South High	40.0	1.5	-
Boinás South Low	0.5	0.8	-
Carlés East	25.0	no caps	-
Carlés South	25.0	no caps	-
Carlés West	25.0	no caps	-
Capa Z	25.0	no caps	-
Carlés North High	20.0	10.0	300.0
Carlés North Low	4.0	4.0	50.0
Carlés Northwest High	20.0	10.0	150.0
Carlés Northwest Low	4.0	4.0	50.0

RPA is of the opinion that the capping grades in the oxides are slightly high and that the high grade sub-domains are only partially restricting the influence of high grades. RPA recommends reviewing the capping levels as new data become available.

VARIOGRAPHY

Variography was performed on composites in the flattened coordinate system using Sage and Datamine Studio 3 software. Given that coordinates were flattened, variogram rotations are azimuth rotations relative to the transformed coordinate set. In the original coordinate system, the variogram rotation represents a plunge to the mineralization.

Orvana generated correlograms and traditional variograms for the data in either original units or for the log transform.

For models generated prior to 2014, the variograms modelled were used to support the search ellipsoid parameters and to inform smoothing ratios from the dispersion variance calculated in Datamine. For models generated during 2014, the variograms were used to support search ellipsoid parameters and for Ordinary Kriging estimation.

The variogram parameters are given in Table 14-9.

TABLE 14-9 VARIOGRAM PARAMETERS
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Zone	Grade	Nugget	Sill 1	Range 1 (m)			Sill 2	Range 2 (m)			Rotation (Z)
				X Axis	Y Axis	Z Axis		X Axis	Y Axis	Z Axis	
Carlés North	Au	0.73	0.24	7.4	11.5	5.6	0.03	93.4	110.7	47.3	-30
Carlés North	Cu	0.07	0.79	2.2	4.7	1.6	0.14	33.2	32.6	4.4	60
Carlés North	Ag	0.24	0.67	1.5	2.6	2.5	0.08	19.8	22.7	13	50
Carlés Northwest	Au	0.02	0.95	3	2	15.6	0.03	50	100	10	30
Carlés Northwest	Cu	0.45	0.50	3	3.6	5.1	0.05	90	125	20	30
Carlés Northwest	Ag	0.21	0.77	3	1.4	13	0.02	85	110	15	30
Boinás East	Au	0.28	0.34	14	29	5	0.38	83	162	33	80
Boinás East	Cu	0.35	0.49	43	27	19	0.16	73	125	30	60
Boinás East	Ag	0.10	0.03	25	38	5	0.87	49	83	9	100
Charnela South	Au	0.50	0.32	11	15	9	0.18	54	101	58	50
Charnela South	Cu	0.40	0.42	25	37	19	0.18	49	111	62	70
Charnela South	Ag	0.10	0.75	17	23	38	0.16	45	102	49	60
Area 107 Upper - Lower	Au	0.00	0.79	3.2	7.5	2.7	0.21	77.9	108.3	17	62
Area 107 Upper - Lower	Cu	0.00	0.41	2.6	2.6	2.1	0.59	46.5	101.4	14.6	42
Area 107 Upper - Lower	Ag	0.01	0.36	5	6.6	3.6	0.63	32.4	110.6	26.8	36
BSN-San Martín Upper Zone	Au	0.21	0.51	3.9	3.8	5.2	0.28	79.2	29.2	15.8	0
BSN-San Martín Upper Zone	Cu	0.07	0.59	4.4	3.4	7.3	0.34	124.3	61.5	20.7	0
BSN-San Martín Upper Zone	Ag	0.29	0.57	9.3	4.7	11.7	0.14	163.1	29.1	25.2	0
BSN-San Martín Lower Zone	Au	0.10	0.66	4.9	3.2	2.4	0.24	144.6	18.3	27.6	0
BSN-San Martín Lower Zone	Cu	0.05	0.65	6	3	6	0.30	133.8	22.4	22.6	0
BSN-San Martín Lower Zone	Ag	0.11	0.57	6.4	3.5	2.7	0.19	101.8	13.5	23.6	0

Notes:
1. Rotations are expressed with respect to flattened coordinates
2. Refer to Noble, Wheeler and Williams, 2012 for variograms for models not updated.

RPA reviewed the variograms modelled by Orvana and has the following comments:

- Orvana did not perform a back transform of the log transformed variograms and therefore, in RPA's opinion, have overstated the ranges and have understated the variances for these variograms. RPA recommends to either model variograms in original units or to back transform log variograms.
- The nugget effects are inferred from the directional variograms. RPA recommends fixing the nugget effect based on observations on the omni-directional and/or downhole variogram.

BLOCK MODEL

Orvana adopted a block model definition strategy utilizing two model prototypes for models updated in 2014. The objective of the two prototypes is to estimate blocks to a realistic resolution based on the drill hole spacing in flattened coordinates and to then represent the estimated blocks in the original coordinate system without the loss of geological resolution.

Models generated prior to 2014 utilized the same block model prototype for both flattened and original coordinate block models, using block sizes representative of the desired geological resolution required for mine planning.

Table 14-10 summarizes the block model definitions used by Orvana:

TABLE 14-10 BLOCK MODEL DEFINITION
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

	Model Origin			Number of Blocks			Reporting Prototype			Estimation prototype		
ZONE	**X**	**Y**	**Z**	**X**	**Y**	**Z**	**X Size**	**Y Size**	**Z Size**	**X Size**	**Y Size**	**Z Size**
A107	719120	4795460	100	380	300	420	1	2	1	10	10	1
Boinás East	718700	4795200	-120	150	85	140	4	4	4	10	10	2
Black Skarn North	718692	4795300	-120	202	200	160	4	4	4	10	10	4
Carlés East	723412.4	4804606	-39.5	720	100	133	0.25	2.5	1.5	0.25	2.5	1.5
Carlés South	723460	4804410	-230	60	44	52	8	8	8	8	8	8
Carlés North	722850	4804800	-400	525	590	715	1	1	1	5	5	1
Carlés North West	722620	4804660	-140	410	480	420	1	1	1	10	10	1
Capa Z	723290	4804725	-125	210	350	315	1	1	1	10	10	1
E107	719250	4795600	50	400	525	500	1	2	1	1	2	1
East Breccia	719250	4795600	50	400	525	500	1	2	1	1	2	1
El Valle Fault	719200	4795960	100	220	240	460	1	2	1	1	2	1
High Angle	718660	4795180	40	380	260	400	1	1	1	1	1	1
S107	718700	4795300	-120	200	207	160	4	4	4	4	4	4
Sienna	718740	4795160	220	280	210	180	2	2	2	2	2	2
A208	719250	4795600	50	400	525	500	1	2	1	1	2	1
Carlés West	722730	4804540	-90	33	25	42	8	8	8	8	8	8

Notes:
1. Prototype is a Datamine term used to describe a file that contains the block model parameters.
2. Reporting prototype refers to the prototype model in original coordinates.
3. Estimation prototype refers to the prototype model in flattened coordinates.

For most zones, a fixed density was assigned to blocks (Table 14-11). The upper portion of Boinás East becomes transitional or oxide material and the density shows a relationship between depth and gold grades (Table 14-12, information sourced from Noble et al., 2012)

TABLE 14-11 BLOCK MODEL DENSITIES
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Zone	Mine	Type	Density
A107	El Valle-Boinás	Oxide	2.25
A208	El Valle-Boinás	Oxide	2.2
Boinás East	El Valle-Boinás	Skarn	Variable
Boinás South	El Valle-Boinás	Skarn	2.9
San Martín	El Valle-Boinás	Skarn	3.03
Black Skarn North	El Valle-Boinás	Skarn	3.03
Charnela South	El Valle-Boinás	Oxide	2.25
E107	El Valle-Boinás	Oxide	2.2
East Breccia	El Valle-Boinás	Oxide	2.2
EV Fault	El Valle-Boinás	Oxide	2.2
High Angle	El Valle-Boinás	Oxide	2.3
S107	El Valle-Boinás	Oxide	2.25
Sienna Zone	El Valle-Boinás	Oxide	2.25
West Skarn	El Valle-Boinás	Oxide	2.25
Carlés East	Carlés	Skarn	3.3
Carlés North	Carlés	Skarn	3.3
Carlés North West	Carlés	Skarn	3.3
Carlés South	Carlés	Skarn	3.38
Capa Z	Carlés	Skarn	3.3

TABLE 14-12 BOINÁS EAST BLOCK MODEL DENSITY DETERMINATION
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Elevation Range	Density (in the presence of gold grade)	Density (in the absence of gold grade)
<150	3.15	3.15
150 to 250	3.2-0.0008483*Au-0.00034*Elevation	3.13
250 to 300	3.59-0.02173070*Au-0.00206*Elevation	2.97
>300	3.59-0.2173070*0.00206*Elevation	2.83

RPA notes that, in some cases, the block sizes used are not optimal for resource reporting. On occasion, mineralization is being modelled to thicknesses that cannot be achieved during mining (Carlés North for example). However, the block sizes are more appropriate for

Mineral Reserve estimation allowing for preferential placement of development and stopes. An exception to this is the Black Skarn, where the highly irregular shape of the deposit is causing undesired dilution during mine planning.

INTERPOLATION STRATEGY

Both Inverse Distance (ID) and Ordinary Kriging (OK) were used to inform block grades. Models generated prior to the 2014 update by ORE used ID with an additional global change of support check to justify the ID exponent. For all models, except for Carlés South and Carlés West, grades were estimated in flattened coordinates, accounting for the non-linear mineralization trends at EVBC. For all models updated by Orvana in 2014, OK was used.

Semi-soft boundaries were used to control grade estimation for the Black Skarn and A107 due to the transitional nature of the contacts between the Black Skarn North, Black Skarn San Martín, and the transition between skarn and oxide in Area 107. The Black Skarn North, Boinás East, and A107 were further divided up into additional structural domains prior to interpolation to deal with the irregular morphology of the zones.

A summary of the interpolation strategies used is summarized in Table 14-13.

TABLE 14-13 INTERPOLATION PARAMETERS
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Zone	Grade	Search Ellipse 1 Pass			Rotation			Number of Samples			Method
		X Axis	Y Axis	Z Axis	Z Axis	Y Axis	X Axis	Min	Max	Max per hole	
Carlés North	Au	50	50	1.5	-30	0	0	5	10	3	OK
Carlés North	Cu	50	50	1.5	60	0	0	5	10	3	OK
Carlés North	Ag	50	50	1.5	50	0	0	5	10	3	OK
Carlés Northwest	Au	50	50	1.5	30	0	0	4	9	2	OK
Carlés Northwest	Cu	50	50	1.5	30	0	0	4	10	2	OK
Carlés Northwest	Ag	50	50	1.5	30	0	0	4	14	2	OK
Boinás East	Au	25	35	4	80	0	0	6	8	2	OK
Boinás East	Cu	25	35	4	60	0	0	6	8	2	OK
Boinás East	Ag	25	35	4	100	0	0	6	8	2	OK
Charnela South	Au	25	25	2	20	0	0	5	8	3	OK
Charnela South	Cu	25	25	2	20	0	0	5	8	3	OK
Charnela South	Ag	25	25	2	10	0	0	5	8	3	OK
Area 107 Upper - Lower	Au	35	35	2	62	0	0	5	10	3	OK
Area 107 Upper - Lower	Cu	35	35	2	42	0	0	5	10	3	OK
Area 107 Upper - Lower	Ag	35	35	2	36	0	0	5	10	3	OK
BSN-San Martín Upper Zone	Au	50	25	10	0	0	0	5	10	3	OK
BSN-San Martín Upper Zone	Cu	50	25	20	0	0	0	5	10	3	OK
BSN-San Martín Upper Zone	Ag	50	25	20	0	0	0	5	10	3	OK
BSN-San Martín Lower Zone	Au	50	25	6	0	0	0	5	10	3	OK
BSN-San Martín Lower Zone	Cu	50	20	10	0	0	0	5	10	3	OK
BSN-San Martín Lower Zone	Ag	50	25	10	0	0	0	5	10	3	OK

Notes:
1. Refer to Noble, Wheeler and Williams, 2012 for variograms for models not updated.

RPA notes that the trend surface methodology for flattening the mineralization is effective and perhaps superior to many conventional techniques in certain areas such as the curvi-planar Carlés zones. However, in other areas such as the larger Boinás skarns or the oxides, there is little evidence for a strong short and long range anisotropy. The flattening methodology imposes a pronounced anisotropy, which produces artificial striping of grades and over-smearing, especially noticeable in the more sparsely drilled Inferred areas. Nevertheless, RPA is of the opinion that, in general, the interpolation approach is reasonable to support the resource block model grades.

BLOCK MODEL VALIDATION

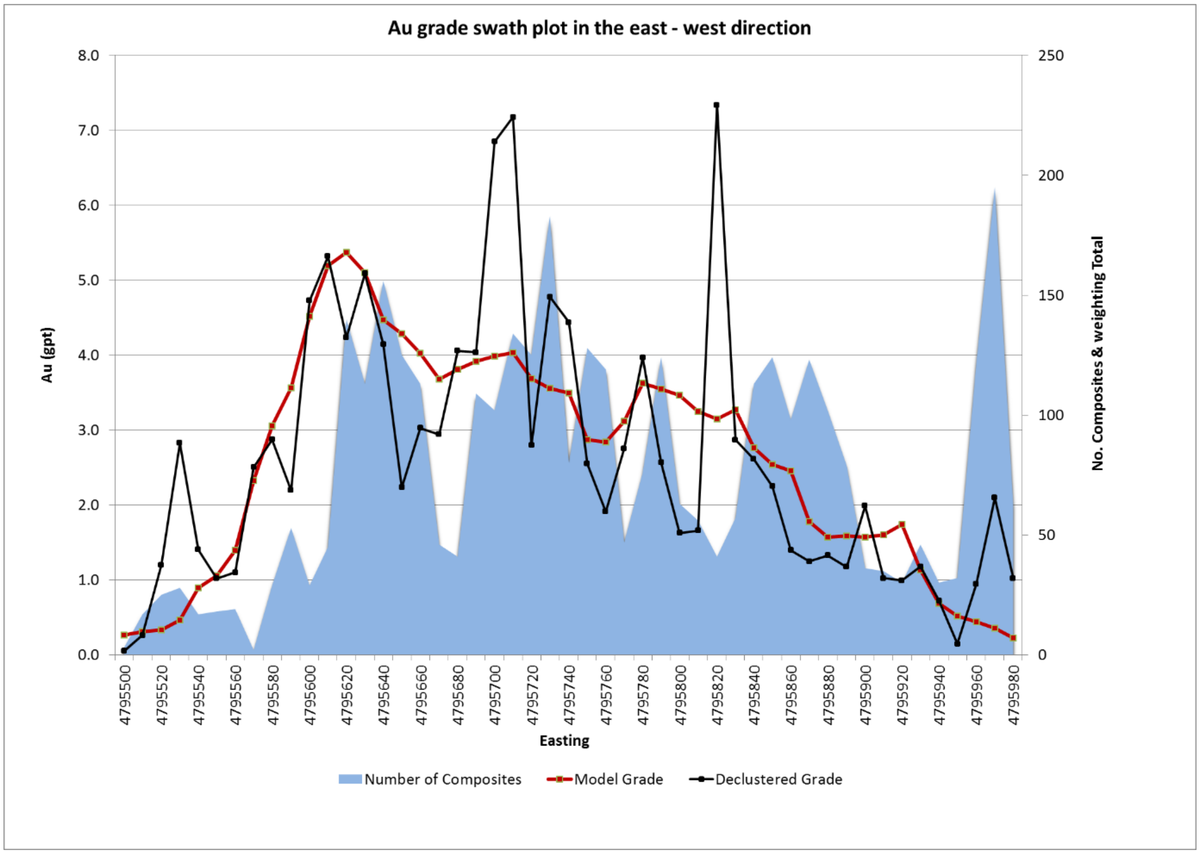
For models generated prior to the 2014 update, models were validated using a global change of support check involving a mean grade and variance check of the ID estimates and a NN model. The ID exponent was adjusted so that the mean grades corresponded between the two methods and that the ratio between the NN and ID models corresponded to the target variance calculated using the dispersion variance for the blocks.

For models updated in 2014, the models were validated using swath plots (Figure 14-7), visual inspections (Figures 14-8, 14-9, and 14-10) and by reconciling the models to production.

In addition, RPA performed the following validation checks:

- Comparison of the drill holes to block grades.
- Comparison of grade control data to block grades.
- Independent check estimates.
- Comparison of mined out Boinás skarns to grade control records.

FIGURE 14-7 A107 EASTING SWATH PLOT



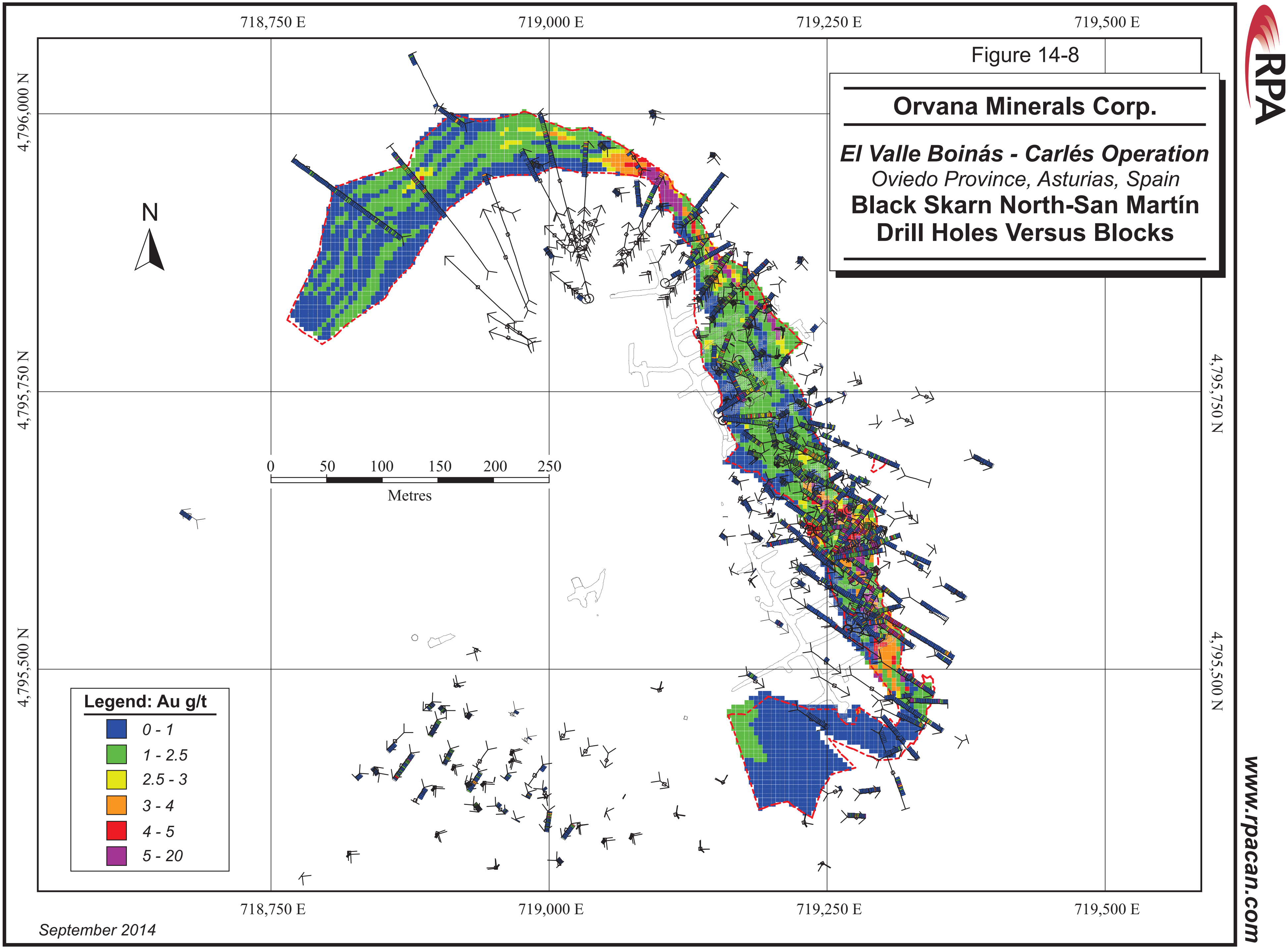


Figure 14-8
Orvana Minerals Corp.
El Valle Boinás - Carlés Operation
Oviedo Province, Asturias, Spain
Black Skarn North-San Martín
Drill Holes Versus Blocks
718,750 E
719,000 E
719,250 E
719,500 E
4,796,000 N
4,795,750 N
4,795,500 N
N
0
50
100
150
200
250
Metres
Legend: Au g/t
0 - 1
1 - 2.5
2.5 - 3
3 - 4
4 - 5
5 - 20
September 2014
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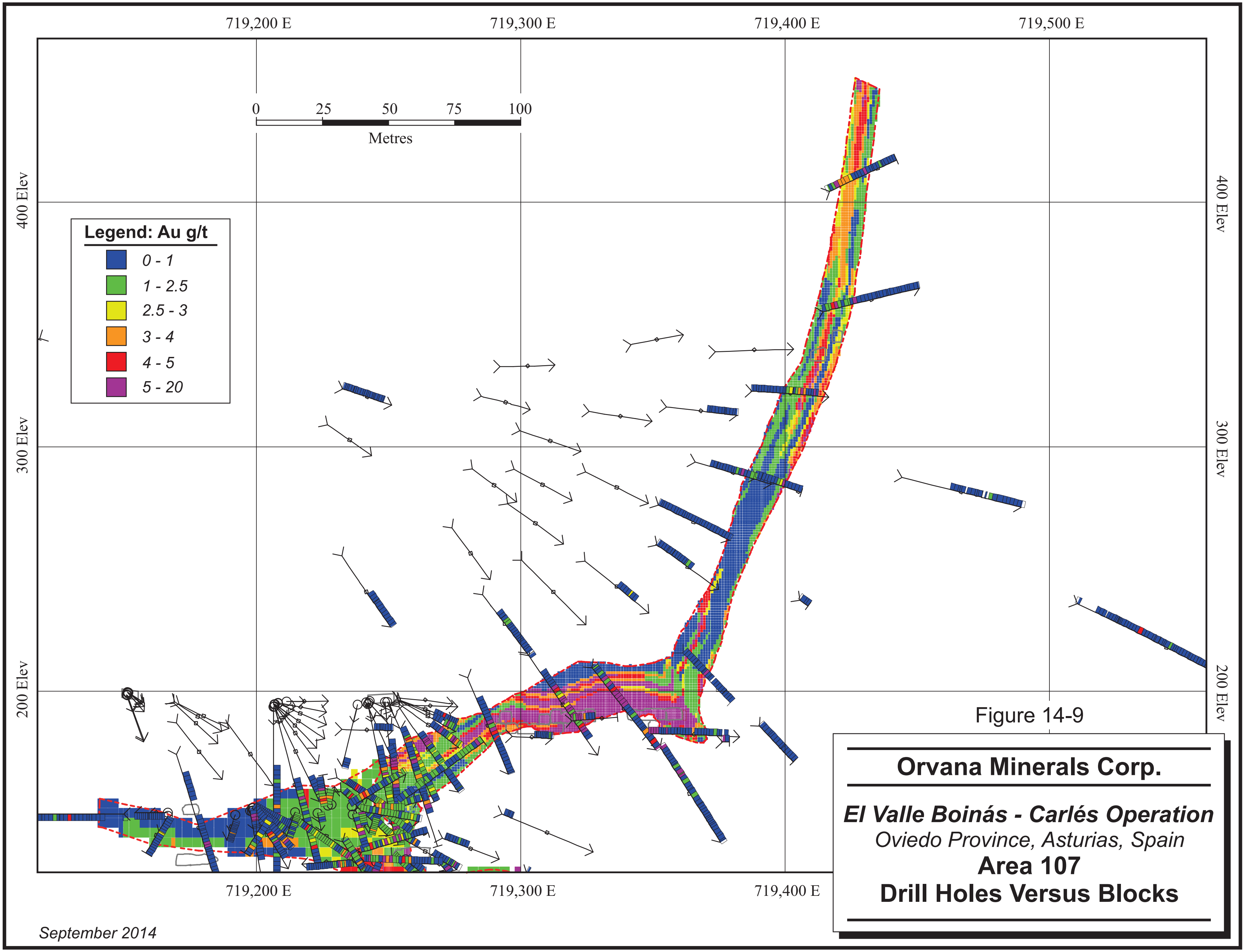

Figure 14-9

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Area 107

Drill Holes Versus Blocks

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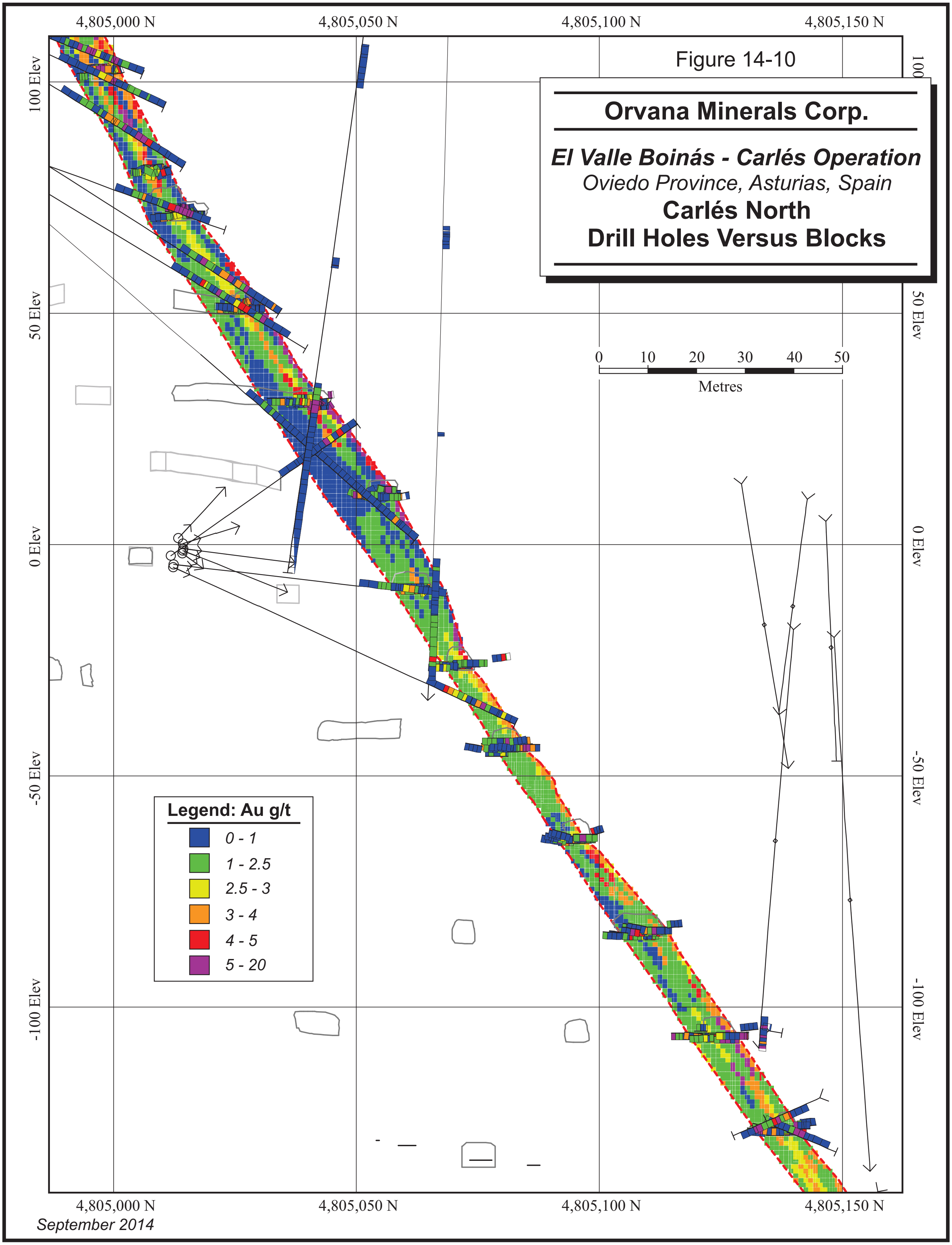


Figure 14-10
Orvana Minerals Corp.
El Valle Boinás - Carlés Operation
Oviedo Province, Asturias, Spain
Carlés North
Drill Holes Versus Blocks
4,805,000 N
4,805,050 N
4,805,100 N
4,805,150 N
100 Elev
50 Elev
0 Elev
-50 Elev
-100 Elev
0
10
20
30
40
50
Metres
Legend: Au g/t
0 - 1
1 - 2.5
2.5 - 3
3 - 4
4 - 5
5 - 20
September 2014

RECONCILIATION

RPA was supplied with reconciliation data from planned or forecasted production (from either the long term or short term model) to grade control samples and truck tonnes compared on a localized basis which is then compared to mill production on a monthly basis. For the Boinás skarns and Carlés skarns, grades are obtained from the muck samples. For Boinás oxides, given that muck samples from multiple headings are mixed prior to geological sampling, localized grades are calculated from the face samples and a grade by level is calculated from the muck samples. In addition, stopes tonnages and dilution are reconciled by the mining department using the Cavity Monitoring System (CMS) survey. Currently the CMS surveys are not being used by the geological department to assess the performance of the short and long term models. Grade control to mill production comparisons are performed on a month to month basis. Mill production is not compared to headings and stopes due to the fact that mill feed is a blend of material from various locations.

Orvana personnel acknowledge the inconsistency between using long and short term models for mine planning and have started implementing a consistent protocol whereby only short term models are used for mine planning

RPA reviewed the reconciliation and recommends the following:

- Orvana should continue to consistently produce long and short term models and comparisons should be reported accordingly.
- An attempt should be made to sample oxide muck by heading to establish localized grades.
- Mill grade and tonnes should be prorated back to headings and stopes based on proportions determined during grade control sampling.
- Orvana should implement a *F1, F2, and F3 reconciliation system.

**The F1, F2 and F3 grade control system involves the following relationships:*

F1 = (Short term model depletion/long term model depletion)
F2 = (Grade control/Mill production)
*F3 = F1*F2*

The F1 factor measures the relationship between the short and long term models while the F2 factor measures the differences between grade control and the mill. The F3 factor allows for an understanding on the mine's ability to recover tonnage, grade, and metal content estimated during Mineral Reserve estimation.

For validation purposes, RPA queried the grades and tonnes depleted from the Black Skarn North, San Martín and Boinás east block models. The results in Table 14-14 show that the block estimates have reasonable variations from the grade control data. A large proportion of the metal content discrepancy may be accounted for by differences between the CMS tonnes and the tonnes recorded during grade control.

The oxide reconciliation is less definitive (Table 14-15). This is mainly due to the following factors:

- Muck samples only provide a global average grade by level due to mixing during grade control.
- Face samples used for localized grade control are only partially representative due to grade control timing issues and faces being partially covered with shotcrete.
- The oxides are highly variable and definition drilling is most likely insufficient to yield robust local estimates.

RPA

TABLE 14-14 COMPARISON BETWEEN MINED OUT STOPES AMD GRADE CONTROL (BLACK SKARN NORTH, SAN MARTIN AND BOINÁS EAST)
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Zone			2014 Mineral Resource Model						Grade Control (Muck Samples)						Difference (2014/GC)		
	STOPE	YEAR	CMS Tonnes	Au (g/t)	Cu (%)	Ag (g/t)	AUEQ (g/t)	AUEQ Ounces	Truck Tonnes	Au (g/t)	Cu (%)	Ag (g/t)	AUEQ (g/t)	AUEQ Ounces	Tonnes	Au (g/t)	Cu (%)
Boinás East	BE_170_15	2012	15,331	1.91	0.37	18.33	2.73	1,348	16,131	2.23	0.46	4.10	2.99	1,551	-5%	-9%	-13%
	BE_170_21	2012	7,549	1.38	0.23	10.24	1.88	456	8,090	1.38	0.24	8.43	1.86	485	-7%	1%	-6%
	BE_170_5	2012	9,566	1.60	0.56	8.53	2.57	792	11,023	1.44	0.63	11.19	2.56	907	-13%	1%	-13%
	BE_170_22	2013	12,497	1.73	0.51	13.11	2.70	1,083	13,064	1.72	0.79	13.77	3.12	1,310	-4%	-14%	-17%
	Total	**2012-2013**	**44,943**	**1.71**	**0.43**	**13.43**	**2.73**	**3,678**	**48,640**	**1.76**	**0.55**	**9.00**	**2.72**	**4,253**	**-8%**	**1%**	**-14%**
Black Skarn North	BS_120_11	2011	26,966	2.34	0.41	13.44	3.16	2,738	42,057	1.32	0.26	6.87	1.81	2,452	-36%	74%	12%
	BS_120_9	2011	11,208	1.81	0.67	12.56	3.00	1,081	12,047	2.24	0.55	11.16	3.24	1,254	-7%	-7%	-14%
	BS_100_10	2013	25,405	1.73	0.50	11.36	2.64	2,160	26,190	1.74	0.51	11.13	2.68	2,253	-3%	-1%	-4%
	BS_100_11	2013	16,518	2.08	0.62	14.50	3.23	1,718	16,598	1.74	0.54	11.62	2.73	1,456	0%	19%	18%
	BS_100_13	2013	34,367	1.73	0.43	11.98	2.56	2,832	38,874	1.47	0.34	9.57	2.12	2,654	-12%	21%	7%
	BS_100_15	2013	14,873	1.65	0.26	7.73	2.15	1,029	17,494	1.64	0.36	8.43	2.31	1,298	-15%	-7%	-21%
	BS_100_7	2013	31,332	1.23	0.51	8.78	2.13	2,144	32,877	1.21	0.47	8.69	2.05	2,167	-5%	4%	-1%
	BS_120_15	2013	18,038	1.50	0.29	7.32	2.05	1,191	30,842	2.64	0.39	11.33	3.39	3,366	-42%	-40%	-65%
	BS_80_17	2014	11,306	1.70	0.23	5.86	2.13	775	12,024	2.42	0.51	13.06	3.38	1,307	-6%	-37%	-41%
	Total	**2011-2014**	**190,013**	**1.74**	**0.44**	**10.69**	**2.57**	**15,668**	**229,004**	**1.72**	**0.41**	**9.69**	**2.47**	**18,207**	**-17%**	**4%**	**-14%**
San Martin	SM_100_15	2012	16,396	3.75	0.53	18.98	4.83	2,545	15,075	3.04	0.53	16.44	4.08	1,978	9%	18%	29%
	SM_100_21	2012	4,864	3.69	0.95	18.86	5.40	845	3,512	4.86	1.18	26.22	7.03	794	38%	-23%	6%
	SM_100_23	2012	9,171	2.40	0.70	12.64	3.65	1,077	10,150	3.28	0.49	12.64	4.21	1,372	-10%	-13%	-22%
	SM_80_15	2012	8,502	2.64	0.76	16.80	4.04	1,105	8,562	3.17	0.45	14.07	4.05	1,116	-1%	0%	-1%
	SM_100_11	2013	12,124	1.50	0.65	9.72	2.62	1,023	13,063	1.15	0.55	7.67	2.10	881	-7%	25%	16%
	SM_100_13	2013	8,126	3.41	0.62	14.33	4.56	1,191	8,465	1.44	0.48	7.85	2.28	621	-4%	100%	92%
	SM_100_14	2013	18,072	3.18	0.63	16.64	4.37	2,537	20,559	2.58	0.68	16.24	3.85	2,542	-12%	14%	0%
	SM_100_22	2013	8,299	2.07	0.61	10.31	3.14	838	10,271	2.12	0.49	8.02	2.98	984	-19%	5%	-15%
	SM_80_14	2013	9,962	1.85	0.58	10.90	2.89	925	10,447	2.98	0.74	19.56	4.38	1,473	-5%	-34%	-37%
	SM_80_16	2013	12,860	3.30	1.05	24.89	5.25	2,172	14,260	2.72	0.76	20.41	4.17	1,910	-10%	26%	14%
	SM_80_20	2013	16,078	3.41	1.05	15.62	5.23	2,706	10,118	2.34	0.80	12.48	3.74	1,216	59%	40%	123%
	SM_100_12	2014	22,858	1.60	0.62	9.09	2.68	1,969	18,104	1.35	0.45	7.93	2.15	1,251	26%	25%	57%
	SM_80_17	2012	12,941	2.26	0.66	19.06	3.53	1,470	13,619	3.46	0.95	21.31	5.21	2,281	-5%	-32%	-36%
	SM_80_19	2012	12,206	3.72	1.30	18.43	5.97	2,343	16,441	4.43	1.00	25.21	6.31	3,336	-26%	-5%	-30%
	SM_80_21	2012	10,526	2.14	0.73	9.97	3.40	1,149	11,974	1.28	0.38	7.66	1.97	758	-12%	73%	52%
	Total	**2012-2014**	**182,985**	**2.70**	**0.75**	**15.01**	**4.07**	**23,895**	**184,621**	**2.59**	**0.65**	**14.80**	**3.79**	**22,514**	**-1%**	**7%**	**6%**
El Valle Boinás	**Grand Total**	**2011-2014**	**417,941**	**2.16**	**0.58**	**12.88**	**3.19**	**43,241**	**462,264**	**2.07**	**0.52**	**11.66**	**3.03**	**44,974**	**-10%**	**5%**	**-4%**

TABLE 14-15 COMPARISON BETWEEN MINED OUT OXIDES AND GRADE CONTROL (A107 AND CHARNELA)

Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

	Long Term Model						Grade Control (Face Samples)						Grade Control (Muck Samples)					
Level/Zone	**Tonnes**	**Au (g/t)**	**Cu (%)**	**Ag (g/t)**	**AuEq (g/t)**	**AuEq Ounces**	**Tonnes**	**Au (g/t)**	**Cu (%)**	**Ag (g/t)**	**AuEq (g/t)**	**AuEq Ounces**	**Tonnes**	**Au (g/t)**	**Cu (%)**	**Ag (g/t)**	**AuEq (g/t)**	**AuEq Ounces**
Charnela South																		
CH+310.1	12,836	4.27	0.08	7.14	4.49	1,851	14,868	2.27	0.11	4.36	2.50	1,195	14,868	3.51	0.2	3.73	3.87	1,849
CH+325_0	20,962	2.31	0.15	7.31	2.64	1,780	22,074	3.81	0.2	4.45	4.18	2,965	22,074	2.9	0.23	5.44	3.33	2,362
Charnela Total	33,798	3.05	0.12	7.25	3.34	3,632	36,943	3.19	0.16	4.41	3.50	4,160	36,943	3.15	0.22	4.75	3.55	4,211
A107																		
A107-180.1	62,884	7.65	0.98	17.29	9.39	18,984	68,739	6.63	0.91	17.09	8.26	18,254	68,739	6.75	0.8	13.72	8.16	18,044
A107-330.2	13,890	3.69	0.29	4.37	4.19	1,873	15,617	6.24	0.51	9.27	7.15	3,590	15,617	3.87	0.44	5.69	4.62	2,321
A107-330.1	10,447	3.28	0.29	4.51	3.79	1,272	8,794	4.02	0.46	5.86	4.80	1,359	8,794	5.19	0.39	4.99	5.86	1,656
A107 Total	87,221	6.50	0.79	13.70	7.89	22,128	93,150	6.32	0.80	14.72	7.75	23,202	93,150	6.12	0.70	11.55	7.35	22,020
Grand Total	121,018	5.53	0.60	11.90	6.62	25,760	130,093	5.43	0.62	11.79	6.54	27,362	130,093	5.28	0.56	9.62	6.27	26,231

	Difference % (Long term/Face Samples)						Difference % (Long term/Muck Samples)					
Level/Zone	**Tonnes**	**Au (g/t)**	**Cu (%)**	**Ag (g/t)**	**AuEq (g/t)**	**AuEq Ounces**	**Tonnes**	**Au (g/t)**	**Cu (%)**	**Ag (g/t)**	**AuEq (g/t)**	**AuEq Ounces**
Charnela South												
CH+310.1	-14%	88%	-30%	64%	80%	55%	-14%	22%	-61%	92%	16%	0%
CH+325_0	-5%	-39%	-25%	64%	-37%	-40%	-5%	-20%	-35%	34%	-21%	-25%
Charnela Total	-9%	-4%	-25%	64%	-5%	-13%	-9%	-3%	-44%	53%	-6%	-14%
A107												
A107-180.1	-9%	15%	8%	1%	14%	4%	-9%	13%	23%	26%	15%	5%
A107-330.2	-11%	-41%	-43%	-53%	-41%	-48%	-11%	-5%	-34%	-23%	-9%	-19%
A107-330.1	19%	-18%	-37%	-23%	-21%	-6%	19%	-37%	-26%	-10%	-35%	-23%
A107 Total	-6%	3%	-2%	-7%	2%	-5%	-6%	6%	12%	19%	7%	0%
Grand Total	-7%	2%	-3%	1%	1%	-6%	-7%	5%	7%	24%	6%	-2%

Reconciliation of grade control to mill production up to April 2014 was provided by Orvana. A summary of the reconciliation of grade control to the mill for April 2012 to April 2014 is given in Table 14-16.

TABLE 14-16 GRADE CONTROL TO MILL RECONCILIATION (APRIL 2012 TO APRIL 2014)

Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

	Grade Control			Plant			% Difference		
Month	Tonnes (DMT)	Au (g/t)	Ounces	Tonnes (DMT)	Au (g/t)	Ounces	Tonnes (DMT)	Au (g/t)	Ounces
Apr-12	49,041	2.90	4,569	47,473	2.62	3,999	-3%	-10%	-12%
May-12	51,296	3.75	6,189	53,971	3.27	5,674	5%	-13%	-8%
Jun-12	52,126	3.17	5,316	49,266	3.35	5,306	-5%	6%	0%
Jul-12	46,205	3.32	4,928	45,851	3.2	4,717	-1%	-4%	-4%
Aug-12	42,061	2.51	3,394	42,024	2.84	3,837	0%	13%	13%
Sep-12	33,782	2.93	3,182	30,562	2.85	2,800	-10%	-3%	-12%
Oct-12	42,054	2.75	3,718	43,585	2.77	3,882	4%	1%	4%
Nov-12	51,183	3.36	5,529	46,567	3.01	4,507	-9%	-10%	-18%
Dec-12	60,722	3.27	6,384	55,737	3.68	6,595	-8%	13%	3%
Jan-13	60,169	3.30	6,384	60,391	3.18	6,174	0%	-4%	-3%
Feb-13	55,706	3.42	6,119	55,438	3.33	5,935	0%	-3%	-3%
Mar-13	65,070	2.46	5,147	60,617	2.65	5,165	-7%	8%	0%
Apr-13	62,578	2.99	6,016	60,461	3.14	6,104	-3%	5%	1%
May-13	64,490	3.45	7,153	62,650	3.75	7,554	-3%	9%	6%
Jun-13	55,430	3.32	5,917	58,488	3.34	6,281	6%	1%	6%
Jul-13	58,445	3.14	5,900	50,902	3.68	6,023	-13%	17%	2%
Aug-13	76,123	3.11	7,600	69,865	2.71	6,087	-8%	-13%	-20%
Sep-13	58,996	3.99	7,570	60,996	3.55	6,962	3%	-11%	-8%
Oct-13	67,545	2.63	5,721	59,491	2.95	5,642	-12%	12%	-1%
Nov-13	52,762	2.61	4,428	63,090	2.55	5,172	20%	-2%	17%
Dec-13	61,160	2.18	4,287	58,131	2.34	4,373	-5%	7%	2%
Jan-14	53,132	2.66	4,545	66,169	2.33	4,957	25%	-12%	9%
Feb-14	57,253	3.08	5,675	61,478	2.79	5,515	7%	-10%	-3%
Mar-14	52,386	3.62	6,090	58,464	3.34	6,278	12%	-8%	3%
Apr-14	50,443	3.22	5,229	46,926	3.38	5,100	-7%	5%	-2%
TOTAL	**1,380,159**	**3.09**	**136,988.84**	**1,368,593**	**3.06**	**134,639**	**-1%**	**-1%**	**-2%**

RPA reviewed the overall results of the reconciliation and is of the opinion that the models perform reasonably well.

RPA is of the opinion that the validation results are reasonable and that the models are adequate to support Mineral Resource and Reserve estimation.

CLASSIFICATION

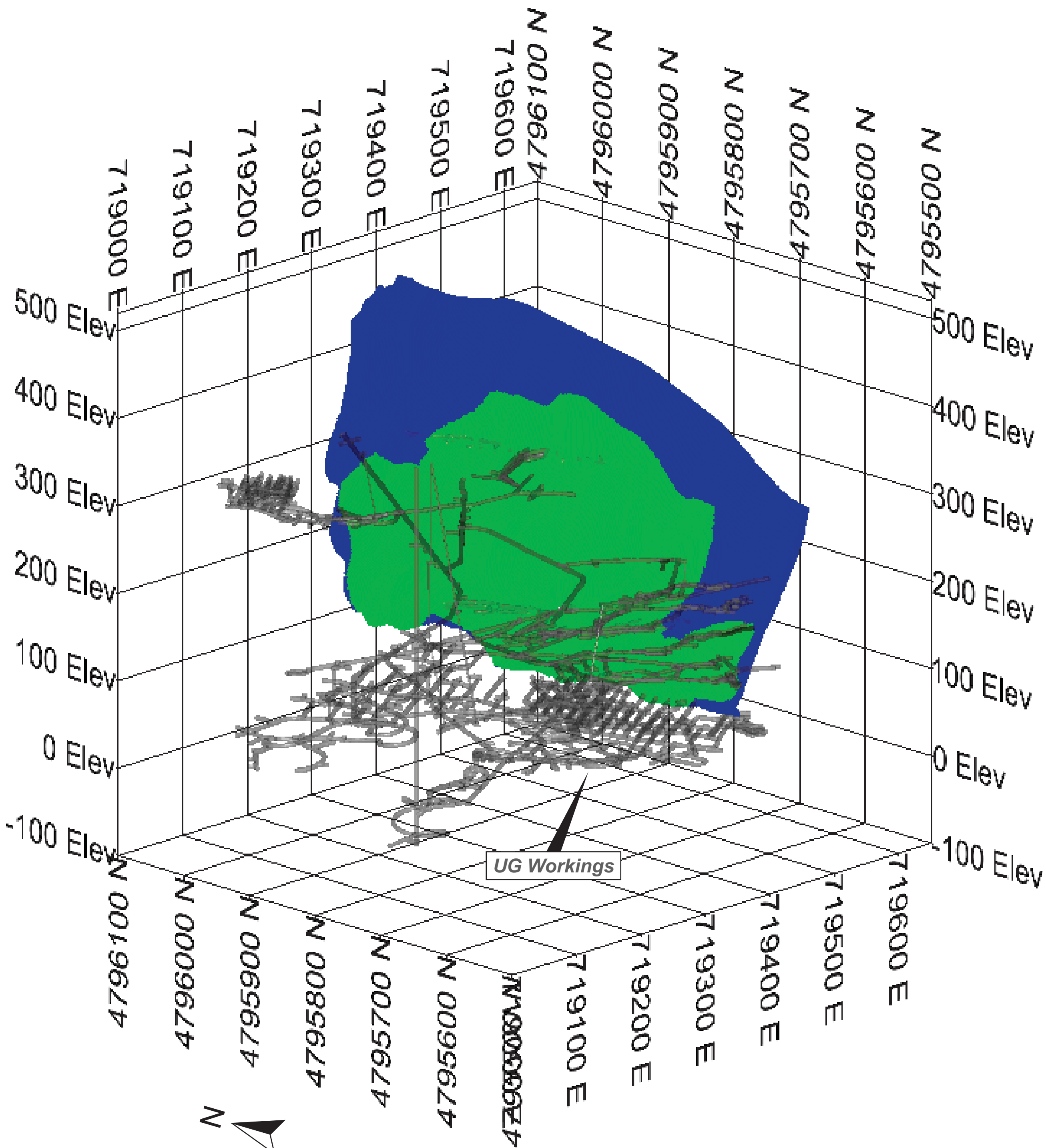
Orvana adopted a sample spacing approach based on the kriging variances computed. The methodology is as follows:

1. Using a near zero nugget isotropic variogram with a linear structure with a slope of 0.5 and an idealized square drill hole grid, it was determined that the kriging variance is equal to the distance to the nearest point when the block estimate is outside of the idealized grid and is equal to about 28% of the drill spacing when the block is at the center of the grid.

2. The kriging variances selected for classification were 5.6 and 11.2 which corresponds to 20 m spaced drilling and 40 m spaced drilling, for Measured and Indicated categories, respectively.

Models generated prior to the 2014 update used a purely numerical approach (Figure 14-13) to classification of blocks, using only the Kriging variance output for reporting resources. In 2014, Orvana added a classification post-processing step, digitizing wireframes around areas of contiguous numerical classification to produce more coherent parcels of Measured, Indicated and Inferred categories.

Examples of the classification of select models are shown in Figures 14-11 to 14-13.



Legend: Classification

Measured
Indicated
Inferred

September 2014

Figure 14-11

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Area 107 Classification

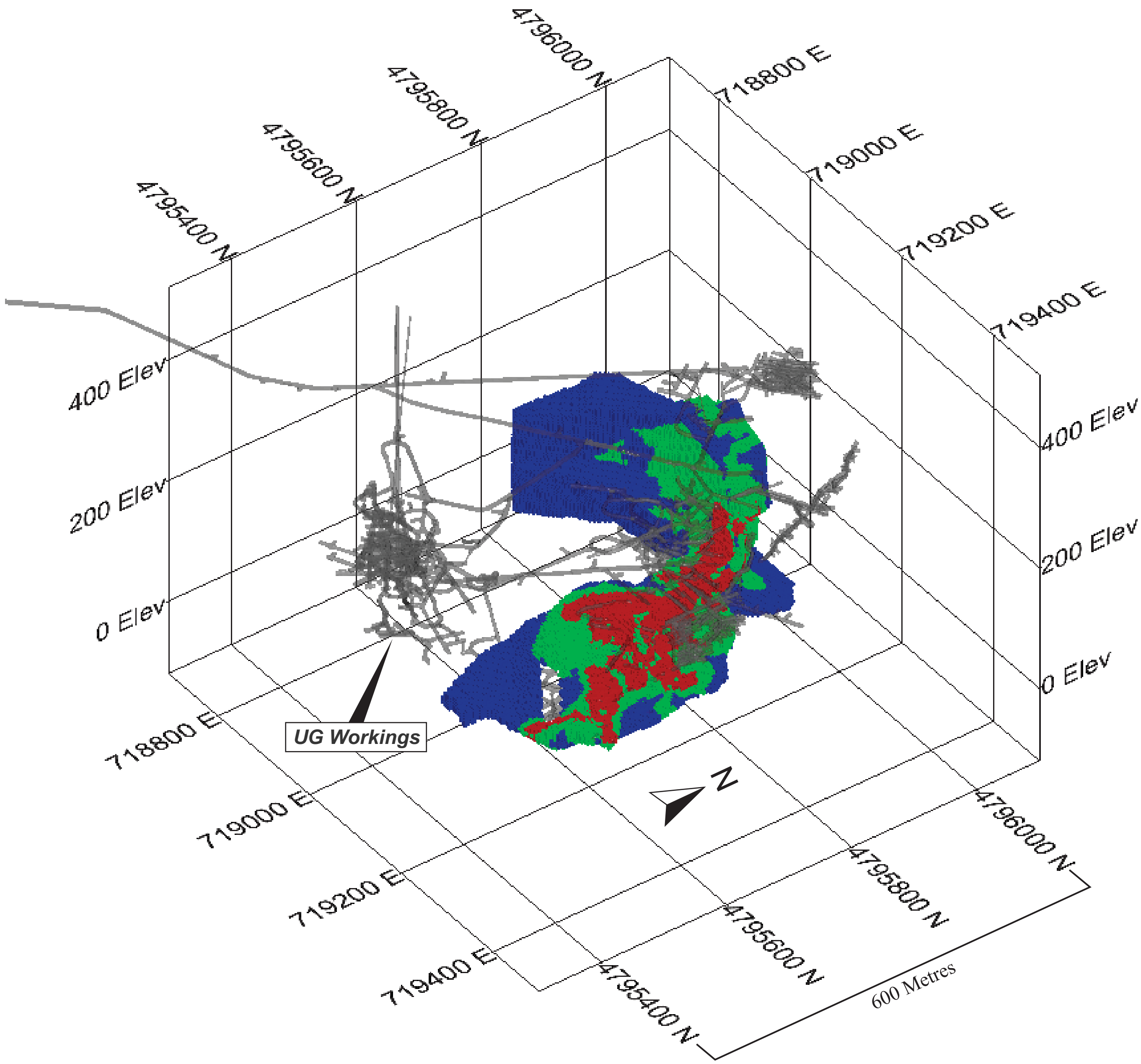


Figure 14-12

Orvana Minerals Corp.

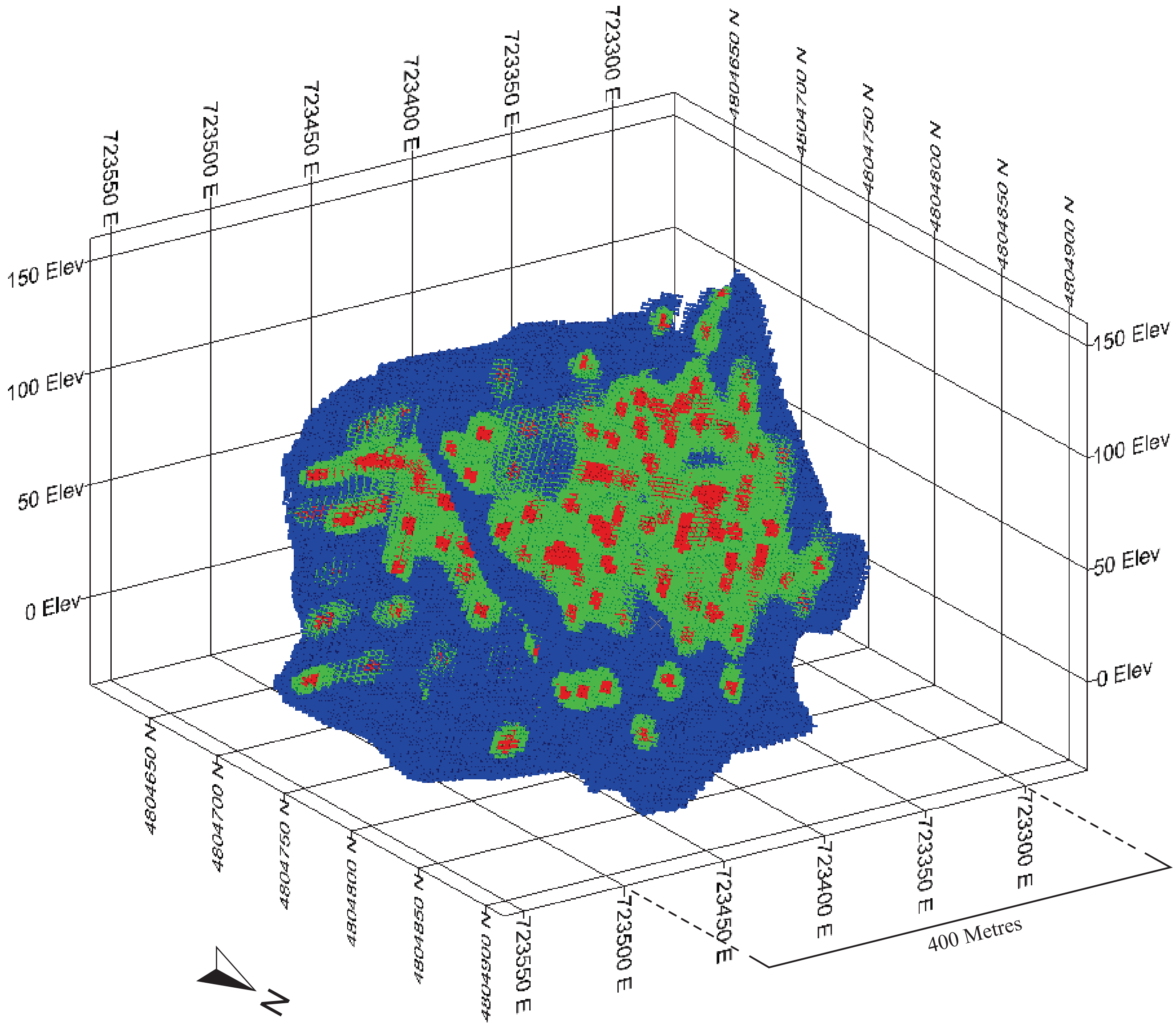
El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Black Skarn North-San Martín Classification

Legend: Classification
- *Measured*
- *Indicated*
- *Inferred*

September 2014



Legend: Classification

- Measured
- Indicated
- Inferred

Figure 14-13

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Carlés East Classification

September 2014

RPA reviewed the classification methodology adopted by Orvana and is of the opinion that the combined Measured and Indicated designations are reasonable, however, RPA notes the following:

- The classification scheme is applied globally over all zones yet the different zones are markedly different in terms of controls on mineralization and continuity. For example, in the Charnela oxide, the nominal drill spacing of 20 m is not producing the variability that is demonstrated by the underground channel samples.
- The models generated prior to the 2014 lack the classification post-processing step that was adopted in 2014 and therefore have patches of isolated Measured and Indicated categories surrounded by Inferred, supported by single drill holes.

RPA recommends that Orvana reevaluate classification for each zone in conjunction with an empirically driven drill hole spacing study and that the models generated prior to 2014 be updated to include the final post-processing step.

CUT-OFF GRADE

Metal prices used for reserves are based on consensus, long term forecasts from banks, financial institutions, and other sources. For resources, metal prices used are slightly higher than those for reserves. Operating costs used for cut-off grade determination correspond to actual operating costs at the EVBC Operation for an 18 month period ending August 2014.

A summary of the cut-off grade parameters for Mineral Resources is given in Table 14-17.

TABLE 14-17 MINERAL RESOURCE CUT-OFF GRADE PARAMETERS
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Ore Type	Boinás Skarn	Boinás Oxides	Carlés Skarn
Cut-off (AuEq g/t)	2.5	3.8	2.3
Au Factor	1	1	1
Cu Factor	1.472	0.997	1.354
Ag Factor	0.014	0.014	0.014
Mining Cost ($/t)	$48	$95	$44
Plant & Admin ($/t)	$37	$37	$37
Gold Price ($/oz)	$1,300	$1,300	$1,300
Copper Price ($/lb)	$3.10	$3.10	$3.10
Silver Price ($/oz)	$23	$23	$23

RPA has tabulated the block model results at various gold prices to illustrate the sensitivity of the Mineral Resource to metal price (Table 14-18).

MINERAL RESOURCES

Mineral Resources are reported following CIM definitions. Block models were depleted in mined out areas and a ten metre crown pillar below the El Valle open pit was excluded from the Mineral Resource report. In addition, Orvana supplied wireframe solids to further exclude areas that do not meet the requirements for reasonable expectations for eventual economic extraction. Such areas include:

- Stope pillars that cannot be accessed or recovered.
- Peripheries of mined out levels.
- Areas where stope failure has occurred.

The effective date of the Mineral Resources is September 30, 2014. RPA has tabulated the resources as follows:

- Mineral Resources inclusive of Mineral Reserves by zone (Table 14-19).
- Mineral Resources exclusive of Mineral Reserves by zone (Table 14-20).

TABLE 14-18 SENSITIVITY OF MINERAL RESOURCES TO AU PRICE
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Inclusive Resources

	Measured & Indicated						Inferred					
Au Price (US$/t)	Tonnage (000 t)	Grade (g/t Au)	Grade (%Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (000 t Cu)	Tonnage (000 t)	Grade (g/t Au)	Grade (%Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (000 t Cu)
Boinás Skarn												
$1,100	1717.3	3.56	0.72	16.65	196.6	12.4	1460.4	3.95	0.49	13.54	185.5	7.2
$1,200	2046.3	3.31	0.68	15.77	217.5	13.8	1783.3	3.63	0.46	12.89	208.1	8.2
$1,300	2435.4	3.06	0.64	14.99	239.6	15.5	2135.4	3.35	0.45	12.27	229.7	9.5
$1,400	2824.6	2.87	0.6	14.32	260.3	17.1	2426.9	3.16	0.43	11.78	246.3	10.5
$1,500	3235.2	2.7	0.58	13.78	280.5	18.6	2816.1	2.95	0.42	11.15	266.7	11.8
Oxides												
$1,100	1870.8	7.11	0.93	17.29	427.6	17.3	1996.1	8.02	0.49	3.74	514.7	9.9
$1,200	2166.1	6.6	0.89	16.89	459.5	19.4	2249.3	7.56	0.47	3.71	546.5	10.7
$1,300	2473.5	6.16	0.86	16.45	489.9	21.4	2498.9	7.16	0.46	3.63	575.3	11.4
$1,400	2766	5.81	0.84	16.11	516.7	23.2	2762.4	6.79	0.44	3.62	603.3	12.2
$1,500	3056.9	5.51	0.81	15.74	541.4	24.8	3010.8	6.48	0.43	3.7	627.3	12.9
Carlés Skarn												
$1,100	814.3	3.87	0.5	6.78	101.2	4	1114.5	4.34	0.47	4.44	155.5	5.2
$1,200	953.5	3.64	0.45	6.47	111.5	4.3	1252.4	4.1	0.45	4.27	165.3	5.6
$1,300	1097.2	3.44	0.42	6.19	121.4	4.6	1392.5	3.9	0.43	4.12	174.5	6
$1,400	1251	3.26	0.38	5.91	131.1	4.8	1535.7	3.71	0.41	3.98	183.3	6.3
$1,500	1398.4	3.11	0.36	5.67	139.8	5	1695.1	3.53	0.39	3.82	192.5	6.6

Exclusive Resources

	Measured & Indicated						Inferred					
Au Price (US$/t)	Tonnage (000 t)	Grade (g/t Au)	Grade (%Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (000 t Cu)	Tonnage (000 t)	Grade (g/t Au)	Grade (%Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (000 t Cu)
Boinás Skarn												
$1,100	1028.2	3.16	0.68	16.64	104.3	7	1460.4	3.95	0.49	13.54	185.5	7.2
$1,200	1318.8	2.89	0.63	15.46	122.7	8.3	1783.3	3.63	0.46	12.89	208.1	8.2
$1,300	1682.7	2.65	0.59	14.48	143.5	9.9	2135.4	3.35	0.45	12.27	229.7	9.5
$1,400	2058.4	2.47	0.55	13.68	163.4	11.4	2426.9	3.16	0.43	11.78	246.3	10.5
$1,500	2456.4	2.32	0.52	13.1	183	12.9	2816.1	2.95	0.42	11.15	266.7	11.8
Oxides												
$1,100	1055.5	6.96	0.91	16.99	236.3	9.6	1996.1	8.02	0.49	3.74	514.7	9.9
$1,200	1282.5	6.34	0.86	16.41	261.4	11.1	2249.3	7.56	0.47	3.71	546.5	10.7
$1,300	1550.1	5.78	0.82	15.89	288	12.8	2498.9	7.16	0.46	3.63	575.3	11.4
$1,400	1812.6	5.35	0.79	15.57	312	14.3	2762.4	6.79	0.44	3.62	603.3	12.2
$1,500	2079	5.01	0.76	15.17	334.7	15.8	3010.8	6.48	0.43	3.7	627.3	12.9
Carlés Skarn												
$1,100	631.6	3.8	0.49	6.41	77.1	3.1	1114.5	4.34	0.47	4.44	155.5	5.2
$1,200	759.3	3.54	0.44	6.11	86.5	3.4	1252.4	4.1	0.45	4.27	165.3	5.6
$1,300	892.8	3.33	0.4	5.84	95.6	3.6	1392.5	3.9	0.43	4.12	174.5	6
$1,400	1041.9	3.14	0.37	5.56	105.1	3.8	1535.7	3.71	0.41	3.98	183.3	6.3
$1,500	1185.3	2.98	0.34	5.32	113.6	4	1695.1	3.53	0.39	3.82	192.5	6.6

TABLE 14-19 EVBC 2014 DETAILED MINERAL RESOURCES INCLUSIVE OF MINERAL RESERVES
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

	Measured						Indicated						Measured + Indicated						Inferred					
	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (000 t Cu)	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (000 t Cu)	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (000 t Cu)	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (000 t Cu)
A107							994.3	7.20	0.65	12.56	230.3	6.5	994.3	7.20	0.65	12.56	230.3	6.5	389.6	7.04	0.27	8.95	88.2	1.0
Charnela							95.6	7.40	0.11	7.78	22.7	0.1	95.6	7.40	0.11	7.78	22.7	0.1	55.9	4.95	0.40	12.60	8.9	0.2
El Valle Fault	22.6	9.67	0.11		7.0	0.0	119.3	8.92	0.18		34.2	0.2	141.9	9.04	0.17		41.2	0.2	424.8	7.40	0.21	0.00	101.0	0.9
Sienna Zone	8.7	12.68	0.94		3.6	0.1	141.6	8.29	1.25		37.7	1.8	150.3	8.54	1.23		41.3	1.9	137.7	5.99	1.01	0.00	26.5	1.4
S107																			75.1	6.75	2.72	37.19	16.3	2.0
E107																			87.7	5.79	0.12		16.3	0.1
East Breccia																			459.1	8.32	0.47		122.8	2.1
A208																			326.3	6.40	0.12		67.1	0.4
High Angle																			192.3	8.44	0.70		52.2	1.4
West Skarn																			224.3	7.90	0.40		57.0	0.9
Boinás East Oxide	607.1	4.11	1.09	26.30	80.2	6.6	484.3	4.76	1.26	23.71	74.1	6.1	1091.5	4.40	1.16	25.15	154.3	12.7	126.2	4.65	0.75	16.60	18.9	0.9
OXIDES TOTAL	**638.4**	**4.42**	**1.05**	**25.01**	**90.8**	**6.7**	**1835.1**	**6.76**	**0.80**	**13.47**	**399.1**	**14.7**	**2473.5**	**6.16**	**0.86**	**16.45**	**489.9**	**21.4**	**2498.9**	**7.16**	**0.46**	**3.63**	**575.3**	**11.4**
Boinás East	68.1	2.37	0.58	19.93	5.2	0.4	370.0	2.58	0.58	16.83	30.7	2.1	438.0	2.55	0.58	17.31	35.8	2.5	518.4	2.58	0.82	26.73	43.0	4.3
Black Skarn North West	198.4	2.55	0.58	12.66	16.3	1.2	1234.8	3.28	0.56	13.41	130.2	7.0	1433.2	3.18	0.57	13.31	146.5	8.1	859.2	2.63	0.32	13.45	72.5	2.8
Black Skarn San Martin	399.4	2.99	0.92	17.96	38.4	3.7	164.8	3.57	0.74	16.32	18.9	1.2	564.2	3.16	0.86	17.48	57.3	4.9	46.5	2.46	1.02	16.75	3.7	0.5
Boinás South																			711.2	4.83	0.28		110.5	2.0
BOINÁS SKARN TOTAL	**665.9**	**2.79**	**0.78**	**16.58**	**59.8**	**5.2**	**1769.6**	**3.16**	**0.58**	**14.40**	**179.8**	**10.3**	**2435.4**	**3.06**	**0.64**	**14.99**	**239.6**	**15.5**	**2135.4**	**3.35**	**0.45**	**12.27**	**229.7**	**9.5**
BOINÁS TOTAL	**1304.3**	**3.59**	**0.91**	**20.71**	**150.6**	**11.9**	**3604.7**	**5.00**	**0.69**	**13.92**	**579.0**	**25.0**	**4909.0**	**4.62**	**0.75**	**15.73**	**729.5**	**36.9**	**4634.3**	**5.40**	**0.45**	**7.61**	**805.0**	**20.9**
Carlés North							622.1	3.24	0.42	8.00	64.8	2.6	622.1	3.24	0.42	8.00	64.8	2.6	129.2	3.54	0.29	6.14	14.7	0.4
Carlés East	23.1	4.66	0.51		3.5	0.1	135.8	4.07	0.51		17.8	0.7	158.8	4.16	0.51		21.2	0.8	295.1	3.85	0.42		36.5	1.2
Carlés North West							222.5	3.24	0.14	2.80	23.2	0.3	222.5	3.24	0.14	2.80	23.2	0.3	152.7	3.04	0.14	3.14	14.9	0.2
Capa Z	15.0	4.38	0.93	13.36	2.1	0.1	78.8	3.98	0.86	12.55	10.1	0.7	93.8	4.05	0.87	12.68	12.2	0.8	176.5	3.67	0.66	11.64	20.8	1.2
Carlés West																			355.6	4.43	0.53	4.73	50.6	1.9
Carlés South																			283.3	4.05	0.38	2.59	36.9	1.1
CARLÉS TOTAL	**38.1**	**4.55**	**0.68**	**5.26**	**5.6**	**0.3**	**1059.2**	**3.40**	**0.41**	**6.22**	**115.8**	**4.3**	**1097.2**	**3.44**	**0.42**	**6.19**	**121.4**	**4.6**	**1392.5**	**3.90**	**0.43**	**4.12**	**174.5**	**6.0**
TOTAL	**1342.4**	**3.62**	**0.91**	**20.27**	**156.2**	**12.2**	**4663.8**	**4.63**	**0.63**	**12.18**	**694.7**	**29.3**	**6006.2**	**4.41**	**0.69**	**13.98**	**850.9**	**41.5**	**6026.9**	**5.05**	**0.45**	**6.80**	**979.5**	**26.9**

TABLE 14-20 EVBC 2014 DETAILED MINERAL RESOURCES EXCLUSIVE OF MINERAL RESERVES
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

	Measured						Indicated						Measured + Indicated						Inferred					
	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (000 t Cu)	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (000 t Cu)	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (000 t Cu)	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (000 t Cu)
A107							610.8	6.07	0.81	16.22	119.1	5.0	610.8	6.07	0.81	16.22	119.1	5.0	389.6	7.04	0.27	8.95	88.2	1.0
Charnela							59.8	6.76	0.11	7.85	13.0	0.1	59.8	6.76	0.11	7.85	13.0	0.1	55.9	4.95	0.40	12.60	8.9	0.2
El Valle Fault	22.6	9.67	0.11		7.0	0.0	119.3	8.92	0.18		34.2	0.2	141.9	9.04	0.17		41.2	0.2	424.8	7.40	0.21		101.0	0.9
Sienna Zone	8.7	12.69	0.94		3.6	0.1	127.3	8.27	1.25		33.8	1.6	136.0	8.55	1.23		37.4	1.7	137.7	5.99	1.01		26.5	1.4
S107																			75.1	6.75	2.72	37.19	16.3	2.0
E107																			87.7	5.79	0.12		16.3	0.1
East Breccia																			459.1	8.32	0.47		122.8	2.1
A208																			326.3	6.40	0.12		67.1	0.4
High Angle																			192.3	8.44	0.70		52.2	1.4
West Skarn																			224.3	7.90	0.40		57.0	0.9
Boinás East Oxide	376.7	3.82	0.95	24.72	46.3	3.6	224.8	4.29	0.99	21.95	31.0	2.2	601.5	3.99	0.97	23.68	77.3	5.8	126.2	4.65	0.75	16.60	18.9	0.9
OXIDES TOTAL	**408.0**	**4.33**	**0.90**	**22.83**	**56.8**	**3.7**	**1142.1**	**6.30**	**0.79**	**13.41**	**231.2**	**9.1**	**1550.1**	**5.78**	**0.82**	**15.89**	**288.0**	**12.8**	**2498.9**	**7.16**	**0.46**	**3.63**	**575.3**	**11.4**
Boinás East	65.1	2.37	0.56	19.65	5.0	0.4	315.9	2.09	0.63	18.01	21.2	2.0	381.0	2.14	0.62	18.29	26.2	2.3	518.4	2.58	0.82	26.73	43.0	4.3
Black Skarn North West	146.8	2.15	0.52	11.65	10.2	0.8	703.9	2.76	0.44	11.41	62.4	3.1	850.7	2.65	0.46	11.45	72.5	3.9	859.2	2.63	0.32	13.45	72.5	2.8
Black Skarn San Martin	297.5	2.84	0.85	17.19	27.2	2.5	153.5	3.57	0.74	16.59	17.6	1.1	451.0	3.09	0.81	16.98	44.8	3.7	46.5	2.46	1.02	16.75	3.7	0.5
Boinás South																			711.2	4.83	0.28		110.5	2.0
BOINÁS SKARN TOTAL	**509.4**	**2.58**	**0.72**	**15.91**	**42.3**	**3.7**	**1173.2**	**2.68**	**0.53**	**13.87**	**101.2**	**6.2**	**1682.7**	**2.65**	**0.59**	**14.48**	**143.5**	**9.9**	**2135.4**	**3.35**	**0.45**	**12.27**	**229.7**	**9.5**
BOINÁS TOTAL	**917.4**	**3.36**	**0.80**	**18.98**	**99.1**	**7.3**	**2315.3**	**4.47**	**0.66**	**13.64**	**332.4**	**15.3**	**3232.8**	**4.15**	**0.70**	**15.16**	**431.5**	**22.6**	**4634.3**	**5.40**	**0.45**	**7.61**	**805.0**	**20.9**
Carlés North							447.2	3.01	0.38	7.74	43.3	1.7	447.2	3.01	0.38	7.74	43.3	1.7	129.2	3.54	0.29	6.14	14.7	0.4
Carlés East	22.9	4.61	0.51		3.4	0.1	133.4	4.03	0.52		17.3	0.7	156.3	4.11	0.51	0.00	20.7	0.8	295.1	3.85	0.42		36.5	1.2
Carlés North West							195.5	3.10	0.15	2.88	19.5	0.3	195.5	3.10	0.15	2.88	19.5	0.3	152.7	3.04	0.14	3.14	14.9	0.2
Capa Z	15.0	4.38	0.93	13.36	2.1	0.1	78.8	3.98	0.86	12.55	10.1	0.7	93.8	4.05	0.87	12.68	12.2	0.8	176.5	3.67	0.66	11.64	20.8	1.2
Carlés West																			355.6	4.43	0.53	4.73	50.6	1.9
Carlés South																			283.3	4.05	0.38	2.59	36.9	1.1
CARLÉS TOTAL	**37.9**	**4.52**	**0.68**	**5.29**	**5.5**	**0.3**	**854.9**	**3.28**	**0.39**	**5.86**	**90.1**	**3.3**	**892.8**	**3.33**	**0.40**	**5.84**	**95.6**	**3.6**	**1392.5**	**3.90**	**0.43**	**4.12**	**174.5**	**6.0**
TOTAL	**955.3**	**3.41**	**0.80**	**18.44**	**104.6**	**7.6**	**3170.3**	**4.15**	**0.59**	**11.54**	**422.5**	**18.6**	**4125.6**	**3.97**	**0.64**	**13.14**	**527.2**	**26.2**	**6026.9**	**5.05**	**0.45**	**6.80**	**979.5**	**26.9**

COMPARISON TO PREVIOUS ESTIMATES

RPA has compared the 2014 Mineral Resource estimate to the AMC June 2013 Mineral Resource estimate (Table 14-21). Changes to the Mineral Resources are attributed to the following:

- Slight changes to the modelling methodology and changes requested by RPA.
- Updating the cut-off grade for Mineral Resources using a gold equivalent cut-off based on actual operating costs specific to each ore type.
- Introduction of wireframe solids to remove blocks that did not meet the criteria for reasonable prospects for eventual economic extraction. Such areas include stope pillars that cannot be accessed or recovered, peripheries of mined out levels, and areas where stope failure has occurred. The impact was the greatest at Carlés where a significant amount of unrecoverable blocks were removed.
- Introduction of a ten metre crown pillar below the El Valle open pit. The pit is currently being used as a tailings impoundment.
- Production between the effective dates of the Mineral Resource estimates accounts for approximately 800,000 tonnes of material at a grade of 3.2 g/t Au (~83,000 ounces Au).

Outside of depletion from production, RPA notes that the greatest impact to the Mineral Resources is the change in cut-off grades. The second greatest impact to the resources is the introduction of the wireframe solids to remove unrecoverable material. Collectively, the remaining items are insignificant.

TABLE 14-21 COMPARISON BETWEEN 2013 AND 2014 MINERAL RESOURCE ESTIMATES
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Measured & Indicated

Zone	2013 Mineral Resource Estimates						2014 Mineral Resource Estimates						% Difference				
	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Contained Metal (000 oz Au)	Contained Metal (t Cu)	Grade (g/t Ag)	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Contained Metal (000 oz Au)	Contained Metal (t Cu)	Grade (g/t Ag)	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Contained Metal (000 oz Au)	Contained Metal (t Cu)
Boinás Oxide	2,300	6.46	0.51	478	11,713	7.97	1,382	7.55	0.63	335.56	8,691	9.57	-40%	17%	24%	-30%	-26%
Boinás Skarns	4,244	3.72	0.75	508	31,694	17.43	3,527	3.47	0.80	393.99	28,238	18.14	-17%	-7%	7%	-22%	-11%
Carlés	2,020	3.62	0.40	235	7,988	6.60	1,097	3.44	0.42	121.36	4,570	6.19	-46%	-5%	5%	-48%	-43%
Total	10,865	3.50	0.47	1,699	51,395	9.72	6,006	4.41	0.69	850.91	41,498	13.98	-45%	26%	46%	-50%	-19%

Inferred

Zone	2013 Mineral Resource Estimates						2014 Mineral Resource Estimates						% Difference				
	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Contained Metal (000 oz Au)	Contained Metal (t Cu)	Grade (g/t Ag)	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Contained Metal (000 oz Au)	Contained Metal (t Cu)	Grade (g/t Ag)	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Contained Metal (000 oz Au)	Contained Metal (t Cu)
Boinás Oxide	4,023	5.22	0.33	675	13,192	2.73	2,499	7.16	0.46	575.27	11,414	3.63	-38%	37%	39%	-15%	-13%
Boinás Skarns	2,974	4.27	0.38	408	11,340	12.22	2,135	3.35	0.45	229.70	9,515	12.27	-28%	-22%	17%	-44%	-16%
Carlés	1,615	4.01	0.33	208	5,273	3.60	1,393	3.90	0.43	174.50	5,957	4.12	-14%	-3%	31%	-16%	13%
Total	8,613	4.66	0.35	1,291	29,806	6.17	6,027	5.05	0.45	979.47	26,886	6.80	-30%	8%	29%	-24%	-10%

15 MINERAL RESERVE ESTIMATE

Mineral Reserves were estimated by RPA, in conjunction with Kinbauri personnel, based on mine designs applied to Measured and Indicated Resources, with dilution and extraction factors applied. Areas where stopes above cut-off grade were isolated, were removed from the estimate. Stopes planned for mining up to September 30, 2014 were also excluded from the estimate. Mineral Reserves are summarized in Table 15-1.

TABLE 15-1 MINERAL RESERVES – SEPTEMBER 30, 2014
Orvana Minerals Corp. – El Valle Boinás – Carlés Operation

Category	Tonnage (000 t)	Grade (g/t Au)	Grade (% Cu)	Grade (g/t Ag)	Contained Metal (000 oz Au)	Contained Metal (t Cu)
Proven	467	3.36	0.96	20.33	50	4,484
Probable	1,722	4.54	0.59	11.54	252	10,193
Proven and Probable	**2,189**	**4.29**	**0.67**	**13.41**	**302**	**14,677**

Notes:
1. CIM definitions were followed for Mineral Reserves.
2. Mineral Reserves are estimated using gold equivalent cut-off grades by zone, consisting of 4.5 g/t AuEq for Boinás Oxides, 2.9 g/t AuEq for Boinás Skarns, and 2.8 g/t AuEq for Carlés. Gold equivalent cut-offs were calculated using recent operating results for recoveries, off-site concentrate costs, and on-site operating costs.
3. Mineral Reserves are estimated using average long-term prices of US$1,100 per ounce gold, US$2.75 per lb copper, and US$20 per ounce silver. A US$/Euro exchange rate of 1/1.33 was used.
4. A minimum mining width of 4 m was used.
5. Numbers may not add due to rounding.

Mineral Reserves detailed by zone are shown in Table 15-2.

TABLE 15-2 MINERAL RESERVES BY ZONE – 30 SEPTEMBER 2014

Orvana Minerals Corp. – El Valle Boinás – Carlés Operation

	ZONE	Proven Tonnage (000 t)	Proven Grade (g/t Au)	Proven Grade (% Cu)	Proven Grade (g/t Ag)	Proven Contained Metal (000 oz Au)	Proven Contained Metal (t Cu)	Probable Tonnage (000 t)	Probable Grade (g/t Au)	Probable Grade (% Cu)	Probable Grade (g/t Ag)	Probable Contained Metal (000 oz Au)	Probable Contained Metal (t Cu)	Proven + Probable Tonnage (000 t)	Proven + Probable Grade (g/t Au)	Proven + Probable Grade (% Cu)	Proven + Probable Grade (g/t Ag)	Proven + Probable Contained Metal (000 oz Au)	Proven + Probable Contained Metal (t Cu)
Boinás Oxides	**A107**							530.49	6.97	0.44	7.61	118.82	2,309.03	530.49	6.97	0.44	7.61	118.82	2,309.03
	Charnela South							55.07	5.58	0.09	6.07	9.88	49.80	55.07	5.58	0.09	6.07	9.88	49.80
	Sienna							12.53	6.68	0.84		2.69	105.13	12.53	6.68	0.84		2.69	105.13
	Sub-total							598.09	6.83	0.41	7.31	131.39	2,463.96	598.09	6.83	0.41	7.31	131.39	2,463.96
Boinás Skarns	**Boinás Este Above 205mRL**	240.83	3.80	1.13	24.69	29.43	2,721.93	289.36	3.79	1.09	18.53	35.26	3,162.37	530.19	3.80	1.11	21.33	64.70	5,884.30
	Boinás Este Below 205m RL	32.65	3.35	0.89	20.09	3.52	289.52	93.26	3.41	0.35	9.67	10.22	323.92	125.91	3.39	0.49	12.37	13.74	613.44
	Black Skarns - North West	65.61	2.89	0.60	12.75	6.09	391.96	604.53	3.28	0.61	13.50	63.70	3,669.06	670.14	3.24	0.61	13.43	69.78	4,061.02
	San Martin	127.56	2.78	0.85	16.06	11.40	1,080.96	41.74	2.21	0.53	9.09	2.97	219.73	169.30	2.64	0.77	14.34	14.37	1,300.69
	Sub-total	466.64	3.36	0.96	20.33	50.44	4,484.36	1,028.89	3.39	0.72	14.39	112.15	7,375.08	1,495.53	3.38	0.79	16.24	162.59	11,859.44
Carlés	**Carlés Norte - Underground**							95.29	2.63	0.37	7.30	8.06	354.07	95.29	2.63	0.37	7.30	8.06	354.07
	Sub-total							95.29	2.63	0.37	7.30	8.06	354.07	95.29	2.63	0.37	7.30	8.06	354.07
	TOTAL	**466.64**	**3.36**	**0.96**	**20.33**	**50.44**	**4,484.36**	**1,722.27**	**4.54**	**0.59**	**11.54**	**251.59**	**10,193.11**	**2,188.91**	**4.29**	**0.67**	**13.41**	**302.03**	**14,677.47**

Note:

No Mineral Reserves were estimated for the following zones: EV Fault, S107, E107, East Breccia, Area 208, High Angle Zones, Boinás East Pit Model, West Skarn, Boinás South, Carlés East, Carlés Northwest, Carlés Pit, Carlés Capa Z, Carlés West, and Carlés South

DILUTION

An overall dilution of 10% was used for the skarns, which are mined by longhole stoping. An overall dilution of 5% was used for the oxides, which are mined by drift and fill methods. All dilution was added at zero grades. The dilution estimates are based on average operating results for the two mining methods, determined by cavity monitoring system surveys compared to mine designs.

RPA notes that these estimates appear to be low, however, much of the diluting material is just below cut-off grade, whereas these dilution factors are intended to account for the few places where grade boundaries are sharp.

EXTRACTION

An extraction of 90% was used for the skarns. An extraction of 85% was used for the oxides. Although the drift and fill mining method is more selective than longhole stoping (reflected in the lower dilution factor), losses are greater due to material being breasted down onto an uneven backfill mucking floor formed from the excavation below.

CUT-OFF GRADE

Cut-off grades were based on gold equivalent calculations, and include consideration for:

- Process recoveries, based on recent operating performance
- Metal prices and exchange rates, consistent with long-term forecasts
- Off-site costs for doré bars and copper concentrate, including:
    - Payability
    - Transportation
    - Treatment
    - Refining
    - Penalty elements
- NSR Royalty of 2.5% at a gold price below $1,100 per oz, 3% otherwise.
- Operating costs, based on recent history

Boinás skarns, Boinás oxides, and Carlés skarns were treated separately, due to differences in mining methods, recoveries and costs.

Resulting gold equivalent factors and break-even cut-off grades are summarized in Table 15-3:

TABLE 15-3 MINERAL RESERVE CUT-OFF GRADE PARAMETERS
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Ore Type	Boinás Skarn	Boinás Oxides	Carlés Skarn
Cut-off (AuEq g/t)	2.9	4.5	2.8
Au Factor	1	1	1
Cu Factor	1.528	1.036	1.407
Ag Factor	0.014	0.014	0.014
Mining Cost ($/t)	$48	$95	$44
Plant & Admin ($/t)	$37	$37	$37
Gold Price ($/oz)	$1,100	$1,100	$1,100
Copper Price ($/lb)	$2.75	$2.75	$2.75
Silver Price ($/oz)	$20	$20	$20

Mine designs were based on the break-even cut-off grades. Dilution and extraction were applied, and the resulting stopes sorted by grade. Incremental material within the stope designs down to 3.5 g/t AuEq was included in reserves for oxides.

RPA notes that considerable marginal grade material is presently excluded from Mineral Reserves. In the future, small changes in cut-off grades may have a large impact on Mineral Reserve tonnage. Going forward, a careful balance between including incremental tonnage and maintaining profitable mill feed grades must be achieved.

16 MINING METHODS

The EVBC Operation consists of underground mines at Boinás and Carlés (El Valle open pit mining has been completed), producing a nominal 2,000 tpd ore, of two material types – oxides and skarns. The current mining methods used at Boinás Mine are overhand drift and fill, and transverse longhole stoping. Due to decreasing ore thickness of remaining Boinás skarns, RPA changed the design of the longhole stoping from transverse to longitudinal, where appropriate. Drift and fill mining will continue to be used in the oxide and some transitional areas of the mine, as dictated by geological and geotechnical constraints. Typical layouts for drift and fill and longhole stoping methods are illustrated in Figures 16-1 and 16-2, respectively.

Carlés Mine currently uses longitudinal longhole stoping methods.

Geotechnical conditions suit longhole stoping in the skarns, which consist of a good to weak rock mass with good joint spacing and rock stresses. Access is typical for longhole methods, with an upper drill drift and lower mucking drift. Cable bolting is done to support the hanging wall and help reduce dilution. Primary stopes in the transverse areas, and all stopes mined longitudinally are backfilled with CRF, while waste fill is used in secondary stopes.

Longhole stopes were designed based on a 20 m to 22.5 m height and 15 m along strike. The stope thickness is up to 20 m.

Drift and fill mining for the oxide ore is also driven by the ground conditions. The oxides are a very weak rock mass consisting of a silicified gravel type material. The mining is done using a rock breaker mounted on a tracked backhoe platform. Muck is moved using an LHD and trucks. Cemented rock fill (CRF) is used in the primary drifts and un-cemented rock (URF) fill is used in secondary drifts. The ground support used in the oxides consists of shotcrete, swellex and split sets. The following zones are planned for this type of mining: Area 107 (A107), Charnela, San Martín in the south end, Sienna, and the upper part of Boinás East.

Oxide mining has been designed with multiple working panels in each zone. No sill pillars have been designed between successive panels, maximising extraction and ensuring no high stress concentrations are created within a single mining horizon. A crown pillar of 20 m has been left between the 305 and 330 levels in A107, to allow extraction to commence from the 330 level. Additionally there is a 60 m crown pillar between the El Valle tailings storage facility and the upper levels of the Charnela workings, in accordance with the recommendations received from Pakalnis & Associates in their September 2010 Report entitled “Report on Site Visit to El Valle-Boinás/Carlés Project Orvana ORVS-01/10”.

Existing ramps and ramp designs have a maximum gradient of 15%.

PRODUCTIVITIES

Productivities used to generate the LOMP were based on recent mine operating history. Development rates in capital headings are 3.5 metres per day (m/d) in a single heading up to a 4.5 m wide x 4.5 m high drift (this is the standard drift size for the mine). For oxide development using the rock breaker, the advance rate is 3 m/d with drift sizes ranging from 3 m x 4 m to 4.5 m x 4.5 m. The advance rate for raises is 4 m/d with a 3 m x 3 m raise as the standard size.

LOMP production rates for the longhole stopes range from 500 tpd to 800 tpd, with 800 tpd being the common rate used to achieve the tonnages required in order to meet production.

The schedule is very sensitive to the backfill rate. In order to achieve the production profile, backfill rates of 300 m^3/d in oxide headings and 600 m^3/d in longhole stopes will be required. These are aggressive rates for this mine, but achievable according to staff. Mitigation of this problem by use of additional raise systems is under investigation.

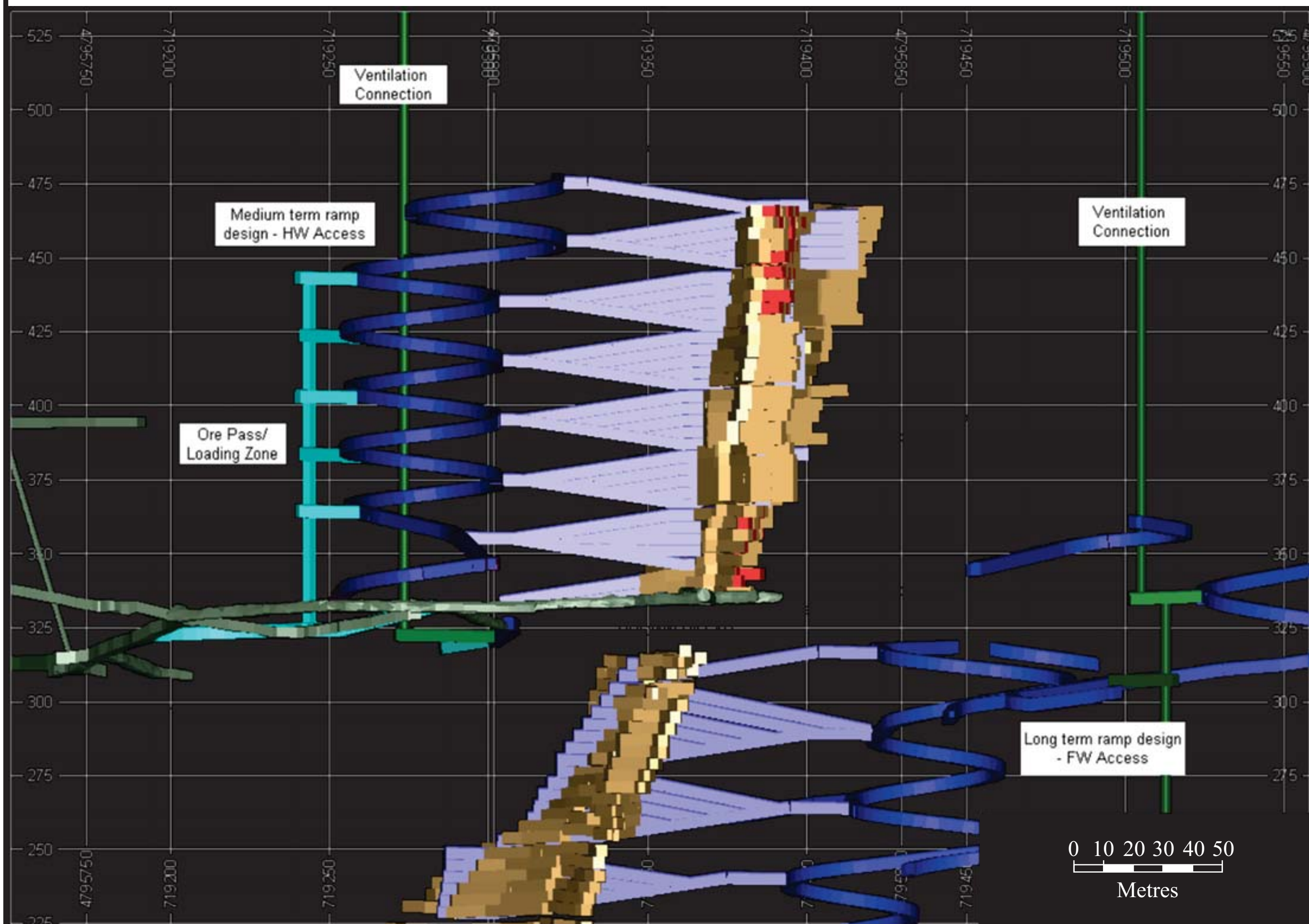


Figure 16-1

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Example of Cut and Fill Area 107

September 2014

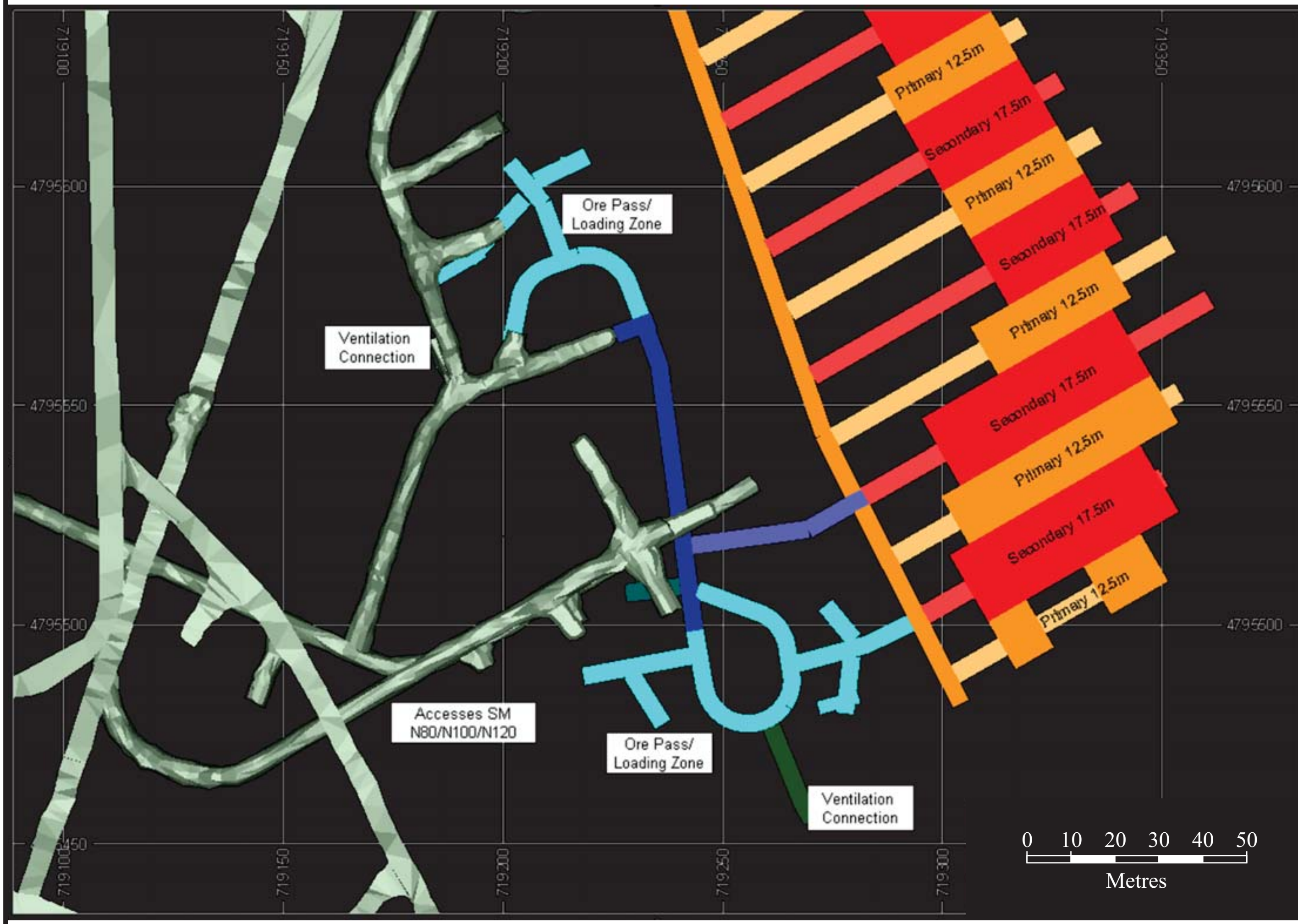


Figure 16-2

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Example of Longhole Mining Plan View of San Martín

September 2014

LIFE OF MINE PLAN

The LOMP is currently a five year plan. The first three years are at full production, with production tailing off in the last two years as shown in Table 16-1. The current LOMP has approximately 2,197,000 t containing an estimated 305,000 oz.

Mining at Carlés will stop in early 2015. The decision was taken after drilling results indicated lower grades in the future mining blocks below current active levels. Orvana has determined that the Carlés mechanized crew will provide greater value in ramping up production in the higher grade Boinás Mine.

Crews are expected to move starting in August 2014 to increase development and prepare for the planned increase in production from Boinás. Production activities are expected to continue at Carlés from developed areas through into early 2015. At that time, Carlés will be placed on care and maintenance, pending an improved economic mining plan or higher metal prices. Orvana is undertaking a review of alternatives including targeting narrow high-grade areas in Carlés with more suitable mining methods and further exploration targeting certain zones.

TABLE 16-1 LIFE OF MINE – OCTOBER 2014
Orvana Minerals Corp. – El Valle Boinás – Carlés Operation

Item	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Total
Mill Feed						
Tonnes ('000)	618	547	547	311	174	2,198
Au (g/t)	4.01	4.06	4.67	4.68	4.51	4.32
Cu (%)	0.73	0.57	0.41	0.91	1.27	0.68
Ag (g/t)	13.86	11.61	9.65	18.98	21.31	13.57
Metal Production						
Au (koz)	74	66	76	43	23	282
Cu (tonnes)	3,656	2,693	1,624	1,708	1,320	11,000
Ag (koz)	220	163	136	152	95	767

Based on the current Mineral Resources and cut-off grades, the LOMP could potentially be extended to six years, at full production rate.

MINE INFRASTRUCTURE

The infrastructure at the Boinás Mine consists of a ramp access and a skip shaft. Ventilation raises move the air through the mine to the various work areas. Muck handling is carried out using both trucks and the shaft. There are issues skipping oxides in the shaft due to the sticky nature of the muck, so typically, the oxide muck is moved via trucks. The skarn material is generally hoisted via the shaft. Orvana is investigating blending as a means of more efficiently handling the oxide ore.

Dewatering is done through a sump and pump system that follows the main ramps and collects at the shaft. Water is pumped to surface and collected in a settling pond near the portal.

At Carlés, infrastructure includes a laydown yard, mine office and dry, and ramp access to underground workings.

Power is provided to the mine from power lines off the regions power grid. Substations exist at the mill and both mines to provide electricity to the working areas.

Maintenance for the underground fleet is done on surface. Each mine has a workshop.

Communication is done via radios at both mine sites using a “leaky feeder” type system.

MOBILE EQUIPMENT

The mining equipment used underground, summarized in Tables 16-2 and 16-3, is sourced from various vendors. The main truck fleet is comprised of 20 t trucks and is capable of hauling all ore and waste to surface. The shaft is capable of handling the Boinás skarn ore and waste more efficiently than truck haulage. Backfill is hauled from surface to be placed into stopes. Development mining outside the oxide zones uses jumbos to advance the face. Inside the oxide zones a rock breaker mounted on an excavator frame is used to advance the face. Once mining is completed at Carlés, the useable mining fleet will be moved over to Boinás along with the necessary personnel.

TABLE 16-2 BOINÁS EQUIPMENT FLEET
Orvana Minerals Corp. – El Valle Boinás – Carlés Operation

Type	Brand	No.	Model	Capacity (t)	Power (kW)
Loader LHD	Sandvik	1	LH 514	14	256
Loader LHD	Atlas Copco	2	ST 1030	10	186
Loader LHD	Atlas Copco	1	ST 710	6.5	149
Truck	Atlas Copco	5	MT 2010	20	224
Jumbo	Atlas Copco	1	Boomer 282		125
Jumbo	Atlas Copco	2	Boomer S1D		75
Jumbo	Sandvik	1	Axera D06		110
Long hole Drill	Atlas Copco	1	Simba H 1354		75
Long hole Drill	Atlas Copco	1	Simba H 4353		100
Rock Bolting Rig	Atlas Copco	1	Boltec MD		120
Shotcrete Machine	Putzmeister	2	PM-407 P		58
Concrete trucks	M. Lorenzana	1	Huron 4	9	103
Telehandlers	Manitou	3	MLT-634		90

TABLE 16-3 CARLÉS EQUIPMENT FLEET
Orvana Minerals Corp. – El Valle Boinás – Carlés Operation

Type	Brand	No.	Model	Capacity (t)	Power (kW)
Loader LHD	Atlas Copco	1	ST 1030	10	186
Loader LHD	Atlas Copco	1	ST 710	6.5	149
Truck	Atlas Copco	2	MT 2010	20	224
Jumbo	Atlas Copco	1	Boomer 282		125
Long hole Drill	Atlas Copco	1	Simba H 1354		75
Rock Bolting Rig	Atlas Copco	1	Boltec MD		120
Telehandlers	Manitou	1	MLT-634		90

Access to each of the individual areas of the mine is achieved via independent ramps that feed off the main ramp to surface. With the smaller tonnages in the new LOMP, only certain areas will be considered for ore pass systems. The areas being considered are the A107 and the northern part of the Black Skarn.

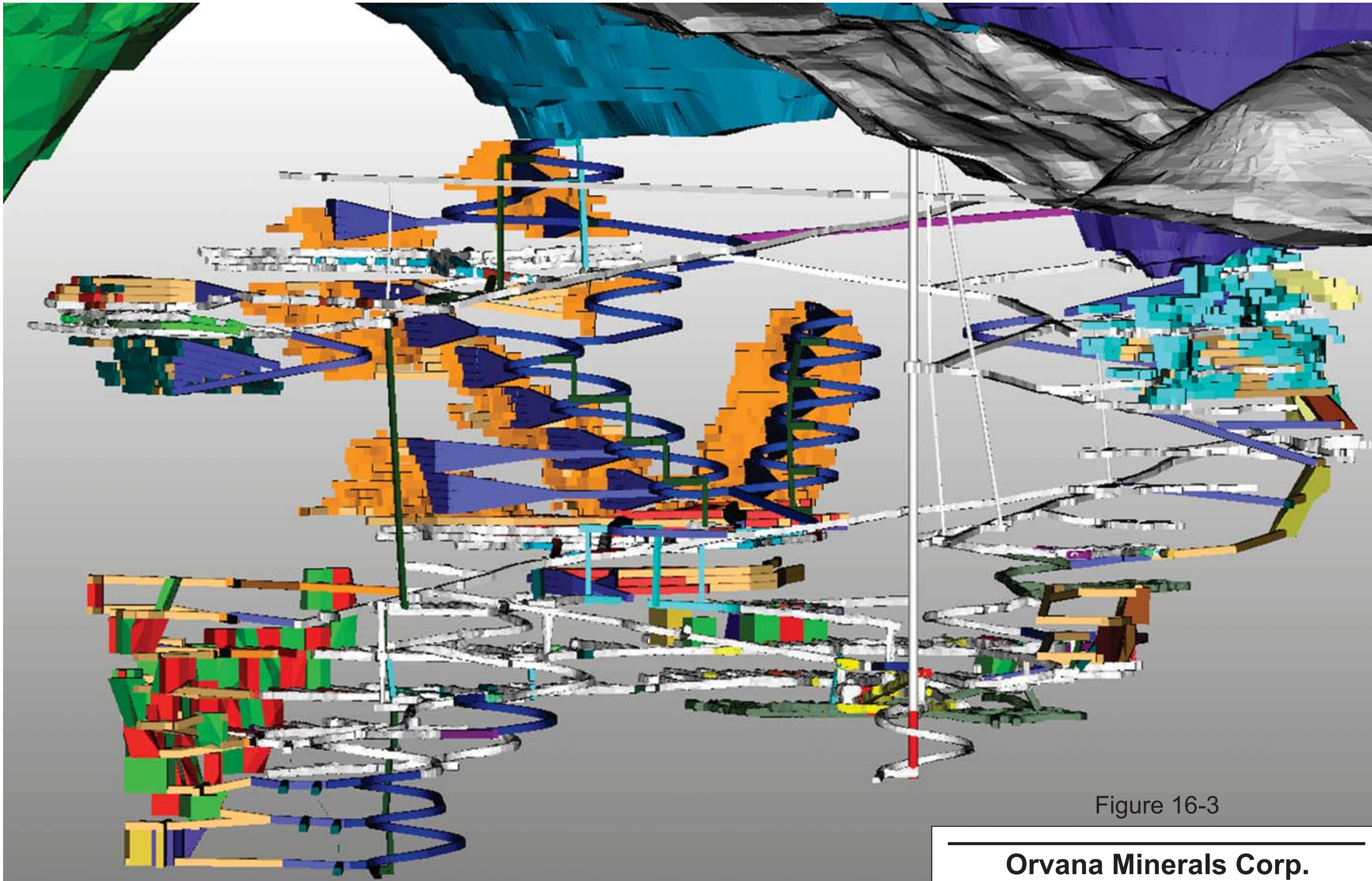


Figure 16-3

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Boinás Mine

September 2014

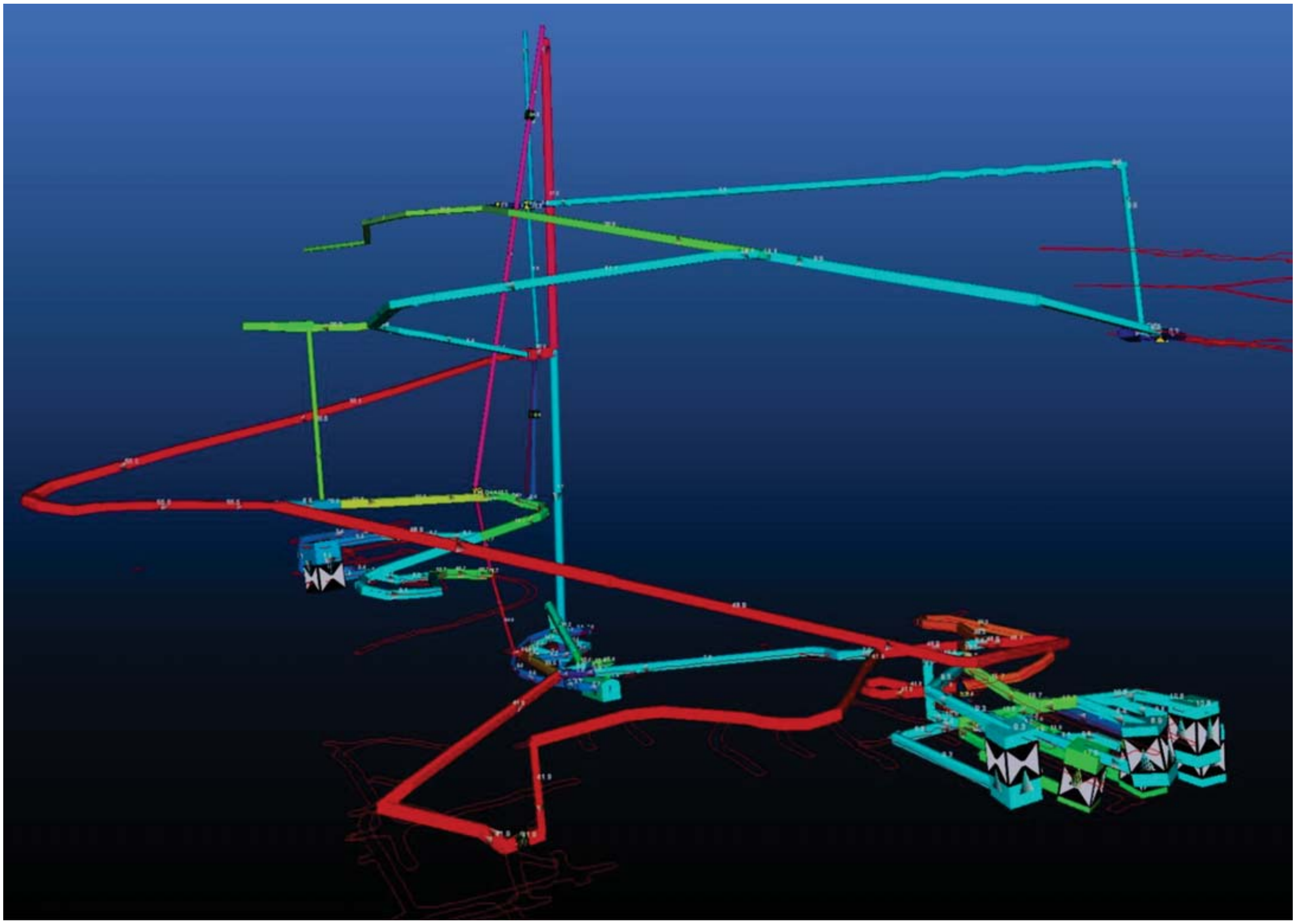
VENTILATION

The primary ventilation circuit in Boinás has been described below, and has been included as Figure 16-4.

Fresh air enters Boinás via the Boinás ramp and is extracted via a 2.7 m diameter primary exhaust raise. The primary ventilation fan is a 355 kW Zitron ZVN 1-25-355/6. Total pressure is 1,350 Pa, and the current circuit consists of a total flow of 146 m^3/s.

The Boinás ventilation circuit is based on the air entering the portal and being distributed to the four principal zones in the mine as follows:

- **Boinás Este**: fresh air arrives at the Boinás Este via the Boinás Este ramp, and is extracted via a connection to the primary exhaust raise at the 150 level.
- **Charnela South:** fresh air arrives at Charnela South directly from the principal ramp and is extracted via an internal vent raise that connects to the underground magazine and from there to the primary exhaust raise at the 295 level.
- **Black Skarn and San Martín:** fresh air arrives at Black Skarn via the principal ramp and at present is returned to the same ramp through an internal vent raise from the 120 level. From this point, the air arrives at the San Martín as a mixture of both clean air and the exhaust air from Black Skarn. The ventilation circuit is undergoing changes to ensure a clean supply of fresh air to both zones in the future.



Legend: Air Quality

- *128.7 m³/s*
- *41.9 m³/s*
- *30.0 m³/s*
- *15.0 m³/s*
- *10.0 m³/s*
- *0.0 m³/s*

Figure 16-4

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Boinás Ventilation Circuit

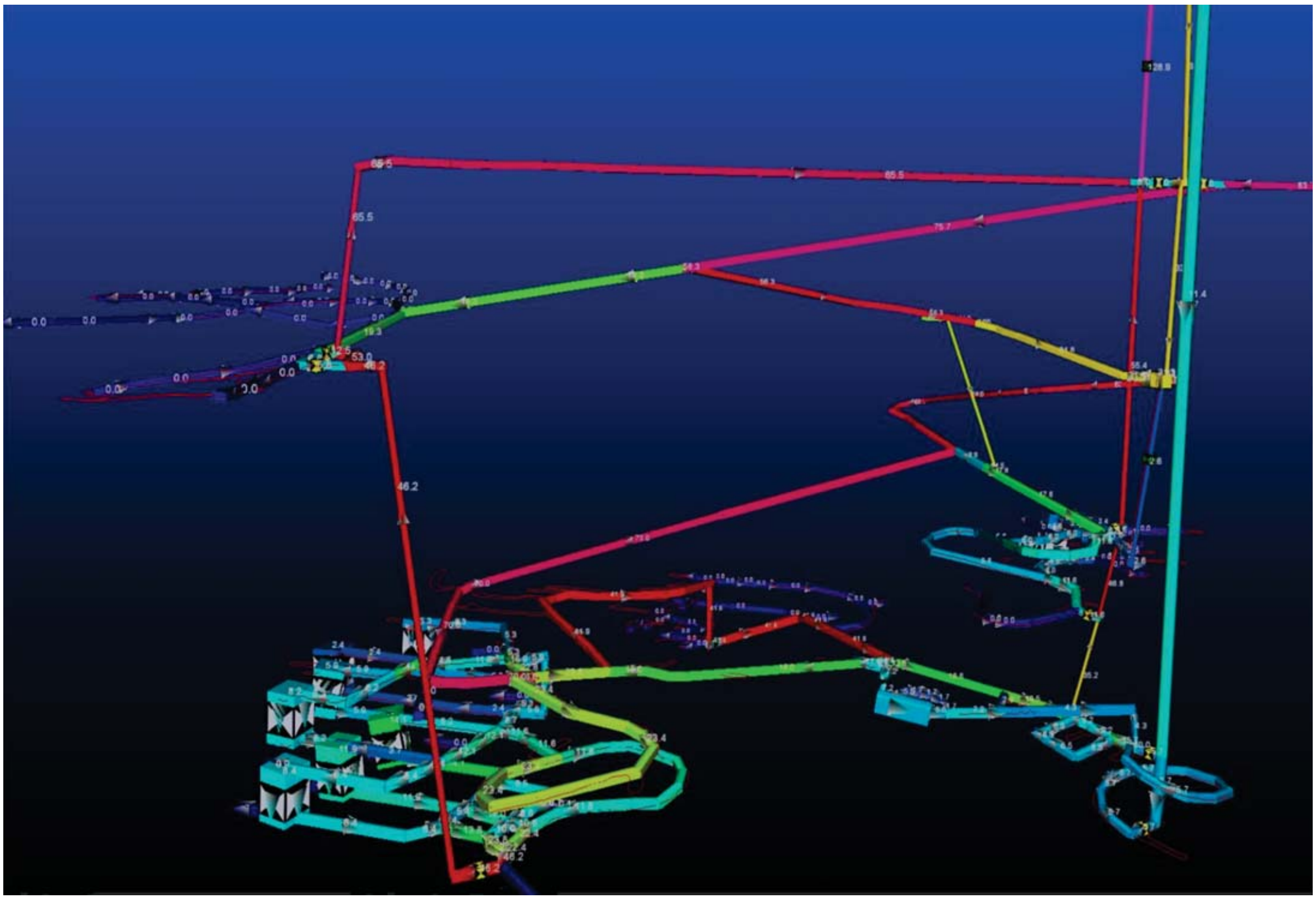
September 2014

The current ventilation circuit has been modeled in VentSIM, which has been used to simulate scenarios to improve the existing circuit. This has demonstrated the need to expand the ventilation circuit in the future, which will be done by extending the Charnela vent raise to allow exhaust air to be extracted from the Black Skarn ramp directly. Details of the internal vent raise are:

- Top elevation: 310 m
- Bottom elevation: 100 m
- Length: 214 m
- Diameter: 2.7 m

The advantages of this will be that all the zones in the mine will be provided with independent sources of fresh air, and there will be greater control over the flow of air to the various working areas of the mine. The vent raise is currently being developed in stages as part of the mine plan.

A schematic of the proposed long-term ventilation circuit has been included as Figure 16-5.



Legend: Air Quality

- 128.7 m³/s
- 41.9 m³/s
- 30.0 m³/s
- 15.0 m³/s
- 10.0 m³/s
- 0.0 m³/s

Figure 16-5

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Long Term Ventilation Circuit for Boinás

September 2014

17 RECOVERY METHODS

INTRODUCTION

Figure 17-1 is a simplified process flow sheet of the processing plant, which consists of the following sequence of macro unit operations:

- Crushing and Screening
- Grinding and Cycloning
- Gravity Concentration
- Flotation Concentration
- Leaching/Adsorption via CIL process
- Gravity Concentrate Leaching (ILIX) (Intensive Lixiviation)
- Desorption and Elution
- Electrowinning
- Smelting
- Detoxification Plant for CIL Tailings Pulp
- Tailings Storage Facility (TSF)

Table 17-1 shows the mill performance referred to in Section 13. The main issue in maintaining gold, silver and copper production has been lower head grades in the ore blend. The exclusion of Carlés ore from the ore blend by the end of 2014 may have a long term impact on overall metal recovery. This requires further investigation and metallurgical testing.

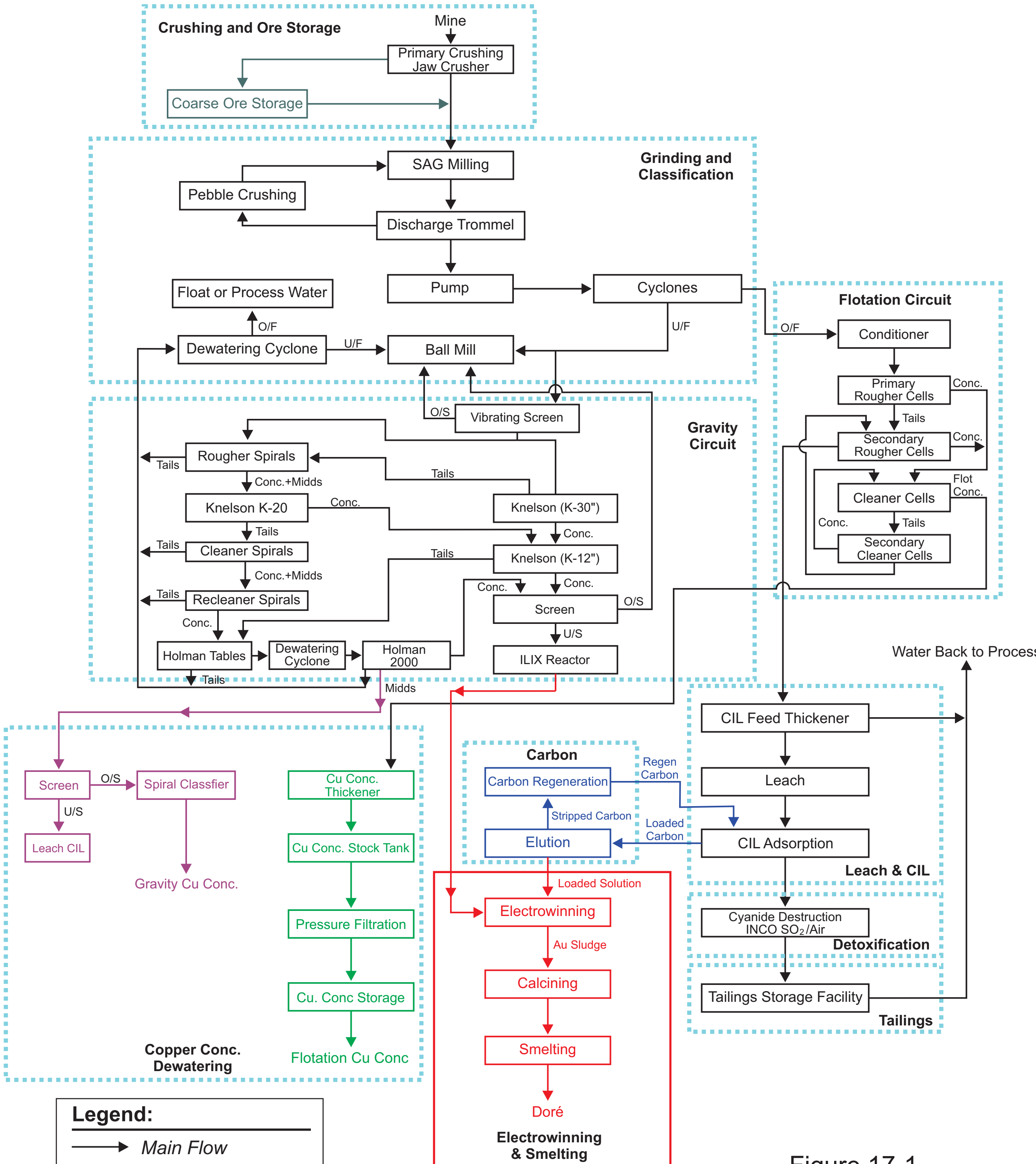
TABLE 17-1 SUMMARY OF PRODUCTION
Orvana Minerals Corp. – El Valle Boinás – Carlés Operation

Item	FY 2013	YTD 2014
Tonnes milled	685,697	466,596
Au Grade (g/t)	3.24	2.84
Ag Grade (g/t)	11.24	8.31
Cu Grade (%)	0.52	0.42
Total Au Recovery (%)	92.5	92.4
Total Ag Recovery (%)	79.8	79.7
Total Cu Recovery (%)	84.4	80.5
Au Production (oz)	65,992	39,442
Ag Production (oz)	197,768	99,340
Cu Production (lb)	6,657,653	3,504,090

Note: YTD 2014 consists of seven months (Oct. 2013 to May 2014).

The plant was originally designed to treat 79 tph, however, with process modifications it was upgraded to process 95 tph or 2,280 tpd of ore from open pit mines. A maximum of 70 tph of skarn ore can be processed and more than 2,000 tpd of the softer oxide ore can be processed together with the skarn ore. The plant has a zero discharge system and both fresh and recycled water is used. Energy is supplied from the grid and is sufficient to maintain operations of all circuits.

A description of each unit operation is presented in this section. The process description is largely extracted from the Technical Report (Nobel et al., 2012).



Legend:

- Main Flow
- Copper Concentrate
- Optional
- Carbon
- Gold

Figure 17-1

Orvana Minerals Corp.

El Valle Boinás - Carlés Mine

Oviedo Province, Asturias, Spain

El Valle Boinás - Carlés Operation

Products	Typical Assays	Weight/month	Typical Gold Rec
Doré	70-90% Au / 10-20% Ag / 2-10% Cu	70-260 kg	30-60%
Flotation Cu Conc	100-300 g Au / 1200 Ag / 25-30% Cu	400-900 tons	40-70%
Gravity Conc	200-300 g Au / 200 Ag / 20-30% Cu	2-4 tons	5-10%
		Total	90-95%

September 2014 **Source: *Orvana Minerals Corp., 2011.***

PROCESS DESCRIPTION

CRUSHING

Ore extracted from EVBC is stockpiled and classified according to mineralogy, gold, copper, and/or deleterious element grades. When possible, a suitable ore blend is prepared to feed the mill with material containing 2 g/t Au to 5 g/t Au and < 1% Cu. A front end loader collects the ore from the various stockpiles and delivers it to the crusher feed bin equipped with a 600 mm aperture slotted grizzly screen. The crusher feed bin has an apron feeder that feeds the primary single toggle jaw crusher and any apron feeder spillage is collected on a conveyor belt below. The jaw crusher set to 153 mm. The spillage and the crushed ore which is less than 153 mm in size are transferred to the next conveyor belt equipped with load cell type belt weightometer and this belt discharges into the 100 ton mill feed bin. A level indicator and controller in the mill feed bin controls the apron feeder feed rate to the jaw crusher to maintain the set level in the bin.

The capacity of the jaw crusher (200 tph) is in excess of that for grinding. The mill feed bin can be allowed to overflow and can be diverted via a conveyor belt to the emergency storage stockpile that has a capacity of 1,000 tonnes. If the primary crushing circuit is not able to feed the grinding circuit directly due to maintenance, plant upsets, etc., then the mill feed can be supplied from the emergency storage stockpile.

The critical areas in crushing area have a wet system for dust control and the dust containing slurry is pumped to the mill discharge sump. A sprinkler irrigation system is also used for dust control in other open areas of the process plant.

PEBBLE CRUSHING

The semi-autogenous grinding (SAG) mill is fitted with pebble ports in the discharge end grate. The product leaving the SAG mill passes through a trommel screen with 12 mm apertures and the oversize is transferred via conveyor belt to the cone crusher. A moving belt magnet above this conveyor belt removes any tramp metal from the feed to the cone crusher and should any metal still be on the belt, a metal detector will open a by-pass chute ahead of the cone crusher to divert the feed to the cone crusher discharge return belt and damage to the cone crusher is prevented. The pebbles feed directly into the cone crusher which crushes the pebbles to < 12 mm. The crushed pebbles return to the SAG mill via a conveyor belt with a load cell type weightometer which weighs the total amount of pebbles that are recirculated. Should the pebble crushing circuit be off-line, the pebbles are diverted to an alternate conveyor belt that dumps the pebbles on the floor to be removed by a front end loader and stockpiled.

The installation of pebble crushing has resulted in a reduction in increased grinding capacity.

GRINDING

Dry crushed ore at P_{80} < 153 mm is fed to the SAG mill (5.5 m internal diameter by 2.3 m effective grinding length) by means of a conveyor belt equipped with a load cell type belt weightometer. The load signal controls the feed rate from the mill feed bin discharge conveyor onto the conveyor belt feeding the SAG mill. The pulp density in the mill is controlled by adding water to the SAG mill inlet. Oversize material is removed from the mill discharge pulp with the discharge end trommel screen. The oversize fraction is delivered to pebble crushing circuit, while the undersize fraction flows to the common pump box for both the SAG mill discharge and the ball mill discharge. The combined mill discharge is pumped to a cluster of seven 250 mm diameter Weir Cavex hydrocyclones for classification. The cyclone overflow reports to the flotation section and the cyclone underflow is split with part reporting to the gravity concentration section (approximately 100 tph) and the balance reporting to the ball mill feed. The ball mill has a 3.85 m internal diameter by 5.65 m effective grinding length. The cyclone overflow at 40% solids at has a size of P_{80} < 74 µm. If flotation is not necessary when processing low grade copper oxide ore then this flow can be diverted directly to cyanidation.

GRAVITY CONCENTRATION

Milling reduces the size of the ore to less than one mm and liberates metallic gold, copper and silver particles (in sizes between 100 µm to 500 µm) that is recovered by gravity concentration due to their density differences in comparison to the host rock. Two types of products are obtained from this circuit:

1. High grade gold in copper concentrate – treated in the ILIX plant.
2. Low grade gold in copper concentrate – final product for packaging.

The cyclone underflow that is split off to the gravity circuit passes over a vibrating screen with two mm polyurethane panels. The screen oversize material returns to the ball mill feed. The screen undersize material is split between a bank of 12 (12LM3/2) rougher double spirals located near the screen and a Knelson-30 centrifugal concentrator (K30). The K30 concentrate is discharged to the Knelson concentrate tank, while the K30 tails feeds two other banks of 12 (12LM3/2) rougher double spirals. The concentrate from the three banks of rougher double spirals feed the Knelson-20 (K20) concentrator, while the tails flow to the gravity tails box.

The K20 concentrate is mixed with the K30 concentrate in the Knelson concentrate tank and the K20 tails are pumped by a vertical pump to the bank of four cleaning double spirals (4LM3/2). The concentrate tank feeds the Knelson-12 concentrator which produces a high grade gravity concentrate as a final product and the K12 tails are delivered to the concentrate dewatering cyclone ahead of the Holman 2000 shaking table.

The cleaner spiral concentrate feeds the re-cleaning double spiral (1LM3/2) and the mixed material is sent to the retreat double spiral (1LM3/2). Tails are sent to the gravity tails box.

The re-cleaning double spiral concentrate feeds two of the four Holman vibrating tables. The concentrates from these two tables are pumped to the concentrate dewatering cyclone ahead of the Holman 2000 shaking table. The cyclone overflow goes to the tails box and the cyclone underflow feeds the Holman 2000 vibrating table to produce a gold concentrate.

Both the retreat spiral concentrate and the mixed material from the re-cleaning spiral and the Holman tables are pumped to two re-cleaning spirals (2xLM3/1). The tails and mixed material from the retreat double spiral and the tails from the re-cleaning double spiral are delivered to the tails box.

The concentrates and mixed material from the two re-cleaning spirals feed the other two Holman vibrating tables. A low grade gravity concentrate is produced from this circuit and the tails are combined with the tails from the two re-cleaning spirals.

The contents of the tails box are pumped to the main dewatering cyclone. The cyclone overflow stream is split for delivery to the following: mill discharge pump box, gravity tails pumps, K30 feeding pump, flotation tails, and flotation dilution. The cyclone underflow is returned to the ball mill.

The ILIX plant consists of a mechanically stirred reactor, an electrolysis tank, and two electrolysis cells. The high grade concentrate from the gravity circuit is fed to the reactor with a mixture of fresh water, soda, and cyanide. The cyanide dissolves the gold in the concentrates. The leach solution containing gold is separated from the solids by decantation. The solids are pumped to the ball mill and the solution is sent to electrowinning.

FLOTATION

After grinding and gravity concentration, significant quantities of fine native gold and native copper and variable amounts of copper sulphide (mostly chalcopyrite) remain. The native metals and sulphides can be recovered in flotation. Copper recovery is extremely important as it has a negative effect on cyanidation and gold recovery.

Flotation consists of two rougher stages, two scavenger stages, and two cleaner circuits.

The mill cyclone overflow flows to the mechanically stirred rougher conditioning tank where flotation reagents are added and the material is sampled. The slurry is conditioned by the addition of the following reagents for 2.5 minutes and is reduced from 40% to 25% solids:

- lime to achieve a neutral pH, if necessary
- Danafloat 123 promoter
- Dowfroth 250 frothing agent

The conditioned slurry flows by gravity to the rougher cells and scavenger cells. The flotation tails are pumped to the CIL feed thickener, while the rougher and scavenger concentrates are directed to a cleaning stage and then a re-cleaner stage. The re-cleaner concentrate gravitates to the concentrate thickener where it is sampled just before the thickener.

THICKENING AND FILTRATION

The re-cleaner copper concentrate flows to a six metre diameter concentrate thickener. Flocculant is added to the feed box as necessary for optimum solids settling and compaction. The thickener overflow containing suspended solids in the froth flows to a lamella clarifier for clarification where additional flocculant is introduced. The clear lamella clarifier overflow can is used as process water.

The underflow from the thickener and clarifier is pumped to a transfer tank where the slurry is sampled and then to either one of two pressure filter feed tanks. The concentrate is then pumped from the pressure filter feed tanks to the recessed plate pressure filter. The filter feed is sampled. The filtered concentrate at approximately 10% moisture is discharged and drops to the floor below the pressure filter. The copper concentrate is then loaded onto trucks and transported to the port warehouse in Gijon where is stored, sampled and loaded onto a ship for sale.

CARBON-IN-LEACH (CIL)

After flotation, the tails still contain a significant amount of fine gold and copper. Residual copper will cause problems both in the cyanidation process (high consumption of cyanide) and carbon adsorption (slow kinetics and reduction in the gold adsorption capacity), and also in the subsequent desorption, electro-deposition and smelting processes. Cyanide leaching and the CIL process will recover gold and undesired copper by dissolution and adsorption in the same tanks.

The CIL feed thickener underflow is pumped to a vibrating screen with 600 µm polyurethane panels where plastics and fibre from the mine explosives, etc. are scalped off to the final tails pump box. The screen underflow gravitates to the leach circuit consisting of six agitated tanks - one cyanide leaching tank and five CIL tanks (for cyanide leaching and adsorption with activated carbon). Each tank is 600 m^3 in volume and air is introduced via a low pressure blower through the agitator shaft into the pulp. The total retention time is 24 hours for the process.

The leach slurry of 40% to 45% w/w solids is prepared by adding lime to control the pH of the slurry between 10.5 – 11.0 and also cyanide in solution. The five CIL tanks are interconnected by overflow launders and Norit extruded activated carbon is suspended in the slurry.

The outflow of each tank has a vertical cylindrical carbon retention screen with 700 µm by 700 µm wire screen panels. A vertical spindle pump transfers loaded carbon from the first CIL tank to a wet vibrating screen for washing before elution. Carbon is transferred between other CIL tanks using air lifts with injectors. The carbon is progressively enriched in gold from the first to the fifth tank. The slurry tails from the last CIL tank flows to the detox section to destroy free cyanide and WAD cyanide and precipitate base metal and iron elements.

DETOXIFICATION

The Carbon-in-Leach tails flow to two tanks for cyanide destruction using the INCO SO_2/Air process, one tank of 528 m^3 live volume and one of 355 m^3 live volume, where residual cyanide is destroyed and heavy metals, e.g. copper, zinc, iron, etc. are precipitated. The detox tails flow to the final tails safety screen that recovers any activated carbon should a carbon retention screen fail. The screen underflow is pumped to the tailings storage facility.

DESORPTION AND ELUTION

Loaded carbon from the first CIL tank is transferred via a vertical centrifuge pump to a cleaning screen and to an elution column, while the slurry returns to the first CIL tank. Elution follows the Anglo-American AARL process, using a nine cubic metre cylindrical column with a capacity for four tonnes of carbon. Stages of desorption and the operating parameters are summarized in Table 17-2.

TABLE 17-2 STAGES OF DESORPTION
Orvana Minerals Corp. – El Valle Boinás – Carlés Operation

Stage	Reagent	Process	Time (min.)	Temp. (°C)	Pressure (kPa)
1	HCl (3%)	Washing	20	Room	Atmospheric
2	Water	Rinsing	120	90	Atmospheric
3	NaCN/NaOH (3%/3%)	Desorption	20	110	350
4	Water	Elution	180	110	350
5	Cold water	Elution	20	60 – 110	250 – 350

The elution process is completed in less than eight hours, including two hours between loading and unloading of the column. The effluents from washing and rinsing report to tailings solutions. Solutions from desorption and elution or eluate are collected as electrolyte for electrowinning (EW). After completing the elution process, the carbon is transferred to the last CIL tank or to the carbon regeneration circuit. If the carbon is high in copper content, then washing with a cold cyanide solution can be performed before elution.

CARBON REGENERATION

Stripped carbon is transferred to a self-draining chute in the regeneration kiln by means of a water pressure injector. The regeneration kiln is a horizontal rotary kiln with a capacity of

250 kg/h and is heated by propane to a temperature between 650°C and 750°C to thermally reactivate the carbon. The reactivated carbon is screened to remove carbon fines before being returned to the last CIL adsorption tank. Regeneration of the carbon takes approximately 15 hours to complete.

ELECTROWINNING

The eluate from desorption and elution is stored in the electrolyte tank of the EW process. There are four electrolyte cells equipped with rectifiers and each cell has nine stainless steel wool cathodes. Electrolyte solution circulates through the cells and contains less than 10 g/t Au. Gold and silver are electrodeposited on the cathodes and later washed off as EW sludge. EW takes less than 16 hours to complete.

SMELTING

Gold deposited as cathodic sludge is removed on a weekly basis and calcined in a kiln at 750°C before direct smelting. After calcination, the gold and silver residues are mixed with fluxes (silica, borax, and nitrate) before smelting, which is carried out in a 0.04 m^3 smelting furnace capable of reaching 1,200°C. The refined gold is then cast into molds as doré bars.

TAILINGS DISPOSAL

Plant tailings are pumped to the tailings storage facility located within the old El Valle open pit mine. The tailings impoundment is properly lined with polyethylene liners and has an adequate pumping system. The EVBC Operation is a zero discharge facility.

Plant tailings are currently not permitted as backfill at the El Valle-Boinás operations, due to the levels of arsenic in the material.

18 PROJECT INFRASTRUCTURE

Infrastructure at EVBC was completed in 1997 (Figure 18-1, Figure 5-2). The office was expanded in 2011. The processing plant has a nameplate capacity of 600,000 tpa, where subsequent expansions have enabled treatment of over 750,000 tpa depending on ore types; a full description of the processing plant is found in Section 17. Auxiliary equipment includes pump systems to distribute water, water recovery systems, gas storage, control boilers, gas heaters, blowers, compressors, etc.

Other surface facilities include changing rooms, lunch rooms, clinic, warehouses, maintenance shops, electromechanical workshops, a reverse osmosis water treatment plant, a shotcrete plant, a complete laboratory that includes a sample preparation area with jaw crusher, roll mill, LM5, LM2, rotary and manual splitter, etc., fire-assay laboratory, an Agilent Technologies (Varian Inc.) ICP emission spectrometer, and a core storage facility, electrical power lines and substations for both mines, and a complete telecommunication system providing phone lines and fast internet and intranet connections for the various offices.

The underground workings at EVBC have auxiliary fixed installations including main and auxiliary ventilation, pumping systems, electrical distribution, and clean-water supply circuit. Also included are mine and surface treatment circuits, drainage, and water decant ponds. A 420 m shaft is again operational after recent repairs.

The tailings impoundment is located within the El Valle pit and is properly lined and has an adequate pumping system. This is a no-discharge facility.

The main access is from the south on a public road that bypasses the village of Boinás; the entrance includes a gate and security.

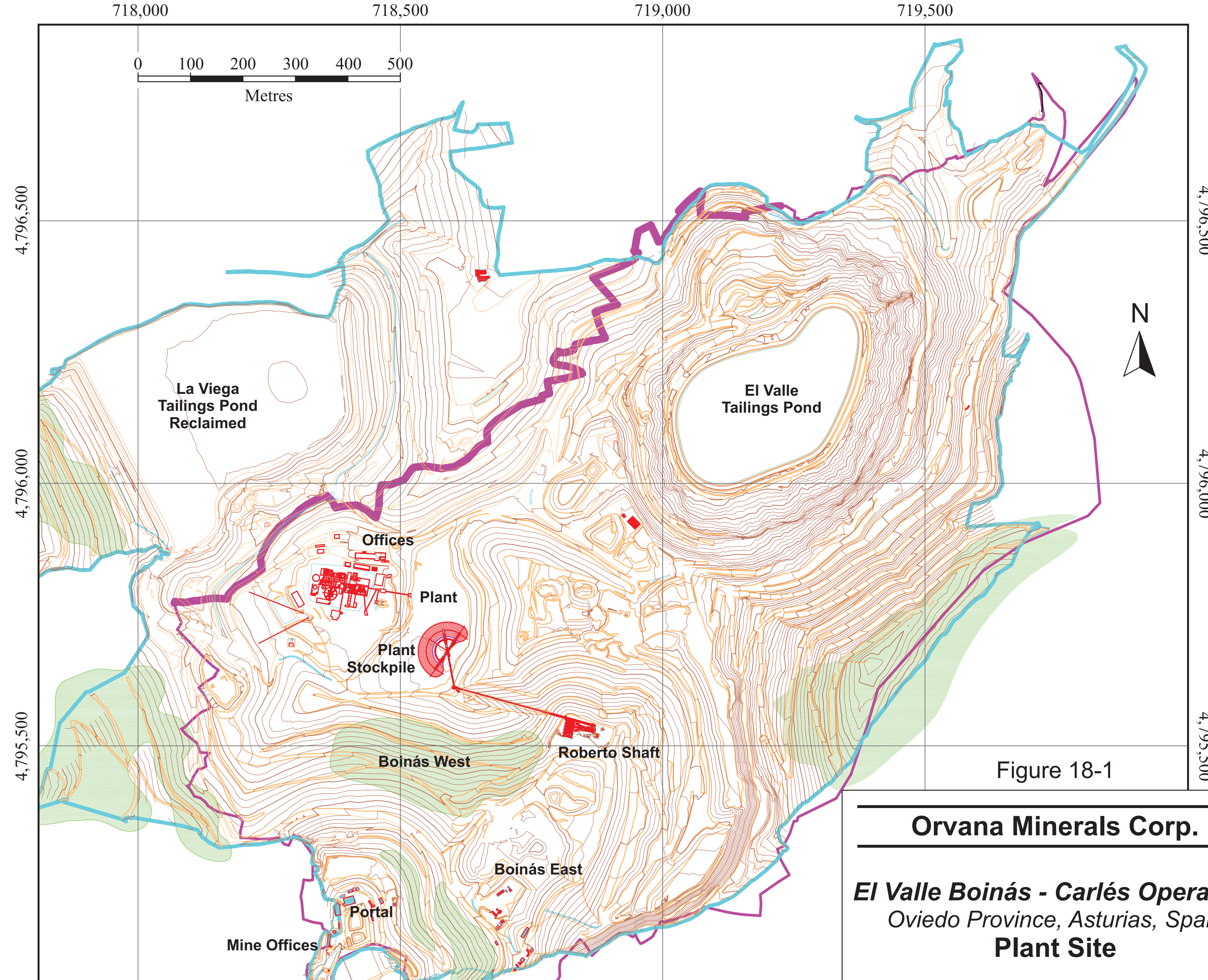


Figure 18-1

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Plant Site

September 2014

Source: Orvana Minerals Corp., 2014.

19 MARKET STUDIES AND CONTRACTS

MARKETS

The principal commodities at the EVBC Operation are freely traded, at prices that are widely known, so that prospects for sale of any production are virtually assured, subject to achieving product specifications discussed below. RPA used metal prices of US$1,100 per ounce gold, US$2.75 per lb copper, and US$20 per ounce silver for estimating Mineral Reserves.

Products include doré bars, and copper concentrate with gold and silver credits. The copper concentrate is subject to limitations on certain deleterious elements, including:

- Arsenic
- Bismuth
- Antimony
- Lead
- Zinc
- Mercury
- Selenium
- Fluorine

As per industry norms, penalty charges are incurred for the deleterious elements when they are over specified concentrations. Fluorine specifications, however, also include a hard cap, above which the concentrate is not readily saleable.

Concentrate lots have been above this cap from time to time, and thus required blending with low-fluorine concentrate lots or negotiation with the off-take company before shipping to the smelter. Another method of mitigation is through blending the mill feed to control fluorine concentrations, however, this will be more difficult in future due to the elimination of the low-fluorine feed from Carlés.

Fluorine is likely to be an issue for EVBC concentrates over the next three years, as the proportion of Boinás skarn ore (the highest-fluorine feed source) is higher than in the past. Following that, Boinás oxide ore will become the dominant feed source, and issues with fluorine will ease.

RPA recommends that Orvana address the potential fluorine problem by undertaking the following:

- Modelling of fluorine in the resource block models, which will require assay data for fluorine (not collected in historical assay work).
- Incorporate blending for fluorine feed grade in short-term and long-term mine planning.
- Review the deportment of fluorine through the process, and investigate methods of reducing fluorine recovery to concentrate.

CONTRACTS

The EVBC Operation employs local contractors to assist with mining in the Boinás oxide zones, provide site security, transportation of ore from Carlés to Boinás, work on the tailings dam lift, and to carry out diamond drilling. RPA also reviewed the current contracts for smelting and refining the copper concentrate.

RPA considers terms, rates, and charges for the contracts to be within industry norms.

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

KE has an environment management plan based on legal requirements, company policies and procedures, preventive design and identified impacts and associated risks. Information in this report section is based on available data from the Technical Report (Nobel et al., 2012) and Orvana.

ENVIRONMENTAL STUDIES

Water samples are collected periodically for testing from various water control points for El Valle-Boinás (Figure 20-1) and the results are reported to authorities. Figure 20-1 also shows infrastructure owned by Mineira del Corcoesto, which is a wholly owned subsidiary of Edgewater. This infrastructure is not the responsibility of Orvana. Two types of monitoring are conducted (Kinbauri, España, 2012):

1. Official monitoring. An ENAC (Entidad Nacional de Acreditacion) accredited company carries out monitoring for water from Carlés, El Valle-Boinás and El Valle Pit Tailings Impoundment and Kinbauri España presents the results to the authorities.
2. In-house monitoring. Kinbauri España's Environmental Department monitors the water quality and carries out adjustments in water treatment.

Regarding water monitoring results, Orvana provided the following statement:

> *To date, although certain parameters have not always been in compliance, evaluations have been provided to the respective regulatory authorities and remedial actions have or are being implemented. EVBC personnel are currently working through one such matter in Spain with a local regulatory authority in respect of which it has received and may receive certain monetary sanctions and in respect of which Orvana has been implementing remedial actions, including the installation of a reverse osmosis water treatment plant. In addition, Orvana has filed applications for amendments to certain permits as a result thereof.*

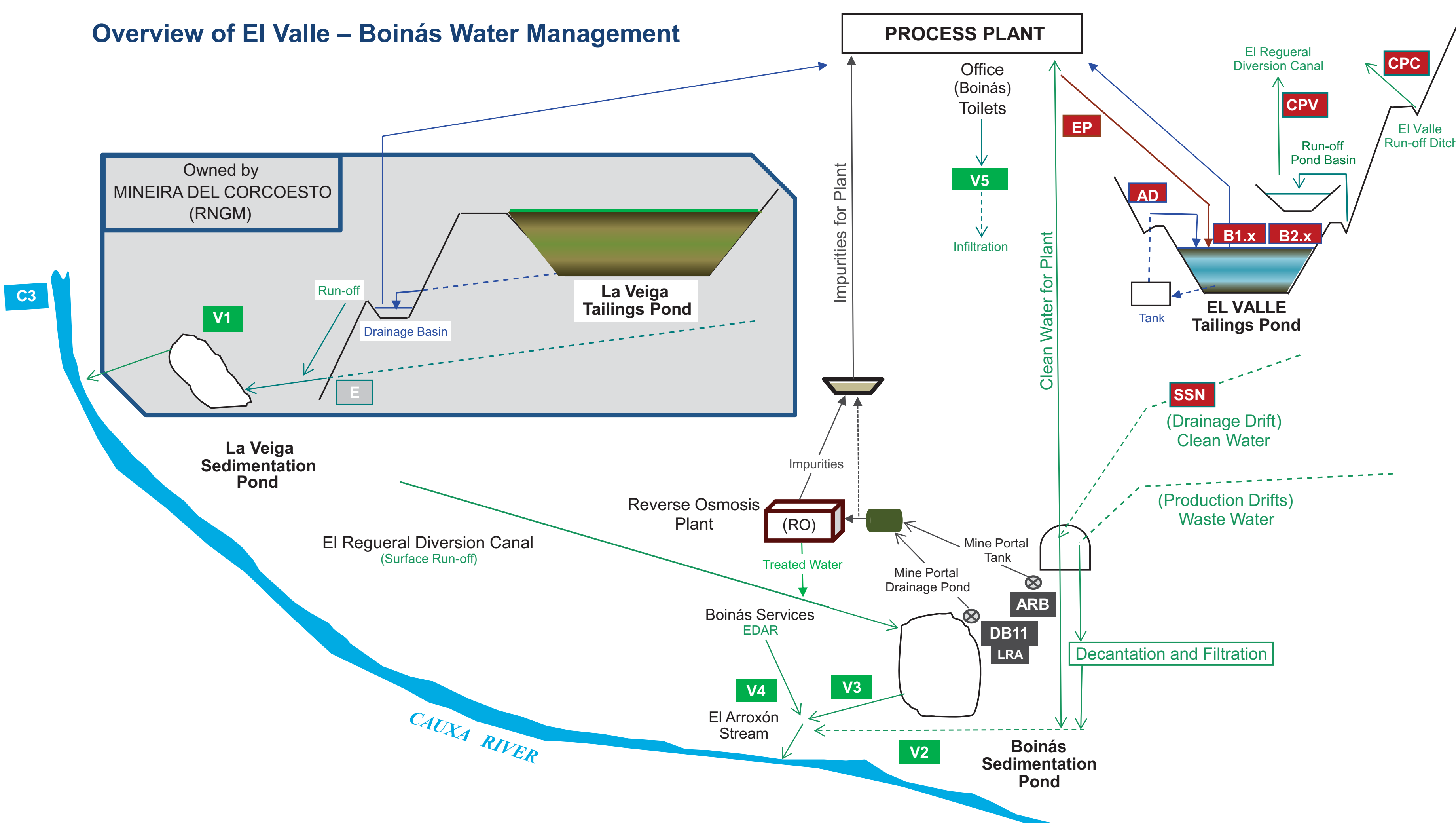


Figure 20-1

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Water Control Points at El Valle - Boinás

Legend:

⊗	*Collection of Se Bearing Water*	Channels
→	*Selenium*	Discharges
→	*Tailings Line*	Tailings
→	*Process Water*	Selenium
→	*Mine Water (Run-off & Drainage Water)*	

September 2014

Source: Orvana Minerals Corp., 2012.

PROJECT PERMITTING

The EVBC Operation is permitted and bonded. Kinbauri España has obtained all the material permits to operate the mines, processing plant, and TSF. Table 20-1 lists the permits which are currently valid.

TABLE 20-1 PERMITTING STATUS
Orvana Minerals Corp. – El Valle Boinás – Carlés Operation

Category	Permit
General	• Integrated Environmental Authorization for the plant • Integrated Environmental Authorization for the new tailings pond • Activity license for El Valle-Boinás project (mine and plant) • Activity license for new tailings pond • Activity license for Carlés • Declaration of Environmental Impact El Valle-Boinás • Declaration of Environmental Impact Carlés • Authorization for re-start of operations
Mine	• Mine permit for El Valle-Boinás • Permit for new deposits for explosives at El Valle- Boinás • Mine permit for Carlés • Permit for new deposits for explosives at Carlés
Plant	• Treatment plant permit
Tailings Storage Facility	• New tailings pond permit
Water	• Water discharge permit at El Valle-Boinás • Water discharge permit at Carlés • Water utilization for the plant
Chemical/Hazardous Materials	• Authorization for hazardous waste at the plant • Authorization for hazardous waste at Boinás mine • Authorization for hazardous waste at Carlés mine • Radioactive facilities
Construction	• Construction permit for works or ditches and dyke at El Valle pit

In June 2011, the Asturias Ministry of Environment required the posting of a €10 million bond for the tailings impoundment, which is located in the old El Valle open pit. Kinbauri España had posted €5 million in response and are continuing to dispute the other €5 million on technical merits. A further €5 million reclamation bond may have to be deposited with the Spanish regulatory authorities at a future date to satisfy reclamation bond obligations.

SOCIAL OR COMMUNITY REQUIREMENTS

Orvana provided a statement on social development:

> *Orvana is committed to the social development and wellbeing of the communities in which it operates. To this end, in addition to the payment of income taxes and other local community taxes such as land moving taxes, Orvana continues to support, financially and otherwise, local community endeavors associated with these objectives. Orvana has supported the communities surrounding EVBC by donating funds to the local municipality of Belmonte to re-open the historic exhibition of gold mining in the area and supports other cultural and sporting activities in the communities of Belmonte and Salas. In addition, the Company has funded the re-stocking of fish species into the local rivers surrounding EVBC. Recently EVBC sponsored the Río Narcea Salmon fair, provided mining educational materials and donations to the elementary school in Salas.*

In terms of archeological and cultural considerations, heritage sites have been identified in the area and include Roman workings, old Roman pits, channels, ponds and fortifications. Any work carried out in those areas requires archaeological follow up by appropriate technical personnel.

It is highly important that the surrounding municipalities are supportive of mining activity at EVBC. The northern projects (Carlés and La Ortosa-Godán) are part of the municipality of Salas and the southern projects (El Valle-Boinás and La Brueva) are part of the municipality of Belmonte de Miranda.

All the deposits are well inside areas classified as “Mining Interest” except the La Ortosa-Godán, which is classified as agrarian interest, and the north part of the La Brueva, which is classified as “landscape” (scenic) interest. The regulations of the Municipality of Salas indicate that mining would be compatible in areas of agrarian interest or landscape interest in areas where an Exploitation Concession has been granted, such as that at La Ortosa-Godán. The regulations of Belmonte de Miranda are more restrictive with respect to areas of landscape interest, such as the northern part of the La Brueva deposit. These limitations may restrict Orvana's ability to drill or conduct mining activities on the north side of the concession.

The La Ortosa-Godán area has a population of Asturian brown bears and their distribution could impact future operations outside of the mining and processing area. Additional permitting from environmental authorities in the La Brueva and La Ortosa-Godán area may be required. No additional approvals are required inside of the El Valle-Boinás Exploitation Plan, because the Exploitation Plan has been approved.

MINE CLOSURE REQUIREMENTS

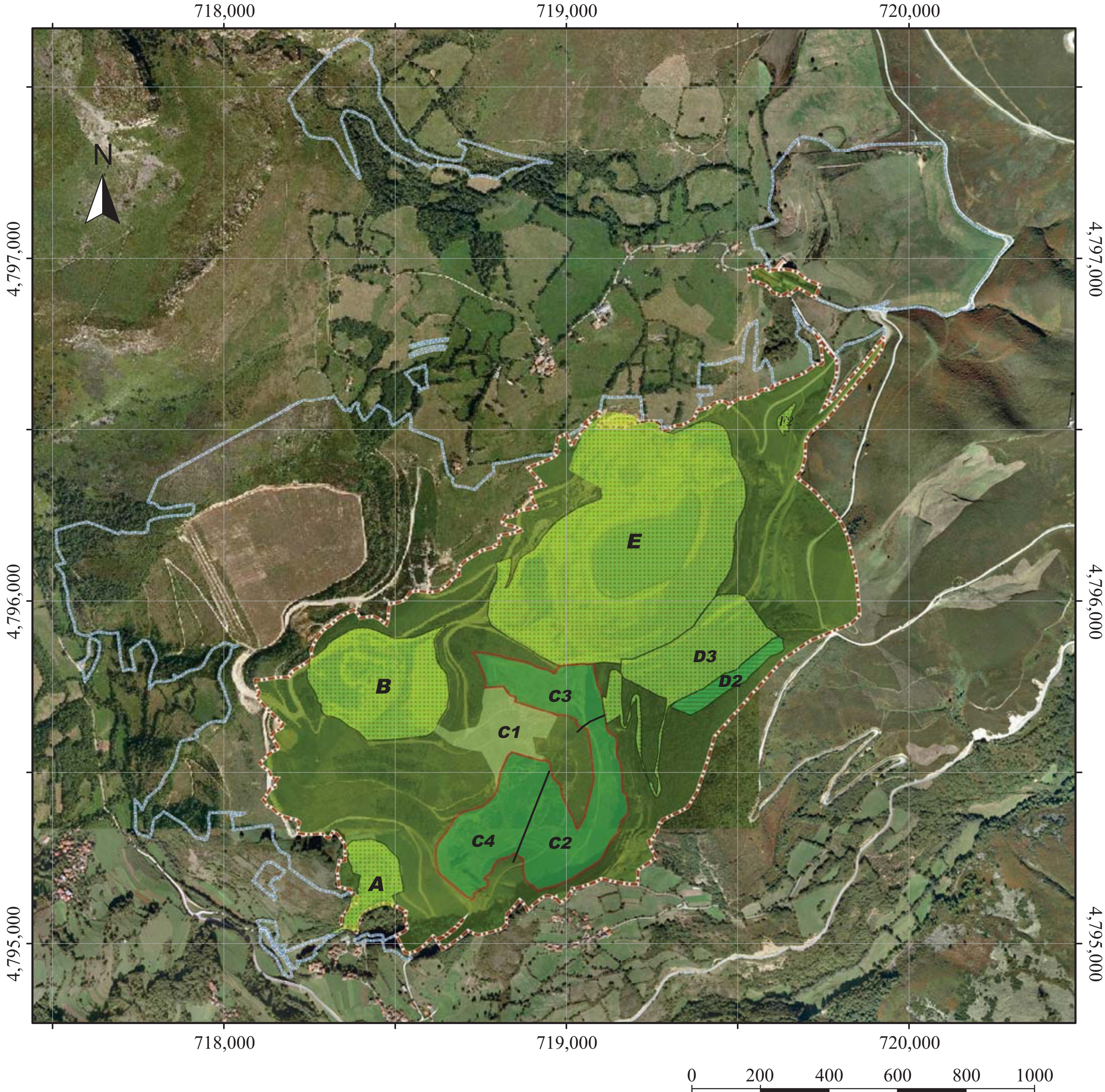
Kinbauri España is responsible for reclaiming portions of the property as follows:

- Zone A – office plant and other installations at El Valle and the parking and adjacent area to Zone A
- Zone B – Boinás Underground Portal
- Zone C – new El Valle tailings impoundment in the El Valle Pit
- Zone D – laboratory facilities
- Reclamation of part of the Carlés area

Figures 20-2 and 20-3 are maps showing the existing facilities, Orvana surface ownership and the areas of responsibility for reclamation for the El Valle-Boinás area and the Carlés area, respectively.

EVBC Operation remediation and closure costs include the following:

- Remediation and decommissioning costs are estimated at US$7.5 million and will be implemented in 2019 at 50% of the total payment.
- Remainder of the payment (40% and 10%) will be made in 2020 and 2021, respectively.
- Reclamation bond of US$10 million (100%) to be collected after the decommissioning work is performed.
- Water treatment plant was included in 2019 at a cost of US$7 million. Operating costs for water treatment are expected to be US$1.4 million in 2020 – 2023.



UTM Zone 29, European Datum 1950

Legend:

Kinbauri Property (164,46 Ha)
RNGM Property (122,68 Ha)
Affected Areas to January 2014
A- 2.91 Ha
B- 10.44 Ha
C2+C3+C4- 13.32 Ha
D2+D3- 13.32 Ha
E- 36.58 Ha
F2- 0.24 Ha
TOTAL: 82.42 Ha

Areas of Topographic Restoration in 2014
C2+C3+C4- 13.32 Ha
TOTAL:13.32 Ha
Areas to Restore in 2014
D2- 1.65 Ha
TOTAL: 1.65 Ha
Areas Reclaimed in 2014
(Seed and/or Fertilizer)
C1- 4.12 Ha
TOTAL: 4.12 Ha

Figure 20-2

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Map of the El Valle-Boinás Area Requiring Reclamation

September 2014

Source: Orvana Minerals Corp., 2014.

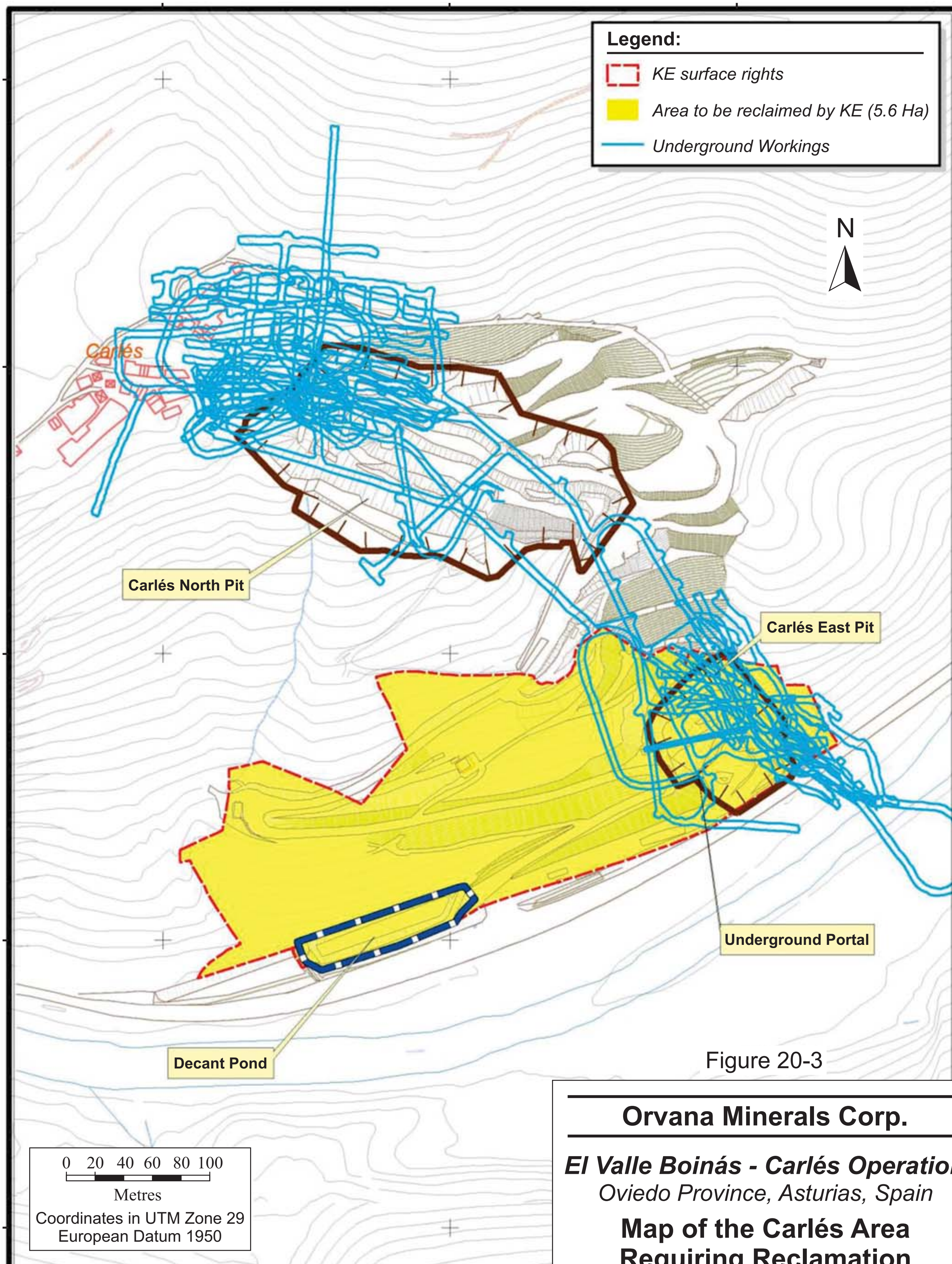


Figure 20-3

Orvana Minerals Corp.

El Valle Boinás - Carlés Operation

Oviedo Province, Asturias, Spain

Map of the Carlés Area Requiring Reclamation

September 2014 **Source: *Orvana Minerals Corp., 2012.***

21 CAPITAL AND OPERATING COSTS

CAPITAL COSTS

The EVBC Operation capital costs are based on the Life of Mine Plan. The estimated sustaining capital costs total $43 million, summarized in Table 21-1, and include mine development (contractor and company), mine infrastructure, equipment costs, plant expansion, and tailings management.

TABLE 21-1 SUSTAINING CAPITAL COSTS
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Year	Mine Development ($ millions)	Equipment & Facilities ($ millions)	Exploration ($ millions)	Tailings ($ millions)	Other ($ millions)	Total ($ millions)
FY2015	3.7	9.6	1.6	0.3	1.5	**16.8**
FY2016	5.1	6.4	1.8	1.1	1.4	**15.8**
FY2017	1.7	4.1	1.5	0.3	0.8	**8.3**
FY2018	-	1.6	-	0.3	0.2	**2.1**
FY2019	-	-	-	0.1	-	**0.1**
Total	**10.5**	**21.7**	**4.9**	**2.1**	**3.9**	**43.1**

Mine development costs are based upon operating experience and the LOMP development schedule. Equipment and facilities costs include mobile equipment rebuilds and replacement, fixed equipment in the mine, site electrical costs, and care and maintenance costs for Carlés. Exploration is based on corporate budgeting. Tailings costs are for ongoing maintenance and a dam lift in FY2016.

RECLAMATION & CLOSURE

In addition to sustaining capital costs, an estimated cost of $20.1 million for reclamation and closure is included. This estimate includes installation and operation of a post-closure water treatment plant, and decommissioning liabilities.

OPERATING COSTS

Operating costs in the LOMP are based on recent operating history, and average $70 million per year for the next three years. After that, costs decline due to lower production forecasts. Unit rates are summarized in Table 21-2.

TABLE 21-2 UNIT OPERATING COSTS
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Item	Units	LOMP Average
Mining	$/t milled	70
Processing	$/t milled	24
G&A	$/t milled	38
Total	**$/t milled**	**131**

Mining unit costs are known to vary significantly by material type, with low-productivity oxide mining via hydraulic hammer being considerably costlier than higher-productivity longhole mining in the skarns.

The tail-off in production after the skarns are mined out presents difficulties in estimation by reference to recent cost history, and were addressed by looking at fixed vs. variable costs. Large quantities of Mineral Resources in addition to Mineral Reserves suggest reasonable prospects for filling in this tail-off in production, given further exploration, resource estimation, and mine planning work.

MANPOWER

The current manpower for the EVBC Operation is summarized in Table 21-3. The table includes company and contractor employees. It includes the company workforce for mine development and production, process plant, mechanical and electrical work, and technical and administrative staff, plus contractors for oxide mining, diamond drilling, ore transport, and tailings dam work.

TABLE 21-3 WORKFORCE SUMMARY
Orvana Minerals Corp. – El Valle Boinás - Carlés Operation

Department	Company	Contractor	Total
Mine – Boinás	94	80	174
Mine - Carlés	53	-	53
Plant	82	26	108
Maintenance	53	-	53
Technical Services	22	-	22
Diamond Drilling	-	12	12
Administration	37	14	61
Total	**341**	**132**	**473**

22 ECONOMIC ANALYSIS

This section is not required, as the property is currently in production and there is no material expansion of current production.

RPA evaluated the Mineral Reserves in a LOMP cash flow analysis, and verified that they are economically mineable, under the metal price and cost assumptions summarized in this report.

23 ADJACENT PROPERTIES

RPA is not aware of any adjacent properties as defined by NI 43-101.

24 OTHER RELEVANT DATA AND INFORMATION

No additional information or explanation is necessary to make this Technical Report understandable and not misleading.

25 INTERPRETATION AND CONCLUSIONS

RPA offers the following conclusions based on a review of company information:

GEOLOGY AND MINERAL RESOURCES

- Drilling, logging and sampling methodologies meet industry standard and are suitable to support Mineral Resource and Reserve Estimation.
- The sampling method and approach is reasonable to support resource estimation.
- The sample preparation, analysis, and security procedures at the EVBC Operation are adequate for use in the estimation of Mineral Resources.
- The QA/QC program as designed and implemented by Orvana is adequate and the assay results within the database are suitable for use in a Mineral Resource and Mineral Reserve estimate.
- The database contains no significant errors and is suitable to support Mineral Resource and Mineral Reserve estimation.
- The Mineral Resource estimate, including databases, geological interpretation, compositing, capping, variography, block models, interpolation strategy, validation, cut-off grade, classification and Mineral Resource reporting is appropriate for the style of mineralization and the resource models are reasonable and acceptable to support the 2014 fiscal year-end Mineral Resource and Mineral Reserve estimates.
- Measured and Indicated Mineral Resources total 6.0 Mt, grading 4.41 g/t Au, 0.69% Cu and 13.98 g/t Ag, containing 850,900 oz Au, 41,500 t Cu and 2,700,500 oz Ag.
- Inferred Mineral Resources total 6.0 Mt, grading 5.05 g/t Au, 0.45% Cu and 6.80 g/t Ag, containing 979,500 oz Au, 26,900 t Cu and 1,318,600 oz Ag.
- There is significant potential to upgrade Inferred Resources to Indicated categories and for expansion of known zones along their peripheries.

MINING AND MINERAL RESERVES

- Proven and Probable Mineral Reserves total 2.2 Mt, grading 4.29 g/t Au, 0.67% Cu and 13.41 g/t Ag, containing 302,000 oz Au, 14,700 t Cu and 944,000 oz Ag. Mineral Reserves are estimated at metal prices of US$1,100 per oz gold, US$2.75 per lb copper, and US$20 per oz silver, and a US$/Euro exchange rate of 1/1.33.
- Considerable marginal grade material is included in Mineral Resources, and excluded from Mineral Reserves, due to application of dilution factors and higher cut-off grades. In the future, small changes in cut-off grades may have a large impact on Mineral Reserve tonnage.

- Mining unit costs are known to vary significantly by material type, with low-productivity oxide mining via hydraulic hammer being considerably more expensive than higher-productivity longhole mining in the skarns.

- The LOMP production schedule forecasts three years of mining at near-current production rates, followed by two years of reduced, oxide-only production. Higher head grades provide gains on metal production relative to recent results (increasing to an average of 72,000 oz gold for the next three years).

- Production activities are expected to continue at Carlés from developed areas through to early 2015, following which this mine will be placed on care and maintenance status. The decision was taken after drilling results indicated lower grades in the future mining blocks below current activities. The Carlés mechanized crew will be moved to assist with ramping up production in the higher grade Boinás Mine.

- Average LOMP operating costs are estimated to be US$131 per tonne milled. Sustaining capital costs are estimated to total US$43 million, plus US$20 million for reclamation and closure.

- Cash flow analysis of the LOMP verified that Mineral Reserves are economically mineable, under the metal price and cost assumptions summarized in this report.

MINERAL PROCESSING AND METALLURGICAL TESTING

- Operating results from the last three years have demonstrated the following:

    - Tonnages treated include approximately 20% Boinás oxide ore, 46% Boinás skarn ore and 34% Carlés skarn ore.

    - The operation has a sound basis of consistent production data.

    - Total average Au and Ag recoveries were 92% and 79%, respectively.

    - Total Cu recoveries averaged between 81% and 84%, despite a slight falling trend in head grades.

- Changes to the mill feed composition will show up soon, as a result of the updated LOMP, including the elimination of Carlés skarn ore and increases in the proportion of oxide ore to skarn ore. Going forward, the projected recoveries should be updated based on metallurgical testwork conducted on the new ore blend. Potential changes in the concentration of deleterious elements in the subsequent ore blend should also be identified.

- Ore samples for metallurgical testwork should be representative of the ore blend for each year for the remainder of the mine plan.

- Keeping fluorine grades in copper concentrate below threshold limits is likely to be an issue for the next three years, as the proportion of Boinás skarn ore (the highest-fluorine feed source) is higher than in the past. Following that, Boinás oxide ore will become the dominant feed source, and issues with fluorine will ease.

26 RECOMMENDATIONS

RPA offers the following recommendations:

GEOLOGY AND MINERAL RESOURCES

- Focus exploration and resource work on skarn type material so as to maintain the blend of mill feed moving forward.

- Consistently assay for fluorine and include results in the Mineral Resource estimate for mine planning purposes. Consider re-assaying previous drill core in critical areas to generate better fluorine estimates.

- Investigate the use of implicit or traditional wireframe modeling of grade distributions within the larger domain wireframes.

- Perform a study to determine sub-domaining thresholds more relevant to the Mineral Resource and Reserve cut-off grades.

- Continue to consistently produce long and short term block models and comparisons should be reported accordingly.

- Prorate the mill grade and tonnes back to headings and stopes based on proportions determined during grade control sampling and implement a reconciliation system comparing mill results with short-term and long-term models.

- Reevaluate the classification for each zone in conjunction with an empirically driven drill hole spacing study and update the models generated prior to 2014 to include a final classification processing step.

MINING AND MINERAL RESERVES

- Review production and cost performance as the blend of ore types changes, and incorporate results into updated cut-off grade estimates.

- Incorporate blending for fluorine feed grade in short-term and long-term mine planning.

- Undertake a review of alternatives for Carlés, including targeting narrow high-grade areas with more suitable mining methods and further exploration targeting certain zones.

- Investigate possibilities of installing a backfill raise system in order to reduce the demands of the truck fleet.

MINERAL PROCESSING AND METALLURGICAL TESTING

- Additional metallurgical testwork should be carried out to consider the impact of the following:
    - Changes in the zones to be mined as a result of updates to the Mineral Resources and Mineral Reserves and LOMP and the elimination of Carlés skarn ore from production.
    - Potential changes in the concentration of deleterious elements, such as fluorine, in the subsequent ore blend, which could impact the grade of the final concentrate.
- Metallurgical testwork should include (but not be limited to) the following scope items:
    - Mineralogical characterization and metal deportment analysis on a broad range of ore samples representative of the areas to be mined and on intermediate products from the extraction process.
- Review the deportment of fluorine through the process, and investigate methods of reducing fluorine recovery to concentrate.

27 REFERENCES

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Martin-Izard, A., Cepedal, A.,Rodríguez-Pevida, L., Spiering, E.D., Gonzalez, S. and Maldonado, C., 1997: “The El Valle deposit: An example of porphyry-related copper gold skarn mineralization overprinted by Late Epithermal events, Cantabrian Mountains, Spain”, in: “Mineral Deposits”, Papuned (Ed). Balkema, Rotterdam, pp. 659-662.

Noble, A.C., Wheeler, A., Williams, W.C, 2012, Technical Report for the El Valle-Boinás/Carlés Gold Deposits: Updated Reserve Estimate and Mine Plan, prepared for Orvana Minerals Corp. (March 8, 2012).

Pakalnis & Associates, 2010, Report on Site Visit to El Valle-Boinás/Carlés Project Orvana ORVS-01/10, September 2010.

28 DATE AND SIGNATURE PAGE

This report titled Technical Report on the El Valle Boinás – Carlés Mine, Asturias, Spain and dated September 26, 2014 was prepared and signed by the following authors:

(Signed & Sealed) ***"Jason J. Cox"***

Dated at Toronto, ON
September 26, 2014

Jason J. Cox, P.Eng.
Principal Mining Engineer

(Signed & Sealed) ***"Jeff Sepp"***

Dated at Toronto, ON
September 26, 2014

Jeff Sepp, P.Eng.
Principal Mining Engineer

(Signed & Sealed) ***"Sean D. Horan"***

Dated at Toronto, ON
September 26, 2014

Sean D. Horan, P.Geo.
Senior Geologist

(Signed & Sealed) ***"Brenna Scholey"***

Dated at Toronto, ON
September 26, 2014

Brenna Scholey
Senior Metallurgist

29 CERTIFICATE OF QUALIFIED PERSON

I, Jason J. Cox, P.Eng., as an author of this report entitled "Technical Report on the El Valle Boinás – Carlés Operation, Asturias, Spain", prepared for Orvana Minerals Corp., and dated September 26, 2014, do hereby certify that:

1. I am a Principal Mining Engineer and Director, Mining Engineering, with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave Toronto, ON, M5J 2H7.

2. I am a graduate of the Queen's University, Kingston, Ontario, Canada, in 1996 with a Bachelor of Science degree in Mining Engineering.

3. I am registered as a Professional Engineer in the Province of Ontario (Reg. #90487158). I have worked as a Mining Engineer for a total of 18 years since my graduation. My relevant experience for the purpose of the Technical Report is:
   - Review and report as a consultant on many mining operations and projects around the world for due diligence and regulatory requirements
   - Feasibility Study project work on several mining projects, including five North American mines
   - Operational experience as Planning Engineer and Senior Mine Engineer at three North American mines
   - Contract Co-ordinator for underground construction at an American mine

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

5. I visited the El Valle Boinás – Carlés Operation from June 9 to 13, 2014.

6. I am responsible for the overall preparation of the Technical Report and for Sections 19 and 21 through 24, and I share responsibility with my co-authors for Sections 1, 2, 3, 25, 26, 27, 28, and 29 of the Technical Report.

7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.

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

9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 26th day of September 2014.

(Signed & Sealed) ***"Jason J. Cox"***

Jason J. Cox, P.Eng.

JEFF SEPP

I, Jeff Sepp, P.Eng., as an author of this report entitled "Technical Report on the El Valle Boinás – Carlés Operation, Asturias, Spain", prepared for Orvana Minerals Corp., and dated September 26, 2014 do hereby certify that:

1. I am Senior Mining Engineer with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave Toronto, ON, M5J 2H7.

2. I am a graduate of Laurentian University, Sudbury, Ontario in 1997 with a B.Eng. degree in mining.

3. I am registered as a Professional Engineer in the Province of Ontario (Reg.# 100139899). I have worked as a mining engineer for a total of 16 years since my graduation. My relevant experience for the purpose of the Technical Report is:
   - Mine planning, open pit and underground mine design and scheduling, ventilation design and implementation for numerous projects in Canada, USA, Turkey, Saudi Arabia, United Kingdom, Mali, Tanzania, Ghana, and Sweden.
   - Senior mining consultant at MineRP Canada Limited.
   - Mining engineer/ventilation specialist for a number of Canadian mining companies, including CVRD Inco (now Vale) and Cameco Corp.

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

5. I visited the El Valle Boinás – Carlés Operation from June 9 to June 13, 2014.

6. I am responsible for Sections 15, 16, and 18 and parts of Sections 1, 2, 3, 25, 26, 27, 28, and 29 of the Technical Report.

7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.

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

9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, Sections 15, 16, and 18 and parts of Sections 1, 2, 3, 25, 26, 27, 28, and 29 for which I am responsible in the Technical Report contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 26th day of September 2014.

(Signed & Sealed) ***"Jeff Sepp"***

Jeff Sepp, P.Eng.

SEAN HORAN

I, Sean Horan, P.Geo., as an author of this report entitled “Technical Report on the El Valle Boinás – Carlés Operation, Asturias, Spain”, prepared for Orvana Minerals Corp., and dated September 26, 2014 do hereby certify that:

1. I am Senior Geologist with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave Toronto, ON, M5J 2H7.

2. I am a graduate of Rhodes University, South Africa, in 2003 with a B.Sc. (Hons.) degree in Environmental Studies, and in 2004 with a B.Sc. (Hons.) degree in Geology. I also have a post-graduate certificate in Geostatistics from the University of Alberta, Canada.

3. I am registered as a Professional Geologist in the Province of Ontario (Reg.#2090). I have worked as a geologist for a total of 10 years since my graduation. My relevant experience for the purpose of the Technical Report is:
   - Geological consulting to the mining and exploration industry in Canada and worldwide, including resource estimation and reporting, due diligence, geostatistical studies, QA/QC, and database management.
   - Geologist responsible for all geological aspects of underground mine development, underground exploration, resource definition drilling planning, and resource estimation at a gold mine in Ontario, Canada.
   - Geologist with an alluvial diamond mining and prospecting company in Angola.
   - Experienced user of AutoCAD, Datamine Studio 3. SQL Database Administration, Visual Basic, Javascript (Datamine Studio 3), Century Systems (Fusion SQL drill hole database tools), Snowden Supervisor, and GSLIB.

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

5. I visited the El Valle Boinás – Carlés Operation from June 1 to June 13, 2014 .

6. I am responsible for Sections 4 to 12 and 14 and portions of Sections 1, 2, 3, 25, 26, 27, 28, and 29 of the Technical Report.

7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.

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

9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, Sections 4 to 12 and 14, and parts of Sections 1, 2, 3, 25, 26, 27, 28, and 29 for which I am responsible in the Technical Report contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 26th day of September 2014.

(Signed & Sealed) ***"Sean Horan"***

Sean Horan, P.Geo.

BRENNA SCHOLEY

I, Brenna Scholey, P.Eng., as an author of this report entitled "Technical Report on the El Valle Boinás – Carlés Operation, Asturias, Spain", prepared for Orvana Minerals Corp., and dated September 26, 2014 do hereby certify that:

1. I am Senior Metallurgist with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave., Toronto, ON, M5J 2H7.

2. I am a graduate of The University of British Columbia in 1988 with a B.A.Sc. degree in Metals and Materials Engineering.

3. I am registered as a Professional Engineer in the Province of Ontario (Reg. #90503137) and British Columbia (Reg. #122080). I have worked as a metallurgist for a total of 25 years since my graduation. My relevant experience for the purpose of the Technical Report is:
   - Reviews and reports as a metallurgical consultant on a number of mining operations and projects for due diligence and regulatory requirements.
   - Senior Metallurgist/Project Manager on numerous base metals and precious metals studies for an international mining company.
   - Management and operational experience at several Canadian and U.S. milling, smelting and refining operations treating various metals, including copper, nickel, and precious metals.

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

5. I did not visit the El Valle Boinás – Carlés Operation.

6. I am responsible for Sections 13, 17, and 20, and portions of Sections 1, 2, 3, 25, 26, 27, 28, and 29 of the Technical Report.

7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.

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

9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, Sections 13, 17, and 20, and portions of Sections 1, 2, 3, 25, 26, 27, 28, and 29 for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 26th day of September 2014.

(Signed & Sealed) ***"Brenna Scholey"***

Brenna Scholey, P.Eng.