Amended NI 43-101 Technical Report and Preliminary Economic Assessment Los Filos Gold Mine Guerrero State, Mexico

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TITLE PAGE

Project Name: Los Filos Gold Mine

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Location: Guerrero State, Mexico

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1.0 SUMMARY

Leagold Mining Corporation (Leagold) requested Stantec Consulting International LLC (Stantec) to prepare an Amended NI 43-101 Technical Report and Preliminary Economic Assessment (the Report) for the Los Filos Gold Operation (the Mine), located in the Los Filos district of Guerrero State, Mexico. The Report presents a description of the Mine operations, including Mineral Resources, Mineral Reserves, and financial evaluation of the current mine. The Report also presents a Preliminary Economic Assessment (PEA) based on Mineral Resources of the Bermejal Underground deposit.

The purpose of the Report is for Leagold to support public disclosure and filing requirements with the Canadian Securities Regulators in relation to the acquisition from Goldcorp Inc. (Goldcorp) of Desarrollos Mineros San Luis S.A. de C.V. (DMSL), a wholly owned subsidiary and 100% owner of the concessions that comprise the Mine property. This Report was prepared in accordance with NI 43-101 and accompanying regulations. The following individuals serve as the Qualified Persons for this Report.

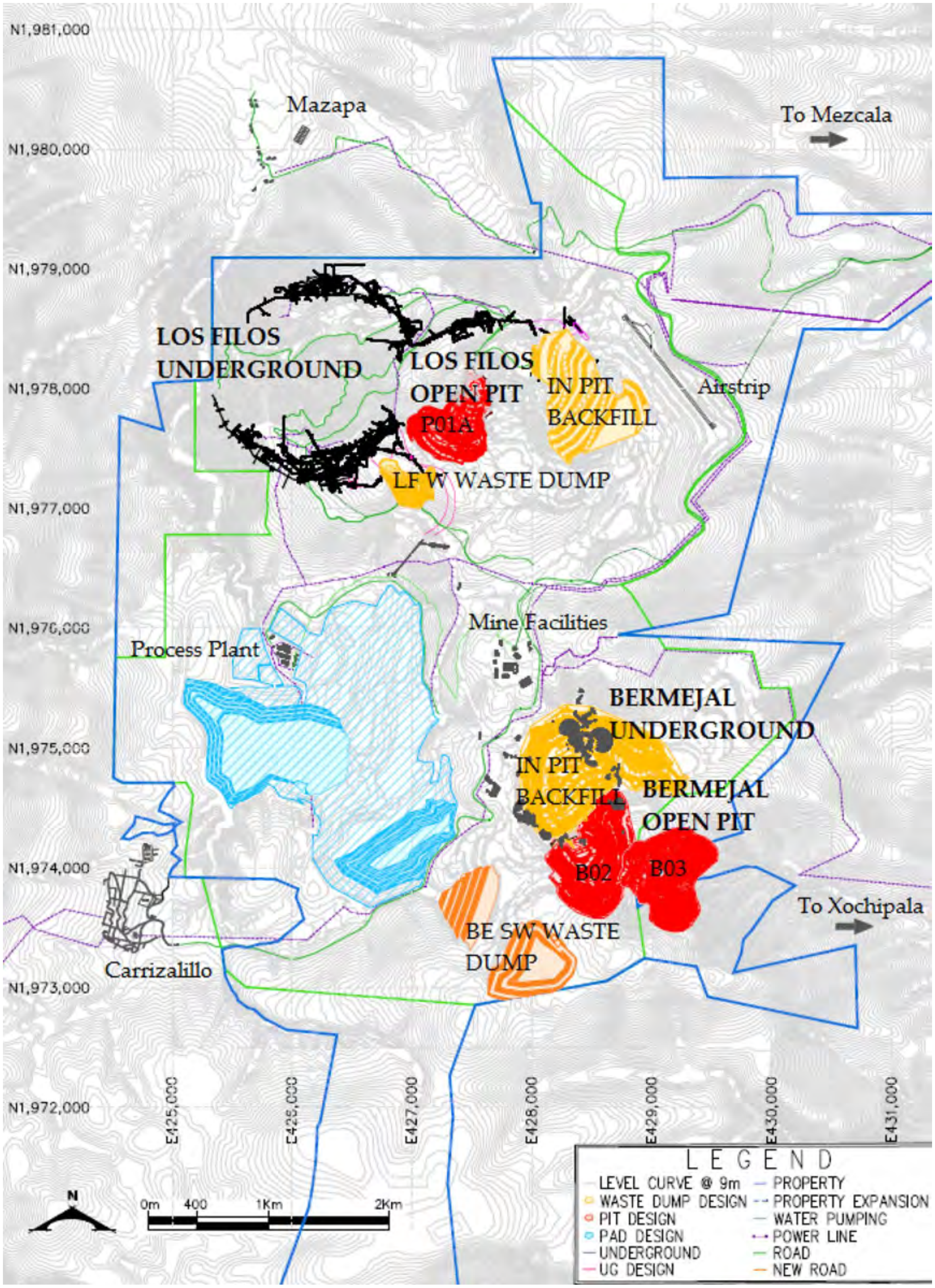
- William A. Glover, P.Eng., Senior Mining Consultant to Stantec
- Allan L. Schappert, CPG, Stantec Employee
- Dawn H. Garcia, PG, CPG, Independent Consultant to Stantec
- Alfred S. Hayden, P.Eng., EHA Engineering, Independent Consultant to Stantec

1.1 Project Setting, Location, and Access

The Los Filos mining operations are located within the Guerrero Gold Belt within Guerrero State.

From Mexico City, Mexico, the Mine property can be accessed via Highway 95, a major paved highway, by turning off at the town of Mezcala onto a paved road that leads to the Mine site. Driving time to site from Mexico City is approximately 4 hours. The Mine is also served by a network of local roads (Figure 1-1).

Figure 1-1: Los Filos Gold Mine Layout



A private airstrip, located on the Mine property, provides service to the mine site. Flights originate from Toluca Airport or Cuernavaca Airport and are approximately 30 minutes flying time to the Mine.

The Mine property is located in a tropical arid zone. Average annual temperature ranges are approximately 18 °C to 22 °C. Average annual precipitation is 900 mm. The predominant wind direction throughout most of the year is north-northwest.

The Mine property area is characterized by large limestone mountains divided by wide valleys. The slopes of the hills vary from very flat (5% to 10%) to steep slopes (50%). Valley slopes are covered with hardwood forest, while the valley bottoms are generally agricultural. The maximum elevation in the Mine property is the summit of El Bermejal Hill, at 1,820 masl. The minimum elevation is the valley, where the gold recovery plant is located, at 1,360 masl.

The Mine has power, water, and communications infrastructure in place. Power is supplied under a self-supply agreement with a subsidiary of InterGen from a combined cycle, natural gas-fired power station located in San Luis de Paz, Guanajuato State. A power transportation agreement with the government utility service, Federal Electricity Commission (Comisión Federal de Electricidad [CFE]), provides backup supply and transfers power from InterGen's power plant to the Mine's power substation. Process and potable water for the Mine is sourced from a large well adjacent to the Rio Balsas located 1.5 km west of Mezcala. Site communications include satellite service, using voice-over internet protocols (VoIP) for telephones) and internet protocols (for regular computer business). The open pit and underground operations use two-way radio communications, and the open pit uses a GPS-based automated truck dispatch system.

The Mine property is located near several centers of supply for materials and workers. The closest communities to the Mine are Carrizalillo, Mezcala, Mazapa, Xochipala, Zumpango, Chilpancingo, and Iguala. Currently, 1,429 persons are employed on site as unionized workers, non-unionized employees, and independent contractors. Operations are conducted year-round.

1.2 Mineral Tenure and Surface Rights

The Mine property consists of 30 contiguous exploitation concessions (totaling 10,433 ha) located within the municipality of Eduardo Neri, Guerrero, Mexico (see Table 1-1). Tenure is held in the name of DMSL. DMSL holds an additional 9 exploration concessions within Guerrero State. All concessions have a term of 50 years, with expiration dates ranging from 2032 to 2060.

Per Mexican requirements for grant of tenure, the concessions comprising the Mine property were surveyed on the ground by a licensed surveyor. All appropriate concession payments have been made to the relevant authorities, and the licenses are in good standing.

DMSL has secured a total of 4,246 ha of surface rights and holds all surface rights required for mine operations, including open pits, underground portals, leach pads, process and ancillary facilities, roads, services, and a buffer zone securing areas for future growth and potential exploration targets. Surface rights were secured by acquisition of private and public land or by entering temporary occupation agreements with surrounding communities.

Table 1-1: DMSL Mining Concessions

No.	Site (*Lote*)	File ID	Title No.	Term		Surface (ha)	*Agrupamiento*	Municipality
				Start Date	End Date			
1	Nukay	033/00672	171533	20/10/1982	19/10/2032	10.0000	Nukay	Eduardo Neri
2	Fracc. 2 de Ampl. a El Filo	033/02101	171534	20/10/1982	19/10/2032	76.0000	F-2(*)	Eduardo Neri
3	Unificación Concepción Carmen	321.42/1086	172677	28/06/1984	27/06/2034	223.2924	José Salvador	Eduardo Neri
4	Enrique	033/00615	187015	29/05/1990	28/05/2040	63.0000	José Salvador	Eduardo Neri
5	Mio Cid	5/2.4/195	204067	13/10/1989	12/10/2039	7.0000	F-2(*)	Eduardo Neri
6	Don Mauricio	5/2.4/195	204068	13/10/1989	12/10/2039	119.5117	Nukay	Eduardo Neri
7	Don Rodrigo	5/2.4/195	204069	13/10/1989	12/10/2039	7.0000	F-2(*)	Eduardo Neri
8	Ana Paula	5/2.4/190	204137	13/10/1989	12/10/2039	440.3905	Nukay	Eduardo Neri
9	La Eloisa	5/1.3/288	208816	15/12/1998	14/12/2048	345.4090	José Salvador	Eduardo Neri
10	Cedros	5/2.4/00426	213075	13/10/1989	12/10/2039	12.0059	F-2(*)	Eduardo Neri
11	Doña Marta	5/2.4/00426	213076	13/10/1989	12/10/2039	7.5000	Nukay	Eduardo Neri
12	Don Norman	5/2.4/00427	213077	13/10/1989	12/10/2039	290.2459	F-2(*)	Eduardo Neri
13	Independencia	5/2.4/00427	213078	13/10/1989	12/10/2039	4.0000	Nukay	Eduardo Neri
14	Don Fausto	5/2.4/00427	213079	13/10/1989	12/10/2039	2.0000	Nukay	Eduardo Neri
15	San Luis Dos	5/1.3/00597	216106	09/04/2002	08/04/2052	17.4382	José Salvador	Eduardo Neri
16	Xochipala Fracc. I	5/1.3/00593	216166	12/04/2002	11/04/2052	1.1098	José Salvador	Eduardo Neri
17	Xochipala Fracc. II	5/1.3/00594	216167	12/04/2002	11/04/2052	4.3749	José Salvador	Eduardo Neri
18	San Luis Uno	5/1.3/00596	216168	12/04/2002	11/04/2052	17.0356	José Salvador	Eduardo Neri
19	Xochipala	5/1.3/00592	217850	23/08/2002	22/08/2052	4,013.5851	José Salvador	Eduardo Neri
20	San Pablo	033/09417	219804	11/04/2003	10/04/2053	55.1771	José Salvador	Eduardo Neri
21	San Luis	5/1.3/00595	220241	25/06/2003	24/06/2053	24.9904	José Salvador	Eduardo Neri
22	Delfina	9/6/00121	236761	26/08/1943	26/08/2060	25.0000	José Salvador	Eduardo Neri
23	Marta	9/6/00122	236762	17/08/1944	26/08/2060	25.0000	José Salvador	Eduardo Neri
24	José Salvador	9/6/00119	237117	14/11/1941	28/10/2060	25.0000	José Salvador	Eduardo Neri
25	José Luis	9/6/00120	237118	27/02/1942	28/10/2060	75.0000	José Salvador	Eduardo Neri
26	El Grande	9/6/00123	237119	04/08/1958	28/10/2060	63.0000	F-2(*)	Eduardo Neri
27	Agüita	9/6/00124	237120	04/08/1958	28/10/2060	14.0000	Nukay	Eduardo Neri
28	East Block	5/3/00167	242454	14/12/2004	13/12/2054	1,799.8882	José Salvador	Eduardo Neri y C

Table 1-1: DMSL Mining Concessions

No.	Site (*Lote*)	File ID	Title No.	Term		Surface (ha)	*Agrupamiento*	Municipality
				Start Date	End Date			
29	West Block	5/3/00167	242455	14/12/2004	13/12/2054	2,196.9560	José Salvador	Eduardo Neri y C
30	Mezcala	5/1.3/00649	217505	16/07/2002	15/07/2052	468.1320	F-2(*)	Eduardo Neri
31	Agau	5/1.3/00537	218086	03/10/2002	02/10/2052	880.3954	F-2(*)	Chilpancingo
32	El Caracol	5/1/00673	218944	28/01/2003	27/01/2053	94.0000	F-2(*)	Heliodoro Castillo
33	Agau 2	5/1/00671	219349	27/02/2003	26/02/2053	9.0000	F-2(*)	Chilpancingo
34	Santa Ana	5/1/00672	219350	27/02/2003	26/02/2053	10.0000	F-2(*)	Eduardo Neri
35	Cacho de Oro	5/1/00735	221096	19/11/2003	18/11/2053	424.9971	F-2(*)	Leonardo Bravo
36	Coacoyula	33/9896	234177	05/06/2009	04/06/2059	6,816.9326	F-2(*)	Iguala
37	Santa Ana	033/9871	238964	11/11/2011	10/11/2061	10,510.6699	F-2(*)	Mochitlán, Chilp.
38	Santa Ana Fracc. Uno	E-33/9871	N/A(**)	Application Date: 08/11/2007		2,373.5442	N/A	Mochitlán, Chilp.
39	Teloloapan	E-33/9903	N/A(**)	Application Date: 03/04/2008		117,355.7817	N/A	Teloloapan, Cuetzala
Total Surface						148,908.3636		

(*) F-2 = Fracción 2 de Ampliación a El Filo.
(**) Application pending to be resolved.

Source: Galicia Abogados Project Latitude | Mining Claims memo, 2017

There are no significant factors or risks that might affect access or title, or the right or ability to perform work on the property. The Mine is not subject to any known significant permitting and/or environmental liabilities that cannot be remediated or otherwise prevent ongoing operations.

1.3 Taxation and Royalties

Current Mexican legislation requires a 30% federal corporate income tax rate, a 0.5% government royalty payment on gold and silver sales, and a 7.5% mining tax on earnings before interest, taxes, depreciation, and amortization.

1.4 Environment, Permitting, Compliance Activities, and Social License

The Mine complies with Mexican Federal, State, and Municipal environmental laws and regulations. The Mine holds all environmental and operating permits required for operations.

The Mine is working with the appropriate regulatory agencies to be in good standing on any compliance issues. It is believed that all compliance issues can be resolved without significant risk to the ongoing operations.

The Mine has submitted studies for an environmental permit to construct and operate proposed development decline ramps for the underground bulk sampling and exploration of the Bermejal Underground deposit. The permit was approved by the government on 13 January 2017, conditional to updating the environmental guarantee cost estimate.

The Mine closure plan is updated every three years at a minimum. In general, the closure plan activities include decommissioning, demolition, rehabilitation, and post-closure monitoring of the Mine. Current closure costs are estimated at US$50.7 million with no contingency included.

Community engagement, assistance, and development programs are in place and are carried out on an ongoing basis including a formal grievance management process. Implementation of sustainable development initiatives for the communities of Carrizalillo, Mezcala, and Mazapa commenced in 2007 and are ongoing.

1.5 History

A total of 222 Mt of ore at 0.7 g/t Au, containing 5 Moz Au, was mined by Los Filos from 2005 to 31 December 2016. Table 1-2 presents a brief history of the Mine.

Table 1-2: Los Filos Gold Mine History

Year	History
1938	Minera Guadalupe S.A. de C.V. (Minera Guadalupe) began underground mining of the Nukay mineral deposit.
1940	Underground mining ceased following the commencement of World War II.
1946	Underground mining commenced after being interrupted at the start of World War II.
1961	Underground operations ceased due to declining head grades and low gold price.
1983	Minera Nukay S.A. de C.V. restarted underground mining and construction of a cyanide leach and Merrill Crowe treatment plant.
1993	Minera Nuteck S.A. de C.V. (Minera Nuteck) (formed by Teck Corporation) began regional exploration.
1995	Los Filos mineral deposit was discovered.

Table 1-2: Los Filos Gold Mine History

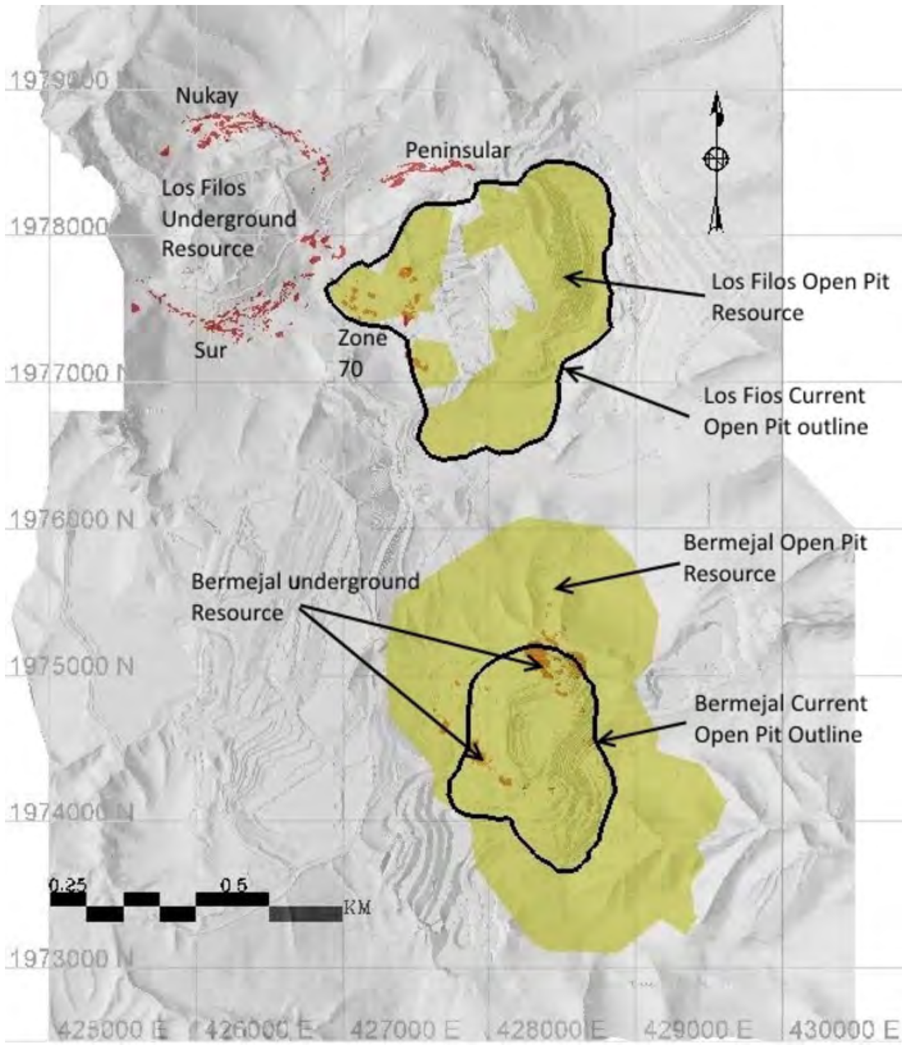
Year	History
2001	Miranda Mining formed when Miranda Mining & Development amalgamated with Malaspina Capital.
2003	Nukay Mining Operations was acquired by Wheaton River Minerals predecessor company Luismin S.A de C.V. Miranda Mining was acquired by Wheaton River Minerals Ltd., providing a 30% interest in Los Filos. The remaining 70% was purchased from Teck Cominco. A preliminary Los Filos concept study was initiated.
2005	Wheaton River Minerals merged with Goldcorp Inc. The Los Filos Construction Project was approved by the Mexican Federal Government. Goldcorp Inc. subsequently acquired the Bermejal deposit from the 56%/44% joint venture partners Industrias Peñoles S.A. de C.V. (Peñoles) and Newmont Mining Corporation (Newmont).
2006	An operating permit for the extension of the Bermejal Open Pit was obtained from the Mexican Federal Government.
2006–2007	The Adsorption-Desorption-Recovery (ADR) Plant, Primary and Secondary Crushing Plant, Refinery, Warehouse, Truck Shop, and Offices were built.
2007	Heap Leaching production was initiated.
2008	Heap Leaching commercial production commenced.
2009	Nukay (original plant) 400 t/d cyanide leach and Merrill Crowe treatment plant closed.
2010	Ore from underground is now blended, crushed, and heap leached at Los Filos. This began in April 2010. A 4 km road was also constructed to transport the ore by a community group contractor from Los Filos underground mines to the crusher.
2011–2012	Four dormitories, each with a 48-person capacity, were built for a camp near Mezcala.
2013	Exploration drilling below Bermejal Open Pit encounters high-grade oxide mineralization that is now referred to as the Bermejal Underground deposit.
2016	Bermejal Open Pit is idled in order to concentrate surface mining in Los Filos Open Pit. Bermejal Open Pit is slated for reopening once Los Filos is complete. An internal study is completed on the Bermejal Underground deposit to examine the potential for development as a new underground mine to augment existing production. Los Filos Mine enters a sales process.

1.6 Geological Setting, Mineralization, and Deposit Types

The Mine property lies near the center of a large, circular-shaped feature known as the Morelos-Guerrero Basin. The roughly circular (150 km × 200 km) basin is occupied by a thick sequence of Mesozoic platform carbonate rocks successively comprising the Morelos, Cuautla, and Mezcala Formations.

The mineral deposits are considered to be intrusion-related gold-silver skarn deposits. Tertiary granodiorite stocks were emplaced into the Cretaceous carbonate rocks of the Morelos Formation, forming metasomatic halos at the intrusive contacts. Mineral deposits are located at Los Filos intrusive (Los Filos Open Pit, Nukay, Peninsular, Zone 70, and Sur zones) and at the Bermejal intrusive (Bermejal Open Pit, Bermejal Underground, and Guadalupe zones) (Figure 1-2).

Figure 1-2: Location of Los Filos Mining Areas and Mineral Deposits



Yellow areas are the surface projection of US$1,400/oz pit shells based on mineral resources.
Red areas are surface projections of underground mineral resources.

Mineralization is hosted by or spatially associated with marble and skarn alteration formed during contact metamorphism of the carbonates. Massive magnetite, hematite, goethite and jasperoidal silica, with minor associated pyrite, pyrrhotite, chalcopyrite, and native gold typically occur in the veins and metasomatic replacement bodies that developed at the contacts between the carbonates and intrusive rocks.

A key feature of the mineralizing event is the oxidized nature of primary mineralization and limited sulfide content in the upper portions of the deposits.

Alteration associated with mineralization is extremely varied and ranges from high-temperature metasomatic to lower-temperature epithermal alteration.

1.7 Exploration

Much of the early exploration and mining activity in the area was focused on the Nukay Zone prior to the discovery of the Los Filos deposit in 1995. The Bermejal Open Pit deposit was identified in 1989.

Exploration activities completed from 1984 to the date of this report included geological mapping, geochemical sampling, geophysical surveys, reverse circulation (RC) and core drilling, underground drill target development and sampling, metallurgical studies, geotechnical and hydrological drilling, development studies, and permitting activities.

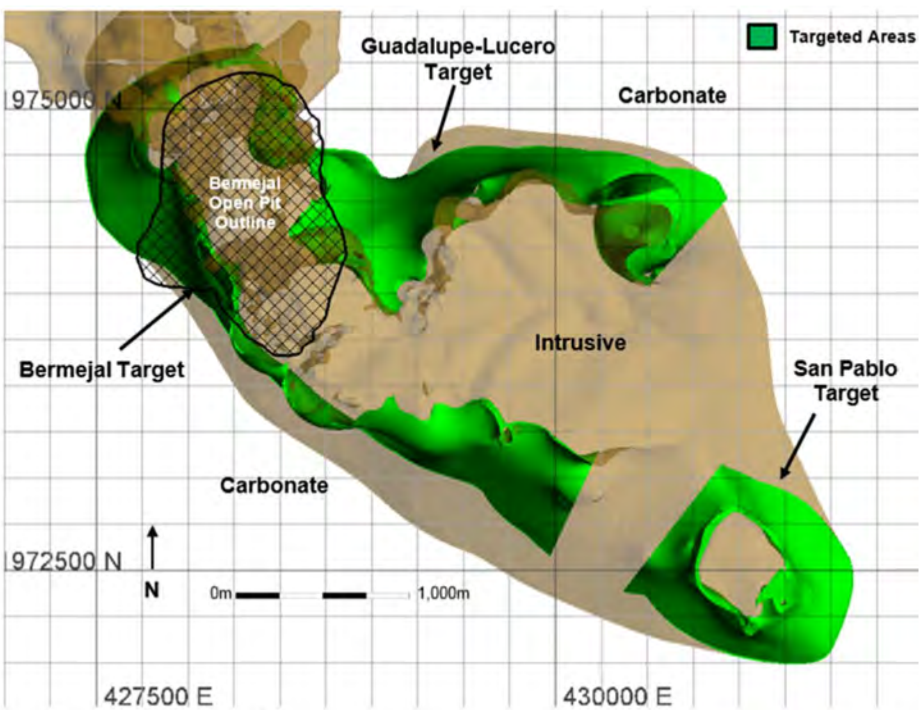
Present exploration activities are concentrated on infill drilling of the Bermejal Underground resource and the extensions of known mineral resources in the Los Filos Underground deposits.

Open Pit Exploration Targets

Potential remains in the immediate vicinity of the Bermejal Open Pit and San Pablo prospect to identify additional mineralization that may support resource estimation. The corridor from the Bermejal south area to the Guadalupe deposit is particularly prospective. Additionally, the San Pablo area southeast of Bermejal contains high potential based on favorable lithology and alteration. Figure 1-3 displays the Bermejal and San Pablo targeted areas. The basis of the targets is as follows.

- Along strike, down dip of known deposits.
- Along intrusive contacts in immediate mined areas.
- Proximity to areas of past production at the Guadalupe Mine.

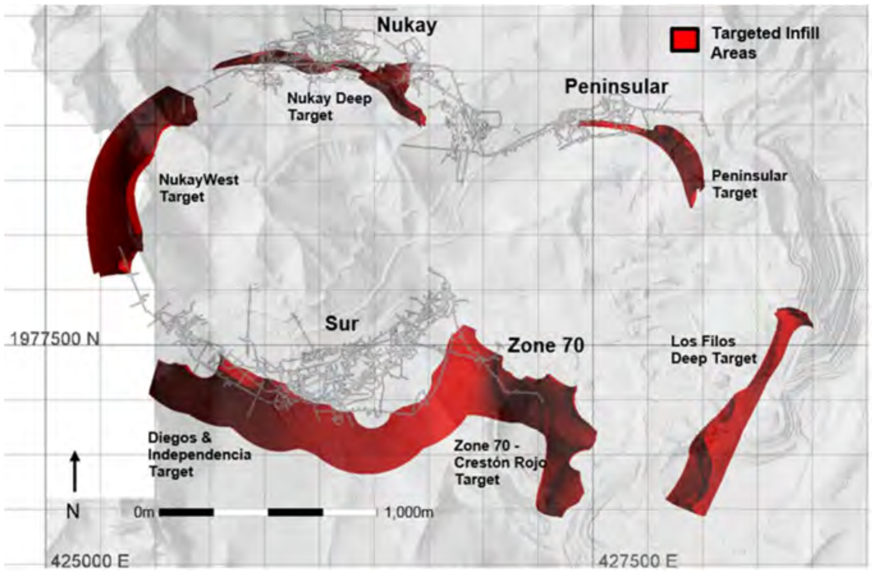
Figure 1-3: Bermejal, Guadalupe, and San Pablo Exploration Potential



Los Filos Underground Expansion

Infill drilling at Los Filos Underground is targeted to further develop resources that are open along the strike of the known mineralized zones to the east and west of the existing infrastructure. The targeted areas are contained in the endoskarn alteration along the granodiorite intrusive and carbonate contact. The underground exploration targets are shown in Figure 1-4.

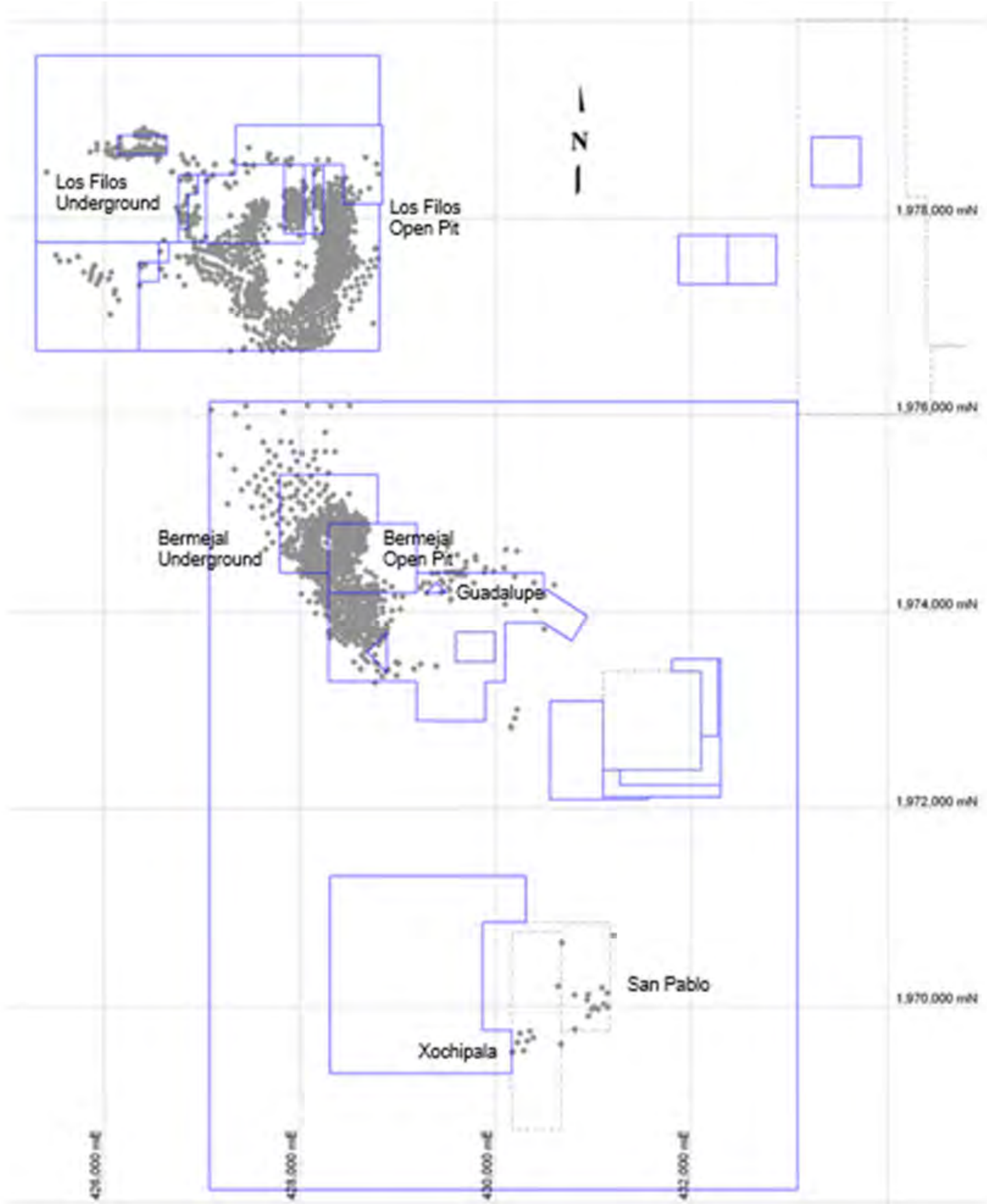
Figure 1-4: Los Filos Underground Expansion Potential



1.8 Drilling

Drill programs have been completed primarily by contract drilling crews supervised by the Mine's exploration department staff. The current drill database contains 3,442 drill holes (740,162 m), of which 2,263 (515,080 m) are core holes, and the remaining 1,179 holes (225,082 m) are RC holes. Figure 1-5 details the drill hole locations for the Mine property.

Figure 1-5: Los Filos Drill Hole Location Map



Orientations of the veins and bodies of skarn mineralization are variable within the Mine property area. Generally, drill orientations were appropriate for the style and type of mineralization being drilled.

The open pit deposits that have Mineral Resources estimated have drill spacing of approximately 25 m × 25 m in areas with close-spaced drilling and approximately 35 m × 35 m in the areas that are less drilled. Drill spacing becomes sparse outside the conceptual pit outlines used to constrain Mineral Resources. Within the area of underground operations and Mineral Reserves, the drill spacing is approximately 25 m × 25 m, while outside operational areas, the spacing increases to approximately 25 m × 50 m.

The sampling has been done over a sufficiently large area to enable deposit modeling to be completed. The data collected adequately reflects deposit dimensions, true widths of mineralization, and the style of the deposits. The samples are representative of the mineralization and respect the geology of the deposits.

Entry of information into databases used a variety of techniques and procedures to check the integrity of the data entered. The databases are acceptable to support the Mineral Resource and Mineral Reserve estimates.

1.9 Sample Preparation, Analyses, and Data Verification

Core samples received from the drill rigs were always attended or locked in the on-site sample dispatch facility.

Sample preparation and analytical laboratories used during the exploration and delineation drilling programs included Bondar Clegg, Skyline, and ALS Chemex. Bondar Clegg was acquired in the early 2000s by ALS Chemex. ALS Chemex holds ISO 17025 accreditations for selected analytical methods.

Since 2003, gold assays have been completed using a 1 assay-ton (29.166 g) charge, with atomic absorption finish. Assays exceeding 10 g/t Au were re-analyzed using fire assay with gravimetric finish. Copper and silver assays were performed using a 1 g charge aqua regia digestion and atomic absorption analysis. Silver values exceeding 100 g/t Ag were re-analyzed using a 1 assay-ton fire assay with gravimetric finish.

Quality assurance and quality control (QA/QC) measures were implemented in 2000. QA/QC procedures are documented and include submission of standard reference materials and blanks as well as re-assay of a portion of the samples. Typical QA/QC sample frequency is insertion of a blank sample after 20 samples, a repeat assay after another 20, and a standard sample after the next 20. This procedure was repeated as sampling continued.

Approximately 2.5% of the splits from the exploration core samples were re-assayed to confirm initial results and, if the check assays were at variance with the original assay, a second split sample was assayed.

In 1998, 2000, and 2001, a number of check assay programs were conducted on legacy (historic) drill samples. In general, the check assay programs found no particular bias, and a good correlation was noted between the original assays and the check assays.

Since 2008 through 2014, Independent Mining Consultants (IMC) reviewed the procedures used by the Mine's geology department to handle, log, and prepare samples for shipment and the QA/QC programs in place (Los Filos/4P Block Model Update, 2015).

In 2016, Stantec reviewed the QA/QC data available for the Mine. The review did not identify any significant issues that would preclude the use of data in Mineral Resource and Mineral Reserve estimation. In Stantec's opinion, the current procedures are acceptable and the data is suitable for use in estimation of Mineral Resources and Mineral Reserves.

1.10 Mineral Processing and Metallurgical Testing

Metallurgical testing on the Los Filos mineralization has been extensive over the last two decades. A principal focus of the testwork has been determining optimum gold extraction parameters.

Early testing focused on bottle roll testing of finely ground ore samples. These tests were conducted at three different laboratories: Lakefield Research in Canada, and McLelland Laboratories Inc. (MLI) and Kappes, Cassiday & Associates (KCA), both located in Nevada, USA. In early testing, finely ground samples were subjected to cyanide leach bottle rolls, which simulated conventional crush-grind-agitated leach technology. Later, the testing focus shifted to column leach testing, which simulated heap leach technology. This technology is less costly per tonne to process and is suitable for high tonnages of low-grade gold ores. Column leach results on coarse (-25 mm) samples were determined to be comparable to bottle roll tests on the same coarse material. This successful comparison permits rapid determination of extraction percentages without waiting for the results of column tests, which take approximately four months to complete.

The results of extensive bottle roll and column tests conducted by KCA were used to provide metallurgical model inputs (expected extractions) for each ore zone. The metallurgical test results were discounted by 3% (absolute) to reflect field performance.

Gold recoveries to be expected from run-of-mine (ROM) ores placed on leaching pads were determined by extrapolating extractions measured in laboratory tests performed with variations in ore particle size.

Silver extraction was determined in each column and bottle roll test; silver extraction results ranged from 3% to over 20%. A value of 5% silver recovery was used by the Mine.

Overall gold recovery was a combination of leach pad extraction and recovery in the Adsorption-Desorption-Recovery (ADR) Plant. ADR recovery typically exceeded 98%, and barren solution containing a very small concentration of gold was recharged with reagents and recycled to the leach pads. Therefore, overall gold recovery was effectively equal to gold extraction in the leach pads.

No significant concentrations of deleterious metals were identified in the Los Filos mineral resources. The ores also did not contain significant concentrations of preg-robbing components, such as organic carbon. Some sulfide-rich zones were identified and metallurgical tests on resources from these zones produced low extractions.

The metallurgical testwork data provided reliable gold extraction data as follows.

- Metallurgical tests were performed using adequate amounts of samples that were representative of each ore type.
- Metallurgical testwork was comprehensive and appropriate for selecting the optimal process technology.
- Recovery factors selected for the heap leaching at the Mine were based on reliable metallurgical tests. These recovery factors were confirmed by recent production data. Depending on ore type, average life-of-mine (LOM) gold recoveries for crushed ore are 71% and 52% for ROM ore.
- Heap leaching process conditions, including reagent additions, were appropriately determined to optimize field operation parameters.

1.11 Mineral Resource Estimates

Los Filos Mineral Resources have an Effective Date of 31 December 2016. Stantec feels the Mineral Resources stated are a reasonable representation for the Los Filos mine. Mineral Resources were estimated using a gold price of US$1,400/oz. Mineral Resources do not include dilution. Stantec cautions that Mineral Resources are not Mineral Reserves and do not demonstrate economic viability at current reserve commodity pricing.

Mineral Resource estimates for the Los Filos Open Pit and Bermejal Open Pit deposits as well as the Los Filos Underground and Bermejal Underground deposits were prepared by Los Filos personnel, depleted to year-end 2016 to account for mining, and were confirmed and replicated by Stantec.

Three-dimensional solid wireframes were created for lithologies and oxidation states by deposit. A grade-capping strategy was used for gold and silver to restrict the impact of outlier grades on the estimates. Density values were assigned within the models by domain, oxide code, and lithology.

Interpolation methods used inverse-distance weighting and were based on a number of passes using pre-set minimum and maximum numbers of composites.

Resource classification categories were based on the number of drill holes and composites used to estimate a model block.

The application of the Lerchs-Grossman (1965) pit shell method was used to determine mineral resources with reasonable expectations amenable to open pit mining methods. The mineralization within the pit shells that satisfy these requirements equates to a minimum cutoff grade of 0.198 g/t Au in the Los Filos Open Pit and 0.179 g/t Au in the Bermejal Open Pit. See Table 1-3.

Open pit Mineral Resources, summarized in Table 1-3, have an Effective Date of 31 December 2016. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

Table 1-3: Total Mineral Resources Amenable to Open Pit Mining Methods

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Measured	134,008	0.71	3,043	6.01	25,882
Indicated	283,731	0.79	7,226	9.31	84,942
Total Measured and Indicated	*417,739*	*0.76*	*10,269*	*8.25*	*110,824*
Inferred	158,206	0.63	3,200	9.76	49,622

Notes:

1. Los Filos Open Pit and Bermejal Open Pit deposits included.
2. Mineral Resources are inclusive of Mineral Reserves.
3. Mineral Resources do not include recovery or dilution factors.
4. Mineral Resources are reported to a gold price of US$1,400/oz.
5. Mineral Resources are defined with Lerchs-Grossman pit shells that use variable mining and recovery estimates, depending on the geometallurgical domain and whether mineralization is projected to report to crush-leach or is considered typical ROM for processing requirements.
6. Tonnages are rounded to the nearest 1 kt, grades are rounded to two decimal places for gold and silver; rounding, as required by reporting guidelines, may result in apparent summation differences between tonnes, grade, and contained metal content.
7. Tonnage and grade measurements are in metric units. Gold and silver contained ounces are reported as troy ounces.
8. Oxide and sulfide materials are included in the resource estimation.

The cutoff grade for the Los Filos Underground resource was determined to be 3.43 g/t Au and the cutoff grade for the Bermejal Underground resource was determined to be 2.52 g/t Au (Table 1-4).

Underground mineral resources are summarized in Table 1-4 and have an Effective Date of 31 December 2016. Mineral Resources that are not mineral reserves do not have demonstrated economic viability.

Table 1-4: Total Mineral Resources Amenable to Underground Mining Methods

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Measured	1,539	8.25	408	20.70	1,024
Indicated	3,251	7.68	802	20.67	2,161
Total Measured and Indicated	*4,790*	*7.86*	*1,210*	*20.68*	*3,185*
Inferred	4,447	5.56	795	11.41	1,631

Notes:
1. Los Filos Underground and Bermejal Underground deposits included.
2. Mineral Resources are inclusive of Mineral Reserves.
3. Mineral Resources do not include recovery or dilution factors.
4. Mineral Resources are reported to a gold price of US$1,400/oz.
5. Tonnages are rounded to the nearest 1 kt, grades are rounded to two decimal places for gold and silver; rounding, as required by reporting guidelines, may result in apparent summation differences between tonnes, grade, and contained metal content.
6. Tonnage and grade measurements are in metric units. Gold and silver contained ounces are reported as troy ounces.
7. Oxide and sulfide materials are included in the resource estimation.

Mineral Resources for the Mine were estimated using channel, core, and RC drill data with relevant modifying factors. Stantec considers the current resource models to be a reasonable representation of Los Filos Mine Mineral Resources.

A summary of the Mineral Resources by principal deposits and mining areas is provided in Table 1-5.

An additional 242 koz Au recoverable of historic Leach Pad Reserve of ROM and Crush material (as described in Section 1.13) has not been included in the above Mineral Resource totals presented in Table 1-5.

Table 1-5: Mineral Resources by Principal Deposits and Mining Areas

Area	Classification	Tonnes ('000)	Au Grade (g/t)	Au oz ('000)
Bermejal Open Pit	Measured	82,010	0.71	1,869
	Indicated	275,505	0.80	7,062
	Measured + Indicated	357,515	0.78	8,931
	Inferred	156,771	0.63	3,180
Bermejal Underground	Measured	0	—	—
	Indicated	171	5.01	28
	Measured + Indicated	171	5.01	28
	Inferred	3,510	5.03	568
Los Filos Open Pit	Measured	51,998	0.70	1,174
	Indicated	8,226	0.62	164
	Measured + Indicated	60,224	0.69	1,338
	Inferred	1,436	0.44	21

Table 1-5: Mineral Resources by Principal Deposits and Mining Areas

Area	Classification	Tonnes ('000)	Au Grade (g/t)	Au oz ('000)
Los Filos Underground	Measured	1,539	8.25	408
	Indicated	3,080	7.82	775
	Measured + Indicated	4,618	7.97	1,183
	Inferred	937	7.54	227
Total Los Filos Mine	Measured	135,547	0.79	3,451
	Indicated	286,982	0.87	8,028
	Measured + Indicated	422,529	0.85	11,479
	Inferred	162,653	0.76	3,995

Factors that may affect the geological models, conceptual pit shells, or the underground mining assumptions and, therefore, the Mineral Resource estimates include the following.

- Metal price assumptions.
- Changes in interpretations of lithological or geometallurgical domains.
- Changes in interpretations of structural boundaries.
- Pit slope angles and geotechnical assumptions supporting underground stope designs.
- Changes to the assumptions used to generate the cutoff grades for resource declaration.
- Changes to the search orientations, search ellipse ranges, and numbers of octants used for grade estimation.
- Review of the Measured classification criteria used at Los Filos.

1.12 Mineral Reserve Estimates

Mineral Reserves were estimated using a gold price of US$1,200/oz. Mineral Reserves were based on material classified as Measured and Indicated Mineral Resources. Mining, processing, and general and administrative (G&A) costs were estimated based on actual production costs and 2017 estimates.

Mineral Reserves primarily targeted oxide ores in the open pit and underground models. Lithologic codes included an identifier for blocks with predominantly sulfide mineralization. Sulfide blocks were removed from Mineral Reserves due to gold recovery issues during the leaching process. Sulfur content was also estimated in oxide blocks in the model. Any block containing more than 1% sulfur was removed from the Mineral Reserves.

The costs resulted in a cutoff grade of 0.241 g/t Au for the Los Filos Open Pit ROM ore types, a cutoff grade of 0.198 g/t Au for the Bermejal Open Pit ROM ore types, a cutoff grade of 0.373 g/t Au for the Los Filos Open Pit crush-leach ore types, and a cutoff grade of 0.364 g/t Au for the Bermejal Open Pit crush-leach ore types. Note that all cutoff grades are based on weighted averages. No allocation (0%) was made for dilution within the open pits Mineral Reserve estimate. Each block within the model is 8 m × 8 m × 9 m and waste is included in the whole block. The maximum bucket width for loading equipment (Caterpillar [CAT] 994) is 6.3 m, so it is assumed that each block can be mined alone without being further diluted.

Table 1-6 summarizes the parameters used in constraining the Mineral Reserves at Los Filos Open Pit. Table 1-7 summarizes the parameters used in constraining the Mineral Reserves at Bermejal Open Pit.

Table 1-6: Assumptions Used for Los Filos Open Pit Mineral Reserve Estimates

Item	Crush-Leach Ore					ROM Ore				
Rock Type	Ia	Ib	II	III	IV	Ia	Ib	II	III	IV
Gold Process Recovery	76.0%	70.0%	54.0%	61.0%	61.0%	64.0%	50.0%	45.0%	30.0%	48.0%
Mining Cost (US$/t)	1.983	1.983	1.983	1.983	1.983	0.794	0.794	0.794	0.794	0.794
Processing Cost (US$/t)	3.800	3.800	3.800	3.800	3.800	0.750	0.750	0.750	0.750	0.750
Sustaining Capital (US$/t)	0.857	0.857	0.857	0.857	0.857	0.857	0.857	0.857	0.857	0.857
G&A (US$/t)	1.978	1.978	1.978	1.978	1.978	1.978	1.978	1.978	1.978	1.978
Total Processing Cost (US$/t)	8.618	8.618	8.618	8.618	8.618	4.379	4.379	4.379	4.379	4.379
Price (US$/oz)	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Profit Margin (US$/oz)	50	50	50	50	50	50	50	50	50	50
CAPEX (US$/oz)	0	0	0	0	0	0	0	0	0	0
Selling Cost (US$/oz)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cutoff (g/t)	**0.307**	**0.333**	**0.432**	**0.382**	**0.382**	**0.185**	**0.237**	**0.263**	**0.395**	**0.247**

Note: Costs reflect historic data from June 2016.

Table 1-7: Assumptions Used for Bermejal Open Pit Mineral Reserve Estimates

Item	Crush-Leach Ore			ROM Ore		
Rock Type	Oxide	Intrusive	Carbonate	Oxide	Intrusive	Carbonate
Gold Process Recovery	64.0%	68.0%	51.0%	48.0%	58.0%	42.0%
Mining Cost (US$/t)	1.958	1.958	1.958	0.284	0.284	0.284
Processing Cost (US$/t)	3.800	3.800	3.800	0.750	0.750	0.750
Sustaining Capital (US$/t)	0.857	0.857	0.857	0.857	0.857	0.857
G&A (US$/t)	1.978	1.978	1.978	1.978	1.978	1.978
Total Processing Cost (US$/t)	8.593	8.593	8.593	3.869	3.869	3.869
Price (US$/oz)	1,200	1,200	1,200	1,200	1,200	1,200
Profit Margin (US$/oz)	50	50	50	50	50	50
CAPEX (US$/oz)	0	0	0	0	0	0
Selling Cost (US$/oz)	0.000	0.000	0.000	0.000	0.000	0.000
Cutoff (g/t)	**0.363**	**0.342**	**0.456**	**0.218**	**0.180**	**0.249**

Note: Costs reflect historic data from June 2016.

The parameters used to support the Mineral Reserve estimates for the Los Filos Underground operation that require development are shown in Table 1-8. The Mineral Reserve estimates for the Los Filos Underground operations that do not require additional development are shown in Table 1-9.

Table 1-8: Assumptions Used to Constrain Los Filos Underground Mineral Reserve Estimates – Development Required*

Item	Units	Inputs
Au Commodity Price	US$/oz	1,200
Mining Cost	US$/t mined	68.63
Crushing Cost**	US$/t processed	0.00
Processing Cost	US$/t processed	5.14
Engineering and Geology	US$/t processed	4.32
G&A Cost	US$/t processed	24.39
Taxes and Royalties	US$/t processed	1.03
Selling Cost	US$/t processed	0.64
Cost of Reclamation	US$/t processed	0.57
CAPEX (development)	US$/t processed	18.71
Total Cost	**US$/t processed**	**123.43**
Au Recovery	%	80.0
Dilution	%	10.0
Cutoff Grade	g/t Au	4.44

*Planned stopes in excess of 100 m from existing ramps.
**Crushing costs are included in processing costs.

Table 1-9: Assumptions Used to Constrain Los Filos Underground Mineral Reserve Estimates – Development Not Required*

Item	Units	Inputs
Au Commodity Price	US$/oz	1,200
Mining Cost	US$/t mined	68.63
Crushing Cost**	US$/t processed	0.00
Processing Cost	US$/t processed	5.14
Engineering and Geology	US$/t processed	4.32
G&A Cost	US$/t processed	24.39
Taxes and Royalties	US$/t processed	1.03
Selling Cost	US$/t processed	0.64
Cost of Reclamation	US$/t processed	0.57
CAPEX (development)	US$/t processed	0.00
Total Cost	**US$/t processed**	**104.72**
Au Recovery	%	80.0
Dilution	%	10.0
Cutoff grade	g/t Au	3.77

*Planned stopes within 100 m of existing ramps.
**Crushing costs are included in processing costs.

Mineral Reserves must meet a minimum cutoff grade of 3.77 g/t Au if underground development has already been carried out and costs are sunk. If underground development is required, the minimum cutoff grade for the Mineral Reserves is 4.44 g/t Au.

A properly applied cutoff grade is important since the Los Filos Open Pit and Bermejal Open Pit models each contain many blocks that are at or close to the cutoff grade. This is evident in the grade-tonnage curve for each deposit. These graphs and associated explanations are detailed in Section 15.0 of the Report.

The "smoothed" pit design includes phases P01b and P01a for Los Filos Open Pit and B02b, B02c, B03, and Guadalupe phases for the Bermejal Open Pit and each are supported by mine plans using a US$1,200/oz Au price and estimated mining costs. The open pit mines have adequate capacity from an equipment and processing standpoint to achieve the planned production rates.

Underground mineralization must have a minimum horizontal continuity of 10 m and mining width of 3 m. Approximately 14% dilution (0.80 m) was added in the preparation of the mineral reserves for the underground deposits. Dilution was applied at a zero grade for gold and silver. Mining recovery assumptions were assigned to the stope sizes, depending on stope width. Once estimated, the Mineral Reserves were trimmed to remove areas of current workings.

Mineral Reserves are presented in Table 1-10 for the open pits, in Table 1-11 for the underground, and in Table 1-12 for the Mine total. Stantec feels the Mineral Reserves stated here are a reasonable representation of the reserves for Los Filos mine. The Effective Date for the Mineral Reserves is 31 December 2016.

Table 1-10: Total Open Pit Mineral Reserve Statement

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Proven	23,332	0.58	433	5.11	3,834
Probable	15,131	0.94	456	9.23	4,488
Total Proven and Probable	*38,462*	*0.72*	*889*	*6.73*	*8,322*

Notes:

1. Los Filos Open Pit and Bermejal Open Pit deposits included.
2. Mineral Reserves are contained within Measured and Indicated pit designs and supported by a mine plan, featuring variable throughput rates (depending on the pit being mined), variable metallurgical recoveries (depending on geometallurgical domain), and cutoff optimization.
3. Mineralization reported for Los Filos Open Pit includes the mineralization within the planned 4P pit extension. Mineralization reported for Bermejal Open Pit includes the mineralization within the planned Guadalupe pit extension.
4. Metal price assumption for gold was US$1,200/oz.
5. The Los Filos Open Pit crush-leach ore is based on an operational 0.373 g/t Au cutoff grade; ROM ore is based on a variable 0.241 to 0.373 g/t Au operational cutoff grade that is determined by lithology. The Los Filos Mineral Reserve is based on a 0.241 g/t Au cutoff grade. The Bermejal Open Pit crush-leach ore is based on an operational 0.364 g/t Au cutoff grade; ROM ore is based on a variable 0.198 to 0.364 g/t Au operational cutoff grade that is determined by lithology.
6. Process gold recoveries vary from 64% to 77% for crush-leach ore and from 49% to 59% for ROM ore at Los Filos Open Pit; recoveries at Bermejal Open Pit vary from 53% to 73%. A 5% silver recovery is assumed from all geometallurgical domains.
7. Rounding, as required by reporting guidelines, may result in apparent summation differences between tonnes, grade, and contained metal content.
8. Tonnage and grade measurements are in metric units. Contained gold and silver ounces are reported as troy ounces.

Table 1-11: Total Underground Mineral Reserve Statement

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Proven	546	8.05	141	16.32	286
Probable	1,700	7.95	435	20.60	1,126
Total Proven and Probable	*2,246*	*7.97*	*576*	*19.56*	*1,412*

Notes:

1. Includes Los Filos Underground deposits only.
2. Mineral Reserves are contained within stope designs that have a minimum horizontal continuity of 10 m, a height of 3 m, and supported by a mine plan that features variable stope mining width from 3 m to a design width depending on zone and cutoff optimization.
3. Metal price assumption for gold was US$1,200/oz.
4. Mineral Reserves are reported based on a cutoff grade of 3.77 g/t Au for stopes within 100 m of a planned ramp and 4.44 g/t Au for stopes further from the ramp.
5. Dilution is assigned a zero grade and assumed to be 0.80 m thickness on average.
6. Mining recovery is variable, based on stope width and can range from 75% to 100%.
7. Process gold recoveries are estimated at 80%. A 5% silver recovery is assumed from all zones.
8. Rounding, as required by reporting guidelines, may result in apparent summation differences between tonnes, grade, and contained metal content.
9. Tonnage and grade measurements are in metric units. Contained gold and silver ounces are reported as troy ounces.

Table 1-12: Los Filos Mine Total Mineral Reserve Statement

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Proven	23,877	0.75	575	5.37	4,120
Probable	16,831	1.65	890	10.37	5,614
Total Proven and Probable	40,708	1.12	1,466	7.44	9,734

* Reported Leach Pad Reserve represents recoverable gold ounces, which are not in situ.

In addition, there is a Leach Pad Reserve of 49,785 kt at 0.51 g/t, which contains 814 koz Au. The estimated recovery is 29.7% and, therefore, there are 242 koz of recoverable gold ounces included in the mine plan. The total Proven and Probable Mineral Reserves, including the recoverable ounces in the Leach Pad Reserve (Probable Mineral Reserve), is 1,707 koz.

Factors that may affect the Mineral Reserve estimates include the following.

- Metal prices.
- Mining and metallurgical recovery assumptions.
- Methodology of assigning ore densities.
- Geotechnical characteristics of the rock mass.
- Effectiveness of the underground dilution assumptions.
- Ability of the mining operation to meet the planned annual throughput rate assumptions for the process plant.

1.13 Leach Reserve

During the earlier years of the Mine, sub-optimal leach pad performance led to lower than expected gold production over the life of the leach pad. This has resulted in a significant accumulation of un-leached recoverable gold inventory within the leach pad. The historic accumulated Leach Pad Reserve is now actively being drawn down.

Accumulated gold from ROM and crushed material placed for leaching (booked inventory) versus recovered gold was estimated by Los Filos at 242 koz Au recoverable (as of 31 December 2016). The Leach Pad Reserve is comprised of 49,785 kt at 0.51g/t, which contains 814 koz Au in situ. The estimated recovery is 29.7% and, therefore, there are 242 koz of recoverable gold ounces included in the mine plan.

A review completed by KCA confirmed the recoverability of this inventory. These gold ounces are considered to be the recoverable portion of the inventory and can be added to the Mineral Reserve. Total Proven and Probable Mineral Reserves contain 1,707 Moz Au (Table 1-12).

The Leach Pad Reserve has been the subject of investigations and third-party reviews, and recovery programs have been ongoing since 2015. During 2016 a total of 32,067 oz Au was recovered using a combination of drilling and reinjection of pressurized leach solution, re-handling of inventory, and surface re-leaching. Accelerated recovery of the remaining historic accumulated gold from the Leach Pad Reserve is scheduled to occur over the next 3 years to 4 years.

1.14 Open Pit Mine Plan

The Mine property has two open pits, Los Filos and Bermejal; only the Los Filos Open Pit is currently in operation, whereas mining operations at the Bermejal Open Pit will resume in 2018 (Table 1-13).

Table 1-13: Open Pit Mine Plan

Area	Units	2017	2018	2019	2020	2021	2022	2023	2024	Total
Los Filos Open Pit	kt (waste)	16,006	13,352	4,167	—	—	—	—	—	33,525
	kt	3,823	5,863	2,210	—	—	—	—	—	11,896
	g/t Au	0.56	0.58	0.88	—	—	—	—	—	0.63
	koz Au (contained)	69	110	62	—	—	—	—	—	241
Bermejal Open Pit	kt (waste)	—	162	8,360	14,311	16,562	14,970	14,710	12,397	81,472
	kt	—	441	5,259	5,725	3,388	4,968	5,239	1,546	26,567
	g/t Au	—	0.55	0.53	0.45	0.57	0.66	0.77	3.44	0.76
	koz Au (contained)	—	8	89	84	62	105	130	171	648
Total	kt (waste)	16,006	13,514	12,527	14,311	16,562	14,970	14,710	12,397	114,997
	kt	3,823	6,304	7,469	5,725	3,388	4,968	5,239	1,546	38,463
	koz Au (contained)	69	118	151	84	62	105	130	171	889

Production is scheduled in two 10-hour shifts per day, 7 days per week. Equipment is Mine-owned and operated, and the Mine is run as a conventional truck-and-shovel operation. All open pit ore and waste requires blasting and blastholes are sampled to determine ore or waste. Mineralization from the open pits is either trucked to the ROM heap leach pad or to the crusher. Ore production from open pit mining in 2016 was 10.46 Mt or 28,700 t/d.

Drilling is completed using Atlas Copco drills and production benches have a height of 9 m. Blasting is undertaken by a contract blasting firm, using ANFO. Hitachi EX 2500 model hydraulic excavators and CAT 992 and 994 front-end loaders are used for loading. Haul trucks (off-road) are CAT 785.

All future mining phases are planned to use the same pit configurations and the same equipment currently in use. The current infrastructure is sufficient to support mining operations. In 2016, the Mine reduced mining rates from the open pits to become a more selective, lower-cost per ounce operation.

The current LOM plan assumes production from open pit sources until 2024. The Los Filos Open Pit, with only 2 years of reserves, will be mined out in 2019. As part of the LOM plan, the Bermejal Open Pit will be suspended until the Los Filos Open Pit is mined out. The Bermejal Open Pit will then operate from 2019 through 2024, producing approximately 90% of the ore tonnage mined, while Los Filos Underground will produce 10% of the tonnage.

The average production rate from the pits will be 4.8 Mt/a of ore and 14.4 Mt/a of waste for the remaining 8-year mine life in the pits. The LOM plan includes 101 koz Au of inferred material treated as waste.

As part of ongoing efforts to increase efficiencies and adjust to changing metals prices, it is expected that the LOM plan may be altered on a year-to-year basis. The Qualified Person considers the open pit mining practices to be suitable for the LOM plan. There is an opportunity, however, to increase efficiencies and lower costs in the ore crushing operation where material is handled multiple times.

1.15 Underground Mine Plan

Current underground production is from the Los Filos Underground (Table 1-14), which is comprised of two underground mines, the Norte and Sur. Each is accessed via decline ramps. Together they consist of more than a dozen separate ore zones. All are mined using a mechanized overhand Cut-and-Fill mining method, starting from bottom-up, with rock fill coming from underground workings. The production sill widths are predominantly 3.5 m, which allows for ore extraction without leaving ore pillars. Deposits being mined in the Norte Mine include Nukay and Peninsular. Deposits being mined in the Sur Mine include Sur and Zone 70.

Table 1-14: Underground Mine Plan

Area	Units	2017	2018	2019	2020	2021	2022	2023	2024	Total
Los Filos Underground – Norte	kt	244	285	307	264	148	46	30	—	1,325
	g/t Au	7.67	8.11	7.23	7.65	7.22	6.61	7.35	—	7.56
	koz Au (contained)	60	74	71	65	34	10	7	—	322
Los Filos Underground – Sur	kt	146	169	71	145	186	154	50	—	921
	g/t Au	7.44	7.70	7.92	8.38	10.76	8.56	8.30	—	8.58
	koz Au (contained)	35	42	18	39	64	42	13	—	254
Total	kt	390	454	379	409	334	200	80	—	2,246
	koz Au (contained)	95	116	90	104	99	52	20	—	576

Production is scheduled for two 10-hour shifts per day, 7 days per week. Underground mining equipment in the Norte Mine is owned and operated by DMSL; mining is based on conventional jumbo-LHD-tramming operations. The Sur underground mine is contractor-operated, using their own equipment, and is also based on conventional jumbo-LHD-tramming mining methods.

All ore and waste requires blasting. Ore from the underground mines is trammed to the surface, then trucked to a stockpile at the surface crusher. Average annual production from all underground sources for the remaining 7-year underground mine life, from 2017 through 2023, is anticipated to be 0.36 Mt/a of ore and 0.20 Mt/a of waste based on current mineral reserves.

The Qualified Person reviewed the current underground infrastructure and deemed it sufficient to support mining operations and the LOM plan.

As part of ongoing efforts to increase efficiencies and adjust to changing metals prices, it is expected that the LOM plan may be altered on a year-to-year basis.

1.16 Waste Rock Facilities

There are five waste rock facilities (WRFs), of which only one is currently in use for disposal of waste rock from the Los Filos Open Pit. There are three WRFs at Los Filos Open Pit (identified as Los Filos WRF East, Los Filos WRF North, and Los Filos WRF West) and two WRFs at Bermejal Open Pit (identified as Bermejal WRF Northeast and Bermejal WRF Southwest).

Approximately 115 Mt of waste is anticipated to be mined from the open pit sources, and will be placed at Los Filos WRF West, Los Filos in-pit backfill, and Bermejal in-pit backfill. The available WRF and in-pit backfills have a combined LOM planned waste storage capacity of 216 Mt, which is suitable for the LOM plan.

Underground waste rock in the LOM plan is 100% used as backfill in underground mining.

1.17 Processing and Recovery Methods

Mineralization from underground and open pit operations is classified as either low-grade (ROM and sub-low-grade [SLG]) or high-grade ores (known at the Mine as “Crush”). Each ore type is processed as follows.

- If medium- to high-grade (currently >0.5 g/t Au) ore is sent to a crushing system consisting of a primary and two secondary crushers, and is reduced to a particle size of ~80% passing minus 19 mm. Crushed ore (known on the Los Filos site as “crush”) is mixed with cement, lime, and water for agglomeration purposes and is transported overland to the heap leach pad(s) via a combination of conveyor/stacking and haulage trucks.
- If low-grade ore (currently >0.198 and <0.5 g/t for the Bermejal Open Pit and >0.241 and <0.5 g/t for the Los Filos Open Pit) is sent directly to the leach pad as ROM ore. No ore sourced from underground is classified as low grade.

The crushing and conveying system capacity is 16 kt/d. Approximately 41% of open pit ore is ROM and the remainder is Crush. No ore sourced from underground is classified as low grade and, therefore, it is all Crush.

Two large leach pad areas are in operation, Pad #1 and Pad #2, each with separate drainage collection systems. Pad #1 has been generally laid out in two sections, one for Crush and the other for ROM ore. Pad #2 became operational in 2013. Initially, ROM was stacked on this pad; however, now only Crush material is stacked on Pad #2.

The leachate from each pad is collected in separate ponds as a Pregnant Leach Solution (PLS). The PLS is pumped to a carbon ADR Plant, where gold and silver is extracted from the PLS by carbon adsorption. The gold is subsequently stripped from the carbon, producing a gold-enriched solution, which is transferred to a secure on-site facility where the gold is removed from solution by electrolysis, known as electrowinning. A gold-rich sludge is removed from the electrowinning cathode cells, dewatered, calcined, and refined to gold-silver alloy (doré) using electric furnaces. The doré bars are then transported off site by a security contractor for further refining.

The ore handling, pad leaching, solution management, and metallurgical processes were reviewed by the Qualified Persons and found to be consistent with widely acceptable practices and accountability. Average recoveries by ore type used for production planning based on testwork and supported by production, designated as % recovery, are as follows.

- Los Filos Open Pit: ROM 52%, Crush 64%
- Los Filos Underground: Crush 80%
- Bermejal Open Pit: ROM 53%, Crush 64%

The proportions of material being treated as ROM/Crush, designated as percent tonnage, are as follows.

- Los Filos Open Pit: ROM 41%, Crush 59%
- Los Filos Underground: Crush 100%
- Bermejal Open Pit: ROM 40%, Crush 60%

1.18 Project Infrastructure

Project infrastructure reflects the open pit and underground mining operations. Key mining and processing infrastructure includes the following.

- Two open pits and one underground mine with two sectors, Norte and Sur.
- Five waste rock dumps.
- Primary and secondary crushing plants.
- Two heap leach pads with associated conveyor systems and stackers.
- ADR plant.
- Open pit truck shop.
- Underground mine workshops and facilities.

Support facilities include the following.

- Warehouse.
- Fuel storage tanks.
- Office facilities.
- Residential camp and mess halls.
- Exploration geology camps.
- Core processing facilities.
- Assay laboratory.
- Chemical laboratory.
- Power substation and power lines.
- Water pumping facilities, pipelines, and storage tanks.
- Access roads.
- Airstrip.
- Explosive storage facilities.
- Personnel training facilities.
- Environmental monitoring facilities.

The infrastructure required to support surface and underground mining activities is sufficient for the current LOM plan.

1.19 Market Studies and Contracts

A refinery gold payable rate of 100% is used based on the current contract for Los Filos doré transport and refining. Under the current contract, the refiner purchases doré with no deduction for refining gold. All costs for transport, insurance, and refining are incurred by the refiner's account.

Los Filos sells 100% of silver bullion production under the Silver Wheaton Streaming Contract. The 25-year contract, which expires on 15 October 2029, requires Los Filos to sell its silver bullion production to Silver Wheaton at an initial price of US$3.90/oz escalated annually at 50% of the US inflation rate. The most recent price was US$4.26/oz.

The Mine has a carbon fines refining agreement with Met-Mex Peñoles.

1.20 Capital and Operating Costs

Capital Costs

Table 1-15 shows the current LOM capital costs. The costs are based on operating experience gained from current operations, 2017 budget data, and quotes received from manufacturers during 2016.

Table 1-15: Life-of-Mine Capital Cost Estimate (Figures in US$ Million)

Area	2017	2018	2019	2020	2021	2022	2023	2024	Total
Development	15.3	7.5	1.6	0.5	—	—	—	—	24.9
Expansionary	—	—	—	—	—	—	—	—	0.0
Compliance	0.5	0.5	—	—	—	—	—	—	1.0
Exploration	—	—	—	—	—	—	—	—	0.0
Sustaining	14.1	12.8	15.5	3.7	1.5	0.9	0.7	—	49.1
Improvement	3.0	0.6	—	—	—	—	—	—	3.7
Grand Total	**32.9**	**21.4**	**17.2**	**4.3**	**1.5**	**0.9**	**0.7**	**—**	**78.8**

Capital cost estimates include funding for infrastructure, mobile equipment replacement, and development drilling as well as miscellaneous sustaining capital expenditures required to maintain production. The capital costs shown do not include the Bermejal Underground capital cost estimates.

Operating Costs

Operating costs were developed by the Mine based on 2017 budget figures and 2016 actual costs, factored as appropriate. These costs were used to establish ore cutoff grade values and, ultimately, Mineral Reserves. Table 1-16 shows the LOM operating costs for the respective dollars per unit of measure.

Table 1-16: Life-of-Mine Operating Cost Estimate

Operational Expenditure Inputs	Units	LOM Average	2017	2018	2019	2020	2021	2022	2023	2024
Los Filos Open Pit Mining	US$/t moved	1.56	1.63	1.51	1.51	—	—	—	—	—
Bermejal Open Pit Mining	US$/t mined	1.66	—	1.66	1.66	1.66	1.66	1.66	1.66	1.66
Los Filos Underground Cut-and-Fill Mining	US$/t mined	80.25	85.56	79.13	79.13	79.13	79.13	79.13	79.13	79.13
Crushing	US$/t milled	1.55	1.66	1.44	1.37	1.59	1.87	1.52	1.44	2.12
Crushed Leaching Open Pit Process	US$/t milled	3.89	5.48	3.37	3.85	3.56	4.20	3.45	4.08	3.44
Crushed Leaching Underground Process	US$/t milled	16.08	5.68	4.84	12.79	15.07	16.97	41.99	82.91	—
ROM Leach Process	US$/t leached	3.02	4.57	2.73	2.72	2.61	3.26	2.76	3.56	—
G&A	US$M	21.89	26.96	25.47	25.67	22.58	22.50	22.57	20.31	9.03

1.21 Economic Analysis

This economic analysis is based on current Mineral Reserves in the open pit and underground mine plan. The average recoveries for ROM, Crush, and the heap Leach Pad Reserve recovery information are combined in the gold production plan in Table 1-17.

Table 1-17: Los Filos Total Gold Production Plan

Area	Units	2017	2018	2019	2020	2021	2022	2023	2024	Total
Los Filos Open Pit	koz Au	43	67	39	—	—	—	—	—	149
Bermejal Open Pit	koz Au	—	5	55	50	38	65	82	109	404
Los Filos Underground	koz Au	76	93	72	83	79	42	16	—	461
Inventory	koz Au	101	65	32	35	9	—	—	—	242
Total	**koz Au**	**220**	**230**	**198**	**168**	**126**	**107**	**98**	**109**	**1,256**

Applying a long-term gold price of US$1,200/oz on a flat-line basis, the after-tax net present value (NPV) at 5% is US$334 million. The LOM average cash cost per ounce is US$734, and with the addition of royalties and sustaining capital, the site's LOM average all-in sustaining cost (AISC) is US$803/oz. The LOM plan includes 101 koz Au of inferred material that is currently treated as waste.

Figure 1-6 outlines the NPV related to gold price and capital and operating costs. Table 1-18 outlines the NPV sensitivities related to capital and operating costs. Table 1-19 outlines the NPV sensitivities related to the gold price and discount rate.

Figure 1-6: Los Filos Mine Sensitivity Chart (Reserves Only)

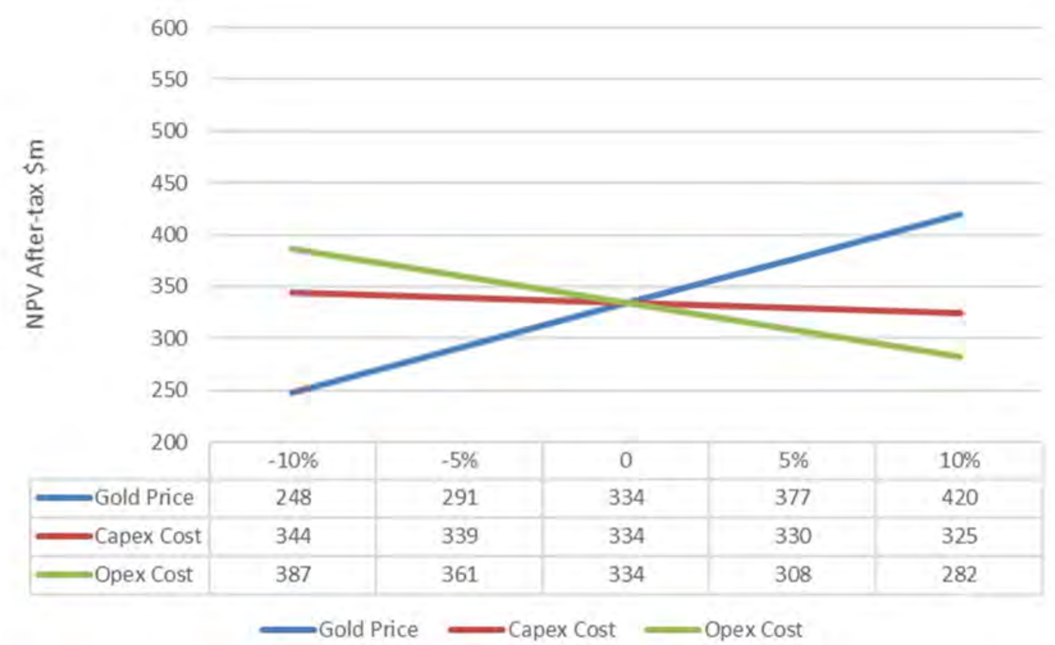


Table 1-18: Los Filos Mine Net Present Value Sensitivity Table at 5% Discount Rate for Capital Expenditure and Operational Expenditure

CAPEX and OPEX Sensitivity at US$1,200/oz Au		
CAPEX (US$M)	**%**	**OPEX (US$M)**
344	-10%	387
339	-5%	361
334	0%	334
330	5%	308
325	10%	282

Table 1-19: Los Filos Mine Gold Price and Discount Rate Sensitivity Table (Figures in US$ Million)

Gold Price	Discount Rate		
	0%	**5%**	**10%**
US$1,100/oz	301	263	232
US $1,150/oz	341	299	265
US $1,200/oz	382	334	297
US $1,250/oz	422	370	329
US $1,300/oz	463	406	361

Assumptions for the economic analysis include the following.

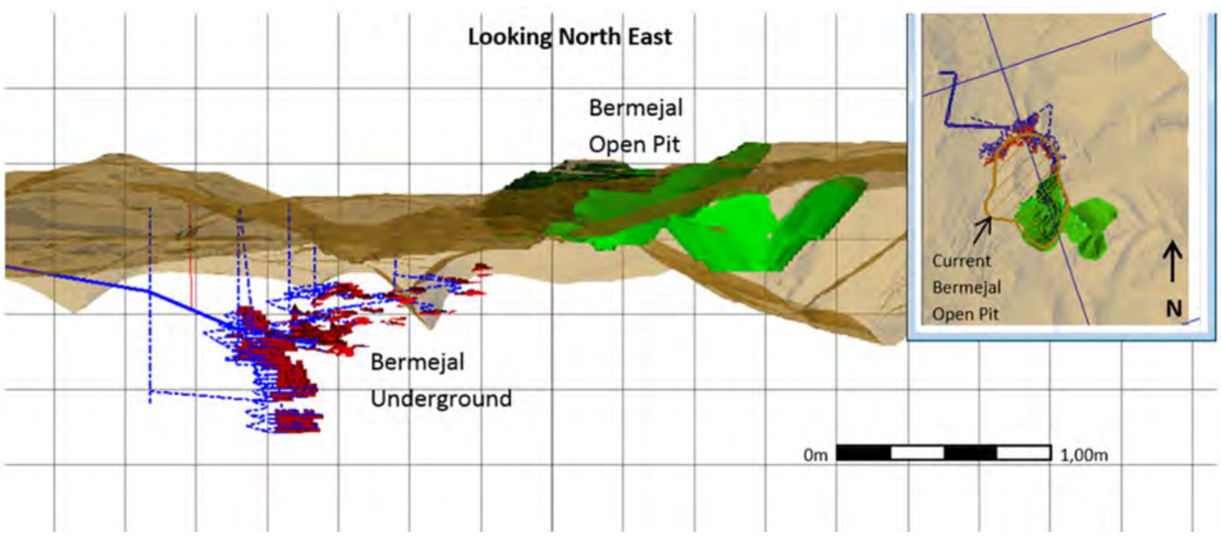
- Mine schedule, Mine operating cost estimates, process operating cost estimates, G&A estimates, and metallurgical performance characterized by testwork on composite, capital, and sustaining capital cost estimates as discussed with the Los Filos personnel.
- Base gold price of US$1,200/oz was used with sensitivities applied above and below this amount.
- Royalties, taxes, discount rates, and other model inputs were provided by Leagold.
- Cash flow analysis excludes any effect due to inflation and all dollars are expressed as real.
- All currency amounts are presented in United States Dollars (US$) with Forex of 21 Mexican Pesos to 1 US$.

1.21.1 Preliminary Economic Assessment – Bermejal Underground

A PEA is presented for the Bermejal Underground deposit. The deposit would be developed and mined concurrently with the Mine and, therefore, the project economic analysis uses the additional capital costs and operating costs required to develop and operate this project in addition to the current mine. The PEA is preliminary in nature; it includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them, which would enable them to be categorized as Mineral Reserves. There is also no certainty that the PEA will be realized.

The geology and mineralization of the Bermejal Underground deposit is similar to the other deposits on the Mine property. The deposit is a gold-silver skarn developed at the contact of the Bermejal intrusive within the Morelos Formation carbonate rocks. The mineralization is typically oxide minerals (hematite, limonite, magnetite) with small amounts of sulfides (pyrite, chalcopyrite). See Figure 1-7 for the location and preliminary mine design of the Bermejal Underground deposit.

Figure 1-7: Bermejal Underground Preliminary Economic Assessment Cross Section



Although an open pit mineral resource of 4.2 Moz of Au (157 Mt at 0.82 g/t Au using a US$1,400/oz pit shell) was identified at Bermejal, this large open pit would have a high strip ratio of approximately 5:1 and involve a large amount of low-grade to marginal ore. Therefore, the Bermejal deposit was examined as an underground opportunity. The Bermejal Underground deposit is entirely below and separate from the current Bermejal Open Pit Mineral Reserves. The portion of the Mineral Resource that could be mined from underground is provided in Table 1-20.

Table 1-20: Bermejal Underground Mineral Resource (Preliminary Economic Assessment)

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained (koz)	Ag Grade (g/t)	Ag Contained (koz)
Measured	13	5.08	2	49.27	21
Indicated	4,722	6.65	1,009	22.30	3,385
Total Measured and Indicated*	4,735	6.65	1,012	22.37	3,406
Inferred	4,173	5.05	678	26.55	3,563

*The dilution yields the 10,505 Mt at 5.15 g/t. Summation errors may be present due to rounding.

Initial metallurgical testwork on samples from the Bermejal Underground deposit show that it is very similar to the Los Filos Underground ores regarding gold recovery. Column and bottle tests were performed on the resource to test its amenability for heap leaching, and agitated leach tests were performed to estimate the recovery of the ore if it was milled. The heap leach tests estimate approximately 75% to 90% recovery and the ground ore had recoveries of approximately 88% to 97%, with a 65 µm grind using 7 g/t Au to 10 g/t Au material.

The cyanide consumption was normal with no cyanide robbing constituents in the material tested. Gold recoveries are assumed to be 80%, which is supported by initial testwork and gold recoveries observed in similar mineralization in the Los Filos Underground deposits.

Existing surface infrastructure and processing facilities at the Mine site are sufficient to support the addition of the Bermejal Underground project.

1.21.2 Bermejal Underground Mine Plan

The concept-level study selected a ramp as the mine access method. The resource is anticipated to be mined by a combination of sublevel caving (80%) and mechanized Cut-and-Fill (20%) mining methods. Mechanized Cut-and-Fill mining is already in use at the Los Filos underground mine.

The tonnes and grade were estimated assuming the application of the following underground mining methods on portions of the deposit.

- Sublevel Caving: 3.10 g/t Au cutoff at US$1,300/oz
- Cut-and-Fill: 4.28 g/t Au cutoff at US$1,300/oz

Bermejal Underground is reported as a Mineral Resource until additional infill drilling and study work is completed and the project is advanced to a prefeasibility study level. The PEA found that access by ramp from surface was the most efficient way to access the mineralization.

The underground mine plan includes all existing Mineral Resources of the Bermejal Underground deposit (Table 1-21).

Table 1-21: Bermejal Underground Preliminary Economic Assessment Mine Plan

Description	Units	2019	2020	2021	2022	2023	2024	2025	2026	Total
Bermejal Underground	kt	875	875	1,169	1,750	1,750	1,750	1,750	586	10,505
	g/t Au	7.59	7.59	5.33	4.56	4.56	4.56	4.56	4.56	5.15
	koz Au (contained)	214	214	200	257	257	257	257	86	1,741

1.21.3 Bermejal Underground Capital and Operating Costs

Capital costs are based on project development for the Bermejal Underground deposit and all associated infrastructure. The operating costs required for this project are in addition to those for the current Mine. The capital and operating costs assumed for the Bermejal Underground PEA are based on cost estimates by Stantec for underground development and mining as well as historical and budget costs for processing and G&A by Los Filos (Table 1-22 and Table 1-23).

Table 1-22: Bermejal Underground Preliminary Economic Assessment Capital Cost Schedule (Figures in US$ Million)

CAPEX Summary	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Development Cost	2.1	9.6	11.9	8.6	4.9	4.6	2.2	2.1	2.2	—	48.1
Equipment Purchases	0.0	10.0	15.0	15.0	10.0	0.0	0.0	0.0	0.0	—	50.0
Infrastructure and Services	3.2	11.1	2.0	0.7	0.1	0.0	0.0	0.0	0.0	—	17.1
Indirect	1.1	2.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	—	3.5
Sustaining	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	—	0.5
Exploration	0.0	0.0	0.0	1.6	1.0	0.8	0.5	0.0	0.0	—	3.9
Reclamation	0.0	0.0	0.5	0.5	0.7	1.0	1.0	1.0	1.0	0.3	6.0
Contingency of 20%	1.3	6.6	5.8	5.2	3.2	1.1	0.5	0.4	0.4	0.0	24.6
Total Cost	7.7	39.4	35.6	31.7	20.0	7.5	4.2	3.5	3.6	0.3	153.6

Table 1-23: Bermejal Underground Preliminary Economic Assessment Operating Cost Schedule

OPEX	Units	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Cut-and-Fill	US$/t	79.13	79.13	79.13	79.13	79.13	79.13	79.13	79.13	79.13	79.13
Sublevel Caving	US$/t	38.73	38.73	38.73	38.73	38.73	38.73	38.73	38.73	38.73	38.73
Process	US$/t	—	—	6.42	6.42	6.42	6.42	6.42	6.42	6.42	6.42
G&A	US$M/yr	3.0	3.0	3.0	3.0	3.0	3.0	5.0	7.9	7.9	7.9
Reclamation Costs	US$/t	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57

1.21.4 Bermejal Underground Preliminary Economic Analysis

Table 1-24 presents a summary of the mine production for the Mineral Resources.

Table 1-24: Bermejal Underground Preliminary Economic Assessment Gold Production Plan (Recovered Ounces)

Description	Units	2019	2020	2021	2022	2023	2024	2025	2026	Total
Bermejal Underground	koz Au	171	171	160	206	206	206	206	69	1,394

At US$1,300/oz, the after-tax NPV, at a 5% discount rate, is US$488M, and the after-tax internal rate of return (IRR) is 107%. The LOM average cash cost per ounce is US$432, net of silver credits, and with the addition of royalties and sustaining capital, the LOM average AISC/oz is US$439.

Figure 1-8 outlines the NPV related to gold price and capital and operating costs. Table 1-25 outlines the NPV sensitivities related to capital and operating costs. Table 1-26 outlines the NPV sensitivities related to the gold price and discount rate. Table 1-27 outlines the IRR sensitivities related to gold price.

Figure 1-8: Bermejal Underground Preliminary Economic Assessment Sensitivity Chart

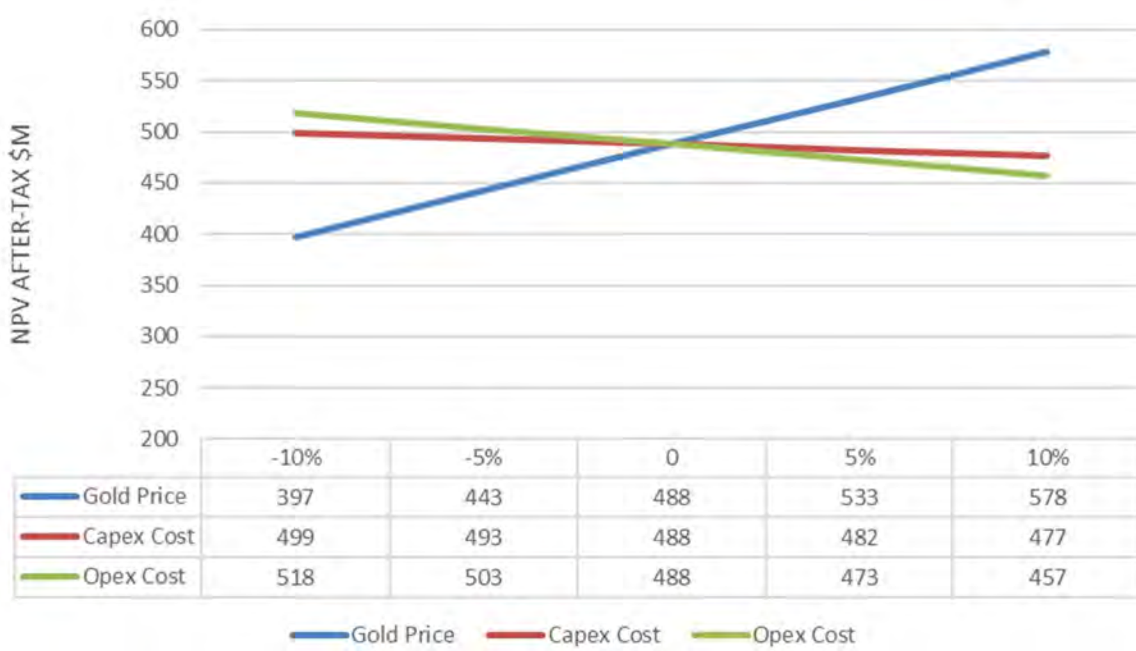


Table 1-25: Bermejal Underground Preliminary Economic Assessment Net Present Value Sensitivity Table at 5% Discount Rate for Capital Expenditure and Operational Expenditure

CAPEX and OPEX Sensitivity at US$1,300/oz Au		
CAPEX (US$M)	**%**	**OPEX (US$M)**
499	-10%	518
493	-5%	503
488	0%	488
482	5%	473
477	10%	457

Table 1-26: Bermejal Underground Preliminary Economic Assessment Gold Price and Discount Rate Sensitivity Table (Figures in US$ Million)

Gold Price	Discount Rate		
	0%	**5%**	**10%**
US$1,200/oz	564	418	315
US$1,250/oz	609	453	343
US$1,300/oz	654	488	370
US$1,350/oz	699	522	398
US$1,400/oz	744	557	425

Table 1-27: Bermejal Underground Preliminary Economic Assessment Internal Rate of Return Sensitivity Table

Gold Price Sensitivity	
Gold Price	**After-Tax IRR**
US$1,200/oz	94%
US$1,250/oz	101%
US$1,300/oz	107%
US$1,350/oz	114%
US$1,400/oz	120%

Assumptions for the PEA economic analysis include the following.

- Mine schedule, mine operating cost estimates, process operating cost estimates, G&A estimates are based on recent costs at the Los Filos site and anticipated costs based on the mining methods selected.
- Metallurgical performance is based on initial testwork on composite samples and also compared to similar mineralization in the Los Filos Underground deposits.
- Capital cost and sustaining capital cost estimates were prepared by Stantec.
- Base gold price of US$1,300/oz was used with sensitivities applied above and below this amount.
- Royalties, taxes, discount rates, and other model inputs were provided by Leagold.
- Cash flow analysis excludes any effect due to inflation and all dollars are expressed as real.
- All currency amounts are presented in US$ with an exchange rate of 21 Mexican Pesos to 1 US$.
- Bermejal Underground would begin underground development in 2017, with production commencing in 2019.

1.21.5 Summary

Table 1-28 presents a summary of the production information on which the cash flow model is based and the key project economic measures. The expansion capital cost in the PEA case assumes the execution of the Bermejal Underground as an expansion project.

The PEA is concurrent to the existing Los Filos Mine and does not include production or economic information within it.

Table 1-28: Financial Summary

Economic Summary	Units	Los Filos Mine Reserves Only	Bermejal Underground PEA Case	
LOM Tonnage Ore Processed	kt	40,709	10,504	
LOM Strip Ratio	w:o	3:1	N/A	
LOM Feed Grade Processed	g/t Au	1.12	5.15	
LOM Au Recovery – Overall	%	69	80	
LOM Au Production	koz	1,256	1,392	
Production Period	yr	8	8	
Upfront Expansion Capital	US$M	N/A	47	
Au Average Annual Production	koz	157	174	
AISC per oz	US$/oz	803	439	
Au price	US$/oz	1,200	1,200	1,300
NPV – 0% Discount Rate (post-tax)	US$M	382	564	654
NPV – 5% Discount Rate (post-tax)	US$M	334	418	488
NPV – 10% Discount Rate (post-tax)	US$M	297	315	370
IRR (post-tax)	%	N/A	94	107

1.22 Development and Production

The Mine LOM production plan for both open pit sources is presented in Table 1-29. This mine plan is based on the year-end 2016 Proven and Probable Mineral Reserves. Production from open pit sources is planned to continue to 2024.

Table 1-29: Open Pit Life-of-Mine Production Plan

Description	2017	2018	2019	2020	2021	2022	2023	2024	Total
Waste (kt)	16,006	13,514	12,527	14,311	16,562	14,970	14,710	12,397	114,997
Ore Crush Leach (kt)	2,244	3,526	4,332	2,519	1,672	3,140	3,887	1,546	22,866
Au (g/t)	0.75	0.81	0.89	0.69	0.88	0.88	0.94	3.44	1.02
Contained Au (koz)	54	91	124	56	47	89	118	171	750
Ore ROM (kt)	438	652	728	619	321	447	407	—	3,611
Au (g/t)	0.35	0.35	0.34	0.34	0.34	0.34	0.34	—	0.34
Contained Au (koz)	5	7	8	7	3	5	4	—	40
Ore SLG (kt)	1,141	2,126	2,409	2,587	1,395	1,381	946	—	11,985
Au (g/t)	0.28	0.28	0.26	0.25	0.25	0.25	0.26	—	0.26
Contained Au (koz)	10	19	20	21	11	11	8	—	100
Grand Total Contained Au (koz)	69	117	152	84	62	105	130	171	889

Cut-and-Fill mining methods are used in the current Norte and Sur Los Filos Underground operations. The planned LOM production schedule is presented in Table 1-30. Production at the Norte and Sur operations is forecast at a nominal 350 kt per year to 2023. This mine plan is based on the year-end 2016 Proven and Probable Mineral Reserves, which do not include Bermejal Underground Resources.

Table 1-30: Los Filos Underground Life-of-Mine Production Plan

Name	2017	2018	2019	2020	2021	2022	2023	Total
Ore tonnes (kt)	390	454	379	409	334	200	80	2,246
Au (g/t)	7.59	7.96	7.36	7.91	9.19	8.11	7.94	7.98
Contained Au (koz)	95	116	90	104	99	52	20	576
Development (m)	9,881	5,664	2,678	2,167	1,920	1,281	217	23,808

1.23 Exploration Potential

Exploration potential in the near term includes extensions to mineralization currently mined in the Los Filos Open Pit and Bermejal Open Pit. Additional exploration potential remains around the Los Filos intrusive body and in the Bermejal-Guadalupe corridor, particularly in the vicinity of the southern extension of the Bermejal intrusion. The Bermejal Underground deposit remains open on strike and to depth and will be the focus of drilling in 2017.

The Xochipala area to the south of the Mine property also retains exploration interest.

1.24 Conclusions

The Mine is a large open pit and underground mining operation producing over 155 koz Au per year at costs under US$803/oz AISC. The LOM based on current Mineral Reserves is 8 years. Additional exploration in the immediate Mine area and on the Mine property provides opportunities for extending the mine life.

The Bermejal Underground mineral resource is a project that warrants additional investigation. The PEA results show opportunity to add additional production and extend the Mine life with a long-term ore source and replace declining production while lowering AISC. The PEA shows a project with over 174 koz/year Au and a LOM of 8 years. This deposit can provide a steady source of high-grade, high-margin ore feed while using the existing mine infrastructure. The Bermejal Underground development would also provide exploration opportunities in adjacent areas and maintain work force continuity.

Factors that may affect the geological models, the conceptual pit shells, or the underground mining assumptions, and, therefore, the Mineral Resource and Mineral Reserve estimates include the following.

- Metal prices.
- Changes in interpretations of lithological or geometallurgical domains.
- Mining and metallurgical recovery assumptions.
- Block model density assignments.
- Changes to the search orientations and search ellipse ranges.
- Review of the classification criteria used for Measured and Indicated Resources at the Mine.
- Pit slope angles and geotechnical assumptions supporting underground stope designs.
- Geotechnical characteristics of the rock mass and the validity of the underground dilution assumptions.
- Changes to the assumptions used to generate the gold cutoff grades for resource declaration.
- Capital and operating cost estimates.

The Qualified Persons are not aware of any significant risk or uncertainty (except as already stated) that may materially affect the reliability or confidence in the Mineral Resource and Mineral Reserve estimates or project economic outcomes based on the information provided by the Mine and the observations made at site.

The results of the economic analyses represent forward-looking information that is subject to a number of known and unknown risks, uncertainties, and other factors that may cause actual results to differ materially from those presented here. Certain important factors that could cause actual results, performances, or achievements to differ materially from those stated include the following.

- Gold price volatility.
- Discrepancies between actual and estimated production.
- Estimates of Mineral Reserves and Mineral Resources.
- Metallurgical recoveries.
- Mining operational and development risks.
- Litigation risks.
- Regulatory restrictions, including environmental regulatory restrictions and liability.
- Activities by governmental authorities, including changes in taxation.
- Currency fluctuations.
- Defective title to mineral claims or property.
- Operating costs that vary from planned reduction in costs in the current mine plan.

2.0 INTRODUCTION

2.1 Terms of Reference

Leagold Mining Corporation (Leagold) requested Stantec Consulting International LLC (Stantec) prepare an Amended NI 43-101 Technical Report and Preliminary Economic Assessment (the Report) for Los Filos Gold Operation (the Mine), located in the Los Filos district of Guerrero State, Mexico (Figure 2-1). The Report presents a description of Mine operations, including Mineral Resources, Mineral Reserves, and a financial evaluation of the current mine. The Report also presents a preliminary economic assessment (PEA) for the Mineral Resources of the Bermejal Underground deposit. The Bermejal Underground deposit would be mined concurrently with the existing open pits and underground mines.

Figure 2-1: Los Filos Mine Location

The operations consist of two operating open pit mines (Los Filos Open Pit and the Bermejal Open Pit) and two operating underground mines (Norte and Sur), which share common process and ancillary facilities. The operations are wholly owned by Desarrollos Mineros San Luis S.A. de C.V. (DMSL), a Mexican company indirectly wholly owned by Goldcorp. Leagold is currently in the process of acquiring DMSL from Goldcorp.

All measurement units used in this Report are metric and the currency is expressed in US dollars, unless stated otherwise.

The exchange rate as of the Report's Effective Date was approximately US$1, equal to 21 Mexican pesos.

2.2 Qualified Persons

The following serve as the Qualified Persons for this Technical Report as defined in NI 43-101, Standards of Disclosure for Mineral Projects (dated 09 May 2016), and in compliance with Companion Policy 43-101CP and Form 43-101F1.

- William A. Glover, P.Eng., Senior Mining Consultant to Stantec
- Allan L. Schappert, CPG, Stantec Employee
- Dawn H. Garcia, PG, CPG, Independent Consultant to Stantec
- Alfred S. Hayden, P.Eng., EHA Engineering, Independent Consultant to Stantec

Qualified Person responsibilities by section are provided in Table 2-1.

Table 2-1: Summary of Qualified Persons

Section	Report Section	Qualified Person Responsible
Overall	Amended NI 43-101 Technical Report and Preliminary Economic Assessment	William A. Glover, P.Eng.
1	Summary	Sign-off by section
2	Introduction	William A. Glover, P.Eng.
3	Reliance On Other Experts	William A. Glover, P.Eng.
4	Property Description and Location	William A. Glover, P.Eng.
5	Accessibility, Climate, Local Resources, Infrastructure, and Physiography	William A. Glover, P.Eng.
6	History	William A. Glover, P.Eng.
7	Geological Setting and Mineralization	Allan L. Schappert, CPG
8	Deposit Types	Allan L. Schappert, CPG
9	Exploration	Allan L. Schappert, CPG
10	Drilling	Allan L. Schappert, CPG
11	Sample Preparation, Analyses, and Security	Allan L. Schappert, CPG
12	Data Verification	Allan L. Schappert, CPG
13	Mineral Processing and Metallurgical Testing	Alfred S. Hayden, P.Eng.
14	Mineral Resource Estimates	Allan L. Schappert, CPG
15	Mineral Reserve Estimates	William A. Glover, P.Eng.
16	Mining Methods	William A. Glover, P.Eng.
17	Recovery Methods	Alfred S. Hayden, P.Eng.
18	Project Infrastructure	William A. Glover, P.Eng.
19	Market Studies and Contracts	William A. Glover, P.Eng.
20	Environmental Studies, Permitting, and Social or Community Impact	Dawn H. Garcia, PG, CPG
21	Capital and Operating Costs	William A. Glover, P.Eng.
22	Economic Analysis	William A. Glover, P.Eng.
23	Adjacent Properties	William A. Glover, P.Eng.
24	Other Relevant Data and Information	William A. Glover, P.Eng.
25	Interpretation and Conclusions	William A. Glover, P.Eng.
26	Recommendations	William A. Glover, P.Eng.
27	References	William A. Glover, P.Eng.

2.3 Site Visits and Scope of Personal Inspection

William A. Glover visited the Los Filos mine from 05 December 2016 to 20 December 2016. During this visit, most the surface facilities, including the open pits, waste rock facilities, and heap leach pad, were examined. Additionally, Mr. Glover completed underground tours in two active mining areas in the underground mines.

Allan L. Schappert visited the Los Filos mine from 12 December 2016 to 21 December 2016. During this visit, Mr. Schappert visited the open pit and underground mines. Mr. Schappert also spent several days at the geology core shed reviewing core, logging records, sample preparation, and drilling records. Mr. Schappert also visited several drill sites to confirm accurate location of selected drill holes.

Dawn H. Garcia visited the Los Filos mine from 20 December 2016 to 22 December 2016, and inspected the area of the facilities where environmental controls are in place, such as the waste water treatment facility, the process ponds and meteorological station at the Adsorption-Desorption-Recovery (ADR) plant, the discharge of the sub-drainage system into Cañada 23, and reclamation plots at the Los Filos East Waste Rock Dump. Ms. Garcia also visited the water supply facility at the Rio Balsas Basin Pumping Stations 1 and 2. Ms. Garcia reviewed the closure plan and cost estimate.

Alfred S. Hayden's associate Grant Feasby visited the Los Filos processing facilities from 19 December 2016 to 22 December 2016, to inspect the crushing plant, ore distribution system, heap leach pads, solution reservoirs, ADR processing plant, and assay laboratory.

2.4 Effective Dates

The Effective Date for the Mineral Resources, Mineral Reserves, and this Report is 31 December 2016. There were no material changes to the information on the Los Filos mine from the Effective Date to the signature date of the Report; however, Leagold is in the process of acquiring DMSL from Goldcorp Inc.

2.5 Information Sources and References

Information used to support this Report was derived from previous technical reports on the property, from Los Filos mine personnel as appropriate, and from the reports and documents listed in the References section of this report.

The following information contained in this Report was supplied by Los Filos mine personnel.

- Current operating and capital budgets.
- Current production plan, including pit and stope geometry, future development design, and current openings for both open pit and underground mines.
- Geological block models and wireframes.
- Land and property title records.
- Historical production data.
- Permits and regulatory agency correspondence.
- Technical reports, memoranda, and presentation materials.
- Closure plan and closure cost estimate.

The information, conclusions, opinions, and estimates contained herein are based on the following.

- Information available to the Qualified Persons at the time of preparation.
- Assumptions, conditions, and qualifications as set forth in this Report.
- Data, reports, and other information supplied by Goldcorp, Los Filos mine personnel, and Leagold Mining Corporation, such as taxes, marketing, and gold refining contracts.
- Operating, capital, and reclamation costs supplied by Los Filos mine personnel for LOM budgets were reviewed by Qualified Persons but not zero-based.

2.6 Previous Technical Reports

Previously prepared technical reports on the mine include the following.

Technical Report NI 43-101 for Goldcorp on Los Filos Project, Mexico. Maryse Belanger, P.Geo., Senior Vice President of Technical Services for Goldcorp 2013.

Technical Report NI 43-101F1 Los Filos Project, Mexico: unpublished technical report prepared by Snowden Mining Industry Consultants for Goldcorp Inc., effective date 31 March, 2006. Barton, P.J., Ross, A.F., Hester, M.G., Kappes, D.W., and Lupo, J.F., 2006.

Technical Report, Los Filos Project: unpublished technical report prepared by Snowden Mining Industry Consultants for Goldcorp Inc., effective date November 2004. Snowden Mining Industry Consultants, 2004.

Technical Report on the Los Filos Gold Deposit Guerrero, Mexico: unpublished technical report prepared by Micon Consultants for Wheaton River Minerals, effective date September 2003. Micon International Limited, 2003.

3.0 RELIANCE ON OTHER EXPERTS

This Report has been prepared by the Qualified Persons referred to in Table 2-1.

For this Report, the Qualified Persons have relied on property ownership information provided by Galicia Abogados (Mexico City) in a memo prepared for Leagold. Stantec and/or Qualified Persons have not researched property title or mineral rights for Los Filos mine property and express no opinion as to the ownership status of the properties.

Alfred S. Hayden, P.Eng. relied on his associate Mr. Grant Feasby, a process engineering professional, to make a site visit to Los Filos and inspect its processing facility.

4.0 PROPERTY DESCRIPTION AND LOCATION

The Mine property is in the Los Filos mining district of central Guerrero State, Mexico, at latitude 17°52′24″ N and longitude 99°41′07″ W, UTM 427,400N, 1,976,300E.

For legal matters related to property ownership and title in respect of Sections 4.1, 4.2, and 4.3 in this Report, the Qualified Persons received a memorandum titled “Project Latitude | Mining Claims” dated 03 February 2017 by Galicia Abogados (Galicia, 2017). Stantec and/or Qualified Persons have not researched property title or mineral rights for the Los Filos mine property.

The mining operations lie within the southern part of the Morelos Formation (Formacion Morelos Sur), a package of Cretaceous carbonate and limestone rocks.

4.1 Property and Title in Mexico

Article 27 of the Mexican Constitution provides that the Mexican Nation has direct ownership of mineral deposits within the national territory, which cannot be transferred. The use and exploitation of such national resources by private parties is only permitted if the Federal Executive Branch grants concessions through its corresponding government agencies. Such concessions are subject to applicable laws and regulations, and these must be complied with; non-compliance can result in cancelled concessions.

Mineral Property Title

Mexican Mining Law was promulgated in 1992, and was most recently amended in 2014 (Ley Minera, DOF 11-08-2014); the current mining regulations were published in 2012, and were most recently amended in 2014 (Reglamento de la Ley Minera, DOF 31-10-2014). A number of Government agencies have responsibility for enforcing mining laws.

Mining concessions may only be granted to Mexican companies and nationals or “ejidos”, agrarian communities, communes, and indigenous communities. Foreign companies can hold mining concessions through Mexican-domiciled companies.

Mining concessions are granted over “free land.” Free land means any land within the Mexican Nation, except for the following.

- Land covered by existing or pending mining concessions and allotments.
- Zones incorporated into mineral reserves.
- Land covered by mining concessions granted through a bidding process, or alternatively, land covered by mining lots from which no concessions would be granted due to the cancellation of the bidding process.

There is no difference in Mexico between an exploration concession and a mining concession. All the concessions run for a term of 50 years, with the term commencing on the date recorded in the registry maintained by the Public Registry of Mining. A second 50-year term can be granted if the applicant has abided by all appropriate regulations and makes the application within 5 years prior to the expiration date.

Mining concession boundaries in Mexico are defined by referencing the position relative to a legally surveyed principal post. To stake a concession, a principal monument must be erected, painted, and photographed by a registered mining expert and then applied to be registered before the relevant mining district office. Once accepted, an official surveyor must be contracted to provide a survey to locate the concession whereby the official survey is reviewed and taken into consideration. Once the relevant mining district office prepares a proposal of the mining concession title, such draft is sent to the Mining Division (Dirección General de Minas), and upon its issuance, the concession title is registered before the Public Registry of Mining (Registro Público de Minería).

Mining concessions confer rights with respect to all mineral substances as listed in the Registry document. The holder must commence exploration or exploitation within 90 days of the Registry Date.

Mining concessions give the holder the right to mine within the concession boundary, sell the mining product, dispose of waste material generated by mining activities within the lease boundary, and have access easements. Concessions can be transferred between companies and can be consolidated.

The main obligations that arise from a mining concession, and which must be kept current to avoid its cancellation, are performance of assessment work, payment of mining taxes (technically called “duties”), and compliance with environmental laws.

Mining regulations establish minimum amounts that must be spent; sales of minerals from the mine for an equivalent amount may substitute for minimum expenditures. A report must be filed in May of each year that details the work undertaken during the previous calendar year.

Mining duties must be paid in advance in January and July of each year, and are determined on an annual basis under the Mexican Federal Rights Law. Duties are based on the surface area of the concession and the number of years that have elapsed since the mining concession was issued.

Concessions are maintained on an annual basis by payment of appropriate fees, as determined by the Ministry of Economy each year. Holders must also supply the Ministry of Economy with all activity, contracts, and agreements that affect the Concession Title to keep and maintain the Public Registry of Mining (Registro Público de Minería).

Surface Rights Title

While a mining concession gives its holder the right to carry out mining work in the area covered by the concession and to take ownership of any minerals found, it does not automatically grant any surface access rights. Such rights must be negotiated separately with the owner of the surface land. If no agreement can be reached with the surface owner (typically for the purchase or lease of the surface land), the Mining Law grants the concessionaire the right to apply to the General Mining Bureau for the expropriation or temporary occupation of the land, which will be granted to the extent that the land is indispensable for the development of the mining project. Compensation is set through an appraisal carried out by the Federal Government's National Goods' Appraisal Commission.

Consideration, payable on a one-time basis for expropriation and on a yearly basis for temporary occupation, is set based on an appraisal of the affected land. Typically, a verbal authorization with no consideration is granted for prospecting and sample gathering. A simple letter agreement or contract will be used for drilling, trenching, basic road building, and similar, more advanced exploration activities, with a small monetary consideration and/or the obligation to fix a road or fence, build an earth dam, paint the local town church or school, etc. Building and operating a mine requires a more formal agreement.

In practice, many surface rights are granted through selective land purchases and temporary occupation agreements.

Environmental Regulations

The Mexican Federal Government department responsible for environmental matters is the Secretary of the Environment, Natural Resources and Fisheries (Secretaría de Medio Ambiente y Recursos Naturales) (SEMARNAT), which has four sub-departments.

- National Institute of Ecology (Instituto Nacional de Ecología) (INE): responsible for planning, research and development, conservation of national protection areas, and promulgation of environmental standards and regulations.
- Federal Prosecutor for the Protection of the Environment (Procuraduría Federal de Protección al Ambiente [PROFEPA]): responsible for enforcement, public participation, and environmental education.
- National Water Commission (Comisión Nacional del Agua [CONAGUA]) (CAN): responsible for assessing fees related to waste water discharges.
- Federal delegation or state agencies of SEMARNAT.

SEMARNAT and its sub-departments, in conjunction with decentralized offices, are responsible for supervision and oversight of the following four main areas.

- Preservation and sustainable development of ecosystems and biological diversity.
- Pollution prevention and control.
- Hydrological resources integral management.
- Climate change.

Mexico's environmental protection system is based on the General Law of Ecological Equilibrium and the Protection of the Environment (Ley General de Equilibrio Ecológico y la Protección al Ambiente [LGEEPA]). Under LGEEPA, numerous regulations and standards for environmental impact assessment, air and water pollution, solid and hazardous waste management, and noise have been issued.

Environmental laws require the filing and approval of an environmental impact statement (Manifestación de Impacto Ambiental [MIA]) for all exploitation work and for exploration work that does not fall within the threshold of a standard issued by the Federal Government for mining exploration. Environmental permitting for exploitation, absent any strong local opposition to the project, can usually be achieved in less than one year.

Mining companies must obtain a Federal environmental license (Integrated Environmental License [Licencia Ambiental Unica] [LAU]), which sets out the acceptable limits for air emissions, and hazardous waste and water impacts, as well as the environmental impact and risk of the proposed operation.

4.2 Mineral Tenure

Per the Galicia Abogados (2017) law firm's *Project Latitude* | *Mining Claims* memo, the Los Filos mine property holds 30 exploitation and exploration concessions in active mining areas totaling 10,433 ha. All the concessions are located within the municipality of Eduardo Neri, Guerrero, Mexico. Concessions are granted for 50-year durations; the expiration dates vary depending on the date of grant of the concession. Renewal dates range from 2032 to 2060. Mineral duty concessions are listed in Table 4-1. All concessions are held in the name of Desarollos Mineros San Luis, S.A. de C.V. (DMSL), an indirectly wholly owned Goldcorp subsidiary (Figure 4-1 and Table 4-2).

Table 4-1: Mineral Concessions Duty Payments

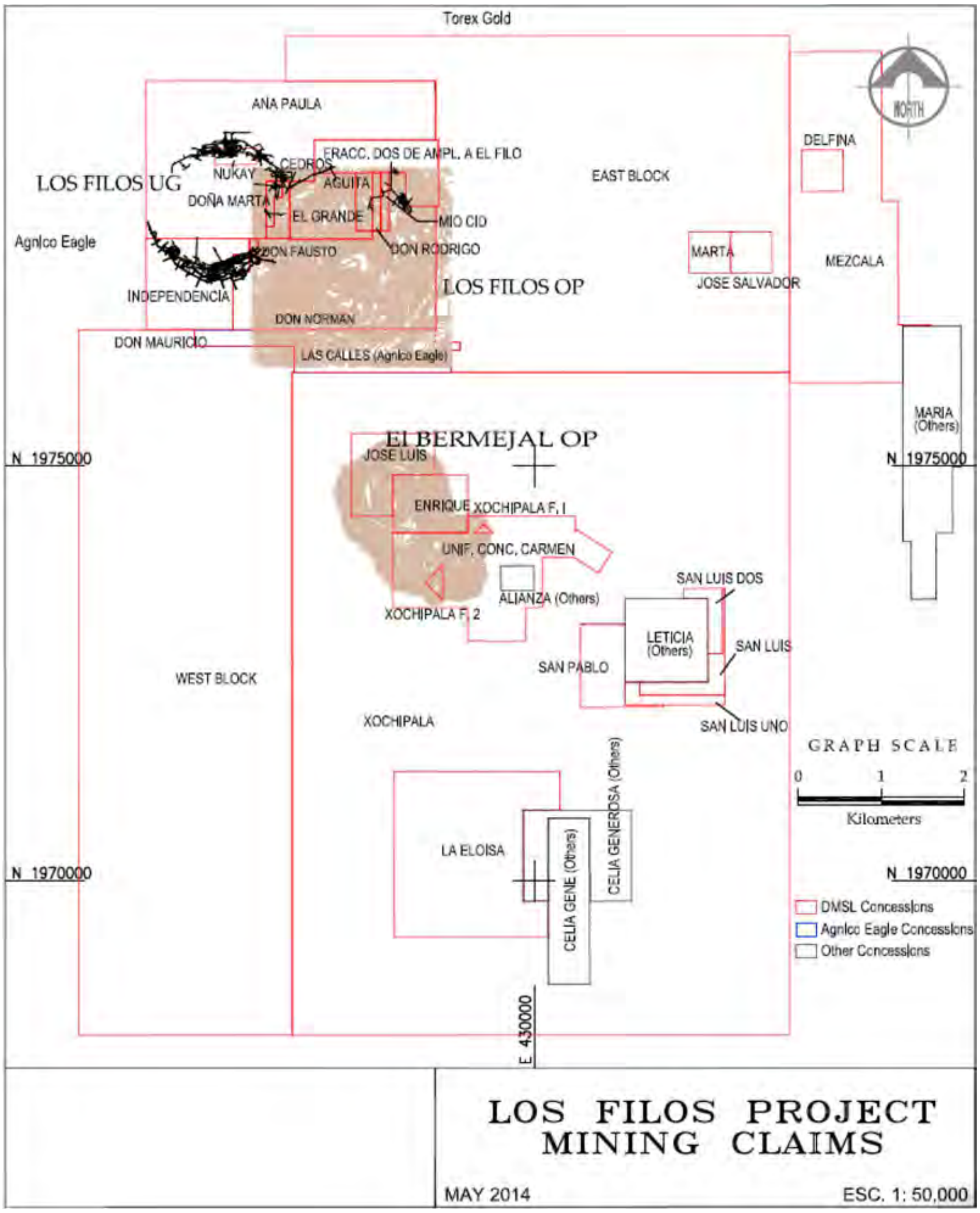
Description	January 2017 ('000)	July 2017 ('000)	Total 2017 ('000)
Los Filos Mine Property Concessions	US$91	US$91	US$182
Guerrero Sur Concessions	US$42	US$42	US$84
Concessions in Process (Guerrero Sur)	US$48	US$48	US$96
Total	**US$181**	**US$181**	**US$362**

Including the 30 concessions that cover the entire active mining areas, DMSL holds a total of 39 exploitation and exploration concessions located in Guerrero State, Mexico (Figure 4-2 and Table 4-3). The total area of all 39 concessions is 148,908 ha, including two concessions that are currently in the process of being purchased.

Under the Mexican Federal Rights Law, duty amounts for mineral concessions are updated on an annual basis. Duty payments for 2016 were made, and payments due for 2017 will be due in January and July. The total payments in 2017 are estimated to be US$182k each for the Mine property, US$84k for the additional seven regional properties, and US$96k for the concessions that are in process. Duties for concessions in process will be paid once the title is received.

Per Mexican requirements for grant of tenure, the concessions comprising the Mine have been land surveyed by a licensed surveyor.

Figure 4-1: Los Filos Mine Property Map

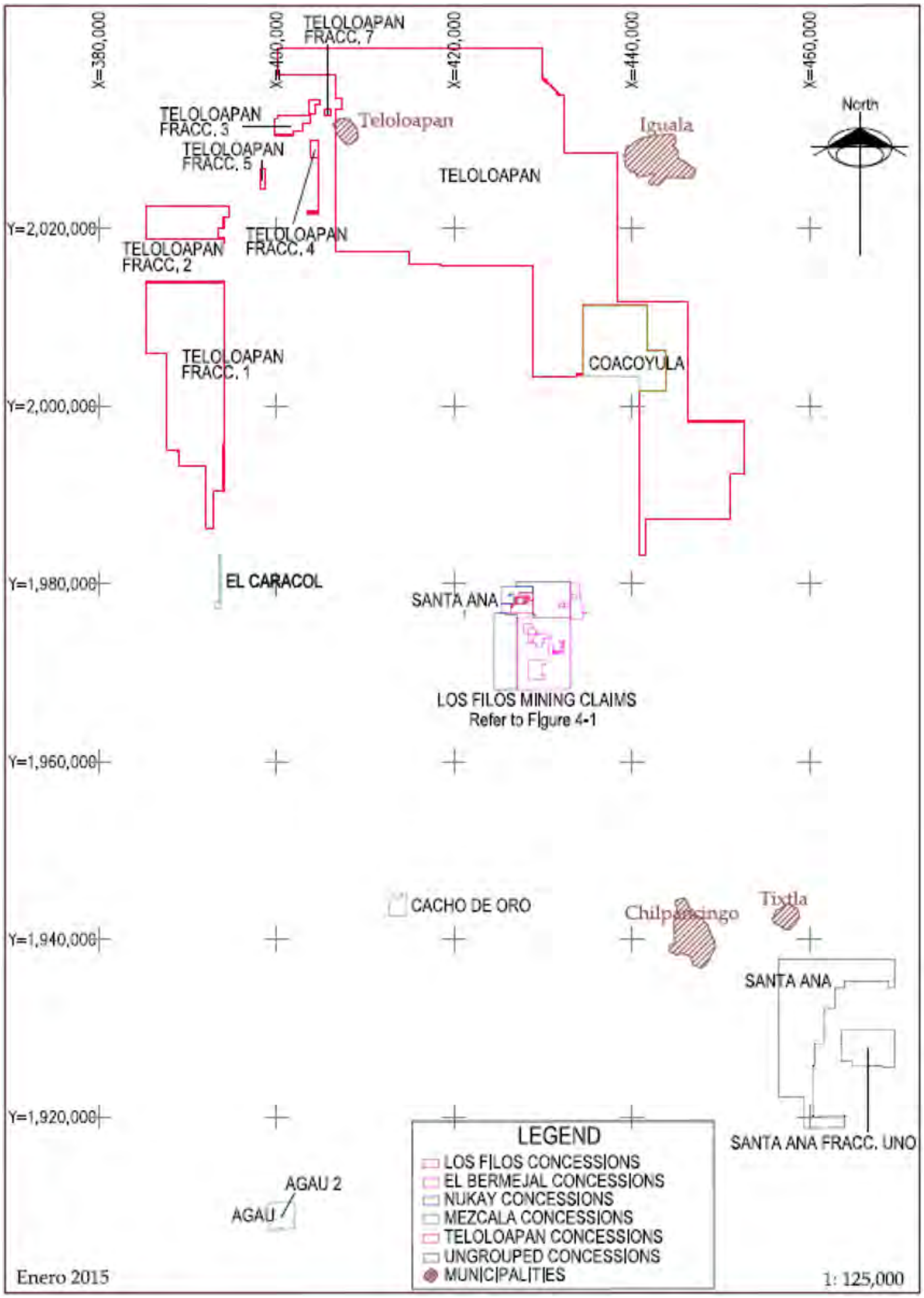


Note: Figure prepared by Stantec, 2016.

Table 4-2: Los Filos Mine Property Tenure Summary

Concession		Validity		Holder Name	Area (ha)
Name	Title	From	To		
Nukay	171533	20-10-1982	19-10-2032	DMSL	10.0
Fracc. 2 de Ampl. a El Filo	171534	20-10-1982	19-10-2032	DMSL	76.0
Unificación Concepción Carmen	172677	28-06-1984	27-06-2034	DMSL	223.3
Enrique	187015	29-05-1990	28-05-2040	DMSL	63.0
Mio Cid	204067	13-10-1989	12-10-2039	DMSL	7.0
Don Mauricio	204068	13-10-1989	12-10-2039	DMSL	119.5
Don Rodrigo	204069	13-10-1989	12-10-2039	DMSL	7.0
Ana Paula	204137	13-10-1989	12-10-2039	DMSL	440.4
La Eloisa	208816	15-12-1998	14-12-2048	DMSL	345.4
Cedros	213075	13-10-1989	12-10-2039	DMSL	12.0
Doña Marta	213076	13-10-1989	12-10-2039	DMSL	7.5
Don Norman	213077	13-10-1989	12-10-2039	DMSL	290.2
Independencia	213078	13-10-1989	12-10-2039	DMSL	4.0
Don Fausto	213079	13-10-1989	12-10-2039	DMSL	2.0
San Luis Dos	216106	09-04-2002	08-04-2052	DMSL	17.4
Xochipala Fracc. I	216166	12-04-2002	11-04-2052	DMSL	1.1
Xochipala Fracc. II	216167	12-04-2002	11-04-2052	DMSL	4.4
San Luis Uno	216168	12-04-2002	11-04-2052	DMSL	17.0
Xochipala	217850	23-08-2002	22-08-2052	DMSL	4,013.6
San Pablo	219804	11-04-2003	10-04-2053	DMSL	55.2
San Luis	220241	25-06-2003	24-06-2053	DMSL	25.0
Delfina	236761	27-08-2010	26-08-2060	DMSL	25.0
Marta	236762	27-08-2010	26-08-2060	DMSL	25.0
Jose Salvador	237117	29-10-2010	28-10-2060	DMSL	25.0
Jose Luis	237118	29-10-2010	28-10-2060	DMSL	75.0
El Grande	237119	29-10-2010	28-10-2060	DMSL	63.0
Agüita	237120	29-10-2010	28-10-2060	DMSL	14.0
East Block	242454	15-10-2013	13-12-2054	DMSL	1,799.9
West Block	242455	15-10-2013	13-12-2054	DMSL	2,197.0
Mezcala	217505	16-07-2002	15-07-2052	DMSL	468.1
Total Area Covered					**10,433.0**

Figure 4-2: Regional Property Tenure Map



Note: Figure prepared by Stantec, 2016

Table 4-3: Regional Property Tenure Summary

Concession		Validity		Holder Name	Area (ha)
Name	Title	From	To		
Agau	218086	03-10-2002	02-10-2052	DMSL	880.4
El Caracol	218944	28-01-2003	27-01-2053	DMSL	94.0
Agau 2	219349	27-02-2003	26-02-2053	DMSL	9.0
Santa Ana	219350	27-02-2003	26-02-2053	DMSL	10.0
Cacho de Oro	221096	19-11-2003	18-11-2053	DMSL	425.0
Coacoyula	234177	05-06-2009	04-06-2059	DMSL	6,816.9
Santa Ana	238964	11-11-2011	10-11-2061	DMSL	10,510.7
Santa Ana Fracc. Uno	In Progress				2,373.5
Teloloapan	In Progress				117,355.8
Total Area Covered					**138,475.4**

4.3 Surface Rights

Los Filos secured a total of 4,246 ha to cover surface rights required for the Los Filos mine, including the area of both open pits, underground mine portals, process and ancillary facilities, roads, services, and a buffer area to allow for any future growth and potential exploration targets (Galicia Abogados, 2017).

A total of 1,418 ha of surface rights have been secured by acquisition of private and public land, 2,774 ha have been secured by entering into temporary occupation agreements with surrounding communities and 54 ha through a lease with a private owner. Agreement payments are made on an annual basis, with the annual payment amount linked to gold prices. Agreements are typically 5 to 30 years in duration. Currently, temporary occupation agreements are renegotiated every 5 years, the term of the agreements is in Table 4-4 (Galicia Abogados, 2017).

Table 4-4: Current Surface Rights with Temporary Occupation Agreements

Community		Surface Rights Area (ha)	Land Use	From	To
Mezcala		1305.34	Exploitation	October 2016	September 2024
Carrizalillo	Common Land	790.90	Exploitation	April 2014	March 2019
	Parcel	537.75	Exploitation	April 2010	April 2039
Xochipala	Common Land	140.00	Exploration	June 2015	June 2017
Total Temporary Occupation		2773.99			

Source: Galicia Abogados, 2017

All land agreements, either acquisition or temporary occupation, have been sanctioned by the relevant State or Federal agencies. All the titles and contracts are on file at Los Filos site and at Goldcorp's Mexican corporate office.

The existence in Mexico of a communal form of agrarian land ownership called "ejidos" and "comunidades agrarias" can present challenges for surface land use. Ejidos are communal farms where individuals may have surface rights to specific plots of land; however, members of the ejido as a whole must make most land-use decisions. Ejidos and comunidades agrarias together cover about one-half of the Mexican territory; the remaining half is legally defined as “Pequeña Propiedad” (private property).

Private property and "propiedad social" (ejidos and comunidades) exist in the Los Filos areas. Temporary Occupation Agreements were entered with the appropriate ejidos and comunidades, and selective private property purchases and leases were completed to ensure continuation of mining activities.

4.4 Taxation, Royalties, and Encumbrances

Mexico has been a party to the North American Free Trade Agreement (NAFTA) since 1994, and thus has a tax and trade regime comparable to the USA and Canada. Mexico operates under western-style legal and accounting systems, with a contemporary taxation system.

Corporate Income Tax

The highest income tax rate applicable to corporations and individuals in Mexico was increased from 28% to 30% on 01 January 2010. The Los Filos mine has a 30% Federal corporate income tax rate.

Mining Royalties

Production costs include two mining royalty taxes payable to the Federal Government of Mexico.

- A 7.5% royalty tax, which has been applied. The tax is calculated on a base of earnings before interest, taxes, depreciation, and amortization (EBITDA).
- A 0.5% gross revenue royalty tax levied on revenue from gold and silver sales.

NSR Royalties

Net Smelter Return (NSR) royalties are applicable to mining from five concessions of the Mine property. See Table 4-5.

Table 4-5: Net Smelter Return Royalties Payable by Concession

Concession Name	Title No.	Issuance Date	Expiry Date	Surface Area (ha)	NSR Royalty Payable to (%):	
					SGM[1]	LC MINES[2]
Xochipala Fracc. I	216166	12-Apr-02	11-Apr-52	1.110	3.0	-
Xochipala Fracc. II	216167	12-Apr-02	11-Apr-52	4.375	3.0	-
Xochipala	217850	23-Aug-02	22-Aug-52	4,013.585	3.0	-
East Block	242454	14-Dec-04	13-Dec-54	1,799.888	2.5	0.75 to 1.75
West Block	242455	14-Dec-04	13-Dec-54	2,196.956	2.5	0.75 to 1.75

[1] Royalties payable to Servicio Geológico Mexicano (SGM) a department of the Mexican Federal Government.

[2] Royalties payable to LC Mines S.A. de C.V., a subsidiary of Agnico-Eagle Mines Limited

No NSR royalties have been included in the LOM economic analysis, as these concessions are located outside the current mining areas and are not envisaged to be mined during the current LOM plan.

4.5 Agreements

DMSL holds 100% of the Mine property and Regional Properties. Property agreements are discussed in Section 4.3.

4.6 Permits

All necessary permits required for the Mine are current and are further discussed in Section 20.0.

4.7 Environmental Liabilities

The Mine has an estimated site rehabilitation and closure cost of $50.7 million. (A detailed cost summary can be found in Table 20-4.) Bonding requirements under Mexican regulatory requirements have been met. Current environmental liabilities are those normally associated with active underground and open pit mining operations feeding a heap leach facility. Additional details are provided in Section 20.0.

4.8 Comments on Property Description and Location

In the opinion of the Qualified Persons, the information discussed in this section supports the declaration of Mineral Resources and Mineral Reserves, based on the following.

- At the Effective Date of this Report, the concessions that constitute the Mine property are wholly owned by “Desarrollos Mineros San Luis S.A. de C.V.” (DMSL), a Mexican company indirectly wholly owned by Goldcorp.
- Information provided by Gailica Abogados supports that the mining tenure held is valid and the area covered is sufficient to support the declaration of Mineral Resources and Mineral Reserves.
- The Mine holds sufficient surface rights in the area to support the mining operations, including access and power line easements.
- The Mine holds the appropriate permits under Local, State, and Federal laws to allow mining operations.
- The Los Filos LAU is based on an approved MIA, an environmental risk study, and a land use change authorization.
- Annual land usage and environmental compliance reports have been submitted.
- Appropriate environmental permits have been granted for the Mine by the relevant Mexican Federal and State authorities.
- At the Effective Date of this Report, environmental liabilities and compliance issues are limited to those that would be expected to be associated with an operating gold mine where production occurs from open pit and underground sources, including roads, site infrastructure, heap leach, waste dumps, and disposal facilities.
- Stantec is not aware of any significant environmental, social, or permitting issues that would prevent continued exploitation of the mineral deposits on the Mine property.
- Site closure costs are appropriately funded by allocating a percentage of sales revenue.
- To the extent known, there are no other significant factors or risks that may affect access, title, or the right or ability to perform work on the property.

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY

5.1 Accessibility

The Los Filos mine site is in Guerrero State, Eduardo Neri Municipality. The Mine is accessible from Highway 95, a major paved highway between Mexico City and Acapulco. At the town of Mezcala, a paved road leads to the Los Filos mine property. Driving time to site from Mexico City is approximately 4 hours.

The Los Filos mining operation has a 1,200 m long paved private landing strip within the site. Flights take off from Cuernavaca Airport or Toluca, and the flight time from Cuernavaca or Toluca is approximately 30 minutes.

5.2 Climate

The Mine property is in a tropical arid zone. Topographic variations result in different climate types at the property, as follows:

- Very hot semi-dry: this is the prevailing climate at the site. The average annual temperature ranges from a high of 22 °C to a low of 18 °C.
- Hot sub-humid: this is the second-most predominant climate at the site. The average annual temperature ranges from 22 °C to 26 °C.
- Semi-hot sub-humid: this climate type also exists at the site. The average annual temperature ranges from 18 °C to 22 °C, with a temperature during the coldest month higher than 18 °C.

The average annual precipitation is 900 mm. The months with the most rainfall are June through September. Very little precipitation (less than 5% of the average annual rainfall) occurs from November to April. However, the Mine property area can be affected by tropical storms and hurricanes that can result in short-term high-precipitation events.

The predominant wind direction throughout most of the year is from the north-northwest.

Mining operations are conducted year-round.

5.3 Local Resources

Supplies and Personnel

The Mine property is located near several centers of supply for materials and workers. The closest communities to the Mine are Carrizalillo, Mezcala, Mazapa, Xochipala, Zumpango, Chilpancingo, and Iguala. Currently, 1,429 persons are employed on site as unionized workers, non-unionized employees, and independent contractors.

Surface Water

The Mine property is in Hydrologic Region 18 in the Rio Balsas basin, which covers 22.66% of the total area of Guerrero State. The Rio Balsas is the only perennial surface water course near the Mine property and is located approximately 4 km from the northern boundary of the Mine property. The Rio Balsas, which supplies water to the Mezcala pumping station near the town of Mezcala, drains an area of 46,530 km². Rio Balsas Basin water is used for water supply for ore beneficiation processes. The estimated volume of water obtained from the Rio Balsas Basin is 46 L/s.

The most important tributaries in the area are the Xochipala and Mazapa streams, both of which join the Rio Balsas on its southern margin.

The Los Filos mine operations are located within a small watershed, approximately 60 km², bounded by the Los Filos watershed to the east, the La Lagunilla hill to the north, the Azul and El Ocotal hills to the west, and the El Cedral hill to the Southeast. Within this watershed, the main course is the shallow Carrizalillo stream whose head is 1–2 km south of the town of Carrizalillo and which flows northward to become the Mazapa stream.

Water from the Mazapa stream is mainly used for livestock consumption.

Watersheds located east of the Los Filos pit drain into Cuauhtepetl Canyon, which opens approximately 8 km east by the Xochipala stream. The Xochipala stream flows intermittently toward the north and is a tributary to the Rio Balsas, in the town of Mezcala. This stream remains dry throughout the year and even during the rainy season, except during storm events.

A small area in the northern section of the Mine property drains to the Tepegolol Canyon, which leads directly to the Rio Balsas, approximately 3 km downstream of the town of Mezcala. Surface flows from Tepegolol Canyon are intermittent and only flow during severe storm events.

5.4 Infrastructure

The Mine has power, water, and communications infrastructure in place. Power is supplied under a self-supply agreement with a subsidiary of InterGen from a combined cycle, natural gas-fired power station located in San Luis de Paz, Guanajuato State. A power transportation agreement with the government utility service, Comisión Federal de Electricidad (CFE), provides backup supply and transfers power from InterGen's power plant to the Mine's power substation. Process and potable water for the Mine is sourced from a large well adjacent to the Rio Balsas located 1.5 km west of Mezcala. Site communications include satellite service, using VoIP (for telephones) and internet protocols (for regular computer business). The open pit and underground operations use two-way radio communications, and the open pit uses a GPS-based automated truck dispatch system.

Additional infrastructure information, including water, power, and a mine site layout plan, is contained in Section 18.0.

5.5 Physiography

The Mine property is characterized by large limestone mountains, divided by wide valleys. The slopes of the hills vary from very flat (5%–10%) to steep slopes (50%). Mountain slopes have sparse vegetation, while the valley bottoms are generally farmed.

The maximum elevation in the Mine property is the summit of El Bermejal Hill, at 1,820 masl. The minimum elevation is the valley, where the gold recovery plant is located, at 1,360 masl.

A total of 255 plant species was identified near the Mine property. Three species are protected under Mexican Standard NOM-059-SEMARNAT-2001. These species are all located outside of the mining disturbance areas and have not been impacted by the Mine. Five plant species of commercial interest were identified on the Mine property. Current mining and construction activities have resulted in clearing of vegetation.

A total of 103 fauna species was identified in the region, most of which were birds. The Mine property lies on a migratory route for two bird species (la paloma de ala blanca and la huilota).

5.6 Comments on Accessibility, Climate, Local Resources, Infrastructure, and Physiography

In the opinion of the Qualified Persons, the availability of power, water, communications facilities, and an existing workforce support the declaration of Mineral Resources and Mineral Reserves. Los Filos mine has obtained sufficient surface rights to support ongoing operations.

6.0 HISTORY

Los Filos

Much of the early exploration and mining activity in the area was focused on the neighboring Nukay claim prior to the discovery of the Los Filos mine in 1995. The Nukay mine is one of the earliest operations in the area, with first underground production in the period 1938–1940; however, there are no production records from this period. Minera Guadalupe S.A. de C.V. (Minera Guadalupe) was the operator of Nukay. Underground operations reopened in 1946 and continued until 1961, producing approximately 0.5 Mt at 18 g/t Au. A third period of exploitation occurred from open pit operations commencing in 1984. There is no production record from this period, either.

The Los Filos area was only subject to sporadic prospecting through the 20th century, until Teck Corporation (Teck) became interested in the Nukay property in 1993; they completed an agreement (the Nukay Agreement) with Minera Miral S.A. de C.V., which was in the process of buying out the owners of Minera Nukay, the holders of the Nukay mining license.

Minera Nuteck S.A. de C.V. (Minera Nuteck) was formed by Teck and Miranda Mining Development Corporation. Minera Nuteck conducted regional exploration and a drilling campaign around the Nukay operations, focusing on the potential for mineralized skarns around the target intrusives. The discovery hole for the Los Filos deposit was drilled in August 1995.

Work in 1996 focused on the delineation of the Los Filos and Pedregal prospects; these were subsequently recognized as one continuous deposit. In 1997, delineation drilling at Los Filos continued, and a first mineral resource estimate was produced. Teck undertook mineral resource estimate updates, preliminary mining studies, and metallurgical test work in the period from 1998 to 2002.

In November 2003, Goldcorp gained 100% ownership of Los Filos through the purchase of Miranda Mining Development Corporation (Miranda) and associated agreements with Teck. In 2004, additional delineation, drilling, geotechnical and environmental studies, and metallurgical test work was conducted to support feasibility-level studies on the mineralization. Mineral Reserves were declared for Los Filos in 2004.

Goldcorp also acquired the Nukay mine is 2008, which was subsequently integrated with the Los Filos operations as the Los Filos Underground mine.

Bermejal

The Bermejal deposit was initially overlooked by prospectors due to low gold grades at surface and negative results from diamond drilling by Draco and the Mineral Resources Council (Consejo de Recursos Minerales, currently: Mexican Geological Survey). Little attention was paid to this area until 1986, when geologists from Industrias Peñoles S.A. de C.V. (Peñoles) sampled jasperoids within an extensive oxidation zone on top of Cerro Bermejal. Gold values were outlined in association with the oxide zone and jasperoids. In 1988, geophysicists recognized strong magnetic and induced polarization anomalies, and in 1989 Peñoles started a detailed exploration program for bulk mineable gold deposits. Peñoles completed a mineral resource estimate and prefeasibility study in 1994 that envisaged a 13,000 t/d open pit and heap leaching operation.

During 2003, Wheaton River Minerals Ltd. evaluated the Bermejal deposit and conducted a due diligence review of the project. Subsequently, a number of pits and adits were excavated to obtain bulk samples for validation of the local grade estimates and to provide representative material for metallurgical test work.

On 22 March 2005, Goldcorp's wholly owned operating Mexican Company Luismin acquired the Bermejal gold deposit from Minera El Bermejal, S. de R.L. de C.V., a joint venture between Peñoles and Newmont Mining Corporation (Newmont).

Due diligence metallurgical studies on the Bermejal mineralization for heap leach amenability were initiated and additional diamond core drilling conducted to support mineral resource and mineral reserve estimates, and to support open pit mining studies.

Los Filos – Bermejal

In 2005, further metallurgical, geotechnical, and engineering studies were undertaken, which resulted in the integration of Bermejal and Los Filos into one comprehensive proposed mining operation.

Feasibility-level studies for Los Filos and Bermejal Open Pits and the Los Filos Underground were completed from 2005 to 2007. The current mining operations commenced in 2007.

An internal study was completed on the Bermejal Underground deposit to examine the potential for development as a new underground mine to augment existing production.

6.1 Production History

Open pit mining commenced at Los Filos in 2005. Underground production and the first gold pour commenced in 2007. Annual open pit ore production rates increased to over 20 Mt/a by 2008, with total mining (ore and waste) of over 45 Mt/a occurring from 2008 to 2015 (Table 6-1). Production from underground sources has varied from 280 t/d in 2009 to over 1,100 t/d in 2015 (Table 6-2).

Table 6-1: Open Pit Production Record 2005–2016

Year	Ore Produced (t)	Au Grade (g/t Au)	Waste (t)	Strip Ratio (waste to ore)
2005	79,968	0.78	3,682,223	46.05
2006	1,435,230	0.38	30,561,665	21.29
2007	8,383,675	0.64	26,816,273	3.20
2008	22,109,446	0.62	22,555,972	1.02
2009	24,984,922	0.61	28,655,310	1.15
2010	27,484,169	0.62	31,644,789	1.15
2011	26,271,849	0.68	39,663,262	1.51
2012	29,328,604	0.62	41,172,715	1.40
2013	27,362,485	0.63	45,805,227	1.67
2014	22,928,394	0.58	37,360,599	1.63
2015	18,349,859	0.65	43,862,008	2.39
2016	10,338,984	0.69	13,344,201	1.28

Table 6-2: Underground Mine Production Record 2007–2016

Year	Ore Produced (t)	Au Grade (g/t Au)
2007	141,496	7.05
2008	130,675	6.68
2009	97,367	5.70
2010	243,643	6.25
2011	309,047	6.15
2012	293,064	6.83
2013	319,681	6.94
2014	333,678	6.89
2015	388,212	6.89
2016	327,691	6.37

7.0 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geology

The Los Filos mine property is in the municipality of Eduardo Neri in the State of Guerrero, near the center of a large, approximately 200 km diameter circular-shaped feature known as the Morelos-Guerrero (sedimentary) Basin. The basin is a thick sequence of Mesozoic platform carbonate rocks successively comprising the Morelos, Cuautla, and Mezcala Formations. The carbonates were intruded by a number of early Tertiary-age granitoid bodies. These carbonate units are underlain by Precambrian and Palaeozoic basement rocks.

The Morelos Formation comprises medium- to thick-bedded fossiliferous crystalline limestones and dolomites. The lower contact is not exposed within the Mine property, but from available (Petroleos Mexcianos) PEMEX drill data, the Morelos Formation has a thickness of at least 1,570 m near the community of Mezcala.

The Cuautla Formation transitionally overlies the Morelos Formation. This formation comprises a succession of thin- to medium-bedded silty limestones and sandstones with argillaceous partings and minor shale intercalations.

The Mezcala Formation, in turn, transitionally overlies the Cuautla Formation and consists of a platform to flysch-like succession of interbedded sandstones, siltstones, and lesser shales, which have been extensively altered to hornfels near intrusive contacts.

The sedimentary succession was folded into broad north-south-trending paired anticlines and synclines because of east-vergent compression during the Laramide time (80–45 Ma). The Mine property area lies at the transition between belts of overthrust rocks to the west and more broadly folded rocks to the east. Most sedimentary rocks observed on the Mine property are of the Morelos Formation.

The Cretaceous sedimentary rocks and Tertiary granitoid intrusions are unconformably overlain by a sequence of Tertiary intermediate volcanic rocks and alluvial sedimentary rocks (red sandstones and conglomerates) that partially cover the region.

Regional structures include sets of northeast- and northwest-trending faults and fractures that cut both the carbonate sequence and the intrusive rocks. The distribution of intrusive bodies in northwest-trending belts is thought to reflect the control on their emplacement by preexisting northwest-trending faults (de la Garza et. al. 1996).

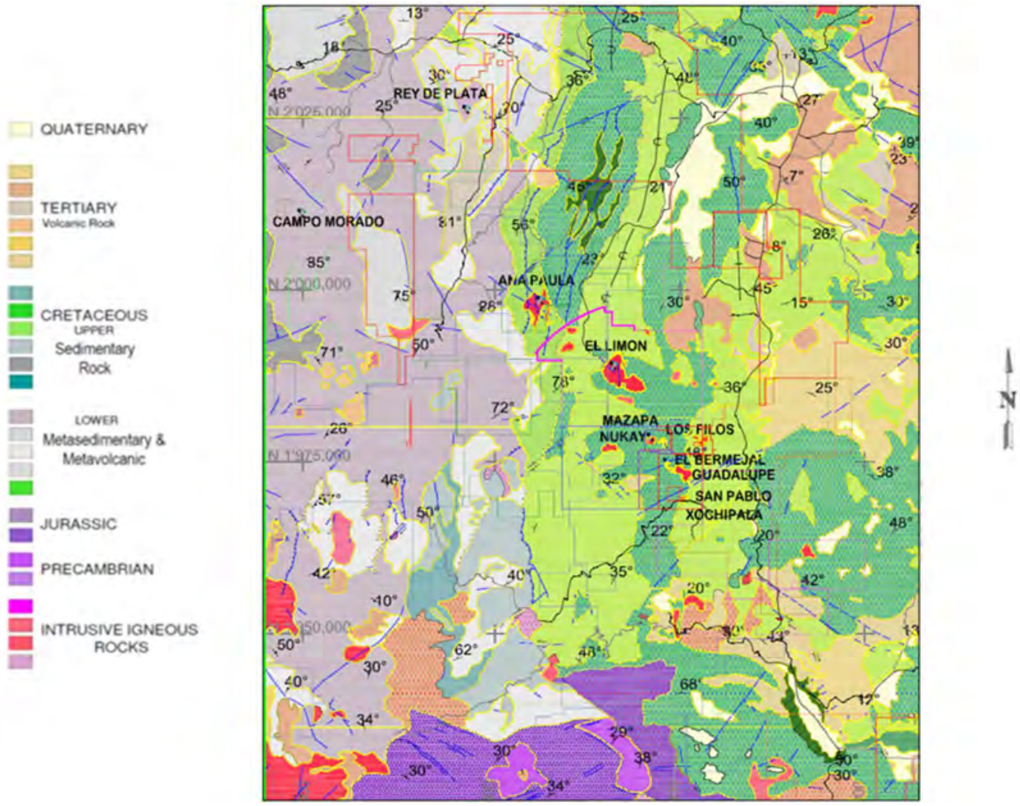
Dissolution of the carbonate rocks has resulted in extensive areas of karst topography consisting of numerous caverns and sinkholes. Typically, a mantle of caliche up to 10 m thick has developed on the carbonate rocks at surface.

7.2 Mineralization

Regional mineralization styles comprise skarn-hosted and epithermal precious metal oxide deposits, as well as volcanogenic massive sulfide deposits. In Guerrero, these occur as two adjacent arcuate belts, with the Guerrero Gold Belt lying to the east and on the concave margin of the massive sulfide belt. Both belts are approximately 30 km wide and over 100 km long, from northwest to southeast.

Figure 7-1 shows the major lithological units and ground holdings in the Guerrero Gold Belt.

Figure 7-1: Regional Geology Plan – Guerrero Gold Belt



Note: Figure prepared by Goldcorp, 2016.

Oxide skarn development occurs at or near the intrusive contact with the carbonate-rich Morelos Formation sediments on the Mine property. Garnet-rich skarn predominates at the base of the deposits with traces of silica grading upward to chlorite, and epidote plus abundant silica toward the top. Sericite is abundant but is restricted to the apexes of the stocks. The oxide skarn formation occurred in three stages, with late hydrothermal veining overprinting the sequence.

- Stage 1 Prograde Skarn: Consists of garnet-pyroxene endoskarn with lesser quantities of exoskarn, including massive magnetite, forming an envelope around the stock.
- Stage 2 Retrograde Skarn: Extensive chlorite-epidote, tremolite-actinolite, and phlogopite-serpentine assemblages with lesser talc, muscovite, and sericite predominate in the upper 400 m of the stock. This halo can be as much as 170 m wide within the intrusion.
- Stage 3 Late Skarn: Skarn consists of garnet veins that cut through both first-stage prograde and later retrograde skarn.
- Stage 4 Late Veining: Consists of two successive gold-bearing stages of silica as well as phlogopite and amphibole veins. Earlier quartz-pyrite-hematite veins were followed by quartz-pyrite, opal-chalcedonic quartz veins, and silica flooding along structures as well as within the intrusive matrix.

Pervasive jasperoids typically occur associated with the late veining stage, replacing skarn and intrusive rocks, and forming a silica cap.

7.3 Deposits

The locations of the major known deposits and mineralized zones naming hierarchy within Los Filos Mine property are illustrated in Figure 7-2 and Figure 7-3.

Figure 7-2: Los Filos Mine Deposit Hierarchy

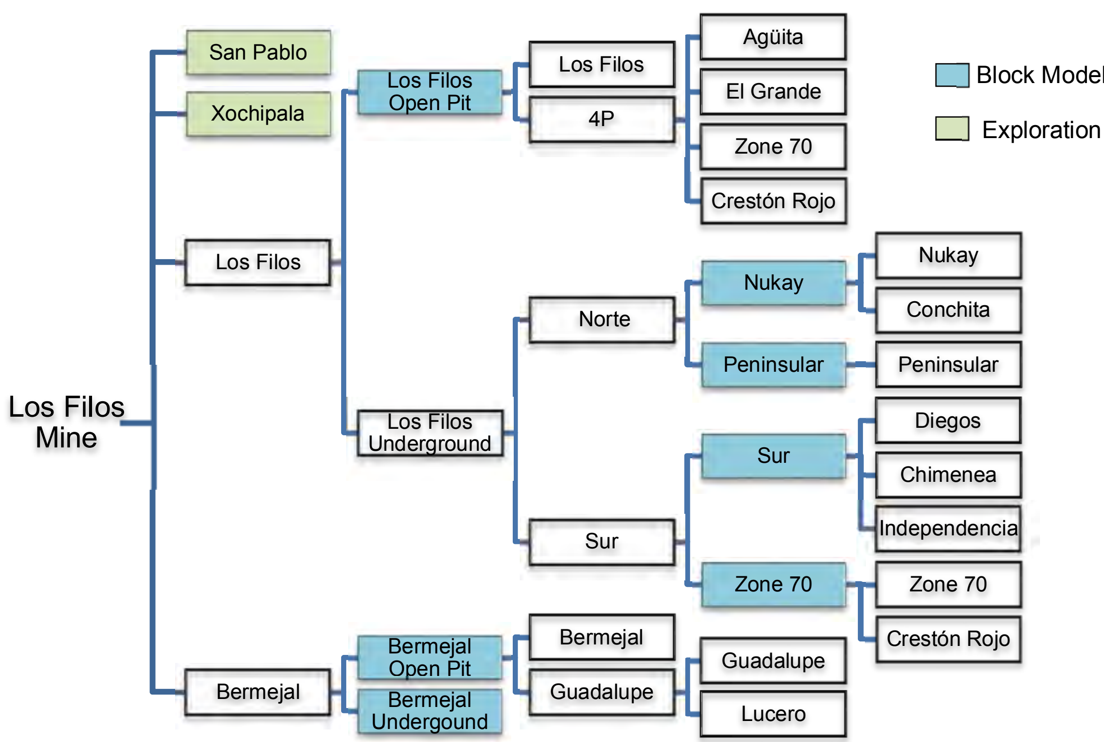
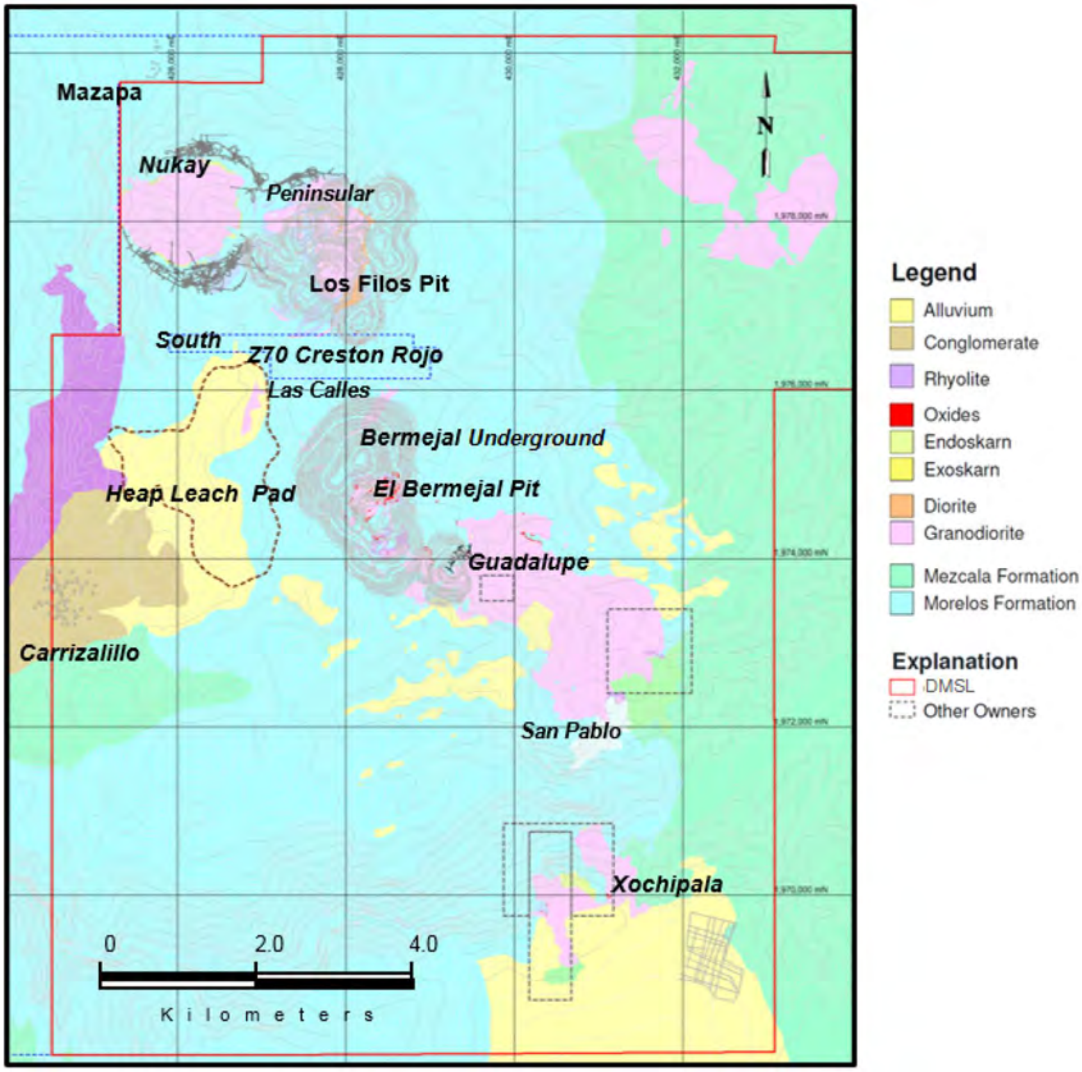


Figure 7-3: Geologic Map with Mine Locations



Note: Figure prepared by Goldcorp, 2016

Los Filos

The Los Filos Open Pit comprises the mineralization contained in Los Filos and 4P sectors. The 4P sector is further subdivided into the Agüita, El Grande, Zone 70, and Creston Rojo zones. The Los Filos Underground is the Nukay, Peninsular, Sur, and Zone 70 workings that were formerly known as the Los Filos Norte and Sur deposits. The underground workings currently incorporate several zones, including Independencia-Subida, Diegos, Nukay, Conchita, and Peninsular.

Bermejal

The Bermejal Open Pit includes mineralization mined in the Bermejal North and South sectors and the Guadalupe deposit. The Bermejal Underground includes material to be mined below the Bermejal Open Pit.

7.3.1 Los Filos

Los Filos

Lithologies

In the Los Filos area, mineralization is associated with two granodioritic stocks that were emplaced in carbonate rocks of the Morelos Formation. The stocks, known as East and West, are early Tertiary in age. The emplacement of the intrusions resulted in development of high-temperature calc-silicate and oxide metasomatic alteration (skarn) assemblages that were followed by distinct meso- to epithermal alteration. Hematite and magnetite are typical skarn minerals, but diopside, which is usually recognized in skarn assemblages, is not present. The Nukay and Sur deposits formed along the north and southern margins of the West stock (Figure 7-10 and Figure 7-11). The Peninsular and Zone 70 deposits formed on the northern and southwest margins of the East stock, respectively.

Figure 7-10 shows the area of the Los Filos Underground mine, with the workings projected to the geological surface. Figure 7-11 is a cross section through the mineralization exploited by the Los Filos underground workings.

The differing morphology of the East and West stocks is interpreted to reflect different structural controls during emplacement. The West stock is roughly circular and approximately 1.3 km in diameter. The East stock is elongate in a north-south direction and is approximately 1.4 km long and 0.5–0.7 km wide in the south; in the north, a western lobe extends for 1 km in a west-southwest to east-northeast direction.

The Los Filos deposit is hosted primarily by a diorite sill that dips from 20° to 50° to the east, away from the East stock (Figure 7-5 and Figure 7-6). The diorite was emplaced into a large, moderately dipping active structure that parallels bedding in the marble. The sill has a sigmoidal shape that starts out roughly flat at the stock, extends east at a moderate dip for approximately 200 m, turns south, flattens out, and extends to the Bermejal stock, located approximately 2 km to the south.

Contained within the sill are thin, discontinuous slabs of marble that dip with the sill. These slabs are interpreted to be structurally bound slivers of wall rock that were caught up in the diorite during emplacement. In the south-central portion of the deposit there is a semicircular gap in the sill, with core holes drilled in the gap showing only marble to depths of 250 m or more.

On the western edge of the sill, the diorite grades into granodiorite of the main intrusion (East stock). Erosion has exposed the upper portions of the sill along with some of the contained marble xenoliths.

Beneath the diorite sill, moderately east-dipping bodies and fingers of granodiorite project into the carbonate wall rocks away from the East stock, forming a lower sill that generally parallels the dip of the upper diorite sill. Over much of the deposit area, a thin sliver of marble lies between the upper diorite sill and the lower granodiorite sill. The lower-sill intrusive bodies extend, at most, halfway across the drilled cross sections. These intrusive projections become less pronounced with depth, and the stock becomes essentially vertical a few hundred meters below the sill.

In the north-central portion of the Los Filos deposit, several of the eastern-most core holes encountered thicknesses of several hundred meters or more of granodiorite above and below the diorite sill.

Alteration

Alteration associated with mineralization is extremely varied and ranges from high-temperature metasomatic to lower-temperature epithermal alteration. However, both beta-quartz (quartz-enriched) granodiorite and diorite sill rocks host the most characteristic and prevalent alteration types, which include the following.

- Orthoclase mantling, flooding, and veining.
- Quartz flooding and veining.
- Calcite veining.
- Sericite-illite-smectite-kaolinite alteration.
- Hypogene iron oxides, including hematite-specularite, and goethite.
- Sulfide mineralization, consisting of pyrite, chalcopyrite, arsenopyrite, bismuth minerals, and tetradymite.

Alteration affects both skarn and non-skarn rocks, and the intensity typically reflects the degree of fracturing of the host rock.

Metal Zonation

There is a distinct mineralogical zonation across the Los Filos deposit.

- Quartz veining is relatively dominant within or adjacent to beta-quartz granodiorites (i.e., the "proximal" part of the mineralized system).
- A transition zone in which quartz veining decreases sharply, while sulfide and calcite-quartz veining increases.
- Calcite veining is dominant toward the far edges of the diorite sill (i.e., the "distal" part of the system).
- Gold grades peak in the transition zone and coincide with the dominance of pure sulfide veins.

Relict pods and subsequently altered zones of massive magnetite dominate the exoskarn alteration around the West stock. The higher-grade gold values found in these iron skarn deposits, as in the Nukay, Subida, and Agüita zones, are interpreted to result from late-stage alteration overprinting the preexisting skarn body.

Mineralization

The East stock diorite sill hosts approximately 75% of the mineralization at the Los Filos deposit. Mineralization is structurally controlled by breccias and quartz-hematite-gold (± calcite) veins that occur relatively late in the paragenetic sequence and probably represent the last stage of hydrothermal activity in the deposit. The veins dip at moderate to steep angles (50°–80°), while the breccias dip more moderately (30°–40°). Both veins and breccias are developed preferentially within the intrusive rocks and their contacts with marble, although they may also occur in marble. The veins typically occur in clusters with spacings of 5–50 cm. The breccias tend to occur as isolated or bifurcating structures.

4P

The 4P portion of the greater Los Filos deposit comprises the El Grande, Agüita, Zone 70, and Crestón Rojo zones. Figure 7-4 provides an overview of the location of the deposits and the associated geology. Figure 7-7, Figure 7-8, and Figure 7-9 show schematic geological cross sections through the deposits.

Mineralization is hosted within Cretaceous-aged medium-bedded to massive fossiliferous limestone of the Morelos Formation. The carbonates were intruded by granodioritic plutons and related dioritic stocks and dike bodies, resulting in the formation of marble within the calcareous rocks and local development of calc-silicate endoskarn in the intrusive rocks. Pods of calc-silicate and iron-rich exoskarn in the marble formed along contacts. The deposits are adjacent to the East and West stocks.

El Grande

The El Grande Zone is situated in the northwest part of the East stock where numerous northeast-trending inliers of carbonates lie in a complex relationship with the intrusive rocks. A series of sections oriented northwest-southeast and a perpendicular set oriented southwest-northeast have been constructed, and interpretation of the lithologies on section indicates a series of stacked carbonate slabs that dip 10°–30° to the northwest, likely following the doming and intrusion-related low-angle structures that project away from the main borders of the stock. The carbonate inliers have been encountered in the upper portions of drill holes, with the lower parts of the same drill holes encountering only massive intrusive rocks. Zones of beta-quartz granodiorite occur within the lower, massive intrusive rocks, but not in the upper, mineralized, inter-slab intrusive bodies.

Alteration is similar to the other East stock deposits. The carbonate slabs show variable alteration from clean marble to pyroxene- and magnetite-replaced exoskarn, both with no oxidation and retrograde altered, with zones of later flooding by jasperoidal silica. Oxidized sericite-clay-silica-K-feldspar-sulfide-hematite alteration of the intrusive is strong and pervasive and likely follows the northwest-dipping low-angle structures.

Gold mineralization occurs in both the intrusive and the variably altered carbonate slabs. The gold zones tend to be thin and erratic and do not correlate well from hole to hole along lithologic contacts, although the mineralization may be following low-angle structures that crosscut the wall rock slabs.

Agüita

The Agüita lies along the north side of the east stock, where a thin band of iron skarn has formed along the north-south contact between the intrusion and marble. The mineralization extent is about 200 m along strike.

Zone 70

Zone 70, which lies to the northwest of Crestón Rojo, has been combined with Crestón Rojo for the purposes of resource estimation. Mineralization at Zone 70 occurs beneath the marble cap rock within a linear, northwest-trending ridge-like cupola of granodiorite that breaches the surface in a small, elliptical outcrop at the TNP095 drill site. Zones of beta-quartz granodiorite were noted in drilling and likely occur along south-dipping, low-angle structures.

Mineralization is associated with a late-retrograde event characterized by K-feldspar-sericite-clay-silica-sulfide-hematite alteration that overprints the retrograde-altered skarn suite. Significant Au values are present only in the highly oxidized material. Although Au values can be present in the beta-quartz granodiorite zones, usually in quartz-calcite-hematite breccia zones along structures, the grades tend to be low compared to the adjacent, strongly altered normal granodiorite. The higher Au zones appear to be preferentially developed above the beta-quartz granodiorite zones, as is seen in Los Filos. Higher gold values are typically found in zones of stronger clay-sericite alteration. Gold is also found in the thin bands of exoskarn that follow the contact, particularly in zones showing strong late-retrograde alteration to massive iron-oxides with the introduction of significant hematitic jasperoidal silica.

Crestón Rojo

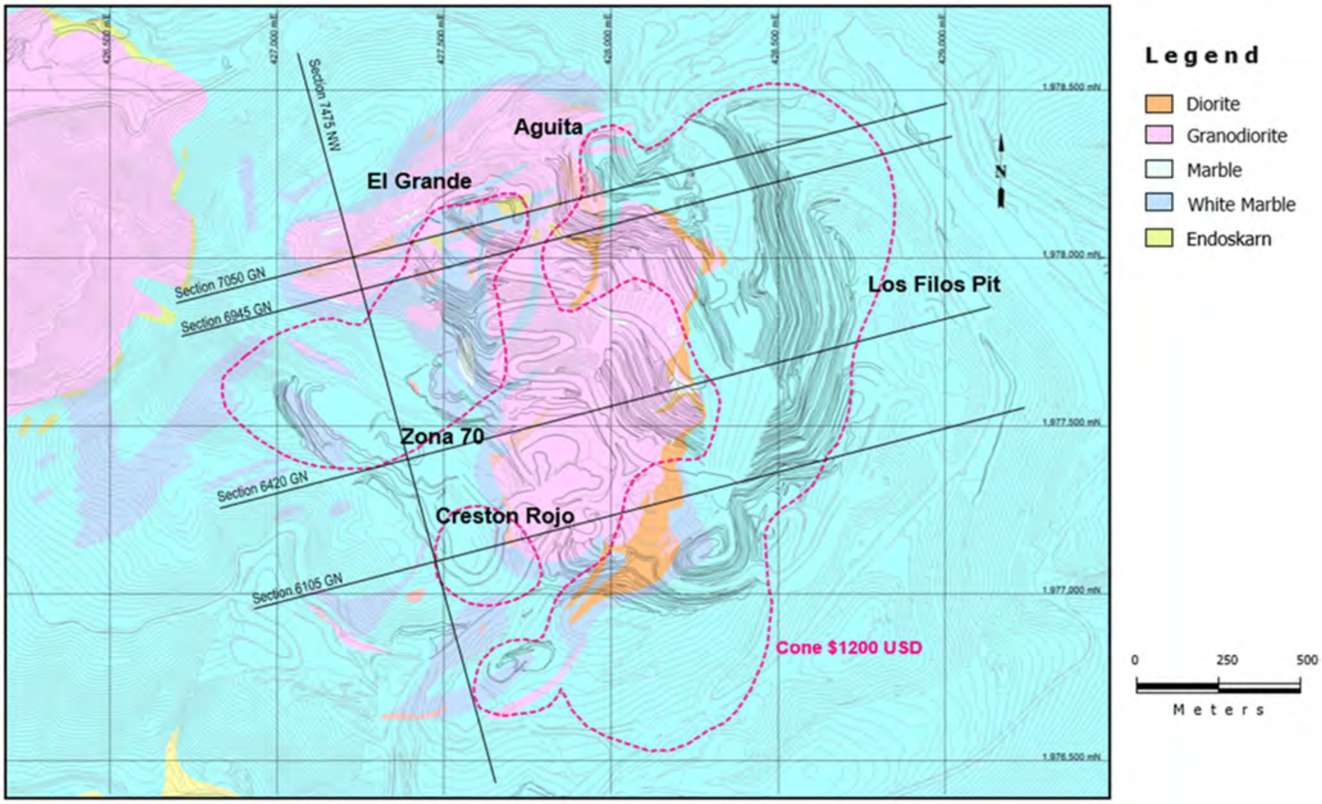
Granodiorite extends beneath the marble cap to the south and southwest away from the East stock and under the marble that covers the area. The intrusive rocks dip from 5° to 20° in the south along an undulating upper contact. In the northwestern area, the intrusion terminates abruptly, with the edge of the intrusive mass plunging up to 100 m vertically. The intrusion is tightly constrained, as drill holes have intersected primarily intrusive rocks as close as 30 m from holes that intersected all marble. The lower intrusive contact bends back flat to the north for 50 m beneath the intrusive sill before extending vertically again, forming a small, north-trending embayment beneath the main intrusive body.

To the southeast, the intrusive persists beneath 50 m to 200 m of marble capping beyond the limits of the drilling. In the very southern portion of the zone, the intrusion divides into several stacked, shallow-dipping sills ranging from 20–50 m in thickness that appear to represent a feathering of the intrusive body away from the main stock. Elsewhere, the intrusion is suggestive of a sill; however, drilling of up to 200 m of intrusive rocks in many of the holes failed to intercept a lower contact, except in places near the southeastern portion of the East stock where the intrusion is clearly resolved into several stacked sills, and in the southeastern part of the zone.

Skarn alteration of the marble is developed along most of the intrusive contacts and ranges from 10 m to 30 m in thickness. Virtually all skarn consists of massive magnetite replacement that has subsequently been oxidized to massive iron-oxide, and much has been replaced by later jasperoidal silica.

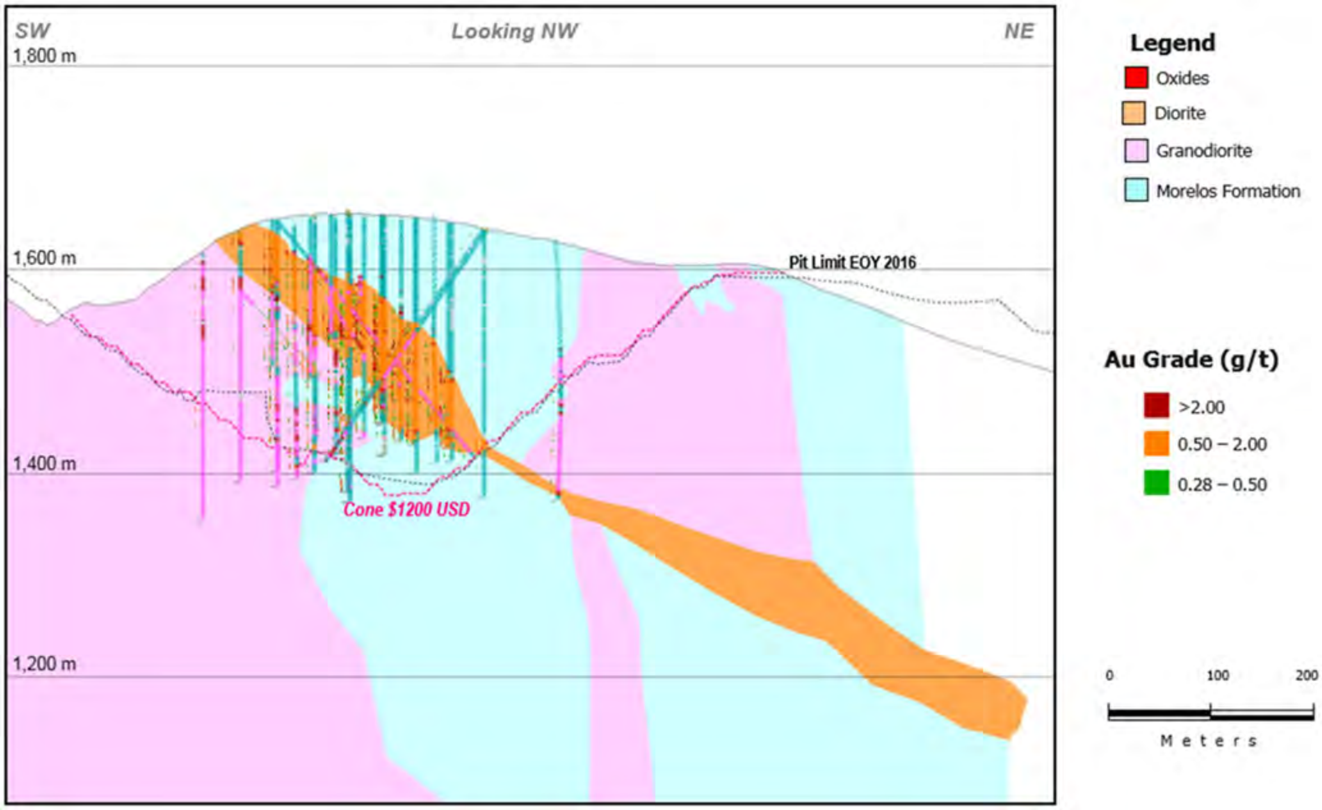
Gold mineralization is found both in the exoskarn and in the granodiorite and is associated with the clay-sericite-silica-K-feldspar-sulfide-hematite alteration typical of mineralization in the East stock intrusive rocks. Mineralization occurs as scattered, erratic zones with no clear continuity along lithologic projections. It is likely that the mineralization follows south-dipping, low-angle structures that are not readily evident in the drilling.

Figure 7-4: Los Filos Geology and Deposit Location Map



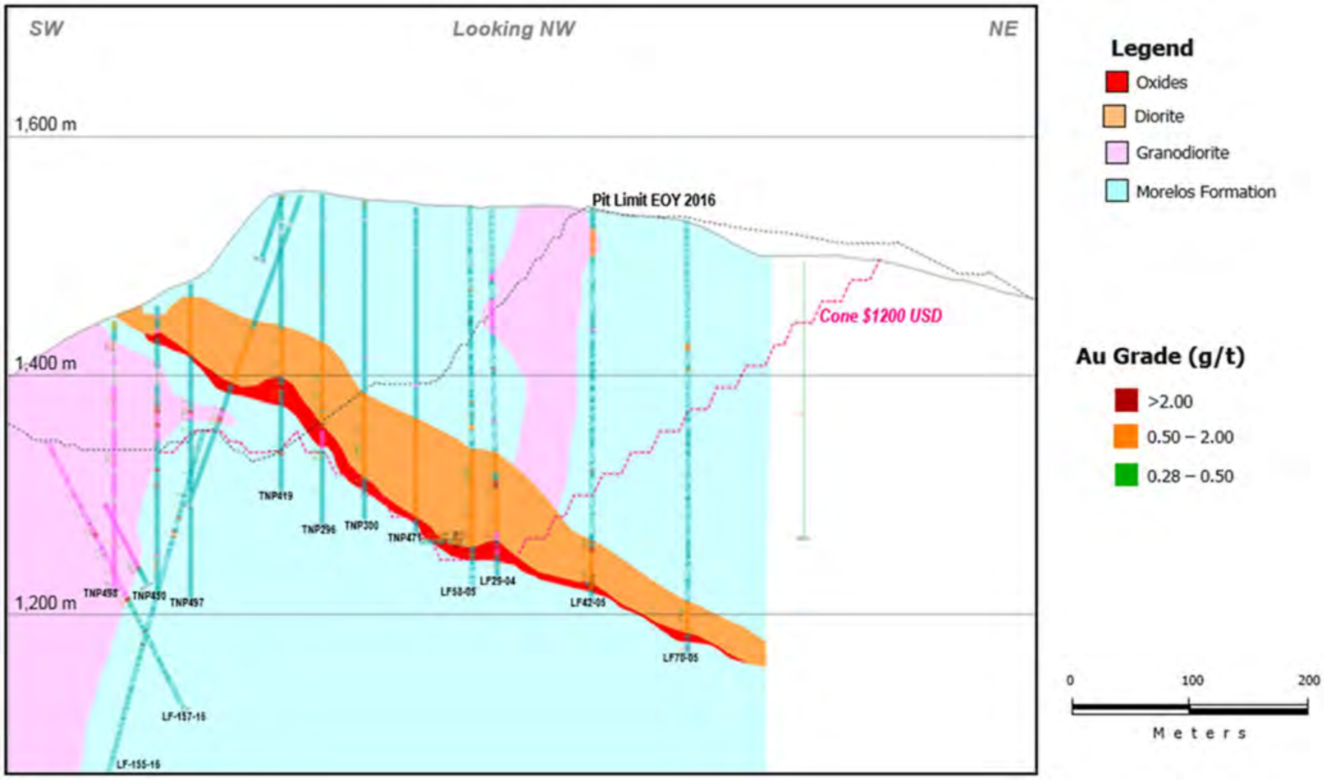
Note: Figure prepared by Goldcorp, 2016. Pit Shell limit shown at US$1,200 supports Mineral Reserve estimate in Section 15.0 of this Report and current as of 31 December 2016.

Figure 7-5: Lithological Cross Section 6420 GN, Los Filos Deposit



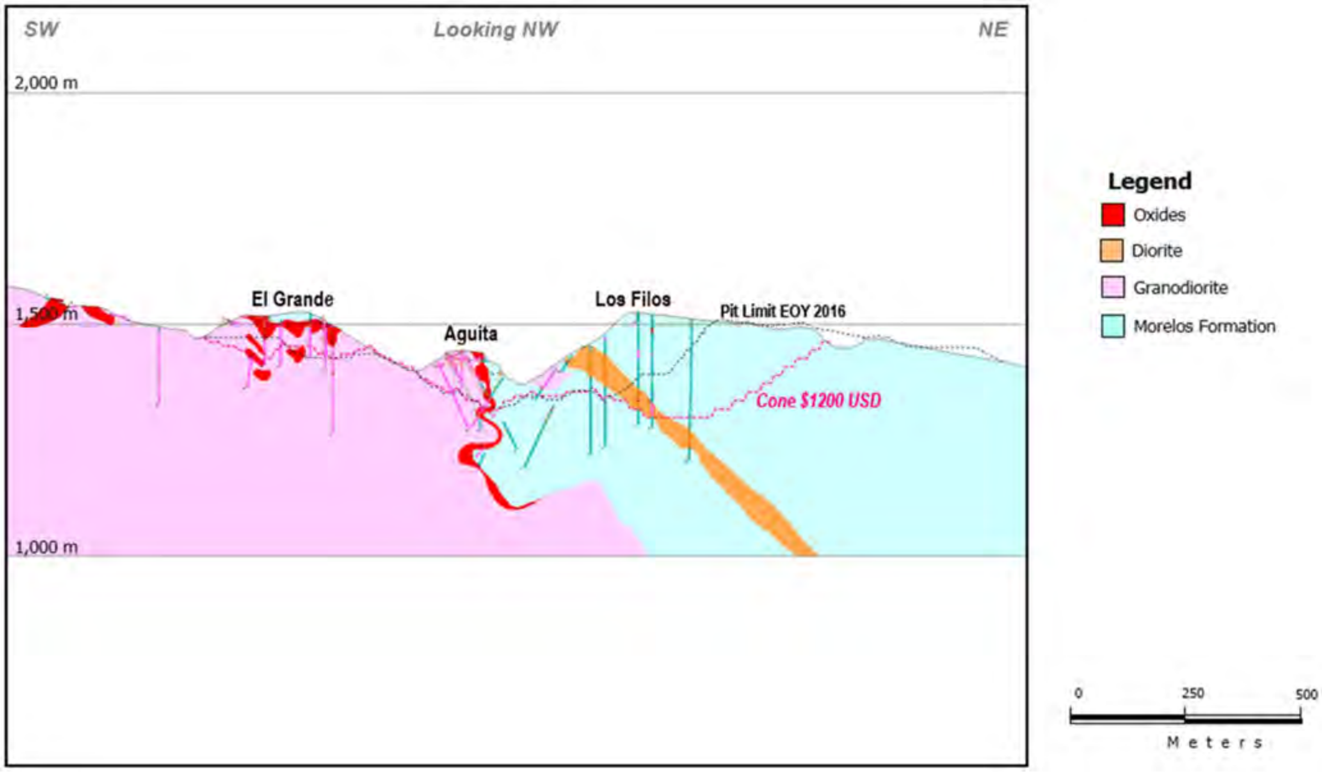
Note: Figure prepared by Goldcorp, 2016. Pit Shell limit shown at US$1,200 support Mineral Reserve estimate in Section 15.0 of this Report and current as of 31 December 2016.

Figure 7-6: Schematic Geological Cross Section 6945 GN, Los Filos Deposit



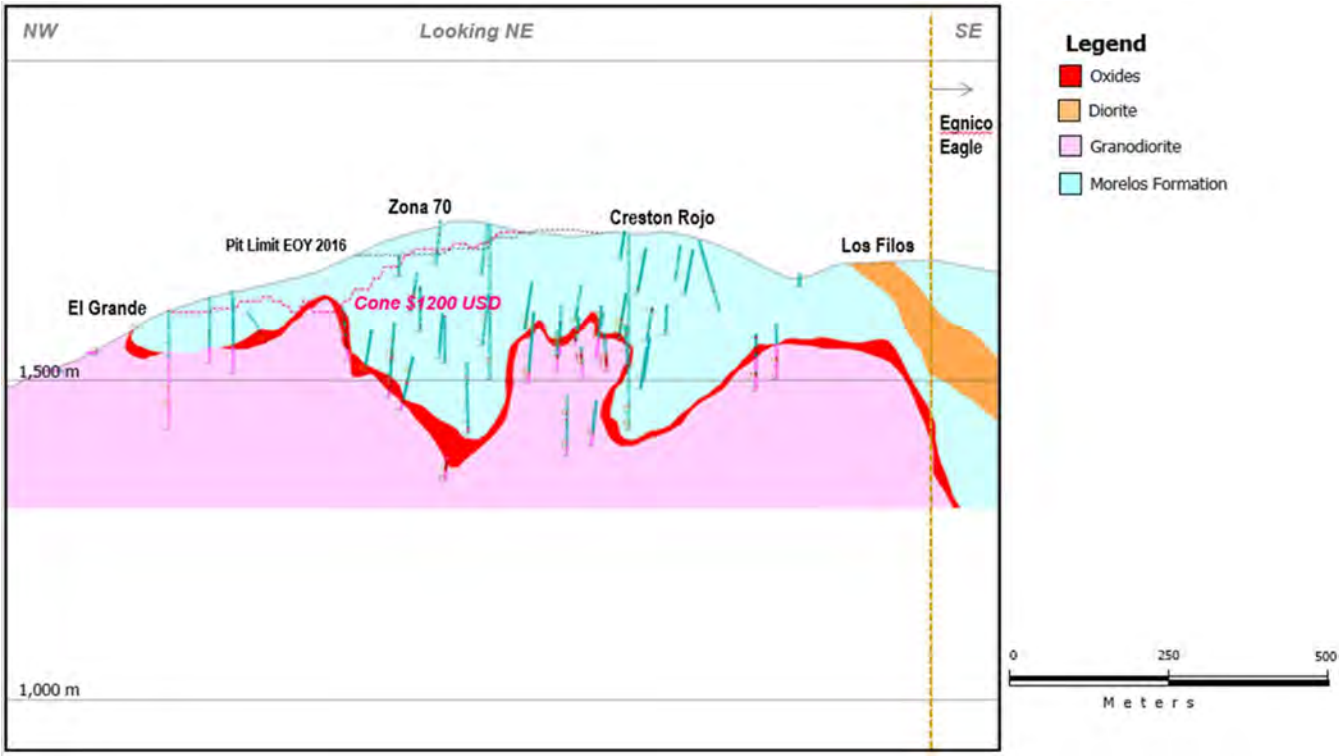
Note: Figure prepared by Goldcorp, 2016. Pit Shell limit shown at US$1,200 support Mineral Reserve estimate in Section 15.0 of this Report and current as of 31 December 2016.

Figure 7-7: Schematic Geological Cross Section 7050 GN, 4P Deposit



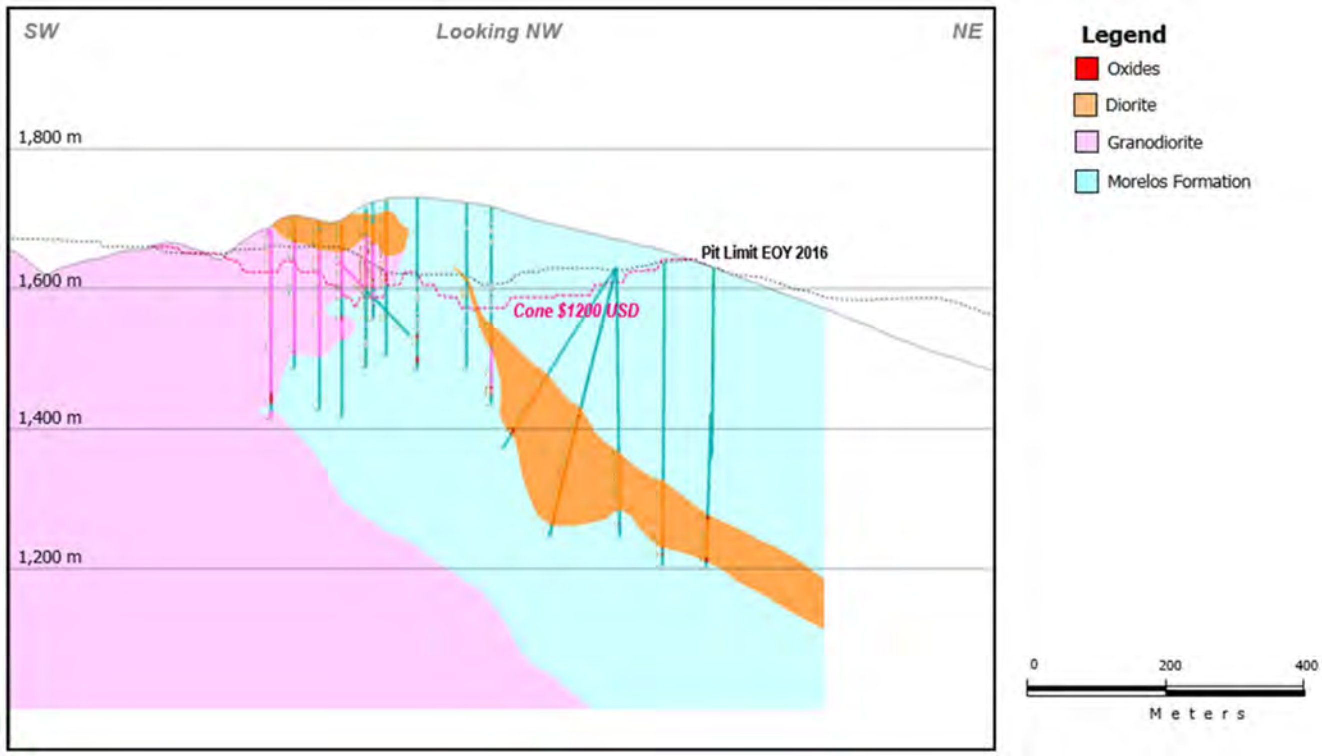
Note: Figure prepared by Goldcorp, 2016. Pit Shell limit shown at US$1,200 supports Mineral Reserve estimate in Section 15.0 of this Report and current as of 31 December 2016.

Figure 7-8: Schematic Geological Cross Section 7475 NW, 4P Deposit



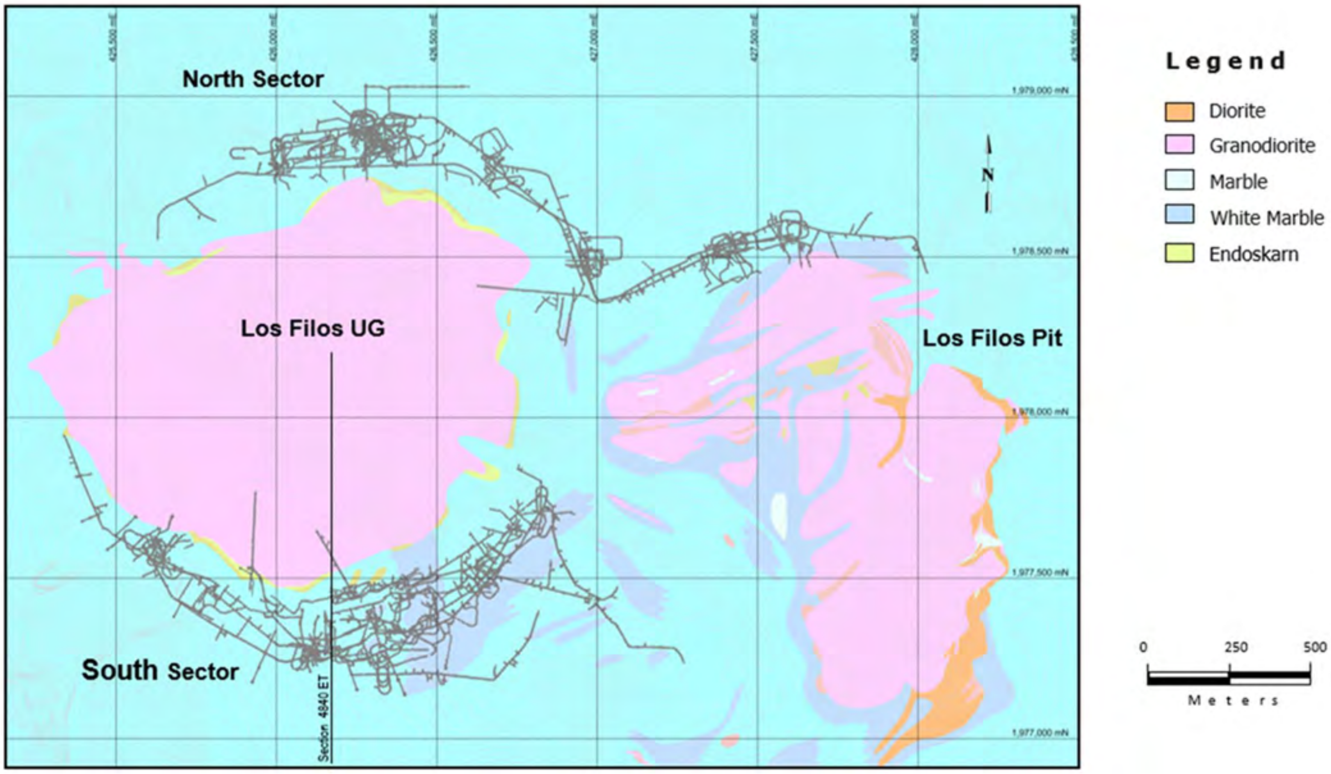
Note: Figure prepared by Goldcorp, 2016. Pit Shell limit shown at US$1,200 supports Mineral Reserve estimate in Section 15.0 of this Report.

Figure 7-9: Schematic Geological Cross Section 6105 GN, 4P Deposit



Note: Figure prepared by Goldcorp, 2016. Pit Shell limit shown at US$1,200 supports Mineral Reserve estimate in Section 15.0 of this Report and current as of 31 December 2016.

Figure 7-10: Los Filos Underground – Geology and Deposit Location Map



Note: Figure prepared by Goldcorp, 2016. Underground workings, current as of 31 December 2016, are shown projected to surface.

Figure 7-11: Geological Cross Section, Los Filos Underground (Section 4840 East)

Note: Figure prepared by Goldcorp, 2016.

7.3.2 Bermejal

The Bermejal deposit consists of the operating Bermejal Open Pit, and mineralization that extends below the Bermejal Open Pit (Figure 7-12).

Bermejal

Lithology

Deposit geology consists of calcareous and argillaceous rocks of Cretaceous age formation that are intruded by a granodiorite stock of Tertiary age, forming metasomatic halos at the contacts. Iron-gold skarn mineralization is best developed at the granodiorite-limestone contacts and within endoskarn. The Bermejal stock is approximately 2 km in diameter, is roughly circular, and has several irregular protrusions on all sides near the sill elevation. A sigmoidal, irregularly shaped diorite sill intrudes the marble and extends roughly horizontally for 2 km from the Bermejal stock. The sill is approximately 1.5 km wide, with an average thickness of 100 m, and joins the northwest side of the Bermejal Stock. The sill is approximately at the 1,300 m elevation, where it originates at the Bermejal Stock.

Figure 7-13 shows the surface geology of the Bermejal area with the final outline of the Mineral Reserve pit discussed in Section 15.0, and the outline of the current underground workings projected to surface.

Alteration

Endoskarn shows incipient garnetization and marmorization that decreases outward. Major pulses of gold and quartz mineralization occurred later, accompanied by strong retrograde alteration. The retrograde alteration stage destroyed the prograde calc-silicate mineral phases, resulting in chlorite, epidote, and other hydrosilicate minerals. Secondary enrichment of gold and to a lesser extent copper within the oxidation zone is common.

Mineralization

The major mineralized bodies at Bermejal consist of iron-gold skarn with minor amounts of copper and silver at the intrusive-limestone contact. Mineralized bodies also occur within endoskarn and are disseminated within the hydrothermally altered intrusive rocks.

Surface drilling defined four mineralized bodies around the Bermejal stocks—Anomalia, BD-3, Tajo-Mez, and Contacto Norte zones—that collectively are considered to be the Bermejal deposit. Except for the Anomalia zone that dips at 30°–40° to the southeast, the zones have almost vertical dips. Quartz, iron oxides, high-grade Au veins, stockwork, and disseminated mineralization are locally important. Both limestones and intrusive rocks host the quartz-FeOx and high-grade gold veins. Stockworks and disseminated mineralization are restricted to the intrusion. Figure 7-13 and Figure 7-14 are schematic cross sections through the Bermejal deposit.

The Bermejal stock extends to at least 250 m in depth and is sub-vertical below the open pit. The mineralization along the contact forms a 10 m to 150 m wide zone, with at least 600 m of length and 1,250 m of vertical extent. The deposit is open laterally and down-dip. This portion of the Bermejal deposit is the focus of the Bermejal Underground PEA.

At Bermejal, mineralized zones are predominantly oxide. At depths of more than 250 m, oxidation is pervasive and continuous while minor sulfides occur locally. Sulfides are found toward the core of Cerro Bermejal, which is the center of the intrusive stock. Although most gold is associated with massive iron-oxide bodies at the intrusive-limestone contact, there is also gold contained within mineralized structures, quartz veins, and the pyroxene skarn zone.

Mineralization is distributed around the granodiorite stock, both at the limestone contact and within the intrusion. The extent of limestone replacement is minor compared to the quantity of endoskarn. Thickness of the zones varies from 10–150 m, with an average of 80 m. Mineralization extends continuously all around the intrusion, which is approximately 600 m in diameter. The shape of the deposit mimics a shell around the dome-shape of the intrusion. Important structural controls strike north-south and east-west, which account for bends and widening of the zones at the Tajo-Mez and Contacto Norte areas.

The mineralogy of the contact zones is predominantly iron oxides with gold, in association with lesser quantities of copper, lead, zinc, and arsenic occurring in carbonates and oxides as well as sulfides. Primary minerals are hematite, magnetite, and jasper, with lesser amounts of pyrite, chalcopyrite, arsenopyrite, sphalerite, galena, pyrrhotite, and marcasite as accessory minerals. Gold occurs as elemental gold or argentian gold in concentrations of 0.3 g/t to 50 g/t Au to 60 g/t Au. About 80% of the gold is associated with hematite and magnetite, and the remainder is within quartz and sulfides (arsenopyrite, chalcopyrite, and pyrite).

Sieve analysis of hundreds of samples coupled with electron microscopy show that most gold is microscopic (92% is less than 100 µm and 8% is less than 150 µm in size). Quartz and calcite, with minor siderite and phlogopite, plus traces of fluorite and orthoclase, occur roughly contemporaneously with primary ore. Anhydrite and gypsum commonly fill vugs within the oxide ores. Secondary oxides are abundant and include plumbojarosite, hematite, goethite, limonite, arsenolite, azurite, malachite, chalcocite, and copper arsenides, with minor amounts of minium, cerussite, and zincite. Calcium and magnesium silicates are abundant and include chlorite, epidote, serpentine, tremolite, actinolite, and talc.

7.3.3 Guadalupe

The Guadalupe deposit is situated adjacent to the southeast wall of the current Bermejal Open Pit. See Figure 7-12.

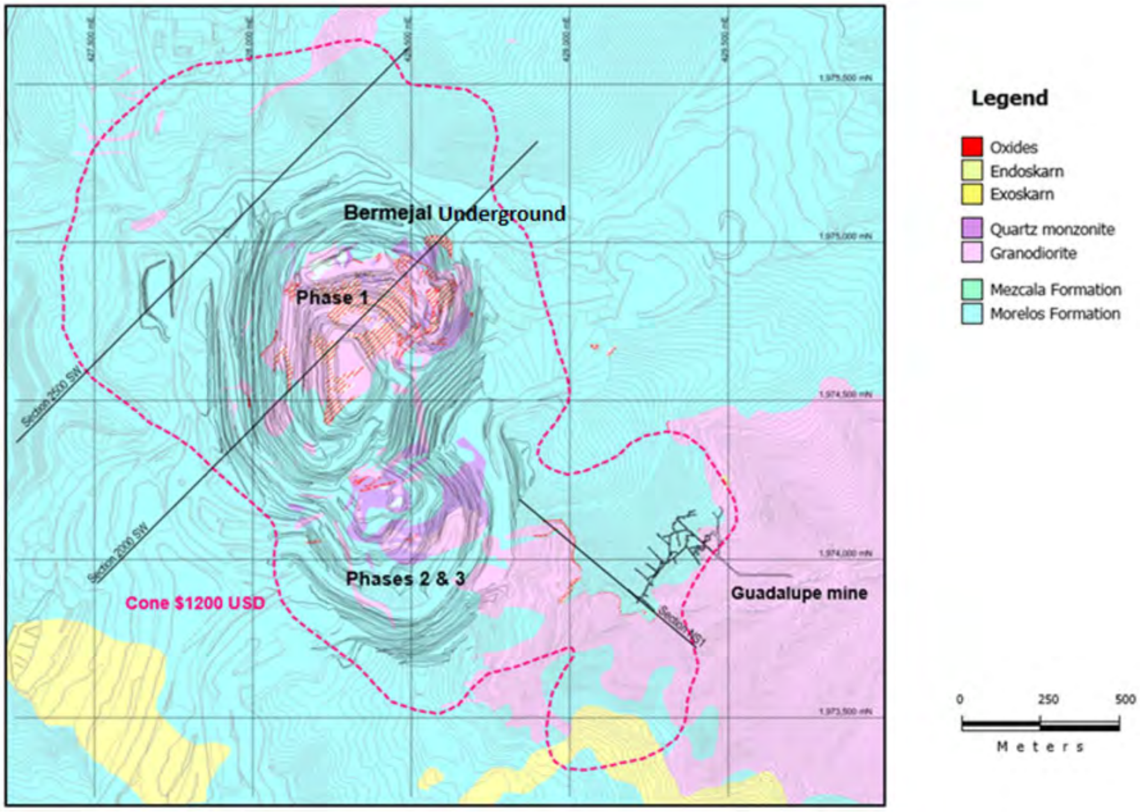
Mineralization comprises iron-gold skarn with minor amounts of Cu and Ag developed along the intrusion-limestone contact. Mineralization also occurs within exoskarn and can form disseminations within the hydrothermally altered intrusive rocks.

Both limestones and intrusive rocks host the quartz-iron-oxide and high-grade gold veins. Stockworks and disseminated mineralization are restricted to the intrusion.

At depths of more than 250 m, oxidation is pervasive and continuous, while minor sulfides occur locally. Although most gold is associated with massive iron oxide bodies at the intrusive-limestone contact, there is also gold within structures, quartz veins, and the pyroxene skarn zone.

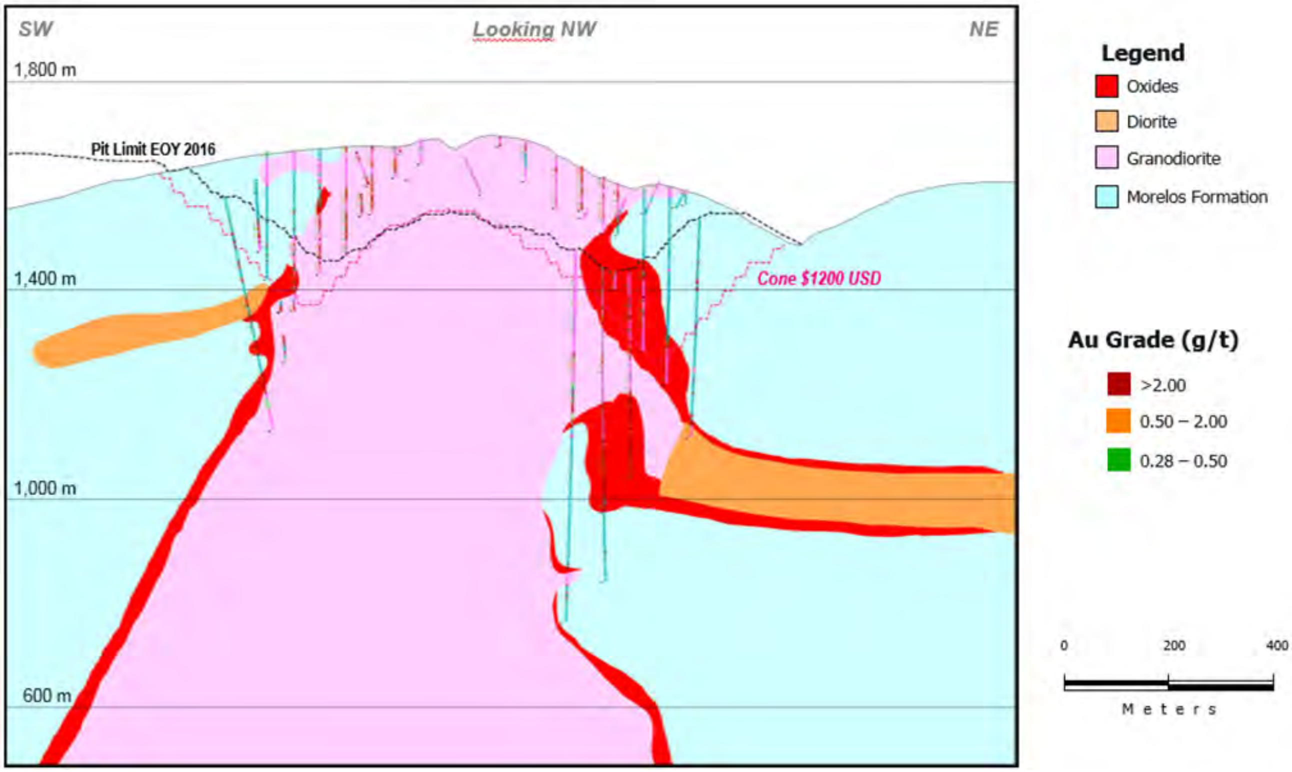
Figure 7-15 is a cross section through the area exploited by underground operations at Guadalupe.

Figure 7-12: Bermejal Geology and Deposit Location Map



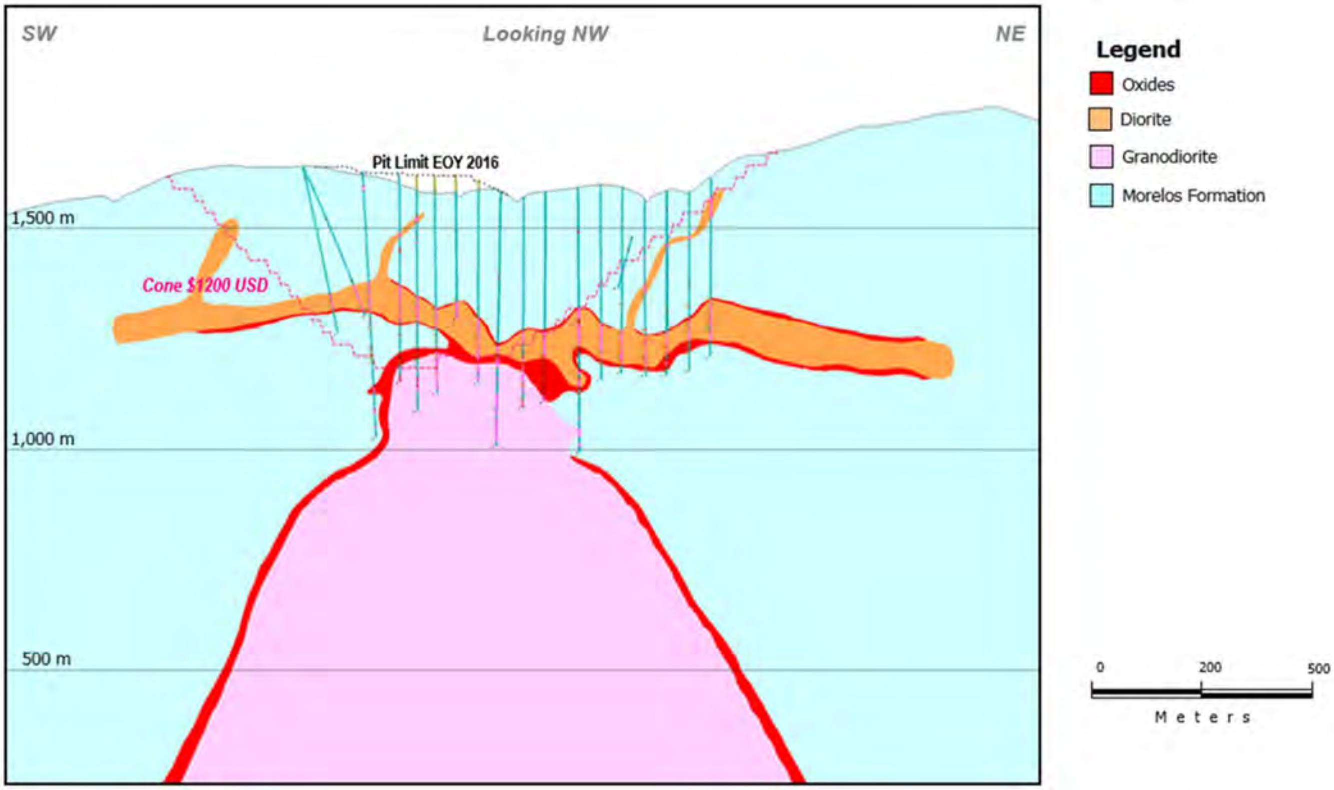
Note: Figure prepared by Goldcorp, 2016. Pit Shell limit shown at US$1,200 supports Mineral Reserve estimate in Section 15.0 of this Report.

Figure 7-13: Cross Section Showing Geology and Mineral Deposit – 2000 SW, Bermejal Deposit



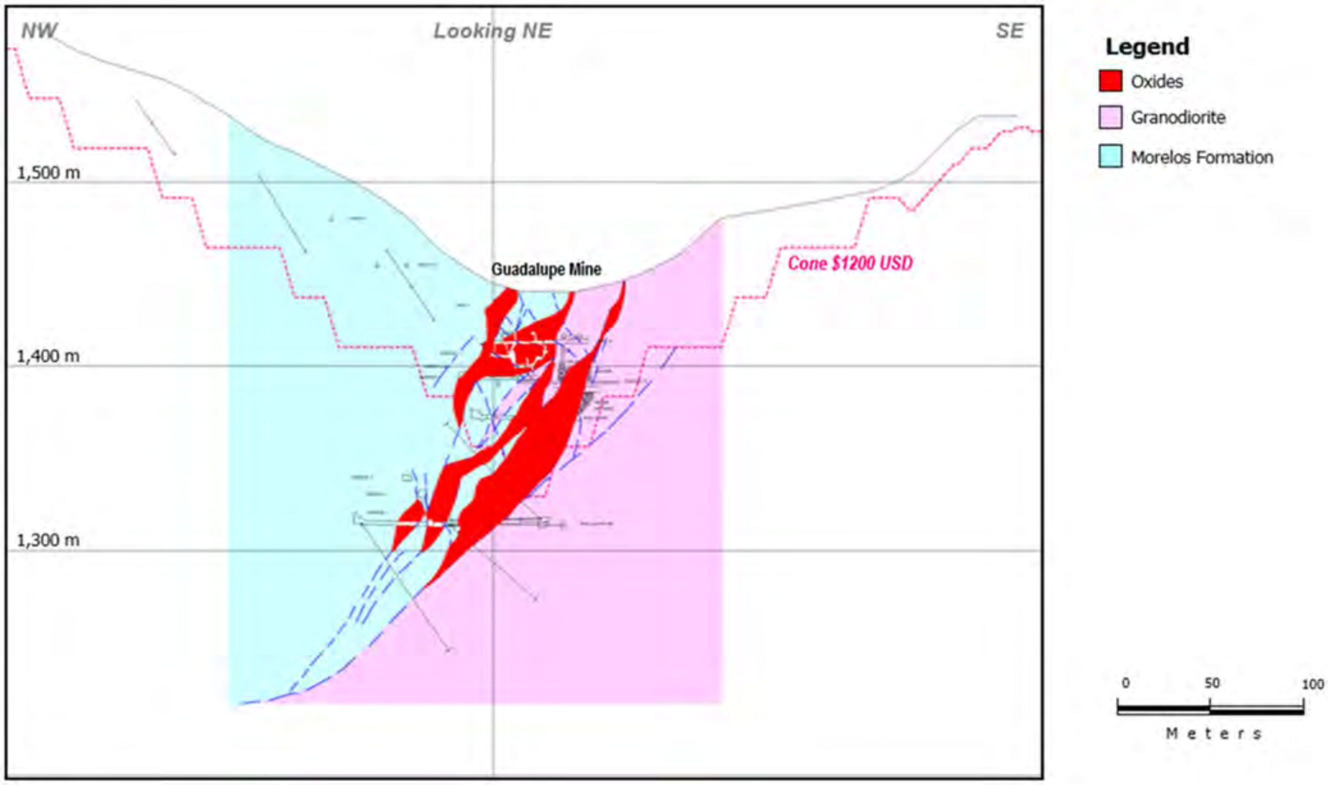
Note: Figure prepared by Goldcorp, 2016. Pit Shell limit shown at US$1,200 supports Mineral Reserve estimate in Section 15.0 of this Report and current as of 31 December 2016.

Figure 7-14: Schematic Geological Cross Section 2500 SW, Bermejal Deposit



Note: Figure prepared by Goldcorp, 2016. Pit Shell limit shown at US$1,200 supports Mineral Reserve estimate in Section 15.0 of this Report and current as of 31 December 2016.

Figure 7-15: Schematic Geological Cross Section NS1, Guadalupe Underground



Note: Figure prepared by Goldcorp, 2016. Pit Shell limit shown at US$1,200 supports Mineral Reserve estimate in Section 15.0 of this Report.

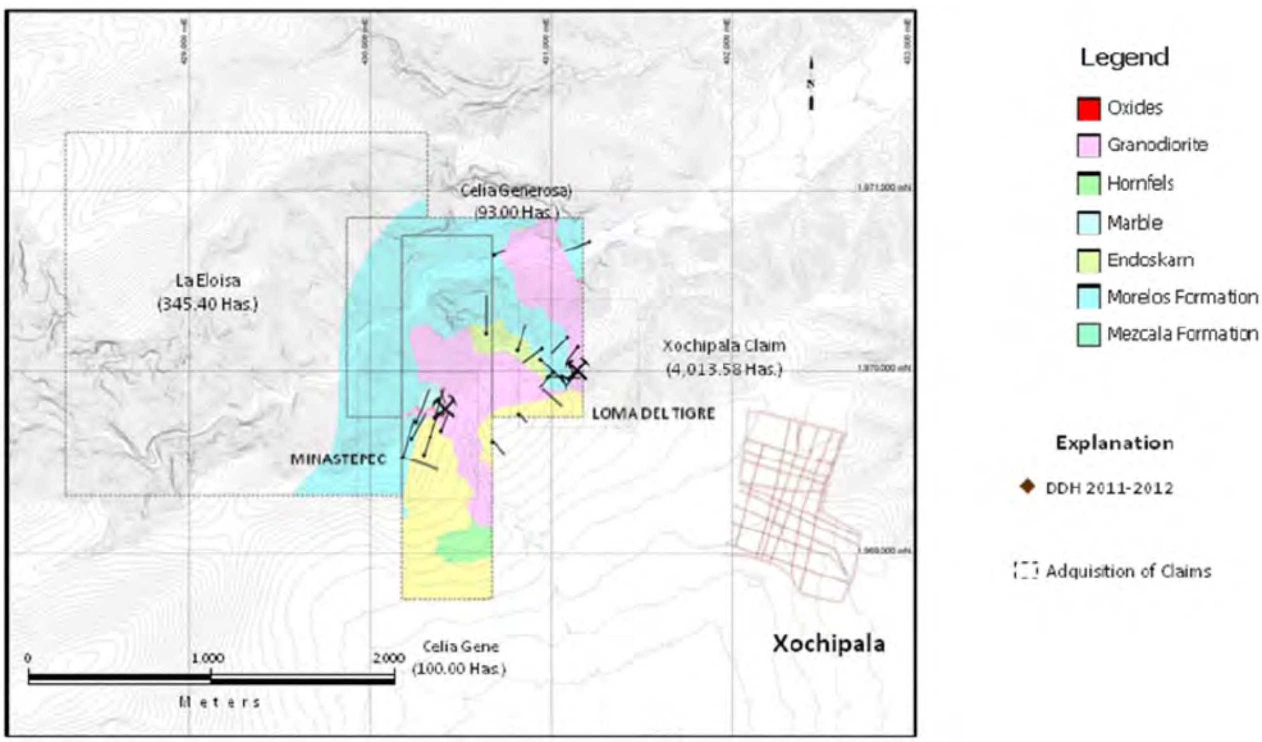
7.3.4 Other Prospects / Exploration Targets

Xochipala

Goldcorp entered into an exploration agreement carried out with land concessionaries Celia Gene and Celia Generosa to allow drilling of the Xochipala prospect. For full details on the signed agreements, refer to the exploration agreement between Goldcorp and the land concessionaries. A drill campaign, exploring two potentially mineralized targets, consisted of 28 diamond drill holes, which totaled 6,860 m over a two-year option agreement.

These targets are of limited lateral extension, are shallow, and are contained in small roof pendant in the intrusive granodiorite. The diamond drilling below the intrusive contact proved the limestones to be without skarn development. Gold values are mainly related to fractures and not to the contact between the intrusive and limestones. Figure 7-16 and Figure 7-17 detail the surface geology along with drill hole locations in the Xochipala area.

Figure 7-16: Geology Plan, Xochipala



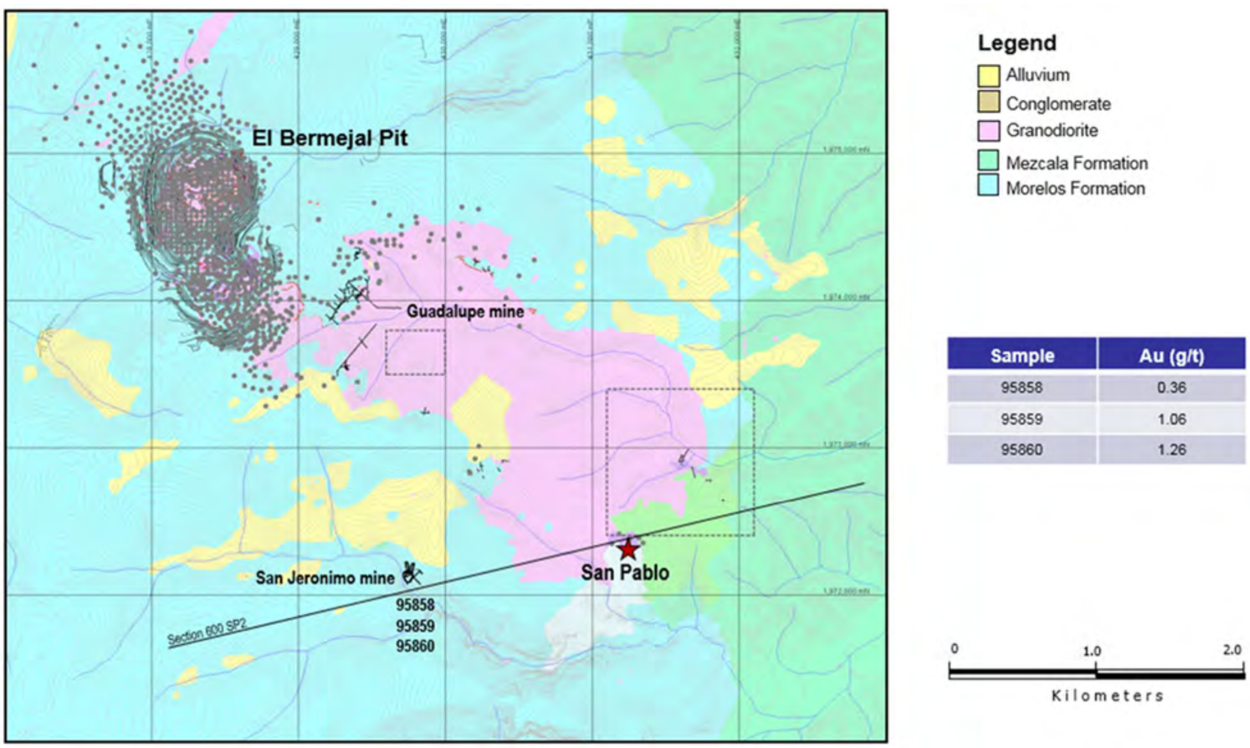
Note: Figure prepared by Goldcorp, 2016

The initial results of the mineral exploration showed that the economic mineralization present in the area does not display lateral and depth continuity, as found in the Los Filos and Bermejal deposits.

San Pablo

Gold mineralization at San Pablo is related to the emplacement of a Tertiary granodioritic stock into limestones and shales of the Morelos and Mezcala Formations, producing marble, skarns, and hornfelsing along the rock contacts. Mineralization consists of iron oxides with elevated gold values and has been exploited in old workings at the San Jeronimo mine. Figure 7-17 shows the surface geology in the San Pablo area. Figure 7-18 is a cross section showing the typical orientation of drill holes that tested the prospect.

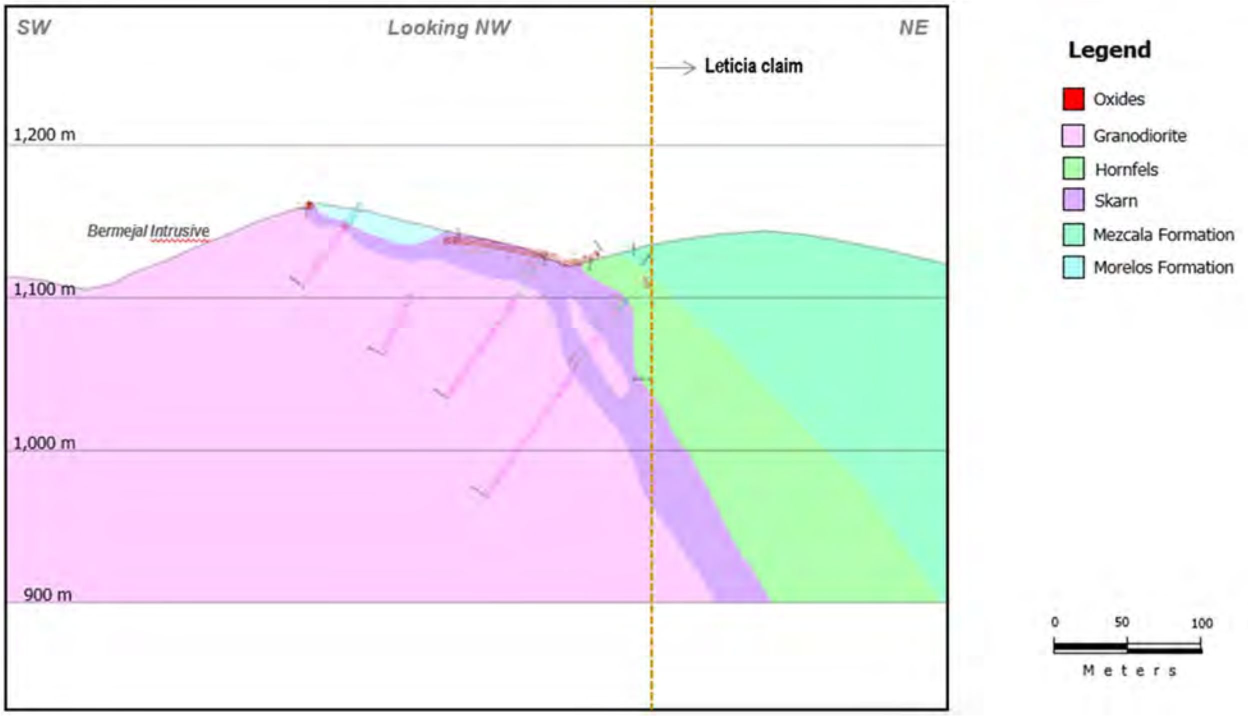
Figure 7-17: Geology Plan, San Pablo



Sample	Au (g/t)
95858	0.36
95859	1.06
95860	1.26

Note: Figure prepared by Goldcorp, 2016

Figure 7-18: Schematic Geological Cross Section 600 SP2, San Pablo



Note: Figure prepared by Goldcorp, 2016.

7.4 Comments on Geological Setting and Mineralization

In the opinion of the Qualified Persons, knowledge of the deposit settings, lithologies, and structural and alteration controls on mineralization, together with the mineralization style and setting of the deposits, are sufficient to support the Mineral Resource and Mineral Reserve estimation and to support mine planning.

The prospects that are at an earlier stage of exploration, and the lithologies, structural, and alteration controls on mineralization in those areas are currently insufficiently understood to support estimation of Mineral Resources.

8.0 DEPOSIT TYPES

Mineralization identified within the Mine property to date is typical of intrusion-related gold-silver skarn deposits. Gold skarns typically form in orogenic belts at convergent plate margins and are related to plutonism associated with the development of oceanic island arcs or back arcs.

Skarns develop in sedimentary carbonate rocks, calcareous clastic rocks, volcaniclastic rocks, or (rarely) volcanic flows. They are commonly related to high- to intermediate-level stocks, sills, and dykes of gabbro, diorite, quartz diorite, or granodiorite composition. Skarns are classified as calcic or magnesian types; the calcic subtype is further subdivided into pyroxene, epidote, or garnet-rich members. These contrasting mineral assemblages reflect differences in the host rock lithologies, as well as the oxidation and sulfidation conditions in which the skarns developed.

- Pyroxene-rich Au skarns typically contain a sulfide mineral assemblage comprising native gold ± pyrrhotite ± arsenopyrite ± chalcopyrite ± tellurides ± bismuthinite ± cobaltite ± native bismuth ± pyrite ± sphalerite ± maldonite. They generally have a high sulfide content and high pyrrhotite:pyrite ratios. Mineral and metal zoning is common in the skarn envelope. Extensive exoskarns form, generally with high pyroxene:garnet ratios. Prograde minerals include diopsidic to hedenbergitic clinopyroxene, K-feldspar, Fe-rich biotite, low Mn grandite (grossular-andradite) garnet, wollastonite, and vesuvianite. Other less common minerals include rutile, axinite, and sphene. Late or retrograde minerals include epidote, chlorite, clinozoisite, vesuvianite, scapolite, tremolite-actinolite, sericite, and prehnite.
- Garnet-rich Au skarns can contain native gold ± chalcopyrite ± pyrite ± arsenopyrite ± sphalerite ± magnetite ± hematite ± pyrrhotite ± galena ± tellurides ± bismuthinite. They generally have a low to moderate sulfide content and low pyrrhotite:pyrite ratios. The garnet-rich Au skarns typically develop an extensive exoskarn, generally with low pyroxene:garnet ratios. Prograde minerals include low Mn grandite garnet, K-feldspar, wollastonite, diopsidic clinopyroxene, epidote, vesuvianite, sphene, and apatite. Late or retrograde minerals include epidote, chlorite, clinozoisite, vesuvianite, tremolite-actinolite, sericite, dolomite, siderite, and prehnite.
- Epidote-rich Au skarns often contain native gold ± chalcopyrite ± pyrite ± arsenopyrite ± hematite ± magnetite ± pyrrhotite ± galena ± sphalerite ± tellurides. They generally have a moderate to high sulfide content with low pyrrhotite:pyrite ratios. Abundant epidote and lesser chlorite, tremolite-actinolite, quartz, K-feldspar, garnet, vesuvianite, biotite, clinopyroxene, and late carbonate form in the exoskarn.

Mineralization frequently displays strong stratigraphic and structural controls. Deposits can form along sill-dyke intersections, sill-fault contacts, bedding-fault intersections, fold axes, and permeable faults or tension zones. In the pyroxene-rich and epidote-rich types, mineralization commonly develops in the more distal portions of the alteration envelopes. In some districts, assemblages of reduced, Fe-rich intrusions can be spatially related to Au-skarn mineralization. Mineralization in the garnet-rich Au skarns tends to lie more proximal to the intrusions.

8.1 Comment on Los Filos Deposit Types

The deposits of the Mine property area are considered to be examples of calcic-type skarns. All the deposits are genetically related to porphyritic diorites, tonalites and granodiorites, and the hydrothermal system that accompanied intrusive emplacement.

Mineralization is either hosted by, or spatially associated with, marble formed during contact metamorphism of the carbonates. Massive magnetite, hematite, goethite, and jasperoidal silica, with minor associated pyrite, pyrrhotite, chalcopyrite, and native gold typically occur in the veins and metasomatic replacement bodies that developed at the contacts between the platform carbonates and intrusive rocks. Extensive, deep oxidation of the deposits (that occurred at the time of mineralization) has altered the mineralization into material that is amenable to cyanidation recovery techniques without the need of pretreatment by roasting or other methods.

In the opinion of the Qualified Person, the skarn deposit type is an appropriate model for the development of Mineral Resource and Mineral Reserve estimates and to use in guiding exploration programs on the Mine property.

9.0 EXPLORATION

Exploration on the Mine and regional properties has been undertaken by Goldcorp, its precursor companies, or by contractors (e.g., geophysical surveys).

Exploration activities on the Mine property have included regional and detail mapping; rock, silt and soil sampling; trenching; RC and diamond drilling; ground IP geophysical, ground magnetic geophysical, and aeromagnetic surveys; mineralization characterization studies; and metallurgical testing of samples. Petrographic studies and density measurements on the different lithologies have also been carried out.

A summary of the work programs completed up to the Report's Effective Date are summarized in Table 9-1.

9.1 Grids and Surveys

The coordinate system used for all data collection and surveying is the Universal Transverse Mercator (UTM) system North American Datum of 1927 (NAD27) Zone 14N.

The topographic base map for Minera Nuteck was originally developed in 1999 by Eagle Mapping Group of Vancouver, Canada, using photogrammetric methods and based on a 1:16,000 scale aerial photography. Walcott and Associates undertook ground control surveys. The contours are spaced at 2 m intervals, and the base map scale is 1:2,000. In 2004, Eagle Mapping Group expanded the topographic coverage at the request of Goldcorp's wholly owned operating Mexican Company Luismin to support infrastructure planning.

Control points include official stations of the National Geodesic Net determined by the National Agency of Statistics, Geography and Information (INEGI).

Control points are distributed throughout the Mine property and were taken as the basis to establish the project topography, and more specifically, drill hole collar locations. Collars were surveyed in UTM coordinates using a Sokkia Set 610 total station with 6-second accuracy. Earlier collar surveys were validated by Luismin's survey crew based on previous triangulation survey landmarks developed by contractor Mr. Juan Herrera, and double-checked with landmarks from the survey developed by Eagle Mapping group.

Table 9-1: Exploration Summary Table and Mine Property History

Year	Operator	Work Undertaken
1938	Minera Guadalupe	Minera Guadalupe S.A. de C.V. purchased the Nukay deposit.
1938–1940	Minera Guadalupe	From 1938 to 1940, development of the underground mine occurred, but no production was reported during this period.
1946–1961	Minera Guadalupe	Resumed development and commenced production after building a 100 t/d cyanide agitation leach plant at the village of Mazapa, some distance north of the Mine site. Production during a 15-year period is reported to be about 500,000 t at 18 g/t Au.
1983–1985	Minera Nukay	Open pit mining of the Nukay deposit began in January 1984 with waste removal and mining from the upper benches. The mine was developed on 5 m benches with front-end loaders and trucks. Ore was processed at a government-owned flotation plant near Mezcala.
1986	Peñoles	Jasperoid sampling at Bermejal identifies anomalous gold mineralization.
1987–2001	Minera Nukay	Nukay mill, a 100 t/d cyanide leach Merrill-Crowe operation, was built near Mezcala. The plant was expanded to 350 t/d in 1994 and was expanded again in 1997 to 400 t/d. Production from the La Agüita open pit mine commenced in May 1995. Underground development of the Subida mine began in August 1995; ore production commenced in August 1996. Development of the Independencia deposit was initiated in 2001.
1988	Peñoles	Magnetic and induced polarization (IP) surveys at Bermejal.
1991–1993	Peñoles	A total of 35,000 m drilled; Anomalia and BD-3 ore bodies discovered at Bermejal.
1993	Teck	Due diligence program; Nukay pit mapped, outlying prospects examined and 1,970 m of RC drilling in 19 holes. Mineral resource estimate.
1994	Teck	District-wide geologic mapping and sampling, litho-geochemical and magnetometer surveys, detailed prospect evaluations, and a total of 14,511 m of RC drilling in 84 holes.
1994	Peñoles	Prefeasibility study completed on Bermejal.
1995	Teck	District-wide geologic mapping, grid litho-geochemical sampling, time-domain electromagnetic (TEM) survey, road-cut mapping and sampling, and drilling of 19,128 m in 90 holes.
1996	Teck	Exploration and delineation of the Los Filos and Pedregal prospects. There were 156 RC rotary and 44 core holes completed at approximate spacing of 35 m on a grid 1,200 m long and 350 m wide. Geological mapping, sampling, density measurements, and metallurgical testing. Seven drill holes at Crestón Rojo and nine holes at El Grande prospect; four holes drilled in other areas of the Mine.
1997	Teck	Delineation drilling on the Los Filos deposit, for a total of 29,219 m in 133 RC holes on a 35 m drilling grid area of 1,400 m × 400 m; metallurgical bottle roll tests and column tests on low- and medium-grade core samples; preliminary geotechnical assessment. Additional drilling of Crestón Rojo (9 holes), Zone 70, also known as Mag Ridge, (14 holes), Peninsular Ridge (3 holes) and El Grande (4 holes), Independencia (6 holes). Completion of scoping level study on Los Filos, mineral resource estimate prepared.
1998	Teck	13 exploration holes for a total of 3,190 m completed at Los Filos. Prefeasibility-level assessment, updated mineral resource estimate prepared for Los Filos.
1999	Minera Nuteck	Metallurgical testwork, environmental studies, sediment control study, aerial photography over the Los Filos site.

Table 9-1: Exploration Summary Table and Mine Property History

Year	Operator	Work Undertaken
1999	Wheaton River Minerals	Mineral resource estimate on Bermejal.
2000	Minera Nuteck	Geological modelling, a 37-hole, 7,105 m confirmatory drilling program, a study on the structural geology, further metallurgical test work, environmental permitting studies, and a review of capital cost estimates.
2001	Minera Nuteck	Geological reinterpretation, re-logging of core, geological modeling.
2003–2006	Wheaton River Minerals	81 diamond drill holes, geotechnical and metallurgical test work, feasibility-level studies completed at Los Filos. Detailed review of the Bermejal deposit resource evaluation data made available by Minera El Bermejal during option-to-purchase negotiations; bulk sampling for metallurgical test work; 36 diamond drill holes drilled.
2006	Minera Nukay, subsidiary of Goldcorp	Approximately 15,000 m completed to explore underground targets at the Nukay mine. Two main targets were tested, ore bodies related to the geological contact (skarn-gold) and ore bodies related to the strong fracture system into the limestone close to the intrusive (chimney). Exploration confirmed the extension of the skarn-gold bodies at Nukay, Subida–Independencia, Arroyo Hondo, and Agüita areas.
2006–2007	Wheaton River Minerals / Goldcorp	Mine construction and permitting activities. First gold pour mid-2007.
2007	Goldcorp	Regional and local geophysical survey was performed to provide information that may be useful in identifying new drilling targets. The survey identified various magnetic anomalies related to iron-skarn bodies along the Guerrero Gold Belt. A 100 m × 25 m grid was used for local survey and geologic mapping. 40 diamond drill holes were drilled at the 4P project (Creston Rojo, Zone 70, Conchita and El Grande prospects) for a total of 7,918 m.
2008	Goldcorp	142 infill drill holes (26,693 m) completed at 4P, comprising 88 core holes (20,687 m) and 54 RC holes (6,006 m).
2009	Goldcorp	238 core holes (34,762 m) drilled in the Southern Bermejal area, as infill, and to extend known underground mineralized zones.
2010	Goldcorp	205 infill and extension drill holes (44,416 m) completed in the Los Filos Underground Sur and at Bermejal Open Pit Norte.
2011	Goldcorp	200 infill and extension drill holes (51,199 m) completed primarily at the Los Filos south underground sector and at Bermejal Norte.
2012	Goldcorp	175 infill and extension drill holes (51,146 m) completed. Drilling at Bermejal was completed at a 100 m × 100 m spacing to support Mineral Resource estimates. Drilling at Los Filos was in support of upgrade classifications to Mineral Resource and Mineral Reserve categories.
2013	Goldcorp	133 core holes (37,162 m) completed. Infill and extension drilling was completed at Bermejal Norte to support upgrade classification of Inferred Resources to Measured and Indicated Resources. Extension drilling was completed at Peninsular to extend known underground mineralized zones. Infill drilling was also completed at Nukay underground and Los Filos underground south zone.
2014	Goldcorp	162 core holes (48,360 m) completed. Infill and extension drilling was completed at Bermejal Norte to support upgrade classification of Inferred Resources to Indicated Resources and to search for continuity of high-grade ore zones. Drilling was completed at Peninsular underground to support Mineral Reserves estimates. Infill drilling was also continued at Nukay underground and Los Filos underground south zone.

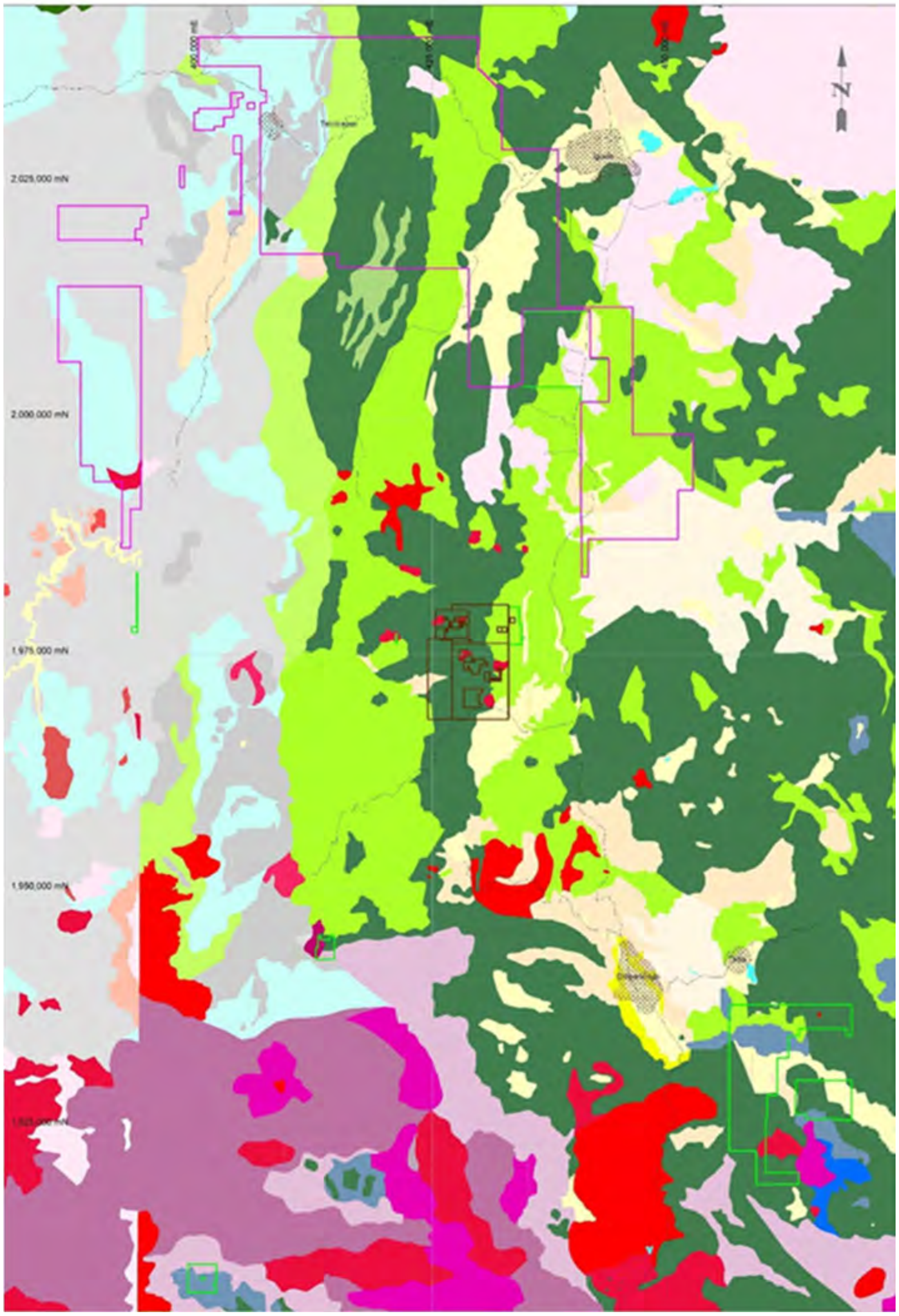
Table 9-1: Exploration Summary Table and Mine Property History

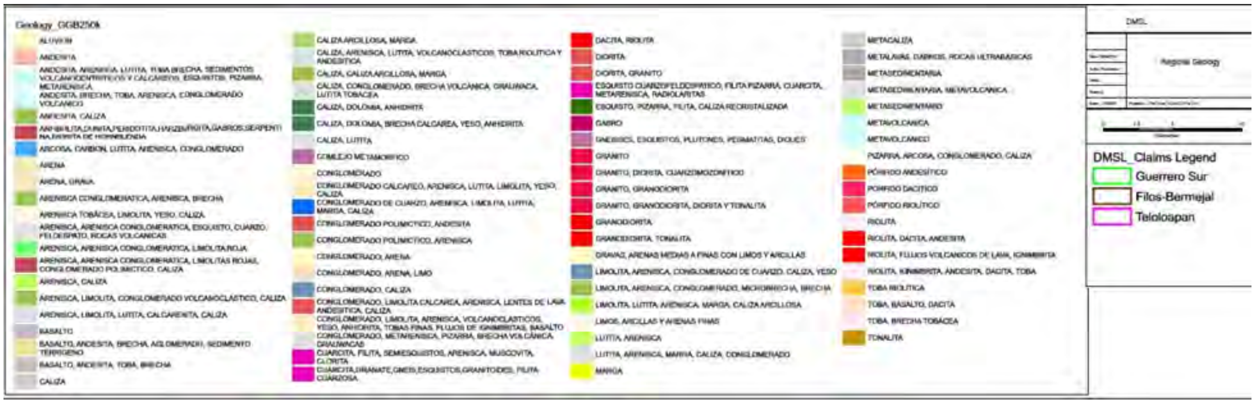
Year	Operator	Work Undertaken
2015	Goldcorp	218 drill holes (47,496 m) completed, comprising 37 RC holes (5,517 m), 7 RC and core combined holes (1,841 m), and 174 core holes (40,138 m). Extension drilling was completed at Bermejal Deep and at Peninsular underground to define the ore body shape. Infill drilling was also completed at Nukay underground, Los Filos underground south zone and Los Filos El Grande zone.
2016	Goldcorp	237 core holes (50,107 m) completed. Drilling in San Pablo was completed to look for continuity of the mineralization. Drilling in Guadalupe was completed to confirm ore grades and continuity of the mineralization. Infill drilling was completed at Bermejal Underground, extension drilling was completed at Zone 70 and Creston Rojo. Drilling was completed at Los Filos to confirm ore grades in Agüita and to look for high-grade mineral that might connect the deep underground mineralization in Los Filos to Peninsular.

9.2 Geologic Mapping

Regional and detailed geological mapping was completed in several phases by Teck Resources in the early 1990s. Map scales varied from regional (1:25,000) to prospect scale (1:1,000). Map results were used to identify areas of quartz veining, alteration, silicification, and sulfide outcrop that warranted additional work. Refer to Figure 9-1.

Figure 9-1: Regional Geologic Mapping Coverage





The open pits are mapped, as operations allow, at a scale of 1:1,000. Underground mapping is typically performed at a 1:250 scale.

9.3 Geochemical Sampling

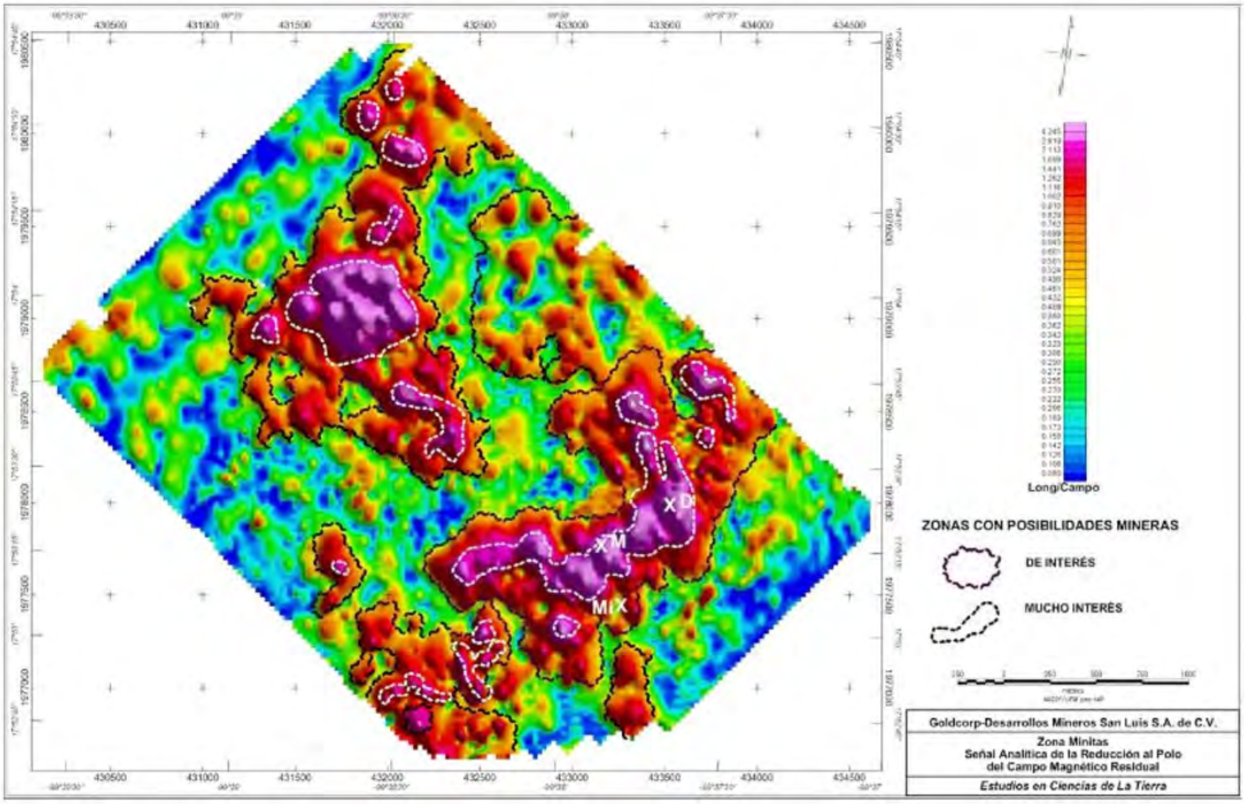
Soil, channel, pit, adit, underground, grab, and rock sampling were used to evaluate mineralization potential and generate targets for reverse circulation (RC) and core drilling. Overall, 6,906 surface channel samples and 39,007 underground channel samples were collected and are stored in the Mine database as proxy drill holes.

The drill programs and production data have superseded surface geochemical data. Geochemical data has not been used in resource estimation.

9.4 Geophysics

Two ground magnetic geophysical surveys were completed in 2007 by Desarrollos Mineros San Luis S.A. de C.V., over the Los Filos-Nukay zone and over the Minitas area. The study investigated the possibility of mineralization between the two main sources of magnetic anomalies. The study area of 847 m × 893 m was selected due to a series of small sources of magnetism. Both surveys used 100 m station spacing, with readings every 30 m and positioned in the field with a GPS. The surveys were limited to areas with mining potential. The ground geophysical surveys were used to vector into mineralization and generate targets for drill programs. Figure 9-2 displays the magnetic spectrum displaying possible zones of mineralization.

Figure 9-2: Magnetic Spectrum of Possible Mineralization

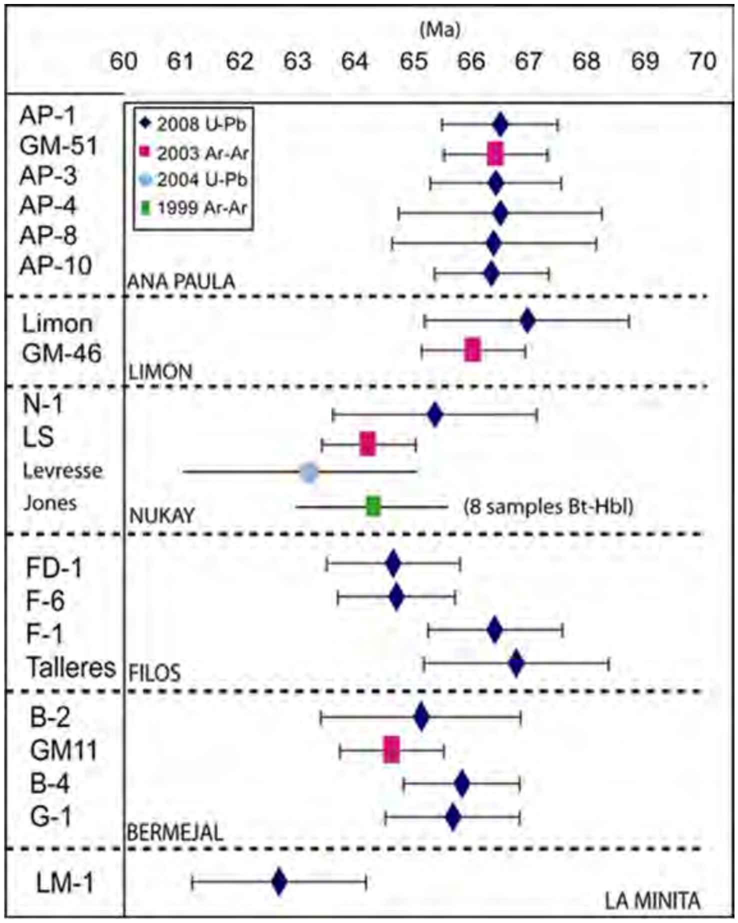


9.5 Petrology, Mineralogy, and Research Studies

Age dating, petrography, mineralogical studies, aerial photography, and QuickBird imagery have been completed.

Age-dating studies were performed at the University of Arizona on selected rock samples from Nukay, Los Filos, and Bermejal stocks. Resulting age dates are as indicated in Figure 9-3.

Figure 9-3: Results, Age-Dating Studies



Note: Figure prepared by Goldcorp, after University of Phoenix data (Report: Resultados Analíticos de la visita de las minas Los Filos, Bermejal y Nukay, Mezcala, Guerrero y el proyecto Ana Paula en Cuetzala del Progreso, Guerrero). The Ana Paula, Limon, and La Minita data are from deposits that are not on the Mine property and are not held by Goldcorp.

Petrographic studies were completed over a 4-year period by Dr. Sidney A. Williams with Paradex Consulting, and a total of 491 outcrop samples have been examined and detailed in this Report: Geology, Alteration, Structure, and Mineralization at the Nuteck project in Guerrero, Mexico. Individual sample reports and responses to questions were received from Dr. Williams for each batch of samples, including petrographic descriptions, relevant photomicrographs, and in some cases microprobe analyses.

Additional petrographic studies were performed by Petroanalisis in Mexico during 2010, to establish vein paragenesis (Estudio de Caracterización Mineralógica realizado a 25 muestras de roca, [Petrografía y Mineragrafía], Mina Los Filos, 2010). A total of 23 samples were sent to Universidad Michoacana de San Nicolás de Hidalgo for petrographic and mineralogical study in 2012 (Informe de la preparación y análisis petrográfico, mineragráfico y de difracción de rayos “X” de 23 muestras, 2012).

X-ray studies performed by the University of Arizona in 1995 indicated that the primary clay mineral is smectite, with associated illite / montmorillonite, and kaolinite in strongly oxidized samples (Reporte de referencia: Geology, Alteration, Structure and Mineralization at the Nuteck project, Guerrero, Mexico).

Data from these specialist studies were used to refine geological and mineralogical descriptions and interpretations.

The aerial photography and QuickBird images were used to help locate areas of alteration and exploration potential (Análisis Aeromagnético Del Guerrero Gold Belt).

9.6 Geotechnical and Hydrological Studies

Initial geotechnical studies were completed during the 1990s, and further studies were conducted in 2004 by Golder and Associates (Estudio Geotecnico Filos [Golder]). The geotechnical study in 2004 comprised core logging, desktop, and site assessments of subsurface conditions in the immediate vicinity of the mineralization at Los Filos and Bermejal. Hydrological studies were completed in the same period to provide baseline data collection. Independent consultants completed more detailed studies to support feasibility-level assessments. Work included geotechnical assessment of infrastructure locations such as the proposed plant, waste dump and tailings sites, groundwater exploration, hydrogeological studies, drainage assessments, and water and contaminant studies.

The geotechnical models are reasonably established and are based on drill data, rock mass classification, and stability modeling carried out during the feasibility studies. The hydrological model is based on drill data.

Specialized geotechnical and hydrological staff are employed at the Mine property and monitor these areas on a day-to-day basis. Support continues to be provided on an as-needed basis by external consulting firms. In late 2016, Call and Nicholas Inc. (CNI) of Tucson, Arizona, was contracted to perform geotechnical studies for the Bermejal Underground Exploration Project. These studies were related to the ground support required for an exploration portal and decline to gain access to the Bermejal Underground resource to mine a bulk sample and gather geotechnical data and to support the mining method to be selected for the ongoing Bermejal Underground prefeasibility study. CNI's studies are ongoing at the time of the writing of this Report; they will analyze the data collected from geotechnical drilling in anticipation of the decline access design and mining method selection.

Additional information on the geotechnical and hydrogeological setting of the project is included in Sections 16.0 and 18.0.

9.7 Exploration Potential

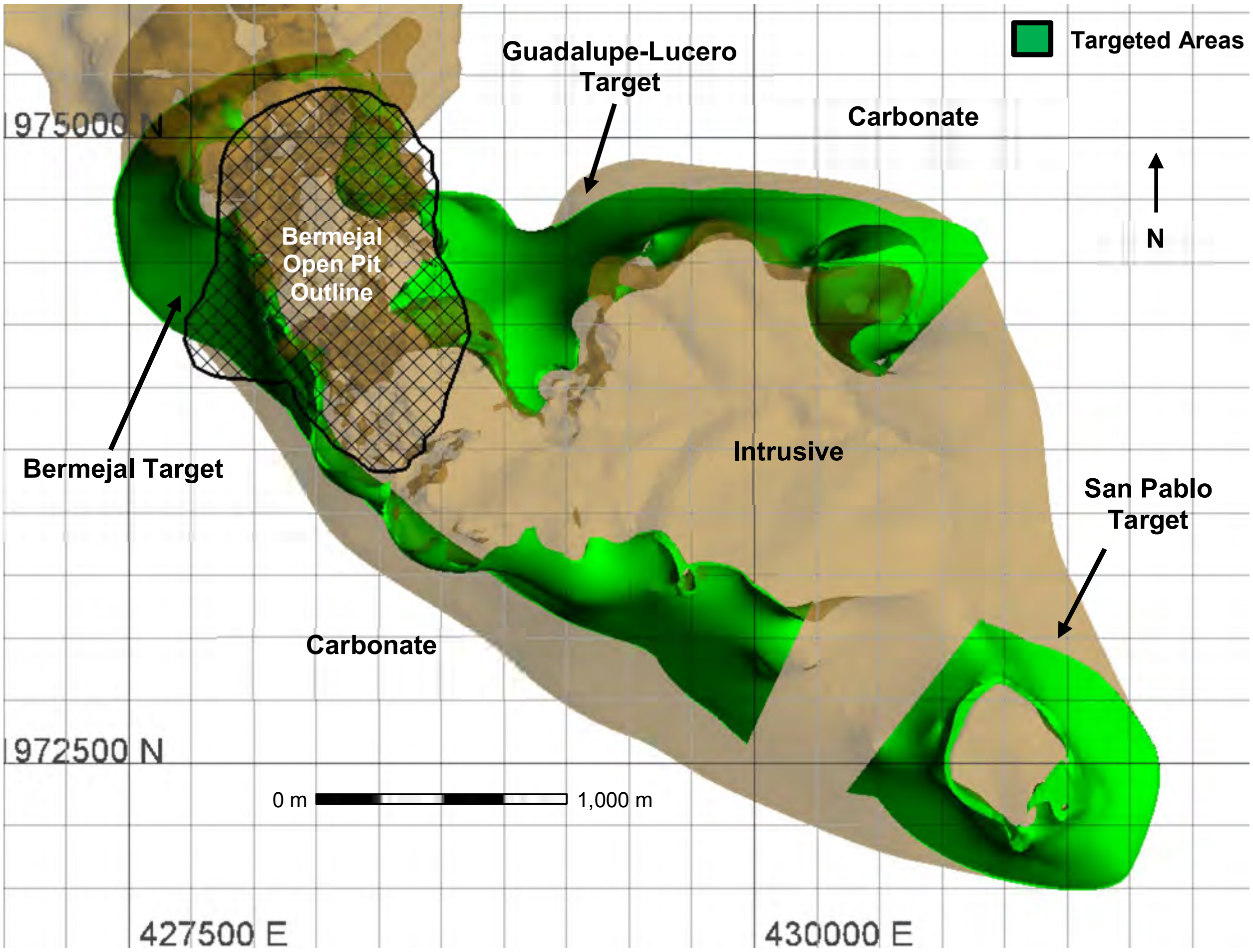
Potential remains in the immediate vicinity of the Bermejal and San Pablo Open Pits to identify additional mineralization that may support resource estimation. The corridor from the Bermejal south area to the Guadalupe deposit is particularly prospective. Additionally, the San Pablo targeted area that is southeast of Bermejal is prospective based on favorable lithology and alteration. The total open pit exploration has a potential exploration target of 1.7 to 4.8 Moz Au. The potential quantity and grade is conceptual in nature, that there has been insufficient exploration to define a mineral resource and that it is uncertain if further exploration will result in the target being delineated as a mineral resource. The exploration target potential quantity and grade has been determined based on prior drilling intercepts and dimensions. The basis of the targets are as follows.

- Laterally and down-dip of known deposits.
- Along intrusive contacts in immediate mined areas.
- Proximity to past producing areas at the Guadalupe mine.

The total open pit and underground exploration has a potential exploration target range of 15 Mt at 3.5 g/t to 31 Mt at 4.8 g/t. The potential exploration targets (Figure 9-4) include the following.

- Bermejal East and West
  - Potential Target Range: 5.8 Mt at 6 g/t to 13.1 Mt at 7 g/t.
  - Potential Targeted Au oz: 1.1 to 2.9 Moz.
  - Geology: FeOx-Au replacements (hematite and goethite).
  - Lithology: Limestone and granodiorite.
  - Structural Control: Ore zone along the granodiorite contact; includes endoskarn with quartz vein stockwork in granodiorite.
  - Alteration: Propylitic and argillic alteration in the contact zone.
  - Style of Mineralization: Iron oxides with Au along the intrusion contact.
  - Summary of Results: Intercepts of 20–40 m averaging 7.0 g/t Au.
- Guadalupe – Lucero
  - Potential Target Range: 2.6 Mt at 4 g/t to 7.7 Mt at 5.3 g/t.
  - Potential Targeted Au Oz: 0.3 to 1.1 Moz.
  - Geology: FeOx-Au replacements (hematite-magnetite).
  - Lithology: Limestone and granodiorite.
  - Structural Control: ore zone at the granodiorite contact, with endoskarn in the intrusion
  - Alteration: propylitic and argillic alteration.
  - Style of Mineralization: Iron oxides with Au, and Cu-Ag.
  - Summary of Results: Intercepts of 10–20 m averaging 5.7 g/t Au.
- San Pablo
  - Potential Target Range: 6.5 at 1 g/t to 10.3 Mt at 1.5 g/t.
  - Potential Targeted Au Oz: 0.2 to 0.5 Moz.
  - Geology: FeOx-Au replacements.
  - Lithology: Limestone and granodiorite.
  - Structural Control: Ore zone at the granodiorite contact, with endoskarn in the intrusion.
  - Alteration: Propylitic and argillic alteration.
  - Style of Mineralization: Iron oxides with Au, and Cu-Ag.
  - Summary of Results: Intercept of 15 m averaging 1.69 g/t Au, intercept of 126 m averaging 0.61 g/t Au.

Figure 9-4: Bermejal, Guadalupe and San Pablo Exploration Potential



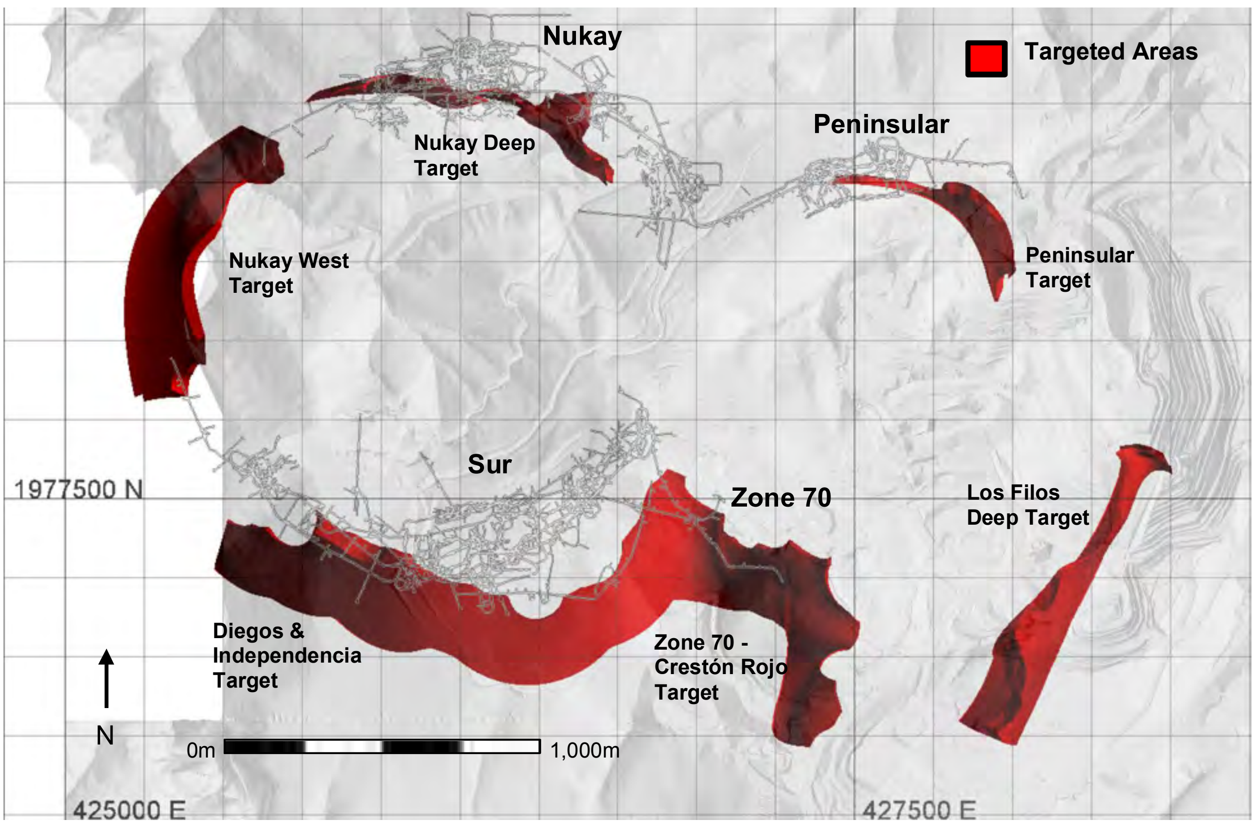
9.7.1 Los Filos Underground Exploration

Infill drilling at Los Filos Underground is targeted to further develop resources that are open along the strike of the known ore, to the east and west of the existing infrastructure as shown on Figure 9-5. The targeted areas are contained in the endoskarn alteration intrusive along the granodiorite and carbonate contact. The total underground expansion has a potential exploration target range of 1.0 to 2.9 Moz Au. The potential quantity and grade is conceptual in nature, that there has been insufficient exploration to define a mineral resource and that it is uncertain if further exploration will result in the target being delineated as a mineral resource. The exploration target potential quantity and grade has been determined based on prior drilling intercepts and dimensions.

The total underground exploration has a potential exploration target range of 5.4 Mt at 6 g/t to 13.2 Mt at 6.8 g/t. The potential exploration targets include the following.

- Peninsular: Target Range of 2.3 Mt at 6 g/t to 4.0 Mt at 7 g/t, high-grade in extension along strike from existing mine, work in progress.
- Zone 70 – Crestón Rojo: Target Range of 1.1 Mt at 6 g/t to 3.3 Mt at 7 g/t, high-grade oxide less than 1 km from crusher, work in progress.
- Nukay Deep and Nukay West: Target Range of 0.5 Mt at 6 g/t to 2.6 Mt at 7 g/t, high-grade extension along and down strike of existing mine.
- Diegos and Independencia: Target Range of 0.4 Mt at 6 g/t to 1.7 Mt at 6 g/t, extension down strike of existing mine.
- Los Filos Deep: Target Range of 1.1 Mt at 6 g/t to 1.6 Mt at 6 g/t, continuation along strike of Peninsular ore body.

Figure 9-5: Los Filos Underground Exploration



9.8 Comments on Exploration

The exploration programs completed to date are appropriate for the style of the deposits and prospects within the Mine property. The structural, age dating, and petrographic research work supports the genetic and affinity interpretations.

10.0 DRILLING

Since 2003, a total of 735,813 m of diamond and RC drilling has been completed on the Los Filos mine property.

Surface and underground drilling completed on the Los Filos mine property by the Los Filos Exploration Department from 2003 to 31 December 2016 is summarized in Table 10-1. Drilling has been completed in Los Filos, Bermejal, Guadalupe, Los Filos Underground, and Xochipala areas. Recent drilling below the Bermejal Open Pit has focused on mineralization for potential as an underground development project.

Table 10-1: Drill Hole Summary Table, Los Filos Mine Property Drilling, 2003–2016

Year	RC		RC-Core (Combined)		Core		Total	
	Number Holes	Meters	Number Holes	Meters	Number Holes	Meters	Number Holes	Meters
2003	927	180,394	0	0	50	10,386	977	190,780
2004	237	44,421	0	0	72	17,171	309	61,592
2005	0	0	0	0	170	46,195	170	46,195
2006	0	0	0	0	139	25,718	139	25,718
2007	0	0	0	0	161	20,187	161	20,187
2008	54	6,006	0	0	88	20,687	142	26,693
2009	0	0	0	0	238	34,762	238	34,762
2010	0	0	0	0	205	44,416	205	44,416
2011	0	0	0	0	200	51,199	200	51,199
2012	0	0	0	0	175	51,146	175	51,146
2013	0	0	0	0	133	37,162	133	37,162
2014	0	0	0	0	162	48,360	162	48,360
2015	37	5,517	7	1,841	174	40,138	218	47,496
2016	0	0	0	0	237	50,107	237	50,107
	1,255	236,338	7	1,841	2,204	497,634	3,466	735,813

Note: Table includes underground and surface drilling. Drilling has been completed at the Los Filos, 4P, Bermejal, Guadalupe, Los Filos Underground deposits.

Collar locations for the drill holes completed over the entire Mine property are shown in Figure 10-1. Figure 10-2 is a detail map showing the drilling completed in the area of the Los Filos Open Pit. Figure 10-3 shows the drilling in the area of the Los Filos (Nukay) Underground mine. Figure 10-4 illustrates the drill locations for drilling at Bermejal and Figure 10-5 the drilling at Guadalupe.

10.1 Drill Methods

RC drilling at Los Filos after late 1995 was accomplished by Layne de Mexico (Layne) using truck-mounted drills.

The main phase of core drilling in 1996 was carried out by Britton Hermanos de Mexico (Britton Brothers). Drill companies used for the 2005–2009 programs were Major Drilling de Mexico, S.A. de C.V. (Major) and Construcción, Arrendamiento de Maquinaria y Mineria S.A. de C.V. (CAMMSA). Rigs included Longyear 38s and URD 200s.

Goldcorp contracted Servicios Drilling for additional RC drilling during 2015 using a truck-mounted drill rig. Six of these holes were drilled as starters through the barren limestone and then switched to diamond drill core using a DDH-DE710 drill rig.

Figure 10-1: Mine Property Drill Hole Location Map

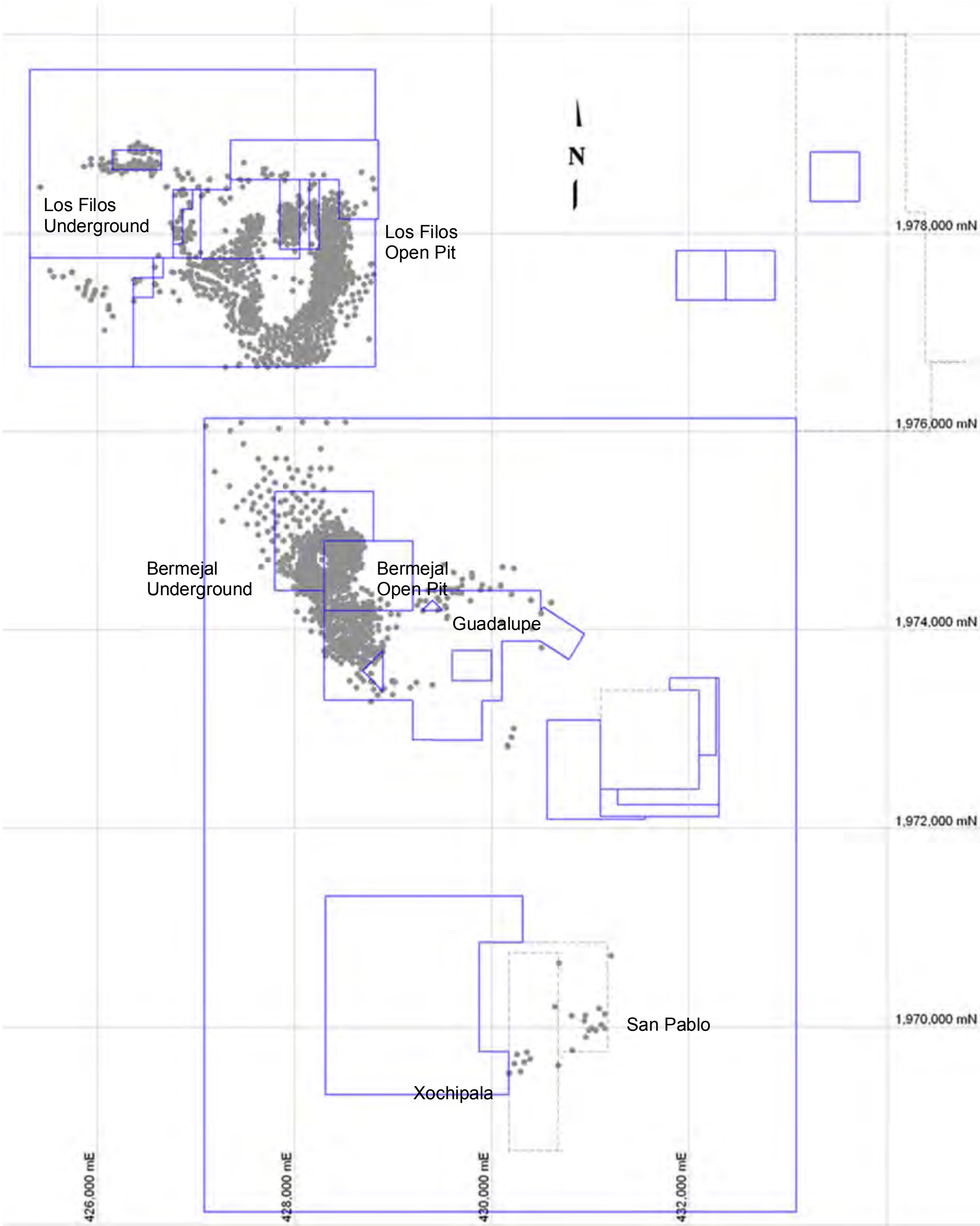
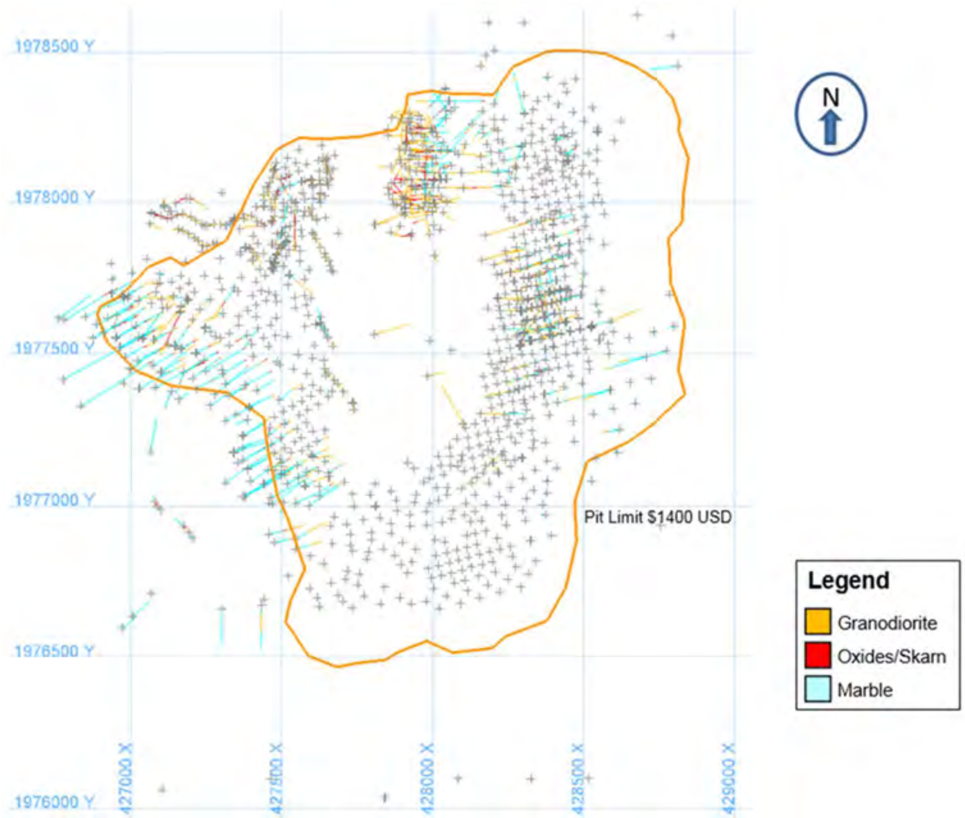


Figure 10-2: Los Filos Deposit Drill Hole Location Map



Note: Pit Shell t limit shown at US$1,400 supports Mineral Resource estimate in Section 14.0.

Figure 10-3: Los Filos Underground Area Drill Hole Location Map

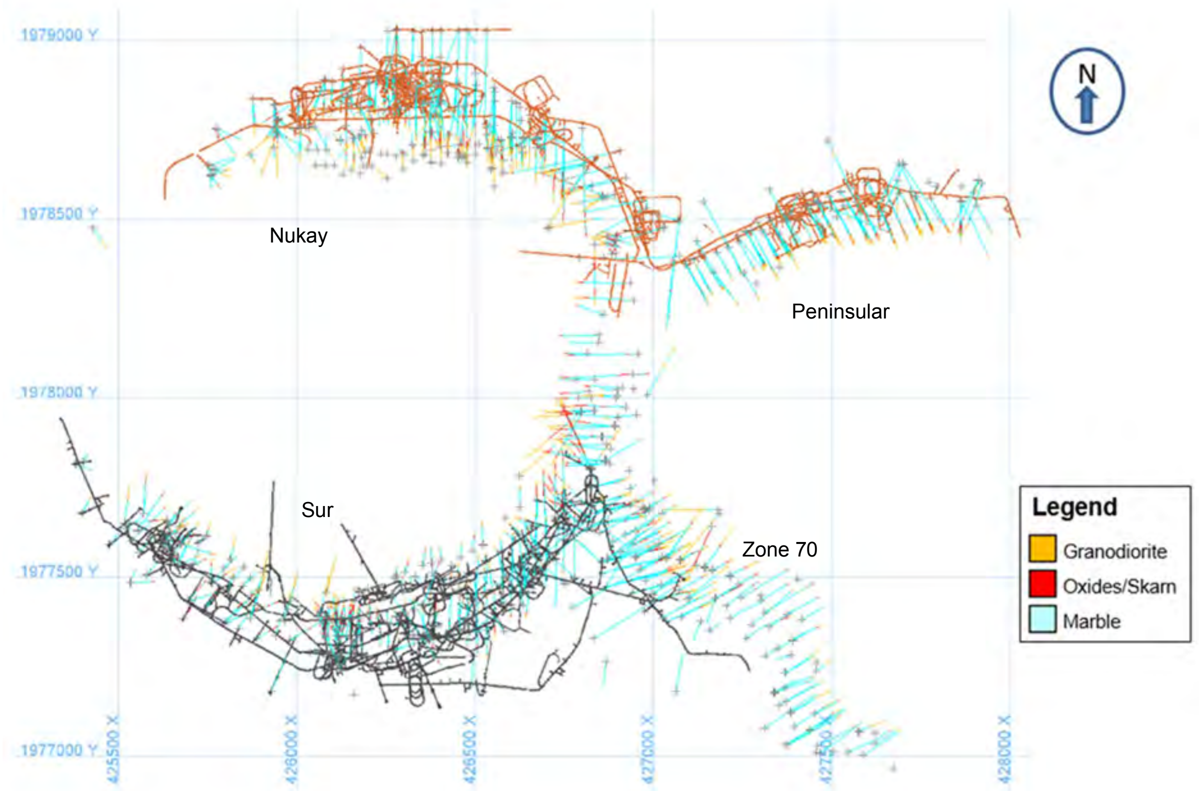
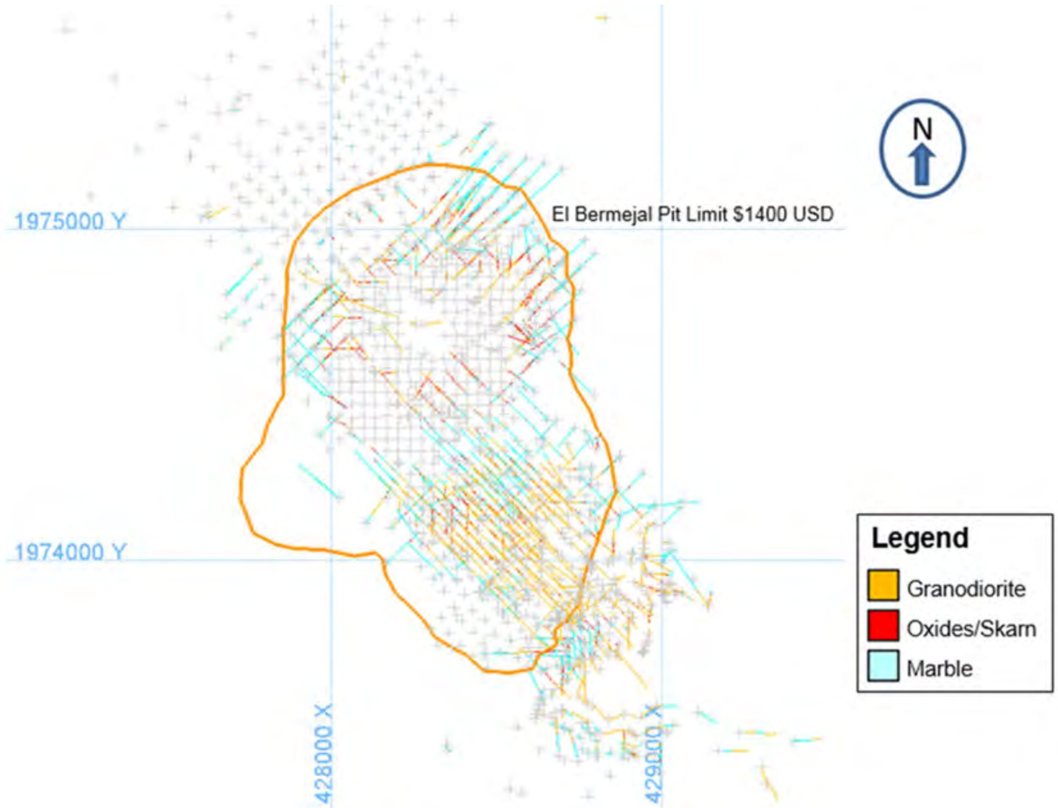
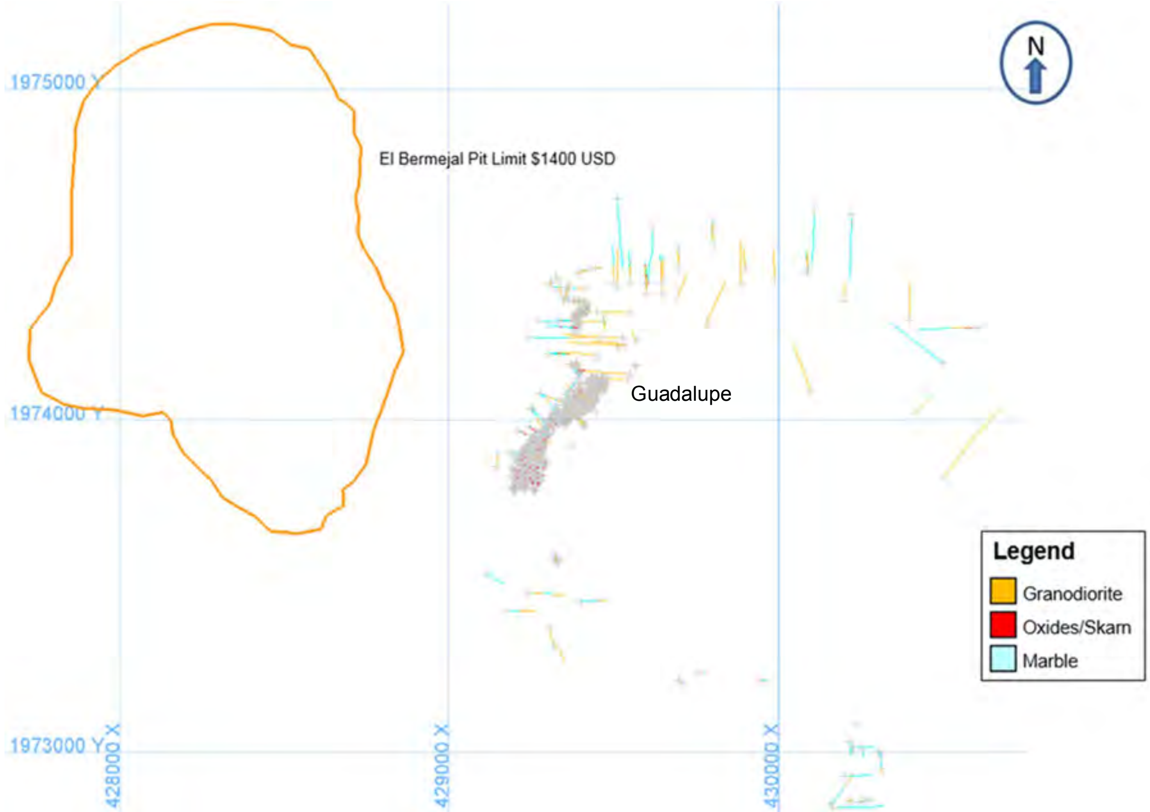


Figure 10-4: Bermejal Deposit Drill Hole Location Map



Note: Pit Shell limit shown at US$1,400 supports Mineral Resource estimate in Section 14.0.

Figure 10-5: Guadalupe Deposit Drill Hole Location Map



Note: Pit shell limit shown at US$1,400 supports Mineral Resource estimate in Section 15.0.

In addition, the following companies and rigs have been employed on the project.

- 2006: Canrock Drilling; Longyear LY38 drill rig
- 2007–2008: Advaiser Drilling; rig types not recorded
- 2007; 2011–2012: Servicios Interlab de México; rig types not recorded
- 2007–2012: Servicios Drilling; Longyear LY44, LF90 drill rigs
- 2008: Layne de México; RC drilling; ITRH 100 drill rig
- 2011–2012: Maza Drilling; Valdor drill rig
- 2012: Energold; rig types not recorded
- 2015: Servicios Drilling; RC – Prospector rig, DDH – DE710

RC drilling was conducted using downhole hammers and tricone bits, both dry and with water injection. Groundwater is generally absent in the marble, but minor water flow is typically present in the adjacent intrusive rocks. Water flow was rarely high enough to impact the drilling, although water had to be injected as needed to improve drilling rates and sample recovery.

Experimentation with various drilling techniques over the durations of the exploration programs led to the development of a drilling protocol to optimize sample quality. The rods used were 3 m or 6 m in length, and samples of the drill cuttings were collected at 1.52 m intervals. Core drilling penetration rates averaged 60 m per day per drill, with an average hole depth of approximately 230 m. Some RC drilling was performed as pre-collars for core drill holes, to reduce costs. Sample recoveries were not routinely recorded for RC holes.

Surface core drilling typically recovered HQ size core (63.5 mm diameter) from surface, then was reduced to NQ size core (47.6 mm) where ground conditions warranted. Following drilling methods tests, face-discharge bits were used for all core drilling. In general, core recoveries were good, averaging around 90%. Metallurgical holes were typically drilled using PQ size core (85 mm).

Drill diameters for the underground operations were either NTW (56 mm) or HQ size, depending on the rig that was used.

Any break in the core made during removal from the barrel was marked with a “color line.” When breakage of the core was necessary to fill the box, edged tools and accurate measurement of pieces to complete the channels were the common practice to minimize core destruction. The end of every run was marked with a wooden tick and the final depth of the run.

Originally, the core was transferred to wooden core boxes, marked with “up” and “down” signs on the edges of the boxes using indelible ink. The drill hole number, box number, and starting depth for the box was written before its use, whilst final depths were recorded upon completion. All the information was marked with indelible ink on the front side of the box and on the cover. More recently, the Los Filos Site has been using corrugated plastic core boxes marked as described above.

Initially, the core was transported 13 km to a core shack in Mezcala; however, since construction of the core shack on site was completed in mid-2006, all core has been processed and stored on site.

Personnel from the drilling company (or the drilling company supervisor) transported the core boxes to the core shed. Core handling logs were completed that included details for all persons involved in any step during the logging and sampling procedures.

10.2 Geological Logging

Logging of RC drill cuttings and core has followed standard logging procedures since project inception. Initial logging utilized paper forms, with data hand-entered into a database from the logging form. Current logs are completed using computer tablets, with data uploaded directly into an acQuire database.

Logs currently record lithologies, skarn type, fracture frequency and orientation, oxidation, sulfide mineralization type and intensity, and alteration type and intensity. Until 2001, the logging descriptions were based on alteration terminology, which led to difficulties with actual lithological identification. In 2001, Minera Nuteck completed a thorough field-based geological reinterpretation, which led to re-logging of all available drill core using lithologies, with alteration as a descriptor. Los Filos site personnel have maintained the logging scheme so that a consistent set of primary lithological records exists for the Mine property.

Rock quality designations (RQD) and recovery percentages were recorded as part of the geotechnical logging. RQD measurements are taken by measuring the sections of core greater than 10 cm that were not fractured over lengths of 5 m; rock hardness measurements are recorded on a scale of 0 to 5, with 0 being very soft and 5 being very hard. All the discontinuities are classified by type and thickness, and discontinuity orientations were recorded as 0°–30°, 30°–60°, and 60°–90°.

Core is photographed and video recorded from collar to toe; these digital files are stored on hard disc at site.

10.3 Collar Surveys

Three exploration grids initially covered the Los Filos deposit: the Mexican State Grid (UTM), the Nuteck grid, and the Los Filos grid. The Nuteck grid orientation was coincident with the UTM grid, and all Nutek drill hole survey coordinates were initially recorded using the local Nuteck grid system. The Los Filos grid is rotated 15° to the west of the Nuteck grid.

In 2001, all drill hole coordinates from the 2000 drill campaign were re-surveyed by Teck. Based on this work, a global modification of 60.5 m to all drill hole elevations was made.

Current drill collars are based on a topographic survey in UTM coordinates using a Sokkia Set 610 total station with 6-second accuracy. Earlier collar surveys were validated by Los Filos survey crews based on previous triangulation survey landmarks developed by contractor Mr. Juan Herrera and double-checked with landmarks from the survey developed by Eagle Mapping (refer also to Section 10.1).

10.4 Downhole Surveys

All pre-2003 holes were surveyed for hole inclination using the hydrofluoric acid test tube etch method. Angle holes were surveyed every 66 m, and vertical holes were tested once at the end of hole. Limited downhole surveying was undertaken with a computerized gyroscopic probe at intervals of 15 m. However, none of the core holes remained open, and only 67 RC rotary holes could be partially surveyed due to closure and collapse.

The post-2003 core drill holes were routinely surveyed ‘downhole’ at 50 m intervals using a Reflex EZ-Shot instrument. Each measurement also recorded magnetic intensity and temperature.

10.5 Surface Drilling

Surface drill hole intersection spacings across the deposits that have estimated Mineral Resources are approximately 35 m × 35 m in areas with close-spaced drilling, and widening to about 70 m × 70 m in the areas that are less well drilled. Drill spacing is wider again in the areas outside the conceptual pit outlines used to constrain Mineral Resources.

Drill hole azimuths range from 0°–225°. Dips range from 65°–90° and are typically 90°. Hole depths range from 0–600 m and average 350 m.

The relationship between true widths, drill intercepts, lithologies, and gold grades for drill hole intervals in drill holes is shown on the cross sections included in Section 7.0 (refer to Figure 7-11 and Figure 7-13 to Figure 7-15). Drill holes may contain oxide and sulfide intersections mineralization and areas of higher grade within lower-grade intervals.

10.6 Underground Drilling

Underground drilling is managed by Los Filos site personnel. Initial drill hole intersection spacing is 25 m × 50 m, and tightened to a final spacing of 25 m × 25 m. Drill hole lengths vary from about 40 m to as much as 350 m, but typically average about 200 m in length. In the South Zone of the underground operations, the drill azimuth is usually at 180°, whereas in the North Zone, azimuths are commonly 0° / 360°. Dip of drill holes vary depending on the target mineralization, from 0° to 90°.

10.7 Surface Blasthole Drilling

Los Filos mine currently operates 10 drills that drill a 17 cm hole diameter. Blastholes are typically spaced at 5 m × 6 m in ore zones, and are 6 m deep. Blastholes are sampled for mineral content and grade control.

10.8 Comments on Drilling

In the opinion of the Qualified Person, the quantity and quality of the lithological, geotechnical, collar survey, and downhole survey data collected in the exploration and infill drill programs are sufficient to support Mineral Resource and Mineral Reserve estimation as follows:

- Core logging performed by Los Filos Site staff meets industry standards for gold and silver exploration.
- Collar surveys since 2003 have been performed using industry-standard instrumentation.
- Downhole surveys performed after 2003 were performed using industry-standard instrumentation.
- Recovery data from Los Filos core drill programs is acceptable.
- Drilling is normally perpendicular to the strike of the mineralization. Depending on the dip of the drill hole and the dip of the mineralization, drill intercept widths are greater than true widths when the drilling is not perpendicular.
- Drilling orientations are generally appropriate for the mineralization style and have been drilled at orientations that are optimal for the orientation of mineralization for the bulk of the deposit areas.
- Drill orientations are shown in the example cross sections in Section 7.0 and can be considered to appropriately test the mineralization. The sections display typical drill hole orientations for the deposits, show summary assay values using color ranges for assay intervals that include areas of no mineralization and very low-grade mineralization, and outline areas where higher-grade intercepts can be identified within lower-grade sections. The sections confirm that sampling is representative of the gold and silver grades in the deposits, reflecting areas of higher and lower grades.

11.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

Sampling programs were conducted by Minera Nukay, Minera Nuteck, and Luismin prior to 2003. After 2003, Goldcorp exploration personnel were responsible for the following:

- Sample Collection
- Core Splitting
- Preparation of Samples for Submission to the Analytical Laboratory
- Sample Storage
- Sample Security

Los Filos staff have also been responsible for grade control sampling and assaying, which is performed in the mine site laboratory.

Company personnel selected and collected samples for preparation and analyses.

11.1 Sampling Methods

11.1.1 Geochemical Sampling

Geochemical samples were collected as soil and regolith samples during early stage exploration on the Property and are superseded by more recent drill and production data.

11.1.2 RC Sampling

RC drill cuttings from drill holes at the Los Filos deposit were sampled at intervals of 1.52 m. The material was split at the drill into several portions of 12 kg or less. Of these, a 300 g “assay split” was shipped to the assay laboratory, ALS Chemex, in Guadalajara, and the “second split” was stored on the property.

A handful of rock chips from each sample interval was collected and logged by experienced onsite geologists. Data from the drill logs were entered digitally into ASCII files for compilation into a drill hole database and subsequently used for resource estimation.

RC drill cuttings from drill holes completed at the Bermejal deposit were sampled dry at intervals of 2 m. All the cuttings were collected in high-strength plastic bags that were previously marked, and then weighed to determine the drill hole recovery. The bags were then transferred to the camp and then riffle split in three cycles until a 10 kg sample was obtained. The split sample was then bagged and tagged and sent to the sample preparation laboratory at San Luis Potosi (Bondar Clegg) or at Hermosillo (Skyline). The remainder of the RC sample was saved in high-strength bags and stored on site.

At times, the Bermejal RC drilling required the introduction of water, and the following sampling method was undertaken. All the material was passed through a cyclone, which permitted 10% of the suspended solids to be recovered. Suspended solids and fluid were stored in pre-labeled micropore bags that allowed the samples to dry. Once dry, the material was weighed, tagged, and sent to the laboratory for analysis.

11.1.3 Core Sampling

The mineralized intervals of core that were drilled prior to 2003 were friable and easily damaged by moving. Logging was completed at the drill site prior to splitting. Splitting of the core was supervised by the geologist who logged the core to ensure sample integrity. Splitting was achieved using a tile saw when solid, or by hand with a knife when soft. Samples were typically shorter than 1.5 m.

Core samples for exploration and infill drill programs conducted after 2003 were cut with 220 V Rockman saws or split with Hydrasplit manual hydraulic splitters, taking lithological contacts into account, as determined by the geologist.

PQ core was cut into three sections, with 75% assigned for metallurgical testing, 12.5% for assaying, and 12.5% stored in the core box in the core shack. NQ core was also cut in three sections, but only 50% was sent for metallurgical testing, 25% for assaying, and 25% stored.

Cut samples were bagged and numbered in polyethylene bags. Groups of 20 sample bags were placed in larger bags and labelled with the name and address of the laboratory, and the number and series of samples that were contained within the bag. When approximately 400 samples had been accumulated, a truck was sent from ALS Chemex's laboratory to the project to transport the samples to the ALS Chemex Guadalajara sample preparation laboratory, approximately 800 km from Los Filos.

Diamond drill core was either cut in half longitudinally with a rock diamond saw or, in the case of friable material, was sampled by spatula. The sampling intervals respected geological boundaries. Samples were typically equal to or shorter than 1.5 m.

11.2 Density Determinations

11.2.1 Los Filos Open Pit

Teck and Luismin collected bulk density data during 3 different drill programs in 1997, 2001, and 2004, for a total of 839 density measurements. Bulk density measurements were calculated using the immersion method. The samples were weighed before and after waterproofing (lacquer or wax) and then immersed in water to determine the amount of displacement. The bulk density was calculated by dividing the sample weight by the volume of displaced water.

Bulk density was assigned to model blocks based on the rock type, as shown in Table 11-1.

Table 11-1: Los Filos Open Pit Assigned Bulk Densities

Rock Type	Geometallurgical Code	Bulk Density (t/m^3)
Intrusive	Ia	2.35
Intrusive	Ib	2.35
Limestone	II	2.55
Endoskarn	III	2.35
Oxides	IV	2.55

11.2.2 Bermejal Open Pit

In 1999, Peñoles conducted a study of bulk density using diamond drill core. Data from the drilling was divided based on rock type and north versus south pit areas. The results of this study were used to assign grades to the Bermejal Open Pit block model, as shown in Table 11-2.

Table 11-2: Bermejal Open Pit Assigned Densities

Rock Type	Rock Code	Bulk Density (t/m³)	
		North	South
Carbonate	6	2.52	2.52
Oxide	7	2.67	2.31
Sulfide	8	2.72	2.69
Intrusive	9	2.36	2.29

11.2.3 Los Filos Underground

To estimate the density for the underground deposits, Los Filos exploration team undertook bulk measurements on 11 representative points of the underground workings in the Los Filos area. The single domain not tested was Peninsular, which did not have exposure and, therefore, the density used for that deposit was based on drill core. The method used was to dig a hole approximately 0.5 m³ in size, to weigh the material extracted from the hole, and to fill the hole with either water or sand, measuring the volume. These 11 samples totaled 3.8 t of material, which is considered more representative than small samples from drill core. The average of the measurements was taken as a single value for each domain. The test results are shown in Table 11-3.

Table 11-3: Bulk Density Values Based on Sampling in Los Filos Underground

Mine	Density (t/m³)
Nukay	3.33
Conchita	2.77
Chimenea	2.53
Peninsular	2.96
Subida-Independencia	3.26
Zone 70	2.66

11.2.4 Bermejal Underground

Bermejal Underground block densities were calculated using the same diamond drill core method as the Bermejal Open Pit. Densities assigned to the appropriate lithologies are shown in Table 11-4.

Table 11-4: Bermejal Underground Assigned Densities

Rock Type	Density (t/m³)
Carbonate	2.52
Oxide	2.67
Intrusive	2.36
Intrusive Sill	2.36

11.3 Sample Preparation and Analysis

Sample preparation and analytical laboratories used during the exploration programs on the project include ALS Chemex, Bondar Clegg (merged into ALS Chemex in 2001), and Skyline (once part of ALS Chemex).

11.3.1 Pre-1995

Due to the remote location of the Los Filos site and lack of infrastructure, early stage exploration samples were trucked from the project site to the Chemex laboratory in Tucson, Arizona.

In 1993, samples were prepared on site using a riffle splitter to produce 250 g splits that were then dispatched to the Chemex assay laboratory in Sparks, Nevada, for additional sample preparation and analysis.

In early 1994, Bondar Clegg, trading as Inchcape Testing Services, opened a sample preparation facility in San Luis Potosi, Mexico. Exploration samples were trucked to this facility for the first nine holes of the 1994 drill program. Following sample preparation, 250 g sample splits were sent to the Chemex laboratory in Vancouver, British Columbia, Canada, for analysis. After the first nine drill holes, samples were sent to the Chemex laboratory in Tucson, Arizona, USA, for preparation. In late 1994, Bondar Clegg initiated a sample pickup service from the Mine property, and the San Luis Potosi facility was again used for sample preparation. However, during review of analytical data, poor sample preparation procedures, including incomplete pulverization and sample contamination, again led to the discontinuation of use of the San Luis Potosi facility.

Second splits for all samples originally assayed by Bondar Clegg in 1994 were submitted to Chemex Vancouver for check assays. The Bondar Clegg values were not used in estimation calculations and instead were replaced by the Chemex results.

11.3.2 1995 to Current

From 1995, all samples were prepared by Chemex at a new facility established in Guadalajara, Mexico, and were assayed at the Chemex Vancouver laboratory. Samples of drill cuttings and drill core for programs prior to 2003 were prepared and assayed by standard procedures at ALS Chemex.

The procedure consisted of the following:

- Samples were weighed and dried at 150° for about 8 hours.
- Samples were crushed to a minimum of 75% passing #10 mesh.
- Crushed samples were split to provide a 300 g or 1,000 g representative cut.
- Samples were then pulverized to a minimum of 95% passing #150 mesh.
- Pulverized samples were bagged and shipped to Vancouver, British Columbia.
- Thirty (30) g of the pulverized samples were fire-assayed for gold.
- For drill programs post-2003, the sample preparation performed by ALS Chemex was modified slightly from the pre-2003 procedure, in that the following occurred:
  - Crushed samples were split to provide a 250 g representative cut.
  - Samples were then pulverized to a minimum of 85% passing #200 mesh.

The same procedures used by Goldcorp and documented above were also used in the Luismin and Minera Nuteck programs.

If requested, the laboratory performed inductively coupled plasma (ICP) emission spectroscopy analyses on 0.5 g samples of pulverized pulps.

All drill samples were routinely assayed for gold and copper. Following the discovery of the Los Filos deposit, the sample pulps for the Los Filos drill holes were resubmitted for silver analysis. All the subsequent Mine property drill samples have been assayed for gold, copper, and silver.

Gold assays were run using a one assay-ton (30 g) charge, with an AA finish. Assays exceeding 10 g/t Au were re-analyzed using fire assay with gravimetric finish. Copper and silver assays were performed using a 1 g charge, aqua regia digestion, and AA analysis. Silver values exceeding 100 g/t Ag were re-analyzed using a one assay-ton fire assay with gravimetric finish.

Approximately 2.5% of the splits from the exploration core samples were routinely re-assayed to confirm initial results and, if the check assays were at variance with the original assay, a second split sample was assayed.

11.4 Analytical and Testing Laboratories

ALS Chemex was responsible for sample preparation throughout the exploration and infill drilling phases through its non-accredited sample preparation facilities in Guadalajara and Hermosillo, Mexico. All samples from 1995 onwards were dispatched to the Vancouver laboratory facility for analysis, which, at the time the early work was performed, was ISO-9000 accredited for analysis. The laboratory is currently ISO-17025 certified for selected analytical techniques. ALS Chemex is independent of Goldcorp.

SGS Laboratories operated the mine laboratory until 2015 and was independent of Goldcorp; currently, the Mine laboratory is operated by Los Filos personnel.

The SGS laboratory in Durango, Mexico, was the Mine property check laboratory in 2012. The laboratory has held ISO-17025 certifications for selected analytical methods since 2009. The laboratory is also independent of Goldcorp.

11.5 Quality Assurance and Quality Control

There is no information in existing documentation that confirms whether blanks and standard reference materials (standards) were included in Los Filos samples submitted for assay prior to 2000. Sufficient documentation shows that comprehensive check-assaying campaigns were undertaken at several intervals whereby splits from samples were routinely re-assayed to confirm initial results, commonly through a separate analytical laboratory.

There is limited data on quality control done for the Bermejal deposit prior to the Luismin purchase in 2005; however, internal Peñoles documents in 1997 confirm there was a quality control process in place for the main laboratory.

Blanks and standards were introduced in sampling programs by Minera Nuteck and have been in place since 2000.

Previously, the Mine’s quality control and data verification procedures incorporated a system of repeat assaying and blanks. One in twenty samples sent to the laboratory were identified for repeat analysis. Goldcorp introduced a blank sample immediately after the repeat sample (i.e., every batch consists of 22 samples). The blank material was limestone sourced from the local river, several kilometers distant from the Mine property area.

The Mine has adjusted the program to include the use of standards. Presently, the Mine puts a blank sample in after 20 samples, a repeat assay after 20 more, then a standard after 20 more. This pattern is repeated downhole as sampling continues. The standards are divided into two groups, three each for underground and open pit areas. Within the two groups, one sample targets typical low grades in that area, another standard targets mid-range grades, and the third targets higher-grade values. The three standards are alternated within each sample set per the mining type for those samples.

Data from this quality assurance / quality control (QA/QC) program is reviewed monthly and includes variance graphs for both gold and silver assays. Any comparison that exceeds a 3% variance is reviewed and resubmitted to confirm there is no real bias. To date, the program has shown very good, repeatable results.

11.6 Databases

Data was initially recorded on Excel spreadsheets and then compiled into a database, but have now been transferred into an acQuire database. Assay data is currently uploaded digitally. Geological and geotechnical logs are manually typed into the database. Survey data is uploaded from the survey instruments.

The database manager or designated personnel verify the data. Data is regularly backed up.

11.7 Sample Security

Sample security was not generally practiced at Los Filos during the drilling programs, due to the remote nature of the site. Sample security relied upon the fact that the samples were always attended or locked at the sample dispatch facility. Sample collection and transportation of samples on site have always been undertaken by company or laboratory personnel using company vehicles.

Samples that are ready for sample preparation and analysis were picked up at site by ALS Chemex and transported to Guadalajara, Mexico, for preparation. The prepared samples were then sent by air to the ALS Chemex analytical laboratory in Vancouver, British Columbia, Canada.

Chain of custody procedures consisted of filling out sample submittal forms that were sent to the laboratory with sample shipments to make certain the laboratory received all samples.

Assay pulps and crushed reject material are returned by ALS Chemex to Goldcorp's core shack at Los Filos mine for storage. Weathering has deteriorated the integrity of individual pulps from earlier drill programs. Some pulps are stored at the Teck storage facility in Iguala.

Drill core is stored in wooden-plastic core boxes on steel racks in the buildings adjacent to the core logging and cutting facilities. The core boxes are racked in numerical sequence by drill hole number and depth.

Coarse rejects in plastic bags are stored in cardboard boxes on steel racks in a separate locked building. The coarse reject boxes are labelled and stored by sample number.

11.8 Comments on Sample Preparation, Analyses, and Security

All collection, splitting, and bagging of RC and core samples were carried out by Minera Nukay, Minera Nuteck, Wheaton River, Luismin, or Goldcorp personnel, depending on the date of the drill program. No factors were identified with the drilling programs that could affect Mineral Resource or Mineral Reserve estimation.

Figures in Section 10.0, which show drill hole collar locations, indicate that the sizes of the sampled areas are representative of the distribution and orientation of the mineralization.

Figures in Section 7.0 show approximate drill hole collar traces in relation to the orientation of the mineralization. The figures also show that drill hole assay intervals include areas of non-mineralized and very low-grade mineralization, and confirm that sampling is representative of the gold, silver, and copper grades in the deposits, reflecting areas of higher and lower grades.

Data validation of the drilling and sampling program is discussed in Section 14.0, and includes review of database audit results.

Twin and infill drilling is used to confirm drill sample assays, and intersection widths and grades, as discussed in Section 12.0.

In the opinion of the Qualified Person, the sampling methods are acceptable, meet industry-standard practices, and are adequate for Mineral Resource and Mineral Reserve estimation and mine planning purposes, based on the following:

- Geochemical sampling covered sufficient area and was adequately spaced to generate first-order geochemical anomalies, and thus was representative of first-pass exploration sampling.
- Drill sampling has been adequately spaced to first define, and then infill drill gold and copper anomalies to produce prospect-scale and deposit-scale drill data. Drill hole spacing varies with depth. Drill hole spacing in shallow oxide mineralization is approximately 150 m. Average drill hole spacing in the core of the deposits is about 50 m. Drill hole spacing increases with depth as the number of holes decrease and holes deviate apart. Average spacing at the base of the ultimate reserve pits is approximately 25 and 35 m.
- Data collection follows industry-standard sampling protocols.
- Sample collection and handling of RC drill cuttings and core was undertaken in accordance with industry-standard practices, with procedures in place to limit potential sample losses and sampling biases.
- Sample intervals in core and RC drilling, comprising a maximum intervals of 1.50 m and 1.52 m, respectively, are considered to be adequately representative of the true thicknesses of mineralization. Not all drill material may be sampled, depending on location and alteration.
- Sample preparations that support Mineral Resource estimation have followed a consistent procedure since 2003. The preparation procedure is in line with industry-standard methods for gold deposits.
- Independent laboratories analyzed samples collected during exploration and infill core and RC programs using industry-standard methods for gold, silver, and copper.
- Current ROM sample analyses are performed by the Mine laboratory, which is staffed by Los Filos personnel.
- Gravity determination procedures are consistent with industry-standard procedures.
- There are sufficient acceptable specific gravity determinations to support the specific gravity values utilized in waste and oxide and sulfide mineralization tonnage interpolations.
- There is limited information available on the QA/QC employed for the earlier drill programs; however, sufficient programs of reanalysis have been performed that the data can be accepted for use in resource estimation.
- Typically, drill programs included insertion of blank samples, duplicate samples, and standard materials. The QA/QC program results do not indicate any problems with the analytical programs, therefore the gold, silver, and copper analyses from the core drilling are suitable for inclusion in Mineral Resource and Mineral Reserve estimation.
- Sample and assay data that were collected were subject to validation using in-built program triggers that automatically check data on upload to the database.

- Data verification is performed on all digitally collected data on upload to the main database, and includes checks on surveys, collar coordinates, lithology data, and assay data. The checks are appropriate and consistent with industry standards.
- Sample security has relied upon the fact that the samples were always attended or locked in the on-site sample preparation facility. Chain-of-custody procedures consist of filling out sample submittal forms that are sent to the laboratory with sample shipments to make certain that the laboratory receives all samples.
- Current sample storage procedures and storage areas are consistent with industry standards.

12.0 DATA VERIFICATION

12.1 Assay Verification

Check assaying on samples from the Los Filos deposit collected during exploration programs prior to 1998 was accomplished in three main batches.

- A batch of original pulps prepared by ALS Chemex from the assay split were reanalyzed at Cone Geochemical Laboratories. The check assays typically compared well with the original assays.
- New sets of pulps were prepared from the rejects of selected assay splits and analyzed by ALS Chemex to check the quality of the original 300 g pulps and test the sample preparation procedure of the laboratory. Instances of poor correlation and an indication of bias were noted. A follow-up study performed by Minera Nukay showed that a better reproducibility could be achieved on 1 kg pulps. Thus, starting with TNP193, all samples were analyzed using larger pulps. In addition, all diorite / granodiorite samples from previous holes were reanalyzed with the new large-pulp method and re-assays were integrated into the database.
- A third batch of check sample included second sample splits to check the quality of the sample splitting procedures at the drills. Although a significant dispersion was noted by Minera Nukay, overall, the second splits averaged only 2% lower than the original assays. In summary, no particular bias and a good correlation were found between the original assays and the check assays.

In the 2000 Los Filos drill campaign, a limited quality control program was undertaken. At the end of each drill hole, 4 blank and 2 standard samples were inserted. Three types of standards were used. The first group (14 samples) represented reject RC samples from previous drill programs. The whole reject was sent, without splitting. The second group (44 samples) was prepared in-house. A large 120 kg sample was crushed, and 9 sub-samples were sent to 3 different laboratories for analyses. The average value from the laboratories was used as a standard assay value for the material. The third group (2 samples) represented commercial standards bought from Prolab.

In 2001, an additional check assaying program was undertaken on Los Filos samples. A total of 417 original ALS Chemex pulps from old RC drill holes and 226 field re-splits from new RC drill holes were reanalyzed by Bondar Clegg. Minera Nukay concluded that the Bondar Clegg pulp re-assays from old RC holes were similar to the assays from the original pulps, and that assays from the re-splits also compared well with the original assays.

Two types of re-assay samples for the Bermejal deposit were undertaken at regular intervals at Bondar Clegg, during the preparation stage and at the last sampling stage of the laboratory analysis. At the preparation stage, a 300 g duplicate was taken at a frequency of 1:40. At the analytical stage, a 60 g repeat sample from the 300 g pulp was taken at a frequency of 1:12.

There is no record of quality control provided by Skyline laboratory.

12.2 Database Validation

Entry of information into databases utilized a variety of techniques and procedures to check the integrity of the data entered.

Nowak (2002) verified a portion of the assay drill hole database and collar coordinates against source information. Approximately 38% of the whole assay database was verified, for a total 23,946 of 62,941 assays. Attention was paid to assays from the central high-grade area of the Los Filos deposit, which would provide a significant portion of the ore for initial mining. Errors identified were minor and accounted for <1% of the database. A total of 370 out of 456 drill collars was checked; errors were noted with the locations of 7 holes, and the database was accordingly modified.

During 2003, Micon completed a database review in support of technical report preparation. No significant errors were noted in the database.

Goldcorp (then Wheaton River Minerals) undertook a due diligence review of the Bermejal deposit and Minera El Bermejal's data during 2003. A team of employees and external consultants performed the review in which no significant issues were identified.

Snowden (2006) reviewed the Los Filos geological and assay databases supplied by Luismin's geological department in 2004 and cross-checked these with data sourced from Micon's 2003 report and work conducted for Goldcorp in 2003. Any inconsistencies were investigated and resolved. Geological interpretations and data developed by Luismin were reviewed by Snowden as new data became available during 2004 and 2005.

Other data verification work performed by Snowden during 2004 and 2005 included the following:

- Detailed review of 5% of the geological logs provided by Luismin.
- Examination of assay certificates and cross-checks against the database supplied by Luismin.
- Verification of extreme values.
- Four visits to site to review aspects of the drill program and reviews with the geological department.
- Review of the quality control procedures.
- Routine validation of the database to check for inconsistencies such as inconsistent hole lengths, missing intervals, zero-length intervals, and out-of-sequence records.

Snowden visited the Bermejal site from 27 September to 02 October 2005 and reviewed the geological interpretations, cross-checked assay certificates with the database, and inspected core from the 2005 Luismin core drilling program. The location of a number of Luismin drill hole collars was verified.

Database checks comprised the following:

- Routine validation of the database to check for inconsistencies such as hole lengths, missing intervals, zero-length intervals, and out-of-sequence records.
- Reconciliation of the drill hole layout with respect to earlier maps.
- Check on the reasonableness of the geological interpretations.
- Comparison of the assay statistics with those provided from the Goldcorp 2003 study, as a cross-check.

12.3 Twin Holes

A number of RC holes in Los Filos have been twinned with core drill holes. Nowak (2002) reviewed the twin data available in 2002 and concluded the following:

- Differences exist between core and RC assays.
- At lower elevations, below 1,500 masl (site elevation), estimates from core composites are on average lower, and at higher elevations are higher than the estimates from RC assays.
- Overall, grade estimates from core composites can be 10% higher than from RC composites.

Micon (2003) reviewed 15 sets of twinned RC-core holes, concluding that only 2 twins out of 15 indicated the possibility of downhole contamination. The remainder of the twin sets show good agreement in picking out the mineralized zone, with differences in average grades explained by nugget effect in 2 samples taken several meters apart in most cases.

Micon (2003) also compared 1,769 core assays to the nearest RC value from the twinned holes. The core samples had a higher mean value of 1.2 g/t Au, compared to 0.98 g/t Au in RC holes. Scatter plots did not indicate any bias with pairs clustering around the equal value line; however, there was poor agreement overall as shown by a high degree of scatter and a low-correlation coefficient.

12.4 Goldcorp Data Checks

Validation checks performed by operations personnel on data used to support estimation comprise checks on surveys, collar coordinates, lithology data, and assay data. No significant errors or omissions were identified with the database following these checks.

12.5 Stantec Data Checks

Stantec reviewed the QA/QC procedures used by Los Filos geologists to handle, log, and prepare samples for shipment and the QA/QC programs in place. The complete details of this process can be found in Section 11.0.

The Mine typically reviews all standards that are more than two standard deviations from the accepted value and requires re-assay of those batches where the standard value is three or more standard deviations from the accepted value.

The Mine submits quarter-core duplicate samples on a regular basis. Analysis of the results by Goldcorp staff indicated that within the confines of duplicates with coarse-grained gold, analytical results were acceptable up to grades of 30 g/t Au. Above this value, the precision and repeatability were erratic.

In Stantec's opinion, the current procedures meet industry standards and there are no significant issues that would preclude the use of data in Mineral Resource and Mineral Reserve estimation. Following review of the QA/QC checks, Stantec accepted the analytical data and deemed it appropriate to support Mineral Resource estimation with no modifications.

12.6 Comment on Data Verification

External consultant firms and Goldcorp personnel have performed data verification for the Mine property. The Qualified Person has reviewed the appropriate reports and is of the opinion that the data verification programs undertaken on the data collected from the Mine property adequately support the geological interpretations, the analytical and database quality, and therefore support the use of the drill hole data in Mineral Resource and Mineral Reserve estimation and in mine planning.

- No QA/QC programs exist for channel sample data collected underground.
- No sample biases were identified in drill hole data from the QA/QC programs undertaken.
- Sample data collected adequately reflect deposit dimensions, true widths of mineralization, and the style of the deposit.
- External reviews of the database have been undertaken in support of acquisitions, support of feasibility-level studies, in support of technical reports, and in support of Mineral Resource and Mineral Reserve estimates, producing independent assessments of the database quality. No significant problems with the database, sampling protocols, flowsheets, check analysis program, or data storage were noted.

Drill data are typically verified prior to Mineral Resource and Mineral Reserve estimation by running a software program check.

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Metallurgical Testwork

Extensive metallurgical testing at the Mine has been conducted over the last two decades. A summary of the metallurgical testwork completed to date is provided in Table 13-1.

Los Filos Open Pit uses metallurgical domains for defining ore types. Los Filos underground, Bermejal open pit, and Bermejal Underground use rock type domains for defining ore types. Targeted ore types for metallurgical testwork are listed in Table 13-2 and Table 13-3.

More recent sampling and metallurgical testwork for the Bermejal Underground deposit is described in Section 13.1.3.

Metallurgical testing is currently being performed on the Bermejal Underground core; a report is forthcoming.

Table 13-1: Summary, Gold Extraction Metallurgical Testwork

Year	Deposit / Zone	Laboratory	Testwork Performed	Gold Extraction – Range	Test Result Notes
1993	Nukay	Lakefield	Bottle rolls; -150 mesh		
1994	Agüita	Lakefield	Bottle rolls; -150 mesh		
1995	Zone 70	Lakefield	Bottle rolls; -150 mesh		
1995	Crestón Rojo / Los Filos	MLI	Bottle rolls; -¼ inch, 200 mesh		
1996-1997	Los Filos	MLI	Bottle rolls; -¼ inch, -¾ inch, -200 mesh; column leach; -19 mm,		
1997-1998	Los Filos	KCA	Column leach; various grain size		
1998	Los Filos core from 19 drill holes	MLI	Bottle roll / column leach comparison	Bottle roll low-grade 58–72 Bottle roll medium 61–59 Bottle roll high-grade 77–81 Column low-grade 63–68 Column medium 75–77	Strong correlation between ore type and gold recovery
1998	Los Filos	KCA	Column tests; -1.70 mm; bottle rolls; 0.150 mesh		
1999	Los Filos	KCA	Column tests -12.5 mm; surface material and drill core comparison tests – 0.15 mm		
2004-2005	Los Filos	MLI	Ore physical characteristics; ore variability testing; grind size sensitivity tests for milling / cyanidation; gravity concentration; column leach		Ore work and abrasion index tests; ore is considered moderately abrasive; crushing work index is relatively low, but the ball mill work index is about average; gravity concentration unsuccessful; ore generally amenable to direct agitated cyanidation treatment at the 1.7 mm and 75 µm feed sizes; gold recoveries significantly higher at 75 µm feed size; cyanide consumptions low; lime requirements were moderate, except for the high copper composites; ore composites evaluated amenable to simulated heap leach cyanidation treatment, gold recovery rates were fairly rapid; cyanide consumptions were moderate and lime or cement requirements were moderate to high

Year	Deposit / Zone	Laboratory	Testwork Performed	Gold Extraction – Range	Test Result Notes
2005-2006	Bermejal OP, bulk samples from declines	KCA	Bottle roll; column leach; compacted permeability; recovery and reagent consumption estimates	Run-of-mine column: 51% Crushed ore: 62%	High clay samples – low permeability; reagent consumptions moderate
2009	Los Filos Underground (92 drums) Nukay high-grade composite	KCA	Bottle roll; column leach; compacted permeability; recovery and reagent consumption estimates; agglomeration and percolation	High-grade samples: Bottle roll Los Filos: 76–94 Bottle roll Nukay: 83–92 Column Los Filos: 82–85 Column Nukay: 75–85	Detailed notes below
2011-2012	4P project 55 drums from 5 zones Filos and Bermejal	KCA	Bottle roll; column leach tests; recovery and reagent consumption estimation; environmental	Bottle Roll Agüita: 75–96 El Grande: 79–96 Creston Rojo: 63–97 Zone 70: 69–95 Column Leach Agüita: 48–82 El Grande: 80–95 Creston Rojo: 73–89 Zona 70: 40–75 Filos Sur: 31–73	Detailed notes below
2013-2015	2014: 18 samples weighing 90–200 kg 2015: 10 drums containing 19 samples Los Filos and Bermejal	KCA	Detailed assaying; cyanide shake (rapid gold extraction); bottle roll - fine grind and as crushed to <20 mm column leach - crushed agglomeration; permeability reagent consumption estimates	High-grade samples: Bottle roll Los Filos: 76–94 Bottle roll Nukay: 83–92 Column Los Filos: 82–85 Column Nukay: 75–85	Detailed notes below
2015	331 samples to 6 composites Peninsular	KCA	Grind versus recovery; gravity test	Bottle roll: 50%–80% Column leach: 57%–81%	High-grade oxides – average 7.4 g/t Au; no sulfides, one composite "preg robbing"
2016	33 samples, 10 composites	KCA	Grind versus recovery; gravity test	Bottle roll, bond work index, recovery validation	

*Note: KCA is Kappes, Cassiday & Associates; MLI is McClelland Laboratories Inc.

Table 13-2: Ore Type Summary by Geometallurgical Code

Deposit	Geometallurgical Domain	Comment
Los Filos Open Pit	Ia	Diorite or granodiorite dike; any intrusion or endoskarn with >30% clay; Ex1 with >10% clay
	Ib	Diorite or granodiorite dike or Ex1 protolith; any intrusion with ≤30% clay; endoskarn (En) with >10% but ≤30% clay; Ex1 with <10% clay
	II	Morelos Fm carbonate protolith; any carbonate rock without significant skarn alteration
	III	Diorite or granodiorite dike or granodiorite dike protolith; En with <10% clay
	IV	Morelos Fm carbonate protolith; any Ex2, Ex3 or Jasperiod

Table 13-3: Ore Type Summary by Rock Type

Deposit	Rock Type	Comment
Los Filos – 4P	Oxid	Oxide
	Carb	Limestone
	Gran	Granodiorite
Bermejal	Oxid	Oxide
	Gran	Intrusive
	Carb	Carbonate
	Hf	Hornfels
Nukay	Oxid	Oxide – Mixed or mineralized Limestone or Granodiorite mineralization types are not significant.
Guadalupe	Oxid	Oxide
		The Mixed classification is not applicable at Guadalupe
	Sulf	Sulfide

13.1.1 Los Filos Testwork

Kappes, Cassiday & Associates (2009)

Ninety-two drums of mineralized material from Los Filos Underground deposit were composited into high-grade, low-grade, and waste composites and sent to Kappes, Cassiday & Associates (KCA) for testwork. Samples making up the Nukay high-grade composite were sourced from the Nukay West, La Conchita, La Subida, and San Andres zones. Los Filos material was used for the Los Filos high-grade and low-grade composites.

Metallurgical testwork completed on the Nukay and Los Filos material included head analyses, milled bottle roll leach testwork, percolation testwork, compacted permeability testwork, and column leach testwork.

Column leach tests were conducted in duplicate on the Nukay high-grade composite material that had been stage crushed to 100% minus 50 mm, 100% minus 25 mm and 100% minus 12.5 mm. Similarly, column leach tests were conducted in duplicate on the Los Filos high-grade sample material that was stage crushed to 100% minus 50 mm, 100% minus 25 mm and 100% minus 12.5 mm.

Head Analyses

Head analyses for gold, silver, and copper were completed on each of the four individual Nukay high grade samples, the barren (Esteril) sample, and the Los Filos low-grade sample. The high-grade sample average assays ranged from 3.60 g/t Au to 9.40 g/t Au, 3.4 g/t Ag to 10.7 g/t Ag, and 355 ppm Cu to 2,850 ppm Cu. The low-grade composite grades averaged 0.48 g/t Au, 2.5 g/t Ag, and 141 ppm Cu.

In addition to gold and silver analyses, one of the pulverized portions from the Nukay high-grade composite and Los Filos high-grade sample were also assayed ICP-OES for additional elements. Whole rock, total carbon, sulfur speciation, and mercury were also determined. A cyanide-soluble copper shake test was conducted on a pulverized head material for each separate sample.

The multi-element analyses indicated that the Nukay high-grade composite material and Los Filos high-grade sample material contained 0.31% and 0.19% arsenic, respectively, 0.06% and 0.05% lead, and 0.12% and 0.07% zinc. The Nukay high-grade composite had a total copper content of 0.19%.

Bottle Roll Tests

The bottle roll leach testwork was completed in several series. A series of time of grind versus size tests were completed on 1 kg samples of minus 1.70 mm crushed material for the Nukay high-grade samples, as well as Nukay high-grade and Los Filos high-grade composites.

The minus 1.70 mm crushed material was milled in KCA's laboratory-scale rod mills for 10, 20, 40, and 60 minutes. The milled material was wet-screened at 0.6, 0.3, 0.15, 0.075, and 0.038 mm; dried; and weighed. Based upon the screen analyses, a graph was developed that showed the time required to reach various grind sizes from the starting feed size of minus 1.70 mm. The ground samples were subjected to either 10-hour or 24-hour cyanide bottle roll leach tests with 2.0 g/L or 0.25 g/L sodium cyanide. Results included the following:

- Ten-hour leach tests with 2.0 g/L sodium cyanide, all grind sizes:
  - Extraction rates for the various grind sizes for the Nukay high-grade composite ranged from 83% to 92% Au, from the coarsest grind to the finest grind. Silver extraction ranged from 30% to 65%, with the highest extraction in the 0.15 mm grind fraction. Cyanide consumption ranged from 1.10 kg/t to 1.68 kg/t NaCN.
  - For Los Filos high-grade composite, extraction rates ranged from 76% to 94% Au and 11% to 23% Ag. Cyanide consumption was from 0.42 kg/t NaCN to 0.61 kg/t NaCN. Higher cyanide consumptions were noted in the coarser grind sizes.
- Twenty-four-hour leach tests with 0.25 g/L sodium cyanide on 0.075 mm material:
  - Extraction rates for the Nukay high-grade composite was 34% Au and 10% Ag. Cyanide consumption was 1.01 kg/t NaCN.
  - For the Los Filos high-grade composite, extraction rates were 94% Au and 10% Ag. Cyanide consumption was 0.20 g/t NaCN.

Analyses of the filter cake portion were then used as tailings assays for the bottle roll leach tests and head assays for the pulp agglomeration column leach tests. The remaining wet-filtered material for each sample and grind size were combined and utilized for pulp agglomeration testwork.

Agglomeration Testwork

Preliminary agglomeration testwork was completed on the Nukay high-grade composite material and the Los Filos high-grade sample material stage crushed to minus 50 mm, minus 25 mm, and minus 12.5 mm.

The minus 50 mm crushed material was agglomerated with the addition of 0, 4, 7.5 and 10 kg/t of Type II cement. Both the minus 25 mm crushed material and the minus 12.5 mm crushed material were agglomerated with the addition of 0, 7.5, 10 and 15 kg/t of Type II cement.

During the percolation test the pH of the effluent solution was monitored. The percolation tests used the non-agglomerated (no cement addition) material for both the Nukay high-grade composite and the Los Filos high-grade sample stage crushed to minus 50 mm, minus 25 mm, and minus 12.5 mm exhibited low effluent pH values ranging from 8.3 to 9.6.

Based upon the results of these agglomeration tests, the Nukay high-grade composite and Los Filos high-grade sample material stage crushed to 50 mm was agglomerated with the equivalent of 4 kg/t of Type II Cement. The Nukay high-grade composite material and the Los Filos high-grade sample material stage crushed to 25 mm and 12.5 mm were agglomerated with the equivalent of 7.5 kg/t of cement.

Compacted Permeability Testwork

Compacted permeability testwork was completed on a preliminary pulp-agglomerated material. A 40 kg portion of Los Filos low-grade material stage crushed to minus 50 mm and blended with a 4 kg portion of pulverized Nukay high-grade composite and Los Filos high-grade sample material was agglomerated with 7.5 kg/t cement. The pulp-agglomerated material was then used for compacted permeability testwork, with compaction loading simulating equivalent heap heights of 60 and 80 m.

Compacted permeability testwork was also completed on the Nukay high-grade composite material stage crushed to minus 25 mm and minus 12.5 mm and on the Los Filos high-grade sample material stage crushed to minus 25 mm and minus 12.5 mm. The purpose of the testwork completed was to examine the permeability of the Nukay high-grade composite material and the Los Filos high-grade sample material under varying conditions. The variables examined were particle size (minus 25 and 12.5 mm), agglomeration cement levels (0, 4, and 7.5 kg/t cement), and compaction loading simulating an equivalent heap height of 80 m.

Compacted permeability testwork was also completed on Los Filos low-grade material stage crushed to 100% minus 50 mm at agglomeration cement levels of 0 and 4 kg/t cement at a simulated equivalent heap height of 80 m. For these series of tests, the Nukay high-grade composite material stage crushed to minus 12.5 mm with no cement addition failed at an equivalent heap height of 80 m. The remaining compacted permeability tests passed.

Column Leach Testwork

A total of 16 separate column leach tests were completed on the Nukay high-grade composite material and Los Filos high-grade sample material. Column leach tests were conducted in duplicate on the Nukay high-grade composite material stage crushed to 100% minus 50 mm, 100% minus 25 mm, and 100% minus 12.5 mm. Similarly, column leach tests were conducted in duplicate on Los Filos high-grade sample material stage crushed to 100% minus 50 mm, 100% minus 25 mm, and 100% minus 12.5 mm.

Results included:

- Nukay High-Grade Composite: 75%–85% Au extracted at a cyanide consumption of 1.38 kg/t to 1.60 kg/t NaCN over a 143-day to 168-day period. Cement addition ranged from 4 kg/t to 7.5 kg/t.
- Los Filos High-Grade Sample: 82%–85% Au extracted at a cyanide consumption of 0.67 kg/t to 0.83 kg/t NaCN over a 145-day to 167-day period. Cement addition ranged from 4 kg/t to 7.5 kg/t.

A series of 4 pulp-agglomerated column leach tests were completed on milled and partially leached portions of the Nukay high-grade composite and Los Filos high-grade sample material. Material from each sample was milled to a target grind size of 0.30 mm and 0.075 mm and utilized for a 10-hour bottle roll leach test. The tailings from the bottle roll leach tests were then agglomerated with portions of the barren rock material stage crushed to 100% minus 50 mm. The ratio of pulp to barren rock material was 1:10.

The results indicated the following.

- For Nukay high-grade composite, pulp agglomerated, 38%–50% Au extraction; cyanide consumption of 7.33 kg/t NaCN; leach time of 118 days to 140 days; cement addition of 4 kg/t.
- For Los Filos high-grade sample, pulp agglomerated, 34%–56% Au extraction; cyanide consumption of 7.05 kg/t to 7.48 kg/t NaCN; leach time of 118 days to 140 days; cement addition of 4 kg/t.

Following the column leach test work, four of the column tests were used for detoxification testwork. Detoxification test work was conducted on one of Los Filos high-grade sample column leach tests using material crushed to minus 50 mm, one of the Nukay high-grade composite column leach tests using material crushed to minus 50 mm, and the pulp-agglomerated columns leach tests utilized partially leached material for each sample milled to a target grind size of 0.075 mm.

Column leaching of the pulp-agglomerated Nukay high-grade material (milled to 0.30 mm and 0.075 mm) resulted in additional recovery of 9% and 4%, for a total recovery of 91% and 93%, respectively. Column leaching of the pulp agglomerated Los Filos high-grade material (milled to 0.30 mm and 0.075 mm) resulted in additional recovery of 9% and 3%, for a total recovery of 93% for both column tests.

The difference between the dissolved gold extracted onto carbon and the total residual solubilized gold remaining in the agitated leach residue used for each pulp-agglomerated column test was determined. The analyses indicated that in both the pulp-agglomerated column leach tests using the coarser milled material (target grind size of 0.30 mm) for both the Nukay high-grade composite material and Los Filos high-grade sample material, additional leaching of the material occurred. Conversely, the pulp-agglomerated column tests using pulp material milled to the finer grind size (target grind size of 0.075 mm) for both the Nukay high-grade composite material and Los Filos high-grade sample material did not indicate additional leaching and exhibited poor recovery of the solubilized gold.

Kappes, Cassiday & Associates (2013)

KCA undertook metallurgical test work on mineralization supplied from the Agüita, El Grande, Creston Rojo, Zone 70, and Filos Sur zones. A total of 55,200 L drums of drill core material were combined into 39 metallurgical composites based on deposit name, material type (intrusive, oxide, or carbonate), and grade range (low, medium, or high). Portions from each composite were then prepared for head analyses, head screen analyses with assays by size fraction, bottle roll leach testing, agglomeration testing, and column leach testing.

Head Analyses

Gold content was determined using standard fire assay methods with flame AA spectrophotometric (FAAS) finish. Silver content was determined using wet chemistry methods (four-acid digestion) with FAAS finish.

Head analyses for carbon and sulfur were conducted using a LECO CS 400 unit. In addition to total carbon and sulfur analyses, speciation for organic and inorganic carbon and speciation for sulfide and sulfate sulfur were conducted.

Head analyses for mercury were conducted using cold vapor / AA methods. Total copper analyses were conducted using inductively coupled argon plasma / optical emission spectrophotometer (ICAP-OES) as well as by FAAS methods.

Semi-quantitative analyses were conducted by means of an ICAP-OES for a series of individual elements and whole rock constituents (lithium metaborate fusion / ICAP).

A cyanide shake test was also conducted on a portion of pulverized head material from each composite.

Portions of material from each sample were utilized for head screen analyses with assays by size fraction. The material apportioned for the head screen from each composite was dry-screened at 25, 19, 12.5, 9.5, 6.3, 3.35, 1.70, and 0.212 mm. Each size fraction was crushed to a nominal size of 1.70 mm, as necessary. From each size fraction, two portions were then split out and individually pulverized to the target size of 80% passing 0.075 mm. The pulverized portions were then assayed using standard fire assaying methods for gold with FAAS finish and wet chemistry methods for silver.

Bottle Roll Leach Testwork

Bottle roll leach testing was conducted on a portion of material from each composite. An additional bottle roll test was conducted on select samples from the Crestón Rojo, Zone 70, and Filos Sur mineralization for comparison purposes.

For each bottle roll test, a 1,000 g portion of head material was pulverized to a target size of 80% passing 0.075 mm. The pulverized material was then slurried with 1,500 mL of tap water and used for leach testing. From the dry tailings, duplicate portions were split out and assayed for residual gold and silver content. Each leach test was run for a period of 96 hours with solution sampling for pH, dissolved oxygen, NaCN, Au, Ag, and Cu performed at 2, 4, 8, and 24 hours, with sampling every 24 hours thereafter. Sodium cyanide was added and maintained at 1.0 g/L of solution. The pH of the solution was maintained at 11.0 with the addition of hydrated lime $Ca(OH)_2$.

Results included the following:

- Agüita: Intrusive composite extraction values from 75% to 92% Au, 52% to 82% Ag, cyanide consumption from 0.60 to 1.03 kg/t NaCN; oxide composite extraction values from 83% to 96% Au, 52% to 59% Ag, cyanide consumption from 0.09 to 3.12 kg/t NaCN; carbonate composite extraction values from 80% to 91% Au, 49% to 54% Ag, cyanide consumption from 0.84 to 2.23 kg/t NaCN.
- El Grande: Intrusive composite extraction values from 95% to 96% Au, 29% to 57% Ag, cyanide consumption from 0.20 to 0.38 kg/t NaCN; oxide composite extraction values from 82% to 95% Au, 46% to 52% Ag, cyanide consumption from 0.30 to 3.56 kg/t NaCN; carbonate composite extraction values from 79% to 88% Au, 39% to 52% Ag, cyanide consumption from 0.11 to 1.43 kg/t NaCN.
- Crestón Rojo: Intrusive composite extraction values from 81% to 97% Au, 29% to 40% Ag, cyanide consumption from 0.19 to 0.26 kg/t NaCN; oxide composite extraction values from 63% to 88% Au, 36% to 42% Ag, cyanide consumption from 0.98 to 2.15 kg/t NaCN; carbonate composite extraction values from 79% to 94% Au, 41% to 76% Ag, and cyanide consumption from 0.13 to 2.95 kg/t NaCN.
- Zone 70: Intrusive composite extraction values from 82% to 95% Au, 59% to 68% Ag, cyanide consumption from 0.18 to 2.78 kg/t NaCN; oxide composite extraction values from 88% to 94% Au, 18% to 45% Ag, cyanide consumption from 0.17 to 0.79 kg/t NaCN; carbonate composite extraction values from 69% to 95% Au, 44% to 80% Ag, and cyanide consumption from 0.46 to 1.58 kg/t NaCN.
- Filos Sur: Intrusive composite extraction values from 39% to 88% Au, 56% to 71% Ag, cyanide consumption from 0.24 to 2.34 kg/t NaCN.

Agglomeration Testing

Preliminary agglomeration testwork was conducted on portions of material from each composite. Each test was conducted using 2 kg portions of material crushed to the size of 100% passing 25 mm and agglomerated with a target of 0, 2, 6 and 10 kg/t cement. Several tests failed the criteria put forth by KCA due to solution ponding when no cement was added. Additional tests failed due to high slump at the target addition of 2 kg/t cement.

Column Leach Tests

An individual column leach test was conducted on a portion of material from each composite for a total of 39 column leach tests. Each column test was conducted in a 152 mm inside-diameter column, using material crushed to the size of 100% passing 25 mm and blended with cement as necessary. Tests were conducted using a sodium cyanide solution and ran for periods of 60 days to 105 days.

Results included the following.

- Agüita: Intrusive composite extraction values from 48% to 82% Au, 9% to 40% Ag, cyanide consumption from 0.64 to 1.07 kg/t NaCN; oxide composite extraction values from 63% to 87% Au, 5% to 25% Ag, cyanide consumption from 0.49 to 1.53 kg/t NaCN; carbonate composite extraction values from 59% to 73% Au, 10% to 20% Ag, cyanide consumption from 0.26 to 0.83 kg/t NaCN.
- El Grande: Intrusive composite extraction values from 80% to 95% Au, 7% to 36% Ag, cyanide consumption from 0.62 to 1.25 kg/t NaCN; oxide composite extraction values from 19% to 73% Au, 3% to 14% Ag, cyanide consumption from 0.66 to 1.95 kg/t NaCN; carbonate composite extraction values from 33% to 57% Au, 6% to 21% Ag, cyanide consumption from 0.39 to 1.64 kg/t NaCN.
- Crestón Rojo: Intrusive composite extraction values from 73% to 89% Au, 30% to 52% Ag, cyanide consumption from 0.67 to 1.33 kg/t NaCN; oxide composite extraction values from 57% to 74% Au, 14% to 19% Ag, cyanide consumption from 0.98 to 1.57 kg/t NaCN; carbonate composite extraction values from 62% to 80% Au, 13% to 36% Ag, and cyanide consumption from 0.70 to 1.72 kg/t NaCN.
- Zone 70: Intrusive composite extraction values from 40% to 75% Au, 11% to 33% Ag, cyanide consumption from 0.78 to 1.54 kg/t NaCN; oxide composite extraction values from 39% to 89% Au, 2% to 15% Ag, cyanide consumption from 0.62 to 0.83 kg/t NaCN; carbonate composite extraction values from 44% to 71% Au, 8% to 35% Ag, and cyanide consumption from 0.17 to 0.62 kg/t NaCN.
- Filos Sur: Intrusive composite extraction values from 31% to 73% Au, 37% to 52% Ag, cyanide consumption from 0.51 to 1.28 kg/t NaCN.

13.1.2 KCA Testwork 2014 – 2015

KCA conducted extensive testwork on large amounts of Los Filos mine samples received in November 2014 and 2015.

November 2014 Samples

Eighteen separate samples were submitted for metallurgical testwork. The samples were identified as representing specific components of mineralization in Los Filos and Bermejal Open Pits and Los Filos Underground. Seven composite samples were prepared from select samples.

Metallurgical testwork included bottle roll tests on finely ground (0.106 mm) individual samples, bottle rolls on crushed (25 mm) composite samples, as well as column tests on the same composite samples. The tests were performed per industry-accepted test standards.

The results of the standard 96-hour bottle rolls on the finely ground individual samples are shown in Table 13-4. The results indicate generally high gold extractions and moderate reagent consumptions. Poor recovery and high reagent consumption resulted from tests on three samples containing significant levels of sulfide mineralization.

For the coarse composite tests, 240-hour bottle roll and 131-day column leach test results are shown in Table 13-5. The results indicate that there is a strong relation of gold extraction to ore type. Column leach testing produces better results than bottle roll tests on the same coarse (-25 mm) ore samples. See Table 13-6.

Table 13-4: Bottle Roll Test Parameters and Results on Finely Ground Samples*

Mine Zone	Client ID	Calculated Head, Au (g/t)	Au Extracted	Leach Time (hr)	Consumption NaCN (kg/t)	Addition $Ca(OH)_2$ (kg/t)
Filos	F-Ia-AL	1.954	93%	96	0.25	3.00
Filos	F-Ia-BL	0.778	94%	96	0.51	3.50
Filos	F-II-AL	1.718	85%	96	0.11	2.00
Filos	F-II-BL	1.037	96%	96	0.12	1.50
Filos	F-III-AL	0.668	91%	96	0.32	3.00
Filos	F-IV-AL	5.597	92%	96	0.11	1.50
Filos	F-IV-BL	14.544	95%	96	0.33	2.00
Filos	F-Gd_Ia-AL	3.141	95%	96	0.25	4.00
Filos	F-Gd_Ia-BL	2.913	94%	96	0.20	4.00
Bermejal	B-Ia-AL	0.807	92%	96	0.35	3.50
Bermejal	B-Ia-BL	5.659	83%	96	0.66	2.00
Bermejal	B-III-AL	3.749	52%	96	5.77	1.00
Bermejal	B-III-BL	0.922	49%	96	6.44	3.00
Bermejal	B-IV-AL	1.701	76%	96	5.44	2.50
Bermejal	B-IV-BL	0.824	45%	96	7.49	4.00
Bermejal	B-IV-AL	6.427	83%	96	0.52	1.00
UG	SS	4.635	91%	96	0.92	1.50
UG	SN	9.313	97%	96	1.74	2.50

*Source: KCA, January 2016, KCA0140180_LF04_01, Report of Metallurgical Testwork, Los Filos Project, Filos, Bermejal and Underground Samples.

Table 13-5: Bottle Roll Test Parameters and Results On Crushed (-25 mm) Samples

Description	Calculated Head, Au (g/t)	Au Extracted	Leach Time (hr)	Consumption NaCN (kg/t)	Addition $Ca(OH)_2$ (kg/t)
Sample 1, Los Filos IA	1.274	79%	240	0.14	3.25
Sample 2, Los Filos IA	1.037	74%	240	0.26	3.00
Sample 4, Los Filos IB	0.658	63%	240	0.26	4.50
Sample 5, Los Filos IB	0.442	82%	240	0.20	3.50
Sample 11, Los Filos IV	0.821	74%	240	0.08	1.50
Sample 3, Los Filos IB	0.660	54%	240	0.14	2.25
Sample 7, Los Filos II	0.702	26%	240	0.08	0.75
Sample 8, Los Filos II	0.837	45%	240	0.10	0.50
Sample 6, Los Filos IB	0.800	49%	240	0.54	1.75
Sample 12, Los Filos IV	1.087	61%	240	0.68	2.50
Sample 2, Bermejal Oxide	1.413	86%	240	0.65	1.50
Sample 3, Bermejal Oxide	0.964	64%	240	1.45	1.50
Sample 4, Bermejal Intrusive	0.452	54%	240	0.34	1.00
Sample 9, Bermejal Carbonate	0.146	78%	240	0.08	0.50

Table 13-5: Bottle Roll Test Parameters and Results On Crushed (-25 mm) Samples

Description	Calculated Head, Au (g/t)	Au Extracted	Leach Time (hr)	Consumption NaCN (kg/t)	Addition $Ca(OH)_2$ (kg/t)
Sample 1, Bermejal Oxide	8.099	84%	240	0.58	1.75
Sample 5, Bermejal Intrusive	0.318	44%	240	0.14	1.75
Sample 6, Bermejal Intrusive	0.719	54%	240	0.28	0.75
Sample 7, Bermejal Carbonate	0.786	55%	240	0.16	0.50
Sample 8, Bermejal Carbonate	0.640	51%	240	0.08	0.50

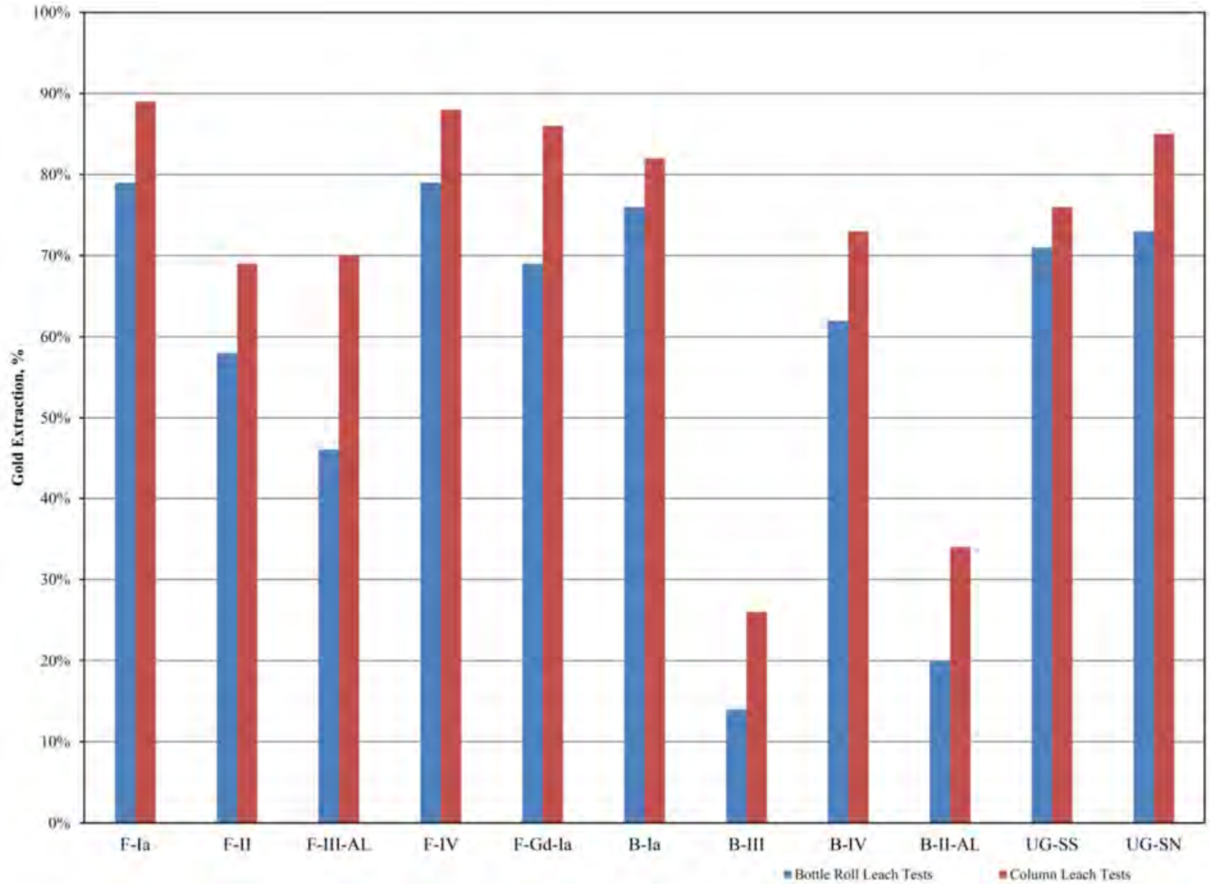
*Source: KCA, January 2016, KCA0140180_LF04_01, Report of Metallurgical Testwork, Los Filos Project, Filos, Bermejal and Underground Samples.

Table 13-6: Summary of Column Leach Tests

Description	Crush Size (mm)	Calculated Head,Au (g/t)	Au Extracted	Calculated Tail p80 Size (mm)	Days of Leach	Consumption NaCN (kg/t)	Addition Cement (kg/t)
Sample 1, Los Filos IA	25	1.316	88%	14.1	75	0.77	7.98
Sample 2, Los Filos IA	25	0.950	86%	11.5	75	0.88	7.98
Sample 4, Los Filos IB	25	0.618	83%	16.5	75	1.25	8.08
Sample 5, Los Filos IB	25	0.460	85%	16.7	75	0.99	8.09
Sample 11, Los Filos IV	25	0.755	76%	13.8	75	0.26	6.00
Sample 3, Los Filos IB	25	0.508	70%	17.3	76	0.90	6.10
Sample 7, Los Filos II	25	0.619	22%	16.8	76	0.09	5.98
Sample 8, Los Filos II	25	0.742	53%	17.6	76	0.27	5.99
Sample 6, Los Filos IB	25	0.875	63%	18.2	75	0.83	6.09
Sample 12, Los Filos IV	25	1.025	67%	13.4	75	0.67	8.09
Sample 2, Bermejal Oxide	25	1.185	89%	12.1	75	0.32	6.00
Sample 3, Bermejal Oxide	25	0.998	72%	11.9	75	1.15	6.04
Sample 4, Bermejal Intrusive	25	0.434	59%	17.4	75	0.44	5.46
Sample 9, Bermejal Carbonate	25	0.178	79%	16.9	75	0.20	6.00
Sample 1, Bermejal Oxide	25	8.917	88%	6.6	75	0.74	11.92
Sample 5, Bermejal Intrusive	25	0.309	50%	12.0	75	0.31	8.05
Sample 6, Bermejal Intrusive	25	0.747	58%	17.3	75	0.43	6.02
Sample 7, Bermejal Carbonate	25	0.624	56%	16.9	75	0.19	7.96
Sample 8, Bermejal Carbonate	25	0.562	54%	17.9	75	0.19	5.97

*Source: KCA, January 2016, KCA0140180_LF04_01, Report of Metallurgical Testwork, Los Filos Project, Filos, Bermejal and Underground Samples.

Figure 13-1: Coarse (<25 mm) Bottle Roll and Column Leach Test Results, November 2014 Samples

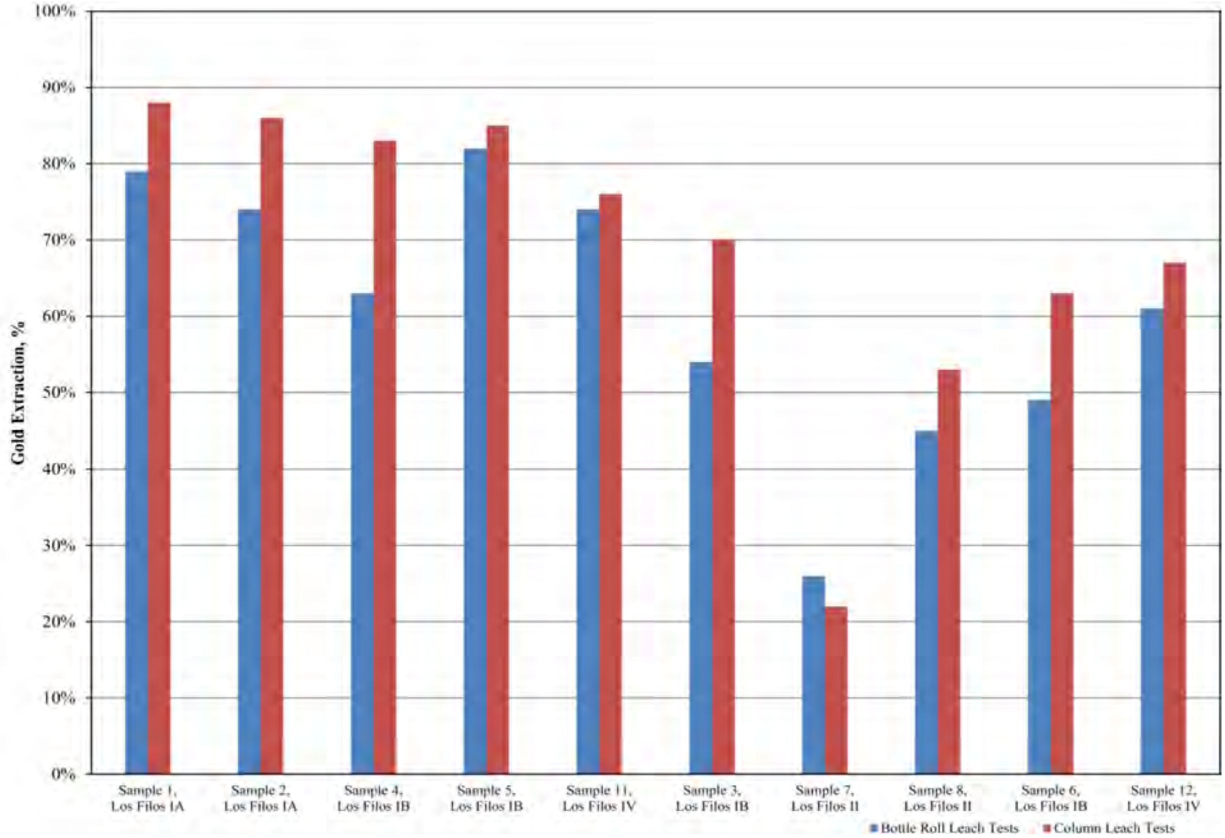


June–August 2015 Los Filos Samples

From June to August 2015, KCA received a total of 10 drums of samples from the Mine. These drums contained 10 distinct samples representing Los Filos resource and 9 samples representing the Bermejal mineralization. Bottle rolls and column leach tests, 240 hours and 75 days in duration, respectively, were performed on the specific samples. Agglomeration as well as percolation tests were performed on the representative samples. The test results for Los Filos and Bermejal are summarized in Figure 13-2 and Figure 13-3.

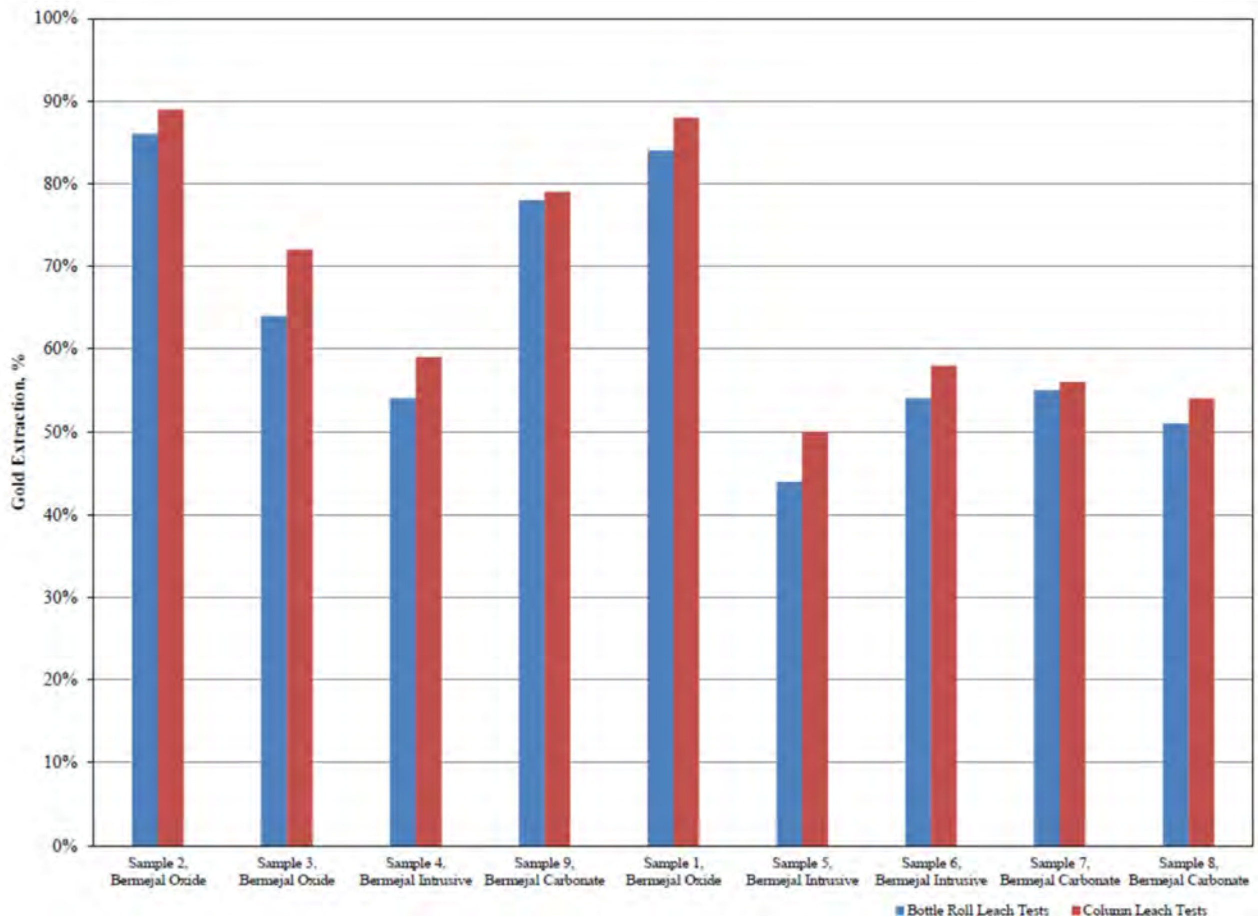
The KCA test protocols and have been reviewed by the Qualified Person and are considered acceptable to meet standards for accuracy and reproducibility.

Figure 13-2: Comparison: Bottle Roll (blue) and Column Leach (red); Coarse (-25 mm) Los Filos Samples



Source: KCA, January 2016, KCA0150051_LF08_01, Los Filos Project, Recovery Validation.

Figure 13-3: Comparison: Bottle Roll (blue) and Column Leach (red); Coarse (-25 mm) Bermejal Samples



Source: KCA, January 2016, KCA0150051_LF08_01, Los Filos Project, Recovery Validation.

Leach curves for column leaching were recorded for all ore types as shown in Figure 13-4 and Figure 13-5. The extraction of gold is fast for Los Filos ores at 70%–90% complete in 7 days, and rapid for Bermejal ores at 85%–95% for the same time.

Figure 13-4: Leach Curve for Column Leach Testing of Los Filos Ore

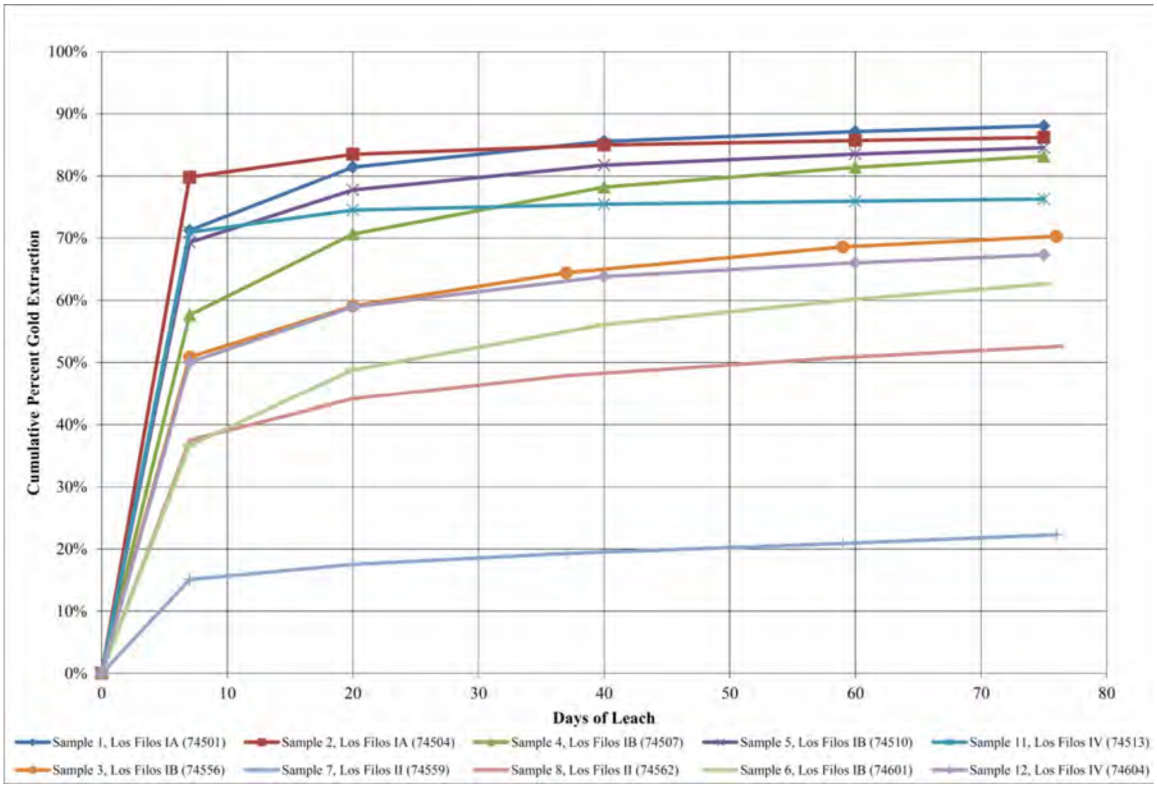
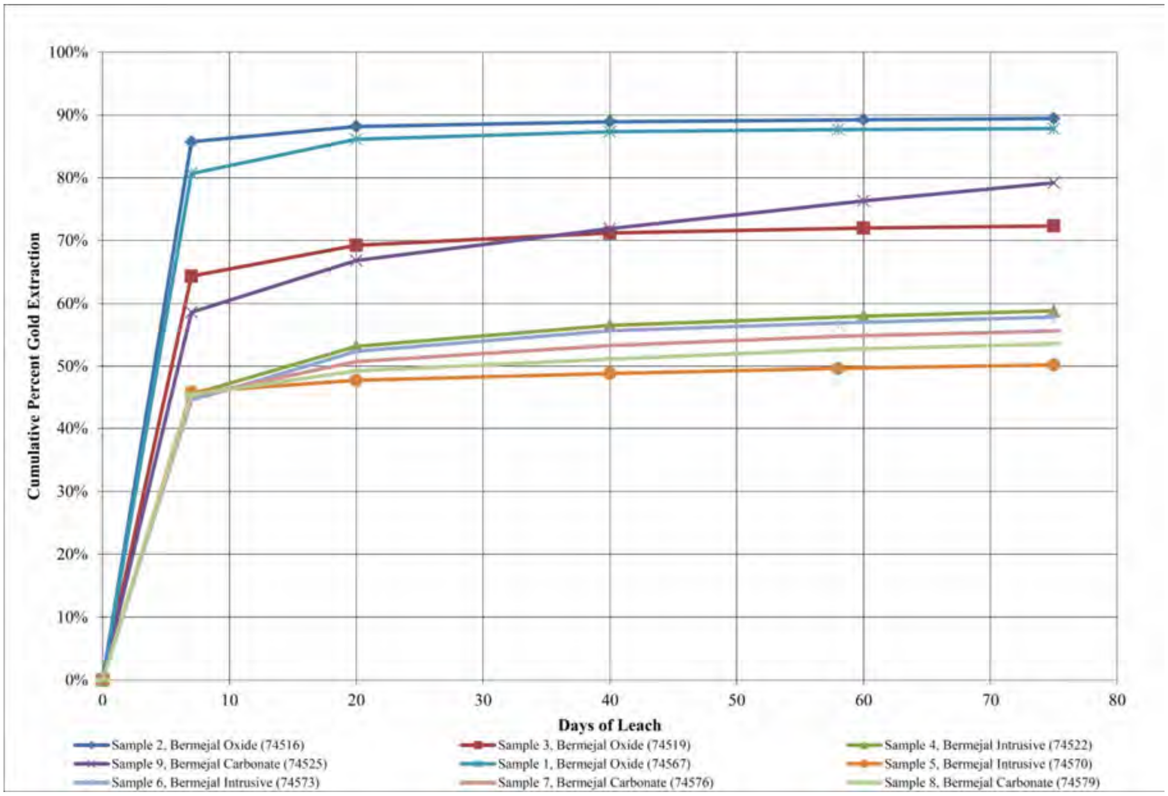


Figure 13-5: Leach Curve for Column Leach Testing for Bermejal Ore



An additional important leach extraction characteristic observed in the metallurgical testwork, and verified by the Qualified Person, is that final gold extraction is relatively independent of ore grade. This supports the application of a single extraction value for each ore type in the modeling of the leach pad operation and predicting gold recovery.

Peninsular

In 2015, six composite oxide samples from the Peninsular zone were subject to standard metallurgical tests at KCA's laboratory. Gold extractions ranged from 50% to 81% for these high-grade samples (average 7.4 g/t Au). No sulfides or significant levels of deleterious metals were found in the samples. One sample was determined to be "preg robbing."

13.1.3 Bermejal Underground Metallurgical Testwork

Metallurgical testwork was initiated in late 2015 on samples from the Bermejal Underground mineral resource, including agitated leach and column leach tests. The material used in the current column leach tests is relatively fine, at about 80% minus 2 mm.

Some general observations for the deeper portion of the Bermejal deposit include the following.

- Same host rock geology and ore mineralogy compared to upper zones.
- Higher-grade oxidized mineralization similar to Los Filos Underground.

The interim results of metallurgical testwork for the deeper portion of the Bermejal deposit indicate the following as summarized in Table 13-7.

Table 13-7: Preliminary Leach Tests on Bermejal Underground Samples

Sample Description	Head Analyses		% Au Extraction					
			Column Leach Test Results 100% – 10 mm				Cyanide Shake Test	Agitated Leach, 80% - 75 µm
	Au (g/t)	Organic C	5 days	26 days	40 days	61 days		4 days
Cuerpo Central	8.28	0.04	71	89	91	91	83	97
Cuerpo Oeste	6.55	0.14	38	67	76	80	63	90
Cuerpo Este	10.90	0.13	33	67	72	75	76	92

The sulfide content of each of the three samples was less than 0.01%. The determination of small amounts of organic carbon in two of the three samples may indicate a limited potential for “preg robbing.” The arsenic content was measured to be slightly elevated at 0.20% to 0.28% in the three samples.

At this time, it is assumed that all underground ore will be processed through the existing crushing plant and heap leaching will be the applied gold extraction technology. Subject to more definitive testwork information, leach pad gold extractions, and ultimately recoveries (by ADR methods), are expected to approach 80%. However, the high gold grades warrant examination of other recovery methods, such as grinding and agitated leaching, which can be expected to yield higher recoveries. As shown in Table 13-7, gold extraction using conventional grind-leach-carbon recovery is indicated to be 90% or higher.

Additional sampling from the Bermejal Underground ore body and lab testing is currently underway to confirm the recovery assumptions. The model for the geometallurgical characterization for Bermejal Underground will be developed when the characterization and metallurgical testing is completed.

Petrographic and mineralogical studies are being carried out that correspond to the characterization of these minerals. Prior experience with oxide ore from the underground mines suggests that acid generation potential is low.

13.2 Estimated Recoveries

The extensive bottle roll and column tests conducted at KCA were reviewed and summarized by Los Filos. From these test results, metallurgical model inputs were established for each ore zone. The allocated gold extractions are presented in Table 13-8. These reported values have been discounted by 3% (absolute) to reflect field performance. This level of discount may be considered conservative.

Table 13-8: Gold Extraction Values Assigned to Ore Types

	Crushed Ore		Average Crushed Ore	Run-of-Mine Ore (Extrapolated)
Ore Type	**No. Samples Tested**	**% Au Extraction Range (+/-1 SD)**	**% Au Extraction**	**% Au Extraction**
Filos Ia	19	70–82	76	64
Filos Ib	15	61–79	70	50
Filos II	5	46–62	54	45
Filos III	15	44–78	61	30
Filos IV	3	50–72	61	48
Bermejal-Ox	17	52–76	64	48
Bermejal-Int	20	57–79	68	58
Bermejal-Carb	15	36–66	51	42
Underground	9	73–87	80	N/A

Extractions to be expected from run-of-mine (ROM) ores placed on leach pads have been determined by extrapolating extractions measured in laboratory tests performed with variations in ore particle size.

Silver extraction was also measured in each column and bottle roll test. Extraction results ranged from 3% to over 20% in the tests. Los Filos (conservatively) considers silver extraction to be 5% for all types of ores.

A close (R2 = 0.929), linear relationship was measured between bottle roll test results and column test results. This allows bottle roll testing to be a reasonably accurate, short duration test proxy for column tests.

Overall gold recovery is a combination of leach pad extraction and recovery in a solution processing facility, such as an ADR Plant. ADR recovery is typically very high (>98%), and barren solution containing a very small concentration of gold is recharged with reagents and recycled to the leach pads. Therefore, gold extraction is effectively equal to overall gold recovery.

Preliminary tests data indicate that recoveries for Bermejal Underground mineralization can be assumed to be 80%.

13.3 Test Sample Variability

The samples selected for testing were representative of the various ore types within the different mineralized zones. Sufficient weights of samples were taken and securely transported to the laboratories.

13.4 Deleterious Elements

Detailed assaying of a large number of metallurgical test samples indicates that the mineral resources at Los Filos contain no significant concentrations of deleterious elements. Small amounts of copper are present but below levels that would challenge the selected metallurgical process. Mercury concentrations in the ores are very low. In general, the ores do not contain “preg robbing” substances such as organic carbon. Some sulfide mineralization has been identified in some of the Bermejal Underground samples.

13.5 Comments on Mineral Processing and Metallurgical Testing

In the opinion of the Qualified Person, the metallurgical testwork data provides reliable gold extraction data that supports the declaration of Mineral Resources and Mineral Reserves.

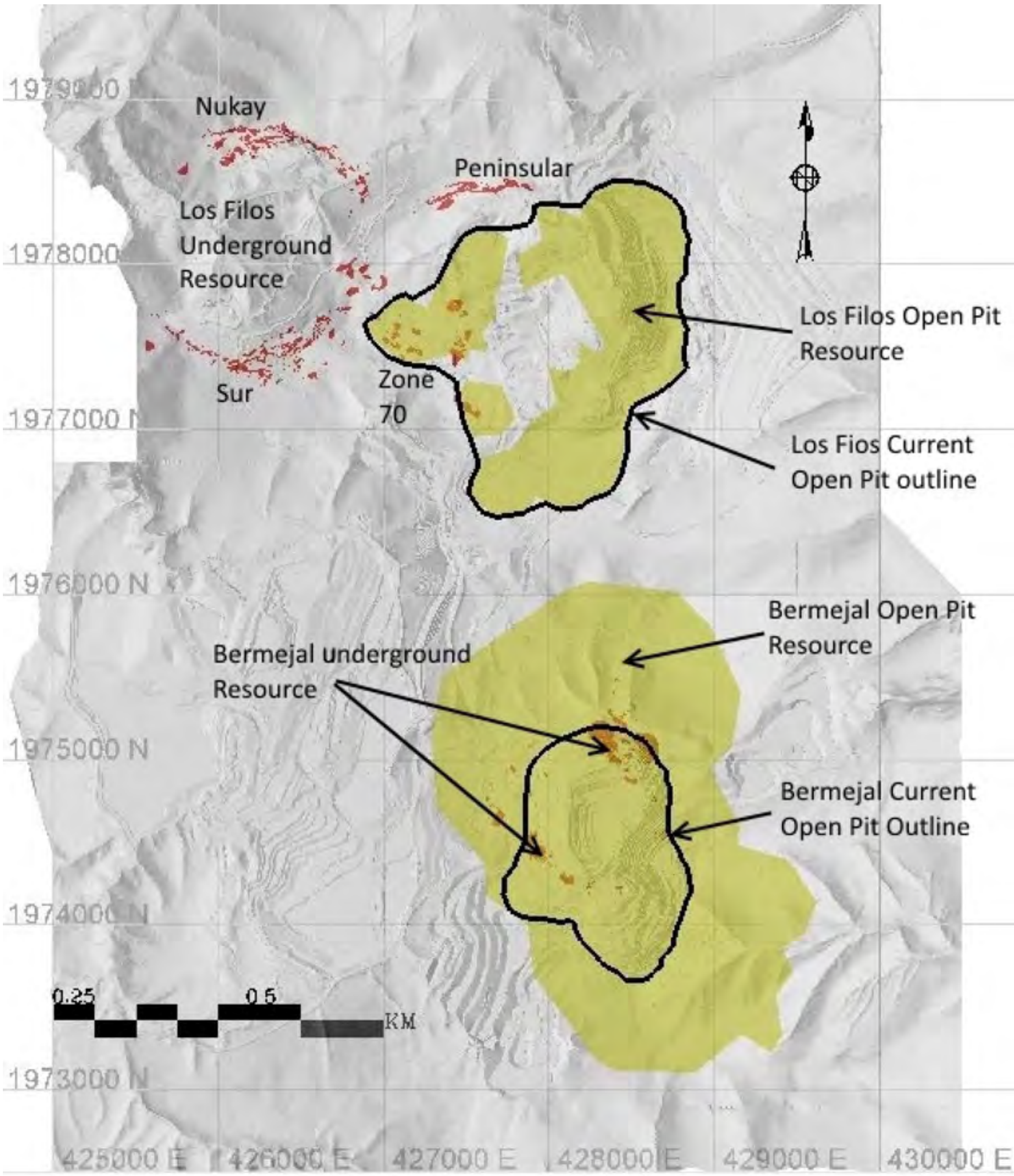
- Metallurgical tests were performed on samples that were representative of each ore type.
- The metallurgical testwork has been comprehensive and appropriate for selecting the optimal process technology.
- Recovery factors estimated for the heap leach are based on appropriate metallurgical testwork, and these have been confirmed by recent production data. Depending on ore type, average LOM gold for crushed ore is 71% and 52% for ROM ore.
- Heap leaching process conditions, including reagent additions, were appropriately determined to optimize field operation parameters.

14.0 MINERAL RESOURCE ESTIMATES

Mineral Resource estimates for Los Filos Open Pit and Bermejal Open Pit deposits as well as Los Filos Underground and Bermejal Underground deposits were prepared by Los Filos mine site, depleted to year-end 2016 to account for mining, and were confirmed and replicated by Stantec (Allan Schappert, CPG, Stantec – Mining).

Figure 14-1 details the location of Los Filos and Bemejal mineral resources.

Figure 14-1: Plan View of Los Filos and Bermejal Mineral Resources



Note: Figure prepared by Stantec 2017.

The Mineral Resource estimates have an Effective Date of 31 December 2016.

14.1 Key Assumptions / Basis of Estimate

Stantec was also provided with updated geologic interpretations for four basic lithological types: carbonate, intrusive, oxide, and sulfide.

Los Filos Open Pit

Los Filos Open Pit block model used for mineral resource estimation purposes is based on 8 m × 8 m × 9 m high blocks. The Y-axis has been rotated 15° counterclockwise, to align the model with the original Los Filos geological grid.

Data used to support the Mineral Resource estimate consisted of 1,542 drill and channel samples, for a total of 30,591 composite samples over 271,269 m.

Bermejal Open Pit

The Bermejal Open Pit block model used for mineral resource estimation purposes is based on 8 m × 8 m × 9 m high blocks. The Y-axis has been rotated 45° counter-clockwise, to align the model with the original Bermejal geological grid.

Data used to support the estimate consisted of 898 drill and channel samples, for a total of 10,698 composite samples over 95,874 m.

Los Filos Underground

Los Filos Underground is divided into four mining areas used for mineral resource estimation purposes.

- Nukay
- Peninsular
- Sur
- Zone 70

Each mining area has a separate block model based on parent blocks of 3 m × 3 m × 3 m high blocks with sub-blocks of 1 m × 1 m × 1 m high. The four block models spatially overlap, but Stantec validated that each model did not contain block values from other models. The database for estimation of Mineral Resources amenable to underground operations was closed for addition of new data as of 31 December 2016. The database contains core and RC drill holes, and channel sampling data. Upon database review, some RC holes were removed from estimation support as more reliable core data were available.

Data used to support Los Filos Underground estimate consisted of the following.

- 1,093 drill holes comprising 186,582 m drilling, with 11,025 sampled intervals.
- Channel samples comprising 68,788 m, with 45,634 sampled intervals.

Los Filos site provided outlines of the existing underground workings to Stantec as modelled solids effective as of 31 December 2016.

Bermejal Underground

The Bermejal Underground block model used for mineral resource estimation purposes is based on 3 m × 3 m × 3 m high blocks.

Data used to support the estimate consisted of 867 drill holes comprising 219,430 m drilling, with 83,882 sampled intervals.

14.1.1 Geometallurgical Domains

Domain codes for mineralization with identifiable metallurgical characteristics were establish as "Jones codes" (Figure 14-1) in the block models.

Table 14-1: Los Filos Geometallurgical Domain Types (Jones Codes)

Geometallurgical Domain Type	Description
Ia	Intrusive, endoskarned intrusive and exoskarn, strongly altered (clay-rich) and strongly sheared
Ib	Intrusive, moderately altered and moderately sheared
II	Mineralized marble, relatively hard and weakly broken
III	"Fresh" endoskarn, hard and weakly sheared or broken
IV	Exoskarn varieties and jasperoid
VI	Sulfide mixed

The Jones code is assigned to the block model based on the drill hole composite data:

- Carbonate rocks are logged as either type II (limestone or marble) or type IV (exoskarn). In the block model the carbonate blocks are assigned either type II or type IV based on a nearest neighbor estimation. Only composites designated as carbonate are used for this estimation. Carbonate composites logged with type code Ia, Ib, or III are considered to have been misclassified and not used for rock type assignment.
- Granodiorite and diorite rock types are logged as type Ia, Ib (intrusive), or III (endoskarn). In the block model the granodiorite blocks are assigned as type Ia, Ib, or III based on a nearest neighbor estimation. Granodiorite and diorite rock types logged with types II and IV were considered to have been misclassified and were not used for the assignment.

14.1.2 Lithology Domains

Three-dimensional solid wire frames were created for lithology domains and oxidation states by deposit using Leapfrog software (Leapfrog). The solid wireframe shapes are used as boundary controls to populate the open pit and underground models. Each mining area has a variety of lithologic domains.

Los Filos Open Pit

Los Filos area geological controls for the resource model consist of the following lithology domains.

- Carbonate (CARB)
- Granodiorite (GDIO)
- Oxides (OXID) (oxide is generally a thin zone on the boundary of intrusive and carbonate)
- Oxide Sill (OXID SILL)
- Sill (SILL)

Bermejal Open Pit

The Bermejal area geological controls for the resource model consist of the following lithological domains.

- CARB
- Granitiod (GRAN)
- OXID
- SILL
- Sulfides (SULF)

Los Filos Underground

The following four model zones were outlined:

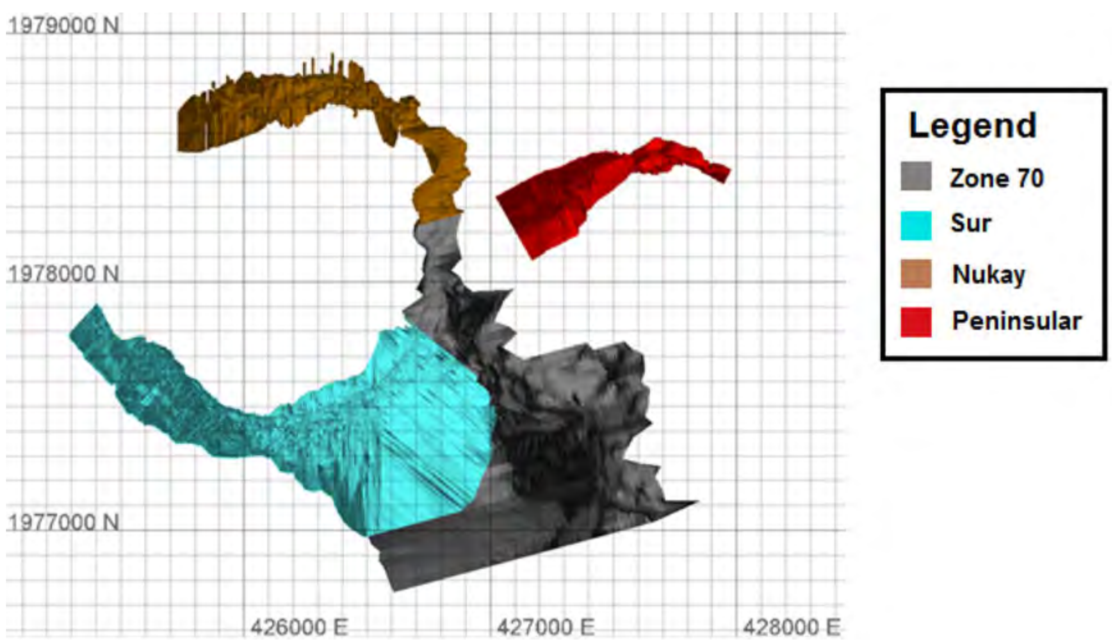
- Nukay
- Peninsular
- Sur
- Zone 70

Los Filos Underground geological controls for the resource models consist of the following:

- Carbonate (CARB)
- Intrusive (INT)
- Oxide (OXID)
- Sulfides (SULF)

The layout of Los Filos Underground final oxide geological models by zone are shown in Figure 14-2. Lithology drill hole log data was used in the creation of the models in Leapfrog. Leapfrog was used to visually validate the resulting shapes to ensure that the geological models correlate to the logging.

Figure 14-2: Los Filos Underground Oxide Geological Models by Zone



Note: Figure prepared by Goldcorp 2017.

Bermejal Underground

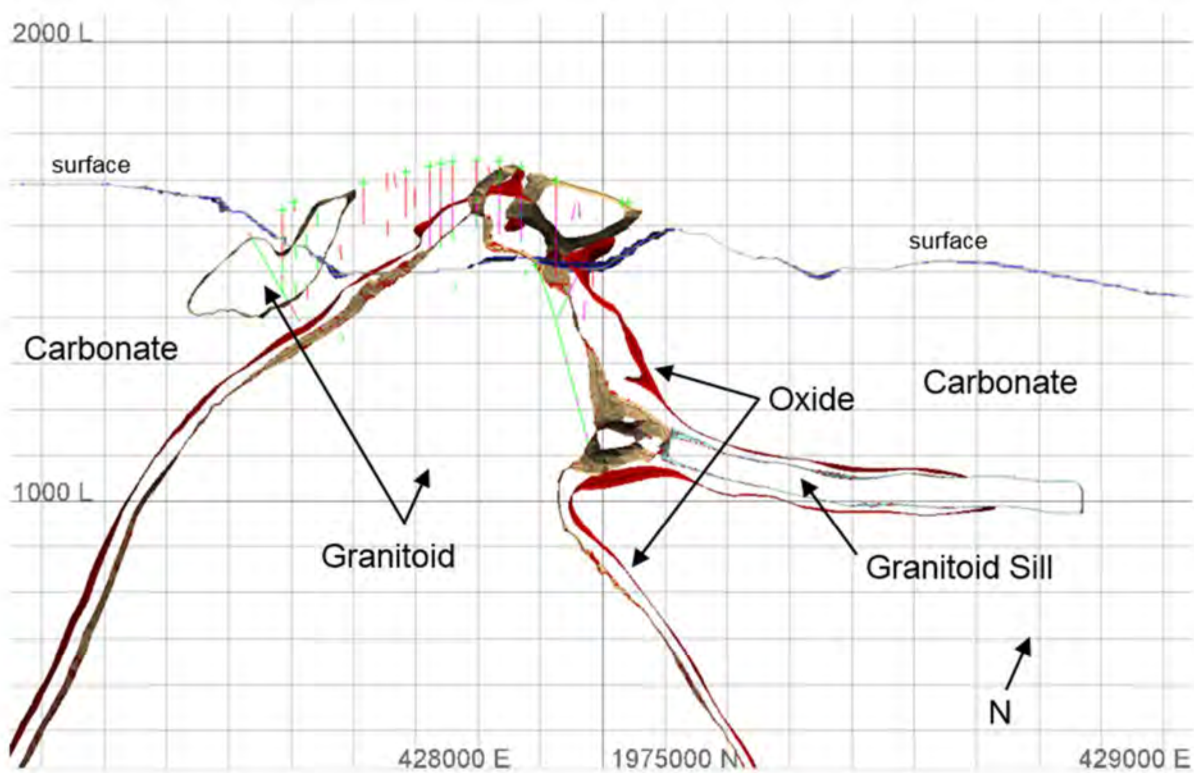
Bermejal Underground area geological controls for the resource model consist of the following.

- CARB
- GRAN
- Granitiod Sill (GRAN SILL)
- OXID

The layout of the Bermejal Underground final geological models by zone are shown in Figure 14-3. Lithology drill hole log data was used in the creation of the models in Leapfrog. Leapfrog was used to visually validate the resulting shapes to ensure that the geological models correlate to the logging.

Figure 14-3 illustrates an oblique section view of the resulting Bermejal Underground lithology model.

Figure 14-3: Bermejal Underground Lithology Model



14.2 Composites

The rock type variable used to control compositing is a "smoothed" or back assigned a rock type (i.e., sample intervals were assigned the rock type from the geologic wireframes). Gold, silver, and copper assays were composited together, along with the rock type, the metallurgical code (Jones code), and mineralization type.

Open Pit – Los Filos and Bermejal Open Pits

For Los Filos and Bermejal Open Pit mines, samples were composited in 9 m drill core lengths. Compositing respected the rock type (oxide, intrusive, carbonate, or sulfide), and did not cross rock type boundaries. A run of assays of the same rock type were composited into equal length intervals as close as possible to 9 m. A review of the grade versus composite length showed no bias as a result of the variable composite lengths.

Underground – Los Filos and Bermejal Underground

For Los Filos and Bermejal Underground mines, samples were composited in equal, varying lengths based on a +/-1.5 m composites confined by the rock type domain extents. Due to this method, there were no residual composites. The varying composites respected the rock type (oxide, intrusive, carbonate, or sulfide), and did not cross rock type boundaries. A review of the grade versus composite length showed no bias as a result of the variable composite lengths.

14.3 Density Assignment

Density values in the block models were assigned by lithology domain for the open pits and by mining areas for the underground models.

Los Filos Open Pit

Average bulk density values in Los Filos Open Pit model were based on lithology domains. The lithology domain densities are summarized in Table 14-2.

Table 14-2: Density Assignments, Los Filos Open Pit

Lithology Domain	Density (t/m³)
Oxide	2.55
Oxide (sill)	2.55
Sill	2.35
Granodiorite	2.35
Carbonate	2.55

Bermejal Open Pit

Average bulk density values in the Bermejal Open Pit model were based on lithology domains. The modelled area was also divided into two zones: north and south. The density assignments were variable by zone. The lithology domain densities are summarized in Table 14-3.

Table 14-3: Density Assignments, Bermejal Open Pit

Lithology Domain	Density (t/m³)	
	North	South
Carbonate	2.52	2.52
Granodiorite	2.36	2.29
Oxide	2.67	2.31
Sill	2.36	N/A
Sulfide	2.72	2.69

Los Filos Underground

Average bulk density values used in Los Filos Underground model were separated by underground mining areas. The density of each mining area is summarized in Table 14-4.

Table 14-4: Density Assignments, Los Filos Underground

Zone	Density (t/m³)
Nukay	3.33
Peninsular	2.96
Sur	3.26
Zone 70	2.66

Bermejal Underground

The bulk density value used in the Bermejal Underground modeling is currently taken as an average. The bulk density value is in Table 14-5.

Table 14-5: Density Assignments, Bermejal Underground

Zone	Density (t/m³)
Bermejal	2.76

14.4 Grade Capping

Grade capping was used to restrict outlier assay values. Caps were applied to the composites by Los Filos mine personnel after examination of the data using log probability plots. Capping grades were determined using only drill core data, and then were applied to all composites used for grade estimation. In some zones, in addition to the grade caps, restricted search radii were applied to some of the higher-grade composites.

Los Filos Open Pit

Within the Los Filos Open Pit, the capping of grades was generally restricted to the upper six to ten composites in each zone / rock type domains and generally corresponded to breaks in the grade distribution. Table 14-6 contains the capping grade limits used in Los Filos model.

Table 14-6: Los Filos Open Pit Capping Grades

	Low Pass					High Pass				
Data / Zone (name of domain)	OXID	OXID (SILL)	SILL	GDIO	CARB	OXID	OXID (SILL)	SILL	GDIO	CARB
Capping limit (Au g/t)	4.25	6.07	3.93	1.18	1.75	7.51	8.96	6.49	1.85	2.53
Capping limit (Ag g/t)	30.4	11.99	10.87	13.56	8.79	52.89	17.1	14.63	25.31	11.51
Capping limit (Cu%)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Capping limit (S%)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

In the Agüita and 4P zones of Los Filos Open Pit model, there were a significant number of drill holes with unsampled intervals in the upper carbonate. Independent Mining Consultants, Inc (IMC) added an additional categorical variable to the drill hole database ("informed") and set it to a value of one if there was a gold assay and a zero value if not. The ones and zeroes were estimated with the same parameters as the gold grade estimations to develop a value between zero and one that is interpreted as the portion of the block that was informed by an assay. If this value was less than 0.5, the block was not estimated for gold, silver, or copper.

El Bermejal Open Pit

Within the Bermejal Open Pit, the capping of grades was generally restricted to the upper 6 to 10 composites in each zone / rock type domain and generally corresponded to breaks in the grade distribution. Table 14-7 contains the capping grade limits used in the Bermejal model.

Table 14-7: Bermejal Open Pit Capping Grades

Data/Zone (name of domain)	Carb	Gran	Ox	Sill	Sulf
Capping limit (Au g/t)	5	5	12	5	3
Capping limit (Ag g/t)	100	120	200	120	200
Capping limit (Cu%)	n/a	n/a	n/a	n/a	n/a
Capping limit (S %)	7.5	7.5	7.5	7.5	7.5

In the Bermejal Open Pit model there were a significant number of drill holes with un-sampled intervals in the upper carbonate. IMC added an additional categorical variable to the drill hole database ("informed") and set it to a value of one if there was a gold assay and zero if not. The ones and zeroes were estimated with the same parameters as the gold grade estimations to develop a value between zero and one that was interpreted as the portion of the block that was informed by an assay. If this value was less than 0.5, the block was not estimated for gold, silver, or copper.

Los Filos Underground

Grade caps were applied separately to each of the Los Filos Underground mining areas (Nukay, Peninsular, Sur, and Zone 70). Capping grades were determined using only core and RC samples but were applied to all composites in the dataset. Table 14-8 details the capping grade limits used in the models.

Table 14-8: Los Filos Underground Capping Grades

Commodity Type	Nukay			Sur			Peninsular			Zone 70		
	Pass 1	Pass 2	Pass 3	Pass 1	Pass 2	Pass 3	Pass 1	Pass 2	Pass 3	Pass 1	Pass 2	Pass 3
Capping limit (Au g/t)	55	55	55	40	40	40	50	50	50	35	35	35
Capping limit (Ag g/t)	220	220	220	1,000	1,000	1,000	200	200	200	200	200	200
Capping limit (Cu%)	2	2	2	8	8	8	2	2	2	4	4	4
Capping limit (Pb%)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Capping limit (Zn%)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Capping limit (Mo%)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Bermejal Underground

Standard capping grade limits were applied to Bermejal Underground assays.

Table 14-9 details the capping grade limits used in the model.

Table 14-9: Bermejal Underground Capping Grades

Commodity Type	Bermejal Underground		
	Pass 1	Pass 2	Pass 3
Capping limit (Au g/t)	40	40	40
Capping limit (Ag g/t)	450	450	450
Capping limit (Cu%)	3	3	3
Capping limit (Pb%)	n/a	n/a	n/a
Capping limit (Zn%)	n/a	n/a	n/a
Capping limit (Mo%)	n/a	n/a	n/a

14.5 Variography

Variography was not used for estimation of the resource models. An inverse distance method was used to populate bock values and was deemed to be suitable for the deposit types given the variable nature of the skarn mineralization.

14.6 Estimation / Interpolation Methods

Grade estimations for all the block models used multipass runs. Passes for Measured (1), Indicated (2), and Inferred (3) blocks were run consecutively. Blocks estimated in a previous run were not recalculated.

Table 14-10 summarizes the interpolation methods, search radii, and grade caps by domain for Los Filos Open Pit model. Table 14-11 summarizes the same parameters for the Bermejal Open Pit model. Table 14-12 summarizes the parameters used for Los Filos Underground models (for Nukay, Sur, Peninsular, and Zone 70). Table 14-13 summarizes the parameters used for the Bermejal Underground model.

Table 14-10: Summary of Estimation Parameters for Los Filos–4P Resource Model

Resource Modeling Parameters	Low Pass					High Pass				
Data / Zone (name of domain)	OXID	OXID (SILL)	SILL	GDIO	CARB	OXID	OXID (SILL)	SILL	GDIO	CARB
Composite length (m)	9	9	9	9	9	9	9	9	9	9
Capping limit (Au g/t)	4.25	6.07	3.93	1.18	1.75	7.51	8.96	6.49	1.85	2.53
Capping limit (Ag g/t)	30.4	11.99	10.87	13.56	8.79	52.89	17.1	14.63	25.31	11.51
Capping limit (Cu%)	n	n	n	n	n	n	n	n	n	n
Capping limit (S %)	n	n	n	n	n	n	n	n	n	n
X, Y, Z, block size (m)	8,8,9	8,8,9	8,8,9	8,8,9	8,8,9	8,8,9	8,8,9	8,8,9	8,8,9	8,8,9
Sub-blocking (y/n)	n	n	n	n	n	n	n	n	n	n
Grade interpolation method	IP3	IP3	IP3	IP3	IP3	IP3	IP3	IP3	IP3	IP3
X-axis search range (m)	100	100	100	80	75	25	25	25	20	18.75
Y-axis search range (m)	100	100	100	80	75	25	25	25	20	18.75
Z-axis search range (m)	25	15	15	40	15	10	6	6	16	6
Min. no. samples per block	3	3	3	3	3	3	3	3	3	3
Bulk density (t/m^3), ore type	2.6	2.6	2.45	2.45	2.67	2.6	2.6	2.45	2.45	2.67

Table 14-11: Summary of Estimation Parameters for Bermejal Open Pit Resource Model

Data / Zone (name of domain)	CARB	GRAN	OXID	SILL	SULF
Composite length (m)	9	9	9	9	9
Capping limit (Au g/t)	5	5	12	5	3
Capping limit (Ag g/t)	100	120	200	120	200
Capping limit (Cu%)	n	n	n	n	n
Capping limit (S%)	7.5	7.5	7.5	7.5	7.5
X, Y, Z, block size (m)	8,8,9	8,8,9	8,8,9	8,8,9	8,8,9
Sub-blocking (y/n)	n	n	n	n	n
Grade interpolation method	IP3	IP3	IP3	IP3	IP3
X-axis search range (m)	60	75	75	75	75
Y-axis search range (m)	60	75	75	75	75
Z-axis search range (m)	20	25	25	40	25
Min. No. Samples per Block	3	3	3	3	3
Bulk density (t/m^3), ore type	2.52	2.36	2.67	2.36	2.36

Table 14-12: Summary of Estimation Parameters for Los Filos Underground Resource Models

Resource Modeling Parameters	Nukay			Sur			Peninsular			Zone 70		
Pass No.	1	2	3	1	2	3	1	2	3	1	2	3
Composite length (m)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Capping limit (Au g/t)	55	55	55	40	40	40	50	50	50	35	35	35
Capping limit (Ag g/t)	220	220	220	1,000	1,000	1,000	200	200	200	200	200	200
Capping limit (Cu%)	2	2	2	8	8	8	2	2	2	4	4	4
Capping limit (Pb %)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Capping limit (Zn%)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Capping limit (Mo%)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
X, Y, Z, block size (m)	3,3,3	3,3,3	3,3,3	3,3,3	3,3,3	3,3,3	3,3,3	3,3,3	3,3,3	3,3,3	3,3,3	3,3,3
Sub-blocking (y/n)	1,1,1	1,1,1	1,1,1	1,1,1	1,1,1	1,1,1	1,1,1	1,1,1	1,1,1	1,1,1	1,1,1	1,1,1
Grade interpolation method	IP3	IP3	IP3	IP3	IP3	IP3	IP3	IP3	IP3	IP3	IP3	IP3
X-axis search range (m)	25	50	70	20	40	50	25	50	75	20	40	60
Y-axis search range (m)	25	50	70	20	40	50	25	50	75	20	40	60
Z-axis search range (m)	15	20	30	35	70	100	25	50	75	40	80	100
Min. # samples per block	3	2	1	3	2	1	3	2	1	3	2	1
Bulk density (t/m^3)	2.96	2.96	2.96	3.26	3.26	3.26	2.96	2.96	2.96	2.66	2.66	2.66

Table 14-13: Summary of Estimation Parameters for Bermejal Underground Resource Model

Resource Modeling Parameters	Bermejal Underground		
Pass No.	1	2	3
Composite length (m)	1.5	1.5	1.5
Capping limit (Au g/t)	40	40	40
Capping limit (Ag g/t)	450	450	450
Capping limit (Cu%)	3	3	3
Capping limit (Pb %)	N/A	N/A	N/A
Capping limit (Zn%)	N/A	N/A	N/A
Capping limit (Mo%)	N/A	N/A	N/A
X,Y,Z, block size (m)	3,3,3	3,3,3	3,3,3
Sub-blocking (y/n)	-	-	-
Grade interpolation method	IP3	IP3	IP3
X-axis search range (m)	25	45	80
Y-axis search range (m)	25	45	80
Z-axis search range (m)	25	45	80
Min. no. samples per block	3	2	1
Bulk density (t/m³)	2.67	2.67	2.67

Los Filos Open Pit

Inverse distance with a power weight of three (ID3) was used for gold grade interpolation at Los Filos Open Pit. All rock type and structural boundaries were treated as hard boundaries for estimation purposes.

Los Filos Open Pit block model grades were estimated in two passes. The low pass had a lower capping grade applied to the composites and a larger search radius. The high pass had a higher capping grade applied to the composites and a much shorter search radius. Table 14-6 shows the capping grades applied to the composites for the two-pass scenario.

The search radii for the estimations varied depending on rock type domain for each search axis (Table 14-10). A maximum of eight and a minimum of two composites were required to estimate a grade and a maximum of two composites per drill hole were allowed.

The interpolation methods, search radii, numbers of composites used, and boundary constraints between domains were the same for silver estimation as those employed for the gold estimate.

An estimation of block copper grades was also performed, as copper represents a potential contaminant element that could potentially affect processing costs. The search radii and power weighting used were the same as for gold and silver.

Bermejal Open Pit

Gold grade estimation for the Bermejal Open Pit was based on ID3 interpolation. The rock type domain boundaries (Oxide, Intrusive, Carbonate, and Sulfide) were treated as hard boundaries for estimation. The structural boundaries are not used as hard boundaries, but were used to control the orientation of the search ellipse. A maximum of six and a minimum of one composite were the requirement to estimate a block grade. A maximum of two composites per drill hole was allowed. Table 14-11 contains the search radii by rock type domain for each search axis.

The estimation of silver grades was similar to the method used to estimate the gold grades. ID3, rock type, and structural zone constraints were the same for gold, as were the search distances and orientations.

Inverse distance squared (ID2) interpolation was used for copper estimation with the same composite search parameters as were used for gold and silver. Composites were not capped for copper.

Los Filos Underground

Gold grade estimation for Los Filos Underground zones were based on ID3 interpolation. Each of the four mining areas had separate search radii. The rock type domain and structural boundaries controlled the search limits. A maximum of six and a minimum of one composite was the requirement to estimate a block grade. A maximum of two composites per drill hole was allowed. Table 14-12 contains the search radii by mining zone for each search axis.

Bermejal Underground

Gold grade estimation for Bermejal Underground zones was based on ID3 interpolation. A maximum of six and a minimum of one composite were required to estimate a block grade. A maximum of two composites per drill hole was allowed. Table 14-13 contains the search radii for each search axis.

Resource Classification Criteria

Estimation of confidence categories within each block in the block model was based on the number of drill holes and number of composites used from each hole. Estimation search radii varied between models to ensure the quality of classification for each deposit.

Los Filos Open Pit

The following criteria were used for the block classifications in Los Filos Open Pit model:

- Measured: At least 4 holes and within 60 m.
- Indicated: At least 3 drill holes and within 90 m.
- Inferred: At least 1 drill hole and within 100 m.

Bermejal Open Pit

The following criteria were used for the block classifications in the Bermejal Open Pit model:

- Measured: At least four drill holes and within 40 m.
- Indicated: At least three drill holes and within 60 m.
- Inferred: At least one drill hole and within 100 m.

Los Filos Underground

The following criteria were used for the block classifications in Los Filos Underground model.

- Measured: Inside the first search ellipse and minimum 3 samples from 3 different drill holes.
- Indicated: Inside the second search ellipse and minimum 2 samples from 2 different drill holes.
- Inferred: Inside the third search ellipse and minimum 1 sample.

Bermejal Underground

The following criteria were used for the block classifications in Bermejal Underground model.

- Measured: Inside the first search ellipse and minimum 3 samples from 3 different drill holes.
- Indicated: Inside the second search ellipse and minimum 2 samples from 2 different drill holes.
- Inferred: Inside the third search ellipse and minimum 1 sample.

14.7 Block Model Validation

Open Pit Models

Stantec completed an inspection of classification of the open pit resource models and considered the classifications to be reasonable. Stantec concluded that the block models are acceptable to support Mineral Resource estimation.

Underground Models

Stantec reviewed block models for the underground resource in the following two ways:

- Model swaths were inspected in the X, Y, and Z directions, comparing the model values against the assay values. No overall bias was observed.
- Onscreen inspection of the block values against the composites was performed. In general, the comparison showed a good correlation.

Stantec concluded the block models are acceptable to support Mineral Resource estimation.

14.8 Reasonable Prospects of Economic Extraction

Mineral Resource Statement

Mineral resources for Los Filos Site Mine included only oxide mineralization classified as Measured, Indicated, and Inferred Mineral Resources. Based on a corporate alignment of historic gold commodity pricing, a gold price of $1,400/oz was used for resource estimates.

Silver pricing is not included in the resource cutoff grade calculation due to a historic agreement with Silver Wheaton. Los Filos sells 100% of silver bullion production under the Silver Wheaton Streaming Contract. The 25-year contract, which expires on 15 October 2029, requires Los Filos to sell its silver bullion production to Silver Wheaton at an initial price of US$3.90/oz, escalated annually at 50% of the US inflation rate. The current contract price is US$4.26/oz.

The following Table 14-14 details the commodity pricing used for the evaluation with the exception of silver pricing.

Table 14-14: Commodity Prices for Mineral Resource or Economic Evaluation

Commodity	Unit	Resources
Gold	US$/oz	1,400.00
Silver	US$/oz	4.26

Open Pit Mining Methods

Mineral Resources that could potentially be extracted using open pit mining methods were assessed for reasonable prospects of economic extraction. Gold pricing of $1,400/oz was used for the process to confine the resource mineralization within Los Filos and Bermejal Open Pit shells. Each open pit has a separate US$1,400 optimized Lerchs-Grossmann (1965) pit shell that was used for determining the economic extraction.

Los Filos Open Pit

The mining, processing, and G&A costs were developed by Los Filos site personnel, are based on budget 2017 estimates, and were validated by Stantec. Recovery estimates by rock type were based on the technical study “Metallurgical Model Update and Validation” conducted by the Los Filos site in August 2016. Table 14-15 contains the economic data for Los Filos Open Pits by geometallurgical domain.

Table 14-15: Assumptions Used for Los Filos Open Pit Mineral Resource Estimate

Los Filos	Crush-Leach Resource (Crush)					ROM Resource				
Geometallurgical Domain	Ia	Ib	II	III	IV	Ia	Ib	II	III	IV
Gold Process Recovery	76.0%	70.0%	54.0%	61.0%	61.0%	64.0%	50.0%	45.0%	30.0%	48.0%
Mining Cost (US$/t)	1.983	1.983	1.983	1.983	1.983	0.794	0.794	0.794	0.794	0.794
Processing Cost (US$/t)	3.800	3.800	3.800	3.800	3.800	0.750	0.750	0.750	0.750	0.750
Sustaining Capital (US$/t)	0.857	0.857	0.857	0.857	0.857	0.857	0.857	0.857	0.857	0.857
G&A (US$/t)	1.978	1.978	1.978	1.978	1.978	1.978	1.978	1.978	1.978	1.978
Total Processing Cost (US$/t)	8.618	8.618	8.618	8.618	8.618	4.379	4.379	4.379	4.379	4.379
Price (US$/oz)	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
Profit Margin (US$/oz)	50	50	50	50	50	50	50	50	50	50
CAPEX (US$/oz)	0	0	0	0	0	0	0	0	0	0
Selling Cost (US$/oz)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cutoff (g/t)	0.261	0.284	0.368	0.326	0.326	0.158	0.202	0.224	0.336	0.210

The mineralization within the US$1,400 Lerchs-Grossmann pit shell that satisfied these requirements equated to a weighted average cutoff grade of 0.198 g/t Au for all lithology domains in Los Filos Open Pit. The waste-to-mineralization ratio at the Los Filos Open Pit is 4.3:1.

Bermejal Open Pit

The mining, processing, and G&A costs were developed by Los Filos site personnel, are based on budget 2017 estimates, and were validated by Stantec. Recovery estimates by rock type were based on the technical study "Metallurgical Model Update and Validation" conducted by Los Filos in August 2016. Table 14-16 contains the economic data for the Bermejal Open Pit by rock type.

Table 14-16: Assumptions Used for Bermejal Open Pit Mineral Resource Estimate

Item	Crush-Leach Resource			ROM Resource		
Rock Type	Oxide	Intrusive	Carbonate	Oxide	Intrusive	Carbonate
Gold Process Recovery	64.0%	68.0%	51.0%	48.0%	58.0%	42.0%
Mining Cost (US$/t)	1.958	1.958	1.958	0.284	0.284	0.284
Processing Cost (US$/t)	3.800	3.800	3.800	0.750	0.750	0.750
Sustaining Capital (US$/t)	0.857	0.857	0.857	0.857	0.857	0.857
G&A (US$/t)	1.978	1.978	1.978	1.978	1.978	1.978
Total Processing Cost (US$/t)	8.593	8.593	8.593	3.869	3.869	3.869
Price (US$/oz)	1400	1400	1400	1400	1400	1400
Profit Margin (US$/oz)	50	50	50	50	50	50
CAPEX (US$/oz)	0	0	0	0	0	0
Selling Cost (US$/oz)	0.000	0.000	0.000	0.000	0.000	0.000
Cutoff (g/t)	0.309	0.291	0.388	0.186	0.154	0.212

The mineralization within the US$1,400 Lerchs-Grossmann pit shell that satisfied these requirements equated to a weighted average cutoff grade of 0.179 g/t Au for all lithology domains in the Bermejal Open Pit. The waste-to-mineralization ratio in the Bermejal Open Pit is 4.2:1.

Underground Mining Methods

Mineral Resources that could be extracted using underground mining methods were assessed for reasonable prospects of economic extraction by constraining mineralization to a minimum 10 m strike length and 3 m mining thickness.

The solid models of current workings were used to remove any mined blocks from the resource estimate.

Los Filos Underground

For the Los Filos Underground mine, the breakeven resource cutoff grade at a US$1,400/oz Au price was determined to be 3.43 g/t Au. Parameters used in the estimate of Los Filos Underground resources are summarized in Table 14-17.

Table 14-17: Assumptions Used to Constrain Los Filos Underground Mineral Resource Estimate

Item	Units	Cost
Gold Price	US$/oz	1,400.00
Mining Cost	US$/t mined	68.63
Crushing Cost	US$/t processed	0.00
Processing Cost	US$/t processed	5.14
Engineering and Geology	US$/t processed	4.32
G&A Cost	US$/t processed	24.39
Taxes and Royalties	US$/t processed	1.03
Selling Cost	US$/t processed	0.64
Cost of Reclamation	US$/t processed	0.57
CAPEX (development)	US$/t processed	18.71
Total Processing Cost	US$/t processed	122.09
Gold Recovery	%	80.00
Mining Loss Grade Adjustment	%	10.00
Cutoff Grade	g/t	3.43

Bermejal Underground

For Bermejal Underground mining, the breakeven cutoff grade was determined at 2.52 g/t Au. Parameters used in the estimate of the Bermejal Underground resources are summarized in Table 14-18.

Table 14-18: Assumptions Used to Constrain Bermejal Underground Mineral Resource Estimate

Item	Units	Cost
Gold Price	US$/oz	1,400.00
Mining Cost	US$/t mined	35.00
Crushing Cost	US$/t processed	0.00
Processing Cost	US$/t processed	5.98
Engineering and Geology	US$/t processed	0.00
G&A Cost	US$/t processed	25.00
Taxes and Royalties	US$/t processed	1.03
Selling Cost	US$/t processed	0.64
Cost of Reclamation	US$/t processed	0.57
CAPEX (development)	US$/t processed	22.50
Total Processing Cost	US$/t processed	90.72
Gold Recovery	%	80.00
Mining Loss Grade Adjustment	%	10.00
Cutoff Grade	g/t	2.52

14.9 Mineral Resource Statement

Stantec feels the Mineral Resources stated are a reasonable representation for the Los Filos mine. Mineral Resources are reported inclusive of Mineral Reserves and do not include dilution. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

Mineral Resources have an Effective Date of 31 December 2016.

Open Pit Mineral Resource

The Los Filos and Bermejal Open Pit mineral resources were estimated by constraining blocks to the topographic surveys conducted on 31 December 2016 and the $1,400 Lerchs-Grossmann pit shells. The resulting mineral resource estimates for deposits considered amenable to open pit mining are summarized in Table 14-19.

Table 14-20 and Table 14-21 are the mineral resource estimates for the Los Filos Open Pit and the Bermejal Open Pit, respectively.

Table 14-19: Los Filos Mine Total Open Pit Mineral Resources, Effective Date 31 December 2016

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Measured	134,008	0.71	3,043	6.01	25,882
Indicated	283,731	0.79	7,226	9.31	84,942
Measured + Indicated	417,739	0.76	10,269	8.25	110,824
Inferred	158,206	0.63	3,200	9.76	49,622

Notes:
Includes both oxide and sulfide mineralization
Summation errors may be present due to rounding.

Table 14-20: Los Filos Open Pit Mineral Resources, Effective Date 31 December 2016

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Measured	51,998	0.70	1,174	2.75	4,604
Indicated	8,226	0.62	164	2.46	651
Measured + Indicated	60,224	0.69	1,338	2.71	5,255
Inferred	1,436	0.44	21	2.91	134

Notes:
Includes both oxide and sulfide mineralization
Summation errors may be present due to rounding.

Table 14-21: Bermejal Open Pit Mineral Resources, Effective Date 31 December 2016

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Measured	82,010	0.71	1,869	8.07	21,278
Indicated	275,505	0.80	7,062	9.52	84,291
Measured + Indicated	357,515	0.78	8,931	9.18	105,569
Inferred	156,771	0.63	3,180	9.82	49,488

Notes:

1. Mineral resources are inclusive of mineral reserves and do not include dilution.
2. Mineral resources that are not mineral reserves do not have demonstrated economic viability.
3. Mineral resources are reported to a gold price of US$1,400/oz and a silver price of US$4.26/oz.
4. Mineral resources are defined with pit shells that use variable mining and recovery estimates depending on the geometallurgical domain and whether mineralization is projected to report to crush–leach ore is considered typical run-of-mine for processing requirements.
5. Mineral resources are reported to variable gold cutoff grades: Los Filos Open Pit 0.198 g/t Au, Bermejal Open Pit of 0.179 g/t Au.
6. Tonnages are rounded to the nearest 1,000 tonnes, grades are rounded to two decimal places for Au, grades for Ag are rounded to one decimal place; rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade, and contained metal content.
7. Tonnage and grade measurements are in metric units. Gold and silver contained ounces are reported as troy ounces.
8. Includes both oxide and sulfide mineralization.
9. Summation errors may be present due to rounding.

Underground Mineral Resource

Mineral Resource estimates for the deposits considered amenable to underground mining are summarized in Table 14-22 (includes Los Filos Underground and Bermejal Underground). Table 14-23 is a total of the deposits in the Los Filos Underground mines. Table 14-24 to Table 14-27 present the individual Mineral Resource estimates for the deposits in the Los Filos area. Table 14-28 is the Mineral Resource estimate for the Bermejal Underground deposit for the portion of the deposit that is below the $1,400/oz pit shell only.

Table 14-28 is the Mineral Resource estimate for the Bermejal Underground deposit. All tables have an Effective Date of 31 December 2016.

Table 14-22: Los Filos Mine Total Underground Mineral Resources

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Measured	1,539	8.25	408	20.70	1,024
Indicated	3,251	7.68	802	20.67	2,161
Measured + Indicated	4,790	7.86	1,210	20.68	3,185
Inferred	4,447	5.56	795	11.41	1,631

Notes:

Includes both oxide and sulfide mineralization.

Summation errors may be present due to rounding.

Table 14-23: Los Filos Underground Mineral Resources

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Measured	1,539	8.25	408	20.70	1,024
Indicated	3,080	7.82	775	20.81	2,060
Measured + Indicated	4,618	7.97	1,183	20.77	3,084
Inferred	937	7.53	227	27.47	827

Notes:
Includes both oxide and sulfide mineralization.
Summation errors may be present due to rounding.

Table 14-24: Nukay Deposit Mineral Resources

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Measured	495	9.33	148	12.23	194
Indicated	387	9.14	114	21.56	269
Measured + Indicated	882	9.25	262	16.34	463
Inferred	149	9.99	48	25.61	122

Notes:
Includes both oxide and sulfide mineralization.
Summation errors may be present due to rounding.

Table 14-25: Peninsular Deposit Mineral Resources

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Measured	141	7.95	36	9.83	44
Indicated	1,224	7.18	282	18.42	725
Measured + Indicated	1,365	7.26	318	17.54	769
Inferred	359	7.64	88	22.06	254

Notes:
Includes both oxide and sulfide mineralization.
Summation errors may be present due to rounding.

Table 14-26: Sur Deposit Mineral Resources

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Measured	769	7.74	191	28.93	715
Indicated	330	7.79	83	14.96	159
Measured + Indicated	1,099	7.75	274	24.73	874
Inferred	29	4.81	4	8.82	8

Notes:
Includes both oxide and sulfide mineralization
Summation errors may be present due to rounding.

Table 14-27: Zone 70 Deposit Mineral Resources

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Measured	134	7.51	32	16.27	70
Indicated	1,138	8.08	296	24.80	908
Measured + Indicated	1,273	8.02	328	23.90	978
Inferred	400	6.71	86	34.33	441

Notes:
Includes both oxide and sulfide mineralization.
Summation errors may be present due to rounding.

Table 14-28: Bermejal Underground Mineral Resources

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Measured	0	0	0	0	0
Indicated	171	5.01	28	18.39	101
Measured + Indicated	171	5.01	28	18.39	101
Inferred	3,510	5.03	568	7.13	804

Notes:
1. Mineral resources are inclusive of mineral reserves and do not include dilution.
2. Mineral resources that are not mineral reserves do not have demonstrated economic viability.
3. Mineral resources are reported to a gold price of US$1,400/oz and a silver price of US$4.26/oz.
4. Mineral resources definition uses a mining cost of US$84.78/t for Cut-and-Fill and US$41.50/t for Sublevel caving, process cost of US$6.75/t, and a process recovery of 80%.
5. Mineral resources are reported to a gold cutoff grade: Los Filos Underground of 3.39 g/t Au; Bermejal Underground of 2.52 g/t Au.
6. Tonnages are rounded to the nearest 1,000 t, grades are rounded to two decimal places for Au, grades for Ag are rounded to two decimal places; rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade, and contained metal content.
7. Tonnage and grade measurements are in metric units. Gold and silver contained ounces are reported as troy ounces.
8. Includes both oxide and sulfide mineralization.
9. Summation errors may be present due to rounding.

Total Open Pit and Underground Mineral Resource

The resulting Mineral Resource estimates for all deposits at the Los Filos site are summarized in Table 14-29. The table has an Effective Date of 31 December 2016.

Table 14-29: Los Filos Mine Total Mineral Resources

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Measured	135,547	0.79	3,451	6.17	26,906
Indicated	286,982	0.87	8,028	9.44	87,103
Measured + Indicated	422,529	0.85	11,479	8.39	114,010
Inferred	162,653	0.76	3,995	9.80	51,254

Notes:
Includes both oxide and sulfide mineralization.
Summation errors may be present due to rounding.

14.10 Factors That May Affect the Mineral Resource Estimate

Factors that may affect the geological models, the conceptual pit shells, or the underground mining assumptions, and therefore the Mineral Resource estimates, include the following:

- Gold and silver price assumptions.
- Changes in interpretations of lithological or geometallurgical domains.
- Pit slope angles for the open pits or geotechnical assumptions for underground stope designs.
- Changes to the methodology used to assign densities in the resource models.
- Changes to the assumptions used to generate the gold cutoff grades for resource declaration.
- Changes to the search orientations, search ellipse ranges, and numbers of octants used for grade estimation.
- Revisions to the classification criteria used at Los Filos.

14.11 Comments on Mineral Resource Estimates

Primary sulfide mineralization was encountered in the Los Filos Open Pit during 2012 mining that resulted in a reduction of material being sent to the crush leach pad. This should continue to be monitored during mining.

The current resource models have been developed by Goldcorp corporate personnel using core, RC, and channel sample data. Steps have been taken to mitigate the bias caused by use of composite channel samples in the present model; however, future models must be estimated using only core and RC composites. Stantec considers the current resource models to be a reasonable representation of the Los Filos Mine Mineral Resources.

Mine site personnel should instigate a program of reconciliation of the long-term resource model versus ongoing production records, to validate the resource model and adjust the capping grades accordingly.

15.0 MINERAL RESERVE ESTIMATES

15.1 Basis of Estimates

Mineral Reserves were estimated using metal prices of US$1,200/oz Au and an Effective Date of 31 December 2016.

Open Pit Mineral Reserve estimates were prepared by Los Filos mine site staff and verified by Stantec. Mineral Reserves are based on material that has been classified as Measured and Indicated Mineral Resources. Gold pricing of $1,200/oz was used for the Lerchs-Grossmann process to confine the resource mineralization within Los Filos and Bermejal Open Pits. Each open pit has a separate US$1,200/oz optimized pit shell that was used for determining the economic extraction. Surface surveys as of 31 December 2016 and the US$1,200/oz pit shells were used to constrain the reserve estimates.

Underground Mineral Reserve estimates were prepared by Stantec with the support of Los Filos mine site staff. Mineral Reserves are based on material that has been classified as Measured and Indicated Mineral Resources. Solids models of underground workings were provided to Stantec by the Los Filos mine site staff. Areas that were mined out were removed to establish an Effective Date of 31 December 2016.

15.1.1 Dilution

In the open pit estimates, no allocation (0%) was made for dilution in the Mineral Reserve. Each block within the model is 8 m × 8 m × 9 m, and waste is included in the whole block. The maximum bucket width for loading equipment (CAT994) is 6.3 m, so it was assumed that each block can be mined alone without being further diluted.

In the underground estimate, approximately 14% dilution (0.80 m) was added. Dilution was assigned with a zero gold and silver grade.

15.1.2 Parameters Used to Constrain Mineral Reserves Mined by Open Pit Methods

A nominal mining rate (ore + waste) of 19.2 Mt/a, smoothed for truck requirements, is required to provide the nominal 4.8 Mt/a of oxide feed to the leach pads. It was assumed that the swell factor would be 32% and the moisture content 6%.

The Los Filos Open Pit and Bermejal Open Pit mining, processing, and G&A costs were based on 2016 budget estimates. Recovery estimates by rock type have been derived from production records. The stripping ratio estimates for Los Filos Open Pit is 2.8:1 and for Bermejal Open Pit is 3.0:1.

Table 14-1 outlines the geometallurgical ore type domains used in the Mineral Reserve estimates.

Table 15-1 summarizes the parameters used in constraining the Mineral Reserves at Los Filos Open Pit. Table 15-2 summarizes the parameters used in constraining the Mineral Reserves at the Bermejal Open Pit.

Table 15-1: Assumptions Used for Los Filos Open Pit Mineral Reserve Estimates

Los Filos	**Crush-Leach Ore**					**ROM Ore**				
Rock Type	**Ia**	**Ib**	**II**	**III**	**IV**	**Ia**	**Ib**	**II**	**III**	**IV**
Gold Process Recovery	76.0%	70.0%	54.0%	61.0%	61.0%	64.0%	50.0%	45.0%	30.0%	48.0%
Mining Cost (US$/t)	1.983	1.983	1.983	1.983	1.983	0.794	0.794	0.794	0.794	0.794
Processing Cost (US$/t)	3.800	3.800	3.800	3.800	3.800	0.750	0.750	0.750	0.750	0.750
Sustaining Capital (US$/t)	0.857	0.857	0.857	0.857	0.857	0.857	0.857	0.857	0.857	0.857
G&A (US$/t)	1.978	1.978	1.978	1.978	1.978	1.978	1.978	1.978	1.978	1.978
Total Processing Cost (US$/t)	8.618	8.618	8.618	8.618	8.618	4.379	4.379	4.379	4.379	4.379
Price (US$/oz)	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Profit Margin (US$/oz)	50	50	50	50	50	50	50	50	50	50
CAPEX (US$/oz)	0	0	0	0	0	0	0	0	0	0
Selling Cost (US$/oz)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cutoff (g/t)	0.307	0.333	0.432	0.382	0.382	0.185	0.237	0.263	0.395	0.247

The mineralization within the US$1,200 pit shell that satisfied these requirements equates to a weighted average cutoff grade of 0.241 g/t Au for all geometallurgical domains in the Los Filos Open Pit.

Table 15-2: Assumptions Used for Bermejal Open Pit Mineral Reserve Estimates

Bermejal	**Crush-Leach Ore**			**ROM Ore**		
Rock Type	Oxide	Intrusive	Carbonate	Oxide	Intrusive	Carbonate
Gold Process Recovery	64.0%	68.0%	51.0%	48.0%	58.0%	42.0%
Mining Cost (US$/t)	1.958	1.958	1.958	0.284	0.284	0.284
Processing Cost (US$/t)	3.800	3.800	3.800	0.750	0.750	0.750
Sustaining Capital (US$/t)	0.857	0.857	0.857	0.857	0.857	0.857
G&A (US$/t)	1.978	1.978	1.978	1.978	1.978	1.978
Total Processing Cost (US$/t)	8.593	8.593	8.593	3.869	3.869	3.869
Price (US$/oz)	1,200	1,200	1,200	1,200	1,200	1,200
Profit Margin (US$/oz)	50	50	50	50	50	50
CAPEX (US$/oz)	0	0	0	0	0	0
Selling Cost (US$/oz)	0.000	0.000	0.000	0.000	0.000	0.000
Cutoff (g/t)	0.363	0.342	0.456	0.218	0.180	0.249

The mineralization within the US$1,200 pit shell that satisfies these requirements equates to a weighted average cutoff grade of 0.198 g/t Au for all lithology domains in Bermejal Open Pit.

Table 15-3 and Figure 15-1 summarize the pit slope assumptions for the Los Filos open pit.

Table 15-3: Pit Slope Assumptions, Los Filos Open Pit

Pit Sector	Inter-Ramp Angle (°)	Bench Face Angle (°)	Overall Angle (°)
1	39/48	Granodiorite (East Wall) = 55 Granodiorite (West Wall) = 60 Limestone = 65	38
2	42		38
3	39/48		38
4	45		38
5	43		38
6	35		38
7	40		38
8	43		38
9	36		38
10	44		38
11	35		38
12	40		38
13	44		38
14	35		38
15	40		38
16	44		38
17	44		38
18	47		38
19	47		38

Figure 15-1: Pit Sectors, Los Filos Open Pit

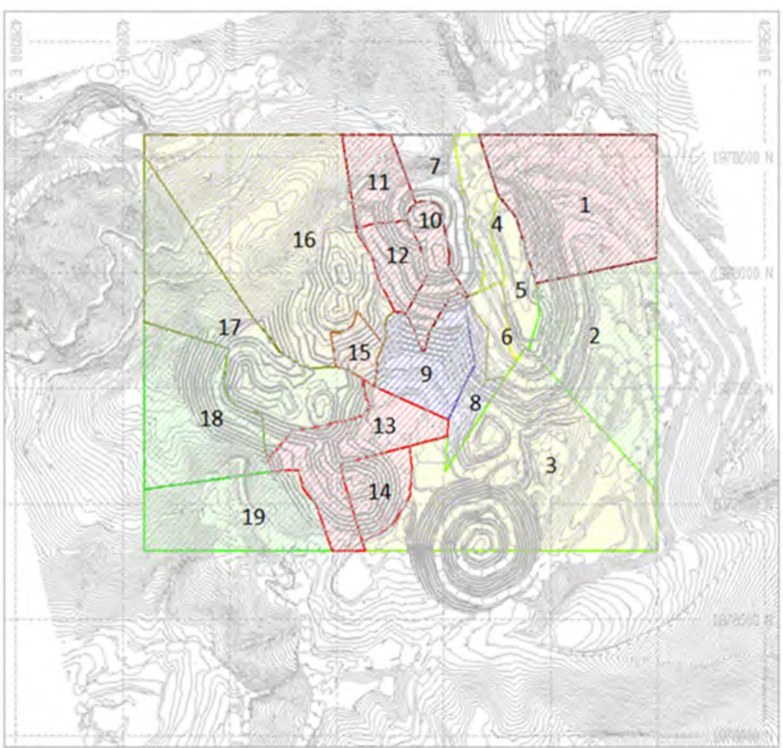
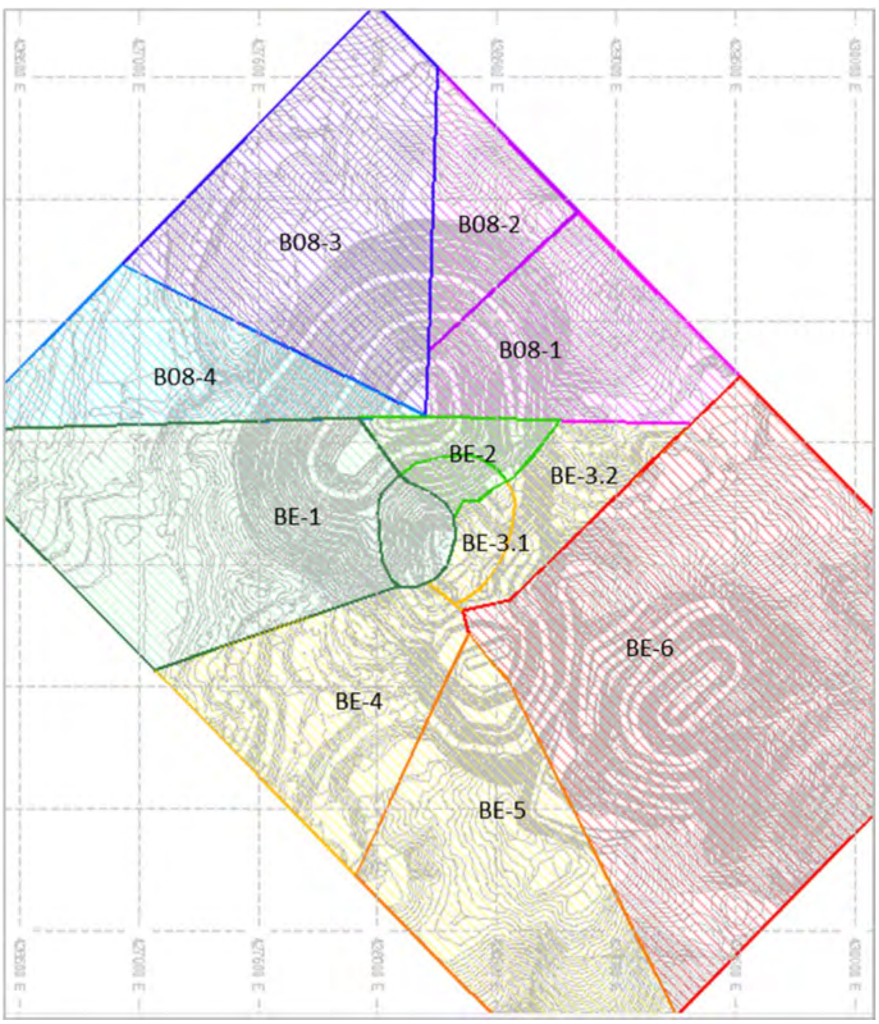


Table 15-4 and Figure 15-2 summarize the pit slope assumptions for the Bermejal Open Pit.

Table 15-4: Pit Slope Assumptions, Bermejal Open Pit

Pit Sector	Inter-ramp Angle (°)	Bench Face Angle (°)	Overall Angle (°)
BE-1	40/49	60/65	45
BE-2	45/49	60/65	45
BE-3.1	40	55	45
BE-3.2	40/46	55/60	45
BE-4	40/51	55/70	38
BE-5	40/51	55/70	38
BE-6	40/48	60/65	38
BE08-1	40/43	60/65	37
BE08-2	43/55	40/65	40
BE08-3	45	60	45
BE08-4	40/43	55/60	43

Figure 15-2: Pit Sectors, Bermejal Open Pit



15.1.3 Parameters Used to Constrain Mineral Reserves Mined by Underground Methods

Los Filos Underground Mineral Reserves were reported at a cutoff grade of 3.77 g/t Au for stopes within 100 m of a developed ramp. Material more than 100 m from a ramp that required additional development had a cutoff of 4.44 g/t Au. Mineralized blocks used to generate a stope shape must have a minimum strike-length of 10 m and a minimum mining width of 3 m. In the underground estimate, approximately 14% dilution (0.80 m) was added at a zero grade for gold and silver. Mining recovery assumptions were assigned to the stope sizes, depending on stope width. The Mineral Reserves were trimmed to remove areas of current workings.

The parameters used to support the Mineral Reserve estimates for the underground operation that require development are shown in Table 15-5. The Mineral Reserve estimates for the underground operations that do not require development are shown in Table 15-6.

Table 15-5: Assumptions Used to Constrain Los Filos Underground Mineral Reserve Estimates – Development Required*

Item	Units	Value
Gold Commodity Price	US$/oz	1,200
Mining Cost	US$/t mined	68.63
Crushing Cost**	US$/t processed	0.00
Processing Cost	US$/t processed	5.14
Engineering and Geology	US$/t processed	4.32
G&A Cost	US$/t processed	24.39
Taxes and Royalties	US$/t processed	1.03
Selling Cost	US$/t processed	0.64
Cost of Reclamation	US$/t processed	0.57
CAPEX (development)	US$/t processed	18.71
Total Processing Cost	US$/t processed	123.43
Gold Recovery	%	80.0
Mining Loss Grade Adjustment	%	10.0
Cutoff Grade	g/t	4.44

*Planned stopes in excess of 100 m or existing ramps.

**Crushing costs are included in processing costs.

Table 15-6: Assumptions Used to Constrain Los Filos Underground Mineral Reserve Estimates – Development Not Required*

Item	Units	Value
Gold Commodity Price	US$/oz	1,200
Mining Cost	US$/t mined	68.63
Crushing Cost**	US$/t processed	0.00
Processing Cost	US$/t processed	5.14
Engineering and Geology	US$/t processed	4.32
G&A Cost	US$/t processed	24.39
Taxes and Royalties	US$/t processed	1.03
Selling Cost	US$/t processed	0.64
Cost of Reclamation	US$/t processed	0.57
CAPEX (development)	US$/t processed	0.00
Total Processing Cost	US$/t processed	104.72
Gold Recovery	%	80.0
Mining Loss Grade Adjustment	%	10.0
Cutoff Grade	g/t	3.77

*Planned stopes within 100 m or existing ramps.

**Crushing costs are included in processing costs.

In addition to the cutoff grade, the following considerations were incorporated in cut-and-fill stope designs.

- Cut height of 3.5 m and a minimum mining width of 3 m.
- Diluted material is assigned a grade of 0 g/t Au and 0 g/t Ag.

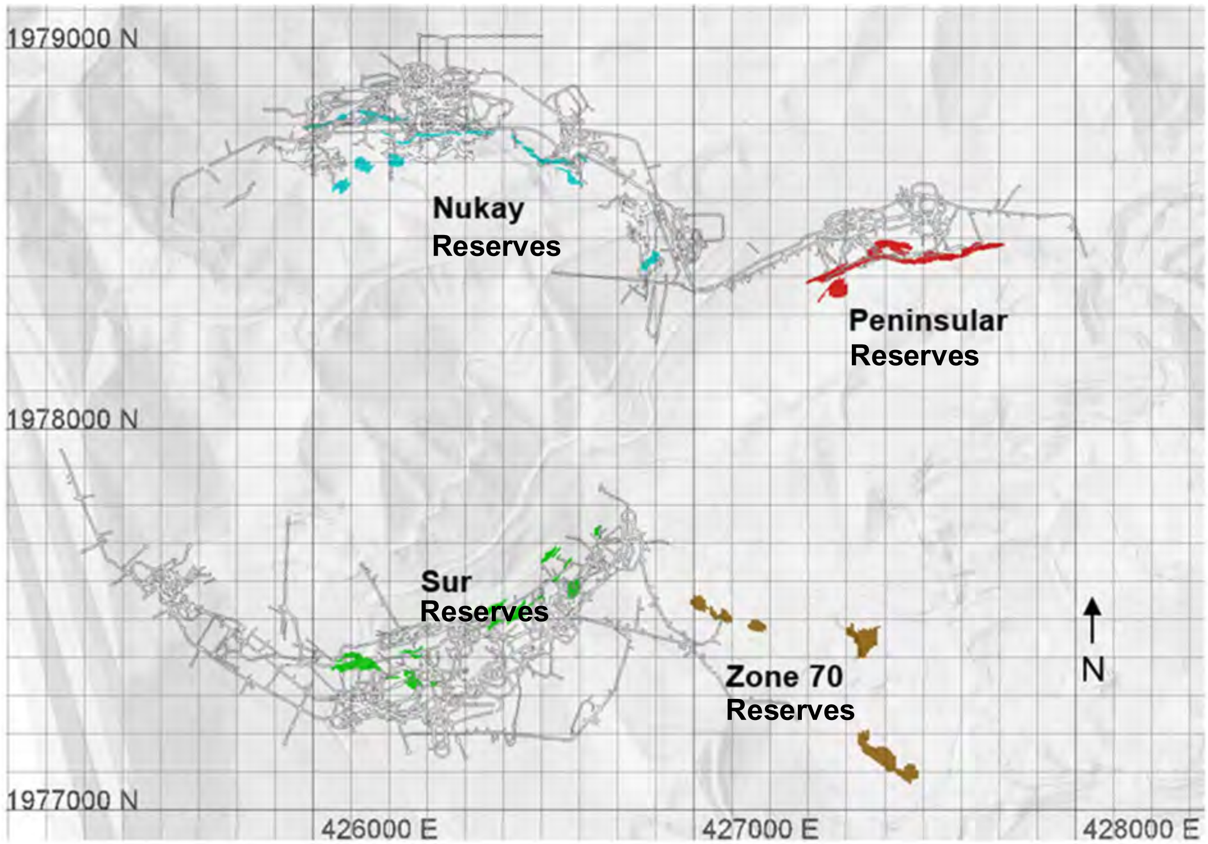
In addition, mining recovery assumptions were assigned to the stope sizes, depending on stope width. See Table 15-7.

Table 15-7: Mining Recovery Assumptions

Stope Width (m)	Mining Recovery Assumption (%)
0–6	100
6–8	80
8–10	80
10–15	80
15–30	75

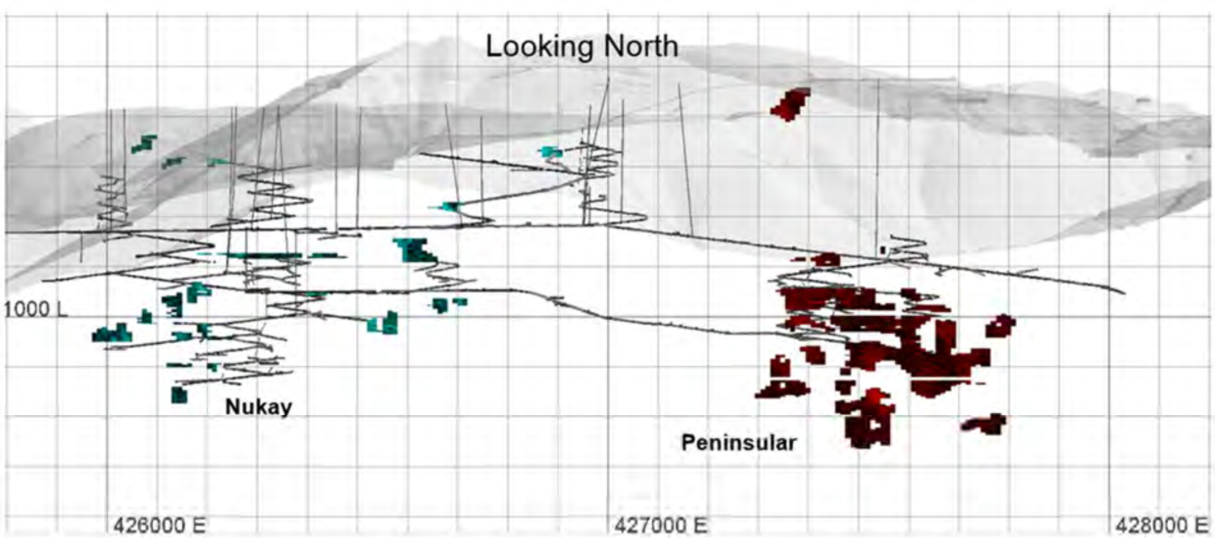
Once estimated, the Mineral Reserves were trimmed to remove mined-out areas. Figure 15-3 shows the relationship between the current operations and the remaining Mineral Reserves by zone. Figure 15-4 and Figure 15-5 show the layout of the Mine workings in relation to the Mineral Reserve panels.

Figure 15-3: Los Filos Underground Mineral Reserves by Zone and Workings



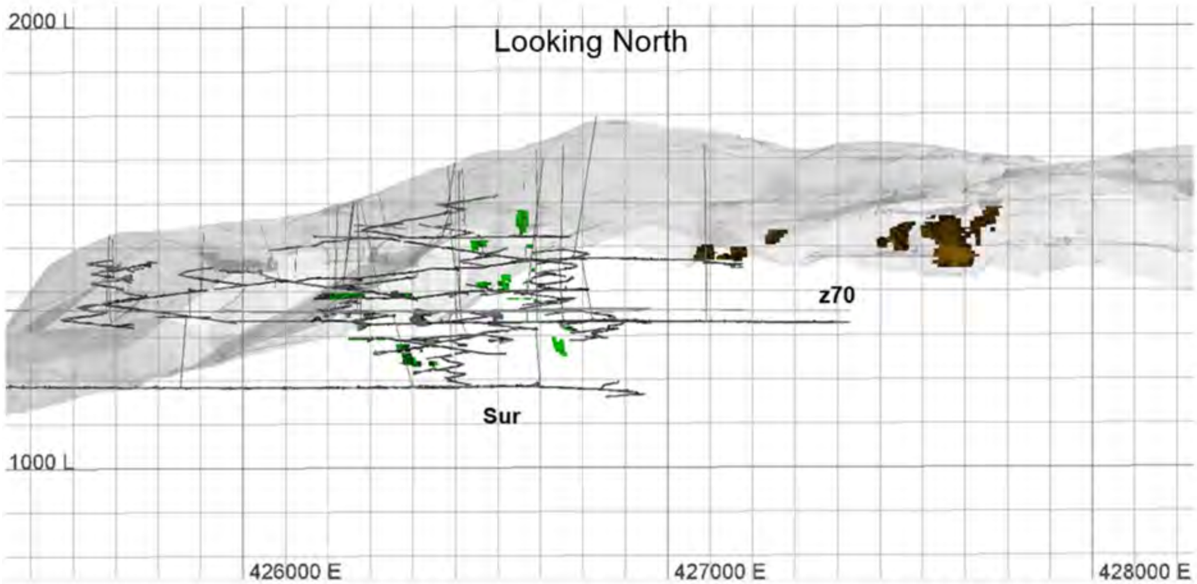
Note: Figure prepared by Stantec, 2017.

Figure 15-4: Mine Design and Reserves Layout, Los Filos Undergound: Nukay and Peninsular Underground



Note: Figure prepared by Stantec, 2017

Figure 15-5: Mined Design Reserves Layout, Los Filos Undergound: Sur and Zone 70 Underground



Note: Figure prepared by Stantec, 2017

15.1.4 Stockpiles

There are no current ore stockpiles associated with the Los Filos mine.

15.1.5 Mineral Reserves Statement

Mineral Reserves for the Los Filos mine includes only mineralization classified as Measured and Indicated Mineral Resources. A gold price of US$1,200/oz is used for reserve estimates along with an economic function that includes variable operating costs and metallurgical recoveries. Silver pricing is not included in the reserve cutoff grade calculation due to a previous silver purchase agreement that has a silver price currently at US$4.26/oz. Table 15-8 details the commodity pricing used. The Effective Date for the Mineral Reserves is 31 December 2016.

Table 15-8: Commodity Prices for Mineral Reserve or Economic Evaluation

Commodity	Unit	Reserve
Gold	US$/oz	1,200.00
Silver	US$/oz	4.26

Preparation of the Mineral Reserves has considered environmental, permitting, legal, title, taxation, socioeconomic, marketing and political factors, and constraints. The Mineral Reserves are acceptable to support mine planning.

Mineral Reserves amenable to open pit and underground mining are presented in Table 15-9 through Table 15-16.

Table 15-9: Total Open Pit Mineral Reserve Statement

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Proven	23,332	0.58	433	5.11	3,834
Probable	15,131	0.94	456	9.23	4,488
Total Proven and Probable	*38,462*	*0.72*	*889*	*6.73*	*8,322*

Note: Summation errors may be present due to rounding.

Table 15-10: Los Filos Open Pit Mineral Reserve Statement

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Proven	10,079	0.63	205	2.28	740
Probable	1,816	0.62	36	2.49	145
Total Proven and Probable	*11,896*	*0.63*	*241*	*2.31*	*885*

Note: Summation errors may be present due to rounding.

Table 15-11: Bermejal Open Pit Mineral Reserve Statement

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Proven	13,252	0.54	228	7.26	3,094
Probable	13,314	0.98	420	10.14	4,342
Total Proven and Probable	*26,567*	*0.76*	*648*	*8.71*	*7,436*

Notes:

1. Los Filos Open Pit and Bermejal Open Pit deposits included.
2. Mineral Reserves are contained within Measured and Indicated pit designs and supported by a mine plan, featuring variable throughput rates (depending on the pit being mined), variable metallurgical recoveries (depending on geometallurgical domain), and cutoff optimization.
3. Mineralization reported for Los Filos Open Pit includes the mineralization within the planned 4P pit extension. Mineralization reported for Bermejal Open Pit includes the mineralization within the planned Guadalupe pit extension.
4. Metal price assumption for gold was US$1,200/oz.
5. The Los Filos Open Pit crush-leach ore is based on an operational 0.373 g/t Au cutoff grade; ROM ore is based on a variable 0.241 to 0.373 g/t Au operational cutoff grade that is determined by lithology. The Los Filos Mineral Reserve is based on a 0.241 g/t Au cutoff grade. The Bermejal Open Pit crush-leach ore is based on an operational 0.364 g/t Au cutoff grade; ROM ore is based on a variable 0.198 to 0.364 g/t Au operational cutoff grade that is determined by lithology.
6. Process gold recoveries vary from 64% to 77% for crush-leach ore and from 49% to 59% for ROM ore at Los Filos Open Pit; recoveries at Bermejal Open Pit vary from 53% to 73%. A 5% silver recovery is assumed from all geometallurgical domains.
7. Rounding, as required by reporting guidelines, may result in apparent summation differences between tonnes, grade, and contained metal content.
8. Tonnage and grade measurements are in metric units. Contained gold and silver ounces are reported as troy ounces.
9. Summation errors may be present due to rounding.

Table 15-12: Total Underground Mineral Reserve Statement

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Proven	546	8.05	141	16.32	286
Probable	1,700	7.95	435	20.60	1,126
Total Proven and Probable with Dilution	*2,246*	*7.97*	*576*	*19.56*	*1,412*

Note: Summation errors may be present due to rounding.

Table 15-13: Nukay Underground Mineral Reserves

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Proven	151	7.45	36	13.29	64
Probable	194	8.59	53	10.39	65
Total Proven and Probable	*344*	*8.09*	*90*	*11.66*	*129*

Note: Summation errors may be present due to rounding.

Table 15-14: Peninsular Underground Mineral Reserves

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Proven	104	7.97	27	8.26	28
Probable	867	7.33	204	15.70	437
Total Proven and Probable	*971*	*7.40*	*231*	*14.91*	*465*

Note: Summation errors may be present due to rounding.

Table 15-15: Sur Underground Mineral Reserves

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Proven	222	8.29	59	23.47	168
Probable	64	6.69	14	14.65	30
Total Proven and Probable	*286*	*7.93*	*73*	*21.50*	*198*

Note: Summation errors may be present due to rounding.

Table 15-16: Zone 70 Underground Mineral Reserves

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Proven	64	9.33	19	12.95	27
Probable	581	8.73	163	31.80	594
Total Proven and Probable	*645*	*8.79*	*182*	*29.93*	*620*

Notes:

1. Mineral Reserves are contained within stope designs that have a minimum horizontal continuity of 10 m, and minimum mining width of 3 m, and supported by a mine plan that features variable stope thicknesses depending on zone; and cutoff optimization.
2. Metal price assumption was $1,200 for Au.
3. Mineral Reserves are reported based on a cutoff grade of 3.77 g/t Au for stopes within 100 of planned ramp and 4.44 g/t Au for stopes requiring development.
4. Dilution is assigned an average of 14% at a 0 grade for Au and Ag.
5. Mining recovery is variable, based on stope width and can range from 75% to 100%.
6. Process gold recoveries are estimated at 80%. A 5% silver recovery is assumed from all zones.
7. Rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade, and contained metal content.
8. Tonnage and grade measurements are in metric units. Contained gold and silver ounces are reported as troy ounces.
9. Summation errors may be present due to rounding.

Inventory

During the earlier years of the Los Filos Mine, sub-optimal leach pad performance led to lower than expected gold production over the life of the leach pad. This has resulted in a significant accumulation of un-leached recoverable gold inventory within the leach pad. The historic accumulated leach pad inventory is now actively being drawn down.

Accumulated gold from ROM and crushed material placed for leaching (booked inventory) versus recovered gold was estimated by Los Filos mine site at 242 koz Au recoverable (as of 31 December 2016). A review was completed by KCA in January, 2017 confirmed the recoverability of this inventory. These gold ounces are considered to be the recoverable portion of the inventory and can be added to the Mineral Reserve. Refer to Table 15-17.

Table 15-17: Los Filos Mine Heap Leach Pad Reserve

Classification	Tonnes (kt)	Au Grade (g/t)	Au Recoverable Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Probable	0	0	242	0	0

The inventory has been the subject of investigations and recovery programs since 2015. During 2016, a total of 32,067 oz Au was recovered using a combination of drilling and reinjection of pressurized leach solution, re-handling of inventory, and surface re-leaching. Accelerated recovery of the remaining historic accumulated gold from the Leach Pad Reserve is scheduled to occur over the next 3 to 4 years.

Los Filos Site Gold Operations

Table 15-18 presents the total Mineral Reserves for Los Filos, with an Effective Date of 31 December 2016.

Table 15-18: Los Filos Mine Total Mineral Reserve Statement

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained Ounces (koz)	Ag Grade (g/t)	Ag Contained Ounces (koz)
Proven	23,877	0.75	575	5.37	4,120
Probable	16,831	1.65	890	10.37	5,614
Total Proven and Probable	40,708	1.12	1,466	7.44	9,734

Note: Summation errors may be present due to rounding.

In addition, there is a Leach Pad Reserve of 49,785 kt at 0.51 g/t, which contains 814 koz Au. The estimated recovery is 29.7% and, therefore, there are 242 koz of recoverable gold ounces included in the mine plan. The total Proven and Probable Mineral Reserves, including the recoverable ounces in the Leach Pad Reserve (Probable Mineral Reserve), is 1,707 koz.

15.2 Factors that May Affect the Mineral Reserve Estimate

Factors which may affect the Mineral Reserve estimates include the following.

- Metal prices.
- Mining and metallurgical recovery assumptions.
- Presence of unexpected quantities of sulfide minerals encountered in the open pits that may require the mineralized ore to be sent to waste rather than to the heap leach.
- Methodology of assigning ore densities.
- Geotechnical characteristics of the rock mass.
- Excess underground mining dilution.
- Ability to recover ounces in Leach Pad Reserve.
- Ability of the mining operation to meet the planned annual throughput rate for the process plant.

15.3 Comments on Mineral Reserve Estimates

Stantec considers the current reserve estimates to be a reasonable representation of the Los Filos mine.

16.0 MINING METHODS

16.1 Geotechnical

Review of the available geotechnical reports for the current open pit and underground mines at Los Filos evidenced a general sound understanding of the geological and geotechnical conditions. Mining is carried out along the mineralized contact between the sedimentary rocks of the Morelos Formation and the dome-shaped granodioritic intrusive bodies. This contact is heavily altered and of poor rock quality.

Existing and proposed open pits and underground mines follow this contact. Geotechnical consulting firms such as Golder Associates (Golder) and Call and Nicholas, Inc. (CNI) have produced feasibility-level geotechnical assessments for pit slopes since 2004. In turn, the underground geotechnical mine design has followed a less formal, but proactive approach to rock mechanics, which has allowed Los Filos to mine several ore bodies under these adverse ground conditions.

16.1.1 Mine Plan

Mine plans for the Los Filos and Bermejal Open Pits were documented in a series of phase pit shell surface models in .dxf format. Proposed underground mine layouts for the Bermejal Underground and the Los Filos Underground (Nukay, Sur, Peninsular, and Zone 70) were provided in a series of polylines, also in .dxf file formats.

A total of two phases (P01a and P01b) for Los Filos Open Pit and four phases (B02b, B02c, B03, and Guadalupe) for Bermejal Open Pit were produced by Los Filos staff, and reviewed and validated by Stantec.

Apart from Bermejal Underground, all proposed underground ore bodies are narrow and dip along the steep contact between sedimentary and intrusive rocks.

16.1.2 Open Pit Designs

Pit slope design criteria for the current Los Filos and Bermejal Open Pits were developed by Golder (2004, 2005) and incrementally modified by CNI (2009, 2011) based on additional geotechnical drilling. Pit slope design criteria for the proposed 4P pits area and the Bermejal North Open Pit were carried out by CNI in 2012 and 2015, and were based on a series of geotechnical drillholes by Golder and CNI.

Production benches in the open pits are designed 9 m in height and stacked in double benches of 18 m, which is the current practice at Los Filos.

Design criteria for the proposed open pits range from inter-ramp angles (IRAs) of 40° to 51° in the Los Filos 4P Open Pit area and almost 48° for the Bermejal Open Pit. The Bermejal North Open Pit pushback is designed for an IRA of 51°.

16.1.3 Achieved Inter-Ramp Angles

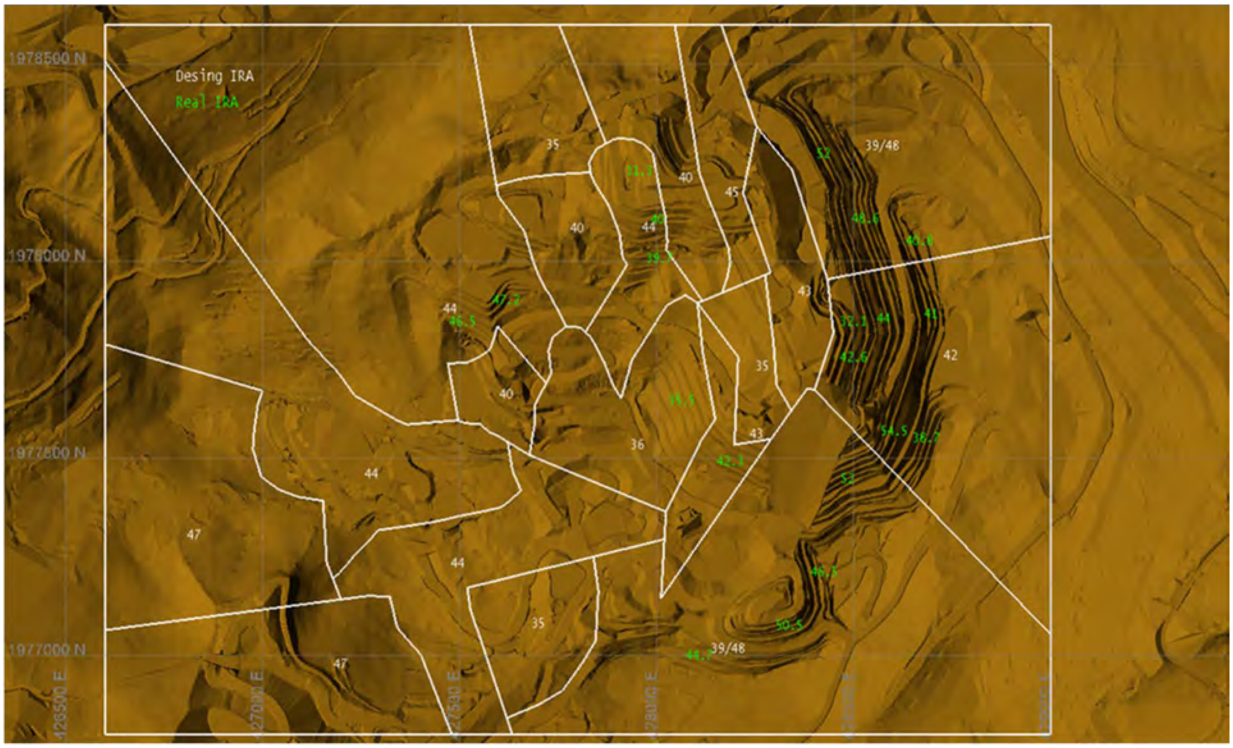
An analysis of the as-built pit slope configurations was completed for the Los Filos and Bermejal Open Pits.

Figure 16-1 and Figure 16-2 depict the as-built sectors of the Los Filos and Bermejal Open Pits, respectively, with the corresponding measured and designed IRA. For this assessment, no detailed kinematic analysis was attempted.

At the Los Filos Open Pit, measured IRAs in the west wall range from 31° to 47°. The southwest wall was mined at a 35.5° IRA in the poor quality rock along the contact between the intrusive and sedimentary rocks. IRAs in the east wall range from 42.5° to 52°; isolated sectors in the pit show IRAs of 32° and 54.5°.

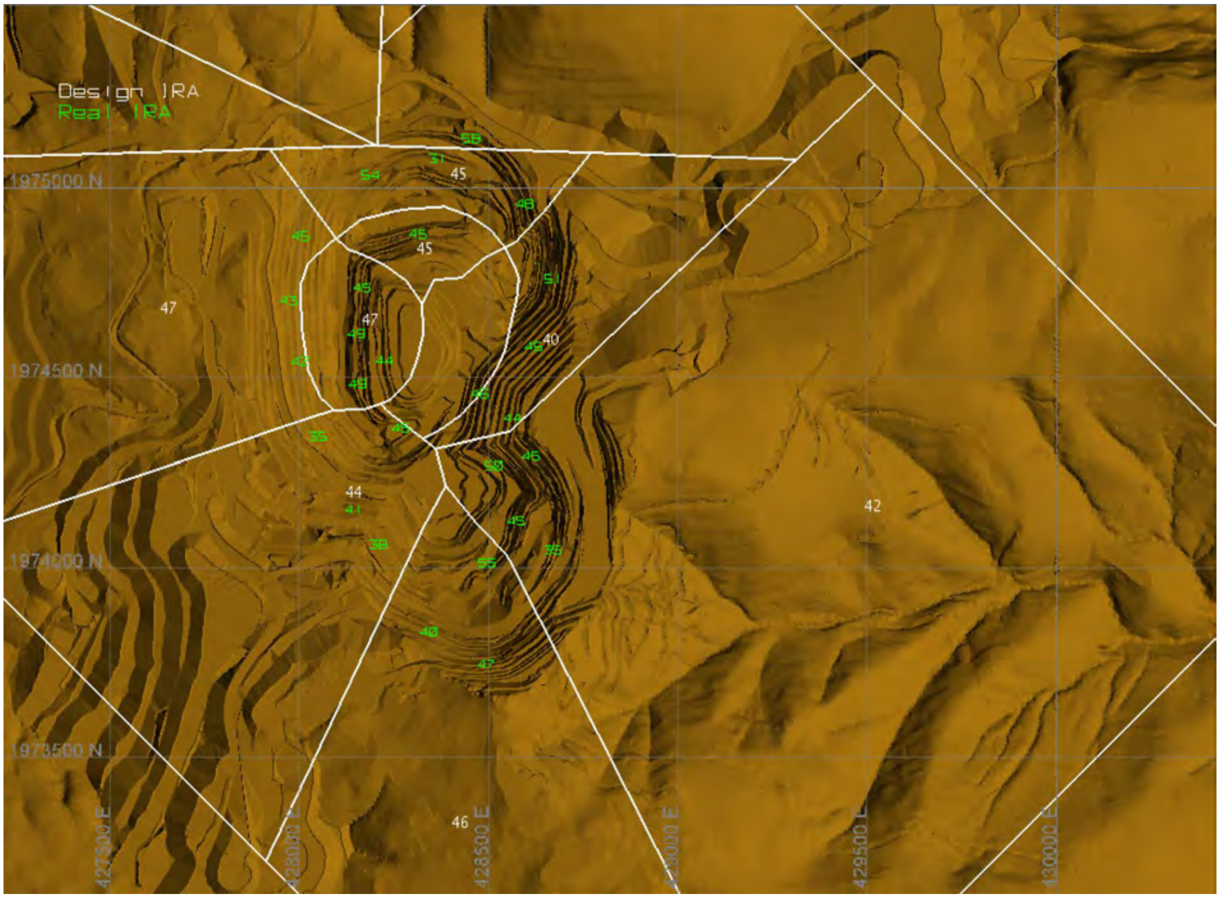
Bermejal design IRAs for west-facing walls range from 45° to 50°, while east-facing walls show slightly lower angles, ranging from 40° to 45°.

Figure 16-1: Plan View of Los Filos Open Pit (Design and Actual Inter-Ramp Angles)



At the Bermejal Open Pit, outer walls excavated in sedimentary rocks exhibited IRAs from 34.9° to 44.9° along the west wall and from 43.9° to 50.6° along the east wall. The interior east walls mined in granodiorite rocks in Bermejal North Open Pit exihibited IRAs from 45.2° to 49.4°.

Figure 16-2: Plan View of the Bermejal Open Pit (Design and Actual Inter-Ramp Angles)



Lower IRA values in the east-facing walls may be associated with district scale, moderately east-dipping features, and joint anisotropy best represented in the sills distribution in the Los Filos Open Pit sill, and possibly in the ore distribution in the Bermejal South Open Pit.

The only significant pit slope instability reported for either Los Filos or Bermejal is by CNI (2011) to the west highwall in Los Filos, which was attributable to poor rock mass quality along the contact between granodiorite and sedimentary rocks. Mitigation included reducing the IRA to 35°. The overall geotechnical design for the Los Filos and Bermejal Open Pits is acceptable for the prevailing geologic conditions.

Open Pit Hydrogeology

No hydrogeological assessments have been carried out for the Los Filos area. Water supply to the Mine is conducted from Mezcala, at approximately 13 km from the site. Groundwater at the Mine is deeper than current mining activity. Water levels at the Presa Caracol and nearby water courses are at about 500 masl.

The current minimum pit floor elevation is at 1,320 masl in the Los Filos Open Pit, with no indications of groundwater. The minimum proposed pit floor is at 1,216 masl at the Los Filos ultimate pit. The final pit bottom for the Bermejal Open Pit is at 1,420 masl.

16.1.4 Geotechnical Block Model

The geotechnical block model constructed by CNI (2012, 2015) is based on core hole RQD values. Snowden (2006) indicated that after drilling, core was transported 13 km to a core shed in Mezcala from the drill pad. It was demonstrated that handling and transportation of core would induce additional mechanical breakage, lowering apparent RQD. An RQD-based model should recognize bias from external damage to the core to reduce an over-conservative bias.

CNI ran basic statistics on the drill holes but did not validate the drill hole database, resulting in the geomechanical database not being validated. The geotechnical logging procedures were based on RQD rock section measurements greater than 12 cm and strength indices from 0 to 6.

16.1.5 Opinion on Proposed Pit Designs

A comparison between design and actual IRAs was completed. It is apparent that the Mine adjusted the pit slope angles to compensate for actual ground conditions.

There is no evidence of water in the highwalls.

16.1.6 Los Filos Underground

Information available characterizes the Los Filos Sur (Subida, San Andres y Diegos) and Los Filos Norte (Periférico Nukay y Peninsular) mines as narrow, high-angle ore bodies developed along the contact between an intensely altered granodiorite in the footwall and sedimentary rock of fair quality. Cut-and-Fill mining methods are used for mining selectivity.

Procedures for excavation stability are directed by geotechnical technicians based on factors such as rock mass and rock quality. Primary development, including ramps and main accesses, are driven in competent limestone whenever possible and generally requires minimal rock bolt and mesh support. In or near the ore zone, which often consists of soft rock and clays, the headings are prone to overbreak, low stand-up time, and deformation. Spans from 3 m to 4 m are common and require a 50 mm shotcrete, bolts, and mesh as primary support.

Underground water sources include induced process water and groundwater and have a negligible impact on mine operations. There is no underground pumping system.

16.1.7 Opinion on Proposed Underground Operations

Geotechnical conditions at Los Filos Underground are well understood based on actual mining experience. Considerations for alternate mining methods, such as Underhand Cut-and-Fill, cemented rock fill, and non-Drill-and-Blast methods, could add value to the mining operations.

16.2 Open Pit Mine Methods

16.2.1 Pit Designs

The pit design assumes development of a number of pit phases as indicated in Table 16-1 and Figure 16-3 (Los Filos), and Table 16-2 and Figure 16-4 (Bermejal). Mining operations for future mining phases are currently planned to use the same pit configurations and the same equipment as is currently in use.

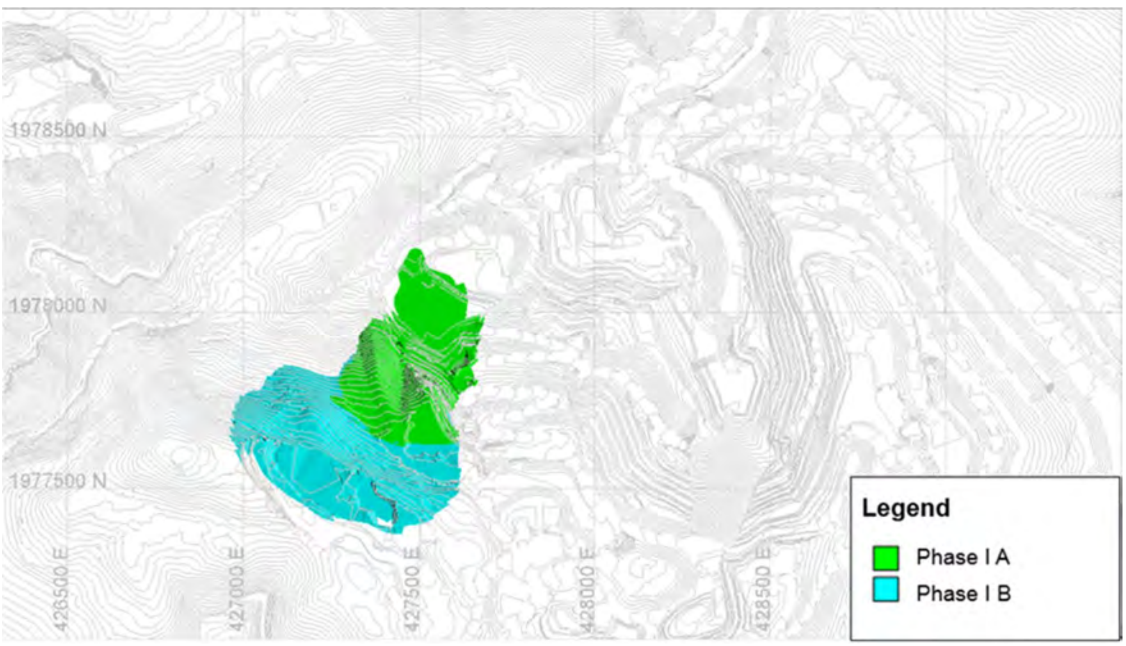
Mine design assumptions include the following.

- Equipment Availability: 82%
- Equipment Utilization: 76%
- Effective Hours: 15 per day
- Mining Days per Year: 354
- Equipment: FC785C Truck; EX2500 Shovel; CF994H Loader
- Haul Road Width: 25 m
- Haul Road Grade: 10%
- Bench Height: 18 m
- Minimum Mining Width: 50 m
- Crushing Capacity: 16 kt/d

Table 16-1: Los Filos Open Pit Design Phases by Year

Deposit	LOM Production
Phase Ia	2017–2019
Phase Ib	2017–2018

Figure 16-3: Final Los Filos Open Pit Design (US$1,200/oz Au)

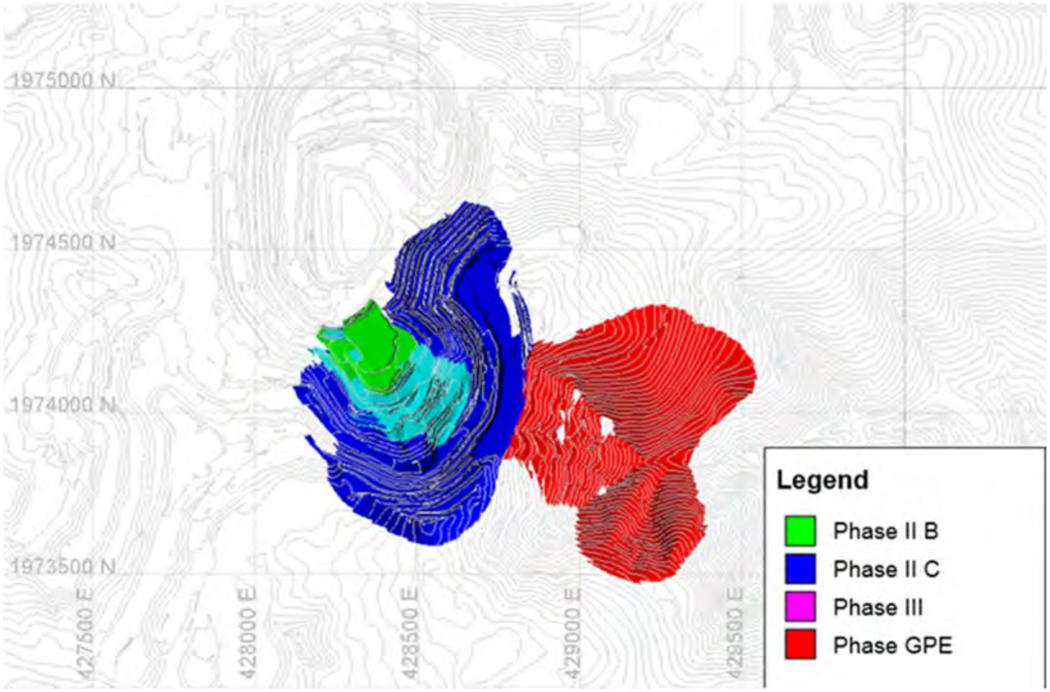


Note: Figure prepared by Stantec 2017.

Table 16-2: Bermejal Open Pit Design Phases by Year

Deposit	LOM Production
Phase IIb	2018–2019
Phase IIc	2019–2020
Phase III	2019–2023
Phase GPE	2020–2024

Figure 16-4: Final Bermejal Open Pit Design (US$1,200/oz Au)



Note: Figure prepared by Stantec 2017.

16.2.2 Mining Method

Drill patterns are laid out by the Mine Planning Department, after consideration of factors such as ore grade, structural geology, geometallurgical domains, rock hardness, fragmentation, drill hole diameter, and explosive to be used. The drill pattern spacing for Los Filos Open Pit is detailed in Table 16-3 and the drill pattern spacing for Bermejal North and South Open Pits are detailed in Table 16-4 and Table 16-5, respectively.

Table 16-3: Los Filos Open Pit Drill Pattern

Rock Type	Geometallurgical Domains	Density (kg/m^3)	Pattern
Intrusive	IA	2.35	5 m × 6 m
Intrusive	IB	2.35	4 m × 5 m
Limestone	II	2.55	4.5 m × 5.5 m
Limestone	II	2.55	4 m × 4.5 m
Intrusive	III	2.35	4.5 m × 5.5 m
Oxide	IV	2.55 / 2.67	5 m × 6 m
Intrusive East	GD_IA	2.35	4.5 m × 5.5 m
Intrusive CZGD	GD_IB	2.35	4.5 m × 5.5 m

Table 16-4: Bermejal North Open Pit Drill Pattern

Rock Type	Geometallurgical Domains	Density (kg/m^3)	Pattern
Intrusive	IA	2.67	5 m × 6 m
Intrusive	IB	2.36	4.5 m × 5.5 m
Carbonate	II	2.52	4.5 m × 5.5 m
Intrusive	III	2.36	4 m × 5 m
Oxide	IV	2.67	4.5 m × 5.5 m

Table 16-5: Bermejal South Open Pit Drill Pattern

Rock Type	Geometallurgical Domains	Density (kg/m^3)	Pattern
Intrusive	IA	2.29	5 m × 6 m
Intrusive	IB	2.29	4 m × 5 m
Carbonate	II	2.52	4.5 m × 5.5 m
Intrusive	III	2.29	4 m × 5 m
Oxide	IV	2.31	4.5 m × 5.5 m

Drilling is completed using Atlas Copco drill rigs. Drilling patterns typically have 40 to 60 blastholes on a given round, and holes are 17 cm in diameter. At Los Filos and Bermejal Open Pits, the production benches have a height of 9 m. On occasion, benches can be 12 m high in waste areas. For slope control, safety berms are constructed every 18 m of bench height.

Explosives loading and blasting is undertaken by the contracted blasting firm using ANFO. When setting up the ANFO mixture, consideration is given to the structural geology, free-facing of the blast, material hardness, slope and vibration control, and the drill pattern being used.

Blasthole cuttings are sampled by Mine Geology Department personnel and sent to the mine laboratory for grade control analysis using AA methods. Analytical data is then sent to the Mine Ore Control Department to designate the waste and ore polygons.

The blasted material in the Los Filos Open Pit is then flagged as follows.

- Waste: <0.241 g/t Au and marked out in blue; waste is sent to one of the waste rock piles.
- Sub-Low-Grade (SLG) Ore: >0.241 g/t to 0.373 g/t and marked out in green; material is sent to the ROM heap leach pad.
- ROM Ore: >0.373 g/t to 0.50 g/t and marked out in green; material is sent to the ROM heap leach pad.
- Crush–Leach Ore: >0.50 g/t and marked out in orange; material is sent to the crush pad.
- Material that has no assay result is marked in white.

The blasted material in the Bermejal Open Pit is then flagged as follows.

- Waste: <0.198 g/t Au and marked out in blue; waste is sent to one of the waste rock piles.
- SLG Ore: >0.198 g/t to 0.364 g/t and marked out in green; material is sent to the ROM heap leach pad.
- ROM Ore: >0.364 g/t to 0.50 g/t and marked out in green; material is sent to the ROM heap leach pad.
- Crush–Leach Ore: >0.50 g/t and marked out in orange; material is sent to the crush pad.
- Material that has no assay result is marked in white.

Loading of blasted ore is by Hitachi EX 2500 model hydraulic excavators with a bucket capacity of 23 t, CAT 992 front end loaders with a bucket capacity of 18 t, and a 994 loader with a bucket capacity of 32 t. Material is loaded into CAT 785 haul trucks with a capacity of 130 t.

16.2.3 Life-of-Mine Production Schedule

The LOM production plan for both open pit sources is presented in Table 16-6. This mine plan is based on the year-end 2016 Proven and Probable Mineral Reserves. Production from open pit sources is currently planned to continue to 2024.

As part of day-to-day operations, the Mine Department continues to perform reviews of the mine plan and consideration of alternatives to the plan. The LOM plan is presented in Table 16-6.

Table 16-6: Open Pits Life-of-Mine Production Plan

	Description	LOM Total	2017	2018	2019	2020	2021	2022	2023	2024
	Waste tonnes (kt)	**114,997**	**16,006**	**13,514**	**12,527**	**14,311**	**16,562**	**14,970**	**14,710**	**12,397**
	Ore Tonnes (kt)	**38,463**	**3,823**	**6,304**	**7,469**	**5,725**	**3,388**	**4,968**	**5,239**	**1,546**
	Gold (g/t)	**0.72**	**0.66**	**0.69**	**0.79**	**0.65**	**0.77**	**0.79**	**0.85**	**3.44**
	Contained Gold (koz)	**889**	**69**	**117**	**152**	**84**	**62**	**105**	**130**	**171**
	Silver (g/t)	**6.73**	**2.44**	**2.63**	**6.53**	**9.08**	**8.63**	**10.36**	**10.53**	**30.81**
	Contained Silver (koz)	**8,322**	**255**	**447**	**1,254**	**1,164**	**693**	**1,369**	**1,609**	**1,531**
By Ore Type	Crush-Leach Ore tonnes (kt)	22,866	2,244	3,526	4,332	2,519	1,672	3,140	3,887	1,546
	Crush-Leach Gold (g/t)	1.02	0.75	0.81	0.89	0.69	0.88	0.88	0.94	3.44
	Crush-Leach Contained Gold (koz)	750	54	91	124	56	47	89	118	171
	Crush-Leach Silver (g/t)	8.94	2.36	2.84	6.78	8.91	8.47	10.41	11.00	30.81
	Crush-Leach Contained Silver (koz)	6,571	170	322	944	722	455	1,051	1,374	1,531
	ROM Ore tonnes (kt)	3,611	438	652	728	619	321	447	407	—
	ROM Gold (g/t)	0.34	0.35	0.35	0.34	0.34	0.34	0.34	0.34	—
	ROM Contained Gold (koz)	40	5	7	8	7	3	5	4	—
	ROM Silver (g/t)	3.95	1.85	1.58	3.66	5.28	5.59	5.81	5.22	—
	ROM Contained Silver (koz)	459	26	33	86	105	58	83	68	—
	SLG Ore tonnes (kt)	11,985	1,141	2,126	2,408	2,587	1,395	1,381	946	—
	SLG Gold (g/t)	0.26	0.28	0.28	0.26	0.25	0.25	0.25	0.26	—
	SLG Contained Gold (koz)	100	10	19	20	21	11	11	8	—
	SLG Silver (g/t)	3.35	1.60	1.34	2.89	4.05	4.00	5.28	5.49	—
	SLG Contained Silver (koz)	1,292	59	92	224	337	180	234	167	—

Table 16-6: Open Pits Life-of-Mine Production Plan

	Description	LOM Total	2017	2018	2019	2020	2021	2022	2023	2024
By Open Pit	Los Filos Ore tonnes (kt)	11,896	3,823	5,863	2,210	—	—	—	—	—
	LF Gold (g/t)	0.63	0.56	0.58	0.88	—	—	—	—	—
	LF Contained Gold (koz)	241	69	110	62	—	—	—	—	—
	LF Silver (g/t)	2.31	2.07	2.03	3.48	—	—	—	—	—
	LF Contained Silver (koz)	885	255	383	248	—	—	—	—	—
	Bermejal Ore tonnes (kt)	26,567	—	441	5,259	5,725	3,388	4,968	5,239	1,546
	B Gold (g/t)	0.76	—	0.55	0.53	0.45	0.57	0.66	0.77	3.44
	B Contained Gold (koz)	648	—	8	89	84	62	105	130	171
	B Silver (g/t)	8.71	—	4.51	5.95	6.32	6.36	8.57	9.55	30.81
	B Contained Silver (koz)	7,436	—	64	1,006	1,164	693	1,369	1,609	1,531

Note: Summation errors may be present due to rounding.

16.3 Underground Mining Operations

16.3.1 Description of Current Underground Operations

The current Los Filos Underground operations are conducted on the perimeter of the Los Filos stock and are accessed by multiple portals that are located outside of the current open pit operations. The main declines are driven at minus 12% to accommodate 10-wheel highway dump trucks. The main declines are driven in the hanging wall about 80 m away from the ore in competent limestone to minimize ground control issues. These declines are driven to access ore zones that are separated by waste or subeconomic material. The ore and the adjacent zones have a poor rock quality and require extra ground support for stability.

An access (attack) ramp is driven exterior to a targeted portion of the skarn to begin stoping. The access ramp system is typically done in 7 passes, in 3 m vertical lifts, and begins from the bottom of a planned stope and progresses upward (see Figure 16-5) as each floor of a stope is mined out. The bottom ramp of an attack ramp system is driven at -15%, and each subsequent ramp is driven at + 15% and is built upon blasted waste rock.

The primary mining method used is Overhand Cut-and-Fill, with underground development waste rock used for unconsolidated backfill (see Figure 16-5 and Figure 16-6). This is supplemented with rock from open pit waste dumps that is dropped underground through 3 m diameter vertical borehole raises. The stopes are sequenced so that sill pillars are not left between stopes.

Figure 16-5: Generalized Overhand Cut-and-Fill Mining

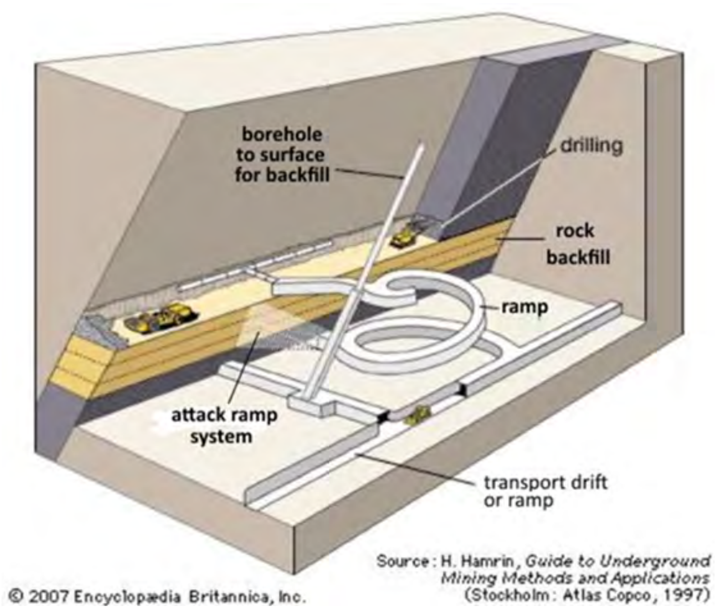
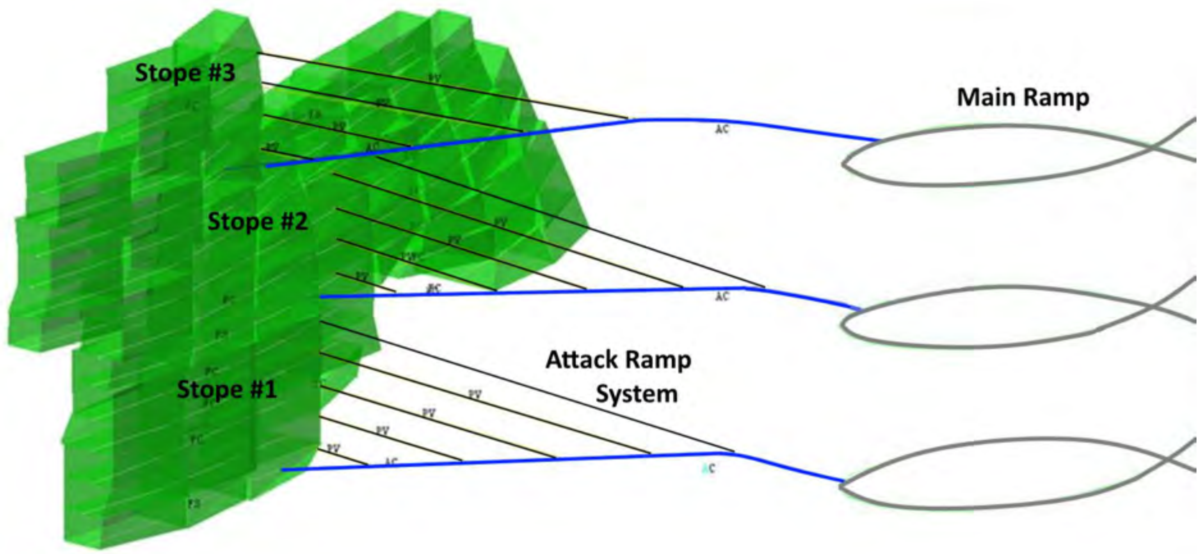


Figure 16-6: Generalized Overhand Cut-and-Fill Development Design



Single-boom electrohydraulic jumbo drills are used for drilling blastholes in the development headings and the stopes, and standard ANFO is used as an explosive. Packaged explosive is used for controlled blasting on the perimeter holes in the stopes, and elsewhere as needed.

Blasted ore is removed from the stopes with 3 m^3-class LHD loaders and transported to muck bays positioned near each stope. The ore is then loaded into 20-t capacity dual-axle Kenworth-style dump trucks with 5.4 m^3 class LHD loaders for transport to the surface and to the surface crusher, shared by both the open pit and underground. The waste rock from mining the main ramps is removed with 5.4 m^3 class LHDs.

Compressed air and service water piping, power cable, leaky feeder communications cable, blasting cable, vent duct, and signal cable are installed in each main and access decline as needed. Centralized blasting is used underground. Ventilation is achieved by main surface fans that pull air from raisebore holes extending into the underground workings. Secondary underground fans and vent duct distribute the air to work areas as necessary.

There are four underground mining areas positioned around the perimeter of the Los Filos intrusive stock.

On the north side of the stock are the Nukay and Peninsular areas, which are mined by unionized employees. On the south side of the stock are the Sur and Zone 70 areas, which are mined by a mining contractor using contractor-supplied equipment. Production from the underground is scheduled for 2 daily shifts, 7 days per week. A contractor trucks the ore from underground to the surface crusher with highway trucks for all underground areas.

Table 16-7 shows the total underground employees.

Table 16-7: Current Personnel Summary

Personnel Type	No. of Personnel
Non-Union Personnel – Underground	43
Union Personnel – Underground	172
Contractor Personnel – Underground	243
Total Personnel at Los Filos Underground	453

Average annual production from all underground sources for 2017 through 2023 will be 0.32 Mt/a of ore and 0.20 Mt/a of waste for the remaining 7-year underground mine life based on current Mineral Reserves. Cut-and-Fill mining methods are used in the current Los Filos Underground operations. Production is forecast at a nominal 0.35 Mt/a to 2023.

16.3.2 Life-of-Mine Production Schedule

Underground mining operations at the Los Filos Underground mine are currently scheduled to continue until 2023. The planned LOM production schedule is presented in Table 16-8. This mine plan is based on the year-end 2016 Proven and Probable Mineral Reserves, which does not include the Bermejal Underground resources. As part of day-to-day operations, the Underground Mine Department completes reviews to optimize the mine plan. The LOM production plan is presented in Table 16-8.

Table 16-8: Los Filos Underground Life-of-Mine Production Plan

Description	LOM Total	2017	2018	2019	2020	2021	2022	2023
Ore tonnes (kt)	2,246	390	454	379	409	334	200	80
Waste tonnes (kt)	1,475	470	331	162	240	137	85	51
Gold (g/t)	7.98	7.59	7.96	7.36	7.91	9.19	8.11	7.94
Silver (g/t)	19.55	15.20	17.68	13.37	25.13	22.78	28.70	15.91
Contained Gold (koz)	576	95	116	90	104	99	52	20
Contained Silver (koz)	1,412	191	258	163	330	244	185	41
Total Development (m)	23,808	9,881	5,664	2,678	2,167	1,920	1,281	217
Daily Development (m/day)	9.79	28.2	16.2	7.7	6.2	5.5	3.7	0.6

Note: Summation errors may be present due to rounding.

The ventilation layouts for the Norte mine are shown in Figure 16-7 (Nukay), Figure 16-8 (Conchita), and Figure 16-9 (Peninsular). Figure 16-10 shows the ventilation layout for the Sur mine (La Subida and Zone 70).

Figure 16-7: Development and Ventilation Plan, Los Filos Underground, Nukay Mine

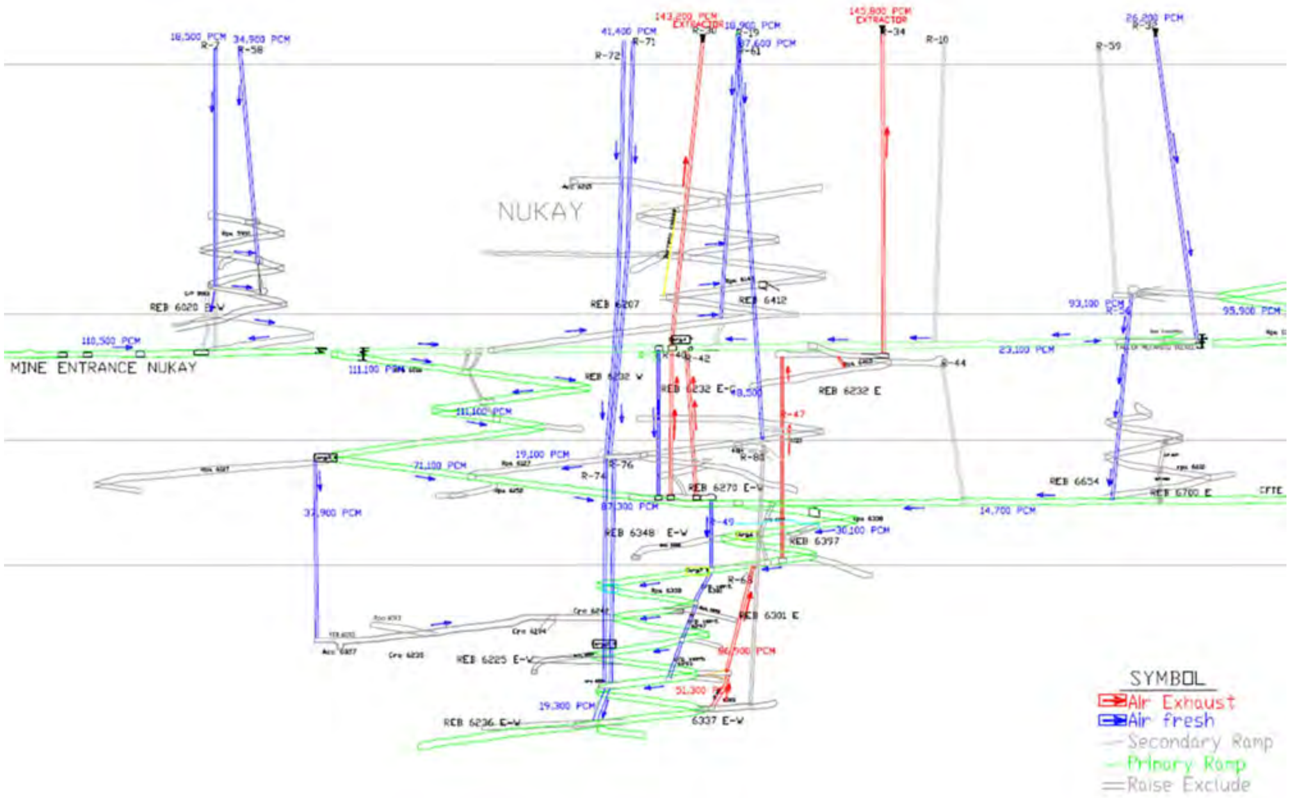


Figure 16-8: Development and Ventilation Plan, Los Filos Underground, Conchita Mine

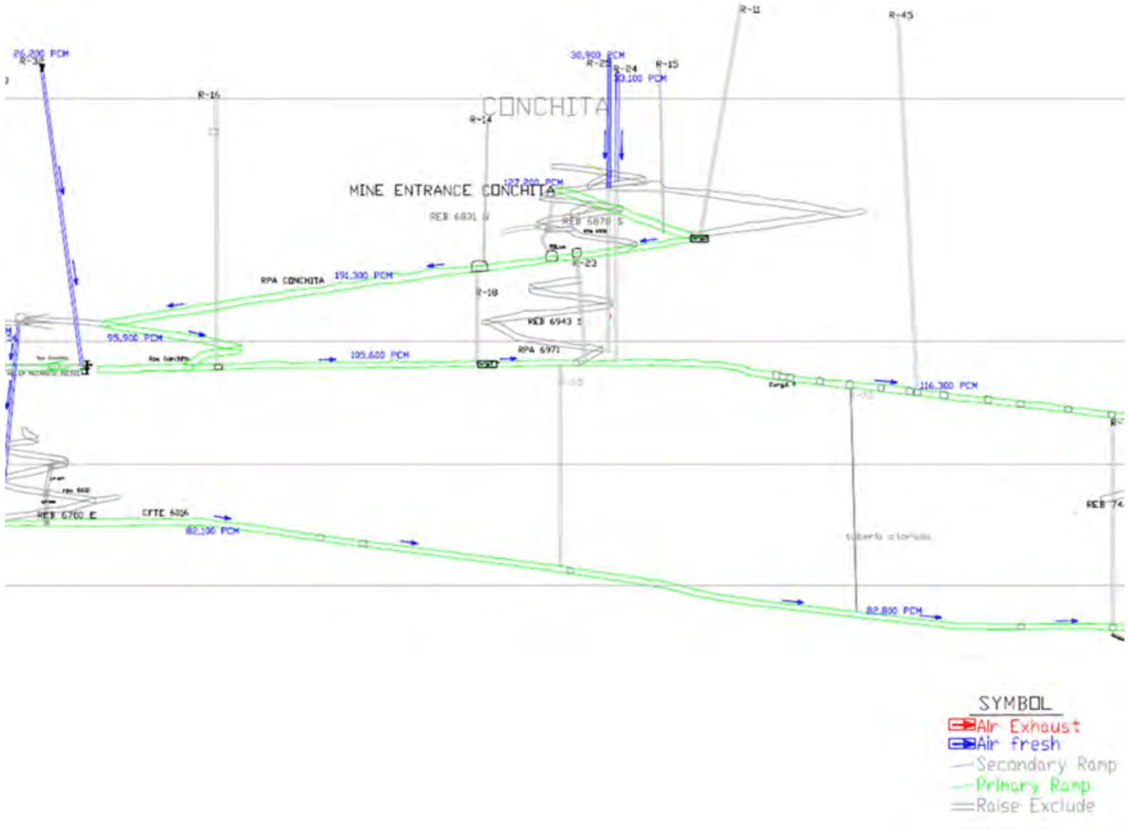


Figure 16-9: Development and Ventilation Plan, Los Filos Underground, Peninsular Mine

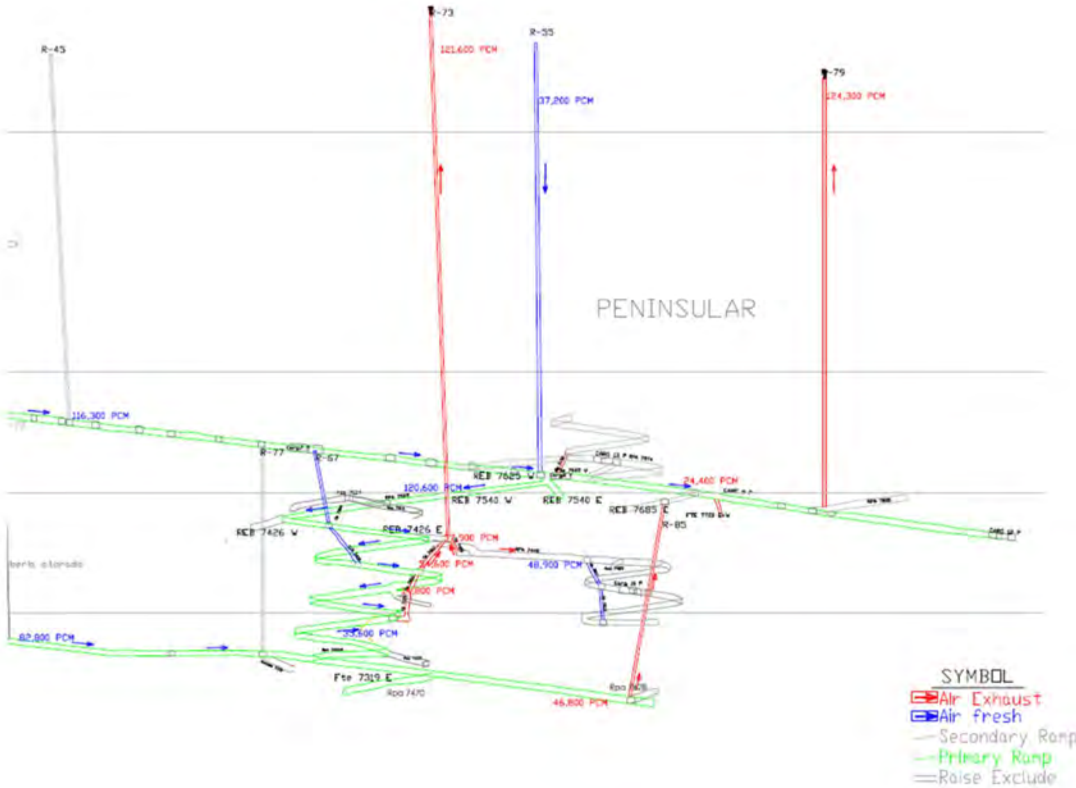
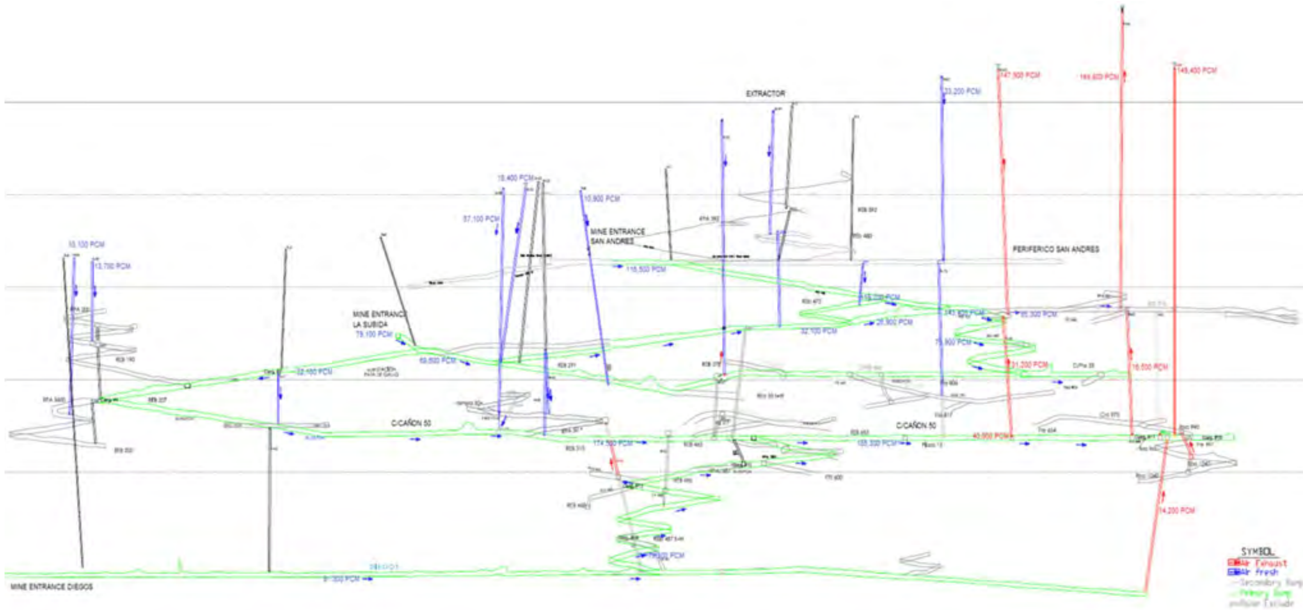


Figure 16-10: Development and Ventilation Plan, Los Filos Underground South Zone



16.4 Reconciliation and Depletion

There was no available data at the time of review to provide reconciliation evidence between mine production and deposit models.

The exploration block model reconciliation to "declared ore mined" (recovered gold) was not completed or reviewed. A proper reconciliation is difficult in a leach operation, especially when there is ore coming from two sources (open pit and underground) and therefore two block models.

Historical reconciliation between the exploration model and the blasthole block model was performed resulting in iterative calibration work to the exploration model. Historical blasthole block model data should be reconciled to the block model used in this Report. This has not been completed.

16.5 Mining Equipment

Table 16-9 shows the open pit and underground equipment that currently owned by Los Filos mine.

Table 16-9: Mining Equipment, Open Pit and Underground

Qty	Open Pit Equipment
31	130-t Haul Truck
5	23-t Excavator
3	18-t Front Loader
1	32-t Front Loader
12	Blasthole Drill
7	Bulldozer
3	Wheel Dozer
4	Grader
4	Water Truck
1	Hydraulic Excavator
2	Backhoe Excavator
1	Vibrator Compactor

Qty	Underground Mining Equipment
3	3 m Jumbo Drill
3	4.3 m Jumbo Drill
1	4.9 m Jumbo
2	4.9 m Rock Bolter
1	3 m Rock Bolter
3	1.5 m^3 Scoop Tram
2	2.7 m^3 Scoop Tram
2	3.1 m^3 Scoop Tram
7	5.4 m^3 Scoop Tram
1	2.3 m^3 Wheel Loader
2	4.6 m^3 Wheel Loader
1	Raise Drill
1	Grader
1	Backhoe Loader
1	Bulldozer

Table 16-10 shows the open pit and underground equipment availability and utilization.

Table 16-10: Equipment Productivity in 2016 (Actual)

Open Pit Equipment		
Equipment	Availability	Utilization
Blasthole Drills	86%	48%
Excavators	90%	67%
Loaders	79%	65%
Haul Trucks	88%	76%
Track Tractors	86%	52%
Water Trucks	81%	37%
Motorgraders	82%	48%
Wheel Dozer	85%	53%

Underground Equipment		
Equipment	Availability	Utilization
Jumbos	90%	21%
Bolters	88%	23%
Scoops (LHD)	83%	29%

16.6 Comments on Mining Methods

The infrastructure, methods, and equipment are suitable for executing the open pit and underground LOM plans.

17.0 RECOVERY METHODS

The processing of ore and the systems in place to recover gold and silver from ore being mined at Los Filos Gold mine has been reviewed and assessed by the Qualified Person.

Mineralization from underground and open pit operations is classified as either low-grade or high-grade ore.

- If medium- to high-grade (currently >0.5 g/t Au) ore is sent to a crushing system consisting of a primary and two secondary crushers, and is reduced to a particle size of ~80% passing minus 19 mm. Crushed ore (known on the Los Filos site as "crush") is mixed with cement, lime, and water for agglomeration purposes and is transported overland to the heap leach pad(s) via a combination of conveyor/stacking and haulage trucks.
- If low-grade ore (currently >0.198 and <0.5 g/t for the Bermejal Open Pit and >0.241 and <0.5 g/t for the Los Filos Open Pit) is sent directly to the leach pad as ROM ore. No ore sourced from underground is classified as low grade.

Currently, heap leach pads (PAD 1 and PAD 2) are in operation, each with separate drainage collection system. PAD 1 has been generally laid out in two sections, one for the Crush ore and the other for ROM ore. PAD 2 became operational in 2013. Initially, ROM was stacked on this pad, but currently only Crush material is stacked on PAD 2.

The leachate from each pad is collected in separate ponds as a Pregnant Leach Solution (PLS). The leachate is pumped to a carbon adsorption-desorption-recovery (ADR) plant, where gold and silver is extracted from the PLS by carbon adsorption. The gold is subsequently stripped from the carbon, producing a gold-enriched solution that is transferred to a secure on site facility where the gold is removed from solution by electrowinning. A gold-rich sludge is then removed from the electrowinning cathode cells, dewatered, calcined, and refined to doré (gold-silver alloy) using electric furnaces.

The ore handling, pad leaching, solution management, and metallurgical processes have been reviewed and found to be consistent with widely acceptable practices and accountability.

17.1 General Ore Processing and Gold Recovery

Ore is sourced from three general sources—Los Filos and Bermejal Open Pits and Los Filos Underground. Ore is currently classified as "high grade" (>0.5 g/t Au) or "low grade" (<0.5 g/t). There are also several ore types including oxides, intrusives, carbonates, alteration, and sulfides. Sulfide-rich gold-bearing material is not currently being processed for gold recovery, but is being stockpiled.

The high-grade ore is crushed to 80% minus 19 mm diameter, agglomerated with cement and lime, and transported by conveyors and CAT 785 haul trucks to PAD 2. The agglomerated ore is cyanide leached for gold extraction using conventional drip irrigation techniques. Low-grade ore is placed on separate sections of the leach pads as ROM following the addition of lime on each loaded haulage truck.

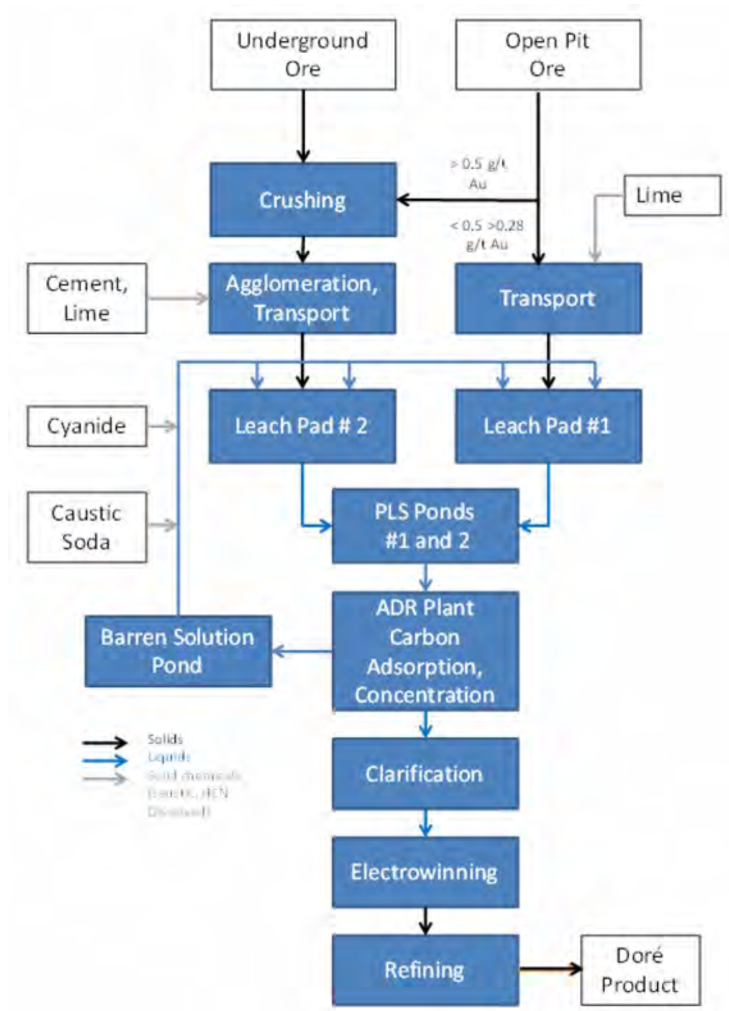
The gold-rich leachate is collected at the bottom of the geosynthetic lined leach pads and channeled to two separate PLS reservoirs. The leachate is pumped to the (ADR) plant where the gold is selectively concentrated on carbon in a series of columns in a conventional continuous process. The gold is subsequently stripped from the carbon in a batch process, is clarified and transferred to the refinery building. The gold along with a small percentage of the silver is electrochemically removed as a sludge from this solution. The sludge is dried and thermally refined in a furnace to produce a doré brick containing a high percentage of gold.

Barren solution (barren of gold), also known as “intermediate” solution at Los Filos, from the ADR plant is recharged with sodium cyanide, and the pH is raised with sodium hydroxide to become an effective leaching agent. This leaching solution is pumped back to the leach pads for distribution by a drip irrigation system at specified cyanide concentration on separate Crush and ROM ore pads.

17.2 Process Flowsheet

A simplified Los Filos processing flowsheet is shown in Figure 17-1. This represents the year end 2016 operating conditions; processing details have evolved since operations began in 2007. However, the basic design of the gold ore processing circuit remains that of the original plan, which was based on a heap-leach operation using multiple-lift, single-use leach pads.

Figure 17-1: Simplified Los Filos Processing Flowsheet



17.3 Ore Delivery and Crushing

The ore coming from the open pits is currently classified in three categories: SLG, ROM, and crush-leach ("Crush") ores as outlined in Table 17-1. All underground ores are Crush.

Table 17-1: Open Pit Cutoff Grade

Ore Source	Sulfide	Ore Type	Designation	Au (g/t)
Los Filos	<1%	Sub-low-grade	SLG	0.241 to 0.373
	<1%	Run-of-Mine	ROM	0.373 to 0.50
	<1%	Crush, leach ore	Crush	>0.50
Bermejal	<1%	Sub-low-grade	SLG	0.198 to 0.364
	<1%	Run-of-Mine	ROM	0.364 to 0.50
	<1%	Crush, leach ore	Crush	>0.50

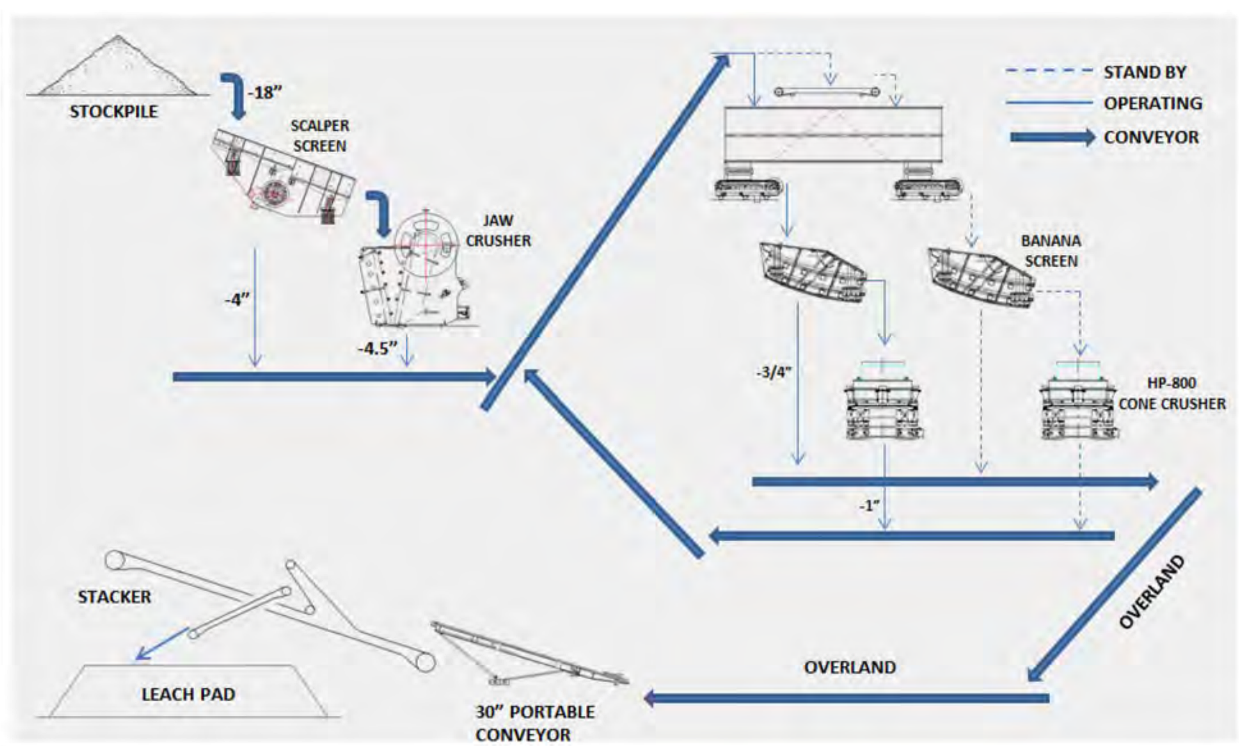
Source: Los Filos Mine, 2016

Low-grade ores (e.g., <0.5 g/t Au) as well as SLG ores are stacked as ROM on separate pads for leaching. Lime (quicklime) is added at a rate of 3 kg/t to each weighed ROM-loaded CAT 785 truck en route to the ROM leach pad.

All ores containing >0.5 g/t Au are crushed to 80% minus 19 mm, treated with lime and cement and transported by a combination of conveyors and trucks to designated Crush leach pads.

The Los Filos crushing flowsheet is shown in Figure 17-2.

Figure 17-2: Los Filos Mine Crushing Flowsheet



Source: Los Filos Mine, 2016

The crushing circuit has a maximum operating capacity of 1,500 t/h[1], but depending on ore supply, crusher feed size distribution and moisture content, the circuit normally operates at 800 t/h for 18 h/d (Los Filos Mine 2016).

Open pit ore is end-dumped from CAT 785 haulage trucks near the primary crusher without significant blending of open pit ore types. Underground ore is end-dumped in a separate nearby pile by 20 t capacity trucks and then rehandled from the stockpile outside the underground mine portals. Los Filos Open Pit ores are generally very fine and clay-rich, with surveys (SRK 2013) suggesting sizes of P80 (100 mm) and P50 (18 mm). Recent data collected by Los Filos indicates that ROM ore is 60% <25 mm.

The ore is delivered to the jaw crusher feeder hopper, which is equipped with a 400 mm grizzly and fed by a dedicated CAT 992 loader. Grizzly oversize material is broken down with a remotely operated stationary rock breaker on the grizzly or by a track-mounted rock breaker.

As shown in Figure 17-2, the crushing plant principal components are a JM 311 Sandvik jaw crusher, which is set at a 100 mm opening, and two Metso HP-800 cone crushers operating in parallel. A scalping screen with 100 mm openings precedes the jaw crusher. Crusher tonnage is measured by a weightometer on the No. 1 conveyor, which is calibrated monthly by Los Filos technicians and checked annually by an external expert. Ore moisture is measured in the assay laboratory by testing grab samples from the pit and channel samples from underground.

No dust collection equipment has been installed in the crusher facility. Instead, a dust suppression agent is used, which is moderately effective around the jaw crusher but ineffective around the Metso crushers and screens. Los Filos reported that dust collection would be considered in future capital expenditure plans.

Los Filos Mine has conducted studies involving the prescreening of ore before crushing (Goldcorp 2016). The results of these studies suggest a significant economic benefit from increased crushing capacity (more ROM material going to the crushing circuit, which results in higher gold recovery) and less process interruption from problems caused by “sticky” ore, particularly during the wet season.

17.4 Crush Ore Treatment and Transport to Leach Pads

The first stage of Crush ore transport to PAD 2 employs a series of conveyors, “grasshoppers,” and a radial stacker. The second stage of transport is by loader and CAT 785 haul trucks, which dump their loads at the pad for distribution on the pad with lower unit footprint weight loaders. Currently, agglomeration of Crush ore is attempted by adding 6 kg/t of cement and 1 kg/t of lime on the transport conveyors and adding moisture (cyanide leach) solution at 6 conveyor drop points, to increase crushed ore moisture from approximately 5%–7% up to 9%. However, success of the agglomeration method is

[1] Los Filos personnel provided information.

limited. As shown in Figure 17-3, fine fragments act like compressible soil and coarse fragments separate out in the pile.

Figure 17-3: Agglomerated Ore at Conveyor Drop Point

The crushed ore is sampled for assaying at a conveyor drop point using a two-stage automatic sampler that produces 6 bags of 25 kg/d of material, to be coned and quartered at the Mine laboratory. The operation of this sampler and subsequent sample handling at the Mine laboratory were reviewed and found to represent good sampling practice.

17.5 Leach Pad Operation

Leach pad operation has evolved over the years of operation. There are two large geosynthetic lined leach pads in operation, both of which have been divided in two sections: one for Crush ore and the other for ROM ore. However, ROM ore is currently stacked mainly on PAD 1 and Crush ore on PAD 2. PAD 2 covers an area of 240,000 m². To date, approximately 230 Mt of ore have been stacked on both pads. The current remaining capacity of the leach pads is about 60 Mt, which is sufficient for the LOM plan (Los Filos Mine, 2016).

The current leach pad operation is summarized in Table 17-2.

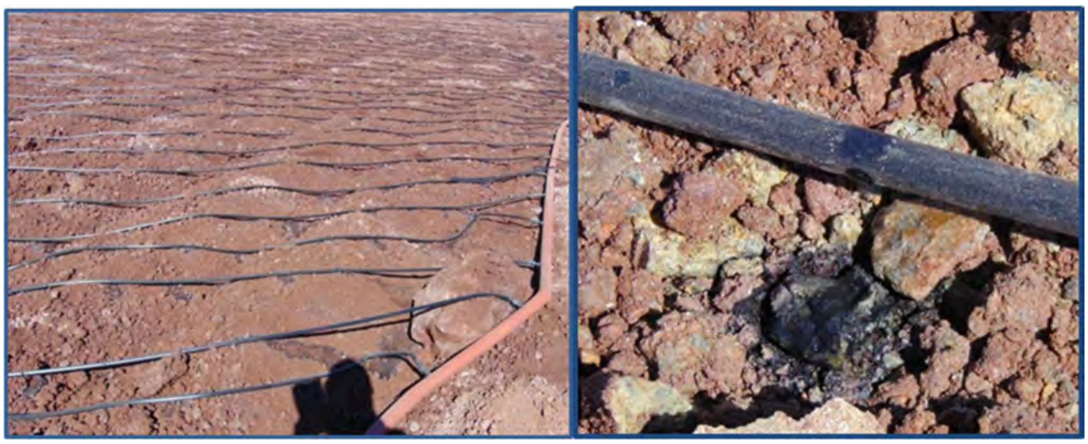
Table 17-2: Leach Pad Operation – Fourth Quarter 2016

Ore	Pad Thickness (m)	Irrigation Rate (L/m²/h)	Cyanide Concentration (mg/L)	Irrigation Time (d)	Rip During Leach Cycle
ROM	5	8–10	350	120	No
Crush	4	12	450	120	Yes

After 60 days, the drip pipes are removed on Crush pad and the pad lift is ripped to a depth of 3.5 m using a CAT D11 dozer. Drip pipes are reinstalled after ripping and leaching is continued for an additional 60 days.

Based on observations, the pad preparation and the installation of the drip irrigation system appear to have performed very well for both Crush and ROM ores. The pad surfaces were observed to be uniformly moist, and no solution ponding was noted. Drip pipes is uniformly spaced, all drip locations were operating, and no leaks were visible in any of the leach solution distribution piping. There is evidence of fine carbon returning from the ADR plant, shown in Figure 17-4. The carbon particle size is reported[2] to be very small at 15 nm, which is too fine to filter out. Los Filos estimates that the loss of this fine carbon represents as much as
450 g/mo Au.

Figure 17-4: Crush Irrigation System – General and Individual Drip Lines



The formation of scale along with the carbon deposits was observed at the drip locations and was likely a result of high calcium sulfate concentrations in the fresh leaching and barren solutions. Carbonate may also be present as bicarbonate and could be coprecipitating with gypsum as calcium carbonate. Los Filos is adding an anti-scaling agent (Zalta MA11) to prevent scaling in the ADR processes and the leach pad irrigation system.

Examples of solution inorganic analyses are shown in Table 17-3. These solution analyses indicate the following.

- Gypsum saturation ($CaSO_4.2HO$).
- Elevated nitrite and nitrate concentrations.
- Depressed pH in the PLS that would promote loss of cyanide as HCN.

[2] Reported by Los Filos management 22 December 2016.

Table 17-3: Solution Analyses, Nalco Assays, 22 February 2016

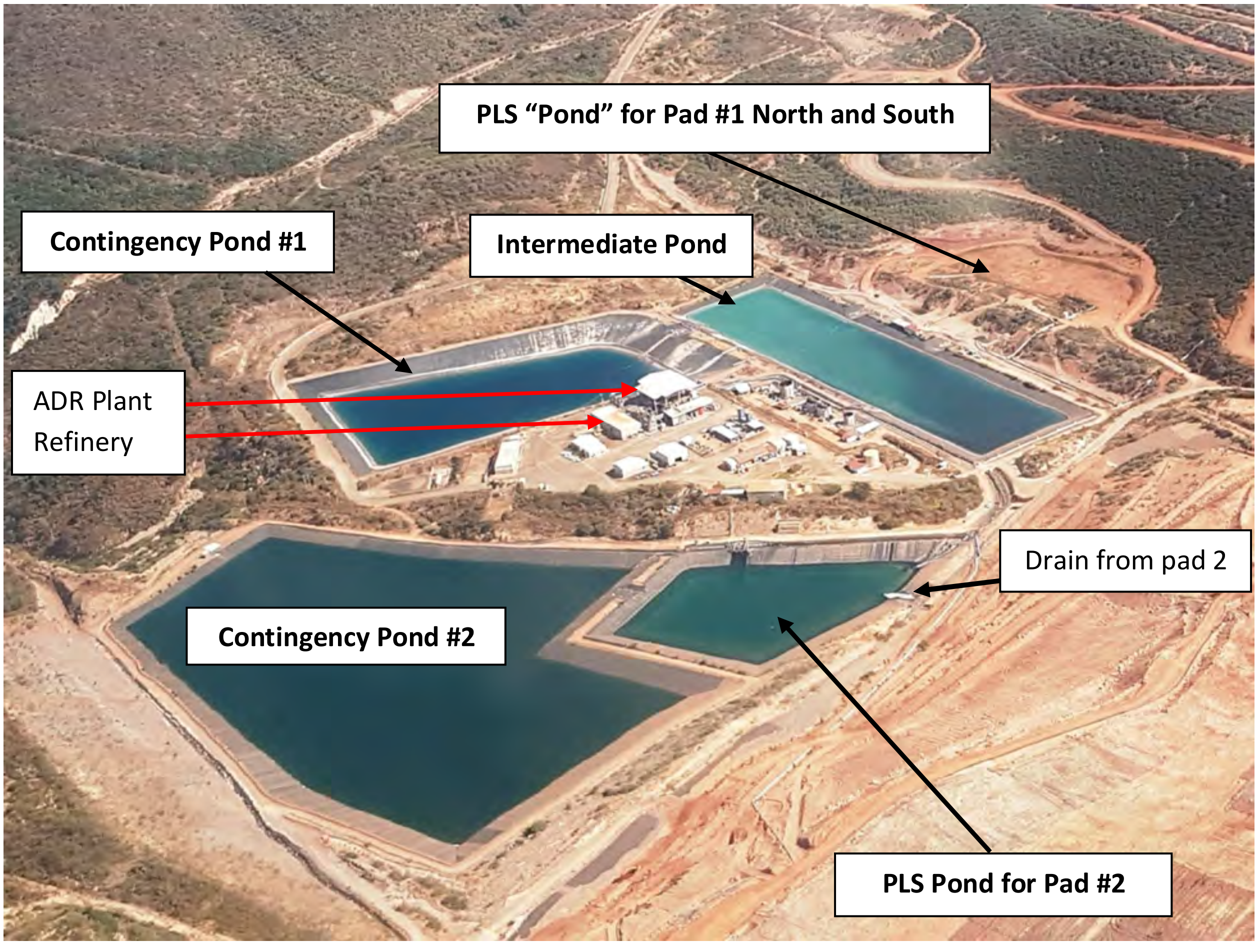
	PLS	Barren Solution	Sterile Solution	Fresh Water
	mg/L			
Calcium	630	540	570	200
Copper	2.6	2.9	2.8	<0.03
Lead	<0.10	<0.10	<0.10	<0.10
Magnesium	7.4	6.1	6.5	42.0
Potassium	19	18	18	5.6
Silicon	6.1	5.1	5.3	18
Sodium	790	690	870	41
Hardness (carbonate)	1,500	1,400	1,400	690
Chloride	110	110	110	22
Nitrite	460	450	470	<2.0
Nitrate	2,000	2,000	2,000	<2.0
Sulfate	1,200	1,200	1,200	590
pH	9.3	9.4	10.0	8.2
Free cyanide	2 to 3			
Weak Acid Dissociable CN	1 to 3			
Au	0.15			
anion:cation (w/o carbonate estimate)	1.05	1.21	1.05	0.90

Leachate (PLS) is collected from the leach pads in three locations: two from Pad #1 and one from Pad #2. No open launders are used.

17.6 Adsorption-Desorption-Recovery Plant

The ADR Plant is a conventional carbon-based recovery facility associated with a gold refinery that produces a gold-silver doré product (Figure 17-5).

Figure 17-5: ADR Plant and Associated Facilities



The adsorption component of the plant consists of 7 trains—5 trains of 4 columns each and 2 trains of 3 columns. The carbon in these columns removes the gold from the PLS by adsorption. Each carbon column is 15 m³ and contains about 6 t of carbon.

Total PLS flow to the 7 trains is approximately 6,100 m³/h per the control room data. The original design flow for each train was 835 m³/h; this is routinely exceeded without difficulty. A flow of 990 m³/h was observed in Train No. 4. Plant solution capacity is reported by Los Filos to now be 6,400 m³/h, adequate for current and immediate future requirements.

There are three carbon stripping circuits where gold is stripped from loaded carbon using a hot alkaline cyanide solution. The concentrated gold strip solution is cooled, clarified, and circulated through four electrowinning cells where the gold is removed into a sludge that is removed from the electrowinning cathodes by high-pressure water.

The refinery (gold room) is a secure facility that includes the electrowinning cells, a filter to dewater the metal-rich electrowinning sludge, a mercury retort, and electric induction furnaces that produce the gold-silver doré product. The mercury content of Los Filos ore is very low, resulting in only 0.02 ppm in the PLS. Approximately 0.5 L of mercury is produced per year. The 500–1,000 oz doré bars are stored in a vault in the refinery until they are transported off site by a security contractor to a refinery.

Los Filos management indicated that there are no significant bottlenecks in the ADR Plant. One exception is the capacity of the fine carbon filter. However, a second filter is planned be installed in 2017.

An important aspect of the ADR facilities is the management of large volumes of water and leaching solutions. As shown in Figure 17-5, there are 5 ponds with large volumes. The basic characteristics of these facilities are summarized in Table 17-4.

Solution sampling is performed automatically using simple drip-string methodology. A single control room controls and monitors the ADR plant, pond inventories, as well as reagent mixing and distribution.

Sodium cyanide is received daily as a solid in ISO containers and is dissolved out into storage tanks. The cyanide receiving and mixing facility is separate from the ADR and was observed to be clean and properly isolated by concrete berms and a base.

Los Filos is a member in good standing of the International Cyanide Management Code for the Manufacture, Transport, and Use of Cyanide In the Production of Gold (Cyanide Code). A detailed audit was conducted for recertification, and the renewal of this membership was confirmed on 19 December 2016.

The ADR Plant was observed to be running smoothly during the site visit.

Table 17-4: Los Filos ADR Pond / Reservoir Characteristics

Pond / Reservoir Name	Volume (m^3)	Estimated Fraction of Capacity (22 Dec 2016)	Comments
PLS 1	109,000	60%	PLS No. 1 is divided into 2 sections and is full of gravel.
PLS 2	147,000	80%	Level estimated from Control Room graphics.
Recirculation / Intermediate	170,000	70%	
Excess Water No. 1	455,000	40%	
Excess Water No. 2	980,000	70%	

17.6.1 Water and Solution Balance

A summary of the 2016 water balance for leaching and ADR operations is shown in Table 17-5.

Table 17-5: Los Filos Pad and ADR Water Balance

Component	Volume ('000 m³)	pH	Cyanide (mg/L)	Au (mg/L) (avg)	Contained Au (oz) (Calc'd)	Comment
Precipitation	3,500					1,004 mm recorded (Los Filos info: 1 mm = 3,500 m³)
Pad Evaporation	3,400					Assuming 6% of solution to pads (Los Filos info: 4%–6%)
To Pad #1	32,488	10.15	343	0.004		
To Pad #2	24,325	10.15	346			Normally 450 ppm cyanide
Total to Pads	56,814	10.15		0.004	7,300	
PLS–North Pad No. 1	11,714	9.04*	1.7			8.6–10.1 pH
PLS–South Pad No. 1	19,905	9.06*	1.9			8.6–10.0 pH
PLS Pad No. 2	24,976	9.59*	3.0			9.0–10.6 pH 56,654 total PLS
Feed to ADR Plant	56,929			0.133	237,411	
Barren Sol'n	56,929			0.00248	4,500	Au recovery in ADR plant 98.3%
Net Water	+160					Pond net (pptn, evap, inventory change) + fresh

* Note: pH is a logarithmic measurement; averaging may be misleading. However, pH less than 9.5 results in cyanide evolution as HCN and loss of leaching capability.

A summary analysis of water data indicates that water management meets appropriate operational requirements. It is, however, apparent from on-site observations that inventories in excess water ponds must be reduced to provide storage capacity for large precipitation events.

17.6.2 Adsorption-Desorption-Recovery Plant Performance and Consumables

Key ADR plant performance characteristics include the following.

- Average 156,000 m^3 PLS treated per day, total 56.93M m^3 in 2016.
- Free cyanide content of PLS is very low; cyanide is added to PLS before carbon adsorption to prevent copper crowding out gold on the carbon columns.
- Au recovery from PLS by carbon columns is 98.3% (average 650.44 oz/d Au).
- 12 t/m of fine carbon containing about 120 oz/mo Au are sold to Peñoles, which pays 94% of the gold value.
- A key issue is the high attrition loss of carbon. The current coconut carbon supplier is Calgon – Goldsorb 6/12. Testing is underway to find a replacement carbon that is less prone to attrition (e.g., Indocarb 1C55)

Year-to-date (2016) ore processing costs are $7.94/t of ore processed. A breakdown of important cost contributors are shown in Table 17-6, which represents November 2016. Cyanide costs in November exceeded half of overall processing costs.

Table 17-6: Processing Costs at Los Filos

Cost Element	November 2016	
	US$/t Processed	%
Contractors / Consultants	0.60	7.9
Electricity	0.44	5.8
Refractories	0.05	1.0
Cyanide	3.90	51.2
Lime	0.13	1.7
General Reagents	0.33	4.3
Cement	0.36	4.7
Maintenance	0.53	7.0
Technical Services	0.20	2.6
Other	1,07	14.1
Total	**7.61**	**100**

17.7 Laboratory

The Los Filos assay and process testing facilities are in the secure compound, which includes the ADR plant, ponds, and reagent mixing facilities (Figure 17-5). The laboratory had been subject to SGS support and oversight until 2014. In 2013, a Laboratory Information Management System (LIMS) was created and installed by Los Filos on site.

While the Los Filos laboratory is not certified under Mexican or international standards, procedures used at the laboratory generally meet acceptable criteria to achieve precision and accuracy. One potentially significant variation in the procedures that may affect assay results for some elements when assaying solid ore samples is the use of elevated drying temperatures (220 °C). Normally, appropriate sample drying temperatures are about 110°C, a temperature at which hydrated minerals would not dehydrate and shed weight, nor gain weight if oxidizable minerals are present. A lower temperature can be successfully adopted at Los Filos if the fresh sample weight is reduced by 10 kg or more. Sample size can be reduced by riffling or cone and quartering of samples as received.

About 300 solid samples are processed daily from the open pits and 80 samples from underground. A 300 g sample is cut from the 10 kg head sample using an automatic proportional sampler. The 300 g cut is finely ground in one of two puck-and-ring pulverisers. The fire assay routine includes the insertion of one duplicate, one blank, and one standard in a 24-sample matrix. Two certified standards are available: 5.0 +/- 0.2126 g/t Au for fire assay/ gravimetric assaying and 0.424 g/t Au for fire assay/AA assaying. Aqua regia is used to leach samples for silver and copper assay is done by AA. Analyses include gold, silver, and copper by AA. Cyanide analyses are performed by titration and colorimetric methods.

The assay laboratory is staffed with 21 persons and operates 24 h/d. In addition, the nearby metallurgical test laboratory is staffed with 3 persons who perform particle size analyses, bottle roll, and column leach testing.

Two sets of column leach apparatus are used: 350 mm diameter × 3 m H and 150 mm × 2 m H columns. The leach test procedures are designed to replicate field conditions (e.g., time [120 days], solution strength, and irrigation rates). The smaller columns are transparent, and air pockets were noted in the ore material in the columns.

The column leach test procedures have been adapted from procedures used at KCA in Reno, Nevada. Other than difficulties encountered with filling test columns with wet samples (KCA fills columns with dry material), all test and sampling procedures meet acceptable practice. The column cells results can be expected to represent, as close as possible, conditions in the pads in the field.

17.8 Recovery of Gold in Leach Pad Reserve

During the earlier years of Los Filos mine, the heap leach was not recovering gold at the anticipated levels. The accumulation of material that contained residual gold considered to be recoverable has resulted in a historic accumulated Leach Pad Reserve that is now actively being drawn down.

An active campaign led by the Hydro-Jex is currently underway to recover gold held in impermeable, incompletely leached material in Pad No. 1. Hydro-Jex injects leaching solution (450 ppm cyanide) at high pressure (1,200 kPa) into wells located in impermeable zones of Crush ore approximately 35 m apart. Hydrated lime is also injected. Leachate solution goes to the ADR plant for gold recovery.

The inventory has been the subject of investigations and recovery programs since 2015. During 2016, a total of 32,067 oz Au was recovered using a combination of drilling and reinjection of pressurized leach solution, rehandling of inventory, and surface re-leaching. Recovery of remaining historic accumulated gold from the Leach Pad Reserve is scheduled to occur over the next three to four years.

Leach Pad Reserve of ROM and crushed material placed for leach versus recovered gold was estimated by Los Filos mine site to be 242 koz Au recoverable (as of 31 December 2016). These gold ounces are considered to be the recoverable portion of the inventory.

17.9 Reagent Storage and Use

The current methods of reagent supply, storage, and distribution meet operational and safety requirements.

Lime and cement are delivered as dry material daily by truck-trailer transports that unload the truck-trailer contents by air activation into designated silos. Caustic soda and hydrochloric acid are delivered separately by tanker trucks specifically designed for these hazardous chemicals.

Sodium cyanide is also delivered daily by road transport. The cyanide is in solid pellet form securely contained in ISO containers. The solids are dissolved out by circulating fresh water through the ISO container and transferring the dissolved cyanide into dedicated storage and process distribution facilities. Los Filos is a member in good standing of the Cyanide Code. Membership is assigned only to those organizations using cyanide that meet strict codes of practice and safety. Los Filos is in the process of Cyanide Code recertification following a detailed on-site audit completed in December 2016.

Other chemicals such as dust suppressants and anti-scaling compounds are received in metal drums. Carbon is received in 1 t tote bags.

17.10 Power Requirements

Overall project power usage is discussed in Section 18.7. An emergency generator building close to the ADR Plant contains two 2.5 MVA CAT diesel generator sets (2,500 kVA, 16 cylinder, 13.8 kV output), which supply the ADR Plant with sufficient backup power for key pumps and the gold refinery furnaces.

18.0 PROJECT INFRASTRUCTURE

The Mine property infrastructure includes the open pit and underground mining operations, heap leach pads, and process, administrative, and maintenance facilities. Key current infrastructure includes the following.

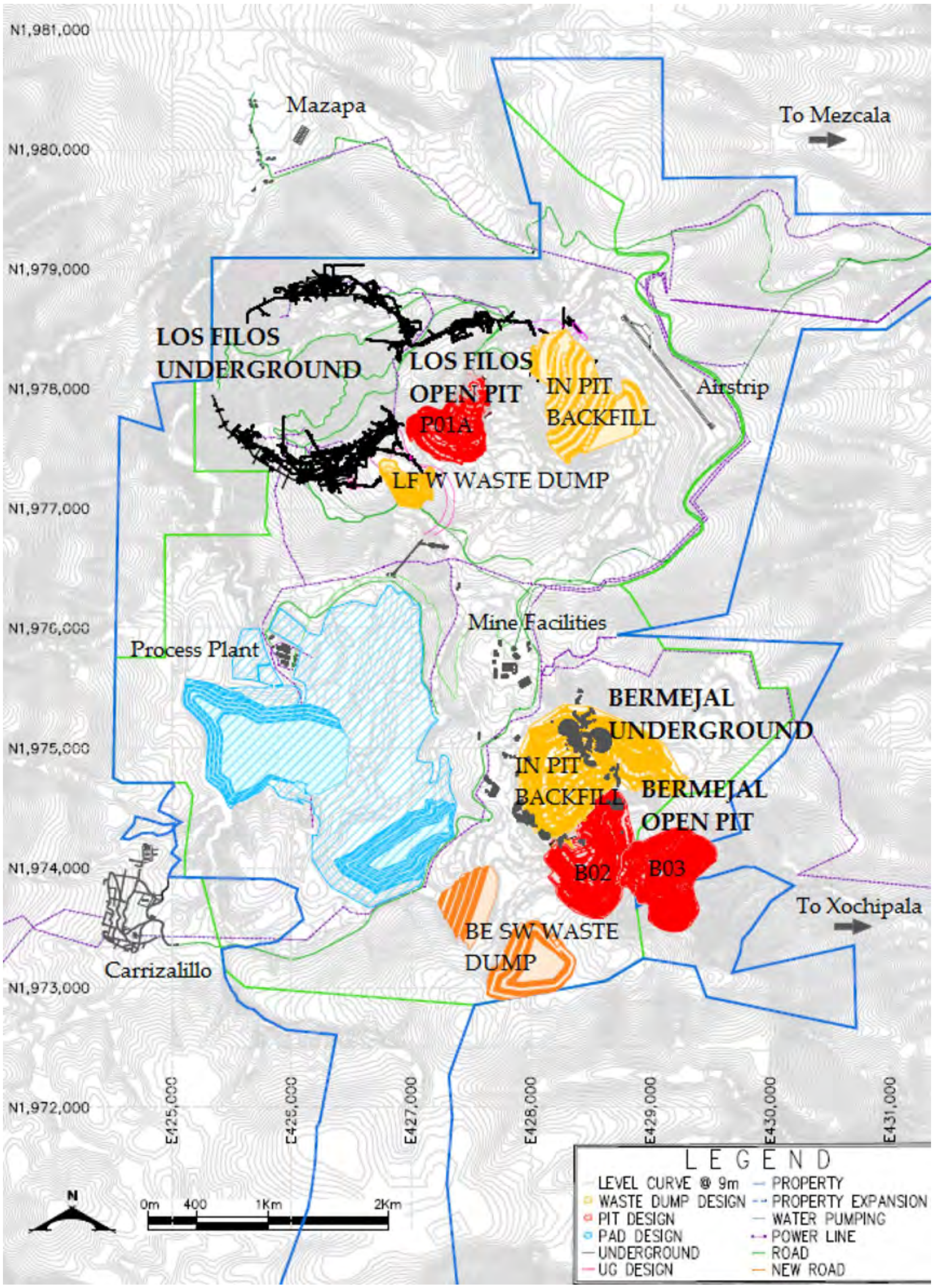
- Two open pits.
- Two underground mines.
- Waste rock dumps including in-pit waste dumps.
- Two heap leach pads, one ROM and one crushed ore, with associated conveyor systems and stackers.
- Primary crushing plant including one Sandvik Jawmaster jaw crusher, 18,000 t/d capacity.
- Secondary crushing plant including two Metso HP800 cone crushers.
- Lime silo.
- ADR Plant.
- Gold refinery.

Support facilities include the following.

- Main open pit truck shop.
- Underground equipment shop.
- Welding shop.
- Warehouse.
- Administrative office facilities.
- Underground mine dry (change house).
- Underground offices (on surface).
- Underground mine compressors (three 250 hp Atlas Copco).
- Residential camp with dining hall and exercise facilities.
- Core logging and storage facilities.
- Site metallurgical laboratory.
- Fire assay and AA assay laboratory.
- Power substation.
- Water pumping facilities.
- Access roads.
- Airstrip (1,200 m paved).
- Explosive storage facilities.
- Fuel storage facilities.
- Personnel training facilities.
- Environmental monitoring facilities.

A Los Filos mine layout plan is included as Figure 18-1.

Figure 18-1: Mine Property Layout Plan



18.1 Road and Logistics

General access to the Mine property by ground is via Federal Highway 95 approximately 245 km south-southwest from Mexico City International Airport to Mezcala (4 hours driving time), and from Mezcala via a 13 km Mine-maintained paved road to the Mine site (0.5 hours).

Los Filos mine maintains a modern 1,200 m paved private airstrip on the site. General air access to the Los Filos mine is via the Cuernavaca Airport, which is a 25 min flight to the Los Filos mine. Cuernavaca is located 95 km south of the Mexico City International Airport via Highway 95 (1.5 hours).

Supplies not available locally are typically trucked to site from major population and industrial centers, such as Mexico City, Cuernavaca, and Toluca, or from port cities, such as Acapulco via Highway 95.

18.2 Waste Rock Facilities

There are five waste rock facilities (WRFs), of which one remains currently in use for disposal of waste rock from the open pits. There are three WRFs at the Los Filos Open Pit (identified as Los Filos WRF East, North, and West) and two WRFs at the Bermejal Open Pit (identified as Bermejal WRF Northeast and Southwest). The facilities are shown in Figure 18-2.

Figure 18-2: Waste Rock Facilities Map

Source: Desarrollos Mineros San Luis, S.A. de C.V., 2016.

Waste rock is also placed as backfill in the open pits. The majority of waste rock generated from underground operations is used as backfill in the cut-and-fill stopes. The remainder of the waste rock from the underground operations is placed in small waste rock dumps near the adit openings and may eventually be used as backfill in the underground workings.

A geotechnical evaluation of the WRF designs was performed to analyze the design stability (Call & Nicolas, Inc. 2011). The study concluded that the designs were adequate for stable slopes, satisfying criteria for static and pseudostatic (earthquake-loading scenario) conditions. The WRF design consists of 2.5H:1V (20.8°) overall dump slope angles with 30–50 m high benches, 25–30 m wide catch benches, and bench faces at 1.5H:1V (33.7°). The study recommended a maximum bench height of 40 m.

Los Filos Underground mining operations are currently scheduled to continue until 2023 and open pit operations are scheduled to continue until 2024, based on the current mine plan. The average production rate for the remaining LOM will be 15 Mt/a. Approximately 115 Mt of waste will be mined from the open pit sources from the remaining LOM. The current facilities have a combined waste storage capacity of 216 Mt, of which 131 Mt are available on the Bermejal in-pit backfill, 63 Mt on the Los Filos in-pit backfill, and 22 Mt on the Los Filos WRF West. The current infrastructure is sufficient to support mining operations under the LOM plan.

A total of 365 Mt of waste rock has already been placed on existing WRFs that are adjacent to the open pits.

The geochemical characteristics of the waste rock lithologies and environmental considerations are discussed in Section 20.0.

18.3 Landfill Waste

Until 2012, all landfill waste was disposed of in the Mezcala landfill facility. In 2013, Los Filos received authorization from the local municipality to construct a landfill with a 43,365 m^2 surface area. Los Filos subsequently constructed the landfill facility on site for combined Los Filos and municipal disposal of “type D” urban solid wastes. The landfill was included in an MIA submitted for site expansion, which was approved in 2012 for 13 years of operation (2012–2025). The landfill is designated “Los Filos-Carrizalillo,” since it is used by the Los Filos mine and the community of Carrizalillo.

The landfill has an HDPE geomembrane liner and a leachate collection system. Wastes are compacted and a soil cover is placed over the wastes at least weekly. Collected leachate is captured in a vault and pumped to the area of waste disposal, where the leachate is placed on the waste or evaporated.

Designated wastes are separated for recycling and reuse. The design life of the landfill is now calculated to have an operating life of 20 years.

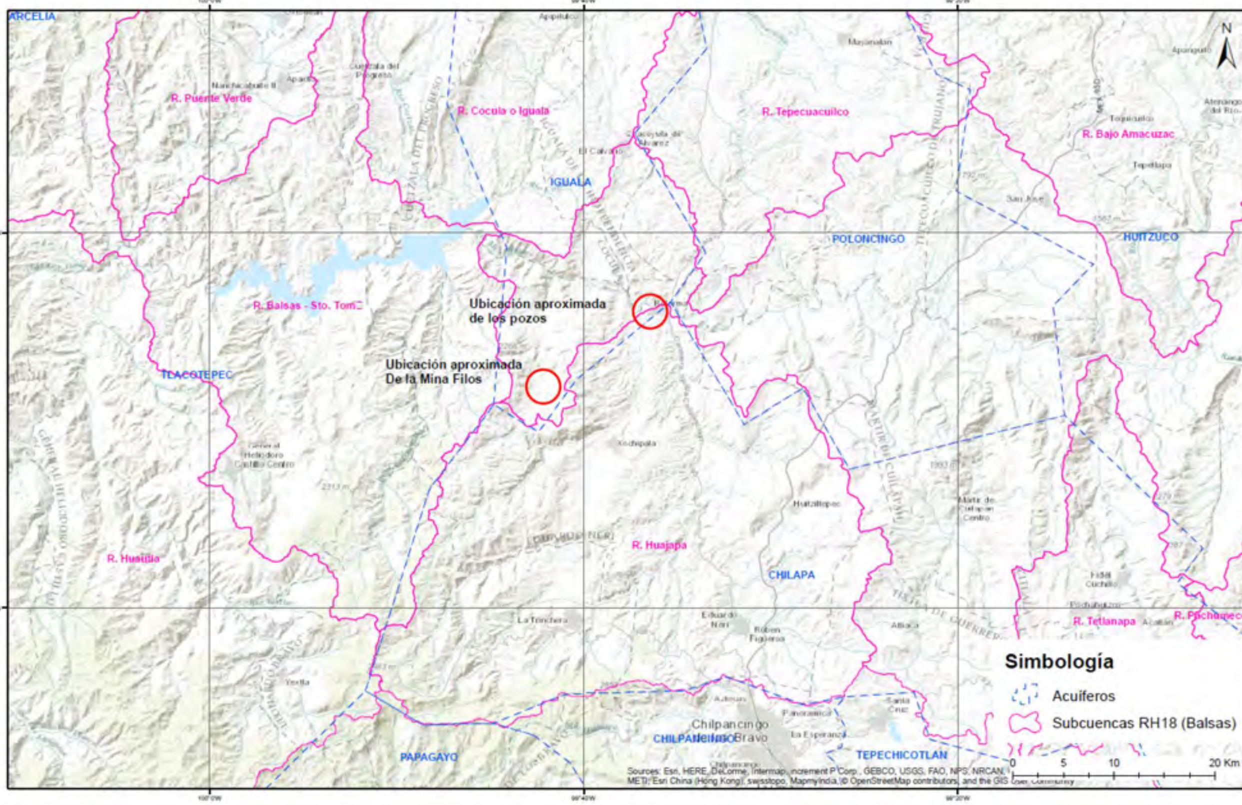
18.4 Water Management

Local water resources were described in the Waste Rock Management Plan (Desarrollos Mineros San Luis, 2016), which provided the primary hydrologic background information. This section of the Report describes the surface water and groundwater conditions, as well as the site-wide water balance. Information on the water supply and water quality monitoring are provided in other sections of this Report.

18.4.1 Surface Water Conditions

CONAGUA is the technical arm of the national environmental agency (SEMARNAT) that is responsible for oversight of the water resources of Mexico. CONAGUA has structured the surface water resources into 13 administrative hydrological regions. The Mine area is in the CONAGUA-designated Hydrologic Region 18 in the Rio Balsas basin and middle Balsas subregion (Figure 18-3). The Rio Balsas basin covers 22.66% of the total area of the state. According to the Chilpancingo Charter of Surface Water, the Mine area lies within Basin B, watershed A2129 (2,129 km^2) and watershed D1336 (1,336 km^2).

Figure 18-3: Locations of Regional Hydrologic Basins and Aquifers Designated by CONAGUA

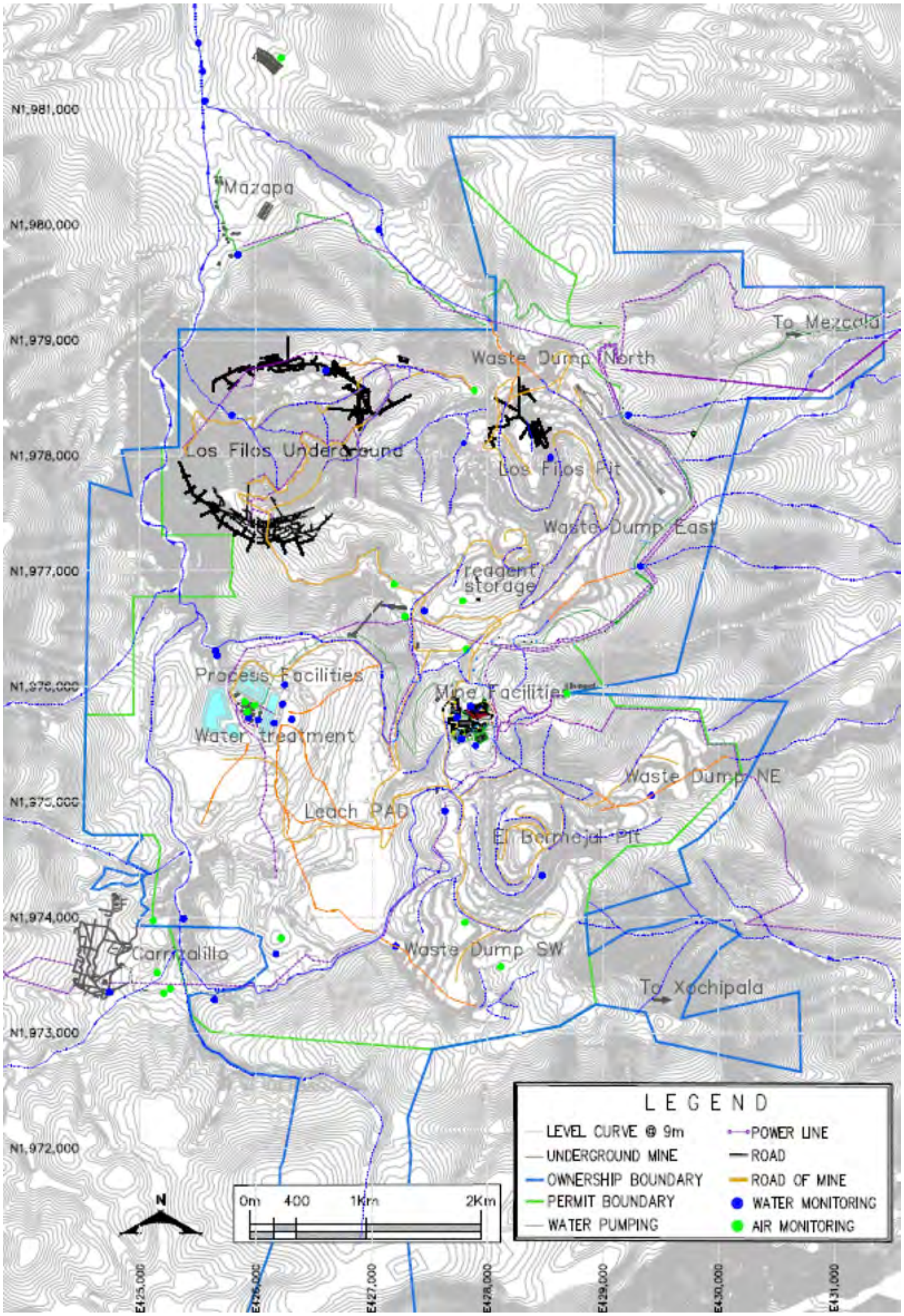


Source: Los Filos, 2017.

The Rio Balsas is the only perennial surface water course in the vicinity of the Mine site and is located approximately 4 km from the northern boundary of the Los Filos mine. The Rio Balsas drains an area of 46,530 km² to Mezcala station, located in the town of Mezcala. The most important tributaries in the area are the Xochipala and the Mazapa rivers, both of which join the Rio Balsas on its southern margin.

Los Filos operations are located within a small watershed, approximately 60 km², bounded by the Los Filos watershed to the east, the La Lagunilla hill to the north, the Azul and El Ocotal hills to the west, and the El Cedral hill to the southeast. Within this watershed, the main course is the shallow Carrizalillo river whose head is located 1–2 km south of the town of Carrizalillo and flows northward to become the Mazapa river. The surface water runoff from the northern and western areas of the Mine site flow to this watershed. Figure 18-4 shows the surface water flow directions and water monitoring points.

Figure 18-4: Surface Water Flow Directions and Water Quality Monitoring Locations



Source: Los Filos, 2016.

Water from the Mazapa river is mainly used for livestock consumption.

Surface runoff from the WRFs located east of Los Filos Open Pit drain into Cuautepetl Canyon, which is located about 8 km east by Xochipala river. The Xochipala river flows intermittently toward the north and is a tributary to the Rio Balsas. This stream remains dry throughout the year and even during the rainy season, except for during storm events.

A small area in the northern section of the Mine property drains into Tepegolol Canyon, which leads directly to the Rio Balsas, located about 3 km downstream of the town of Mezcala. Surface flows from Tepegolol Canyon are intermittent and only flow during severe storm events.

18.4.2 Groundwater Conditions

CONAGUA has designated 653 “aquifers” as part of the groundwater resources management system. CONAGUA is responsible for defining each aquifer and for estimating the water availability in the system. Los Filos is located in the southern tip of the Iguala Aquifer, which covers a surface area of 2,356 km^2 (Figure 18-3).

The information published by CONAGUA on the Iguala Aquifer (CONAGUA, 2015) describes the aquifer as occurring as recharge from the river and that there is no hydrogeological continuity between aquifers, although small aquifers occur in alluvial deposits and sandy conglomerates. Springs occur related to partial discharge from limestone units of the regional aquifer and along structural controls such as faults. The region is considered to have an unconfined aquifer related to the water stored in the sediments and rock units beneath the river and also an aquifer related to the water stored in fractures and as secondary porosity in the rock units. It is inferred that the phreatic surface is directly related to recharge from the river. CONAGUA has calculated that the aquifer has available water for new water concessions at a volume of 13,732,928 m^3 annually.

The phreatic surface of groundwater is reported to be deeper than the final depth of the open pits and current underground operations. No water elevation data in the area was available in the CONAGUA report.

In one area of the Los Filos Open Pit there is groundwater seepage occurring. The water is temporarily diverted and contained in a retention pond and then pumped out of the pit and allowed to flow as surface water runoff. The presence of excess groundwater can require specific management of the explosives. It is understood that the surface water infiltrates rapidly enough that operations are not halted due to excess water except during strong storms, when there is excess water in the underground workings from seepage and in the open pit from surface water runoff and precipitation. Dewatering is not required for the current Los Filos Underground mine operations and is not planned. No information was available regarding the water flow rates into the Los Filos mine.

According to site personnel, groundwater was not encountered in any of the exploration boreholes, which were drilled to depths of about 300 m in the pit areas, with some holes going even deeper. Limestone is the dominant rock type in the area. In many areas where the rock is exposed, it appears to be highly fractured with vugs and dry solution cavities reported in some drill logs. These features were also observed at the surface in some locations. The reverse circulation drilling logs indicate that the entire section of limestone encountered during exploration drilling was very dry, and only very limited water was encountered within the intrusive rocks. Los Filos geologists working at the site have observed that the limestone and skarn are both very dry, and within the underground workings there is only seepage from precipitation infiltration or drill water.

From a regional perspective, groundwater likely discharges to Rio Mezcala (Balsas), which flows to the north of the Mine property. Based on the regional topographic maps, it appears that most of the Mine area drains to the gully (arroyo) that passes adjacent to the Mazapa village (hereinafter referred to as Mazapa Wash). Mazapa Wash enters Rio Mezcala about 10 km west of the town of Mezcala. The remainder of the Mine property appears to drain eastward toward a large ephemeral stream that is tributary to Rio Mezcala. Recharge probably occurs as infiltration during the rainy season, which lasts from June through September. A formal hydrogeologic study has not been conducted, although a future review of hydrogeologic conditions is planned. The details of the future study have not been finalized (SRK Consulting 2016).

The water level data in Mazapa Wash, although limited, are useful in developing a preliminary conceptual model of the flow system. The alluvium that is visible in the wash is very coarse grained and presumably has a very high permeability. In the vicinity of Mazapa the topography is flatter than elsewhere, suggesting a relatively alluvial deposit in the area. Downstream of the village, the wash narrows and eventually enters a canyon before it is discharged to the river, which is at an elevation of slightly below 500 masl at the confluence. The approximate elevation of the water table at the well is 884 masl, based on a 2 m topographical map developed by the Mine. The wash appears to enter a relatively steep canyon about 1 km downstream of the well. The fact that the alluvium of Mazapa Wash continues to provide water near the end of the dry season suggests that it is collecting water from the underlying bedrock and routing it to the river through the alluvium (or in fractured bedrock below the alluvium).

From the observations in Mazapa Wash, one can infer that groundwater that accumulates in the bedrock is discharged to alluvium-filled streams. These ‘drains’ control the elevation of water in the bedrock. It is likely that structures (e.g., faults, fracture zones, solution channels) also collect water from bedrock and direct it to locations where these features cross the surface washes, thus providing a network of drains that control water levels within the bedrock.

Natural springs occur where the heap leach Pad Nos. 1 and 2 were constructed. The heap leach was designed with a subsurface underdrain system to dewater beneath the heap leach Pad Nos. 1 and 2. Both pads have their own subdrains, and both systems convey water via pipelines to outlets at a concrete-lined vault in Cañada 23. The vault has a separate outlet that conveys water to the arroyo.

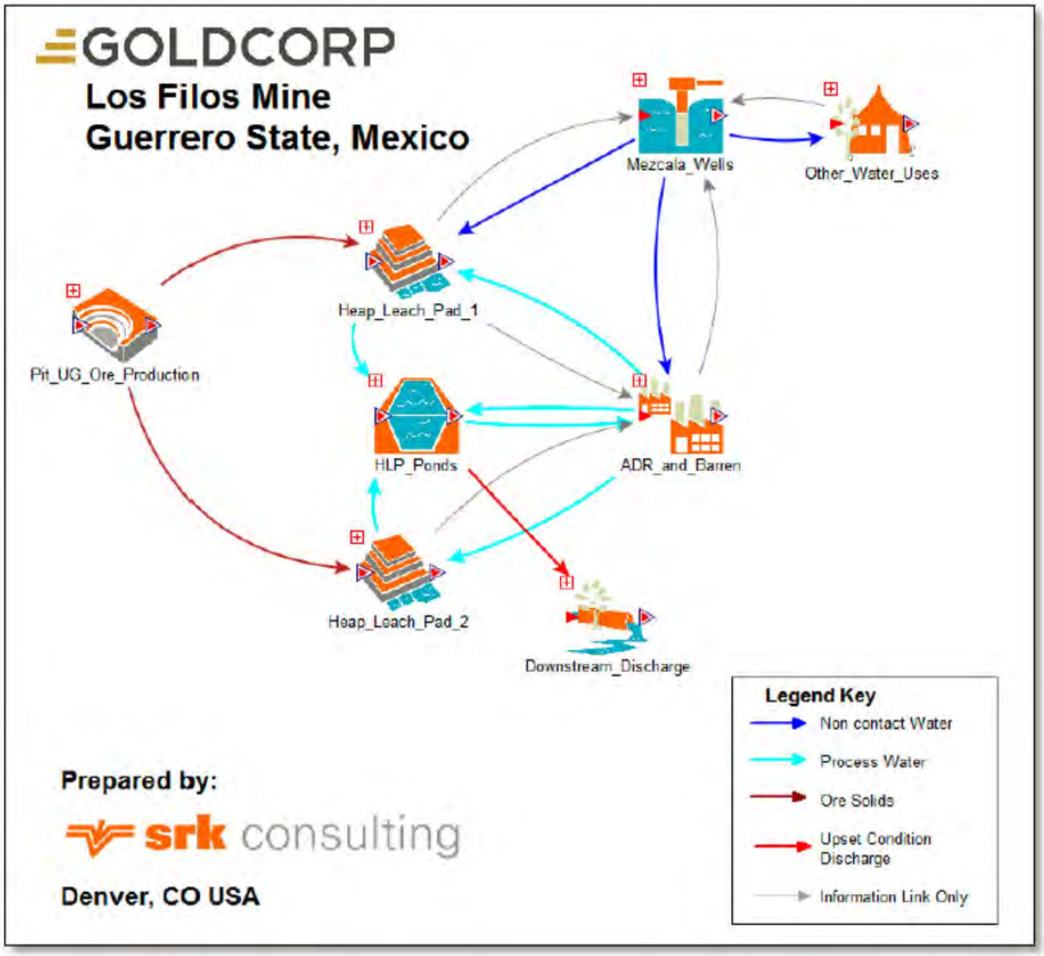
PAD 1 has a second system that conveys water back onto PAD 1. The PAD 1 subdrain system has a sampling port at the toe of the installation to allow for water quality monitoring. The PAD 2 subdrain system water quality is sampled at the concrete-lined vault.

Volumes of water pumped to PAD 1 and to the vault in Cañada 23 are metered.

18.4.3 Site Water Balance

The main water management components at the Mine site are fresh makeup water from the intake system adjacent to the Rio Balsas, fresh water used for dust suppression reused impacted water, water use in the process and pit operations, and permitted discharges of diverted clean storm water and treated sanitary waste water. A simplified site-wide water balance flowsheet is presented in Figure 18-5.

Figure 18-5: Site Water Balance

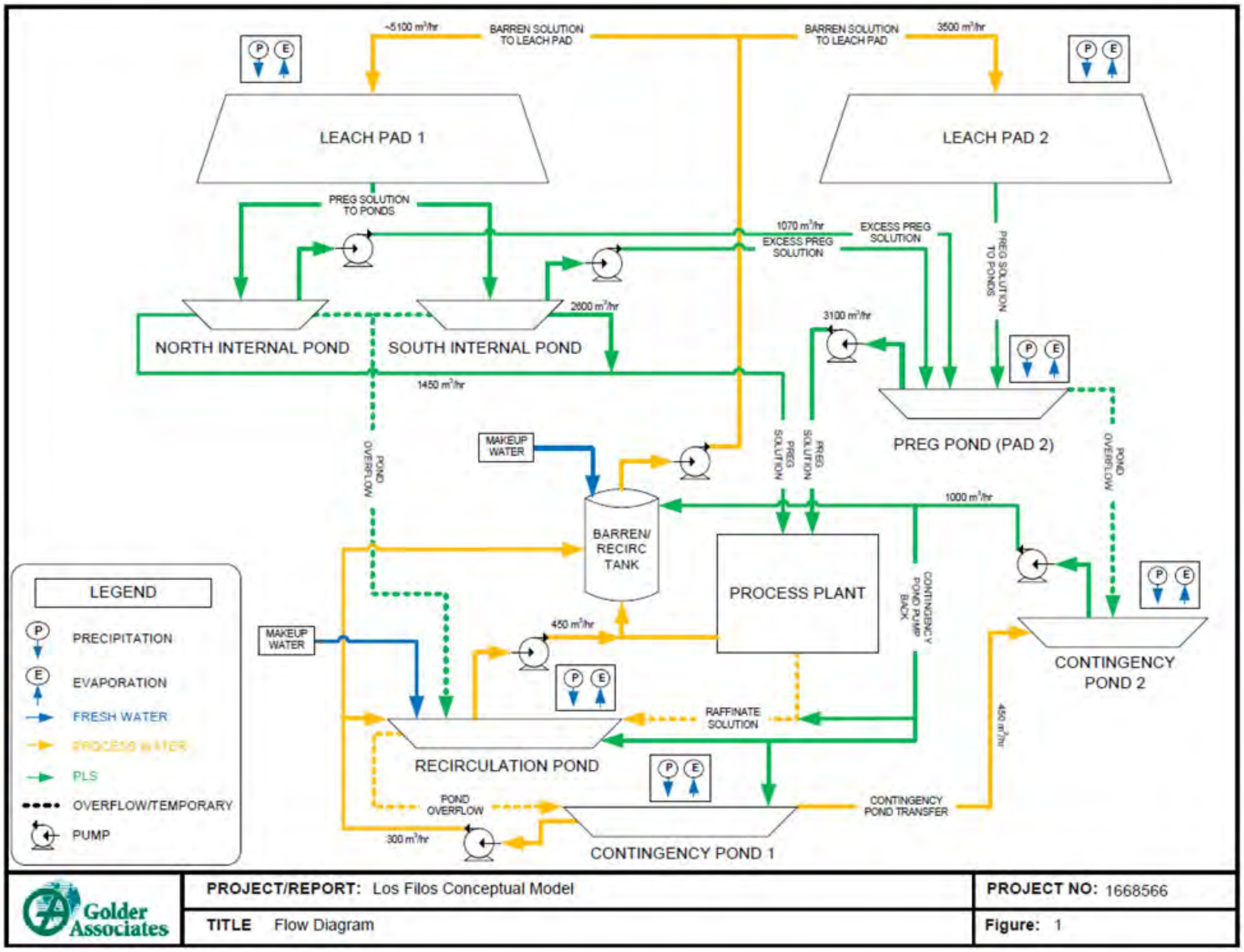


Source: SRK, 2016.

Fresh water pumped to the site is conveyed to a storage tank for redistribution to different parts of the operations. Fresh water at the ADR Plant is transferred to the cyanide mixing tank (T-100). Cyanide is delivered as a solid in the ISO containers on a truck and is dissolved with fresh water. The cyanide solution is then transferred to a storage tank (T-200). The cyanide in solution is subsequently added to the barren solution and pumped to the heap leach pads. Pregnant solution is recovered at 2 gravel-filled ponds at the toe of Pad #1 and the PLS pond associated with Pad #2, and then pumped to the ADR

Plant. Barren solution is returned to the barren and recirculation tanks. The water balance flow diagram at the ADR Plant is presented in Figure 18-6.

Figure 18-6: Flow Diagram



Source: Golder Associates, 2017.

There are three process ponds at the ADR Plant (PAD 1 has 2 gravel-filled pregnant solution ponds and PAD 2 has one pregnant solution pond), a recirculation pond and two contingency ponds (Contingency Pond 1 and Contingency Pond 2). There is a cyanide neutralization unit next to the recirculation pond that can be used in case of overflow from the recirculation pond to Contingency Pond 1. The recirculation pond has a spillway to Contingency Pond 1 in case of overflow. The freeboard in the Contingency Pond 1 is 2 m. The pond configuration is shown in Figure 17-5.

Recovered impacted water from ADR Plant operations, such as impacted rainwater and water used for cleaning, is conveyed to the recirculation pond. Neutralized solution may also be conveyed to the recirculation pond.

Stormwater is conveyed around the ADR Plant via concrete-lined channels and discharged to Cañada 23, which is a natural drainage. Runoff from natural areas around the process area and from the WRFs is diverted to natural arroyos and discharged off site as stormwater that meets permissible limits for surface water. Shallow groundwater from springs beneath the heap leach pads is conveyed by the underdrain system to a small concrete-lined catchment with a mesh cover, and is discharged to Cañada 23 (also known as Arroyo Carrizallilo). The catchment discharge point is also a monitoring point to ensure that surface water discharge permissible limits are met.

Los Filos has developed a probabilistic water balance model as an Excel spreadsheet. Use of the model is described in two written procedures. The model includes the heap leach pads, the ADR Plant, and the process ponds (north pregnant, south pregnant, Pad #2 PLS pond, recirculation, and contingency). The model allows the user to include only the pad areas where ore is loaded, and to exclude the lined but unused pad areas where runoff is temporarily diverted (Golder Associates, Los Filos Detailed Audit Report, 2014). The model has been updated to include all current ponds and facilities (Golder Associates 2017).

Solution application rates are back-calculated from actual pumping rates. Precipitation and evaporation data from the on-site meteorological station are used as input data. Seepage losses are not considered, but this is a conservative assumption with respect to pond overtopping. However, seepage returned to the excess pond from the small concrete structure in Arroyo Carrizallilo is considered in the model. Run-on from natural areas uphill from the pad is not included because all such areas are diverted. Freezing and thawing are inapplicable for the climate in central Mexico. Potential power outages can be considered by zeroing out the pumping rates. Los Filos has a treatment system that is used when solution transfers from the recirculation pond to Contingency Pond 1; it is not used for discharge of treated solution to surface water and therefore is not included in the model as a loss to the system. Los Filos has evaporation machines at the recirculation pond and Contingency Pond 1 that are included in the water balance.

The model is probabilistic in that it can evaluate scenarios or single large storms (e.g., the 100-year, 24-hour event of 135 mm), wet periods, and power outages. The model data has not been updated based on a shorter frequency, more intense storm, such as a 500-year, 1-hour event. It is recommended that Los Filos evaluate both scenarios and use the larger volume in the water balance.

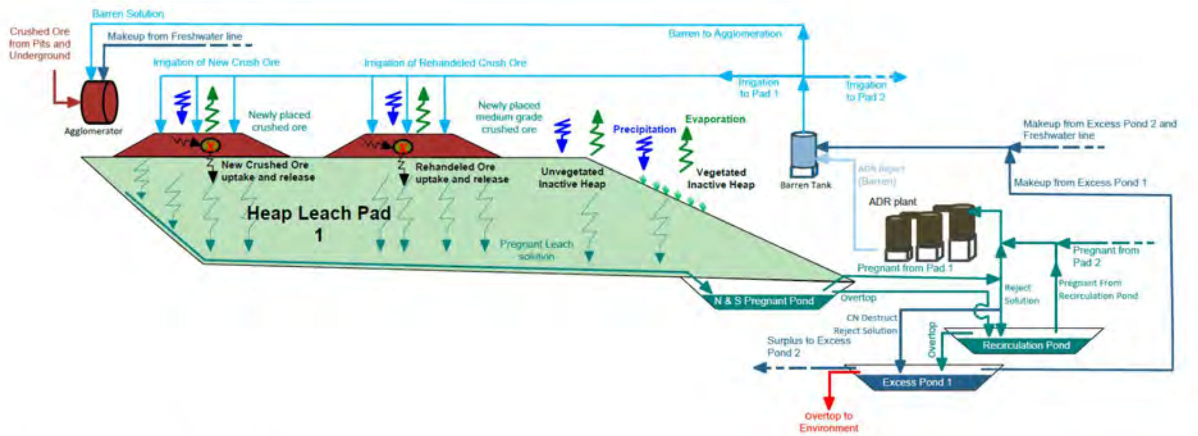
The contingency procedure of the excess water pond covers failure of the neutralization system and measure to avoid or manage overtopping. The emergency response plan for the Mine contains procedures for other traffic, exposure, stability, earthquake, and spill scenarios.

Los Filos has implemented measures to protect groundwater at the facilities that manage and use cyanide. The heap leach pads have a composite liner system consisting of a primary geomembrane of 60 mil HDPE, geonet and secondary geomembrane of 60 mil HDPE placed on a secondary clay or clay-rich soil liner above prepared and compacted subgrade, with an underdrain system of perforated pipe for leak detection and piping to convey water from natural springs. The pregnant solution ponds north and south are gravel filled, with a double-lined leak-detection system. The recirculation pond is double-line with a leak detection system. The spillway between the recirculation pond and Contingency Pond 1 is geomembrane lined. The contingency ponds are single-lined with a geomembrane liner. The ADR plant, including the cyanide offload, is constructed with a concrete pad underlain by 60 mil HDPE liner that is connected to a lined perimeter channel that discharges to the recirculation pond.

18.4.4 Pond Storage

A more detailed schematic of the water movement between the heap leap pads and ponds is shown below in Figure 18-7. The water levels in the ponds are monitored and managed to prevent overflow to the environment.

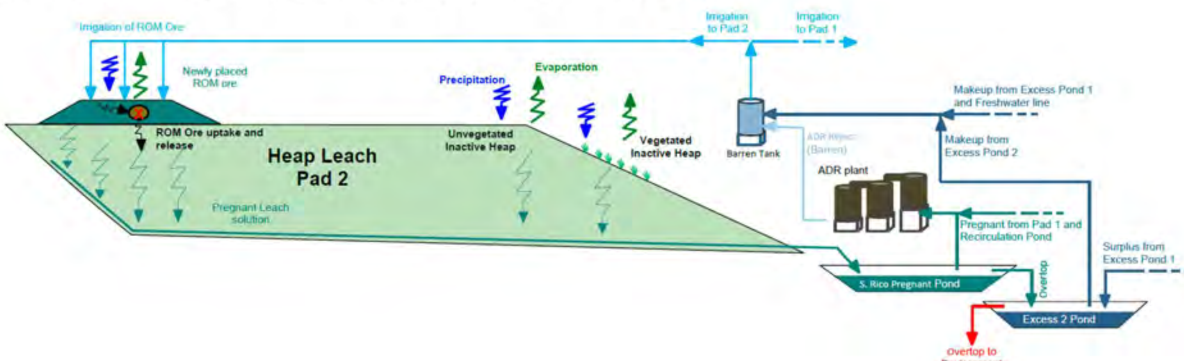
Figure 18-7: Schematic of Heap Leach Pad #1 and Ponds



Source: SRK Consulting, 2016.

A similar configuration exists at the heap leach Pad #2 (Figure 18-8).

Figure 18-8: Schematic of Heap Leach Pad #2 and Ponds



Source: SRK Consulting, 2016.

Los Filos monitors the daily values of water pumping to and from the ADR plant as well as the irrigation areas and pond water levels and volumes. The pond capacities are listed in Table 18-1.

Table 18-1: Volume Capacity of Ponds at Adsorption-Desorption-Recovery Plant

Pond Identifier	Capacity (m^3)	Year Constructed	Pumping Capacity (hp)
Pad #1 Pregnant Solution Ponds – North and South	109,000	Unknown	1 pump at 200 2 pumps at 400 1 pump at 600
Recirculation	170,000	Unknown	none
Contingency Pond 1	455,000	Unknown	none
Contingency Pond 2	980,000	2014	2 pumps at 750
Pad #2 Pregnant Leach Solution Pond	147,000	2014	none

Source: Marsh, 2016.

The water balance model was updated in January 2017 (Pepe, J. for Golder Associates, 2017). The simulations were based on the 24-hour, 100-year storm event. Precipitation and evaporation were simulated in the model through a combination of historic data and generated data. Daily flows and climate conditions were simulated and calibrated by iterating between model runs and historic pond volumes. Models were run assuming forced evaporation and no forced evaporation. The model results showed a 100% chance of overflowin all ponds in 2017 based on a 150 mm storm with no forced evaporation and a 95% chance with full-time use of the two fogger units at the spillway of the recirculation pond. These results indicate a reasonable probability of overflow based on the current operational plan. It is recommended that the water management practices be revised so that the ponds have sufficient capacity for the next rainy season.

A new model for site-wide water balance and future closure planning is in preparation (SRK Consulting 2016).

18.5 Camps and Accommodation

A modern camp for housing Mine employees/contractors/visitors is located 9.5 km from the Los Filos mine and 2.5 km west of Mezcala. The Mine camp is currently able to accommodate 294 persons and is comprised of a mixture of four 2-story hotel-style buildings housing 48 persons each, one 2-story building housing 10 persons, and twenty-two 3-room houses housing about 120 persons. The camp is furnished with dining and laundry facilities, visitor offices, meeting rooms, indoor gymnasium, outdoor soccer field, and tennis and basketball courts.

18.6 Workforce

The current number of personnel at the Mine is 1,429 employees (Table 18-2). Administration and supervisory roles are filled by non-union personnel. Other roles, including maintenance, operators and mill personnel, are filled with contractors or union personnel. The underground and open pit operations personnel work on 2 shifts, and the ADR Plant operates with two shifts.

Table 18-2: Personnel Summary

Personnel Type	No. of Personnel
Non-Union Personnel – OP	187
Non-Union Personnel – UG	43
Total Non-Union Personnel	**230**
Union Personnel – OP	392
Union Personnel – UG	172
Total Union Personnel	**564**
Contractors – OP	392
Contractor – UG	243
Total Contractors	**635**
Total Personnel at Los Filos	**1,429**

18.7 Power and Electrical

Power is currently supplied under a self-supply agreement from a subsidiary of InterGen from a combined cycle natural gas-fired power station located in San Luis de Paz, Guanajuato State. A power transport agreement with the government utility service, Comision Federal de Electricidad (CFE), provides back-up supply and transfers power from InterGen's power plant to the Mine's power substation. Power is delivered at 115 kV from the Mezcala main substation located 8 km from site to the Los Filos 20 MVA (2-10MVA GE transformers) substation, which is designed to have capacity for an additional 6 MVA for future Mine expansions. Current power consumption is about 14 MW/a, or about 70% of the existing power capacity.

An emergency power plant was constructed during 2008 to provide back-up power for the leach-solution pumps and the gold refinery. The generators are housed within the ADR Plant; there are two redundant CAT diesel generator plants (2,500 kVA, 16 cylinder, 13.8 kV output) installed. There is a concrete foundation for a third unit if necessary.

Details of the other various diesel generators used for emergency loads at the site are provided in Table 18-3.

Table 18-3: Backup Diesel Generators

Name	Size, MW	Year	Make and Model	Load
G1	1.275 (1,593 kVA)	2006	CAT 3516 Generator SR4B	Various mill loads
G2	1.275	2006	CAT 3516 Generator SR4B	Various mill loads
G3	2.0 (2.5 MVA)	2006	CAT 3516 Generator SR4B	Various mill loads
G10 (5819)	1.75	2010	CAT 3516 Generator SR5	Tailings and thickener
G20 (5818)	2.0	2010	CAT 3516 Generator SR5	Pump house, camp, and administration
G1 Esker	1.825	2012	CAT	Main underground ventilation
G2 Esker	1.825	2012	CAT	Main underground ventilation
G3 Esker	1.825	2012	CAT	Main underground ventilation

Name	Size, MW	Year	Make and Model	Load
G4 Esker	1.825	2012	CAT	Main underground ventilation

18.8 Fuel Supply

Fuel and gasoline are trucked to site from Iguala, Acapulco, or Cuernavaca, and stored in five 75,000 L diesel tanks and one 40,000 L gasoline tank. Further explanation on the fuel agreement the Mine has with PEMEX and the transportation contract with Ferevic can be found in Section 0.

18.9 Water Supply

Procesos Mineros Metalurgicos S.A. de C.V. designed the fresh water supply and pumping system in 2006 for a pumping flow of 2,800 gpm. Fresh water is taken from the Rio Balsas via multiple inlets that transport water to a concrete storage container adjacent to the river, but at a higher elevation. The structure is identified as a shaft in engineering drawings but identified as a well ("noria") in the water concession. The engineering drawings indicate that there are two underground "capture" inlets (tunnels) that extend to the edge and below the river bottom. It is not clear whether the tunnels are constructed in sand and sediments at the bottom of the river, or whether the tunnels are anchored into bedrock. Each of the capture inlets has multiple openings from the main tunnels. There is also an additional perforated concrete structure at a higher elevation than the inlets that transports river water directly to the shaft. The elevation of the perforations in the concrete structure are indicated to be approximately at the average river surface elevation.

The water concession permit is for 4,005,510 m^3/yr of water extraction for industrial and sanitary services. The operations water requirement is estimated at 126 L/s (2,000 gpm). The usage is 70% for processing, 20% for road maintenance (dust suppression), and 10% for general services.

The water concession permit for "groundwater extraction" was granted in 2006 and renewed in 2016 for another 10 years. The Rio Balsas, a major river in the states of Guerrero and Michoacán, has a length of about 800 km and an average flow of 24,944 m^3/s (Balsas River Information, 2015). No site-specific study has been conducted regarding the water supply assurance; however, the Rio Balsas is a significant water source, and Los Filos operations water supply requirements are relatively small compared to the average flow of the river.

Fresh water collected in a 30 m deep concrete vault adjacent to the river is conveyed through 4 pumping stations via pipeline for about 15 km to the Mine site for an elevation gain of 1 km. Pumping station 1 is located adjacent to the water collection system. One of the three pumps is for backup. Pumping Station 2, which is located close to Pumping Station 1, has a filtration / clarification system to remove sediments. An anti-scalant is added to the water at Pumping Station 2. Sediments are discharged below the clarifiers and then pumped to a pond at Pumping Station 2. When the pond is full, sediments are transported to a reservoir at the Mine for final disposal. Pumping Stations 3 and 4 are booster stations. From Pumping Stations 1 through 3, water is transported through two 10-inch lines. From Pumping Station 3 to Pumping Station 4, the water is transported through one 14-inch line (Marsh Risk Consulting 2016).

The pumping capacity of the system is 175 L/s, which is more than required. The capacity of individual pumps at each station are listed in Table 18-4.

Table 18-4: Pump Station Details

Station Identifier	Number of Pumps	Power		Capacity		Elevation (masl)	
		kW	HP	L/s	gpm	m	ft
Pump Station 1	3	185	250	88.2	1,400	478	1,570

Station Identifier	Number of Pumps	Power		Capacity		Elevation (masl)	
		kW	HP	L/s	gpm	m	ft
Pump Station 2	6	300	400	37.8	600	580	1,900
Pump Station 3	3	520	700	88.2	1,400	945	3,100
Pump Station 4	3	520	700	88.2	1,400	1,320	4,330
Storage Tank (El Bermejal)	None					1,666	5,460

Source: Marsh Risk Consulting, 2016.

Fresh water pumped to the Mine is received in Distribution Tank 5, with a 5,000 m^3 capacity.

There are three potable water treatment facilities. The facilities are located next to Distribution Tank 5, a second at the ADR Plant, and the third at the Mine camp. The plants are operated by site personnel and tested every 6 months to monitor Mexican drinking water standards.

A site-specific assured water supply study has not been completed, but it seems the water supply is stable. The Mexican authority CONAGUA has classified the local aquifer as available, thus it is believed that the water source will continue to be available for operations (CONAGUA 2015).

18.10 Communications

Site communications include satellite service, using VoIP (for telephones) and Internet protocols (for regular computer business and communications). Surface operations, including the open pits, use two-way radio communications, and a wireless truck/shovel dispatch system supplied by Modular Mining Systems. The underground mines have a leaky feeder radio communications system.

18.11 Comments on Project Infrastructure

Los Filos has the appropriate road networks and logistics, waste rock facilities, waste landfill, water supply and management, camp and accommodations, workforce, power supply, fuel and reagents storage, and communications to reasonably continue the current Mine operations and execute the LOM plan.

19.0 MARKET STUDIES AND CONTRACTS

19.1 Market Studies

19.1.1 Doré Refining

A refinery gold payable rate of 100% is used in the Los Filos Economic model based on the current contract for Los Filos doré transport and refining. Under the current contract, the refiner purchases doré with no deduction for refining gold. All costs for transport, insurance, and refining are incurred by the refiner's account.

19.1.2 Gold Bullion Sales

Gold bullion is sold on the spot market at prevailing prices, to a variety of international banks using in-house marketing agents.

19.1.3 Silver Bullion Sales

Los Filos sells 100% of silver bullion production under the Silver Wheaton Streaming Contract. The 25-year contract, which expires on 15 October 2029, requires Los Filos to sell its silver bullion production to Silver Wheaton at an initial price of US$4.00/oz, escalated annually at 50% of the US inflation rate. The current price is US$4.26/oz.

19.1.4 Carbon Fines Sales

Los Filos has an operative evergreen, carbon fines refining agreement with Met-Mex Peñoles, with no minimum or maximum volume requirements. Additionally, Los Filos periodically tenders carbon fines to the open market to realize higher values. Carbon fines volumes produced are approximately 700 t/yr to 800 t/yr, with gold grades typically in the range of 300 ppm to 7,500 ppm and silver grades of 200 ppm to 1,200 ppm. Gold and silver payable terms typically range from 91% to 94%, depending on metal grades. Other deductions and penalties are in line with standard industry terms.

19.2 Market Price

The gold price forecasts used for the Mineral Reserves and the economic model is US$1,200/oz and for Mineral Resource estimate is US$1,400/oz. A silver price of US$4.26/oz is used in all cases given the current price received under the Silver Wheaton Streaming Contract. Mineral Resource and Reserve pricing as of 2016 year-end are provided in Table 19-1.

Table 19-1: Commodity Pricing

Commodity	Unit	Reserves	Resources
Gold	US$/oz	1,200	1,400
Silver	US$/oz	4.26	4.26

19.3 Contracts and Agreements

19.3.1 Fuel Supply Agreement

The Mine has a free on board (FOB) sales agreement to purchase fuel from PEMEX. Fuel is trucked from PEMEX stations at Iguala, Acapulco, or Cuernavaca to a service station near the town of Carrizalillo and the open pit maintenance shops. The Mine is responsible for supplying and maintaining this service station. Transportation is executed by Transportes Fervic, S.A. de C.V., a transportation company contracted by the Mine that has been authorized by PEMEX.

The contract with PEMEX is valid until 31 July 2022, after which it can be renewed for an additional 5 years. This contract establishes the commercial margin for the PEMEX's gasoline products, which are provided in Table 19-2.

Table 19-2: Commercial Margin for PEMEX Products

Product	Commercial Margin
PEMEX Magna	5.70%
PEMEX Premium	5.92%
PEMEX Diesel	4.20%

19.3.2 Cyanide Supply Agreement

The Mine has a sales agreement to purchase sodium cyanide from The Chemours Company (Chemours). The agreement with Chemours runs until 31 December 2019 and can be extended.

Chemours is in charge of supplying and transporting the sodium cyanide supply to the Mine property. The supply commitment is for 21,900 t/y of dry sodium cyanide delivered in Iso containers at a base price of US$1,917.28/t. The Mine shall buy at least 90% of the commitment quantity; the contract can be amended if more than 10% of this quantity is needed.

19.3.3 Explosive Supply Agreement

The Mine has agreements with Orica, Austin Bacis S.A. de C.V., and Mexicana de Explosivos y Voladuras S.A de C.V. to supply blasting materials to the Mine.

19.4 Comments on Market Studies and Contracts

The information for this section was supplied by Los Filos mine personnel, and the authors of this Report believe the following.

- Los Filos is currently able to market the doré produced from the Mine and will in the future.
- The terms contained within the sales contracts are consistent with standard industry practice and are similar to contracts for the supply of gold doré elsewhere in the world.
- 100% of the silver production is sold to Silver Wheaton through a long-term contract.
- Metal prices for projected revenue have been reviewed and validated by Stantec and are appropriate to the commodity and mine life projections.

20.0 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

20.1 Baseline Studies

Environmental baseline studies for Los Filos were prepared to characterize the environmental conditions of the area, including climate, fauna, flora, and hydrology, and were presented in 2005 to the Mexican environmental agency, the Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT), for the original approvals and later expansions (Table 20-1).

Table 20-1: Completed Baseline Studies

Baseline Studies	Report Author	Date Completed
Los Filos Environmental Impact Studies		
Laboratory analysis results	ALS ENVIRONMENTAL	August 2004
Climate data	AIR SCIENCES INC.	November 2005
Air pollution emissions analysis	AIR SCIENCES INC.	February 2005
Soil analysis	TERRA QUAESSTUM S.C.	December 2004
Physical environment assessment	TERRA QUAESSTUM S.C.	December 2004
Assessment of possible existence of pre-Hispanic relics (archeology surveys)	CORPORACIÓN DE SERVICIOS ECO AMBIENTALLES, S.A. DE C.V.	January 2005
Explosives study	AUSTIN BACIS, S.A. DE C.V.	December 2004
Los Filos Expansion Environmental Impact Studies		
Flora & Wildlife surveys	UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO.	June 2005
Climate data	ALS ENVIRONMENTAL	May 2005
Weather station information	SRK CONSULTING	July 2005
Air pollution emissions analysis	AIR SCIENCES INC	September 2005
Soil analysis	FACULTAD DE ESTUDIOS SUPERIORES, IZTACALA (UNAM)	August 2005
Physical environment assessment	UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO.	July 2005
Explosives study	DUFIL, SISTEMA DE FRAGMENTACIÓN DE ROCA	June 2005
Physical environment assessment	pH Environmental Consulting	March 2007
Climate and landscape study	pH Environmental Consulting	January 2007

Source: Los Filos Mine, 2016.

The Mine is located in a rural area of the Guerrero State, Mexico, in an area that has a low population density and no protected areas designated by Federal, State, or Municipal entities. The environmental conditions are summarized in this section.

20.1.1 Climate

The Mine property is in a tropical arid zone. Average annual temperature ranges are approximately 18 °C to 22 °C. The area is characterized by distinct dry and wet seasons. Climate conditions during the wet season (June through October) are hot and humid. Guerrero is a zone that can be affected by tropical storms and hurricanes.

Climate trends were recently evaluated using the Mine site's weather station data (SRK Consulting 2016). The mean annual precipitation measured at the site from 2006 to 2016 is 889 mm/yr. Based on the temperature data from the Mine (2014–2016), the mean annual temperature is 21.7 °C. Mean annual pan evaporation is 1,870 mm/yr.

The predominant wind direction is north-northwest, although the mountains can occasionally cause local changes in wind direction.

20.1.2 Soils

Soils were classified to understand the genesis of soils in relation to the soil-forming factors. This information is used to understand regions best suited for grazing livestock and farming.

Soils at the site include phaeozem (typically soft and with abundant organic material and nutrients), fluvisol calcareous (poorly developed soils composed of materials deposited by water), rendzina (thin soils with high clay content and abundant in organic material), lithosol (shallow rocky soils), regosol luvisol (poorly developed soils with little organic matter, very similar to parent rock), and luvisol chromatic (reddish- or yellow-colored, with high clay content).

The clay resources can be a benefit in the future should the closure activities require low-permeability materials.

20.1.3 Seismicity

The site is in the high-risk Seismic Zone C per the National Seismic Service of the National Autonomous University of Mexico (Universidad Nacional Autónoma de México). There are no active faults within the Mine site.

20.1.4 Mining Wastes

The Mine generates waste rock and spent ore as part of the operations. Waste rock includes carbonates, granodiorite, and oxides. The annual waste rock volumes generated in 2016 based on the different types of waste characterization are presented in Table 20-2.

Table 20-2: Annual Waste Rock Volumes

Waste Identifier	Lithology	Description	Potential Acid Generator	Annual Quantity (t)
Waste rock, El Bermejal- IV	Hematite-magnetite oxides	Soft rock, semi-hard and hard, mainly mineralized	No	720,000
Waste rock, El Bermejal – Ia	Intrusive granodiorite	Intrusive soft rock with over 30% of argillized clay	No	3,250,000
Waste rock, El Bermejal – Ib	Intrusive granodiorite	Intrusive hard rock partially silicified	No	3,250,000
Waste rock, El Bermejal – II	Gray limestone - marmorized limestone	Hard rock preferentially non-mineralized	No	12,000,000
Waste rock, El Bermejal – III	Intrusive granodiorite-granodiorite quartz with sulfides	Semi-hard rock with pyrite and disseminated arsenopyrite, with microveins and massive sulfide veins	Yes	450,000
Waste rock, Los Filos - Gd - Ia	Intrusive granodiorite-east	Intrusive soft rock very argillized, over 30% is clay	No	1,300,000
Waste rock, Los Filos - Gd - 1b	Intrusive granodiorite-east	Intrusive semi-hard rock, argillized and epidotized	No	4,500,000
Waste rock, Los Filos – II	Gray limestone - marmorized limestone	Hard rock preferentially non-mineralized	No	13,300,000
Waste rock, Los Filos – III	Intrusive granodiorite-granodiorite quartz with sulfides	Semi-hard rock with pyrite and disseminated arsenopyrite, with microveins and massive sulfide veins	Yes	530,000
Waste rock, Los Filos – IV	Hematite-magnetite oxides	Soft rock, semi-hard and hard, mainly mineralized	No	450,000
Waste rock, Los Filos Underground – IV	Hematite-magnetite oxides	Soft rock, semi-hard and hard, mainly mineralized	No	230,000

Source: Los Filos, Plan de Manejo, 2016.

Geochemistry studies have been carried out to determine whether special management of waste rock is required to prevent potential future environmental impacts. Testwork included acid base accounting (ABA), multi-element assays, meteoric water mobility procedure (MWMP), and humidity cell tests.

The testwork was appropriate for geochemistry assessment, since it included static (at one point in time) and kinetic (prediction of geochemistry over time) tests. There will be a need for additional testwork should modifications to the mineral resource and changes in the mine plan occur that will alter the waste materials and their representative volumes in the final waste rock storage facilities.

The results from the geochemical characterization programs consistently demonstrate that the majority of the waste rock from the Los Filos Open Pit and the Bermejal Open Pit comprises net-neutralizing material with limited sulfide content. Approximately 2% of waste from the Bermejal Open Pit will consist of sulfide-bearing material that shows the potential for acid generation and will need to be managed appropriately. Based on the current mine plan, no sulfide-bearing material is anticipated to be encountered within the Los Filos Open Pit and the Los Filos Underground operations.

Arsenic and antimony are likely to be mobilized under the circum-neutral to moderately alkaline conditions. All waste rock lithologies show the potential for arsenic release, and the carbonate rock, which comprises the majority of waste rock from the Los Filos and El Bermejal Open Pits, shows the additional potential for antimony release.

These findings are supported by the results of the ongoing water quality monitoring data, which show that runoff waters associated with the waste rock dumps and pit walls are circum-neutral, but with consistently elevated levels of arsenic and antimony. These elevated levels were also found in baseline water quality studies prior to starting operations, suggesting current operations have had minimal impact to water quality.

The spent leach ore has been subject to characterization to determine the potential for environmental impacts (Los Filos 2016). A preliminary baseline study in 2005 was carried out on five residue samples from column leach tests from ROM ore and medium-grade ores. The results indicated that the spent ore is net-neutralizing and has a low sulfide content. The short-term kinetic test, Meteoric Water Mobility Procedure (MWMP), indicated that the leachate pH is alkaline. Arsenic concentrations in the MWMP results were within the permissible limits. The spent ore was subsequently considered to be non-hazardous. A second phase of testwork was conducted in 2015 on ten samples with similar results to the baseline study. All constituents in the MWMP extract were within the permissible limits. The spent ore samples were classified as non-hazardous.

20.1.5 Hydrology

The hydrologic conditions have been characterized based primarily on the CONAGUA regional reports for surface water basins and aquifers. The only permanent surface waterbody near the site is the Rio Balsas. The water in the Rio Balsas has a high sediment content and contains high concentrations of total aluminum, total iron, total manganese, and total lead. The dissolved metal concentrations are very low. Naturally occurring springs (or very shallow groundwater) were also identified in the current area of the heap leach pads. A gravity-flow dewatering system was installed to reduce the hydraulic head beneath the heap leach pads.

Limited hydrogeologic data was available during the baseline studies. There are three locations with groundwater depth data (two wells near the community of Mazapa and a spring located east of the Los Filos operating pit). Samples of water collected from Noria La Pileta, Noria Cachuananche, and the spring La Agüita had high concentrations of total and dissolved arsenic. The two springs located near Carrizalillo had high concentrations of metals and total suspended solids. All water resources in the area had high concentrations of fecal coliform (Desarrollos Mineros San Luis 2014).

20.1.6 Flora

Field surveys were carried out to identify the vegetation types and to characterize the ecology. According to the surveys conducted for the Los Filos environmental permit for expansion, there are multiple types of vegetation: deciduous tropical forest (with elements of secondary vegetation), sub-deciduous tropical forest, thorn forest, xerophytic scrub, oak forest, pine forest, and mesophyll mountain forest. The major types of vegetation present are typical of tropical deciduous forest, oak forest, and agricultural areas. Human activities have converted some areas from native vegetation to agriculture and pasture land. The area is considered to be of low sensitivity, due to the previous usage.

The flora studies reported 50 families, 103 genera, and 128 species, with the largest number of species in the families of Leguminosae, Asteraceae (15), Euphobiaceae (9), Burseraceae (8), Anacardiaceae (5), Bromeliaceae (4), Fagaceae (4), Graminae (3), Malpighiaceae (3), Moraceae (3) and Orchidaeceae (3). The most abundant species were grasses (43), bushes (36), and trees (34).

Field studies have identified species that have special conservation status:

- A hardwood tree species (*Syderoxylon capiri*), which is a threatened species within its range from Panama to Mexico.
- A laurel tree (*Litsea glaucescens*) in danger of extinction.

20.1.7 Fauna

Field work was carried out to characterize the biodiversity of the Mine area. During the surveys for the environmental permits for expansion, there were 98 species of vertebrates, classified in 50 families, 88 genera, and a total of 670 individuals. There were 4 amphibian species. There were 52 species of birds logged. There were 25 species of mammals detected.

Field studies have identified the following species that have special conservation status.

- In Danger of Extinction: *Leopardus wiedii* (margay).
- Threatened: *Boa constrictor mexicana* (Mexican boa constrictor), *Lampropeltis triangulum* (milk snake), *Ctenosaura pectinate* (Mexican spiny-tailed iguana), *Coluber mentovarius* (Neotropical whip snake), *Otus seductus* (Balsas screech owl), *Turdus infuscatus* (black thrush), and *Leptonycteris curasoae* (lesser long-nosed bat).
- Special Protection: *Crotalus simus* (Central American rattlesnake), *Tantilla rubra* (Veracruz black-headed snake), and *Myadestes occidentalis* (brown-backed solitaire).

20.2 Environmental Permits

Guidance for the Federal environmental requirements, including conservation of soils, water quality, flora, fauna, noise emissions, air quality, and hazardous waste management, derives primarily from the LGEEPA, the General Law for the Prevention and Integral Management of Waste (Ley General para la Prevención y Gestión Integral de los Residuos), and the National Water Law (Ley de Aguas Nacionales [LAN]). Article 28 of the LGEEPA specifies that SEMARNAT must issue prior approval to parties intending to develop a mine and mineral processing plant.

On 07 June 2013, the Federal Law of Environmental Liability (*Ley Federal de Responsabilidad Ambiental*) was enacted. According to this law, any person or entity that by its action or omission, directly or indirectly, causes damage to the environment will be liable and obliged to repair the damage, or to pay compensation in the event the repair is not possible. This liability is in addition to penalties imposed under any other judicial, administrative, or criminal proceeding.

Environmental permitting in the Mexican mining industry is mainly administered by the Federal Government body SEMARNAT, who establishes the minimum standards for environmental compliance. SEMARANT has set regulatory standards for air emissions, discharges, biodiversity, noise, mining wastes, tailings, hazardous wastes, and soils. The regulatory standards apply to construction and operation activities.

There are three main SEMARNAT permits required prior to construction and development of a mining project. An MIA must be filed with SEMARNAT for its evaluation and, if applicable, further approval by SEMARNAT through the issuance of an Environmental Impact Authorization. In addition, the Ley General de Desarrollo Forestal Sustentable indicates that authorizations must be granted by SEMARNAT for land use changes to industrial purposes. An application for change in land use, or Cambio de Uso de Suelo Forestal, must be accompanied by a technical study that supports the environmental permit application (Estudio Técnico Justificativo [ETJ]). In cases requiring a change in forestry land use, a Land Use Environmental Impact Assessment is also required. Mining projects must also include a risk analysis for the use of regulated substances and an accident prevention program, which are reviewed and authorized by an interministerial governmental body.

Once the MIA is submitted for review, the government publishes an announcement to allow for public review of the proposed project. If the government receives requests, a formal public hearing will be conducted. The government also requires that the mining company publish announcements in the local papers to provide an opportunity for public comment. Government review, comment, and approval of the environmental permit documents are estimated to be completed in 3 to 6 months; however, it should be noted that permitting can be delayed with requests for information or for political reasons.

Following the main approvals and receipt of the Change of Land Use authorization, there will be a number of permits to acquire from various Federal agencies. The LAN provides authority to CONAGUA, an agency within SEMARNAT, to issue water extraction and discharge concessions and specifies certain requirements to be met by applicants. Key permits include an archaeological release letter that is required from the National Institute of Anthropology and History (Instituto Nacional de Antropologia e Historia [INAH]), an explosives permit that is required from the Ministry of Defense (Secretaria de la Defensa Nacional [SEDENA]) before construction begins, and a water discharge and usage permit must be granted by the CONAGUA.

A project-specific environmental license (LAU), which states the operational conditions and requirements to be met, will be issued by SEMARNAT when the agency approves the project operations. A construction permit will be required from the local municipality. Other local permits regarding non-hazardous waste handling and municipal safety and operating authorizations may also be required. The permitting process requires that the mining company has acquired the necessary surface titles, rights, and agreements for the land to be used for the project.

Hazardous wastes from the mining industry are highly regulated and specific handling requirements, such as a hazardous waste generation documentation, log books, and handling manifests, must be met once they are generated. Hazardous waste storage areas must comply with Federal requirements.

The operational permits for Los Filos were granted based on the environmental impact assessments and land use change technical submittals. The authorizations included approval of mitigation measures proposed by Los Filos in compensation of potential environmental impacts and a monitoring program to identify any impacts from operations. The agency resolutions to authorize operations and the key permits are listed in Table 20-3. Los Filos holds the appropriate permits under Local, State, and Federal laws to allow the current mining operations.

Table 20-3: Key Pemits for Los Filos

Permit	Agency	Applicable Mining Stage	Permit Number	Date Issued	Expiration Date
Environmental Impact Statement	SEMARNAT	Construction/Operation/ Post-Operation			
First stage supply services (main access road rehabilitation, water pipelines, and power lines)			S.G.P.A/DGIRA/DEI.2917.04	18-Nov-04	11.5 years (March 2017)[1]
Los Filos Mining Project			S.G.P.A/DGIRA/DEI.1410.05	26-May-05	13 years (2018)
Los Filos Mining Project, Expansion			S.G.P.A/DGIRA/DEI.0086.06	24-Jan-06	15 years (2021)
Los Filos Aerodrome			S.G.P.A/DGIRA/DG.5511	21-Jul-11	25 years (2036)
Los Filos Production Expansion			S.G.P.A/DGIRA/DG.2867	16-Apr-12	13 years (2025)
Los Filos Production Increase with Two Underground Ramps (modification of S.G.P.A./D.G.I.R.A/DG./2867)			12GE2011M0032	SEMARNAT response on submittal is pending	
Land Use Change	SEMARNAT	Construction/Operation			
First Stage Supply Services (main access road rehabilitation, water pipelines, and power lines)			DFG.SGPARN.02.018/05	18-Feb-05	8 months (October 2005)
Los Filos Mining Project			DFG.02.03.284/05	07-Jul-05	10 years (2015)
Los Filos Mining Project Expansion			DFG.02.03.206/06	09-Mar-06	11 years (2017)
Los Filos Production Expansion			DFG.UARRN.135/2012	29-May-12	17 years (2029)
Risk Analysis	SEMARNAT	Construction/Operation			
Included in Los Filos Expansion			S.G.P.A/DGIRA/DEI.0086.06	24-Jan-06	None
Included in Los Filos Production Expansion			S.G.P.A/DGIRA/DG.2867	16-Apr-12	13 years (2025)
Explosives Handling and Storage	SEDENA	Construction/Operation	3890-GRO	01-Jan-17	31-Dec-17
Archaeological Release	INAH	Construction	Release notifications received for 40 of 48 sites identified. There are 2 sites with restrictions for mining activities and 6 sites pending additional studies.	Release dates from multiple sites have been in 2008 through 2010 and in 2016.	
Water Use Concession and Wastewater Discharge Permit	National Water Commission	Construction/Operation			
			04GRO115667/18ISOC07	04-Aug-06	Expired[2]
			04GRO150559/18EMDL12	18-Jul-12	10 years[3]
			04GRO150560/18EMDL12	18-Apr-12	10 years[4]

Permit	Agency	Applicable Mining Stage	Permit Number	Date Issued	Expiration Date
			04GRO115667/18ISDL16	04-Aug-16	10 years[5]
Site-Specific Operations License	SEMARNAT	Operation	12-75-LU-01/2009	13-Mar-09	None
Accident Prevention Plan	SEMARNAT	Operation	DGGIMAR.710/008514	05-Nov-09	None
Hazardous Waste Generator	SEMARNAT	Operation	DSM121207511	24-Apr-08	None
		Modified Due to Update of Data	DFG-UGA-DGIMAR/276/12	28-Nov-12	None
Hazardous Waste Management Plan	SEMARNAT	Operation	12-PMG-I-1991-2016	14-Mar-16	None
Landfill	Municipality of Eduardo Neri	Construction	DUYOP/021/2013	30-May-13	Expired
	SEMARNAT (included in MIA for production expansion)	Operation	S.G.P.A.DGIRA/DG.2867	16-Apr-12	2025
Used Oil Recycling	SEMARNAT	Operation	DGGIMAR.710/001382	29-Feb-08	None

Note:

[1] Request for renewal submitted in January 2017. Issues with renewal are not expected.

[2] 72,533 m^3/year, extraction of surface water from Rio Balsas o Mezcala, flow of 9.90 L/s for industrial use.

[3] 43,070 m^3/year, discharge of treated wastewater from bathrooms.

[4] 4,736 m^3/year discharge of treated wastewater from bathrooms at core shack.

[5] 4,005,510 m^3/year (industrial and services) groundwater usage and a discharge of wastewater 30,600 m^3/year.

Los Filos is in the process of recertification under the International Cyanide Management Institute's certification program, which is a voluntary program to demonstrate commitment to the safe, responsible use of cyanide. The signatory companies demonstrate compliance through third-party, independent audits based on nine codified principles related to cyanide handling and usage. Los Filos became a signatory in 2007 and received its original certification in 2010, and a second one in 2013. Recertification through an audit is required every 3 years. The most recent recertification audit was conducted in December 2016 with a full-compliance result.

Los Filos has submitted studies for an environmental permit to construct and operate the proposed development decline ramps for the exploration of the Bermejal Underground deposit. The permit was conditionally granted by the government authority in January 2017 with the requirement to submit an economic technical study to update the amount of the reclamation financial bond. Los Filos has a total of 3 months to submit the study. Development of the decline ramps may commence immediately after submitting this economic technical study.

20.2.1 Permit Compliance

Compliance with environmental laws and regulations is enforced by the SEMARNAT branch PROFEPA, which is the environmental attorney general. The Los Filos expansion environmental permits state that Los Filos must maintain a log and evidence of the monitoring activities. Compliance reports that present the results and observations of the flora, fauna, water, air, and noise monitoring, plus the soil restoration and conservation program are provided annually to SEMARNAT and PROFEPA. These reports include the results and analysis of the environmental management and monitoring program. Reports are also provided to CONAGUA on water exploitation and sanitation wastewater discharge test results.

The following pending permitting issues are in the process of resolution with the relevant authorities.

- Los Filos is currently in an administrative procedure with CONAGUA regarding the wastewater permit modification submittal and resolution of the sample results. Samples collected by the agency representative in August 2016 were reported to have some parameters above the permissible limits in the permit. Improvements made to the wastewater system were submitted as a formal modification to the existing permit in October 2016 and verification samples collected and submitted by Los Filos in December 2016 were all within the permissible limits.
- Los Filos has received clearances for 40 of the 48 possible archaeological sites identified in the baseline studies. There are 2 sites restricted from mining operations and Los Filos has not received clearances on the remaining 6 of the possible archaeological sites. One of these sites is located in an area included in the mine plan for 2018. Los Filos has reasonable expectation that clearances to these sites will be received without impact to the operation. The Waste Rock Management Plan initially submitted to SEMARNAT was not approved during PROFEPA's 2013 inspection and a revised plan is awaiting approval.
- The waste rock management plan initially submitted to SEMARNAT was not approved and this was found to be a deficiency during an inspection by PROFEPA in 2013. A revised waste rock management plan was subsequently submitted and is awaiting approval. It is likely that the plan will be approved.
- Los Filos is currently internally reviewing the permitting requirements of the expansion of the Mine camp. This is a low risk to operations.

20.2.2 Environmental Monitoring

Mexican laws require mandatory monitoring programs that are implemented under SEMARNAT. The environmental management system and environmental and social management plans were developed in accordance with the appropriate Mexican regulations. The following monitoring programs have been established at the Los Filos mine: groundwater quality, surface water quality, air quality, perimeter noise, fauna registry, flora species rescue record, nursery plant production, soils, and cleared surface restored/reforested registry. Most monitoring is carried out every 6 months or annually, with the exception of groundwater quality, which is monitored quarterly. Los Filos has voluntarily established a number of routine sampling locations that are not required under its permits and uses those results for its own assessment of environmental performance or as part of the demonstration of environmental protection required for its voluntary certifications. Los Filos uses a software program (Enablon) to log and track incidents related to environmental, health, safety, social performance (i.e., community relations), and security.

Water Monitoring

Prevention and mitigation measures to protect surface water and groundwater quality include surface erosion controls around the facilities. Clean storm water is transported in concrete-lined channels around the heap leach facilities, whereas impacted storm water is directed to the ponds.

The water monitoring program includes surface water, runoff water from waste rock facilities and within the open pit, groundwater, potable water, process water, and wastewater. The site has a written water quality monitoring plan that specifies the locations, laboratory parameters, and frequency of monitoring to meet Mexican regulations, assess natural variations, to detect potential impacts from operations. The program includes quality control samples.

Results of the program show that runoff waters for the pit walls and WRFs are circum-neutral (pH from 6 to 9) with measurable alkalinity (10–309 mg/L). Arsenic is frequently detected in the runoff waters, with concentrations of total arsenic from 0.03 mg/L to 4.12 mg/L and concentrations of dissolved arsenic from 0.02 mg/L to 0.37 mg/L. In addition, concentrations of total iron, manganese, and aluminum are frequently detected, with measured concentrations of 0.03 mg/L to 180 mg/L iron, 0.001 mg/L to 41.6 mg/L manganese, and 0.005 mg/L to 392 mg/L aluminum. These monitoring results are consistent with the findings of the various characterization programs, which indicate that the waste rock and pit walls are likely to be net neutralizing but will leach arsenic and antimony under the circum-neutral to moderately alkaline pH conditions. Baseline studies show arsenic and antimony are naturally occurring in the groundwater.

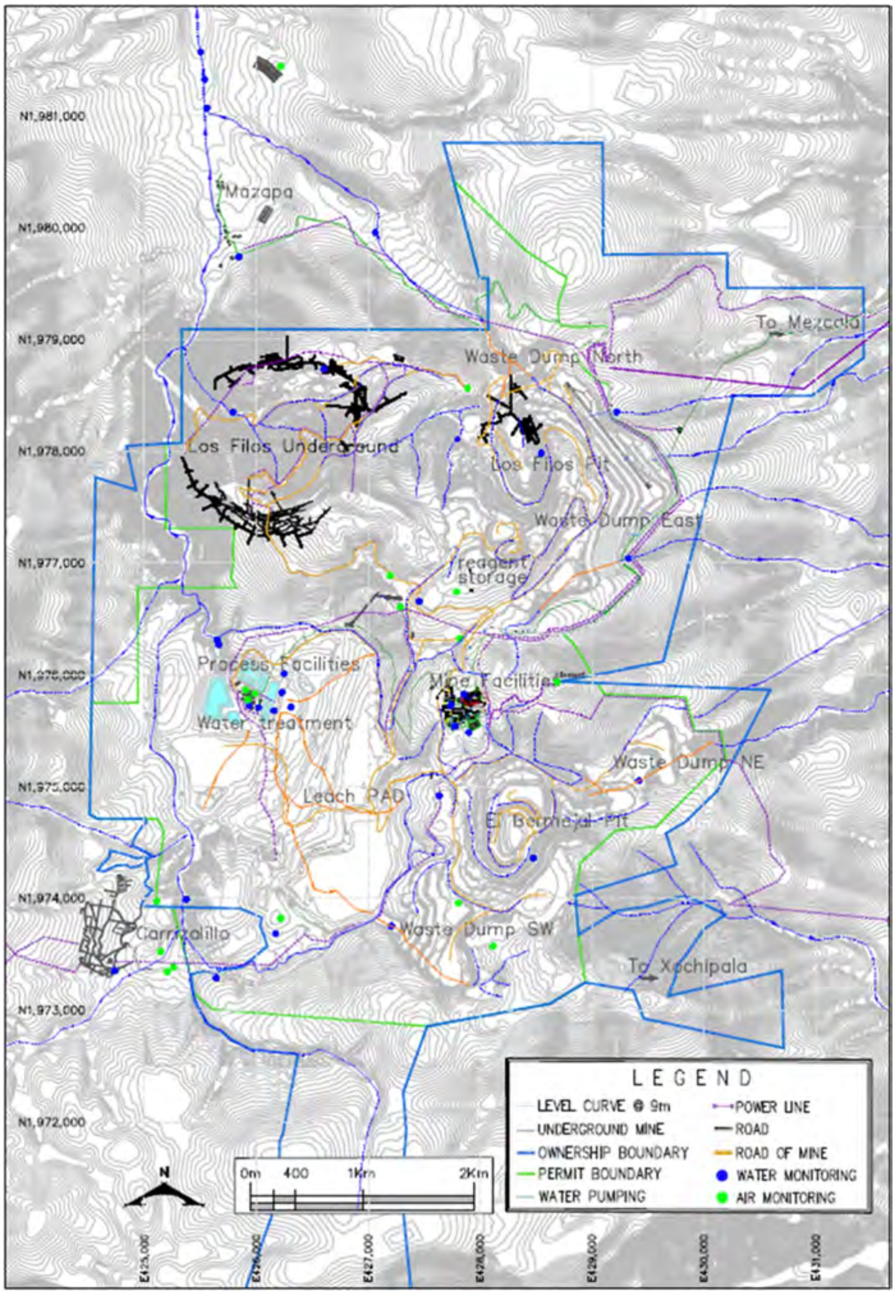
The wastewater discharges from the sanitation treatment systems had results within regulatory limits in December 2016.

The Los Filos site currently has two groundwater monitoring wells that comply with the Mexican environmental requirements for heap leach facilities. One well (LF-49) is located upstream of the heap leach pads in a canyon close to the community of Carrizalillo and the other (LF-48) is located approximately 400 m downstream of the heap leach pads in Cañada 23. Each well is drilled and cased with a PVC casing. LF-49 was constructed to a depth of 50 m below ground surface and was dry. LF-48 was also constructed to a depth of 50 m below ground surface, but groundwater was encountered at an approximate depth of 32 m (Pozos as Wells report, Golder, 2013). In December 2015, LF-48 had problems with an obstruction preventing the sample bailer entry but was functional in April 2016 and no water was encountered. The well was obstructed again in September 2016 and is currently undergoing rehabilitation.

Groundwater quality results in January 2016 were below permissible limits. Results from LF-48 have reported occurrences of cyanide, plus high total suspended solids. The results also show sulfates and arsenic concentrations are below permissible limits. The cause of the reported indicator parameters in LF-48 has not been determined. Due to the rehabilitation at the well, this well is not currently available for sampling.

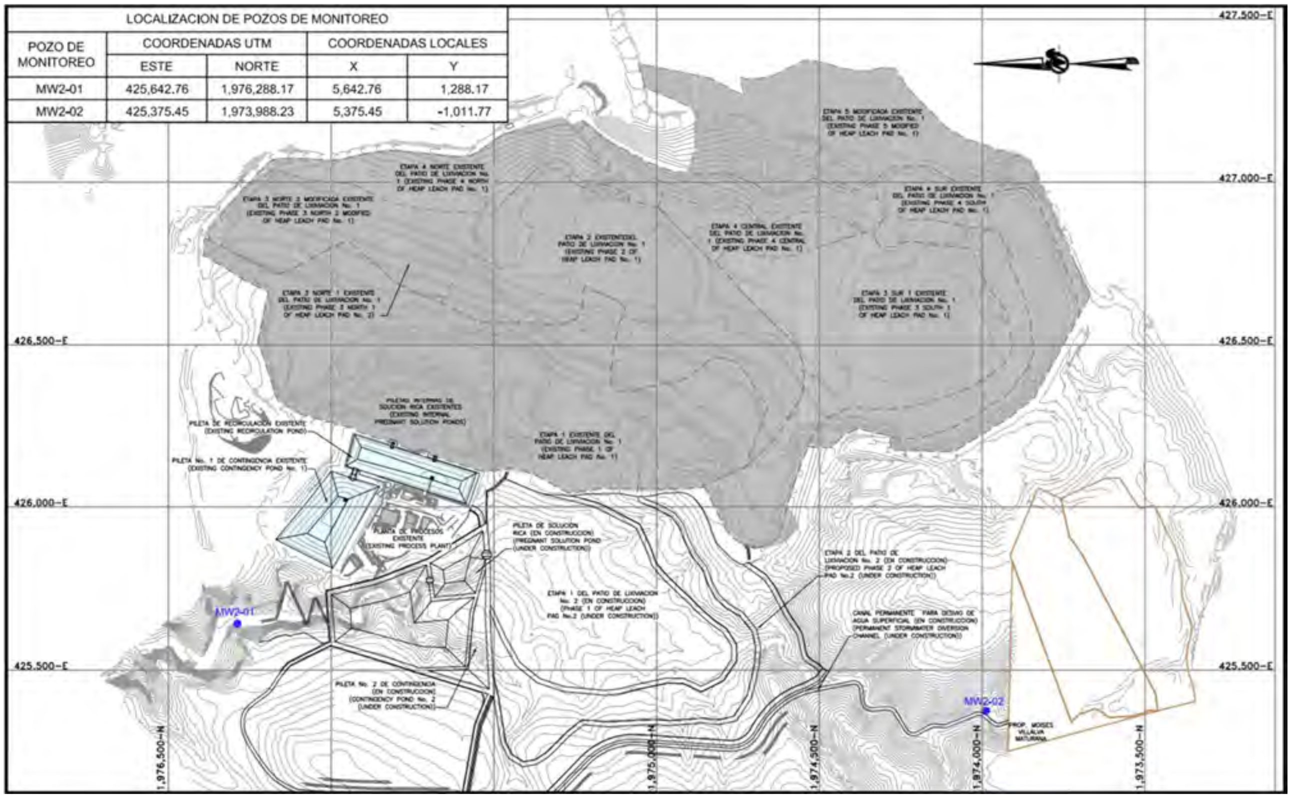
The water monitoring locations are shown in Figure 20-1; well locations are shown in Figure 20-2.

Figure 20-1: Water and Air Monitoring Locations



Source: Los Filos, 2016.

Figure 20-2: Well Locations



LOCALIZACION DE POZOS DE MONITOREO				
POZO DE MONITOREO	COORDENADAS UTM		COORDENADAS LOCALES	
	ESTE	NORTE	X	Y
MW2-01	425,642.76	1,976,288.17	5,642.76	1,288.17
MW2-02	425,375.45	1,973,988.23	5,375.45	-1,011.77

Air and Noise

Dust is controlled by spraying water on the roads. Air quality monitoring is done at fixed point sources and at points around the site perimeter to ensure compliance with Mexican air quality regulations. Los Filos conducts monitoring of total suspended particles, particles less than 10 micrometers in diameter and particulates less than 2.5 mm in diameter at the site perimeters. At fixed point sources, sampling is conducted for carbon monoxide, nitrogen oxides, mercury, and particulates. Emissions are reported annually to SEMARNAT in the operating report (Cédula de Operación Anual).

Noise caused by operating machinery is mitigated where possible and worker hearing protection is required in high-noise areas. Machinery is subject to routine maintenance to reduce noise levels. Noise is monitored at the Los Filos mine offices, Carrizalillo, and Mazapa. The monitoring locations are shown in Figure 20-1.

Fauna

Los Filos has a written monitoring plan for the cyanide facilities to identify risks to wildlife, document the type and number of animals encountered, and prevent impacts to wildlife (Goldcorp Mexico, Los Filos, undated). The following four areas were identified as having a potential risk to wildlife: the heap leach facilities, the toe of the heap leach pads, the solution ponds, and other ponds that contain cyanide. Wildlife monitoring associated with the cyanide facilities is conducted daily at the heap leach pads if there is ponding, otherwise it is conducted weekly. Monitoring at the ponds is conducted daily if the Weak Acid Dissociable cyanide concentrations are 50 mg/L or greater, or if the copper concentration is 30 mg/L or greater. Otherwise, the monitoring at the ponds is completed monthly. For other water bodies that may occur due to ponding or rainfall, the monitoring is conducted monthly if the Weak Acid Dissociable cyanide is above 50 mg/L and weekly if less than 50 mg/L.

Los Filos has implemented measures to restrict access by wildlife and livestock to the areas of cyanide usage. At the heap leach pads, Los Filos also has procedures to prevent ponding, which could endanger wildlife due to drowning or ingestion of solution with cyanide. The perimeter of the heap leach pads and ponds is fenced by a combination of barbed-wire fence and cyclone fence. The cyclone fence has a concrete pad in some areas. Monitoring data are maintained in Enablon.

In addition to the monitoring plan developed for SEMARNAT, Los Filos has a written Wildlife Rescue, Handling, and Relocation Plan (Desarrollos Mineros San Luis S.A. de C.V., 2015). The plan for the entire Mine site includes methods for relocation of amphibians, reptiles, mammals, and birds.

Flora

Los Filos has addressed vegetation impacts as part of the permitting process. Protected species were recovered during site construction. In addition, organic topsoil was recovered during clearing and it is stored at site for reuse in reclamation. Protected plant species were relocated during construction activities. A nursery for native species is currently under renovation. The nursery will be used to provide native species for replanting in the future.

Sewage

Wastewater discharges are produced at seven permitted sites (sanitation facilities, kitchens, laundry, and cafeterias). The wastewater is transported to secondary treatment plants that remove settleable solids and a biological process is in place to remove dissolved and suspended organic compounds. The systems include activated sludge, grids, sandcatchers, pumping casings, primary settlers, aerobic and anaerobic rectors, clarifiers, and shock tanks.

Mining Wastes

A Waste Rock Management Plan was prepared in 2016 and submitted to SEMARNAT as part of a compliance action (Los Filos, 2016), and is pending approval. A spent ore monitoring program was developed in 2016 to comply with Mexican regulatory requirements (Los Filos, 2016).

Hazardous and Regulated Wastes

Typical wastes produced at the site are water contaminated with hydrocarbons, used oil and grease, containers that stored hazardous substances, waste antifreeze, and expired medications. The wastes are reported annually to SEMARNAT in the operating report (Cédula de Operación Anual). Wastes are characterized per the Mexican hazardous waste criteria and handled by a third-party contractor, with the exception of some wastes generated at the laboratory (such as the cupolas), which are disposed of in the heap leach area.

20.3 Closure Considerations

A Closure and Reclamation Plan was prepared for the Mine site (Desarrollos Mineros San Luis S.A. de C.V., 2014). The plan incorporates international best practices, including the following.

- World Bank Environment, Health and Safety Guidelines Mining and Milling - Open Pit.
- Draft International Finance Corporation (IFC) Environmental, Health and Safety Guidelines – Mining.
- Cyanide Code.

The key objectives of the reclamation and closure plan include the following.

- Minimize erosion damage.
- Protect surface and groundwater resources through control of water runoff.
- Establish physical and chemical stability of the site and its facilities.
- Ensure all cyanide and process chemicals are safely removed from the site at closure and equipment is properly decontaminated and decommissioned.
- Clean and detoxify all facilities and equipment used in the storage, conveyance, use, and handling of cyanide and other process chemicals in accordance with international practice.
- Establish surface soil conditions conducive to the regeneration of a stable plant community through stripping, stockpiling, and reapplication of soil material and/or application of waste rock suitable as growth medium.
- Repopulate disturbed areas with a diverse self-perpetuating mix of plant species to establish long-term productive plant communities compatible with existing land uses.
- Maintain public safety by stabilizing or limiting access to landforms that could constitute a public hazard.

The Closure and Reclamation plan is updated every 3 years. The current plan is conceptual and contains discussions of possible closure method options without specifications (Desarrollos Mineros San Luis S.A. de C.V., 2016). Technical studies are being prepared by SRK Consulting for completion in 2017 to advance the closure planning process. The work will include geochemistry studies of waste rock and spent ore with a prediction of future metals leaching potential, preparation of a preliminary hydrogeologic conceptual model, update of the Water Quality Monitoring Plan, preparation of a site-wide water balance, update of the existing Waste Rock Management Plan, preparation of a closure landform design, assessment of closure material available for closure cover designs, preparation of a draindown analysis of the heap leach pads, development of a Revegetation Plan, and assessment of existing storm water controls.

The conceptual closure costs were calculated using the standard reclamation cost estimator (SRCE) model that was developed for the State of Nevada, USA. The closure cost spending schedule was updated for the current Mine life and reflects anticipated expenditures prior to closure, during decommissioning, and during the post-closure monitoring and maintenance period. The most recent closure cost estimate for 2016 assumes the heap leach will be rinsed for chemical stability and that solution (draindown from heap leach and rinseate water from decontamination of equipment at the ADR plant) will be treated. Final slopes are assumed to be 2.5H:1V for the heap leach and no change of slope at the open pits.

Current closure costs based on the Los Filos Mine disturbance at the end of 2016 are estimated to be US$50.7 million as shown in Table 20-4. These costs were estimated to include legal and constructive obligations to reclaim the site to safe and stable conditions and minimize environmental impacts. These closure costs do not include a contingency. Site closure costs are funded by allocating a percentage of sales revenue to closure activities.

Table 20-4: Summary of Estimated Closure Costs

Item	Subtotal (in US$ millions)
Earthworks and Recontouring	21.2
Revegetation/Stabilization	0.4
Detoxification / Water Treatment / Disposal of Wastes	6.8
Structure, Equipment, and Facility Removal / Miscellaneous	2.3
Monitoring	0.6
Construction Management and Support	3.5
Closure Planning, G&A, and Human Resources	11.2
Subtotal	*46.1*
Indirect Costs (10%)	4.6
Contingency (0%)	0.0
Total	**50.7**

Source: Los Filos (filename: Los Filos ARO 2016 SRCE_Cost Comparation_Cash Flow_11_01_2017_MC), 2017.

20.4 Considerations of Social and Community Impacts

Prior to the start of operations, a social baseline study was completed to determine the socioeconomic characteristics of the local population and to assess the perceptions and views of the residents regarding mining and the company. The primary communities near Los Filos are Mazapa, Mezcala, Xochipala, and Carrizalillo. There are about 46,000 inhabitants within the local municipality of Eduardo Neri[3], of which about 315 persons live in Mazapa, 3,400 persons live in Mezcala, 5,000 persons live in Xochipala, and 1,100 persons live in Carrizalillo. The villages of Mazapa, Mezcala, and Carrizalillo are all communal organizations under Mexico's agrarian law. Carrizalillo is an ejido and Mazapa is part of "bienes communales" of Mezcala. Both ejidos and "bienes communales" are agrarian units that are registered with Mexico's National Agrarian Registry. Both units have communal ownership of the land. The community has control of the land, although the community can grant ejido members property rights for individual parcels. The ejido of Carrizalillo was formed in 1937, with a land grant of 1,000 ha. Mezcala received a land grant of 10,616 ha in 1934 and later received additional land leading to a total of 13,628.76 ha.

[3] The Eduardo Neri Municipality is one of 81 municipalities of Guerrero, in southwestern Mexico. The municipal capital is Zumpango del Río. The municipality covers an area of 1,289.6 km² and includes 80 towns and villages.

Baseline Studies

A baseline social survey was conducted in 2004 in Mezcala and in 2005 in Carrizalillo. The baseline studies were updated with new surveys conducted by a third-party (Consultoria Especializada) during 2015 in Carrizalillo, Mazapa, and Mezcala. The surveys gathered data on demographics, economics, education, cultural activities, health, infrastructure, work, leisure time activities, and access to services. Interviews were made house to house, plus observations in the field.

The survey of Mezcala in 2004 indicated that 20% of the population financially supported the other 80%, which were primarily housewives and children. There were very few professionals. Of the population considered working age, most of the male population had completed a secondary school education (that is, 9th grade) and about half of the female population had completed a secondary school education. At the time of the survey, about 16% were working for DMSL. The survey indicated the population had modest homes. It was identified that the community did not practice adequate garbage disposal. The feedback on the Los Filos Mine was minimal because it was not well known. In the survey of Carrizalillo, 63% of the population financially supported the other 37%. The feedback was predominantly favorable to the Los Filos Mine. The primary economic activities of the region are agriculture, livestock, and mining. The main products are mescal and swine. In Mezcala, fishing and tobacco production are also important.

The updated surveys in 2015 indicated a higher percentage of youths to adults due to a high birthrate and migration away from the area due to security concerns. About 50% of the population in Carrizalillo is less than 20 years old. Of the working age population, about 64% of the household heads work as Los Filos employees. In Mazapa, about 72% work in mining (for the Los Filos mine and Torex Gold). In Mezcala, about 38% work for Los Filos Mine and 14% are employed by contractors to the Mine.

The 2015 survey has noted the following improvements in standard of living.

- Access to plumbing increased from about 9% to 81%, and the housing with hard floors (not dirt) increased from 5% to 75% in Carrizalillo.
- Improvement of roads from unpaved to paved.
- All housing in Mazapa has plumbing and sanitation service. The percentage of houses with hard floors rose from 4% to 88%.
- Improved literacy.
- Access to health care.

Social Risks

In 2014, production was shut down due to a 42-day work stoppage related to a dispute with the local communities on their land access agreement. Negotiations took place to produce a new 5-year land access or occupation agreement between the parties. Los Filos subsequently established a new dialogue model in 2015 that uses proactive engagement to avoid future risks. Los Filos also applies proactive engagement of the communities and the union.

Social Development Agreement

The Los Filos Mine has a collaborative agreement for social development that provides contributions to the communities in the amount of approximately US$0.85 million annually. Under the collaborative agreement, the Los Filos mine makes the following contributions.

- A landfill that is used by the community of Carrizalillo.
- Repairs to community facilities.
- Education scholarships.
- Assistance for disadvantaged members of local communities.
- Environmental restoration project funding.

- Employment of 43 local providers in Mezcala who provide services to the Los Filos Mine.
- A third-party to help develop small enterprises as part of sustainability efforts.

In addition to the specific agreement that Los Filos made with the communities, there are funds that have been generated for mining areas through the new Mexican mining tax introduced in 2014.

Social Performance

Los Filos has made contributions to health, infrastructure, education, culture, and sports in the local communities. Local businesses contract to provide water trucks, ore haulage trucks, other material hauling trucks, uniforms, waste collection, heavy equipment rental, transportation, potable water, kitchen services, portable sanitation facilities, facility maintenance, general supplies, and temporary labor. Public consultation and community assistance and development programs are ongoing.

Los Filos developed a written procedure to handle complaints and comments from the public. The information received by any employee is captured and reported through a general email address that is reviewed daily by the Sustainable Development department.

The Los Filos Mine was recognized by the Mexican Mining Chamber for its commitment to the environment and community in 2015. Los Filos Mine underwent a gap assessment per the Voluntary Principles on Security and Human Rights program in 2015 and 2016. The Los Filos Mine received positive results from both assessments. Los Filos reports that it has strong relationships with the local communities based on proactive engagement.

Security

Security continues to be a concern in Mexico, particularly in the southern states such as Guerrero, which are used by the cartels for drug transport and production. The southern states have seen a fragmentation of organized crime groups and there is competition between these criminal groups.

Security issues in the area have been reported in local, national, and international news outlets, including an incident where four local Los Filos employees were kidnapped outside the Los Filos Mine property in the town of Carrizalillo on 06 March 2015 and three of the victims were killed. At the time of the incident, the employees were not on company business and the incident was determined to be unrelated to their employment at Los Filos.

Government attention has been most focused on security in the State of Guerrero, particularly after 43 student teachers disappeared in Ayotzinapa, Guerrero, in 2014. In general, the Federal Government is supportive of mining as a means for economic development that will mitigate poverty and reduce crime.

In the State of Guerrero, there is strong support of mining and it is included as one of the five economic development sectors in the state development plan for the years 2016 through 2021 (Gobierno del Estado de Guerrero, 2016). The plan stated lack of security as its primary challenge and that economic improvement will combat the poverty that is the root of violence. The annual report prepared by the governor of the State of Guerrero for 2016 described the state's strategy to improve security is to have efficient institutions, well-equipped and trained security personnel, effective measures of prevention and intelligence, and the best legal justice services (Astudillo Flores, Héctor, 2016). The annual report specifically named Los Filos and El Límon-Guajes as the two most important producing mines in the State of Guerrero.

In 2016 funds for 18 new infrastructure projects were approved for the municipality of Eduardo Neri, where Los Filos is located.

Management of Security

Risk assessments are conducted by the site security staff at least annually and more often when conditions warrant. The risk analysis determines the mitigation actions included in the annual action plan of the security team.

To mitigate security impacts to the operations, the Los Filos Mine has written security guidelines that focus on company assets and personnel working at the Mine. Internal procedures at Los Filos require all incidents be logged and classified per a corporate risk matrix. The risk categories are reputation, fraud and corruption, regulatory and legal, industrial health and safety, asset security, environmental, community relations, financial, cashflow, reserve ounces, reserve model, and production ounces. Each incident is categorized according to the risk categories and probability. The procedure is well-structured and organized with appropriate criteria.

The number and severity of incidents in 2016 is lower than in 2015. The Mine has been able to operate consistently for more than 10 years without material impacts to the operations from the security environment surrounding the Mine site.

20.5 Discussion of Risks

The Qualified Person is not aware of any significant risk or uncertainty that may materially affect the reliability or confidence in the Mineral Resource or Mineral Reserve estimates or project economic outcomes due to the environmental permits. Risks that may impact current or future operations have been identified to include the following.

- There are six archeological areas pending classification from INAH. There is a risk that these areas will be restricted from entry if pre-Hispanic ruins are encountered. One area pending classification is within the 2018 Mine Plan.
- The security instability in the State of Guerrero and in the project area is a risk that could cause temporary closure of operations or disruptions in services. The security issues may also impact the ability of the company to contract and retain skilled, experienced employees.
- Continued access to properties not owned by Los Filos is a potential risk. In particular, ejidos may have frequent changes in the directors and new management may renegotiate existing agreements. As part of the Los Filos Mine activities, the Mine reduces potential risk to exploration and mining through long-term surface access agreements and proactive communications.

21.0 CAPITAL AND OPERATING COSTS

21.1 Capital Costs

Capital spent as of 31 December 2016 is considered sunk capital, either spent or committed to being spent, and is not included in the economic evaluation.

Table 21-1 shows the current LOM capital costs. The costs are based on operating experience gained from current operations, 2017 budget data, and quotes received from manufacturers during 2016.

Table 21-1: Life-of-Mine Capital Cost Estimate (Figures in US$ Million)

Area	2017	2018	2019	2020	2021	2022	2023	2024	Total
Development	15.3	7.5	1.6	0.5	—	—	—	—	24.9
Expansionary	—	—	—	—	—	—	—	—	0.0
Compliance	0.5	0.5	—	—	—	—	—	—	1.0
Exploration	—	—	—	—	—	—	—	—	0.0
Sustaining	14.1	12.8	15.5	3.7	1.5	0.9	0.7	—	49.1
Improvement	3.0	0.6	0.0	0.0	—	—	—	—	3.7
Total	32.9	21.4	17.2	4.3	1.5	0.9	0.7	—	78.8

Note: Summation errors may be present due to rounding.

Capital cost estimates include funding for infrastructure, mobile equipment replacement, and development drilling as well as miscellaneous sustaining capital expenditures required to maintain production. Infrastructure requirements are incorporated in the estimates as appropriate. Mobile equipment is scheduled for replacement when operating hours reach threshold limits. Sustaining capital costs reflect current price trends. The capital costs shown do not include the Bermejal Underground capital cost estimates, which will be further discussed in Section 24.0.

Exploration expenditure has been excluded from the financial forecasts as exploration targeting additional mineralization may identify Mineral Resources that may be converted to Mineral Reserves, but this does not relate to the current Mineral Reserves and the LOM plan being considered.

21.2 Operating Costs

The Mine developed operating costs based on 2017 budget figures and 2016 actual costs, factored as appropriate. These costs were used to establish ore cutoff grade values and, ultimately, Mineral Reserves. Table 21-2 shows the LOM operating costs for the respective dollars per unit of measure.

Table 21-2: Life-of-Mine Operating Cost Estimate

Operational Expenditure Inputs	Unit	LOM Average	2017	2018	2019	2020	2021	2022	2023	2024
Los Filos Open Pit Mining	US$/t moved	1.56	1.63	1.51	1.51	—	—	—	—	—
Bermejal Open Pit Mining	US$/t mined	1.66	—	1.66	1.66	1.66	1.66	1.66	1.66	1.66
Los Filos Underground Mining	US$/t mined	80.25	85.56	79.13	79.13	79.13	79.13	79.13	79.13	—
Crushing	US$/t milled	1.55	1.66	1.44	1.37	1.59	1.87	1.52	1.44	2.12
Crushed Leaching Open Pit Process	US$/t	3.89	5.48	3.37	3.85	3.56	4.20	3.45	4.08	3.44
Crushed Leaching Underground Process	US$/t	16.08	5.68	4.84	12.79	15.07	16.97	41.99	82.91	—
ROM Leach Process	US$/t	3.02	4.57	2.73	2.72	2.61	3.26	2.76	3.56	—
G&A	US$M	21.89	26.96	25.47	25.67	22.58	22.50	22.57	20.31	9.03

21.3 Comments on Capital and Operating Costs

The Qualified Persons reviewed the capital and operating costs and consider them appropriate for the LOM plan as stated. Capital costs were estimated using a combination of operating experience, 2017 budget data, and written supplier quotes. The capital cost total is US$78.8 million over the LOM. Operating costs were estimated on 2017 budget figures and 2016 actual costs, and factored as appropriate.

22.0 ECONOMIC ANALYSIS

An economic model for the LOM plan of the Los Filos Mine, incorporating the parameters derived during preparation of this Report, was prepared as a cash flow with associated economic analysis. The economic analysis accounts for mined tonnages, ore grades, associated recoveries, gold price, capital costs, operating costs, and government royalties. The Mine was evaluated on a 100% ownership basis.

The economic analysis presents net present value (NPV) and allows for sensitivity evaluations for changes in gold price, operating costs, and capital expenditures to determine their relative importance in evaluating Mine economics. The economic assessment was prepared with input from Leagold and Los Filos mine personnel. Stantec, with assistance from Leagold, undertook the economic analysis.

The economic analysis presented in this section is for the Mineral Reserves-only case based on the current Los Filos mine operations. A PEA, which evaluates the incremental value of the Bermejal Underground deposit, is presented in Section 24.0 of this Report. The PEA envisions that the Bermejal Underground deposit may be mined in conjunction with the current Los Filos operations, offering potential to extend Mine life and lower overall AISC.

The Los Filos mine Mineral Reserves-only case economic analysis represents forward-looking information that is subject to a number of known and unknown risks, uncertainties, and other factors that may cause actual results to differ materially from those presented here.

Certain important factors that could cause actual results, performances, or achievements to differ materially from those in the forward-looking statements include the following.

- Gold Price Volatility
- Discrepancies between Actual and Estimated Production
- Estimates of Mineral Reserves and Mineral Resources
- Metallurgical Recoveries
- Mining Operational and Development Risks
- Litigation Risks
- Regulatory Restrictions (including environmental regulatory restrictions and liability)
- Activities by Governmental Authorities (including changes in taxation)
- Currency Fluctuations
- Defective Title to Mineral Claims or Property

Principal Assumptions

The economic valuation of the Mineral Reserves-only case was based on the following.

- Mine schedule, Mine operating cost estimates, process operating cost estimates, G&A estimates, a metallurgical performance characterized by testwork on composite samples, capital, and sustaining capital cost estimates as discussed with the Los Filos Mine.
- Base gold price of US$1,200/oz was used with sensitivities applied above and below this amount.
- Royalties, taxes, discount rates, and other model inputs were provided by Leagold.
- Cash flow analysis excludes any effect due to inflation.
- All currency amounts are presented in United States Dollars (US$) with an exchange rate of 21 Mexican Pesos to 1 US$.

Basis of Estimate

- Tonnage, stripping ratio, and head grade were based on the mining schedule as discussed in Section 16.0.
- The overall recovery figures are based on current recoveries for the ore from the Los Filos Open Pit, Bermejal Open Pit, and Los Filos Underground.
- The sustaining and capital cost estimate is used as the basis for the cash flow model as discussed in Section 21.0.
- The mining, processing, and G&A costs are based on the operating cost estimate discussed in Section 21.0.
- The overall recovery figures are based on current recoveries for the Los Filos Open Pit, Bermejal Open Pit, and Los Filos Underground.

Depreciation

- The treatment of depreciation and company taxes are based on the understanding of current Mexican tax law.
- A provision was made for depreciation using a straight-line method for a period of 10 years for sustaining capital and exploration costs.

Company Tax

- Corporate tax rate of 30%.
- A special mining duty of 7.5% is applied on EBITDA.
- A beginning balance of tax-loss carry forwards that could be used as deductions offsetting taxable income is assumed.

Royalties

- The Government of Mexico is entitled to a 0.5% royalty on gold and silver sales, without any deductions.

Refining Costs

- A refinery gold payable rate of 100% is assumed.
- All costs for transport, insurance, and refining are incurred by the refiner. There is no deduction for refining gold.

Silver Stream

- Los Filos has a silver streaming agreement with Silver Wheaton, whereby Silver Wheaton purchases up to 5 Moz Ag produced at the Los Filos mine for a period up until 15 October 2029.
- The purchase price of the silver is equal to the lesser of US$3.90/oz Ag delivered and the spot price, with the US$3.90/oz Ag payment subject to an annual inflation adjustment. Incorporating the effects of inflation adjustments since the inception of the silver streaming agreement, the last payment price was US$4.26/oz Ag delivered.
- For the purposes of income tax calculations, the assumed silver sales price will be based on the silver spot price for the period instead of the contracted Silver Wheaton purchase price.

Working Capital

- An initial working capital balance of US$26.1 million is assumed and is based on the purchase agreement for the Los Filos Mine.
- All outstanding working capital is assumed to be recovered at the end of the mine life, returning to a nil balance.

Closure Costs

- In the economic model, reclamation and closure activities occur throughout the mine life.
- The total amount of closure costs is $50.7 million for the Reserves-only case.

Development and Production

The Los Filos Open Pit mine production plan is presented in Table 22-1, the Bermejal Open Pit mine production plan is presented in Table 22-2, and the overall production plan is presented in Table 22-3. These mine plans are based on the 31 December 2016 Proven and Probable Mineral Reserves. Production from open pit sources is currently planned to continue to 2024.

Table 22-1: Los Filos Open Pit Mine Life-of-Mine Production Plan

	Description	2017	2018	2019	2020	2021	2022	2023	2024	Total
	Waste (kt)	16,006	13,352	4,167	—	—	—	—	—	33,525
Crush	Ore Leach (kt)	2,244	3,247	1,544	—	—	—	—	—	7,035
Crush	Au (g/t)	0.75	0.81	1.13	—	—	—	—	—	0.91
Crush	Contained Au (koz)	54	85	56	—	—	—	—	—	195
ROM	Ore (kt)	438	612	190	—	—	—	—	—	1,240
ROM	Au (g/t)	0.35	0.35	0.35	—	—	—	—	—	0.35
ROM	Contained Au (koz)	5	7	2	—	—	—	—	—	14
SLG	Ore (kt)	1,142	2,005	476	—	—	—	—	—	3,622
SLG	Au (g/t)	0.28	0.28	0.28	—	—	—	—	—	0.28
SLG	Contained Au (koz)	10	18	4	—	—	—	—	—	32
	Total Contained Au (koz)	69	110	62	—	—	—	—	—	241

Note: Summation errors may be present due to rounding.

Table 22-2: Bermejal Open Pit Mine Life-of-Mine Production Plan

	Description	2017	2018	2019	2020	2021	2022	2023	2024	Total
	Waste (kt)	—	162	8,360	14,311	16,562	14,970	14,710	12,397	81,472
Crush	Ore Leach (kt)	—	279	2,788	2,519	1,672	3,140	3,887	1,546	15,832
Crush	Au (g/t)	—	071	0.76	0.69	0.88	0.88	0.97	3.44	1.09
Crush	Contained Au (koz)	—	6	68	56	47	89	118	171	555
ROM	Ore (kt)	—	41	538	619	321	447	407	—	2,371
ROM	Au (g/t)	—	0.34	0.34	0.34	0.34	0.34	0.34	—	0.34
ROM	Contained Au (koz)	—	0.4	6	7	3	5	4	—	26
SLG	Ore (kt)	—	121	1,933	2,587	1,395	1,381	946	—	8,364
SLG	Au (g/t)	—	0.26	0.25	0.25	0.25	0.25	0.26	—	0.25
SLG	Contained Au (koz)	—	1	16	21	11	11	8	—	68
	Total Contained Au (koz)	—	8	89	84	62	105	130	171	648

Note: Summation errors may be present due to rounding.

Table 22-3: Total Open Pit Life-of-Mine Production Plan

Area	Units	2017	2018	2019	2020	2021	2022	2023	2024	Total
Los FIlos Open Pit	kt (waste)	16,006	13,352	4,167	—	—	—	—	—	33,525
	kt	3,823	5,863	2,210	—	—	—	—	—	11,896
	g/t Au	0.56	0.58	0.88	—	—	—	—	—	0.63
	koz Au (contained)	69	110	62	—	—	—	—	—	241
Bermejal Open Pit	kt (waste)	—	162	8,360	14,311	16,562	14,970	14,710	12,397	81,472
	kt	—	441	5,259	5,725	3,388	4,968	5,239	1,546	26,567
	g/t Au	—	0.55	0.53	0.45	0.57	0.66	0.77	3.44	0.76
	koz Au (contained)	—	8	89	84	62	105	130	171	648
Total	kt (waste)	16,006	13,514	12,527	14,311	16,562	14,970	14,710	12,397	114,997
	kt	3,823	6,304	7,469	5,725	3,388	4,968	5,239	1,546	38,463
	koz Au (contained)	69	118	151	84	62	105	130	171	889

Note: Summation errors may be present due to rounding.

Cut-and-Fill mining methods are used in the current Los Filos Underground operations. The planned LOM production schedule is presented in Table 22-4. Production from Los Filos Underground is forecast at a nominal rate of 350 kt/a to 2023. This mine plan is based on the year-end 31 December 2016 Proven and Probable Mineral Reserves, which do not include Bermejal Underground resources.

Table 22-4: Los Filos Underground Life-of-Mine Production Plan

Area	Units	2017	2018	2019	2020	2021	2022	2023	2024	Total
Los Filos Underground – Norte	kt	244	285	307	264	148	46	30	—	1,325
	g/t Au	7.67	8.11	7.23	7.65	7.22	6.61	7.35	—	7.56
	koz Au (contained)	60	74	71	65	34	10	7	—	322
Los Filos Underground – Sur	kt	146	169	71	145	186	154	50	—	921
	g/t Au	7.44	7.70	7.92	8.38	10.76	8.56	8.30	—	8.58
	koz Au (contained)	35	42	18	39	64	42	13	—	254
Total	kt	390	454	379	409	334	200	80	—	2,246
	koz Au (contained)	95	116	90	104	99	52	20	—	576

Note: Summation errors may be present due to rounding.

The economic analysis is based on current Mineral Reserves in the Los Filos Open Pit and Bermejal Open Pit as well as the Los Filos Underground mine. The average recoveries for ROM, Crush, and the heap Leach Pad Reserve are combined in the site-wide gold production plan in Table 22-5.

Table 22-5: Los Filos Mine Total Gold Production Plan

Area	Units	2017	2018	2019	2020	2021	2022	2023	2024	Total
Los Filos Open Pit	koz Au	43	67	39	—	—	—	—	—	149
Bermejal Open Pit	koz Au	—	5	55	50	38	65	82	109	404
Los Filos Underground	koz Au	76	93	72	83	79	42	16	—	461
Inventory	koz Au	101	65	32	35	9	—	—	—	242
Total	koz Au	220	230	198	168	126	107	98	109	1,256

Note: Summation errors may be present due to rounding.

Applying a long-term gold price of US$1,200/oz on a flat-line basis, the after-tax net present value (NPV) at 5% is US$334M. The LOM average cash cost per ounce is US$734, and with the addition of royalties and sustaining capital, the site's LOM AISC/oz is US$803. The LOM plan includes 101 koz Au of inferred material that is currently treated as waste.

Table 22-6 outlines the LOM plan Cash Flow.

Table 22-6: Los Filos Mine Cash Flow

Item	Unit	LOM Total	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Mining Schedule																	
Open Pit Mining																	
Total Material Moved	Mt	153.5	19.8	19.8	20.0	20.0	20.0	19.9	19.9	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Waste Moved	Mt	115.0	16.0	13.5	12.5	14.3	16.6	15.0	14.7	12.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Ore Mined	Mt	38.5	3.8	6.3	7.5	5.7	3.4	5.0	5.2	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stripping Ratio	w:o	3.0	4.2	2.1	1.7	2.5	4.9	3.0	2.8	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Au Grade – Ore Mined	g/t	0.72	0.56	0.58	0.63	0.45	0.57	0.66	0.77	3.44	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Contained Au	oz	889,320	69,139	117,498	151,676	83,556	62,107	104,757	129,707	170,880	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Underground Mining																	
Total Ore Mined	Mt	2.2	0.4	0.5	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Au Grade – Ore Mined	g/t	7.98	7.59	7.96	7.36	7.91	9.19	8.11	7.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Contained Au	oz	576,128	95,204	116,218	89,578	104,002	98,598	52,119	20,408	0	0	0	0	0	0	0	0
Processing Schedule																	
Total Ore Processed	Mt	40.7	4.2	6.8	7.8	6.1	3.7	5.2	5.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Au Grade – Ore Processed	g/t	1.12	1.21	1.08	0.96	0.95	1.34	0.94	0.90	3.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Contained Au	oz	1,469,072	164,344	233,716	241,255	187,558	160,705	156,876	153,739	170,880	0	0	0	0	0	0	0
Au Recovery	%	69.0%	72.2%	70.7%	68.6%	71.2%	72.7%	68.1%	63.6%	63.8%	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recovered Au	oz	1,013,534	118,706	165,191	165,594	133,505	116,905	106,772	97,839	109,021	0	0	0	0	0	0	0
Inventory Ounces	oz	242,439	101,000	65,455	31,895	34,601	9,488	0	0	0	0	0	0	0	0	0	0
Au Sold	oz	1,255,973	219,706	230,647	197,489	168,106	126,394	106,772	97,839	109,021	0	0	0	0	0	0	0
Recovered Ag	oz	486,726	22,290	35,265	70,861	74,708	46,845	77,673	82,509	76,575	0	0	0	0	0	0	0
Cash Flow Summary																	
Gross Revenue	$M	1,507.2	263.6	276.8	237.0	201.7	151.7	128.1	117.4	130.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plus: Silver Credits	$M	2.2	0.1	0.2	0.3	0.3	0.2	0.3	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Less: Royalties	$M	-7.5	-1.3	-1.4	-1.2	-1.0	-0.8	-0.6	-0.6	-0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Revenue	$M	1,501.8	262.4	275.5	236.1	201.0	151.1	127.8	117.2	130.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 22-6: Los Filos Mine Cash Flow

Item	Unit	LOM Total	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Operating Costs																	
Open Pit Mining	$M	-250.6	-32.4	-30.1	-32.3	-33.3	-33.1	-33.1	-33.1	-23.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Underground Mining	$M	-180.2	-33.4	-36.0	-30.0	-32.4	-26.4	-15.8	-6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Processing	$M	-211.1	-26.1	-27.4	-36.5	-28.1	-22.0	-29.4	-33.0	-8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Inventory Drawdown Cost	$M	-106.8	-36.1	-29.1	-26.6	-15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Site G&A	$M	-175.1	-27.0	-25.5	-25.7	-22.6	-22.5	-22.6	-20.3	-9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Operating Costs	$M	-923.8	-154.9	-148.0	-151.0	-131.4	-104.1	-100.9	-92.8	-40.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Operating Margin (mine EBITDA)	$M	577.9	107.5	127.6	85.1	69.6	47.0	27.0	24.4	89.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sustaining Capital	$M	-78.8	-32.9	-21.4	-17.2	-4.3	-1.5	-0.9	-0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reclamation	$M	-47.3	-6.5	-2.5	-2.4	-1.6	0.0	0.0	-0.9	-0.9	-0.9	-4.7	-9.4	-9.6	-2.7	-2.6	-2.6
Working Capital	$M	26.1	-1.1	-0.6	0.2	-1.6	-2.2	-0.3	-0.7	32.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Special Mining Duty	$M	-43.7	-8.1	-9.6	-6.4	-5.3	-3.6	-2.1	-1.9	-6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Income Taxes	$M	-52.6	0.0	-11.5	-14.8	-10.4	-4.0	0.0	0.0	-12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net After-Tax Cash Flow	$M	381.6	59.0	82.0	44.6	46.6	35.8	23.7	20.3	102.3	-0.9	-4.7	-9.4	-9.6	-2.7	-2.6	-2.6
Cumulative After-Tax Cash Flow	$M	—	59.0	141.0	185.6	232.2	267.9	291.6	311.9	414.2	413.3	408.6	399.1	389.5	386.9	384.2	381.6
Cash Cost per Ounce (net Ag credits)	$/oz	734	705	641	763	780	822	942	944	371	0	0	0	0	0	0	0
AISC per Ounce	$/oz	803	861	740	856	811	840	956	957	377	0	0	0	0	0	0	0

Note: Summation errors may be present due to rounding.

Figure 22-1 outlines the NPV related to gold price and capital and operating costs. Table 22-7 outlines the NPV sensitivities related to capital and operating costs. Table 22-8 outlines the NPV sensitivities related to the gold price and discount rate.

Figure 22-1: Los Filos Mineral Reserve Sensitivity Chart (Reserves Only)

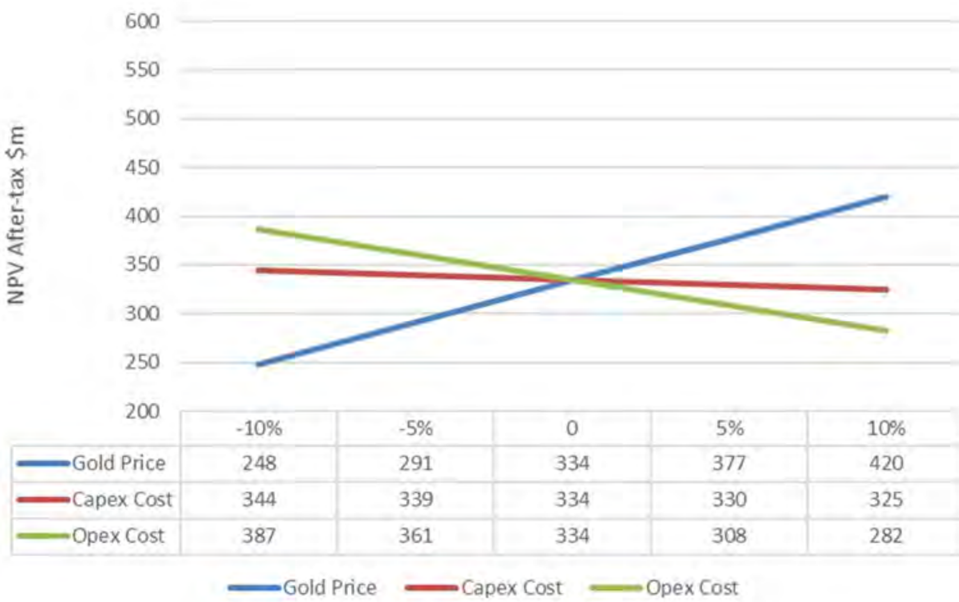


Table 22-7: Los Filos Mine Net Present Value Sensitivity Table at 5% Discount Rate for Capital Expenditure and Operational Expenditure

CAPEX and OPEX Sensitivity at US$1,200/oz Au		
CAPEX (US$M)	**%**	**OPEX (US$M)**
344	-10%	387
339	-5%	361
334	0%	334
330	5%	308
325	10%	282

Table 22-8: Los Filos Mine Gold Price and Discount Rate Sensitivity Table (figures in US$ million)

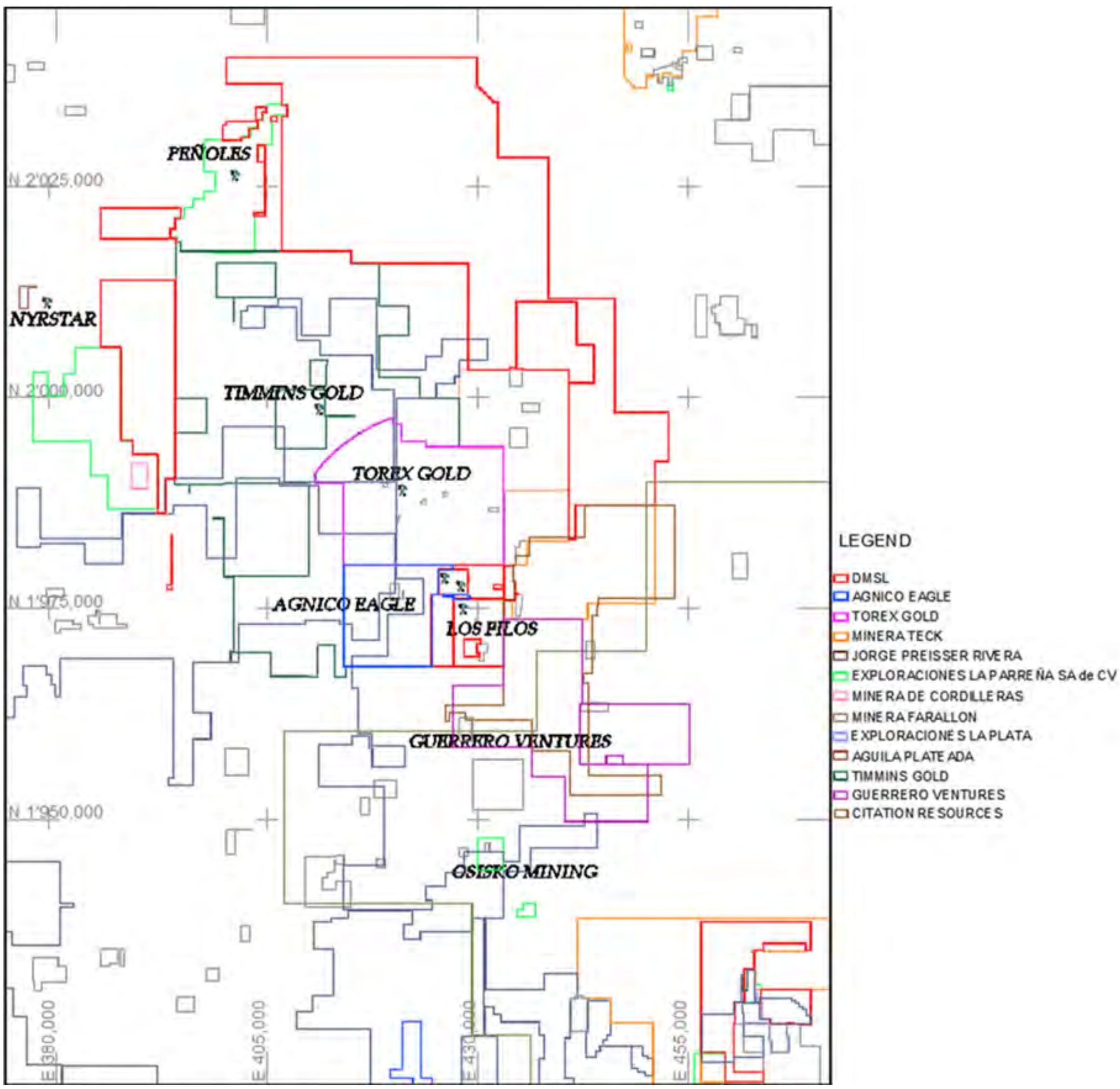
Gold Price	Discount Rate		
	0%	**5%**	**10%**
US$1,100/oz	301	263	232
US $1,150/oz	341	299	265
US $1,200/oz	382	334	297
US $1,250/oz	422	370	329
US $1,300/oz	463	406	361

As part of ongoing efforts to increase efficiencies and adjust to changing metals prices, it is expected that the LOM plan may be altered on a year-to-year basis.

23.0 ADJACENT PROPERTIES

The Los Filos Mine property is located in the Guerrero Gold Belt, near other mines, advanced projects, and properties belonging to Torex Gold (El Limon – Los Guajes mine), Timmins Gold (Ana Paula Project), Nyrstar (Campo Morado Mine), Agnico Eagle (Los Calles property), Osisko Mining, and Guerrero Ventures. Concessions held by public and private companies in the region are shown in Figure 23-1.

Figure 23-1: Regional Adjacent Mining Concessions and Mining Operations



Note: Prepared by Stantec, 2017.

There are 39 concessions held by DMSL; 30 of these concessions constitute the Los Filos Mine property, and the other 9 concessions are regional exploration properties.

The Guerrero Gold Belt has gold skarn mineralization associated with Tertiary intrusives within carbonate rocks. This mineralization is present in the various deposits on the Los Filos Mine property and at El Limon mine and other nearby prospects.

24.0 OTHER RELEVANT DATA AND INFORMATION

24.1 Summary of Concept Study – Bermejal Underground

From 2012 to 2015, a large open-pit Mineral Resource of 4.2 Moz Au (157 Mt at 0.82 g/t) was identified by Goldcorp on the perimeter of the Bermejal intrusive (skarn) beneath the north wall of the Bermejal Open Pit (see Figure 24-1). This was considered marginal mineralization by open pit means because of the high stripping ratio of approximately 5:1 (see Figure 24-2). It was decided to evaluate this material as an underground resource rather than an open pit resource to allow further study on the deposit. A concept study was prepared by Goldcorp and updated by Stantec in September 2016, which analyzed the resource as one to be mined by underground methods.

Figure 24-1: Bermejal Underground Location Map

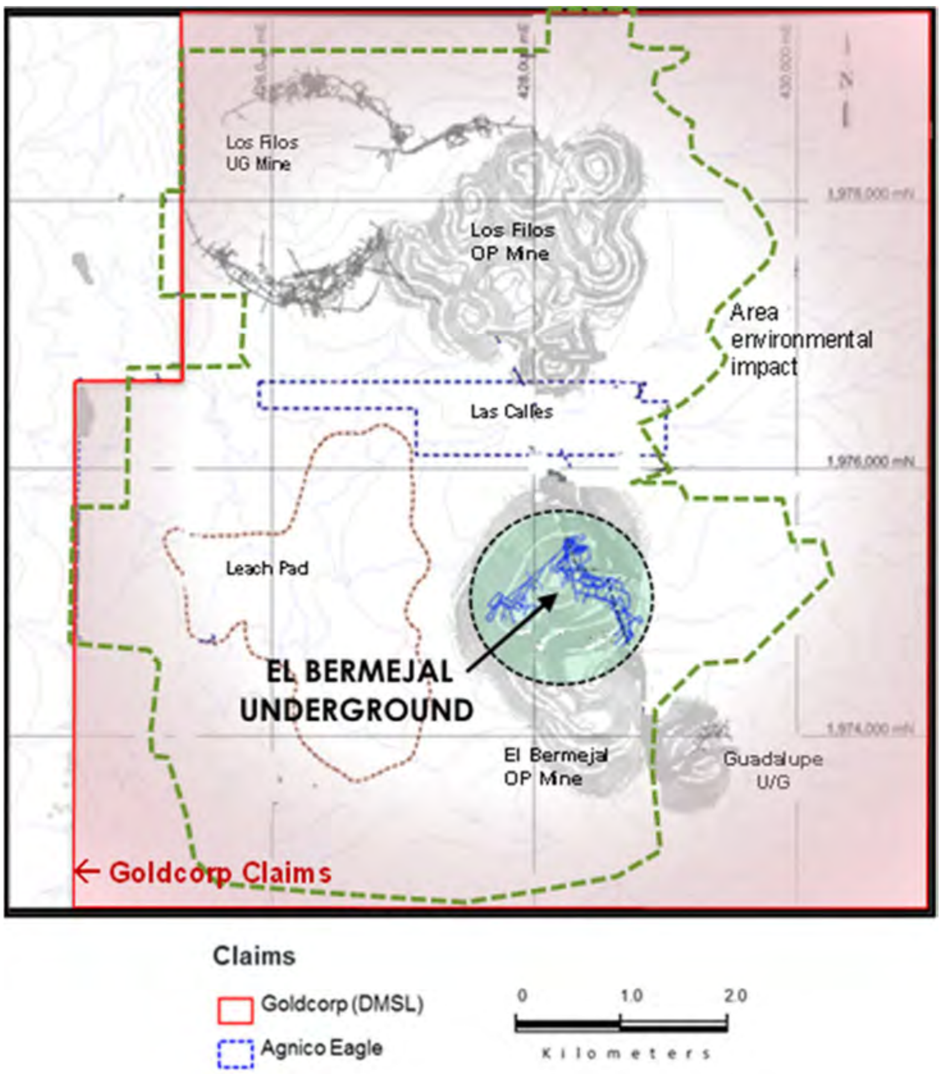


Figure prepared by Goldcorp, 2016

Figure 24-2: Bermejal Resource General Arrangement

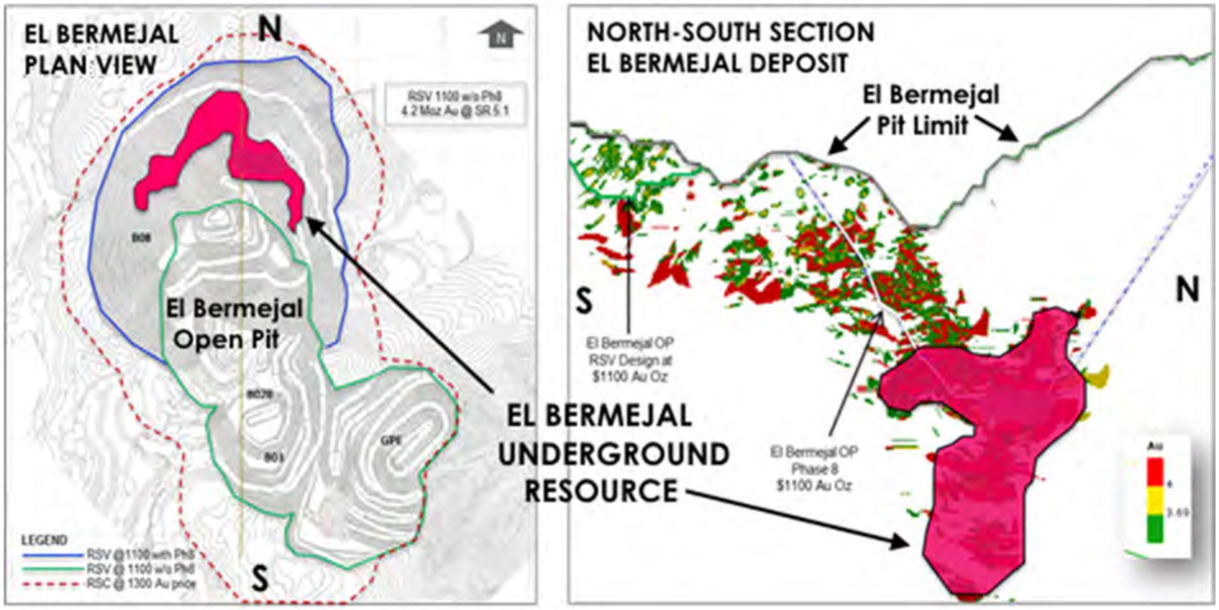


Figure prepared by Goldcorp, 2016

The study revealed that the underground resource has a potential bulk-tonnage core with additional resources unevenly distributed to the east and west (see Figure 24-3). The concept study identified Sublevel Caving and Cut-and-Fill mining as potential methods to mine the two different resource styles of the Bermejal Underground deposit.

Figure 24-3: Sublevel Caving and Cut-and-Fill Areas General Arrangement

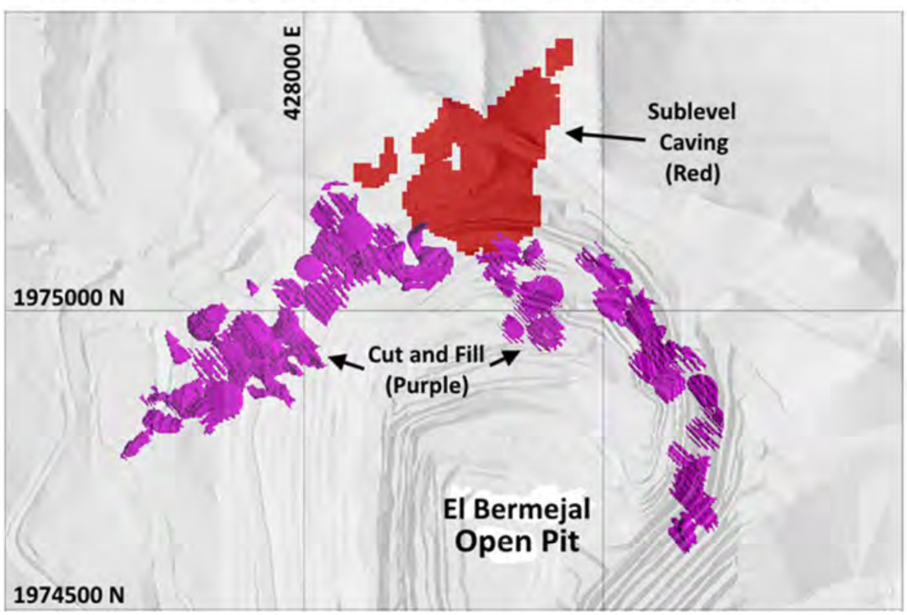


Figure prepared by Stantec, 2016

The concept study made recommendations for additional exploration holes to convert the Bermejal Underground resource into proven and probable reserves. This study also revealed operating efficiencies in site G&A and capital expenditure requirements that were not considered in previous studies, as well as further refinement of the underground mining schedule. For a future prefeasibility study, it was also recommended to evaluate alternative mining methods and consider a bulk sample ramp to access the resource and gain metallurgical and geotechnical data.

The updated concept study indicates that the Bermejal Underground deposit demonstrates positive economics with the potential to extend the mine life at Los Filos while lowering overall cash costs and AISC. Exploration potential exists at the Bermejal Underground deposit to increase its resources vertically and laterally.

The Bermejal Underground deposit is planned to be mined in parallel with the current operations; therefore, the outputs of the Bermejal Underground concept study could be considered incremental to Los Filos' existing operations.

24.1.1 Cutoff Grade

The cutoff grade design for the Bermejal Underground Deposit is estimated using the profit equation "Revenue − Cost", where the total profit takes the value of zero.

Current unit costs from Los Filos operations for processing and G&A activities were used for this study.

Operating costs were estimated based on similar current tasks being performed for the Los Filos Underground mining operations; other costs were obtained from similar underground operations given the level of effort for this study. Finally, a gold metal price of US$1,250/oz Au was used.

Two cutoff grades were determined for this study, one for Cut-and-Fill and one for Sublevel Caving mining methodologies (see Table 24-1).

Table 24-1: Cutoff Grades Determined for Cut-and-Fill and Sublevel Caving

Parameters	Unit	Cut-and-Fill	Sublevel Caving
Mining Cost	US$/t	68.71	35.00
Process Cost	US$/t	5.98	5.98
G&A	US$/t	24.39	25.00
Taxes	US$/t	1.03	1.03
Selling Cost	US$/t	0.64	0.64
Reclamation Cost	US$/t	0.57	0.57
Sustaining	US$/t	22.50	22.50
Total Cost	US$/t	123.82	86.57
Au Prices	US$/oz	1,250	1,250
Au Recovery	%	80	80
Au Cutoff Grade	g/t	4.28	3.14

Note: The cutoff grade was calculated using US$1,250/oz Au. The cutoff grade for each of the mining methods was used to generate the mine plan from the block model. The financial model was calculated with US$1,300/oz Au, but the cutoff grade and block model was not recalculated.

24.1.2 Geology

The Bermejal Underground deposit was discovered during the 2012 to 2015 drilling program, which was targeted to find a downward extension of the Bermejal Open Pit deposit, and resulted in the discovery of higher-grade gold mineralization in the skarn.

The current Bermejal Underground drill hole database includes 566 diamond drill holes. See Table 24-2.

Table 24-2: Bermejal Underground Drill Hole Database

Hole Type	Count	Meters
Diamond Drill Hole	566	188,745

The major rock types in the Bermejal Underground deposit are oxides, granodiorites, and carbonates, which is similar to the Bermejal Open Pit.

Additional drilling is currently being conducted on the Bermejal Underground resource. The primary purpose of these additional exploration holes is to convert current Inferred Resources to Indicated Resources and to further determine the extent of the deposit. There are also geotechnical holes being drilled that will assist in the determination of the mining method during the forthcoming prefeasibility study.

24.1.3 Resources Used for the Underground Mine Design

The database used was the year-end 2015 resource model. The characteristics of the model are as follows (see Table 24-3).

- Official Name of the File: mb_be_DEEP20160111
- Block Size: 3 m × 3 m × 3 m
- Capping: Au = 40 g/t (statistically derived)
- Origin of the Model: X = 1,973,000, Y = 427,400, and Z = 450 m
- Number of Blocks on Each Axle: NX = 667, NY =1,000, and NZ = 484 m

Table 24-3: Bermejal Underground (Mine Stope Optimizer) Resource

Method	Resource Type	Tonnes (‘000)	Au (g/t)	Ag (g/t)	Au (koz)	Ag (koz)
Cut-and-Fill	Measured	8	6.22	72.80	2	20
	Indicated	1,598	8.42	15.52	433	797
	Inferred	252	7.20	31.24	58	253
Sublevel	Measured	5	3.06	7.45	0	1
	Indicated	3,120	5.74	25.80	576	2,588
	Inferred	3,917	4.91	26.28	619	3,310

Note: Summation errors may be present due to rounding.

24.1.4 Mine Access Selection

A concept-level analysis was performed on four possible options to access the resource for underground mining (see Figure 24-4 and Figure 24-5). The advantages and disadvantages of each were reviewed.

- Option 1 – Access by Guadalupe mine.
- Option 2 – Access by the South Zone.
- Option 2a – Access by the Los Diegos mine.
- Option 3 – Access by a shaft or raisebore with a service ramp at the waste dump.
- Option 4 – Access from the current bottom elevation of Bermejal Open Pit.

Figure 24-4: Mine Access Options – Plan View

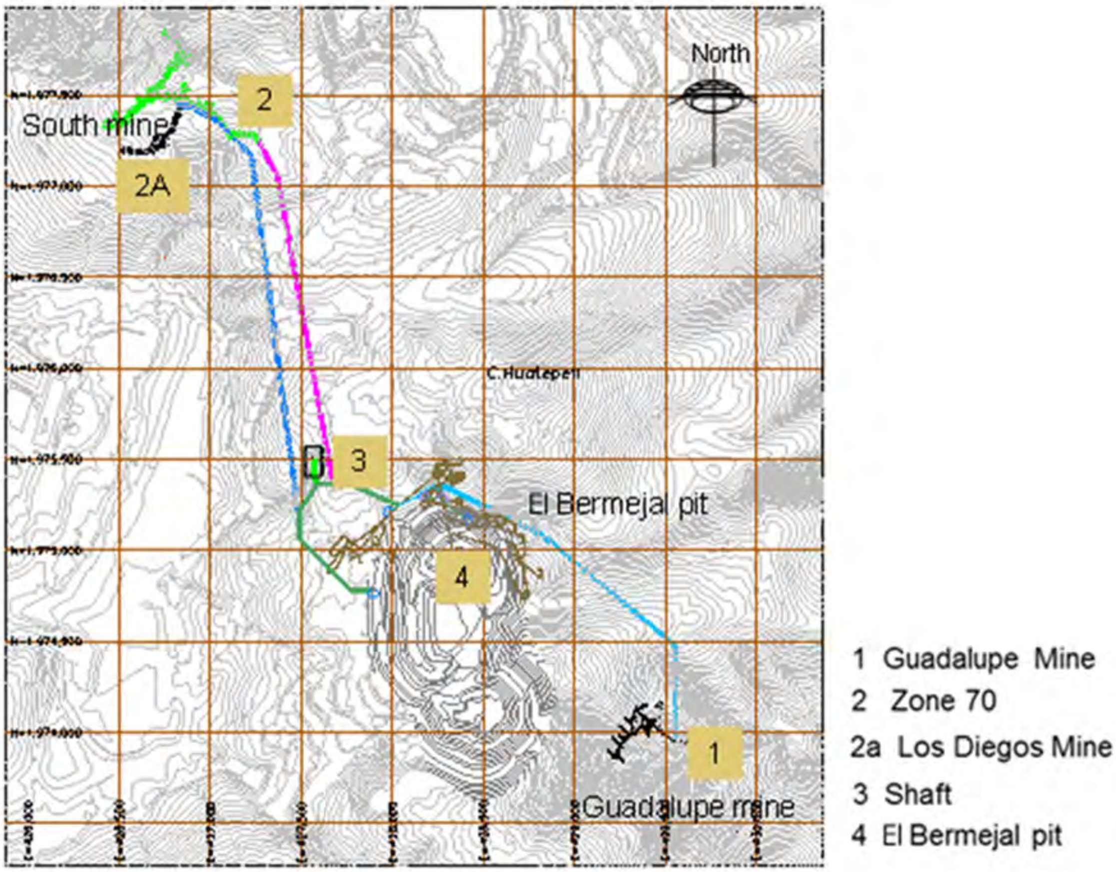
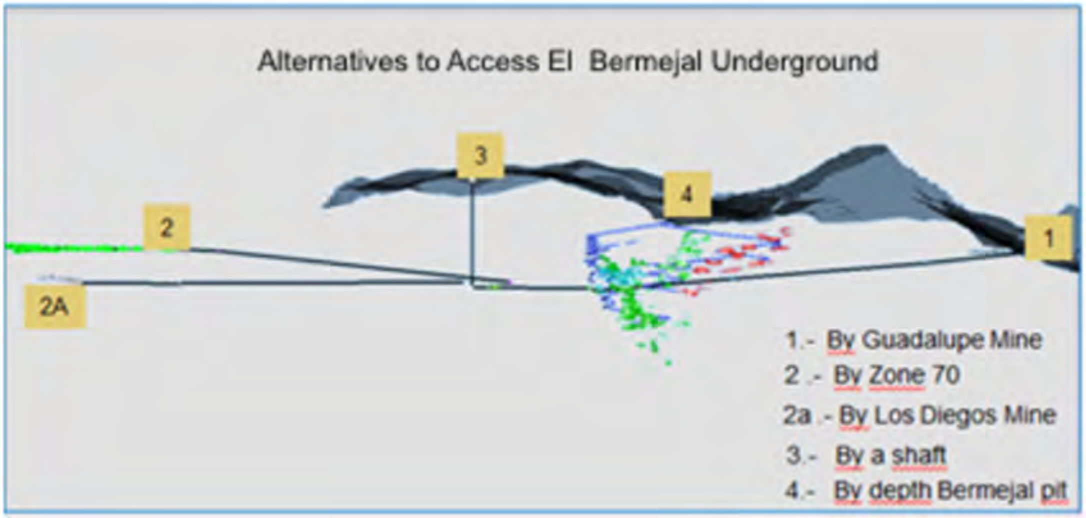


Figure 24-5: Map of Access Alternatives, Section View



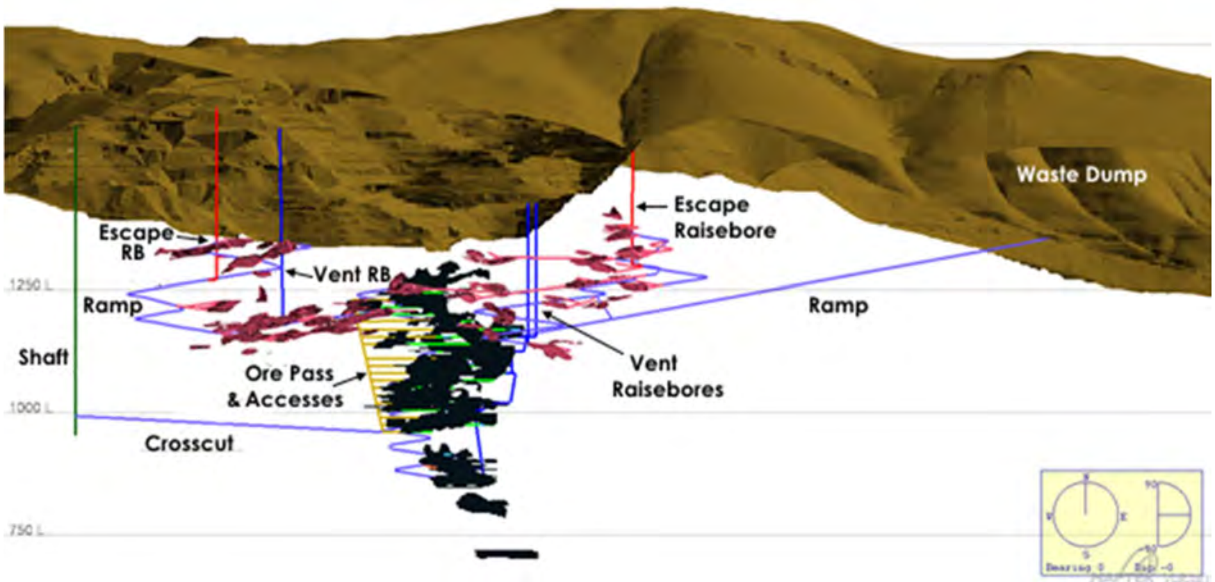
24.1.5 Mine Access Design Criteria

The following is a list of criteria for the Bermejal Underground access design.

- The design of main accesses will be in limestone, as it is better quality rock.
- The average advance rate for main ramp is 3.0 m/d.
- The advance rates for lateral development for Sublevel Caving are 9.0 m/d.
- The advance rates for lateral development for Cut-and-Fill are 6.0 m/d.
- The maximum gradient of the main ramp is 12%.
- The access ramps will have an excavation profile of 4.5 m × 4.0 m.
- The haulage drift will have an excavation profile of 4.5 m × 4.0 m.
- The ore passes and ventilation raise accesses for Sublevel Caving will have an excavation profile of 4.0 m × 4.0 m.
- The ore passes and ventilation raises for Cut-and-Fill will have an excavation profile of 2.1 m in diameter.

Figure 24-6 illustrates the initial underground mine access development and the underground block model for the concept study.

Figure 24-6: Underground Mine Development



24.1.6 Mining Method Selection

Several mining methods were investigated, and two methods were chosen.

- Cut-and-Fill (accounts for 20% of production). This is the current mining method in the Los Filos Underground mines. See Figure 24-7.
- Sublevel Caving (accounts for 80% of production). See Figure 24-8.

Figure 24-7: Cut-and-Fill Mining Method

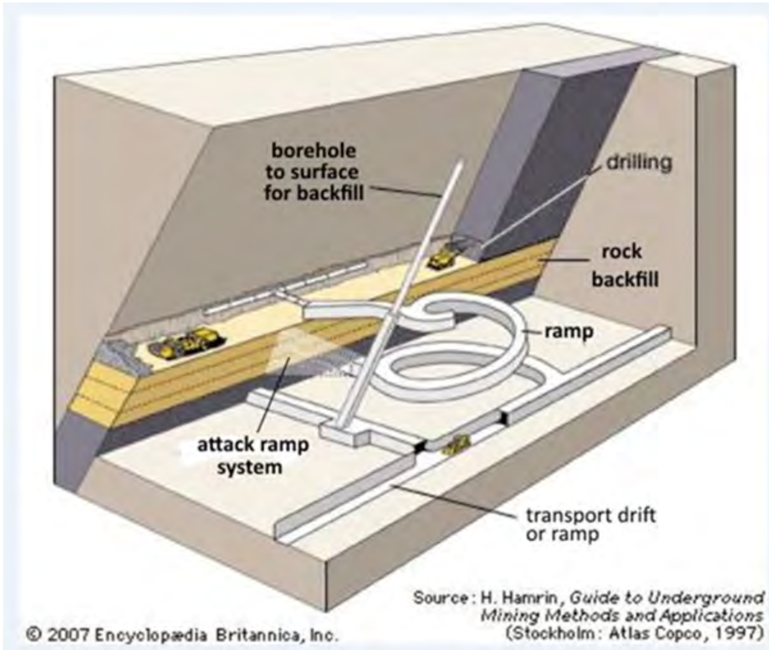
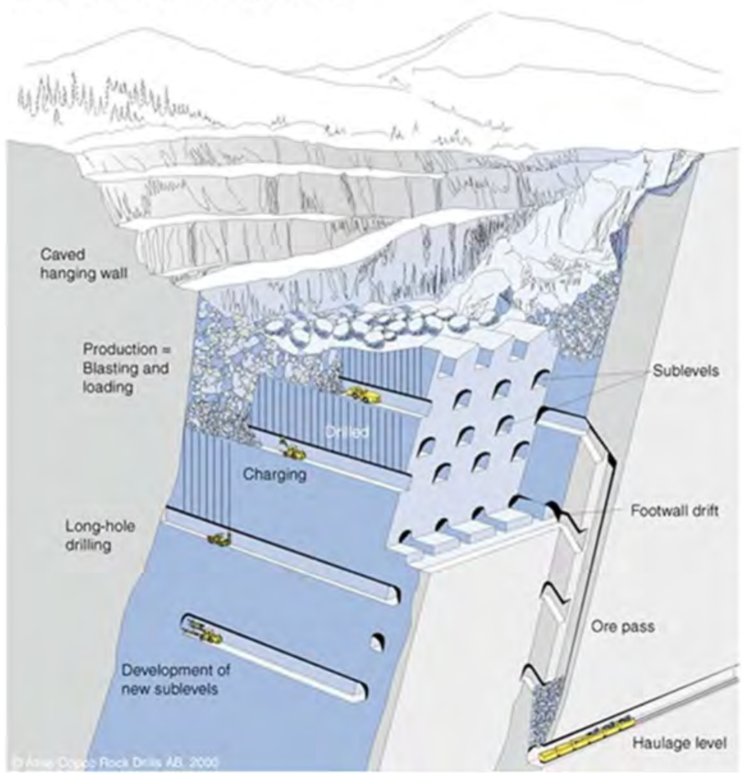


Figure 24-8: Sublevel Caving Mining Method



Stantec recommended that, during the forthcoming prefeasibility study, bulk underground mining methods be reviewed in more detail. The geotechnical data for the Bermejal Underground deposit will assist in determining if methods such as Sublevel Caving are appropriate for the deposit. A bulk mining method would allow for mining larger volumes at lower cutoff grades.

Los Filos management has proposed to develop a bulk sample ramp to access the mineralized body. This ramp would also serve as a production or service ramp once production is initiated. There is a plan to analyze different access options to the ore body via trade-off during the prefeasibility study.

An external mining dilution rate was incorporated into the Cut-and-Fill mining at 10% and the Sublevel Caving at 20%. The average grade of wall rock material bounding the mineralized zones is typically over 1 g/t; therefore, the diluting material is assumed to be 1 g/t.

Geotechnical

A concept-level study was completed by Goldcorp (2016) that presented bulk mining methods and mine access alternatives. CNI (2015) prepared a high-level geotechnical characterization for the Bermejal Open Pit and the geotechnical block model. The area of the Bermejal Underground appears to be dominated by low RQD and low rock strength. Prefeasibility-level geotechnical assessments will be undertaken to include drilling of 12 or more oriented core holes, 3 geotechnical logging core holes, and sampling and laboratory testing for intact rock characterization.

The central Bermejal Underground resource presents a footprint of 200 m × 350 m that may be amenable to bulk mining methods. The mining model contains a combination of Cut-and-Fill and Sublevel Caving mining methods. For production assumptions, an estimated breakdown of 20% of the tonnes mined through Cut-and-Fill and 80% through Sublevel Caving was adopted.

Geological conditions on Bermejal Underground require a full geotechnical assessment and a rock mass characterization to support the use of a bulk mining method. Further study is required for the ventilation raises relative to the location of sills with poor rock quality. There is a need to investigate the mining-induced stresses caused by bulk mining methods in the lower levels of the sequence. Bulk mining methods, such as Sublevel Caving, introduce ground control risks, so the adoption of Underhand Cut-and-Fill or other Longhole Stoping methods could be considered.

A concept-level study was completed by Goldcorp-Stantec (2016) that discusses mining methods and mine access alternatives. No Bermejal Underground-specific geotechnical drilling or characterization has been developed, which is proposed for the prefeasibility study.

Geology appears well understood; however, a formal geotechnical assessment that provides a structural framework or a rock mass characterization has not been completed to support Sublevel Caving or vent raises. The main control to implementing Sublevel Caving is the mining-induced stresses in the lower / drawing levels in the sequence and in nearby infrastructure, such as vent raises.

This remains an economically attractive alternative, but posed with significant ground control risks; adoption of Underhand Cut-and-Fill or Longhole Stopes could be considered. Issues in the geomechanical database as indicated in Section 16.1.7 could result in conservative estimates of the rock mass and hydraulic radii.

24.1.7 Production and Schedule

Table 24-4 presents the schedule for Sublevel Caving and Cut-and-Fill operations and Table 24-5 shows the underground production plan.

Table 24-4: Bermejal Underground Development and Production Schedule

Description	Units	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Vertical Development														
Ore Pass	m	0	0	0	0	0	285	0	0	0	0	0	0	285
Ventilation Raise – Cut-and-Fill	m	0	0	321	513	351	264	0	0	0	0	0	0	1,449
Ventilation Raise – Sublevel Caving	m	0	390	0	309	0	0	0	0	0	0	0	0	699
Ramp	m	1,050	2,355	2,622	1,524	1,062	906	0	0	0	0	0	0	9,519
Footwall and Haulage	m	0	42	690	750	450	600	600	600	618	0	0	0	4,350
Accesses	m	0	156	90	576	810	516	534	510	540	0	0	0	3,732
CAPEX Lateral Total	**m**	**1,050**	**2,553**	**3,402**	**2,850**	**2,322**	**2,022**	**1,134**	**1,110**	**1,158**	**0**	**0**	**0**	**17,601**
Stope Access	m	0	597	798	1,350	1,878	2,148	600	600	0	0	0	0	7,971
OPEX Lateral Total	**m**	**0**	**597**	**798**	**1,350**	**1,878**	**2,148**	**600**	**600**	**0**	**0**	**0**	**0**	**7,971**
Robbins	m	0	390	972	822	351	549	0	0	0	0	0	0	3,084
Vertical Total	**m**	**0**	**390**	**972**	**822**	**351**	**549**	**0**	**0**	**0**	**0**	**0**	**0**	**3,084**
Total	**m**	**1,050**	**3,540**	**5,172**	**5,022**	**4,551**	**4,719**	**1,734**	**1,710**	**1,158**	**0**	**0**	**0**	**28,656**

Table 24-5: Bermejal Underground Production Plan

Description	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12
Cut-and-Fill													
Rate	—	None	None	Initial	Initial	Initial	Initial	Initial	Initial	Initial	Initial	Initial	Initial
Tonnes (kt)	2,044	—	—	875	875	294	—	—	—	—	—	—	—
Au g/t	—	—	—	7.59	7.59	7.59	—	—	—	—	—	—	—
Ag g/t	—	—	—	16.28	16.28	16.28	—	—	—	—	—	—	—
koz Au (contained)	499	—	—	214	214	72	—	—	—	—	—	—	—
koz Ag (contained)	1,070	—	—	458	458	154	—	—	—	—	—	—	—
Sublevel													
Rate	—	None	None	None	None	Initial	Full	Full	Full	Full	Full	Full	Full
Tonnes (kt)	8,461		—	—	—	875	1,750	1,750	1,750	1,750	586	—	—
Au g/t	—	—	—	—	—	4.56	4.56	4.56	4.56	4.56	4.56	—	—
Ag g/t	—	—	—	—	—	21.70	21.70	21.70	21.70	21.70	21.70	—	—
koz Au (contained)	1,242	—	—	—	—	128	257	257	257	257	86	—	—
koz Ag (contained)	5,902	—	—	—	—	610	1,221	1,221	1,221	1,221	409	—	—
Total													
Tonnes (kt)	10,505	—	—	875	875	1,19	1,750	1,750	1,750	1,750	586	—	—
Au g/t	—	—	—	7.59	7.59	5.33	4.56	4.56	4.56	4.56	4.56	—	—
Ag g/t	—	—	—	16.28	16.28	20.34	21.70	21.70	21.70	21.70	21.70	—	—
koz Au (contained)	1,741	—	—	214	214	200	257	257	257	257	86	—	—
koz Ag (contained)	6,972	—	—	458	458	764	1,221	1,221	1,221	1,2221	409	—	—

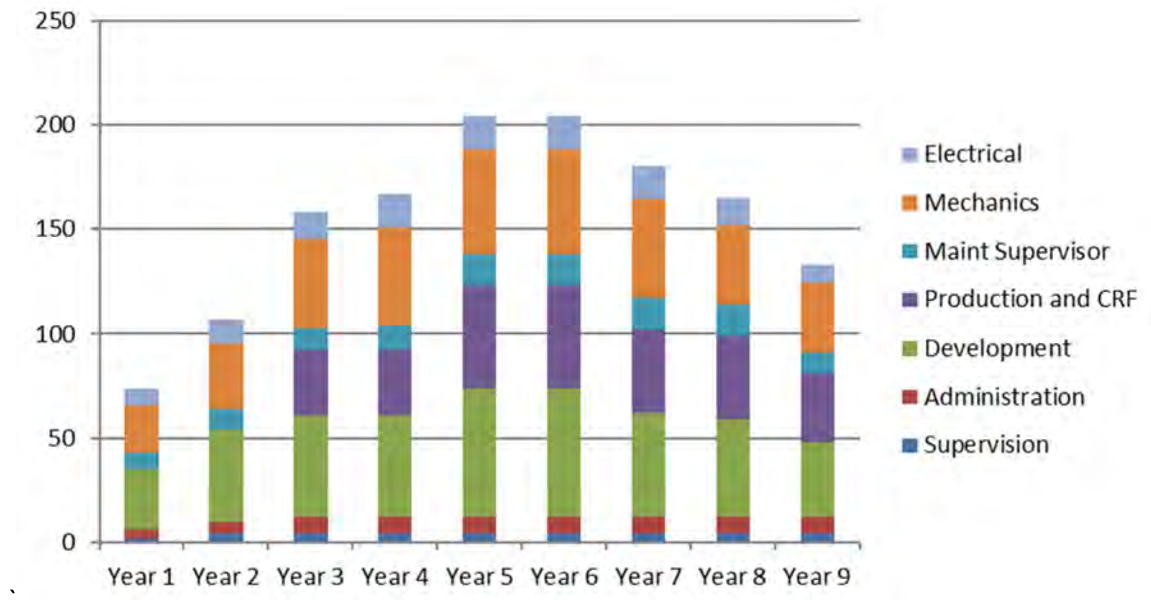
Note: Summation errors may be present due to rounding.

Initial production of 2.5 kt/d is expected to begin 24 months after the start of preparatory work. Toward the end of Year 3 of production, full production can begin at 5 kt/d.

24.1.8 Employees

The estimated staff totals, organized by type, are provided in Figure 24-9.

Figure 24-9: Total Staff



24.1.9 Processing and Recoveries

The site recovery model was updated in 2016. The Bermejal Underground gold recovery is estimated to be 80%, which is the same as the Los Filos Underground.

24.1.10 Production Schedule

The underground mine plan includes all existing Mineral Resources of the Bermejal Underground deposit (Table 24-6).

Table 24-6: Bermejal Underground Concept Study Mine Plan

Description	Units	2019	2020	2021	2022	2023	2024	2025	2026	Total
Bermejal Underground	kt	875	875	1,169	1,750	1,750	1,750	1,750	586	10,505
	g/t Au	7.59	7.59	5.33	4.56	4.56	4.56	4.56	4.56	5.15
	koz Au (contained)	214	214	200	257	257	257	257	86	1,741

Note: Summation errors may be present due to rounding.

The concept study was then used as the basis for the PEA.

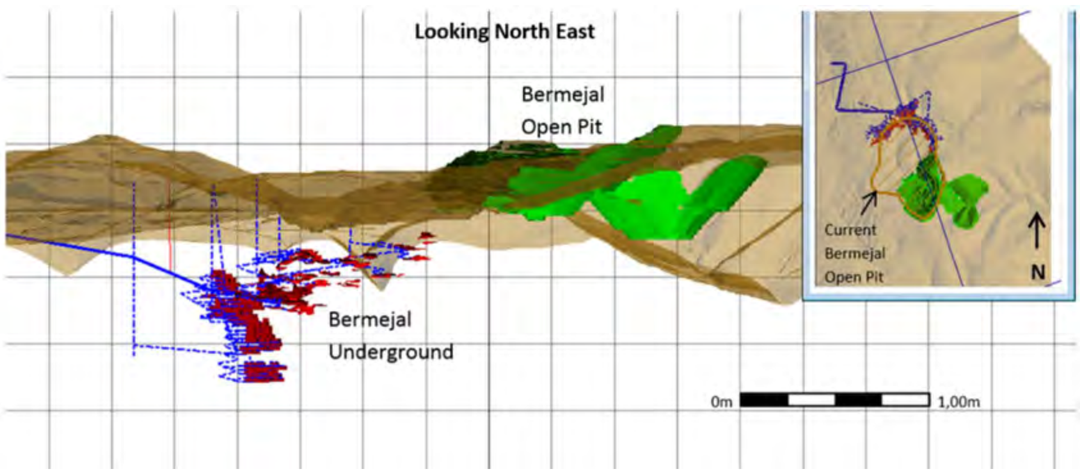
24.2 Economic Summary

24.2.1 Preliminary Economic Assessment – Bermejal Underground

As part of the technical report, a PEA was prepared and is presented for the Bermejal Underground deposit. The deposit would be developed and mined concurrently with the Los Filos Mine and, therefore, the project economic analysis uses the additional capital costs and operating costs required to develop and operate this project in conjunction with the current Mine. The PEA is preliminary in nature; it includes Inferred Mineral Resources that are considered too speculative geologically to apply economic considerations that would enable them to be categorized as Mineral Reserves. There is also no certainty that the PEA will be realized.

The geology and mineralization of the Bermejal Underground deposit is similar to the other deposits on the Los Filos Mine property. The deposit is a gold-silver skarn developed at the contact of the Bermejal intrusive within the Morelos Formation carbonate rocks. The mineralization is typically oxide minerals (hematite, limonite, magnetite) with small amounts of sulfides (pyrite, chalcopyrite). See Figure 24-10 for the location and preliminary mine design for the Bermejal Underground deposit.

Figure 24-10: Bermejal Underground Preliminary Economic Assessment Cross Section



Although an open pit mineral resource of 4.2 Moz Au (157 Mt at 0.82 g/t Au using a US$1,400/oz Au pit shell) was identified at Bermejal, only a portion is amenable to underground mining. The Bermejal Underground deposit is below and separate from the current Bermejal Open Pit Mineral Reserves. The portion of the Mineral Resource that could, therefore, be mined from underground is provided in Table 24-7.

Table 24-7: Bermejal Underground Mineral Resource (Preliminary Economic Assessment)

Classification	Tonnes (kt)	Au Grade (g/t)	Au Contained (koz)	Ag Grade (g/t)	Ag Contained (koz)
Measured	13	5.08	2	49.27	21
Indicated	4,722	6.65	1,009	22.30	3,385
Total Measured and Indicated	4,735	6.65	1,012	22.37	3,406
Inferred	4,173	5.05	678	26.55	3,563

Notes:

The dilution yields the 10,505 Mt at 5.15 g/t. Summation errors may be present due to rounding.

Summation errors may be present due to rounding.

Initial metallurgical testwork on samples from the Bermejal Underground deposit show it is similar to the Los Filos Underground ores regarding gold recovery. Column and bottle tests were performed on the resource to test its amenability for heap leaching, and agitated leach tests were performed to estimate the recovery of the resource if it was milled. The leach tests estimate approximately 75% to 90% recovery and the ground leach tests had recoveries of approximately 88% to 97%, with a 65 µm grind using 7 g/t Au to 10 g/t Au material.

The cyanide consumption was normal, with no cyanide-robbing constituents in the material tested. Gold recoveries were assumed to be 80%, which is supported by initial testwork and gold recoveries observed in similar mineralization in the Los Filos Underground deposits.

Existing surface infrastructure and processing facilities at the Los Filos Mine property are sufficient to support the addition of the Bermejal Underground project.

24.2.2 Bermejal Underground Mine Plan

The PEA has selected service ramps as the mine access method. The resource would be mined by a combination of Sublevel Caving (80% of production) and Cut-and-Fill (20% of production) mining methods. Cut-and-Fill mining is already in use at the Los Filos Underground mine.

The tonnes and grade were estimated assuming the application of the following underground mining methods on portions of the deposit.

- Sublevel Caving: 3.10 g/t Au cutoff at US$1,300/oz Au
- Cut-and-Fill: 4.28 g/t Au cutoff at US$1,300/oz Au

Bermejal Underground will be reported as a Mineral Resource until additional infill drilling and study work is completed and the project is advanced to a prefeasibility-study level. The PEA found that access ramps from surface was the most efficient way to access the mineralization.

The underground mine plan includes all existing Mineral Resources of the Bermejal Underground deposit (Table 24-8).

Table 24-8: Bermejal Underground Preliminary Economic Assessment Mine Plan

Description	Units	2019	2020	2021	2022	2023	2024	2025	2026	Total
Bermejal Underground	kt	875	875	1,169	1,750	1,750	1,750	1,750	586	10,505
	g/t Au	7.59	7.59	5.33	4.56	4.56	4.56	4.56	4.56	5.15
	koz Au (contained)	214	214	200	257	257	257	257	86	1,741

Note: Summation errors may be present due to rounding.

24.2.3 Capital and Operating Costs

The capital and operating costs assumed for the Bermejal Underground PEA are based on cost estimates by Stantec for underground development and mining as well as historical and budget costs for processing and G&A by the Los Filos Mine (Table 24-9 and Table 24-10).

Table 24-9: Bermejal Underground Preliminary Economic Assessment Capital Cost Schedule (Figures in US$ Million)

CAPEX Summary	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Development Cost	2.1	9.6	11.9	8.6	4.9	4.6	2.2	2.1	2.2	—	48.1
Equipment Purchases	0.0	10.0	15.0	15.0	10.0	0.0	0.0	0.0	0.0	—	50.0
Infrastructure and Services	3.2	11.1	2.0	0.7	0.1	0.0	0.0	0.0	0.0	—	17.1
Indirect	1.1	2.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	—	3.5
Sustaining	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	—	0.5
Exploration	0.0	0.0	0.0	1.6	1.0	0.8	0.5	0.0	0.0	—	3.9
Reclamation	0.0	0.0	0.5	0.5	0.7	1.0	1.0	1.0	1.0	0.3	6.0
Contingency of 20%	1.3	6.6	5.8	5.2	3.2	1.1	0.5	0.4	0.4	0.0	24.6
Total Cost	7.7	39.4	35.6	31.7	20.0	7.5	4.2	3.5	3.6	0.3	153.6

Note: Summation errors may be present due to rounding.

Table 24-10: Bermejal Underground Preliminary Economic Assessment Operating Cost Schedule

OPEX	Units	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Cut-and-Fill	US$/t	79.13	79.13	79.13	79.13	79.13	79.13	79.13	79.13	79.13	79.13
Sublevel Caving	US$/t	38.73	38.73	38.73	38.73	38.73	38.73	38.73	38.73	38.73	38.73
Process	US$/t	—	—	6.42	6.42	6.42	6.42	6.42	6.42	6.42	6.42
G&A	US$M/yr	3.0	3.0	3.0	3.0	3.0	3.0	5.0	7.9	7.9	7.9
Reclamation Costs	US$/t	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57

24.2.4 Preliminary Economic Assessment Economic Analysis

Table 24-11 presents a summary of the Mine production for the Mineral Resources.

Table 24-11: Bermejal Underground Preliminary Economic Assessment Gold Production Plan

Description	Units	2019	2020	2021	2022	2023	2024	2025	2026	Total
Bermejal Underground	koz Au	171	171	160	206	206	206	206	69	1,392

Note: Summation errors may be present due to rounding.

At US$1,300/oz, the after-tax NPV, at a 5% discount rate, is US$488M, and the after-tax internal rate of return (IRR) is 107%. The LOM average cash cost per ounce is US$432, net of silver credits, and with the addition of royalties and sustaining capital, the LOM average AISC/oz is US$439.

Figure 24-11 outlines the NPV related to gold price and capital and operating costs. Table 24-12 outlines the NPV sensitivities related to capital and operating costs. Table 24-13 outlines the NPV sensitivities related to the gold price and discount rate. Table 24-14 outlines the IRR sensitivities related to gold price.

Figure 24-11: Bermejal Underground Preliminary Economic Assessment Sensitivity Chart

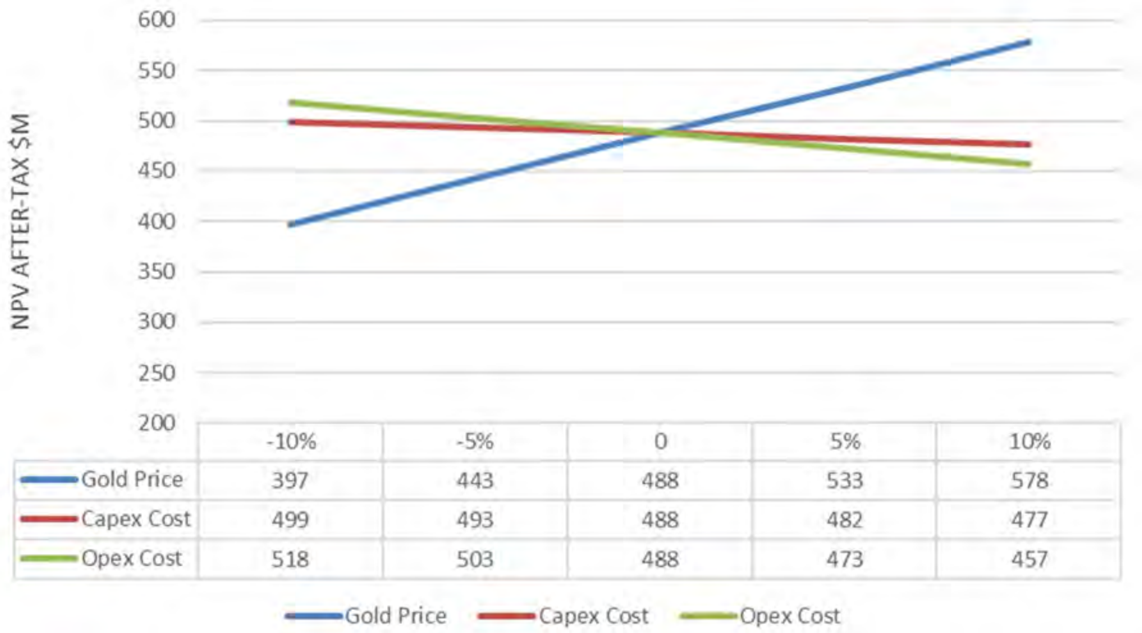


Table 24-12: Bermejal Underground Preliminary Economic Assessment Net Present Value Sensitivity Table at 5% Discount Rate for Capital Expenditure and Operational Expenditure

CAPEX and OPEX Sensitivity at US$1,300/oz Au		
CAPEX (US$M)	**%**	**OPEX (US$M)**
499	-10%	518
493	-5%	503
488	0%	488
482	5%	473
477	10%	457

Table 24-13: Bermejal Underground Preliminary Economic Assessment Gold Price and Discount Rate Sensitivity Table (Figures in US$ Million)

Gold Price	Discount Rate		
	0%	**5%**	**10%**
US$1,200/oz	564	418	315
US$1,250/oz	609	453	343
US$1,300/oz	654	488	370
US$1,350/oz	699	522	398
US$1,400/oz	744	557	425

Table 24-14: Bermejal Underground Preliminary Economic Assessment Internal Rate of Return Sensitivity Table

Gold Price Sensitivity	
Gold Price	**After-Tax IRR**
US$1,200/oz	94%
US$1,250/oz	101%
US$1,300/oz	107%
US$1,350/oz	114%
US$1,400/oz	120%

Table 24-15: Bermejal Underground Preliminary Economic Assessment Cash Flow

Description	Unit	LOM Total	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Mining Schedule												
Underground mining												
Total tonnes mined	Mt	10.5	0.0	0.0	0.9	0.9	1.2	1.8	1.8	1.8	1.8	0.6
Au grade - mined	g/t	5.15	0.00	0.00	7.59	7.59	5.33	4.56	4.56	4.56	4.56	4.56
Contained Au	oz	1,740,589	0	0	213,547	213,547	200,115	256,842	256,842	256,842	256,842	86,013
Processing Schedule												
Total tonnes processed	Mt	10.5	0.0	0.0	0.9	0.9	1.2	1.8	1.8	1.8	1.8	0.6
Au grade - processed	g/t	5.15	0.00	0.00	7.59	7.59	5.33	4.56	4.56	4.56	4.56	4.56
Contained Au	oz	1,740,589	0	0	213,547	213,547	200,115	256,842	256,842	256,842	256,842	86,013
Au recovery	%	80.0	0.0	0.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
Ag recovery	%	5.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Au production	oz	1,392,471	0	0	170,837	170,837	160,092	205,474	205,474	205,474	205,474	68,810
Total Ag production[1]	oz	348,638	0	0	22,899	22,899	38,211	61,046	61,046	61,046	61,046	20,444
Cash Flow Summary												
Gross revenue	US$M	1,810.2	0.0	0.0	222.1	222.1	208.1	267.1	267.1	267.1	267.1	89.5
Plus: Silver credits[1]	US$M	1.6	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.1
Less: Royalties	US$M	-9.1	0.0	0.0	-1.1	-1.1	-1.0	-1.3	-1.3	-1.3	-1.3	-0.4
Net Revenue	US$M	1,802.7	0.0	0.0	221.1	221.1	207.2	266.1	266.1	266.1	266.1	89.1
Operating Costs												
Underground mining	US$M	-489.4	0.0	0.0	-69.2	-69.2	-57.1	-67.8	-67.8	-67.8	-67.8	-22.7
Processing	US$M	-67.5	0.0	0.0	-5.6	-5.6	-7.5	-11.2	-11.2	-11.2	-11.2	-3.8
Site G&A	US$M	-46.7	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-5.0	-7.9	-7.9	-7.9
Total operating costs	US$M	-603.6	-3.0	-3.0	-77.9	-77.9	-67.6	-82.0	-84.0	-86.9	-86.9	-34.4
Operating Margin (mine EBITDA)	US$M	1,199.1	-3.0	-3.0	143.2	143.2	139.6	184.0	182.0	179.1	179.1	54.7
Expansionary capital	US$M	-147.1	-7.6	-39.1	-35.0	-31.2	-19.3	-6.5	-3.2	-2.5	-2.6	0.0
Sustaining capital	US$M	-0.5	-0.1	-0.3	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reclamation	US$M	-6.0	0.0	0.0	-0.5	-0.5	-0.7	-1.0	-1.0	-1.0	-1.0	-0.3
Special mining duty	US$M	-90.5	0.0	0.0	-10.8	-10.8	-10.5	-13.8	-13.7	-13.5	-13.5	-4.1
Income taxes	US$M	-300.9	0.0	0.0	-35.5	-36.3	-34.8	-46.9	-46.2	-45.3	-45.2	-10.6
Net after-tax cash flow	US$M	654.0	-10.7	-42.4	61.4	64.4	74.3	115.8	117.9	116.8	116.8	39.7

Table 24-15: Bermejal Underground Preliminary Economic Assessment Cash Flow

Description	Unit	LOM Total	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Cumulative after-tax cash flow	US$M		-10.7	-53.2	8.2	72.6	147.0	262.8	380.7	497.5	614.3	654.0
Cash cost per ounce (net Ag credits)	US$/oz	432	0	0	455	455	421	398	408	422	422	498
AISC per ounce	US$/oz	439	0	0	462	462	428	404	414	428	428	505

[1]Silver is sold to Silver Wheaton at US$4.26/oz, subject to a 1% annual inflation adjustment

24.2.5 Summary

Table 24-16 presents a summary of the production information on which the cash flow model is based and the key project economic measures. The expansion capital cost in the PEA Case assumes the execution of the Bermejal Underground as an expansion project.

The concept study is concurrent with the existing Los Filos mine and does not include production or economic information from Los Filos.

Table 24-16: Financial Summary

Economic Summary	Units	Los Filos Mine Reserves Only	Bermejal Underground PEA Case	
LOM Tonnage Ore Processed	kt	40,709	10,504	
LOM Strip Ratio	w:o	3:1	N/A	
LOM Feed Grade Processed	g/t Au	1.12	5.15	
LOM Au Recovery – Overall	%	69	80	
LOM Au Production	koz	1,256	1,392	
Production Period	yr	8	8	
Upfront Expansion Capital	US$M	N/A	47	
Au Average Annual Production	koz	157	174	
AISC per oz	US$/oz	803	439	
Au price	US$/oz	1,200	1,200	1,300
NPV – 0% Discount Rate (post-tax)	US$M	382	564	654
NPV – 5% Discount Rate (post-tax)	US$M	334	418	488
NPV – 10% Discount Rate (post-tax)	US$M	297	315	370
IRR (post-tax)	%	N/A	94	107

24.2.6 Recommendations

- The Bermejal Underground mineral resource is a project that warrants additional investigation. The PEA results show opportunity to add production and extend the Los Filos Mine life, with potential for a long-term source of feed for processing and replacing declining production while lowering AISC. The PEA shows a project with 174 koz/yr Au average annual output and an LOM of 8 years. This deposit could provide a steady source of quality feed while using the existing Mine infrastructure. The Bermejal Underground development could also provide exploration opportunities in adjacent areas and maintain work force continuity.
- Based on the PEA results, it is recommended to complete a Prefeasibility Study for Bermejal Underground.

25.0 INTERPRETATION AND CONCLUSIONS

The Los Filos mine is a large open pit and underground mining operation with an LOM plan producing over 155 koz/yr Au on average an AISC of US$803/oz. The LOM based on current Mineral Reserves and a total mining rate of 20 Mt/a is 8 years. Additional exploration in the immediate Mine area and on the Mine property provides opportunities for extending the Mine life.

The Qualified Persons have reviewed the data for this Report and provide the following opinions.

- The LOM plan based on Proven and Probable Mineral Reserves from the open pit and underground sources is reasonable.
- The PEA on the Bermejal Underground is a separate case based on lower confidence Mineral Resources and potentially could be mined concurrently with existing operations.

Claims and Ownership

- Goldcorp holds 100% of ownership in the Los Filos Mine property as of 31 December 2016 through its wholly owned Mexican subsidiary DMSL.
- DMSL controls a total of 39 concessions issued by Mexican authorities for exploration and exploitation, 30 of which cover all mineralized zones and mine infrastructure that are within the LOM plan. The concessions are valid for 50 years from granting and all are in good standing, with expiration dates ranging from 2036 to 2060.
- Renewable Surface Land agreements are in place for all access, infrastructure, open pit mining, and underground portals necessary for the LOM plan. There is some risk due to potential delays when negotiating renewals, but this is considered low risk due to long-term surface access agreements and proactive communications with the local land owners.
- There is a risk associated with land agreements and archeological permits for a mining phase of the Bermejal Open Pit, which may delay access to that phase in 2018. This risk can potentially be mitigated by rescheduling the mine plan.

Open Pit Mining Operations

- Ore production for the LOM plan is scheduled at approximately 5 Mt/a can be attained. The Los Filos Open Pit has a 2-year life and will operate from 2017 to 2019. The Bermejal Open Pit will be on standby until 2018 and will then operate from 2018 to 2024 when known open pit mineral reserves will be depleted.
- The LOM plan includes 101 koz Au in inferred material treated as waste.

Underground Mining Operations

- The current underground operating mines, the Norte and Sur, are scheduled to produce approximately 10% of the total ore produced at the Mine on an annual basis.
- The existing underground mines will operate from 2017 to 2023, at which time known mineral reserves from Los Filos Underground sources will be depleted.
- Primary underground development, including portals, ramps, and access drifts, is completed in the relatively competent limestone host rock. Ground support normally includes patterned bolts and screen. Shotcrete is used for additional ground support in many areas as directed by site geotechnical technicians.
- Mineralization in the underground mines is mainly an incompetent oxide ore with a low RQD. All ore headings are bolted and screened and have a 50 mm minimum skin of shotcrete applied.
- The underground mining method is Cut-and-Fill, using jumbo drill-and-blast, mucking by LHD scooptrams, and unconsolidated rock fill placed by LHD in the fill cycle.

- The tonnes-per-man-shift currently achieved by the underground operations is lower than industry standards for the Cut-and-Fill mining method. Obvious factors affecting productivity include ground support practices, fill cycles, and equipment selection.
- An experimental stope using Underhand Cut-and-Fill mining methods employs Drill-and-Blast plus non-Drill-and-Blast mining methods and cemented rock fill. This is showing preliminary promise for increasing stope efficiencies.

Exploration

- Exploration potential for lateral and dip extensions to the Bermejal Underground mineral resource is evident. Further exploration of the skarn mineralization occurring at the carbonate/intrusive contact is warranted.
- Other exploration potential includes extensions to mineralization in the existing deposits in the Los Filos Open Pit and Bermejal Open Pit areas. Additional exploration potential also remains around the Los Filos intrusive body and in the Bermejal-Guadalupe corridor, particularly in the vicinity of the southern extension of the Bermejal intrusion. The Xochipala area to the south of the Mine property also retains exploration interest.

Sampling Methods and Available Data

- Sample preparation and sampling methods meet industry-standard practice and are adequate for Mineral Resource and Mineral Reserve estimation and mine planning purposes.
- Data verification was performed by external consultant firms and Los Filos personnel and a reasonable level of verification has been completed. The Qualified Person has reviewed the available data and appropriate reports and has also completed data verification for the data used in the preparation of the Mineral Resources and Mineral Reserves. The Qualified Person is of the opinion that the data verification programs undertaken on the drill and RC data collected adequately support the geological interpretations and the analytical and database quality.
- Diamond drill core, RC drill data, and channel sampling data were used to estimate mineral resources.
- Tests have been completed to determine specific gravity of the different mineral lithologies and are reasonable. In situ densities vary from 2.35 to 3.33 by lithology or a 30% spread.

Mineral Resources and Mineral Reserves

- Reconciliation results for Los Filos have shown variances between the long-range block model and the ore-control model on a bench-by-bench basis. This translates into a wide variance in results for shorter time periods, such as a calendar quarter. Over longer periods of time the comparisons are more reasonable.
- Reconciliation needs to be completed between the reserve block model and actual production numbers.
- Mineral Reserves, which have been estimated using drill data, appropriately consider modifying factors and have been estimated using industry best practices.
- The assay laboratory on Los Filos Site performs fire assays and AA assays for gold and is not fully accredited. This on-site assay laboratory was operated by SGS until 2014 and by Los Filos Site personnel since 2014. The site laboratory is used for production-related assays only.

Infrastructure

- The overall surface infrastructure of the property has been constructed to industry standards and found to be very conducive to support mining operations now and in the future.

Process and Gold Recovery

- Extensive bottle roll and column tests were previously conducted by consultants and outside laboratories. From these test results, metallurgical model inputs were established for determining gold recoveries for each ore zone.
- Gold recoveries used for each lithology and ore type are suitable for LOM estimates. The estimate of 5% Ag recovery is considered conservative.
- Sulfide-rich gold-bearing material is refractory in nature and currently not being processed; however, it is being stockpiled for possible future treatment by pressure oxidation technology.
- The recorded performance of the ADR plant in 2016 has been steady and meets acceptable operational criteria. Gold recovery from leachate (PLS) by carbon columns is excellent at over 98%.
- A key issue is the high attrition loss of carbon. The current carbon supplier is Calgon – Goldsorb 6/12. Testing is underway to find a replacement carbon that is less prone to attrition (e.g., Indocarb 1C55).
- During 2016, a total of 32.07 koz Au was recovered using a combination of drilling and reinjection of pressurized leach solution (Hydro-Jex), re-handling of inventory, and surface re-leaching. An active campaign is underway to recover up to 242 koz Au from material in incompletely leached or impermeable zones from Pad #1. The inventory has been the subject of investigations and recovery programs since 2015.
- Agglomeration using conveyor drop points are ineffective and may be consuming more lime and cement than is necessary. The potential for creating additional impermeable zones in the crush pads is a significant risk to gold recovery.
- The pH of the PLS is too low and cyanide is being lost. With effectively no cyanide in the PLS, gold and silver can be adsorbed on mineral surfaces.
- There is a need to reduce calcium sulfate content in the PLS and leaching solution.
- Tests show few deleterious or preg robbing materials that affect gold recoveries.
- Crushing capacity is reduced since no fines bypass exists at the crusher, which subsequently reduces throughput.
- Crush ore is re-handled at least seven times, causing inefficiencies and increasing the overall hauling/handling costs.

Environmental, Permitting, and Social or Community Impact

- There are no pumping systems in the underground design. To date, water inflow into the underground mines has been limited to induced drill water and minimal seepage during the rainy season. The groundwater system at the Mine is poorly understood and a comprehensive hydrogeological study has not been conducted.
- The current water balance indicated that the process water ponds have inadequate capacity for a non-routine event based on the conditions and water management practices at the time of the model; however, measures are being taken to address this issue and reduce the current level of water in the ponds.
- There are un-diverted fresh water springs underneath Pad #1.
- The Rio Balsas basin is more than adequate to supply the operational needs. The Iguala Aquifer also has availability for additional groundwater concessions.
- There are six areas that are pending classification from INAH. There is a risk that these areas will be restricted from entry. One area pending classification is within the 2018 Mine Plan.
- The permit has been granted to construct and operate the proposed surface access ramps for the exploration of Bermejal Underground and additional information is required regarding the financial bond for reclamation.
- Security instability in the State of Guerrero and in the region around the Mine area due to the presence of criminal groups could result in temporary disruptions to Los Filos Mine operations or impact employees outside of the workplace.
- Los Filos Site has implemented measures to isolate the mining operations from security issues present in the State of Guerrero.

- Security at the Los Filos Mine property and camp was found to be adequate; the current sociopolitical climate is unpredictable and security must be on alert.
- The mining operations have provided community development and employment opportunities.
- Sustainability programs have been implemented in the community to help mitigate the impact of eventual mine closure or work force reductions.
- The Los Filos LAU is based on approved environmental impact assessments, an environmental risk study, and land use change authorizations. Potential environmental impacts to surface soils, water, the ecology, and air quality are mitigated as part of the mining operations. Environmental monitoring is ongoing at the Mine and will continue over the remainder of the mine life.
- There is no comprehensive geochemistry study to determine the long-term potential for metals leaching and post-closure water management.
- Estimated closure costs appear reasonable based on the available information; however, more detailed studies are being undertaken to determine future impacts from mining operations. The estimated closure costs are appropriately funded by allocating a percentage of sales revenue as a bond to cover closure costs. Final closure costs take progressive reclamation strategies into account.
- Appropriate environmental permits have been granted for the Mine by the relevant Mexican Federal and State authorities.
- The Qualified Persons are not aware of any significant environmental, social, or permitting issues that would prevent continued exploitation of the Mine deposits. As of the Effective Date of this Report, environmental liabilities are limited to those that would be expected to be associated with an operating gold mine. The Los Filos Mine has strategies in place to manage compliance issues.

Capital and Operating Costs

- Capital costs were estimated using a combination of operating experience, the 2017 budget data, and written supplier quotes.
- Operating costs were estimated based on June 2016 actual costs, appropriately factored using a cost reduction plan over the LOM plan.

Economic Analysis on Los Filos Mine Reserves Only

- The economic analysis of the current Los Filos Mine shows that the operation is viable, producing positive cash flow every year and producing 1.26 Moz over an 8-year LOM. The NPV at a 5% discount rate at US$1,200/oz Au is US$334 million.
- A sensitivity analysis demonstrates that the Mine's financial outcome is most sensitive to variations in the gold price. The next most sensitive parameter is operating costs. Capital costs have the least influence on cash flows.
- The margin on higher-grade ore being produced from the Los Filos Underground is greater than the ore being produced by the open pit mines. As a result, increasing production rates from the existing underground operations provides an opportunity to improve operational efficiency and profitability.

Economic Analysis of the Bermejal Underground Preliminary Economic Assessment

- The economic analysis of the current Bermejal Underground PEA shows an average of 174 koz/yr for a total of 8 years, yielding 1.39 Moz.
- Upfront expansion capital is US$47 million and total capital costs are estimated at US$154 million.
- Average cash cost is US$432/oz and AISC is US$439/oz.
- The NPV at a 5% discount rate is US$488 million and IRR of 107% at US$1,300/oz Au.
- The project would be concurrent with existing operations and would benefit from the ability to use current infrastructure. Additional exploration and further studies are warranted for this project.

The Qualified Persons confirm the data was appropriately collected, evaluated, and estimated to support the continuation of mining operations and are not aware of any significant risk or uncertainty (except as already stated) that may materially affect the reliability or confidence of the Mineral Resource and Mineral Reserve estimates, estimated cost, or financial evaluations stated in this Report.

26.0 RECOMMENDATIONS

During the site visits in December 2016 and the preparation of this Report, the Qualified Persons reviewed operating procedures, methods, infrastructure, and historical data of the Los Filos Mine and make the following recommendations.

Exploration

- Continue with an active area exploration program.

Mineral Resources and Mineral Reserves

- Discontinue the use of underground channel samples for the estimation of Mineral Resource.
- Implement an ore reserve versus production reconciliation program for the open pit and underground operations.
- Implement a block model ore density estimation program using diamond drill data. Use this information to reconcile current estimated densities per lithology. Ensure density samples are dried per the assay sample drying procedures.
- Review ore resource and production grade capping programs.
- Review segregation and stockpiling requirements of higher-grade sulfide material for potential future recovery.

Open Pit Mining

- Review open pit mining practices for potential increased efficiencies.

Underground Mining

- Review underground productivities and complete additional benchmarking on similar underground operations to adopt the best procedures and methods to improve the efficiencies of the Los Filos Underground operations. Tonnes mined per man-shift seem lower than industry standards.
- Review underground equipment type, size, and application, and compare to design openings and duty. Jumbos and Scooptrams are too large for the narrower stopes and appear to be contributing to dilution because of mining wider than necessary to accommodate equipment.
- Review rockbolter jumbo and bolting practices. The booms are too long for some headings, which results in improperly applied bolts that are not perpendicular to the back. The rockbolter was observed being operated by two men, whereas one operator is normal.
- Review bolt type selection to determine whether the use of labor-intensive cement cartridges, boom length, and bolter type are all appropriate for the Mine.
- Continue to study mining alternatives to the use of unconsolidated rock from development for fill in the Cut-and-Fill stopes.
- Continue with the cemented rock fill experiment and plans for an underhand Cut-and-Fill experimental stope. A high-level study on paste fill is recommended based on existing reserves and the potential of the Bermejal Underground resources.
- Continue experiments with the mechanical breaker-miner for drift advance in soft oxide ore headings, which could replace Drill-and-Blast methods in some areas. Other mechanical equipment such as a roadheader should also be pursued on a test basis.
- Review ground support cycles, especially shotcreting methods. The total ground support cycle is the most restrictive and longest part of the underground mining cycle. A combination of underhand Cut-and-Fill plus cemented rock fill is expected to decrease cycle time and increase productivities.
- Conduct Hydrogeology studies on groundwater and review the need for installation of an underground pumping system.
- Continue with training programs to increase skills of unionized underground work force at Norte mine. The contractors at Sur mine are more productive on a tonnes-per-man-shift basis.

- Review productivity losses due to groundwater inflows and the need for installation of an underground pumping system.
- Review the current practice of mining the approximately 1 m thick clay footwall in the stopes. The clay increases mining dilution and lowers gold recovery by encapsulating ore on the leach pad.

Processing and Gold Recovery

- Complete a study on the crushing operation, including multiple handling, fines scalper, and modification of primary crusher feeder to accept direct truck dumping.
- Complete a study of the surface grizzly arrangement.
- Reduce multiple handling points at the crusher operation. From the open pits to the leach pad, the crush material is handled seven times, including loading, crushing, and transport. This excessive re-handling could be reduced by increasing conveyor capacity and extending the conveyor reach to Pad #2.
- Re-examine possible simple, low-cost measures for bypassing fines from the crusher. Crushing capacity could effectively be increased and more ROM would be crushed, resulting in higher extraction and recoveries from crushed material.
- Install proper agglomeration equipment capable of treating at least half of the crush or possibly handling all crush material. The current attempts at agglomeration using conveyor drop points are ineffective and may be wasting lime and cement. The potential for creating additional impermeable zones in the crush pads is a significant risk. Potential remedies to the poor agglomeration and cement use would focus on the installation of industry-standard drum agglomerating equipment coincidental with the location of cement, lime addition, and moisture control at the front-end of the conveyor train. Appropriate agglomeration equipment was installed at the start of the Los Filos mine in 2007; however, an underground surge bin accepting crusher discharge proved inoperable due to ore hang-up. The specific agglomeration equipment remains on site but only has half the capacity of the current crush ore production.
- Investigate the potential benefit of increased lime addition in crush and possibly in SLG. The pH of the PLS is too low (<9.5) and cyanide is being lost. With effectively no cyanide in the PLS, gold and silver can be adsorbed on mineral surfaces. The low pH and corresponding low alkalinity in the PLS may be addressed by the addition of additional lime, particularly to crush and agglomerated ore. This would be expected to reduce the loss of cyanide in the leach pads. The extra cost for lime could be expected to be compensated by less cyanide use, which is currently significant and accounts for approximately 60% of total processing costs.
- Reduce the calcium sulfate concentration in the PLS and leaching solution. A simple solution to the gypsum saturation challenge would be dilution by fresh water of the barren solution. However, to provide water inventory space, some excess pond water would need to be discharged to the surface water environment, following the necessary water characterization/treatment and permit approval. The presence of nitrite and nitrate might generate some permitting challenges in the consideration of direct discharge. An alternate solution could be the substitution of clean excess pond water for the significant volumes of fresh water currently being used for dust suppression on haul roads.

Environment, Water Management, and Social License

- Review the backup plan for supplying power in the case of an electrical system failure. The water supply system in Mezcala is currently powered by CFE with no backup system.
- Perform a complete site-wide water balance study using the storm water data to assess the capacity of the contingency ponds. It is recommended that the site-wide water balance be analyzed prior to the next rainy season to avoid emergency discharges.
- Study the storm return periods and calculate the maximum precipitation, climate scenarios, and results compared to the existing calculation of 100-year, 24-hour storm event. The Mine is in an area that receives short-duration, high-intensity storms.
- Continue to analyze security incidents on a frequent basis to identify trends and determine whether changes in security protocols are required.

- Continue sustainability programs in the community to help mitigate the impact of future mine closure or work force reductions.
- Finalize the geochemistry study already in progress to determine the long-term potential for metals leaching and the need for post-closure water management.

Operating and Capital Costs

- Review the operating cost reduction plan on a regular basis, (monthly, quarterly, and annually) to monitor operating cost reduction measures and adjust budgets and strategies accordingly.

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28.0 SIGNATURE PAGE

The undersigned prepared this Technical Report, titled *Amended NI 43-101 Technical Report and Preliminary Economic Assessment, Los Filos Gold Mine, Guerrero State, Mexico* with an Effective Date of 31 December 2016, in support of the public disclosure by Leagold Mining Corporation on the technical aspects of the Los Filos Gold Mine owned by DMSL, a wholly owned subsidiary of Goldcorp Inc. The format and content of the report are intended to conform to Form 43-101F1 of National Instrument 43-101 (NI 43-101) of the Canadian Securities Administrators.

Signed,

"William A. Glover", P.Eng. — 28 February 2017
Signature — *Date*

"Allan L. Schappert", CPG — 28 February 2017
Signature — *Date*

"Dawn H. Garcia, PG", CPG — 28 February 2017
Signature — *Date*

"Alfred S. Hayden", P.Eng. — 28 February 2017
Signature — *Date*

Glover Mining Services
William A. Glover, P.Eng.

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CERTIFICATE of AUTHOR

This Certificate of Author has been prepared to meet the requirements of National Instrument 43-101 Standards of Disclosure for Mineral Projects as published 09 May 2016, Part 8.1. This certificate applies to the "Amended NI 43-101 Technical Report and Preliminary Economic Assessment, Los Filos Gold Mine, Guerrero State, Mexico" herein referred to as the "Technical Report," dated 01 March 2017.

I, William A. Glover, hereby certify that:

a) I reside at 90 Lillico Road, Kenogami, PO Box 344, Swastika, Ontario P0K 1T0, Canada.

b) I am a graduate of Queens University in Kingston, Ontario, Canada with a Bachelor of Science, Mining Engineering (1972), and I have practiced my profession continuously since that time.

c) I am a member of the Canadian Institute of Mining, Metallurgy and Petroleum and am a Professional Engineer registered with Professional Engineers of Ontario (No. 16357014) authorized to practice professional engineering.

d) I am the President of 1593530 Ontario Limited (known as "Glover Mining Services") and am employed as a Senior Mining Engineer by Stantec Consulting International LLC, an engineering firm authorized to practice professional engineering by the State of Arizona Board of Technical Registration.

e) I am a qualified person for the purpose of NI 43-101 with regard to mining. I have worked as a mining engineer at operating mines and mining projects for 44 years since graduation. My relevant experience for the purpose of this Technical Report is:
   - I was responsible for Section 16.0 of the technical report for AsiaPhos Private Limited for initial listing on the Catalist Board of the Singapore Exchange Securities Trading Limited, including a site visit to Sichuan, China.
   - I was responsible for managing the North American Palladium Arctic Platinum Project Feasibility Study located in Northern Finland, including site visits.
   - I was responsible for managing portions of the INCO Limited Copper Cliff Deep Pre-Feasibility Study located in Sudbury, Ontario, Canada, including site visits and writing several mining sections.

f) I visited the Los Filos property once for 8 days between 12 and 20 December 2016.

g) I was solely responsible for Sections 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 15.0, 16.0, 18.0, 19.0, 21.0, 22.0, 23.0, 24.0, 25.0, 26.0, and 27.0 of the Technical Report and for contributing to portions of Section 28.0. I was also responsible for signing off on the entire report.

h) I am independent of Leagold Mining Corporation, Goldcorp Inc. and any of their associated or affiliated entities and the property that is the subject of the Technical Report, applying the definition of independence set out in Section 1.5 of NI 43-101.

i) Neither I, nor any affiliated entity of mine, is at present under an agreement, arrangement, or understanding or expects to become an insider, associate, affiliated entity, or employee of Leagold Mining Corporation, Goldcorp Inc. or any of their associated or affiliated entities or the property that is the subject of the Technical Report.

j) Neither I, nor any affiliated entity of mine, own—directly or indirectly—nor expect to receive any interest in the properties or securities of Leagold Mining Corporation, Goldcorp Inc. or any of their associated or affiliated companies or the property that is the subject of the Technical Report.

k) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding 3 years from Leagold Mining Corporation, Goldcorp Inc. or any of their associated or affiliated companies or the property that is the subject of the Technical Report.

l) I have not had prior involvement with the property that is the subject of the Technical Report.

m) I have read NI 43-101, NI 43-101CP, and Form 43-101F1 and have prepared the Technical Report in compliance with NI 43-101, NI 43-101CP, and Form 43-101F1. I have prepared the Technical Report in conformity with generally accepted Canadian mining industry practice, and as of the date of the certificate, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 1st day of March 2017.

"William A. Glover"
Signature
William A. Glover
Glover Mining Services

Stantec Consulting International LLC
Allan L. Schappert, CPG

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CERTIFICATE of AUTHOR

This Certificate of Author has been prepared to meet the requirements of National Instrument 43-101 Standards of Disclosure for Mineral Projects as published 09 May 2016, Part 8.1. This certificate applies to the "Amended NI 43-101 Technical Report and Preliminary Economic Assessment, Los Filos Gold Mine, Guerrero State, Mexico" herein referred to as the "Technical Report," dated 01 March 2017.

I, Allan L. Schappert, hereby certify that:

a) I reside at 711 South Sean Drive, Chandler, Arizona 85224, USA.

b) I am a graduate of Lakehead University in Thunder Bay, Ontario, Canada with a Bachelor of Science, Geology (1979), and I have practiced my profession continuously since that time. I am employed by Stantec Consulting International LLC as a Project Manager.

c) I am a Certified Professional Geologist registered with the American Institute of Professional Geologists (Membership No. CPG-11758). I am a registered member of the Society for Mining, Metallurgy & Exploration (Membership No. 4164071).

d) I am a qualified person for the purpose of NI 43-101 with regard to Geology and Resource Estimation. I have worked as a geologist for 37 years since graduation. As a mine and consulting geologist over the last 25 years I have worked on over 25 projects and mines, conducting mineral/resource estimation and other related studies. My recent and relevant experience for the purpose of this Technical Report is:
   - I assisted in preparation of the Sunshine Silver Mining Feasibility Study for the Los Gatos Mine located in Chihuahua, Mexico.
   - I was responsible for the Mineral Reserves and Mine design for the Silver Standard Mining Feasibility Study for the Pitarrilla Mine in Durango, Mexico.
   - I was responsible for the annual reserve update and reconciliation at Capstone Mining's Cozamin Mine in Zacatecas, Mexico.

e) I visited the Los Filos property once for 9 days between 12 and 21 December 2016.

f) I was solely responsible for Sections 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, and 14.0 of the Technical Report and for contributing to portions of Sections 1.0, 15.0, and 28.0.

g) I am independent of Leagold Mining Corporation, applying the definition of independence set out in Section 1.5 of NI 43-101.

h) I am independent of Leagold Mining Corporation, Goldcorp Inc. and any of their associated or affiliated entities and the property that is the subject of the Technical Report, applying the definition of independence set out in Section 1.5 of NI 43-101.

i) Neither I, nor any affiliated entity of mine, is at present under an agreement, arrangement, or understanding or expects to become an insider, associate, affiliated entity, or employee of Leagold Mining Corporation, Goldcorp Inc. or any of their associated or affiliated entities or the property that is the subject of the Technical Report.

j) Neither I, nor any affiliated entity of mine, own—directly or indirectly—nor expect to receive any interest in the properties or securities of Leagold Mining Corporation, Goldcorp Inc. or any of their associated or affiliated companies or the property that is the subject of the Technical Report.

k) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding 3 years from Leagold Mining Corporation, Goldcorp Inc. or any of their associated or affiliated companies or the property that is the subject of the Technical Report.

l) I have not had prior involvement with the property that is the subject of the Technical Report.

m) I have read NI 43-101, NI 43-101CP, and Form 43-101F1 and have prepared the Technical Report in compliance with NI 43-101, NI 43-101CP, and Form 43-101F1. I have prepared the Technical Report in conformity with generally accepted Canadian mining industry practice, and as of the date of the certificate, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 1st day of March 2017.

"Allan L. Schappert"
Signature
Allan L. Schappert
Stantec Consulting International LLC

Dawn Garcia, PG, CPG

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CERTIFICATE of AUTHOR

This Certificate of Author has been prepared to meet the requirements of National Instrument 43-101 Standards of Disclosure for Mineral Projects as published 09 May 2016, Part 8.1. This certificate applies to the "Amended NI 43-101 Technical Report and Preliminary Economic Assessment, Los Filos Gold Mine, Guerrero State, Mexico" herein referred to as the "Technical Report," dated 01 March 2017.

I, Dawn Garcia, hereby certify that:

a) I reside at 8261 East Placita del Oso, Tucson, Arizona 85750, USA.

b) I am a graduate from Bradley University in Peoria, Illinois, with a Bachelor of Art, Geological Sciences (1981) and from California State University with a Master of Sciences, Geology (Hydrogeology Emphasis) (1995). I have practiced my profession continuously since 1985. I am an independent consultant.

c) I am a licensed Professional Geologist in Arizona (License No. 26034), Alaska (License No. 610), and California (License No. 5425) and a Certified Professional Geologist registered with the American Institute of Professional Geologists (Membership No. CPG-8313). I am also a registered member of the Society for Mining, Metallurgy & Exploration (Membership No. 4135993).

d) I am a qualified person for the purpose of NI 43-101 with regards to Environmental, Permitting, Social, and water-related aspects. I have worked as an environmental Geologist and Hydrogeologist for 32 years since graduation. My relevant experience for the purpose of this Technical Report is:
   - Acted as the Qualified Person for the Environmental, Permitting, and Social sections for 8 NI 43-101-compliant technical reports and more than 15 detailed environmental and permitting reviews, including sites located in Mexico.
   - Conducted environmental, socio-economic, or water-related tasks for over 30 mineral development, mineral processing, and mining operations in Mexico. I have also carried out geologic and hydrogeologic studies for environmental projects at over 50 projects in other countries.
   - I was responsible for Section 20.0 of the Newstrike PEA for the Ana Paula project located in Guerrero, Mexico.
   - I was responsible for Section 20.0 of the Minas de Oro Technical Report for the Los Mulatos mine located in Sonora, Mexico.
   - I was responsible for Section 20.0 of the Timmins Gold PEA for the Ana Paula project located in Guerrero, Mexico.
   - I was responsible for Section 20.0 of the McEwen Technical Report for the El Gallo Phase II project located in Sinaloa, Mexico.

e) I visited the Los Filos property once for 2 days between 20 and 21 December 2016.

f) I was solely responsible for Section 20.0 of the Technical Report and for contributing to portions of Sections 1.0, 4.0, 5.0, 16.0, 18.0, and 28.0.

g) I am independent of Leagold Mining Corporation, Goldcorp Inc. and any of their associated or affiliated entities and the property that is the subject of the Technical Report, applying the definition of independence set out in Section 1.5 of NI 43-101.

h) Neither I, nor any affiliated entity of mine, is at present under an agreement, arrangement, or understanding or expects to become an insider, associate, affiliated entity, or employee of Leagold Mining Corporation, Goldcorp Inc. or any of their associated or affiliated entities or the property that is the subject of the Technical Report.

i) Neither I, nor any affiliated entity of mine, own—directly or indirectly—nor expect to receive any interest in the properties or securities of Leagold Mining Corporation, Goldcorp Inc. or any of their associated or affiliated companies or the property that is the subject of the Technical Report.

j) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding 3 years from Leagold Mining Corporation, Goldcorp Inc. or any of their associated or affiliated companies or the property that is the subject of the Technical Report.

k) I have not had prior involvement with the property that is the subject of the Technical Report.

l) I have read NI 43-101, NI 43-101CP, and Form 43-101F1 and have prepared the Technical Report in compliance with NI 43-101, NI 43-101CP, and Form 43-101F1. I have prepared the Technical Report in conformity with generally accepted Canadian mining industry practice, and as of the date of the certificate, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 1st day of March 2017.

"Dawn H. Garcia"
Signature
Dawn Garcia

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CERTIFICATE of AUTHOR

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I, Alfred S. Hayden, hereby certify that:

a) I reside at 284 Rushbrook Drive, Newmarket, Ontario L3X 2C9, Canada.

b) I am a graduate of the University of British Columbia in Vancouver, British Columbia, with a Bachelor of Applied Science, Metallurgical Engineering (1967), and I have practiced my profession continuously since that time.

c) I am a member of the Canadian Institute of Mining, Metallurgy and Petroleum as well as a Professional Engineer and Designated Consulting Engineer registered with Professional Engineers Ontario (No. 18898015).

d) I am the President of EHA Engineering Ltd., a consulting metallurgical engineering firm, which has been authorized to practice professional engineering by the Association of Professional Engineers of Ontario (PEO) since 1990. I am an Associate Metallurgical Engineer with Stantec Consulting International LLC, an engineering firm authorized to practice professional engineering by the State of Arizona Board of Technical Registration.

e) I am a qualified person for the purpose of NI 43-101 with regard to mineral processing and hydrometallurgy. I have worked as an engineer for 49 years since graduation. My relevant experience for the purpose of this Technical Report is:

- Estimation/confirmation of capital and operating costs, assessment of metallurgical status, and contract metallurgical laboratory capabilities for a heap leach project in Kazakhstan.
- Assistance with the design, procurement, and start-up of a 40,000 tonne pilot heap in Canada.
- Metallurgical evaluations and cost estimating for a proposed heap leach operation, incorporating a number of small gold deposits in Mexico.

f) I have not visited the Los Filos property. An EHA Engineering Ltd. associate with over 40 years in the industry and a Master of Science, Metallurgical Engineering visited site on my behalf for 2 days from December 20 and 21 December 2016 and he has acted under my supervision.

g) I was solely responsible for Sections 13.0 and 17.0 of the Technical Report and for contributing to portions of Sections 1.0 and 28.0.

h) I am independent of Leagold Mining Corporation, Goldcorp Inc. and any of their associated or affiliated entities and the property that is the subject of the Technical Report, applying the definition of independence set out in Section 1.5 of NI 43-101.

i) Neither I, nor any affiliated entity of mine, is at present under an agreement, arrangement, or understanding or expects to become an insider, associate, affiliated entity, or employee of Leagold Mining Corporation, Goldcorp Inc. or any of their associated or affiliated entities or the property that is the subject of the Technical Report.

j) Neither I, nor any affiliated entity of mine, own—directly or indirectly—nor expect to receive any interest in the properties or securities of Leagold Mining Corporation, Goldcorp Inc. or any of their associated or affiliated companies or the property that is the subject of the Technical Report.

k) Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding 3 years from Leagold Mining Corporation, Goldcorp Inc. or any of their associated or affiliated companies or the property that is the subject of the Technical Report.

l) I have not had prior involvement with the property that is the subject of the Technical Report.

m) I have read NI 43-101, NI 43-101CP, and Form 43-101F1 and have prepared the Technical Report in compliance with NI 43-101, NI 43-101CP, and Form 43-101F1. I have prepared the Technical Report in conformity with generally accepted Canadian mining industry practice, and as of the date of the certificate, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 1st day of March 2017.

"Alfred S. Hayden"
Signature
Alfred S. Hayden
EHA Engineering Ltd.